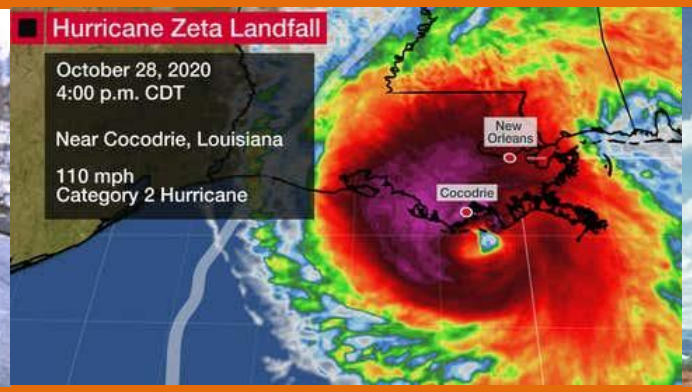
Princeton University LIBRARY

October 29, 2020

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



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

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 libraries remotely since 1988

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

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

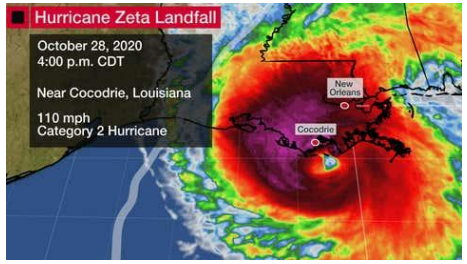
August 2020: Library Research for Energy, Minerals, and Uranium Resources https://www.fdlp.gov/library-research-for-energy-mineral-and-uranium-resources

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

Overview



- Earthquakes
- Hurricanes
- Volcanoes
- Wildfires

- Online Talks
- Education
- Data/Maps
- Publications

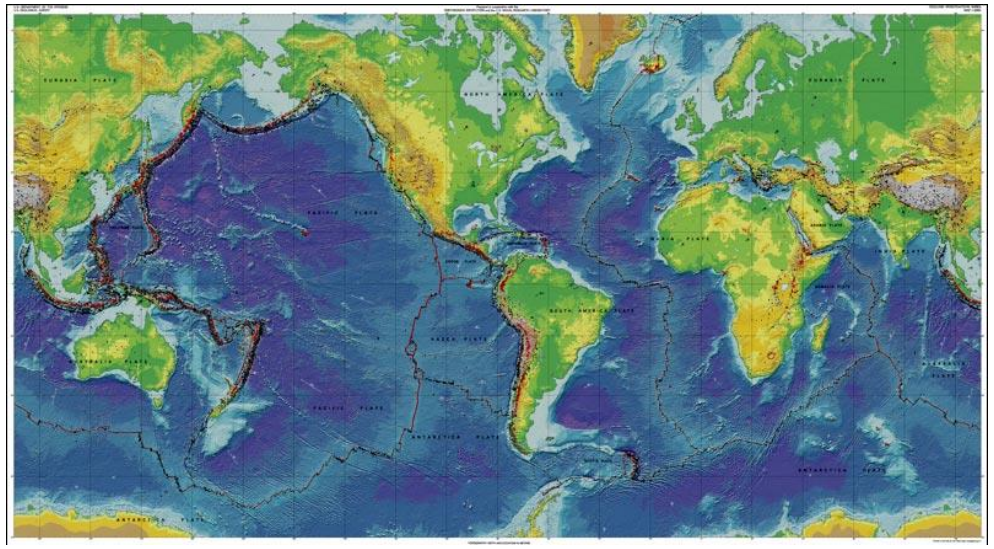
https://www.usgs.gov/faq/natural-hazards

https://www.usgs.gov/products/data-and-tools/real-time-data

Earthquakes

Harry Hess

https://www.geolsoc.org.uk/Plate-Tectonics/Chap1-Pioneers-of-Plate-Tectonics/Harry-Hess



The History of Ocean Basins

https://pubs.geoscienceworld.org/books/book/847/chapter/3918672/History-of-Ocean-Basins

Harry Hess was a professor of geology at Princeton University (USA), and became interested in the geology of the oceans while serving in the US Navy in World War II. His time as a Navy officer was an opportunity to use **sonar** (also called echo sounding), then a new technology, to map the ocean floor across the North Pacific.

He published '**The History of Ocean Basins**' in 1962, in which he outlined a theory that could explain how the continents could actually drift. This theory later became known as '**Sea Floor Spreading**'.

Hess discovered that the oceans were shallower in the middle and identified the presence of **Mid Ocean Ridges**, raised above the surrounding generally flat sea floor (**abyssal plain**) by as much as 1.5 km. In addition he found that the deepest parts of the oceans were very close to continental margins in the Pacific with Ocean Trenches extending down to depths of over 11 km in the case of the Marianas Trench off the coast of Japan.

Earthquakes

Geosciences Lecture Series: Fifty Years of Plate Tectonics
https://mediacentral.princeton.edu/media/Geosciences+Lecture+SeriesA+Fifty+Years+of+Plate+Tectonics/1_xtgniyh2/14934491

Jason Morgan Recalls Discovering Earth's Tectonic Plates

https://www.quantamagazine.org/jason-morgan-recalls-discovering-earths-tectonic-plates-20170828/

In 1967, Jason Morgan discovered the theory of plate tectonics — the idea that rigid plates pave the Earth's surface, moving relative to one another with the continents and oceans in tow.

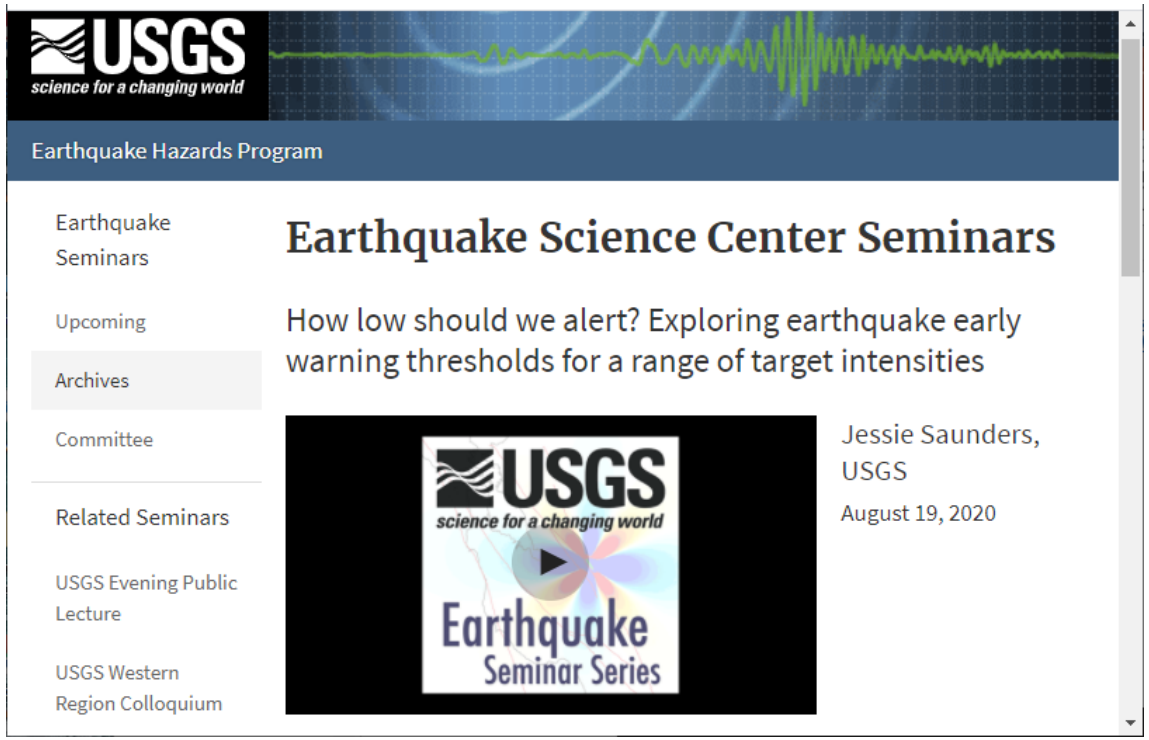
Earthquakes

Online Videos/Lectures

https://www.usgs.gov/science-support/osqi/yes/resources-teachers/online-lectures

USGS Earthquake Science Center Seminar Series

https://earthquake.usgs.gov/contactus/menlo/seminars/archives/2020



https://earthquake.usgs.gov/contactus/menlo/seminars/1291

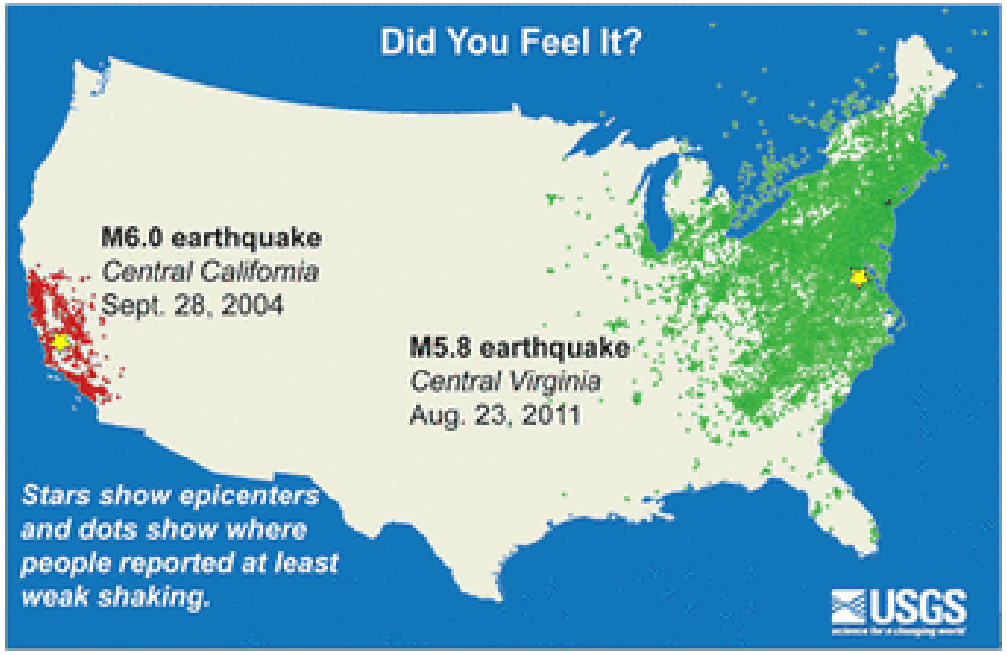
Public Talks: https://www.usgs.gov/science-support/communications-and-publishing/public-lecture-series/multimedia

PubTalk 10/2019 — Remembering Loma Prieta Earthquake 30 Years Later
https://www.usgs.gov/media/videos/pubtalk-102019-remembering-loma-prieta-earthquake-30-years-later

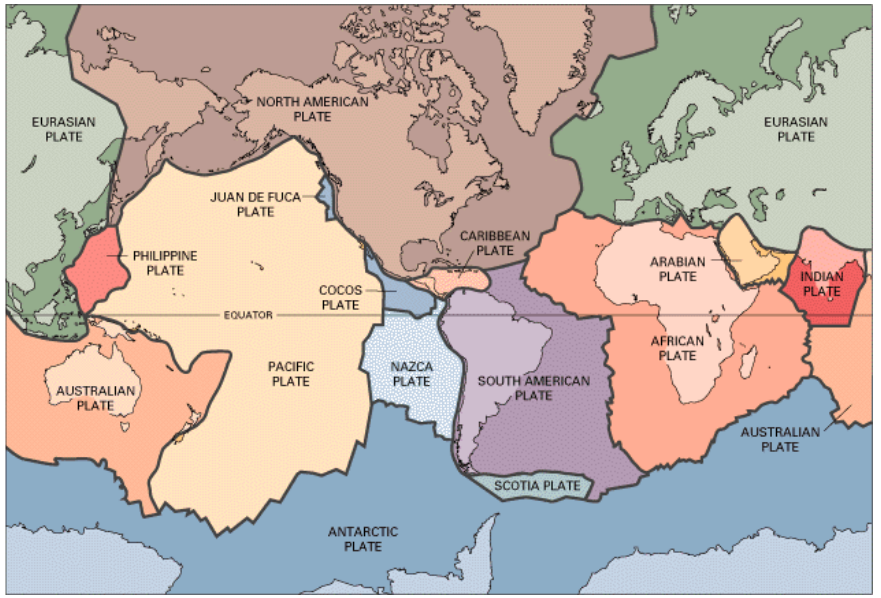
Earthquakes

Education

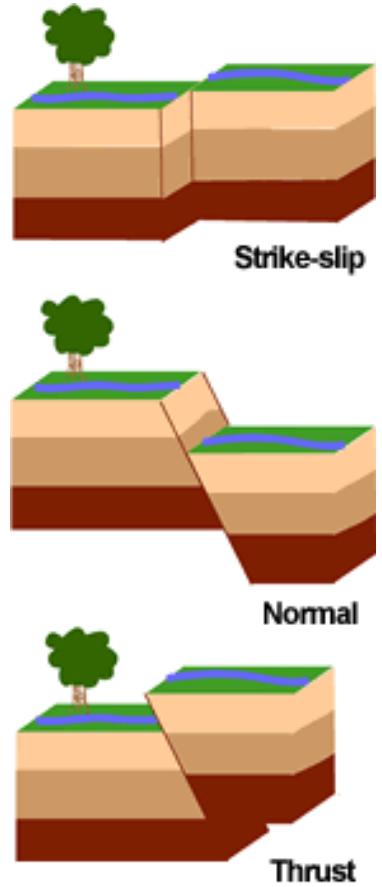
https://www.usgs.gov/natural-hazards/earthquake-hazards/education



https://www.usgs.gov/natural-hazards/earthquake-hazards/science/washington-dc-stone-and-brick-buildings-vulnerable?qt-science_center_objects=0#qt-science_center_objects



