2000

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DOUGLAS S. KENNEY, ASSESSING THE EFFECTIVENESS OF WATERSHED INITIATIVES: THE CURRENT STATE OF KNOWLEDGE (Natural Res. Law Ctr., Univ. of Colo. Sch. of Law 2000).

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This investigation was supported by a small grant from the U.S. Environmental Protection Agency

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Abstract

In general, the research community is not currently in a strong position to offer opinions about the effectiveness or "success" of watershed initiatives. Several studies provide lists of "keys to success" which are of some value, but few investigations are academically rigorous, and few directly address the issue of effectiveness. This lack of quality research is likely due to the inherent challenges posed by the subject matter, namely the wealth of contextual factors and interrelationships presented, the relative youth of most efforts, and the complexity of the problems being addressed. A rich "gray literature" (i.e., non-academic work) does exist, but should not be heavily relied upon by policy-makers and resource managers as a basis for making funding and administrative strategy decisions.

INTRODUCTION

One of the most significant trends in the world of natural resources and environmental management is the proliferation of multi-stakeholder, public/private groups voluntarily organizing to collaboratively address management problems at the scale of small watersheds. The exact number of "watershed initiatives" (a.k.a., watershed partnerships, councils, or groups) currently in existence is difficult to ascertain, given that even subtle differences in definitional criteria can dramatically alter estimates. Nearly all researchers agree, however, that the past decade has seen a several-fold increase in the number, and prominence, of these efforts. The Natural Resources Law Center, for example, suggests that the number of these efforts in the West has increased at least three-fold since 1995 (Kenney et al., 2000). As these numbers have increased, so has the literature on watershed initiatives.

The more details we learn about watershed initiatives, however, the stronger we are pulled back to very basic questions. Of particular importance are unanswered questions about success, namely: Are watershed initiatives effective in addressing natural resources and environmental problems? What factors are most associated with success or failure? As it turns out, these questions are extremely difficult to answer for a variety of reasons. Yet, they undoubtedly are the most important questions on the research agenda, as it would certainly be unwise to waste such an outpouring of enthusiasm, effort, and hope on a mirage. While these are not questions the research community can currently answer with any precision, a significant body of thought and data has begun to emerge.

KEYS TO SUCCESS: LESSONS IDENTIFIED IN THE LITERATURE

Rather than attempt to directly answer the question about whether watershed initiatives are successful in general (as compared to other management strategies), most investigations instead focus on trying to identify those attributes that contribute (or impede) success in particular cases. In part, this reflects a common bias among researchers that watershed initiatives are a positive innovation. Accordingly from this perspective, the research challenge is to determine how to make watershed initiatives better, rather than to investigate whether or not they are desirable. This bias gives much of the literature a "lessons learned" orientation, with several studies offering insights about which factors are most key to success.

Recently, Leach et al. (2000) synthesized findings found in 36 studies published in the 1990s that examined those factors thought to be associated with success in watershed partnerships in the United States, Australia, and Canada. This list of studies is believed to be relatively exhaustive, and includes both peer-reviewed studies and many components of the gray literature.[1] The studies are:

[1] To be included in the review, all papers had to meet several criteria, including: focused on diverse stakeholder groups organized to resolve conflict and manage watershed resources; empirical in that they included case studies, survey research, and/or quantitative comparisons; and possessing some analytical

- *Exploring the Watershed Approach: Critical Dimensions of State-Local Partnerships* (Born and Genskow, 1999)

- *An Evaluation of Selected Watershed Councils in the Pacific Northwest and Northern California* (Huntington and Sommarstrom, 1999)

- *Cooperation and Institutional Innovation: The Case of Watershed Partnerships* (Lubell, 1999)

- *Integrated Environmental Management: The Foundations for Successful Practice* (Margerum, 1999)

- *Integrated Environmental Management: Lessons from the Trinity Inlet Management Program* (Margerum, 1999)

- *Bioregional Conflict Resolution: Rebuilding Community in Watershed Planning and Organization* (McGinnis et al., 1999)

- *Stakeholder Involvement and Social Capital: Keys to Watershed Management Success in Alabama* (Mullen and Allison, 1999)

- *The Changing Landscape: Landowner Participation in Collaborative Forums* (Rickenbach, 1999)

- *Linking Public Agencies with Community-Based Watershed Organizations: Lessons from California* (Thomas, 1999)

- *The Challenges of Change for the West Hume Landcare Group* (Woodhill et al., 1999)

- *Citizens Initiated River Basin Planning: The Salmon Watershed Example* (Cantwell and Day, 1998)

- *Monitoring and Evaluation of Selected Rural Watershed Councils in the Continental United States* (Gordon and Jones, 1998)

- *Collaborative Resource Management: Organizational Benefits and Individual Costs* (Manring, 1998)

- *Watershed Management in British Columbia* (Marshall, 1998)

- *Shared Decision Making in Public Land Planning* (Penrose et al., 1998)

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content (i.e., not merely descriptive). Conference papers, Master's theses, and "journalistic sources" (e.g., *Chronicle of Community*) were not considered in this analysis.

