



# Library Research for Water Resources

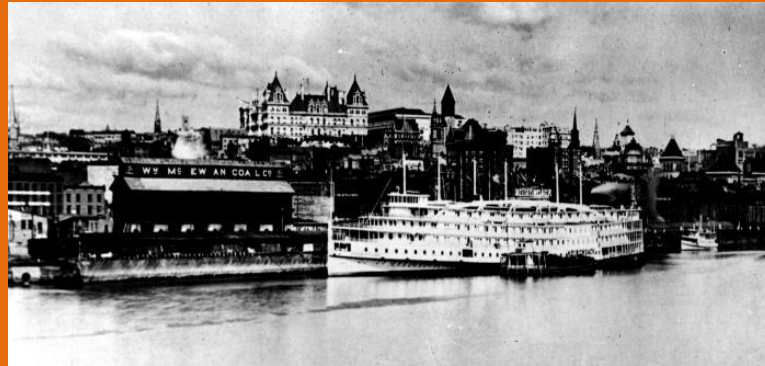
March 5, 2020

Emily C. Wild, Chemistry, Geosciences and Environmental Studies Librarian

ewild@princeton.edu 609-258-5484

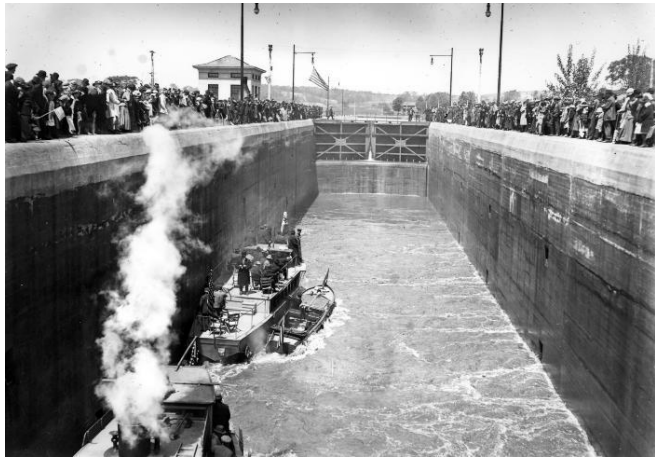


<http://digitalcollections.archives.nysed.gov/index.php/Detail/objects/4197>



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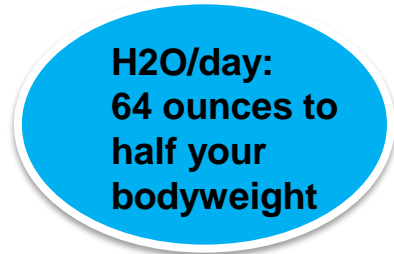


The opening of the first section of the Erie Canal  
<http://digitalcollections.archives.nysed.gov/index.php/Detail/objects/9566>



## Session Information & Questions :

1. My Past Presentations & Bio
2. What is Hydrology?
3. Who is a Hydrologist?
4. What does a Hydrologist Research?
5. What does this water map mean?
6. Is there oil/gas/mining in my watershed?
7. What are your most frequently asked questions?
8. How do I become a Hydrologist?



January 2020 – “Introduction to Geosciences Library Research” <https://www.fdlp.gov/introduction-to-geosciences-library-research>

March 2018 - "U.S. Geological Survey (USGS) Library Materials for Natural Hazards (and Land Change)" <https://www.fdlp.gov/usgs-library-materials-for-natural-hazards>

March 2018 - "USGS Library Materials for Water Resources Information" <https://www.fdlp.gov/usgs-library-materials-for-water-resources-information>

March 2018 - "USGS Library Materials for Earth's Age" <https://www.fdlp.gov/usgs-library-materials-for-earth-s-age>

September 2017 - "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>

August 2017 - "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>

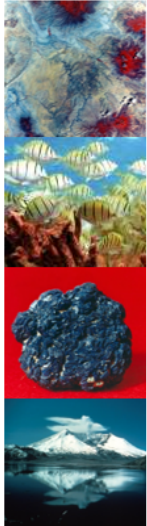
May 2017 - "USGS Library - Using USGS Image, Map, and Data Products for Information Inquiries" <https://www.fdlp.gov/usgs-library-using-usgs-image-map-and-data-products-for-information-inquiries>

December 7, 2016 - "USGS Library: Geoscience Outreach and Instruction" <https://www.fdlp.gov/usgs-library-geoscience-outreach-and-instruction>

August 2014 - U.S. Government Printing Office (GPO) Federal Depository Library Program (FDLP), "Tricks and Tips for Finding and Using USGS Topographic Maps" : <http://www.fdlp.gov/all-newsletters/community-insights/2045-tricks-and-tips-for-finding-and-using-usgs-topographic-maps>

May 2014 - "U.S. Geological Survey Library: Access and Outreach”

**\*Contact me if you would like my old modules\***



## Course Goals and Objectives for *Finding and using scientific literature and data from the USGS Library:*

At the conclusion of the course, we hope participants have gained additional tips on:

- Finding and using materials available from the USGS Library
- Organizing citations and bibliographies
- Finding USGS map and data sources
- Finding and using data and publication information from USGS programs and science centers



## Course Outline

### Session 1: Introduction to the USGS Library and Services

Session 2: USGS Publications and the USGS Library Catalog

Session 3: Using the physical USGS Library

Session 4: Science Literature Searching Concepts and Citation Databases

Session 5: Accessing Scientific Literature from eJournal and eBook Searches

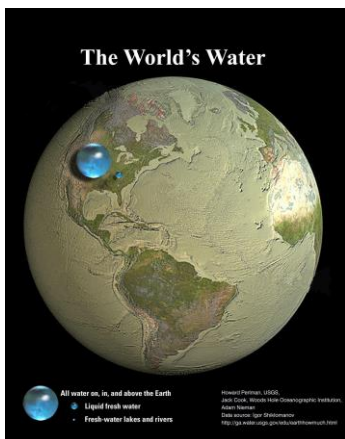
Session 6: Organizing Citations and Bibliographies

Session 7: Cited Reference Searches



<https://www.usgs.gov/about/organization/science-support/human-capital/national-training-center>





**January – Introduction to Geosciences Library Research**

**March – Library Research for Water Resources**

**May – Library Research for Climate Change**

**TBD – Library Research for Atmospheric and Oceanic Sciences**

**TBD – Library Research for Energy, Mineral, and Uranium Resources**

**TBD – Library Research for Natural Hazard Events: Earthquakes, Hurricanes, Volcanoes, and Wildfires**

**TBD – Using Art to Teach Chemistry, Geosciences and Environmental Studies in the Library**



**Emily C. Wild**  
**Lewis Science Library**  
**Princeton University**  
**ewild@princeton.edu**  
**609-258-5484**

**Help Schedule:**  
**9:00 am – 5:00 pm , Eastern**  
**Monday – Friday**

- **Princeton University Library, 2018-Present**  
**Chemistry, Geosciences and Environmental Studies Librarian**

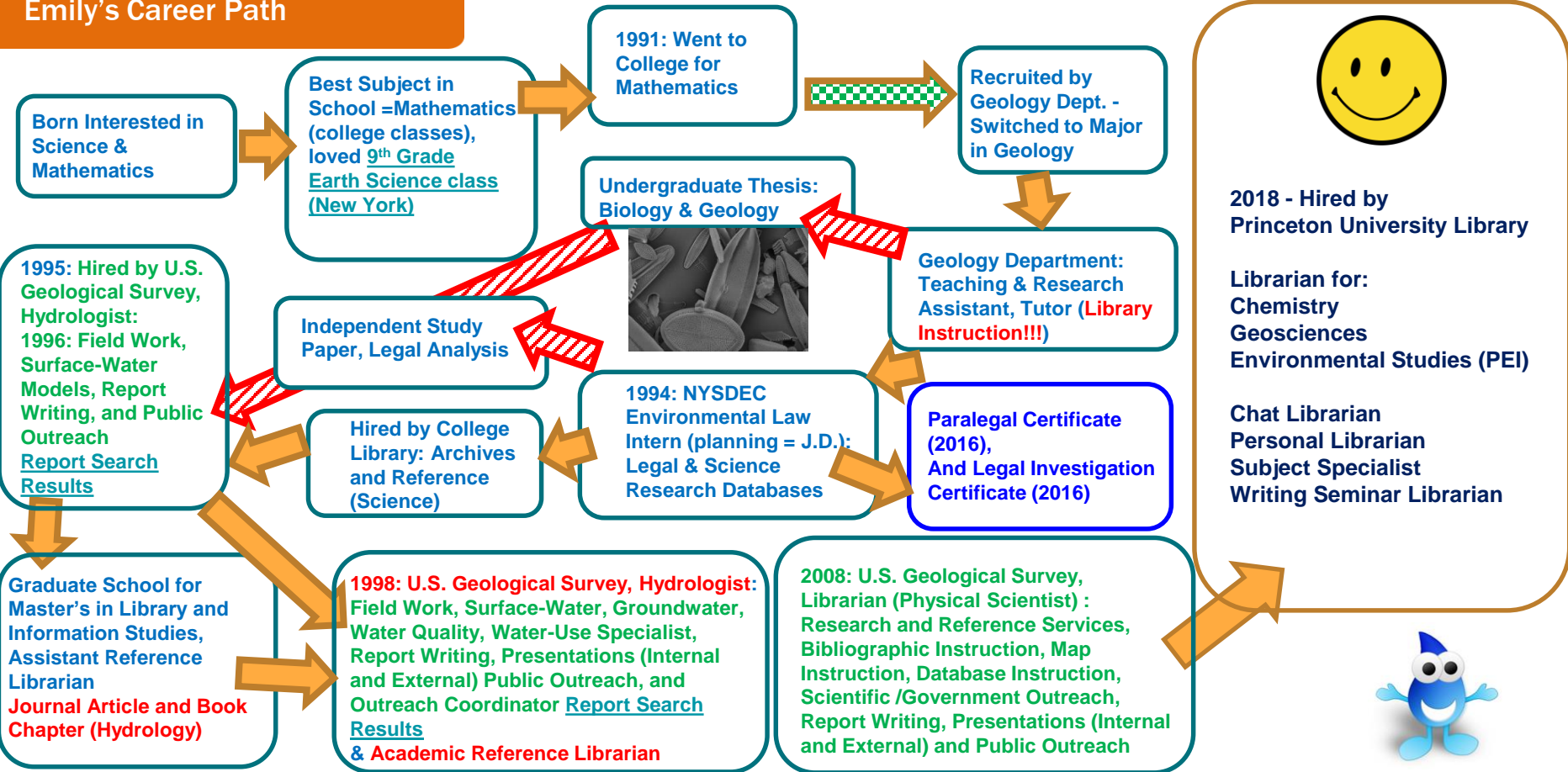
<https://library.princeton.edu/staff/ewild>

**ORCID:** <https://orcid.org/0000-0001-6157-7629>



- **U.S. Geological Survey, Denver, Colorado : 2008-2018**  
**Librarian (Physical Scientist) : Water, Minerals, Energy & Hazards research services, instruction, and outreach**
- **U.S. Geological Survey, NH-VT & MA-RI: 1996-2008**  
**Hydrologist: Water Use, Surface Water, Groundwater, Water Quality, Bibliographic Databases, NWIS Groundwater Database Administrator**
- **Reference Desk at Providence College (2005-7), University of Rhode Island (1998-2000), and Hartwick College (1995) (thesis, water resources)**
- **Environmental Law Intern at New York State Department of Conservation (NYSDEC), 1994 – mostly water resources**
- **Education: MLIS, University of Rhode Island ; BA Geology, Hartwick College ; Paralegal Certificate & Legal Investigations Certificate, and currently taking classes in legal studies**

# Emily's Career Path



## A Hydrologist?



What People think I did as a hydrologist



Really working as a hydrologist



Open Credits for “House” :  
Princeton University & Lake Carnegie

### New Jersey American Water, U. professors dispute Environmental Working Group report on contaminants in Princeton water

By [Hannah Wang](#) and [Katie Tam](#) | Nov 25, 2019

New Jersey American Water, which supplies Princeton’s drinking water, stood behind their water quality record in a statement to [Patch](#). They went on to state that they were aware of the contaminants reported by EWG, and that most are disinfectants or at levels far below the standards set by drinking water guidelines.

“At New Jersey American Water, we take water quality and safety very seriously,” the statement read. “Our treatment processes ensure our systems meet or surpass all current EPA and NJ DEP standards for safe drinking water, and we continually sample our water to ensure compliance.”

At the University, drinking water quality is monitored by the Office of Environmental Health and Safety (EHS) to ensure compliance with federal, state, and local guidelines. The standards used by EWG raise some doubt from both EHS and other University professors.

“The EWG often cites scientific studies that are questionable — either not peer-reviewed or not repeatable — or emphasizes outlier data,” Robin M. Izzo, Executive Director of EHS, wrote in a statement to The Daily Princetonian.

“For this reason, Princeton University EHS does not use their thresholds as a guide,” she added.

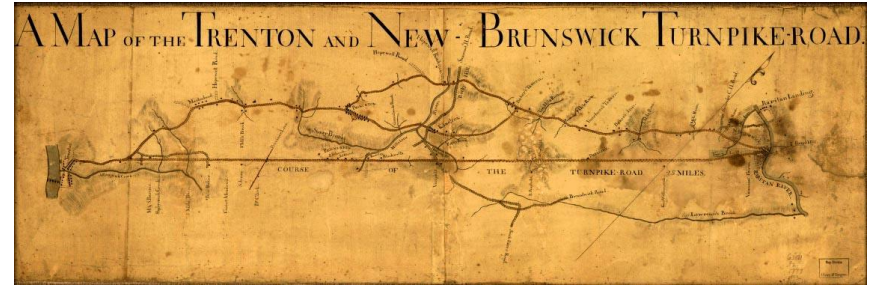
Instead, they use recommendations from the World Health Organization, the EPA, and other countries as guidelines.

<https://www.dailyprincetonian.com/article/2019/11/new-jersey-american-water-u-profs-dispute-environmental-working-group-report-on-contaminants-in-princeton-water>





Lake Carnegie (background), Towpath (middle), and Delaware & Raritan Canal (foreground)  
Princeton, New Jersey

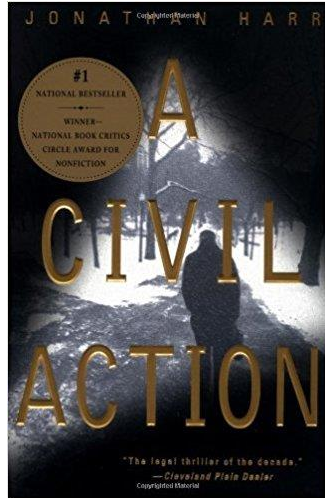


<https://www.dandrcanal.com/index.php/history>

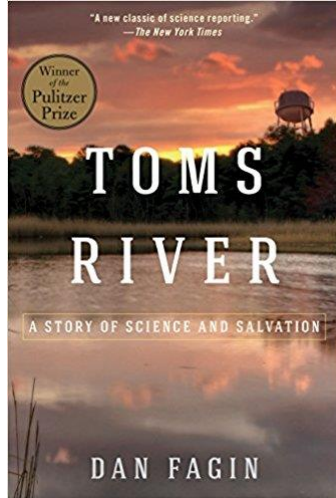


Andrew Carnegie (left) and Princeton University officials at Lake Carnegie's dedication ceremony on December 5, 1906.

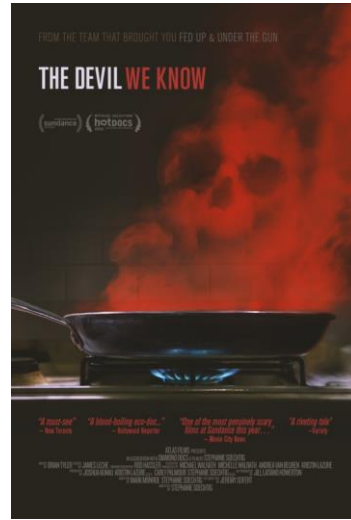
# Water Resources, Can Be A Personal Topic



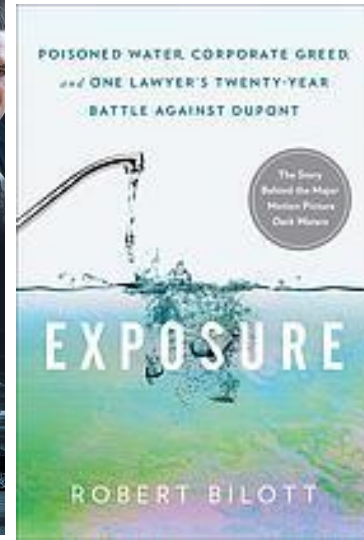
[A Civil Action by Jonathan Harr](#)



[Toms River: A Story of Science and Salvation by Dan Fagin](#)



<https://thedevilwewknow.com/>



[Exposure : poisoned water, corporate greed, and one lawyer's twenty-year battle against DuPont](#)

**THE DEVIL WE KNOW** is the story of how one synthetic chemical, used to make Teflon products, contaminated a West Virginia community. But new research hints at a much broader problem: nearly all Americans are affected by exposure to non-stick chemicals in food, drinking water, and consumer products. With very little oversight on the chemical industry in this country, we invite you to learn more about the problem and how you can protect yourself and your family.





