

11,000 scientists declare a climate emergency

World Scientists' Warning of a Climate Emergency

FREE

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A correction has been published:

[BioScience, Volume 70, Issue 1, January 2020, Page 100, <https://doi.org/10.1093/biosci/biz152>](https://doi.org/10.1093/biosci/biz152)



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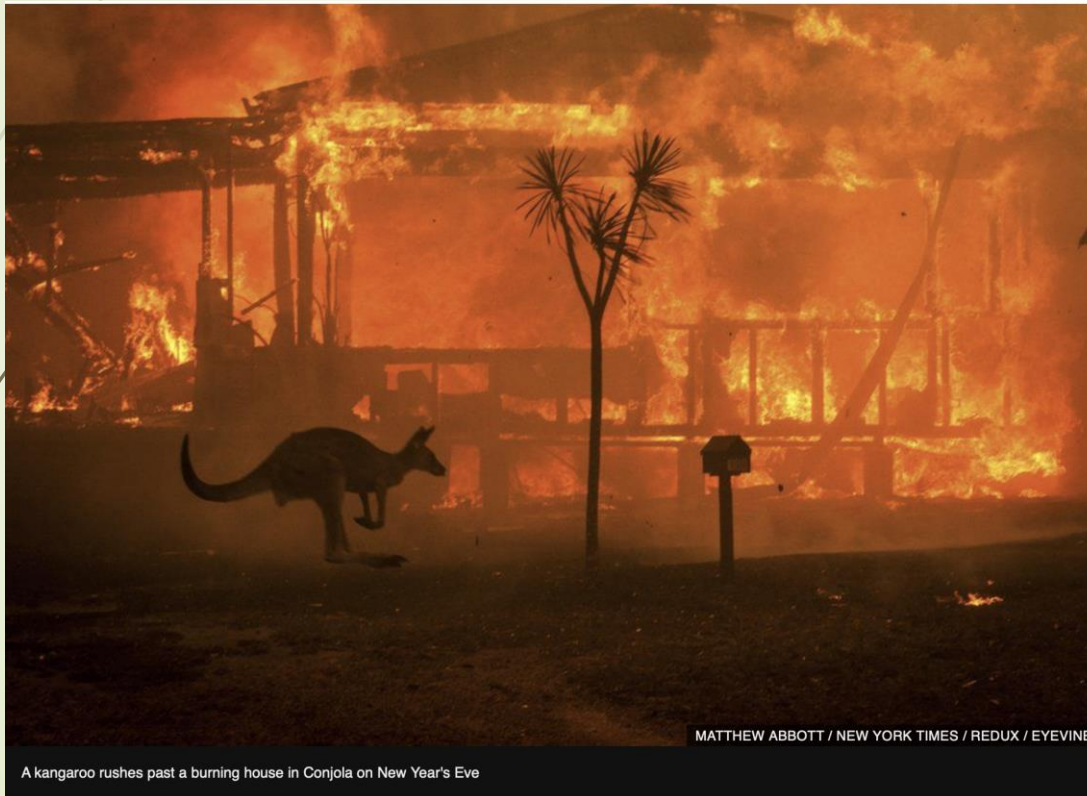
Scientists have a moral obligation to clearly warn humanity of any catastrophic threat and to “tell it like it is.” On the basis of this obligation and the graphical indicators presented below, we declare, with more than 11,000 scientist signatories from around the world, clearly and unequivocally that planet Earth is facing a climate emergency.

BioScience

ACCURATE CARBON
ACCOUNTING IS AS
ESSENTIAL TO SUCCESS
AS THE MEASURES WE
IMPLEMENT

William R Moomaw
Tufts University
Board Chair Woods Hole
Research Center

Global warming is reaching levels at which forests and other natural systems cease to be allies

