8-2018

Boundary Spanners and Trust Development Between Stakeholders in Integrated Water Resource Management: A Mixed Methods Study

Jodi L. Delozier
University of Nebraska-Lincoln, jodidelozier@gmail.com

BOUNDARY SPANNERS AND TRUST DEVELOPMENT BETWEEN STAKEHOLDERS IN INTEGRATED WATER RESOURCE MANAGEMENT: A MIXED METHODS STUDY

by

Jodi L. Delozier

A THESIS

Presented to the Faculty of

The Graduate College at the University of Nebraska

In Partial Fulfillment of Requirements

For the Degree of Master of Science

Major: Natural Resource Sciences

Under the Supervision of Professor Mark E. Burbach

Lincoln, Nebraska

August, 2018

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University of Nebraska, 2018

Adviser: Mark E. Burbach

Natural resource issues are inherently complex, even more so are those that involve the management of water. Because watersheds tend to cross multiple jurisdictional and geographical boundaries, a diverse set of stakeholders are needed to develop appropriate and sustainable management policy. This research sheds light on the importance of boundary spanners assisting in the development of trust between stakeholders in integrated water resource management (IWRM). Previous literature has explored the advantages to boundary spanning leadership in business practice, emergency management, university and community management as well as fish and wildlife management, but has failed to address the area of integrated water management. Boundary spanners are key to establishing stakeholder relationships, providing safe spaces for open and honest communication, and aiding in trust development.

Through a mixed-methods approach, we posed the following research questions: 1) Do boundary spanners cultivate trust between stakeholders within the IWRM process? 2) How do boundary spanners cultivate trust between stakeholders within the IWRM process? The quantitative phase surveyed individuals who had previous experience with IWRM in Nebraska. Demographic factors (age, education, and gender) and boundary spanning were used as predictors in a regression analysis of trust building between

stakeholders. Power imbalance, scale of governance, conflict, and cooperation were used as moderators of the relationship between boundary spanning and trust building between stakeholders. Autonomy, authentic leadership, and trustworthiness were used as predictors of boundary spanning behavior. Boundary spanning predicted a large percentage of the variance in trust building between stakeholders. Power imbalance, scale of governance and cooperation did not moderate the relationship between boundary spanning and trust building; however, conflict was a weak, negative moderator.

In subsequent model testing using hierarchical regression, boundary spanning, cooperation, power imbalance, and scale of governance were found to be predictors of trust building with boundary spanning having the greatest influence on trust building between stakeholders. Authentic leadership, autonomy, trustworthiness, older participants, and females all positively influenced boundary spanners' ability to influence trust building, with trustworthiness being the strongest predictor of boundary spanning. The qualitative phase involved interviewing 13 individuals who participated in the online survey and scored more than one standard deviation above the mean on boundary spanning behaviors. Seven themes emerged from the analysis of the interviews and increased our understanding of the role of boundary spanners in building trust between stakeholders. Boundary spanning behavior sets the stage for improved stakeholder relationships and enhances trust and the likelihood of a more successful IWRM outcome.

Key words: boundary spanning; integrated water resource management; stakeholders; trust building

Acknowledgements

I would like to begin by thanking my committee for their willingness to not only provide guidance and advice throughout the thesis process, but for their unending support. I am very grateful for the opportunity to have worked with such a talented group of individuals. I would first like to thank Dr. Gina Matkin for her interest in my professional aspirations as well as her willingness to not only discuss, but enhance my research writing. Her insight and attention to detail was invaluable during the thesis process. I would also like to extend a big thank-you to Dr. Connie Reimers-Hild for her involvement, advice, and friendship. Unbeknownst to Dr. Connie, her life coaching was needed at just the right moment! Her ability to challenge me with questions about my personal goals helped clarify the path before me. Last but definitely not least, I owe a debt of gratitude to my advisor, Dr. Mark Burbach. Without the humor, patience, and guidance extended by Dr. Burbach, the challenges I faced as a nontraditional student would have been much greater. His belief in my abilities encouraged me to not only complete my degree, but gain confidence to take that next step of pursuing a doctorate. I leave these last three years not only much wiser, but having developed new friendships.

I cannot thank my family enough for their constant support these last three years; it was at times an exhausting process. My mother and sister never failed to provide words of encouragement and support, and even though my father is no longer here to see the completion of my master's thesis, I know that he would be extremely proud of my achievement. Thank-you, Dad and Mom, for being the best of role models.

My daughters, who are now young adults, also deserve my thanks. I am very proud of my youngest, Regan, for I know it was difficult having me study at all hours and

absent in the evenings or at the end of her school day. She demonstrated a resiliency and maturity that will benefit her in the years to come. I would also like to thank Sidney for recognizing the challenges I faced and handling the role of big sister and oldest daughter so eloquently. I am very proud of the fact that she is going to pursue a graduate degree and confident that she will be successful in her chosen field. Love you both.

I would next like to extend a heartfelt thank you to the man in my life who listened to my complaints, proofread all my papers, helped me understand the ins and outs of technology, and provided unwavering support these past three years. He always encouraged me to move forward even when computer troubles pushed my patience to the limit! I love you, Troy, and am so grateful to have you in my life.

My friends deserve a big round of thanks for without them this process would have been much more demanding and a lot less enjoyable. Thank you Lana, Judy, Angie, Susan, Cathy, Sheryl, and Kelly. The support of my girlfriends did not go unnoticed, and it gave me the confidence to confront the numerous challenges before me. A special thank you to Polly Ubben, my speech therapist. Without her skill, persistence, and support, I would not be where I am today.

I greatly appreciate the support from Lee Orton who welcomed me into the Nebraska Water Leaders Academy and encouraged my work on boundary spanning. Finally, I would like to thank all those Academy participants, Natural Resource Commission members, NRD general managers, and the myriad of other individuals who participated in my study. Without their involvement, my research would not have resulted in a study of which I am extremely proud.

Grant Acknowledgement

Funding for this research was provided by the Nebraska Environmental Trust (NET) through a subaward with the Nebraska State Irrigation Association.

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Chapter 1 – Introduction

Background

"The international scientific community must rapidly reorganize to focus on global sustainability solutions. We must develop a new strategy for creating and rapidly translating knowledge into action, which will form part of a new contract between science and society…" (State of the Planet Declaration, 2012, p. 9). Water is one resource that requires an immediate and serious response from not only the scientific community, but public, nonprofit, and private stakeholders as well. Water is a key driver of economic and social development while being a basic need for survival; and as demands increase, more stress is placed on this diminishing supply. Climatic changes, population growth, shifting power alliances, and an increased need for more water will continue to stress water supplies. Government and private sector leaders are being forced to make difficult decisions on water allocation. Nations, states, and communities have recognized the necessity of finding new methods of managing their water resources more sustainably in order to meet the many and varied demands of usage. It is no longer possible to utilize the traditional, fragmented approach to water management. A more holistic approach is required, which incorporates varying scales of governance, economic and environmental factors, and individuals.

Water resource managers have responded to this call to action. Over the last few decades, water resource management has experienced a transformation from a top-down, mono-disciplinary and single sector approach into a multi-dimensional model opening the way for more stakeholder participation in planning and decision-making (Rees, 1998; Basco-Carrera, Warren, Van Beek, Jonoski, & Giardino, 2017). Integrated water resource

management (IWRM) was initially a pragmatic concept that existed for decades; it was formally introduced at the first global water conference in Mara del Plata in 1977. It was not until 1992 in Rio at the World Summit on Sustainable Development that IWRM became seriously discussed as to what it meant in practical terms (Dublin Principles) (GWP 2000). IWRM stresses an equitable, reliable, and sustainable approach to water management with the end goal being resilience of a system that is limited in what it can deliver. It is defined 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" (Hassing, Ipsen, Clausen, Larsen, & Lindgaard-Jorgensen, 2009, p. 3). This all-inclusive approach encourages collaboration from a variety of stakeholders and scales and works to reduce conflict, strengthen knowledge sharing, improve trust, and build cooperation.

A variety of approaches and methods for participatory planning and decision-making have been developed in response to the evolution of the IWRM process (Bousset, Macombe, & Taverne, 2005; Stöhr, Lundholm, Crona, & Chabay, 2014; Basco-Carrera et al., 2017). The central challenge to sustainable development is how to balance the many competing uses and users of water while maintaining a healthy ecosystem. Although there is no one single solution to achieving water sustainability, a combination of environmental, social, and economic components can be used to strike a balance between available water and socio-economic purposes while protecting ecosystems.

This study explores the issue of stakeholder trust within the IWRM process in the state of Nebraska, specifically, in those situations where conflict exists between

agricultural, economic, and environmental interests. The complexity of water issues in Nebraska are just as severe and contentious as they are elsewhere in the world (Smith, 2011; Babbitt, Burbach, & Pennisi, 2015). Municipalities, agriculturalists, industry, and others vie for limited water resources. The increasing demands on ground and surface water creates severe challenges, but also opportunities for stakeholder involvement, trust building, and collaboration in order to reach successful long-term solutions to water apportionment and quality goals. Only through stakeholder trust in the IWRM process can we establish long-term water resource policies that can withstand alterations to both the environment and human wants and needs.

Statement of the Problem

The establishment of trust between stakeholders within any integrative management process is critical to achieving long-term successful outcomes. Involving stakeholders in the participatory process from the onset establishes a platform from which to work and sets the tone for future positive engagement. Facilitators and program managers who strive toward acknowledging the unique perspectives and experiences of stakeholders involved in the engagement process often find collaboration easier to achieve. Trust between participants provides a starting point, which encourages stakeholders to share knowledge, accept vulnerability, acknowledge power and resource imbalances, and set aside prior animosities.

As natural resource challenges become more intense, state and federal agencies are searching for strategies to develop better working relationships with local organizations, community members, and citizens. Studies have shown that trust between stakeholders is directly related to more successful integrated natural resource governance

(Davenport, Leahy, Anderson, & Jakes, 2006; Gilmore, Dwyer, & Day, 2015; Stern & Coleman, 2015; Turner et. al., 2016; Young, Searle, Butler, Simmons, Watt, & Jordan, 2016), whereas a lack of trust is "often the most fundamental barrier to the negotiation and construction of NRM [Natural Resource Management] plans" (Lachapelle & McCool, 2012, p. 322). Establishing common ground and recognizing others' values and perspectives leads to not only trust development, but sharing of knowledge, movement toward a common goal, and better policy implementation. There are numerous case studies demonstrating the advantages to strengthening relationships between stakeholders and improving collaborative governance (Klijn, Edelenbos, & Steijn, 2010; Newig, Schulz, & Jager, 2016; Ansell & Gash, 2017; Fliervoet, van den Born, Riyan, & Meijerink, 2017). It is critical that stakeholder participation emphasize empowerment, trust, and social learning in order to enhance the legitimacy and effectiveness of the integrated management process (Reed, 2008; Akhmouch & Clavreul, 2016; Talley, Schneider, & Lindquist, 2016; Megdal, Eden, & Shami, 2017).

It is not surprising, however, that trust development between stakeholders in an integrated water management situation often involves a variety of individuals whose backgrounds, experiences, and perceptions about water management are uniquely their own. Although facilitators or project leaders are cognizant of the benefits of trust between participants, their role demands more than relationship building. Research on trust building recognizes this fact, and results suggest that other actors within the participatory process may be capable of taking on the role of relationship development. Empirical studies have identified the positive impacts of trust and boundary spanning leadership on collaboration and natural resources practices. Because trust typically develops in informal

network settings, boundary spanners – those who cross organizational borders to build important relationships – are necessary in establishing and stimulating these informal spaces.

The literature on boundary spanning has evolved over the years and attracted a great deal of attention in the areas of organizational business practices (Zhao & Anand, 2013; Schotter, Mudambi, Doz, & Gaur, 2017), industry (Lindgren, Andersson, & Henfridsson, 2008), emergency management (Curnin & Owen, 2014; Curnin & Owen, & Trist, 2014), and university/community engagement (Delaine, Cardoso, & Walther, 2014). It is only now being discussed as an essential part of natural resource management. Unfortunately, studies on the impact of boundary spanners on stakeholder relationships within the IWRM process are deficient. Little is known about the characteristics of boundary spanners in IWRM, and whether the context influences their ability to function successfully. The importance of understanding how individuals can act as boundary spanners may facilitate not only the building of trust within the participatory process, but minimize stakeholder attrition while fostering more collaboration. Utilizing boundary spanners within the engagement process has the potential to bring together a diverse group of individuals who may not necessarily hold the same values or perspectives, but are willing to work towards a common goal (van Meerkerk & Edelenbos, 2014; Edelenbos & van Meerkerk, 2015).

Purpose Statement

The purpose of this study, using an explanatory sequential mixed methods design, is to examine the influence of boundary spanners on cultivating trust between stakeholders to improve the stakeholder engagement process within an IWRM process.

The use of quantitative and qualitative approaches, in combination, should provide a better understanding of the influence of boundary spanners on cultivating trust between stakeholders than either approach alone.

Research Questions

The research question that guided the quantitative phase of study was: Does boundary spanning behavior influence cultivation of trust between stakeholders within the IWRM process? Sub-questions included the following:

1. Does the context, specifically power imbalance, scale of governance mismatch, conflict, and cooperation, impact the success of boundary spanners on the facilitation of trust between stakeholders within IWRM?

2. Do boundary spanners' perceptions of their autonomy, authentic leadership ability, and trustworthiness influence their boundary spanning ability to build trust between stakeholders within IWRM?

The research question that guided the qualitative phase of the study was: How do boundary spanners cultivate trust between stakeholders within the IWRM process? The Grand Tour Question was: How do boundary spanners describe how they cultivate trust between stakeholders within the IWRM process? Sub-questions included the following:

1. How does the context, specifically power imbalance, scale of governance mismatch, conflict, and cooperation, impact the success of boundary spanners on the facilitation of trust development between stakeholders within an IWRM process?

2. How do boundary spanners' perceptions of their autonomy, authentic leadership ability, and trustworthiness influence their boundary spanning ability to build trust between stakeholders within an IWRM process?

Significance of this Study

The ultimate goal of this mixed methods study is to determine the effectiveness of boundary spanning in trust development between stakeholders within the integrated water management process. Understanding how and why boundary spanners affect stakeholder participation is necessary in today's complex and multi-scalar water governance systems. Facilitators and project managers who are able to identify potential boundary spanners or encourage boundary spanning activity are more likely to see significant knowledge sharing, trust building, and stronger stakeholder relationships that can better withstand future challenges resulting in more effective collaborative efforts.

Delimitations and Limitations

As with all studies, there exists factors that may potentially constrain the findings for both the quantitative and qualitative phases. For the quantitative section, the greatest challenge was locating a large enough population of individuals who have been involved in an IWRM process. The on-line questionnaire, although able to reach more participants quickly and less expensively, also carries with it the possibility of more respondent error and/or lack of timely response or no response. There were challenges to ensuring that participants completed the entire survey as well. Survey takers also had the opportunity to forward the survey to others with experience in the IWRM process. However, there was no way to ensure that the survey was forwarded to those without experience with the IWRM process. A review of participants indicates that the survey was forwarded to very few people and only those with experience completed the survey.

The qualitative phase has different limitations due to the nature of how it was conducted. Distance and time constraints forced the researchers to select participants

within a two-hour driving distance. Although the majority of interviews were conducted in person, one telephone and one video conference took place to complete the interviews. Telephone interviews for the qualitative phase occurred with the understanding that this had the potential to limit the researcher's ability to observe participants' physical reactions and/or facial expressions during the interview.

Researcher Positioning and Reflexivity

Merriam (2016) wrote that in qualitative research, "the researcher is the primary instrument for data collection and analysis" (p. 7). With that in mind, self-reflection by any researcher is critical before, during, and upon conclusion of the study. Throughout this research, the primary goal was to remain aware of any personal biases and assumptions so that this researcher's judgement did not interfere with the results of the study; by moving beyond personal beliefs and experiences, the researcher remained open to participants' feelings, attitudes, and experiences. "Reflexivity is generally understood as awareness of the influence the researcher has on what is being studied and, simultaneously, of how the research process affects the researcher" (Probst & Berenson, 2014, p. 64). It is both a state of mind and intentional activity (Ben-Ari & Enosh, 2011).

This researcher acknowledges some familiarity with stakeholder engagement in an IWRM process before beginning this study, which may have influenced her interpretations and expectations of the participant experience. The researcher worked as a graduate assistant for the Nebraska Water Leaders Academy prior to and during the writing of this thesis. It was through this involvement that the researcher met individuals, who had either facilitated or participated in an integrated water management process. From this experience, she began to understand just how complex and unique water

resource issues could be for both program managers and stakeholders. The opportunity to engage with others during Academy sessions and workshops enabled the researcher to learn more about the frustrations and potential conflicts that can arise throughout the collaborative effort. This recognition, however, made the researcher more aware of guarding against personal biases, and remaining open to participants' comments and emotions.

Additionally, the researcher needed to be very careful not to lead participants during the qualitative interviews. It was critical that the beliefs and opinions, which she had formed during previous interactions with other individuals working in an IWRM process, remained in check. The researcher strictly adhered to the interview questions, but in those instances when the conversation took a different direction, she encouraged participants to share their experiences being careful to simply interpret what was being said.

Finally, the researcher understands the advantages of being a part of the Nebraska Water Leaders Academy and appreciates that participants were open to answering both challenging and personal questions. It was, therefore, important to have a critical eye and acknowledge that the point of the research is to do research *with* people, not *on* people. Moreover, this researcher had much to gain from this experience and was careful not to unduly influence participants because of her personal experience with the Academy.

Definition of Terms

These definitions were used to guide the research project and were used throughout this inquiry. The following definitions are being provided to assist with clarity and remove any ambiguity:

Adaptive Capacity – the ability of a resource governance system to first alter processes and if required convert structural elements as response to experienced or expected changes in the societal or natural environment (Pahl-Wostl, 2009).

Boundary Spanners - Individuals within an organization who can reach across organizational borders to build relationships, interconnections, and interdependencies in order to manage complex problems.

Collaborative Governance - The processes and structures of public policy decision-making and management existing between governmental, nongovernmental, and/or civic actors that create public services and values.

Integrated Water Management - The coordinated involvement of various parties in the management, governance, and conservation of water resources.

Legitimacy - The right of a governing body to rule and the recognition of this right among those being governed (Turner et al., 2016).

Spatial Scale Mismatch – The boundaries of governing organizations do not align with the environmental systems that they govern, and often leads to failed or inefficient resource management (Sayles & Baggio, 2017).

Social Learning – a process of collective and communicative learning that is thought to enable stakeholders to arrive at a shared understanding of a specific environmental situation and to develop new solutions as well as ways of acting together in pursuit of a shared ambition. (Muro & Jeffrey, 2012).

Stakeholders - Individuals, agencies or organizations who are affected by or can affect a decision by being involved in the participatory process.

Trust - A psychological state in which an individual (the trustor) accepts some form of vulnerability based upon positive expectations of the intentions or behavior of another individual (the trustee), despite inherent uncertainties or potential biases in that expectation (Stern & Coleman, 2015, p.118-119).

Chapter 2 – Review of the Literature

Introduction

The topic of trust is generating increased interest in a variety of sectors, and although it is a much researched topic, its study has remained problematic for several reasons: the numerous definitions of trust itself; confusion between trust and the antecedents that impact it; the complex relationship between trust, risk, and vulnerability; and the lack of understanding as to how context influences trust development (Mayer & Davis, 1995). "Trust belongs to the same class of abstract concepts as freedom, justice, knowledge, power, prosperity, solidarity or truth" (Möllering, 2006, p. 1). Because trust is such a fundamental element to social relationships, it has been researched extensively in areas such as economics (Williams, 2002), organizational business practices (Zhao & Anand, 2013; Schotter et al, 2017), industry (Lindgren et al., 2008), emergency management (Curnin et al., 2014; Curnin & Owen, 2014), and university/community engagement (Delaine, Cardoso, & Walther, 2014).

Although not as extensively researched, the role and impact of trust in natural water resource management is increasing. Prior studies have demonstrated that trust in environmental planning and management is key to establishing solid working relationships between stakeholders in order to achieve long-term environmental policies and solutions. Trust not only acts as a lubricant (Gilmour et al., 2015), but is an important driver for the emergence and sustainment of collaboration (Ansell & Gash, 2008; Edelenbos & Klijn, 2007).

