

National Geodetic Survey Update

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April 8, 2015



The National Geodetic Survey Ten-Year Plan

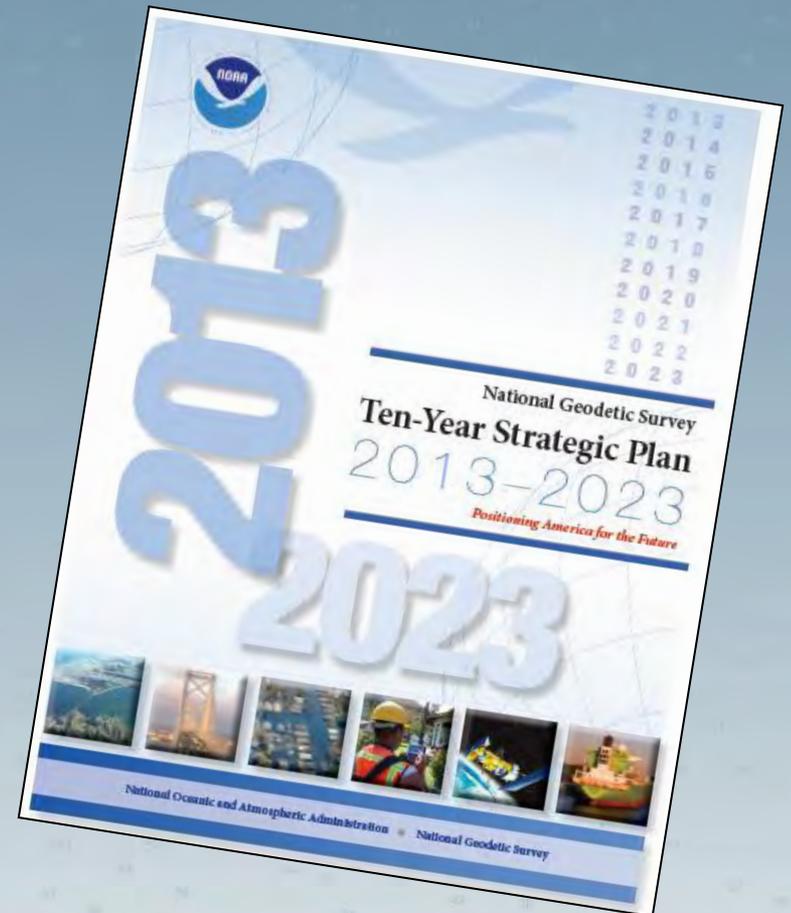
Support the users of the National Spatial Reference System.

Modernize and improve the National Spatial Reference System.

Expand the National Spatial Reference System stakeholder base through partnerships, education, and outreach.

Develop and enable a workforce with a supportive environment.

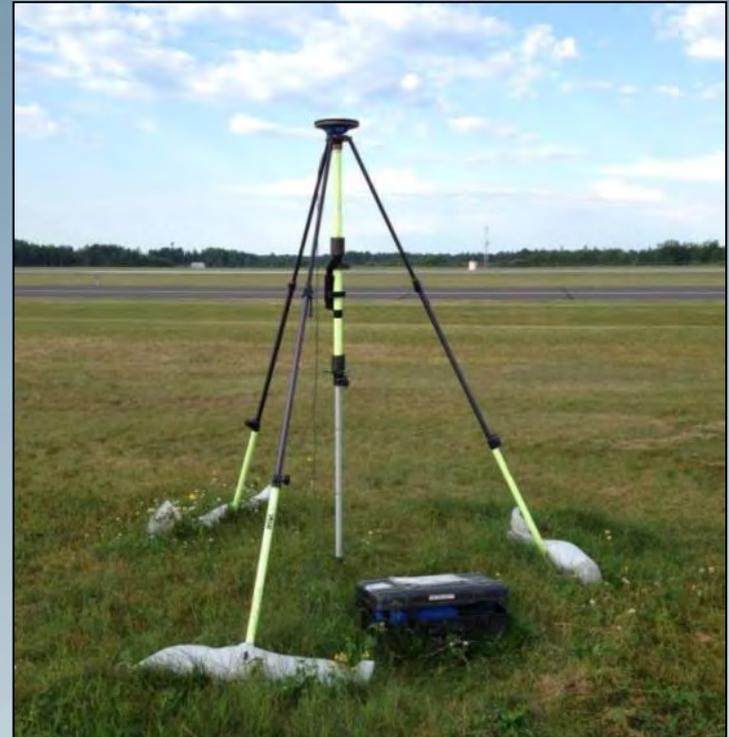
Improve organizational and administrative functionality.



http://www.geodesy.noaa.gov/web/news/Ten_Year_Plan_2013-2023.pdf

New Datums Are Coming in 2022!

