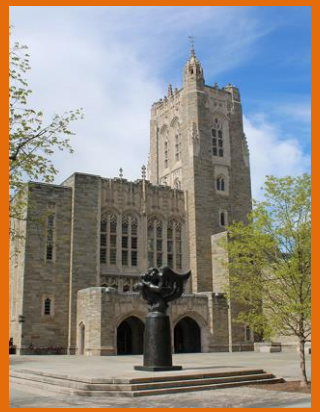
Princeton University LIBRARY

October 26, 2020

Geoscience Librarianship 101: Introduction & Instruction Tips



Presented by Emily C. Wild, Chemistry, Geosciences and Environmental Studies Librarian
ewild@princeton.edu

Firestone Library, Research Collections and Preservation Consortium (ReCAP), Lewis Science Library

PRINCETON UNIVERSITY

About the Instructor

Emily C. Wild

Schedule a Research Consultation :
Monday – Friday
email me ewild@princeton.edu

Meet Our Specialists – Emily Wild

https://www.linkedin.com/in/emilycwild/

https://orcid.org/0000-0001-6157-7629

Princeton University Library, 2018-Present
Chemistry, Geosciences and Environmental Studies Librarian
About 75% of my research inquires = worldwide USGS info
http://library.princeton.edu http://geosciences.princeton.edu

Emily Wild joined Princeton University Library in 2018 as the Chemistry and Geosciences Librarian. From 1996 to 2018, she was a hydrologist and librarian (physical scientist) at the U.S. Geological Survey. She has a Bachelor of Arts in Geology from Hartwick College and a Master of Library and Information Studies from the University of Rhode Island. Emily's scholarly interests include library instruction; reference, citation and data management; raw and geospatial datasets; and physical and laboratory sampling methods.

- **Working remotely since March 2020**
- **Using GeoRef remotely since 1991**
- **Using libraries remotely since 1988**

From hurricanes to astrogeology: Princeton's geosciences librarian and collections serve national, international communities

Work responsibilities?

Chemistry, Geosciences and Environmental Studies Librarian

Research Consultant: students, faculty, researchers, public, companies

Library Instruction: Courses (CHM, GEO, AOS, ENV, WRI), Internal/External

Workshops: Professional Development Sessions, Wintersession

Collection Development (shaping the collections)

Selector (budgets & purchasing) ; (not contracts)

Subject Specialist : Chemistry, Geosciences, Environment & Energy

Department/Program Liaison: Chemistry, Geosciences, Princeton Environmental Institute (PEI)

Project Collaborator: Research Grant with Faculty (PEI)

Two Library Consortiums

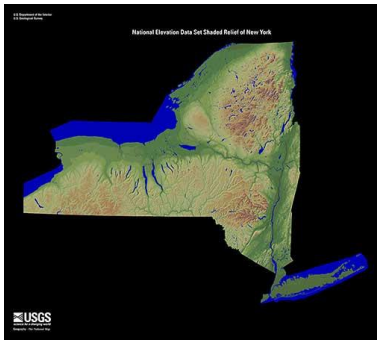
Research Collections and Preservation Consortium (ReCAP) Libraries: Columbia University, Harvard University, New York Public Library, and Princeton University
https://recap.princeton.edu/

Ivy Plus Libraries Confederation:
https://ivpluslibraries.org/

Participating Institutions

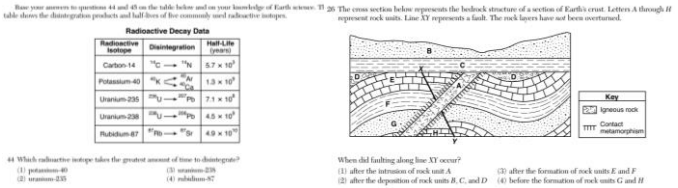
- Brown University Library
- Columbia University Libraries
- Cornell University Library
- Dartmouth College Library
- Duke University Libraries
- Harvard University Libraries
- Johns Hopkins University Libraries
- Massachusetts Institute of Technology Libraries
- Princeton University Library
- Stanford University Libraries
- University of Chicago Library
- University of Pennsylvania Libraries
- Yale University Library

Why a Geosciences Librarian?



https://eros.usgs.gov/image-gallery/shaded-relief/new-york

HARTWICK COLLEGE
est. 1797


Base your answers to questions 44 and 45 on the table below and on your knowledge of Earth science. The table shows the disintegration products and half-lives of five commonly used radioactive isotopes.

Radioactive Decay Data

Radioactive Isotope	Disintegration	Half-Life (years)
Carbon-14	$^{14}C \rightarrow {}^{14}N$	5.7×10^3
Potassium-40	$^{40}K \rightarrow {}^{40}Ar$, ^{40}Ca	1.3×10^9
Uranium-235	$^{235}U \rightarrow {}^{207}Pb$	7.1×10^8
Uranium-238	$^{238}U \rightarrow {}^{206}Pb$	4.5×10^9
Rubidium-87	$^{87}Rb \rightarrow {}^{87}Sr$	4.9×10^{10}

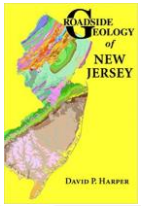
44 Which radioactive isotope takes the greatest amount of time to disintegrate?
(1) potassium-40 (3) uranium-238
(2) uranium-235 (4) rubidium-87

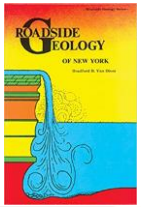
26 The cross section below represents the bedrock structure of a section of Earth's crust. Letters A through H represent rock units. Line XY represents a fault. The rock layers have not been overturned.

When did faulting along line XY occur?
(1) after the intrusion of rock unit A (3) after the formation of rock units E and F
(2) after the deposition of rock units B, C, and D (4) before the formation of rock units G and H

New York State, 9th Grade, Earth Science

Professor Titus:
The Catskill Geologist

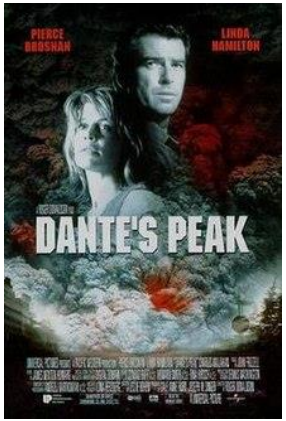




Hartwick Geology
https://www.hartwick.edu/academics/academic-departments/geology-environmental-sciences-department/

Hartwick Library
https://www.hartwick.edu/academics/stevens-german-library/

https://www.usgs.gov/observatories/hawaiian-volcano-observatory



NEW YORK STATE

NYS DEC - Environmental Law Internship in College (Legal Research)

USGS science for a changing world

https://www.usgs.gov/staff-profiles/emily-wild

https://volcanoes.usgs.gov/vsc/file_mngr/file-153/FAQs.pdf

Who do I help?

"Princeton in the nation's service and the service of humanity"

When working at the U.S. Geological Survey

- General Public
- Teachers (K-12)
- College/University Professors
- City, County, State Natural Resource Managers
- Undergraduate & Graduate Students
- New Employees to Geosciences or Post-Docs
- Federal Science Agencies, Scientists & Attorneys
- Private Sector: Scientists & Attorneys
- International Governments & Institutions
- Experienced Library Users that need a refresher

When working at Princeton University

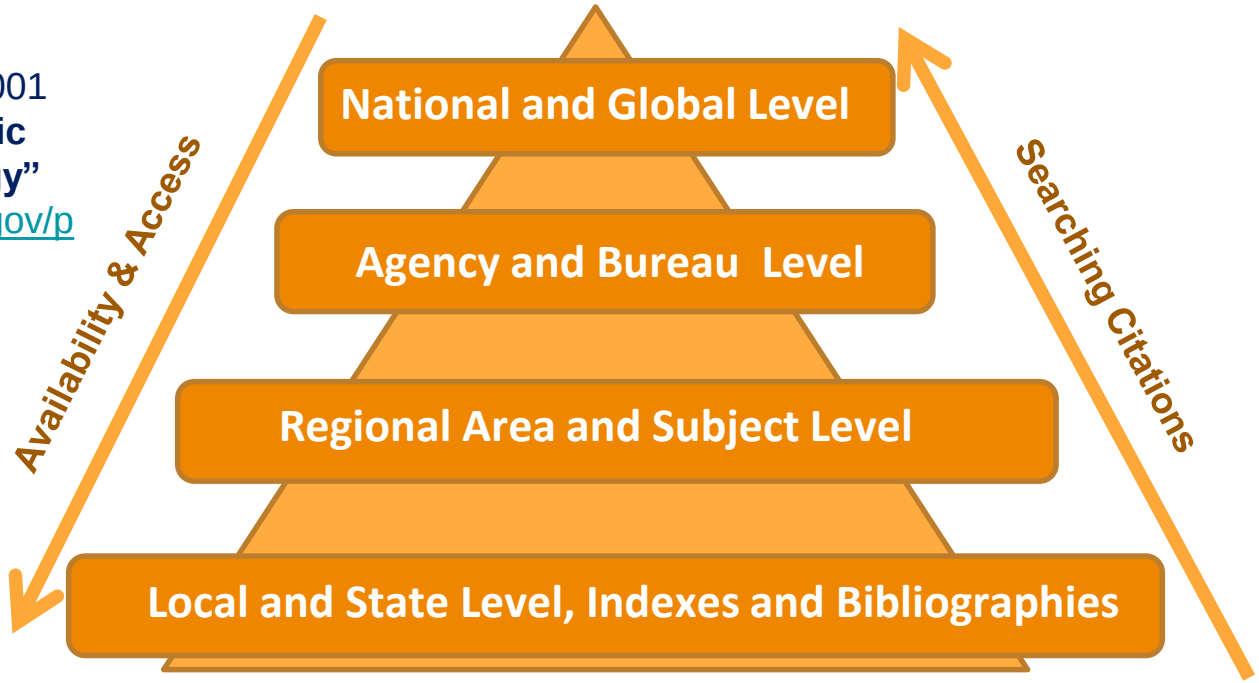
- Undergraduate & Graduate Students
- College/University Professors
- Librarians
- Post-Docs
- Federal Science Agencies, Scientists & Librarians
- Private Sector: Scientists & Librarians
- Finance Industry
- International Governments & Institutions
- City, County, State Natural Resource Managers
- Experienced Library Users that need a refresher

How do I help?

- **Raw Data:** Real-Time, Continuous, Recent Partial Records, Historical
- **Calculated Data:** Equations, Software Results, Lab Results, and Model Results
- **Map Data:** Specific Location Information by Geosciences Topic
- **Citation Data:** Bibliographic Information for Reference Lists & TO FIND THE PUBLICATION

Modified from :
Wild and Havener, 2001
"Online bibliographic sources in hydrology"
https://pubs.er.usgs.gov/publication/70023512

Free & Open Geosciences Information Sources



Session Outline

Mount St. Helens, WA

Mount Pinatubo, Philippines

Part 1. Introduction to Geoscience Librarianship: Research Consultations

- What is Geoscience? Who are the Geoscientists?
- Geosciences Societies
- Geological Surveys
- University Presses
- Geosciences Publication Databases

Part 2. Geoscience Instruction Tips

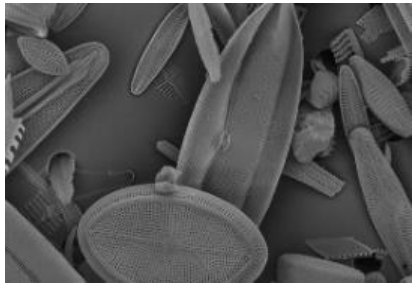
- Using my USGS experiences at Princeton
  - Geologic & Hydrologic Overviews
- Instruction at Princeton University

What is Geoscience?

From American Geosciences Institute (AGI) :
https://www.americangeosciences.org/critical-issues/faq/what-is-geoscience

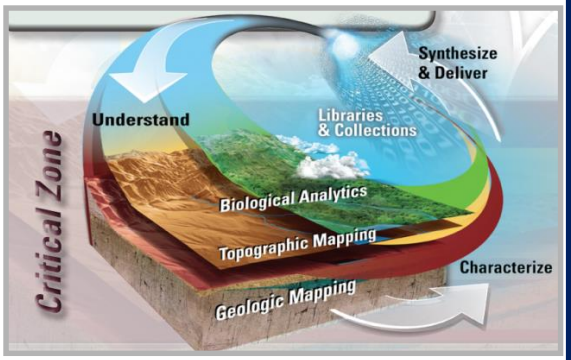
Geoscience is the study of the Earth - its oceans, atmosphere, rivers and lakes, ice sheets and glaciers, soils, its complex surface, rocky interior, and metallic core. This includes many aspects of how living things, including humans, interact with the Earth. Geoscience has many tools and practices of its own but is intimately linked with the biological, chemical, and physical sciences.

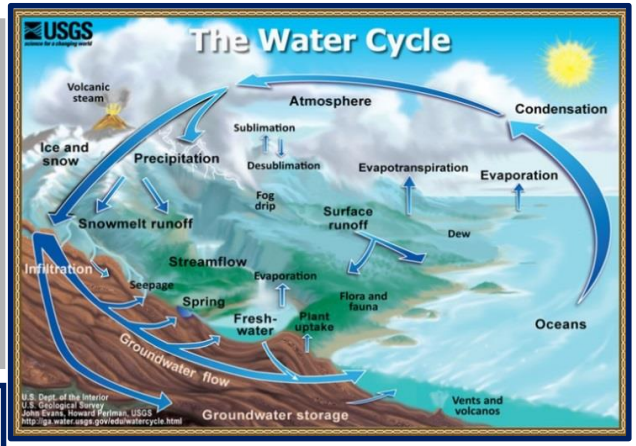
Geoscience investigates the past, measures the present, and models the future behavior of our planet. But it also involves the study of other planets, asteroids, and solar systems, both to better understand the Earth and to expand our knowledge of the universe.

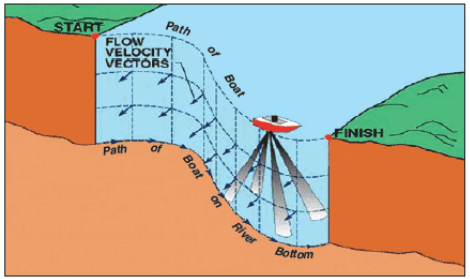




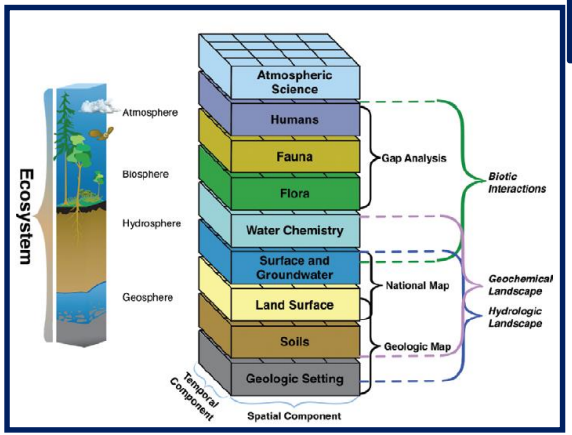
Geoscience is the study of the Earth - its oceans, atmosphere, rivers and lakes, ice sheets and glaciers, soils… = Atmospheric Science, Biology, Hydrology & Oceanography

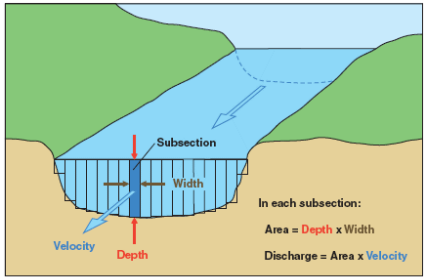




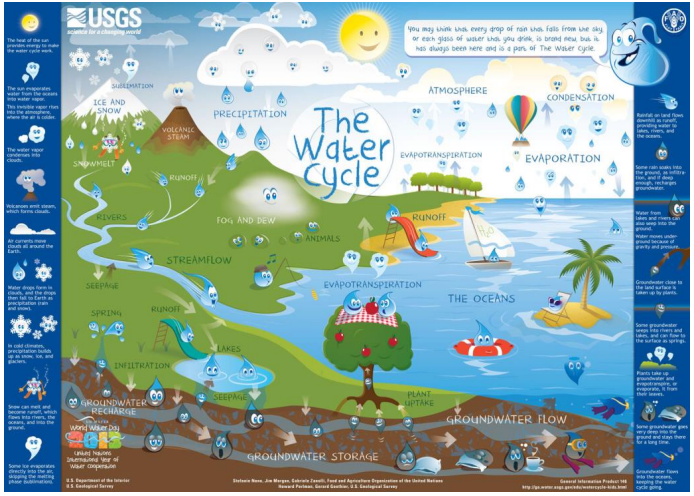


Acoustic Doppler Current Profiler (ADCP) mounted in a small watercraft, is used for measuring the discharge of a river. The ADCP acoustic beams are directed down into the water as it is guided across a river channel.

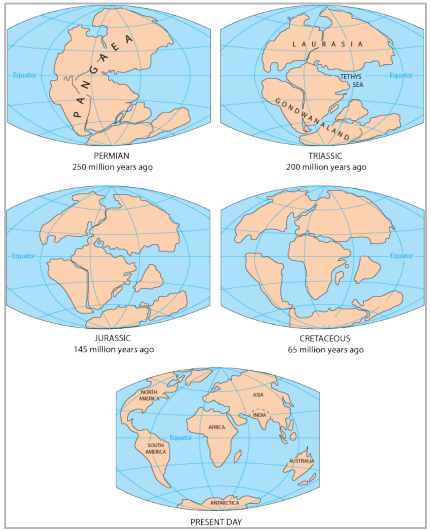


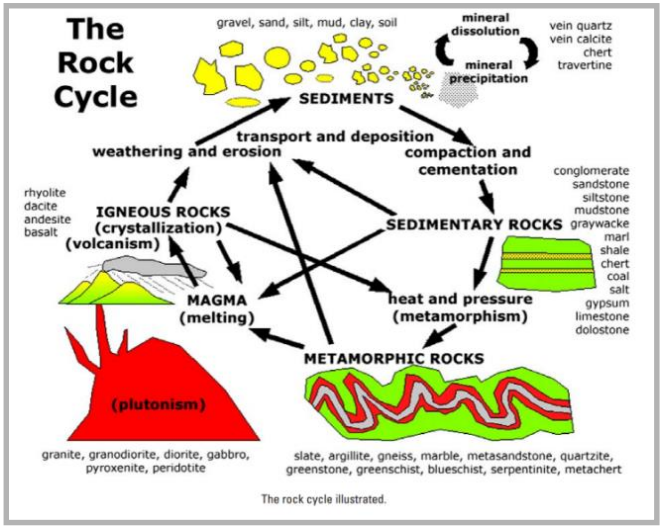


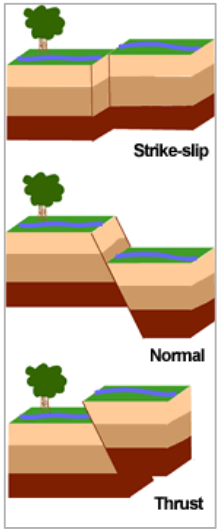
Current-meter discharge measurements are made by determining the discharge in each subsection of a channel cross section and summing the subsection discharges to obtain a total discharge.



Geoscience is the study of the Earth - …its complex surface, rocky interior, and metallic core… = structural, earthquakes, mineralogy, petrology, geomagnetism, geochemistry, and geophysics







Igneous: Volcanic & Plutonic

Metamorphic: Gneiss & Marble

Sedimentary: Limestone & Sandstone

Who is a geoscientist?

- Biologists
- Biogeochemists
- Cartographers
- Chemists
- Engineers
- Geologists
- Hydrologists
- IT Specialists
- Librarians
- Mathematicians
- Physicists
- Physical Scientists
- Seismologists
- Volcanologists
- And more!

https://www.usgs.gov/staff-profiles/susan-m-hall

https://pubs.er.usgs.gov/search?q=susan+hall

Critical analysis of world uranium resources
https://pubs.er.usgs.gov/publication/sir20125239

Is this citation in GeoRef? Yes
Web of Science? No
Scopus? No
GeoscienceWorld? No
AAPG Datapages? No
Princeton University Library? Yes with link!
USGS Library? No (in Pubs Warehouse)

https://www.usgs.gov/staff-profiles/peter-george-chirico

https://pubs.er.usgs.gov/search?q=Peter+Chirico

The Central African Republic Diamond Database—A geodatabase of archival diamond occurrences and areas of recent artisanal and small-scale diamond mining
https://pubs.er.usgs.gov/publication/ofr20181088

Is this citation in GeoRef? Yes
Web of Science? No
Scopus? No
GeoscienceWorld? No
AAPG Databases? No
Princeton University Library? No
USGS Library? No (in Pubs Warehouse)

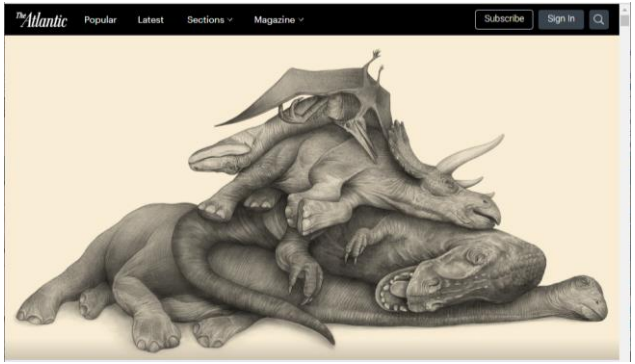
Who is a Geoscientist?

