

National Discovery Data Coordination Procedure

FINAL

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FEMA

Revision History

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Acronyms and Abbreviations

3DEP	3D Elevation Program
AAL	Average Annualized Loss
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
B/W	Black and White
CAC	Community Assistance Contact
CAV	Community Assistance Visit
CBRS	Coastal Barrier Resources System
CCM	Compressed County Mosaic
CIR	Color Infrared
CIS	Community Information System
CLICK	Center for LiDAR Information Coordination and Knowledge
CNMS	Coordinated Needs Management Strategy
CRS	Community Rating System
CSC	Coastal Services Center
CTP	Cooperating Technical Partners
DEM	Digital Elevation Model
DHS	Department of Homeland Security
DOQ	Digital Orthophoto Quadrangle
DOQQ	Digital Orthophoto Quarter Quadrangle
EROS	Earth Resources Observation and Science
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FTP	File Transfer Protocol
GeoMAC	Geospatial Multi-Agency Coordination
GeoTIFF	Georeferenced TIFF
GIS	Geographic Information System
HMGP	Hazard Mitigation Grant Program
HUC	Hydrologic Unit Code

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IA	Individual Assistance
JALBTCX	Joint Airborne LiDAR Bathymetry Technical Center of Expertise
KML	Keyhole Markup Language
LiDAR	Light Detection and Ranging
LOMA	Letter of Map Amendment
LOMC	Letter of Map Change
LOMR	Letter of Map Revision
MEOW	Maximum Envelope of Water
MIP	Mapping Information Platform
MLI	Midterm Levee Inventory
MOM	Maximum of Maximum
MRLC	Multi-Resolution Land Characterization
MSC	Map Service Center
NAD27	North American Datum of 1927
NAD83	North American Datum of 1983
NAIP	National Agriculture Imagery Program
NAVD88	North American Vertical Datum of 1988
NBI	National Bridge Inventory
NDOP	National Digital Orthophoto Program
NED	National Elevation Dataset
NFHL	National Flood Hazard Layer
NFIP	National Flood Insurance Program
NGA	National Geospatial-Intelligence Agency
NGVD29	National Geodetic Vertical Datum of 1929
NHD	National Hydrography Dataset
NID	National Inventory of Dams
NLCD	National Land Cover Database
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
OFA	Other Federal Agency
PA	Public Assistance
PLSS	Public Land Survey System

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PM	Procedure Memorandum
QQ	Full-Resolution Quarter-Quad Tiles
Risk MAP	Risk Mapping, Assessment, and Planning
RSC	Regional Service Center
SLOSH	Sea, Lake, and Overland Surges from Hurricanes
SOP	Standard Operating Procedure
TIGER	Topologically Integrated Geographic Encoding and Referencing
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator

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Purpose

The Department of Homeland Security's Federal Emergency Management Agency (FEMA) prepared the Geospatial Data Coordination Procedures to outline sources of geospatial data and contact information, preferences for base map data in Flood Insurance Studies, information for the project Discovery stage, and other information for use during the FEMA project lifecycle.

To use the Geospatial Data Coordination Procedures, each Regional Service Center (RSC) maintains State Standard Operating Procedure (SOP) documents that detail how specific datasets within that State should be used for flood hazard mapping and Discovery projects. Some of the data to be used in those projects can be retrieved from national data suppliers, which are typically other Federal agencies (OFAs).

To supplement the State SOP documents, this document, the National Discovery Data Coordination Procedure, provides instructions on the most appropriate data to collect on a national scale for flood hazard mapping and Discovery projects. This information, in conjunction with the State SOPs, is intended to help reduce the level of effort needed to find appropriate project data.

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National Discovery Data Resources

The table below lists the most appropriate data to reference on a national scale for flood hazard mapping and Discovery projects. The FEMA Discovery Data Repository contains downloads for some of the datasets below that are maintained by FEMA. It can be found on FEMA's Mapping Information Platform (MIP) File Explorer at J:\DISCOVERY_DATA_REPOSITORY\NATIONWIDE_DATA.

Data	Agency	Location	In the Discovery Data Repository
Digital Orthophotography	Multi	<p>Refer to the Federal Mapping Program Fact Sheets for the National Agriculture Imagery Program (NAIP) and the Natural Resources Conservation Service/U.S. Department of Agriculture (NRCS/USDA) Geospatial Data Gateway provided in this document.</p> <p>National Oceanic and Atmospheric Administration (NOAA Data Access Viewer) – Imagery</p> <p>USGS Staged Products Directory – JP2 4-Band Tiles</p> <p>https://gis.apfo.usda.gov/arcgis/rest/services - WMS Services</p>	No
Elevation and Bathymetry	Multi	<p>The 3D Elevation Program (3DEP) initiative is being developed to respond to the growing need for high-quality topographic data and for a wide range of other three-dimensional representations of the Nation's natural and constructed features. The primary goal of 3DEP is to systematically collect enhanced elevation data in the form of high-quality Light Detection and Ranging (LiDAR) data over the conterminous United States, Hawaii, and the U.S. territories, with data acquired over an 8-year period. Interferometric synthetic aperture radar (IfSAR) data will be collected over Alaska, where cloud cover and remote locations preclude the use of LiDAR over much of the State.</p> <p>NOAA Data Access Viewer - Elevation</p> <p>Lacking elevation data from other valid, more detailed sources, the U.S. Geological Survey (USGS) Digital Elevation Model (DEM) data can be used. USGS DEM resolution for an area can be determined using the Resolution Layer shapefiles (downloaded from the USGS National Map Viewer) in the Discovery Data Repository. USGS DEM data can be downloaded from the National Map Viewer (3DEP, NED, etc.).</p> <p>Refer to the Federal Mapping Program Fact Sheets at the end of this document for the National Map (3DEP, NED, etc.) and the NOAA Office for Coastal Management.</p>	Yes
Tribal Land Boundaries	BIA	<p>The Bureau of Indian Affairs (BIA) maintains Tribal Land Boundary data nationally. Local data should be reviewed before beginning project work. The BIA does not distribute a Geographic Information System (GIS) layer for Tribal Land Boundaries through its website, but Tribal boundary data can be found in the Discovery Data Repository or through the USGS's National Map, which provides pre-generated downloadable products available in multiple formats (i.e. FTP, Cloud-based, Small-Scale) and at multiple scales.</p>	Yes

