

KINO LAB.

Climate Changes across the Past, Present, and Future



Department of Human and Social Systems
Large-Scale Experiment and Advanced-Analysis Platform (LEAP)

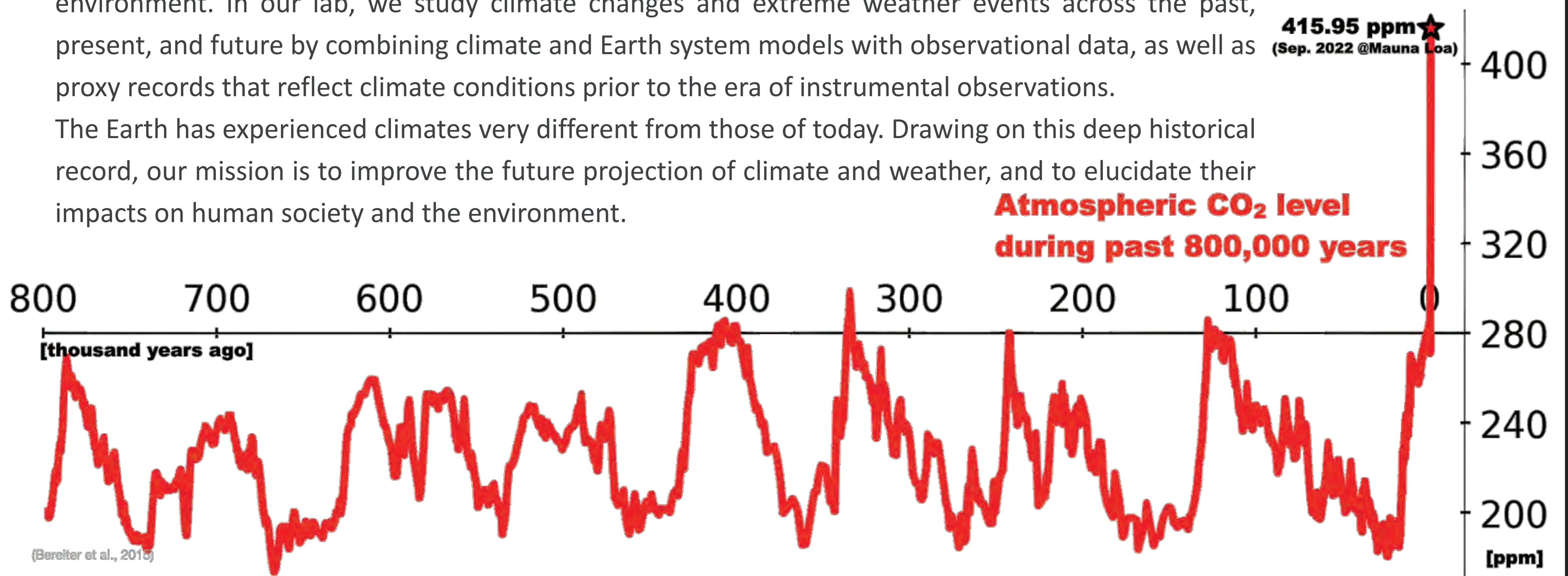
Long-term Climate and Environmental Change Modeling
Department of Civil Engineering, Graduate School of Engineering <https://sites.google.com/g.ecc.u-tokyo.ac.jp/kinolab/>

How unusual is the climate change caused by human activities?