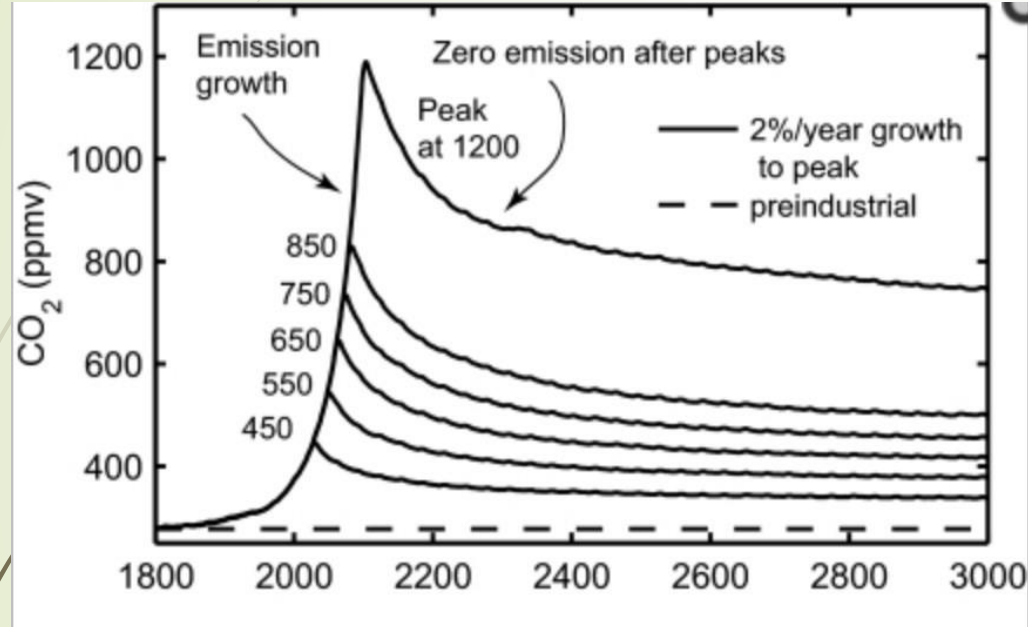


Forest loss to wildfires releases CO_2 & Black Carbon

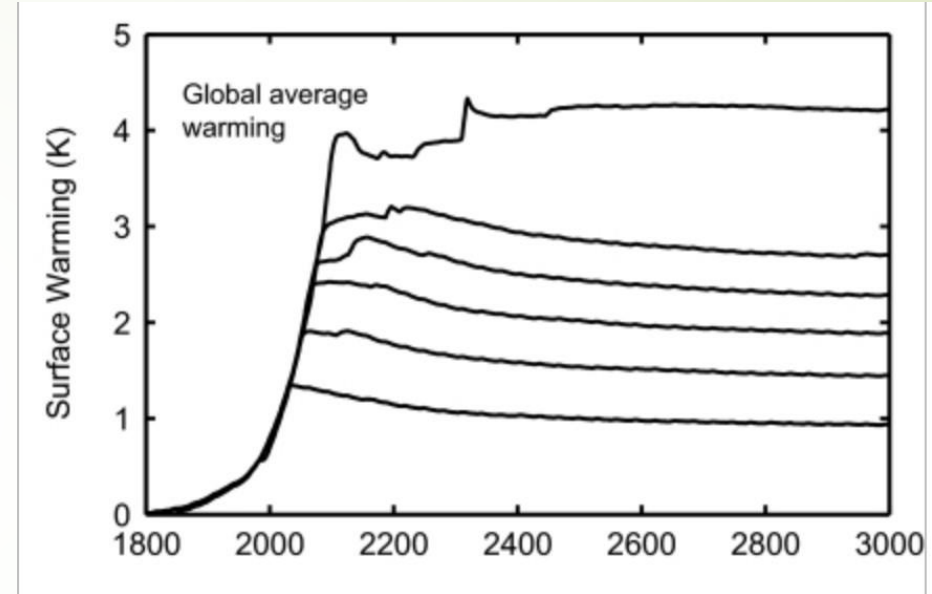


Thawing permafrost releases CO_2 & CH_4

↴ CO₂ ppm



↴ Global average warming



Urgent action is needed to limit and reverse the growth of heat trapping gases in the atmosphere

Intergovernmental Panel on Climate Change Special Report *Global Warming of 1.5°C*

