



USNC Professional Team 2016

The US-Netherlands Connection Project

May 9-13, 2016

Delft, Netherlands



UNESCO-IHE
Institute for Water Education

Province
Zeeland



Rijkswaterstaat



Hoogheemraadschap van
Delfland

Deltares
Enabling Delta Life



Schedule

Saturday, May 7	
Morning/Early Afternoon	Optional tour of Amsterdam
Late Afternoon	Train to Delft

Sunday, May 8	
Morning/Early Afternoon	Optional trip to Keukenhof
6:30 PM	Welcome dinner at 't Postkantoor Address: Hippolytusbuurt 14, 2611 HN Delft

Monday, May 9	
Morning/early afternoon location: UNESCO-IHE Address: Westvest 7, 2611 AX Delft Afternoon/evening location: The Hague & Scheveningen	
9:00 AM	Introduction and Orientation
9:30 AM	Welcome and Introduction to UNESCO-IHE
10:00 AM	Tour of UNESCO-IHE
11:00 AM	The History of Dutch Water Management by Michiel van Haersma Buma, president Delfland Water Board
12:00 PM	Lunch lecture: UNESCO-IHE's Work Around the World
1:00 PM	WeSenseIt: Challenges and opportunities in Citizen Science by Uta Wehn de Montalvo, Capacity Development and Innovation, UNESCO-IHE
2:00 PM	The Digital Delta and the Dutch Water Authorities by programme director Raymond Feron, Innovation manager Joost de Haan and Delfland and TU-Delft Professor Nick vd Giesen (Interactive session)
4:30 PM	BEGOOD: EU initiative on Big Water Data by Raymond Feron
5:00 PM	Train to The Hague and a walking tour of Parliament, US Embassy, & the King's Palace
7:00 PM	Dinner at the beach in Scheveningen
9:00 PM	Return to Delft
9:50 PM	Arrive in Delft

Tuesday, May 10	
Morning/early afternoon location: Zeeland Province	
Late afternoon/evening location: Middelburg	
7:15 AM	Depart Delft
9:15 AM	Arrival and welcome at the Watersnood Museum
9:30 AM	Tour of the Watersnood, by Ria Geluk, Founder and Board Member
11:15 AM	Depart museum; drive to lunch with stops along the way
12:15 PM	Lunch at Neeltje Jans Mosselen
1:15 PM	Visit the Oosterschelde Barrier
2:30 PM	Depart Neeltje Jans for Middelburg
3:30 PM	Arrive at the provinciehuis in Middelburg
3:45 PM	3D flood demonstration
5:00 PM	Dinner at Vriendschap
6:30 PM	Return to Delft
8:30 PM	Arrive in Delft

Wednesday, May 11	
Morning & lunch location: Kinderdijk	
Afternoon location: Biesbosch National Park	
8:15 AM	Depart Delft
9:15 AM	Arrive at Kinderdijk
9:30 AM	Kinderdijk film in the Pumphouse
10:00 AM	The Story of Kinderdijk and Dutch Water by Jan Luijendijk
10:45 AM	Walking tour of Kinderdijk
12:00 PM	Lunch at Grand Café Buena Vista
12:45 PM	Leave for Biesbosch National Park, Biesbosch MuseumEiland
1:45 PM	Arrive at Biesbosch MuseumEiland
3:30 PM	Boat Tour of the Biesbosch
5:00 PM	Depart for Delft
6:30 PM	Arrive at Delft. Dinner on your own.

Thursday, May 12	
Morning & lunch location: FutureLand at the Maasvlakte 2	
Early afternoon: Maeslant Barrier	
Late afternoon: Sand Motor Project	
9:00 AM	Depart Delft
10:00 AM	Arrive at Futureland
10:45 AM	Making of Maasvlakte 2
11:30 AM	FutureLandFerry boat tour and lunch
12:45 PM	Bus to Maeslant Barrier
1:30 PM	Arrive at the Maeslant Barrier, the world's largest moving object.
3:30 PM	Depart the Maeslantkeringhuis
4:00 PM	Visit to the Sand Motor Project with TU-Delft Professor Marcel Stive
5:00 PM	Depart for Delft
5:30 PM	Arrive Delft. Dinner on your own.

Friday, May 13	
Location: Deltares Delft Offices	
9:00 AM	Depart for test polder "Flood Proof Holland"
9:15 AM	Arrive at test polder "Flood Proof Holland"
9:30 AM	Flood simulation at test facility
11:30 AM	Depart for Deltares
11:45 AM	Arrive at Deltares
12:00 AM	Lunch at Deltares Café
1:00 AM	Introduction to Deltares
1:30 PM	Sand replenishment information for CAPEX-OPEX decisions on coastal Resilience (Sand Motor Data Enrichment)
2:30 PM	ID-LAB experience, 'Enabling Data Life...'
3:30 PM	Adjourn and return to Delft
3:45 PM	Free time to explore, shop, or rest
4:30 PM	Closing session and debrief
6:45 PM	Farewell dinner at Stadsherberg de Mol Address: Molslaan 104, 2611 RP Delft

Welcome to the US-Netherlands Connection's 2016 Professional Team!

Pre-trip Preparations

Our Group Site

Be sure you have joined the USNC Pro Group on <http://floridaeearth.thewaternetwork.com>. This website is an incredible tool that we will use constantly.

What to Wear

Weather in the Netherlands is unpredictable, but during May it is generally around 40°F in the morning and warming up to low 60s in the afternoon. The wind blows 24/7, which can make it cold, especially if it rains. Count on it raining during at least some days of the trip and when it rains it is a slow drizzle that will last for 24 hours or longer. That being said, bring layers that you can shed as the day warms and also bring a compact umbrella. Suggested dress by day:

1. Monday – Business. This is the only day for ties for men and business for women. We will be indoors for most of the day until we get to The Hague in the late afternoon.
2. Tuesday – Business casual. Jeans are fine and are commonly worn to work in the Netherlands. Closed-toed shoes are required.
3. Wednesday – Jeans are fine and shoes that you can get muddy. We will be on the beach in the afternoon at the Sand Motor project.
4. Thursday – Jeans are fine and wear shoes you can get muddy.
5. Friday – Business casual.

Other Things to Consider

1. Power socket travel adapter – European electrical sockets are different than in the US, so pick up a socket adapter, which is usually less than \$10. Most things we use electronically like laptops, phone chargers, etc., are already dual voltage compatible, so no need to get a voltage converter unless you have something you want to bring that is not adapted to 220 volts. Ladies, the hotel has hair dryers that run off of 220 volts so do not bring yours.
2. It is very customary for delegations like ours to give a gift of appreciation to hosts at each location. It does not have to be anything of significant value, but if your organization has anything like pens, key chains, medallions, etc., you might want to bring something to hand out (less than 10).
3. Call your phone carrier to add a short-term international package. When you land, turn roaming off. There will be some expensive lessons if you do not do this. Use Wi-Fi for data unless it is imperative that you do otherwise.

Credit Cards vs. Cash

Major U.S. credit cards work fine in the Netherlands at restaurants, hotels, shops and just about anywhere else. Do note that the train system only accepts Visa, MasterCard, and cash. European credit cards come standard with an imbedded chip, which some U.S. cards still do not have. Almost all vendors require that a card with a chip be used; few, if any, vendors allow payment using the old magnetic strip system. ATM's are everywhere and accept all U.S. credit cards with a chip and some also accept cards without a chip.

Although using your card will almost always be possible, it is highly recommended to carry cash as well. So, when you land and get out of customs, the first thing to do is trade dollars for euros. There are physical banks located in at Schiphol Airport so currency exchange is quite easy. The euro has been hovering around \$1.14 over the past couple of months. Do not carry large amounts of cash. One hundred euros will last for the duration of the program.

Pre-program Options

Since we are not going to Amsterdam during the program itself, quite a few team members are flying out May 6, and arriving in Amsterdam on Saturday morning, May 7. Stan and Sydney will rendezvous with everyone at Schiphol Airport and do a tour of Amsterdam that day before heading to Delft. Once you clear customs at Schiphol, go to the center of the great hall and you will find a Burger King, which is our rendezvous point. There are very good luggage lockers available at Schiphol, so we will store luggage there before heading out for the tour. Once the tour is finished we will return to Schiphol, pick up the luggage, and proceed to Delft. We have done this many times in the past and it works well.