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Data	Agency	Location	In the Discovery Data Repository
Federal lands, County and State Boundaries	USGS	Federal, State, county, and jurisdictional boundary data should be verified locally and through the State SOPs. National data can be found in the Discovery Data Repository or through the USGS's National Map, which provides pre-generated downloadable products available in multiple formats (i.e. FTP, Cloud-based, Small-Scale) and at multiple scales.	Yes
PLSS	BLM	The Bureau of Land Management (BLM) maintains Public Land Survey System (PLSS) data nationally. The BLM does not distribute a GIS layer for PLSS. The USGS's National Map provides pre-generated downloadable products available in multiple formats (i.e. FTP, Cloud-based, Small-Scale) and at multiple scales. The PLSS data are dated November 2010 and the data scale ranges from 1:100,000 to 1:2,000,000.	Yes
Transportation	Census	Refer to the Federal Mapping Program Fact Sheets provided in this document for information about Topologically Integrated Geographic Encoding and Referencing (TIGER) data. Data are current as of January 2019. https://www.census.gov/cgi-bin/geo/shapefiles/index.php?year=2019&layergroup=Roads	Yes
Stream Lines and Watershed Boundaries	USGS	The USGS maintains stream line and watershed boundary data in the National Hydrography Dataset (NHD), which can be downloaded directly from a cloud based repository at https://prd-tnm.s3.amazonaws.com/index.html?prefix=StagedProducts/Hydrography/ In addition to the NHD, the USGS's National Map provides pre-generated downloadable products available in multiple formats (i.e. FTP, Cloud-based, Small-Scale) and at multiple scales. The national coverages in the Discovery Data Repository are at a scale of 1:1,000,000. Streams may also be downloaded at a medium resolution (1:100,000), high resolution (1:24,000), and in limited areas, a local resolution (1:5,000).	Yes
CBRS	USFWS	Coastal Barrier Resources System (CBRS) data are maintained by the U.S. Fish and Wildlife Service (USFWS), and an approximate boundary for general reference can be downloaded from https://www.fws.gov/cbra/maps/boundaries.html . The official maps are available at https://www.fws.gov/cbra/maps/index.html . The data are available at a scale of 1:24,000. The approximate boundary is acceptable for Discovery.	Yes

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Data	Agency	Location	In the Discovery Data Repository
Levees	FEMA, USACE	<p>FEMA’s National Flood Hazard Layer (NFHL) depicts levees shown on Flood Insurance Rate Maps (FIRMs) and is available at http://www.fema.gov/national-flood-hazard-layer-nfhl. FEMA also maintains a Mid-term Levee Inventory (MLI), which can be accessed through FEMA’s RSCs.</p> <p>The U.S. Army Corps of Engineers (USACE) National Levee Database (NLD) is available to the public through a web viewer at https://levees.sec.usace.army.mil/#/. USACE is developing a download feature for Mapping Partners to be able to download NLD spatial data for use on Risk Mapping, Assessment, and Planning (Risk MAP) projects. While that is in development, Mapping Partners may obtain NLD data for flood hazard mapping and Discovery by collaborating with the RSC. RSC contact information is listed at https://hazards.fema.gov/femaportal/resources/rsc_contacts.htm.</p>	No
Dams	USACE, USGS	<p>The National Inventory of Dams (NID) database is available for viewing and querying on the NID website at http://nid.usace.army.mil. The NID includes the locations of dams, notes on their structure, and inspection information for 87,000 dams in the United States. The NID is maintained by the USACE. The USGS provides dam locations as a subset of their NHD datasets. See “Stream Lines and Watershed Boundaries” section above.</p>	Yes
Bridges	FHWA	<p>National Bridge Inventory (NBI) data are maintained and distributed by the Federal Highway Administration (FHWA) at https://www.bts.gov/geospatial/national-transportation-atlas-database. FHWA updates ASCII files on a more frequent basis at http://www.fhwa.dot.gov/bridge/nbi/ascii.cfm. FEMA has downloaded the latest available ASCII file (the 2015 release), and it is available in the Discovery Data Repository.</p>	Yes
Stream Gages	USGS	<p>The USGS maintains stream gages across the Nation, with a variety of information for each gage station. Search for gages and download information from http://waterdata.usgs.gov/nwis/inventory. Data are also available as a Keyhole Markup Language (KML) file from USGS at http://waterwatch.usgs.gov/new/?m=real&w=kml, and the USGS provides stream gage locations as a subset of their NHD datasets. See “Stream Lines and Watershed Boundaries” section above.</p>	Yes
Wave Data	NOAA	<p>NOAA’s buoy datasets at https://www.ndbc.noaa.gov can be helpful for wave gages, wind, and other measurements. Click a buoy on the NOAA map to be taken to that buoy’s data download section for specific information.</p> <p>USACE Wave Information Studies (WIS) data are no longer publicly available along the entire U.S. coastline; however, select wave data are available for download at https://frfdataportal.erdc.dren.mil/.</p>	No

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Data	Agency	Location	In the Discovery Data Repository
Tide Gages	NOAA	Tide gage station data are available from NOAA and can be found at https://www.tidesandcurrents.noaa.gov/map/index.html (searchable by map) and here: https://tidesandcurrents.noaa.gov/stations.html?type=Water+Levels (searchable by station name or ID). NOAA also provides various services to download data here: https://www.tidesandcurrents.noaa.gov/web_services_info.html . These data can be downloaded in a variety of formats; from 6-minute to monthly intervals and referenced to different datums.	No
Coastal Wind Stations	NOAA	NOAA meteorological station observations can be found at https://tidesandcurrents.noaa.gov/stations.html?type=Meteorological+Observations or the National Climatic Data Center at http://www.ncdc.noaa.gov/cdo-web/datasets .	No
Historic Flood Events	Multi	FEMA maintains a shapefile containing historical disaster declaration areas that may be useful for Discovery. This file can be found on FEMA's website at https://gis.fema.gov/DataFeeds.html . A hosted version of the datasets can also be retrieved from FEMA's ArcGIS Services Directory at https://gis.fema.gov/arcgis/rest/services/FEMA/HistoricalDesignations/MapServer . The NOAA severe weather events database includes floods and can be downloaded at ftp://ftp.ncdc.noaa.gov/pub/data/swdi/stormevents/ .	Yes
Historic Earthquakes	NOAA	NOAA manages and distributes historic non-geospatial earthquake data at http://www.ngdc.noaa.gov/hazard/earthqk.shtml . FEMA has converted this dataset to geospatial points for the Discovery Data Repository. The USGS Earthquake Hazards Program also maintains an archive of historical and hypothetical scenario data, known as ShakeMaps, at https://earthquake.usgs.gov/data/shakemap/ . ShakeMaps provide near-real-time maps of ground motion and shaking intensity following significant earthquakes. Federal, State, and local organizations, both public and private, use these maps for post-earthquake response and recovery, public and scientific information, preparedness exercises, and disaster planning.	Yes
Landslides	USGS	Landslide data maintained by USGS are available from the USGS raw data download site at https://www.usgs.gov/natural-hazards/landslide-hazards . See also https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=ae120962f459434b8c904b456c82669d .	Yes
Soils	NRCS	The NRCS maintains national soil data in a GIS format. Data can be downloaded from the NRCS Data Mart at http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm or from the NRCS Data Gateway listed in the Other Resources section of this document. Data ranges in scale from 1:12,000 to 1:63,360.	No

