PDO/IPO/PDV/SHPDO/SPDO Guiding Questions for 4/17/18

**Recent intensification of wind-driven circulation in the Pacific and the ongoing warming hiatus**

**England et al. 2014**

1a) Compare figure 1a to the [Keeling curve](https://scripps.ucsd.edu/programs/keelingcurve/wp-content/plugins/sio-bluemoon/graphs/mlo_full_record.png), which shows the rise in atmospheric CO2 since ~1960. Do CO2 and surface air temperatures show similar trends?

1b) What factors might explain variations in surface air temperature trends?

2) How is the global warming “hiatus” defined here?

3) What is the proposed relationship between the IPO, trade winds, and ocean heat uptake? How does this mechanism account for unusually cold sea surface temperatures in the eastern Pacific?

4) Why does this study rely on both coupled and ocean-only climate models?

5) How much of the radiation deficit during the hiatus can be explained by wind-induced cooling?

6) Why do the central and south Pacific show modeled decreases in SST as winds increase (Fig. 4), yet ocean heat uptake increases?

7) If/when the IPO switches back into a positive phase, what might happen to surface air temperatures?

**Sea surface temperature variability in the eastern tropical Pacific since AD 1649**

**DeLong et al. 2012**

1) Why are paleoclimate proxies useful for studying low-frequency climate variability? Why are proxies necessary in the South Pacific in particular (hint: see Supp. Fig. 1)?

2) What proxy is used, and what climate variables does it measure in corals? What might be the advantages/limitations of this proxy?

3) How do SST’s at New Caledonia relate to the IPO/PDO (Fig. 1), and why might correlations between SST at New Caledonia and the eastern equatorial Pacific be unusually low? Are spatial correlations with precipitation stronger/weaker than those with SST? Why?

4) In figures 2 & 3, what do the red triangles represent, and why do they often correspond with anomalously cold SST’s?

5) How do DeLong et al. conclude that this proxy record accurately reconstructs the SHPDO/SPDO?

6) What do DeLong et al. conclude about changes in decadal/interdecadal variability during the industrial period (1850-present)? What evidence do they use to support their conclusion? Do you agree with this conclusion?