



# Measuring Climate Change: Methods in Data Analysis and Scientific Writing (stl) na, npdf

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SYLLABUS FOR FALL 2016

Tu Th 1:30 pm - 2:50 pm, 155 Guyot Hall

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## Texts:

Assigned readings will be available to you free of charge through e-reserves on our course *Blackboard* site, or zipped into the weekly lab assignments. Please be sure to read the assigned readings by their deadlines.

## Writing Assignments:

You will write two scientific papers during the term.

1. **W01 Adopt a Patch!** Choose a 170x170 km (the size of one Landsat TM tile) patch of land in Utah or Nevada that is within 100 km of a weather station (red symbols on our shared Google map) that records rainfall. Make an argument about the area's sensitivity to climate change over time by (1) choosing at least two Landsat TM scenes separated in time, (2) analyzing the imagery to measure quantities such as vegetation density, vegetation type, vegetation health, drainage patterns, etc, and (3) comparing image-derived data to weather station data over the same interval of time. Conclude by developing a hypothesis to test when you fly the drone over and ground truth a 2 km<sup>2</sup> segment of your adopted patch. Your finished paper should be  $\leq 8$  pages. Full Draft due mid-October  $\rightarrow$  Final Revision due Tuesday before Fall Break.
2. **W02 Close-Up** Through analysis of the human-collected and drone-derived data you gathered during our trip to the Southwest, compared to or calibrated with other online data, develop a hypothesis that responds to a question that emerged for you in W01, or one that has emerged since. Be sure to inform your argument(s) by engaging with the scientific literature about your site, about related sites where similar issues are at stake and about the methods you do or do not employ. Your finished paper should be  $\leq 2500$  words. Full Draft due Sunday before Thanksgiving  $\rightarrow$  Final Revision due Early December.

Maximum page and word counts refer to your entire text, including bibliography, figures, figure captions, and table, but do not include cover letters. Prepare writing assignments using the  $\text{\LaTeX}$  template provided.

**Final Presentation (7 minutes):**

During Reading Period in January, you'll present your research to an audience of invited guests. The goal is to communicate clearly and compellingly to interested, non-expert listeners. Choose the most interesting aspect of your findings in W01 and/or W02: you'll have to be very selective since there will only be time to do justice to a tiny fraction of your overall project(s). Remember you can include figures that aren't central to the main story in an appendix to discuss during Q&A. Work on your presentation is great practice for [Princeton Research Day](#) on May 11.

**Lab and Notebook Assignments:**

1. Effective scientific writing depends as much on effective figures as on effective prose. Over the course of the semester, you will complete numerous problem sets (we call them labs) designed to hone your skills in collecting data, analyzing data, and creating figures. For each exercise, you will turn in a collection of graphs, figures, photographs, and tables with captions and motivating text using some combination of the L<sup>A</sup>T<sub>E</sub>X lab template provided, commented computer code, and spreadsheets. The text part of your lab assignments should never exceed 500 words.
2. During campus field work and on the **mandatory 9-day field trip to the American Southwest over Fall Break**, you will keep a detailed field notebook that chronicles your field observations, data collection, interpretations, and daily experiences. Each evening, you will digitize your notes, graphically present your data, and diary your work. Your digital field notes will be due shortly after the trip, and will be used by the entire class during W02.

**Citizenship:** GEO/WRI 201 is at least half workshop-based and also involves extensive fieldwork, so it's especially important for everyone to participate and be heard. You should be honest with your classmates and with us, respectful toward everyone's thoughts and opinions, and compassionate toward your subject matter and the views of your peers.

Stellar citizens of 201:

- are always on time and well-prepared.
- participate consistently and democratically in class, both by listening attentively and contributing thoughtful comments and questions that build on classmates' responses; they speak not only to the professors but to other students; work energetically in small group or pair activities; overall, improve the day-to-day quality of the seminar for everyone.
- write cover letters that reflect thoughtfully and critically on their own writing.
- submit thoughtful and complete pre-draft assignments and drafts.
- write draft response letters that offer fellow students substantive, constructive feedback.
- participate actively in group draft conferences, joining with both insight and tact in the conversation about their fellow group members' essays.

- are Outstanding in the Field (more details to come before we head out on our trip!)

