

Analysis & Prediction



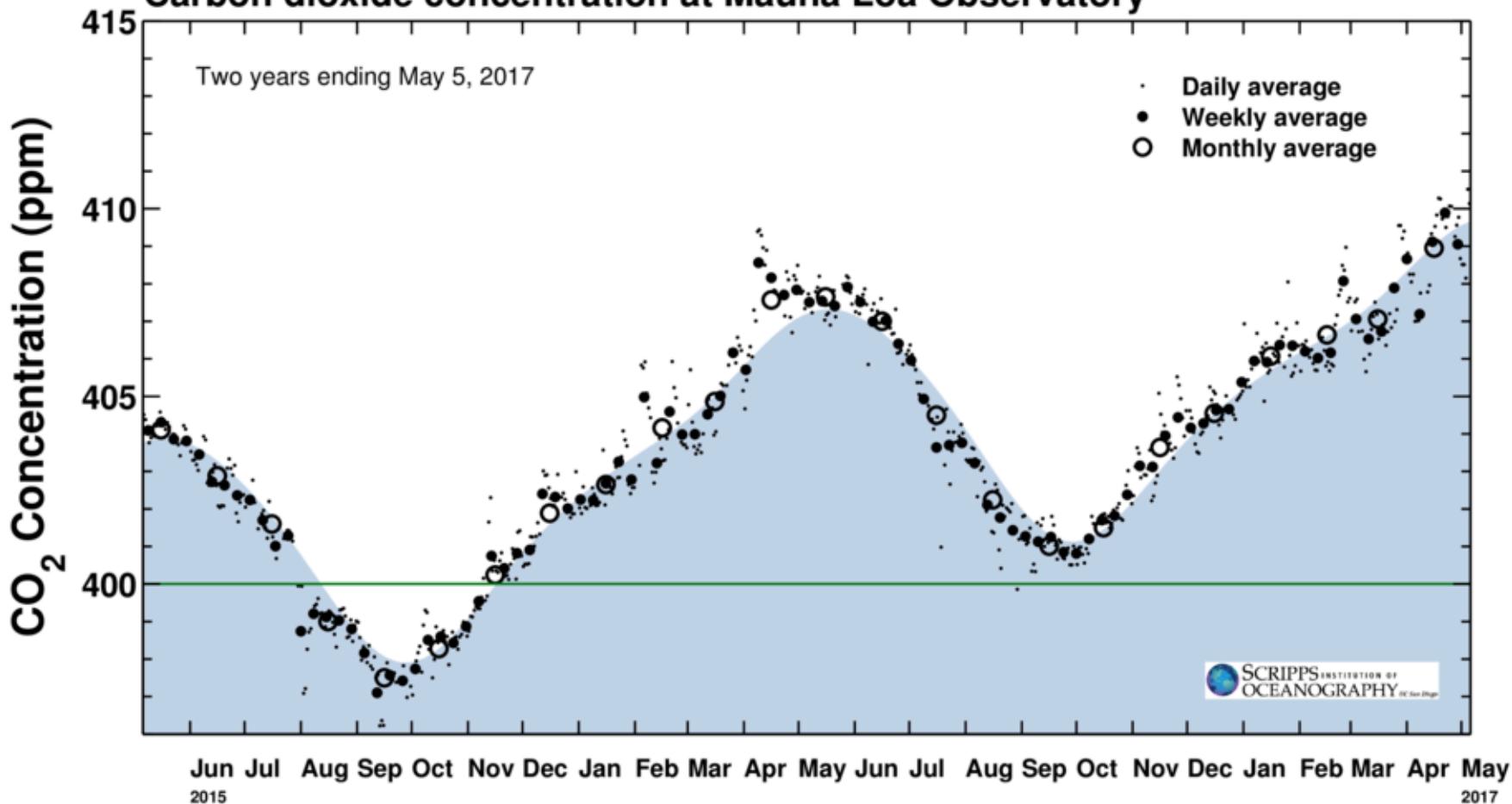
**Research
Dialogue
SBSTA 46**

D Carlson
Director, WCRP

Latest CO₂ reading
May 05, 2017

410.14 ppm

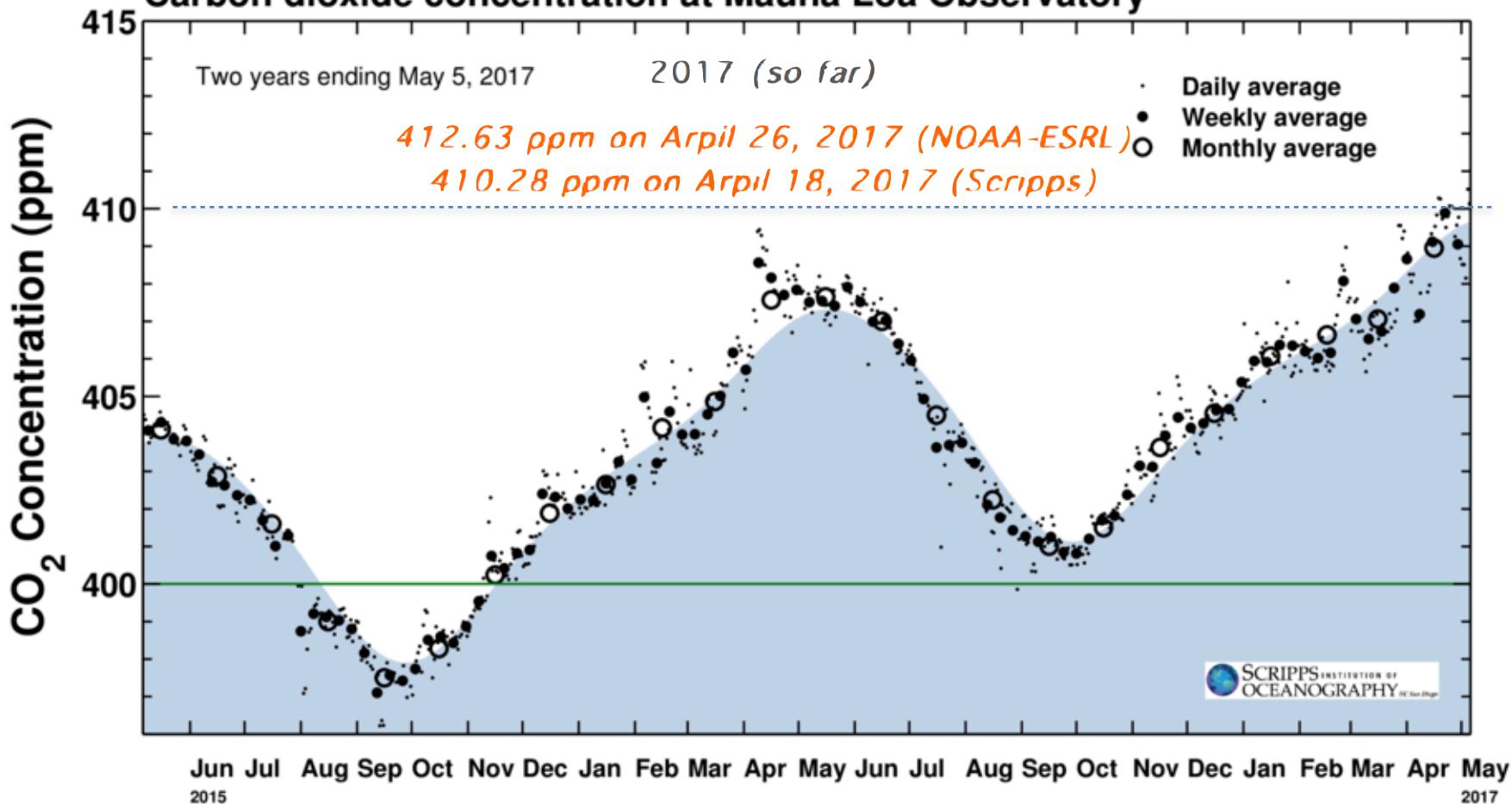
Carbon dioxide concentration at Mauna Loa Observatory