Getting Around: You and Your OV Chipkaart

All members of the team will receive their own “OV Chipkaart,” which is a voucher card to use on the trains, buses, and trams. It will be preloaded, and we will use it throughout the week. Those arriving on Saturday morning will get their card upon arrival. Those arriving on Sunday or later will need to get their cards on Monday morning at the beginning of the program.

To use the card at a train station you simply need to check in and out at one of the gates or yellow check-in/out poles. On buses and trams you enter through the front door and check in by holding your card against the reader for 2-3 seconds. To check out of a bus, repeat this process at the back door. Regardless of the mode of transportation, *do not forget to check out!*

How to Travel from Schiphol Airport to Delft and Vice Versa

Schiphol Airport (near Amsterdam) is the Netherlands’ main airport. You can take the train very easily from Schiphol Airport to Delft (Station Delft). The train station is underneath the Great Hall of Schiphol. The airport has good signage about where to buy train tickets, which train to take, at what time, and from which platform. You can take care of everything yourself at a self-service kiosk or at the information desk. If you choose to visit the information desk, the representative will also be able to assist you with ticket purchase and travel information.

Schiphol Airport to Delft

To travel from Schiphol Airport to Delft you will need to purchase a single use ticket valid for a trip from Schiphol Airport to Station Delft. While there are a few options, the simplest way is to take the “NS Intercity richting Vlissingen” (Intercity train heading to Vlissingen). The train normally departs every half hour and will take you to Station Delft in about 40 minutes. Station Delft is the fourth stop of this train. Routes from Station Delft to the hotels can be found on the next two pages.

Delft to Schiphol Airport

From the hotel navigate to Station Delft. You will need to purchase a single use ticket valid for a trip from Station Delft to Schiphol Airport. The easiest option is to take the “NS Intercity richting Lelystad Centrum” (Intercity train heading to Lelystad Centrum). The train normally departs every half hour and will take you to Schiphol Airport in about 40 minutes. Schiphol Airport is the fourth stop of this train. Once you arrive at Schiphol, head upstairs into the Great Hall and use signage to make your way to the appropriate terminal. Routes from the hotels to Station Delft can be found on the next two pages.

Identification

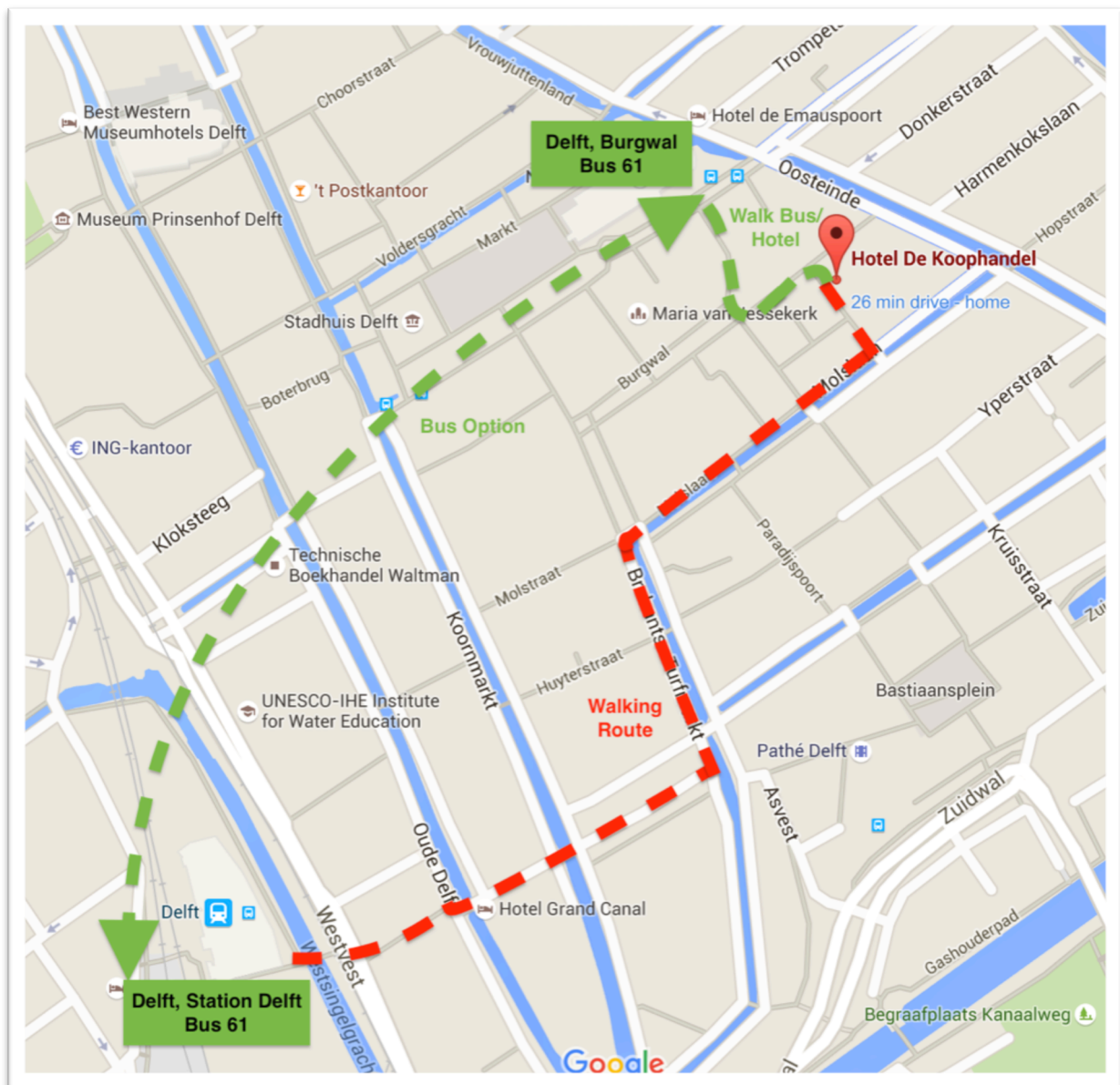
Please carry your passport with you at all times during the program. Not having your passport can be a make or break situation at certain times during the trip, so make sure to always bring it along.

Routes Between Station Delft and Hotel de Emauspoort



Hotel Address: Vrouwenregt 9 – 11, 2611 KK Delft

Routes Between Station Delft and Hotel de Koophandel



Hotel Address: Beestenmarkt 30, 2611 GC Delft

Important Contact Information:

Stan Bronson

Cell: +1 (561) 281-5081

Email: stan@floridaearth.org

Put this in your phone before you depart.

Sydney Folsom

Cell: +31 624483851 (from a non-Dutch number)

0624483851 (from a Dutch number)

Email: sydneyfolsom@floridaearth.org

Hotel de Emauspoort

Phone: +31 152190219 (from a non-Dutch number)

0152190219 (from a Dutch number)

Email: info@emauspoort.nl

Address: Vrouwenregt 9 – 11, 2611 KK Delft

Website: <http://emauspoort.nl/en/contact/>

Hotel de Koophandel

Phone: +31 152142302 (from a non-Dutch number)

0152142302 (from a Dutch number)

Email: info@hoteldekoophandel.nl

Address: Beestenmarkt 30, 2611 GC Delft

Website: <https://www.hoteldekoophandel.nl/en/>

UNESCO-IHE

Phone: +31 152151715

Address: Westvest 7, 2611 AX Delft

Website: <https://www.unesco-ihe.org/>

Country Visitation Information

Helpful Websites

Country Information: <https://travel.state.gov/content/passports/en/country/netherlands.html>

Official Netherlands Tourism Site: <http://www.holland.com/global/tourism.htm>

U.S. Relations With the Netherlands: <http://www.state.gov/r/pa/ei/bgn/3204.htm>

U.S. Passports & International Travel: <https://travel.state.gov/content/passports/en/passports.html>

Smart Traveler Enrollment Program: <https://step.state.gov/step/>

U.S. Embassy and U.S. Consulate Information

U.S. Embassy The Hague

Lange Voorhout 102

2514 EJ The Hague

Telephone: +(31)(70) 310-2209

After-Hours Telephone: (070) 310-2209

Fax: +(31)(70) 310-2207

U.S. Consulate General Amsterdam

Museumplein 19

1071 DJ Amsterdam

Telephone: +(31)(20) 575-5309

Emergency After-Hours Telephone:

+(31)(70) 310-2209

Fax: +(31)(0) 20-575-5330

USCitizenServicesAms@state.gov

Please note that all requests for consular assistance in the Netherlands must be directed to the Consulate General in Amsterdam. There are no consular services available at the Embassy in The Hague.

