Place-Based Knowledge and Consensus Building:
From Access to Impact

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ABSTRACT

If the holders of local knowledge have sufficient power so that they have to be heard by decision-makers and expert analysts, is that enough for local knowledge to be effectively integrated into decision making? The literature on local knowledge provides few direct answers to this question, in large part because it is rarely addressed directly. This paper provide more direct insights into the question of what lies beyond the point at which holders of local knowledge find themselves with access to and some standing in the halls of mainstream policy-making. It does so by looking at a conflict over agricultural water use efficiency in California. Despite agriculture's significance political influence and other resources for the conflict, the agricultural community claimed that it had place-based knowledge that was not being sufficiently acknowledged and incorporated into decision making. And yet, in one consensus building process, a group of environmental, agricultural, and agency stakeholders were able to craft an agreement that the agricultural community felt did incorporate what they knew. This paper explores this case to provide analyzes the barriers remain to the incorporation of local knowledge into environmental decision making once sufficient power is obtained and provides some insights into how these barriers might be overcome in consensus building processes.

INTRODUCTION

There are several reasons why local knowledge is often not integrated with the scientific knowledge of professional analysts. These challenges are roughly divided into two categories: access and ability. Access questions revolve around power and credibility: what are the actions and conditions necessary to enable professionals to listen to and consider

not only the facts that local community members, but also their questions, analyses, and ideas. Ability questions, as Corburn describes in the quote above, revolve around the problems of communicating across different communities that are different not only in position and training, but also in culture.

While the local knowledge literature speaks about the two problems above, the solutions proposed by the same authors seem to focus on the first question: access. What happens if you take away problems of power and access from the considerations of whether local knowledge is incorporated into policy-making? If local communities can organize their knowledge and themselves to gain a seat at the table, is that enough to get their message heard and to participate fully in the resulting deliberations?

Even more ambitiously, can they have a say on what recommendations are given to analysts and decision-makers about how to proceed? Can consensus building processes, which seek to convene all the stakeholders (or more specifically their representatives), provide the means for better local knowledge integration into decision making? What challenges do these consensus building processes have to overcome to enable this integration?

When looking at the prospect of using consensus building processes to integrate different knowledges, some students of the politics of deliberation have concerns. Power manifests itself in many ways, they say, and communities that are restricted by geography, race, or other partial yet shared feature should be wary of participating in deliberative processes convened (and dominated) by technocrats.

Local knowledge holders often must struggle with many power imbalances that go beyond expertise and available resources, including: the language and the tone and style of deliberation; the setting of which questions and problems will be addressed; the methods and assumptions that will be used to determine facts and answers; and access to resources and training to absorb and analyze new information as it emerges during a deliberation. All of these are sources of power that can favour more established and wealthy professional and government groups (Sanders 1997; Young 2001).

Fischer (2000) and Corburn (2005) propose slightly different models of how local communities can participate more fully in the analysis of and decision making about environmental policies. Fischer argues that participatory inquiry and community-based research can provide one means by which local knowledge can be integrated into decision making. The experts facilitate the community in generating the needed information, which they can then be incorporated into the expert analysis and decision making.

Corburn proposes a slightly different model where the local knowledge holders are more consciously aware of the need to gain power along with consolidating their knowledge. In his model of "street science," communities should start their efforts at influence by consciously organizing coalitions and searching for ways to link their specific concerns and ideas to larger social movements.

Intermediaries play an important role as well, Corburn states. These intermediaries are both entrepreneurs, in terms of spurring action and helping community members to

engage in their own community-based research, and boundary spanners who help the community translate its knowledge to professionals. Furthermore, Corburn suggests that local knowledge holders look for opportunities to take action on their own. Such actions not only help address some of the current or anticipated problems, but also give the community confidence and experience in interacting with the underlying issues.

Of the recommendations above, three directly address the problem of access—getting local knowledge ready for and accepted by professional analysts and decision-makers. Only the use of intermediaries deals directly with the translation problem Corburn himself identifies. Furthermore, Corburn seems to dismiss the possibility that consensus building might provide a forum in which local knowledge could interact directly with scientific knowledge. His main concerns revolve around the issue of power. Beyond the obvious resource and influence inequities, Corburn also notes that language can be a key barrier. Essentially, Corburn worries that the interaction among the community members and the professionals will be done using the technical language of science. By privileging one group's terms and modes of expression, the process increases the already present power imbalance because the lay are not as familiar with the terms and style necessary to follow the conversation and influence the others (Sanders 1997; Young 2001).

And yet, the entire premise of consensus building is to give each stakeholder a voice in the group's recommendations or decisions. Can consensus building processes address the concerns of Corburn and others? More importantly, because local knowledge needs not only access to decision making, but effective means of influencing it, does it deserve another look?

Consider first that if local communities develop knowledge through their own community-based research or internal deliberations, then they have a body of knowledge that is valuable **and** a practiced process of generating more of it when needed. Imagine that the local knowledge holders gain access to policy-making circles, either through the strategic actions that Corburn proposes or the institutionalized means that Fischer seems to favour. Can they still make an impact given that access? What about the problems of translating that knowledge? No matter what forum or avenue they choose to share what they know, the problem of translation may still exist. The boundary spanner is one possible solution that may address this problem[1], but this still leaves the question: in which kind of process would a boundary spanner be more effective, especially once the community is organized enough in terms of knowledge and influence to be given enough credibility (though not necessarily or likely equal) to have some kind of influence and say?

