MUDDYING THE WATERS:
THE FAILURE OF WATER RESTORATION BUREAUCRACIES IN KANSAS

by

TERRIE A. BECERRA

B.G.S., University of Kansas, 1978
M.S., Kansas State University, 2005

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Sociology, Anthropology, and Social Work
College of Arts and Sciences

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2010

Abstract

In the almost 40 years since the passage of the Clean Water Act and 25 years of regulating nonpoint source pollution, and despite countless state and local community projects focused on water quality issues, clean water goals have not been met. To comprehend this failure and understand how water resources are governed and how water quality goals are pursued, I explore how watershed-level governance structures emerged and function in their specific local environment, within the state hierarchy of water governance, and as implementation of state and national policy. To this end, the structure, process, and outcomes of two newly organized and local watershed-level governance structures in Kansas were examined. An actor-oriented political ecology approach informed by environmental governance and watershed management literature was used to guide the study. Attaining water quality goals necessitates recognizing the connections between the political economy of agriculture, the cultural factors acting upon agricultural producers, and the natural, biophysical environment. Thusly, a comparative case study strategy was employed for the overall research design. Documents and interview transcripts were analyzed employing a grounded theory approach for differences and similarities; they were also sorted into topical categories and coded for common themes. The research questions focused on the agency and capacity of local watershed structures to determine the relations regarding water resource use in their watershed. Central questions addressed structure responsiveness to local versus state or national concerns; the underlying interests reflected by community member participation; and the effectiveness of local water-governance in protecting water resources. Governance models that began with holistic, alternative, participatory strategies are evolving into targeted, problem-solution strategies, and what began as watershed management is becoming problemshed management.

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In the almost 40 years since the passage of the Clean Water Act and 25 years of regulating nonpoint source pollution, and despite countless state and local community projects focused on water quality issues, clean water goals have not been met. To comprehend this failure and understand how water resources are governed and how water quality goals are pursued, I explore how watershed-level governance structures emerged and function in their specific local environment, within the state hierarchy of water governance, and as implementation of state and national policy. To this end, the structure, process, and outcomes of two newly organized and local watershed-level governance structures in Kansas were examined. An actor-oriented political ecology approach informed by environmental governance and watershed management literature was used to guide the study. Attaining water quality goals necessitates recognizing the connections between the political economy of agriculture, the cultural factors acting upon agricultural producers, and the natural, biophysical environment. Thusly, a comparative case study strategy was employed for the overall research design. Documents and interview transcripts were analyzed employing a grounded theory approach for differences and similarities; they were also sorted into topical categories and coded for common themes. The research questions focused on the agency and capacity of local watershed structures to determine the relations regarding water resource use in their watershed. Central questions addressed structure responsiveness to local versus state or national concerns; the underlying interests reflected by community member participation; and the effectiveness of local water-governance in protecting water resources. Governance models that began with holistic, alternative, participatory strategies are evolving into targeted, problem-solution strategies, and what began as watershed management is becoming problemshed management.

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List of Acronyms

BMPs – Best Management Practices

CLW – Cheney Lake Watershed

CLWI – Cheney Lake Watershed, Inc.

CLWQP – Cheney Lake Watershed Water Quality Project ()

CMC – Citizen's Management Committee

DCP – Direct and Counter-Cyclical Program

EPA – Environmental Protection Agency

EQIP – Environmental Quality Incentive Program]

GMD – Groundwater Management District

GREM - grass-roots ecosystem management

KAWS – Kansas Alliance for Wetlands and Streams

KDHE – Kansas Department of Health and Environment

KNRC – Kansas Natural Resource Council

KVHA – Kaw Valley Heritage Alliance

MOU – Memorandum of Understanding

NPS – nonpoint source

NRCS – Natural Resource Conservation Service

SCC – State Conservation Commission

SLT – stakeholder leadership team

TMDL – Total Maximum Daily Load

USDA – US Department of Agriculture

USGS – US Geological Survey

UWW – Upper Wakarusa Watershed

WRAPS – Watershed Restoration and Protection Strategy

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I would also like to recognize the social science component of the CEAP research, led by Dr. Theresa L. Selfa, which was the source for background information on Cheney Lake Watershed. Working on this project also afforded access to key informants in the watershed.

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Numerous others are due gratitude as well, including Dr. Frank Weyher, Dr. Nadia Shapkina, Albert Iaroi, Laura Logan, and especially Uma Sarmistha.

Dedication

I would like to dedicate this work to the women who planted this seed: Dr. Torry Dickinson, Dr. Bonnie Nelson, and Dr. Jacqueline Spears. And those who helped nurture it to fruition: Bonnie Bressers; Dr. Kristina Boone; and my daughters, Megan and Moriah.

Chapter 1 – Introduction

As human populations grow and strive to improve their quality of life and their communities, they demand an increasing supply of clean, fresh water. Greater demand increases competition for domestic water supplies, agriculture, industry, recreation and ecosystem needs, and power generation. This increased competition among various users increases the potential for conflict. Water scarcity, declining water quality, demand for increased access to water, climate change, and drought are all indicators of the growing saliency of water quality and quantity concerns worldwide. Although water quantity and quality are global concerns at all geographic scales, ultimately water issues are personal and local, embedding in and giving rise to local, state, and federal powers and organizations. In addition, socio-cultural factors play a significant role in the formation of governing institutions.

In the almost 40 years since the passage of the Clean Water Act, the United States continues to endure water quality issues that affect human and environmental health and quality of life. Why have the mandates of this law not been met? This study takes place at the watershed level and examines water governance structures that have arisen to address water quality within the context of agricultural watersheds. Farming practices and associated soil erosion from both wind and water generally are recognized as affecting water quality and quantity. Local watersheds incorporate diverse land use practices, streams and rivers, water supply reservoirs as well as governance and regulation by local, state, and national level agencies and organizations. They are also influenced by state and national economic and political structures. My use of the term "local" refers to the drainage basin for the specific water body or portion of river or stream of concern and to residents living within the drainage basin involved as stakeholders.

Interest in water quantity and quality issues has recently returned to the public arena at global, national, and local levels. In the United States, the 2007 drought in the Southeast provoked court battles over rights to Lake Lanier, northeast of Atlanta, Georgia, as a water supply. The U.S. Government Accountability Office expects 36 states to be experiencing water shortages by 2013 (Gies 2010). In addition to water scarcity, the lack of progress in meeting the mandates of the Clean Water Act as well as resistance to comply with the clean water legislation also have recently received media coverage. In 2009, the *New York Times* (Duhigg 2009)

printed a series on the failure of the Clean Water Act to ensure clean water for Americans. The *Times* collected water pollution records through Freedom of Information Act requests to every state and to the Environmental Protection Agency (EPA). The newspaper compiled a national database of water pollution violations, which the *Times* asserts is more comprehensive than databases maintained by states or the EPA. The *Times* research shows that ten percent of Americans have been exposed to drinking water that either contains dangerous chemicals or fails other federal health standards. Moreover, an estimated 19.5 million Americans are made sick each year by contaminated drinking water. In addition, tap water in farm-states such as Illinois, Kansas, Missouri, and Indiana has contained pesticides at concentrations that some scientists have linked to birth defects and fertility problems (Duhigg 2009).

The media coverage continued in 2010 with reports on two major Supreme Court rulings that created a level of uncertainty sufficient to prompt some businesses and companies to declare that the Clean Water Act no longer applies to them and that judicial districts are using different interpretations of the decisions in their rulings. Language in the Clean Water Act refers to "navigable waters." Until these recent rulings, the Supreme Court has always interpreted the language broadly to include all of the country's water bodies, including intermittent streams, wetlands, and tributaries to major rivers (Murchison 2005). The two recent decisions indicate that lakes unconnected to rivers, small tributaries, and waterways that do not cross state lines may not be considered navigable, and if not, then the Clean Water Act does not cover them. Lawyers for the EPA are now avoiding cases in which proving jurisdiction of the law is too difficult. The *Times* story quotes an EPA report that "About 117 million Americans get their drinking water from sources fed by waters that are vulnerable to exclusion from the Clean Water Act" (Duhigg and Roberts 2010). Lisa Jackson, EPA administrator, acknowledged in a *New York Times* interview that not only does the water in the United States not meet public health goals, but that "enforcement of water pollution laws is unacceptably low" (Duhigg 2009:par14).

The U.S. Supreme Court has long recognized federal control of the nation's navigable water, which it defined in broad terms. Although federal pollution control legislation was not written until the twentieth century, the Rivers and Harbors Act of 1899, known as the Refuse Act, laid the groundwork for shaping the later legislation. The Refuse Act prohibited the discharge of refuse into navigable waters or their tributaries and made it punishable with fines and imprisonment. The U.S. Government assumed the control of surface water pollution in

1948. Since then its role evolved from one of research and financial support to one of legislating standards and permit requirements and to establishing a mandate to achieve quality. Although the EPA became responsible for the quality of the nation's water with the passage of the Clean Water Act in 1972, Congress constrained the effectiveness of the agency by not providing the necessary monetary resources to carry out its responsibilities. While the Clean Water Act was considered breakthrough legislation for addressing industrial or point source discharges into water bodies, it did not affect agricultural producers or nonpoint sources. Nonpoint sources of pollution are those originating from multiple diffuse sources such as sediment and chemicals in runoff from agricultural fields rather than a single identifiable source. The EPA lacked the authority to force states to establish controls on nonpoint sources, and the states lacked the political will to enact controls without a federal mandate.

Almost another decade passed before revisions were made in 1987 that addressed toxic pollutants, pollution from nonpoint sources, and storm water discharges (Murchison 2005). In addition, Congress expanded the EPA's ability to enforce the statute. Congress made "expeditious" control of pollution from nonpoint sources a "national policy" and directed states to make another effort to address problems stemming from nonpoint sources. However, it did not mandate management programs to include regulatory limits on nonpoint sources and it did not give EPA enough authority to ensure compliance (Murchison 2005). Litigation in the 1990s was the stimulus for the preparation of Total Maximum Daily Load (TMDL) limits. A Total Maximum Daily Load is the maximum amount of a pollutant that a water body can receive and still meet water quality standards. Environmental groups increasingly turned to the courts to expedite states' preparation of controls on nonpoint sources.

Control of nonpoint sources has now been part of the water quality law for nearly 25 years. The National Water Quality Inventory Report to Congress (U.S. EPA Office of Water 2009) shows that for the 2004 reporting cycle, assessments of the nation's water bodies had only been completed on 16 percent of rivers, 39 percent of lakes, and 29 percent of estuaries. Of the bodies assessed, 44 percent of rivers, 64 percent of lakes, and 30 percent of estuaries are impaired. The report also cites agricultural activity as the top source of impairment in the nation's assessed rivers and streams. The report identifies agriculture as affecting 94,182 miles of rivers and streams. Similarly, the report ranked agriculture as the third top source of impairments affecting 1,670,513 acres of water in the nation's assessed lakes, ponds, and

reservoirs (U.S. EPA Office of Water 2009). The report defines agricultural activity as crop production, grazing, and animal feeding operations.

There has been a long-standing reluctance by federal policy makers to enforce or regulate agricultural related conservation measures in the United States. This voluntary approach is in keeping with the historical legacy that agricultural resource conservation is properly achieved through voluntary farmer compliance and the logic of farmers' long-term economic interests rather than through regulation (Batie 1986). The historic dust storms of the 1930s firmly established the relationship between agricultural land use practices and soil and water conservation. Recognizing the need for soil and water conservation, the 1937 Standard Soil Conservation District Model Law prescribed strict land use regulations, although the soil conservation districts chose not to implement them (Batie 1986). Agricultural conservation efforts since then have been approached on a voluntary basis rather than a regulatory one. Similarly, agricultural nonpoint sources also have been addressed through voluntary measures. Historically, family farming has been a powerful political symbol, and regulating farmers in the same way as corporate polluters has been politically unacceptable. Thus, the federal government has been reluctant to do so (Buttel 1987).

Conflict between agricultural interests and water quality proponents arose with public awareness of the environmental degradation that can result from farming practices and with the increased competition over water sources that accompanied water demands for quality of life uses. The rise of the environmental movement signaled resistance to the control and commoditization of land and water. The conflict between farm and non-farm segments pushed farmers to protect themselves from non-farm rural neighbors' complaints and ultimately from possible restrictive legislation (Hays 1987). Agricultural producer and industry groups had maintained close connections within the U.S. Department of Agriculture (USDA), which enabled them to influence the department's policies. The greatest concern regarding farming practices was farm chemicals, and environmental activists tried to restrict their use. The USDA controlled farm chemical regulation until the 1970s when the pesticide control program became the responsibility of the EPA. Retaliation by farm groups succeeded in limiting the effectiveness of the EPA with the inclusion of a requirement that the EPA consult with an advisory committee when it formulated pesticide regulations. The advisory committee included strong representation from farm groups who advocated farming interests. The conflict over chemical controls then

went to the states. Environmentalists and non-farm groups again tried to move regulation out of agricultural departments but state farm organizations and the farm chemical industry stopped such action (Hays 1987).

The structure of property rights plays an important role in determining the way a society organizes natural resources for production. Traditionally, U.S. farmers or landowners have always held implicit user rights to their own property (Batie 1986). An unencumbered property rights structure that permits landowners to care for their land as they see fit combined with an appropriative water right creates tension between the economic goals of agricultural producers and the quality of life benefits for the public good. In the 1970s, scholars wrote about the decreased availability of water and land resources that resulted from increased demand as water and land use plans were implemented. The decrease in land and water resources caused concern from agriculture regarding the definition and enforcement of their rights to water and land as agricultural inputs (Anderson and Hill, 1986).

To some, taking a voluntary, albeit agriculture-friendly, approach to addressing water quality seems to be inconsistent with achieving nonpoint source goals. Lynch (2005) questions whether agriculture, as currently practiced, can restore and maintain healthy soil and water resources. If not, then Lynch further questions agriculture's drive toward maximum production; he postulates an industry paradigm shift to producing at optimum levels that would allow restoration and maintenance of water and soil resources rather than continuing with a paradigm that controls or manages degradation.

The fiscal crisis in the 1980s and 1990s led to increased decentralization and decreased federal responsibility with state and local governments taking up government responsibilities. Although some recent statutory changes demonstrate the reluctance of the federal government to impose strong policy mandates in environmental and water pollution policy, the federal government has retained control of point source pollution with states providing the administration of federal policy. The devolutionary trend of federal policy became increasingly apparent in water governance as states and local government agencies assumed responsibility for meeting the requirements of nonpoint source pollution. Statutes addressing nonpoint source pollution were designed as part of a federal grant structure in which states have the discretion to work either within an EPA review process or within grant-related requirements, or they can create their own nonpoint source policies (Hoornbeek 2005). While much work on water

resource issues has concentrated on the biophysical aspects, more recent work focuses on social aspects shaping water use and management, e.g., attitudes, beliefs, values, and community participation in decision-making. Place-based, participatory decision making, which has a long history, experienced revitalization in the 1980s and 1990s. Several types of participatory structures emerged in the 1980s to address water resource governance. These structures brought together stakeholders who would collaboratively manage water resources in a more egalitarian manner as an alternative to traditional agency-driven water resource management (Leach and Pelkey 2001; Parisi et al. 2004; Sabatier et al. 2005; Morton 2008).

Additionally, in the last few decades, broader communities of interest have expressed a claim to water resources and sometimes to participating in the decision-making process governing them. While some herald the democratic nature of participatory governing as being closer to those being governed, others question its effectiveness. Criticism of such governance includes the limited capacity of local communities. In addition, critics question whether it is decision-making authority or the responsibility of implementation that is devolving (Dewees, Lobao, and Swanson 2003; Winter 2006). Recognizing whether the new water governance structures are traditional or alternative is necessary for decision-makers to render the structures effective.

In this study, I examine the structure, process, and outcomes of local watershed-level governance structures. I ask whether the structures that have arisen to address water quality within agricultural watersheds have the political capacity, i.e., the decision-making authority, to identify water quality issues for themselves in addition to state identified TMDL impairments. Do they have the financial and other necessary resources to make a positive impact on water quality for the water resources of the state? What success have they achieved and what success do they expect? How do locally led watershed governance structures that are closely affiliated with agricultural agencies create change in traditional agriculture practice?

Kansas incorporates many characteristics that make it an ideal place to study local water governance structures related to agriculture. The degree of environmentalism and the prominence of an ecological perspective vary across the United States. These attitudes came late to the Plains states where farming remains predominant and environmental action is limited. The critical issue in these states is water supply, and the limit of the water supply initially resulted in less water dedicated to supporting wildlife habitat, water ecosystems, wetlands, and water for

hunting and fishing areas, etc. Not only is agriculture still a vital component of the Kansas economy, farming interests remain politically strong, and the Kansas Department of Agriculture houses the state's primary water authority. The water quality restoration and protection process that Kansas adopted to meet TMDL requirements is based on a model of voluntary action taken by local landowners. In addition, the state's geographic and climatic variability resulted in social, cultural, and political variability across the watersheds.

To answer these questions regarding local watershed-level governance structures, I compare the local structures in two watersheds: Cheney Lake and Upper Wakarusa (Clinton Lake). These two watersheds are located in different climatic areas of the state and in different river basins. The Upper Wakarusa watershed is within the eastern humid portion of the state, while Cheney Lake Watershed is within the High Plains and extends across both semi-arid and more humid microclimates. The difference in biophysical landscape may have contributed to cultural variation, particularly regarding attitudes toward water and the politicization of each area. I will examine the resultant local water governance structures for their decision-making authority and agency, and their representation of an alternative to traditional top-down government involvement in local-level watershed management. While both watersheds have the same types of governance organizations with similar processes, their approaches appear to have taken dissimilar paths, as may their accomplishments.

As local watershed-level governance structures organize to address water quality concerns, questions arise regarding their grassroots nature and their political capacity to address water quality issues. The research questions posed in this study are:

RQ1: To what extent do local water-governance structures determine water resource issues and exhibit decision-making authority, agency, and capacity within their individual watersheds?

RQ 2: To what extent do local water-governance structures reflect local concerns versus Kansas- or national-policy concerns?

RQ 3: What interests or concerns are reflected through community member participation in local water-governance structures?

RQ 4: How effective are local water-governance structures in protecting water resources? Are land and water concerns integrated within ecological boundaries of a watershed

to achieve both local and state water quality goals? To what extent do they contribute to or hinder the attainment of local state water quality goals?

With increasing demand for access to water, understanding how water is managed is of increasing importance. Soil and water conservation, agriculture, politics, and culture are inter-connected. Attaining water quality goals will require recognizing those inter-connections and taking into account the relationships among the political economy of agriculture, the cultural factors acting upon agricultural producers, and the biophysical environment. An examination of water-governance structures and the social-cultural factors that affect such governance provides the opportunity for greater understanding of structural influences and a clearer understanding of local actor agency and resistance, along with other actor-oriented forces at work that both promote and constrain achieving water quality goals.

Overview of Chapters

This dissertation is organized with an introductory chapter followed by a background chapter (Chapter 2). The background chapter presents the biophysical and historical context of Kansas and the study sites. The literature review and methods follow in chapters three and four, respectively. Chapters five and six present the two case studies—Cheney Lake Watershed and the Upper Wakarusa Watershed. Chapter seven presents the comparative analysis of the two case studies, discussion, and conclusions.

Chapter 2, the background chapter, provides information regarding the biophysical environment of Kansas and the study sites. It also includes a description of the people who settled in Kansas and why. Although lengthy, the chapter is broken into thematic sections. A section on the early settlement of the state follows the biophysical description. Although these people and their descendants have inhabited Kansas for only 150 years, the circumstances that brought them to Kansas and their socio-cultural practices—their farming practices and attitudes toward nature and its appropriate use—set in motion the human-landscape interactions that shaped their own lives but also continue to influence those interactions today. This chapter describes the formation of attitudes and dispositions toward water resource use. The law was the fundamental method Kansas used to mold their landscape. A review of Kansas water law provides background and historical context. Water law has tended to follow social and cultural change, and as socio-cultural change brought about increased environmentalism, state law

reflected the tension of that change. Sections on conservation and environmentalism demonstrate that despite this cultural change, economic issues continued to drive public policy. This chapter moderates the functional view of governing agencies and organization by putting some focus on the cultural and historical development of the study areas.

The literature review (Chapter 3) begins with a discussion of political ecology, which I found useful in providing an overall framework for the research. A political ecology framework holds the concepts of environmental governance and watershed management that have been used in water governance as well as the social, biophysical environment, and conservation factors that are included in a holistic examination of local water governance. A political ecology framework permits exploration of political, institutional, and cultural components.

With its roots in developing countries, political ecology has been closely associated with primary production and issues of access, property rights, and justice. Given that association, scholars have debated the applicability of political ecology to issues in industrialized nations (McCarthy 2002, 2005; Robbins 2002; Schroeder 2005; Wainwright 2005; Walker 2003). McCarthy (2005) in his work on the Wise Use Movement; Vandergeest, Flaherty, and Miller (1999) in their work on shrimp aquaculture in Thailand; and others have demonstrated its appropriateness. Their discussions make connections between key components of political ecology—the use of an actor-oriented approach, politicization of environments, cultural relationships, and identity—and how they apply to the case studies. These connections offer insights regarding not only why new local governance structures arose, but also why the particular type of structure arose. They also may account for differences despite their similar processes.

Environmental governance is a second area of literature I draw on to understand and explain the local governance structures that have emerged in the study watersheds. Governance and governance structures have changed in the last three decades. Traditional natural resource governance, characterized as a top-down hierarchy with command and control type regulations, has undergone change with the trend being toward diffused decision-making and increased participation from civil society. This literature provides the socio-cultural context for the new governance structures and their development. A third area of literature, watershed management, characterizes the advantages and disadvantages encountered by using a local watershed as a management unit. Watershed management is one of the endpoints in changing environmental

governance and the devolutionary trend of water resource management and reflects the management unit that is emerging to address nonpoint sources of water pollution.

The methods chapter (Chapter 4) describes and discusses the research design and method of analysis. Drawing on literature from Ragin (1987), Stake (1995), and Yin (1981, 2002), the chapter begins with the rationale for using a case study strategy. Methods are presented for both data gathering within each case study and for comparative analysis of both cases.

Chapters 5 and 6 present the case studies of Cheney Lake and the Upper Wakarusa watersheds. The case studies begin with biophysical descriptions of the study sites that are more specific than what is presented in chapter 2 and follows with the origins of the watershed governance structures that subsequently arose. An historical narrative provides specific social context for the eventual organization of each governance structure. The case studies discuss the role of the new structures—how they fit into the state water plan and work with existing agencies. Cultural and political characteristics within the watersheds are linked to the governance structures. Chapter 7's discussion will compare the two case studies and make the connections between water governance structures as formal institutions and the cultural context in which they are expected to function. How can institutions and governing structures that are charged with promoting agricultural productivity have the contradictory responsibility of solving the conservation problems that agricultural production creates?

The next chapter begins our understanding of the two case study watersheds by presenting background information on the biophysical setting, social history, and water legislation in Kansas. The relations between the biophysical landscape, society, and local and national political economic forces describe the formation of attitudes and dispositions, or politicization that defines how each watershed approaches water resource governance.

Chapter 2 – Background

Physical Landscape of Kansas

Understanding water governance in Kansas is reliant on an understanding of both the environmental and socio-political history of Kansas. The biophysical environment does not solely determine human society; there is a reciprocal relationship between human societies and the biophysical space they occupy (Trentelman and Coons 2009; Middendorf et al. 2008). The intersection between the biophysical and the social has created unique circumstances within Kansas.

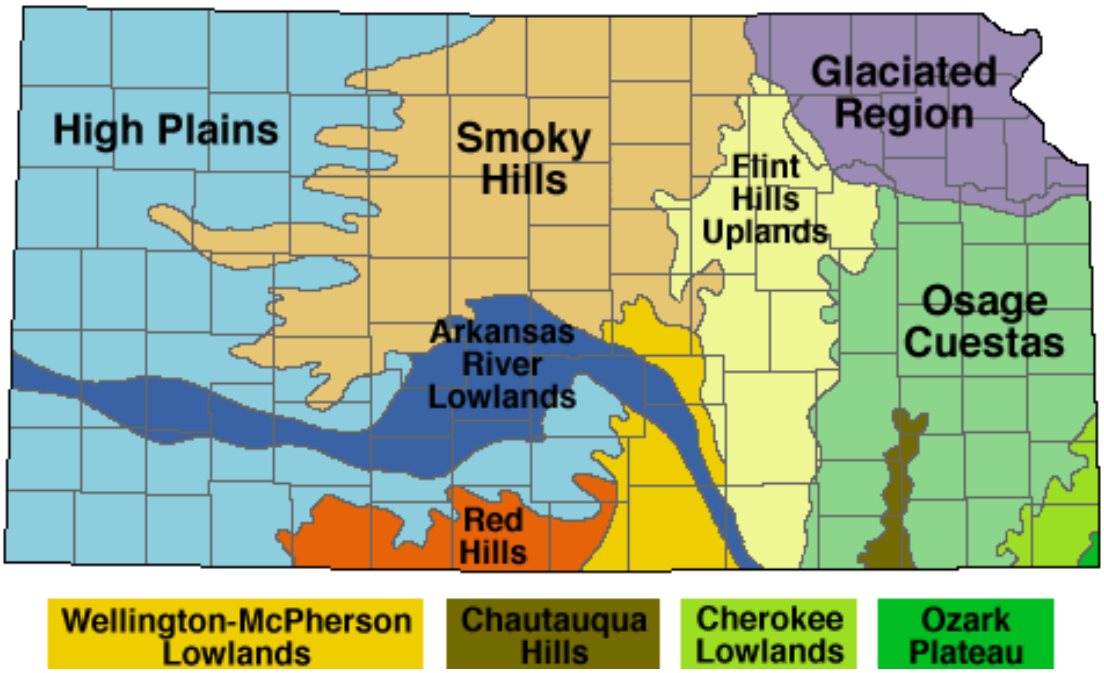
Kansas lies in the center of the continental United States and in the heart of the prairie regions once known as the Great American Desert. Its location imparts both great climatic and geophysical variability. The east-west expanse of Kansas is nearly 411 miles, a distance such that the sun rises and sets 30 minutes later on its western line than its eastern one (State of Kansas 2009). The elevation of the state rises from its lowest point of 679 feet in the southeast corner of the state to its highest elevation of 4,039 feet at one point on the Kansas-Colorado state line (State of Kansas 2009). Kansas gets most of its moisture from the Gulf of Mexico, which comes north in an almost direct line to the eastern part of the state (Iseley and Richard 1953, Abmeyer 1970). The eastern portion of the state may receive as much as 40 inches of rain annually. Rainfall amounts decline steadily across the state to the west, with the western portions receiving as little as 0-16 inches annually.

Kansas has 12 physiographic regions (Figure 2.1). The eastern portion of the state is an ecotone, where the eastern deciduous forest transitions to the tallgrass prairie (Figure 2.2). The northeast corner is a region of loess and glacial drift hills. However, most of eastern Kansas south of the Kansas River—beginning with western Wabaunsee, southern Shawnee, and most of Douglas and Johnson counties—is the Osage Cuestas region. The Upper Wakarusa watershed lies in this region. A series of east-facing ridges lying between gently sloping plains characterizes this region (Kansas Geological Survey 2005). These rolling hills are covered with transitional vegetation primarily of bluestem grasses and perennial streams with riparian forests of oak and hickory; upland forests dominated by shagbark and bitternut hickory; red, white, and black oak; and with Ohio buckeye, American bladderpod, and pawpaw as common understory

trees (Chapman et al. 2001; Kansas Geological Survey 2005; Clark 1979). The Flint Hills of east-central Kansas, which contain the largest remaining contiguous tract of tallgrass prairie in North America (Middendorf, Becerra, and Cline 2009; Knapp and Seastedt 1998), separates Kansas' rolling tallgrass prairie from the mixed and short grasses prairies of the high plains. West of the Flint Hills, from north to south, are the Smoky Hills, the Arkansas River Lowlands, and—bordering Oklahoma—the Red Hills. The High Plains cover most of the western third of Kansas and a portion known as the Great Bend Sand Prairie that reaches eastward to encompass most of Pratt, Kingman, and Reno counties between the Arkansas River Lowlands and the Red Hills (Chapman et al. 2001). The North Fork Ninnescah River or Cheney Lake watershed is mostly located in the Great Bend Sand Prairie; a small portion just above the lake lies in the Wellington-McPherson Lowlands. The High Plains are mostly flatlands with some gently rolling hills.

Another important division in the state is that of the 98th or 100th longitudinal meridians, both of which are used to demarcate the humid east from the arid west. West of the 98th meridian precipitation levels decline, the tall-and mixed-grasses give way to short grasses, rivers and streams become intermittent, and trees become increasingly scarce, while east of the meridian river flow is generally perennial and annual precipitation is about 30 inches.

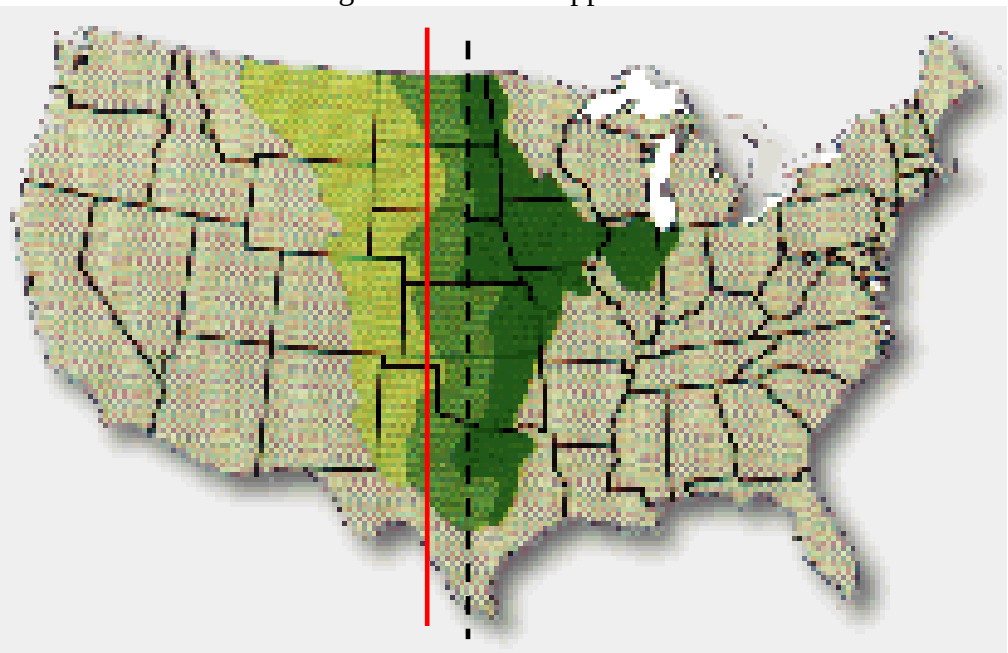
Figure 2.1 – Generalized Physiographic Map of Kansas.



Source**:** Kansas Geological Survey, www.kgs.ku.edu/Physio/physio.html**.**

Figure 2.2 – Prairie Regions: East to west, tallgrass, mixed grass and short-grass prairie.

The solid red line on the left indicates the approximate location of the 100th meridian. The broken white line on the right indicates the approximate location of the 98th meridian.

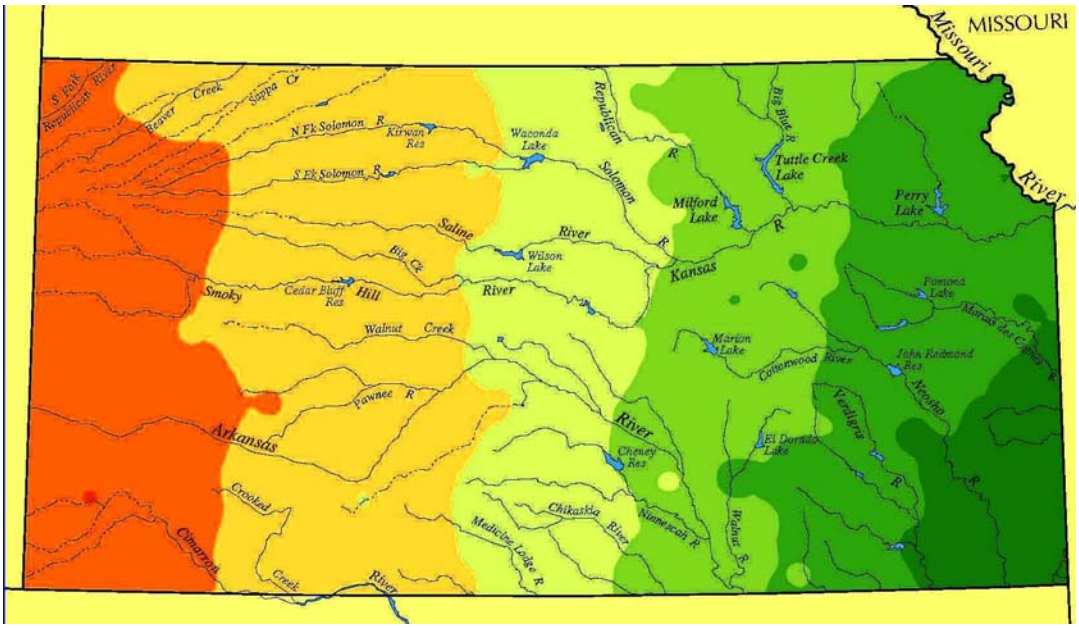


Source: National Park Service, U.S. Department of Interior.

In addition to multiple physiographic regions, Kansas also exhibits seven precipitation zones, although an annual precipitation map shows twice that variability (Figures 2.4 and 2.5). Kansas lies completely within the Mississippi River Valley, but within its boundaries, the state recognizes 12 smaller river basins as important. The Kansas and Arkansas River valleys dominate the water drainage of the state. These two river valleys essentially divide the state in half, north from south (Figure 2.6). The northern and east-central area of Kansas falls within the Missouri River Valley, which flows from the north and defines the northeast boundary of the state down to Kansas City where the Kansas River, coming from the west, joins it. The Kansas River, only 185 miles long, has the fifteenth largest drainage in the United State and is the largest tributary to the Missouri River from Kansas (Iseley and Richard 1953; Sherow 2004). The Kansas River supplies much of the domestic water demand for the cities of Topeka and Lawrence and the suburbs of Kansas City in Johnson County (Sherow 2004). The southern portion of the state falls within the Arkansas River Valley, which flows eastward from the Rocky Mountains of Colorado until it turns to the south at Great Bend and flows into Oklahoma.

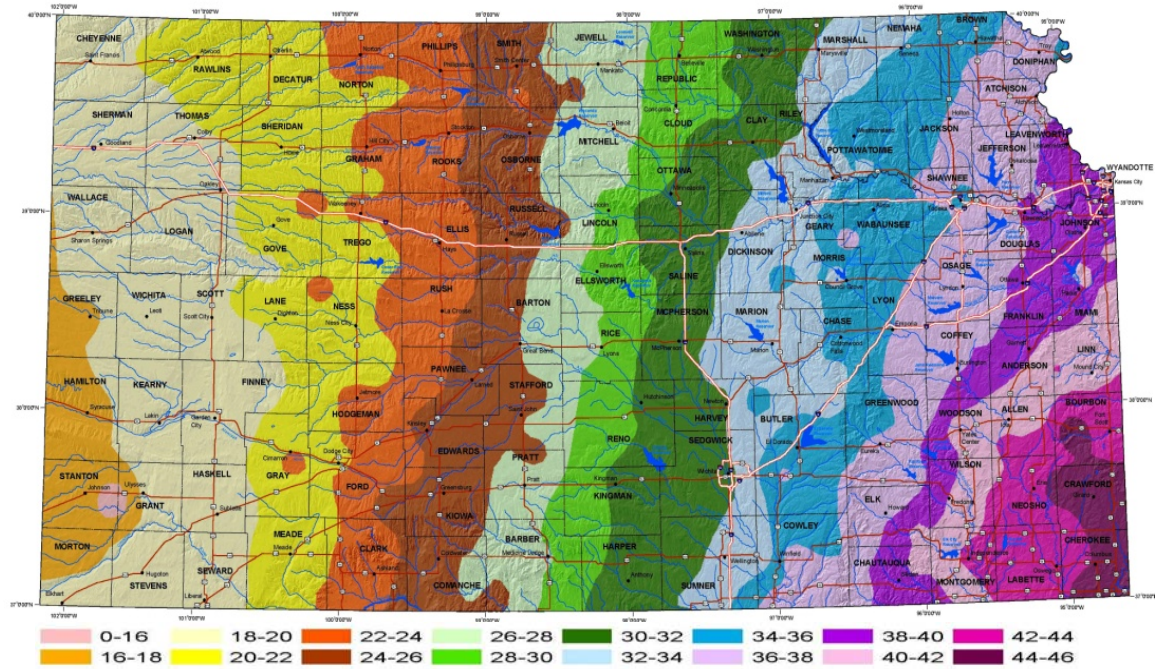
Several of Kansas' rivers contribute to the flow of the Arkansas, and both the Arkansas and the Missouri eventually join the Mississippi River.

Figure 2.3 – Precipitation zones in Kansas



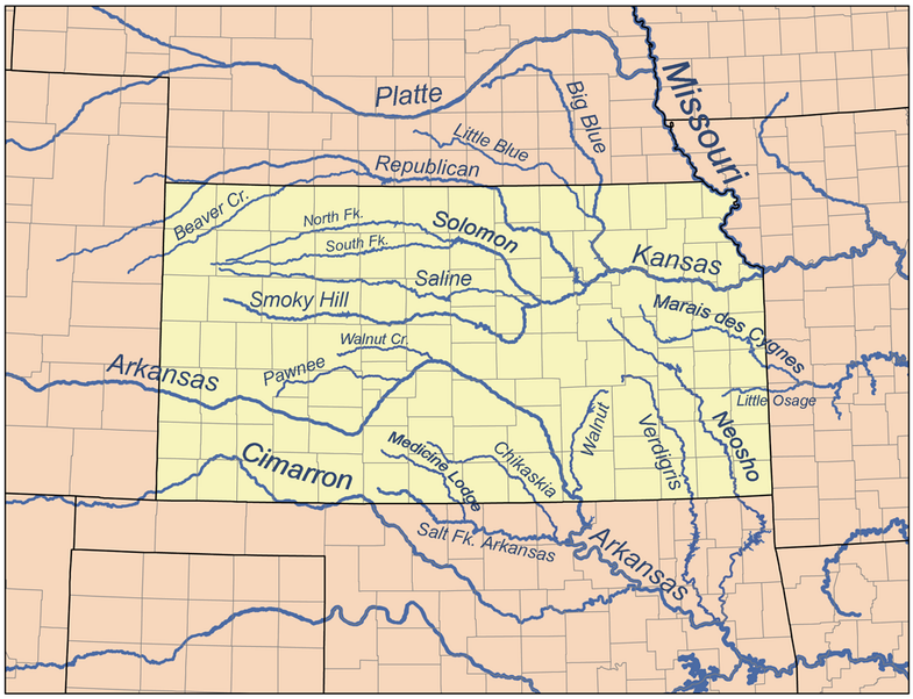
Source: U.S. Geological Survey, The National Atlas of the U.S.

