

USGS Natural Hazards Response

Natural Hazards Response and Hazard Data Distribution System

Bob Bewley

USGS Office of Natural Hazards Response and Geospatial Data Delivery

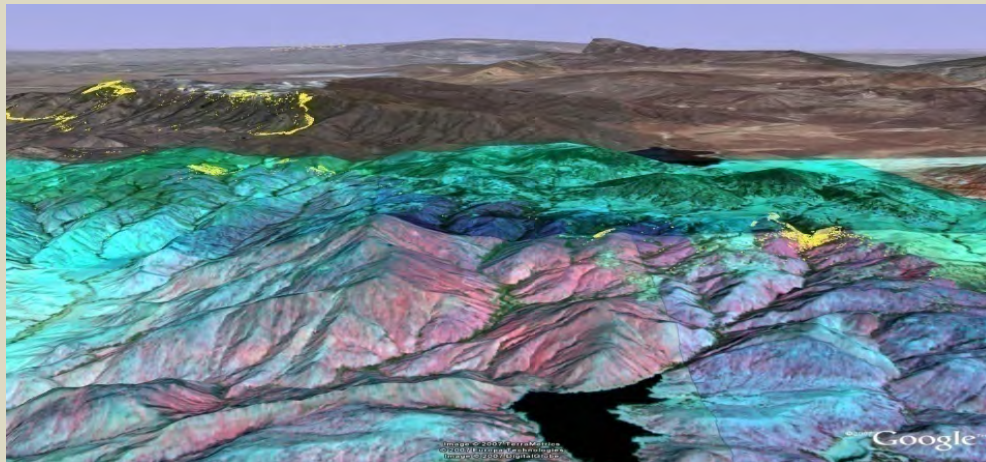
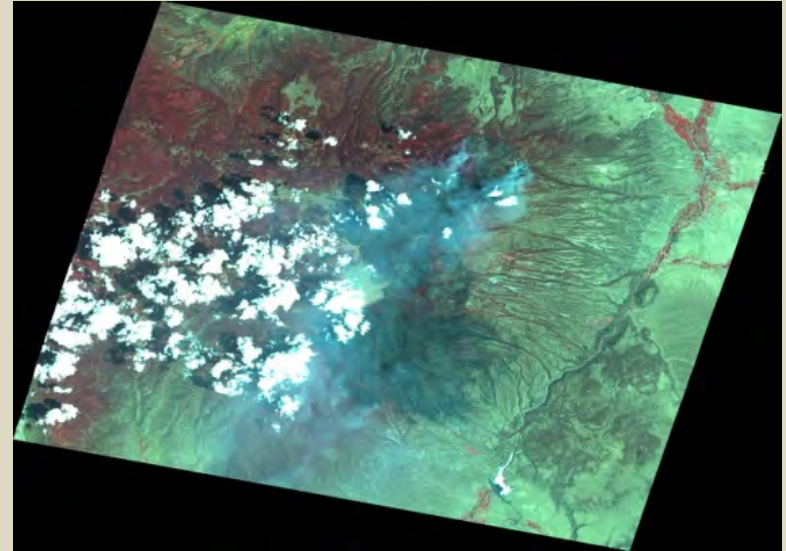
Overview

- Office of Natural Hazards Response & Geospatial Data Delivery
- Natural Hazards Response
- Hazard Data Distribution System (HDDS)



Office of Natural Hazards Response & Geospatial Data Delivery

- Agency Coordination
- Geospatial Data Delivery
- Coordinate Emergency Imagery Acquisition and Delivery
- Support for Deployed Geospatial Experts
- Develop and Distribute Custom Time Sensitive Products
- Provide Support for DOI OEM



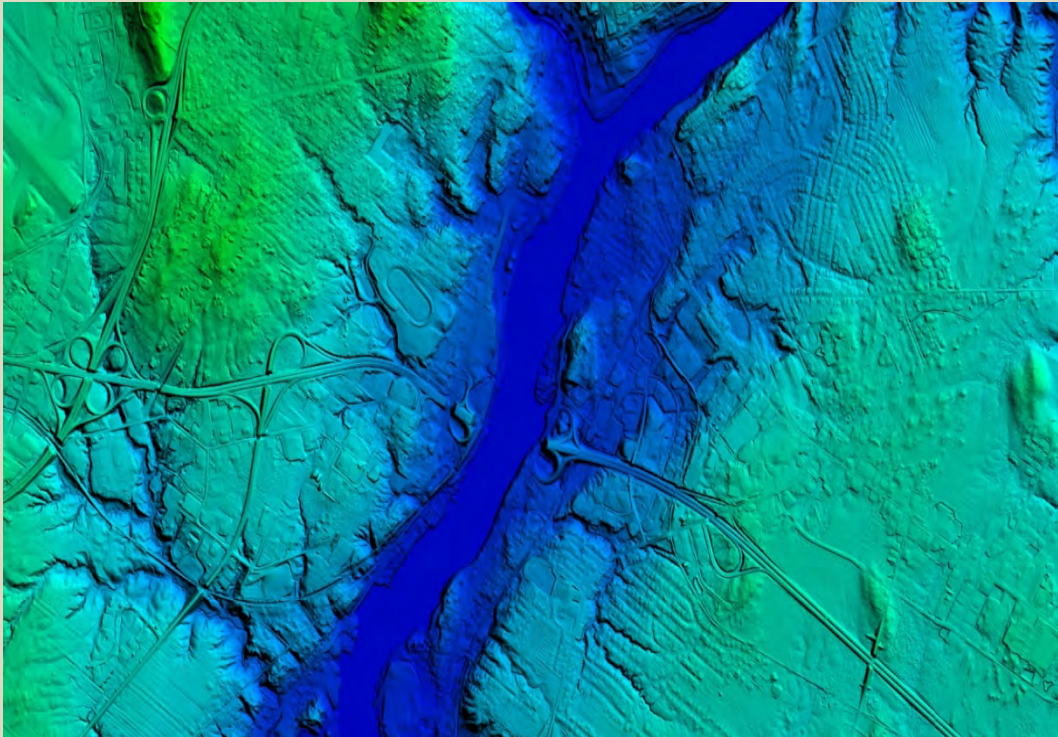
Interagency Coordination

- **USDA/DOI**
 - **FS/RSAC/NIROPS**
 - **IOC – Emergency Response Surge Support**
 - **National Interagency Fire Center**



