AMS280B-01: Seminars in Statistics for Nov-19th (Monday 4pm at BE 156)

Speaker: Claudie Beaulieu, Ocean Sciences Department, UCSC

Title: Detection of climate change: separating signal and memory

Abstract: Natural variability in all aspects of the Earth system – including the climate system and ecosystems – presents a formidable challenge to the detection and quantification of change forced by industrial activities. Error in detection can disrupt concerted efforts to respond to the challenges of climate change, whereas statistically robust quantification informs our understanding of underlying mechanisms of change. The rate of observed climate change results from the superposition of mixed signals such as trends and shifts on variability arising from the memory within the climate system. Statistical methods used to characterize change in time-series must be flexible enough to distinguish these components. In this talk, I describe an approach based on change point detection that is used to separate unsteady change from memory in global mean surface temperatures, which clarifies a key point in the scientific debate related to the recent "hiatus" in warming. I also discuss the importance of considering memory timescales (i.e. short vs long memory), and highlight regions in the ocean where the routinely assumed short-memory assumption may affect detection.