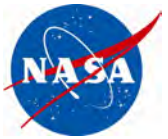
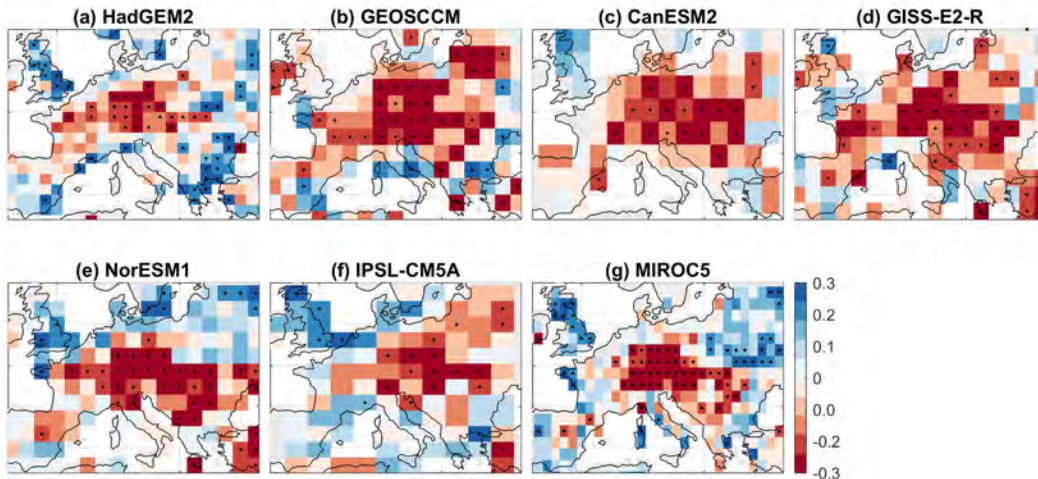


SMAP Finds Bias in Model Representation of Soil Moisture–Air Temperature Coupling



Problem: To provide reliable future projections of air temperature extremes, General Circulation Models (GCMs) must accurately represent the coupling between soil moisture and near-surface air temperature. Before SMAP, quantifying this coupling was difficult due to the lack of high-quality, global soil moisture data products.



Red: GCMs are under-coupled

Blue: GCMs are over-coupled

Finding:

Comparison to observed coupling (sampled using SMAP L3 soil moisture) demonstrate that GCMs uniformly underestimate soil moisture - air temperature coupling strength in Central Europe. This bias was not apparent in comparisons with coupling estimates derived using earlier (less-accurate) soil moisture products.

Impact: Past research has shown that accurately capturing soil moisture - air temperature coupling is critical for forecasting the prevalence of summer heat waves in Europe. SMAP is showing that GCM's are not accurately capturing this critical process.