COMPILING A LITERATURE REVIEW: ATMOSPHERIC SCIENCES

SEPTEMBER 2018

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Outline

• Search process
• Types of sources
• Peer review
• Evaluating what you find
• Library catalog
• Finding journal articles with subject databases
• Searching Google
• Citation guides
Why the literature review?

- Exposes main gaps in knowledge & identifies areas of dispute and uncertainty
- Helps identify general patterns
- Explore conflicting findings
- Define terminology or identify variations in definitions
- Identify appropriate research methodologies
- Identify validated scales and instruments

Credit: Andrew Booth and Mary Dixon-Woods.
Systematic literature search

- Formulate the research question(s): Select a topic and set criteria (inclusion/exclusion)
- Search the literature
- Gather, read, analyze and assess quality of results
- Search and refine
- Write and reference
Types of sources

- Primary sources: a report by the original researchers of a study
- Secondary sources: description or study by someone other than the original researcher (e.g. a review article)
- Conceptual/theoretical: papers concerned with analysis of theories associated with the topic
- Anecdotal/opinion: Views about the subject that are not research, review or theoretical in nature
Types of sources

- People
- Scholarly publications or journals
- Books or monographs
- Dissertations
- Encyclopedias
- Online sources
- Digital collections
- Government documents
Peer review

- Sometimes called “refereed”
- Reasons for peer review
- How does the peer review process work?
- Telling the difference between “popular” and “peer reviewed”
Evaluating web resources

- **Accuracy**: examine references; thoroughness, documentation
- **Authority**: who created site?, “about” page, author qualifications
- **Objectivity**: purpose of site, representative of multiple viewpoints, is there bias?, Examine URL (.gov, .edu, .com, .org, country codes)
- **Currency**: dates listed and updates listed
Types of research questions

- Prediction: What is the likely result of X?
- Historical: How have we gotten from A to B?
- Intervention: Is doing Y better than doing Z?
- Exploration: What are the possible explanations for A?
- Attitudes: How do people feel about B?
- Causation: What are the likely causes of C?
- Measurement: What is the size of X, how often does it occur etc?
- Characterisation: How can we understand and specify W?
Define research problem

Are there papers (and data) that discuss a link between glacial melt and climate change?

glacial + melt + climate change

Synonyms:
1) glacier(s), ice mass(es), ice sheet(s)
2) recession, receding, melt(ing), erosion, retreat, mass loss
3) climate change, climate variability, climate history

It's harder than it looks to ask good research questions. Often the question with which we start is too vague or unfocused to offer much help for how we should go about answering it.
Search strategies

• Remember variant word endings, Boolean operators (and, or, not) and synonyms

• Limit search terms to specific fields (title, subject heading), within a certain proximity to each other, year ranges

• Note controlled vocabularies

• To narrow a search: limit by theoretical approach, one aspect of subject, by time, by geographic location

• To broaden a search: generalize your topic, check more databases, limit jargon, check Web or newspaper databases if topic is too new
Things to consider

• Develop keywords
• Use scientific names
• Current articles
• Older articles
• Review papers and dissertations
Library catalog overview

www.library.wisc.edu

• Use to find books, government reports, journal titles and their locations

• Journal articles or contents of books (specific chapters) ARE NOT in the catalog

• Schwerdtfeger Library holdings are in the library catalog
Library catalog search

Search the Catalog

Keywords: glacier AND recession

Available Online
Limit to UW-Madison

Submit

REefined by
Libraries  Formats  Media  Subjects  Authors  Languages  Places

17 results sorted by Relevancy

1. The 1983 recession of Columbia Glacier

Save to Lists

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| PUBLICATION | AVAILABILITY | |
| --- | --- | |
| | | |

| AUTHOR | | |
| --- | --- | |
| by M.F. Meier ... [and others] | | |

| DATE | |
| --- | |
| 1984 | |

Advanced search options
- Advanced Search
- Browse by...

Search and place interlibrary loan requests
- Uborrow (Big Ten Catalog)
- WorldCat (OCLC Catalog)
Glacier science and environmental change

Subjects
- Glaciers.
- Glaciology.
- Climatic changes – Detection.

Publication Details
- Creator: edited by Peter G. Knight
- Format: Books
- Contributors: Knight, Peter, 1961-
- Physical Details: xiv, 527 pages, 24 unnumbered pages of plates : illustrations (some color), maps ; 28 cm
Place request

Glacier science and environmental change

Physical Availability

Place a request

Steenbock Library
Stacks
GB2403.2 G53 2009

Estimated delivery time to your pickup location: 2-3 business days. You will be contacted by email.

Pick up for

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Pickup location

Place a request  Cancel
Your library account

My Account

Archives and Special Collections Account
Request non-circulating materials for use in Special Collections, University Archives, Mills Music Library, or the Wisconsin Historical Society Archives.

