AN ABSTRACT OF THE THESIS OF

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Title: Beyond Random Acts of Conservation: An Institutional Analysis of the Natural Resource Conservation Service's Agricultural Water Enhancement Program

Abstract approved:

Hannah Gosnell

Irrigated agriculture accounts for 90 percent of consumptive use of freshwater in the western US and is considered the largest contributor to nonpoint source water pollution. The diffuse nature of most water quality and quantity challenges necessitates institutions that can more effectively engage agricultural producers in strategic, integrated, watershed-scale approaches to water management such as those associated with Integrated Water Resource Management (IWRM). With approximately 9,400 professionals working in nearly every one of the nation's 3,071 counties and an emphasis on voluntary, incentives-based approaches to conservation, the Natural Resources Conservation Service (NRCS) is well poised to influence land and water management on private working lands. NRCS conservation programs, however, have been criticized as "random acts of conservation" that lack a strategic vision for addressing natural resource challenges at-scale. Using NRCS's new Agricultural Water Enhancement Program (AWEP) as a case study, this paper seeks to examine the factors that enable or inhibit NRCS from promoting an integrated approach to water management consistent with IWRM principles.

Following the Institutional Analysis and Development (IAD) framework this paper traces the development of AWEP and examines how the rules established at the national level impact implementation at the national, state and local levels. The paper then evaluates AWEP based on a set of six IWRM design principles to determine (a) the extent to which AWEP represents an IWRM approach, and (b) the institutional factors that facilitate or inhibit NRCS from taking a more integrated approach to water management. I found that institutional factors vary greatly between levels of analysis depending on the specific context, but did identify several consistent enablers and barriers. The three most significant factors that facilitate an IWRM approach are: (1) AWEP's focus on priority resource concerns within a defined hydrographic area; (2) AWEP's emphasis on pursuing a partnership-based approach; and (3) increased local involvement in defining projects. The three most significant factors that inhibit an IWRM approach are: (1) a lack of clarity concerning partner roles and responsibilities and constraints on partner involvement; (2) limited flexibility of existing program rules; and (3) limited local capacity to engage with landowners and implement projects. The paper offers institutional recommendations for facilitating an IWRM approach within NRCS, and concludes with a consideration of the utility of IWRM design principles and the IAD framework for analyzing water management institutions.

Beyond Random Acts of Conservation: An Institutional Analysis of the Natural Resource Conservation Service's Agricultural Water Enhancement Program

by
Harmony S J Burright

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I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.

Harmony S J Burright, Author

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DEDICATION

"The significant problems we face cannot be solved at the same level of thinking we were at when we created them." ~ Elinor Ostrom

This thesis is dedicated to the memory and work of the great Dr. Elinor Ostrom. She has left behind an incredible legacy and her thoughts and words will continue to resonate with any and all who seek new and creative forms of collaborative governance.

1 Introduction

Traditional water management approaches have generally been characterized by centralized decision-making and regulatory enforcement of discrete, visible, point-source problems that are readily identified and addressed at localized scales (Durant et al., 2004a; Fiorino, 1999; Ruckelshaus, 1995). Environmental regulations enacted in the 1970's promoted species-specific, media-specific, and pollutant-specific approaches to conservation as opposed to more integrated approaches that address environmental problems within the context of complex social and ecological systems (Durant et al., 2004b; Cortner & Moote, 1994). As a result, many government agencies tend to operate within administrative "silos" and have limited capacity to tackle complex water management problems spanning multiple political jurisdictions and involving a large number of stakeholders with oftentimes competing demands on limited water supplies (Imperial, 2009; Weber, 1999). The diffuse nature of nonpoint source pollution, water scarcity, and habitat fragmentation make these environmental challenges particularly difficult to address through a centralized approach (Durant et al., 2004b; John, 1994; NAPA, 2000). Consequently, scholars and practitioners seek new paradigms that facilitate more strategic, integrated, cooperative approaches to water management at a scale commensurate with these challenges (Durant et al., 2004a; Weber, 1999).

Integrated Water Resources Management (IWRM) emerged in response to these traditionally fragmented approaches as a way to account for the inter-disciplinary, inter-sectoral, and transboundary nature of water (Jonch-Clausen & Fugl, 2001). IWRM represents a systems approach to water management that seeks to effectively integrate natural and human dimensions in water management policies, institutions and practices at a larger scale. An overarching principle in IWRM is that management units should be delineated by hydrologically defined geographic areas, rather than

political boundaries. Within the natural system it is necessary to better understand and manage the nexus between land, surface water, groundwater, energy and other natural resource issues in order to assess potential impacts and tradeoffs. Within the human system, IWRM highlights the need to develop institutions that can: 1) work across traditional programmatic or administrative boundaries; 2) coordinate multiple interests; and, 3) balance ecological, social, and economic considerations. An IWRM approach encourages broader stakeholder involvement in defining objectives, identifying alternatives, and implementing management practices at the appropriate spatial and temporal scales. Academics and practitioners alike have struggled to figure out how IWRM works in practice and continue to observe that the most enduring challenges to IWRM are institutional in nature (Jonch-Clausen & Fugl, 2001). [1]

In order for an IWRM approach to integrate natural and human systems, we must develop institutions to engage private landowners since, taken collectively, their decisions and actions greatly influence water management issues. In 2007 the US Department of Agriculture found that land used for agricultural purposes totaled 1.16 billion acres, about 51 percent of the total US land area, with most of it in private ownership (Nickerson et al., 2011).[2] Irrigated agriculture accounts for 90 percent of consumptive use of freshwater in the western United States and has been identified as the largest contributor to non-point source water pollution (Ribaudo & Johansson, 2006). Over 90 percent of species listed under the Endangered Species Act (ESA) have some or all of their habitat on nonfederal lands (US General Accounting Office, 1994). Private landowners are increasingly being asked to engage in and contribute to integrated approaches to land and water management, but they may lack the

[1] Institutions are the formal and informal "rules, norms and shared strategies" that humans develop to tackle collective action problems resulting from rational individual behavior that compounds to produce socially unfavorable outcomes (Imperial 2010).

[2] This includes cropland, grassland pasture and range, forestland grazed, land in farmsteads, and farm roads and lanes.

appropriate information, resources or incentives to modify their management practices (Bellamy et al., 1999; Goldman & Tallis, 2009). Furthermore, many existing incentive programs do not require or promote a coordinated approach to natural resource management across working landscapes (Goldman et al., 2007).

Operationalizing an IWRM approach across working landscapes requires institutions that can influence individual landowner decisions and coordinate activities at a larger scale to address mounting water management challenges. IWRM scholars emphasize the need to identify institutional arrangements that facilitate an IWRM approach. In order to determine what institutional arrangements can achieve a more integrated approach to water management we must: 1) examine how current institutions influence individual and collective behavior with respect to land and water management decisions; and, 2) identify opportunities to reshape or craft new institutions that are better equipped to meet enduring land and water management challenges consistent with IWRM principles. In this paper I will examine how the Natural Resources Conservation Service's (NRCS's) Agricultural Water Enhancement Program (AWEP), has shaped actor behavior and interactions at multiple levels. I will use this as a means to identify the institutional factors that either enable or constrain NRCS's ability to implement programs that are consistent with a set of IWRM design principles.

NRCS is a federal natural resources agency within the US Department of Agriculture that is well poised to align private land and water resource management decisions with IWRM principles. NRCS's guiding mission is to "help people help the land." It seeks to achieve this mission by providing landowners with technical assistance and financial incentives to voluntarily enhance and conserve critical natural resources on private working lands. NRCS operates at multiple scales; as a federal agency, NRCS provides recommendations for improving national farm policy and distributes

conservation funding across the nation in accordance with national policy. NRCS representatives at the regional, state and local levels identify priority resource concerns, promote conservation management practices and deliver assistance to landowners consistent with program rules. NRCS has a strong local presence in comparison to many other federal agencies, with approximately 9,400 NRCS professionals working in nearly every one of the nation's 3,071 counties (Johnson, 1996). Given the strong local presence of NRCS offices, NRCS personnel also have the potential to influence community capacity, social norms and individual landowner decision-making.

NRCS conservation programs, which are typically delivered on a landowner-by-landowner basis, have been criticized as "random acts of conservation" that lack a strategic vision for delivering landscape-scale outcomes (Scarlett, 2011; Goldman et al., 2007). Research in several watersheds suggests that, commonly, about 80 percent of the conservation problems occupy about 20 percent of a watershed (Zinn, 2007). Since all participation in NRCS conservation programs is voluntary, these programs often do not address the most severe or concentrated problems, especially when implemented on a farm-by-farm basis. Toombs and Roberts (2009) also found that some NRCS conservation programs may work at cross-purposes, thereby necessitating a more coordinated approach.

Consistent with national and international trends, the 2008 Farm Bill created more opportunities for NRCS to engage in large-scale conservation projects that engage multiple partners (Scarlett, 2011; Kelly & Kassen, 2011). These new initiatives include AWEP, which allows partner organizations to propose strategic, multi-landowner projects that address priority resource concerns within specific hydrographic or geographic boundaries. AWEP is just one example of NRCS's move towards a more integrated approach to water management that goes beyond "random

acts of conservation." AWEP represents a new institutional arrangement that may enable NRCS to connect landowners with more integrated approaches to water management, but it is unclear what existing institutional factors facilitate or inhibit realization of this goal. Consequently, this study seeks to answer the following research question:

- What institutional factors impede or support NRCS's ability to facilitate an Integrated Water Resources Management (IWRM) approach across working landscapes?

Using AWEP as a case study this research will determine the extent to which and how changes in NRCS's institutional arrangements align with IWRM principles and facilitate better outcomes at the operational level. This research will also examine the institutional barriers to implementing IWRM approaches at multiple levels of analysis.

A central theoretical problem this thesis aims to address is the absence of a clear and consistent analytical framework to assess whether policies and institutions are successful in facilitating a more integrated approach that achieves the desired social, economic and environmental outcomes associated with IWRM (Stalnacke & Gooch, 2010). Consequently, I propose to analyze AWEP using the institutional analysis and development (IAD) framework (Ostrom, 1990). The IAD framework provides a structured framework for isolating and analyzing important variables that influence institutional design, institutional performance and institutional change. IAD has been used to examine enduring institutional arrangements that facilitate successful management of natural resources at multiple levels (Corbera et al., 2009; Cortner et al., 1998; Dietz et al., 2003; Imperial, 1999a; Imperial, 1999b). IAD allows an analyst

to examine how institutions change over time, by explicitly focusing on the formal and informal rules that structure behavior at multiple levels of analysis.

This research uses a nested case study approach to examine how AWEP influences decision-making at multiple levels (Yin, 1994). Following the IAD framework this paper begins by looking at the development of AWEP at the national level and then examines how the rules established at the national level impact implementation at the national, state and local levels and the resultant outcomes. Having systematically characterized the institutional arrangements associated with AWEP, this paper then evaluates those arrangements using a set of IWRM design principles gleaned from an extensive literature review to examine whether and how AWEP facilitates a more integrated approach to water management.

I aim to satisfy the following objectives through this research:

- Identify the contextual and institutional factors that enable or constrain NRCS's ability to facilitate an integrated approach to water resources management across working landscapes using AWEP as a case study.

- Recommend institutional arrangements within NRCS that may facilitate more integrated approaches to land and water management consistent with IWRM principles.

- Contribute to IWRM scholarship by using the IAD framework as a theoretical framework for analyzing IWRM institutions. Identify ways to improve the IAD framework for use in IWRM research.

- Develop a set of design principles and indicators for IWRM institutions based on IWRM and IAD literature. Assess the utility of the design principles and indicators for evaluating IWRM institutions.

This paper is structured as follows:

- Section 2 lays out the theory and framework used to guide the research questions and research design for this study. It provides a more thorough discussion of IWRM and describes how the IAD framework can be used to analyze IWRM institutions. Within this section I propose to use six design principles and indicators to evaluate AWEP as an IWRM institution.

- Section 3 details the methods used to conduct the research, including an overview of the case study approach and rationale for case study selection. This section also discusses how data was collected and analyzed and concludes with a discussion of the limits of the methods employed.

- Section 4 presents each of the sub-studies using the IAD framework. It begins with a discussion of general background and context and transitions to a narrative about how AWEP was negotiated through the legislative and rule-making processes. The subsequent sections present sub-studies of how AWEP was implemented at the national, state and local levels and highlights the institutional factors that facilitate or inhibit program implementation. Finally, the section concludes with a summary and analysis of the various institutional factors that enable or constrain NRCS from implementing a more integrated approach to water management using the IWRM design principles and indicators presented in Section 2 to structure the analysis.

- Section 5 presents specific recommendations for institutional adjustments within NRCS that could better facilitate an IWRM approach. It also reviews the utility of integrating the IAD framework with IWRM design principles to evaluate water management institutions and makes suggestions for adapting these tools for future research.

- Section 6 provides a high-level overview of the results of this research and identifies future research opportunities.

2 Conceptual Framework

This section lays out the theory and framework used to guide the research questions and research design for this study. I begin by reviewing and clarifying some of the significant conceptual components of Integrated Water Resources Management (IWRM), including water governance and adaptive water management. I argue that water governance is a central feature of IWRM and should not necessarily be treated as a distinct concept. Recent IWRM literature has recognized the need for IWRM to promote more adaptive forms of management. I describe how adaptive management and adaptive capacity fit within the context of this research suggesting that adaptive capacity should be incorporated into design principles for IWRM institutions. IWRM has been implemented to varying degrees within the United States; I describe some of these efforts and also highlight the challenges encountered by IWRM practitioners. This discussion of IWRM in the United States highlights the importance of explicitly researching and evaluating institutional arrangements that facilitate IWRM. IWRM scholarship, however, lacks a consistent framework for structuring IWRM research and does not have widely accepted evaluation criteria for determining the extent to which an institution aligns with IWRM.

I suggest that the institutional analysis and development (IAD) framework can provide a consistent framework for conducting and communicating IWRM research. The IAD framework focuses on how rules structure behavior and can be used to assess how rules at multiple levels influence decision-making and outcomes at the operation level. I provide background on why IAD may be an appealing framework for IWRM research, briefly discuss the variables that comprise the IAD framework and specify how I will employ the framework to structure my own research. I describe how the IAD framework is used to analyze institutional change at multiple levels of analysis and indicate how this informs my own research. I review how the IAD framework has

been employed in the field of natural resource management to identify key design principles for successful institutions and summarize some of those design principles. Finally, I propose six modified institutional design principles that reflect the goals of IWRM and describe how they can be used to evaluate the extent to which institutions represent an integrated approach to water management. I describe how I will use these design principles as evaluative criteria to assess the extent to which AWEP can be thought of as an IWRM institution.

2.1 Integrated Water Resources Management

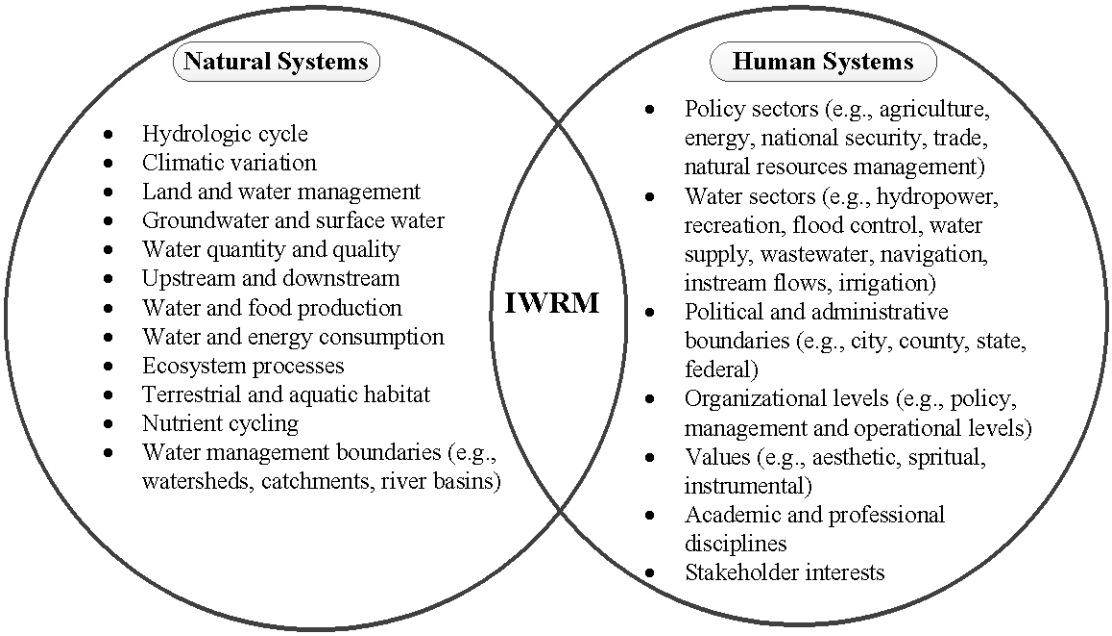
IWRM emerged as a significant unifying concept following the Earth Summit in 1992 (Mitchell, 2005) and was popularized by the Global Water Partnership in 2000 following the second World Water Forum (Amezaga, 2006). The most cited definition for IWRM was developed by the Global Water Partnership, which defines IWRM as "a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems" (Global Water Partnership Technical Advisory Committee, 2000). This definition is consistent with sustainable development concepts that emerged in parallel with IWRM in the international arena (Cardwell et al., 2006). Although the GWP offers the most popular definition, it has been criticized for being too general and not specifying what is to be coordinated under an IWRM approach (Cardwell et al., 2006). IWRM as an academic concept and an environmental management paradigm has received ample attention from academics and practitioners in the past two decades, though academics note that various iterations of IWRM have been promoted and practiced for decades across the globe without formally being called IWRM (Biswas, 2004; Biswas, 2008; Shively & Mueller, 2010).

Scholars have been careful to distinguish between an integrated approach and a comprehensive or holistic approach (Hooper, 2003; Mitchell, 2004). The lack of distinction between these concepts became problematic for other popular environmental management paradigms such as ecosystem management (Hooper, 2003). A comprehensive or holistic approach, which seeks to simultaneously account for all components and linkages in the system, can be prohibitively complex especially in highly developed systems. Consequently, under a comprehensive approach it may take too long to translate assessment and planning into action (Hooper, 2003). Alternately, an integrated approach focuses on those components that are "judged to be the key drivers of variability in the system" based on knowledge generated from the stakeholders (Hooper, 2003). IWRM is not an "all or nothing" approach; there can be various degrees of integration within and between natural and human systems (Cardwell et al., 2006). IWRM thus represents a continual process by which tradeoffs are balanced in an informed way between different social, economic and environmental goals at different scales (Jonch-Clausen & Fugl, 2001).

In order to understand IWRM in more specific terms, it is important to identify what exactly is being integrated within and between natural systems and human systems. In an effort to strengthen the conceptual basis of IWRM, Jonch-Clausen and Fugl (2001) outline 12 specific variables that should be considered when pursuing a more integrated approach to water management. The list of variables is not exhaustive, and has been modified by various scholars who seek to create a common approach for evaluating integrated water resources policies, institutions and programs (De Stefano et al., 2010; Shively & Mueller, 2010). A summary of some of the relevant variables are presented in *Figure 1. IWRM Points of Integration* and are organized by natural and human systems. It is important to note that IWRM does not promote the universal and equal application of these variables; variables that drive the system will vary

depending on the natural setting, the institutional environment and the knowledge and needs of involved stakeholders.

Figure 1. IWRM Points of Integration



Along with an enhanced understanding of the interconnectedness of natural and human systems, it is important to include spatial and temporal considerations into management decisions (Cardwell et al., 2006; Savenije & Van der Zaag, 2008). Savenije and Van der Zaag (2008) represent four dimensions of integration: water resources (natural dimensions); water users (human dimensions); spatial scale; and, temporal scale. They represent each of these broad points of integration on a continuum to demonstrate variability in the degrees of integration. Integration of water resources with other land and environmental management issues necessitates a greater understanding of the complex interactions within natural systems. Integration of water users highlights the need to coordinate management activities to optimize achievement

of multiple uses and objectives (e.g., agriculture, recreation, navigation, hydropower, ecological integrity) advocated by different stakeholders. Managing water resources for multiple objectives necessitates coordination of institutions across traditional programmatic or sectoral boundaries (horizontal integration) and between different levels of management (vertical integration). Spatial integration is the coordination of water resources within a defined geographic area and "from the lithosphere to the atmosphere" (Cardwell et al., 2006). Spatial integration is based on hydrologic concepts, both in terms of climate and the hydrologic cycle, how water moves across and interacts with the landscape and how human communities use water at different spatial scales. Defining the spatial extent of the water resource issues to be managed has significant impacts on integrating the objectives and institutions. For instance, as the scale of the IWRM effort increases in size, the scope of potential actors and issues will also increase. Most IWRM scholars advocate for management units based on hydrographic boundaries. Finally, there is a need to integrate temporal considerations into water management since values, knowledge and technology change over time.

IWRM has been criticized for lacking a clear, unambiguous definition (Jonch-Clausen & Fugl, 2001). The current definitions of IWRM are considered to be too broad, vague and "unimplementable in operational terms" (Biswas, 2008; Biswas, 2004). IWRM definitions and concepts do not provide sufficient guidance for how it is to be achieved in practice (Stalnacke & Gooch, 2010). The need to adapt IWRM to local contexts makes transferable strategies and techniques difficult to develop (Jeffrey & Gearey, 2006). The most common criticism of IWRM is that "the gap between theory and practice remains extensive" namely because IWRM has failed to generate meaningful scientific contributions and does not embrace the uncertainty that accompanies complexity as completely as adaptive management (Jeffrey & Gearey, 2006). Scholars argue that IWRM has been reduced to a "buzz word" or "fad" much like ecosystem management in the 1990's (van der Zaag, 2005). Jewitt (2002)

expresses concern that traditional command-and-control approaches to water management will continue to be implemented under the guise of IWRM, resulting in further depletion of ecosystem services.

2.1.1 Water Governance and IWRM

Water crises are in large part considered "governance crises" (Jonch-Clausen & Fugl, 2001). It is acknowledged by many scholars that effective water governance is necessary for the successful implementation of IWRM policies and programs (Hooper, 2003; Imperial, 2009; Jonch-Clausen & Fugl, 2001; Kidd & Shaw, 2007; Medema et al., 2009; Savenije & Van der Zaag, 2008). Water governance focuses on one particular dimension of IWRM. The term water governance has taken on many different definitions in literature, leading to some uncertainty as to what it actually means: "although acknowledgement of and appreciation for water governance's importance is widespread, definitions of the concept can be broad and fuzzy, and inconsistencies in usage and interpretation are common" (Lautze et al., 2011, p. 2). Lautze et al. (2011) attempt to provide conceptual clarity by explaining what water governance *is* and what it *is not*: water governance is the processes and institutions that contribute to decision-making and it *is not* the outcomes of decision-making. They argue that water governance is distinct from water management, and should provide the framework for determining what water management activities ought to be pursued. The authors also contend that water governance has been "subsumed" by IWRM and that IWRM does not necessarily represent good governance since it pre-determines the objectives of water management activities: "rather than using a water governance process to define a goal, it is a water governance process with a pre-defined goal" (pg. 5).

Differentiating between IWRM and water governance does not necessarily provide a useful distinction. The name IWRM, with its focus on "management" may be misleading. I argue that water governance is an integral component of IWRM and that decision-making should not be divorced from management actions and the resultant outcomes. The IWRM framework is broad enough to allow for myriad forms of governance to emerge, though there is a strong preference within IWRM literature for more polycentric forms of governance that combines many actors at different levels representing different sectors and interests (McGinnis, 2011). IWRM scholars advocate for more participatory decision-making within a sustainability framework that emphasizes the need to balance multiple social, economic and environmental objectives. This is consistent with the "building blocks" for an integrated approach developed by Mitchell & Hollick (1993) and adapted by Hooper (2010). The "building blocks" are presented in *Box 1. Building Blocks of an Integrated Approach* and can be viewed as the basic principles for developing an IWRM approach.

Box 1. Building Blocks of an Integrated Approach

1. ***Systems Approach.*** Understanding of both natural and human systems, their component parts, and the interrelationships among those parts.
2. ***Strategic Approach.*** Management decisions do not focus on all components or variables; rather, they focus on key issues and variables and the linkages between them as identified through consultation with stakeholders.
3. ***Participatory Approach.*** Citizens, individual resource users, and non-government organizations are able to participate in decisions about resource management.
4. ***Partnership Approach.*** Government organizations, non-governmental organizations and individuals each have a role in establishing common objectives, defining roles and responsibilities and implementing management actions.
5. ***Balanced Approach.*** Economic development, ecosystem protection and fulfillment of social norms and values are all considered in management decisions. Management decisions balance tradeoffs between multiple interests.

Adapted from Hooper (2010).

According to Duchovny (2004), IWRM implementation can be particularly helpful as management systems transition from traditional resource management approaches to more integrated approaches:

- From administrative to geographic boundaries (e.g., catchment or watershed);
- From sector to inter-sector management;
- From a unidirectional to a bilateral approach that reconciles "bottom-up" needs and capacity with "top-down" limitations and support;
- From command and control forms of "government" to more distributive and collaborative "governance"; […] and,
- From a closed system comprised of water management "experts" to a more open and transparent system inclusive of the broad spectrum of water users and stakeholders. (Dukhovny, 2004)

As Dukhovny (2004) suggests, implementation of IWRM signals a transition from "government" to "governance." This same trend can be identified in the building blocks of an integrated approach. The issue of governance directly relates to the types of institutional arrangements that influence water management decisions and enable or constrain actor behavior. Consequently, this study seeks to contribute to the discussions on water governance through the lens of IWRM institutions.

2.1.2 Adaptive Water Management and IWRM

Much of the literature on IWRM does not explicitly address the methods by which institutions change and adapt over time. As scholars and practitioners continue to

grapple with managing the inherent complexity of natural and human systems, there have been recent efforts to combine integrated and adaptive approaches to water management (Engle et al., 2011; Medema et al., 2009; Pahl-Wostl et al., 2007). Adaptive management (AM) has its roots in resilience theory (Holling, 1978), and is primarily concerned with managing uncertainty by intentionally developing and testing hypotheses about management practices and outcomes (Engle et al., 2011). AM acknowledges that our ability to predict future key drivers of ecosystem change is inherently limited (Pahl-Wostl et al., 2007). Rather than attempting to prevent or control change through engineered solutions, AM advocates for a management approach that enhances the capacity of human systems to respond to uncertainty and change through social learning and adaptation. Management is not the search for the optimal solution; rather, it is an ongoing process of learning about the system by strategically manipulating system components and assessing the outcomes. AM suggests a very deliberate and conscious experimentation process and should not be conflated with the more general concepts such as flexibility or adaptability.

Engle et al. (2011) examine the interplay between IWRM and AM paradigms through an empirical analysis of Brazilian water reform and concludes that "the mechanisms of IWRM may be at odds with the flexible, experimental, and self-organizing nature of AM" (pg. 19). IWRM and AM, however, are not inherently incompatible; they depend largely on the institutional context within which they are implemented. In some instances, an AM approach may be more feasible within traditional hierarchical arrangements where institutions can act unilaterally rather than through horizontally and vertically integrated networks. Alternately, an IWRM approach can include both "top-down" enabling legislation as well as "bottom-up" collaborative approaches, such as watershed partnerships. IWRM has been criticized for being too reliant upon highly predicable system behavior and for not explicitly acknowledging the role of uncertainty in decision-making (Pahl-Wostl et al., 2007). Despite preliminary

investigations, there is still a need examine the particular factors that enable systems to be both integrated and adaptive and also the relative advantages and tradeoffs of this approach (Engle et al., 2011; Medema et al., 2009). This is especially important since disturbance events create potential opportunities for growth, reorganization, and innovation (Engle et al., 2011; Medema et al., 2009; Pahl-Wostl, et al., 2007).

Given the complexity and uncertainty of water resources, it is vital for water institutions to develop the tools and capacity to both learn from and adapt to ever-changing conditions. The inflexibility or "institutional inertia" of many current water institutions requires some degree of institutional reform to foster greater adaptive capacity, where adaptive capacity is broadly defined as the ability to learn from and respond to changing circumstances. Adaptive capacity becomes increasingly important in the face of mounting uncertainty about climatic variability and long-term water availability. Even though IWRM institutions may not practice AM in its strictest sense, there is a need to consider the how IWRM institutions adapt to changing conditions over time. This study includes adaptive capacity as an important design principle for IWRM institutions since it accounts for temporal integration. When I use the term "adaptive" or "adaptive capacity" in this paper, it is employed in its broadest sense and does not refer specifically to AM.

2.1.3 IWRM in the United States

The term IWRM is predominantly used within an international context, especially as it pertains to aid and development, and the majority of case studies examine IWRM in international river basins (Cardwell et al., 2006). There are, however, a number of case studies examining IWRM in the United States (Hooper, 2010; Imperial, 2009; Mitchell, 1990; Shively & Mueller, 2010). Stahkiv (2003) contends that the water resources management in the US is characterized by a "disintegrated" approach that could benefit from an infusion of IWRM principles. Shiveley and Mueller (2010)

suggest that particularly in the western US, IWRM is "generally considered to be an unattainable goal," though they do not support that claim with any empirical research (pg. 671). In this section I discuss how IWRM principles are implemented under the banner of similar environmental paradigms such as ecosystem management. Rather than presenting IWRM as an all or nothing approach, I propose thinking about IWRM in terms of its component parts. This will help analysts identify IWRM even when it may be promoted using a different label.

Cardwell et al. (2006) contend that the specific term IWRM may not have been embraced domestically because similar concepts such as ecosystem management and the watershed approach, which share many of the same principles as IWRM, have been formally adopted by national land management and environmental agencies in the last two decades. The US Forest Service, Bureau of Land Management, National Park Service, Bureau of Mines, Bureau of Reclamation, and the Fish and Wildlife Service, publicly adopted ecosystem-based approaches to land and water management in the mid-1990's (Koontz & Bodine, 2007; Morrisey et al., 1994)). These ecosystem-based approaches broadly encouraged many of the same principles embodies by IWRM, including: inter-agency coordination; integration of economic, social and environmental considerations in management decisions; collaborative approaches that are inclusive of multiple stakeholders; greater consideration of the interconnectedness of ecosystem structure, function and species composition; the use of natural boundaries to determine appropriate units of management; and adaptive management (Koontz & Bodine, 2007; Morrisey et al. 1994)).

Koontz and Bodine (2007) examined efforts to implement ecosystem management within the Forest Service and Bureau of Land Management and concluded that ecosystem management was only partially implemented. According to agency managers, the agencies were more successful in fostering collaborative initiatives, but

had not succeeded in implementing adaptive management. The biggest barriers to successful implementation of all components of the ecosystem management approach were political, cultural or legal in nature. The study also concluded that agency personnel and the public had different perceptions of agency success in implementing an ecosystem management approach, with the agency personnel having a more favorable assessment of agency success.

In 2000, eight US federal agencies[3] adopted the Unified Federal Policy for a Watershed Approach to Federal Land and Resource Management (65 FR 62566), which defines the watershed approach as:

> A framework to guide watershed management that: (1) uses watershed assessments to determine existing and reference conditions; (2) incorporates assessment results into resource management planning; and (3) fosters collaboration with all landowners in the watershed. The framework considers both ground and surface water flow within a hydrologically defined geographical area. (pg. 62566)

Several IWRM principles are evident in this policy, particularly in its emphasis on stakeholder collaboration, integration of groundwater and surface water, and management based on hydrologic units rather than according to traditional administrative boundaries. The policy is inconsistent with IWRM in that it narrowly focuses on resolving water quality issues caused by federal activities on federal lands. The policy lacked any guidance on implementation and was not supported with any targeted funding, thereby limiting its overall effectiveness (Hipfel, 2001). This illustrates that the principles have been formally acknowledged by federal actors, but there is a lack of institutional commitment to alter management practices consistent with these principles.

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[3] The Departments of Agriculture, Commerce, Defense, Energy and the Interior, the Environmental Protection Agency, the Tennessee Valley Authority, and the Army Corps of Engineers

Despite efforts taken by federal agencies over the past two decades, approaches to water management in the US still remain largely uncoordinated. Some attribute this to the fact that the US lacks a clear national framework with respect to water management, much like the European Union's Water Framework Directive (Chave, 2001). In light of this enduring challenge, the Army Corps of Engineers initiated a national collaborative effort in 2010 to use IWRM as a platform for establishing a national agenda for sustainable water resources management. According to the Army Corps of Engineers:

> IWRM aims to develop and manage water, land, and related resources, while considering multiple viewpoints of how water should be managed (i.e. planned, designed and constructed, managed, evaluated, and regulated). It is a goal-directed process for controlling the development and use of river, lake, ocean, wetland, and other water assets in ways that integrate and balance stakeholder interests, objectives, and desired outcomes across levels of governance and water sectors for the sustainable use of the earth's resources. (Army Corps of Engineers, 2010)

As a part of this national initiative, the Army Corps developed a memorandum of understanding with various federal agencies[4] to "build a Federal Support Toolbox for IWRM" (MOU, 2011). This MOU formalizes an interagency partnership with the intent to:

> Better align programs within current authorities, enhance communications and the exchange and availability of information, and to establish opportunities for joint projects, programs, […] services and tools to support integrative and adaptive water resources management. (MOU, 2011)

The federal "toolbox" for IWRM emphasizes the physical tools (e.g., models, decision support tools) rather than the social or policy tools that can help agencies implement a

[4] US Army Corps of Engineers, US Geological Survey and National Oceanic and Atmospheric Administration

more integrated approach. In 2005, prior to this national initiative, the Army Corps and NRCS signed a similar memorandum of agreement that outlined a process by which the two organizations would improve coordination in multiple areas, including watershed planning, consistent with IWRM (Partnership Agreement, 2005). There is no research assessing the degree to which these partnerships have promoted IWRM or the degree to which these agreements have resulted in institutional change institutions have changed as a result of this agreement.

