

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

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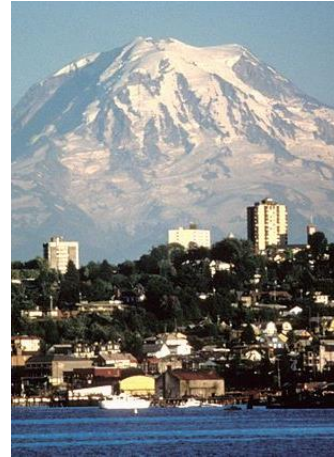




Bottom Line, Up Front

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



How We Got Here

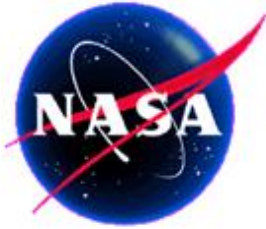
- 1960** – Launch of Corona, Nation's first photo-reconnaissance satellite
- 1965** – Bureau of Budget mapping study
- 1967** – President Johnson's Science Adviser establishes committee to test utility of classified images for use by civilian agencies
- 1969** – USGS opens classified facility to update 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





Civil Applications Committee Members

Principal



Associate



Ex Officio





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

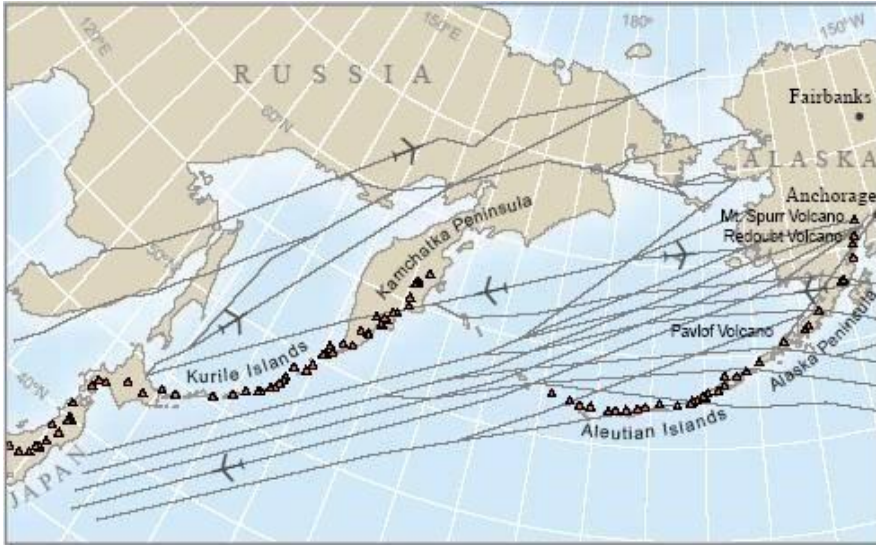
Environmental Monitoring



Mapping, Charting, and Geodesy



Aviation Safety / Volcano Monitoring



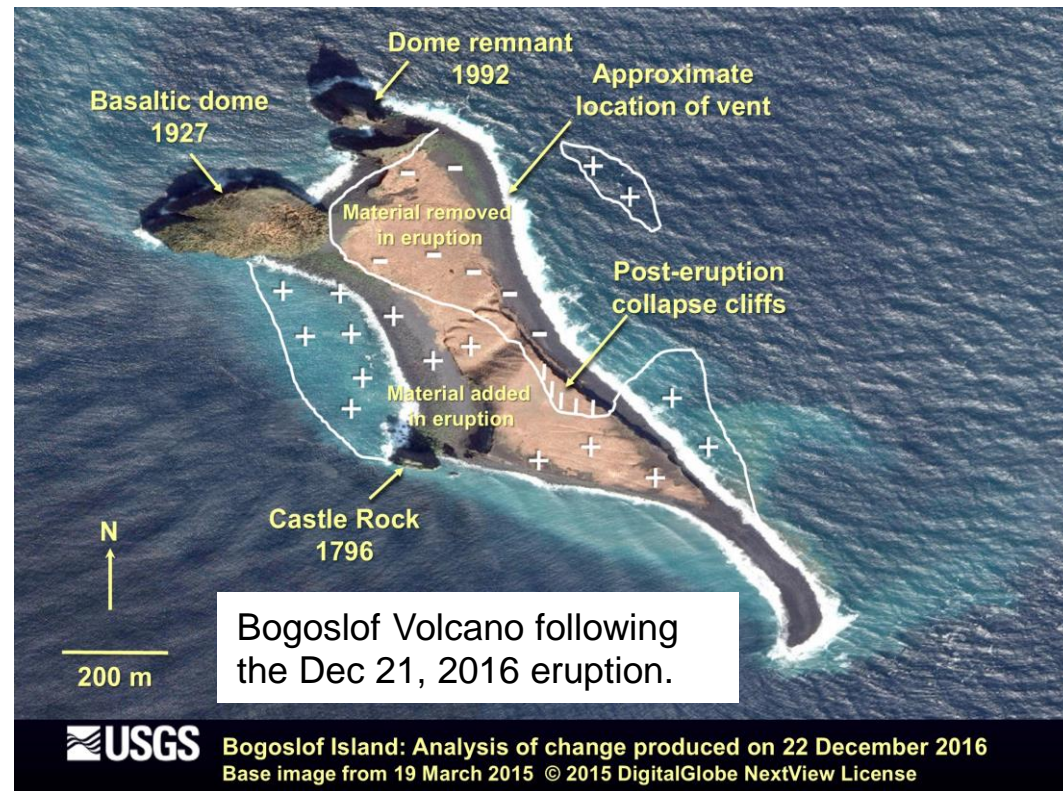
The U.S. and its territories contain 169 potentially active volcanoes, of which over 50 are a very high or high threat to public safety.

