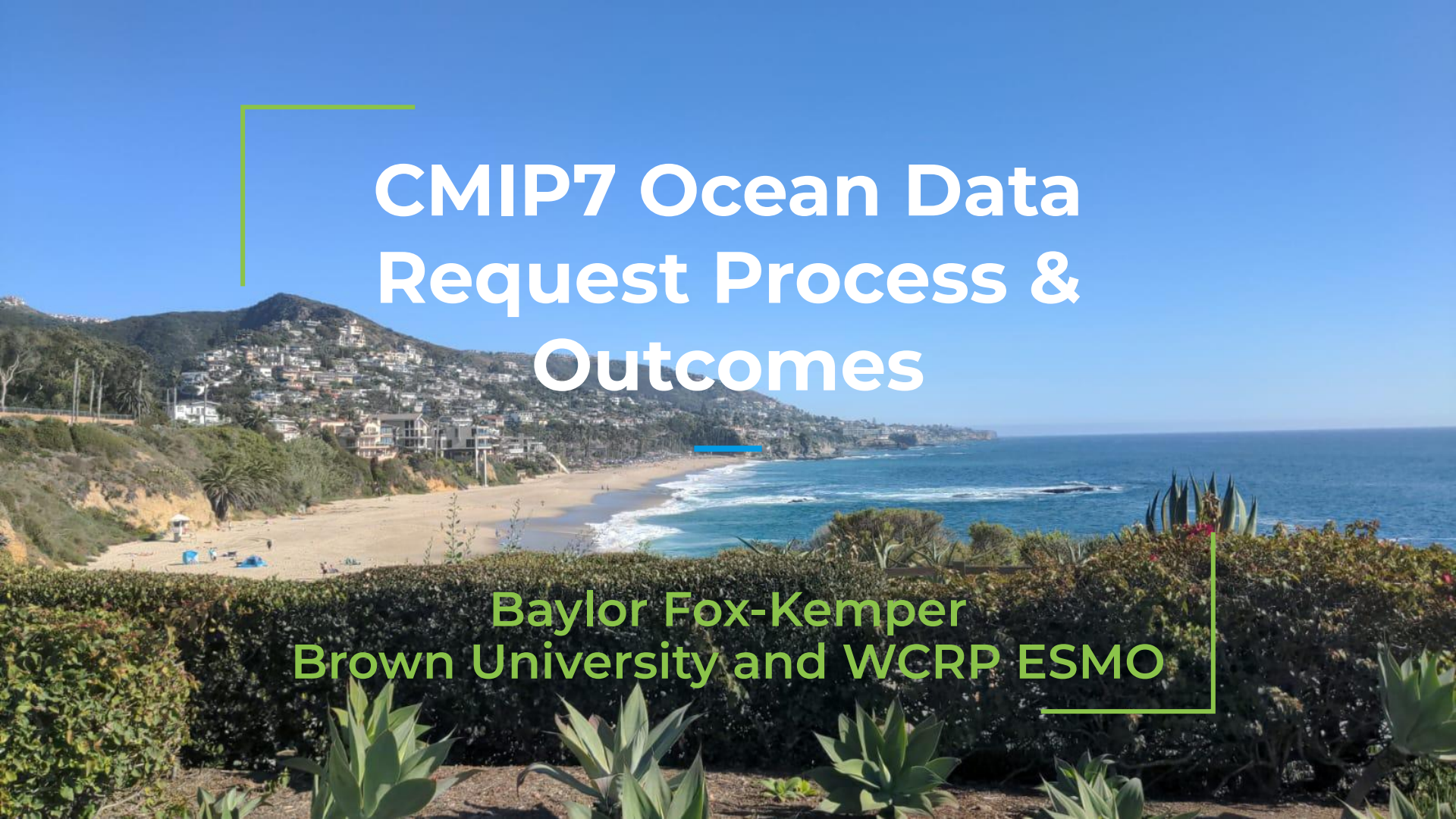
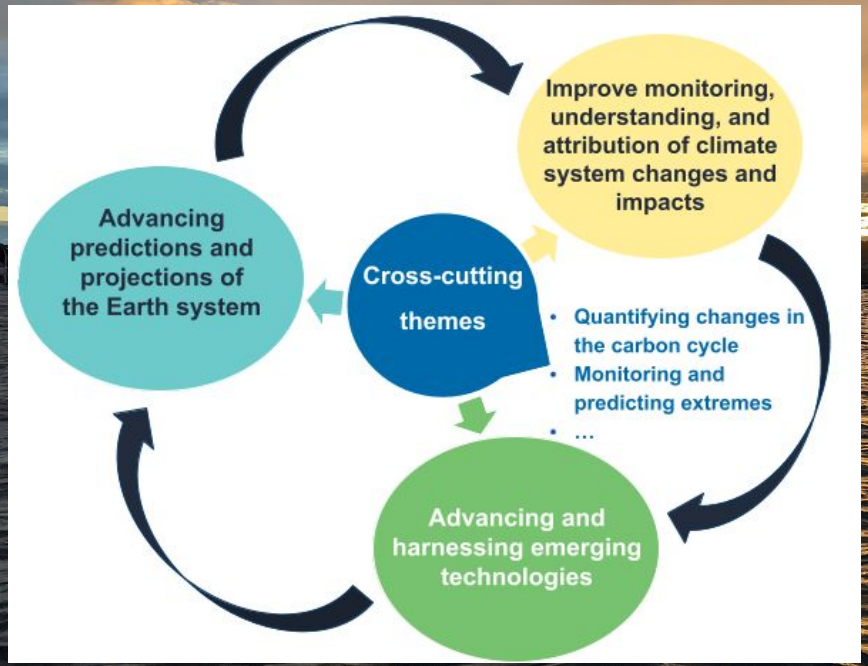


CMIP7 Ocean Data Request Process & Outcomes

Baylor Fox-Kemper
Brown University and WCRP ESMO

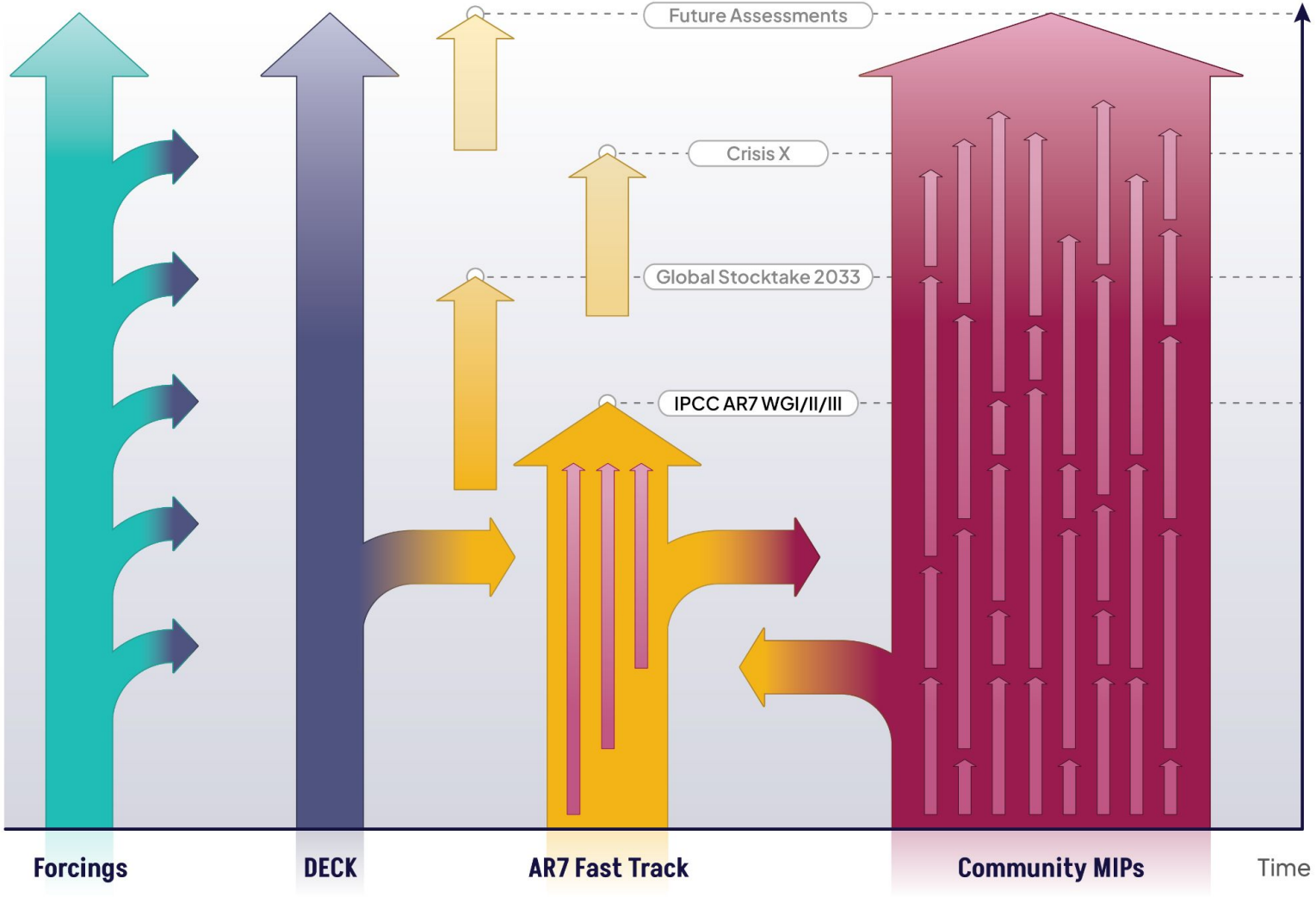
WCRP's Earth System Modeling and Observations (ESMO) **New Core Project**



CMIP7

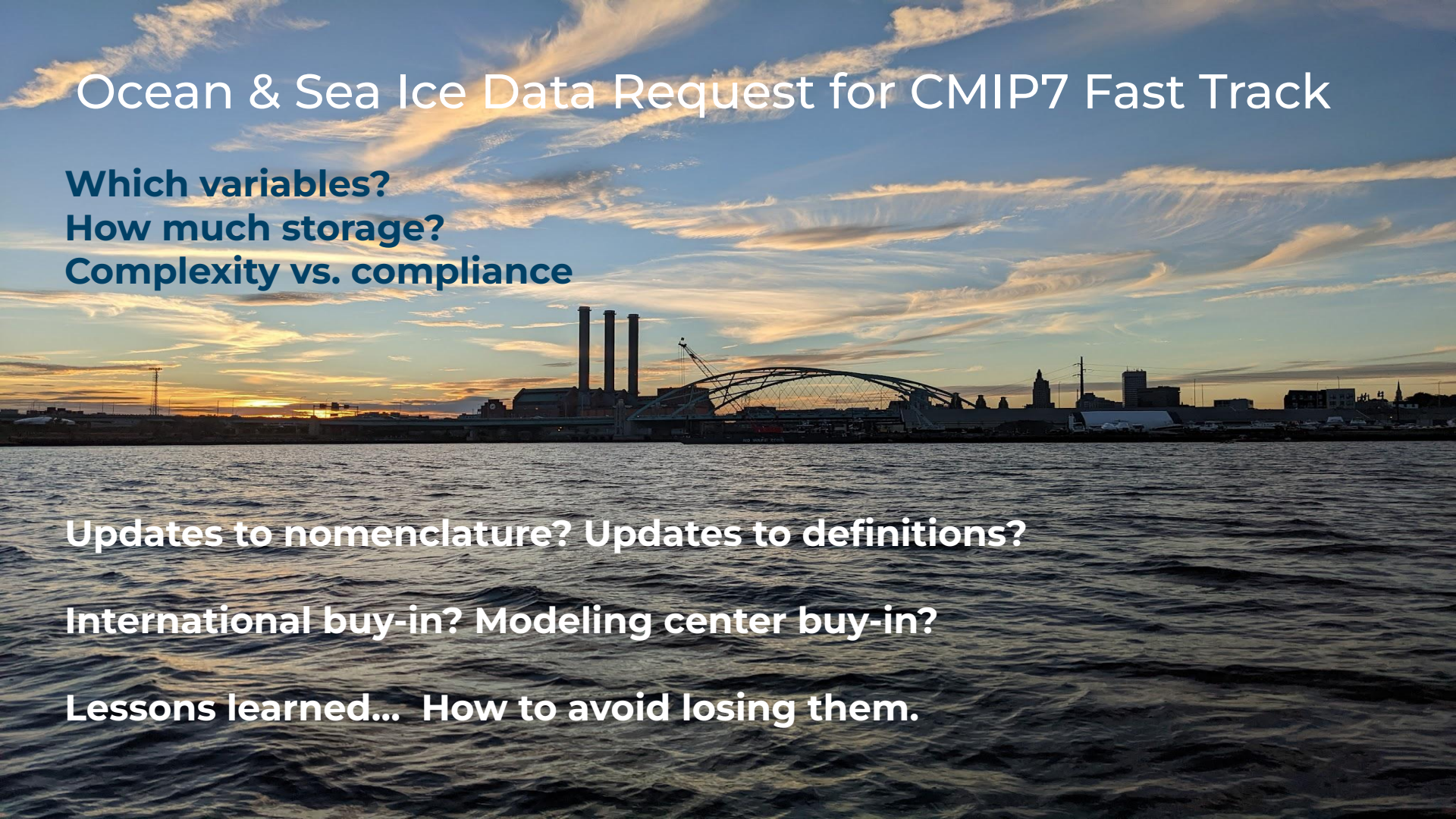
And its malcontents ....

For real deadlines, note that IPCC AR7 WGI is forming momentarily.



Ocean & Sea Ice Data Request for CMIP7 Fast Track

Which variables?
How much storage?
Complexity vs. compliance



Updates to nomenclature? Updates to definitions?

International buy-in? Modeling center buy-in?

Lessons learned… How to avoid losing them.

Ocean & Sea Ice Data Request Process

CMIP-IPO has led the process of author selection, meetings, framework.
CMIP-IPO is involved in the writing of all of the papers (e.g., templates, common examples, organizing spreadsheets, etc.)

There is a scheduled internal review of papers beginning March 7. A writing sprint March 17-21. Final freeze is Mar 27, and final release (v1.2) is Mar 31. Submission to GMD special issue of Explanatory sublications is planned for shortly afterward.

Fox-Kemper, Derepentigny et al. (Ocean & Sea Ice DR Paper).

Opportunities & Variables (For CMIP7 Fast Track)

Ocean and Sea Ice Data Request Paper

Ocean changes, drivers and impacts

Sea ice changes, drivers and impacts

Causality of Polar Amplification

(SI, Ocean dailies, ML and Ocean Extremes, etc.)

Ocean extremes

(Upper ocean dailies–MLD, SST, SSH, SSS, pH, Chl)

Advancing Wind-Wave Climate Modelling for Coastal Zone Dynamics, Impacts, and Risk Assessment

(COWCLIP)

Wind driven ocean surface waves

(Online waves)

Paleoclimate research at the interface between past, present, and future

Other, e.g., Earth's Energy Budget

Other Ocean & Sea Ice papers in progress… (Contact: baylor@brown.edu)

OMIP for CMIP7

This community paper (open to all interested participants) is being written in parallel with the Ocean & Sea Ice DR paper. It is collecting experiences (positive and negative) from the OMIP and CMIP6 experiences, for individual studies and for AR6. The science rationales behind variable updataes are intended to go here.

Ocean Spin-Up for Projections, Predictions, and Forecasts

An ESMO Task Team proposal is in progress to complete this paper. This paper will span interests of NWP, S2S, and Climate. Opportunities from Data Assimilation, Acceleration (e.g., Khatiwala), and Emulators will be part of the plan.

Diagnostics, Protocols & Variables (Deeper, for OMIP)

OMIP for CMIP7 Paper

Review Paper format covering:

Mixed Layer Depth
(Treguier et al. 2023)

Density and Ocean Heat Content Anomaly
(MacDougall et al. 2021)

Sea Level Contributions
(Gregory et al. 2019)

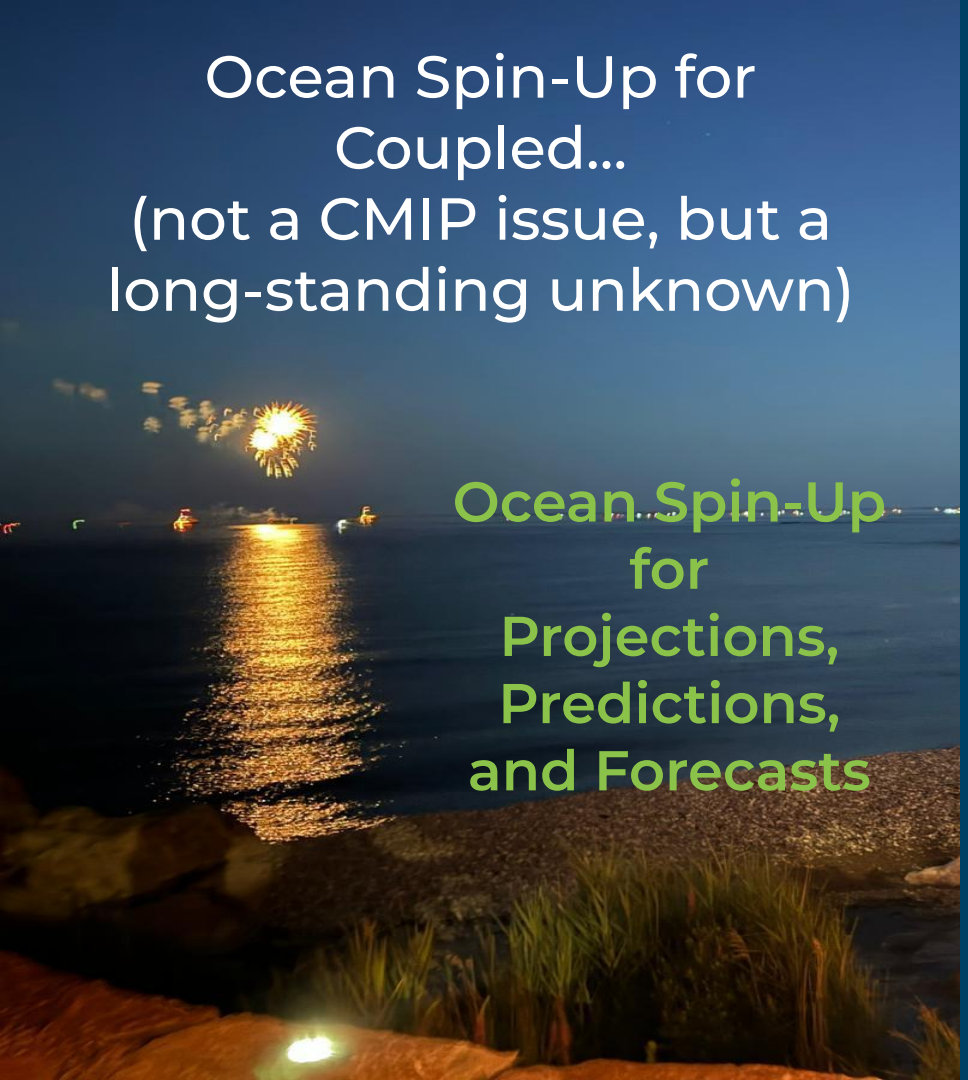
OMIP3 protocols
(CORE, CORE-2, OMIP-1, OMIP-2, ...)

O-FAFMIP
(Added Heat, etc.; Todd et al. 2020)
Will extend the OMIP-3 protocol

Needs to Compare with Observations
(Vertical Integrals on p ranges)
(Meridional Cross Sections and Zonal Means)
(Calculation of Integrals Offline)

Fitness for Global Carbon & Heat Budgets
(What trends are “acceptable” in ocean-only spin-up?)

Priorities for CMIP Spin-up and Fast Track



A state-of-the-science review covering practices in:

- Ocean timescale theory
- CMIP spinup
- OMIP spinup
- Coupled NWP spinup
- S2S spinup

Also, reviewing innovations in potential new approaches:

- Emulators (Van Roekel)
- Accelerators (Khatiwala)
- Data Assimilation

Discussion

Why am I doing this?

Is ESMO useful?

Is CMIP too bureaucratic?

Are there other variables we need to consider for the Data Request?

Do you want to join the community papers? (baylor@brown.edu)