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Data	Agency	Location	In the Discovery Data Repository
Volcanic Eruptions	NOAA	NOAA maintains and distributes historical non-geospatial volcanic eruption data on its website at http://www.ngdc.noaa.gov/nndc/struts/form?t=102557&s=50&d=50 . FEMA has converted these data to a geospatial point file. An interactive viewer is available at http://maps.ngdc.noaa.gov/viewers/hazards/ .	Yes
Storm Surge Data	NOAA	Historic and modeled storm surge data may be obtained from local flood hazard management authorities; from Federal agencies such as NOAA, USACE, and USGS; and through review of academic literature. Historic storm surge elevations are often available from tide gage records for specific events. See the “Tide Gages” section above for data download information.	No
SLOSH Zones	NOAA	NOAA produces composite storm surge products by modeling thousands of potential storms through the basins. These products are available for the U.S. East and Gulf of Mexico coastlines, as well as Hawaii, Guam, Puerto Rico, and the U.S. Virgin Islands. The Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model results include maximum possible surge elevations for a variety of storm categories, trajectories, and speeds. These data also include information on land inundation, but the land elevation data are generally very coarse. You can download all the most current Maximum of Maximum (MOM) and Maximum Envelope of Water (MEOW) data here (registration required): http://slosh.nws.noaa.gov/sloshPub/ . Additionally, many State and local emergency management websites post the SLOSH storm tide inundation limit maps (using MOM data) in various formats, including shapefiles. The National Hurricane Program, National Weather Service, NOAA, U.S. Department of Transportation, and USACE fund hurricane evacuation studies. These studies use the SLOSH Basins surge outputs to more accurately map potential inundation areas (SLOSH Zones) for different storm characteristics and then define evacuation zones based on the potential inundation. Some studies can be obtained through the FEMA Hurricane Program contacts in each Region, especially in Regions III, IV, and VI. Nonetheless, the older studies, generally those prepared before 2000, may no longer be available from any source. For more information about hurricane evacuation studies, see NOAA’s website at https://www.coast.noaa.gov/hes/ .	No
Wildfire Hazard Areas	NWCG NIFC	The National Wildfire Coordinating Group (NWCG) includes nine member agencies that coordinate on and display wildfire data on an online GIS map, which can be found at https://maps.nwcg.gov/sa/#/%3F39.8212/-96.2709/4 . The National Interagency Fire Center (NIFC) also maintains Esri layer files containing its data here: https://data-nifc.opendata.arcgis.com/ .	Yes
Wildland-Urban Interfaces	NWCG NIFC	Wildland-Urban Interfaces are most commonly created in conjunction with local wildfire susceptibility analyses. Wildfire risk assessment data layers can be found here: https://data-nifc.opendata.arcgis.com/	No

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Data	Agency	Location	In the Discovery Data Repository
Campgrounds	USGS	USGS and the U.S. Board on Geographic Names maintain and distribute the Geographic Names Information System (GNIS) data, which can be downloaded as text files from https://www.usgs.gov/core-science-systems/ngp/board-on-geographic-names/download-gnis-data . FEMA has extracted the GNIS features for campgrounds and converted these data to a GIS shapefile for the Discovery Data Repository. The GNIS file can also be downloaded from the National Map Viewer at https://viewer.nationalmap.gov/basic/ . The data are available at a scale of 1:250,000.	Yes
Evacuation Routes	FEMA	FEMA maintains data on evacuation routes. The routes were last updated in 2007. Many States maintain geospatial data for emergency evacuation routes, and the State SOPs should also be consulted.	Yes
Tsunami Data	NOAA	NOAA maintains and distributes data on tsunami events and tsunami runup through the National Geophysical Data Center (NGDC)/World Data Center Historical Tsunami Database, Boulder, CO, which can be found at http://www.ngdc.noaa.gov/hazard/tsu_db.shtml . FEMA has converted these data to a spatial format for the Discovery Data Repository.	Yes
CNMS	FEMA	<p>The Coordinated Needs Management Strategy (CNMS) is a FEMA-maintained system comprising the processes and data used to track new, validated, or updated engineering study reaches with identified change characteristics, as well as requests for FEMA's flood mapping program. The CNMS Database is made up of the CNMS Study Inventory and CNMS Requests. A CNMS Study record represents the most current knowledge of a mapped Special Flood Hazard Area in FEMA's Inventory. A CNMS Request record describes a desire to address mapping needs based on lack of existing engineering studies, cartographic concerns, or labeling issues.</p> <p>CNMS data are available for viewing through FEMA's interactive map at https://www.arcgis.com/apps/webappviewer/index.html?id=34a65cf704441c081b557e2877585a1. Additionally, CNMS data are available from each of FEMA's RSCs. RSC contact information is listed at https://hazards.fema.gov/femaportal/resources/rsc_contacts.htm. The latest version of the <i>CNMS Technical Reference</i> can be found at https://www.fema.gov/sites/default/files/2020-02/CNMS_Technical_Reference_Nov_2019.pdf. The <i>CNMS Technical Reference</i> details the FEMA CNMS Data Model and its uses, providing an overview of its purpose and structure.</p>	No
AAL	FEMA	FEMA maintains a nationwide Average Annualized Loss (AAL) dataset that was created using Hazards U.S. Multi-Hazard (HAZUS-MH) data. Flood loss estimate information is available for the continental United States at the county level and at the HUC8 watershed level. The analysis was performed using the USGS 30-meter DEM. The current HAZUS Flood AAL data are found in the Discovery Data Repository. The 2009 HAZUS Flood AAL study data and the flood loss estimate summary data can also be found at the Discovery Data Repository. Data are also available by contacting your Region's RSC lead.	Yes

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Data	Agency	Location	In the Discovery Data Repository
Flood Claims and Repetitive Loss Properties	FEMA	<p>A Discovery report has been developed in the Community Information System (CIS), which is available to registered CIS users. Additionally, FEMA maintains information on the number of flood insurance policies, the number of single claims, and repetitive losses at the HUC8 watershed level. The Risk MAP National Flood Risk Analysis Version 2.0 report is available in Excel format and can be found in the Discovery Data Repository.</p> <p>Mapping Partners may obtain Repetitive Loss and Severe Repetitive Loss data for use in their Discovery project but must take appropriate privacy precautions. The following are the guidelines for obtaining the data and maintaining privacy:</p> <ol style="list-style-type: none"> 1. Contact the Regional Insurance Specialist and request Bureau.net access. Include the requestor's name and contact information, organization, reason access is needed, and how long access is needed. 2. Do not release maps or data to the public at large in a format that would enable identification of specific addresses of Repetitive Loss properties and respective payments. Use a more general color-coding method for areas with Repetitive Loss properties. This way, a community can see in detail where Severe Repetitive Loss properties are located without disclosing specific addresses and information linked to those addresses. 3. If a State or municipality wants Repetitive Loss information with address specificity, it may make a Privacy Act routine use request. More detailed information can then be placed on a map and disclosed to the State/municipality. In this situation, though, the State/municipality would not be allowed to further disclose the information to the public. 	Yes
CRS	FEMA	<p>The Community Rating System (CRS) is a voluntary program for National Flood Insurance Program- (NFIP) participating communities. A link to the pages from the most recent Flood Insurance Agent's Manual containing current and historical listings of all CRS communities, their class, and insurance discount is available at the following website: https://www.fema.gov/sites/default/files/2020-08/fema_crs_eligible-communities_oct-2020.pdf. CRS data can also be pulled from the CIS.</p>	Yes

