Briefing to CSIRO Delegation about JPL Ocean Research

Tong Lee
Jet Propulsion Laboratory, California Institute of Technology

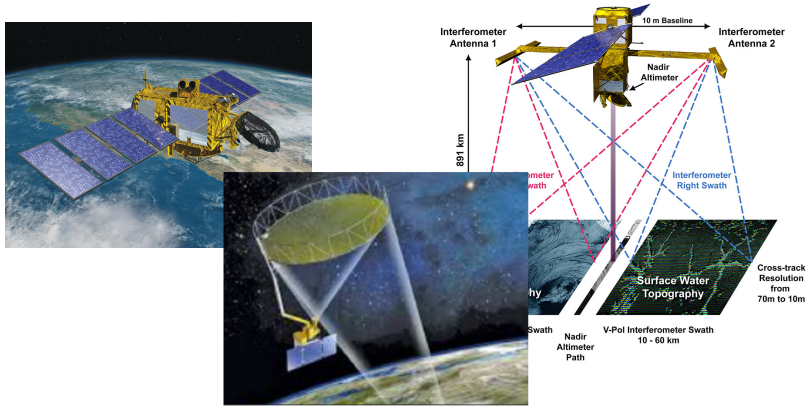
© 2018 California Institute of Technology.
Government sponsorship acknowledged.

Jet Propulsion Laboratory
California Institute of Technology

JPL's Ocean Research in the context of the Earth System

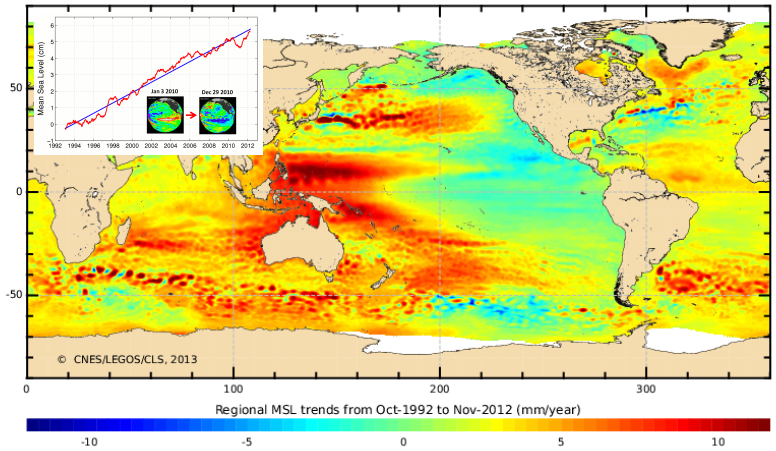
Satellite missions:

- Formulation & development
- Geophysical parameter retrievals
- Calibration/validation



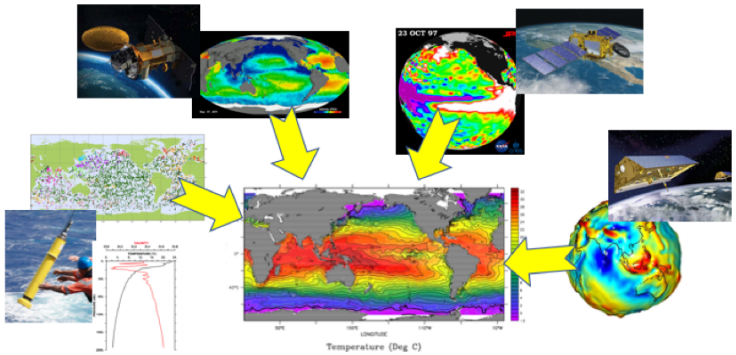
Science & operational applications:

- Sea level changes; ocean-ice interactions
- Upper-ocean processes; air-sea interactions
- Relationships with climate variability
- Linkages to water cycle
- Tsunami modeling & early warming

