




Sunk Cost, Well Spent: Enhancing Interagency Remote Sensing with the Civil Applications Committee

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Bottom Line, Up Front

Federal Civil agencies have access to:

- Intelligence Community (IC)/Department of Defense (DoD) remote sensing data/capabilities, aka U.S. National Imagery Systems (since late 1960's)
- National Geospatial-Intelligence Agency (NGA) procured high resolution, unclassified satellite images (since 2010)
- **Geospatial Intelligence (GEOINT)** -- the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the earth. GEOINT consists of imagery, imagery intelligence and geospatial information

Federal Civil agencies use these images and data to:

- Support public safety and disaster response
- Contribute to land, water, and resource management
- Increase scientific knowledge about the Earth's surface and processes
- Discuss applicable DoD standards and methodologies for use by FedCivs

Civil Applications Committee

- Provides oversight and facilitation of civil agency use of IC and DoD remote sensing data and capabilities
- Enables Federal agency use of IC and DOD remote sensing data, tools, applications, and other capabilities

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How We Got Here

1960 – Launch of Corona, Nation's first photo-reconnaissance satellite

1965 – Bureau of Budget mapping study

1967 – President Johnson's Science Adviser establishes committee to test utility of classified images for use by civilian agencies

1969 – USGS opens classified facility to update topographic maps; other Federal agencies use the facility as well

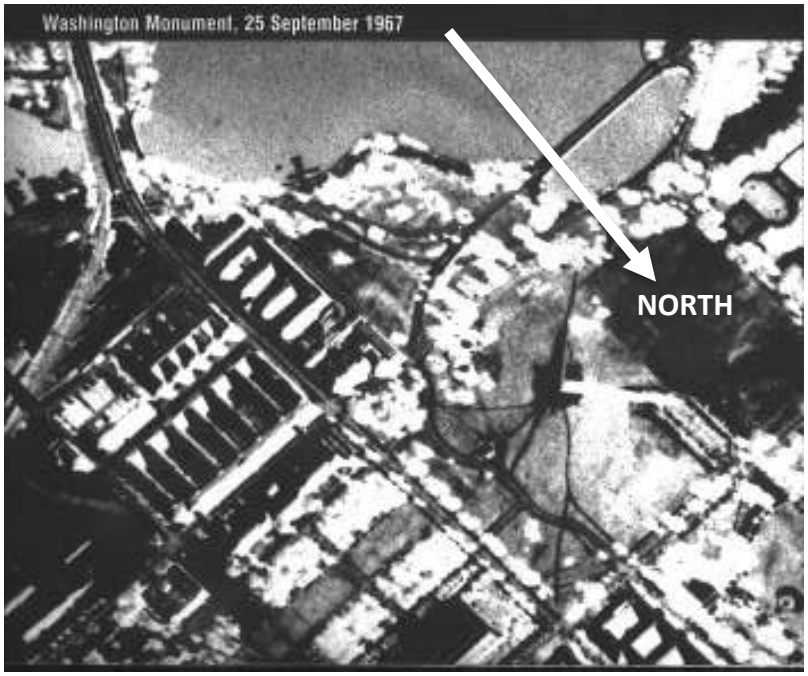
1975 – President Ford directed Interior Secretary to establish Civil Applications Committee (CAC)

1995 – Existence of the CAC declassified

2001 – CAC Executive Steering Group (ESG) established, chaired by Deputy Interior Secretary

2010 – Oversight expanded to include commercial imagery

2014 – ESG affirmed CAC's role to support member missions, including law enforcement, regulatory, and homeland security functions



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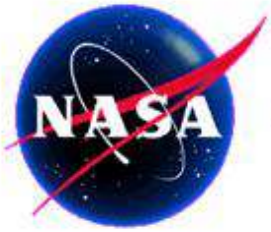
Civil Applications Committee Members

Principal



Associate

Ex Officio

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Today's Civil Applications

Public Safety / Natural Hazards & Disasters

Detection, Assessment, Response, and Mitigation

Volcanoes	Earthquakes
Wildfires	Landslides
Floods	Hurricanes

Scientific Research

Land, Water, and Resource Management

Environmental Monitoring

Mapping, Charting, and Geodesy

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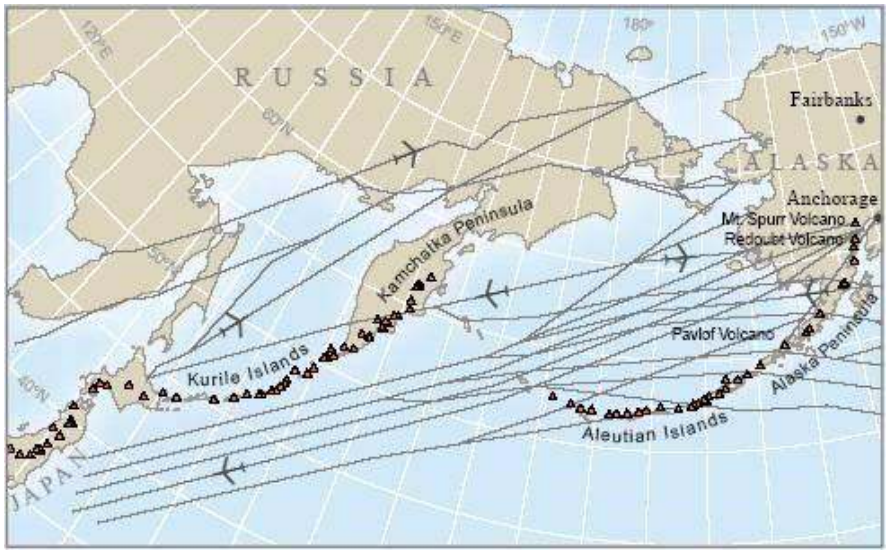
Aviation Safety / Volcano Monitoring