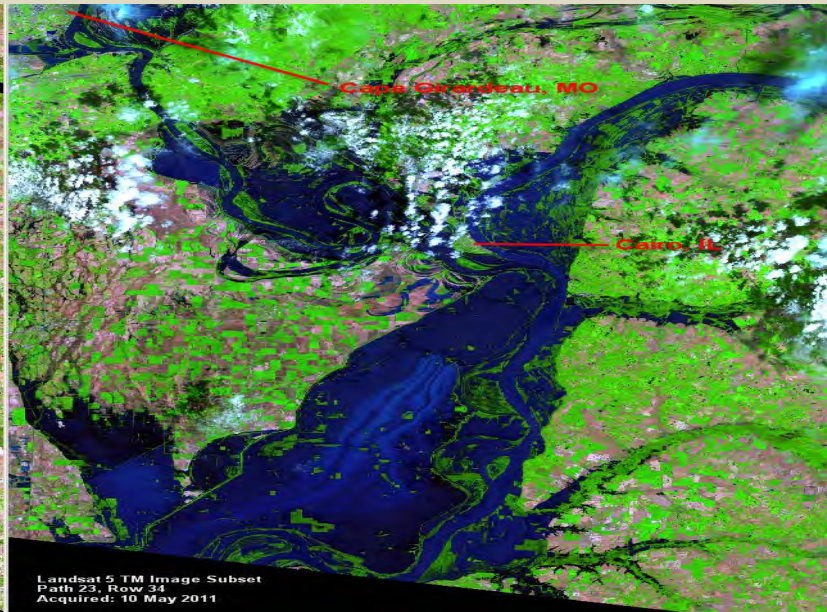
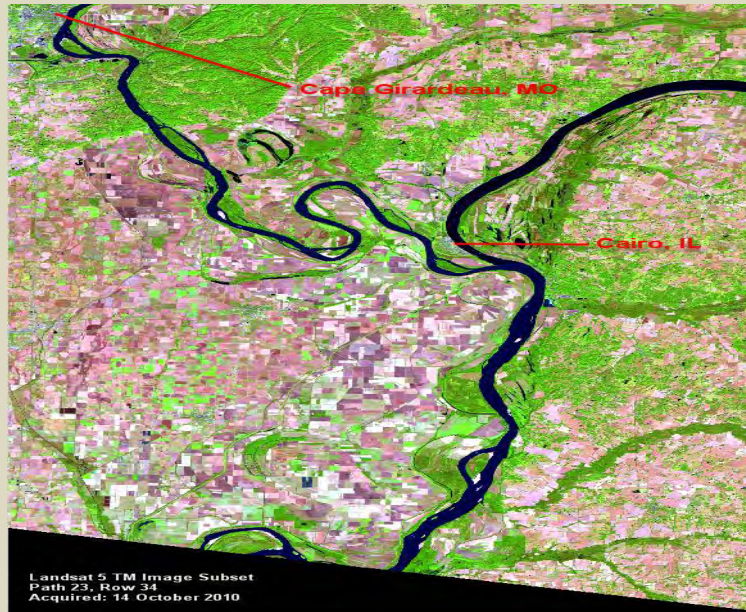
Geospatial Information Response Team (GIRT)

- Facilitate the effective collection, storage, and dissemination of geospatial data to first responders
- Ensure that geospatial data are available for use by emergency responders, land and resource managers in a timely manner.