October 8, 2018



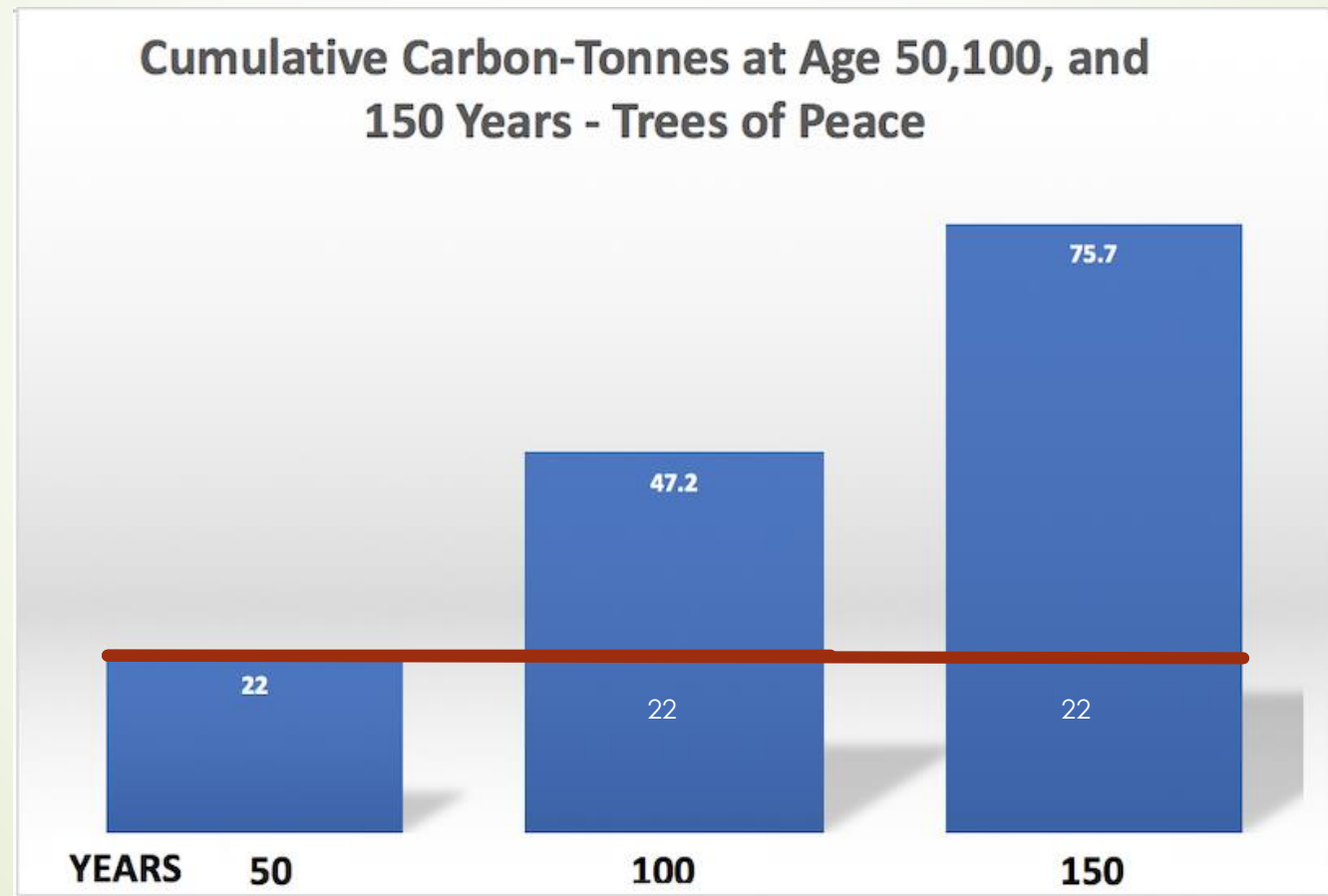
To keep temperatures from rising excessively
“... global **net** anthropogenic carbon
dioxide emissions (must) decline by about 45%
from 2010 levels by 2030 ... reaching **net** zero
around 2050 ...”

**Must simultaneously reduce combustion emissions
and decrease atmospheric carbon dioxide by
forest growth immediately.**

**Continue to lower Concentrations below current
levels to 350 ppm or lower after 2050**

Moomaw 2020

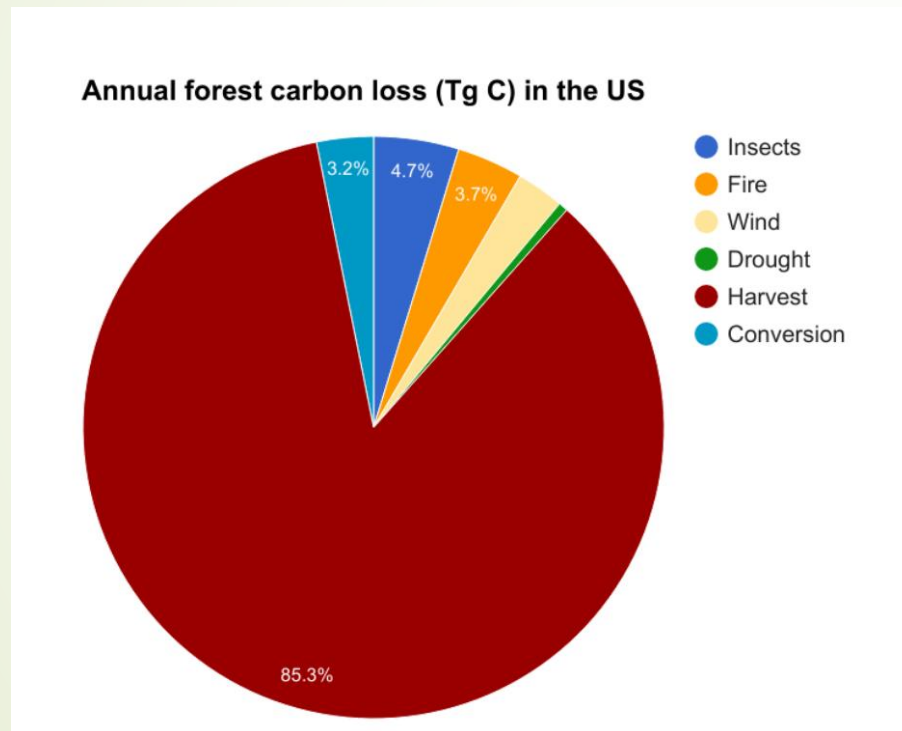
Dynamics of carbon from repeated harvests for lumber or bioenergy