General Overview of Trust

Trust is generally defined as "a willingness to be vulnerable to the discretionary actions of another party" (Pierson & Malhotra, 2011) and is recognized as a key component of success in any type of public engagement process or effective social system. Trust is many things to many people and, thus, its role and importance varies significantly according to the situation. More generally, trust enhances motivation, aids in compliance with policies and regulations, reduces risk perception, and promotes cooperative behavior (Gray et al., 2012; Coleman & Stern, 2015; Turner et al., 2017; Fulton, 2017; Hamm et al., 2016; Hamm, 2017). Trust is valued because it entails positive expectations regarding another party's behavior and intentions (Rousseau, Sitkin, Burt, & Camerer, 1998). Levesque, Calhoun, Bell, and Johnson (2016) found that trust promotes information sharing, honest participation, and risk-taking during the collaborative process.

Trust is also a valuable tool to be used within governance networks systems. According to Klijn, Edelenbos, and Steijn (2010), trust increases the chance that stakeholders will invest their resources in cooperation, stimulates learning by increasing knowledge sharing, and promotes innovation by lowering the uncertainty about opportunistic behavior. Lachapell and McCool (2012) discovered during their study of two community wildfire protection planning processes that trust can positively affect subsequent implementation of plans or decrease the likelihood of litigation. Federal and state agencies were viewed by local stakeholders as having their own agendas. Rather than letting lack of trust become a barrier to negotiation and compromise, participants worked to find a shared identity through better transparency, effective leadership,

reframing of risk, and attention to scale which ultimately rebuilt their trust. This illustrates the significance of trust as a critical condition necessary to addressing multi-scale issues.

Lack of trust is often a common starting point for any type of integrated natural resource management or collaborative process. When there exists prior conflict or antagonism among stakeholders, trust building becomes the most prominent aspect of the early participatory process (Ansell & Gash, 2017). Edelenbos and Klijn (2007) have conducted numerous studies on trust in complex decision-making networks, and although there is consensus that trust is difficult to achieve, the benefits far outweigh the challenges. According to Edelenbos and Klijn, trust is valued because it facilitates, solidifies, and enhances cooperation between stakeholders. Actors representing different values and perspectives are more willing to embrace collaboration and share knowledge, which provides stability when future challenges are met. Gray, Shwom, and Jordan (2012) explored the factors that predicted levels of trust between recreational anglers and fisheries management. Their results highlighted the fact that although stakeholder participation is crucial for moving the process forward, it does not always conclude in trust.

Participation in collaborative management varies greatly in terms of who is involved, how early and often in the process, and who has influence in the outcome. Scale of governance (Gray et al., 2012; Gilmour et al., 2015), equity (Reed, 2008; Olvera-Garcia & Sipe, 2016; Turner et al., 2016), stakeholder perception (Klijn et al., 2010; Pirson & Malhotra, 2011; Abbas et al., 2015; Hornagic et al., 2015; Nastran, 2015; Young et al., 2016), knowledge sharing (Cash et al., 2006; Sol, Beers, & Wals, 2012;

Zhao & Anand, 2013; Thaler & Levin-Keitel, 2015; Alexander, Andrachuk, & Armitage, 2016; Young, 2016; Enloe et al., 2017), and transparency (Mazur & Curtis, 2006; Ansell & Gash, 2008; Gray et al., 2012; Nastran, 2015) all impact trust.

Trust definition. Trust has been proven vital for compliance among stakeholders in the co-management of natural resources (Pretty 2003; Armitage et al., 2009). This has resulted in numerous trust definitions, each having a slightly different interpretation. Rousseau (1998) has described trust as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviors of another" (p. 395). Whereas, Mayer et al. (1985) go further to describe trust as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that party" (p. 712). This definition parallels Rousseau's with its emphasis on one party being vulnerable to another, yet it differs in the sense that something of importance could be lost. Edelenbos and Klijn (2007) evaluated trust as a stable positive expectation that actor A has (or predicts she has) of the intentions and motives of actor B in refraining from opportunistic behavior, even if the opportunity arises. They move beyond this formulaic description of trust, however, to delineate some general characteristics found in the literature on trust. Trust cannot occur without vulnerability. Trusting that another person will consider one's interests allows trust to occur. The second characteristic is risk and the third is expectations. These three traits encourage trust to develop and occur between individuals, and ultimately can lead to cooperation, collaboration, and more successful outcomes in the decision-making process. With respect to the IWRM process, trust should be viewed

as something that can exist between individuals, groups, and institutions and can represent either a local, regional, or national belief or a situation-specific and/or trustee-specific attitude (Dunn & Schweitzer, 2005).

Trust characteristics and criteria. The literature on trust clearly emphasizes that vulnerability, risk, and expectations are characteristics specific to trust development (Edelenbos & Klijn, 2007); stakeholders must be willing to take some risk in order for collaboration to occur. Risk-taking is a key component to building relationships that are open to knowledge sharing, reciprocity, and ultimately trust building. Ostrom (1998) suggests that trust "affects whether an individual is willing to initiate cooperation in the expectation that it will be reciprocated" (p. 12). If a trusting stakeholder's cooperation is not reciprocated, this can impact future negotiations negatively. As Pretty (2003) explains, "relations of trust lubricate cooperation, and so reduce transaction costs between people" (p. 1913). Furthermore, research has shown that trust is dynamic and never static; natural resource managers need to be aware that interactions, exchanges, and dialogue between stakeholders have the potential to actively change the nature or type of trust (Gilmour et al., 2015). It is critical that policy-makers recognize not only the importance of trust in the participatory process, but how it should be nurtured throughout the entire process. In a study conducted by Metcalf et al. (2015), the researchers found that building and maintaining trust over long timeframes in large-scale projects with multiple actors is a challenge. Delays in implementation, revisions of project plans, and changes in key staff all impact trust; this requires constant attention and maintenance of the engagement and implementation process. Successful outcomes can be achieved when natural resource managers are cognizant of the timing of stakeholder engagement and

recognize the uniqueness of each participant as well as their different degrees of vulnerability.

Trust does not happen in a vacuum; it requires a certain degree of dependency accompanied by a set of expectations. Stakeholders have a belief that their involvement in the process will result in something positive. This simple statement is complicated by the fact that stakeholders also hold certain perceptions, values, and prior experiences that may challenge the situation. In a study conducted by Turner et al. (2016), natural resource users' (commercial fishers and tourism operators) perceptions were assessed as to how they supported the rules and policies of the Great Barrier Reef Marine Park. Results indicated that resource managers could no longer view user groups as homogenous entities with similar values and interests. Today's participants bring competing values, knowledge, and perceptions, which requires natural resource managers to continually manage the relationship and develop unique strategies for particular groups. Natura 2000, a regional protected park project in Slovenia, is one such example of an integrated natural resource process that failed due to mistrust, poor communication, and lack of local stakeholder cooperation (Nastran & Pirnat, 2012). Natural resource and government agency planners failed to acknowledge the negative perceptions that local stakeholders held of public organizations. Ultimately, the lack of stakeholder cooperation, trust, and bottom-up participation resulted in an even greater mistrust of public agencies, experts, and the governance network. The failure of Natura 2000 demonstrates how vital communication and stakeholder engagement are to natural resource management, and represents the "deep human need for recognition of owners' roles in landscape management" which is often missing in environmental planning and

policy (Nastran & Pirnat, 2012, p. 157). In order for trust to flourish, stakeholders must view the natural resource manager or facilitator as someone with perceived independence, knowledge, and expertise in the areas of relevance, professionalism, competence, and credibility as well as reputation (Gilmour et al., 2015; Metcalf et al., 2015). Confidence or prior personal experience with an individual or institution provides a base or parameters from which to begin developing trust (Sjölander-Lindqvist, Johansson, & Sandström, 2015).

Trust constructs. Trust is many things to many people, which results in an abundance of scholarship on trust. Unfortunately, this results in a lack of consistency in not only defining trust, but there is no universally accepted approach to measuring trust. There exists, however, a handful of conceptualizations or constructs of trust which provide some guidance to evaluating trust within the natural resource process. Stern and Coleman (2015) suggest that stakeholders within a system have differing degrees of vulnerability, power and/or tolerance for risk depending on their positions within the project. Moreover, stakeholders may require diverse types or amounts of information in order to develop strong relationships and formulate trust within the participatory process.

Trust may be approached in different ways according to the literature; Stern and Coleman (2015) argue that in a natural resource management context, trust exists in four forms: dispositional trust (based on a propensity to trust others), rational trust (based on the calculated utility of trusting), affinitive trust (based on a relationship between the trustor and trust target), and procedural trust (trust based on the systems governing the interactions between the trustor and trust target). Of all four dimensions, rational trust is typically the first to form in a new relationship, and once affinitive trust develops, it

becomes more stable and resilient. (Stern & Baird, 2015; Hamm, 2017). Different trustors may also have differing degrees of tolerance for risk and uncertainty. As such, individuals may have dissimilar requirements for the amount of information needed to formulate trust or distrust. Similarly, diverse value sets held by different individuals influence the types of information most important to developing trust assessments (Stern & Coleman, 2015). Personal histories and experiences can also play an important role in the development of trust (or distrust) between stakeholders and toward institutions.

Heemskerk, Duijves, and Pinas (2015) add to the research on trust building between stakeholders, particularly when the trust has been tainted by both history and culture. Distrust, in this case, is one that has developed over time with a period of reoccurring breaches of trust and is often difficult to eliminate. Thus, it is critical that natural resource managers understand the shared history of stakeholders especially when abuse of that resource is a part of the community's local heritage. "Once such negative expectations are created, actions by the other become negative self-fulfilling prophecies…which often lead the conflict into greater scope, intensity, and even intractability" (Lewicki & Wiethoff, 2000, p. 101). In these situations, trust building requires time and can only develop by establishing good interpersonal relations with representatives of the entity, which may have wronged them in the past. In addition, the context of a situation is often ignored when determining how to assess trust; different environmental or organizational situations and imbalances of power or resources may influence individuals as well as determining different baselines of trust.

The drivers of trust have also been categorized by different researchers into various models of trust. While some authors use a single trustee characteristic to identify

trust, others may delineate as many as ten characteristics. Based on the extant literature, Mayer et al. (1995) argue for the importance of three particular elements of trust: ability, integrity, and benevolence. More recently, Pirson and Malhotra (2011) added to this framework with a fourth and fifth dimension: identification and transparency. The reasons for this expansion was to incorporate organizational stakeholders and their perceptions. After interviews with actual organizational stakeholders, two further modifications were inserted into their framework: a distinction was made between managerial and technical competence, thus replacing the *ability* construct. Hamm (2017) strikes out in another direction, categorizing trust as either trust-as-attitude or trust-as-choice. According to Hamm, this conceptualization places the emphasis of trust squarely within the trustor and his/her willingness to accept vulnerability to harm from others' actions whereas trust-as-choice refers to the trustor's decision to accept vulnerability due to the perceived benefits of that relationship. Needless to say, a natural resource manager's approach to trust may appear somewhat complex yet this complexity lends itself to flexibility and adaptability, which is crucial when working with a diverse group of stakeholders.

Trust constraints. There is much research on the building of trust, which requires facilitators and natural resource managers to be mindful of the impediments to relationship development. Because good water governance and effective stakeholder engagement are tightly linked, it is critical that the barriers to trust building be minimized. Davenport, Leahy, Anderson, and Jakes (2007) concluded that low levels of community engagement, unclear participation, and a history of adverse relationships between stakeholders would constrain collaboration. Reed and Abdel-Monem (2016)

recognize the challenges inherent in overcoming historical perceptions. Natural resource project managers and other water management institutions must be cognizant of becoming "prisoners of history which embody past rather than present, much less future, knowledge and necessity" (Hoffman & Zellmer, 2013, p. 806). Many western states including Nebraska have finally acknowledged the hydrologic connectivity between ground and surface water, yet struggle to address such conflicts outside the court of law. In these instances, prior beliefs about water rights are difficult to overcome; however, coordinated efforts between diverse stakeholders have the potential to address future impacts of groundwater use on river and sub-basins.

Trust is not only defined by history, but also shaped by the culture of those involved in the IWRM process. Heemskerk et al. (2015) researched the relationship between small-scale Suriname gold miners and their government. This long history of distrust, developed through years of unfair regulations and resource controls, severely undermines the ability of these stakeholders to collaborate. Conscious efforts to understand and address the historic developments and cultural sensitivities that shaped these perceptions must be undertaken to rebuild trust.

Participation between the various actors is also dependent on the power or resource relationship between different scales of governance (Armitage et al., 2009). It is critical for facilitators to identify who has the power, who seems to be powerless, and notice how the different stakeholders deal with this power (Thaler & Levin-Keitel, 2016). According to Armitage et al. (2009) imbalances of power can fragment stakeholders' interests and values into non-communicating behavior and lead to competition rather than cooperation. Furthermore, participants with more capacity and resources tend to align the

results of the collaborative governance in their favor (Reed, 2008). This influences not only stakeholder motivation and information sharing, but reduces perspective taking (Wald, Segal, Johnston, & Vinze, 2017) and places the entire IWRM process at risk. In addition, the willingness to trust cannot be one-sided. Government agencies need to be open-minded and demonstrate a willingness to relinquish their power or resources in order to reach a successful policy outcome (Sol et al., 2012; Nastran, 2015).

A study done by Sol et al. (2013) examined the social learning process in the Dutch Westerkwartier region of the Netherlands. The researchers wanted to understand the role of trust and commitment in social learning. During the collaborative process, however, the government representatives demonstrated their lack of commitment to problem solving, which resulted in a sudden decline in mutual trust and commitment. Because the government held the power and resources, they were able to commit loosely to the process, which negatively affected the attitudes of local stakeholders. Nevertheless, there are cases where local stakeholders are strongly dependent on state or national authorities (Thaler & Levin-Keitel, 2016), and recognition of these different degrees of vulnerability and power is crucial to working through the participatory process. Different situations demand different forms and degrees of risk in decision-making (Stern & Coleman, 2015).

Diversity and perceptions. Stakeholder diversity and perceptions can also negatively affect the ability of facilitators to establish trusting relationships between parties. Perceptions are often formed by not only a single event, but rather several interconnected occurrences (Nastran, 2015). A study done by Nastran (2015) in the Slovenia Alps Regional Park analyzed the perceptions local stakeholders held toward a

protected area. These strong emotions arose from perceived costs and benefits of the park as well as previous direct and indirect experiences with institutions associated with the park and its founders. Perceptions about fairness and equity in the decision-making process often interrupt the development of trust between stakeholders (Nastran, 2015). Nie (2003) argues that it is not *what* natural resource decisions are made but *how* they are made that causes distrust and conflict.

Stakeholders can often build a relationship with agency personnel even if the institution, which that individual represents, is perceived as not trustworthy. According to Davenport et al. (2007), a portion of the public does not trust agency management decisions and thus gets involved in order to overcome this barrier. Institutional trust [participants' perceptions of the knowledge and values reflected in an organization's decisions and actions] is what is most meaningful to them. There are others in the public, however, who rely on interpersonal trust [the trust developed with individuals with whom they have developed relationships]. Those stakeholders who have had positive interactions with agency personnel are able to distinguish between trusting an individual and trusting that agency (Gilmour et al., 2015). Natural resource managers need to know their audience in order to seek opportunities to build these different types of trust. However, Rousseau et al. (1998) caution that too much institutional control used to build trust can actually work against trust. Remembering to personalize the engagement process is a key to getting more local stakeholder involvement.

Scale mismatch. Scale is another factor that shapes the function and distribution of trust as well as its degree of implementation within the IWRM process. Developing trust across different scales and levels of governance with more than one scale mismatch

occurring can be a challenge. One might trust certain individuals or organizations within a natural resource management agency, but not trust the overall institution. Failure to recognize the importance of cross-scale and multi-level interactions may impinge on the capacity to develop trust between stakeholders (Cash et al., 2006). A study conducted by Enloe, Schulte, and Tyndall (2017) found that scale mismatch caused by socio-economic and ecological pressures can present substantial obstacles to trust development and stakeholder collaboration. Program leaders of this study realized a lack of institutional trust between farmers and governmental agencies. In order to combat this mismatch, they focused on building interpersonal trust by working with and seeking out farmer champions, individuals who can talk to other farmers and positively influence them on new management practices and finding Natural Resource Conservation Service program leaders of high social capital (Enloe et al., 2017). Often, state and federal agencies' practice standards are written at different bureaucratic complexity levels that do not necessarily translate or work with the realities of farm management. Sometimes actors higher up in the institutional or bureaucratic levels need to realign their perceptions and values.

Not only does the scale of governance influence trust, but the size of the natural resource project as well. Maynard's (2013) research demonstrates that smaller scale projects achieve higher levels of participation because there are more personal interactions that build trust and flexibility to integrate diverse goals. Large-scale projects often lead to mistrust and a top-down approach that brings about perceptions of powerlessness. In addition, Gray et al. (2012) found that trust varies with scale – higher levels of trust in state (and local) agencies as opposed to federal agencies. Building and

maintaining trust in large-scale projects that cross multiple jurisdictional borders can be a challenge.

Trust building. By recognizing those challenges inherent to trust building, natural resource managers have the opportunity to mediate the adverse impacts of scale mismatch, power imbalance, negative perception, and diversity. A positive perception of fairness in the collaborative process increases the acceptability of decision outcomes even when values are in conflict (Lind & Tyler, 1988). Facilitators who understand the value of a systems-based trust can provide space for ambivalent stakeholders to move forward in trusting other actors within the participatory process (Stern & Baird, 2015). Research in this area generally agrees that collaborative processes that include fairness, transparency, and relationship building promote trust (Pretty, 2003; Davenport et al., 2007; Armitage et al., 2009).

In addition, natural resource management will be able to maneuver the complexities and challenges of stakeholder engagement more effectively where multiple types of trust exist. Since vulnerability varies from stakeholder to stakeholder, and according to the agency involved, participants will have different needs and expectations during the IWRM process. This can be overcome by building different levels and degrees of trust. To encourage interpersonal trust, agencies should focus on informal relationship building strategies that provide both knowledge sharing and numerous interactions (Davenport et al., 2007). To build institutional trust, facilitators and agencies need to create opportunities to incorporate local values and knowledge into natural resource management policies and programs. By enhancing the adaptive capacity of the participatory process, stakeholders, program managers, and agencies will be better able to

respond to disturbances in the participatory process and withstand any negative effects until damaged trust recovers (Stern & Baird, 2015).

Involving stakeholders throughout the engagement process has been proven an effective strategy toward developing both collaboration and trust in an IWRM. Trimble and Berkes (2013) examined how participatory research is becoming ubiquitous in natural resource management. Bringing together a diversity of knowledge sources and types to tackle a problem collaboratively results not only in community empowerment, but increased trust between stakeholders. Their research was based on a case study in the Piriápolis artisanal fisheries of Uruguay and involved local fishers, scientists, and both nongovernmental and government agencies. Incorporation of stakeholders into the learning and research process resulted in three findings associated with relationship, trust, and respect. First, most stakeholder relationships improved. Second, trust among stakeholders increased in most relationships, especially among participants who had established new relationships and/or had more interactions or group work. Finally, respect toward group members improved (Trimbel & Berkes, 2013). When questioned about the participatory process, all actors stated that they wished to maintain the relationships they had established, a positive condition for future collaborative work. Moreover, facilitators who inject a dynamic learning dimension in the early stages of the participatory process are more likely to enhance trust between stakeholders and contribute toward feelings of empowerment and equity.

Surprisingly, too much trust between stakeholders can lead to groupthink and stifle independent and innovative thinking (Edelenbos & Klijn, 2007). Beyond a certain threshold, greater degrees of trust may have a negative effect on the resiliency and

effectiveness of the participatory process. According to Stern and Baird (2015), this is called the complacency threshold. Unlimited trust can demotivate participation and reduce the development of new ideas and active debate (Smith, Leahy, Anderson, & Davenport, 2013). There is also the opportunity for high-trust relationships to result in closed networks, thus hampering cross-boundary interaction (Edelenbos & Meerkerk, 2015).

Boundary Spanners

The definition of a boundary spanner varies according to the discipline and context. Williams (2002) provides readers with a general overview of a boundary spanner's role suggesting that they are individuals who serve as connectors between two or more stakeholders. Zhao and Anand (2013) extend that definition further by acknowledging that boundary spanners operate on the edge or periphery of an organization positioning themselves as both internal and external communicators. Although boundary spanners typically represent their home organizations, they actively work toward collaboration, attempting to link diverse stakeholders, processes, and information from both sides (Alexander, Andrachuk, & Armitage, 2016; van Meerkerk & Edelenbos, 2014). By acting as inter-organizational ambassadors, they have an opportunity to influence perceptions and improve knowledge sharing between stakeholders. Creating multiple pathways for stakeholders to learn about each other's values, experiences, and skills is critical to the development of trust (Coleman & Stern, 2018).

