Syllabus: SIO 221C, Data Analysis Laboratory

Sarah Gille

Class Meetings: Tuesday and Thursday, 12:30-1:50, OAR 150 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. In addition, to get started, you will read the draft chapter on data analysis from the revised edition of Descriptive Physical Oceanography and provide a written review. (You may work together on the review.)

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: September 25
— Project 1 (spectral methods): September 30, October 7, October 9, October 14, October 16, October 21 (Data analysis chapter review due October 7; written project reports due October 21)
— Project 2 (EOFs or objective mapping): October 23, October 28, October 30, November 4, November 6, November 13, (written reports due November 13)
— Project 3: November 18, November 20, November 25, December 2, December 4, December 9, (written reports due December 9).
No class meeting October 2 (travel), November 11 (Veterans’ Day), November 27 (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
Box Inverse
Probability Density Functions

Texts on reserve for SIO 221C: Data Analysis Laboratory