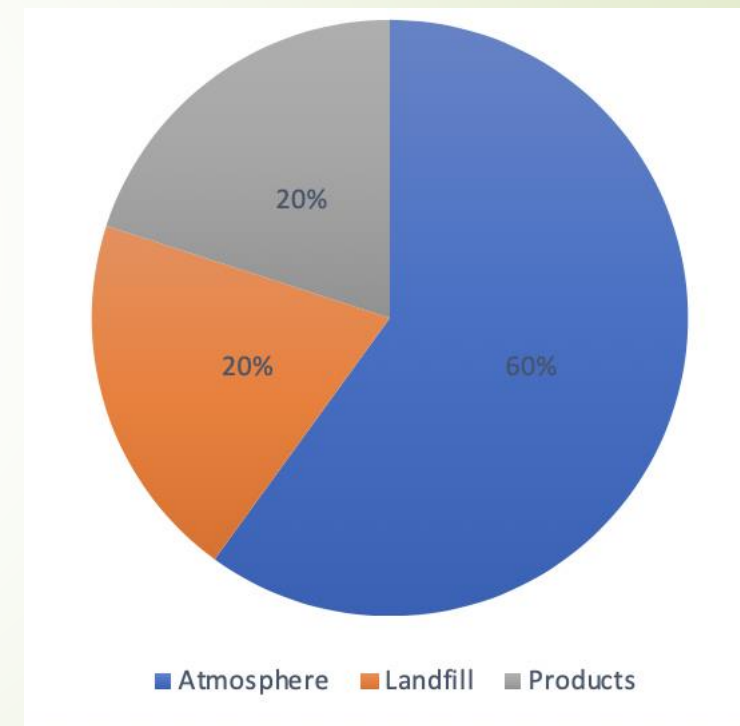
Tons
per
acre

Proforestation –
Letting forests grow
to their ecological
capacity to store
carbon and reach
its biodiversity
potential

Emissions from Harvesting US 2016 (Harris et al, 2016)



Carbon from Oregon After 115 years (Hudiburg 2019)



Estimates of carbon storage in wood products is overestimated between 2-100-fold (Harmon, 2019)

Direct Emissions from Forest Bioenergy

Southeast U.S. harvested for wood pellets to replace coal in Europe



- Global emissions from forest bioenergy **adds 4-5% to global fossil fuel CO₂ emissions**
- Particulate air pollution from bioenergy is especially harmful to human health
- **STOP Subsidizing Forest Bioenergy!**



Wetland forests: “Enviva suppliers take extra care by using specialized harvesting equipment and techniques that minimize environmental impacts and protect soil and water quality”