Research has found that boundary spanners originate more frequently from private and societal organizations and less from governmental agencies (van Meerkerk &

Edelenbos, 2014). The challenge for a government agent acting as a boundary spanner is great, especially when the issue at hand involves numerous scales of governance. Typically, boundary spanners representing public agencies have limited autonomy, which many participants see as undesirable. Studies show that the higher the autonomy of a boundary spanner the more likely she is to develop trust between stakeholders (Williams, 2002; van Meerkerk & Edelenbos, 2014; Thompson et al., 2016). This area, comparing the boundary spanning capacity between private and public actors, however, requires much more study.

Ultimately, boundary spanners attempt to build trust in order to establish solid relationships and improve collaboration between diverse stakeholders. Many are highly sensitive to and skilled in bridging interests and organizations. Numerous studies have shown that trust increases between stakeholders as they participate in the collaborative process (Ostrom, 2003; Davenport et al., 2007; Stern, 2008; van Meerkerk & Edelenbos, 2014). Furthermore, trust has been shown to develop in informal network structures (Edelenbos & van Meerkerk, 2015), and boundary spanners are crucial to creating spaces of interaction so that collaboration can occur. A study done by Stern and Coleman (2018) on three-forest landscape restoration collaboratives demonstrated the advantages to using a boundary spanner to help stakeholders agree to rules and procedures, which created a safe place for discussion. This structure allowed participants to express their views and concerns within the participatory process. One boundary spanner from Collaborative A commented, “I like structure; people can trust that they’re safeguarded, that there’s venues to be heard, there’s processes that are supported by the group, whether we like what someone might want to discuss or not, there’s a freedom in the structure to

allow for, like, a group, like a joint fact finding on an issue if there is a disagreement about it, and we can trust that will happen" (Coleman & Stern, 2018, p. 7).

The bundle of attributes and abilities that define a boundary spanner is unsettled; nevertheless, an effective combination of the following characteristics is necessary to overcome the barriers needed for long-term stakeholder engagement: demonstration of independent thinking, good listening and communication skills, competence in power management, neutrality, and high integrity (Williams, 2002; Pirson & Malhotra, 2011; Delaine, Cardoso, & Walther, 2015; Coleman & Stern, 2018). In some organizations, upper management chooses boundary spanners because they are well connected within their home organization and are perceived as trustworthy (Schotter et al., 2017). On the other hand, others are individuals who become involved because they want to be an active change agent or cross boundaries and establish lasting relationships (Williams, 2002). Boundary spanners who are perceived by stakeholders as more independent are often considered more trustworthy and viewed as less likely to have a hidden agenda (Thompson et al., 2016).

The specific role of the boundary spanner is critical to a successful IWRM process. The primary objective is to create an environment where diverse stakeholders feel confident to express their opinions, share knowledge, and accept vulnerability thus leading to better collaboration and trust between participants. Boundary spanners that can make the decision-making process more transparent and less contentious encourage more knowledge sharing and participation from stakeholders. Of particular interest to researchers is how boundary spanners can assist with information sharing, which includes both scientific and local knowledge. Grygoruk and Rannow (2017) refer to this as

"horizontal interactions" and support the idea of using boundary spanners to help bridge that gap between complex scientific data and stakeholder needs. Sharing scientific and technical information at a level of comprehension, which can be not only understood but also applied, helps facilitate wider stakeholder participation, dialogue, and the associated social learning process that takes place in small group settings. Such information is valuable and should be utilized to aid in the decision-making practice, but as Munoz-Erickson et al. (2010) point out, disputes over expert knowledge can become a central point of conflict. These debates over issues of fact or information can incapacitate a collaborative process. It is critical that boundary spanners minimize the "us v. them" mentality between groups of stakeholders so that the conflict does not become so deep-seated that participation ceases.

Without a doubt, the primary focus of a boundary spanner is building sustainable relationships. IWRM involves individuals from a variety of professional and organizational backgrounds; thus, these collaborative encounters require boundary spanners to not only recognize but also manage these differences (Williams, 2002). This can be achieved by a boundary spanner maintaining a high degree of contact with her internal organization as well as the external environment. Zhou and Anand (2013) point out that boundary spanners dealing with highly technical or scientific information must often grapple with its complexity, and then must process, filter, and feed that information to external stakeholders. The challenge lies in ensuring that the information is not so distorted or complicated that stakeholders feel excluded and unwilling to negotiate.

A study done by Schotter et al. (2017) on boundary spanning in global organizations realized the advantages to utilizing such individuals in complex

negotiations. The researchers concluded that boundary spanners' work be modeled after a rubber band allowing for flexibility in mediation. This loose connection permits stakeholders to act independently but still change directions when applicable in order to demonstrate alignment with others. Participants benefit from this type of participatory process because they can stretch to accommodate different perspectives yet remain within the confines of their organization's plans and policies. As boundaries become more complex with the addition of more diversity and perspectives, the advantages to the rubber band principle increase. Schotter et al. (2017) stress the benefits of this model.

Even when stakeholder interests conflict significantly, research has shown that the presence of a boundary spanner within the participatory process has been positive (Williams, 2002; Kjiln et al., 2010; van Meerkerk & Edelenbos, 2014; Coleman & Stern, 2018). Establishing sustainable and working relationships in complex networks takes on a variety of forms yet the primary goal is the same: cross borders, establish effective connections, facilitate good information exchange, and seek out shared meanings between stakeholders. Although boundary spanners seek to establish personal and lasting relationships between diverse participants and organizations, the danger of creating too tight of a relationship must be recognized. Williams (2002) warns that those networks that are overly reliant on these personal relationships may suffer when the boundary spanner leaves the network.

Based on the information presented above, the following hypothesis is proposed:

H1: Boundary spanning will have a significant positive effect on building trust between stakeholders in Integrated Water Resource Management.

Power imbalances. Imbalances of power within the participatory process can leave a boundary spanner struggling to retain and/or engage stakeholders, let alone succeed in developing trust. Stakeholders who feel inadequate because of power or resource imbalances often complain of feelings of exclusion, inequality, and hierarchies. An Alexander et al. (2016) study revealed that people in governance networks involved with community-based conservation initiatives had to be cognizant of powerful or more influential stakeholders who attempted to control the types and sources of knowledge. Stakeholders that are more powerful can manipulate social learning and impact the level of trust and collaboration that is formed, thus undermining the participatory process. In these instances, it is critical that boundary spanners find strategies to defuse those behaviors and outcomes. Identifying the core values and interests of a diverse group of stakeholders can be achieved with time (Pretty, 2003); however, key actors need to create the space required for these differences to be deliberated (Lejano et al., 2013; Alexander et al., 2016). Wald et al. (2017) maintain that egocentric behavior within the participatory process of natural resource management must be overcome to establish trust and collaborative behavior.

When control of resources or access is unequal, interventions must occur or those participants with less power will reduce perspective taking and turn away from further collaboration. Previous studies suggest that perspective taking is a key to shared understanding, social bonds, and collaborative behavior (Cialdini, Brown, Lewis, Luce, & Nueberg, 1997), and if stakeholders are unable to develop secure relationships, the collaborative process is at risk. Imbalances exist with not only power or resources, but also ability (Ansell & Gash, 2008). Local stakeholders may not have the skill or

expertise to engage in complex or highly technical decision-making deliberations (Yang & Pandey, 2010).

One example of a perceived imbalance of power occurred during the Platte River Collaborative Watershed Planning Process. Conservation advocates complained that the negotiating table was "uneven and weighted toward development interests" (Ansell & Gash, 2008, p. 551). Since development interests and environmental advocates can have widely diverse capabilities, the collaborative process often favors well-organized and more powerful interests. Some stakeholder groups are spread out and lack the necessary organizational infrastructure placing them at a disadvantage.

Based on the information presented above, the following hypothesis is proposed:

H2: Power imbalances will moderate and negatively influence the effect of boundary spanners on building trust between stakeholders in Integrated Water Resource Management.

Governance mismatch. Other contextual factors besides power imbalance influence the role of a boundary spanner. Scale of governance mismatch, experience of the facilitator or project manager, prior conflict between stakeholders, and degree of autonomy of the boundary spanner can add both positive and negative dimensions to the collaborative process. It is important that boundary spanners identify patterns and dimensions of stakeholder group identities early on especially when varying scales of governance are at play (Cheng & Daniels, 2005). Recognizing that watersheds often occur at multiple geographic and jurisdictional scales, boundary spanners need to be cognizant of participants' unique needs and values. In this way, they can develop a sense of community encouraging stakeholders to connect and identify with others' concerns about the watershed and community as a whole (Cheng & Daniels, 2005).

Findings by Cash et al. (2006) reinforce the idea that knowledge is perceived differently at various levels or scales, which is a result of individual perceptions as to what is credible, valuable, and legitimate information, and whether or not it is important. This "plurality challenge" (Cash et al., 2006, p. 6) can be addressed by a boundary spanner since this individual acts as an intermediary between the different levels or scales, perceptions, and interests, by assisting in the co-production of knowledge. This type of cross-sector, multi-stakeholder collaboration creates a more comprehensive watershed-based management approach (Enloe et al., 2017), allowing for a variety of discussion and debate.

Results of research on collaborative engagement consistently emphasize the importance and significance of stakeholder perceptions toward other stakeholders, whether stakeholders be from public agencies, nonprofit organizations, or the local community. The notion that stakeholders perceive boundary spanners as somewhat independent or autonomous from their home organization is also significant and the key to successful collaboration. Schotter et al. (2017), whose study was primarily conducted on boundary spanning in global organizations, acknowledged that a boundary spanner's actions and effectiveness are influenced by both the organizational structure of one's home institution and that individual person's capabilities. That being said, boundary spanners can be viewed as direct representatives of their organizations tied to its beliefs and values, lacking autonomy and an unbiased voice. In addition, managerial motivations and one's business identity can adversely affect their actions and effectiveness. Because a boundary spanner's role is to cross-organizational borders and

make connections, she is more effective when given a certain amount of autonomy to engage constructively with other actors (Williams, 2002).

Based on the information presented above, the following hypothesis is proposed:

H3: Scale of governance mismatch will moderate and negatively influence the effect of boundary spanners on building trust between stakeholders in Integrated Water Resource Management.

Conflict. Stakeholders who have experienced a history of conflict with another actor in the IWRM process are more likely to express low levels of trust presenting a challenge to boundary spanners. Tense and conflicted history between participants is likely to result in lack of commitment and participation as well as feelings of suspicion and distrust (Ansell & Gash, 2017). On the other hand, strong trust and interdependence among groups of stakeholders may discourage collaboration among a wider set of actors. Ansell and Gash (2017) suggest that factions of any kind within the participatory process are less likely to favor collaboration. In those instances, when stakeholders come to the table with predetermined feelings and perceptions, boundary spanners must work to remediate those low levels of trust and social capital. In fact, when there is a prehistory of conflict among participants, the development of trust becomes the most important aspect of the collaborative process.

Based on the information presented above, the following hypothesis is proposed:

H4: Conflict will moderate and negatively influence the effect of boundary spanners on building trust between stakeholders in Integrated Water Resource Management.

Cooperation. The absence of conflict does not always result in cooperation or cohesion within the IWRM process. Participants, for one reason or another, may refuse

to acknowledge perspectives different from their own. This may be the result of stakeholders not being given enough time to develop strong relationships, the complexity of the resource issue, feelings of marginalization, or other factors. The boundary spanner's role in this situation is more challenging yet can be overcome with early and transparent communication, continued inclusiveness, and more face-to-face interactions between stakeholders (Megdal, Eden, & Shamir, 2017). In those situations, where interest conflicts are not a significant factor, boundary spanners can work on improving the efficiency of the IWRM process. For example, a one-day participatory workshop in Koraro, Ethiopia offered stakeholders an opportunity to share their understanding and perspectives of a water management project that directly impacted them. Agency officials discovered after listening to stakeholder concerns that a one-size-fits-all approach was ineffective and costly, and failed to acknowledge local citizens' preferences. (Medgal et al., 2017).

Although boundary spanners strive to promote learning and build competence during the participatory process, the system is not always effective resulting in divided stakeholder relations. Because knowledge sharing is critical to strong cross boundary cooperation, boundary spanners can focus their energies into the quality of the engagement process. Utilizing experts and serious gaming (or role-playing) improves social learning and provides participants the opportunity to explore and learn from these simulations (Medema, Furber, Adamowski, Zhou, & Mayer, 2016).

Based on the information presented above, the following hypothesis is proposed:

H5: Cooperation will moderate and positively influence the effect of boundary spanners on building trust between stakeholders in Integrated Water Resource Management.

Antecedents to Boundary Spanning

A multitude of potential factors could influence a boundary spanner and her influence on the stakeholder engagement process. Unfortunately, limited research exists on the facilitating conditions or antecedents, which impact boundary spanning activities and those involved in the participatory process (Brion, Chavuvet, Chollet, & Mothe, 2016; Lee & Sawang, 2016). Because boundary spanners deal with interpersonal relationships as well as the external environment, understanding oneself is vital to successfully managing diverse stakeholders and various scales of governance (van Meerkerk & Edelenbos, 2017; Schotter et al., 2017).

Joshi, Pandey, and Han (2009) reinforce the idea that antecedents can influence both boundary spanning activities and behavior. Their comprehensive review of 20 years of research on team boundary spanning resulted in a proposition – boundary spanning can be impacted at both the micro and macro level. At the micro level, stakeholders' cognitive and behavioral responses can influence their interactions and impact boundary spanning activities; these antecedents are viewed at "bottom-up" factors. At the macro level, both organizational structure and its culture can influence the extent and nature of a boundary spanning activity; these macro antecedents are viewed at "top-down" factors (p. 734). This is similar to Schotter et al.'s (2012) idea that boundary spanning can have an organizational as well as an individual component that can also affect boundary-spanning functions.

Autonomy. To understand the influence of antecedents on boundary spanning, Brion et al. (2012) conducted a study involving 73 project leaders from multiple manufacturing firms in France. They tested the impact of boundary spanning activities

on new product development outcomes and explored the antecedents of these activities. The focus was on structural holes, strength of ties, and vertical and horizontal bridging ties within the management process. They discovered that a project leader's ability to perform boundary spanning activities was greatly influenced by the value of strong ties in one's personal networks. Brion et al. (2012) concluded that strong ties could lead to increased political support, which refers to understanding the organization's expectations and differentiating between potential enemies and allies. Furthermore, a boundary spanner who already has strong connections and displays a sense of autonomy is more likely to have success when valuable information or integration of knowledge is necessary.

Boundary spanners who demonstrate a certain degree of empowerment are not only more effective, but able to engage more constructively with stakeholders (Williams, 2002). According to Thompson et al. (2016), program managers, scientists, and boundary spanners are more often trusted by stakeholders when they are they are viewed as less likely to have a hidden agenda or financial motive. The ability of a boundary spanner to work independently within certain parameters is critical. Along similar lines, Schotter et al. (2017) suggest that boundary spanners who are able to utilize their personal legitimacy during the participatory process are more likely to replace stakeholder distrust with confidence and good faith.

Boundary spanners acting in an autonomous manner are often described as individuals adept at breaking down boundaries between themselves and other stakeholders to listen empathetically and build trust. At the same time, however, they must protect themselves from enmeshment with the recipient's desires as well as their

home organization's overarching needs, thus striking a balance between remaining independent and a team player (Williams, 2002).

Based on the information presented above, the following hypothesis is proposed:

H6: An increase in a boundary spanner's autonomy results in an increase in boundary spanning behavior in Integrated Water Resource Management.

Authentic leadership. Authentic leadership has been described by Bass and Steidlmeier (1999) as simply an extension of transformational leadership, whereas contemporary explanations view authentic leadership as the foundation for the positive attributes found in charismatic, transformational, spiritual, and other leadership theories. Work done by Luthans and Avolio (2003) use terms such as "confident, hopeful, optimistic, resilient…" (p. 243) when defining authenticity in leadership. Likewise, Shamir and Eilam (2005) stress that an authentic leader is an individual with a "high level of self-resolution or self-concept clarity" (p. 399). Utilizing these findings and others, Ilies, Morgeson, and Nahrgang (2005) developed a four-dimensional model of authentic leadership, which includes self-awareness, unbiased processing, authentic behavior and authentic relational orientation.

Based on the suggestions of these and other authors, Walumbwa, Avolio, Gardner, Wernsing, and Person (2008) set out to prove that there was much more to authentic leadership than just being true to oneself. Their suggestion that when leaders act on their true beliefs, values, and strengths, while assisting others to do the same, employee well-being will improve and positively impact follower performance as well. This line of thinking eventually led to their development of a multidimensional construct of authentic leadership. Overall, their conclusions suggest that an authentic leader's

ability to enhance stakeholder behavior and commitment is promising to those involved in any type of IWRM.

Based on the information presented above, the following hypothesis is proposed:

H7: Authentic leadership will have a significant positive effect on boundary spanning behavior in Integrated Water Resource Management.

Trustworthiness. "Trustworthiness is a quality of the trustee (i.e. person being trusted), while trusting is something that the trustor (i.e. person doing the trusting) does" (Sharp et al., 2013, p. 1248). Recognizing that trust and trustworthiness are related, yet distinct constructs is vital to understanding the importance of trustworthiness in the participatory process. According to Mayer et al. (1995), three characteristics of a trustee appear to explain a major portion of one's level of trustworthiness: ability, benevolence, and integrity. Each one of these attributes contribute to the perception of trustworthiness; however, Mayer et al. (1995) recommend that trustworthiness should be looked at as a continuum with different attributes sometimes acting together and sometimes independently. Hamm (2016) goes a step further and proposes five constructs of trustworthiness: competence, care, confidence, procedural fairness, and shared values. Hamm's research extrapolates that trustworthiness, which is often used as a way to determine another's likely future behavior, may appear to overlap with motivation. This suggestion elevates the importance of trustworthiness in relationships, whereby faith in another encourages trust development.

This study will measure trustworthiness from the perspective of the boundary spanner looking at one's self. Previous studies have recognized the importance of trust in natural resource management and research has shown that it is not only what agencies do,

but also how they do it that influences stakeholder perceptions and cooperation. A participant's willingness to collaborate in an IWRM process is often influenced by their perception of others. Furthermore, boundary spanners who are cognizant of their trustworthiness capability may be more successful not only building relationships, but developing trust between stakeholders.

Based on the information presented above, the following hypothesis is proposed:

H8: Trustworthiness will have a significant positive effect on boundary spanning behavior in Integrated Water Resource Management.

Need for Further Exploration of Boundary Spanners and Trust Building

Quantitative methodology allows the researcher to analyze data efficiently, investigate relationships within the data and control bias as much as possible. Whereas qualitative research provides detailed perspectives of a select few individuals encouraging participants to expand upon their personal experiences (Creswell, 2015). In addition, qualitative analysis explains and expands upon the quantitative data and seeks to discover specifics 'truths' about the situation in order to generalize. The results of a quantitative study may then impact who is interviewed in the qualitative strand, allowing the researcher to purposively select individuals who fit her criteria, and then widen the study to explain important variables and look closer at outlier cases from the quantitative results.

Few studies have examined the effect of boundary spanning on trust in IWRM. No studies have been found that utilized mixed methods. Thus, there is a need to explore the mechanisms and processes by which boundary spanners build stakeholder trust in IWRM. This research on boundary spanning and trust development within the IWRM can

help fill this knowledge gap by exploring those situations that encourage individuals to behave as boundary spanners. In addition, it is relevant to find out what kinds of difficulties boundary spanners face in building trust or performing their duties. The following summarizes the little qualitative research on boundary spanning and trust.

Coleman and Stern (2018) conducted a qualitative study on participants involved in the U.S. Collaborative Forest Landscape Restoration Program in order to examine how collaborative processes influence the development of trust between boundary spanners and other stakeholders in the network. They noted that participation in the collaborative process and boundary spanning involvement resulted in trust development, shared understanding, and compromise with other stakeholders. In each case, however, trust developed through somewhat different pathways and boundary spanning activities. They discovered through interviews with participants that boundary spanners play a critical role in collaborative efforts because they act as intermediaries or ambassadors, moving sensitive information between stakeholders and influencing perceptions of both stakeholders and information. Coleman and Stern recognize the link between boundary spanners and trust, but conclude that more work needs to be done to understand fully their role within the collaborative process.