- *Is Locally Led Conservation Planning Working?* (Salamon et al., 1998)
- *Conservation Partnerships: Indicators of Success* (Toupal and Johnson, 1997)
- *Managing Public Forests: Understanding the Role of Collaborative Planning* (Carr et al., 1998)
- *Toward Integrated Resource Management: Lessons About the Ecosystem Approach from the Laurentian Great Lakes* (MacKenzie, 1997)
- *Theory and Practice: Applying Participatory Democracy Theory to Public Land Planning* (Moote et al., 1997)
- *Lessons Learned from Collaborative Approaches* (President's Council on Sustainable Development, 1997)
- *Resource Management at the Watershed Level* (Kenney, 1997)
- *Ensuring Sustainability of Natural Resources* (Holland, 1996)
- *What They Told Us: Queensland Integrated Catchment Management in Focus* (McDonald and Shrubsole, 1996)
- *Developing Sustainable Salmon Management in Willapa Bay, Washington* (Nugent et al., 1996)
- *Ecosystem Management in the United States* (Yaffee et al., 1996)
- *Integrated Environmental Management – Strengthening the Conceptualization* (Born and Sonzogni, 1995)
- *Towards More Effective Integrated Watershed Management in Australia* (Hooper, 1995)
- *Integrated Environmental Management: Moving from Theory to Practice* (Margerum and Born, 1995)
- *Community Participation in Landcare Policy in Australia* (Curtis et al., 1994)
- *Coordinating Growth and Environmental Management Through Consensus Building* (Innes et al., 1994)
- *Building Bridges Across Agency Boundaries* (Wondolleck and Yaffee, 1994)

- *Towards More Integrated Management of Watersheds: Some Past Efforts, Present Attempts, and Future Possibilities* (Farrow and Bower, 1993)

- *Success of Citizen Advisory Committees in Consensus-Based Water Resources Planning in the Great Lakes Basin* (Landre and Knuth, 1993)

- *Integrated Catchment Management in Western Australia* (Mitchell and Hollick, 1993)

- *Integrated Catchment Management: The Western Australia Experience* (Wallis and Robinson, 1991)

The 36 studies yield 210 distinct—and not always compatible—keys to success. Many of the most common categories of "keys to success" are listed below:[2]

- Adequate Funding. The most common theme in the studies is the need for funding for a variety of administrative and project purposes, and the desirability of stable and diversified funding sources.

- Appropriate Membership. Many studies emphasize the importance of a diversified and inclusive membership of stakeholders, governmental entities, and individuals with diverse disciplinary expertise.

  However, many other studies stress a need to maintain a manageable number of clearly defined participants.

- Cooperative, Enthusiastic, and Committed Participants. Several keys to success pertain to personal qualities of individuals, including a commitment to work through difficult issues in a cooperative manner.

- Effective Leadership. Many studies emphasize the importance of leadership, often as provided by facilitators and/or coordinators.

- Local or Bottom-Up Initiation, Leadership, or Implementation. Several studies suggest that successful partnerships are those with a bottom-up orientation and that feature a leadership role for local stakeholders.

- Balanced Local, State, and Federal Participation. Many studies emphasize the importance of governmental involvement at many levels, while cautioning about the danger of dominance or disparity among participants.

- Trust. Several studies suggest that trust among participants and in the process itself is an important prerequisite to effective communication and action.

[2] Although similar, these are not the exact terms or descriptions used by Leach et al. (2000). The terms and descriptions are slightly modified herein in the interest of brevity.

- Manageable Level of Conflict. Many studies suggest that it is important for partnerships to feature individuals with relatively similar value and belief structures regarding social, economic and environmental considerations.

  Several other studies, however, suggest that these traits are not essential to successful interaction and problem-solving.

- Proper Geographic Scope. Several studies emphasize the importance of utilizing spatial scales adequate to encompass key physical factors and stakeholders groups.

- Proper Scope of Activities. Several investigations emphasize the desirability of clear and manageable goals, and the importance of prioritization and strategic thinking in establishing activities and objectives.

  However, several studies also stressed the importance of thinking holistically and broadly, and the potential drawbacks of narrow scopes that ignore large, more salient, forces.

