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Wicked Wisdoms: Illuminations of Conceptual Capacities Among Local Leaders of the Yellowstone River

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Abstract

The Yellowstone River is the longest free-flowing river in the lower 48 states. Traveling unfettered for more than 600 before its confluence with the Missouri River, the river and its basin support wide ranging natural resource based economic activities, including mining, oil and gas production, extensive wildlife habitat, ranching, farming and tourism. In 1997, various state and federal entities began an initiative to develop and implement holistic management plans for the river corridor. This study, which analyses data gathered from 68 interviews with civic leaders working in jurisdictions all along the river corridor, endeavors to understand how these officials comprehend the complex interaction of scientific, technical, political, social and economic variables, the wicked problems that characterize management efforts along the river. The study also seeks to develop a clearer understanding of how these leaders conceptualize their roles amid such complexities. Using a phenomenological interpretation, the findings reveal that local leaders have and recognize their own capacity to understand and deal with wicked problems. The article concludes with preliminary suggestions of how this capacity might contribute to capacity of these officials and their communities' to engage in collaborative or participatory management efforts.

Key words: Yellowstone River; Holistic management plans; River corridor

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INTRODUCTION

The management of the Yellowstone River's resources is complex. As a physical system, the river traverses well over 600 miles of the western United States, and its mechanics are varied and complicated. The river hosts a variety of biotic communities, including an array of aquatic, terrestrial and avian communities, as well as endangered and invasive species. The river serves the immediate needs of agriculturalists, municipalities, recreationists, residentialists and a variety of other local industries in Montana and North Dakota. As a tributary to the Missouri River, and as an upstream source of water to the Mississippi River, it is an important national resource. Jurisdictionally, it is overseen by more than two dozen local, state and federal governmental entities and agencies. In sum, the management challenges presented by the Yellowstone River are wickedly complex.

Rittel and Webber (1973) describe wicked problems as those that include a wide range of political, economic, and social problems. They explain that wicked concerns are likely to interconnect multiple types of problems, especially as changes in physical and social dynamics become apparent. Wicked problems often manifest conflicts in which stakeholders bring to bear significantly

different perspectives. These constituencies introduce any number of contrasting and competing ideological, cultural, political, and economic constraints. As a consequence, solutions to wicked problems are never wholly right or wrong; rather, solutions are simply better or worse within a specific context. Over time, wicked problems are not permanently solved, but they are affected by iterative initiatives that create ever-new dynamics that must, in turn, to be addressed (Conklin, 2006). Moreover, because effective resource management strategies must continually adapt to new information regarding changing physical and social dynamics, flexible governance is necessary to deal with the wicked problems, especially when those dynamic involve shared or public resources.

Efforts to locate governance processes at the local level allow for such flexibility (Turner, 1999), but this flexibility is often in tension with demands for the broadly "appropriate social and structural responses" required of state and federal entities (Steelman and Kunkel, 2004). Policy compliance is often a function of how well local officials mediate the differences in perspectives between particular resource users and state and federal resource authorities. Local leaders are asked to simultaneously attend a variety of local users' interests and to insure conformity with state and federal regulations. All the while, they must operate with integrity as neighbors and as officials. They are called upon to reconcile the complications that emerge when the interests of their communities are combined with the shifting and multiplicity requirements of larger governing units. In other words, they find themselves at this concentrated hub of wickedness. Even so, little attention has specifically focused on local leaders and their capacities to deal with wicked problems.

Concerning the Yellowstone River, events since 1996 make this river a potentially insightful situation to analyze. Specifically, back-to-back floods in 1996 and 1997 were mechanically powerful and severe bank erosion left some houses, previously 100 feet from the riverbank, with their riverside foundations exposed. Others homes were lost entirely to the river. By 1998, particularly in Park County, Montana, the number of requests for bank stabilization permits soared as landowners sought permissions to protect their private properties.