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.

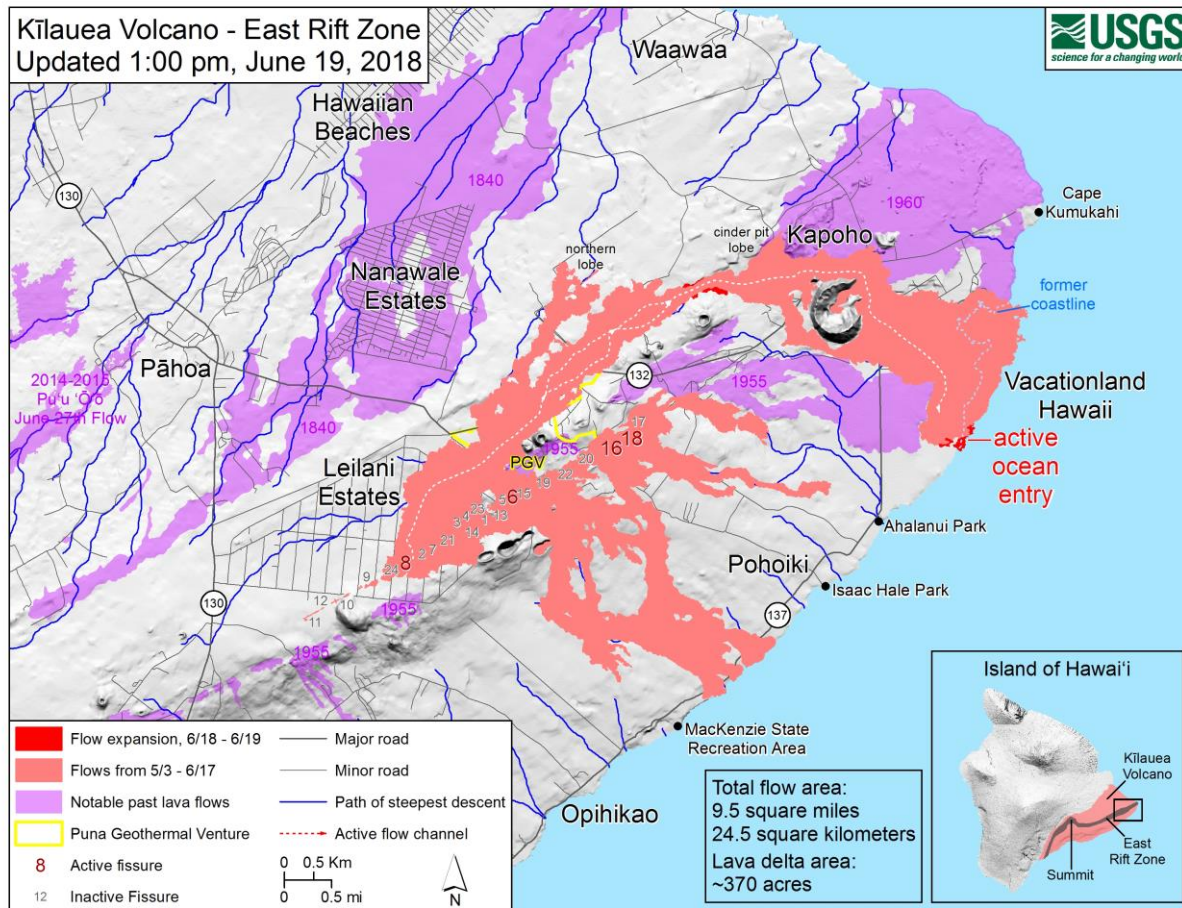
NCAC supports USGS Volcano Observatories in their mission to provide information about and warnings of volcanic activity in the United States and internationally through the Volcano Disaster Assistance Program



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



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.



