

# Water Diplomacy @ Tufts

<http://waterdiplomacy.tufts.edu>

## **Water Diplomacy IGERT @ Tufts:**

### **Resolving Complex Water Problems in an Interconnected World**

In our highly interconnected and globalized world, water is an integral part of any discussion on energy, agriculture, public health, transportation, environment and the future. In the 20th century, we solved our water problems with reservoirs, dams, and treatment facilities. Today, we have found that these responses often did not balance the value-laden needs of individuals and communities with those of industry and agriculture while protecting our natural resources. We have discovered that many of our intended solutions are not sustainable, especially considering global population growth, consumption ethic, and changing global climate. We must find ways to resolve water problems, account for legacy effects from past allocation and infrastructure development decisions, and meet demands for industrial and economic growth while ensuring a more sustainable future.

More effective resolutions to our increasingly complex water problems demand integration of scientific knowledge of water in both natural and human ecosystems with the politics of real-world problem solving. Water professionals struggle to translate solutions that emerge from science and technology into the messy context of the real world. We need to find effective ways to bridge this divide between theory and practice and resolve complex water management problems - where natural, societal, and political elements cross multiple boundaries and interact in unpredictable ways. Our Water Diplomacy IGERT is a step in that direction.

**What is Water Diplomacy?** *a theory and practice of implementing adaptive water management for complex water issues.* The Water Diplomacy approach diagnoses water problems, identifies intervention points, and proposes sustainable solutions that are sensitive to diverse viewpoints and values, ambiguity and uncertainty as well as changing and competing needs.

**Why do we need Water Diplomacy?** *Increasingly complex water problems require negotiated solutions. Water Diplomacy teaches the skills to transform a fixed quantity of water into a flexible and sustainably shared resource.* Water issues create contentious arguments over its availability, access and allocation for human needs, agricultural use, industrial development and ecosystem services. Water Diplomacy shifts the discussion from “allocation of water” to “benefit from water resources” to open up new avenues for resolving water conflicts.

**What are the guiding ideas, assumptions, and principles related to Water Diplomacy?** It appears that simply connecting experts, creating more scientific knowledge, developing models and sharing data are not enough to effectively manage 21<sup>st</sup> century water problems. These problems require water professionals and decision makers to find intervention points where framing of water issues and envisioning of a different water future can be imagined, planned, and executed.

The Water Diplomacy Framework (WDF) explicitly recognizes water is not an innate object but a shared resource with conflicting needs. Consequently, WDF argues that resolution of wicked water resource problems requires more than scientific and technological analysis and solutions: reflective and inclusive decision making processes are required to obtain sustainable resolutions. The WDF underscores that decisions are process and context sensitive. Whether a particular decision is appropriate or not depends not only on the scientific analyses and technological innovations underlying the decisions, but also on the processes used to derive those decisions. It suggests that explicit attention needs to be given to such issues as: who is involved in making the decisions, what goals are to be achieved, whose values do these goals reflect, who will benefit, whose interests may not be met, and who will pay for achievement of these goals.

The WDF starts with the hypothesis that some decision making processes will produce more durable and effective long-term resolutions than others. For example, there is growing evidence that negotiated agreements using mutual-gains and non-zero sum approaches and involving a broad array of stakeholders may produce decisions that are enduring and are more likely to be implemented.

Our approach transforms competing needs of water resources into value-creation opportunities by blending science, policy, and politics in innovative and contextually relevant ways. We focus on activities that are pragmatic and actionable to (a) identify and characterize a water problem; (b) seek politically feasible and socially acceptable intervention points; and (c) implement technologically appropriate and contextually relevant decision making processes leading to more sustainable solutions with measurable outcomes. Water Diplomacy incorporates ideas from complexity theory, systems analysis, and cooperative approaches providing the framework to understand and manage water issues as a network of interactions and relationships. The WDF is based on following key ideas, assumptions, and principles:

- Conflicts over water resources occur when natural, societal, and political processes and variables interact to create complex and competing water demands.
- Water-related problems are complex not only because they involve various stakeholders (e.g., farmers, industrial users, urban developers, environmental activists) who are competing for a limited resource, but also because water problems cross multiple boundaries (e.g., natural, societal, political, etc.), scales (spatial, temporal, jurisdictional, institutional, etc) and levels (local, regional, global, etc.) that are too difficult to incorporate into a traditional modeling approach.
- Water problems, when viewed from a network perspective, is a flexible resource, where fixed quantities can be expanded through appropriate application of technology, management, and policy interventions;
- Water networks are open and continuously changing. Uncertainty, variability and ambiguity are integral part of these networks and must be acknowledged and discussed for all problem framing and formulation.
- Characterization and management of complex water networks – where natural, societal, and political variables and processes are coupled – emphasize several key ideas: (a) we focus on water problems arising from competing needs and demands that cross boundaries; (b) we use methodological approaches that blend knowledge from natural and societal domains including water science, environmental and ecological economics, water resources planning and systems analysis, and decision making processes and methods;
- Resolution of water problems with conflicting demands will require cooperative approaches designed to achieve mutual-gains outcomes through joint fact finding, collaborative monitoring and contextual problem solving skills.

**How are we planning to prepare the next generation of Water Diplomats?** We expect students from our IGERT Water Diplomacy program to develop a broader understanding of these key ideas, assumptions, and principles through their

- Individualized curriculum,
- Colloquium designed to explore problems, tools, solutions, and methods in a group setting,
- PhD qualifying examination proposal,
- Internship experience, and
- Joint advising on PhD dissertation topic by both natural and societal domain faculty.

Successful student work in this program requires a deeper level of understanding and creation of new actionable knowledge for a water problem. Additionally, the Water Diplomacy IGERT program is actively engaged in adaptive learning to continuously improve how we teach, communicate, and collaborate in this evolving interdisciplinary program.