Figure 2.4 – Kansas Average Annual Precipitation 1971-2000 (inches per year)



Source: NRCS, 2007, Resource Conservation Staff - Salina, KS

Figure 2.5 – Major Rivers of Kansas



Source: Geology.Com, http://geology.com/state-map/kansas.shtml, Kansas Map Collection

The physiographic differences in the state contributed to different practices among the people who settled Kansas. As those who settled in the semi-arid portion of the state west of the 98th meridian became familiar with the biophysical environment, they modified their farming practices to accommodate water scarcity, or its constant threat. Having access or sufficient access to water played a significant role in decisions affecting their livelihoods. By contrast, those who settled in the eastern humid portion of the state had sufficient rainfall and water in their rivers and streams, so availability of water was not a concern, except when too much rain created flood conditions. The biophysical differences resulted in differences in social organization. Water scarcity called for management of water resources, which resulted in a more cooperative social structure.

Kansas Settlement and Early Water Policy

Kansans' populist roots, anti-government attitude, and utilitarian outlook toward the natural, biophysical environment can be understood in terms of who settled in the territory and how settlement occurred. Those who were to become Kansans came from diverse origins, but they were attracted to this place for similar political reasons; more importantly, they sought the

opportunity to prosper. Rapid settlement coupled with periodic multiple-year droughts contributed to high turnover among settlers. Settlers came with no knowledge of the variable climate. There was no historical memory to help newcomers cope in the new state. Drought caused many settlers to leave after just a few years.

The Kansas-Nebraska Act of 1854 established Kansas as a U.S. territory, which set into motion the bitter slavery dispute along with the in-migration that led to statehood in 1861. The Homestead Act, The Pacific Railroad Act, and the Morrill Acts of 1862 all contributed to settlement and agricultural transformation of the western territories and states, including Kansas. The railroad companies saw the advantage of selling land directly to farmers and they sent agents to Europe to advertise the land (Miner 2002). They sweetened the deal for emigrants by offering extremely low rates on transportation for both settlers and their household goods. In 1874 Kansas passed legislation that exempted from service in the military all members of any religious group whose creed opposed bearing of arms (Miner 2002; Pantle 1945). Kansas became an ideological symbol for freedom that acted as a pull factor for many politically or economically marginalized groups and individuals. Famine and crop failures in 1868 and 1869 led to a Scandinavian migration. In addition to the draw of the Homestead Act, some Europeans saw the United States in general and Kansas in particular as a refuge from military oppression. Political turmoil in France and an obligation to serve in the German Army pushed many Volga Russians and Mennonites from the Volga region to immigrate to Kansas (Miner 2002).

Before Kansas opened for settlement, hunting was the primary occupation in the region. With the opening of the territory and the arrival of settlers, hunting gave way to farming. The first settlers to Kansas claimed land east of the 98th meridian. Of the approximately 100,000 that came to Kansas between 1855 and 1860, 99 percent settled east of that line (Middendorf et al. 2008; Irvine 1997). Settlers coming west to Kansas found mostly grassland while the land they had left to the east was mostly forest. Being unfamiliar with prairie grasslands, the earliest settlers chose land in timbered areas where walnut and cottonwood trees provided building materials and fuel (Iseley and Richard 1953). They also established towns along watercourses to be able to take advantage of the waterpower for grist and flourmills. They sometimes built dams to increase the efficiency of water flowing through their mills.

The new settlers found turning the prairie grasslands into a familiar type of farmland was hard work. Farmers brought with them the seed and farming practices they had used on their

farms in the East. They soon learned that farming east of the Flint Hills was similar to what it was in states they had come from. The crops they had grown in Missouri, Illinois, Ohio, and Pennsylvania also grew well in eastern Kansas. Kansas settlers were primarily concerned with building homes and prosperous communities, as were state leaders. While still engaged in the Civil War in 1864, the Kansas Governor in his annual message spoke of the need to promote immigration into the state if prosperity was to be ensured. Likewise, the succeeding governor also pressured the state legislature for appropriations to cover the expense of hiring an immigration agent.

Kansans living in the eastern portion of the state understood the differences between living there and living in the western portion. The transition from tallgrass to short grass prairie marked a change in climate and a change in native subsistence economies. The High Plains of western Kansas had very little agriculture and very few locations were permanently inhabited. As settlers traveled west of the Flint Hills, trees were increasingly scarce. Crops grew only in rainfall-favorable years (Iseley and Richard 1953). In the drought of 1860, many crops failed because farmers did not know the climate, and the crops they planted were ill suited to the region (Iseley and Richard 1953). Kansas' population remained concentrated in the eastern portion of the state well into the 1880s, although by then irrigation was enticing more Kansans to farm in the western portion.

Kansas newspapers and state records of the time show a prevailing concern for growth and prosperity. Business owners and the railroad companies in Kansas worked to attract more settlers and business to the state. In order to attract people to the state, Kansans had to dispel the myth that the state was a desert. They did so by promoting the landscape of eastern Kansas and promoting the use of the riparian doctrine to protect property rights and ensure that landowners received undiminished flow from rivers and streams (Irvine 1997).

By the riparian doctrine, land that had water flow through or by it had an attached right to use the water. The riparian doctrine also established that the act of using water made the presence of water a property right. Two components of the riparian doctrine were significant. First, landowners with a watercourse flowing through their property were protected from having upstream users diminish either the quality or the quantity of the water flowing past their property. This protection of quantity and quality were also the only restrictions landowners faced regarding water use (Irvine 1997; Sherow 2002).

The alternative water law doctrine was prior appropriation. Prior appropriation allowed an individual to claim water on a first come basis regardless of the claimant's location on the waterway, and it allowed the user or holder of the water right to withdraw and transport water to use it wherever the holder chose. The first person to use a waterway held senior rights; later users held junior rights in the order that they arrived and put the water to use (Irvine 1997).

Kansans deliberately modeled the state constitution after the U.S. and Ohio constitutions in an effort to reaffirm in Kansas the mandate of the national constitution to protect citizens' property and their pursuit of economic gain (Irvine 1997; Sherow 2002). Laws enacted by the state legislature reflected the emphasis on riparian doctrine, and immigrants moved into the state claiming land east to west, going no farther west than was necessary to find land (Irvine 1997). The riparian doctrine held that landowners with a watercourse flowing past their property were protected from having upstream users diminish either the quality or the quantity of the water flowing past their property.

Because the settlement pattern was primarily from east to west, the differences between eastern and western Kansas water needs seemed to be a non-issue at the time. However, the differences became an issue within 20 years of statehood and created a controversy regarding the nature of Kansas water law that continued for 60 years. Kansas settlers worked to remake their new homes on their new land in ways that were familiar to them and to recreate institutions and social practices (Irvine 1997). The desire to be successful, or profitable, was one attribute that settlers all across the state had in common and one of their common practices was controlling water.

Western Kansans adopts irrigation, calls for appropriation begin

In their efforts to recreate the familiar, settlers and immigrants turned to technical solutions to remake the western Kansas landscape. Primarily they worked to bring more water to the land. Irrigation was the most practical solution, which was neither a new concept nor new technology. Despite the problems of early irrigation companies, farmers in western Kansas soon learned that irrigation could make farming profitable. They also quickly realized the riparian doctrine and its mandate that water usage could not diminish the quantity of water for downstream users impeded their ability to use irrigation (Irvine 1997). Kansas farmers turned to irrigation, which was labor and capital intensive, only after more familiar dry land agriculture

failed. Many farmers who had recently come to western Kansas left. In addition to a dearth of rainfall, farmers in western Kansas no longer had water from the Arkansas River. Irrigators in Colorado had developed the Arkansas to the point of appropriating most of the river's flow (Irvine 1997).

By 1890, farmers in central and eastern Kansas were also experimenting with irrigation in hopes of increasing their profitability. The turn to irrigation in the western portion of the state contributed to the establishment of social structures and cultural practices different from what had arisen in the eastern part of the state. Water development and irrigation contributed to the intensification of agriculture, which in turn contributed to creating a divided rural class structure. Irrigation supported the accumulation of large tracts of land into the hands of fewer landowners and consequently to dispossess smaller landholders (Worster 1985).

Settlement of western Kansas began in earnest in the 1870s, which coincided with a cycle of average and above average precipitation, and farmers grew successful crops. Farmers were too new to the area to have knowledge or memory of the region's precipitation or climatic cycles. When faced with the possibility of a second crop failure in 1879, a farmer who had experience with irrigation decided to try irrigating. His crop was a success, and other farmers in and out of Kansas who had observed the success of irrigation were soon following suit (Smythe 1970; Sherow 1990).

Not only did farmers in western Kansas begin using water from rivers and streams for irrigation, they also began calling for a change in water rights and water law that fit their climate and landscape, and for the technology that made farming profitable. Western farmers were few in number and lacked the political power to get the state water law rewritten. However, by 1886, enough people came together to collectively advocate for appropriative rights that they managed some change. The state courts and legislature responded with the passage of the 1886 Irrigation Statutes, which initiated a limited form of prior appropriation water rights for the region (Irvine 1997; Sherow 2002). At the same time, state courts began applying a standard of reasonable use for deciding water disputes.

The 1886 Irrigation Statutes authorized the diversion of water from a running stream for irrigation purposes, and that the first person to do so would have first rights. Furthermore, the law authorized that water could be diverted from streambeds, basins, and channels of watercourses lying west of the 99th meridian for irrigation and other industrial purposes

(Windscheffel 1954). This was the first time that Kansas lawmakers established water rights for irrigation according to the doctrine of prior appropriation (Irvine 1997). With prior appropriation, water is regarded as public property, giving individuals the right to use some portion of stream flow for a legally recognized beneficial use (Sherow 2002). The statutes also made Kansas' water a commodity by allowing individuals to buy and sell water rights separately from the land (Irvine 1997). More importantly, the irrigation statutes made irrigating more attractive.

By 1891, the legislature recognized the importance of irrigation and supported it by passing further legislation that made irrigation the second priority use in the state. Water use priorities were set as domestic, irrigation, and industrial use. The legislature further supported irrigation by creating a Board of Irrigation in 1895. The Board of Irrigation was to search for the best irrigation methods and equipment. It also was charged with investigating both the use of groundwater for irrigation on the uplands of western Kansas, and with investigating pump technology. Significantly, the 1895 Act required the Irrigation Board to disseminate its findings to farmers, which further encouraged irrigation. The potential to increase crop yields with irrigation was becoming widely known. The spread of this knowledge enabled irrigation farmers as well as ditch and canal companies to gain the legislative strength they needed to realize success (Irvine 1997).

Irrigated farming in Kansas may have begun west of the 99th meridian, but farmers to the east were soon making use of the practice as well. Farmers were irrigating in central and eastern Kansas by 1898 (Irvine 1997). Along with political endorsement, other social and economic factors arose to push Kansans to support appropriation. Demand for water grew the state's urban centers. Urban growth called for secure, dependable water rights. Increased consumption began to threaten existing supplies. Deep-well technology made accessible water sources that were previously unavailable. Despite the advances made by irrigation advocates, there still was not a statewide commitment to irrigation or to prior appropriation in Kansas by the end of the nineteenth century. The proportion of Kansas farmers using or trying to use irrigation remained small. Kansas irrigators joined with irrigators in western states calling for federal assistance with irrigation programs. The federal response was the passage of the 1902 Reclamation Act, which sanctioned the federal government's involvement in developing irrigation programs (Worster 1985).

East vs. West and Riparian Doctrine vs. Prior Appropriation

After the 1860s, Kansas' rivers remained important as a power source. The riparian doctrine also continued to meet farmers' needs. The Kansas Supreme Court had affirmed the riparian doctrine in 1877 as the presiding water law in Kansas. The decision in *Shamleffer v. Council Grove Peerless Milling Co.* (1877) affirmed that water rights were attached to the land, which made them a property right. This decision established the legal relationship between water and land that stood as a precedent for almost 75 years. Future courts did not want to contest the decision because it would amount to taking property, and "the importance Americans invested in the sanctity of property ownership guaranteed that any attempt to change the state's water law would face staunch opposition" (Irvine 1997). The Kansas Supreme Court further clarified groundwater rights when the court ruled that groundwater belongs to the landowner as much as the land does and is available for use at the owner's discretion. Between 1886 and 1946, the Kansas Supreme Court upheld the riparian doctrine as the primary water law in Kansas, although it did moderate its interpretation by initiating a standard of reasonable use in deciding water disputes (Irvine 1997).

In addition to patterns of land and resource use, settlers also brought with them ideas of acceptable social behavior and rules of law. Coming from eastern states, settlers were familiar with riparian doctrine, and the territorial legislature formally adopted this law to preclude conflict with the U.S. Constitution. The Kansas constitution made limited mention of water and did not establish how it was to be governed. The only specific references to water were in regards to draining swamplands and prohibiting state involvement with infrastructure improvements such as building dams, developing municipal water supplies, and irrigation schemes (Irvine 1997). The void in the constitution left water policy to emerge from citizens' social and economic needs and dictates of the landscape.

As most Kansas settlers lived in the humid, well-watered, eastern portion of the state between the Missouri River and the Flint Hills, they found water most useful left in the riverbeds and channels for use in transportation and powering mills, and streams and rivers served as a food source as well as a waste disposal system. In-stream flow was important to industry. A button industry arose from the harvesting of freshwater mussels. Extractive industries such as this one required constant stream flow and clean water, which was the kind of protection that the riparian doctrine offered (Sherow 2002). Those that settled in the High Plains, where rivers were

not perennial and where rainfall was less, found that water was more valuable out of the streambeds and used for irrigation (Irvine 1997).

Debate through the courts

Three Kansas Supreme Court cases established the riparian doctrine for guiding Kansas water development. The common element in these three decisions was that the justices based their decisions on the protection of the economic potential of water use, and they used the riparian doctrine to implement this interpretation of the law (Sherow 2002). Two important components came from the decisions. The first was that although the legislature could insert prior appropriation into existing water law, riparian doctrine would retain priority. The second component was that although "reasonable use" was a new interpretation of the law, the courts could use prior appropriation reasoning because it enabled them to consider local conditions and let reasonable use vary with location (Irvine 1997).

Following the decisions that established the riparian doctrine as guiding law for water development, Kansas sued Colorado. In *Kansas v. Colorado (1907)*, Kansas alleged that Colorado was illegally depleting the Arkansas River. Kansas asked the court to either direct Colorado irrigators to leave a specified flow in the river for use in Kansas or for the court to establish a required flow. The Supreme Court ruled that since Kansas was not suffering economic harm Colorado did not owe Kansas a specific amount of water, and Colorado irrigators could continue their water use. The more important result of the lawsuit was that the court established a "rule of equity" by examining the amount of water being used and its impact (Irvine 1997; Sherow 2002).

The Kansas-Colorado decision called attention to the differences between eastern and western Kansas and the water law people in each region believe they needed. These court cases also illustrated a consensus among the parties involved regarding the appropriate use of water on the land—economic benefit. Increased support for irrigation emerged because of the continued promise of greater profitability and significantly, because the Kansas Secretary of Agriculture expressed support for irrigation (Irvine 1997; Sherow 2002).

In 1917, the Kansas Supreme Court reaffirmed that reasonable use was an acceptable modifier of the riparian doctrine. The court found in favor of a railroad's need for water for its engines at the expense of an upstream riparian owner who used the water for mills. The Kansas

Supreme Court again upheld the riparian doctrine in 1938 (Irvine 1997). The controversy between the riparian doctrine and prior appropriation would continue in the courts until Kansas passed a prior appropriation law in 1945.

Social factors supporting prior appropriation

Coming out of the nineteenth century, eastern Kansas had enough water to meet the needs of farmers and municipalities; however, as the state moved into the twentieth century demand grew and water became a scarce resource. Towns and cities were growing, as was their demand for a reliable water source. Increasing numbers of farmers in eastern Kansas wanted to adopt irrigation practices while at the same time there was a declining need for waterpower and the use of rivers for transportation (Irvine 1997). By the 1930s, Kansans statewide had an economic desire to take water out of its streambeds. Increasing numbers of Kansans thought the answer lay in prior appropriation.

In the 1910s and 1920s, some cities found they needed to go farther from their local area to find water sources. In its recurring search for an adequate water supply, Wichita eventually began using the Equus Beds, which created conflict with area farmers who had been accustomed to high water tables due to the aquifer. By 1944, almost 400 cities in Kansas provided municipal water supplies by taking water from streams or from groundwater and they were all interested in having a secure water right (Irvine 1997). The municipal need for water eventually became the trigger for changing the state's water law (Gattin 1991, Irvine 1997).

An increased demand for feed grains, forages, and beef occurred between 1900 and 1920. The outbreak of World War I further called for increased exports of wheat and beef, which drove demand even higher (Middendorf et al. 2008). The primary response to the call for increased agricultural production during this time was to farm more land (Worster 2003; Middendorf et al. 2008). The increased demand pushed an increase in land prices and a corresponding increase in the equity and borrowing capacity for farmers and ranchers, which incentivized Kansas farmers to increase their productivity, and this increase was accomplished with irrigation.

Kansas courts also became involved in the drive for increasing economic activity in the state. In a case that pitted railroad against mill, the court sided with the railroad and the rationale of reasonable use. The court understood that rail transportation was vital to Kansas farmers and

millers if they were to be able to take advantage of high market prices. The railroad was the link to the rest of the world, and more importantly the international markets (Middendorf et al. 2009).

The federal government gave irrigation a boost during the Depression with water projects intended to boost the farm economy (Sherow 2004). The greatest boost came with the Pick-Sloane Plan following the 1927 Mississippi River flood. The plan included building numerous flood control dams throughout the Missouri River Valley and controlling the flow of the Kansas River and its tributaries (Sherow 2004). Another flood event of the Missouri River in 1943 contributed additional incentive for the Corps to control the Missouri River (Sherow 2004). Some opposition to dam building in the Kansas River tributaries was successful until the floods of 1951. Following 1951, flood control advocates overcame all opposition. The Blue River was dammed and the inundation of valley left a legacy of deep distrust of the government (Sherow 2004).

In 1943, a lawsuit brought before the Kansas Supreme Court (*Peterson v. Board of Agriculture 1944*) forced lawmakers to address how Kansas managed water and to examine its water law (Irvine 1997). The decision supported the primacy of the riparian doctrine, affirmed that the right to use groundwater was a property right without exception, and ruled that the Division of Water Resources had no statutory authorization to be concerned with the use of groundwater (Irvine 1997). The language of the decision cited case law and made no mention of the state constitution. From this language, prior appropriation advocates realized changing the law would not require a constitutional amendment.

1945 Water Appropriation Act

For 80 years, the riparian doctrine and the standard of reasonable use kept some water in Kansas' watercourses and facilitated access to water by as many landowners as possible (Irvine 1997). The 1945 Water Appropriation Act stood in stark contrast to the riparian policy. The Kansas Supreme Court had supported "reasonable use" as a way to both resolve water disputes and protect property rights until 1945.

In response to a resolution from the State Board of Agriculture, the governor, in favor of a new water law, appointed the Governor's Committee on Appropriation. The chief engineer led the committee that was to study water use in Kansas, make recommendations, and write a new law that would allow maximum development and use of Kansas' water resources (Irvine 1997).

The legislature passed the Water Appropriation Act in 1945. With the new law, "beneficial use" replaced "reasonable use." The new water law also authorized complete removal of all water from the state's watercourses (Irvine 1997). Rather than facilitating access to as many landowners as possible, the law served to limit access to holders of junior water rights. The provision for full appropriation encouraged financial investment in the state and facilitated state and federal development. Appropriation ensured more secure and absolute rights to water. This meant Kansas farmers could irrigate for increased production and that irrigators and municipalities could pursue water federal engineering projects for flood control systems and federal reservoirs. The new law made economic gain the highest priority for water use. It also defined water as a commodity and that failure to make use of it amounted to waste. Specifically the law stated that an appropriation right would be terminated when an appropriator discontinued beneficial use for three years (Irvine 1997). The law established the water in the state as state property; permits to use water did not grant ownership.

Dissatisfaction with the Water Appropriation Act

Satisfaction with the change in the state water law did not last long. Intensified water use in one place caused a shortage in another. Opposition arose from concerns regarding the loss of equity in water usage and primarily the loss of riparian rights in the form of diminished stream flow, depleted wells, and lowered water tables, resulting in loss of sub-irrigation (Gattin 1995, Sherow and Socolofsky 1995, Irvine 1997).

In 1954, residents in Meade County complained that irrigators were withdrawing too much water and were depleting their wells. The citizens of Meade County did not prevail. Maintaining their well levels would have meant zero depletion, which ran counter to the idea of complete development (Irvine 1997). Municipalities statewide added their voices to those of individuals expressing concern about irrigators withdrawing too much water and the effects of that withdrawal had on water supplies. Concerns were not confined to groundwater. In 1956, the citizens of Halstead complained about irrigators depleting the Little Arkansas River. In calling for action to prevent streams from going dry, Halstead in effect was calling for limits and controls on irrigation and a change in the law to ensure municipal water supplies (Irvine 1997). Further dissatisfaction with the law surrounded actions taken to manage the state's water,

including Army Corps of Engineers projects to control the Missouri River and flooding on its tributaries.

Managing the state's water

The 1945 water law shaped Kansans' perceptions of water and its relationship to the land. As a resource that could be bought and sold, water became a commodity, and water and watercourses represented profits. More to the point, the new law created a strong government authority over the state's water through the Board of Agriculture and the Division of Water Resources. While the Water Resources Board was promoting planning and research, the Kansas Supreme Court was again affirming the Water Appropriation Act in *Williams v. City of Wichita* (1962). One of the dissenting justices argued that the state had no right to regulate, allocate, or distribute water. Coming almost 20 years after passage, this judicial test demonstrates the lack of consensus among Kansans about how much state management was needed (Irvine 1997).

Kansas' populist roots nurtured a long-lived preference for local control and despite their support for a state water plan, that sentiment remained strong. In order to keep as many water decisions as possible at the local level, the state sanctioned numerous water districts. By the time the first state water plan went into effect, Kansas had rural water districts, irrigation districts, groundwater management districts, and numerous water advisory boards (Irvine 1997). The numerous institutions with responsibilities for water development, along with competition among water users, water interest, and political groups greatly hindered the implementation of a statewide water plan (Sherow and Socolofsky 1995).

The first state water plan set agricultural interests against urban and environmental interests. The water plan was intended to facilitate, through the Water Resources Board, participation as a partner in federal projects. The cost of the plan and an ensuing controversy regarding its funding source pitted agricultural interests against urban and environmental interests. The Water Resources Board intended funding for the water plan to come primarily from water use fees and farm chemicals. Only supplemental funding was to come from general fund revenues. The funding provisions met stiff resistance from the state's powerful farm groups who successfully lobbied against the assessments. As of the mid-1960s, urban representatives outnumbered rural representatives, and the two groups addressed the issue in the legislature. Urban representatives questioned the ability of the Division of Water Resources to direct water

development for all Kansans and not just advance the interests of farmers. The long dominance of rural and agricultural political power began to give way to urban interests (Sherow and Socolofsky1995).

Although Kansas had officially embraced environmental health and controlling pollution as part of its goals for managing water resources, by the mid-1960s, water use continued as it had. The Kansas Legislative Council's committee on agriculture and livestock held that local control was of the utmost importance and that the decision to form a groundwater management district must come from the local people; each district must have the authority to limit water use and act on problems the local people identified (Irvine 1997). The legislators who voted in favor of establishing groundwater management districts stated one reason for doing so was to preserve the right of "local users to determine their destiny …" (Irvine 1997:256).

Water quality issues unfortunately arose from the very activities driving the state's economy. Livestock feedlots had located in the state because of cheap, irrigated feed crops. Feedlot waste was responsible for 57 fish kills in the state between 1963 and 1967 (Prophet 1967). Such events pushed Kansas toward pollution regulation and abatement. Public meetings revealed that while Kansans wanted action, they were opposed to legal requirements. A subcommittee determined that the people wanted to streamline the water rights application process, retain local control, limit irrigation growth, enforce uniform limitations, implement non-compulsory conservation practices, and for the state to provide legal and technical support (Irvine 1997).

By 1980, agriculture as an industry had begun to lose political power in the state and with it the power to dictate public water policy. In 1985, the 12 Water Basin Advisory Commissions were criticized for not having urban members. Cities like Wichita and Hays complained that they were excluded from making recommendations regarding water rights because they were not represented in the state's water management hierarchy. Many Kansans began to argue that every citizen had a stake in water use policies (Irvine 1997). Environmentalism in Kansas took hold and public opinion made a fundamental shift away from the efficient use of resources and toward preserving them. This shift put many traditional uses of water in the state under scrutiny.

By 1990 there were 11 state agencies overseeing 70 different programs, all with varying responsibilities for the use, quality, and protection of water (Sherow and Socolofsky1995). The Water Resources Board was replaced by the Kansas Water Authority in 1981.

Conservation, Environmentalism, and Recreational Use

The introduction of farming to Kansas first as a territory and then as a state brought on an immediate degradation of water quality due to soil erosion from cultivating bottom-lands closest to streams. By 1926, the Kansas Fish and Game Commission was attributing the loss of nearly all natural spawning beds for fish in Kansas streams to farmland cultivation and stream sedimentation (Angelo 1998). By this time as well, nearly two dozen fish species and other stream fauna, including freshwater mussels, had been reported to have experienced greatly reduced range and numbers. The discovery of oil in Augusta in 1914 and a few years later in El Dorado also contributed to water quality degradation. Salt water was extracted along with the oil and at first was discharged onto the land or into nearby streams. The brine contaminated groundwater, the Walnut River, and its tributaries. At first, the problem received little attention as workers, businesspeople, and landowners were all profiting from the oil boom. However, freshwater mussels were harvested for making mother-of-pearl buttons. Freshwater mussels are an indicator species, the "canary in the coal mine" for water quality. Mussels require clean water and a natural and sustained flow. The oil and brine from the oil fields killed the mussels. A story in the August 6, 1920, Iola *Register* reported that button company workers were anxious for the river to be watched closely by local authorities and argued that if state law was not adequate to protect the river then the Chamber of Commerce should work to amend it so that it does protect water quality (Angelo 1998). Such public outcries of concern contributed to the passage of a law in 1927 that gave the State Board of Health the authority to regulate discharges of sewage and industrial waste for the explicit goal of protecting aquatic life.

Soil Conservation Service

Following the droughts of the 1930s, soil scientists from the state agricultural colleges in Kansas, Oklahoma, Colorado, and New Mexico persuaded the federal government to establish farms to demonstrate conservation farming, farming practices suited to little rainfall. Experiment stations were established in both the High Plains and in eastern Kansas. Experiments to develop better farming practices had begun in 1929 at Fort Hays State College (Iseley and Richard 1953). The federal government created the Soil Conservation Service in 1935, largely in response to the Dust Bowl, to stop and prevent soil erosion. Soil Conservation Service experts mapped soil types and offered farmers guidance on farming practices and crops appropriate for the different

parts of their farm. The Kansas legislature passed a law in 1937 allowing the organization of local soil conservation districts. In the 1950s, the Soil Conservation Service objective changed from one of preventing soil erosion to one of developing farmland and water resources for efficient resource use and production (Hays 1987).

Similar to soil conservation, fish and game management came about in the 1930s as a means to protect what was regarded as another renewable resource. Fishing advocates saw the biophysical environment—water, forest, land—as habitat rather than as commodities. In addition, the concern for wildlife and the loss of species gave rise to wildlife conservation. Game and fowl hunters were instrumental in establishing national parks as wildlife refuges, prohibiting hunting in national parks, limiting the bag limits on birds, and in protecting resting and nesting habitat for waterfowl. Fish and game management also underwent transformation in the 1950s as hunting and fishing became more popular and accessible to more people. Management objectives turned to controlling hunting pressures, which contributed to making wildlife conservation a highly controlled system of resource use and development (Hays 1987).

The Conservation movement of the late nineteenth century touched central Kansas by way of Cheyenne Bottoms, an ephemeral wetland area located in Barton and Rush Counties (in the tier of counties north of Cheney Lake Watershed). Although Cheyenne Bottoms had become a valued hunting area and an important local industry, wetland or swampland areas in Kansas, for the most part, were viewed as areas to be drained to be made suitable for agriculture. Farmer groups and conservation groups of the time expressed conflicting ideas for how the area was to be used—the farmers advocated drainage and agricultural production, and the conservation groups advocated protection and a national game refuge.

The nineteenth century Conservation movement had two components. One component advocated wise use of natural resources, which included responsible hunting of wildlife; the other advocated preservation of nature for its own sake. Out of this movement came organizations like the American Game Protective Association, the Izaak Walton League, and the Audubon Society. The American Game Protective Association began advocating for a game preserve by 1920. The organization's support for hunting grounds reflected a board of directors largely composed of weapons and ammunition companies' employees (Harvey 2001). The Izaak Walton League, which became the voice of the conservation movement, promoted the great outdoors, and the Audubon Society focused on saving habitat and protecting birds from illegal

hunting. Hunters in Kansas viewed these conservation groups as meddlers from the east. Eventually, however, Kansas responded with improved conservation laws and bag limits on the number of birds hunters could take (Harvey 2001). The Kansas legislature, in 1925, created a commission of forestry, fish, and game, which two years later became the Kansas Forestry, Fish, and Game Department. Although the commission had no enforcement power, it could use surplus revenue collected from hunting licenses to acquire land suitable for state parks (Stene 1946).

Plans for draining Cheyenne Bottoms originated thirty years earlier, but did not become a real possibility until August 1927 when a fourteen-inch rain fell in a few hours to create a 64,000-acre lake overnight (Harvey 2001). Area farmers formed a drainage district and proposed building a canal below the bottoms that would connect to the Arkansas River. Farmers opposed to the idea hired Frank Robl to raise funds to fight the establishment of a drainage district. Robl was known for his work in banding migratory birds that used the bottoms, and that helped determine that Cheyenne Bottoms was a part of the North American great central flyway (Schwilling 1985). The citizens of Hutchinson, Kansas, joined the opposition to the drainage district arguing that it would create an unnecessary flood hazard for the city (Harvey 2001). The Fish and Game Commission, the State Game Warden, and other state leaders from the area familiar with Cheyenne Bottoms began the process of getting the bottoms designated a wildlife refuge and seeking Congressional appropriations for land and easement purchases. Local sportsmen joined in and wrote letters to the Izaak Walton League and other conservation groups to ask them to lobby for making Cheyenne Bottoms a national refuge. (Harvey 2001)

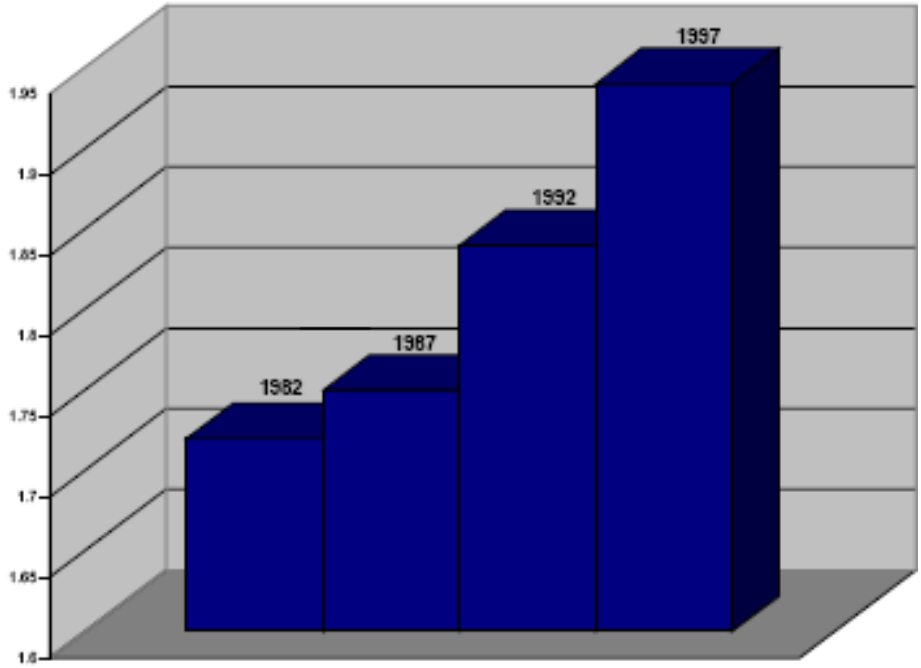
Barton County merchants realized that the local economy saw more revenues from hunters than could be generated from turning the bottoms into wheat ground. Such economic considerations were the only ones taken seriously at the local level, leading the Great Bend and Hoisington Chambers of Commerce to back the refuge (Harvey 2001).

Finally resolved in the courts, the convincing argument was an economic one—the moneymaking potential of the tons of edible fish and migratory birds as well as the worth of fur-bearing animals taken from the area each year (Harvey 2001).

The prosperous years following World War II saw the Conservation Movement transform into the Environmental Movement, which moved public sentiment away from the wise and efficient use of resources to one of preservation of species and ecosystems. At the same time,

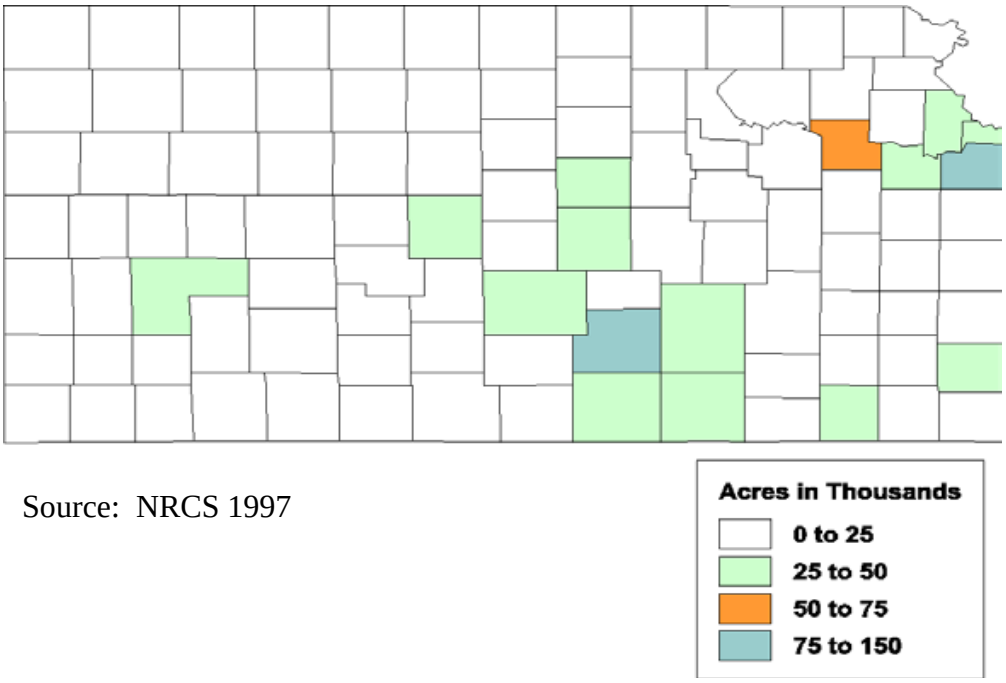
farmers were facing rising energy costs, pressure to conserve water, falling water levels, and negative characterizations as mis-managers of water (Irvine 1997). After 1945, the Kansas population slowly changed from a rural population to an urban one. Sedgwick County (the location of Wichita, for which Cheney Lake is the primary municipal water supply) is the largest urban area in the state with 130,900 urban acres. Between 1982 and 1997, approximately 229,800 acres of rural land were converted to urban uses—development and transportation corridors. Urban land area increased from 1.72 million acres to 1.9 million acres (NRCS 1997) (Figures 2.7 and 2.8).

Figure 2.7 – Urban Land trend in millions of acres.



Source: NRCS 1997.

Figure 2.8 – Urban Land Distribution



Source: NRCS 1997

With this growth came increased flooding, increased demand for domestic water supply, increased demand for waste disposal, increased potential for surface and groundwater contamination from runoff, and a reduction in the agricultural land base (NRCS 1997). Increased urbanization also meant an increase in awareness of environmental health and a shift away from economic considerations and toward valuing the landscape. Fish and wildlife groups used reports of dry streams to gain public attention to water. In 1980, *Kansas Fish and Game* reported that the Arkansas River was dry from the Colorado state line to Dodge City (Mathews 1980).

Fish and game experts lay the blame for dry streambeds, loss of riparian habitat, timber stands, wildlife habitat, and fish on water withdrawn for irrigation and other development sanctioned by the water appropriation law. They argued the law favored development and economic interests over the benefits of water in the streams for fish and wildlife. These groups began calling for recognition of water for fish and wildlife as a beneficial use (Mathews 1980). The governor's task force in 1977 resulted in changes to the state water plan that put a greater emphasis on conservation. However, it did not change its historical emphasis on agricultural and industrial production (Irvine 1997). In 1980, although the legislature passed a new law that established a minimum in stream flows, the rights carried contemporary dates and were not to

interfere with existing vested water rights. The restrictions on the law prevented it from achieving any conservation or environmental goals (Irvine 1997).

In 1989, the conflict over scarce water and its proper use resurfaced. Low water levels were threatening the survival of Cheyenne Bottoms. Irrigation farmers in the area also depended on the area's water resources. The ensuing conflict was whether the scarce resource should go to irrigation for crops or to preserving the wetland habitat for wildlife. Kansas law stipulated five beneficial uses of water for which the division of water resources issued permits, and both irrigation and recreation are included among those uses. Cheyenne Bottoms qualified as a recreational use. The date of Cheyenne Bottoms' appropriation permit was December 1948, which was senior to irrigation permits in the area (Hays 1990). However, instead of eliminating irrigation pumping until the bottoms' allotment was met (Sherow 2002, Irvine 1997), the Chief Engineer restricted irrigation pumping for five years, a decision that protected irrigators as well as the refuge. A similar dispute that same year, 1992, arose between irrigators in the Rattlesnake drainage and the Quivira National Wildlife Refuge. In light of the decision regarding Cheyenne Bottoms and since Quivira's permit predated most of the area irrigators, the two sides agreed to a compromise (Irvine 1997).

Kansas record of water use has given more credence to economic development than to non-consumptive uses (Sherow 2002). The legal victories of Cheyenne Bottoms and Quivira National Wildlife Refuge were not so much victories for protecting wildlife and the biophysical environment as they were reaffirmation of the prior appropriation law and the use of water for beneficial use. The victory for environmentalists lay in recognizing recreation, wetlands, and wildlife as a beneficial use.

Recreational use of Kansas' rivers is often in conflict with economic uses or private property rights despite its designation as a beneficial use. Access is an obstacle to river recreation in Kansas as 98-99 percent of the land is private property (NRCS 1997). Kansas has only three public or navigable rivers—the Missouri, Kansas, and Arkansas—and has no public access. The Kansas Constitution was purposely written to protect private property interests of land ownership. Until 1990, with the understanding that Kansas water was publicly owned, most river recreationists believed that as long as they were in publicly owned water they were not trespassing (Hittle 2007). That changed with *Meek v. Hays 1990*. In this lawsuit, the Kansas

Supreme Court ruled, “The public had no right to the use of non-navigable water over-lying private lands for recreational purposes without the consent of the landowner.”