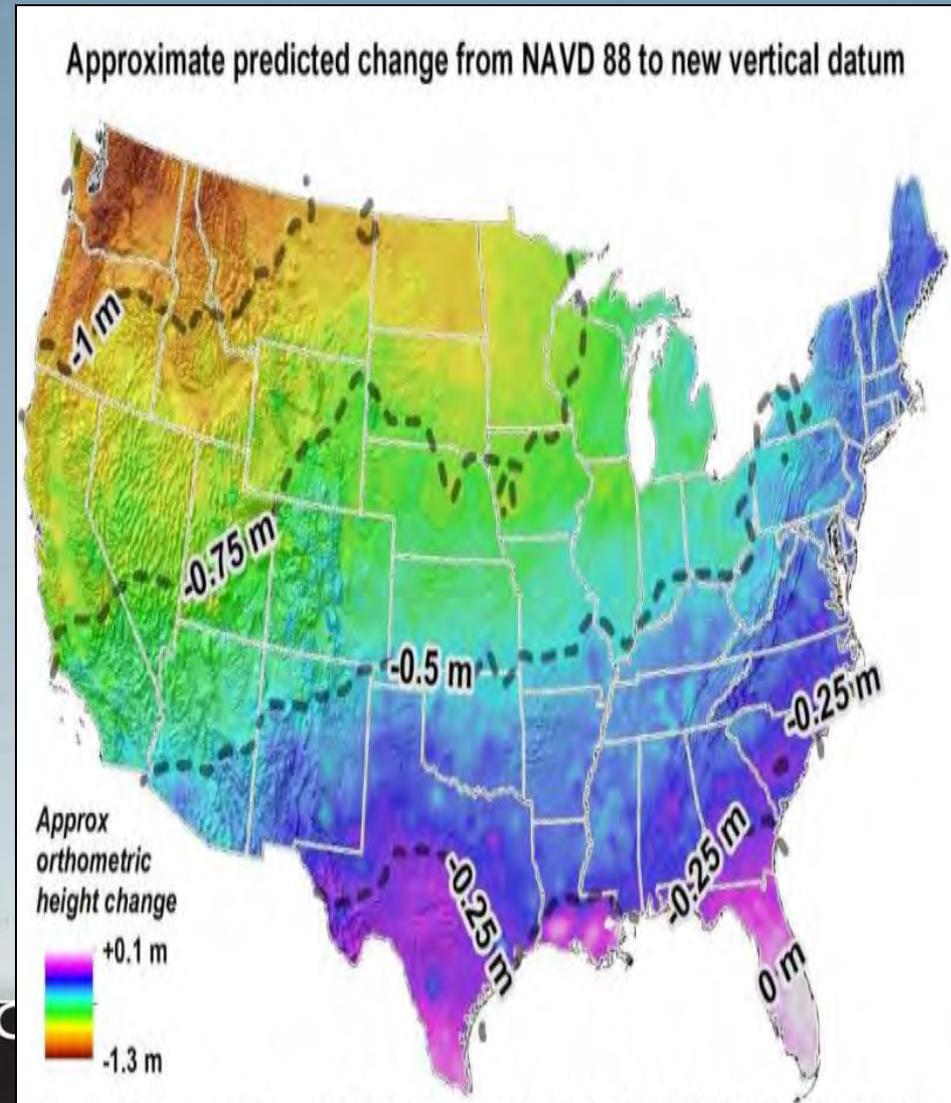
- Both a new **geometric** and a new **geopotential** (vertical) datum will be released in **2022**.
- The realization of the new datums will be through **GNSS receivers**.
- **NGS will provide the tools** to easily transform between the new and old datums.



How will the new datums affect you?

The **new geometric datum** will change latitude, longitude, and ellipsoid height by between **1 and 2 meters**.

The **new vertical** (geopotential) **datum** will change heights on average **50 cm (20")**, with a **1-meter (39") tilt** towards the Pacific Northwest.



New Datums: Outreach



The screenshot shows the NOAA DEV 'New Datums' webpage. At the top left is the NOAA logo and 'DEV Internal Development Area'. The main title is 'New Datums' under the 'National Geodetic Survey' banner. A navigation menu includes 'NGS Home', 'About NGS', 'Data & Imagery', 'Tools', 'Surveys', and 'Science & Education'. A search bar is on the right. The main content area features a globe with a color-coded datum overlay and the heading 'Replacing NAVD 88 and NAD 83'. The text states: 'NAD 83 and NAVD 88 will be replaced in 2022, and there are many related projects to make sure the transition goes smoothly. Read the **NGS Ten-Year Plan** to learn more and continue to visit this web-page for more information.' Below this is a section titled 'Why is NGS replacing NAD 83 and NAVD 88?' with the text: 'NAD 83 and NAVD 88 are defined by geodetic markers that continue to deteriorate over time, so the new datums will be more sustainable and more cost-effective to maintain. Additionally, scientists know of'. The date 'December 11, 2014' is in the top right corner.