This research will not seek to compare how effective boundary spanners can be across different forums.[2] Instead, it takes a step back from the idea of boundary spanning intermediaries and looks at the prospect of local knowledge holders participating in consensus building processes to ask, "why not consensus building?" Once local knowledge holders have enough power to be heard, if not understood, can consensus building processes address, at least partially, the apparent translation challenges among expert and local community participants? If so, how?

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[1] Indeed many communities do either bring "their experts" as advisors or appoint them as representatives.

[2] Some research has explored the concepts of people who bridge different communities (e.g. Padgett et al. 1993 and Burt 1992).

More specifically, this paper looks at the question of whether local knowledge can indeed play a stronger role in environmental decision making, through the participation of its holders in consensus building processes and the integration of local knowledge with professional knowledge in producing wise decisions. It does so through the eyes of one case of conflict over environmental and water management in California, namely the Agricultural Water Use Efficiency Steering Committee (Steering Committee), which was a deliberative body convened by the CALFED Bay-Delta Program to aid in its conflict-ridden policy making efforts for improving the efficiency of water use by agricultural water users.

Below, the paper continues by first introducing the empirical case that sparked the research, the Agricultural Water Use Efficiency Steering Committee (Steering Committee) of the CALFED Bay-Delta Program. Next, the paper explores the concept of local knowledge, including the characteristics that make its integration with professional knowledge a difficult affair even when its holders gain enough power and credibility to have a seat at the table. In doing so, the paper introduces illustrative examples from the case.

The paper then explores the case more deeply to show how the consensus building group being studied was able to find ways to improve the incorporation of local knowledge into its deliberations, analyses, and eventual decisions. The paper concludes by inferring some new possible ways of understanding how local knowledge and professional knowledge can better integrate what they know, study what they don't know, and make joint recommendations on what ought to be done.

CALFED and the Agricultural Water Use Efficiency Steering Committee

Termed "ground zero for California's legendary water wars" by one observer[3], the Bay-Delta estuary is an important source of water for California. Resting at the confluence of California's two largest rivers – the San Joaquin and Sacramento – it provides drinking water for nearly two-thirds of California's population as well as the irrigation water to grow almost half of the California's fruits and vegetables. The Bay-Delta provides a rich habitat for a diverse range of fish and wildlife while supporting a wide range of economic and recreation interests. Yet it is also a region that is degrading, suffering the consequences of the current lack of clear water policy. When policymakers decided to consult and cooperate with interested members of the public, interest was immediate and intense.

To coordinate their efforts and lay the ground for cooperation, Federal and State agencies created the CALFED Bay-Delta Program (CALFED). Initially, CALFED consisted of the ten state and federal agencies; however, as the program evolved, additional agencies having relevant responsibilities joined the program. Just before it was replaced by the CALFED Bay-Delta Authority in 2003, CALFED was comprised of over 20 agencies.

Although it was understood that CALFED would undertake its activities under the direction of federal and state agencies, it was agreed that CALFED should be its own entity with an executive director and dedicated staff. CALFED's staff were recruited from state and federal agencies, especially from the California Department of Water Resources on whose premises CALFED is housed.

CALFED's Mission

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[3] Sarah Connick (interview).

The original mission for CALFED was essentially to come up with the plan for protecting and restoring the Bay-Delta ecosystem for the next 30 years. This plan was to include long-term strategies for ecosystem restoration, water conservation[4], water storage and conveyance, levee management, and improved operation of the entire system. CALFED's mission was: "1) to restore the ecological health of a fragile and depleted Bay-Delta estuary; 2) improve the water supply reliability of the state's farms and growing cities that draw water from the Delta and its tributaries, including 7 million acres of the world's most productive farmland; 3) protect the drinking water quality of the 22 million Californians who rely on the Delta for their supplies; and 4) protect the Delta levees that ensure its integrity as a conveyance and ecosystem"[5].

CALFED convened a citizen advisory committee called the Bay-Delta Advisory Council (BDAC) to provide advice and to give CALFED a chance to test potential stakeholder support for various proposals. While the initial membership was smaller, BDAC expanded over the years when it became apparent that the CALFED initiatives affected the interests of upstream watershed, tribal, and environmental justice interests. The membership at the time of the Steering Committee included 35 people. Because it was chartered under the Federal Advisory Committee Act (1972), BDAC's ground rules and role were largely pre-determined and it did not have an official say in decision-making[6].

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[4] Water conservation was later changed to water use efficiency. This is important as it means moves away from just reducing water use to a more flexible idea of using water more effectively.
[5] CALFED, 2000. *California's Water Future: A Framework for Action*.
[6] This role is reflected in the meeting structure. BDAC meets once every one to two months and its meetings are announced in advance and open to the general public. The meetings usually start with presentations by CALFED staff on the progress and direction of the program; occasionally outside experts are also invited to provide information. BDAC members then usually **react** to the information in a discussion.

As the program evolved, CALFED realized that they would need additional stakeholder input for several areas of the program, including the Water Use Efficiency Program. To meet this need, CALFED convened five BDAC subcommittees in 1996, including the Water Use Efficiency Work Group (Work Group). The Work Group was chaired by a BDAC member who managed the process together with dedicated CALFED staff.

