



Key Uncertainties in the Global Carbon-Cycle:

Perspectives across terrestrial and ocean ecosystems

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Naomi Levine (USC)

Annalisa Bracco (Ga. Tech)
Curtis Deutsch (Washington)
Matt Long (NCAR)
Galen McKinely (Wisconsin)



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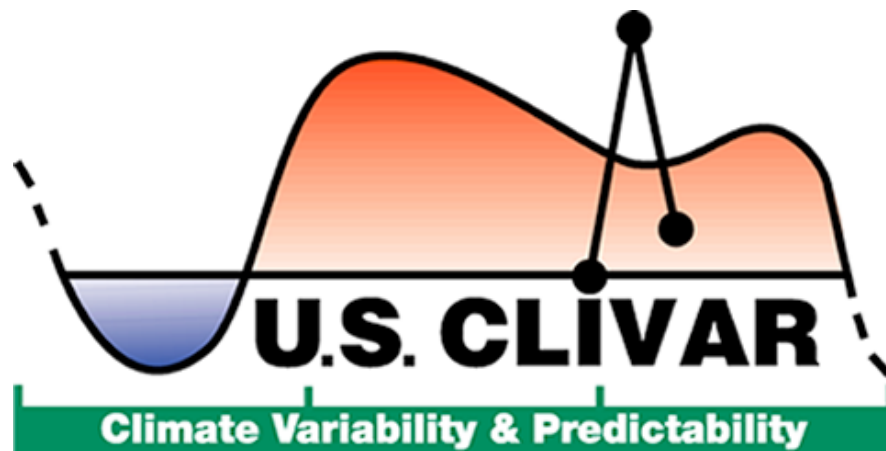
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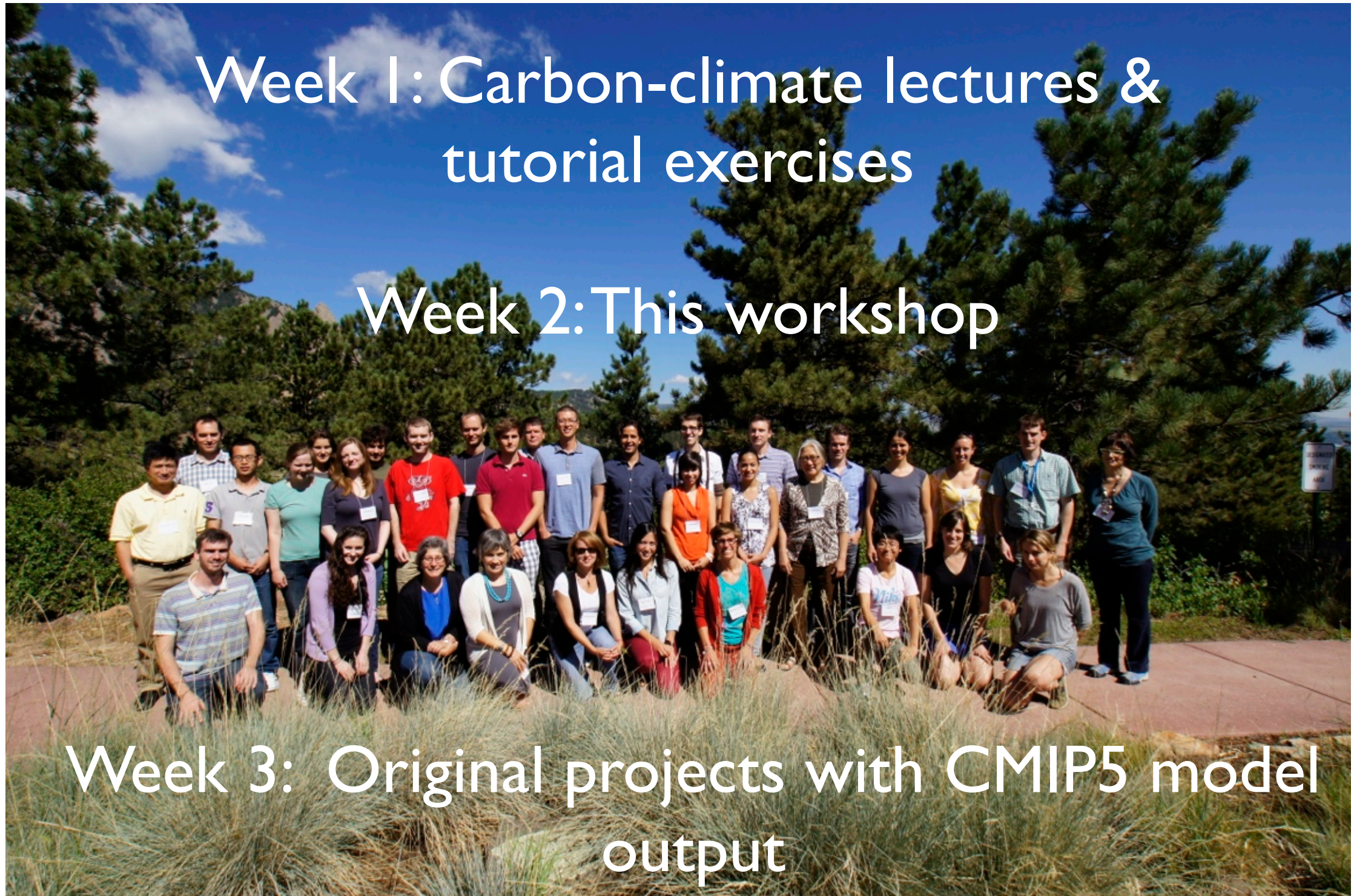
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ASP Summer Colloquium 2013: Carbon-Climate Connections in the Earth System