New Datums Videos

https://www.youtube.com/playlist?list=PLsyDI_aqUTdFY6eKURmiCBBk-mP4R10Dx

New Datums Webpage and FAQs

<http://www.geodesy.noaa.gov/datums/newdatums/NewDatums.shtml>

2015 Geospatial Summit

<http://www.geodesy.noaa.gov/2015GeospatialSummit/>

Other Stakeholder Activities

- Regular meetings



- Web resources

- http://www.geodesy.noaa.gov/corbin/online_learning.shtml
- http://www.geodesy.noaa.gov/web/science_edu/presentations_library/

- Social media

- Visit National Ocean Service
- NGS is still scoping

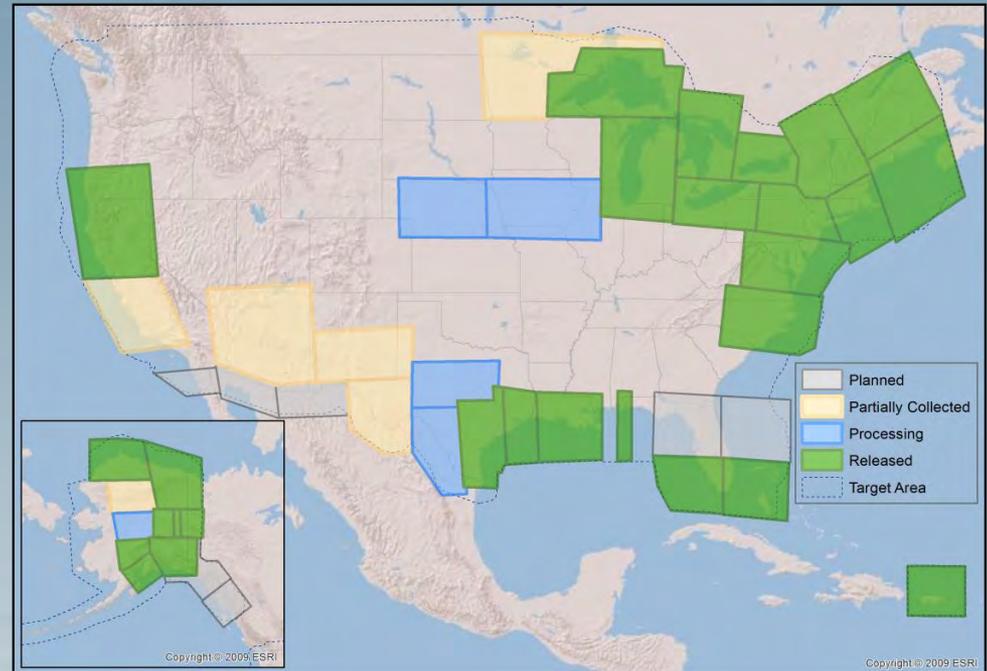


Gravity for the Redefinition of the American Vertical Datum (GRAV-D)

Project to collect gravity data to redefine the U.S. vertical datum by 2022 (at current funding levels).

Target: 2-centimeter accuracy relative to sea level (orthometric heights) using GPS/GNSS and a geoid model.

GRAV-D for California is a priority.