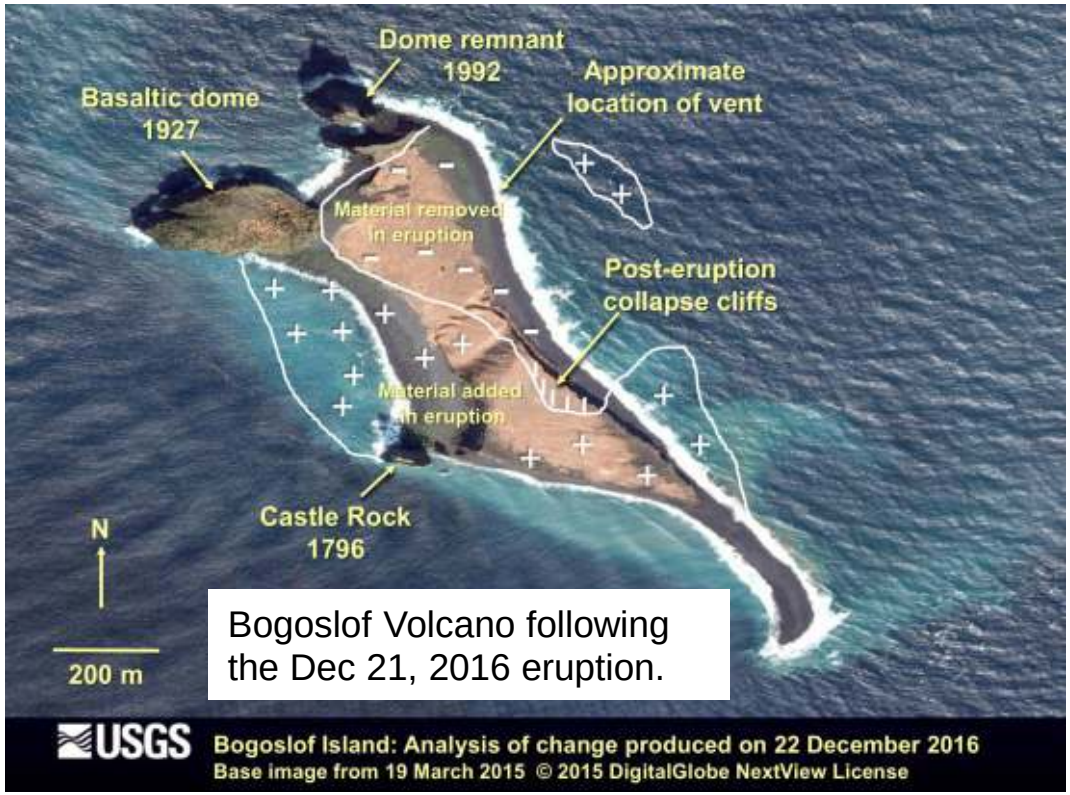
The U.S. and its territories contain 169 potentially active volcanoes, of which over 50 are a very high or high threat to public safety.

Aviation Safety and Volcano Monitoring

- Aircraft flying the air routes shown above carry more than 50,000 passengers and millions of dollars of cargo each day
- Ash has caused jet engines to fail and is usually blown to the east and northeast, directly across the air routes
- Several explosive eruptions occur every year

USGS access to National Imagery Systems (NIS) is critical for volcano monitoring and supporting aviation safety.

NCAC supports USGS Volcano Observatories in their mission to provide information about and warnings of volcanic activity in the United States and internationally through the Volcano Disaster Assistance Program



Bogoslof Volcano following the Dec 21, 2016 eruption.

NCAC produced the image map above from several sources including NIS. This is an example of an unclassified non-literal **image derived product**

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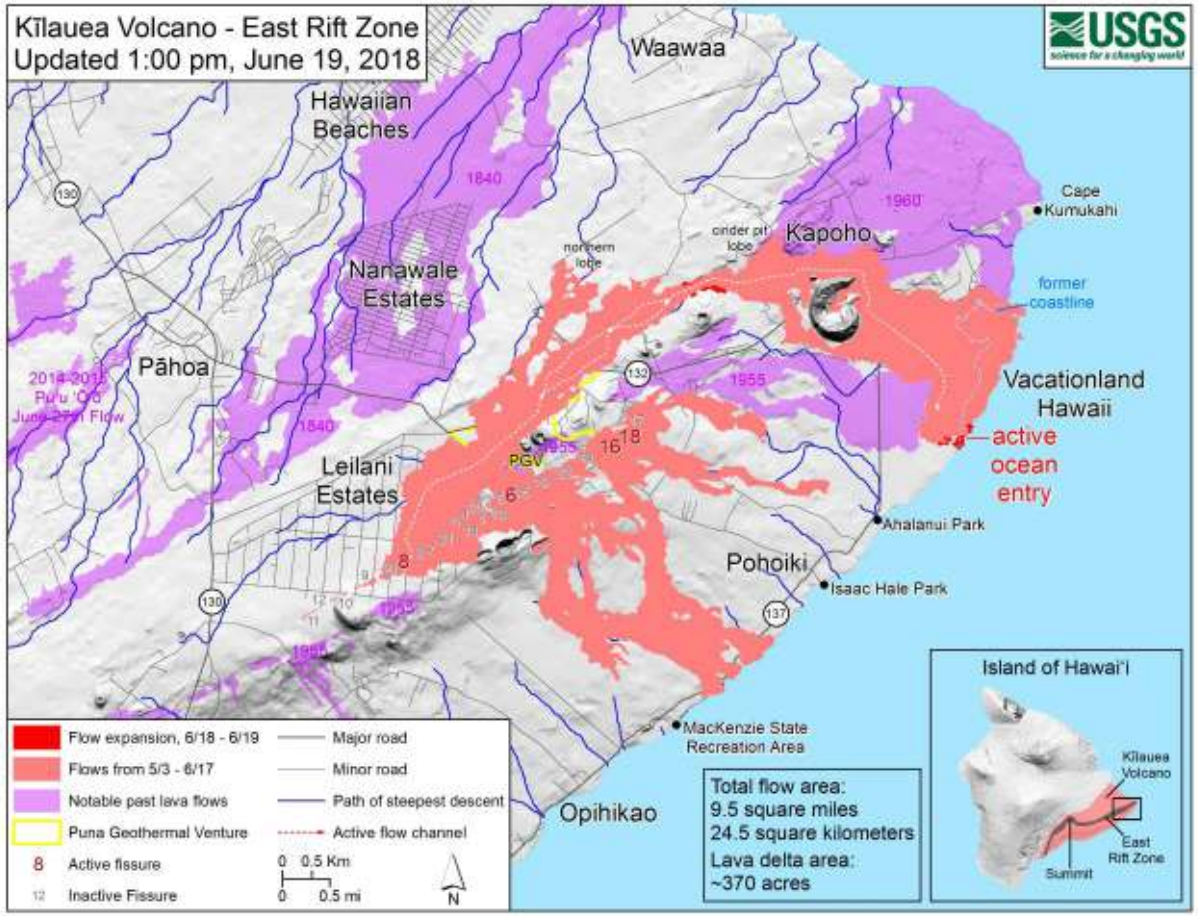
Public Safety / Lava Flow Monitoring



Hawaii Volcano Observatory produced the map above from several sources, including information NCAC provided, to track flow of lava from Kilauea. Maps such as this inform local officials and the public about the danger.