<http://www.envivabiomass.com/faq-forests-fiber-sourcing/#wetlands>

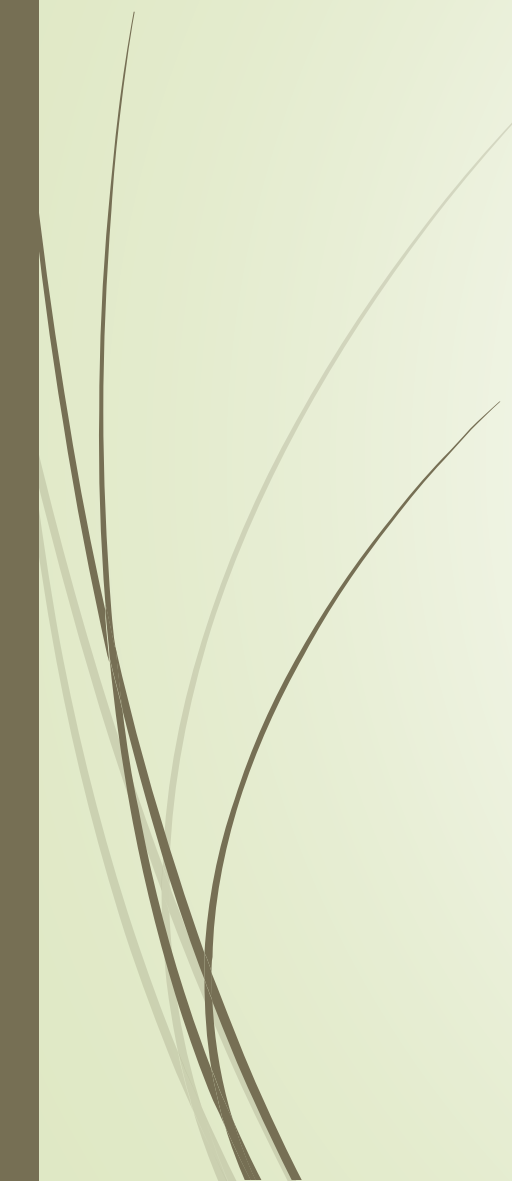


Lands in North Carolina harvested to supply wood pellets for Europe



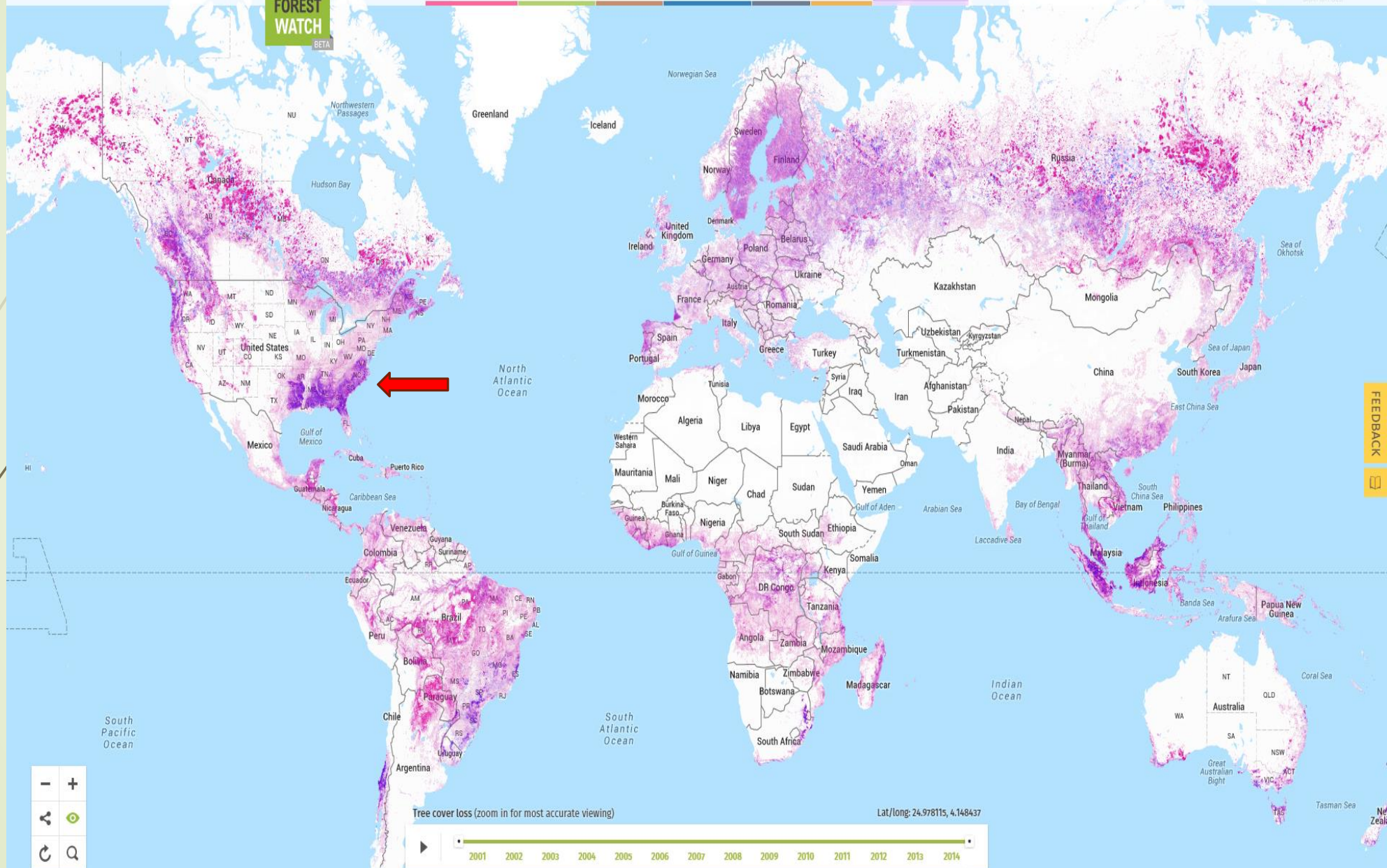
IPCC AR 5 WG 3 11.13.4

GHG emission estimates of bioenergy

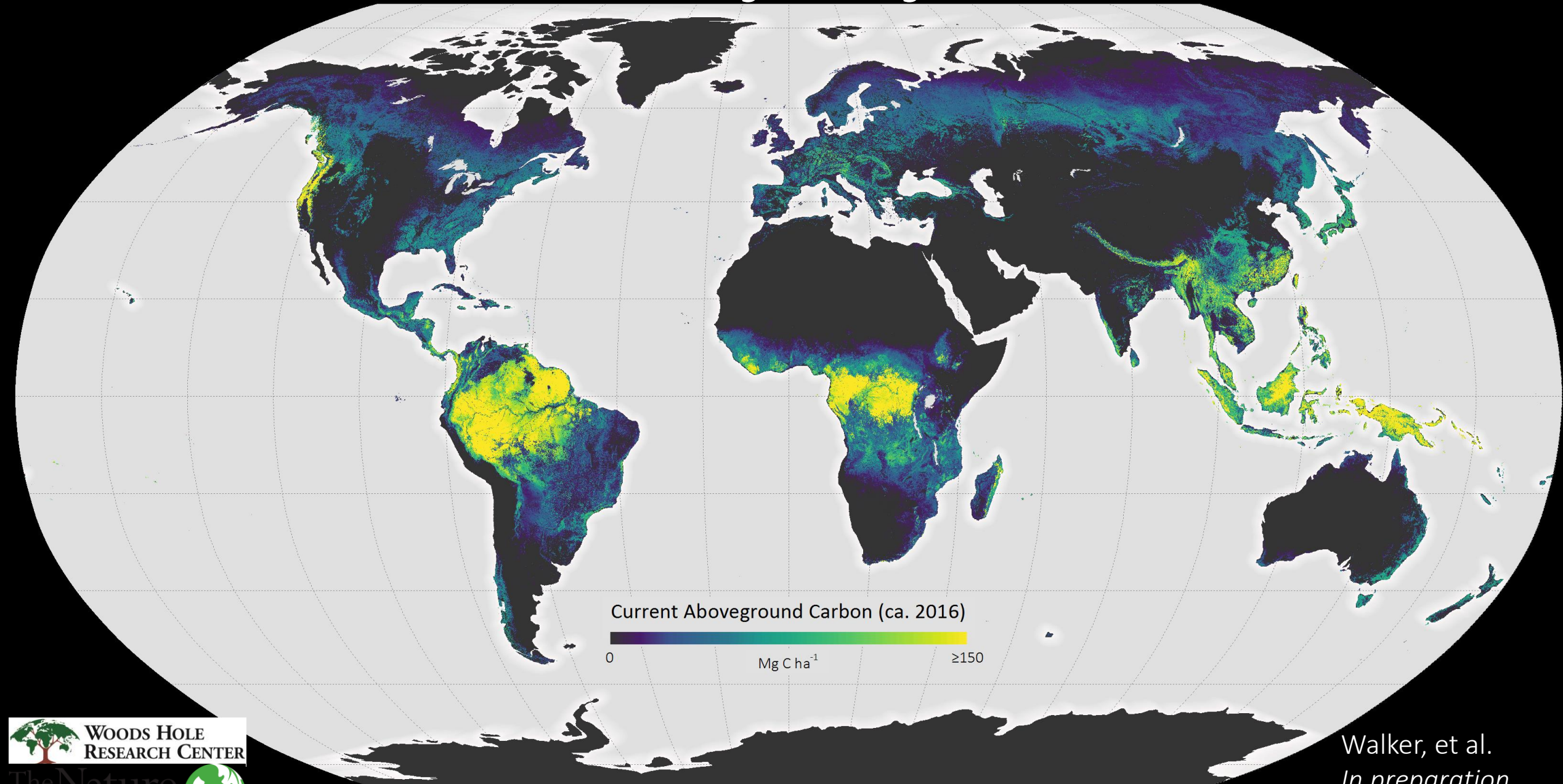
- “The combustion of biomass generates gross GHG emissions roughly equivalent to the combustion of fossil fuels. If bioenergy production is to generate a net reduction in emissions, it must do so by offsetting those emissions through increased net carbon uptake of biota and soils.”
 - “...bioenergy systems have often been assessed under the assumption that CO₂ emitted from combustion is carbon neutral. ... The shortcomings of this assumption have been extensively discussed...”
- 