The American Water Resources Association (AWRA) has also been a strong proponent of using IWRM as a unifying concept in national, regional state and local water resources management. In a recent policy statement, AWRA recommends that national water management goals, policies, programs, and plans be organized around the concept of IWRM (AWRA, 2011). Given the recent trend in the United States to advocate for a national framework based on IWRM principles, any theoretical or empirical contributions to enhance our collective understanding of IWRM are valuable and timely.

This brief overview of IWRM in the US reveals that analysts should not fixate on the occurrence of the specific term IWRM; rather, any assessment of the status of IWRM in a national, regional, state or local environmental management context should focus on the degree to which institutions align with IWRM principles and indicators in statement and in practice. Just because an agency or organization has not labeled their approach as an IWRM approach or is not held up as the paragon of IWRM, does not mean that it is not effectively advancing IWRM principles. Furthermore, this section highlights the need to consider institutional arrangements that foster actual implementation of IWRM at multiple levels.

2.1.4 The Importance of Institutions

Implementation of an integrated approach to land and water management requires changes to existing institutions and perhaps emergence of new institutions. Institutions are distinct from organizations, although they are often conflated in academic literature. Organizations can be thought of as "groups of individuals bound by some common purpose to achieve objectives" (North, 1990, p. 5). Organizations are generally defined by membership and the collective pursuit of shared objectives (North, 1990). Institutions, on the other hand can be conceived more broadly as "human-constructed constraints or opportunities within which individual choices take place and which shape the consequences of their choices" (McGinnis, 2011). Institutions include many different types of entities, including organizations and the rules created to structure interactions within and between organizations (Ostrom, 2007). Institutions seek to increase the predicability of human behavior through the creation and perpetuation of rules, norms and strategies (Ostrom et al., 2001).

Institutions are formed by humans in order to tackle collective action problems that result when rational individual behavior compounds to produce socially unfavorable outcomes (Imperial, 1999b). Institutions can be difficult to identify and study because they are not always immediately apparent. Institutions are essentially shared concepts that guide individual and collective decision-making and actions (Ostrom, 2007). In an environmental context, institutions attempt to shape human interactions with the natural environment through informal means and more formal channels so as to yield socially desirable outcomes (Dietz et al., 2003). Water management institutions can assume many forms, including: national policies and objectives; laws and regulations; court rulings; organizations, including their core values and administrative jurisdiction; operational plans and procedures; incentives mechanisms; property rights; and, norms, traditions, practices and customs (Amezaga, 2006). According to Ostrom

(1992) institutions can "increase the benefits from a fixed set of inputs" or they may "lower efficiency so that individuals have to work harder to achieve the same benefits" (p. 24).

Many scholars have highlighted the need to investigate institutional arrangements that facilitate a more integrated approach to resource management (Amezaga, 2006; Biggs, 2010; Bonnell & Koontz, 2007; Cortner et al., 1998; Goldman et al., 2007; Jonch-Clausen & Fugl, 2001; Lejano et al., 2007; Mitchell, 2005; Yaffee, 1996) and there have been numerous case studies assessing institutional dimensions of integrated resource management (Hanna, 2008; Imperial, 1999a; Kalikoski et al., 2002; Koontz & Bodine, 2007; Korfmacher, 2000; Olsson & Folke, 2004). Given the diversity of social-ecological systems, there is a need for IWRM institutions to be tailored to environmental and cultural variability. IWRM institutions must also be able to change and adapt over space and time based on new understanding, thus requiring continual examination and analysis of existing and potential institutional arrangements (Fischhendler & Heikkila, 2010). Given that many of the environmental challenges in the United States are highly distributed, there is also a need to create and modify institutions that induce private landowners to manage their land and water consistent with prevailing IWRM principles. This research seeks to identify institutional arrangements that may facilitate landowner involvement in IWRM approaches.

2.1.5 Evaluating IWRM Institutions

IWRM has consistently been represented in pragmatic terms as an approach to planning and management rather than an "academically stringent theory" (Jonch-Clausen & Fugl, 2001). According to Schlager (2007), theories place values on some variable within the system, "posit relationships among the variables, and make predictions about likely outcomes" (p. 296). IWRM places value on balancing social, economic and environmental objectives, and posits that an integrated, collaborative

approach to water management will result in better outcomes. IWRM may not be considered "academically" stringent because these relationships and outcomes have not been systematically "tested" using comparable analytical frameworks. It should not be presumed that an integrated approach is the most effective, efficient or equitable method for achieving more sustainable water management (Bellamy et al., 1999). IWRM should only be valued in so far as it results in better institutional performance and outcomes as indicated by involved actors (Imperial, 2009). Some outcomes may be more tangible (e.g., increased instream flows, improved water quality, greater agricultural productivity) while others may be based on the perceptions of actors (e.g., improved relationships, broader economic impacts).

The IWRM literature lacks a clear and consistent analytical framework for structuring research. While there have been numerous empirical studies of IWRM, each study employs a different analytical framework and therefore focuses on different variables to explain causal factors or overall performance. Some research focuses on watershed partnerships at the local level, while other research focuses on high-level policies. A framework within IWRM literature has not emerged to connect the multiple levels of analysis and provide common linkages between the different levels. By focusing on rules as a common denominator, institutional analysis could provide a "common language" for IWRM research.

IWRM scholarship also lacks evaluative criteria that can be used to assess whether policies and institutions are successful in facilitating a more integrated approach (Stalnacke & Gooch, 2010). According to Mitchell (2004) the evaluative criteria used for assessing IWRM are generally "left implicit, so the basis on which the assessment is done is never clear" (p. 398). To address this research gap, several scholars have proposed approaches to evaluating IWRM (De Stefano et al., 2010; Hooper, 2010; Mitchell, 1990; Shively & Mueller, 2010; Varis & Lahtela, 2010), though none of

them have been widely replicated in the literature. De Stefano et al. (2010) recommend using the Water and Wetland Index to assess whether policies implemented under the Water Framework Directive in Europe are aligning with IWRM principles. They applied this methodology in 20 countries across Europe and noted that even with a common regulatory framework (i.e., the Water Framework Directive), there are significant social, cultural, economic and political differences that make it difficult to make a meaningful comparison between countries. This finding highlights the importance of context for assessing IWRM, which has been a recurrent theme in the literature (Imperial, 1999a; Lejano et al., 2007). Consequently, De Stefano et al. (2010) identify the need to develop methods that are able to account for these differences. Hooper (2010) echoes this finding in his attempt to develop universal indicators of IWRM performance. He concludes that further work is required to develop indicators and procedures that can account for diverse, location-specific factors. I suggest that the Institutional Analysis and Development (IAD) framework may be able to help address this research gap.

IAD is a well-tested framework that has been used to analyze diverse institutional arrangements all over the world. IAD focuses on the rules, norms and strategies that structure human interactions and decision-making. IAD also explicitly calls attention to the specific contextual factors that influence resource decisions at multiple levels. IAD has been used as a framework for analyzing common pool resource management (Ostrom, 1990), institutional change (Ostrom & Basurto, 2011), decentralization measures in natural resource management (Blomquist et al., 2010; Clement, 2010) integrated resource management (Bellamy et al., 1999), ecosystem management (Imperial, 1999a; Imperial, 1999b), watershed partnerships (Hardy & Koontz, 2009; Imperial, 2009; Kauneckis & Imperial, 2007), payments for ecosystem services (Corbera et al., 2009; Vatn, 2010) and specific environmental challenges such as soil conservation (Prager, 2010), among many others. In the next section I provide an

overview of the working components of the IAD framework and outline how it can be employed to analyze IWRM institutions.

2.2 Institutional Analysis and Development

IAD is an analytical framework that can provide a structured way to examine complex water management institutions and their corresponding impacts on actors at different levels of analysis. Consequently, IAD can be used to assess how a policies and programs at the national, state or local level might influence individual landowner decision-making and behavior. Frameworks are beneficial for the accumulation of knowledge, since they provide a common language for comparing theories and results generated from diverse empirical settings (Schlager, 2007). Frameworks bound inquiry and direct analysis to the most salient features of the social and physical environment and "they attempt to identify the universal elements that any theory relevant to the same kind of phenomena would need to include" (Ostrom, 2007, p. 25). The broad scope and adaptability of the IAD framework has made it a prevailing framework for analyzing many important policy problems in the United States and abroad (Sabatier, 2007).

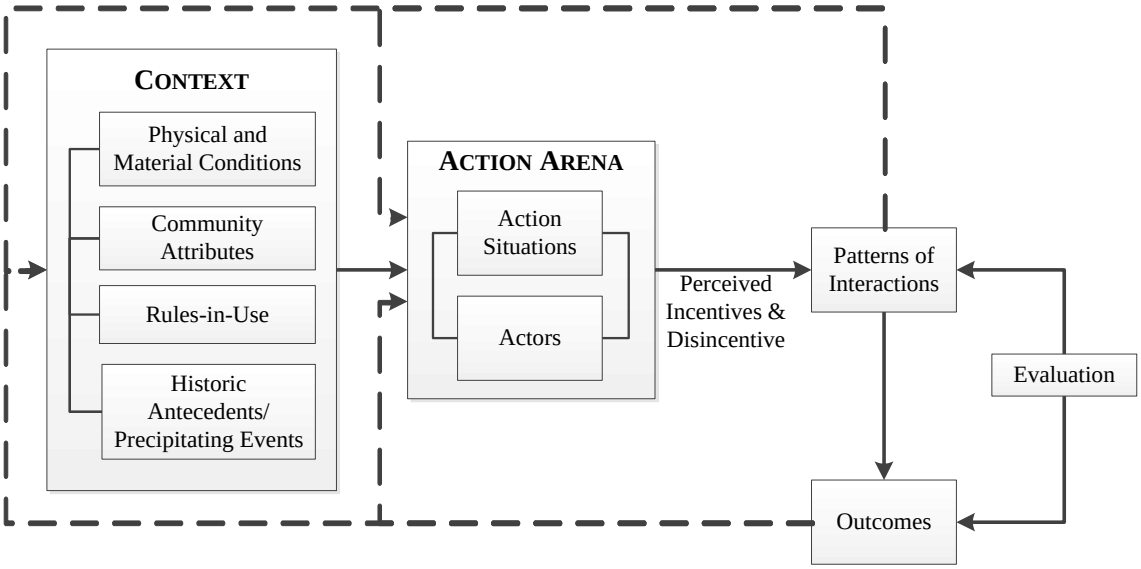
Imperial (1999a) identifies several additional attributes that make IAD a particularly appropriate framework for examining complex institutional arrangements: 1) it is sensitive to the contextual conditions that influence institutional design, implementation and performance (e.g., geographic, social, economic, cultural); 2) it does not contain any normative bias with respect to what constitutes the "ideal" institutional arrangement; 3) it provides evaluative criteria for assessing institutional performance; and, 4) by focusing on rules rather than policies, it broadens the analysis to look at how the full range of institutional relationships impact individual behavior. This framework is particularly appealing because it presents a practical method for dealing with multiple levels of analysis; an analyst can use IAD to assess how

decisions at higher levels of decision-making impact actions at the operational level (Ostrom, 2007).

2.2.1 Unit of Analysis

The unit of analysis in IAD is the "action arena" in which actors interact to make decisions based on rules-in-use, available information, sense of control, and the perceived benefits or costs of their actions and outcomes. The basic framework is presented in *Figure 2. A Framework for Institutional Analysis*. Actors can be thought of as either a set of individuals or a group that has "a regularized way of making decisions, such as a firm or a government" (Ostrom et al., 2001, p. 23). Under IWRM the actors can be numerous, especially as the spatial or temporal scale increases. Defining the context of the action arena helps to bound the number of actors included in the analysis. According to Ostrom (2007), actors can be characterized by the following four variables: 1) the *resources* that an actor brings to a situation such as time, energy, financial resources; 2) the *internal valuation*, or "norms" that an actor brings to a situation; 3) the particular ways in which actors "acquire, process, retain and use *knowledge* and *information*;" and, 4) the *process* or *strategy* that actors use to select actions based on their control over a situation, their perceptions of benefits or costs and the intended outcome (Ostrom et al., 2001, p. 277).

Figure 2. A Framework for Institutional Analysis



Source: Adapted from Ostrom, Gardner, and Walker 1994, pg 37

IAD incorporates several assumptions about human nature that may impact the overall analysis. IAD scholars generally assume that actors are characterized by bounded rationality, meaning that while individuals tend towards actions that maximize self-interest, they do so within a set of limitations. Actors lack access to complete information given the high transaction costs of acquiring information. Consequently, actors will make decisions based on incomplete knowledge about the range of alternatives and their possible outcomes. There are also likely to be information asymmetries between different actors given their respective resources. For instance, a firm with the resources (i.e., time, money, employees) to acquire outside information and knowledge will likely know more about a situation than an individual actor with limited resources. I adopt the view that actors are fallible learners who make mistakes and have the capacity to learn from those mistakes to modify future outcomes (Ostrom et al., 2001). Finally, I posit that actors are not motivated solely by self-interest. Actors may be guided by personal and community norms that may place higher value on

traits such as honesty, generosity and reciprocity rather than maximization of individual gain.

The action situation, also referred to as the "decision-making space" is an analytical concept used to understand the variables that influence patterns of interactions and subsequent outcomes. An action situation has been best described as the "social space where individuals interact, exchange goods and services, engage in appropriation and provision activities, [share information], solve problems, or fight" (Ostrom et al., 1994, p. 28). Changing the structure of interactions through the action arena is generally thought be one method of improving outcomes (Ostrom et al., 2001). The common variables used to describe the action situation are: 1) the set of actors; 2) the positions or roles filled by the actors; 3) the allowable actions; 4) the potential outcomes linked to patterns of interactions; 5) the level of control the actor has over the situation; 6) information available to the actors; and, 7) the costs and benefits assigned to actions and outcomes (Ostrom & Basurto, 2011). It is also useful to know whether the situation represented by the action arena will occur only once, multiple times or an infinite numbers of times. The elements that comprise the action arena are derived from the elements used to construct a formal game in game theory (Ostrom et al., 2001). However, in contrast to formal game theory, IAD assumes that actors can communicate and coordinate to reach mutually beneficial solutions to collective problems.

A discussion of the context should precede any in-depth analysis of how actor behavior is influenced by institutional arrangements since it "bounds" the analysis and can greatly influence the action situation. The context consists of the following variables: (1) attributes of the physical world, (2) attributes of the community within which actors operate, and (3) rules that create incentives and constraints for certain actions (Ostrom et al., 1994; Koontz, 2003). According to Ostrom et al. (2001) the types

of rules that are important to consider at each level are the entry and exit rules, position rules, scope rules, payoff rules, aggregation rules, authority rules and information rules. These rules are summarized in

Box 2. IAD Rules.

Box 2. IAD Rules

1) *Position rules* specify a set of positions with corresponding resources, opportunities and responsibilities.
2) *Boundary rules* influence how actors enter or leave positions.
3) *Choice rules* indicate what actions are required, prohibited or permitted for each position.
4) *Aggregation rules* determine who decides what action(s) will be undertaken.
5) *Information rules* affect what information is available to actors about which actions are available and the link between actions and outcomes.
6) *Payoff rules* indicate how benefits and costs are assigned to particular actions and outcomes.
7) *Scope rules* determine which outcomes "may, must or must not" be affected within a situation.

Adapted from McGinnis (2011)

IWRM scholarship could benefit from following a consistent framework for conducting research on IWRM institutions. Following a consistent framework would allow for more effective comparisons between case studies of IWRM institutions and meta-analyses of the institutional factors that enable and constrain IWRM approaches. IAD presents a useful approach to structuring case study research since it specifies the important variables for any institutional analysis. Within this research, I employ the IAD framework to structure the sub-studies that comprise the overall case study; all of the sub-studies follow this general framework to analyze how new rules structure the behavior and actions of actors at various levels of analysis. Each sub-study focuses on the action arena as the unit of analysis, with a discussion of the contextual factors that are likely to influence decision-making. Contextual factors vary by national, state and

local collective-action arenas, though some contextual factors influence multiple levels (e.g., agency culture influences every level). Finally, I examine two specific AWEP projects to understand how AWEP modifies operational behavior and the resultant social, environmental and economic outcomes at the local level. I do not explicitly examine outcomes that may have resulted at higher levels of decision making (i.e., at the state or national level).

2.2.2 Analyzing Institutional Change

IAD has been widely used as a framework to examine new institutions that emerge through self-organization to collectively manage common pool resources in a local context (Ostrom, 1990). Ostrom (1990) indicates the importance of distinguishing between the "origin" of new institutions and changing existing institutions, since it requires a different type of analysis. Once a set of rules is in place, it can greatly impact the ability to adapt existing rules or create new rules since there may be incentives to maintain the status quo (Ostrom, 1990). Changing existing institutions is generally an "incremental, sequential, and self-transforming process" that involves revisiting and revising rules in an iterative manner (Ostrom, 1990, p. 139). The definition of institutional change is then conceived of as "a change in *any* rules affecting the set of participants, the set of strategies available to participants, the control they have over outcomes, the information they have, or the payoffs" (Ostrom, 1990, p. 140, my emphasis). NRCS is an existing institution with a complex set of rules governing collective and individual behavior. Consequently, AWEP can be viewed as an institutional change.

When designing new rules Ostrom and Basurto (2011) recommend: 1) generating a variety of potential rule changes; 2) evaluating the projected outcomes and performance of each rule change; and, 3) retaining the rules that perform better and lead to better outcomes in terms of agreed upon evaluation criteria. Institutions need to

have sufficient flexibility to adapt to changing circumstances: “Rules governing the supply and use of any particular physical [or natural] system must be devised, tried, modified, and tried again, and considerable time and resources will be invested in learning more about how various institutional rules affect participants’ behavior.” (Ostrom, 1992, p. 41). This process somewhat resembles adaptive management through the use of experimentation and social learning to select the most favorable management rules. With enough empirical research, analysts may be able to identify the conditions and processes that lead to the desired outcomes without the need for lengthy trial and error processes (Ostrom & Basurto, 2011).

With complex water management situations where change is likely to be incremental, it is advisable to examine the extent to which changes in the rules reflect an IWRM approach consistent with a set of widely accepted design principles and indicators. An analyst can study how institutional rules have changed to be more or less reflective of IWRM principles and how those institutional changes have also changed outcomes. Over time, analysts may be able to use these relationships between rules, behavior and outcomes to design better institutions. I propose to look at how AWEP represents an incremental change to NRCS’s rules and whether AWEP is generally reflective of IWRM principles.

2.2.3 Multiple Levels of Analysis

When studying institutional design and institutional change it is necessary to look at multiple levels of analysis since “changes in the rules used to order action at one level occur within a currently “fixed” set of rules at a deeper level” (Ostrom, 2007, p. 44). The IAD framework distinguishes between three levels of rules: operational rules, collective-choice rules, and constitutional rules. Operational rules directly affect the day-to-day actions of actors and the resultant physical outcomes of a resource. For instance, a farmer’s actions on his or her land are considered operational. The rules

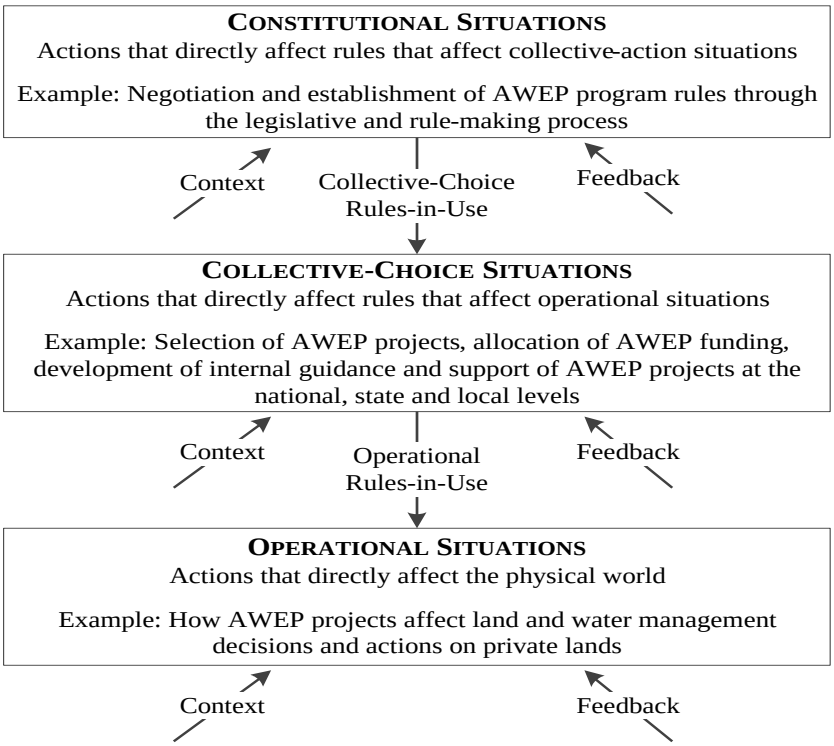
that structure these operational situations may themselves be designed or agreed upon within collective-choice contexts. Collective-choice rules affect operational activities by determining the rules used to modify operational rules. Collective-choice rules may be formal (e.g. technical standards developed by NRCS) or informal (e.g., community norms). Constitutional-choice rules affect both collective-action and operational activities by determining the rules that structure available choices within the collective-action and operational rules. Ostrom (2007) introduces a meta-constitutional level that impacts rule-making at the constitutional level and all lower levels, but indicates that this level is not frequently analyzed. Rules at the higher levels of rule-making (i.e., constitutional and meta-constitutional levels) are usually more difficult and costly to modify, which has led to a greater focus on the design of rules at the operational and collective choice levels (Ostrom E. , 2007). These different levels of analysis are represented in *Figure 3. Levels of Analysis within IAD.*

Understanding the level of analysis is very important for IWRM research. If an analyst is looking only at high-level constitutional or collective-action arenas it can be difficult to ascertain the actual on-the-ground outcomes. If an analyst looks only at the operational situation, it may be challenging to understand the higher-level institutional constraints or barriers. Ideally, IWRM research will include multiple level analyses to show how institutional changes affect actors at multiple levels. This research analyzes how changes in the rules at higher levels of decision-making (within the legislative and rule-making processes) enable and constrain the ability for actors at lower levels of decision-making to take a more integrated approach to water management. In this context I am presenting the legislative and rulemaking processes that produced AWEP as the constitutional arena.[5] Actors in collective-action arenas are impacted at the

[5] It can be difficult to differentiate between the constitutional level and collective action levels. For the purposes of this research I conceive of the policy-making arena as the constitutional level. The policy then structures implementation of the program through collective-action and operational situations at

national, state and local level during implementation of AWEP (this includes NRCS representatives, partners and stakeholders involved in interpreting rules and implementing the program). Finally, landowner decision-making is presented as the operational level.

Figure 3. Levels of Analysis within IAD



Source: Adapted from Ostrom 2007, pg 45

2.2.4 Institutional Design Principles

According to Ostrom (1992) crafting new institutions and modifying existing institutions "is challenging and requires skill in understanding how rules, combined

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the national, state and local levels. However, it could be argued (and likely has been argued) that the legislative and rule-making processes are themselves, collective-action arenas.

with particular physical, economic and cultural environments, produce incentives and outcomes" (pg. 41). Ostrom and other scholars have used the IAD framework to identify design principles for "stable" or "robust" common pool resources institutions (Ostrom, 1990). Ostrom (1992) also used the IAD framework to identify a set of design principles specific to self-organizing irrigation institutions. The design principles for these two institutions are presented in *Table 1. Design Principles Identified Using the IAD Framework.* Both sets of design principles highlight the need to account for local conditions, involve resource users in decision-making, counteract opportunistic behavior, monitor actions and outcomes, penalize resource users who do not follow the rules and develop mechanisms for resolving conflict. In addition, institutions should complement existing rules at other levels and should also create processes that allow resource users to modify institutional rules over time in response to changing conditions. These design principles are subsequently used as evaluation criteria to assess the "robustness" of common pool resource institutions and self-governing irrigation institutions.

Common pool resources theory tends to focus on the rules created by the resource users themselves in managing locally governed resources, but this is not characteristic of many natural resources in highly developed systems (Bromley, 1992; Ostrom, 1990). In most water management situations in the United States, rules are generally crafted by formal federal, state and local entities in complex decision-making arenas, rather than by the resource users at the local level (Kauneckis & Imperial, 2007). Kauneckis and Imperial (2007) term these situations "complex environmental commons" and used the IAD framework to identify five additional design principles that are characteristic of institutions that can effectively operate within and manage the complex environmental commons. The five additional design principles are presented in *Table 1. Design Principles Identified Using the IAD Framework* alongside the other design principles discussed above.

Table 1. Design Principles Identified Using the IAD Framework

Six Design Principles for Self-Organizing Irrigation Institutions (Ostrom, 1992)	Eight Design Principles for "Robust" Common Pool Resources Institutions (Ostrom, 1990)	Five Design Principles for Complex Environmental Commons Institutions (Kauneckis & Imperial 2007)
• Account for varying environmental conditions • Account for varying cultural conditions • Counteract opportunistic behavior • Provide mechanisms to monitor and sanction activities as well as resolve conflict • Work in conjunction with complementary rules-in-use at multiple levels • Create processes that allow institutions to adapt to the unique variables present in a system over space and time	• Clearly define boundaries that delineate resource area and "entitled" resource users • Develop rules regarding the appropriation and provision of common resources that are adapted to local conditions • Develop collective-choice arrangements that allow most resource appropriators to participate in the decision-making process • Conduct monitoring in a way that the monitors are accountable to the resource users • Establish graduated sanctions for resource users who violate community rules • Establish effective mechanisms for conflict resolution • Recognize rights for local self-organization and self-determination • Work in conjunction with complementary rules-in-use at multiple levels	• Develop and maintain inter-organizational and interpersonal trust • Develop a shared understanding of the underlying problem • Recognize and define mutual interests • Balance power between actors • Utilize a wide range of policy instruments

2.2.5 Design Principles for IWRM Institutions

An agreed upon set of design principles and associated indicators can be used to evaluate the degree to which institutions promote IWRM. Design principles and

indicators may be also be used to guide development of new IWRM institutions or modification of existing IWRM institutions. Interestingly, there is some overlap between IWRM principles and IAD design principles presented in *Table 1. Design Principles Identified Using the IAD Framework.* The design principles of effective IWRM institutions and associated indicators gleaned from IWRM and IAD literature are presented in

. These design principles are based on the building blocks of an integrated approach (Hooper, 2010; Mitchell & Hollick, 1993) and are supplemented by indicators that emerged from a review of IWRM and IAD literature. The principles are intentionally broad to allow for greater applicability. Indicators are imperfect yet informative measurements of a complex reality. By definition, "no single indicator or combination of indicators can give a fully truthful and completely reliable measure of the phenomenon that is assessed" (De Stefano et al., 2010, p. 1365). While imperfect, indicators are central to qualitative assessments of policies and institutions.

This list of design principles and associated indicators for IWRM institutions is not exhaustive; rather, it reflects some of the key findings presented in IWRM and IAD literature. These principles and indicators should be evaluated and modified over time to reflect new knowledge about IWRM approaches. While these principles represent an "ideal" IWRM institution, as presented in the literature, it is important to remember that most institutions operate within a complex set of rules that enable or constrain realization of these principles. Consequently, different IWRM institutions will incorporate these principles and indicators to varying degrees and in some instances these principles and indicators may be at odds. For instance, a strategic approach may not be entirely consistent with systems thinking. Institutions should seek to find the optimal balance between the relevant principles and indicators as determined by stakeholders. I use these design principles to determine the extent to which AWEP

promotes an IWRM approach and the institutional factors that enable or constrain actors from implementing an IWRM approach at multiple levels.

Table 2. Design Principles of Effective IWRM Institutions

Design Principles	Key Indicators
Systems Approach	• Recognizes linkages within and between the components of the natural and human systems • Considers the inter-disciplinary, inter-sectoral and trans-boundary nature of water management • Examines how management decisions affect other parts of the system
Strategic Approach	• Identifies and manages key variables that drive the system • Identifies different management alternatives and balances associated tradeoffs • Balances information gathering, planning, implementation and monitoring efforts • Cost-effectively implements priority management actions • Operates at a scale appropriate to the resource concern • Utilizes a wide range of technologies and policy tools
Participatory Approach	• Develops a shared understanding of the underlying problem • Identifies mutual interests between different stakeholders and examines potential tradeoffs • Develops collective-choice arrangements that involve stakeholders in decision-making • Develops and maintains inter-organizational and interpersonal trust between stakeholders
Partnership Approach	• Fosters inter-disciplinary, inter-sectoral and trans-boundary networks of governmental and non-governmental actors • Leverages knowledge, skills, and resources of multiple partners • Develops collective-choice arrangements that involve partners in decision-making • Develops and maintains inter-organizational and interpersonal trust between partners • Complements existing institutional arrangements of other organizations
Balanced Approach	• Balances tradeoffs between social, economic and environmental objectives and outcomes • Equitably distributes available resources • Balances power between actors • Counteracts opportunistic behavior • Provides mechanisms to monitor and sanction activities and resolve conflict
Adaptive Approach	• Monitors conditions and outcomes over time to inform future decision-making • Creates rules that are flexible enough to adapt to local conditions (environmental, social and economic) • Develops processes by which rules are modified over time in response to changing conditions

3 Methods

This study employs a nested case study approach to analyze the rules that enable and constrain actor behavior at multiple levels within the context of the Agricultural Water Enhancement Program (AWEP). Case study research is a widely used and well accepted form of empirical inquiry in the social sciences that allows a researcher to explore a topic that has rich contextual considerations using multiple sources of information (Yin, 1993; Creswell, 1998). Case study research presents a particularly useful way to "investigate a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 1994, p. 13). The most important first step in case study research is to identify the unit(s) of analysis, which consequently bound the analysis. Theory is also helpful in designing a case study and may provide a useful means for generalizing results (Yin, 1993).

For this research, both the IAD framework and the IWRM theory were used to guide case study selection, design and analysis. Consistent with the IAD framework, the unit of analysis is the action arena, which is comprised of the actors and "decision space" that structure interactions and lead to certain outcomes. Rule changes within one action arena can constrain or enable actions in other arenas, thereby necessitating examination of multiple levels, which are presented in the IAD framework as the constitutional, collective-action and operational arenas and which I adapt and present as the policy-making, implementation and operational arenas. Although I am exploring a single institution as the overall case study, there are multiple units of analysis nested within this institution that warrant their own sub-studies. According to Yin (1993) "multiple sub-studies make sense when a single topic is so diverse that multiple processes and outcomes are at work" (p. 103). Sub-studies are used to focus on diverse processes and outcomes, but each sub-study will still inform my

understanding of the central case study. This type of research design is particularly appropriate for conducting evaluations or examining complex causal relationships.

Consistent with this approach, I present a series of sub-studies that address these various levels of analysis and present a comprehensive case study of AWEP. I begin by examining the policy-making arena (i.e., the constitutional choice situation), where the AWEP policy was negotiated and ultimately approved through the legislative and rule-making processes. I then analyze how AWEP has influenced implementation at the national and state levels and local levels in collective-action situations. More specifically, I explore how AWEP has influenced landowner behavior and resultant outcomes by looking at two specific AWEP projects. This multi-level analysis enables me to examine how these nested set of rules ultimately influences outcomes.

3.1 Case Study Selection

The central research question of this study emerged during the summer of 2011 while I was doing field research on a larger project funded by the USDA National Institute for Food and Agriculture. My colleagues and I conducted over 120 interviews in Washington, Oregon, Montana and Idaho to understand the role that intermediary organizations play in connecting landowners to payments for conservation on private land. Many interviewees either worked for or with NRCS in some capacity to help landowners access Farm Bill programs. AWEP emerged as an intriguing program that is emblematic of the direction that NRCS is taking towards more strategic, outcome-based, landscape-scale investments in conservation. So, in essence, AWEP led me to the research question rather than the other way around.

My interest in contributing to IWRM research led me to focus on AWEP rather than a similar program known as the Cooperative Conservation Partnership Initiative (CCPI). AWEP explicitly focuses on water quality and quantity issues within a hydrographic

area, thereby making it an appropriate case to explore using IWRM principles. AWEP also represents a change in the "rules" and I was interested in exploring how these changes translated to on-the-ground outcomes. Many of the projects that were funded under the original request for proposal (RFP) are now approaching completion, thereby making it an appropriate time to evaluate how this program was implemented and recommend further institutional chances. Furthermore, a study of AWEP is particularly timely given the current hearings and negotiations on the 2012 Farm Bill. Findings related to AWEP may also be generalizable to some of the landscape-scale initiatives that NRCS is currently undertaking in the Chesapeake Bay, San Francisco Bay Delta, and Mississippi River Basin.

This study looks at the design and implementation of AWEP at the national, state and local levels. At the national level I explore how AWEP was developed and how it is being implemented. At the state level I look specifically at the state of Oregon because 1) Oregon secured the second highest number of AWEP projects in the country, and 2) AWEP was partially conceived in response to handling of EQIP dollars in the Klamath Basin, which straddles Oregon and California. Oregon has consistently ranked well in the national AWEP competition; in the first year of implementation, there were 8 projects within the state of Oregon out of 66 nationally awarded projects. In order to understand the local arena I focused on two of the 8 original projects in Oregon, which are described in *Table 3. AWEP Project Case Study Areas*. One of the AWEP projects focuses on altering management practices (transition to dryland grazing), while the other focuses on structural improvements (irrigation system upgrades). These projects represent two of the larger AWEP projects (in terms of funding) in Oregon. Furthermore, these projects involve organizations that have not traditionally partnered with NRCS (an irrigation district and non-profit non-governmental organization). A cross-comparison between these two projects allows me to examine how rules

influence operational behavior and decision-making at the local level within different contexts.