Helicopter overflight of Kīlauea Volcano's lower East Rift zone on May 19, 2018, ‘A‘ā lava flows emerging from the elongated fissure 16-20 form channels. The flow direction in this picture is from upper center to the lower left.

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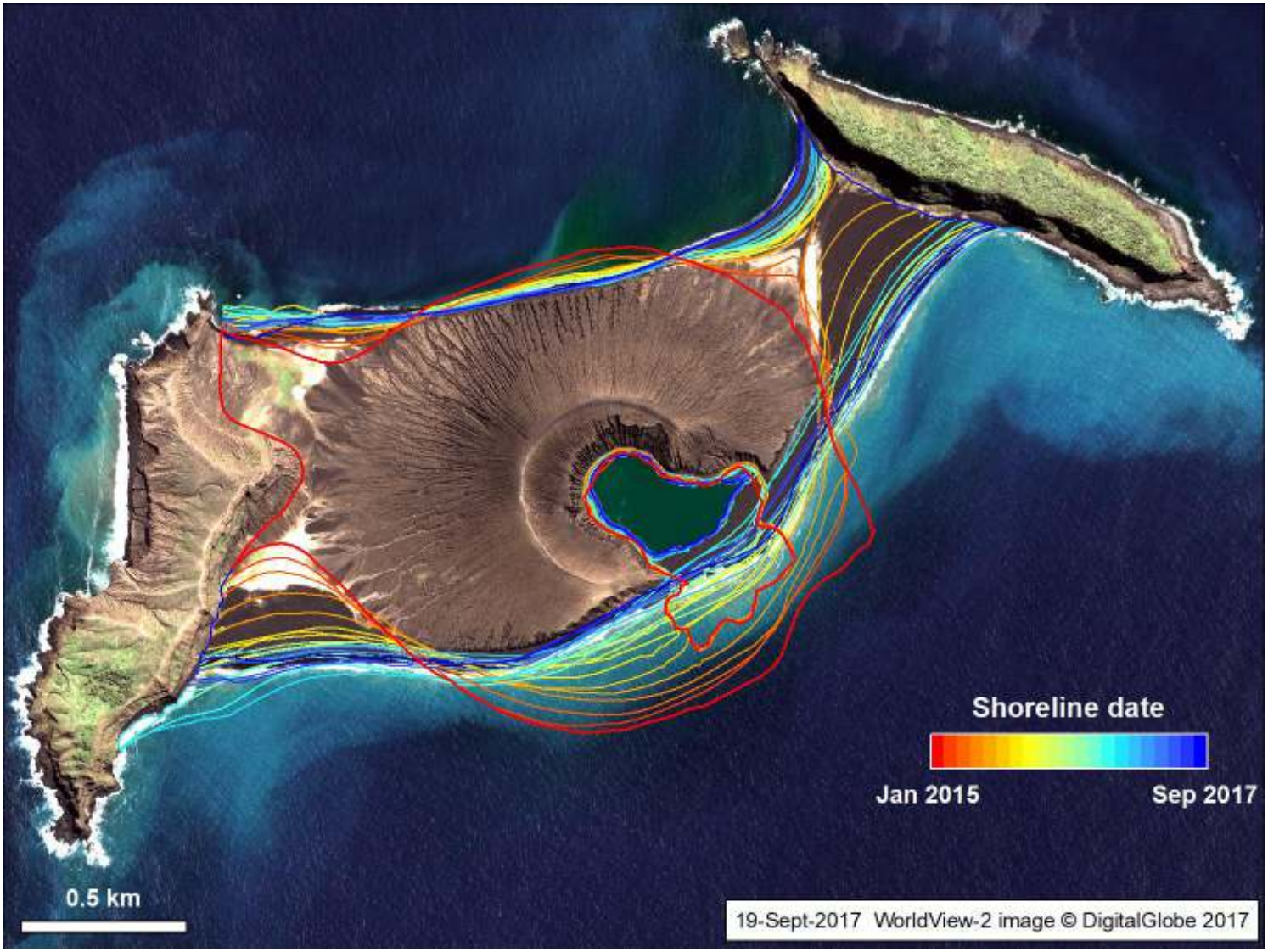
Volcano Interagency Science Collaboration



NCAC Source and NASA Collaboration Effort

- DoD Imagery supporting USGS/NASA science
- **Hunga Tonga-Hunga Ha'apai** is the first island of this type to erupt and persist in the modern satellite era, it gives scientists an unprecedented view from space of its early life and evolution
- The new study offers insight into its longevity and the erosion that shapes new islands
- Understanding these processes could also provide insights into similar features in other parts of the solar system, including Mars
- **Video:** https://www.youtube.com/watch?v=sIXyxvSEKFY

NCAC produced the image map above from DigitalGlobe imagery collected via NGA's EnhancedView contract with federal access granted via the NextView License. Platforms used include WorldView-2 and WorldView-3 imagery, NITF format, 0.5 - 2 m resolution (pan to MS)