However, public objections were raised when it was made clear that the permitting process simply reviewed proposals in terms of their immediately traceable effects while no attention was given to the cumulative impacts of (perhaps) hundreds of projects. Among the many disputed claims still discussed today are concerns regarding the potential effects of bank stabilization activities on riparian zones and fisheries. Some in the public also raised concerns about unforeseeable ramifications of human activities on both physical and socio-political environments. A favorite example in Montana is the case of having spent several decades purposefully introducing Russian olive trees into local environs, only to now be concerned with their invasive nature. Since the late 1990s state and federal authorities have been working under a congressionally defined mandate to manage the river in ways that better balance sensitivity to local needs and understandings of cumulative effects.

In 2006, a comprehensive study was commissioned by the Yellowstone River Conservation District Council and the US Army Corps of Engineers to document the various concerns expressed by the people of the Yellowstone River (Gilbertz, Horton and Hall, 2006). The interview protocol was designed to encourage participants to explain and elaborate their understandings of: 1) erosion processes and bank stabilization techniques, 2) riparian zones and their functions, and 3) the degree to which the management strategies of the various entities and agencies impacted the overall health and sustainability of the river's resources. Researchers conducted semi-structured interviews with over 300 people from the counties along the river. The interviews were audio-recorded and transcribed. Initial analyses of the interview texts identified the primary themes of conversation found among particular interest groups, within particular geographic areas. Verbatim quotes were gathered under the established thematic categories, providing rich qualitative collections of commentaries.

The thematically organized analyses, including quotes, were released to the public in 2007. This collection included well over 700 quotes from 68 local civic leaders, all of whom had interests in the Yellowstone River as a shared resource, and all of whom were working at the heart of wicked problems. As county commissioners, mayors, city councilpersons, flood plain administrators, city managers, and local permitting agents, these leaders had variously been involved in on-going attempts to define and implement management objectives for the river. As well, ad hoc committees had assembled to address issues concerning management of the Yellowstone River. Notably, 95% of the local county commissioners whose jurisdictions included the river were interviewed.

Even cursory readings of the organized "Civic Leaders" quotes suggested the collection represented much more than local leaders' technical or scientific understandings of erosion processes, riparian zones and management strategies. Specifically, readers have been impressed by local leaders in terms of how they understood and dealt with the complexities of the river and their situations. To critical readers, the quotes offered especially powerful illuminations of how local civic leaders operate as mediators at the "hubs" of wickedness.

In this study, we investigate this rich, qualitative collection as an organic representation of the degrees to which, and strategies by which, local-level officials recognize and define as the dimensions of their wicked problems. In addition, we examine the collection as an emergent depiction of the degree to which situational

differences impact how local leaders deal with such wickedness.

CONVENTIONAL AND ALTERNATIVE CONCEPTUALIZATIONS OF POLICY ENVIRONMENTS

The animating feature of this study is the unique position that local officials hold in the highly complex sociopolitical and policy environments related to management of the Yellowstone River. A wide range of policy theories have been developed over the last several decades that provide means to assess the processes by which, and structures within which, policies are developed and implemented. We begin, here, by looking to the policy literature in an effort to better understand the position and role of these officials in the development and implementation of management policy for the river.

For example, policy process models have become increasingly elegant and sophisticated since the first, simple descriptions of a rational comprehensive policy process were articulated (e.g. see Lindblom, 1959). Specifically, the models moved towards generalizable propositions that were testable as means of producing effective policy management approaches (e.g. see Lynn, 1987), and by the 1990s, Sabatier (1991a) suggested that the study of policy processes was able to provide opportunities for applying and integrating accumulated knowledge about political behavior across institutional settings. He explained that this approach avoided explanations that focused on a single type of institution or the "iron triangles" that strap decision making into perspectives valued by a single level of government. The study of policy processes had moved beyond earlier heuristic approaches in that endeavored to develop causal models (Sabatier, 1991b).

Miller (2002) further explained the limitations of conventional policy process models. He argued that two taken-for-granted concepts must be recognized as running through conventional policy literature. The first is the predominance of assumed instrumental rationality, which he describes as the belief that the top down, means-ends, teleological reasoning common in bureaucratic settings will result in sound policy decisions. Second, he explained that conventional literature assumes that a legal-rational culture patterns social relations and decision making such that instrumental rationality can be legitimately universalized (2002, p. 1-4). Along these lines, it is not surprising that a number of researchers noted difficulties when attempting to apply these imbedded theoretical orientations to the functioning sociopolitical conditions of the late 20th and early 21st centuries. Namely, it became clear that researchers could seldom, if ever, operationalize the policy processes suggested by the concepts associated with instrumental rationality and legal-rational culture (Farmer, 1995; Miller, 2002; Miller and Fox, 2006).