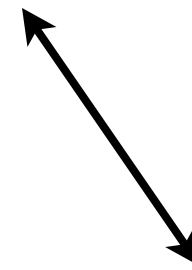
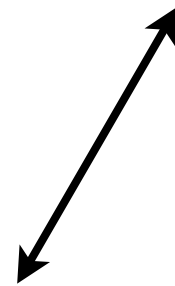
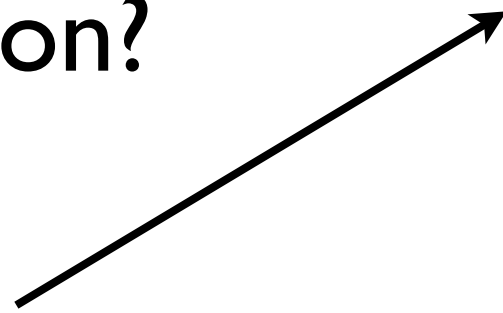
Week 1: Carbon-climate lectures &
tutorial exercises

Week 2: This workshop

Week 3: Original projects with CMIP5 model
output



How do ocean and terrestrial processes alter the allowable emissions for climate stabilization?



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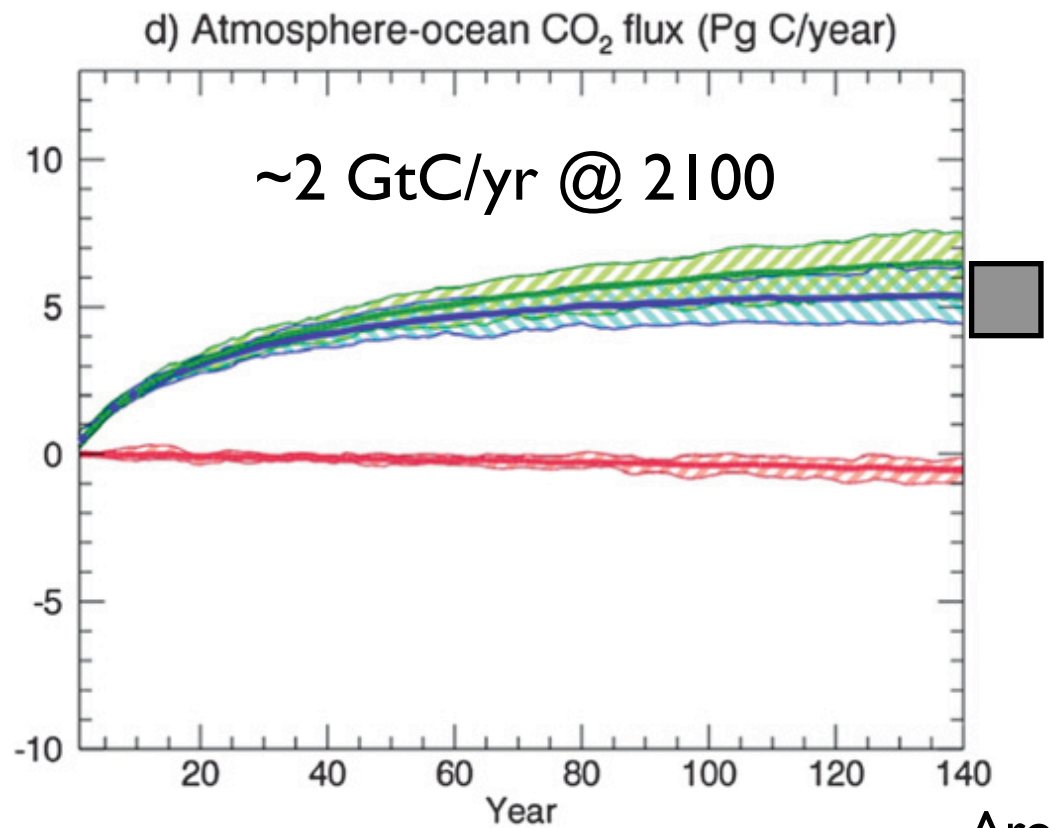
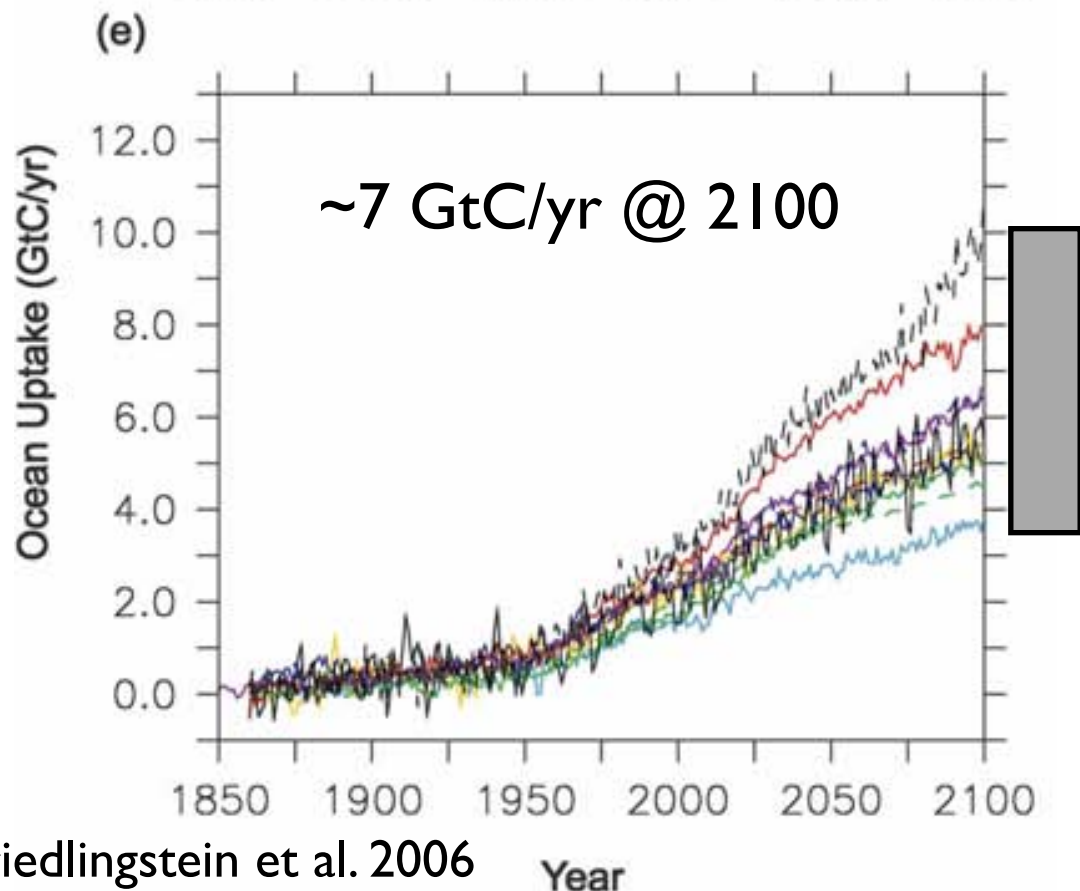
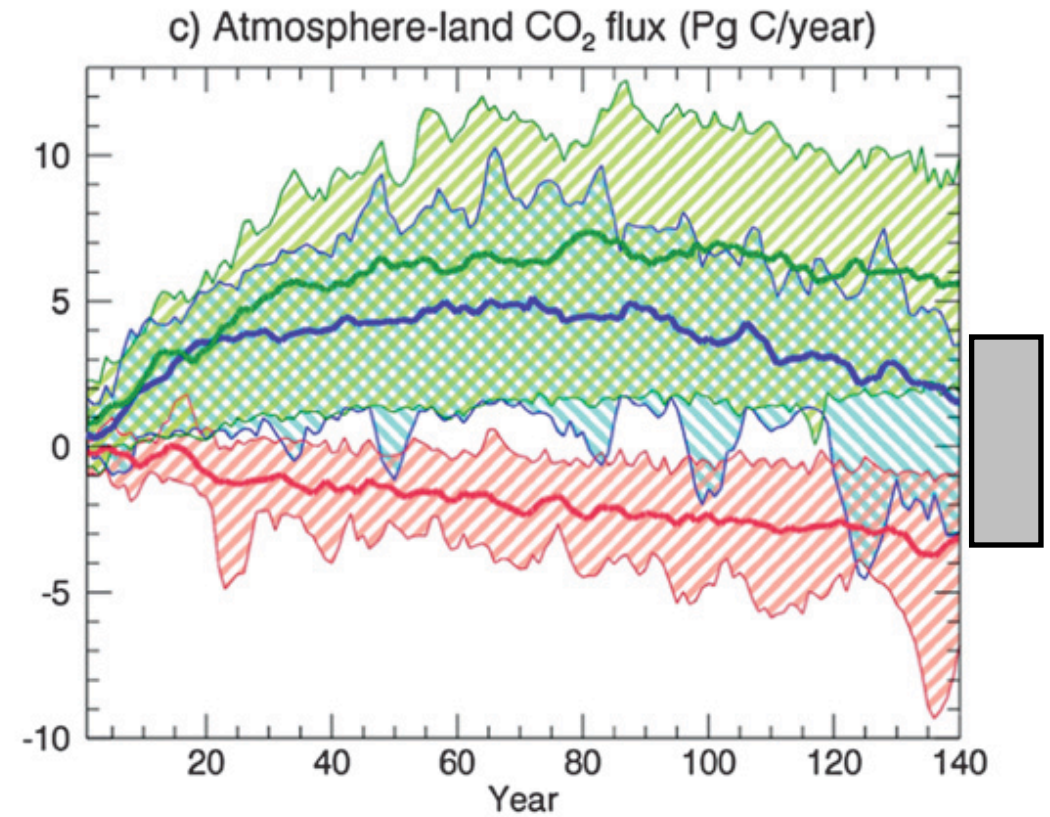