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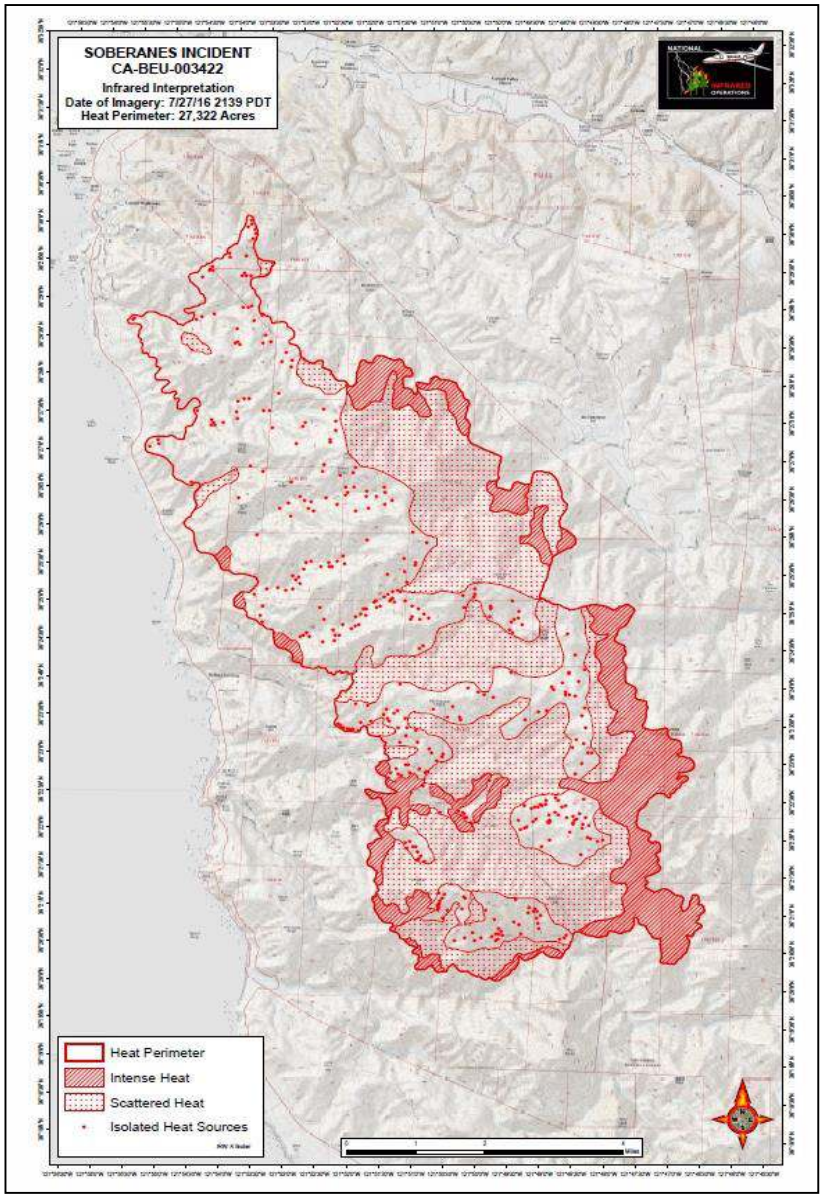
Fire Detection, Response, and Restoration

- Detection: timely reporting of wildfires.
- Response: fire perimeter map (right) used by the National Interagency Fire Center for incident command, daily planning, and dispatch.
- Restoration: remote sensing used for restoration efforts.



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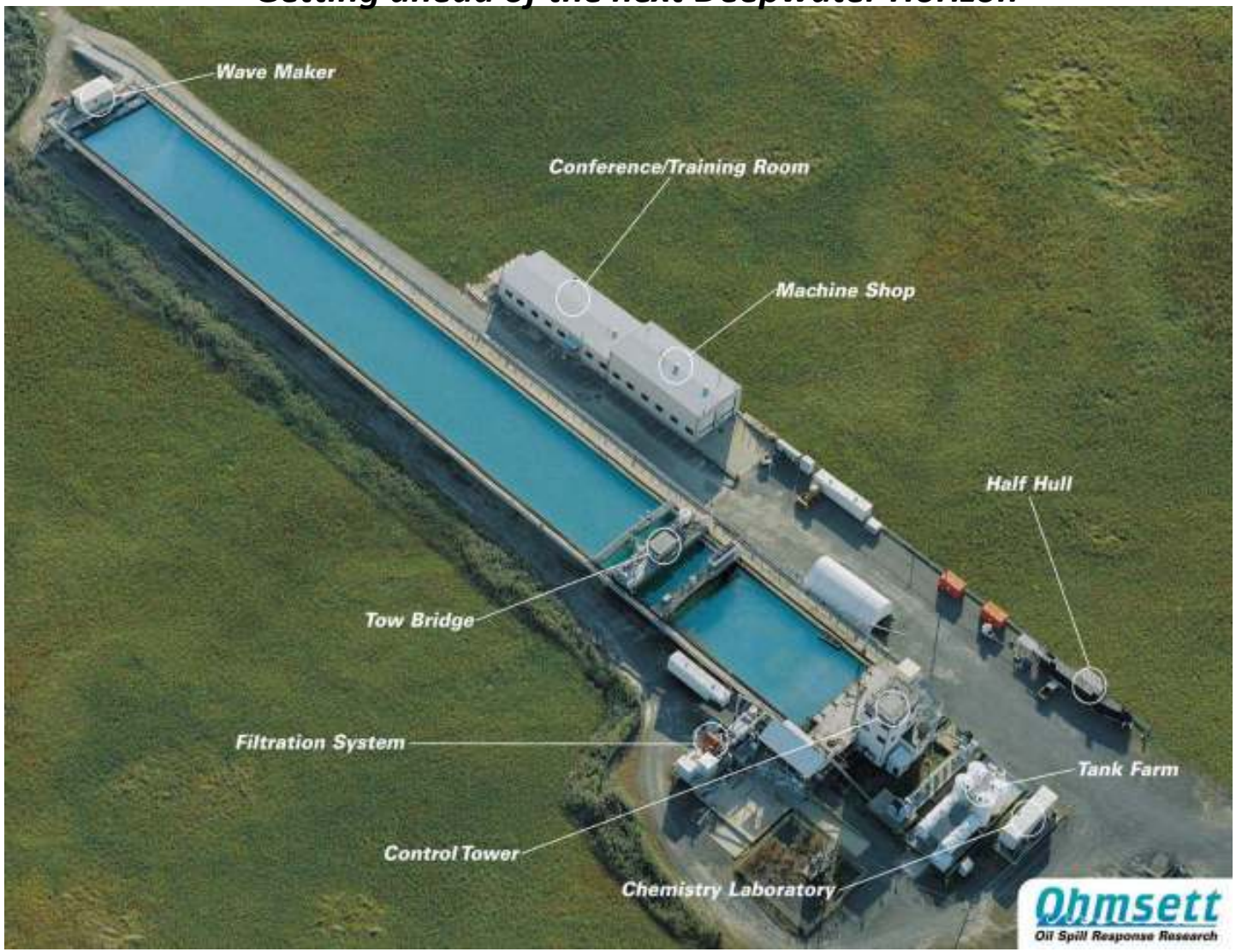
Oil Spill Research and Testing

The Bureau of Safety and Environmental Enforcement and the National Oceanic Atmospheric Administration conduct comparative analysis on how remote sensing systems detect, monitor and measure oil slicks and emulsions in the marine environment.

Analysis done using panchromatic and multi-spectral imagery.