Unfortunately, the Water Use Efficiency Work Group had to be terminated after nine meetings when it reached an impasse about how to improve agricultural water use efficiency. CALFED knew it could not give up, and so it tried a different approach by forming the Agricultural Water Use Efficiency and Assurances Focus Group (Focus Group). The stakeholders were carefully chosen by CALFED in consultation with the agricultural and environmental constituencies. The two main attributes CALFED looked for in Focus Group candidates was open-mindedness and the ability to influence the member's home constituency.

Unlike its predecessor, the Steering Committee was not convened within BDAC; instead, the Focus Group was charged with directly advising the Program Manager of the Agricultural Water Use Efficiency (AgWUE) Program in his efforts to develop a viable policy. All ideas and recommendations from the Focus Group, and later the Agricultural Water Use Efficiency Steering Committee (Steering Committee), would still be vetted by BDAC, but the deliberations themselves were not subject to the federal and state laws which would have required them to be open to the public. CALFED hoped that by taking the

deliberations out of the spotlight, the Steering Committee members could explore more creative possibilities without fear of immediate censure from their less adventurous peers.

Finally, CALFED also convened an expert joint fact-finding panel called the Independent Review Panel on Agricultural Water Conservation Potential (IRPAWCP) to address disputes among stakeholders about the validity of the science that CALFED was using.

Through the deliberations of the Focus Group and the Independent Review Panel, possible alternatives began to emerge and the possibility of a solution became again more real. At this point, the Focus Group, which was due to disband, instead decided to continue in a new role and under its new guise as the Agricultural Water Use Efficiency Steering Committee. In the end, the Steering Committee remained intact for two years beyond the mandate of the Focus Group and it was able to develop policies that mobilized significant support among key agricultural and environmental stakeholders. Funding for the Program has been much less than agreed upon, and so the Program's implementation remains incomplete. However, the Steering Committee itself remains remarkable. Very few stakeholders at the time believed that any agreement was possible. They certainly did not anticipate seeing agricultural and environmental lobbyists working hand in hand to seek funding for this program. While the effort has not yet reached the finish line, it has gotten much farther than anticipated and shown that different knowledges can be integrated into one Program design.

DATA AND ANALYSIS

This paper relies heavily on a series of over 30 in-depth interviews conducted between 2002 and 2004 with non-government and government stakeholders who participated in one or more of the collaborative processes. Each interview was semi-structured, built around a small set of open-ended questions that probed the main challenges each groups faced, the key breakthroughs each made, and the dynamics that hindered or helped their progress. Many of the stakeholders interviewed had participated in more than one group and were able to provide comparisons among them. The research also made extensive use of archival data, in part to refine interview questions and confirm information arising from the interview.

This paper is not an evaluation of the degree to which place-based knowledge was incorporated into each process. Instead, it accepts the beliefs of the placed-based knowledge holders that their knowledge was better incorporated into the Steering Committee process, and then explores what the Steering Committee did that seemed to enable this integration of place-based and more universal scientific knowledges. In this way, the paper skips the question of whether place-based (and thus local) knowledge should be integrated into official decision making to explore the specific challenges to and opportunities for integrating it with universal knowledge when problems of power and acknowledgement become less important.

Local knowledge—power and place

How can we define local knowledge, and how do we separate the aspects of it that relate to power and those that relate to practice? The definition of local knowledge (also indigenous

knowledge, traditional knowledge, and others) is still contested.[7] Generally, there seem to be two streams of thought regarding local knowledge's possible contributions: (1) local knowledge is data about a place that is important for improving scientific analysis and decision making and (2) local knowledge is a practice that happens in parallel with scientific knowledge-making and the two processes need to be better coupled to produce wiser decisions.

I will not delve into the debate deeply here. Instead, I will build upon the thoughtful work of Jason Corburn who proposes that local knowledge can be best understood as a place-based, practical, practice of knowing and doing (Corburn 2005). I will use examples of knowledge practice differences between the environmental and agricultural communities in the CALFED Bay-Delta Program case. I use these two communities because (a) each had significant influence over policy and (b) each seemed to have particular government agencies that leaned towards them in attitude and approach. California agricultural stakeholders claimed to have important place-based knowledge that needed to be given greater consideration by policy-makers. On the other hand, like Corburn's professional knowledge holders the environmentalists tended to favour universal efficient water management practices and targets for water use efficiency, regardless of the particularities on any particular farm or region. In this sense, the struggle of the apparent local knowledge holders mirrors in large part the struggle described by Corburn, with the exception that the local knowledge holders had significant ability to mobilize resources and knowledge as well as influence decision-makers.

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[7] For example, Fischer (2000) focuses on local knowledge as knowledge about a context.

Let's start with the more well-known aspect, "place-based." Corburn and others argue that local knowledge can not be understood entirely without living in the place under concern. To Clifford Geertz, for example, local knowledge can be captured as "to-know-a-city-is-to-know-its-streets" (Geertz 1983). To streets, other authors like Corburn and Fischer (2000) add various attributes that may be shared by a community, such as language, ways of deliberating, a certain activity, and so on. A combination of these components makes up a place, though a shared place does not need to have all of these characteristics. For example, the "community" that holds local knowledge is not necessarily grounded in a shared physical space. They may, for example, share a set of experiences, problems, and solutions like the HIV/AIDS community in the early years after the condition was discovered. This community worked together to experiment with treatments to AIDS at a time when the mainstream medical community seemed to be ignoring the condition. They shared the same condition, developed protocols for testing cures, and otherwise shared information, ideas, results, and other aspects of what they were learning or doing, even though they lived in separate locations (Corburn 2005).