USGS Geospatial Liaisons

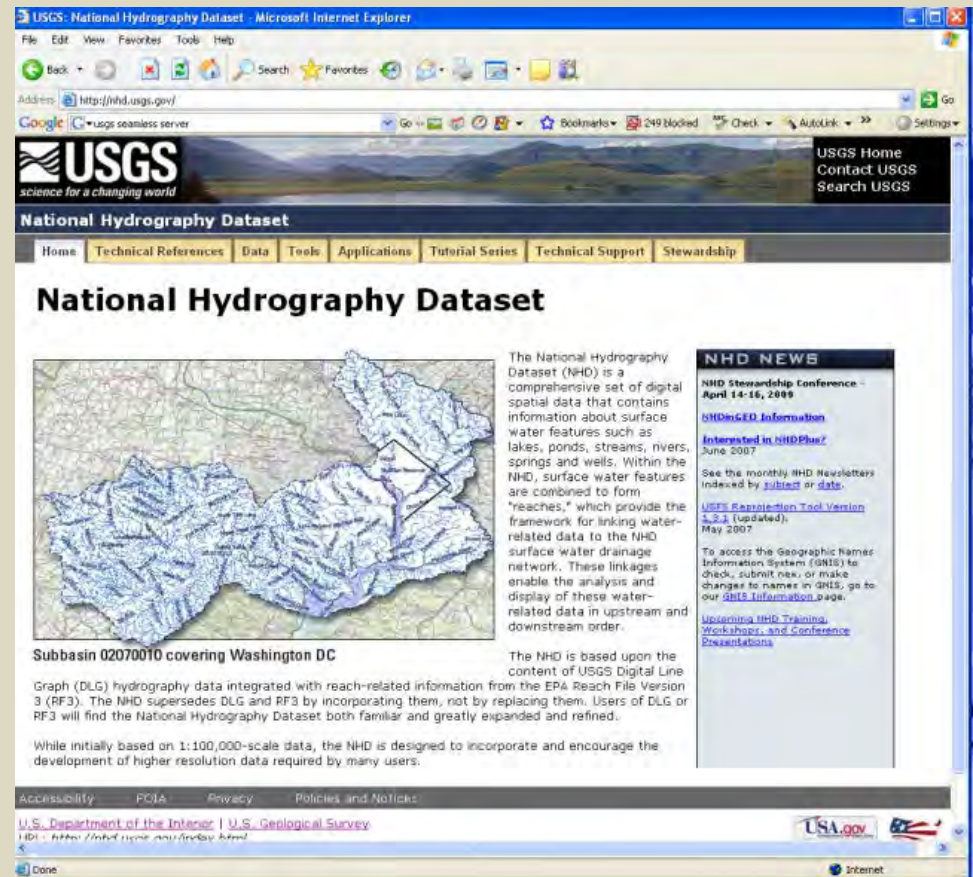
- Established for each State to engage and support State, local, Tribal, regional, Federal and other partners in improving timeliness, quality and accessibility of USGS geospatial data for the community.
- Assist agencies during disasters or emergencies that affect their jurisdiction
- Southeast and Gulf Coast Representatives



National Geospatial Information

The National Map Datasets

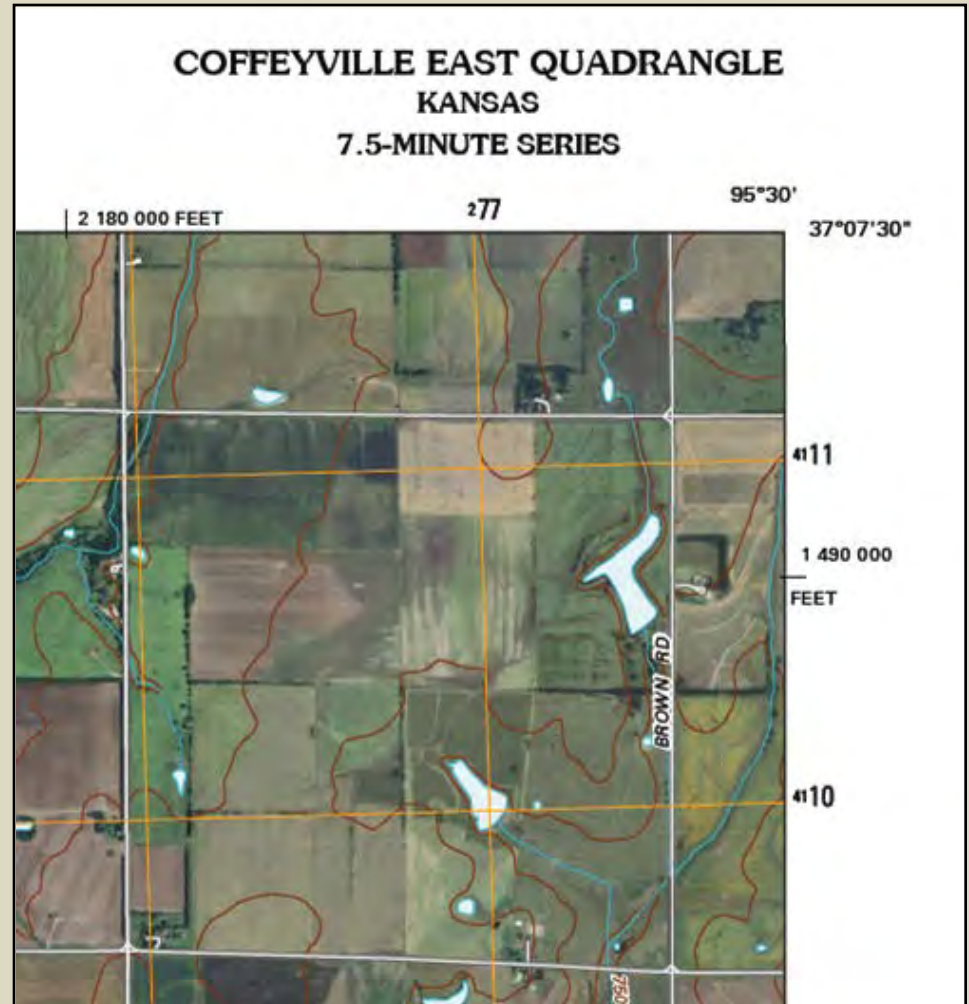
- Digital Orthoimagery
- Elevation
- Geographic Names
- Hydrography
- Land Cover
- Structures
- Transportation
- Boundaries



US Topo

■ USGS topographic map product

- ✓ Built from *The National Map* data
- ✓ Digital
- ✓ GeoPDF Format
- ✓ Available free on the Web
- ✓ Image base
- ✓ Core feature layers
- ✓ Regular update