Latest CO₂ reading
May 05, 2017

410.14 ppm

Carbon dioxide concentration at Mauna Loa Observatory



Warm ocean
under cold ice

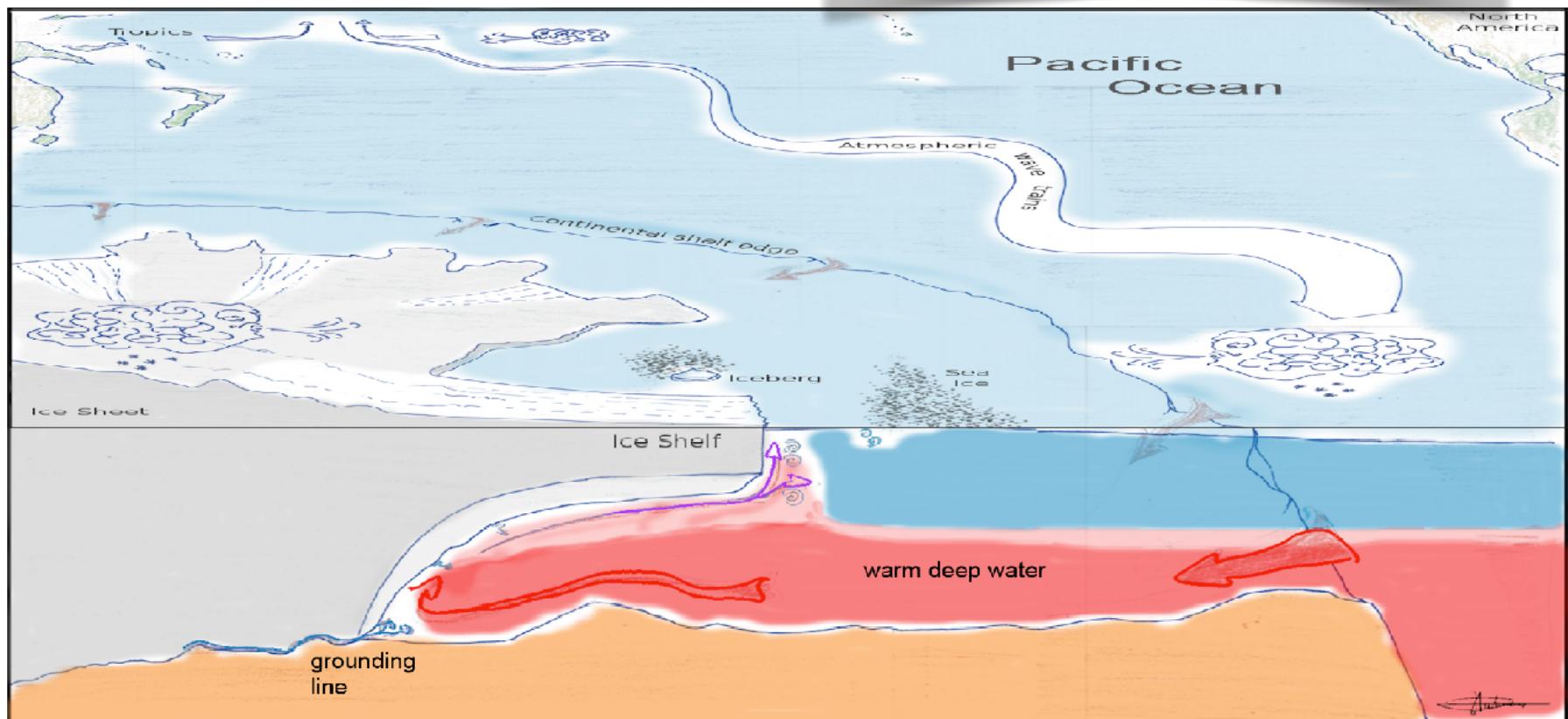
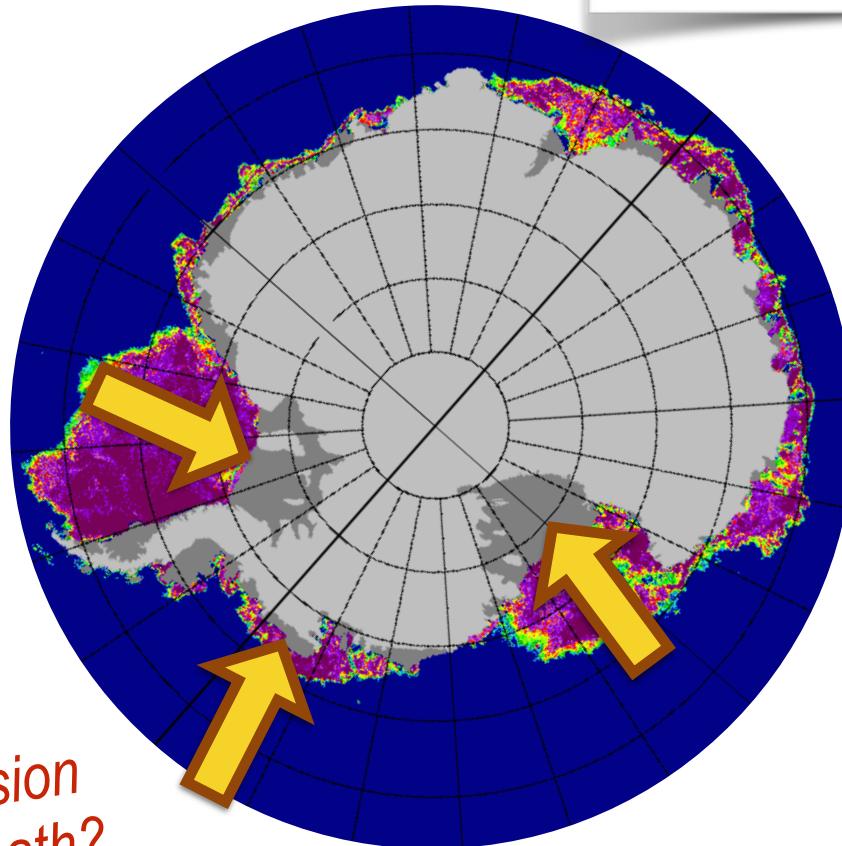


