

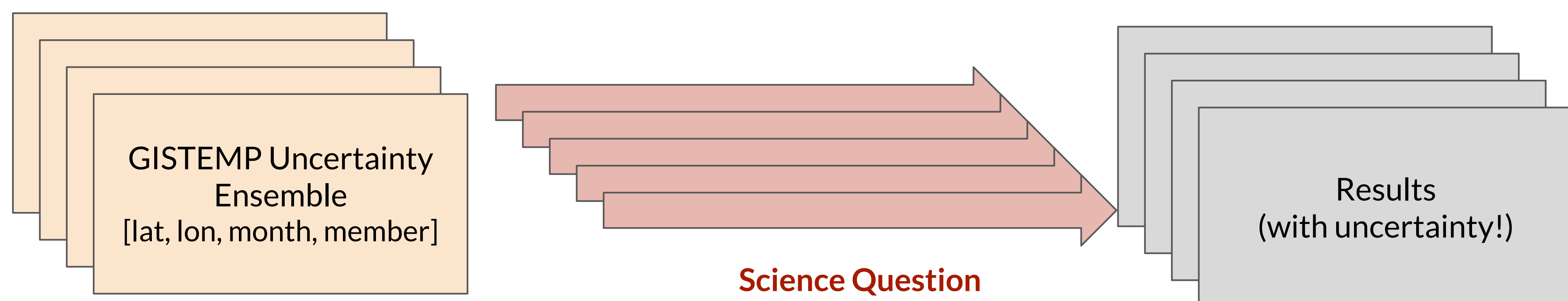
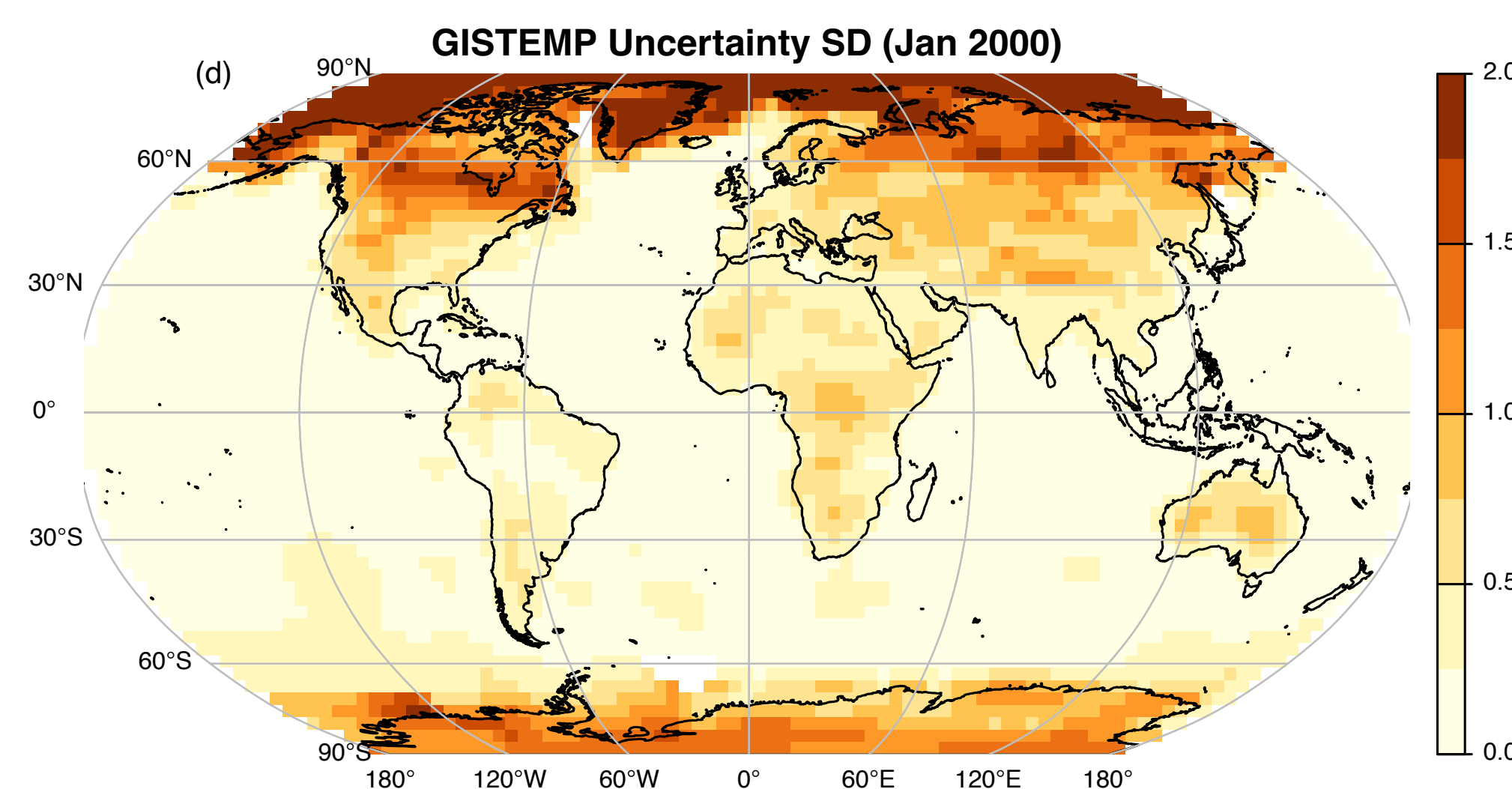
# When Does Observational Uncertainty in Surface Temperature Matter?