This Dynamic Earth
https://pubs.usgs.gov/gip/dynamic/dynamic.html



https://earthquake.usgs.gov/learn/glossary/?term=fault

Earthquakes

https://www.usgs.gov/media/galleries/2019-ridgecrest-earthquake-sequence

Earthquake monitoring stations: https://www.usgs.gov/natural-hazards/earthquake-hazards/monitoring

Earthquake Summary posters : https://earthquake.usgs.gov/education/posters.php

Earthquake photos:
Historical : https://library.usgs.gov/photo/#/
NEIC : https://www.usgs.gov/natural-hazards/earthquake-hazards/science/earthquake-photo-collections

Earthquake statistics: https://www.usgs.gov/natural-hazards/earthquake-hazards/lists-maps-and-statistics

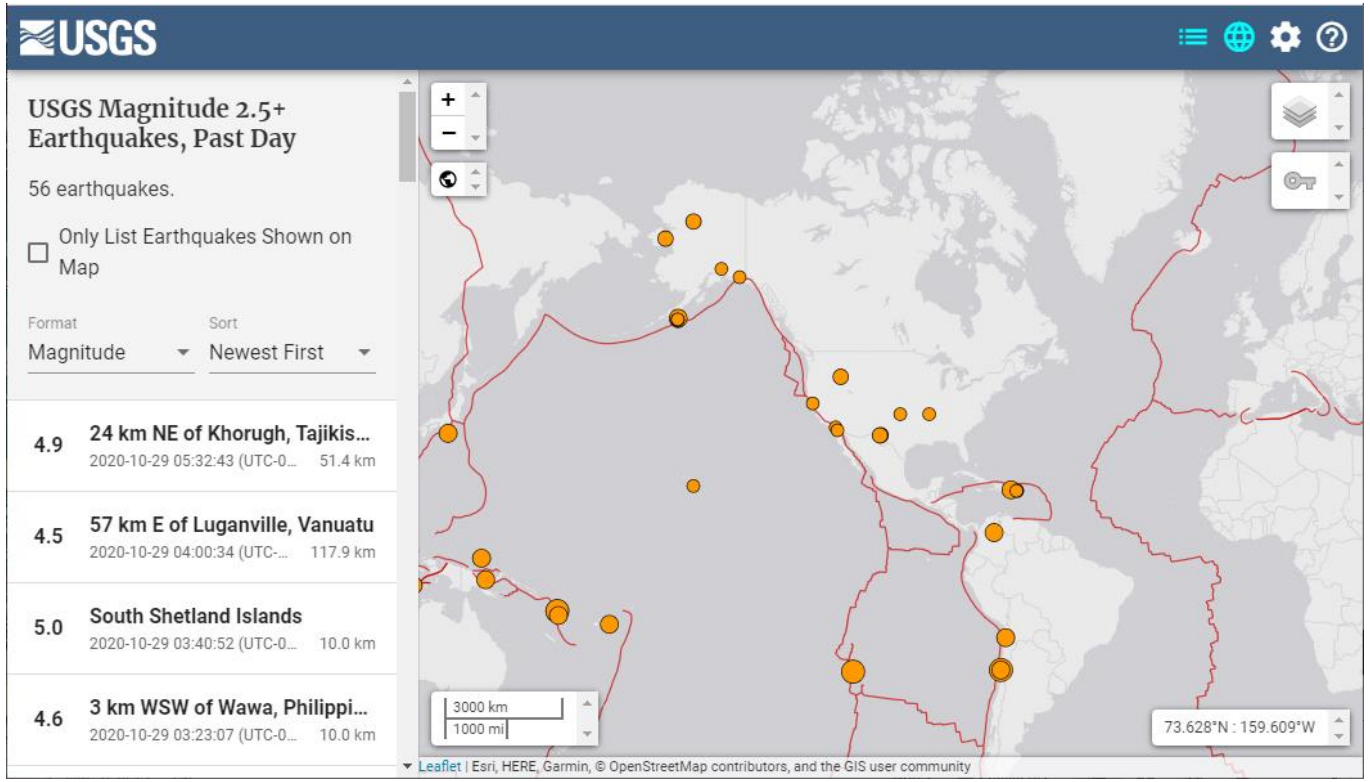
Earthquake education: https://www.usgs.gov/natural-hazards/earthquake-hazards/education

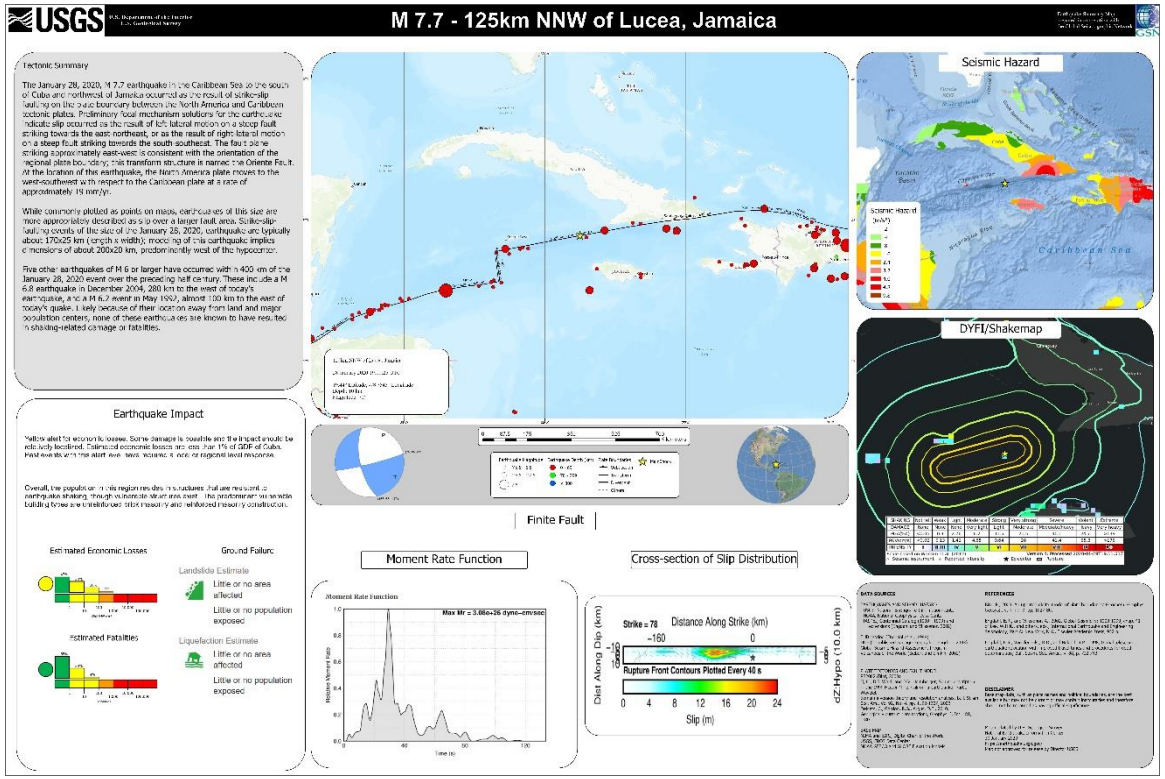
Earthquake software : https://www.usgs.gov/natural-hazards/earthquake-hazards/software

Earthquakes

Real-Time Data/Maps

https://www.usgs.gov/products/data-and-tools/real-time-data



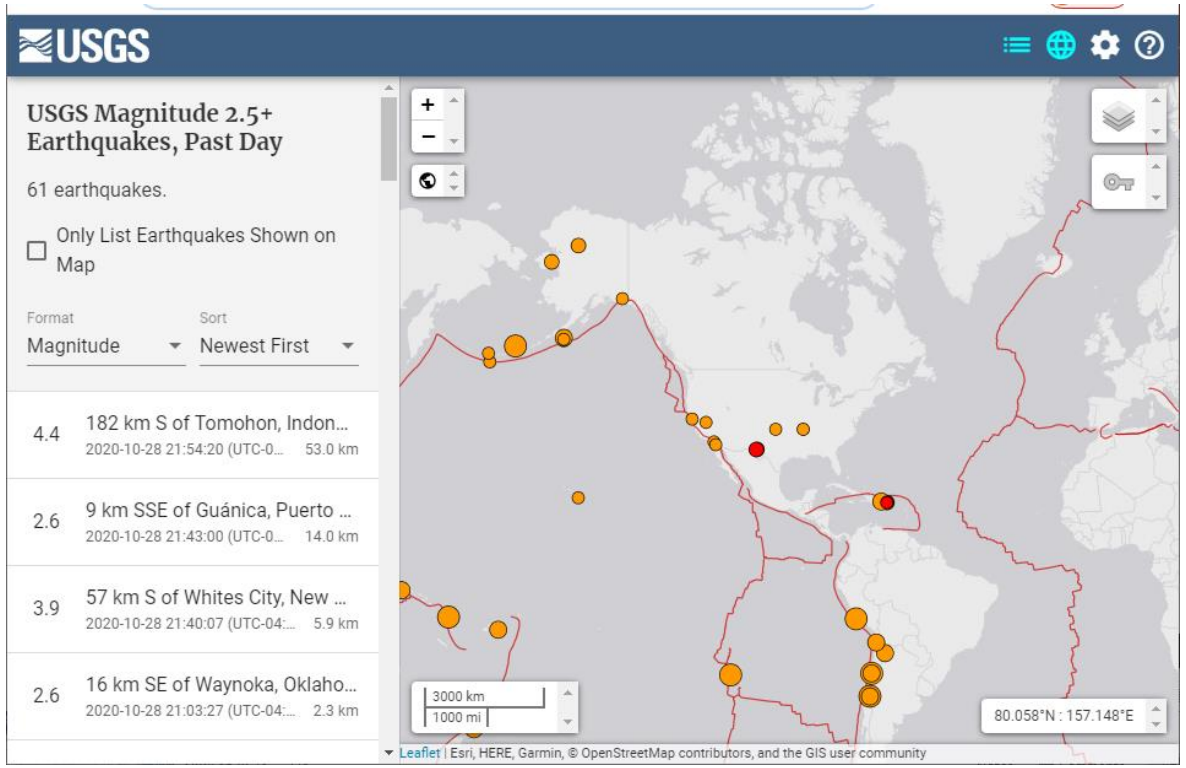


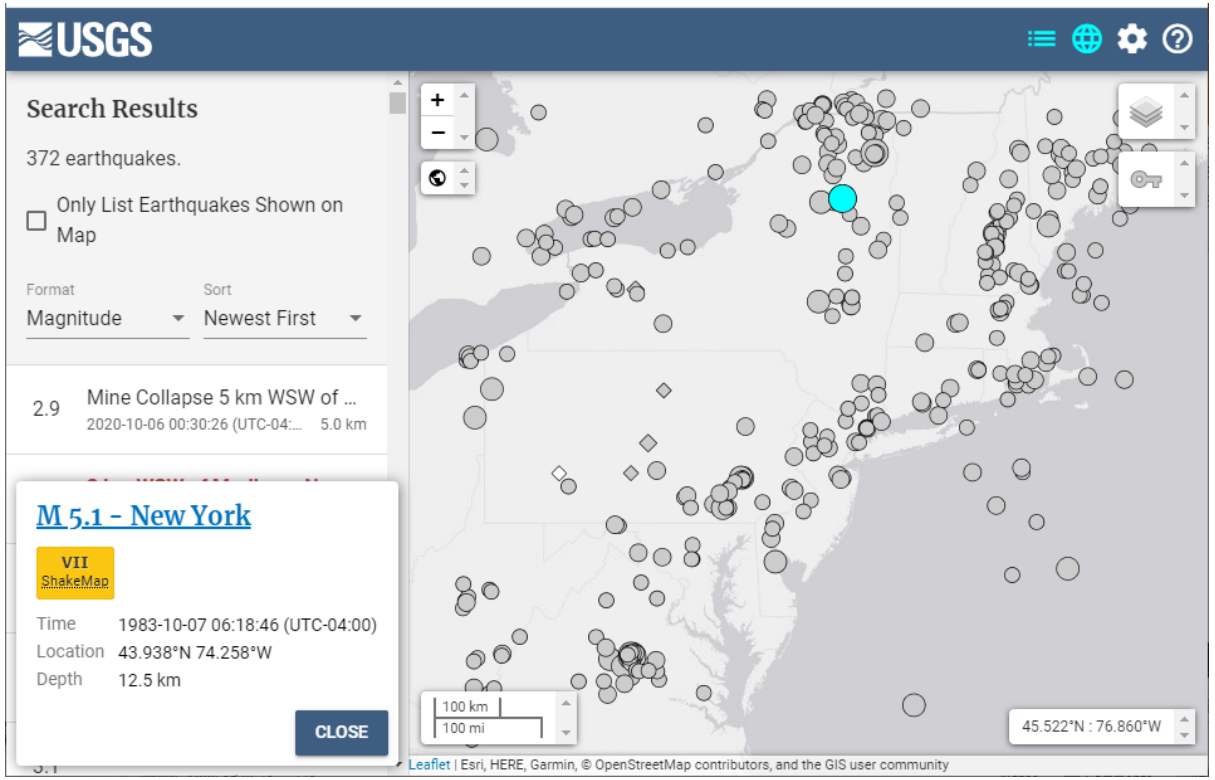
https://earthquake.usgs.gov/earthquakes/map/?extent=-51.39921,-230.625&extent=78.83607,27.77344

https://earthquake.usgs.gov/education/posters.php

Earthquakes

https://earthquake.usgs.gov/earthquakes/map





https://earthquake.usgs.gov/earthquakes/map/?extent=-49.15297,-206.71875&extent=80.11856,16.875

1970 to yesterday

Earthquakes

Searching for citations:

The Geological Society of London
https://www.lyellcollection.org/

GeoScienceWorld
https://pubs.geoscienceworld.org/

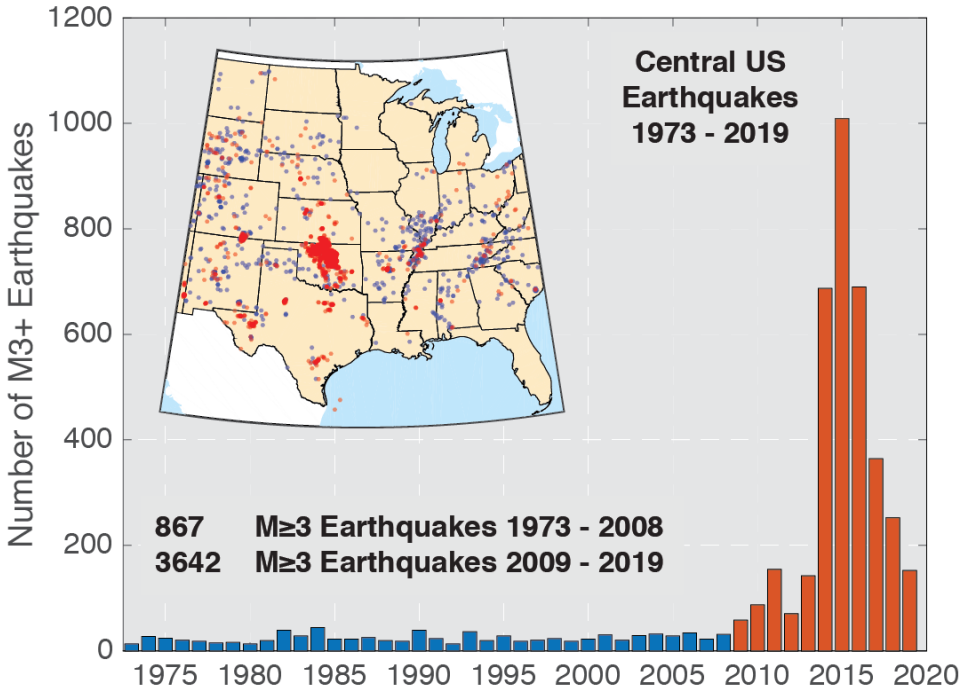
OpenGeoSci:
https://pubs.geoscienceworld.org/pages/opengeosci

USGS Publications:
https://pubs.er.usgs.gov/

Earthquake Publications:
https://www.usgs.gov/natural-hazards/earthquake-hazards/research

Induced Earthquakes

Current research on induced earthquakes due to human activities. Observations, modeling, and hazards.



External Grants

The USGS supports external research that will assist in achieving the goals of the National Earthquake Hazards Reduction Program (NERHP).

Earthquakes

Searching for citations:

The Geological Society of London
https://www.lyellcollection.org/

GeoScienceWorld
https://pubs.geoscienceworld.org/

American Geophysical Union
https://www.agu.org/

Geological Society of America
https://www.geosociety.org/

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

Seismological Society of America (SSA)

https://pubs.geoscienceworld.org/ssa

The Seismic Record – New - Open Access
https://www.seismosoc.org/publications/the-seismic-record/

Bulletin of the Seismological Society of America
https://www.seismosoc.org/publications/bssa/

Princeton University catalog search
- eresource through GeoScienceWorld:
https://catalog.princeton.edu/catalog/9774587

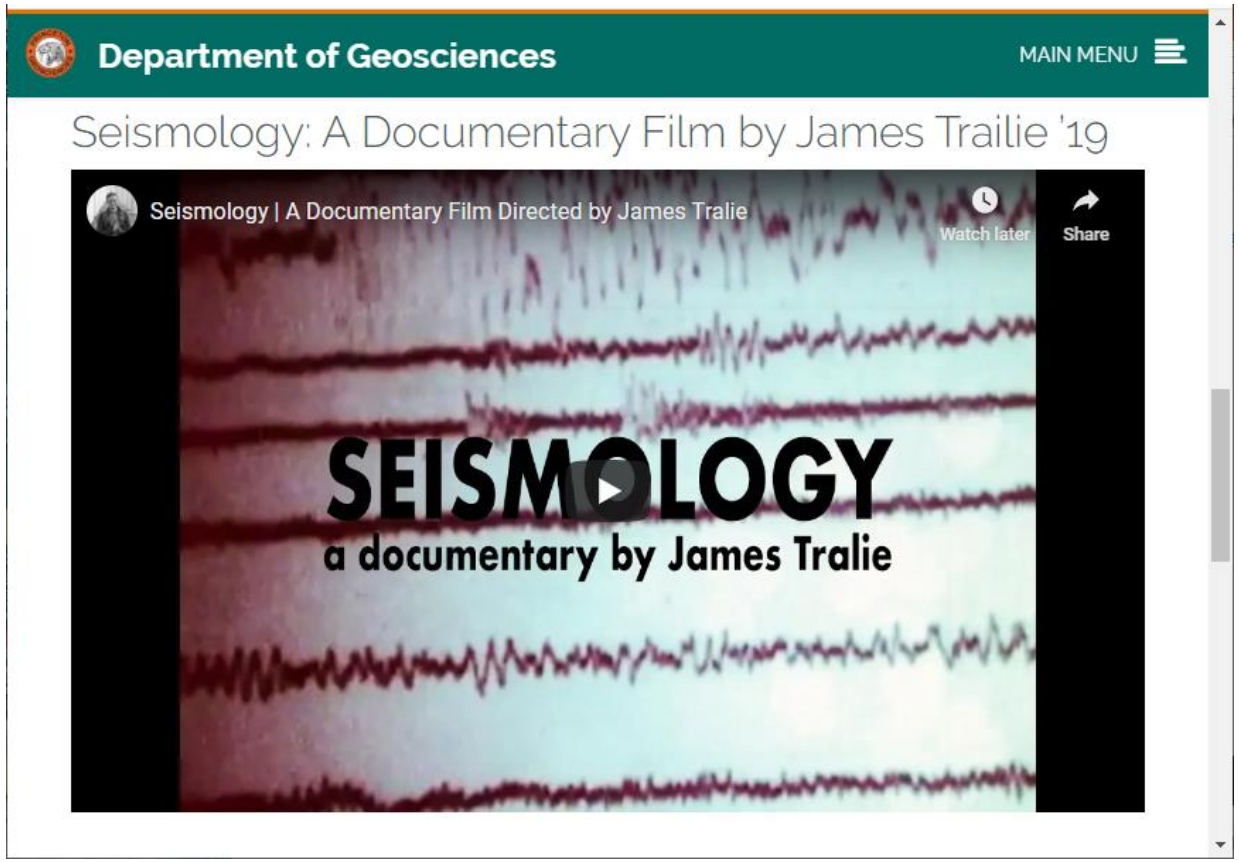
Seismological Research Letters
https://www.seismosoc.org/publications/srl/

Princeton University catalog search
-ereource through GeoScienceWorld
https://catalog.princeton.edu/catalog/9781263

Earthquakes

https://geosciences.princeton.edu/research/geophysics

Seismology: A Documentary Film by James Trailie ’19

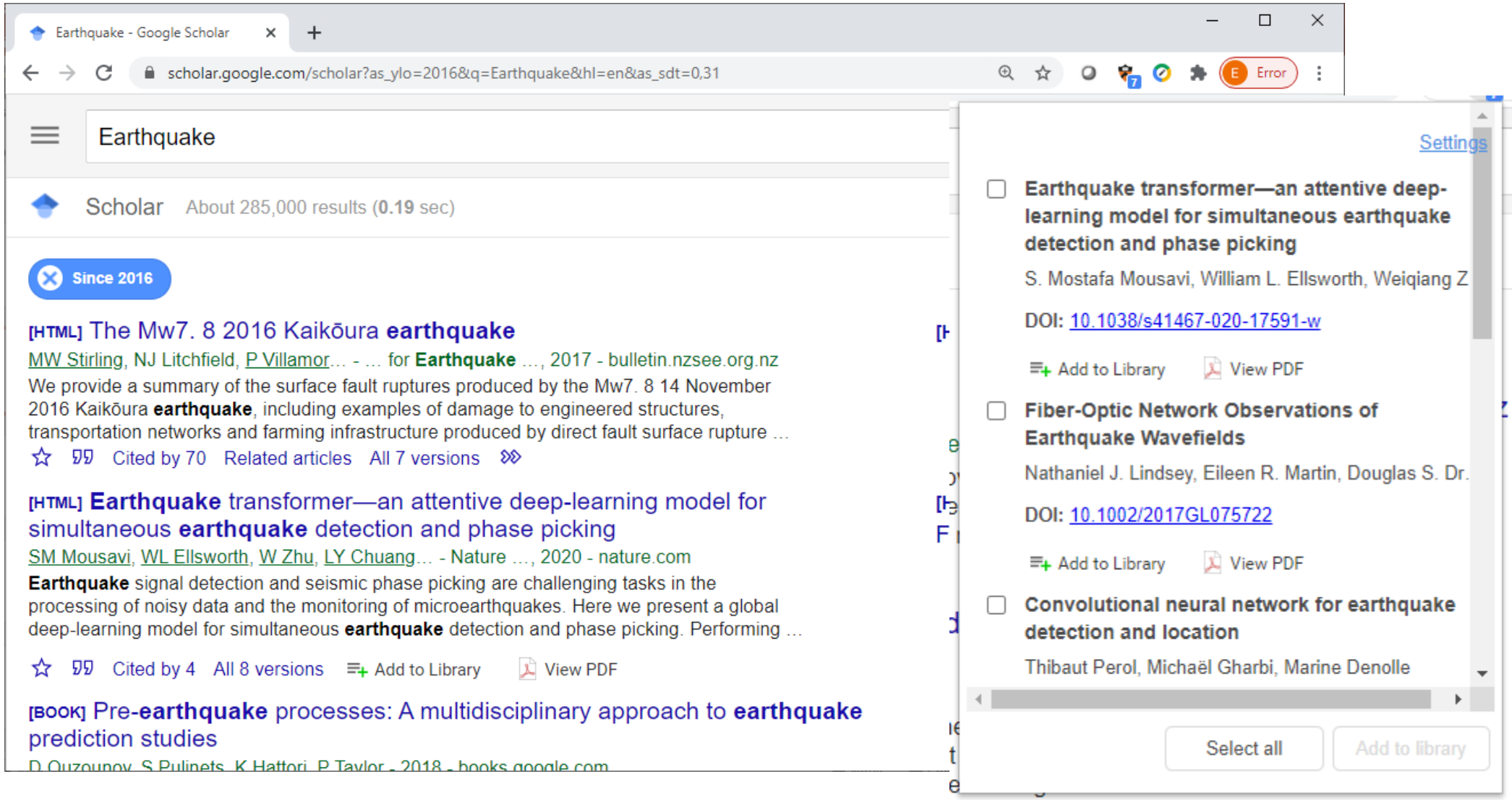


Geology, Geophysics, and Geochemistry Science Center
https://www.usgs.gov/centers/gggsc

Geology, Minerals, Energy, and Geophysics Science Center
https://www.usgs.gov/centers/gmeg

GoogleScholar

https://libguides.princeton.edu/AnywhereAccess



Hurricanes

https://environment.princeton.edu/event

PEI Faculty Seminar: "Climatic Influences on Tropical Cyclones and Their Severity"
https://www.youtube.com/watch?v=EUL0gMizPbA

Human-caused warming will cause more slow-moving hurricanes, warn climatologists
https://www.princeton.edu/news/2020/04/22/human-caused-warming-will-cause-more-slow-moving-hurricanes-warn-climatologists

Experts: Warming makes Delta, other storms power up faster
https://apnews.com/article/climate-climate-change-oceans-storms-weather-108ee106d20ab2ab4880011b78e71981

Recent increases in tropical cyclone intensification rates
https://www.nature.com/articles/s41467-019-08471-z

Climate scientist Gabriel Vecchi: Climate crisis contributes to intensity of storms
https://vecchi.princeton.edu/
https://vecchi.princeton.edu/publications/search
https://vecchi.princeton.edu/news

Hurricanes

https://www.usgs.gov/hurricanes

https://www.noaa.gov/zeta

2020 Tropical Storms

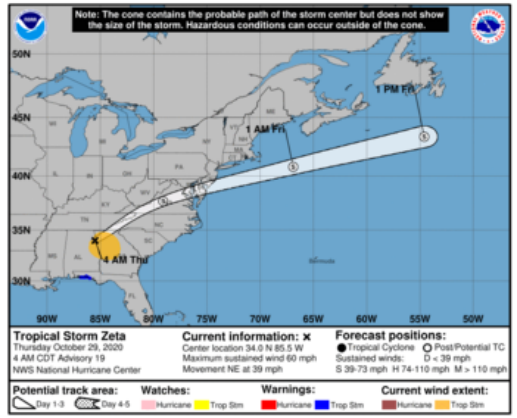
- Tropical Storm ARTHUR
- Tropical Storm BERTHA
- Tropical Storm CRISTOBAL
- Tropical Storm DOLLY
- Tropical Storm EDOUARD
- Tropical Storm FAY
- Tropical Storm GONZALO
- Hurricane HANNA
- Hurricane ISAIAS
- Tropical Depression TEN
- Tropical Storm JOSEPHINE
- Tropical Storm KYLE
- Hurricane LAURA
- Hurricane MARCO
- Tropical Storm OMAR
- Hurricane NANA
- Hurricane PAULETTE
- Tropical Storm RENE
- Hurricane SALLY
- Hurricane TEDDY
- Tropical Storm VICKY
- Tropical Storm BETA
- Tropical Storm WILFRED
- Subtropical Storm ALPHA
- Tropical Storm GAMMA
- Hurricane DELTA
- Hurricane EPSILON
- Hurricane ZETA

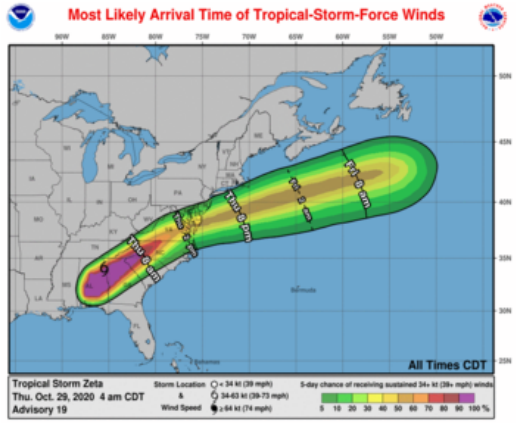
Key Messages for Tropical Storm Zeta

Advisory 19: 4:00 AM CDT Thu Oct 29, 2020

1. Strong, damaging wind gusts, which could cause tree damage and power outages, will continue to spread well inland across portions of northeastern Alabama, northern Georgia, the Carolinas, and southeastern Virginia today due to Zeta's fast forward speed. Wind gusts could be especially severe across the southern Appalachian Mountains.