### A plan for study of hexavalent chromium, CR(VI) in groundwater near a mapped plume, Hinkley, California, 2016

Open-File Report 2016-1004  
Prepared in cooperation with the Lahontan Regional Water Quality Control Board  
By: John A. Izbicki and Krishangi D. Groover

<https://doi.org/10.3133/ofr20161004>



<https://pubs.er.usgs.gov/publication/ofr20161004>

Links



### Natural and man-made hexavalent chromium, Cr(VI), in groundwater near a mapped plume, Hinkley, California—study progress as of May 2017, and a summative-scale approach to estimate background Cr(VI) concentrations

Open-File Report 2018-1045  
Prepared in cooperation with the Lahontan Regional Water Quality Control Board and the State Water Resources Control Board  
By: John A. Izbicki and Krishangi D. Groover

<https://doi.org/10.3133/ofr20181045>

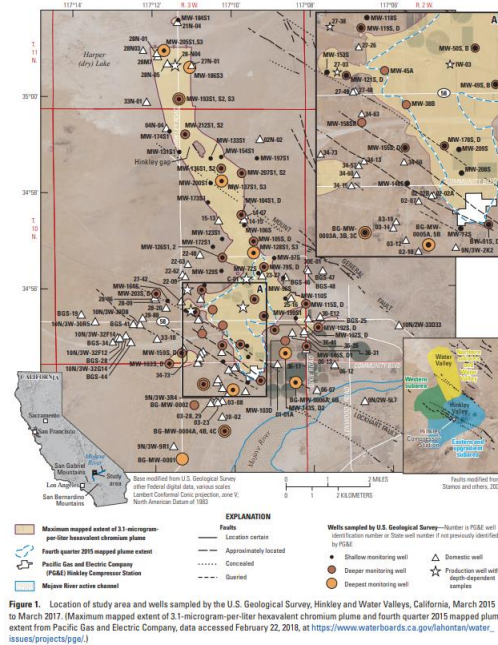


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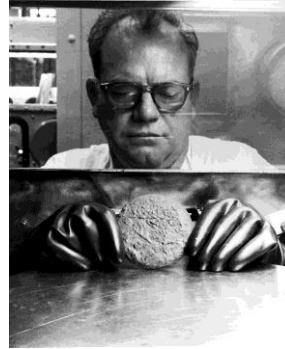
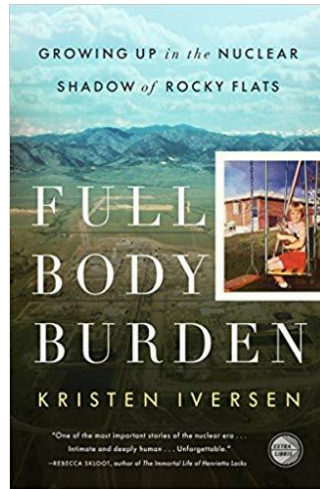
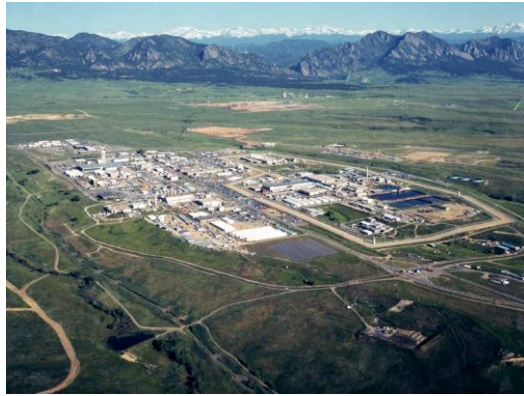
Links

- Document: [Report \(1.4 MB pdf\)](#)
- Open Access Version: [Publisher Index Page](#)
- Download citation as: [RIS](#) | [Dublin Core](#)

[https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C31&q=hinkley+groundwater+contamination&btnG=&oq=Hinkley](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C31&q=hinkley+groundwater+contamination&btnG=&oq=Hinkley)



## Rocky Flats, Colorado

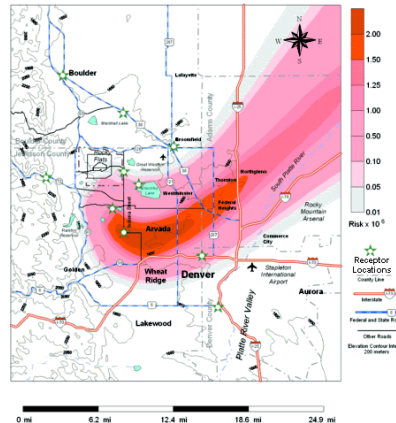


## Geohydrology of the shallow aquifers in the Denver metropolitan area, Colorado

The work was undertaken by the U.S. Geological Survey in cooperation with the U.S. Army-Rocky Mountain Arsenal, U.S. Department of Energy-Rocky Flats Field Office, Colorado Department of Public Health and Environment, Colorado Department of Natural Resources-State Engineers Office, Denver Water Department, Littleton-Englewood Wastewater Treatment Plant, East Cherry Creek Valley Water and Sanitation District, Metro Wastewater Reclamation District, Willows Water District, and the cities of Aurora, Lakewood, and Thornton.

[https://en.wikipedia.org/wiki/Rocky\\_Flats\\_Plant](https://en.wikipedia.org/wiki/Rocky_Flats_Plant)

Figure showing lifetime cancer risk for the laborer from the 1957 plutonium fire at the Rocky Flats Plant. A full explanation of this figure and risks can be found in a [1999 report](#) of the Colorado Department of Public Health and Environment which states that this image is specific to a laborer residing in the area between 1953-1959 (see page 18 of report).



<https://pubs.er.usgs.gov/publication/ha736>

## Review and Interpretation of Previous Work and New Data on the Hydrogeology of the Schwartzwald Uranium Mine and Vicinity, Jefferson County, Colorado

By Jonathan Saul Caine, Raymond H. Johnson, and Emily C. Wild

<https://pubs.usgs.gov/of/2011/1092/>

# Plutonium?

Count On News 2 NEWS STORM TEAM 2 TRAFFIC SPORTS INVESTIGATORS LIVING LOCAL FEATURES WAT



by: SUSAN MONTOYA BRYAN, The Associated Press

<https://www.counton2.com/news/latest-news/trump-admin-proposes-27b-to-restart-production-of-plutonium-cores-in-sc/>

**Posted: Mar 4, 2020 / 10:08 AM EST / Updated: Mar 4, 2020 / 10:08 AM EST**

ALBUQUERQUE, N.M. (AP) — The Trump administration's proposed budget for the U.S. Energy Department drew criticism Tuesday as Democratic senators voiced concerns that spending to clean up sites contaminated by decades of nuclear research and bomb-making was being cut in order to fund modernization of the nation's nuclear arsenal.

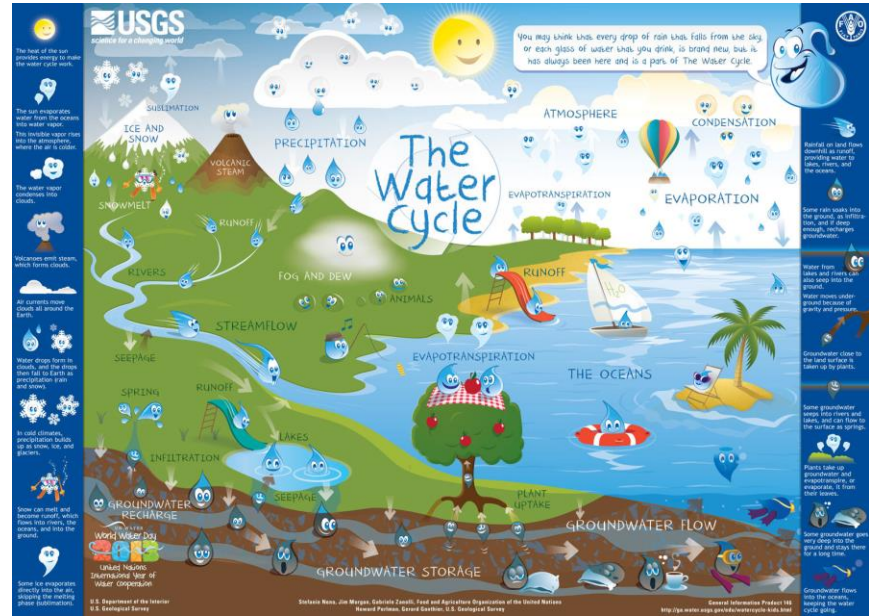
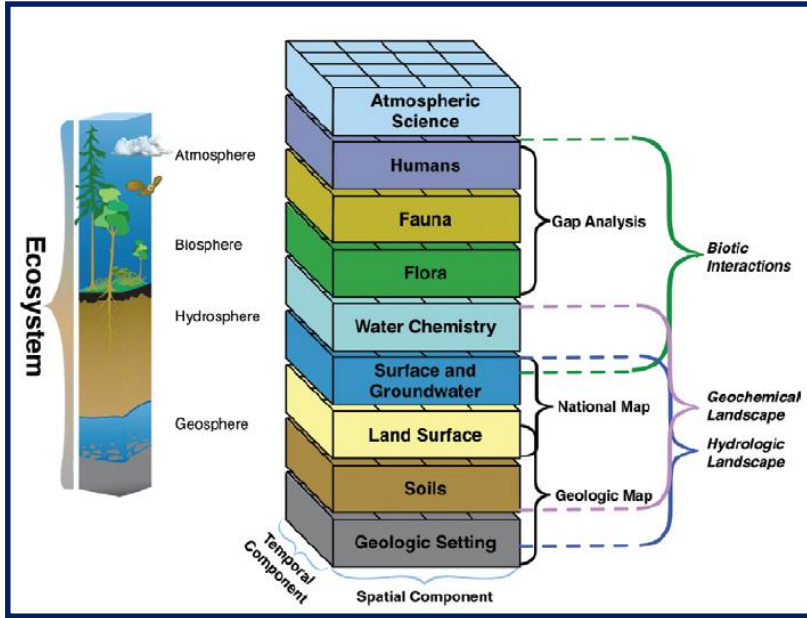
The [proposal](#) includes nearly \$27 billion, most of which would go toward nuclear security work that includes restarting production of the plutonium cores that are used as triggers inside nuclear weapons. The plutonium work would be split between sites in New Mexico and South Carolina.



# What is Hydrology?

[https://www.usgs.gov/special-topic/water-science-school/science/what-hydrology?qt-science\\_center\\_objects=0#qt-science\\_center\\_objects](https://www.usgs.gov/special-topic/water-science-school/science/what-hydrology?qt-science_center_objects=0#qt-science_center_objects)

From the U.S. Geological Survey: "Hydro" comes from the Greek word for... water. Hydrology is the study of water and hydrologists are scientists who study water.



<https://www.usgs.gov/special-topic/water-science-school/science/water-cycle-components>

# Surface Water



**1** Zoom in to activate trace buttons  
double click

**2** Click on a trace button  
Downstream Upstream

**3** Click on a stream

**4** Click Map Contents for more map layers

Go To Map

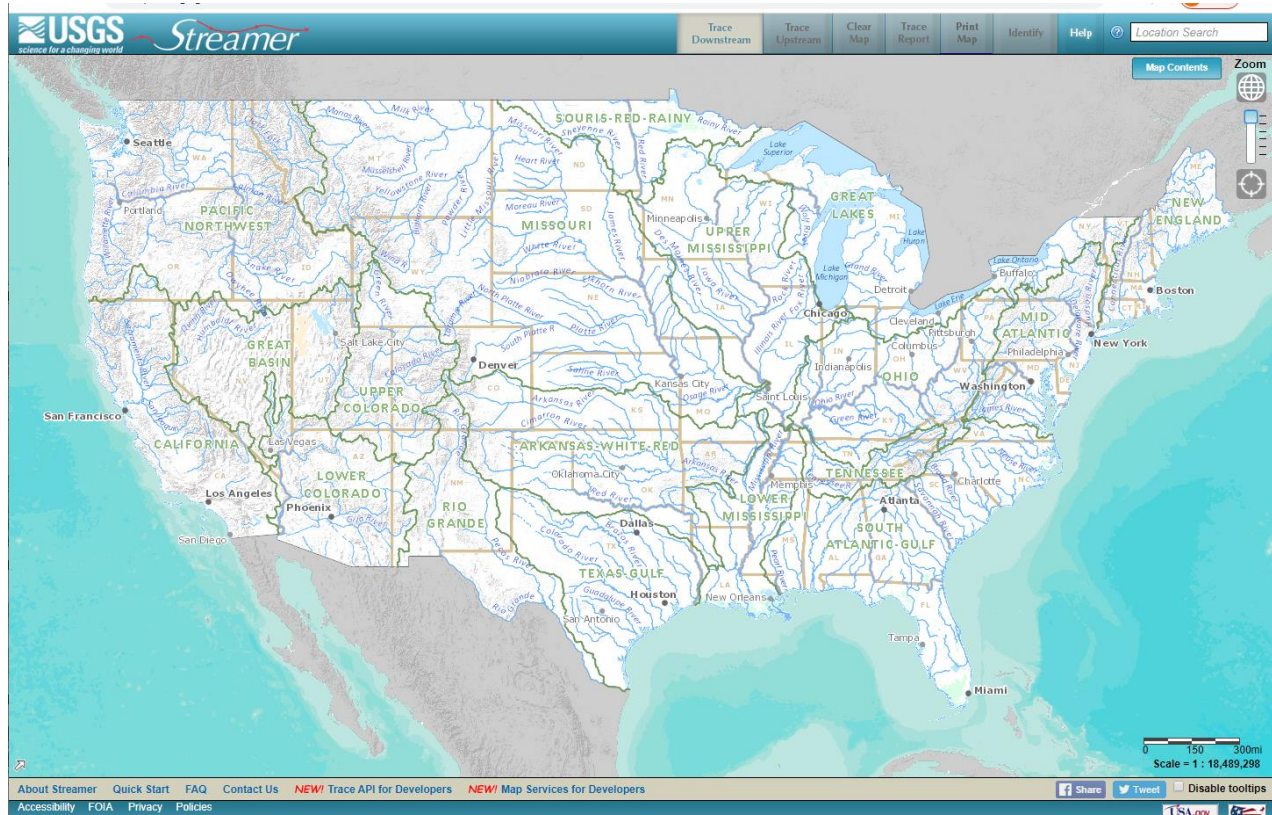
Welcome to Streamer!  
Explore America's larger streams as you trace upstream to their source or downstream to where they empty.

Learn more about your stream traces and the places they pass through in brief or detailed reports.

See weather radar and near real-time streamflow conditions.

Getting started with Streamer is as easy as following these quick instructions to the right.

[https://www.usgs.gov/centers/tw-water/science/streamer?qt-science\\_center\\_objects=0#qt-science\\_center\\_objects](https://www.usgs.gov/centers/tw-water/science/streamer?qt-science_center_objects=0#qt-science_center_objects)



USGS Streamer

Trace Downstream Trace Upstream Clear Map Trace Report Print Map Identify Help Location Search

Map Contents Zoom

Scale = 1 : 18,489,298

About Streamer Quick Start FAQ Contact Us NEW! Trace API for Developers NEW! Map Services for Developers

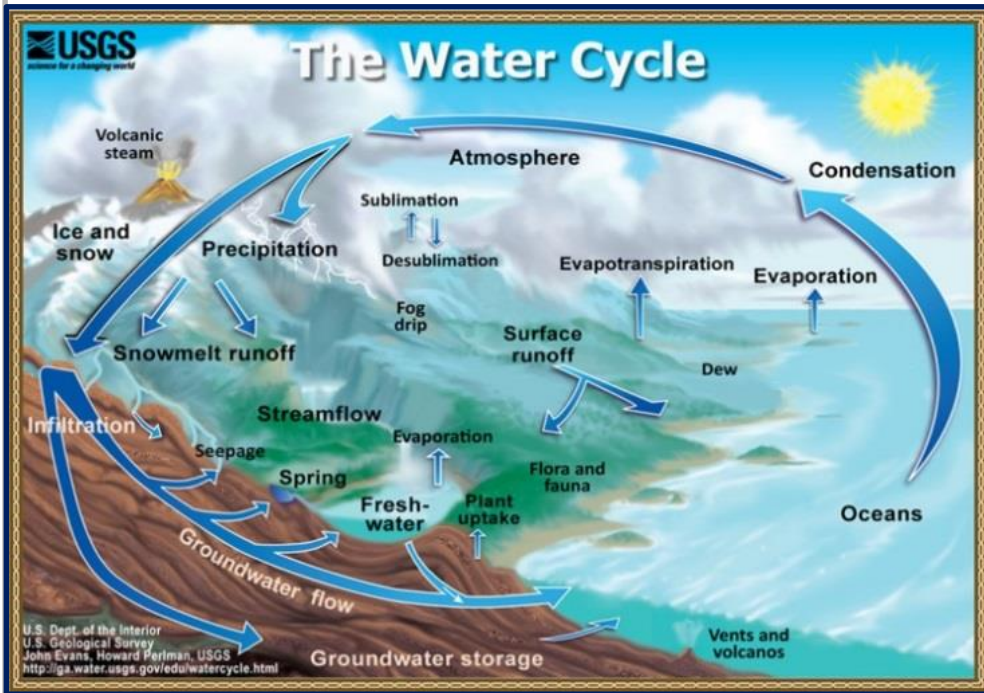
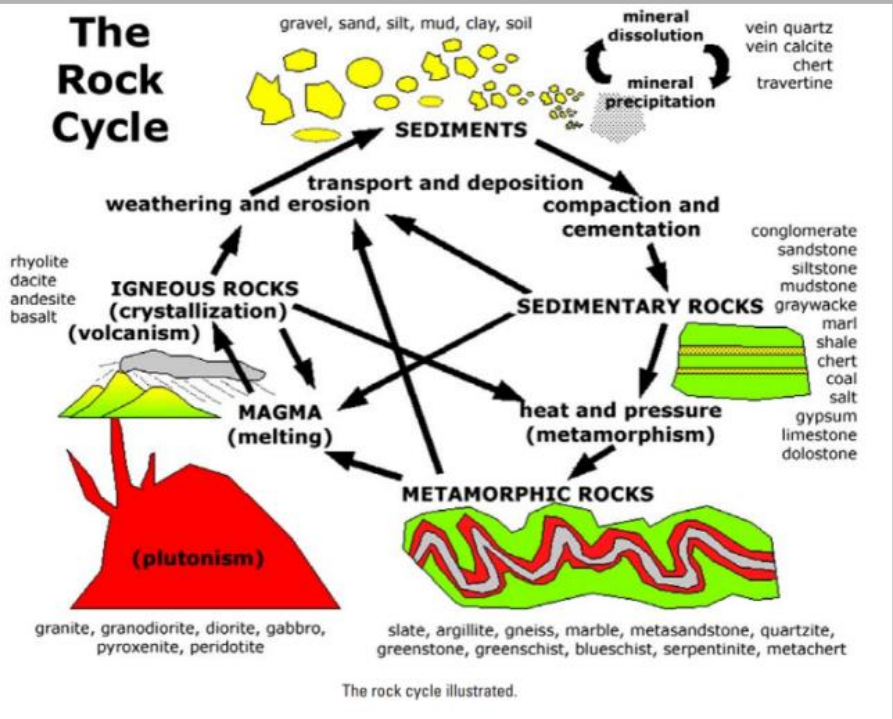
Accessibility FOIA Privacy Policies

