Syllabus: SIO 221C, Data Analysis Laboratory

Sarah Gille

Class Meetings: Tuesday and Thursday, 12:30-1:50, OAR Conference Room

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Grading: S/U

Course Objectives: Students refine data analysis skills by carrying out projects that employ specific techniques and by discussing data analysis problems with the group.

Course requirements: Complete 3 projects from list below. In order to keep everybody on the same page, the first project should involve spectral analysis, the second can be objective mapping or EOFs, and the third will be free choice (and may be arranged with instructor to be tailored to research). Each project is scheduled to take 3 weeks. Report on progress at each class meeting and discuss problems and possible solutions with the group. Written reports are submitted at the end of each project.

Written reports should include text and figures, with sufficient detail to allow you and your classmates to reconstruct the work that you have done. Although you may wish to put together slides to present to the class, the presentation alone does not constitute a report. As in any scholarly writing, you must acknowledge your sources using proper scientific citations. (You may find useful resources on the web, that could prove difficult to cite formally, but please provide as much information as possible.) Your report should clearly indicate the specific sources of facts and opinions that you draw from other sources. You should also follow the strictest guidelines for quotation: if you draw more than three consecutive words verbatim from a source, place them in quotation marks and identify the source.

Schedule:
- Organization and Introduction: September 23
- Project 1 (spectral methods): September 28, September 30, October 5, October 7, October 12, October 14. (Written project reports due October 14.)
- Project 2 (EOFs or objective mapping): October 19, October 21, October 26 (guest “lecture” by Bruce Cornuelle), November 2, November 4, November 12.
- Project 3: November 16, November 18, November 23, November 30, December 2, December 6, (written reports due December 6.)

No class meeting October 28 (travel), November 9 (travel), November 11 (Veterans’ Day), November 25 (Thanksgiving Day).

Projects
- Time series and spectra
  - Complex Demodulation
  - Salinity Spiking
  - Filtering and Assessing Resolution
— Wind-Driven Currents
— Wind-Driven Geostrophic Currents
— Wavelets

• Empirical Orthogonal Functions
  — Empirical Orthogonal Functions
  — EOFs with Missing Data

• Objective Mapping
  — Objective Mapping
  — Objective Mapping (with Anisotropic Decorrelation Functions)
  — Geostrophic Velocity

• Other
  — Box Inverse
  — Probability Density Functions

Texts on reserve for SIO 221C: Data Analysis Laboratory