

Building a coalition of concerned stakeholders to guide watershed decisions

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Dam removal, spills, and epic flooding are important events that can energize and galvanize people in a watershed. But in ordinary circumstances, what is the catalyst that brings these individuals together and unifies them in efforts to improve water quality, reduce the impact of flooding, and addresses other issues? Building and sustaining a coalition of concerned and invested stakeholders allow us to be more connected and informed about important issues that affect water quality, recreation opportunities, and other demands on water use. Surface water is used for many purposes that often compete with one another in the regulatory and policy arena. We suggest that the geoscience community is well positioned to play a lead role in bridging the gap between science and policy and in guiding public discourse in watershed issues.

Consider a hypothetical competition over a river in the northeastern United States: On one hand is the requirement for minimum discharge levels and water temperatures to sustain a native trout fishery, and on the other hand there is the direct economic benefit of water-taking to satisfy high water demand industries, such as microchip manufacturing plants. A situation like this may be polarizing, but resolution and equity are likely to be achieved if all sides have a voice in the decision-making process. Without a regional awareness of competing needs and interests, poor decision-making can result in asymmetric rules for taking, using, and managing finite water resources.

Thus, a key to guiding watershed management is to establish a working dialog among stakeholders. There are many examples and attempts at building discourse among various stakeholders within a watershed, and we believe geoscientists can play a pivotal role in facilitating this discourse. Here we highlight the success we have had with the Mohawk Watershed Symposium (MWS) in New York State as an example of how an annual conference focused on watershed issues can level the playing field and provide a forum for competing and complementary interests.

The Mohawk Watershed in east-central New York State is typical of many watersheds in the eastern United States, where a number of different, but not mutually exclusive, interests pull policy and science in more than one direction. Issues surrounding clean water and a healthy ecosystem dovetail with recreation and economic opportunities along the primary river corridor. These interests are complicated by changes in the overall hydrology,

including flood and drought regimes (e.g., Cockburn and Garver, 2015), point-source pollution, and water extraction for use by industry and municipalities.

We have discovered that basin stakeholders are many and diverse, but all derive value in the basic resources a watershed has to offer. However, the concerns of a fly fisherman may have little in common with a microchip manufacturer, except they all rely on the availability of abundant clean water. Likewise, several tiers of municipal, state, and federal government agencies represent the rule-makers and enforcers. In our experience, the small stakeholders, who may be more familiar with local issues, tend to lack the organizational and political clout to affect policy directions in a meaningful and sustainable way. We believe our success is grounded in the guiding principle that informed decisions come out of evidence-based science and open discussions.

In the Mohawk Watershed, relationships have been strained in the wake of several recent floods and water-use issues related to dams. In light of these problems, we recognized the need to bring stakeholders together, and in 2009, we established the MWS. This annual symposium builds momentum and significance by bringing stakeholders together and establishing a dialog between groups working and living in the basin.

The MWS has important and far-reaching successes, in part because our efforts cast the light on an underappreciated asset in New York State. Many of the major successes in the basin grew from dialog and partnerships, and the MWS has been instrumental in facilitating this exchange. Paramount among them is initiating a dialog between stakeholders and allowing for a meaningful exchange of ideas.

This dialog facilitated the New York State Department of Environmental Conservation (NYSDEC) Mohawk Watershed Agenda and the newly released Mohawk Watershed Management plan. In the past two years, appropriations from the state have resulted in Mohawk River Basin Action Agenda Grants that provide funding for projects that enhance: (1) habitats, ecosystems, and water quality; (2) flood hazard risk reduction; (3) community planning and revitalization; and (4) working landscapes, land use, and open space. MWS discussions and priorities fed into the Hudson-Mohawk River Basin Act, which was introduced in the U.S. Congress in 2013 by Congressman Tonko (it was not enacted).