Example: Princeton University:
[Department of Geosciences]

Climate scientist Gabriel Vecchi: Climate crisis contributes to intensity of storms

How Has Climate Change Affected Hurricane Dorian?

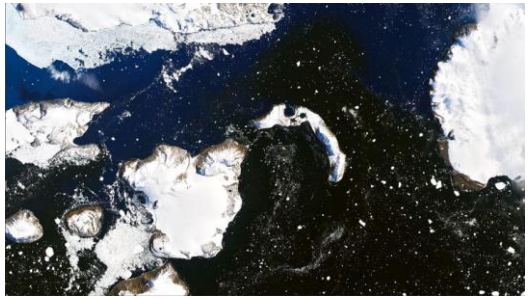
Princeton University/Geophysical Fluid Dynamics Laboratory



The Nastiest Feud in Science
A Princeton geologist has endured decades of ridicule for arguing that the fifth extinction was caused not by an asteroid but by a series of colossal volcanic eruptions. But she's reopened that debate.

Deccan Volcanism caused the mass extinction 66 million years ago

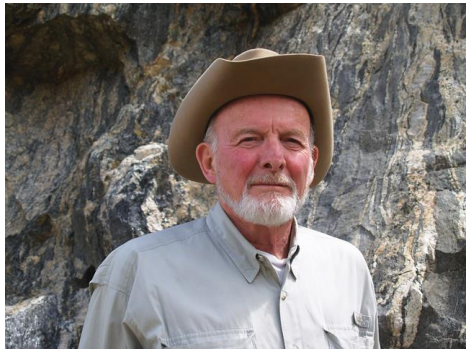
Gerta Keller



Princeton Environmental Research
A Half-Century at the Forefront

Princeton University's research across the spectrum of environmental issues is making pivotal contributions to solving some of humanity's toughest problems. Our impact is built on a legacy of personal commitment, intellectual leadership, perseverance and innovation.

Who is a geoscientist?



John C. Reed, Jr. “Jack”
https://www.earthmagazine.org/article/down-earth-john-jack-reed-jr

Generalized Geologic Map of the United States, Puerto Rico, and the U.S. Virgin Islands
https://pubs.usgs.gov/atlas/geologic/

Database of the Geologic Map of North America: Adapted from the Map by J.C. Reed, Jr. and others (2005)
Data Series 424
Prepared in cooperation with the Geological Society of America
By: Christopher P. Garrity and David R. Soller

https://ngmdb.usgs.gov/gmna/

Who helped me at USGS in Denver?

USGS Energy: https://www.usgs.gov/energy-and-minerals/energy-resources-program/

Christopher J Schenk
Susan M Hall
Robert Zielinski
Raymond Obuch

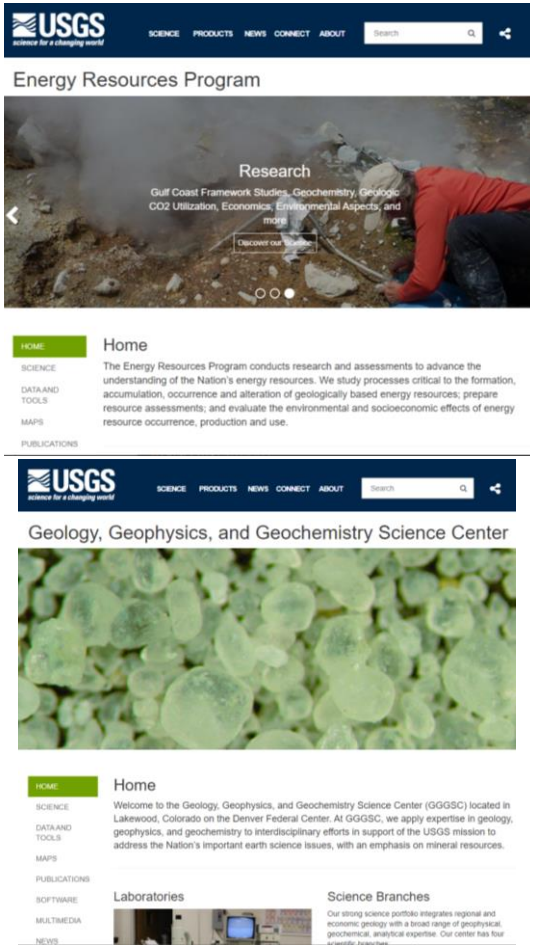
Geoffrey S Ellis
Timothy S Collett
Kristen Marra
Seth Haines
Stanley Paxton
Debra K Higley
Michael D Lewan
Paul Lillis
Chris Potter
Tracey Mercier

USGS Minerals: https://www.usgs.gov/energy-and-minerals/mineral-resources-program

Geology, Geophysics, and Geochemistry Science Center https://www.usgs.gov/centers/gggsc

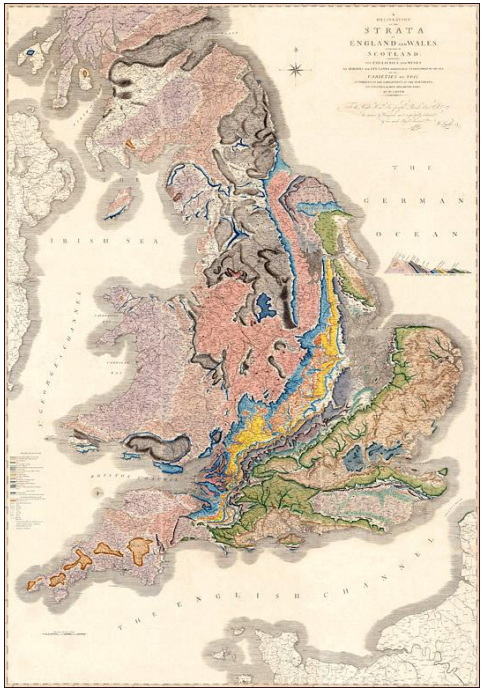
Jonathan Caine
Lyndsay B Ball
Benjamin J Drenth
Carol A Finn
JoAnn Holloway
V. J. Grauch
Christopher Holm-Denoma
Craig A Johnson
Erin Marsh
Anjana K Shah
Steven M Smith
Matthew Granitto
Erin Marsh
Gregg A Swayze
Cliff D Taylor
Bradley S Van Gosen
Thomas J Casadevall
George N Breit
Edward A du Bray
Karl V Evans
Todd K Hinkley

Anna Burack Wilson
Martin Goldhaber
Paul A Bedrosian
Cyrus J Berry
Benjamin Bloss
William B Ferguson
Poul Emsbo
Raymond Kokaly
Andrew H Manning
Karen Lund
Celestine Mercer
Burke Minsley
Jean M Morrison
Rae Ann Orkild-Norton
William Ridley
Mary Ellen Benson
Douglas B Yager
Ryan D Taylor
Russell G Tysdal



Geosciences Societies

***A Geological Map of England and Wales and Part of Scotland*, first published in 1815**



http://www.strata-smith.com/

The Geological Society

The Geological Society of London is the UK's national society for geoscience, providing support to over 12,000 members in the UK and overseas. https://www.geolsoc.org.uk/

Lyell Collection

Geological Society Publications

https://www.lyellcollection.org/

Open Access Collection:
https://www.lyellcollection.org/cc/open-access-collection

Geosciences Societies

Geoscience Information Society

GEONET Email List
http://www.geoinfo.org/e-mail-list/
Or email me: ewild@princeton.edu

Newsletter
http://www.geoinfo.org/newsletter/

Proceedings:
http://www.geoinfo.org/proceedings/

Free access - Search the Geologic Guidebooks of North America Database

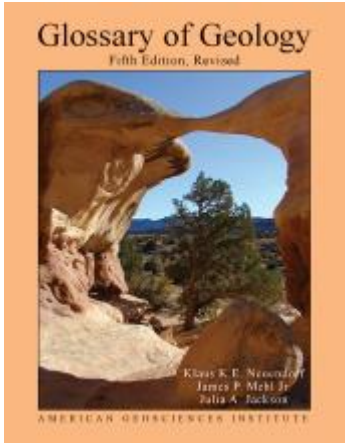
Geoscience Information Society (GSIS)
http://www.geoinfo.org/

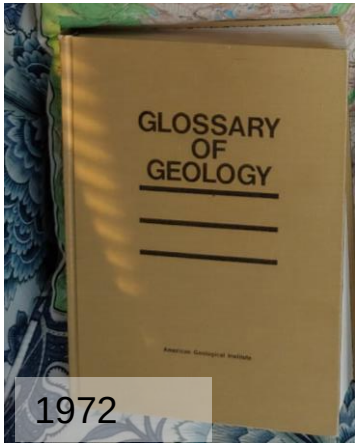
The Geoscience Information Society (GSIS) facilitates the exchange of information in the geosciences through cooperation among scientists, librarians, editors, cartographers, educators, and information professionals.

Member Society of American Geosciences Institute (AGI) https://www.americangeosciences.org/member-societies

Associated Society of Geological Society of America (GSA)
https://www.geosociety.org/GSA/About/Who_We_Are/Associated_Societies/GSA/About/Associated_Societies.aspx

Geosciences Societies





https://www.americangeosciences.org/pubs/glossary

Example:
Glossary of Geology – Online for Princeton University
https://catalog.princeton.edu/catalog/8875615

american geosciences institute
connecting earth, science, and people

American Geosciences Institute (AGI)
https://www.americangeosciences.org/

Policy & Critical Minerals: https://www.americangeosciences.org/policy-critical-issues

GeoRef

https://www.americangeosciences.org/information/georef

The GeoRef database, established by the American Geosciences Institute in 1966, provides access to the geoscience literature of the world. GeoRef is the most comprehensive database in the geosciences and continues to grow by more than 100,000 references a year. The database contains over 4 million references to geoscience journal articles, books, maps, conference papers, reports and theses. You can gain access to this vast amount of information through searching on the worldwide web, online, or on GeoRef CDs.

Open-Access Journals / Series:
https://www.americangeosciences.org/information/georef/open-access-journals

Geosciences Societies

American Geosciences Institute (AGI) : Member Societies
https://www.americangeosciences.org/member-societies

The Member Societies of AGI

- AASP - The Palynological Society
- American Association of Geographers
- American Association of Petroleum Geologists
- American Geophysical Union
- American Institute of Hydrology
- American Institute of Professional Geologists
- American Meteorological Society
- American Rock Mechanics Association
- Association for the Sciences of Limnology and Oceanography
- Association for Women Geoscientists
- Association of American State Geologists
- Association of Earth Science Editors
- Association of Environmental & Engineering Geologists
- Clay Minerals Society
- Council on Undergraduate Research
- Geo-Institute of the American Society of Civil Engineers

Geosciences Societies

American Geosciences Institute (AGI) : Member Societies
https://www.americangeosciences.org/member-societies

Geochemical Society
Geological Association of Canada
Geological Society of America
Geological Society of London
Geoscience Information Society
History of Earth Sciences Society
International Association of Hydrogeologists/U.S. National Chapter
International Medical Geology Association
International Medical Geology Association
Karst Waters Institute
Mineralogical Society of America
Mineralogical Society of Great Britain and Ireland
National Association of Black Geoscientists
National Association of Geoscience Teachers
National Association of State Boards of Geology
National Cave and Karst Research Institute

Geosciences Societies

American Geosciences Institute (AGI) : Member Societies

https://www.americangeosciences.org/member-societies

- National Earth Science Teachers Association
- National Speleological Society
- Paleobotanical Section of the Botanical Society of America
- Paleontological Research Institution
- Paleontological Society
- Petroleum History Institute
- Seismological Society of America
- SEPM (Society for Sedimentary Geology)
- Society for Mining, Metallurgy & Exploration
- Society of Economic Geologists
- Society of Exploration Geophysicists
- Society of Independent Professional Earth Scientists
- Society of Mineral Museum Professionals
- Society of Vertebrate Paleontology
- Soil Science Society of America
- The Society for Organic Petrology
- United States Permafrost Association

Geosciences Societies

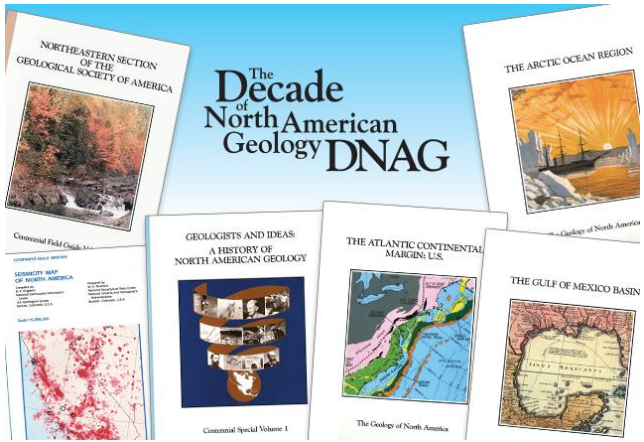
https://www.geosociety.org/

THE GEOLOGICAL SOCIETY OF AMERICA®

https://www.geosociety.org/GSA/Publications/GSA/Pubs/GSA_Publications.aspx

https://pubs.geoscienceworld.org/

https://pubs.geoscienceworld.org/gsa



26–30 October

GSA 2020 CONNECTS ONLINE

https://community.geosociety.org/gsa2020/home

Ex: The geology of North America [electronic resource] : an overview
: https://catalog.princeton.edu/catalog/9959130

Geological Society of America (GSA) Associated Societies

1. AASP - The Palynological Society
2. American Association of Petroleum Geologists (AAPG)
3. American Geophysical Union (AGU)
4. American Institute of Professional Geologists (AIPG)
5. American Quaternary Association (AMQUA)
6. American Rock Mechanics Association (ARMA)
7. Association for the Sciences of Limnology and Oceanography (ASLO)
8. American Water Resources Association (AWRA)
9. Asociación Geológica Argentina (AGA)
10. Association for Women Geoscientists (AWG)
11. Association of American State Geologists (AASG)
12. Association of Earth Science Editors (AESE)
13. Association of Environmental & Engineering Geologists (AEG)
14. Association of Geoscientists for International Development (AGID)
15. Blueprint Earth (BE)
16. The Clay Minerals Society (CMS)
17. Colorado Scientific Society (CSS)
18. Council on Undergraduate Research Geosciences Division (CUR)
19. Cushman Foundation (CF)
20. Environmental & Engineering Geophysical Society (EEGS)
21. European Association of Geoscientists & Engineers (EAGE)
22. European Geosciences Union (EGU)
23. Geobiological Society (GBS)
24. Geochemical Society (GS)
25. Geologica Belgica (GB)
26. Geological Association of Canada (GAC)
27. Geological Society of Africa (GSAF)
28. Geological Society of Australia (GSAus)
29. Geological Society of China (GSC)
30. Geological Society of London (GSL)
31. Geological Society of South Africa (GSSA)
32. Geoscience Information Society (GSIS)
33. Geoscience Society of New Zealand (GSNZ)
34. German Geological Society (GV)
35. Groundwater Resources Association of California (GRA)
36. History of Earth Sciences Society (HESS)
37. International Association for Geoscience Diversity (IAGD)
38. International Association for Promoting Geoethics (IAPG)
39. International Association of Emergency Managers (IAEM)
40. International Association of GeoChemistry (IAGC)

Geological Society of America (GSA) Associated Societies

41. International Association of Hydrogeologists (IAH)
42. International Association of Limnogeology (IAL)
43. International Medical Geology Association (IMGA)
44. International Society for Aeolian Research (ISAR)
45. Israel Geological Society (IGS)
46. Karst Waters Institute (KWI)
47. Microanalysis Society (MAS)
48. Mineralogical Association of Canada (MAC)
49. The Mineralogical Society (MS)
50. Mineralogical Society of America (MSA)
51. Minnesota Ground Water Association (MGWA)
52. National Association of Black Geoscientists (NABG)
53. National Association of Geoscience Teachers (NAGT)
54. National Association of State Boards of Geology (ASBOG®)
55. National Cave and Karst Research Institute (NCKRI)
56. National Earth Science Teachers Association (NESTA)
57. National Ground Water Association (NGWA)
58. National Speleological Society (NSS)
59. Nepal Geological Society (NGS)
60. Nigerian Society of Physical Sciences (NSPS)
61. Paleontological Research Institution (PRI)
62. Paleontological Society (PS)
63. Seismological Society of America (SSA)
64. Sigma Gamma Epsilon (SGE)
65. Sociedad Geológica Mexicana, A.C. (SGM)
66. Società Geologica Italiana (SGI)
67. Society for American Archaeology (SAA)
68. Society for Environmental Geochemistry and Health (SEGH)
69. Society for Mining, Metallurgy & Exploration (SME)
70. SEPM (Society for Sedimentary Geology)
71. Society for the Preservation of Natural History Collections (SPNHC)
72. Society of Economic Geologists (SEG)
73. Society of Exploration Geophysicists (SEG)
74. Society of Vertebrate Paleontology (SVP)
75. Soil Science Society of America (SSSA)
76. Western Interior Paleontological Society (WIPS)

Geosciences Societies

https://www.aapg.org/

http://archives.datapages.com/data/index.html

Rocky Mountain Group:
Earth Science Bulletin (WGA) 1968-1988, Four Corners Geological Society 1952-2010, Grand Junction Geological Society 1960-2012, Montana Geological Society 1950-2006, North Dakota Geological Society 1952-1993, Rocky Mountain Association of Geologists 1937-2006, Rocky Mountain Section (SEPM) 1979-2003, Saskatchewan Geological Society 1958-2015, The Mountain Geologist (RMAG) 1964 to present, Utah Geological Association 1950-2010,Utah Geological Survey 1988-2012, Williston Basin Symposia 1956-1998, Wyoming Geological Association 1946-2011

Geosciences Societies

AGU ADVANCING EARTH AND SPACE SCIENCE

https://www.agu.org/

https://agupubs.onlinelibrary.wiley.com/

Journal of Geophysical Research

- Atmospheres
- Biogeosciences
- Earth Surface
- Oceans
- Planets
- Solid Earth
- Space Physics
- Journal of Geophysical Research (1896-1977)

- AGU Advances **Open Access**
- Earth's Future **Open Access**
- Earth and Space Science **Open Access**
- Geochemistry, Geophysics, Geosystems
- GeoHealth **Open Access**
- Geophysical Research Letters
- Global Biogeochemical Cycles
- Journal of Advances in Modeling Earth Systems (JAMES) **Open Access**
- Paleoceanography and Paleoclimatology
- Radio Science
- Reviews of Geophysics
- Space Weather **Open Access**
- Space Weather Quarterly
- Tectonics
- Water Resources Research

News **20 October 2020**

Biggest Risk to Surface Water After a Wildfire? It's Complicated

https://eos.org/

Research Spotlight **23 October 2020**

Rising Seas and Agriculture Created Wetlands Along the U.S. East Coast

GeoScienceWorld

Where do societies index and publications available?
https://pubs.geoscienceworld.org/

GSW Publishers

- AASP -The Palynological Society
- American Association of Petroleum Geologists
- Association of Environmental & Engineering Geologists
- Cambridge University Press
- Canadian Institute of Mining, Metallurgy & Petroleum
- Canadian Science Publishing
- Canadian Society of Petroleum Geologists
- Clay Minerals Society
- Cushman Foundation for Foraminiferal Research
- E. Schweizerbart'sche Verlagsbuchhandlung Science Publishers
- Earthquake Engineering Research Institute
- Environmental & Engineering Geophysical Society
- European Association for Geochemistry
- Geological Society of America
- Geological Society of London
- Geological Society of South Africa
- GeoScienceWorld
- Gulf Petrolink
- Micropaleontology Press
- Mineralogical Association of Canada
- Mineralogical Society of America
- Mineralogical Society of Great Britain and Ireland
- Pacific Section AAPG
- Paleontological Society
- Seismological Society of America
- SEPM Society for Sedimentary Geology
- Societa Geologica Italiana
- Société Géologique de France
- Society of Economic Geologists
- Society of Exploration Geophysicists
- Soil Science Society of America
- University of Wyoming

