Description of document:	U.S. Geological Survey (USGS) Transition Briefing Document for the incoming Biden Administration, 2020
Requested date:	01-January-2021
Release date:	07-January-2021
Posted date:	01-February-2021
Source of document:	FOIA Request United States Geological Survey (USGS) P.O. Box 262 State College, PA 16804 Fax: (703) 648-7199 Email: foia@usgs.gov

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
12201 Sunrise Valley Drive
Reston, Virginia 20192-0002

In Reply Refer To:
U.S. Geological Survey
Attention: Eric J. Darby
12201 Sunrise Valley Drive
Reston, Virginia 20192-0002

January 7, 2021

Re: U.S. Geological Survey (USGS) Freedom of Information Act (FOIA) Tracking # DOI-USGS-2021-001552 – Response

This is our response to your FOIA request, dated January 1, 2021, in which you requested copies of the following records:

> A digital/electronic copy of the transition briefing documents (late 2020) prepared by USGS for the incoming Biden Administration.

We have enclosed one Portable Document Format (PDF) electronic file containing briefings the USGS verbally presented to the transition team, consisting of 141 pages, which is being released to you in full.

For the USGS final briefing materials sent by the Department of the Interior to the Office of Management and Budget/General Services Administration, only the Office of the Secretary (OS) FOIA Office has those materials. Any FOIA requests to the OS may be submitted through the FOIAonline portal. The OS FOIA Office is planning to post these materials in its FOIA library soon. You may wish to contact the OS FOIA Office if you have not done so already. The contact information for the OS FOIA Office is at the following:

U.S. Department of the Interior
Office of the Secretary
Mr. William Holzerland, FOIA Officer
1849 C Street, NW

MS-7328, MIB
Washington, DC 20240
Phone: (202) 513-0765
Email: osfoia@ios.doi.gov
Website: https://www.doi.gov/foia/os

The final briefing materials are not within the USGS's possession and control. Therefore, we are unable to provide you with these records. Ms. Judy Cearley, Government Information Specialist, is responsible for this partial denial.

You may appeal this response to the Department's FOIA/Privacy Act Appeals Officer. If you choose to appeal, the FOIA/Privacy Act Appeals Officer must receive your FOIA appeal **no later than 90 workdays** from the date of this final response. Appeals arriving or delivered after 5 p.m. Eastern Time, Monday through Friday, will be deemed received on the next workday.

Your appeal must be made in writing. You may submit your appeal and accompanying materials to the FOIA/Privacy Act Appeals Officer by mail, courier service, fax, or email. All communications concerning your appeal should be clearly marked with the words: "FREEDOM OF INFORMATION APPEAL." You must include an explanation of why you believe this response is in error. You must also include with your appeal copies of all correspondence between you and USGS concerning your FOIA request, including your original FOIA request and this response. Failure to include with your appeal all correspondence between you and USGS will result in the Department's rejection of your appeal, unless the FOIA/Privacy Act Appeals Officer determines (in the FOIA/Privacy Act Appeals Officer's sole discretion) that good cause exists to accept the defective appeal.

Please include your name and daytime telephone number (or the name and telephone number of an appropriate contact), email address and fax number (if available) in case the FOIA/Privacy Act Appeals Officer needs additional information or clarification of your appeal.

DOI FOIA/Privacy Act Appeals Office Contact Information
Department of the Interior
Office of the Solicitor
1849 C Street, N.W.
MS-6556 MIB
Washington, DC 20240
Telephone: (202) 208-5339
Fax: (202) 208-6677
Email: FOIA.Appeals@sol.doi.gov

You were classified as an "other-use" requester. Because the cost to process your request is less than $50.00 you are not being charged for the processing of your request. *See 43 C.F.R. 23.7(g).*

The 2007 FOIA amendments created the Office of Government Information Services (OGIS) to offer mediation services to resolve disputes between FOIA requesters and Federal agencies as a

non-exclusive alternative to litigation. Using OGIS services does not affect your right to pursue litigation. You may contact OGIS in any of the following ways:

Office of Government Information Services
National Archives and Records Administration
8601 Adelphi Road – OGIS
College Park, Maryland 20740-6001
Telephone: (202) 741-5770
Fax: (202) 741-5769
Toll-free: 1-877-684-6448
E-mail: ogis@nara.gov
Web: https://archives.gov/ogis

Please note that using OGIS services does not affect the timing of filing an appeal with the Department's FOIA & Privacy Act Appeals Officer. Contact information for the Department's FOIA Public Liaison, who you may also seek dispute resolution services from, is available at *https://www.doi.gov/foia/foiacenters.*

This completes the processing of your request. If you have any questions about our response, you may contact Mr. Eric J. Darby by electronic mail at foia@usgs.gov.

Sincerely,

ERIC DARBY Digitally signed by ERIC DARBY Date: 2021.01.07 15:44:33 -05'00'

Eric J. Darby
U.S. Geological Survey
Government Information Specialist

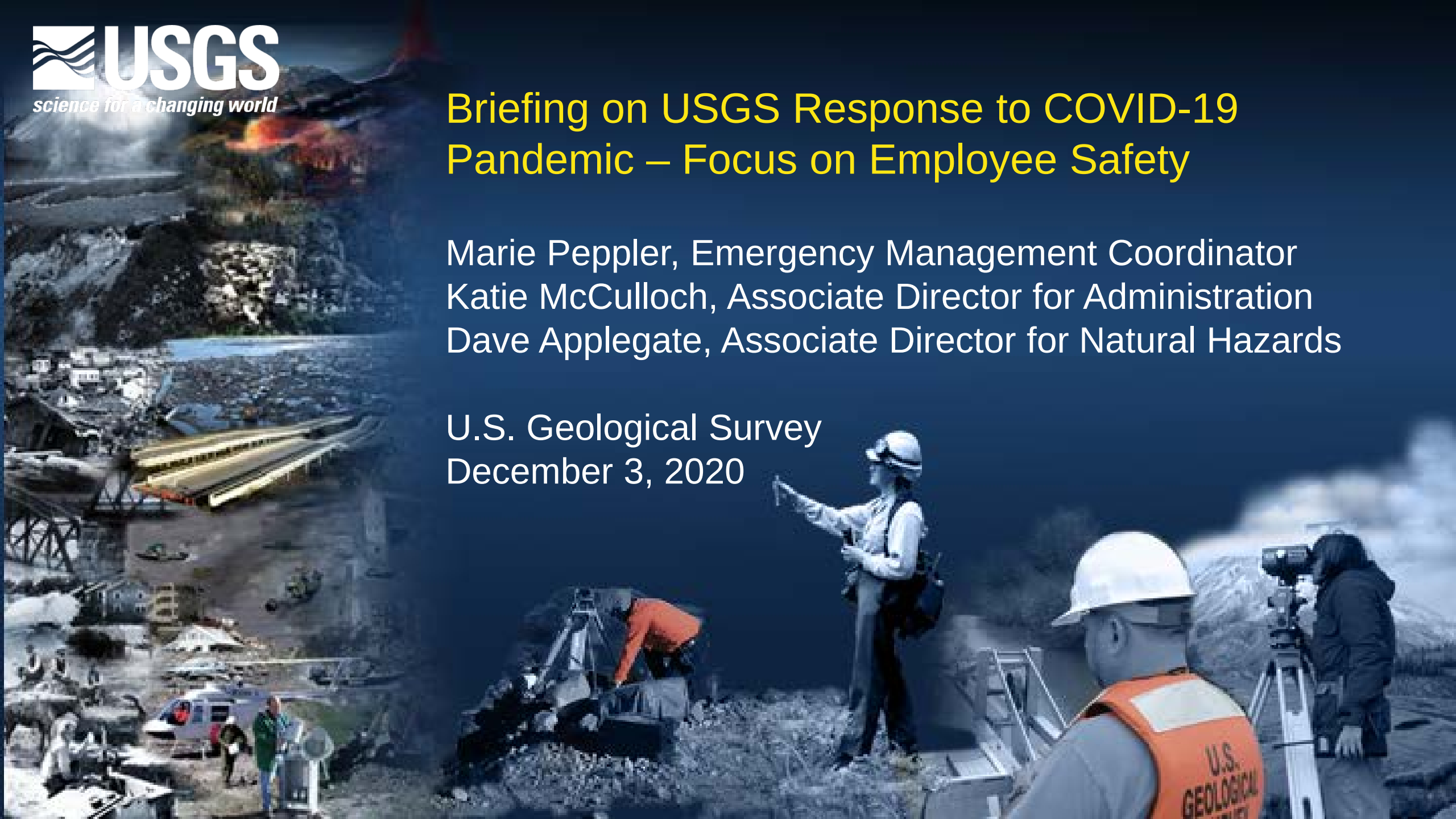
Enclosure:
2021-1552 Combined Records.pdf (141 pages)

USGS
science for a changing world

Briefing on USGS Response to COVID-19 Pandemic – Focus on Employee Safety

Marie Peppler, Emergency Management Coordinator
Katie McCulloch, Associate Director for Administration
Dave Applegate, Associate Director for Natural Hazards

U.S. Geological Survey
December 3, 2020



USGS hazard roles and responsibilities

- Responsible for providing assessments and alerting for earthquakes, volcanic eruptions, and landslides
- Seismic networks support NOAA's tsunami warnings
- Streamgages and storm surge monitors support NOAA's flood and severe weather (including hurricane) warnings
- Coastal and marine geologic surveys and research support assessments of earthquake and tsunami hazards, and coastal impacts from storms, hurricanes and sea-level rise
- Geomagnetic observatories support NOAA and US Air Force 557th Weather Wing geomagnetic storm forecasts
- USGS has key role in tracking chemical and biological threats, in particular zoonotic diseases
- Geospatial information supports response operations for wildfire and many other disaster types

USGS
science for a changing world

Starting COVID-19 Pandemic Goals

1. Mitigate exposure and transmission in the workforce (Zero Employee-to-Employee Transmissions)
2. Ensure the Bureau has the ability to carry out its Mission Essential Functions throughout this event

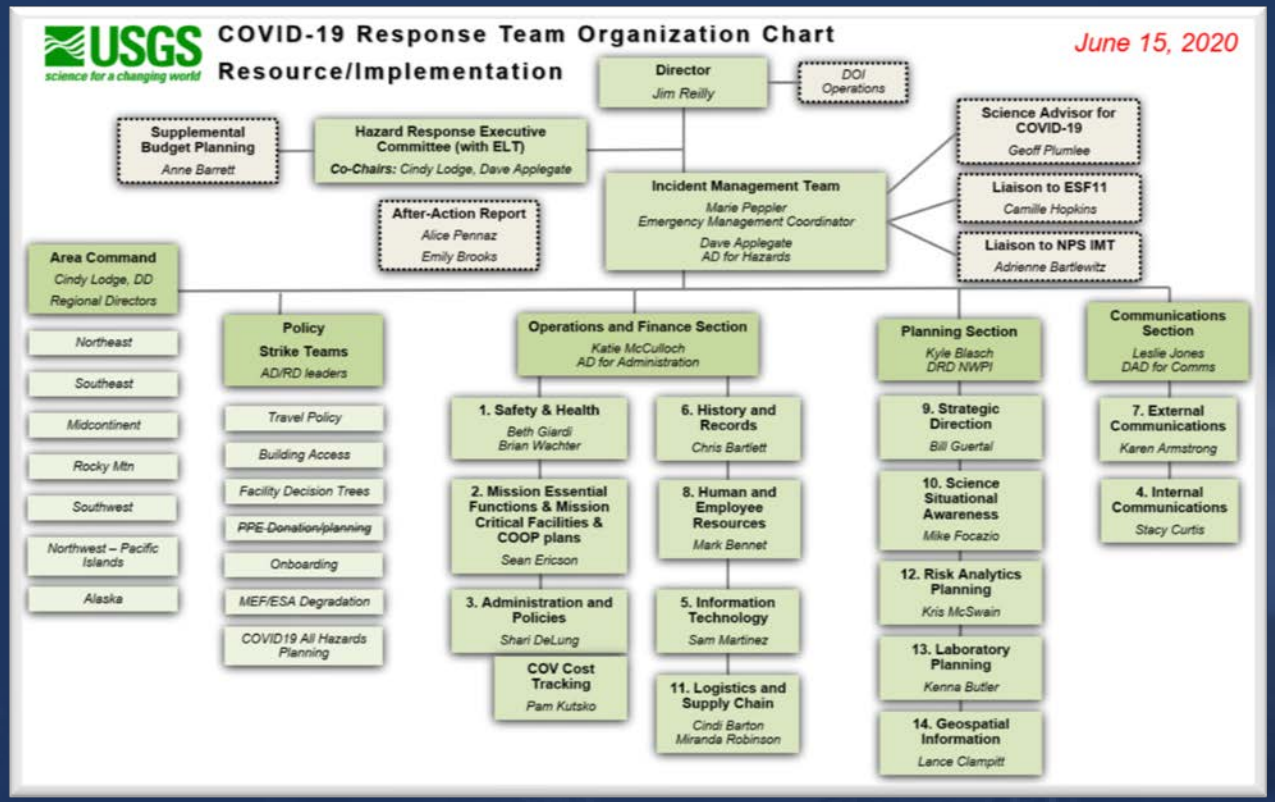
Hazards Response Executive Committee meeting, March 6 2020

- Initial focus on Mission Essential Functions
  - Field work for flood measurements
  - Earthquake and volcano monitoring and reporting
  - LANDSAT operations
  - Zoonotic Disease and other critical lab-based research
- Gradually developed guidance and safer processes to expand field work and work done in offices
  - Needed to understand LOCAL risks and focus on local decision making
- We remain in a maximum telework posture for all work that can be done that way
  - At present, most field work and lab activities are taking place with modifications

USGS science for a changing world

Developing protocols to enable mission activities

- Stood up Incident Command System-like Response Team with over 200 contributors
- Developed extensive “Critical Information” guidance and records management
  - Travel
  - Human resources (onboarding, telework)
  - Planning for safe return to labs and other on-site operations
  - Response to employees with symptoms/exposures to protect others



COVID-19 Managers & Supervisors Portal

Navigating Phases and Cases

- Main Guidance
- Individual Decision Matrix
- Case Worksheet
- Employee Diary example
- Contact notification script
- Communications templates/processes
- Case Report Form
- Facility Phase Report Form

Developing Phased Recovery Plan

- USGS Bureau-level Plan
- Supervisor Reference Guide
- Cleaning Guidance
- Face Covering Guidance
- IT Readiness Steps
- Credentialing Center support
- Risk Assessment Worksheet
- Facility Guidance and Checklist
- Employee Checklist
- Science Center Plan template
- Communications templates
- Facility signage templates
- Training for returning staff

Guidance for Fieldwork and Laboratories

- Field Travel guidance & approval checklist
- Close-quarters guidance
  - Small Vessel
  - Dive Operations
  - Large Vessel
  - Small Aircraft
  - Commercial Airline
  - Hotel Stay
- Laboratory guidance and Checklist

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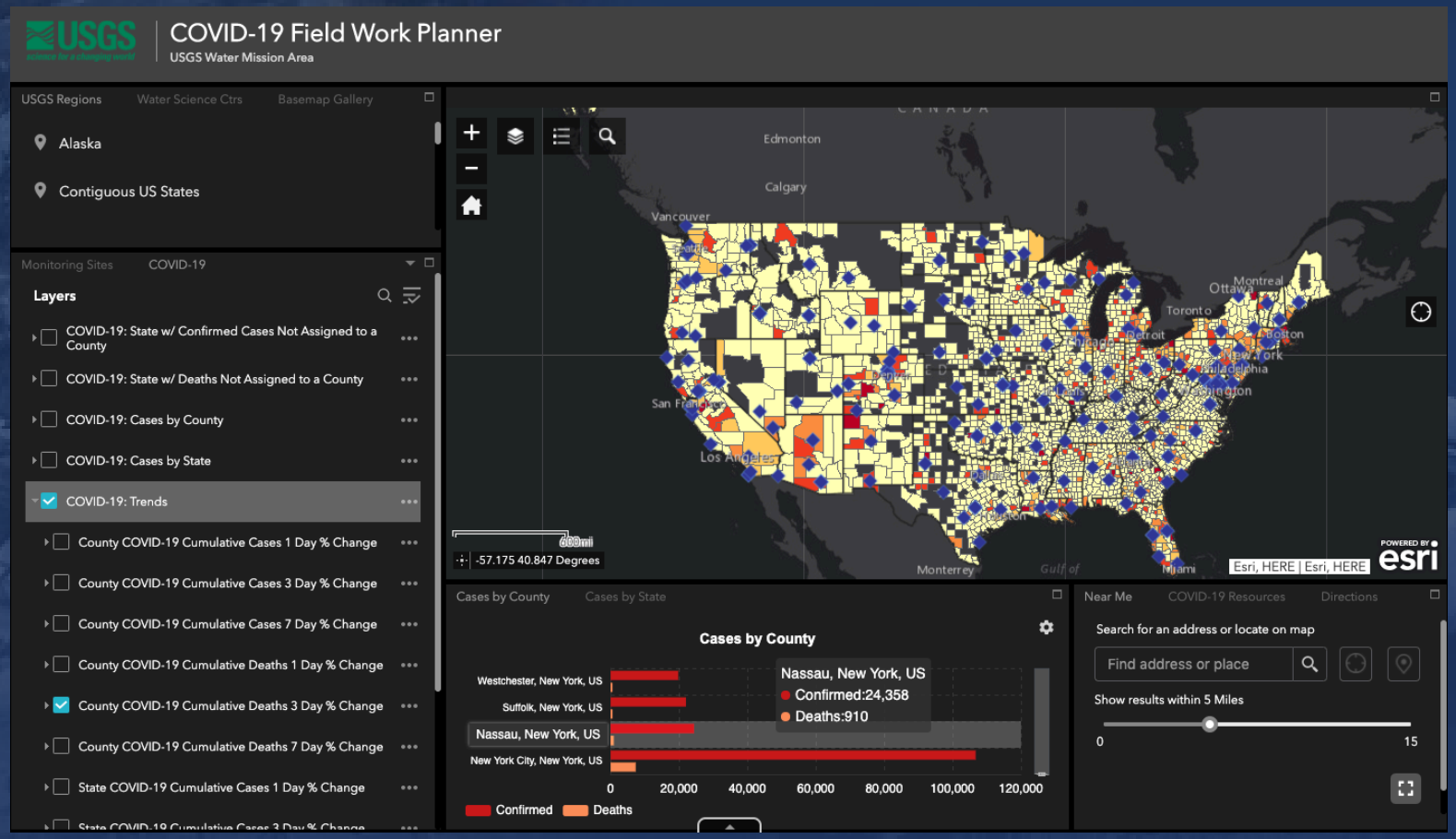
COVID-19 Field Work Planner:
Initially designed to support streamgage visits



Enhanced Data Layers

- COVID-19 1-, 3-, and 7-day trends in cases and deaths by county and state,
- COVID-19 cases and deaths by state,
- National Weather Service (NWS) Advanced Hydrologic Prediction Service Flood Stage Forecasts,
- NWS Quantitative Precipitation Estimates,
- NWS Quantitative Precipitation and Excessive Rainfall Forecasts,
- NWS National Significant River Flood Outlook Forecasts
- Live Traffic Services

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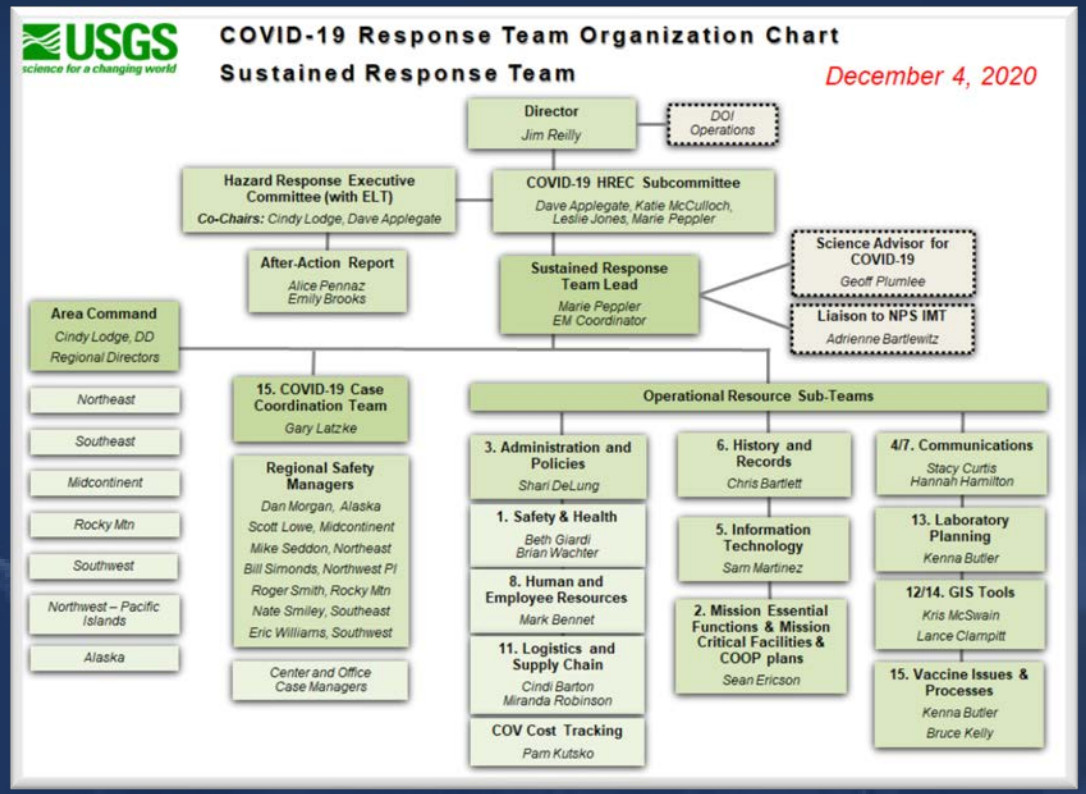
Sustaining vigilance over the long haul

- In early September, slimmed down the active team to allow staff to go back to their “day jobs”
- Case management teams at each location and Regional Case Coordinators to guide safe operations and daily closures/quarantine decisions
- Weekly Executive and Response Team meetings to stay aligned nationally and to the latest guidance
- We are planning to hold this posture for the foreseeable future.
- Adding a Team 15: Vaccine Issues and Processes



Current workforce support and plans

Bright Points

- Largely accomplishing the mission
- Flexibilities have been good for morale
  - 20 hrs of Admin leave
  - Max teleworking (especially for supervisors)
  - Creative scheduling
- Internal Communications
  - Massive webpage/records management
  - Internal Teams Live (recorded and 3,084 views)
    - Regional briefs (7) in June
    - Manager/Supervisor trainings (8) in July
    - Ask-the-Team-Anything Sessions in Sept, Nov, Dec

Opportunities for Future Focus

- Discrepancies between local and DOI rules cause confusion
  - Mask mandates vs recommendations
  - Local health dept signage
  - “Essential Worker” definitions
- CARES Act
  - PPE supply chain
  - Hiring Authority
  - Proposals for catching up on critical missed work – Volcanoes and EEW installations
- Stress is starting to take a toll on staff
  - EAP & work/life balance training can only go so far

USGS science for a changing world

USGS Resources

Check out all posters at the USGS COVID-19 Managers & Supervisors SharePoint Portal.

https://doimspp.sharepoint.com/sites/usgs-emergency-management/COVID-19/C19MSP/SitePages/Home.aspx

USGS

USGS Resources

Questions?

Marie Peppler, Emergency Response Coordinator
mpeppler@usgs.gov; 571-419-7524 cell
Katie McCulloch, Associate Director for Administration
kmcculloch@usgs.gov; 571-488-4839 cell
Dave Applegate, Associate Director for Natural Hazards
applegate@usgs.gov; 703-395-5790 cell

USGS science for a changing world

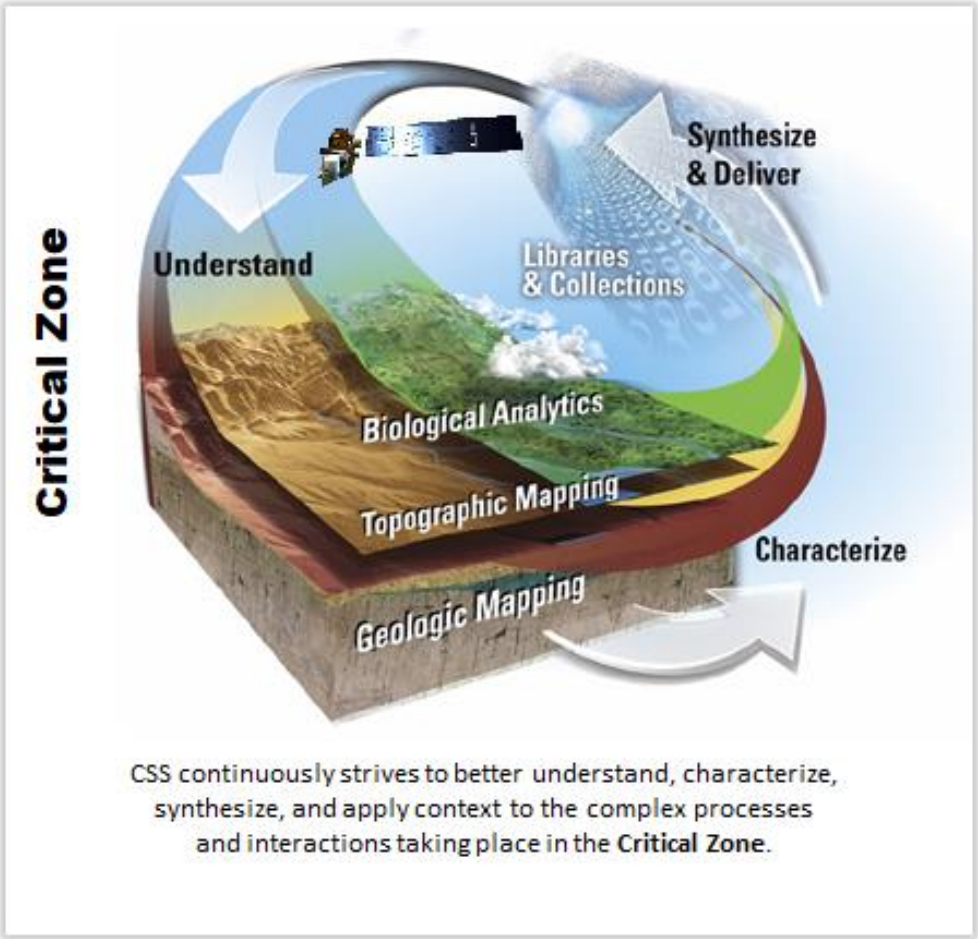
Core Science Systems Mission Area

Kevin T. Gallagher, Associate Director
USGS Core Science Systems Mission Area

16 December 2020

Core Science Systems – Mission Overview

America relies on our broad range of nationally-focused Earth system and observation science, geospatial research, and foundational data to remain informed, safe, and healthy.

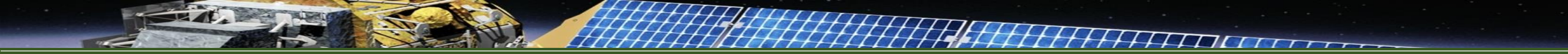


CSS continuously strives to better understand, characterize, synthesize, and apply context to the complex processes and interactions taking place in the **Critical Zone**.

- **Serve as the Nation's Civilian Mapping Agency.**
- **Provide remote sensing, topographic, geologic, and biogeographic data and maps to the Nation (Federal, State and Local governments, Tribes, the Public) and the World.**
- **Conduct surveys and research** on the Nation's surficial, geologic and biologic resources.
- **Coordinate effective and economical use and management of geospatial data assets** for Federal agencies and the Nation.
- **Operate Landsat Satellites** and deliver science-quality data.
- **Architect and develop Landsat Satellite ground and flight systems** in collaboration with NASA.
- **Provide analyses using remote sensing imagery** from satellites and unmanned aerial vehicles.
- **Provide multidisciplinary research and data** to understand and anticipate the changing climate, environment, and land use.
- **Support data management, data synthesis and analysis across science disciplines.**
- **Connect USGS scientists to published literature, data, and collections** to support evidence-based practices.
- **Inventory and preserve geological and geophysical data collections** to provide a framework for geoscience data and information sharing.
- **Improve Federal-State cooperation and collaboration** by effectively leveraging partnerships.

Core Science Systems – Sample of Stakeholders

- National Park Service
- Bureau of Land Management
- US Forest Service
- National Oceanic and Atmospheric Administration
- US Department of Agriculture
- Natural Resources Conservation Service
- Fish and Wildlife Service
- Bureau of Ocean Energy Management
- National Weather Service
- US Census Bureau
- Department of Transportation
- National Geospatial-Intelligence Agency
- Oak Ridge National Laboratory
- Environmental Protection Agency
- Department of Defense
- US Army Corps of Engineers
- Defense Logistics Agency
- NORTHCOM
- Department of Homeland Security
- State, local, and Tribal governments
- Federal Emergency Management Agency
- National Guard
- State Emergency Responders
- Western Governors Association
- American Institute of Professional Geologists
- American Geosciences Institute
- American Geophysical Union
- Geological Society of America



Five Core Science Systems Programs

- **National Geospatial Program**
  - 3D Elevation Program (3DEP)
  - Alaska Mapping and Map Modernization
  - National Hydrography Dataset Plus -High Resolution
  - US Topo
  - Federal Geographic Data Committee
  - Disaster Response

- **National Cooperative Geologic Mapping Program**
  - 3-D Geologic Mapping
    - FEDMAP, STATEMAP, EDMAP
  - National Geologic Map Database (NGMDB)
  - Great Lakes Geologic Mapping Coalition
  - Earth Mapping Resources Initiative (Earth MRI)

- **Land Change Science Program**
  - Risk and Vulnerability Assessments
  - Land Change Science, Research, and Technology Investigations

Science Synthesis, Analysis & Research Program

- High Performance Computing
- USGS Library
- Biogeographic Mapping
- Data Integration and Synthesis
- National Geological & Geophysical Data Preservation
- National Science Foundation – Ice Core Facility
- Geological Materials Repository
- John Wesley Powell Center for Analysis & Synthesis

National Land Imaging Program

- Satellite Operations
  - Landsat Satellite Operations (Landsats 7 and 8)
  - Landsat 9 Ground System Development
- National Civil Applications Center
- Unmanned Aircraft Systems (UAS)
- Land Change Monitoring, Assessment, and Projection (LCMAP)

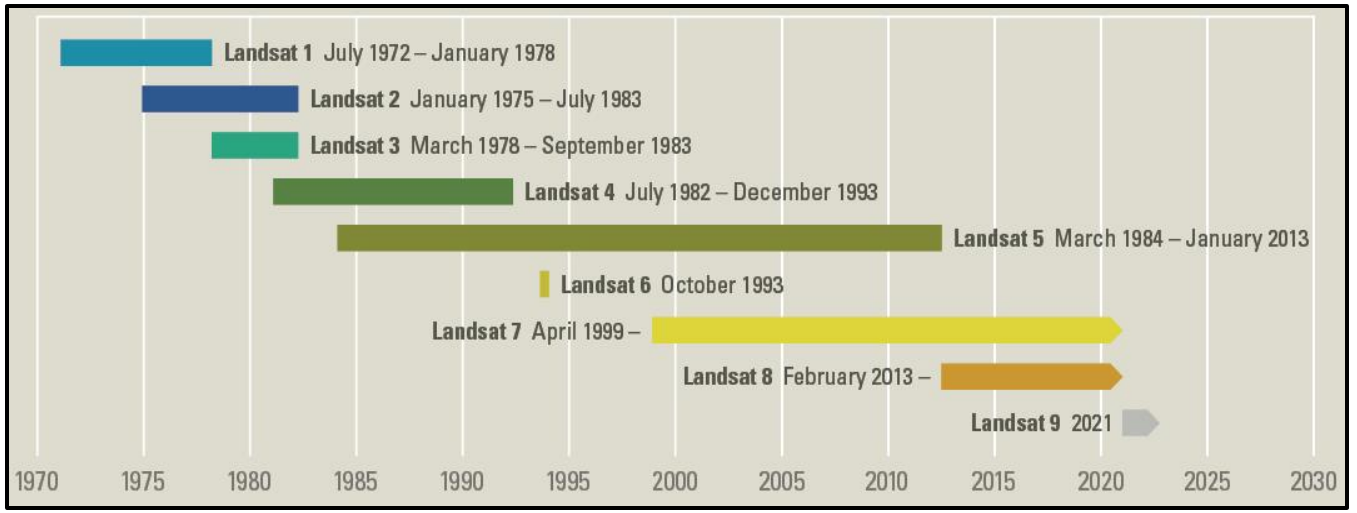
The NASA/USGS Landsat Program

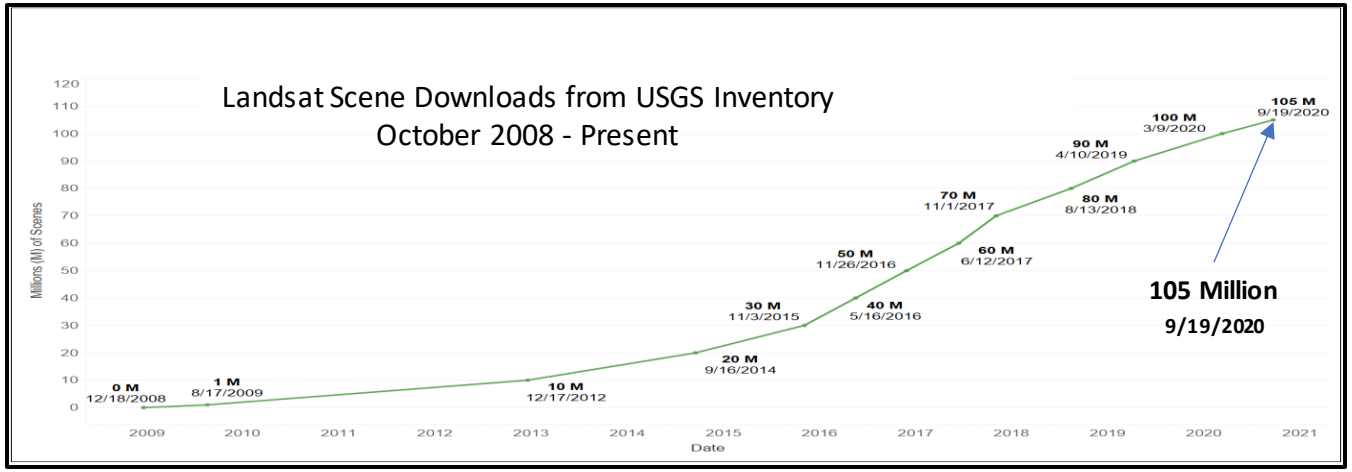
A partnership between DOI and NASA to maintain spaceborne imaging knows as Sustainable Land Imaging (SLI).

There are now more than 9 million unique Landsat scenes available for download from USGS

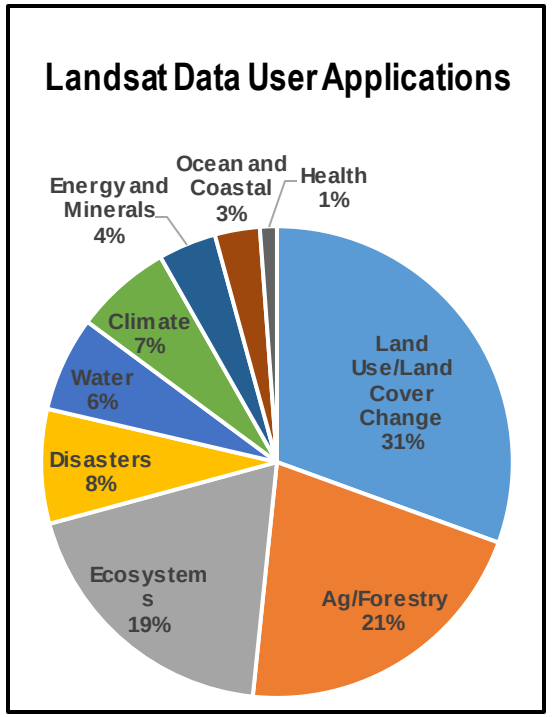
More than 105 million scenes have been downloaded from USGS and cloud hosting sites since the archive became freely available in October 2008

Millions more scenes have been and are being re-distributed by commercial cloud vendors





Landsat first launched in 1972, and has continuously provided Earth imagery ever since



Landsat Program Stakeholders & Coordination per Interagency Agreement

Assistant Secretary for Water and Science, DOI

Umbrella IAA

SLI Joint Steering Group Co-chairs

Associate Administrator for the Science Mission Directorate, NASA

USGS Director

Landsat Next Annex to IAA

Landsat Next Joint Steering Group Co-chairs

NASA Earth Science Division Director

USGS Core Science Systems
- Associate Director
- National Land Imaging Program Coordinator
- EROS Center Director

SLI Roundtable Coordinators

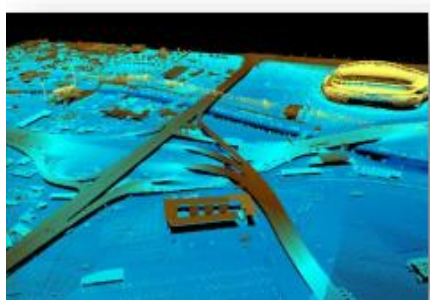
Management Points of Contact

Flight Programs / Earth Systematic Missions
- Associate Director for Flight Programs
- Earth Systematic Missions Program Executive
- Associate Director Earth Science Projects Division

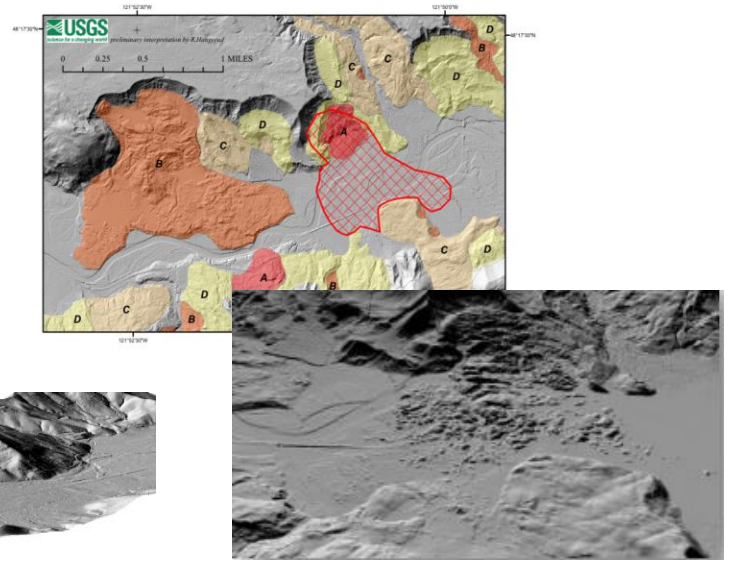
3D Elevation Program (3DEP)

The 3DEP provides high resolution elevation data (lidar and IfSAR) products and services, with the goal of achieving national coverage in 8 years. This addresses the mission-critical requirements of 34 Federal agencies, 50 states, and other organizations documented in the National Enhanced Elevation Assessment (Dewberry, Inc.).

