

SIO 220: Observations of Large-Scale Ocean Circulation

“The chief source of ideas in oceanography comes from new observations.”

- Henry Stommel

Objectives:

The aim of this class is to:

1. To provide a broad overview of global ocean circulation and the role of ocean circulation in climate. This will include the strength, spatial structure and temporal variability of the oceans' boundary currents and interior flows, and the circulation in water mass formation regions and in marginal seas.
2. To enable students to interpret the literature of observational oceanography:
 - through familiarization with controversial issues in modern oceanography,
 - by understanding the implications of oceanographic data sets,
 - by distinguishing between conjectural and well-supported conclusions.
3. To familiarize students with the global observing system. Provide access to modern global datasets and become accustomed to instrumentation and methods used for observing the large-scale circulation.

In general, the course should provide sufficient background for students to be able to search, review, and assess the state of knowledge on any given topic in large-scale ocean circulation, for example as part of a NSF proposal or the introductory section of a paper.

Format:

- Everyone will take turns acting as discussion leader for individual topics.
- A preliminary list of references is provided by the instructor, including some ideas on an appropriate focus for discussion.
- The discussion leader will designate the main paper for discussion.
- The instructors' function is to act as a resource and to offer additional perspective or recent information (e.g. what does Argo add to our knowledge of this topic?).
- The objective of each class discussion should be to reach a consensus on:
 - Background and significance of the topic
 - Observational basis of the paper - Adequacy
 - Analysis methods and results
 - Conclusions – What is robust; what is conjectural?
 - Follow-up using modern datasets (Argo, altimetry: What would you do next?)

The format is designed to meet the objective of the course to advance your ability to synthesize background material and recognize the issues arising from a specific data set or experiment. This is a skill you must develop in order to be able to plan and propose your own experiments. The topics are chosen to constitute a broad survey, though not a complete one, of the global large-scale circulation and can be somewhat tailored to the classes interests.

Grade

Grade will be based on class participation only. There are no exams or finals. You are expected to read papers, participate in class discussion, and lead some class 3 class discussions.