



Canopy

THE MONTHLY NEWSLETTER OF THE
WOODS HOLE RESEARCH CENTER

OCTOBER
2014

WHRC in the News

Dr. Houghton Accepts ICCG Award in Venice.

On October 2, Dr. Houghton attended the International Center for Climate Governance (ICCG) award ceremony in Venice, Italy, and received the award for WHRC as the top-rated think tank active in the field of climate change economics and policy. Dr. Houghton accepted the graceful Murano glass sculpture and delivered a speech entitled, "Beyond REDD+: What management of land can and cannot do to help control atmospheric CO₂." http://iccgov.org/newsletter/2014/events/international-lectures/invitation_lecture_2014-10-02-en.html

The Woods Hole Research Center is an independent research institution where scientists investigate the causes and effects of climate change to identify opportunities for conservation, restoration, and economic development around the globe. Learn more at <http://www.whrc.org>.



A Vision After Venice

Dr. Richard Houghton, Acting President

My reward for going to Venice to receive the ICCG award for the most influential think tank on climate change was not the motor launch ride through the canals of Venice at 8 o'clock in the morning or bringing home the graceful glass sculpture that came, surprisingly, with the award, but the question I was asked by a student at the end of my acceptance speech. The question seemed mild at the time of asking, and it wasn't until two sleepless travel days later that I knew the real answer.

The question/comment was, "Your idea for stabilizing the concentration of CO₂ in the atmosphere while transitioning from fossil to renewable forms of energy, is based on the assumption that the carbon sinks on land and in the ocean will continue." "Of course," I agreed, "and it's an assumption that I am not very confident about. I would expect those sinks to have declined already, when, in fact, they have only grown in proportion to the emissions of carbon to the atmosphere."

But the real answer that I not only missed the opportunity to present, but didn't even have in my mind, is, "Of course. The assumption that the sinks will continue may not be valid, but what's the alternative?"

What is the alternative to reducing emissions of carbon from fossil fuels? In theory, we could capture the CO₂ released from smoke stacks and tail pipes and sequester it in underground, geological formations (Carbon Capture and Storage), but geologists are far from united that such storage is feasible

or long-term. The process is energetically expensive, and the CO₂ might leak back out to the atmosphere. There are other geo-engineering schemes, as well, but the risks and our ignorance of the effects make them seem like science fiction, or worse, like flights of fancy that keep us from addressing the real problem: how to live sustainably within our means.

The other alternative to moving to a low-carbon economy is to let climatic disruption play out its course. That's the course we're on – continuing as usual. We're headed for a 4°C warming by the end of the century, and look at the storms, droughts, and floods we've had with a warming of less than 1°C.

No. The alternatives to moving to a low-carbon economy are not a burned-up planet or a planet with an ingenious fix for keeping our fossil fuel interests intact. There is no alternative. And if past rates of carbon uptake by land and oceans don't continue into the future, we're fried anyway.

The idea of planting trees instead of cutting them down, which is, of course, the idea of managing ecosystems to take CO₂ out of the atmosphere, may seem hokey and not very high-tech, but it is something we know how to do. It's part of the solution. It's the part that's essential for keeping the concentration of CO₂ from continuing to increase while we're getting out of the fossil fuel business.

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Dr. Johan Rockström selected as 2014 recipient of the Lawrence S. Huntington Environmental Prize. The award recognizes leaders in the public or private sector who advance and promote research and communication on climate, Earth sciences and conservation. Dr. Rockström will accept the award at a ceremony in New York City in November.