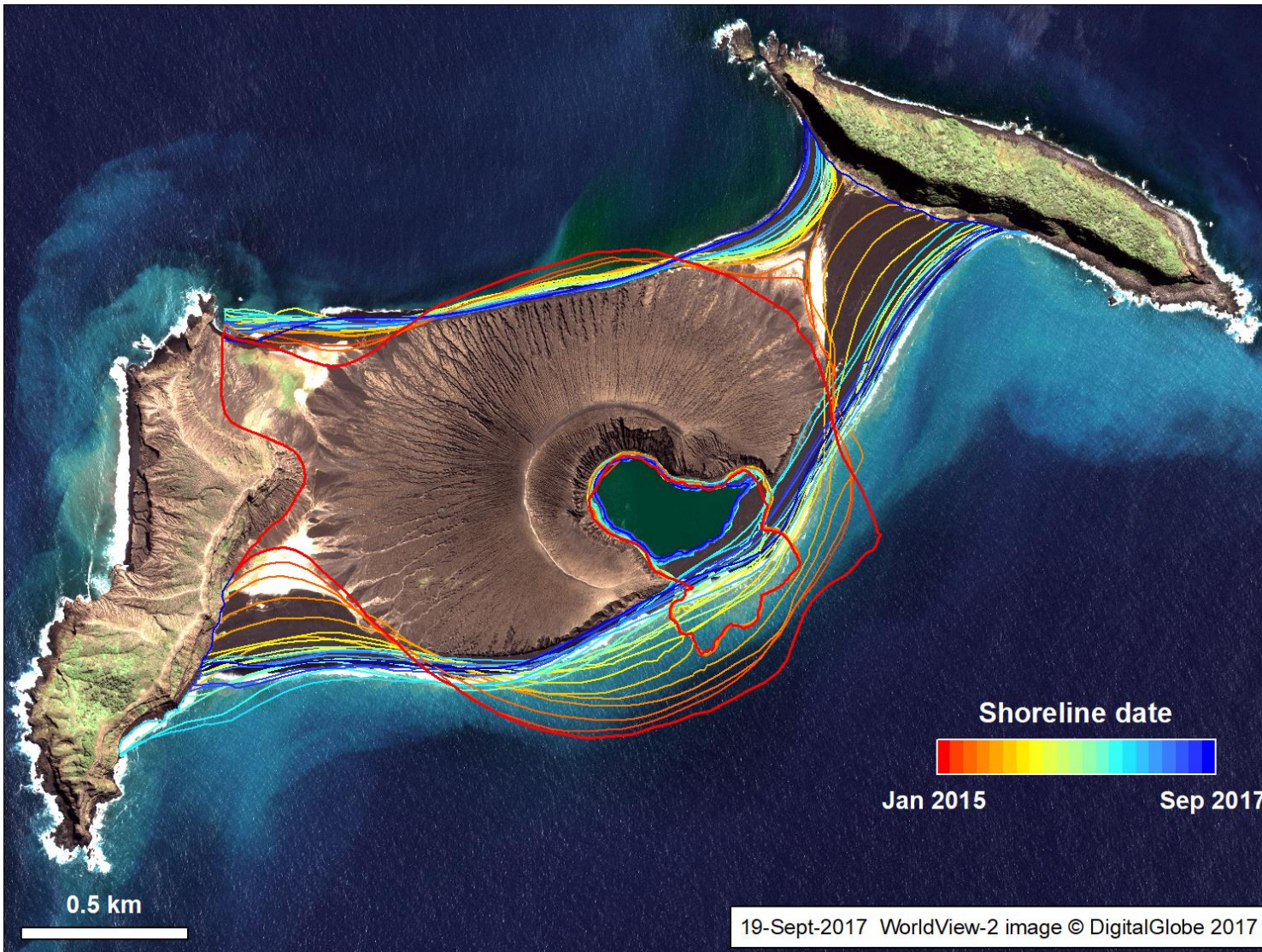
Helicopter overflight of Kīlauea Volcano's lower East Rift zone on May 19, 2018, 'A'ā lava flows emerging from the elongated fissure 16-20 form channels. The flow direction in this picture is from upper center to the lower left.



Volcano Interagency Science Collaboration

NCAC Source and NASA Collaboration Effort

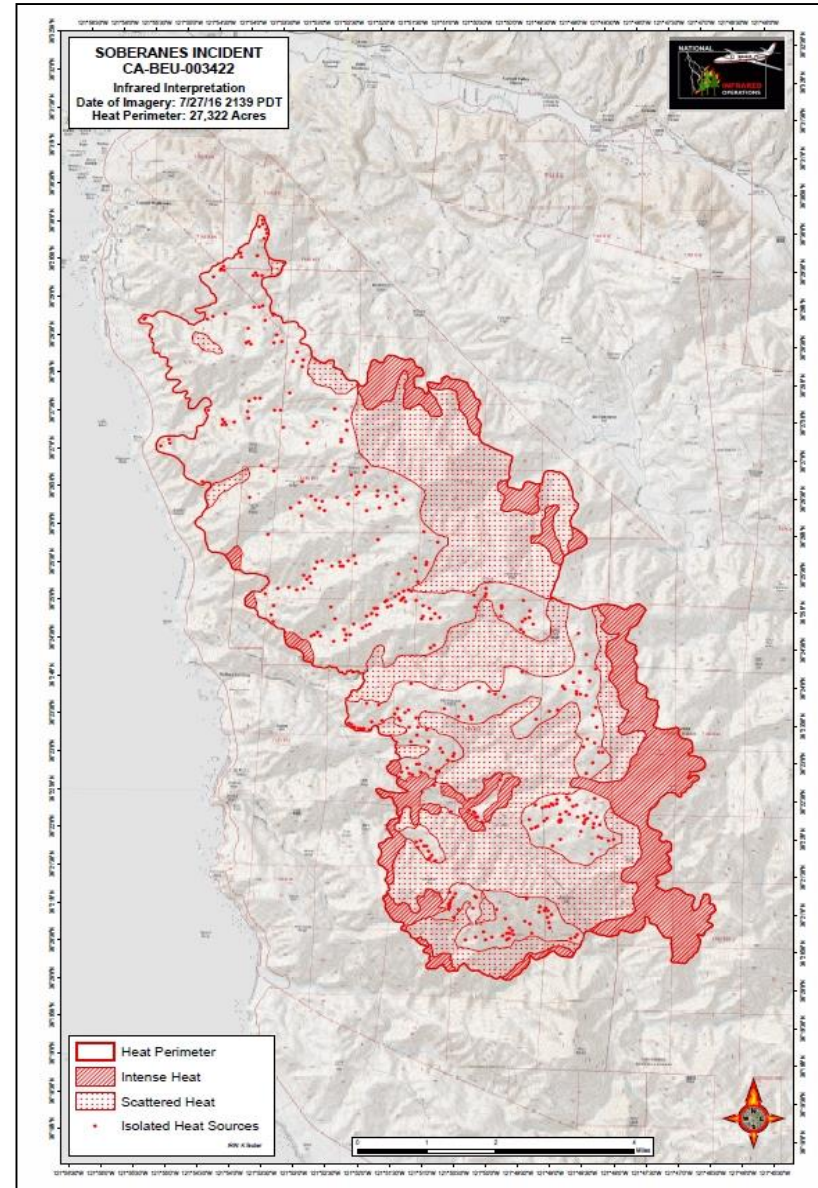
- DoD Imagery supporting USGS/NASA science
- ***Hunga Tonga-Hunga Ha'apai*** is the first island of this type to erupt and persist in the modern satellite era, it gives scientists an unprecedented view from space of its early life and evolution
- The new study offers insight into its longevity and the 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)