Figure 1. Cartoon of the Thwaites – Amundsen system and its large-scale teleconnections. Artwork by P. Dutrieux and David Holland.

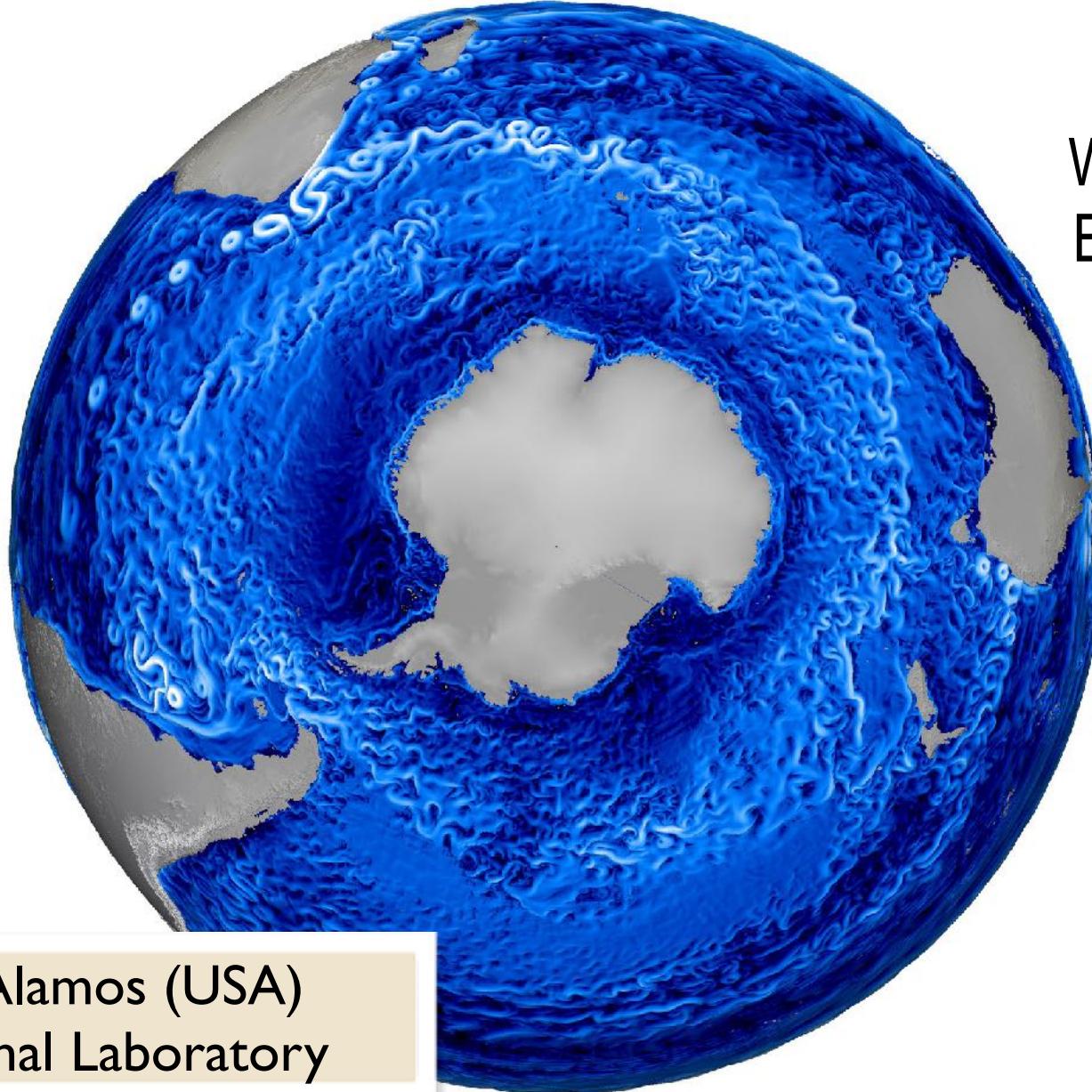
Sea ice extent
2017-04-09



Ice shelf erosion
from underneath?