Delanie, Cardoso, and Walther (2015) conducted a study at the Universidade of Sâo Paulo, which involved numerous interviews of stakeholders engaged in a landscape collaboration project. During the first phase of this study, researchers discovered several barriers to successful engagement and wanted to learn how these challenges could be overcome through boundary spanning intervention. Because of the variety of stakeholders involved and complexity of these environmental issues, a variety of

challenges arose when performing community engagement. Delaine et al. (2015) highlight those barriers to collaboration; limited knowledge and awareness of how to perform engagement activities as well as the institutional culture and structure inhibited the success of the participatory process in this particular situation. The resulting conclusions of phase one of the study draws attention to the importance of not only the boundary spanning role but the associated challenges. Not having a knowledgeable individual assist in the connecting of stakeholders and information, resulted in failed communication and success of the project.

The results of the Schotter et al. (2017) study reinforce the idea that boundary spanners are necessary for successful collaboration. Their extensive literature review examines the role of who becomes a boundary spanner and the various contexts that influence their ability to build bridges and develop trusting relationships. Schotter et al. (2017) stress that existing research on boundary spanning is predominantly conceptual or based on a limited number of case studies, which encourages study on the role of boundary spanning and trust development within the IWRM process. Previous research focused on boundary spanning in the areas of business, education, industry, healthcare, and emergency response. Although some qualitative studies have researched the effectiveness and impact of boundary spanning activities in natural resources, it typically encompasses land or fisheries management.

Schotter et al. (2017) summarize that stakeholder interactions with particular groups can make it difficult to develop the perception of a common identity, which creates a challenge for boundary spanners. In these situations, boundary spanners must construct a bridge between stakeholders in order to increase trust as well as leverage the

diversity within a group. Schotter et al. (2017) conclude that previous research views boundary spanners as change agents critical to facilitating knowledge flows across both internal and external boundaries and policy entrepreneurs who connect "…problems with solutions, and mobilize resources and effort in the search for successful outcome" (Williams, 2002, p. 121).

More and more researchers recognize the important function of boundary spanning and how it facilitates not only trust building between participants, but also the attainment of creative solutions through increased knowledge sharing. Tippman, Sharkey Scott, and Parker (2017) set out to study the concept of multinational corporation knowledge transformation and its relationship with solution creativity. Their mixed methods study was built on the argument that boundary spanning leads to the development of creative problem-solving outcomes, which is extremely valuable to multinational corporation innovation. Data collected from 67 problem-solving projects and face-to-face project leader interviews confirmed that boundary spanning resulted in better knowledge transfer and the development of more innovative and creative solutions.

Learning how to unlock the potential of knowledge diversity is key to not only novel ideas, but also a more successful collaborative process. Natural resource managers often deal with stakeholders whose attitudes, values and experiences are vastly different. Boundary spanners who can maneuver through the diversity of perspectives and use the power of knowledge diversity are setting the foundation for trust development and enhanced collaboration. Only through further study on boundary spanners can we learn how to convert this diversity of knowledge into tangible value and work towards building

better stakeholder partnerships and trusting relationships. Further research is needed to explore how boundary spanners can maximize trust in IWRM.

Chapter 3 – Methods

Overview

For the purposes of this study, a mixed methods approach was conducted following the general guidelines of Creswell's quantitative and qualitative approach to research "in which the investigator gathers both quantitative (closed-ended) and qualitative (open-ended) data, integrates the two, and then draws interpretations based on the combined strengths of both sets of data to understand research problems" (2015, p. 2). Data can be collected either sequentially or concurrently, and integrated together at one or more stages in the research process. Results in this study will be collected first, in the quantitative stage and then in the second, qualitative stage of the research process. Thus, an explanatory sequential design methodology was chosen in order to explore first whether specific antecedents and contextual settings in the IWRM process influence the boundary spanner's ability to build trust between stakeholders.

Based upon this data, further questions pertaining to how a boundary spanner builds trust between stakeholders were asked to ascertain a better understanding of this activity. Furthermore, by collecting and analyzing data on boundary spanning behavior and its impact on trust building, facilitators or program managers involved with IWRM can encourage and/or facilitate boundary spanning activities during the collaborative process. This study provides insight on the impact of certain antecedents and contextual factors on boundary spanning and trust building. Specifically, this study investigates first, do boundary spanners influence trust building between stakeholders; second, how do autonomy, trustworthiness, and authentic leadership ability of a boundary spanner impact their ability to build trust; and third, how do power imbalances, scale of governance

mismatch, conflict, and cooperation effect the boundary spanners development of trust between stakeholders within the IWRM process? The explanatory sequential design is modeled in Figure 1.

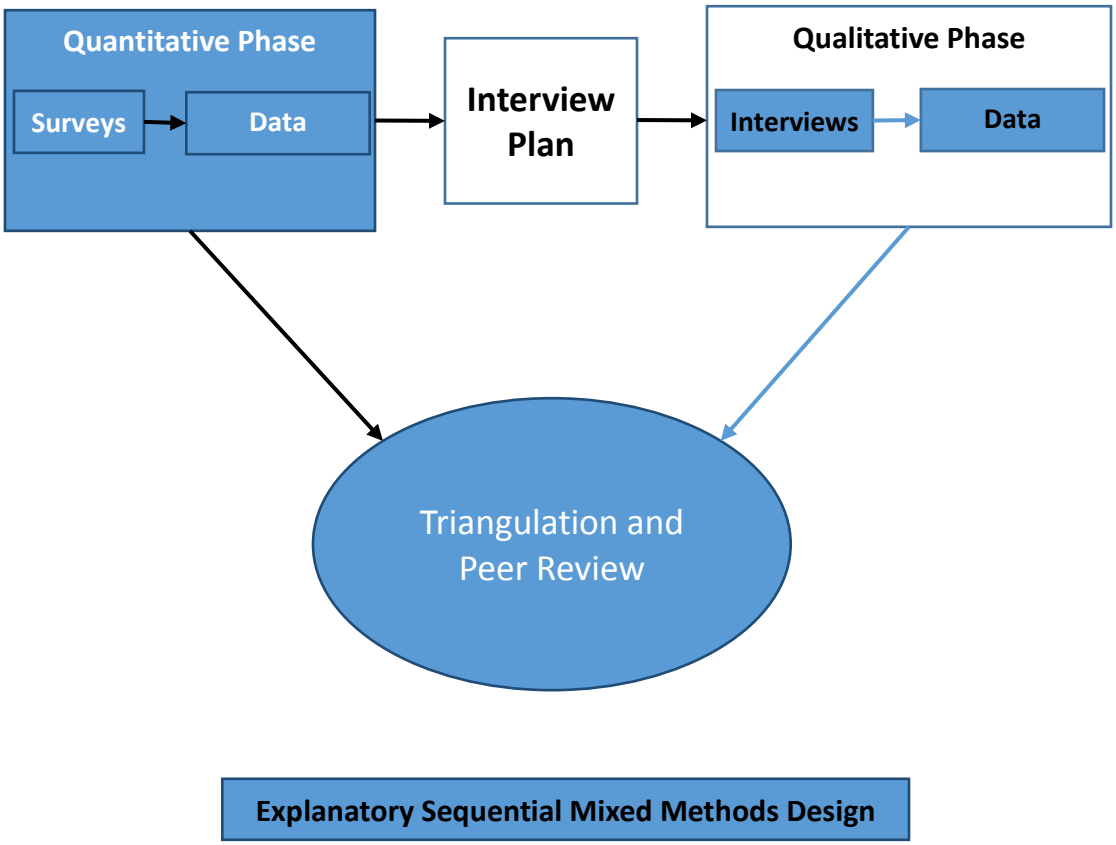

Figure 1. Explanatory Sequential Mixed Methods Model.

Rational for a Mixed Methods Design

The need for an explanatory sequential design on this subject is necessary in light of the complexity and lack of research on this issue. The intent of this type of design is to "first use quantitative methods and then qualitative methods to help explain the quantitative results in more depth" (Creswell, 2015, p. 6). This investigation into how

boundary spanners influence the development of trust between stakeholders throughout the IWRM process lends itself well to a mixed methods design. A model demonstrating the study's design is available in Figure 1.

The research on this topic of study is limited and therefore, the use of quantitative research or qualitative research alone is insufficient for gaining a complete understanding of the problem. Quantitative research does not sufficiently explain how boundary spanners can influence trust building within the IWRM process nor does it explain how certain contextual factors impact boundary spanning activities. A lack of meaning or deep probing of stakeholders' perspectives is apparent with the quantitative methodology. Whereas, qualitative research does not usually allow one to generalize from a small group of participants to a larger population. By utilizing both types of research methods, the strengths of one form of research will make up for the weaknesses of the other.

The strength of a mixed methods design is its ability to combine two different perspectives, one acquired from a closed-ended response data and one from open-ended personal data (Creswell, 2015). Coalescing both methods provides for a more comprehensive view and more data about the problem than either the quantitative or the qualitative perspective. Mixed methods also allows different research questions to be asked thus providing an extensive amount of data for this study. More importantly, this method offers differing viewpoints from both the researcher in the quantitative stage and the participants in the qualitative stage.

Phase I: Quantitative Methods

Theoretical Framework. The theory of boundary spanning and its influence on governance network performance was adapted from van Meerkerk and Edelenbos (2014).

They distinguished five different boundary spanning activities indicative of the presence of boundary spanners in governance networks. A theory of trust was adapted from Klijn, Edelenbos, and Steijn's (2010) study on trust in governance networks. Relationships between hypotheses are depicted in Figure 2.

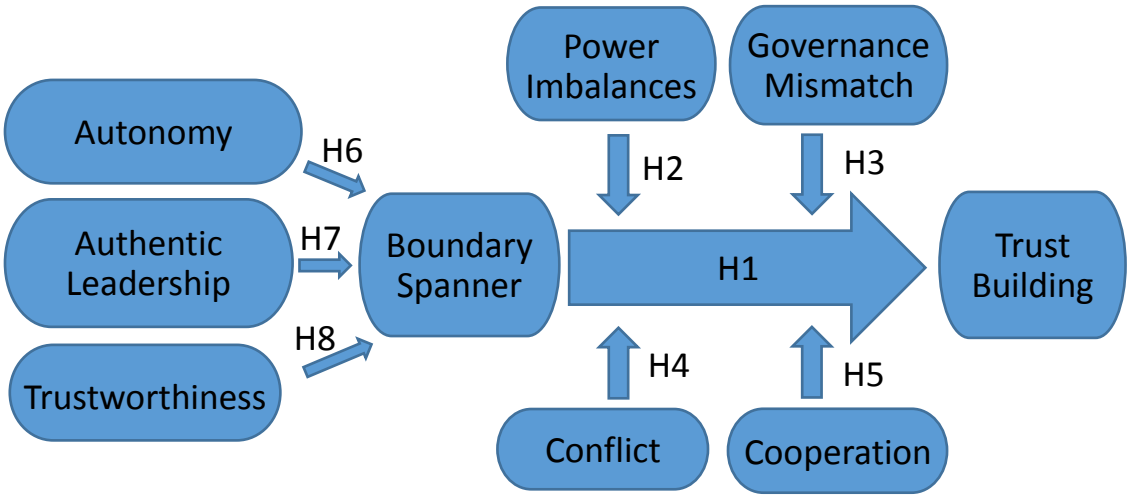

Figure 2. Boundary Spanner and Trust Development Model.

Hypotheses. Hypotheses for this study were developed based on results of research on the boundary spanning model of van Meerkerk and Edelenbos (2014) and the trust building model of Klijn, Edelenbos, and Steijn (2010) as well as additional existing literature (Williams, 2002; Cash et al., 2006; Walumbwa et al., 2008; Armitage et al., 2009; Sol et al., 2012; Coleman & Stern, 2015; Edelenbos & van Meerkerk, 2015; Nastran, 2015; Alexander et al., 2016; Thompson et al., 2016; Ansell & Gash, 2017). Hypotheses for this study are summarized below:

H1: Boundary spanning will have a significant positive effect on building trust between stakeholders in Integrated Water Resource Management.

H2: Power imbalances will moderate and negatively influence the effect of boundary spanners on building trust between stakeholders in Integrated Water Resource Management.

H3: Scale mismatch will moderate and negatively influence the effect of boundary spanners on building trust between stakeholders in Integrated Water Resource Management.

H4: Conflict will moderate and negatively influence the effect of boundary spanners on building trust between stakeholders in Integrated Water Resource Management.

H5: Cooperation will moderate and positively influence the effect of boundary spanners on building trust between stakeholders in Integrated Water Resource Management.

H6: An increase in a boundary spanner's autonomy results in an increase in boundary spanning behavior in Integrated Water Resource Management.

H7: Authentic leadership will have a significant positive effect on boundary spanning behavior in Integrated Water Resource Management.

H8: Trustworthiness will have significant positive effect on boundary spanning behavior in Integrated Water Resource Management.

Quantitative Data Collection and Analysis. Participants were purposely selected utilizing criterion-based sampling. The quantitative portion of the study's sample size was determined by the number of individuals in Nebraska that are assumed to have previously participated in at least one integrated water management process in Nebraska. This resulted in approximately 290 potential participants. Participants included alumni of the Nebraska Water Leaders Academy (NWLA), an organization whose purpose is to build the leadership skills and abilities of Nebraska's future water leaders. These individuals were identified as appropriate candidates in light of their previous Academy experience and current involvement with water issues. In addition, their participation in the NWLA demonstrates their interest in developing strong leadership capabilities and civic capacity with water resource issues. There is also an expectation that the knowledge

and awareness gained from this experience has inspired these individuals to become more intrigued and involved with IWRM. The remainder of the participants were individuals who have participated in IWRM.

All participants were sent an online questionnaire via email, which provided instruction on how to complete the questionnaire. This was followed up by a reminder email sent approximately seven days after the initial survey. In addition, phone calls were made to participants encouraging them to complete the survey and, if necessary, resending the questionnaire. The researcher also attended an out-of-town board meeting for Natural Resource Commission members urging them to complete the survey and answering any questions they might have had. The process followed the Dillman, Smyth, and Christian (2009) method for internet surveys. The quantitative questionnaire comprised nine separate subsections with no more than 38 items inquiring about their personal IWRM experience. Participants' names were each assigned an identification number in order to protect their identity during the collection of data; all other personal information has been kept anonymous. An online consent form was either sent or given to all participants as well. The survey itself was identical for all participants as was the delivery of the survey via electronic mail.

Statistical Analysis. The survey was conducted through an online program supported by Qualtrics. The data was captured and exported into a Microsoft Excel spreadsheet. The Excel spreadsheet was uploaded and statistical analyses were conducted using the SPSS program. Significant results were identified and the survey instruments were statistically measured for reliability, validity, and rigor. Two survey questions

pertaining to Scale Mismatch necessitated reverse scoring. As the scale of governance changes, the ability to positively influence trust between stakeholders decreases.

Regression analysis was used to test all eight hypotheses. Although the request for educational background is typically treated as categorical, this researcher chose to treat this particular demographic as continuous, which necessitated dummy coding in order to enter it into the analysis. H1, H2, H3, H4, and H5 were tested for their ability to influence the building of trust between stakeholders within IWRM. H6, H7, and H8 were tested for their influence on boundary spanning behavior within IWRM.

Survey Instrument Design. The quantitative questionnaire contained items covering nine different scales. Five of the nine measures were being adapted from previous studies focused on boundary spanning and trust as found within an IWRM process. Appropriate measures were selected for this study based on past validity, reliability, and appropriateness of fit between variables in this study and to prior studies. Participants were asked to decide between the continuums of "Strongly Disagree" to "Strongly Agree" on a six-point Likert scale. Example items from this measure are "I actively build and maintain sustainable relationships with different organizations involved." and "I generally live up to the agreements I make with others."

The instrument of measurement employed for boundary spanning originates from a 2014 study completed by van Meerkerk and Edelenbos. Their previous research demonstrated that boundary spanning and trust are important building blocks in any governance network that calls for connective capacity. It was the goal of this study to determine the effectiveness of boundary spanners in trust development within an IWRM situation.

The scale used by van Meerkerk and Edelenbos (2014) assessed the presence of boundary spanners in governance networks, and how these individuals actively engage with others. Communication with their home organization and between stakeholders was evaluated as well as their ability to make these connections more effective; this was achieved through a five-item unidimensional scale. The scale was found to be valid and reliable. This study asked participants, using the same five-item questionnaire, to what degree they have ever undertaken the boundary spanning role in an IWRM project.

Another important variable in this analysis is trust building. Klijn, Edelenbos, and Steijn (2010) researched the impact of trust in achieving results in governance networks whereas this study is testing how boundary spanning impacts trust development in IWRM. Klijn et al. (2010) explored whether trust could influence the outcomes of an environmental project. To measure trust within the network, five items were constructed, each one assessing how individuals behave within network governance systems. This study used Klijn et al.'s (2010) measurement of trust to examine how participants view their effect on trust between stakeholders when they engaged in IWRM.

There are numerous factors that can influence boundary spanning and trust development between stakeholders; however, this study focused on four: power imbalance, scale of governance mismatch, conflict, and cooperation. Each of these contextual influences has the potential to both positively or negatively influence successful trust development with the IWRM process. The challenge to measuring such factors is due to the ambiguity in defining and evaluating each one. For example, Cash et al. (2006) has provided a range of competing scale interactions within the following social-ecological systems: spatial, temporal, administrative, institutional, management,

etc. Furthermore, evaluating how conflict or cooperation affects a collaborative process can be complex due to the numerous stakeholders involved in one IWRM process.

In order to effectively and reliably measure scale of governance mismatch, this study concentrated on administrative scale interactions. IWRM frequently involves local, regional, and national level interactions, which can hinder or help both the building of trust and collaborative process. Local landowners working with regional resource managers, who may need to answer to state or federal regulators, often encounter conflict or lack of trust from farmers or ranchers based on differing values and expectations. This type of scale mismatch can constrict the collaborative process and hinder trust development between stakeholders. Studies (Gray et al., 2012; Gilmour et al., 2015) have shown that community members may have interpersonal trust with an individual working for a public agency although they may not trust that institution. It is critical that networks overcome these challenges in order to build connections and achieve successful outcomes. For the purposes of this study, scale of governance was measured by agreement with the following statements: "as levels of agencies involved in water management increase from local, to state, to federal, my ability to develop trust between stakeholders decreases correspondingly" and "as the spatial scale of water management increases, my ability to positively influence trust between stakeholders decreases." The previous statements were guided by the scales and levels of interaction work done by Cash et al. (2006) and Daniell & Barreteau (2014) relevant to water governance.

The questionnaire also analyzed the influence of power imbalances within the collaborative process. Power imbalance can be a result of one party having greater authority than another does or more resources (financial, natural resources, or

experience). Armitage et al. (2009) emphasize that these imbalances can fragment stakeholders' interests and reduce their desire to cooperate or even trust. In those instances, where local stakeholders are strongly dependent on state or national authorities, recognizing the varying degrees of vulnerability and power is crucial to working through the participatory process. The Survey of Influence Effectiveness (Bacon, 1994) effectively measured participants' ability to determine the impact that power imbalance may have on the collaborative process. This study used three of the 10 items from the subscale on power imbalance.

Conflict and cooperation, two additional factors that can impact the boundary spanners' ability to develop trust between stakeholders, were measured independently. Conflict was evaluated using a three sub-factor construct developed by Moore (2003). The following sub-factors included relationship, interest, and value conflicts. The items used for cooperation were developed by Žižlavský and Estélyi (2013) and based on the resources and motives needed when entering into close cooperation with an inter-firm partner. An example item is "If my motives to cooperate are strong enough, it is easier for me to develop trust between stakeholders."

Autonomy, one of three boundary-spanning antecedents, was measured using the Ryff Psychological Well-Being (PWB) scale (Abbott, Ploubidis, Huppert, Kuh, & Croudace, 2010). The PWB scales incorporate six dimensions: autonomy, positive relations with others, environmental mastery, personal growth, purpose in life, and self-acceptance. Ryff's scale is specifically designed to measure positive aspects of psychological behavior. The quantitative questionnaire used the four items with the highest factor loadings of the subscale on autonomy from the PWB. Participants were

asked to determine if they view their behavior as autonomous which may or may not influence a boundary spanner's ability to build trust between stakeholders during the participatory process.

