5. Coordinating Approaches to HAB Problems

HARRNESS highlights the importance of effective coordination among scientists, resource managers, public health and social service agencies, legislatures, affected communities, concerned citizens and other partners that play an integral role in reducing and responding to impacts from HABs in the US (e.g., HARRNESS, page 1). This section discusses the need for research in an area of social science called "Institutional Analysis" to optimize the effectiveness and economic efficiency of coordinated approaches.

Research Need: Analyze, and develop strategies to promote, the effectiveness and efficiency of coordinated governance, institutional, and socio-political processes in reducing and responding to the impacts of HABs.

Lead Author: Tom Leschine (Email: tml@u.washington.edu)

Institutional analysis (IA) refers broadly to research addressing the roles of governance, institutions, and processes (organizational, management, and political) in relation to HABs. Institutions and processes may either facilitate or hinder responses to HABs. For example, state human health and shellfish management programs may work well together or differences in regulatory standards or approaches across jurisdictional boundaries (e.g., federal and state) may hinder effective management.

The benefits of IA are well stated in a 2001 report of GESAMP (the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection, an international scientific consultative body organized to assist the UN, UNEP, FAO, and a number of other international environmental organizations), in a major assessment of needs for controlling land-based source pollution worldwide (GESAMP 2001):

> "IA provides a systematic way of obtaining an understanding of the nature, strengths and weaknesses of institutions within the context in which they are operating or which it is proposed they may operate in the future. It is therefore a key element in moving away from sectoral-based management of natural resources to a holistic approach that is likely to require modifications in the role of different institutions."

Following Elinor Ostrom (1990), institutions are viewed from a broad perspective understood to consist simply of groups of actors governed by agreed rules and norms. Institutions can be informal or informal, with formal organizations such as government agencies a special case. Similarly, governance is understood to be the larger system of actors and organizations engaged in a policy arena in which formal governmental arrangements are operating to address a particular problem or opportunity. Government is at the core of governance. The organizational, managerial, political and other processes affected by HABs outbreaks or engaged in proactive response to the threat of HABs are similarly broadly construed.

From the perspective of institutional analysis, HABs natural science research can be viewed as the product of a specialized set of scientific institutions and actors, and its role in the HABs arena can be examined just as the roles of other institutional or organizational entities can be (Leschine et al. 2003). An important role for institutions that incorporate scientific research is support for communications between researchers and users of research findings (managers and other interested and affected parties). Effective institutions facilitate potential users of research results helping frame the questions that researchers examine as well as researchers informing users of relevant results (Judd et al. 2005). This process of framing and informing was referred to as "analytic-deliberative" in an influential report of the National Research Council on the management of environmental risks (1996).

The connections that any actors or institutions have to the HABs problem can be either direct or indirect. For example, public health agencies may be directly engaged in determinations of whether beaches should be open or closed to shellfishing, while restaurants and motels far from shorelines, perhaps organized through local chambers of commerce whose primary purpose is to maximize local economic opportunity, may be indirectly affected by the decisions these institutions make. Even where the primary social problem in the face of a HABs outbreak may be seen to be one of individual behavioral choice – for example, the willingness of individuals to volunteer cooperation with closures or other mitigating measures – institutions may lie at the core of the problem, particularly if institutional barriers or lack of institutional trust hinder behavioral change.

Institutional studies can take a great variety of forms. One thread long-prominent in organizational and management studies is that of the "collective choice" problem. Simply put, a fundamental question is whether the conditions that prevail in a problem arena conducive to the emergence or sustenance of institutional arrangements can effectively manage "commons" problems over long periods of time (Ostrom 1990, Dietz et al. 2003). Ostrom's institutional analysis and development (IAD) framework directs researchers to focus on the key arenas in which actors engage over a particular problem, the strategies they undertake to keep transaction and other costs low in comparison to perceived benefits of interaction, the quality of the policy outcomes they achieve, and their institutional performance in crafting and putting into place policies and the institutional mechanisms that support them (Imperial 1999). At a more immediate level, researchers such as Eugene Bardach (1998) have developed understanding of conditions under which governmental interagency collaboration in a particular problem-solving arena can be expected to be effective.

The effectiveness of institutions at developing the capacity necessary to reach out to public and other stakeholders, engage in bargaining with other institutions, develop conflict resolution measures, and "create, collect and disseminate scientific knowledge" (Haas, Keohane, and Levy 1993) are additional potentially productive avenues for institutional analysis in relation to HABs. The role of scientific and technical information in environmental problem solving is another thread that has received attention in institutional studies, going back to pioneering work of Dorothy Nelkin on nuclear power, the supersonic transport airplane (SST), and other controversies of the 1960s and 1970s. The emphasis in such studies is often on whether the scientific information brought into a policy arena has sufficient impact to induce the organizational learning necessary for policy change to occur (Sabatier and Jenkins-Smith 1993), or whether shared beliefs about scientific and technical aspects of a problem are sufficiently strong and wide-spread to induce the emergence of a "culture of science" that contributes to problem identification and problem solving within a decision making organization (i.e., understood by Haas and colleagues (1993) as an "epistemic community").

Research Objectives

An overarching objective for IA in the context of HABs could be stated as determining how governance, institutions and socio-political processes help or hinder effective and efficient resource management in relation to HABs.

1. *Examine institutional arrangements to determine the degree to which approaches to HABs management are integrated or fragmented.* Fragmented management raises transaction costs on participants and may lead to ineffective or inefficient overall management.

2. *Examine collection and dissemination of HABs-relevant information by institutions for evidence of improved effectiveness and efficiency of management.* A "value of information" question that focuses on the role of institutions in fostering and utilizing information collection and dissemination. Effective use of information should result in more flexible and adaptive management.

3. *Examine the role of institutions in enhancing or eroding resilience in coupled human- natural-world systems affected by HABs.* Coupled human- nature- systems are resilient if both systems are able to adjust to "shocks" to either one. Does management succeed in limiting damage to recreation and tourism-dependent economies

while still maintaining protectiveness for human health?

4. *Examine the robustness of institutional arrangements from the perspective of IAD, asking whether incentives structures and other important institutional aspects to effective HABs management are robust, functioning and sustainable through time.*

Example Project

Leschine and his associate Meg Chadsey are using the IAD framework to examine interactions between researchers and managers in what has proved to be a successful effort to enhance the efficiency of Washington State's management of recreational shellfish harvests in relation to domoic acid contamination that has severely disrupted an economically, recreationally, and culturally important razor clam fishery (Leschine and Chadsey, in prep).