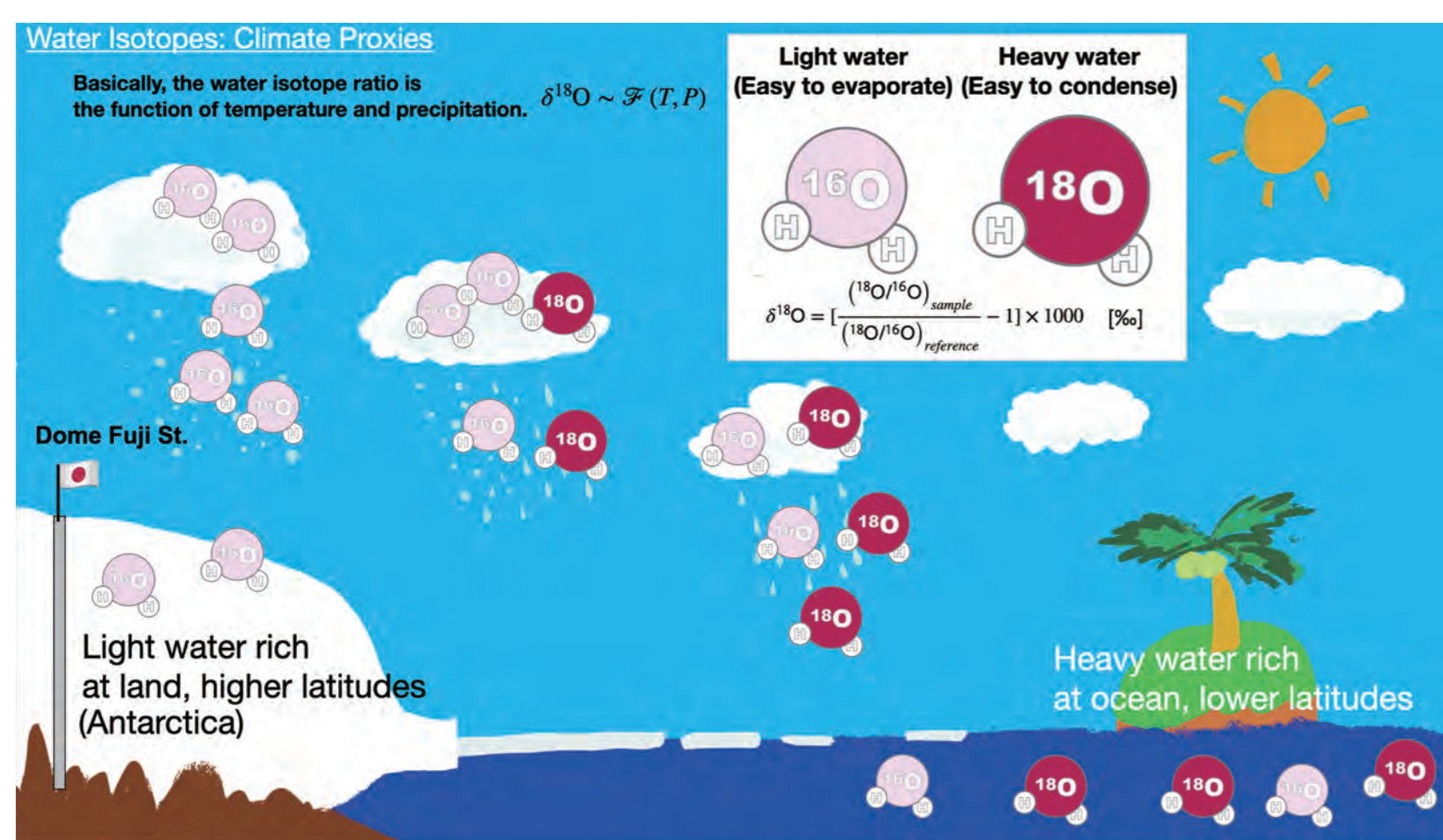
Climate change and increases in extreme weather are serious threats to human society and the environment. In our lab, we study climate changes and extreme weather events across the past, present, and future by combining climate and Earth system models with observational data, as well as proxy records that reflect climate conditions prior to the era of instrumental observations.

The Earth has experienced climates very different from those of today. Drawing on this deep historical record, our mission is to improve the future projection of climate and weather, and to elucidate their impacts on human society and the environment.