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.



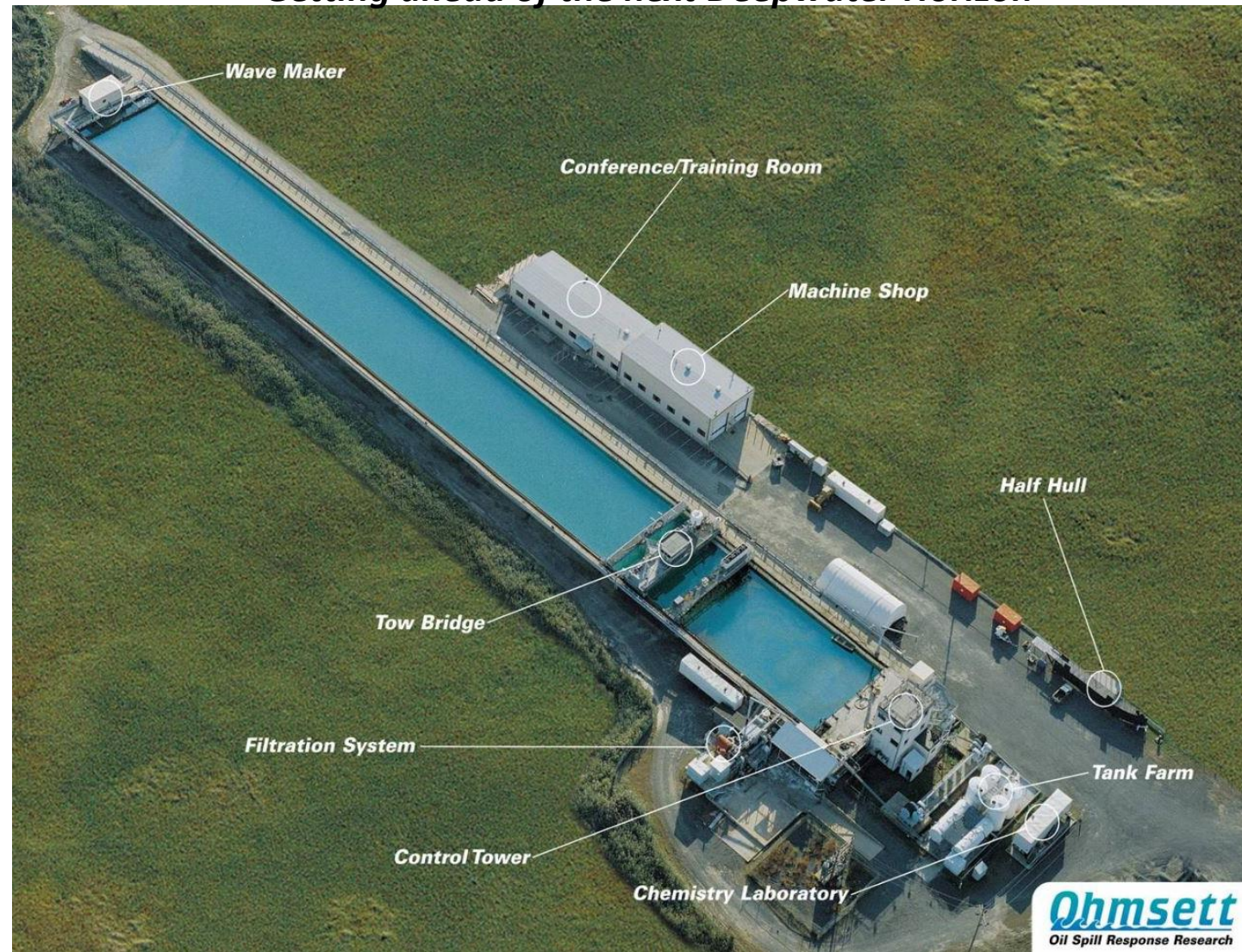


Oil Spill Research and Testing

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





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

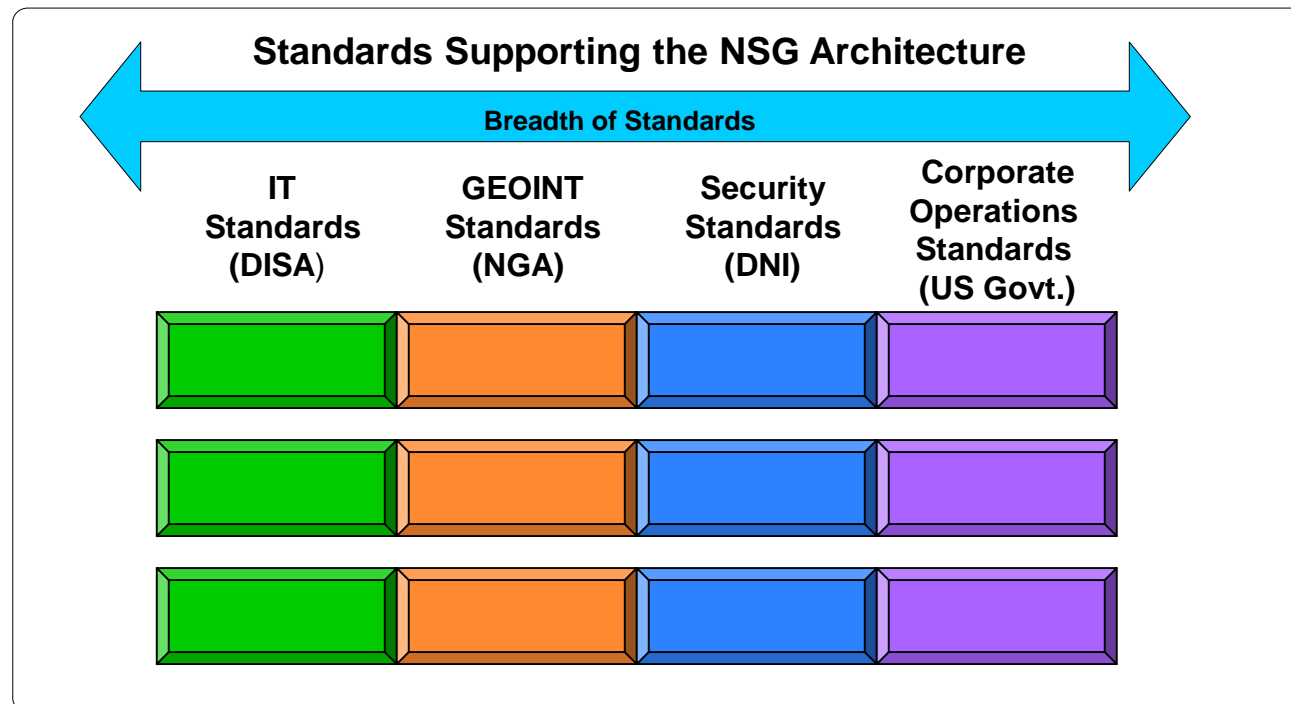


Ocean Surface Topography Mission on JASON-2 Satellite



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"





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



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

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

Civil Applications Committee

Overview Content People Subspaces and Projects Reports

All Places Spaces Projects

Type to filter by text

Filter by tag

Sort by latest activity: newest first

(U//FOUO) Civil Applica...



Followers
20