Putnam (1995) and Corburn propose that using the framework of practices can shed light on how communities know and act. They argue that the concept and examination of practices encourages the creation of unified accounts of knowing and doing. "Practice emphasizes that knowledge, knowledge application, and knowledge creation cannot be separated from action; knowing and doing are intimately related" Corburn (2005). In other words, if professional knowledge holders seek to get and understand local knowledge, they need to look beyond how its local knowledge holders respond to PK questions and incorporate their practice into the professional knowledge holders' practice of analysis.

Local knowledge is not data, it is a way of knowing and doing in which actions inform inquiry and inquiry informs action in ways that accord to the norms of the community.

To understand the attractiveness of looking at knowledge as a practice, consider the field of adaptive management. At the heart of adaptive management is the idea that knowledge is uncertain and that to understand the system in question, one must first act upon it in a deliberate experiment and then evaluate the outcomes (Holling 1978; Lee 1993). The findings are then analyzed to determine how to proceed in the next round of actions. Here, knowing requires doing, and doing is always informed by what we know, however incomplete that is.

Corburn proposed five key questions of place-based practice as a way of distinguishing local knowledge and scientific knowledge: (1) who holds the knowledge, (2) how is it acquired, (3) what makes evidence credible, (4) in what forums is the knowledge tested, and (5) what is the community's attitudes regarding risk in terms of justifying when enough is known to act. These distinctions as captured in Table 1 and described below.

Table 1: Distinguishing knowledge practices (Corburn 2005:51)

Aspects of practice	Local knowledge	Scientific knowledge
Who holds it?	Community members —often identity group/place specific	Members of a profession, university, industry, government agency; sometimes sophisticated NGOs
How is it acquired?	Experience, cultural tradition	Experimental, epidemiological

What makes evidence credible?	Evidence of one's eyes, lived experience; not instrument dependent	Highly instrumentally mediated; statistical significance; legal standard
Forums where it is tested?	Public narratives; community stories; courts; media	Peer review; courts; media
Action orientation	Precautionary/ preventative; consensus over causes not necessary	Scientific consensus over causal factors; further study in face of uncertainty

CALFED's Agricultural Water Use Efficiency Program and most of the preceding policy-making efforts directed at water use efficiency were stalled by deep value differences, disagreements about what knowledge counted and what science was valid, and a surprising divergence in language, interpretation and methods of deliberation among the communities involved. Agricultural stakeholders demanded that their expertise in local agricultural conditions and farming practices, environmental stakeholders argued for universal efficient water management practices based on available and accepted science, and different government agencies were unsuccessful in their individual policy-making efforts, in part because each agency seemed to be affiliated with one stakeholder constituency and its perspective.[8] To understand why I invoke the idea of place-based knowledge here as well as the challenges of divergent knowledge practices, this paper looks at the differences between agricultural and the environmental knowledges as they manifested in CALFED's deliberations. In doing so, this paper largely invokes the perspectives of the agricultural community, largely because it mirrors to a great degree those who struggle with and against the challenges of integrating local knowledge into

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[8] The convening of CALFED not only brought the contending non-government stakeholders together, it also represented an important opportunity for the various government agencies to confront and integrate their own divergent knowledge perspectives on the issues.

policy-making. Furthermore, it should be noted that as an environmentalist and irrigation engineer, I am sympathetic to both views.

In the CALFED Bay-Delta Program and other previous policy-making efforts, agricultural stakeholders often claimed, with little success, that the farming conditions varied in each location around the San Joaquin and Sacramento River watersheds. The climate, soil water conditions, crops grown and other factors affecting water management practices such as irrigation and drainage were different in each location—e.g. in the Sacramento River flooding was a concern while in the San Joaquin River, the problem was more of too little water and managing the potential adverse impacts from irrigating soils. In fact, even within a particular region, local conditions might vary considerably according to the characteristics of the soil—for example, the speed and direction of water flows through the soils of a farm are difficult to identify for any particular farm, let alone a region.[9]

Environment stakeholders did not accept such claims and the initial programs developed by CALFED staff for water conservation were based largely on the model of universal similarity. The initial policy-making efforts of CALFED proceeded without using much of the place-based knowledge that individual groups of farmers might have about managing crops, the land, and water in each of their particular contexts.

But if the stakeholders disagreed about the validity of agriculture's place-based knowledge, did this mean that the knowledge practices were different? And if so, in what ways and how

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[9] This is based on the author's own training in agricultural and irrigation engineering.

did they address them in the later stages of the CALFED Bay-Delta Program to produce a program that took agriculture's place-based knowledge better into account?

In terms of professional knowledge, there are many professionals who claim to have knowledge about agriculture as well as water management, including civil and agricultural engineers, crop scientists, agricultural economists, and many others. In the agricultural communities, however, the holders of relevant knowledge are often the particular working farmers. These farmers inherit knowledge from their predecessors, but they also learn as they try new crops and farming practices to adapt to changing markets and opportunities.