- Adequate Time. Given the frequent complexity of the problems of concern, many investigations emphasize the need for a long-term perspective.

- Appropriate Decision Rules and Processes. Many studies stress the importance of processes explicitly designed to facilitate communication, married to clear rules articulating the roles and responsibilities of participants and establishing the mechanisms for making and implementing decisions.

  Other studies, however, emphasize the need to maintain flexibility and informality.

- Consensus Decision-Making. Many studies emphasize the value of consensus-based processes.

  However, other investigations suggest that consensus processes may be poorly suited to directly addressing contentious issues and may encourage lowest common denominator decisions.

- Enforcement Mechanisms. Some studies suggest a need for formal and binding enforcement mechanisms, while others urge a reliance on advisory powers and moral authority.

- Communication and Information Exchange. Several investigations emphasize the importance of freely and regularly sharing information among participants and others. Several studies specifically mention the value of adequate scientific and technical information.

- Training in Collaboration. Several studies suggest that special skills and training are useful in promoting collaborative problem-solving.

- Agency Support. Several investigations suggest that the active involvement in, and support of, watershed partnerships by agency personnel is a key to success. Additionally, several studies find a need for internal agency processes and reward structures to be modified to provide adequate incentives for this participation. In many instances, it is also suggested that these incentives should come, at least in part, from legislative reforms.

- Community Resources and Support. Some studies also emphasize the importance of having adequate resources and support for the partnership within the local community.

A similar (but much less structured) review of the "lessons learned" literature was conducted by the Environmental Protection Agency in 1997, leading to a publication entitled: *Top 10 Watershed Lessons Learned*. The lessons identified are listed below:

1. The Best Plans Have Clear Visions, Goals, and Action Items
2. Good Leaders are Committed and Empower Others
3. Having a Coordinator at the Watershed Level is Desirable
4. Environmental, Economic, and Social Values are Compatible
5. Plans Only Succeed if Implemented
6. Partnerships Equal Power
7. Good Tools Are Available
8. Measure, Communicate, and Account for Progress
9. Education and Involvement Drive Action
10. Build on Small Successes

Another compilation of "keys to success" was recently compiled by the Natural Resources Law Center in *The New Watershed Source Book* (Kenney et al., 2000), based on survey data from participants in 118 western watershed initiatives.[3] The following list features the ten most common responses, by category:

1. The most frequently cited key to success of these watershed initiatives was *collaboration, consensus and/or participation by stakeholders*. Almost 60 percent of all respondents listed this as a key to their success. Clearly, stakeholder collaboration and consensus is viewed as a central defining element of watershed initiatives.

2. The next most commonly listed key to success was *consistent funding and/or paid staff*. Over 25 percent of all respondents listed funding and/or paid staff as essential to success. This response is parallel to other responses in the watershed survey. When asked which institutional barriers impeded their progress, the most frequent response by watershed initiatives was inadequate attention/funding being given to the natural resource problem. In addition, nearly half of the respondents said that their funding was inadequate to meet short term goals.

[3] Note that this publication was too recent to be considered in the review by Leach et al. (2000).

3. Approximately twenty percent of the respondents listed the *education of participants and/or the public* as a key to success. This response corresponds to the high level of attention that most watershed initiatives give to education efforts. Around two-thirds of the surveyed watershed initiatives indicated they were engaged, or planned to be engaged, in some type of educational activity.

4. Nearly 10 percent of the respondents suggested that *coordination of participants/agency efforts* was a key to success. This response is similar to the respondents recognition of inadequate interagency or interjurisdictional coordination as the second most cited institutional barrier to the success of watershed initiatives.

5. Approximately 10 percent of the respondents listed *on-the-ground projects/modifications* as a key to success. This response is lower than expected given that nearly 75 percent of the groups said they were in the process, or planning, on-the-ground remediation projects.

6. Around 7.5 percent of respondents felt that *clearly identifying the problem* was a key to success.

7. Another 7.5 percent of the responses listed *following through on goals* as a key to success.

8. Some 5 percent of the groups listed *leadership* as a key to success. This level of response is lower than expected given the widespread belief by academics that leadership is an essential component of success to these endeavors.

9. Approximately 5 percent listed a *long-range vision or outlook* as a key to success.

10. Another 5 percent listed the *government and/or stakeholder buy-in/investment in the project* as a key to success.

Additional keys to success cited by 3 percent or fewer of the groups included: volunteer help, an immediate problem to address, technical assistance, good media exposure/coverage, enforcement of existing laws, empowerment of group members, customizing planning, flexibility, and finally, population control.

