Perhaps the most remarkable thing about last week’s March for Science is that it should have been necessary in the first place. One would think that the many benefits of science would be manifest and beyond dispute. After all, if one recognizes science as the process of accumulating understanding by testing hypotheses against observations, then science is what has allowed humanity to progress beyond the Stone Age. If nothing else, the importance of science as a key contributor to our economic prosperity and to our military strength is normally understood and valued by members of both political parties.

But this administration is different. Its disinterest in science is reflected in the president’s proposed budget, and in leaving vacant key science-related positions in the administration. The proposed budget includes cuts to science-based federal agencies that are unprecedented in their breadth and depth. Even the National Institutes of Health (NIH), which traditionally enjoys wide support because it works to cure illnesses that affect virtually every family at some point, is slated for a massive 18% funding cut. Science-related vacancies to which no one has even been nominated include the heads of NASA, NOAA, USGS, and of course Assistant to the President for Science and Technology, to name only a few.

All of this suggests that this administration genuinely doesn’t understand the value of science. This is perhaps not surprising in light of this president’s apparent lack of appreciation for all forms of expertise. (Remember, this was the presidential candidate who refused national security briefings and claimed to “know more about ISIS than the generals” do.) Indeed, the very idea that someone with no experience in government or public service is qualified to be president implies a lack of respect for expertise.

It is also remarkable that so many people, including more than a few scientists, seem to think that it is wrong for scientists to publicly point out the value of their enterprise, because this “politicizes science.” The trouble with this position is that science is already highly politicized, and this politicization is causing great harm. John Holdren has pointed out that federal science funding is determined by Congress, which makes that a political process. But that’s only the beginning. This administration wants to promote the fossil fuel industry, to which many of its members have personal and financial ties. It does not make sense to do this if one accepts climate science: so for political reasons, climate science and...
climate scientists have to go under the bus. Under those circumstances it is appropriate and important for us to publicly defend the integrity of our work and its benefit to society. Concern about scientists engaging in politics no doubt also originates in part from fear that this will tarnish the credibility of scientists, who as a group traditionally rank highly in surveys measuring public trust. (It's unfortunate, but understandable, that engaging in politics should be associated with lack of credibility.) This concern has validity, but that must be weighed against the harm done by letting attacks on science go without a vigorous response.

In the end the decision for WHRC to march for science was easy. If we stand for one thing, it is the importance of making policy based on science. I'll march for that any day. If science is not a factor in decision-making, that creates a vacuum that too often is filled by... politics.

Thanks as always for your interest and support.

INTEGRITY continued from front...

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Last month, the MacArthur Foundation awarded a two-year grant to WHRC to develop solutions for extreme climate events in southwestern Amazonia. The project is led by Senior Scientist I. Foster Brown, who has spent the past 25 years living and working in the tri-national Acre River Basin, where recent severe droughts have burned thousands of hectares and severe floods have caused massive damage.

The tri-national region includes the states of Madre de Dios, Peru, Acre, Brazil, and Pando, Bolivia - the area known as MAP. Dr. Brown describes the project as one of “planetary stewardship,” where civil society understands how the Earth works, develops resilience to extreme climate events, and contributes to the management of the Acre River Basin.

The project involves building climate science literacy among local government officials, community leaders, schoolchildren, and university students and communicating that awareness to a broader audience through videos, publications, social media, and lectures. One important educational tool is NOAA's Science on a Sphere (SOS), which illustrates the Earth system through animation. The project will employ a new two-dimensional SOS version that simply uses a computer and projector.

According to Dr. Brown, the goal of the project is “a paradigm shift from exploiting the Amazon to taking care of the Amazon.” At the project’s outset he has found that, with the recent history of extreme events, “nobody needs convincing that we need to work on the planet. Everyone is aware that we have a planetary crisis.” Dr. Brown believes that in order to incorporate effective local action, it is necessary to build awareness that the Earth is finite, which is in turn a critical understanding for creating a paradigm shift to stewardship at both local and global levels.

Within MAP are indigenous groups that avoid contact with outsiders, one of the region's fastest growing cities, the interoceanic highway, and the increasing existence of drug cartels, all of which add to the challenge of the work. Dr. Brown is optimistic and thinks of it as “a small project trying to help save the world.”

Dr. Brown encourages long-range planning, pointing out that he will have a grandchild in 2081, a great grandchild in 2146, and a great-great grandchild in 2211. “From 1950 to 2211 are four people, two of whom already exist, with links that overlap,” he said. “We have to start thinking 150 to 200 years ahead.”
Last week, 25 WHRC scientists, supporters, and colleagues from other Woods Hole science organizations drove through the night to reach the March for Science in Washington, DC.

WHRC President Phil Duffy kicked off the bus trip by telling the travelers that the United States is experiencing an unprecedented attack on science and scientists by the federal government. He applauded the passengers for their dedication in traveling to the march.