EndNote Basic
A popular citation manager that allows you to easily organize your research.

Interlibrary Loan
Request materials from other libraries and manage your current requests.

Learn@UW
Log into your UW-Madison course webpages.

Library Account
Renew items, view fines, manage requested items, and more.

My UW
Access your personal UW-Madison account.

WiscMail
Sign into your campus email.
Finding journal articles

• UW-Madison Libraries have licensed many databases for your use

• Not all articles and information are free and available from a Google search (most are proprietary)

• Most databases have links to full-text via the Find-It feature

• For a list of AOS subject databases, visit our guide here: https://researchguides.library.wisc.edu/atmosphericoceanicclimate
Atmospheric, Oceanic, Climate Research Guide

Atmospheric/Oceanic/Climate Research Guide: Articles & Books
A guide to selected research tools in the atmospheric and related sciences.

**Articles & Books**

Reference Resources

Govt. Documents & Dissertations

**Databases**

The UW-Madison Libraries have licensed many databases for your use. Those containing literature related to the atmospheric sciences are selectively listed below, with the best meteorology-related files listed toward the top. Once you find specific articles you'd like to read, search for the journal titles in the Library Catalog to determine which libraries on campus have them or use the Find It button within the record to locate full-text journal articles.

**Meteorological and Geoaestophysical Abstracts, 1974-**
- Meteorology and climatology
- Physical oceanography, hydrology and glaciology
- Remote sensing, atmospheric chemistry, and physics

**Web of Science, 1985-**
- Earth and atmospheric science
How to access databases

From the campus libraries page
http://www.library.wisc.edu/

From Schwerdtfeger Library
http://library.ssec.wisc.edu
Meteorological and Geoastrophysical Abstracts

- Updated monthly, 1974 to present
- MGA covers meteorology, climatology, oceanography, atmospheric chemistry, hydrology, glaciology, etc.
- Indexes journal articles, conference proceedings, books, technical reports. Includes abstract for most entries
- Includes links to full-text for AMS journals and other journals if the campus has a license
Web of Science

- Updated weekly, 1965 to present
- Combination of three databases (can be searched independently or together)
- Indexes peer-reviewed journal literature and now includes conference proceedings
- Known for its currency and meticulous indexing
- Used to do general, cited reference or author searching
- Journal Citation Reports is companion database
Web of Science

Basic Search

- glacier* OR ice sheet* OR ice mass
- And recession OR reced* OR melt* OR erosion OR retreat*
- And "climate change" OR "climate variability" OR "climate history"

Timespan

- All years (1900 - 2018)
Results

1. Climate change, glacier retreat and a new ice-free island offer new insights on Antarctic benthic responses
   By: Lagger, Cristian; Nime, Monica; Torre, Luciana; et al.
   ECOGRAPHY Volume: 41 Issue: 4 Pages: 579-591 Published: APR 2018
   Find It

2. The Multitrophic Effects of Climate Change and Glacier Retreat in Mountain Rivers
   By: Fell, Sarah C.; Carrivick, Jonathan L.; Brown, Lee E.
   BIOSCIENCE Volume: 67 Issue: 10 Pages: 897-911 Published: OCT 2017
   Find It

3. "ASG-Rhine" - The snow and glacier melt components of streamflow of the river Rhine and its tributaries against the background of climate change
   By: Sek, Joerg Uwe; Krahe, Peter
   HYDROLOGIE UND WASSERBEWIRTSCHAFTUNG Volume: 61 Issue: 1 Pages: 69-75 Published: FEB 2017
   Find It
Centennial glacier retreat as categorical evidence of regional climate change

By: Roe, GH (Roe, Gerard H.); Baker, MB (Baker, Marcia B.); Herla, F (Herla, Florian)

Abstract
The near-global retreat of glaciers over the last century provides some of the most iconic imagery for communicating the reality of anthropogenic climate change to the public. Surprisingly, however, there has not been a quantitative foundation for attributing the retreats to climate change, except in the global aggregate. This gap, between public perception and scientific basis, is due to uncertainties in numerical modelling and the short length of glacier mass-balance records. Here we present a method for assessing individual glacier change based on the signal-to-noise ratio, a robust metric that is insensitive to uncertainties in glacier dynamics. Using only meteorological and glacial observations, and the characteristic decadal response time of glaciers, we demonstrate that observed retreats of individual glaciers represent some of the highest signal-to-noise ratios of climate change yet documented. Therefore, in many places, the centennial-scale retreat of the local glaciers does indeed constitute categorical evidence of climate change.