THE ISSUE OF EFFECTIVENESS

The findings from the literature examining “keys to success” and “lessons learned” is clearly valuable, but is somewhat limiting if the real goal is to evaluate the overall effectiveness of watershed initiatives. However, as discussed below, several factors complicate answering this more difficult question.

DEFINING SUCCESS

One reason why it is so difficult for researchers to reach meaningful conclusions about the merits of watershed initiatives is that the definition of success raises complex issues (Kenney, 1999). Of particular concern is the notion that success, in practice, is frequently defined using two different criteria. The first criterion suggests that success can be measured by "organizational and process outcomes" related to group formation, dispute resolution, trust building, and so on. This definition also can rely on "activity measures" such as plan development or public education. Certainly these are achievements of note.

The second definition raises the bar higher, requiring that watershed initiatives be judged according to their success in achieving on-the-ground outcomes. After all, most watershed initiatives are formed to solve tangible on-the-ground problems, such as water quality deficiencies and ecological degradation. Consequently, one way to measure success is through the use of water quality indices, or measures of species health.

At the Natural Resources Law Center, we understand that both definitions have merit and can coexist. However, we agree with those who argue that success must *ultimately* be measured by what happens on the ground, and from the standpoint of agencies (such as EPA) with environmental protection responsibilities, success must be defined in terms of improved environmental indicators.[4] Additionally, we believe that organizational and process outcomes must be shown to be linked to—perhaps even be a prerequisite to—on-the-ground accomplishments in order for organizational and process outcomes to have true validity as a success criterion. With this perspective in mind, we have offered the following—admittedly imperfect—definition of success (adapted from Kenney, 2000:10):

> A watershed initiative is successful if it contributes (or can be reasonably expected to eventually contribute), in whole or in part, to the achievement of on-the-ground natural resource objectives, defined in accordance with prevailing social norms and laws, beyond what would have occurred (or will likely occur) in the absence of the watershed initiative.

This definition is offered with the caveat that on-the-ground success can take several years to achieve, and that some intermediary measures of progress are therefore necessary—albeit difficult to identify. Additionally, this definition primarily emphasizes

[4] It is acknowledged that some watershed initiatives may actually define their roles in terms of "organizational outcomes," such as conflict resolution. To the extent that that is the case, then many of the issues raised in this report can legitimately be dismissed as irrelevant to the resources management community. However, that argument is valid only to the extent that these watershed initiatives do not expect contributions or support (in terms of time, money or implementation authority) from resource management agencies operating under mandates emphasizing resource protection and/or improvement rather than organizational outcomes such as conflict resolution. This report pertains to watershed initiatives that acknowledge resource protection and/or improvement as a major function, and that seek to achieve these goals through partnerships between private stakeholders and agency personnel. The vast majority of efforts studied by the Natural Resources Law Center fit this criterion (*see* Kenney et al., 2000).

the need to demonstrate progress toward a goal, but does not address the difficult questions inherent in deciding exactly what rate of progress is acceptable in a given situation. To the extent that this question is addressed in legal standards, then that becomes the criterion. Such specificity is often not available.

MEASURING SUCCESS

Many of the same factors that make defining success difficult become most problematic in efforts to measure success. Even if it is accepted that on-the-ground improvements are the appropriate lens for truly evaluating success, issues of scale—spatial and temporal—can raise formidable methodological hurdles. For example, documenting the connection between discrete projects and achieving larger system-wide goals can be extremely difficult, as can specifying the relationship between current actions and long-term consequences. Making assessments of this kind requires as least two types of analyses. First, the quality of each discrete project must be assessed in terms of its technical quality; and second, there must be sound theory and data to suggest that the project, or set of projects, is part of a technically sound strategy for achieving the larger system-wide goal(s). A field-level project that is not part of a sound strategy is equally impotent as a good plan that fails to spur any implementing activity.

While considerations of this nature certainly complicate research, they are not insurmountable. This is perhaps best illustrated by Huntington and Sommarstrom (1999) in research conducted for the Pacific Rivers Council and Trout Unlimited.[5] Rather than focus merely on organizational achievements or on project accomplishments, the authors examined both, and more importantly, examined the relationship among the two types of activities. The authors used a diversity of performance measures to evaluate 14 watershed initiatives concerned with ecological restoration in the Pacific Northwest.[6] Each of the watersheds chosen have streams with impaired water quality, and all but one are home to salmon species listed under the Endangered Species Act. The investigation, predictably, yielded mixed results. For example, 13 of the 14 groups studied had implemented on-the-ground environmental restoration projects, with most producing ecological benefits: 52 percent (of projects) were clearly beneficial, and another 36 percent were likely beneficial. Particularly beneficial were activities such as fencing off riparian areas, road treatments, and installation of fish passage systems. However, the authors also identified several problems, concluding that about 10 percent of restoration projects had poor designs and about 67 percent of restoration projects were negatively affected by environmental stressors that the groups could not (or did not) control (e.g., water diversions, upstream land-uses).[7]

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[5] As of February 2000, the report can be viewed online at http://www.pacrivers.org/alerts/watershed.html.

