Interpretation of Short Climate Records, with Comments on the North Atlantic and Southern Oscillations

Wunch 1999

1. First some very important definitions: What is a stochastic process? A stationary time series? A red spectrum (or red noise)?
2. What are the implications of the “synthetic” NAO time series analysis for interpretation of climate excursions and/or trends?
3. What does the author suggest as a statistically rigorous way to diagnose significant excursions and/or trends?
4. What is the potential danger of inferring correlation or covariance between two time series? When is this issue most likely to occur (hint: compare 7a with 7b/c)?
5. What is the impact of record length on identifying significant deviations (esp. for series with memory / red noise)?
6. What are some main conclusions from this cautionary tale, and implications for identifying departures and trends in modes of variability (given data limitations discussed on Tuesday 1/30)?

Uncertainty in climate change projections: the role of internal variability

by Clara Deser, et al. 2012

1. Why is the biggest uncertainty at middle and high latitudes?
2. Why does uncertainty go up from air temp, to precip, to sea level pressure?
3. Why did they choose 40 ensembles for the new model? Why not more or less? Do you think we have enough ensemble members to accurately sample the actual distribution?
4. Is 10,000 years a reasonable number for a control integration of the atmospheric model?
5. From page 541, “how realistically does CAM3 depict the temporal behavior of the annular modes?” How is the 40-member CCSM3 ensemble model different from the other models?
6. What are the implications of their conclusions for detection & attribution studies of climate change?
7. If we were the committee discussing CMIP6 design, what would we recommend each modeling center to contribute?
8. If we were to analyze global temperature trends, what types of ensembles might we use? And for precip? SLP? How many ensemble members are needed for each?