Share Tweet Disable tooltips



# Rock Cycle & Water Cycle

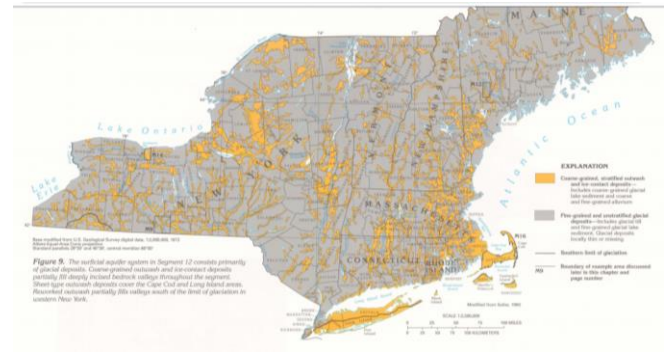
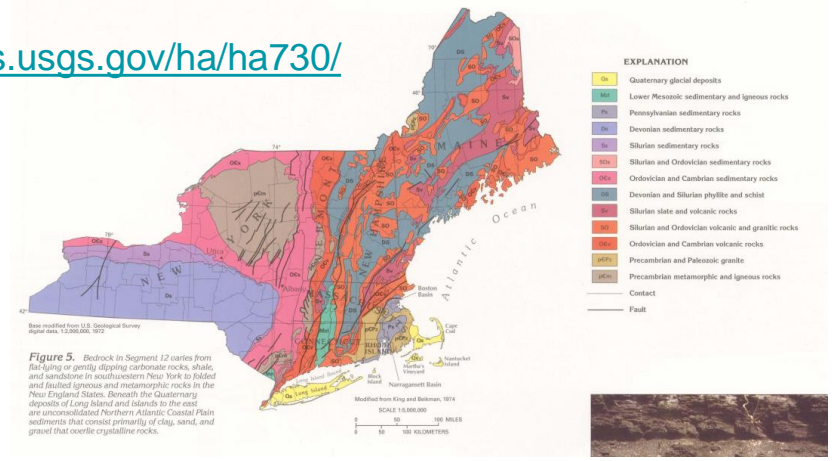
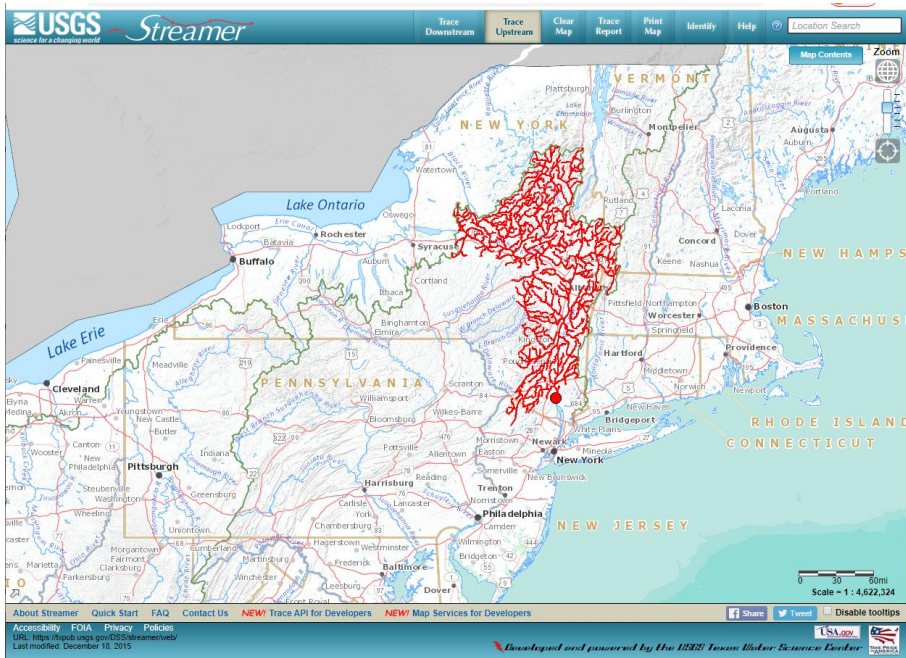
## The Rock Cycle



<https://www.usgs.gov/special-topic/water-science-school/science/water-cycle-components>

# Hudson River Basin

<https://pubs.usgs.gov/ha/ha730/>



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



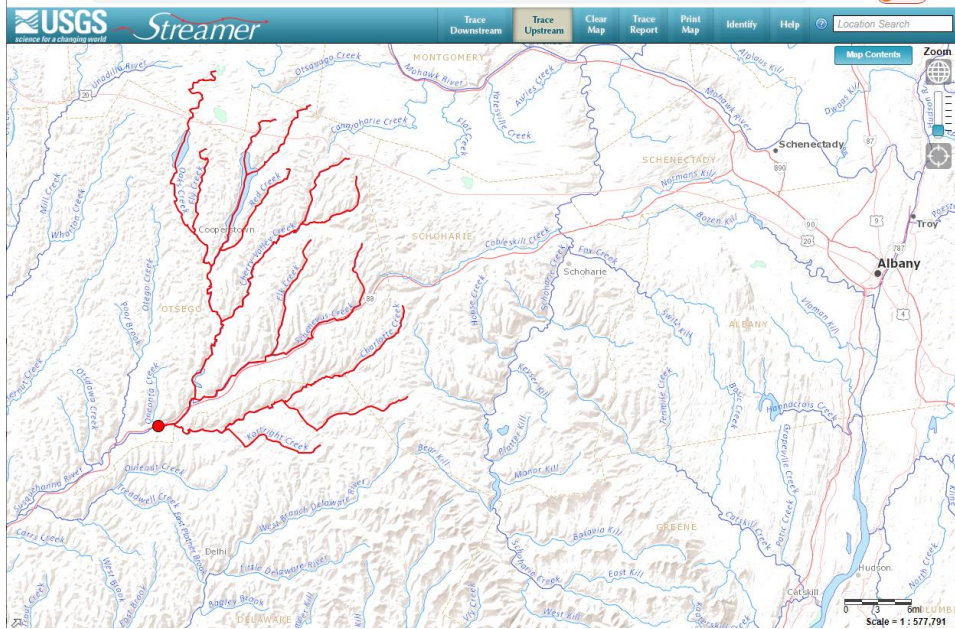
<https://pubs.usgs.gov/ha/ha730m/report.pdf>



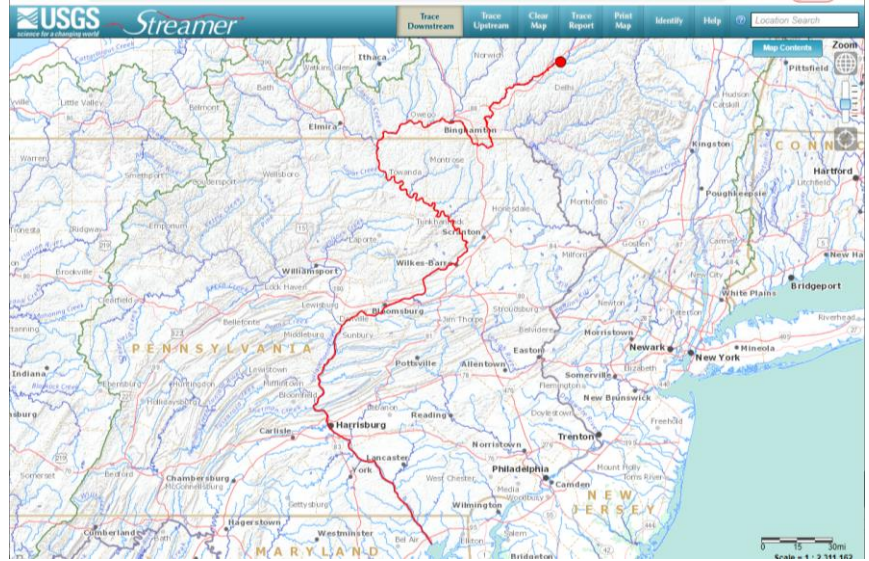
# Susquahanna River Basin



<https://www.hartwick.edu/>

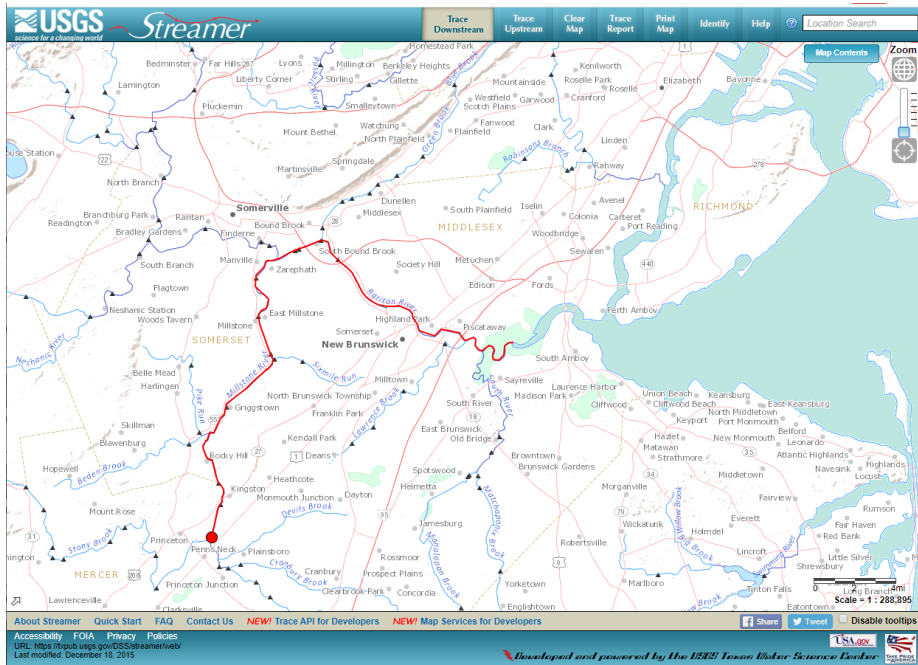


<https://txpub.usgs.gov/DSS/streamer/web/>





# Raritan River Basin (Millstone River)



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

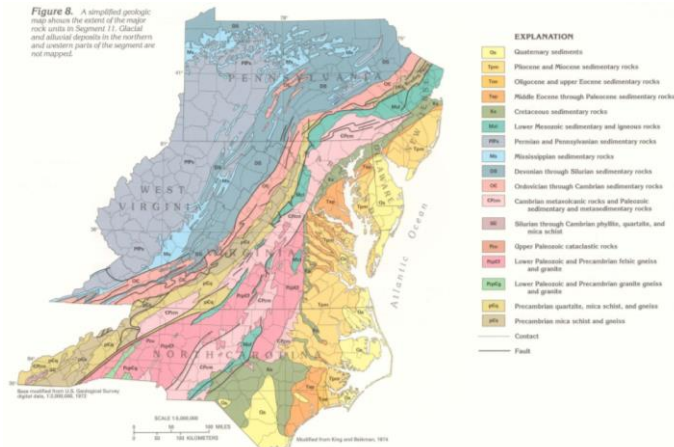


Figure 8. A simplified geologic map shows the extent of the major rock units in Segment 11. Glacial and alluvial deposits in the northern and western parts of the segment are not mapped.

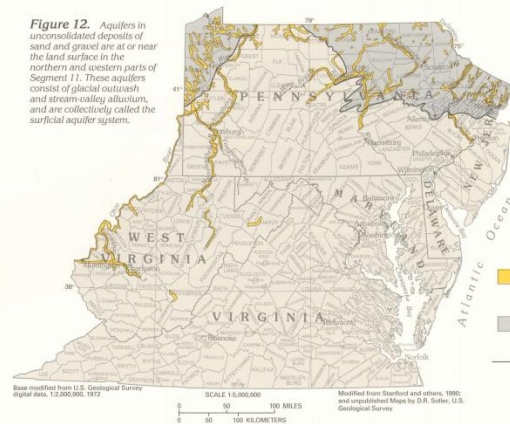


Figure 12. Aquifers in unconsolidated deposits of sand and gravel are at or near the land surface in the northern and eastern parts of Segment 11. These aquifers consist of glacial outwash and stream-valley alluvium, and are collectively called the surficial aquifer system.

<https://pubs.usgs.gov/ha/730l/report.pdf>

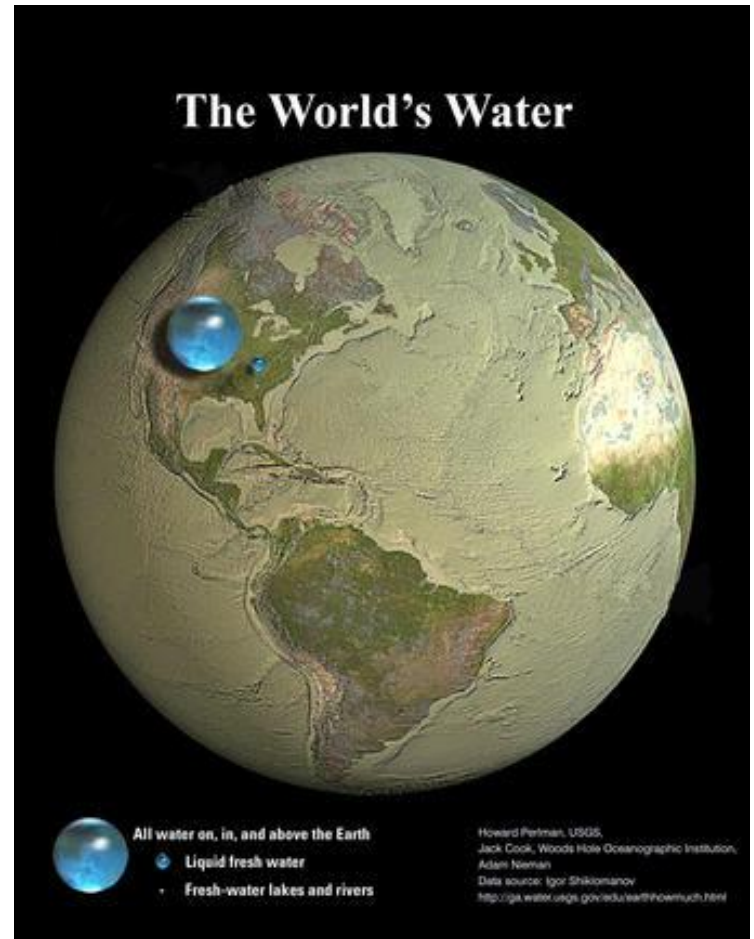
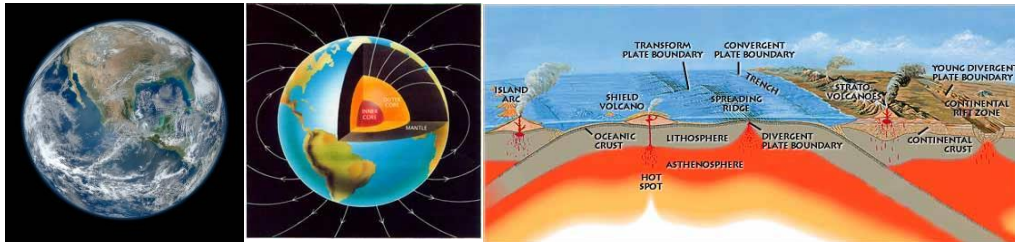
## The Water on Earth

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

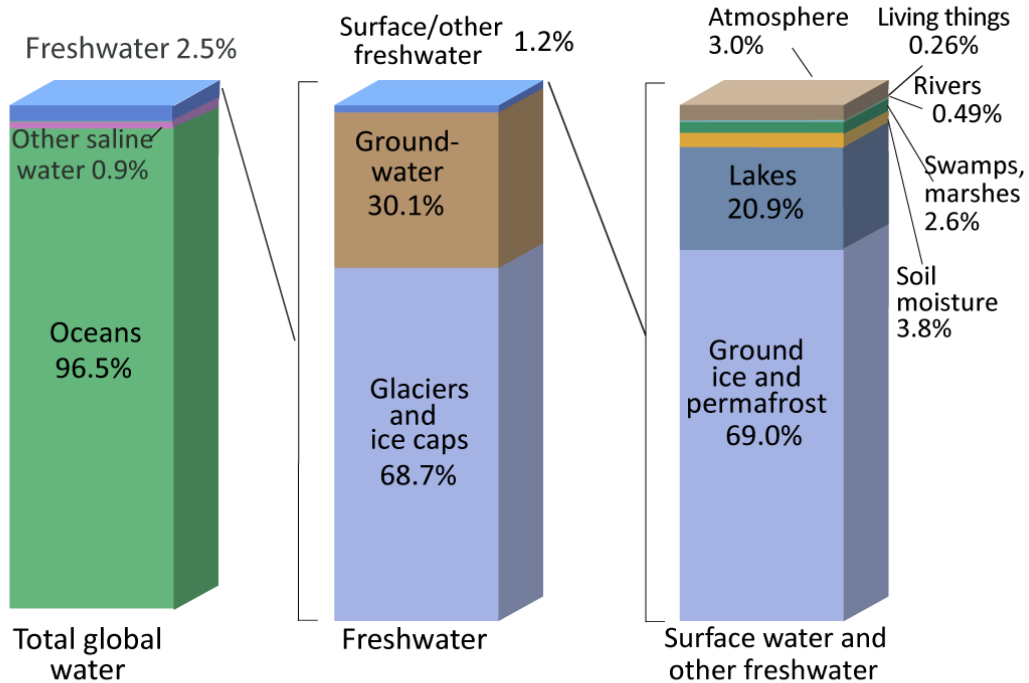
### All Earth's freshwater, liquid fresh water, and water in lakes and rivers

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).



