

CLIMATE CHANGE**ADAPTATION**

In May, a team of engineers, architects, sociologists, legal experts and university administrators and professors visited the Netherlands to explore Dutch expertise in water infrastructure and management as it relates to sea-level rise adaptation and resilience. As a part of Florida Earth Foundation's U.S.-Netherlands Connection Project, this team of professionals from the U.S. not only saw examples of Dutch ingenuity, but also had opportunities to engage with those engineers, scientists and administrators leading Dutch efforts. This article incorporates input from team members.

U.S. Can Learn Valuable Lessons From Dutch Expertise on Sea-Level Rise



BY STAN BRONSON

Introduction

Water connects the human experience, but a special connection exists between Florida and the Dutch. With common duties to manage floodwaters along exposed coastlines, and dense agricultural and urban environments threatened by the risks of sea level rise, water managers from the U.S. and the Netherlands can learn from one another. So, while the

Florida government shrinks in a difficult budgetary climate, a West Palm Beach-based nonprofit organization has developed relationships with the Dutch Consulate in Miami, along with the Dutch Embassy in Washington, and seized an opportunity.

In two weeks in May, the Florida Earth Foundation led 20 U.S. water resources professionals, and then another 27 law students, on a journey throughout the Netherlands, a country with nearly 50 percent of its land mass below sea level. The capacity and ingenuity of Dutch engineering, from past to present, emerged as a central theme of the trip. A walk along the dikes and

levees of Kinderdijk offered postcard-perfect moments at the national park of 19 brick and thatch windmills dating to the 1700s. But during the trip to the nation's first water district in Utrecht, established in 1222, the quaint gave way to the modern. The bus passed by the massive levees, highway tunnels, wind energy turbines, glass skyscrapers and then, suddenly, rural areas of grazing cattle and blooming tulips. All you had to do was look around and you immediately understood the nation's unofficial motto: "God created the Earth, but the Dutch created the Netherlands."

Central in the focus of the U.S.-Netherlands Connection Project (USNC) is the exploration of Dutch ways of thinking, which are in many ways different than in the U.S. Most noticeable is the way the Dutch approach the planning process. Long-term planning is utilized as a normal way of looking at the future. Most Dutch planners have a 100- to 200-year view of how they look at things, whereas planners in the U.S. usually take a much shorter view. In talking with Dutch planners, it was discovered that they intentionally try to match planning horizons with the effect under consideration.

Another lesson learned is that their "Polder Model," the intense method used to achieve stakeholder buy-in for programs and projects that have a controversial nature, can be utilized in many parts of the world successfully. Stakeholder engagement is critical to the success the Dutch have had in implementing and developing projects that might risk public rejection. Creating an air of problem-solving and ownership of the process were evident in all that the Dutch described and showed the U.S. delegation.

The unofficial Dutch motto was best demonstrated by Maasvlakte II, the extraordinary effort to expand the overburdened Port of Rotterdam. The privately financed, 2.9 billion euro (\$3.9 billion) project dredged the North Sea and created 20 square kilometers (7.7 square miles) of new land, including the storage, roads and rail systems needed to accommodate the massive Chinese superfreighters delivering tens of thousands of container units each to Europe every day. Highlighting the Dutch mind-set, from planning to implementation, the expanded port opened only five years after project construction began, ahead of schedule, below budget, and, perhaps most remarkably for the visiting Americans, without legal challenges.

Approach Rooted in History

The public support for such intensive planning and execution has its roots in history. Americans take great pride in their military traditions and national defense, but the Dutch, hardened by the realities of life below sea level, keep water defense at the core of their national identity. A visit to the Flood Disaster Museum in the Province of Zeeland, where the ocean breached the coastal levees in 1953, offers a dark "we will never forget" perspective, reminiscent of the Holocaust Museum in Washington.

That mind-set, in turn, empowered the Dutch to undertake a series of extraordinary engineering projects to protect themselves, and the Americans visited two of the most famous structures within the 13 projects that were part of the "Delta Works" to protect the Netherlands. In the southeast, the 7-mile-long Oosterschelde-dering storm surge barrier in Zeeland, surrounded by water, not only protects the people along the Schelde River from surging oceans with a retractable dam-like structure, but also functions as an essential bridge for commerce. And to the north, the Maeslantkering storm surge barrier, with two pivoting steel barriers, like Eiffel towers lying on their sides, protects Rotterdam and the communities along the Maas River from similar disasters.