The consequence is that while policy theories have become more sophisticated, they fail to sufficiently recognize the fundamentally irresolvable and un-decidable character of wicked problems. That is, given the complex and overlapping relationships between social, political, physical, and administrative factors, no universalizable causal policy theory will be sufficient for understanding the position and role of any managing official, let alone the local officials functioning as action brokers between local situations and governing bodies. Some other theoretical basis is needed.

Here, we turn to American pragmatism which, beginning in the mid-1990's, re-emerged as a an alternative to conventional, positivist approaches to policy and administration. The appearance of pragmatism – primarily from the work of John Dewey, William James and James Pierce - occurred simultaneously in at least two connected areas of scholarship: environmental political theory, and public administration and policy. In environmental political theory, significant attention was given to developing a theory of environmental pragmatism, and exploring the applications of that theory to various cases and settings. At the same time, public administration theory scholars began re-examining pragmatism as possibly presenting an alternative theoretical grounding for responding to critiques leveled at the modernist perspectives of public administration in previous decades. Much of what emerged took shape as postmodernist or poststructuralist thinking.

Perhaps the most extensive treatment of environmental pragmatism is to be found in the 1996 volume, *Environmental Pragmatism*, edited by Andrew Light and Eric Katz. This piece includes a number of works that explore specific aspects of American pragmatism as a foundation for thinking about environmental policy. Although this work is fairly heterodox, there are some important areas of continuity across these chapters. Among these is an antifoundational ontology. Parker, Rosenthal and Buchholz, and Norton raise, in various formulations, the pragmatist critique of a modernist or sciencist world view. They reject efforts to find universal foundations or overarching principles from which subsequent knowledge can be derived. Parker's (1996) essay, for example, points out that there are no absolutes in an epistemology of environmental pragmatism. Similarly, Rosenthal and Buchholz' (1996) essay reveals an anti-dualist perspective which collapses subject-object and fact-value distinctions. Several essays also acknowledge the embedded, relational and social aspects of environmental issues. Parker (1996) discusses life in context as an immersion and argues that it effects one's ontological and epistemological commitments. Santas (1996) describes a relational continuum of existence that links together all of the entities in an environment, including linkages that define individuals as elements

of, not separate from, the environment. Rosenthal and Buchholz, as well as Hickman (1996), recognize the relational, creative and even constructivist experience of nature. In fact, Hickman goes so far as to describe our conceptualizations of nature as being elements of culture.

Public administration and policy scholars have also given renewed attention to pragmatism as a means of responding to many of the critiques leveled against modernist administrative institutions. Common attributes of a pragmatist approach to public administration and policy include: a rejection of foundational or universal truth claims, attention to contextual and experiential characteristics of any given concern, and a recognition of, or even preference for pluralism (Shields, 2003, Bogason, Kensen and Miller, 2002; Box, 2002 and McSwite, 1997). Despite the valuable contributions that American or classical pragmatism brings to contemporary thinking in public administration, several of these same scholars point out what they believe to be critical limitations in classical pragmatism (Bogason, Kensen and Miller, 2002; Miller, 2004). They look beyond the classical pragmatism of scholars such as John Dewy to the neo-pragmatism of Richard Rorty (1982, 1991). The difference, according to Miller (2004), between pragmatism and neo-pragmatism can be summed up in three areas. First, neo-pragmatists have made the linguistic turn and as such recognize experience as one of any number of external "realities". Second, their antifoundational orientation notwithstanding, pragmatists retain a sort of scientism that postpositivist neo-pragmatists reject. Finally, despite their emphasis on context and experience, pragmatism tended to be ahistorical, whereas the neo-pragmatists tend to see historical changes in practice and language as critical.