Revisions made to the Clean Water Act in 1987 charged each state with the responsibility of designating a use for each body of water within its boundaries. From that designated use, the state was to determine the water quality standard for each body of water. Bodies of water given a “fishable/swimmable” designation, for example, were to comply with the strictest standard—the primary contact standard (U.S. Environmental Protection Agency, 2003b). It was not until February 1998 that Kansas submitted water quality standards to EPA in compliance with the Clean Water Act. The EPA rejected some of the standards, requiring Kansas to make corrections and resubmit. When resubmitted, six issues remained disapproved (U.S. Environmental Protection Agency, 2003a). Kansas submitted revised water quality standards again in 1999. Again, some of the standards remained disapproved. In 1999, Kansas Natural Resource Council (KNRC) and the Kansas Chapter of the Sierra Club sought the state’s compliance through the courts (U.S. Environmental Protection Agency, 2003a). On July 3, 2000, the EPA published a proposed rule addressing the six issues or standards that were not yet approved. The state then resolved all issues but one. On December 13, 2000, the KNRC and the Sierra Club sued EPA a second time, requesting the court order that EPA take action on the disapproved waters. The court so ordered and EPA issued a final rule for Kansas in June 2003, which was published July 7, 2003 (U.S. Environmental Protection Agency, 2003a). Kansas continued to perform Use Attainability Analyses, and once they were completed and submitted, EPA was to withdraw the promulgated designated uses applicable to those waters (U.S. Environmental Protection Agency 2003a).

Summary

Kansas has a highly variable biophysical environment, geographically and climatically. Two river drainages dominate the state. The northern half drains to the Kansas River, the southern half to the Arkansas River. Surface water in the Arkansas River drainage west of the 98th meridian is much scarcer than rivers and streams in the Kansas River drainage. Precipitation is also highly variable in the state. West of the 98th meridian annual rainfall ranges between 30 inches to 4 inches, east to west; east of the meridian it ranges between 30 to 46 inches annually, west to east.

Kansans' populist roots can be traced to the anti-government attitude and utilitarian outlook toward the natural, biophysical environment of the people who settled the state. Rapid settlement and period drought led to high turnover among settlers. The 98th meridian, falling along the western edge of the tallgrass prairie region, marked more than a change in climate and the transition from tallgrass to short grass prairie of the High Plains. The High Plains had little agriculture and few permanent settlements.

The riparian doctrine, water law that settlers brought with them to Kansas, held that landowners with water flowing through their property were protected from having upstream users diminish either the water's quality or the quantity. The doctrine also established that the act of using water made the presence of water a property right. The alternative water law was prior appropriation. Appropriation allowed an individual to claim water on a first come basis regardless of being upstream or downstream. It also allowed the user to withdraw and transport water for use elsewhere. According to appropriation, first in time meant first in right.

Droughts in western Kansas and the successful implementation of irrigation pushed farmers to lobby the state for a change in state water law and the federal government for assistance with irrigation and the necessary technology. Floods in the Kansas and Missouri River valleys affected those in the eastern part of the state. Flood control advocates pushed for government flood control. Both levels of government eventually responded. Kansas passed Irrigation statutes in 1886, which permitted water withdrawal for irrigation and that the first person to do so would have first rights. The Kansas legislature recognized the economic value of irrigation and continued to pass legislation supporting it. Federal assistance for irrigation and flooding came in 1902 with the Reclamation Act.

At statehood, the state constitution did not mention or provide guidance on how the state should manage water resources. As a result, water law was determined through the courts by citizens as individual conflicts were resolved. Three Kansas Supreme Court cases served to establish the riparian doctrine as the state's guiding law for water development. The decisions protected the economic potential of water use. They used an appropriation rationale to make "reasonable use" decisions. Following these decisions, Kansas irrigators filed suit against Colorado irrigators in *Kansas v. Colorado* (1907). Kansans argued that because Kansas followed the riparian doctrine Kansas irrigators should have the rights to a guaranteed flow in the Arkansas River. The U.S. Supreme Court found that Colorado did not owe Kansas a specific

amount of water. Kansas did not show that it was suffering economic harm. This lawsuit was significant because it verified what was considered the proper use of land and water—economic benefit. Ten years later, 1917, the Kansas Supreme Court reaffirmed that reasonable use—the rule of equity—was an acceptable modifier of the riparian doctrine.

Irrigators from the High Plains were not the only residents of Kansas in favor of an appropriative water law. Growing towns and cities were increasingly demanding a reliable water source. Wichita began using the Equus Beds for a municipal water supply. That action put the city at odds with area farmers who had depended on the high water table for their crops. World War I brought about an increased need for agricultural products, which provided the incentive for Kansas farmers to increase productivity through irrigation.

After 80 years of the riparian doctrine, the state adopted appropriation as the state's water law in 1945. The new law made economic gain the highest priority for water use, and failure to make economic use of water was defined as wasting it. The Water Appropriation law replaced "reasonable use" with "beneficial use," giving the removal of all water from watercourses the sanction of state law. Rather than facilitating access to all water users, the law limited access to holders of junior water rights.

The Water Appropriation Law gave the state government strong authority over water resources. Many Kansans opposed the new law because of loss of equity in usage from loss of stream flow, depleted wells, and lowered water tables. Court challenges to the new law were defeated. However, the challenges illustrated the lack of consensus in the state about how much control state government should have over water resources. Kansans maintained their preference for local control. The state complied by leaving many decisions at the local level and sanctioned the organization of water districts, irrigation districts, groundwater management districts, and numerous water advisory boards.

After 1945, the Kansas population slowly changed from a rural population to an urban one. With this change came increased flooding, increased demand for domestic water supply, increased demand for waste disposal, increased potential for surface and groundwater contamination from runoff, and a reduction in the agricultural land base (NRCS 1997). Environmental health and pollution control officially became part of the state's goal for managing water resources in the mid-1960s. In practice, water users continued using water as they always had. Water quality issues arose from the very activities that drove the state's

economy. Numerous fish kills from livestock waste pushed the state toward pollution regulation. The agriculture industry resisted, but by 1980 it had begun to lose some of its political power. Urban areas were beginning to be included in the state's water hierarchy.

Increased urbanization also meant an increase in awareness of environmental health and a shift away from economic considerations and toward valuing the landscape. Fish and wildlife groups used reports of dry streams to gain public attention to water. Fish and game experts lay the blame for dry streambeds, loss of riparian habitat, timber stands, wildlife habitat, and fish on water withdrawn for irrigation and other development sanctioned by the water appropriation law. They argued the law favored development and economic interests over the benefits of water in the streams for fish and wildlife. These groups began calling for recognition of water for fish and wildlife as a beneficial use (Mathews 1980). The governor's task force in 1977 resulted in changes to the state water plan that put a greater emphasis on conservation.

The socio- and political history and the biophysical environment form the attitudes and dispositions of the people that live in a particular place. Although the settlers of Kansas arrived with similar social values and political views, the differences in water availability resulted in differences in social organization and led to the formation of different attitudes and dispositions and the politicization of water resources. This politicization of watersheds will be explored in each case study.

The literature review, Chapter 3, presents the theoretical framework for this research. Political Ecology, environmental governance, and watershed management are discussed as relevant to gaining a thorough understanding of current efforts to achieve water quality goals.

Chapter 3 – Literature Review

Water resource issues are complex, drawing together many factors as efforts are made to meet the legally mandated water quality requirements, the increasing water quality and quantity demands of the public, and achieving both of these objectives with effective governance. Water resources not only have a role as a natural resource and input for agriculture, but they have social and cultural significance as well. All of these roles contribute to the politics that are associated with specific landscapes. To address this complexity holistically, I draw on literatures from political ecology, environmental governance, and watershed management. The three areas of literature integrate the cultural relationships of political ecology and environmental governance with watershed management without disregarding the biophysical environment.

Political Ecology

Political ecology research began with the premise that environmental change is not a neutral process that lends itself solely to technological management, but rather is a process that has political sources, conditions, and consequences that affect existing ecological, social, economic, and political arenas. The field of political ecology has theoretical roots in political economy and in ecology, from the former in the connection between the distribution of power and productivity, and from the latter in its broadened bioenvironmental relationships. Together these roots guided the major theoretical underpinnings of political ecology to expand ecological concepts to include cultural and political activities that some perceived as excluded from political economy approaches (Greenburg and Park 1994). For ecosystems that are substantially, though not entirely, socially constructed, political ecology explicates the relationship between political economy, human society, and the natural biophysical world. This connection provides both an interpretation and a clarification of the critical role the biophysical environment has in shaping social relations (Vandergeest et al. 1999).

In the 1970s, environmental research in developing countries was apolitical despite the fact that politics was implied in almost every ecosocial problem of the time (Bryant and Bailey 1997). Political ecology arose as a response and offered research that addressed the political side of ecosocial problems. Researchers taking a political ecology approach contend that current environmental conditions are the result of political interests and conflict, making politics

important (Byant and Bailey 1997; Robbins 2004). Also contributing to the rise of political ecology was the criticism that cultural ecology did not acknowledge that the local-level culture and the ecology of communities were both part of and influenced by broader political and economic structures (Peet and Watts 1993; Simmonds 1993). In their argument for the relevance of politics, political ecologists argue that understanding politics requires an understanding of two core concepts: first, that politics do concern the interaction of actors over environmental resources; and second, that even the weakest actors have some power to act in their own interests. Political ecologists comprehend politics and the environment as thoroughly connected, making it impossible to understand environmental problems in isolation from the political and economic contexts that created them (Bryant and Bailey 1997, Robbins 2004).

Traditionally, political ecology has been associated with developing countries and focused on issues surrounding commodity production on rural lands and control and access to natural resources. However, some scholars have established its relevance to developed, industrialized nations (McCarthy 2002, 2005; Robbins 2002; Schroeder 2005; Wainwright 2005; Walker 2003), and others have conducted empirical studies in industrialized countries (Willems-Braun 1997, Jarosz and Qazi 2000, St Martin 2001, Emel 1995, Emel and Roberts 1995, Burwell 1995, Sayre 1999, Wilson 1999 and Sheridan 2001). Works in industrialized nations have examined such areas as wetlands in Minnesota and Illinois (Robertson 2000, 2004), forests (Prudham, 2003; 2004), federal lands in the West (McCarthy 2002), and even the American lawn (Robbins and Sharp 2003a; 2003b). McCarthy (2002) demonstrated that the core concepts of political ecology affect environmental governance in the United States. In 2005, McCarthy further argued that many of the major themes of political ecology also are present in natural resource issues in industrialized countries. (These major themes include natural resources access and control, marginality, challenge to property rights, the centrality of livelihood issues, the influence of extralocals or expanded communities of interest, the importance of local histories, meanings, culture, and micropolitics in resource use, the effects of limited state capacity.) Similarly, local communities in the United States, regardless of cultural and ecological differences, are influenced by the broader economic and political structures at the state and national levels.

The role of the state is understood to have the responsibility to act in the interest of the national good, which has created the dual responsibility of economic development as well as

environmental stewardship and protection. Traditionally, the state has defined the interactions and relationships between various actors and the biophysical environment. The multiple roles of economic developer and environmental steward compromise a state's ability to act in the public good. In its role as developer, a state government may use its power to grant business firms privileged access to natural resources (Bryant and Bailey 1997; Forsythe 1993). Bryant and Bailey (1997) point out that acting as economic developer often creates a direct link between the state and the environmental problems created by development activities—the state is committing the violation it is supposed to prevent. The intra-government tension created by this contradiction is often manifested through conflict between rival agencies.

In the early years of political ecology research (1970s – mid-1980s), structural frameworks were often employed, which tended to overshadow the agency of grassroots actors (Bryant and Bailey 1997). This emphasis diminished by the mid-1990s and since then work has tended to focus on broadly defined politics (or micropolitics). The more recent work is likely to examine such roles as culture, discourse, moral economy, and "community" management and indigenous knowledge, among others, as they shape contests over resources (Moore 1993; Peet and Watts 1996; Neumann 1998).

Walker (2003) calls for using a regional approach for research in industrialized nations, such as what was prevalent in the field's early work. He submits that a regional approach not only circumvents problems associated with the developed-developing nation frames, but also allows commonalities and differences to be seen across both worlds. He cites McCarthy (2002) as an example of such regional analysis. Walker (2003) further proposes that regional analysis affords the potential for comparative approaches and identifying differences between specific places within a distinct region. He sees regional analysis as useful in explaining why some social and environmental outcomes occur in one place but may not in another, and how exurbanization generates conflict and possibly changes local politics in its reconfiguration of political identities and concepts of what is local.

While scholars have demonstrated the relevance of political ecology research in industrialized countries, they recognize that it may require a different focus. The rules governing resource use in industrialized societies are based largely on property laws, which mostly are institutionalized and centralized; however, such laws do represent codified social relationships. These formal institutions may be concealing the expression of the various individual relations

that influence the contests over resources (Walker 2003). As the site of environmental contests in countries, Robbins (2002) argues for political ecology research to focus on formal institutions in industrialized nations.

Scholars undertake current work in political ecology through numerous approaches. In addition to focusing on a specific environmental problem or through the context of a particular geographic location or region, researchers may take a conceptual approach, such as examining the discourse of soil erosion and conservation (Zimmerer 1993); they may use socio-economic characteristics to explore political-ecological problems (Dei 1990); or they may use an actor-oriented approach (Benjaminsen and Ba 2009). The actor-oriented approach focuses on the different types of actors and their interests, characteristics, and strategies and their roles in political-ecological conflict. With this approach, researchers understand actors as participants in political or ecological processes, participants who often are pursuing distinct objectives, and that cooperation and conflict are outcomes of the interactions between actors.

Political ecologists also have drawn on and found cultural studies useful in providing insights into the relationships between identity and resource politics. These insights have broadened ecological concepts to include cultural and political activity within the analysis of ecosystems that are at least partially socially constructed. How people value the environment is visible through the meanings and narratives they attach to it, which in turn reveals how local landscapes or ecosystems are politicized. Water in particular is an element that carries potent symbolism. The ability of people to remake their physical surroundings has been a symbol of wealth and privilege. These linkages between water and prosperity and power make water an emotionally strong subject, although the meaning attached to water may be less about water's economic value and more about organizational and political control. Being able to control water often signals power and efficacy, while failure to control it signals impotence (Espeland 1998).

Regional variation in politicization and disposition toward natural resource use can occur for a variety of reasons, including variations in the biophysical geography, land ownership, pre-existing livelihoods, jurisdiction of government resource agencies, the activities of environmental groups, and the activities of land managers. A thorough analysis of such landscapes should include both past and present relationships between policy, political economy, and the natural environment (Greenburg and Park 1994; Vandergeest et al. 1999).

Politicized environments are a key concept in using political ecology to explain environmental change. Acknowledging the politicized nature of environments is also an acknowledgement of their social construction of nature, the human involvement in their production. That social construction includes political forces or motivations. A political ecology framework for social inquiry into environments then seeks to identify the political sources, conditions, and implications of environmental change. An examination of the political components raises questions about power in the relations between the actors involved and the actors' power over the environment. Power is reflected in actors' abilities to control access to natural resources, shift detrimental effects onto other actors, direct social resources into specific projects and not others, and to control the public discourse (Bryant and Bailey 1997).

Environmental Governance

Environmental governance is a second area of literature relevant to this study. Governance is the set of rules that establishes access to and use of natural resources. In the United States, the rules governing the use of natural resources, including water resources, have a strong basis in property laws, which have long been institutionalized and have organizational structures for their administration.

Governance has accompanied the human manipulation of water resources, whether it is the drainage of wetlands or irrigation of dry lands. Although the federal government formulates water policy at the national level, ultimately water issues are local issues that embed in and give rise to local, state, and federal powers and to organizations. Worster (1985) drew on the "hydraulic society" thesis to explain the society-nature relationship in the arid west. This thesis posits that where great water control exits, whoever controls the water would gain political power and become the elite ruling class. Supporters of this perspective contend that water development in the west has been undemocratic and exploitive by repressive government and corporations. In addition, they fault capitalist economics for environmental degradation in the Great Plains. Opponents argue that water development has been democratic; farmers, townspeople, and local businesses initiated water development (Schneiders 1999, Sherow 1990). Opie (1993) makes the point that democratic pluralism determined water development in the Great Plains and that a dominant political, economic, or social system does not exist. He argues that access to the Ogallala aquifer has been open everyone. Although these scholars agree on the

democratic nature of water development, some agree that the capitalist economic system is responsible for the environmental degradation.

Other scholars (Reisner 1986; Glennon 2002) indict the federal government and the Bureau of Reclamation as misappropriating power and political process for the benefit of a few through their various water development projects. Pisani (1996) interprets the Reclamation Act, which institutionalized irrigation, as a tool used for social reform. By promoting irrigation, the act facilitated the settlement of arid and semi-arid lands by moving people out of the more densely populated and humid areas. Controlling water and establishing an irrigation system also requires establishing institutional arrangements that define cooperation and resolve conflict. Fiege (1999) describes how, in the process of bringing irrigation to southern Idaho, farmers established multiple social structures and characteristics. Farmers created irrigation districts and companies. They also organized economic and labor systems, which combined forms of cooperative, corporate, family, and community organization. Fiege also recounts how the natural environment changed as a result, which led to further social changes. In making the point that irrigators in Idaho found it to their advantage to cooperate, Fiege iterates the message that human society is in relationship with the natural world:

> Nature—water, soil, or organisms—will seldom if ever follow the boundaries that we try to place upon it. It will always draw us out of our individual plots and, whether we choose to recognize it or not, transform us into groups in which we, as individuals, have standing only in relation to the community (p. 207).

Water policy in the United States has evolved through the nation's history reflecting changing social conditions as well as different political visions of sitting presidents. Gerlak (2006) defines five eras of national water policy evolving from state-centered, to central control, to various forms of shared responsibility. These varying modes of policy continue to define water management.

Early in U.S. history, states held the primary responsibility for water management and development, with minimal federal involvement (Gerlak 2006). Communities looked to their own state legislatures to address water issues, such as those associated with forming water districts to support community growth. With the passage of the Reclamation Act of 1902, the federal government assumed a greater role in water management. This legislation sanctioned federal involvement in developing irrigation. The Army Corps of Engineers and Bureau of Reclamation were the "go to" agencies for solutions to water resource issues, particularly those

concerned with resource development (Gottleib and Fitzsimmons 1991; Pisani 1992; Gerlak 2006). Federal water policy during this era was complementary to the larger conservation movement of the time. The conservation movement advocated the wise use of natural resources, and federal policy sought to transform them into manageable, measurable units that could be bought, sold, and traded (Pisani 1996; 2002). Development of water resources and irrigation intensified agriculture, which had the dual results of contributing to farmers' profitability that led to a stratified class structure by facilitating the accumulation of large tracts of land by fewer landowners (Worster 1985; Pisani 1992). Although the Reclamation Act increased federal involvement, the act catered to local rule and participation. In addition, the act not only sanctioned numerous laws that significantly inhibited coordinated planning and management, but it also provided justification for the Supreme Court ruling in *Kansas v. Colorado (1907)* that the federal government had no water rights of its own (Pisani 1992).

The environmentalism of the 1960s and 1970s and the societal acceptance of environmental quality as a social problem led to the institutionalization of environmental quality as a social issue (Dunlap and Mertig 1992). This institutionalization introduced an era of shared state-federal cooperative management. The Clean Water Act was the first environmental law that made local governments responsible for carrying out national policies and priorities (Gerlak, 2006). Scholars describe this era as one of cooperation between the federal level and the state level. The 1980s ushered in the era of devolution. Devolution and privatization reflected the decentralization or deconcentration from higher levels of government to more local levels and from government to market forms. Devolution and privatization were viewed as the paths to good or effective governance. The Reagan and Clinton administrations both signaled significant shifts in national water policy. The Reagan administration's public policy reform and government devolution in the 1980s increased state's responsibilities through federal mandates while it decreased the funding for meeting them. This administration expected states to build capacity and share the costs of water management. The Clinton administration continued a focus on efficiency but did so with a partnership approach that highlighted collaboration and coordination. Environmental partnerships evolved as a new governance structure for environmental and natural resource protection and management, including water resource management. Although local concerns may continue to shape and control water issues, water policy is associated with larger regional, state, and national forces that have led to a complex,

and often hidden, political geography composed of water as well as political and economic power (Gottleib and Fitzsimmons 1991).

Between1980 and 2000 the discontent with the regulatory federalism that had previously characterized environmental and natural resource policy set the stage for the policy reform and societal shifts. The reemergence of citizen participation spurred by the political activism of the 1960s and 1970s marked a change in political thought and spawned new structures that allowed the public to participate in environmental policy-making. At the same time, the public began to perceive environmental degradation as a social problem rather than primarily as a biophysical and technological one. Government devolution prefaced the societal shift toward neo-liberalism that the United States and other western, industrial countries underwent in the 1990s. The shift toward neoliberalism privileged individual rights over public rights and the common good, and began a trend to seek market mechanisms for solutions to social problems, including problems of environmental degradation, such as water pollution.

The shifting political thought in the United States included a change in perception about how government and governance should occur and introduced a set of moral principles or values (equal worth, opportunity for all, responsibility, and community) as guidelines for environmental problem solving (Rose 2000). The changing political philosophy also contributed to a new mode of governance. While government in the United States is traditionally thought of as a hierarchy, this new governance implied diffused decision-making, with a plurality of interests and opinions, coordination and decentralization, and a move away from command and control and toward negotiation and persuasion (Lockie 2009; Knepper, Sitren, Smith, and Central University of Florida 2006; Reddel 2002, 2004; Salamon 2002). Other characteristics of the changes in governance included references to civil society and activism, and emphasis on strong communities through individual rights, duties, and responsibilities.

Although these political ideas were not entirely new, Rose (2000) points out that what was new was an expanded ethic of collective responsibility that included nature and a reciprocal obligation between those being governed and those who govern. The phrase “the personal is political” gained meaning in the broader social realm with the creation of new linkages between what is personal and what is political. The terms social and rational as applied to people broke out of their respective discourses—the social welfare state and maximizers of self-interest. The new political thought understood people as ethical beings, social problems as ethical problems,

and that governance should operate through this dimension of ethics (Rose 2000). Reform in the 1980s came through corporate management and marketization, which was based on defining and clarifying goals rather than following rules, and is more oriented toward outcomes. In this process, government departments were broken down into activity-based units, and each unit had a plan that included goals and performance assessments. By the 1990s, contracts and competitive market mechanisms were the preferred methodology for social programs (Reddel 2004).

Devolution was meant to increase the efficiency and flexibility of public policy and better meet the needs of local communities. Support for devolution came from the idea that states and local communities are better suited to manage and cope with local problems (Sharp and Parisi 2003). This devolutionary nature of U.S. federal policy is reflected in water governance by delegating to local government entities the responsibility for meeting the requirements of addressing nonpoint sources of pollution. States have wide latitude in decision-making (Hoornbeek 2005). Local rural governments respond to this increased responsibility in various ways and with varying degrees of success depending on the particular challenges of their communities. While devolution has given rural communities more control and flexibility to negotiate their own solutions, incomplete devolution of environmental governance makes this control more complicated. Economic development opportunities for communities may pose challenges to water governance mandates directed toward water pollution from nonpoint sources.

The appropriateness of local environmental governance is an issue of some debate. Dewees et al. (2003) contend that local governance in some communities may be restricted by limited capacity, especially when addressing environmental issues affecting local well-being. Rural communities are typically characterized as being remote, having low population density, higher poverty, and lower education levels. They argue that combining these traits with such challenges as often having fewer professional staff members, more volunteer or part time leaders, insufficient personnel, inadequate administrative ability, less money dedicated to economic development, and less experience managing such initiatives may limit the capabilities of rural communities to develop and implement programs. These limitations are in tension with the argument that a government closer to the people may have greater flexibility in addressing local needs and preferences. Rural communities atypical to this characterization, however, have been shown to have greater success (Dewees, et al. 2003).

Several alternative participatory governance structures emerged in the 1980s to address water resource governance. They initially emerged as a response to widespread dissatisfaction with the traditional top-down regulatory process in place at the time and its inability to meet effectively the provisions of environmental legislation (Sabatier et al. 2005; Wagenet and Pfeffer 2007). The continued existence of these alternative governance structures was justified by the continued degradation of land and water by agriculture and the subsequent farm/rural crisis, both of which contributed to the delegitimation of the federal government (Swanson 2001; Lockie et al. 2006). The reappearance of participatory governance structures and the trend toward devolution went hand-in-hand. The emergence of these alternative environmental governance structures at this time was also reflective of the change in political thought. These alternative structures brought together stakeholder groups who would collaboratively manage water resources in a more egalitarian manner and as an alternative to traditional agency-driven water resource and planning (Leach and Pelkey 2001; Parisi, Taquino, Grice, and Gill 2004; Sabatier, Focht, Lubell, Trachtenberg, Vedlitz, and Matlock 2005; Morton 2008). Additionally, these structures often endorsed diffused decision-making, with a plurality of interests and opinions, coordination and decentralization, and a move away from command and control and a move toward negotiation and persuasion (Lockie 2009, Knepper et al. 2006, Reddel 2002, 2004; Salamon 2002).

Alternative environmental governance structures took various forms, including networks and local partnerships (Murdoch 2006; Winter 2006; Geddes 2000; Fuller 2004). These structures also held a variety of names, e.g., collaborative watershed management, ecosystem management, grass-roots ecosystem management (GREM), watershed partnerships, and community-based natural resource management (Weber 2000; Wollondeck and Yaffee 2000; Brick et al. 2001). A common feature of these alternative structures was that they brought together a diverse group of interested citizens to manage water resources using the watershed as an ecological unit. In addition, meeting environmental mandates requires detailed local knowledge and the coordination of multiple agencies, which had been difficult under the traditional top-down dominant agency strategy, but was facilitated by the new governance institutions (Sabatier et al. 2005).

The environmental partnerships that emerged in the mid-1980s stem from three root sources that intended to solve social problems. The concept of environmental partnerships

emerged as a new form of governance to respond to the perception that the nation state was unable to provide and protect environmental quality for the public good (Mol 2007; Glasbergen 2007). Government policy moved away from regulation and turned to incentive-based, market-oriented policy that called for bringing together non-state actors with state actors to address public sector tasks that focused more on efficiency, brought in new capital, and introduced market logics. Public-private partnerships also emerged to provide environmental services, and again non-state actors were brought together with state actors to fulfill public sector tasks. The addition of private parties from the market arena and civil society strengthened public administration. A third partnership concept traces to literature in international and global environmental policymaking (Mol 2007; Glasbergen 2007).

The primary premises of the partnership paradigm hold that: (a) public, market, and civil sectors of society all have an interest in sustainable development; (b) dialogue can occur in a setting that is non-hierarchical and egalitarian, and produce a shared belief that collaborative action is mutually beneficial; (c) voluntary, collaborative arrangements with a commitment of joint resources and shared responsibility can serve both public and private interests, partnerships can be commercial; (d) government can initiate partnerships as an extension of government policy; (e) private parties can initiate partnerships where public administration is one of many partners; and (f) that partnerships can arise from cooperation between business and non-government organizations (Glasbergen 2007).

Partnerships and collaborative institutions established formal and informal rules for making collective decisions and governing resource use. These rules define who is allowed to participate in the decision-making process, how natural resources can or cannot be used, and the consequences of non-compliance. It is not the incorporation of rules themselves, but the particular nature of the rules of collaborative institutions that make them unique. Collaborative process rules include language of inclusiveness, transparency, redistribution of power and equity, consensus rule for decision making, mutually acceptable solutions, and voluntary cooperation for implementation rather than penalties and enforcement (Sabatier, et al. 2005; Mol 2007). Collaborative institutions may share the same core set of ideas, but the stakeholders in each one choose the combination best suited to their local circumstances. This flexibility is credited as the source of adaptive capacity and survivability for the institution (Sabatier, et al. 2005).

Gerlak (2006) characterizes national water policy from 1990 as responding to four social and political trends: 1) including participation from environmental groups to balance local economic interests; 2) being sensitive to litigation of environmental issues regarding water that has increased conflict between the federal government and the states; 3) changing demographics, population shifts, urban pressures, and a stronger environmental ethic; and 4) filling the void left by the absence of national guidance regarding water management. Current national water policy seeks to address problems on an individual watershed basis. Policy practices are place-based, collaborative and experimental, or unique to their geographical, ecological, political, and social circumstances. The key to current water policy is its pragmatism. It is problem and process oriented. Increasingly, specific problems are identified and processes are designed to address them. Instead of watersheds, the policy focus is a "problemshed" (p.241).

Although the concept of partnerships has been in governance discourse since the mid-1980s, it has only been since the mid-1990s that environmental partnerships became common enough to influence social science research agendas. Although partnership as a concept has been incorporated into political language, it has not been incorporated into actual practice and decision-making. Critics claim that partnerships have failed to meet their theoretical claims of non-hierarchical, multi-actor governance. In practice, regardless of government emphasis on the need for partnerships, they often end up as subcontracted agreements with market entities that have clear rules, goals, and targets. Failure of partnerships has been attributed to implementation processes that have not relinquished the project design, actors, and arrangements of traditional state-centered governance (Mol 2007). As mentioned for other participatory structures, how a partnership is structured is crucial to governance outcomes, especially legitimacy (Brinkerhoff 2007). While the partnership concept has not been entirely successful, neither was the state successful in protecting and managing the environment and natural resources. Trends in environmental and natural resource policy have been toward a decrease in the command and control of traditional government and an increase in stakeholder involvement.

The definition of partnerships is evolving to reflect the characteristics of relationships that work. When local participation occurs in partnership structures that are included in a national or regional policy framework that pairs government agencies with local groups, those partnerships have been labeled as natural resource co-management (Brinkerhoff 2007). Few examples of strict self-management are found among partnership structures, and the distinction

between self- and co-managed natural resource partnerships is one of degree. The appropriate role of government in environment and natural resource partnerships has been identified as one of empowerment and support. This support and empowerment indicates selective devolution of authority, the creation of enabling conditions for local self-governing entities, and a condition of deconcentration rather than decentralization because local entities have little discretion in decision-making (Brinkerhoff 2007). The partnerships found to be most successful are not necessarily those that arose spontaneously, but rather those in which governments play a role in developing and facilitating their function even when the government itself is not a direct party. Partnerships formed to address environmental concerns are often best used to address problems in their early stages and government regulation is premature. The same can be said of using voluntary approaches as a policy instrument with a transitional function, to use until regulatory actions are appropriate. The weaknesses of voluntary environmental partnerships in achieving environmental goals can be strengthened by combining them with some command and control regulations. Although regulation in agriculture has not been a preferred choice, in some cases the combination of voluntary partnerships and regulation has been shown not only to be successful but also to provide some benefit to agricultural producers as well (Gunningham 2007).

The legitimacy of these governance structures, and the outcomes of their work, is largely dependent on the procedures they employed. The legitimacy of the procedures an organization uses is a powerful determinant of justice; if participants consider the procedures fair, then they will likely consider the outcomes fair as well. The structure and terms of participation in these governance organizations was another factor important to the legitimacy of these structures. The type of stakeholder participation is equally important as inclusion in the process (Espeland 1998; Brinkerhoff 2007). Legitimacy has also been shown be a condition of the institution's survival. The belief that a collaborative effort is achieving its goals motivates stakeholder participants to continue investing their efforts (Sabatier, et al. 2005).

Decentralization and devolution do not necessarily clear a single path to alternative forms of governance. New governance structures may serve to facilitate policy implementation or they may represent an alternative form of governance. A partnership formed between and among entities, working towards the same end, can increase the group's financial and political capabilities while enhancing their legitimacy and efficacy by involving resource users and stakeholders. Likewise, a partnership may facilitate policy implementation or it may represent

an alternative form of governance. The concept of partnership is rooted in the recognition of the limited capacity of local governing groups and communities where partnership offers a pragmatic solution (Geddes 2000; Morton 2001). The formation of partnerships, however, may not originate from alternative governance but more from a need to improve implementation of policy from a central government (Winter 2006). New governance structures cannot be assumed as alternatives, but rather must be critically assessed to determine whether they genuinely represent an alternative form of governance—whether they represent devolution of responsibility (for implementation) or devolution of decision-making. Touchstones for such assessment include determining whether the actions taken are through new (non-regulatory) or old (regulatory) policy instruments and whether non-state or local actors create and perform in a governance structure or network to produce a desired outcome (Jordan, Wurzel, and Zito 2005).

Watershed Management

Watershed management is a third area of literature contributing to this study. Watershed-level management was one type of alternative governance structure that emerged in the 1980s (Sabatier et al. 2005; Ferreyra et al. 2008). The new governance structures emerging in Kansas, and the structures this study is examining, are organizing at a local watershed level and are using the watershed as a management unit.

Watershed-level management protects ground and surface water by integrating land and water concerns and addressing them within the ecological boundaries of a watershed rather than the political boundaries of townships, cities, counties, and states. The watershed approach is not bound by political boundaries. This process focuses on the watershed as a whole looking for all the sources of pollutants rather than on types of sources (point or nonpoint source). The novel characteristic of watershed management partnerships is the inclusion of multiple stakeholders with diverse interests who treat each other equitably. Agencies, experts, and non-experts are included as equal stakeholders with equal power in the decision-making process. Scientific or expert knowledge is connected to local knowledge for problem solving. These stakeholders collectively negotiate the management of the watershed in a more proactive and egalitarian manner, which is an alternative to traditional agency-driven water resource and planning (Leach and Pelkey 2001, Parisi et al. 2004, Sabatier et al. 2005, Morton 2008). Accordingly, the watershed-level management process is collaborative and involves problem-solving, face-to-face

negotiations among the stakeholders, and consensual decision-making rules. It represents a new approach to environmental governance that added adaptations and innovative choices to traditional management in order to make the most of opportunities. The goal is to achieve win-win solutions to an interrelated set of social, economic, and environmental issues within the watershed (Sabatier et al. 2005).

The concept of watershed-level management is not new; it emerged with John Wesley Powell during the Progressive Era. Partnerships for watershed governance have been documented in the United States since the 1960s; however, most were organized after 1980 (Leach and Pelkey 2001). Both the Army Corps of Engineers and the Bureau of Reclamation later adopted the concept. The Environmental Protection Agency (U.S. EPA 1996) adopted public participation in water management as policy in 1996. Nine federal agencies have endorsed the watershed management approach, and the federal government made the approach part of the 1996 Farm Bill (Sabatier et al. 2005). What is new in the watershed management structures that emerged in the 1980s is the balance they sought between economic development and environmental protections goals.

The rationale for a process of citizen participation in watershed management or partnerships is the belief that local citizens contribute knowledge, experience, understanding, and insight to local issues that leads to solutions more preferred by the public and to an appreciation of the larger community as a whole (Irvin and Stansbury 2004; Mitchell 2005; Weber 2000). A second part of the rationale is that by participating, citizens will gain a more sophisticated level of technical and social understanding and better policy decisions will result. Such understanding will translate into social and environmental outcomes that are more desirable. Another benefit is that agency administrators will learn which policies are acceptable or not to different community groups. The most powerful motivator for citizen participation, however, may be in creating a cooperative public. Participation may provide acceptance as a prerequisite to successful implementation (Irvin and Stansbury 2004). Decision-makers, however, do not always achieve a cooperative public. Sometimes, well-organized, resourceful grassroots groups win political decision-making battles. Carrels (1999) describes the only victory of a grassroots group over the Bureau of Reclamation and the irrigation and business establishment.

Using a watershed as an ecological unit for environmental planning and policy implementation is not without challenges. Scholars have identified some of the challenges that

watershed management organizations face, including representation, building trust and civic community, effectiveness, longevity, and boundaries. The premise of including all stakeholders creates concern among national environmental groups because they cannot achieve representation in all watershed partnerships across the United States. On the other side, property rights advocates are concerned about infringement of property rights. These advocates believe only landowners should be included in the decision-making process that affects their land. Building trust and civic community, which is important to the cohesiveness of democratic communities and effectiveness of collaborative actions, is sometimes problematic. The ability of such a collaborative process to result in actions that improve environmental conditions also is sometimes questioned because compliance is often voluntary without regulatory enforcement. The concern is that without enforcement mechanisms these efforts contribute to delays and avoidance of the environmental problems they are supposed to address.

Another concern is whether these structures can survive in the traditional governance terrain that is dominated by single-function agencies that often depend on legal boundaries with little relationship to watersheds (Sabatier et al. 2005). Ecological boundaries rarely coincide with the political ones, and the challenge is to address land and water issues with a consistent approach throughout the watershed and across the multiple political entities (Blomquist and Schlager 2005, Ferreyra et al. 2008). This boundary mismatch may raise questions about who is included or excluded, what the structure of participation should be, by what mechanism will policymakers will be held accountable, and which local agencies are responsible (Blomquist and Schlager 2005, and O'Neill 2005).

Barham (2001) argues that using a watershed as a management unit requires a change from how society viewed the environment and thought about watersheds in the past. This change in perspective connects the human and natural communities. A problem in one area is really a problem in both. Acknowledging a connection between human and biophysical communities has been shown to encourage a sense of environmental responsibility. Additionally, the transition to a watershed approach may constrain effective planning if in the transition, policymakers are removed or existing regulations are changed. Democratic institutions and processes that facilitate access to information, the possibility of public debate about the changes must be created to accompany the transition to a watershed approach if social injustices are to be avoided. Such a shift in human understanding of natural systems and

humankind's place within them will present social/political solutions to environmental problems rather than technical solutions (Barham 2001).

While some understand watersheds as a "multiple-use common source resource" (Morton 2003), individual users of water resources who are profit-driven may find themselves at odds with those agencies and community-led groups that are charged with protecting and conserving those same water resources. Protection of water resources often means changing the behavior of those who use them. When water is an economic input, often short-term profitability rather than long-term sustainability serves as the operational guidance. Thus, upstream users may have little incentive to protect the downstream flow. Frequently, protection for downstream users only comes with financial incentives provided to upstream users (Morton 2003).

Incentive-driven and regulatory measures may undermine democratic processes of management by taking away social ownership and responsibility from the local residents. Morton (2003) calls for a model in which individuals in a community collectively share ownership of the problems and the responsibility for finding the solution. She envisions a model that focuses on changing behavior by "raising awareness, reinforcing land and water stewardship values, and using group norm pressures to monitor and enforce practices that limit sedimentation and nutrient runoff" (p.123).

Some scholars (Blomquist and Schlager 2005, and O'Neill 2005) warn that the overlap of socio-political units with a watershed may contribute to political disputes or to disputes between rural and urban residents. Rural residents may create a watershed management area to protect their livelihoods and interests from outside regulation. Those interests may be in contrast to urban residents' efforts to protect the natural environment from human activities. These scholars also question whether the watershed is an appropriate planning unit. As a management unit the watershed may pose a threat to property rights and contribute to competition between municipalities for economic development projects (Blomquist and Schlager 2005; O'Neill 2005).

Conca (2006), in discussing governance of water globally, posits that when established institutional forms are inadequate, new institutional forms may arise from grassroots networks, coalitions, citizens' organizations, activists groups, or social movements. He suggests these agents may create mechanisms for environmental governance outside established institutions.