2. Through today, heavy rainfall is expected near and in advance of Zeta from portions of the central Appalachians, Mid-Atlantic and lower to middle Ohio Valley. This rainfall may lead to flash, urban, small stream, and isolated minor river flooding.





For more information go to hurricanes.gov

2020 Storms

- Hurricane Delta
- Hurricane Sally
- Hurricane Laura
- Hurricane Marco
- Hurricane Isaias

2019 Storms

- Hurricane Dorian

2018 Storms

- Florence
- Michael

2017 Storms

- Nate
- Maria
- Jose
- Irma
- Harvey

2016 Storms

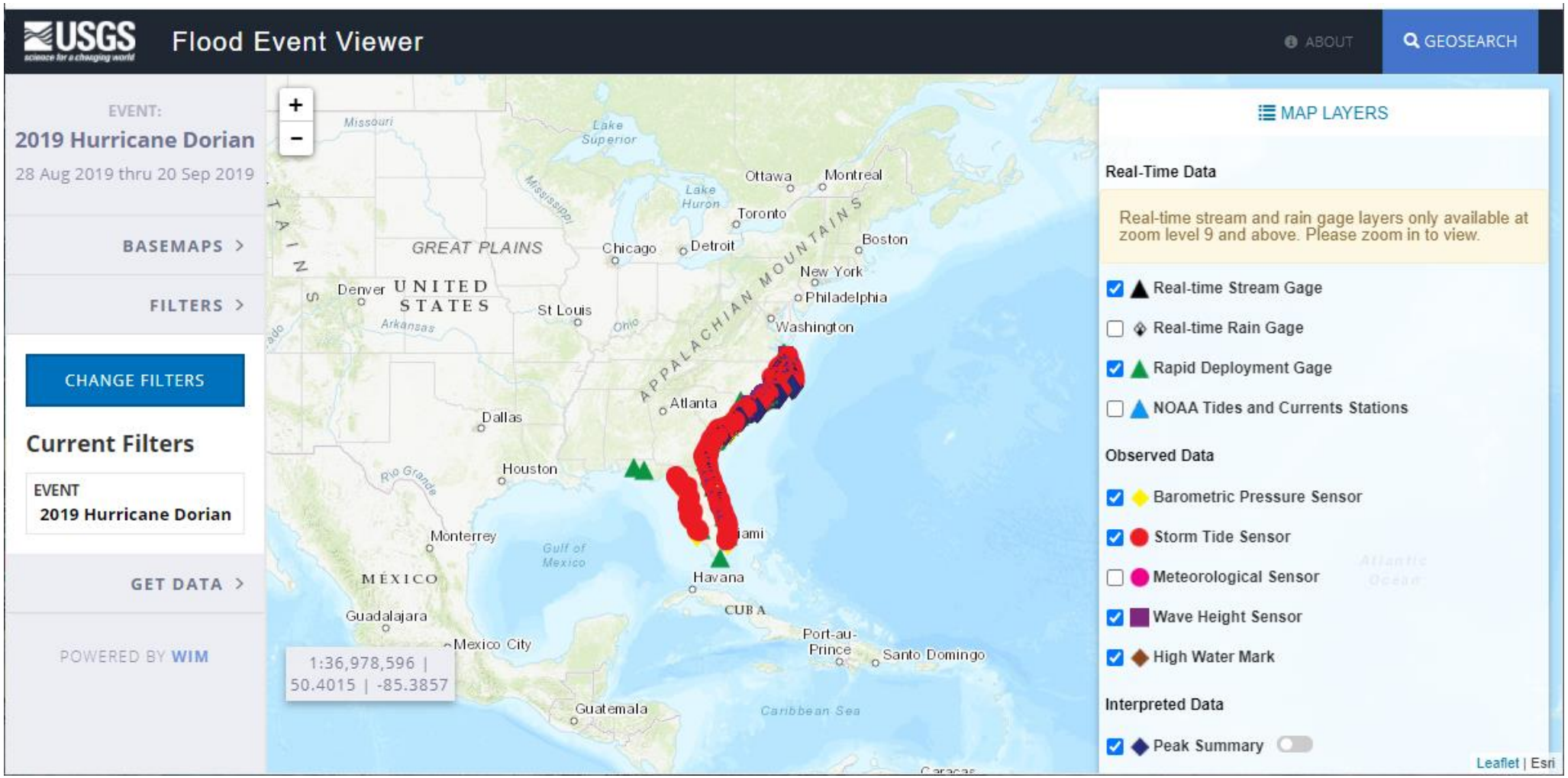
- Matthew

2012 Storms

- Sandy

Real-Time Data/Maps – Archive Example

https://www.usgs.gov/products/data-and-tools/real-time-data



https://stn.wim.usgs.gov/fev/

Hurricanes

Emergency Operations International Charter
https://www.usgs.gov/science-explorer-results?es=Emergency%20Operations%20/%20International%20Charter

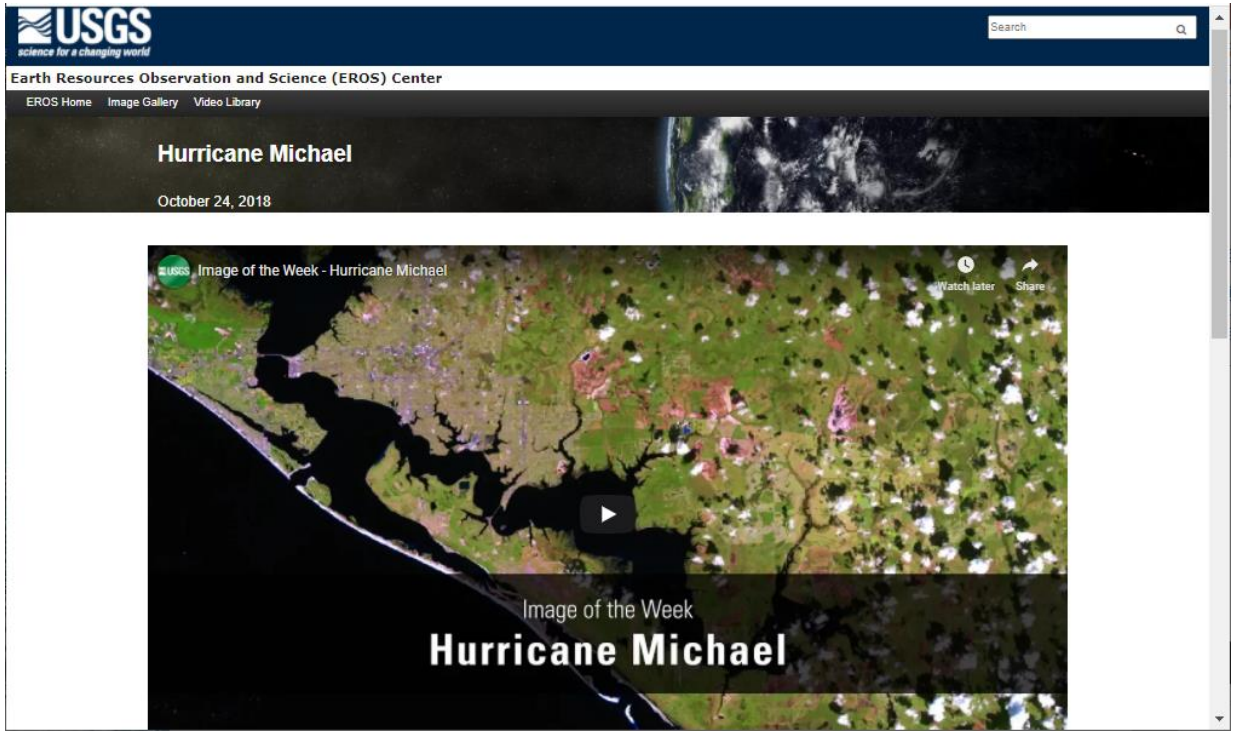
Hazards Data Distribution System (HDDS)
https://www.usgs.gov/core-science-systems/hdds/hazards-data-distribution-system-hdds
The Hazards Data Distribution System (HDDSExplorer) is an event-based interface that provides a single point-of-entry for access to remotely sensed imagery and other geospatial datasets as they become available during a response. The imagery hosted on HDDS

Emergency Operations Portal
https://www.usgs.gov/centers/eros/science/emergency-operations-portal
USGS Emergency Response strives to ensure that the disaster response community has rapid access to timely, accurate, and relevant geospatial imagery, products, and services before, during, and after a disaster.