Like many other holders of place-based knowledge, we can see in the following words of an organic farmer that the agricultural stakeholders find it difficult to respect those who have not been in the field. However, there is something more for us to see here as well:

[T]o the farmer audience the urban environmentalists look like they sit behind the computer and try to play God all the time. ...For the farmer, the working landscape is the ultimate. A place where people live and work and make a livelihood and sort of manage and even control that landscape. For the urban environmentalist, the landscape is a place you go play and you want to be all clean and pristine and unharmed, you know. I mean farmers have this great sense of entitlement partly because they are dealing with nature every day. They are actually out there in the elements. [10]

Agricultural stakeholders believe that to know their place, one has to work there. Playing is not enough. [11] Furthermore, when environmentalists do work, it appears to even the most

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[10] Interview with organic farming representative, Fall 2004.
[11] See also White (1995)

friendly farmer that they "sit behind the computer and try to play God all the time." It's not only that they do not live and work in the landscape, but also that they appear not even to be interested in learning. There is a deep sense among the agricultural community that environmentalists do not respect what they do and know, even when the agricultural community has significant influence and resources, and the two parties have been discussing and fighting about water use efficiency for decades.

If an environmentalist is genuinely interested in learning, would that be sufficient for a productive deliberation to take place? Consider the words of this agricultural stakeholder as he describes the interactions among the two constituencies.

> *Their experience and their language for describing [phenomena] were just different. When the farmers talk about green space, [the environmentalists] are thinking about park land. [We said, t]his is not parkland, this is my livelihood. Let me turn* your *job into an amusement park. I've got a financial and emotional investment here. [*emphasis *in interview]* [12]

The answer here seems to be "no." Willingness is not enough, because they do not share the same language and experience. This idea of parkland or green space was one of several words that often proved inflammatory in its use, leading to blowups between the stakeholders because of their divergent interpretations (Fuller 2005). This problem of different interpretations of words is one common in conflicts (Forester 1999; Lewicki et al. 2003; Schön and Rein 1994), and it has persisted in the agricultural-environmental interactions for a long time.

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[12] Interview with agricultural stakeholder, Fall 2004.

If words couldn't bridge the gaps between stakeholders' knowledges, was there another way? Field tours were considered one very important way to get the environmentalists' hands dirty. Listen to another agricultural stakeholder as he describes an attempt to use field trips during the AB3616 Advisory Committee process, a multi-stakeholder dialogue on agricultural water use efficiency that preceded the CALFED Bay-Delta Program.[13]

Agriculture really wanted to have these tours. They felt that if they could just get the environmentalists walking around in the fields, kicking dirt clumps around, getting an understanding of how farms produce what they produce, they would finally understand what they are dealing with. And that was a hold up for a while, because the environmentalists felt like they weren't going to learn anything by walking around and having a farmer whisper in their ear.

Environmentalists have a different thrust to where they are going. They are highly educated, and have a worldview that is different from where the agriculture folks came from.[14]

Environmentalists often seemed uninterested in getting their hands dirty. Furthermore, even when they did visit, they were not convinced by the evidence presented to them. In part, the agricultural stakeholder says, this is because they have a different thrust to how they interact with the environment. Their concern touches not only the working landscape on and around the farm, but also to more distant ecosystems. In tying those dispersed locations together, they rely on more abstract models and equations that do not speak to

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[13] For more information on this process, see Fuller (2005) or the website of the agricultural Water Management Council at http://www.agwatercouncil.org/

[14] Interview with agricultural stakeholder, Fall 2004.

the farmers' way of understanding their landscape. Going to the field may be an action of respect, but it is not by itself a means of sharing and vetting knowledge between the two communities. Both sides have something to tell each other, but they lack the means of exchanging, integrating, and legitimizing knowledge.

Looking at the differences between two communities described above, we see that they cover four of the five aspects of practice identified by Corburn—who holds it; how it is acquired; what makes evidence credible, and in what forums is it tested? Let us look at the fifth aspect, "action orientation." Though the following is not true universally, the differences described were important ones in the discussion.

The environmentalists as a whole, though not always accurately, wanted any action to be measurable and capable of being enforced. This was one of the reasons why they pushed for a more universal approach, since determining whether that approach had been implemented would be easy to measure and the appropriate punishments for not implementing them easy to target. Similarly, environmentalists generally favoured a precautionary approach, meaning that actions that might harm the environment should not be taken until such harm was ruled out by consensus—i.e. definitively. On the other hand, the agricultural community favoured self-reliance and experimentation. Farmers should be allowed to experiment with different crops and water management ideas, though they also had precautionary ideas in terms of the efficient water management practices—do not ask us to use them unless you can show they will lead to a tangible benefit that exceeds the cost.

In summary, we have explored how two different practices of knowledge found it difficult to interact with one another. There were problems of credibility and of communication, where communication revolved around specific words, styles of speaking, and the modes of sharing and testing knowledge (field trips versus studies). Not all of these differences are universal, of course. Agricultural stakeholders mustered science to bolster their claims and environmentalists had their own field knowledge from their visits to specific ecosystems and by driving through the region. However, as a whole the generalizations are good characterizations of the differences, perceived and actual, among the two groups in terms of how they made communication between the different knowledges difficult. They are also strikingly similar to the knowledge-as-practice differences identified by Corburn (2005).

Given the challenge of communication and cooperation, as well as the perceived polarized positions and values of the two communities, it was a surprise to everyone when the Agricultural Water Use Efficiency Steering Committee (Steering Committee) was able to reach a consensus on a recommended program for the Agricultural Water Use Efficiency Program. It is to this process that this paper now turns, to see what the experiences of that group can show us about how place-based knowledge might be better integrated into the analysis conducted by and decision making of governments.