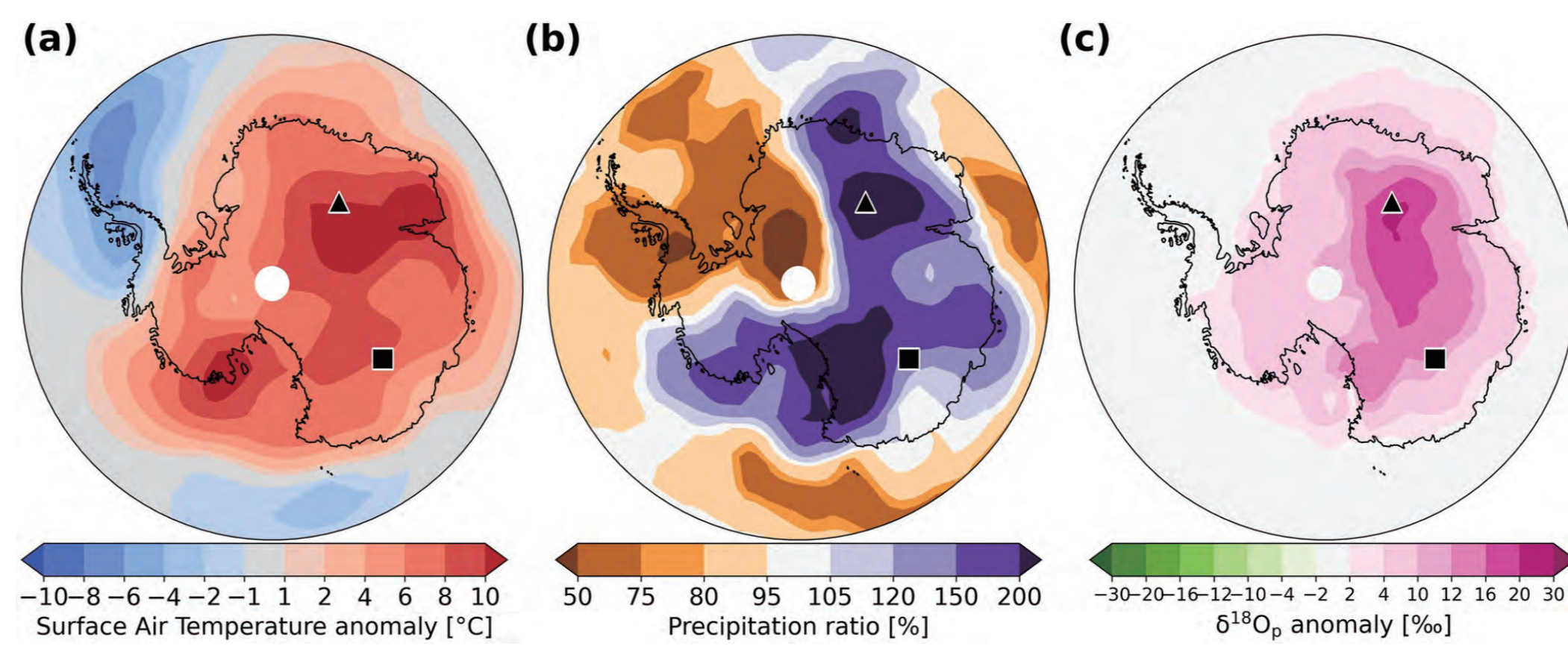
Atmospheric CO₂ level during past 800,000 years



