

ESS 203 - Glaciers and Global Change

Wednesday February 06, 2008

Focus the Nation reports due today (online)

Friday Field Trip - UW Library

Lab next week – Discovery Park

- Be prepared for rain, mud, and a great experience!

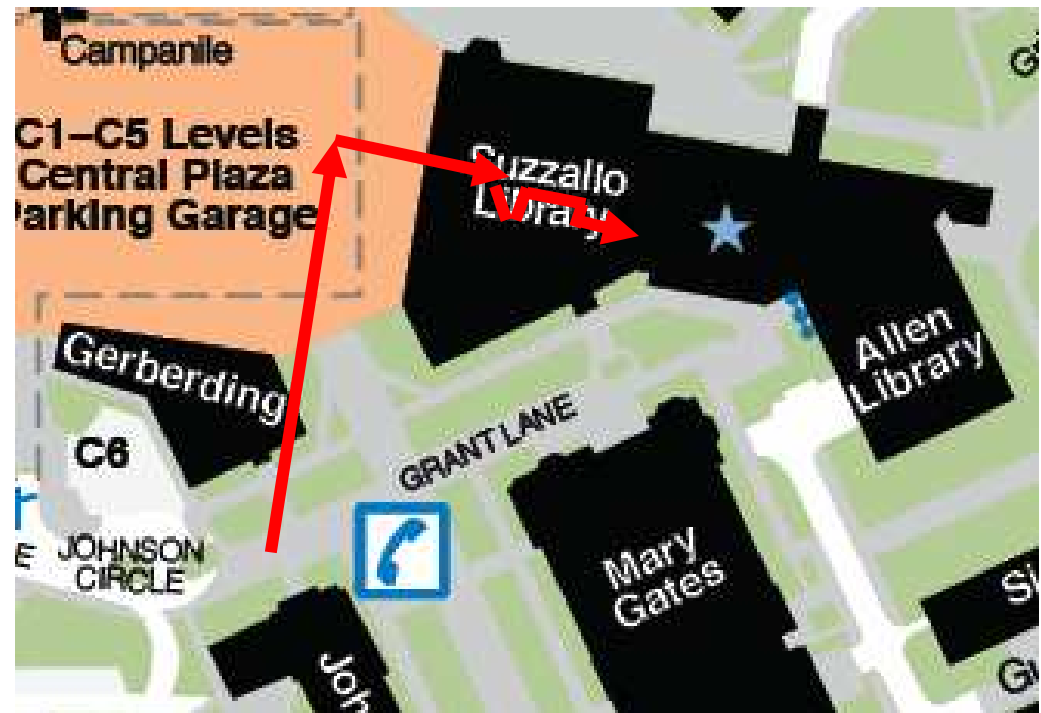
Friday - Field Trip to Suzzallo Library

Meet in Maps/Special Collections classroom at 9:30.

- Matthew Parsons is Librarian for Earth Sciences.
 - Matthew will show you how to search for and locate reference materials, both in the stacks on online, through UW subscriptions to journals.
 - You need to see this to do your term project effectively.
- There will be a group Library-search assignment handed out at the end of the Library class.

Directions to the Maps Classroom

- Go down to the basement of Suzzallo Library. Use the central stairs in the stacks, *not* the grand staircase by the Red Square entrance.
- Instead of entering the Map Collection, go to the right then left and down the hall.
- Classroom is halfway down the hall on the left.



Group Term Project

Only a few of you have used the *Go Post* discussion board linked from GROUP PROJECTS on the class site.

- You can outline your interests for a project.
- Find potential group partners with similar interests.

Only a few of you have entered your ideas.

- Time is running out – you can't do a good job on your project if you leave it to the last minute.

Group Term Project

Writing assignment – due Friday

- I want you to make at least one contribution to the discussion boards by Friday.
- This counts toward your *Class participation* grade.

Future mileposts

- I want to get a report from your group identifying your group members and your topic by the end of next week (February 15).
- I will want a 1-page outline of your group paper, including at least 2 sources that you have identified by February 22.
- Please get on it!

Writing Assignments - due this Friday

- (a) In a paragraph, describe your current understanding of how peer review keeps scientific research productive and “on track”.
- (b) Enter a Group-Project idea on the *Go Post* discussion board.

You also need to start taking the next steps.

- you need to *talk* with your classmates about their postings so that you can find partners.

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Lab this Week

Glacial Seattle field trip #1– be on time or miss the bus.

- Lab B folks - be prepared for showers or rain.
- Be prepared to present an idea for a group project at the start of your Lab tomorrow.