The shift toward neoliberalism in the 1990s resulted in environmental problems and their solutions being framed in market terms; agricultural producers were credited with both

environmental degradation as well as market failures (Woods 2006; Rose 1996). This framework attributed the financial failures in agriculture to poor management and conversely implied that good managers were the solution for environmental degradation that came from farming. If good land managers were the solution, then individual farming operations were the most appropriate site for environmental reparation (Lockie et.al. 2006; Higgins and Lockie 2002). Farm level reparation supports the model of watersheds as a management unit.

Summary

For this study, I draw on political ecology, environmental governance, and watershed management to understand the contribution new governance structures are making toward reaching water quality goals. Environmental, or water quality issues, are not isolated concerns unconnected from other social issues, neither are they disconnected concerns in a person's everyday life. They are interconnected with the economic, cultural, and biophysical landscapes of our lives. Political ecology permits a holistic view of water quality concerns. As an approach, it draws on the reciprocal relations between political economy, human society, and the biophysical environment in which we live. While this approach has typically been used to explain environmental change, the same relations can explain the maintenance of the status quo and the lack of environmental change.

These three bodies of literature combine to illuminate the salient components of structure, process, and outcomes. An actor-oriented approach from political ecology helps deconstruct the institutions created by environmental governance to reveal human individuals acting in relations. It also keeps in the forefront of analysis the reciprocity of relations between the biophysical environment, human society, and political economy. Environmental governance is not unidirectional with humans or their institutions acting on the environment without consequences that in turn affect human society and the political economy. Environmental governance sets the rules for determining who has access to natural resources and how they can be used. Watershed management examines the mode of management, whether by a single issue or a holistic approach. These literatures locate the new structures within an area of water resource governance. Their effectiveness can only be determined by first identifying what they are.

The next chapter presents the research design and methods used for analyzing local water governance structures in the subject watersheds.

Chapter 4 – Methods

This research examines newly organized, local watershed-level governance structures in Kansas via case studies of two watersheds. I used an actor-oriented approach within a political ecology framework. Documents and interview transcripts were analyzed employing a grounded theory approach (Glaser & Strauss 1967, Miles and Huberman 1994, Strauss 1996) for differences and similarities, sorted into topical categories and coded for common themes.

The research questions guiding this study are:

RQ1: To what extent do local water-governance structures determine water resource issues and exhibit decision-making authority, agency, and capacity within their individual watersheds?

RQ 2: To what extent do local water-governance structures reflect local concerns versus Kansas- or national-policy concerns?

RQ 3: What interests or concerns are reflected through community member participation in local water-governance structures?

RQ 4: How effective are local water-governance structures in protecting water resources? Are land and water concerns integrated within ecological boundaries of a watershed to achieve both local and state water quality goals? To what extent do they contribute to or hinder the attainment of local state water quality goals?

To address the questions I used a comparative case study strategy. Within each of the two cases, qualitative data were collected from interviews and historical documents. The data were analyzed both within and across the two cases using a case comparative approach (Yin 1981). I selected an instrumental case study strategy for this research because my objective was to acquire an in-depth, holistic understanding of local watershed-level governance structures (Stake 1995). The watersheds themselves, while interesting, were not the primary object of focus. Rather, my interest is in how watershed-level governance structures emerge and function in their local, biophysical environments, within the state hierarchy of water governance, and as implementation of national policy.

A case study has two necessary conditions: it must be an identifiable unit with specific characteristics, and it must refer to an analytical category or theory (Wieviorka 1992, Stake 1995). Using a case study research strategy is appropriate when other methods are inadequate,

when causal links are too complex for survey or experimental designs, when the project is to describe an intervention and the context in which it occurs, and to explore situations in which an intervention being evaluated has no clear single set of outcomes (Stake 1995, Yin 2002). Case studies are a useful strategy when each case is to be examined as a total situation that results from a combination of conditions and cases are compared as whole entities. There are no assumptions about the cases being equivalent, and the strategy works well with a few cases. Moreover, case studies work well to uncover patters of similarity and constant association (Ragin 1987).

Case study research may be carried out with multiple sources of data—documents, interviews, and observations—that can be either qualitative or quantitative or both. These multiple sources of evidence contribute to the holistic understanding of the object of study, especially when the boundaries between the phenomenon and its context are not evident (Yin 2002). Gathering data for qualitative case studies is an iterative process. The process of conducting interviews and collecting relevant documents may reveal additional samples of informants, observations, or new documents (Yin 2002, Miles and Huberman 1994).

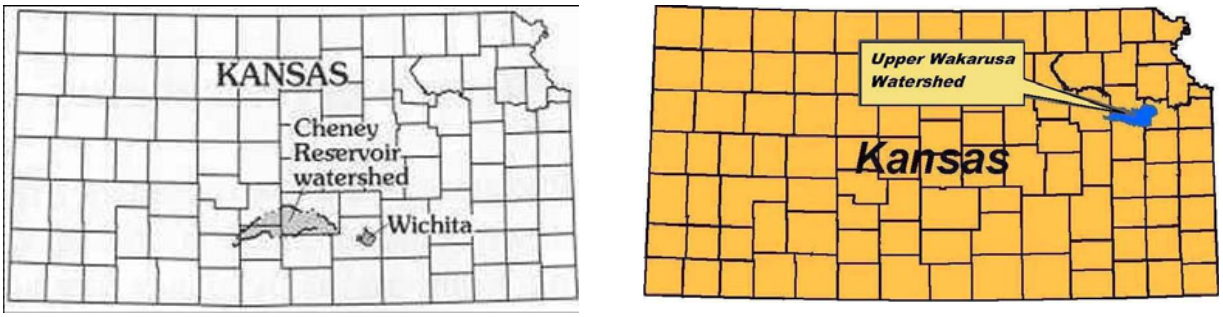
Case study selection

The sampling in this research was purposive (Miles and Huberman 1994), beginning with the selection of the case studies. Cheney Lake Watershed, established July 1994, is a unique case of a watershed-level management unit that has achieved some success in promoting the use of Best Management Practices for water quality conservation. Cheney Lake is a federal reservoir that functions as a primary water supply for the city of Wichita, Kansas. Cheney Lake watershed and Cheney Lake Watershed Project, the structure charged with implementing measures to improve water quality, was selected as a case study because it is unique in the state. It serves as a model for the more recently organized local water governance groups and because it has operated in a successful partnership with the city of Wichita, its larger community of interest, for more than 15 years.

The second case study is the Upper Wakarusa watershed. While neither watershed initially organized as a Watershed Restoration and Protection Strategy group (WRAPS), both eventually were incorporated into the state WRAPS program. This local watershed-level organization arose to address water quality issues in Clinton Reservoir, which is a water supply

for the city of Lawrence, Kansas, as well as some rural water districts serving small communities. The Upper Wakarusa watershed was selected not only because of its similarities to Cheney Lake watershed, but also because it is located in a different physiographic region in the eastern, more humid area of the state and comprises more urban area (Figure 4.1). In addition to both lakes functioning as a water supply, both watersheds have similar land uses and are primarily agricultural. As a result, most nutrients entering the river and lake are nonpoint source from agricultural production creating similar soil loss problems in the watersheds and water quality issues in each lake. Each watershed was historically tallgrass prairie that settlement transformed into areas of small farmsteads interspersed with small communities. Both local watershed organizations began with grassroots stakeholders, and later both became WRAPS projects. The WRAPS process has been adopted by the state of Kansas as the process to use in addressing water quality issues from nonpoint sources.

Figure 4.1 – Location of Cheney Lake and Upper Wakarusa Watersheds



A WRAPS is a planning and management framework through which locally organized water governance groups can address local water resource issues. Kansas WRAPS projects rely on local leadership to plan, implement and manage, and maintain water restoration and protection efforts. Local stakeholders organize as a group, but also draw upon county, state, and federal agencies for technical expertise and financial resources. Key components of the process of these local water governance groups are local knowledge to guide the development of the project and local involvement as the driving force of the project.

Within-case sampling and methods

I selected interview subjects from each watershed area by identifying the county and state agencies working with agriculture to promote water conservation and by looking at the network

or partnerships typically formed with various watershed-level organizations. These agencies and organizations typically include, but are not limited to, county offices of Natural Resource Conservation Service (NRCS), county conservation districts, groundwater management districts, rural water districts, irrigation districts, and Kansas Wildlife and Parks. As I identified these entities for each watershed, I also identified the individual mostly likely to work with the watershed group or make decisions regarding cooperation between the two organizations, e.g. NRCS District Conservationist, Conservation District Manager, etc. As those interviews were conducted, other informants were identified using a snowball technique. I then added those names to the interview list.

To address the research questions, I used document analysis and in-depth interviews. A review of Kansas water law provided background knowledge and historical context, which was presented in the previous chapter. Providing background knowledge for the study are reviews of the history of the Natural Resource Conservation Service in Kansas and County Conservation Districts. I also review published accounts and previous research on the newer water governance groups. I draw on data obtained from focus groups and interviews conducted during preliminary research. The preliminary research includes two research projects. The first project provides focus group data from selected watersheds in the state (Hill et al. 2004-2006). Interview data from Cheney Lake watershed was collected in the second project (Nelson et al. 2006-2010).

In-depth, semi-structured interviews provided primary data (Weiss 1994). The interview subjects were purposely selected for their knowledge and experience of the watershed organization. The informants had knowledge of the origin and history; past and current operation; and future direction of operation. Interviews were conducted with members of the Cheney Lake Watershed Citizen's Management Committee (CMC), the Upper Wakarusa Management Team, NRCS (Natural Resource Conservation Service) District Conservationists, and managers of county conservation districts for the most active counties in the study watersheds, and personnel and water experts from county and state offices. Counties in the Cheney Lake watershed include Kingman, Reno, and Stafford counties; counties in the Upper Wakarusa watershed include Douglas, Osage, and Shawnee. About 30 interviews were conducted in the entire study. Interviews included informants from both watersheds and representatives from state government offices. All interviews were digitally recorded and transcribed.

Analysis

Analysis of case study research relies on both categorical aggregation and direct interpretation of individual occurrences. Categorical data is needed for understanding a phenomenon within a case study or for understanding the relationships within a case study (Stake 1995). Within-case interviews and documents were analyzed for differences and similarities, sorted into topical categories, and coded for common themes. Initial categorization was made of responses to the interview questions. The semi-structured nature of the interviews allowed respondents to move off topic and talk about side issues, which were sorted into categories and coded for themes as well. Data were organized into cluster summary tables for cross-case comparison. For example, see Table 4.1.

Table 4.1 – Leadership Team Composition and Approach

Topic	Theme	Evidence or Supporting Quote	
		Cheney Lake	Upper Wakarusa
Origination	Initiating event	Algae Bloom	Kaw Valley Heritage Alliance (KVHA)
	Leadership Team	Citizens' Management Committee (CMC) all producers	Personnel from water agencies
		The watershed project has to be producer led—The city can be a partner but not the leader. But they had an idea, and they got people together and began to say hey, it can't be an agency driven thing, it has to be producer-driven. People bought into it and it's working.	Water Quality and the Natural Resource sub committees of KVHA
Leadership approach:	Inclusive; Watershed-wide; all producers		Emphasis on problem sites—identifying problematic areas by aerial photography; Wetland delineation; Emphasis on physical structures
	Build producer trust	*I believe you have to build some confidence and trust.* They [CMC] want me to spend more time in restaurants and coffee shops. And the reason that is, is because you get to see a good set of people that way and you can socialize with them and get to know them and you become one of them. And that makes you accepted in an area.	---
	Education	We have producer meetings, and we have seminars, we have field days, we hosted one in which a different organizations that want to come out to see what we're doing. We take them on walking tours of how a watershed functions along a stream or a creek, and why erosion happens.	---[*KVHA held education programs before KAWS became coordinating agency]
	Personal Contact	One on one with farmers is the main thing I'm supposed to do. We can take time to explain programs. 561809	---

Validity is always a question with interview data. Are the respondents being truthful? Weiss (1994, p.150) states, "For the most part we must rely on the quality of our interviewing for the validity of our material." Getting feedback from those interviewed allows for correction if the interviewer gets off track in synthesizing the data (de Wit 2003). In the process of analyzing data, interview subjects were contacted for clarification as necessary.

Limitations

This study is limited to analyzing only a few water governance structures and their operations at a local, district, or county level. Another limitation is that the water governance structures analyzed in this study are those related to agricultural production. The Upper Wakarusa watershed is a sub-watershed of the Wakarusa River drainage that drains to Clinton Lake. The location of this sub-watershed is such that it does not drain the adjacent more urbanized areas. Further research is indicated for examining institutions that affect water governance both directly and indirectly at all hierarchical levels. Further research is also indicated for governance structures that address urban sources of nonpoint source pollution. Not meeting clean water standards is a nation-wide problem and other states have different processes, which makes cross state research valuable to obtaining a national picture.

The nature of qualitative research and case study research are both susceptible to problems with objectivity and generalizability. Additionally, a case is only one example of a group or category of a subject entity. The data collected are specific to the individual structures, and while description and understanding of the type of structure is gained, the results and findings are not statistically generalizable.

The remaining sections

The next two chapters, the individual case studies, present findings and analysis for each subject watershed. The case studies begin with a biophysical description, an agricultural and demographic profile, and background information specific to the watershed and water governance.

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Chapter 5 – Case Study: Cheney Lake Watershed

Cheney Lake watershed, the drainage basin for Cheney Reservoir, has many unique characteristics, not the least of which is its 15-year partnership with the city of Wichita. Cheney Lake watershed stretches across five counties in south-central Kansas. Cheney Lake is a federal reservoir that serves as a primary water supply for the city of Wichita. Wichita, the largest city in the state with a population of 366,046 (U.S. Census Bureau 2009), currently draws 60 to 70 percent of its daily water supply from the reservoir. The city also markets water from Cheney Lake to other towns in the Wichita area. In addition, Cheney Lake provides many quality of life benefits to a larger population than that of the watershed. The need to preserve the reservoir as Wichita's water supply initiated the concern for water quality in the lake and more rigorous soil conservation efforts in the watershed.

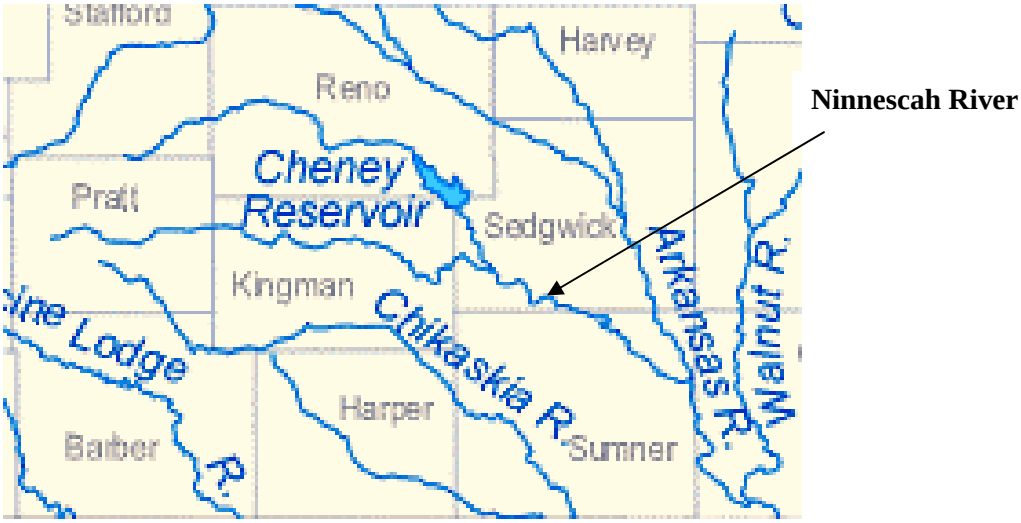
Cheney Lake Watershed has been the focus of organized water-quality protection efforts for more than 15 years, beginning prior to its classification as a Category I watershed by the Kansas Unified Watershed Assessment (KDHE 1998). According to the assessment, a Category I watershed is one in need of restoration. Cheney Lake watershed was classified as a Category I based on water quality. Kansas Department of Health and Environment (KDHE), the state drinking water regulatory agency, set eutrophication and silt as Total Maximum Daily Loads (TMDLs) for Cheney Lake. A TMDL is a measure of the maximum level of a pollutant in a waterway that would allow the waterway to maintain applicable water quality standards, taking into consideration the seasonal variations and a determinable margin of safety.

Physical Description

Cheney Lake watershed is the drainage for the North Fork Ninnescah River and drains most of the southern portion of Reno County. The North Fork Ninnescah is a tributary to the Arkansas River, which it joins in Sumner County (Figure 5.2). The watershed encompasses 633,000 acres in the Great Bend Sand Prairie portion of the High Plains (see Figure 2.1). Although most of the drainage basin and the reservoir are in Reno County, the basin extends southward into Kingman County, the southeast corner of Stafford County, northern Pratt County, and culminates in eastern Kiowa County. Also notable, the watershed straddles the 98th meridian, regarded as a longitudinal marker dividing the semi-arid west from the humid eastern

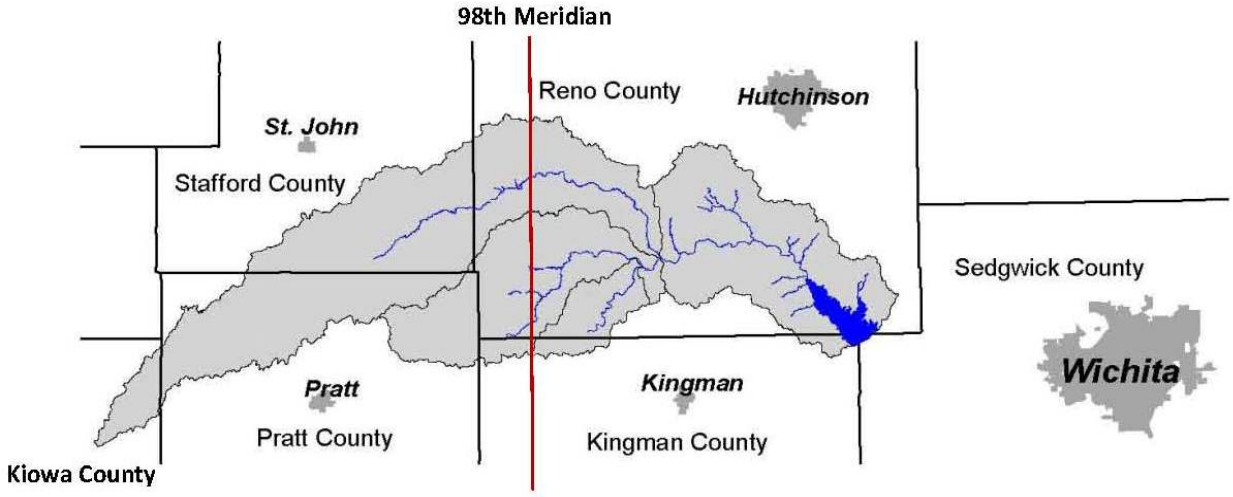
part of the state. The meridian transverses the watershed just a little more than seven miles east of the Pratt County line (Figure 5.3). The watershed also encompasses two of the state's seven precipitation-zones and three of its areas annual precipitation (See Figures 2.4 and 2.5).

Figure 5.1 – Kansas Tributaries to the Arkansas River



Source: Map adapted from original map at http://geology.com/state-map/kansas.shtml,

Figure 5.2 – Location of Cheney Lake Watershed and the location of 98th Meridian

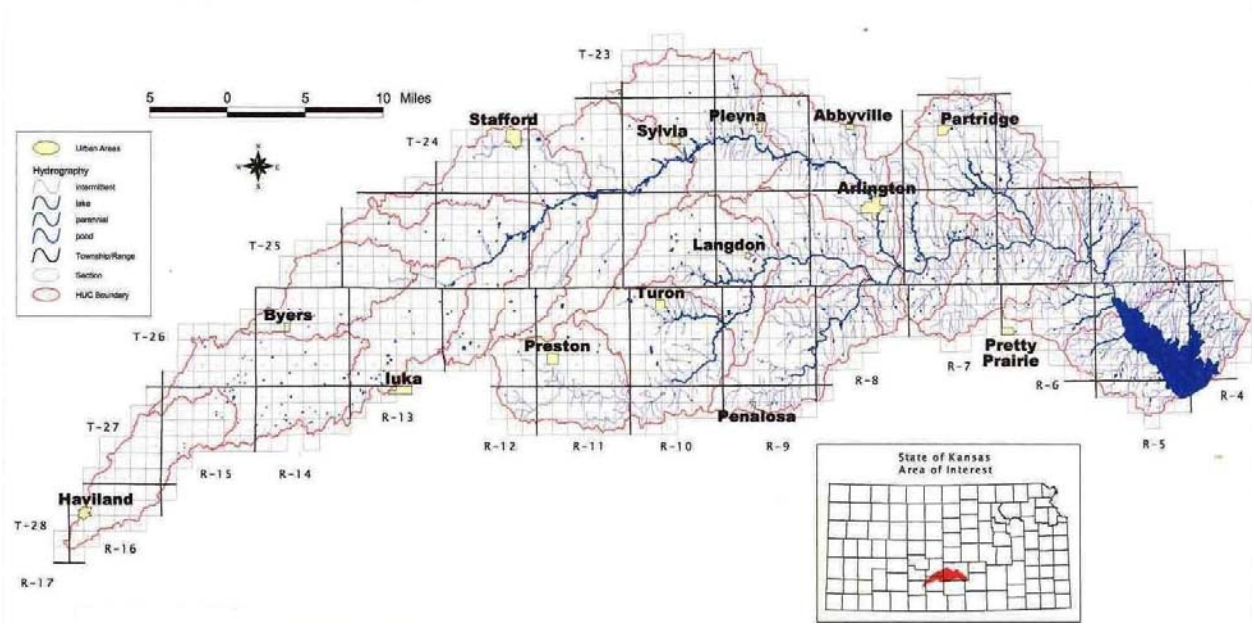


Source: Cheney Lake Watershed, Inc., adapted by author

Demographic and Agricultural Characteristics

Although the watershed area includes several urbanized areas the overall human population is about 4,000 (Devlin et al. 2008). The several urbanized areas in Cheney Lake Watershed range in population size between 200 and 1,200, and the overall human population is about 4,000 (Devlin et al. 2008) (Figure 5.3).

Figure 5.3 – Cheney Lake Watershed and Urbanized Areas



Source: USDA NRCS

With the exception of Reno County, which has the largest population center of the counties comprising the watershed, population growth in the watershed counties has been generally declining since the 1950s. There is little racial diversity in the county populations; 94.0 to 97.6 percent are white (U.S. Census 2010). The agricultural community is more homogeneous with more than 99 percent white producers. Land use in the watershed is primarily agricultural, creating concern for nonpoint source pollution. More than 99 percent of the Cheney Lake Watershed is in production, in either cropland or pasture. Crops are grown on 72 percent of the land area. These crops include corn, grain sorghum, soybeans, and wheat. Livestock raised include cattle, hogs, and some sheep. The watershed includes about 1,000 agricultural operations. The low population density coupled with the presence of only one-permitted cattle feeding operation creates little potential for point source pollution.

Three of the five watershed counties show an increase in farm numbers (Table 5.1). This small increase in the number of farms is accompanied with a decrease in average farm size. The rural population is considered stable suggesting that one possible explanations for the increase in farm numbers is that individuals are coming from urban centers and purchasing small acreages—40 to 160 acres—and are farming part time. The National Agricultural Statistics Service defines a "farm" as any place with any combination of sales, potential sales, and government payments totaling at least $1,000 annually. Other possible explanations include land divisions as one generation dies and children inherit the land in smaller pieces, investment in land for recreational purposes, such as hunting, "hobby farmers", or individuals who purchase small acreages to build a home and may have animals and/or a large garden (Reno County NRCS employee, personal communication).

The average age of producers ranges between 57 and 62 years. Agriculture is the primary occupation for about 42 percent of producers in the watershed counties. The average farm subsidy payment (for farms receiving payments) in these counties ranges between $8,000 and $12,000 per farm (Census of Agriculture 2007).

Table 5.1 – Selected Ag Statistics for Counties in Cheney Lake Watershed - 2007

Cheney Lake watershed (CLW) Counties	Reno	Stafford	Kingman	Pratt	Kiowa
Percent of county in watershed	45%	20%	3%	16%	3%
Estimated number of farms in Cheney Lake watershed per county*					
2007	787	112	26	86	10
2002	707	107	25	95	11
Total estimated number of CLW farms					
2007: 1021					
2002: 945					
Percent operators, primary occupation farming	41.91%	48.75%	44.63%	39.41%	50.69%
Average age of principal operator (yrs)	58.8	60.8	57.2	60	61.9
Average Payment Per Farm of Farms Receiving Government Payments (2007)	$8,438	$14,684	$9,580	$12,171	$11,566

*Estimated by percentage of county that is in the watershed. *Source: 2007 Census.

Commodity and Conservation Payment Programs

Conservation and commodity payments are important agricultural characteristics as they contribute to producer income. These payments demonstrate the implementation of national farm policy promoting maximum agricultural production. Both payment programs are directed by the same federal agency and are not integrated. Kansas ranked fourth in the nation in 2009 for money received from The Direct and Counter-Cyclical Program (DCP). Kansas 2009 DCP payments totaled $313 million. The DCP provides payments to eligible producers on farms enrolled for the 2008 through 2012 crop years. Both direct and counter-cyclical payments are computed using the base acres and payment yields established for each farm (USDA FSA 2008). Commodities eligible for DCP payments are wheat, sorghum, and corn. The counties in the Cheney Lake Watershed ranked in the top half of counties in the stated receiving payments. Producers in these counties received 7.0 percent or $4,369,660 in payments made to Kansas producers (Table 5.2).

Table 5.2 – DCP payments by county in Cheney Lake Watershed - 2009

Rank	County	Total Direct Payments 2009	Pct of State Total	Est. Payment in CLW
7	Reno	$5,534,432	1.8%	$2,490,494
13	Pratt	$4,648,744	1.5%	$743,799
14	Stafford	$4,648,079	1.5%	$929,616
32	Kingman	$3,984,516	1.3%	$119,536
55	Kiowa	$2,873,836	0.9%	$86,215
Total estimated DCP payments into the watershed			7.0%	$4,369,660

Source: Environmental Working Group Farm Subsidy Database, 2010, http://farm.ewg.org/. Compiled from USDA data

Kansas farmers received one-third of the $32 billion conservation payments paid in the United States between 1995 and 2009 (Environmental Working Group 2010). Kansas conservation program payments totaled $125 million in 2009. Combined, the counties comprising the Cheney Lake Watershed received seven percent of the payments coming to the state or $333,363 (Table 5.3). Conservation and DCP payments together brought $$437 million

into the Kansas economy in 2009. Combined they contributed an estimated $6,774,223 to the economy of the CLW.

Table 5.3 – Counties in CLW Receiving 2009 Conservation Programs payments

Rank	County	Subtotal, Conservation Programs 2009	Pct of state Total	Est. payment to watershed
3	Reno County	$3,672,176	2.9%	$ 1,652,479
19	Kiowa County	$2,160,160	1.7%	$ 64,805
21	Stafford County	$1,987,574	1.6%	$ 397,515
28	Pratt County	$1,528,468	1.2%	$ 244,555
30	Kingman County	$1,506,973	1.2%	$ 45,209
Total payments into watershed			8.6%	$ 2,404,563

Source: Environmental Working Group Farm Subsidy Database, 2010, http://farm.ewg.org/. Compiled from USDA data.

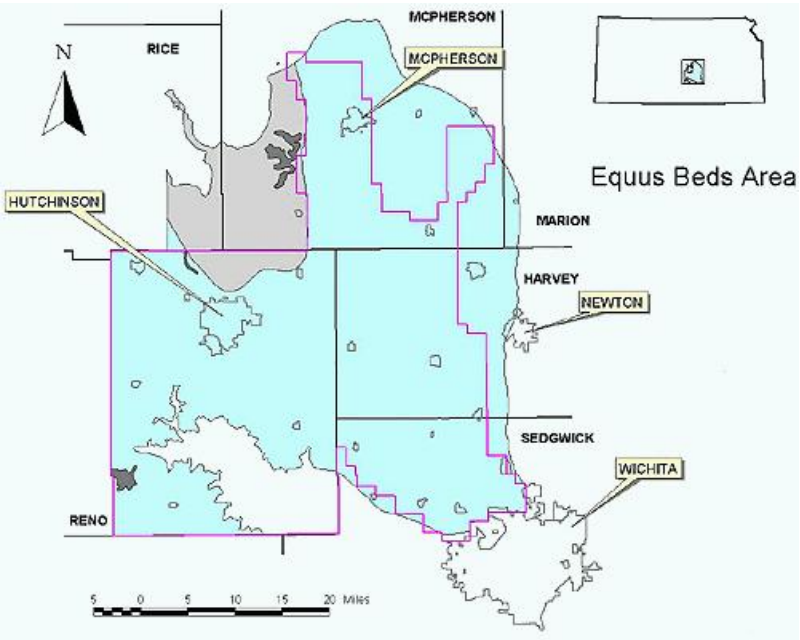
Origin of Cheney Lake

The story of Cheney Lake is largely a story of Wichita's water needs, and within that story resides a source of rural/agriculture-urban and rural/agriculture-government mistrust. The city of Wichita was established at the confluence of the Arkansas and Little Arkansas Rivers in 1871, and conflict surrounding the issue of a public water supply began then. In 1882, the city contracted with a private corporation, the Wichita Water Company, to supply and distribute water to the city. The 40-year contract included options for the city to purchase the system. Conflict over private versus municipal ownership of the water system in Wichita, supply and distribution, persisted for 60 years and was the source of numerous court battles (Gattin 1995). In 1922, during one of these judicial disputes Wichita began experiencing water shortages. At this time, the city used the Arkansas River as its municipal water supply. A study done at the time showed that the river water was so mineral-rich it would cause the city to incur increased maintenance costs for its water works if the river continued to serve as the city water supply. The firm conducting the study suggested the city instead draw water from the Equus Beds aquifer.

The Equus Beds is a groundwater aquifer underlying portions of McPherson, Marion, Harvey, Reno, and Sedgwick Counties in south-central Kansas (Figure 5.4). This aquifer is a primary source of usable water. The aquifer lies in a precipitation zone that receives 28-32 inches of moisture annually. Precipitation is the predominant source of recharge for the aquifer.

Additional recharge occurs through seepage from river- and stream-beds, percolation of irrigation water, and groundwater inflow. Groundwater Management District No. 2 is responsible for management of the aquifer and does so according to the Safe Yield and Groundwater Quality Principals, which means withdrawals are limited to annual recharge and the naturally occurring water quality is attempted to be maintained by protection and remediation (Equus Bed GMD2 2010). The Little Arkansas, Arkansas, and Ninnescah Rivers drain the area overlying the aquifer. Cheney Lake lies on the southern edge of the aquifer.

Figure 5.4 – Location of Equus Beds Aquifer in South-Central Kansas



Source: Map courtesy of Groundwater Management District No. 2

It was not until the late 1930s, however, that Wichita moved to obtain its water from the Equus Beds. Industrial growth in the late 1930s renewed the need for an increased water supply. The city could no longer solely rely on the Arkansas River for its water and it looked to the Equus Beds for as an additional source. The city passed a bond in late 1938 for using the Equus Beds and the project began operating wells in 1940. The city installed a system of 25 wells. Local farmers, property owners, and businesses living close to the well field violently opposed the city taking the water. They feared that not only would the city take their water, but it would also take their opportunities for growth and economic prosperity (Irvine 1997). One unidentified protester shot at city crews working to install the wells and other opponents threatened violence (Sherow and Socolofsky 1995). Wichita thought its water problems had ended as the water from

the Equus Bed was good quality, clean, and low in minerals; moreover, annual precipitation was sufficient to recharge the aquifer. However, the population of Wichita doubled between 1940 and 1946, and industrial usage increased by 157 percent, which resurrected the need for more water (Gattin 1995). The population pressure for an increased water supply continued. A drought in 1950 compounded the effects of a population that had grown to more than 166,000, and was cause for the city to renew its search for a new water supply (Gattin 1995).

Another drought in 1952 drove the city to pump more water from their Equus Beds wells causing a drastic fall of the Equus Beds water level. The drought hit farmers twice, first with inadequate rainfall and again with the lowered water table caused by the city's pumping (Sherow and Socolofsky 1995). Farmers who had relied on the high water table for natural irrigation found they had to drill irrigation wells to have water for their crops. Conflict arose in and out of court between the city and the farmers over the drawdown of the aquifer. In their attempt to protect their interests, the farmers organized the Central Kansas Conservation Association. The association exploited Kansas' traditional rural-urban conflict. The association's agenda was not only to block Wichita's expansion into the Equus Beds, but also to overturn the 1945 water appropriation law (Gattin 1995).

Although the group achieved support from the then rural-dominated legislature, ultimately their efforts failed. They managed to convince the state senate to pass a bill repealing the 1945 law; however, the bill was returned to committee where it remained (Gattin 1995). Historians have speculated that although Kansas Senators were willing to go "on the record" against Wichita, they were not willing to reinstate the riparian doctrine as the state's water law (Corbin 1972). The city, however, holding no sympathy for the farmers, used their power of eminent domain to pursue extended water rights in the Equus Beds (Sherow and Socolofsky 1995). In 1952, Wichita had requested that the Bureau of Reclamation investigate the possibility of the city obtaining a water supply from the Ninnescah River. In 1954, Wichita experienced yet another water shortage emergency as peak demand reached 62 million gallons per day, which was only eight million gallons short of the total available supply. With the rural-dominated state legislature still expressing a hostile attitude toward the city, the city continued its search for a new water supply (Gattin 1995).

Meanwhile in 1947, the Bureau of Reclamation had conducted a basin-wide study of the Arkansas River to identify existing and potential needs for water in the area for irrigation,

municipal and industrial uses. The mission of the Bureau of Reclamation was to alleviate local irrigation development. By the 1940s, the need for irrigation projects had decreased, and the Bureau's funding and existence were at risk. With survival at stake, the Bureau was expanding its scope of work hoping to become the federal leader in local water supply, which put it in competition with the Army Corps of Engineers. The Bureau differed from the Corps in that its approach recognized the importance of multiple use projects. In response to Wichita's request that the Bureau investigate a water supply from the Ninnescah, the Bureau recommended damming the Ninnescah River on its North Fork at Cheney. Later the same year, Wichita requested the Bureau continue the investigation with sufficient detail to determine the engineering and economic feasibility of using the Ninnescah as a water supply (Gattin 1995). As a federal Bureau of Reclamation project, the city of Wichita would benefit by not being the initiating agency and by not having the responsibility to pay for the entire project, and as a federal project, the state could not become involved to stop the project. In addition, the Bureau tended to push projects independently of state planning, negating some of the states' attempts to manage their water resources (Irvine 1997). The details that made the project beneficial to the city served to entrench the rural-urban and rural-government mistrust.

On November 6, 1956, the citizens of Wichita voted in favor of the Cheney dam and reservoir project. The project was not without rural opposition; eighty families, some of whom operated second and third generation farms on land that some considered the most fertile farmland in the state, organized to stop the Cheney project (Gattin 1995). The farmers did not believe the city would pay them a fair price for their land and they resisted the city forcing them out. They also believed that the real purpose behind the lake was not for use as a water supply, but rather as a recreation area for the people of Wichita. The farmers' opposition efforts delayed the project but did not stop it. Cheney Reservoir and Park were officially dedicated in 1965. The Bureau of Reclamation constructed the reservoir as a 100-year multipurpose project and intended it to serve as a water supply, wildlife and recreation area, and to provide flood control. The reservoir filled by 1968, symbolizing what the city officials thought was the end of Wichita's water supply problems for the next century.

For the next 25 years, Cheney supplied about half of Wichita's water needs. Most of the residents of Wichita took the reservoir for granted and saw it primarily as a recreation area (Gattin 1995). In the early 1990s however, residents began complaining of taste and odor

problems. City water personnel became concerned about phosphorus and sediment in the lake. Only 25 years into a 100-year lifespan, they were concerned that the lake was eutrophic.

Structure: Cheney Lake Watershed Project

Wichita water personnel had determined that the taste and odor problems stemmed from blue-green algae blooms resulting from high concentrations of phosphorus. While algae blooms do not pose a health threat, treating water to eliminate the taste and odor problems could be costly for the city. In 1991 and 1992, water staff found that phosphorus, which chemically binds to soil particles, was coming into the lake with soil from field erosion. Sediment is problematic not only because of the nutrients (phosphorus and nitrogen) that it carries, but also because sedimentation, filling in the lake, would reduce the life expectancy of the reservoir. In 1992, the water department requested the Bureau of Reclamation survey the reservoir to measure sediment accumulation. The designers of Cheney Lake expected it to have a sediment accumulation rate of 80 acre-feet per year. The survey showed the rate was less than the expected rate, perhaps only 60 acre-feet per year, suggesting a 30-year extended lifespan for the reservoir (Gattin 1995). Although the conditions of the reservoir were better than expected, a long-term plan was still necessary to address the taste and odor problems from excessive nutrients.

At the same time that Wichita water personnel were becoming concerned about the water coming from Cheney Lake, conservationists from the Reno County Conservation Districts were concerned about sediment deposition in Cheney Reservoir. As one conservationist recounted:

> We knocked on the door at almost the very time they [the city of Wichita] were starting to do this investigation about what kind of approaches they could do in the watershed up above the reservoir. Timing was by chance, but it could not have been planned any better. That's how the pieces came together.

NRCS and district conservationists had observed stream bank erosion along the river and sediment filling at the upper end of the lake. Some individuals, whose families the reservoir displaced, were now agricultural producers in Cheney watershed and were conservation district members. Residents of the area remembered the conflict that occurred when Wichita put wells in the Equus Beds and when Cheney Lake was constructed. Memories of farmers shooting at city employees and of police escorting families out of the Cheney reservoir area were still strong. Watershed residents did not want to see the city of Wichita come back to the watershed and take more land upstream.

Confronted with the taste and odor problem, the city had to find a way resolve it. The city took the approach that the taste and odor problem was a symptom, and their choice was to either just treat the symptom or to also find the cause and work to eliminate it. A Wichita Department of Utilities employee said of the situation:

> My view was. . . the taste and odor compound is an indicator of a problem. It's not addressing the problem to taking the taste and odor compounds out of the water after they're already there. If that's the symptom then what's the cause? The cause is the algae blooms. And what's causing the algae blooms? It's caused by the nutrients getting into the lake. How are the nutrients getting into the lake? They're running off the land. You keep working it backward.

The city was beginning to investigate what kind of approaches they could take in the watershed. Their preliminary plan was to look at several different locations to construct sediment retention dams. At this point, the Reno County Conservation District board members approached the city. As an alternative, they suggested working with producers in the watershed to reduce the amount of sediment transported off fields. The Conservation District board members suggested that the Conservation District employees approach producers with a plan to stop the erosion at the field. Wichita agreed to the suggestion and the Conservation Districts began putting together a watershed management plan. Some of the Reno County Conservation District board members had familial connections to those displaced by construction of the reservoir. The agreement signaled cooperation; however, the motivation on both sides was self-interest. Cooperation protected the farming communities from direct regulation and the city taking more land; the city benefited financially with a less costly solution.