Global hydroclimate and stable water isotopes

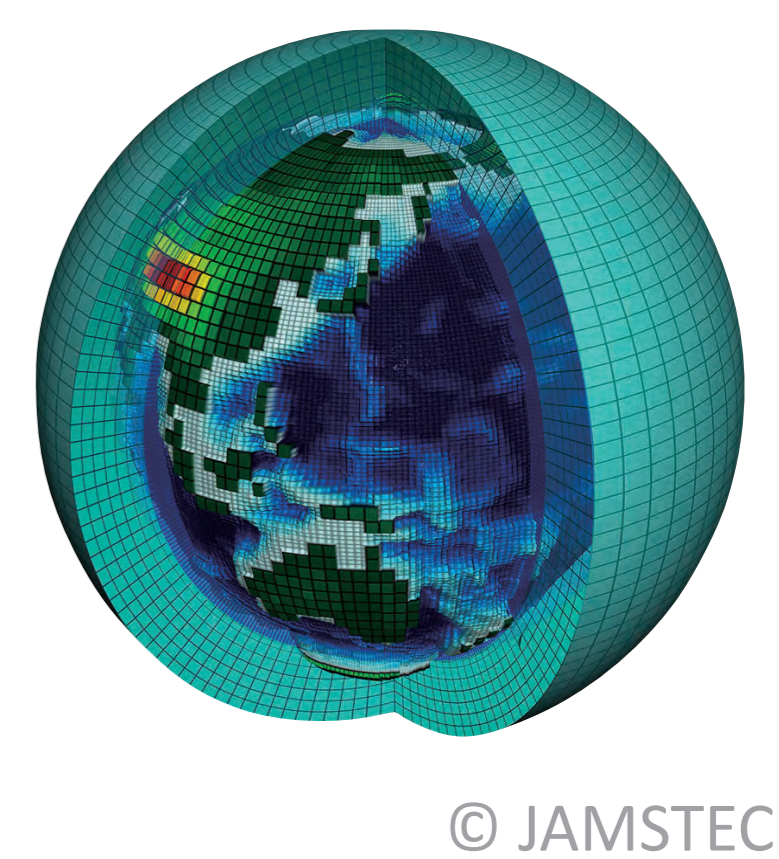


Influence of westerly winds on Antarctic climate



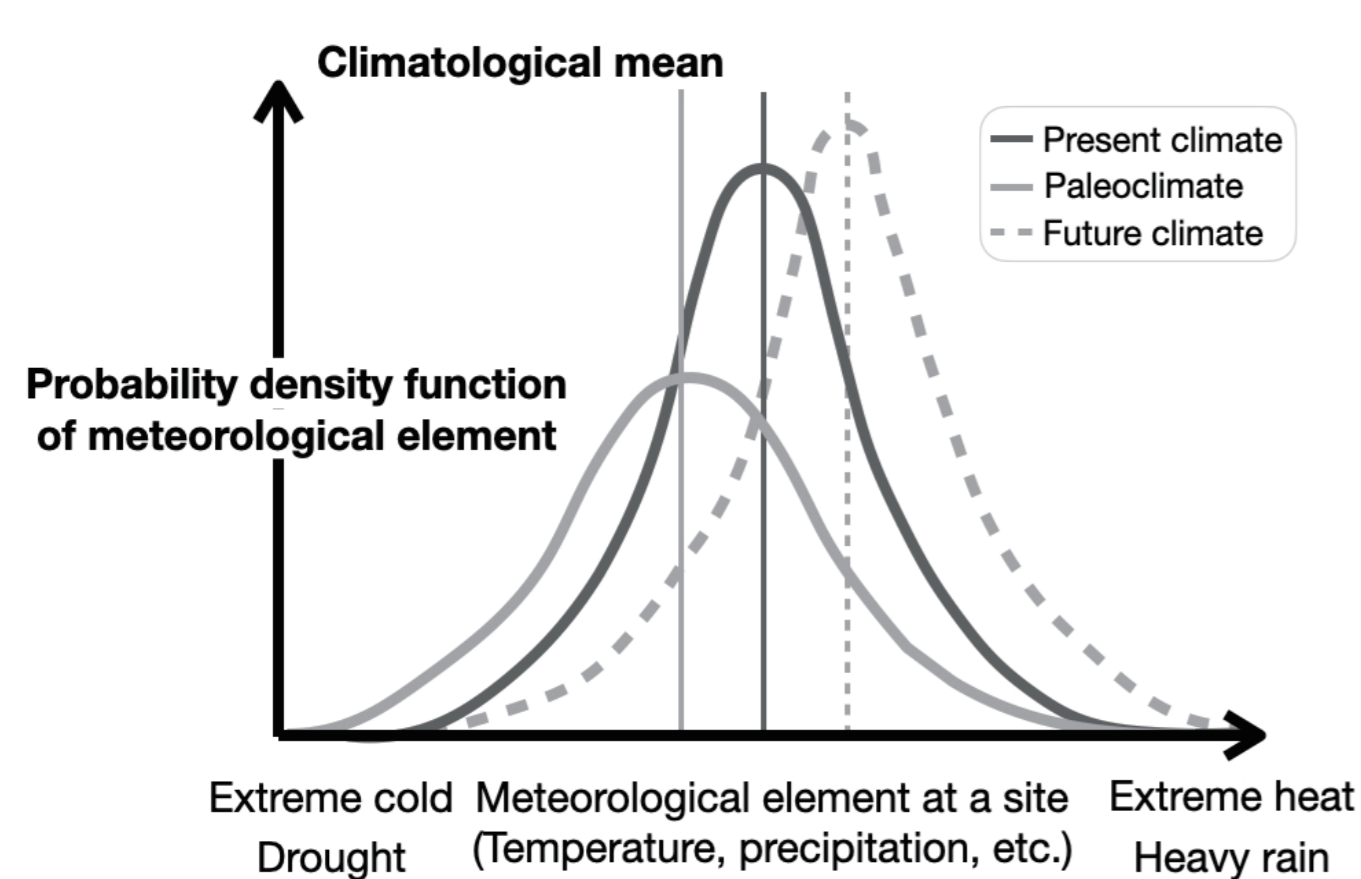
(Kino et al., 2021, *Journal of Geophysical Research, Atmosphere*)