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## A New Community Resource GISTEMP Uncertainty Ensemble

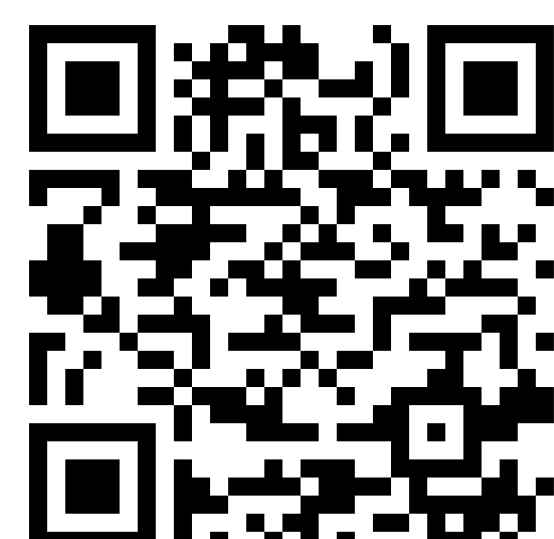
**Data:** A 200-member gridded monthly ensemble spanning all sources of uncertainty in land and ocean historical monthly temperature from 1880-2020



**Applications:** An uncertainty ensemble makes it very easy to incorporate observational uncertainty in **your** science by running your analysis once with each member!

### Uncertainty Ensemble Preprint

Nathan Lenssen, Gavin A. Schmidt, Michael Hendrickson, Peter Jacobs, Matthew J. Menne, Reto Ruedy. "A NASA GISTEMPv4 Observational Uncertainty Ensemble." *Revised at JGR: Atmospheres*