Accompanying the group during part of the experience was Jantienne van der Meij-Kranendonk, a science and technology officer from the Netherlands Embassy in Washington. She offered the Dutch perspective, explaining that "the Dutch embrace visits of foreign professionals to the Netherlands. One reason is that the impressive story of the Netherlands is best told when the massive waterworks can be seen in real time. But equally important is the exchange of knowledge that naturally happens when people meet each other in real life. To stay competitive with its larger neighbors, the Netherlands has always been open to exchanging ideas, culture and learning from others, thus creating fertile ground for great innovations. By visiting, people learn the most about each other's country- or state-specific circumstances and issues. These encounters strengthen long-standing cooperation like the one with the Florida Earth Foundation."

One of the highlights of the trip was a half-day meeting with Dutch university administrators and professors to discuss setting up a USNC Academic Program. Exchange during that session was facilitated by Van der Meij-Kranendonk. Students engaged in engineering and water-related studies at the graduate and upper-class levels will go to the Netherlands in 2014 for intense learning about Dutch expertise and students from Netherlands universities will come to the U.S. Building this type of knowledge exchange platform illustrates Florida Earth's commitment to providing opportunities to learn from each other. Delegates in this meeting from both sides of the Atlantic contributed insights as to what a knowledge exchange like this could accomplish. Representatives from the consultancy world found this approach refreshing as it provided expansion of future employees' understanding of critical issues in water and climate science.

U.S. Participants Praise Interaction

Program delegate Michèle Companion, an associate professor of sociology at the University of Colorado-Colorado Springs and co-chairman of the Natural Hazard Mitigation Association's International Activities Committee, agreed. "Climate change poses tremendous challenges to livelihood systems and to food security

To request permission to reuse or share this document, please contact permissions@bna.com. In your request, be sure to include the following information: (1) your name, company, mailing address, email and telephone number; (2) name of the document and/or a link to the document PDF; (3) reason for request (what you want to do with the document); and (4) the approximate number of copies to be made or URL address (if posting to a website).

around the globe. These have impacts on physical and cultural survival and a population's sense of safety and well-being. All of these factors are important for the stability of governments and their ability to work with communities in the event of disasters, rebuilding, or the implementation of mitigation plans. Working with other nations, we can expand collective knowledge of 'best practices' and programs that have worked well. We also benefit from open discussions about what has not been as successful, thus illuminating both challenges and potential solutions. This collaboration between practitioners, academics from an array of disciplines, government officials and community members can generate exciting new ideas and opportunities. This exchange has given each of us a chance to gain new perspectives and to put some of these ideas into action."

"Water leaders, including those in Florida, need to take this trip," said Keith Rizzardi, a former water manager district lawyer and now a professor at St. Thomas University in Miami who directs a comparative water law program in the Netherlands. "With sea level rise in our future, coastal water managers need to engage in a long-term effort to identify the places where people can live, and then make the multibillion-dollar investments to support those decisions and protect those places."

Dutch Can Learn From U.S. Experience

Russell Jones, a managing analyst with Stratus Consulting, found many examples of Dutch innovation in the realm of sea-level rise adaptation, but found reciprocity on the U.S. side would be of great benefit. Although the U.S. can learn much from the Dutch on the engineering side, the Dutch can learn from the U.S. on the ecological side, such as efforts being done in Florida in the Comprehensive Everglades Restoration Plan.

"I think the U.S. has a lot of expertise related to environmental approaches to adaptation that could be passed to the planners in the Netherlands," he said. "A good example is our 'living shorelines' programs. Several states have implemented green adaptation projects that would normally have been conducted using shoreline armoring. Although these projects are fairly recent, they have been in place long enough to collect quantitative information on their effectiveness as protection as well as the ecological services they provide. For my work as a private environmental consultant examining the impacts and adaptations to climate change, both inland and coastal, the U.S.-Netherlands Connection Project's Professional Program was invaluable. First, I was amazed at the engineering measures used by the Dutch to protect the lands from inundation. The innovation shown as well as the scale and effectiveness of their projects was truly astounding. Many of the methods and approaches used in the Netherlands could be used in the U.S. Although application we saw in the Netherlands are site-specific, concepts like the Maeslant Barrier might be appropriate for similar situations. However, I also gained an appreciation of the additional hurdles we have in the U.S. that planners in the Netherlands don't have to consider—both on the regulatory side as well as from the small amount of adverse environmental impacts in the Netherlands compared to the U.S. This comparison gives me an additional perspective on adaptation measures that I didn't previously have."