Climate/Earth system model

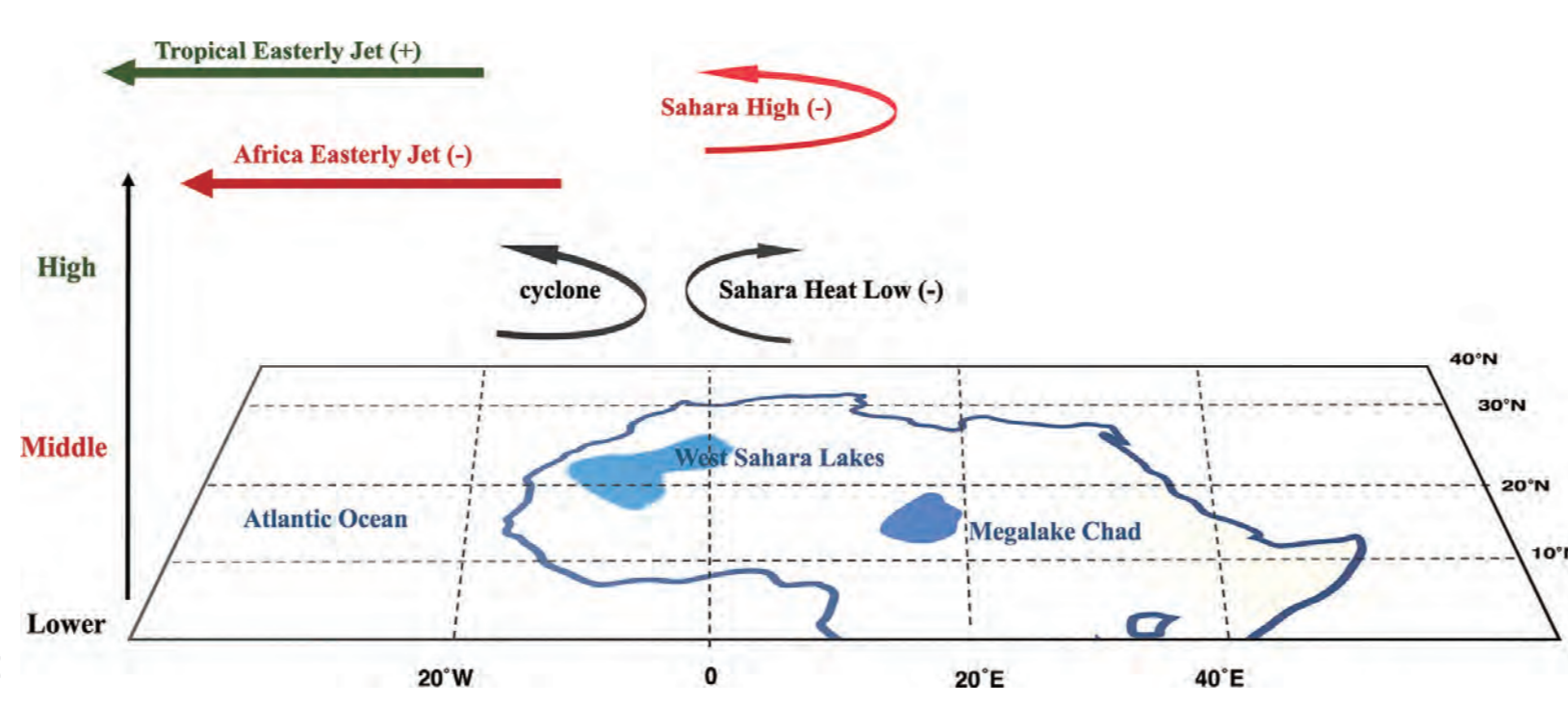


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Climate change and extreme weather

