Syllabus: SIO 221C, Data Analysis Laboratory (2013)

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. Bring graphics or code to share for each class meeting. 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 26
— Project 1 (spectral methods): October 1, October 3, October 15, October 17, October 22, October 24. (Written reports due October 24.)
— Project 2 (EOFs or objective mapping): October 29, October 31, November 5, November 7, November 12, November 14. (Written reports due November 14.)
— Project 3: November 19, November 21, November 26, December 3, December 5, December 10. (Written reports due December 10.)
No class meeting October 8, October 10 (travel), November 28 (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