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

# U.S. Geological Survey (USGS)



## 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 OF NEW JERSEY  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

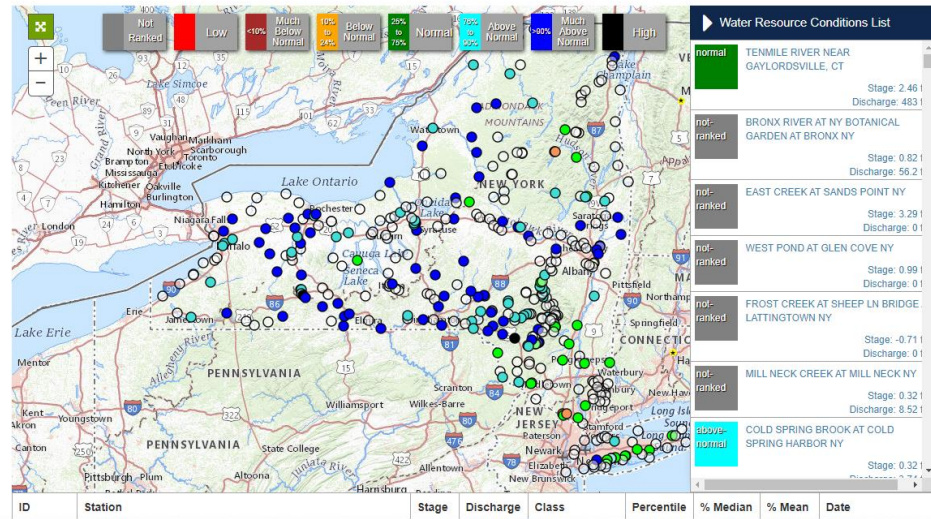




## New York Current Water Conditions

Overview Groundwater Surface Water Water Quality

BASEMAP



ID	Station	Stage	Discharge	Class	Percentile	% Median	% Mean	Date
normal	TENMILE RIVER NEAR GAYLORDSVILLE, CT	Stage: 2.46	Discharge: 483					
not-ranked	BRONX RIVER AT NY BOTANICAL GARDEN AT BRONX NY	Stage: 0.82	Discharge: 56.2					
not-ranked	EAST CREEK AT SANDS POINT NY	Stage: 3.29	Discharge: 0.1					
not-ranked	WEST POND AT GLEN COVE NY	Stage: 0.99	Discharge: 0.1					
not-ranked	FROST CREEK AT SHEEP LN BRIDGE LATTINGTOWN NY	Stage: -0.71	Discharge: 0.1					
not-ranked	MILL NECK CREEK AT MILL NECK NY	Stage: 0.32	Discharge: 8.52					
above-normal	COLD SPRING BROOK AT COLD SPRING HARBOR NY	Stage: 0.32						

A **percentile** is a value on a scale of one hundred that indicates the percent of a distribution that is equal to or below it. In general,

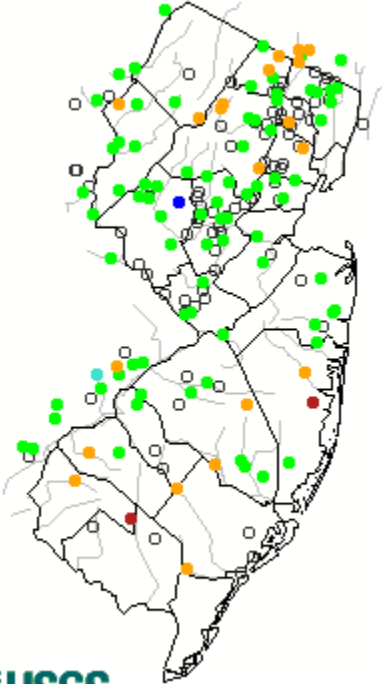
- streamflow which is greater than the 75th percentile is considered *above normal*
- streamflow which is between 25th and 75th percentiles is considered *normal*
- streamflow which is less than the 25th percentile is considered *below normal*

### 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		



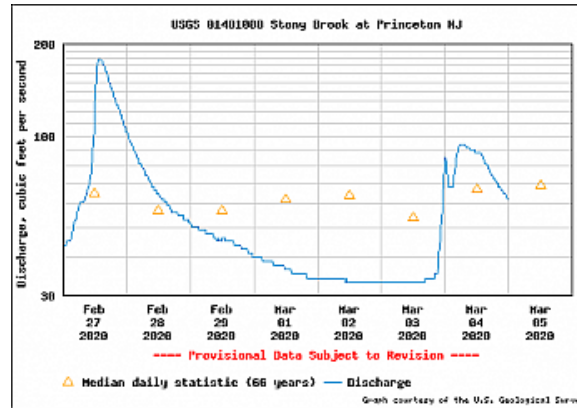
Wednesday, March 04, 2020 14:30ET



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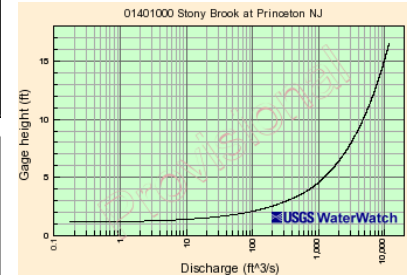
- streamflow which is greater than the 75th percentile is considered *above normal*
- streamflow which is between 25th and 75th percentiles is considered *normal*
- streamflow which is less than the 25th percentile is considered *below normal*

WaterWatch: Water Resources Conditions	
Summary	Hydrograph
USGS 01401000 Stony Brook at Princeton NJ	
Drainage area:	44.5 mi <sup>2</sup>
Discharge:	65.1 cfs
Stage:	1.90 ft
Adj. stage:	64.13 ft
Date:	2020-03-04 22:30:00
Flood stage:	9 ft
Percentile:	50.79 %
Length of Record:	65 years
Class symbol:	<span style="color: green;">●</span>
% normal (median):	101.88 %
% normal (mean):	58.21 %



USGS 01401000 Stony Brook at Princeton NJ

Date	Time	Discharge (cfs)	Flags
2020-03-04 22:30:00		65.1	
2020-03-04 18:00:00		65.1	
2020-03-04 12:00:00		65.1	
2020-03-04 06:00:00		65.1	
2020-03-03 22:30:00		65.1	
2020-03-03 18:00:00		65.1	
2020-03-03 12:00:00		65.1	
2020-03-03 06:00:00		65.1	
2020-03-02 22:30:00		65.1	
2020-03-02 18:00:00		65.1	
2020-03-02 12:00:00		65.1	
2020-03-02 06:00:00		65.1	
2020-03-01 22:30:00		65.1	
2020-03-01 18:00:00		65.1	
2020-03-01 12:00:00		65.1	
2020-03-01 06:00:00		65.1	
2020-02-28 22:30:00		65.1	
2020-02-28 18:00:00		65.1	
2020-02-28 12:00:00		65.1	
2020-02-28 06:00:00		65.1	
2020-02-27 22:30:00		65.1	
2020-02-27 18:00:00		65.1	
2020-02-27 12:00:00		65.1	
2020-02-27 06:00:00		65.1	



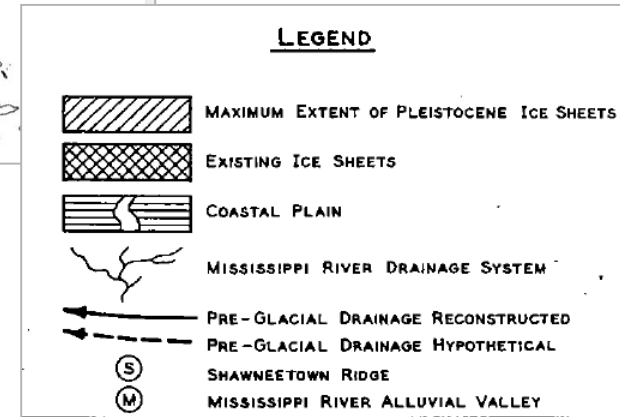
Explanation - Percentile classes							
<span style="color: red;">●</span>	<span style="color: red;">●</span>	<span style="color: orange;">●</span>	<span style="color: green;">●</span>	<span style="color: cyan;">●</span>	<span style="color: blue;">●</span>	<span style="color: black;">●</span>	<span style="color: white;">○</span>
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked



### Cretaceous Western Interior Seaway.

Colorado was covered by a shallow, temperate sea.

<https://pubs.usgs.gov/pp/1561/report.pdf>



Select a Water Resources Region.



## Hydrologic Units: HUCs



## Watershed Boundary Dataset

The [National Hydrography Dataset \(NHD\)](#), [Watershed Boundary Dataset \(WBD\)](#), and [NHDPlus High Resolution \(NHDPlus HR\)](#) are digital geospatial datasets that map and model the surface water of the United States.

The NHD represents the nation's drainage networks and related features, including rivers, streams, canals, lakes, ponds, glaciers, coastlines, dams, and streamgages. The [NHD](#), at 1:24,000 scale or better, is the most up-to-date and detailed hydrography dataset for the Nation. The [WBD](#) represents drainage areas of the country in eight nested levels.

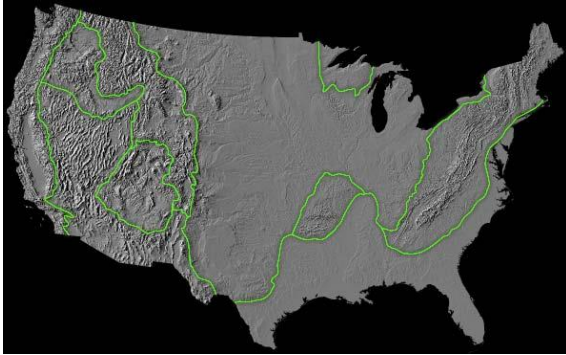
<https://www.usgs.gov/core-science-systems/ngp/national-hydrography>

Hydrologic Unit Codes (HUCs)

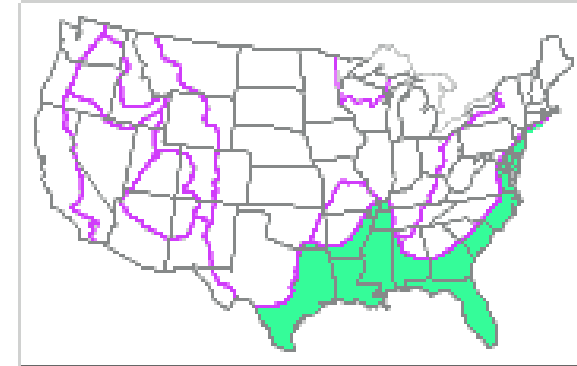
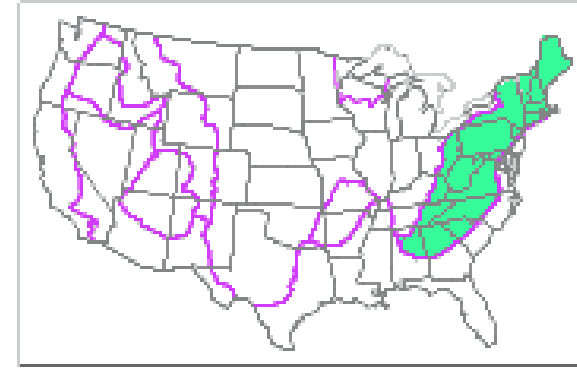
- [Region 01](#) New England
- [Region 02](#) Mid-Atlantic
- [Region 03](#) South Atlantic-Gulf
- [Region 04](#) Great Lakes
- [Region 05](#) Ohio
- [Region 06](#) Tennessee
- [Region 07](#) Upper Mississippi
- [Region 08](#) Lower Mississippi
- [Region 09](#) Souris-Red-Rainy
- [Region 10](#) Missouri
- [Region 11](#) Arkansas-White-Red
- [Region 12](#) Texas-Gulf
- [Region 13](#) Rio Grande
- [Region 14](#) Upper Colorado
- [Region 15](#) Lower Colorado
- [Region 16](#) Great Basin
- [Region 17](#) Pacific Northwest
- [Region 18](#) California
- [Region 19](#) Alaska (Old numbering system)
- [Region 20](#) Hawaii
- [Region 21](#) Caribbean



## Geologic Provinces



- 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>

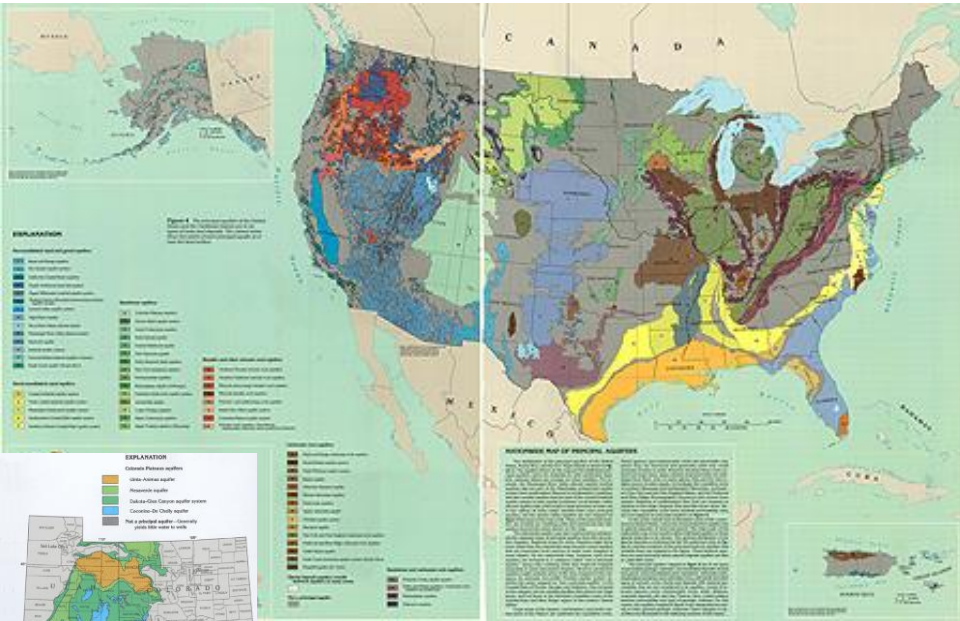
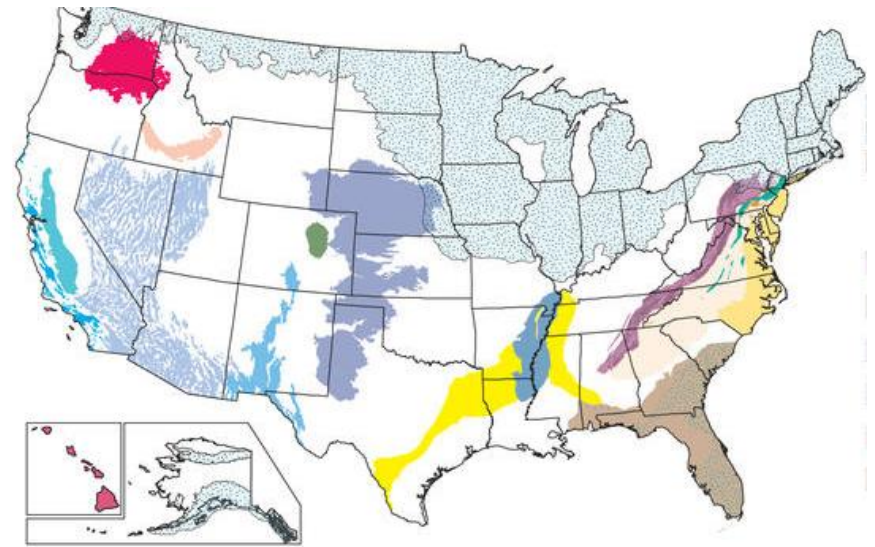


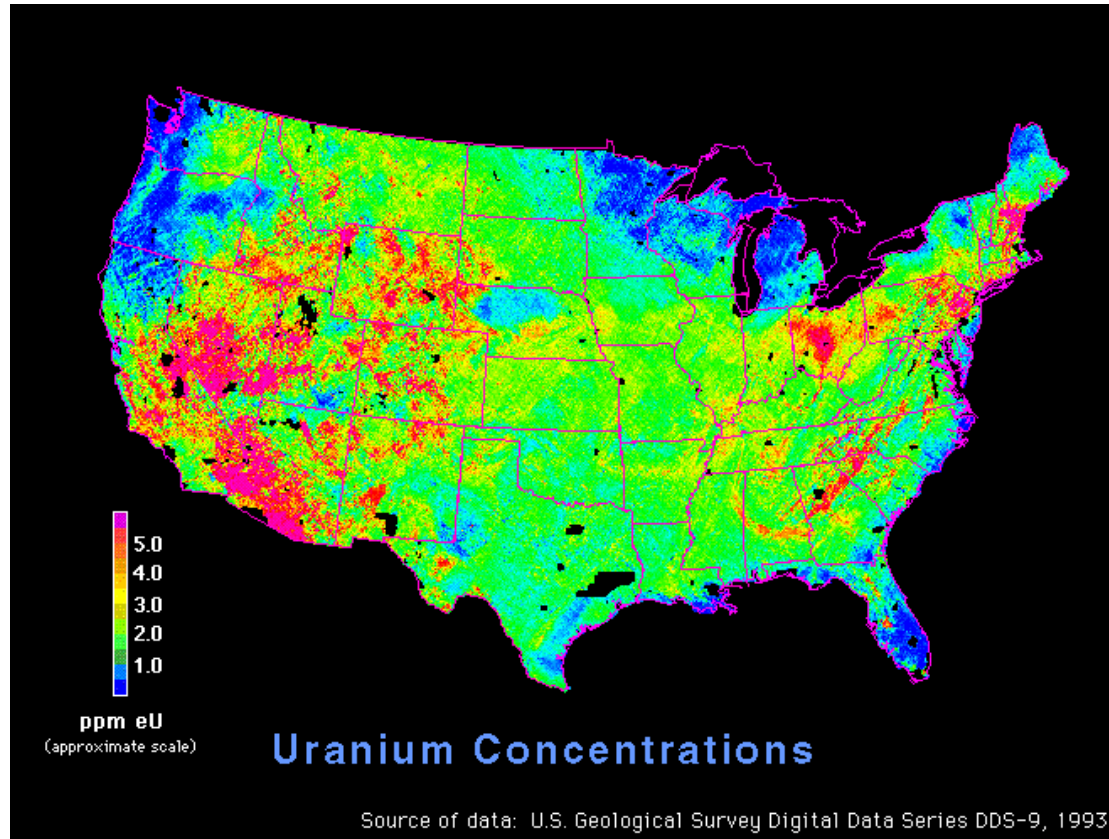
Figure 107. The Colorado Plateau is underlain by four principal aquifers. The principal aquifer beneath the uppermost carbonate aquifer is an artesian basin.