GeoRef

Geological Surveys of the World

https://www.gsj.jp/en/gsj-link/directory/index.html

Afghanistan

Afghanistan Geological Survey
Afghanistan Geological Survey building, next to slaughter house, Jalalabad road, District 9, Kabul
Email: wasy54@yahoo.com
WWW Page: http://www.bgs.ac.uk/afghanminerals/

Albania

Albanian Geological Survey
Rruga e Kavajës, Nr.153, Tiranë
Phone: +355-4 222 578
Fax: +355-4 229 441
Email: urtesi2001@yahoo.com
WWW Page: http://www.gsa.gov.al/

Algeria

Algerian Geological Survey Agency (ASGA)
(Agence du Service Géologique de l'Algérie)
Ministry of Industry and Mines
Tour B, Val d'Hydra, Alger
Phone: +213-21 48 85 09
Fax: +213-21 48 84 64
Email: asga@asga.dz
WWW Page: http://www.asga.dz

National Agency for Mining Activities (ANAM)
(Agence Nationale des Activités Minières)
Siège du Ministère de l'Energie, Tour B Val d'Hydra, Alger
Phone: +213-21 48 85 50
Fax: +213-21 48 83 27/48 85 53
Email: anam@anam.gov.dz
WWW Page: http://www.anam.gov.dz

U.S. Geological Survey (USGS)

https://www.usgs.gov/

Ecosystems
- Status and Trends Program
- Fisheries Program
- Wildlife Program
- Environments Program
- Invasive Species Program

Energy and Mineral Resources
- Mineral Resources Program
- Energy Resources Program

Natural Hazards
- Earthquake Hazards Program
- Volcano Hazards Program
- Landslide Hazards Program
- Global Seismographic Network
- Geomagnetism
- Coastal/Marine Hazards and Resources

Core Science Systems
- National Geospatial Program
- National Cooperative Geologic Mapping Program
- Science Synthesis, Analysis, and Research Program

Water Resources
- Groundwater and Streamflow Information Program
- National Water Quality Program
  - National Water-Quality Assessment Project (NAWQA)
  - National Atmospheric Deposition Program
  - USGS-National Park Service Water-Quality Partnership
- Water Availability and Use Science Program
- Water Resources Research Act Program

State Geological Surveys

AASG Association of American State Geologists

https://www.stategeologists.org/

Colorado Geological Survey:
https://coloradogeologicalsurvey.org/

New Jersey Geological and Water Survey:
https://www.nj.gov/dep/njgs/

New York Geological Survey:
http://www.nysm.nysed.gov/research-collections/geology

Rhode Island Geological Survey:
https://web.uri.edu/geo/rhode-island-geological-survey/

Utah Geological Survey : https://geology.utah.gov/

Washington Geological Survey:
https://www.dnr.wa.gov/geology

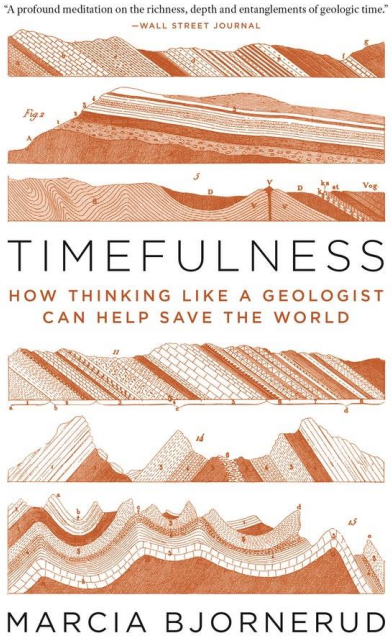
The Washington Geology Library was created in 1935, and was mandated to collect, archive, and provide access to materials on the geology of Washington State. In addition, publications on tsunamis and emergency management are collected on behalf of the NOAA National Tsunami Hazard Mitigation Program. The library has more than 80,000 items in its collection. Less than a quarter of the collection is available online. Links to those items can be found in the library catalog. A visit to the library is required to view the rest of the collection. Contact us about additional ways to access materials.

University Presses

Princeton University Press (PUP): https://press.princeton.edu/

“Puppies”

Timefulness: *How Thinking Like a Geologist Can Help Save the World*



https://press.princeton.edu/books/paperback/9780691202631/timefulness

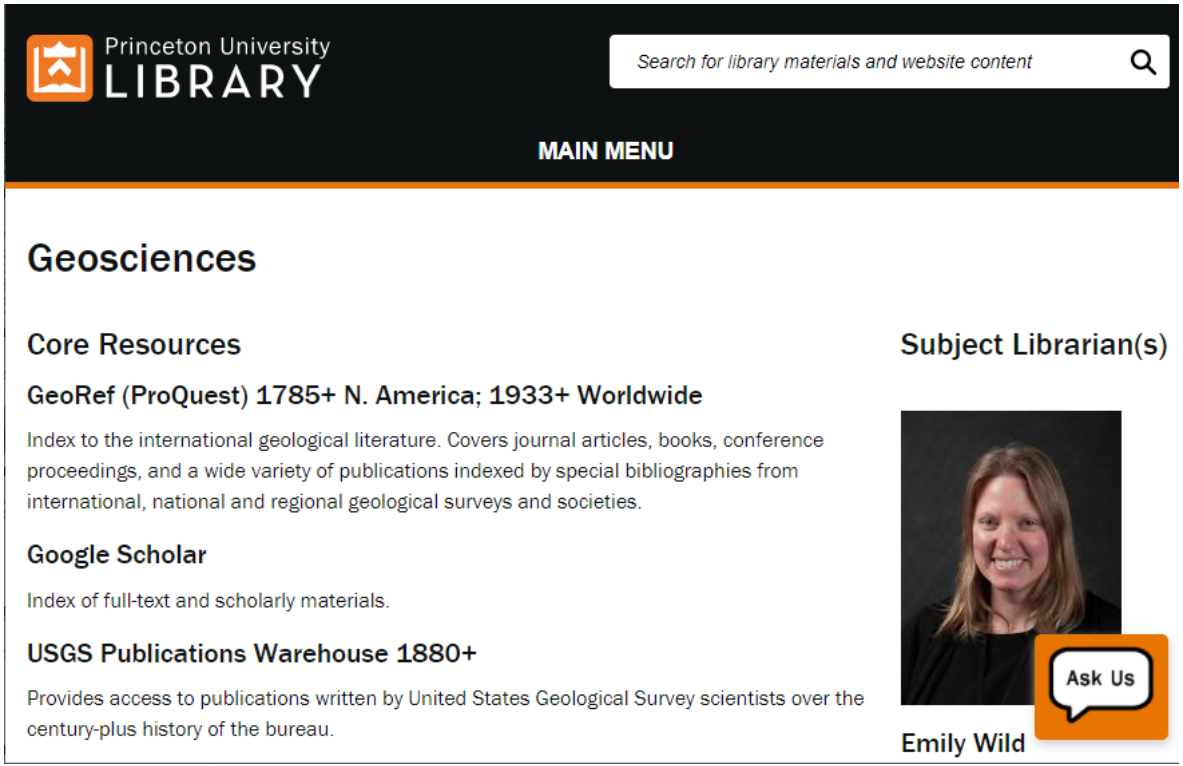
Earth Science: https://press.princeton.edu/subjects/earth-science

New York: https://press.princeton.edu/search?search=new+york

Library Bibliographic Databases

https://library.princeton.edu/research/databases

https://library.princeton.edu/databases/subject/geosciences



Geosciences = Grey Literature = More indexing and availability from free sources – commercial databases do not always index free

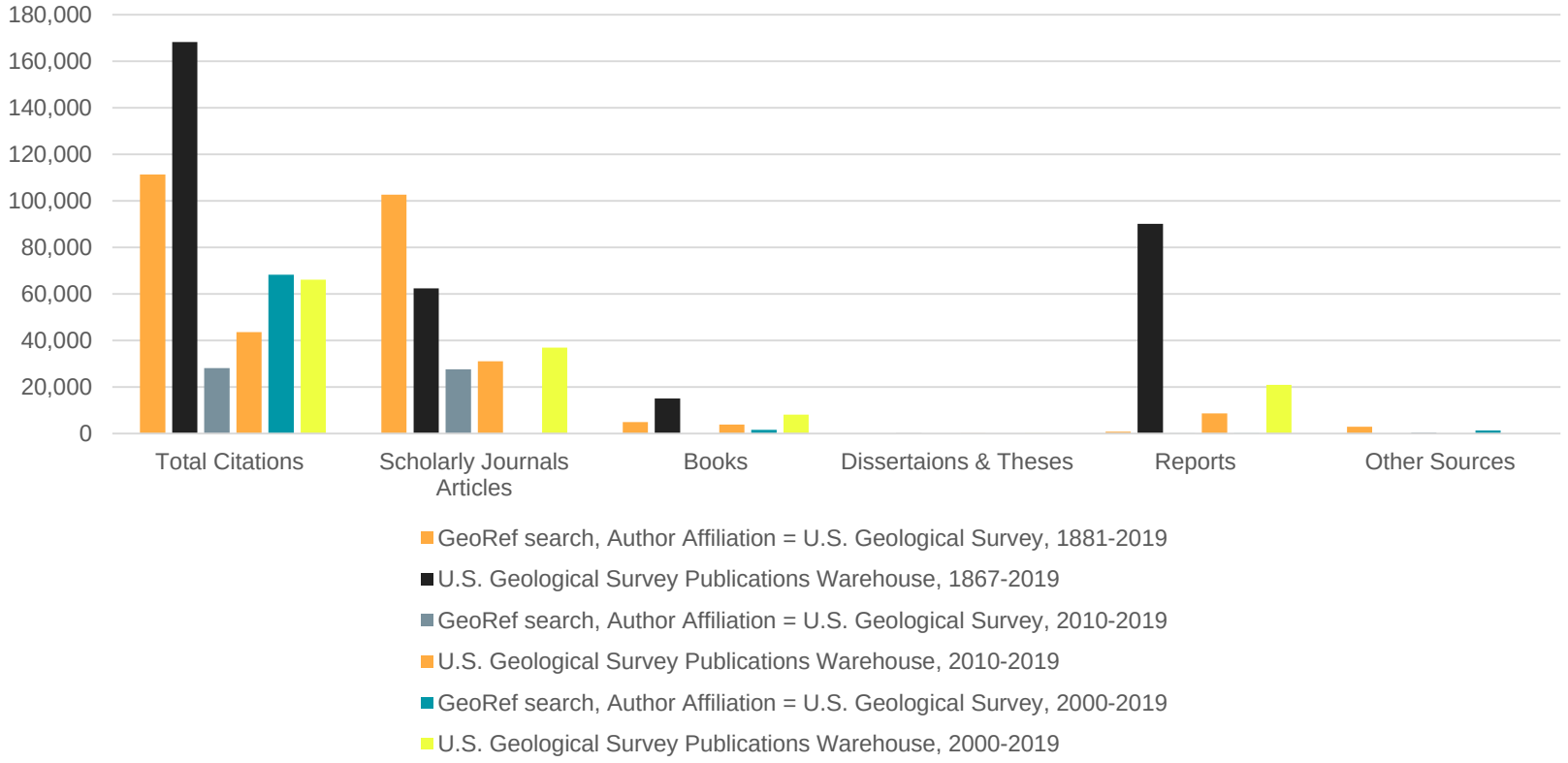
Main Commercial Science Publishers:

- **Springer**
- **Wiley**
- **Elsevier**

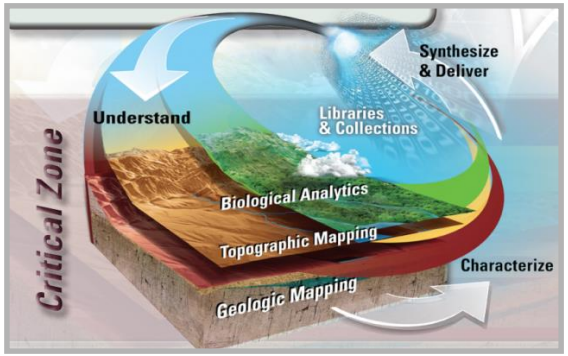
Main Commercial Science Databases:

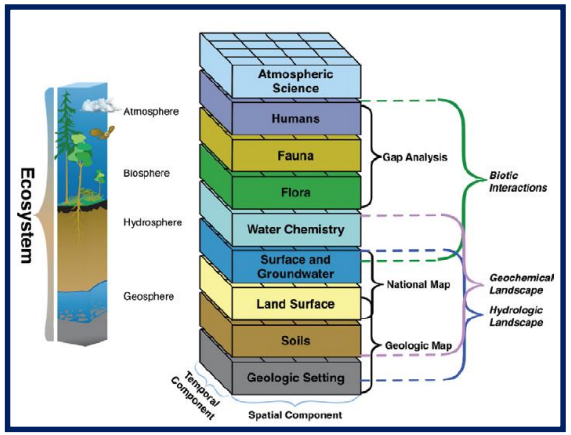
- **Web of Science**
- **Scopus**

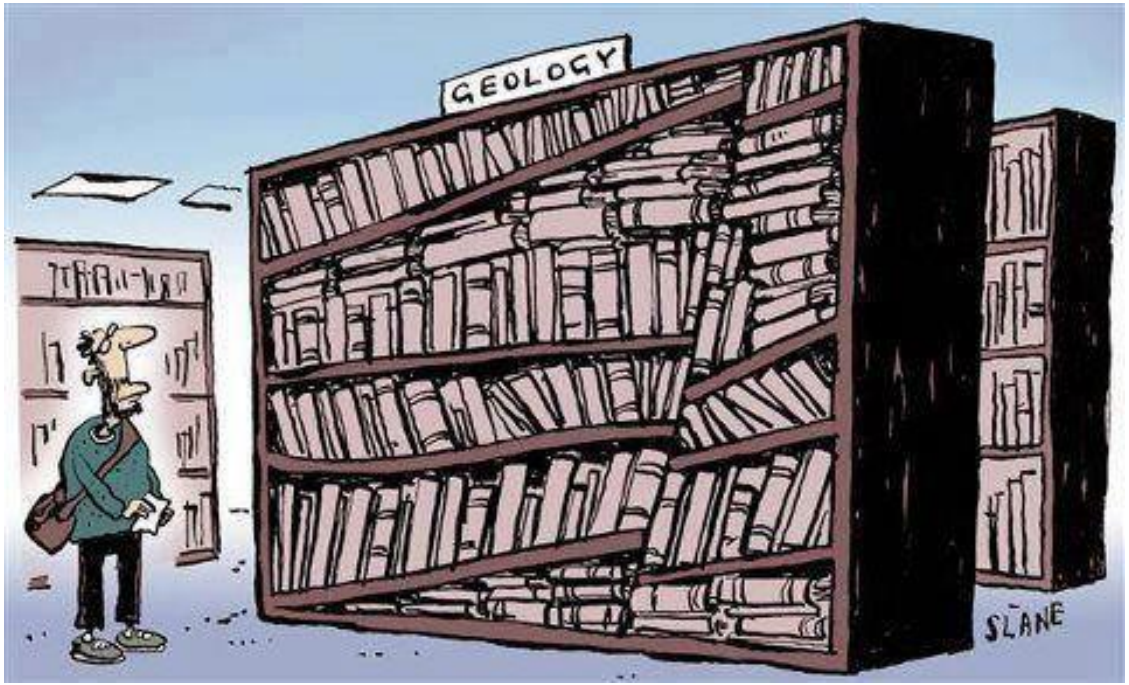
Discovery of USGS Publications by Affiliation in GeoRef vs. the USGS Publications Warehouse (Official Government Database for USGS Publications)



Part 2: Geosciences Library Instruction







Very Happy to be in New Jersey (Shore) and to be near home (New York), but often asked about…

Worked about 23 years at the U.S. Geological Survey (USGS) : hired after 1995 RIF, left because of 2018 RIF (Reduction In Force: https://www.opm.gov/policy-data-oversight/workforce-restructuring/reductions-in-force/ ; https://eos.org/articles/usgs-library-cuts-would-harm-research-education-say-scientists)

About 13 years as a USGS Hydrologist: NH-VT & MA-RI offices (now New England office)

- **Outreach coordinator for USGS Massachusetts-Rhode Island Office & Ask A Geologist**
- **Surface Water, Groundwater, Water Use (Water Quantity), Water Quality, Coastal Waters**

10 years as a USGS Librarian (Physical Scientist) in Denver, Colorado

- **Reference & Research Consultations**
- **Teaching workshops: Map & Compass, GPS, USGS Library Instruction**
- **Ask USGS, Ask A Librarian, Ask A Geologist**
- **Subject Matter Expert (SME), 2012-2017 = 8-hour course available on Department of the Interior (DOI) University: https://doiu.doi.gov/ and**
- **2017-2018: Live & recorded sessions through the Federal Depository Library Program (FDLP)**

https://libguides.princeton.edu/geo/librarianwebinars

Past webinars, U.S. Geological Survey (USGS)

USGS Library Materials for Natural Hazards https://www.fdlp.gov/usgs-library-materials-for-natural-hazards

USGS Library Materials for Water Resources Information https://www.fdlp.gov/usgs-library-materials-for-water-resources-information

USGS Library Materials for Earth's Age https://www.fdlp.gov/usgs-library-materials-for-earth-s-age

USGS Library: Indexes, catalogs, and other bibliographic tools, a day in the life of a reference librarian https://www.fdlp.gov/usgs-library-indexes-catalogs-and-other-bibliographic-tools-a-day-in-the-life-of-a-reference-librarian

USGS Library: Oil, Gas, Coal, Uranium, and Minerals Maps and Data https://www.fdlp.gov/usgs-library-oil-gas-coal-uranium-and-minerals-maps-and-data

USGS Library: Using USGS Image, Map, and Data Products for Information Inquiries https://www.fdlp.gov/usgs-library-using-usgs-image-map-and-data-products-for-information-inquiries

Geosciences Library Instruction

https://libguides.princeton.edu/geo/librarianwebinars

Since 1884, Princeton University has participated in the Federal Depository Library Program (FDLP): https://www.fdlp.gov/

FDLP Academy Training Repository : https://www.fdlp.gov/fdlp-academy/fdlp-academy-training-repository

Upcoming Chemistry, Geosciences, and Environmental Studies webinars
December 17, 2020 at 2 p.m. : From the Rocks to the Stocks - Library Research with a Geosciences Librarian and a Finance Librarian

November 24, 2020 at 2 p.m. : Using Art Sources for Chemistry, Geosciences, and Environmental Studies Library Research https://www.fdlp.gov/news-and-events/4756-webinar-using-government-art-sources-for-chemistry-geosciences-and-environmental-studies-library-research

October 29, 2020 at 2 p.m. : Library Research for Natural Hazard Events: Earthquakes, Hurricanes, Volcanoes, and Wildfires - To register for this free webinar, please refer to: https://libcal.princeton.edu/event/7165734 or https://www.fdlp.gov/news-and-events/4696-webinar-library-research-for-natural-hazard-events-earthquakes-hurricanes-volcanoes-and-wildfires

Geosciences Library Instruction

https://libguides.princeton.edu/geo/librarianwebinars

Past Chemistry, Geosciences, and Environmental Studies webinars, Princeton University

September 2020 : Pharmaceutical Research Sources Available for COVID-19 https://www.fdlp.gov/pharmaceutical-research-sources-available-for-covid-19

August 2020: Library Research for Energy, Minerals, and Uranium Resources https://www.fdlp.gov/library-research-for-energy-mineral-and-uranium-resources

July 2020 : Library Research for Atmospheric and Oceanic Sciences (Including Climate Change) https://www.fdlp.gov/library-research-for-atmospheric-and-oceanic-sciences-including-climate-change

March 2020: Library Research for Water Resources https://www.fdlp.gov/library-research-for-water-resources

January 2020: Introduction to Geosciences Library Research https://www.fdlp.gov/introduction-to-geosciences-library-research

Geosciences Instruction

https://www.usgs.gov/media/images/blue-marble-image-earth

At Princeton - Undergraduates in Departments & Programs:

Chemistry: https://chemistry.princeton.edu/

Geosciences: https://geosciences.princeton.edu/

Environmental Studies: https://environment.princeton.edu/

Policy: https://cpree.princeton.edu/

Engineering: https://acee.princeton.edu/

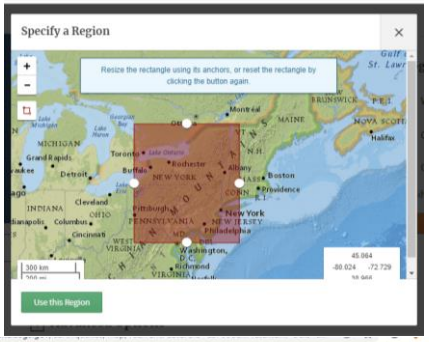
Finance: https://bcf.princeton.edu/

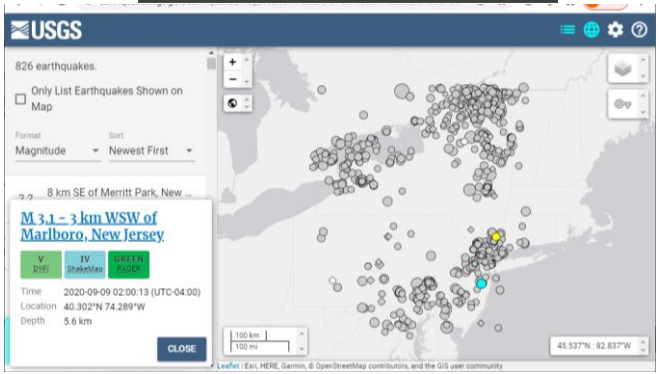
Writing Seminars:
https://writing.princeton.edu/undergraduates/writing-seminars

How? 10 seconds?