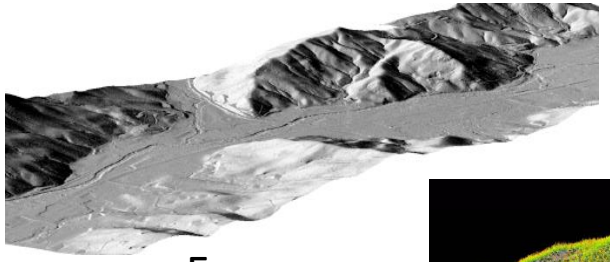
Flood Risk Management



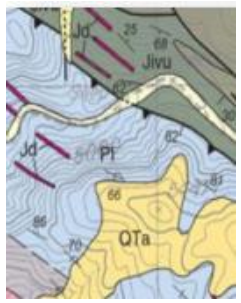
Infrastructure



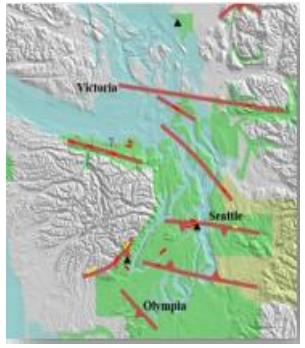
Landslides



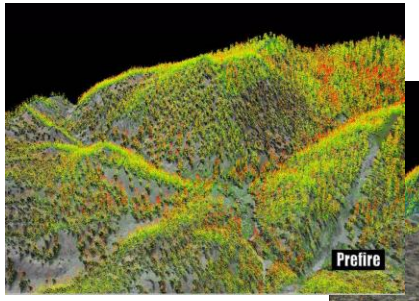
Energy

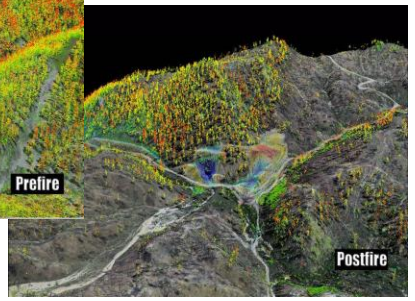


Critical Minerals



Seismic Hazards



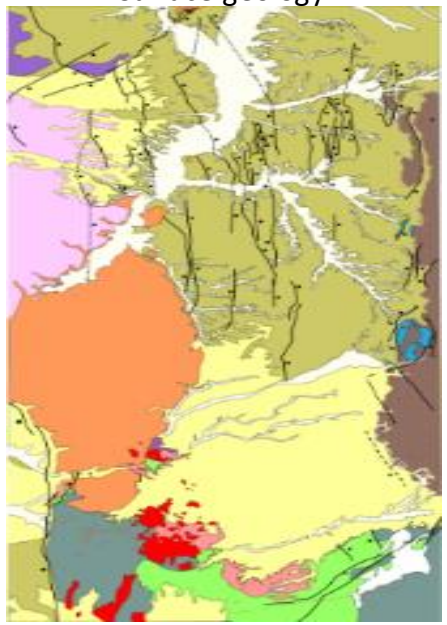


Wildfire Disturbance

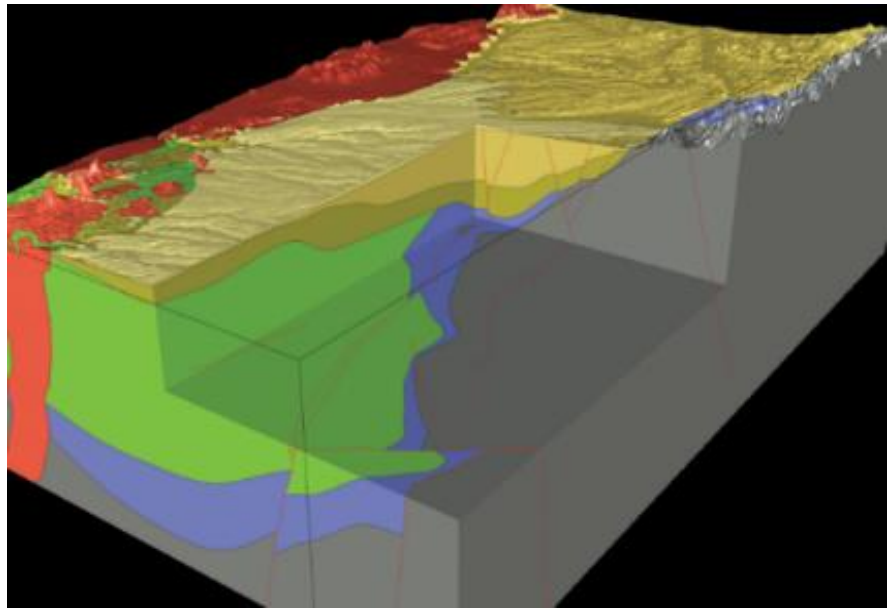
3D Geologic Mapping

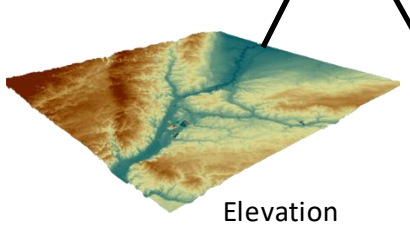
Creating integrated, three-dimensional, variable-scale digital geologic models and derivative map(s) of the U.S. and territories to address the changing needs of the Nation. Geologic Mapping provides subsurface data on structure, stability, faults, groundwater, contaminants, and geologic resources (e.g. geothermal or industrial resources).

Surface geology

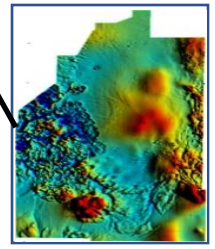


Scientific Interpretation





Elevation



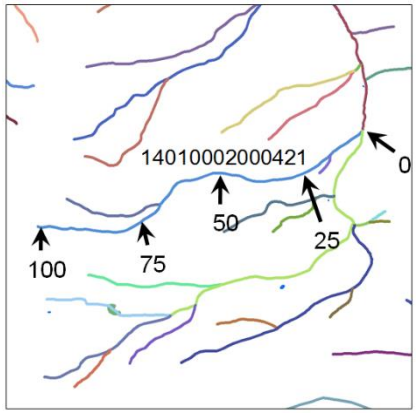
Subsurface information

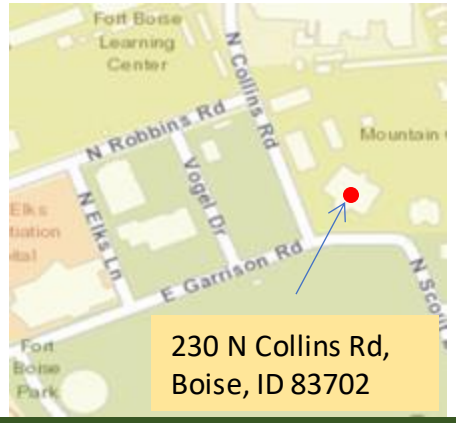
Hydrographic Mapping - National Hydrography Dataset (NHD)

The NHD is a Common Referencing System for the Nation's waterways through providing a nationwide hydrography framework that delivers 10-times more detailed hydrography data for applications like the National Water Model, which improves flood forecasting.

National Hydrography Dataset

Watershed Boundaries Dataset



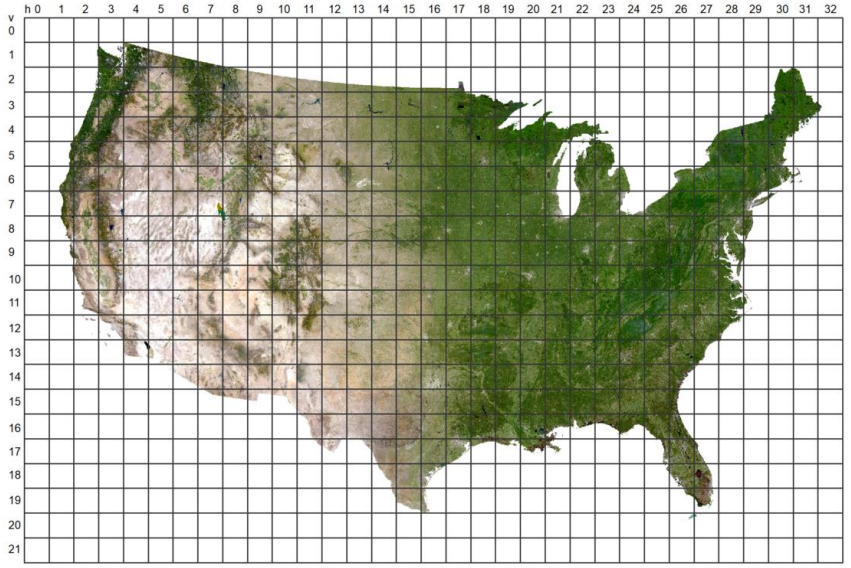


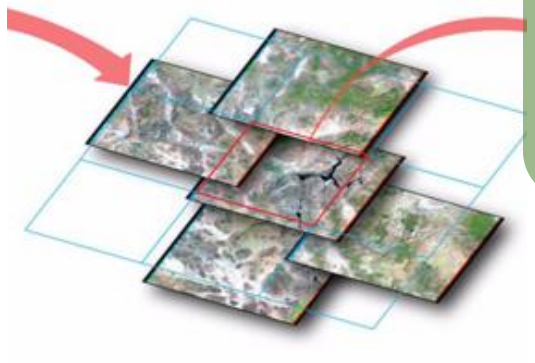
NHD provides a network, addresses and flow direction that enable analysis

Land Change Research and Analysis Ready Data

- Land Change Monitoring, Assessment, and Projection (LCMAP)
  - A new generation of land cover mapping, change monitoring, and modeling tools that enables scientists to analyze land change within a discrete area over time using the Landsat archive (1982 – 2020).

CONUS Analysis Ready Data (ARD) Tiles





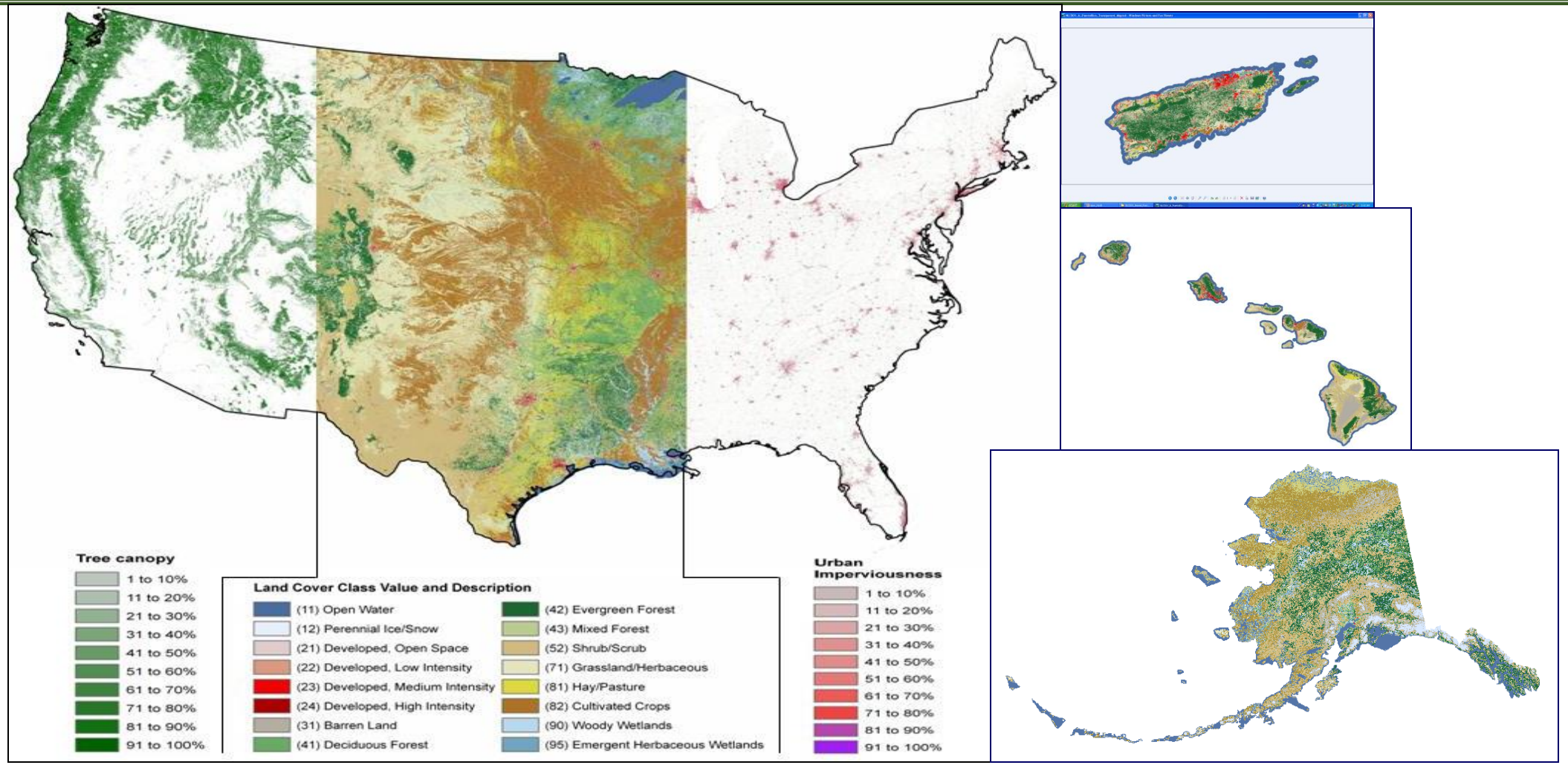
The release of Landsat ARD will make Landsat data much easier to be applied for time series analysis and will open doors in many scientific applications.

Land Use Change
Land Cover Change

Canopy Monitoring
Drought Monitoring

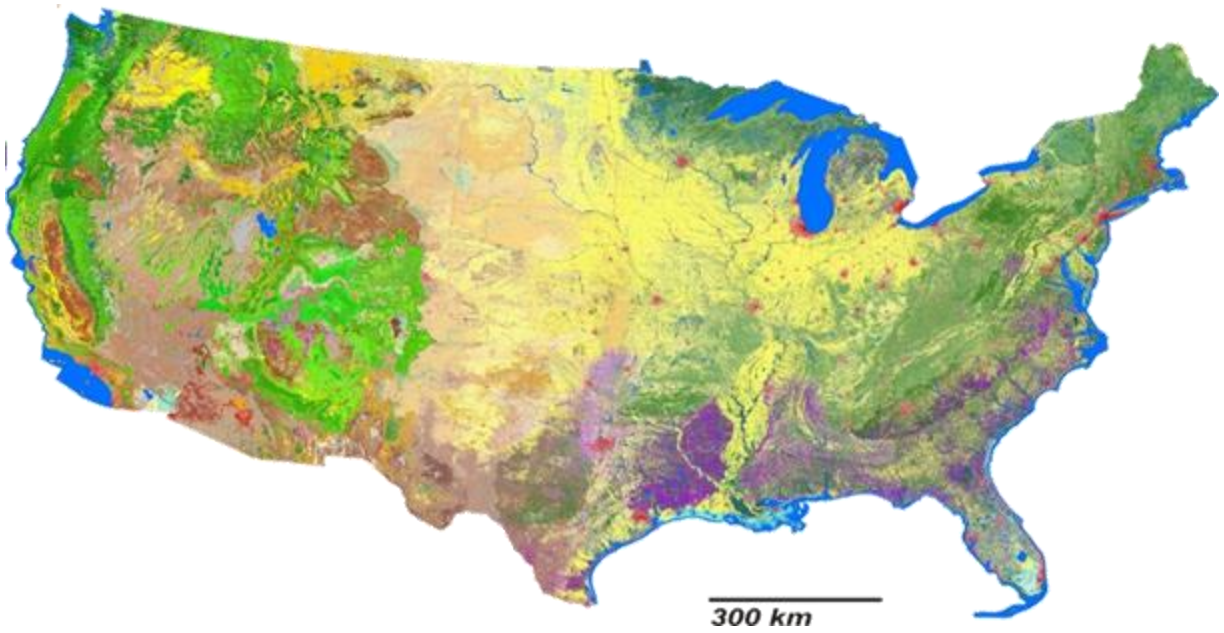
Fire Analysis
Flood Analysis

National Land Cover Database



The National Land Cover Database (NLCD) provides nation-wide data on land cover and land cover change at the Landsat Thematic Mapper (TM) 30-meter resolution. NLCD provides spatial reference and descriptive data for characteristics of the land surface such as thematic class (e.g., urban, agriculture, and forest), percent impervious surface, and percent tree canopy cover. The database is designed to provide five-year cyclical updates of U.S. land cover and land cover change since 2001 .

Land Change Science Program - LANDFIRE



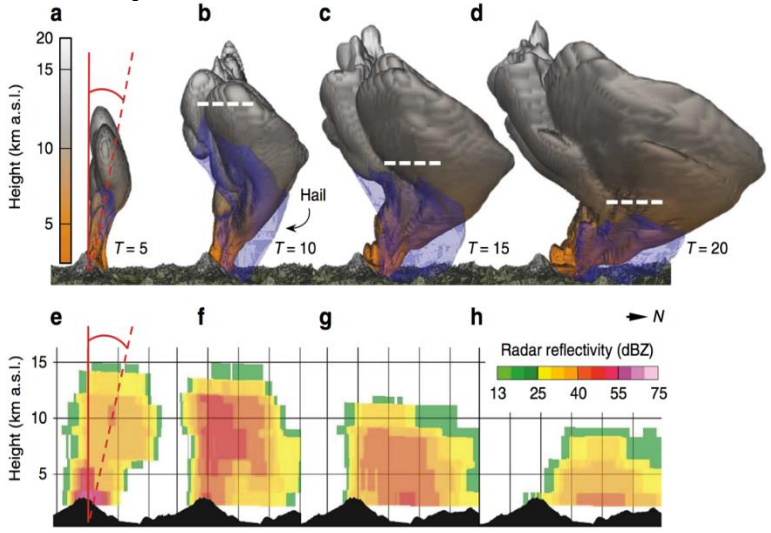
LANDFIRE team members gathering field data in a remap prototype area of central Idaho

High Performance Computing (HPC)

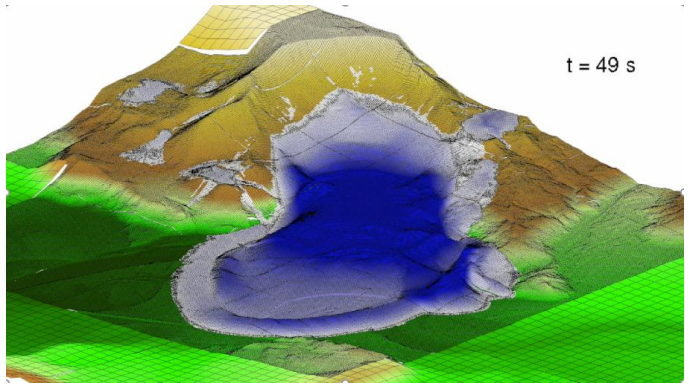
Increase capacity to perform scientific analysis and synthesis using some of the world's fastest supercomputers and provide training and consultative services to improve analytical capabilities, model performance, and facilitate large-scale and national capabilities. Use HPC to advance analyses of hazards and enhance forecasting capacity in support of emergencies.

HPC Improves Scientific Visualizations

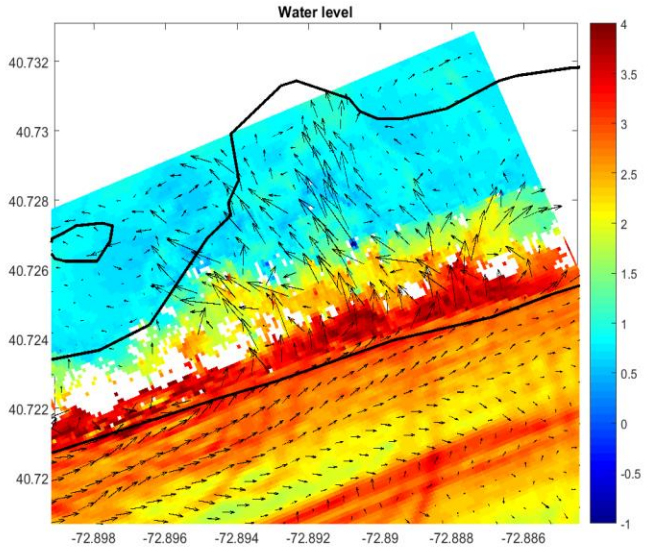
3D Volcanic Plume Model



Oso landslide model



Kilauea Lava Flow Prediction - HPC was used to predict Kilauea lava flows more efficiently and timely to aid in public health and safety decisions through optimizing code that runs 3300+ times faster on Yeti, the HPC computing cluster.

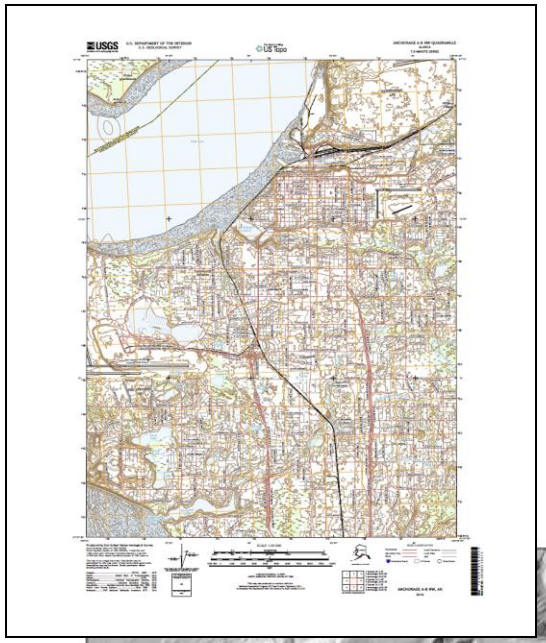


Numerical simulations of hurricane overwash

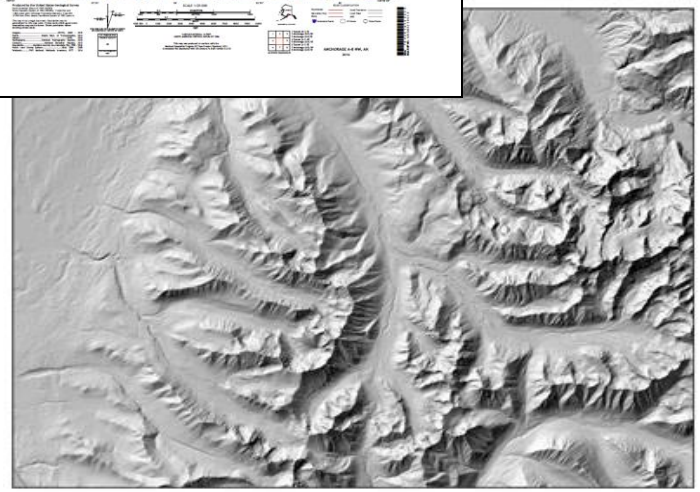
Alaska Mapping

Initiative that is a collaboration of Federal, State, local and tribal organizations to improve accuracy of maps and digital map data for Alaska.

Alaska IfSAR acquisition was completed in FY2019, FY2020 emphasis on terrestrial hydrography through NHD, WBD, and NHD Plus HR



US Topo Map in vicinity of Anchorage, Alaska

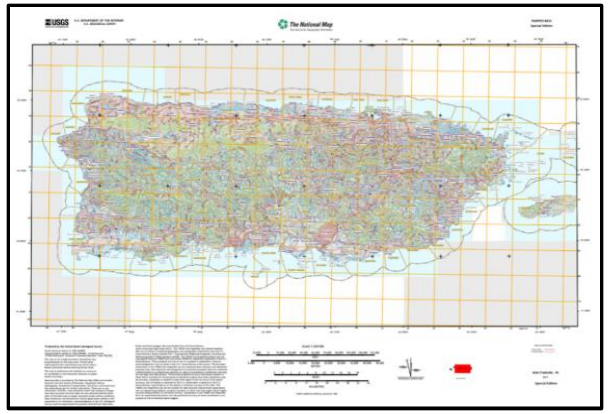


IfSAR-derived shaded relief, Chugach Mountains, AK

Emergency Response

Provides geospatial data coordination and communication that supports the response to, and mitigation of hazards. The Program supports the following Disaster Response Support Areas: USGS Geospatial Response, Disaster Data Archive and Distribution, and Liaison with NORAD / USNORTHCOM (N-NC)

Emergency Operations: Successful Response Starts with a Map and calibrated baseline land imagery.



USGS "Special Edition" Map supports Puerto Rico response, hurricane Maria 2017.

Recent Emergency Response Support

Hurricanes/Tropical Storms – Event Support Map

- 2019-20 Hurricane Season ESM Support for Hx Barry, Hx Dorian, TS Arthur, TS Cristobal, TS Gonzalo, Hx Hanna, Hx Isaias, Hx Laura, Hx Marco, Hx Sally, Hx Delta, Hx Zeta, Hx Eta

Earthquakes/Volcanoes - Science / Data Support

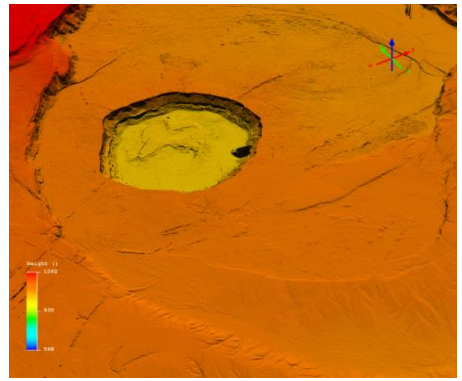
- Ridgecrest Earthquake (July 2019) - N-NC Coordination / Base Access
- Kilauea Volcano Eruption (May 2018)- Lidar flown to support terrain analysis and flow modeling
- Anchorage Earthquake (November 2018)- post-event lidar collection to support damage assessment and recovery efforts

Wildfires

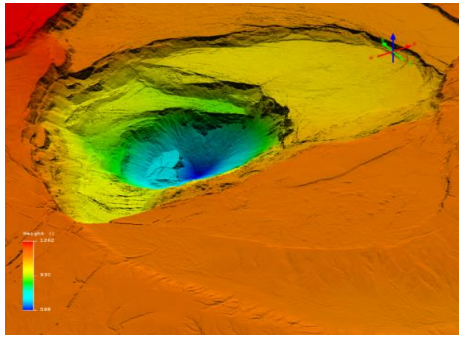
- 2020 Western States Wildfires (lidar 3DEP supplemental drafted)
- Camp Fire (November 2018)- pre- and post-fire lidar collected in support of relief, landslide analyses and mitigation activities.
- Real-time Landsat examples for Burned Area Emergency Response

US Topo Hard Copy Map Support

- Hx Dorian (2019/20) - 2688 Maps to FL Div Emergency Management
- Hx Florence Recovery (2018)- 300 Maps to Army National Guard / DHS
- Hx Harvey / Maria Recovery (2017)- 10,000+ Maps
    - FL Div Emergency Management / Army National Guard



June 2009



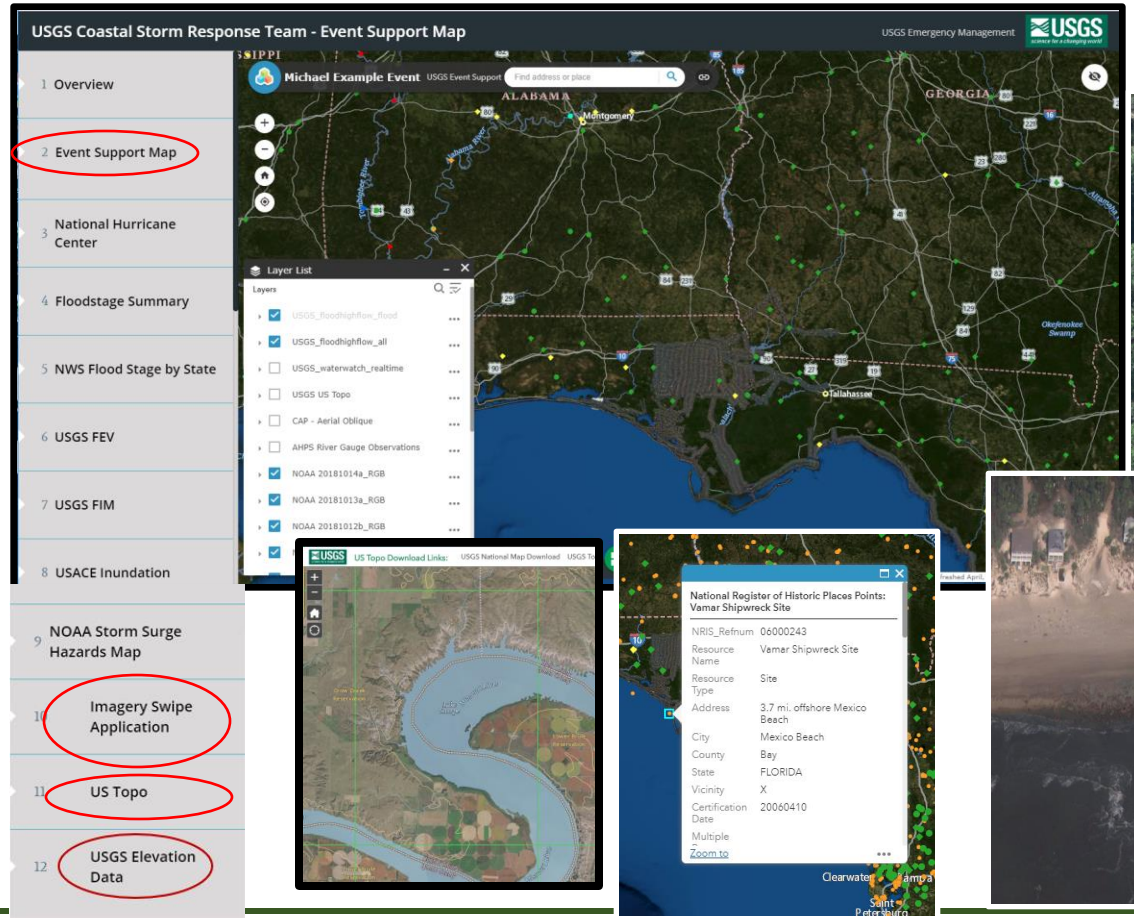
July 11, 2018

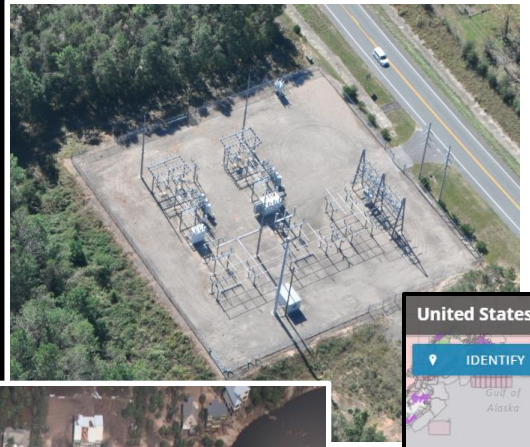
Pre- and post-eruption lidar images of the Kilauea summit caldera

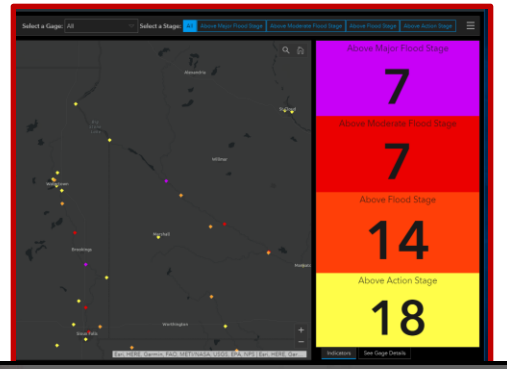
Emergency Response

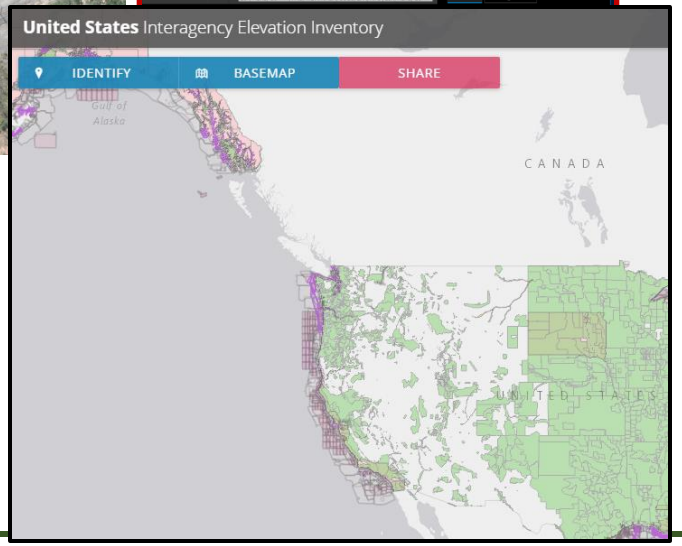
FY20 Event Support Maps (ESMs)

- 03/2020 COVID-19
- 04/2020 MRCTI Local Govt
- 04/2020 Earthquake Early Warning
- 05/2020 Midwest flooding
- 06/2020 Hx Hanna
- 07/2020 Hx Isaias
- 08/2020 Hx Laura
- 08/2020 Hx Marco
- 09/2020 Hx Sally
- 10/2020 Hx Delta / Zeta
- 11/2020 Hx Eta



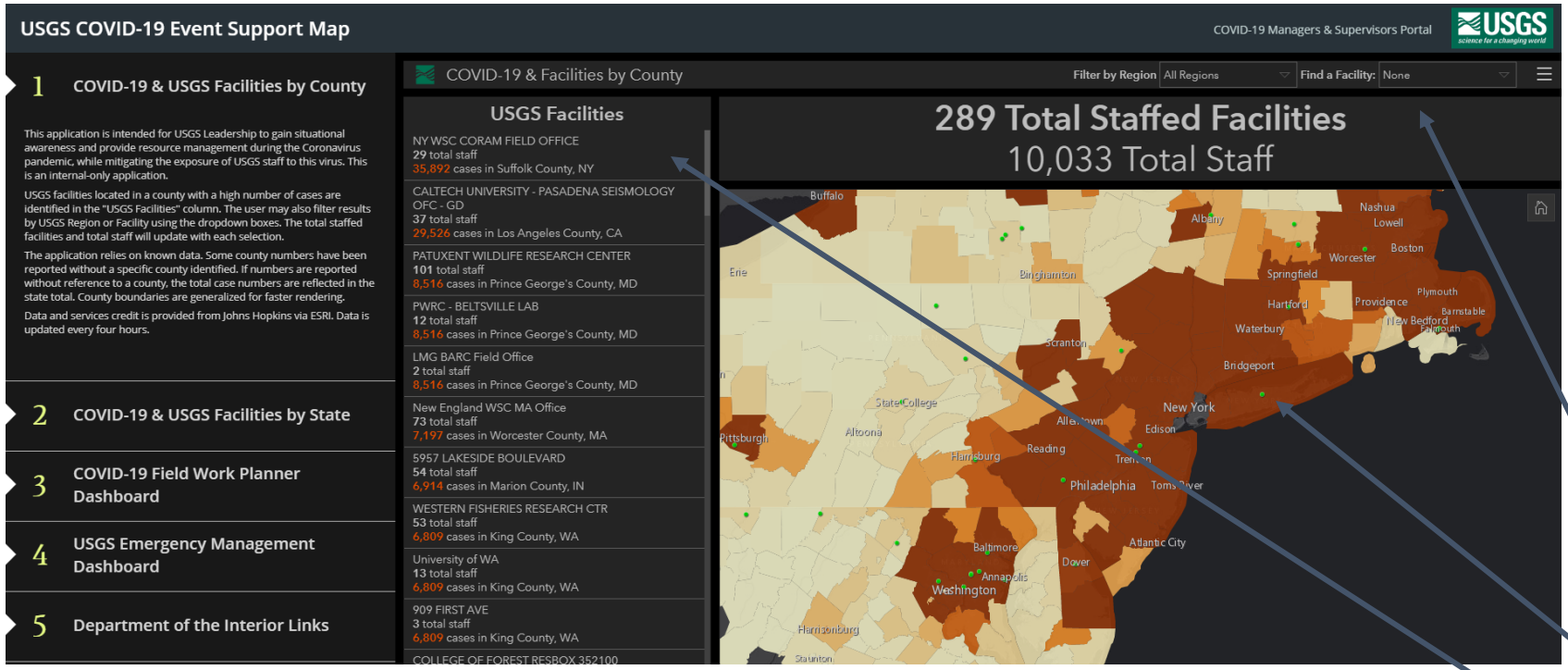






USGS COVID-19 Event Support Map

The COVID-19 ESM is maintained by the Geospatial Information Response Team (GIRT) and used by USGS Leadership to gain situational awareness and provide resource management during the Coronavirus pandemic.



- Data Sources
  - USGS Admin – BE facilities / personnel
  - Case Data – JHU
- Updated – every 4 hours
- Included in DOI Common Operating Picture
- Provides access to other Agency COVID Links
- One-Stop for Link Critical COVID Information

Indicators include

USGS Regional and Facility View

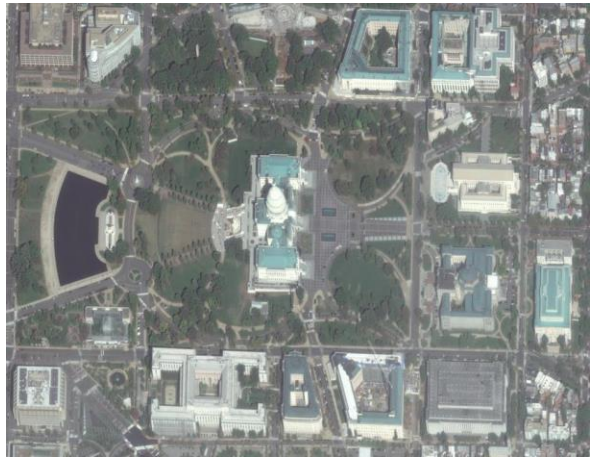
Individual Facility Information

Highest county case count / facility / staff

Layers show the location of USGS assets. The COVID-19 ESM helps managers and field personnel plan operations, monitor the current pandemic numbers and safely continue Mission Essential Fieldwork with potential dangers mitigated.