Ocean
Model

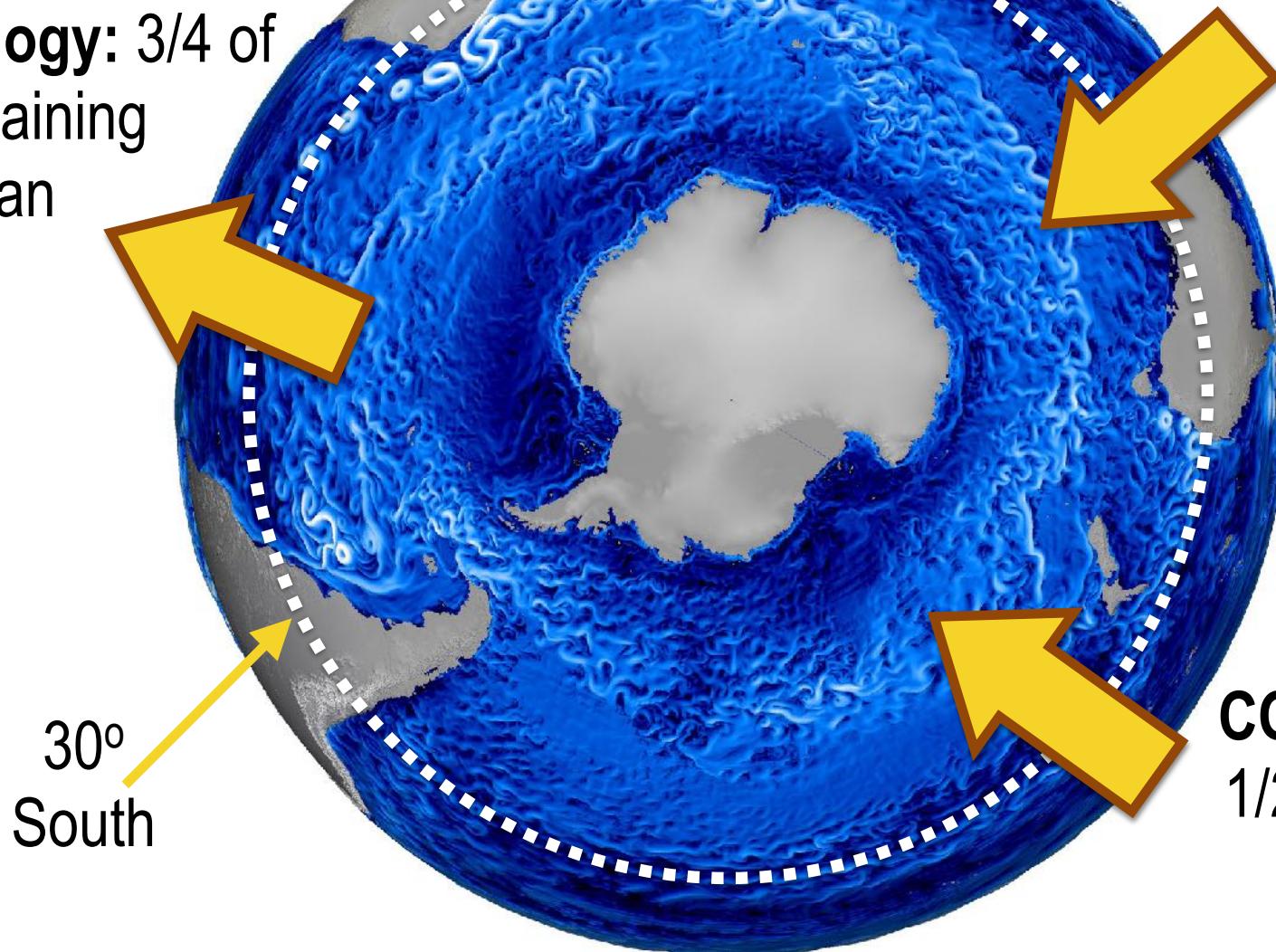


White = fast
Blue = slow

Los Alamos (USA)
National Laboratory

**Nutrients for
biology:** 3/4 of
remaining
ocean