[6] The study focused on eight groups in Oregon, two in Washington, two in Idaho, and two in northern California.

[7] To the extent that some watershed initiatives struggled to achieve their restoration goals, the authors identified three primary impediments. First, the inability to control or significantly influence large-scale processes in the watershed, such as urbanization or timber harvest patterns. Second, many groups, for a variety of reasons, failed to adequately prioritize (spatially) restoration activities. And third, many efforts were limited by a shortage of cooperative landowners. Generally, the performance of the more urban

Another complication in efforts to measure success is the potential problem of self-assessment that permeates through much of the literature. In general, the only readily accessible data regarding watershed initiatives is information that is provided by the members of these efforts through newsletters, web sites, and presentations, or information that is accumulated through surveys completed by these same participants. In either case, the accuracy of the data often cannot be verified by the researcher. This is of concern for two reasons. First, most participants in watershed initiatives volunteer their time to the effort. This dynamic ensures that most participants are people who have a pre-disposition to believe that the effort has a good chance of success. This underlying bias may result in an optimistic assessment of the effort's progress that is not representative of a broader set of viewpoints. Second, most watershed initiatives struggle to compete for grant funds and other sources of financial support. This provides an incentive for the group to emphasize and even exaggerate the positive attributes of the effort, while downplaying the negative. Thus, both factors, in very different ways, result in self-assessments that may be overly positive.

These comments are not offered as a challenge to the honesty or integrity of watershed initiative participants, and are not intended to suggest that data and opinions provided by participants are invalid. Almost without exception, participants in watershed initiatives appear to be very good and capable people, and it would clearly be foolish not to consider the insights of those who actively participate in these efforts. It is difficult to conceive of any practical research strategy that did not rely upon participants for data and insights. Rather, the research challenge is how to balance the insights of that population with other sources of information and analysis.

DATA FROM *THE NEW WATERSHED SOURCE BOOK*

A wealth of statistical information is provided in *The New Watershed Source Book* (Kenney et al., 2000) that speaks to issues of success and effectiveness. This information was generated by two surveys of western watershed initiatives. In the first survey, representatives (one each) from over 100 western watershed initiatives were asked to provide self-assessments of the effectiveness of their efforts as pertaining to "natural resource problems" (e.g., poor water quality, endangered species) and "institutional problems" (e.g., inadequate interagency coordination, ineffective management programs or laws). The results are shown below in Table 1.

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watershed initiatives was best, prompting the authors to conclude that this may be due to their easier access to technical and financial resources than more rural areas. Many watershed initiatives also were hindered by intractable issues, and by inadequate decision-making procedures. Conversely, the initiatives studied generally were highly effective in creating awareness of problems and improving relationships among stakeholders. Achieving greater successes will likely require providing greater technical resources/skills, improved monitoring, more explicit self-evaluation and adaptation, and a greater financial commitment.

TABLE 1. SELF-ASSESSMENT OF EFFECTIVENESS PROVIDED BY REPRESENTATIVES OF WESTERN WATERSHED INITIATIVES*	
HOW SUCCESSFUL DO YOU BELIEVE THE WATERSHED GROUP IS BEING IN ADDRESSING THE NATURAL RESOURCE PROBLEMS IDENTIFIED?	
Very Successful	17 percent (18 of 109)
Moderately Successful	66 percent (72 of 109)
Relatively Unsuccessful	17 percent (18 of 109)
Total Failure	1 percent (1 of 109)
HOW SUCCESSFUL DO YOU BELIEVE THE WATERSHED GROUP IS BEING IN ADDRESSING THE INSTITUTIONAL PROBLEMS IDENTIFIED?	
Very Successful	19 percent (20 of 108)
Moderately Successful	49 percent (53 of 108)
Relatively Unsuccessful	29 percent (31 of 108)
Total Failure	4 percent (4 of 108)
* Adapted from Kenney et al., (2000), *The New Watershed Source Book* (Natural Resources Law Center, University of Colorado). For a more complete discussion of this (and related) data, view chapter 13. (Percentages do not total 100 due to rounding error.)	

The second survey is of 276 individuals associated with 26 watershed initiatives within the state of Oregon.[8] Respondents were asked to respond to a variety of statements regarding their watershed initiative. One statement, shown below in Table 2, directly addressed the issue of effectiveness.