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



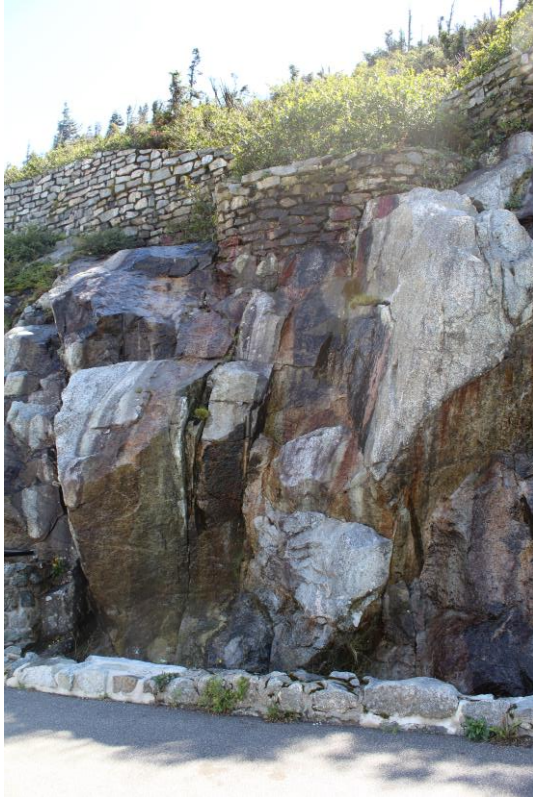
- High Plains aquifer—Circular 1337
- Glacial aquifer system—Circular 1352
- Northern Atlantic Coastal Plain surficial aquifer system—Circular 1353
- Piedmont, Blue Ridge, and Valley and Ridge aquifers—Circular 1354
- Piedmont and Blue Ridge carbonate-rock aquifers
- Piedmont and Blue Ridge crystalline-rock aquifers
- Valley and Ridge siliciclastic-rock aquifers
- Valley and Ridge carbonate-rock aquifers
- Early Mesozoic basin aquifers
- Upper Floridan aquifer and overlying surficial aquifers—Circular 1355
- Mississippi embayment—Texas coastal uplands aquifer system—Circular 1356
- Mississippi River Valley alluvial aquifer
- Denver Basin aquifer system—Circular 1357
- Southwest Principal Aquifers—Circular 1358
- California Coastal Basin aquifers
- Central Valley aquifer system
- Basin and Range basin-fill aquifers
- Rio Grande aquifer system
- Western Volcanics—Circular 1359
- Hawaiian volcanic-rock aquifers
- Snake River Plain basin-fill and basaltic-rock aquifers
- Columbia Plateau basin-fill and basaltic-rock aquifers

## Uranium-238 Concentrations across United States from NURE





## Groundwater at Atmospheric Station



Atmospheric Sciences Research Center (ASRC), of the State University of New York at Albany, was established on February 16, 1961 by the Board of Trustees of the State University of New York, as a SUNY system-wide resource for developing and administering programs in basic and applied sciences related to the atmospheric environment.

<https://www.albany.edu/asrc/indexmain.php>

**5<sup>th</sup> Highest Mountain in New York State**

[https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C31&q=Groundwater+adirondacks&btnG=&oq=Groundwater+Adironda](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C31&q=Groundwater+adirondacks&btnG=&oq=Groundwater+Adironda)

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 MR McHale, JJ McDonnell, MJ Mitchell. - Water Resources ... 2002 - Wiley Online Library  
 Nitrate (NO<sub>3</sub><sup>-</sup>) movement was studied using a combination of isotopic, chemical, and hydrologic data within the 135 ha Archer Creek watershed in the Adirondack Mountains of New York from January 1995 to December 1996. This research was conducted to identify ...

**Wetland nitrogen dynamics in an Adirondack forested watershed** [PDF] wiley.com  
 MR McHale, CP Cirino, MJ Mitchell. - Hydrological ... 2004 - Wiley Online Library  
 ... We examined the effect of two wetlands, one riparian peatland and one beaver meadow, on stream water N concentrations and flux in the Archer Creek watershed in the central Adirondack Mountains of New York State. Groundwater N dynamics were examined in the riparian ...

**Habitat suitability for brook trout (*Salvelinus fontinalis*) reproduction in Adirondack Lakes** [PDF] wiley.com  
 CL Schofield - Water Resources Research, 1993 - Wiley Online Library  
 ... Several management programs and experimental lim-ing studies in the Adirondacks [Kretser and Co ... Self-sustaining brook trout populations in Adirondack lakes generally spawn only in nearshore areas or tributary streams having well-defined groundwater seepage zones ...

**Neutralization of acidic groundwater inputs and control of metal mobility by near-shore adirondack lake sediment**  
 GC Schafraan, RV Ika - Water, Air, and Soil Pollution, 1991 - Springer  
 Biogeochemical processes contributing to the neutralization of acidic groundwater passing through near-shore sediments of an acidified lake (Dart's Lake) were investigated in a controlled laboratory experiment. Three intact sediment cores collected from the near-shore ...

**Dynamic temporal patterns of nearshore seepage flux in a headwater Adirondack lake**

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Cites/paper: 48.12	<input checked="" type="checkbox"/> 34	1.10	6	WW Staubitz, PJ Z...					
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g-index: 129	<input checked="" type="checkbox"/> 13	0.87	9	DR Warren, SD Se...					
hi_norm: 36	<input checked="" type="checkbox"/> 11	1.10	10	M O'Connor, M Z...					
hi_armed: 0.63	<input checked="" type="checkbox"/> h 104	3.47	11	DA Schaefer, CT D...					
Papers with ACC >= 1,2,5,10,20:	<input checked="" type="checkbox"/> h 215	6.14	12	CT Driscoll, RM N...					
153,98,32,11,2	<input checked="" type="checkbox"/> h 80	2.35	13	MP Anderson, CJ ...					
	<input checked="" type="checkbox"/> 55	1.83	14	C Wels, RJ Cornett...					
	<input checked="" type="checkbox"/> 35	3.50	15	MA Lavigne, MN...					
	<input checked="" type="checkbox"/> h 201	7.44	16	CT Driscoll, R Van ...					
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Where does water go ...	2003	Hydrological processes	Wiley Online Library
Chemical response of l...	2003		ACS Publications
Causes of concentrati...	1998	Water Resources Research	Wiley Online Library
Nitrogen saturation an...	2000	Ecological Applications	Wiley Online Library
Effects of acidic depos...	2003	Environmental Pollution	Elsevier
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Ecological communiti...	1990		dec.ny.gov
Recent advances in un...	1995	Reviews of Geophysics	Wiley Online Library
Vertical zonation of Sp...	1983	Canadian Journal of ...	NRC Research Press
Concentration and flu...	1987	Biogeochemistry	Springer
Contrasts between ma...	1998	Limnology and Oceanogr...	Wiley Online Library
Export mechanisms fo...	2004	Hydrological ...	Wiley Online Library
Interspecific competi...	1984	Nature	nature.com
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The microbial diversity...	2006	Current opinion in biotec...	Elsevier
A field-based study of ...	2002	Water Resources ...	Wiley Online Library
The challenge of acid r...	1988	Scientific American	JSTOR
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U.S. Geological Survey	Google Sc...	974	106654	711.03	154	273	111	0.74	88	01/2/2020	01/2/2020	0
soclow, the wedges	Google Sc...	48	4542	302.80	16	48	14	0.93	6	12/10/2019	12/10/2019	0
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Publication years: 1963-2020		Jl Drever	The geochemistry of natural waters	1988	1985	pdfs.semanticscholar.org	BOOK
Citation years: 57 (1963-2020)		CS Cronan, GR Aik...	Chemistry and transport of soluble sulfur substances in forested watersheds of the Adirondack Park, New...	2000	Geochimica et Cosmochi...	Elsevier	
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		CT Driscoll, R Van ...	Seasonal and long-term temporal patterns in the chemistry of Adirondack lakes	1990	Water, Air, and Soil Pollut...	Springer	
		C Reschke	Ecological communities of New York state	1990		dec.ny.gov	
		TC Winters	Recent advances in understanding the interaction of groundwater and surface water	1995	Reviews of Geophysics	Wiley Online Library	
		RE Andrus, DJ Wa...	Vertical zonation of Sphagnum mosses along hummock-hollow gradients	1983	Canadian Journal of ...	NRC Research Press	
		MD Rascher, CT D...	Concentration and flux of solutes from snow and forest floor during snowmelt in the West-Central Adiron...	1987	Biogeochemistry	Springer	

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A McEwen	2011	Adirondack Park Forest Preserve Carrying Capacity of Water Bodies Study: Phase 1-Selecting Indicators for Monitoring Recreational Impacts SUNY College of ... Added to Library: 05 Mar 2020 Last Updated: 05 Mar 2020 Online Link+ Go to URL
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Publication of an Organization Other than the U.S. Geological Survey

## Specific ultra-violet absorbance as an indicator measurement of mercury sources in an Adirondack River basin

Biogeochemistry  
By: Douglas A. Burns, George R. Aiken, Paul M. Bradley, Celeste A. Journey, and Jakob Schelker

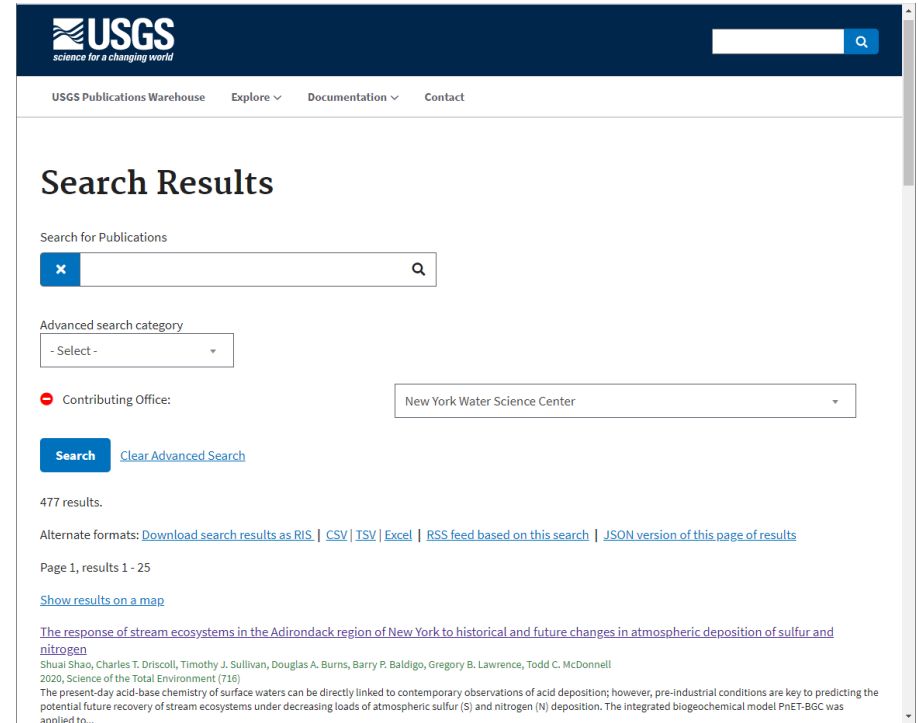
<https://doi.org/10.1007/s10533-012-9773-5>

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Contributing Office: New York Water Science Center

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[The response of stream ecosystems in the Adirondack region of New York to historical and future changes in atmospheric deposition of sulfur and nitrogen](#)

Shuai Shao, Charles T. Driscoll, Timothy J. Sullivan, Douglas A. Burns, Barry P. Baldigo, Gregory B. Lawrence, Todd C. McDonnell  
2020, Science of the Total Environment (718)

The present-day acid-base chemistry of surface waters can be directly linked to contemporary observations of acid deposition; however, pre-industrial conditions are key to predicting the potential future recovery of stream ecosystems under decreasing loads of atmospheric sulfur (S) and nitrogen (N) deposition. The integrated biogeochemical model PnET-BGC was applied to...

<https://pubs.er.usgs.gov/search?q=&contributingOffice=New+York+Water+Science+Center>

The screenshot shows the USGS New York Water Science Center website. The header includes the USGS logo and navigation links: SCIENCE, PRODUCTS, NEWS, CONNECT, ABOUT. A search bar is present. The main content area features a large image of a water treatment facility with the text "Groundwater and Streamflow Information" and "Surface-water Monitoring, Groundwater monitoring, and Flood Hazards". Below this is a "HOME" section with a "Home" heading and a paragraph describing the center's mission. A sidebar on the left lists navigation options: SCIENCE, DATA AND TOOLS, MAPS, PUBLICATIONS, NEWS, SOFTWARE, and MULTIMEDIA. At the bottom, there are links for "Current Water Conditions", "Science", and "NY WSC Quick Links".

<https://www.usgs.gov/centers/ny-water>

The screenshot shows a USGS news article page. The header includes the USGS logo and navigation links: SCIENCE, PRODUCTS, NEWS, CONNECT, ABOUT. A search bar is present. The main content area features a large image of a flooded road with the text "Record and Major flooding in parts of the Southern Adirondacks and northern Mohawk Valley October 31-November 1, 2019". Below this is a "Release Date: NOVEMBER 1, 2019" section with a "Summary of Event Impact:" and "Event Information:" section. A "Contacts" section lists Gerard Butch, Associate Director for Data, with his email and phone number.

<https://www.usgs.gov/center-news/record-and-major-flooding-parts-southern-adirondacks-and-northern-mohawk-valley-october>

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## New York Water Science Center

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- [Friends of Georgia Pond Foundation](#)
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**National Water Information System: Web Interface**

USGS Water Resources | Data Category: Current Conditions | Geographic Area: New Jersey | GO

Click to hide News Bulletins

- Introducing The Next Generation of USGS Water Data for the Nation
- Full News

Click to hide state-specific text

**ALL DATA ARE AT LOCAL TIME**

**Current Conditions for New Jersey: Weather -- 96 site(s) found**

PROVISIONAL DATA SUBJECT TO REVISION

Predefined displays: New Jersey Weather Table | Group table by: Major River Basin | Select sites by number or name: go | show sites on a map

[Customize table to display other current-condition parameters](#)

Station Number	Station name	Date/Time	Precipitation in inches during the previous			
			1 hour	4 hours	24 hours	7 days
<b>Passaic Hackensack and Wallkill River Basins</b>						
<a href="#">01367715</a>	Wallkill R at Scott Road at Franklin NJ	03/05 08:00 EST				
<a href="#">01380450</a>	Rockaway River at Main Street at Boonton NJ	03/05 07:00 EST				
<a href="#">01390450</a>	Saddle River at Upper Saddle River NJ	03/05 08:00 EST				
<a href="#">404217074294701</a>	Basking Ridge USGS unheated rain gage NJ	03/05 07:45 EST	0	0	0	0.32
<a href="#">404440074211301</a>	Canoe Brook USGS heated rain gage NJ	03/05 08:15 EST	0	0	0	--
<a href="#">404751074250601</a>	Morristown USGS unheated rain gage NJ	03/05 07:45 EST	0	0	0	0.28
<a href="#">404955074171101</a>	Essex Fells USGS unheated rain gage NJ	03/05 07:45 EST	0	0	0	0.28
<a href="#">405002074310001</a>	Morris Plains USGS unheated rain gage NJ	03/05 07:45 EST	0	0	0	0.40
<a href="#">405037074140501</a>	Verona USGS unheated rain gage NJ	03/05 07:45 EST	0	0	0	0.28
<a href="#">405219074132001</a>	Little Falls USGS unheated rain gage NJ	03/05 07:45 EST	0	0	0	0.30
<a href="#">405236074051801</a>	Lodi USGS unheated rain gage NJ	03/05 07:45 EST	0	0	0	--
<a href="#">405305074105401</a>	Garrett Mountain USGS unheated rain gage NJ	03/05 07:45 EST	0	0	0	0.24

**USGS** science for a changing world

**National Water Information System: Web Interface**

USGS Water Resources | Data Category: Current Conditions | Geographic Area: New Jersey | GO

Click to hide News Bulletins

- Introducing The Next Generation of USGS Water Data for the Nation
- Full News

Click to hide state-specific text

**ALL DATA ARE AT LOCAL TIME**

**\* IMPORTANT: Next Generation Station Page**

**USGS 404751074250601 Morristown USGS unheated rain gage NJ**

PROVISIONAL DATA SUBJECT TO REVISION

Available data for this site | Time-series: Current/Historical Observations | GO

Click to hide station-specific text

Funding for this site is provided by:

U.S. Army Corps of Engineers - New York District, CENAN-OP

**SURFACE-WATER RECORDS**

**LOCATION.**--Lat 40°47'48", long 74°25'14" referenced to North American Datum of 1983, Hanover Township, Morris County, NJ, Hydrologic Unit 02030103,

**The 15-minute precipitation data for this station are temporary** and will only be displayed for 120 days. Although the instrumentation is calibrated at least once/year, the temporary classification means that documented routine inspections and other quality assurance measures are not performed that would make the data acceptable for archival, retrieval, or future use in general scientific or

[https://waterdata.usgs.gov/nj/nwis/uv/?site\\_no=404751074250601&PARAMeter\\_cd=00045,00021,00052,00035,61728,00036](https://waterdata.usgs.gov/nj/nwis/uv/?site_no=404751074250601&PARAMeter_cd=00045,00021,00052,00035,61728,00036)

## “Emily the Uranium Librarian”

**Geohydrologic data for a low-level radioactive contamination site, Wood River Junction, Rhode Island**

Open-File Report 84-725 **By:** Barbara J. Ryan <https://pubs.er.usgs.gov/publication/ofr84725>

**Low-level radioactive ground-water contamination from a cold scrap recovery operation, Wood River Junction, Rhode Island** Open-File Report 84-66 **By:** B.J. Ryan and K.L. Kipp

<https://pubs.er.usgs.gov/publication/ofr8466>

**[Tragic Death Gives Way to Environmental Rebirth](#)** [January 06, 2016](#)

“WOOD RIVER JUNCTION, R.I. — Fifty-two years ago this July an explosion rocked this rural village and devastated a local family.

