**Di Lorenzo et al. 2015**

1. From Tuesday’s lecture and Figure 1, how do the spatio-temporal patterns compare among PDV, PDO, NPGO and IPO indices? How do they compare to the Tropical Pacific Decadal Variability (TPDV) index, and how is that defined? What may this suggest about the dynamics behind tropical to subtropical decadal variability?
2. What is the hypothesis that the authors set out to test?
3. \*What is the wind-evaporation-SST (WES) feedback , and by what process does the subtropical variability in the North Pacific influence tropical variability in the western Pacific?  In the eastern Pacific?
4. What are the “meridional” and “zonal” modes, and what role do they play in the proposed “red noise null hypothesis” for Pacific decadal variability?
5. What observations and models do the authors use to test their Pacific climate null hypothesis? What are some potential limitations of this approach? What evidence do they use to support the validity of this approach?
6. How do the feedbacks between ENSO and the meridional mode differ between the flavors of ENSO events?
7. Why are 1.5 year lead / lag patterns used to characterize the growth and decay of the ENSO-like Pacific decadal pattern?
8. What do their results suggest controls the growth and decay phase of the ENSO-like decadal pattern [hint: Figure 5]? What evidence do they use to support these findings?
9. What are the implications of this framework for Pacific variability in response to warming?

**Liguori et al. 2018**

1. What data/simulations do the authors use to diagnose the impact of greenhouse forcing on Pacific Decadal Variability?
2. How many ensemble members to they use? Based on our discussion of Deser et al. (2012) and the expected signal-to-noise ratio of the target variables (SST & SLP), do you think this is a sufficiently large ensemble for their objectives? For which of these variables is the detection & attribution analysis with these 30 members more robust?
3. How is the Pacific meridional mode isolated in these observations and simulations? How is the ENSO signal removed, and what are the limitations of this approach?
4. How is the PROG index developed and what does it represent?
5. How are significant correlations determined [hint—remember our good ‘ole Wunch 1999! ☺]?
6. What model biases do they identify in the LENS simulations, and how may these biases impact their results? Are these biases a concern for identifying trends in PDV?
7. How does the lagged correlation between the meridional mode (MM) and ENSO in the LENS compare to that of observations (see Di Lorenzo et al. 2015, Figure 4 for comparison)? And why a 9-month lead of the MM in the models instead of 6 months lead (as in the observations)? Implications for their results?
8. What are the challenges of detecting and attributing changes to WES over the observational period?
9. \*How do the authors quantify the WES feedback?  Does this metric represent a measure of feedback strength, i.e. coupling? What **2** atmospheric parameters could be driving the simulated increase in the WESp?  Now compare the time series in Fig.3 and Fig.4.  What behavior of the simulated ocean/atmosphere state is consistent with the simulated WESp?  What is inconsistent?  What behavior of the **observed** ocean/atmosphere state is consistent/inconsistent with the observed WESp?
10. What changes in MM and ENSO variance are observed in the LENS, and what do the authors propose as the mechanism for why?