TABLE 2. SELF-ASSESSMENT OF EFFECTIVENESS OF OREGON WATERSHED INITIATIVES*

Statement. *The watershed group with which I am associated is effective.*

RESPONSE	NUMBER OF RESPONSES (n = 276)	PERCENTAGE OF ALL RESPONSES
Strongly Disagree	13	4.7 percent
Disagree	46	16.7 percent
Neutral	77	27.9 percent
Agree	121	43.8 percent
Strongly Agree	19	6.9 percent

This translates to a mean of 3.32 on the following scale:
1 (strongly disagree) 2 (disagree) 3 (neutral) 4 (agree) 5 (strongly agree)
Negative opinion ---------- Positive opinion

* Adapted from Kenney et al. (2000), *The New Watershed Source Book* (Natural Resources Law Center, University of Colorado), page 372. Data compiled by Mike Hart.
(Percentages do not total 100 due to rounding error.)

[8] This data was collected by Michael Hart, and is thus referred to as the "Hart survey" in Kenney et al. (2000). Unlike the Natural Resources Law Center survey which was primarily designed to collect descriptive information, the Hart survey was designed to facilitate formal analysis. Consequently, only the Hart survey practiced random sampling methods and featured a response rate over 70 percent.

As shown below in Table 3, these opinions vary somewhat depending upon the sector with which the participant is affiliated.

TABLE 3. SELF-ASSESSMENT OF EFFECTIVENESS OF OREGON WATERSHED INITIATIVES, BY SECTOR*

Statement. *The watershed group with which I am associated is effective*.

RESPONDENT POPULATION (listed in order of decreasing satisfaction)	MEAN (see scale below)
Local Government Representatives (n = 43)	3.63
Recreation Industry Affiliates (n = 70)	3.51
Watershed Initiative Proponents (n = 244)[b]	3.43
Agricultural Industry Affiliates (n = 95)	3.41
Private Company Representatives (n = 26)	3.38
ALL RESPONDENTS (n = 276)	3.32
State Agency Representatives (n = 29)	3.31
Environmental Movement Affiliates (n = 135)[a]	3.27
Federal Agency Representatives (n = 22)	3.23
Timber Industry Affiliates (n = 62)	3.21
Private Citizens (n = 95)	3.20
Watershed Group Skeptics (n = 11)[b]	3.18
Mining Industry Affiliates (n = 7)	3.00

Means are based on the following scale:
1 (strongly disagree) 2 (disagree) 3 (neutral) 4 (agree) 5 (strongly agree)
Negative opinion ---------- Positive opinion

* Adapted from data provided by Michael Hart in support of *The New Watershed Source Book* (Kenney et al., 2000; Natural Resources Law Center). Note that many individual respondents have multiple affiliations.
a = Environmental movement affiliates are individuals agreeing with the statement: "I consider myself a part of the environmental movement."
b = Proponents and skeptics are individuals disagreeing and agreeing, respectively, to the following statement: "I do not support the concept of watershed groups."

The clear theme emerging from Tables 1 through 3 is that participants in western watershed initiatives generally view their efforts as being moderately successful and effective. Overall, however, this is a tempered enthusiasm. For example in Table 1, the categories of "very successful" and "relatively unsuccessful" both generated an equal level of response, although both lagged far behind the more tempered assessment of "moderately successful." Additionally, in the Hart survey, over 21 percent of respondents disagree or strongly disagree with the assertion that their watershed initiative is effective (Table 2).

TRANSFERABILITY OF FINDINGS

Another issue of concern when trying to evaluate the effectiveness of watershed councils is the degree to which research findings are transferable. Presumably, it is only appropriate to assume that results will be transferable between cases with similar contextual factors. As Michaels and Kenney (2000) have documented in a comparison between watershed management in Massachusetts and Arizona, regions can differ dramatically in terms of context. They identified several potentially salient categories of contextual factors influencing watershed management arrangements[9]:

- Biophysical and anthropogenic factors (e.g., climate, geography, demographics)
- Legal and administrative regimes
- Water uses and issues
- Community governance traditions

Differences in context are also aptly illustrated by research associated with the so-called "Four Corners" project, which compared watershed management strategies in California, Massachusetts, Washington, and Florida (Born and Genskow, 1999).