National Civil Applications Center (NCAC) / Civil Applications Committee (CAC)

- Under the oversight of the **Civil Applications Committee (CAC)** Federal Civil agencies access and use Intelligence Community (IC) and Department of Defense (DoD) overhead capabilities to:
  - Support public safety
  - Respond to natural and anthropogenic disasters
  - Contribute to land, water, and resource management
  - Increase scientific knowledge about the Earth and its natural processes
  - Mapping and Charting



- CAC access to these data provides a ***whole of government approach:***
  - Maximizes taxpayer investment
  - Includes commercial remote sensing data procured by the National Geospatial-Intelligence Agency (NGA) and the National Reconnaissance Office (NRO), see example on right
  - ***Buy the image only once***–opportunity to save the taxpayer's money

Early 2021

- Brief Assistant Secretary Water and Science on major initiatives:
  - Sustainable Land Imaging (SLI)
  - 3D Elevation Program (3DEP)
  - National Hydrography Dataset
  - Land Change Monitoring, Assessment, and Projection (LCMAP)
  - High Performance Computing

- Major Stakeholders you will likely hear from: Association of American State Geologists (AASG), Management Association for Private Photogrammetric Surveyors (MAPPS), 3DEP coalition, U.S. Geospatial Executives Organization (USGEO), American Geosciences Institute (AGI)

Early 2021

- Brief Assistant Secretary on their role in:
  - Federal Geographic Data Committee (FGDC) - several meetings will occur
  - Geospatial Data Act (GDA) - report due to Congress
  - Position, Navigation, and Timing (PNT) - meeting will occur
  - Alaska Mapping Executive Committee (AMEC) - meeting will occur
  - Aquatic Resources Working Group - report due in February

- Relationship and engagement with NASA:
  - Meet with Thomas Zurbuchen, Associate Administrator for the Science Mission Directorate, NASA
  - Re-sign MOU for Sustainable Land Imaging

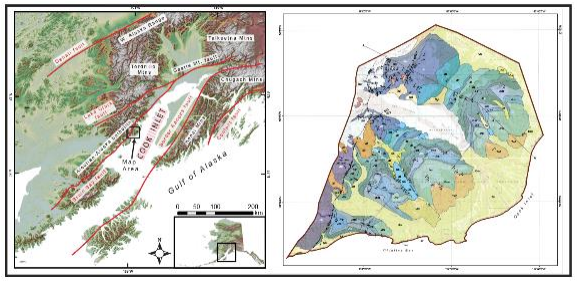
Mark the calendar for the **Landsat 9 Satellite Launch**!

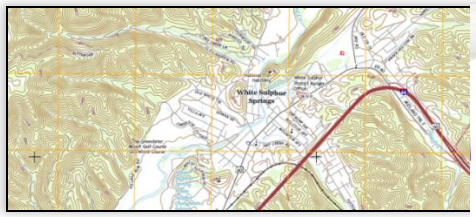
Challenges

- Erosion of science support
  - facilities
  - human resources
  - contracting
  - information technology
- Human Resources Policy

Core Science Systems – Outlook

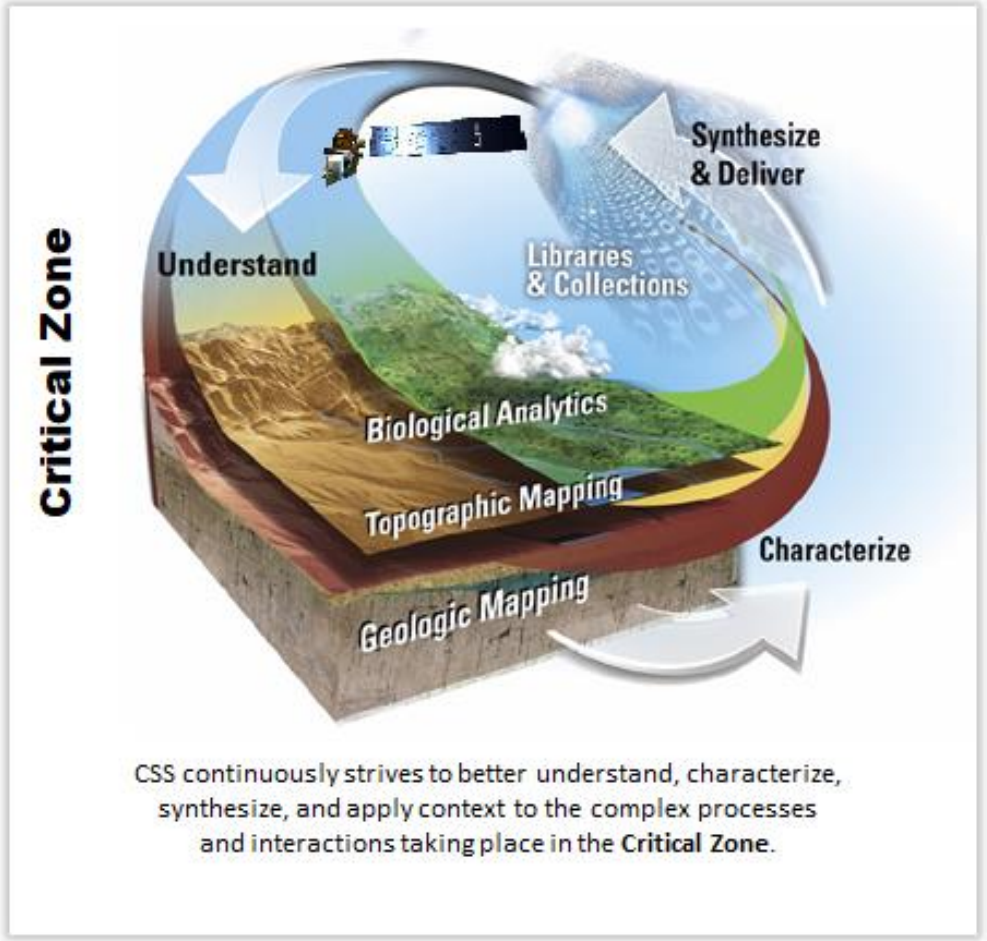
- Launch Landsat 9 Satellite
- Finish 3DEP and Alaska Mapping
- Build a 3-D geologic framework for the Nation
- Build a water data framework for the Nation
- Produce topographic maps on-demand
- Produce land cover mapping, change monitoring, and modeling tools for the Nation
- Expand high performance computing capabilities in DOI
- Document and improve access to USGS scientific collections
- Develop Landsat Next Satellite





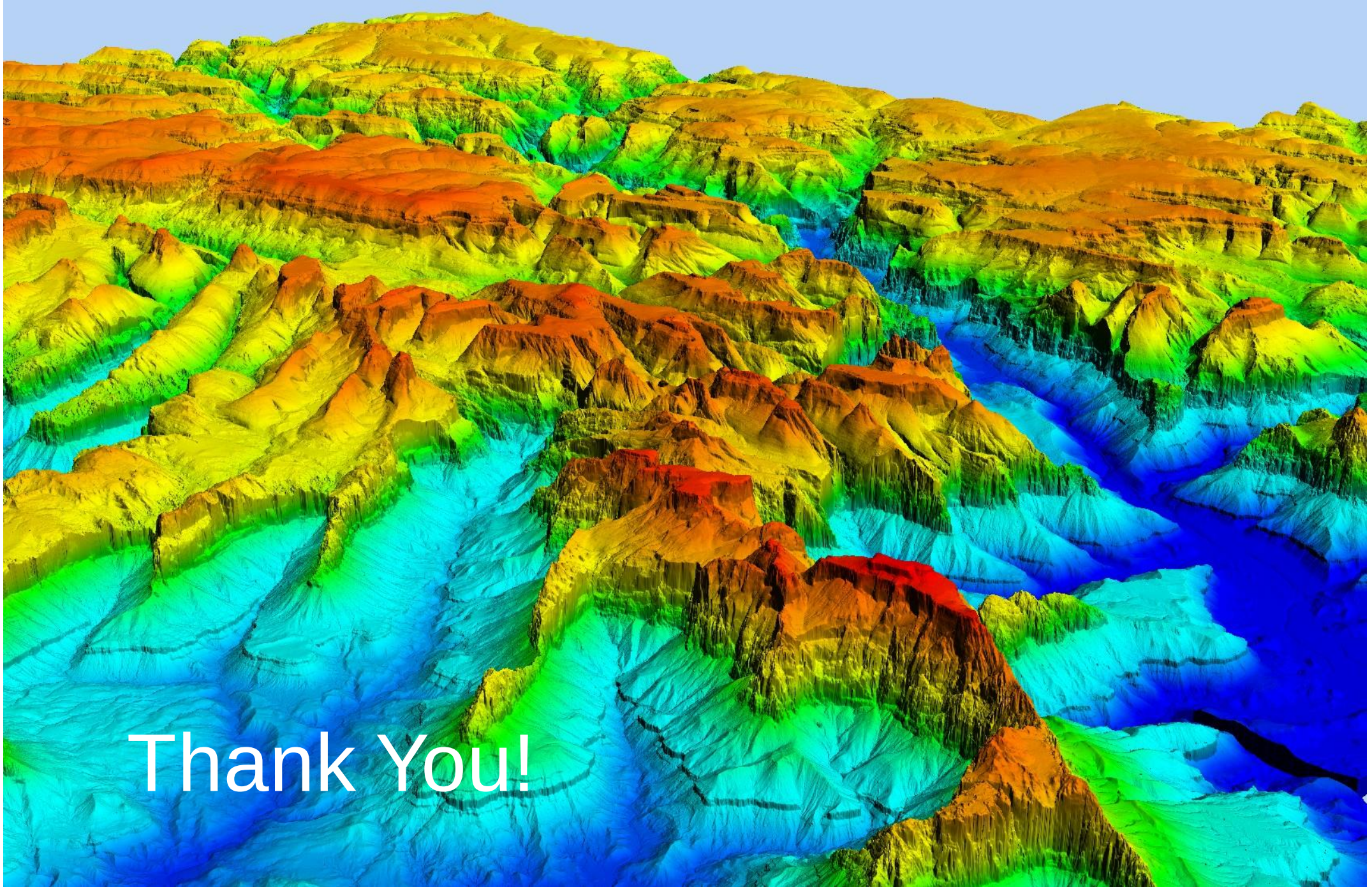
Find More Information on Core Science Systems

- https://www.usgs.gov/mission-areas/core-science-systems



CSS continuously strives to better understand, characterize, synthesize, and apply context to the complex processes and interactions taking place in the **Critical Zone**.

Kevin T. Gallagher,
Associate Director
USGS Core Science Systems Mission Area
kgallagher@usgs.gov



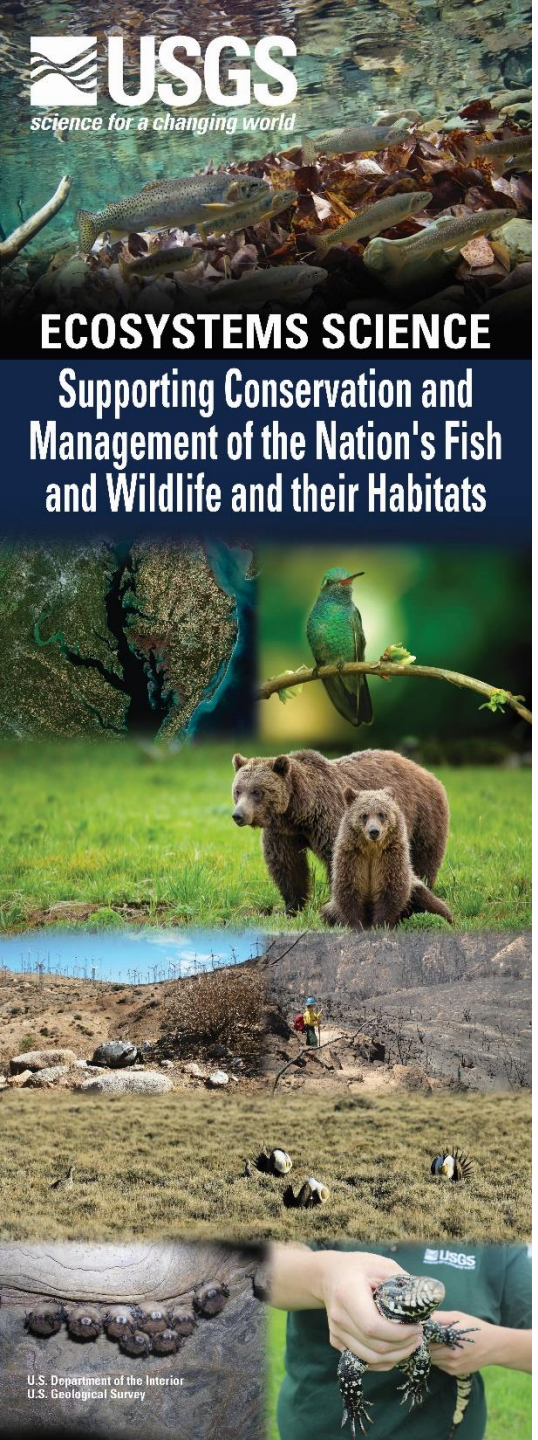
Zion National Park, UT

For reference - Early 2021

- DOI ASWS meet with Thomas Zurbuchen, **Associate Administrator for the Science Mission Directorate at NASA** to discuss impending Landsat 9 launch, currently scheduled for a September 2021 launch window. The ASWS is also a co-chair for the **Sustainable Land Imaging (SLI) Joint Steering Group**. The SLI Interagency Agreement needs to be renewed as it expires in late 2021. The Launch Readiness Date for Landsat Next will also need to be discussed and planned.
- The **Federal Geographic Data Committee (FGDC)** is a group of Federal executives that provide direction and oversight for geospatial decisions and initiatives across the Federal government. In accordance with Office of Management and Budget (OMB) Circular A-16, the FGDC is chaired by the Secretary of the Interior with the Deputy Director for Management, OMB as Vice-Chair. The role of **Chair is typically delegated to the Assistant Secretary of Water and Science (ASWS)**. Meetings occur regularly and will be scheduled in the 1st quarter.
- The **Geospatial Data Act (GDA)** calls for the Federal Geographic Data Committee (FGDC) to provide a report to Congress on the status of the GDA implementation. As the managing partner for the FGDC, DOI has the lead on collaborations with a "covered agencies" and **documenting the report to Congress**. The GDA Report to Congress will be reviewed by all FGDC member agencies and ASWS before being sent to Congress by DOI.

For reference - Early 2021

- ASWS has an Executive Committee role in **Position, Navigation and Timing (PNT)** policy and governance, is responsible for decision-making regarding PNT, and has generally relied on USGS subject matter expertise. DOI needs for high-precision positioning, navigation, and timing require real-time, uninterrupted Global Positioning System (GPS) and multi-constellation Global Navigation Satellite System (GNSS) signals without interference at all times. There will be an **Executive Steering Group meeting in Q1**.
- DOI is **Co-Chair** (along with NOAA) of the **Alaska Mapping Executive Committee (AMEC)** and is responsible for several action items resulting from the Fall 2020 AMEC meeting. A virtual meeting will likely be scheduled in the first quarter. The AMEC is an interagency committee of **15+ Federal Agencies and the State of Alaska** whose common goal is to modernize mapping. This initiative supports many strategic Arctic issues from Climate Change, to Fisheries, Indigenous Welfare, Aviation Safety, Infrastructure, Hazards Response, and more.
- The **USGS, USFWS, EPA, and Department of the Army** are collaborating on a plan for developing an **Aquatic Resource Decision Support System** that will support mapping the **waters of the United States**. The final report will be ready in February focused on defining requirements, options, and resources needed.



Ecosystems Mission Area

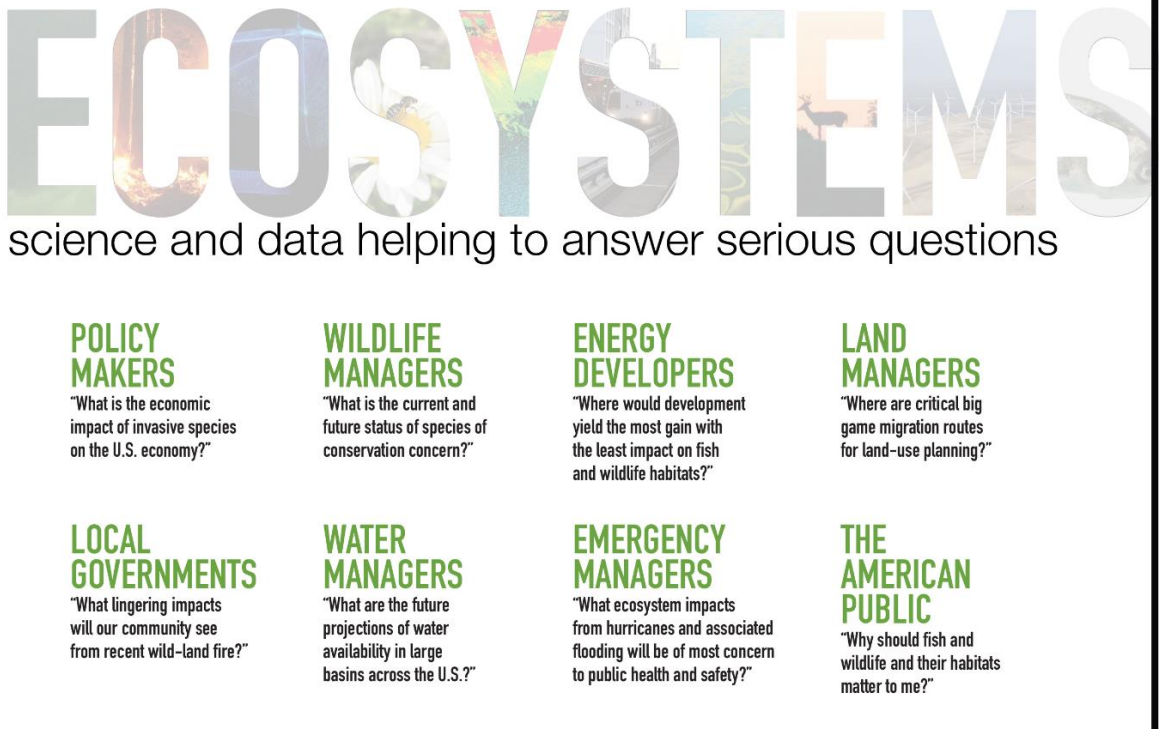
Anne Kinsinger, Associate Director

December 15, 2020

Ecosystem Mission Area Science Vision

The USGS is a leader in Ecosystem Science, bringing unbiased information to the forefront of decision-making on the Nation's natural resources and human well-being.

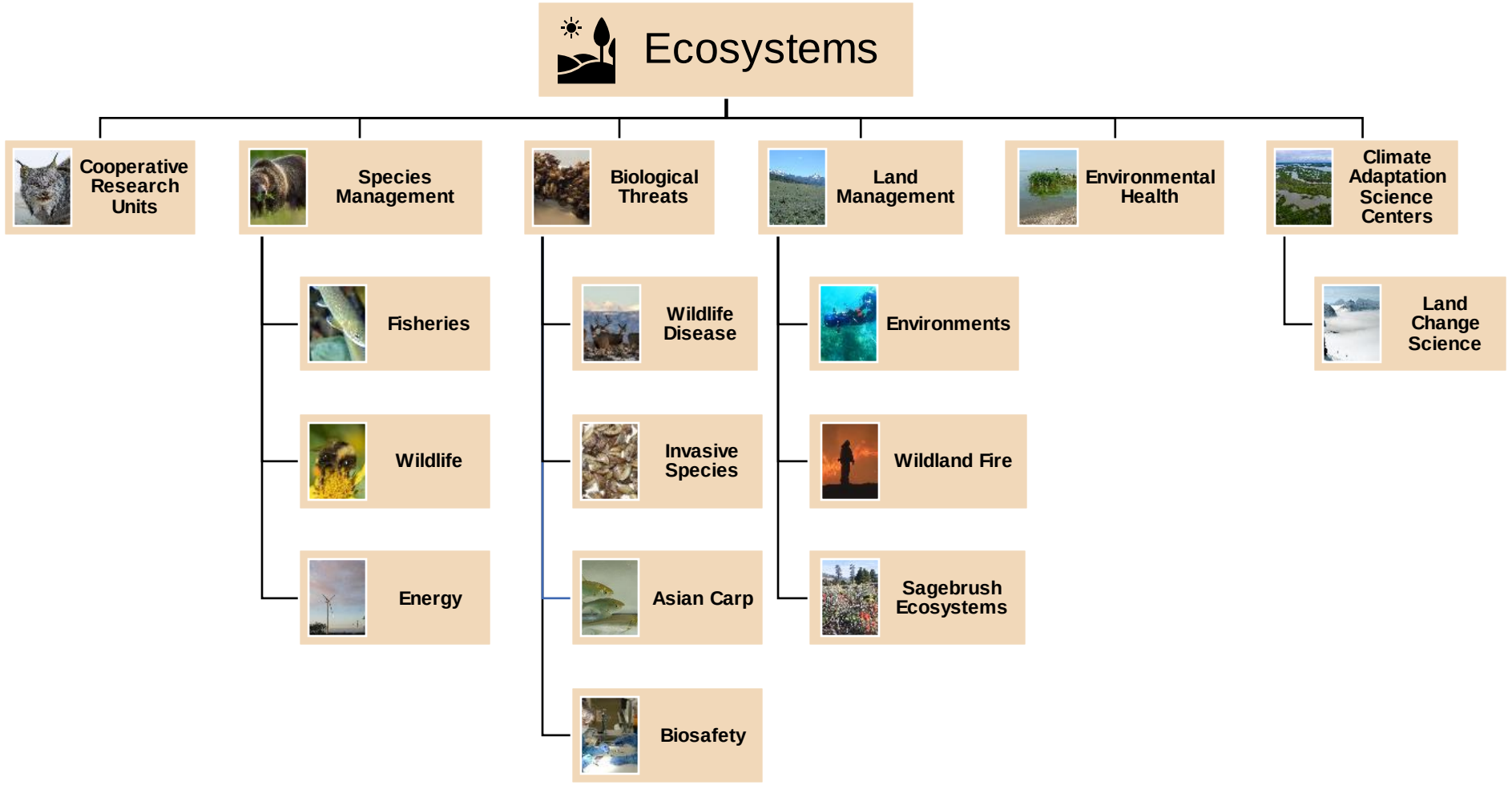
- Ecosystems is considered the biological research arm of the DOI.
- Sought out by thousands of partners and stakeholders from other federal, state, and local agencies, tribal entities, industry, and NGOs for expertise in earth and biological science.



Ecosystem Mission Area Science Priorities

- Science Supporting a Legacy of Sustainable Fish and Wildlife
- Science for Land, Water, & Wildlife Conservation
- Trusted Science Supporting Hard Decisions on ESA Species
- Science to Battle Costly Biological Threats
- Providing Science for Managing Risks and Responding to Extreme Events
- Science for Preservation and Restoration of Iconic Landscapes
- Science to Support Adaptation and Address Impacts of Climate and Land Change

Ecosystem Mission Area Programs



USGS
science for a changing world

Cooperative Research Units

Meet the actionable science needs of cooperators, provide technical assistance, and develop the future workforce through graduate education/mentoring. The Coop Units are located on 40 universities in 38 states. They are called Coop Units because each cooperator plays a role in the staffing, funding and directing the units.

- Congressional and NGO interest in establishing new units in Nevada, Michigan, Indiana

USGS
science for a changing world

Climate Adaptation Science Centers

Works directly with partners and stakeholders on regional issues related to climate impacts and adaptation strategies. The Land Change Science program advances the understanding of the physical, chemical, and biological components of the Earth system, the causes and consequences of climate and land use change, and the vulnerability and resilience of the Earth system to such changes.

- Creation of Midwest Climate Science Center
- Re-establishment of a FAC for climate science

USGS
science for a changing world

Species Management

Provides science used by managers, policy makers, and others for decisions that protect, conserve, and enhance healthy fish and wildlife populations across the United States and beyond.

- Secretarial approval needed for an altered High Flow Event strategy using USGS science in the Colorado River for spring.
- FWS Monarch listing decision using USGS science is planned for mid-December but may be delayed.

USGS
science for a changing world

Biological Threats

Delivers science to protect public safety, property, and ecosystems from invasive plants and animals and infectious fish and wildlife diseases that pose significant ecologic and economic threats to the resources of the United States.

- House mark contains $60 million for modernization of the NWHC
- Release of the DOI Invasive Species Strategic Plan.
- Asian Carp:
  - Potential Congressional interest in Asian carp removal
  - Deployment of Underwater Acoustic Deterrent System (uADS) for Asian Carp
  - Submission of WRRDA report to Congress with USGS content
- Standing up of the Chronic Wasting Disease Task Force

Land Management

Conducts research to improve the effectiveness of land management and inform restoration of priority ecosystems on millions of acres including public lands such as National Parks, refuges, and other critical landscapes that support the biodiversity of fish, wildlife, and plant species, as well as thriving economies.

- USGS Wildland Fire Science Strategic Plan
- WAFWA Sagebrush Conservation Strategy
- WAFWA Greater Sage-Grouse Conservation Assessment Report

USGS
science for a changing world

Environmental Health

Supports integrated natural science expertise and capabilities across the USGS related to environmental contaminants and pathogens. This science informs stakeholder decisions on the management of fish and wildlife health and provides environmental exposure information to partners in public health.

- USGS Strategic Science vision for water contaminants known as “PFAS” (per- and polyfluoroalkyl substances). This report addresses and transcends PFAS-related science requirements for USGS as documented in the National Defense Authorization Act.

USGS
science for a changing world

Visibility and Urgency of Arctic Research

- Significant Land Management Decisions (67% DOI lands in AK)
- Arctic Research and Policy Act
- Alaska Native Stakeholder Engagement
- 2020 Arctic Report Card (Rapidly Changing Climate)

USGS
science for a changing world

Ecosystems Mission Area Publications

EMA was lead author on ~54% of all USGS publications in FY20

Published 258 so far in FY21

Advanced Notifications to DOI; early notification of high-profile and/or controversial topics

Selected publications in first Quarter:

- Transmission risk of highly pathogenic avian influenza varies with migration strategy of wild ducks in the Black Sea-Mediterranean Flyway
- COVID-19 reopening strategies at the county level in the face of uncertainty: Multiple Models for Outbreak Decision Support
- Water storage decisions will determine the distribution and persistence of imperiled river fishes
- Targeted chemical analysis and potential effects of drinking-water contaminants in private-supply tapwaters in 2019 reconnaissance from the Strong Heart Tribal Human Health Cohort.
- Increased burning in a warming climate reduces carbon uptake in the Greater Yellowstone Ecosystem despite productivity gains
- Beyond pesticides - wild pollinators are exposed to a range of pesticides while foraging in agroecosystems.
- Demographic risk assessment for a harvested species threatened by climate change: polar bears in the Chukchi Sea
- Incorporating climate change in a harvest risk assessment for polar bears Ursus maritimus in Southern Hudson Bay
- A bright spot analysis of inland recreational fisheries in the face of climate change: learning about adaptation from small successes
- How Decision Makers View Wildlife Conservation Challenges in the Southeast United States
- ACRCC 2019 Asian Carp Interim Summary Report Submissions: "USGS Illinois River Catch Database and Visualization" and "USGS Geospatial Support for Unified Fishing Method"

Challenge: Financial Assistance Clearance System (FACS)

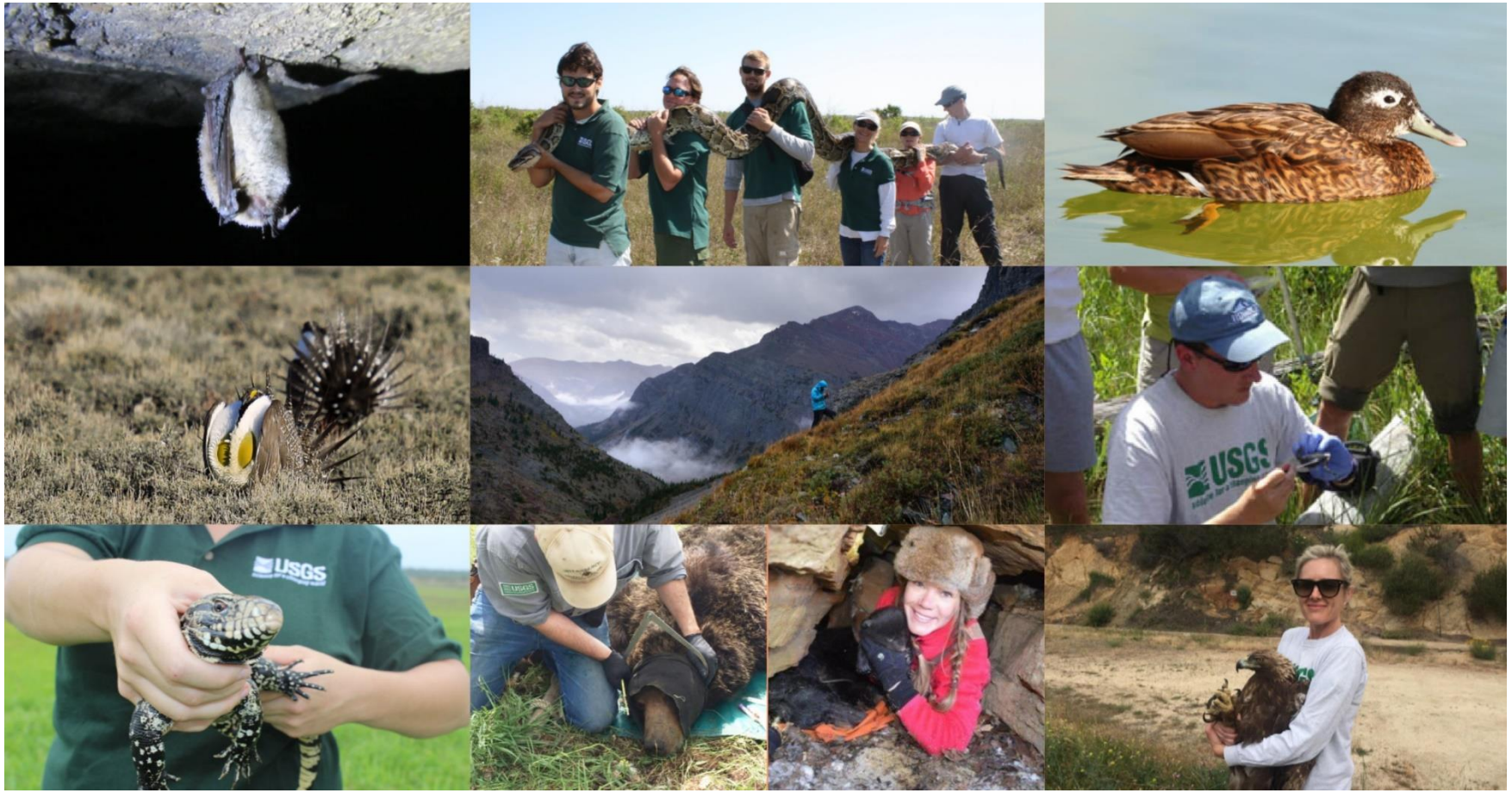
- System tracks approval for agreements for USGS to fund scientific collaboration, particularly universities.
- Many Congressional inquiries as to the status of these agreements, including a request from appropriators for weekly updates on progress.
- Partners have made inquiries to USGS, DOI and Congress regarding status. As some projects have been terminated and graduate students let go because of timing of agreements.

Looking Forward

- Scientific advances in climate adaptation, species conservation, wildland fire, energy and wildlife, zoonotic diseases and iconic landscapes
- Enhanced diversity and inclusion opportunities
- Broadened outreach and engagement opportunities

USGS
science for a changing world

Questions?



USGS
science for a changing world

Energy and Mineral Resources Upcoming Products and Events

Transition Team Briefing
December 16, 2020

Sarah J. Ryker, Ph.D
Associate Director for Energy & Mineral Resources

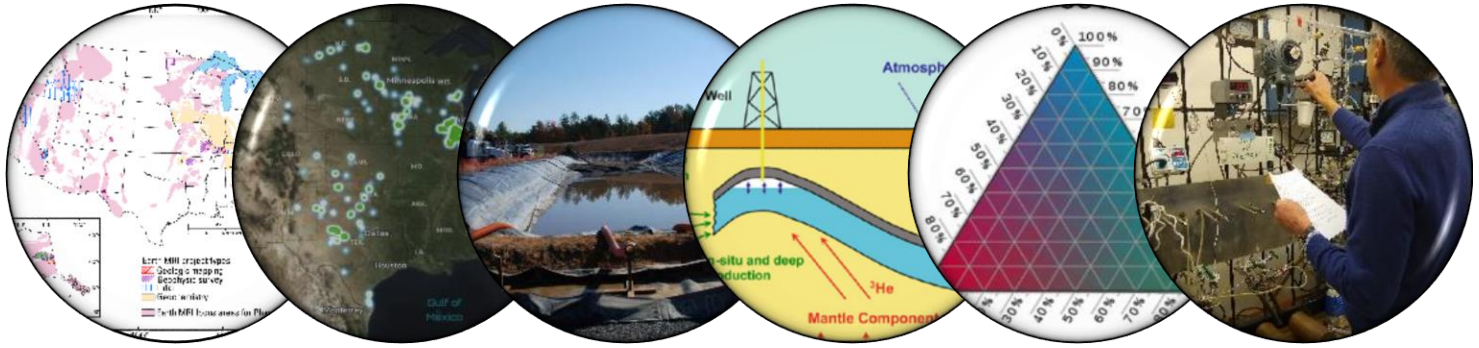
U.S. Department of the Interior
U.S. Geological Survey

Energy and Mineral Resources Mission Area

- Impartial science required to understand the foundational geologic framework of the Nation.
- The Energy Resources Program (ERP) and the Mineral Resources Program (MRP) are required under the Organic Act of 1879 to examine the geological structure, mineral resources, and products within and outside the national domain.