Table 3. AWEP Project Case Study Areas

Project Title	Upper Klamath Lake AWEP	McKenzie Canyon AWEP
Location	Upper Klamath Lake, Williamson, and Sprague Watersheds, including Seven-mile Creek and Wood River Sub-basins in Klamath County, OR	Lower Division of the Three Sisters Irrigation District in Deschutes County, OR and Jefferson County, OR
Partner Name	Klamath Basin Rangeland Trust	Three Sisters Irrigation District
Partner Type	Non-Profit Non-Governmental	Irrigation District
Total Funding Request	$9,000,000	$1,204,312
Scope	Assists growers in converting to partially irrigated or dryland grazing operations.	On-farm irrigation improvements to accompany installation of a pressurized mainline.
Resource Concerns	Water quality, water conservation, energy conservation	Water quality, water conservation, energy conservation
Rationale for Inclusion	This was the only project in the state that focused on conversion to dryland grazing and was one of two projects with a local, non-profit, non-governmental organization (that was not a conservation district) as the partner. It was the largest project in Oregon, both in terms of geographic scope and allocated funding.	This project provided funding to do the on-farm work necessary to connect landowners to a large-scale mainline piping project implemented by the irrigation district. The partner in this case study was an irrigation district. It focused on capital improvements rather than management practices. This was one of the fourth largest projects in Oregon and was highlighted as a success story in NRCS's conservation highlights.

3.2 Data Collection

The case study approach does not denote any particular form of data collection, but it does support collecting and analyzing multiple sources of data (Yin, 1993; Creswell, 1998). Consistent with this approach, data for this study was collected through semi-structured interviews, document analysis and participant observation. Examining different data sources allowed triangulation to be used to improve the validity of the study's findings (Yin, 1994). A total of 40 interviews were conducted at various

levels, which are described in *Table 4. List of Interviewees*. Interviewees were selected based on both purposive and snow-ball sampling methods. Initial key informants were identified using publicly available information and were asked to identify additional participants who I contacted via phone or email. Saturation was achieved for the interviews conducted within the national arena and state arena, but was not achieved at the local level given the variability in landowner experiences with AWEP projects.

Each interviewee was provided a letter describing the nature of the project, how findings would be used and their rights as a participant. Three separate semi-structured interview guides were developed for each "arena" to ensure that the questions were relevant to that particular level of analysis. Interviews were conducted between August 2011 and March 22, 2012 either over the phone or in-person and lasted anywhere from 15 minutes to 2.5 hours. Participants were asked about their involvement in developing AWEP legislation, administering the AWEP program or implementing a specific AWEP project. Questions focused on the rules that enabled or constrained their ability to influence decision-making, perceived and actual outcomes that resulted from AWEP and recommendations for improving program design and implementation. All interviews were recorded, with the interviewees' oral consent, and transcribed. Transcribed interviews were supplemented by my notes from the field.

Documents for content analysis were retrieved from the internet or were obtained from key informants who were involved in the conceptualization and implementation of AWEP at the national, state and local levels. Documents include multiple proposed drafts of legislative language, the proposed agency rule, public comments on the proposed rule, requests for proposals (RFPs) for the multiple rounds of AWEP, news releases, speech transcripts, NRCS manuals and guidance, national and state ranking

criteria, original AWEP proposals, AWEP project documentation and various internal correspondence and memos. In addition, I attended a meeting convened by the newly formed Western Agricultural and Conservation Coalition, which originally advocated for AWEP, as well as several local working group meetings. No formal data was collected from these events; rather, the experiences provided informal insight into participant interactions in collective-action situations.

Table 4. List of Interviewees

Type of Interviewee	Numbers of Interviewees
National Level	
Officials within the executive branch who influenced AWEP development - 2 National NRCS representatives involved in the original design of AWEP - 2 Representatives of national organizations who proposed AWEP language and advocated for the passage of AWEP - 4 National NRCS representatives who administer AWEP and EQIP - 4	12
State Level	
State NRCS representatives responsible for administering AWEP and EQIP - 3 State NRCS representatives responsible for developing state-wide conservations strategies - 4	7
Local Level	
Upper Klamath Lake AWEP Local NRCS representatives - 2 Local project partners - 4 Landowners currently enrolled in AWEP - 3 Landowner previously enrolled in AWEP - 2	11
McKenzie Canyon AWEP Local NRCS representatives - 2 Local project partners - 4 Landowners currently enrolled in AWEP – 3 Landowners previously enrolled in AWEP – 1	10

3.3 Data Analysis

Data was organized using both predetermined, or *a priori*¸ and emergent codes (Miles & Huberman, 1994). All data was organized and coded using NVivo software (qualitative data analysis software) (Gray, 2009). Codes were developed to examine how institutional changes either enable or constrain certain actions and the consequent

outcomes at different levels of analysis. Data was also coded to understand the context within which those actions and outcomes occur. Predetermined codes were gleaned from an extensive review of IWRM and IAD literature to identify design principles and evaluative criteria relevant to this case study. Emergent codes were identified during an extensive review of available data to capture important thematic similarities between different cases that were not addressed by the predetermined codes. Specific coding rules were developed for both predetermined and emergent codes to ensure consistency throughout the coding process (Miles & Huberman, 1994).

Interview transcripts, field notes and primary documents were uploaded to NVivo and organized based on the sub-study they were most likely to reflect. At the outset, data for each of the sub-studies was reviewed and coded independently to understand what factors were most important to the actors at each individual level of analysis. Following this initial step, the data was reviewed a second time to capture the linkages between the different sub-studies. Selective material was coded a second time to ensure intra-rater reliability. Contested material was triangulated with documents and follow-up interviews to the extent practical to ensure validity of claims made by interviewees (Berg, 2004). External data validation was also achieved by inviting key informants to review drafts of written material.

3.4 Methodological Limitations

The research methods for this study present several limitations. Most of the interviews for this study were conducted over a relatively short span of time (from February 2012 to March 2012) leaving relatively little time to identify additional important interviewees and validate data. This was not an issue for the sub-studies conducted at the national and state level, but did pose a challenge for conducting landowner interviews. I was only able to interview four landowners who participated in the McKenzie Canyon AWEP project and five landowners who participated in the Upper

Klamath AWEP project. Given the small sample size, it is highly unlikely that I reached saturation for this particular demographic. Saturation is defined as the point in qualitative research methodology when researchers can reasonably conclude that if any additional interviews were conducted they would cease to reveal any new information (Glaser, 1967). Each interview I conducted with landowners yielded new information about their experiences with and perceptions of AWEP in particular and NRCS in general. This speaks to the diveristy of factors that influence landowner decision-making and behavior.

Given the limited amount of time alloted to complete interviews, I also was not able to connect with several key NRCS representatives at the local level. This research could have benefited from the perspectives of more NRCS soil conservationists and engineers who work one-on-one with landowners to develop conservation plans and design projects. I was not able to validate some of the claims made by landowner participants with key NRCS staff. Given that staff turnover occurred at both of the local NRCS offices involved in this study during project implementation I was not able to interview some of the NRCS representatives who originally worked with partners to draft the AWEP proposals, conduct outreach and initiate projects. These representatives may have offered additional insight into the earlier phases of the AWEP projects.

Both purposive and snowball sampling techniques can introduce bias into the study (Gray, 2009). This did not pose a problem for the sub-studies where I was able to reach saturation (national and state levels), but may have introduced bias into the sub-studies of the AWEP projects. For the McKenzie Canyon AWEP project, leaders representing the irrigation district connected me with four irrigators who had been involved with AWEP. I would characterize these irrigators as innovators within the district who were very well connected, proactive and resourceful. The experiences of

these irrigators may not be generalizable to all of the irrigators within the district. All of these interviewees were very complementary of the AWEP project and other interviewees may have offered more critical insight. The irrigation district leaders who arranged the interviews may have been more interested in highlighting the success of the project and general irrigator satisfaction rather than exposing some of its weaknesses.

In the case of the Upper Klamath AWEP project, two of the landowner interviewees were recommended by another landowner who had previous negative experiences with NRCS. As a result, the subsequent interviews may have been skewed towards the negative. Given the time constraints and NRCS's privacy policy I was not able to locate additional interviewees who may have had a more positive experience with the AWEP program. The two landowners who reported more satisfactory experiences and outcomes had initiated dryland conversion prior to the AWEP project. Consequently, it made it difficult to isolate and analyze their perspectives of AWEP specifically. It is worth noting that even the interviewees who had positive experiences were more prone to highlight the barriers and challenges that they faced rather than the benefits. Without more landowner interviews, the results from this study are not generalizable to all project participants. Furthermore, a key informant who reviewed the Upper Klamath sub-study indicated that the analysis did appear to be unbalanced, with greater emphasis placed on the negative experiences with the program. The analysis reflects what was heard during the interviews, but may not be fully representative of the project. It is important to note that all landowner experiences differed greatly, highlighting the need to create flexible programs that can adapt to widely varying landowner concerns, management objectives and contextual considerations.

4 Results and Analysis

This section presents the results and analysis of the sub-studies that comprise the overall AWEP case study. It begins by providing the overall background and context that influenced the initial development of AWEP and also likely impact each level of decision-making during implementation. Following the discussion of important contextual factors, the first section examines how AWEP rules were negotiated at the federal level through the legislative and rule-making processes. The AWEP rules represent an incremental change to NRCS's program rules, which subsequently alters the action arena at lower levels of decision-making. Some of these rules fostered are aligned with IWRM principles, while other rules may constrain an IWRM approach. The rules that facilitate or inhibit an IWRM approach are further examined by looking at the implementation of AWEP at multiple levels.

The second sub-section explores how implementation of AWEP has influenced actor behavior at the national, state and local level. After discussing AWEP implementation at the national and state level, this study looks specifically at how AWEP has been implemented in two AWEP projects in Oregon. Each sub-study follows the general structure of the IAD framework with a discussion of context preceding the discussion of the action arena. Within the action arena I call attention to the institutional factors that enable or constrain actor decisions and behavior. Outcomes are only discussed at the operational level within in the context of the two AWEP projects. Finally, AWEP is evaluated against the six IWRM design principles and its associated indicators to a) determine the extent to which AWEP aligns with IWRM principles and, b) summarize the institutional factors that may impact NRCS's ability to implement IWRM approaches.

4.1 Designing the Agricultural Water Enhancement Program

This section discusses the history of AWEP and how AWEP rules were negotiated through the legislative and rulemaking processes. Rules developed at the policy-making level have important implications for actors implementing the program at the national, state and local levels. This section provides the overall context for understanding high-level barriers to institutional change for an agency such as NRCS.

4.1.1 Background and Context

In order to understand how institutional changes affect actors at multiple levels, it is necessary to understand the context within which the change occurs. In this section I discuss the main contextual factors at the national level that likely impact the rules, strategies and norms of the institutional actors responsible for developing and implementing AWEP. I focus on agricultural policy, agency history and culture, legislative and administrative priorities, and precipitating events. This is not an exhaustive discussion of context; rather, I seek to highlight the high-level issues that have the most significant impact on this particular case study. It is important to remember that contextual factors at the national level also influence state and local actors. Factors specific to the state and local context are discussed for each of the sub-studies in following sections.

4.1.1.1 Farm Policy

The primary legal framework for agricultural policy in the United States is commonly referred to as the Farm Bill, which is set through a legislative process that occurs approximately every 5 years. The statutory rules that established AWEP were included in the 2008 Farm Bill, also known as the Food, Conservation, and Energy Act of 2008, and is authorized through 2012. The scope of the Farm Bill has expanded over time to include myriad agricultural interests. The Conservation Title, which provides funding

for conservation issues on agricultural lands, was originally included in the 1985 Farm Bill. The Conservation Title of the Farm Bill is one of 15 titles contained in the 2008 Farm Bill that covers a broad range of issues, including support for commodity crops, horticulture and livestock, conservation, nutrition, trade and food aid, agricultural research, farm credit, rural development, energy, forestry, among others (Johnson & Monke, 2011).

The omnibus nature of the Farm Bill and the expanded scope of the legislation has led to increased interest and involvement of diverse organized interests in the legislative process. According to the Congressional Research Service, the 2008 Farm Bill negotiations differed from previous years "in terms of the number and scope of proposals seeking changes to existing legislation, some of which gained support within and outside Congress" (Johnson & Monke, 2011). The constituencies who hope to influence Farm Bill legislation are competing to include their specific interests and secure a sufficient allocation of limited baseline funding. Consequently, the "competition for available funds suggests a growing need to find more efficient ways to design and deliver programs" (USDA, 2006a).

4.1.1.2 Executive and Legislative Priorities

Linking performance or outcomes of government programs with taxpayer investments became a national priority during the Bush administration, both within the administration and Congress. The Bush administration made "integrating performance information into budget deliberations one of five government-wide management priorities under its President's Management Agenda" (Gilmour, 2007). In the 2002 Farm Bill Congress directed NRCS to link taxpayer investments with environmental outcomes; the NRCS has struggled, however, to quantify the outcomes and effectiveness of its programs and has relied on measures such as acres enrolled rather than actual conservation benefits (Helms, 2005): "That's what we're learning now,

we've made large investments in various resource issues, and we've done some great work, but we're having trouble telling our story about what we achieved with that investment" (US-6). The desire to better articulate conservation outcomes for taxpayer investments became a significant driver behind the initial conceptualization of AWEP within the Office of Management and Budget (OMB).

4.1.1.3 Agency History and Culture

The NRCS was created by Congress in 1935 to address the "menace" resulting from "the wastage of soil and moisture resources on farm, grazing and forest lands" experienced during the dust bowl (USDA NRCS, n.d.). In an effort to extend conservation assistance to more private landowners, the USDA, with the endorsement of President Roosevelt, issued the Standard State Soil Conservation Districts Law in 1937. This law encouraged states to authorize creation of local soil (and water) conservation districts. The soil (and water) conservation districts are composed of a board of local landowner leaders who, in concert with local working groups, connect landowners to NRCS conservation assistance and prioritize local resource concerns. As a result of these early initiatives, NRCS has a strong local presence in comparison to many other federal agencies, with approximately 9,400 NRCS professionals working in nearly every one of the nation's 3,071 counties (Johnson, 1996). NRCS's original emphasis on local input has significantly influenced the agency culture and the way that the agency is structured.

Many of NRCS's original demonstration projects were implemented at the watershed scale and involved extensive watershed planning efforts. The original chief of the NRCS, Hugh Hammond Bennett, was a strong advocate for addressing resource concerns the watershed scale. In 1954 Congress passed the Watershed Protection and Flood Prevention Act (Public Law 84-566, herein referred to as PL 566), which granted NRCS permanent authority to conduct watershed planning efforts and

conservation efforts at the watershed scale, so long as the projects contributed to flood control. PL 566 also established a mechanism for congress to authorize discretionary funding for specific watershed projects, though the program has been defunded in recent years. It is important to consider any new approaches to water management within the context of policies and practices.

The role and scope of NRCS has evolved over time in response to new information about conservation practices, advancements in technology, changing public sentiment, and congressional mandates (Helms, 2002). In the 1960's NRCS's role was expanded to include rural development and recreation as conservation planning objectives. In the 1970's, NRCS directed more attention to water quality and non-point source pollution following passage of the Federal Water Pollution Control Amendments (PL 92-500) in 1972 and the Clean Water Act (PL 95-217) in 1977. The Food Security Act of 1985 (PL 99-198) made certain conservation practices a prerequisite for participation in USDA programs, and also conferred some regulatory authority onto NRCS. The 1985 Farm Bill also created the Conservation Reserve Program (CRP), which paid landowners to "set-aside" highly erodible land. NRCS provided technical assistance for the CRP and the financial payments were administered by NRCS's sister agency, the Farm Services Agency (FSA).

In 1994, Congress initiated a major reorganization of the USDA. As a part of this reorganization, the agency was renamed to reflect its expanded scope and was given greater responsibility to administer USDA's financial assistance programs. With more money comes a greater degree of scrutiny and administrative processes to ensure efficiency, equitability, and accountability. The increased focus on delivering financial assistance was solidified in 1996 with the creation of the Environmental Quality Incentives Program (EQIP). For the first time NRCS was in charge of designing both the financial and technical aspects of a program, including developing a list of

available practices, assisting landowners with applications, ranking applications, monitoring conservation practices and making payments (Helms, 2005). The Environmental Quality Incentives Program (EQIP) is the largest working lands payment program overseen by the NRCS (Canada & Zinn, 2005). EQIP is considered the "work horse" of NRCS since it can address so many different types of resource concerns, but over time the rules and paperwork associated with EQIP have become increasingly complex and are considered burdensome by the producers that seek to enroll in the program (Cattaneo et al., 2005). Funding for technical assistance has not kept pace with the financial assistance programs, thereby increasing administrative demands on NRCS employees and limiting the time available to work on planning, implementing and monitoring conservation practices (Helms, 2005). Internally, NRCS has struggled to balance its administration of financial assistance programs with delivery of technical assistance.

4.1.1.4 Precipitating Events

On April 6, 2001 the Bureau of Reclamation announced that, based on the Fish and Wildlife Service's updated Biological Opinions for Coho salmon and two species of sucker fish, there would be no water available from Upper Klamath Lake for irrigation to the Bureau of Reclamation's Klamath Project in Oregon (Powers et al., 2005). Conflicts within the basin erupted over allocation of water between multiple competing uses. Immediately following the Klamath crisis, two Oregon senators worked with the Bush administration to include $50 million dollars in earmarks under the EQIP provision in the 2002 Farm Bill to assist landowners with on-farm irrigation efficiencies, which was expected to address both water quantity and quality issues. This earmark supplemented additional investments made by NRCS in the Klamath Basin, totaling over $100 million dollars from 2002 through 2007.

NRCS was given little time to plan for the influx of money and struggled to administer financial assistance programs with limited staff resources. During this time period, NRCS was criticized for: high overhead costs; lack of coordination with other agencies, irrigation districts, producer groups and water user associations; and its inability to clearly articulate actual environmental outcomes achieved:

> So these guys [at NRCS] all the sudden are charged with spending a lot of money, […] they had been given a mandate by the higher ups at USDA and the administration saying 'we want to tackle this Klamath problem, let's get this stuff on the ground as soon as possible.' […] And a lot of good individual projects were built that probably helped the individual landowners, but you can't even determine if it's resulted in water savings that provide water back into the Klamath river, there's really no way to tell. We don't know if it was the highest benefit for that amount of money. So NRCS got all this money, individual producers were going to them trying to get these projects built. Oftentimes, NRCS would approve these things, and not even coordinate with the local irrigation district or Bureau of Reclamation. Irrigation districts are actually the ones who deliver the water to their customers and so you have this situation where you had a shotgun approach to conservation […] there was really no regional approach. (US-1).

While this investment undoubtedly resulted in environmental benefits on individual parcels, it was difficult for NRCS to clearly articulate exactly what had been achieved in terms of species recovery, increases in instream flow or water quality improvements at a larger scale. NRCS was also unable to quantify the benefits to producers and the local economy as a result of the federal investment. The outcomes of this investment were primarily conveyed in terms of acres enrolled, which was a common measure employed by NRCS to convey the extent of its impact (Klamath Basin Partnership Accomplishments, 2007). The challenges faced by NRCS in both delivering and measuring outcomes in the Klamath Basin, led to the initiation of a partnership effort to study the effects of conservation; the Klamath became one of 24 special emphasis watersheds in the Conservation Effects Assessment Project (CEAP) program. Furthermore, it highlighted the need for NRCS to develop more strategic, coordinated,

landscape-scale approaches to conservation. The Klamath crisis catalyzed emergence of new institutions as well as important changes to existing local, state and national institutions. The challenges faced specifically by NRCS in the Klamath Basin precipitated the development of AWEP at the national level as well as more strategic approaches at the state level.

Box 3. Klamath Conservation Outcomes

- Conservation systems planned on 360,725 acres of private land.
- 15,896 acres enrolled in the Conservation Security Program (CSP)
- 21,034 acres enrolled in the Wetland Reserve Program (WRP)
- Irrigation improvements on 77,390 acres using the Environmental Quality Incentives Program (EQIP)
- Grazing plans developed for 129,150 acres of pasture
- Habitat improved on 49,723 acres to benefit upland and aquatic species through the Wildlife Habitat Incentives Program (WHIP)
- Significant investments in the local economy

Adapted from Klamath Basin Partnership Accomplishments (2007)

4.1.2 Action Arena

In response to perceived inefficiencies in NRCS's administration of financial assistance in the Klamath Basin and the challenges that NRCS faced in linking taxpayer investments to outcomes, actors at multiple levels began to conceptualize a program that could more effectively deliver desired conservation outcomes at-scale. An official within the OMB, who had been a liaison to the Klamath Basin immediately following the 2001 crisis and who now oversaw the NRCS's budget within OMB, worked with OMB staff and key leaders within the Klamath Basin to develop the Regional Water Enhancement Program (RWEP) concept. This initial group then reached out to a larger coalition of conservation and producer groups to

collaboratively develop proposed legislative language, representing a convergence of "top-down" perspectives with "bottom-up" contributions.

The purpose of RWEP was to "enhance performance-based, cost-effective conservation, to be administered […] through cooperative agreements with conservation partners" (Original RWEP Proposal). The original RWEP language was collaboratively developed by members of OMB and representatives of conservation organizations and producer groups. RWEP was developed in direct response to the perceived inflexibility of NRCS's current approach under programs like EQIP. The findings and purpose section of RWEP called attention to the limitations of existing conservation programs:

> Current conservation programs and practices are not designed to address complexity across geographic scales; […] no framework exists to diffuse, scale-up or integrate technical assistance delivery of innovative practices and program lessons; and there is no location specific knowledge, nor organizational design, for making and implementing targeted program delivery for landscape-scale response. (Original RWEP Proposal)

OMB and the coalition intended to create a new program that was more strategic and also had greater flexibility to address water management concerns through myriad conservation practices:

> With RWEP the idea was really just to take the gloves off and get to work. In cutting across all of the authorities to have a super flexible program, rather than having everything stovepiped…well we have an easement program here and we have incentive programs there and we have a cost-share program here…just put 'em all together. […] So we can put together in one contract and one plan, all of the tools instead of having to go across all of these program barriers and pull together this Frankenstein approach, which is not very adroit and effective. (US-6)

As written, the original RWEP proposal represented a significant departure from the existing NRCS conservation programs, including the following features:

- Required that projects be implemented in a delineated hydrographic area (e.g., watershed, irrigation, water or drainage district) and address a priority water resource concern. Rather than being administered on a landowner-by-landowner basis without any strategic coordination, RWEP sought to focus funding on a priority water management concern within a specified area. The thinking was that this would provide more significant, measurable outcomes for the dollars invested.

- Would have provided grants to partners whose project proposal was selected through a national competition. There were no statutory limitations on how the grant could be used, as long as it resulted in measurable environmental outcomes across working landscapes. Partners could aggregate participating landowners in multi-landowner contracts. This would reduce NRCS's administrative responsibilities and also facilitate larger-scale projects that involved a large number of landowners. The initial proposal required that 85 percent of funding to be allocated to partners through grants. These grants would also enable partners to establish contracts with other partners to implement the program. There was no limit placed on eligible participants.

- Would have enabled NRCS and its partners to use any conservation activity to achieve project outcomes. Eligible actions included assessing resource conditions, developing conservation plans, conducting evaluation and monitoring, delivering cost-share or incentives payments to participating landowners, purchasing conservation easements, developing water transaction programs (e.g., water banking), establishing groundwater recharge programs, and any other activities deemed appropriate by the Secretary of Agriculture.

- Would have expanded eligible producers to include producers who did not produce at least $1000 in commodities. RWEP also would have provided

authority to the Secretary to "to modify any limitation relating to eligibility, benefits, or time if the Secretary determines that such modification would contribute to the effectiveness of achieving the goals in the partnership agreement plan by ensuring that all producers and landowners in the region have the opportunity to participate." Both of these provisions placed emphasis on the conservation values presented by a parcel of land, not necessarily its ability to produce commodities or the wealth of the producer. The logic is that in order to achieve landscape-scale outcomes, every producer must be able to participate.

- Authorized NRCS and partners to consult with and coordinate activities with other agencies. While RWEP did not make interagency coordination *mandatory*, it promoted coordination with the aim of minimizing duplication and maximizing outcomes.

As originally conceived, RWEP would have allowed partner organizations to receive grants to address resource concerns at a larger scale by aggregating landowners in a consolidated contract rather than addressing the concerns on a landowner-by-landowner basis. The idea behind the partnership approach is that partners would develop a strategic plan, conduct outreach, and leverage additional resources to help implement the project. The proposed program also allowed for the flexibility to use tools that were embedded in different NRCS programs and modify eligibility requirements for larger producers whose participation was crucial to resolving resource issues at-scale. Officials at OMB and the coalition that helped to develop RWEP believed that a flexible program that actively engaged partners and landowners within a defined geographic area would ultimately be more effective at delivering measurable outcomes with respect to water quantity and quality concerns.

A diverse group of stakeholders representing conservation groups and agricultural interests from across the nation who saw the potential benefits of a more strategic and flexible NRCS program were integral to the development of the RWEP concept. It was the vision and intent of the original RWEP concept that fostered the coalescence of these "strange bedfellows" who were able to work across historic divisions to focus on shared values and objectives:

> It's AWEP that brought us together and now we're setting up principles, general conservation agriculture principles with a very diverse group of people. We've got an amazing coalition, some really powerful players, some people that are not traditional bedfellows working together on the Farm Bill. (US-1)

This group dedicated time and resources to develop the statutory language for RWEP as well as support its passage through the legislative process. With the assistance of some key individuals, the coalition was also able to hire consultants well versed in the legislative process to help shepherd RWEP through the complex negotiation processes. Without the continued effort of this coalition, RWEP likely would not have been included in the final Farm Bill. This coalition was recently formalized as the Western Agriculture and Conservation Coalition, which advocates for principles shared by agricultural and conservation interests.

Preceding the 2008 Farm Bill, the Secretary of Agriculture initiated extensive listening sessions across the nation to understand the needs and concerns of producers and partner organizations, an undertaking that was unprecedented for the Farm Bill:

> The service has not provided recommendations to Congress to the depth and level of detail as we did in 2007. […] The Secretary [of Agriculture] at the time was really interested in playing a large role in the Farm Bill, because in 2002, when President Bush took office, the administration deferred to Congress entirely. So [the Secretary] really deferred to the public and asked, "what do you want to see in the Farm Bill?" The administration held listening sessions all across the country on all titles of the Farm Bill. There was a large effort to take all of that input, condense it and make it available for the public

> to look at, and come up with the administration's recommendations. So out of all those comments, out of our experience implementing programs, we developed the administration's recommendations. (US-7)

The Secretary convened 52 forums in 48 States and received over 4,000 comments, which were categorized into 41 summary papers. These papers formed the basis for the Secretary's recommended modifications to the Farm Bill. With respect to the Conservation Title, commenters urged the USDA "to eliminate loopholes and simplify, streamline, consolidate, and coordinate programs." Commenters also expressed support for "local-level decision-making and authority, flexibility to meet local needs, and cooperative conservation (USDA, 2006c)." As a result of the listening sessions, the USDA saw a need to consolidate and simplify programs as a means to increase efficiency and improve delivery of conservation outcomes (USDA, 2006a). Consolidating multiple programs within EQIP would allow NRCS to address myriad resource issues using one program rather than several discrete programs with different rules.

When OMB approached USDA with the RWEP concept, officials within the USDA and NRCS expressed reluctance to create an entirely new program given the feedback they had received in the field about the desire to consolidate and simplify programs:

> At the time we were trying to focus on streamlining the farm bill and increase flexibility, and not creating programs necessarily. […] We had already talked about consolidating all of those programs and individual initiatives within EQIP and just making it a broader program so that we wouldn't have to create specific program rules for each of these specific areas. So the idea was never, let's not do ground and surface water, but let's not create these different rules, let's make it as easy as possible, so that people don't have to manage different programs that essentially promote the same practices and address the same problems. (US-7)

This quote highlights a tension faced within the USDA between consolidating and streamlining programs, while also responding to OMB's desire to create an entirely

new program unencumbered by existing rules. USDA's intent was to create one program, EQIP, which would have sufficient flexibility to address multiple resource concerns. After negotiations between the USDA and OMB, RWEP was included in the Administration's recommendations for the 2007 Farm Bill as a new program within EQIP. Embedding RWEP within EQIP had both benefits and drawbacks. As a subprogram within EQIP, RWEP was more likely to receive mandatory funding rather than discretionary funding, which is essential to support program operations. Conversely, it was more likely to be saddled with existing administrative rules under EQIP.

The proposed RWEP language generated by OMB in consultation with the agriculture and conservation coalition was passed by the House Agriculture Committee and the full House with limited modifications. The modifications made by the House Agriculture Committee included the following (US House of Representatives Agricultural Committee, 2007):

- Limited eligible partners to producer groups, state or local units of government (including irrigation districts and conservation districts). By removing non-governmental organizations from the list of eligible partners, this modification had the potential to limit NRCS's ability to pursue a partnership-based approach in certain instances.

- Removed language that would have allowed program dollars to be spent on private agricultural land that did not produce commodities. Limiting eligible producers has the potential to impact NRCS's ability to target the most important producers from a conservation standpoint.

- Prioritized projects that assisted producers in meeting regulatory requirements. Projects that balanced environmental outcomes and agricultural productivity with resolving regulatory concerns were given greater priority when being ranked at the national level.

- Removed language that would have dedicated 85 percent of funding to partner grants. Grants could still be distributed to partners, but there was not a set limit for the amount of money that had to be allocated to partners.

- Reduced funding from $175,000,000 to $60,000,000.

- Included the Chesapeake Bay, Mississippi River Basin, Everglades, Sacramento River watershed and Klamath River Basin as national priority areas and required that 50 percent of funning be directed to these areas.

- Removed language that encourages the Secretary and partners to coordinate activities with other agencies. The new version had no language explicitly encouraging interagency coordination.

The provision that would have required the Secretary and project partners to coordinate with other entities was likely removed because the language created a nexus with other House Committees and the Agriculture Committee wanted to guard its jurisdiction: “Congress, to some degree will write these bills in a way that limits their exposure to other committees” (US-7). Priority areas were added by Committee members in response to various constituencies who were advocating for their particular resource concerns. Despite these modifications, the House Bill was largely consistent with the original intent of the RWEP concept. The inclusion of RWEP was largely attributed to the advocacy work conducted by the agriculture and conservation coalition, which had broad appeal across party lines.

The Senate version of the bill, however, did not include any mention of the RWEP. There are differing explanations for why RWEP might have been excluded from the Senate version. One interviewee suggested that the RWEP language may not have been ready by the time the bill was submitted to the Senate for consideration: "I think it was just a question of timing…that we didn't have the RWEP statutory language adequately delineated for the Senate Bill" (US-4). Another interviewee suggested that RWEP was not included in the Senate version because it conflicted with the desires of key constituents:

> There were some states that benefited under the Ground and Surface Water Conservation program and they were fearful that the new program would expand eligibility. Ground and surface water conservation was a water quantity program and they were concerned that by expanding it to water quality, it was going to open up a lot of other states to have access to those pools of money. (US-7)

The version approved by the Senate preserved the GSWC program, which was a popular program amongst a key set of constituents who relied on irrigation water from the Ogallala Aquifer and Eastern Snake Plain Aquifer. The Senate's version increased funding under GSWC for these geographic areas (US House of Representatives Agricultural Committee, 2007). Just as in the House Committee, the Senate Agricultural Committee tailored its revisions to benefit their respective constituencies.

Following passage of the initial Farm Bill legislation in both the Senate and House, a conference committee was convened to resolve contradictory provisions between the Senate and House versions of the bill. This is where "a lot of horse trading happens […] and it happens in a much less transparent process" (US-4) Interviewees noted that the conference committee meetings were much less open to outside influence:

> You know, once it goes to conference, it really depends on the individual members of Congress, so certainly those members who are on the conference committee were well aware of what different entities are hoping for, but it's not really an open process to any other entities, it's really just members of Congress…and really just those members who happen to be on the conference committee. (US-4)

Consequently, the coalition that had so effectively worked with the House Agriculture Committee to pass the original language wielded less influence during the conference committee meetings. The committee grappled with issues concerning landowner eligibility, cap requirements, the suite of eligible actions, the role that partners could and should play in administering programs, the merits of creating new program rules versus employing existing EQIP rules and the desire to address specific priority areas supported by their respective constituencies. There were members on the committee that favored EQIP and did not see the need to introduce a new program with a different set rules. Many of the more significant rule changes proposed in the original RWEP concept were stripped out in conference committee in preference of a more traditional approach. This deferral to EQIP was observable in the final statutory language.

When the bill finally emerged from conference, it contained substantial differences from the version that passed the House, which drastically changed the scope of the original proposal. In addition to a new name, the Agricultural Water Enhancement Program (AWEP), the committee version also made the following modifications (Sec. 2510, P.L. 110-246):

- Limited the actions that qualified as "water enhancement activities" by removing certain activities such as conservation easements, which were covered under other programs, and water banking, which was considered to be

in conflict with state laws regarding water use. This effectively limited the suite of available conservation activities

- Removed any reference of "grants" to partners and replaced with language about partnership "agreements." The language lacked clarity about whether partners could enter into contracts on behalf of producers.

- Directed the Secretary to "ensure that resources made available for regional agricultural water enhancement activities are delivered in accordance with applicable program rules," thus tying it more closely to EQIP and its associated rules.

- Restricted the USDA from spending any funds on the administrative costs incurred by partner organizations.

- Removed language that would cap NRCS's administrative costs.

- Removed priority areas from the statutory language and included them in the joint committee report. The committee report also identified the need to address water quantity issues in the Ogallala aquifer, prioritize investments that assisted landowners in converting to dryland agriculture, and allow for funds to be used towards water storage projects in areas experiencing drought as identified by the Drought Monitor.

Despite these major modifications, the final version still emphasized the need to 1) focus on priority resource concerns within a defined hydrographic area, and 2) leverage partnerships to implement larger-scale projects. The new version of AWEP also granted authority to the Secretary to waive eligibility and cap requirements for those producers whose participation was deemed crucial to project success.