Solutions Not Discipline-Specific

Team member Karen Langbehn, a Ph.D. candidate from the University of South Florida, is working on a dissertation that deals with scientific rhetoric. In commenting on her experience with the team, she stated that "one of the most valuable realizations of our experience was that water solutions aren't discipline-specific. Although this may seem like a simplistic observation, determining how to facilitate interdisciplinary solutions for adaptation to sea-level rise proves challenging, but possible. For this reason, the opportunity for an academic knowledge exchange in which graduate students collaborate with Dutch engineering, water management, policy and sociological experts would be mutually beneficial."

"Both countries' policies about climate change adaptation can be traced to a common challenge: the management of uncertainties regarding sea-level change. Despite vast discrepancies in the existence (or absence) of technologically advanced water management in our countries, the pervasive challenge of developing and implementing policy to respond to future sea level change is a shared, international issue."

"Important to the scientific and technological development of solutions, as we learned, is the development of creative, *local* solutions—solutions that reflect an understanding that a variety of public values, as represented by localized communities' interests, exist within 'the public.' Understandably, climate change adaptations will be developed within our countries differently, to meet the needs of our particular contexts (i.e. political systems and dissimilar publics). However, the value of 'inside-outsider' perspectives (via knowledge exchanges between disciplinary students and experts) has the potential to provide creative and nuanced recommendations for alternatives to current practices and pragmatic plans for future policies."

Continuing observations about the Dutch treatment of sea-level rise adaptation and resilience, John Englander, author of the recent book "High Tide on Main Street," observed that our two nations can learn from each other. Englander noted that "the Dutch have been coping with low lands, sudden storms and flooding rivers for a thousand years with sophisticated technology and social adaptation. The recent advent of rising sea level from the melting polar regions will challenge both nations and the world at large. There is nothing like learning from the Netherlands firsthand about their research, engineering and governance issues. One of the things we learned is that they already recognize that rising sea level now presents an entirely new challenge beyond the threats from centuries past." Under a very innovative program called 'Room for the River,' flood-prone areas along the Rhine River are being modified to mitigate accelerated snow melt in the river's water source, which is the Alps. This clearly was a move made by the Dutch to adapt to changing climate conditions.

Need for International Collaboration

The Dutch engineers and water managers were also eager to talk with the Americans. Rijkswaterstaat, an agency that is roughly the counterpart to the U.S. Army Corps of Engineers and Federal Highway Administration, hosted the Florida Earth Foundation at its headquarters building to discuss its relationship with the Eu-

ropean Union. The global consultants at Twynstra Gudde invited the group to discuss water management with them, focusing on the need for more international collaborations like the i-Storm initiative through which Amsterdam, London, New Orleans, St. Petersburg and Venice all share data and experience on flood management. Deltares, a nonprofit research institute, also opened its doors to allow the visitors to see its enormous wave pools where engineering works are constructed and tested at one-eighth scale.

Joan Fitzgerald, interim dean of the School of Public Policy and Urban Affairs at Northeastern University in Boston, noted that the trip highlighted the important link between engineering, public policy and planning. Faculty in several departments at Northeastern are focusing their research on “coastal zone management.” Fitzgerald will use the Dutch experience in the classroom so students can see the importance of policy to engineering solutions. “What I noticed in all of the large engineering projects we saw is the way the Dutch accept a high degree of government planning—the public recognizes that they would literally be under water if

they didn’t. That’s a harder sell in the U.S., but as more cities experience severe storm events, that will change.”

Eventually, Florida Earth Foundation hopes this type of global collaboration and education will grow. We are currently working on an effort to get graduate-level students from a variety of universities, in both the U.S. and the Netherlands, working together on sea-level rise and water management projects. Through newly signed memorandums of understanding with the American Society of Civil Engineers and the American Water Resources Association, students engaged in water-related disciplines will have an opportunity to experience many of the same things as the USNC professional team. We firmly believe in connecting people interested in water solutions with the rest of the planet.

The 2014 U.S.-Netherlands Connection Project’s professional team is already assembling and will go to the Netherlands May 12-16. To become a member of USNC, contact the Florida Earth Foundation at stan@floridaeearth.org.