Neo-pragmatism is sometimes regarded as a departure from phenomenology. However, it is Rorty (1982, 1991) who does more than perhaps any other philosopher to demonstrate the links between pragmatism and Heideggerian phenomenology. He argues that pragmatism and phenomenology have parallel views in several important areas (Rorty, 1982). He explains that both pragmatism and phenomenology draw a critical distinction between contemplation and action, with a preference towards the later, and both also highlight Cartesian problems, namely those associated with assuming the world is out there, operating with a near-flawless precision that is understandable via universal truths. Oakrent (1988) and Bramdon (2007) also identify these parallels in their treatment of the anti-mentalist and anti-transcendental character of pragmatism and phenomenology. Although several of the policy and administration scholars noted above look to Rorty as key source in the shift into postpositivism, Dreyfus (1990) points out that most, if not all, of the Continental philosophers who are recognized as postmodernists draw directly or indirectly from the Heidegger's phenomenology. Dreyfus shows that the concepts developed in Heidegger's *Being and Time* (1962) offer similar conceptual opportunities as those advanced in pragmatism and neo-pragmatism. Of importance, Heidegger's work emphasizes wisdom and experience as realities worthy of consideration.

Before proceeding too far into phenomenology, it is worth noting several connections between pragmatism and phenomenology more closely. Steelwater (1997) explores links between pragmatism and phenomenology in her essay examining Mead and Heidegger's contributions to an ethical theory of space, place and the environment. She presents a useful starting point by highlighting two areas of overlap. First, both Mead's pragmatism and Heidegger's phenomenology focus on experience, specifically taking an anti-foundational and anti-mentalist approach that is removed from Cartesian subject/object orientations to inquiry. Steelwater also focuses Mead's attention to spatiality and relatedness, which she argues augment a perceived weakness of Heidegger's phenomenology, namely its asociality. However, Heidegger's (1962) treatment of the so-called "other minds" problem, and his development of *the one*, or das Man, seems to respond to concerns about asociality quite sufficiently. Specifically, Heidegger opens up possibilities for a coherent ontology in so far as he lays a foundation for integrating social interaction with human-world interaction.

Heidegger introduces *Dasein*, roughly, as an alternative to 'individual' or 'subject.' He prefers this terms as it avoids the burdens associated with Cartesian ontological and epistemological assumptions. He also distinguishes between the "world", an element of Dasein's phenomenological experience, and the "universe", the subject of study by natural and physical scientists. He does not use the term place, but in some sections of his writing, uses the term "space" in a way that associates it with his notion of the "world". Careful, contextualized readings are necessary to sort out Heidegger's theory, but in the end it is possible to appreciate that experiential "worlds" operate as phenomenological categories. Dasein is always already thrown into the world, and as such is always already interacting with elements of the world. Dasein comes to know the world through interaction with and experience of it. This reveals the extent to which Heideggerian phenomenology is antiessentialist, both in its epistemology and its ontology.

Further, Heidegger expands the Greeks ideas of phronesis and the phronimos. As a point of entry, phronesis is often understood as wisdom, and is contrasted with knowledge. Where knowledge is universal and transcendent, phronesis (wisdom) is contextual and variable; wisdom accounts for situational differences. Further, wisdom is disclosed in and operates within the specifics of a situation rather than being observed from an outside, universalistic perspective. The phronimos, then, is a sort of cultural virtuoso or wise-person, embedded in the concrete situation (including the social world). The phronimos has the ability to respond spontaneously

and to deviate from mundane or typical public standards and practices. Such wise behavior is contrasted with an inauthentic way of being, wherein experience of the concrete situation is preempted by abstracted or universalized action driven by rules for a general situation.

What makes the phronimos inherently social is that virtuosity results from "the gradual refinement of responses that grow out of long experience acting within the shared cultural practices" (Dreyfus, 1990, p. 10). The very fact that these are cultural practices reminds us that Dasein is always already a world that is constituted as those things that are present-at-hand (those things that generally available to us, but not part of our immediate consciousness), ready-to-hand (those things that are immediately useful to us, and that we give direct attention to) and other *Daseins*. When Thompson argues that, as environmental pragmatists often seek truths, not for "their empirical or logical adequacy, [but for]…their serviceability for the task at hand" (1996, p.201-2), he echoes the focus on present-at-hand and ready-at-hand.