Important Things to Note

You must carry identification at all times in the Netherlands if you are age 14 or older. Accepted forms of identification for U.S. citizens include a U.S. passport or a Dutch residence card issued by the Ministry of Foreign Affairs. A copy of a U.S. passport is not sufficient under Dutch law.

Medical Facilities and Health Information: Good medical facilities are widely available. Emergency medical response can be accessed by dialing 112. Pharmacies ("Apotheek") are widely available and can assist with emergency prescription needs. Some common medications are not available in the Netherlands without a prescription, and some prescription drugs cannot be sent to the country. Travelers are urged to carry an adequate supply of prescription drugs in their original container, in their carry-on luggage. Please carry a letter from your pharmacist or medical doctor with you, as some drugs are subject to confiscation by local custom agents. Those traveling with any pre-existing medical problems should bring a letter from the attending physician, describing the medical condition and any prescription medications, including the generic name of prescribed drugs. Vaccinations are not required for travel to the Netherlands.

Map of the Netherlands



Map of Our Program Area (Zuid-Holland and Zeeland)



Flag of the Netherlands



What We Will Be Doing

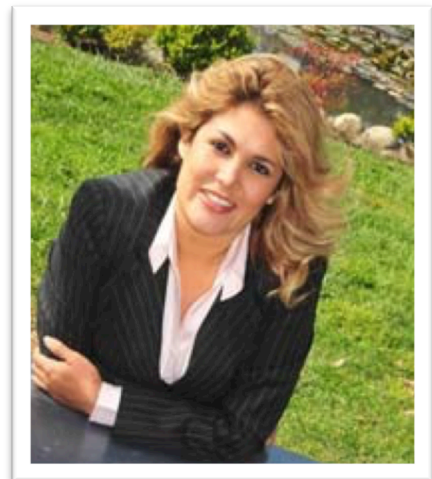
The team will do several things over the course of the program. As we learn about how water is managed, how the Dutch are facing climate change and sea level rise, how they are proceeding with climate adaptation, and how they deal with 17 million people on 14,000 square miles (Florida is about 35,000 square miles), we will compare the challenges they are facing with those in the United States. We will also look at ways in which they are meeting those challenges in planning for the future. At the same time we will observe the different mindsets of the Dutch and see how they are the same or different from our own. By the end of the week we will be able to create a matrix of our observations and overlay them with what we know. Then we should be able to envision ways that the US-Netherlands relationship could create possibilities under the umbrella of that formal relationship.

As we travel, be sure to write down ideas as they come to mind (notecards will be provided for this purpose). Please keep these notes with you during the entire trip and even a few days afterwards. At the end of each day we will collect the cards and categorize them. On Friday, we will prioritize them and create a vision for the components of the relationship.

Meet Your Team Members

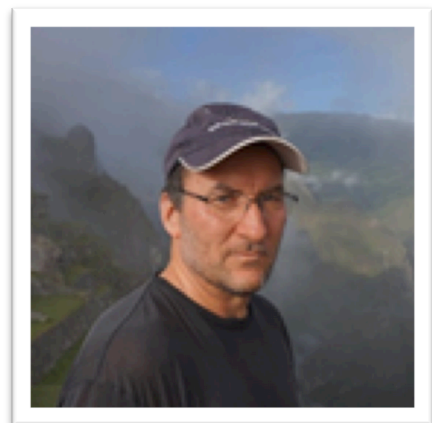
Claudia Avendano

Doctor in Public Policy, Planning and Development Candidate at the USC Sol Price School of Public Policy. Professional Practitioner as International Coastal Manager, Coastal Land-Use planner, and Geographic Information Systems Analyst for over fifteen years. In her most current work, as a part of an International consortium working for INECC, Mexican Government and the World Bank, Claudia completed the Selection and design of Adaptation Measures to implement for a community of Coastal Lagoons and Wetlands of the Gulf of Mexico over the next hundred years. Currently Claudia is currently working with former members of the California Coastal Commission, as well as the Santa Barbara and Ventura Region to create a predictive DSS to aid the Beach Erosion Authority for Clean Oceans and Nourishment (BEACON) to adopt adequate adaptation measurements and draft model ordinances into Local Coastal Plans in response to the most recent Sea Level Rise predictions. Her contribution draws from the principles of collaborative governance, social and environmental justice, land-use planning, spatial analysis, geomorphology, and GIS Decision Support Systems Theory. She is also a proponent of a Decision Support Matrix to evaluate different shoreline management strategies in response to different Sea Level Rise Scenarios. Guidance provided by the results of the DSSM, could be translated into local government shoreline management policies, which could be adopted into Local Coastal Plans (LCP) and policy making strategies for delivery of Coastal Adaptation Practices.



Paul Bovitz

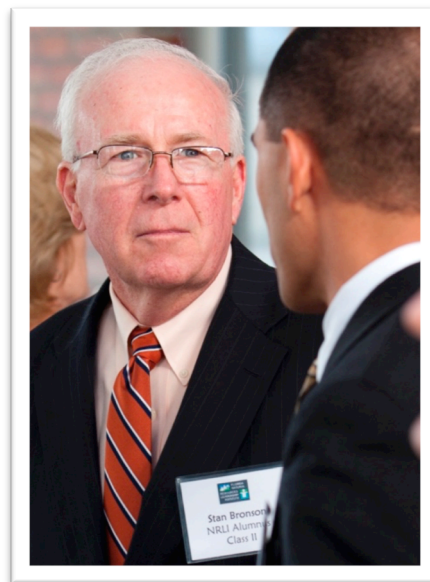
Mr. Bovitz is principal consultant with over 30 years' experience as an Environmental Project Manager with expertise in leading interdisciplinary teams on national and international projects. He has extensive professional experience in ecological assessment and natural resources management in public, private, and academic sectors. Mr. Bovitz earned his B.S. in Wildlife Biology from Colorado State University, an M.S. in Ecology from Rutgers University, followed by his MBA in Finance from Rutgers University. Mr. Bovitz has worked extensively in the following areas: (1) ecological risk assessment and remediation of contaminated sites, (2) environmental impact assessment of infrastructure and energy projects, (3) wetlands assessment, and ecological restoration of wetlands and (4) environmental compliance, permitting and "greening" of ports. Much of his career as a consultant has been spent directing ecological investigations of sites requiring environmental restoration nationwide within the U.S. He is experienced in environmental impact assessment, having completed several EAs, DMMPs, EIS and other NEPA documents, including extensive contracting experience in preparing NEPA compliant feasibility studies for habitat restoration and environmental remediation projects. Mr. Bovitz has served on nationwide peer review panels for environmental impact and restoration documents and has presented widely on environmental topics. In June 2014, Mr. Bovitz presented a two-day short course in "Greening Seaports" in Cape Town, South Africa for terminal operators, attorneys, regulators and port officials, which focused on measures that Ports may take to improve their



environmental footprint. He recently (January 2016) completed a project for a large Chinese bulk port aimed at improving their environmental practices in order to meet and eventually exceed international standards. Mr. Bovitz currently serves as acting member of the New Jersey Governor's Science Advisory Board, Ecological Sciences Committee, and formerly served on the Comparative Risk Analysis Panel of the New Jersey Department of Environmental Protection (NJDEP).