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Data	Agency	Location	In the Discovery Data Repository
LOMC	FEMA	<p>FEMA maintains and distributes Letters of Map Change (LOMCs), including Letters of Map Amendment (LOMAs) and Letters of Map Revision (LOMRs). FEMA hosts a nationwide .zip file of LOMA points in shapefile format. It is unclear how often it is updated, but it tends to reflect the current month. LOMAs are frequently processed and the spatial data does not include older LOMAs or LOMAs that go effective after the update of the spatial file.</p> <p>Spatial data for LOMRs and LOMAs are updated monthly in the NFHL and can be accessed from the FEMA Map Service Center (MSC) website at https://www.fema.gov/flood-maps/tools-resources/flood-map-products/national-flood-hazard-layer. These spatial data do not include LOMR data where FIRM data are not digital and may not include older LOMRs.</p> <p>To supplement the LOMA and LOMR spatial data, users can obtain a current, comprehensive list of LOMCs from the MIP. If LOMCs in the generated list do not have latitudes and longitudes, the LOMC locations can be determined by consulting the final determination documents, which can be obtained through FEMA's MSC https://msc.fema.gov/porta.l/home.</p>	No
NFHL (FEMA Effective Data)	FEMA	<p>The NFHL dataset is a compilation of effective FIRM Databases (a collection of the digital data that are used in GIS systems for creating new FIRMs) and LOMCs (LOMAs and LOMRs only) that create a seamless GIS data layer for a State or territory. This dataset is maintained and distributed by FEMA and can be accessed through FEMA's MSC at https://www.fema.gov/flood-maps/tools-resources/flood-map-products/national-flood-hazard-layer.</p> <p>An Open Geospatial Standards Web Mapping Service of the NFHL is also available and can be viewed in Google Earth or in your own mapping software. Instructions for accessing FEMA's GeoPlatform are located here: https://hazards.fema.gov/femaportal/wps/portal/NFHLWMS. Data are available at a scale of 1:12,000.</p>	No
Q3 Flood Data (FEMA Effective Data)	FEMA	<p>Q3 Flood Data were developed by scanning the paper FIRMs and digitizing the flood hazard zone boundaries into a GIS. The datasets are available from FEMA and can be accessed through FEMA's MSC at the following website: https://msc.fema.gov/portal/home. Data are available at a scale of 1:24,000.</p> <p>The NFHL data should be used where possible. Q3 Flood Data are mostly obsolete, may not be an accurate representation of the effective floodplain, and are only relevant where no NFHL data exist.</p>	No

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Data	Agency	Location	In the Discovery Data Repository
Mitigation Plan Status	FEMA	<p>FEMA maintains a National Status Map showing local jurisdictions with mitigation plans that are approved, approved pending adoption, expiring, and expired: https://fema.maps.arcgis.com/apps/webappviewer/index.html?id=ec2fb023df744cf480da89539338c386</p> <p>Mapping Partners may also contact the appropriate State Hazard Mitigation Officer. Geospatial data related to mitigation plan status are available as a GIS mapping service in ArcGIS. More information and instructions are online at https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning/status.</p>	No
Community Information System (CIS) Data (including CACs and CAVs)	FEMA	<p>FEMA's CIS is available, via authorized user account, at the following website: https://portal.fema.gov/famsVuWeb/home. The CIS provides information about floodplain management, mapping, and insurance for NFIP communities. It includes demographic-, engineering-, insurance-, and community-specific information for jurisdictions in the United States that are identified as floodprone.</p> <p>The specific datasets available from CIS include CRS Status, Population, Disaster Assistance Claims, Flood Insurance Claim Info, Floodplain Management Ordinance Level, Last Community Assistance Visit (CAV) (that is, FEMA CAV – does not necessarily include State CAVs), NFIP Participation, and of course, a start on contact info (however, it is frequently out of date). Community Assistance Contacts (CACs) and CAVs are two key methods FEMA uses to identify community floodplain management program deficiencies and violations and to provide technical assistance to resolve these issues. To obtain the CAC/CAV-related information, run a Discovery Report from the website above.</p> <p>Most FEMA Cooperating Technical Partners (CTPs) and Production and Technical Services contractor offices have staff with access to CIS. New user CIS access can be requested through the website above.</p>	No
HMGP	FEMA	<p>The Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a Major Disaster Declaration. HMGP information on mitigated projects and properties at the community level can be found on FEMA's Open Data Feed under Datasets. For HMGP grant datasets with spatial detail at a higher resolution than the community level, contact openfema@fema.dhs.gov for further assistance.</p>	No
IA	n/a	<p>The Individual Assistance (IA) program provides grants and assistance for individuals. IA data are currently unavailable. FEMA will determine procedures for accessing these data in the future.</p>	No

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Data	Agency	Location	In the Discovery Data Repository
PA	FEMA	Through the Public Assistance (PA) Program, FEMA provides supplemental Federal disaster grant assistance for debris removal; emergency protective measures; and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain private non-profit organizations. FEMA maintains a spreadsheet listing all PA recipients, designated as applicants in the data. The dataset also features project worksheets that list every funded project. The dataset can be found at https://www.fema.gov/openfema-data-page/public-assistance-applicants .	No
FloodSmart	FEMA	The NFIP launched the FloodSmart campaign to educate the public about the dangers of flooding and to help them protect their property. It is the premier resource for flood insurance and flood risk information. More information can be found on the following website: https://www.floodsmart.gov/ . FloodSmart datasets can be requested from floodsmart@fema.dhs.gov .	No
Information on Active Disasters	FEMA	A list of Federal Disaster Declarations since 1953 can be obtained at https://www.fema.gov/disasters/disaster-declarations .	No
CTP	FEMA	Information about FEMA's CTP Program, including active partners, can be found here: https://www.fema.gov/flood-maps/guidance-partners/cooperating-technical-partners . A list of CTPs can be found at https://www.floodmaps.fema.gov/fhm/CTPList/ctp_list.asp .	No
Areas of Land Use Change Datasets	USGS, NOAA	<p>The Multi-Resolution Land Characterization (MRLC) consortium is a group of Federal agencies that coordinate and generate consistent and relevant land cover information at the national scale for a wide variety of environmental, land management, and modeling applications. The creation of this consortium has resulted in the mapping of the lower 48 States, Hawaii, Alaska, and Puerto Rico into the National Land Cover Database (NLCD), a comprehensive land cover product composed of decadal Landsat satellite imagery and other supplementary datasets.</p> <p>All MRLC NLCD data products are available at https://www.mrlc.gov/data. The data has a 30-meter resolution.</p> <p>The National Urban Change Indicator dataset provides vector and raster data to show annual persistent change in urban areas of the United States over the past 25 years. Urbanization of areas due to events such as land development and construction can be key indicators of where Risk MAP Discovery is planned. GIS data are available for use on Discovery projects by contacting the RSC. RSC contact information is listed at https://hazards.fema.gov/femaportal/resources/rsc_contacts.htm.</p> <p>The NOAA Coastal Change Analysis Program (C-CAP) Regional Land Cover Data are developing a standardized database on habitat and land cover change in coastal regions of the United States. C-CAP notes changes in habitats on 1-to-5-year cycles, depending on the rate and magnitude of change in a geographic region. Data are currently available from 1996 to 2011 (30-meter resolution raster converted to polygon shapefile). Data can be downloaded by county at https://coast.noaa.gov/digitalcoast/tools/lca.html.</p>	No