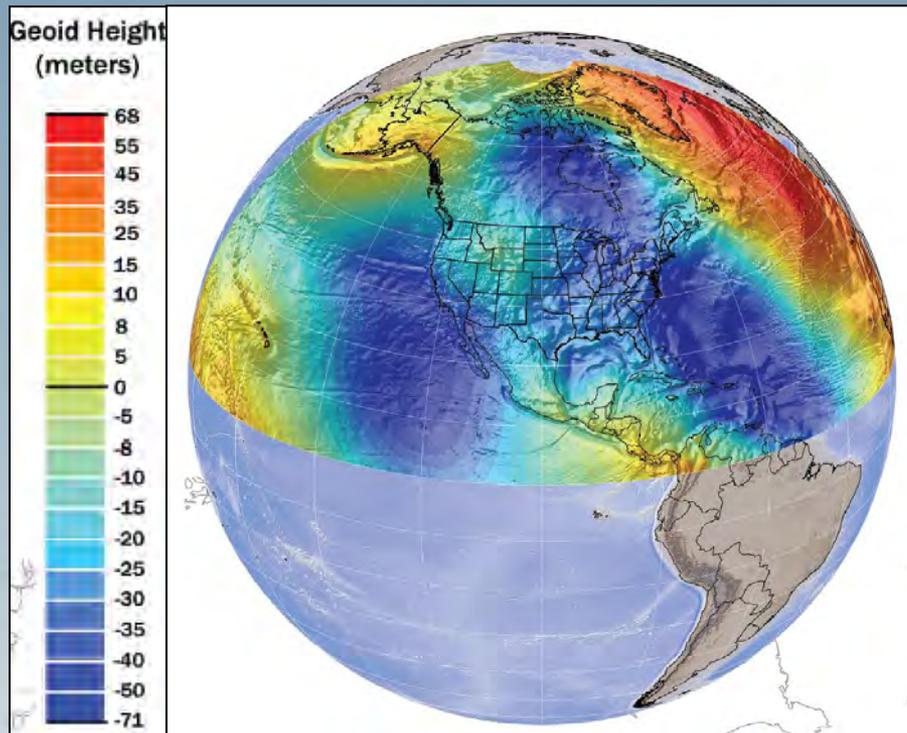


GRAV-D Status April 2015: >40%

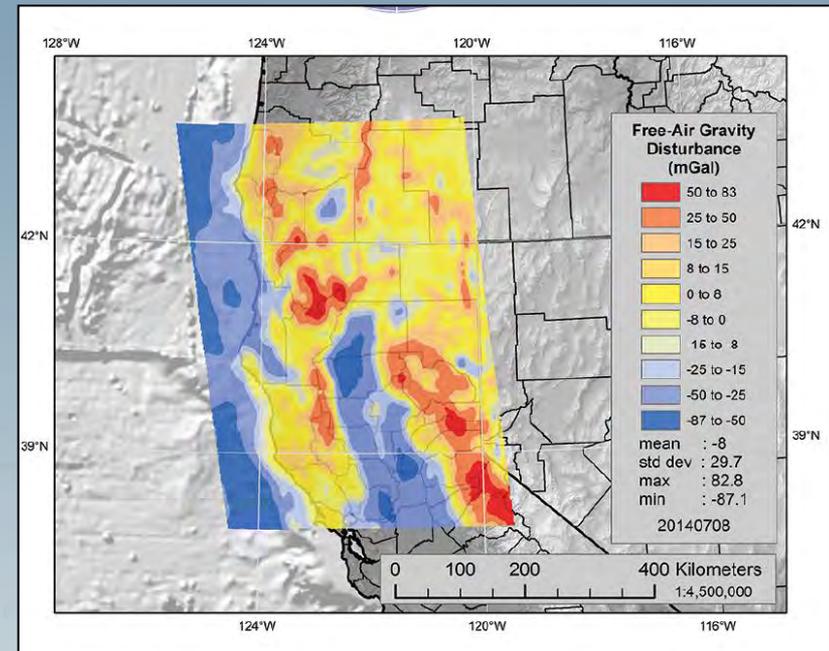
<http://www.ngs.noaa.gov/GRAV-D/>

Experimental Geoid Models

NGS has released (2014) the “best available experimental gravimetric geoid” using aerogravity collected through GRAV-D.



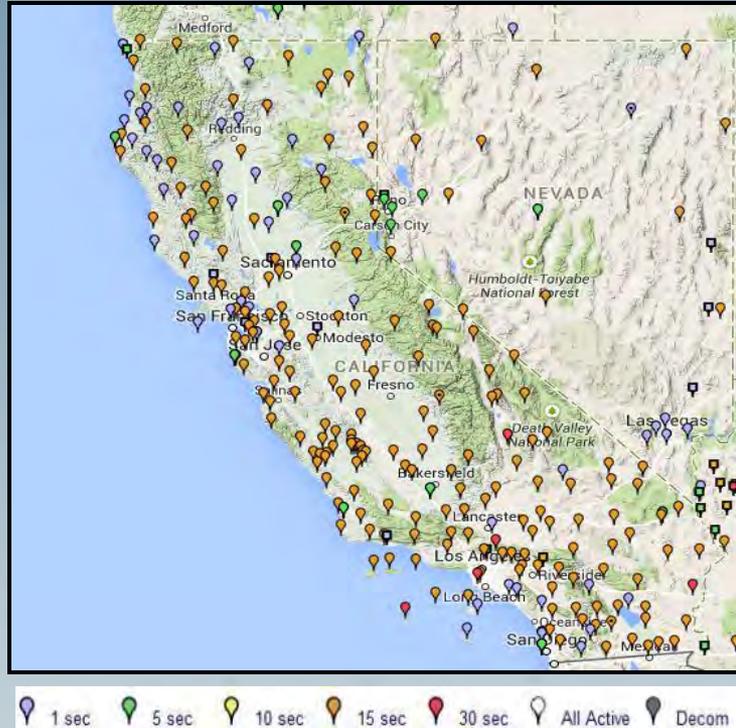
xGeoid14b



“Free-air Gravity Disturbance” for California gravity block used to create xGeoid14b

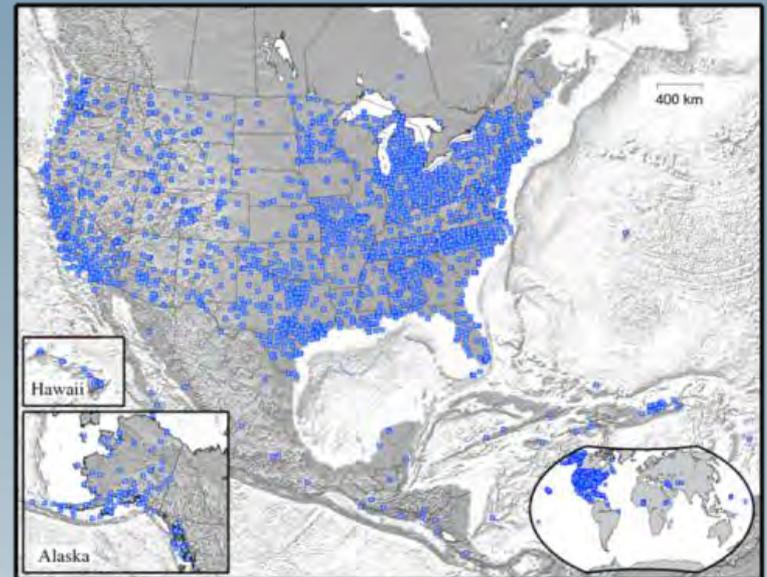
<http://beta.ngs.noaa.gov/GEOID/xGEOID14/>

Continuously Operating Reference Stations (CORS)



The location of all CORS in California.
(Color-coded bubbles represent the sampling rate of the GPS receiver at the site.)