Land Resources, Earth Resources Observation and Science (EROS) Center

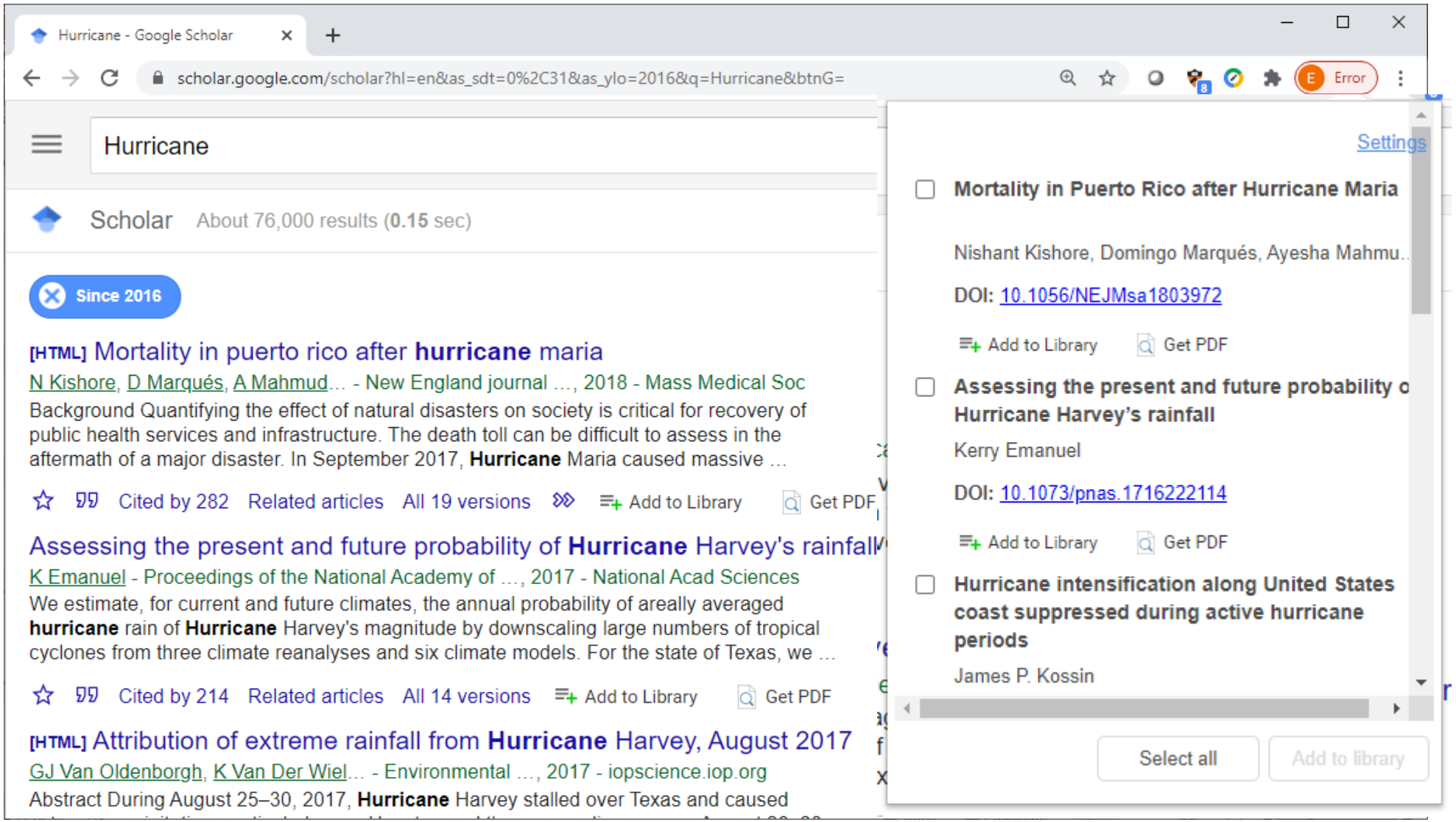
https://eros.usgs.gov/image-gallery

https://eros.usgs.gov/image-gallery/image-of-the-week/hurricane-michael



GoogleScholar

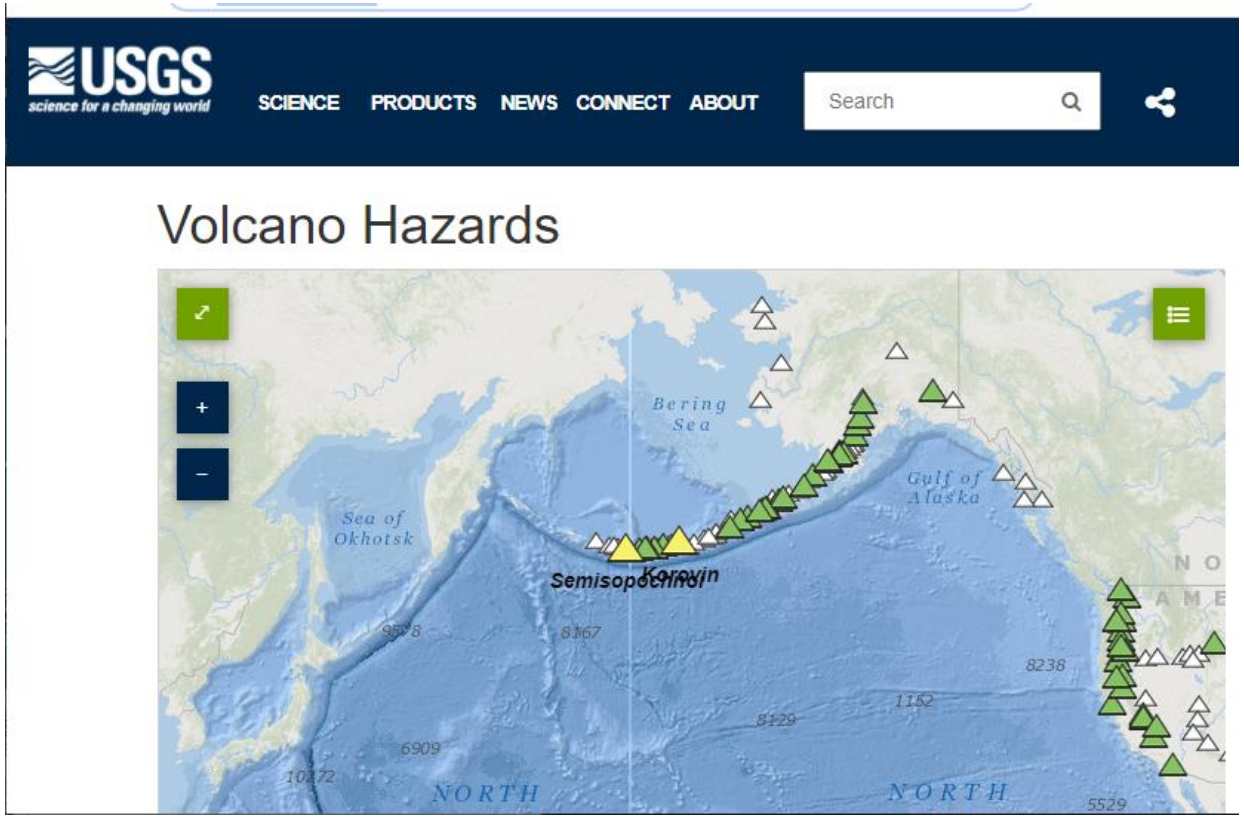
https://libguides.princeton.edu/AnywhereAccess

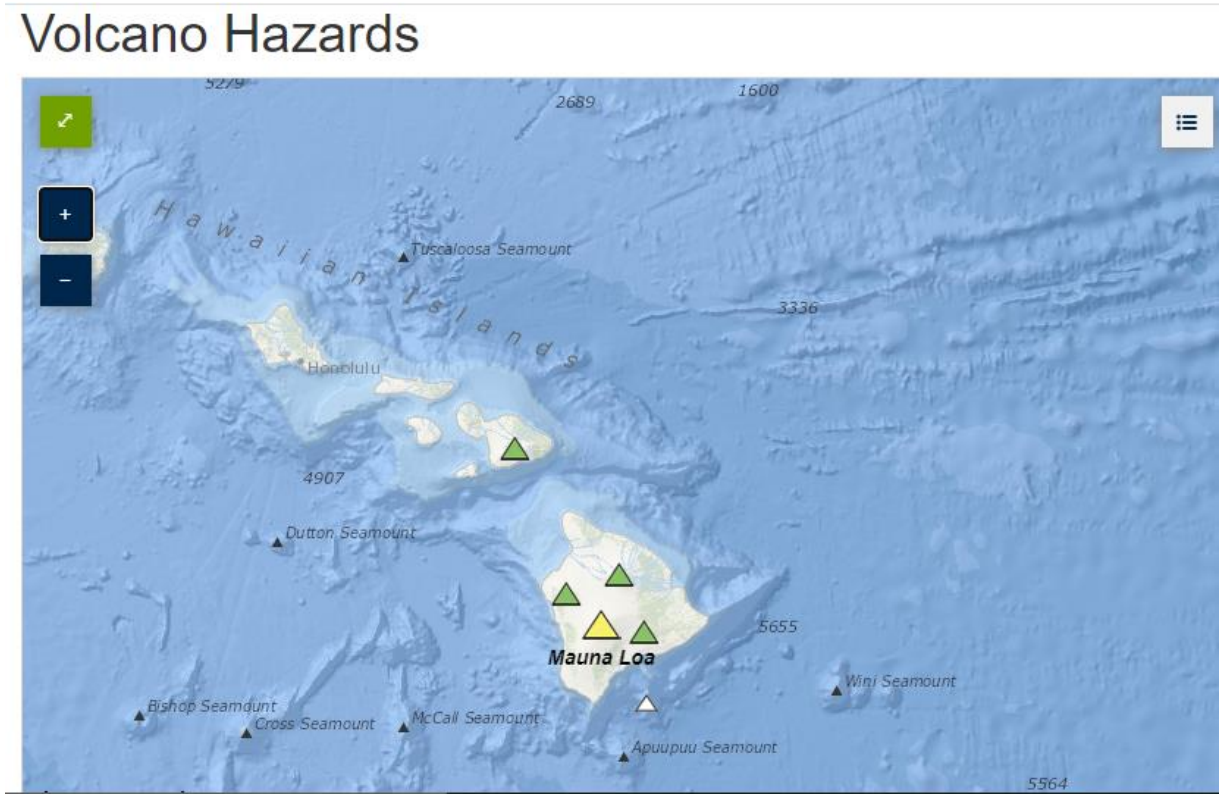


Volcanoes

Real-Time Data/Maps

https://www.usgs.gov/volcano





https://avo.alaska.edu/activity/Semisopochnoi.php

https://avo.alaska.edu/activity/Korovin.php

https://www.usgs.gov/volcanoes/mauna-loa

Volcanoes

Online Videos/Lectures

https://www.usgs.gov/science-support/osqi/yes/resources-teachers/online-lectures

https://www.usgs.gov/volcano

Mount St. Helens: May 18, 1980

▶ Video Transcript

Mount St. Helens: A Catalyst for Change

▶ Video Transcript

Alaska Volcano Observatory
California Volcano Observatory
Cascades Volcano Observatory
Hawaiian Volcano Observatory
Yellowstone Volcano Observatory

https://www.usgs.gov/natural-hazards/volcano-hazards/multimedia

Mount St. Helens

https://www.usgs.gov/volcanoes/mount-st-helens

https://www.usgs.gov/observatories/cascades-volcano-observatory/mount-st-helens-videos

https://www.usgs.gov/volcanoes/mount-st-helens/multimedia

Volcanoes

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.

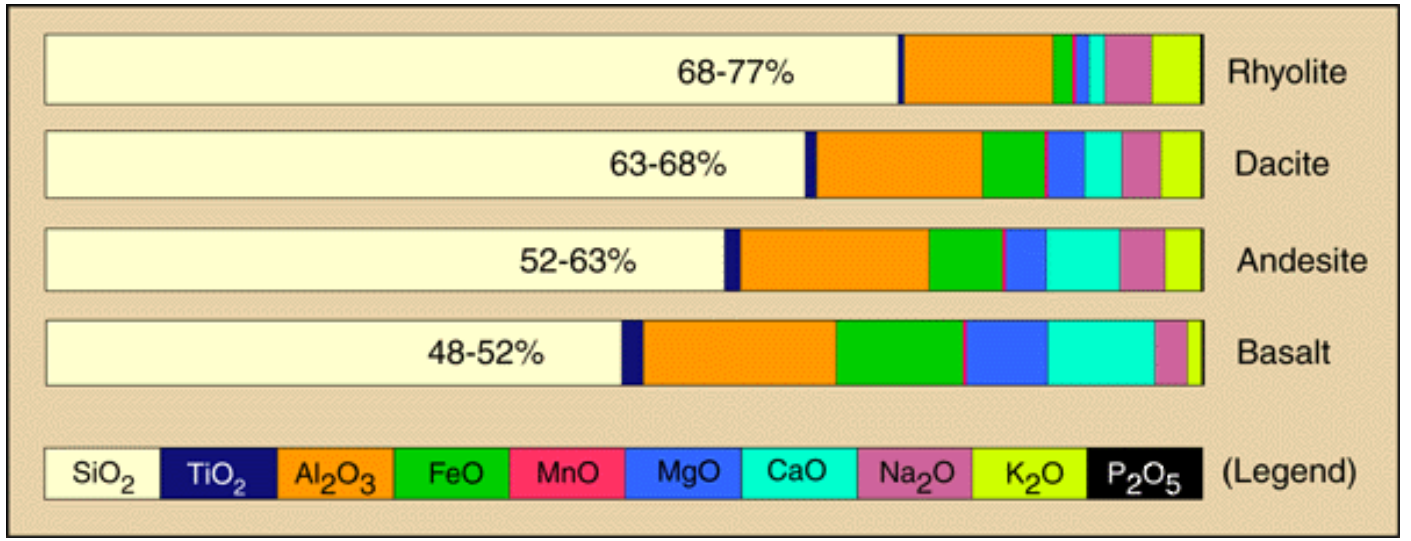
June 6, 2018 The vigorous lava fountain at Fissure 8 reached heights of 45 m (150 ft) as shown in this image taken around 9:30 AM.

Education

USGS Volcano Teaching Materials

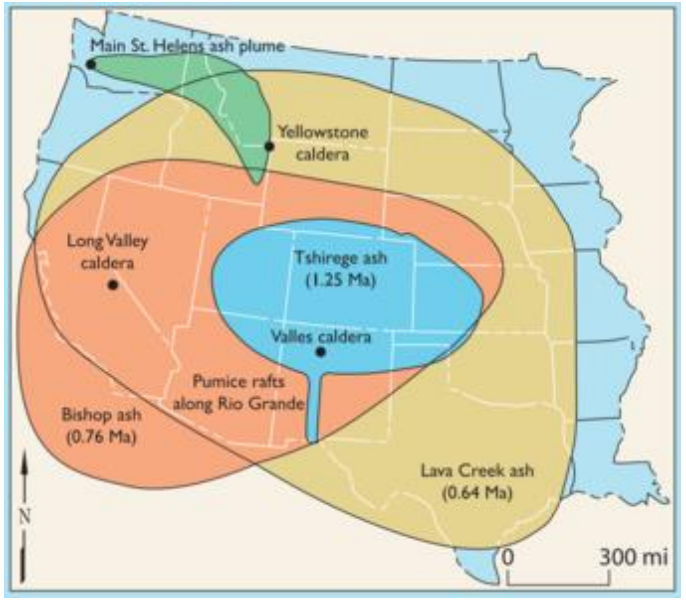
https://www.usgs.gov/natural-hazards/volcano-hazards/education-resources