Getting ahead of the next Deepwater Horizon



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CAC Member Use of Data

- Must be Federal civil agency and within their statutory mission
- Follows applicable laws and regulations protecting personal rights, personal privacy, and civil liberties
- Proper Use Memoranda in limited circumstances; most departments will maintain Civil Domestic Tasking Memoranda to oversee efforts/legal authorities

Ocean Surface Topography Mission on JASON-2 Satellite

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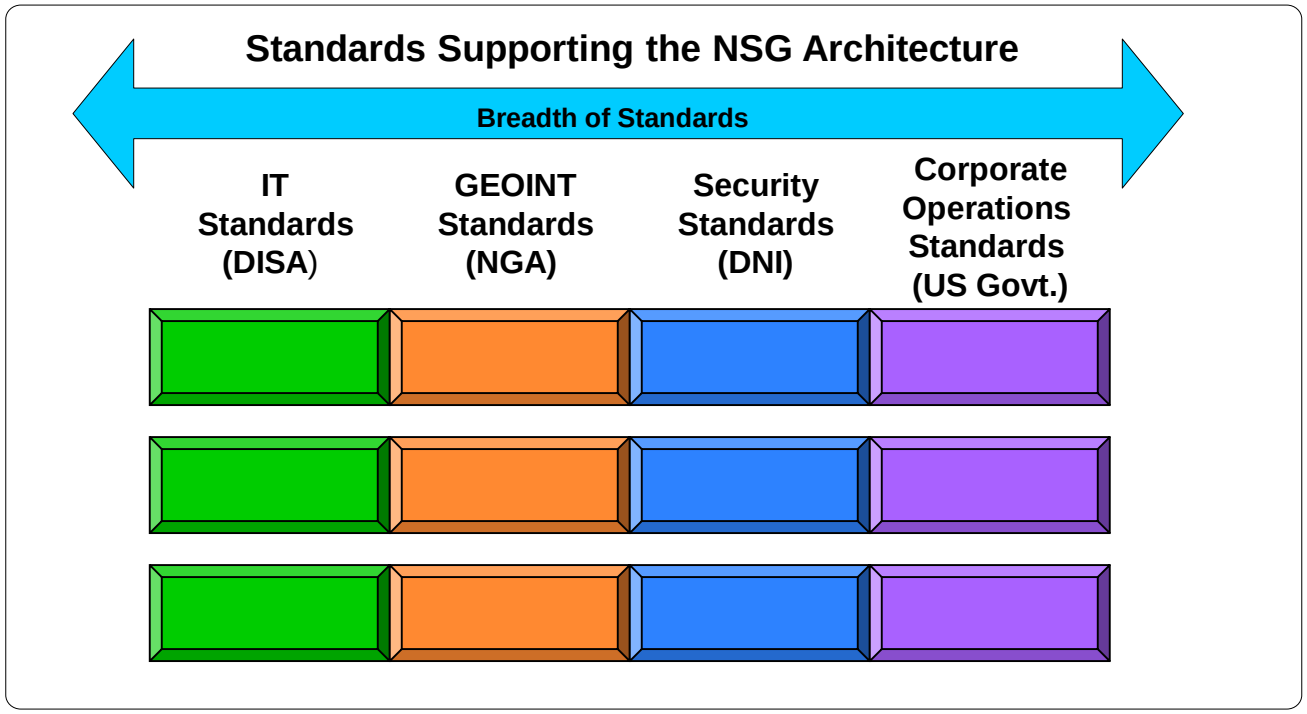
CAC and Geospatial Intelligence Standards

- CAC/FGDC intersects with the NGA's Geospatial Intelligence Standards Working Group: http://www.gwg.nga.mil/
- Standards are crucial to ensuring the compatibility and interoperability of GEOINT data and systems that make up the NSG architecture
- Universally accepted and agreed upon standards ensures that NSG system components do what they are required to do and are integrated in a way that allows GEOINT to be exchanged between them.
- Challenging in a time of change within IT architecture and with the advent of "Big Data"



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CAC and Geospatial Intelligence Trends

- Artificial Intelligence (AI, Augmentation and Automation)
- Social Media/Mobile Data
- Geospatial Data As A Service (NOT the raw pixels)
- Cloud Computing (Back-end IT and Geospatial Software) Geospatial Information to create Decision Advantage
- Ubiquity of Unmanned Aerial Systems (Motion Imagery Standards Board of the GWG)

Source: Geospatial World, https://www.geospatialworld.net/blogs/top-six-geoint-trends/ and author

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CAC / NSG Engagement

- **CAC is a combined voice for the federal civil community within the National System for Geospatial-Intelligence (NSG)**
  - NSG: US Government community, capabilities, assets, and other aspects of geospatial-intelligence that supports US national security decision making and US military operations
  - GEOINT: The term 'geospatial intelligence' means the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the earth. Geospatial intelligence consists of imagery, imagery intelligence, and geospatial information
  - NSG GEOINT Functional Manager is the NGA Director
- **NSG Senior Management Council** - semi-annual meeting, 3-star and Senior Executive level forum chaired by NSG Functional Manager
  - USGS (Principal member)
  - CAC (Associate member)
- **National Geospatial Intelligence Committee, aka GEOCOM** - governance body for NSG coordination and decision making, chaired by NGA Associate Director
  - USGS (Principal member), CAC (Associate member)
  - CAC also participates on the GEOINT Operations Board, GEOINT Resources Board, GEOINT Collections Subcommittee, and other Ad Hoc/Standing Committees as needed
  - GEOCOM is an Ex-Officio member of the CAC