Outline for today

- Volunteer for summary on Monday_____
- Summary of last Wednesday's class – *Alex*
- How do scientists communicate their work?
- What is Peer Review?
- Why does good science depend on it?
- 'Balance' vs 'Bias' in news reporting?

Questions Questions Questions ...

Before we go too far into this topic, what are your thoughts now about scientific communication?

(Group discussions, 5 minutes)

- How do scientists communicate their work?
- What is Peer Review?
- Why does good science depend on it?

Understanding Scientific Papers

Why can scientific fields make substantial progress quickly?

- Researchers all over the world can quickly learn about results of their colleagues.
- Findings are communicated in ways that allow others to duplicate experimental conditions, reproduce results, or develop ideas and methods further, knowing that the prior work is sound.

Peer Review - I

The primary medium for communicating scientific results is publication in peer-reviewed science journals.

- Many of these journals are now published on-line as well as in hard-copy form.
- When a manuscript is received by a journal, a scientific editor sends the manuscript to at least two other scientists who are experts in the subject matter of the manuscript, i.e. they are "peers" of the author (or authors).

Peer Review - II

Reviewers must not be closely associated with the authors of the manuscript in question, i.e. they are free of conflict-of-interest.

- These experts read and critique the manuscript, and send their written evaluation to the editor.
- They have the option to remain anonymous; this guarantees that they can be frank without jeopardizing their own careers or grant prospects etc, should the authors of the manuscript be powerful figures who take unkindly to honest criticism.

Peer Review - III

A paper is published only after it successfully addresses all the comments and concerns of the reviewing peers.

- Papers that cannot pass peer review do not get published.
- Manuscripts can be revised and submitted again to the same or different journals, but they still have to hold up under peer review.
- This process improves the reliability of the science, and the effectiveness of the communication from the authoring scientists.

Types of Scientific Journals - I

Journals dedicated to publishing research articles in very specialized fields

- *Journal of Glaciology*
 - *Journal of Crystal and Molecular Structure*
 - *Journal of Cyclic Nucleotide and Protein Phosphorylation Research* (I didn't make that up!)
-
- Read mainly by the hard-core specialists.
 - Small circulation.

[Examples]

Types of Scientific Journals - II

Some journals publish peer-reviewed research findings in many different fields across the sciences.

- The two most widely respected examples are *Nature* and *Science*.
- These journals have a large circulation, because scientists from many research disciplines read these journals to stay in touch with other areas of science, as well as their own.

[Examples]

Types of Scientific Journals - III

Some journals publish news stories written by science reporters about new and exciting developments in science.

- These are *not* peer-reviewed.
- An example would be *Science News*.

Some peer-reviewed journals such as *Nature* and *Science* also publish news about science, and editorials on issues relating to science.

- Layout of the journal makes it very clear to readers whether they are reading peer-reviewed material or commentary.

Publishers

Many specialized journals are published by scientific societies.

- These societies also organize research conferences and provide other services to scientists who are members.

Some journals are published by large publishing houses as profit-making ventures (for the investors in the publishing company that sells the journals ☺, *not* for the scientists who submit the articles ☹).

- High cost of commercial subscriptions is a challenge for Libraries, including UW Library.

One Disincentive to Publish

Scientists are *not* free-lance journalists.

- They are *not* paid for their articles.
- In many journals, scientists *pay* the journal a fee (from research grants) based on the length of their paper to offset the publication costs.
- Most journals will publish meritorious papers even if the authors are broke.

In general, reporters at the science-news magazines are the only writers who are paid for their written work.

- **Bummer!**

Are Those Scientists Nuts?

What is a writer's first obligation? Obviously it is to sell enough stuff to pay the rent. **Nobody but a blockhead, said Dr. Johnson, writes except for money.** Beyond that practical consideration lies a duty not so easily defined. It is to use words precisely, to keep their sword edges honed, to search for the exact word and not settle for a nicked saber. Ah, but other considerations intrude. For whom are we writing? In what forum?

James J. Kilpatrick. Sun Jan 22, 2006. *The Writer's Art*

Samuel Johnson (1709-1784) Often referred to simply as **Dr Johnson**, was one of England's greatest literary figures: a poet, essayist, biographer, lexicographer and often considered the finest critic of English literature. (Wikipedia)

So there must be other incentives ...

Motivation for Scientists to Publish

To be “team players”.

- Scientists need to share their own work if they want to benefit from easy access to results of work by other scientists.

Some journals are harder to get published in than others.

- Scientists enjoy the prestige and reputation that comes with a good publication record in "distinguished" journals.

To get Promotion and Grants

- Promotion Review and Grant Review panels consider a scientist's publication record.