Stan Bronson

Stan Bronson is a seven generation Floridian, born in Orlando, with undergrad education done at Florida Southern College and grad work done at Florida Atlantic University and the University of Florida. Spending most of his career in the citrus industry, 14 years of which was COO of a large citrus operation, in 1999 he joined the extension faculty of the University of Florida, developing a natural resources education program for South Florida ecosystem restoration initiatives. That program has evolved into the Florida Earth Foundation, begun in January 2002. FEF is a public-private partnership of over 120 agencies, universities, industries and not-for-profits. The organization develops knowledge exchange programs that center on water disciplines. Bronson serves as Executive Director of Florida Earth, which administers the nation's only permanent US program in graduate water education with the United Nations, the UNESCO-IHE/Florida Earth Partnership. Florida Earth also runs the US-Netherlands Connection (USNC) program, which brings teams of delegates from the US to the Netherlands to see Dutch expertise in water infrastructure and management, especially as it relates to sea-level rise adaptation and knowledge exchange platform that puts together those needing help in solving coastal resilience issues with those possessing expertise in those issues. Coming from a ranching family who supplied the land for Walt Disney World in the 1960's, Stan's love of the land has always been an inspiration throughout his career.



Anne E. Carey

Anne E. Carey is a Professor in the School of Earth Sciences at The Ohio State University and director of the undergraduate program in Earth Sciences. She teaches Earth sciences, physical geology, oceanography, watershed hydrology and other topics in hydrology and hydrogeology. Her NSF-funded research, spanning topics from physical hydrology to biogeochemistry, has shown the significance of chemical weathering in the denudation of rapidly uplifting geologic environments and the role of small mountainous rivers in transporting organic carbon and the products of chemical weathering to the world ocean. She has conducted field work for those studies in streams in New Zealand, Taiwan, Philippines, Dominica, Panama, Nicaragua, Spain and Italy. Her current research is investigating the importance of landslides in mobilizing carbon in tropical watersheds. She has previously investigated seawater intrusion into coastal aquifers via field work and mathematical modeling. Her work has been published in journals such as *Geology*, *Journal of Geophysical Research*, *Geochimica et Cosmochimica Acta*, *Environmental Science & Technology*, *Water Resources Research* and *Chemical Geology*. She came to Ohio State in 1999 after completing



her S.M. in environmental engineering at MIT and her Ph.D. in hydrogeology at the University of Nevada, Reno. During 2007–2009, she served as Associate Dean for Student Services in Ohio State’s College of Mathematical and Physical Sciences during which time she was a co-principal investigator on Ohio State’s NSF ADVANCE Project CEOS, Comprehensive Equity at Ohio State. She is a fellow of the Geological Society of American and of the American Association for the Advancement of Science.

Jeffrey Carney

Jeffrey Carney is Associate Professor at the LSU School of Architecture and Director of the Coastal Sustainability Studio (CSS). Jeff's work in Louisiana has centered on trans-disciplinary efforts to plan and design in the dynamic Gulf Coast Environment. Working with a broad range of scientists, engineers, and designers the CSS offers design solutions to the most pressing and complex problems that face Gulf Coast Communities. Jeff received his BA from Washington University in St. Louis and master's degrees in both architecture and city and regional planning from the University of California, Berkeley. At CSS Jeff has been involved with the development of numerous projects. Recently, Jeff directed the Mayors' Institute on City Design Regional session, led the inaugural Louisiana Community Resilience Institute, was a team leader on a winning entry in the Changing Course Competition, and is currently leading the visualization program for the Louisiana Coastal Protection and Restoration Authority.



James Charles

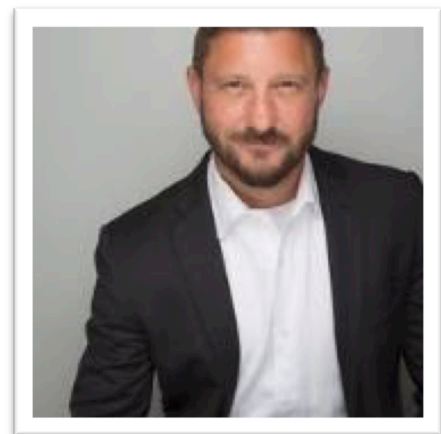
James Charles works closely with Tribal Governments assisting and representing them with Government-to-Government consultations; developing and implementing strategies to protect tribal interests on and off tribal lands (cultural, environmental, and natural resources); developing and negotiating agreements with local, state and federal agencies; enhancing Tribal Self-Governance/Self Determination; and developing tribal infrastructure and capacity. His passion for working with Tribal Governments began with assisting the Seminole Tribe of Florida in protecting their cultural and environmental interests in connection with Everglades Restoration (the largest environmental restoration project in the world). This passion carries forward as his greatest satisfaction is working collaboratively with Tribal Governments to develop tribal capacity for self-governance and preserve tribal culture and heritage for future generations. In addition to his Indian Law practice, James also represents private and public sector clients before local, state, and federal agencies and courts regarding regulatory issues concerning historic, environmental and natural resources. His practice includes providing legislative and rulemaking support on behalf of clients on state and federal levels, which includes advocating client interests during commenting periods, rulemaking workshops, public hearings, stakeholder meetings, commission meetings, and agency meetings. James’ litigation experience includes representing clients before federal court, state court, and administrative



proceedings. He serves as the Chair of the firm's Indian and Aboriginal Law Industry Group and previously served as Chair of the Numeric Nutrient Criteria Practice Area and Marine and Coastal Construction Industry Group. James currently serves as a Board of Director for the Florida Marine Contractors Association and is the Director for the Marine Contractors Association, South Florida Chapter. For seven years, James served on the Board of Directors at The Lord's Place, which is a nonprofit organization dedicated to breaking the cycle of homelessness in Palm Beach County. In 2009, James was selected as a Florida Rising Star by Florida Super Lawyers, a peer designation awarded to only 2.5% of Florida lawyers. When he is not working, James enjoys spending time with family and friends, traveling, basketball, Tae-Kwon-Do, and tirelessly working to train his overly active puppy Aonghas. James is a graduate of the University of Florida College of Law where he earned his J.D., with honors, in 2002 and was awarded the University's Environmental and Land Use Law Certificate.

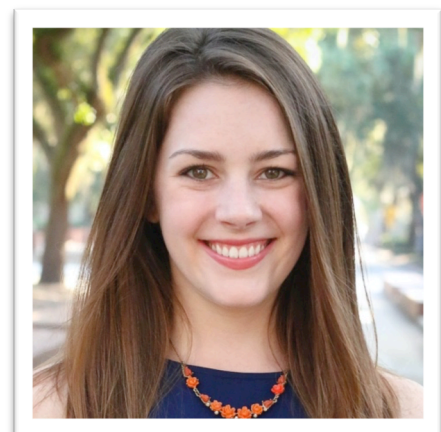
Robert Daoust

Mr. Daoust specializes in ecosystem restoration and coastal protection projects as well as climate adaptation studies that focus on sea level rise and storm surge flood risk mitigation. He has almost 20 years of experience in environmental consulting experience with public and private clients, including state, municipal, and federal agencies. He formerly led Arcadis' national Ecosystem Restoration and Coastal Protection practice in the United States where his work involved efforts to restore coastal Louisiana and the Florida Everglades, as well as climate change adaptation to mitigate future flood risk associated with extreme storm events and sea level rise in New York City and south Florida. Currently, Mr. Daoust is responsible for driving the strategic growth of Arcadis' Water practice in southeast Florida. In addition, he is an expert on coastal resilience of southeast Florida, assisting several southeast Florida municipalities in efforts to plan and adapt to rising seas and storm surge risk. Mr. Daoust's background is in ecosystem ecology and includes extensive experience in experimental design, implementation and optimization of long-term monitoring as part of adaptive management programs, as well as statistical analysis and interpretation of ecological data. He holds a BSc degree with Honors in Geography from McGill University in Montreal, Canada and an MS in Biological Sciences from Florida International University, where he did research on the effects of phosphorus on slough and ridge community dynamics in northeastern Everglades National Park. He also completed doctoral research at the University of South Carolina investigating how salinity and plant physiology drives differential nutrient limitation along an estuarine gradient. Originally from suburban Toronto, he's now resides in Fort Lauderdale, Florida.