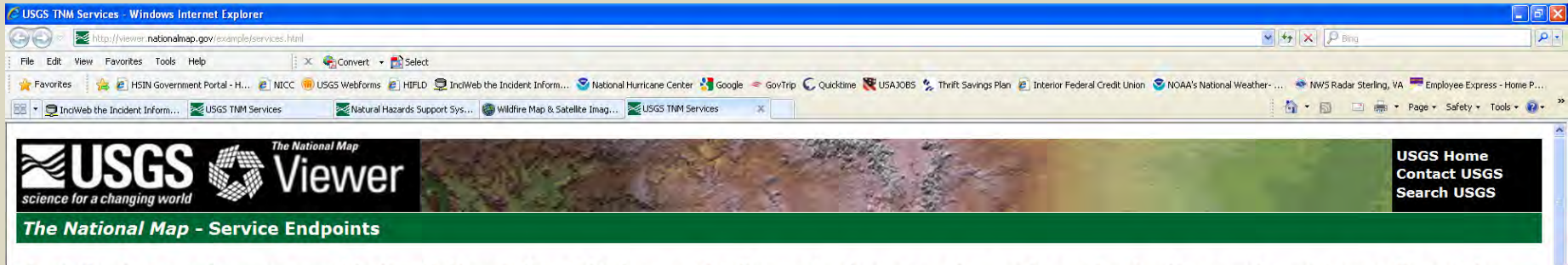


New Products

- Imagery-Topo cached web basemap that will look very much like US Topo.
- Working on a US Topo data bundle that would offer the cartographically styled data layers for ingest into a GIS.
- GeoPDF format will be made more available as a product supported by GIS.
- No plans at this time to make the product available as a GeoTIFF there is an open source SW product, GDAL (<http://www.gdal.org/>) that can take a GeoPDFf and create a GeoTIFF. In the GeoTIFF format you cannot turn on and off the various layers, but the conversion can take place after you have selected the layers you want to be displayed.
- Essentially GeoPDF is not a format designed for the GIS user but rather the non-GIS user. Our other products are for the GIS user; i.e. the web basemap, map services and data download packages.

Web Map Services

http://nationalmap.gov/services



The following services are used in the National Map 2.0 viewer. The 'Layers' column queries each service for the number of layers it contains. The 'Legend' column links to a page that displays the legend icons for the selected layer.

Background Maps

Name	Type	URL	Layers	Legend
Shaded Relief - Small Scale	tilled	http://raster1.nationalmap.gov/ArcGIS/rest/services/TNM_Small_Scale_Shaded_Relief/MapServer	3	
Shaded Relief - Medium Scale	tilled	http://raster1.nationalmap.gov/ArcGIS/rest/services/TNM_Medium_Scale_Shaded_Relief/MapServer	6	
Shaded Relief - Large Scale	dynamic	http://raster.nationalmap.gov/ArcGIS/rest/services/TNM_Large_Scale_Shaded_Relief/MapServer	4	
Vector Fills - Small Scale	tilled	http://basemap.nationalmap.gov/ArcGIS/rest/services/TNM_Vector_Fills_Small/MapServer	36	
Vector Fills - Large Scale	dynamic	http://services.nationalmap.gov/ArcGIS/rest/services/TNM_Vector_Fills_Large/MapServer	10	
Vector Base Map - Small Scale	tilled	http://basemap.nationalmap.gov/ArcGIS/rest/services/TNM_Vector_Small/MapServer	73	
Vector Base Map - Large Scale	dynamic	http://services.nationalmap.gov/ArcGIS/rest/services/TNM_Vector_Large/MapServer	60	
Imagery - Small Scale	tilled	http://raster1.nationalmap.gov/ArcGIS/rest/services/TNM_Small_Scale_Imagery/MapServer	2	

Hazards Data Distribution System (HDDS)

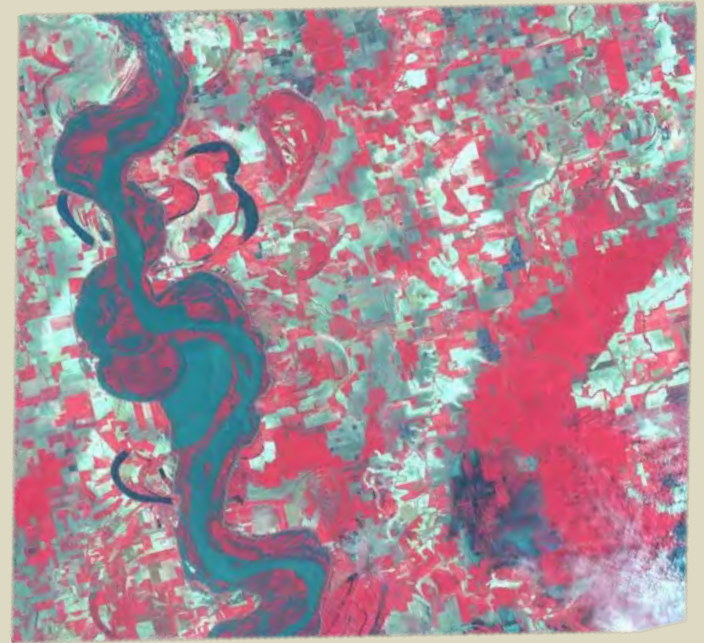
HDDS provides a single point-of-entry for access to the USGS-hosted datasets related to emergency response.