https://volcanoes.usgs.gov/vsc/glossary/



Major Chemical Elements Forming Igneous Rocks

Volcanoes



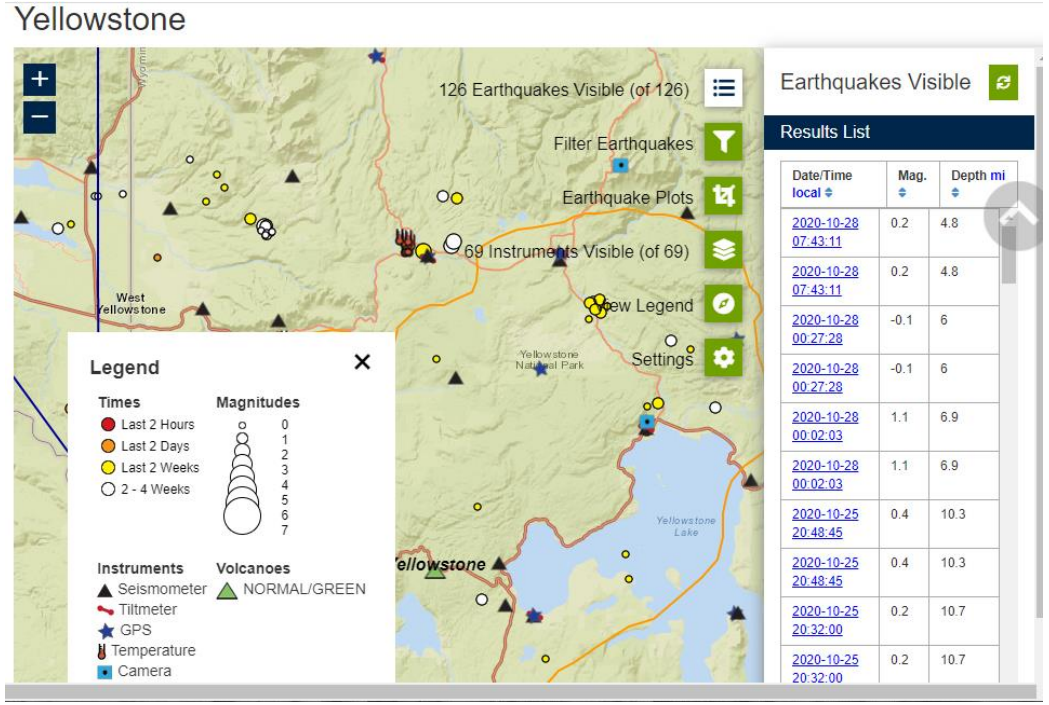
Data/Publications

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

Yellowstone Volcano

https://www.usgs.gov/volcanoes/yellowstone/

- Earthquakes
- Deformation
- Hydrology
- Hydrothermal
- Volcanic Gas

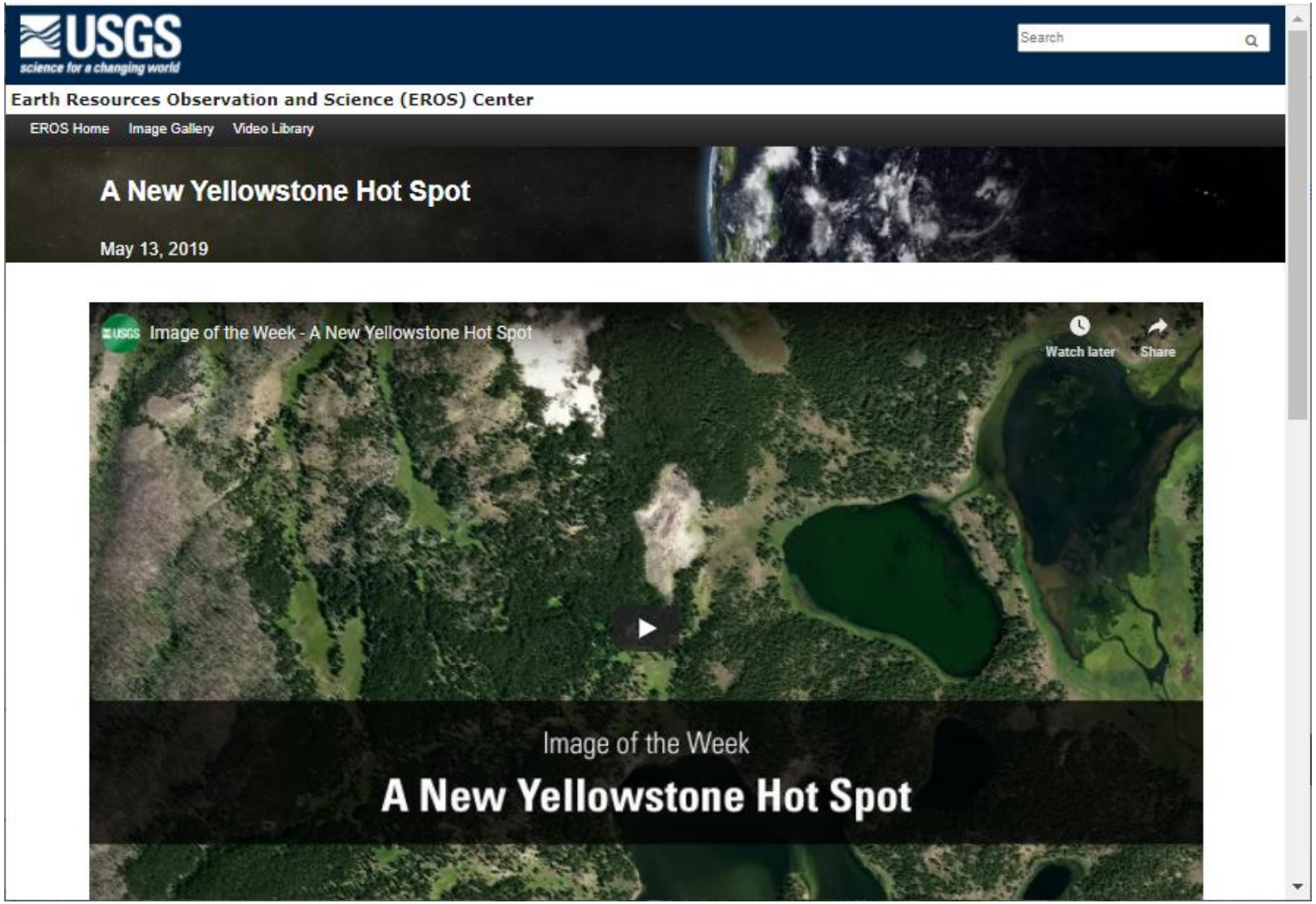


https://www.usgs.gov/media/images/grand-prismatic-spring-midway-geyser-basin-yellowstone

https://www.usgs.gov/volcanoes/yellowstone/monitoring

Volcanoes

https://eros.usgs.gov/image-gallery/image-of-the-week/new-yellowstone-hot-spot



GoogleScholar

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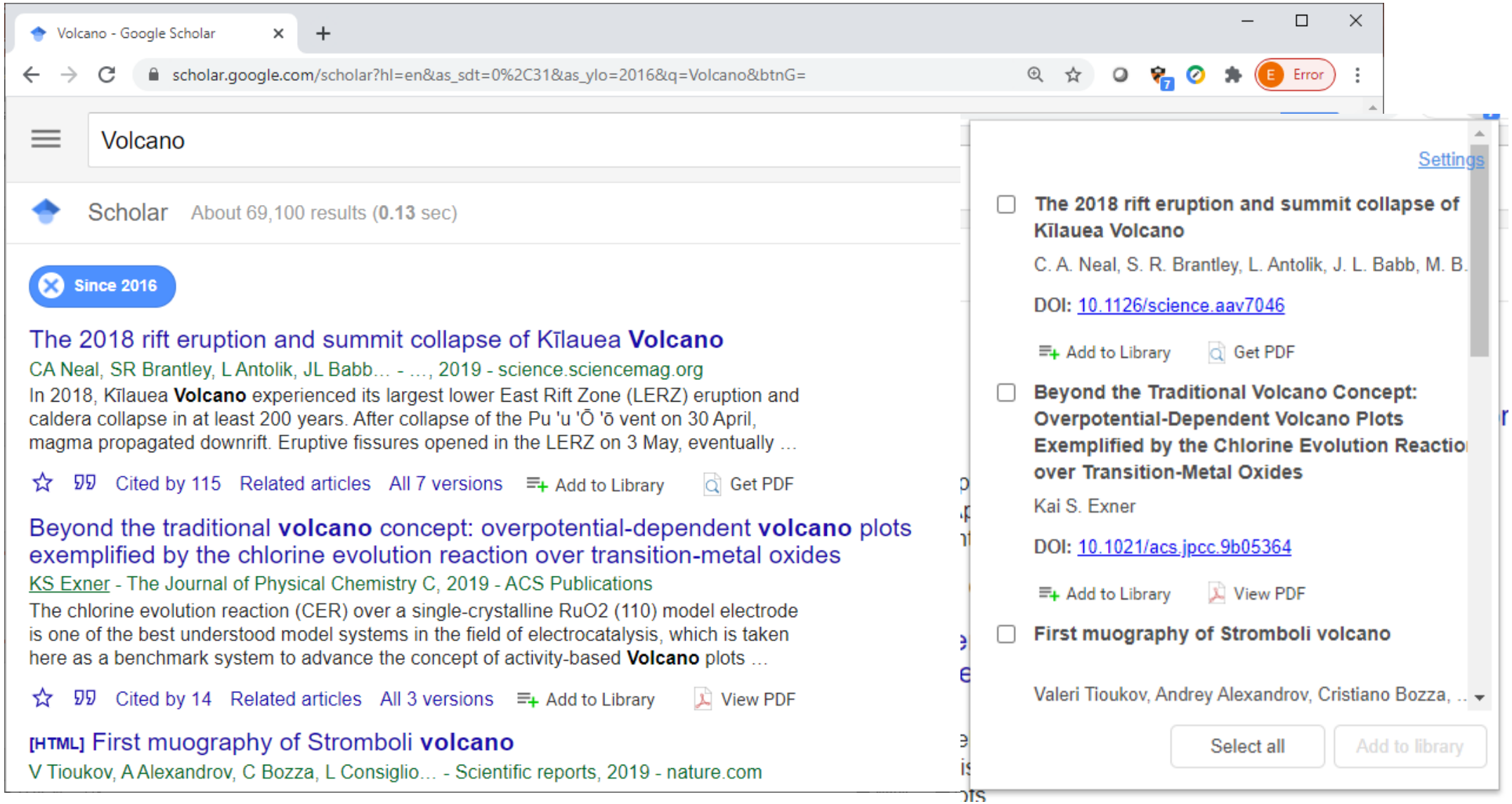
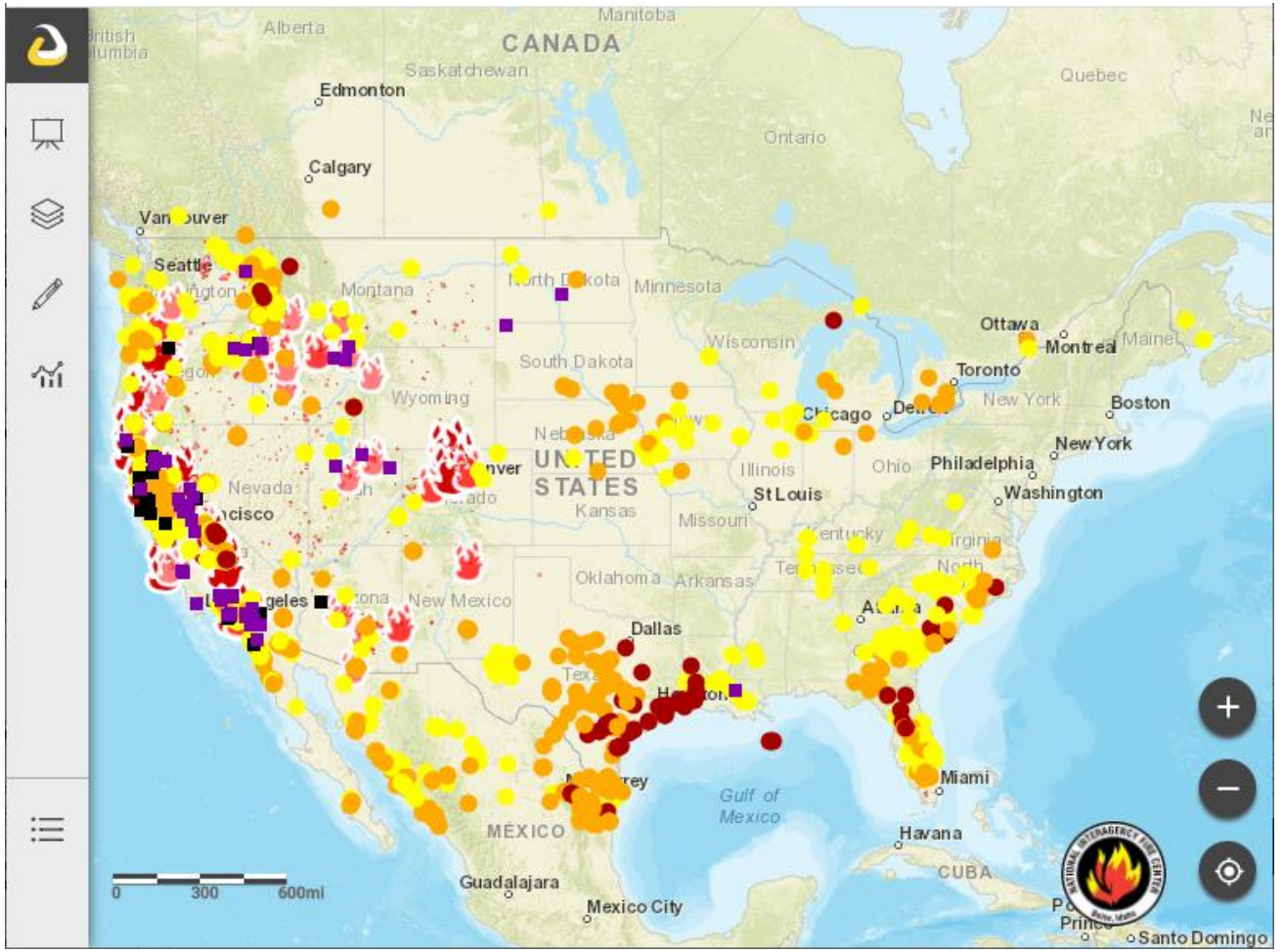


