



MONTHLY NEWSLETTER
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WOODS HOLE RESEARCH CENTER



Don't like big government? Act now to stop climate change.

Dr. Philip B. Duffy
President &
Executive Director

Among the many parallels between COVID-19 and climate change is that both are apt to bring us big government and loss of liberty.

Naomi Orkeskes and Eric Conway's groundbreaking book *Merchants of Doubt* showed that opposition to "big government" is behind a lot of climate change denial in the US. Deniers cynically sow doubt about climate change (its reality, human origins, seriousness, and the feasibility of stopping it) because they fear that solutions will involve government interference in free markets, like subsidies for renewable energy, and intolerable restrictions on basic individual liberties, like having to drive an efficient car or use LED light bulbs. The effectiveness of this strategy, which is modeled on successful campaigns to limit government policies on tobacco, acid rain, and other perils, is a big part of why we haven't had strong federal climate policies in the US.

This approach is misguided on several levels. To begin with, climate change is the result of a market failure—polluters don't pay the cost of disposing of greenhouse gases in the atmosphere. In addition, fossil fuels are heavily subsidized in various ways, more than renewable energy is. The foundational solution to climate change—carbon pricing—actually corrects that market failure. It is also becoming clear that the economic harms from climate change itself will soon be worse than those from the policies needed to stop it.

But there is a bigger problem: one of the many lessons we can learn from coronavirus is that the longer we ignore a looming global threat, the more certain it becomes that the eventual solution will involve a massive dose of big government and loss of liberty. Many were horrified at China's authoritarian response to the outbreak, but here in the U.S., we've seen measures that a couple of months ago would have been unimaginable — restrictions on travel and public gatherings, and now, most Americans being told to stay home except for special circumstances. Recently decried on the presidential campaign trail as socialism, we now have government-funded sick leave and family leave, even some amount of free health care.

These previously inconceivable measures have been taken because the only alternative is calamity. If we continue to ignore climate change, we're going to get to a similar place, where more and more restrictive measures will be needed

ACT NOW *continued on next page*



Study: Drying Brazilian forests are climate harbinger

Climate change is already creating sizable shifts in the forests of northeast Brazil's Caatinga region, with much greater changes still to come, according to a new study led by WHRC scientist Dr. Andrea Castanho and published in *Environmental Research Letters*. Co-authored by WHRC scientists Drs. Michael Coe, Paulo Brando, Marcia Macedo, Alessandro Baccini and Wayne Walker, the finding has important implications for forests worldwide.

The study of Brazil's Caatinga region, which is the world's largest, seasonally dry tropical forest, combines an exhaustive compilation of field data, landmark biomass estimates from Drs. Baccini and Walker, and historical and future climate data to quantitatively link climate, plant physiognomy, and biomass. The study finds that from 2008–2017, more than 90% of the region shifted to a dryer climate space compared to the historical reference period of 1950–1979.

STUDY *continued on next page*

WHRC is an independent research organization where scientists study climate change and how to solve it, from the Amazon to the Arctic. Learn more at www.whrc.org.

to control the problem. If we don't implement effective carbon pricing soon, for example, we'll eventually need to simply ban fossil fuel use entirely. Among other things, that would bring a halt to activities in difficult-to-decarbonize sectors like aviation, shipping, and heavy industry. And there's no vaccine for climate change—no easy, universal, inexpensive solution—so those restrictions would last until we figure out how to power those sectors without emitting carbon.

Coronavirus is inevitably and appropriately “taking up all the oxygen” now. But this presents the opportunity to drive home important lessons which apply to climate change: Unfolding global-scale crises need to be addressed forcefully, early on, using policies based on science, and within a framework of transparency and global cooperation. A massive mobilization of public and private resources is needed. We also need to learn that it's essential to invest in and nurture our scientific capabilities and infrastructure. If we don't, those capabilities won't be there to help us when the next emergency comes. And as I have said, perhaps the most important lesson we might learn is that truly terrible things can happen on a global scale. At WHRC, we're broadcasting these lessons, and also pushing for the next round of stimulus funding to include measures to advance progress against climate change.