Further, Heidegger is clear in *Being and Time* (1962) that virtuosity is necessarily active, rather than mentalistic. Heidegger says that Dasein's "resoluteness does not first take cognizance of the Situation and put the Situation before itself; it has put itself into the Situation already. As resolute, Desien is already *taking action* (emphasis in the original)" (1962, p. 347).

What emerges from the examination of these elements of pragmatism and phenomenology is a shared antifoundationalism, an emphasis on the uniqueness of context and variation across circumstances, and a concern for social embeddedness and action. These elements, along with the concept of wisdom and the wise actor (the phronimos), specifically borrowed from Heidegger's discussion of phenomenology, constitute an important alternative for understanding local officials responses to the wicked management problems along the Yellowstone River. The potential recognition and confrontation of wickedness by local officials, coupled with the resistance to universalizing strategies, contextual and socially embedded character of interpretation and action, open the possibility of a different capacity to comprehend the wicked complexity of the management environment and any subsequent development of management initiatives.

ANALYSIS AND FINDINGS - DISTILLING EVIDENCE OF WICKEDNESS, CAPACITIES AND WISDOMS

Exposing a Topology of Wickedness. In the first phase of this project, the entire set of "Civic Leaders" quotes, representing leaders in 13 counties, was examined. We began by disassociating the data from the thematic categories offered in the published collection. We then shuffled and roughly divided the statements into three bundles, each with approximately 350 specific quotes. Working as three independent readers, we began to organize the quotes in terms of what they told us about the wickedness described by these local leaders. We worked to find, inductively, the primary means of explaining the management challenges concerning the river. After each having sorted approximately 100 quotes independently, we compared our findings to determine the degree to which the strategy was yielding sensible categories that could be abstractly representative of wickedness. That is, we compared our interpretations to see if we were consistent in establishing meaningful and replicable categories of analyses. The results were, indeed, quite consistent and thus we established a measure of internal validity. Specifically, we were able to establish three specific and primary aspects of wickedness concerning the river: overlapping administrative jurisdictions, disparate and conflicting information, and competing interest group agendas. It was also obvious that the forms were interrelated and that seven categorical types of wickedness needed to be recognized (see Table 1). Once the seven categories were defined, the remainder of the civic leader comments were analyzed and sorted based on which category each exemplified. Quotes that did not appear to fit the categorical scheme were set aside. Of the entire collection, approximately 80% were coded into one of the seven categories.

Indeed, local civic leaders demonstrated awareness and recognitions of problems that are easily described as wicked. Notably, though, comments offered more than a simple topology of concerns. The results indicated that local civic leaders were preoccupied with administrative layering and conflicting interest group demands (see Table 2). This finding suggested that for these local leaders wickedness is foremost a function of administrative goals being complicated by constituency or interest group demands (43%), of overlapping administrative jurisdictions (17%) and of complications involving interest group and constituencies' demands (16%). Taken together, these three categories account for 76% of the descriptive comments. As such, they revealed that local leaders are far less concerned with conflicting information and far more concerned with complications associated with serving a multi-layered bureaucracy and a multi-faceted public.

Exposing Wisdoms and Capacity. Having determined that local leaders' were indeed identifying wicked problems, the next concern was to determine the extent to which their efforts to deal with the wickedness could be described as constructive. That is, we set out to determine differences in how well local leaders were able to also grapple with the complexities. Here we borrowed two terms as central to our investigation. First, we desired to frame the analyses in terms of local leader "capacity," specifically drawing from how this concept is widely used in economic and community development

to describe the extent to which the community has the ability and resources necessary to respond to its situation (see McGuire et. al 1994 as an example of this use). We draw on this usage, as well as similar concepts such as civic capacity (Stone, 1996) and adaptive capacity (Turner et. al., 2000) to describe the ability, skills, and willingness to engage in community social processes. Also, we added the notion of "wisdom" to our analytical framework. Wisdom is an embodied form of grounded knowledge, understanding, experience, discretion and intuition which is brought to bear in practical decision making, as contrasted to "expertise," which represents a single universalized and incontestable form of knowledge. Bardach (1987), Nichols (1996), and Churchill (1997) develop various, similarly applied concepts of wisdom that draw on thinking dating as far back as Aristotle.