Sub-spaces
1

FOUO space for members of the Civil Applications Committee.

CAC Disaster Response Hub



Followers
11

A hub for information based on emails disseminated by GI...

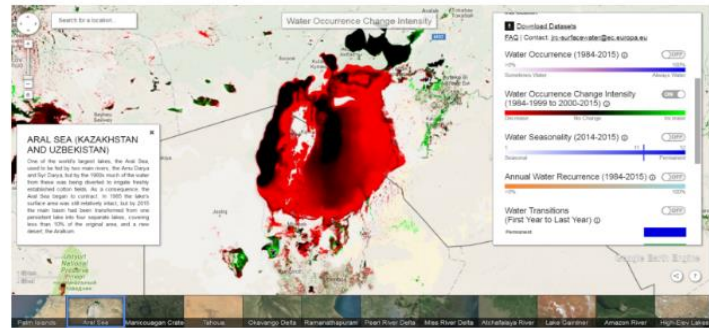
Daniel Opstal Dec 15, 2016 3:00 PM

Global Surface Water Explorer

All,

Those in the water/hydrologic community (a large percentage of the USGS workforce and many others) should appreciate the tool below created Google Earth Engine. Using a variety of toggles (see the image below), you can look at trends over time with respect to seasonality, intensity, & image below is of the Aral Sea (located in Kazakhstan and Uzbekistan).

<https://global-surface-water.appspot.com/>



Here is a fascinating article on the subject as well from the NY Times - "Mapping Three Decades of Global Water Change":

