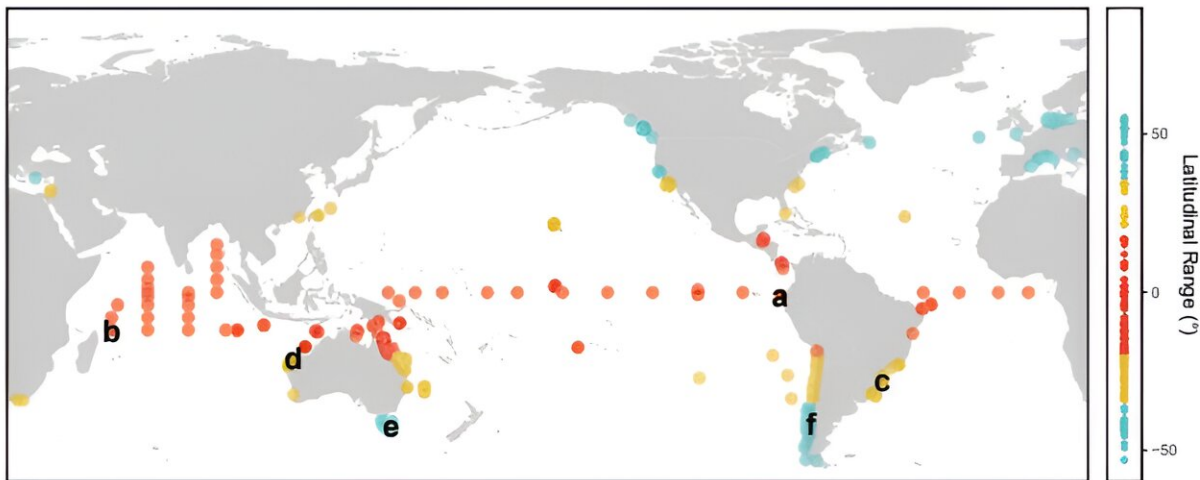


The variability of ocean weather: Researchers test for patterns in temperature variability across climate regions

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Distribution of the 492 high frequency temperature time series used in this study. Credit: Li Shing Hiung et al

Tropical waters are not as thermally stable as once thought. Ocean waters vary widely in temperature over space and time, but the spatial and temporal resolution of remotely sensed sea surface temperature data is insufficient to capture the fine-scale variability that is relevant for marine organisms.

Darren Li Shing Hiung and colleagues investigated whether ocean

temperatures measured at high temporal scales are more stable in the tropics (often termed the "climate variability hypothesis") by assembling a global array of in situ ocean temperature data with hourly or better temporal resolutions. The authors found that the long-held pattern of tropical ocean temperature stability was only valid at annual scales.

The research was [published](#) in *PNAS Nexus*.

At finer temporal scales, [tropical waters](#) were as variable as [temperate regions](#)—and [subtropical waters](#) were the most variable of all. This unexpected tropical and subtropical variability suggests correspondingly high variation in temperature-dependent biological rates, such as metabolism and photosynthesis, which may help to elucidate previously unexplained macroecological patterns. For instance, the results may help explain why tropical fish are more thermally tolerant than temperate fish when both are living in an overlapping subtropical range.

The authors call for consideration of ocean weather in research on species' vulnerability to future ocean climate change.

More information: Hiung et al. Ocean weather, biological rates, and unexplained global ecological patterns, *PNAS Nexus* (2024). [DOI: 10.1093/pnasnexus/pgae260](https://doi.org/10.1093/pnasnexus/pgae260), [academic.oup.com/pnasnexus/art ... /3/8/pgae260/7727704](https://academic.oup.com/pnasnexus/article/3/8/pgae260/7727704)

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