Further, we wondered whether or not any discovered differences would parallel with differences in the local situations. Thus, we structured and limited further analyses focus on comments generated by leaders from three regions, selected for the differences in their socioeconomic histories and development trajectories. Specifically, we selected one region that had seen little development over the past 20 years, one in which a large and quickly growing urban centre had emerged, and finally one that had seen tremendous growth in terms of non-resident residential developments ("trophy" summer homes). These three regions offered the broadest variety of situational histories and thus had the best potential to reveal whether or not local capacities develop as a function of situational complexity.

Again, wickedness has several potential attributes, but as a whole these local leaders had disclosed the three categorical concerns: administrative jurisdictions, conflicting information and competing interests groups. Also, if wisdoms are defined as forms of grounded understandings and intuitions brought to bear in practical decision making, we determined to analyze contextualized attributes of wickedness. Specifically, we selected wickedness involving multiple knowledge bases, wickedness involving the inevitability of change, and wickedness involving the pluralism introduced by multiple interest groups. We allowed for synthesized wisdoms to emerge by sorting only comments relevant to three primary contexts of wisdom: wisdoms about the physical world, wisdoms about the future of the local community and wisdoms about collaborative management and administrative duties (see Table 3).

Finally, we assumed that not all comments were especially constructive. Thus, we determined to sort in terms of an apparent positive or negative capacity to accept and deal with the wicked attribute. For instance, with regards to Wisdoms about the Physical World, the following quote was coded as focused on change with positive capacity:

> The river changes courses… As it exists today [it has] is changed significantly… it meanders…it picks its course… I built a cabin on the Yellowstone River bank 60 years ago that is now an island, and this is just from the natural flow of the Yellowstone River… It's a natural thing for the river to do… and it will continue to change.

The above comment is a specific reference to the physical changes that must be accepted when dealing with a free flowing river. We viewed such expressions of positive capacities as "wisdoms," forms of flexible, contextualized knowledge. At this juncture we were able to analyze the comments into nine groupings, with each comment having been rated as positive or negative. All available comments from 40 local officials, representing the three selected regions, were sorted and rated. Each grouping then afforded some broad conclusions.

With regards to wisdoms about the physical world, the findings suggested that, comparatively, the inevitability of changes in the physical world generated fewer comments. Yet, the comments were strikingly in that they suggest these changes are real and essentially undeniable. When the physical world generates conflicting information, one strategy employed by local leaders is to draw on local experiences that ground the discussion in a shared local reality. For example, understandings of flood events may be technically arguable, but the lesson of a boat on the porch of one's home is unforgettable:

> There's disagreement among hydrologists [about] whether that [1918 flood] was the 100-year flood or the 500-year flood. If it was the 100-year flood, we're due for it again. I have a picture of the [1918] owner [of this house] in a boat on the front porch. So that [flood] really pretty much took care of everything in town. Everything was flooded.

Comparisons of wisdoms and negative capacities within Wisdoms about the Community's Future revealed striking differences in terms of understanding the importance of governmental layering and administrative deliberations:

> Bureaucracy is a tool that you can either use to your advantage or a disadvantage. The fellow that [complains] probably doesn't realize the benefit he's getting from these layers of bureaucracy….The general rule, I believe, is that [bureaucracy] serves the purpose for which it was intended—it serves the people.

Wisdoms, here, also included statements that link the inevitabilities of change with growing difficulties associated with accounting for more people and more variety of perspectives:

> It's a real tussle sometimes between property rights and community values and who owns community resources. The river, like it or not, is fundamentally and primarily a community resource with very private sector edges, and that dynamic is not going to go away. The problems there and the conflicts are only going to intensify.

A final example from Wisdoms about the Community's Future shows how some leaders encouraged collective-minded actions without necessarily trampling private

rights:

> We will listen…and advise… We look at hydrology, [to see] if it is…in a hazard area. We have regulations about altering the flood flow or armoring the banks or putting fill in. We look at all these things. The best thing we can tell them is, 'If you get near the river, you will get your feet wet.'

In contrast, negative capacity was identified when the local leader says, in reference to multiple interest groups, "You don't want the troublesome fight." This person seems to lack the energy needed to engage the conversation.