New Publications

Postdoctoral Fellow **Brendan Rogers** co-authored an article demonstrating how remote sensing can be utilized to measure carbon emissions from boreal forest fires. The article, entitled "Quantifying fire-wide carbon emissions in interior Alaska using field measurements and Landsat imagery," was published in the *Journal of Geophysical Research: Biogeosciences*. <http://onlinelibrary.wiley.com/doi/10.1002/2014JG002657/abstract>

Research Assistant **Kevin Guay**, Drs. **Scott Goetz** and **Alessandro Baccini** and colleagues co-authored an article entitled "Vegetation productivity patterns at high northern latitudes: a multi-sensor satellite data assessment" that was published in *Global Change Biology*. <http://onlinelibrary.wiley.com/doi/10.1111/gcb.12647/abstract>

A Vision After Venice ...continued



We can only pack so much carbon onto land in trees and soils before it's essentially full. Doing so while developing renewable technologies and infrastructure for replacing fossil with renewable energy is part of the solution for ending further climatic disruption. It may be hokey, but it's also cheap and something at which we've had centuries of practice. There are difficulties and risks (perhaps the subject of another e-newsletter), but the alternatives are worse. We have little to lose by restoring the Earth with trees and productive soils and much to gain.

Thank you, Venice and the International Center for Climate Governance, for recognizing the Woods Hole Research Center and for helping frame in my mind the importance of carbon management on land.

ICCG Award photo by Christy Lynch Designs

Focus: Ekaterina Bulygina

Ekaterina Bulygina came to WHRC in 2005 to run what was then primarily a soils laboratory. Today, she manages the WHRC Luce Laboratory of Environmental Chemistry where she works with scientists to analyze water, soil samples and permafrost cores.

When she arrived at WHRC, the lab contained three pieces of equipment. Now the lab is home to many devices with exotic names like the SHIMADZU TOC-Vcph TNM, UV-1800 Spectrophotometer, HORIBA Fluoromax-4, ASTORIA Analyzer, ATLAS Suntest XLS, and BIOTEX

PowerWave XS2. These instruments are used to determine the content of carbon, nitrogen or nutrients in samples from soils, rivers, permafrost and oceans.

Beyond her laboratory skills, Ms. Bulygina has been an invaluable asset for WHRC's Siberian arctic work, serving as laboratory support, den mother, travel adviser and translator. She and Dr. Max Holmes have had many exciting adventures involving multi-day rides on the frozen Lena River, and dark winter snowmobile rides through boreal forests and the arctic tundra to rendezvous with remote reindeer herders.

During the summer of 2014, Ms. Bulygina was part of a delegation that traveled to Moscow with the Yukon River Inter-Tribal Council (YRITC), a sector of the Network of Indigenous Knowledge (NIK). NIK is an international non-governmental organization with a focus on watersheds and the people who rely upon them. NIK seeks to integrate indigenous knowledge and modern science by connecting native peoples and scientists confronting the climate crisis and environmental degradation. On this trip, Ms. Bulygina worked with Jon Waterhouse, Director of YRITC, National Geographic photographer Mary Marshall, and YRITC's Jody Insker.

Ms. Bulygina has a master's degree in Ecology and Hydrobiology from Moscow State University. Before coming to WHRC, she was with the Upstate Fresh Water Institute in Syracuse, NY.

For more information about YRITC, see <http://www.yritwc.org>



Ekaterina Bulygina

WHRC Names Philip Duffy Next President

Woods Hole Research Center named Dr. Philip B. Duffy as its next president. Dr. Duffy is a national leader in climate science and policy and brings considerable breadth and depth of expertise in climate change to the Center. Dr. Duffy will begin his tenure as WHRC president in January of 2015. <http://whrc.org/news/pressroom/PR-2014-Oct-08-WHRC-Director.html>

President Designate Philip Duffy



REDD Summer School

In the first week of September, WHRC was invited by the government of the Democratic Republic of the Congo (DRC) to describe lessons learned from reducing deforestation and degradation (REDD) programs in Central Africa during a week-long “REDD Summer School” program in Kinshasa. The meetings brought together provincial and national government officials, civil society groups, academics and representatives from the private sector. The purpose of the meeting was to exchange and share field experiences on how the DRC REDD program, initiated in 2009, is progressing and what more needs to be done to reduce deforestation in the most effective way.