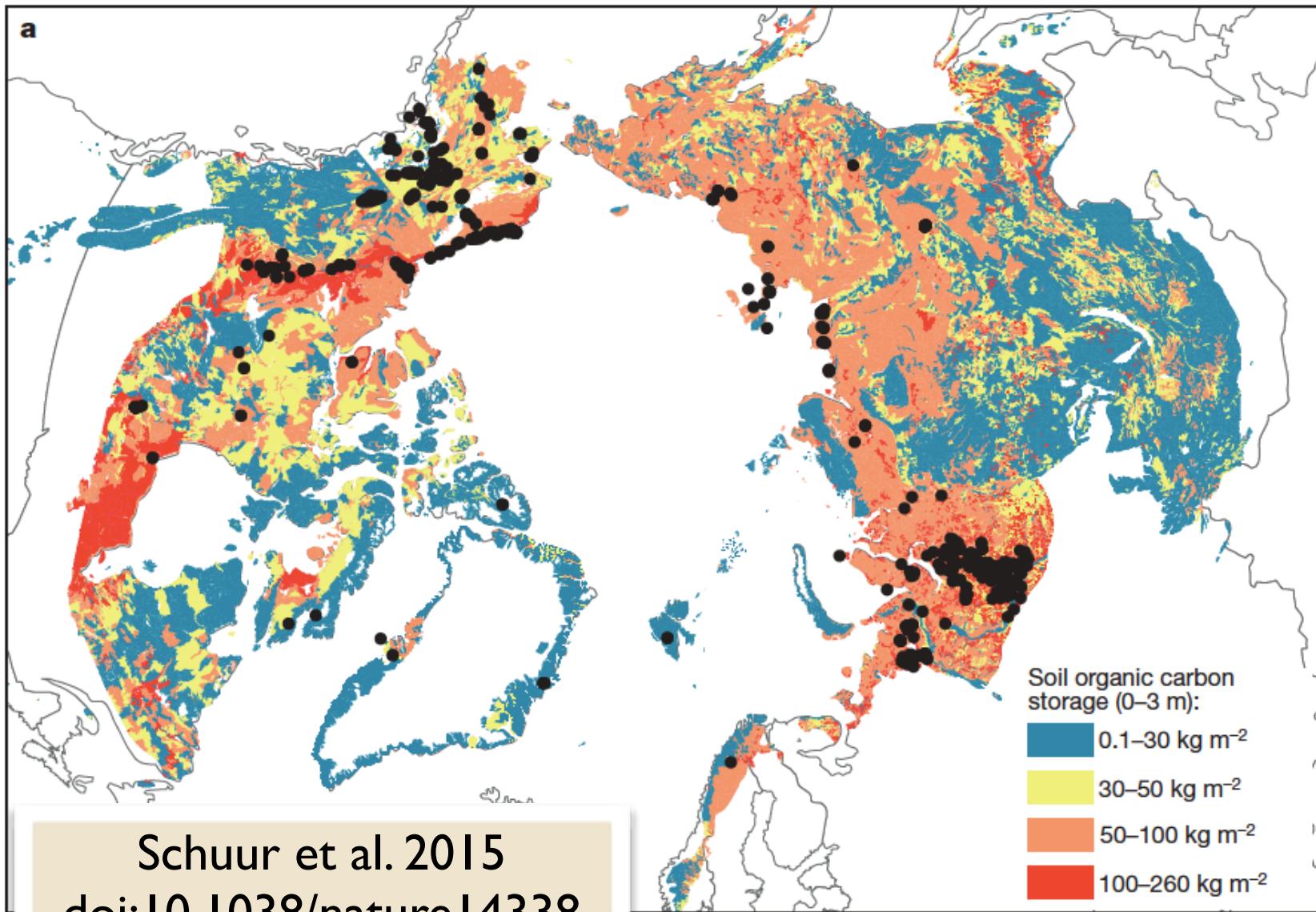
Heat uptake:
3/4 of ocean
total



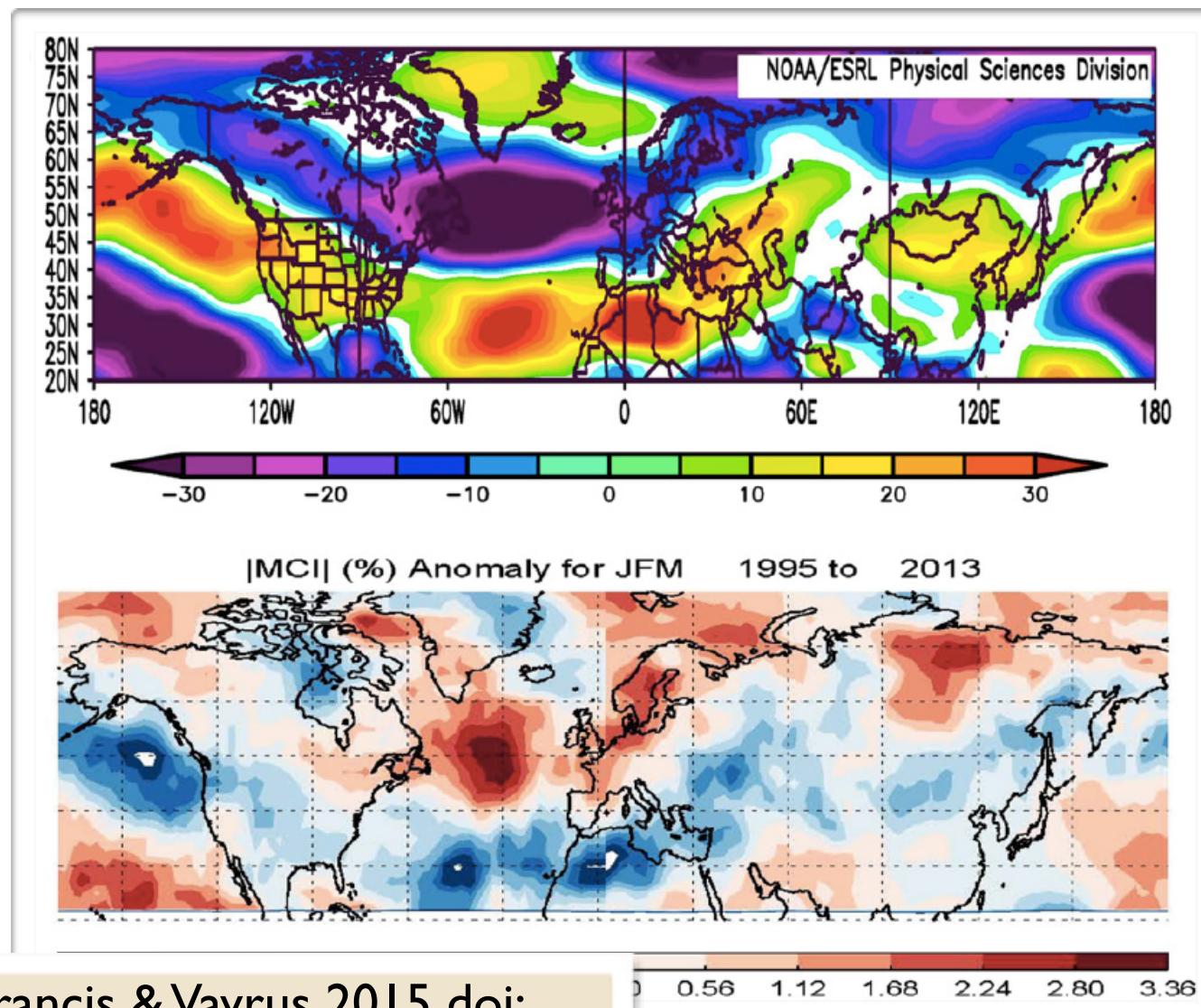
Carbon in
permafrost

Southern
Ocean

Warm ocean
under cold ice

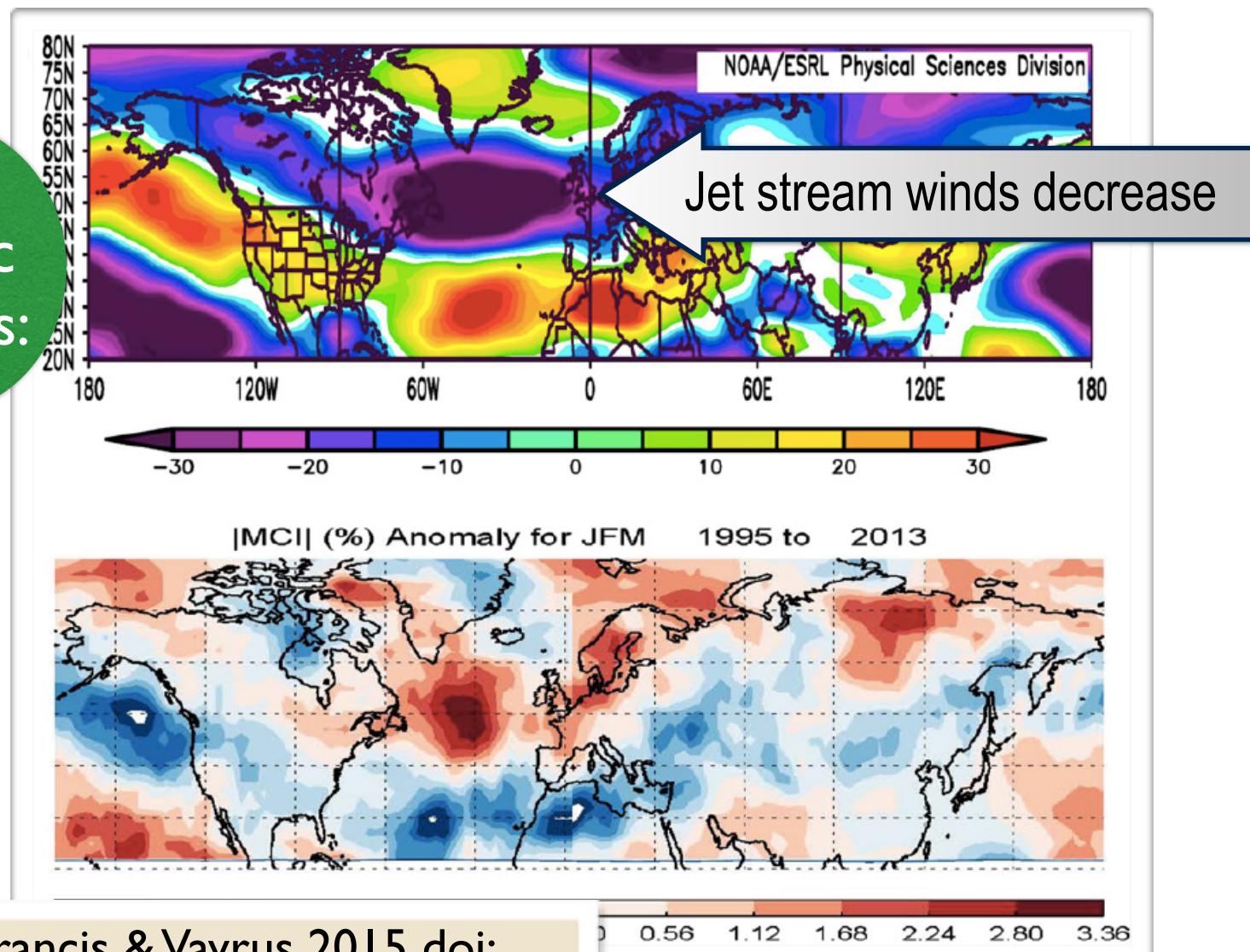