As a whole, the findings suggest that negative capacities and wisdoms fit along continuums of capacities. Regarding negative capacities, some local leaders operate from simplified visions of their situations while others appear to be ideologically opposed to some primary tenant of collaborative government. Regarding wise leaders, at one end of the wisdom continuum are comments that demonstrate a resignation regarding the need to at least recognize particular dimensions of wickedness. They may not yet be dealing with wickedness in highly constructive ways, but at least they recognize dimensions of wickedness in their situations. At the other end of the wisdom continuum are those leaders' whose comments demonstrate engagement, and even sometimes apparent sophistication in their means of constructively engaging conversations about the wickedness found in their localized worlds.

Also, in each of the three regions studied, the majority of comments were catalogued as Wisdoms about Collaborative Management and Administrative Duties. Further, comparisons of the sorted quotes suggested that only in terms of willingness to deal with pluralism do the situational histories of the regions promote advanced capacities on the part of local leaders. With regard to the other refined wisdoms (multiple knowledge bases and inevitability of change) the proportion of negative capacity comments was no higher in the region with the least situational complexity.

CONCLUSIONS AND DISCUSSION

Several conclusions emerge from the preceding analysis. The first is that there is strong evidence to suggest that local officials have a keen sense, both consciously and intuitively, of the wicked complexity of river management along the Yellowstone. In some instances, this sense or awareness is explicitly present in officials' consideration of policy issues and their roles as involved policy conversants. In other cases, this awareness appears to be less conscious and less of a direct factor in explaining how officials positioning themselves with respect to policy issues. Regardless of the extent to which this sense of wickedness is conscious or intuitive, its consistent presence among elected and a merit officials is notable.

Second, these findings indicate that while local officials may voice a desire to have access to good science and to credible information concerning current and possible future physical, social and economic conditions of their communities and the river, their recognition of wickedness appears to be linked to courses of action that avoid dogmatic or abstracted ideological commitments. That is, while officials clearly would not describe themselves as epistemologically antifoundational in their orientation, their comments do not reveal dogmatic commitment to abstracted ideological or policy positions. As is revealed most starkly in table three, conflicts among bodies of knowledge are not the primary concern revealed in these interviews. The findings also provide evidence that place-contingent agents (local leaders) are able to identify and minimize abstract interest-based orientations and that they can function with a great deal of wisdom regarding the wickedness of natural resource management. So while having access to valid scientific research will undoubtedly be important to the discursive processes of making decisions, this finding also highlights the importance of giving sufficient attention to how those discursive processes function effectively.

Those serving in local governing capacities appear to build their capacity to deal with wickedness when a singularity of purpose is derived from a commitment to the local community—the place they live. As such, place becomes a context for the appearance of wisdom. Such wisdom is place-congruent rather than universal. It is embedded in the social, political and economic setting of the locality, and while it may applicable in other similar places, and the wisdoms generated are not *assumed* to be abstractly and universally valid when being considered by local leaders.

In general, the analyses demonstrate that local leaders are embedded in their local situations and that the specifics of their communities are reflected in their wisdoms. From each region, leaders offered statements that indicted awareness of wickedness and a variety of capacities to deal with wickedness. Understanding the presence of wickedness positions civic leaders to more effectively respond to perceived challenges in a positive way. That is, with the recognition of wickedness present among many civic leaders, those leaders will be better able to craft more widely adopted and effective responses.

Interestingly, we did not find indications that situational differences expose a greater willingness to deal with wickedness. However, when considered in total, it does seem reasonable to note that those leaders who are pre-occupied with the complexities of administrative layering and conflicting interest group demands, are the same people who express a great deal of wisdom in terms of managing multiple knowledge bases, change and pluralism. Moreover, when considered in conjunction with other research (e.g. Brewster et. al. 2011; Stivers, 2009), the existence of the exposed wisdom suggests that the necessary preconditions to support engagement in

discursively-based, contextualized and consensus based decision making processes are present among some of these civic leaders.