Imagery to Support Emergency Response

- FY12, HDDS has distributed imagery for 57 emergency events; 33 domestic, 24 international

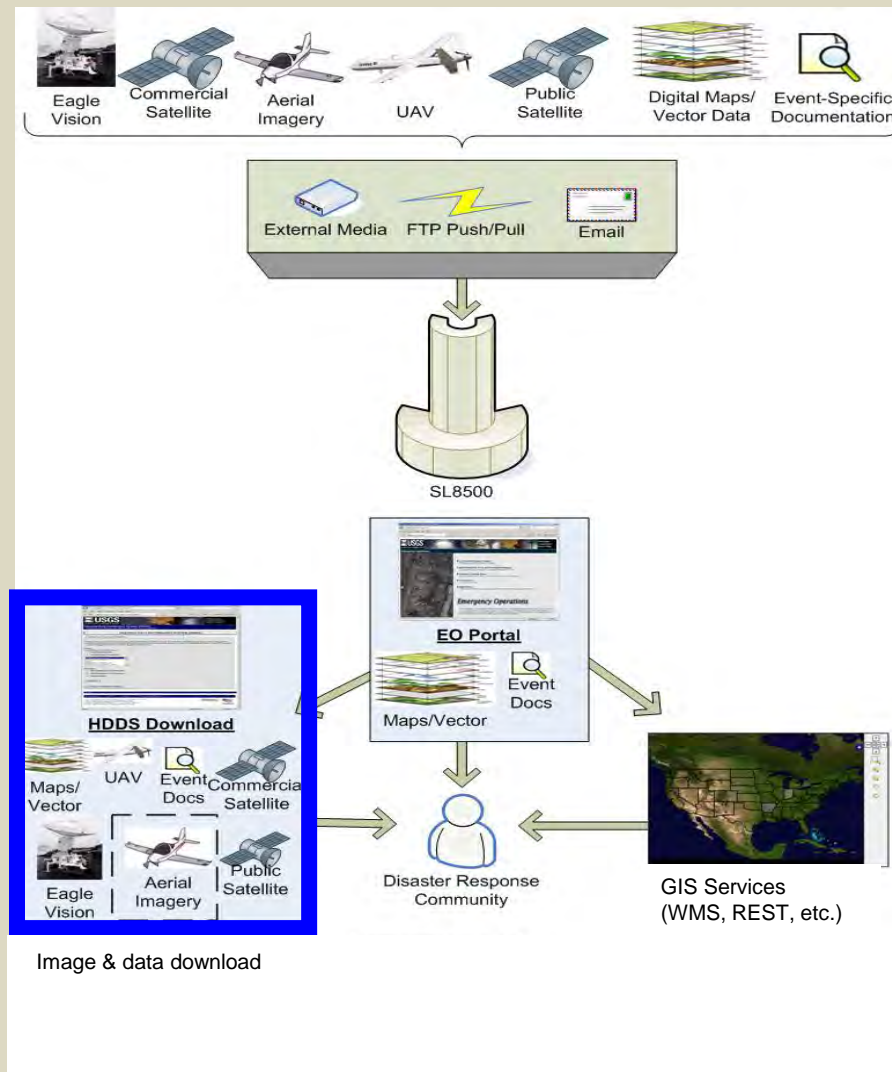
Geospatial Data

- HDDS currently serves 135 Terabytes data representing over 4.5 million files



*5/19/2011 SPOT-5 of Rolling Fork, MS
Collected via the Eagle Vision Program
© CNES 2011, Distribution Astrium Services / Spot Image S.A.,
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Hazards Data Distribution System (HDDS)



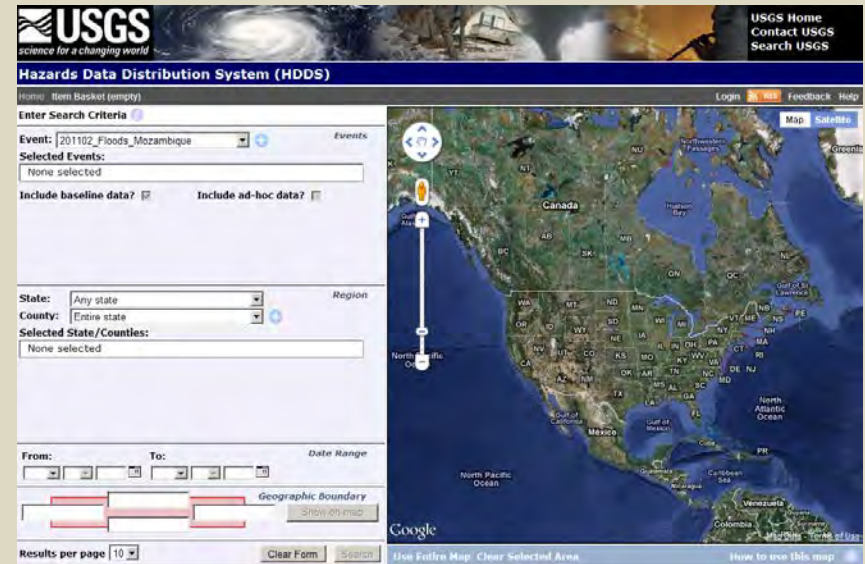
Hazards Data Distribution System (HDDS)

- The HDDS provides a consolidated storage and point-of-entry system for access to the USGS-hosted datasets related to emergency response.
- HDDS supports two access categories:
 - **Public** – unrestricted access for general public
 - **Restricted** – password-protected access for designated emergency response personnel. Generally contains licensed data not intended for public use.
- All requests for Restricted access are submitted and approved on event-by-event basis.
 - Requested online through HDDS interface: <http://hdds.usgs.gov/hdds2/>

HDDS - Graphical Interface

■ Features

- Interactive map-based interface (HDDS2)
- Graphical data viewing with browse and footprint area overlay
- Search by event, location, date
- Extensive metadata reporting in multiple formats (e.g. CSV, KML, shapefiles, etc.)
- Includes storage and directory-based access for all non-ingested (“ad hoc”) datasets
- RSS feeds for newly ingested data
- Registration and login access for ‘Public’ and ‘Restricted’ datasets
- Bulk delivery capability via downloadable web-based client