The idea of leadership and its impact on the stakeholder engagement process is often an integral part of boundary spanning literature. It is, therefore, vital that boundary spanners are not only perceived by stakeholders as strong leaders, but that they themselves possess a strong belief in their own leadership abilities.

The quantitative questionnaire analyzed two additional antecedents – leadership and trustworthiness - from the boundary spanner's vantage point. This study used the Authentic Leadership Inventory (ALI) developed by Neider and Schriesheim (2011) to measure how a boundary spanner evaluates herself as a leader when participating in an IWRM process. Expecting a leader (program manager, facilitator, or boundary spanner) to be authentic and demonstrate high integrity is critical especially when a diverse group of stakeholders is involved. Neider and Schriesheim (2011) patterned their measure of authentic leadership on four dimensions found in the Authentic Leadership Questionnaire (ALQ) developed by Walumbwa, Avolio, Gardner, Wernsing, and Peterson (2008). Walumbwa et al. (2008) previously tested a theory-based measure of authentic leadership using participants in separate studies from three countries: United States, China, and Kenya. Their work not only suggests that the core components of authentic leadership exists across cultural contexts, but that when leaders "…act upon their true values, beliefs, and strengths, while helping others to do the same…" follower behavior and performance will be positively impacted (p. 91). Walumbwa et al. (2008) integrated various perspectives and definitions into their model of authentic leadership resulting in a

theory that recognizes the importance of both leadership and follower development. The ALQ construct includes the notion of self-awareness, relational transparency, balanced processing, and internalized moral perspective (p. 95-96). Its influence can be seen in the ALI, which was used in this study to measure authentic leadership and its impact on trust development.

The four components making up the Authentic Leadership Questionnaire are self-awareness, relational transparency, internalized moral perspective, and balanced processing (p. 95-96). Although there are similar instruments used to measure leadership, the items in the ALI questionnaire are appropriate when assessing how boundary spanners behave and lead in their boundary spanning role. This scale has demonstrated good validity and reliability according to Neider and Schriesheim (2011).

Trustworthiness was the third antecedent being measured quantitatively and another important facet of boundary spanning. Although this study evaluated the role of trust within the collaborative IWRM process, trustworthiness has been identified as the quality of the person being trusted (Sharp, Thwaites, Curtis, & Millar, 2013). Mayer, Davis, and Schoorman (1995) have worked extensively on trust, citing its importance in such areas as leadership, management, communication, and natural resources. Their work resulted in not only a model of trust, but also the development of three factors of perceived trustworthiness: ability, benevolence, and integrity (p.715). This typology of trustworthiness resulted in further research involving data collection from employees and supervisors at a small manufacturing firm in the Midwest (Mayer & Davis, 1999). The intent of the survey was to study the trust and trustworthiness factors of top management. Mayer et al. (1995) developed an instrument to measure not only trust, but also its

relationship to trustworthiness. Three of the seven subscales were used to access one's perception of trustworthiness with a total of nine items.

Reliability of this study's survey instrument was tested using the coefficient alpha. Validity was based on content validity, as two individuals with experience in research were asked to review the survey's questions and the study's purpose, and by using previously validated instruments. Anonymity was maintained, as email addresses were the only form of identification and there was no physical contact between the researcher and the participants due to the online nature of this phase of the study. Each response received a number to ensure further anonymity. Confidentiality of responses were also set by the researcher through the Qualtrics software. All statistical tests were considered significant when the probability was less than or equal to .05 with a 95% confidence interval. During statistical analysis, the NEAR Center was consulted.

Phase II: Qualitative Methods

Definition and rationale for a grounded theory approach. The qualitative section of this research study is based on the foundations of grounded theory (Glaser & Strauss, 1967). Further researcher done by Strauss and Corbin propose that grounded theory is used to generate a theory or explanation "of a process, action, or interaction constructed by the views of a larger number of participants" (1998, p. 63). Grounded theory is often utilized when a theory is lacking or expands upon an existing theory and the researcher wants to develop an explanation via an inductive process (Creswell, 2013; Lichtman, 2013). This bottom-up approach allows the researcher to use data collected from participants in order to generate or expand upon a theory. The grounded theory

methodology provided insights into the theoretically based model developed in this study to explain boundary spanners effect on trust in IWRM.

To further illustrate how boundary spanners develop trust between stakeholders in an IWRM process, a modified grounded theory approach was used. The intent was not to develop a new model as suggested by Strauss and Corbin, but to elaborate upon current boundary spanning theory. Recent studies have successfully utilized a modified grounded theory methodology without proposing a new model. In the same manner, the following researchers have used such an approach in relation to psychiatric nursing (Cutliffe, Stevenson, Jackson, & Smith, 2006), ethnographic sociology (Tavory & Timmermans, 2009), workplace cooperation (Selvaraj & Fields, 2010), and gender stereotypes (Einstein, 2018).

Qualitative Data Collection. Qualitative data collection for this study has been influenced by Creswell's (2013) suggestion that qualitative researchers utilize a wide range of interconnected interpretive practices in hopes that one will get a more thorough understanding of the subject matter. This study explored how individuals, who demonstrate boundary spanning behavior, maneuver through the various antecedents and contextual factors that may impact successful trust building within the IWRM process. The conceptual model developed for the quantitative investigation guided the qualitative investigation. Building connections and relationships through personal interviews allowed this researcher the opportunity for more in-depth collection, and unlike quantitative research, a qualitative approach encourages the researcher to inductively build theory and connections.

Data was collected by conducting face-to-face, in-depth interviews with individuals who also participated in the first quantitative phase of the study. Participants chosen for the qualitative study were selected to participate based on quantitative scores which indicated them exhibiting high boundary spanning behaviors. In addition, participants who scored more than one standard deviation above the mean were also approached to be interviewed for the study. Thirteen study participants were ultimately chosen based on their availability, location, and whether they met the conditions of a boundary spanner with experience in IWRM.

Qualitative data was collected using a semi-structured interview protocol and conducted either over the phone, by Zoom video, or in person. Each interview was guided by the research questions, but remained unstructured enough to allow for more flexibility in questioning (Creswell, 2013; Merriam & Tisdell, 2016). These open-ended questions encouraged participants to expand upon their boundary spanning role and provided the researcher an opportunity to probe for more information when necessary in order to discover new ideas and themes (Appendix C). All interviews were digitally recorded and conducted in private with each interview requiring 30 to 60 minutes. After the initial introduction, the purpose of the study was explained and followed up by a discussion regarding the written consent form, which the participant was asked to sign prior to the interview. A copy of the consent form was available to each participant upon his or her request.

The study was conducted during the months of April and May 2018. During the interview, physical notes were taken in the event there were technical difficulties or clarification of the participant's response was necessary. The researcher paid special

attention to participants' hesitations and reactions to the interview questions, noting that a number of participants were initially brief in their responses. This behavior changed mid-interview as participants became more open and readily shared examples of stakeholder interactions. All interviews ended with the researcher answering any participant questions, thanking the participant for their time and involvement, and asking if they would like a copy of the transcription and the results of the study. All participants requested a copy of the results once the quantitative and qualitative data was analyzed and discussed. Interviews were discontinued after the thirteenth participant as the researcher noted that a point of saturation had been reached. The recorded transcripts were then transcribed, prepared, and analyzed.

Data analysis. According to Creswell, qualitative research is "interpretive research in which you make a personal assessment as to a description that fits the situation or themes that capture the major categories of information (2015, p. 237). Hence, the interpretation and analysis of the data was distinct and unique due to the researcher's own personal perspective. Furthermore, the basic principles of grounded theory data analysis (Strauss & Corbin, 1998) were employed to help guide this study.

The transcriptions of interview data were completed by a third party vendor, HINZtime.com. Organizing and reducing the data into meaningful concepts or themes was achieved through a coding process, and as information was collected, it was edited with redundancies removed and parts of the data synthesized to generate categories (Merriam & Tisdell, 2016). These concepts were developed through constant comparison, and then analyzed by identifying statements or singular comments into groups of similar thoughts or ideas; this was followed by the development of individual

themes. The researcher attempted to capture significant statements or quotes expressed by participants in order to provide a clearer understanding of their experiences. The most relevant concepts were integrated to confirm the theoretical framework and to develop a detailed synopsis, which lead to the findings of this study. Validity was confirmed through member checking and expert review (Creswell, 2013) after transcription. The researcher proceeded to analyze the data utilizing an iterative process and constant comparison of all aspects of qualitative data analysis. This was done by validating what was observed matched the audio recording and what was audio recorded matched the transcription. The transcription and notes taken during the interview were then compared during the analysis to ensure that the researcher accurately portrayed what each participant during the interview intended to share.

Phase III: Methods for Integration of Quantitative Results for the Qualitative Inquiry

Mixed Methods Integration. The study methodology used two independent research phases; data collected in the quantitative section was used to guide the qualitative part of the study. An explanatory sequential design follows this two-phase process whereupon the qualitative section builds upon the quantitative section. Results from the quantitative section were analyzed first, and then based on those results and the theoretical model, questions were developed for the qualitative questionnaire. Phase one assisted in the selection of participants for the qualitative phase of the study. Participants were selected for the qualitative study based on their boundary spanning scores on the survey. Resulting data from the quantitative section also contributed to the development of interview questions for the qualitative phase. The qualitative phase explored the

statistically significant relationships between variables in the quantitative phase to gain insight in how boundary spanners build trust in IWRM.

Chapter 4 – Results and Findings

The results of the quantitative analyses and the findings of the qualitative analyses are discussed in this chapter. This study utilized a mixed methods approach; therefore, both quantitative results and qualitative findings are presented.

Quantitative Results

Demographic Information. For the quantitative phase of this study, 290 recruitment emails were sent to people who have previously participated in at least one integrated water management process in Nebraska. One hundred sixty-five participants responded to the online survey, leading to a response rate of 56.9%. Alumni of the Water Leaders Academy were among the participants. Descriptive statistics regarding all the variables in the study are shown in Table 1. The mean age of participants was 51.5 and more males than females participated in the survey. Of those 165 participants, 34 were female and 131 were male. The majority of the participants (89%) had at least a college education. Interestingly, females scored higher in boundary spanning behavior, contributing more to the variance than males.

For the qualitative phase of this study, thirteen individuals were selected based on the criteria of scoring more than one standard deviation above the mean on the boundary spanning behavior scale. Eight of the participants were male with the remaining five female. Each participant completed the online survey sent out during the quantitative phase, had been involved with IWRM, and scored at least one standard deviation above the mean in boundary spanning behaviors. Eleven of the thirteen participants were interviewed face-to-face with the interviews lasting from 30 to 60 minutes. Two

participants, who lived out of the local area, were interviewed using Zoom video or via phone.

Reliability. The measurment scales had satisfactory internal reliability (Table 1). Nunnally and Bernstein (1994) concluded that acceptable minimum reliability (Cronbach's Alpha) for measurement scales should be >0.70, The Cronbach's Alpha for the variables were: trust (α = .72), boundary spanning (α = .70), power imbalance (α = .77), conflict (α = .77), cooperation (α = .74), autonomy (α = .73), authentic leadership (α = .72), and trustworthiness (α = .86). Reliability of scale of governance was .63 using the Spearman-Brown statistic because it was composed of two items.

Descriptive statistics and correlations. Descriptive statistics and Pearson correlations provided the initial basis of analysis for the variables. Results are presented in Table 1.

Table 1. *Descriptive Statistics and Correlation Matrix for Variables* (N=165)

	Variables	Mean	S.D.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1.	Trust Building	4.75	.57	(.72)									
2.	Boundary Spanning	4.86	.62	.63**	(.70)								
3.	Scale of Governance	3.79	1.02	.07	-.04								
4.	Power Imbalance	2.78	.84	-.28**	-.16*	.42**	(.77)						
5.	Conflict	3.36	.88	-.19*	-.21**	.42**	.51**	(.77)					
6.	Cooperation	4.57	.73	.41**	.39**	.09	.01	.14	(.74)				
7.	Autonomy	4.76	.68	.36**	.49**	.08	-.12	-.17*	-.21**	(.73)			
8.	Authentic Leadership	4.97	.62	.64**	.67**	-.05	-.22**	-.15	.35**	.51**	(.72)		
9.	Trustworthiness	5.06	.57	.66**	.72**	.03	-.18*	-.07	.37**	.47**	.73**	(.86)	
10.	Age	51.50	12.88	.11	.20*	.14	.14	-.01	.19*	.25**	.11	.10	
11.	Gender	.79	.41	-.20*	-.19*	.03	.20*	.14	-.02	.05	-.14	-.09	.20*

Note. Reliability coefficient estimates (α) are in Parenthesis along diagonals. *$p < 0.05$; **$p < 0.01$. (Two-tailed tests). N = 149 for Age. N = 162 for Gender. Scale of Governance only included 2 items; thus, reliability was not tested.

A Pearson correlation was not appropriate for testing the relationship between the continuous variables (e.g. Trust Building) and the categorical variable level of Education. Results of a one-way ANOVA with a Tukey post hoc test found no significant relationship between the continuous variables and education level.

Hypothesis Testing. The SPSS program was used to analyze all hypotheses. All hypotheses testing utilized linear regression statistical analyses. In the first linear regression boundary spanning, was used as a predictor of trust building. Scale of governance, scale mismatch, conflict, and cooperation were moderators in linear regressions of the relationship between boundary spanning and trust building between stakeholders. Furthermore, autonomy, authentic leadership, and trustworthiness were used as predictors of boundary spanning in linear regressions. This study utilized linear regression in order to understand whether trust building (dependent variable) between stakeholders in an IWRM process can be predicted based on the aforementioned predictor and moderator variables (independent variables). Boundary spanning was both an independent variable and a predictor variable.

Hypothesis 1 was:

H1: Boundary spanning behavior will have a significant positive effect on building trust between stakeholders in Integrated Water Resource Management.

The results indicate that Boundary Spanning predicted 39.5% of the variance in Trust Building ($F(1,163) = 106.59$, $p<.001$). For each unit increase in Boundary Spanning there was a corresponding .63 unit increase in Trust Building. Thus, hypothesis 1 was accepted. Table 2 summaries the statistics for testing hypothesis 1.

Table 2. *Summary of Linear Regression Analysis for the Effect of Boundary Spanning on Trust Building*

	B	*SE B*	β	*t*	*Sig.*
Boundary Spanning	.58	.06	.63	10.32	.000

Note. $N = 165$

Hypothesis 2 was:

H2: Power imbalances will moderate and negatively influence the effect of boundary spanning on building trust between stakeholders in Integrated Water Resource Management.

The results indicate that Power Imbalance did not moderate the relationship between Boundary Spanning and Trust Building (t =.99, p>.05). Thus, hypothesis 2 was rejected. Table 3 summarizes the statistics for testing hypothesis 2.

Table 3.*Summary of Linear Regression Analysis for the Moderating Effect of Power Imbalance on Boundary Spanning and Trust Building*

	B	*SE B*	β	*T*	*Sig.*
Boundary Spanning	.55	.06	.59	9.68	.000
Power Imbalance	-.51	.39	-.74	-1.30	.194
Boundary Spanning x Power Imbalance	.07	.07	.56	.99	.324

Note. N = 165

Hypothesis 3 was:

H3: Scale mismatch will moderate and negatively influence the effect of boundary spanning on building trust between stakeholders in Integrated Water Resource Management.

The results indicate that Scale Mismatch did not moderate the relationship between Boundary Spanning and Trust Building (t=-.85, p>.01). Thus, hypothesis 3 was rejected. Table 4 summarizes the statistics for testing hypothesis 3.

Table 4. *Summary of Linear Regression Analysis for the Moderating Effect of Scale Mismatch on Boundary Spanning and Trust Building*

	B	*SE B*	β	*T*	*Sig.*
Boundary Spanning	.58	.06	.62	10.10	.000
Scale Mismatch	.06	.04	.10	1.66	.099
Boundary Spanning x Scale Mismatch	-.03	.04	-.05	-.85	.399

Note. N = 165

Hypothesis 4 was:

H4: Conflict will moderate and negatively influence the effect of boundary spanning on building trust between stakeholders in Integrated Water Resource Management.

The results indicate that Conflict did moderate the relationship between Boundary Spanning and Trust Building (t=-2.16, $p<.05$). Thus, hypothesis 4 was accepted. Table 5 summarizes the statistics for testing hypothesis 4.

Table 5. *Summary of Linear Regression Analysis for the Moderating Effect of Conflict on Boundary Spanning and Trust Building*

	B	*SE B*	β	*T*	*Sig.*
Boundary Spanning	.55	.06	.59	9.35	.000
Conflict	.68	.33	1.04	2.03	.044
Boundary Spanning x Conflict	-.13	.06	-1.11	-2.16	.032

Note. $N = 165$

Hypothesis 5 was:

H5: Cooperation will moderate and positively influence the effect of boundary spanning on building trust between stakeholders in Integrated Water Resource Management.

The results indicate the Cooperation did not moderate the relationship between Boundary Spanning and Trust Building (t=-1.39, $p>.05$). Thus, hypothesis 5 was rejected. Table 6 summarizes the statistics for testing hypothesis 5.

Table 6. *Summary of Linear Regression Analysis for the Moderating Effect of Cooperation on Boundary Spanning and Trust Building*

	B	*SE B*	β	*T*	*Sig.*
Boundary Spanning	.48	.06	.52	7.60	.000
Cooperation	.52	.27	.67	1.94	.055
Boundary Spanning x Cooperation	-.06	.04	-.47	-1.39	.165

Note. $N = 165$

Hypothesis 6 was:

H6: An increase in a boundary spanner's autonomy results in an increase in boundary spanning behavior in Integrated Water Resource Management.

The results indicate that Autonomy predicted 23.8% of the variance in Boundary Spanning ($F(1, 163) = 50.83$, $p<.001$). For each unit increase in Autonomy there was a corresponding .49 unit increase in Boundary Spanning. Thus, hypothesis 6 was accepted. Table 7 summarizes the statistics for testing hypothesis 6.

Table 7. *Summary of Linear Regression Analysis of the Effect of Autonomy on Boundary Spanning*

	B	*SE B*	β	*t*	*Sig.*
Autonomy	.44	.06	.49	7.13	.000

Note. $N = 165$

Hypothesis 7 was:

H7: Authentic leadership will have a significant positive effect on boundary spanning behavior in Integrated Water Resource Management.

The results indicate that Authentic Leadership predicted 44.2% of the variance in Boundary Spanning ($F(1,163) = 129.16$, $p<.001$). For each unit increase in Authentic Leadership there was a corresponding .67 unit increase in Boundary Spanning. Thus, hypothesis 7 was accepted. Table 8 summarizes the statistics for testing hypothesis 7.

Table 8. *Summary of Linear Regression Analysis of the Effect of Authentic Leadership on Boundary Spanning*

	B	*SE B*	β	*t*	*Sig.*
Authentic Leadership	.67	.06	.67	11.37	.000

Note. $N = 165$

Hypothesis 8 was:

H8: Trustworthiness will have significant positive effect on boundary spanning behavior in Integrated Water Resource Management.

The results indicate that Trustworthiness predicted 51.8% of the variance in Boundary Spanning ($F(1,163) = 175.22$, $p<.001$). For each unit increase in Trustworthiness there was a corresponding .72 unit increase in Boundary Spanning. Thus, hypothesis 8 was accepted. Table 9 summarizes the statistics for testing hypothesis 8.

Table 9. *Summary of Linear Regression Analysis of the Effect of Trustworthiness on Boundary Spanning*

	B	*SE B*	β	*t*	*Sig.*
Trustworthiness	.79	.06	.72	13.24	.000

Note. $N = 165$

Models explaining trust building and boundary spanning. Hierarchical multiple regression was used to more fully understand how the independent and demographic variables related to the dependent variables, trust building and boundary spanning. During initial data analysis, it was determined that autonomy, authentic leadership, and trustworthiness had a stronger correlation to boundary spanning than trust building. This result suggested a secondary way to test the models - splitting the overall model in two and testing each model independently. The first model tested the influence of boundary spanning, cooperation, power imbalance, scale mismatch, conflict, and demographics on trust building between stakeholders. The second model tested autonomy, authentic leadership, trustworthiness, and demographics on boundary spanning. This decision to split the overall model fits the initial premise and allows this researcher to stay true to the hypothetical model I started with - three predictors influencing boundary spanning, which in turn influences the building of trust. Hierarchical multiple regression allowed the researcher to investigate the relationship between several independent variables and a continuous dependent variable while

controlling for the effects of all the other independent variables in the regression equation.