National Discovery Data Coordination Procedure

Additional Resources

The following non-specific sources for national data can be researched for Discovery or flood hazard mapping data. If a dataset cannot be found from the National Discovery Data Resources and cannot be found in the State SOPs through the FEMA RSC, the following list may be useful.

Service	Internet Location
OpenFEMA	https://www.fema.gov/about/reports-and-data/openfema
Federal Open Data	https://www.data.gov/
The National Map	https://viewer.nationalmap.gov/advanced-viewer/
USDA Geospatial Data Gateway	https://datagateway.nrcs.usda.gov/
Bureau of Land Management Navigator	https://navigator.blm.gov/home
FEMA MSC	https://msc.fema.gov/portal/home
FEMA MIP	https://hazards.fema.gov/femaportal/wps/portal
FEMA GeoPlatform	https://www.geoplatform.gov/

State Contacts

FEMA maintains contact information for State geospatial representatives and their Federal counterparts on the MIP at <https://hazards.fema.gov/contacts/statecontacts/contacts.asp>.

State Standard Operating Procedures

FEMA also maintains State SOPs that detail the best practices for obtaining and using State and community data for Discovery and flood hazard mapping. The State SOPs are available through the MIP via the link under the “Additional Resources” section of “Tools and Links.” For additional assistance, contact the respective RSC representative. RSC contact information is listed at https://hazards.fema.gov/femaportal/resources/rsc_contacts.htm.

Federal Mapping Program Fact Sheets

Additionally, the following Federal Mapping Program Fact Sheets summarize information on the primary national mapping programs that are tracking, developing, and/or sharing geospatial data. This information is available to support the Regions, RSCs, and FEMA’s Mapping Partners as they conduct Discovery.

National Discovery Data Coordination Procedure

National Agriculture Imagery Program

Leaf-On Orthophotography Base Maps

<https://www.fsa.usda.gov/programs-and-services/aerial-photography/imagery-programs/naip-imagery/index>

Program Highlights

Data Product

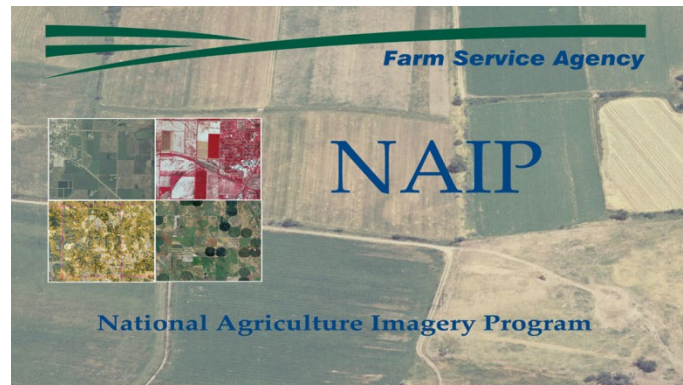
- County-level and quarter-quadrant orthophotography.
- 0.5-meter, 1-meter, or 2-meter resolution available (more detail below).
- Many areas captured using digital sensor.

Advantages

- These are generally more recent than National Digital Orthophoto Program (NDOP) Digital Orthophoto Quadrangles (DOQs).
- They offer four-band or natural color.

Disadvantages

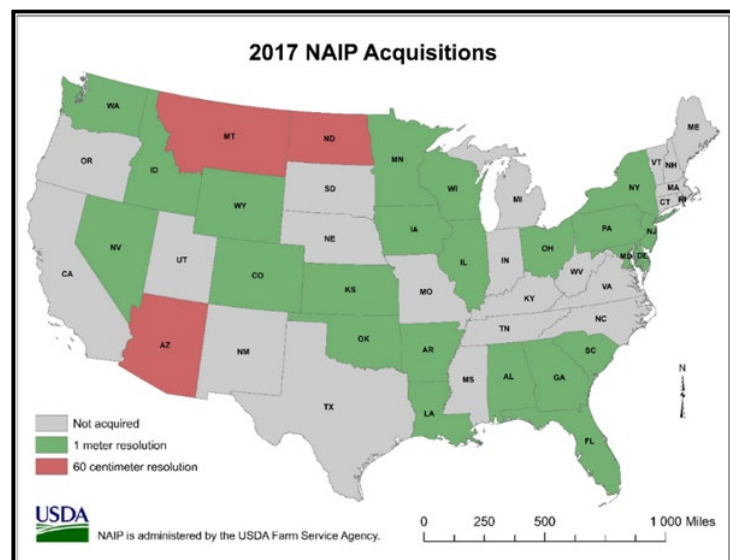
- Imagery is acquired during the peak growing season; it may not be suitable for areas with heavy “leaf-on” conditions.
- The 2-meter data are not acceptable for FIRM base maps.
- County mosaics use varying degrees of compression. Some may substantially degrade visual quality.
- Clouds occasionally appear on the images.