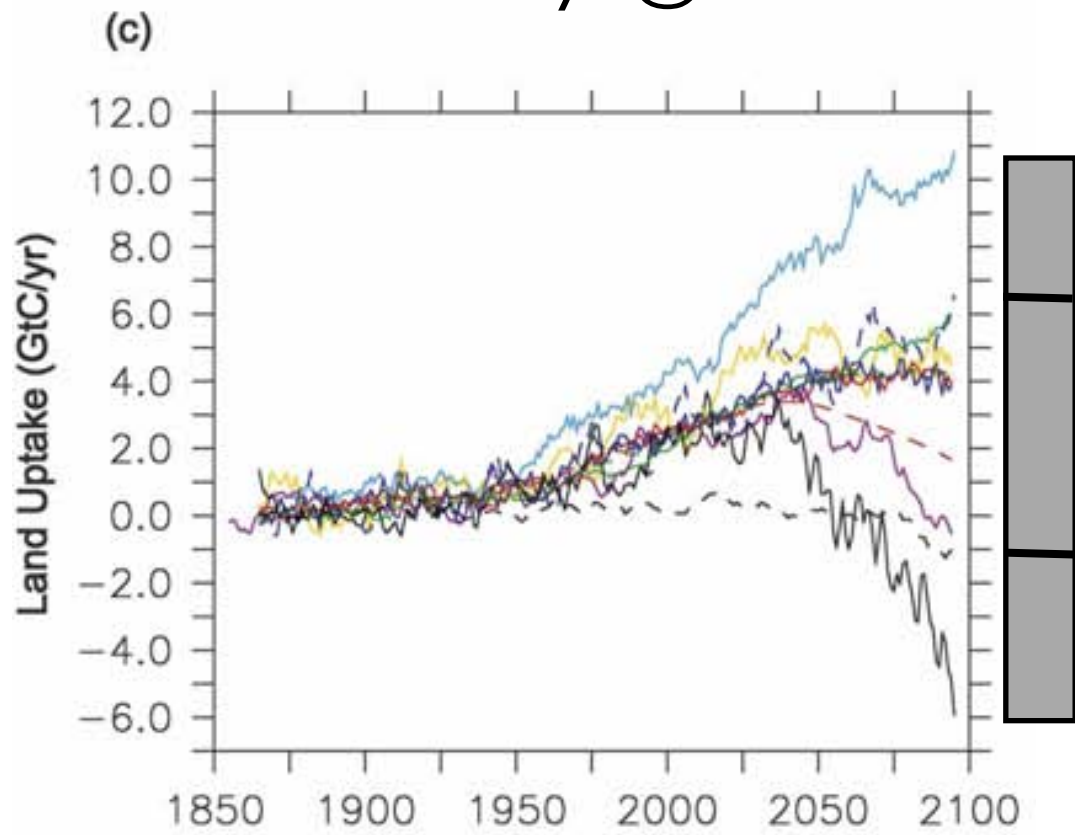
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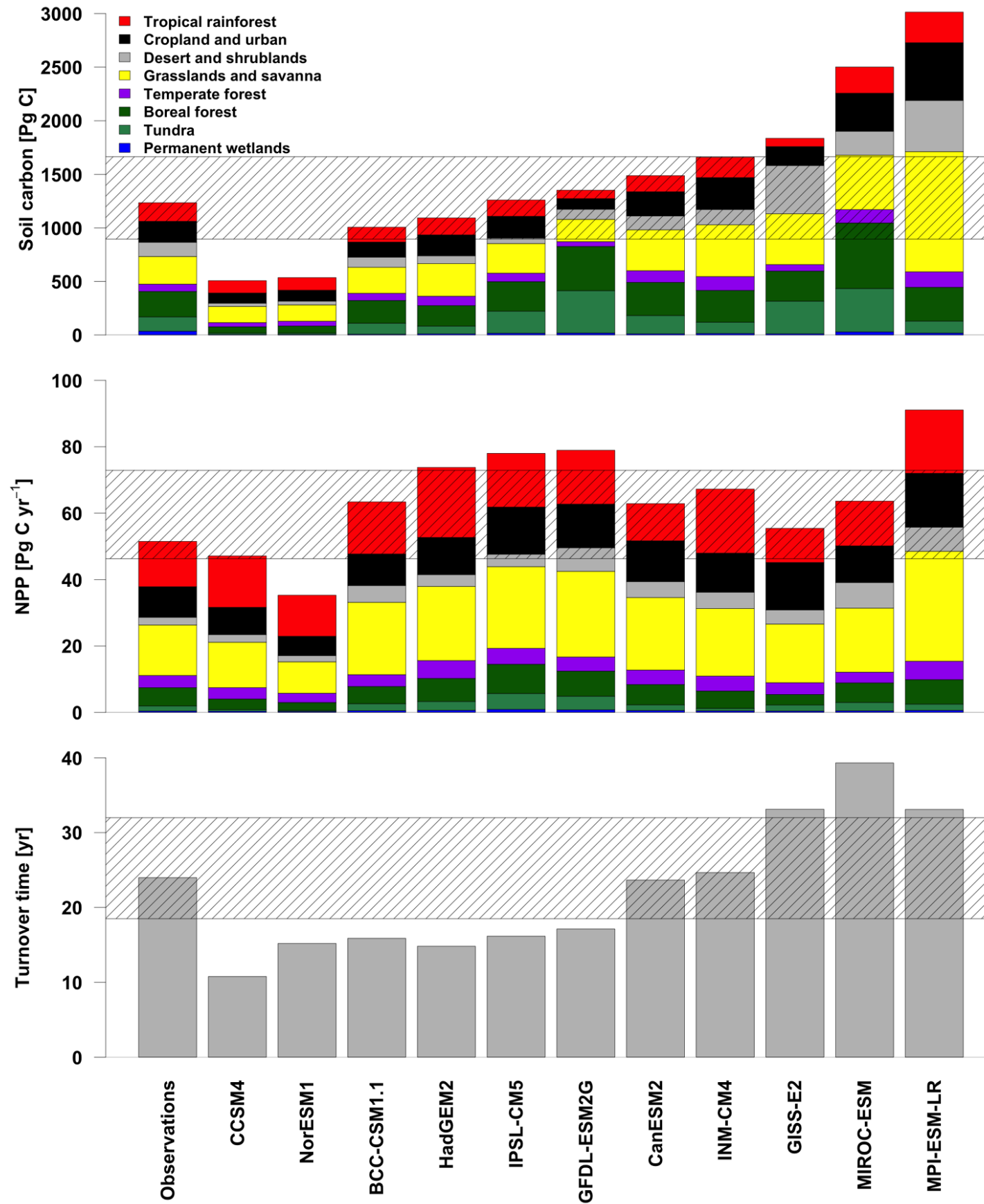
Uncertainty among models

