

good!! (50/50)

11-15-06

1. It is very common for different spatiotemporal fields to interact with others. For example, climate cannot be accurately modeled unless the atmosphere and the ocean interact. Given that different portions of the earth system are not isolated, it's interesting to know whether two fields covary and on what time scale. It may provide insight to the mechanism controlling that interaction or predictive capability. Looking at the covariance of winter 500mb height anomalies and SST in the Pacific Ocean tells you about storm tracks and storm severity, and about how ocean conditions might be related to the arrangement of the semi-permanent highs and lows in the atmosphere.
2. The first EOF of SST shows a big cold patch in the north-central Pacific. Really, it looks like a wet manifestation of the Aleutian Low. The first EOF of the 500mb height anomaly is more complex, but it also shows a big low pressure in the north central Pacific.
3. A heterogeneous map relates the variability of one dataset to the spatial variability of the other. A homogenous map combines information from the same dataset. While the heterogeneous map actually shows the interaction between the two, a homogenous map can elucidate forcings or mechanisms, by illustrating what patterns are controlling the expansion coefficients projected onto the other variable. Patterns on homogenous maps tend to be more distinct than those on heterogeneous maps. Homogenous maps tend to look a little more like independent EOF's, which makes sense, since both represent information about a single variable. Variability in each variable explains a relatively large percentage of variation in the other, more so that was indicated by correlation between principal components of the two. The first heterogeneous and homogenous SST maps look like the first SST EOF. However, the heterogeneous and homogenous maps of 500mb height anomalies look like a combination of the first two EOF's, as they highlight a high in western Canada that is only evident in the second EOF.

tells how much variance in one field is explained by patterns of variance in the other.