

Knowledge to Action Networks: A Summary
Science/Technology Committee
Oregon Global Warming Commission
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As scientific knowledge of climate change processes and impacts continues to expand, it is more important than ever that this research be incorporated into planning and decision making processes. However, complex institutional and communication barriers continue to thwart this process. One approach has been to develop a network of scientists, managers, policy makers, etc. who collectively and collaboratively engage in the process of linking research to decision making. Such “Knowledge to Action Networks” or “Knowledge-Action Systems” as they are also known serve two functions: (1) facilitating coordination among the different participants and (2) transmitting information, knowledge, and data among members. As documented in a workshop summary for the National Research Council (NRC 2005),¹ there have been a number of case studies in which Knowledge to Action Networks have been successful in delivering key science and technology information to policy makers and other stakeholders in ways that allow all participants to make better decisions.

Scientific information is likely to be useful to decision makers only when the user believes that the information is credible, that it is salient, and that the process is legitimate. Credibility is the extent to which information is perceived as true, or at least worth using instead of competing information. Saliency measures the extent to which the user considers the information to be relevant and timely. Legitimacy reflects users’ perceptions of how the process that generated the information considered their concerns. As it turns out, saliency, credibility, and legitimacy are often enhanced through different, and sometimes conflicting, processes. Raising the credibility of information, for example, does not automatically increase saliency or legitimacy of information. Scientific findings may convince other scientists that information is credible, but may have little influence in the world of organizational and political decision-making where different notions of truth and knowledge may hold sway. Involving only “credible” scientists in developing information can decrease its legitimacy if decision makers believe that their concerns are not incorporated and can decrease its saliency if they find it irrelevant to current problems they face. But increasing the participation of non-scientists to increase legitimacy and saliency tends to undercut perceptions of credibility. By bringing together scientists and decision makers in an ongoing process, Knowledge to Action Networks can result in simultaneous enhancements in credibility, saliency, and legitimacy.

But what makes a successful Knowledge to Action Network? How is the network formed? What is needed to sustain the network? These questions have been addressed and partially answered in the literature and are summarized below.

¹ Cash, D. and J. Buzier. 2005. *Knowledge-Action Systems for Seasonal to Inter-annual Climate Forecasting: Summary of a Workshop. Report to the Roundtable on Science and Technology for Sustainability.* Washington, D.C.: National Research Council/Academy of Sciences.

1. What are key components of a successful Knowledge to Action Network?

A successful approach brings together scientists, managers, and decision makers at all stages of the process to define the scope and nature of the problem, the credibility requirements, the type and timing of information that is required, and ultimately, an assessment of the results and “lessons learned.” An effective system starts by using a collaborative but user-driven approach to defining the problem. It also includes all participants in an end-to-end system such that scientists start by going into the field and talking policymakers, environmental managers, business people, and individuals. Talking with such “information users” allows scientists to better understand what information is needed and the form results should take so that they can use the information directly. “Boundary organizations” can serve as an intermediary link between the academic and management communities. They can provide effective leadership and a trusted venue for translating and transmitting information between scientists and decision makers (in both directions). An approach that encourages flexibility, innovation, and responsiveness will be far more successful than one that rigidly adheres to static knowledge. However, stability and long-term commitment are also important.

2. How is a Knowledge to Action Network Formed?

There is more than one way for a Knowledge to Action Network to form. In some cases, the emergence of a critical problem (endangered salmon, natural disaster) brings together relevant actors from various academic, management, decision-making, and other communities. In other cases, the networks evolve from existing partnerships and expanding collaborations. They can also entail more intentional development of boundary organizations. The Climate Impacts Group (CIG) at the University of Washington is a good example of a boundary organization that promotes and facilitates links between climate research and stakeholders. With multi-year funding from NOAA through the Regional Integrated Sciences and Assessment (RISA) program, CIG works directly with stakeholders to identify needs for seasonal climate forecasts and predictions of climate impacts which are addressed through scientific research in several sectors: water resources, forest ecosystems, aquatic ecosystems, and coastal zones. They have recently added two new sectors: human health and agriculture as part of a statewide assessment of climate impacts for Washington.

3. What is needed to sustain a network?

A successful network has a high degree of collaboration combined with focus, flexibility, and stability. What is needed is to convene a group of committed individuals – legislators, agency personnel, scholars, and members of the attentive public – who are willing to engage in the work of a network. A committee appointed and tasked by the Governor, for example, can provide the legitimacy and urgency needed for a network start-up.

However, funding has also been found to be critical to long-term success. While there is a perennial need for resources for scientific research at the national, regional and local level, with knowledge-to-action networks funding is required to help implement and use network-generated knowledge in both traditional and innovative venues.

In the long term, a sustained effort will require engaging the right people “who can work across disciplines, issue areas, and the knowledge-action interface” (NRC workshop report and also see Mitchell et al., 2006)². Developing this base of people requires concerted effort by individuals and institutions to create educational systems promoting interdisciplinary user-driven education at the undergraduate, graduate and post-graduate levels. We also need to identify and create career incentives for researchers to become more engaged in user-driven science. And, there must be more recognition of the success of systems that link decision making and science by maintaining a strong presence in the scientific, educational, and decision-making realms through publications, web sites, courses, seminars, etc.

Recommendations

1. The Governor and legislature should establish and support a Knowledge to Action Network that brings information producers and users together on a regular and sustained basis (e.g., three times per year) to address important climate change questions in Oregon. The Oregon Climate Change Research Institute (OCCRI) could act as the liaison with Oregon’s research community. The first project for the Knowledge to Action Network should be the design and implementation of a state-wide climate assessment, most likely in partnership with the Climate Impacts Group at the University of Washington as they have access to critical regional climate information and experience that could facilitate the conduct of a state-wide assessment.
2. The Oregon Global Warming Commission should co-sponsor with the Institute for Natural Resources (INR) a statewide workshop with potential climate information producers and users. The winter 2009 workshop could (1) identify potential participants to involve in a Knowledge to Action Network; (2) characterize the variety of questions to be considered and what information is currently available; and (3) draft an action plan for addressing questions. Completing this exercise before the arrival of the Director of the OCCRI will maintain the momentum of the Commission and the Scientific Advisory Committee while laying the groundwork for the long-term process of creating a Knowledge to Action Network that can work to produce usable climate science.

² Mitchell, R., W. Clark, D. Cash, N. Dickson, Eds. 2006. *Global Environmental Assessments: Information and Influence*. Cambridge, MA: MIT Press.