ERP and MRP characterize the **full lifecycle** of geologic resources. We provide science and data on:

- Occurrence and distribution of geologic resources, including current and future energy and mineral resources and their wastes
- Environmental and socioeconomic effects of geologic resource occurrence and use
- Global supply, demand, and trade in nonfuel mineral commodities



USGS

ERP Resource Assessments:
Mandates and Historical Context

- ERP investigates processes critical to the formation and accumulation of geologically based energy resources by:
  - Conducting resource assessments (i.e. quantifying potential supply) and other energy-based studies (e.g., wind) in priority basins of the U.S. and world using a geology-based approach
  - Evaluating the geological aspects of renewable energy resources (e.g., geothermal) and carbon sequestration
  - Investigating the environmental effects of energy resource occurrence, production, and use
- USGS by law must assess the potential for these resources under Federal Lands
  - Energy Policy and Conservation Act of 2000 (EPCA, 2000)
  - Amended in 2005 (USGS must use identical methodology for all petroleum assessments)
- Assessments involve cooperation with Federal agencies (e.g. BLM, DOE, USFW, USFS) and non-Federal stakeholders (e.g. States, local governments, industry)
- Assessments are estimates of **recoverable resources only** – no attempt is made to determine the economic or commercial viability of resources

(excludes the U.S. Outer Continental Shelf)

USGS

High Visibility Oil and Gas Resource Assessments
(undiscovered, technically recoverable oil and natural gas)

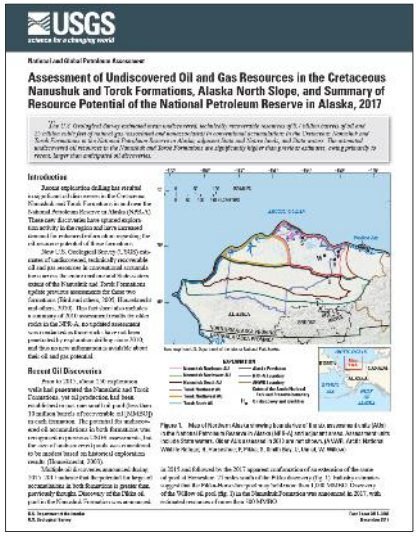
Alaska

30
- Assessment of Oil and Natural Gas Resources of the Area West of the National Petroleum Reserve-Alaska (NPR-A) – January 2021
  - Secretarial Order 3352 directed ERP to revise resource assessments of the Alaska North Slope and the adjacent offshore in cooperation with BLM and BOEM
  - Strong interest by Alaska Congressional delegation (e.g., Sen. Murkowski) and the State of Alaska (a major partner)
  - Assessments on NPR-A and the Central North Slope released previously

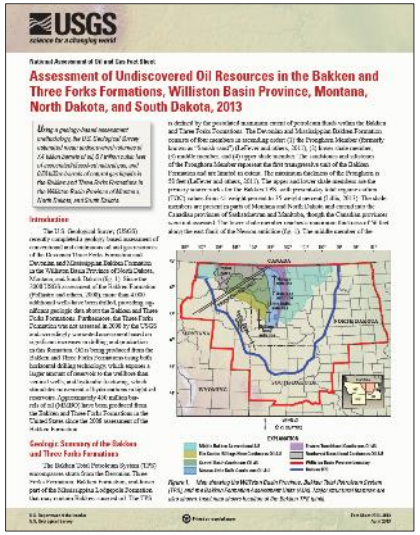
30
- Major paper on Alaska North Slope oil geochemistry and correlation of oils to source rocks (in *Marine and Petroleum Geology*)

Williston Basin

30
- Assessment of recoverable **<u>conventional</u>** oil and natural gas resources
  - Reassessment requested by U.S. Senator John Hoeven (ND)
  - Strong interest by state and local governments (especially in North Dakota), industry, academia (and has garnered significant media exposure)
  - Releasing conventional assessment first, followed by continuous assessment in 2021


USGS

Assessment of Undiscovered Oil and Gas Resources in the Cretaceous Nanushuk and Torok Formations, Alaska North Slope, and Summary of Resource Potential of the National Petroleum Reserve in Alaska, 2017


USGS

Assessment of Undiscovered Oil Resources in the Bakken and Three Forks Formations, Williston Basin Province, Montana, North Dakota, and South Dakota, 2013

USGS

Additional O&G Resource Assessments

60

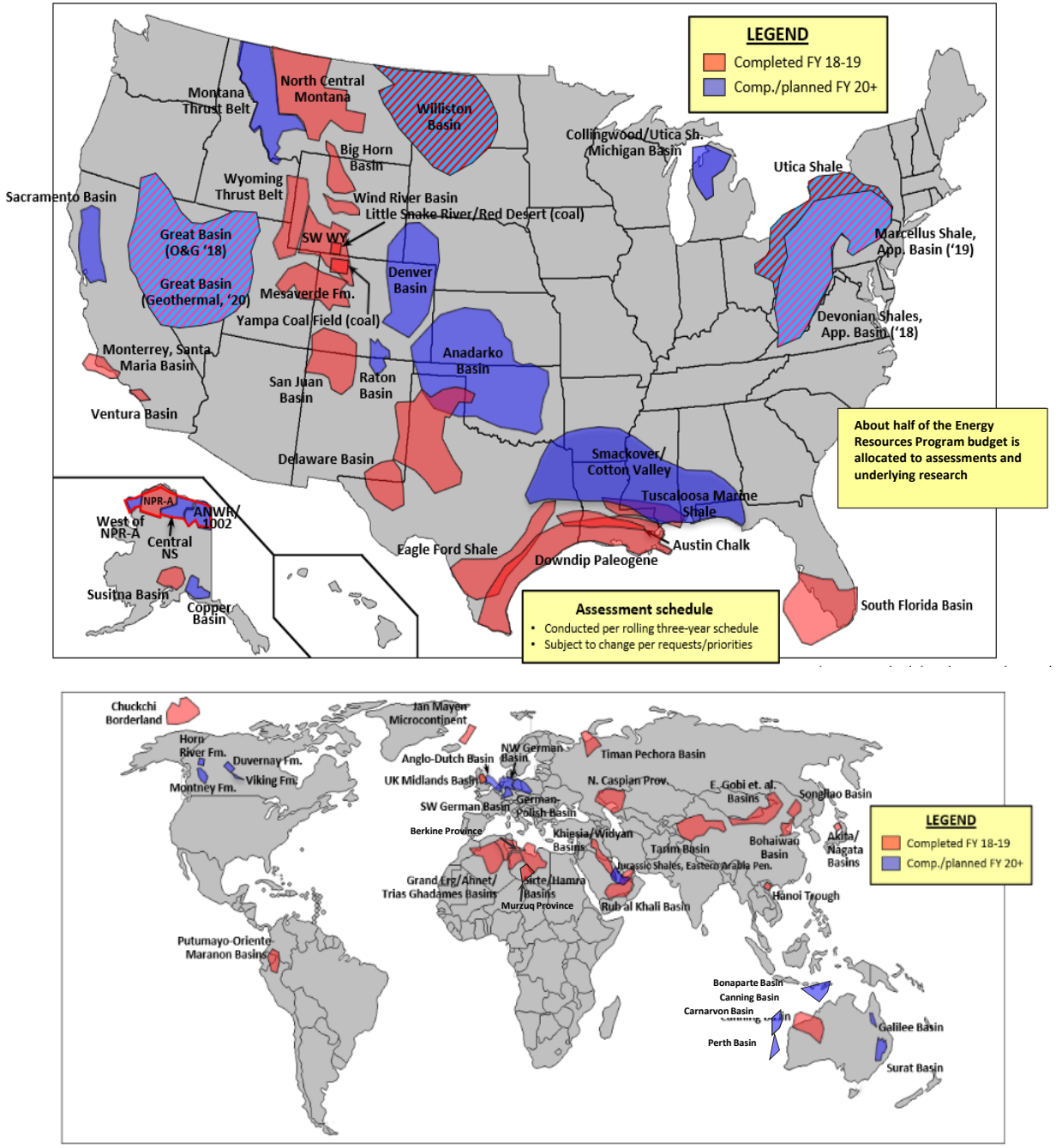
Assessments anticipated February – March 2021

- Shale-oil and shale-gas of the Cretaceous Mowry Formation in the Wind River Basin Province, Wyoming
- Shale-oil and shale-gas of the Horn River Formation in the Western Canada Sedimentary Basin Province
- Undiscovered conventional oil and gas of four geologic provinces of Western Australia

90

Assessments anticipated March – April 2021

- Undiscovered conventional oil and gas, Paleozoic provinces of Europe
- Undiscovered conventional oil and gas, Mesozoic provinces of Europe
- Undiscovered conventional oil and gas, nine geologic provinces of China
- Shale-gas in the Berkine and Murzuq Provinces of North Africa
- Tight-gas in the Berkine and Murzuq Provinces of North Africa
- Shale-gas in the Grand Erg Province of North Africa



Recently completed and upcoming domestic and international assessments

Carbon Capture, Utilization and Storage / Helium Assessment

Carbon Capture, Utilization, and Storage

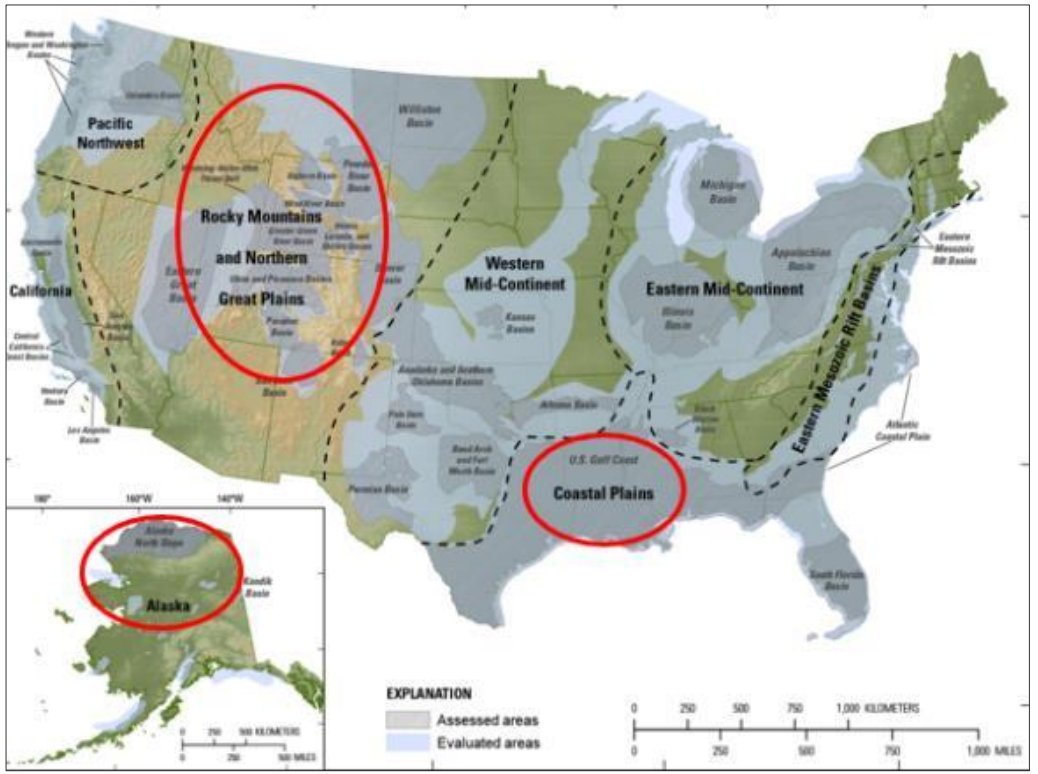
90

- *National Assessment of Carbon Dioxide Enhanced Oil Recovery and Associated Carbon Dioxide Retention Resources*
  - Quantitative assessment of potential volumes of oil and gas recoverable by injection
  - Sequestration of industrial CO2 in formations
  - Under the Energy Independence and Security Act (2007)

Helium Resources

90

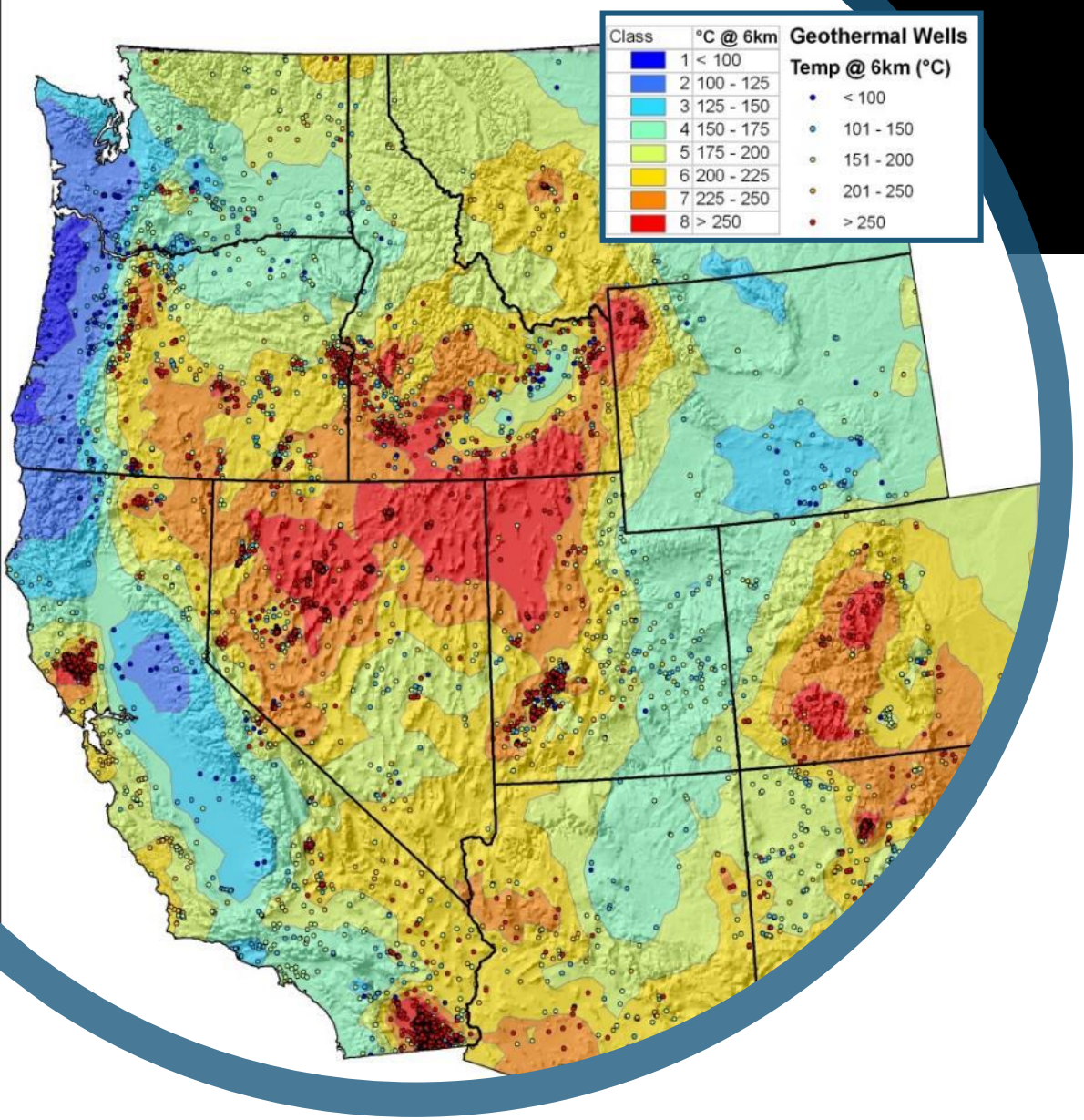
- *National Assessment of Helium Resources Within Known Natural Gas Reservoirs*
  - A probabilistic assessment of the volume of recoverable helium within known geologic natural gas reservoirs of the U.S.
  - Under the Helium Stewardship Act (2013)



Red circled regions have the largest technically accessible storage resources

USGS

Geothermal Resource Characterization and Assessment



Subsurface temperature at 6 km depth
(hotter temperatures increase the favorability for Enhanced Geothermal Systems)

Better understanding geothermal potential may enable growth of an underutilized but potentially plentiful energy source

- ERP characterizes and assesses (quantifies) geothermal energy **resources** in the U.S.
- DOE and other partners advance the **technologies** to utilize those resources

- Significant upcoming publications:
  - 30 *"National-Scale Reservoir Thermal Energy Storage Pre-Assessment for the United States"*
  - 30 *"Geophysical Studies of the Umatilla Indian Reservation Geothermal Resources Assessment – Phase 2A"*

Solid Energy Fuels:
Coal, Shale, Uranium, Thorium, & their Byproducts & Wastes

Solid energy fuels are strategic resources for a range of applications (metallurgy, extraction of rare earth elements, and derivative products such as carbon fiber and coal-to-liquid fuels). The USGS studies energy and non-energy resource aspects of coal and other solid fuels, and impacts of their use.

90

Rare Earth Elements (REEs) and Critical Minerals

- USGS is a collaborator in proposals to DOE's Carbon Ore, Rare Earth and Critical Minerals Initiative to expand next generation uses of solid energy fuels. USGS proposals focus on the Central Appalachian, Illinois, and Williston Basins and the Texas Gulf Coast

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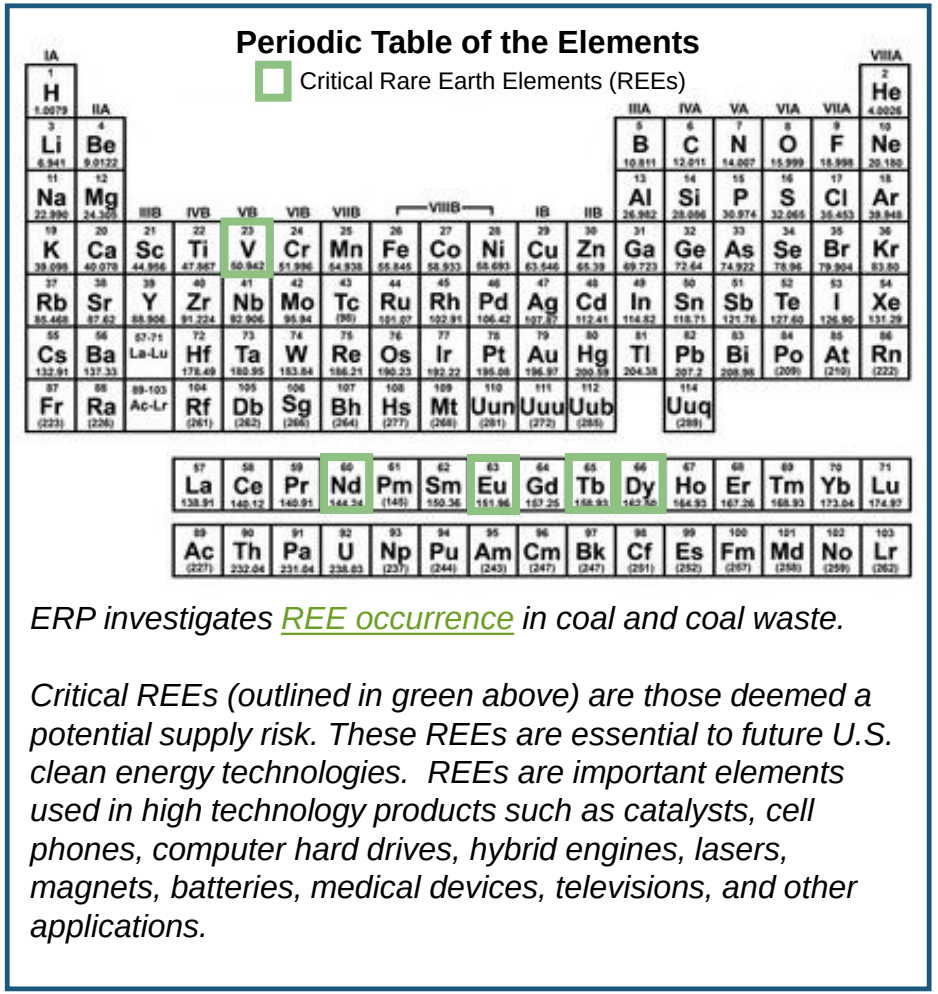
Coal

- Open-file report "*An Assessment of the Economic Potential of Lignite and Leonardite Resources in the Williston Basin, North Dakota*" - final report of a project requested by BLM
- Techniques and Methods Report: "*Probabilistic Methodology for the Assessment of Original and Recoverable Coal Resources, Illustrated with an Application to a Coal Bed in the Fort Union Formation, Wyoming*"



ERP investigates REE occurrence in coal and coal waste.

Critical REEs (outlined in green above) are those deemed a potential supply risk. These REEs are essential to future U.S. clean energy technologies. REEs are important elements used in high technology products such as catalysts, cell phones, computer hard drives, hybrid engines, lasers, magnets, batteries, medical devices, televisions, and other applications.

USGS

U.S. Wind Turbine Database

- Creation jointly funded by:
  - DOE Wind Energy Technologies Office, Lawrence Berkeley National Laboratory (LBNL)
  - USGS ERP
  - American Wind Energy Association (AWEA)

Upcoming activity

90

- New publication: "*Effects of fatalities from wind energy on raptor populations using potential biological removal and demographic models*"

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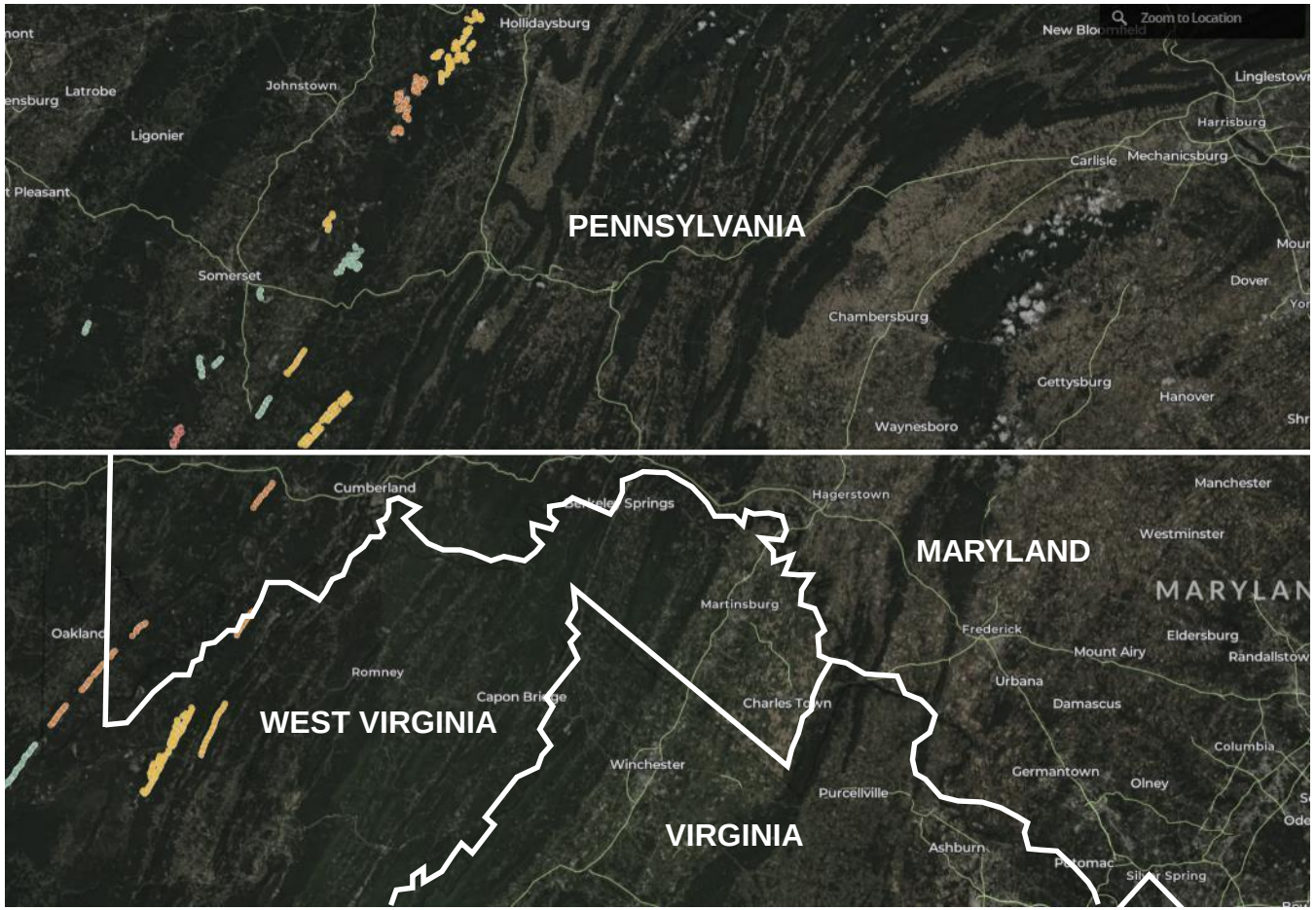
- Wind Energy Database: Quarterly update by collaborators (LBNL, USGS, and AWEA)



U.S. Wind Turbine Database (regional scale, mid-Atlantic seaboard near Washington, DC), Wind projects are color coded by capacity.

USGS

Mineral Resources Program (MRP):
Products for the Federal Strategy on Critical Mineral Supply Chains

The USGS co-chairs the National Science & Technology Council's interagency Critical Minerals Subcommittee, which authored the *Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals* (2019).

30/60/90 day events under the Federal Strategy, Executive Order (EO) 13817 (2017), Secretarial Order (SO) 3359 (2017), and EO 13953 (2020):

60

- Develop and update list of critical minerals (Draft list due to Federal Register March 2021) *(Federal Strategy Call to Action 4)*
- Improve understanding of domestic critical mineral *resources (Federal Strategy Call to Action 4):*
  - Below-ground and above-ground domestic critical mineral resources (geological, geophysical, and topographic mapping) (Earth Mapping Resources Initiative; in progress)

60

- 2 regional assessments of the critical mineral *tungsten (Federal Strategy Call to Action 5)*

Related:

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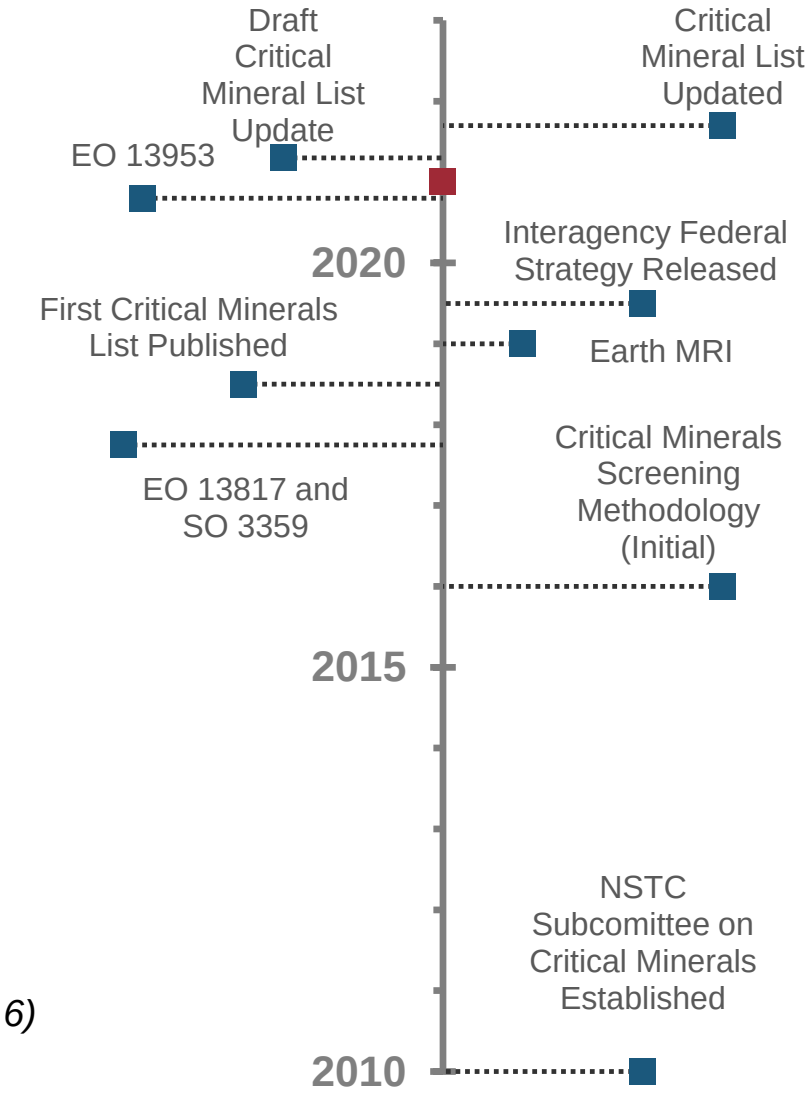
- Potential critical minerals language in H.R. 4447 (energy bill)
- MOU for cooperation between USGS and BLM expected in January 2021, to include training of BLM staff by USGS personnel *(Federal Strategy Call to Action 6)*



USGS

MRP's Most Significant Change:
The Earth Mapping Resources Initiative (Earth MRI)

Appropriated MRP Earth MRI Funding in FY2019-20:

25% - Data synthesis to prioritize new data acquisition, and data delivery

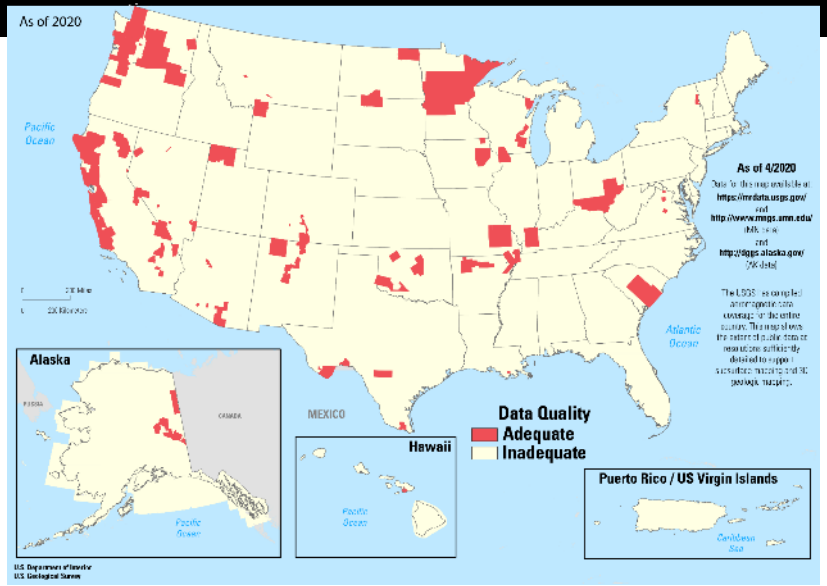
75% - Data acquisition and preservation and mapping through:

- **Minerals Resources Program:** Designs, contracts and interprets new airborne geophysical surveys in cooperation with State Surveys. Geophysics available in less than 7% of the U.S. (at adequate scale)
- **National Cooperative Geologic Mapping Program:** Funds geologic mapping and geochemistry reconnaissance projects by State Surveys. Geologic mapping available in less than 35% of the U.S. (at adequate resolution)
- **National Geospatial Program:** Leverages funds from partners to acquire new lidar* data. Available in 70% of the U.S. (*IFSAR in AK)
- **National Geologic and Geophysical Data Preservation Program:** Supports State Surveys to make critical mineral and borehole data publicly available and participate in Earth MRI workshops

Existing Geophysical Surveys

Usable quality

mrdata.usgs.gov, www.mngs.umn.edu, dggs.alaska.gov

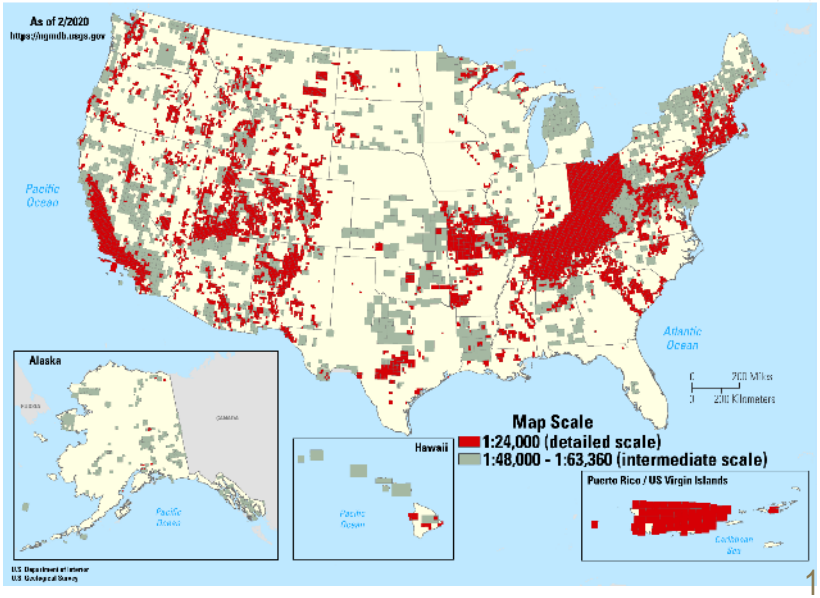


Existing Geological Mapping

Fine-scale

Moderate

ngmdb.usgs.gov



USGS

Earth MRI:
Modernizing the Nation's surface and subsurface mapping

A partnership between USGS and State Geological Surveys to generate foundational, state-of-the-art geophysical, geologic mapping, and elevation (lidar) data for the Nation.

- Under EO 13817, focus is on areas with potential to host critical minerals.
- Data and scientific interpretations have broad application to energy, groundwater, natural hazards, infrastructure, and other vital geoscience issues

Upcoming activities:

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- Publish geophysical survey from South Carolina

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- Publish national map of areas with potential for 13 more critical minerals

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- Publish stream sediment geochemistry for Alaska

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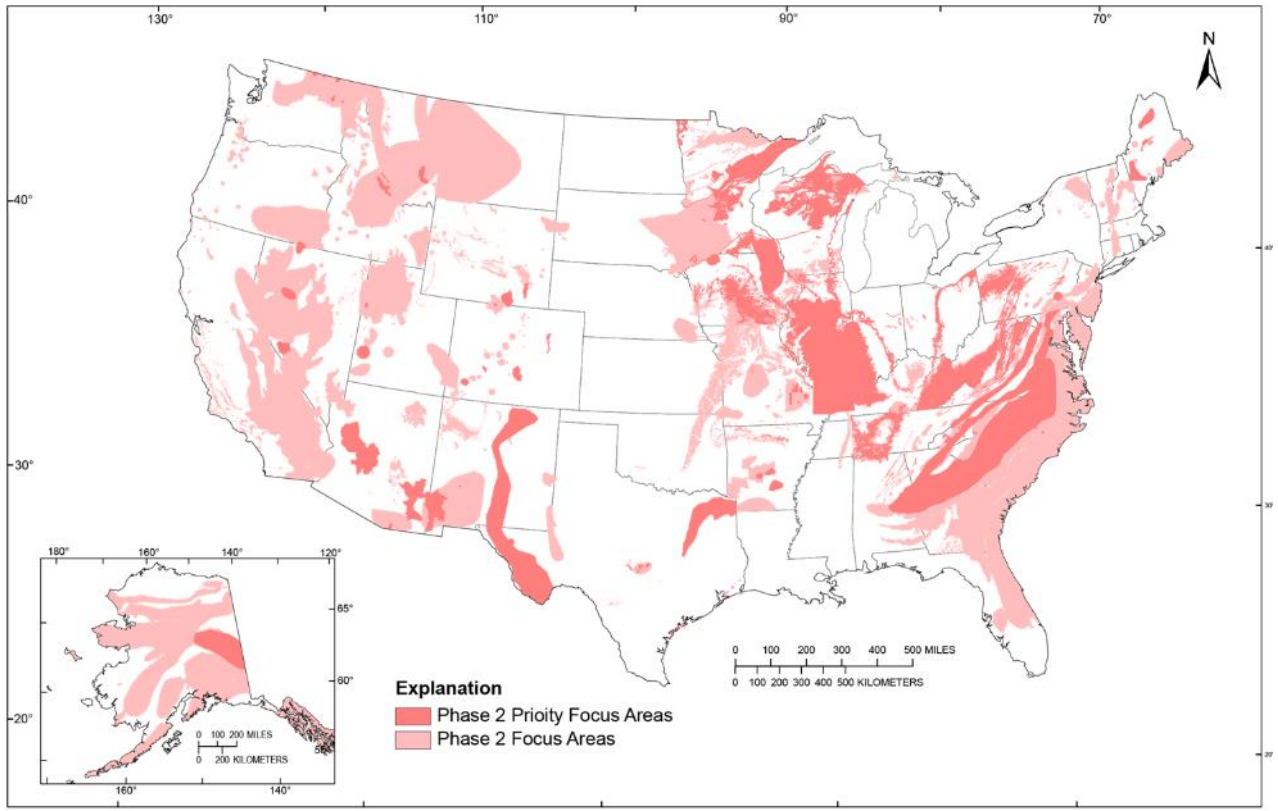
- Launch 15 new geologic mapping projects with State geological surveys

First national map of areas with potential to host 11 critical minerals



Shaded areas are a priority for data acquisition, mapping, and quantitative resource assessment, based on potential to host 11 critical minerals (aluminum, cobalt, graphite, lithium, niobium, platinum group elements, rare earth group elements, tantalum, tin, titanium, and tungsten).

USGS

MRP:
National Minerals Information Center

The Nation's source of supply, demand, and trade data for over 90 minerals and materials essential to the U.S. economy.

Upcoming products:

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- Infographic on critical minerals in medical implants

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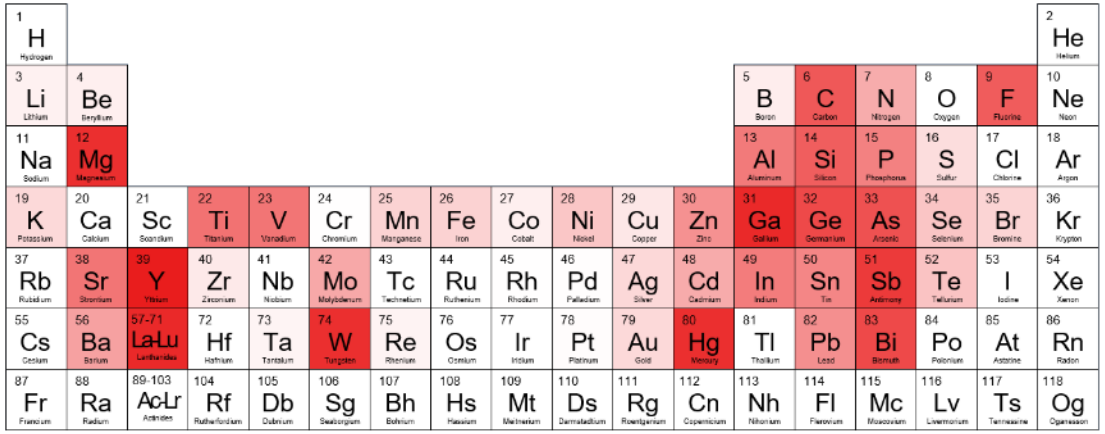
- Mineral Commodity Summaries 2021 (annual publication, released late Jan)

Mineral Commodity Summaries stakeholders and users:

- Defense Department (National Strategic Stockpile and Defense Production Act offices) and Intelligence Agencies, Department of Commerce and U.S. Trade Representative, and other national and international agencies
- Wall Street and private industry
- Press interest: Bloomberg, Wall Street Journal, Forbes and others

USGS

Share of each element's global production from China:



Energy generation uses:

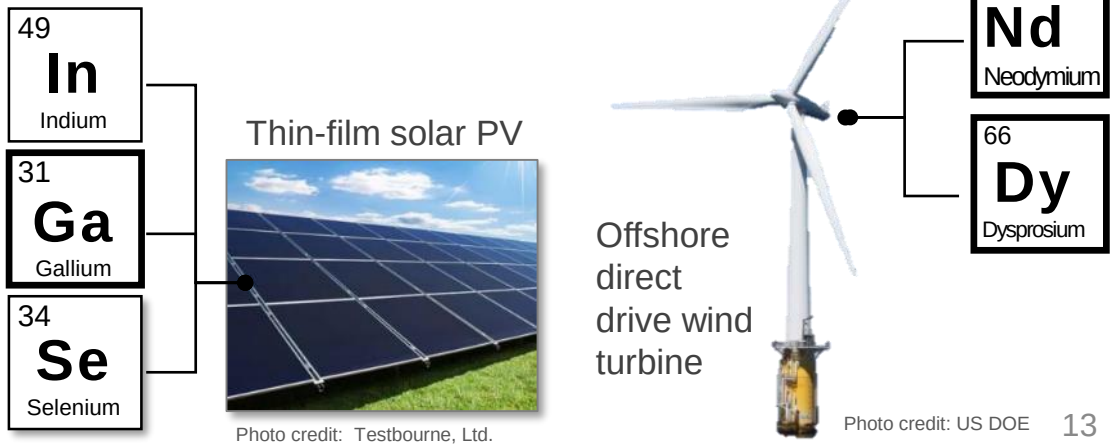


Photo credit: Testbourne, Ltd.

Photo credit: US DOE

Mineral Resources Research and Assessments

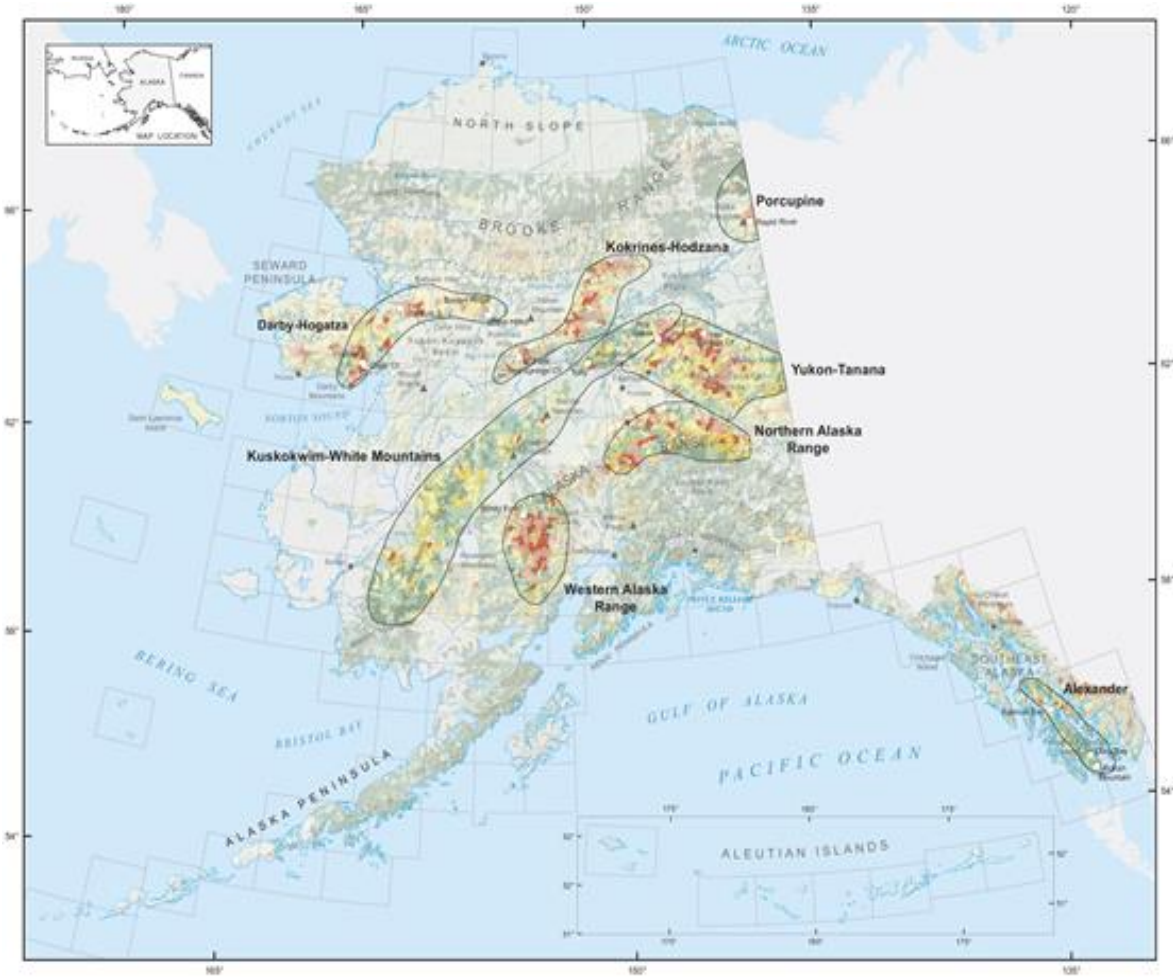
MRP conducts quantitative and qualitative mineral resource assessments for undiscovered deposits.