Program Overview

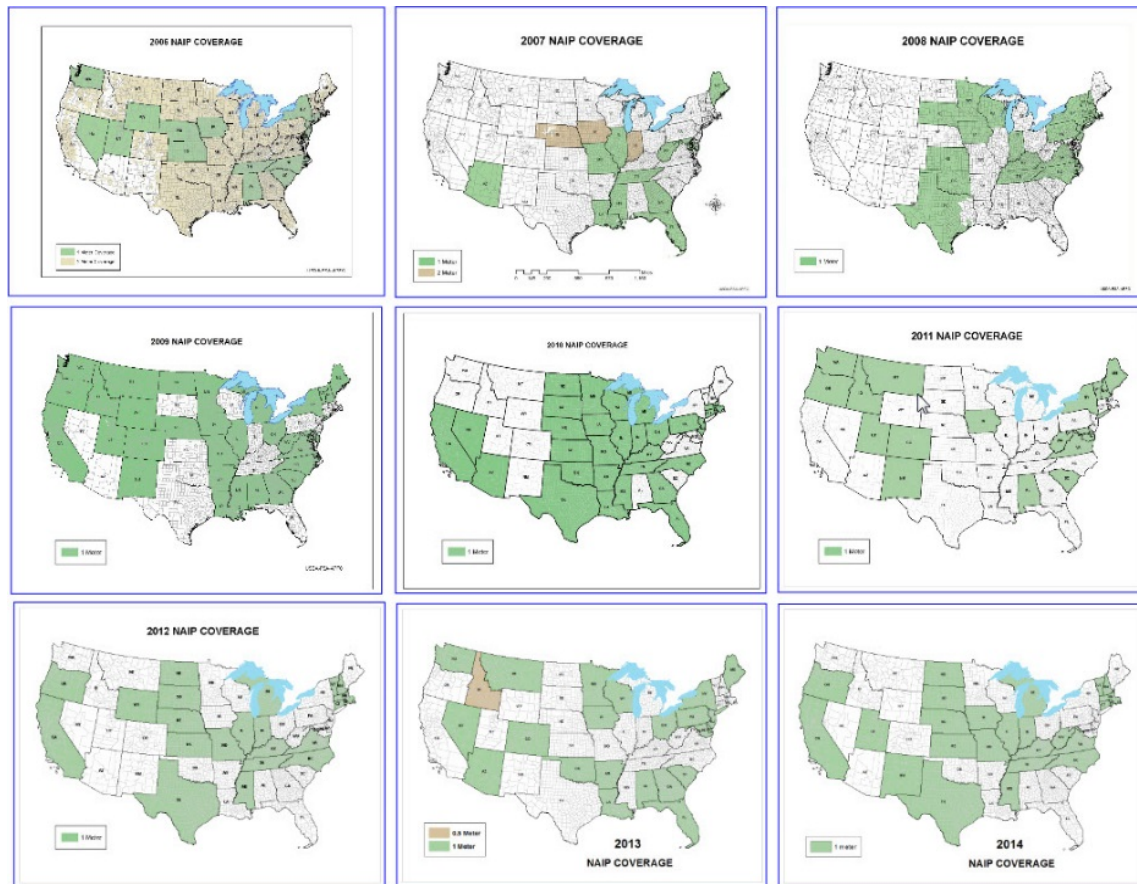
In 2002, the USDA started the NAIP to support the continued development of its own GIS program through the acquisition of digital orthophotography. This imagery, when used in conjunction with other available land and customer information, provides the ability to effectively administer farm programs and geo-reference natural disasters and animal or plant disease outbreaks to support better decision making.

The program’s goal is to acquire 1-meter-resolution imagery on a 3-year cycle over the contiguous 48 States and deliver it to



National Discovery Data Coordination Procedure

users within a few months. To support agricultural analysis, imagery is captured during the peak growing seasons (June to August). Link to [Interactive NAIP Coverage Map](#).



Data Details

Two primary data products are developed and available through NAIP. These include the Compressed County Mosaic (CCM) and the Full-Resolution Quarter-Quad Tiles (QQ). Historically, imagery of some States was acquired at a 2-meter resolution. More recently, all data are acquired at a 1-meter resolution. These data are in natural colors (red/green/blue bands), and many recent datasets include a near infrared band that is often used for vegetation identification and other image analysis techniques.

Because the imagery is captured during peak growing season, this “leaf-on” status is likely to obscure some ground-level features, especially in heavily treed areas. This issue should be considered based on the geography of the region under consideration. All data come with a full suite of Federal Geographic Data Committee-compliant metadata for documentation.

Compressed County Mosaic

The CCMs are developed for the convenience of full-county coverage. In many contexts, a single, full-county file is easier to manipulate than multiple, smaller Digital Orthophoto Quarter Quadrangles (DOQQs). It can reduce the costs for management of data and increase production efficiency. CCMs are useful when larger geographic coverage is required. CCMs use varying degrees of compression. Some may substantially degrade visual quality.

National Discovery Data Coordination Procedure

Full-Resolution Quarter-Quad Tiles

The QQ is the full-resolution standard delivery product. The QQ can be a better format for smaller geographic areas, as the tiles cover an area measuring 3.75-minutes longitude by 3.75-minutes latitude, or approximately 2.5 miles on each side. The DOQQ is in a Georeferenced TIFF (GeoTIFF) format.

Digital Sensors

In some cases, vendors use digital cameras for an entire State. In a fully digital workflow, retrieving the raw imagery for other uses can be very efficient for vendors. Negotiating with the vendors to produce high-quality elevation data for targeted areas may be possible using these data. Because the data have already been acquired, this procedure may be a practical way to obtain small areas of quality elevation data for high-risk areas.

Data Applicability to Flood Mapping Program

The 1-meter-resolution data are acceptable for FIRM base maps, provided vegetation does not obscure roads or other important ground features. This imagery is more recent than NDOP DOQs, but 2-meter-resolution data and highly compressed county mosaics are not acceptable for FIRM base maps.

Data Availability

The program has been meeting or exceeding a 3-year refresh cycle, so all States have received new 1-meter-resolution data within the past 3 years.

Data Ordering

For more information, call (801) 975-3500. To order full-resolution NAIP imagery, visit the main website.

National Discovery Data Coordination Procedure

The National Map

Bare Earth Elevation Data

<https://www.usgs.gov/core-science-systems/national-geospatial-program/national-map>

Program Highlights

Data Products

- Products include standard DEMs at various horizontal resolutions, elevation source and associated datasets, an elevation point query service, and bulk point query service. All 3DEP products are available free of charge and without use restrictions. To download 3DEP products, visit <https://viewer.nationalmap.gov/basic/>.
- For the latest information on 3DEP products and services, visit the [3DEP Product News](#) page.

Advantages

- High-quality LiDAR or IfSAR topographic data are available for free in a number of different formats.
- Most edge-matching/seam issues from quad-based DEMs have been fixed.
- The 1/3 arc-second National Elevation Dataset (NED) provides very close fidelity to quad contours and is suitable for non-regulatory flood risk products.
- The data avoids many of the problems in the original 30-meter DEMs.
- The 1/9 arc-second data are generally suitable for regulatory mapping.
- The availability of newer 1/3 and 1/9 arc-second data from LiDAR and other high-resolution data sources is increasing.



Disadvantages

- 2 arc-second and 1 arc-second NEDs are based on many sources with variable quality. Generally, they are not suitable for hydraulics or floodplain mapping.
- Data for 1/9 arc-seconds are not available everywhere.
- The quality of 1/3 arc-second data varies based on original quad contour interval and NED production methods.
- Small areas of 1/3 arc-second data are resampled from 1 arc-second data and are of low quality.

Program Overview

The 3DEP initiative is being developed to respond to a growing need for high-quality topographic data and for a wide range of other three-dimensional representations of the Nation's natural and constructed features. The primary goal of 3DEP is to systematically collect enhanced elevation data in the form of high-quality LiDAR data over the conterminous United States, Hawaii, and the U.S. territories, with data acquired over an 8-year period. IfSAR data will be collected over Alaska, where cloud cover and remote locations preclude the use of LiDAR over much of the State. The 3DEP initiative is based on the results of the National Enhanced Elevation Assessment.