Wildfires

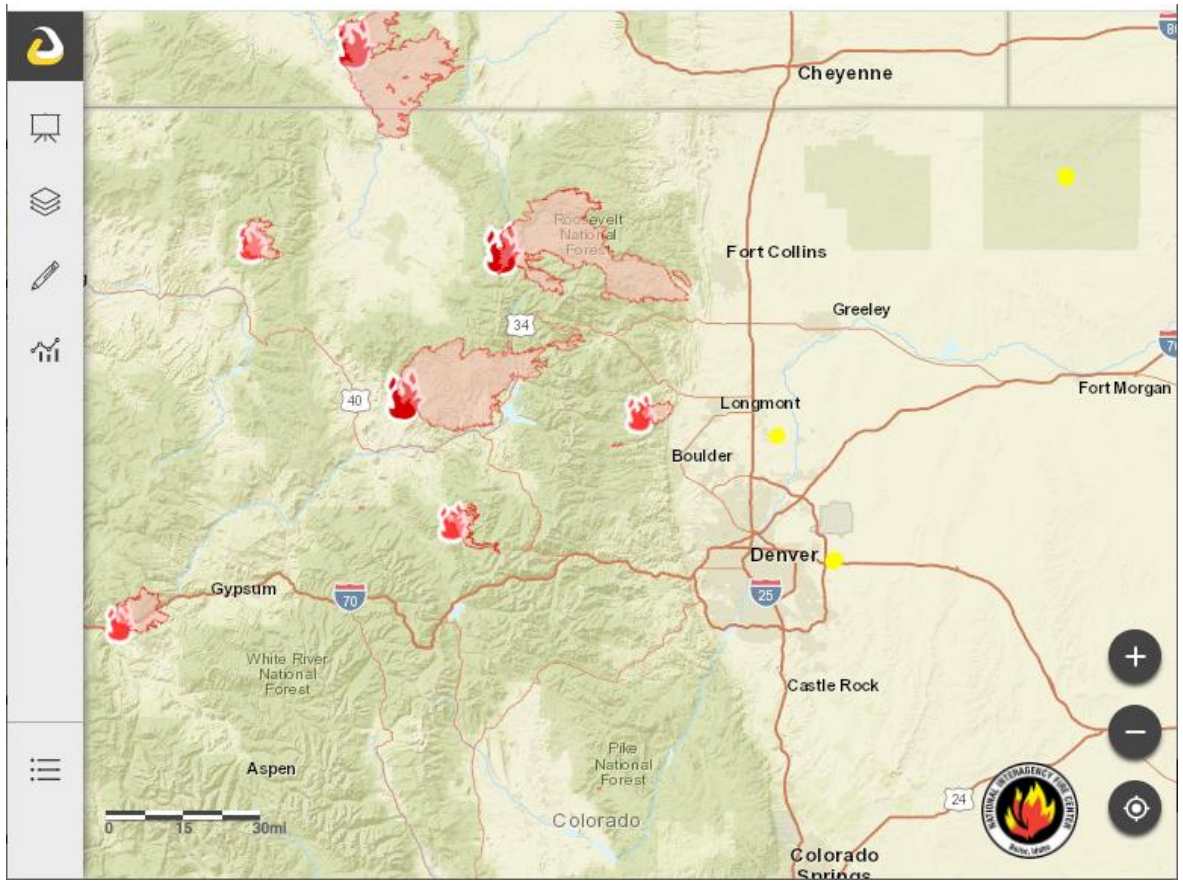
Real-Time Data/Maps

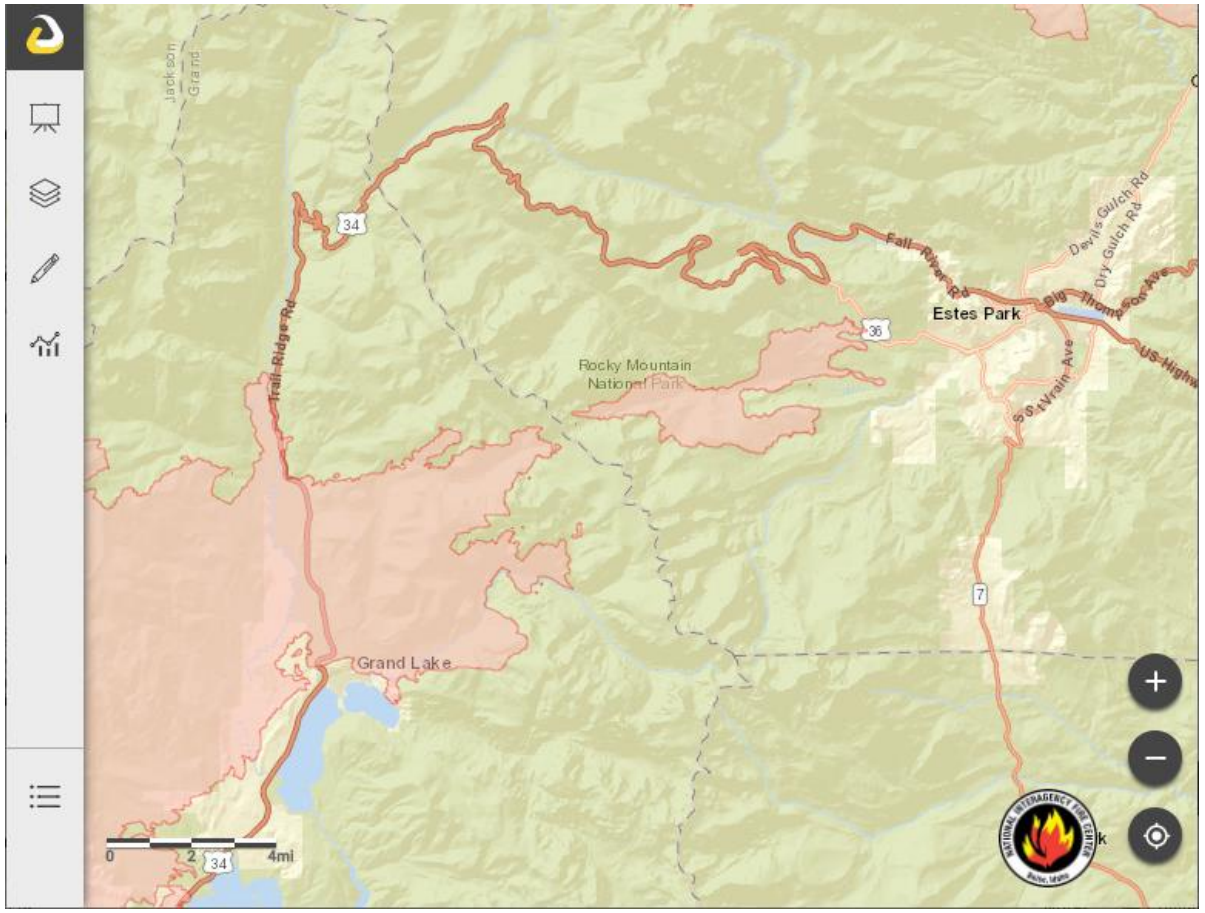
https://www.geomac.gov/



https://maps.nwcg.gov/sa/#/%3F/39.8212/-96.2709/4

Wildfires



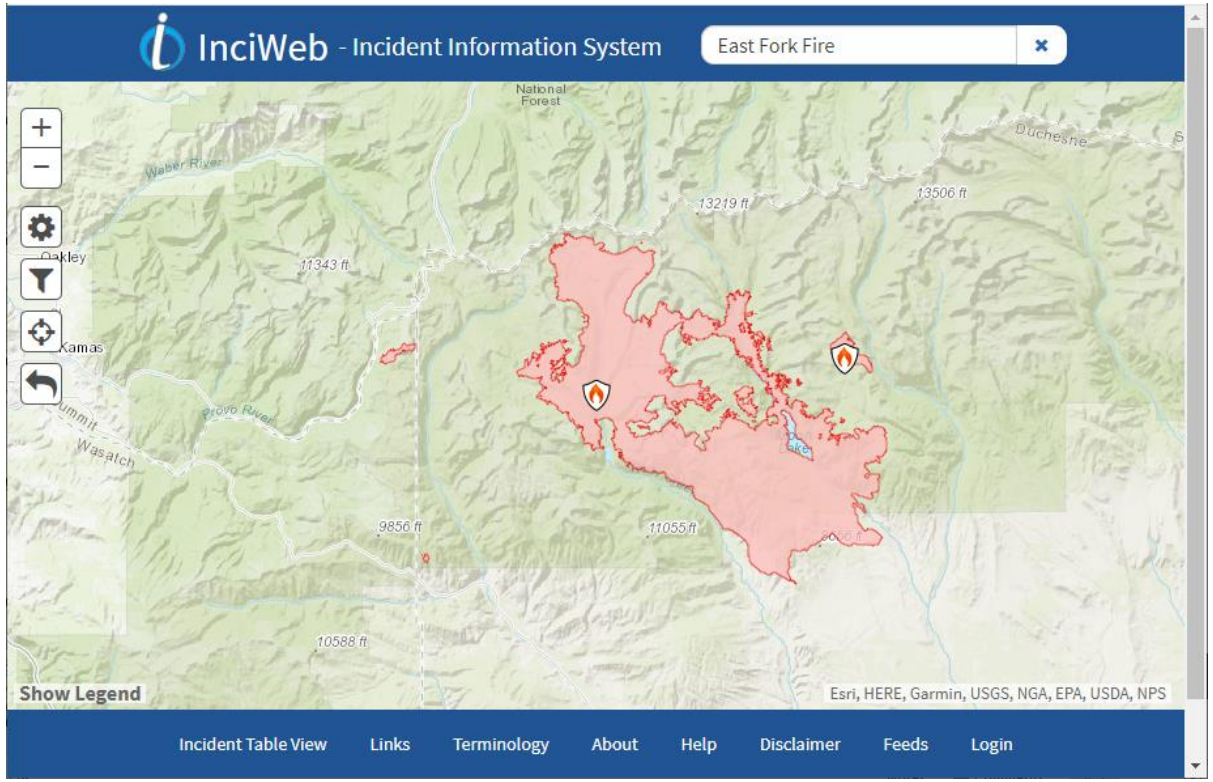


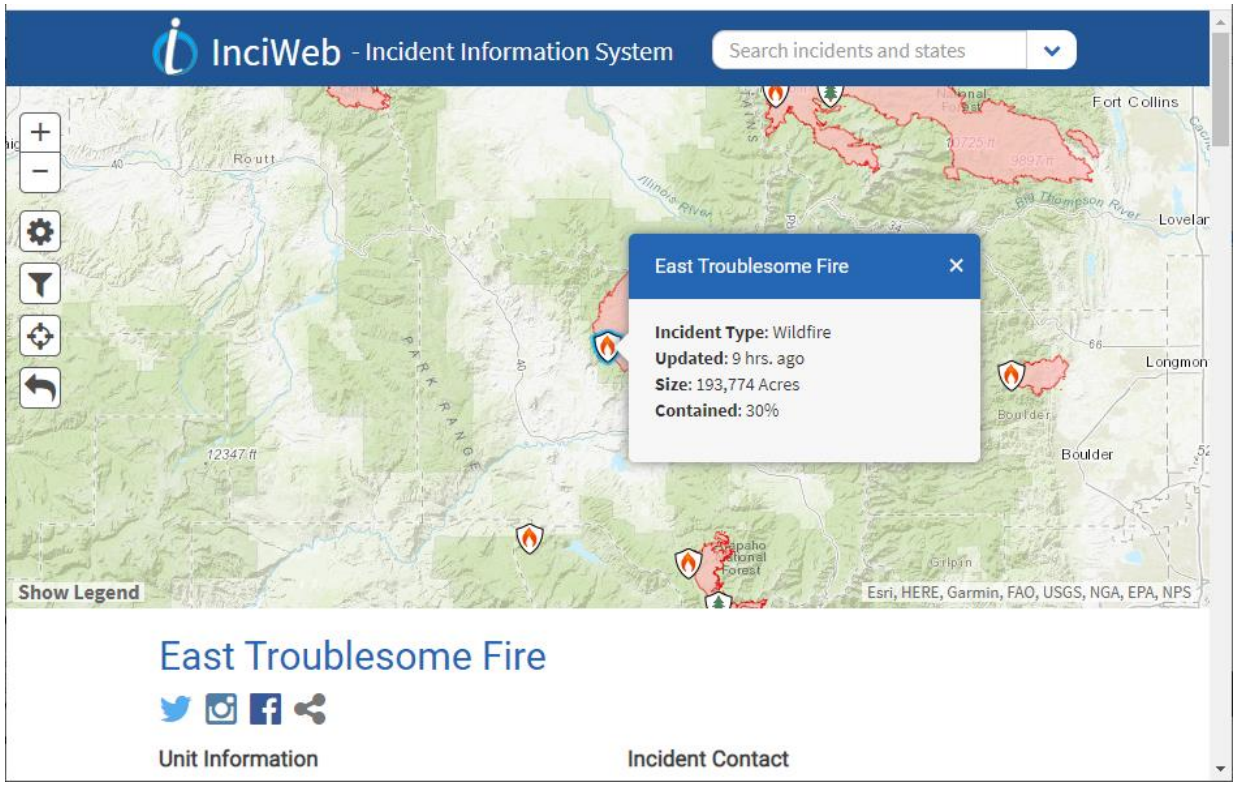
https://maps.nwcg.gov/sa/#/%3F/39.8212/-96.2709/4

Wildfires

https://inciweb.nwcg.gov/

https://inciweb.nwcg.gov/incident/6964/





Wildfires

USGS Fire Science
https://www.usgs.gov/media/videos/pubtalk-062019-usgs-fire-science

USGS Fire Science is fundamental to understanding the causes, consequences, and benefits of wildfire and helps prevent and manage larger, catastrophic events
https://www.usgs.gov/special-topic/fire