The meeting is hosted in a neutral academic environment, which has served as a pivot point between state and federal government organizations (such as the U.S. Geological Survey, the National Oceanic and Atmospheric Administration, and

NYSDEC), schools and universities, and non-governmental organization interests, primarily those of citizen advocacy groups and municipal entities. Although the meeting explores policy, history, and education, topics center on watershed science such that the community understands hydrology and water quality, and the depth of that science is one key aspect of stakeholder buy-in.

Stakeholder-driven watershed meetings are not a new idea (e.g., Leach et al., 2002; Smutko et al., 2002), but we believe the long-lasting interest and investment achieved through the MWS is noteworthy as it finds its roots in evidence-based science. It is difficult to draw direct comparisons with other watershed groups and meetings because they are many and varied. Other meetings are commonly organized as an education outreach connected to school curriculum and thus miss some audiences (e.g., post-secondary, government scientists, and policymakers). Meetings run by watershed professional societies (e.g., water-resource engineering) may be too specific and fail to engage citizen scientists.

The MWS encourages and facilitates equitable access to watershed research and provides a setting for expressing concerns. The MWS example is important because the investment comes from the full range of stakeholders, and involvement continues to grow. In the seven years of successful meetings, the formula for the symposium has not changed. The annual meeting includes invited and volunteered oral presentations, and a single concurrent poster session that is interwoven with vendors and displays from participating organizations (Fig. 1). The fact that it is annual is important because stakeholders invest time, build relationships, and add to their knowledge of basin issues.

Participants have diverse interests and expertise: they include politicians, policymakers, local, state and federal government employees and representatives, not-for-profit organizations, researchers (from private, government, and academia sectors), students (elementary, high school, undergraduate, and graduate level) and the general public. Attendance continues to grow, with at least 150 to 180 registered participants in the past three years.

One of the successes of the Watershed Symposium is the direct access to information and the translation and transfer of this knowledge to all stakeholders. Translation involves presenting policy and scientific analysis so that the entire community understands and is able to appreciate the significance. For many, MWS

is the primary opportunity to connect with stakeholders in the watershed, and as such, the meeting is integrated into annual outreach programs. Accessibility is maintained with a proceedings volume of extended abstracts produced at each MWS, available to attendees in hard copy and online (<http://minerva.union.edu/garverj/mws/2015/symposium.html>).

Knowledge transfer includes mentoring and fostering interest in the next generation of watershed scientists and their policy-making counterparts. Increasing student participation and leadership within the MWS is an important objective. Groups with student-driven research include undergraduate and graduate students primarily from local colleges and universities and several other post-secondary institutions in the northeastern United States. Students find that this forum is targeted directly to their research efforts, so interaction can be particularly rewarding due to the interest stakeholders have in their findings. We also encourage participation by high school students and science teachers, many of whom are already associated with the Environmental Study Team from the Schoharie River Center.

From the beginning, the MWS was envisioned as an opportunity to facilitate and foster conversations that drive positive change and expand the understanding of physical processes within the watershed. This success is demonstrated in the breadth and depth of participation and the dynamic nature of the annual meeting. Thus, we highlight the value of community engagement to direct the future of scientific and policy directions in a watershed and hope that the MWS represents a useful illustration of how all the time and effort has paid dividends. Although specific to the Mohawk Watershed, the most important success of the MWS is the least tangible because it has resulted in investment by a wide range of individuals. The orphan of New York State watersheds, the annual symposium has given the Mohawk River an identity, and it has given basin advocates a sense of importance that results in ownership of the basin and its issues. As geoscientists, we play a special role in shaping the dialog and in charting the course, because we have a unique perspective that includes the underpinning science and how that science relates to the public discourse and policy decisions.

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Figure 1. Michelle Berube (presently a Kansas State University graduate student) explaining her undergraduate thesis research work to Meghan Haley-Quigley (Union College sustainability coordinator) at the 2015 Mohawk Watershed Symposium. In addition to poster presentations, an important aspect of the symposium is that people have time to talk, interact, and understand the varied issues. Photo by M. Millers.

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