On July 24, 1964, a [criticality accident](#) occurred at the United Nuclear Corp.’s fuels recovery plant, killing a 37-year-old production technician. On the evening of the accident, Robert Peabody was reportedly pouring what he thought was a bottle of trichloroethylene, to remove organics, into a mechanical mixer when he saw a blue flash. He had accidentally poured a concentrated uranium solution into the mixer, which contained sodium carbonate, resulting in a critical nuclear reaction.

With so much uranium in one container, it reached critical mass and reacted, knocking Peabody to the floor, splashing him with radioactive liquid and exposing him to a fatal radiation dose of 10,000 rads (1 rad equals 0.01) — 1,000 times the lethal dose and the equivalent of 700,000 chest X-rays. Peabody, bombarded by neutrons and gamma rays, had been exposed to more radiation than anyone outside of Hiroshima or Nagasaki, Japan, two decades earlier.

Peabody died two days later. His wife and their nine children were left with a small cash settlement. The accident was blamed on a combination of factors, including incorrect procedures approved by supervisors. The **Atomic Energy Commission** eventually charged United Nuclear Corp. with 14 violations of nuclear-safety regulations, eight directly involved in Peabody’s accident, but no fines were ever imposed.”

**2013- BACK TO THE FUTURE:  
URANIUM INFORMATION AT THE  
USGS DENVER LIBRARY**

<https://gsa.confex.com/gsa/2013AM/webprogram/Paper225430.html>

**2013- THE PAST IS THE KEY TO THE  
FUTURE: URANIUM RESEARCH AT  
THE USGS DENVER LIBRARY**

<https://gsa.confex.com/gsa/2013AM/webprogram/Paper222073.html>

**2012 - Critical analysis of world  
uranium resources**

<https://pubs.er.usgs.gov/publication/sir20125239>

**2011 - Review and Interpretation of  
Previous Work and New Data on the  
Hydrogeology of the Schwartzwalder  
Uranium Mine and Vicinity, Jefferson  
County, Colorado**

<https://pubs.usgs.gov/of/2011/1092/>

1992-1995: Working for the Geology Department  
Teaching Assistant for Mineralogy



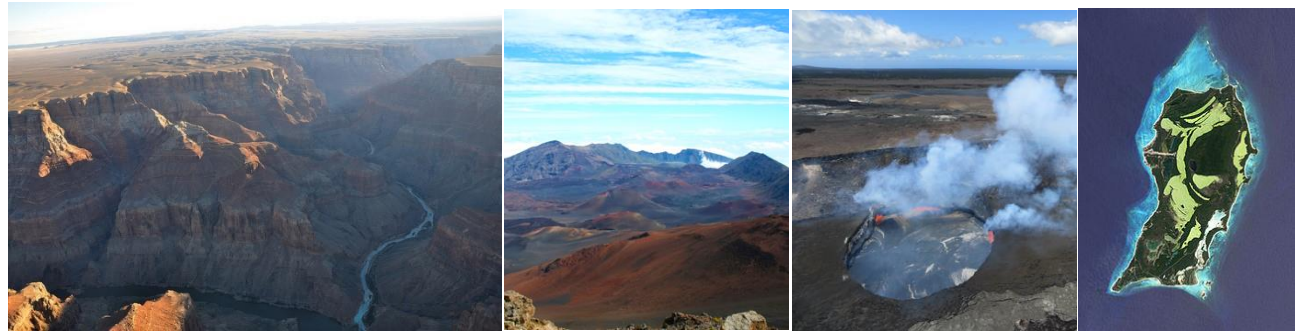
Geology Tutor: GeoRef and study sessions in the Stevens-German Library

Research Assistant for Structural Geology projects and “The Catskill Geologist”  
<https://thecatskillgeologist.com/> “I will never kick a rock”

Summer 1995: Reference & Archives at Hartwick College Stevens-German Library

Geologic Mapping in:

- New York
- Pennsylvania
- Vermont
- Tucson, AZ (1992)
- Grand Canyon (1992)
- Hawai'i (1993)
- San Salvador, Bahamas (1994)





### 1996-1998: Hydrologist

Vermont Bridge Scour

Floods/Hurricanes in New Hampshire & Vermont

Water Quality projects for EPA

Literature reviews for:  
Fractured Bedrock  
NAWQA New England  
Mirror Lake, NH



April 5, 1987

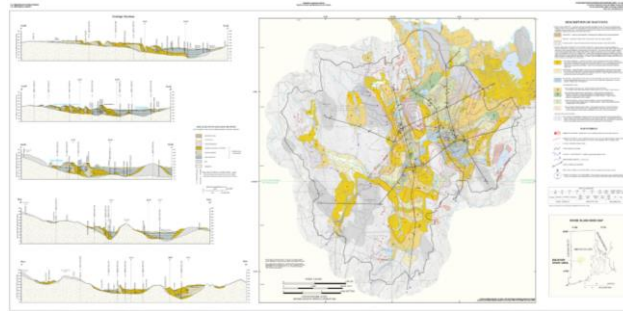
### 1998-2008: Hydrologist

Massachusetts & Rhode Island  
Water Use & Availability  
- “Emily Law” in Rhode Island

Floods/Hurricanes in Massachusetts  
& Rhode Island

Water-Quality United States

Groundwater Research & Database  
Administrator (GWSI)



### 2008-2018: Librarian & Physical Scientist

Minerals/Mining: US and Worldwide

Oil & Gas: US and Worldwide

Uranium Resources: US & Worldwide

Geology, Geophysics, and Geochemistry

Water, Earthquakes, etc... US & Worldwide



# My Bibliography = Over 70 Citations - I know what I published : )

## [On-line access to geoscience bibliographic citations](#)

Emily C. Wild

2012, EXPLORE: Newsletter for the Association of Applied Geochemists (155) 1-5

On-line geoscience bibliographic citations and access points to citations are exponentially increasing as commercial, non-profit, and government agencies worldwide publish materials electronically. On-line bibliographic tools capture cited works, and open access content allows for freely obtained citations and documents. For this newsletter, citations from the numerous journals and books listed...

## [Review and interpretation of previous work and new data on the hydrogeology of the Schwartzwalder Uranium Mine and vicinity, Jefferson County, Colorado](#)

Jonathan S. Caine, Raymond H. Johnson, Emily C. Wild

2011, Open-File Report 2011-1092

The Schwartzwalder deposit is the largest known vein type uranium deposit in the United States. Located about eight miles northwest of Golden, Colorado it occurs in Proterozoic metamorphic rocks and was formed by hydrothermal fluid flow, mineralization, and deformation during the Laramide Orogeny. A complex brittle fault zone hosts the...

## [Estimated water use and availability in the East Narragansett Bay study area, Rhode Island, 1995-99](#)

Emily C. Wild

2007, Scientific Investigations Report 2007-5168

Water availability became a concern in Rhode Island during a drought in 1999, and further investigation was needed to assess the current demands on the hydrologic system from withdrawals during periods of little to no precipitation. The low ground-water levels and streamflows measured in Rhode Island prompted initiation of a...

## [Estimated water use and availability in the Pawtuxet and Quinebaug River basins, Rhode Island, 1995-99](#)

Emily C. Wild, Mark T. Nimiroski

2007, Scientific Investigations Report 2006-5154

Water availability became a concern in Rhode Island during a drought in 1999, and an investigation was needed to assess demands on the hydrologic system from withdrawals during periods of little to no precipitation. The low water levels during the drought prompted the U.S. Geological Survey and the Rhode Island...

## Emily's search:

<https://pubs.er.usgs.gov/search?q=%22emily+c+wild%22>

64 Citations, USGS Publications Catalog

Emily C Wild - Google Scholar Citations

scholar.google.com/citations?user=5aqY2RwAAAAJ&hl=en&oi=ao

Google Scholar

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Help colleagues find you. **ADD**

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Emily C Wild  
Princeton University  
Verified email at princeton.edu

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	All	Since 2014
Citations	32	11
h-index	3	2
i10-index	1	0

**CITED BY**

TITLE	CITED BY	YEAR
<input type="checkbox"/> Bibliography on the Occurrence and Intrusion of Saltwater in Aquifers along the Atlantic Coast of the United States PM Barlow, EC Wild US Department of the Interior, US Geological Survey	13	2002
<input type="checkbox"/> Review and interpretation of previous work and new data on the hydrogeology of the Schwartzwalder Uranium Mine and vicinity, Jefferson County, Colorado JS Caine, RH Johnson, EC Wild Open-File Report	6	2011

Co-authors **EDIT**

Bar chart showing citations from 2011 to 2018:

Year	Citations
2011	6
2012	0
2013	13
2014	0
2015	0
2016	0
2017	0
2018	11

## Emily's search:

<https://scholar.google.com/citations?user=5aqY2RwAAAAJ&hl=en&oi=ao>

32 Citations, Google Scholar

## Favorite Projects



### Vermont Bridge Scour:

<https://pubs.er.usgs.gov/search?q=vermont+bridge+scour+emily>

54 Published Reports (WSPRO models)

A screenshot of a WorldCat search results page. The search query is 'ti:vermont au:wild, emily c'. The results show three items, all of which are 'Level II scour analysis' reports. The first item is for bridge 37 on Town Highway 12, crossing Ridley Brook, Duxbury, Vermont, by Emily C Wild and Michael A Ivanoff, published in 1997. The second item is for bridge 8 on Town Highway 1, crossing Wardsboro Brook, Newfane, Vermont, by Emily C Wild and James R Degnan, published in 1998. The third item is for bridge 44 on Town Highway 33, crossing the New Haven River, Lincoln, Vermont, by Ronda L Burns and Emily C Wild, published in 1993. The page also shows search filters for format (All Formats, Print book) and refine your search options (Author, Year, Language).

<https://www.worldcat.org/search?q=ti%3Avermont+au%3Awild%2C+emily+c&qt=advanced&dblist=638>

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[PDF] Theories for **sustainable futures** [PDF] jstor.org  
CS Holling - *Conservation ecology*, 2000 - JSTOR  
Sustainable designs driven by conservation interests often ignore the needs for an adaptive form of economic development that emphasizes human economic enterprise and institutional flexibility. Those driven by economic and industrial interests often act as if the ...  
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Photovoltaics—a path to **sustainable futures** [PDF] archives-ouvertes.fr  
JM Pearce - *Futures*, 2002 - Elsevier  
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Renewable energy and **sustainable futures**  
D Elliott - *Futures*, 2000 - Elsevier  
The development of renewable energy technology is now widely seen as important if the world is to move towards a sustainable approach to energy generation. However, there are a range of obstacles facing the rapid development of these technologies: they are trying to ...  
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**Sustainable futures: policies for global development** [PDF] cepal.org  
BB Hughes, PD Johnston - *Futures*, 2005 - Elsevier  
Global sustainable development is the overarching challenge for social and economic policy today. The paper elaborates the concept of sustainable development, identifies some of the levers and policies that might help attain it, describes a modeling system used for analysis ...  
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Transcript (250,999)  
Report (196,413)  
Book / eBook (36,628)  
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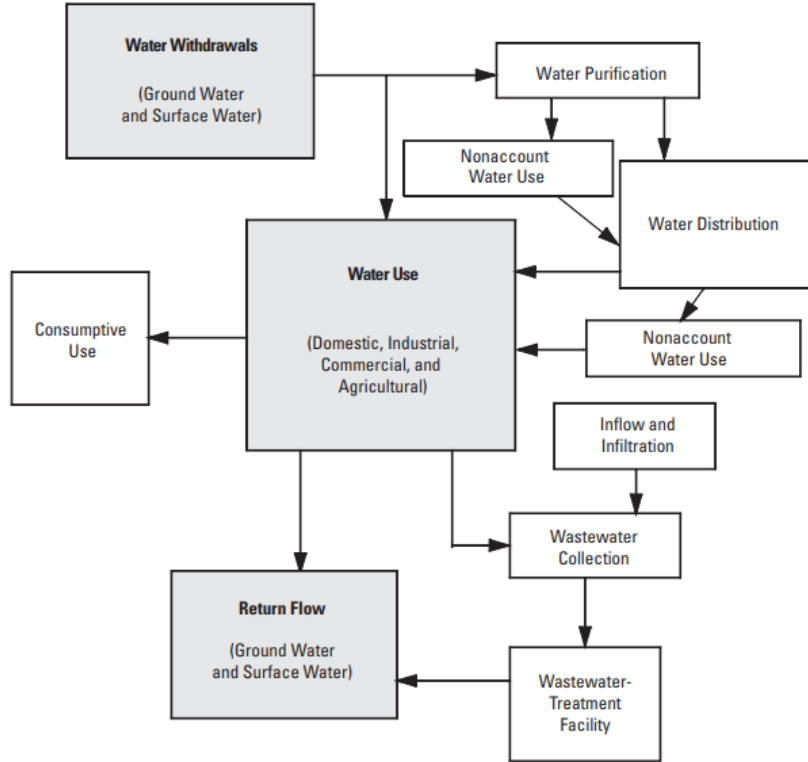
economics (172,595)  
engineering (154,421)  
business (128,427)  
environmental sciences (67,729)  
agriculture (59,401)

1 online 4th Generation District Heating (4GDH): Integrating smart thermal grids into future sustainable energy...  
by Lund, Henrik; Werner, Sven; Wiltshire, Robin; More...  
Energy, 2014, Volume 68  
... The motive is to identify the future challenges of reaching a future renewable non-fossil heat supply as part of the implementation of overall sustainable energy systems...  
Journal article: Full Text Online  
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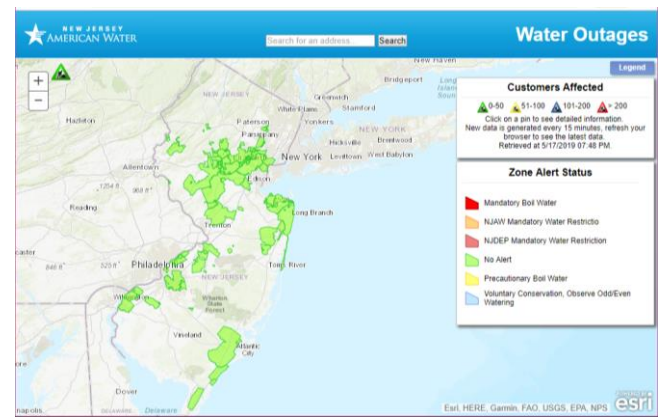
2 online Designing bimetallic catalysts for a green and sustainable future  
by Sankar, Meenakshisundaram; Dimitratos, Nikolaos; Miedziak, Peter J.; More...  
Chemical Society reviews, 12/2012, Volume 41, Issue 24  
This Critical Review provides an overview of the recent developments in the synthesis and characterization of bimetallic nanoparticles. Initially the review...  
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# Water Quantity & Quality



<https://pubs.usgs.gov/sir/2007/5168/pdf/sir2007-5168.pdf>



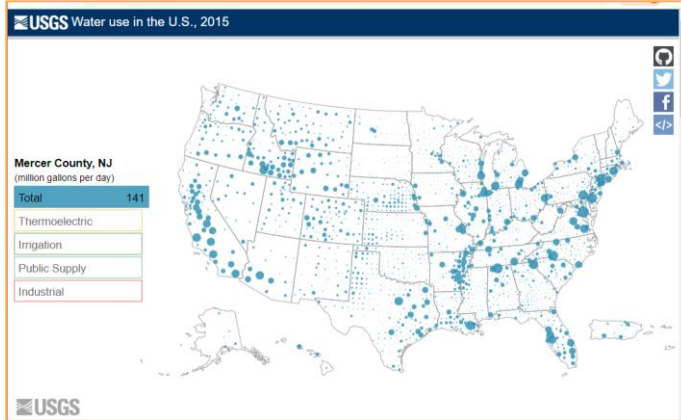
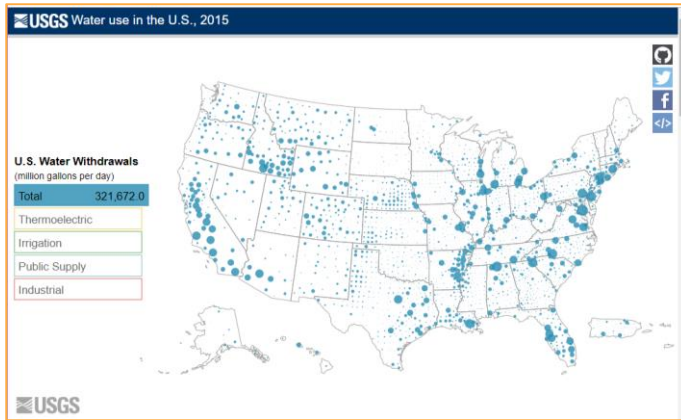
<https://wateroutages.amwater.com/>



<https://amwater.com/njaw/water-quality/water-treatment>

# Water Use in the United States, 2015

[https://www.usgs.gov/mission-areas/water-resources/science/water-use-united-states?qt-science\\_center\\_objects=0#qt-science\\_center\\_objects](https://www.usgs.gov/mission-areas/water-resources/science/water-use-united-states?qt-science_center_objects=0#qt-science_center_objects)



**Aquaculture, mining, self-supplied domestic, and livestock water uses** are distributed unevenly across the U.S. There are large withdrawals for aquaculture along the Snake River in southern Idaho.

**Industrial withdrawals** are driven by many factors. Historically, steel production developed in areas with access to large amounts of water, good transportation, and ore and coal deposits. Lake County, Indiana, on Lake Michigan, accounts for 8% of the U.S. industrial water withdrawals, largely for steel production.