2015 CORS Network

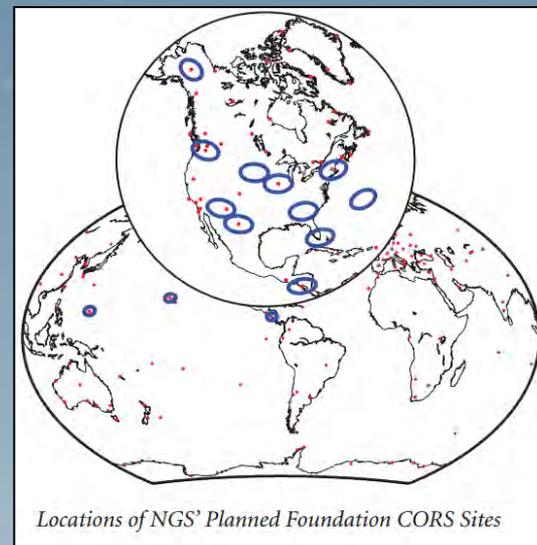


> 1900 Stations

<http://www.geodesy.noaa.gov/CORS/>

Foundation CORS

- NGS owned and operated sites. In 2015 installed a foundation CORS in Richmond, Florida.
- Highest quality equipment / deep drill braced.
- GNSS capable.
- Improve link of NSRS to the International Terrestrial Reference Frame (ITRF).
- Meet high accuracy requirements of critical scientific and surveying projects, such as measuring sea level change to within a few millimeters.



Foundation CORS installation in Richmond, FL

NGS IGLD Activities

NGS is working with CO-OPS to coordinate International Great Lakes Datum (IGLD) activities. This includes GPS Field Campaigns:

- NGS to conduct Coordinated GPS campaign in FY15 and FY20 with Canada.
- GPS measurements will occur at bench mark locations at permanently operating water level gauges.
- GPS measurements/leveling also at seasonal water level gauging sites.



Coastal Mapping Program

California shoreline is in good shape!

- Most has been updated using NOAA and USACE data

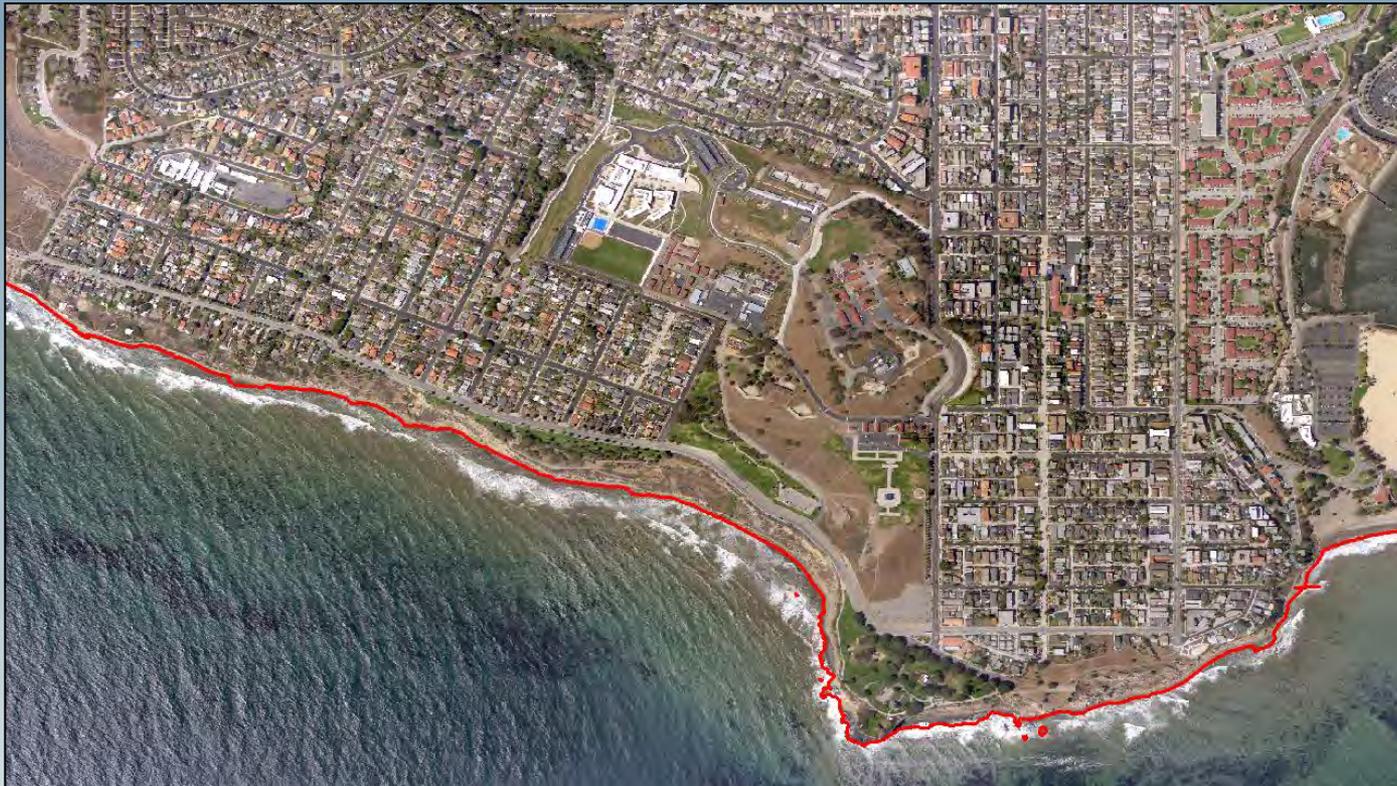
Focus areas:

- Sandy Supplemental contract – topobathy lidar, imagery, and shoreline
- Continued collection of topobathy lidar in the Florida Keys and Puerto Rico
- Installation and acceptance of upgraded digital cameras (Nadir and Oblique)



LA/Long Beach

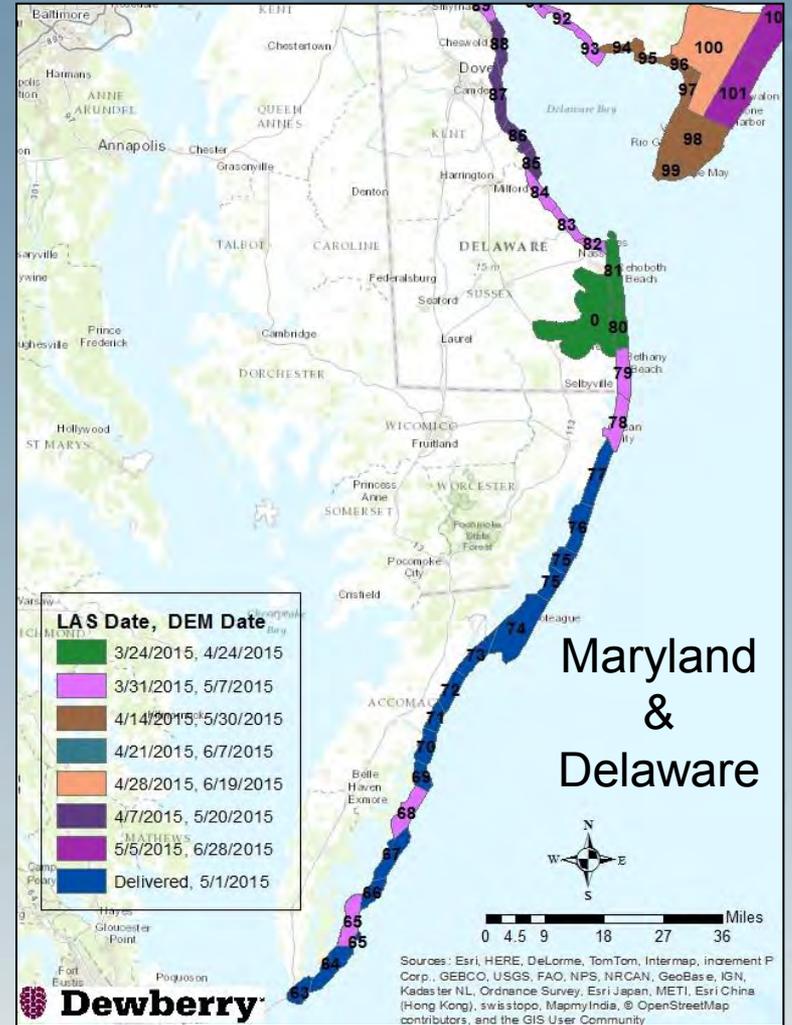
Long Beach, CA DSS Natural Color 8 Bit Imagery collected in 2013 on Digital Coast
and
National shoreline collected in 2010-2013 on Shoreline Data Explorer