"I spent 2 weeks trying to find that information, how did you find it in 10 seconds?" **– Asked by many library users**

[Earthquakes in New York & New Jersey area, 1900-present]



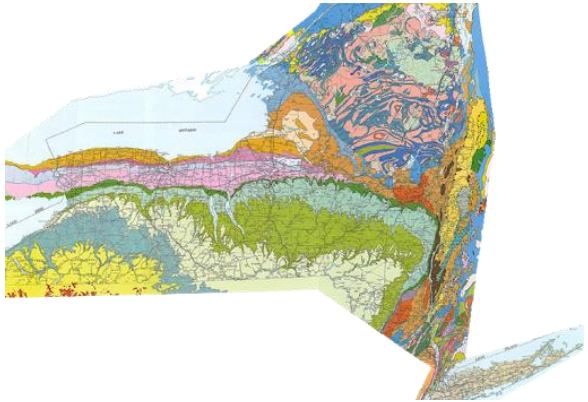


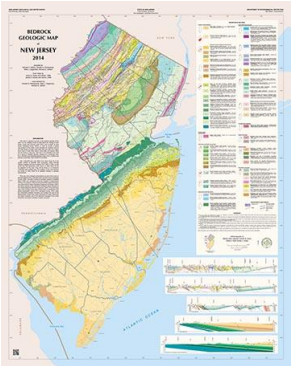
Latitude & Longitude Searches

Geology (and Hydrology) Maps for New York & New Jersey : GeoPDFs, TIFFs, JPGs, KMZs
[USGS National Geologic Map Database]

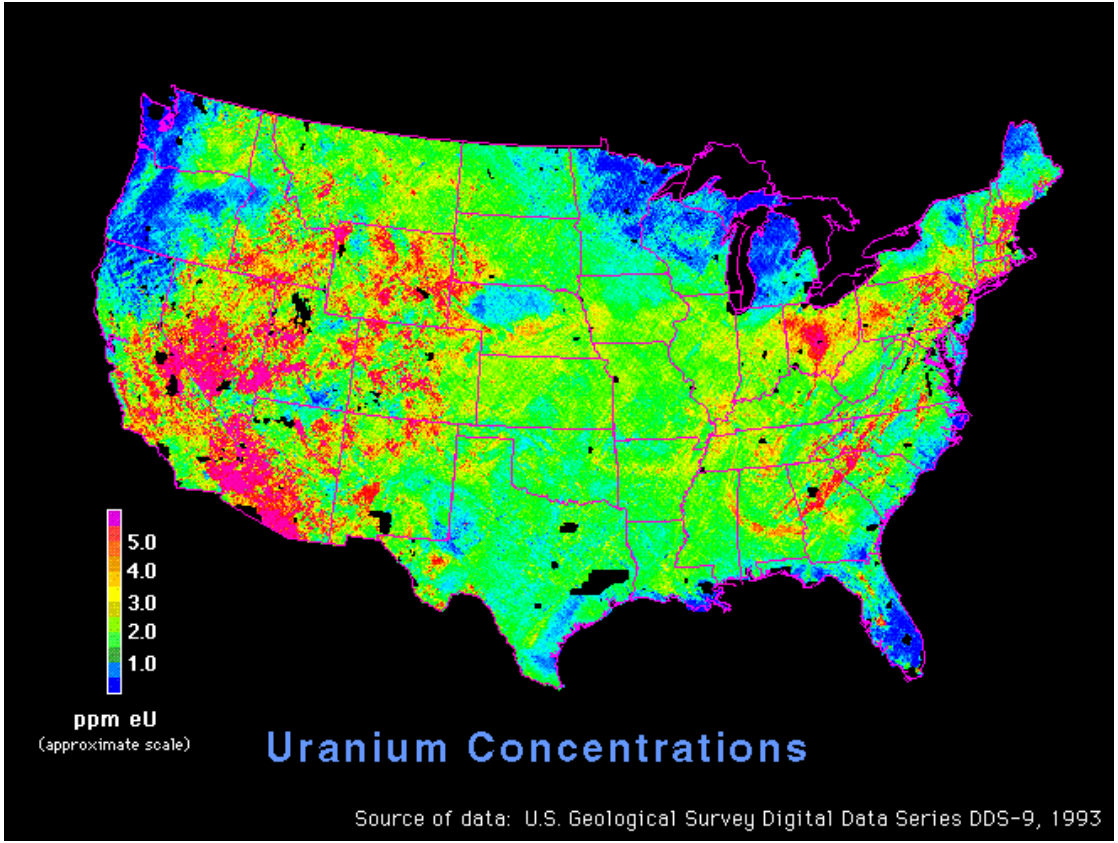
[New York Maps] [New York Geologic Units]

[New Jersey Maps] [New Jersey Geologic Units]



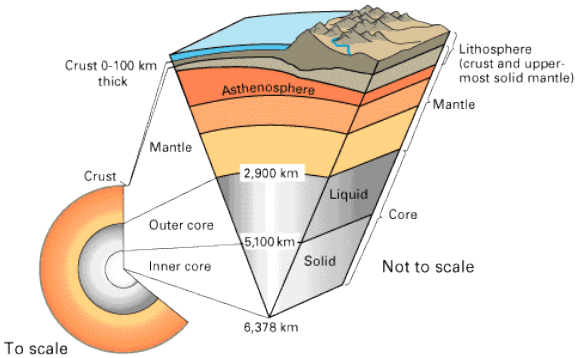


Uranium-238 Concentrations across United States from NURE

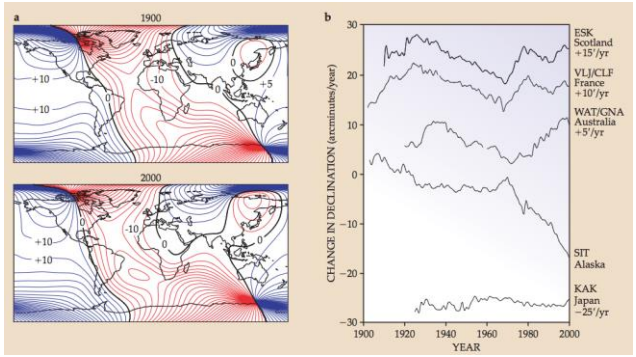


Earth

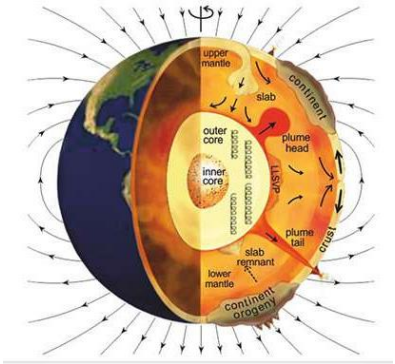
Blue Marble
https://www.usgs.gov/media/images/blue-marble-image-earth



https://pubs.usgs.gov/gip/dynamic/inside.html

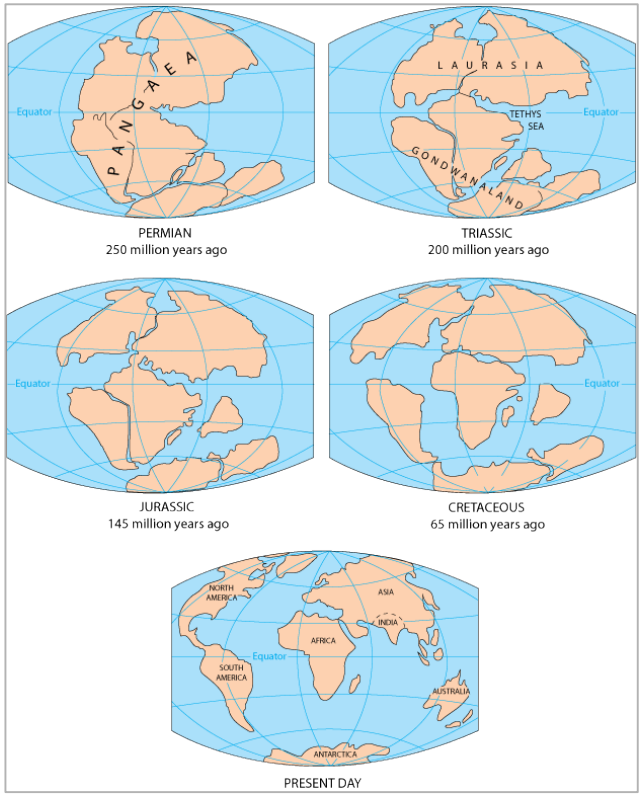


https://www.usgs.gov/natural-hazards/geomagnetism



https://phys.org/news/2018-06-insight-earth-crust-mantle-outer.html

Earth's History



https://pubs.usgs.gov/gip/dynamic/dynamic.html

Types of Rocks Found in Earth

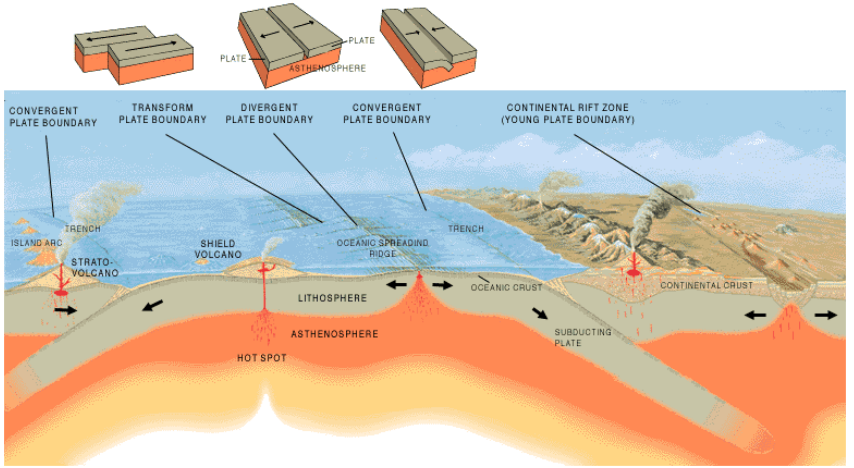
Crust: Silicic rocks, Andesite, Basalt

Upper Mantle: Peridotite, Eclogite, Olivine, Spinel, Garnet, Pyroxene, Perovskite, Oxides

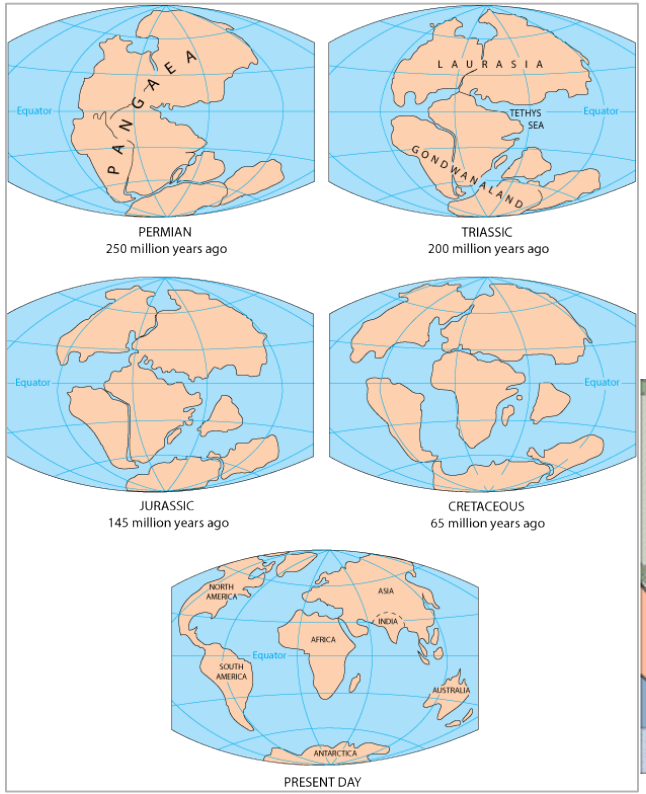
Lower Mantle: Magnesium and Silicon Oxides

Outer Core: Iron+Oxygen, Sulfur, Nickel Alloy

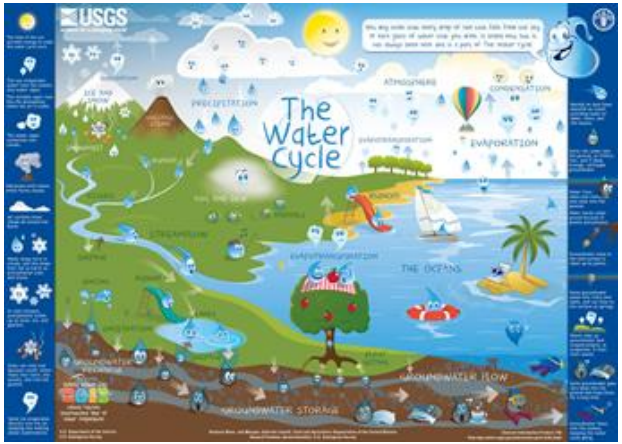
Inner Core: Iron+Oxygen, Sulfur, Nickel Alloy

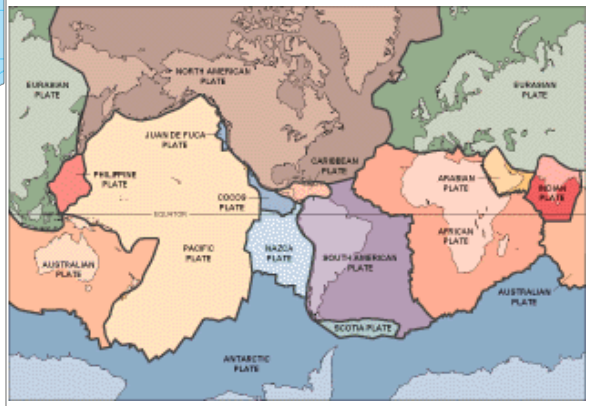


Geology & Hydrology

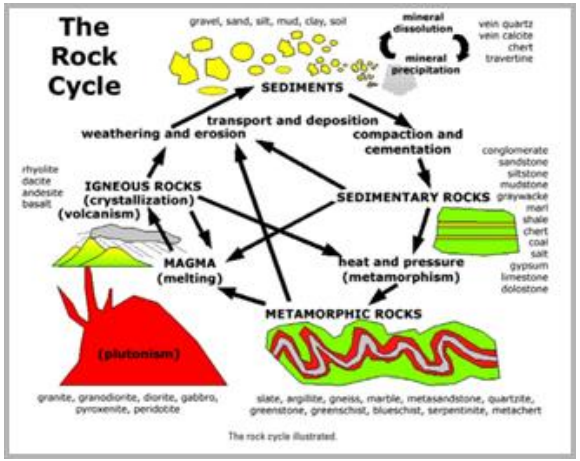


https://www.usgs.gov/natural-hazards/geomagnetism



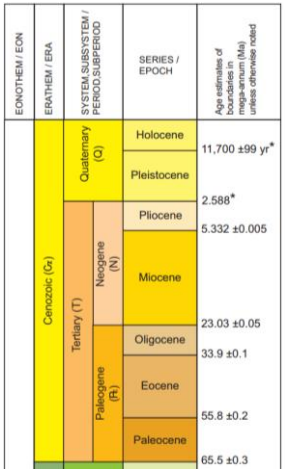


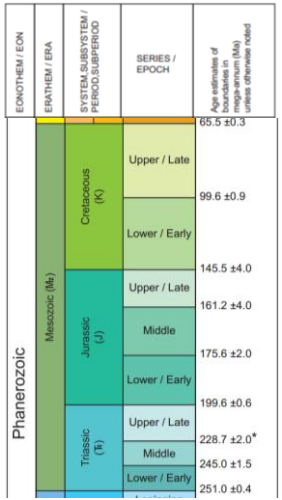
https://pubs.usgs.gov/gip/dynamic/dynamic.html

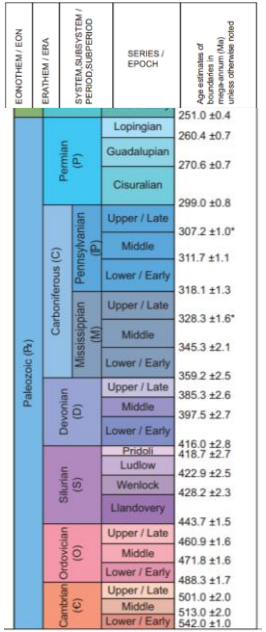


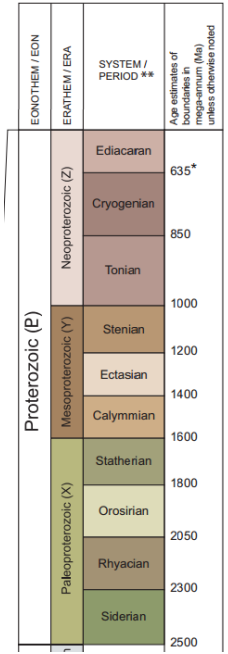
USGS Geologic Time

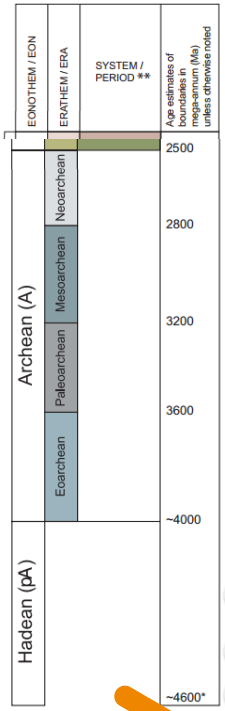
2018 Divisions of Geologic Time— Major Chronostratigraphic and Geochronologic Units