Projet Equateur, WHRC’s REDD project in the Congo, was represented at the Kinshasa meetings by Technical Assistant Joseph Zambo and Project Manager Melaine Kermac. Both Mr. Zambo and Mr. Kermac were encouraged by what they saw as growing political support for REDD in the DRC. No less than six governmental ministers were in attendance, including representatives from the Ministries of Agriculture, Land Rights and Energy.

WHRC’s Projet Equateur is a unique REDD project, because it is the only Congolese project initially conceived of within the context of REDD. In addition, it approaches REDD as a means rather than an end to stimulating a green economy. The most critical factor in WHRC’s program is the community engagement model *free prior and informed consent*, or FPIC, which is the principle that offers a community the right to give or withhold its consent to proposed projects that affect their lands. For Projet Equateur, this has taken the initial form of participatory workshops to engage and educate community members about their forest capital.

Through this process, WHRC has discovered that the ever increasing demand for food combined with the absence of technical and institutional capacity, demands a highly flexible and responsive REDD program for success in the DRC.

While the goal of reducing deforestation in the Congo will be a long process involving the engagement of more national and international stakeholders, the Projet Equateur team is confident it can be achieved.



Melaine Kermac



Senior Scientist **Mike Coe** co-authored an article examining the relationship between deforestation, climate and hydrology. The article, entitled “Feedbacks between deforestation, climate, and hydrology in the Southwestern Amazon: Implications for the provision of ecosystem services,” was published in *Landscape Ecology*. <http://research.mblwhoilibrary.org/works/40103>

Research Associate **Marcia Macedo** co-authored an article published in *Environmental Research Letters*, which describes as the title suggests, “Multiple pathways of commodity crop expansion in tropical forest landscapes.”

Recent Grants

Tom Stone was awarded a grant from the Cape Cod Five Foundation in support of the Ocean Acidification Conference to be held on October 20 in New Bedford, MA. <http://whrc.org/news/pressroom/PR-2014-Oct-20-Ocean-Acidification.html>

Dr. Mike Coe was awarded a grant from the Brazilian National Science Council to expand research and policy outreach on the effects of agricultural expansion in Brazil.

Promotions

Dr. Patrick Jantz was promoted from Postdoctoral Fellow to Research Associate II.

Kevin Guay was promoted from Research Assistant I to Research Assistant II.

Ecology as Cause and Cure

Economics and politics pretty much dominate the news and the daily conversation until wars or drought take over. And between the Middle East and Southern California, with small diversions to West Africa and Australia, wars and drought pretty much have it all right now. Politics and economics are closer to victims than cures. Our business, Ecology and Environment and Laws of Nature, seems to slip totally out of sight.

Except that wars and drought each amplify the other's misery and both have roots in ecology as cause – and cure! The climatic disruption is following its predicted course, drying out the continental centers, forcing people off the land, stirring unrest and destabilizing millions. No question, it has contributed to the quagmire of the Middle East as those lands have become parched and less and less habitable, even as Mexico and our own Southwest including California shrivel.

The cure? Obviously, a rapid definitive shift away from fossil fuels to reduce the heating of the atmosphere. But then what? The climatic disruption has no cure without close attention to the management of land and forests, especially all of the forests and all of the normally forested land restored to forest and storing billions of tons of carbon annually. No other factor has the potential for reducing the hemispheric burden of carbon dioxide by 1-2% in a few months seasonally and, through respiration, restoring it again in weeks. No other factor controls water flows in drainage basins as powerfully as the natural forests.

Cures require a plan. A century-long return to 300 ppm of CO₂ in the atmosphere will bring the Earth to a stabilizing, verdant biosphere – potentially the pride, and salvation, of each in habitant.

–George M. Woodwell, WHRC Founder



Woods Hole Research Center
149 Woods Hole Road
Falmouth, MA 02540
508-540-9900
www.whrc.org