National Discovery Data Coordination Procedure

Data Details and Availability

Standard DEMs represent the topographic surface of the earth and contain flattened water surfaces. Each DEM dataset is identified by its horizontal resolution and is produced to a consistent set of specifications. Standard DEMs are characterized either as project-based or seamless. Project-based DEMs are available for the full areal extents of projects when produced from LiDAR, or as 1-degree blocks with overedge when produced from IfSAR. Seamless DEMs are produced by blending only the highest quality project data into a continuous terrain surface for the United States. These data are distributed in tiles that can be merged to support analysis across large geographic areas.

Project-Based

- 1 meter – This dataset was introduced in 2015 with limited coverage of the United States but will be expanding as new DEMs from 3DEP quality level 2 or better LiDAR data are acquired. Horizontal coordinates are referenced to the Universal Transverse Mercator projection.
- 1/9 arc-second – This dataset covers about 25 percent of the conterminous United States and is produced from 3-meter or higher resolution DEMs acquired by the USGS prior to January 2015. Horizontal coordinates are referenced to geographic coordinates (longitude, latitude). The 1/9 arc-second dataset will no longer be updated with newly acquired DEMs; however, it will continue to be distributed.
- 5 meter – This dataset is comprised of 5-meter IfSAR-derived DEMs (3DEP quality level 5) over Alaska only. Horizontal coordinates are referenced to Albers Equal Area Conical projection.

Seamless*

- 1/3 arc-second – This is the highest resolution seamless DEM dataset for the United States with full coverage of the 48 conterminous States, Hawaii, and U.S. territories. Alaska coverage is partially available now and is being expanded to statewide coverage as part of the Alaska Mapping Initiative. Ground spacing is approximately 10 meters north/south, but variable east/west due to convergence of meridians with latitude.
- 1 arc-second – This is a lower resolution seamless dataset providing complete coverage over the conterminous United States and partial coverage of Alaska. Most of Canada and Mexico are also covered by the 1 arc-second dataset. Ground spacing is approximately 30 meters north/south, but variable east/west depending on latitude.
- 2 arc-second – This seamless dataset is the lowest resolution seamless dataset available and covers only Alaska. Although ground spacing is approximately 60 meters north-south, east-west spacing can vary from 35 meters in southern Alaska to 20 meters on the North Shore.

** The seamless datasets are created from elevation data that are sourced from multiple technologies, positional accuracies and collection dates. Although these datasets are being continuously updated as new elevation source is acquired, much of the national coverage is derived from topographic map contours that may be decades old. The spatial metadata for each tile in a seamless DEM layer must be examined to fully determine the source datasets used to create each tile.*

Source Data Products include LiDAR point clouds, source (original) resolution DEMs from which the 3DEP standard DEM datasets were produced, and additional data types produced from IfSAR collections.

National Discovery Data Coordination Procedure

LiDAR Point Cloud

These data are foundational for 3DEP in the conterminous United States, and they contain the original three-dimensional information from which the DEM products are derived. Most of the data collected in or after 2014 meet 3DEP specifications for quality level 2 nominal pulse spacing and vertical accuracy, while data collected prior to 2014 often do not meet the quality level 2 specification. Distinctions in nominal pulse spacing are provided in the LiDAR point cloud status graphics and in the download platform; however, other qualities (such as vertical accuracy) must be examined to determine if the data meet particular 3DEP quality level specifications.

IfSAR Digital Surface Model (DSM)

These 5-meter rasters, available only in Alaska, are the initial IfSAR product, before bare-earth filtering is done to create the DEMs. Manmade structures and vegetation are modeled in the DSM.

IfSAR Orthorectified Radar Intensity Image (ORI)

These rasters (resolutions vary), available only in Alaska, are radar reflectance intensity recordings detected by the IfSAR sensor.

Source Resolution DEMs

These data are the original bare earth DEMs derived from the LiDAR point cloud source. Source DEMs processed by the USGS after January 2015 are provided where the original DEM horizontal resolution or projection differ from the 3DEP standard DEM datasets.

Point Query Service (PQS) returns an elevation value for any latitude/longitude coordinate pair within the conterminous United States. This service presently interpolates the elevation from the highest resolution seamless DEM dataset – 1/3 arc-second. This service is available at <https://nationalmap.gov/epqs>. A Bulk Point Query service is available in a beta version at <https://viewer.nationalmap.gov/apps/>. The Bulk Point Query allows users to upload a comma-separated values (CSV) file containing longitude and latitude points and returns the corresponding elevation values. Input is currently limited to no more than 500 points. Elevation values from these services can be displayed on the screen and downloaded as a CSV or Excel spreadsheet that contains the original points and elevation values expressed in meters and feet.

Data Applicability to Flood Mapping Program

FEMA's *Elevation Guidance-May 2016* provides the specifications for elevation data for regulatory flood mapping projects. Most LiDAR data will satisfy the data standards in PM 61, and thus can be used on most Risk MAP projects. The metadata records for each LiDAR dataset should be reviewed prior to use on a FEMA project to ensure sufficient accuracy for the project.

Data Ordering

- These data are available for download directly through the National Map website.

National Discovery Data Coordination Procedure

NOAA Office for Coastal Management

Coastal LiDAR, Bathymetry, Shoreline Data, and Inventories of Terrestrial Elevation Data and Bathymetry

<https://coast.noaa.gov/>

Program Highlights

Data Products

- NOAA Digital Coast: LiDAR data collected over the U.S. coast by NOAA and other agencies, such as the USACE through its Joint Airborne LiDAR Bathymetry Technical Center of Expertise (JALBTCX), is available at <https://coast.noaa.gov/digitalcoast/>.
- NOAA Shoreline website: Historical shoreline data with the average accuracy of measured benchmarks at 3.06 meters (10 feet), which meets the NOAA guidelines for fixed aids to navigation and objects charted as landmarks, is available at <https://shoreline.noaa.gov/>.

Advantages

- LiDAR data covering most of the coast generally have sub-meter vertical and horizontal root mean square error.
- Data can be downloaded for free in the user's choice of vertical datum and projection.
- Variety of shoreline data are available.
- Topography and bathymetry inventories survey a wide variety of sources to identify the best available information.



Disadvantages

- USACE JALBTCX elevation data is in a narrow strip along the coast only.
- Not all the U.S. coastline has been mapped.
- Shoreline data are dated, and no update schedule is provided.

Program Overview

This organization was established in 2014, when NOAA combined two offices: the Coastal Services Center and the Office of Ocean and Coastal Resource Management. The basic missions of the two programs remain intact, but the new organizational structure is bringing value-added services to taxpayers.

In addition to implementing specific initiatives, a top priority for NOAA's Office for Coastal Management is to unify efforts to make communities more resilient. Many organizations are involved, including the private sector, nonprofits, the scientific community, and all levels of government. The Office for Coastal Management works to be a unifying force in these efforts, providing unbiased NOAA data and tools and providing opportunities for the community to come together to define common goals and find ways to work smarter by working together. Issues run the gamut from protecting endangered species to erosion to generating better building codes for storm-resistant buildings.