Sandy Contract Update



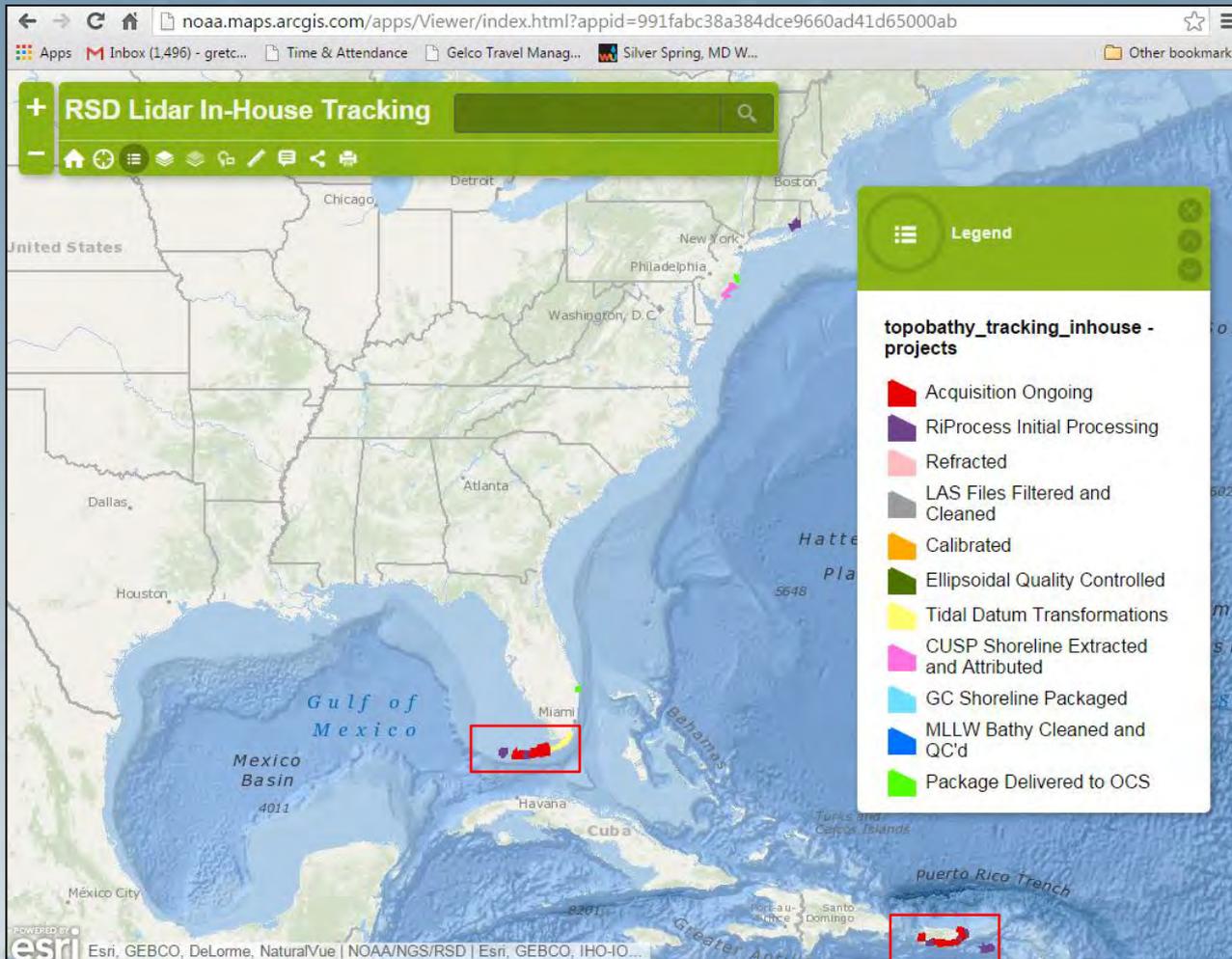
Sandy Contract Update



Sandy Contract Update



Topo-Bathy In-house Operations



Sandy In-house Topo-Bathy Data Available to Public

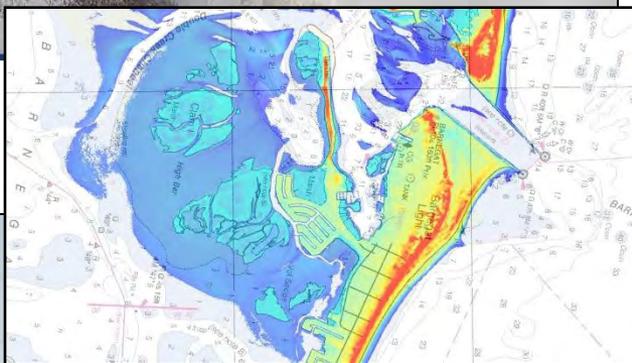


DigitalCoast
OFFICE FOR COASTAL MANAGEMENT



More Than

Dive into the Digital Coast to Get
Communities Need to Ad



DIGITAL COAST
NOAA Office for Coastal Management

Data Access Viewer

Enter Long/Lat

-74.132,39.772

Go

or

Draw Area

no buffer

Refine Search

Data Type

Change



Licensed Data

Include

Data Provider

Change



Results (1)

Data Detail

Cart (0)



Zoom



Share



Clear

Sort by

Year (Asc.)