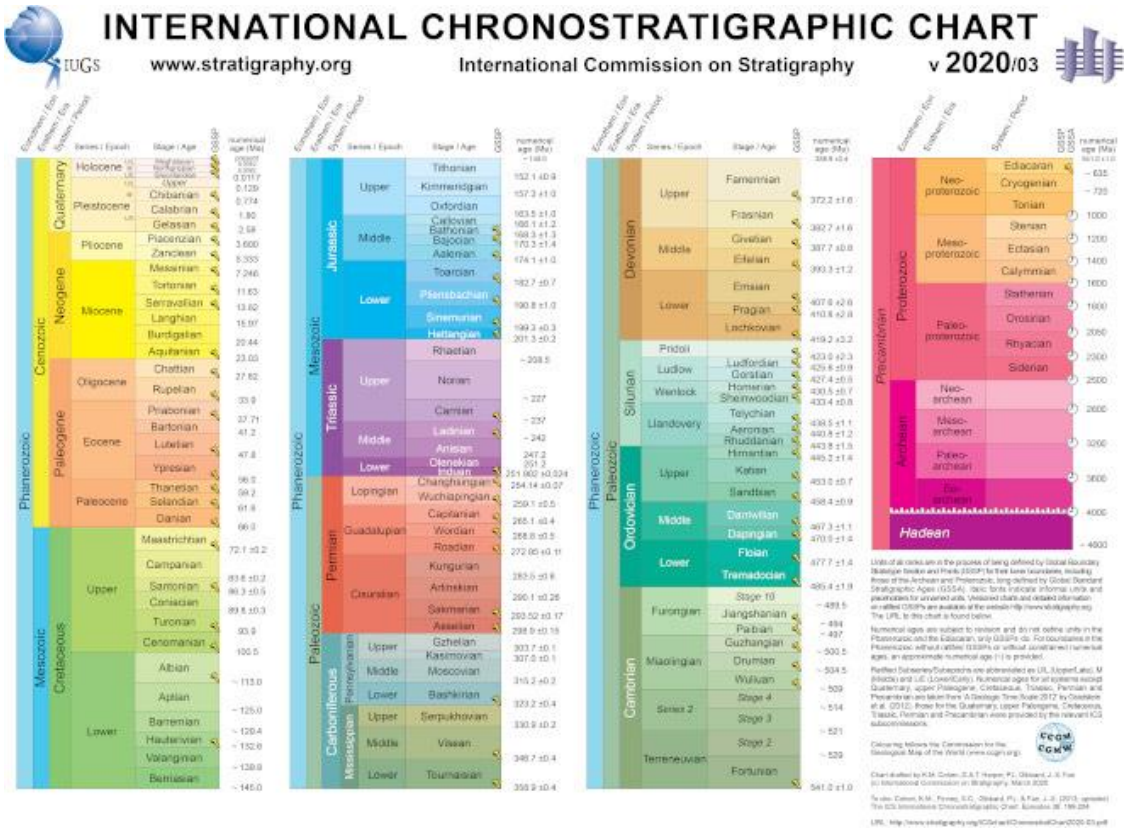


~4.6 Billion Years

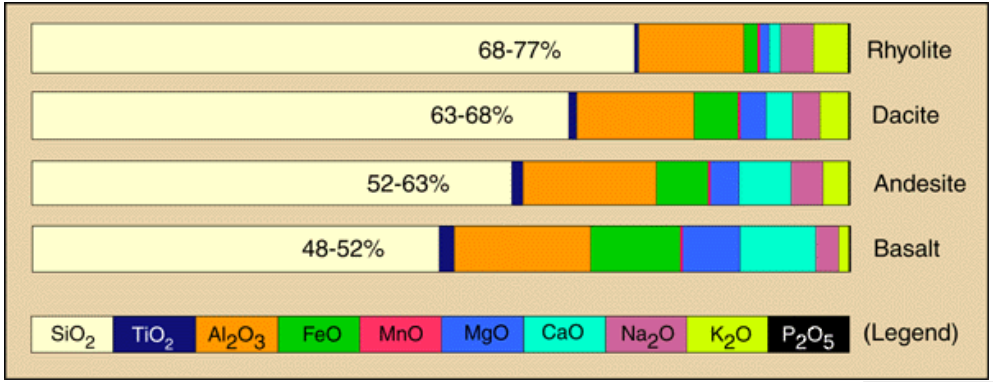
Lexicon: United States, Canada, and Mexico (North America) https://ngmdb.usgs.gov/Geolex/search

Geologic Time - International Commission on Stratigraphy

International Chronostratigraphic Chart, 2020: https://stratigraphy.org/chart



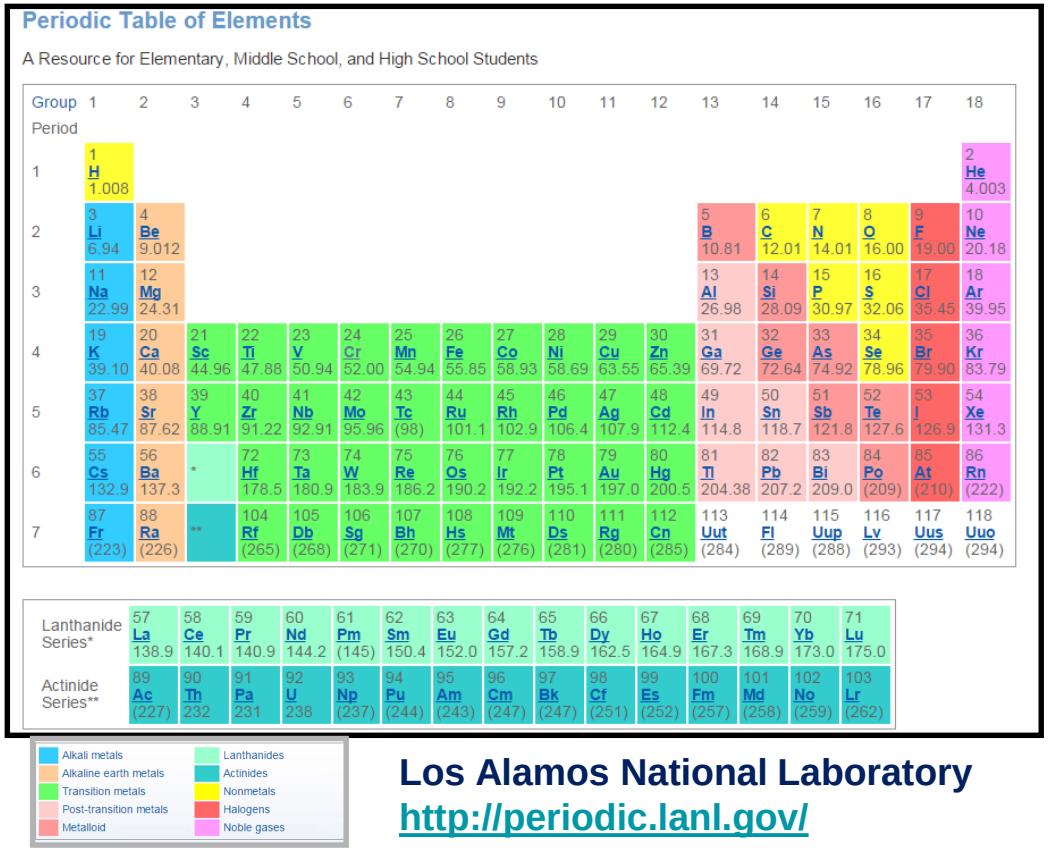
Major Chemical Elements Forming Igneous Rocks



[Eruption of Mount St. Helens. Oblique aerial view of the eruption of May 18, 1980, which sent volcanic ash, steam, water, and debris to a height of 60,000 feet.]

[June 6, 2018 The vigorous lava fountain at Fissure 8 reached heights of 45 m (150 ft) as shown in this image taken around 9:30 AM.]

Labs & Periodic Table of Elements



Los Alamos National Laboratory
http://periodic.lanl.gov/

Abundant Elements in the Earth's Crust

Oxygen, O

Silicon, Si

Aluminum, Al

Iron, Fe

Calcium, Ca

Sodium, Na

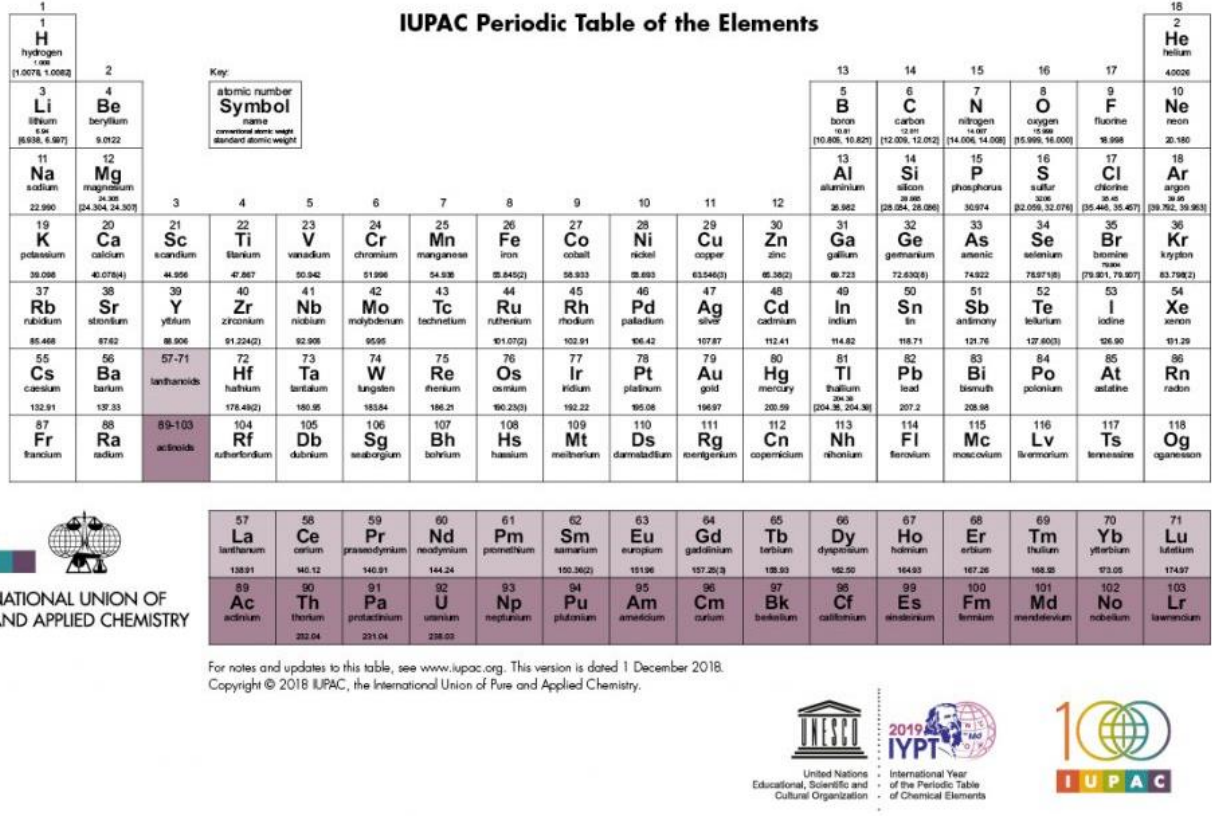
Potassium, K

Magnesium, Mg

Chemistry!

International Union of Pure and Applied Chemistry (IUPAC)

https://iupac.org/what-we-do/periodic-table-of-elements/



Chemistry!

Standard Atomic Weights, 2017 from International Union of Pure and Applied Chemistry (IUPAC) http://ciaaw.org/atomic-weights.htm

CIAAW COMMISSION ON ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS — INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY

HOME | ATOMIC WEIGHTS | ISOTOPIC ABUNDANCES | REFERENCE MATERIALS | THE COMMISSION | FAQ'S

ATOMIC WEIGHTS | ABRIDGED & HISTORICAL ATOMIC WEIGHTS | NATURAL VARIATIONS | MONOISOTOPIC & RADIOACTIVE ELEMENTS | ATOMIC MASSES

STANDARD ATOMIC WEIGHTS

Standard atomic weights are CIAAW recommended values for atomic weights applicable to all normal materials. Since 1902, the Commission regularly publishes critical evaluation of atomic weights of elements and below is the most recent definitive table of the standard atomic weights.

STANDARD ATOMIC WEIGHTS 2017

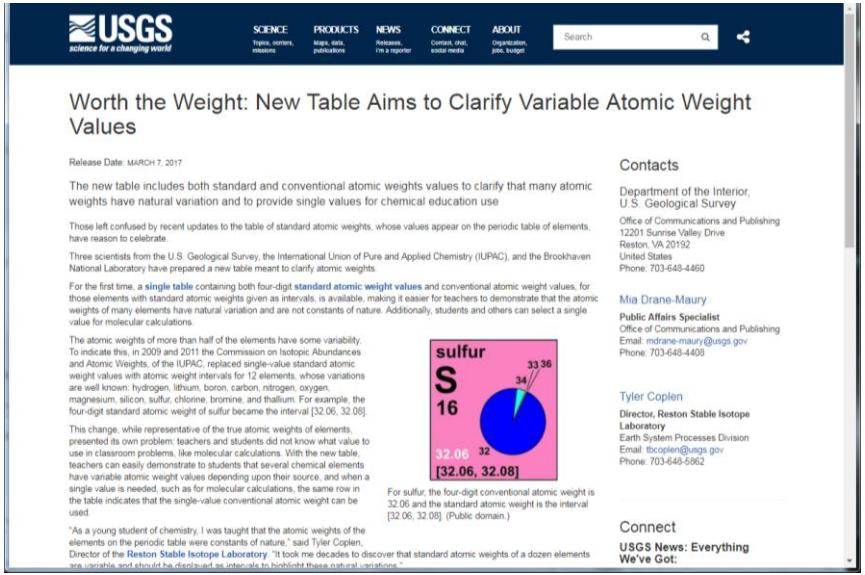
Z	Symbol	Element	Standard Atomic Weight	Notes
1	H	hydrogen	[1.007 84, 1.008 11]	m
2	He	helium	4.002 602(2)	g r
3	Li	lithium	[6.938, 6.997]	m
4	Be	beryllium	9.012 1831(5)	
5	B	boron	[10.806, 10.821]	m
6	C	carbon	[12.0096, 12.0116]	
7	N	nitrogen	[14.006 43, 14.007 28]	m
8	O	oxygen	[15.999 03, 15.999 77]	m
9	F	fluorine	18.998 403 163(6)	
10	Ne	neon	20.1797(6)	g m

Citation

The most recent Standard Atomic Weights are presented in this Table and they are based on the "Atomic Weights 2013" report and on the subsequent revisions that were made by the CIAAW in 2015 and in 2017. The IUPAC Technical Report "Atomic weights of the elements 2017" will be published in the *Pure and Applied Chemistry*.

This Table can be cited as follows: CIAAW. **Atomic weights of the elements 2017**. Available online at www.ciaaw.org.

There are three broad groups of elements depending on what is the main cause of the uncertainty of their standard atomic weights:
(1) well-documented natural variations of isotopic abundances,
(2) our ability to determine the isotopic abundances, and
(3) our ability to precisely determine the atomic masses of the isotopes.
Elements in the first category are distinguished by an interval standard atomic weight.



Worth the Weight: New Table Aims to Clarify Variable Atomic Weight Values
https://www.usgs.gov/news/worth-weight-new-table-aims-clarify-variable-atomic-weight-values

***Journal of Chemical Education*:**
Clarifying Atomic Weights: A 2016 Four-Figure Table of Standard and Conventional Atomic Weights
https://pubs.acs.org/doi/10.1021/acs.jchemed.6b00510

Chemistry!

Frank Wigglesworth Clarke: A chemist that determined the composition of Earth's Crust ; "Father of Geochemistry"
– One of the Founders of the American Chemical Society (ACS), (President of ACS in 1901)
– Worked at USGS from 1873 to 1925, USGS Atomic Weights Series
U.S. Geological Survey Publications: https://pubs.er.usgs.gov/search?q=Frank+Wigglesworth+Clarke
Examples:
1895: The constitution of the silicates, USGS Bulletin 125
https://pubs.er.usgs.gov/publication/b125

1903: Mineral analyses from the laboratories of the United States Geological Survey, 1880 to 1903, USGS Bulletin 220:
https://pubs.er.usgs.gov/publication/b220

1908: The data of geochemistry, USGS Bulletin 330 https://pubs.er.usgs.gov/publication/b330

1924: The composition of the river and lake waters of the United States, USGS PP 135
https://pubs.er.usgs.gov/publication/pp135

Biographical Memoir of Frank Wigglesworth Clarke 1847-1931:
http://www.nasonline.org/publications/biographical-memoirs/memoir-pdfs/clarke-frank-w-1847-1931.pdf

Beryl (a beryllium-aluminum silicate)

Uranophane. Monoclinic crystallography. Uranophane is one of the many secondary uranium minerals. It is unusual in being a silicate but it shows the bright yellow color of the secondary uranium ores.

The Water on Earth

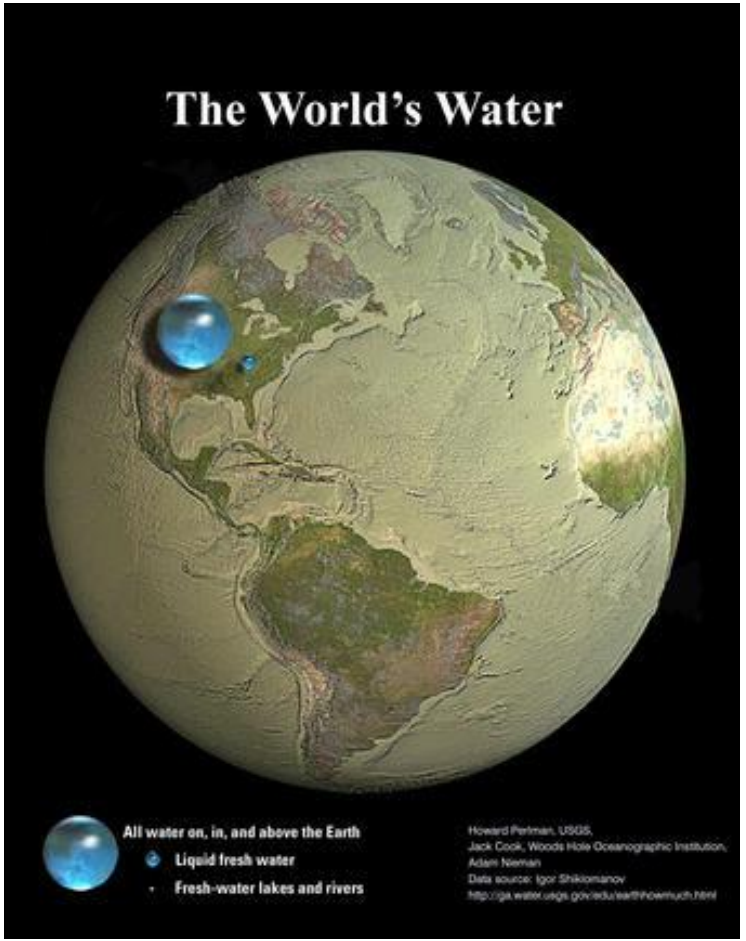
All Earth's freshwater, liquid fresh water, and water in lakes and rivers
Spheres showing:

(1) All water (sphere over western U.S., 860 miles in diameter)

(2) Fresh liquid water in the ground, lakes, swamps, and rivers (sphere over Kentucky, 169.5 miles in diameter), and

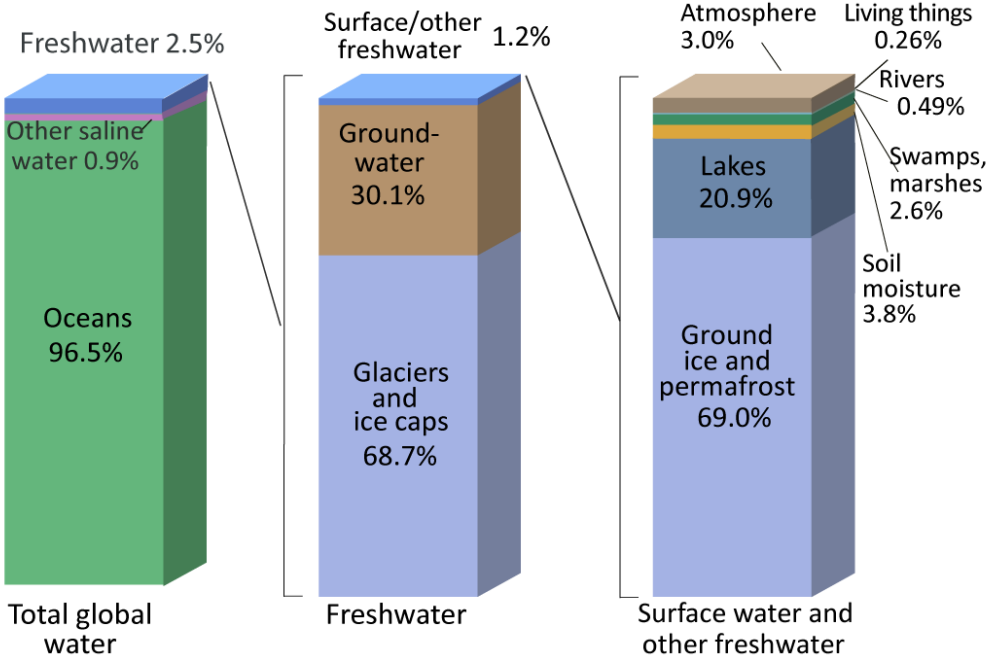
(3) Fresh-water lakes and rivers (sphere over Georgia, 34.9 miles in diameter).

https://www.usgs.gov/media/images/all-earths-water-a-single-sphere



The Water on Earth

Where is Earth's Water?



