Syllabus: SIO 221C, Data Analysis Laboratory

Sarah Gille
Class Meetings: Tuesday and Thursday, 12:30-1:50, OAR Conference Room
SIO Office: Nierenberg Hall 348
Telephone: 822-4425 e-mail: sgille@ucsd.edu
Course website: http://www-pord.ucsd.edu/~sgille/sio221c
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: via e-mail
— Project 1 (spectral methods): October 2, October 4, October 9, October 11, October 16, October 18. (Written reports due October 18.)
— Project 2 (EOFs or objective mapping): October 23, October 25, October 30, November 1, November 6, November 8. (Written reports due November 8.)
— Project 3: November 16, November 20, November 27, November 29, December 11, December 13. (Written reports due December 13.)
No class meeting September 27 (travel), November 13 (travel), November 15 (travel), November 22 (Thanksgiving Day), December 4 (AGU), December 6 (AGU).

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**