**Thermoelectric power plants** use steam to drive turbines and generate electricity. In the **eastern U.S.**, where water is relatively abundant, large volumes of water often are withdrawn, used once for cooling, then returned to the source a little warmer than before. In the **western U.S.**, cooling water is more often withdrawn and recirculated many times, so less is withdrawn overall.

**Irrigation** occurs in most areas of the country, but is larger in areas where rainfall is insufficient to meet crop needs, such as in the **drier parts of the West**.

**Irrigation in eastern Arkansas** provides water to flood rice fields as well as supplement rainfall to other crops.

**Public Supply** water withdrawals, mostly for domestic use, are generally highest in counties with large numbers of people.

Larger withdrawals in Alaska in the "other" categories are for **aquaculture and mining**.

**Industrial withdrawals** for the chemical and petroleum industries occur along the Gulf Coast.

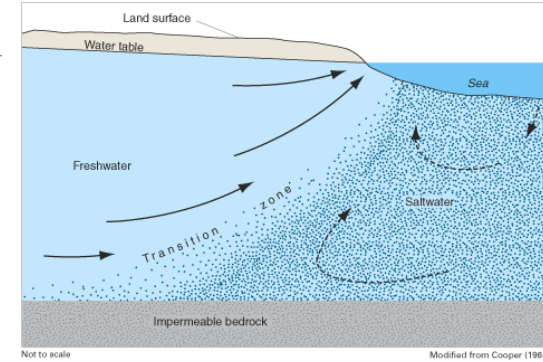
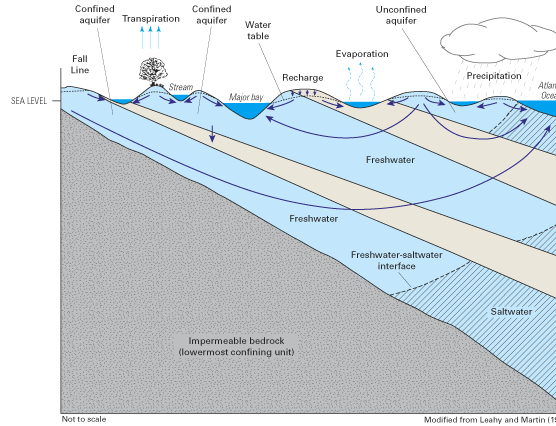


# Water Quantity & Quality



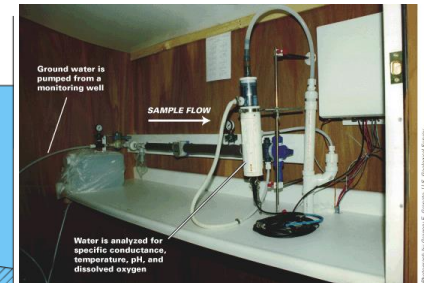
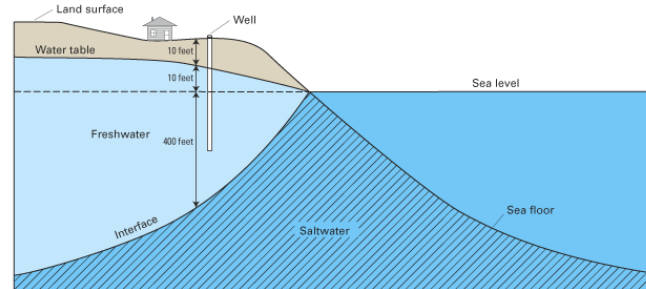
## Bibliography on the Occurrence and Intrusion of Saltwater in Aquifers along the Atlantic Coast of the United States

<https://pubs.usgs.gov/of/2002/ofr02235/>



**EXPLANATION**  
■ Aquifer  
■ Confining unit  
 → Ground-water flow paths—  
 Shows general direction of ground-water flow

<https://pubs.usgs.gov/circ/2003/circ1262/>



Robowell



Science & Technology Libraries



ISSN: 0194-262X (Print) 1541-1109 (Online) journal homepage: <https://www.tandfonline.com/loi/wst20>

### Online Bibliographic Sources in Hydrology

Emily C. Wild & W. Michael Havener

To cite this article: Emily C. Wild & W. Michael Havener (2001) Online Bibliographic Sources in Hydrology, Science & Technology Libraries, 21:3-4, 63-86, DOI: 10.1300/J122v21n03\_05

To link to this article: [https://doi.org/10.1300/J122v21n03\\_05](https://doi.org/10.1300/J122v21n03_05)

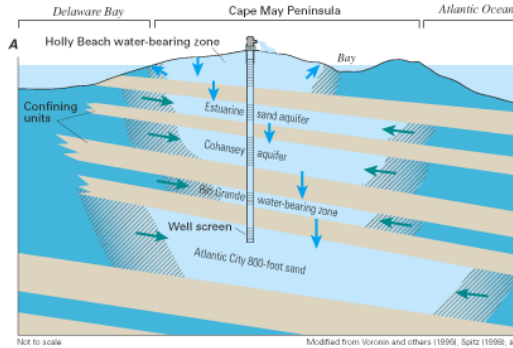
[https://www.tandfonline.com/doi/abs/10.1300/J122v21n03\\_05](https://www.tandfonline.com/doi/abs/10.1300/J122v21n03_05)

## Ground Water in Freshwater-Saltwater Environments of the Atlantic Coast

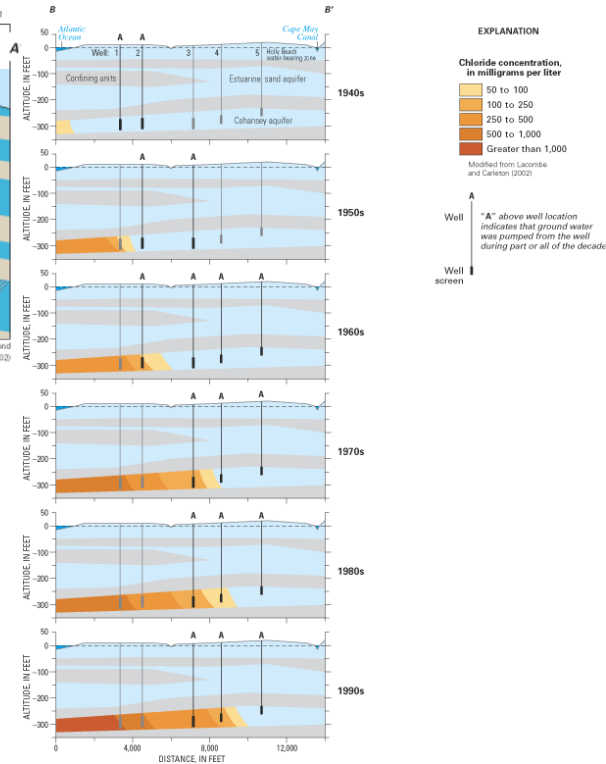
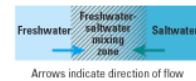
### Development of a Desalination System in Response to Saltwater Intrusion, Cape May City, New Jersey



Base from U.S. Geological Survey digital data, 1:100,000, 1983. Universal Transverse Mercator Projection, zone 18. Modified from Lacombe and Carleton (2002)

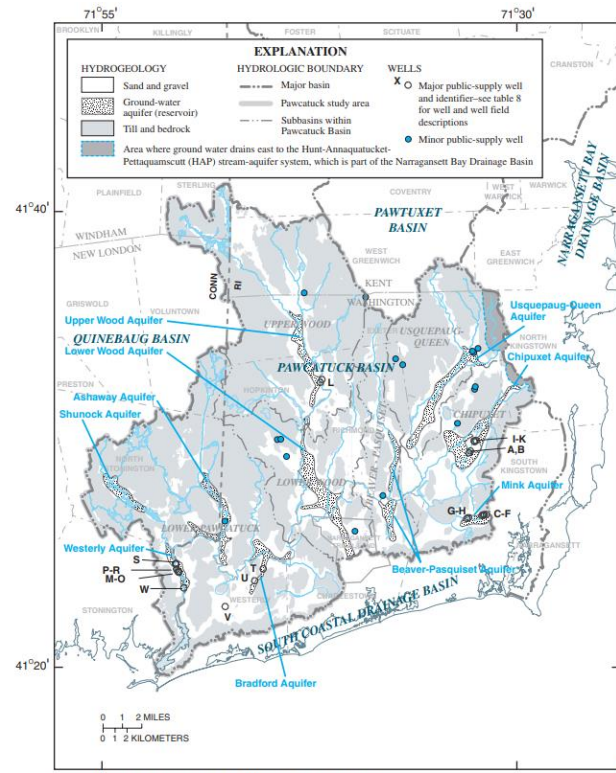
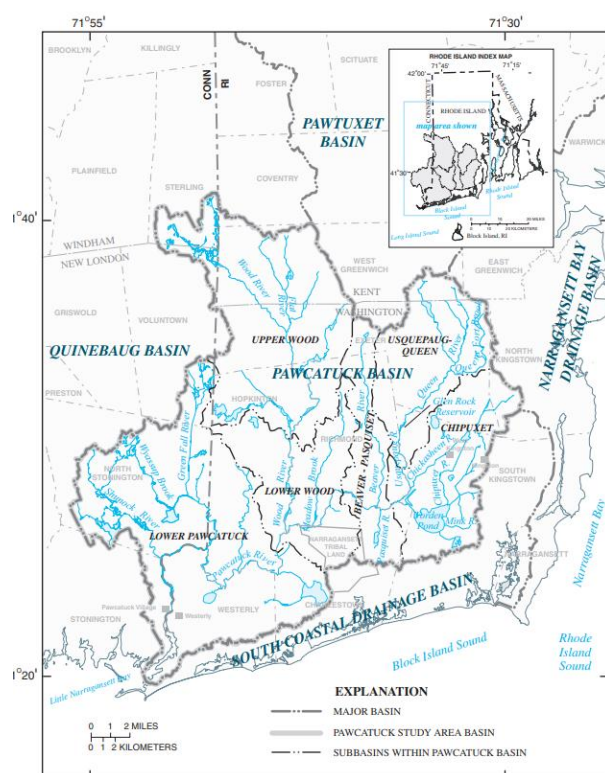


**EXPLANATION**



# State of Rhode Island and Providence Plantations

<https://pubs.usgs.gov/sir/2004/5020/>



**USGS**  
science for a changing world

In cooperation with the Rhode Island Water Resources Board

## Estimated Water Use and Availability in the Pawtucket Basin, Southern Rhode Island and Southeastern Connecticut, 1995–99

Scientific Investigations Report 2004-5020

U.S. Department of the Interior  
U.S. Geological Survey

Base from U.S. Geological Survey, Connecticut MAGIC, and Rhode Island GIS data sets  
Rhode Island state plane, 5176 fipzone  
Horizontal datum is NAD 83  
Source map scale 1:300,000

Base from U.S. Geological Survey, Connecticut MAGIC, and Rhode Island GIS data sets  
Rhode Island state plane, 5176 fipzone  
Horizontal datum is NAD 83  
Source map scale 1:300,000



# Water Use and Availability in Rhode Island

Wild, E.C., 2007, Estimated water use and availability in the East Narragansett Bay study area: U.S. Geological Survey Scientific Investigations Report 2007-5168, 51 p. <http://pubs.usgs.gov/sir/2007/5168/>

Wild, E.C., and Nimiroski, M.T., 2007, Estimated water use and availability in the Pawtuxet and Quinebaug River Basins, Rhode Island, 1995-99: U.S. Geological Survey Scientific Investigations Report 2006-5154, 68 p. <http://pubs.usgs.gov/sir/2006/5154/>

Wild, E.C., and Nimiroski, M.T., 2005, Estimated water use and availability in the South Coastal Drainage Basin, Southern Rhode Island, 1995-99: U.S. Geological Survey Scientific Investigations Report 2004-5288, 46 p. <https://pubs.usgs.gov/sir/2004/5288/>

Wild, E.C., and Nimiroski, M.T., 2004, Estimated water use and availability in the Pawcatuck Basin, southern Rhode Island and southeastern Connecticut, 1995-99: U.S. Geological Survey Scientific Investigations Report 2004-5020, 80 p. <http://pubs.usgs.gov/sir/2004/5020/>

Nimiroski, M.T., and Wild, E.C. Water use and availability in the West Narragansett Bay Area, coastal Rhode Island 1995-99: Scientific Investigations Report 2005-5256, 54 p. <https://pubs.usgs.gov/sir/2005/5256/>

Nimiroski, M.T., and Wild, E.C., 2005, Water use and availability in the Woonasquatucket and Moshassuck River Basins, north-central Rhode Island: U.S. Geological Survey Scientific Investigations Report 2005-5031, 44 p. <https://pubs.usgs.gov/sir/2005/5031/>

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

*“The Emily Law”*

RI Water Resources Board

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Statutes

*Water Use and Efficiency Act*

- § 46-15.8-1 Short title
- § 46-15.8-2 Legislative findings
- § 46-15.8-3 Purposes
- § 46-15.8-4 Duties of water suppliers
- § 46-15.8-5 Duties of state agencies

Statutes

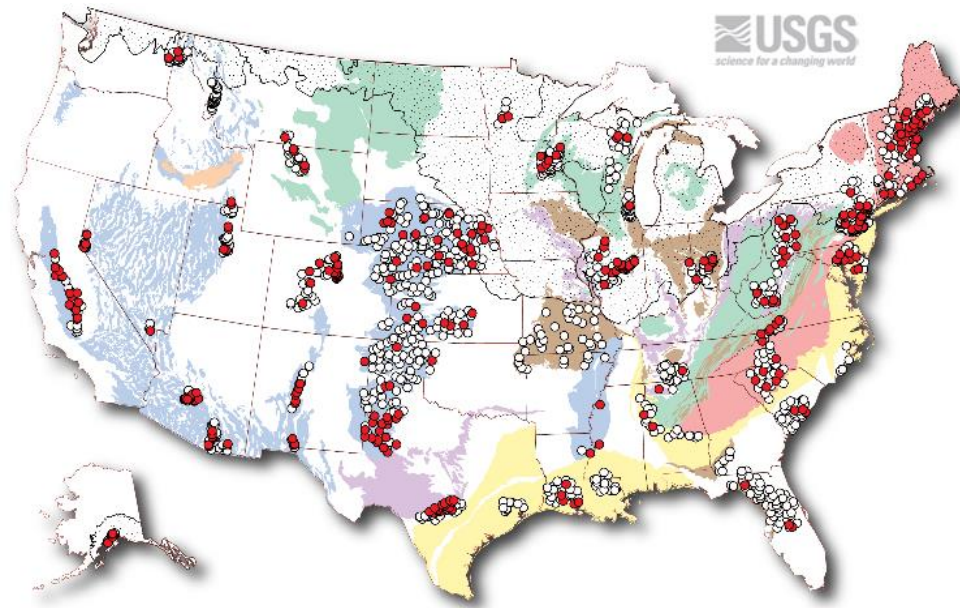
- Protection and Use of the State's Waters
- Water Allocation
- Water Use and Efficiency Act
- WSSMP
- BCWA
- Strategic Planning
- Water Supply Development

Rules

- WSSMP
- WUEA
- WFAFP
- Open Records

<http://webserver.rilin.state.ri.us/Statutes/TITLE46/46-15.8/INDEX.HTM>

## Domestic (Private) Well Water Quality



### EXPLANATION

- At least one contaminant concentration greater than a human-health benchmark
- No contaminant concentration greater than a human-health benchmark

### Health-Based Screening Levels for Evaluating Water-Quality Data

## Water Quality of Domestic Wells: (1991-2004)

In a [study of 2,100 domestic wells](#), water pumped from about one in five wells contained one or more contaminants at a concentration greater than a human-health benchmark for drinking water.

- The contaminants most often found at these elevated concentrations were inorganic chemicals, such as [metals](#), [radionuclides](#), and [nitrate](#); all of these but nitrate are derived primarily from natural sources.
- Man-made organic compounds, such as [pesticides](#) and [solvents](#), were detected in more than half (60 percent) of the domestic wells sampled, but concentrations were seldom greater than human-health benchmarks (less than 1 percent of wells).
- About half of the wells had at least one “nuisance” contaminant—a compound that impairs [taste, odor, or other aesthetic considerations](#)—at a level or concentration outside the range of values recommended by the U.S. Environmental Protection Agency.
- Microbial contaminants (for example, bacteria) were detected in about one-third of the approximately 400 wells that had their water analyzed for those contaminants.
- Contaminants found in domestic wells usually co-occurred with other contaminants as mixtures, rather than alone, which is a potential concern because the total toxicity of a mixture can be greater than that of any single contaminant.