Steering Committee and Place-Based Knowledge: breakthroughs

Before the Focus Group, the initial multi-stakeholder group convened to advise the AgWUE Program Manager, first met, CALFED convened the Independent Review Panel on Agricultural Water Conservation Potential (IRPAWCP). The IRPAWCP was comprised of five experts carefully vetted with the agricultural and environmental communities. Its original task was to evaluate the science that CALFED was using to estimate water conservation potential. Originally, CALFED's plan was that the experts would meet privately to deliberate the issues, and then present their findings to the stakeholders. However, the stakeholders lobbied for a preliminary session in which their representatives and ideas could be heard directly by the experts. CALFED adjusted its plan and convened the Scoping Session.

The Scoping Session was opened to the stakeholders. Stakeholders also nominated eight technical representatives with specific expertise in the Bay-Delta system. These technical representatives provided clarification on specific issues as needed, and could pose questions for and comments on the Panel's consideration. Other stakeholders could also attend this part of the joint fact-finding deliberation. The panel was facilitated by the same facilitators as the Steering Committee.

The main point of contention was on the methodology by which CALFED was estimating the quantity of water that agriculture could reasonably save from implementing efficient water management practices. One important point of contention, for instance, was whether to account for "irrecoverable losses" of water and, if so, what methodology should be employed. [15]

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[15] Irrecoverable losses occur when water flows into locations from which it does not return to the watershed. On the other hand, recoverable losses occur when water flows into a location—e.g. an

Aside from the definition and methodology for estimating water conservation potential, the panellists were also asked to give advice on efficient water management practices. The meeting was managed by the same facilitators who were to aid CALFED with the Steering Committee process and started with the CALFED AgWUE Program Manager presenting the draft list of questions that they wanted the Panel to address in their upcoming deliberations. What followed would lead to a fundamental redefinition of water use efficiency, the Program, and the ability of the Focus Group to cooperate.

Upon hearing the task and questions presented to them, the Panellists suggested that CALFED take an alternative approach in which they set specific ecological goals, identify specific target water-related targets to help them achieve those goals (e.g. a reduction of the salt concentration in water entering a particular ecosystem), and then seek, on a case-by-case basis, ways that upstream agricultural water management might be altered to meet those targets (e.g. different irrigation techniques that either reduce the amount of salt in drainage waters).

The stakeholders liked this reframing. For the environmentalists, it meant that a water conservation program would for the first time focus on specific ecological goals. For the agricultural stakeholders, it provided a framework that (a) provided a direct rationale for why water use efficiency measures were needed; (b) recognized local variation in farming conditions and thus (c) provided leeway for farmers to choose what they believed were appropriate water use efficiency measures to reach the identified target. Students and

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aquifer—from which it can be recovered and used again. Reducing irrecoverable losses increases the total amount of water available while reducing recoverable losses does not.

practitioners alike have found such reframing essential for moving forward on difficult policy conflicts (Lewicki et al. 2003)

However, discovering a possible reframing is only the beginning; the new idea needed to be tested and built upon to construct an acceptable and implementable AgWUE Program. There were several hurdles that still needed to be cleared. First, CALFED and the other stakeholders had little experience putting together such a program and much of the data and the calculations required by such an objective-based program had not yet been created. Second, this reframing and the supporting "architecture" (science, politics, appropriate legislation, etc.) had not yet been vetted by the agricultural and environmental communities nor the various federal and state agencies who needed also to achieve certain mandates and were constrained by the expectations of their employers and peers. Third, in order to achieve this vetting and build support, the Steering Committee and CALFED had to be able to present and talk about their ideas and Program in ways that made sense to the various stakeholders with their different knowledge practices, perspectives, and language. In other words, the products of the Steering Committee not only needed place-based knowledge, it also had to be vetted by the place-based constituencies with their different knowledge practices just as it would be by the other official and non-government stakeholders with their more universal perspectives. It was a daunting task.

To overcome these hurdles, CALFED and the Steering Committee undertook a number of measures and actions to (a) explore ideas creatively and build an innovative AgWUE Program; (b) develop an half-hybrid, half-new knowledge practice at the boundaries between the place-based and more universal knowledges; and (c) find ways of vetting, fine-

tuning, and ultimately generating support for these new ideas and Program using the language and knowledge practices of each and every constituency.

Creating space and the components for creativity

Susskind (1999) and other students of mediation have often stressed the importance of ground rules for consensus building processes. For this process, as we will see, the ground rules were important, especially with regards to how the Steering Committee shared information with their constituencies and the public. Unlike the Bay-Delta Advisory Council and its subcommittees, the Focus Group and Steering Committee were deliberately convened such that they were not governed by the state and federal laws requiring their deliberations to be open to the public.

In interviews, representatives of the various stakeholder constituencies talked about how difficult it was to explore opportunities to improve communication and brainstorm solutions with the other side. Often, people seen reaching out to their "opponents" would be quickly chastised by their peers; others never tried because they suspected the possible these consequences. By making the deliberations private, CALFED created an opportunity for the stakeholder representatives to explore ideas without significantly less fear of immediate censure.

However, the group could not remain out of sight for long periods and still be considered legitimate. The principals of each constituency had to be kept informed of progress, and so the ground rules also allowed for the sharing of draft work products. The choice of "work products" was deliberate in that when scrutiny did occur, it would focus on the product, not

the process. Two advantages of that choice were (a) the work product would not be attributed to any particular member of the committee, and (b) they would be the result of significant previous deliberations, such that creative ideas could be explored and honed before they were subject to the harsh scrutiny of concerned constituents. These work products and other objects were a crucial component for developing a Program that combined the different knowledge practices.

