Opportunity and diversity

Dr. Philip B. Duffy
President & Executive Director

Under-representation of women in the highest ranks in science means that we’re all missing the benefits of the contributions women are not given the opportunity to make. WHRC didn’t create this problem, and we can’t totally solve it, either. It is present nearly everywhere, and its causes have roots in our larger society.

Nonetheless, we at WHRC are committed to doing what we can here to address this issue within our own institution. Recruiting is an important strategy, and probably the first that comes to mind. We hire relatively few scientists, however, and nearly all of those are at the early-career level. That means that for us, mentorship and cultivation are essential elements of our approach. These ideas and more, are an important part of our new strategic plan, and I am excited about working with staff and outside experts to implement them effectively. As a first step, we are obtaining outside advice on all aspects of Center management, including recruiting, mentoring, and diversity.

The issue of opportunities for women has a personal element for me. My mother was a scientist (a climate scientist, in fact), who clearly had the attributes needed to rise to a high level in academia. That did not happen, though, because in that era women faced severe trade-offs between family and career. I am grateful, of course, to have been the beneficiary of the choices she made—and proud of what she accomplished academically nonetheless—but I hope that my daughter (also a climate scientist—and talented, in her father’s opinion) has much better options. I can’t control that, of course, but I can influence the environment here at WHRC, and I hope that we can create one I would be happy to have my own daughter work in. If we do that, we will have succeeded.

The recent issue of our Canopy magazine illustrates some of the unique challenges women encounter in science, as well as the progress that’s been made in addressing them. It also highlights the work of one of our outstanding young women scientists, Marcia Macedo.

That issue also includes WHRC’s financial data for the fiscal year completed on June 30. I am grateful for our recent success, but keenly aware that the immediate future is extraordinarily uncertain, if not perilous. While we are working to reduce our dependence on federal research grants, they still comprise 40 percent of our annual budget. WHRC’s new strategic plan outlines a comprehensive program of income diversification that I believe can and will be successful, but we will have work to do and I expect challenges ahead.

At the same time, of course, the need for our work and the opportunities available to us have never been greater. The federal government’s willful denial of reality, and its unwillingness even to try to protect its citizens from the risks of climate change mean that non-governmental organizations like WHRC must do more. Our strategic plan continues our long-time focus on international efforts, and adds an emphasis on work here in Massachusetts. This is the right agenda for today and for the foreseeable future, and with your help we can make it happen.

Thanks as always for your interest and support.
A troubling spike in nitrogen in the Santuit River

WHRC scientists have discovered a troubling increase in nitrate near the mouth of Cape Cod’s Santuit River. The increase in nitrate over a one-mile stretch of the river was initially detected in November during routine sampling conducted by WHRC’s Cape Cod Rivers Observatory (caperivers.org).

Excess levels of nitrogen in water can cause algal blooms, loss of oxygen, fish kills, and salt marsh degradation in a cascade of effects known as eutrophication. This process plays out locally as well as globally, for example, in the dead zone of the Gulf of Mexico created by elevated nitrogen inputs from the Mississippi River. Fertilizers and septic systems are the main sources of excess nitrogen to the Cape’s waterways.

To investigate the source of the elevated nitrate in the lower reaches of the Santuit River, a team of WHRC scientists conducted a more thorough sampling of the Santuit in December. WHRC scientists entered the Santuit from a worn-out bridge on the south end, and walked upriver, taking water quality measurements every 100 meters to determine how and where nitrate increased in this short reach of the river.

“We have learned a lot already,” said Dr. Max Holmes, WHRC’s Deputy Director and coordinator of this project. “We can’t say definitely where the extra nitrogen is coming from, but it is noteworthy that a golf course borders the river in this area. Septic inputs are also possible, though it is not clear why we would see a huge septic input in this stretch of the river.”

The Santuit is one of nine rivers that WHRC samples weekly as part of the Cape Cod Rivers Observatory (CCRO). Holmes launched the CCRO 18 months ago to get a better handle on the health of the Cape’s rivers, and particularly how their health may be changing over time. These data on water quality will help establish a baseline from which WHRC can continue to monitor the impacts of environmental pollutants and climate change. Rob Stenson, a retired nurse practitioner and a member of the WHRC President’s Council, has been an intrepid citizen scientist on the project, sampling these rivers every week through the seasons to keep the data stream alive.

This style of continuous observation helps important signals cut through the noise, according to Holmes. It is difficult to discern the threat to an ecosystem without knowing first what it used to look like.

“There have been some really good focused studies on some of the streams, but nobody is doing the ongoing monitoring to be able to detect change - good or bad - over time,” he said.

WHRC’s data on the rivers of Cape Cod are poised to help land managers protect and restore these ecosystems and the estuaries into which they flow. This project is closer to home than the Global Rivers Observatory and Arctic Great Rivers Observatory, through which Holmes monitors rivers as far away as Siberia and as large as the Amazon. Under proper monitoring and management, Holmes noted, rivers like the Santuit can maintain their role in the ecosystem and thrive over the long-term.

New study finds stopping deforestation would remove 12 years of fossil fuel emissions

Stopping global deforestation and allowing secondary forests to grow would remove 120 billion metric tons of carbon from the atmosphere by the end of the century, according to a new WHRC study published this month in Global Change Biology.

That amount of atmospheric carbon is roughly equal to 12 years of fossil fuel emissions at today’s rates of usage.