National Discovery Data Coordination Procedure

Data Details and Availability

These data are generated through both private-sector contracts and government-owned systems. The USACE-collected LiDAR data are typically targeted at a narrow strip of coastline and are usually a kilometer or less in width. Wide-area topographic LiDAR are also available for coastal areas. The vectorized shoreline data were created from scanned historical shoreline maps in raster format and are in decimal degrees, referenced to the NAD83 datum. The accuracy of the shoreline datasets is stricter than national standards and four times the accuracy of current USGS 1:24,000 scale topographic maps. This means that the original topographic sheets can be assumed to also meet NOAA guidelines and to be very accurate in their depiction of the shoreline that existed at the time of the surveys. The topographic and bathymetric inventories are compiled regionally and are not updated on a regular schedule. They integrate inventory information from a wide variety of sources to provide a reasonably comprehensive summary of the bathymetric and topographic data available for a particular area. The NOAA Digital Coast site at <https://coast.noaa.gov/digitalcoast/> also provides access to a wide variety of other data sets for coastal resource managers.

Data Applicability to Flood Mapping Program

FEMA Procedure Memorandum (PM) 61, *Standards for LiDAR and Other High-Quality Digital Topography*, provides the specifications for elevation data for regulatory flood mapping projects. Most LiDAR data will satisfy the data standards in PM 61, and thus can be used on most Risk MAP projects. The metadata records for each LiDAR dataset should be reviewed prior to use on a FEMA project to ensure sufficient accuracy for the project. Some LiDAR datasets also include precise near-shore bathymetry. Because of the historical nature of the shoreline data, each dataset should be examined for its potential use for FEMA projects.

Data Ordering

These data are available for download directly through the NOAA website listed in the Data Products section above.

National Discovery Data Coordination Procedure

U.S. Census Bureau TIGER Files

Accurate, Detailed Vector Street Base Maps

<https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-line-file.html>

Program Highlights

Data Product

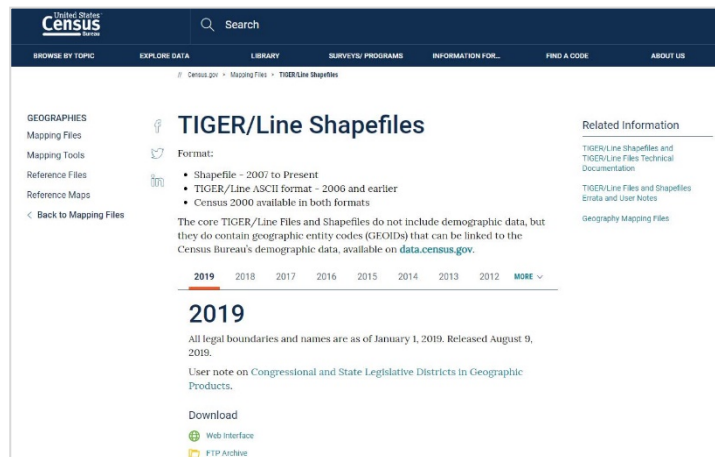
- Street centerline files with road names and address ranges for geocoding.

Advantages

- Realigned files are accurate enough to use as FIRM base maps and are now considered the default source for FIRM Database transportation features.
- They are smaller and often easier to work with than orthophotographs.
- Vector-based maps can be easier to read.
- TIGER spatial data are available in shapefile format.

Disadvantages

- Some communities may prefer orthophotographs.
- Local planimetric data could be more current or contain better attributes (i.e. local road names).
- TIGER/Line files may still contain features that have not been realigned to more accurate source data.



Program Overview

The U.S. Census Bureau realigned the street features for all counties in the United States in preparation for the 2010 Census.

Data Details and Availability

The U.S. Census Bureau has released updated TIGER/Line files on a regular basis. The newest files incorporate updates discovered during the field activities for the 2010 Census and information reported by cooperators.

Data Applicability to Flood Mapping Program

Realigned files are accurate enough to use as FIRM base maps and are now considered the default source for FIRM Database transportation features.

Data Ordering

Files containing nationwide primary roads and State-by-State primary and secondary roads are available directly from the U.S. Census website at <https://www2.census.gov/geo/tiger/TIGER2019/>. Files containing all roads, by county, are available at <https://www2.census.gov/geo/tiger/TIGER2019/ROADS/>.

National Discovery Data Coordination Procedure

In addition, you can purchase the files on CD-ROM or DVD from the Census Bureau's Customer Service Center at (800) 923-8282 or (301) 763-INFO (4636).

National Discovery Data Coordination Procedure

USDA Geospatial Data Gateway

Distribution of a Variety of Base Maps and Other GIS Data

<https://datagateway.nrcs.usda.gov/>

Program Highlights

Data Product

- The Geospatial Data Gateway provides one-stop shopping for natural resources or environmental data.
- This is the source for NRC USDA Countywide Compressed Orthophoto Mosaics.

Advantages

- Data downloads are free and near real-time.
- Compressed, mosaicked counties are easier to work with, color/tone balanced, and potentially more accurate than individual quarter quad NDOP DOQs.

Disadvantages

- Compression of imagery may degrade visual quality.
- County mosaics generally use first-generation NDOP imagery, so they are fairly old.
- The USDA is not the authoritative source for all data on the site, so some data may be out of date.

Program Overview

The Geospatial Data Gateway is intended to provide a single access point for resource data. It provides a way to easily locate data that exist for selected geographic areas, find the types of data for that area, and deliver the data packaged in formats compatible with commercial and USDA Service Center application formats.

One major purpose of the gateway is to support the development, presentation, and dissemination of information by service center field staff working in the field with customers away from the office. However, the public has access to the gateway to find and retrieve resource data.

Data Details

The datasets served by the gateway are primarily determined by the USDA Service Center GIS Strategy. The data themes are listed on the Gateway Data Management page at https://datagateway.nrcs.usda.gov/GDGHome_StatusMaps.aspx. This page also identifies non-geospatial data that may be available through the gateway.

The gateway provides metadata that comply with the Federal Geographic Data Committee metadata standards. Metadata enables users to assess the applicability of a dataset to their needs before downloading or ordering data.



National Discovery Data Coordination Procedure

Data Applicability to Flood Mapping Program

County orthophotograph mosaics can be used as FIRM base maps, provided the compression does not reduce the usability of the image. These mosaics are much easier to work with and have more consistent image brightness, contrast, and sometimes better positional accuracy than the first-generation tiled DOQs.

Data Availability

The Geospatial Data Gateway provides access to many different data layers, which may be updated as frequently as once per week. The most critical themes are generally available nationwide.

Critical Themes

- Orthoimagery
- Soils
- Common Land Unit

Data Ordering

Users can download data directly from the website, retrieve it from an FTP site, or order it on CD or DVD.