Thanks as always for your interest and support.

“There's a direct link between biomass and climate—if you know what the climate is, you have a really good idea of what the biomass is going to be. What we saw was that for more than a decade, it's been drier than normal. Climate models predict a continuing trend to drier conditions in this region in coming decades, and that will lead to a shift away from current forests toward reduced biomass ones,” said Dr. Castanho.

According to the new work, thorn woodlands or non-vegetated areas could dominate the Caatinga region by the end of this century. That would translate to a 30-50% decrease in above-ground biomass and a corresponding drop in the amount of carbon absorbed by the ecosystem.

“This study has huge ramifications not just for the region but for the world. Forest biomass is not going to remain static in the face of changing temperatures and precipitation. Forests will change and probably fairly rapidly. We have to account for that when we are calculating the impact on greenhouse gas emissions and climate,” said Dr. Coe. “Additionally, at the local and regional level, this research can help improve micromodels of local vegetation and species and how they interact with climate.”

This research was supported by both the US National Science Foundation (NSF) and the Brazilian NSF. You can support research like this by going to [WHRC.org/donate](https://whrc.org/donate) and designating the WHRC/IPAM Amazon Fund as your recipient.

Broadening the scientific pursuit of global carbon

WHRC scientist Dr. Richard Houghton hopes to make the land-based changes of carbon in annual budgets more accessible. The goal of a new review article, published in *Global Change Biology*, is to help researchers from different parts of the

scientific community better understand what's in carbon budgets, and where they could contribute new insights.

The annual budget from the Global Carbon Project (GCP) is an accounting of carbon moving into and out of the atmosphere as a result of both natural and human processes, including fossil fuel burning and land use changes. In the case of the latter, the budget focuses on net fluxes—how much carbon is released or absorbed by terrestrial systems—but Houghton argues the “gross components” of those systems need more attention.

“The question that's puzzled the climate science community for years now is, where's the big terrestrial carbon sink? Why isn't atmospheric carbon rising as fast as emissions would indicate? And

there are other unanswered questions that WHRC is working on, like is permafrost a bigger source than first thought? Is carbon fertilization a bigger sink than we know? I'd like help from terrestrial ecologists in solving those puzzles,” said Dr. Houghton.

Understanding the processes that drive carbon uptake by land-based ecosystems is critical to gauging the potential of these systems in combating climate change and how that could be altered by land use decisions and by climate change, itself.

“There aren't many people in the world with Dr. Houghton's depth of knowledge, decades of experience, and willingness to invest this time to bring scientists together to try to answer climate science's toughest questions,” said WHRC President Dr. Phil Duffy.



New CARES Act's implications for charitable donations

The recently-passed CARES Act has tax implications for charitable contributions made in calendar year 2020. For those who don't itemize, it allows up to \$300 in charitable contributions to qualified charities, and for those who do itemize, it increases the cap on annual giving from

60% of adjusted gross income to 100%. The CARES Act also raises the annual limit on corporate giving from 10% to 25% of taxable income. To learn more about giving to WHRC, contact Chief Development Officer Leslie Kolterman at lkolterman@whrc.org or 508-444-1584.



Kaneb Speaker Series goes online during COVID-19

With most of America under instruction to help limit the spread of the coronavirus by staying home, WHRC has moved spring speaker events online, launching the Kaneb Webinar Series. Each week, speakers are presenting key climate science topics in a way that's educational and understandable for all ages.

"As this pandemic has forced us to close our schools, museums, and other places of learning, we wanted to give Americans new opportunities to engage with this important issue. The climate crisis is as pressing as ever, and our scientists continue to study climate change and develop solutions - even while working from home. We hope this speaker series helps people keep their connection to science, and to each other," said Dr. Heather Goldstone, WHRC Chief Communications Officer.