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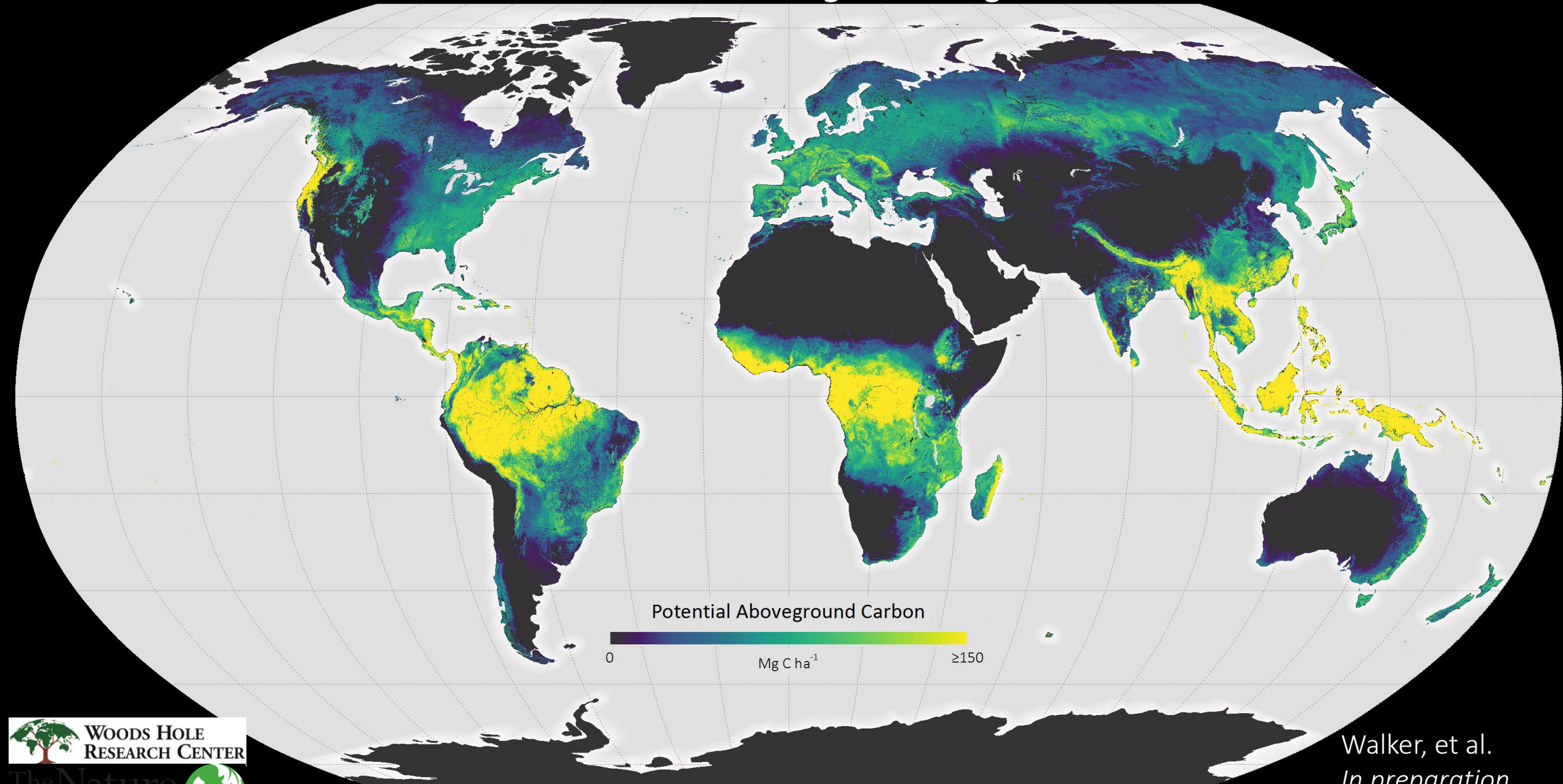
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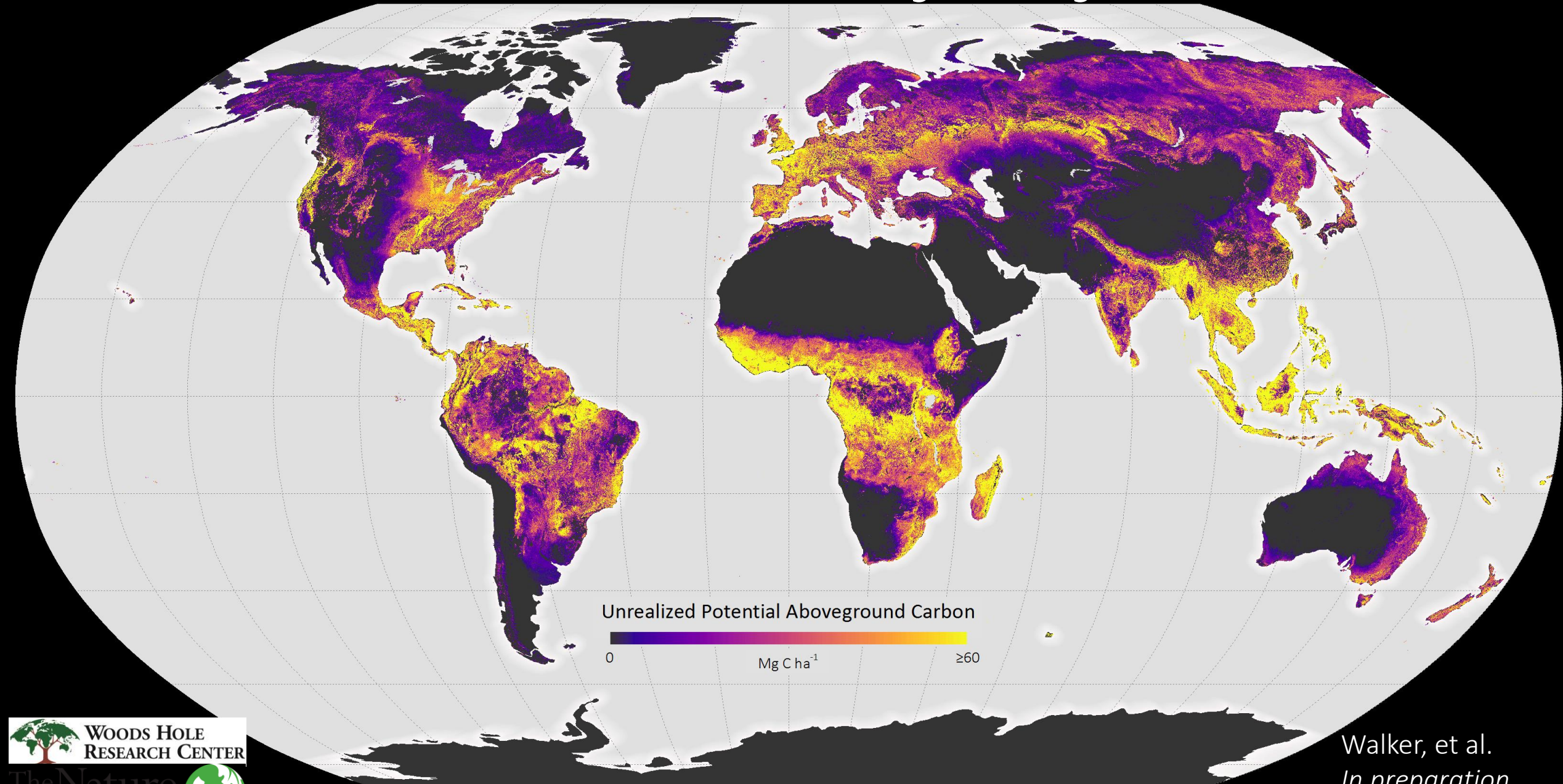
Current Carbon Storage (Aboveground ca. 2016)



Potential Carbon Storage (Aboveground)



Unrealized Potential Carbon Storage (Aboveground)



Strategies for closing the sequestration gap

Preventing deforestation and degradation, the draining of wetlands and soil degradation are essential to avoid irreversible and catastrophic climate change before it is too late

Proforestation management of more of our forests is among the most effective actions and least costly options for removing and storing additional atmospheric carbon dioxide (Moomaw et al, 2019)