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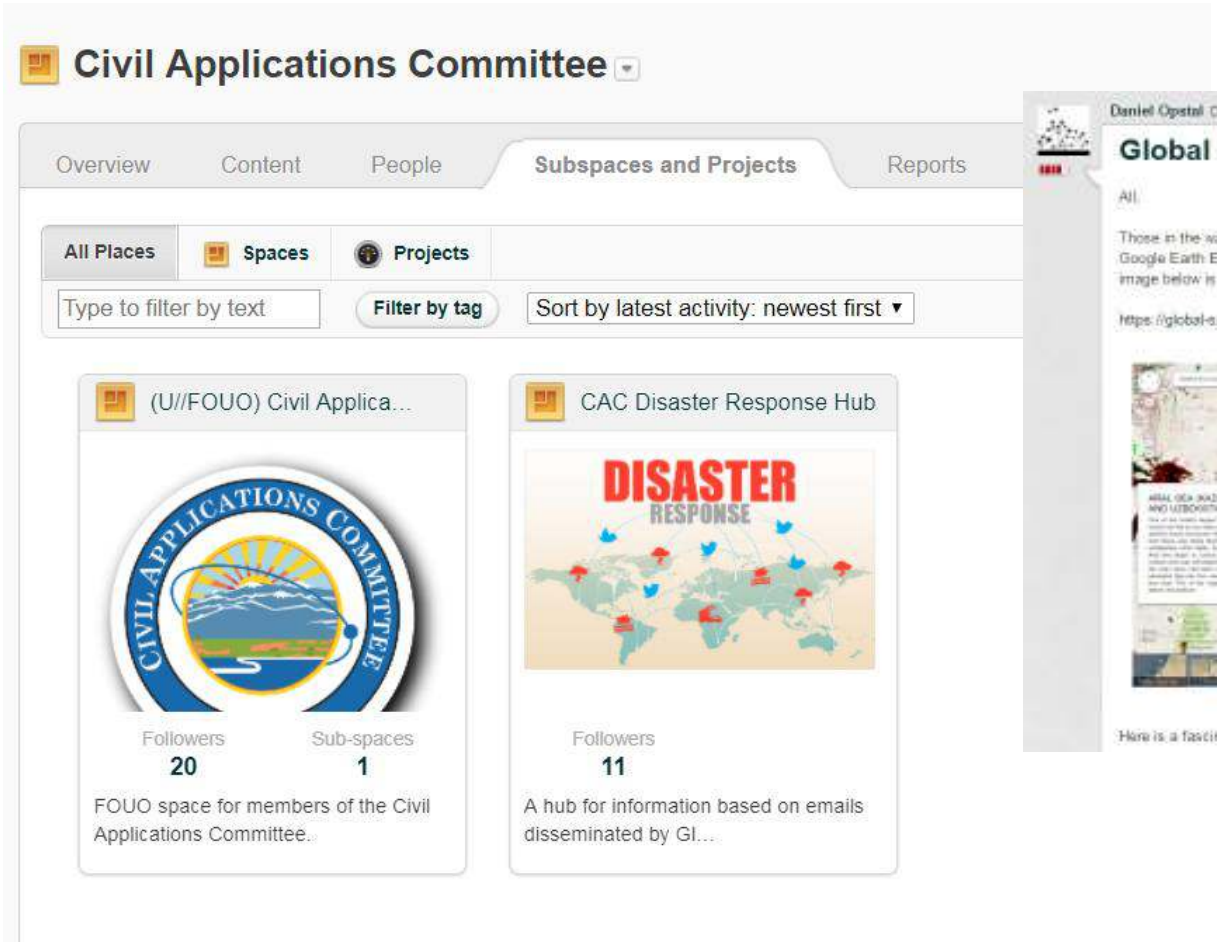
Structured Analytic Gateway for Expertise (SAGE) –
Open, FOUO and mobile information sharing



Hosts FEMA/USDA Disaster Community Data

A hub for CAC minutes and topics of interest to the Federal Civil Community

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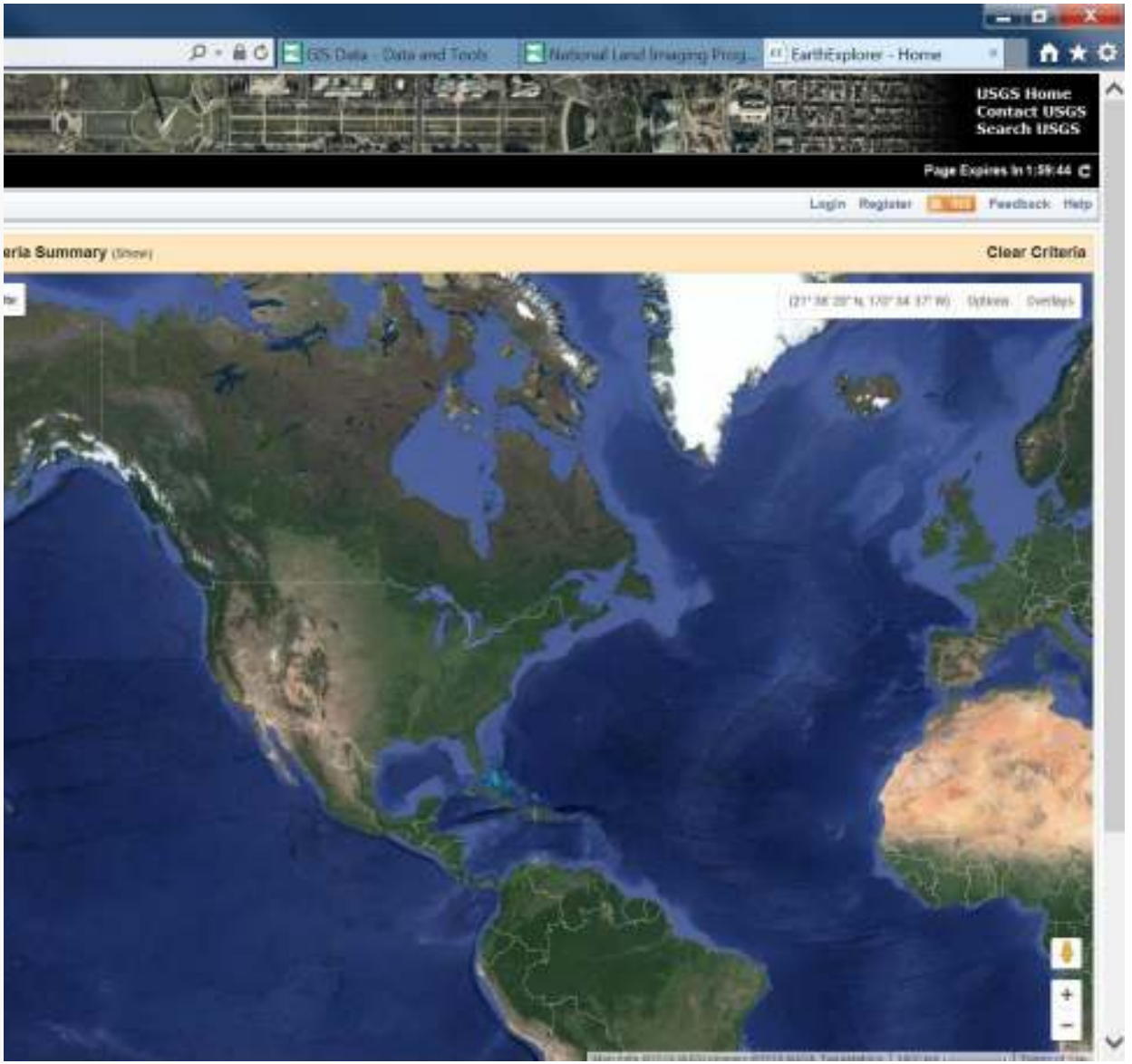
Backup Slides