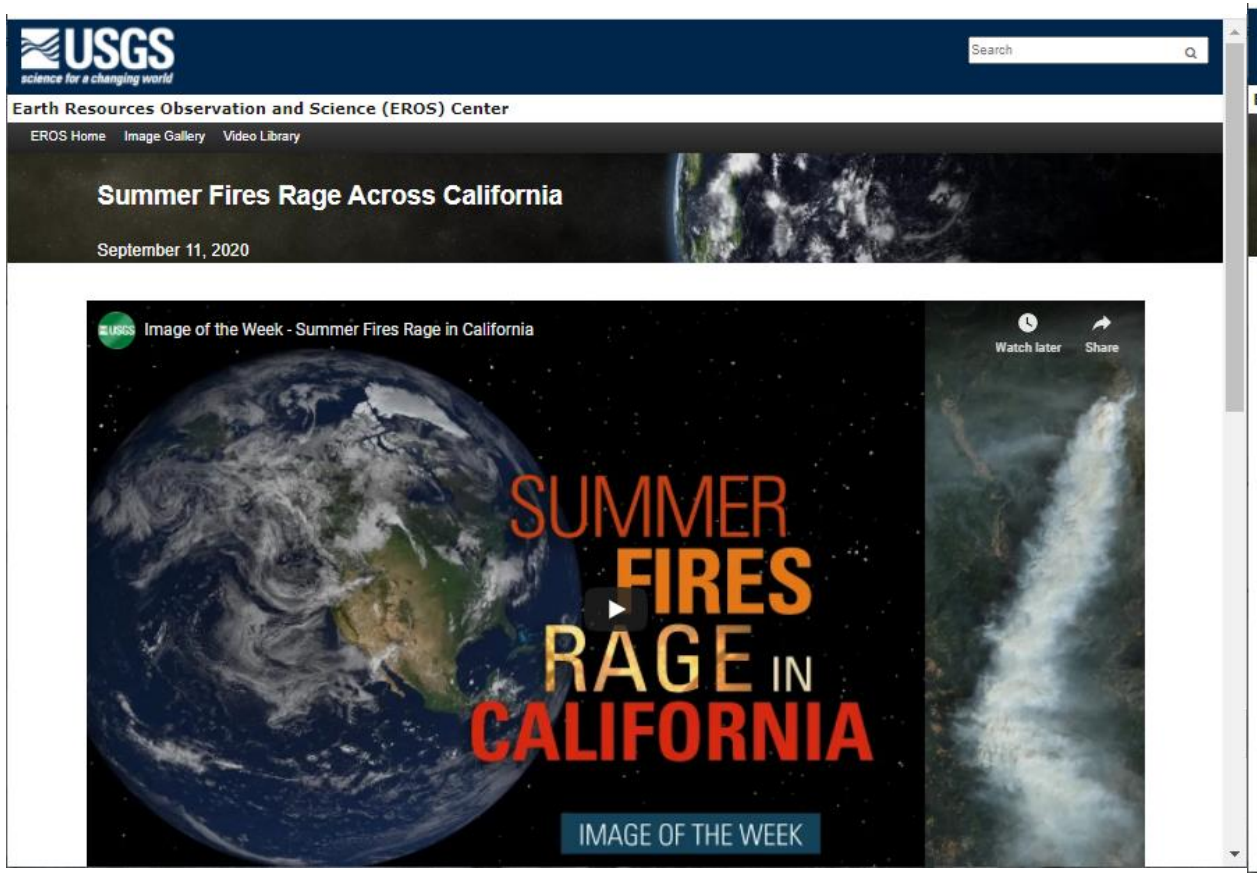
Online Videos/Lectures
https://www.usgs.gov/science-support/osqi/yes/resources-teachers/online-lectures

Public Lectures: https://www.usgs.gov/science-support/communications-and-publishing/public-lecture-series/multimedia

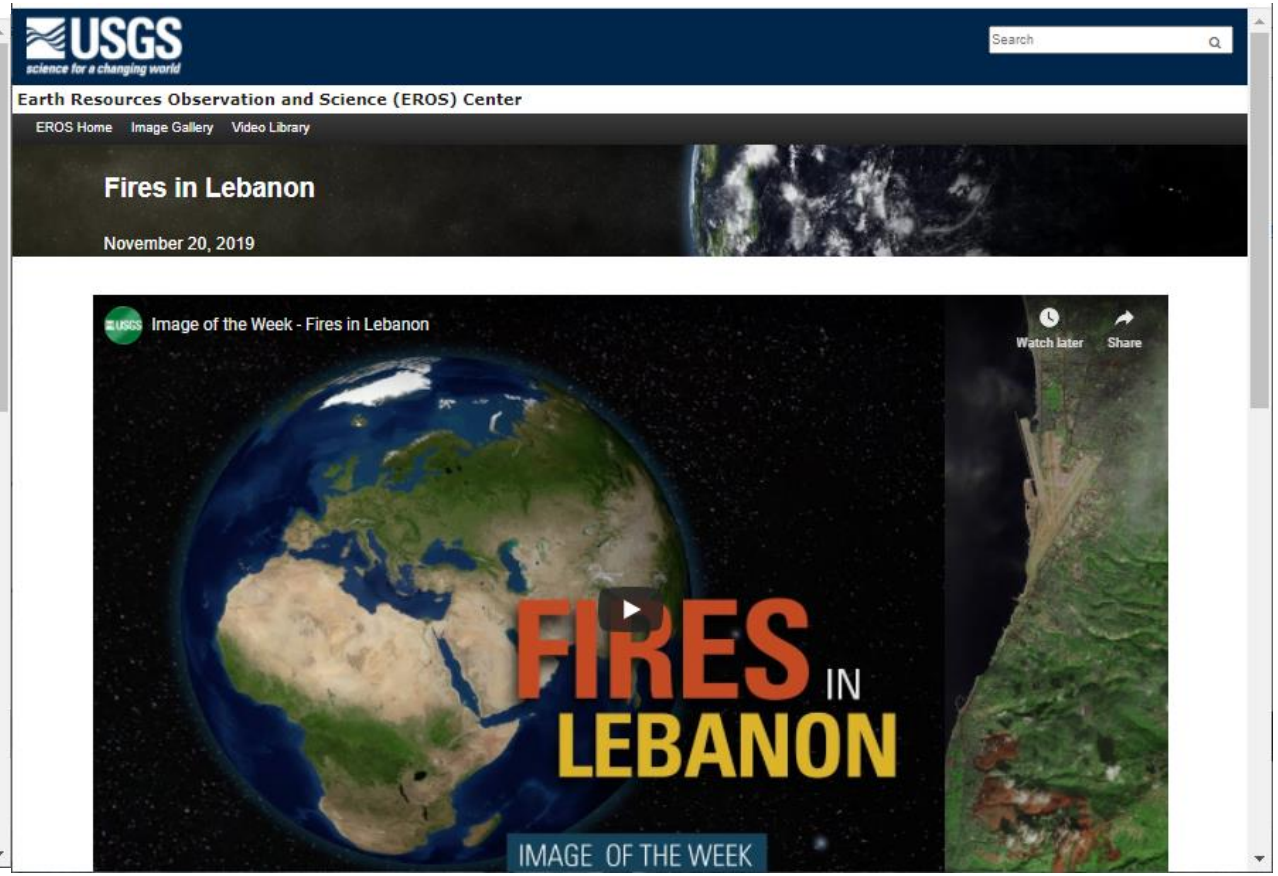
Post-fire debris flow early warning
https://www.usgs.gov/media/videos/pubtalk-102018-post-fire-debris-flow-early-warning

Wildfires

https://eros.usgs.gov/image-gallery/image-of-the-week/summer-fires-rage-across-california



https://eros.usgs.gov/image-gallery/image-of-the-week/fires-lebanon



Wildfires

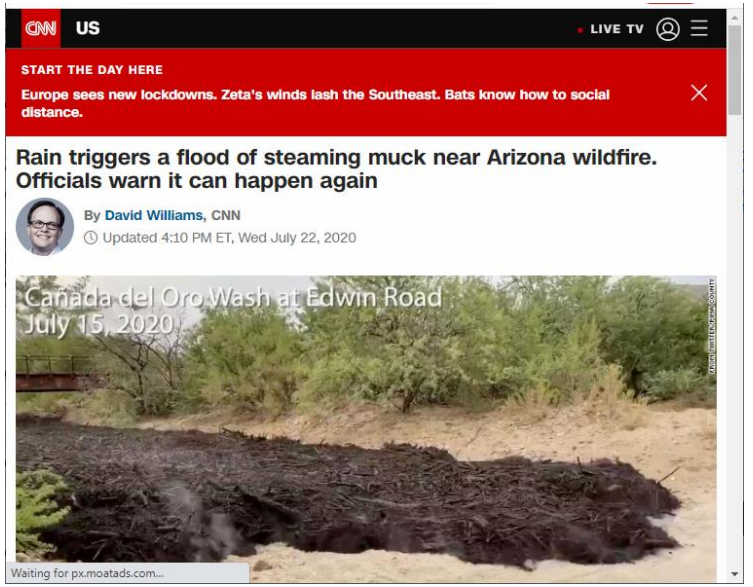
Emergency Assessment of Post-Fire Debris-Flow Hazards
Wildfire can significantly alter the hydrologic response of a watershed to the extent that even modest rainstorms can produce dangerous flash floods and debris flows.
https://landslides.usgs.gov/hazards/postfire_debrisflow/

Preparedness
What To Do and Look For During and Immediately

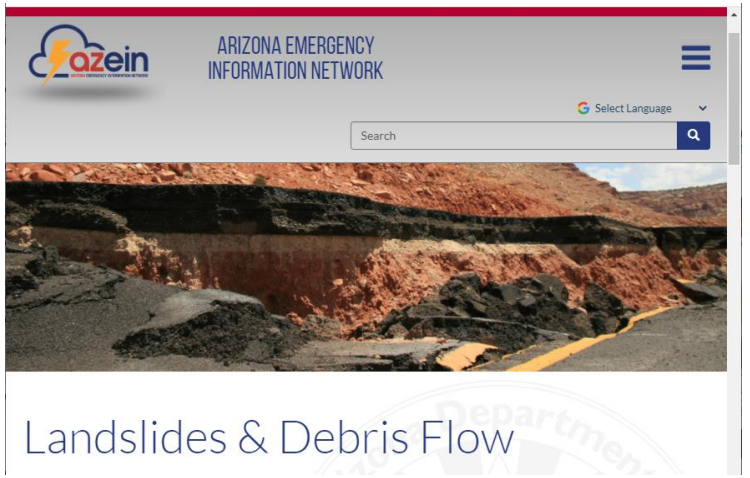
After Heavy Rains
Landslide Preparedness & Safety Information

National Weather Service
Post Wildfire Flash Flood & Debris Flow Guide

WHERE IT BURNS, IT FLOODS: PREDICTING POST-FIRE MUDSLIDES IN THE WEST



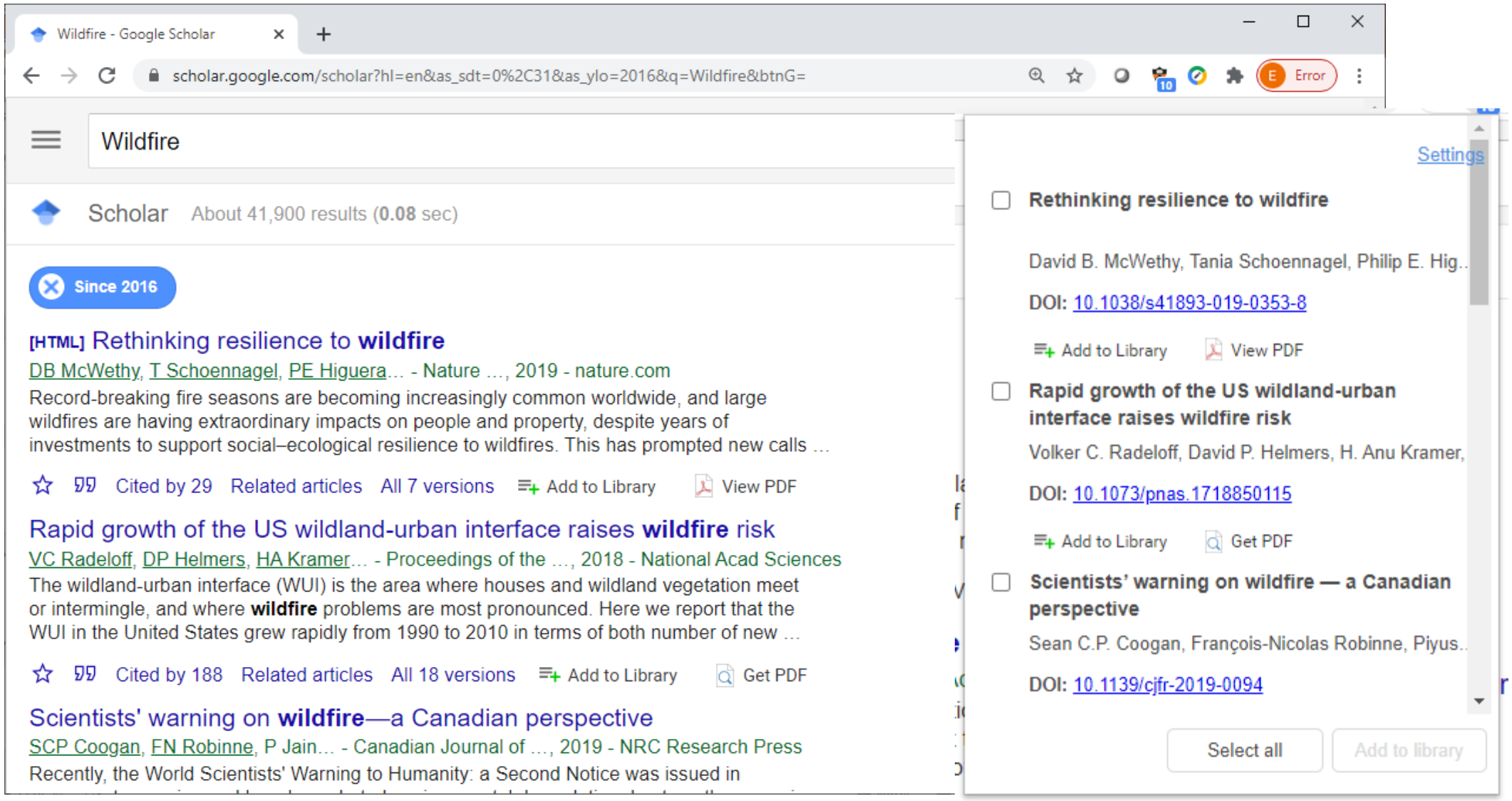
https://www.cnn.com/2020/07/22/us/tucson-wildfire--debris-scn-trnd/index.html flood



https://ein.az.gov/hazards/landslides-debris-flow

GoogleScholar

https://libguides.princeton.edu/AnywhereAccess



Thank You!

Geological Survey art room

https://artmuseum.princeton.edu/collections/objects/32428

https://artmuseum.princeton.edu/exhibitions

Stay Connected With Librarians

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

GEONET listserv: http://www.geoinfo.org/e-mail-list/

Disaster Librarians & Information Professionals :
https://disasterinfo.nlm.nih.gov/disaster-info-specialist

DISASTR-OUTREACH-LIB Listserv :
https://disasterinfo.nlm.nih.gov/stay-connected

Next webinar: November 24, 2020 at 2 pm:
Using Government 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