**Grading:**

Writing Assignment 01:	25%
Writing Assignment 02:	25%
Final Presentation:	20%
Labs:	20%
Field Notebook:	5%
Citizenship:	5%

Your grade on each assignment will be evaluated on a scale of multiples of 1-10

- 10: Exceptional; significantly exceeds the highest expectations for undergraduate work
- 9: Outstanding; meets the highest standards for the assignment or course
- 8: Excellent; meets high standards for the assignment or course
- 7: Good; meets most of the standards for the assignment or course
- 6: More than adequate; shows some reasonable command of the material
- 5: Acceptable, while falling short of meeting basic standards in several ways
- 4: Minimally acceptable; lowest passing grade
- 3: Does not meet minimum expectations; failing grade

**Ground Rules:**

## 1. Due Dates

- All deadlines in this class are firm, and there are serious consequences to missing them. If you hand in an assignment after its due date and time, you will receive no written feedback. The standard grade penalty is half credit for submissions within 24 hours of the deadline and no credit thereafter. We give no individual extensions except in the case of medical or family emergency. You do, however, have one 24-hour free pass that you may use at your discretion any time during the semester. In other words, you may choose to extend any one deadline by one full day \*as long as you notify us in advance that you'll be using your free pass and as long as you are not scheduled to have your draft workshopped by the class.\*

## 2. Submission Format

- All homework should be typeset using the L<sup>A</sup>T<sub>E</sub>X template and turned in as a single PDF document that you upload directly to *Blackboard*.
- Your submission should be named netid???.pdf; in other words, malooofL01.pdf for Adam's Lab 01, awilkinsW02c.pdf for Amanda's writing assignment 02c, and so on — we will tell you when and how to deviate from this rule.
- Figures and tables should have numbers and captions, and, like equations, they should be embedded within the text, and should be referred to within the main body of text. Equations need to be punctuated as sentences.
- Graphs should have titles, legends, and labeled axes with units.

- All mathematical or graphical answers should be accompanied by short text explaining your work.
  - All work completed in Microsoft Excel, MatLab, ArcGIS, etc. should be consolidated into neat files and clearly annotated/commented.
3. Attendance
- Your active engagement in writing workshops and other in-class activities is an indispensable part of the course. For this reason, you are expected to attend every class. Two or more absences are considered cause for concern. If you are absent more than four times for any reason, you may not complete the course. Please note that a late arrival to class of more than 15 minutes will count as an absence.
4. Draft Conferences
- We will have two required draft conferences during the semester to discuss your writing and ideas, one for each paper. You'll meet with Adam and Amanda in pairs, which gives you not only an opportunity for expanded feedback, but also the chance to practice offering constructive peer critique. Please be sure to review your own writing before coming in, and bring specific ideas or questions about how you hope to approach the revision process. In addition, be sure to read your conference partner's draft carefully in advance and come ready to give detailed feedback on the strengths, weaknesses, and most promising ideas in the paper.
5. Acknowledgment of Original Work
- This course follows Princeton University policies on plagiarism, stated in Rights, Rules, Responsibilities and discussed at greater length in Academic Integrity at Princeton. According to these policies, you must properly cite your sources to distinguish your ideas from others'. You must also write the following pledge at the end of all drafts and revisions and then sign your name: "This paper represents my own work in accordance with University regulations." Suspicions of plagiarism will be reported to the Committee on Discipline and may have serious consequences.
6. Acknowledgment of Feedback and Support
- In keeping with common scholarly practice, you should express your indebtedness in an Acknowledgments section to anyone who gave you feedback on drafts, helped you with your code, or contributed informally to your thinking on your topic—for example, your classmates, roommates, and family members. Exceptions are the professors of this course and Writing Center Fellows.

**The Writing Center:** Located in Lauritzen Hall, the Writing Center offers student writers free, one-on-one conferences with experienced fellow writers who are trained to consult on assignments in any discipline. Writing Center Fellows can help with any part of the writing process, from getting started to developing a thesis, structuring an argument, or revising a draft. There to listen, suggest, diagnose, and advise, Fellows serve as sounding boards, careful readers, and helpful critics, and are able to suggest possibilities implicit in your own thinking and writing. Every writer—no matter how confident or experienced—can benefit enormously from the insights and suggestions

an intelligent outside reader offers. Last year, the Writing Center held over 6,000 conferences, with writers bringing everything from their first college essay to their Senior Thesis or dissertation. To make an appointment or for information about drop-in hours, visit <https://wriapps.princeton.edu/scheduler/appointments/>.