**Hosts FEMA/USDA Disaster
Community Data**

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



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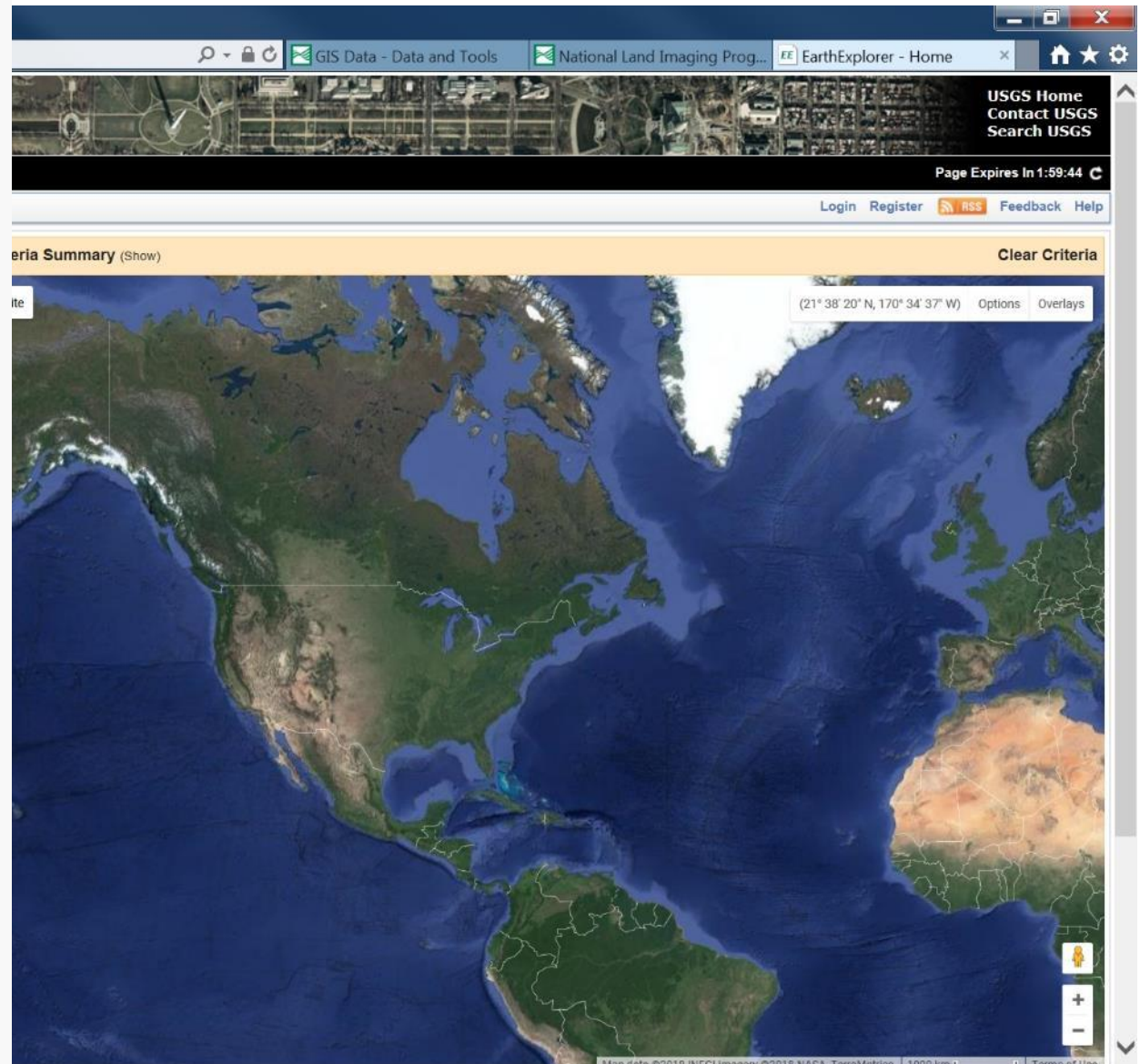


Backup Slides



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/>

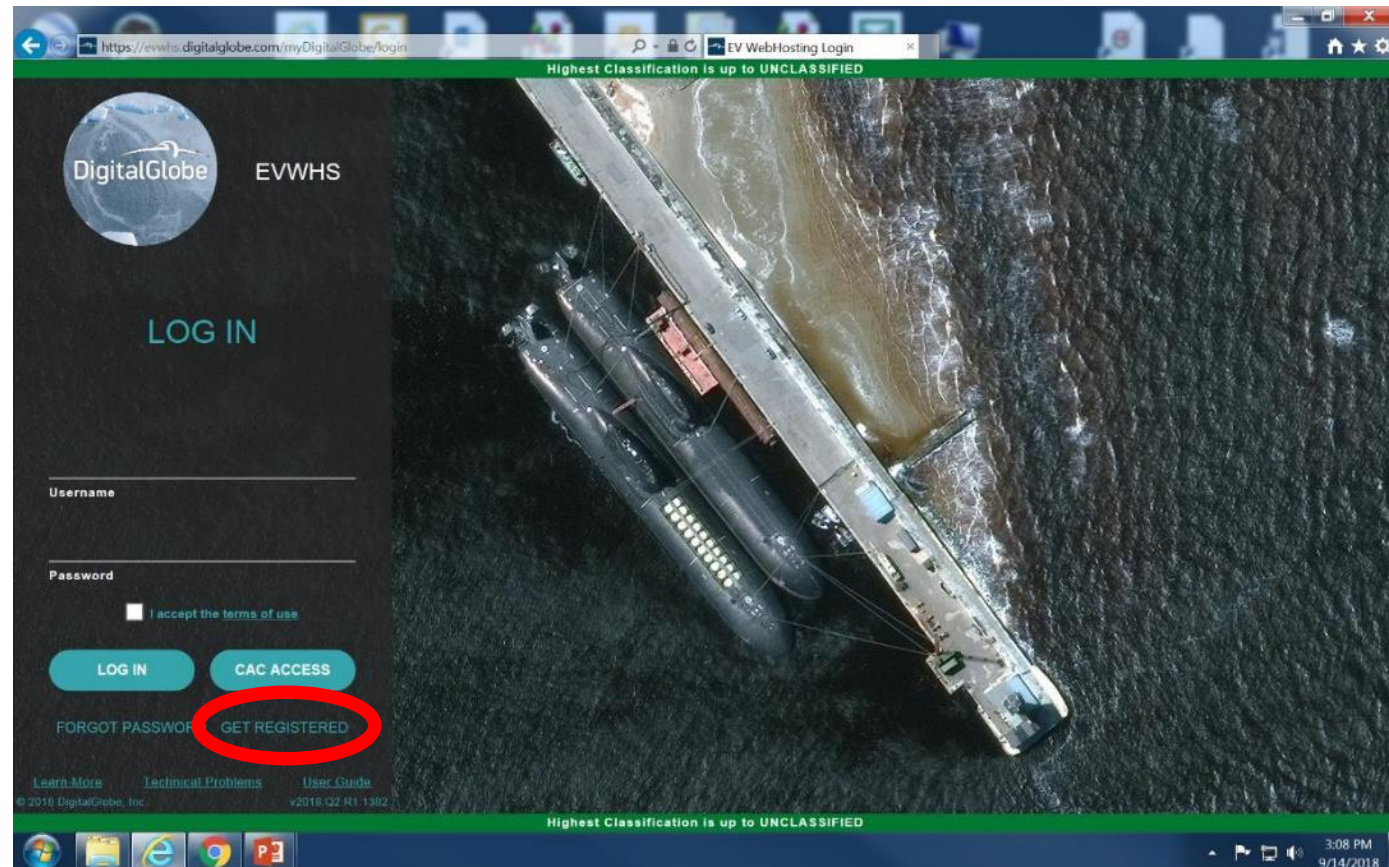
Enhanced View Web Hosting Service Access

