Protecting water resources calls for international efforts
AAAS symposium sheds light on potential disasters—and remedies

By Anne Q. Hoy

The Mekong River courses over some 2700 miles of dramatically changing terrain, traverses six Southeast Asian countries from China’s Tibetan Plateau to the South China Sea, supports one of the planet’s most productive inland fisheries, and continues to reshape a region it has defined for thousands of years.

So powerful is the discharge from the swollen Mekong during the June to October rainy season that it forces the Tonle Sap River in central Cambodia to reverse course, stretching the boundaries of the upstream Tonle Sap Lake, depositing Mekong-rich sediment, and submerging surrounding forests to establish a rich breeding ground for fish. Just south of the ancient Angkor temples, this water basin produces a diverse variety of fish, employs some 2 million people, and accounts for up to 75% of the animal protein and a large percentage of the nutrients Cambodians consume, said Michael Cooperman, director of Conservation International’s freshwater fish and fisheries program.

Yet, expanding populations, improving living standards, and increasing hydropower construction—coupled with inefficient irrigation practices and strained resource governance—threaten to set off cascading effects. Such effects include the flight of rural residents to cities, overfishing by those who remain, and land clearing for agricultural purposes as the Tonle Sap River shrinks—outcomes that threaten to destroy this “complex human-natural ecosystem,” Cooperman added.

The Mekong Delta was one of many vulnerable water systems highlighted during a full-day symposium entitled “Water Diplomacy: Can Global Cooperation Safeguard our Most Fundamental Resource?”, hosted by AAAS at its Washington, D.C., headquarters on 12 May.

The symposium was organized by scientists who are current and former participants in the AAAS Science & Technology Policy Fellowships program and members of the Science Diplomacy Affinity Group, one of 24 organizations that bring together such AAAS fellows eager to leverage science to help build cooperation between and among governments and nongovernmental groups, and contribute to resolving world challenges. In general, the goal of the AAAS Science & Technology Policy Fellowships is to forge relationships between the worlds of science and policy by presenting scientists and engineers with an opportunity to work alongside congressional staff or participate in policy-making in federal agencies—inventing fellows to apply their scientific knowledge to policy concerns, while also giving them an eye into the policy-making process. The Science Diplomacy Affinity Group looks specifically at applying science to collaborate on important issues across borders.

“These scientific connections can sometimes be the key to solving problems intractable through official channels,” said Joel Creswell, co-

The Mekong Delta offers an example of a vulnerable water system requiring cross-boundary collaboration.
The “Water Diplomacy” symposium explored the increasing stresses facing freshwater and ocean systems. Instrumental to human health, food, energy, economic stability, national security, and recreational pleasures, water resources are increasingly strained by industrialization in emerging economies, poor resource management, and scarcity driven by climate change, presenters said. Multiple examples cited during the symposium pointed to common missteps and outlined remedies. Central Asia’s shrinking Aral Sea, for instance, was offered as a case study. The world’s third-largest lake lost three-quarters of its water volume through outdated water-sharing agreements, competing stakeholder objectives, and a near absence of local input, said Katherine Himes, an adjunct professor at Evergreen State College. Syria’s aggressive groundwater tapping for agricultural projects in 1971 increased after successive droughts and became a contributing factor to the Syrian uprising in 2011, said Sherri Goodman, a senior fellow at the Woodrow Wilson International Center for Scholars.

Increasingly, water resources are incorporated into global threat assessments, noted Goodman. The U.S. intelligence community’s most recent risk report released on 11 May predicted some regions will see “heightened tensions over shared water resources” and singled out the festering dispute between Egypt and Ethiopia over the construction of the Grand Ethiopian Renaissance Dam on the Nile as “likely to intensify” as Ethiopia plans to begin filling the reservoir in 2017. Of the five areas of highest risk to global economic stability and security over the next decade, “water crises” topped the list and three of the other four dangers were closely linked to water, said Goodman, citing the World Economic Forum’s 2016 assessment. Minimal human water needs include clean drinking water and water for sanitation, bathing, and cooking. Yet in 2015, 32% of the world’s population used inadequate sanitation facilities, while diarrheal diseases often linked to contaminated water continued to kill more than 1400 children a day, a UNICEF and World Health Organization report said.

The U.S.-Canada Boundary Waters Treaty of 1909 was presented as a model of water resource management. The treaty continues to serve as an enduring framework designed to avert and resolve disputes over water quantity, quality, and governance along the 5525-mile border.

Charles Lawson, the secretary of the U.S. section of the International Joint Commission, the governing body that helps local governments monitor and enforce the treaty’s provisions, said the agreement has withstood the test of time because it is simple yet comprehensive. The treaty requires agreements to be reached by consensus before any project obstructing or diverting boundary waters can move forward. It sets similar terms for projects that raise water levels on one side of the border. The treaty bars actions by either party that would pollute shared water resources, or injure or damage the health or property on either side of the border. Beyond the consensus requirement, the International Joint Commission has defined authorities, requires equal representation of U.S. and Canadian officials, and mandates that findings be based on science, Lawson said.

The United Nations, aid organizations, nongovernmental groups, and nations across the world recognize the need for multi-agency cooperation to craft solutions, several speakers said. Aaron Salzberg, the U.S. State Department’s special coordinator for water resources, said the good news is that most countries now view cooperation as essential. “They know to meet future needs we’re going to need to work across the sectors, across borders,” he said, “that cooperation opens up new opportunities for growth and economic development and reduces collective risks.”

Screeners needed for journalism awards
Scientists from the U.S. and abroad who will be in the Washington, D.C., area between late August and late September are needed to review the scientific accuracy of entries in the prestigious AAAS Kavli Science Journalism Awards competition. If you can volunteer, please contact Nkongho Beteck (nbeteck@aaas.org) for screening dates and categories.
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