<http://hdds.usgs.gov/hdds2/>

Hazards Data Distribution System (HDDS)

HDDS Supported Events (FY 2012)

FY 2012 Events (Total = 71)

201209_Fires_WA	201207_NRDA	201204_Fires_VA
201209_Floods_South_Sudan	201207_Training_CAP	201204_Tornadoes_TX
201209_Floods_Pakistan	201207_Fires_UT	201204_Fires_CO
201209_Fires_Ecuador	201207_Floods_Russia	201203_Cyclone_Irina
201209_Landslide_India	201207_Fires_MT	201202_Floods_Algeria
201209_Floods_Cameroon	201207_Floods_India	201202_Tornadoes_Central_US
201209_Earthquake_China	201206_Fires_NM	201202_GasExplosion_AK
201209_Seep_LA	201206_Fires_WY	201202_Volcano_Semeru
201208_Floods_Nigeria	201206_TropicalStorm_Debby	201202_Floods_Peru
2012_HSIP_Freedom	201206_Floods_MN	201202_Cyclone_Giovanna
201208_Floods_Niger	201206_Fires_AZ	201202_NRDA_BigBend_FL
201209_Floods_Senegal	201206_Volcano_Guatemala	201202_Landslide_AK
201209_Hurricane_Isaac	201206_Fires_CO	201201_Fire_NV
201208_Fires_Algeria	201205_Fires_NV	201201_Floods_Brazil
201208_Fires_OK	201205_Fires_NM	201112_Fires_Chile
201208_Fires_NV	201205_Snowmelt_AK	201112_NRDA
201208_Fires_ID	201205_Fires_CO	201111_Fires_Reno
201208_Fires_CA	201205_Fires_AZ	201111_Storm_Ak
201208_Floods_Philippines	201205_Fires_TX	201110_Floods_Thailand
201207_Exercise_CA	201205_Floods_China	201110_Earthquake_Turkey
201207_Fires_SD	201205_Hurricane_LA_TX_TEST	201110_Volcano_AK
201207_Fires_NE	201204_NRDA_Louisiana	201110_Oilspill_New_Zealand
201207_Fires_OR	201204_VMOC_Demo	201110_Floods_Algeria
201207_DNC	201204_Tornadoes_Central_US	

HDDS Support: FY 2012 Fire Incidents

■ **FY 2012 Fire Support**

■ HDDS Events and Associated Incidents

201209_Fires_WA: 6 images (Cascade Creek)

201209_Fires_Ecuador: 9 images

201208_Fires_OK: 1 image (McNac, Freedom Hills)

201208_Fires_NV: 10 images (Holloway, Bull Run Complex, Frasier)

201208_Fires_ID: 7 images (Trinity Ridge, Tindall, Flat Top 2)

201208_Fires_CA: 5 images (Salt Creek, Clear Fire / Piute Complex, Fort Complex, Ponderosa, Reading)

201208_Fires_Algeria: 330 images

201207_Fires_SD: 24 images (Myrtle, Longhorn Complex, Wellnitz Fire)

201207_Fires_NE: 50 images (North Central NE, Ash Creek, Fairfield Creek, Region 23 Complex (Douthit, West Ash))

201207_Fires_OR: 7 images (Benwalk, South Indian, Kinyon Road, Jacks, Long Draw, Miller Homestead, Barry Point, Waterfalls 2, Parish Cabin)

201207_Fires_UT: 20 images (Quail Fire, Seely Fire, Wolf Den)

201207_Fires_MT: 38 images (Ash Fire, Sarpy Hills Complex, Rosebud Creek Complex, Millie, Prisoner Lake, Eagle Creek)

201206_Fires_WY: 811 images (Arapaho, Squirrel Creek, Oil Creek, Fontanelle, Sawmill Canyon, Alpine Lake, Horsethief Canyon)

201207_Fires_AZ: 13 images (Fox Fire, Poco Fire)

201206_Fires_CO: 2914 images (Waldo Canyon, High Park, Flagstaff)

201206_Fires_NM: 271 images (Whitewater-Baldy Complex, Little Bear)

201205_Fires_NV: 2 images (Lake Topaz Fire)

201205_Fires_AZ: 59 images (Bull Flat, Sunflower, Gladiator)

HDDS Support: FY 2012 Fire Incidents

- **FY 2012 Fire Support (cont.)**

- HDDS Events and Associated Incidents

- 201205_Fires_CO: 75 images

- 201205_Fires_TX: 4 images (Livermore Ranch Complex)

- 201204_Fires_VA: 13 images (Easter Complex)

- 201204_Fires_CO: 38 images (Lower North Fork)

- 201201_Fires_NV: 8 images (Washoe)

- 201112_Fires_Chile: 83 images

- 201111_Fires_Reno: 21 images

- Number of HDDS Events (total): 25

- Number of Fire Incidents (total): 70

- Number of images (total; tiles): 4819

HDDS Support: FY 2012 Fire Support

- **FY 2012 Fire Support**

- Available Imagery:

- Aerial Photography (CAP) – ***PUBLIC***
 - Landsat 5 TM – ***PUBLIC***
 - Landsat 7 ETM+ – ***PUBLIC***
 - Terra ASTER – ***PUBLIC***
 - EO-1 Advanced Land Imager (ALI) – ***PUBLIC***
 - International Space Station (ISS) – ***PUBLIC***
 - SPOT 4/5 (acquired via USAF EagleVision) – ***RESTRICTED***
 - WorldView-1/2 (acquired via NGA) – ***RESTRICTED***
 - GeoEye-1 (acquired via NGA) – ***RESTRICTED***
 - IKONOS-1(acquired via NGA) – ***RESTRICTED***
 - QuickBird-2 (acquired via NGA) – ***RESTRICTED***