Having a new framing of the problem meant that for the first time, the place-based and universal-inclined stakeholders had a common problem to solve, namely how to use water in ways that promoted the multiple objectives of agriculture and the environment. This challenging of and reframing of a problem is often seen as one of the key contributions that place-based and other non-government stakeholders can make to official policy- and decision-making (Corburn 2005; Fischer 2000).

Interlangauge

However, even if the parties agree to the same words, does it mean anything given their different knowledge practices, which includes both different perspectives and language? The CALFED AgWUE Program Manager gives the first hint of how this was accomplished:

[The facilitators] worked really hard to maintain some of the rules involving **no ownership of ideas***. That really becomes pervasive. Sometimes [the facilitators] synthesize [your idea] with stuff that other people have said, and this new direction starts to emerge. The group gets this feeling that they invented it—and they did, they honestly*

> *did... In some cases we literally invented* **new words, or new buzzwords** *I probably should*
>
> *say.* [16]

The task of deliberating between and creating a Program incorporating different knowledge practices starts at the fundamentals, with the creation of new terms and concepts that can describe what the world looks like, what solutions might be possible, and what targets and vision will guide their joint problem-solving. Some of these new words and concepts were re-defined *for the purposes of the Program* after the Steering Committee participants discovered their multiple interpretations. Others were created from scratch.

In looking at cooperation across multiple scientific disciplines, Galison (1997) noticed that the interacting groups developed what he called an "interlanguage." Interlanguage included not only these modified and new words and concepts, but also a similar set of processes and objects that were created at the boundary among the groups and enabled interaction among the participants. These different elements of an interlanguage existed in this case too.

The formal ground rules developed by the Steering Committee were one instance of a new process of deliberation. The expectation of "no ownership of ideas" is another informal example, setting the stage for a different kind of problem-solving in which parties set aside debates to develop a solution using the new words, concepts, and ideas. Steering Committee members also pointed out to the important role of the facilitators in modeling

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[16] Interview with the AgWUE Program Manager, Fall 2003.

active listening; as time passed, the stakeholders more and more took on that deliberative habit, allowing the facilitators to reduce their role in managing the conversation.

Consider the words of this environmental stakeholder as he discusses another important assistance the facilitators provided:

The facilitators took pains to always make sure that this brainstorming was occurring within the context of, and was captured in, a conceptual framework which made sense and which was understood and approved by the participants. They would make sure that the relationship between the objectives of the programs and the tools …were always represented in a conceptual model. That the relationships between the different types of programs and the different types of funding, … the relationship between the participation of various entities in the Program and the institutional, legal, political implications of that participation …[were] always part of an architecture. That was extremely useful because, very often, groups like these will come up with some good concepts which don't necessarily survive as part of a coherent and congruent whole. (emphasis added)[17]

In this quote, we see both new processes and the use of objects as part of a means of communication. Notably, we see this careful construction of a "coherent and congruent whole," which is a marked change from the acrimonious debates that had dominated most previous meetings. This architecture was not comprised solely of words. Diagrams, flow charts, spreadsheets, political briefings, conceptual maps showing flow paths, and other visible and tangible products of the ongoing creative problem solving process all were pieces used in building the whole the stakeholder above discusses.

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[17] Interview with environmental representative, Fall 2003.

To provide an analogy, give some children Lego and they can often use it to model houses, cars, and many other products they imagine, even if they do not share a common language, culture, or other element of a knowledge practice. Innes and Booher (1999) have observed this piece-by-piece process within other negotiations and called it "bricolage." The objects discovered are "boundary objects," meaning that they enable and structure communication across disciplinary or cultural boundaries (Carlile 2002; Galison 1997). No literature that the author is aware of has tied the idea of bricolage, boundary objects, and interlanguage together with consensus building theory to understand how place-based knowledge might become integral to official problem solving and decision making.

This paper has described how the Steering Committee developed new and hybrid words, boundary objects, new processes of deliberation for science (joint fact-finding) and problem solving. Place-based knowledge as developed from Corburn's definition of local knowledge is both "about a place" and "from a place." Above, we have touched upon some of the ways the Steering Committee seemed to address differences across knowledge practices in the case where one comes from a specific place (in contrast to more universal perspectives) with its own knowledge practice. The Steering Committee's inventions and hybridizations seem to address the problems that emerge when one or more groups come "from a place" and the others practice knowledge from a universal perspective. However, the group as a whole still needed to talk "about a place." To examine this, we return to the "coherent and congruent whole" described by the stakeholder in the previous quote.

Like everything else, this "coherent and congruent whole" is partly new and partly hybrid.

Start with the conceptual architecture mentioned by the stakeholder above. It includes

politics, legal issues, competing and common objectives, tools, and understanding about

the relationships between each element. As the Steering Committee developed their

Program, it also worked with CALFED to develop the scientific framework needed for

calculating the quantifiable objectives and the links between them and upstream proposed

projects. The science was also built piece by piece, with each element joined by a

conceptual model of flow paths (represented by diagrams) and calculations in a

spreadsheet that water supply was being developed in parallel with the conceptual

architecture discussed above. Furthermore, this science was itself a piece, along with

elements mentioned in the quote above, of a larger conception of what the place in

question is and ought to be. With these elements in place, the Steering Committee was

able to integrate place-based knowledge with more universal knowledge by creating a

boundary place that was comprised of both and newly generated elements as well.