What these and most similar studies (and interviews) suggest is that certain "keys to success" may be—or are at least thought to be—relatively universal (as listed earlier). However, unique contextual factors are also typically of high importance. Additionally, it is often quite difficult to make credible assumptions about which cases are likely to offer similar contexts. While it may be easy to safely assume that Massachusetts and Arizona—the subjects of the Michaels and Kenney (2000) investigation—offer very different biophysical contexts, many such relationships are not so obvious. For example, there is little intuitive reason to expect state watershed management programs in Massachusetts and Arizona to look more similar than those in Oregon and Idaho, yet that is the case (*see* Michaels and Kenney, 2000; Natural Resources Law Center, 1998). When extremely case-specific factors such as "leadership" are also considered, then the uniqueness of each context is easy to appreciate.

[9] For a somewhat different set of contextual factors, see the work of Pelkey et al. regarding factors that may or may not be associated with partnership formation in California (*see* http://wpp.ucdavis.edu/appam_paper.pdf).

The best way to deal with the issue of transferability of findings is to systematically gather a wealth of standardized contextual information from a high number of case studies, thereby allowing statistically significant analyses. This is extremely difficult for many reasons, as the number of possible variables and relationships ensures that the data set must be of high number and high quality to support significant findings. This is prohibitively expensive and time-consuming for most researchers and research organizations.

One ongoing investigation of this type is the Watershed Partnerships Project, located at the University of California, Davis. The study, led by Professors Paul Sabatier and James Quinn, is using three distinct theoretical frameworks to try to evaluate the extent to which stakeholder negotiation processes actually lead to environmental restoration agreements and implementation. In order to account for a variety of contextual factors, the study is using a sample size of about 60 watershed initiatives in California and Washington. For each case, detailed histories and descriptions are being produced, 3 to 5 interviews are conducted, and surveys are being conducted on as many as 20 to 30 stakeholders per effort. Inferential statistics will be used to evaluate the importance of various factors in contributing to successful outcomes, with preliminary results expected in winter of 2000/2001. This $500,000 project should help answer many questions regarding success and effectiveness, at least in California and Washington.

IDEOLOGICAL CONSIDERATIONS

Finally, it is important to appreciate that even the most sophisticated and rigorous research efforts will never be able to fully bridge the ideological divide that separates watershed initiative proponents and skeptics. Only part of this divide is based on incomplete knowledge of watershed initiative characteristics and outcomes. There is also a set of issues underlying efforts in watershed management that are more normative in nature. For example, some questions surround the "fairness" or "democracy" of these efforts; others focus on the "appropriateness" of the demarcation of public and private roles in watershed initiatives, and of the balance of power between local constituencies versus national interests; still others question the "societal emphasis" being placed on consensus-based (rather than conflict-oriented) decision-making. To a large part, these and related concerns are tied to speculations about eventual outcomes of watershed initiatives, things cannot be measured at the current time. Even more problematic (for researchers) are those concerns that are truly normative in nature, reflecting different value structures and ideologies.

In Table 4 below, arguments of watershed initiative proponents and skeptics are contrasted in order to illustrate some of the existing ideological diversity.[10] Note that a distinction is made between arguments that are "positive" (in presuming to describe an existing situation) and/or "speculative" (describing an expected future situation), and those which are "normative" (describing an appropriate or ideal situation). These

[10] This table is adapted from *Arguing About Consensus* (Kenney, 2000), a publication of the Natural Resources Law Center addressing in detail the arguments for and against collaborative processes.

distinctions are valuable in that they delineate the limits of research, and similarly, show the futility of trying to offer a definitive answer to the questions surrounding watershed initiative success. Presumably, the "positive" arguments can be critically addressed by research; the "speculative" arguments are, as the name implies, subject only to educated guesses; and the "normative" opinions are purely value-based opinions, based on differing notions of fairness or appropriateness. To the extent that all these arguments are central to the debate of watershed initiative success, we must accept that any conclusions regarding the effectiveness of these efforts are bound to be incomplete. This, however, does not diminish the importance of the undertaking.

