

SIO 276L Syllabus Quantitative Theory of Populations and Communities (Lab)  
Winter Quarter 2017  
Instructor: Dr. George Sugihara  
Meeting Time: Tuesdays 10-11:00am

### Course Goal

This is a continuation of the course offered last year and is open only to those students who were previously enrolled. The plan for this quarter is to write up the results from last year. It will consist of weekly planning meetings and writing assignments.

### Last Year's Course Goal:

The initial concept for this project is to apply convergent cross-mapping (CCM) to a suite of large, long-term ecological datasets in order to: 1) quantitatively model interspecies interactions, 2) produce an influence web, and 3) compare the observed patterns with traditionally produced food webs.

In the development of this project, we will 1) decide as a group what specific research directions to take; 2) refine our analytical techniques; 3) look for evidence of traditional trophic and ecological patterns in our results (i.e. trophic cascades, interspecific competition, top-down and bottom-up control, etc); 4) examine the efficacy of the this approach for different kinds of datasets; 5) produce a submission-ready paper summarizing our investigations and findings.

### Preliminary Reading List

- Bascompte, Jordi (2009) "Disentangling the Web of Life"
- Berlow, Eric (2004) "Interaction strengths in food webs: issues and opportunities"
- Cohen, Joel (1978) "Food Webs and Niche Space"
- Faust, Katherine (2002) "Comparing Networks Across Space and Time, Size and Species"
- Link, Jason (2002) "Does food web theory work for marine ecosystems?"
- Moniz, L.J. (2007) "Application of information theory methods to food web reconstruction"
- Polis, Gary (1991) "Complex Trophic Interactions in Deserts: An Empirical Critique of Food-Web Theory"
- Sala, Enric (2002) "Community-wide distribution of predator-prey interaction strength in kelp forests"
- Schoenly, Kenneth (1991) "Temporal Variation in Food Web Structure"
- Sugihara, George (1984) "Graph theory, homology and food webs"