

Examining long-term hydroclimate variability in the southern Indo-Pacific Warm Pool using paleo-indicators of water isotopes



Grace Windler and Jessica E. Tierney
The University of Arizona Dept. of Geosciences

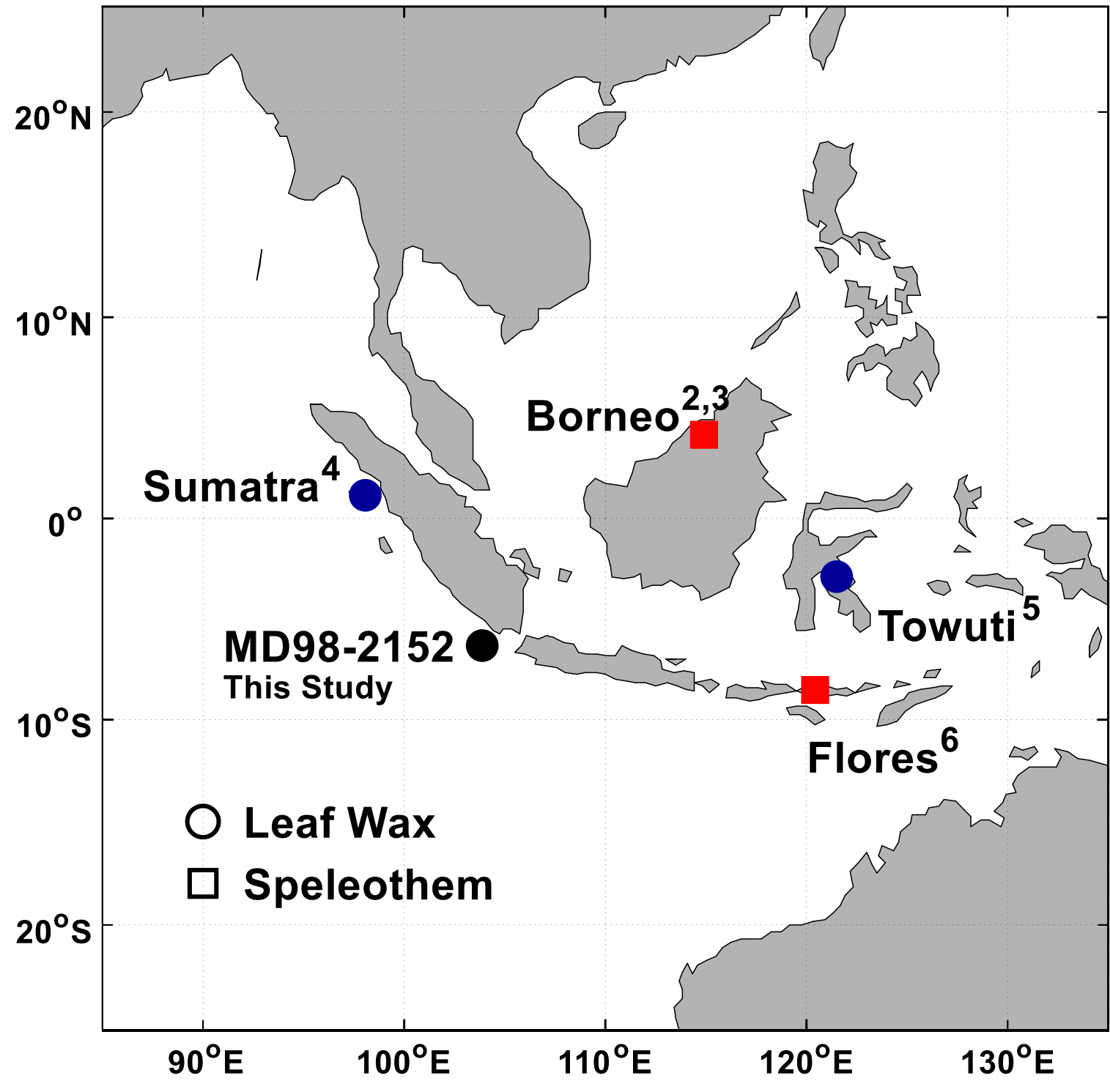
gwindler@email.arizona.edu
@graciewind



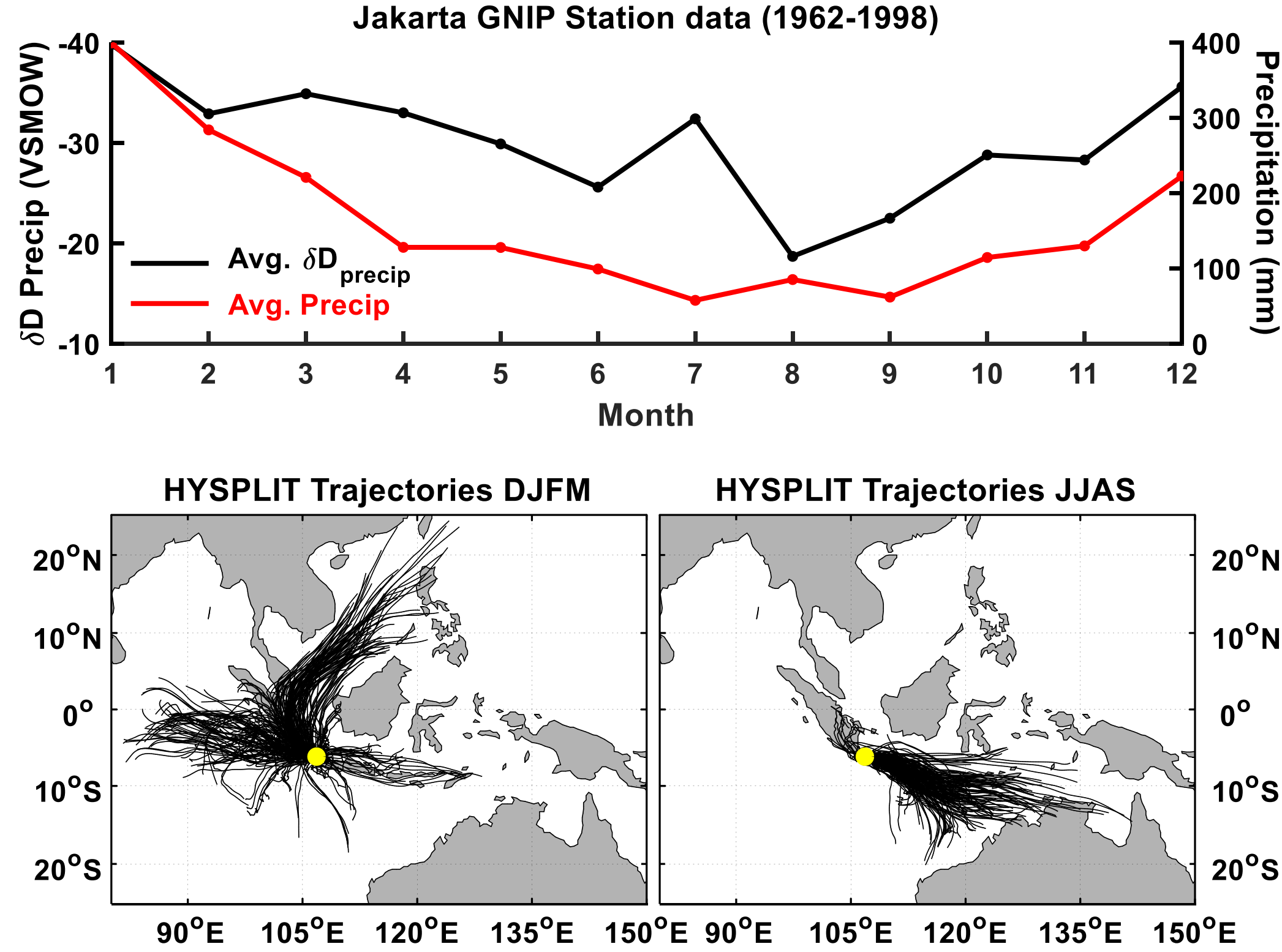
Introduction

Published paleo-precipitation-isotope records from the Indo-Pacific Warm Pool (IPWP) rarely extend far beyond the LGM and show varying hydroclimate responses to climate change. **To examine long-term forcing mechanisms acting on the climate of this region, we present a 450ky precipitation record based on the δD of leaf waxes from core MD98-2152.** We conduct a proxy-model comparison at the LGM using iCESM results and isotopic records from across the IPWP.