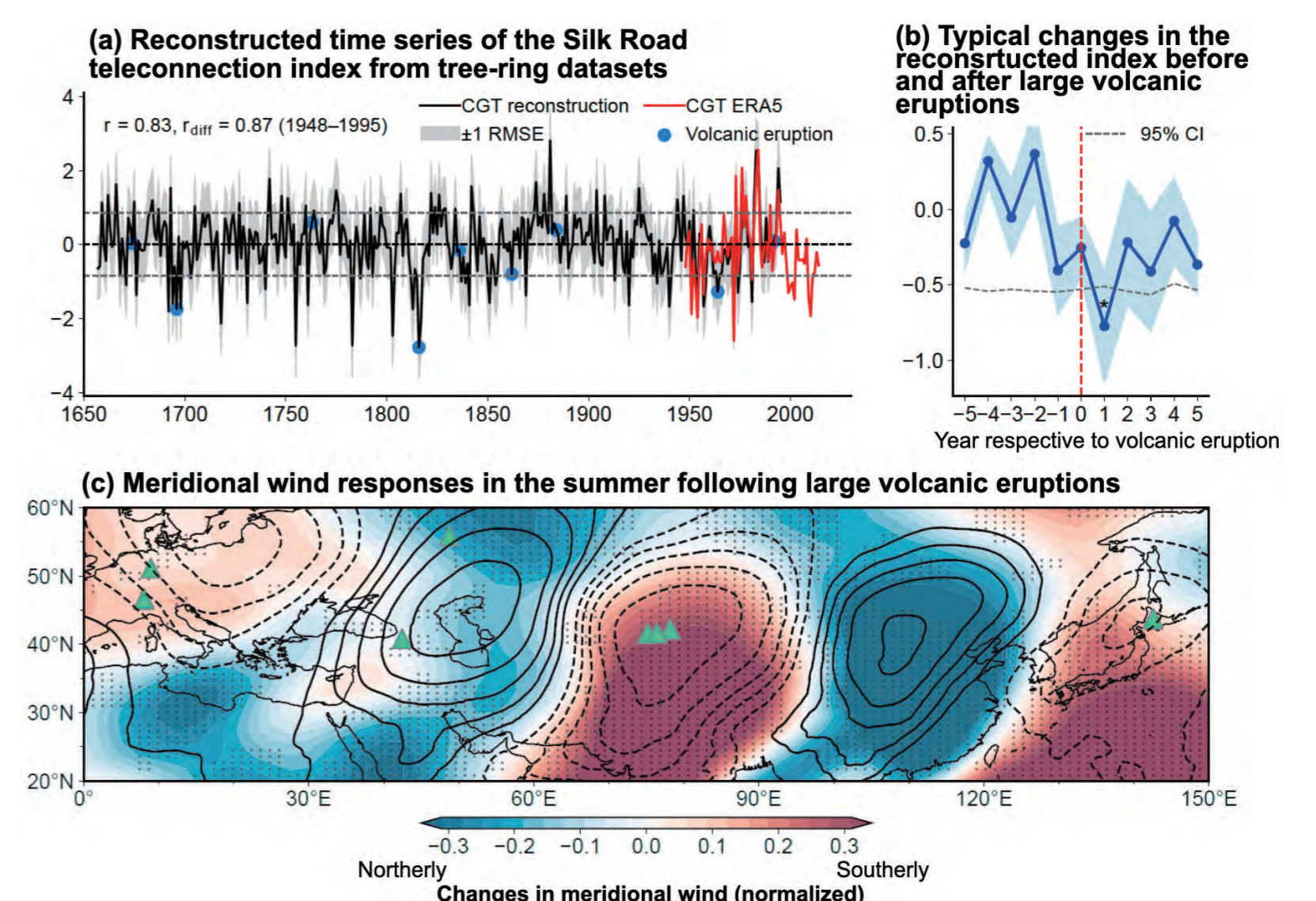


Influence of lake expansion in North Africa on atmospheric circulation



(Li et al., 2023, *Climate of the Past*)

Westerly wind meandering induced by large volcanic eruptions



(Nie et al., 2026, *Nature Communications*)