The Washington march was the flagship event, but just one of hundreds of Marches for Science around the world. WHRC scientists also attended marches in Boston and Falmouth.

Hundreds gathered in the chilly drizzle on the Falmouth Green for the event. Colorful signs were carried by young and old, and speakers highlighted scientific achievements and the importance of the world-renowned scientific institutions of Woods Hole. The march continued down Main Street to the Falmouth Public Library for films and family-friendly activities.

“There was great energy in Boston,” said WHRC scientist Brendan Rogers.

“Clearly there are many people who care about the role of science in society and in policy. There was a lot of passion and a lot of diversity.”

During Washington’s March for Science festivities, Dr. Duffy spoke at The Nature Conservancy’s “teach-in” on the National Mall. He emphasized the critical role that science will play in making the Paris climate agreement succeed.

“For the agreement to succeed, we need international diplomacy, it turns out we need advocacy here at home, and we need a lot of science,” Duffy said. “Is 2 degrees of warming too much? Is 1.5 degrees a better target? How do we answer that question? We answer that question of course through science. We need to better understand the critical thresholds and tipping points.”

Dr. Duffy told the crowd that science is also needed to craft adaptation measures and to manage forests and soils to pull carbon out of the atmosphere.

Despite a driving rain that persisted throughout the day, the marchers gathered for a five-hour rally that featured Bill Nye, the musician Questlove, climate scientist Michael Mann, and former UN climate chief Christina Figueres.

“We’re here to stand up for science and to stand up for what is right,” said WHRC’s Alexander Nassikas, as he stood in the shadow of the Capitol Building at the end of the march.

The National Academy of Sciences has announced the formation of a committee to study carbon dioxide removal (CDR) from the atmosphere (http://bit.ly/2oJENe4). WHRC’s Richard Birdsey has been named one of seventeen committee members, whose task will be to “develop a detailed research and development agenda needed to assess the benefits, risks, and sustainable scale potential for carbon dioxide removal and sequestration approaches and increase their commercial viability.”

Over the course of 20 months, the committee will consider varied scientific approaches for CDR, such as land management, direct air capture, accelerated weathering, bioenergy with capture, geologic sequestration, and blue carbon (carbon captured in coastal and ocean ecosystems). The committee will also assess the costs and benefits of a research and development program for implementing each approach it recommends.
Washington, DC

Boston, MA

Falmouth, MA
Laboratory analysis is a critical part of WHRC’s mission to understand the causes and effects of climate change. This winter, the WHRC lab has been busier than ever thanks to the work of new staff members and an upgrade in equipment.

Located on the third floor of the Woodwell Building, the WHRC lab houses instruments for processing soil, vegetation, and water samples. Over the past year, WHRC has purchased equipment to expand the capabilities of the lab, enabling cutting-edge scientific analyses. The results provide vital information about environmental changes based on field work samples from New England to Alaska.

Lab Manager and Research Assistant Ludda Ludwig uses the lab to process soil samples and frozen permafrost cores collected from the Yukon Delta National Wildlife Refuge in Alaska. She measures carbon dioxide and methane concentrations in the cores in order to quantify greenhouse gas emissions from thawing permafrost in the rapidly warming Arctic.

Dr. Jonathan Sanderman uses the lab’s FTIR, a spectrometer that quickly assesses the organic composition of soils. Using predictive models, he correlates the machine’s readings with the results of more time-consuming procedures, allowing complex soil properties to be measured in a matter of seconds.

Many other researchers have been in and out of the lab. Research Assistants Lindsay Scott and Hillary Sullivan joined WHRC last year and have been transitioning their previous lab work to WHRC’s in-house facilities. Anya Suslova works on WHRC’s Cape Cod River Observatory to monitor water quality using the lab’s UV Spectrophotometer. The WHRC lab is also frequented by scientists from neighboring institutions who utilize such instruments as the Atlas Suntest, which measures how organic compounds degrade when exposed to sunlight.

The lab will be a hub of even greater activity this summer, when Polaris Project college students return from the Yukon River Delta to process their soil and water samples. The students have the freedom to choose their own projects, but they will not be limited by the lab’s capabilities. A lot of work will be done prior to their arrival. “We are now set up to do most relevant biogeochemical analyses,” said Ms. Ludwig.

WHRC plans to continue improving its state-of-the-art laboratory facilities. In the coming months, a new gas chromatograph will be added to the lab, allowing researchers to obtain direct, accurate measurements of greenhouse gas concentrations from field samples.
Save the Date  Friday, July 28, 2017

Science Under the Stars

Cocktails ☆ Dinner ☆ Music ☆ Science

Woods Hole Research Center

For information about tickets or sponsorship opportunities, please contact Beth Bagley at ebagley@whrc.org / 508-444-1517