Winter Welcome 2025

PROGRAM ON
CLIMATE CHANGE

UNIVERSITY OF WASHINGTON

PROGRAM ON CLIMATE CHANGE

UNIVERSITY OF WASHINGTON

PCC aims to bring together natural scientists working on climate science across campus to facilitate interaction, ignite interdisciplinary research, and strengthen interdisciplinary activities.

With its roots in the natural sciences, PCC branches out to applied and social sciences research on campus.

Strategic Priorities

PROGRAM ON
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UNIVERSITY OF WASHINGTON

1. Catalyze interdisciplinary natural climate research
2. Educate the next generation of climate scientists
3. Serve as a community resource on climate science and solutions
4. Broaden PCC funding resources

PCC Board Members

Director

Becky Alexander (ATMOS)

Executive Board

Kyle Armour (ATMOS/OCEAN)
TJ Fudge (ESS)
Abigail Swann (ATMOS/BIOL)

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Ann Bostrom (Evans)
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Alison Gray (OCN)
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Greg Johnson (NOAA/PMEL)
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Jason Vogel (CIG)
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Ex-Officio

James Murray (OCEAN)

Graduate Student Representatives

Mariah Rubin (DEOHS)
Tara Kalia (OCEAN)
Andy Liu (ATMOS)

Agenda

- Welcome new faculty and staff
- Graduate student activities
- Undergraduate cohort activities
- New RFP for Research Accelerator
- PNW Climate Ambassador Program
- Postdocs/Research Scientist quick talks
- Summer Institute

- Socializing in the hall with food and drink

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UNIVERSITY OF WASHINGTON

Welcome to New Faculty and Staff on Campus!

Monica Conte
Earth Lab
Community Partnerships Lead

Aditya Khuller
APL
Senior Research Scientist

Hilairy Hartnett
Director of the School of Oceanography

Welcome to New Faculty and Staff on Campus!

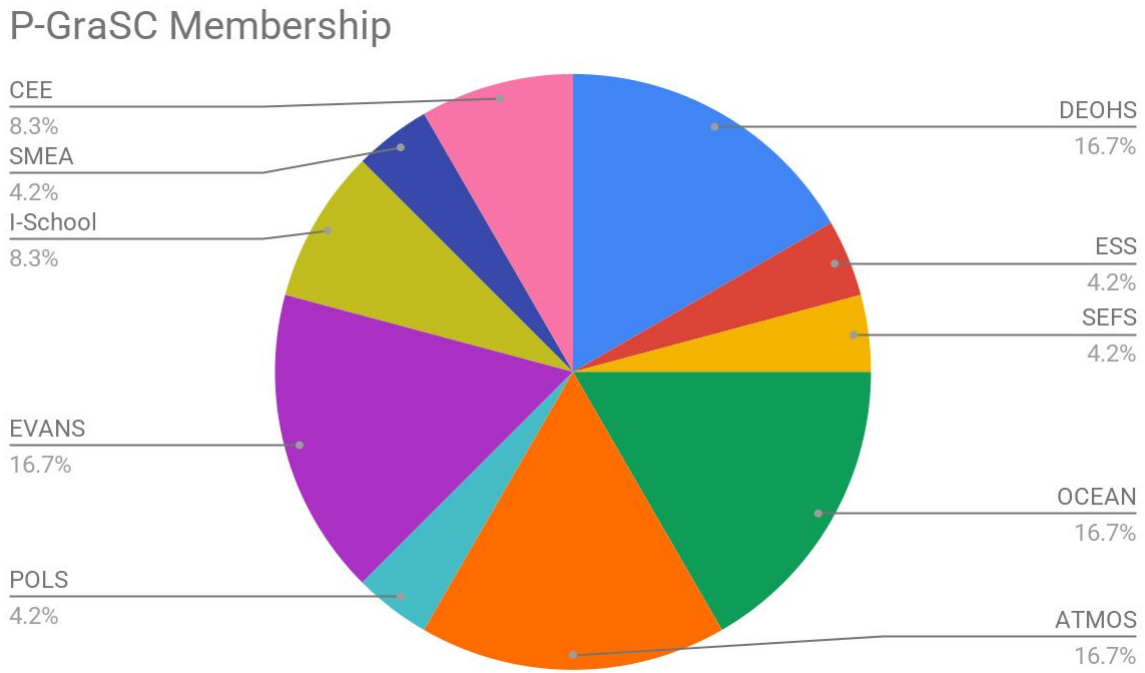
Marissa Childs
Environmental and
Occupational Health Sciences
Assistant Professor

Claire Willing
SEFS
Assistant Professor

Francisca Santana
SEFS
Assistant Professor

2025 PCC Graduate Steering Committee (PGraSC)

Mac Baker (EVANS)
Reese Barrett (OCEAN)
Apala Chaturvedi (I-School)
Amelia Dogan (I-School)
Stella Heflin (ATMOS)
Sonia Hitchcock (EVANS)
Daniel Hogan (CEE)
Tara Kalia (OCEAN)
Andy Liu (ATMOS)
Ben Lloyd (ESS)
Cecilia Martindale (DEOHS)
Aesha Mokashi (DEOHS)
Ashley Moore (DEOHS)
Kayla Morton (POL S)
Mark Nepf (EVANS)
Isaac Olson (SMEA)
Joseph Rotondo (ATMOS)
Mariah Rubin (DEOHS)
Natalee Singleton (EVANS)
Clara Stanbury (OCEAN)
Em Stevenson (DEOHS)
Katelin Teigen (DEOHS)
Elaina Thomas (OCEAN)
Celeste Tong (ATMOS)
Hemalatha Velappan (SEFS)



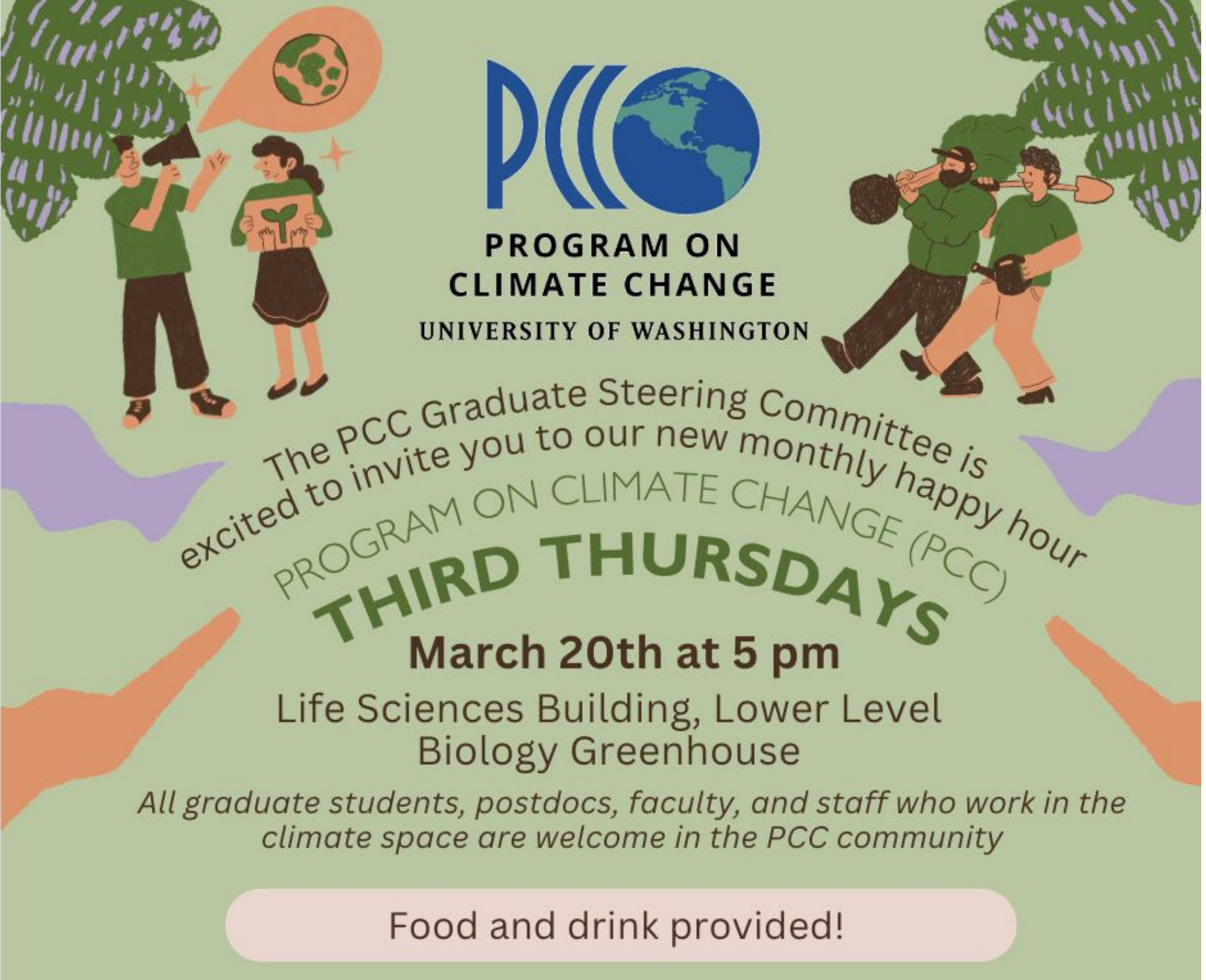
P-GraSC is restructuring in 2024-2025!

We're working to create a program that is more focused on building graduate student community and better serves our needs

During this process, ACORN applications and outreach requests are paused

If you have any questions or input on this process, feel free to reach out to us! You can email pccacorn@uw.edu or anyone on P-GraSC

P-GraSC folks during a brainstorming meeting in January 2025



RSVP here and you'll get a reminder email a few days before the event:

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PCC Fellows

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UNIVERSITY OF WASHINGTON

2024 PCC Graubard Graduate Fellowship Awards

Tara Kalia (OCEAN)

Claire Jensen (ESS)

Iana Ferguson (ATMOS)

Thank you to William Calvin and Katherine Graubard for establishing and supporting the Graubard Fellowship and Climate Research Acceleration Fund

UCo - Undergraduate Cohort

2024-2025 Goals: Community Building, RSO collaboration, environmental service, professional development

In the last year:

- Grad School Explained Panel
- Climate Jeopardy
- Current Events Discussion
- Whale Scout - Ecological Restoration
- Internship Search Party
- Environmental Opportunities for Undergrads

Upcoming:

- UW Greenhouse Tour
- Spring Ecological Restoration Events
- Faculty and Grad Coffee Chats

uwpccuco@uw.edu ***@uwpccuco***

PROGRAM ON CLIMATE CHANGE
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New Research Accelerator RFP

PROGRAM ON CLIMATE CHANGE
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Climate Science Research Acceleration Fund

- Proposals should clearly show how the work will advance fundamental and/or applied climate science at the UW.
- Funding requests up to $30K will be considered.
- UW faculty, UW research scientists and UW Postdoctoral Researchers from any program are invited to apply.
- Submit by 5pm on June 1, 2025

Full RFP may be found here:
https://pcc.uw.edu/research/funding-opportunities/

PNW Climate Ambassador Program

A collaboration between PCC, the Washington State Climate Office (WASCO), and the College of the Environment Communications Team

The PNW Climate Ambassadors program at the University of Washington seeks to train graduate students studying climate change, its impacts, or potential responses to effectively engage with various sectors of the public.

First cohort: 11 graduate students from 6 units (Oceanography, Urban Design and Planning, SAFS, Evans School, SEFS, and ESS).

Speed talks by New Postdocs/Research Scientists

- **Aditya Khuller** (APL)
- **Camille Henkel** (ATMOS/CICOES)
- **Haruki Hirasawa** (ATMOS)
- **Xinyu Li** (CICOES/PMEL)
- **Matt Luongo** (CICOES/PMEL)
- **Chan-Pang Ng** (ATMOS)
- **Man-Yin Tsang** (OCEAN)
- **Rin Jin** (CICOES)
- **Daniel Sandborn** (OCEAN/CICOES/PMEL)

Aditya Khuller: Who does he think he is?

akhuller@uw.edu

- **Research interests:**
  - Snow and Ice
  - Radiative Transfer
  - Atmospheric Boundary Layer
  - Climate Evolution
  - Remote Sensing
  - Geomorphology
  - Astrobiology

Hobbies:

Soccer, dogs, reading, writing and playing music, improv (comedy), photography, woodworking, finding interesting places to explore, and writing unnecessarily long descriptions

- Just moved to Seattle from LA, and looking for new friends to go on adventures together!

Camille Hankel
UW CICOES/Dept. of Atmospheric and Climate Science

Interests:

- Large-scale climate dynamics, particularly of the high-latitudes
- Positive feedback cycles between the ocean, atmosphere, and ice
- Abrupt climate change

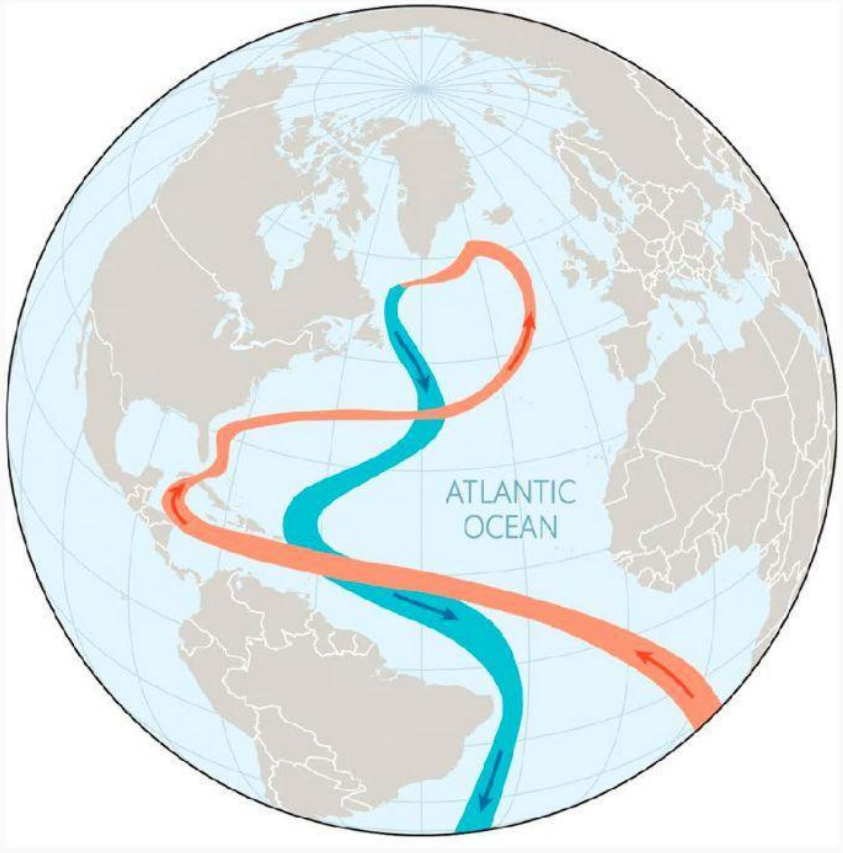
Methods:

- fully coupled Global Climate models → idealized box models → dynamical systems

Current project:

- How AMOC-sea ice feedbacks modulate the circulation's response to climate change

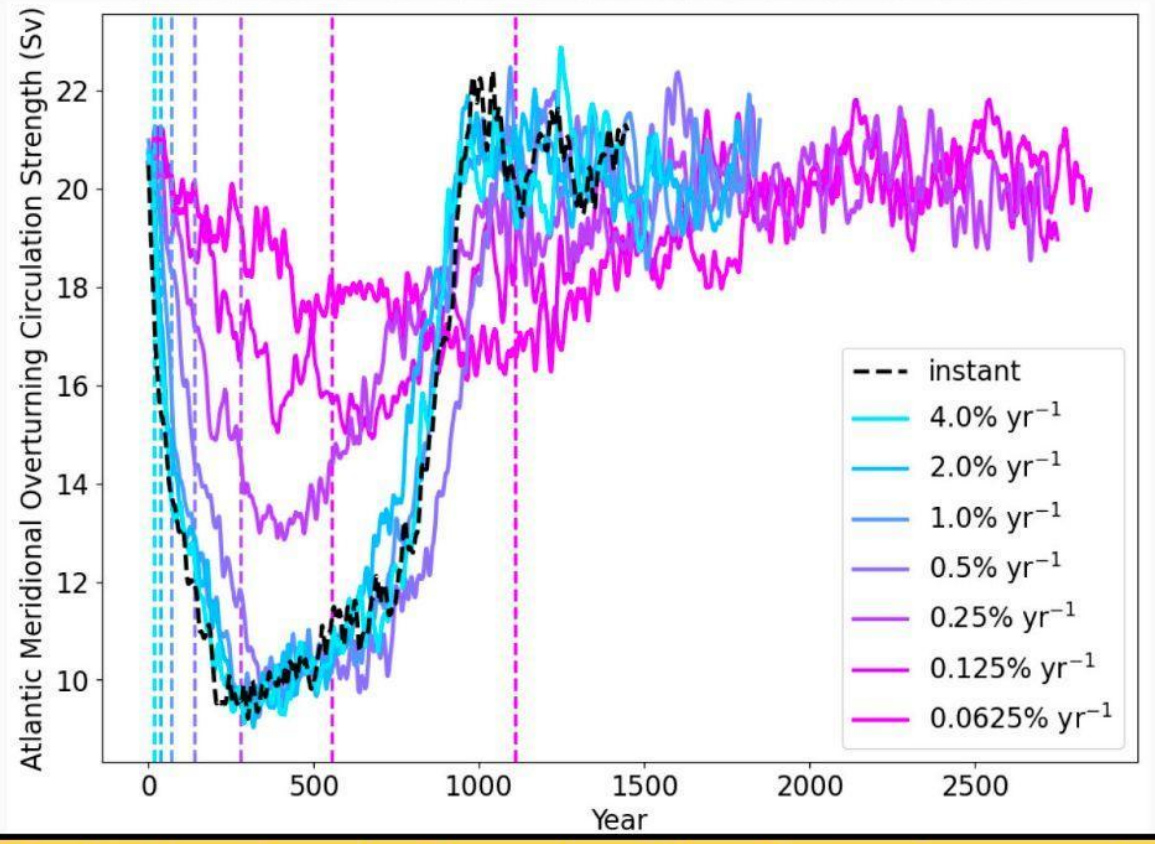
Atlantic Meridional Overturning Circulation (AMOC)

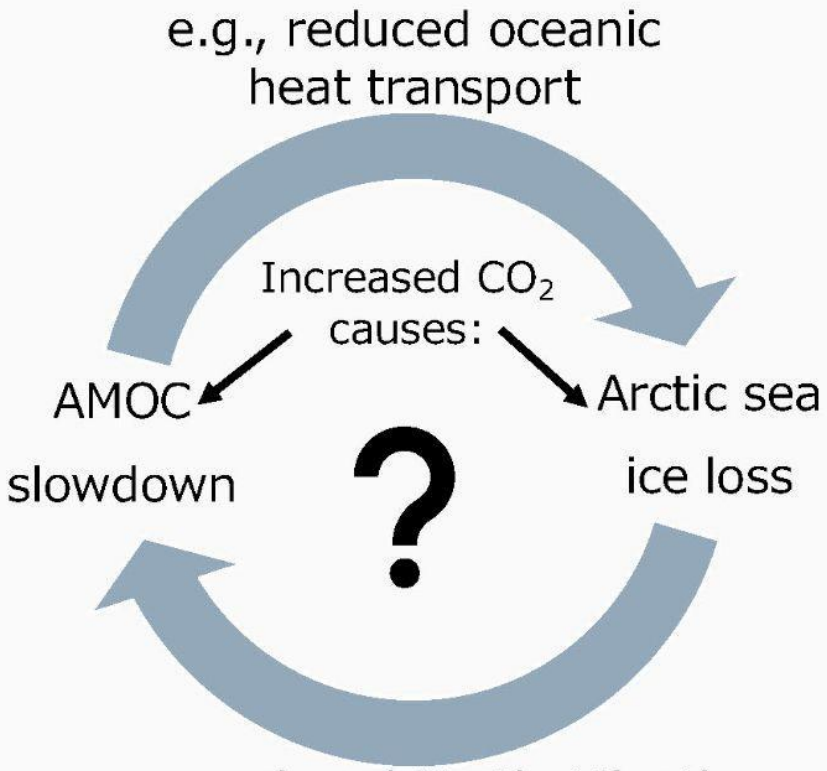


Source: Potsdam Institute for Climate Research and UK Met Office

Positive feedbacks impact the AMOC's sensitivity to the rate of CO_2 change

AMOC slowdown when atmospheric CO_2 is doubled over different amounts of time



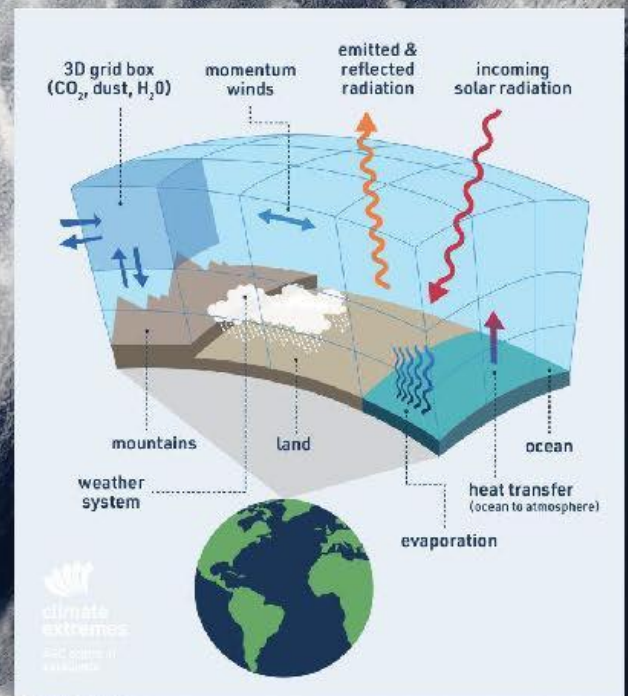


Goal: disentangle the role of Arctic sea ice as a forcing and a feedback on the AMOC to further understand its response to anthropogenic climate change using Global Climate Model experiments

Global Climate Modeling of Marine Cloud Brightening (MCB)

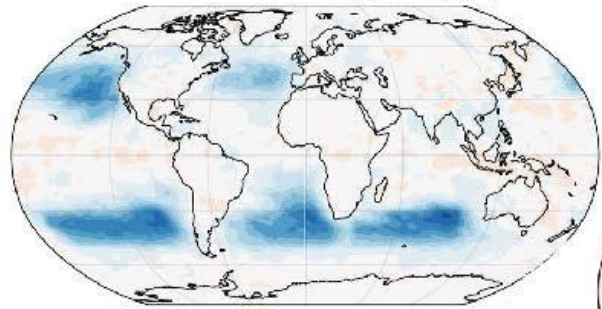
Haruki Hirasawa (ATMOS)

1. How well do climate models represent MCB?

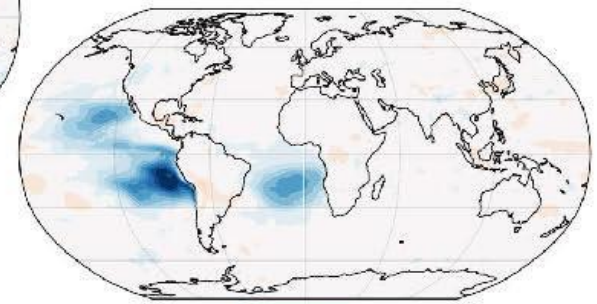


2. Where might MCB be deployed?

Midlatitude MCB (12.5Tg/yr)



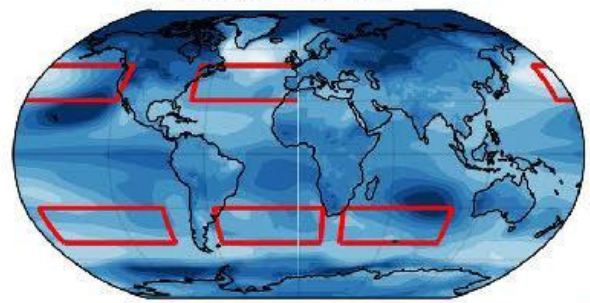
Subtropical MCB (7.5Tg/yr)

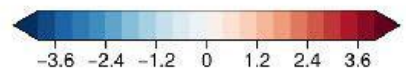


Reflected sunlight (Wm^{-2})

3. What could the climate impact be?

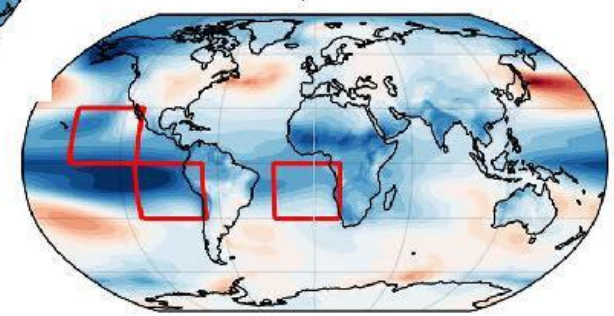
Midlatitude MCB





2m temperature (K)

Subtropical MCB



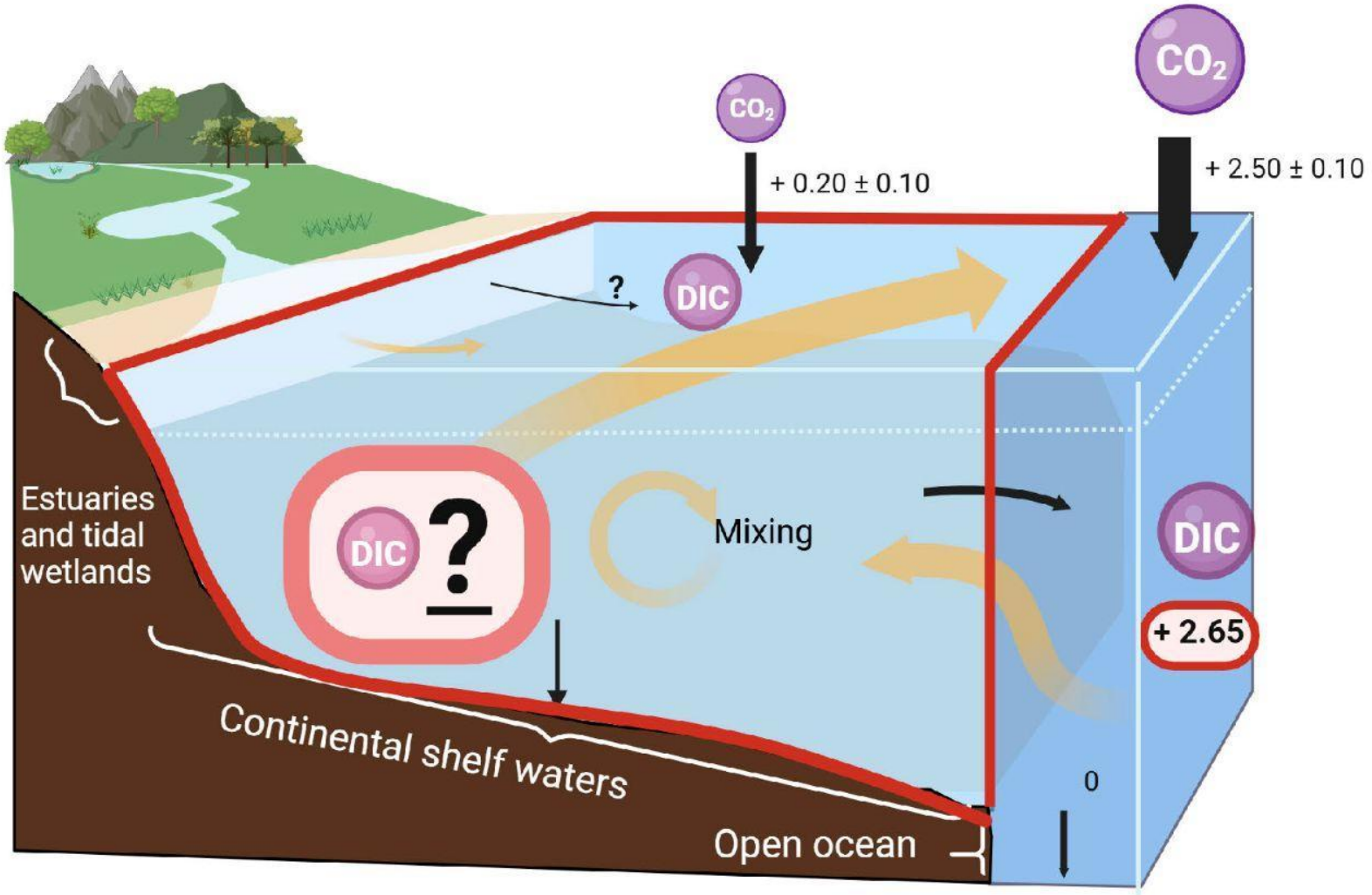
Anthropogenic Carbon Accumulations in U.S. Coasts

Xinyu Li
(UW CICOES)
Cooperative Institute for CLIMATE, OCEAN & ECOSYSTEM STUDIES

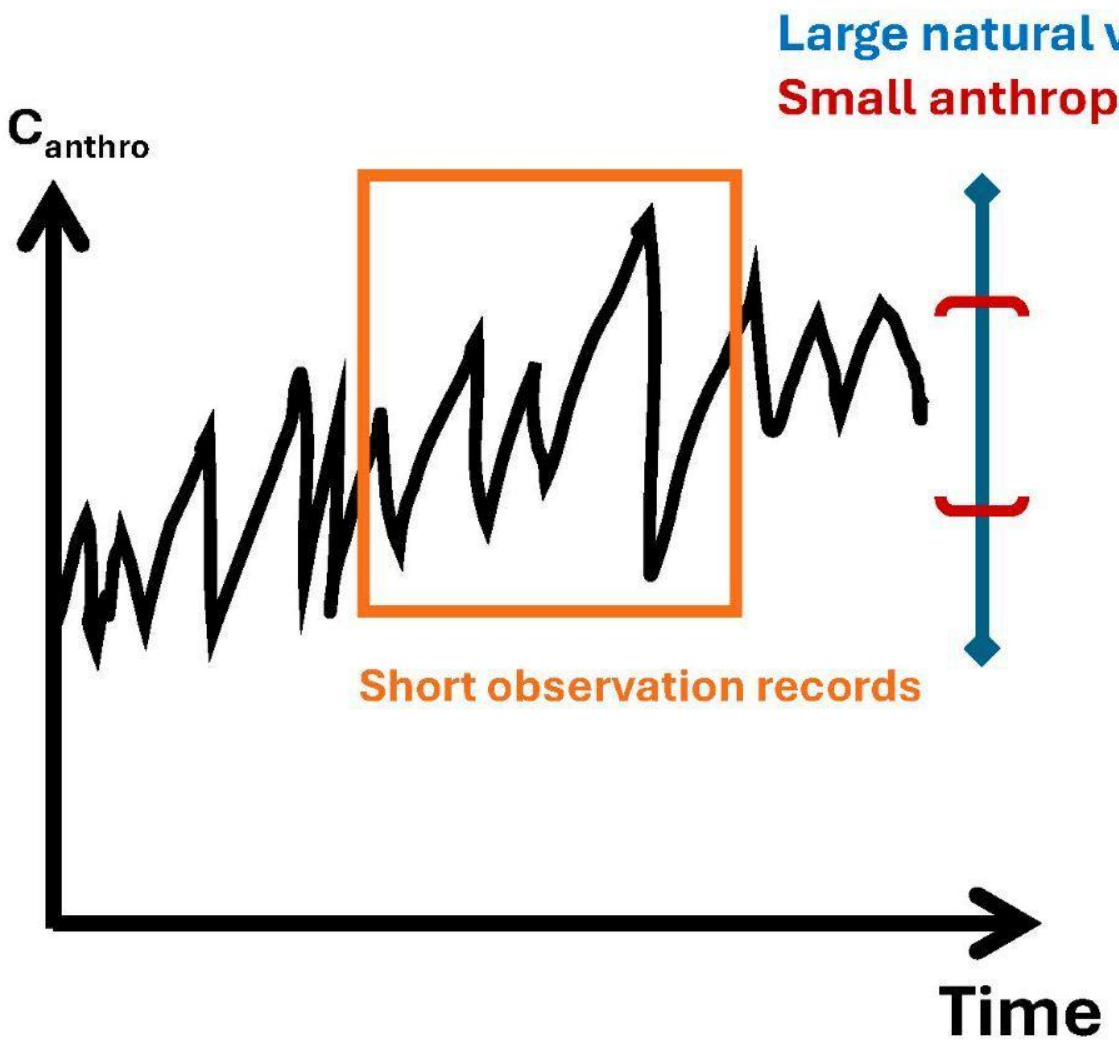
Research Questions:

*Anthropogenic carbon (C_{anthro}) distribution, inventory and mechanism?

*Land-to-ocean anthropogenic carbon (C_{anthro}) lateral transport?



Anthropogenic Carbon Accumulations in U.S. Coasts



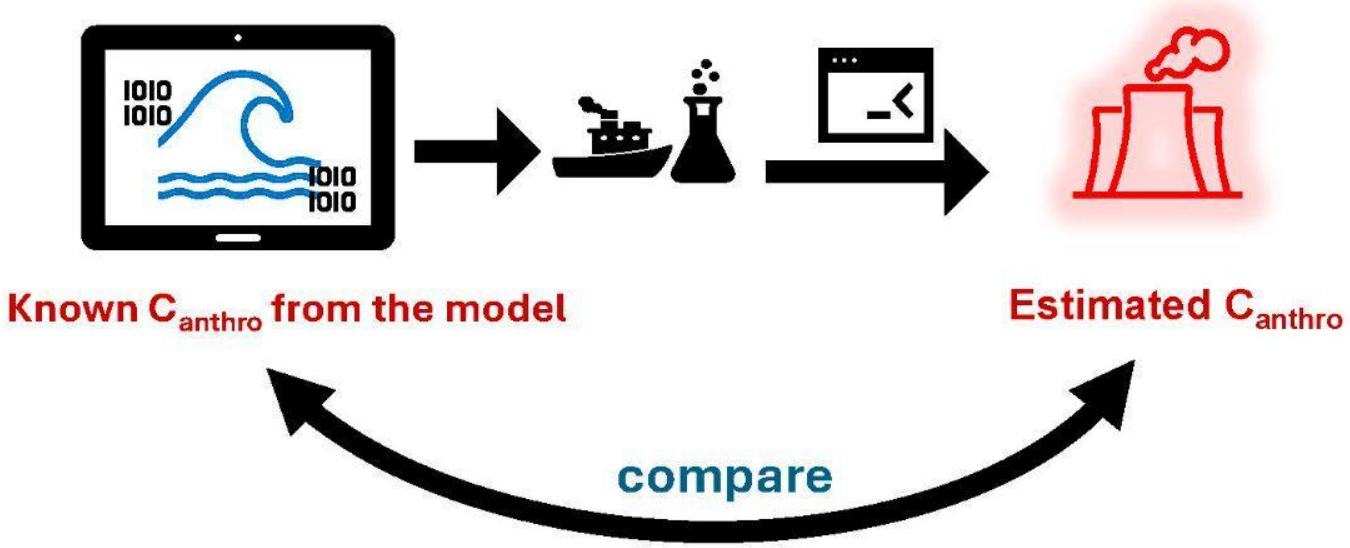
Keys:

- Effective methodology
- High-quality and Long-term data

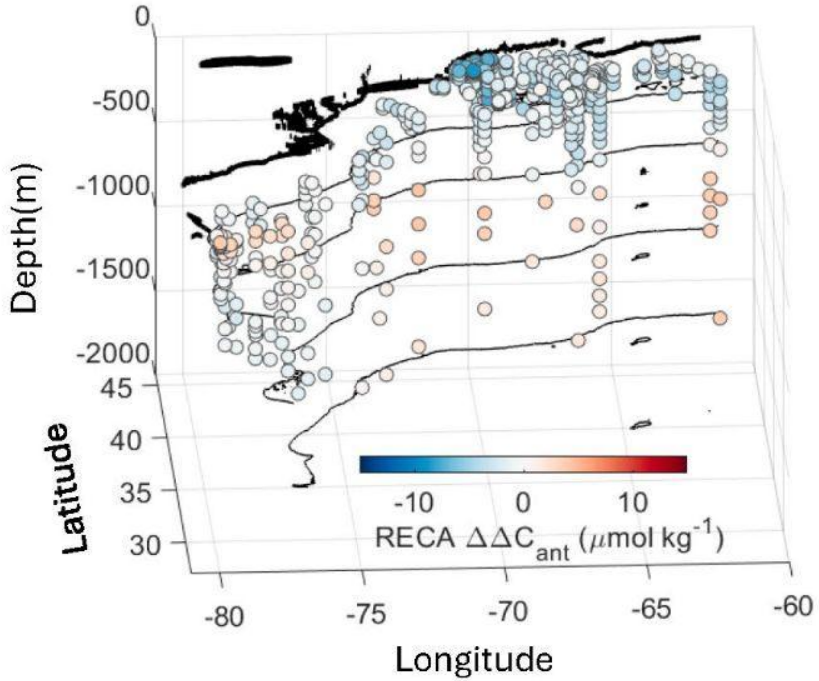
Anthropogenic Carbon Accumulations in U.S. Coasts

Develop and evaluate C_{anthro} algorithm with model data

Ocean system simulation experiences (OSSE):



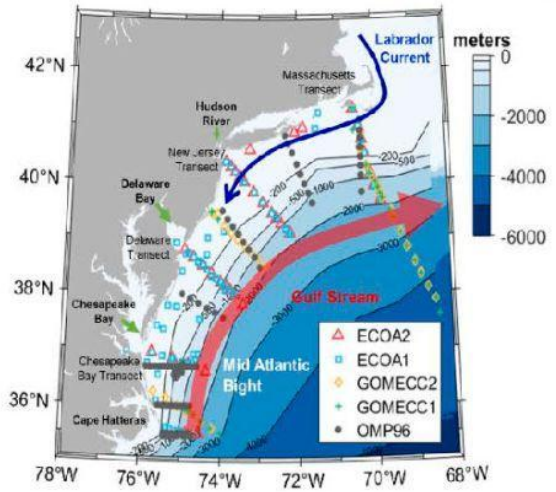
Reconstructed C_{anthro} biases

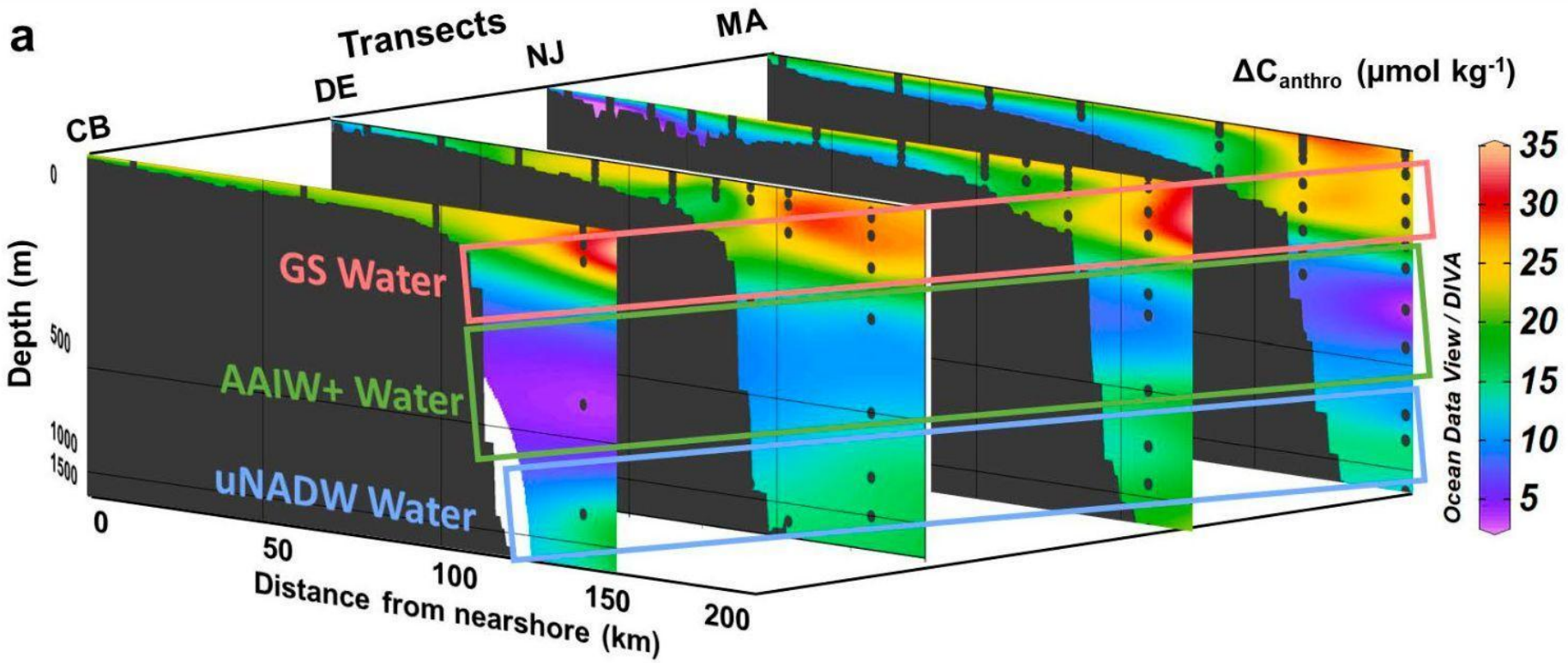


Effective methodology with small biases on C_{anthro} estimations

Anthropogenic Carbon Accumulations in U.S. Coasts

Apply C_{anthro} algorithm with observation data (U.S. East Coast)





- C_{anthro} distributions are determined by water mass source and properties
- C_{anthro} budget analysis suggested limited influence from terrestrial input

Matt Luongo

CICOES & School of Oceanography

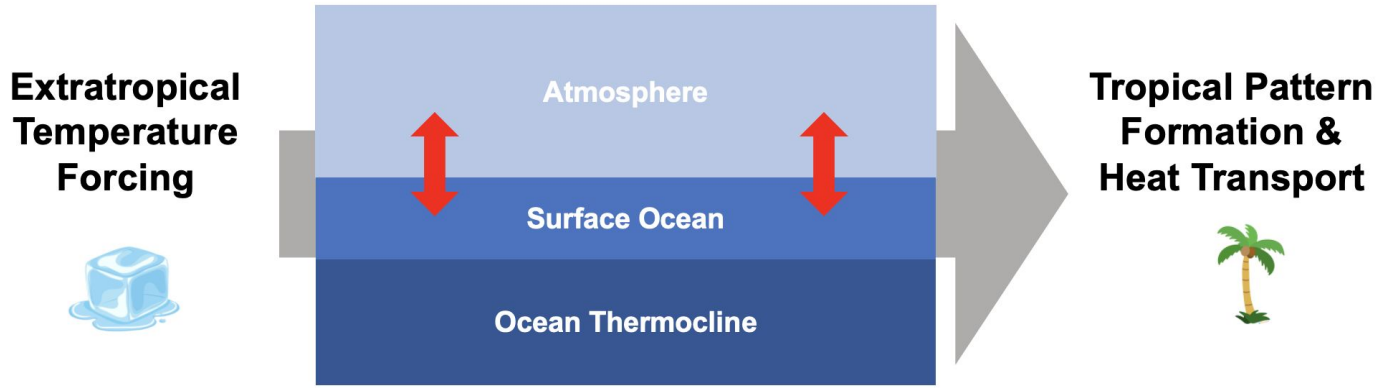
PhD, Scripps Institution of Oceanography, UCSD

Research Interests:

- Large-scale climate dynamics
- Coupled ocean-atmosphere interactions
- Extratropical-tropical teleconnections
- Physical oceanography
- Heat transport

Research Techniques:

Exploring coupled climate phenomena through a hierarchy of modeling simulations to illuminate underlying dynamics.



mluongo@uw.edu

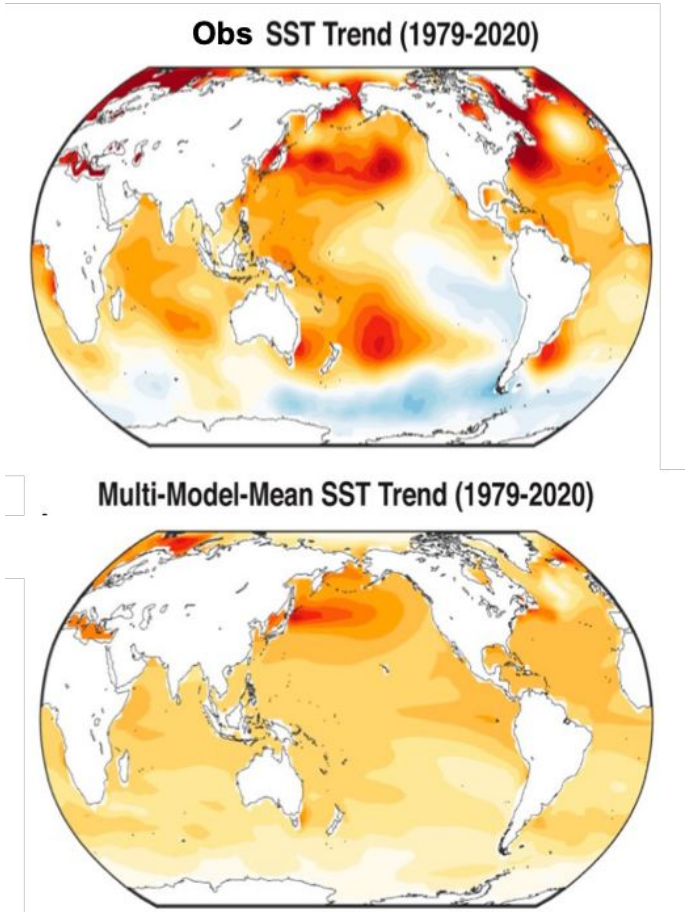
As a CICOES Fellow at UW, I'm applying these techniques to understand how the Southern Ocean impacts the tropics.

Nearly all climate models are unable to recreate observed SST trends in the SO & SE Pacific over the past 40 years.

→ This mismatch has major implications for climate change projections!

SSH Adjustment to SO Cooling

Q1. What is the local SO response to surface forcing?
Q2. Are there non-local impacts of this response?
Q3. How do modeling choices affect 1 & 2?



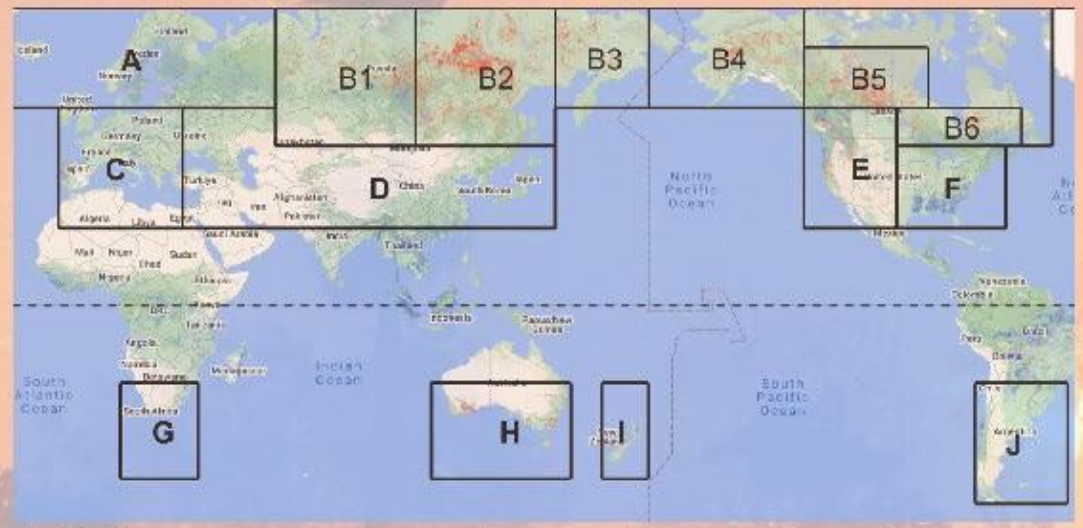
Wills et al. (2022)

I'm excited to collaborate with PCC & CoEnv colleagues! Please reach out!

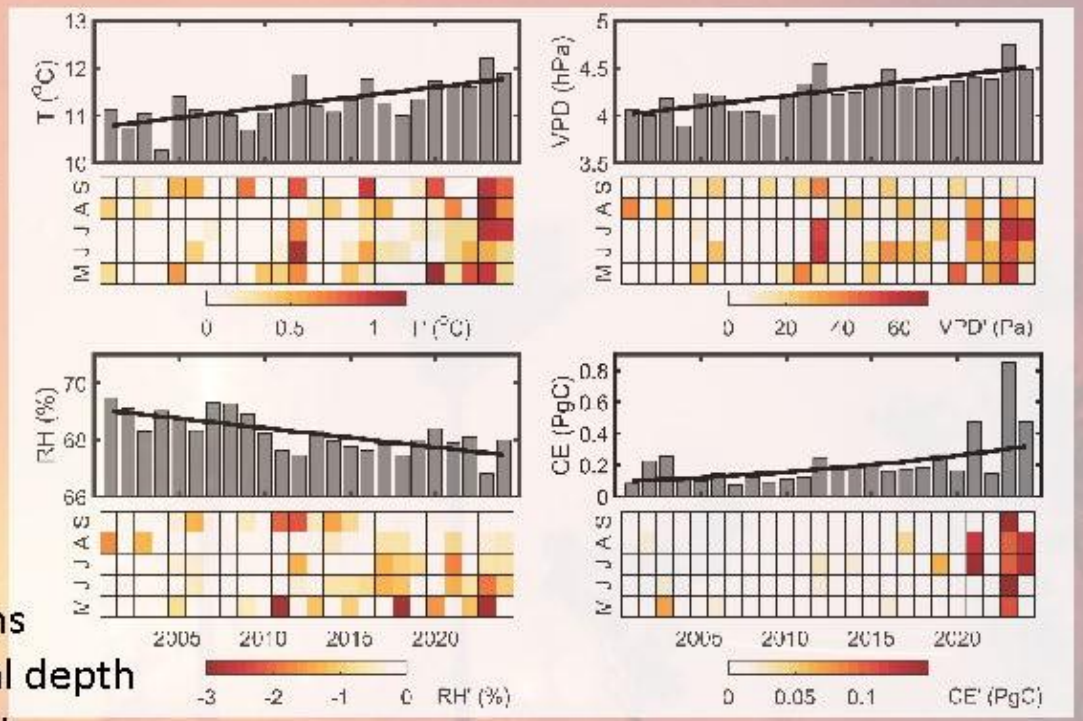
mluongo@uw.edu

21st Century Extratropical Wildfires: A Multi-scale, Global Survey

Chan-Pang Ng; Collaborators: John M. Wallace, Jinhyuk E. Kim, Aodhan Sweeney and Siyu Zhao



	Forest (10^6 km^2)	Loss (10^6 km^2)	Loss (%)	CE (PgC)
A	2.2	0.01	0.5	0.05
B	**9.6**	**1.16**	**12.1**	**4.7**
C	1.2	0.02	1.6	0.1
D	2.3	0.01	0.4	0.2
E	**1.2**	**0.10**	**8.5**	**0.5**
F	1.8	0.005	0.3	0.1
G	0.1	0.002	4.7	0.02
H	**0.3**	**0.08**	**23.8**	**0.4**
I	0.1	0.0004	0.4	0.001
J	0.7	0.01	1.7	0.1



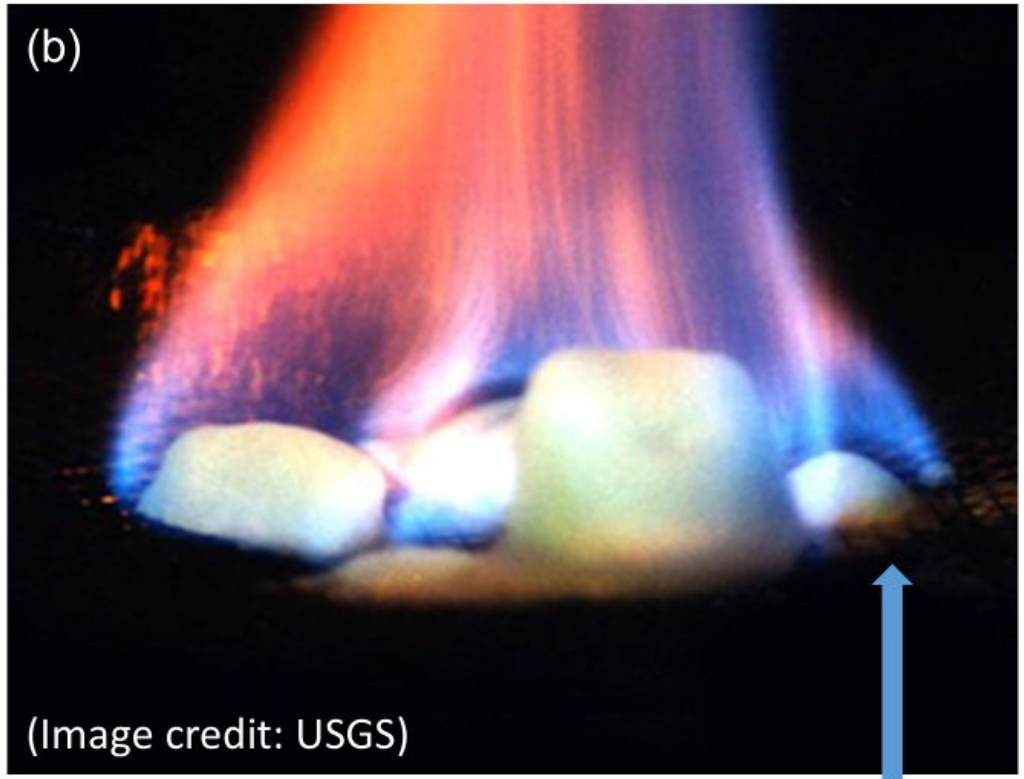
CE: Carbon Emissions
AOD: Aerosol optical depth
RH: Relative Humidity
VPD: Vapor Pressure Deficit

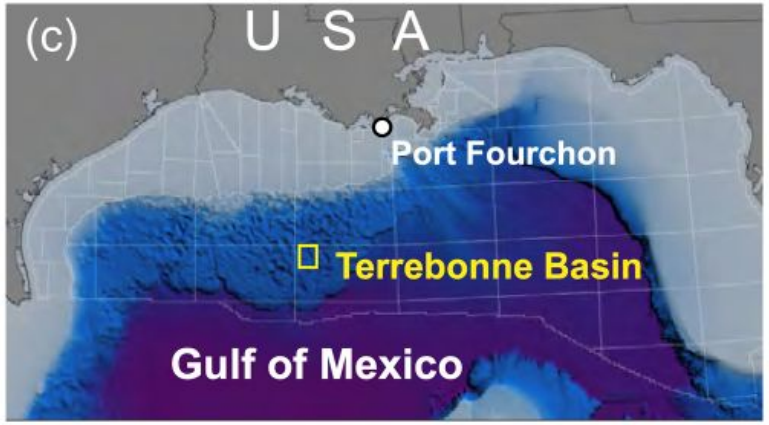
	CE	AOD	T (°C)	RH (%)	VPD (hPa)
B	2.22**	0.19	0.99**	−1.56**	0.49**
E	3.54**	0.18	1.16**	−0.59	0.66*
H	−0.56	0.18	0.45	1.52	−0.10

**: $p < 0.01$; *: $0.01 < p < 0.05$

Email: cpng@uw.edu Website: chanpangng.github.io

Man-Yin Tsang, postdoc
(Oceanography, Solomon Lab)



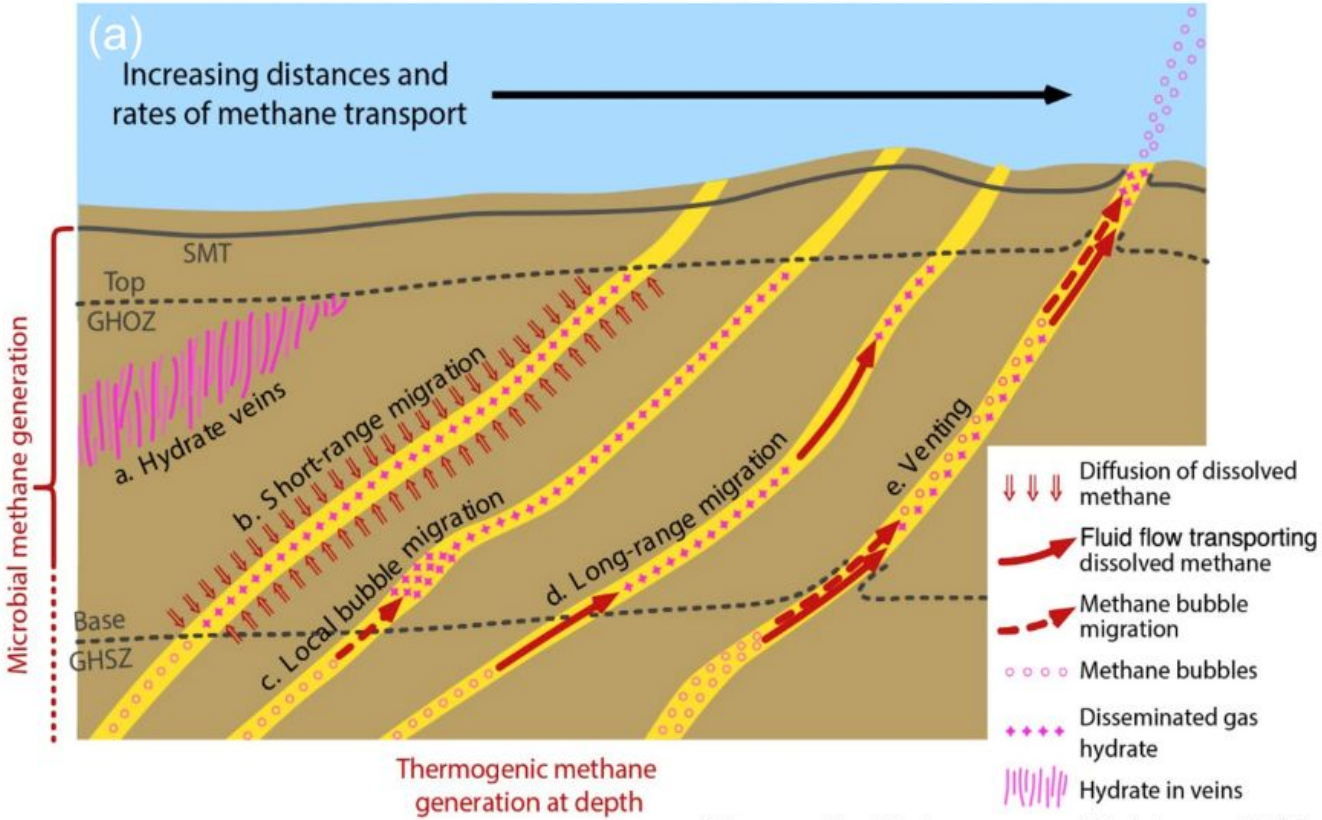


Drilled in 2023. Cores stored at in-situ pressure.

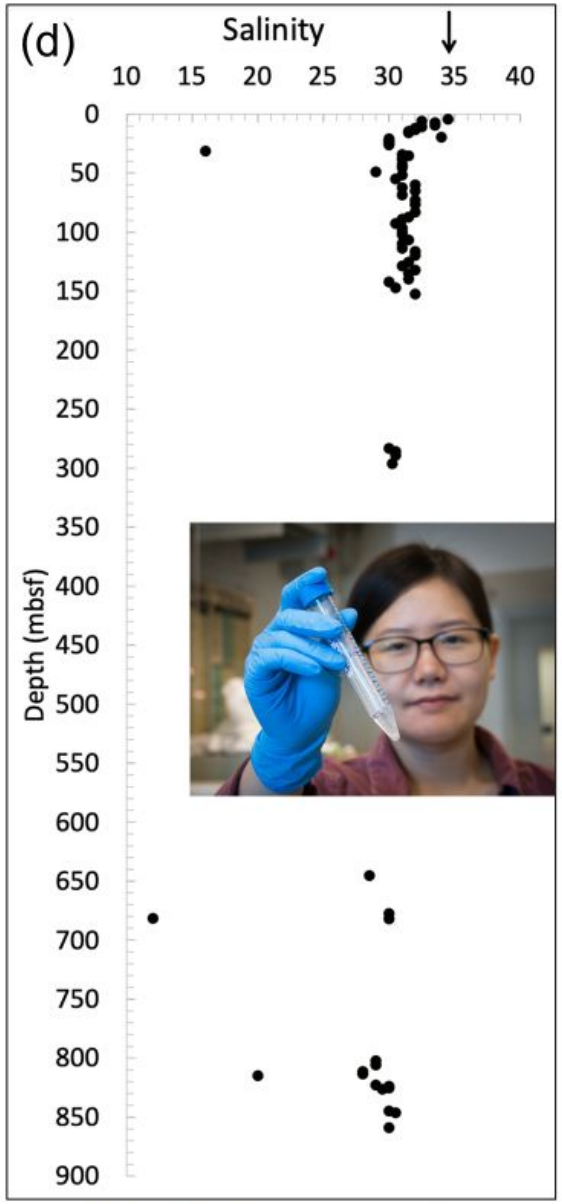
Methane:

- A strong greenhouse gas
- Locked up as methane hydrates (‘fire ice’) in continental shelves
- Understanding the mechanisms of hydrate dissolution and formation is essential

(More about the project: https://ig.utexas.edu/energy/gom2-methane-hydrates-at-the-university-of-texas/gom2-2-expedition/)



(Figure after Malinverno and Goldberg, 2015)



- What drives hydrate formation?
  - Intense methanogenesis in adjacent sediments?
  - Fluid transport?
    - Methane transported in dissolved form or as gas?
- Does hydrate formation always come with elevated salinity?
- We answer these questions by analyzing the salinity, composition and solute distribution in sediment porewater

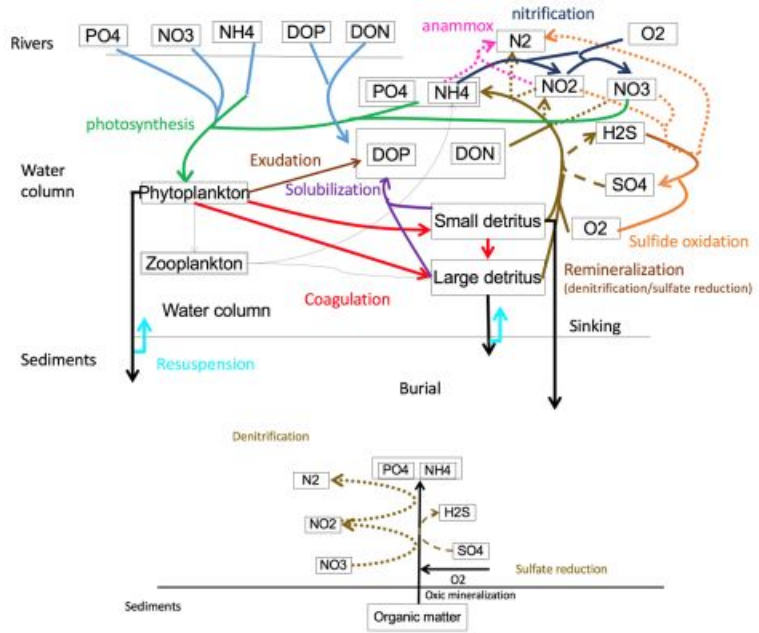
Man-Yin Tsang, postdoc
(Oceanography OSB416)
manyint@uw.edu

Hello, I’m Rui Jin!

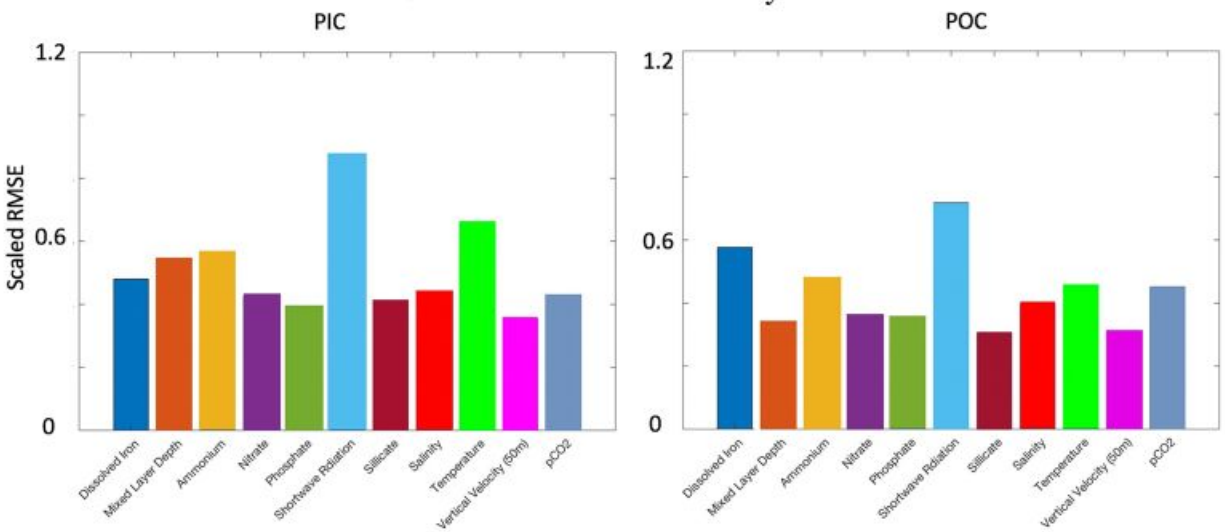
Postdoc at Cooperative Institute for Climate, Ocean, and Ecosystem Studies (CICOES) and NOAA’s Pacific Marine Environmental Laboratory (PMEL).

Biogeochemical oceanography, with expertise in Earth system modeling, biogeochemical cycle dynamics, and machine learning applications in ocean science.

Numerical models, including developing and refining biogeochemical modules, integrating observational datasets, and analyzing large-scale environmental datasets.



Schematic of the merged biogeochemical code developed as the new baseline model for the Bay



Variable importance plots for particulate inorganic carbon (left) and particulate organic carbon (right) of the log10 transformed target data sets

Before Joining UW..

- Completed my PhD at Johns Hopkins University, where I worked on both coastal and global ocean biogeochemistry.
- My previous work:

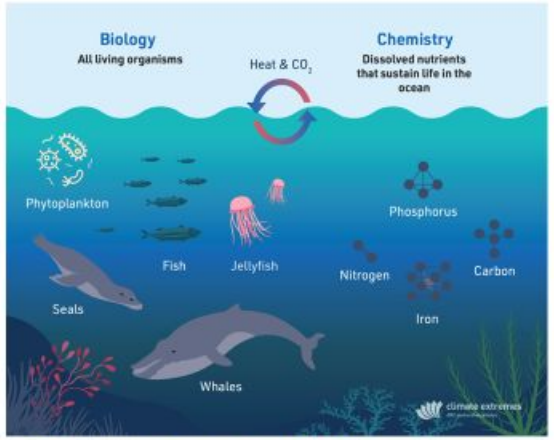
- Comparing two ocean biogeochemical models of Chesapeake Bay with and without the sulfur cycle instead highlights the importance of particle sinking, burial, organic matter, nitrification and light attenuation

- How does colored dissolved organic matter (CDOM) influence the distribution and intensity of hypoxia in coastal oceans?

- Using Random Forests to Compare the Sensitivity of Observed Particulate Inorganic and Particulate Organic Carbon to Environmental Conditions

Rui Jin

Advancing understanding of biogeochemical feedbacks to support ocean-based carbon management solutions.



Biogeochemical Processes

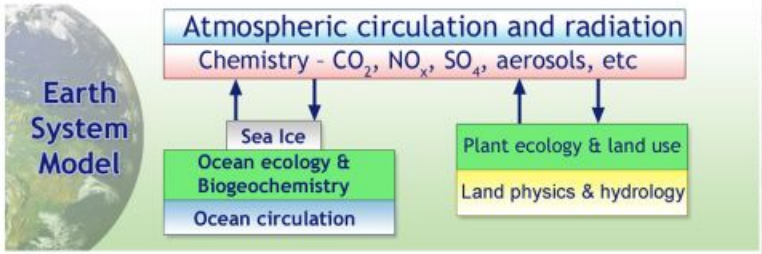
Investigating carbon dynamics and nutrient cycling within ocean ecosystems.

Key Project
Biotic Calcification Feedbacks in mCDR

1. **Objective:** Evaluate how biotic feedbacks influence mCDR effectiveness.
2. **Tools:** MOM6-COBALT Earth System Model.
3. **Impact:** Optimize strategies for CO_2 reduction and climate mitigation.
4. **Collaborators:** Kelly Kearney, Brendan Carter, Darren Pilcher (NOAA), Albert Hermann (CICOES).

Earth System Modeling

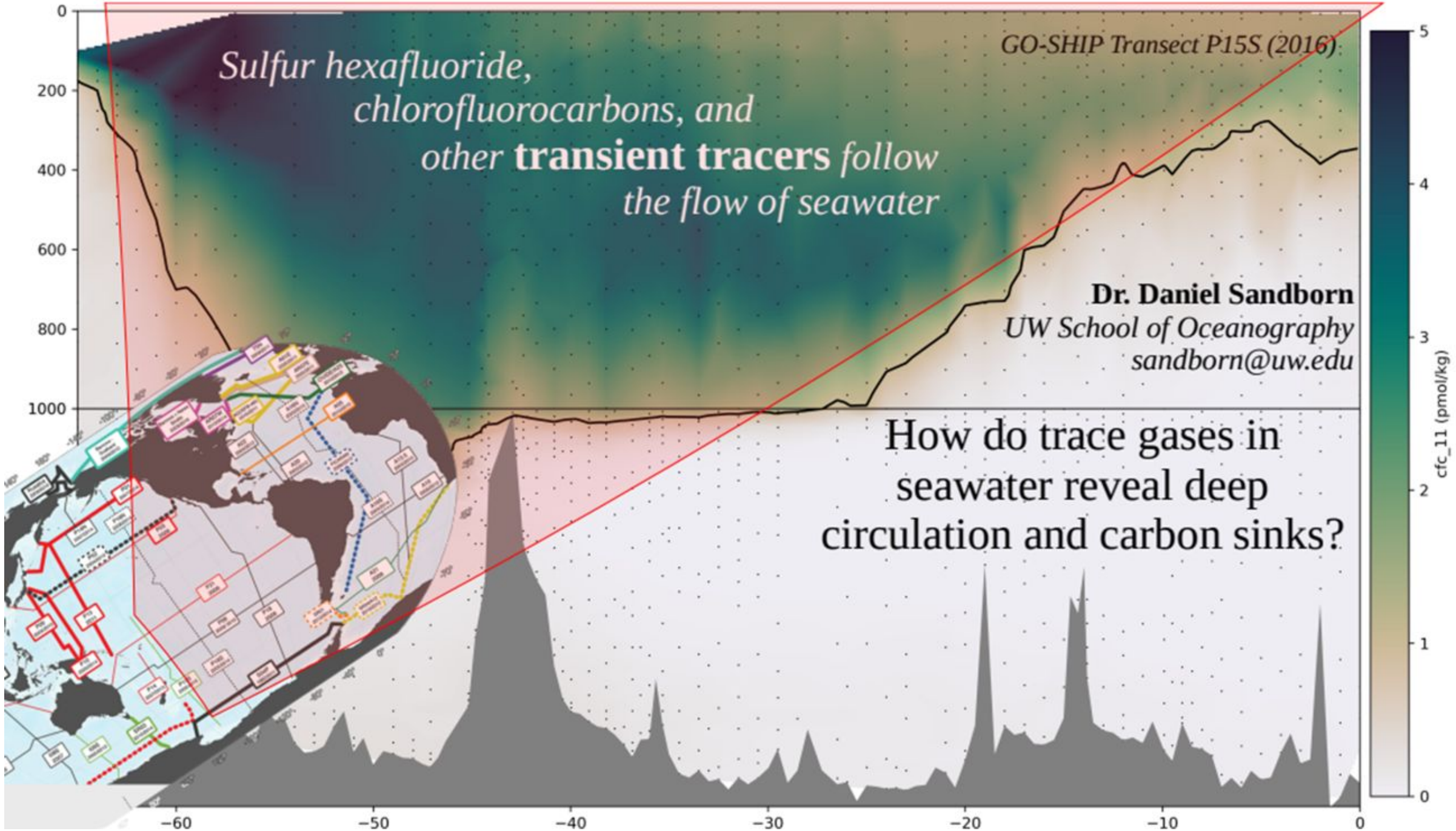
Development and refinement of **MOM6-COBALT** to simulate marine carbon processes.



Marine Carbon Dioxide Removal (mCDR)

Exploring century-scale effectiveness of mCDR strategies with focus on biotic calcification feedbacks.

CICOES


GO-SHIP Transect P15S (2016)
Sulfur hexafluoride,
chlorofluorocarbons, and
other transient tracers follow
the flow of seawater
Dr. Daniel Sandborn
UW School of Oceanography
sandborn@uw.edu
How do trace gases in
seawater reveal deep
circulation and carbon sinks?
cfc_11 (pmol/kg)
0
200
400
600
800
1000
−60
−50
−40
−30
−20
−10
0
5
4
3
2
1
0

I measure transient tracers on *GO-SHIP* transects.

(Global Ocean Ship-based repeat Hydrographic Investigations Program)

- **Is overturning circulation changing?**
  We're creating an inventory of Southern Ocean transient tracers.
- **What is the fate of carbon in the deep ocean?**
  We're following carbon into the sea via transient tracer inference.
- **How can transient tracer science be made accessible?**
  We're producing open-source tools for ventilation & age calculations.

Have an interest in climate-ocean variability? CO_2 & trace gas analysis? Inverse state estimation? Statistical inference? Open-source software? Let's talk.

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PROGRAM ON CLIMATE CHANGE
UNIVERSITY OF WASHINGTON

2025 Summer Institute

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Themes to vote on:

- Paleoclimate constraints on future climate
- Climate extremes and attribution science
- PNW climate change and impacts

September 10-12, 2025 at Friday Harbor Lab on San Juan Island.

Invitation to share potential speaker ideas for these themes, or ideas for future SI topics, thru the survey.

The link is also in your email and on the PCC Winter Welcome webpage