Working together in 1992, the city of Wichita and the Conservation Districts created a task force to identify and alleviate potential sources of pollution in the watershed and Cheney Reservoir. The Task Force was comprised of landowners, representatives of the Reno County Conservation District, Farm Service Agency, Extension Service, and Health Department; the Sedgwick County Conservation District, the Wichita Water and Sewer Department, Kansas Departments of Wildlife and Parks, and Health and Environment; Kansas Water Office, Natural Resource Conservation Service (NRCS), Bureau of Reclamation, U.S. Fish and Wildlife, U.S. Geological Survey, Environmental Protection Agency; and other local, state, and federal agencies (CLWI 2006).

The inclusion of landowners on the task force and subsequent management committee demonstrated a change in the city's interactions with rural landowners (Gattin 1995). To

overcome initial skepticism and build rapport between the city and the producers in the watershed, city personnel arranged a tour of Wichita's treatment facilities to facilitate producers' understanding of that process. The city personnel also toured farms and ranches in the watershed to gain an appreciation of what the producers were doing. The two tours facilitated an understanding that the producers comprised an agribusiness community and the city a manufacturing community. One city employee commented, "They are businesses that are inextricably linked. We need each other, and helping each other solve our problems is a good way to approach problem solving."

The work of the task force demonstrated that existing farmer-support programs of the conservation districts and NRCS could be used as a preventative program for reducing sediment and nutrients reaching rivers and streams, and ultimately the lake. The task force not only identified which best management practices (BMPs) would contribute the most, but also the agency programs that offered incentives for their implementation. Best management practices are those farming practices and conservation structures that promote soil and water conservation by reducing the effects of farming or other human land uses. The environmental baseline for comparison is land in native condition. The task force determined that the best course of action would be to establish a watershed project that was a coalition of partners and would include many members of the task force—the agricultural producers and agencies. Such a project would benefit the city through improved quality in their water supply, and agricultural producers would benefit from reduced runoff and soil erosion on their fields, which would mean better water retention on the fields and soil moisture retention. The watershed project or management plan would focus specifically on water quality and would promote the use of BMPs through existing state and federal conservation and incentive-based programs. In addition, the task force also recognized the legacy of hard feelings and mistrust between the city and the agricultural community. To be successful, the task force determined that the city could not lead the watershed project but rather a subcommittee of the conservation district should lead the project.

In presenting options to the Wichita City Commission for solving the taste and odor problems, the water utilities personnel discussed water treatment options and their costs as well as the task force's suggested watershed management plan. One city commissioner speaking for the city said:

> The reservoir is ours, and we have a certain stewardship responsibility for it. If that stewardship responsibility takes us into the watershed to best maintain it, then that's what

> we should do. And yes, we'll agree that if we require specific practices in the watershed, the city will participate in funding their implementation.

The city commission agreed to a water quality project and management plan for the watershed and agreed that the city would participate as a funding partner. A city water employee said:

> Part of the management plan was that we [the city] recognized that this had to be farmer led. The city could be a partner but not the leader.

The task force went forward with planning the watershed project and creating a leadership team—the Citizen's Management Committee (CMC). In the process of organizing the project, the leadership team wrote a mission statement defining the group's primary purpose: "to provide water quality education and funding for cost effective clean water projects that improve the watershed and the reservoir" (French 2010, personal communication). The watershed mission aims beyond maintaining the water quality of Cheney Reservoir. Its aspiration is toward some degree of restoration and sustainability that includes soil quality and farm value. A representative of the CMC stated:

> I think that's broad enough that it includes not just water quality that people recognized that they wanted not just the water quality improved but that wanted to have a positive impact on people's farms as well. So, the watershed is bigger than just the river itself. We tend to focus on Cheney Lake. That's the end point, and that's really where the issue is, but we wanted to have a positive impact above that too.

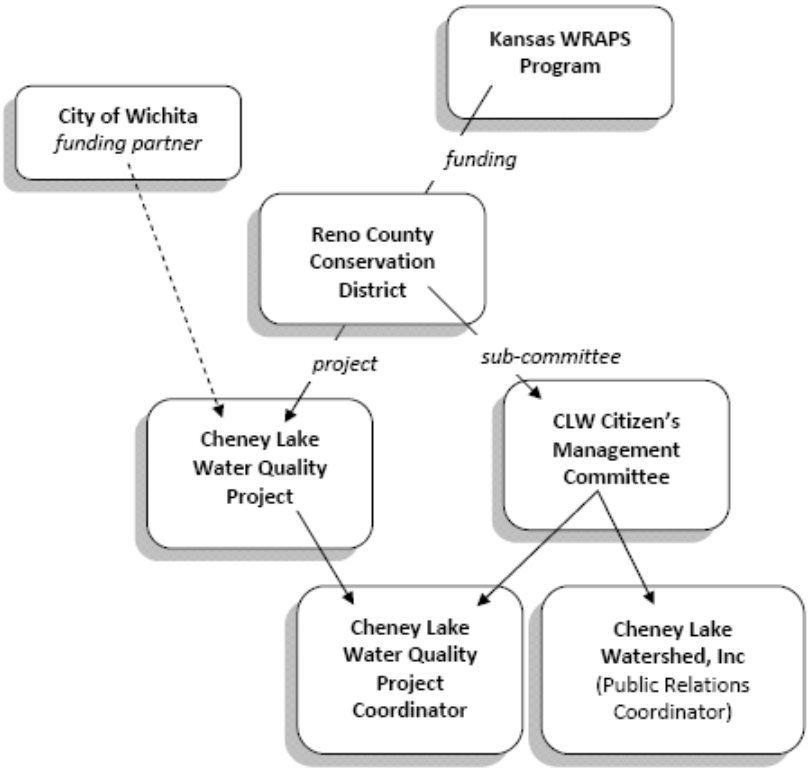
As a partner in the watershed project, the city of Wichita agreed to pay 25 percent of the cost of implementing the required practices as a complement to state and federal incentives thus enabling producers to adopt practices that would benefit the watershed at little or no additional personal cost. In addition, the producers in the watershed, or more specifically the Cheney Watershed CMC would direct the watershed project, which would be a subcommittee of the Reno County Conservation District. The Reno County Conservation District assumed the role of sponsoring organization for the watershed management group. The CMC would identify which projects met the goals of the management plan and try to identify ways to make the program successful. To facilitate operations, Reno County NRCS as the sponsoring organization, manages the conservation contracts.

The cooperation of Kansas Department of Health and Environment (KDHE) facilitated the procurement of Environmental Protection Agency (EPA) monies to fund a coordinator for the watershed project, as an employee of the Reno County Conservation District. With receipt of

these monies, the watershed project became a WRAPS project, although a uniform process had yet to be developed. Memorandums of Understanding (MOUs) were written between the five NRCS offices designating the Reno County office as the hub. The other conservation districts agreed to provide information on cost share projects. Within a few years, the Reno County NRCS and the CMC decided that a non-profit entity, primarily for funding purposes, would be more appropriate. They formed Cheney Lake Watershed, Inc. (CLWI), as a complementary entity in addition to the watershed project.

CLWI was created not as a replacement organization but rather as a non-profit that could pursue grant funding independently of NRCS (Figure 5.5). In addition, the CMC reasoned that as a non-profit there would be some tax advantages for people in donating to the non-profit. The CMC has the authority to decide which management practices or conservation structures would be most effective in addressing sediment and phosphorus issues. However, their partnership with Wichita exists to address sediment and phosphorus and the city only pays incentives for practices or structures addressing those issues. Similarly, funds to WRAPS groups are specifically to address the state assigned TMDL.

Figure 5.5 – Organization of Cheney Lake Watershed Water Quality Project



The watershed group can choose to address other issues; however, funding through WRAPS, NRCS, and SCC sources have specific designations. If there is another issue that can be connected to one of the approved program, then these funds can be used. Cheney Lake Watershed, Inc., was created for just this purpose—to be able to pursue other sources of funding that it might not be able to as a WRAPS project. The group also forms partnerships with other organizations, like KAWS or Kansas Rural Center, and others, many of which are WRAPS Program service providers. These other organizations may have funds for water quality or related projects. The watershed group will have as a partner any funding or cost share source they can find. They CMC recognized a need for more grass in the watershed, and they decided to offer an incentive for planting grass. Although it is not a WRAPS Program priority, Cheney Lake water quality project, with funding from Wichita, offered an additional incentive for producers. They also offered an incentive for producers to keep acres in grass as their CRP contracts expired. They offered to pay producers 50 percent of the cost of up to two miles of fence.

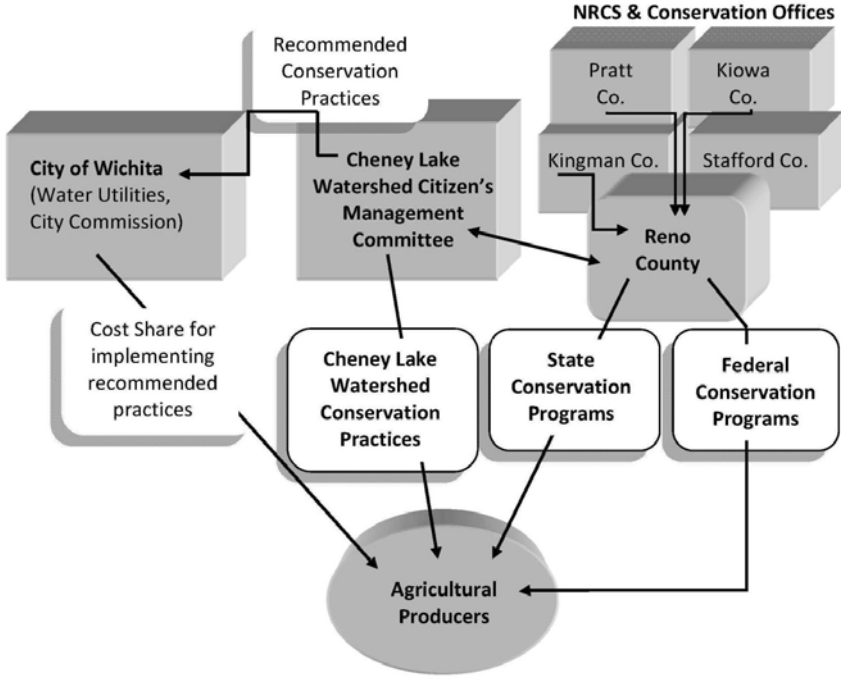
To this point, the reciprocal relations of political economy, human society, and the biophysical environment explain the chain of events from the decisions to build the reservoir to the necessity of creating a watershed project. With the creation of the non-profit arm, and despite partnership with Wichita, the watershed project retains the authority to define the interactions and relationships between it and the biophysical environment.

Process: The City-Watershed Partnership and WRAPS

The city-watershed partnership exemplifies the partnership premise that dialogue can occur in a setting that is non-hierarchical and egalitarian and produce a shared belief that collaborative action is mutually beneficial (Glasbergen 2007). The agreements between the city of Wichita and the watershed are in the form of Memorandums of Agreement. In July 2009, the city and watershed had five MOUs in effect: Grass Land Incentives, Water Resources Cost Share, NRCS-cost shared BMPs, Watershed Demonstration Projects, and watershed staff position. In contrast to the CRP program, watershed's Grass Land Incentives program not only allows farmers to establish grasslands but it also allows producers to use the grassland for grazing. The other four MOUs are agreements saying that the city will provide funds for these projects and staff positions (Ary 2009, personal communication).

Partnerships offer pragmatic solutions to problems, especially when any of the potential partners has limited capacity to solve the problem on their own. The Cheney Lake Watershed Task Force and the city of Wichita reached agreement on what they believed to be the best solution to problems in Cheney Lake, implementing that solution was more difficult. The partnership they created consists of three partners, Cheney Lake Watershed, the city of Wichita, and the NRCS offices in the watershed. Although the partners differ in resources and capacities, they function with essentially equal power. Cheney Lake Watershed Water Quality Project and Cheney Lake Watershed, Inc., coordinate the project and the participation of the partners as well as contribute local knowledge, provide education and awareness, and project promotion. At the center of the partnership is the Cheney Lake CMC. This leadership team has the task of identifying specific practices—either structural or managerial—that directly address the transport of sediment and phosphorus into Cheney Lake. According to KDHE regulations at the time, the city of Wichita held the legal authority to require actions in the watershed to remediate the problems with Cheney Lake. The city, however, chose to work cooperatively with the agricultural community, and brought with them some funding to commit to the effort. The NRCS and conservation districts offer federal and state incentive-based programs that address the issue (Figure 5.6).

Figure 5.6 – Cheney Lake Watershed, Inc. Partnership with Wichita and NRCS



The CMC and Cheney Lake Watershed WRAPS

The Kansas Watershed Restoration and Protection Strategy (WRAPS) program funds the Cheney Lake Watershed Water Quality Project (CLWQP) through the Reno County Conservation District. The Watershed project received EPA funds in 1994 to conduct watershed restoration work. Subsequently, 2003-2006, KDHE developed a uniform WRAPS process for use in watershed throughout the state. When that was in place, Cheney Watershed applied for and received further grant money. At that point (2004), the Cheney Watershed Project officially became a Kansas WRAPS project (French 2010, personal communication). As a WRAPS project, CLWQP is funded in part through the Kansas Water Office, with appropriations from the Kansas Water Plan Fund; and the Kansas Department of Health and Environment, through EPA Nonpoint Source Pollution funds.

The Citizens Management Committee (CMC) is the stakeholder leadership team (SLT) or governing board of Cheney Lake Watershed Project. On the part of watershed stakeholders, the desire to create a watershed group and the CMC arose from a diverse set of motivations: awareness of the water quality issues in the lake; a desire to be involved from an active voluntary standpoint rather than a reactive one; from a desire to have it managed with local leadership; and from a sense of responsibility or ownership. Stakeholder involvement with the establishment of the CMC and the desire to take an active voluntary role in addressing water quality issues in the reservoir demonstrates self-protection as much as it does responsibility and ownership of the problem.

Two producers involved with the CMC expressed their motivation for helping to establish the CMC in terms of voluntary action:

> We wanted to be involved doing positive best management practices for the water quality of the Lake, from an active standpoint instead of a reactive standpoint.
> If we don't do something up here, and voluntarily, then they are going to tell us what to do. I'd rather be trying to get it done voluntarily than have those 500,000 people come up here and tell us what were going to do.

Pre-empting regulation was a driving motivation for organizing the watershed project. It also was part of the narrative used by the CMC to encourage producer participation. Two other producers who served on the CMC expressed their motivation more as one of ownership and responsibility. They said, “I felt like I had a responsibility to get involved” and “I live in the watershed. Just felt like I should.”

Ownership, responsibility, and volunteerism as motivations were complementary to the conception of the locally led watershed group expressed by the city of Wichita. Whether from a sense of responsibility or one of self-protection, mutual agreement on this point established the idea of a partnership as the foundation of the watershed structure that was to emerge. The composition of the CMC initially had wide geographic representation of the watershed. The board consisted of one member from each of the watershed's seven sub-watersheds and included some at-large members. These characteristics of the watershed project and CMC were representative of alternative participatory governance structures that emerged in the 1980s (Leach and Pelkey 2001; Parisi et al. 2004; Sabatier et al. 2005; Morton 2008). More recently, the CMC decided such a composition was not necessary. While they do not want all the CMC members to be from the same township, it does not matter if they are all from Reno County, which is the current circumstance.

The CMC assigns on-going priorities of the watershed project in conjunction with the agreement with Wichita to address the original sediment and phosphorus impairment of Cheney Reservoir. The CMC sets priorities on the specific actions the watershed project will promote to address the impairment. Since the beginning of the watershed project, priorities have undergone some change. However, the water quality issues of the watershed-city partnership have remained sediment and phosphorus without the addition of any other issues. Recently the focus of the project and priority areas have changed. The CMC began emphasizing the need to identify areas that are greater contributors to the sediment load. A representative of CLW explained this change in focus:

> Initially there were some priority areas and then they [city of Wichita] expanded it to the entire watershed. They would fund anything that had to do with water quality and we've kind of stayed at that point. We began to focus our educational efforts, and now we're looking at specific areas of the watershed that are more of a concern to us. Some of the research has been specifically aimed at those areas of the watershed, and now we've even started to do some projects—some of the funding is only available in particular areas. We have a grass incentive program that's only available east of Highway 14 …, and there's a buffer program that's just around the lake.

The CLW representative further explains:

> We're beginning to identify areas that contribute more to sediment than other areas. So there's a little push for the CMC to recognize that and to use those areas as their priority areas even if that hasn't been the priority before. … Project leadership … People who are doing the research are telling us those are the areas you need to work on; KDHE tells us 'you need to set priorities,' EPA says you need to set priorities. And we can see

> where those areas are. So—me, I'm telling them, Wichita is telling them, we need to prioritize, and they recognize it too.

This return to the idea of identifying and focusing on priority areas follows guidelines of the EPA Nine Element Plan. Although the comments of the CLW representative portray the CMC as having ownership of the targeting concept, in reality the decision to identify priority areas is more tied to available funding source requirements at both the state and national level. Targeting represents a fundamental change in the watershed group away from being non-hierarchal and egalitarian and toward a government-initiated partnership that is an extension of government policy.

The EPA has a comprehensive watershed plan that contains nine elements. Beginning with fiscal year 2003 grants, EPA has required all implementation, demonstration, and outreach-education projects that are funded under Section 319 of the federal Clean Water have a Watershed Plan that includes the agency's nine listed elements.

When asked whether new concerns have arisen since the formation of the watershed project and partnership, the project coordinator commented, "No, nothing that we can do anything about—like Zebra mussels or any of that kind of thing." Zebra mussels have been identified in some northeast Kansas lakes. The presence of this invasive species does have implications for water quality as well as for water supply. The coordinator's reply demonstrates a narrow interpretation of "watershed restoration and protection strategies," and the practical limitation of the WRAPS program regarding non-agricultural issues.

Implementation approach

The Reno County Conservation District has a dedicated coordinator for the Cheney Lake Watershed Project. The coordinator's job description is to work with agricultural producers in the watershed to implement water quality practices to protect the Cheney Reservoir. The coordinator uses an educational approach with producers in the watershed. By providing producers with information about BMPs, the coordinator works to lead producers to come to their own conclusion that they should change their behavior. The watershed coordinator described the job in this way:

> Helping them [producers] understand what things they could be doing to protect water quality—and what kind of programs are available to help them do that. I do that through on-farm visits, we do a newsletter, we do brochures, and we do farmer meetings, some farm tours, grazing meetings in the wintertime. Those are probably most of the things—

> and then just following up on phone calls that people make to us. They [CMC members] meet up with people and suggest they call in about something, and then we follow up on those things too.

In addition, Cheney Lake Watershed, Inc., has had a Public Relations Coordinator promoting watershed programs for more than 10 years. The primary focus of this position is to facilitate producer participation. The PR Coordinator explains that the priority of this position is to have one-on-one contact with producers. Unlike NRCS employees, the PR Coordinator can take time to explain to producers the conservation programs available to them through NRCS, the conservation district, and through the watershed program. The PR Coordinator takes a collaborative, service-minded approach—what can the watershed project do for you that will help you protect water quality? The coordinator said:

> I try to go out to a farm and find out what their farm goals are…. See if we have any programs that fit what they want to do on their farm. Where the government's approach is what programs [exist]? My approach is, let's see if we can fit your farm into our program.

The objective of the one-on-one approach is to build rapport and trust with watershed producers. Achieving "producer buy-in" is critical to persuading producers to adopt BMPs or install conservation structures. As one of the watershed employees explained:

> It is really critical to have the right people working on the project and to get buy-in from the farmers or landowners who are being required to make changes. People have to own the goal, understand the issues, and be willing to make changes.

The inclusiveness of the approach taken by watershed employees facilitates a sense of ownership and responsibility on the part of producers; it generates producer buy-in. When producers choose to adopt conservation practices they are included in the larger effort—a grassroots effort—to protect water quality in their watershed. The change to focusing on priority areas may have the opposite effect. Interviews conducted with producers in the Cheney Lake Watershed, while not decisive, indicate that excluding some producers would be perceived as unfair and it would not necessarily ensure more participation in conservation efforts (Nelson et.al. 2006-2010). One producer said about not being included in a priority area:

> I wouldn't like that at all. I think it should be the whole watershed if they're going to do it. I think it should be spread out throughout the whole watershed district and then you have to educate the people.

Another producer said of being inside a priority area, "I probably would not participate. Because I've found once somebody gives you money, they want you to jump through hoops."

The comments surrounding the question of how producers would feel about a priority area reflected their confidence in the voluntary nature of conservation measures, that the extent of their participation was entirely their decision.

The city of Wichita

In an annual proposal to the city, the CMC proposes practices eligible for implementation incentives. The city then appropriates money for the program, which the city pays directly to participating producers. A Memorandum of Agreement (MOU) is written each year to cover the watershed projects for that year. Projects that receive federal funding are covered in an MOU between the city and the watershed project. An MOU between Cheney Lake Watershed, Inc. and the city covers the special projects that are not part of a federal cost share program. Cheney Lake Watershed Project has various MOUs that it renews with the city each year. Each one has a stated amount of funding to come from the city that is to be spent and not exceeded. These MOUs are approved by the Wichita city council each year.

NRCS and the Conservation Districts

The NRCS is a federal agency and county offices are the local level of the national hierarchy. The country is divided into three regions, East, Central, and West. Kansas is in the central region and is divided into three administrative areas. Area 2 includes 30 counties in the central portion of the state (Figure 5.7). Cheney Lake Watershed lies in Area 2.

Figure 5.7 – Kansas NRCS Administrative Area 2.

Source: Kansas NRCS

The resource concerns in Area 2 are: soil erosion (wind and water) on cropland; water quality degradation from sediment, nutrients, pesticides and animal waste; water quantity; overuse of grasslands; loss of upland bird habitat; and invasive species in native rangelands. The

major practices promoted by NRCS in Area 2 counties are grade stabilization structures; terraces or diversions; waterways; and livestock waste systems. NRCS offers programs that assist farmers in addressing the agency's resource concerns. As a Cheney Lake watershed partner, water quality programs generally are eligible for cost share funds from the watershed as well.

The county conservation districts, although partnered with the county NRCS office, are local offices of the State Conservation Commission (SCC). The county NRCS and conservation offices for the counties in Cheney Lake Watershed cooperate with the watershed project by promoting watershed projects and informing producers in their counties of the additional watershed incentives for producers to participate in the qualifying programs.

The Cheney Watershed partnership with NRCS is, in effect, a partnership between the watershed project and each county office. Although water quality and Cheney Lake are included in each office's scope of work, the five offices and staffs contribute varying levels of experience, differing impacts on the lake, and varying numbers of producers located within the watershed with variable willingness to participate.

Communication between the Water Quality Project Coordinator in Reno County and the other county offices is crucial for the process of the watershed project. One county NRCS conservationist said of the communication process in their office:

> I have to confess that I'm very bad about remembering about the whole Cheney thing because it is a small corner of our county. I didn't know about their grass-planting program, but I don't go to their meetings. And a lot of times if I get their minutes I'll file them but I don't necessarily read over them.

Success of the WRAPS project depends on producer participation, which in turn is dependent on each county office participating as a partner to promote the watersheds programs. When county offices fail to promote the watershed's objectives the structure of the partnership breaks down.

Outcomes: Results

Successful producer participation, however, does not depend solely on producers receiving information about programs. Many factors affect producer adoption of BMPs; some of them are due to the structure of the agencies involved and processes they use. Other factors include the characteristics of the individuals in the county conservation offices as well as producer characteristics and situations. These factors may include experience or knowledge of

the office personnel and their workload, the economic capability of the producer, various social factors including age and attitudes of the producer, producer reluctance to change current production practices, and economic issues.

Constraints to producer participation: society – political economy relations

Economics and the financial capability of the producer are always a major determinant to a producer's participation in a particular program. The availability of cost share is often not the deciding factor. Overriding a financial incentive may be the producer's age or a particular attitude. Again, the average age of producers ranges between 57 and 62 years (see Table 5.3). Stage of life circumstances, such as nearing retirement, may constrain participation if participation requires a large cash outlay or new equipment. The obstacle may be an anti-government attitude. As one local agency employee put it:

> They don't want anybody telling them what to do, and the fact that they don't want to spend the money. I know … they don't like the government telling them what they can and can't do. They already feel overregulated. They don't want somebody telling them more what to do.

Another obstacle may be making significant change to the way the producer has been operating. Oftentimes, producers have been following a particular practice for generations. Producers sometimes do not understand the need to change. Their grandfather and father both did it this way, why should they do it differently? One NRCS employee gave the example:

> When producers come in to sign up under EQIP [Environmental Quality Incentive Program] they have to go by stocking rates. And if they want to put 200 head of cattle out there, they want to put 200 head of cattle out there. And NRCS says they can only put 150, well the producers won't do it.

The education and whole-farm approach taken by the Cheney Watershed employees combats constraints founded in attitudes and long-held production practice. By taking an individual, whole-farm approach the watershed employees look for an individual solution. The solution they recommend for a producer nearing retirement would not necessarily be the same solution they would recommend to a younger farmer. The partnership between the watershed entity and county NRCS and Conservation District Offices is a part of the individual approach. These offices usually have the benefits of local knowledge; agency personnel generally know the producers of the county, where they live, and have knowledge of their land and operations.

When the agency representative lacks that knowledge, communication of watershed programs suffers. As one conservation district employee said:

> One thing . . . is that I don't have this built in county map that I know where everybody lives and what area they're from. I can talk to a person about something and it will not occur to me where in the county they're at. A lot of district conservationists have been in their positions a long time …. I mean they just have this mental map. And, so and so walks in and they automatically place him in this corner of the county or this township or whatever—I don't have that.

In the political ecology framework, these constraints are located in the human society-political economy relation. Ownership, responsibility, stewardship, and environmentalism have all been found to be motivators for participation in conservation programs. However, they all place second to financial considerations (Nelson et al. 2006-2010). The producer has to stay on the farm in order to implement conservation practices

Willing participation

Cheney Lake Watershed Project has been operating for more than 15 years. Since 1994, more than 1,200 cost-shared or incentive-payment conservation contracts have been implemented in the watershed (Devlin et al. 2008). Producers have voluntarily installed conservation structures, such as terraces or waterways, or implemented conservation management practices. These BMPs have changed farming practices regarding tillage, stream bank protection, grassland, grazing, nutrient management, and irrigation, among others. The city of Wichita and the Cheney Lake Watershed CMC, as well as producers in the watershed believe the partnership has been successful. One city employee said of the partnership:

> From my own perspective, the most successful part of this has been the willingness on the part of two groups that historically have been at odds coming together and working collegially towards a solution with benefits for both parties.

A CMC member commenting on the success of the partnership said:

> I think, at least within our watershed they've recognized that they are part of the problem and they need to be part of the solution. Wichita is also ready to be part of the solution too because it's to their benefit.

Wichita's water personnel attribute the success of the partnership to the fact that it is mutually beneficial. Members of the CMC attribute success to local control and local knowledge. The Cheney Lake Watershed task force, the city of Wichita water personnel, and later the Cheney Lake Watershed CMC and staff used complementary narratives of sense of

ownership, local knowledge, and local leadership as the foundation of their partnership. Both partners believe the partnership and the watershed project have been successful. The watershed employees attribute success to the one on one interaction with producers that provide information and build trust, and to producer recognition of culpability in the water degradation problem.

Although they perceive the project and partnership as a success, not all the producers in the watershed participate in the promoted programs and some producers continue to engage in behaviors that are detrimental to water quality. In addition, such producers may not want to talk with watershed representatives. Producer participation or adoption of promoted conservation measures are voluntary, there is no regulatory arm. Although KDHE has regulatory power, they direct their efforts to larger, more urgent violations.

The watershed project relies on education, peer pressure, and a producer's sense of stewardship to attain their goals. Participating producers share information with other producers in their social and informational networks through word-of-mouth. The producers in the watershed highly self-identify as being stewards of the land, and when practices are demonstrated to be beneficial there is a greater willingness to adopt.

The CMC and watershed employees have learned that 100 percent producer participation is not required to make a positive impact on the lake. They look for the opportunities for producer participation, and more recently, they look for areas to prioritize where their efforts can make the greatest impact.

The producers who served on the task force and the CMC recognized that they wanted to do more than just improve the quality of the water in Cheney Lake. Although that was to be the endpoint of their efforts, they wanted the watershed project to improve the lives and farms of above the lake as well. The mission statement they wrote expands the scope of the watershed project beyond the quality of Cheney Lake to include the entire watershed. Cheney Lake Watershed Project and Cheney Lake Watershed, Inc., perceive their work as helping agricultural producers recognize when their behaviors are contributing to the diminishment of their soil quality and their farm value and then moving them toward behaviors that have some degree of replenishment and sustainability.

The Wichita water department employees believe the efforts in the watershed have been successful. Although watershed and city of Wichita interview respondents reported there is not

empirical evidence from monitoring stations that the sediment and phosphorous loads have been reduced, Wichita city employees cite anecdotal evidence. According to the water department employees the lake has not experienced a greater number, more frequent or more intense algae blooms since the partnership became effective. Meanwhile, Wichita's population grew from 304,011 in 1990 (Institute for Public Policy and Research 1996) to 366,046 (U.S. Census Bureau 2009). The water department employees see maintaining the status quo of water quality while experiencing 20 percent population growth as improvement.

The watershed employees expressed the opinion that they believe t he WRAPS process can work with the caveat that it be the model as it was initially envisioned—that is to create a bottom-up process with local decision-making regarding issues and priorities, and inclusive, one-on-one education with producers.

Summary

The climatic diversity of the watershed and the variability stemming from straddling the line between semi-arid and humid contextualize attitudes regarding water. Water in the High Plains was found to be more useful and more valuable outside of streambeds. Settlers in these areas were in continuous conflict over water, and social organization reflected the need to manage water resources. Water, both quality and quantity, has always been and continues to be an issue of great concern. Grassroots efforts worked to change the state's water law from the riparian doctrine to appropriation to accommodate irrigation as well as to lobby for federal assistance for irrigation.

Conflict in south central Kansas arose between the city of Wichita and the surrounding farming community over water in the Equus Beds and the construction of Cheney Reservoir. With disregard for farmers' needs, the city of Wichita withdrew water from the Equus Beds in a time of drought, depriving area farmers of water for their crops. Then to ensure a water supply for the city, Wichita made a request to the Bureau of Reclamation to build Cheney Reservoir. Conflict between the agricultural community of the area and the city of Wichita contributed to both rural-urban mistrust and rural-government mistrust. Reciprocal relations of political economy, human society, and the biophysical environment explain the chain of events from the decisions to build the reservoir to the necessity of creating a watershed project.

In the early 1990s, in response to taste and odor problems in the water coming from Cheney Lake, Wichita agreed to a partnership with the agricultural community to address the problem. The city also agreed that their role in that partnership would be limited to providing funding to reduce producers out-of-pocket cost to change to beneficial farming practices. A task force was formed to create a producer-led leadership team to work with producers in the watershed to adopt BMPs. With the acquisition of EPA funds and the development of WRAPS process criteria, the Cheney Lake Watershed Project of the Reno County NRCS office became a WRAPS project.

Cheney Lake Watershed Project is unique because of its partnership with the city of Wichita. Wichita, as a stakeholder in the watershed via Cheney reservoir, finds assisting producers in their efforts to protect the reservoir in their own best interest. The city of Wichita contributes financial incentives to producers for adopting BMPs promoted by the WRAPS. The NRCS and conservation districts have overlapping scopes of work with the WRAPS. This overlap provides producers with cost share assistance from the WRAPS and NRCS for a federal program or the conservation district for a state program. The agricultural producers were motivated to participate in a partnership as a way to pre-empt the need for direct regulation or further intrusion by the city of Wichita into the farming areas.

The WRAPS is limited by the KDHE assignment of TMDL impairments. State funding for WRAPS is limited to the state water priorities and the TMDLs assigned that body of water. WRAPS do have the freedom to address other issues in their watersheds if they have or can raise the money to do so. Although Cheney Lake Watershed Project created a non-profit arm just for that purpose, they have not addressed any local issues that were not state priorities. The effectiveness of the partnership is also limited by the engagement of the parties. NRCS offices and conservation districts have the first priority of serving their own constituents. The effectiveness of these agencies in achieving water quality goals as set by a WRAPS is limited by their restriction of volunteerism and their capacity to communicate WRAPS programs.

The Cheney Lake Watershed Project has been successful in engaging watershed stakeholders. The stakeholders are rather homogeneous racially and culturally. Historical conflict with government agencies contributes to more autonomous, grassroots problem solving within the watershed. The watershed-wide, educational approach taken by the CMC has contributed to building producer trust. In addition, the education process and has contributed to

word-of-mouth dissemination that contributes to peer pressure. The watershed has emphasized whole farm evaluation and one-on-one service to the producer to engage producers in watershed programs. In addition to the two watershed employees, the members of the CMC also approach watershed producers on an individual basis. The whole farm approach works with watershed stakeholders to meet personal goals beyond TMDL impairment issues, although financial assistance is restricted to approved cost-share programs.

Since the beginning of the Cheney Lake Watershed project, more than 1,200 conservation contracts have been implemented. Watershed representatives and researchers acknowledge that monitoring stations throughout the watershed have not shown quantifiable improvement, however, they suggest some problem with the monitoring sites. The lack of measureable improvement is also some stimulus for targeting practices to specific areas.

Land use in the watershed is 99 percent agricultural and agriculture is the primary occupation for about 42 percent of producers in the watershed counties. Commodity and conservation payments together brought $437 million into the Kansas economy in 2009. They contributed an estimated $6,774,223 to the economy of Cheney Lake Watershed. These payments come through NRCS, one of the primary partnering agencies in the WRAPS program. Kansas WRAPS are funded through EPA monies, which flow through KDHE. KDHE strongly suggests that stakeholder leadership teams for a WRAPS are composed of agricultural producers from the watershed. Because agriculture is the greatest contributor to nonpoint source pollution, agricultural producers leading conservation efforts may be considered self-regulation.

In Cheney Watershed, the producer-filled CMC has had some success promoting a narrative of ownership and responsibility. The narrative of ownership expresses the idea that the watershed is their land, their water, their farms, and that they have the responsibility to take care of them. This narrative also suggests that if they do not take care of problems on their land that affect the city of Wichita, then the city may come in and take care of the problem. Producers have expressed that they are choosing voluntary compliance to preempt such action by the city or direct regulation by the state.

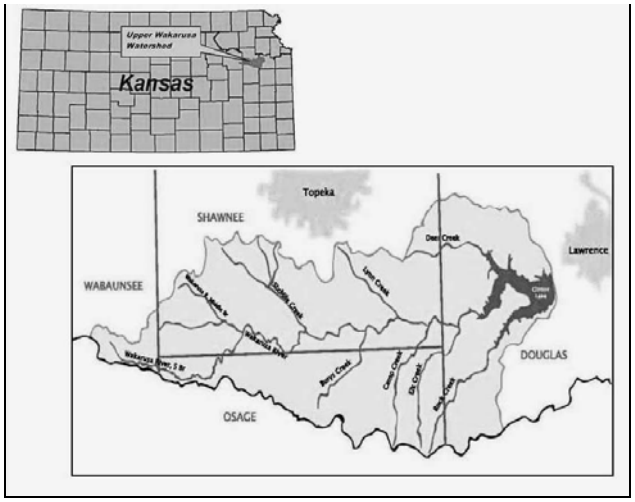
Prior to becoming an official WRAPS project, the design of the watershed project reflected the characteristics of the alternative participatory governance structures of the 1980s. However, as an official WRAPS project and obligated to the program guidelines, the

organization is moving toward the characterization of government-initiated partnership that is an extension of national and state government policy.

Chapter 6 – Upper Wakarusa Watershed

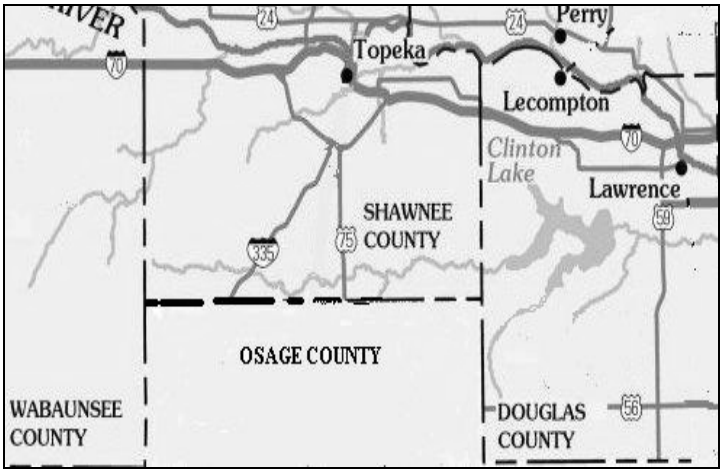
The Upper Wakarusa Watershed is the drainage basin for Clinton Lake, one of Kansas' 24 federal water supply reservoirs supplying water to the city of Lawrence as well as to several water districts within the basin. The Upper Wakarusa Watershed (Figure 6.1) extends across parts of western Douglas county, northern Osage county, across the southern quarter of Shawnee county and into Wabaunsee county. The watershed lies south of Interstate 70 with the Deer Creek sub-basin and Clinton Reservoir lying between Topeka and Lawrence (Figure 6.2). Land use in the watershed is 85 percent agricultural. The livestock population is approximately 33,000 and outnumbers the human population of 25,000. Several urbanized areas of varying populations lie within the watershed. In addition, major traffic ways – U.S. Highway 75, the Kansas Turnpike, and Kansas Highways 40 and 56 – comprise a critical component of the area economy and contribute to nonpoint source water quality issues.

Figure 6.1 – Location of Upper Wakarusa Watershed



Source: Upper Wakarusa WRAPS

Figure 6.2 – The Upper Wakarusa Watershed area in relation to I-70



Source: Adapted from map by USGS Water Resources Division, Kansas District.

Clinton Lake is the water supply for about 100,000 people in northeast Kansas. It supplies water for almost all of Douglas County, which includes Lawrence and Baldwin City.

The lake also serves the cities of Wellsville and Edgerton and about ten rural water districts. Clinton Lake is the most heavily used federal water supply reservoir in Kansas. Each year an estimated one million people use the lake and surrounding park area for recreation.

The Upper Wakarusa Watershed has been the subject of numerous government studies since the 1940s; the most recent was completed in 2001. These historical studies have consistently shown that soil erosion and runoff from agricultural production were contributing to water quality impairment of the Wakarusa River and Clinton Lake. Continued water quality degradation from sediment and runoff led to the 1979 Kansas Legislature designating the Upper Wakarusa watershed as the state's top priority water quality management area for agricultural nonpoint source contamination. It was one of 13 pilot projects of the national Clean Water Program sponsored by the USDA between 1980 and 1983. The objective of this federal program was to install Best Management Practices (BMPs) throughout agricultural watersheds to address the impairment to water bodies caused by agricultural runoff. The BMPs implemented during the Clean Water Program were mostly structures, like sediment ponds and terraces.

The Upper Wakarusa Watershed is a sub-basin of the Middle Kansas watershed, which was classified as a Category I watershed by the Kansas Unified Watershed Assessment (KDHE 1998). Kansas Department of Health and Environment (KDHE) assigned the Upper Wakarusa watershed a TMDL for fecal coliform bacteria and assigned Clinton Lake a TMDL for eutrophication caused by excess nutrients.