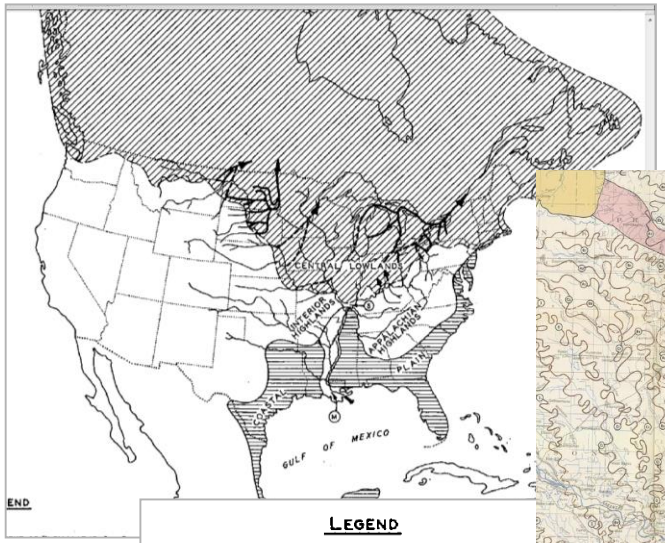
Source: Igor Shiklomanov's chapter "World fresh water resources" in Peter H. Gleick (editor), 1993, Water in Crisis: A Guide to the World's Fresh Water Resources. (Numbers are rounded).

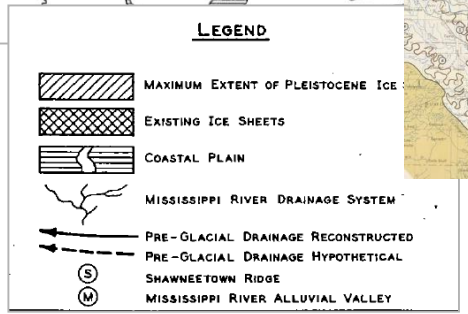
https://www.usgs.gov/special-topic/water-science-school/science/where-earths-water?qt-science_center_objects=0#qt-science_center_objects

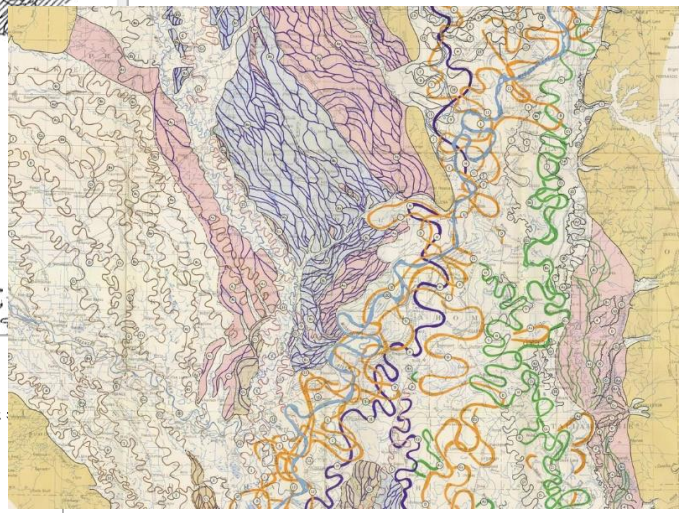
Earth's History

Cretaceous Western Interior Seaway. Colorado was covered by a shallow, temperate sea.
https://pubs.usgs.gov/pp/1561/report.pdf

Geological Investigation of the Alluvial Valley of the Lower Mississippi River, Fisk, 1944:
https://ngmdb.usgs.gov/Prodesc/proddesc_70640.htm

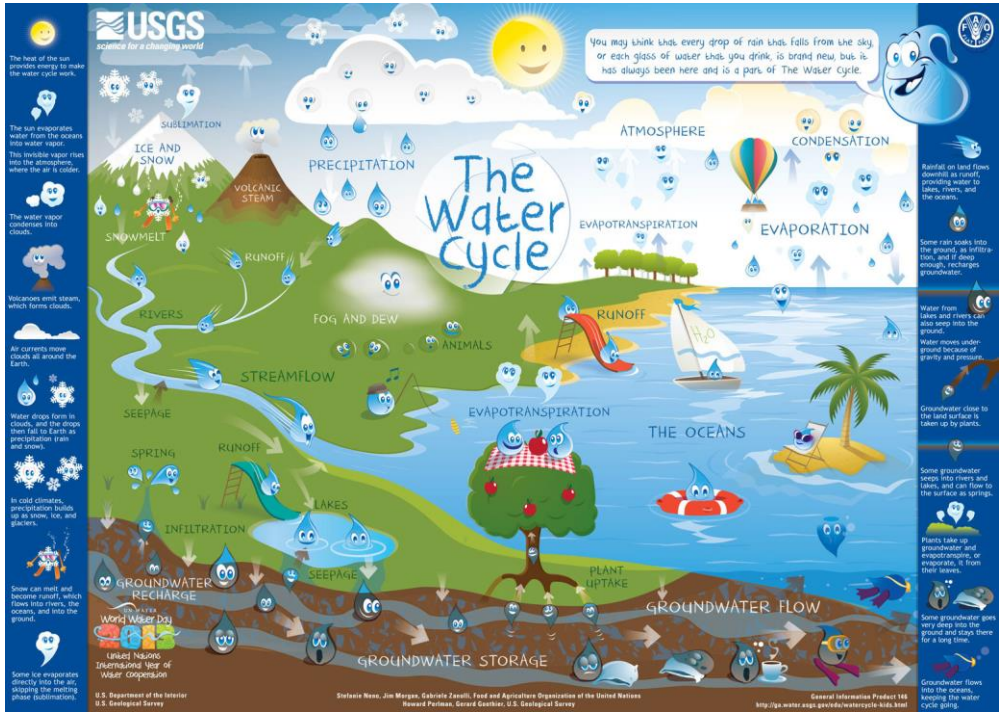






26. Plate 15 (Sheet 2): Stream courses in the alluvial valley -- north-central part

What is Hydrology?



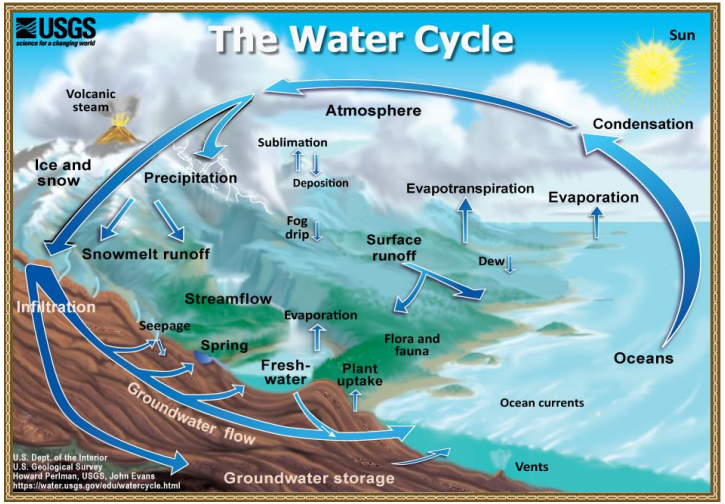
https://water.usgs.gov/edu/watercycle-kids.html

***Available for most languages on Earth**

Hydrology is the study of water

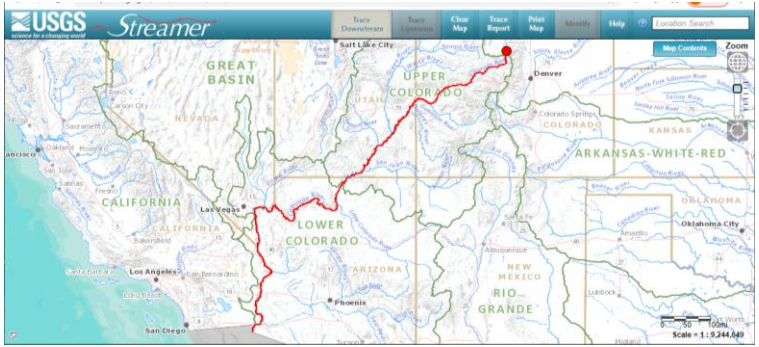
encompasses the occurrence, distribution, movement and properties of the waters of the Earth and their relationship with the environment within each phase of the hydrologic cycle (water cycle)

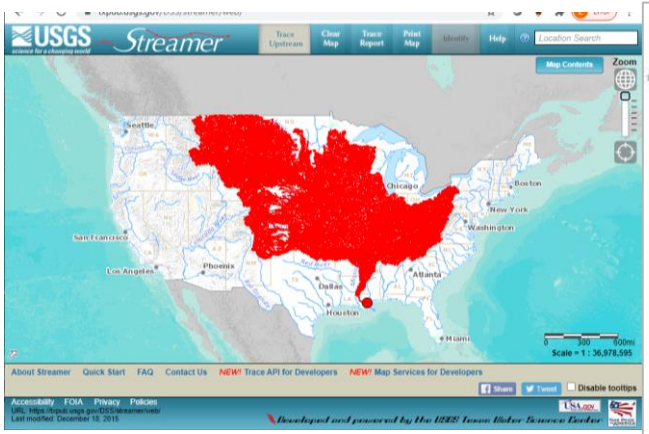
https://water.usgs.gov/edu/hydrology.html



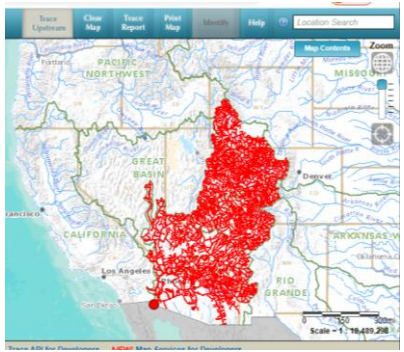
https://water.usgs.gov/edu/watercycle.html

https://txpub.usgs.gov/DSS/streamer/web/

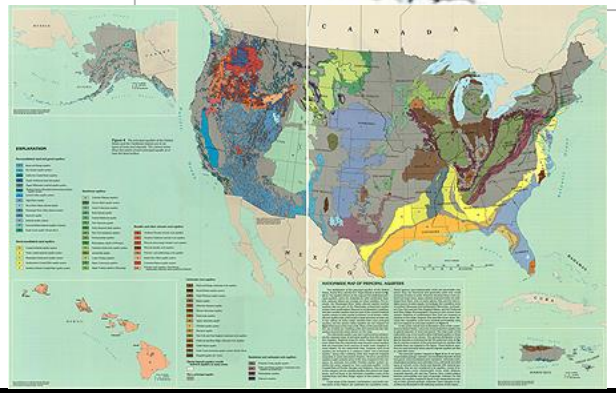




Downstream Trace

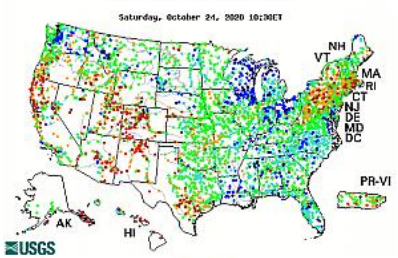


Upstream Trace

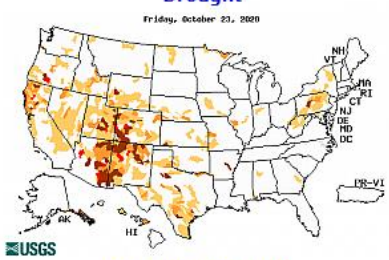


Hydrology Basics

Current Streamflow

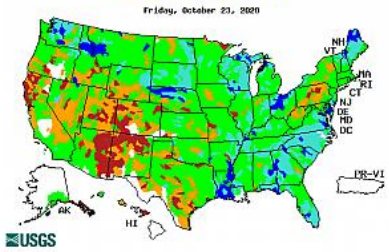


Drought



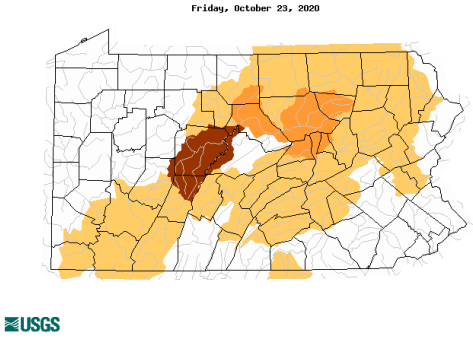
Flood

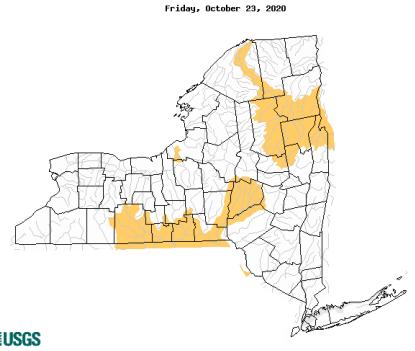
Past Flow/Runoff



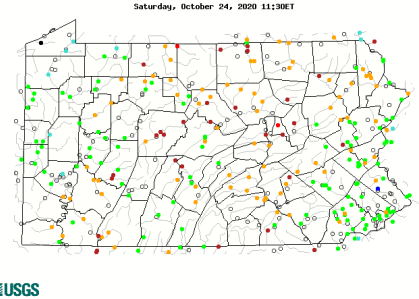
Search USGS streamgage

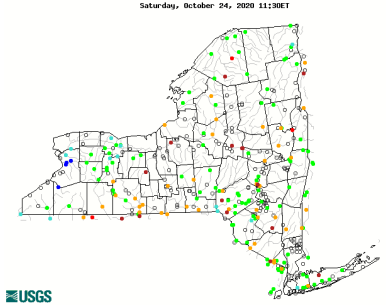
USGS WaterWatch





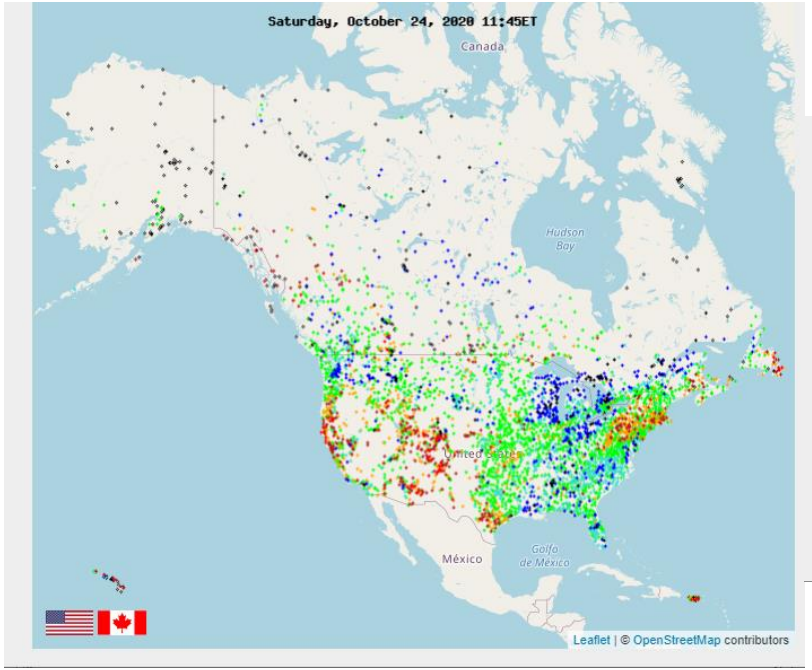
Explanation - Percentile classes			
Low	<=5	6-9	10-24
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal

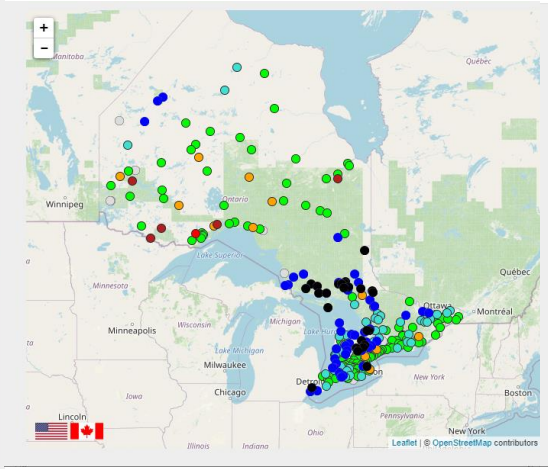


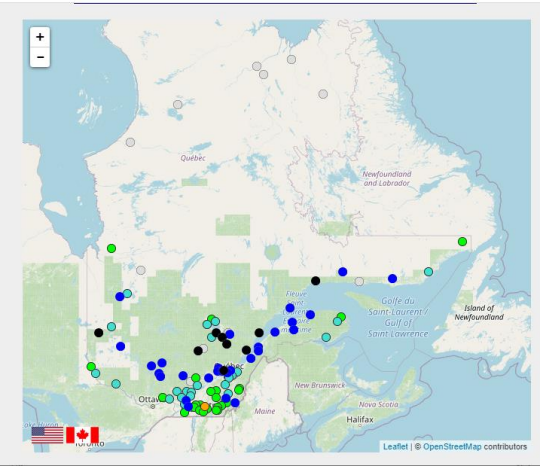


Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Hydrology Basics







North America WaterWatch
https://watermonitor.gov/naww/

Explanation - Percentile classes							
●	●	●	●	●	●	●	○
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

https://pubs.usgs.gov/ds/529/

https://www.usgs.gov/mission-areas/water-resources/science/international-water-resources-activities

USGS science for a changing world

USGS Home
Contact USGS
Search USGS

Data Series 529

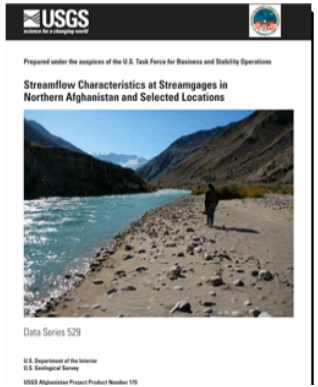
>> Pubs Warehouse > DS 529

Prepared under the auspices of the U.S. Task Force for Business and Stability Operations

Streamflow Characteristics at Streamgages in Northern Afghanistan and Selected Locations

By Scott A. Olson and Tara Williams-Sether

ABSTRACT



Statistical summaries of streamflow data for 79 historical streamgages in Northern Afghanistan and other selected historical streamgages are presented in this report. The summaries for each streamgage include (1) station description, (2) graph of the annual mean discharge for the period of record, (3) statistics of monthly and annual mean discharges, (4) monthly and annual flow duration, (5) probability of occurrence of annual high discharges, (6) probability of occurrence of annual low discharges, (7) probability of occurrence of seasonal low discharges, (8) annual peak discharges for the period of record, and (9) monthly and annual mean discharges for the period of record.

First posted September 8, 2010

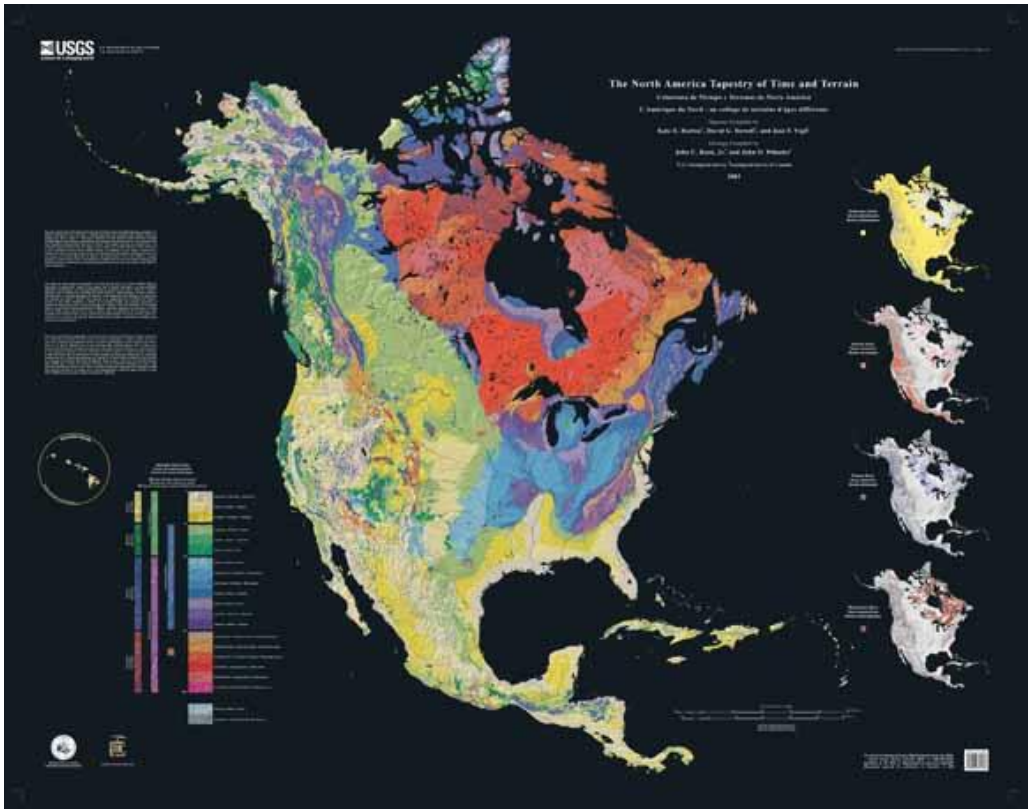
- **Report** PDF (5.60 MB)

For additional information contact:
Chief,
International Water Resources Branch
U.S. Geological Survey
420 National Center
Reston, VA 20192
http://water.usgs.gov/international

Part or all of this report is presented in Portable Document Format (PDF); the latest version of Adobe Reader or similar software is required to view it. Download the latest version of Adobe Reader, free of

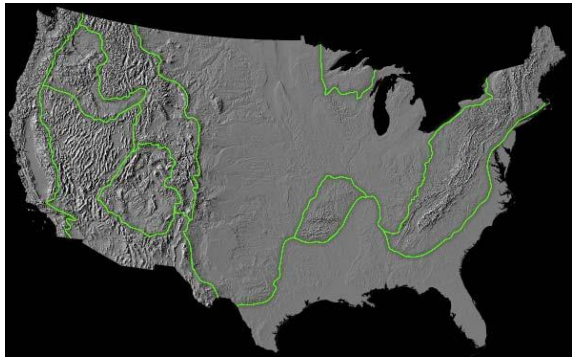
Earth Today

https://pubs.usgs.gov/imap/i2781/



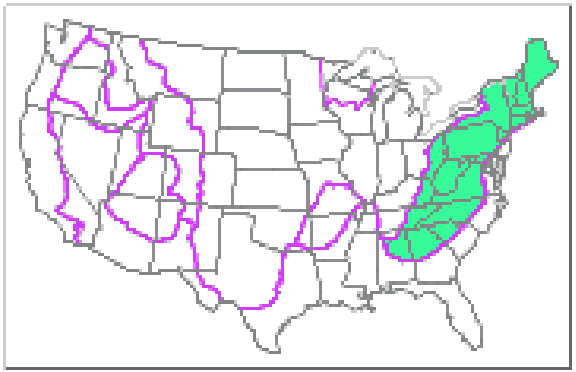
The North America Tapestry of Time and Terrain (1:8,000,000 scale) is a product of the US Geological Survey in the I-map series (I-2781). This map was prepared in collaboration with the Geological Survey of Canada and the Mexican Consejo Recursos de Minerales.