60
- *Tungsten skarn mineral resource assessment of the Great Basin region of western Nevada and eastern California:* Journal of Geochemical Exploration

60
- *Tungsten skarn potential of the Yukon-Tanana Uplands, Eastern Alaska, USA – A mineral resource assessment:* Journal of Geochemical Exploration

90
- *Mineral Resource Inventory of North Dakota,* USGS Open-file Report

90
- *GIS-Based identification of areas that have resource potential for sediment-hosted Pb-Zn deposits in Alaska:* U.S. Geological Survey Open-File report



Rare earth element resource potential (Karl et al., 2015, OFR 2016-1191); the forthcoming OFR will provide a similar map for lead-zinc deposits

ERP and MRP:
Mine Waste and Above Ground Resources

ERP and MRP are expanding efforts to characterize mine waste and the Nation's legacy mine sites, under the Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals – Call to Action 4.

- The USMIN Mineral Deposit Database is a new national geospatial database of the most important mines, mineral deposits, and mineral districts of the United States. The database is supported by BLM. Data are used by USGS researchers, State and Federal land management agencies, private industry, and the general public.
- DOI's Office of Environmental Policy and Compliance, NPS, and USGS ERP and MRP are planning a pilot study for re-mining waste at an abandoned mine site.

Publications:

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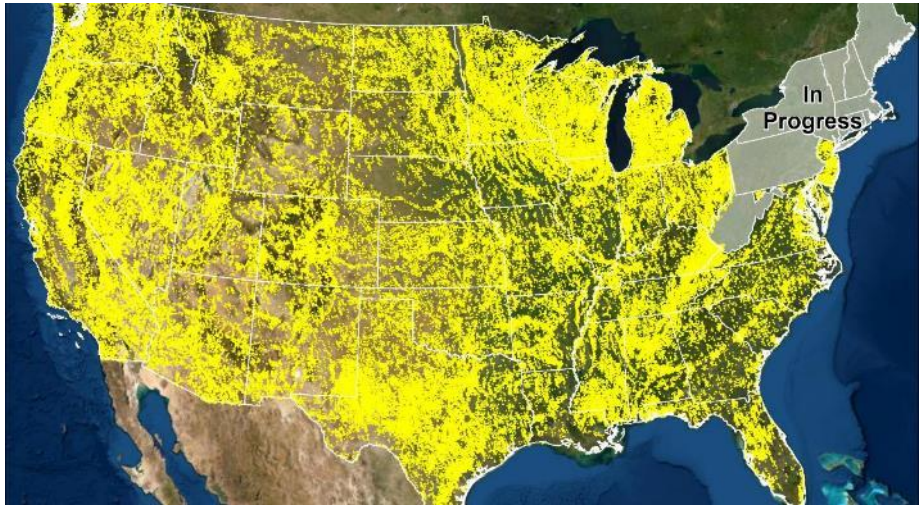
- *USMIN: The critical minerals initiative of the U.S. Geological Survey's mineral deposit database project: USMIN*: *Mining, Metallurgy & Exploration.*
- *USMIN: Data Releases describing Niobium, Tantalum and Graphite deposits in the U.S.*



USGS USMIN geospatial database of mines, mineral deposits, and mineral regions in the U.S. Each yellow dot is a mine feature.

30

Workshop to launch community of practice:

- *USGS event (Feb 2021): First Bureau-wide workshop on mine waste will identify gaps in approaches and datasets, and opportunities to enlarge collaborations internally and externally.*
- *Goal is to increase understanding of the potential to reclaim and restore mine waste sites and of potential resources in energy and mineral wastes*.

USGS

Significant Change:
International Partnerships

Formal bilaterals – Cabinet-level agreements, Deputy-level meeting chairs, USGS AD-level membership:

- U.S.-Canada Critical Minerals Working Group
- U.S.-Australia Critical Minerals Working Group

Critical Minerals Mapping Initiative science trilateral:

- USGS
- Geoscience Australia (GA)
- Geological Survey of Canada (GSC)

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- Release of GA-hosted data portal on all critical minerals for approximately 10,000 ore specimens from around the world.

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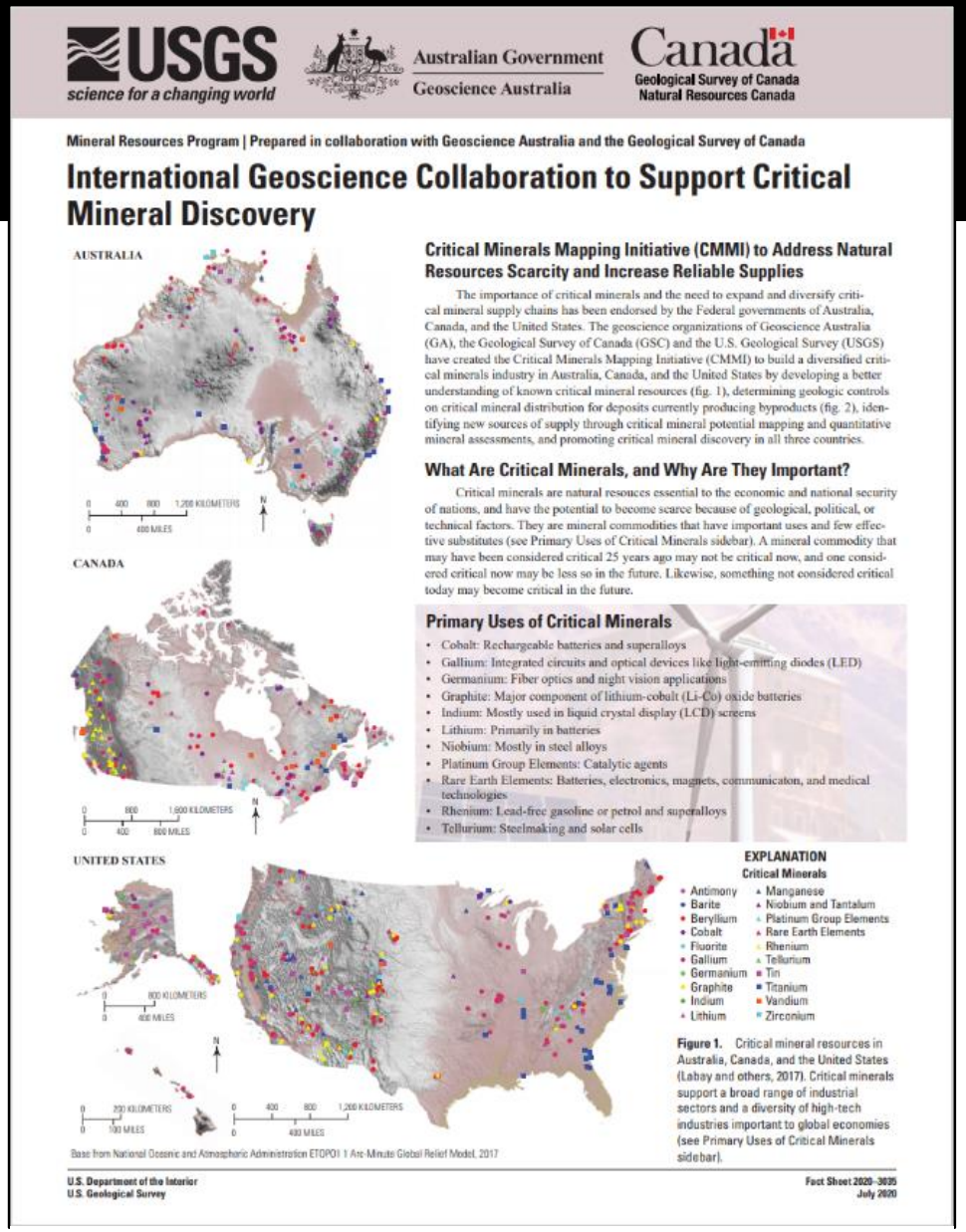
- 3 Regional “Critical Mineral Forums” – virtual meetings between national geological surveys on latest developments in critical minerals research (Feb 12-26, 2021)

USGS



USGS science for a changing world | Australian Government Geoscience Australia | Canada Geological Survey of Canada Natural Resources Canada

Mineral Resources Program | Prepared in collaboration with Geoscience Australia and the Geological Survey of Canada

International Geoscience Collaboration to Support Critical Mineral Discovery

AUSTRALIA

CANADA

UNITED STATES

Critical Minerals Mapping Initiative (CMMI) to Address Natural Resources Scarcity and Increase Reliable Supplies

The importance of critical minerals and the need to expand and diversify critical mineral supply chains has been endorsed by the Federal governments of Australia, Canada, and the United States. The geoscience organizations of Geoscience Australia (GA), the Geological Survey of Canada (GSC) and the U.S. Geological Survey (USGS) have created the Critical Minerals Mapping Initiative (CMMI) to build a diversified critical minerals industry in Australia, Canada, and the United States by developing a better understanding of known critical mineral resources (fig. 1), determining geologic controls on critical mineral distribution for deposits currently producing byproducts (fig. 2), identifying new sources of supply through critical mineral potential mapping and quantitative mineral assessments, and promoting critical mineral discovery in all three countries.

What Are Critical Minerals, and Why Are They Important?

Critical minerals are natural resources essential to the economic and national security of nations, and have the potential to become scarce because of geological, political, or technical factors. They are mineral commodities that have important uses and few effective substitutes (see Primary Uses of Critical Minerals sidebar). A mineral commodity that may have been considered critical 25 years ago may not be critical now, and one considered critical now may be less so in the future. Likewise, something not considered critical today may become critical in the future.

Primary Uses of Critical Minerals

- Cobalt: Rechargeable batteries and superalloys
- Gallium: Integrated circuits and optical devices like light-emitting diodes (LED)
- Germanium: Fiber optics and night vision applications
- Graphite: Major component of lithium-cobalt (Li-Co) oxide batteries
- Indium: Mostly used in liquid crystal display (LCD) screens
- Lithium: Primarily in batteries
- Niobium: Mostly in steel alloys
- Platinum Group Elements: Catalytic agents
- Rare Earth Elements: Batteries, electronics, magnets, communicaton, and medical technologies
- Rhenium: Lead-free gasoline or petrol and superalloys
- Tellurium: Steelmaking and solar cells

EXPLANATION

Critical Minerals

Antimony, Barite, Beryllium, Cobalt, Fluorite, Gallium, Germanium, Graphite, Indium, Lithium, Manganese, Niobium and Tantalum, Platinum Group Elements, Rare Earth Elements, Rhenium, Tellurium, Tin, Titanium, Vandium, Zirconium

Figure 1. Critical mineral resources in Australia, Canada, and the United States (Labay and others, 2017). Critical minerals support a broad range of industrial sectors and a diversity of high-tech industries important to global economies (see Primary Uses of Critical Minerals sidebar).

Base from National Oceanic and Atmospheric Administration ETOPO1 1 Arc-Minute Global Relief Model, 2017

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

Fact Sheet 2020–3035
July 2020

USGS Fact Sheet 2020-3035
https://doi.org/10.3133/fs20203035

Denver Federal Center Building 20 and the USGS-Colorado School of Mines Move

USGS and Colorado School of Mines agreed to co-locate Denver-based USGS energy and minerals researchers and labs to a new facility on the Mines campus. The plan would:

  - Move Federal scientists and equipment out of the dilapidated Denver Federal Center Building 20
  - Create a world-class hub for geology, geophysics, geochemistry and minerals research.

- As a direct result of the pandemic, the State of Colorado and the Colorado School of Mines were unable to provide $143.8 million in direct funding and bonds for the building.
- The building was to break ground in Fall 2020; the loss of this shovel-ready project creates significant risk to the energy and minerals mission of the USGS.
- The inability to move out of Building 20 to Mines creates cascading impacts to other USGS laboratory facilities at the Denver Federal Center.

USGS

Mission Area Contact Information

Sarah Ryker, PhD
Associate Director
Energy and Mineral Resources Mission Area
sryker@usgs.gov
(703) 648-5210 - office
(571) 533-7000 – mobile/telework

USGS

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science for a changing world

USGS Natural Hazards Mission: Urgent Issues for Agency Review Team

David Applegate
Associate Director for Natural Hazards
December 15, 2020

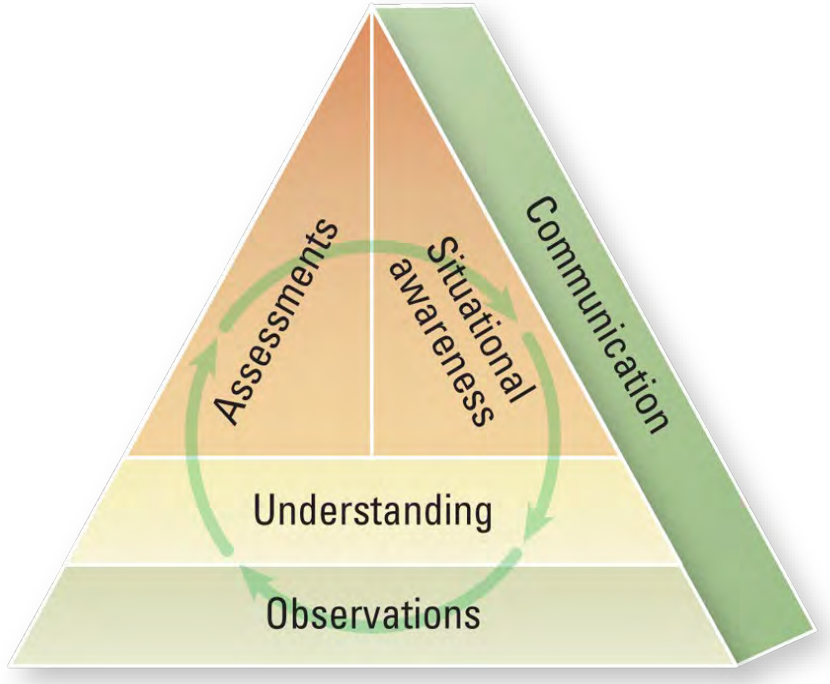
USGS hazard roles and responsibilities

- Responsible for providing assessments and alerting for **earthquakes**, **volcanic eruptions**, and **landslides**
- Seismic networks support NOAA's **tsunami** warnings
- Streamgages and storm surge monitors support NOAA's **flood and severe weather (including hurricane)** warnings
- **Coastal and marine** geologic surveys and research support assessments of earthquake and tsunami hazards, and coastal impacts from storms, hurricanes and sea-level rise
- Geomagnetic observatories support NOAA and US Air Force 557th Weather Wing **geomagnetic storm** forecasts
- USGS has key role in tracking chemical and biological threats, in particular **zoonotic diseases**
- Geospatial information supports response operations for **wildfire** and many other disaster types

USGS science for a changing world

USGS Natural Hazards Mission Area

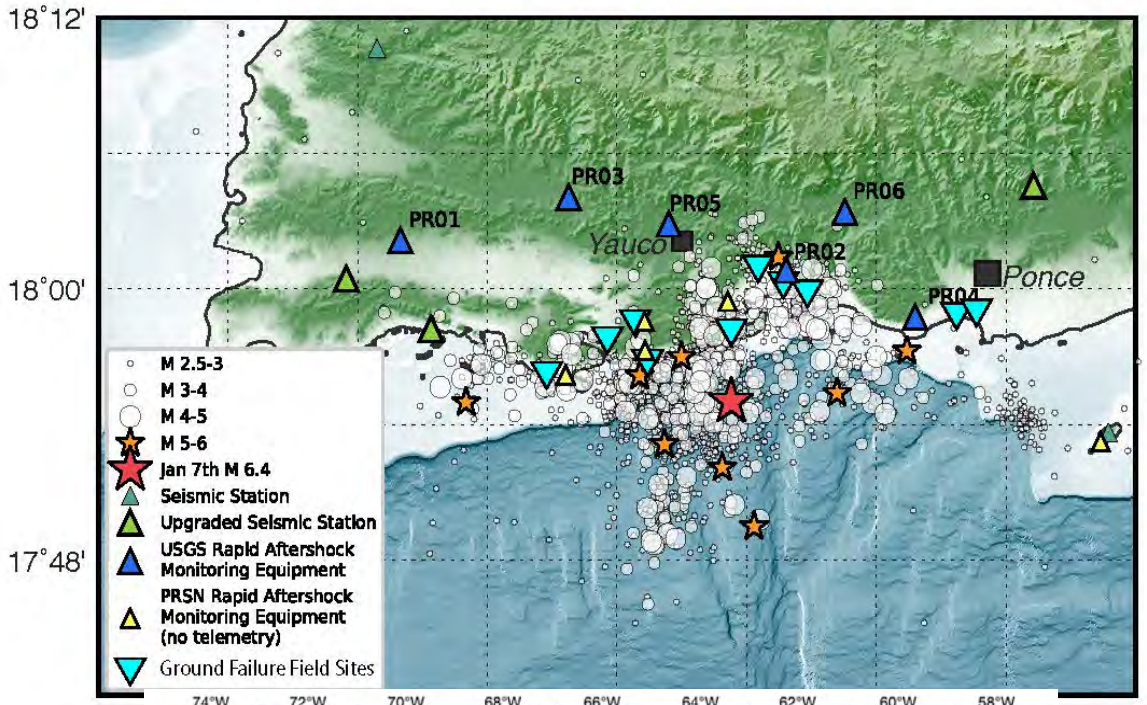
- Direct responsibility for six programs:
  - **Coastal/Marine Hazards & Resources**
  - **Earthquake Hazards**
  - **Geomagnetism**
  - **Global Seismographic Network**
  - **Landslide Hazards**
  - **Volcano Hazards**

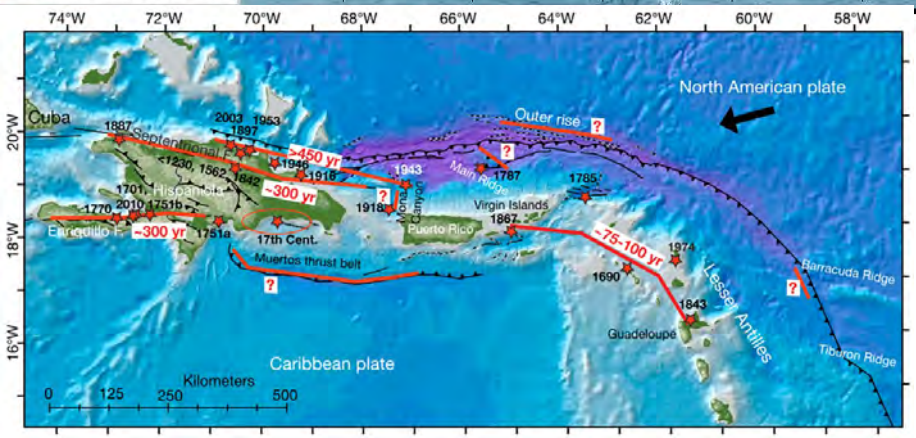


- Coordinates and supports long-term planning and integration for the broader hazards mission of the USGS including floods, hurricanes, tsunamis, and wildfires. This integrative role includes implementation of a new risk science strategy and the Science Application for Risk Reduction (SAFRR) project.
- Coordinates USGS emergency management and response activities following disasters, including DOI Strategic Sciences Group

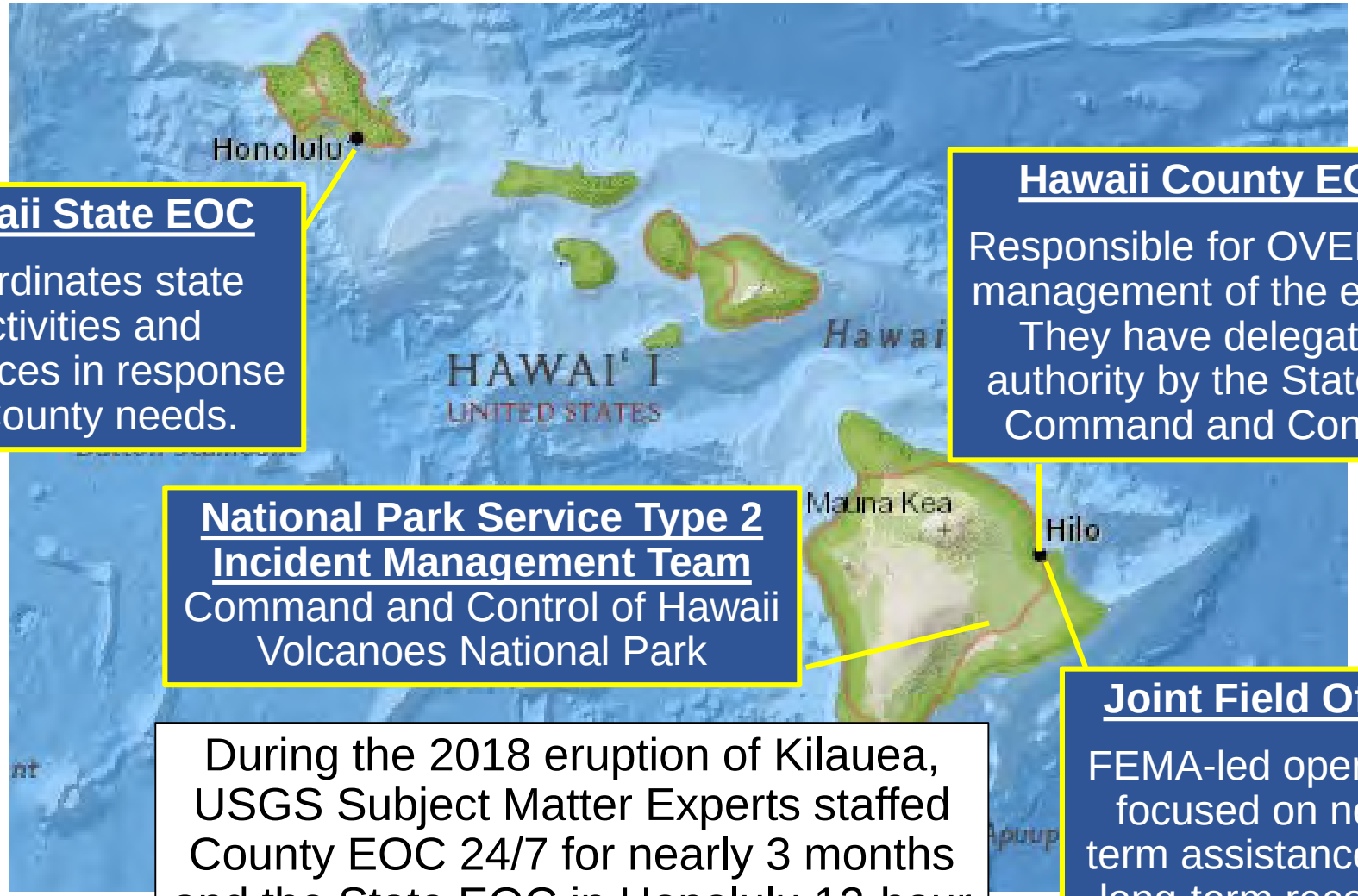

Oso, Washington
March 22, 2014
Volcano Hazards Program
National Cooperative Geologic Mapping Program
Coastal & Marine Hazards/ Resources Program
Landslide Hazards Program
Earthquake Hazards Program
National Geospatial Program
Groundwater & Streamflow Information Program
Photo: Jonathan Godt, USGS

USGS response to 2020 Puerto Rico earthquake sequence





Emergency Operations Centers — the room where it happens



Hawaii State EOC

Coordinates state activities and resources in response to County needs.

Hawaii County EOC

Responsible for OVERALL management of the event. They have delegated authority by the State for Command and Control

National Park Service Type 2 Incident Management Team

Command and Control of Hawaii Volcanoes National Park

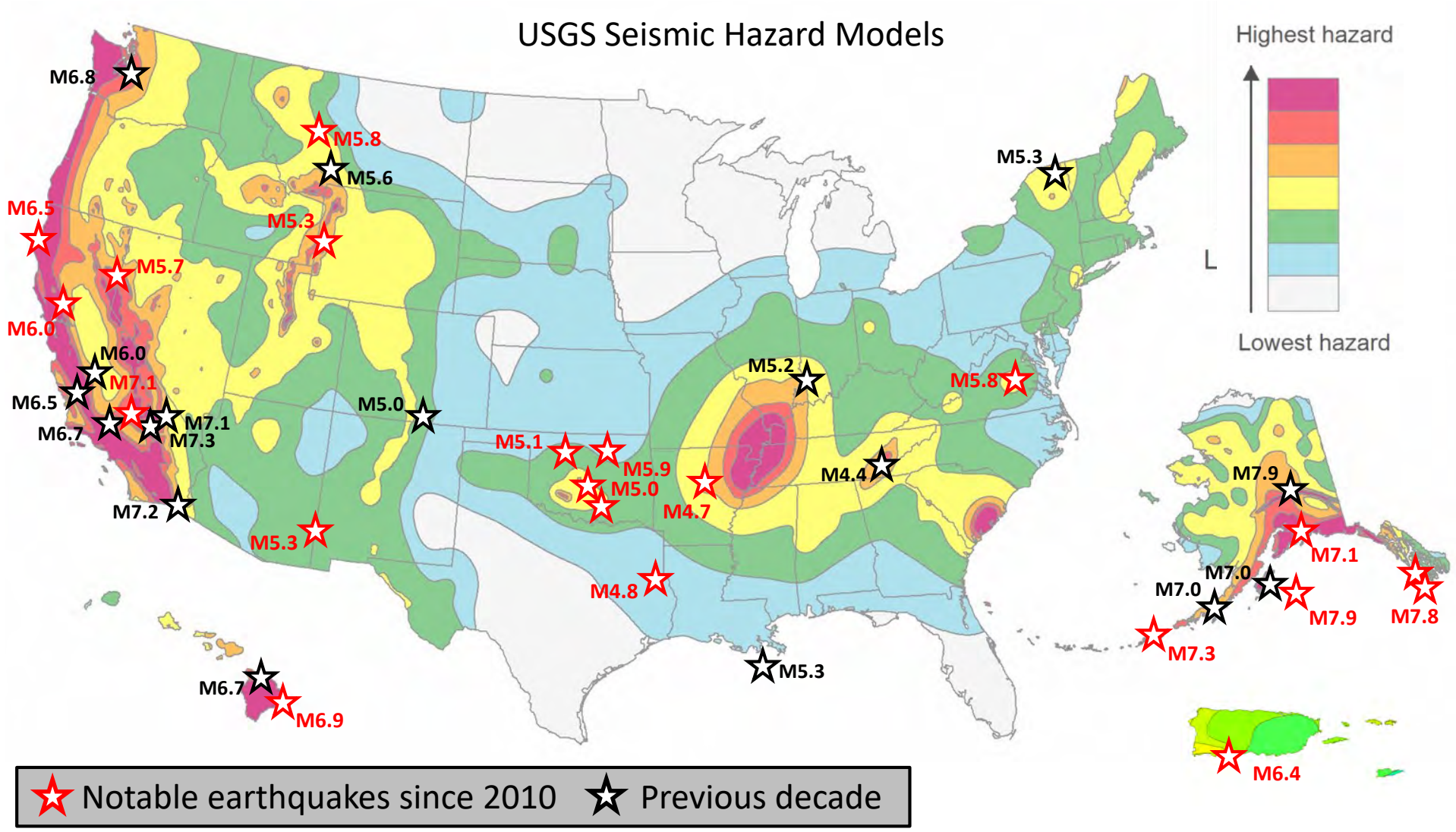
Joint Field Office

FEMA-led operation focused on near-term assistance and long-term recovery

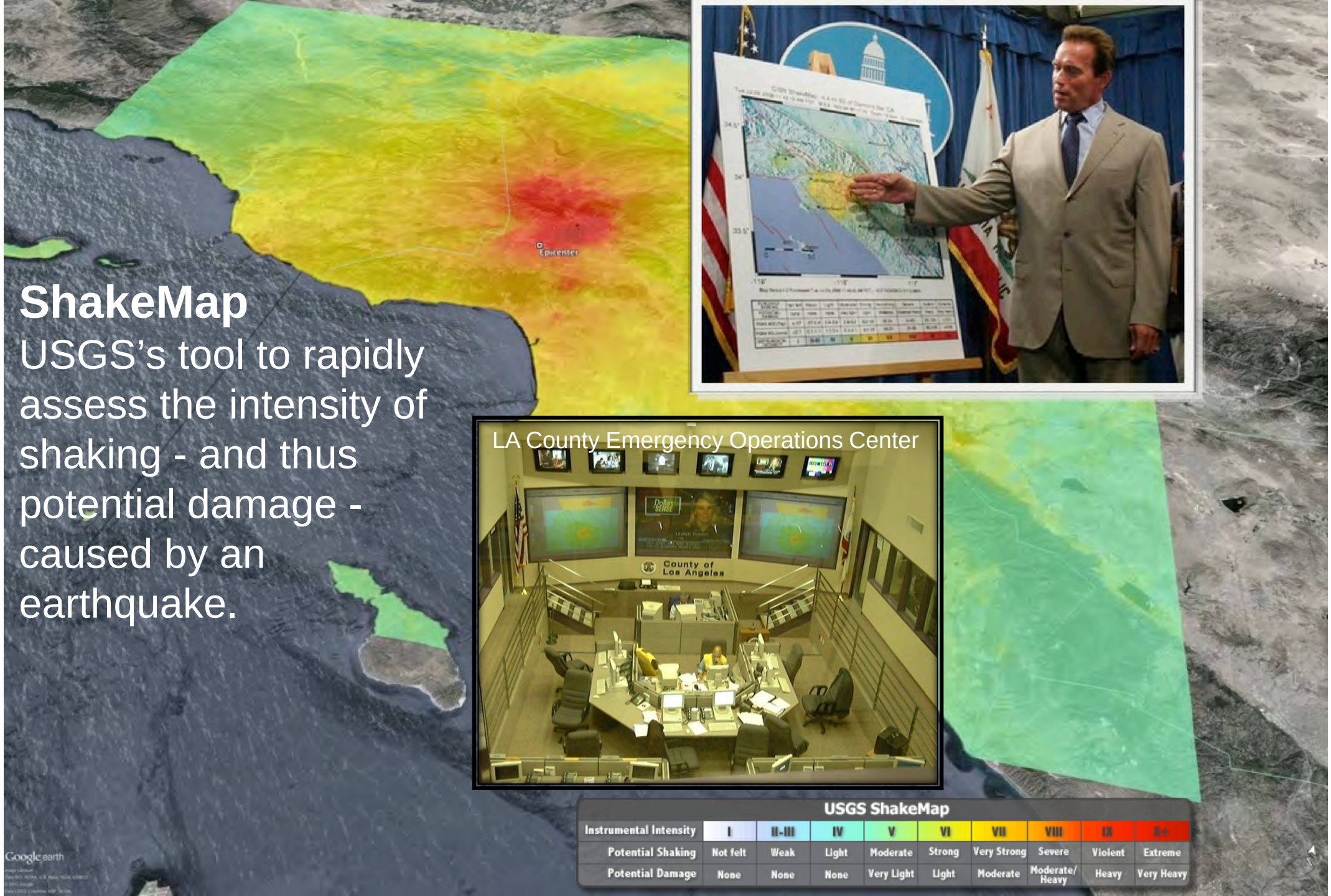
During the 2018 eruption of Kilauea, USGS Subject Matter Experts staffed County EOC 24/7 for nearly 3 months and the State EOC in Honolulu 12-hour day shift for nearly 2 months

USGS
science for a changing world

Earthquakes are a national hazard



Nearly half of Americans are at risk for earthquake damage.
Earthquake risk exists in every state and territory.
Annual U.S. building losses are estimated at $6.2 billion.



ShakeMap

USGS's tool to rapidly assess the intensity of shaking - and thus potential damage - caused by an earthquake.

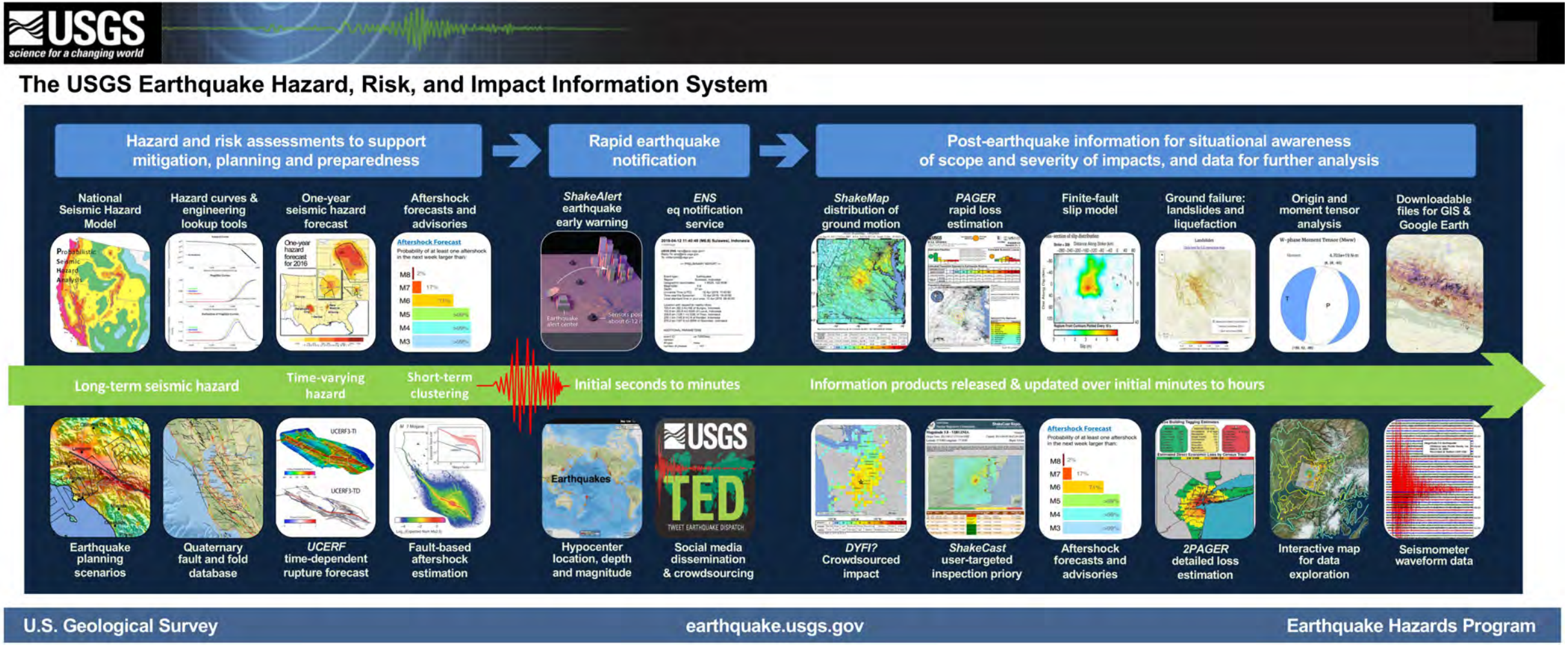
USGS ShakeMap

Instrumental Intensity	I	II-III	IV	V	VI	VII	VIII	IX	X+
Potential Shaking	Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
Potential Damage	None	None	None	Very Light	Light	Moderate	Moderate/ Heavy	Heavy	Very Heavy

USGS science for a changing world

Google earth

Earthquake hazard, risk, and impact information system



ANSS-ShakeAlert Earthquake Early Warning

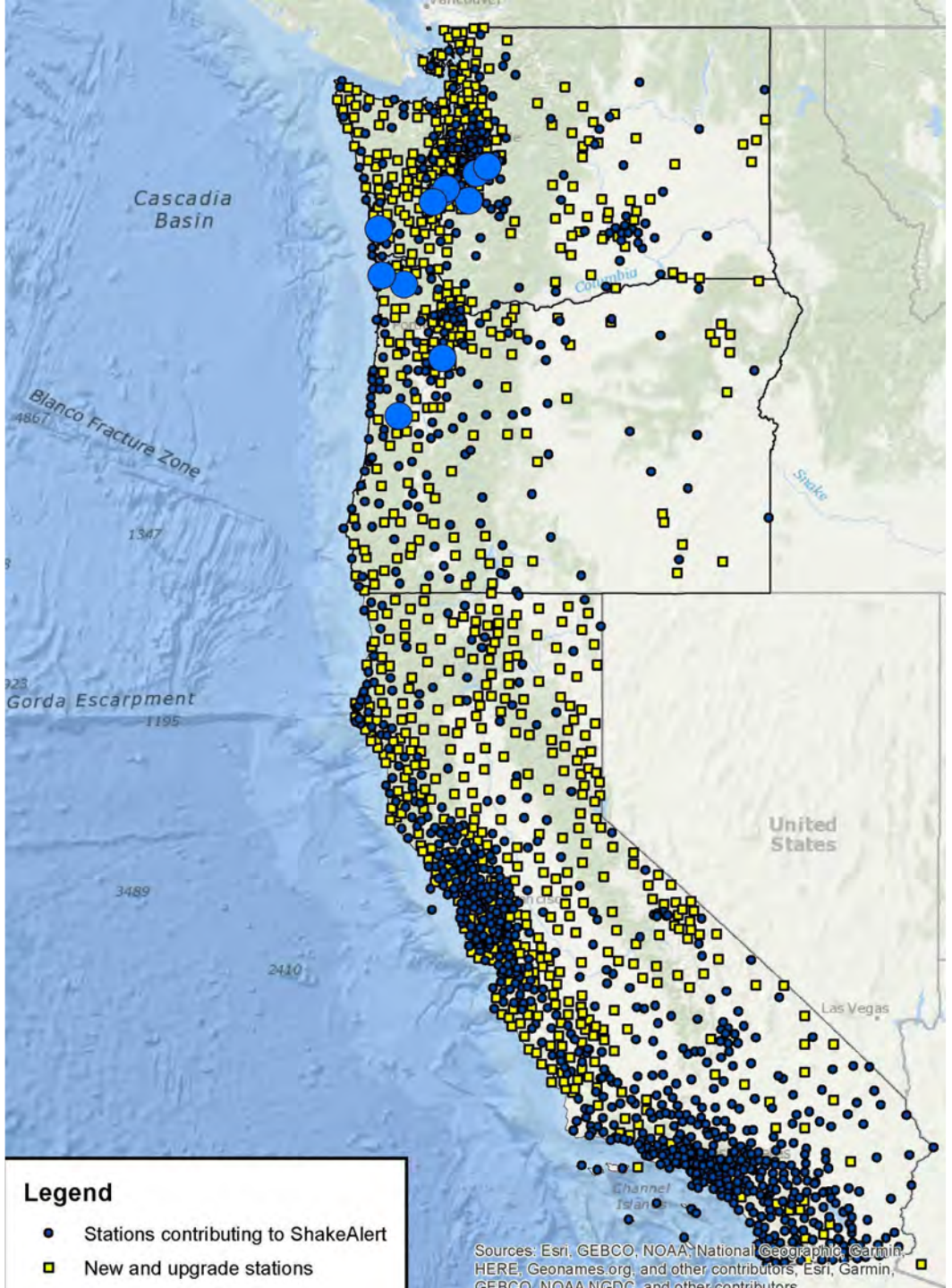
ShakeAlert began public alerting in California in October 2019.