Sydney Folsom

Sydney Folsom is a recent graduate from the University of Florida, and holds a bachelor of science in civil engineering. In the beginning of 2016 she moved to the Netherlands to continue pursuing her education and various passions. During her bachelor studies, Sydney gained experience through work within the public sector and in large engineering companies. As a team member of the Florida Earth Foundation she enjoys working with a multicultural group to develop programs that aim to educate and inspire water professionals from around the world.



Madeleine Harvey

Madeleine Harvey is a graduate student at Scripps Institution of Oceanography in La Jolla, California studying coastal physical oceanography. Her work focuses on the impacts of sea level rise and extreme water level events on the circulation and sediment transport in Southern California estuaries. Madeleine has a background in environmental engineering and received a Bachelor of Science from Brown University in Civil Engineering in 2012. As an avid sailor, her research is motivated by the desire to protect our oceans, estuaries and coasts for future generations.

**Shahnoor Hasan**

Shahnoor Hasan is a PhD fellow at Water Governance Chair group in UNESCO-IHE Institute of Water Education. She is affiliated with the Department of Geography, Planning and International Development Studies of the University of Amsterdam as well under a joint doctorate program. Her research explores the role of participatory planning tools in the delta planning process. An increasing number of tools are used for creation of consent among participants of delta planning processes on specific planning outputs. During the design and development, setting up expectations, and appraising roles of these tools, the context of use is not always considered. Technological components, planning culture and trends, users and their approach, power play and/or conflicts between participants influence tools' use, roles and planning outcomes. The research uses actor network theory to explore what roles participatory planning tools do play depending on specific contexts, be it design and development, expectation or use. The research is funded by the NWO (the Netherlands Organization for Scientific Research) UDW (Urbanizing Deltas of the World) project on strengthening strategic delta planning processes in Bangladesh, the Netherlands, Vietnam and beyond. Prior to pursuing her PhD research, Shahnoor has been worked as a Senior Lecturer and Research Associate at the University of Liberal Arts Bangladesh. She started her career at Independent University, Bangladesh (IUB) as a Lecturer in the Department of Environmental Science in 2010. Her research work focused on urban rainwater harvesting, and assessment of persistent organic pollutants and heavy metals in water and food chain. With support from a colleague, she also initiated the sustainable campus development program in Bangladesh. Shahnoor graduated magna cum laude in Environment Management from IUB in 2009, and holds a Bachelor of Science in Environmental Studies from North South University.



Isaac Hoyos

Architect turned into urban and regional planner after 30 plus years of progressive professional planning practice and complementary graduate studies in the US and Colombia. My areas of primary expertise are growth management, urban redevelopment, city, regional and environmental planning, natural resource protection and restoration and climate change adaptation. Former member of the Federal Everglades Restoration Task Force Working Group that implements Everglades and other restoration efforts in South Florida. Currently involved in regional initiatives addressing climate change and sustainability in SE Florida. Through the years I have developed, implemented or participated in master development plans, suitability analysis studies, land use plans, redevelopment and comprehensive plans, water and energy management plans for cities and regions in the US and Colombia, including among others Cali and 12 other municipalities in Colombia; Camden, New Jersey; State of New Jersey; Palm Beach County; and the Southeast Florida Region in the USA. I hold a Masters in Regional Planning from University of Pennsylvania, Philadelphia, PA, under the chairmanship of the late Ian McHarg. A Masters in Architecture & Urban Studies from Universidad del Valle, Cali, Colombia; and several others certificates from these and other universities.

**Robert Lempert**

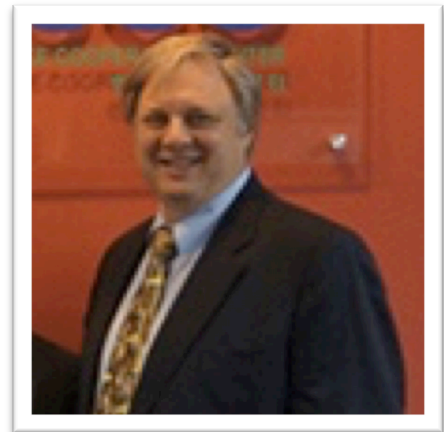
Robert Lempert is a senior scientist at the RAND Corporation and Director of the Frederick S. Pardee Center for Longer Range Global Policy and the Future Human Condition. His research aims to advance the state of art for organizations managing risk in today's conditions of face-paced, transformative, and surprising change and helping organizations adopt these approaches to help make proper stewardship of the future more commonly practiced. His research focuses on risk management and decision-making under conditions of deep uncertainty, with an emphasis on climate change, energy, and the environment. His research group assists agencies including the U.S. Bureau of Reclamation, the California Department of Water Resources, the Metropolitan Water District of Southern California, the Coastal Protection and Restoration Authority of Louisiana, the Environmental Protection Agency, and the World Bank incorporate climate change in their resource management plans. Dr. Lempert is a Fellow of the American Physical Society, a member of the Council on Foreign Relations, a lead author for Working Group II of the United Nation's Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report and for the IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation, and a member of numerous study panels for the U.S. National Academies, including the Transportation Research Board's Climate Change and U.S. Transportation, and the National Research Council studies America's Climate Choices and Informing Decisions in a Changing Climate. Dr. Lempert was the Inaugural EADS Distinguished Visitor in Energy and Environment at the American Academy in Berlin. A Professor of Policy Analysis in the Pardee RAND Graduate School, Dr. Lempert



is an author of the book *Shaping the Next One Hundred Years: New Methods for Quantitative, Longer-Term Policy Analysis*.

Henry Loescher

Prior to his time at NEON, Hank was formerly a research associate in the Department of Forest Science at Oregon State University, where he managed the network-level QA/QC lab for tower-based systems in the DOE-AmeriFlux network. Dr. Loescher attended the NEON technical evaluation meeting in Boulder as a Science Advisor. He earned his BA in Environmental Science from the State University of Vermont, and a Masters and Ph.D. in Forest Resources from the University of Florida. His research interests include determining the biotic and abiotic controls on ecosystem-level carbon and energy balance across spatial and temporal scales. Dr. Loescher has served as a panelist on the NSF Conceptual Design Review of NEON, a member of the Technical Review Committee, and as Chair of the Tower Systems Tiger Team.



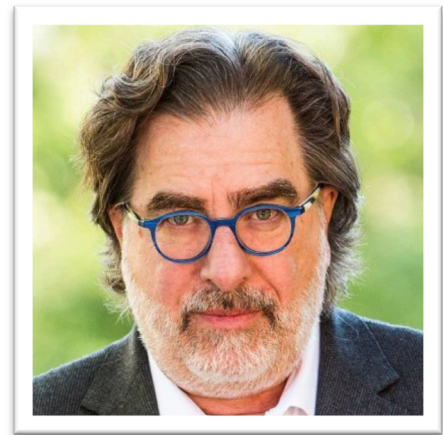
Marilys R. Nepomechie

Marilys Nepomechie, FAIA, is Associate Dean for Strategic Initiatives, Architect and Professor of Architecture at the Florida International University College of Architecture + The Arts, as well as National President of the Association of Collegiate Schools of Architecture. Her professional and academic projects --focused on urban resilience and on the design of sustainable, affordable housing and infrastructure-- are included in the archives of the National Building Museum, and have been honored with over 40 design and research awards, national and international exhibition, and wide publication. As Principal Investigator, she has received grants from the U.S. Department of Energy; the national Endowment for the Arts; the Graham Foundation; the American Institute of Architects; the Andrew W. Mellon Foundation; and the 2nd International Architecture Biennale Rotterdam, where she was an invited curator on the subject of coastal urban development. The National Science Foundation and Cejas Family Foundation fund her current research, focused on the effects of sea level rise in Miami, Florida. Nepomechie is an International CINTAS Fellow in Architecture, and co-curator of the exhibition MIAMI 2100: Envisioning a Resilient Second Century. She has served as Visiting Scholar in a number of national and international universities, and is most recently the author of *Building Paradise: An Architectural Guide to the Magic City*. Nepomechie holds the Master of Architecture from MIT and has been inducted to the College of Fellows of the American Institute of Architects.



