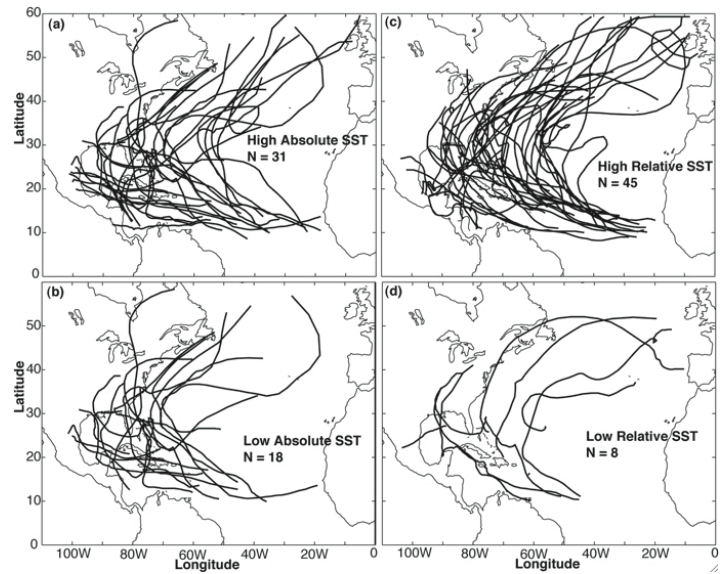


Kyle Swanson – Research Interests

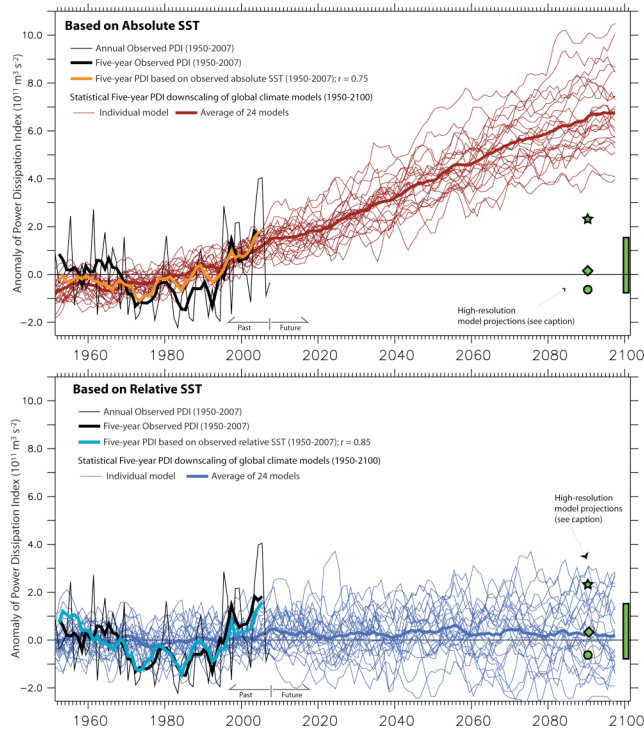
My current research interest center around several areas:

Hurricanes and past/future climate change

Research suggests that Atlantic hurricane activity is controlled by sea surface temperatures (SSTs) in the tropical Atlantic relative to the tropical mean, rather than by the absolute SST in the tropical Atlantic itself. For example, the figure to the right shows the incidence of intense Atlantic hurricanes for the 10 years over the period 1950-2006 when the absolute/relative SST was the highest/lowest. This appears to be supported by dynamical models of future hurricane activity (below).



Atlantic Tropical Cyclone Power Dissipation Index Anomalies: Observed and Based on Sea Surface Temperature



Climate Dynamics

Numerous questions still exist regarding how the climate will change in the future, and why climate has changed in the past. One area of particular interest to me is the question of climate sensitivity, and specifically, whether climate sensitivity can vary as a function of climate state. The figures below show the dynamically evolving climate sensitivity from a current generation climate model, for both shortwave (blue) and longwave (red) components. Both of these vary by an amount that exceeds the water vapor feedback (about $2 \text{ W/m}^2/\text{K}$) on multi-decadal time scales. Understanding why this is the case and whether similar drift occurs in nature is a current focus of my research.