Three events are in development for early in 2021:

- Washington is targeting a test of FEMA's public Wireless Emergency Alert System for ShakeAlert messaging on February 28, 2021, coincident with the 20th anniversary of the M6.8 Nisqually earthquake that caused damage across the Puget Sound region.
- Oregon has set the goal of launching public alerting on March 11, 2021, the 10th anniversary of the devastating M9.1 Tohoku earthquake in Japan that occurred in a similar subduction zone environment.
- Washington is targeting May 2021 for its preferred public alerting rollout date.

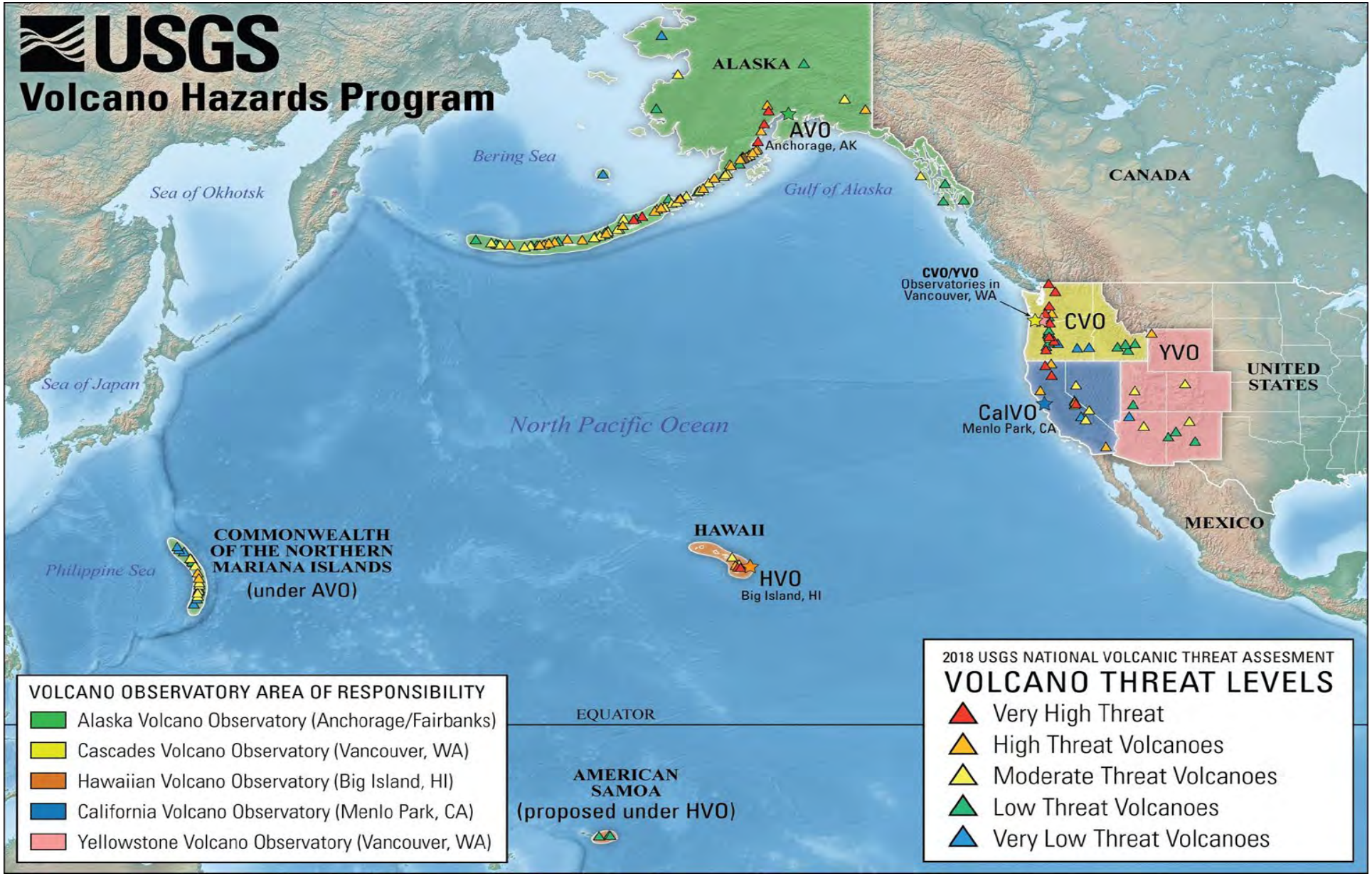
State Investments in FY21: CA - $17M; OR - $7.5M; WA - $1M

ShakeAlert Station Inventory	CISN	PNSN	West Coast
TARGET	1,115	560	1,675
Contributing	764	325	1089
Percent complete	69%	58%	65%
Stations remaining	351	235	586



USGS science for a changing world

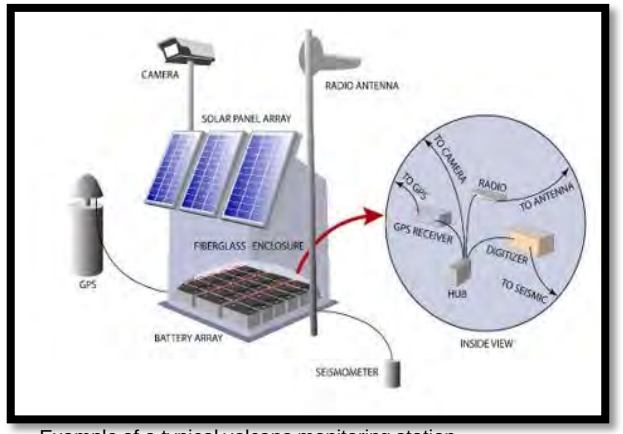
USGS Volcano Hazards Program area of responsibility



USGS
science for a changing world

The National Volcano Early Warning System (NVEWS)

Authorized from 2019-2023 through enactment of Title V of the John Dingell Jr., Conservation, Management, and Recreation Act (Public Law 116-9) on 3/12/19.



Example of a typical volcano monitoring station

Components

- All 161 U.S. volcanoes will be proactively monitored at levels commensurate with the threats they pose
- All five U.S. volcano observatories will comprise an interoperable system with standardized analytical software and automated alarm systems capable of integrating multiple data types
- A combined national Volcano Watch Office and Data Center will provide 24/7 continuity of operations and will aggregate and distribute real-time monitoring data from all observatories
- An external grants program will support research in volcano monitoring science and advancements in monitoring technologies.
- An interagency advisory committee (DOT, FAA, NOAA, FEMA, NASA, NSF, volcano science community) will advise USGS on NVEWS implementation
- Public Law 116-9 authorizes annual appropriations totaling $55M from FY2019-2023

Unmanned Aircraft Systems (UAS) came of age for eruption response at Kilauea

Hexacopter UAS equipped with microDOAS gas sensor used to measure SO2 emission rates in bulk and at individual fissures.

A team of UAS pilots from USGS and the DOI Office of Aviation Services (OAS) was quickly formed to assist in monitoring the eruption, specifically in areas inaccessible by field crews and manned aircraft.

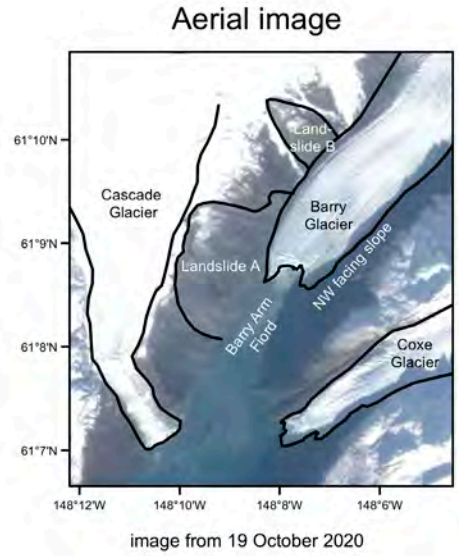
Ground control at Fissure 8

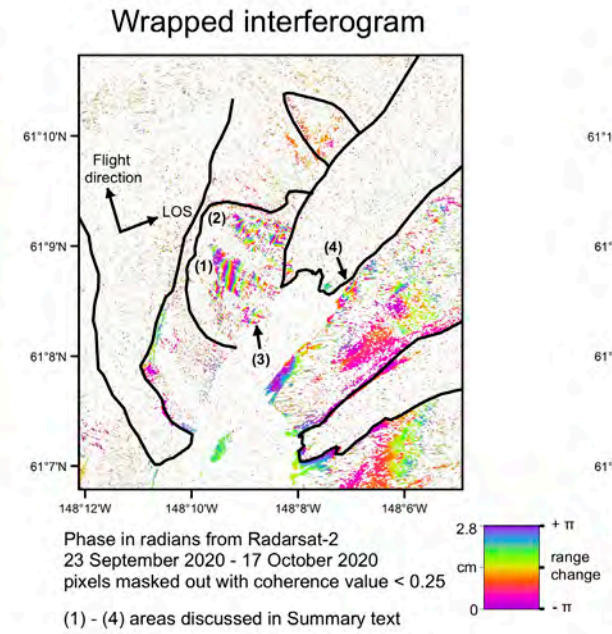
Photos: USGS

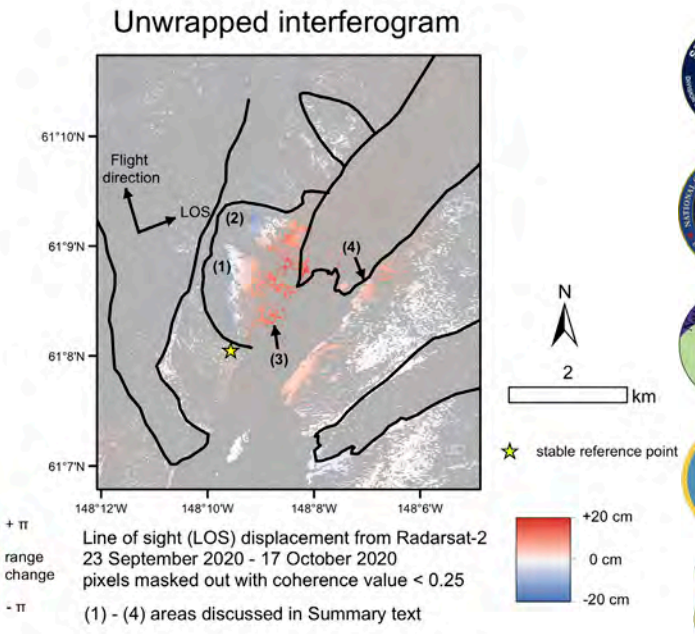
USGS science for a changing world

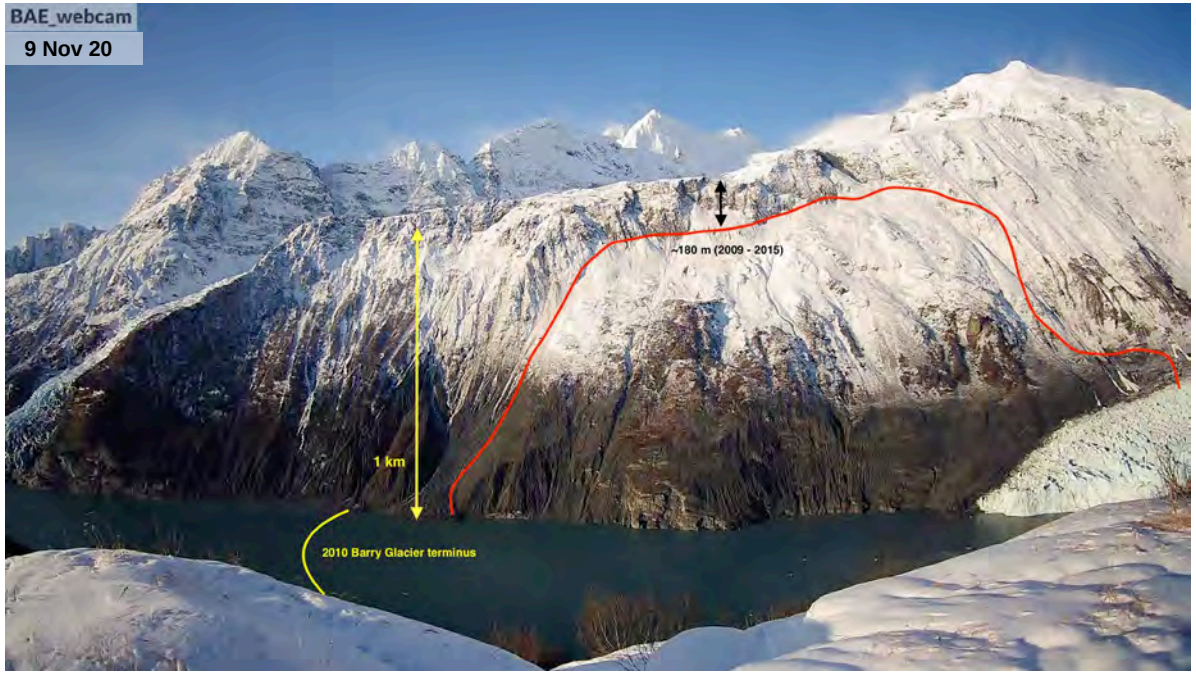
Landslide Hazards: Current Events in Alaska

Barry Arm Landslide,
Prince William Sound, AK





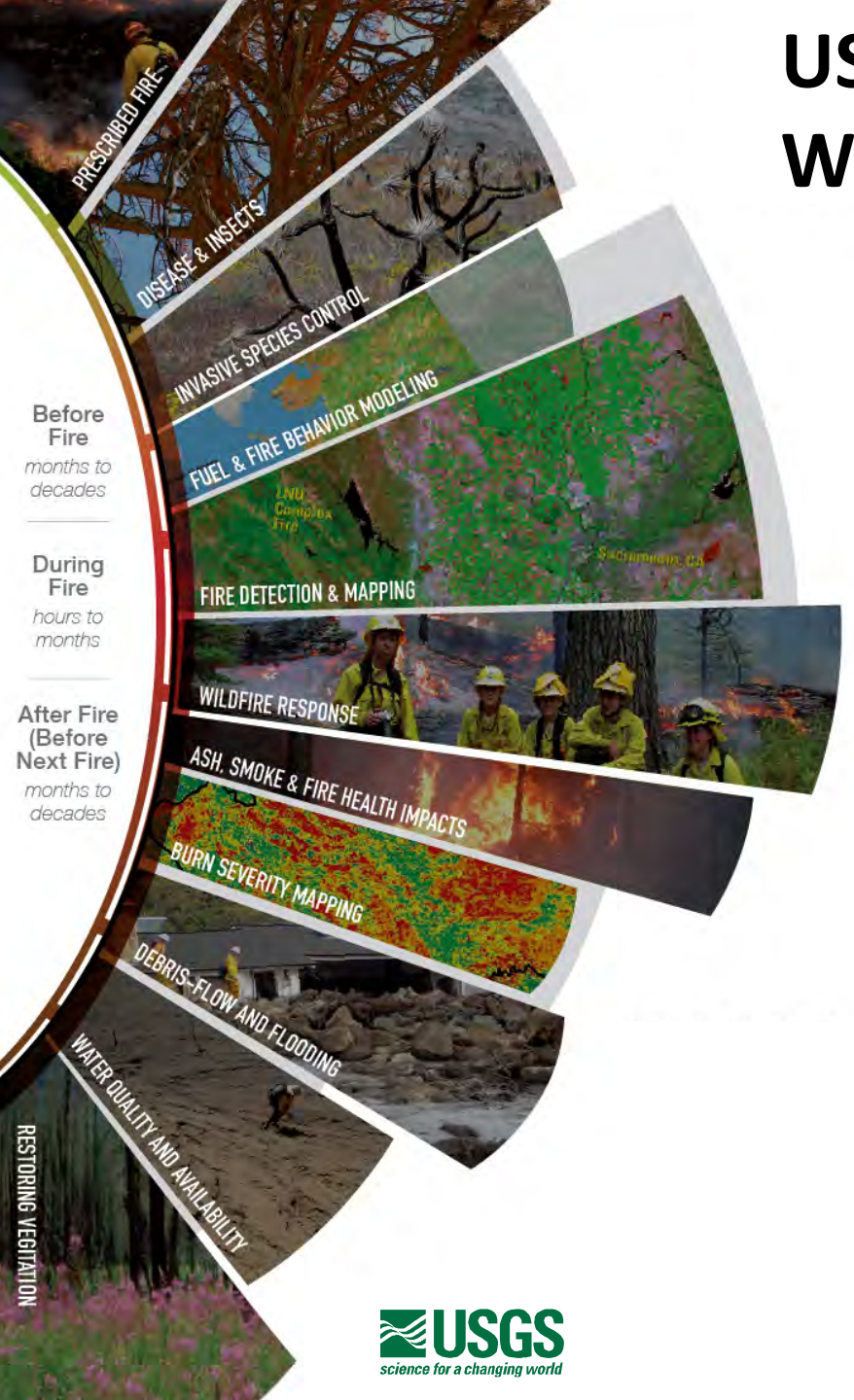




- Between 2009 and 2015 a large landslide moved 180 m (600 ft) with the retreat of Barry Glacier
- Concern is rapid movement of the slide would generate a tsunami impacting marine interests and nearby communities
- Based on satellite radar analyses the slide was stable between May – October 2020, but began moving again in November
- Movement in November was relatively small (~30 cm), but snow cover makes radar analyses impossible during the winter season
- USGS is coordinating with the State and NOAA tsunami warning center on alert and response plans, but no system is yet in place
- Senate FY21 appropriations bill directs USGS to assess hazard and implement a landslide monitoring system, includes $4M plus-up.
- Landslides are increasingly a concern in Alaska; two people are still missing after a landslide triggered by record rainfall swept their home into the sound near Haines in SE Alaska

USGS
science for a changing world

USGS Wildland Fire Science Informs Land, Water, and Emergency Management Decisions



$71–$246 BILLION Net annual economic impact of wildland fire across the U.S.[1]

650 MILLION Acres of public lands that are managed for wildland fire.[2]

16.1 FATALITIES Average annual fatalities from wildland fire.[3]

64,000 WILDFIRES Average number of wildfires per year.[4]

6.8 MILLION Average acres burned per year by wildfires.[4]

3.7 MILLION Average acres burned per year in prescribed fires.[5]

USGS provides critical actionable information on areas vulnerable to severe wildfire and post-fire hazards - to reduce risk pre-fire, during fires, and right after fires occur.

Science support for fire operations includes:

- **Fire mapping** – fire detection, perimeters, direction and intensity
- **LANDFIRE** – map vegetation/fuels as part of 22+ data layers, used for fire behavior modeling and decision support in fire response, fire planning, fuels reduction and vegetation recovery.
- **Burn Severity Mapping** – extent that vegetation & duff are consumed in fire
- **Post-fire Debris flow assessments** – support Burned Area Emergency Response teams
- **Streamflow monitoring** - flash flooding, water quality, and water availability

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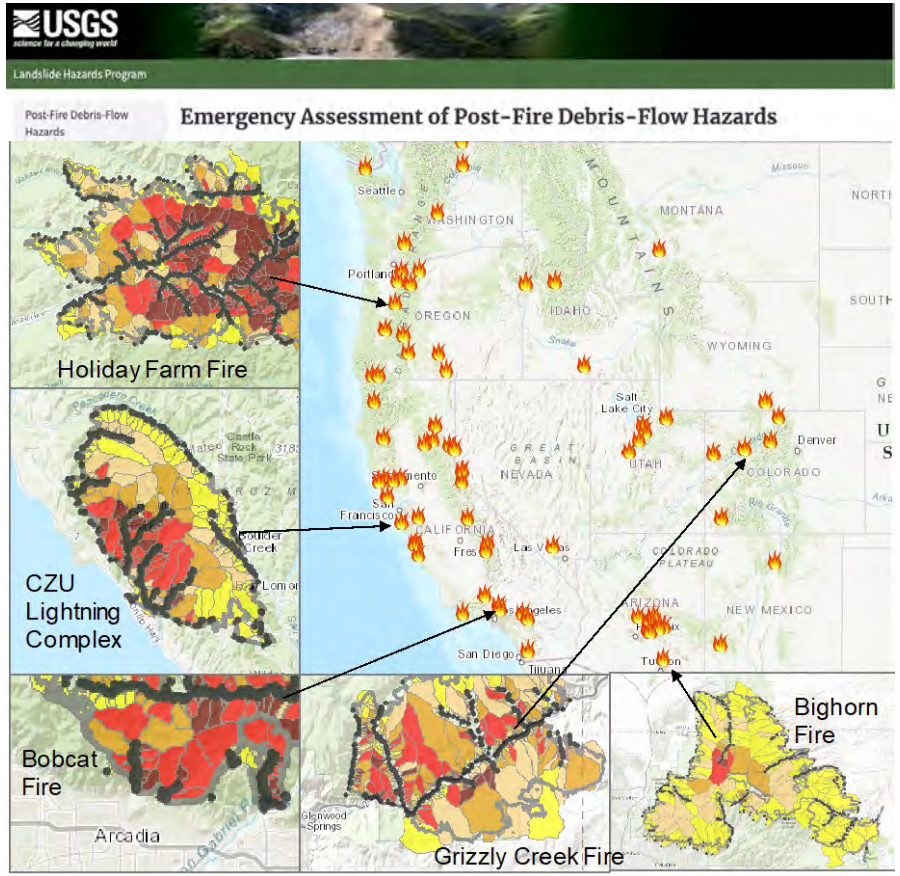
Post-fire debris flows in the Western U.S.



Twenty-three people were killed and hundreds of homes were destroyed by debris flows on Jan. 9, 2018 when heavy rain fell on steep hillsides burned by the Thomas Fire in Montecito, CA.

- Wildfire increases the propensity for debris flows: fast moving, potentially destructive landslides the consistency of wet concrete
- This year, the USGS has delivered 78 post-fire debris-flow hazard assessments covering more than 6.5 million acres across the western U.S. (30 assessments over 3.7 million acres in CA).
- Hazard assessments are used by federal and state response teams to evaluate post-fire risk and inform alerts delivered by the National Weather Service for recently burned areas

USGS
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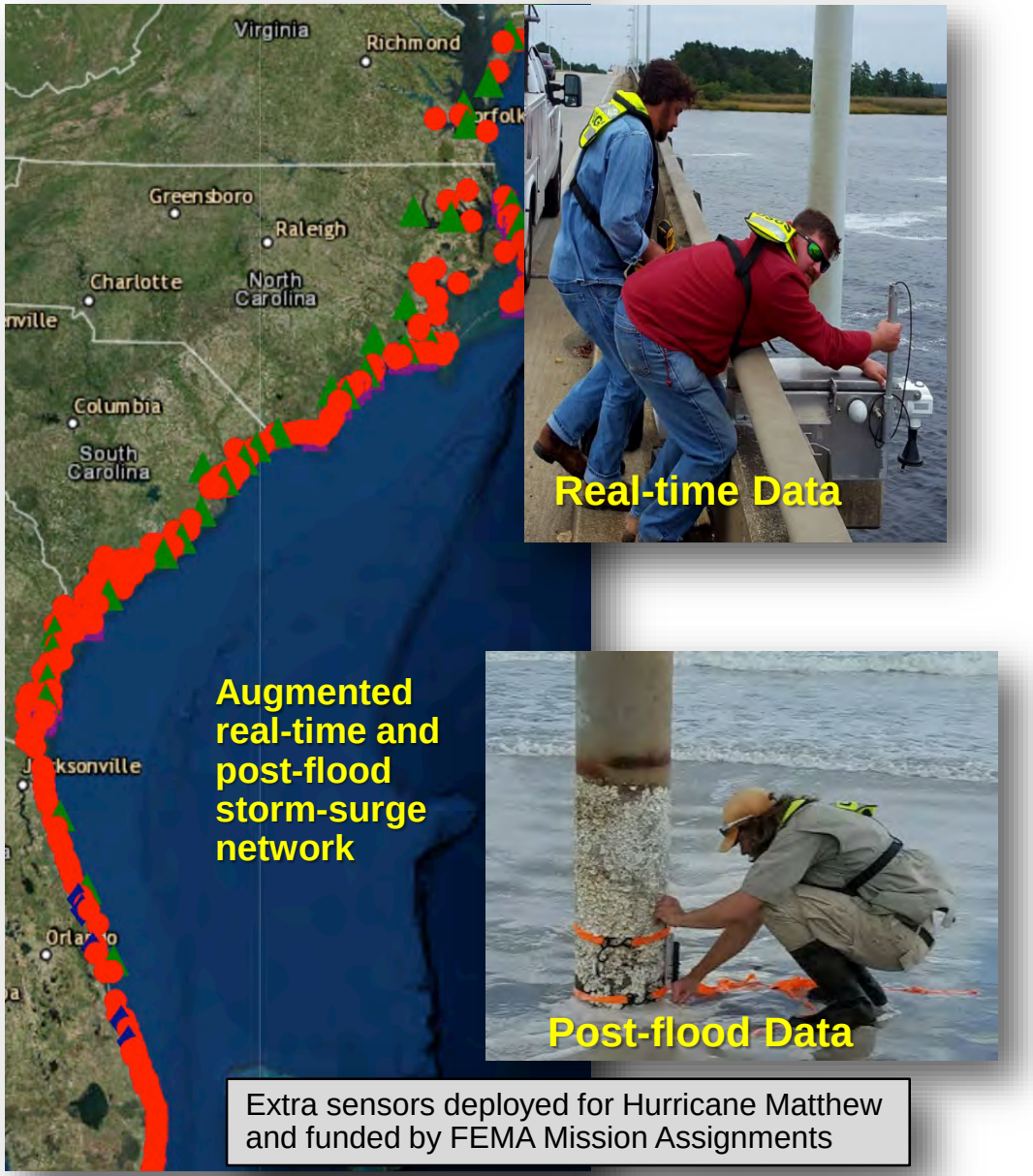
USGS event-driven posture for floods and severe weather



Extra sensors deployed for Hurricane Matthew and funded by FEMA Mission Assignments

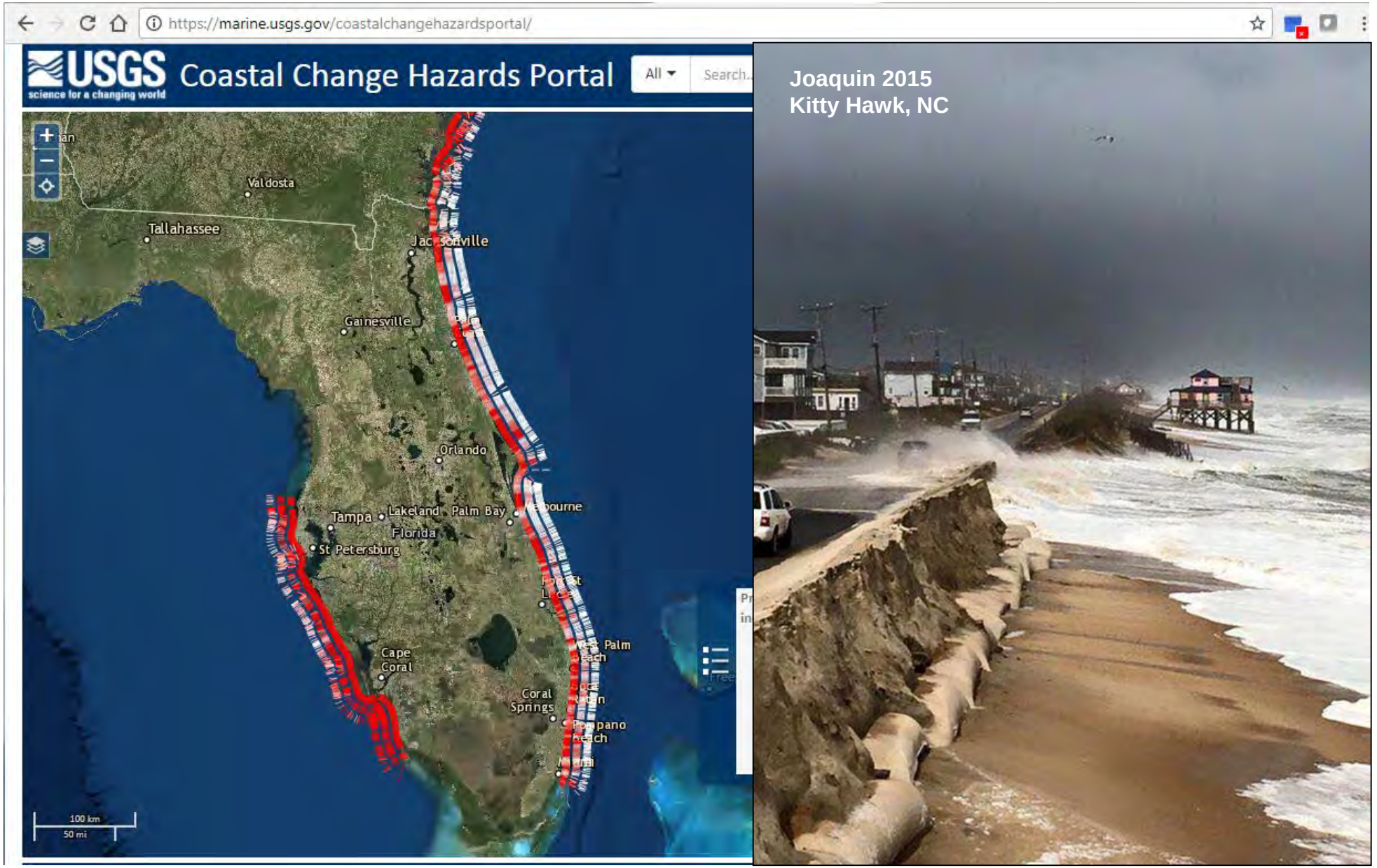
- Streamgage Network Operations
  - Supports national water security and partners
- Rapid Deployment Streamgages
  - Temporary real-time data for critical locations
- Non-transmitting stage sensors
  - Coastal surge, river flooding, dam breaks
  - Post-event calibration data for modeling
- Flood documentation
  - High-water mark flagging and surveying
  - Post-flood “indirect measurement”
  - Inundation mapping computations
  - Accurate damage assessment and planning
  - Flood-insurance map verification
- Flood-frequency calculations
  - Bridge, dam, levee design and repair

water.usgs.gov/floods/

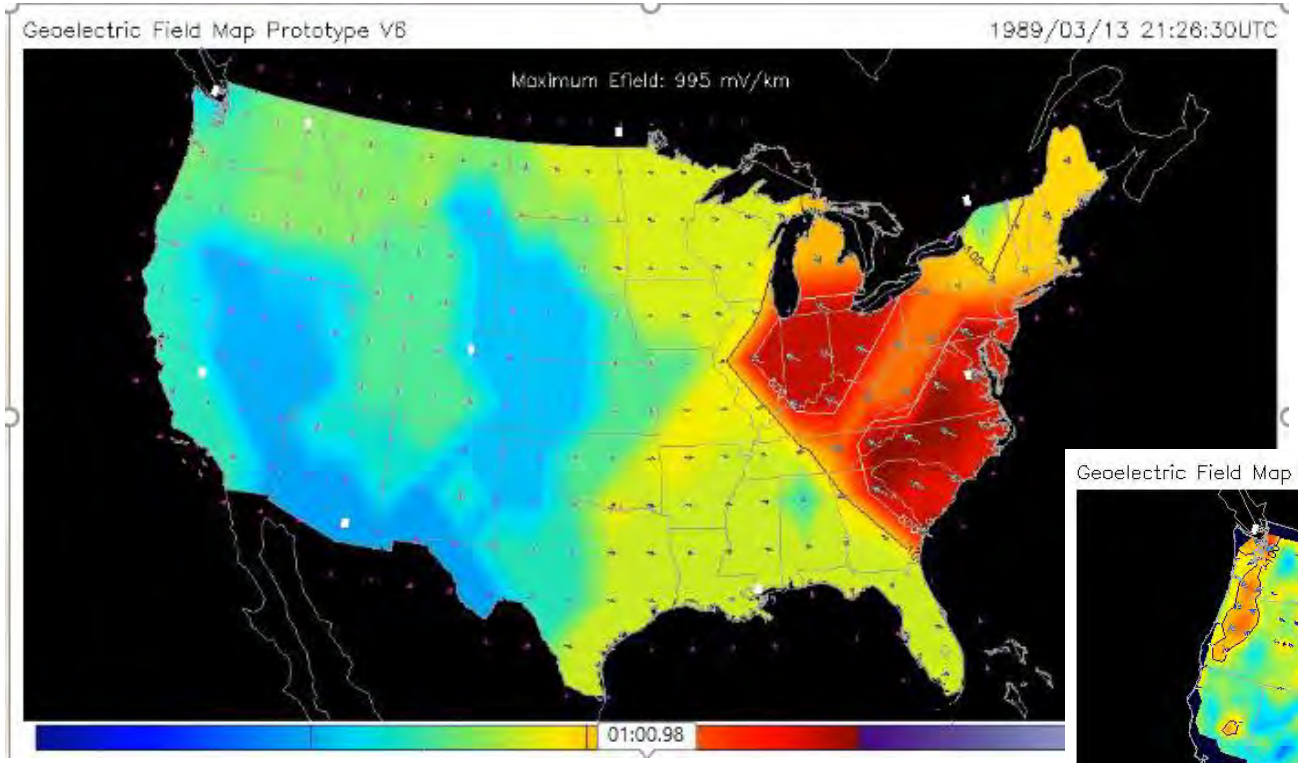
USGS science for a changing world

Coastal Change Hazards Portal

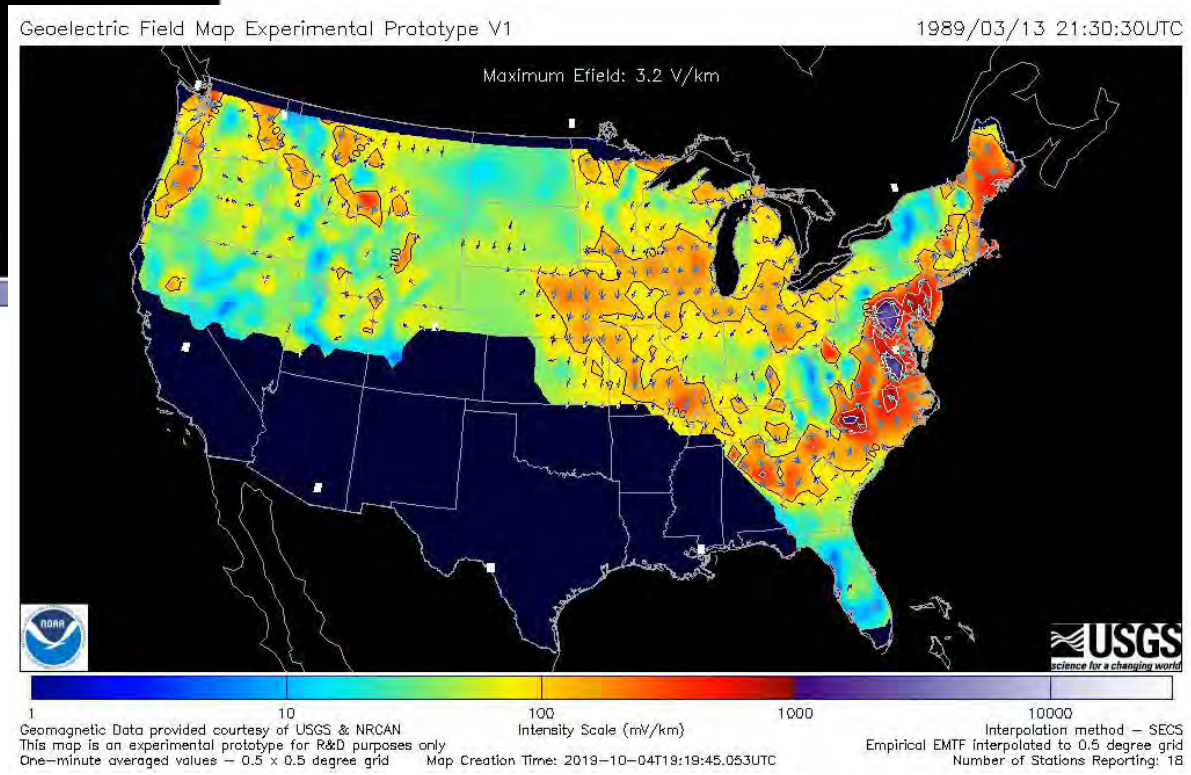
marine.usgs.gov/coastalchangehazardsportal



Geoelectric field mapping helps electric grid operators prepare for magnetic storms



Existing operational models provide coarse resolution.



Combination of USGS geomagnetic observatory data and magnetotelluric surveys enables much more detailed and robust modeling of electric currents that the power grid would be exposed to as a result of magnetic storms.

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The International Charter: Space and Major Disasters

Makes use of collaborative international partner-ships between space agencies and space system operators when disaster strikes around the world

Charter Members and Partners

Disaster supplemental appropriations to build back better

2018

Received $42.2M for equipment repair/replacement, lidar acquisitions, and impact assessments

- Equipment repair and replacement
  - Water gages (TX, FL, PR/VI)
  - Seismic/Geomagnetic monitoring assets (PR)
  - Coral reef monitoring equipment (PR)
- Data restoration at gage locations (PR)
- Lidar for hurricanes and wildfires
- Landslide assessments (PR)
- Coastal impact assessments (FL, PR)

All activities completed by 2021. Water gages were functional for the 2018 hurricane season and fully operational for the 2019 hurricane season.