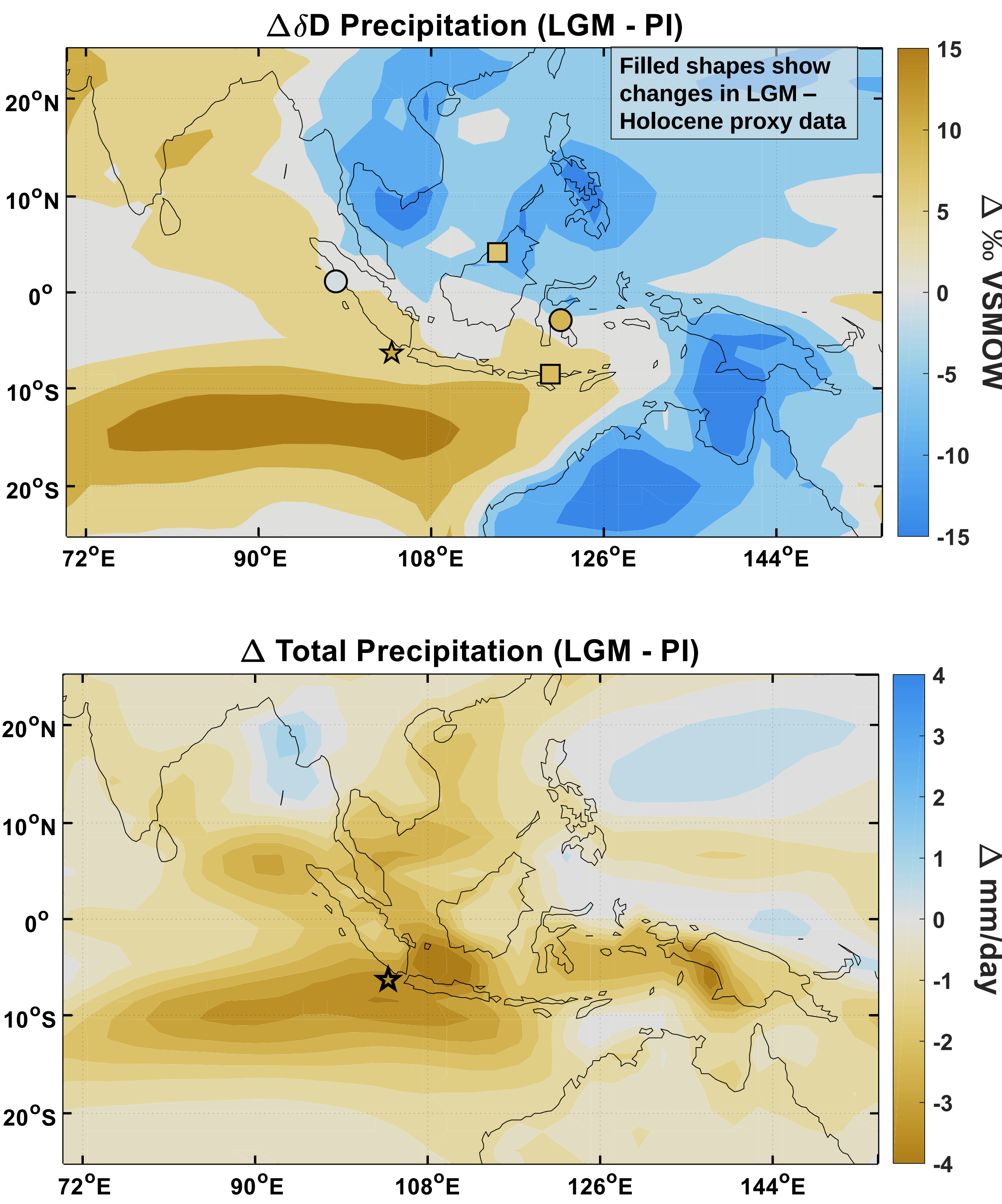
Site Locations