The first event on April 1, *Climate Change in the Era of COVID-19*, was watched by nearly 400 people. It was followed on April 8 by *Can Tapirs Help Restore Amazon Forests?* Other events include *The Stories Rivers Tell*

presented by WHRC Deputy Director Dr. Max Holmes on April 15 and an Earth Day Special on April 22. See the full schedule and register by going to WHRC.org and clicking on upcoming events.

The webinar series is one of many ways WHRC is responding and adapting to the coronavirus pandemic. WHRC scientists and staff have been working from home since mid-March, when President and Executive Director Phil Duffy, following the advice of public health officials, closed the Falmouth campus indefinitely. With WHRC's laboratory shut down and protective equipment in short supply, WHRC donated 2,300 gloves to Falmouth Hospital.

Dr. Duffy has been featured speaking about COVID-19's climate connection and the donation on *PBS NewsHour*, NBC Boston, WBZ-TV/CBS Boston, WCAI's *The Point*, and other outlets.

"The COVID-19 pandemic is an extraordinary public health emergency



and our thoughts are with its victims and the medical professionals working tirelessly to respond. Overcoming it will require strong leadership, preparation based on mathematical modeling of future scenarios, international cooperation, and a massive mobilization of public and private resources - all things we also need to confront the climate crisis," said Dr. Duffy.

As highlighted in the first webinar and comments to the media, if there is a silver lining to the COVID-19 crisis it could be the collective realization that the unimaginable can happen, and that we are capable of dramatic action.

Leslie Kolterman joins WHRC as Chief Development Officer

Woods Hole Research Center has welcomed Leslie Kolterman as its new Chief Development Officer. Kolterman began in March and oversees the development team.

Kolterman brings extensive experience in fundraising to support scientific research. Most recently, she served as Director of Development for McLean Hospital. Prior to that, she held various roles at Boston University School of Public



Health, Tufts University School of Medicine, Harvard Medical School, and Brigham and Women's Hospital.

"I am passionate about the role that philanthropy can have in moving research forward to catalyze real change and solutions to combat climate change. I look forward to building on WHRC's strong

tradition of supporter events and our outside-the-box partnerships, such as our work with financial management firms

to better understand climate risk," said Kolterman.

Alison Smart, who had overseen development, is now Executive Director of Probable Futures, the new project of WHRC Senior Fellow Spencer Glendon. Smart will continue to advise WHRC as a Senior Fellow.

"I am excited to have Leslie as a key member of our team at WHRC. At this critical moment I am especially grateful to have someone with her depth of experience to lead our development department," said WHRC President Dr. Phil Duffy.

In the news : highlights

Could COVID-19 Lead to a Cleaner World? WhoWhatWhy.org quotes Phil Duffy. April 7

As the world stays home, will the environment improve? *PBS NewsHour* interviews Phil Duffy. April 4

Game changer? Antarctic ice melt related to tropical weather shifts: Study. *Mongabay* quotes Jennifer Francis. April 1

Don't Lose Sight Of Climate Crisis, Says Heather Goldstone. WGBH-FM Boston Public Radio features Heather Goldstone. March 31

Climate Change and COVID-19. WCAI's *The Point* interview with Phil Duffy. March 26

Empty labs, abandoned research: Coronavirus puts climate science on hold. *Grist* quotes Max Holmes. March 27

Snow Parched Scandinavia. NASA Earth Observatory quotes Jennifer Francis. March 24

Arctic permafrost moving toward crisis, abrupt thaw a growing risk: Studies. *Mongabay* features Sue Natali. March 18

Letter: Preserving the Planet 101. *Salem News* quotes Phil Duffy on COVID19-climate connection. March 18

Beyond the new coronavirus pandemic: governance and essential services. *A Gazeta* (Acre, Brazil) op-ed co-authored by Foster Brown. March 17

Commercial Real Estate "Grossly Unprepared" For Climate Change. *Commercial Property Executive* features Spencer Glendon. March 10

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