Format of a Scientific Paper - Title

Scientists don't have time to read everything that is published in their field.

- Title must state the subject succinctly and clearly.
- Readers should be able to tell from the title whether the article describes research that they want to read about (or not).

Format of a Scientific Paper - Authors

Just as in the arts, or in industry, reputations depend on the quality of work.

- Proper citation and giving credit to the right individuals for ideas and results is essential.
- The names and addresses of the authors are displayed prominently, so that the article can be easily referenced.
- (Plus, authors like to see their names in print. 😊)

Format of a Scientific Paper - Abstract

Almost all scientific articles have an abstract.

- Usually a single paragraph at the beginning of the article.
- Describes the essential points in the paper, including the conclusions.
- Abstracts are often collected in databases specializing in particular fields of study, so that scientists can quickly find work relevant to their own.

Past and Future Grounding-Line Retreat of the West Antarctic Ice Sheet

H. Conway,¹ B. L. Hall,^{2,3} G. H. Denton,² A. M. Gades,¹
E. D. Waddington¹

The history of deglaciation of the West Antarctic Ice Sheet (WAIS) gives clues about its future. Southward grounding-line migration was dated past three locations in the Ross Sea Embayment. Results indicate that most recession occurred during the middle to late Holocene in the absence of substantial sea level or climate forcing. Current grounding-line retreat may reflect ongoing ice recession that has been under way since the early Holocene. If so, the WAIS could continue to retreat even in the absence of further external forcing.

The grounding line of the WAIS has retreated nearly 1300 km since the Last Glacial Maximum (LGM) about 20,000 years before present (yr B.P.), when grounded ice in the Ross Sea Embayment extended almost to Coulman Island (1–3) (Fig. 1). Complete collapse of the WAIS would cause sea level to rise 5 to 6 m. Estimates of the present stabil-

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Format of a Scientific Paper – Text & Figures

The body of the manuscript describes

- Questions being addressed.
- Motivations to solve the question.
- Prior Research on the topic.
- Methods and Analyses.
- New results.
- Implications.
- Conclusions, i.e. what was learned that was valuable?