US Air Force EagleVision

- The DoD's ONLY Deployable, Commercial Imagery Ground Station
- Directly Receives and Processes Critical Imagery Data
- Will provide support without Federal declaration
- Provide capability for rapid tasking and license uplift for disaster response

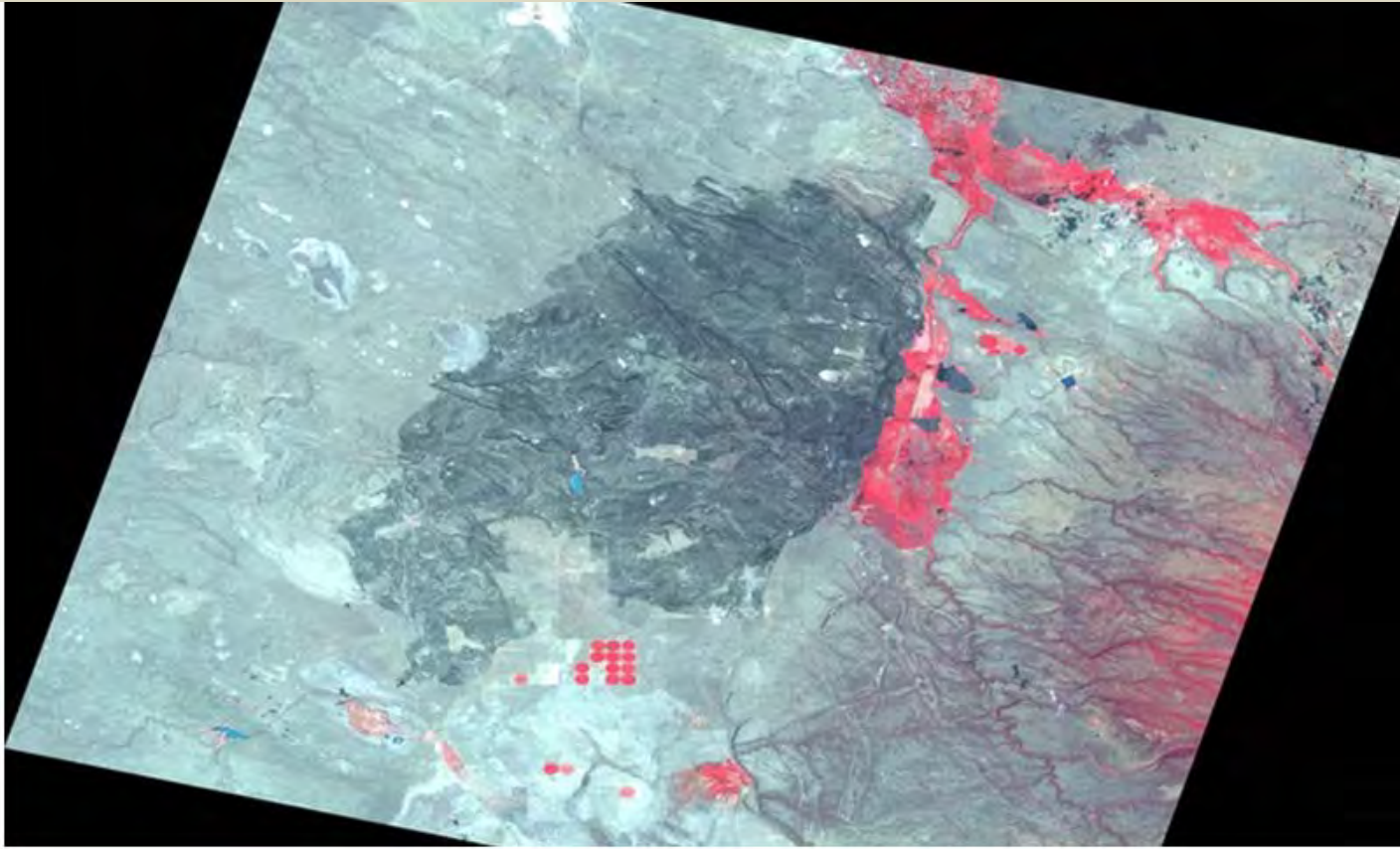


USAF EagleVision: Current Satellites

- SPOT 2: 10M Pan 20M Multi (France)
- SPOT 4: 10M Pan 20M Multi (France)
- SPOT 5: 2.5 Pan 5M Pan 10M Multi (France)
- RADARSAT: 8M (Canada)
- RADARSAT2: 3m (Canada)
- IKONOS: 1M Pan (US) (*EV 5 only*)
- RAPIDEYE: 5M (Germany)

HDDS Support: Example Fire Imagery

- **SPOT-5 (MSI) acquired via USAF EagleVision**
 - HDDS Event: 201107_Fires_OR



HDDS Support: Example Fire Imagery

- **Civil Air Patrol (CAP)**
 - HDDS Event: 201106_Fires_CO



*Example: Oblique aerial image from Colorado Civil Air Patrol (CAP)
(Waldo Canyon Fire, acquired July 10, 2012)*

HDDS Support: Example Fire Imagery

- NASA International Space Station (ISS) Imagery
 - HDDS Event: 201208_Fires_Algeria
 - 3-band imagery (RGB), 20m

