

Class Information

SIOG 200C Geophysics Research Skills: Reading

In this class we will be developing skills in reading and evaluating scientific sources, including peer-reviewed journal articles and abstracts, editorials, white papers, and technical reports. The emphasis will be on providing you with the tools and skills needed to digest the large volume of written literature material you will encounter during your own scientific research. These skills will also be useful when preparing for the oral component of the Departmental Exam.

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Meeting Times and Locations: Tuesdays 1:00pm - 2:50pm (Munk 303)

Format: 1 meeting per week; 2-units, S/U only, no grade option.

Grades based on presentations, paper summaries, and annotated bibliography.

Website on Canvas: <https://canvas.ucsd.edu/courses/43285>

Here you will find class information and reading material.

Learning Outcomes

1. Gain familiarity with the range of tools available to efficiently research scientific literature
2. Develop the ability to read, understand, and critique arguments and assumptions presented in diverse forms of scientific documents (e.g. articles, reports, abstracts)
3. Build the capacity to quickly and efficiently assimilate results from a large number of sources
4. Recognize and deconstruct problematic arguments, such as those biased by under- or overstated uncertainty or speculation
5. Deepen skills in presenting and critiquing arguments
6. Understand how to incorporate literature into your own research, by citing discoveries and arguments fairly and effectively
7. Prepare skills needed to succeed in oral component of GP Departmental Exam

Weekly reading

Each week, you are expected to read at least five papers. In week 1 the topic is up to you, and in weeks 2–10 we will all focus on the same topic, starting with the ‘first’ paper given in the schedule below. You will use the references in the ‘first’ paper to find additional papers to read (and potentially present) on the topic.

In-class presentations

In weeks 3–7, one or two of you will present talks about papers that you have read that week (you will need to coordinate between yourselves to avoid overlap). The talks should introduce the papers and summarize the main results or areas of debate, and should be **no more than 15 minutes long**. The whole class will then discuss the paper, consider some questions, and provide feedback.

Paper summaries

In weeks 8–10, you will each write a 300 word summary of that week’s topic. These summaries will be shared for in-class peer-review, followed by discussion.

Bibliography assignment

Throughout the quarter you will each create an annotated bibliography, which will constitute part of your weekly homework and be submitted via Canvas. You will be responsible for a minimum of five entries each week, for a total of at least 45 entries over the quarter.

Class Schedule

		In Class	Homework		Topic	First Paper (all read)
Introduction	Week 1 Tu 10-Jan	Class Intro: homeworks, bibliography entries. Tools to use: databases, software, tricks, pitfalls	Annotated bibliography & software setup	5 bibliography entries	Your choice	
How to Read a Paper	Week 2 Tu 17-Jan	Three pass method; Popular media, abstracts, white papers, reports. Peer review, predatory journals	Prepare to present/discuss 5 papers with class	5 bibliography entries	Cryosphere	Whitehouse, Pippa L., Gomez, Natalya, King, Matt A. and Wiens, Douglas A. 2019. Solid Earth change and the evolution of the Antarctic Ice Sheet. <i>Nature Communications</i> , 10 , 1–14, https://doi.org/10.1038/s41467-018-08068-y .
Literature Sources & Peer Review	Week 3 Tu 24-Jan	Speed reading: 2 talks, discussion; comment & reply	Prepare to present/discuss 5 papers with class	5 bibliography entries	Seismic tomography, BDKs	van der Hilst, Robert D. and de Hoop, Maarten V. 2005. Banana-doughnut kernels and mantle tomography. <i>Geophysical Journal International</i> , 163 , 956–961, https://doi.org/10.1111/j.1365-246X.2005.02817.x .
Reading & Presenting 1	Week 4 Tu 31-Jan	Speed reading: 2 talks, discussion; comment & reply	Prepare to present/discuss 5 papers with class	5 bibliography entries	Slow-slip earthquakes	Peng, Zhigang and Gombert, Joan. 2010. An integrated perspective of the continuum between earthquakes and slow-slip phenomena. <i>Nature Geoscience</i> , 3 , 599–607, https://doi.org/10.1038/ngeo940 .
Reading & Presenting 2	Week 5 Tu 7-Feb	Speed reading: 2 talks, discussion. Mid-Quarter Reflection	Prepare to present/discuss 1 paper with class	5 bibliography entries	Mantle convection	Duvernay, Thomas, Davies, D. Rhodri, Mathews, Christopher R., Gibson, Angus H. and Kramer, Stephan C. 2021. Linking Intraplate Volcanism to Lithospheric Structure and Asthenospheric Flow. <i>Geochemistry, Geophysics, Geosystems</i> , 22 , 1–29, https://doi.org/10.1029/2021GC009953 .
Reading & Presenting 3	Week 6 Tu 14-Feb	Detailed reading: 2 talks, discussion	Prepare to present/discuss 1 paper with class	5 bibliography entries	Electromagnetics	Gustafson, Chloe, Key, Kerry and Evans, Rob L. 2019. Aquifer systems extending far offshore on the U.S. Atlantic margin. <i>Scientific Reports</i> , 9 , 1–10, https://doi.org/10.1038/s41598-019-44611-7 .
Reading & Presenting 4	Week 7 Tu 21-Feb	Detailed reading: 1 talk, discussion	Write summary about 5 papers	5 bibliography entries	Oceanic crust	Maher, Sarah M., Gee, Jeffrey S., Cheadle, Michael J. and John, Barbara E. 2021. Three-dimensional magnetic stripes require slow cooling in fast-spread lower ocean crust. <i>Nature</i> , 597 , 511–515, https://doi.org/10.1038/s41586-021-03831-6 .
Reading & Writing 1	Week 8 Tu 28-Feb	Peer-review summaries, discussion	Write summary about 'first' paper	5 bibliography entries	Geodesy	Jiang, Junle, Bock, Yehuda and Klein, Emilie. 2021. Coevolving early afterslip and aftershock signatures of a San Andreas fault rupture. <i>Science Advances</i> , 7 , 1–16, https://doi.org/10.1126/SCIADV.ABC1606 .
Reading & Writing 2	Week 9 Tu 7-Mar	Peer-review summaries, discussion	Write summary about 'first' paper	5 bibliography entries	Satellite Hydrology	Borsa, Adrian Antal, Agnew, Duncan Carr and Cayan, Daniel R. 2014. Ongoing drought-induced uplift in the western United States. <i>Science</i> , 345 , 1587–1590, https://doi.org/10.1126/science.1260279 .
Reading & Writing 3	Week 10 Tu 14-Mar	Peer-review summaries, discussion		3		