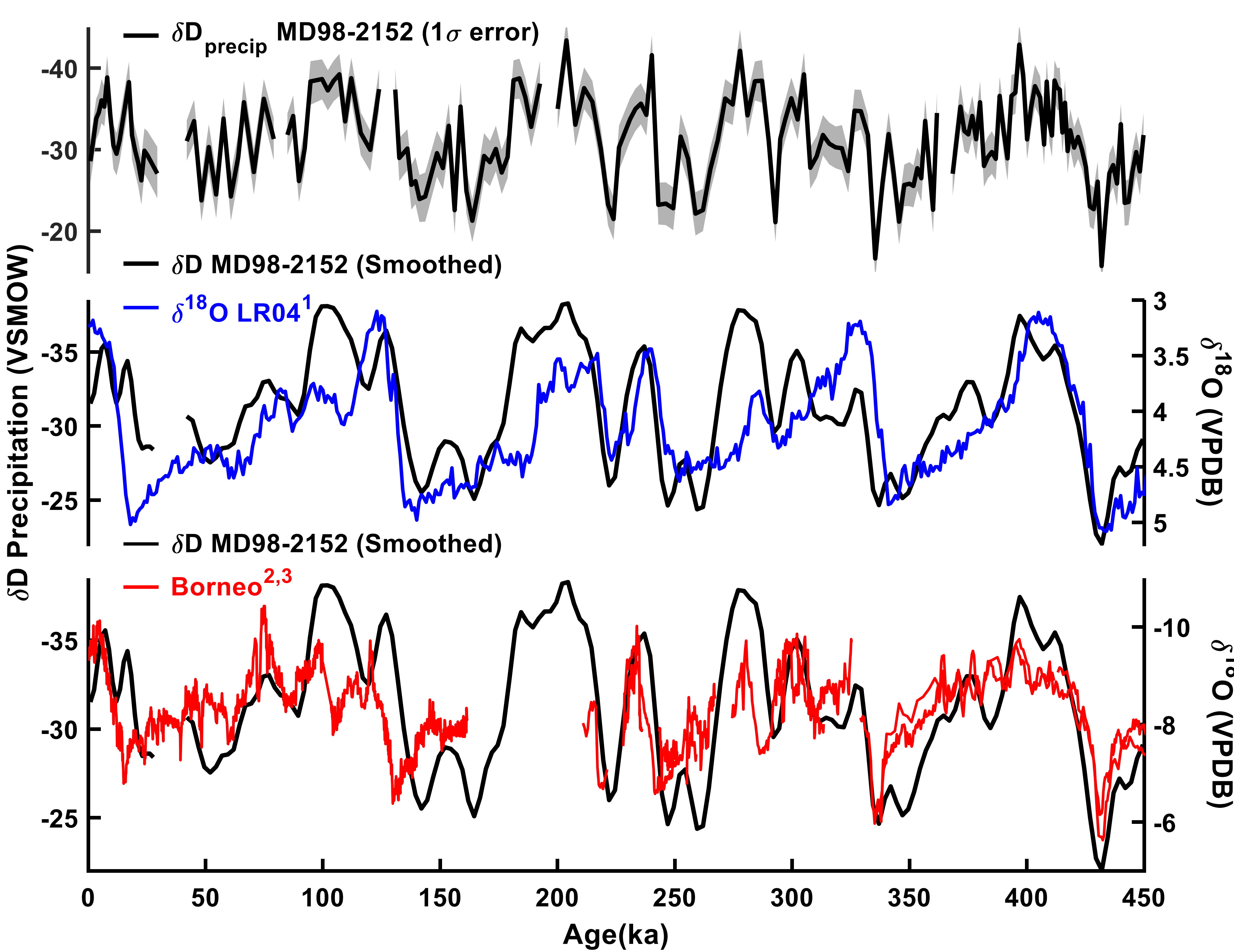
Modern Seasonality



iCESM Results (ΔLGM-PI)