Hierarchical Regression #1. Prior to conducting the hierarchical multiple regression to test model #1, the relevant assumptions of this statistical analysis were tested. All assumptions were met.

A stepwise hierarchical multiple regression was conducted with Trust Building as the dependent variable. Demographic variables (age, education, gender) were entered stepwise at the beginning of the regression. The Boundary Spanning variable was entered next. Scale Mismatch, Power Imbalance, Conflict, and Cooperation were entered last.

The hierarchical multiple regression revealed that at Step one, Gender contributed significantly to the regression model, F (1,147) = 5.32, $p < .05$) and accounted for 3.5% of the variation in Trust Building (Table 10). Introducing the Boundary Spanning variable explained an additional 36.8% of variation in Trust Building and this change in R^2 was significant, F (2,146) = 49.34, $p < .001$. Adding Cooperation to the regression model explained an additional 4.3% of the variation in Trust Building and this change in R^2 was significant, F (3,145) = 39.00, $p < .001$. Adding Power Imbalance to the regression model explained an additional 3.1% of the variation in Trust Building and this change in R^2 was significant, F (4,144) = 32.91, $p < .001$. Finally, the addition of Scale of Governance to the regression model explained an additional 4.5% of the variation in Trust Building and this change in R^2 square was also significant, F (5,143) = 31.33, $p < .001$. When all five independent variables were included in Step five of the regression model, Gender was no longer a significant predictor of Trust Building. The most important predictor of Trust Building was Boundary Spanning, which uniquely explained

37% of the variation in Trust Building. Together the five independent variables accounted for 52.3% of the variance in Trust Building. Age, Education, and Conflict were not significant and were excluded from the model.

Table 10. *Summary of Hierarchical Regression Analysis for Variables Predicting Trust Building*

Variable	*B*	*SE B*	β	R^2	*Adj.* R^2	ΔR^2
Step 1				.04	0.3	.04
Gender	-.25	.11	-.19*			
Step 2				.40	.40	.37
Gender	-.08	.09	-.06			
Boundary Spanning	.57	.06	.62***			
Step 3				.45	.44	.04
Gender	-.10	.09	-.07			
Boundary Spanning	.49	.06	.54***			
Cooperation	.17	.05	.22***			
Step 4				.48	.46	.03
Gender	-.06	.08	-.05			
Boundary Spanning	.46	.06	.51***			
Cooperation	.18	.05	.24***			
Power Imbalance	-.12	.04	-.18**			
Step 5				.52	.51	.05
Gender	-.05	.08	-.04			
Boundary Spanning	.47	.06	.51***			
Cooperation	.17	.05	.22***			
Power Imbalance	-.19	.04	-.28***			
Scale of Governance	-.13	.04	-.24***			

Note. $N = 149$; $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

A graphical representation of the model explaining trust building between stakeholders is presented in Figure 3.

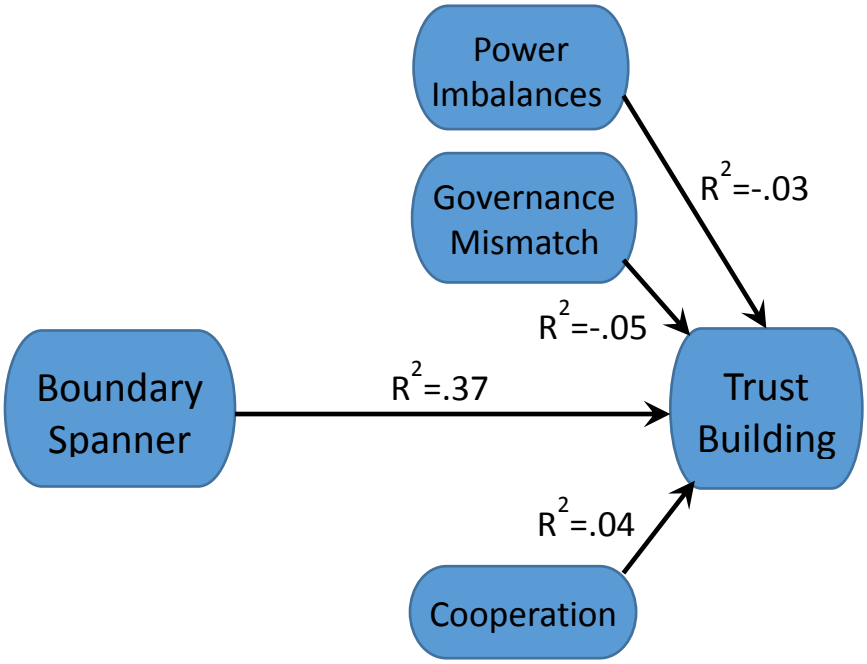

Figure 3. Model of trust building with predictor variables.

Hierarchical Regression #2. Prior to conducting the hierarchical multiple regression to test model #2, the relevant assumptions of this statistical analysis were tested. All assumptions were met.

A two-stage hierarchical multiple regression was conducted with Boundary Spanning as the dependent variable. Demographic variables (age, education, gender) were entered stepwise at stage one of the regression. Trustworthiness, Authentic Leadership, and Autonomy were entered stepwise at stage two.

The hierarchical multiple regression revealed that at Step one, Age contributed significantly to the regression model, F (1,147) = 6.31, $p < .05$) and accounted for 4.1% of the variation in Boundary Spanning (Table 11). Introducing the Gender variable explained an additional 5.7% of variation in Boundary Spanning and this change in R^2 was significant, F (2,146) = 7.94, $p < .01$. Adding Trustworthiness to the regression

model explained an additional 46.2% of the variation in Boundary Spanning and this change in R^2 was significant, F (3,145) = 61.61, $p < .001$. Adding Authentic Leadership to the regression model explained an additional 3.4% of the variation in Boundary Spanning and this change in R^2 was significant, F (4,144) = 52.66, $p < .001$. Finally, the addition of Autonomy to the regression model explained an additional 1.1% of the variation in Boundary Spanning and this change in R^2 square was also significant, F (5,143) = 43.87, $p < .001$. The most important predictor of Boundary Spanning was Trustworthiness, which uniquely explained 46.2% of the variation in Boundary Spanning. Together the five independent variables accounted for 60.5% of the variance in Boundary Spanning. Education was not significant and was excluded from the model.

Table 11.*Summary of Hierarchical Regression Analysis for Variables Predicting Boundary Spanning*

Variable	*B*	*SE B*	β	R^2	*Adj.* R^2	ΔR^2
Step 1				.04	.04	.04
Age	.01	.00	.20*			
Step 2				.10	.09	.06
Gender	-.37	.12	.24**			
Age	.01	.00	.25**			
Step 3				.56	.55	.46
Gender	-.25	.09	-.17**			
Age	.01	.00	.16**			
Trustworthiness	.75	.06	.69***			
Step 4				.59	.58	.03
Gender	-.22	.08	-.14**			
Age	.01	.00	.15**			
Trustworthiness	.54	.09	.50***			
Authentic Leadership	.27	.08	.27***			
Step 5				.61	.59	.01
Gender	-.23	.08	-.15**			
Age	.01	.00	-.13**			
Trustworthiness	.52	.09	.47***			
Authentic Leadership	.22	.08	.22**			
Autonomy	.12	.06	.13*			

Note. N = 149; *p < .05, **p < .01, ***p< .001

A graphical representation of the model explaining boundary spanning is presented in Figure 4.

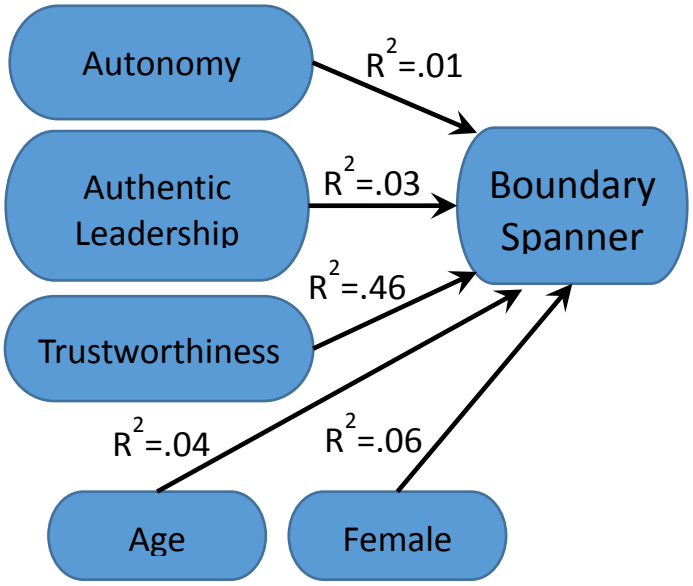

Figure 4. Model of boundary spanning with predictor variables.

Qualitative Findings

The themes in this section are derived from the participants who were interviewed about their personal experience with integrated water resource management. Table 12 outlines the themes and subthemes, and is followed by an in-depth description of each theme.

Table 12. *Themes Depicting the Influence of Boundary Spanning Behavior on Trust Building between Stakeholders*

Theme
1. To Lead or not to Lead? That is the question
1.1.By Example
1.2.Take Charge
1.3.Independence
1.4.Safe Space
2. Finding structure out of chaos
3. Are you talkin' to me?!
3.1.Messaging
4. Connecting the dots
5. Speak now or forever hold your peace
6. There is no truth, only perceptions
7. Conflict Management 101
7.1.Low Trust
7.2.Limitations

Themes. A rigorous coding process of thirteen transcribed interviews resulted in seven carefully derived themes, which are described below. Each theme is not only explained, but accompanied by at least one quote from a participant in order to further clarify its meaning. Each theme is significant to understanding the role of boundary spanners facilitating trust between stakeholders, and were represented frequently by participants during the interview process.

Theme 1: To Lead or not to Lead? That is the question. The idea of being a leader or leading in some fashion was expressed frequently during this study. Participants were quick to express the importance of leading, but the spectrum of how and when to lead was extreme. Several participants expressed the idea that the situation often dictates the direction and strength of their leadership behavior.

1.1: By Example. Modeling behavior or sharing examples of successful projects was viewed by various participants as a positive way to lead stakeholders. Being someone who is factual and knowledgeable about the situation was considered a necessity as well.

1.2: Take Charge. The idea of managing conflict, providing a vision, and identifying common goals was expressed often during the interviews. This included taking calculated risks and being committed to the process especially when working with a diverse group of stakeholders where imbalances may exist. Participants added that knowing when to move on is necessary; as demonstrated by a participant:

> Leadership takes vision. Vision takes leadership. I mean, if you don't know where you're goin', you can't lead and you're probably not gonna be a good follower either. You've got to know where you're going.

1.3: Independence. Participants commented that moving the process forward requires some degree of independence from one's agency or organization. Stakeholders are expecting objectivity, transparency, and an equitable approach to the collaborative process, which opens the door to better communication. One participant expressed this observation in particular, "When you know you're the voice, you have to be seen as not being in the pocket of anyone. And it also gives you the courage to speak up."

1.4: Safe Space. Several participants described the idea of a "safe space" as the creation of an environment accessible to all without fear of reprisals or repercussions. Being that one individual whom everyone can go to for questions, concerns, and clarification, or as one participant labeled it, the "flagpole mentality." Reaching out and listening enabled participants to put others at ease reducing peer pressure and

encouraging stakeholders to let their guard down. One participant shared an interaction with a stakeholder during a contentious water project, "You know, I really agree with things you're sayin'. I really am on your side, but I can't say that in this group because if I do, the guy that I sell my hay to won't buy it."

Theme 2: Finding structure out of chaos. The idea of identifying a process or framework for stakeholders to work with in the collaborative process was voiced frequently. Participants noted that having a mechanism in which to handle conflict allowed stakeholders to trust in the process and let down their guard. Involving stakeholders in the development of a structure not only ensured commitment to the process, but leveled the playing field somewhat. In addition, implemented safeguards built into the framework can provide certain expectations and ground rules for those involved. This expectation was expressed by a participant below:

> People had the foresight to deeply involve the stakeholders in how that was done and created. And that was, that really started off with the drafting of a charter document that hopefully represented a structure and a framework, and again, the values and the interests of the people that were gonna participate.

Theme 3: Are you talkin' to me?! Communicating one's message in an appropriate manner during the engagement process was expressed by all participants as one key to successful collaboration. Water resource issues that involve complex issues and diverse stakeholders may require breaking down the message into smaller, more manageable parts. Project leaders who avoid using highly technical or vague terminology are more apt to have a more engaged and receptive audience.

3.1: Messaging. Providing a message that is well-defined, impartial, and factual helps to alleviate stakeholders feeling marginalized, left out, or attacked; frequent and

consistent communication keeps stakeholders engaged throughout the process. This expectation was expressed by a participant below:

> …to go out there with, no matter who folks are talking to, they're hearing the same thing. So they're, you know, I believe they're more likely to actually start going, "ok, well, I'm not only hearing the government, you know, state employees or the conservation groups. I'm also hearing, you know, other ag producers or other ag groups talking about it in the same way. And so, I think it would help to open up people's perspective and…

Study participants also stressed the importance of transparency and simplicity in one's communication to others. "You don't want it to be science-y and to the point where it's only acceptable by, let's say, a hydrogeologist or someone." Participants also mentioned knowledge sharing as a necessity for it encourages a two-way exchange of information, and provides an opportunity for inclusive behavior and clarification of the message.

Theme 4: Connecting the dots. Participants expressed the importance of connections within the engagement process as crucial to developing trust between stakeholders. Reaching out to individuals and acknowledging their different backgrounds opens the door to not only better communication, but also the opportunity to seek common goals. Many of the participants stressed the advantage of one-on-one and frequent communication with stakeholders when possible; sharing one's background also helped enhance relationships and strengthened bonds of trust. Getting stakeholders to take ownership of the issue at hand can be achieved through the development of resilient connections, which can then endure future challenges. This expectation was expressed by a participant below:

> I don't have to tell 'em we're gonna go take that hill. They already said they wanted to take the hill. I'm just givin' 'em the suite of options they get to choose from to go take that hill.

Theme 5: Speak now or forever hold your peace. Engaging others during the collaborative process was mentioned regularly by the participants. Once the participants connected with stakeholders, they were challenged with creating an environment where opinions were valued and participant voices heard. Many of the interview participants mentioned the importance of multiple settings, both formal and informal, for stakeholder engagement and recognition that the collaborative process requires time and commitment from all. More than one participant acknowledged the challenge in acknowledging all perspectives and not being caught up in one problem stakeholder, which can stall momentum. This expectation was expressed by a participant below:

> You have to also just kind of, as a person, internally say, "OK, I'm never…they're never gonna get it." …I just have to accept…that that is their perspective. And I can't change it now… Because if you spend all of your time going, "I'm gonna, I've gotta get through to this person." You lose the ability to, you know, keep the other folks that may be more readily engaged or…you know, willing to work together, you know, share their ideas, you risk, you know, losing them because they see…all you're focused on is this one.

Using smaller groups not only provides a safe space for stakeholders to let their guard down, but increases opportunity for the exchange of local and traditional knowledge. Participants stressed that incorporating local and traditional knowledge into the planning process gives stakeholders a sense of ownership and strengthens the policy outcome. As one participant stated, "I believe in science; I do. But I think it has its own bias sometimes… If you are not in the ground, in the trenches so to speak, there's things you're gonna miss."

Theme 6: There is no truth, only perceptions. The idea of perceptions (both good and bad) was raised by numerous participants. A stakeholder, who may previously have had a negative experience with a particular individual or institution, has the potential to adversely impact the collaborative process. Participants suggested that attempting to understand the situation and/or meet with that stakeholder separately to address the issue can oftentimes resolve the situation. This expectation was expressed by a participant below:

> It's not always possible but it's good to understand if there have been issues in the past, and to know what those issues were and how it transpired, and then you can use those, that knowledge to potentially work through it faster.

More than one participant stressed the utilization of risk communication when addressing misperceptions and the fears that drive many stakeholders to feel marginalized or confrontational. Participants repetitively expressed the lack of trust, which local stakeholders have for government entities, fearing that their involvement comes with "strings attached" or worse, loss of use of that resource. Furthermore, acknowledging pre-conceived notions or that prior conflict between stakeholders may have taken place, allows the collaborative process to keep moving forward. Several participants mentioned that stakeholders often misunderstand the mission of governmental agencies, which can cause conflict. This expectation was expressed by a participant below:

> I think the biggest problem we have is people don't understand the roles of different entities and partners. So they have perceptions of imbalance when it's really not an imbalance. …I think there's a lack of understanding of what the scope and mission of different entities are.

Theme 7: Conflict Management 101. Participants were very interested in not only identifying conflict between stakeholders, but mitigating it. Containing or managing conflict was expressed repeatedly by the participants and various methods were suggested. Some participants welcomed conflict – "Embrace controversy. Embrace opposition" – and viewed controversy as an opportunity for growth. A few participants noted that conflict between stakeholders could result in new pathways when stakeholders are asked to share their frustrations. This expectation was expressed by a participant below:

> I frequently find that it's in the conflict conversations where a lot of those facts come out. But you have to be willing to walk into that and say, "OK, what can we pull out of this? Tell me more about that. Why are you so upset? Why is this a problem for you?"

Conflict properly handled can be a catalyst to change; one participant commented that conflict could be a good thing if it is managed properly. This particular participant held a unique perspective regarding conflict, "…I do believe that if you don't address conflict it festers and it will rot the whole process from inside out. So, to some extent, I kind of hit conflict head on."

7.1: Low Trust. Participants acknowledged that certain situations are ripe for conflict and low trust between stakeholders. Any type of scale mismatch can bring about suspicion and the potential for a power struggle. Local stakeholders are fearful of governmental agencies controlling access to their resource and often view their involvement as having strings attached. Participants have suggested working with stakeholders by suggesting voluntary involvement with management programs and transparent policy development. This expectation was expressed by a participant below:

> You've gotta bring these folks in from day one in the planning process. Going to a group of people saying, "Hey, look! We made this plan for you. Now go do it." They have no ownership of it. To them it's, "You're just coming in and telling me what to do and I don't like the government, so I'm gonna completely ignore it even if it's a great idea."

7.2: Limitations. Participants recognized that resolving conflict has its limits. There are circumstances when acknowledging that some issues cannot be solved or certain stakeholders will not be swayed and moving on is the best plan for the collaborative process. Putting too much energy and time into a lost cause has the potential to not only slow forward process, but can result in stakeholders disengaging or leaving the collaboration. Interview participants realize that collaboration between diverse stakeholders is a balancing act between unique perspectives, different agency missions, and the water resource being managed. This notion was stated succinctly by one participant, "I think the mistake there is thinking that you're gonna fit the public in a process instead of making the process fit the public."

CHAPTER 5 – Discussion

Introduction-Discussion of the Results and Findings

This section interprets the results and findings. Both quantitative results and qualitative findings will be discussed by stating each result/finding, relating it back to the literature review, and describing why each finding is important.

Discussion of Quantitative Results

Hypothesis testing. The first part of Phase one of the study tested the hypotheses that were developed based on a review of literature on trust building and boundary spanning. Statistical review of the data using simple linear regression found that boundary spanning explained 39% of the variance in trust building between stakeholders in IWRM. Subsequent linear regressions of the potential moderating variables (i.e. power imbalance, scale mismatch, conflict and cooperation) found that only conflict moderated the relationship between boundary spanning and trust building between stakeholders in IWRM. Results of the hypothesis testing indicates that power imbalance, scale mismatch, conflict, and cooperation may be better predictors of trust building than moderators of the relationship between boundary spanners and trust building between stakeholders in IWRM.

These results may signify the necessity of having boundary spanners involved within the IWRM process, especially in those instances when the issue at hand is complex, contentious and involves a variety of geographic and jurisdictional boundaries. Conflict is more likely experienced when stakeholders of diverse knowledge, backgrounds, and values are engaged in the process. Boundary spanners have the opportunity to mediate the tension and suspicion that might arise during the collaborative

process. Furthermore, they have the chance to embrace conflict and use it as a catalyst for better communication, thus opening the door to trust building. Perhaps the role of the boundary spanner is only required in certain IWRM circumstances - highly contentious, long-term projects with a history of conflict between stakeholders.