~16 GtC/yr @ 2100

~8 GtC/yr @ 2100



Uncertainty when compared to data



What important processes are unaccounted for in carbon-climate simulations and how do they contribute to the uncertainty?

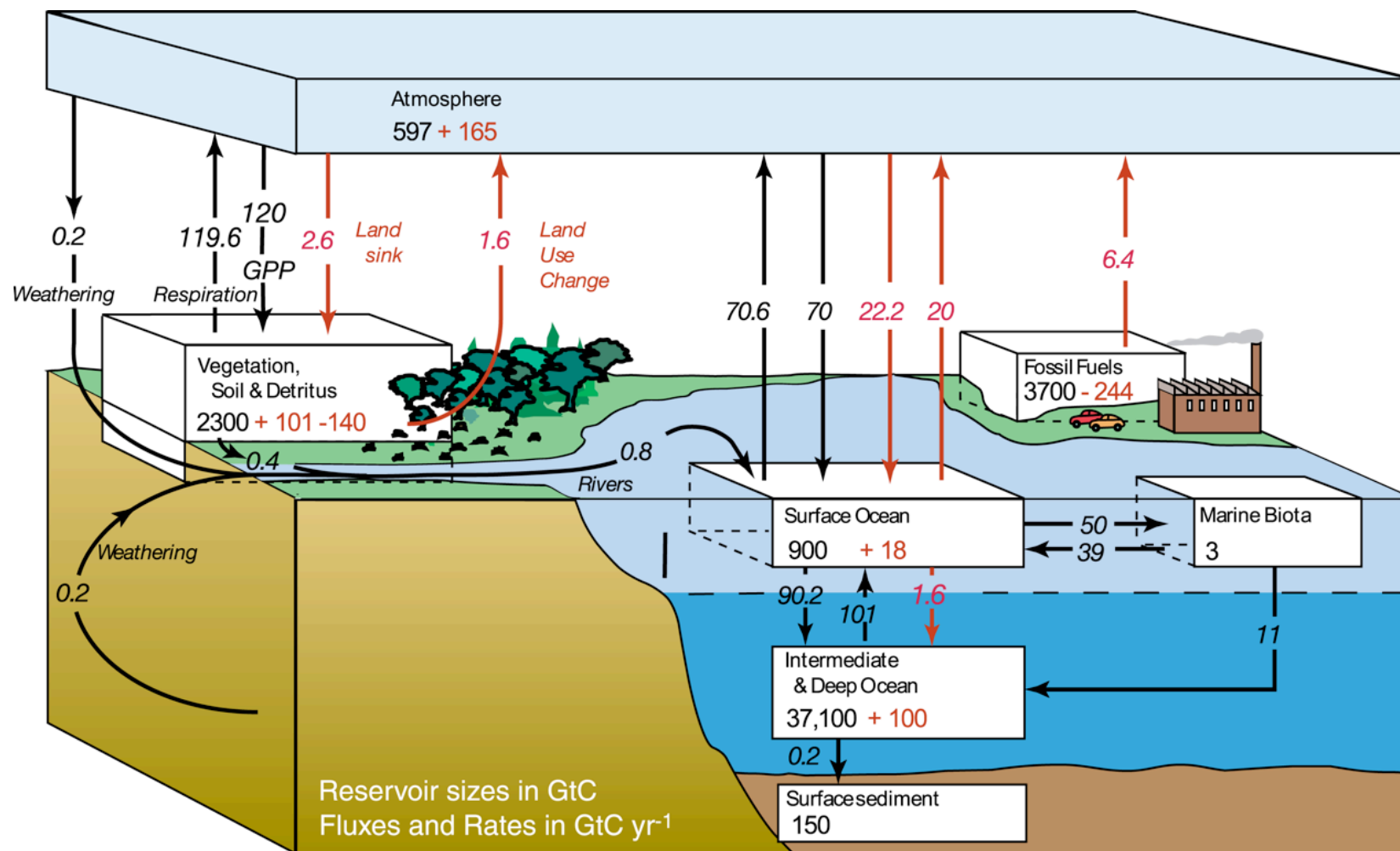


How are the processes similar between ocean and terrestrial ecosystems?

How can research progress in one ecosystem help inform the other?