## New Jersey Water: PFAS

### New Jersey sues DuPont, 3M over toxic firefighting foam

[https://www.nj.gov/oag/newsreleases19/AFFF\\_Complaint.pdf](https://www.nj.gov/oag/newsreleases19/AFFF_Complaint.pdf)

May 14, 2019

### NRDC Advises Tougher Standards for PFAS in NJ Drinking Water, May 15, 2019

<https://www.nrdc.org/experts/kimberly-ong/nrdc-advises-tougher-standards-pfas-nj-drinking-water>

### USGS : Per- and Polyfluoroalkyl Substances (PFASs) detected in Source Waters and Treated Public Water Supplies

[https://www.usgs.gov/mission-areas/environmental-health/science/and-polyfluoroalkyl-substances-pfass-detected-source?qt-science\\_center\\_objects=0#qt-science\\_center\\_objects](https://www.usgs.gov/mission-areas/environmental-health/science/and-polyfluoroalkyl-substances-pfass-detected-source?qt-science_center_objects=0#qt-science_center_objects)

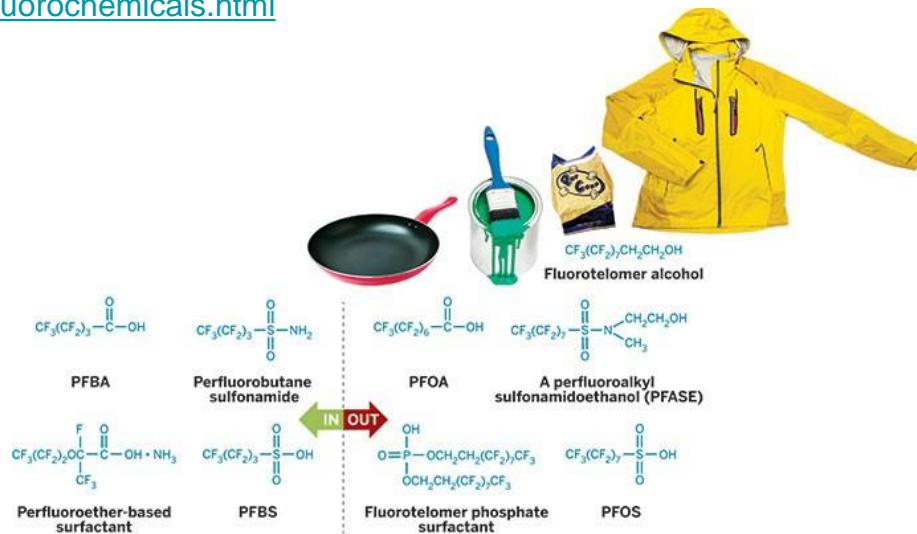
### How to say goodbye to PFAS

Researchers call for phaseout of fluorochemicals based on health, safety, and societal need

<https://cen.acs.org/environment/persistent-pollutants/say-goodbye-PFAS/97/i46>

### The Shrinking Case For Fluorochemicals

As the long-alkyl-chain fluorocarbons found in many household products are replaced with short-chain ones, debate over safety continues <https://cen.acs.org/articles/93/i28/Shrinking-Case-Fluorochemicals.html>





# Water Quality Investigation

## Accident Description

**Accident:** Freedom Industries Chemical Release

**Location:** Location: Charleston, WV

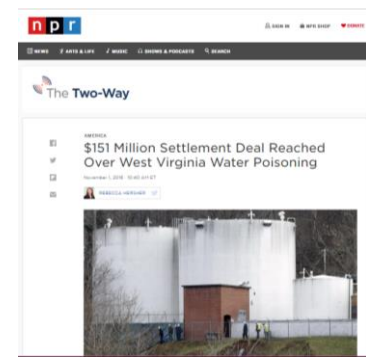
**Accident Occurred On:** 01/09/2014 | **Final Report Released On:** 05/11/2017

**Accident Type:** Release

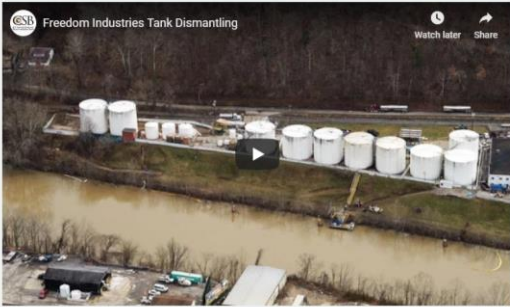
**Investigation Status:** The CSB's final investigation report was released on 5.11.2017

A leak originating from a storage tank at Freedom Industries contaminated the local water supply leaving hundreds of thousands of West Virginia residents without clean drinking water.

<https://www.csb.gov/freedom-industries-chemical-release/>

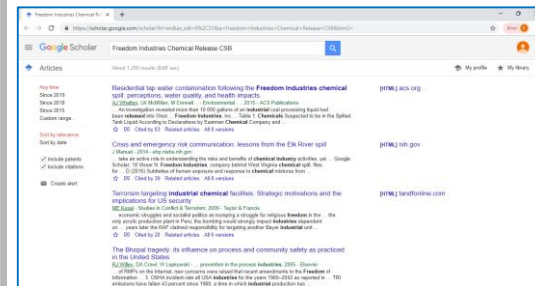
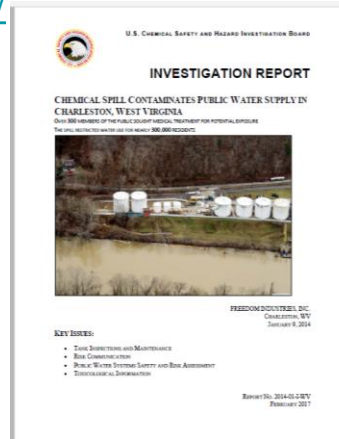
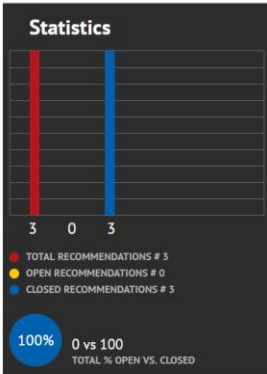


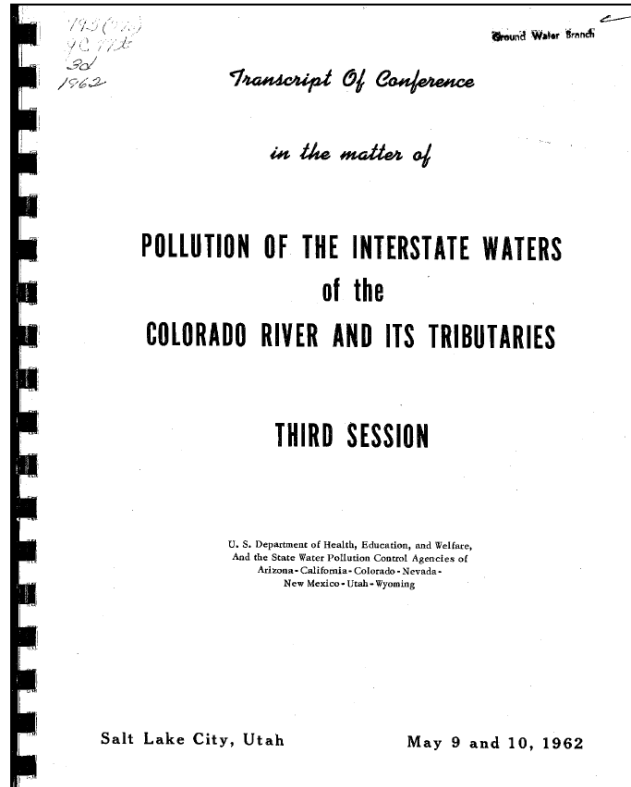
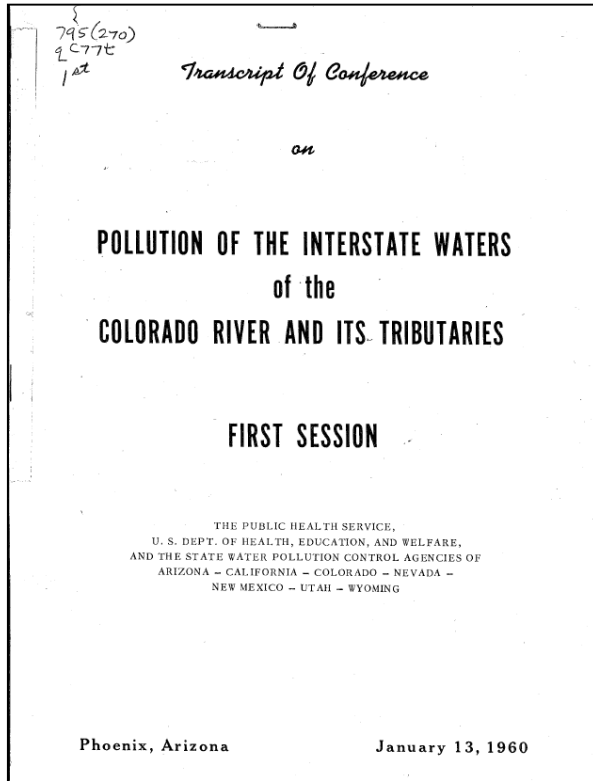
### Related Video



Freedom Industries Tank Dismantling  
7/16/2014 6:13:00 PM

VIEW ALL VIDEOS

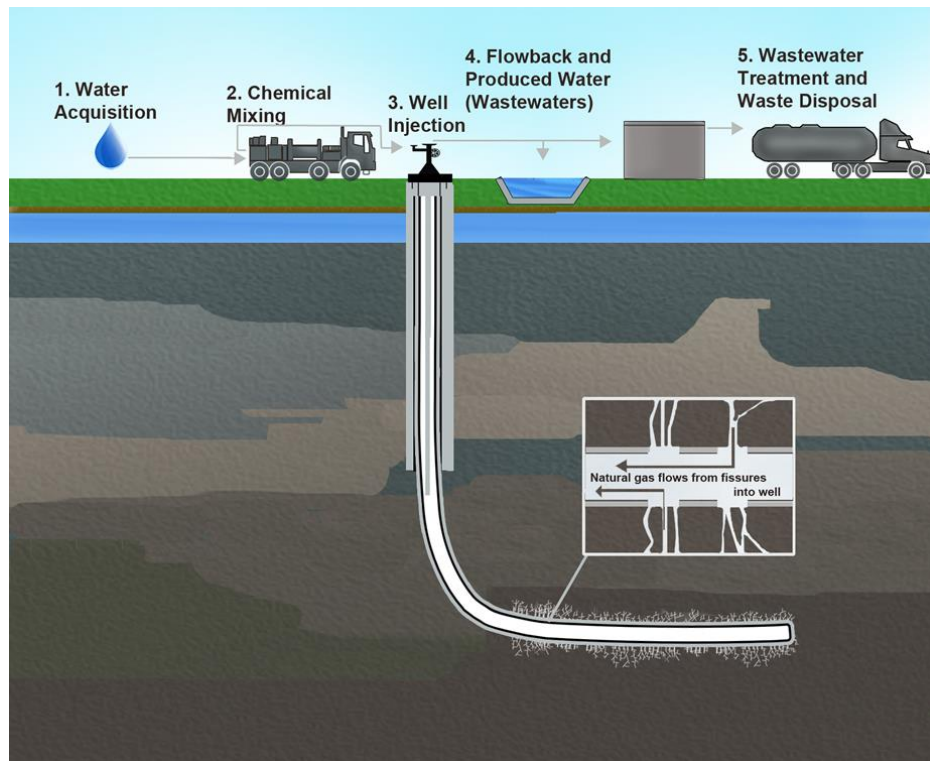




Reports include  
Raw & Calculated  
USGS data

These are the Pre-EPA  
reports: EPA created on  
December 2, 1970

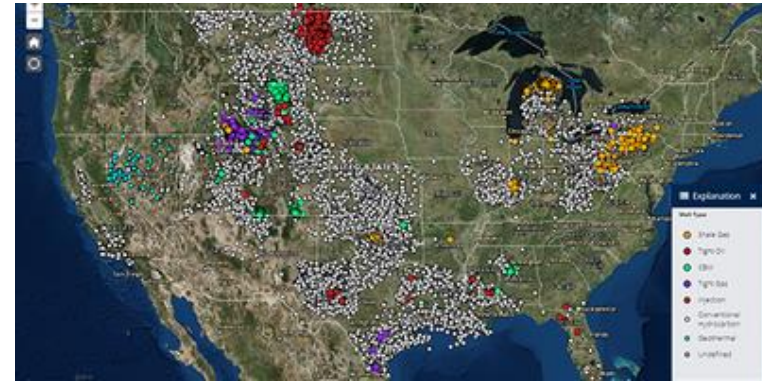
<https://www.epa.gov/history>



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.

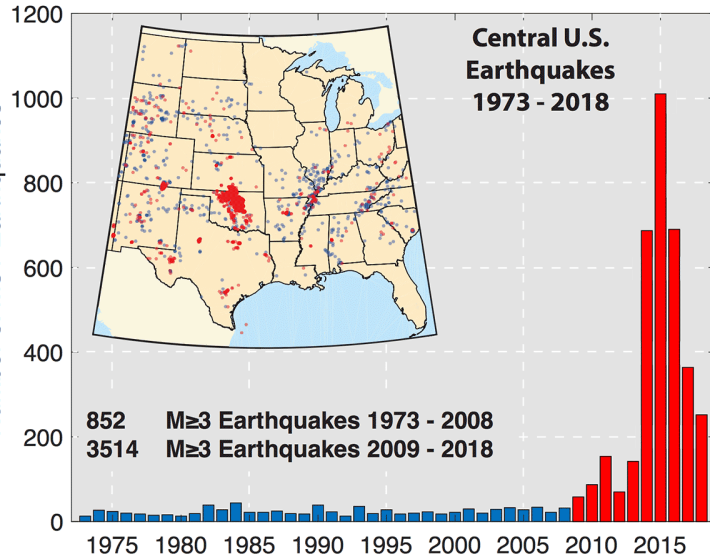
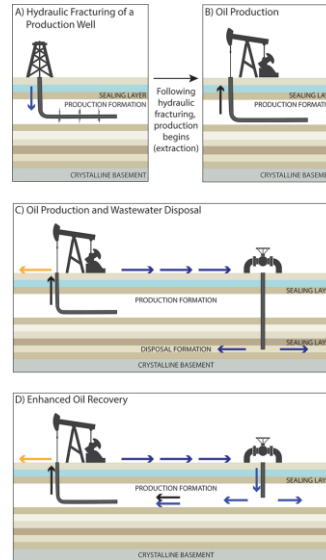
Hydraulic fracturing is a well-stimulation technique used commonly in low-permeability rocks like tight sandstone, shale, and some coal beds to increase oil and/or gas flow to a well from petroleum-bearing rock formations. A similar technique is used to create improved permeability in underground geothermal 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.

## 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.



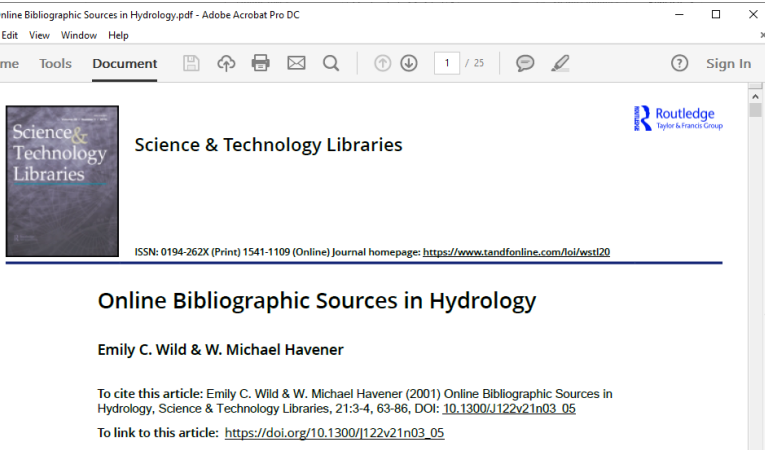
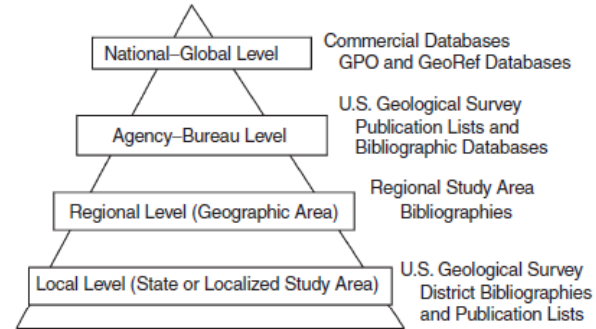
<https://earthquake.usgs.gov/research/induced/overview.php>



I hope to publish an update in 2020-2021

<https://pubs.er.usgs.gov/publication/70023512>

FIGURE 2. Indexing and Availability Trends of U.S. Geological Survey Publications in Hydrology



## Abstract

Traditional commercial bibliographic databases and indexes provide some access to hydrology materials produced by the government; however, these sources do not provide comprehensive coverage of relevant hydrologic publications. This paper discusses bibliographic information available from the federal government and state geological surveys, water resources agencies, and depositories. In addition to information in these databases, the paper describes the scope, styles of citing, subject terminology, and the ways these information sources are currently being searched, formally and informally, by hydrologists. Information available from the federal and state agencies and from the state depositories might be missed by limiting searches to commercially distributed databases.

# Water Resources – Hydrology Jobs

<https://www.usajobs.gov/Search/?k=Hydrology>

<https://www.opm.gov/policy-data-oversight/classification-qualifications/classifying-general-schedule-positions/>

<https://www.opm.gov/policy-data-oversight/classification-qualifications/classifying-general-schedule-positions/#url=1300>

The screenshot shows the USAJOBS search results page for the keyword "Hydrologist". The page displays three job listings. The first listing is for a Hydrologist position at the U.S. Air Force - Agency Wide, with a starting salary of \$87,252 (GS 13-14). The second listing is also for a Hydrologist position at the U.S. Air Force - Agency Wide, with a starting salary of \$78,681 (GS 13-14). The third listing is for a Hydrologist position at the Forest Service, with a starting salary of \$64,009 (GS 11). The right sidebar shows filter options for hiring path, federal employees, armed forces, and students & recent graduates.

The screenshot shows the USAJOBS search results page for the keyword "Student trainee (hydrology)". The page displays one job listing for a Student Trainee (Engineering) position at the U.S. Army Corps of Engineers, with a starting salary of \$27,800 (GS 3-4). The right sidebar shows filter options for hiring path, students & recent graduates, and pay.

## Ex. me = Hydrologist-GS-1315-11

<https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/2020/general-schedule/>

[https://www.usajobs.gov/Search/?k=Student %20trainee%20\(hydrology\)](https://www.usajobs.gov/Search/?k=Student%20trainee%20(hydrology))

Thank You!

New England Water Science Center: NH-VT & MA-RI  
<https://www.usgs.gov/centers/new-england-water/>

New York Water Science Center  
<https://www.usgs.gov/centers/ny-water>

New Jersey Water Science Center  
<https://www.usgs.gov/centers/nj-water>



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Princeton University Library  
<http://library.princeton.edu>

Princeton University Geosciences  
<http://geosciences.princeton.edu>  
Geophysical Fluid Dynamics Laboratory  
<https://www.gfdl.noaa.gov/>  
Princeton Environmental Institute  
<http://environment.princeton.edu>

Princeton University Chemistry  
<https://chemistry.princeton.edu/>

Andlinger Center for Energy and the Environment  
<https://acee.princeton.edu/>