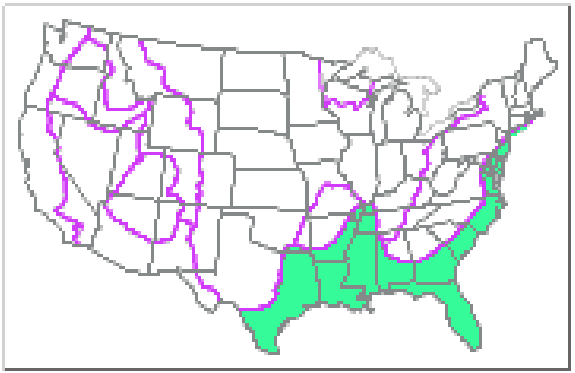
Geologic Provinces



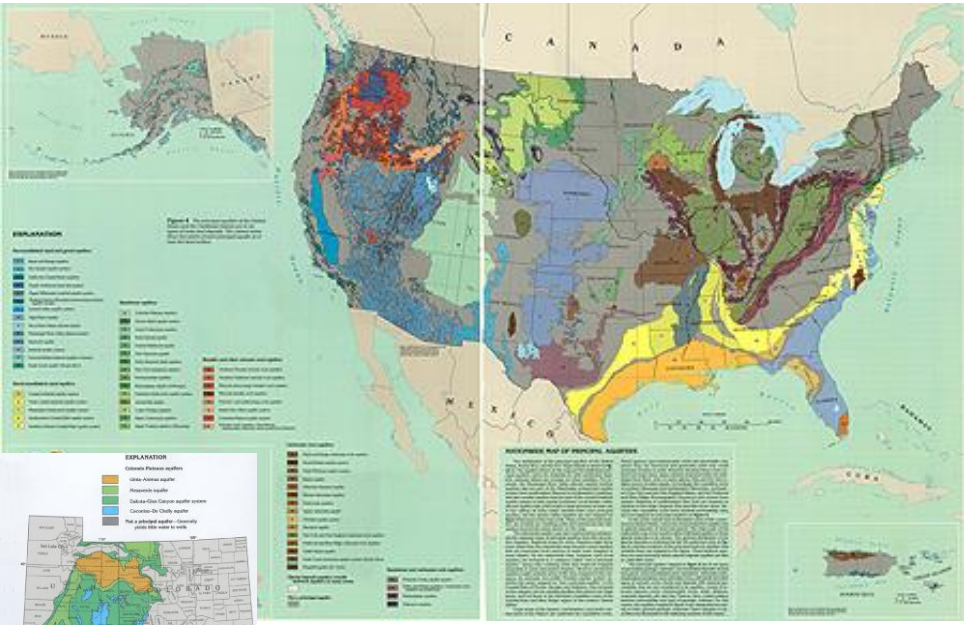
https://pubs.usgs.gov/imap/i2720/

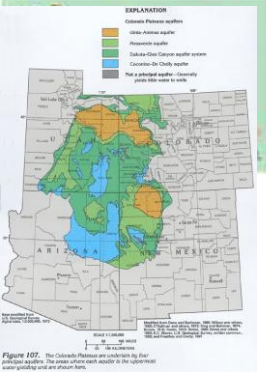
- Atlantic Plain Province
- Appalachian Highlands Province
- Laurentian Upland Province - Superior Upland
- Interior Plain Province
- Ouachita-Ozark Interior Highlands
- Rocky Mountains
- Colorado Plateau Province
- Columbia Plateau Province
- Basin and Range Province
- Pacific Province
- Alaska
- Hawai'i

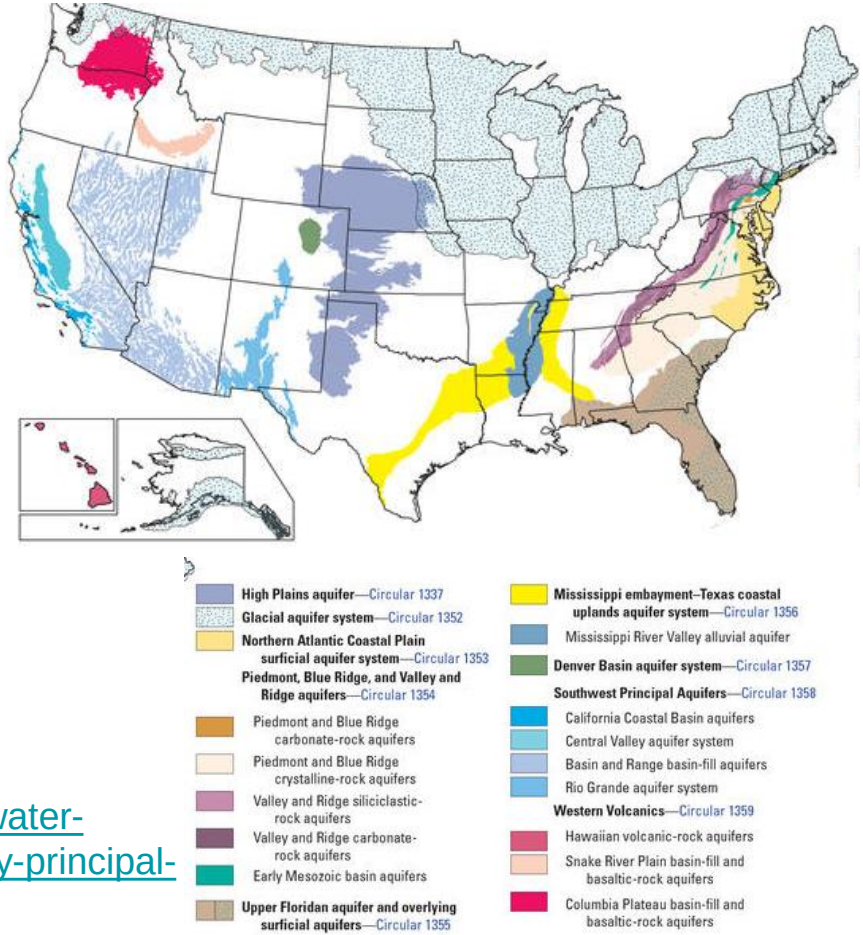




https://water.usgs.gov/ogw/aquifer/atlas.html

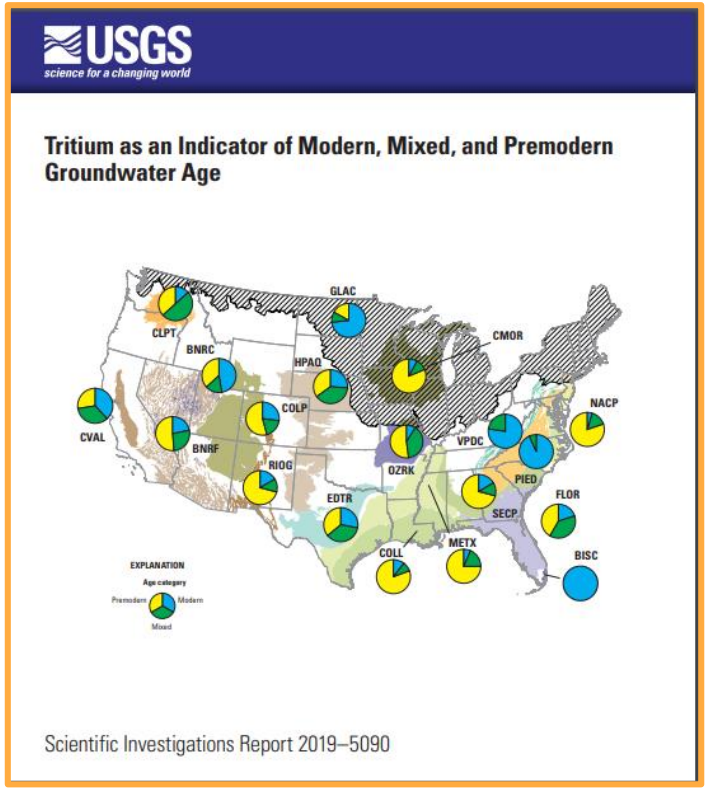






https://www.usgs.gov/mission-areas/water-resources/science/groundwater-quality-principal-aquifers-nation-1991-2010

Groundwater Age: https://www.usgs.gov/mission-areas/water-resources/science/groundwater-age



Why does groundwater age matter? Young groundwater is more likely than old groundwater to have contaminants from recent manmade sources, such as pesticides, nitrate, and solvents, because those chemicals were applied to or released on the landscape when the young groundwater recharged the aquifer. For example, water that entered the aquifer after 1950 is more likely than older water to contain the herbicide atrazine, whose use has increased since that time. On the other hand, old groundwater is more likely than young groundwater to have contaminants from natural sources, such as metals and radionuclides, because old groundwater can spend thousands of years in contact with and reacting with aquifer rocks and minerals that might contain these elements. The geochemical processes that frequently occur in old water, such as **redox reactions**, can profoundly affect groundwater quality.

https://pubs.er.usgs.gov/publication/sir20195090

Brackish Groundwater in the United States

https://pubs.er.usgs.gov/publication/pp1833

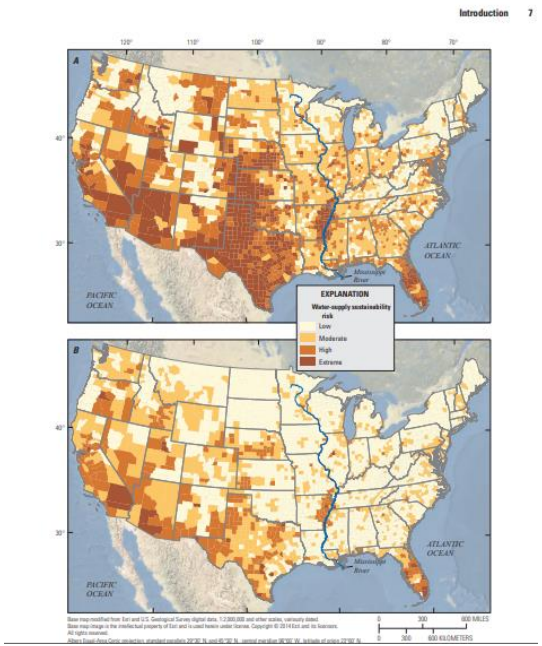


Figure 1. Water-supply sustainability risk index for the conterminous United States in 2050 linking water demand A, to population growth, increases in power generation, and climate change and B, to population growth and increases in power generation. Modified from Roy and others (2012).

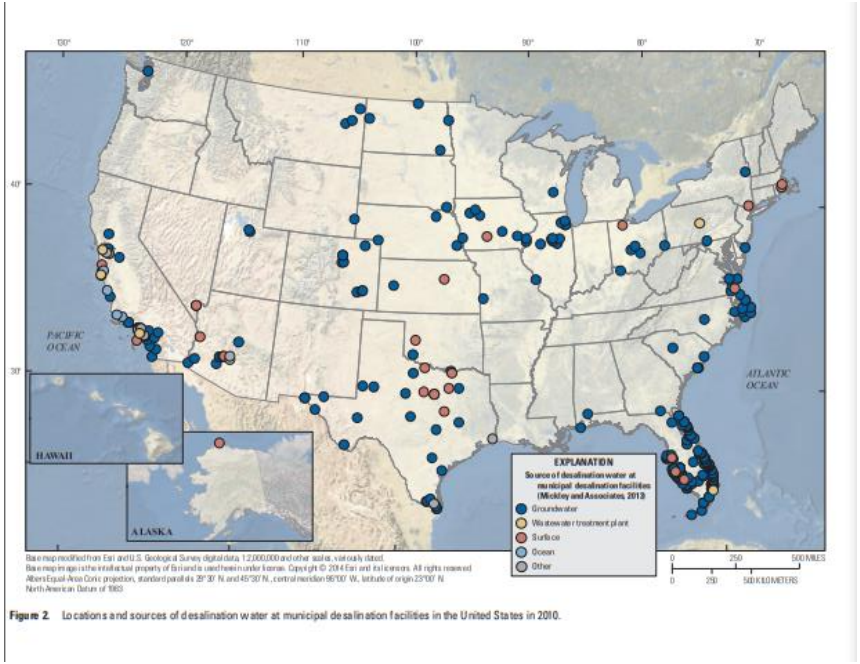
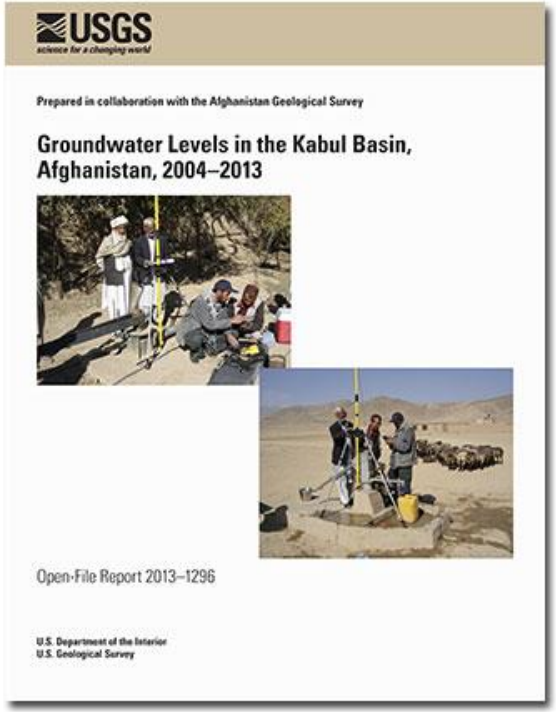


Figure 2. Locations and sources of desalination water at municipal desalination facilities in the United States in 2010.

Figure 2. Locations and sources of desalination water at municipal desalination facilities in the United States in 2010

Groundwater



https://pubs.usgs.gov/of/2013/1296/

Groundwater Levels in the Kabul Basin, Afghanistan, 2004–2013

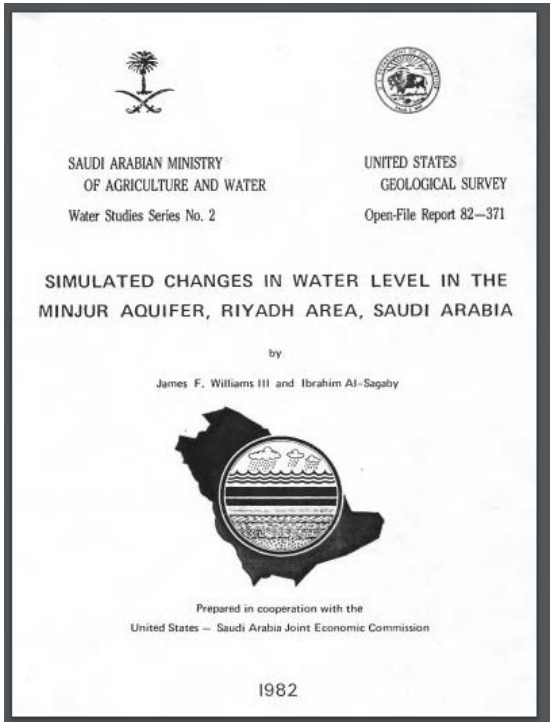
By Mohammad R. Taher, Michael P. Chornack, and Thomas J. Mack

Abstract

The Afghanistan Geological Survey, with technical assistance from the U.S. Geological Survey, established a network of wells to measure and monitor groundwater levels to assess seasonal, areal, and potentially climatic variations in groundwater characteristics in the Kabul Basin, Afghanistan, the most populous region in the country. Groundwater levels were monitored in 71 wells in the Kabul Basin, Afghanistan, starting as early as July 2004 and continuing to the present (2013). The monitoring network is made up exclusively of existing production wells; therefore, both static and dynamic water levels were recorded. Seventy wells are in unconsolidated sediments, and one well is in bedrock. Water levels were measured periodically, generally monthly, using electric tape water-level meters. Water levels in well 64 on the grounds of the Afghanistan Geological Survey building were measured more frequently. This report provides a 10-year compilation of groundwater levels in the Kabul Basin prepared in cooperation with the Afghanistan Geological Survey.