“Reducing emissions of carbon dioxide is going to be difficult and take time,” said Dr. Richard Houghton, a senior scientist at WHRC and the lead author on the paper. “We will need to remove carbon dioxide from the atmosphere to avoid further warming as we make these reductions. This paper offers an estimate of how much carbon could be taken out of the atmosphere if we managed the world’s forests for that purpose.”

WHRC’s Alexander Nassikas was the other author on the paper. The findings were also featured in a policy brief released in conjunction with the COP23 climate change meetings in Bonn, Germany, last November.

The study used land-use information from the UN’s Food and Agriculture Organization and a bookkeeping model to calculate the potential negative emissions that would result from immediately stopping all forms of new land use and allowing forests to recover fully. Houghton and Nassikas found that 4.4 billion metric tons of carbon are sequestered each year when large areas of forest recovering from rotational agriculture in the tropics are included in the model.

The authors noted that this analysis looks forward into the 21st Century at what is biophysically possible, not at any calculated projection of what is most likely to occur. Still, with appropriate action and a potential cumulative sink of 120 billion metric tons by the end of the century, the study shows forests to be a valuable asset for any global strategy to reduce atmospheric carbon.
Stakeholders gather in DR Congo for WHRC workshop on low-carbon rural development

Government officials from across the Democratic Republic of the Congo (DRC) gathered last fall for a WHRC workshop to establish greenhouse gas emissions reductions programs in three key provinces, redirecting land-use towards low-carbon rural development.

The gathering, held in Kinshasa, was organized to develop a joint application to the Green Climate Fund, which was established within the UNFCCC to finance climate change adaptation and mitigation in developing countries. WHRC environmental economist Dr. Glenn Bush led the event.

“We would like to express our gratitude for the timely development of the emissions reductions proposal,” said S.E. Célestin Bolili, environment minister. "I am convinced this project concept has legitimacy for Equateur Province. "I am convinced that this project concept has legitimacy with the provincial stakeholders and that it delivers a clear strategy for the assembled partners to get our people out of the poverty that plagues them despite their immense forest resources.”

Officials from the DRC’s national environment ministry and three provincial governments attended, along with representatives from several non-profits and from the Green Climate Fund. The Congo Basin contains the world’s second largest tropical forest - after the Amazon. According to Bush, the main causes of deforestation in the DRC are slash-and-burn agriculture and charcoal production, with indirect drivers being population growth, weak governance structures, and lack of sustainable land-use management.

The workshop participants identified priorities for their Green Climate Fund proposal, including strengthening natural resource management at provincial, district and local levels, developing new agricultural systems that would reduce the need for constant clearing of primary forest, and the creation of incentives for private sector investment in land management and emissions reductions.

Bush said he was pleased high-ranking government officials attended the workshop, and that their presence showed climate change and deforestation were priorities in the DRC.

“This is a project that the people want,” he said.

WHRC in the news


Here’s Why Scientists Have Been Fertilizing the Arctic. Dr. Linda Deegan’s 30-year-long fertilization experiment to study a changing Arctic was featured in a Science News for Students article. January 4. http://bit.ly/2DM4IyW


WHRC launches project to quantify impact of climate change on investment risk

This month, WHRC launched a new project to quantify the risks that climate change poses to global financial investments. WHRC scientist Dr. Christopher Schwalm and President Phil Duffy will be co-leading the effort, along with Spencer Glendon, senior vice president and director of Global Macroanalysis at Wellington Management, an investment firm that manages over $1 trillion.

The project will identify the metrics that are particularly relevant to investor decisions, and then analyze how these metrics evolve over the next 20 to 30 years in global climate models. Visualizations of these data will help investors better evaluate climate risk in a language and timeframe that they understand.

“I am excited to use our strengths and experience in climate change research to tackle this complex problem of climate-related investment risk,” Schwalm said. “Investors need numbers to operate, not just hand-waving assessments of risk. We aim to provide those numbers.”

Also joining the team is Melissa Flores, who recently arrived at WHRC as a research assistant on the project. Flores graduated from The University of Texas at Austin in the fall of 2017 and has worked in the climate program at the World Resources Institute. She will synthesize large dataset output from global climate models in order to quantify and map the trends and patterns of those climate metrics identified as applicable to investment decision-making.

“The application to public policy makes this project particularly compelling,” Flores said. “Investors hold a lot of influence, and they can push governments to do more.”

According to NOAA, who keeps track of U.S. billion dollar weather and climate disasters, 2017 was the most expensive year on record for the United States. The cumulative cost of last year’s events, including hurricane and wildfire, amounted to $306.2 billion, easily surpassing the previous record of $214.8 billion set in 2005, the year of Hurricanes Dennis, Katrina, Rita, and Wilma.
Dr. Sue Natali’s upcoming expedition to Antarctica

In less than a month, WHRC scientist Dr. Sue Natali is scheduled to leave on an expedition to Antarctica as part of a project to help female scientists develop their leadership, advocacy, and outreach skills.

Natali was selected last year to take part in the 2018 edition of the Homeward Bound project. She will depart from Ushuaia, Argentina, for Antarctica on February 18, and will participate in leadership skills workshops, as well as programs from top Antarctic scientists, who will deliver a cutting-edge program on global climate, biological, and earth system science.

Natali is a permafrost expert and a leading authority on the impact climate change will have on the Arctic.

Homeward Bound is a 10-year effort to build a 1,000-woman global scientific network, focusing on the leadership and planning required to contribute to climate science and environmental conservation.

You can support Natali’s expedition here: gofundme.com/women-climate-leaders-to-antarctic