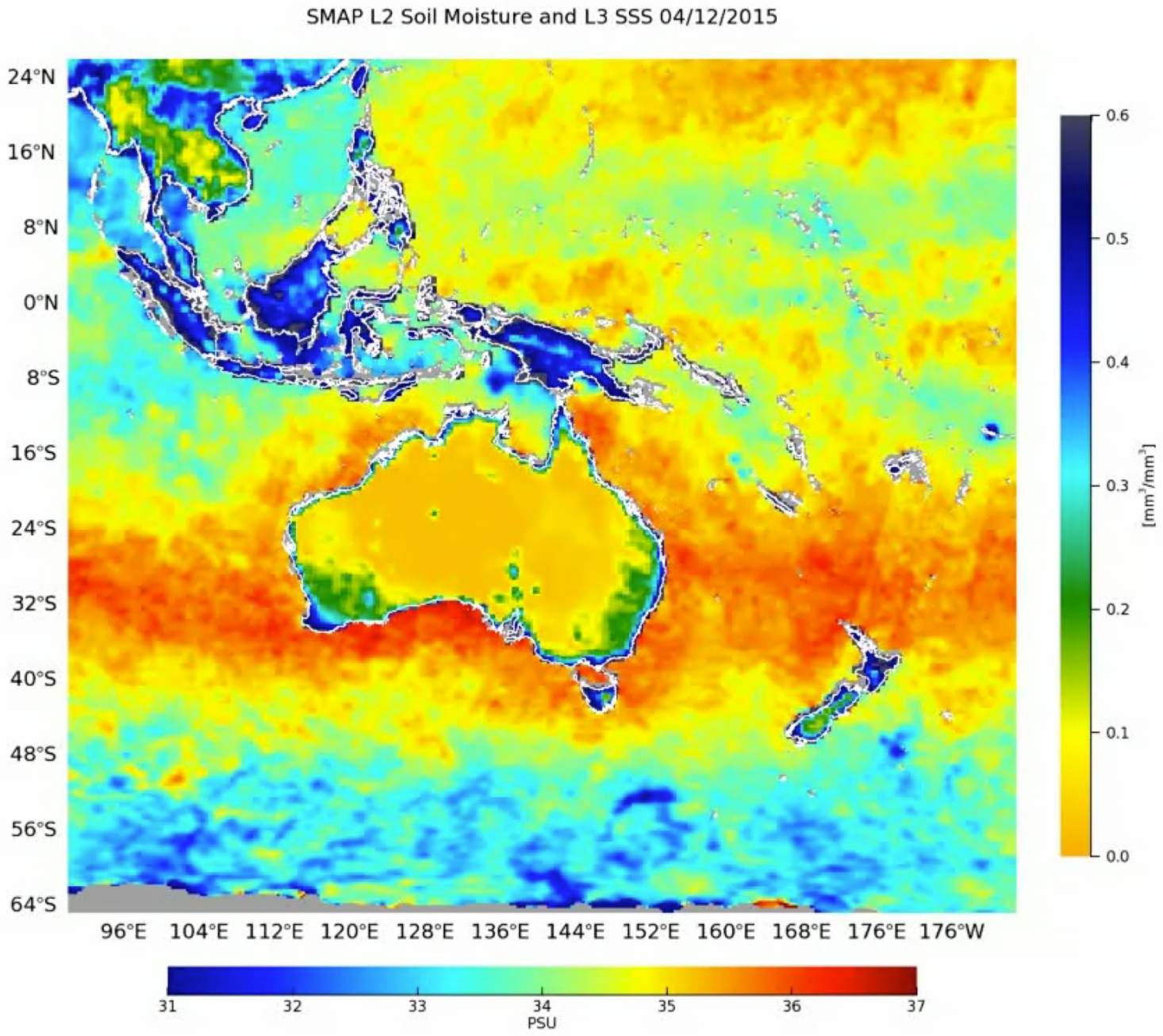


Data assimilation:

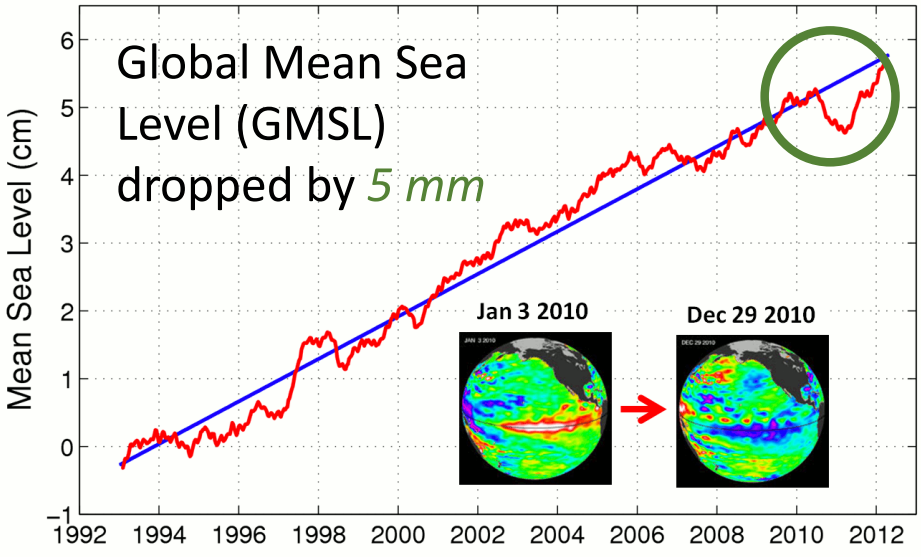
- Global ocean system
- Regional high-resolution ocean systems