Leading up to the rulemaking process, NRCS experienced pressure from both internal and external actors to minimize new rules. EQIP is a well-known program that field staff are familiar with and there was hesitance at the national level to modify rules that were widely accepted: "From a lot of people's views, if it ain't broke, don't fix it…they kind of like that EQIP's working. So there's a real reluctance to break stuff down and make something untested work" (US-2). The administrative challenges faced by NRCS in the Klamath Basin did not provide the necessary impetus throughout the agency to reexamine and revise EQIP rules. USDA was also directed by certain members of Congress during the legislative process to make AWEP dollars subject to EQIP rules, which would ensure consistency and accountability in how the program was administered. Furthermore, interviewees suggested that political appointees such as the Secretary of Agriculture and the NRCS Chief are generally "reluctant to commit field staff to new programs and rules" (US-7). This indicates that there were multiple disincentives to institutional change leading up to the rule-making process.

NRCS's proposed rule for EQIP made little mention of AWEP aside from noting that the program needed to comply with all EQIP rules and procedures (7 CFR Part 1466). Given the need to immediately begin allocating program dollars, and the high transaction costs associated with developing new rules, the NRCS decided to forego a separate rulemaking process for AWEP and instead opted to issue a request for proposals (RFP) in the Federal Register (74 FR 2040). AWEP thus became a small subset of rules nested in a larger and more complex set of EQIP rules that limited overall program flexibility:

> Since AWEP was within EQIP it was now bound by all the rules of EQIP. They could add more rules to EQIP but they really weren't going to exempt it from EQIP. […] So NRCS wrote rules that were consistent with EQIP that maybe focused it a little bit, but in essence a lot of the original concept got

> watered down and that, you'd expect that, it's the way things kind of work in the bureaucracy with new ideas. (US-2)

Consequently, the program, as administered, almost entirely resembles EQIP since AWEP funds are to "be administered directly through program contracts between NRCS and eligible producers" (74 FR 2040). The coalition of conservation groups and agricultural producers wrote letters during the public comment period to salvage some of the original AWEP components, but had little influence on the rulemaking process. As one interviewee put it: "We beat them to death with comments. We had all kinds of people comment on the rule to make sure that it got done the way we wanted it, but it was clear that they were going to do everything they could to make it mirror EQIP" (US-3). Efforts made by external actors during the rulemaking process had very little impact on the resulting rule. NRCS's reluctance to initiate more significant institutional changes at the national level engendered frustration amongst several key partner organizations.

As Ostrom (1992) suggests, modifying existing institutions is an iterative and incremental process and is more difficult at higher levels of decision-making given the complexity of the rules that structure who is involved and what information, resources and strategies are available to actors that seek to influence the process and outcomes. Furthermore, existing institutions may resist change. This section illustrated that there were multiple disincentives to embracing more significant institutional change. Despite the fact that the final version of AWEP only slightly resembled the original proposal, one interviewee expressed that creating a new program within the Farm Bill still represents a significant accomplishment:

> I don't know exactly what happened, but by the time it got through the whole negotiations of the Farm Bill, which are very very complicated, with so much give and take and deal making going on.[…] the proposal that we had totally got diminished […], but it was a whole new program associated with EQIP in

> the Farm Bill, so that was an accomplishment right there, to get a new program in the Farm Bill, that doesn't happen very often. (US-1)

The original RWEP concept would have made significant changes to existing rules at the national level, but as authorized, AWEP represents an incremental adjustment to NRCS's rules. Though incremental, the rules under AWEP do signal a transition to a more integrated approach to water management when measured against the IWRM design principles. *Table 5. Adjustments to RWEP/AWEP through the Legislative and Rulemaking Processes* represents the iterative adjustments made to RWEP through the legislative and rulemaking processes and illustrates how these adjustments align with IWRM principles.

Table 5. Adjustments to RWEP/AWEP through the Legislative and Rulemaking Processes

	Original Proposal	House Revisions	Joint Committee Version	NRCS Rule/RFP
Systems Approach	+ Integrates water quantity and quality + Integrates surface water and groundwater management + Integrates environmental considerations with agricultural productivity - Limited to water resources projects on agricultural land (does not address other sectors)	+ Integrates water quantity and quality + Integrates surface water and groundwater management + Integrates environmental considerations with agricultural productivity - Limited to water resources projects on agricultural land (does not address other sectors)	+ Integrates water quantity and quality + Integrates surface water and groundwater management + Integrates environmental considerations with agricultural productivity - Limited to water resources projects on agricultural land (does not address other sectors) - Statutory preference for addressing water quantity concerns	+ Integrates water quantity and quality + Integrates surface water and groundwater management + Integrates environmental considerations with agricultural productivity - Limited to water resources projects on agricultural land (does not address other sectors) - Statutory preference for addressing water quantity concerns
Strategic Approach	+ Strategic focus on water resource concerns + Projects based on priority water management concerns within defined hydrographic areas + Partners can apply on behalf of producers (multi-landowner contracts) + Expands producer eligibility beyond EQIP eligibility requirements + Provides authority to Secretary to modify *any* limitations relating to eligibility, payment caps or timing if the change would contribute to overall effectiveness of the project -/+ Would enable NRCS to develop new agency rules	+ Strategic focus on water resource concerns + Projects based on priority water management concerns within defined hydrographic areas + Partners can apply on behalf of producers (multi-landowner contracts) - Requires producer to meet EQIP eligibility requirements + Provides authority to Secretary to modify *any* limitations relating to eligibility, payment caps or timing if the change would contribute to overall effectiveness of the project -/+ Would enable NRCS to develop new agency rules	+ Strategic focus on water resource concerns + Projects based on priority water management concerns within defined hydrographic areas + Partners can apply on behalf of producers (multi-landowner contracts) - Requires producer to meet EQIP eligibility requirements -/+ Allows the Secretary to waive income limitations and payment caps if determined necessary to fulfill program objectives -/+ Encourages NRCS to use existing rules	+ Strategic focus on water resource concerns + Projects based on priority water management concerns within defined hydrographic areas - Projects administered on a landowner-by-landowner basis through EQIP contracts - Requires producer to meet EQIP eligibility requirements -/+ Allows the Secretary to waive income limitations and payment caps if determined necessary to fulfill program objectives -/+ Uses existing EQIP rules to deliver program

Table 5. Adjustments to RWEP/AWEP through the Legislative and Rulemaking Processes

	Original Proposal	House Revisions	Joint Committee Version	NRCS Rule/RFP
Participatory Approach	+ Local entities have greater input at the national level to direct funding to local projects + Projects with greater producer participation are prioritized + Expands producer eligibility beyond EQIP requirements + Multi-landowner contracts could foster greater producer interactions	+ Local entities have greater input at the national level to direct funding to local projects + Projects with greater producer participation are prioritized - Limits producer eligibility to EQIP requirements, which may exclude certain producers + Multi-landowner contracts could foster greater producer interactions	+ Local entities have greater input at the national level to direct funding to local projects + Projects with greater producer participation are prioritized - Limits producer eligibility to EQIP requirements, which may exclude certain producers + Multi-landowner contracts could foster greater producer interactions	+ Local entities have greater input at the national level to direct funding to local projects + Projects with greater producer participation are prioritized - Limits producer eligibility to EQIP requirements, which may exclude certain producers - Projects administered on a landowner-by-landowner basis through EQIP contracts, which limits producer interactions
Partnership Approach	+ Partners propose and sponsor local projects + Partners receive grants to engage producers and implement conservation activities + Partners leverage additional resources to supplement NRCS support + Prioritizes projects with more collaborating partners + Wide range of eligible partners + Explicitly encourages NRCS and partners to coordinate activities with other entities to minimize duplication and maximize outcomes	+ Partners propose and sponsor local projects + Partners receive grants to engage producers and implement conservation activities + Partners leverage additional resources to supplement NRCS support + Prioritizes projects with more collaborating partners - List of eligible partners is limited - Does not explicitly encourage interagency coordination	+ Partners propose and sponsor local projects - Partners cannot receive grants or any funding for capacity + Partners leverage additional resources to supplement NRCS support + Prioritizes projects with more collaborating partners - List of eligible partners is limited - Does not explicitly encourage interagency coordination - Role of partners limited to conducting outreach, leveraging funds, conducting monitoring and reporting project results	+ Partners propose and sponsor local projects - Partners cannot receive grants or any funding for capacity + Partners leverage additional resources to supplement NRCS support + Prioritizes projects with more collaborating partners + List of eligible partners is expanded - Does not explicitly encourage interagency coordination - Projects administered on a landowner-by-landowner basis through EQIP contracts, which may limit partner involvement

Table 5. Adjustments to RWEP/AWEP through the Legislative and Rulemaking Processes

	Original Proposal	House Revisions	Joint Committee Version	NRCS Rule/RFP
Balanced Approach	+ Balances agricultural productivity with environmental outcomes + Partners compete at the national level for funding + Local actors have more power to determine priority resource issues and to direct funding to address those issues	+ Balances agricultural productivity with environmental outcomes + Partners compete at the national level for funding + Local actors have more power to determine priority resource issues and to direct funding to address those issues -/+ National priority areas identified	+ Balances agricultural productivity with environmental outcomes + Partners compete at the national level for funding + Local actors have more power to determine priority resource issues and to direct funding to address those issues -/+ National priority areas identified + EQIP program is transparent, accountable, and limits potential abuse of the system	+ Balances agricultural productivity with environmental outcomes + Partners compete at the national level for funding + Local actors have more power to determine priority resource issues and to direct funding to address those issues -/+ National priority areas identified + EQIP program is transparent, accountable, and limits potential abuse of the system
Adaptive Approach	+ Flexibility to develop new agency rules + Wide range of eligible conservation activities + Flexibility to tailor payments to achieve program purpose - Projects limited to five year duration + Partners contribute to monitoring and documenting project outcomes	+ Flexibility to develop new agency rules + Wide range of eligible conservation activities + Flexibility to tailor payments to achieve program purpose - Projects limited to five year duration + Partners contribute to monitoring and documenting project outcomes	- Encourages NRCS to use existing rules - Limits conservation activities to list of EQIP conservation practices + Flexibility to tailor payments to achieve program purpose - Projects limited to five year duration + Partners contribute to monitoring and documenting project outcomes	- AWEP participants must adhere to all existing EQIP rules - Limits conservation activities to list of EQIP conservation practices - Limits payments to EQIP payment schedule - Projects limited to three year duration with the option of extending an additional five years + Partners contribute to monitoring and documenting project outcomes - Projects administered on a landowner-by-landowner basis through EQIP contracts, which may limit overall flexibility

4.2 Implementing the Agricultural Water Enhancement Program

Rules developed through legislative and rule-making processes ultimately affect subsequent levels of decision-making in the national, state and local arenas. The subsequent sections examine how AWEP affected actor decision-making at multiple levels and highlights institutional factors that enable or inhibit a more integrated approach to water management consistent with the IWRM design principles within this set of new rules. These institutional factors may be specific to the context of the action situation or to the higher level rules. Following the IAD framework, each sub-study examines the context within which decision-making occurs, interactions between actors and the subsequent outcomes. Institutional factors are summarized in a table following each sub-study.

4.2.1 National Implementation of AWEP

The national NRCS office began implementing AWEP in 2009. This section examines how AWEP changed the decision-making arena at the state NRCS office with the aim of identifying institutional factors that enable or constrain actors from implementing a more integrated approach to water management.

4.2.1.1 Context

The contextual factors that influence implementation of AWEP at the national level were presented in *Section 4.1.1. Background and Context*.

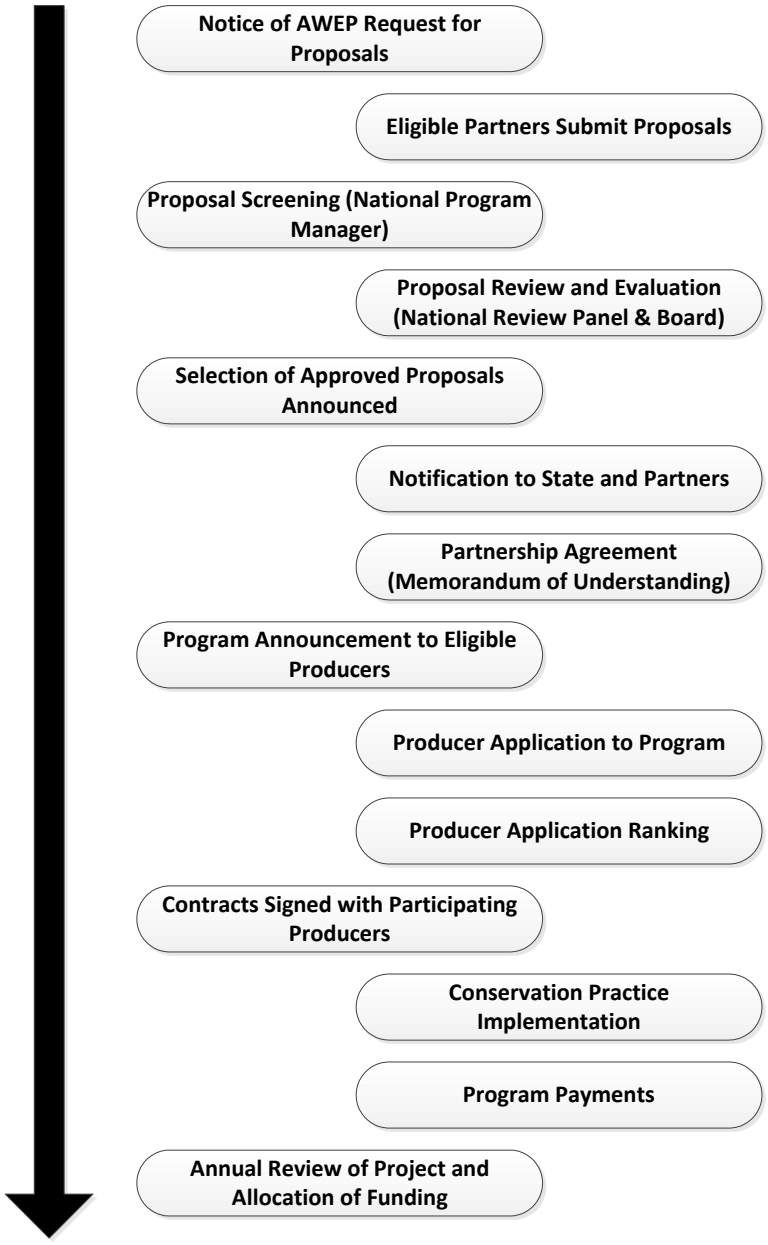
4.2.1.2 Action Arena

The establishment of AWEP resulted in minor modifications to overall program administration at the national level: "We've changed things in small ways, but […] we're still basically doing the same work" (US-10). AWEP, in most respects, is very

similar to EQIP since all dollars go directly to individual landowners through EQIP contracts: “AWEP is basically EQIP with a partnership” (US-8). Embedding AWEP within EQIP’s rules simplified the implementation process since EQIP already has an established method for processing contracts. EQIP is one of NRCS’s oldest financial assistance programs and the process is generally well-known at the national, state and local levels within NRCS.

The most significant administrative change at the national level resulted from the emphasis on partnerships. NRCS manages the partnership approach through a competitive process administered at the national level. The national office issues a RFP in the Federal Register on an annual basis that solicits project proposals from local partners. Local partners send their application directly to the national office and send a copy to the state office for endorsement. Decisions about project proposals are made at the national level by the program manager and a national review board based on national criteria. *Figure 4. National AWEP Evaluation Guidance* provides an overview of the AWEP process. The national office has slightly modified the proposal process over the years to increase efficiency. The original proposals were narrative, but later versions were structured to be self-ranking. Streamlining the process enabled the national office to respond more quickly to program applicants, but may have resulted in less detailed and nuanced project proposals. Once projects are approved, the national office directs money to the state level after it is appropriated by Congress and allocated by OMB. The state and local office are then responsible for obligating the money through individual EQIP contracts within the specified project areas.

Figure 4. National AWEP Evaluation Guidance



NRCS's interpretations of statutory and administrative rules has resulted in iterative adjustments which are communicated to NRCS state and field offices through the RFP process, the EQIP manual and modifications to field office technical guidance documents (FOTG). Through the RFP, the NRCS has made minor adjustments to expand the list of eligible partners to include "agricultural land trusts and other non-governmental organizations that work with agricultural producers," which are entities that had not been previously included in the statutory language (74 FR 2040). This was likely in response to letters received during the rule-making process seeking greater inclusivity for potential partners. Recent modifications to the EQIP manual also expand landowner eligibility by eliminating the requirement that applicants produce a minimum of $1000 in commodities. There are still eligibility requirements associated with adjusted gross income (AGI) and payment caps, which are meant to ensure equitable distribution of limited program funding. Eligibility requirements, especially income limits may limit NRCS's overall ability to achieve conservation outcomes, especially if it precludes the involvement of larger landowners who can have a significant impact on water resources. NRCS has slightly modified the RFP on an annual basis and has the flexibility to modify the EQIP manual and FTOG when there is a need to clarify program rules or provide guidance for implementing program rules. Any internal modifications to NRCS programs, however, must be consistent with their statutory authority granted by Congress through the Farm Bill. These statutory rules constrain NRCS's ability to adapt program rules at the national, state and local levels.

In addition to overseeing the solicitation and review of applications, clarifying program rules and developing guidance, the national program administrators are responsible for responding to inquiries about the program. Most inquiries, however, are handled at the state level: "Yeah, we do have some inquiries. In the end, since we're really administering this at the state level, they get most of the inquiries" (US-

10). In some instances, officials at headquarters may be requested to waive certain stipulations within EQIP, including income or cap limitations. Any waiver request must be submitted by the State Conservationist with rationale explaining why the waiver is necessary to achieve the conservation outcomes outlined in the project proposal. These waivers are used "relatively sparingly" due to the many levels of review that are required for approval and the need to maintain overall equitability in program administration (US-6). The layers of review and approval serve as a disincentive to local actors seeking to waive eligibility requirements.

There is also a perception that AWEP enhances NRCS's ability to deliver conservation outcomes at a larger scale and involve more stakeholders in identifying projects:

> AWEP allows us to focus on the geographic watershed problem, based on resource concerns, and bring in a lot more folks to make an influence in that area than say just EQIP would…even though that's available. But this concentrated effort, pulling the group together on a unified approach to tackle a regional resource issue; I think you can address these issues better through AWEP. (US-9)

By concentrating on a geographic or hydrographic area, AWEP dollars can actually "create a critical mass of conservation," which is something that the traditional EQIP program typically did not do (US-10). In addition, AWEP is meant to facilitate inter-state coordination for proposed projects transcend state boundaries. AWEP can provide a venue through which to resolve the "quirks" that have evolved at the state level in terms of administering EQIP. The interviewees thought the structure of the program worked well and was relatively easy to administer. There was a desire, however, for increased funding to meet local demand: "I think it's a good program and I just wish we had more dollars" (US-8). Challenge associated with funding are discussed in greater detail below.

The biggest institutional challenges identified at the national level are limited funding and the lack of clarity in partner roles and responsibilities. In terms of funding, the annual appropriations process makes it difficult to plan for multi-year, landscape-scale projects. For instance, NRCS needed to obligate all of the AWEP funding in the first year, which made it difficult to fund additional projects in subsequent years since a majority of the money was already committed to three-year contracts:

> Once we get it we have to obligate it that year, we have to obligate it in contracts. So that's a little bit of a challenge. Of course, all programs need more money. But if it was multi-year funds, it would give us more flexibility. (US-8)

Having multi-year funds that do not have to obligated on a yearly basis would provide more flexibility for complex, landscape-scale projects. Limited funding also presented a challenge. Appropriations for AWEP were reduced after the first year, which prevented NRCS from being able to fully fund projects at the levels expected by partners: "It all depends on the appropriation. We start funding that first year based on that first year obligation. Now we're in the second year, do we have enough money to fund that proposal at the level the partner is asking for?" (US-9). This leads to uncertainty and frustration when engaging with project partners. There was no money in FY 2012 to fund new AWEP projects and funding for existing projects was a fraction of the amount appropriated in 2009. Variability in annual funding makes it difficult for NRCS to make out-year commitments to project partners and results in general inconsistencies in program administration.

NRCS has limited influence on how its funding is allocated between technical assistance and financial assistance. The OMB has control over the NRCS budget and makes determinations about where money is allocated:

> So Congress will pass […] 73 million for AWEP and Congress doesn't care how much goes to contracts with producers, how much is administration, how much is design. But what OMB will do is they'll take that money and say 'you know, we think, based on our observation, this is what we expect you to do.' Then you'll have to spend 60 million on financial assistance and 13 million on technical assistance, which is everything from signing them up, the people managing the process and doing the contracts, to actual design work, who draw up the plan. One of the challenges we had with EQIP is the agency would go back and say, we need 28 percent technical assistance for the financial assistance dollars to be spent effectively because we're not only taking in applications, we're designing the practices, but then we have this required follow-up where we've got to go back every year and look at the practice. So for every dollar you give us, we need 28 cents to administer it. And OMB would come back and say you only get 19 cents to administer it. So that's one of those things, that when you're trying to design these programs is, how do you design them in a way so that you actually have the dollars to administer it properly. So you have the money for design, implementation, monitoring and enforcement afterwards. (US-7)

The restrictions on technical assistance can diminish the capacity for NRCS to effectively administer its programs and projects, especially projects that seek to address complex resource concerns at a larger scale with multiple partners. These types of complex projects generally require greater capacity to build and maintain relationships and deliver the appropriate technical assistance for interrelated resource concerns at-scale. Though restrictions on technical assistance have limited NRCS capacity, they have also encouraged NRCS to find creative ways to supplement their implementation capacity at multiple levels through local partners.

Partners can help to supplement capacity, but program administrators identified challenges with delineating roles and responsibilities between NRCS and its partners. NRCS has processes and procedures in place to administer both the financial and technical assistance and national administrators see the need to be more explicit about the role that local partners should play in actual implementation of the project:

> I would say from a larger perspective, a challenge would be to make sure…there's gotta be a fine line there where the partner provides the outreach, the assistance to sell or market the program, and then they have to stop and let the technical side of things come in. They may be technically savvy, but they're not technically savvy in the NRCS way. There are processes and procedures at NRCS that our partners may not be aware of or understand. The partner needs to be able to stop and let the NRCS overlap and take over and fulfill the rest of that duty. […] I'm not sure where that partner stops and where NRCS starts. That line is sometimes blurred and that can create confusion during implementation of the program. (US-9)

As NRCS moves towards a more partnership-based approach the relationship between NRCS and its project partners will have to be negotiated at multiple levels to account for and take advantage of the experience, knowledge and resources that each entity can bring to bear on the project. NRCS also needs to make sure that partners actually have the capacity to actually assist with the project, otherwise it can overburden local NRCS offices.

4.2.1.3 Summary

Box 4. Summary of Institutional Factors that Enable or Constrain AWEP Implementation at the National Level provides a summary of the institutional factors that enable or constrain implementation AWEP at the national level. AWEP facilitates a more strategic approach by focusing funding on priority resource concerns within a defined hydrographic. Since AWEP is embedded within EQIP it easy for NRCS to communicate at multiple levels and implement at the local level. NRCS has some flexibility to interpret rules, but the agency is also constrained by Congressional statutes and annual appropriation cycles. Funding is a major constraint for project implementation since it can vary from year to year and has to be immediately obligated. National representatives also saw the need to limit partner involvement to outreach and monitoring so that NRCS can implement its programs consistent with

internal rules. Constraining partner roles and responsibilities could impede a partnership-based approach and may hinder overall project success.

Box 4. Summary of Institutional Factors that Enable or Constrain AWEP Implementation at the National Level

+/-	AWEP uses existing EQIP program rules, which are well known and widely accepted amongst NRCS staff at multiple levels
+/-	The NRCS Chief has the ability to waive income eligibility requirements and payment caps but the process is used sparingly due to the many layers of review and approval that are required
+	AWEP targets funding to priority resource concerns in a specified hydrographic area
+	Partners compete at the national level for program funding based on publicly available criteria
+	AWEP encourages greater local involvement in defining projects and directing funding to locally defined priority areas
+	Partners leverage additional resources to supplement NRCS capacity
+	National NRCS office has the ability to modify RFP and evaluation criteria on an annual basis based on program needs and feedback
+	NRCS office has the ability to clarify program rules through rule-making process and EQIP manual and can provide guidance to field offices through the Field Office Technical Guide (FOTG)
+	The FOTG can be tailored to the local conditions of each field office
+	EQIP program is transparent, accountable, and limits potential abuse of the system
–	National NRCS office is constrained by statutory rules (e.g., cannot provide funding to partners to cover administrative costs)
–	NRCS has limited influence on allocation of funding between technical and financial assistance dollars (the appropriation process is controlled by the OMB)
–	Annual appropriations process and funding cuts make it difficult to maintain out year commitments to partners and reduces flexibility
–	Lack of clarity about partner roles and responsibilities
–	Perception of partner roles is potentially limited to outreach and monitoring, which may not capitalize on the full capabilities of partner organizations
–	Partners may not have the financial capacity to follow-through on commitments, which may over extend local NRCS office

4.2.2 State Implementation of AWEP

In its first year of implementation, the State of Oregon received 8 out of 66 AWEP grants and had the second highest number of projects per state (behind California). The State NRCS office in Oregon was well poised to compete for AWEP funding and implement AWEP projects due to a number of interesting institutional adjustments within the state. While AWEP was being developed at the national level, the Oregon state NRCS was conceiving of a similar approach that would enable the state to better track and articulate conservation outcomes at a larger scale. This section examines how AWEP changed the decision-making arena within the state NRCS office with the aim of identifying institutional factors that enable or constrain actors from implementing a more integrated approach to water management.

4.2.2.1 Context

Following the events in the Klamath Basin the Oregon NRCS office began working at the state level to take a more strategic approach to identifying resource concerns and allocating program dollars. From 2003 to 2006, Oregon conducted Rapid Watershed Assessments for all 8-digit hydrologic units in the state to better understand resource concerns and prioritize conservation investments. The Rapid Watershed Assessment process heightened awareness of resource concerns at a hydrographic scale and laid the groundwork for NRCS to take a more strategic approach to conservation investments.

When the AWEP RFP was announced, Oregon was already in the process of initiating an approach to EQIP investments that resembled AWEP: "We started focusing our EQIP investments here in Oregon at the same time that AWEP was coming out. The same concept as AWEP…and that is why we've been very competitive in receiving AWEP funding" (OR-4). This "strategic approach to conservation" requires District Conservationists to work with local and regional partners to identify priority resource

concerns in each county, which are captured in long range plans, and develop conservation implementation strategies to address those resource concerns. The idea is that these long-range plans and implementation strategies will help the state and local "transition from a reactive to a proactive mode" in dealing with resource concerns (OR-3). Both plans must be reviewed and approved by multiple stakeholders and state staff before a District Conservationist receives funding to implement the conservation strategy.

The structure of Oregon NRCS is well suited to both the development and implementation of strategic, landscape-scale projects within the state. Under the Small Watershed Program (PL-566), Oregon had developed a team at the state level who was engaged in conducting watershed assessments, developing plans and implementing "watershed project actions." For many years the watershed planning team "was kind of a separate entity operating on its own and our district conservationists generally weren't involved" (OR-3). Over time less and less money was allocated to the small watersheds program under PL-566, thereby prompting the need to reconsider staff assignments at the state office. The State Conservationist wanted to preserve the strategic function of the watershed team and saw the need to engage in more "proactive planning with cost-share programs" (OR-4). Consequently, the State Conservationist institutionalized the water resources planning team within the state office in 2004 and charged the team with implementing a more strategic approach to conservation within the state of Oregon. The State Conservationist has also continually invested in a full-time partnership liaison who is dedicated to fostering partnerships at the state, basin and local levels with both traditional and non-traditional partners. The commitment to building and sustaining staff capacity at the state level were vital as Oregon began to transition to more strategic, partnership-based approaches.

NRCS has an active network of advisory committees at the state, basin and local levels that engage partners in identifying priorities and developing strategies to address resource concerns at multiple scales. The Oregon Technical Advisory Committee (OTAC) is comprised of multiple state partners representing multiple disciplines. The State Conservationist convened members of OTAC with expertise in water quantity and quality issues and sought their input on AWEP projects. This type of review was not required by the national office, but it ultimately helped state partners identify additional resources that could be directed at priority areas to assist in overall implementation. Oregon NRCS is also unique in that it has organized its area offices by hydrographic rather than administrative boundaries. Oregon has found the basin concept and the accompanying Basin Working Groups to be beneficial in identifying priorities, building partnerships and implementing projects across county lines: "Some states don't do that, they'll maybe have the county and then the state working groups, bypassing the basin. We find that the basin is kind of a conglomeration…it kind of is the sounding board for what is happening in other counties." (OR-5) In fact, some of the successful AWEP proposals stemmed from work being done by Basin Working Groups.

In more recent years Oregon has prioritized and invested in training for all of its District Conservationists. The area wide planning course, which encourages staff to think about and plan for landscape-scale approaches to conservation, is now requisite for District Conservationists and Basin Team Leaders. This planning course has helped to bridge the gap between on-farm conservation plans for single farms and landscape-scale conservation strategies that require multiple landowners:

> The area wide planning course laid out, here is how you approach planning for multiple landowners, because our training for NRCS is really focused on how do you develop a good conservation plan for individual farm or operation. So there is a field level planning, and a whole farm planning, but if you are really

> trying to look at a strategy to solve a resource issue in a watershed or over a landscape, then you need to start looking at multiple landowners. So it's sort of a multi-land approach. (OR-4)

In addition to helping District Conservationists think strategically at a larger scale, Oregon has also been training staff in the partnership approach. All of these initiatives have worked to Oregon's advantage in nationally competitive programs such as AWEP.

State representatives have recently begun implementing the state strategic approach; long-range plans are completed for all of the counties and the state has already approved a number of conservation implementation strategies. Creating a new, more strategic approach at the state level is possible in large part because of NRCS's organizational structure. The state conservationist is given a significant amount of latitude to tailor program delivery to the needs and structure of their particular state. The decentralized nature of NRCS facilitates more experimental and innovative approaches to program delivery at the state level:

> We're a decentralized federal agency, which we really like. The state conservationists are responsible for their resources and how they get implemented and how they help the agency meet the mission. It enables us to have the flexibility to work with the state partners, deal with state law and regulations, that's the biggest one […] you can't do things in New York the same way you would do things in Oregon. It's totally different, so that's the beauty of the agency is that we are decentralized and we have the authority to deliver our programs that are tailored to our state. (OR-1)

All of the interviewees at the state level strongly support a decentralized approach to program delivery since it allows them to be more responsive and adaptive to priority resource concerns within the state.

4.2.2.2 Action Arena

The state NRCS office was privy to information about AWEP prior to the RFP, which was advantageous for both the state and its local partners. An Oregon staff member, who was on assignment in Washington DC when AWEP was being developed, returned to Oregon and was effectively able to generate interest and support at the state level: "My boss and I made the determination when I got back to OR, that once this thing got out, we were gonna hit it fast, and really ramped up" (OR-2). Advance knowledge of AWEP gave Oregon NRCS a strategic advantage in understanding and preparing for the program at the state level by engaging potential partners:

> We went very early into the process and started contacting irrigation districts, conservation districts, watershed councils, we held teleconferences and other meetings to get folks prepped for when it came out so that we could…basically the game in federal government is, the state that gets out there first is gonna get the majority of the money if you're quick. (OR-2)

As a result of Oregon's previous investments in fostering partnerships, NRCS had strong working relationships with local partners: "We have a really good connection to our partners, so our partners are informed about what is happening" (OR-4). Existing partnerships allowed the State office to effectively disseminate information about the program, mobilize interested partners during the proposal process and remain connected throughout project implementation.

Oregon also had an opportunity to provide input on AWEP during the rulemaking process and the development of the RFP. When headquarters was developing a strategy for implementing AWEP, they sought feedback from state offices, including the Oregon office. Oregon had useful input given the groundwork that had been laid for the statewide strategic approach to EQIP: "When they asked us for feedback, we actually sent them a template on what we were using here on our strategic approach. They adopted that same thing for the AWEP approach" (OR-1). The template

provided by Oregon greatly informed the resultant process at the national level. Prior to this exchange, these two very similar approaches had developed on separate but parallel paths at different levels in NRCS.

AWEP has benefitted the state NRCS office in a number of ways. AWEP provides additional funding to Oregon to accomplish conservation projects and offers another opportunity to focus EQIP investments on priority concerns. AWEP has served as a catalyst and a testing ground for the new strategic approach that Oregon has introduced across the state: "AWEP was a catalyst to get us to do what we've been wanting to do for a long time and to finally make that transition" (OR-2). AWEP provided a good template for the state's new approach to EQIP and was used to familiarize staff and partners with the process:

> Practically speaking, in learning how to process that strategic approach, in the field, the day to day grind, […] AWEP's been a good template for how that can work and practically how…as a District Conservationist it's sometimes hard to get these get these concepts down and AWEP was a real good way to practice that whole process. (OR-7)

It can be difficult for some field level staff to make the transition to a more strategic approach, especially if it differs significantly from "business as usual," but AWEP provided a half-step between the traditional approach and the state's new strategic approach:

> Internally we had some challenges because people are very used to taking whoever comes and at that point in time we were just starting down that move to be more strategic. […] So the folks internally received it okay, only because it was new dollars, so they said, 'at least you're not taking our existing dollars and trying to make it more strategic.' But then we were able to use AWEP to say 'if you want to bring in more dollars, you need to be more strategic, so every project, everything you do we want to look like AWEP, to build you up to have more AWEP-like projects.' So basically, we used AWEP the other way; we used AWEP to get people thinking more strategically, internally. (OR-2)

The state used AWEP to incentivize strategic thinking and partner-based approaches at the local level and to begin familiarizing local staff with new state rules. AWEP also created a new avenue for local partners to advocate for projects at the local and state levels.