Physical Description

The Wakarusa River has its headwaters in Wabaunsee County but the river originates in western Shawnee County where the West, North, Middle, and South branches of the Wakarusa meet. As a tributary to the Kansas River, the Upper Wakarusa Watershed is a sub-basin of the Kansas River Basin. The watershed encompasses 235,400 acres and extends west to east across Wabaunsee County; northern Osage County; across the width of Shawnee County, draining the south quarter of the county; western Douglas County; and into Clinton Lake. The largest proportions of the watershed lie in Douglas and Shawnee Counties, with 33 and 40 percent of the watershed, respectively. Osage County contains 20 percent of the watershed, and Wabaunsee County holds five percent. The watershed lies south of Interstate 70 with the high-priority Deer Creek sub-basin and the reservoir lying between Topeka and Lawrence. The watershed lies

within a single precipitation zone, but one with sufficient variability to be sub-divided into two distinct areas (See Figures 2.4 and 2.5).

Historically, the floodplain of the Wakarusa River consisted of 18,000 acres of wetlands (Jayhawk Audubon Society 1999). Wetland areas not only provide critical habitat for a rich diversity of flora and fauna, they also provide valuable benefits to water quality, flood control, recreational areas, and open space. Wetlands, on a per acre basis, are the most productive ecosystems and produce the most animal and plant life. This production capability demonstrates the ability of wetlands to rapidly cycle nutrients. This characteristic makes them valuable as biological filters for municipal waste, storm water runoff, agricultural runoff, and animal waste. Wetlands also provide flood control, groundwater recharge, and recreational opportunities, e.g., camping, hunting, canoeing, fishing, and bird watching. Much of the wetland areas in the Wakarusa Valley were converted first to agricultural land as the territory was settled. As the population grew, they were then converted to residential and commercial uses. The creation of Clinton Lake also inundated many wetland areas. About 600 acres of wetlands remain in the Wakarusa floodplain in the Lower Wakarusa watershed south of Lawrence.

Demographic and Agricultural Profile

The population of the Upper Wakarusa Watershed is estimated at 25,000. Urbanized areas within the watershed include several incorporated and unincorporated towns with populations ranging from 947 to 1,478. Incorporated cities include Auburn, 1,121; Carbondale, 1,478; and Overbrook, 947, for a total population of 3,546. Adjacent population centers include Topeka, Lawrence, and Burlingame. Burlingame, in Osage County, has a population of 1,017. Lawrence, the county seat, has a population of 88,605 (U.S. Census Bureau 2009) and is approximately 50 highway miles from Kansas City, Missouri, and 30 from Topeka. Topeka, the state capitol with a population of 176,255, estimated for 2009. (U.S. Census Bureau 2009) is located in Shawnee County. Travel distance to Kansas City, Missouri, is approximately 70 miles. Many rural residents travel to these population centers for employment. Major traffic ways include U.S. Highway 75, the Kansas Turnpike, and Kansas Highways 40 and 56. The road and highways are vital to the area economy. They also contribute to nonpoint source water quality issues.

The more urban Douglas and Shawnee Counties have had almost continuous growth since 1900. In contrast, the more rural Osage and Wabaunsee Counties have had near continuous decline. The general population and agricultural producers are predominantly white with percentages ranging from 85.5 to 97.6 percent (U.S. Census 2010; USDA National Agricultural Statistics Service 2009).

Land use in the watershed is 85 percent agricultural. However, the watershed has numerous small- acreage landowners (5-20 acres) who are not producers. Agricultural land use is estimated to be 56 percent range land and 27 percent crop land. Corn, sorghum, and soybeans are the major row crops. There are approximately 22 livestock operations that are registered, certified, or have been issued permits by Kansas Department of Health and Environment within the watershed. All of these facilities have the appropriate waste management systems. These operations represent beef cattle, dairy cattle, horses, and swine. Numerous other smaller livestock operations also exist within the watershed. The Upper Wakarusa Watershed is estimated to have 306 farming operations, down from 590 in 2002 (Table 6.3). Expectedly, farm size is also declining. Declining farms numbers and farm acreage indicates that new producers are not taking their place and farmland is going out of production. Agriculture is the primary occupation for 35-40 percent of operators. The average farm subsidy payment (for farms receiving payments) in these counties is about $4,500. The average age of farmers in these counties ranges between 57 and 59 years.

Table 6.1 – Selected Ag Statistics for Counties in Upper Wakarusa Watershed - 2007

Upper Wakarusa watershed (UWW) counties		Douglas	Shawnee	Osage	Wabaunsee
Percent of county in watershed		22%	28%	13%	2%
Estimated number of farms in Upper Wakarusa watershed per county*	2007	34	248	22	2
	2002	229	253	86	22
Total estimated number of UWW farms	2007	306			
	2002	590			
Percent farming as primary occupation		35.38%	41.24%	35%	41.36%
Average age of principal operator (yrs)		58.5	57	59	57.8
Average Per Farm Receiving Payments (2007)		$4,335	$4,458	$4,106	$4,687

*Estimated by percentage of county that is in the watershed. Source: 2007 Census of Agriculture

Commodity and Conservation Payment Programs

Conservation and Direct and Counter-Cyclical Program (DCP) payments brought $437 million into the Kansas economy in 2009, of which an estimated $1,139,221 was paid to producers in the Upper Wakarusa watershed. The Upper Wakarusa watershed counties ranked in the bottom fourth of counties in the state, accounting for 1.6 percent of DCP payments, or $805,858 (Table 6.4). Kansas conservation programs in 2009 totaled $125 million. Two percent of state payments, or $333,363, went to producers in the counties of the Upper Wakarusa watershed (Table 6.4).

Table 6.2 – DCP payments by county in Upper Wakarusa Watershed - 2009

Rank	County	2009 Total Direct Payments	Percent of State Total	Est. Payment in UWW
81	Osage County	$1,551,035	0.5%	$201,635
89	Shawnee County	$1,201,794	0.4%	$336,502
91	Douglas County	$1,133,965	0.4%	$249,472
93	Wabaunsee County	$ 912,428	0.3%	$ 18,249
			1.6%	$805,858

Source: Environmental Working Group Farm Subsidy database, http://farm.ewg.org/. Compiled from USDA data.

Table 6.3 – Counties in Kansas receiving Conservation Programs payments - 2009

Rank	County	Total Direct Payments	Pct of State Total	Est. Payment in UWW
81	Osage	$1,551,035	0.7%	$201,635
89	Shawnee	$1,201,794	0.3%	$336,502
91	Douglas	$1,133,965	0.4%	$249,472
93	Wabaunsee	$912,428	0.6%	$ 18,249
Total estimated DCP payments into the watershed			2.0%	$805,858

Source: Environmental Working Group Farm Subsidy database, http://farm.ewg.org/. Compiled from USDA data.

Origin of Clinton Lake

Federal flood control efforts

Construction of the Clinton dam and reservoir was ultimately a product of a decades-long effort by national flood control activists and the rivalry between the Army Corps of Engineers and the Bureau of Reclamation. Flood control was first called for regarding the Mississippi and Missouri Rivers. The flood control movement arose because landowners, shippers, merchants, other business interests, and politicians lobbied the government for financial aid and protection from flooding that threatened their participation in the national economy (O'Neill 2005). Flood control activists worked to make regional flooding a national issue.

Before roads and railroads, the Missouri River provided the most feasible means to travel northwest of St. Louis, Missouri, and to transport goods to eastern U.S. or European markets. Until the late 1800s, the federal government's involvement on the Missouri was limited to removing obstructions to steamboat navigation. The Missouri River flood of 1881 signaled a turn in public perception toward controlling the river through channelization and bank protection. A 100-year flood of the Missouri in 1903 was caused by a heavy rain event in the Kansas River valley that converged with another further north of Kansas City. Because the Missouri was already at flood state, the Kansas River had nowhere to flow but out of its banks into the streets of Kansas City. Of the city's 17 bridges crossing the Kansas River, 16 were washed downstream.

The Missouri flooded again in 1904, 1905, and 1908. This was the era of progressive conservationists, which included President Theodore Roosevelt. The progressive conservationists believed that the federal government should be engaged in protecting the country's natural resources for sustained-yield production. The progressives saw the Missouri River as only one part of a larger transportation system that included the Great Lakes, Mississippi River, Ohio River, and the soon-to-be-completed Panama Canal (Schneiders 1999). Federal interest in the Missouri River was rejuvenated in 1907 when the Army Corps of Engineers opened a Kansas City District Office. Careers in the Corps became entwined with work on the Missouri, as did the survival of the district office. In order to justify its existence, the office needed to oversee work on the Missouri (Schneiders 1999). Channelization of the Missouri proceeded until World War I, and a lack of funding for federal waterway projects

brought it to a halt. By 1922, only 35 percent of the stretch from the mouth of the river to Kansas City had been channelized. Without channelization, deep-draft steamers and barges were restricted to the Mississippi River. Business interests in Kansas City were concerned about the lack of river activity and organized to resume Missouri River channelization.

In 1927, a major flood occurred on the Mississippi River, causing devastation from Minnesota to Louisiana. Flood control activists nationwide pressed their advantage to lobby for a national flood control policy. The activists effectively argued that flood control was a national concern (O'Neill 2005). In response, the Congress authorized the Army Corps of engineers to conduct a flood control study of the entire Mississippi River basin. The basin-wide study was to include the Missouri River and its tributaries, among them the Kansas River. The passage of flood control legislation in 1936 gave the Army Corps of Engineers the authorization to begin building flood control structures. Flood control structures were built in the watersheds of the Missouri, Arkansas, Canadian, and Pecos rivers. Another flood of the Missouri in 1943 gave the Corps further incentive to work to contain that river (Sherow 2004).

Following the 1943 flood, Congress also requested a flood control plan from the Bureau of Reclamation. The plan proposed by the Army Corps of Engineers concentrated on reducing flooding and improving navigation. Not to be outdone, the Bureau of Reclamation prepared a plan that focused on irrigation, local economic stability, and hydroelectric power. President Franklin Roosevelt, inspired by the success of the Tennessee Valley Authority, was looking for similar holistic planning for the Missouri River basin. Both the Corps and the Reclamation Bureau felt threatened that a regional agency could replace them. The two agencies joined their two plans and won the approval of Congress by appealing to House and Senate members who were against centralized planning. The resulting plan was the Missouri River Basin Development Project, known as the Pick-Sloan Plan.

A series of weather events led to flooding in 1951, which was Kansas' worst natural disaster to date. That winter the northern Great Plains suffered its coldest and wettest winter since European settlers began farming in the area. Spring came simultaneously to the lower and upper Missouri River basin and massive flooding occurred throughout the basin (Schneiders 1999). The Kansas River and its tributaries flooded, reaching their highest levels since 1844 (Sherow and Socolofsky 1995). Above normal precipitation in May and June caused some flooding, raised stream flow and groundwater levels, and saturated the soil. Then a rainstorm

came that lasted five days (July 9-13) with some areas receiving more than 16 inches of rain (Juracek, Perry, and Putnam 2001). As a result of this flood, pressure for flood protection increased as did political confrontations over the issue. Conflicts arose between farmers and townspeople, between communities downriver and small towns upriver. The presence of the Army Corps of Engineers in Kansas and their plan to construct Tuttle Creek dam and reservoir was the most contentious (Sherow and Socolofsky1995). As of 2003, the Corps had built 24 federally funded and eight state funded structures in the state. Clinton dam and reservoir in the Upper Wakarusa was one.

Local flood control efforts

Local flood control efforts in the Wakarusa Valley began in 1958 with efforts to organize a Wakarusa Watershed District. The primary purpose of the watershed district was to control flooding and erosion in the Wakarusa Valley. The watershed district received certification in 1959 and elected a Board of Directors with representatives from throughout the watershed. The board applied for assistance under the federal Hope-Aiken Act. This Act provided assistance for flood control measures for watersheds of 250,000 acres or less. Because the entire Wakarusa Valley exceeded this limitation, the watershed was divided into the Upper and Lower Wakarusa watersheds and both submitted applications for assistance.

The Army Corps of Engineers was already working on a plan to construct the Clinton Reservoir as part of its larger work plan to control flooding on the Missouri River. There was disagreement among members of the watershed district steering committee regarding the construction of large dams for flood control. Members of the committee also disagreed about how the Watershed District's program and the Army Corps of Engineer's Clinton Reservoir program would coexist in the same watershed. Initially the Watershed District and the State Watershed Association opposed the construction of large dams; however, in 1961 the steering committee changed positions and adopted a resolution in which they pledged to work with all government agencies and to develop both their own watershed plan and the Clinton Reservoir plan. The proposed construction of Clinton Dam created conflict among the watershed district board of directors causing several to resign their positions. Despite problems, the Watershed District Plan was approved, financial assistance was obtained, and the first phase of the work plan was implemented in 1963. The watershed district completed construction of its first

structure in 1968. In 1962, Congress authorized the Army Corps of Engineers to construct Clinton Dam and Reservoir. The Wakarusa River was impounded in 1971.

The construction of Clinton Dam and reservoir was one part of the Army Corps of Engineer's larger flood control plan for the entire Mississippi River Basin, of which controlling the Missouri River was a part. Controlling local-level flooding was an additional benefit. In 1964, the city of Lawrence had prepared a comprehensive plan that was supportive of building the dam and reservoir. From Lawrence's point of view, the lake would reduce local flood damage, improve commercial opportunities related to recreation and tourism, accelerate land speculation, and provide an additional option for community water supply. Research into the social and environmental impacts constructing the reservoir showed that the sustainability of the lake would depend on implementing conservation and protection measures. However, such a plan was not made. The impoundment has had significant impacts. The changes to the water table affected the natural recharging of the wetlands. Of the 18,000 acres of wetlands before construction of Clinton Dam, only the 600 acres of Baker Wetlands remain in the Lower Wakarusa south of Lawrence (Reber 2005).

Structure: Upper Wakarusa WRAPS

KVHA and the Upper Wakarusa WRAPS

The Upper Wakarusa Watershed Restoration and Protection Strategy (WRAPS) was born out of the commitment of a group of individuals who saw the Kaw River Valley as an entity with historical, cultural, environmental, and economic value. Sand dredging in the Kansas River, also known as the Kaw River, had become an issue of concern and became the event initiating restoration and protection efforts in the valley. Representatives from Kansas Wildlife and Parks, Kansas Audubon society, the EPA, Kansas Historical Society, as well as other individuals conceived the idea of a partnership group whose purpose was active advocacy of the Kaw River Valley. This group envisioned promoting the well-being of the people, the history, and the natural resources of the valley while keeping in mind the economic needs of those who live there. Thus, in 1996, the Kaw Valley Heritage Alliance (KVHA) was formed. It was reorganized as a non-profit in 1999. The vision of KVHA was to expand community and personal understanding of how water infiltrates every aspect of human life—historically, economically, culturally, and environmentally. Its original purpose was to look at the status of

the cultural and natural resources within the Kaw Valley, determine what the most significant among them are, and then try to bring consensus to the process of their long-term preservation. Because KVHA took a holistic approach to quality of life concerns in the Kaw Valley, the group's structure included several committees to address various areas of concern. One of these was the Water and Natural Resources Committee. One of the first actions of this committee was to organize a celebration of water and the valley's namesake. At its completion, the committee members came to the realization that not only did they share a concern about water resources in the local area, but collectively, as representatives of various government agencies and organizations, they also they held unique knowledge and experience. They were informed about current efforts in the state to address water resource issues and they had at their disposal a substantial amount of background data and research.

Research on the Upper Wakarusa watershed has been conducted since the 1940s. That historical data was available to the KVHA, as were comprehensive studies of the lake and watershed. When Clinton Reservoir was constructed, Kansas Department of Health and Environment (KDHE) researched how to prevent it from filling in with sediment. In addition, the city of Lawrence had requested that the Kansas Biological Survey and Kansas State University collect information on nonpoint source pollution. The most recent study on the Upper Wakarusa watershed was completed in 2001. This study investigated taste and odor concerns of both Clinton Lake and the Wakarusa River.

The Water and Natural Resources Committee knew that the foundation of the WRAPS process was local leadership and participation, which closely aligned with KVHA's vision and philosophy regarding education and local involvement. The conclusion of these realizations was writing a WRAPS for the Upper Wakarusa watershed. The initial leadership team consisted of individuals who professionally were involved with water and included individuals from KDHE, Kansas Biological Survey, and Shawnee County NRCS, Kansas State University, the Douglas County Conservation District NPS (nonpoint source) Coordinator; the City of Lawrence Department of Water Quality, a grant writing consultant, and a representative from KVHA. One member of the founding leadership team said about deciding to form a WRAPS:

> This is our part of the state—the Kaw River Valley. We'll just write a WRAPS plan for the Upper Wakarusa River.

The decision to address water quality issues in the Upper Wakarusa watershed and Clinton Lake in fact did arise from the concerned interests of local stakeholders. This origin and the leadership team composition and process of the Cheney Lake Watershed Project were the ideal water governance groups envisioned by the state when Kansas adopted the WRAPS process. The members of the KVHA Water and Natural Resources Committee were the local stakeholders that were interested in water resource issues; however, they were professionals employed by agencies involved with water resources. KVHA wrote the WRAPS for the Upper Wakarusa watershed in 2003. Under their sponsorship, the group focused on education and outreach projects, which was more aligned with their organizational mission and vision. KVHA did move the group through the process and into the implementation phase. While KVHA was the coordinating group, some wetland areas were constructed. Wetland construction not only met the requirements of restoring water quality, but it also intersected other goals of KVHA such as creating or improving wildlife habitat.

The WRAPS process has four phases: development, assessment, planning, and implementation. In the development phase, stakeholders are recruited and a leadership team is formed. In the second phase, watershed conditions are assessed. The stakeholders identify the restoration and protection needs of the watershed. The third phase is developing a working plan. This plan includes identifying actions to achieve goals, preparing cost estimates, identifying the BMPs and other actions needed for restoring and protecting the water, and identifying a strategy to secure stakeholder participation and implementation of BMPs. The fourth phase is securing the financial resources to implement the plan.

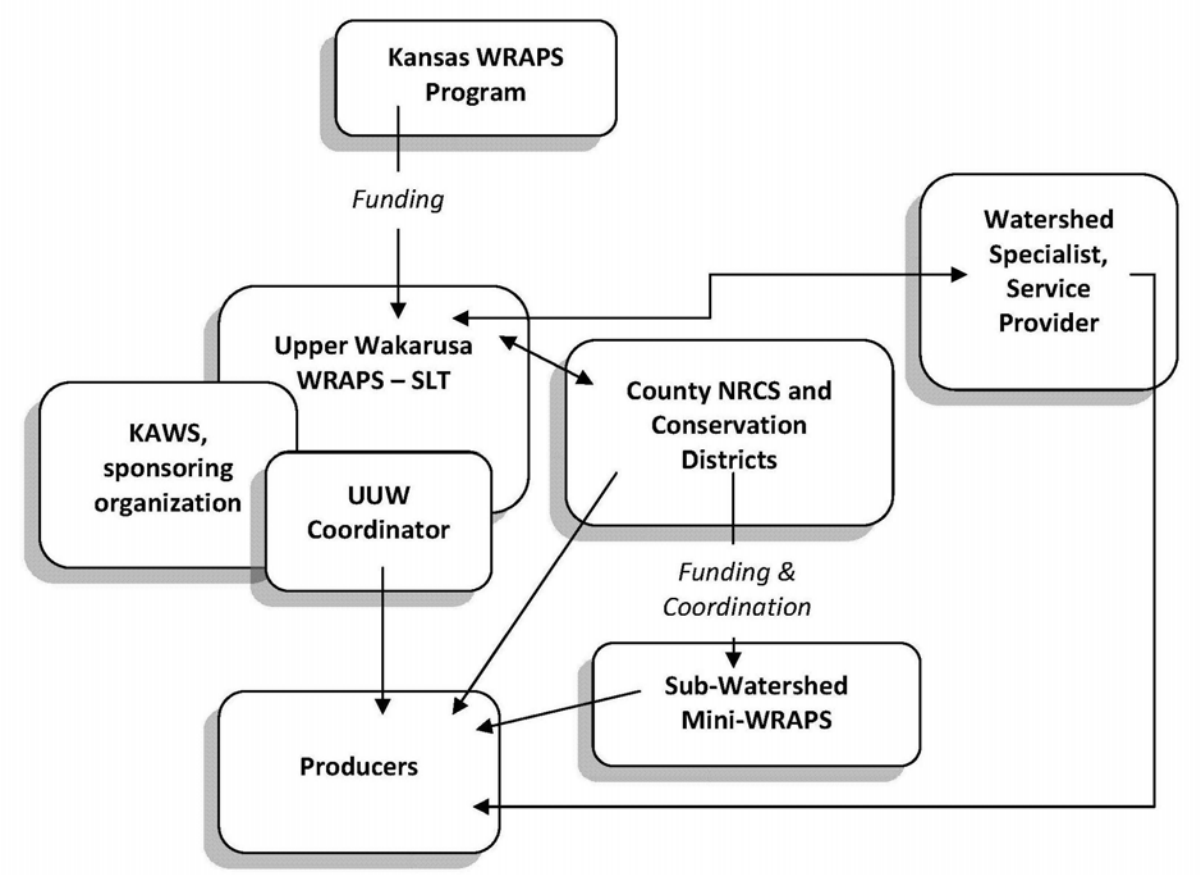
The state of Kansas endorsed the WRAPS process in 2006 and with that endorsement came not only came funding opportunities but also guidelines. One guideline (but not a requirement) was for the stakeholder leadership team to be composed of agricultural producers. In addition, as the Upper Wakarusa WRAPS moved into the implementation phase, there was increasing need for one-on-one contact with producers to discuss implementing BMPs. Members of the leadership team and KVHA leaders realized the organization was not the best fit for coordinating WRAPS efforts. As their grant for coordinating expired, Kansas Alliance for Wetlands and Streams (KAWS) submitted a proposal to take on the coordinating functions. Around 2008, KAWS became the sponsoring organization. The change in coordination brought a new emphasis to bringing producers onto the stakeholder leadership team. The focus of

implementation projects also was shifted from education and outreach to installing conservation structures or enrolling producers into programs adopting BMPs.

KAWS and the Upper Wakarusa WRAPS

With KAWS as the sponsoring agency, the organizational structure matches what is suggested by KDHE (Figure 6.3). The support team for the Upper Wakarusa watershed includes a coordinator from KAWS, the sponsoring agency; the KAWS Regional Representative; and the KAWS Lower Kansas River Coordinator. Independently contracted service providers include a Water Quality Specialist from Kansas State University Extension, the Kansas Rural Center, Kansas State University Extension, and others as needed.

Figure 6.3 – Upper Wakarusa Watershed WRAPS Organizational structure



Several state and federal officials serve as consultants to support the Upper Wakarusa WRAPS. Many of these officials were part of the original leadership team. Of the services providers, the Water Quality Specialist is heavily used for his one-on-one experience with producers in the watershed. One of the duties of the Watershed Specialist is to work with livestock producers to resolve issues that have caused them to be cited by KDHE. Generally, the role of the Watershed Specialist is to promote adoption of BMPs that protect water quality. Other one-on-one contact with producers is made through the conservation districts.

An effort was made to recruit producers onto the stakeholder leadership team and move people from water-related agencies into roles as consultants. In 2010, following stakeholder leadership team elections, the leadership team composition consisted of the chair and a member of the Shawnee County Conservation District Board, the President of Norman Ecological Services (a wetlands consultant and former KAWS employee); the Shawnee and Osage County Conservation District Managers; a Lawrence water utilities employee; the manager of Douglas County Rural Water District #3; and the Shawnee County Sanitarian. Despite efforts to recruit producers, the stakeholder leadership team remains largely filled by individuals professionally engaged in water resource management. The stakeholder leadership team (SLT) members who are also members of the Shawnee County Conservation District Board of Directors are agricultural producers in the watershed. However, their participation on the SLT is a way to look out for the interests of the conservation district work. As one member said:

> As an agency we need to be involved in it because this is where priorities are being set on how certain funding is going to be spent and that is funding that we get. So, we have to make sure that we're at the table to get our share so that we're doing our job.

This statement demonstrates the perception held by some NRCS and conservation district representatives that the WRAPS process is primarily a funding mechanism to further existing conservation efforts. It also illustrates that the stakeholder leadership team is not part of policy-making decisions; their role is limited to prioritizing the implementation process.

Some of the SLT members are serving strictly as part of their job function and some, like the founding KVHA committee members, have both a professional and personal interest. Although the SLT is mostly comprised of water professionals, both past and current members of the SLT and the conservation district and NRCS personnel believe that the Upper Wakarusa WRAPS is locally led with bottom-up implementation, and that the agricultural producers' interests are being served. One SLT member explains it this way:

> We may not have a lot of individual farmers, but … we've got the leadership. If you were to pick the people out of the conservation district that made the most difference, you'd pick the ones we have. So we have access to the farm population, it's just not directly.

A conservation district board member agrees. Not all informants from this watershed agreed. The WRAPS process promotes recruiting local agricultural leaders, and conservation district board members are elected by producers in the district, which supports the idea that producers' interests are indirectly represented.

Another SLT member expressed his view of state and federal program requirements attached to funding monies:

> We wouldn't exist without the money, but I don't feel that the money is necessarily the driving force. They've given us an opportunity by making the funds available and then as the local leadership team works through the coordinator to try to establish where we can get the most for our money. We go up and down and through the assessment process and try to get the people on board that would have an impact on the overall goals of making things better. So I think it's mostly being handled at the local level and not being pushed by the big guys.

A former leadership team member under KVHA and member of the WRAPS Work Group believe the structure absolutely provides for local leadership. When asked about the strong presence of water professionals on the stakeholder leadership team, and whether the group has decision-making authority, this watershed stakeholder commented:

> You bet [they have decision-making power]! They actually guide what goes on in the watershed in terms of restoration initiatives. Nothing else is going in. How each WRAPS group addresses the same TMDL, like eutrophication, that may vary across the state.

Although WRAPS funding is tied to state priorities, the structure of a WRAPS group theoretically provides for addressing other issues in the watershed. Rural Water District #3 is one of the rural water districts that falls within the boundaries of the Upper Wakarusa watershed and Clinton Lake is their water supply. The manager of the water district serves on the SLT for the Upper Wakarusa WRAPS. He serves on the SLT to represent the interests of the water district, which are to have the water stay as clean as long as possible. The water district is in the process of expanding an alternative water source because their water production from Clinton Lake is at its maximum. In addition to facing water quantity limitations, the district is also dealing with Zebra mussels. Zebra mussels are an invasive species that, in a water supply lake, attach to infrastructure and plug pipes or the water intake. Zebra mussels also contribute to algae

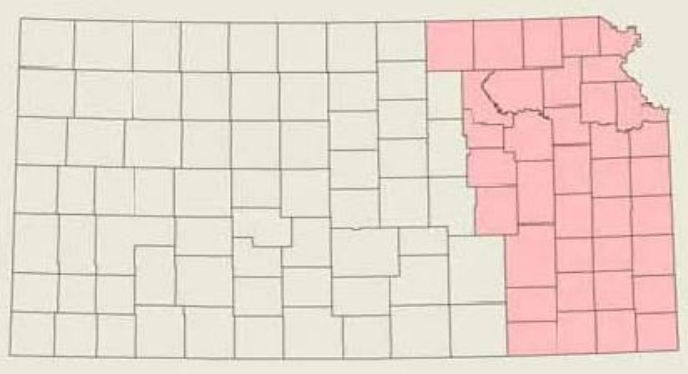
blooms that cause taste and odor problems in the water. The water district estimates that it will cost them about $50,000 per year to treat for Zebra mussels, if they can use a chemical treatment at the stage before shells start to develop and the mussels begin to attach. The cost share programs affiliated with WRAPS, through the Farm Bill and NRCS, or state programs through SCC would not help with addressing the Zebra mussel problem. Although, if they are not dealt with, the presences of the mussels will contribute to algae blooms. The water district manager stated, "I don't know that the WRAPS could really help with the Zebra mussel problem. Once they're introduced into a lake, they're going to find the environments they will thrive in."

From the matter-of-fact manager's statement, it is clear there is no expectation that WRAPS—watershed restoration and protection—would address either invasive species or water quantity. Zebra mussels are known to exist in other lakes in northeast Kansas, and without intervention, the mussels will create supply and quality problems in Clinton Lake. Functionally, the WRAPS process is tied to agricultural processes in scope as well as in funding opportunities. The ability to define what constitutes a water quality issue, to define what constitutes water resource protection, and define the scope of watershed management resides with the state-level actors in the WRAPS model, not with local-level actors.

Process: Partnerships

The Kansas WRAPS process is a state-local partnership comprised of government and non-government members. An actor-oriented approach within a political ecology perspective examines the power relations among the human and biophysical actors. The distribution of power among partnership members and who has power over the environment distinguishes the type of partnership that characterizes the WRAPS Program. Clinton Lake has KDHE-assigned TMDLs for sediment and excess nutrients. These impairments overlap with the scope of work of the watershed counties' NRCS and conservation district offices. The Upper Wakarusa watershed (Wabaunsee, Osage, Shawnee, and Douglas Counties) is in NRCS Administrative Area 3 (Figure 5.7). The resource concerns of Area 3 that overlap with Upper Wakarusa watershed TMDL impairments are soil erosion from continuous annual crop production, surface water quality degradation due to sediment and nutrients, and wetland and riparian area losses due to past farming practices.

Figure 6.4 – Kansas NRCS Administrative Area 3.



The major practices NRCS is promoting in Area 3 for these concerns are erosion control on cropland, terraces (gradient, tile-outlet, and grass-back), waterways, grade stabilization structures, grass seeding, and no-till and reduced tillage practices. The loss of wetland and riparian areas are a state concern; however, actions that would remedy this concern for NRCS would also serve to reduce sediment loss and improve and protect water quality. The desirable result may make it appropriate for WRAPS funds to help with wetland and riparian restoration. NRCS has partnerships with the county conservation districts and with Kansas Department of Wildlife and Parks, who provides two area biologists as support. Another partner to the Upper Wakarusa WRAPS is Kansas Alliance for Wetlands and Streams (KAWS). In addition to serving as the coordinating agency and supplying support staff to the project, KAWS provides expertise on wetland restoration and construction.

The WRAPS partnership with NRCS and the conservation districts is guided by state-level policy. As one member of the WRAPS Work Group put it:

> We [the state] need NRCS and the conservation districts to concentrate their efforts in places we consider to be high priority for water quality reasons. What the state considers high priority—that would be all the public water supply lakes. Especially those like Cheney, Hillsdale, Clinton, Tuttle, and all those …

Setting priorities and objectives for the Upper Wakarusa WRAPS is part of the decision-making role of the stakeholder leadership team, keeping in mind that the Upper Wakarusa WRAPS is part of the state WRAPS program and therefore has to be responsive to state priorities. The Upper Wakarusa WRAPS coordinator explained the groups approach to implementation:

> We're pretty committed to staying close to the conservation districts and their programs. As a matter of fact there are very few projects that we do that are independent of the NRCS.

The close ties with NRCS for program implementation demonstrates the strong role the state maintains over water resources. State-level policy not only specifies the goal to be achieved, but also the method of achieving the goal.

The WRAPS program, NRCS, and State Conservation Commission (SCC) are three sources of funding for the group. The SCC money is targeted to watersheds above federal reservoirs that are public water supplies. The stakeholder leadership team views targeting specific fields as a strategy to get the greatest effect per dollar spent and thus stretching funding dollars over more projects. Watershed projects not tied to these funding sources would need to have a different funding source.

The Upper Wakarusa WRAPS was already in the implementation phase when KAWS became the sponsoring agency. While under KVHA sponsorship, the leadership team divided the watershed into sub-watershed units to facilitate greater local management of restoration and protection efforts. These sub-watersheds organized their own mini-WRAPS to address water quality issues on an even more local basis. The sub-watershed areas formed partnerships with watershed districts and other entities that complement their goals and objectives. The mini-WRAPS have their own leadership team but their purpose is to identify and tell the larger WRAPS leadership team what they what kind of practices they need in the sub-watershed to help water quality there. The larger Upper Wakarusa WRAPS leadership team then finds projects to meet their needs. The larger group also uses the smaller mini-WRAPS leadership team to make personal contact with producers in the sub-watershed and persuade them to implement the practices that been identified as suitable. This network of county-level federal and state agencies and the function of the mini-WRAPS support the partnership premise of government initiated partnerships as an extension of government policy.

Education and outreach is ongoing in the WRAPS process. The group relies heavily on the services of the watershed specialist to make individual producer contact. The watershed specialist has an office in Douglas County. The specialist has been involved with the Upper Wakarusa watershed under the sponsorship of both the KVHA and KAWS. A former stakeholder leadership team member described this watershed specialist as "an integral part of what goes on. He goes out and does a lot of one-on-one contacts with people in the watershed."

To further the implementation process and meet the targeting objectives of the funding agencies, the watershed coordinator has begun using aerial photography and GIS technology to pinpoint locations of likely problem areas. Field confirmation is conducted to eliminate as many errors as possible. Once a problem field has been identified, the landowner is identified and personal contact is made. The problem sites have been divided into three priority tiers based on proximity to the river. Tier 1 is closest to the river, then Tier 2, and Tier 3, which is about one-quarter of a mile away from streams. About 215 producers have been identified in this process.

Stakeholder leadership team members and watershed support providers use a two-part narrative to persuade producers to participate in a WRAPS program or implement a BMP. The first part touts providing a public good while reaping personal benefits. The other is a preemptive narrative that promotes self-regulation over government regulation. One stakeholder leadership team member describes using the public good approach:

> I think you just have to be honest. Our interest is the overall water quality, what's going down there. The property owner may not necessarily be—everybody has an attitude on it … The bigger the project with more benefit to the producer, the better the attitude. I think the property owner is going to look at it more from an economic perspective. I think they're going to be more focused on how is it going to affect me and less focused on the bigger picture. This is why we have a fairly high percentage of cost share on projects, 70 percent.

The public good narrative, the idea that making a change will improve the overall quality of water plays on the producer's sense of stewardship. If the producer can see the benefits of a specific practice to improved quality of water in Clinton Lake and can incorporate it without suffering financially, then s/he is more likely to do so. Personal financial situations often constrain producer adoption. When there is no financial constraint, then motivations such as land stewardship, community good will, and protecting the lake will be expressed. The financial incentive or cost share may be the determining factor, and it is part of the "mutually beneficial, public good" narrative. As another stakeholder leadership team member put it,

> Mainly I guess, … in their mind that [implementing a practice] will help the community out…clean water and everything and the money they get.

When contact is made, the producer is given information about programs that would address the particular problem. Instead of working for broad, watershed-wide producer buy-in, the process works to persuade individual producers on specific practices or structures. The WRAPS representative making the call aims to persuade the producer by stressing the importance of improving water quality in the lake and the benefits the producer will accrue,

which may be reduced soil loss, long-term financial gain, or another benefit; the benefits depend on the specific practice being adopted. The large percentage of cost share is also an argument for implementing the practice through the WRAPS project.

The preemptive narrative plays on anti-government sentiment that according to one conservation district representative "is everywhere." The preemptive narrative emphasizes the need for producers to take action so the government does not. The stakeholder leadership team member said of taking this approach with producers:

> We also like to include in there at some point that Big Brother is going to come looking for you and make you do certain things. And if nothing else, here's an opportunity to try and address those issues in a way that you can live with—be preemptive about it and it's in our interests to do that.

The idea of targeting specific problem sites is another dimension of the preemptive narrative. By addressing a specific problem at a specific location, the producer is not being asked to make broad changes to his/her operation. Rather, the approach is one of problem solving; it points out a specific problem and a specific solution. Both narratives work on the producer's self-interest and both can be employed in situations where there is not a relationship between the watershed and producer.

The practice of targeting problem fields is consistent with state and federal policy and is viewed positively and pragmatically by the stakeholder leadership team. It is a strategic process that allows the most benefit per dollar spent. One stakeholder leadership team member explained the process of prioritizing the projects they were pursuing in the watershed:

> The projects are pretty well done on a priority basis.... Initially they [the WRAPS] would just provide that money to people who wanted to do this or that. Now they are trying to be more proactive and to making sure the money is going to people who have the most impact. That's being addressed, yes. That's really how the priorities are set up, for the projects.

The stakeholder leadership team uses a narrative of strategic planning and getting the most benefit from the funding dollars rather than a narrative that that says following the guidelines is required to be eligible for funding.

Outcomes: Results

The structure of the Upper Wakarusa WRAPS and its close alliance with NRCS and the county conservation districts has resulted in the WRAPS program serving or being perceived as

another funding source for these agencies. The conservation districts can frame their partnership with the Upper Wakarusa WRAPS as a way to secure additional services or funding for their constituents and promote the conservation district's agenda. The conservation district and the WRAPS are charged with the same responsibilities—to reduce soil erosion and improve water quality. One conservation district manager said:

> Our responsibility is to the landowner. So if the landowner comes in and wants something, then we find a way to serve the landowner. So if that's through a WRAPS project, we try to get them with the WRAPS project. If that's through something we offer through the conservation district we do that; if it's through NRCS, we promote that. Our focus is more to the landowner.

An NRCS conservationist described the WRAPS program as "a funding mechanism to apply conservation needs on a farm." This conservationist characterizes the WRAPS program as a periodic refocusing of the work done by conservation districts. He cites the TMDL program that was initiated to quantify water quality problems and the Rural Clean Water program of the 1980s. Of the current WRAPS program and its focus on smaller problem areas, he explained:

> So these WRAPS, they're just a more current emphasis on targeting what needs to be done. It provided a mechanism for all these groups. Here are nine different groups that I count working together to develop this project. … The districts have had targeted funds through the years before WRAPS. There were processes that targeted either areas of the county or a [specific] concern. About every five years there's a new [emphasis]… let's kick start it by looking at another approach.

This characterization has more validity when considering that Osage county has four WRAPS groups working in the county and the conservation district and NRCS are involved with them all. Conservation personnel may hold various positions with different WRAPS groups simultaneously. In addition, the targeting process sometimes results in the formation of mini-WRAPS within a larger WRAPS. The conservation district often serves as the coordinating agency for these smaller projects as they fall entirely within the political boundaries of one county and the conservation district's jurisdiction. Within the Upper Wakarusa WRAPS, mini-WRAPS were conducted in the sub-watersheds of Lynn Creek, Deer Creek, Rock Creek, and Six Mile Creek. These mini-WRAPS are held to the same process and implementation requirements as WRAPS for the larger watershed. The conservation district uses the WRAPS program as a funding mechanism to target funds to address specific issues.

The Lynn Creek sub-watershed has implemented nearly 70 conservation contracts. This mini-WRAPS used a narrative of ownership and responsibility to persuade producers to

participate in conservation programs. This sub-watershed was described by conservation district representatives as already having a strong sense of community, which is credited with the success of the ownership narrative. A second mini-WRAPS in another sub-watershed was approached with the same narrative, but was less successful. This area did not have a sense of community. The residents were scattered throughout the area.

The success of the mini-WRAPS supports the concept of targeting smaller watersheds or areas and focusing implementation there as outlined in EPA's Nine Element plan. Conservation contracts implemented in the sub-watersheds are also counted as implementation in the overall larger watershed. Monies that are not spent by the mini-WRAPS can be used by the conservation district elsewhere in the watershed to address water quality issues. The partnership between the WRAPS program and the conservation districts increases local capacity by funding technical assistance.

The close alliance with the NRCS and conservation district offices may also contribute to the lack of producer interest in participating in the WRAPS stakeholder leadership team. One Upper Wakarusa WRAPS support person explains:

> I think that's part of the reason that the interest from farmers and ranchers is not very strong. Is not necessarily because they're not interested in conservation or they're not interested in protecting water supply, I think it's that they're comfortable with the situation. … These people, I think are pretty satisfied with the conservation district staying with our program and I think they trust the people that are working in the watershed that are doing this work. I think we've made some pretty substantial effort to recruit farmers and we didn't get a strong interest…. Had we given these people a sense that there was a need—an essential need for farmers and ranchers to be on this leadership team we would have had people come . . . .

This confidence in government entities has historical precedence. Since the early years of statehood, the state water governance had served the needs of citizens in the eastern part of the state. While anti-government sentiment is present regarding regulation and the ability to appropriate water, there has also been support for government agencies and programs that help producers.

The Upper Wakarusa watershed is reaching a modest constituency of small acreage landowners who would not traditionally participate in NRCS or conservation district programs. The programs these agencies provide are generally geared to operations of a certain size for economical feasibility. Although these smaller acreages might not be eligible for cost share, the county offices are seeing more awareness of conservation programs. On the other side, since the

WRAPS project was initiated, landowners that have taken advantage of programs in the past are using the WRAPS programs as another tool to make improvements to their land.

The watershed employee and the Stakeholder Leadership Team expressed the opinion that the WRAPS model could be successful across the state some also expressed some doubt about its success if it remained a voluntary program without regulation behind it. One member stated:

> I don't think that we're going to meet our load reduction requirements under a voluntary system … it seems to me if we're going to do this in a time frame that EPA expects, something stronger is going to have to take place.

Summary

The Upper Wakarusa watershed is the drainage basin for Clinton Lake, one of Kansas' 24 federal water supply reservoirs, making it a high priority watershed for the state. Since the 1940s, watershed studies have consistently shown that soil erosion and runoff from agricultural production were contributing to water quality impairment of the Wakarusa River and Clinton Lake. These studies recommended that actions be taken to protect these water bodies; however, no such process was put into place. The lack of water resource protection led to the selection of the Upper Wakarusa as one of 13 pilot projects of the national Clean Water Program sponsored by the USDA between 1980 and 1983. The objective of this federal program was to install Best Management Practices (BMPs) throughout agricultural watersheds to address the impairment to water bodies caused by agricultural runoff. Several conservation structures had been constructed as a part of that program. The BMPs implemented during the Clean Water Program were mostly structural, like sediment ponds and terraces. Most of these structures were constructed in the portion of the watershed that lies in Osage county. Although soil loss continues as a TMDL for the watershed, the Upper Wakarusa watershed also faces the circumstances that most of the watershed already has soil retention structures in place. Efforts to stop continued soil loss will have to come from other practices. Wetland restoration and construction, and stream bank stabilization are remedies being promoted by the Upper Wakarusa WRAPS and conservation districts.

The Upper Wakarusa WRAPS was originated with the Water and Natural Resources Committee of the KVHA. A group of water professionals served on the committee and decided

to pool their expertise and knowledge resources and write a WRAPS that would address water quality issues in the Upper Wakarusa River. The Upper Wakarusa WRAPS under the coordination of KVHA was functioning prior to the state's official adoption of the WRAPS process. Under the guidance of KVHA, this WRAPS project was complementary to that organization's larger vision and mission. KVHA's objective was to identify and preserve the most significant cultural and natural resources within the Kaw Valley. After the state adopted WRAPS as a state program, the KVHA withdrew as the sponsoring organization and KAWS stepped into the role. The WRAPS was already in the implementation phase.

It is expected that culture within the farming communities within the watershed lack diversity and that producers would hold similar attitudes about government agencies. The area's historical attitude toward government assistance may contribute to current attitudes toward conservation efforts. Watershed representatives characterize producers in the watershed as trusting the water professionals to take care of water issues. They trust the NRCS and conservation district personnel to look after the conservation needs of the counties and districts. By extension, they trust the Upper Wakarusa WRAPS to address the watershed's water issues.

The close alliance between the Upper Wakarusa WRAPS and NRCS and the conservation districts may contribute to lack of producer participation in the watershed group. This relationship has brought about a change in the perception of the WRAPS program. These agencies have flipped the frame and see WRAPS facilitating their work rather than the county offices facilitating WRAPS projects. They see the WRAPS program as another funding mechanism for county conservation work.

The Upper Wakarusa WRAPS was initiated by KHVA with local interest in protection of KAW Valley and its resources. The original team, although interested individuals, was comprised of professionals working in water-related fields. When the coordination of the WRAPS project was transferred to KAWS, despite a concerted effort to recruit agricultural producers, the members of the stakeholder leadership team remain mostly professionals. The two agricultural producers serving are primarily doing so as leaders of their conservation districts to make sure the conservation districts can take advantage of any funding opportunities. Agency representatives see their position on the team as a way to further the objectives and goals of their parent agency and to make sure their agency interests are represented.

The partnership structure of the Upper Wakarusa WRAPS supports the partnership premise that government can initiate partnerships as an extension of government policy. Producer buy-in is not a strong focus of the structure of the Upper Wakarusa WRAPS. This is partly due to the group changing coordinating agencies and project coordinators at the implementation stage of the WRAPS process. It is also partly due to targeting focus of funding agencies. Funding requirements of the EPA and the WRAPS program stipulate a targeting process to small problem areas. Since problem areas in the watershed can be identified with technology and without contact with producers programs are not intended to be basin-wide. Without basin-wide programs, high producer participation is not needed. The focus of implementation has a problem-solving orientation, making it more a mini "problemshed" management than watershed management.

Financial considerations are often a factor constraining producers from implementing conservation practices or structures. Upper Wakarusa WRAPS uses two narratives to approach producers in persuading them to implement BMPs conservation structures. The first is a narrative of mutual benefit—adopting conservation practices not only provides a public good, but it solves soil loss problems producers may have on their land, and it can be done with little out-of-pocket expense. The second narrative is preemptive. This narrative promotes voluntary participation to avoid government regulation.

The Upper Wakarusa watershed has been implementing best management practices since the 1980s, but sedimentation and chemical runoff still constitute serious water quality issues for the watercourses in the watershed and in Clinton Lake. Less than 100 conservation contracts have been implemented by the WRAPS, and most that have been implemented have been in the Lynn Creek sub-watershed as the product of a mini-WRAPS, which operated under a different leadership team, formed its own partnerships, and promoted a different narrative.

One of the successful outcomes of the Upper Wakarusa WRAPS is building conservation awareness to an audience that would not traditionally be reached. Being close to Topeka and Lawrence there are many small-acreage landowners in the watershed that are not agricultural producers. Awareness of the Upper Wakarusa WRAPS programs is reaching some landowners that would not traditionally participate in NRCS or conservation district programs. Despite the successes, some of the leadership team believes regulation may ultimately be necessary.

One weakness in the Kansas WRAPS structure is its narrow scope of water quality restoration and protection. The program, per state priorities, is limited to agricultural processes in terms of degradation as well as restoration and protection. While local groups theoretically have the authority to address other watershed issues, in practice they do not have the efficacy.

The Cheney Lake WRAPS and the Upper Wakarusa WRAPS have many commonalities and many differences. Although both of them have been incorporated into the Kansas WRAPS program, their structures, processes and outcomes have significant differences. The next chapter will draw comparisons between these two watersheds and their efforts to address water quality issues in their watershed and their respective reservoirs.

Chapter 7 – Discussion and Conclusion

A question in the introduction asked why, after almost 40 years since the passage of the Clean Water Act and 25 years of regulation controlling nonpoint source pollution, have clean water goals not been met. States and local communities have implemented projects to address water quality issues, but clean water has not been achieved. To comprehend this failure and understand how water resources are governed and how water quality goals are pursued, I explored how watershed-level governance structures emerged and function in their specific local environment, within the state hierarchy of water governance, and as implementation of state and national policy. I examined the structure, process, and outcomes of the local watershed-level governance structures in the Cheney Lake (North Fork Ninnescah River) and the Upper Wakarusa (Clinton Lake) watersheds. Recognizing the connections between the political economy of agriculture, the cultural factors acting upon agricultural producers, and the biophysical environment is necessary to the attainment of water quality goals. An actor-oriented political ecology approach informed by environmental governance and watershed management literature guided my examination of these two local watershed-level governance structures. The specific research questions were:

RQ1: To what extent do local water-governance structures determine water resource issues and exhibit decision-making authority, agency, and capacity within their individual watersheds?

RQ 2: To what extent do local water-governance structures reflect local concerns versus Kansas- or national-policy concerns?

RQ 3: What interests or concerns are reflected through community member participation in local water-governance structures?

RQ 4: How effective are local water-governance structures in protecting water resources? Are land and water concerns integrated within ecological boundaries of a watershed to achieve both local and state water quality goals? To what extent do they contribute to or hinder the attainment of local state water quality goals?

From a Political Ecology Approach

The actor-oriented approach within political ecology and the concepts of politicization and territorialization help explain the lack of environmental change, or failure of conservation policy to meet the decades-old mandates of the Clean Water Act. The actor-oriented approach, as described in Chapter 3, focuses on the different types of actors and their participation in political and ecological processes. Politicization is a key concept for explaining environmental change. In these watersheds, it was very useful for understanding how water resources have attained the current state of degradation. Political and economic decisions to conform the landscape to meet human needs created the environmental change that constitutes current conditions. Political and economic decisions have maintained that status quo despite some decisions and efforts to reverse or stop environmental degradation. Territorialization, from political ecology's conservation and control thesis, is a concept that lends itself to current pragmatic government policy that focuses on identifying and solving specific problems rather than identifying causes.

The organizations of this chapter presents a comparison of the two watersheds and their local water governance structures, first by comparing the structures, processes, and outcomes, and second by presenting a comparison of how the actors execute their roles. The discussion begins with the broader, political ecology approach, then moves to environmental governance, and then to watershed management.

Differences and Similarities

The Cheney Lake and the Upper Wakarusa River drainage basins have many biophysical and socio-cultural similarities, but significant differences as well. The settlers who came to Kansas did so for many reasons, including common political reasons, but perhaps more significant as a pull factor was the potential for a prosperous livelihood. This desire for prosperity prompted settlers to transform their land into a more familiar landscape.

Historically both drainage areas were areas of tallgrass prairie that were converted to agricultural use, and the primary land use in both watersheds remains agricultural. Agricultural producers in both watersheds adopted intensive monocrop agricultural practices to maximize the economic livelihoods. These practices, promoted by state and federal farm policy, have been determined as the primary cause of water pollution from nonpoint sources. Sediment and

excessive nutrients are state-identified impairments for both reservoirs. Cheney and Clinton are both public water supply reservoirs and as such are high priorities for the state.

The reciprocal relations between the political economy, the biophysical world, and human society created the landscapes of the two watersheds. Initially the differences between the two were largely biophysical. Although of diverse origins, the people who came to Kansas settled the land in an east to west pattern. The differences in precipitation and available surface water contributed to different attitudes and dispositions toward using water resources. As settlers in each area adapted to and transformed their local landscape they espoused attitudes and behaviors that politicized each area differently, as would be expected from a political ecology approach (Bryant and Bailey 1997; Greenburg and Park 1994; Vandergeest et al. 1999).

Faced with making a livelihood in an area of water scarcity, settlers in semi-arid areas not only had to cope with inadequate rainfall, but they also had to cope with a water law that was detrimental to their livelihood. Moreover, they lacked the political influence to change it. This combination produced, or reinforced, a mindset of self-reliance. Farmers began irrigating regardless of the riparian doctrine. Irrigation helped ensure a successful crop despite unreliable rainfall. Irrigation technology favored those who could afford to use it. By raising the potential of profitability, irrigation also encouraged concentration of land into larger farms. Increased irrigation further transformed the landscape. Water taken for irrigating crops came at the expense of in-stream flows, aquatic life and habitat, and other wildlife. They needed the water not only to make their farms profitable, but also to recreate their surroundings into something familiar. This meant remaking the landscape into something familiar. This recreation not only included farming method and crops, but also the physical trappings of their culture—trees and plants, the architecture of their homes, towns, churches, etc.

The Supreme Court Decision in *Kansas v. Colorado* placed an emphasis on economic gain, and by doing so provided incentive for Kansas farmers to be more productive. The court ruled that Colorado farmers did not have to change their pattern of use because they were getting more value or benefit from their use of the water than were Kansas farmers. It was the first step towards water appropriation. As the area became more populous, agricultural use of water came into conflict with cities and population centers. Again, farmers lacked the political influence to stop Wichita from taking water from the Equus Beds that farmers had relied upon. The federal Bureau of Reclamation dammed the North Fork Ninnescah River at Cheney to create a water

supply reservoir for Wichita. The inundation of farmland fed the mistrust farming communities held for government. These occurrences all contribute to the politicization of the Cheney Lake watershed. Farmers perceive themselves as politically marginalized and are mistrustful of a government that they perceive as having taken land and water from them for the benefit of the city of Wichita.

The agricultural community brought this disposition of government mistrust and personal self-reliance to the formation of the Cheney Lake Watershed Project in 1992. Conservation agency personnel and city of Wichita representatives recognized this disposition and addressed it with a philosophy of collaboration, cooperation, and partnership. The water governance structure that evolved out of this rural-urban partnership reflects the area's political disposition. Both government mistrust and self-reliance are reflected in the composition of the leadership team—all agricultural producers—and the two watershed employees. That the watershed employees are intimately familiar with the producers' point of view is a mechanism of trust-building that demonstrates it is not outsiders telling producers their farming practices need to change, but rather some of their own, insiders, relaying information. This peer-to-peer communication and the inclusive, watershed-wide approach taken by the Cheney watershed CMC and the watershed project employees was at the foundation the ownership narrative. Self-reliance is also evident in the producers' unwillingness to participate in watershed programs. To pre-empt government intervention and the opportunity for "someone to tell them what to do and how to do it," oftentimes producers would rather take on the conservation measures themselves without government assistance.

The politicization of the Cheney Lake watershed is instrumental to the original type of partnership the Cheney Lake watershed project envisioned. The Cheney Watershed-Wichita partnership best exemplifies the partnership premise that dialogue can occur in a setting that is non-hierarchical and egalitarian and produce a shared belief that collaborative action is mutually beneficial (Glasbergen 2007). The inclusive approach taken by the Cheney Lake Watershed Project, the CMC, and watershed employees fosters a sense of ownership and responsibility. It also generates producer buy-in. The watershed project chose to use this model of governance because it was egalitarian and inclusive. As the WRAPS model follows national- and state-directed change to targeting priority areas, the incentives for using an inclusive approach changes. The incentive is that the approach gives agency administrators the ability to learn

which BMPs producers in a given watershed will accept and then to promote their use. Such an approach creates a cooperative public (Irvin and Stansbury 2004).

Lack of producer participation reflects resistance to what producers see as threats to their property rights and livelihoods. Agricultural producers oftentimes interpret farm programs that promote changes to production practices or the construction of conservation structures as government intervention in their lives, and they interpret regulations as infringements of property rights. An example of this is the best management practice (BMP) that promotes keeping livestock out of streams and providing the animals an alternative water source. The objective of the BMP is to reduce contamination from animal waste and to reduce stream bank erosion. Cattle producers have a long-held practice of wintering and feeding cattle by a stream where timber provides the animals some shelter from the wind and cold and the stream provides a consistent source of water. Promotion of a practice that seems counter to producers' historical knowledge is perceived as an intrusion.

In contrast, settlers in the area of the Upper Wakarusa watershed, the humid eastern portion of the state, could raise crops without irrigation. In this area, insufficient rainfall has not historically been as great a concern as was spring flooding. Most of the state's population is concentrated in the eastern part of the state. In addition, the riparian doctrine as the state water law suited their needs. Legislation to allow water appropriation for irrigation also worked in their favor. Irrigation provided water when farmers wanted it, reduced rain-related risk, and boosted yields. Although the construction of big dams was not without opposition, these Bureau of Reclamation, or Army Corps of Engineers projects were perceived more as protection from flood damage than a government intrusion or as a threat to their livelihoods.

A dissimilar experience, less conflict, and more trust that government would protect their interests led to an attitude toward using water resources unlike that which developed in the semi-arid areas of the state. This disposition, or politicization, also is reflected in the Upper Wakarusa WRAPS. As a project of the Natural Resources Committee of Kaw Valley Heritage Alliance, the leadership team of the Upper Wakarusa WRAPS consisted of water elites. Despite specific efforts to recruit agricultural producers to serve, the stakeholder leadership team remains comprised of water agency professionals. The WRAPS coordinator is a retired government agricultural engineer and is an independent contractor for Kansas Alliance for Wetlands and Streams, a non-profit advocacy group. This choice reflects the professional, agency-orientation

of this WRAPS group. The coordinator attributes the lack of producer interest in serving on the leadership team as producers' trust in the decision makers. Produces are confident that their decisions will not be harmful to farmers. Farmers have trust in the conservation district and NRCS personnel, and their close association with the WRAPS provides some reassurance. The partnerships comprising this WRAPS group are best described as government initiated partnerships that are an extension of government policy.

Although the farming population in the Upper Wakarusa is small compared to their urban neighbors—the cities of Topeka and Lawrence—a perception of marginalization appears to be less. Like their counterparts in Cheney, perceived government intervention and the prospect of regulation are interpreted as threats to farmers' property rights and livelihoods. Table 7.1 compares the characteristics of the two watersheds.

Table 7.1 – Comparison of Cheney Lake and Upper Wakarusa Watersheds

Categories	Cheney Lake Watershed	Upper Wakarusa Watershed
Land use	99% agricultural; 633,000 watershed acres	85% agricultural; 235,400 watershed acres
Biophysical characteristics	High Plains, semi-arid	Osage Cuestas, humid
Politicization determinants	Water scarcity, political disenfranchisement, conflict with state policy	Flood control, political representation and influence, accord with state policy
Organization of water quality protection	Pre-WRAPS, producer inclusive, extra-local partner	Pre-WRAPS, water elites, no extra-local partners
Initiating event for watershed restoration project	Water quality issue – taste and odor concerns from algae blooms	Stakeholder (water elites) interest in protecting water quality of lake
State-assigned impairments	Sediment and phosphorus	Sediment and excess nutrients

Structure, Process, and Outcomes

Although both Cheney Lake and the Upper Wakarusa watersheds had unique beginnings, their ultimate assimilation into the state WRAPS program meant their projects had to conform to the specifications of the state program. Both watershed restoration projects were started prior to Kansas adopting the WRAPS process. The Cheney Lake watershed project, prompted by water quality issues in the reservoir, was initially conceived by the city of Wichita and NRCS

conservationists. However, after the initial conceptualization, the organization was quickly handed over to agricultural producers from within the watershed. What is unique about this project, and is a significant difference between the two cases, is the extra-local partnership the Cheney Lake watershed has with the city of Wichita.

The primary structural difference of the two groups is the inclusion of Wichita as an extra-local partner in the Cheney Lake WRAPS. The partnership with the city of Wichita increases the agency and capacity of the Cheney Lake watershed group. The financial contribution from Wichita enables the group to reduce drastically the out-of-pocket costs for producers, which may increase producer participation. In addition, it gives the group the ability to offer programs that state agencies and the state WRAPS program do not. Another capacity-generating difference is that the Cheney Lake watershed group also formed a non-profit arm of the group. The Cheney Lake watershed project, as a sub-committee of the Reno County Conservation District, is an extension of a state agency. Cheney Lake Watershed, Inc., as a non-profit organization can apply for independent funding; in addition, such funding is not subject to WRAPS requirements.

The most significant differences between the two groups lie in the processes they use to implement change. Part of this process is how they approach producers to persuade them to participate. Cheney Lake watershed has used an inclusive producer-centered, one-on-one approach since its initial organizing effort. Local leaders of the watershed approached producers with the narrative that the watershed was their land and their water resources and they had a responsibility to care for it. This narrative resonated with the producers' self-identification as being stewards of the land (Nelson et al. 2006-2010). This narrative also implied that producers had the opportunity to voluntarily address the water quality issues of Cheney Lake, or that the city could use regulatory authority to address them.

The threat of regulation was the motivation for much of the early producer participation, making the city-watershed partnership more of a preemptive resistance to government action than a voluntary, mutually beneficial, public-good action. The threat of regulation as part of the narrative has decreased as producers have become knowledgeable about the watershed project. The CMC recognizes that conservation and water resource protection are not a purely technical problem. The people living within the watershed are integral to the problem and so must be integral to the solution.

The other difference in the Cheney Lake WRAPS process is how the goals and objectives of the WRAPS were determined. This process speaks to the level of agency and decision-making the organization has. When the partnership was initially formed with Wichita, the city established the primary objective for reducing sediment and phosphorus to reduce algae blooms in the lake. The CMC determined the actions and goals for achieving that objective. When the group became part of the state WRAPS program, the group had to adopt state TMDL objectives, at least in actions using state and federal funds. Other objectives of the group remain at the discretion of the CMC. The Upper Wakarusa WRAPS, without an independent source of funding, is limited to state programs.

In contrast to Cheney Lake watershed, the Upper Wakarusa WRAPS currently uses a technological approach, which is also a change from the approach used when originally organized as part of the Kaw Valley Heritage Alliance (KVHA). Under KVHA, the WRAPS approach was more holistic and producer-focused. The technological approach and focus on wetland restoration and construction of wetland areas came with Kansas Alliance for Wetlands and Streams (KAWS) assuming the role as the coordinating agency and the provision of a KAWS contractor serving as the project coordinator. Under the direction of KAWS, rather than cultivating producer participation through education and awareness, technology is used to identify both conservation problems at the field level and the property owner. Personal contact is then made with the landowner who is encouraged to participate in the appropriate program to solve the problem.

The narrative used by the Upper Wakarusa watershed touts the public good, the value added to the producer's land, and the financial incentives that reduce the landowner's out-of –pocket expense. This process sets aside the broad, inclusive trust building of personal contact used in the Cheney Lake watershed process. Instead of producer buy-in on the watershed level, individual producers are persuaded to adopt or construct specific practices or structures. This approach may reap the greatest water quality affect for the money spent, but it is a technological fix to the symptom and not a solution to the larger problem.

From a political ecology perspective, problem solving is an apolitical approach. The apolitical approach to addressing NPS pollution is to fix the problem—soil loss, which contributes both sediment and chemical pollutants to watercourses—by pinpointing field-level problem locations and implementing a change in farming practices or erecting a conservation

structure at that point. The flaw in this approach is that it does not address the problem from a biophysical protection point of view. It also ignores the problem from the larger human society point of view. It does not recognize the human role in creating the problem or the need for a corresponding role in the solution. The problem site may be a weak point, but "fixing" that specific location does not attempt to address the larger underlying cause, which is the mode of production currently espoused by the political economy of agriculture. It is an issue of control over access. Access is granted to those who can afford new technology.

The goals and objectives of the Upper Wakarusa WRAPS are addressing the state-identified TMDLs as outlined by the WRAPS program. The stakeholder leadership team determines what projects it can fund and prioritizes them. In contrast to Cheney Lake WRAPS, the Upper Wakarusa WRAPS has emphasized technological, structural solutions over changes to producer management practices. The different processes have resulted in different levels of producer participation. (Although some of the difference may be accounted for by the length of time each watershed group has been in existence.) To date the Cheney Lake watershed/ WRAPS has signed approximately 1,200 conservation contracts. Of these contracts, 39 percent represent changes to tillage practices, 12 percent stream bank protection, and 11 percent grass programs. The Upper Wakarusa WRAPS has less than 100 contracts signed. They are mostly tile outlet terraces with wetland retention structures. The Lynn Creek sub-watershed had 70 project contracts completed as part of a mini-WRAPS that operated as its own WRAPS project within the larger Upper Wakarusa WRAPS.

Table 7.2 summarizes the comparison of the structure, process, and outcomes of the two WRAPS projects.

Table 7.2 – WRAPS Structure, Process, and Outcomes Comparison

Categories	Cheney Lake Watershed	Upper Wakarusa Watershed
Absorption into Kansas WRAPS program	After organization, approximately 10 years;	After organization, approximately 3 years
Official WRAPS project	After organization approximately 4 years	7 years total – 3 years with KAWS, 4 years with KVHA
WRAPS Structure	Producer-led	Primarily water professionals and organizational leaders
	Extra-local partner	No extra-local partner; not all water consumers participate
	Sponsoring agency: NRCS	Sponsoring agency: KAWS
	Ag-producer employees	KAWS affiliated employee
WRAPS Process	Narrative: ownership and responsibility	Narrative: Public and personal benefit
	Approach: Producer centered, one-on-one, service to producers	Approach: Technology-oriented, targeted problem solving
	Cooperative relationship with producers	Persuadable relationship with producers
	Goals and objectives decisions: city of Wichita, CMC, Kansas WRAPS	Goals and objectives decisions: Kansas WRAPS
	Implementation decisions: CMC	Implementation decisions: SLT
	Focus on management BMPs	Focus on structural remedies
	High producer involvement on CMC; good producer participation in programs	Low producer involvement on SLT; low producer participation in programs
WRAPS Outcomes	Approximately 1200 contracts. (39% tillage practices, 12% stream bank protection, 11% CRP or conversion to grass)	Less than 100 contracts. Primarily Tile outlet terraces with wetland retention structures (70 in Lynn Creek; 9 KAWS projects)

An Actor-Oriented Approach

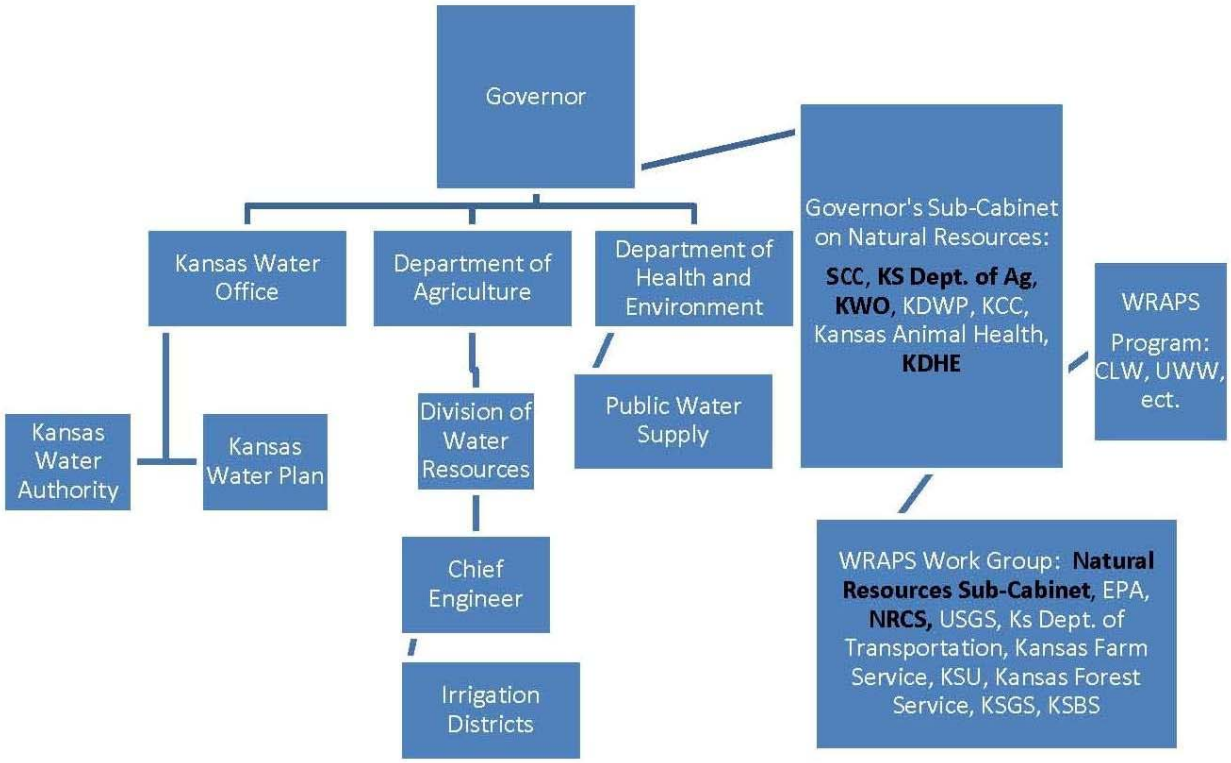
The local water governance structures of Cheney Lake and the Upper Wakarusa watershed bring together actors of federal, state, and county government as well as non-governmental actors and private citizens (Table 7.3). An actor-oriented approach to understanding theses local governance structures, or WRAPS, does so by identifying the actor types, the actors, their interests or characteristics, and their role or action in the structure.

Table 7.3 – Actor-Oriented Approach within Political Ecology

Actor Types	Actors	Interest/Characteristics	Actions	Role
Federal	EPA	Clean Water Act	Policy maker, funder, enforcement	Political
	NRCS	Care of national natural resources	Policy maker, funder,	Political
Kansas (state) Actors	WRAPS Work Group; Kansas Water Office	Kansas natural resources	Administer funding, policy making	Political
	KDHE	Agricultural focus, Kansas' environmental quality	Administer funding, enforcement	Political
	State Conservation Commission	Conservation district law and Watershed district Act	Administer funding	Political
Extra-local	City of Wichita	Resource protection	Funding	Ecological
Watershed	CMC (producers) or SLT (professionals)	Implementation contracts	Guidance, producer contact	(micro)Political
	WRAPS Coordinator	Implementation contracts	Persuasion, producer contact	Ecological
NGO, government service agencies	Services providers	(Specific to each provider)	Education, technical expertise, outreach, construction	Ecological
NGO, dedicated employees, independent contractors	Support personnel	NGO-interests, watershed interests, personal interests	Education, outreach, persuasion, administrative, project construction	Ecological
County	NRCS Conservation Dist	Conservation at farm level, serving individuals	Provide planning, technical & financial assistance	Ecological
Citizenry	Producers Small-acreage landowners	Livelihood, stewardship Recreation, stewardship	Direct action onto environment and area economy	Ecological

Kansas continues to have strong government authority over the state's water. The Kansas WRAPS Program is administered at the state level. The Cheney Lake and Upper Wakarusa WRAPS projects are a state-local partnership with the state of Kansas. The process engages multiple actors from national-level policy makers to private citizens. Examination of the actors and their roles in the WRAPS process shows a traditional command and control structure. Power through policy decisions, funding, and enforcement are concentrated at the federal and state levels. Decision-making excludes those who interact directly with the biophysical environment and area economy. The political sources and conditions for change are also concentrated in the top levels of t he hierarchy (Figure 7.1).

Figure 7.1 – Kansas Water Governance



Although local-level actors have some power of resistance their ability to change the direction of impact on the biophysical environment is conditioned by economic development and agricultural policy as much as it is by water management policy decision-makers for economic development and agricultural policy are part of the group making water management decisions. A political ecology approach explicates their role in conservation and management of water resources. Agribusiness interests that promote technology for maximum production and as a way to solve nonpoint source pollution from agriculture contribute to further social stratification of agricultural producers, economic inequality, land concentration, and limiting access. Not all producers can afford the new technology, which favors those producers with large landholdings and higher incomes.

Environmental Governance and Watershed Management

Current policy within in the United States and Kansas for environmental governance is a variation on shared responsibility. The Kansas WRAPS model for water quality governance originated at the end of the 1980s at a time when environmental partnerships had emerged as the new governance structure for natural resource protection. The Kansas WRAPS model called for bringing together local stakeholder groups for watershed planning and management. Ideally, local stakeholders would develop and implement holistic action plans for their watersheds rather than addressing single issues. In addition to water quality, the holistic watershed plan would also address other resource issues like drinking water supply, flood management, wildlife habitat, and water based recreation. This early vision of the WRAPS model embodied the alternative governance structures that emerged as policy moved away from regulation and turned toward incentive-based policy. This model conceived the watershed structures in both cases.

In the course of standardizing the model for statewide adoption, the process advocated by the model was co-opted by the state. The WRAPS model has changed from being a holistic plan to a narrowly focused, targeted plan that seeks to address problems at the specific sites within a watershed. Gerlak (2006) identifies this policy focus as a "problemshed." The concept of a problemshed describes the approach to water resource protection being practiced in the Upper Wakarusa WRAPS.

The Cheney Lake watershed project originated prior to the earliest conception of the WRAPS program, and was organized more along the lines of a holistic watershed plan would

address multiple water-related issues within a watershed. However, the recent move towards targeting problems areas is moving the project towards the concept of a problemshed. The concept of a problemshed, or reducing conservation problems to isolated problems areas disconnected from the watershed as a whole, is inappropriate for natural resource management. Natural resources, biophysical systems, cannot be confined to a bounded location. Without addressing conservation in a holistic manner, a localized solution in one place may result in moving the problem to another.

Brinkerhoff (2007) describes a hybrid partnership model as natural resource co-management. These entities are governance structures that are included in a national or regional policy framework that form partnerships with government agencies and local groups. The concern about local partnerships is the potential for their lack of capacity to be effective. The inherent weakness of voluntary partnerships has been recognized and the solution is to combine them with some command and control. As state-private partnerships, voluntary environmental partnerships may be strengthened with some command and control regulations in order to achieve environmental goals. Environmental partnerships in some cases are used to address environmental concerns while a regulation process is premature; The WRAPS process in Kansas is both voluntary and, with the exception of KDHE regulation, without command and control. Some leadership team members expressed the opinion that efforts to achieving water quality goals would accomplish more if there were some command and control or measures in place. However, the close ties the WRAPS program has with agriculture, and the dominance of agriculture in Kansas, makes regulatory measures untenable.

The local nature of environmental governance is also a subject of debate (Dewees et al. 2003). Partnerships are often formed to address the issue of limited capacity that local governing groups often face. Neither of the two watersheds examined here have the capacity to address watershed issues beyond state water quality priorities. The Cheney Lake watershed's partnership with the city of Wichita meets partnership criteria of addressing issues for mutual benefit. That partnership is limited to the impairments of the lake that are of concern to the city. Cheney Lake watershed's holistic vision for improving the watershed has been left behind as the group became incorporated in the Kansas WRAPS program. The Upper Wakarusa has the potential for something similar with the rural water districts that are stakeholders within the watershed. However, the limited water supply provided by Clinton Lake may be an obstacle to inclusion of

the water districts as partners who would help fund restoration and protection. These water districts may be looking for an alternative water supply as increasing demands are made on Clinton Lake. While the WRAPS groups have county conservation districts and NRCS as partners, their funding is attached to federal and state priorities and programs. This situation leaves the relationship between the WRAPS groups and these agencies as a funding mechanism for state implementation rather than a partnership where goals are mutually determined.

Watershed Management

Watershed-level management is intended to integrate land and water resource concerns and address them within the boundaries of a watershed rather than by political boundaries. Like partnerships, the watershed approach is characterized as being inclusive of many diverse stakeholders who have an equitable status in the watershed management (Leach and Pelkey 2001; Parisi et al. 2004; Sabatier et al. 2005; Morton 2008). The concept evolved by the 1980s to seeking a balance between environmental protection and economic development. The watershed-level management of water resource restoration and protection as envisioned by the Kansas WRAPS program falls within this description. The concept of watershed management is founded in democratic principles of inclusion. In the process of protecting water resources, however, is often the need to change the behavior of water users. The change in policy away from command and control and towards incentives is thought to have the potential of undermining democratic processes and resulting in a loss of sense of ownership and responsibility by water users (Morton 2003).

In the two study watersheds, both sides of this potential were observed. Sense of ownership and responsibility were cultivated the Cheney Lake Watershed as watershed employees and the CMC conducted education and outreach programs and spoke individually with producers about water quality and the desirability of using BMPs. The outcome is not as conclusive in the Upper Wakarusa watershed. The sense of ownership and responsibility may not have been undermined by financial incentives, but neither was it cultivated through WRAPS activities. This narrative may have been used more when the watershed structure was a project of the Kaw Valley Heritage Alliance (KVHA), than it has when under the coordination of Kansas Alliance for Wetlands and streams. Not only was that narrative more closely aligned with the mission of KVHA, but the early phases of the WRAPS process were completed under

KVHA coordination where education and outreach was not efficiently directed toward agricultural producers.

Summary and Conclusion

The social history and biophysical characteristic of the areas of both watersheds contributed to different politicization, which led to different dispositions toward water use in each watershed area. Part of this politicization was the relationship each area had with state water policy or law. These past relations between the biophysical environment, human society, and political economy explain the degradation of the state's water resources. Although measures are being taken to address water quality issues in the state, to date they have not been successful. The EPA Watershed Assessment, Tracking and Environmental Results report (U.S. EPA 2010) shows that 88.39 percent of Kansas' rivers and streams in 2008 remained impaired. The same report shows 91.22 percent of lakes, ponds, and reservoirs are impaired, and that 96.57 percent of Kansas' domestic water supply is impaired. The same set of relations— biophysical, human society, and political economy—that explain how negative environmental change occurred can also explain why change has not occurred to reverse or improve it.

The water governance structures, WRAPS projects, that have developed in Kansas are place-based and if not already targeted and pragmatic, are moving in that direction. Current national water policy is seeking to address water resource problems on an individual watershed basis, and more specifically, by addressing resource problems within a watershed with a problem and solution tactic. This study looked at two of more than 40 WRAPS projects in the state. These two projects organized before the WRAPS model was officially adopted as a state program. This contributed to differences in their initial structure. However, as a state program the structure and process were standardized for broad implementation. Once the two groups signed on to the program and began participating in the cost-share and funding process, the leadership teams were pressured to adopt the program structure and process. Individual adaptation, as far as structure and process, was eliminated. Prior to the initiation of the Kansas WRAPS program, the structure and processes of the governance groups may have been an important factor in its success obtaining producer participation and implementation of BMPs and conservation measures. However, since the adoption of the WRAPS model by the state, the state

recommendation and requirements seem to supersede the structure and process of an individual WRAPS project.

Research Questions 1 and 2 address the structure and process of the WRAPS groups.

> RQ1: To what extent do local water-governance structures determine water resource issues and exhibit decision-making authority, agency, and capacity within their individual watersheds?
> RQ 2: To what extent do local water-governance structures reflect local concerns versus Kansas- or national-policy concerns?

Initially, the Cheney Lake Watershed project and later its non-profit arm, Cheney Lake Watershed, Inc., did exhibit agency and decision-making authority within the watershed. As originally organized, the watershed group was structured to address watershed concerns holistically. Watershed concerns had a broad connotation. Their partnership with Wichita had only one requirement: reduce the sediment and phosphorus load into Cheney Reservoir that was contributing to algae blooms. The Cheney watershed Citizens Management Committee (CMC) had broad latitude to implement strategies to address the problem. Although the watershed project created the non-profit arm to increase the group's capacity to address broad-scope watershed issues, additional funding was not generated. The Upper Wakarusa was not organized as long before it became an official WRAPS project. Although a broader scope of watershed issues was part of the Kaw Valley Heritage Alliance vision, the group did not develop the agency or capacity to implement it.

As part of the Kansas WRAPS program, neither group has the agency or capacity to address broad scope watershed issues as originally envisioned or to go beyond the state and federally funded programs that address state priorities. While both groups do have some decision-making authority, it is restricted to implementation decisions. This limitation supports the idea that implementation action is what has been devolved and not the authority to identify concerns and define the best means of addressing them (Dewees et al. 2003; Winter 2006).

Invasive species such as Zebra mussels are a concern for both reservoirs. Water quantity to meet the needs of water consumers for which Clinton Lake is a water supply is another watershed concern in the Upper Wakarusa. Although additional water supply may have to come from groundwater, it is groundwater in the same drainage basin. The official WRAPS process does not address these additional concerns. The position of the WRAPS Work Group is that each individual WRAPS can address other concerns as long as they address the state's priorities

and they do not use WRAPS program monies for concerns that are not state priorities. The use of local leaders has facilitated producer buy-in, and local knowledge has been used to facilitate producer participation by determining which BMPs the producers in the watershed will adopt.

There are two significant differences between the two cases. The first is the extra-local partnership that the Cheney Lake watershed group has with the city of Wichita, and the second is the approach the leadership teams take when contacting agricultural producers in their respective watersheds. The funding arrangement the watershed has with the city of Wichita was instrumental in securing producer participation. Not only did it make conservation efforts a negligible cost for producers but it also contributed to producer's sense of stewardship and community. By participating in watershed programs, they were being good land stewards and contributing to the public good. The all-producer composition of the Cheney Lake watershed Citizens Management Committee (CMC) was important to building producer trust. The CMC members take an active role in promoting the watershed project to producers. Citizens Management Committee members as well as the watershed employees talk with producers individually. Pragmatically, this means about nine individuals are talking with producers. Rather than an outsider making recommendations, the Cheney Lake watershed approach is neighbor to neighbor, which also contributes to the diffusion of information. The outcome in the Cheney Lake watershed is that greater producer participation also means greater producer education regarding best management practices and methods to protect soil and water. In contrast, the Stakeholder Leadership Team in the Upper Wakarusa watershed leaves producer contact to the project coordinator, who in turn relies heavily on the area Watershed Specialist to make individual contact. Two individuals are primarily responsible for producer contact. There is less producer trust, less participation, less knowledge transferred, and less participation in implementation of conservation measures.

Over time, the structure and process used by the Cheney Lake watershed may have resulted in lasting changes to the way farming is practiced. However, the state program imposes its own structure, which conditions the process of each WRAPS project. Individual structure becomes less relevant for changes in farming behavior if projects do not have access to independent funding sources and the projects are tied to state and federal programs. In practice, the structure and process of each WRAPS group can only affect the degree to which state policy is implemented in each watershed.

Research Question 3:

> RQ3; To what extent does local participation result in better policy decisions, more desirable social and environmental outcomes, a more cooperative public, or resistance to outside regulation?

The WRAPS groups are implementation structures for top-down state policy. They are not included in the policymaking. When an inclusive approach is taken, a more cooperative public is generated that is willing to participate in conservation programs. The initial formation of the Cheney Lake watershed project resulted in outcomes that are more desirable; however, much of that early participation was as expression of resistance to regulations. Producers preferred to self-regulate rather than have regulation imposed upon them. In doing so, they assumed an attitude of personal ownership, responsibility, as well as one of civic responsibility.

Individual projects in the WRAPS program are limited by their lack of legal authority and by grant funding that is tied to state and federal programs. The WRAPS program has drifted from its original concept and is no longer a "watershed" strategy. The program does not address water resource issues on a watershed basis, but rather uses a watershed division to organize and facilitate the implementation of a practice to fulfill state conservation policy. Water quantity, groundwater, and invasive aquatic species are additional issues in these two watersheds that the WRAPS program does not address. The local structures have freedom to address additional issues, but they lack capacity—so in many ways the transition to a focus on a prioritized, problem-solution process makes WRAPS an unfunded mandate. The voluntary nature of the program is also problematic. Achieving Clean Water Act goals is unlikely without complementary regulatory measures. Producers have the ability to resist these government programs simply by choosing not to participate.

Despite acknowledging recreation (entertainment, enjoyment, relaxation, and fish and wildlife benefits) as a beneficial use, economic benefits remain privileged. Agricultural agencies and industry leaders are part of the decision-making body that formulates water policy in the state. The Governor's Natural Resources Sub-Cabinet administers the WRAPS program. The Kansas Department of Health and Environment (KDHE) and the Kansas Water Office, as members of the WRAPS Work Group and members of the Sub-Cabinet, report on the progress of the program. KDHE is responsible for Kansas' drinking water, and Watershed Management for the state is housed in KDHE's Bureau of Water. KDHE was involved in the task force that developed the initial model for the Cheney Lake watershed. It is by KDHE guidance that the

WRAPS stakeholder leadership teams are called to be composed of agricultural producers. KDHE was also instrumental in the creation of the Extension Watershed Specialists positions in Kansas. Although KDHE has the authority to sanction producers for water quality violations, they prefer to have producers work with the state's watershed specialists, NRCS offices, and conservation districts to address water quality problems and mediate them. Included among the members of the Governor's Sub-Cabinet and the WRAPS Work Group are the Kansas Department of Agriculture and the Kansas Farm Service Agency.

As mentioned in the introduction, agriculture is still a vital component of the Kansas economy. Agriculture and water resources are inextricably entwined. The Kansas Department of Agriculture houses the state's primary water authority. Farming interests remain politically strong and they are pursued by such organizations as the American and Kansas Farm Bureau, Sedgwick County Farm Bureau, Kansas Grain and Feed Association, the associations for corn, wheat, and soybean growers, the Kansas Livestock Association, and the Kansas Legislative Policy Group. In addition to these producer groups, the governing boards of the county conservation districts are composed of locally elected producers, and NRCS county offices are committed to serving their producer constituents. Whether WRAPS Stakeholder Leadership Teams are composed of all producers or not, the interests of farmers and ranchers are incorporated into Kansas WRAPS from the top down. Less represented or not represented at all are the interests of non-agriculture stakeholders. Local water quality concerns that are not agriculture-related have been left out of the model. The agency of local WRAPS groups is not limited by not being composed exclusively of agricultural producers, but rather by not having a pluralistic composition with a wide variety of interests and points of view.

Although agricultural producers may be a numerical minority in the state with less legislative representation, agricultural producers and agro-industry interests are not without a voice in water resource policy. The opportunity for input that they lack at the watershed level through the local WRAPS project may be more than compensated for by the representation they have at higher levels of decision-making through agricultural lobbying and advocacy groups. The financial interests of agriculture as an industry in the state and those of individual producers are protected by the government agencies charged with promoting agricultural development and by the lobbying agents, and the numerous local-level agencies established to ensure local control.

To reiterate, early in the formation of the Cheney watershed project participation of local agricultural producers was a means of resisting outside regulation. This same participation as sought by the Kansas WRAPS Program is a means of generating a more cooperative public. Excluding non-agricultural stakeholders is contrary to practices intended to achieve better water policy decisions, and more desirable social, and environmental outcomes. There is an inherent conflict when the agencies and experts that are charged with promoting the economic activity that is primarily responsible for causing water quality degradation also are in charge of restoring and protecting water quality.

Research Question 4 addresses the effectiveness of the local water governance structures and project outcomes.

> RQ4: How effective are local water-governance structures in protecting water resources? Are land and water concerns integrated within ecological boundaries of a watershed to achieve both local and state water quality goals? To what extent do they contribute to or hinder the attainment of local state water quality goals?

Neither of the watershed groups has identified local water quality goals that are different from the state-designated TMDLs for their respective reservoirs or stream segments.

Environmental degradation was brought about by policies that promoted intensive agricultural production and profitability without regard for biophysical outcomes. The economies of both study watersheds are tied to the larger state and national agricultural economies. As such, they are closely tied to the Farm Bill and farm commodity payments. Kansas ranks fourth in the country in terms of commodity payments, receiving 6.6 percent of the national total. Reno County, 45 percent of which is covered by the Cheney Lake WRAPS project, is the sixth-ranked county in the state for receipt of Total Direct Payments (farm subsidy payments). Both case study watersheds are also tied to the conservation programs and payments associated with agriculture and the Farm Bill. Many of the top recipients of these payments are producers in Cheney Lake watershed and are eligible to participate in watershed conservation programs. Kansas ranks third in the nation in number of conservation dollars received, receiving 6.2 percent of the national total. I propose that policy that promotes both agricultural production and conservation using commodity and conservation incentive payments through the same institution serves to subordinate conservation to profit.

Cheney Lake watershed has been implementing best management practices (BMPs) for more than 15 years. The Upper Wakarusa watershed participated in the Clean Water Program in

the early 1980s, which was a program of implementing BMPs. Although both watersheds have had a high numbers of BMPs in use for many years, monitoring sites do not show quantifiable improvement in water quality (as discovered during fieldwork and as reported by interview participants). A member of the WRAPS Work Group did report two WRAPS programs that have been successful. One has resulted in a water body being taken off the impaired waters list, and a second one has been recommended for delisting. Neither watershed integrates land issues within the watershed boundaries. While there is a federal cost share program that could be used to help address soil health issues, the WRAPS groups do not include it in their programs. The program is unpopular with Cheney Lake watershed producers (Nelson et al. 2006-1010) and they do not participate.

The efforts of the State Conservation Commission, through their county conservation districts as well as different government initiatives have failed in the last four decades to achieve clean water. Kansas delayed complying with the Clean Water Act for more than two decades. The current WRAPS program, which is strongly steeped in agricultural interests by design, shows no promise of changing the status quo. Agricultural interests in Kansas have long-thwarted environmental regulation by keeping control in state agricultural agencies. The narrative of ownership and responsibility used in the Cheney Lake watershed and to some extent in the Upper Wakarusa watershed makes the argument that agricultural landowners will take care of land and water resources because it is in their best interests to do so. While agricultural producers like to perceive themselves as good land stewards that has often been shown to be a misperception. Farming practices are often passed from one generation to the next with little accommodation for new knowledge. Some producers, who have the knowledge and a desire to farm in an environmentally positive way, when given a choice, choose financial benefits over environmental ones. State-level promotion of local agricultural control over agricultural practices that lead to water impairment—local self-regulation—capitalizes on anti-government sentiment and generates producer buy-in to state policies. Producer buy-in helps create a cooperative public that more willingly adopts and implements state policy.

After decades of programs implementing agricultural Best Management Practices, both case study watersheds show negligible quantifiable water quality improvement. Why do governance structures/bureaucracies endorsing this method fail? They are established with a bottom-up philosophy but are tied to top-down rules, resources, and interests. The local

bureaucracies have no legal authority and no mechanism to demand compliance. Moreover, enforcing compliance of individual landowners would be difficult and costly. The state agencies responsible for the administration of the local structures established rules and guidelines to ensure agricultural production and water resource development are not compromised.

As presently configured, the Kansas WRAPS program offers no real change to the status quo. Achieving environmental change—water quality restoration and protection—will require moving the responsibility for achieving clean water quality out of the jurisdiction of the industry responsible for its degradation. It will require a change in farming practices away from a system of maximum production that requires extensive inputs and degrades soil and water health. Enduring water quality and protection will require a holistic approach to environmental, social, and economic health.

References

Abmeyer, Walter and Howard V. Campbell .1970. “Soil Survey: Shawnee County, Kansas.” Washington, DC: Government Printing Office.

Anderson, Terry L. and Peter J Hill.1976. Private Property and the Development of American Agriculture, 1776-1976 .*American Journal of Agricultural Economics*, 58: 5, 937-945.

Angelo, Robert. 1998. “Historical Perspectives on Kansas Surface Water and Groundwater Quality.” Symposium on Kansas Water Resources: Past, Present and Future .April 19, 1998, Kansas Newman University, Wichita, Kansas.

Ary, Debra E. 2009. Superintendent of Production and Pumping, Wichita Water Utilities. Personal communication (July 10, 2009).

Barham, Elizabeth. 2001. “Ecological Boundaries as Community Boundaries: The Politics of Watersheds.” *Society & Natural Resources* 14:181-191.

Batie, Sandra S. 1986. “Why Soil Erosion: A Social Science Perspective.” In Stephen B. Lovejoy and Ted L. Napier, eds., *Conserving Soil: Insights from Socioeconomic Research*. Ankeny, IA: Soil Conservation Society of America.

Benjaminsen, Tor A. and Boubacar Ba. 2009. “Farmer–herder conflicts, pastoral marginalization and corruption: a case study from the inland Niger delta of Mali.” The Geographical Journal, 175(1):71-81.

Blomquist, W .and E .Schlager .2005. “Political Pitfalls of Integrated Watershed Management.” *Society and Natural Resources*, 18:101-1 17.

Brick, P., D .Snow, and S .Van De Wetering, eds .2001. “Across the Great Divide: Explorations in collaborative conservation and the American West”. Washington, DC: Island Press.

Brinkerhoff, Derick W. 2007. “Enabling Environmental Partnerships: The Role of Good Governance in Madagascar’s Forest Sector.” Pp. 93-114 in Glasbergen, Pieter, Frank Biermann, and Arthur Mol, eds., *Partnerships, Governance, and Sustainable Development: Reflections on Theory and Practice*. Cheltenham, UK and Northampton, MA: Edward Elgar.

Brinkerhoff, Jennifer M. 2007. “Partnerships as a means to good governance: Towards an evaluation framework.” Pp.68-89 in Glasbergen, Pieter, Frank Biermann, and Arthur

Mol, eds., *Partnerships, Governance, and Sustainable Development: Reflections on theory and Practice*. Cheltenham, UK and Northampton, MA: Edward Elgar.

Bryant, Raymond L. and Sinéad Bailey. 1997. *Third World Political Ecology.* New York: Routledge.

Burwell, T. 1995. "Bootlegging on a desert mountain: the political ecology of agave." *Human Ecology: An Interdisciplinary Journal*, 3; 407–33.

Buttel, Fred. 1987. "New Directions in Environmental Sociology." *Annual Review of Sociology*. 13;456-88.

Carrels, Peter. 1999. *Uphill against Water: The Great Dakota Water War.* Lincoln: University of Nebraska Press.

Chapman, Shannen S., James M. Omernik, Jerry A Freeouf, Donald G. Huggins, James R. McCauley, Craig C. Freeman, Gerry Steinauer, Robert T Angelo, and Richard L. Schlepp. 2001. "Ecoregions of Nebraska and Kansas." Reston, Virginia, U.S. Geological Survey.

Cheney Lake Watershed Inc. (CLWI). 2006. North Fork Ninnescah River Project Management Plan.

Clark, Terrie A. 1979. "Fishes of the Mouth of Wolf River, Doniphan County, Kansas." *Transactions of the Kansas Academy of Science (1903-)*, 82:3;188- 193. Lawrence, KS: Kansas Academy of Science.

Conca, K. 2006. *Governing Water: Contentious Transnational Politics and Global Institution Building.* Cambridge: The MIT Press.

Corbin, Harry F. "The Politics of Water: Wichita to Washington," diss., The University of Chicago, 1972 (Chicago: The University of Chicago, June 1972).

de Wit, Cary W. 2003. "Field Methods for Investigating Sense of Place." *The North American Geographer*, 5;1-2.

Dei, George S. 1990. "Deforestation in a Ghanaian Rural Community." *Anthropologica*, 32:1; 3-27.

Devlin, Daniel; Kyle Mankin, Theresa Selfa, Nathan Nelson, Philip Barnes, Lisa French, Howard Miller, Lyle Frees, Michael Langemeier. 2008. "Assessing the Impact of Implementing Conservation Practices." Kansas State University.

Dewees, Sarah; Linda Lobao, and Louis E. Swanson, 2003. “Local Economic Development in an Age of Devolution: The Question of Rural Localities.” *Rural Sociology*, 68(2):182-206.

Duhigg, Charles and Janet Roberts. 2010. “Ruling Restrict Clean Water Act, Foiling EPA.” New York Times, 2-28-2010. http://www.nytimes.com/2010/03/01/us/01water.html. Accessed 2-18-2010.

Duhigg, Charles. 2009. “Clean Water Laws Are Neglected, at a Cost in Suffering.” New York Times, 9-13-2009. http://www.nytimes.com/2009/09/13/us/13water.html. Accessed 9-13-2009.

Dunlap, Riley E. and Mertig, Angela G. 1992. “The Evolution of the US Environmental Movement from 1970 to 1990: An Overview.” In Riley E. Dunlap & Angela G. Mertig, eds., *American Environmentalism: The US Environmental Movement 1970-1990.* Washington, DC: Taylor and Francis.

Emel, J. 1995. ”Are you man enough, big and bad enough: ecofeminism and wolf eradication in the USA.” *Environment and Planning D: Society and Space* 13:707–34.

Emel, J. and Roberts, R. 1995. “Institutional form and its effect on environmental change: the case of groundwater in the southern High Plains.” *Annals of the Association of American Geographers*, 85: 664–83.

Environmental Working Group. 2010. Farm Subsidy Database: Conservation Payments in Kansas. Retrieved July 18, 2010. http://farm.ewg.org/progdetail.php?fips=20000&progcode=totalcons&page=county&yr=2009&regionname=Kansas

Equus Beds Groundwater Management District No. 2. 2010. http://www.gmd2.org/AboutUs.html

Espeland, Wendy Nelson. 1998. *The Struggle for Water: Politics, Rationality, and Identity in the American Southwest*. Chicago: University of Chicago Press.

Ferreyra, Cecilia; de Loe, Rob C.; Kreutzwiser, Reid D. 2008. “Imagined communities, contested watersheds: Challenges to integrated water resources management in agricultural areas.” *Journal of Rural Studies.*

Fiege, Mark. 1999. *Irrigated Eden: The Making of an Agricultural Landscape in the American West*. Seattle: University of Washington Press.

Forsyth, Tim. 2003. *Critical Political Ecology: The politics of environmental science.* New York: Routledge.

French, Lisa. 2010. Personal Communication.

Fuller, Crispian. 2004. "Local government and the changing institutional landscape of economic development in England and Wales." *Environment and Planning C: Government and Policy,* 22; 317-347.

Gattin, Timothy D. 1995. Cheney Reservoir: Creating and Preserving a Surface Water Supply for the City of Wichita." Unpublished Masters' Thesis. Hugo Wall Center for Urban Studies, Wichita State University, Wichita, KS.

Geddes, Mike. 2000. Tackling Social Exclusion in the European Union? The Limits to the New Orthodoxy of Local Partnership. *International Journal of Urban and Regional Research,* 24(4): 782-800.

Gerlak, Andrea K. 2006. "Federalism and U.S. Water Policy: Lessons for the Twenty-First Century." *Publius: The Journal of Federalism,* 36: 2; 231-257.

Gies, Erica. 2010. "Water wars springing up all around." OnlineAthens, Athens Banner-Herald, 1-24-2010. http://www.onlineathens.com/stories/012410/opi_553748148.shtml. Accessed 1-25-2010.

Glasbergen, Pieter, 2007. "Setting the Scene: the partnership paradigm in the making." Pp. 1-89 in *Glasbergen*, Pieter, Frank Biermann, and Arthur Mol, eds. *Partnerships, Governance, and Sustainable Development: Reflections on theory and Practice.* Cheltenham, UK and Northampton, MA: Edward Elgar.

Glaser, B. G. and Strauss, A. L. 1967. *The discovery of grounded theory*. Chicago: Aldine.

Glennon, Robert. 2002. *Water Follies: Groundwater Pumping and the Fate of America's Fresh Waters.* Washington: Island Press.

Gottlieb, Robert and Margaret Fitzsimmons. 1991. *Thirst for Growth: Water Agencies as Hidden Government in California.* Tucson: The University of Arizona Press.

Greenberg, James B. and Thomas K. Park, 1994. "Political Ecology." *Ecology,* 1;1-12.

Gunningham, Neil. 2007. "Environmental Partnerships in Agriculture: Reflections on the Australian Experience." Pp. 115-137 in *Partnerships, Governance, and Sustainable Development: Reflections on theory and Practice,* edited by Glasbergen, Pieter, Frank Biermann, and Arthur Mol. Cheltenham, UK and Northampton, MA: Edward Elgar.

Harvey, Douglas S. 2001. “Creating a ‘Sea of Galilee’: The Rescue of Cheyenne Bottoms Wildlife Area, 1927-1930.” Kansas History: A Journal of the Central Plains, 24;1. Retrieved November 18, 2009. (http://www.kshs.org/publicat/history/2001spring.htm)

Hays, Jean. 1990. “Cheyenne Bottoms Fight Pits Farmers Against Fowl,” *Wichita Eagle,* December 2, 1990.

Hays, Samuel P. 1987. *Beauty, Health, and Permanence: Environmental Politics in the United States, 1955-1985*. Cambridge University Press: New York.

Higgins Vaughan, and Stewart Lockie. 2002. “Re-discovering the social: neo-liberalism and hybrid practices of governing in rural natural resource management.” *Journal of Rural Studies*, 18; 419–428.

Hill, Steven G; Terrie Clark (Becerra), Ted Cable, and Kristina Boone. “Impact of Watershed Specialist Activities in Kansas.” Research conducted July 2004 – May 2006.

Hittle, T.J. 2007. “Obstacles to River Recreation in Kansas.” Retrieved February 2, 2010. (http://www.kansas.net/~tjhittle/)

Hoornbeek, John A. 2005. “The Promises and Pitfalls of Devolution: Water Pollution Policies in the American States.” *Publius*, 35: 1; 87-114.

Institute for Public Policy and Business Research. 1996. “1990 Census of Population and Housing.” University of Kansas, Lawrence, KS.

Irvin, Renee A. and Stansbury, John. 2004. “Citizen Participation in Decision Making: Is It Worth the Effort?” *Public Administration Review;* 64:1.

Irvine, Robert. 1997. “Putting the water to work: A history, Kansas water law and the environment.” An unpublished dissertation.

Iseley, Bliss, and W. M. Richards. 1953. *The Story of Kansas*. Topeka: Kansas State Printer.

Jarosz, L. and Qazi, J. 2000. “The geography of Washington’s world apple: global expressions in a local landscape.” *Journal of Rural Studies* 16; 1–11.

Jayhawk Audubon Society. 1999. “Letter to Governor Bill Graves, Topeka, Kansas, July3, 1999.” Retrieved December 25, 2009 (http://www.skyways.org/orgs/jayhawkaudubon/lettertograves.htm).

Jordan, A., Wurzel, Rüdiger K. W., and Zito, Anthony. 2005. “The Rise of ‘New’ Policy Instruments in Comparative Perspective: Has Governance Eclipsed Government?” *Political Studies,* 53; 477-496.

Juracek, Kyle E., Charles A. Perry, and James E. Putnam. 2001. USGS Fact Sheet 041–0. "The 1951 Floods in Kansas Revisited." U.S. Geological Survey.

Kansas Department of Health and Environment (KDHE) and United States Department of Agriculture Natural Resources Conservation Service (USDA NRCS). 1998. *Kansas Unified Watershed Assessment FFY 1999,* Topeka, KS.

Kansas Geological Survey. 2005. "Geologic Regions." Retrieved December 21, 2009. (http://www.kgs.ku.edu/Extension/factsheets.html)

Knapp, A. K., and T. R. Seastedt. 1998. "Introduction: Grasslands, Konza Prairie, and Long-Term Ecological Research. Grassland Dynamics: Long-Term Ecological Research in Tallgrass Prairie." Pp. 3-15 in Alan K. Knapp, John M. Briggs, David C. Hartnett, and Scott L. Collins (eds.) *Grassland Dynamics: Long-Term Ecological Research in Tallgrass Prairie.* New York: Oxford,.

Knepper, H., A.Sitren, H.Smith, and University of Central Florida. 2006. "An Examination and Synthesis of Two Public Administration Concepts and their Relevance for Public Administration Students." *Public Affairs Review.*

Leach, W. D., and Pelkey, N. W. 2001. "Making Watershed Partnerships Work: A Review of the Empirical Literature." *Journal of Water Resources Planning and Management.*

Lockie, S. 2009. "Agricultural Biodiversity and Neoliberal Regimes of Agri-Environmental Governance in Australia." *Current Sociology*, 57:3; 407-426.

Lockie, S., G. Lawrence, and L. Cheshire. 2006. "Reconfiguring rural resource governance: the legacy of neo-liberalism in Australia." In P. Cloke, T. Marsden and P. Mooney ed. *Handbook of Rural Studies* 29-43.

Lynch, J.M. 2005. "Overview of Various Global Environmental Issues." Pp. 1-10 in *The Farmer's Decision: Balancing economic agriculture production with environmental quality*, edited by Jerry L. Hatfield. Ankeny, Iowa: Soil and Water Conservation Society.

Mathews, Bob. 1980. "Water Crisis on the Plains." *Kansas Fish and Game* 37; 27.

McCarthy, James. 2002. "First World political ecology: lessons from the Wise Use movement." *Environment and Planning A,* 34; 1281-1302.

_____ 2005. "Rural geography: Multifunctional rural geographies-reactionary or radical?" *Progress in Human Geography* 29:6; 773-786.

Middendorf, Gerad, Derrick Cline and Leonard Bloomquist. 2008. “Agrarian Landscape Transition in the Flint Hills of Kansas: Legacies and Resilience.” Pp. 206-237 in *Agrarian Landscapes in Transition: Comparisons of Long Term Ecological and Cultural Change*, edited by Charles Redman and David Foster, New York: Oxford University Press.

Middendorf, Gerad, Terrie A. Becerra, and Derrick Cline. 2009. “Transition and Resilience in the Kansas Flint Hills.” *Online Journal of Rural Research and Policy.* http://www.ojrrp.org.

Miles and Huberman. 1994. *Qualitative Data Analysis*: an expanded sourcebook. Thousand Oaks: Sage Publications.

Miner, H. Craig. 2002. *Kansas: The History of the Sunflower State, 1854-2000.* Lawrence, KS: University Press of Kansas

Mitchell, Bruce. 2005. “Participatory Partnerships: Engaging and Empowering to Enhance Environmental Management and Quality of Life.” *Social Indicators Research;* 71.

Mol, Arthur P.J. 2007. “Bringing the environmental state back in: partnerships in perspective.” Pp.214-23 in *Partnerships, Governance, and Sustainable Development: Reflections on theory and Practice,* edited by Glasbergen, Pieter, Frank Biermann, and Arthur Mol. Cheltenham, UK and Northampton, MA: Edward Elgar.

Moore, D. 1993. “Contesting terrain in Zimbabwe’s Eastern Highlands: political ecology, ethnography and peasant resource struggles.” *Economic Geography* 69, 380–401.

Morton, L. W. (2001) “The Contributions of Business and Civil Society Sectors to Rural Capacity to Solve Local Health Issues.” *Journal of Rural Health* 17:3; 41-73.

_____ 2003. “Civic Watershed Communities Walking towards Justice: Democratization in Rural Life.” *Research in Rural Sociology and Development,* 9.

_____ 2008. “The Role of Civic Structure in Achieving Performance-Based Watershed Management.” *Society and Natural Resources,* 21;751–766.

Murchison, Kenneth M. 2005. “Learning From More than Five-and-a-Half Decades of Federal Water Pollution.” *Boston College Environmental Affairs Law Review,* 32; 3.

Murdoch, J. 2006. “Networking rurality: emergent complexity in the countryside.” Pp. 171-184 in *Handbook of Rural Studies,* ed. P. Cloke, T. Marsden and P. Mooney.

Natural Resource Conservation Service (NRCS). 1997. "Conditions and Trends of Natural Resources in Kansas." National Resource Inventory Publication, USDA/NRCS, Salina, Kansas.

Nelson, Nathan, Kyle R. Mankin, Michael R. Langemeier, Daniel L. Devlin, Philip L. Barnes, Theresa L. Selfa, William L. Hargrove. "Assessing the Impact of a Strategic Approach to Implementation of Conservation Practices." Research conducted 2006-2010.

Neumann, R. 1998. *Imposing wilderness*. Berkeley, CA:University of California Press.

O'Neill, Karen. 2005. "Can Watershed Management Unite Town and Country?" *Society and Natural Resources* 18:3; 241-253.

Opie, John. 1993. *Ogallala: Water for a Dry Land.* Lincoln: University of Nebraska Press.

Pantle, Alberta. 1945. "Settlement of the Krimmer Mennonite Brethren at Gnadenau, Marion County," *Kansas Historical Quarterly,* 13:5; 259 -285.

Parisi, Domenico, Michael Taquino, Steven Michael Grice, and Duane A. Gill. 2004. "Civic Responsibility and the Environment: Linking Local Conditions to Community Environmental Activeness." *Society and Natural Resources,* 17:2;97-112.

Peet, R. and M. Watts. 1993. "Introduction: development theory and environment in an age of market triumphalism." *Economic Geography*, 69; 227-53.

Peet, R. and Watts, M. 1996: *Liberation ecologies*. London: Routledge.

Pisani, Donald J. 1992. *To Reclaim a Divided West: Water, Law, and public Policy 1848-1902.* Albuquerque: University of New Mexico Press.

_____ 1996. *Water, Land, and Law in the West: The Limits of Public Policy, 1850-1920.* Lawrence, Kan.: University Press of Kansas.

_____ 2002. Water *and American Government: The Reclamation Bureau, National Water Policy, and the West, 1902-1955.* Berkeley and Los Angeles: University of California Press.

Prophet, Carl. 1967. "River Pollution by Feedlot Runoff." Proceedings of the Oklahoma Academy of Science for1967. Retrieved February 3, 2010. http://digital.library.okstate.edu/OAS/oas_pdf/v48/p207_209.pdf

Prudham, W.S. 2003, "Taming trees: capital, science, and nature in Pacific Slope tree improvement." *Annals of the Association of American Geographers,* 93:636-656

Prudham W. S. 2004. “Poisoning the well: neo-liberalism and the contamination of municipal water in Walkerton, Ontario.” *Geoforum*, 35;343- 359.

Ragin, Charles C. 1987. *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies*. Berkeley and Los Angeles: University of California Press.

Reber Alison L. 2005.Wakarusa WRAPS Grant Proposal.

Reddel, T. 2002. “Beyond Participation, Hierarchies, Management and Markets: New Governance and Place Policies.” *Australian Journal of Public Administration*, 61; 50-63.

_____ 2004. “Third Way Social Governance: Where is the State?” *Australian Journal of Social Issues*, 39:2.

Reisner, Marc. 1986. *Cadillac Desert: The American West and Its Disappearing Water*. New York: Penguin Books.

Reno County NRCS employee. 2010. Personal communication (August 31, 2010).

Robbins, P. 2002, “Letter to the editor. Obstacles to a First World political ecology? Looking near without looking up.” *Environment and Planning A*, 34:1509 -1513.

_____ 2004. *Political Ecology: A Critical Introduction.* Malden, MA: Blackwell Publishing.

Robbins, P. and J. Sharp. 2003a. “The lawn chemical economy and its discontents.” *Antipode* 35;955-979.

_____ 2003b, “Producing and consuming chemicals: the moral economy of the American lawn.” *Economic Geography*, 79; 425- 451.

Robertson, Morgan M. 2000. “No Net Loss: Wetland Restoration and the Incomplete Capitalization of Nature.” *Antipode*, 32:4, 463-493.

_____ 2004. “The neoliberalization of ecosystem services: wetland mitigation banking and problems in environmental governance.” *Geoforum*, 35; 361–373.

Rose, Nikolas. 1996. “The death of the social? Re-figuring the territory of government.” *Economy and Society*, 25:3; 327-356.

_____ 2000. “Community, Citizenship, and the third Way.” *American Behavioral Scientist* 43;1395-1410.

Sabatier, Paul A.; Will Focht; Mark Lubell; Zev Trachtenberg; Arnold Vedlitz; and Marty Matlock. Eds. 2005. *Swimming Upstream: Collaborative Approaches to Watershed Management.* Cambridge: The MIT Press.

Salamon, L. 2002. *The Tools of Government: A Guide to the New Governance*. Oxford University Press: New York.

Sayre, N. 1999. "The cattle boom in southern Arizona: towards a critical political ecology." *Journal of the Southwest*, 41:239-71.

Schneiders, Robert Kelley. 1999. *Unruly River: Two Centuries of Change Along the Missouri.* Lawrence, Kan.: University Press of Kansas.

Schroeder, Richard A. 2005. "Debating the place of political ecology in the First World." *Environment and Planning A,* 37; 1045-1048.

Schwilling, Marvin. 1985. "Cheyenne Bottoms." Kansas School Naturalist 32: 7.

Sharp, Jeffery S. and Domenico Parisi. 2003. "Devolution: Who is Responsible for Rural America?" Pp.353-362 in *Challenges for Rural America in the Twenty-First Century,* edited by David L. Brown and Louis E. Swanson. University Park: Pennsylvania State University Press.

Sheridan, T. 2001. "Cows, condos and the contested commons: the political ecology of ranching on the Arizona-Sonora borderlands." *Human Organization* ,60:141–52.

Sherow, James E. 1990. *Watering the Valley*. Lawrence: University Press of Kansas.

_____ 2002. "The Art of Water and the Art of Living." *Kansas History*, 25:1; 52-71.

_____ 2004. "Water," in the *Encyclopedia of the Great Plains*, edited by David J. Wishart Lincoln: University of Nebraska Press.

Sherow, James E. and Homer E Socolofsky. 1995. "Kansas and Water: Survival in the Heartland," Pp. 106-119 in *Politics in the Postwar American West*, edited by Richard Lowitt. Norman: University of Oklahoma Press.

Simmonds, I.G. 1993. *Interpreting Nature: Cultural Constructions of the Environment*. London: Routledge.

Smythe, William. 1970. *The Conquest of Arid America*. Seattle: University of Washington Press.

St Martin, K. 2001. "Making space for community resource management in fisheries." *Annals of the Association of American Geographers* 91; 122–42.

Stake, Robert E. 1995. *The Art of Case Study Research.* Thousand Oaks: SAGE Publications.

State of Kansas Travel and Tourism Fast Facts. 2009. Retrieved December 21, 2009. (http://www.travelks.com/fastfacts)

Stene, Edwin O. 1946. "The Development of Wildlife Conservation Policies in Kansas." Topeka: State Printer.

Strause, A.L. 1996. *Qualitative Analysis for Social Scientists.* Cambridge: University Press.

Swanson, Louis E. 2001. "Rural policy and direct local participation: Democracy, inclusiveness, collective agency, and locality-based policy." *Rural Sociology*, 66: 1; 1-21.

Trentelman, Carla Koons. 2009. "Place Attachment and Community Attachment: A Primer Grounded in the Lived Experience of a Community Sociologist." *Society and Natural Resources*,22:3; 191- 210.

U.S. Environmental Protection Agency. 1996. "Why Watersheds?" EPA800-F-96-001. http://www.epa.gov/owow/watershed/why.html

_____ (2003a). EPA Revises Kansas Water Quality Standards, U. S. Environmental Protection Agency Region 7 Fact Sheet. http://www.epa.gov/region 7

_____ (2003b). Proposed Rule for Kansas Water Quality Standards Fact Sheet. http://www.epa.gov/region 7

_____ 2009. National Water Quality Inventory: Report to Congress, 2004 Reporting Cycle. Retrieved April 12, 2010. http://www.epa.gov/owow/305b/2004report/

_____ 2010. Watershed Assessment, Tracking & Environmental Results. Retrieved August 11, 2010. http://iaspub.epa.gov/waters10/w305b_report_control.get_report?p_state=KS&p_cycle=

U.S. Census Bureau. 2009. www.citypopulation.de/USA-Kansas.html. Retrieved March 4, 2010.

_____ 2010. quickfacts.census.gov/qfd/states/2000.htm. Retrieved July19, 2010.

U.S. Department of Agriculture – Farm Service Agency. 2008. "Direct and counter-cyclical Payment (DCP) Program." Retrieved July 19, 2010. http://www.fsa.usda.gov/Internet/FSA_File/dcp2008.pdf

U.S. Department of Agriculture – National Agricultural Statistics Service. 2009. 2007 Census County Profile 02/04/2009. Retrieved March 15, 2010 (http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Kansas/index.asp).

Vandergeest, Peter, Mark Flaherty, and Paul Miller. 1999. "A Political Ecology of Shrimp Aquaculture in Thailand." *Rural Sociology*, 64:4; 573-596.

Linda P. and Pfeffer, Max J. 2007. “Organizing Citizen Engagement for Democratic Environmental Planning.” *Society & Natural Resources,* 20; 801-813.

Wainwright, Joel. 2005. “The Geographies of political ecology: after Edward Said.” *Environment and Planning A*, 37; 1033-1043.

Walker, Peter A. 2003. “Reconsidering regional political ecologies: toward a political ecology of the rural American West.” *Progress in Human Geography,* 27:1; 7-24.

Weber, Edward P. 2000. A New Vanguard for the Environment: Grass-Roots Ecosystem Management as a New Environmental Movement. *Society & Natural Resources*, 13; 237-259.

Weiss, Robert S. 1994. *Learning From Strangers: The Art and Method of Qualitative Interview Studies.* New York: The Free Press.

Wieviorka, Michel. 1992. “Case Studies: history or sociology.” Pp.159-171 in *What is a Case? Exploring the Foundations of Social Inquiry*, edited by Charles C. Ragin and Howard S. Becker. 1992. Cambridge: Cambridge University Press.

Willems-Braun, B. 1997. “Buried epistemologies: the politics of nature in (post) colonial British Columbia.” *Annals of the Association of American Geographers* 87; 3–31.

Wilson, R. 1999. “Placing nature: the politics of collaboration and representation in the struggle for La Sierra in San Luis, Colorado.” *Ecumene* 6;1–28.

Windscheffel, Arno. 1954. “Water Law in Kansas.” *The Journal of the Bar Association of the State of Kansas*, 2;171-176.

Winter 200 Winter, M. 2006. “Rescaling Rurality: Multilevel governance of the agrofood sector.” *Political Geography* 25;735-761.

Wondolleck, J.M. and Yaffee, S.L. 2000. “Making collaboration work: lessons from a comprehensive assessment of over 200 wide ranging cases of collaboration in environmental management.” *Conservation in Practice*, 1: 1;17-25.

Woods, M. 2006. “Political articulation: the modalities of new critical politics of rural citizenship.” Pp. 457-471 in *Handbook of Rural Studies*, ed. P. Cloke, T. Marsden and P. Mooney.

Worster, Donald. 1985. *Rivers of Empire: Water, Aridity, and the Growth of the American West.* New York: Pantheon Books.

_____ 2003. “The Dirty Thirties: A Study in Agricultural Capitalism.” In Rita Napier (ed.), *Kansas, and the West: New Perspectives.* Lawrence: University Press of Kansas, 318-333.

Yin, Robert K. 1981. “The Case Study Crisis: Some Answers.” *Administrative Science Quarterly,* 26:1;58-65.

Yin, Robert K. 2002. *Case Study Research: Design and Method*, Third edition. Thousand Oaks, CA: Sage.

Zimmerer, Karl S. 1993. “Soil Erosion and Social (Dis)Courses in Cochabamba, Bolivia: Perceiving the Nature of Environmental Degradation.” *Economic Geography*, Vol. 69(3);312-327.