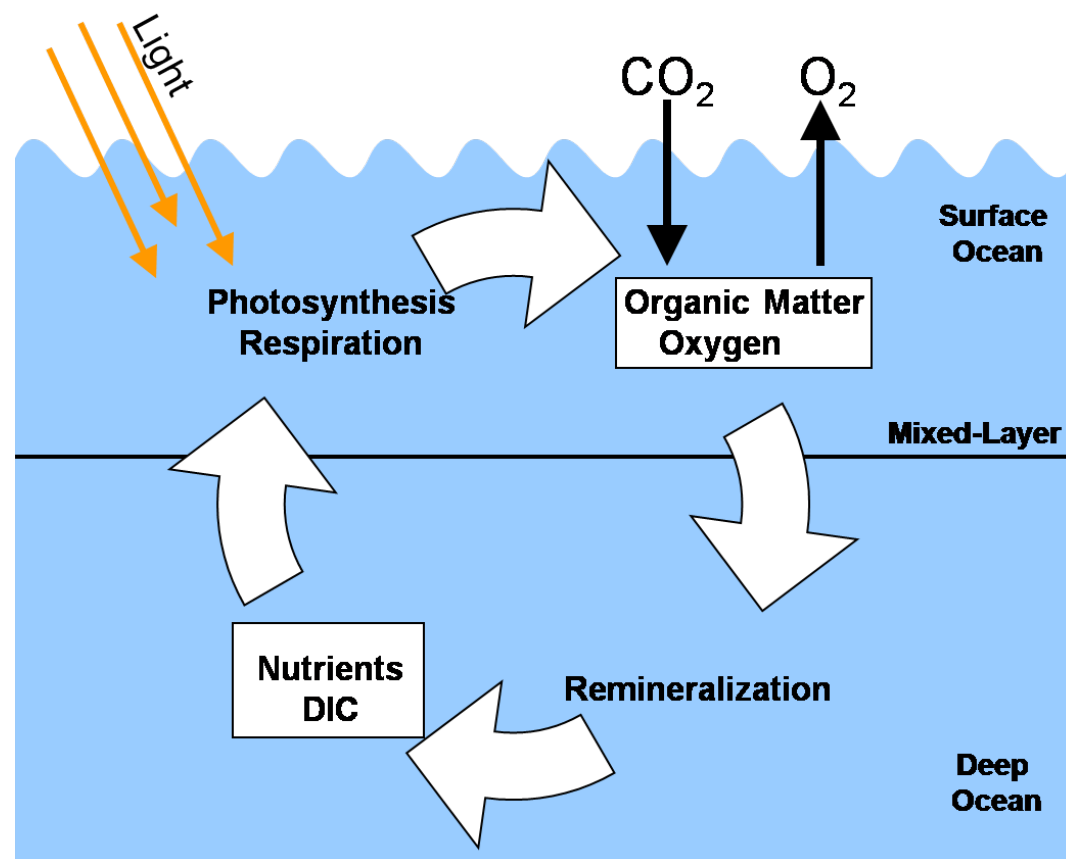
This week:

Overview of the state of carbon-climate interactions



This week:

Are important remineralization pathways and dynamics missing from carbon-climate simulations?

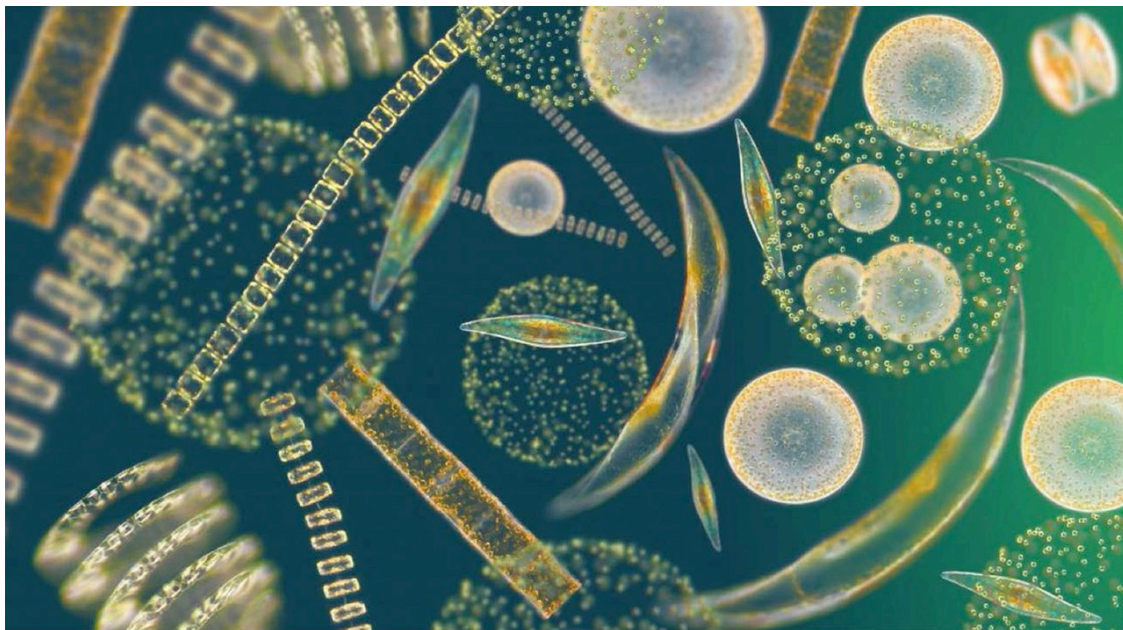


N. Cassar, Duke



This week:

What are the impacts of including demographic dynamics of individual organisms on carbon-climate interactions?

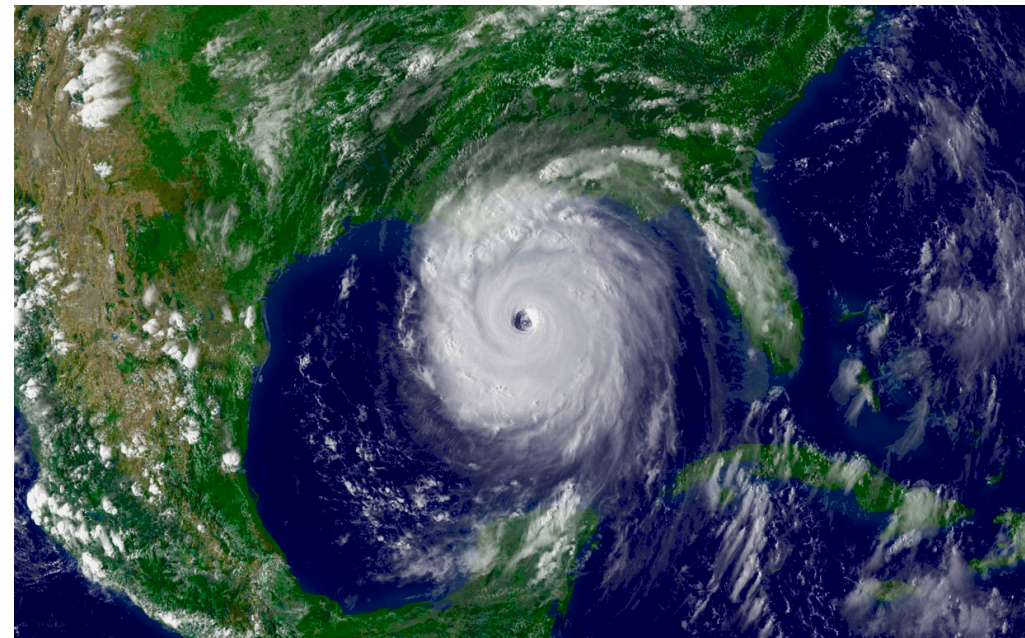


This week:

How does variability in physical climate influence carbon-climate interactions?



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noaa

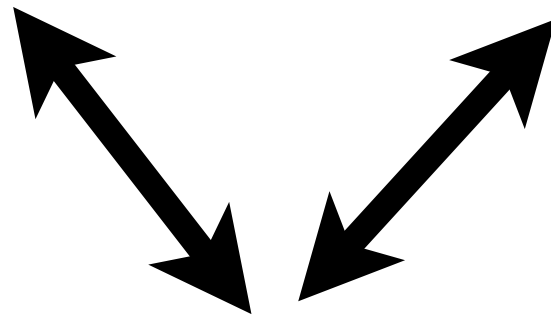
This week:

How should we best represent trophic dynamics in models of carbon-climate interactions?



This week:

How can data be used to constrain the modeled dynamics of these ecosystem processes?



Goals

1) Have cross-system discussions throughout the week.

45 minute talks with 15 minutes of discussion

30 minutes talks with 10 minutes of discussion

2 poster sessions

2) Outline the key processes that are missing from the carbon-climate uncertainty estimates and potential paths forward to better including the processes in Earth System models.

3) Engage interested participants in preparing a review paper that will serve as an overview of the processes for both ocean and terrestrial communities.

4) Have fun!

The plan

- 1) Verbal discussion around talks and posters.
- 2) Written collaborative interactions through a Google document.
- 3) Break out groups to highlight the key processes missing from the uncertainty.