Now add to that mix a language for describing it, processes for analyzing and improving it,

and boundary objects that make it tangible and we see that a new knowledge practice—

partial, task specific, fragile, and "from a place"—emerges. And that knowledge is also

"about a place." Place-based knowledge and universal knowledge meet to (a) describe the

local geographies, state and federal politics, site-specific data collection, watershed wide

analyses, and specific farming practices and (b) use these understandings, perspectives,

data, and analyses to construct site-specific solutions based on site-specific farming

conditions and practices that meet specific environmental goals at particular, chosen

locations in order to achieve watershed and state-wide benefits in terms of economy and environment.

The Steering Committee was constructing ideas, solutions, and a Program that were far different from the expectations of any of the stakeholder constituencies. How did the Steering Committee make the ideas, and eventually the Program, acceptable to each and every knowledge practice? We examine this next.

Connecting to Constituencies

The paper has so far focused on new problem definitions and ideas, and about how these were formulated using a new (inter)language based in a jointly created, ad hoc, boundary place. Yet, the Program and its underlying premises had to be vetted by each constituency, both government and non-government. And CALFED and the Steering Committee knew that this was unlikely unless the ideas and products made sense to people in terms of their original languages and knowledge practices. To understand better how the Steering Committee dealt with this challenge, consider the words of this environmental stakeholder talking about a discussion around one of the new ideas.

We had people say, "I cannot say this publicly. I'll say it here but I can't say it publicly. Here's why I can't say it publicly. Now we have to figure out a way around it."

We had developed enough trust to know that they weren't just stonewalling; it really was a fact. ...So then, we thought: "If this is the perception out there, you can't take a frontal assault, and so what are we trying to achieve here? Why is this sensitive? What are the issues that these [stakeholders are] dealing with? Now that we have this, and now

that we know why we're perceiving it this way, now... are there things that we can get

to?[18]

The agricultural stakeholder reveals personal support for an idea, but tells his Steering Committee peers that he can not sell the idea back home. This stakeholder clearly trusts her counterpart, and that leads to her openness to considering carefully how new ideas might provoke certain reactions in one of the constituencies and how the Steering Committee might address those concerns in finding a solution acceptable to all. At times, these concerns were addressed by finding new ways to present the ideas so that they were clear to the constituency in question. They were also addressed by testing different solutions to see which ones might attract broad support.

This dynamic of vetting and refining ideas, with a deep consciousness of refining and communicating the product in the right way was a common theme among the interviews conducted for this research. Each of its member were very active in using email and phone calls, their "hot lines," to get feedback on and ideas for the emerging Program from specific leaders and experts within each constituency. As the Program evolved, the links between the Steering Committee and the constituencies became more and more varied. For example, as the group started working on the specific procedures and calculations for their Program, they convened a group of regional liaisons who provided regional-specific expertise as required. Strikingly, the members of this group were primarily from the agricultural community, a sign of the growing importance placed on, and trust given to, agriculture's place-based knowledge. And for all of these interactions, the Steering

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[18] Interview with Steering Committee member, Summer 2004.

Committee, facilitators, Technical Team, and CALFED staff paid careful attention to the perspectives, languages, and knowledges of the different constituencies and how to present and get feedback from them.

The experience of the Steering Committee tells us that, while the creation of an interlanguage and an ad hoc, bridging place is important, significant effort must also be expended keeping these new shared elements grounded in the ongoing differences in knowledge practices. Work products of the group were tested in terms of their content *and* their validity to the knowledge practices of each community involved, whether the more universal perspectives of the environmentalists and agencies or the place-based perspectives of agriculture. This process was iterative, with the products moving back and forth between different groups (e.g. various state and federal agencies, the Technical Team, the Regional Liaisons, the agricultural and environmental constituencies) until the product was ready, both in terms of content and the style and language of its presentation.

LESSONS: CREATE A PLACE FOR DELIBERATION

This paper shows how the Agricultural Water Use Efficiency Steering Committee and CALFED as a whole provide interesting insights into the challenges and opportunities for place-based knowledge in its efforts to integrate with scientific knowledge once it has gained enough power to be given a well-intentioned place at the table. Using Corburn's model of knowledge practices, it showed some of the sources of difficulty for agriculture as it struggled to get its place-based knowledge incorporated into CALFED's analysis and decision making. These challenges arose not from a lack of power in terms of influence and

resources, but a problem of mismatched places with a series of attached practice differences that made communication and problem solving difficult.

The Steering Committee found a way around these challenges, in large part because it created what looks like an ad hoc, hybrid and new place in which the stakeholders could meld and create the needed knowledge as well as the interlanguage to express and deliberate about it and to use this crafted knowledge to formulate possible solutions. The Steering Committee carefully and persistently tested and modified the knowledge products from this boundary place so that they were recognizable and acceptable to each knowledge practice involved in the process, including both placed-based agriculture as well as the more universal perspectives of many government agencies and the environmental community.

The idea that a deliberative group can create an ad hoc, boundary place suggests an interesting answer to the concerns of those who worry about how a mainstream culture might dominate a process through its technical know how and language. Gaining access is not enough. Place-based communities need to push for and contribute to the creation of boundary places and interlanguages that allow for the integration of knowledges, at least in terms of how they will be applied to a specific problem at hand. This paper suggests that future research needs to explore how the ideas of bricolage, boundary objects, and interlanguage together with consensus building theory might be combined to better understand how place-based and universal knowledges can be integrated effectively.

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