This begs the question, though, as to why power imbalance, scale mismatch, and cooperation might operate better as predictors of trust building. One suggestion is the possible lack of awareness which boundary spanners have of power imbalance and scale mismatch. In addition, many individuals may not have the skills to handle these imbalances or governance mismatches even if they are recognized. The results demonstrate that trust building is more directly impacted by power imbalance and scale mismatch as opposed to it moderating through a boundary spanner. The same can be said for cooperation; the relationship between boundary spanners and trust building is not dependent on cooperation. The expectation is that cooperation is a positive and thus, boundary spanners can direct their focus onto other issues such as stakeholder misperceptions or feelings of marginalization. Nevertheless, cooperation can directly impact trust building because it results in less conflict and suspicion encouraging relationship building and eventually the beginnings of trust between participants.

In addition, autonomy, authentic leadership, and trustworthiness were tested to see how they impact boundary spanning behavior. Results demonstrated that all three of the predictor variables influenced boundary spanning behavior in a positive manner. Thus, one could suggest that a boundary spanner's behavior is going to vary according to not only the water resource issue, but that particular boundary spanner. This brings to light the importance in identifying those boundary spanners who have the necessary skills

and traits to engage a specific set of stakeholders in an IWRM process. The data also indicates that some predictors are more influential than others are, showing that stakeholders may be more responsive to certain boundary spanner behaviors.

Development of a model explaining trust building. The second part of Phase one of the study utilized hierarchical multiple regression in order to test a model of predictor variables together with demographic variables explaining the dependent variable trust building between stakeholders in IWRM. Autonomy, authentic leadership, and trustworthiness had a higher correlation with boundary spanning than trust building (see Table 1) so they were not included in the model explaining trust building. They were used in a subsequent model explaining boundary spanning.

When testing the model explaining the building of trust between stakeholders in IWRM, the data demonstrated that boundary spanning has a large positive effect. Although gender did have a significant initial contribution to the regression model (3.5%) in Step 1, once boundary spanning was incorporated into the model the significance dropped out. Boundary spanning explained a 37% variance in trust building and gender ceased to be a factor. Whereas, adding cooperation, power imbalance, and scale mismatch to the regression model revealed that they are weak predictors of trust building. Ability to manage conflict added no variance to the model. In summary, boundary spanning had the greatest impact on trust building because it explained 37% of the variation. Taken together all five independent variables explained 52.3% of the variance in trust building. Cooperation, scale mismatch, power imbalance, and gender, however, only contributed 15.3% of the variation or change in trust building. Clearly, boundary spanning has the biggest impact on trust building in this study.

Development of a model explaining boundary spanning. The third part of Phase one of the study utilized hierarchical multiple regression in order to test a model of independent variables together with demographic variables explaining the dependent variable to build a model explaining boundary spanning. Results demonstrated that autonomy, authentic leadership, age, and female gender impacted boundary spanning minimally; whereas, trustworthiness had the most significant positive impact on boundary spanning behavior when analyzed with hierarchical regression.

Discussion of the Qualitative Findings

The qualitative phase of this mixed methods study delved into the essence of boundary spanning's influence on trust building. Knowing what is important to participants during the collaborative process is critical, however, understanding how one influences trust development between stakeholders is the true purpose of this study.

To Lead or not to Lead? That is the question. Study participants were very much aware of the need for leadership during the engagement process, however, knowing when to lead and to what degree varied according to the stakeholder group and type and size of project. Stakeholders often want a leader to emerge, someone who can demonstrate vision, identify common goals and manage conflict. Because a typical integrated water resource process has many moving parts and a diverse set of stakeholders involved in the discussion, a central person is often needed to keep the process moving forward (flagpole mentality). In essence, study participants imagine a situation involving one person (boundary spanner), who has the ability to not only be a resource, but promote an environment accessible to all stakeholders. The opportunity to express one's feelings, opinions, and concerns within the group may help minimize bias

and establish a baseline from which to build trust. Such an individual not only represents openness, but also demonstrates some degree of autonomy from her/his organization. In addition, the added ability to contain or control conflict between stakeholders increases this individual's capacity to build relationships and influence trust between stakeholders. However, knowing your limits is particularly important when dealing with conflict between stakeholders. Not all stakeholders are involved in the collaborative process for altruistic reasons, and recognizing when to cut your losses often benefits the group as a whole.

Finding structure out of chaos. Participants believed that identifying and providing some sort of structure for stakeholders enabled stakeholders to more likely trust in the collaborative process and each other. It is critical that stakeholders are not only involved in, but committed to the development of a framework. Having an organizational structure can be results-oriented, yet still allow stakeholders to revisit the framework when conflict arises. Participants acknowledge that when a governmental agency is involved in the process, this often leads to suspicion among the rest of the players. Incorporating safeguards into the structure can level the playing field in many of the stakeholders' eyes, thus, encouraging more cooperation and less distrust. Setting ground rules early on provides stakeholders with the ability to manage conflict in order to build relationships that can lead to long-lasting trust.

Are you talkin' to me?! First and foremost, communicating the appropriate message is essential to not only trust development between stakeholders, but to an overall successful collaborative process. Study participants maintain that the key to clear messaging is one that is well-defined, impartial and factual. Attempting to engage a

stakeholder using technical or vague commentary is not only ineffectual, but can encourage feelings of marginalization and discourage a two-way exchange of information. In addition, participants noticed that stronger stakeholder connections developed when a message was communicated in a transparent and open fashion that allowed for knowledge sharing between stakeholders. Once stakeholders were receptive to an exchange of information, participants were able to assist others in identifying the real issue at hand; often a message is so convoluted that is must be broken down into smaller parts. It is only then, that stakeholders can begin to understand the wants and needs of others – a precursor to trust building.

Connecting the dots. In order for a message to be meaningful, stakeholders must not only understand what is being communicated, but be willing to acknowledge and act upon it. Participants stressed the importance of establishing connections between actors by engaging them in one-on-one conversations throughout the collaborative process, thus providing an opportunity to share the message in a more directed and individualized way. First impressions were noted by study participants as particularly crucial because it set the stage for future engagement, and by providing a comfortable (safe) environment for stakeholders to share their backgrounds and experiences, it encouraged them to connect on a more personal level. This finding is important because it can result in stakeholders taking ownership of the issue at hand and working toward common goals, which can only happen when some modicum of trust has developed between them.

Speak now or forever hold your peace. Overall, participants agreed that involving stakeholders at the beginning of the collaboration process was critical to finding common ground and working through potential conflict. Failure to engage

stakeholders throughout the process and recognize cultural differences sets the stage for mistrust and power struggles. This finding is important because it demonstrates the need for a "safe space" or environment that allows for freedom of expression without repercussions. Stakeholders, who feel comfortable expressing their personal opinions, are more apt to set aside preconceived notions and work toward a common goal.

Participants reiterated the necessity of providing multiple settings and opportunity for stakeholders to meet, whether that be formal or informal. Participants noticed that stakeholder engagement which occurred during informal settings such as a break between sessions or evening get-together allowed individuals to share personal information and opinions, thus encouraging the start of trust building. For example, a stakeholder who has moved beyond "You represent a government agency that I distrust" to "We share the same home town" is more willing to have some flexibility when a difference of opinion arises. This translates into more collaboration, knowledge sharing, and sense of ownership in the project at hand. Utilizing a feedback loop also allows stakeholders to understand exactly what someone is saying rather than making false assumptions. Engaging others is more about active listening than hearing, for it forces one to understand the message and respond appropriately.

There is no truth, only perceptions. Several participants acknowledged that during the collaborative process one often encounters perceptions that may or may not be accurate. When dealing with stakeholders, who not only possess diverse backgrounds but also represent various constituencies, there can be misunderstandings of agency mission or long-standing institutional distrust. Getting stakeholders to acknowledge and communicate their concerns increases the chance for clarification of meaning and

mission; identifying perceived risk early on can level the playing field allowing stakeholders to freely engage. Sharing factual information and addressing misperceptions or previous conflict can oftentimes resolve the situation before it negatively impacts the entire collaborative process. In those instances, when one particular individual continues to struggle with the engagement effort, participants have taken steps to individually meet with that person in hopes of alleviating their anxieties.

Conflict Management 101. Study participants acknowledged that conflict is inevitable during the engagement process, but proper attention to and management of conflict can result in positive outcomes. Stakeholders, who bring conflict into the collaborative process, often want their voices to be heard. Therefore, conflict must be addressed if trust between stakeholders is to develop. Many participants viewed conflict as an opportunity for growth and attempted to reign in the emotion and negativity associated with it by listening and learning from it. More often than not, stakeholders must engage with agencies from different scales of governance; this type of mismatch often results in suspicion and a struggle for the upper hand. Previous studies have indicated that this type of conflict can exist due to the multiple geographic and jurisdictional scales associated with watershed management (Cheng & Daniels, 2005). However, study participants, who encountered such scale mismatch, managed the situation by recognizing each participant's needs and values. This encouraged a sense of community encouraging stakeholders to reach out and identify with others' concerns. Unfortunately, not all conflict can be managed or addresses successfully. Although conflict can be seen as a catalyst to new ideas and directions, difficult situations between stakeholders sometime conclude with feelings of distrust and apathy. Recognizing and

accepting that certain issues cannot be resolved, encourages stakeholders to move on so that the relationships, which have been established between others, continue to remain strong.

Understanding Boundary Spanners and Trust Building between Stakeholders in IWRM – Integrating the Quantitative and Qualitative Phases

Both the quantitative phase and qualitative phase resulted in unique findings providing both breadth and depth to this study on trust building in IWRM. Although similarities between the data exist, differences were also demonstrated. The quantitative phase provided information about the degree of importance the study variables are to trust building between stakeholders in individuals with experience in IWRM during the stakeholder engagement process; whereas the qualitative phase provided an in-depth look as to *how* participants achieved collaboration and trust building between stakeholders. The advantage of combining the two data sets allows the strengths of one form of research to make up for the weaknesses of another. Qualitative data allows for a more detailed probe of stakeholder perspectives and takes into account contextual factors, while the quantitative results offer the perspectives of a larger population.

The research revealed, primarily, that trust is foundational to establishing and developing relationships in an integrated water management process. Both the quantitative and qualitative phases confirmed in distinct ways how and why trust is a necessary component to the collaborative process. Project managers involved in an integrated water management process need to recognize the significance of building trust between stakeholders from the onset. Assuming that stakeholders will easily and seamlessly engage with others is naïve; providing guidance, structure, and multiple settings and opportunities for communication as well as an environment free from peer

pressure is key to trust development. Facilitators and project leaders would do well to acknowledge the challenges associated with building trust, and seek out an individual or individuals within the engagement process, who have the ability to build bridges and establish relationships between a diverse set of stakeholders.

This study purposely focused on whether or not power imbalance, scale mismatch, conflict, and cooperation moderated the building of trust. Only conflict was found to be a weak moderator of the relationship between boundary spanning and trust building between stakeholders. However, further testing revealed power imbalance, scale mismatch, and cooperation to be weak predictors of trust building. While conflict was not a direct predictor of trust building, many qualitative participants discussed the positives consequences of properly managed conflict. This condition may be a result of how one views conflict and that particular situation. This could also be due to the differences in the way the questions were presented in the quantitative survey and then the open-ended questions of the qualitative interview. Participants were asked to describe how they dealt with conflict in the integrated water management process, which allowed for a more focused interpretation of conflict's impact during collaboration. Furthermore, quantitative results showed that conflict did not have a significantly strong impact on trust building, whereas qualitative participants expanded greatly on the usefulness, at times, of conflict. When managed properly, stakeholders were able to use conflict as a means to uncover areas of disagreement and to think outside the box in order to find common ground. This dichotomy in results demonstrates the difficulty of determining what influences trust building, especially when each water project and stakeholder group is unique.

Although power imbalance and scale mismatch did not moderate the relationship between boundary spanning and trust building between stakeholders, they were found to have a weak direct influence on trust building. This finding was consistent with the comments made by interview participants, who often failed to notice an imbalance or mismatch of any type. These results could suggest that trust building between stakeholders is minimally affected by power struggles or that individuals fail to identify the true source of the problem, and therefore, are unsure how to manage it or simply accepted the situation as status quo. Qualitative participants relied on the creation of a framework or structure to minimize not only potential conflict, but also situations of scale mismatch and imbalance. The theme "finding structure out of chaos" supports the concept of stakeholders being involved in the development of a framework so that power struggles or conflict may be addressed. As one interview participant stated, "...have a clearly spelled out process that they have trust in...[so] they know that the federal agency is following that process as well." Ignorance of negative influences during the collaborative process suggests that individuals with the ability to recognize and work through such challenges would be useful in order to establish better and long-lasting relationships between stakeholders.

Interestingly, cooperation was not a moderator of trust building, but rather was found to have a weak direct influence on trust building. Participants in the qualitative interviews did not view cooperation as something particularly relevant, although they did suggest that it resulted in less education and time spent on conflict containment. Study participants are viewing cooperation as something they did not have to manage, which could possibly explain the lack of influence which cooperation had on trust building.

Previous studies (e.g. van Meerkerk & Edelenbos, 2014) have emphasized the importance of using boundary spanners in natural resource management decisions. This study supports such a recommendation, and suggests an increased and intentional use of boundary spanners during the integrated water management process. Quantitative results indicate boundary spanner as a strong predictor of trust building. Qualitative participants expressed support for having an individual or individuals involved in the collaborative process, who are capable of reaching out to stakeholders in a different capacity than project leaders. It is critical the natural resource managers plan to identify boundary spanners either prior to or during the IWRM process.

The second part of phase one tested whether autonomy, authentic leadership, and trustworthiness predicted an increase in boundary spanning behavior. All three hypotheses were accepted demonstrating that certain characteristics can improve a boundary spanner's performance. Further analysis investigated the combined influence of autonomy, authentic leadership, and trustworthiness on boundary spanning. Surprisingly, autonomy and authentic leadership only minimally influenced a boundary spanner's behavior; however, it was a boundary spanner's trustworthiness that explained a large amount of the variance. Participants from the qualitative interviews supported these findings, although autonomy and authentic leadership had a larger impact than expressed in the quantitative results. The theme "To Lead or not to Lead. That is the question" summarizes participant beliefs in that being somewhat autonomous from one's home agency benefitted their ability to connect with stakeholders. Participants did acknowledge that expending one's autonomous muscle varies according to the sensitivity of the issue. Moreover, boundary spanners, who can demonstrate autonomous and

objective behavior, are more likely to engage stakeholders and set the stage for trust building. Participants expect to provide a form of leadership, which is often dependent on the water resource issue and stakeholders' composition. As one individual expressed, "If you're sitting at the table, you are expected to have that ability."

Research has shown that a boundary spanner's leadership (Walumbwa et al., 2008), and autonomy (Williams, 2002; Brion et al., 2012; Thompson et al., 2016; Schotter et al., 2017) during the engagement process is important; however, trustworthiness outweighs both considerably. Participants in this study frequently stressed the importance of trustworthiness when dealing with stakeholders. In order to build trust between stakeholders, there must exist a certain level of comfort, familiarity, and equity. Boundary spanners can help level the playing field by avoiding a personal agenda and creating an environment ripe for a two-way exchange of information between stakeholders.

The question remains as to how boundary spanners cultivate trust between stakeholders within an IWRM process. The quantitative survey results and qualitative interviews revealed numerous practices, which a boundary spanner could use to help stakeholders build stronger, more resilient relationships in an effort to develop trust. Study participants, who recognized the necessity of using a variety of strategies due to the uniqueness of both the stakeholders and water resource issue being managed, were better equipped to handle the challenges inherent in building trust between stakeholders.

Communication. Through the qualitative analysis, this study suggests the importance of a well-defined, transparent, and consistent message. Boundary spanners have the unique opportunity to ensure that stakeholders understand what is being

communicated through a variety of techniques and strategies. This study reinforces what previous studies (Reed et al., 2009; Luyet, Schlaepfer, Parlange, & Buttler, 2012; Reed et al., 2014) have found regarding the idea of engaging stakeholders early on and throughout the collaborative effort. Although project managers may provide opportunity for stakeholders to meet formally, a boundary spanner can reach out to individuals during an informal setting and encourage conversation between diverse stakeholders. By being that liaison, a boundary spanner can bring together stakeholders from different entities and viewpoints, thus establishing a baseline for future collaboration. Studies show (e.g. Stern & Coleman, 2015) that certain types of trust are built on mutual understanding and shared identities; rational trust (based on the calculated utility of trusting) is the first to form in a new relationship and can morph into affinitive trust (based on a relationship between the trustor and trust target) given the opportunity.

Just as important, however, is how the integrated water management process is being conducted. Stakeholders, who feel left out of the process or marginalized, may not be understanding the message due to highly technical or complex natural resource issues, or simply feel they have no power in the process. Boundary spanners are useful in this situation because they can meet one-on-one with those stakeholders, who are on the fringes, and connect them with other stakeholders more familiar with the subject matter. Controlling bias and minimizing misperceptions early on is crucial to forming a web of connections and a baseline of trust.

Attempts to establish trust between stakeholders can only be successful when individuals are confident in a boundary spanner's ability to be impartial and straightforward. Study participants were cognizant of the fact that they needed to remain

objective and neutral during the collaborative process, yet still represent their home organization. When engaging with stakeholders, it is crucial that one is very clear in articulating what or who is being represented when a particular statement is made. Being able to wear "those different hats" is part of the boundary spanner role, but just as important is being transparent and honest with stakeholders. There are times, according to study participants, when stakeholders expected a project manager or facilitator to have a well-defined message. In contrast, participants found that being open to stakeholder opinions and beliefs set the stage for better communication and trust building. Boundary spanners must also be able to control their own personal prejudices during the engagement process. Being able to pocket individual opinions and biases when engaging with stakeholders not only levels the playing field, but also demonstrates an openness and a willingness to not only listen but hear what is being said.

Engagement. Participants in this study acknowledged the difficulty in engaging all stakeholders and ensuring that their voices were not only heard, but legitimately considered. Again, identifying individuals early on, who have the ability to engage stakeholders on a personal level, has many benefits. Often, an integrated water resource process crosses multiple geographic boundaries and jurisdictional levels; it can encompass many stakeholders from a variety of entities. Involving citizens across political boundaries can be extremely difficult (Brown, 2011). Previous studies (Maynard, 2013; Metcalf et al., 2015) acknowledge that small-scale projects are easier to engage stakeholders; whereas, large-scale projects may lead to miscommunication, a top-down approach, and the potential for power imbalances. In those instances, utilizing a

boundary spanner can be the difference between moving forward toward a common goal or disenfranchised stakeholders causing conflict and leaving the process all together.

The majority of participants discussed the idea of utilizing a feedback loop as one method to encourage stakeholder engagement. Boundary spanners have the unique opportunity to use the iterative process to not only clarify meaning, but also seek out those stakeholders, who may hold traditional or local knowledge useful to the issue at hand. Several participants stressed the importance of acknowledging and including traditional knowledge in the project discussion. Boundary spanners, who can establish a safe space for conversation, afford stakeholders the chance to share their personal knowledge and values with others and are more likely to take ownership of the water resource issue.

Flagpole Mentality. Multiple studies on stakeholder engagement have discussed the benefits of providing an environment conducive to transparent and honest conversations between participants (Mazur & Curtis, 2006; Ansell & Gash, 2008; Gray et al., 2012; Nastran, 2015). Results of this study reinforce the idea of a "safe space" with more than one qualitative participant emphasizing it as a top priority for effective communication and trust building. Stakeholders are astute enough to recognize when bias or an imbalance of power exists, and are often quick to withdrawal from the collaborative process. One function of a boundary spanner is to be cognizant of stakeholder angst and suspicion of others; being aware of the prior history between stakeholders as well as their unique perspectives aids in trust development. Participants in the study learned from their individual IWRM experiences that stakeholders are seeking a person or persons to whom they can come to for questions and where validation

of their concerns can take place. This type of 'flagpole mentality" is an extension of the safe space concept. Program managers and facilitators may be willing to respond to participant questions, but stakeholder needs are often more complex and their beliefs and opinions deeply rooted. It is crucial that this person be accessible, credible, and open to different perspectives and ideas. Such modelling sets the tone for what is expected of other stakeholders in the participatory process. Stakeholders who feel validated are more willing to listen to other perspectives, be vulnerable to new ideas, and seek common goals. Consistent with other studies (Klijn et al., 2010; Pirson & Malhotra, 2011; Abbas et al., 2015; Hornagic et al., 2015; Nastran, 2015; Turner et al., 2016; Young et al., 2016; Coleman & Stern, 2018), this research found that the beginning of trust building hinges on individuals not just having similar values and beliefs, but also a willingness to be vulnerable and open.