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)



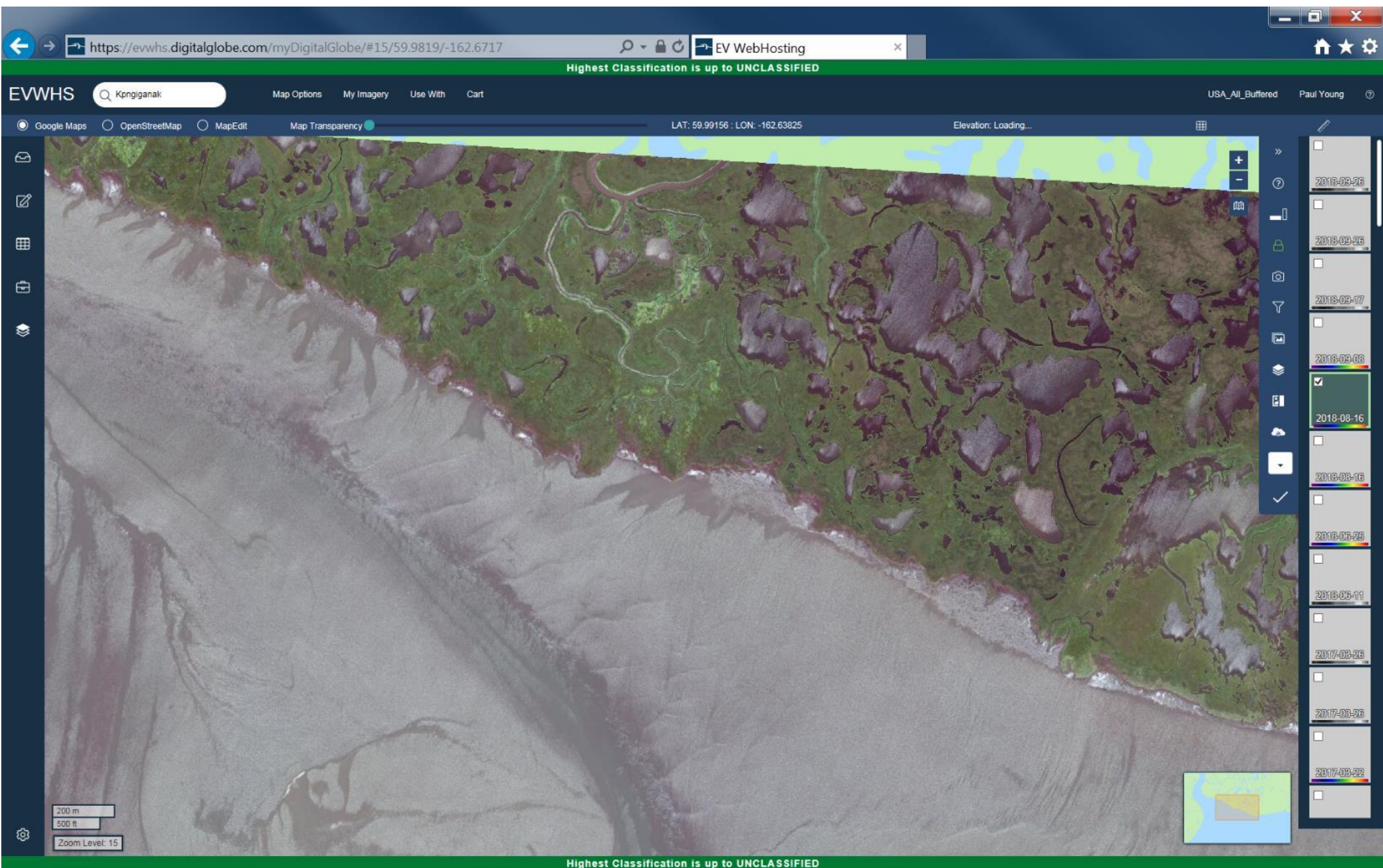
Browser address bar: <https://evwhs.digitalglobe.com/myDigitalGlobe/Console.html#3/0.00/0.00> EV WebHosting