Where to Find Remote Sensing Data

- Aerial Imagery
- AVHRR
- CEOS Legacy
- Commercial Satellites
- Declassified Data
- Digital Elevation
- Digital Line Graphs
- Digital Maps
- EO-1
- Global Fiducials
- HCMM
- ISERV
- Land Cover
- Landsat
- NASA LPDAAC Collections
- Radar
- Sentinel
- UAS
- Vegetation Monitoring
- ISRO Resourcesat



Earth Explorer - https://earthexplorer.usgs.gov/

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Enhanced View Web Hosting Service Access

To view current and past data:
https://evwhs.digitalglobe.com

Needed to request an account:

- Organization: Military, Dept of Defense, Intelligence Community, Federal Civilian, or Contractors
- Name, agency, title, phone, email, citizenship
- Geographic Area of Interest
- Justification for Access Requested (must be within mission of your agency)

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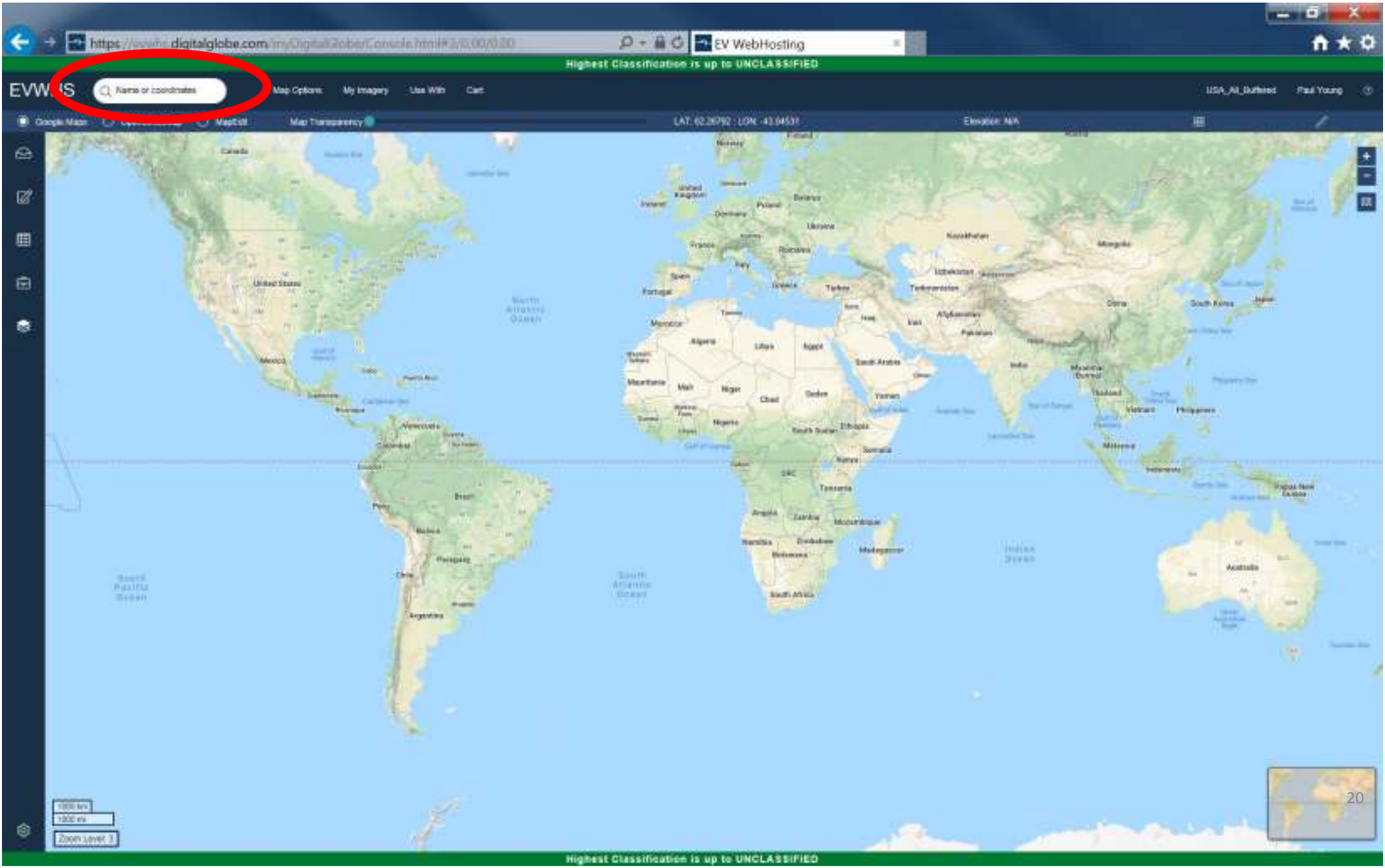
EV WebHosting
Highest Classification is up to UNCLASSIFIED
Name or coordinates
Map Options
My Imagery
Use With
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Map Transparency
Highest Classification is up to UNCLASSIFIED