TABLE 4. SUMMARY OF ARGUMENTS RAISED TO DEFEND AND CHALLENGE THE USE OF WATERSHED INITIATIVES	
ARGUMENTS OF THE PROPONENTS	ARGUMENTS OF THE SKEPTICS
Positive Arguments (i.e., arguments presumably based on facts) and Speculative Arguments (i.e., those based on expected future outcomes).	
Traditional means of management and problem-solving do not work now, and/or will not work in the future. Watershed initiatives offer greater future problem-solving potential.	Existing processes of decision-making and problem-solving, while imperfect, are not fundamentally flawed, and create the context within which collaboration can be attempted.
Even if watershed initiatives are not successful, they are (and will be) no worse than existing mechanisms.	Due to problems of inadequate representation, unequal resources, and the limits of consensus, watershed initiatives may exacerbate unfair concentrations of power and have a coercive affect on minority viewpoints.
Many watershed initiatives have already achieved significant organizational objectives. Some have also already achieved significant on-the-ground results.	Organizational achievements may not lead to on-the-ground results—the only valid measure of effectiveness. Many "success stories" lack empirical proof, and involve implementing obvious solutions to easy problems—not a real test of success.
Consensus processes help to overcome historic animosities, encourage learning and compromise, and facilitate problem-solving in a way that adversarial and highly formalized processes cannot.	A reliance on consensus discredits value differences, ensures that zero-sum problems cannot be addressed, encourages "lowest common denominator" decisions, and provides few due process protections.
Collaborative processes offer advantages in time, money, and "durability" of outcomes.	The costs of participating in collaborative processes are significant, and are usually in addition to—rather than instead of—costs of other traditional processes.
Normative Arguments (i.e., arguments based on personal notions of right and wrong, and based on desired—rather than actual or predicted—conditions).	
Local residents should be more involved in decisions that have local consequences. The role of citizens in decision-making should be enhanced.	The views of distant stakeholders should have equal weight in decisions involving public resources. Public officials should make decisions about public resources.
Collaborative processes are inherently preferable to those based on conflict. Consensus-building activities build cohesive communities more capable of pursuing appropriate social, economic and environmental goals.	Conflict oriented processes—namely litigation—provide a healthy mechanism for expressing, rather than suppressing, divergent opinions. Managed conflict, rather than suppressed conflict, is the real measure of a healthy democracy.

CONCLUSIONS

The research community is not currently in a strong position to offer opinions about the effectiveness or "success" of watershed initiatives. Many factors limit the utility of the research conducted to date. Success remains a difficult concept to define, let alone measure. The relationship between organizational efforts and on-the-ground outcomes is often difficult to precisely describe. Issues of time lag and spatial relationships (e.g., transboundary impacts) complicate assessments of individual efforts. Lack of independent data combined with an embarrassment of self-assessments raise questions about the integrity of the data compiled. Important (yet poorly understood) issues of context limit the transferability of findings. Finally, questions of ideology remain largely unacknowledged.

In part, the failure of the research community to adequately address issues of "effectiveness" and "success" reflects the lack of academic rigor in the literature. Much of what has been written is not the product of formal peer review processes, and relatively few studies feature advanced analytical tools or theory-based frameworks.[11] This apparent lack of academic rigor is likely due to the inherent challenges posed by the subject matter, namely the wealth of contextual factors and interrelationships presented, the relative youth of most efforts, and the complexity of the problems being addressed. Also important, however, is that the reductionist nature of formal scientific research methods runs counter to the integrated and adaptive nature of watershed initiatives and, perhaps more importantly, watershed initiative participants. Participants in watershed initiatives are generally happy to sacrifice academic rigor in the interest of findings which are believed to offer more immediate and pragmatic findings.[12] This is what is offered in the rich body of "gray literature" (i.e., non-scholarly work) that is so characteristic of this field.

When the subject matter is effectiveness and/or success, this reliance on the gray literature is troubling. Presumably, measures of effectiveness and/or success are the basis on which policy-makers and resource managers should make important decisions about funding and administrative strategies. These are important decisions that should be tied to research that is beyond reproach. This is not the strength of the gray literature. That body of literature is better suited—actually very well suited—to describing numerous case studies, and providing an understanding of what the overall "watershed movement" looks like. In that sense the gray literature is very valuable. However, to the extent that the literature extends into issues of analysis, especially with respect to effectiveness and/or success, then the value of the work is limited.

Until the academic community finds a better way to address issues of effectiveness and/or success, policy-makers and resource managers should move forward cautiously.

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[11] For example, of the 36 studies (listed earlier) evaluated by Leach et al. (2000), only 2 utilized inferential statistics.

[12] Not surprisingly, Leach et al.'s (2000:20) assessment of the literature found that "Peer review and increasing rigor in methodology had a dampening effect on the number of lessons learned … "

While it seems wise to continue existing support for, and participation in, watershed initiatives, resource managers should maintain a stance of "guarded optimism" regarding the eventual outcomes of these efforts. Policy-makers and agency personnel should remember that learning through experimentation is a legitimate means of identifying improved institutional arrangements only to the extent that these "experiments" are faithful to the scientific construction of experimentation. That means collecting credible data, testing clearly articulated assumptions, utilizing peer review, and perhaps most fundamentally, basing conclusions on measurable results. The appropriate role of policy-makers is to provide the assistance needed to give these efforts (within acceptable bounds) a chance to succeed or fail, to fund the research necessary to make these observations about success or failure, and then to base future decisions upon that emerging track record.

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