Will Sarni

William Sarni is a veteran of sustainability and environmental consulting who has provided guidance to public- and private-sector enterprises for more than three decades. He is currently a director and practice leader with Deloitte Consulting LLP. Sarni's diverse client list includes Fortune 500 companies and multinational corporations, as well as nongovernmental organizations (NGOs). He has managed projects throughout the United States, Europe and Asia, working with some of the world's most recognizable brands. In addition, he led the development of environmental sustainability performance methodology for the 2011 and 2012 Best Global Green Brands. He is a member of the CDP Water Disclosure Water Advisory Council and an Advisor to the University of Cambridge Natural Capital Leaders Platform project, "The Right Value for Externalities," which focuses on the real value of water. Sarni is the author of *Greening Brownfields: Remediation through Sustainable Development* and contributor to *Environmental Regulation of Colorado Real Property* (Bradford Publishing). He is the author of the recently published *Corporate Water Strategies* and the forthcoming book, *Water Tech – A Guide to Innovation and Business Opportunities*.



Ashley Schwemmer

Ashley Schwemmer is a designer at EDSA, an international planning and landscape architecture firm. She received her Master's degree in Landscape Architecture from Kansas State University in 2014. There, she focused her thesis studies on the New Urban Water Management paradigm – developing a design approach for projects to incorporate stormwater management elements that are perceived as both ecologically and socially valuable by the public. At EDSA, Ashley is part of the Technology Focus Group, a team tasked with keeping the firm abreast of the latest technologies and advancing the use of software as a means to enhance the design process – making site analysis, design and representation more efficient. Ashley is joining the USNC on the Joseph J. Lalli Fellowship, awarded by EDSA. She tailored her fellowship proposal for this specific program in hopes to learn more about how to design with water, and to connect with others who are passionate about water management. Ashley's goal is to bring the Dutch's water ideologies back to her design firm, where they can incorporate them into future design efforts and project implementation.

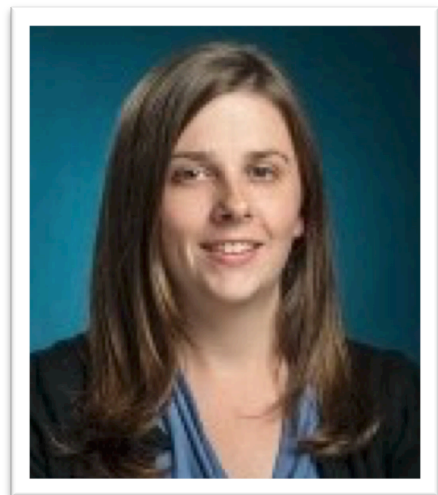


Anne R. Siders

Anne Siders is a PhD candidate in the Emmett Interdisciplinary Program for Environment and Resources at Stanford University. Her research combines methods from hazards geography, law, digital humanities, and computational social science to identify mechanisms and build adaptive capacity of government systems in the context of climate change. Her work is geographically diverse, with projects in maritime regulation in the Arctic, coastal defense planning in the United States, and urban resilience in the United Kingdom and Philippines. Prior to coming to Stanford, Siders was a Presidential Management Fellow with the U.S. Navy and an Associate Director of the Center for Climate Change Law at Columbia University. She holds an A.B. in Human Evolutionary Biology and a J.D. from Harvard.

**Sara Turner**

Sara Turner is a doctoral candidate at the Pardee RAND Graduate School and an assistant policy analyst at RAND. She has an M.A. in international studies, specializing in international political economy, from the Josef Korbel School of International Studies at the University of Denver, and dual B.A. degrees in economics and international relations from Gonzaga University. Prior to joining Pardee RAND, Turner was a research associate at the Frederick S. Pardee Center for International Futures at the University of Denver, where she worked on a project to forecast potential futures for fisheries and aquaculture development and another to collect and analyze new data on the structure of the international system. She also served as a consultant for the Institute for Security Studies in Pretoria, South Africa, developing forecasts for poverty reduction in Africa in light of proposed sustainable development goals. Her research interests include climate change, food security, poverty, human development, and disaster risk reduction.



Questions to Ponder Throughout the Week

1. What do I see that reminds me of something I see in the United States?
2. How do the Dutch think when they are faced with the challenge this project represents?
3. Who do they consider as stakeholders? How are they involved? Why is this different from our engagements in the U.S. and what benefits and/or complications might it bring?
4. In what categories of endeavor does this project or event fall?
5. What are the institutions that had a hand in this and what institutions would we engage in the United States to do something like this? Can the U.S. federal system be adapted to allow robust implementation?
6. What types of outreach are they doing for the challenges they are facing?
7. What can we create that will have the possibility of true impact on both the United States and the Netherlands in one year or less?

Questions and Points to Consider Regarding Formal Relationships & Partnerships

1. How do we have both sides agreed on the fundamental, overarching, most desirable outcome(s) for this meeting?
2. If you were to pursue a state-nation relationship, what would be the nature of that relationship? Co-development? Co-marketing? How would that look like for a relationship between two nations?
3. What might the go-to-market model look like?
4. What might the business model look? Co-equal partners?
5. How will solutions be monetized?
6. Would this be a "research" relationship only?
7. What is the most efficient process to identify candidate projects and prioritize projects as to value, importance, etc., and whose exploration/solution represent areas of certain (or very likely) combined (USA + NL) high poles in the tent?
8. How would candidate projects, proof of concepts, experiments, trials, etc. be funded?
9. If the goal is to develop a commercial-grade solutions, who would lead on that? There may very well be multiple answers to this question.
10. How will intellectual property creation/ownership be handled?
11. Who would hold the contract for a formal relationship? (I.e. some legal entity has to be the contract source for T&Cs, etc.)
12. What is the most logical way to categorize or segment the problem categories? Identifying these categories up front will later help us organize subgroups or workgroups that focus on particular categories or problem areas.
13. Agree on framework to further categorize projects/pursuits as to level of difficulty, technical uncertainty, cost of development and/or commercialization, time to pilot implementation, time to commercialization, etc.
14. Organization issues need to be considered and dealt with early on. We have many stakeholders from many organizations on the team and you will be meeting with many people and organizations while in the Netherlands. We will be well served if we begin thinking about a core leadership team (2 or 3 people) on both sides that form the "board" or core leadership team for the combined entity. This team will drive the development and implementation of the plan going forward.

Topics for Consideration

1. What is the vulnerability of surface water based drinking water systems to SLR and salinity impacts?
2. What is the vulnerability of brackish ecosystems to SLR and salinity impacts? How can this be managed? What are the impacts?
3. What could be soft (non structural) defenses against SLR and their environmental impacts and (possible) benefits?
4. Building with Nature as a climate adaptation tool: where could this be relevant in U.S., and what are possible areas for cooperation between the U.S and Netherlands.
5. How has Deltares managed to coordinate across the various Dutch governmental agencies? How does it effectively deploy resources for decision making?
6. What are major political, operational, financial, and bureaucratic obstacles that the developers of Deltares had to overcome in order to achieve success in working with the Dutch government? In deploying resources for decision making?
7. Can we explore ways of determining which elements of the Deltares "model" would provide value to the ways in which the U.S. government operates its scientific and operational resources for adaptation?
8. What mechanisms could create a more long-term and sustainable working relationship and collaborative environment between appropriate U.S. research and operational elements and Deltares?

Program Destinations (In Order of Arrival)

[Schiphol International Airport](#)

Schiphol is Europe's fourth-largest airport in terms of passenger number, number four in air transport movements, and ranks third in terms of cargo volume. Schiphol is the oldest international airport in the world to be located at the original site of its first aircraft landing. This event took place over 90 years ago, on 19 September 1916. Schiphol is also one of the lowest lying airports in the world. The airport is located in a polder reclaimed between 1848 and 1852, at 4.5 metres below sea level. Since 1980, the airport has won some 200 international awards and is recognised as one of the best airports in Europe and the world at large.