Implementing AWEP also helped the state staff identify some potential challenges with the adoption of strategic approaches at the local level and found that it "depends on the personality of the person and on their willingness to accept change" (OR-2). While state NRCS staff believe that most NRCS representatives in the field are supportive, some individuals are still reluctant to adopt the new approach:

> So there are some people who have been thinking this way forever and they're just thrilled to death that someone finally recognized it. There are some people who say, okay, yeah I'll give it a try. There are some people who are being pushed, pulled or dragged along by their local partners. There are some who say 'come hell or high water I'm not gonna do it' which we call change by retirement, you know, they're not gonna do it until they retire. And then someone else will come in and it will be the norm. We determined at NRCS, I think we did a five year process of implementing this change, so we decided early on that we would not force this to happen overnight or it would not be successful, so we took small steps over five years and I think they're at year four now, and it's much more accepted now than it was four years ago. And, you know, some people have retired. (OR-2)

This quote further illustrates the fact that change happens incrementally within an agency. The ability or inability for an agency to change is contingent upon a number of factors, including the organizational culture, leadership at the state and local level, individual personalities and the influence and preferences of partners. Change can be very hard, especially for those individuals who have been with the agency for a long time and have grown accustomed to certain rules and norms. NRCS has been changing fairly rapidly over the past decade and there are field staff who would prefer a return to the days when one-on-one technical assistance was the norm.

Many of the local AWEP projects were complementary to larger projects that had been planned and were being undertaken by local partners. In most cases, AWEP partners have strong relationships with landowners and have successfully demonstrated their ability to develop implementation strategies and deliver conservation outcomes. In addition, partners had experience applying for other competitive grants at the state and national level: "Our other partners are adept at putting together projects and applying for grants, whether it is through the Environmental Protection Agency, Department of Environmental Quality, Oregon Department of Agriculture or Oregon Watershed Enhancement Board" (OR-4). AWEP became another mechanism for NRCS to support existing efforts that already had momentum at the local level and to expedite the realization of important conservation outcomes. NRCS also supports an important niche by funding the on-farm work necessary for large-scale conservation projects.

In terms of actually administering AWEP, there were relatively minor adjustments necessary within the state office since "AWEP is EQIP" (OR-6). The similarity in program administration allowed the state office to easily communicate the new program to the field staff:

> Having AWEP under EQIP, the structure of EQIP was already there. That is, the field technical people knew how to run EQIP […] it wasn't a new program, sometimes there's new nuances that you have to learn and get used to. EQIP has been around for a decade, at least, before AWEP came out and so the structure was in place and everybody was familiar, so it wasn't something we had upload and learn and train on and it worked real well. (OR-1)

AWEP was not an entirely new concept for the field staff, so NRCS at the state level was able to "operate the program just like we do all of our other programs" (OR-2). In terms of reviewing and approving proposals, the state plays a limited role by giving

"the thumbs up or thumbs down" on proposals that are submitted from the local level to the national office (OR-2). The state office ranks the applications each year of its own volition with the assistance of the OTAC, but the national office only wants to know whether the project is endorsed by the state and are less interested in the prioritization or ranking of projects. Decisions about project proposals are ultimately made at the national level based on national criteria: "They tell us which ones we are going to get done from the national level" (OR-3).

While NRCS field staff were familiar with the rules of the program, EQIP represented relatively unfamiliar territory for many of the project partners. At the state level, the biggest challenge was informing partners about the rules associated with both AWEP and EQIP, assisting with proposal development, and managing the expectations of partner organizations. In the first year, there were applicants who did not coordinate with the field level NRCS offices, thereby leading to some confusion about the actual structure of the program and their role in project implementation. Lack of coordination also led to some surprises at the local and state level when partners submitted applications without informing or consulting the local NRCS office, which would ultimately be "on the hook" for implementing the project (OR-3). In following years, the state addressed this by conducting extensive outreach to all potential project partners to make sure that they worked with local NRCS staff and fully understood the program rules:

> So NRCS, by statute, gives all the money to the producers on the ground. So these guys, the applicants who didn't understand that, thought that they would get some funding out of it and they don't get a dime. So we had frustration from local folks who thought that they were going to get money for their organizations. […] We had the same issues with applicants the next year, but we were able to catch it early and fix the application by making sure that they were working with us while they were applying. So it was really just a matter of…our programs are very arcane and if you don't work for the agency you

> don't really get 'em. So holding their hands through the application process became really important. (OR-2)

AWEP, which was administered like EQIP, was far from the norm for project partners who were accustomed to more traditional grant programs administered through state agencies or private foundations. The state played a critical role in communicating the differences and helping partner organizations navigate the complex set of EQIP rules. The state office was able to do this during proposal development and when negotiating the memorandum of understanding with the local partner. Staff at the state office also aided during project implementation when questions arose in the field about conservation practices, eligibility and payment schedules.

Even though local partners were less familiar with EQIP program rules, they were still instrumental to project implementation: "[These projects] have been successful for that reason, it's because we have the partner. By ourselves, we just don't have the resources, either the financial or technical assistance, to be successful on our own. But these are clearly making us more successful, these partnerships" (OR-3). Local partners were able to help NRCS think strategically about its investments, conduct outreach to local landowners, leverage additional federal and non-federal funding, and provide supplemental information and technical assistance to local landowners. Leveraging the skills, expertise and resources of multiple partners will become even more important as NRCS funding becomes more limited at the national level: "Obviously as an agency, we can't solve some of these small area issues alone. Therefore, our local folks, and our area wide folks, and are state office folks need to partner up to leverage resources just like every other agency has to do" (OR-4).

AWEP contracts are generally out of synch with the EQIP contract cycles and have to be completed in a short timeframe. Without the assistance of partners, engaging landowners to make sure they get signed up in time would be increasingly difficult:

> The way that AWEP proposals get funded and when it comes into a state, it usually comes in late in our contracting cycle. So when it comes in, the field offices have to move very quickly to get those dollars allocated in the contracts and planning done and all that. Without that local partnership, you would never be able to advertise and hope people would come in. That partnership is sort of guaranteeing that people are gonna sign up for this, they want to participate in it. (OR-6)

NRCS benefits from the relationships that partners have fostered at the local level and the ability for partner organizations to mobilize broader partner networks and landowner networks. Partners communicate program rules with potential participants, help participants navigate the NRCS process and assist them in filling out the correct paperwork.

Interviewees indicated that AWEP and more strategic approaches to conservation at the state level also help NRCS to better communicate the outcomes of NRCS investments when compared to traditional conservation programs such as EQIP:

> The regular EQIP program is probably achieving great environmental outcomes, but it's very difficult to measure when you haven't packaged those things together and 'said this set of projects on this landscape is what we want to achieve.' So over 15 years, NRCS might have done the same thing in that watershed, but it would also be funding 10 other things. So [AWEP] achieved measureable outcomes at a rate that is much quicker than it would have been through the traditional programs, and with a partner who is supposed to be monitoring it, which NRCS doesn't have the money necessary to monitor every project. (OR-2)

NRCS does not generally have the capacity to monitor its projects beyond basic compliance monitoring, which limits its overall ability to understand and articulate the results of its investments. NRCS's ability to more effectively conservation outcomes was partially attributed to the work done by partners to monitor and report on project outcomes. The national office only required monitoring reports in the first year of the program, but the state has continued to request them. These reports help the state

office communicate priorities with the national office and also give the state office feedback on how to improve local program delivery.

Although partners are clearly key to the successful implementation of AWEP projects, they do not receive funding through AWEP to help administer the projects or monitor outcomes. In some instances, partners may receive limited funding to assist NRCS with general administrative tasks or to provide technical assistance, but this funding is not connected to the actual AWEP project:

> So we can contract with them to help with the EQIP applications, but not with the AWEP project as a whole. Where we need them most is on the big picture stuff and where we couldn't pay them was on the big picture stuff. (OR-2)

As indicated by this interviewee, NRCS does not have the ability to direct funding to the highest need, which in this interviewees opinion is strategic planning. Some representatives at the state level felt that NRCS should financially support the capacity of local partners, while others were concerned that funding local partners would divert too much funding away from local NRCS offices or producer contracts. All interviewees were in general agreement, however, that administrative and technical assistance dollars need to be better aligned with project needs regardless of whether that funding is directed to NRCS or its partners at the local level.

State NRCS staff expressed enthusiasm about AWEP and the more strategic initiatives that are being pursued at all levels within NRCS and identified several institutional factors that may hinder or facilitate overall success of this approach. State NRCS representatives advocated for greater NRCS involvement in AWEP project development and selection at the state and local level since the state and local offices would ultimately be responsible for administering the program. The state and local NRCS offices needed to ensure that they would have sufficient capacity to fully

support project implementation: “The burden is on us with EQIP, we have to have all the sign-ups, the implementation of it. So if we’re not aware of these, it puts us in an awkward position” (OR-1). Interviewees recommended that future RFPs include a requirement that applicants consult with the District Conservationists during proposal development. Greater involvement of state and local NRCS employees minimizes “surprises” and helps to ensure that proposed projects align with long-range plans. One interviewee was careful to note, however, that there is immense value in it still being a locally led process, not an NRCS led approach and that NRCS should be a creative partner, but not necessarily the leader.

Funding and contracting cycles also present a challenge to the state. Some state staff are concerned that inconsistency in funding and NRCS’s inability to follow through on out-year funding commitments to partners reflects poorly on the agency and may impact their reputation as a “good” partner:

> We always need to build on our partnerships. […] I think the challenge that we have for this is the funding levels. […] Our partners put forward these beautiful proposals and every year they request $500,000 and they can only get $200,000. That’s discouraging for the partners…considering you know, in their budget, they’re probably putting in their in-kind and cash matches as well. (OR-5)

Funding has been reduced each year for the projects approved in 2009 and there is no funding available in 2012 for new projects. Consequently, all of the AWEP projects in Oregon received less money in each subsequent year. Fortunately, the state office has some flexibility to determine how limited AWEP funding is allocated between projects within the state. This allows the state staff to proactively engage with partners, explain the circumstances, inquire about project needs and allocate the limited funding as fairly as possible.

4.2.2.3 Summary

Box 5. Summary of Institutional Factors that Enable or Constrain AWEP Implementation at the State Level provides a summary of the institutional factors that enable or constrain implementation AWEP at the state level. AWEP facilitates a more strategic approach by focusing funding on priority resource concerns within a defined hydrographic area and also represents a transition towards more partnership-based approaches. State representatives highlighted the importance of engaging partners and attributed much of the success of AWEP projects to partner contributions. Past investments in planning and partnership-building at the state level were key to both securing and implementing AWEP projects. AWEP also helped the state office to familiarize its staff with more strategic approaches that are being pursued at the state level for general EQIP funds. State representatives expressed concern that NRCS rules are difficult to communicate to new partners, which may hinder the partnership-based approach. State representatives also indicated that there may be limited local capacity to properly deliver programs and fully support landowners and managers. Finally, the way that AWEP projects are selected may partially circumvent the local and state NRCS offices. As a result, some AWEP projects may not fully align with state and local NRCS priorities and strategies. State representatives emphasized the need for the AWEP applicants to engage with state and local NRCS representatives to fully understand program rules, to make sure projects address priority resource concerns, and also to ensure that NRCS has the capacity and resources to assist with project implementation.

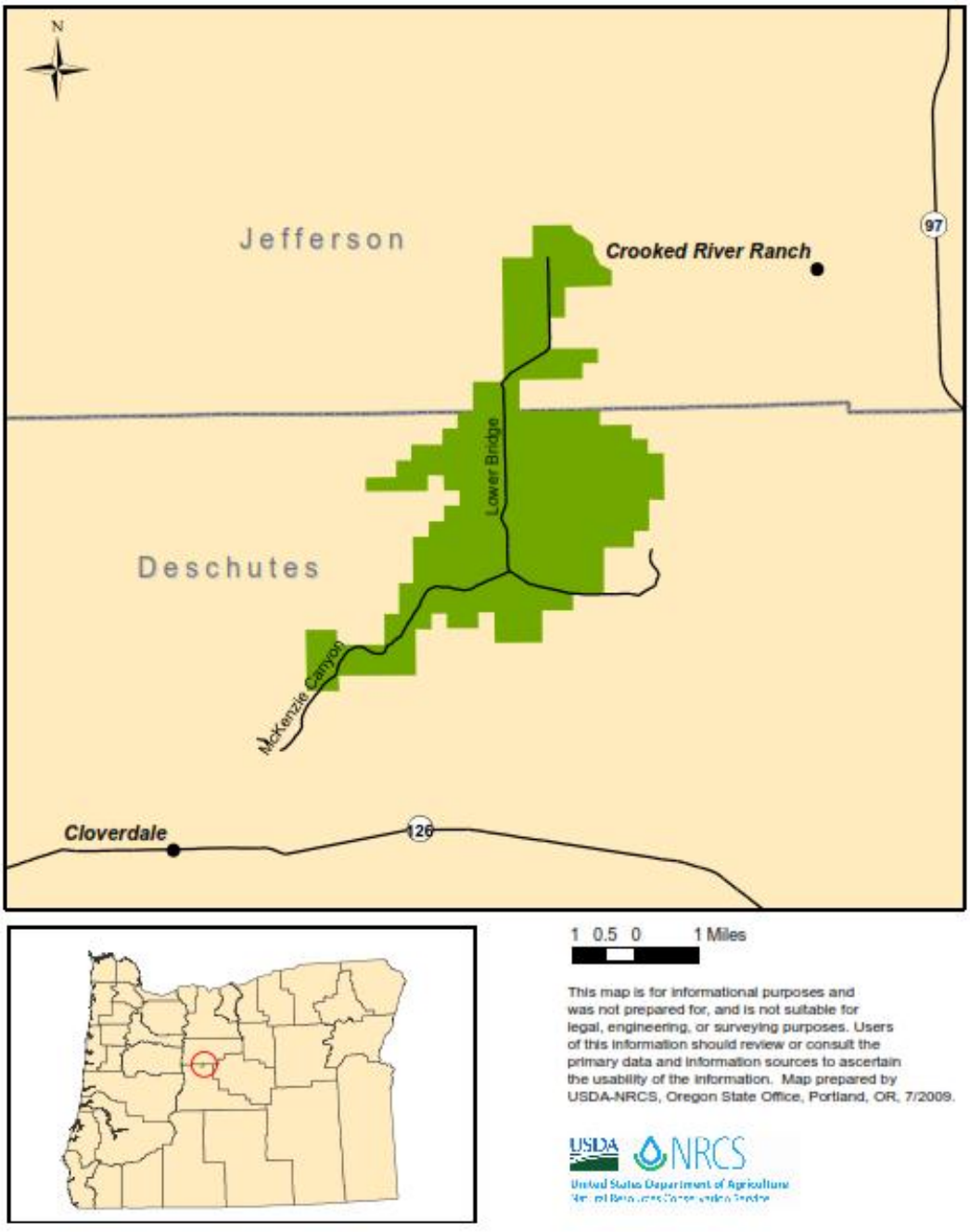
Box 5. Summary of Institutional Factors that Enable or Constrain AWEP Implementation at the State Level

+/-	AWEP uses existing EQIP program rules, which are well known and widely accepted amongst NRCS staff at multiple levels
+	NRCS involvement in legislative and rule-making processes during AWEP development
+	Previous NRCS investments in watershed-scale planning in the basin (e.g., Rapid Watershed Assessments)
+	AWEP targets funding to priority resource concerns in a specified hydrographic area
+	AWEP encourages greater local involvement in identifying projects and directing funding to locally defined priority areas
+	Previous NRCS investments in fostering partnerships at multiple levels (e.g., partnership liaison, Oregon Technical Advisory Committee, Basin Technical Working Group, Local Working Group)
+	Partners leverage additional resources to supplement NRCS capacity and implement project
+	Previous partner investments in strategic planning at the local and state level
+	Partner familiarity with developing strategic plans and competitive grant proposals
+	State office structured by basins (hydrographic areas) to facilitate inter-county coordination
+	Development and implementation of a state strategic approach to delivering EQIP that resembles AWEP
+	AWEP provided the state office with an opportunity to “test-run” a strategic approach
+	NRCS investments in training to improve staff capacity to conduct strategic planning, implement multi-landowner projects and build more effective partnerships
+	EQIP program is transparent, accountable, and limits potential abuse of the system
–	No requirements at the national level to coordinate with state and local NRCS offices in AWEP proposal development
–	Complex program rules are difficult to communicate to partners
–	Inconsistent federal funding for local projects
–	Limited local capacity (administrative and technical assistance dollars are not tied to project needs)
–	Limited ability to supplement capacity of local partners
–	Individuals within the agency may be resistant to new strategic approaches

4.2.3 McKenzie Canyon Irrigation Improvement AWEP Project

The McKenzie Canyon AWEP Project is being implemented in the Lower Division of the Three Sisters Irrigation District (TSID) in the Upper Deschutes River Basin of Central Oregon (see *Figure 5. McKenzie Canyon AWEP Project*). The AWEP project builds upon a larger project in the TSID to replace 10.5 miles of open irrigation canals with pressurized, high-density polyethylene (HDPE) pipeline. AWEP has enabled landowners within the Lower Division of the district to do the on-farm work necessary to connect to a newly installed pressurized mainline. The program provided financial assistance to construct turnouts as well as to replace on-farm delivery ditches with HDPE laterals that deliver high pressure water to 31 farms and 1,976 acres. In addition, AWEP funds are used to install sprinkler systems on properties that had previously relied on flood irrigation or old and inefficient sprinkler systems. The overall objective of this project was to improve irrigation efficiency, increase agricultural productivity, return water instream and reduce energy costs by connecting landowners in the Lower Division of district to the pressurized pipeline. This section examines how AWEP has changed the decision-making arena at the local level with the aim of identifying institutional factors that enable or constrain actors from implementing a more integrated approach to water management.

Figure 5. McKenzie Canyon AWEP Project



4.2.3.1 Context

Water for TSID is diverted from Whychus Creek, which is a tributary to the Upper Deschutes River in Central Oregon. The previous open canal system resulted in seepage losses ranging from 40 percent to 50 percent, exacerbating low flow conditions in Whychus Creek and impacting the district's ability to deliver water. Extreme low flows during the late summer irrigation season impaired water quality and habitat for Endangered Species Act (ESA) listed bull trout as well as other resident trout in Whychus Creek. Whychus Creek was historically an important spawning and rearing stream for Steelhead and Chinook salmon and efforts to reintroduce these species started in 2007 as part of the Federal Energy Regulatory Commission (FERC) re-licensing requirements for a dam that had historically limited passage to the Upper Basin. Fisheries and water quality are the primary drivers for instream flow restoration in the Upper Basin (NRCS, 2004).

The high elevation (2700-3500 feet) and low rainfall create difficult conditions for crop farming in the Deschutes River Basin. Despite the challenges, the Lower Division of TSID is a mainstay of commercial agriculture in the area and produces a diversity of crops. Alfalfa or grass hay is grown on over half of the acreage. Roughly a quarter of the acreage is in irrigated pasture, which supports various livestock operations such as cattle, horses, llama, alpacas and elk (NRCS, 2004). Specialty crops such as carrots and radish for seed are grown on the remaining acreage. For many landowners in the area, both within and immediately surrounding the Lower Division of TSID, farming is not a sustaining economic activity, but rather a lifestyle choice, which impacts the dynamics of the community and the irrigation district.

The piping project on the main canal had been a long-time goal of the irrigation district board and manager who wanted to find a "win-win" solution for sustainable

agriculture and fisheries. This project complemented a larger comprehensive strategy developed by local conservation organizations to restore instream flows and habitat in the Whychus creek system. Early in the process the district was able to secure PL-566 watershed planning grants through NRCS, which were crucial for conducting environmental assessments and designing the pressurized system. PL-566 funds were also used to assist with the cost of materials for the main pipeline. Piping of the main canal was initiated in 2004 with significant financial and technical support from NRCS, the Oregon Watershed Enhancement Board (OWEB), Bureau of Reclamation, the Deschutes River Conservancy, and Portland General Electric/Confederated Tribes of Warm Springs. Entities in the Deschutes River Basin have a strong history of effective inter-organizational coordination and collaboration, which facilitated the process. TSID and the landowners in the Lower Division also provided significant in-kind investments for work on the main pipeline: "So the farmers down here got together and we took a very unique approach because the first phase of the project was almost built with 100 percent volunteer labor" (DS-6). Landowners pooled their money to purchase a welder, which volunteers used to weld 10 miles of varying sizes of HDPE pipe over the course of 4 winters.

4.2.3.2 Action Arena

As the main pipe neared completion, TSID applied for AWEP to assist with the on-farm portion of the work. The district manager had foreknowledge of AWEP through his membership with the Oregon Water Resource Congress and had advocated for the program at the national level. During the proposal stage, TSID worked closely with the Jefferson Soil and Water Conservation District (SWCD) to conduct outreach and inform landowners, many of whom had not previously engaged with NRCS, about the AWEP program and the EQIP process. The partner also worked closely with local and state NRCS staff to develop a successful national proposal for AWEP. The McKenzie Canyon AWEP Project allows landowners to enter into three-year EQIP contracts

during each annual sign-up period. The project was fully funded during its first year at $727,830, but funding was reduced in subsequent years to $177,038 in FY 2010 and $198,995 in FY2011. The on-farm work was initiated in phases, based on available funding, and most of the projects are either complete or nearing completion. In years with diminished AWEP support, the local NRCS office was able to supplement AWEP funding with regular EQIP funding.

All of the participants interviewed for this study were largely satisfied with both the process and outcomes of the AWEP project. From NRCS's perspective, having AWEP nested within EQIP made it easier to understand and implement at a local level since it was consistent with past approaches:

> It doesn't make sense to have two sets of rules and two manuals. It is hard enough to get one current EQIP manual, if they had to generate three of them for every farm bill, we would be three farm bills down the line before we had a working manual for the last one. That consistency is important. Unless they dramatically changed the EQIP program and somehow modify the NRCS's role versus the partner's role or something like that where the partners are being asked to do more of it, I don't see any reason now why there would be an advantage to having a separate set of rules. (DS-2)

In addition to the administrative consistency, there were several strategic aspects of AWEP that made it a good complement to the work being done in the McKenzie. AWEP was essential for targeting sufficient funding to actually complete a project: "What is effective is that it carves out the dollars so that you can focus on tying into the larger projects. EQIP just doesn't have that funding level that AWEP does" (DS-6). Were it not for AWEP, landowners would have had to "compete" for limited funding based on broader federal, state and local criteria and may not have "ranked out." AWEP allowed NRCS and its local partners to dedicate funding to a specific, high priority resource concern, thereby expediting the overall project:

> So it became a focus area, is basically what it was, because you couldn't dedicate EQIP funds to this project every year time and time again because there's other, obviously, under EQIP we're addressing other resource concerns. So AWEP made it possible to direct funds to the McKenzie project. (OR-5)

AWEP projects occur in a defined a geographic priority area and only cover certain predetermined conservation practices. Consequently, AWEP provided some certainty that there would be funding available to assist landowners in connecting to the main pipeline and upgrading their irrigation equipment. Enhanced certainty for financial assistance fostered greater landowner buy-in within the irrigation district. Furthermore, finding funding for on-farm improvements can be difficult: "The on-farm piece has always been tricky because it is improving somebody's private property" (DS-4). NRCS fills this very important funding niche for conservation projects that generate private benefits in addition to public benefits.

Much of the success of the McKenzie Canyon AWEP project was attributed to the upfront planning effort that preceded the entire piping project. Key planning activities included the watershed assessment, conducted in the mid-2000's, the environmental assessment and watershed plan developed through the PL-566 process and the on-the-ground work of NRCS engineers. NRCS was instrumental in the upfront planning process:

> [The partner's] relationship with NRCS has been stellar. […] Oregon's rapid watershed assessment process has helped the Klamath, Owhyee, the Deschutes, the Willamette. They have just done a really awesome job. Because of their planning and because of their engineering staff, a lot of really great projects have gotten built. That is a component that I would advocate and encourage more of, because that is how good AWEP projects are going to develop. There is no question that without the NRCS assessment and engineering, I would not have the ability to say, 'yeah here is the project, we are ready to go.' (DS-6)

As a result of investments in planning and design, the irrigation district had a very clear plan with distinct phases that allowed for a more strategic and efficient approach once the AWEP project was approved:

> McKenzie Canyon in particular was easier because it was a discrete project. [The district] knew exactly how many landowners they had in there. They already had a pretty good sense of how many on farm dollars it was going to take to get everybody hooked up. A lot of that work was already done before that grant was approved. (DS-2)

This was particularly important given the rapid turnaround expected at the local level once the sign-up period was announced. In many cases there was a short window for new contracts to be signed for the McKenzie Canyon AWEP project and they did not align with traditional EQIP sign-up periods. The irrigation district knew who still needed assistance and was able to mobilize landowners and connect them with NRCS during the brief sign-up period.

There is a continual need for funding sources and partners that can support comprehensive project planning. NRCS funding and on-the-ground engineers played a pivotal role in the planning process and it's important to provide funding for this type of work into the future. Limited planning dollars was mentioned by two interviewees as a significant barrier to implementing large-scale strategic projects:

> I would say one of the common barriers is getting enough information to bring forward a proposal. I mean getting money for design work. There are a lot of potential projects out there, but often they require some level of due diligence and time and engineering […] but, there, there aren't many grant programs that we work with that give you enough flexibility to look into projects and find ones that maybe don't work out for a variety of reasons. Not be held accountable. I mean no one wants to fund a project that doesn't happen. […] Sometimes just those initial investments are hard to find money for. (DS-5)

A project like the McKenzie Canyon AWEP project benefits greatly from upfront planning, and yet funding can sometimes be limited for this type of work since most

many organizations prioritize "shovel-ready" projects. Programs like NRCS's Small Watershed Program (PL-566) fill an important funding niche for planning projects.

In addition to the extensive planning efforts, the TSID had been working over the years to educate landowners, complete conservation projects on a smaller scale and enhance capacity within the district: "They have been preparing themselves, doing small projects and building capacity" (DS-5). The preparatory work, both in designing the project and preparing the people was a fundamental driver of success. The structure of AWEP encourages up-front planning and local buy-in to the concept, which is requisite for projects that require coordination between landowners. An AWEP proposal that can demonstrate widespread local buy-in is ranked more highly in the competitive process. The McKenzie Canyon project was an "all or nothing" project meaning that all landowners needed to be able to connect to the main pipeline in order for it to be successful (DS-3). This made local buy-in particularly important. AWEP encouraged greater stakeholder input during proposal development, which had implications for project success:

> You're all meeting together with the producers so everybody is sitting at the table and you get buy-in before you get the dollars and so things go smoother. In the past, you just had it opened up…you advertise and hope people come in the door. But when you have a project area and you do all the groundwork ahead of time, you kind of know what your participation is gonna be ahead of time. We like that. And it's not a guarantee…it's a voluntary program so nothing's guaranteed…but the more groundwork you lay upfront, then the better your chances are for success down the road. (DS-1)

Local landowners were credited for their leadership in galvanizing support. The project partner was also a key player in generating landowner buy-in by effectively communicating the personal and communal benefits. The social influence of the irrigation district and neighbors was crucial for getting some of the more reluctant

landowners to participate: “because a lot of times there might be some reluctant landowners and only their friends and neighbors can talk them into it.” (DS-2)

Strong leadership within the district was a major contributing factor to the realization of the project. The TSID manager was responsible for aligning myriad funding sources, all with their own sets of rules, with key phases of the project while also resolving inter-personal, political, administrative and technical issues that arose during project implementation:

> [The manager] is super pro-active, not the type of irrigation district manager you normally meet and this guy was a real go-getter, learning about all the programs, figuring out how the rules worked and then plugging in all the landowners […] working with each of them to fill out an application. […] He spent a lot of time working with folks at the NRCS office, getting to know all the Farm Bill programs. […] He had the wherewithal and expertise to work through all these hurdles and smooth over all the little complications. (DS-5)

Effective leadership and a cohesive governing body within the TSID were crucial to moving the project forward.

The biggest challenges from an administrative standpoint were deadlines and processing paperwork. NRCS and the project partners all mentioned that timing and “just the logistics of getting the right people through the door at the right time,” (DS-2) presented a major challenge and resulted in several landowners missing out on the opportunity to receive financial assistance because they could not qualify in time. The lengthy contracts and general amount of paperwork required for the process also presented an obstacle to administering the program: “The paperwork on contracting is always a barrier, getting people eligible and getting them through that process. That’s always been a barrier” (DS-1). This was especially challenging given the number of new applicants who had not been previously entered into the database: “Whenever we have a program where we have got a significant number of new people that haven’t

participated in USDA programs before, you end up with the challenge of getting them in the system" (DS-2). Partners expressed frustration with the "antiquated process" and felt that there should be less paperwork and better coordination between NRCS and the Farm Services Agency (FSA), which is NRCS's sister agency that determines eligibility.

Staff turnover during the project also presented a minor challenge. Shortly after the project entered the implementation phase, the original district conservationist departed, leaving one district conservationist to cover a three county area. The project partner provided consistency in the interim. Once the new district conservationist came on board, the project partner helped to get him up to speed on the status of the project: "I rely on [the partners] a lot as far as who is doing what and who is ready to go" (DS-2). One interviewee noted that there is a need to be explicit about the roles and responsibilities of NRCS and its partners:

> It definitely needs to be a clear understanding between the sponsor and the NRCS whose roles are what. I think the policy is deliberately fairly flexible on that because there are so many different kinds of projects and different relationships and different sponsoring organizations. (DS-2)

Closely coordinating with project partners will minimize redundancy, focus resources on the highest priorities and ensure that there are no gaps in coverage. These types of agreements should be recorded, if possible, to ease transition in the case of staff turnover.

Unanticipated problems that arose during project implementation required both NRCS and the project partner to creatively manage the administrative process. During the second year the project partner did not receive the full amount of money that was expected, so the partner asked landowners to temporarily withdraw part of their plan in order to address some of the higher priority issues first:

> In some cases we did the hookups on that first system, but we didn't do the sprinkler system pieces of it, because we knew that there was going to be a second opportunity to come back and pick up some of those other bits that we had left on the table. (DS-2)

In this instance, the project partner had a clear idea of the sequence of events, had the trust of the individual landowners and had the flexibility to negotiate with landowners. The project partner was in a position to negotiate with individual landowners more effectively in the context of these constraints when compared to an NRCS staff member.

The project was also delayed in its second year due to a lawsuit that sought to prevent the main canal from being piped. Piping the canal turned out to be a very emotionally charged issue for some landowners who were adjacent to the canal but were not district members (and thereby did not stand to directly benefit from a pressurized system). Some landowners preferred the aesthetics of an open canal and the perceived wildlife benefits. Attempts to negotiate with the litigants were all unsuccessful. Consequently, the lawsuit disrupted implementation of the project and delayed some of the on-farm work that was planned under AWEP. EQIP rules require that a landowner initiate a cost-share practice within the first twelve months, but NRCS could not do the on-farm work until there was a pressurized pipe to hook onto. In this instance NRCS had to obtain waivers for the twelve-month requirement for each individual contract that was impacted by the delay. Although the local NRCS staff was able to adapt the project in response to the delays, the need to modify every individual contract was an unnecessarily laborious process.

There were several aspects of AWEP in particular that worked well for irrigators. For one irrigator, AWEP involved a more straight forward approach in comparison to EQIP:

> AWEP it was a much more of a turn-key operation, where you knew what you were applying for, and if you were approved, you knew what you would get. In the EQIP program, they would put you in a group and determine how much cost-share you would get. It might be this much, it might be that much. It depended on how much money they had. So they had a committee look at it. So the AWEP program was much more straightforward. I knew exactly what I was applying for and what I was getting. (DS-8)

Involvement of the entire Lower Division of the irrigation district also helped to reduce information costs. Information was readily shared between NRCS, the staff and board of TSID and the members of TSID. There was a community of people helping each landowner connect with the central project. Connecting individual farmers with the main pressurized system was extremely important and according to the irrigators, AWEP was a pivotal program for completing the project: "honestly, without this program, it wouldn't be happening" (DS-9).

All four of the irrigators interviewed for this project had previous experience with NRCS programs, had a good working relationship with NRCS and were not overwhelmed by the process. All of the irrigators felt that the NRCS staff was very accessible and responsive and the irrigators were particularly complementary of the engineering staff. Any barriers mentioned by irrigators were unique to each irrigator's situation. One irrigator had a minor disagreement with the NRCS staff about engineering design (the length and path of buried pipe) and did not feel that their input was valued. The irrigator worked with NRCS and was only able to modify the design when a new engineer was assigned to the project, highlighting the fact that some challenges may be more indicative of individual personality rather than administrative rules. According to the irrigator, the modified engineering design saved a significant amount of time and money, both for himself and for the taxpayer.

EQIP contracts work by reimbursing landowners after the project is installed and inspected. For this particular project, EQIP reimbursed irrigators for the cost of materials and the irrigator's cost-share consisted of the labor necessary to install the pipeline. One irrigator had a difficult time paying for all of the materials and equipment upfront and had accrued a significant amount of interest on the lines of credit he had taken out for the first phase of work. He identified upfront costs as a significant barrier to involvement: "That's one of the biggest obstacles with this program is that there's nothing upfront. You get the money back when you're done" (DS-9). The interviewee indicated that this challenge was not particular to his situation: "I know people who have opted out of EQIP contracts because they couldn't afford to be involved" (DS-9). This interviewee recommended that NRCS develop a sliding scale to address the disparity between different landowners' ability and willingness to pay. He recommended that NRCS connect landowners with subsidized or guaranteed loan programs for large capital intensive projects. The interviewee also indicated that the potential tax implications for enrolling in a program are very confusing, and there was no one available at NRCS to help explain those implications.

4.2.3.3 Outcomes

It is important to note that many of the outcomes achieved through AWEP largely resulted from the previous work and planning efforts of partner organizations and NRCS. AWEP provided an additional funding stream for partners to continue work that had been undertaken using alternate funding mechanisms. It was difficult to clearly distinguish which, if any, outcomes *resulted* from AWEP itself. This section details outcomes that NRCS and its partner believe that were facilitated, in part, by AWEP.

The main piping project, along with the AWEP project, had significant benefits for the irrigation district and broader community in terms of economic outcomes. Pressurized

water allowed for greater certainty throughout the Lower Division; a pressurized system ensured that landowners would receive their full allotment throughout the growing season:

> The landowners are lovin' it down there…because now they can irrigate more efficiently as opposed to…in the summertime they're previous system would dry up near the middle or three quarters of the way through the irrigation season. They didn't have the assurance of water. Now they have total assurance of water. (OR-5)

This was the case for one of the interviewees who was at the "end of the line" in the Lower Division and could not previously rely on irrigation water to reach his property later throughout the season given the significant conveyance losses. More efficient, effective and reliable water delivery resulted in greater agricultural productivity throughout the district. Interviewees noted that producers have transitioned to growing higher value crops and landowners can obtain more and better agricultural products from their land due to reliable water supply throughout the season. For instance, producers growing hay now have the assurance of at least three cuttings as opposed to one.

For most producers, a pressurized system eliminates the electricity costs that had been associated with pumping water out of irrigation ponds and on-farm delivery of water. Combined with more efficient water use the overall savings would allow them to recoup their investment in the on-farm pipeline and invest in other aspects of their operation: "One of the biggest benefits, by providing this water here, at an extremely low cost to the farmer, it gives me the ability to build towards the future and make other important investments." (DS-9) Increased productivity and lower operation costs allows producers to "pour a tremendous amount of dollars into the local community" (DS-6). Producers have invested more money in irrigation infrastructure, seed,

fertilizer and other inputs, which bolsters the local businesses that support the farming economy.

From an irrigation district standpoint, the TSID significantly reduced all of its operations and maintenance costs in the lower district, which saves the district money. Maintenance costs associated with the new system have been minimal in comparison to maintaining an open canal since canals have to be burned and cleaned:

> This project benefited not only the farmers, you know, we ended up with pressurized water and a little bit more water because we eliminated the loss. But it benefited the district, they don't have the maintenance that they had, you know, cleaning ditches and burning stuff along the ditch banks and the head gates and the meters and everything. (DS-10)

All of the farms are now metered, which allows the district to manage water allocations more efficiently and fairly. According to one TSID representative, the system now "runs like clockwork" and any misuse in the system can be identified and handled more readily (DS-6). Successful implementation of this large-scale project also opens up other opportunities for TSID to further improve its operation. For instance, TSID submitted another successful AWEP proposal to fund on-farm connections to a pressurized system in the Upper Division of the district. Furthermore, TSID is looking at ways to generate energy through the pressurized system that the district can sell back to the grid. The earnings from energy production could be used to invest in future improvements to maintain viable farming and ranching operations within the irrigation district.

The McKenzie project also has significant environmental outcomes. Providing pressurized irrigation water to the Lower Diversion enables TSID to return 6 cubic feet per second (cfs) of protected instream flow to Whychus Creek. Coupled with the other projects that TSID is implementing inside the district, at least 20 cfs of protected

instream flows will be restored to Whychus Creek. Furthermore, a pressurized system eliminates conveyance losses and irrigators in the Lower District use only the water that they need. The efficiency of the system allows water that is not being used to remain instream:

> The less water the irrigation district needs to divert to serve their customers, that water is going to stay in the creek, so it is not like they divert their full allocation whether they have customers downstream that need it or not, they are going to manage their diversion to meet the demands of the landowners. So I have a sense that a significant amount of that water, in truth, is staying in the creek. (DS-2)

As a result of the protected instream flows and irrigation efficiency improvements, habitat for ESA listed bull trout has been enhanced and minimum spawning flows improve the likelihood that reintroduction of Steelhead and Chinook salmon to the Upper Basin will succeed. This helped to address some of the irrigators' ESA concerns and as one irrigator put it, "it keeps the government agencies off of our back because we are working with them to get water back in stream" (DS-10). Improved fisheries will have a significant economic effect in the region since healthy, productive streams attract more anglers and outdoor recreationists. Furthermore, these fisheries are significant cultural resources for local tribes.

More efficient on-farm water use reduces runoff and leaching of fertilizer, herbicides and pesticides to surface water and groundwater sources and improves water quality. The open canal no longer receives on-farm runoff and livestock no longer have access to water in the canal: "historically farmers have always let their cattle and horses run free and drink out of the canal. So the on-farm quality of that water is greatly improved now" (DS-6). The district and NRCS have assisted landowners in constructing stock water ponds to benefit livestock. Since the Lower Division is a closed system (there is no return flow from the irrigation district to the source) the

improvements in water quality are less significant than the water quantity improvements, but they still contribute to the overall environmental outcomes. Finally, the irrigation district invested in creating more ponds to support wildlife habitat since there would no longer be an open canal. These ponds have year-round benefits to wildlife whereas the canal only benefited wildlife during the irrigation season (when water was flowing in the canal). Several interviewees noted that they have noticed more wildlife, including birds and deer, within the last two years. Improved wildlife habitat can have a positive effect on the local economy as more tourists visit the region for outdoor recreation.

Social outcomes are much more difficult to ascertain because they are generally less tangible than environmental or economic outcomes. The piping project exposed some fissures between irrigators, who valued more effective, and efficient water delivery, and some non-irrigators, who placed greater value on the open canal. Unresolved tension may emerge in other arenas. Interviewees noted that among the irrigators who volunteered time and resources to install the main pipeline, there was a greater sense of community and camaraderie. However, some irrigators expressed that the distribution of labor and investments on the main pipeline were inequitable, which may cause a slight rift between those who contributed and those who did not. The primary positive social outcome from the AWEP project is that it improved the relationship between NRCS and basin partners, including landowners. A successful project could have beneficial implications for future projects: “When the landowners see […] the plusses, the benefits of these AWEP projects than they’re apt to get engaged with not only NRCS, but our other partners as well” (OR-5). There was increased trust between NRCS, the project partners and the landowners who were able to work cooperatively to resolve issues that arose.

4.2.3.4 Summary

Box 6. Summary of Institutional Factors that Enable or Constrain McKenzie Canyon AWEP Implementation provides a summary of the institutional factors that enable or constrain implementation of the McKenzie Canyon AWEP. As identified at the national level and state level, AWEP facilitates a more strategic approach by focusing funding on priority resource concerns within a defined hydrographic area and also represents a transition towards more partnership-based approaches. Partners were able to leverage additional resources to help implement the AWEP project and were also able to capitalize on the relationships that they had formed over the years with local landowners. Previous investments made by NRCS and its partners in strategic planning efforts were integral to successful project implementation. The most significant challenge faced by NRCS and its partners were the administrative requirements for establishing and modifying individual contracts with landowners. Based on this case study it appears that AWEP, and EQIP, are well equipped to assist landowners with capital improvements such as irrigation upgrades, especially within a well-organized irrigation district.

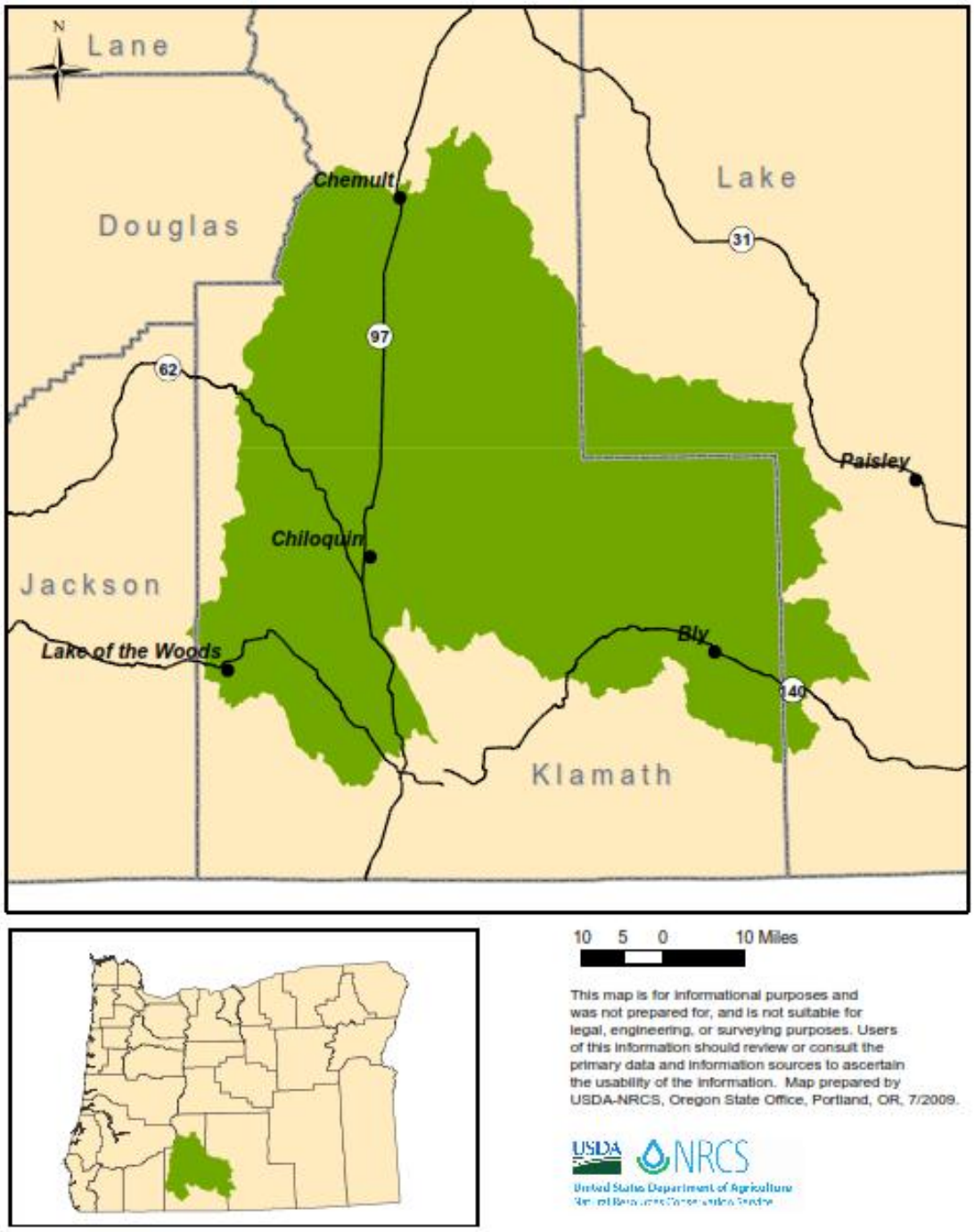
Box 6. Summary of Institutional Factors that Enable or Constrain McKenzie Canyon AWEP Implementation

+/-	AWEP uses existing EQIP program rules, which are well known and widely accepted amongst NRCS staff at multiple levels
+	Partner involvement in legislative and rule-making processes during AWEP development
+	AWEP targets funding to priority resource concerns in a specified hydrographic area
+	AWEP enables local partners to identify projects and direct funding to locally defined priority areas
+	Previous NRCS investments in watershed-scale planning in the basin (e.g., Rapid Watershed Assessments, PL-566)
+	Previous partner investments in strategic planning and building local capacity to collectively implement irrigation district projects
+	Strong local leadership (within the partner organization as well among local landowners)
+	Well defined hydrographic area with clear project boundaries and specific conservation practices
+	Existing governing body that connects landowners with opportunities (i.e., irrigation district)
+	Landowner benefits of involvement in AWEP project are clear
+	Scope of work accomplished under AWEP is a part of a comprehensive restoration strategy developed by multiple local and state partners
+	Strong network of local and state partners (including NRCS)
+	Good working relationship between partners and NRCS
+	Good working relationship between landowners and NRCS
+	Local partners leverage additional resources to supplement NRCS capacity and implement project (conduct outreach, mobilize landowners during sign-up period, organize overall project implementation, monitor outcomes)
+	Technical capacity of NRCS engineers
+	Partner familiarity managing multiple programs with different rules
+	NRCS provides funding for materials so that landowners can connect to main pipeline
+	EQIP program is transparent, accountable, and limits potential abuse of the system
–	Unpredictable project deadlines (deadlines vary each year) and brief sign-up periods
–	Extensive administrative requirements for EQIP enrollment
–	Unpredictable funding (reduced each year)
–	Staff turnover in local office
–	Lack of clarity in roles and responsibilities of NRCS and partners
–	Personal disagreement between landowner and NRSC engineer on program design
–	High upfront costs for landowner participation
–	Lack of information for landowners on tax implications

4.2.4 Upper Klamath Lake Watershed AWEP Project

The Upper Klamath Lake AWEP is being implemented in sub-basins that contribute water to Upper Klamath Lake in South-Central Oregon (see *Figure 6. Upper Klamath AWEP Project*). Upper Klamath Lake is critical to the recovery of endangered fish species in the Klamath Basin and it is also the source of irrigation water for thousands of acres of farms and ranches. The purpose of this AWEP project is to complement the efforts of Klamath Basin Rangeland Trust (KBRT) and the Oregon Watershed Enhancement Board (OWEB) to increase instream flows and improve water quality. The AWEP project enables landowners to convert either all of or a portion of their pasture to partially irrigated or non-irrigated dryland pasture while under contract with NRCS. The project also provides financial assistance for measures such as cross-fencing and stock water facilities for cattle management. The overall objective of the project was to enroll 15,000 acres of pasture into dryland contracts, which would result in the delivery of an additional 15,000 acre feet of water into Upper Klamath Lake, improve water quality in the system, and enhance aquatic habitat for listed species in the Basin (OWEB, 2009). This section examines how AWEP has changed the decision-making arena at the local level with the aim of identifying institutional factors that enable or constrain actors from implementing a more integrated approach to water management.

Figure 6. Upper Klamath AWEP Project



4.2.4.1 Context

The AWEP project covers a large geographic area in the upper basin, including the Sprague, Williamson, and Upper Klamath Lake sub-basins. The Sprague River sub-basin covers approximately 1.02 million acres, the Williamson River Sub-basin covers 928,000 acres and the Upper Klamath Lake sub-basin covers 465,300 acres. Combined, the Williamson and Sprague River sub-basins make up 79 percent of the lake's total drainage area. Consequently, the confluence of the Sprague and Williamson contributes 758,800 acre feet per year to Upper Klamath Lake, which is almost half of the lake's total annual water supply (OWRD, 1999). Irrigated pasture is the predominant land use in all of the sub-basins, which supports extensive livestock grazing operations. Water quantity and quality in Upper Klamath Lake are major resource concerns because they impact important fisheries in Klamath Lake and the Klamath River. ESA listed species, including the Lost River and short nose suckers, interior red band trout and bull trout are key fish species present in Upper Klamath Lake. Water in the sub-basins is over-allocated, and land and water management practices contribute to elevated temperatures and nutrient loading, which has negative impacts on other listed species in the Klamath River. Loss of riparian habitat and fish passage barriers have also been identified as resource concerns.

KBRT, the main project partner in the AWEP project, was established in 2002 by two Wood River Valley landowners in response to the conflicts that ensued from the 2001 curtailment of water rights to Bureau of Reclamation irrigators and a catastrophic fish die-off in the Lower Klamath Basin in 2002. Although the landowners in the Wood, Sprague, and Williamson River sub-basins, collectively known as "off-project" lands since they are not a part of the Bureau of Reclamation's Klamath Irrigation Project (KIP) – were not immediately impacted by the curtailment, the KBRT founders saw the need and opportunity for landowners to proactively address water quantity and

quality concerns in the Upper Basin. KBRT uses voluntary incentives to encourage landowners to adopt different management practices that increase instream flows, improve water quality and restore critical habitat. KBRT is committed to addressing water quality and quantity concerns in a way that maintains the viability of the ranching economy and communities in the Upper Basin.

Water rights in the Klamath Basin have been under adjudication since 1975. The adjudication process seeks to establish the dates and quantities of water claims that originated prior to the State Water Code in 1909.[6] The list of claimants in the water rights adjudication process includes several federal agencies, irrigation districts, the Klamath Tribes, and private landowners who recently acquired land in the basin as well as families that have farmed and ranched in the basin for multiple generations (OWRD, 1999). All of these entities have claims to water in the Klamath that pre-date 1909. In December 2011, the adjudication process confirmed the tribes' entitlement to the amount of water necessary to maintain habitat for hunting, fishing, trapping and gathering on the Williamson River, Sprague River, Sycan River, Wood River, Klamath Marsh, their tributaries and springs (Hottman, 2011). While this amount has not yet been quantified, the ruling calls into question the water rights of individual irrigators in the Upper Basin since the Tribes have the most senior water right. The adjudication process, the mandate to protect ESA-listed species, and multiple lawsuits catalyzed an effort to negotiate a restoration agreement within the basin.

For over three years the Klamath Settlement Group, representing over 30 organizations, worked collectively to negotiate a comprehensive solution for the Klamath Basin that would restore fisheries, establish reliable water and power supplies for various user groups and sustain the local economies in the Klamath Basin. The

[6] The adjudication process is important because, like most western states, water use in Oregon follows the appropriation doctrine where "first in time, first in right" is the rule for allocating water.

final agreements, known as the Klamath Basin Restoration Agreement (KBRA) and the Klamath Hydroelectric Settlement Agreement (KHSA), were signed in early 2010, though the signatory parties are still waiting for authorizing legislation from Congress to approve and fund the agreement. The KBRA identifies a need to restore 30,000 acre feet of water to Upper Klamath Lake, preferably through voluntary mechanisms. Water rights adjudication and negotiation of the KBRA have been contentious processes and there is still significant uncertainty about how these decisions will ultimately affect off-project irrigators in the Upper Basin. Uncertainty about water allocation in the Upper Klamath Basin has prompted some landowners to seek ways to effectively manage their ranching operations with less water. Adjudication has been a significant driver for landowner participation in various conservation programs implemented in the basin, not excluding AWEP.

In 2002 the Bureau of Reclamation Klamath Project formed the Klamath Water Bank to meet the terms of the ESA by restoring instream flows. The Klamath Water Bank offered payments to landowners to transfer water instream by either idling their land or substituting surface water for groundwater. From 2004 to 2008 the Klamath Water Bank provided payments to Upper Basin landowners to forego some or all of their irrigation water to support downstream species recovery efforts (GAO, 2005). KBRT helped to connect landowners with the Klamath Water Bank and also helped to direct some of the Klamath EQIP funding towards dryland conversion projects. In 2007, funding for the Water Bank was decreased and the Bureau of Reclamation stopped making payments to off-project irrigators in the Upper Basin.

When funding from the Water Bank ceased, KBRT relied on Farm Bill programs to compensate landowners, albeit indirectly, for conserving water and leasing that water instream. NRCS programs compensated landowners to offset the estimated loss of productivity and associated income through a dryland transition. Although landowners

were not being directly compensated for leaving water instream, KBRT would work with willing landowners to arrange short-term leases through the state to protect that water right.[7] Landowners were able to transition into dryland grazing operations, protect their water right and determine, on their own terms, if they wanted to make a permanent conversion to dryland. For landowners who decided to make the transition permanent, KBRT worked with OWEB and other funding partners to purchase and permanently transfer senior water rights instream.

The AWEP project in the Upper Klamath Basin built upon prior work undertaken by the KBRT to transition ranches to dryland pasture and return water instream. Prior to the AWEP project, KBRT had already succeeded in leasing over 31,000 acre feet of water from 11 landowners (KBRT, 2008). In 2008, KBRT leased more water instream through the Oregon Allocation of Conserved Water Program than any other entity in the state and the interest in KBRT water leasing programs outpaced available funding for the first time (KBRT, 2008). Funding for the Upper Klamath AWEP project came at an opportune time since EQIP funding from the 2002 Farm Bill, which KBRT had used to support their work with landowners, was no longer available and there were no other mechanisms to support instream flow restoration efforts:

> There really is no funding for short-term leases is what we have run into here. In the Columbia Basin, under the Columbia Basin Water Transactions Program and the Bonneville Power Administration Program, there is plenty of funding available for short-term leases. Down here, OWEB and everyone says, we don't want to pay for something that is just temporary. If it is permanent, we would love to do that, but we are just not going to pay for something that is short-term. So that is really why we had to turn to NRCS's programs. They

[7] If a landowner does not use their water right within five years, it is subject to forfeiture. This is known as the "use it, or lose it" rule in Western Water Law. Since instream use is considered beneficial in Oregon, the landowner can protect that water right (even if it is not being used to irrigate cropland or pasture) by filing a temporary lease through the state Conserved Water Rights program. The landowner's water right is thus protected instream until they use it to irrigate or until they decide to permanently transfer the water right instream.

> were really the only one who could cover that short term effort. So it's a huge empty vacuum that the NRCS AWEP program has filled wonderfully. So, it is necessary for what we are trying to do down here. (KL-5)

AWEP was an important program for sustaining KBRT's projects in the Upper Basin that enabled landowners to experiment with dryland pasture and return water instream.

4.2.4.2 Action Arena

KBRT was actively involved in the development of AWEP at the national level, which undoubtedly influenced its ability to put forth a successful proposal. Although KBRT had previously been using EQIP to help landowners transition to dryland grazing practices and temporarily return water instream, "it wasn't a perfect fit" for the intended purpose because it could not compensate landowners directly for conserved water and instream leases (KL-5). Consequently, the staff and board members at KBRT began to engage with partners at the national level to conceptualize a regional approach to water management that would offer greater flexibility. Representatives from KBRT helped to draft the proposed language and worked with the broader AWEP coalition during the legislative and rulemaking processes. KBRT submitted an application for AWEP under the assumption that it would allow for greater flexibility in project design and implementation than traditional EQIP.

Most of the interviewees agreed that "AWEP is a great concept" and that it represents an improvement over traditional approaches to program delivery (KL-9). Interviewees highlighted the importance of addressing priority resource concerns in a coordinated fashion within a defined hydrographic area. AWEP was an important tool to sustain the momentum of previous efforts initiated by local partners and the dedicated funding allowed partners to work at a scale that could actually produce significant outcomes. Large-scale projects require significant financial investments, and the funding available through the general EQIP program at the county or regional level is limited:

> Under most EQIP allocations there is not very much money in a region to do it. For example, I think the EQIP down there is like $300,000-$400,000. And these are really expensive projects, so you wouldn't be able to really have an impact by doing such a small scale amount of work. So […] having something that can bring an increased pot of money focused towards one specific goal, is beneficial, because then you can say, we need to do x, y, z to have a measurable impact and then you have the funds to do it. (KL-3)

AWEP funding facilitated larger-scale projects that produced measurable environmental outcomes. As designed, AWEP also leveraged partner resources to help articulate those outcomes; in this particular project area, KBRT and OWEB had previously invested in infrastructure that enabled them to monitor and measure outcomes.

NRCS played an important role by providing a suite of conservation practices and technical assistance to help landowners during the transition. This differed significantly from the Klamath Water Bank, which took a more "hands off" approach:

> Under the water bank, it was up to the landowner to figure out what to do in terms of changes in management, and what levels of cattle they should put on there and everything. Under NRCS, there is more technical assistance, in terms of NRCS saying, 'Well, we *think* this is about what you can run. We *think* if you instituted this rotational grazing strategy, it would increase your productivity some. You no longer have water in your irrigation ditches, so we can help design and pay for an off-stream stock watering system for you.' So, NRCS does provide a host of other benefits that a straight water bank didn't. (KL-5)

Rather than just paying for water left instream, NRCS provided greater assistance to landowners to ensure long-term viability of their operation. From the partners perspective, it was beneficial that NRCS could help to develop comprehensive plans, identify specific management practices and assist with implementing those practices.

Each interviewee emphasized the importance of pursuing a partnership-based approach and attributed many of the project's successes to the strong working

relationships between local partners and landowners in the Upper Basin. Partners conducted outreach throughout the project area, assisted landowners in applying for AWEP funding, and helped landowners navigate NRCS program rules throughout implementation.

> What works is using the non-profit to help landowners usher through the NRCS process because a lot of landowners don't feel that is a very friendly process. It's complex and…to have someone that can help usher landowners through that is very helpful. (KL-6)

Each of the landowners highlighted the importance of having a local partner assist with the process: "[She's] been a real easy person to work with. Good advice from her. She knows what she's doing. […] I think [she] understood where I was coming from. She was from the area and knows what we have to do" (KL-10). Partners were well-trusted members of the community and were familiar with the landowners and their practices. This network of local partners was critical to project implementation given the limited capacity of the local NRCS office.

All of the landowners interviewed for this project indicated that neighbors had a significant influence on their decision to enroll in AWEP. One interviewee had been hesitant to engage with NRCS upon hearing from his neighbors about past negative experiences with Farm Bill programs, primarily the Conservation Reserve Enhancement Program, which is actually administered by a separate USDA agency (the Farm Services Agency). Two interviewees decided to enroll in AWEP based on the recommendation of their neighbors. One interviewee encouraged multiple adjacent landowners to consider the program after he successfully transitioned his pasture to dryland. This highlights the importance of building and maintaining good working relationships with landowners, since future involvement is predicated upon past experiences, demonstrable successes and word-of-mouth.

Landowner leaders who had previously transitioned some or all of their acreage to dryland through NRCS programs with the assistance of KBRT acted as ambassadors for the program by showcasing their property. These successful demonstration projects confirmed that ranchers could maintain viable ranching operations with less irrigation water and helped to allay some concerns about transitioning to dryland pasture. The early adopters promoted the practices to their neighbors, affirmed the credibility of local partners and galvanized additional landowner interest. NRCS, KBRT and other entities had also invested in research to reduce some of the uncertainty associated with dryland transitions.[8] These studies helped NRCS and project partners more effectively communicate potential tradeoffs with interested landowners, thereby reducing the overall information costs.

According to many interviewees NRCS and the project partners generally expressed that the AWEP project had been successful in achieving its objectives, though it was hampered by many institutional barriers that arose during project implementation. From the perspective of several interviewees, these challenges limited the overall effectiveness of the project: "It really has the potential, like a lot of the programs, to be *really* helpful. But somewhere in all the bureaucracy, things kind of fall apart" (KL-6) The most significant challenge faced by local partners was that the rules for AWEP changed over time and no one could fully predict how the program would operate from one year to the next:

> And the rules always seem to change from one year to the next. In other words, they've signed up for what they thought was a five-year program, now it's a three-year program. Oh, and by the way, we can't pay you what we said we were gonna pay you. So it seems like every time they turn around, something is happening where they fall off the radar, and they get a letter later, saying,

[8] The most extensive research was conducted by NRCS in partnership with other organizations through the Conservation Effects Assessment Program (CEAP).

> well, we can't pay you what we were gonna pay you. So I have a lot of people call me about that. And [as a partner] it's out of my control, obviously. (KL-4)

Changes in the rules made it difficult for NRCS and its local partners to clearly convey project information to landowners, which reflected poorly on the organizations:

> The rules kept changing for awhile and that was…the most important thing in working with landowners is developing trust with them. Then if we tell them one thing and the rules get changed, for example, dates or rates or irrigation allowances or duties…if any of those change, then it diminishes the trust that we're building. So we have to be able to be consistent and we can't decide six months after we've entered an agreement that something's going to change. It really compromises our integrity and it's not a good way to do business. (KL-6)

Rules continued to change between sign-up periods which made it exceedingly difficult for local partners to provide any certainty and resulted in unmet landowner expectations.[9] After two years in the program, one particular landowner was still confused about how the program was being implemented: "I'm confused on the program and I've been confused since day one" (KL-11). An interviewee suggested that landowner confusion may be compounded by the fact that partner organizations are not familiar with the intricacies of the EQIP program rules and may have provided misinformation to landowners.

Interviewees mentioned several rules that changed over the course of the project: the list of acceptable conservation practices changed after the first year; the allowable contract length was modified during the first year; the contract deadlines were not consistent in any given year; project funding was decreased annually, thereby limiting the number of new contracts; and, the payment schedule (i.e., the amount that a landowner could be paid for the conservation practice) was reduced over time for new

[9] It is important to note that once a landowner enters a contract with NRCS, there are certain elements that will not change, such as the approved conservation practices and associated payment rates. These remain consistent throughout the life of the contract.

contracts. The issues involving conservation practices, contract length and payment schedules are discussed in greater detail below. Some rules were perceived as being too restrictive, namely the specific technical requirements for dry land seeding and the need to initiate projects within 12 months of signing a contract. Some rules could be modified in response to local conditions, especially when there was an unforeseen setback, but the process was generally very involved and required a significant amount of effort on behalf of local NRCS staff.

From the onset, project partners had a difficult time identifying the correct conservation practices to support project implementation. The project partners thought there would be greater flexibility to create new conservation practices and negotiate payments, but the partners had to select from existing conservation practices. NRCS did not have any conservation practices or associated payments that could be used to compensate landowners for leaving water instream. There was concern at the national level that leasing water instream might be construed as an attempt to fallow or idle agricultural land, which is a politically sensitive issue:

> It is very controversial because there were a lot of agricultural groups who resisted the idea of taking agricultural water off ag lands. I know that there has been some internal struggles about what they will and won't pay for related to that. But, basically, this is a new thing. NRCS never made payments tied to taking water off property. So there was a bit of a struggle to find their correct practice that applied. (KL-5)

Modifying water rights is a particularly complex issue that is within the state's jurisdiction and officials at NRCS did not want to be perceived as taking land out of production or infringing on state's rights. As one interviewee put it: "We tend to avoid anything that has to do with water rights or water itself. That's more of a state authority." (KL-2) Many states do not have the proper legal mechanisms in place to protect water instream and some states do not yet recognize instream flows as a

beneficial use. NRCS develops practices that do not pose a conflict with state rules and can be broadly applied across the United States. Political sensitivities at the national level can made it difficult for NRCS to tailor conservation practices and payments to this particular AWEP project.

When AWEP was approved at the national level it authorized five year contracts for landowners transitioning to dryland farming in comparison to standard EQIP practices, which had three year contracts. A longer contract length is particularly important when trying to transition to dryland pasture since it takes time for the new species to become established and for landowners to adjust their cattle management accordingly. In the first year, landowners generally need to remove all cattle from the portion of their property that is undergoing the transition to allow for the dryland species to take hold. During the following years the landowner gradually re-introduces cattle back onto the land. Project partners indicated that it can take five to eight years for a landowner to really be able to determine what will work on their property. Management practices also need to be responsive to individual landowner objectives and variability in environmental conditions. Although AWEP statutorily allowed NRCS to approve five year contracts for transition to dryland, NRCS favored three year contracts with the possibility to extend it for an additional two years. This added administrative complexity when it came time to renew a contract:

> When it came time to do a contract extension, NRCS has realized that they are not allowed to...they can't do a contract extension, they would have to do a new contract. And they can't do a new contract for the same practice on the same ground. So we hit this bureaucratic snag that we had not foreseen. (KL-5)

Landowners need ample time to make the transition to dryland and get comfortable with new management practices. Programs like EQIP appear to be better equipped to handle structural improvements (e.g., engineered solutions), but are less effective at

dealing with the nuances of changing landowner management practices over a longer period of time.

Finding the correct payment to help offset the cost of transitioning to dryland presented a significant challenge. The list of conservation practices and authorized payments changes every year and has affected this particular project: "For the first year it was fabulous, last year is was borderline, this year it is not good. (KL-5) When KBRT used EQIP prior to AWEP (from 2003 to 2007), landowners were compensated for each animal unit (AUM) that was excluded from their land during the dryland transition. This same approach was employed during the first year of AWEP, but landowners that signed up in following years were required to follow a different conservation practice that paid significantly less. The state office generally had flexibility to create a state-based cost-list that was responsive to variable conditions within the state, but in this instance the state was not able to effectively negotiate with the national office. According to interviewees, the resultant payment did not suit the project needs:

> The downside of NRCS being incredibly efficient at being able to pay producers is that we do it by putting everything in a box. So if you're doing irrigation, we will pay you one rate for converting to a sprinkler and one rate to convert to a drip system and one rate for converting to a center pivot, it's just on and on and on. And we have a rate for everything and everything has its rate. Nobody knew how to do conversion to dryland…what's the cost and what are you paying for? So they didn't have a price…there's no box to put that in. So they made up a box and the box didn't fit [this AWEP project]. It was an absolute mess. We knew how much to pay them and we had a good reason why, and we actually ran it that way one year and we got hammered by the national office. We didn't have the right box…and the right box would pay them nothing. We knew how much we needed to pay them, we put them in a box that would let us pay them that much, which wasn't the right box and the right box would pay them $8 bucks and they needed $26. (OR-2)

The local partners worked with the local and state NRCS representatives to develop rules that were more responsive to local needs and conditions, but were ultimately constrained by national rules. Within the last year, NRCS has moved from a state-based list to a regional list that covers multiple states. For instance, payments will be consistent between Washington, Idaho and Oregon. Using a regional list presumably makes NRCS more efficient in administering programs, but may limit local flexibility: "When you go to a regional level, you lose some flexibility" (KL-1). In the context of the Upper Klamath AWEP project, this has resulted in low payments that may not be sufficient to induce landowner involvement:

> So right now they have pasture rental rates from Washington, Idaho, and Oregon, and they average them together and come up with what the payment will be based on that. I am working in an area that has really high rental rates, but now we are sucking in low rental rates, so it is lowering what can be paid here, and it is making it far more beneficial for landowners to keep running cattle on the property than to risk going into this program for a year. They will actually take a financial loss under the new payment rate. (KL-5)

Annual changes in allowable payments made it increasingly difficult for project partners to conduct outreach, since they could not provide reliable information to landowners.

Project partners were hoping that AWEP would be a more fluid program that allowed for greater flexibility, but the program is constrained by the internal rules, regulations and processes required under EQIP. These constraints also hindered NRCS's ability to respond to unique local conditions or unforeseen setbacks. For instance, one landowner had planned to seed their property in the late fall, but winter came earlier than expected that year and the ground was frozen before the land could be prepared and seeded. The landowner thought it prudent to wait until spring, but the contract did not inherently allow that flexibility since the practice had to begin within a 12 month

window. The local office worked to modify the terms of the contract, but it was a laborious process for all parties involved:

> We had to go through this whole huge process to change it. So—and I understand they're accountable to their funds, but there doesn't seem to be any real ability at the local level to make decisions based on local information. And I'm not blaming the local office, 'cause their hands are tied. You know, they've got these set of rules. But if the ground freezes the first of October, there's not much you can do about it. (KL-4)

Partners cited several similar examples, which seem to exemplify the lack of local input and flexibility in project design and implementation. In some instances the lack of flexibility was attributed to local personnel, but for the most part the rigidity was attributed to national rules associated with managing EQIP projects. The partners pointed out that the local NRCS staff was generally great to work with and that some employees had even "gone leaps and bounds" to make the program work well for the project, but the program was ultimately too constricting for its intended purpose (KL-5).

Landowners also indicated that there was a lack of flexibility in program implementation. In some instances, it was unclear whether the rules themselves were inflexible, or whether the particular people implementing the program did not know how to adapt rules to fit the specific management needs of the landowner. One landowner encountered rigidity when trying to seed a portion of his pasture with dryland species. This landowner felt that the management practices required by NRCS were restrictive and the staff did not take his knowledge and management objectives into account. The landowner wanted to delay planting the dryland crop because, from his perspective, it was too late in the season for a new crop to take hold:

> I told [them] I wasn't going to plant [the dryland species] because it was too late, we needed to plant something else, and they were like – 'No, you have to plant this.' Then we didn't want to plant this particular type of seed – 'No you

> have to plant this type of seed.' [You have to wait until] the ground is ready, put a crop in it in the meantime like a cereal crop, but they went – 'No, you can't put that cereal crop in. You can't harvest anything off of it.' Didn't make any sense. It absolutely did not make any sense. And they said well, and they put it to me, they said, 'If you want to pay us back the money you go right ahead.' You want to get out of the program you're welcome to. I go – 'No, can't afford to.' You have to go by their program. You can't go by your own program. (KL-10)

In this instance, the landowner did not think that the field had been properly prepared prior to seeding and he expressed concern that the new species will not be able to withstand environmental stressors and compete effectively against pernicious weeds. He was frustrated that his efforts might all be for naught.

Another landowner had a disagreement with local NRCS staff about the water rights on his property, which impacted the payments he received: "So I did not irrigate and found out that I had about 11 acres more of water then they were paying me for…which I questioned at the time, but it was like – 'This is what it is, sorry about that…this is the way it's gonna be'" (KL-11). According to the interviewee the regional water master's confirmation of the water rights for his property did not resolve the variance between the paper water right and the way NRCS was assessing water rights. The process to resolve discrepancies between the landowner and NRCS may have been constrained by NRCS's need to follow program rules:

> There are so many rules. I mean there's a chart and paper for every aspect of this …people are not making decisions based on good sense and stuff like that, they're making decisions based on the rules…that's the reason it's taking so long to get something processed. (KL-11)

Negative experiences and lack of transparency may impede future effectiveness of these programs, especially as landowners share their experiences with other landowners. Building trust and maintaining consistency is incredibly important when working with private landowners:

> How the government works well with private landowners is through trust […] and that comes from familiarity and it comes from one rancher telling his neighbor, you know, call [this person], because they'll give you the straight scoop on it and will help you find a solution to your problem there. So continuity is really important. (KL-6)

Almost all the interviewees indicated that the NRCS conservation programs in general, and AWEP in particular could greatly benefit from greater flexibility at the local level. This would allow NRCS to be more responsive to local conditions and to adapt practices to meet landowner objectives.

According to local NRCS staff, AWEP was relatively straightforward in its implementation, given its administrative similarities to EQIP. Juggling myriad programs that all have their own sets of rules and drawing from different pools of funding, however, creates its own set of administrative challenges for local NRCS staff:

> Because it's very similar to EQIP, [AWEP is] no more complicated, but [we spend] more time spent juggling multiple programs, because they're all ranked separately, they look a little different, they're financed from different funding pots. All of those differences add up to more office time. Juggling EQIP versus AWEP versus CSP versus CCPI, watch out there's a lot of acronyms coming 'atcha. Every one of those has a different funding source and different rules. I've got all these binders up here in my office and for every program there's different policies. So you end up having to know more and more and more about more and more and more programs that do, theoretically, the same thing. AWEP and EQIP do pretty much the same thing. (KL-2)

It is difficult for local staff to understand the nuances of each program and each program requires additional administrative tasks which ultimately results in less time available for technical assistance. Funding increases for financial assistance have outpaced increases for technical assistance funding, thereby limiting overall capacity to administer projects and work with landowners:

> I would say NRCS over the years has had less time available to work with folks one-on-one to help them through some of these practices than we used to because we have so much money now that Congress expects us to get out of the door. So a lot of our time spent is just preparing contracts in the office, doing all the computer work to get it all set up…then we hand it to the producers and say 'here you go, have fun.' And in reality that's what happens now because we've had so much money on the front end, we're not able to spend as much time working with folks implementing those practices, we try…you know, we try to make ourselves available when they have questions and we'll go out to the field to visit with them, but reality is that Congress has set up so many different programs like AWEP, it didn't give us a lot of the technical assistance staff to help producers really think through and work with them to be successful. In other words, the financial assistance went way up, technical assistance went up some…it didn't quite track at the same pace. We're getting better with managing the financing and stuff, but we still often struggle with the technical side of it now because we do have so much work related to the financial side. (KL-2)

Creation of new programs through the Farm Bill and the allocation of more financial assistance dollars stretches NRCS's already limited resources to administer projects at the local level. In Klamath, this was exacerbated by the 2002 earmark which drastically increased the amount of financial assistance dollars available in the basin without a commensurate increase in staff resources.

Partners and landowners were complementary of the NRCS staff and sympathized with the challenge of working within a complex set rules: "I love the people, the people are super. But you can tell that they're hands are really tied by the rules." (KL-11). Most of the interviewees shared the view that NRCS has limited capacity to properly administer projects on a larger scale given limited staff and numerous administrative requirements. According to partners there is generally not enough staff to accomplish all of the work associated with these different programs, especially when it comes to strategic planning and outreach:

> In the local office here, NRCS does not have the staff, and maybe not the expertise, to do outreach to implement their programs. This office here is very understaffed for the amount of people that they're supposed to be serving, and the amount of funds they're supposed to be getting out on the ground. They simply can't do it, and they spend—I mean, NRCS as an agency is very burdensome in terms of bureaucratic levels. The paperwork and the contracting, and everything they're required to do. […] To my knowledge, NRCS does no outreach. They depend on the Soil and Water Conservation District, Extension, and other groups, to do the outreach. Their function is basically, they put an announcement in the paper when a program is open, and they wait for people to come through their door and apply for the program. (KL-6)

Limited administrative capacity traditionally put the local NRCS office in more of a reactive role rather than a proactive role. In addition to limited staff, relatively rapid staff turnover hampered project implementation:

> There has been a lot of turnover in our local office, the people that were here when AWEP started, none of them are here now […] and that has been a little bit of a struggle for us, in terms of the AWEP contracts because it is new people that do not know what is happening. (KL-5)

Given the rate of staff turnover, the project partners had to expend significant resources getting new NRCS staff up to speed on the AWEP project and in some instances the partners had to convince NRCS staff of the merits of the project. Staff turnover was also difficult for maintaining landowner relations since "landowners want the same person" (KL-4) and every new staff member has to build relationships and trust with local landowners. Local partners helped to facilitate this process by introducing landowners to NRCS and walking them through the application process. Local partners also helped to alleviate landowner apprehension about enrolling in a government program with untested partners.

The primary project partner and its collaborators also struggled with capacity issues during implementation of AWEP project. One of the original project collaborators, a

local non-governmental organization, determined that they did not have sufficient funds to support their efforts to do outreach in the Sprague River Sub-basin. Consequently, overall landowner participation in the Sprague River Sub-basin was limited since most of KBRT's connections and previous demonstration projects were in the Wood River Sub-basin. Fortunately, another agency with connections in the Sprague River Sub-Basin was able spread the word and introduce landowners to KBRT and the AWEP project. KBRT also hired an independent consultant with contacts in the Sprague Sub-basin and expertise in dryland grazing to supplement their own capacity. Some landowners were confused about what role the partners played and could not figure out the relationship between the different partners and NRCS: "The process is confusing. It sounds like they work together, so I'm not quite sure what the relationship is. Do you? Because I'd like to know." (KL-11)

Throughout the project, partners had limited funding to conduct outreach and support landowners throughout the transition process: "Currently we do not having funding to cover our time doing the project." (KL-5) It can be difficult to find funding sources that can be tied to administering the project. Project partners have the desire to help NRCS, but are ultimately constrained by limited staff resources or funding:

> There's this total disconnect between what is needed, what they're willing to fund, what they can fund. You know, I would love to help 'em. But I don't get paid to take 'em by the hand and take 'em around to every landowner out there. […] I can't invest a huge amount of time in their programs. I'd love to. But unfortunately I can't" (KL-4).

Limited NRCS and partner capacity ultimately means that landowners receive less individual support, which can drastically impact the likelihood for success at an individual landowner level, especially for a management practice that requires significant technical assistance.

The paperwork and administrative steps required to determine eligibility, apply for the program and process programs is oftentimes a barrier to landowner participation and has required a significant amount of effort from project partners:

> I think what we have found has made it difficult for landowners to work with NRCS directly, is the amount of paperwork involved. And I should show you examples of their applications and contracting. It's huge. So to apply for the program it's a massive stack of papers that you have to go to three different offices for, and get things notarized. And then the contracts—every contract is a three ring binder. And it's just not easy. […] There's ten pages before you get to the one page that's really all people need to know. And it's full of…like, bureaucratic lingo that the average landowner doesn't understand fully. So, we've found that a huge role that we have to play as an intermediary is helping landowners through the process. We sit down, and we do the application with them, and we take them to the different offices they have to go to. We explain the contracts to them when they come out, so they're comfortable signing it. We make sure that every year they do what they're supposed to be doing, according to the contracts. And for your average landowners, it's just not worth it to them, to go through, for that amount of work. (KL-3)

Partners and landowners alike are intimidated by the amount of paperwork required for landowners to participate in a program. Furthermore, there is not enough time to complete all of these administrative steps within the contracting period. In fact, several willing landowners missed the deadline to participate for that particular calendar year. Landowners can enroll at any point, however, and be considered for funding during the next funding cycle. The administrative complexity and funding deadlines may deter otherwise willing landowners from participating.

4.2.4.3 Outcomes

It is important to note that many of the outcomes achieved through AWEP largely resulted from the previous work and planning efforts of partner organizations and NRCS. AWEP provided an additional funding stream for partners to continue work that had been undertaken using alternate funding mechanisms. It was difficult to clearly distinguish which, if any, outcomes *resulted* from AWEP itself. This section

details outcomes that NRCS and its partner believe that were facilitated, in part, by AWEP.

The project undertaken in the Upper Klamath using AWEP funding had important environmental outcomes for the basin. In 2011, 10,819 acres of land were enrolled in dryland or reduced irrigation programs through KBRT and NRCS. As a result of these projects, KBRT was able to temporarily protect 36,210 acre-feet of water instream and is working to permanently transfer water instream through the newly formed Klamath Water Transaction Program, which was partially funded through a NRCS Conservation Innovation Grant (CIG) (KBRT, 2011). Monitoring conducted by KBRT, OWEB and NRCS showed increased instream flows and improved water quality within the Wood River and Seven-mile Creek, which are smaller tributaries of Upper Klamath Lake. The partners did not have monitoring equipment on the Sprague River, which limited their ability to measure the environmental benefits produced in that sub-basin.

Increasing instream flows in Seven-mile Creek and Wood River provides multiple ecological benefits, which have been well documented by project partners. Seven-mile creek provides habitat for red band trout, and could provide habitat for salmon (if reintroduced) and endangered suckers. Prior to the instream leases, the creek was essentially dewatered throughout the irrigation season preventing connectivity between the upper reaches and Agency Lake, which is the northern arm of Upper Klamath Lake. Monitoring of the system four years after KBRT began protecting water instream showed that “fish habitat greatly improved as shown by increased pool numbers, pool quality, pool depth, large woody debris, and presence of gravel substrate” (Graham Matthews & Associates, 2008, p. 12). Enhanced instream flows in the Wood River improve spawning and rearing habitat for endangered suckers. The Wood River currently provides habitat for red band trout and could provide critical

habitat for salmon if they are reintroduced into the system. The Klamath AWEP project had visible, measurable outcomes for smaller tributaries to Upper Klamath Lake, though overall benefits to the Upper Klamath Lake are difficult to measure given the complexity of the system (KBRT, 2011).

NRCS is responsible for monitoring conservation practices on individual parcels, but did not directly measure outcomes associated with water quantity or water quality: "Their contracts aren't tied to the water at all. They are tied to grazing. So they come out and check stubble height and check grazing records. NRCS doesn't require any water monitoring information" (KL-5). Most NRCS management practices have been well researched and can be used as proxies for measuring outcomes. As a part of the Conservation Effects Assessment Program (CEAP),[10] NRCS commissioned a three year study to look at the impacts of dryland transitions on instream conditions and habitat as well as on cattle operations (e.g., animal health and productivity). The report communicates potential benefits of dryland conversion to both landowners and the environment. For the landowner who had successfully transitioned to dryland pasture, he noted that soil health had improved, there was a reduction in invasive species and his cattle were healthier.

The economic impacts of converting to dryland grazing vary by sub-basin and by the management practices undertaken by each particular landowner. Research in the Wood River sub-basin suggests that with reduced irrigation (one application in the summer, generally July/August), and improved cattle rotation programs (30 day rest

[10] "CEAP was originally intended to account for the benefits from the 2002 Farm Bill's substantial increase in conservation program funding through the scientific understanding of the effects of conservation practices at the watershed scale. […] EQIP offers financial assistance to producers to implement many of the conservation practices analyzed in the CEAP assessment; however, the assessment does not correlate the effects and benefits of conservation practice to any one federal program" (Stubbs, 2010).

cycles for pastures), landowners could theoretically sustain 94 percent of their standard production capacity. The report also suggested that with no irrigation and improved rotation, landowners could still potentially sustain 90 percent of their standard production capacity (Graham & Associates, 2008; KBRT, 2011). High levels of production are largely attributable to the "better quality, more vigorous forage in non-irrigated pastures and the higher rate of weight gain landowners have observed in cattle on the dryland pastures" (KBRT, 2011, p.26). Anecdotal evidence from landowners indicates that these figures may be high, but productivity is strongly correlated with each landowner's ability to optimize their rotational grazing patterns. The Wood River sub-basin is a low-lying basin with shallower water table where deep-rooted dryland species can be sustained with minimal irrigation.

One interviewee in the Wood River Basin indicated that his land had returned to nearly 90 percent productivity after six years in dryland pasture. This landowner was grateful for the opportunity to more proactively manage any risk associated with losing his water right through the adjudication process. Now that he can sustain his operation with little to no irrigation, he is considering options to sell his water right and permanently transfer it instream, which would benefit the long-term financial sustainability of his operation. He also noted that "the ranch just looks better" and if his family ever decided to sell the ranch it would be more attractive to conservation and recreation-oriented buyers who tend to pay higher prices (KL-7).

An evaluation of the potential economic impacts in the Sprague sub-basin has not yet been conducted, though research suggests that dryland pasture will be less productive given the deeper water table and higher consumptive use rates of vegetation in much of the basin (KBRT, 2011). Experience in the Sprague shows that most people can generally sustain at least 70 percent productivity with limited irrigation and improved cattle rotation. One landowner in the Sprague who was in his second year, believes

that the transition, if successful, will benefit him financially, especially in terms of energy savings:

> Again, because we're right at the beginning of the process, we're not sure what it's gonna do, but if it takes off, it's gonna be great for us to do dryland. I mean, no one wants to pay the enormous electrical bills that it costs to actually irrigate. (KL-11)

It can take a long period of time, between five and ten years, to optimize dryland operations. Consequently, the economic impacts may not be readily apparent at the beginning of the projects; it may take several years to fully understand the economic tradeoffs on an individual parcel.

The AWEP program itself was financially beneficial for some of the landowners, but detrimental for others. For one landowner the payment was not enough to fully offset the cost of converting to dryland, but he was grateful for the help since implementing the management practices would have been cost prohibitive without some financial assistance: "[The payment] is not enough, but something is better than nothing." (KL-11) The program gave landowners an opportunity to experiment with a new approach by reducing the financial liability. One landowner who was not pleased with the outcome indicated that he would likely lose money because of how the conservation practice had been implemented, not necessarily because of the size of the payment:

> I'd never do it again. Because of the crop requirement that they had me put it into. […] It's going to cost me more money to get it out of what I've put it into. It's not going to stay in that crop. I know that 40 acres of it's not going to pan out. I'm going to need to put something else in it. (KL-10)

The economic impacts of the AWEP projects vary greatly from one landowner to the next and can only be ascertained by examining the local environmental conditions, how the initial conservation practices were implemented (e.g., tilling and seeding), and the long-term management practices (e.g., stocking rate, irrigation, rotational grazing).

In general, a transition to dryland pasture does reduce overall productivity, but reductions in productivity may be minimized by implementing optimal management practices. Foregone income may be offset by financial assistance programs, savings in energy costs and payments to temporarily or permanently transfer water rights instream. Decreasing reliance on irrigation water helps landowners to sustain long-term viability by mitigating future risks associated with water scarcity and regulatory enforcement in the basin.

The social outcomes of the AWEP project are not as readily apparent as the environmental and economic outcomes. Interviewees had a difficult time articulating how AWEP has impacted social dynamics in the basin. The primary positive social outcome from the AWEP project is that it improved the relationship between NRCS and basin partners since the project required them to coordinate efforts: "We definitely work closely together, and it has made [our relationship] stronger because [the project] does require us to coordinate a lot more closely." (KL-5) Representatives of the local NRCS office were grateful for the assistance offered by partners and expressed the need to continue to foster local partnerships. Some partners expressed concern that inconsistencies in program rules from one year to the next and prescriptive NRCS standards eroded trust with local landowners. Partners were also concerned that confusion about the program and landowner dissatisfaction with NRCS's rules would negatively impact their own reputation and credibility in the basin.

4.2.4.4 Summary

Box 7. Summary of Institutional Factors that Enable or Constrain Implementation of Upper Klamath AWEP provides a summary of the institutional factors that enable or constrain implementation of the Upper Klamath AWEP. As identified at the national level and state level, AWEP facilitates a more strategic approach by focusing funding on priority resource concerns within a defined hydrographic area and also represents a

transition towards more partnership-based approaches. Partners were able to leverage additional resources to help implement the AWEP project and were also able to capitalize on the relationships that they had formed over the years with local landowners. There were also challenges that accompanied a partnership-based approach. In this particular case study the partners were not able to negotiate EQIP rules at higher-levels and rules did not remain consistent over the life of the project. The partners did not fully understand all of the program rules and may have miscommunicated them to landowners, resulting in unfulfilled expectations. The complexity of EQIP rules resulted in high information costs between NRCS, its partners and local landowners. Partners and landowners also indicated that EQIP rules were not sufficiently flexible and could not easily be adapted to the particular circumstances of individual landowners. The inflexibility of program rules significantly impede NRCS's ability to induce long-term land and water management practices since it cannot be responsive to the diverse institutional factors that influence landowner decision-making. Finally, limited local capacity (both for NRCS and its partners) may mean that landowners do not have the resources necessary to actually support significant land and water management transitions.

Box 7. Summary of Institutional Factors that Enable or Constrain Implementation of Upper Klamath AWEP

+/-	AWEP uses existing EQIP program rules, which are well known and widely accepted amongst NRCS staff at multiple levels
+/-	Partner involvement in legislative and rule-making processes during AWEP development
+/-	Concerns about water rights relinquishment and regulatory enforcement is a driver for landowner involvement
+	AWEP targets funding to priority resource concerns in a specified hydrographic area and identifies specific conservation practices
+	AWEP enables local partners to identify projects and direct funding to locally defined priority areas
+	Previous NRCS investments in relevant research (e.g., Conservation Effectiveness Assessment Program)
+	Previous NRCS and partner investments in strategic planning and demonstration projects
+	Scope of work accomplished under AWEP is a part of a comprehensive restoration strategy developed by multiple local and state partners
+	Network of local and state partners (including NRCS)
+	Good working relationship between partners and NRCS
+	Local partners leverage additional resources to supplement NRCS capacity and implement project (conduct outreach, mobilize landowners during sign-up period, organize overall project implementation, monitor outcomes)
+	Past positive experiences with NRCS or partners facilitate future involvement
+	NRCS provides funding for landowners to transition to dryland grazing
+	Partner works with willing landowners to protect water instream (protects water right and contributes to instream flow targets)
+	EQIP program is transparent, accountable, and limits potential abuse of the system
–	Unpredictable project deadlines (deadlines vary each year) and brief sign-up periods
–	Unpredictable funding (funding reduced each year)
–	Rapid staff turnover in local office (few staff from original AWEP proposal remain)
–	Staff turnover in partner organizations
–	Lack of clarity in roles and responsibilities of NRCS and partners
–	Partners may not understand or properly communicate program rules
–	Inability for NRCS to pay for instream leasing arrangements (political sensitivity of NRCS involvement in water rights)
–	Changing program rules at the national level (e.g., eligible conservation actions, payments)
–	Past influx of financial assistance funding strained overall capacity of local NRCS office
–	Limited NRCS and partner capacity to administer projects and provide technical assistance
–	Limited NRCS and partner technical expertise in dryland grazing
–	Past negative experiences with NRCS or partners may impede landowner involvement
–	Landowner sense of entitlement may make landowners more resistant to strategic approaches
–	Payments not sufficient for some landowners
–	Income eligibility requirements and payment caps restrict involvement of large landowners
–	Landowner misperceptions and confusion about program rules, benefits and role of actors
–	Extensive administrative requirements for EQIP enrollment
–	Limited flexibility of EQIP program
–	Implementation of project by NRCS technical standards may not align with landowner objectives
–	Large geographic area with loose landowner networks
–	Payoffs to landowners are variable and are not immediate (more risk involved)
–	Short contract length not amenable for long-term change in management practices

4.3 Evaluating the Agricultural Water Enhancement Program

This section summarizes the findings from the nested case studies and analyzes the extent to which AWEP aligns with IWRM principles and indicators. This section also summarizes the institutional factors that may enable or constrain actors from implementing an integrated approach to water management. These institutional factors are summarized at the end of the section in *Table 6. Summary of Institutional Factors that Enable or Constrain an IWRM Approach.*

4.3.1 Systems Approach

AWEP represents a shift towards a systems approach by seeking to address resource concerns within a defined geographic or hydrographic area. Rather than implementing conservation practices that address differing resource concerns on individual parcels of land, AWEP challenges NRCS and local partners to look at larger scale objectives and determine how individual participants can contribute towards these system-wide improvements. For AWEP, the "system" is generally bounded by the scope and scale of the project. Consequently, the extent to which AWEP represents a systems approach is largely contingent upon the local partners who propose a project. In both case studies, the projects represented one component of larger, comprehensive restoration strategies that had been developed by a network of state and local partners, oftentimes including NRCS.

In contrast to its predecessor, the Ground and Surface Water Conservation program, which focused exclusively on groundwater and surface water conservation, AWEP expanded the purpose to include water quality improvements. In recent years, NRCS has also prioritized projects that result in energy savings. Projects that demonstrate and address these interrelated components in the natural system are prioritized under AWEP. The McKenzie Canyon and Upper Klamath AWEP projects both resulted in

multiple, interrelated environmental benefits, including increased water quantity, improved water quality and energy savings. Interviewees also noted benefits for soil health, vegetation composition and wildlife habitat that indirectly resulted from project implementation.

AWEP highlights the need to consider how conservation practices influence the viability of agricultural production within the defined geographic area, thereby drawing the connection between the natural and human system. It is important to note that traditional NRCS programs generally do assess the interconnectedness of various components within the natural systems and human systems, but this assessment has traditionally occurred within the confines of a single parcel of land rather than at-scale. The McKenzie Canyon Project increased reliability of irrigation delivery and overall agricultural productivity within the irrigation district. The Upper Klamath Project sought a means to sustain ranching operations and communities with less irrigation water. Dryland pasture and partially irrigated pasture reduces productivity,[11] but helps to ensure the long-term viability of ranching operations in the face of climatic and regulatory uncertainty.

It is difficult to institutionalize systems thinking and systems approaches to water management. NRCS programs generally focus on agricultural activities and may not explicitly promote an inter-sectoral approach to water management or coordination between upstream and downstream users. Furthermore, focusing exclusively on water issues may preclude projects from considering and addressing other interconnected

[11] In some instances landowners were able to return productivity to 90percent over several years, especially where the shallow water table allowed for sub-irrigation. Overall, the productivity of partially irrigated pasture and dryland pasture ranged from 70percent to 90percent depending on the location in the basin and management practices of each landowner. For some landowners reduced productivity was offset by lower energy costs and payments received for permanently transferring some or all of their water right instream.

resource concerns. The new approach to EQIP being implemented by Oregon NRCS may promote a systems approach at the state and local levels. Oregon NRCS is training staff to develop and implement multi-landowner projects and to assess the linkages between resource concerns at-scale.

4.3.2 Strategic Approach

While focusing exclusively on water conservation and water quality on agricultural land may not represent a systems approach, it is a strategic aspect of AWEP. AWEP recognizes that water management issues are of central concern to many agricultural communities and demonstrates a commitment to allocate funding specifically for that purpose. Addressing priority resource concerns within a geographic or hydrographic area also represents a more strategic approach since it coordinates the range of activities undertaken by individual landowners to achieve measurable outcomes at a larger scale.

From the perspective of some NRCS representatives, nesting AWEP within EQIP was strategic because it allowed NRCS to use an existing mechanism to quickly deliver a new program. Consequently, NRCS did not make a significant investment in creating new, untested program rules. State and local NRCS staff were also familiar with EQIP, so it did not require new training. EQIP's rules, however, constrain local actors and can present a significant barrier to implementing projects. The following challenges associated with EQIP rules were gleaned from the case studies:

- Coordinating many individual EQIP contracts may limit the effectiveness of achieving watershed-scale impacts, especially if there is limited local capacity to handle the administrative component of EQIP. Time spent administering EQIP contracts detracts from technical assistance.

- Lengthy and involved EQIP eligibility and contracting requirements may preclude some landowners who are uncomfortable divulging sensitive personal information to the federal government.

- EQIP contract deadlines are not coordinated with project schedules or landowner operations and it can be difficult to get landowners through the contracting process in the allotted amount of time.

- Requirement to initiate work within 12 months can be difficult if there are project set-backs.

- EQIP limits the types of tools or conservation practices that are available to implement projects. For instance, EQIP focuses on structural and management improvements and does not include conservation easements. NRCS and local partners must work with a defined set of conservation practices that may not be appropriate for the proposed project.

- Structured payment schedules through EQIP limit the ability for NRCS and local partners to establish or negotiate payments that will provide adequate compensation for landowners to adopt certain structural or management practices.

- Adjusted gross income (AGI) limits and caps on the allowable payments to producers may preclude involvement of larger landowners whose practices could be instrumental to achieving conservation outcomes at a watershed-scale.

- Short EQIP contract lengths may not be appropriate for inducing significant management changes that take time to become established, such as conversion to dryland pasture.

- EQIP rules change over time, making it difficult to plan and consistently implement certain projects.

NRCS's hesitance to deal directly with water rights and instream flows also poses a major institutional barrier to taking a more strategic approach to water conservation, especially in the western United States.

The McKenzie Canyon and Upper Klamath AWEP projects differed greatly since one focused on structural practices (upgrading irrigation equipment) and the other focused on changing long-term management practices (conversion to dryland pasture). The McKenzie Canyon project encountered relatively few challenges with EQIP rules given the nature of the project. EQIP rules presented a much greater challenge to the Upper Klamath AWEP, especially since rules changed throughout the course of project implementation. It appears that EQIP is better equipped to assist with structural practices that result in on-farm capital improvements, but may be less appropriate for incentivizing long-term changes in management. This is especially true if the payoffs for changing management practices are uncertain and will only become apparent over a longer period of time.

The decentralized structure of NRCS enables states to adopt innovative and strategic approaches to program delivery. The Oregon NRCS has created an approach that requires local NRCS staff to work with stakeholders to identify long-range objectives, priority resource concerns and implementation strategies that will begin to address resource concerns. These NRCS plans draw from and complement the work being undertaken by local partners. Even though this represents a more strategic approach at the state level, project implementation may continue to be hampered by EQIP rules. Organizational culture and individual willingness to change may also present institutional barriers to adopting more strategic approaches. Over time, if NRCS

makes a commitment to strategic approaches that focus resources on priority resource concerns within defined geographic and hydrographic boundaries, it is more likely to become the norm for NRCS staff, partners and local landowners.

4.3.3 Stakeholder Approach

Historically, NRCS has worked with state and local entities, namely the soil conservation districts and local working groups, to establish local priorities for addressing resource concerns. In that respect, NRCS has made a concerted effort to incorporate resource users at the local level. AWEP, however, allows local groups to have greater decision-making power with respect to funding:

> I think it was an opportunity for local groups to really get involved and say this is what's really important to us, and for them to express what they want, where they need it to go and then submit it from national review. So it gave them a really local voice for where they want to focus things. (OR-1)

AWEP projects that can "demonstrate the ability to coordinate water quality and quantity efforts among agricultural producers" and that "include high percentages of agricultural land and producers in a region or other appropriate area" are ranked more highly through the RFP process (74 FR 2040). The extent to which a project increases stakeholder involvement relies primarily on the project partner and the work that they do to engage individual resource users and other entities in developing and implementing an AWEP project.

The McKenzie Canyon AWEP Project was implemented within an irrigation district, which had an established governing body and irrigator members. This existing structure made stakeholder engagement during project implementation much easier since each irrigator was connected to the same system and stood to benefit from the system improvements. The Upper Klamath AWEP project was more dispersed and had to rely on more informal networks of partners and landowners to engage

stakeholders. Neighbors were very influential in the diffusion and adoption of the management practices promoted through the AWEP project. Local partners played a critical role in connecting landowners to the AWEP project and helping them navigate EQIP rules.

Since AWEP is managed through individual EQIP contracts, it does not, in itself, create opportunities for stakeholders to collectively decide upon the overall implementation strategy or to negotiate rules. Each landowner interfaces with NRCS individually to discuss the conservation action plan and select from a predetermined list of conservation management practices. By emphasizing individual contracts, the AWEP program may miss out on significant opportunities to mobilize landowner networks and foster collaborative capacity between stakeholders. In the McKenzie Canyon AWEP project, the landowners had very few reasons to negotiate program rules, and were generally complementary of how the program operated. Successful completion of this project increased trust between resource users, the project sponsor and NRCS. In the Upper Klamath AWEP project, landowners and partners were generally unsuccessful at negotiating program rules and rules kept changing over time. The lack of power to successfully negotiate or change program rules and management outcomes may have eroded trust between local landowners and NRCS and may have also affected the perceived credibility of local partners.

4.3.4 Partnership Approach

Partnerships are a distinguishing feature of AWEP. AWEP incentivizes partner involvement by committing federal funds towards a project sponsored by a local partner. Partners are responsible for developing project proposals, conducting outreach to interested landowners and other local partners, generating landowner support for the project, leveraging other funding sources, and monitoring project performance.

Interviewees at the national, state and local level all emphasized the critical importance of building and sustaining partnerships.

Local partnerships were integral to the implementation of the McKenzie Canyon and Upper Klamath Basin AWEP projects. Partners have specialized knowledge about local resource concerns and can propose AWEP projects that build upon existing local strategies and initiatives to address these concerns. In both case studies, partners had invested in strategic planning and could leverage their relationships with other partners and landowner leaders to coordinate and promote AWEP projects. Partners are important intermediaries who connect landowners to multiple sources of technical and financial assistance and can help landowners navigate complex government systems. In many local areas, these organizations provide the "connective tissue" between many different resources and opportunities (DS-4).

In geographies where landowners are skeptical of government involvement and government programs, a partnership with a trusted non-governmental organization can be particularly beneficial in fostering landowner engagement. In both case studies, partners provided some continuity in project implementation when there was staff turnover within the local NRCS office. Furthermore, local partners helped NRCS to monitor and articulate conservation outcomes in new ways. Given recent budget cuts, it is important that NRCS continues to leverage the expertise, skills and resources of state and local partners to implement landscape-scale projects. Working with partners can pose a unique set of challenges, especially if there is a lack of clarity about roles and responsibilities or if project partners misunderstand or misrepresent program rules. Unfulfilled landowner expectations may have resulted from misinformation received from project partners.

Oregon NRCS has invested in building partnerships at the state, basin and local levels, which gave Oregon partners a strategic advantage during the proposal process and also helped during project implementation. The state office has the ability to contribute to strategic planning, effectively disseminate program information and mobilize partners. The AWEP program did not require much involvement from the state office, aside from a general endorsement of each proposal. Furthermore, project sponsors were not required to coordinate with the local NRCS office. In some instances this could lead to a lack of coordination between NRCS and local partners. This was not an issue for either the McKenzie Canyon AWEP Project or the Upper Klamath AWEP Project during proposal development. Projects sponsors for both projects worked very closely with the state and local offices as well as other state and local partners to develop proposals.

Although AWEP emphasizes the role of partners in developing proposals, generating landowner interest, and monitoring outcomes, the statutory language and associated RFP are less clear about what role partners should play during project implementation. As a result, AWEP may not fully capitalize on the skills and resources that partners offer. Administering the program on a landowner-by-landowner basis through EQIP contracts may also limit the overall creativity and flexibility of the local NRCS office and its partners to achieve conservation outcomes. Interviewees expressed concern that once an EQIP contract was signed, NRCS would no longer have an incentive to engage partners and that it would become an NRCS-driven process. Interviewees indicated that in order for projects to truly succeed at the local level partners needed to be given a greater stake in overseeing projects and negotiating program rules. At present, partners have very limited ability to negotiate program rules to improve efficiency or effectiveness.

Funding to administer NRCS conservation programs (technical assistance) has not kept pace with funding for implementing conservation practices (financial assistance). This may limit the NRCS's capacity to provide quality technical assistance to local landowners. Furthermore, AWEP, by statute, cannot provide any funding to local partners to help administer the project, which may further limit overall local capacity to deliver the program. Funding for AWEP projects is unpredictable and the funding cycle makes it difficult for NRCS to make out-year funding commitments to approved projects. Uncertainty about funding makes it difficult for NRCS and local partners to plan for and implement complex, multi-stakeholder projects that span multiple years.