Implications for Practice

The idea of intentionally collaborating with a boundary spanner for IWRM is foreign to many natural resource managers, yet boundary spanners have been involved in organizational business practices, emergency management, university/community engagement, and industry for years. This study focuses on the idea of capitalizing on boundary spanners to enhance IWRM collaborative efforts by strengthening relationships and developing trust between stakeholders. Water resource managers may consider the results of this research to further expand their personal knowledge about boundary spanning activity. It is crucial that both project managers and facilitators are not only aware of the role and function of boundary spanners, but are prudent when seeking them out during the collaborative process. This research, however, is not suggesting that

boundary spanners replace mediators or facilitators. Rather, boundary spanners are there to help the collaborative effort, and since they are not leading the process, there are limits to their abilities.

Boundary spanners are as unique as the water resource being managed; their individual traits and skills can positively influence the collaborative process and assist in the development of trust between stakeholders. This study advocates for the idea that boundary spanners, who possess some autonomy from their home organization, are more apt to be viewed by stakeholders as trustworthy and objective. Natural resource managers, who are willing to set the stage for boundary spanning activities and allow time for boundary spanners to connect with participants, create an environment ripe for improved stakeholder participation, which requires less process to accomplish IWRM goals. Providing opportunities to meet informally and "off the record", encourages individuals to establish a baseline relationship between each other; understanding other perspectives allows one to become more vulnerable and thus, willing to accept risk, a precursor to trust development.

Natural resource managers and project leaders have the opportunity to use the results and findings of this research to further consider how boundary spanners can mitigate certain types of inequities within the collaborative process. Since boundary spanners are in direct contact with stakeholders during the IWRM process, their ability to not only notice, but minimize the negative influence of power imbalance and scale mismatch cannot be underestimated. Boundary spanners, who have the ability to recognize the beginnings of a power struggle or a lack of institutional trust between individuals, can work to minimize stakeholder angst, frustration, and feelings of

marginalization by encouraging the implementation of a charter developed and agreed upon by all participants. This structure levels the playing field and provides stakeholders transparency in the process and the sense that their knowledge and personal beliefs are valued. In addition, boundary spanners, who can create an environment that encourages open and honest communication and knowledge sharing, set the stage for the building of trust between stakeholders. Controlling bias and offering stakeholders a neutral site opens the door for not only recognition of cultural differences, but stakeholders willing to think outside the box.

The potential contributions of boundary spanners may not be the same for each IWRM process; however, natural resource managers, who are involved in large long-term water resource projects, may find it to their benefit to identify boundary spanners. Research has shown (Gray et al., 2012; Maynard, 2013) that stakeholders who have developed strong bonds of trust between each other are able to withstand future challenges and more likely to find success with extended collaborative projects. Boundary spanners involved in projects that cross multiple geographic and jurisdictional scales must be cognizant that stakeholder knowledge is perceived differently (Cash et al., 2006) and respond appropriately to an individual's perception of what is credible, valuable, and legitimate information. Smaller scale projects have the ability to achieve higher levels of participation because there are more personal interactions that build trust and flexibility and may not require the extra attention of a boundary spanner.

The benefits to having boundary spanners actively involved in the IWRM process are far reaching. Establishing a foundation of trust and respect between stakeholders does more than create an environment of goodwill. Stakeholders, who can put aside

animosities and narrow perceptions, are less likely to feel marginalized and more willing to work toward a common goal. Natural resource managers will spend less time on stakeholder education and conflict management, allowing for better dialogue and forward progress. Boundary spanners not only look for opportunities to build consensus and repair damaged relationships, but can also be alert to a collaborative process that fails to be dynamic and diverse in its thinking. Too much cooperation can be an indication of "groupthink", which on one hand reduces conflict, but also discourages stakeholders from questioning the process and others.

Private and public entities participating in an IWRM process would be wise to consider a person who has certain boundary spanning characteristics, someone who can work across multiple forms of organizational governance, interact with individuals from diverse cultures, and negotiate with different organizational priorities. This individual must be able to work in a collaborative fashion in order to achieve shared goals, yet remain loyal to the home organization.

The question remains whether or not boundary spanning is an acquired skill or a process that happens naturally. Similar to many talents, some individuals may inherently possess particular boundary spanning capabilities, whereas, others require guidance. Fortunately, learning to be an effective boundary spanner is achievable. The results of this study reveal some of the essential skills necessary to becoming a boundary spanner.

A development program for boundary spanners would advance the idea of remaining true to one's home organization while simultaneously displaying autonomous behavior. It would stress the importance of personal trustworthiness as well as authentic leadership, a critical finding of this study. It is paramount that potential boundary

spanners be taught to communicate effectively in a clear, concise, and transparent manner, thus encouraging others to share their unique perspectives and knowledge. The potential influence of power imbalance, scale of governance mismatch, and cooperation within the collaborative process must be acknowledged by natural resource managers as well. In addition, conflict would be presented as not just something that needs to be managed, but as a catalyst for new ideas and change. Such a resource has the opportunity to provide natural resource managers with the necessary tools to guide and nurture boundary spanning behavior.

Finally, natural resource managers should feel comfortable calling upon more than one boundary spanner, if necessary. Too many boundary spanners, however, can backfire; stakeholders want consistency not only in the message, but in the messenger. One participant reminds project leaders to be watchful that boundary spanners remain balanced and true to their purpose in the IWRM process. Boundary spanners, who identify too closely with stakeholders, may become less objective, which could negatively hurt the collaborative process if they leave the process early. Additionally, the potential downside of too much informality is an over-reliance on personal relationships; boundary spanners must enforce boundaries to protect themselves from becoming too entangled in stakeholder concerns.

Implications for Future Research

Since the idea of boundary spanners influencing trust building between stakeholders in an IWRM process has yet to be widely researched, there are many future research opportunities utilizing various elements outlined within this study. The question remains as to whether individuals from private entities are more equipped to be boundary

spanners than those representing public organizations. Are stakeholders more open and willing to work with boundary spanners who have both the ability and freedom to make decisions that are more independent? Recognizing the appropriate boundary spanner requires understanding the type of natural resource project being discussed as well as the type of stakeholders who may be engaged in the collaborative effort.

An interesting contradiction found in this study was how scale mismatch and imbalances of power had minimal influence on trust building between stakeholders, albeit previous research emphasizes their negative influence on relationship building in the collaborative process. Further investigation is necessary to understand why these moderators had little impact on the development of trust in IWRM.

Very few studies have focused on the impact that a prior negative experience between stakeholders may have on trust development. Participants of this study were very cognizant of the fact that local stakeholders are often distrustful of federal or state agencies due to an earlier encounter that went poorly. These negative interactions have the potential to halt trust development and collaboration early on. It would be beneficial to conduct more research on how boundary spanners can minimize this negative influence, and assist stakeholders in mending unhealthy relationships.

This study's purpose was to explore the relationship between boundary spanners and trust development. However, identifying boundary spanners and cultivating their performance within the collaborative process is important and worthy of future research. The realization that boundary spanners are not mediators or facilitators poses a challenge when attempting to define their role. Should natural resource managers be pulling individuals aside at the start of the engagement process labeling them as boundary

spanners, or should the process happen naturally? Does it depend on the water resource issue, the composition of the stakeholder group, or the size and scope of the project?

Extant literature does suggest certain traits and skills needed in order to have a modicum of success as a boundary spanner; however, little research exists on how boundary spanners could be "groomed" to take on this role. Perhaps the development of a boundary spanner mentoring program is a worthwhile consideration. Natural resources managers, who are willing to provide opportunities for boundary spanning activities, may opt to identify individuals early in the collaborative process and provide the guidance and encouragement needed to take on the boundary spanning role. Further study on the characteristics of boundary spanners and how the individual actor compliments that particular water environment is necessary.

The idea of whether gender, age, and/or experience influences a boundary spanner's effectiveness in IWRM is also worthy of additional investigation. The quantitative phase of this study determined that older and female participants scored higher in boundary spanning behavior. Natural resource management is predominantly a male-dominated field, yet particular characteristics and behaviors of gender may inherently benefit a boundary spanner's efficacy. The age of an individual or their experience with integrated water management has the potential to be an advantage as well. Being familiar with natural resource procedures and practices provides a certain sense of confidence. On the other hand, too much insight or history with an agency could hinder one's ability to be impartial and transparent.

Finally, future research could investigate the expansion of the boundary spanner's role as one of an interpreter of scientific or technical information. Today's water

resource projects involve many actors and scales of governance; individuals are needed who can build connections between complex scientific data and stakeholder needs. One study has already contemplated the idea of targeting specific stakeholder audiences with tailored information in order to encourage better communication and cooperation (Grygoruk & Rannow, 2017). Perhaps boundary spanners could be used to help adjust the message about water resource management, thus, making it more relevant, easier to comprehend, and acceptable to other stakeholders.

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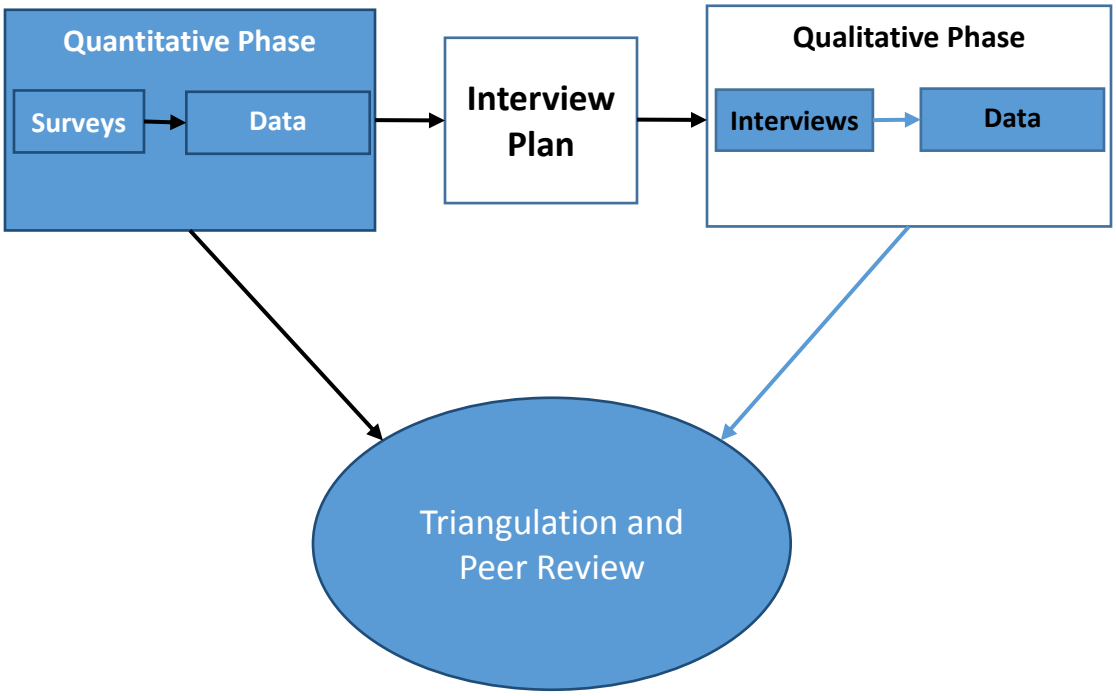

Explanatory Sequential Mixed Methods Design

Appendices

Appendix A – Acronym List

IRB – Institutional Review Board

IWRM – Integrated Water Resource Management

NRM – Natural Resource Management

NRD – Natural Resources District

NWLA – Nebraska Water Leaders Academy

SPSS – Statistical Package for the Social Sciences

Appendix B – Interview Informed Consent Letter

University of Nebraska Lincoln

INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
SCHOOL OF NATURAL RESOURCES

Dear Study Participant,

My name is Jodi Delozier. I am conducting a study exploring how individuals can develop trust between stakeholders in water resource management or policy activities.

Participation in this study will require you to participate in one face to face interview of up to 60 minutes. Participation in an interview will take place at your place of business or location of your choice. This interview will be audio recorded for future reference.

There are no direct benefits to you as a research participant. Indirect benefits may include boundary spanning activities being utilized in a future integrated water management process. There are no known risks or discomforts associated with this research.

The results of this interview will be utilized for a Master's thesis and potential inclusion in conference presentations and scientific articles.

Your responses to this interview will be kept confidential, and a pseudonym will be associated with the data recording. The data and recordings will be kept on a password-protected laptop and will only be seen by the investigator(s) during the study and for two years after the study is complete. Your name will not be associated with any publication of the study results.

You may ask any questions concerning this research at any time by contacting me at 402-560-6340 or at jodi.delozier@huskers.unl.edu. You may also contact Dr. Mark Burbach at 402-472-8210 or at mburbach1@unl.edu. If you would like to speak to someone else, please call the Research Compliance Services Office at University of Nebraska-Lincoln at 402-472-6965 or irb@unl.edu.

Participation in the study is voluntary, and you must be 19 years of age or older to participate. You can refuse to participate or withdraw at any time without harming your relationship with the researcher or the University of Nebraska, or in any other way receive a penalty or loss of benefits to which you are otherwise entitled.

You are voluntarily making a decision whether or not to participate in this research study. By agreeing to participate in the interview and signing this form, you have given your consent to participate in this research.

Sincerely,

Jodi Delozier

_____ _____

Signature of Research Participant Date

I agree to be audio recorded during this interview.

Appendix C – Interview Script

INTERVIEW SCRIPT

Project Title:

Boundary Spanners and Trust Development in Integrated Water Resource Management: A Mixed Methods Study

Time of Interview:

Date:

Interviewer:

Interviewee / Name Code:

Title / Position of Interviewee:

Organization Code:

Interview Script:

Hello,

My name is Jodi Delozier. I am a master's student studying Natural Resource Sciences at the University of Nebraska-Lincoln and the principal investigator for this project. The purpose of this project is to describe the experiences people have with a water resource management or policy process.

This project may discover knowledge that could help those involved in water management and policy in Nebraska.

I want to reassure you that confidentiality of your identity and of your responses will be maintained. I would also like to thank you for participating in this study. I will be audio recording and taking notes during our interview today.

Before we get started, I need you to read, sign, and date an informed consent form. This form states that you give me permission to record and transcribe our interview. After you have read the information contained on this form, please sign and date it. Do you have any questions?

Please let me know if at any time you wish to either take a break or withdraw from the interview.

Stakeholder definition – an individual participating in a water resource management or policy process who has a vested interest in its outcome.

If you're ready, let's begin:

The first set of questions will focus on your experiences with stakeholder engagement, collaboration, and trust building. (Boundary Spanning)

1. Describe how you develop **external** relationships in order to accomplish collaborative water management objectives. (relationships between others)

2. In your experiences with collaborative water resource management, what did you do to facilitate trust development between stakeholders?

3. Are there any particular strategies that have been successful?

4. Tell me about those strategies that did not facilitate trust successfully.

5. Describe what you could have done differently in those instances?

The next set of questions asks you to consider how one resolves differences within the collaborative process.

6. Tell me how you deal with **imbalances of power** between stakeholders in collaborative water management. A power imbalance could refer to any situation where there is disparity in financial or natural resources, information, experience, or position.

7. How did this impact your ability to develop trust?

8. Please describe how a mismatch in the **scale of governance** (local, state or federal levels) influenced your ability to develop trust between stakeholders?

9. Describe how you deal with **conflict** between stakeholders. (How did you work through the conflict?)

10. Tell me how **cooperation** influenced your ability to develop trust between stakeholders, **or** put another way: describe a situation where you used cooperation between stakeholders to move the collaborative process forward. (*Cooperation does not always exist when there is an absence of conflict.)*

The following questions will focus on pre-existing conditions, which may have influenced your behavior in collaborative water resource management.

11. Describe how your level of **independence** (whether that be in decision making or voicing of your opinion) influenced your ability to act in collaborative water management.

12. Describe how your **leadership** skills influenced your behavior in collaborative water management.

I am going to ask a question about trustworthiness and its role in developing trust between stakeholders. [Trustworthiness is a quality of the trustee (i.e. person being trusted), while trusting is something that the trustor (i.e. person doing the trusting) does".]

13. Tell me how your personal trustworthiness may have played a role or influenced your behavior in collaborative water management.

14. Is there anything else about building trust between stakeholders that is important to know?

Closing Comment to participant:

15. Thank you very much for your time and participation in this project. Do you have any questions for me?

Interviewer Field Notes:

Interviewer may take notes during and immediately following the interview to record personal observations, reactions, impressions, and conditions during the interview.

Appendix D – Internet Survey Informed Consent E-mail

Dear Participant,

I am a student researcher at the University of Nebraska-Lincoln and am writing to ask you for your assistance with a research project studying people's influence on the development of trust between other participants involved in water resource management or policy activities.

The survey should take approximately 15 minutes or less to complete. Participation in the survey is entirely voluntary, and you must be 19 years of age or older to participate. Failure to complete the survey will in no way compromise your relationship with the investigators or the University of Nebraska.

There are no known risks to participation in this survey. Any information obtained during this study that could identify you will be kept strictly confidential. Once your data is entered into a spreadsheet, your name and all identifying codes, including IP addresses, will be removed. Upon completion of data collection, the surveys will be closed and all material other than the raw data file will be destroyed.

Follow this link to the Survey:
https://ssp.qualtrics.com/jfe/form/SV_4SzBhDTlaXUSfNr

Completion of the survey indicates your consent to participate in this study.

Thank-you,

Jodi Delozier
jodi.delozier@huskers.unl.edu, 402-560-6340

Dr. Mark Burbach
mburbach1@unl.edu, 402-472-8210

Appendix E – Internet Distributed Questionnaire Sample

Boundary Spanners & Trust (Example Questions)

This portion of the survey describes your overall experience with stakeholders and organizations while involved with water resource management or policy activities. Please use the following rating scale:

Strongly Disagree 1	2	3	4	5	Strongly Agree 6

1. I build and maintain long lasting relationships with different organizations. 1 2 3 4 5 6
2. I generally live up to the agreements I make when developing trust between others. 1 2 3 4 5 6
3. I am not afraid to voice my opinion even when I think they are in opposition to the opinions of most people. 1 2 3 4 5 6
4. I have a feeling for what is important and what matters to other organizations or parties involved. 1 2 3 4 5 6
5. I give others the benefit of the doubt when developing trust between others. 1 2 3 4 5 6
6. My decisions are not usually influenced by what everyone else is doing. 1 2 3 4 5 6
7. I take care of information exchanges between those involved in water resource management or policy and my home organization or business. 1 2 3 4 5 6
8. I keep others' intentions in mind when developing trust between others. 1 2 3 4 5 6
9. I have confidence in my opinions even if they seem contrary to the general consensus. 1 2 3 4 5 6

Appendix F – IRB Approval Letter

University of Nebraska Lincoln

December 19, 2017

Jodi Delozier
School of Natural Resources
2910 Hoy St Lincoln, NE 68516-6034

Mark Burbach
School of Natural Resources
HARH 512, UNL, 685830995

IRB Number: 20171217827 EX
Project ID: 17827
Project Title: Boundary Spanners, Trust Development and Integrated Water Management

Dear Jodi:

This letter is to officially notify you of the certification of exemption of your project. Your proposal is in compliance with this institution's Federal Wide Assurance 00002258 and the DHHS Regulations for the Protection of Human Subjects (45 CFR 46).

You are authorized to implement this study as of the Date of Final Approval: 12/19/2017.

o Review conducted using Exempt category 2 at 45 CFR 46.101
o Funding: N/A

1. Your stamped and approved informed consent form has been uploaded to NUgrant. Please use this document to distribute to participants. If you need to make changes to the document, please submit the revised document to the IRB for review and approval prior to using it.

We wish to remind you that the principal investigator is responsible for reporting to this Board any of the following events within 48 hours of the event:
* Any serious event (including on-site and off-site adverse events, injuries, side effects, deaths, or other problems) which in the opinion of the local investigator was unanticipated, involved risk to subjects or others, and was possibly related to the research procedures;
* Any serious accidental or unintentional change to the IRB-approved protocol that involves risk or has the potential to recur;
* Any publication in the literature, safety monitoring report, interim result or other finding that indicates an unexpected change to the risk/benefit ratio of the research;
* Any breach in confidentiality or compromise in data privacy related to the subject or others; or
* Any complaint of a subject that indicates an unanticipated risk or that cannot be resolved by the research staff.

If you have any questions, please contact the IRB office at 402-472-6965.

Sincerely,

Becky R. Freeman

Becky R. Freeman, CIP
for the IRB