Viewed in total, we believe that local officials' awareness of wickedness, antifoundational attitudes and situational, or contextual awareness suggests the possibility that these officials are well positioned to engage in and even facilitate discursive and non-linear policy dialogues on river-related issues. Coupled with processes consistent with or even drawing on the notion of wisdom and the phronimos, or wise actor, it may be possible to for these individuals to generate ongoing discourse that supports the development of responses – not purported solutions, because wicked problems are not "solved" in any permanent way - to wicked problems. While this last claim is most speculative, it may be possible that these concepts can combine in practice in such a way that it has the wider effect of creating a new or renewed capacity of communities to democratically respond to not only river management concerns, but a wide range of other community challenges as well.

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Table 1
Dimensions of Wickedness in Yellowstone River Concerns

Dimension of Wickedness	Example
1) **Administration/Administration:** wickedness as a function of overlapping administrative or agency jurisdictions	Highway bridges, managed by the department of transportation, sometimes require stabilization remedies that must be approved by the Corps of Engineers which is charged with eliminating encumbrances to streamflows
2) **Information/Information:** wickedness as a function of competing expert claims	State biologists disagree on what volume of instream flow is necessary to maintain the fisheries
3) **Interest/Interest:** wickedness as a function of multiple interest groups and constituencies demands	River recreationists demand improved fish passages when irrigation diversion dams impede seasonal migrations of endangered species
4) **Administration/Information:** wickedness as a function of interaction between multiple administrative goals, and multiple types and sources of (and potentially contending) information	Flood plain limits must be determined by hydrologists in order to properly implement federal (FEMA) flood plane regulations
5) **Administration/Interests:** wickedness as a function of multiple administrative goals being complicated by multiple interest group demands	Recreational groups demand state authorities impose water restrictions that impact agricultural irrigators
6) **Information/Interest:** wickedness as a function of interest groups presenting competing priorities based on scientific claims	Interest groups commission studies that result in conflicting data
7) **Administration/Information/Interests:** wickedness as a function of overlapping administrative jurisdiction, competing information, and competing constituencies	Privately hired engineers challenge rip-rap specifications as overly restrictive, while environmental groups hire engineers who report the specifications are overly lenient

Table 2
Percentages of Comments Representing Each Dimension of Wickedness

Dimension of Wickedness	% of Comments
1) Admin/Admin	17
2) Information/Information	3
3) Interest/Interest	16
4) Admin/Information	8
5) Admin/Interests	43
6) Information/Interest	5
7) Admin/Information/Interests	9

Table 3
Wisdoms Among Local Leaders

Primary Context of Wisdom	Contextualized Attribute of Wickedness
Wisdoms about the Physical World understandings of the physical world, especially the flood plane	Multiple Knowledge Bases as Means of Understanding the Physical World possession of specific, individualized knowledge(s) about the flood plain, derived from education, experience and/or intuition
	Inevitability of Changes in the Physical World recognition and acceptance of change as an inevitable dynamic when considering the river, the flood plain, and the physical processes that shape the world
	Inevitabilities of Pluralism as More People Concern Themselves with the Physical Aspects of the River recognition and acceptance of multiple legitimate perspectives and demands that impact the physical aspects of the river
Wisdoms about the Good Life and the Community's Future visions of the future that address individual and collective pursuits of the good life	Multiple Knowledge Bases as Means of Understanding the Good Life and the Community's Future
	possession of specific, individualized knowledge(s) about promoting individual and collective well being, derived from education, experience, and/or intuition
	Inevitability of Changes to the Community and Ideas of the Good Life recognition and acceptance of change as an inevitable dynamic when considering individual and collective efforts to secure the good life
	Inevitabilities of Pluralistic Pursuits of the Good Life recognition and acceptance of multiple legitimate perspectives and demands as more people integrate the river's resources into their views of the good life
Wisdoms about Collaborative Management and Administrative Duties understandings of the complexities of collaborative government	Multiple Knowledge Bases as Central Components in Collaborative Efforts possession of specific, individualized knowledge(s) that are brought to bear in collaborative efforts, derived from education, experience, and/or intuition
	Inevitability of Change as a Necessary Component of Collaborative Efforts recognition and acceptance of change as an inevitable dynamic when engaged in collaborative governance activities
	Inevitabilities of Pluralistic Objectives in Collaborative Efforts recognition and acceptance of multiple legitimate management and administrative objectives