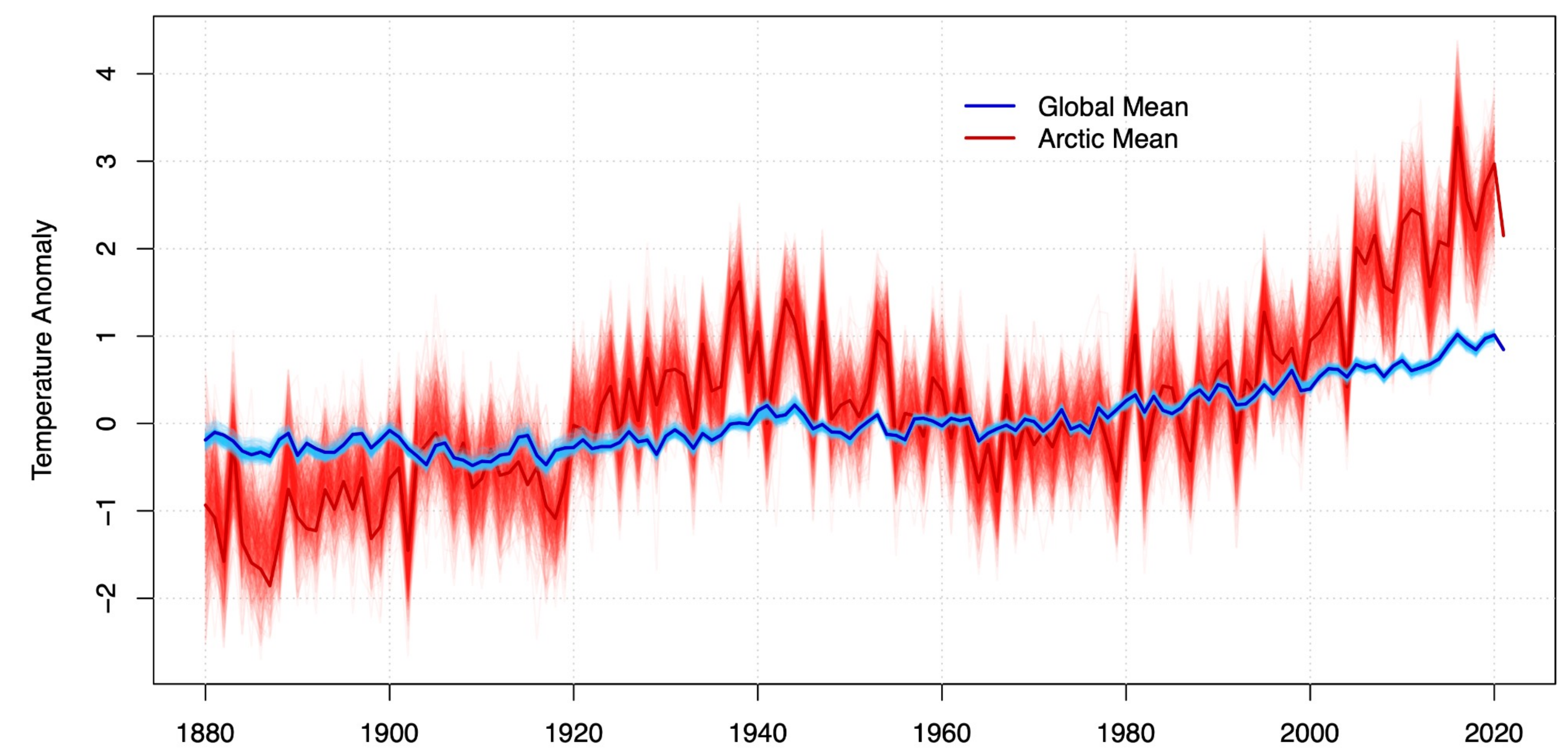


## Case Study #1

### Observed Arctic Amplification

(Lenssen, Jacobs, Schmidt)

Observational Uncertainty



**Conclusion:**

The arctic has warmed 3.5x faster than the global mean

**Conclusion with uncertainty:**

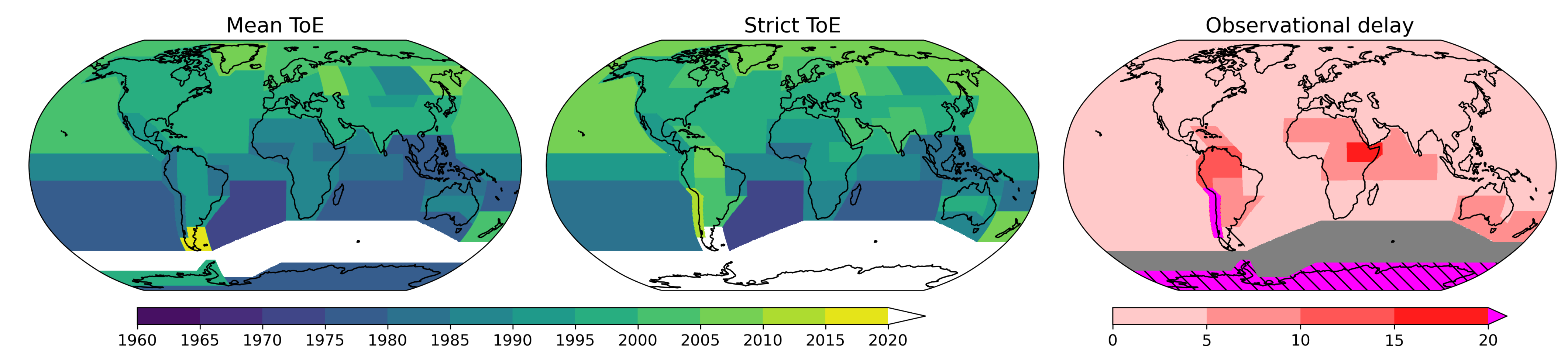
The arctic has warmed 3-4x faster than the global mean

## Case Study #2

### Time of Emergence of Temperature Trends

(Shaw & Lenssen)

IPCC Region Emergence: CESM1-GISTEMP\_5x5



**Conclusion:**

Observed regional trends cannot be explained by natural variability

**Conclusion with uncertainty:**

Observed regional trends cannot be explained by natural variability **even when accounting for observational uncertainty**