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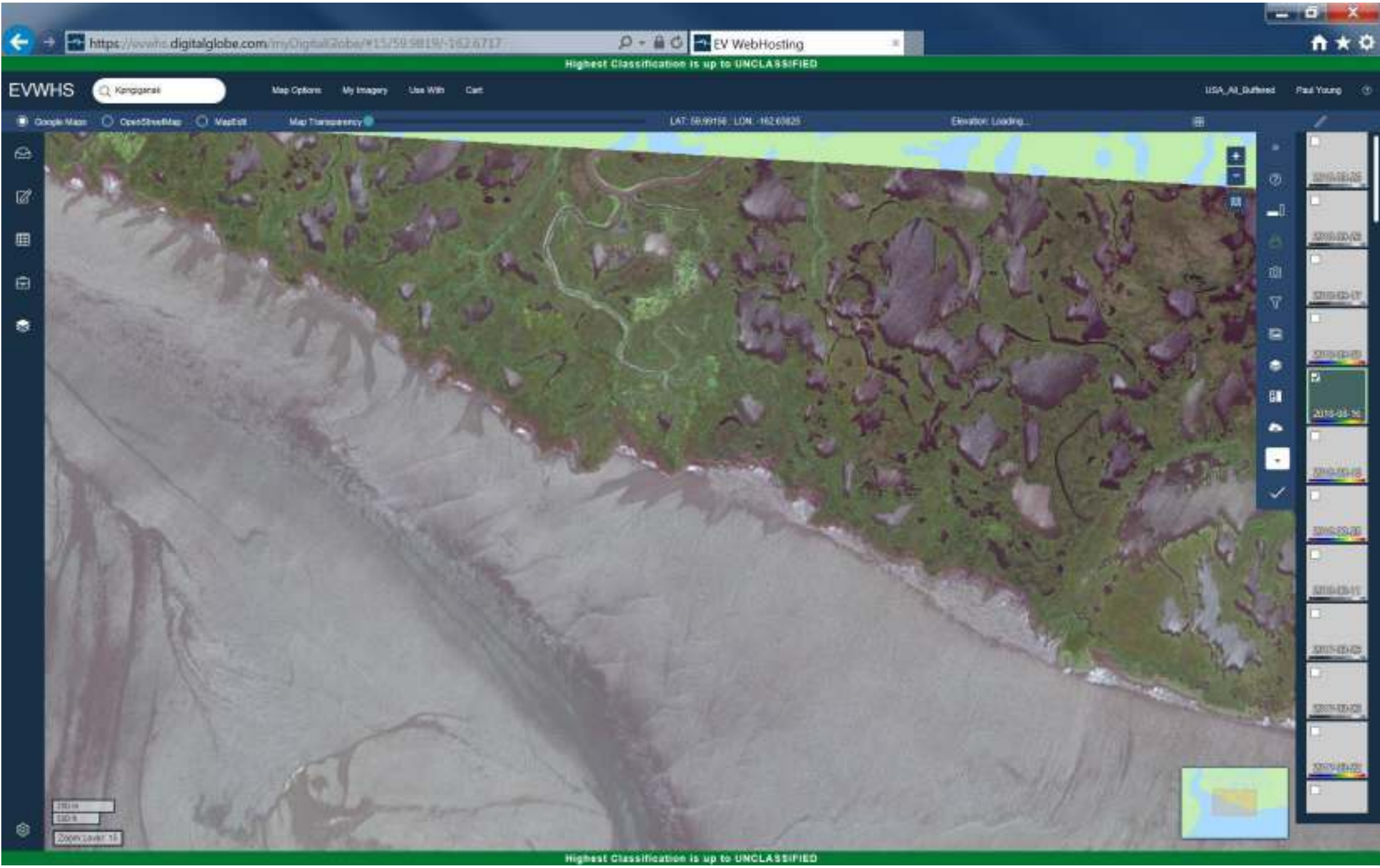

Yukon River Delta, August 16, 2018

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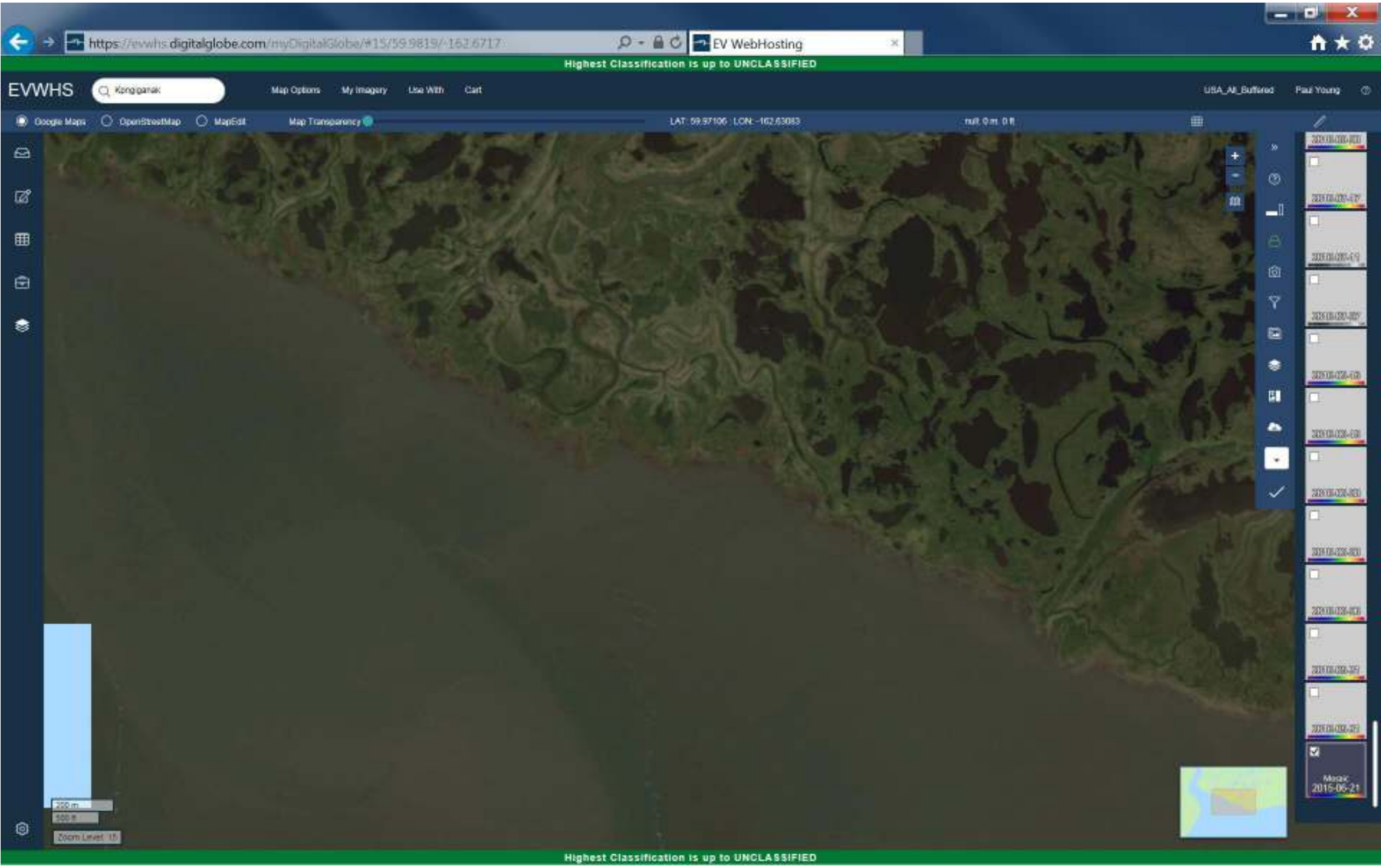

Yukon River Delta, June 21, 2015

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CRSSP Imagery Derived Requirements (CIDR)

Commercial Remote Sensing Space Policy (CRSSP) Imagery Derived Requirement (CIDR):

Entry Tool for Federal / Civil agencies to submit imagery requirements (new tasking and historical images from the archive)

https://cidr.cr.usgs.gov

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