[Amsterdam](#)

The capital of the Netherlands, Amsterdam, is one of the world's great small cities. From canals to world famous museums and historical sights, it is one of the most romantic and beautiful cities in Europe. Canal cruises are a popular way to see the city from the perspective of its canals. Amsterdam is also a city of tolerance and diversity. It has all the advantages of a big city: rich culture, lively nightlife, international restaurants, good transport, but is also quiet largely thanks to its extensive canals and little road traffic.



[Zuid-Holland](#)

The province of Zuid-Holland is a cultural paradise. The Hague, Delft, Leiden and Rotterdam boast art and history museums with outstanding collections. A few must-see museums are the Royal Picture Gallery Mauritshuis, Gemeentemuseum Den Haag, Boijmans van Beuningen, Kunsthal Rotterdam and Vermeer Centre Delft. Traditional shots of Holland can be taken at the world famous mills of Kinderdijk, the Delft Blue pottery factory Royal Delft, the cheese market of Gouda, miniature park Madurodam and Keukenhof and its surrounding flower fields. Everyone who visits The Hague for the first time is overwhelmed by the abundance of monuments. "Het Binnenhof," palaces, stately mansions and numerous squares truly give the city an unprecedented sense of history. Rotterdam is the complete opposite of The Hague. It is a modern world city, which besides being the largest port of Europe, is renowned for its daring architecture.



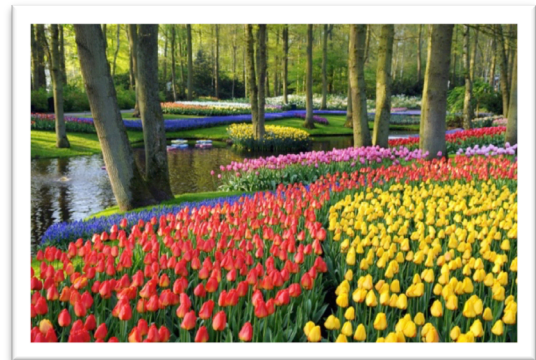
Delft

Delft is a city and a municipality in the Netherlands. It is located in the province of South Holland, where it is situated north of Rotterdam and south of The Hague. Delft is known for its historic town centre with canals, Delft Blue pottery, the Delft University of Technology, painter Johannes Vermeer and scientist Antony van Leeuwenhoek, and its association with the royal House of Orange-Nassau.



Keukenhof

Keukenhof is the international and independent showcase for the Dutch floricultural sector, with a special emphasis on flower bulbs. In the space of eight weeks Keukenhof shows what the Dutch floricultural sector has to offer. The focus in the park is on the 7 million spring-flowering bulbs, in which the 100 participating companies show their living catalogue. In more than 20 flower shows, 500 flower growers present an enormous variety of cut flowers and pot plants. The Keukenhof theme for 2016 is “The Golden Age,” the era when Holland became rich through worldwide trade.



UNESCO-IHE

Since 1957, UNESCO-IHE has provided graduate education to more than 15,000 water professionals from over 162 countries, the vast majority from the developing world. The Institute offers a unique combination of applied, scientific and participatory research in water engineering combined with natural sciences, social sciences and management and governance. Since its establishment the Institute has played an instrumental role in developing the capacities of water sector organizations in the Global South by strengthening the efforts of other universities and research centres to increase the knowledge and skills of professionals working in the water sector. UNESCO-IHE carries out educational, research and capacity development activities in the broad fields of water engineering, water management, environment, sanitation, and governance.



[The Hague \(Den Haag\)](#)

The Hague is the seat of government in the Netherlands and the capital city of the province of South Holland. With a population of 515,880 inhabitants (as of 1 January 2015), it is the third largest city of the Netherlands. The Hague Metropolitan Area, with a population of approximately 2.7 million, is the 12th largest in the EU and the most populous in the country. The Hague is the seat of the Dutch government and parliament, the Supreme Court, and the place of residence of the royal family. Many foreign embassies international organisations are located in the city, including the International Court of Justice and the International Criminal Court, making it one of the major cities hosting the UN.



[Zeeland](#)

The history of Zeeland has been defined by its battle against the tide. In 1953, Zeeland was devastated by a terrible flood, giving rise to new coastal defences in the form of the Delta Works. The idea behind the Delta Works was to shorten the amount of coastline that was exposed to the sea. In order to accomplish this, the estuaries needed to be dammed, and those estuaries that remained open to the sea needed to have their sea walls raised to five metres above sea level. Today, coves, potholes or “kolks,” and ancient dikes are reminders of how much of the province once belonged to the sea while the remains of lost villages show evidence of how high the floodwaters once reached. The waterways have also brought prosperity to the region, mainly in the form of maritime trade, especially during the Dutch “Golden Age” in the 17th and 18th centuries.



[Oosterschelde Barrier](#)

The Oosterscheldekering (Eastern Scheldt Barrier) is the largest (9 km long), most expensive, and most difficult to build of the 13 Delta Works constructions. The barrier was initially designed, and partly built, as a closed dam, but after public protest, huge sluice-gate-type doors were installed in the remaining four kilometers. These doors are normally open, but can be closed under adverse weather conditions. Since its completion in 1986, the dam has been closed twenty-five times due to water levels exceeding or being predicted to exceed the three meters. The dam is designed to last more than 200 years.



[Middelburg](#)

The historic town of Middelburg is the provincial capital of Zeeland. The town's former connections with the Dutch East India Company are visible in the old warehouses and canals. One of the many listed buildings is the abbey complex with the Lange Jan (Tall John), a 91 meter (approx. 300 foot) high tower that is, for many, the ultimate symbol of Middelburg. The town owes its name to the central circular fortifications ("burgen") around the city, which once protected residents from intruders.



[Kinderdijk](#)

The windmills of Kinderdijk are part of a unique phenomenon. Nowhere else in the world can you find the complete history of water management at a single location. Excess water from the Alblasserwaard is drained using the windmills and pumping stations into the river Lek via the Elshout sluices after which the water discharges into the sea. A visit to Kinderdijk is an opportunity to visit a UNESCO World Heritage. In 1997, Kinderdijk was added to the prestigious list because the polder area with its dykes, boezems, mills, and pumping stations is considered to be proof of human inventiveness in reclaiming and protecting land.



[Biesbosch National Park](#)

The unique nature reserve De Biesbosch National Park lies in the provinces of Noord-Brabant and Zuid-Holland, and is one of the few freshwater tidal areas in Europe. Walk through the delta where the rivers Meuse and Rhine meet and experience the maze of rivers, water basins and clear creeks where nature has completely free reign. You'll see countless birds, such as geese, ducks and waders. And to make things even better, excellent recreational facilities are available.



[Rotterdam](#)

Rotterdam is a bustling metropolis known by most people for its huge port. In Rotterdam you won't find a historic city centre, as a major part was devastated during World War II. During the last decades the city of Rotterdam has been fully rebuilt with designer homes and skyscrapers under modern architecture. Today, Rotterdam is world famous due to the mixed maritime scene of historic buildings and modern design like the iconic cube houses and stunning Erasmus Bridge.



[Port of Rotterdam](#)

The port of Rotterdam is the largest port in Europe, consisting of five distinct port areas and three distribution parks. Its annual throughput amounts to some 465 million tonnes. The total length of the port is more than 40 km (approx. 25 mi) and covers 105 square kilometers (approx. 41 square miles). Approximately 30,000 seagoing vessels and 110,000 inland vessels visit the port of Rotterdam every year. From the port goods are transported further inland by ship, river barge, train or road.



[Maasvlakte 1 & Maasvlakte 2](#)

Maasvlakte 1 land reclamation was created in the 1960s by adding onto an existing and problematic sandbank. The sand for the suppletion was acquired from the North Sea and from the Lake of Oostvoorne, which was created by the construction of the Maasvlakte. The Port of Rotterdam Authority has a long tradition of applying advanced technologies and processes. Maasvlakte 2, which began construction in 2008, will serve as a new port and industrial area designed to add nearly 5,000 acres of port area and aims to become the most sustainable and innovative port in the world.