4.3.5 Balanced Approach

Like most NRCS programs, AWEP seek to balance agricultural productivity and landowner viability with environmental outcomes. This is discussed in Section 4.3.1. It is less clear about what types of social outcomes the conservation programs seek to achieve. Social outcomes are not explicitly addressed in AWEP, but AWEP did have impact social dynamics in each of the project areas.

AWEP projects are funded on a competitive basis and the list of eligible project sponsors is broad and inclusive. Structuring AWEP as a competitive "grant" helps to ensure that the projects with the best prospects for producing lasting environmental benefits get funded. Ranking criteria are made equally available to all potential sponsors, which increases fairness and transparency. Congress did identify priority AWEP areas, based on feedback from their constituencies, which receive a higher ranking during the review process. However, these projects still compete with other projects from across the nation.

Once a project is awarded, any landowner within the project boundary can apply for an EQIP contract under AWEP. Contracts at the local level are ranked based on

criteria established by the local NRCS office and project partners to determine the potential contributions it will have to overall project outcomes. This helps to prevent personal bias or favoritism at the local level. All interviewees expressed that funding was allocated equitably and that money was directed to the highest priority resource concerns. Technical assistance was somewhat different. The participants in the McKenzie Canyon AWEP project felt that they had adequate access to technical assistance. Many of the Upper Klamath AWEP participants felt that there was limited capacity to deliver technical assistance and that communication with NRCS and partner organizations was lacking in some instances. This may have been due to the fact that the project was much more dispersed and implementation was also more involved and complex.

It is unclear how AWEP balances power between resource users, project partners and NRCS. The program is completely voluntary, meaning that the resource user always has the option to decline enrollment in the program. Once a resource user has signed a contract, however, they might not have the power to negotiate the terms of the contract. This was evident in the Upper Klamath AWEP. Partners may also lack the power to successfully negotiate program rules that may be counter to overall project objectives. AWEP does provide greater power to partners by allowing them to directly compete for funding on behalf of their local projects. Individual landowners also have the ability to form a collective with other landowners and apply for an AWEP project, though this was not evident in Oregon.

4.3.6 Adaptive Approach

Embedding AWEP within EQIP inherently limits overall flexibility of the project and may inhibit project partners and local stakeholders from tailoring program rules specific to local conditions. For the McKenzie Canyon AWEP project this posed less of an issue because it was a relatively straightforward capital improvement project that

could be implemented and functional within a couple of years. Very clear rules that provided certainty about project timing and cost of materials were looked upon favorably by irrigators. This project also resulted in immediate, measurable improvements for participating irrigators. For the Upper Klamath AWEP project, which was trying to make long-term modifications to land management practices, the program required more flexibility to adapt to local conditions and landowner expectations. Conversion to dryland pasture requires five to eight years to become established and a landowner may need to significantly modify their management practices over time to optimize production. EQIP conservation practices and rules were not adaptive enough to account for significant variability in management practices and environmental conditions. AWEP requires that projects achieve "land and water treatment objectives within five years or less" (2009 RFP). Limited contract lengths and expedited project implementation may inhibit NRCS from being able to adapt projects based on local feedback and may also preclude projects that require a longer lead time to change behavior or see measurable improvements.

There is no language in the statute, rule or RFP that specifies how the program can or should be adapted to local conditions. NRCS monitors projects for compliance purposes, but has limited capacity to conduct additional monitoring to communicate overall project outcomes. AWEP requires project partners to monitor project performance, but the monitoring results may not be used to improve project implementation or overall program design. The mechanisms that are in place to modify rules may not be sufficiently nimble for complex and unpredictable projects; changes in project implementation required modifying each individual contract. Partners and resource users expressed frustration with the rigidity of the program, especially in the Upper Klamath AWEP. In some instances it was unclear if the inability to adapt rules was a result of the inflexibility of the rules themselves or the inflexibility of people implementing the rules.

Table 6. Summary of Institutional Factors that Enable or Constrain an IWRM Approach

Systems Approach	+/- Partially dependent on partner's ability to integrate systems thinking into project design and implementation + AWEP integrates water quantity and quality considerations + AWEP integrates surface water and groundwater management considerations + AWEP integrates environmental considerations with agricultural productivity + AWEP projects complement larger restoration strategies developed by state and local partners – AWEP is limited to water resources projects on agricultural land (does not address other sectors)
Strategic Approach	+/- AWEP uses existing EQIP program rules, which are well known and widely accepted amongst NRCS staff at multiple levels +/- AWEP projects focus on a set of predetermined set of conservation actions + AWEP has a strategic focus on water resource concerns + AWEP provides focused funding for priority water management concerns within defined hydrographic areas + AWEP projects complement larger restoration strategies developed by partners + Previous investments by NRCS and partners in strategic planning facilitate AWEP projects + AWEP is complementary to state-initiated strategic approach – Eligible actions are limited (e.g., NRCS cannot pay for instream leasing arrangements) – Projects are administered on a landowner-by-landowner basis through EQIP contracts, which can be administratively complex – NRCS is constrained by statutory rules (e.g., NRCS cannot provide funding to partners which may limit capacity, income eligibility requirements and payment caps restrict involvement of large landowners which may impact ability to achieve large-scale conservation outcomes) – AWEP does not require project sponsors to coordinate with state and local NRCS offices during proposal development and the national office seeks limited feedback – Limited local capacity to administer projects since administrative and technical assistance dollars are not tied to project needs – Individuals within the agency may be resistant to new strategic approaches – Landowners who benefited under the previous "open door" approach may be resistant to new strategic approaches that focus funding on specific areas and practices – Unpredictable project deadlines (deadlines vary each year) and brief sign-up periods may make project planning and implementation difficult – Changing program rules at the national level (eligible conservation actions, allowable payments, contract length) make project planning and implementation difficult
Participatory Approach	+ Local entities have greater input at the national level to direct funding to local projects + NRCS and partner involvement in legislative and rule-making processes during AWEP development + Strong working relationships between NRCS and landowners and partner organizations and landowner facilitates project implementation + Partners engage landowners during proposal development and projects with greater producer participation are prioritized – Projects administered on a landowner-by-landowner basis through EQIP contracts may limit interactions between producers – Income eligibility requirements and payment caps restrict involvement of large landowners – Extensive administrative requirements for EQIP enrollment and inconsistent deadlines may deter participants – Partners and landowners have limited involvement in negotiating higher-level EQIP rules – Landowner misperceptions and confusion about program rules, program benefits and role of NRCS and partners may strain relationships

Table 7. Summary of Institutional Factors that Enable or Constrain an IWRM Approach

Partnership Approach	+ Partners propose and sponsor local projects, develop local ranking criteria and select eligible conservation actions + Previous investments (by NRCS and others) in fostering partnerships at multiple levels facilitate project implementation + Local partners leverage additional resources to supplement NRCS capacity and implement project (conduct outreach, mobilize landowners during sign-up period, organize overall project implementation, monitor outcomes) + AWEP prioritizes projects with more collaborating partners + Strong working relationships between partners facilitates project implementation – Partners cannot receive grants or any funding for capacity which may restrict their involvement – AWEP does not explicitly encourage interagency coordination – Projects administered on a landowner-by-landowner basis through EQIP contracts may limit partner involvement in overall project implementation – Lack of clarity about partner roles and responsibilities may diminish the effectiveness of the partnership – Perception of partner roles is potentially limited to outreach and monitoring, which may not capitalize on the full capabilities of partner organizations – Partners may not have the financial capacity to follow-through on commitments, which may over-extend local NRCS office – Partners may not understand program rules and may miscommunicate rules to participants – Partners have limited involvement in negotiating higher-level EQIP rules
Balanced Approach	+ AWEP balances agricultural productivity with environmental outcomes + Any partner can compete at the national level for AWEP funding + Local actors have more power to determine priority resource issues and to direct funding to address those issues + Existing EQIP program is transparent, accountable, and limits potential abuse of the system – Partners have limited involvement in negotiating higher-level EQIP rules
Adaptive Approach	+/- NRCS office has the ability to clarify program rules through rule-making process and EQIP manual and can provide guidance to field offices through the Field Office Technical Guide (FOTG) +/- Flexibility to tailor conservation practices to local context is uncertain + National NRCS office has the ability to modify RFP and evaluation criteria on an annual basis + The FOTG can be tailored to the local conditions of each field office + NRCS has the ability to alter projects under certain circumstances (e.g., project delays) + Partners contribute to monitoring and documenting project outcomes through AWEP – Projects are administered on a landowner-by-landowner basis through EQIP contracts, which means that changes in project implementation results in a change to each individual contract – Limited flexibility to tailor EQIP program to local context in some instances (e.g., EQIP may not be appropriate for inducing long-term changes in land management) – National NRCS office is constrained by statutory rules (e.g., cannot provide funding to partners to cover administrative costs) – Annual appropriations process and funding cuts make it difficult to maintain out year commitments to partners and reduces flexibility – It is unclear how monitoring information informs future decision-making

5 Discussion

This section builds on the results and analysis of Section 4 and seeks to locate this research within larger conversations about IWRM institutions in general and NRCS in particular. This section will also expound on the theoretical contributions to IWRM research and the IAD framework. I begin by discussing what institutional arrangements are likely to facilitate an IWRM approach on private lands. I use this information to provide specific recommendations for how NRCS could better facilitate integrated approaches to water management. I conclude by discussing how the IAD framework could be adapted to better suit IWRM research and the utility of identifying design principles for IWRM.

5.1 Recommendations for Institutional Arrangements within NRCS that may Facilitate IWRM

The AWEP case study reveals myriad factors that may enable or constrain NRCS from implementing an integrated approach to water management across working landscapes. As a result of this analysis I have identified a number of key recommendations that could sustain or improve NRCS's capacity to facilitate an IWRM approach. Some of the recommendations can be implemented by NRCS while others require legislative action or coordination with other federal offices. NRCS should begin by focusing on institutional changes that can be enacted at lower levels of decision-making since higher-level decisions are presumably more complex and difficult to influence. This list of recommendations is by no means exhaustive, but it touches on some of the more important or interesting findings from this research. In order to promote an IWRM approach across working landscapes, I suggest the following institutional arrangements:

1. ***Continue to promote programs that focus on priority resource concerns within a geographic or hydrographic area.***

   NRCS currently promotes landscape-scale, partnership-based approaches through AWEP, CCPI, the Small Watershed Program (PL-566) and its "Conservation beyond Boundaries" initiatives. Working on priority resource concerns within a specific geographic or hydrographic area enables NRCS to be more strategic with its investments and achieve measurable conservation outcomes. NRCS should continue to recommend that strategic, landscape-scale approaches like AWEP are authorized and funded by Congress. Congress should allocate a greater portion of funding towards strategic approaches. Oregon NRCS is currently implementing a more strategic approach to delivering EQIP at the state level that may also serve as a model for other state offices.

2. ***Continue to promote partnership-based projects and initiatives.***

   Partners play a pivotal role in developing strategic approaches to conservation and connecting landowners to larger initiatives. Partners may also leverage other skills, technical expertise and financial resources that can be integral to project success. Building partnerships will require NRCS to reconsider its role in the context of those partnerships. In certain instances project partners may be more nimble and effective at administrative tasks or may have technical expertise in areas not traditionally overseen by NRCS. NRCS staff cannot keep pace with rapidly changing knowledge of ecosystems, conservation practices, agricultural economics and technology. In an increasingly complex world, NRCS will need to nurture its organizational strengths and seek assistance in areas where its capacity is limited. NRCS already has strong partnerships at multiple levels and should continue to foster partner involvement in designing and implementing projects to minimize overall transaction costs and maximize conservation outcomes.

3. ***Write a rule allowing aggregation of landowners (multi-landowner contracts).***

   Most of NRCS's conservation programs (with the exception of PL-566) continue to allocate funding through contracts on a landowner-by-landowner basis, which can create an administrative burden and lead to inefficiencies when implemented at-scale. AWEP was initially created to help address this institutional barrier, but the program was ultimately constrained by EQIP program rules. NRCS has the statutory authority to develop rules that allow for aggregation of landowners into a multi-landowner contract held by partner organizations but the current administrative rule requires NRCS officials to deliver AWEP through individual EQIP contracts. There is some concern within NRCS that this approach may reduce overall transparency and accountability. Given the complexity of developing new rules, and the uncertainty of an untested approach, NRCS should pilot several projects across the nation that allow partner organizations to aggregate landowners into multi-landowner contracts. Partner organizations could develop and submit proposals for piloting this approach. Conducting pilot projects will help NRCS to manage uncertainty and limit any potential abuse of the system. Local organizations involved in the pilot approach could recommend rules that would ease burdensome contracting requirements while still remaining accountable to taxpayer investments.

4. ***Improve local capacity by increasing funding and reducing administrative complexity.***

   The number of issues addressed by NRCS's conservation programs has expanded rapidly over the past two decades along with the funding that is delivered to landowners to help address those issues. During the same time, the number of employees available to administer those programs has either been held constant or has been reduced (Zinn, 2007). NRCS has very limited influence on how much funding it receives and how its funding is allocated between financial assistance to landowners

and program administration (e.g., conducting outreach, designing projects processing paperwork, providing technical assistance). Funding is authorized and appropriated by Congress on an annual basis and OMB is responsible for allocating funding for financial assistance and administrative costs. OMB should coordinate more closely with NRCS and its partners to better understand the optimal balance between delivering financial assistance and technical assistance. Administrative costs and technical assistance dollars should be more closely tied to the scope and scale of actual projects. This will likely require more strategic planning by NRCS and its partners so that it can clearly communicate how project dollars should be allocated.

At present NRCS is statutorily restricted from providing funding to local entities to help administer projects like AWEP. NRCS is able to provide some funding to organizations that offer general administrative or technical support, but this money is not tied to project implementation. As NRCS moves towards more strategic approaches it should be granted the flexibility to provide funding to local organizations. This may be especially important for areas with limited local capacity.

5. Clarify flexibility/adaptability of program rules.

Statutory rules are very difficult to change given the complex decision-making arena. NRCS is bound by statutory requirements, but does have some flexibility to interpret statutory language through internal agency rules and guidance. National rules for EQIP and AWEP are captured in the EQIP Manual and guidance is captured in the Field Office Technical Guide (FOTG). States can also determine state-specific rules that field offices must follow. District conservationists are encouraged to tailor the FOTG to the local conditions, but any practices must remain within the confines of state and national rules. It is unclear which rules can be adapted by whom and to what extent. NRCS should clarify the latitude that field staff have to adapt NRCS rules and guidance to local conditions, partner recommendations and landowner objectives.

6. Introduce greater flexibility into EQIP conservation programs and payments.

There are multiple program rules within EQIP that may limit NRCS's ability to be strategic when it comes to achieving conservation outcomes at-scale. Local NRCS staff should have the ability to work with local partners to adapt the list of eligible conservation actions and practices to better fit the particular resource concerns. NRCS should also provide latitude to local NRCS staff to tailor technical standards and specifications to local standards in consultation with landowners and other qualified partners. Being able to adapt projects to fit the needs of the landowner and multiple partners will improve the likelihood that it will be maintained over time. Under the 2002 Farm Bill NRCS had the ability to negotiate payments with landowners to better match the landowners' actual willingness to accept. Over the years NRCS has moved towards a more structured practice payment schedule, which was adapted by the state to better reflect local conditions. As of last year the practice payment schedule is now determined on a regional basis, which inhibits the state from adapting payments to location specific factors. While this provides more certainty to NRCS officials, it may limit overall enrollment in areas where payments are not sufficient to offset actual costs. NRCS should be granted greater flexibility to negotiate payments depending on local costs, the landowners' financial circumstances and the significance or urgency of a project.

7. Continue to promote innovation and experimentation at the state level.

As discussed in the AWEP case study, the Oregon NRCS office has been developing strategic approaches to EQIP program delivery at the state level. The decentralized nature of NRCS enables state offices to develop new and innovative approaches to conservation. NRCS should continue to encourage state offices to innovate and experiment and should develop more effective means for diffusing innovation. NRCS

should foster formal and informal networks between state offices to facilitate intra-organizational learning.[12]

8. Authorize mandatory funding for the PL-566 Watershed Program and restructure into a competitive program.

PL-566 gives NRCS broad authority to "provide both technical and financial (project implementation) assistance to help urban and rural communities protect, improve, and develop water and land resources in small watersheds (up to 250,000 acres)" in cooperation with local sponsors, states and other public agencies. The watershed project costs are shared with local partners. In many ways PL-566 resembles the original AWEP proposal; the Watershed Program can be used to address myriad resource concerns and offers more administrative flexibility in comparison to other NRCS conservation programs.

Flexibility under PL-566 could help to address some of the institutional constraints that are present under programs such as EQIP. Funding for this program is discretionary and has consistently been funded at amounts far less than the authorized appropriations. Congress did not appropriate any funding to the Watershed Program in FY11 or FY12 (Stubbs, 2011). Congress should authorize mandatory funding to this program in future Farm Bills. The program could be structured as a competitive program, much like AWEP or CCPI, to allow project partners to compete at the state or national level for significant watershed-scale projects. Structuring PL-566 as a competitive program would help to ensure more transparent and equitable distribution of funding.

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[12] This research did not examine interactions between state offices. Consequently, a type of formal or informal learning network between state offices may already exist.

5.2 Analyzing IWRM Using IAD as a Theoretical Framework

In this study I used the IAD framework to structure my case study research and bound my analysis. Given that much of the criticism of IWRM has to do with the lack of clarity about the types of institutional arrangements that are necessary to facilitate such an approach, IWRM scholarship could benefit from adopting a more consistent approach to case study research that uses a similar sets of assumptions and explores similar institutional variables. The utility of institutional analysis in general and IAD in particular lies in its focus on rules, norms and strategies. This allows analysts to study how formal institutions (e.g., government agencies, policies) as well as informal institutions (e.g., cultural norms, familial expectations) structure individual and collective decision-making. The IAD framework, with its focus on rules, norms and strategies, could provide a common "language" for IWRM scholars and may allow for more effective case-study comparisons and meta-analyses of institutional arrangements that facilitate IWRM. The IAD framework is also broadly applicable to many different issue areas and geographies, which makes it appealing for interdisciplinary research or research that is international in scope.

Although IWRM research could benefit from using a consistent framework, the IAD framework poses its own set of challenges to IWRM scholars and practitioners. The IAD framework is well-developed and widely accepted among academics, but it may be too complicated to effectively communicate findings to a general audience. The vocabulary employed by IAD scholars as well as the fundamental assumptions underlying IAD research may not be immediately apparent to audiences that stand to benefit from IWRM research, including policy-makers, practitioners and landowners. McGinnis (2011) summarizes this tension quite nicely: "Although designed as a tool to simplify the analytical task confronting anyone trying to understand institutions in their full complexity, over time this framework itself has become quite complicated" (pg. 1). The

IAD framework may be a powerful explanatory tool, but it is necessary to take these findings and communicate them in a way that is useful to a more general audience. Since IWRM scholarship is generally oriented more towards the practitioners, IAD may prove to be prohibitively complex and "academic." It would be useful for scholars to reflect on the "grammar of institutions" and in order to find words and concepts that are easier to communicate and that resonate with intended audiences (McGinnis, 2011).

The IAD framework may be more appropriate for a certain scale of analysis that focuses on the resource user and the resource in question rather than on higher-level policy making arenas. The IAD framework has primarily been used to examine self-organizing institutions such as irrigation districts, watershed partnerships and fishing communities that create their own institutions for managing shared resources. The IAD framework is especially powerful for examining these local institutions where actors collectively define a set of rules to manage resources held in common, such as in common pool resource theory (Agrawal, 2001; Ostrom, 1990). The IAD framework may thus be better equipped to help explain "bottom-up" IWRM phenomena that involve less complicated institutions. It is decidedly more difficult to apply this framework to "top-down" IWRM institutions given the complexity of decision-making situations at higher levels. Further, IAD may not be well equipped to examine situations that include *both* "bottom-up" and "top-down" elements. There is an ongoing effort to develop a Social-Ecological Systems (SES) Framework that looks at larger-scale systems and gives greater attention to the biophysical foundations of institutional systems (McGinnis, 2011; Ostrom, 2009). The SES Framework may prove to be appropriate for looking at higher-level decisions and cross-scale linkages.

IAD focuses on the context and rules that structure actor decisions and behaviors at multiple levels and allows the analyst to explore rules as nested systems. While it is useful to think of rules as nested systems, it can be exceedingly difficult to bound the

discussion of context, examine how the different levels interconnect and isolate important causal factors. The IAD framework could benefit from a more explicit examination of how to adapt the analytical variables to examine complex institutions such as government agencies and national policies and how to structure a multi-level analysis. The multi-level analysis currently employed by IAD scholars presents rules as a hierarchy, with higher level rules constraining actors at lower levels. Rules filter down from one level to the next, but there is not an explicit mechanism for exploring how rules made at lower levels may alter actor decisions made at higher levels. The framework does not discuss how lessons learned from lower levels in the rule hierarchy feed back into the system to change rules at higher-levels. The linear nature of the multi-level analysis is appealing from an analytical standpoint since it is easier to explain, but it lacks the nuance and complexity of how rules are created and negotiated over space and time. I modified *Figure 3. Levels of Analysis within IAD* consistent with this critique to account for feedback from lower levels. IAD scholarship could benefit by exploring these more dynamic relationships between different levels of analysis.[13]

At present, the IAD framework does not explicitly account for large disturbances or precipitating events that may significantly alter institutional arrangements within the system. My research shows that the Klamath Basin crisis catalyzed changes in existing institutions at the local, state and national level as well as the creation of new institutions. Significant institutional changes at multiple levels were spurred by one event and developed on separate but parallel paths. These changes ultimately converged in the Klamath Basin, where the idea had originated, with the implementation of AWEP. IWRM scholars should embrace frameworks that examine how larger perturbations impact multiple institutions and how the resultant changes are aligned with IWRM. The

[13] It must be noted that I am not an expert in the IAD framework or the theories underlying the framework. I have not been formally trained to use the IAD framework. These critiques are based only on my limited experience with the framework.

IAD framework could be used to examine the impact of these events so long as the analyst is consciously considering these events as a variable to be analyzed. I propose modifying the IAD framework to explicitly call attention to precipitating events, or historic antecedents, in the discussion of context (see *Figure 2. A Framework for Institutional Analysis*).

5.3 Utility of IWRM Design Principles

The IAD framework has been used to identify design principles of "robust" common pool resource institutions and other self-organizing institutions such as irrigation districts. Kauneckis and Imperial (2007) considered these design principles in the context of more complex environmental commons and added five additional design principles. Rather than using the design principles advocated by Kauneckis and Imperial (2007), I searched IWRM literature for common design principles and associated indicators specific to IWRM institutions. The five "building blocks" of an integrated approach developed by Mitchell and Hollick (1993) provided a good foundation for establishing a set of design principles. According to these scholars, an integrated approach to water management is based on systems thinking, encourages strategic approaches, leverages partnerships, engages diverse stakeholders in decision-making and is equitable and balanced. In light of recent scholarship on the need to develop more adaptive approaches to water management, I added adaptive capacity as one of the principles of integrated water management. Adaptive capacity can help to account for the temporal considerations in IWRM (Savenije & Van der Zaag, 2008). Overall I proposed six design principles for effective IWRM institutions. I then proceeded to look for indicators within IWRM and IAD literature that would signify if and when these principles are put into practice.

Identifying common design principles of successful IWRM institutions presents an appealing direction for IWRM research. As more theoretical and case study research is conducted, scholars can continue to identify and compare design principles in different

contexts with the intent of identifying more universal principles and indicators. Scholars could follow either a deductive or inductive approach to identify and validate IWRM design principles in future research. Following an inductive approach, researchers could examine institutions that appear to be effectively managing water resources and allow design principles to emerge from those particular case studies. After multiple case studies have been conducted, an analyst could compare and compile the design principles and indicators shared by each institution. The alternate approach is to develop a list of principles and indicators based on normative considerations and determine the extent to which an institution aligns with those principles and indicators. This study followed a hybrid approach; I gleaned a list of ideal design principles and associated indicators from IWRM and IAD literature and used existing IWRM case studies to corroborate the list.

There are obvious limitations to the list of IWRM design principles and indicators that were identified for this study. All of the high-level principles are purposefully left very broad, which may invite competing definitions. For instance, stakeholders may disagree on what constitutes a strategic approach. Implementing AWEP using EQIP rules was considered strategic by NRCS since it precluded the need to develop new rules and allowed the agency to deliver the program more quickly. On the other hand, partners may not have considered this to be strategic since EQIP rules impeded local flexibility and adaptation. Some principles may be at odds with one another depending on how they are perceived by stakeholders. For instance, focusing specifically on water quality and water quantity issues may be more strategic, but it is not necessarily in alignment with systems thinking. Including more resource users in decision-making may represent a more participatory and balanced approach, but it may be less strategic depending on the scope, scale and urgency of a situation. Finally, there may also be overlap between principles. For instance, pursuing a partnership approach to implement AWEP was also strategic since it consolidated resources to focus on a specific resource concern. Furthermore, creating mechanisms that allow for institutions to change and adapt over time can also be

considered strategic. This demonstrates that it may be hard to clearly distinguish between design principles. The paradoxes within and between each of these design principles necessitates greater examination and may only be illuminated in the context of each case study. Future research should explore how the meaning of these design principles are constructed by stakeholders and examine how stakeholders ultimately negotiate tradeoffs.

Identifying indicators for each design principle may provide some conceptual clarity. The indicators should, in essence, embody the meaning of the design principle and help guide the researcher. Future research could help identify the indicators that may be universally applicable versus those that are more specific to local context. Furthermore, analysts may need to adapt indicators in accordance with the specific level of decision making; indicators at the policy-making level may differ from indicators at the operational level. This research used the same set of indicators for each level of decision-making, which may have limited the overall analysis. The indicators selected for this research are unquestionably qualitative in nature and it would be useful to supplement them with quantitative indicators. I anticipate that the collection of design principles and indicators will evolve over time as more researchers contribute to the discussion. Rather than proposing and rejecting design principles and indicators in academic literature, I recommend convening IWRM scholars and practitioners to work collaboratively and try to reach some agreement on a list of principles and indicators that could be used for future research.

6 Conclusion

In this research I used the IAD framework to organize multiple sub-studies that comprise a multi-level case study of NRCS's AWEP. Each sub-study examined the context and action arena for sets of actors at different levels with the intent of revealing the factors that inhibited or facilitated an IWRM approach. Outcomes were examined at the local level in two separate sub-studies. Finally, AWEP was compared against a set of six IWRM design principles and its associated indicators to a) determine to what extent it resembled an IWRM approach, and b) to highlight the institutional factors that facilitate or constrain an IWRM approach. AWEP represents a change in NRCS rules that facilitates a more integrated approach to water management consistent with IWRM design principles and indicators. While AWEP does not represent an "ideal" IWRM institution in its strictest sense, the incremental rule adjustments do signal an important shift in how NRCS conservation programs are delivered.

Analysis of sub-studies at the national, state and local levels revealed different factors that either facilitated or inhibited project implementation and realization of IWRM principles. Authorization of AWEP in the 2008 Farm Bill (Sec. 2510, P.L. 110-246) enabled NRCS to fund projects that focus on interrelated water resource concerns within a specific geographic or hydrographic area. By leveraging local partnerships, AWEP provides NRCS with the ability to improve landowner participation and deliver measurable conservation outcomes at a larger scale. In order to streamline program delivery, AWEP was embedded within EQIP (an existing conservation program), which ultimately limited the role of partners and flexibility of the program at the local level. In addition to analyzing AWEP, this research examined how EQIP rules affected AWEP implementation and overall outcomes.

AWEP did not result in significant administrative changes for NRCS staff at the national, state or local level since local projects were managed through individual EQIP contracts with landowners. In many ways, AWEP was indistinguishable from EQIP with the exception that it provided more funding to a local NRCS office and focused on specific resource concerns and conservation practices. The change in rules most significantly impacted partner organizations, which now had a direct channel to national funding through a competitive program. Partners were responsible for developing proposals, selecting eligible conservation practices, conducting outreach and monitoring project performance. Partners played a crucial role in connecting NRCS projects to comprehensive conservation strategies and leveraging other resources to amplify conservation outcomes. Partners also acted as an important intermediary between local landowners and NRCS.

The State of Oregon has initiated an approach to delivering EQIP that very closely resembles AWEP. Oregon NRCS has made significant investments in strategic planning and building partnerships at the state and local level. These investments contribute to project planning and success at the local level. Although the state has a very limited role in AWEP, state staff helped project partners to navigate program rules and negotiate with the national office. AWEP provided a template for Oregon's strategic approach that familiarized partners, staff and local landowners with strategic approaches to conservation. In many ways AWEP helped to ease the transition between the traditional approach and the new approach to program delivery at the state level. This study cannot comment on how implementation of AWEP may differ between states since the analysis only focused on AWEP projects in Oregon.

Program delivery differed greatly between the McKenzie Canyon and Upper Klamath AWEP projects. These differences can be attributed to contextual factors as well as to the rules and structure of AWEP. The McKenzie Canyon project covered a smaller

geographic area and involved a well-organized irrigation district that could more easily mobilize irrigation district members. This project covered the cost of materials to allow for on-farm delivery of pressurized water from a main pipeline. The project resulted in immediate, measurable economic and environmental benefits. The Upper Klamath AWEP project covered a very large geographic area and relied on a more dispersed network of partners and landowners to conduct outreach. This project helped landowners cover the cost of transitioning all or a portion of their property to dryland pasture. Conversion to dryland pasture requires a long transition period and active management by landowners to optimize productivity. This practice generally may reduce productivity, but offers landowners greater certainty in the face of climatic and regulatory uncertainty. Comparison of the case studies showed that AWEP, since it is bound by the rules of EQIP, is well equipped to support structural practices, but may not have sufficient flexibility to address the nuance and complexity associated with changing long-term land management practices. Furthermore, changing rules within the Upper Klamath AWEP project complicated outreach efforts and ongoing communication during project implementation.

The analysis revealed numerous institutional factors that enable and constrain actors at multiple levels and it also showed that institutional factors become more nuanced at the operational level. This research identified three significant ways in which AWEP has facilitated an IWRM approach within NRCS. First, AWEP focuses funding on a specific priority resource concern within a defined geographic or hydrographic area. This signals a more strategic approach that enables NRCS and its partners to achieve measurable conservation outcomes on a larger scale, as was demonstrated by the two sub-studies that examined AWEP project implementation. Second, AWEP utilizes partnerships to conduct strategic planning and broaden its impact on private working lands. Partners can help NRCS to coordinate landowner involvement and also leverage additional resources to amplify NRCS's investment. Lastly, AWEP provides a direct conduit for local entities

to identify and fund priority resource areas. Although NRCS has historically encouraged participation in identifying priority resource concerns, AWEP allows local entities to be more involved in project design and implementation.

The barriers to implementing an IWRM approach within the context of AWEP were highly variable depending on the level of analysis. This highlights the value of using a structured framework to assess the context within which decisions occur. This research identified three significant institutional barriers that were evident at multiple levels. First, there appears to be a lack of clarity concerning the roles and responsibilities of NRCS and its partners with respect to project implementation. While all interviewees (both from NRCS and partner organizations) indicated that they had strong working relationships, limited coordination between the NRCS and partners (during proposal development and implementation) can lead to miscommunication and unfulfilled expectations at multiple levels. Administering AWEP projects on a landowner-by-landowner basis through EQIP contracts may limit overall partner involvement. Furthermore, limiting the role of partner organizations to outreach and monitoring may not fully capitalize on the strengths of the partner. Second, EQIP rules may not be flexible enough for some conservation projects, especially projects that seek to change long-term land or water management practices. EQIP restricts eligible practices that can be used for AWEP projects, which may limit NRCS and its partners' ability to be strategic. Furthermore, EQIP rules may exclude involvement of large landowners who can have a significant impact on conservation outcomes. Finally, limited local capacity to deliver projects may significantly limit project effectiveness. The issue of capacity is primarily tied to how funding is allocated at the national level and Congress's statutory restrictions on providing capacity funding to local organizations.

Conducting an institutional analysis is a very complex and difficult task that benefits from a structured framework such as the IAD framework. The IAD framework, however,

introduces its own complexity. The IAD framework has primarily been used to examine "bottom-up" approaches to resource management and may not be well equipped to address the complexity of larger IWRM institutions with many cross-scale linkages. This paper provided some recommendations for revising the IAD framework to allow for analysis of more complex multi-scale institutions such as NRCS. The IAD framework provides a good starting point for facilitating more rigorous and consistent analyses of IWRM institutions. IWRM scholars should continue to use and modify the IAD framework to improve its utility for IWRM research.

This research also suggested six design principles of IWRM institutions and identified associated indicators based on IWRM and IAD literature. The study used these design principles and indicators as evaluative criteria to assess the extent to which AWEP aligned with IWRM and also to better understand how institutional factors facilitate or inhibit an IWRM approach within the context of those principles. These evaluative criteria have not been employed in any other IWRM research. While these design principles and indicators were useful for framing this study, the utility of this approach for other IWRM researchers is questionable. Future research could benefit from a more rigorous meta-analysis of IWRM principles and indicators. Alternately, IWRM scholars and practitioners could be assembled to discuss and reach preliminary agreement on a set of principles and indicators.

NRCS is an incredibly important agency with respect to private land and water management and is well poised to align land and water management on private working lands with IWRM principles. NRCS has always had a local orientation which has enabled the agency to foster strong working relationships with local entities in most counties and it also has a reputation for helping landowners improve agricultural productivity while also conserving important natural resources on working landscapes. NRCS's emphasis on voluntary, incentives-based programs and technical assistance differentiate it from many

other federal agencies that are responsible for enforcing federal regulations. As NRCS has taken on greater responsibility to administer financial assistance to landowners it has struggled as an agency to articulate the outcomes of those investments. AWEP is one example of how NRCS is moving beyond "random acts of conservation" to implement more strategic, landscape-scale, partnership-based approaches consistent with IWRM principles. This research reveals, however, that NRCS still faces numerous institutional barriers to fully realizing an IWRM approach.

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