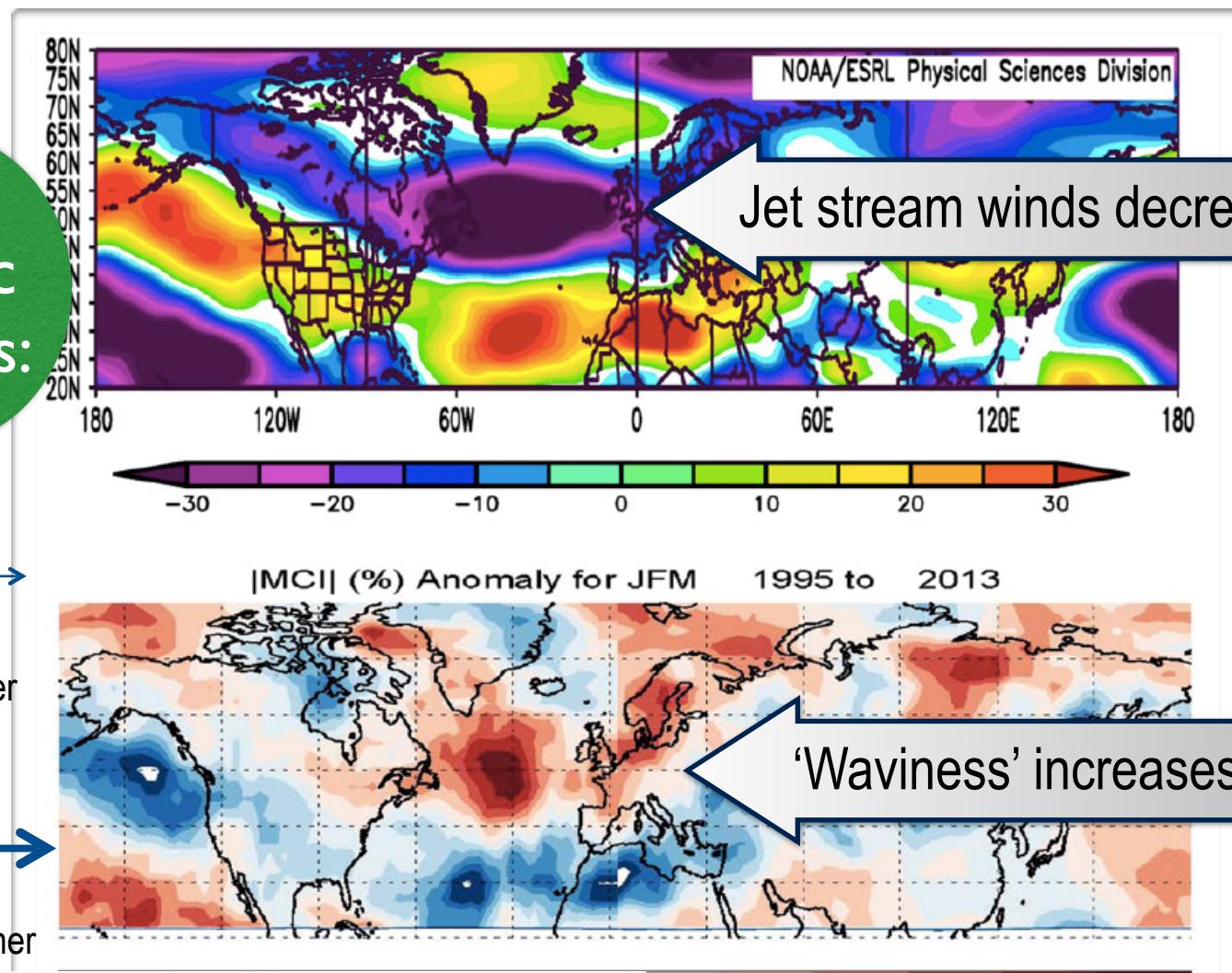
Francis & Vavrus 2015 doi:
[10.1088/1748-9326/10/1/014005](https://doi.org/10.1088/1748-9326/10/1/014005)

As
Arctic
warms:

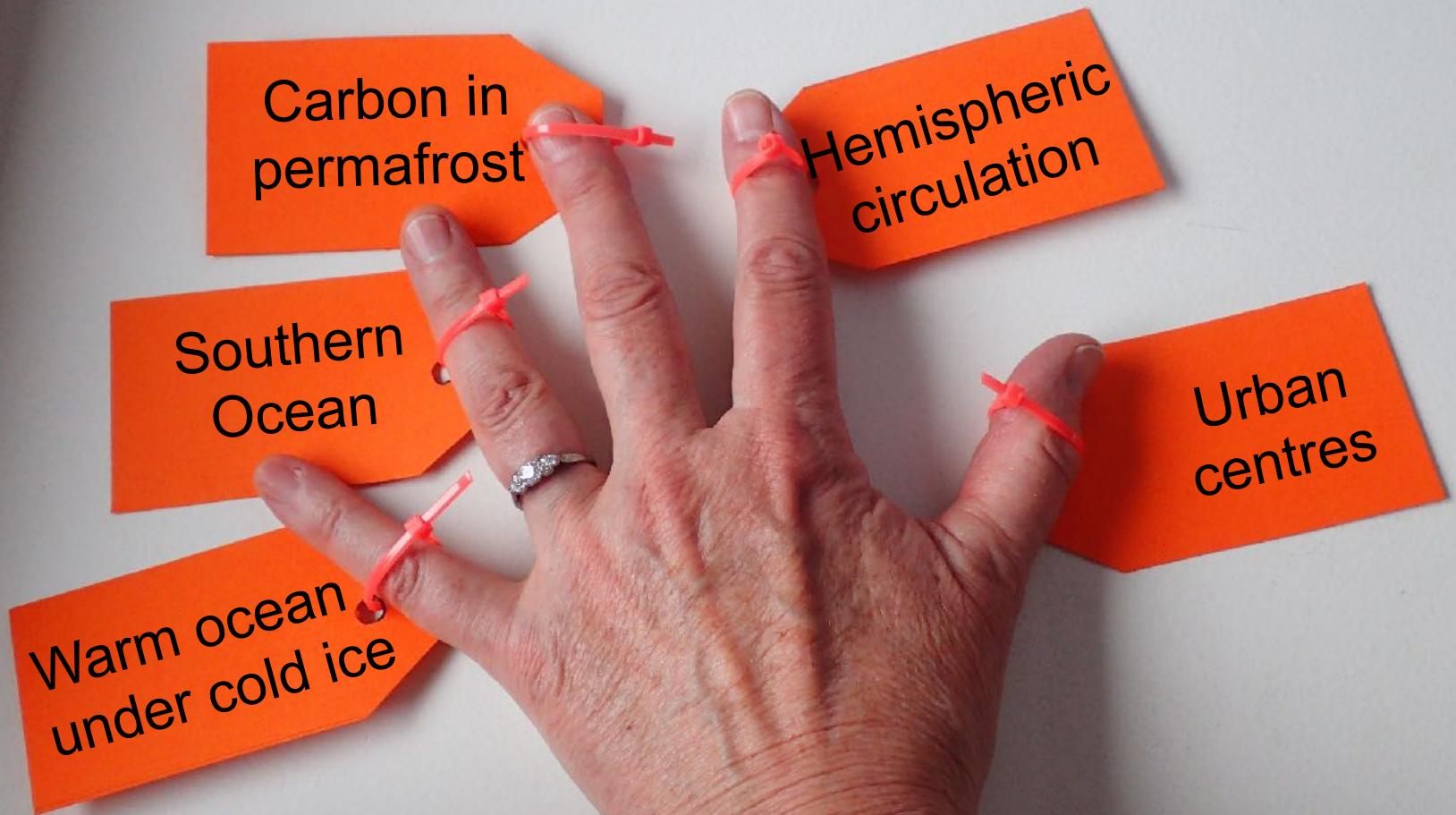


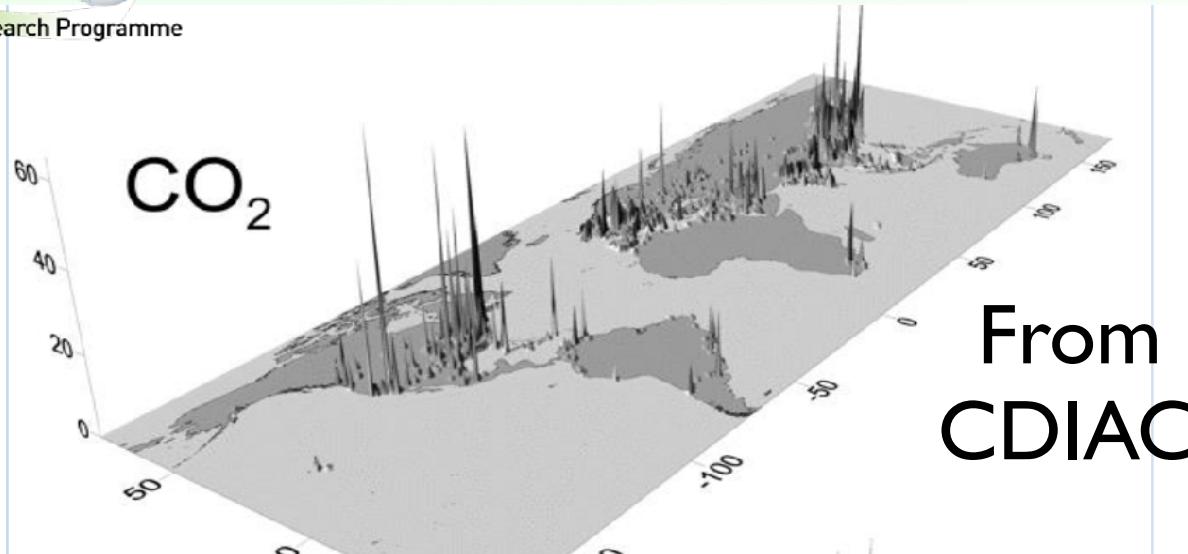
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As Arctic warms:

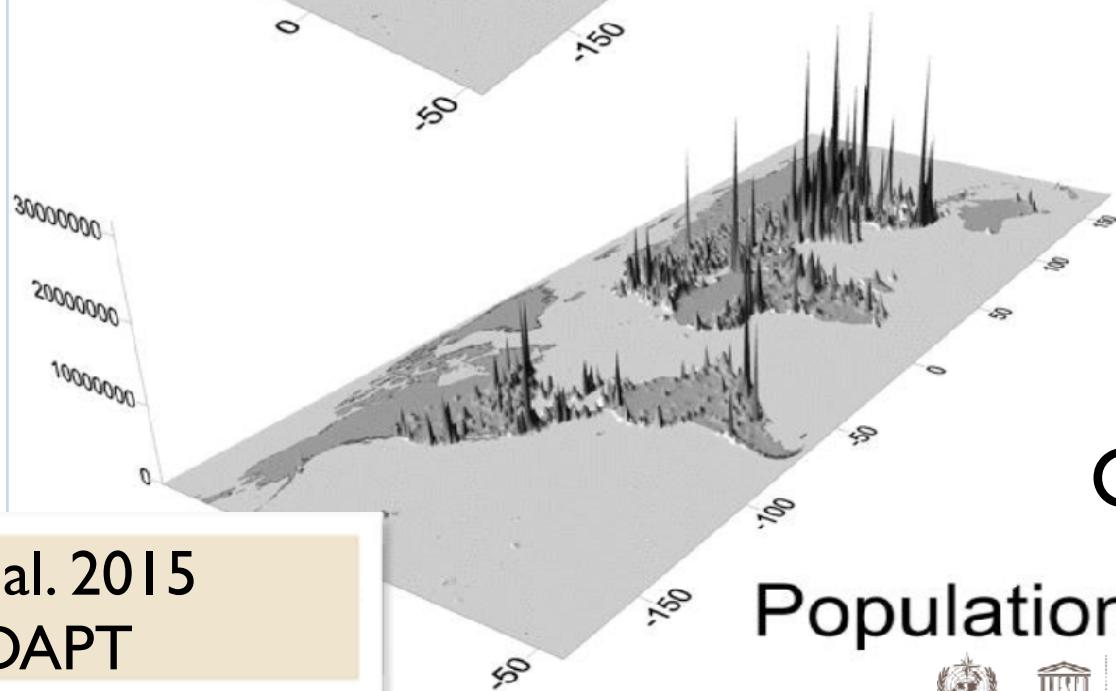


Francis & Vavrus 2015 doi:
[10.1088/1748-9326/10/1/014005](https://doi.org/10.1088/1748-9326/10/1/014005)



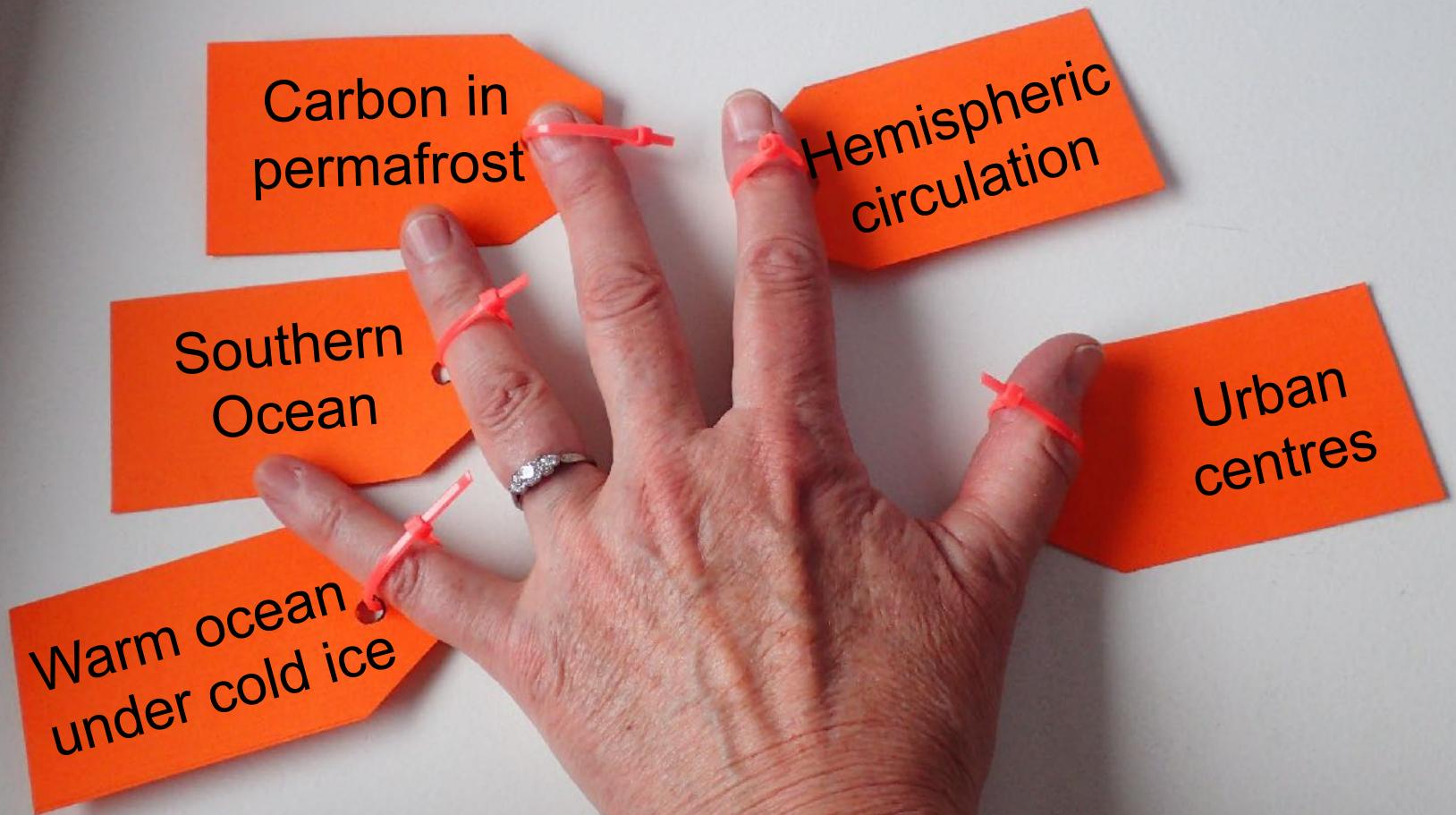


From
CDIAC



From
CESIN

Mills et al. 2015
WUDAPT



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Watch this space