Keywords
MASS-BALANCE; ICE-AGE; VARIABILITY; FLUCTUATIONS

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Funding

<table>
<thead>
<tr>
<th>Funding Agency</th>
<th>Grant Number</th>
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<td>Institute of Atmospheric and Cryospheric Sciences, University of Innsbruck</td>
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Find It feature

Web of Science

Centennial glacier retreat as categorical evidence of regional climate change

By: Roe, GH (Roe, Gerard H.)[1]; Baker, MB (Baker, Marcia B.)[1]; Herla, F (Herla, Florian)[2]

NATURE GEOSCIENCE
Volume: 10 Issue: 2 Pages: 95-4
DOI: 10.1038/Ngeo2863
Published: Feb 2017
Document Type: Article
View Journal Impact

Abstract
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Centennial glacier retreat as categorical evidence of regional climate change

Gerard H. Roe, Marcia B. Baker & Florian Herla

Nature Geoscience 10, 95–99 (2017) | Download Citation

Abstract

The near-global retreat of glaciers over the last century provides some of the most iconic imagery for communicating the reality of anthropogenic climate change to the public. Surprisingly, however, there has not been a quantitative foundation for attributing the retreats...
Review and refine

- Refine results
- Check keywords for more terms
- Check “Cited by”
- Check “Related Records”
- Check “References”
glacier* OR ice sheet* OR ice mass
AND recession OR recede* OR melt* OR erosion OR retreat*
AND "climate change" OR "climate variability" OR "climate history"
Search history:
Edit, save, set up alert

1. Supra-glacial Melt Lake Sensitivity to Climate Variability on the Greenland Ice Sheet
   Amedor, Nathan S.; Box, Jason.

2. Evidence of climate change impact upon glaciers recession within the Italian Alps
   Diolaiuti, G.; Bocchiola, D; D'agata, C; Smiraglia, C. Theoretical and Applied Climatology; Wien Vol. 109, Iss. 3-4, (Aug 2012): 429-445.

3. Evidence of climate change impact upon glaciers recession within the Italian Alps. The case of Lombardy glaciers
   Diolaiuti, G.; Bocchiola, D; D'agata, C; Smiraglia, C. Theoretical and Applied Climatology Vol. 109, Iss. 3-4, (August 2012): 429-445. [Duplicate]
GLACIER RETREAT: Reviewing the Limits of Human Adaptation to Climate Change


**Abstract**

The negative consequences of glacier retreat for important issues—water resources, natural hazards, and landscapes—are also straightforward and clear, and significant agreement between expert and lay opinion on its existence, nature, and impacts makes glacier retreat an area of overlap between the views of the scientific community and the general public. In recent years, public institutions have formed to address climate change, including the United Nations Framework Convention on Climate Change (UNFCCC), many national and regional bodies, and nongovernmental organizations (NGOs) concerned with sustainable development.

**Details**

Subject: Climate change; Glacier retreat; Climatic change influences on water resources; United Nations Framework Convention on Climate Change (UNFCCC); nongovernmental organizations; Climatic changes; Water resources; Sustainable development; glaciers; United Nations; adaptability

Review subjects for related keywords & ideas for refining your search
Saving records

• Save, Print, E-mail records
• Export to bibliographic management tool like EndNote, Mendeley, or Zotero
• Make sure you have complete references
• Document your search: Take notes, helps to avoid duplication and allows replication (include search date, sources used, strategy implemented)
Searching Google or Google Scholar

• Trending news articles on your topic
• Government websites with background information & current studies/projects
• Use quotes around terms to group them together
• Try using Advanced Search feature in Google Scholar
Google Search Results

• Searched for (glaciers AND melt AND “climate change”)
• Top results included government agencies and trending articles
  • NASA
  • NSIDC (National Snow & Ice Data Center)
  • National Park Service
  • Article from National Geographic
Glaciers and climate change

Glacial Ice can range in age from several hundred to several hundreds of thousands years, making it valuable for climate research. To see a long-term climate record, scientists can drill and extract Ice cores from glaciers and Ice sheets. Ice cores have been taken from around the world, including Peru, Canada, Greenland, Antarctica, Europe, and Asia. These cores are continuous records providing scientists with year-by-year information about past climate. Scientists analyze various components of cores, particularly trapped air bubbles, which reveal past atmospheric composition, temperature variations, and types of vegetation. Glaciers preserve bits of atmosphere from thousands of years ago in these tiny air bubbles, or, deeper within the core, trapped within the ice itself. This is one way scientists know that there have been several Ice Ages. Past eras can be reconstructed, showing how and why climate changed, and how it might change in the future.
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- American Institute of Physics
  http://www.aip.org/pubservs/style/4thed/toc.html

- American Geophysical Union
  http://www.agu.org/pubs/authors/manuscript_tools/journals/pdf/AGU_author_guide.pdf

- Citing References in Your Paper (Writing Center, UW-Madison): Chicago/Turabian, MLA, APA…
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