Groundwater

https://pubs.er.usgs.gov/search?q=Kingdom+of+Saudi+Arabia+



SAUDI ARABIAN MINISTRY OF AGRICULTURE AND WATER

Water Studies Series No. 2

UNITED STATES GEOLOGICAL SURVEY

Open-File Report 82—371

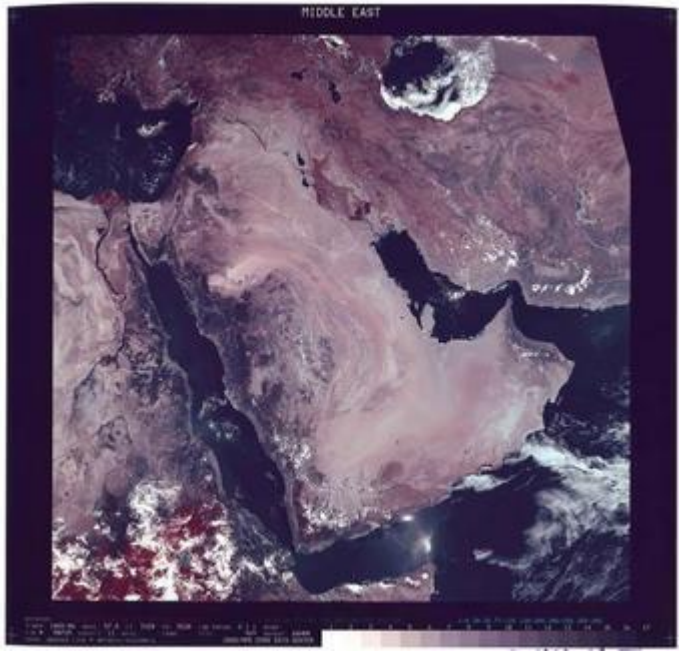
SIMULATED CHANGES IN WATER LEVEL IN THE MINJUR AQUIFER, RIYADH AREA, SAUDI ARABIA

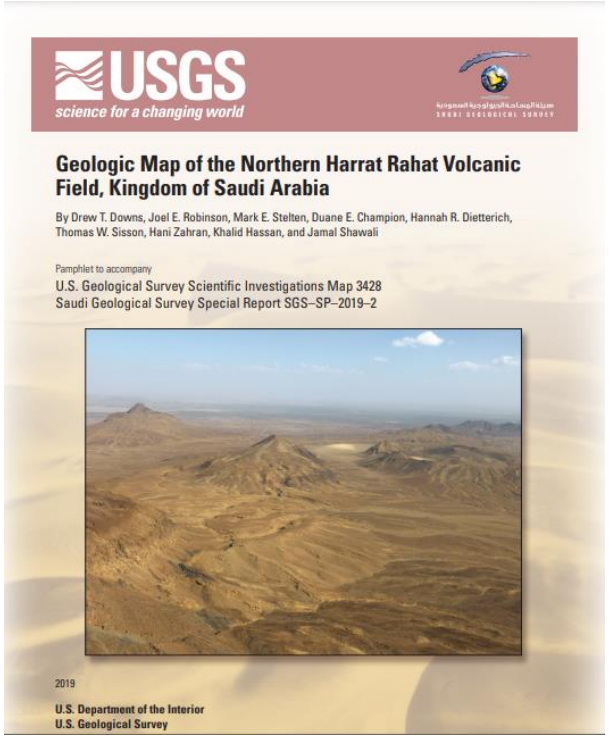
by

James F. Williams III and Ibrahim Al-Sagaby

Prepared in cooperation with the United States — Saudi Arabia Joint Economic Commission

1982





USGS science for a changing world

Geologic Map of the Northern Harrat Rahat Volcanic Field, Kingdom of Saudi Arabia

By Drew T. Downs, Joel E. Robinson, Mark E. Stelten, Duane E. Champion, Hannah R. Dietterich, Thomas W. Sisson, Hani Zahran, Khalid Hassan, and Jamal Shawali

Pamphlet to accompany

U.S. Geological Survey Scientific Investigations Map 3428

Saudi Geological Survey Special Report SGS–SP–2019–2

2019

U.S. Department of the Interior

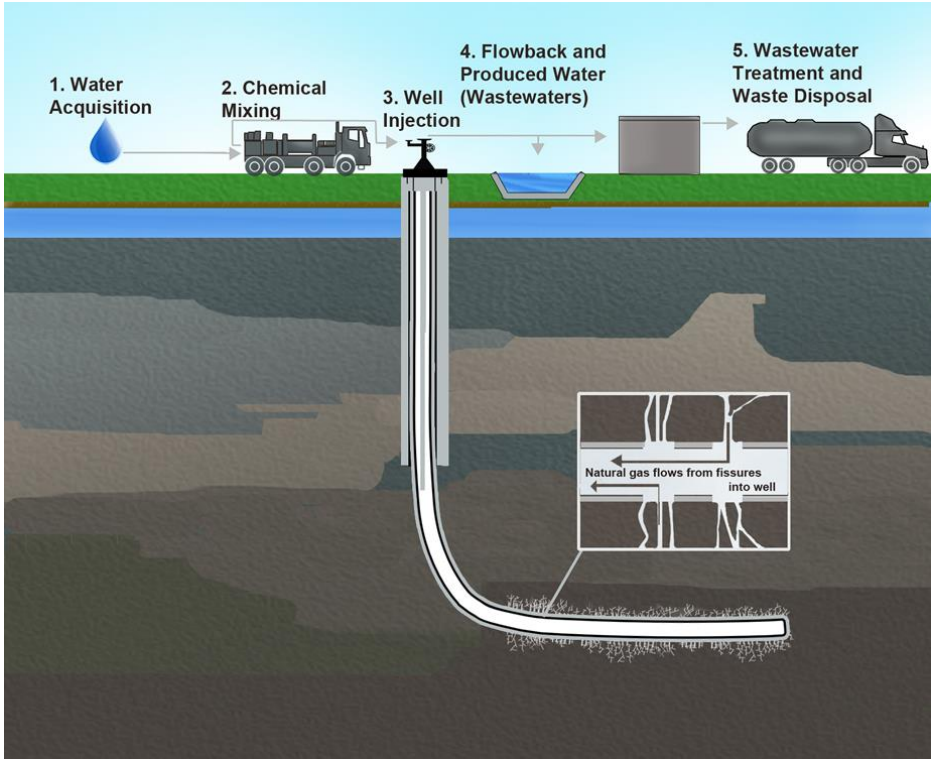
U.S. Geological Survey

https://pubs.usgs.gov/of/1982/0371/report.pdf

https://pubs.er.usgs.gov/publication/sim3428

Water-Quality Topics: Hydraulic Fracturing

https://water.usgs.gov/owq/topics/hydraulic-fracturing/

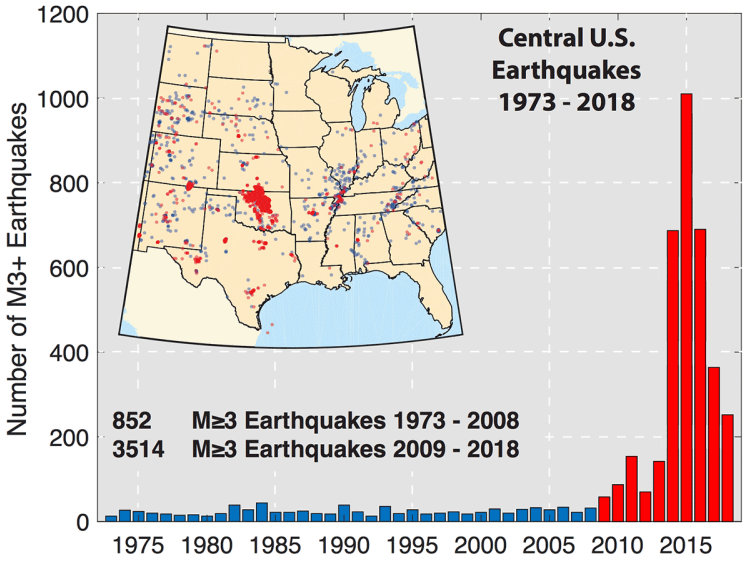


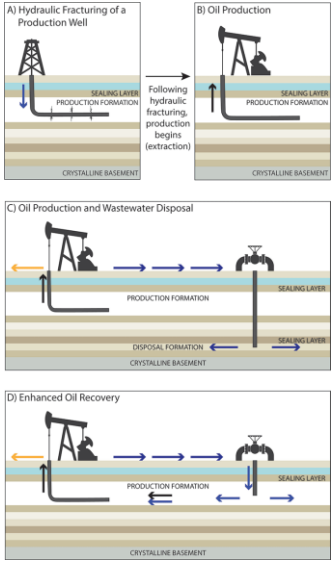
Hydraulic fracturing (informally known as hydrofracking, fracking, fracing, or hydrofracturing) is a process that typically involves injecting water, sand, and (or) chemicals under high pressure into a bedrock formation via a well. This process is intended to create new fractures in the rock as well as increase the size, extent, and connectivity of existing fractures.

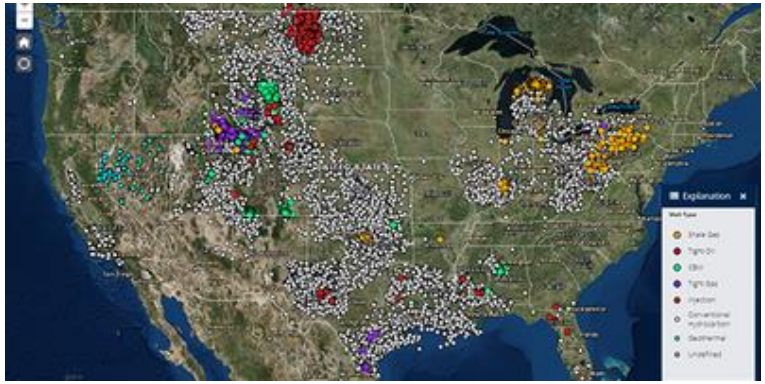
Hydraulic fracturing is a well-stimulation technique used commonly in low-permeability rocks like tight sandstone, shale, and some coal beds to increase oil and/or gas flow to a well from petroleum-bearing rock formations. A similar technique is used to create improved permeability in underground geothermal reservoirs. A form of hydraulic fracturing is also used in low permeability sediments and other tight subsurface formations to increase the efficiency of soil vapor extraction and other technologies used in remediating contaminated sites.

Water Quality - Energy

Energy Program: Environmental Aspects







Produced Waters Database

The primary objective of this project is to provide information on the volume, quality, impacts, and possible uses of water produced during generation and development of energy resources (particularly hydrocarbons) as well as related fluids injected into reservoirs for energy development and associated waste disposal.

USGS Publications Access Points

National Geologic Map Database:
https://ngmdb.usgs.gov

Geology and Hydrology Maps

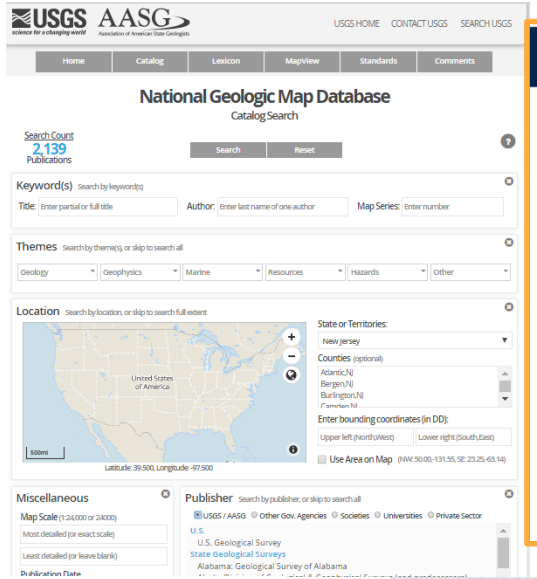
TopoView = Topographic Maps

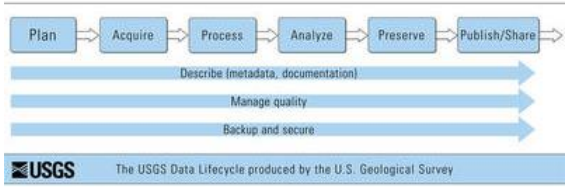
Publications Warehouse:
https://pubs.usgs.gov

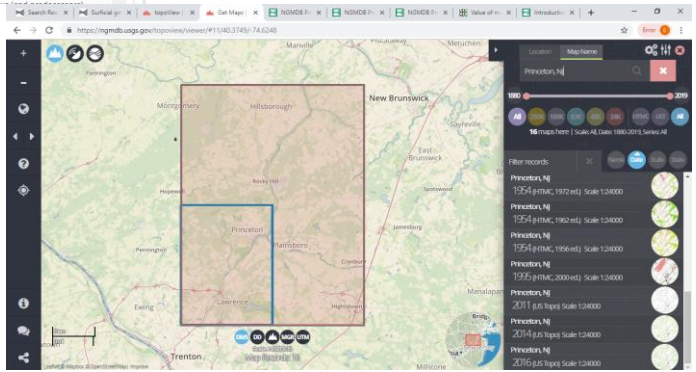
ScienceBase.gov

Data.usgs.gov

DataOne (Earth Data)
https://www.dataone.org/







Faundeen, J.L., Burley, T.E., Carlino, J.A., Govoni, D.L., Henkel, H.S., Holl, S.L., Hutchison, V.B., Martín, Elizabeth, Montgomery, E.T., Ladino, C.C., Tessler, Steven, and Zolly, L.S., 2013, The United States Geological Survey Science Data Lifecycle Model: U.S. Geological Survey Open-File Report 2013–1265, 4 p., *http://dx.doi.org/10.3133/ofr20131265*

Earth As Art!

Earth As Art 1 : https://eros.usgs.gov/image-gallery/earth-art-1

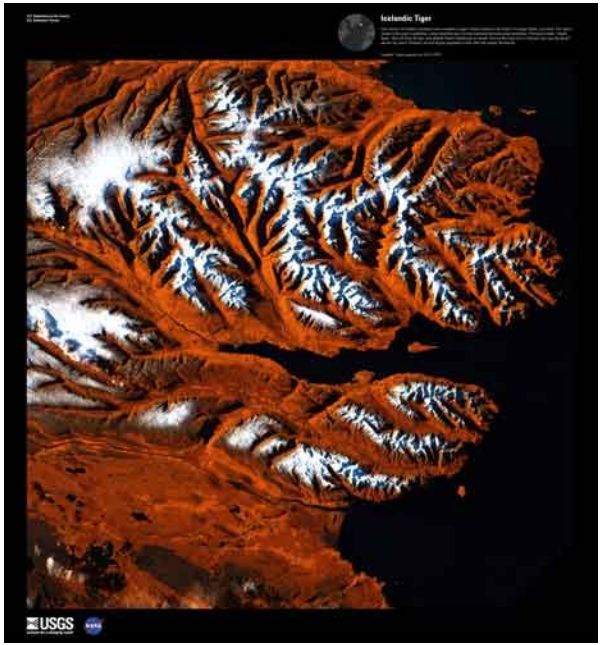
Earth As Art 2 : https://eros.usgs.gov/image-gallery/earth-art-2

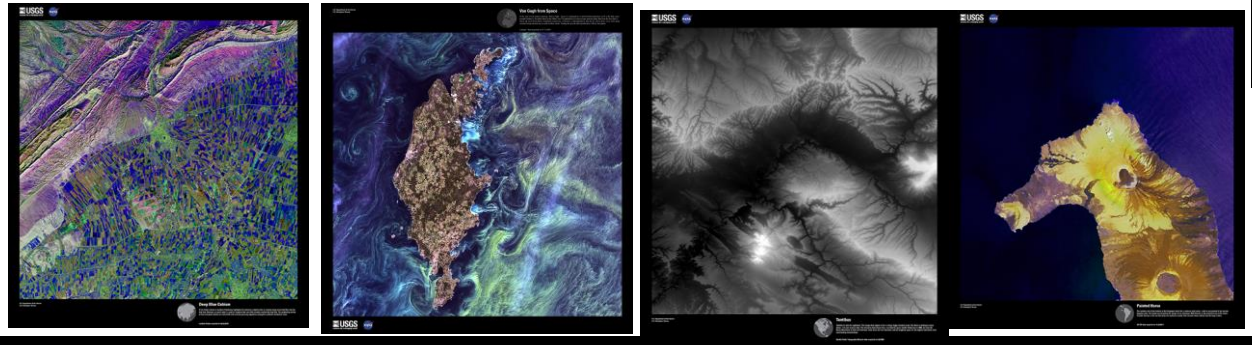
Earth As Art 3 : https://eros.usgs.gov/image-gallery/earth-art-3

Earth As Art 4 : https://eros.usgs.gov/image-gallery/earth-art-4

Earth As Art 5 : https://eros.usgs.gov/image-gallery/earth-art-5

Earth As Art 6 : https://eros.usgs.gov/image-gallery/earth-art-6





https://eros.usgs.gov/image-gallery

Earth News

E&E News (Subscription):
https://www.eenews.net/

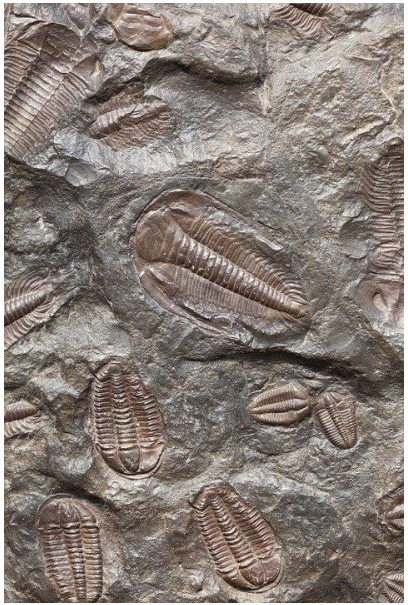
New York Times:
https://www.nytimes.com/column/trilobites

Eos: https://eos.org/

Eurekalert!:
https://www.eurekalert.org/
Earth Science:
https://www.eurekalert.org/bysubject/earthscience.php

Rocky Mountains:
https://www.rmag.org/publications/publications/

Yale E360: https://e360.yale.edu/



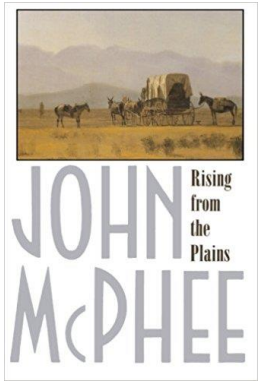
ADAPTATION
Sand shortages expose beaches to rising seas

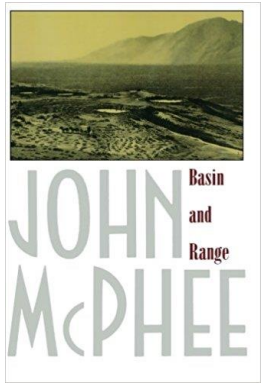
ELECTRIC VEHICLES
Study reveals why buyers shun EVs

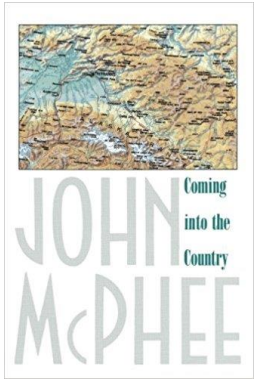
CAMPAIGN 2020
In a debate first, environmental justice took center stage

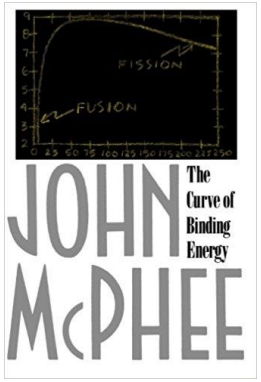
John McPhee Books

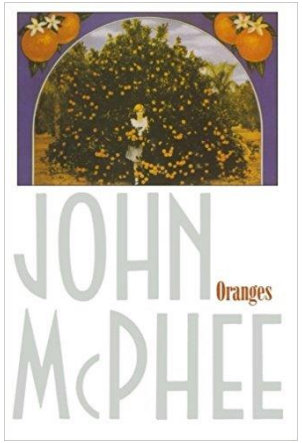
https://journalism.princeton.edu/people/john-mcphee/

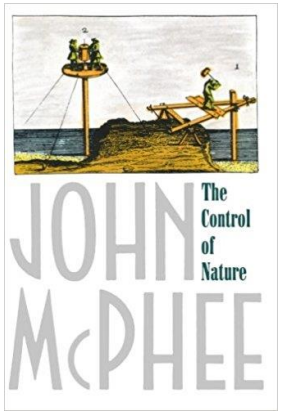


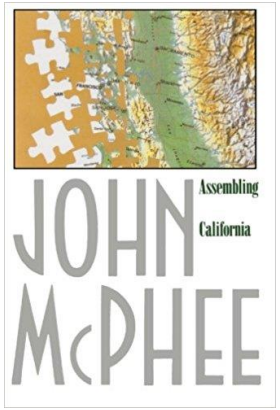


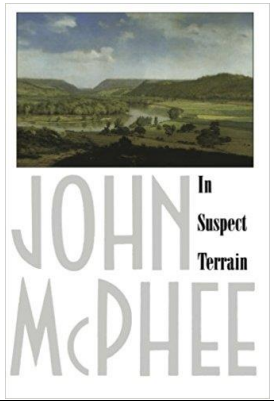


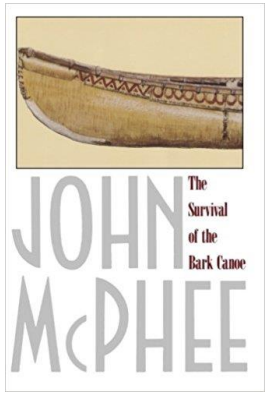


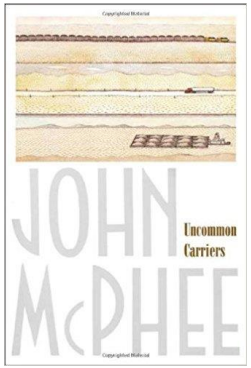


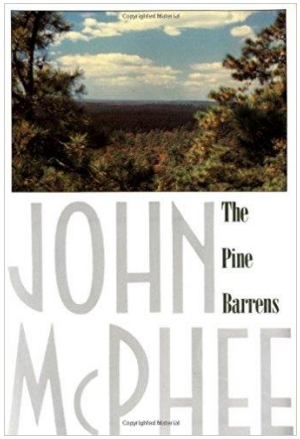


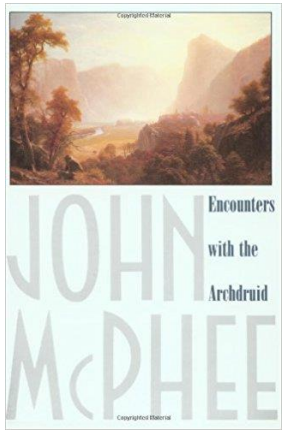












Thank you!

Questions?

Nassau Hall, Princeton University

In 1783, the building served as the nation's capitol, housing the Continental Congress from June to November.