2019

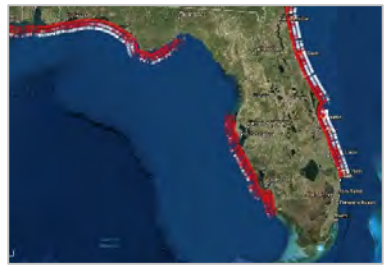
DOI approved the USGS operating plan for $98.5M in facilities/ equipment repair and replacement, lidar acquisition, and impact assessments

- Kilauea eruption
  - Replacement of Hawaii Volcano Observatory
  - Geologic investigations and equipment hardening
- 2018 Anchorage Earthquake repair/hardening and damage response
- 3DEP Lidar acquisition for wildfires, hurricanes, and Kilauea
- Coastal impact assessments from hurricanes
- Debris-flow assessments and fire behavior models for CA wildfires

Needs identified for 2020 hurricanes and wildfires







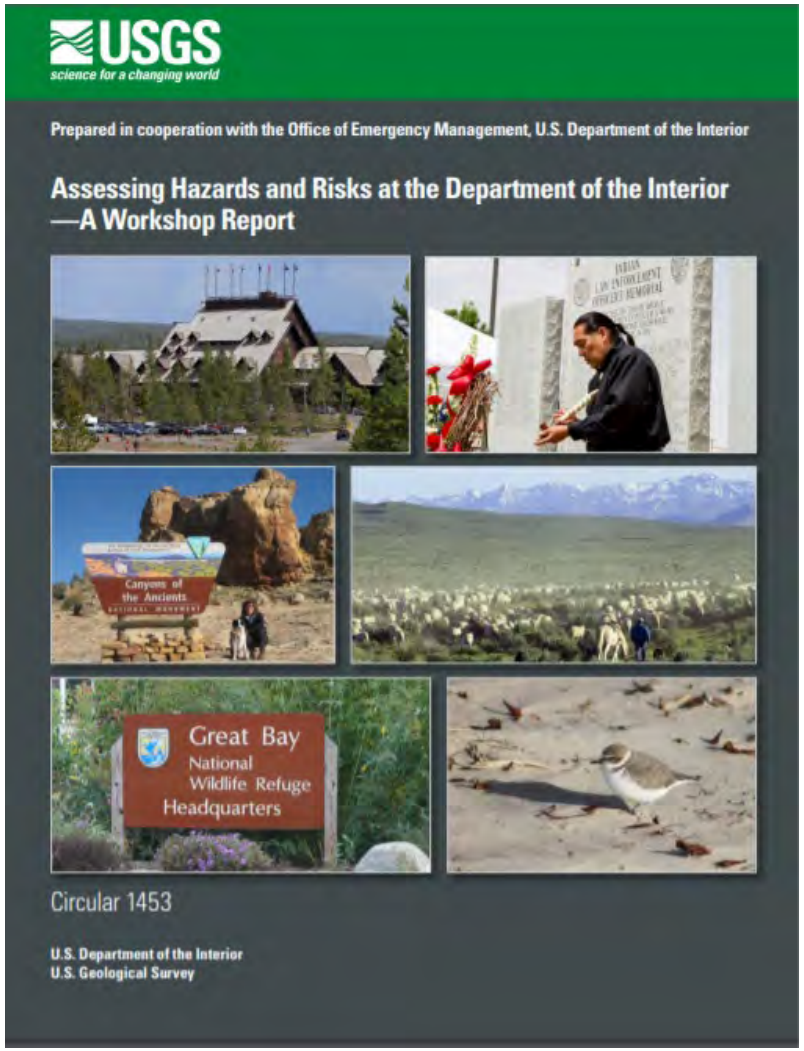
USGS science for a changing world

Strategic **H**azard **I**dentification and **R**isk **A**ssessment on DOI Resources Project (SHIRA)

Collaboration: DOI Office of Emergency Management (OEM)

Purpose: To improve OEM understanding of risks to DOI assets, resources, and lands from various natural and anthropogenic threats

- Determining DOI needs for risk data, analysis, and application
- Identifying commonalities in DOI threats to enable multi -hazard planning
- Curating the best available federal hazard, asset, and jurisdictional data
- Quantifying DOI hazard exposure
- Developing web-based tools to support DOI unit and regional planning
- Building a risk community of practice among DOI and other federal partners



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Funded by DOI through FY22.
https://communities.geoplatform.gov/shira/

DOI Strategic Sciences Group

www.doi.gov/strategicsciences

- **Established** in 2012 to assess the environmental, economic, and social cascading consequences of a crisis.
- **Co-leaders** report to Secretary's Science Advisor
- **Multidisciplinary Crisis Science Teams** include experts from government, academia, NGOs, and private sector.
- **Deployments:**
  - 2010 - Deepwater Horizon
  - 2013 - Hurricane Sandy
  - 2018 – Kilauea eruption
- Support workshops, publish reports on the use of **science during crisis**.

USGS science for a changing world

Additional early 2021 topics

- USGS has a leadership role in the planning and implementation of a major federal workshop scheduled for January 26, 2021, to lay the groundwork for federal efforts to enhance coastal resilience through better development and delivery of science products.
- The ocean science and mission agencies are developing a National Ocean Mapping, Exploration and Characterization (NOMEC) implementation plan for mid-January release. NOMEC products set federal goals to map the EEZ and direct federal agencies in program prioritization, external engagement and environmental consultation and compliance. USGS co-chairs the NOMEC council.
- The USGS is seeking to convene an initial meeting of the interagency National Volcano Early Warning System (NVEWS) advisory committee in Q1 of 2021, pending approval of nominated federal agency representatives. The advisory committee was established by Public Law 116-9.
- The Earthquake Hazards Program has two congressionally authorized federal advisory committees, and it has been challenging to get clearance of new and returning members for both the Scientific Earthquake Studies Advisory Committee (SESAC) and National Earthquake Prediction Evaluation Council. The SESAC has not met since August 2019, affecting delivery of congressionally mandated annual reports. Early action will be needed to get these committees on track.

Any questions?

applegate@usgs.gov
703-648-6600

Get more information at

www.usgs.gov/natural_hazards/

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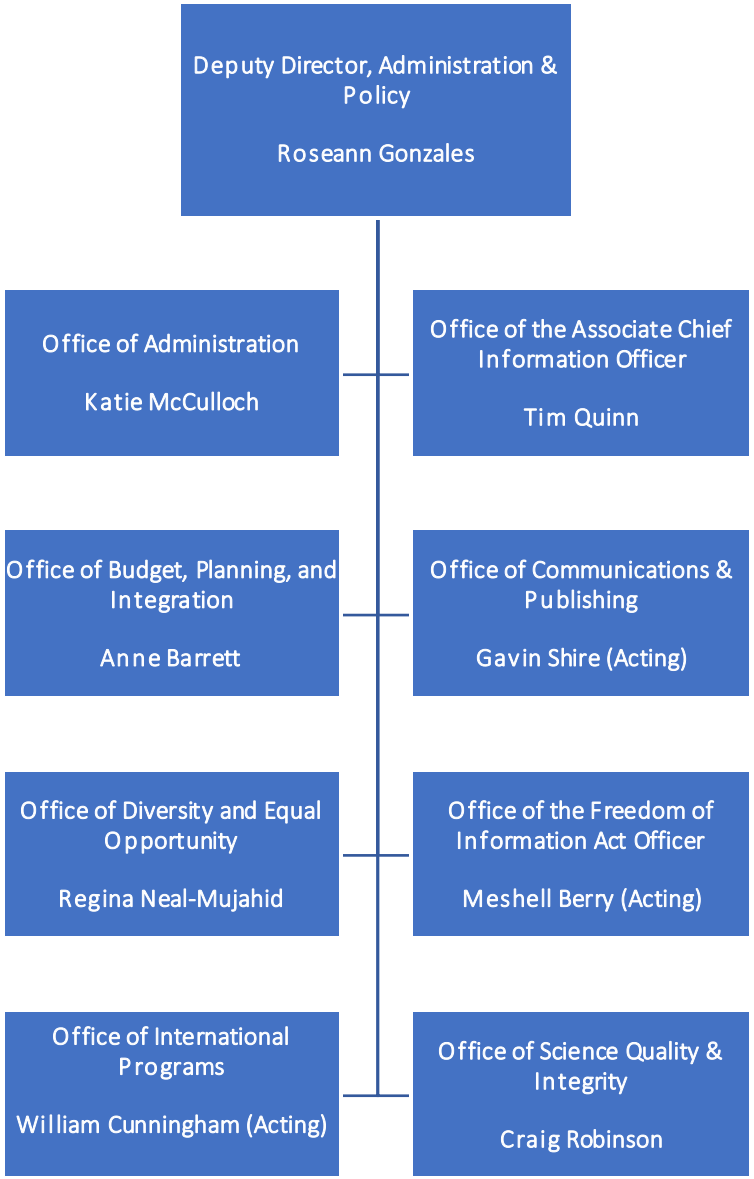
Science Support

Briefing to the Biden Agency Review Team

December 2020

Presenter: Roseann Gonzales

Administration & Policy



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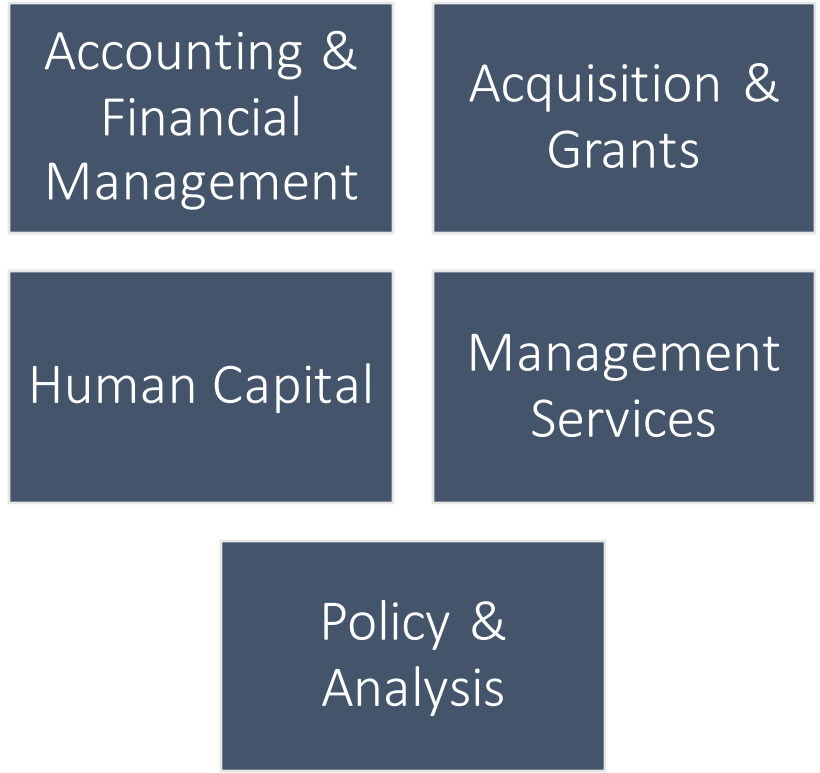
science for a changing world

Office of Administration

- Secretarial Clearance for Financial Assistance
- Position classification
  - @ the OPM level
- Schedule F
- Workplace culture definition
  - What's in and what's out
- Conference policy
- SS Funding
- Increasing DOI WCF bills
- Facilities
  - Menlo to Moffett
  - HVO
  - HIF
  - DFC Building 20
  - NWHC



USGS
science for a changing world

Office of the Associate Chief Information Officer

FY 21/Q1 Planned Actions:

- Publish the USGS IMT Strategic Plan (2021-2025) to provide enterprise direction for coordinating information technology activities and addressing emerging technology needs across the bureau.
  - Build a detailed operational plan with associated zero-based budget milestones.
  - Increase management of IMT across the bureau, through the ACIO, in alignment the Federal Information Technology Acquisition Reform Act (FITARA) and DOI guidance
- Continue the Menlo Park to Moffett Field (M2M) Phase II relocation efforts to consolidate data centers, ensure IT equipment requirements are defined for each new building and laboratory, and leverage 21st Century technology.
- Mature the AI/ML Community for Data Integration (CDI), Community of Practice to create a bureau-wide strategy for integrating AI/ML into science activities.
- Expand services within the Cloud Hosting Solutions (CHS) program to support AI/ML and High Performance Computing (HPC).
- Continue diligence in Cybersecurity across the bureau specifically around Internet-of-Things (IoT) - e.g., sensors and laboratories.

Barriers:

- Inadequate funding model for enterprise IMT activities to support ongoing operations plus new strategic activities.
- DOI WCF.
- Hiring 21st Century IT Specialists skilled in New Technology.
- Delegated hiring authority for IT positions from DOI.

Office of Budget, Planning, and Integration

- **FY 2022 President's Budget**
  - DOI leadership will need to make decisions on USGS funding levels based on known priorities and funding barriers within the bureau
- **FY 2022 – 2026 Strategic Plan for DOI**
  - Work will begin in 2021.
  - Determinations on DOI strategic goals and how the USGS fits into those will need to be made by DOI leadership.
  - Will develop USGS strategic performance measures that link these performance measures to the science strategy based on those decisions.
- **Current and Upcoming Publications**
  - USGS Program Book
  - USGS State of the Survey (Accomplishments)
  - USGS FY 2022 President’s Budget Submission (Greenbook)

Office of Diversity and Equal Opportunity

- OPM Mandatory Review of Employee Training under Executive Order 13950, Combating Race and Sex Stereotyping (**EOCRaSS**)
  - USGS completed and submitted to the DOI Phase I of the review in November 2020 and Phase II of the review to the DOI in December 2020;
- EEOC Management Directive (MD) 715 Evaluation and Review
  - USGS completed and submitted its FY2019 MD-715 Report to the EEOC in July 2020; and its FY 2020 review and assessment is underway with the 1st Quarter data briefing, which is planned for January 2020; and USGS was selected by the EEOC, amid 65 other agencies, to review and evaluate compliance federal EEO laws and regulations, therefore, USGS is currently underway with preparation for the FY2021 EEOC Evaluation.

Office of International Programs

USGS authority for international work authorized by the Organic Act amendment. This Office supports the global reach of USGS science by enhancing USGS domestic activities thru international science, and by advancing USG global interests through reimbursable projects with DOS, USAID, countries, and others. Projects often have high-level (presidential) interest in these nations.

- **Afghanistan**: USGS leads a multi-agency program to assess the occurrence of mineral resources and gemstones which have the potential to revitalize the Afghan economy, move it away from illicit activities, and provide critical minerals to the world market. A report on gemstones work will go into review during Jan-Mar.
- **Middle East**: science diplomacy in the Middle East is being impacted by the current USG government policy that prohibits engagement with Palestinian colleagues. This impacts Israel/Palestine water-sharing initiatives, and the long-term Reducing Earthquake Losses in the Extended Mediterranean Region (RELEMR) program. The next RELEMR workshop is scheduled for the 4th quarter of CY2021, and planning will begin during Jan-Mar, if authorized.
- **Uzbekistan**: conducted in the interest of national security, this project will improve Uzbekistan's economy through improved understanding of its mineral endowment and energy independence. Bilateral virtual meetings continue during Jan-Mar to create an open data policy re: critical minerals and energy resources.
- **Critical Minerals Mapping Initiative (CMMI):** This **US-Canada-Australia** partnership was formed to address scarcity and increase reliable supplies. During Feb 2021, CMMI will be leading a 3-day, worldwide virtual conference: Americas (2/12); Europe and Africa (2/19) and Asia and Oceania (2/26).
- **Mekong US Partnership (MUSP)**: USGS leads the NexView program, designed to provide decision support tools in support of DOS priorities in the Lower Mekong River region of Southeast Asia. During Jan-Mar, USGS will contribute important water and socioeconomic guidance to the DOS MUSP Policy Dialogue.
- **International Agreements** (IA) are required to conduct any international work. IA's listed below are or should be ready for DOI approval during Jan-Mar 2021: **Peru, Colombia, Taiwan, Mexico, Morocco, Iceland, UAE, India, Canada Jordan, and Korea**. IA approval delays can have negative impacts. For example:
    - Approval of a Memorandum of Agreement between the USGS and the **National Commission for Aerospace Research and Development (CONIDA)** of the Republic of Peru. This agreement will allow CONIDA to share high resolution data from PeruSat-1, enhancing USGS domestic projects relating to disaster risk reduction and digital elevation modeling
- **Providing direct service to DOI:** OIP is providing updates to the DOI-wide DI-1175 form (international travel permission). Migration should be operational during Jan-Mar 2021

Office of Science Quality & Integrity

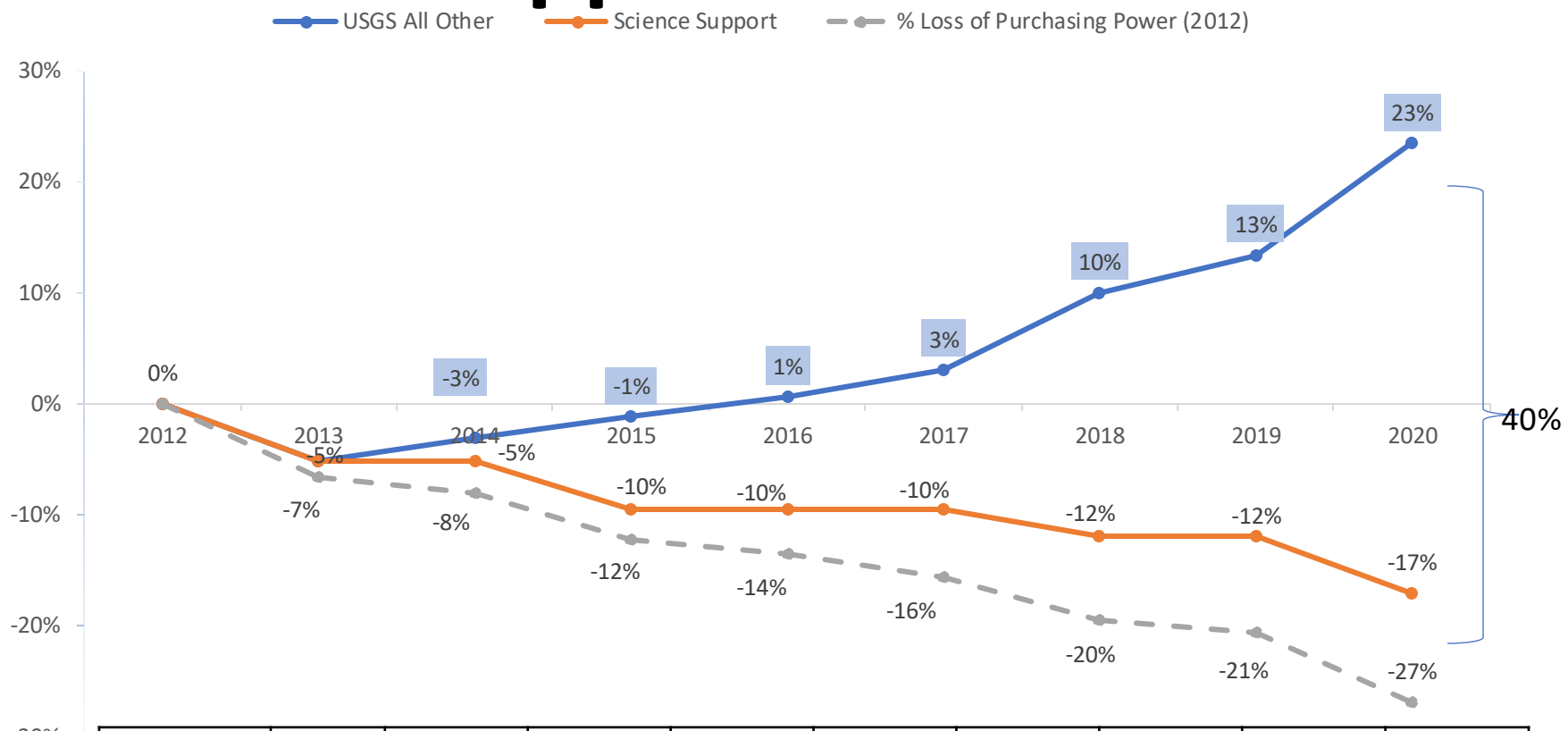
- **Scientific Integrity Staff Survey** – Conducted survey of USGS employee attitudes and opinions about scientific integrity. Results and recommendations expected in March 2021.
- **Quality Management System (QMS) for Laboratories** -- Phase 1 implementation across over 120 labs with Stages 1 (Central Concepts and Requirements), 2 (Documentation) and 3 (Lab Methods) to be completed by March 2021.
- **Fundamental Science Practices (FSP) Guidance** – Authorship guidance expected to be released as a new FSP chapter supporting scientific integrity.
- **Tribal Lands Locator Toolkit** – Important tool for staff to ensure that we provide notification to tribes before working on, or flying over, tribal lands – for release in January 2021.
- **Powell Expedition STEM Education Publication** – Results from re-creation of John Wesley Powell's 1869 expedition down the Colorado River; expected to be available in January 2021.
- **Scientists in the Virtual Classroom** – Virtual visits to school classrooms starting in early 2021 as part of an enhanced culture of community service. It builds off our successful "Learning from Home" series getting USGS science and data to benefit teachers, parents and kids.

Freedom of Information Act Office

- **FOIA is an affirmative release statute**
  - USGS FOIA Program has an obligation to release as much information as possible under to the law.
- **DOI updated FOIA regulation in 2019**
  - Deputy Chief Freedom of Information Act Officer (DCFO) required to defend policy changes against negative public perceptions and claims of politicization.
- **Collecting Text Messages Responsive to FOIA request**
  - DCFO has issued policy in coordination with the OCIO; successful implementation depends on employee compliance with records preservation guidance as per SMC 431.3.
- **Agreements between USGS, partners and cooperators (e.g., States, Universities, other non-Federal entities, and International Governments/Organizations)**
  - Unstipulated and/or joint ownership of data, working products and/or final reports encumbers processing request within statutory timelines.
- **Recruit and retain qualified FOIA analyst**
  - The process of FOIA requests is administrative, however it does require analyzation and critical thinking.

Back-Up

SIR Appropriation Comparison
USGS v Science Support



$ Millions	2012	2013	2014	2015	2016	2017	2018	2019	2020
USGS All Other	$951.2	$901.5	$921.3	$939.4	$956.4	$979.6	$1,045.6	$1,057.8	$1,174.1
Science Support	$116.8	$110.7	$110.7	$105.6	$105.6	$105.6	$102.8	$102.8	$96.8
SIR Appropriation	**$1,068.0**	**$1,012.2**	**$1,032.0**	**$1,045.0**	**$1,062.0**	**$1,085.2**	**$1,148.4**	**$1,160.6**	**$1,271.0**

*Inflation rate derived from the Bureau of Labor Statistics

- Gaps in service funding have continually broadened over the past eight years.
- Support activities that enable high quality science have been impacted, delaying or eliminating delivery of science information and data to policy and decision makers.

ISSUE: COVID-19 Pandemic Response

I. KEY POINTS

Through the tremendous efforts of its staff during the current global health pandemic, the USGS continues to ensure America's communities, policy makers, and emergency managers have the most up-to-date scientific data and information to keep Americans safe and prosperous.

The USGS has developed extensive safety guidelines and processes during the COVID-19 pandemic that have made it possible for the bureau to continue to deliver on its mission through a maximum telework posture with carefully implemented field and on-site activities when and where they can be safely conducted.

II. OPPORTUNITIES AND CHALLENGES

The COVID-19 pandemic continues to affect the entire, highly distributed USGS workforce but with uneven and ever-changing impacts across different regions. This challenging situation is being managed through a bureau-level, cross-disciplinary incident response team structure with direct engagement from bureau leadership through the USGS Hazard Response Executive Committee.

All USGS centers have developed plans to inform and guide appropriate transitions from wide-scale restrictions imposed to slow COVID-19 infections, to scalable operations that allow for routine office operations and that sustain communities and local economies, but do not compromise public and employee health and safety.

The USGS will continue to maintain situational awareness of all employee COVID-19 exposures, confirmed cases, and recoveries. The USGS has been able to avoid employee-to-employee workplace transmission thus far (early November 2020) but must remain vigilant if that is to continue. Tracking exposed staff, confirmed and probable cases is a major focus and will continue to be a significant burden for science center managers, regional safety officers, and bureau emergency management into 2021 and possibly beyond.

The USGS is making contributions in support of the Nation's pandemic response. Under the National Response Plan framework, the USGS has the lead DOI responsibility for Emergency Support Function 11 (Natural and Cultural Resources) related to wildlife health and the potential for disease transmission to human populations. As an example, the USGS National Wildlife Health Center in Madison, WI, has conducted studies to better understand the risks to human health if the virus establishes itself in wild animal populations, bat species in particular.

Along similar lines, the USGS has supported the response to a wide range of natural hazards that have taken place during the pandemic, most notably earthquakes, floods, wildfires, and hurricanes. We have adapted our procedures and posture in order to deliver critical scientific information that informs local, state, and Federal decision making.

The USGS has an after-action reporting process in place with a mechanism for in-stream submissions, which has made it possible to adopt lessons learned and will build our capacity for the future. The USGS Concept of Operations (CONOPS) document describes the processes by

which the bureau's regional and headquarters components operate during emergencies, and the COVID-19 effort has been an opportunity to refine those interactions.

III. BACKGROUND

Since March 22, 2020, the USGS operational posture has been to maximize telework while also conducting mission-essential and critical functions in offices, laboratories, and field sites, providing computer support and maintaining our buildings as it is safe to do so.

As was the case for the Department of the Interior as a whole, the USGS began the response with an existing pandemic plan in place that had been developed with a focus on influenza but was applicable to other diseases that have similar effects on operations. From that starting point, new guidelines and processes have been implemented to ensure the safety of our employees and communities, following guidance from the White House, DOI, Centers for Disease Control and Prevention, and state and local authorities.

Early in the pandemic, the USGS established a bureau-wide COVID-19 Incident Response Team to formalize a coordination mechanism to facilitate consistent guidance across the bureau, ensure clear communication with our staff and Department leadership, and limit duplication of effort. The goals for the Response Team were to mitigate exposure and transmission in the workforce and to ensure the bureau maintained the ability to carry out its mission essential functions throughout this event. The team was by far the largest, most cross-disciplinary, and most complex emergency effort that USGS has assembled.

The team is supporting development of a wide range of USGS-specific guidance for safe operations, unified communications to USGS staff, assessed potential long-term impacts to USGS, and ensured workforce continuity planning for maximum telework conditions. Guidance documents available through an intranet portal include: operations on small and large vessels, dive operations, small aircraft operations, commercial air travel, hotel stays, laboratory social distancing and cleaning plans, and what to do when an employee gets sick in the office or field or at home.

In May 2020, the USGS released its Adaptive Operations Recovery Plan outlining the steps that would be taken to return to on-site operations where and when it was safe to do so. Since then, individual centers and facilities have developed reoccupation plans outlining how they would return employees to duty stations in a safe and deliberate manner as new recovery phases are entered. These plans present considerable complexity, particularly for large, multi-center facilities such as the USGS National Center or the USGS presence on the Denver Federal Center.

IV. PREPARED BY

Marie C. Peppler, U.S. Geological Survey, Bureau Emergency Management Coordinator, 703-648-5033, mpeppler@usgs.gov.

DATE: November 4, 2020

ISSUE: USGS Science Supporting Emergency Management when Disasters Strike

I. KEY POINTS

When disaster strikes, emergency managers at all levels of government depend on USGS information to respond effectively, and the news media and the public turn to USGS to understand what has happened. The USGS delivers alerts on earthquakes, volcanic eruptions, and landslides, and provides the NOAA National Weather Service (NWS) with critical information to carry out its warning responsibilities for coastal storms including hurricanes, floods and post-wildfire debris flows, geomagnetic storms, volcanic ash clouds, and tsunamis. The USGS supports interagency wildfire response and coordinates geospatial data and imagery collection for all disaster types. These mission responsibilities ensure that the best science available informs response efforts and recovery planning for a safer, more resilient society. Key federal users of USGS situational awareness include the Department of the Interior (DOI) Office of Emergency Management, the FEMA National Response Coordination Center, the Department of Defense, and the White House Situation Room. The USGS-run DOI Strategic Sciences Group is a resource for the Secretary providing scientific advice during environmental crises.

II. OPPORTUNITIES AND CHALLENGES

Natural hazard events can strike at any time, and that includes the opening months of a new Administration. This submission provides an overview of the expectations that DOI leadership should have for its involvement in hazard response. Earthquakes in particular are no-notice events, and USGS is the primary source for situational awareness on likely impacts to population and infrastructure globally. For a major event, USGS experts will brief senior White House officials and appear on major media outlets. An ongoing challenge for the USGS is ensuring resources are available to support robust monitoring capabilities and expertise across all hazards.

III. BACKGROUND

The USGS is recognized globally as a source for research and information on the causes, occurrence, and consequences of natural hazards. The USGS collects accurate and timely earth observations, assesses human and environmental risk from natural hazards, conducts research to assess vulnerability, and ensures science is effectively applied to reduce losses.

In the immediate aftermath of a disaster, there is an urgent need and high demand for the acquisition and coordinated distribution of pre- and post-event geospatial products and imagery. The USGS Hazards Data Distribution System provides the primary portal for use in emergency management. The USGS coordinates interagency remote sensing acquisition tasking for FEMA and US coordination of global remote sensing acquisition under the International Charter “Space and Major Disasters”.

The USGS National Earthquake Information Center (NEIC) reports 24/7 on domestic and global earthquakes using data from the Advanced National Seismic System (ANSS) and the Global Seismographic Network (GSN). GSN data are also used by NWS Tsunami Warning Centers for global tsunami advisories and warnings. The USGS Prompt Assessment of Global Earthquakes for Response (PAGER) system rapidly estimates population exposure to

strong shaking within 20-30 minutes after damaging earthquakes for use by aid agencies, relief organizations, and the military to determine likely impacts and mobilization needs. The USGS reports on all global seismic events, including large explosions and meteor strikes.

For floods and hurricanes, the USGS network of streamgages and storm-surge sensors provides data directly to NWS, which relies heavily on USGS data for issuing flood warnings. FEMA relies on USGS for high-water marks and other flood documentation. Storm-surge sensors, airborne coastal mapping and satellite imagery track hurricane impacts on coastal erosion, wetlands loss, and vulnerable ecosystems and support USGS forecasts of erosion from impending coastal storms.

For volcanoes, the USGS continually monitors activity in Hawaii, Alaska, the Pacific Northwest, Yellowstone, Long Valley (CA), and the Northern Marianas. USGS issues advisories and warnings at a series of alert levels and closely collaborates with the FAA, NWS, and U.S. Air Force 557th Weather Wing regarding volcanic threats to aviation, helping airline pilots avoid dangerous ash clouds and at-risk communities prepare for ash falls and mud flows. The USGS/USAID Volcano Disaster Assistance Program provides capacity building and rapid response for impending volcanic eruptions around the globe.

For landslides, USGS delivers rapid estimate of debris-flow potential and volume for wildfire-impacted areas to DOI and US Forest Service Burned Area Emergency Response teams, NWS, and local emergency management. In a major US landslide event, such as struck near Oso, WA in 2014, USGS expertise and technology can provide on-site support for search and recovery, monitoring the active slide face and impacted river channels.

USGS geomagnetic observatories deliver real-time observations of the Earth's dynamic magnetic field to the NWS Space Weather Prediction Center and USAF. USGS calculates and distributes indices of geomagnetic activity that quantify the severity of a storm. USGS is currently working to quantify the risk of geomagnetic storms to the Nation's power grid.

USGS science supports DOI and other land and emergency managers in all aspects of the wildfire cycle from fuel management through response and recovery. USGS is a key participant in the LANDFIRE fuel-mapping project that provides landscape scale geospatial products to support cross-boundary planning, management, and operations. USGS fire activities are closely coordinated with the DOI Office of Wildland Fire.

Established by Secretarial Order and reporting through the Secretary's Science Advisor, the DOI Strategic Sciences Group (SSG) provides the Secretary with a standing capacity to rapidly deploy multi-disciplinary teams to conduct science-based assessments. During environmental crises affecting Departmental lands and resources, the SSG can quickly deliver actionable recommendations to decision makers. The SSG was deployed during the Deepwater Horizon oil spill and Hurricane Sandy, and it would serve as a key source of insight on long-term consequences of actions taken during a future large-scale natural or technological disaster significantly impacting DOI-managed landscapes.

IV. PREPARED BY: David Applegate, USGS Associate Director for Natural Hazards, 703-648-6600, applegate@usgs.gov
DATE: October 30, 2020

DRAFT
U.S. Geological Survey

I. BUREAU/OFFICE CONTACT

Cynthia Lodge, Deputy Director, 703-648-7412 (Office) | 571-524-2239 (Cell)

II. SUMMARY OF ORGANIZATION

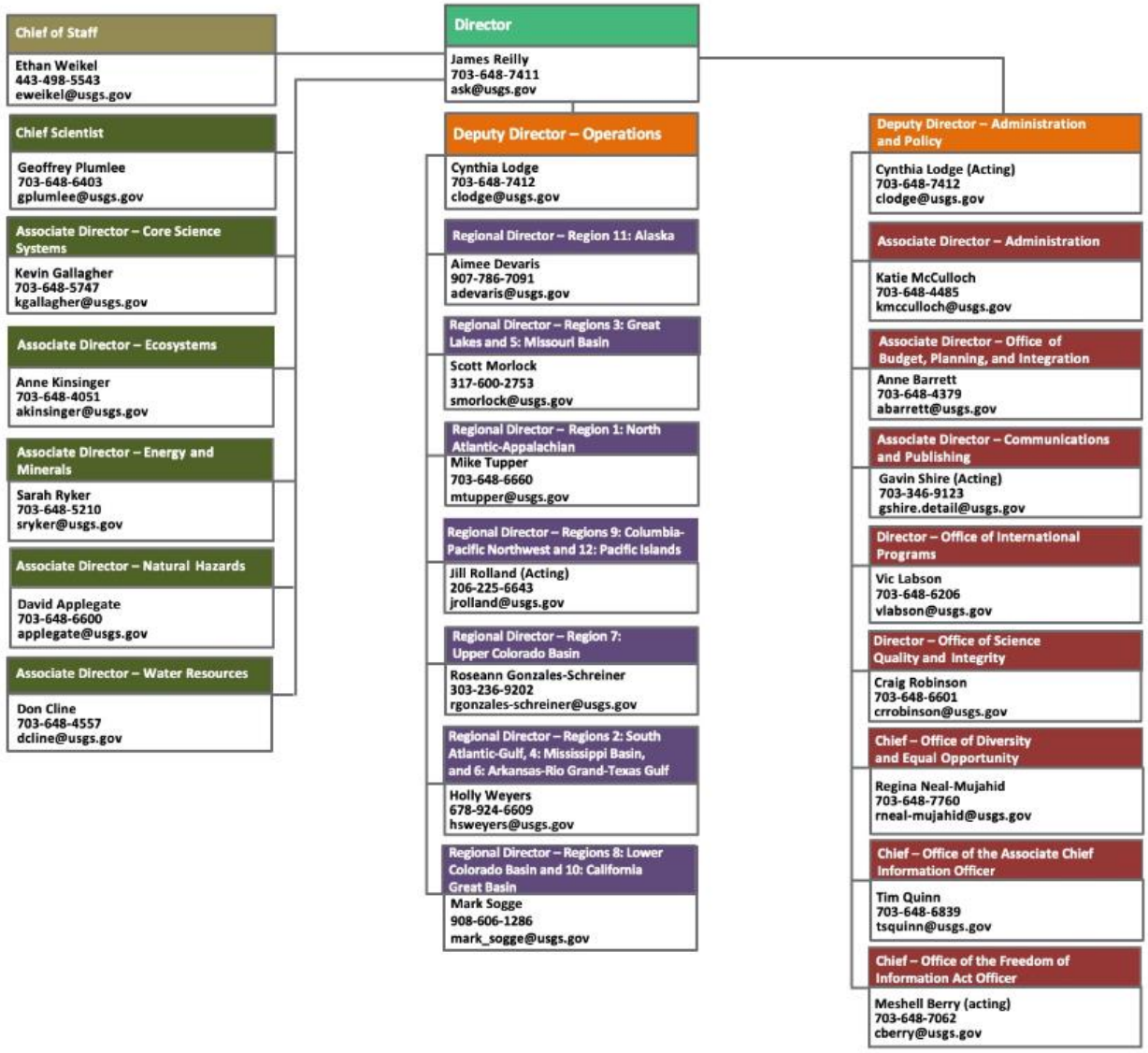
The U.S. Geological Survey's (USGS) mission is to monitor, analyze, and predict current and evolving dynamics of complex human and natural Earth-system interactions and to deliver actionable information at scales and timeframes relevant to decision makers.

The USGS is a world science leader responding to 21st century challenges. Our work enhances the well-being of the Nation, protects the safety and health of our people, contributes maps and data for the public good, and advances our understanding of the Earth and its systems, which interact in myriad ways, often with complex and unanticipated consequences. Through collaboration with partners in government, academia, industry, and the public, the USGS addresses enduring societal needs:

- Protect life and property by providing hazard and risk assessments and warning of earthquakes, volcanic activity, landslides, flooding, and coastal erosion in the United States.
- Through leading-edge modeling capabilities, help ensure the availability and quality of the Nation's freshwater supply.
- Conduct on-the-ground research and sophisticated data modeling to provide actionable intelligence on: land resources and species management, invasive species, and biological threats.
- More accurately characterize the Earth and its processes and provide three-dimensional data, maps, and models that enhance scientific insight and enable new applications in the management of the Nation's public lands and resources, through lidar, remote sensing, and satellite operations.
- Conduct geological studies, research, and assessments that help ensure continued availability and quality of mineral and energy resources.
- Use science to understand the causes, consequences, and benefits of wildfire and help prevent and manage larger, catastrophic events.
- Deliver science to support the development of adaptive management plans that incorporate environmental changes and their impacts on fish, wildlife, water, land, and people.
- Serve the pursuit of knowledge of our Solar System by conducting innovative, fundamental research that advances the fields of planetary cartography, geoscience, and remote sensing.

As of August 1, 2020, the USGS had 7,977 employees. With nearly 300 facilities and field sites across the U.S, we proudly serve all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam. The USGS organization chart shown below is also available on our

website. The leaders shown on the chart make up the *Executive Leadership Team* and are considered the bureau's key decisionmakers.



III. MANAGEMENT AND KEY PERSONNEL

PAS officials:

James Reilly, Director

Non-career SES:

Robert Gordon, Senior Advisor to the Director

Schedule C employees: The USGS has no Schedule C employees.