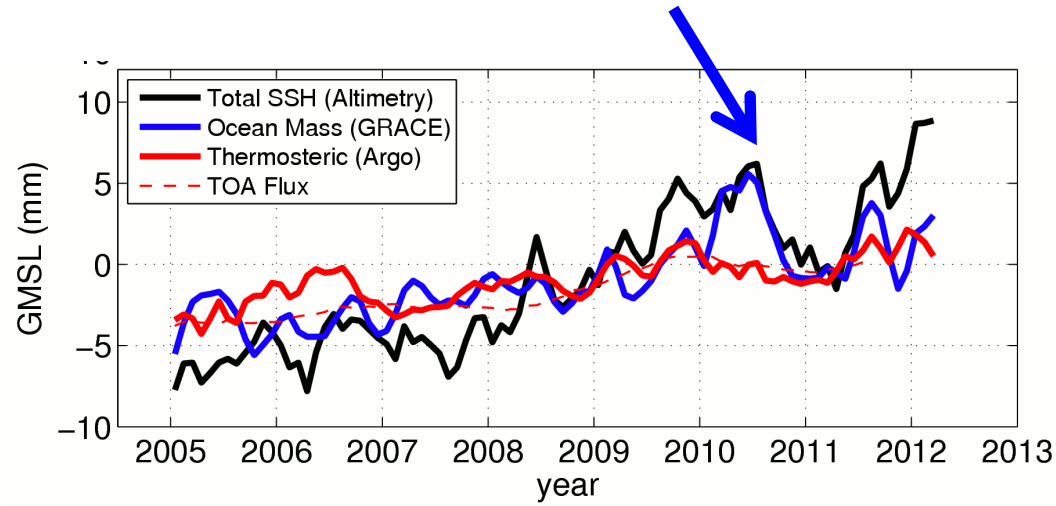
Sea surface salinity & soil moisture from the Soil Moisture Active Passive (SMAP) satellite provide new resources for studying ocean-water cycle linkages



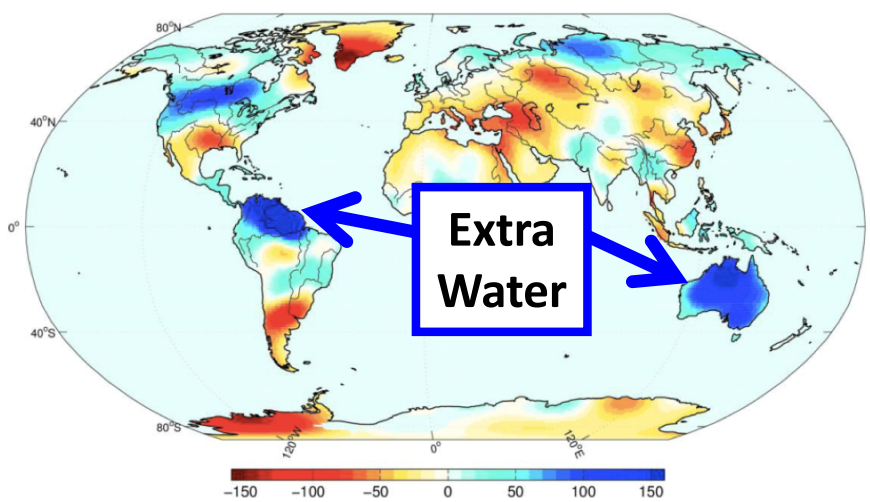
Impact of 2011 La Niña on global mean sea level & record flooding in Australia: ocean-climate-water cycle linkages



Explained by missing *ocean mass*



GRACE shows change in land water storage from 2010 to 2011



- **Combination of altimeters, GRACE, Argo to study the GMSL *drop in 2010/11***
- **Main findings: GMSL drop was primarily caused by *freshwater exchange between ocean & land* (e.g., flooding in Australia).**

Boening et al. (2012)

Previous collaborations with CSIRO scientists

- Indo-Pacific Ocean research in relation to interannual/decadal climate variability
- Inter-basin linkages and teleconnections
- Ocean observing system evaluation and design (e.g., GODAE, TPOS2020, IndOOS)