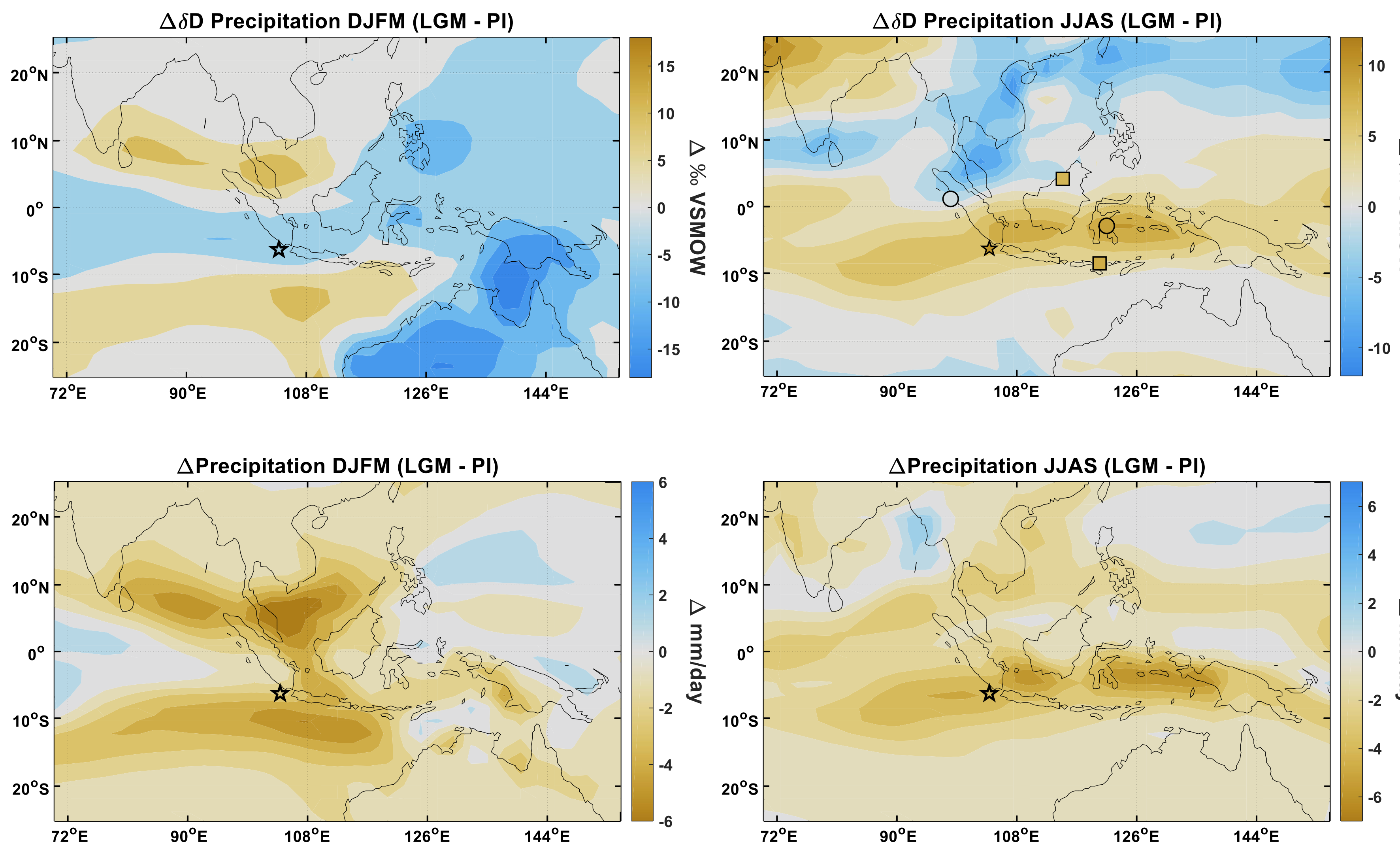
Leaf Waxes Record Glacial Cycles



Results and Conclusions

- According to GNIP water-isotope data from Jakarta and HYSPLIT trajectories for “rain-bearing” airmasses, modern wet season rain (DJFM, depleted in δD) comes from the South China Sea and the Indian Ocean, whereas, “dry” season rain (JJAS, enriched in δD) originates in the Timor Sea.
- Clear glacial structure in MD98-2152 δD_{precip}
- LGM-Holocene difference in proxy data (filled shapes in plots) is roughly consistent with iCESM simulated δD changes for JJAS, suggesting a dry season control in the south
- Simulations show that wet season rain is more depleted in δD at the LGM across the southern IPWP, suggesting changing source contributions and/or convection along moisture trajectories (e.g., from shelf exposure)

Seasonal iCESM Results (ΔLGM-PI)



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