Career SES:

Cynthia Lodge, Deputy Director Operations, Acting DD Administration and Policy

Aimee Devaris, Alaska Regional Director (DOI Region 11)

Anne Barrett, Associate Director for Budget, Planning, & Integration

Anne Kinsinger, Associate Director for Ecosystems

Christopher Loria, Director for Earth Resources Observation and Science Center

David Applegate, Associate Director for Natural Hazards

Donald Cline, Associate Director for Water Resources

Gavin Shire, Acting Associate Director for the Office of Communications and Publishing

Holly Weyers, Southeast Regional Director (DOI Regions: South Atlantic, 2; Mississippi Basin, 4; & Arkansas-Rio Grande-Texas Gulf, 6)

Jill Rolland, Northwest Pacific Islands Acting Regional Director (DOI Regions: Columbia-Pacific Northwest, 9 & Pacific Islands, 12)

Katherine McCulloch, Associate Director for Administration

Kevin Gallagher, Associate Director for Core Science Systems

Mark Sogge, Southwest Regional Director (DOI Regions: California-Great Basin, 8 & Lower Colorado River Basin, 10)

Michael Tupper, Northeast Regional Director (DOI Region: North Atlantic-Appalachian,1)

Roseann Gonzales-Schreiner, Rocky Mountain Regional Director (DOI Region: Upper Colorado River Basin, 7)

Sarah Ryker, Associate Director for Energy and Minerals

Scott Morlock, Midcontinent Regional Director (DOI Regions: Great Lakes, 3 & Missouri Basin, 5)

Other senior career employees:

Craig Robinson, Director for the Office of Science Quality and Integrity, SL

Geoffrey Plumlee, Chief Scientist, SL

Regina Neal-Mujahid, Chief of the Office of Diversity and Equal Opportunity, GS-15

Timothy Quinn, Associate Chief Information Officer, SL

Victor Labson, Director for the Office of International Programs, SL

Ethan Weikel, Acting Chief of Staff, GS-15

IV. CRITICAL OPERATIONAL AND MANAGEMENT ITEMS

- **EarthMap** - USGS has begun a multi-year effort to develop a framework for an integrated Earth-system predictive capability named Earth Monitoring, Analysis, and Predictions (EarthMAP). EarthMAP will employ advanced integrated predictive models that are enhanced through the use of artificial intelligence, machine learning and high-performance/cloud computing. EarthMAP will deliver actionable intelligence in the form of integrated observations, scenario planning, and predictions of the future state of Earth systems. Implementing EarthMAP will be challenging, with fiscal constraints and competition for the highly qualified people necessary for developing EarthMAP.

- **Partner Funding:** Through cooperative agreements, the USGS conducts science in direct support of partner needs, including Federal, State, Local and Tribal governments. Annually, about one third of USGS' budget is derived from partner funding. Examples include Cooperative Matching Funds, with 1,500+ partners, to monitor and assess water resources and programs defined by law, such as the National Cooperative Geologic Mapping Program, requiring funding be granted to, and matched by, State Geological Surveys. The economic effects of COVID-19, and natural disasters like wildfires and hurricanes, have negatively impacted partner budgets.

- **IT infrastructure** - The current distributed and decentralized approach and implementation of Information Technology (IT) in the USGS decreases the bureau's ability to better support the concept of 21st Century IT. The IT environment encompasses many localized and distributed data centers, servers, and help desks. The most pressing IT infrastructure issues are: lack of a robust telecommunications network to support cloud-smart activities, lack of funding to support data center consolidation, lack of resources for enterprise-wide IT support, and legacy applications requiring refactoring to support cloud and cybersecurity requirements. These infrastructure components need to be upgraded to support the USGS.

- **Facilities** - The world-class science provided by the USGS is jeopardized by aging infrastructure in need of significant investment. The deferred maintenance need for replacement, repair, and rehabilitation of major building components is estimated at $166M, with an additional $285M required for facility replacement and modernization. The most urgent need is a replacement facility for the Energy and Minerals program, currently located in dilapidated space at the Denver Federal Center. A purpose-built facility, co-located with the Colorado School of Mines, has been put on hold due to the impact of the Covid-19 pandemic on the state economy and an alternative solution must be found immediately.

- **Emergency Management** - When disaster strikes, emergency managers everywhere depend on USGS information to respond effectively, and the news media and the public turn to the USGS to understand what has happened. The USGS delivers alerts on earthquakes, volcanoes, and landslides, and provides the National Weather Service with critical information for coastal storms including hurricanes, floods and post-wildfire debris flows,

geomagnetic storms, and tsunamis. The USGS supports interagency wildfire response and coordinates information collection for all disaster types. Federal users of USGS data include DOI, FEMA, the U.S. Northern Command, and the White House Situation Room.

- **COVID-19** - Despite the current global health pandemic, USGS staff continue to ensure America's communities, policy makers, and emergency managers have the most up-to-date scientific data and information to keep Americans safe and prosperous. The USGS developed extensive safety guidelines and processes to support operations during the COVID-19 pandemic, including: operations on small and large vessels, dive operations, small aircraft operations, commercial air travel, hotel stays, laboratory social distancing, and cleaning plans, and what to do when an employee gets sick in the office, field or at home.

- **Streamlining Permitting Processes for Earthquake and Volcano Monitoring** - The DOI has sought to streamline permitting for the installation and upgrade of USGS earthquake early warning (EEW) and volcano monitoring equipment on Federal lands. The U.S. Department of Agriculture collaborated with DOI to streamline U.S. Forest Service (USFS) permitting of EEW sites resulting in forest-specific changes. The most significant permitting challenge is in the Cascades Range of Washington and Oregon, where volcano monitoring stations are needed to close the monitoring gap for volcanoes considered high threat.

- **Maintaining an Agile, Competitive, and Diverse USGS Science Workforce** - Science, technology, engineering, and mathematics (STEM) talent is a driving force behind the extraordinary work that comes out of the USGS. The USGS needs a skilled STEM workforce and agile hiring capabilities to maintain our worldwide science leadership. However, the bureau lacks the resources for rapid hiring and onboarding and does not have pay and retention flexibilities available to other Federal science organizations, including potentially, an alternative pay system competitive with the private sector. These comparative disadvantages put the future success of the USGS at risk.

USGS 2021 Budget

($ in Thousands)						
	2019	2020	2021			2021 Req to
	Actual	Enacted	Request	House	Senate	2020
Current	1,160,596	1,270,957	971,185	1,292,987	TBD	-299,772
Permanent	1,374	1,144	1,144	1,144	TBD	-
Total	**1,161,970**	**1,272,101**	**972,329**	**1,294,131**	**TBD**	**-299,772**
Supplemental	98,500	-	-	-	-	-
FTE	**7,556**	**7,606**	**6,779**	**N/A**	**N/A**	**-827**

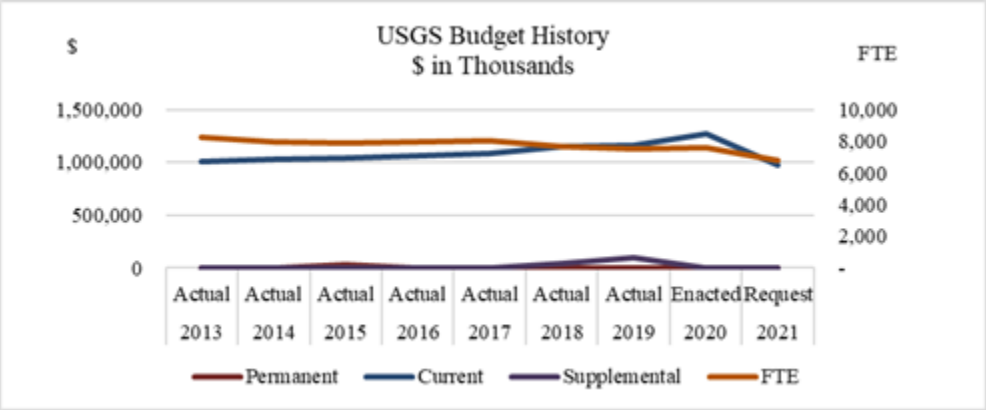
Budget Profile

The 2021 current budget request is $971.2 million and supports energy security, critical mineral independence, natural hazard monitoring, research to inform resource management, Landsat

development and operations, and nationwide networks of more than 8,400 streamgages and more than 3,000 earthquake sensors. Overall, including permanent accounts, the total budget request is $972.3M in 2021. The budget request supports 6,779 full-time equivalents. Additional information on the FY 2021 President's Budget request may be found on the Department's website: https://www.doi.gov/sites/doi.gov/files/uploads/fy2021-bib-bh053.pdf

Key Budget Issues

Key budget issues can be found in the critical management and operational items listed above, most notably, IT infrastructure and facilities.



USGS
science for a changing world

Water Resources Mission Area

Urgent Issues for Agency Review Team

Dr. Donald W. Cline, Associate Director for Water Resources

December 15, 2020

USGS Water Resources Mission

Serve society through water-resource monitoring, assessment, modeling, prediction, and research to provide tools that managers and policymakers can use for:

- Preserving the quality and quantity of the Nation's water resources;
- Balancing water quantity and quality in relation to potential conflicting uses;
- Understanding, predicting, and mitigating water-related hazards;
- Quantifying the vulnerability of human populations and ecosystems to water shortages, surpluses, and degradation of water quality.

OBSERVE - UNDERSTAND - PREDICT - DELIVER

Five Core Functions

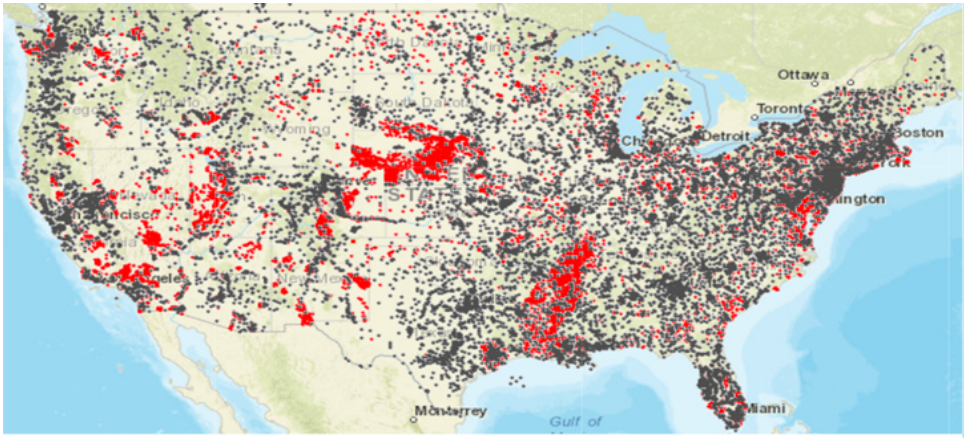
1. Provide society the information it needs regarding the amount and quality of water in all components of the water cycle at high temporal and spatial resolution, nationwide.
2. Advance understanding of processes that determine water availability.
3. Predict changes in the quantity and quality of water resources in response to changing climate, population, land-use, and management scenarios.
4. Anticipate and respond to water-related emergencies and conflicts.
5. Deliver timely hydrologic data, analyses, and decision-support tools seamlessly across the Nation to support water-resource decisions.

OBSERVE - UNDERSTAND - PREDICT - DELIVER

Nation's Water Monitoring Backbone

USGS operates the Nation's largest water observing system:

- Continuous streamflow data from 10,000+ real-time streamgages
- Discrete data from ~80,000+ manual streamflow measurements per year
- Groundwater conditions monitored at 17,000+ wells
- Continuous water-quality monitored from 2,100+ stations
- 1.2 billion data requests last year through NWIS web
- Funded by USGS and over 1600 partners



USGS Integrated Water Science Initiatives

Next Generation Water Observing System (NGWOS)

NGWOS collects real-time data on water quantity and quality in more affordable, rapid, and intensive ways than has previously been possible. The flexible monitoring approach enables USGS networks to evolve with new technology and emerging threats.

Integrated Water Availability Assessments (IWAA)

IWAAs examine the supply, use, and availability of the nation's water. These regional and national assessments evaluate water quantity and quality in both surface and groundwater, as related to human and ecosystem needs and as affected by human and natural influences.

Integrated Water Prediction (IWP)

IWP builds a powerful set of modeling tools to predict the amount and quality of surface and groundwater, now and into the future. These models use the best available science to provide information for more rivers and aquifers than can be directly monitored.

National Water Information System (NWIS) Modernization; National Water Dashboard

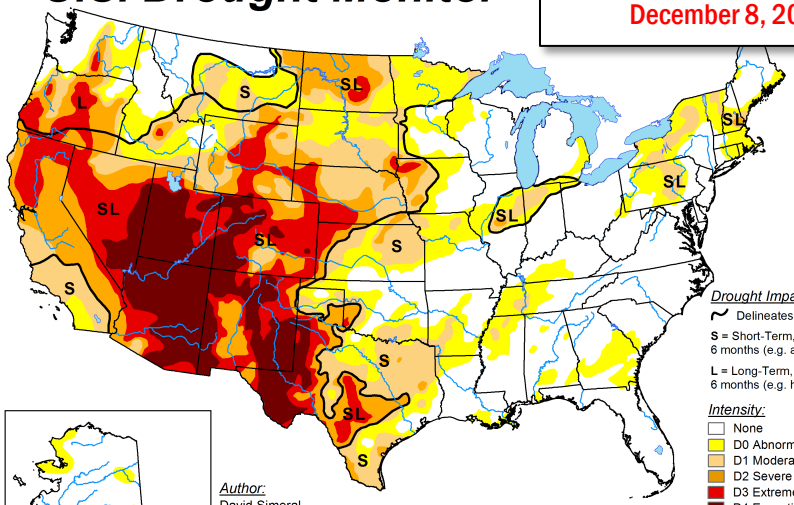
NWIS data systems that house USGS water information are being modernized to maximize data integrity, simplify data delivery to the general public, automate early warning to enable faster response times during water emergencies, and support the new National Water Dashboard.

January – March 2021

1. Southwest Drought not expected to improve.
    - Three-month outlook for southwestern U.S. is below normal precipitation and above normal temperature.
2. Spring flooding likely in central and eastern U.S.
    - Interagency coordination will spin up in early January.
    - Joint NOAA/USGS press briefing (Spring Flood Outlook) scheduled 3rd week of March.
    - In recent years major flooding has occurred in central and eastern U.S. in January and February.

U.S. Drought Monitor

Current Conditions
December 8, 2020



Drought Impact Types:

Delineates dominant impacts

S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

Author:
David Simeral
Western Regional Climate Center

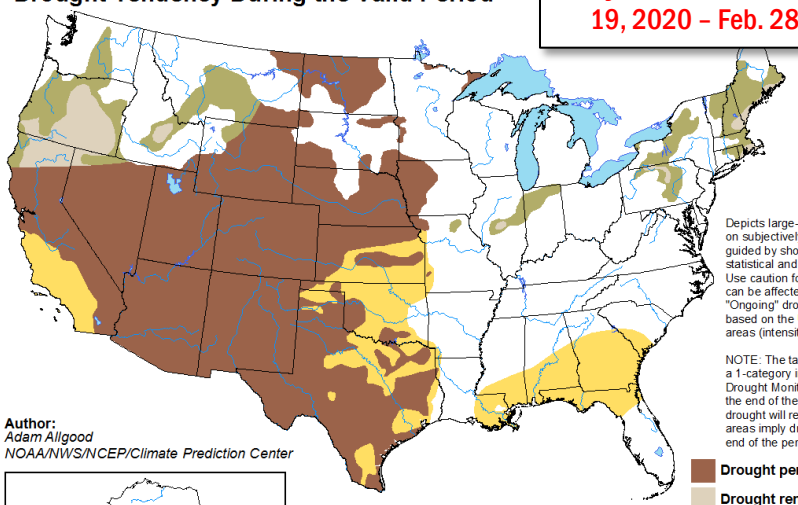
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

droughtmonitor.unl.edu

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Projected Conditions Nov. 19, 2020 – Feb. 28, 2021



Author:
Adam Allgood
NOAA/NWS/NCEP/Climate Prediction Center

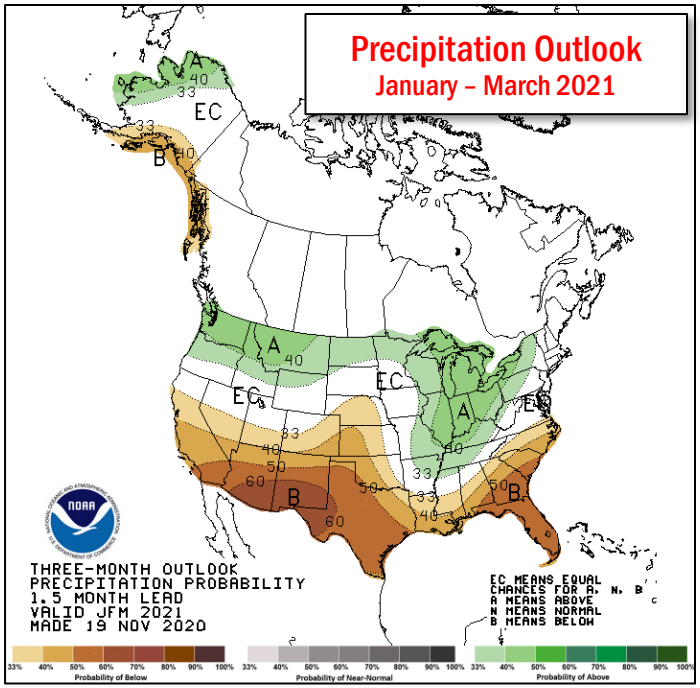
Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

- **Drought persists**
- **Drought remains but improves**
- **Drought removal likely**
- **Drought development likely**

http://go.usa.gov/3eZ73

Precipitation Outlook
January – March 2021

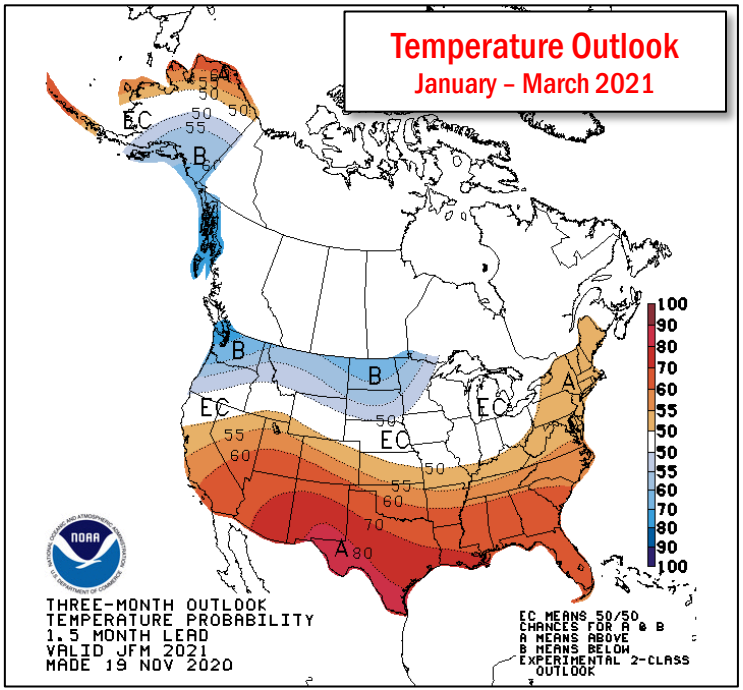


THREE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
1.5 MONTH LEAD
VALID JFM 2021
MADE 19 NOV 2020

EC MEANS EQUAL CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW

Probability of Below | Probability of Near-Normal | Probability of Above

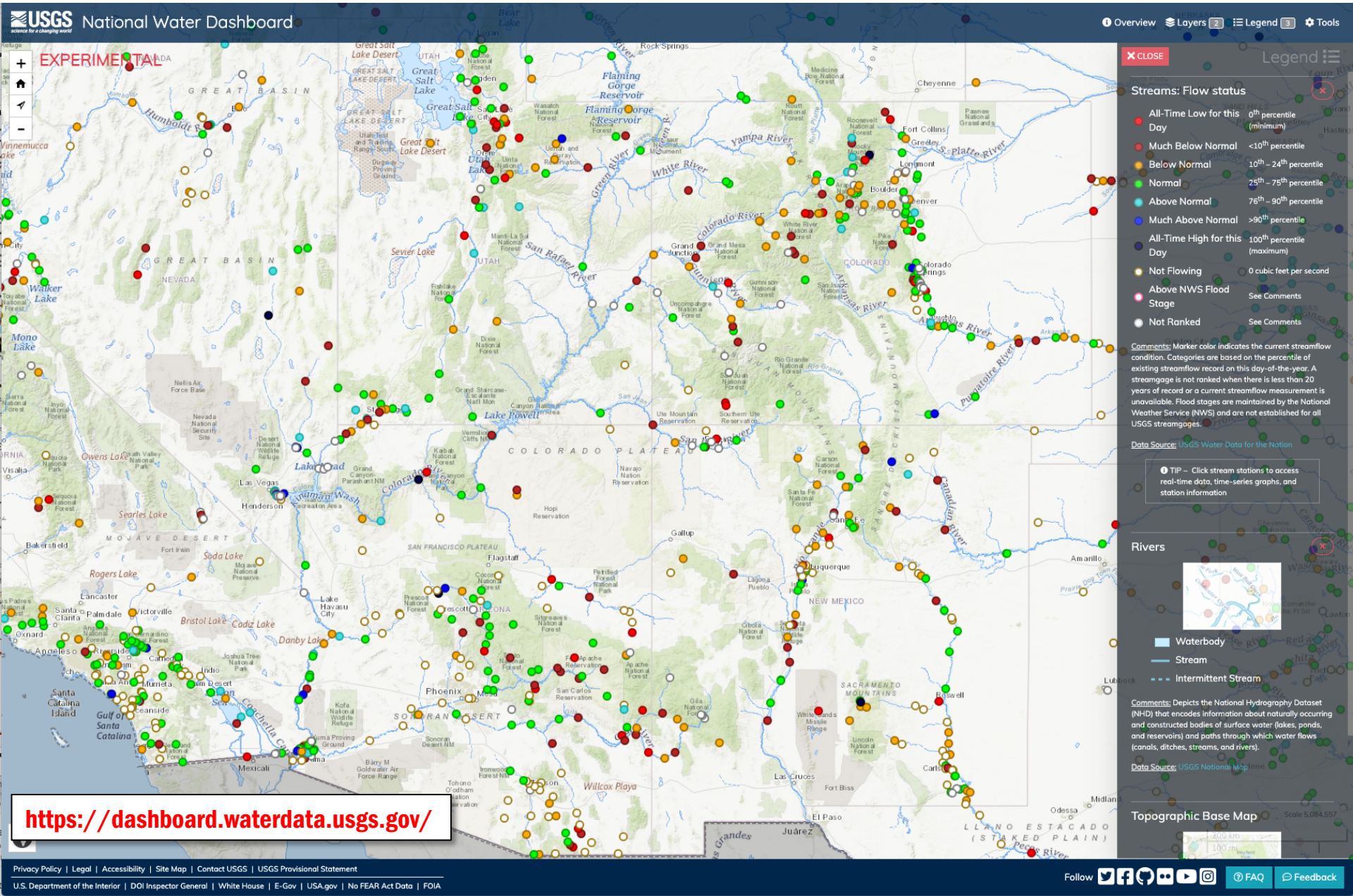
Temperature Outlook
January – March 2021



THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
1.5 MONTH LEAD
VALID JFM 2021
MADE 19 NOV 2020

EC MEANS 50/50 CHANCES FOR A & B
A MEANS ABOVE
B MEANS BELOW
EXPERIMENTAL 2-CLASS OUTLOOK

Current Streamflow Conditions



Additional Early 2021 Topics

1. Hydrologic Instrumentation Facility (HIF)
    - HIF currently located at Stennis Space Center, since 1972
    - Responsible for calibration, testing, repair, and distribution of water monitoring equipment for USGS national water observing systems.
    - Received $38.5M FY2020 for construction of HIF 2.0
        - Architectural design will be completed in early January 2021
        - Construction expected to begin late Spring 2021; estimated completion December 2022
        - University of Alabama campus, Tuscaloosa AL

Additional Early 2021 Topics

2. Integrated Water Resources Science and Services (IWRSS)
   - Federal consortium of agencies with complementary water missions
     - Currently USGS, NOAA, USACE, and FEMA
   - Established 2010 to enhance joint planning and collaboration
   - Memorandum of Understanding (MOU) expires May 2021
   - Currently working on finalizing renewal MOU with addition of EPA, USDA, and DOE
   - Expect renewal MOU will be ready for Assistant/Under Secretary signatures January or February 2021

For further information:

Don Cline

Associate Director for Water Resources

dcline@usgs.gov

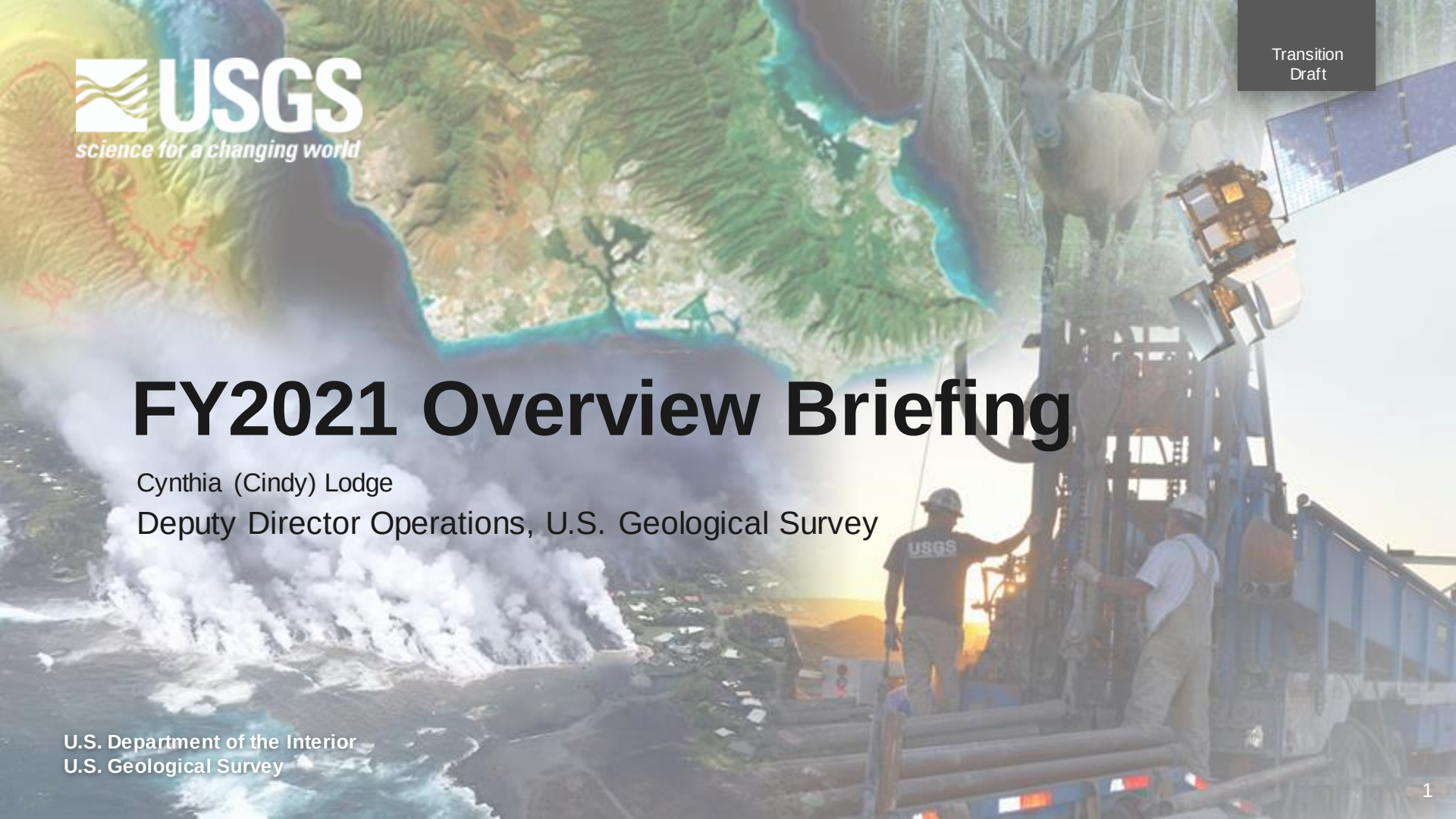
952-564-9093

Bill Guertal

Deputy Associate Director for Water Resources

wguertal@usgs.gov

703-648-5060

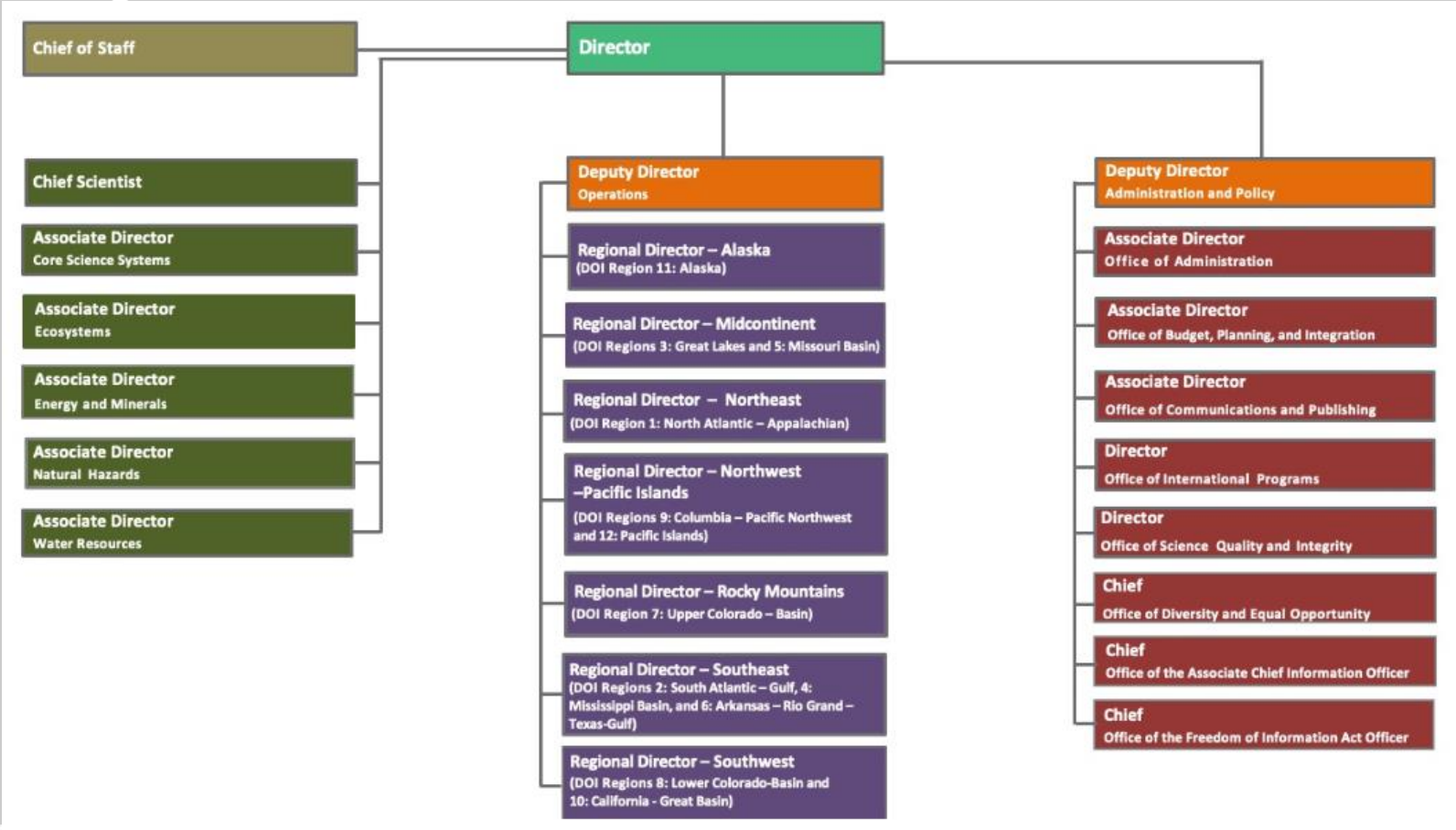

USGS
science for a changing world
Transition Draft
FY2021 Overview Briefing
Cynthia (Cindy) Lodge
Deputy Director Operations, U.S. Geological Survey
U.S. Department of the Interior
U.S. Geological Survey

USGS Mission & Vision Statement

The USGS mission is to monitor, analyze, and predict current and evolving dynamics of complex human and natural Earth system interactions and to deliver actionable intelligence at scales and timeframes relevant to decision makers.

Vision Statement: Lead the Nation in 21st-century integrated research, assessments, and prediction of natural resources and processes to meet society's needs.

USGS Organization



Ecosystems

The 2021 budget request is $127.3 million.

It is estimated that fighting the economic, ecological and health threats posed by over 6,500 invasive species costs over $120 billion in damages annually to the United States economy.

USGS provides wildlife health and disease investigative, research and training support to federal, state, local and international agencies.

USGS

Energy and Minerals Resources

The 2021 budget request is $91.2 million.

The USGS conducts scientific research, completes energy and mineral resource assessments, and compiles information and statistics on the worldwide supply and flow of minerals, including critical minerals, and materials essential to our economy and national security.

USGS science informs decision making to improve our environment, our economy, our and our quality of life.

USGS

Natural Hazards

The 2021 budget request is $138.0 million.

EARLY WARNING TOOLS

USGS science reduces the impacts of natural hazards (like earthquakes, volcanic eruptions, landslides, and coastal erosion) and improves our nation's safety and quality of life.

USGS

Water Resources

The 2021 budget request is $180.8 million.

WATER INFORMATION FOR THE NATION

USGS monitors and assesses the amount and characteristics of the Nation's water resources, assesses sources and behavior of contaminants in the water environment, and develops tools to improve management and understanding of water resources to support human well-being, healthy ecosystems, and economic prosperity.

USGS

Core Science Systems

The 2021 budget request is $212.0 million.

LANDSAT IMAGING

The USGS has provided continuous, objective imaging of the Earth's surface for over four decades.

3-DIMENSIONAL ELEVATION PROGRAM

A fully funded and implemented 3DEP would provide more than $690 million annually in new benefits to America.

USGS

Science Support and Facilities

The 2021 budget request for Science Support is $94.2 million and for Facilities is $127.6 million.

Science Support provides the core business functions and information management and technology services that make it possible for the USGS to conduct science.

Advancing Information Management Technology by establishing Artificial Intelligence and Machine Learning services.

USGS is making efforts to consolidate its facilities footprint and reduce costs by co-locating with partners and taking a strategic look at our overall space portfolio.

USGS

THE FUTURE IS LOOKING BRIGHT…

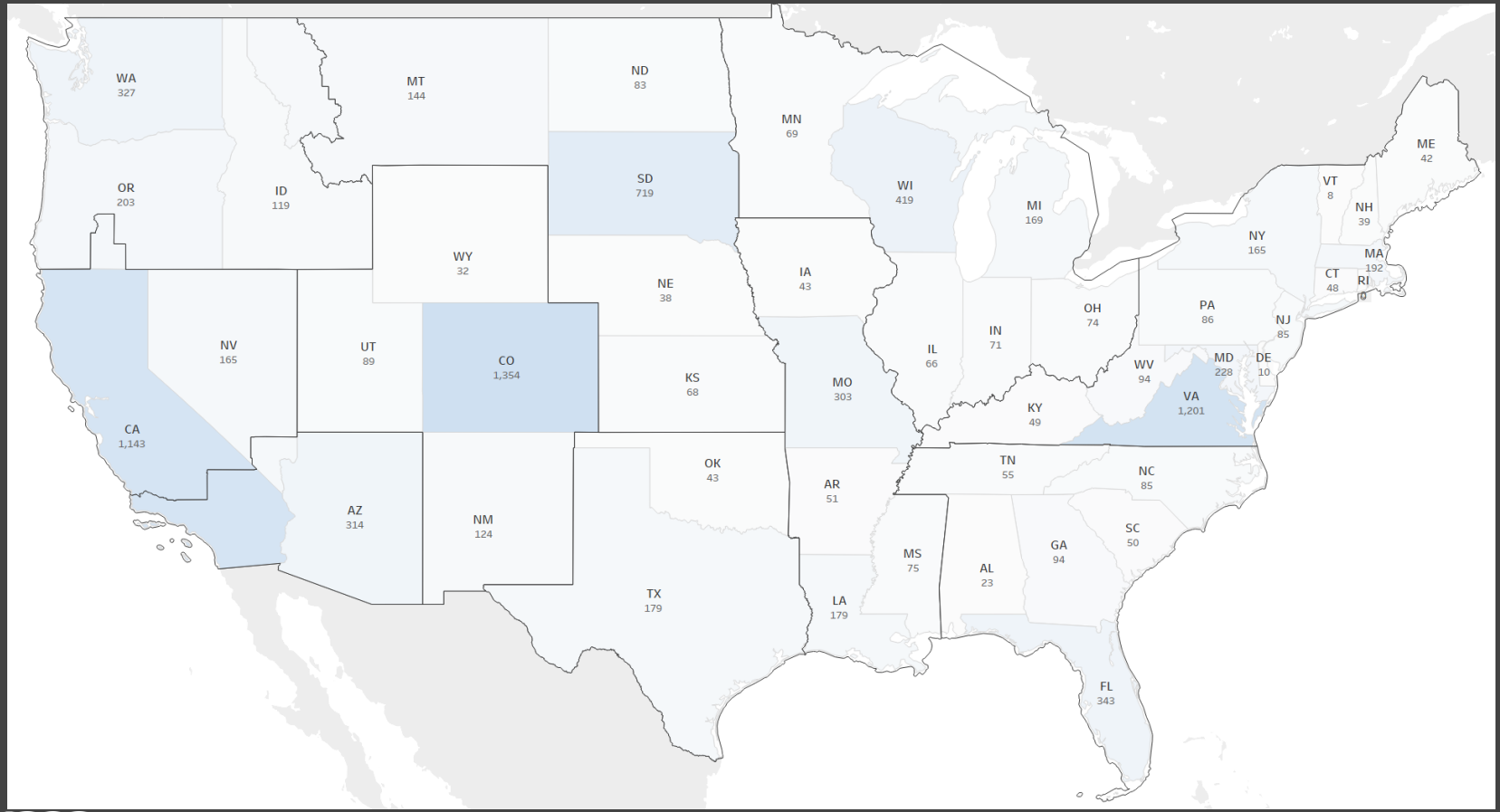
21st-Century Science

Systems-of-systems approach to analyze the interlinked Earth processes that comprise the Earth System to achieve the USGS Vision.


Questions?
USGS

Backup Slides

USGS Staff Count by CONUS State



USGS 2020-21 Budget

The 2020 enacted budget is $1.27 billion.

USGS 2020 Enacted - 2021 Congressional Marks ($ in Thousands)				
USGS Mission Area	2020 Enacted	2021 President's Budget Request	2021 House Mark	2021 Senate Mark
Ecosystems	251,527	127,337	261,257	258,227
Energy and Mineral Resources	90,041	91,181	91,181	90,041
Natural Hazards	170,870	137,999	173,588	175,009
Water Resources	234,120	180,809	237,443	265,820
Core Science Systems (includes Satellite Operations)	246,688	212,049	252,291	246,688
Science Support	96,828	94,173	97,245	98,234
Facilities	180,883	127,637	179,982	131,883
Total, USGS	**1,270,957**	**971,185**	**1,292,987**	**1,265,902**

USGS