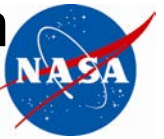
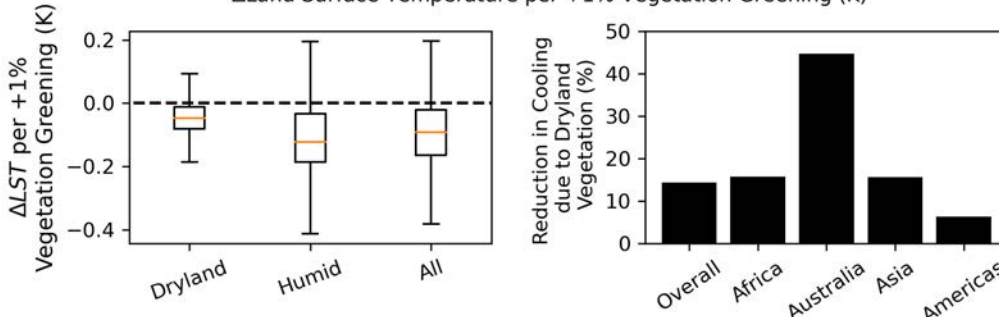
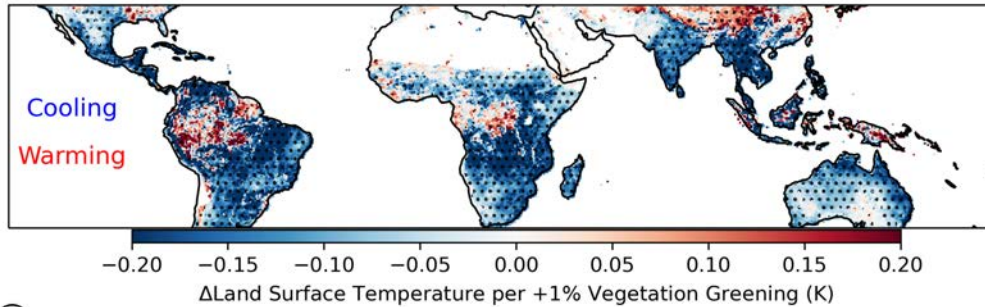




# Tropical Surface Temperature Response to Vegetation Cover Changes and the Role of Drylands



**Problem:** Vegetation has competing warming and cooling effects on the land surface and it is yet unclear how plants net impact tropical surface temperature



Caption: Interannual effect of vegetation (MODIS NDVI) on LST determined in units of estimated change in LST per 1% increase in mean NDVI (stippling  $p < 0.05$ ). (Bottom left) Distribution of values in drylands, humid regions, and all together. (Bottom right) Percent reduction in biophysical cooling due to drylands (all regions  $p < 0.05$ ).

**Finding:** Plants net cool the surface across the tropics, but drylands' magnitude of cooling is strongly (~50%) reduced due to their:

- Reduced ability to cool with lower soil moisture
- Tendency to increase solar radiation absorption

Results determined based on satellite observations from SMAP, SEVIRI, and MODIS

**Impact:** Cooling feedbacks with greening are weaker than predicted with climate change. Caution should be shown for planned tree planting efforts in dryland locations given vegetation's reduced ability to cool in these locations