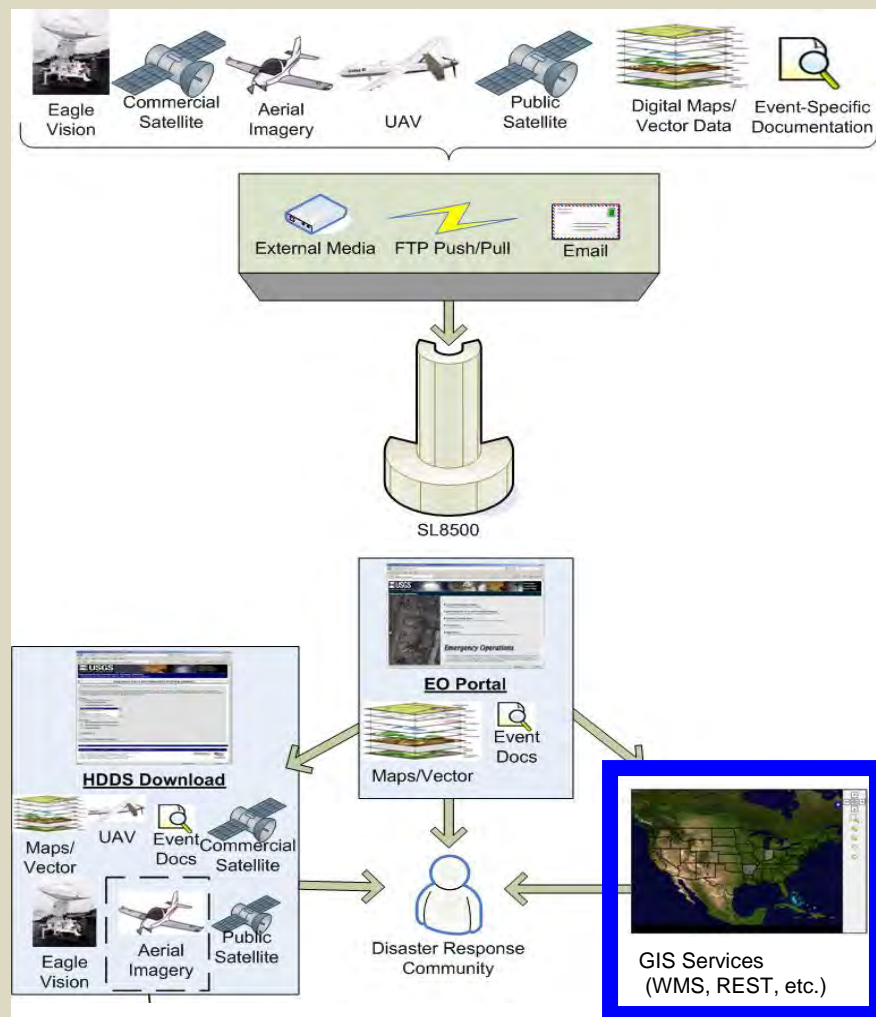
The screenshot displays the USGS Hazards Data Distribution System (HDDS) interface. At the top, the USGS logo and tagline "science for a changing world" are visible. Below this, the title "Hazards Data Distribution System (HDDS)" is prominently displayed. The page includes navigation links for "Home", "Item Basket (empty)", "Login", and "Register". A search bar is present with the text "Redefine Search Criteria" and "Results per page: 50 100 250".

The "Search Results" section shows the following filters:
Event: 201208_Fires_Algeria
Platform: AERIAL
Agency: NASA
Buttons: Clear Filter, Apply Filter

The "Ingested Data" section displays "Results 1 - 7 of 7" and "Filtered results for: AERIAL/NASA". Two data entries are shown, each with a thumbnail, ID, Acquisition Date, Platform, Sensor, Agency, File Format, and options for Footprint, Browse, and Download.

The main map area shows a satellite image of Algeria with a large, semi-transparent, multi-colored polygon overlaid, representing the fire event. The map includes labels for various locations such as Oued El Kheir, Mesra, Relizane, and Oued El Abtal. The bottom of the page features links for "Accessibility", "FOIA", "Privacy", "Policies and Notices", and "Google Maps API Disclaimer".

GIS Services



GIS Services

- Supported services:
 - Web Mapping Services (WMS):
 - <http://eoportal.cr.usgs.gov/EO/gis.php>
 - Representational State Transfer (REST) Services:
 - <http://hdds.usgs.gov/ArcGIS/rest/services>
- Datasets include:
 - Baseline (high-res orthoimagery and USGS map layers)
 - Post-event imagery (*limited events only*)

Available Services:

Click a service to show the available layers

- » 200903_MtRedoubt
- » 201001_Earthquake_Haiti
- » 201004_OilSpill_GulfOfMexico
- » 201101_NRDA_DOQQ
- » 201104_Floods_Central_US
- » 201104_US_Midwest_Floods
- » 201105_Tornadoes_MO
- » 201107_NRDA_DOQQ
- » 201108_Hurricane_Irene
- » 201112_NRDA_DOQQ
- » FLOODS_MIDWEST_200806

Emergency Operations: Useful Links

- USGS EO Portal
 - <http://eoportal.cr.usgs.gov/>
- HDDS (Directory View)
 - <http://hdds.usgs.gov/hdds/>
- HDDS (Graphical View)
 - <http://hdds.usgs.gov/hdds2/>
- EO User Quick-Guide
 - <http://eoportal.cr.usgs.gov/EO/library.php>
- International Charter Website
 - <http://www.disasterscharter.org/>

Contact Us



Rynn M. Lamb

Disaster Response Coordinator

USGS/EROS Center

Sioux Falls, SD 57198

Phone: 605.594.6958

Email: lamb@usgs.gov

Brenda K. Jones

Disaster Response Coordinator

USGS/EROS Center

Sioux Falls, SD 57198

Phone: 605.594.6503

Email: bkjones@usgs.gov