EWWS Map Options My Imagery Use With Cart USA_All_Buffered Paul Young

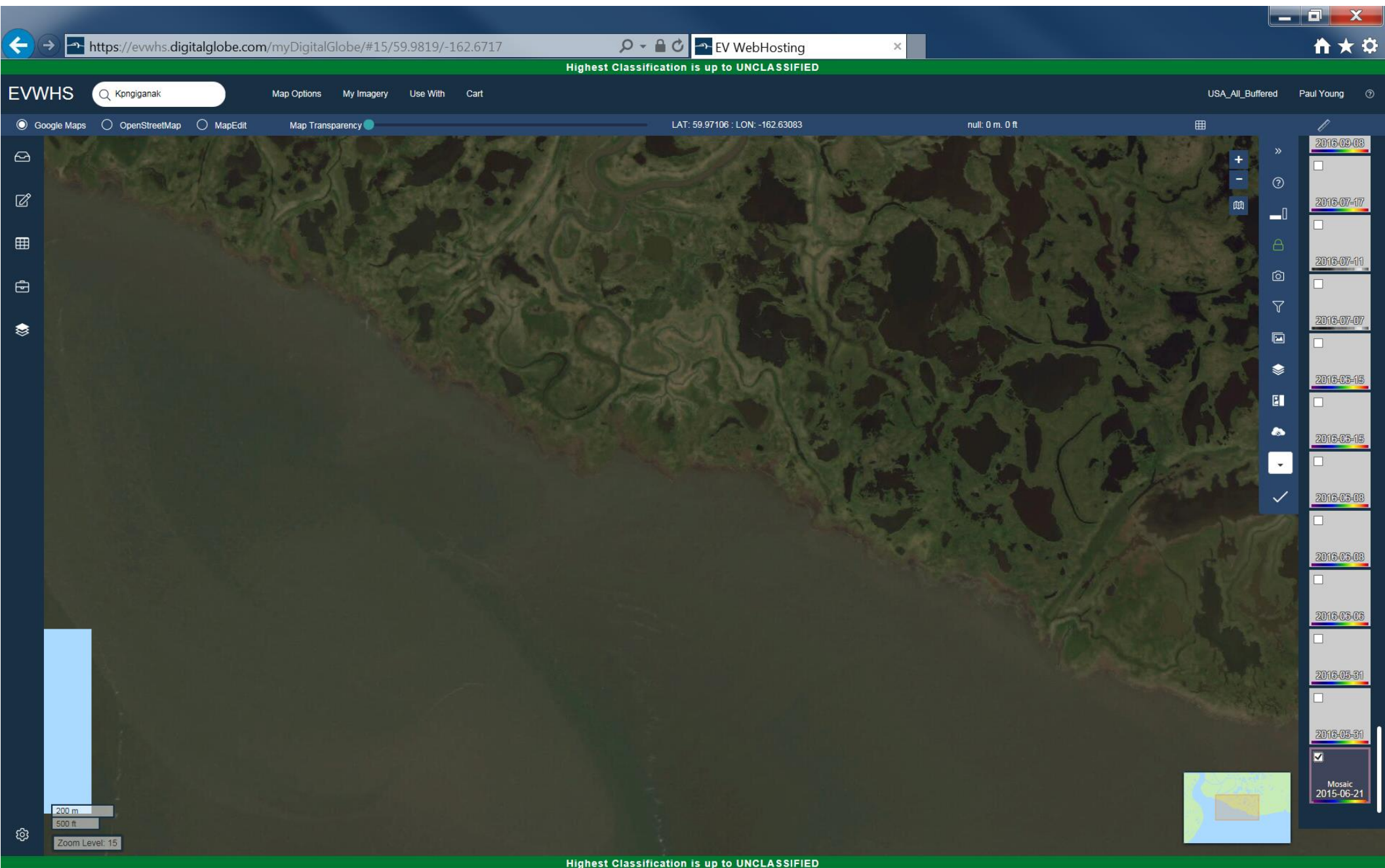
Google Maps MapEdit Map Transparency LAT: 62.26792 LON: -43.94531 Elevation: N/A

Scale: 1000 km 1000 mi Zoom Level: 3

Highest Classification is up to UNCLASSIFIED



Yukon River Delta, August 16, 2018



Yukon River Delta, June 21, 2015

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)



The screenshot shows the USGS logo at the top left with the tagline "science for a changing world". To the right is a navigation bar with links: "USGS Home", "Contact USGS", and "Search USGS". Below this is a dark blue header for the "CRSSP Imagery-Derived Requirements (CIDR) Tool". A grey navigation bar contains links: "Home", "User's Guide", "What's New", and "CRSSP Website". The main content area has a large blue heading "Welcome to the CRSSP Imagery Derived Requirements (CIDR) Tool". Below this, it says "With this tool, you can" followed by a bullet point: "• Enter CRSSP Data Requirements (Federal Users)". A note states: "Note: This system is not a recommended tool for entering sensitive requirements." Below the note, it says: "To login, click the login button below. You will be taken to the authentication portal and will be redirected back to CIDR upon successful login." There is a "Login" button. Below the button, it says: "Data entry assistance or questions: 1-800-252-4547, (M-F, 8-4 Central Time) Email: cidr@usgs.gov". At the bottom, there are three satellite imagery examples: 1. "WorldView-2 © DigitalGlobe" showing "Matlacha Pass Aquatic Preserve, FL" dated "12/28/2010". 2. "IKONOS-2 © DigitalGlobe" showing "Galveston, TX" dated "11/11/2003". 3. "QuickBird-2 © DigitalGlobe" showing "San Diego, CA" dated "03/09/2002".

<https://cidr.cr.usgs.gov>