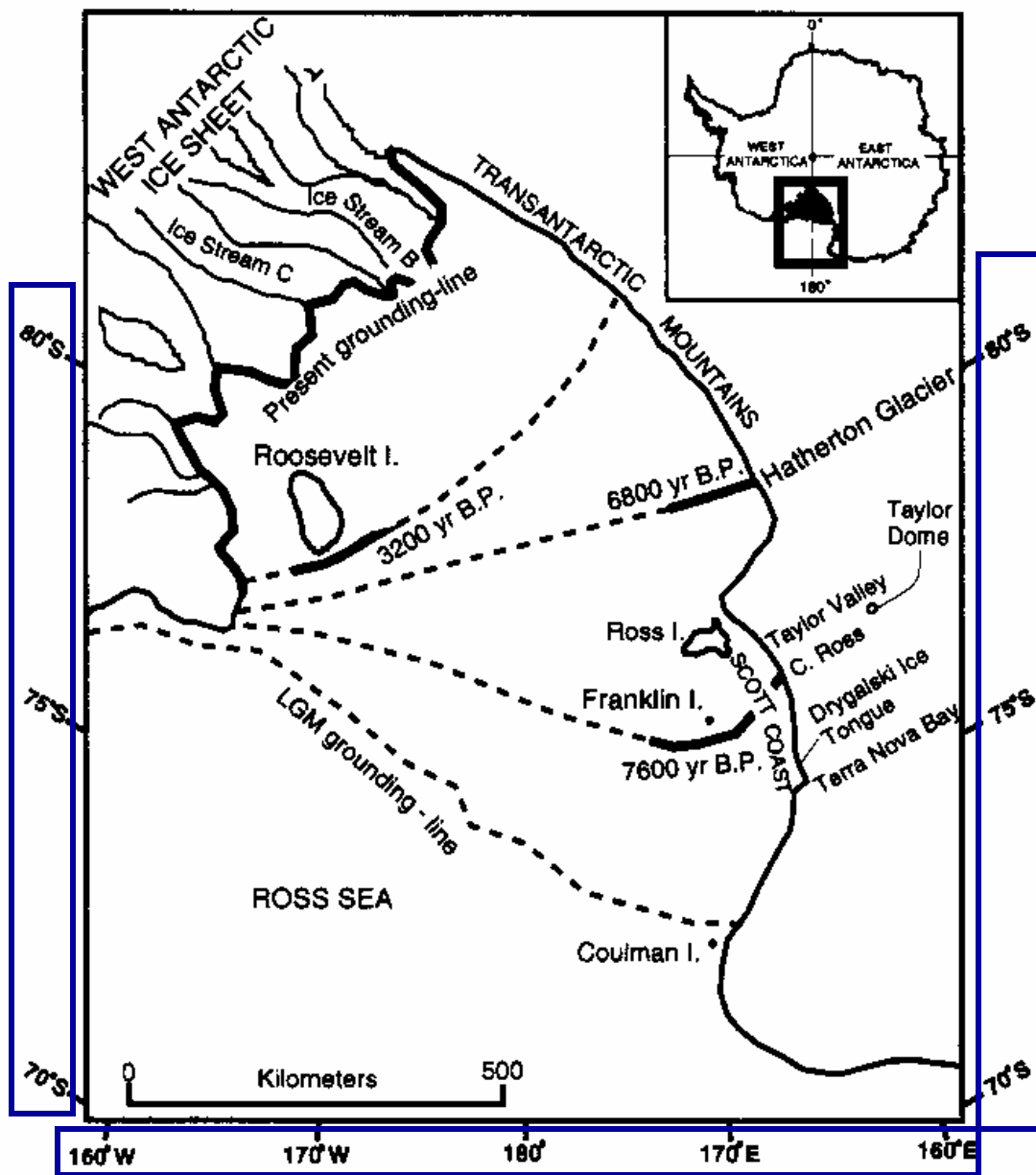


Fig. 1. Map showing dated locations used to resolve Holocene grounding-line retreat to its present position in the Ross Sea Embayment. Although the detailed structure of past grounding-line positions is unknown, dotted lines show the simplest grounding-line pattern consistent with the dates in the text.

An Example of a Figure

line continues to pull back at the present rate, complete deglaciation will take about 7000 years (31).

We suggest that modern grounding-line retreat is part of ongoing recession that has been under way since early to mid-Holocene time. It is not a consequence of anthropogenic warming or recent sea level rise. In other words, the future of the WAIS may have been predetermined when grounding-line retreat was triggered in early Holocene time. Continued recession and perhaps even complete disintegration of the WAIS within the present interglacial period could well be inevitable.

An Example of Conclusions

References and Notes

8 OCTOBER 1999 VOL 286 SCIENCE www.sciencemag.org

Format of a Scientific Paper – References

Publications that were important for prior research or ideas are included so that readers can follow the trail backward.

- All entries must be cited in the Text (i.e. it's not just a *Suggested Reading* list).
- Details are given in a References section (or occasionally as footnotes on each page).

References and Notes

1. J. B. Anderson, S. S. Shipp, L. R. Bartek, D. E. Reid, in *Contributions to Antarctic Research III*, vol. 57 of *Antarctic Research Series* (American Geophysical Union, Washington, DC, 1992), pp. 39–62; S. S. Shipp, J. B. Anderson, E. Domack, *Geol. Soc. Am. Bull.*, in press.
2. K. J. Licht, A. E. Jennings, J. T. Andrews, K. M. Williams, *Geology* **24**, 223 (1996); K. J. Licht, N. W. Dunbar, J. T. Andrews, A. E. Jennings, *Geol. Soc. Am. Bull.* **111**, 91 (1999).
3. M. Stuiver, G. H. Denton, T. J. Hughes, J. L. Fastook, in *The Last Great Ice Sheets*, G. H. Denton and T. J. Hughes, Eds. (Wiley-Interscience, New York, 1981), pp. 319–436; G. H. Denton, J. G. Bockheim, S. C. Wilson, M. Stuiver, *Quat. Res.* **31**, 151 (1989).

An Example of References

Reading a Scientific Paper - I

Sometimes it is valuable to go to a peer-reviewed scientific source to learn about a scientific question.

- You can often read about scientific results in the news, but often the news reporters get the story wrong.
- We will read some peer-reviewed articles from the journals *Nature* and *Science*.

When you read a scientific paper, keep these three questions in your mind:

- 1) What is the question that the paper tries to answer?
- 2) What is the answer (according to the authors)?
- 3) What points are still unclear to you?

Reading a Scientific Paper - III

- Read the title and abstract carefully first.
- Look at the Conclusions if you are in doubt about questions 1) and 2).

Some details of how the problem was solved may be unclear (e.g. equations, footnotes, or descriptions of methods).

- Don't worry about this when you first read the paper. We will go over some of these details in class.
- Some details you can just accept, if the peer-reviewers have done their job.

Reading a Scientific Paper - II

Some details are unclear?

- Don't worry.
- Just try to figure out answers to the 3 questions.
 - 1) What is the question that the paper tries to answer?
 - 2) What is the answer (according to the authors)?
 - 3) What points are still unclear to you?