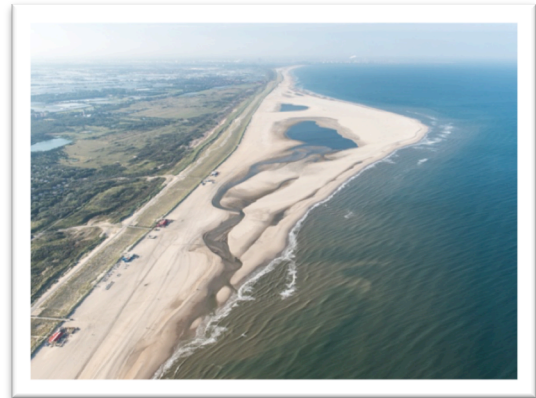
[Maeslant Barrier](#)

The impressive Maeslantkering (Maeslant Barrier) is one of the wonders of the modern world. The barrier was built to protect Rotterdam and its surroundings from flooding. The waterway at Hoek van Holland is very important for Rotterdam, as the large port must be easily accessible. The waterway must be open, but Rotterdam also needs to be protected at times from storms and high tide. That's a dilemma. Therefore, the Maeslant Storm Barrier has two huge movable arms that can close off the waterway in case of a storm. Closing the barrier is a fully automated process, even the notification of the ships, eight hours before closure is done without any human intervention.



[Sand Motor Project](#)

The Sand Motor, constructed in 2011, is a great example of building with nature. By depositing a large amount of sand in a single operation, repeated disruption of the vulnerable seabed can be avoided. Nature will take the sand to the right place. If the Sand Motor fulfils expectations, sand replenishment off the Delfland Coast will be unnecessary for the next 20 years. The Sand Motor is the first experiment of its kind. With this pilot project, the Netherlands is continuing to set the standard in water management by actually working with water instead of against it. If the Sand Motor works as we expect, the concept can be employed in other locations around the world.



[Deltares](#)

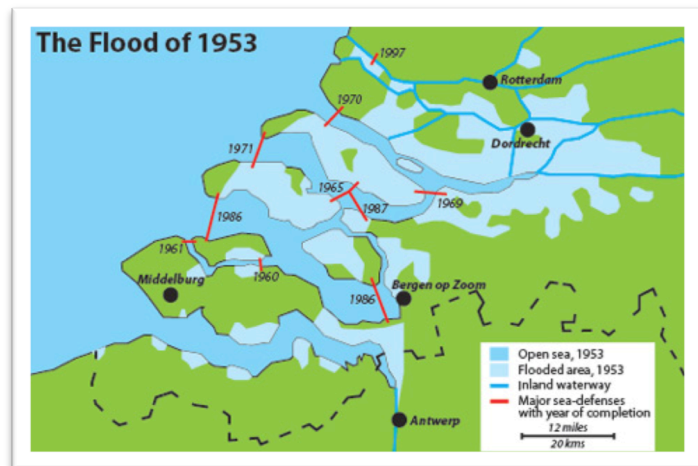
Deltares is an independent institute for applied research in the field of water and subsurface. Throughout the world, Deltares works on smart solutions, innovations, and applications for people, environment, and society. Its main focus is on deltas, coastal regions, and river basins. Managing these densely populated and vulnerable areas is complex, which is why Deltares works closely with governments, businesses, other research institutes, and universities at home and abroad. The motto of the institute is “Enabling Delta Life.” For Deltares the quality of its expertise and advice comes first.



The Flood of 1953

In 1953, the Dutch were once again confronted with the power of the sea. The colossal disaster happened on February 1, 1953. It was to be one of the biggest floods in the history of the Netherlands. What caused this flood? What were the consequences?

Within the sub-articles, you will learn what factors influenced the flood, where the flood damage occurred, and what the scope of the flood was. On the site is also a video clip with the first images from the disaster area.



For more: [Delta Works – The Flood of 1953](#)

Sequence of Events:



The Delta Works

History

Studies conducted in 1937 by Rijkswaterstaat (Department of Public Works), showed that safety in many parts of the Netherlands could not be guaranteed at times of storms and high sea levels. In the densely populated areas near the river mouths of the Rhine, the Meuse, and the Schelde, it proved very difficult to build new dikes or strengthen the original ones. The first solution was to close all the river mouths: the Western Schelde, the Eastern Schelde, the Haringvliet, and the Brouwershavense Gat. This proposal was christened “the Deltaplan.” In 1950, the first river mouths of the Brieles' Gat and the Botlek were closed. The Brielse Maas became a freshwater basin. This not only made the area safer, but it also provided Voorne with a freshwater supply. The



plan was to build the remaining dams in the following decades. Unfortunately though, the infamous flood of 1953 prevented this from happening. Nearly two thousand people died and more than 150,000 hectares of land were flooded. People soon became aware that something had to be done, and very, very quickly.

Twenty days after the flood of 1953, the Delta commission was inaugurated. The commission would give advice about the execution of the Deltaplan, which would, in the long run, increase the safety of the Delta area. Although safety was the number one priority, the seaways De Nieuwe Waterweg and the Western Schelde would have to stay open, because of the economic importance of the ports of Rotterdam and Antwerp. In order to be able to build dams in the rivers' mouths, some auxiliary dams would first have to be built in the Zandkreek, the Krammer, the Grevelingen, and the Volkerak. These dams were known as 'compartment dams', since they would divide the large area of water into multiple compartments. In 1959, the Delta Law was passed, in order to organize the construction of the dams. The building of the “Delta Works” was such an enormous project, that it was sometimes referred to as the “eighth wonder of the world” and not without good reason.

Significance of the Delta Works

Besides shortening the total length of the dikes by 700 kilometers, the Delta Works had many other advantages. Firstly, the agricultural freshwater supply was improved. Because the border between freshwater and saltwater was moved further west, less freshwater was required to balance the freshwater-saltwater division. The excess water could be transported to the north of the Netherlands, in the direction of the IJsselmeer (IJssel lake), where extra freshwater was welcomed to improve the water conditions.

Secondly, the complete water balance of the Delta area was improved. Thanks to the construction of the major and auxiliary dams, the streams in this area were able to be manipulated more easily. Different types of sluices made it possible to allow fresh water in, or polluted or excess water out.

Thirdly, the construction of the Delta Works encouraged traffic between the many islands and peninsulas. Large parts of the province of Zeeland had literally been isolated for centuries. The building of the Zeeland Bridge together with a tunnel under the Westerscheldetunnel (2003), also helped increase mobility.

Fourthly, inland waterway shipping was supported by the Delta Works. In 1976, Belgium and the Netherlands signed a contract that would regulate the shipping between the ports of Antwerp and Rotterdam. Obviously, this agreement had to be taken into account when building the Delta Works.

Lastly, the Delta Works have influenced new developments in the areas of nature and recreation. Understandably, a number of nature reserves were irreparably damaged, but as compensation, new nature reserves have emerged at different sites. Nowadays, dry shores are sometimes used as recreational areas. Whether or not nature has benefited from the Delta Works will remain an unsolved debate. However, there is no doubt over the need for durable water management, in which safety, prosperity, and nature are taken into account.

For more: [The Delta Works](#)

European Water Framework Directive

Water does not stick to national boundaries. This is why EU member states have agreed to the European Water Framework Directive (EWFD). The goal of this directive is to ensure that the quality of surface water and groundwater in Europe meets high standards (sound ecological status) by the year 2015.

The EWFD is based on a river basin district approach to make sure that neighbouring member states assume joint responsibility for managing the rivers and other bodies of water they share. To meet the 2015 deadline, water authorities in each river basin district in Europe must have agreed on a coherent programme of measures by 2009. Where a river basin district includes more than one member state, a trans-boundary management plan must be drawn up. The Netherlands is involved in management plans for four trans-boundary river basin districts: Rhine, Meuse, Scheldt and Ems.

For more: [English Summary European Water Framework Directive](#)

Notes:

Notes: