

Lessons learned from a high CO₂ world: an ocean view from ~3 million years ago

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for more details please see the discussion paper at *Climate of the Past Discussions*

Data synthesis and data-model comparison: Heather Ford, Sze Ling Ho, Julia Tindall, Alan Haywood, Montserrat Alonso Garcia, Ian Bailey, Melissa Berke, Kate Littler, Molly Patterson, Benjamin Petrick, Francien Peterse, Christina Ravelo, Bjorg Risebrobakken, Stijn De Schepper, George Swann, Kaustubh Thirumalai, Jessica Tierney, Carolien van der Weijst, and Sarah White



Key questions

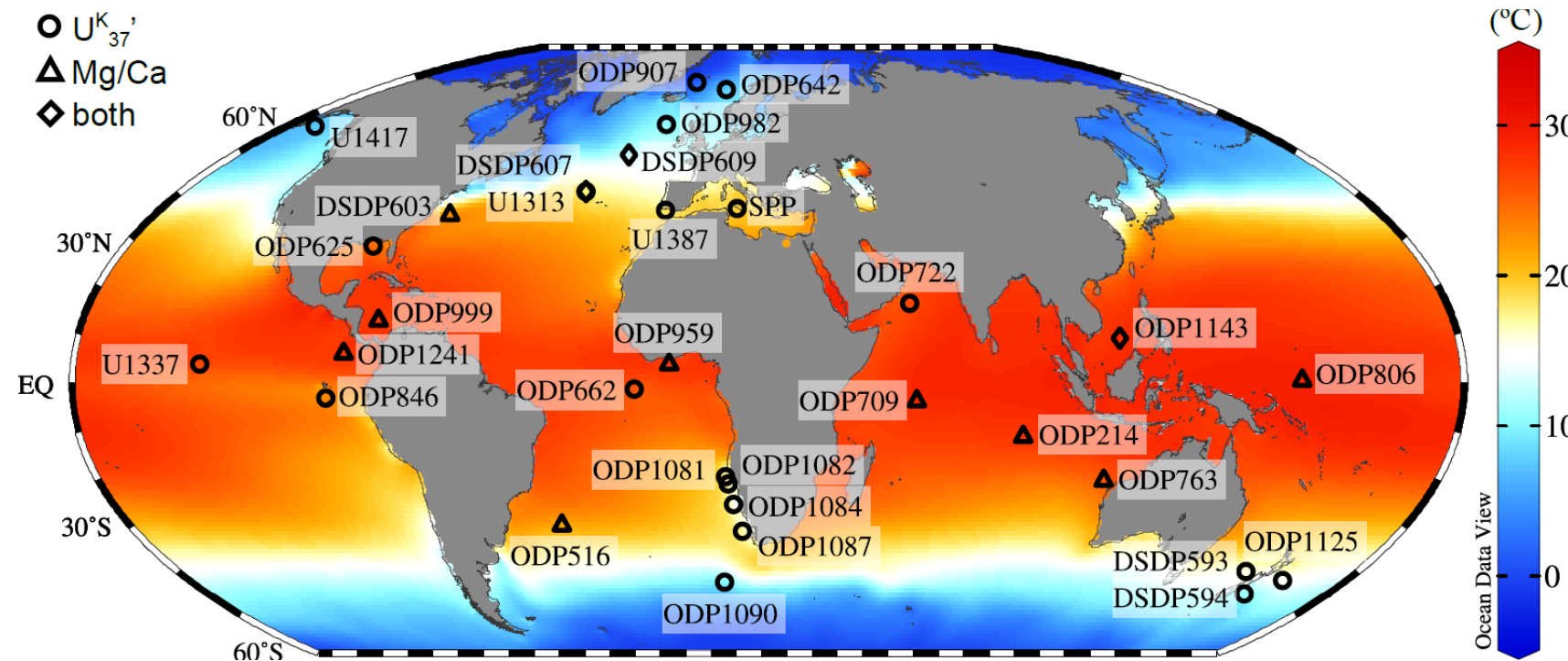
- How variable was late Pliocene climate?
- What are the key forcings and responses?



@PlioceneClimate

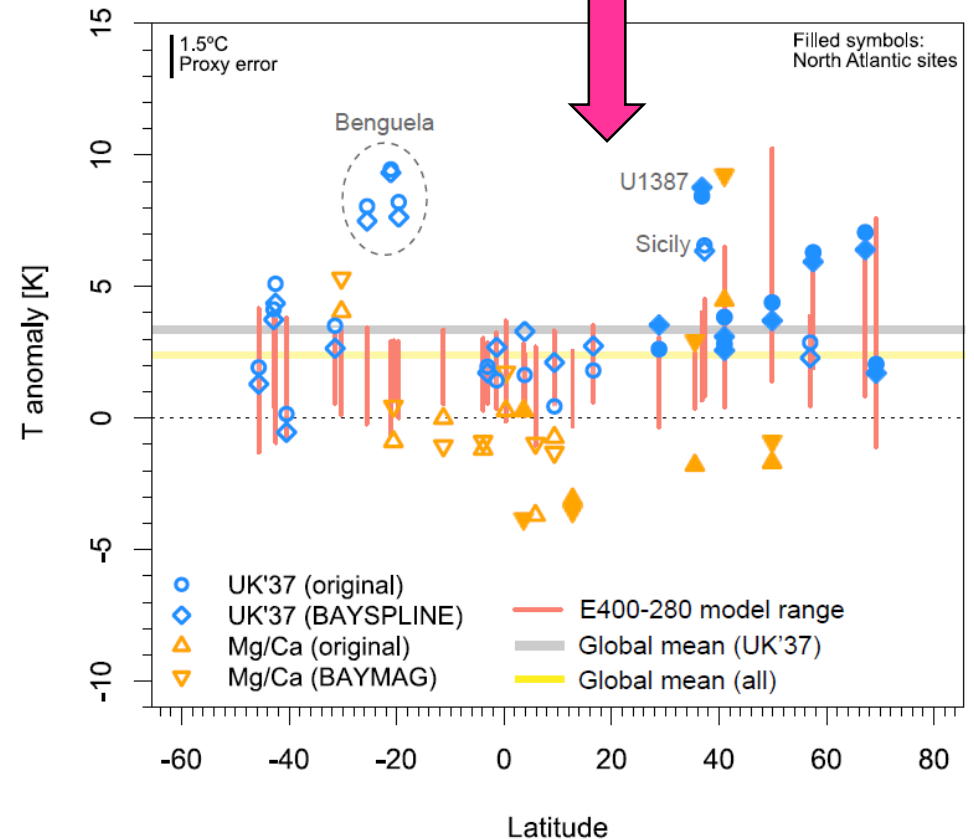
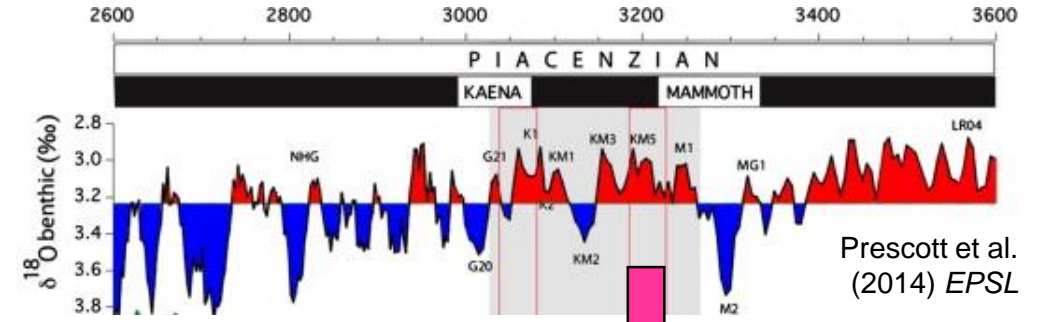
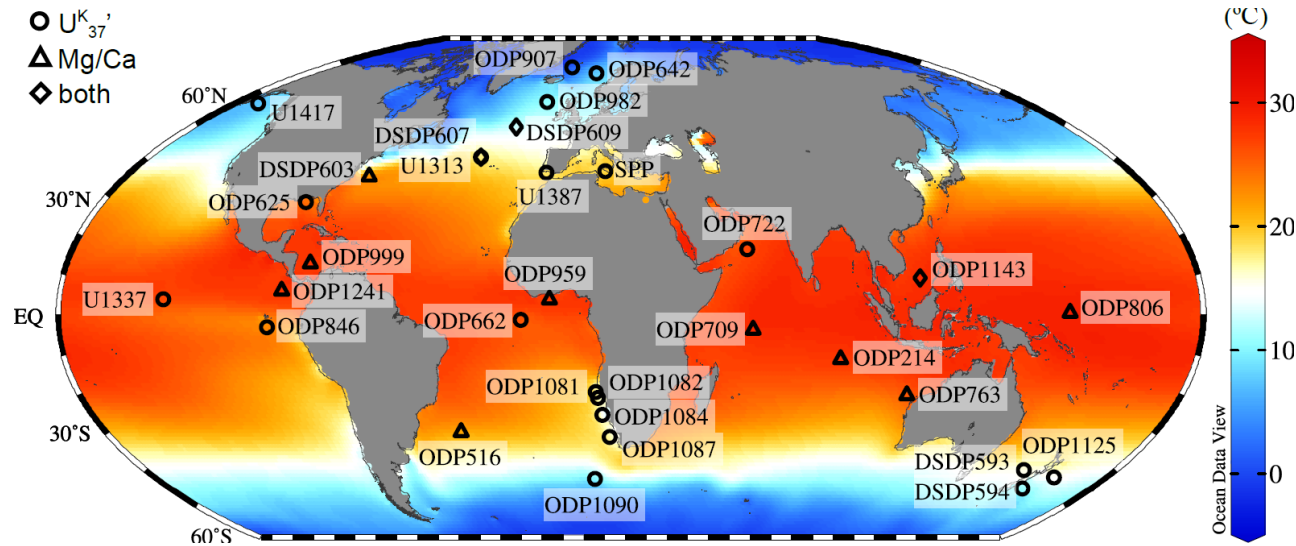
➤ How did the oceans respond at a global scale?

(PlioVAR SST synthesis and model outputs from the PlioMIP2 initiative, summary by Haywood et al. 2020 – Climate of the Past Discussions)



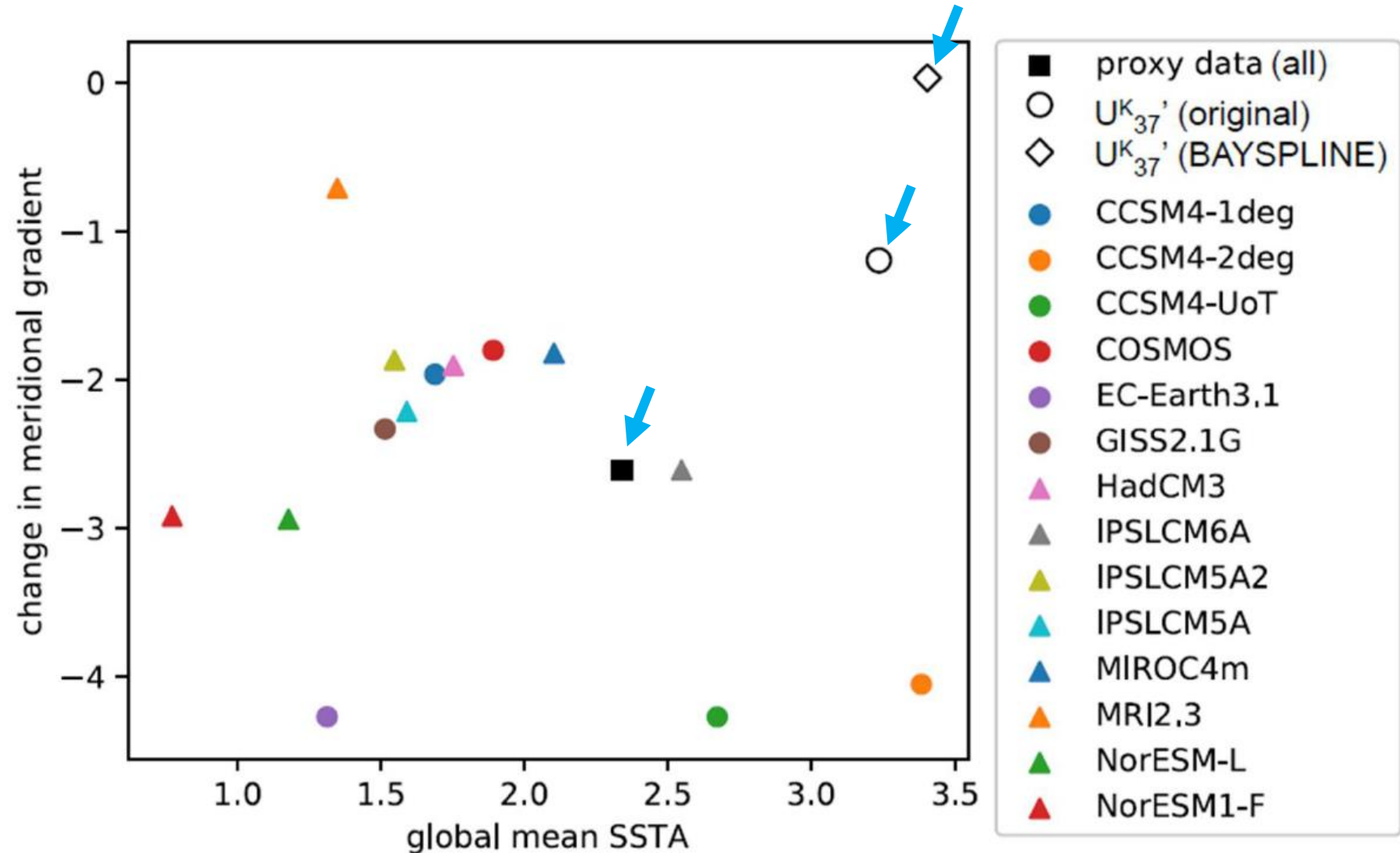
2) Ocean temperature response to elevated atmos. CO₂

- Previously, data and models recording different things?
- New approach gives better agreement



2) Ocean temperature response to elevated atmos. CO₂

- Warmer ocean than Pre-Industrial
- High-latitude warming > low-latitude
- **But proxy-dependent and model-dependent**



Role of seasonality in the proxy signals?