2013 NGS Topobathy Lidar: Barnegat Bay (NJ)

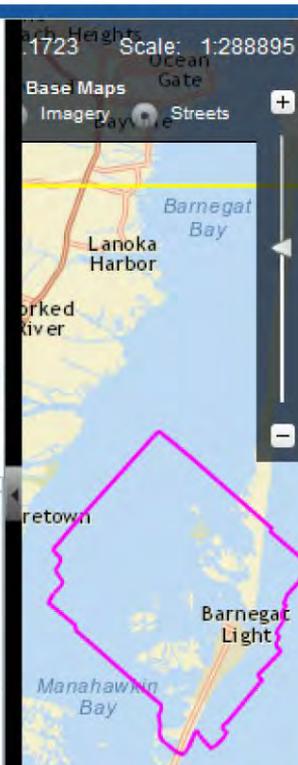
NOAA

LAZ fmt

Lidar >2 billion Pts 317 MB

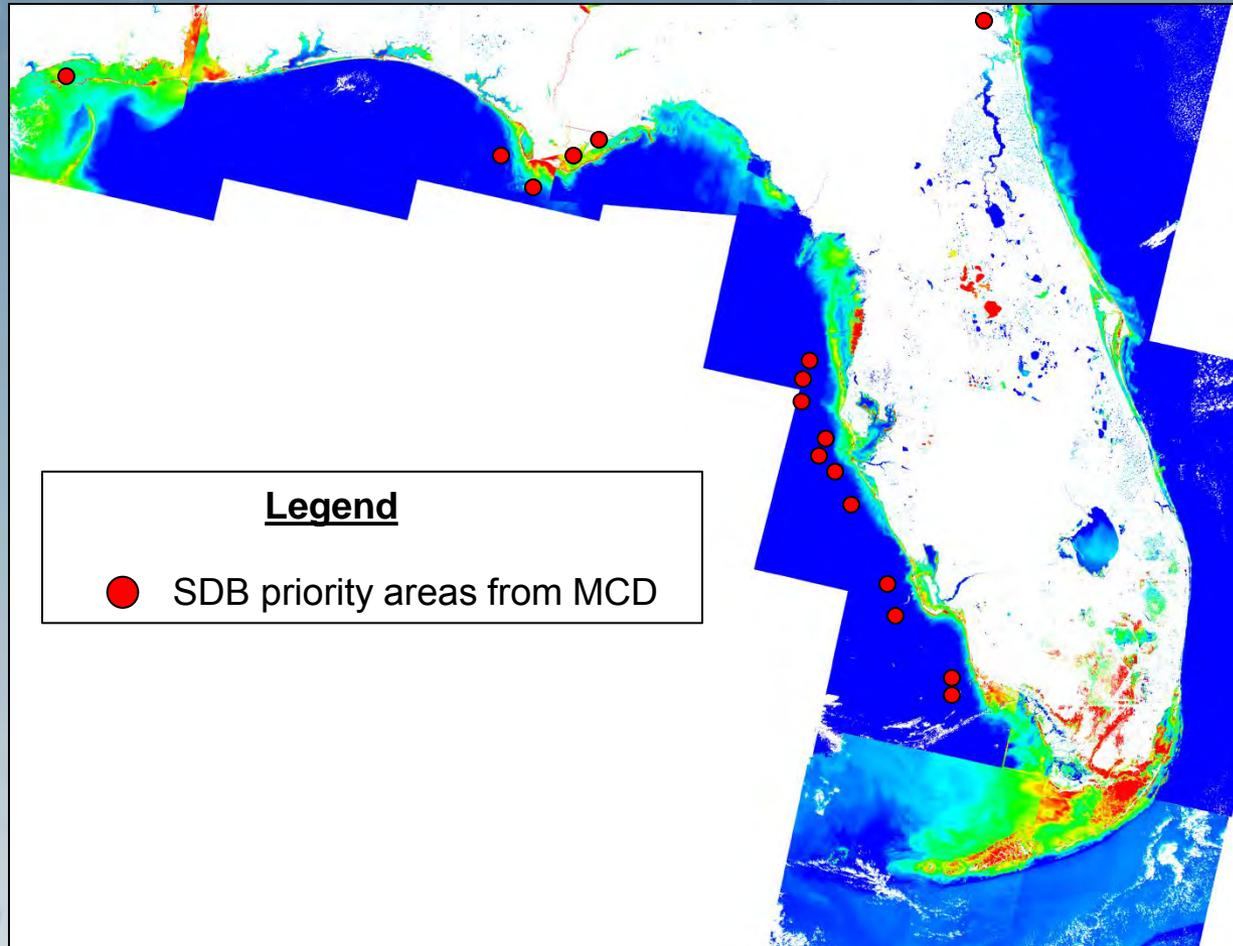


Add to Cart



HYDROGRAPHIC SE

Satellite Derived Bathymetry



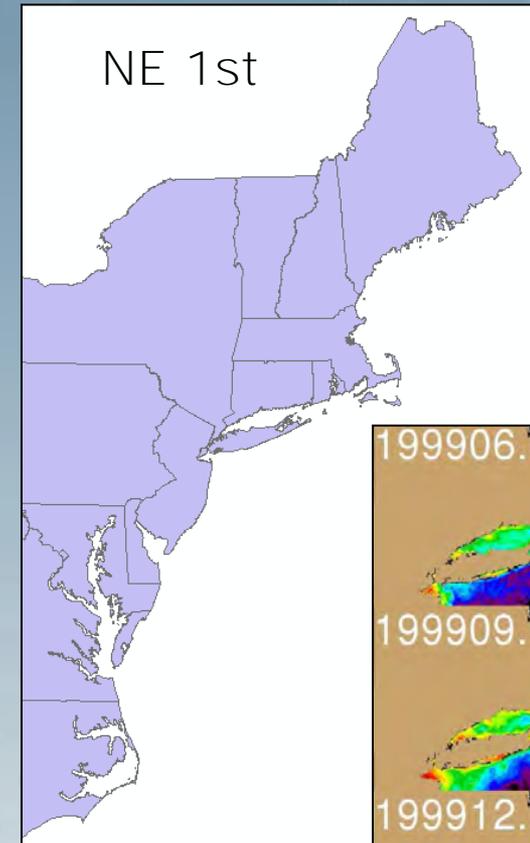
Collaboration with NCCOS on Climatology Model

Year 1 (2015?)

- Prototype with **300 m** climatology for **NE** and **prototype Alaska** with key areas (Alaska has different “back end”)
- Design front end strategy for access
- Determine system requirement/production strategy

Year 2

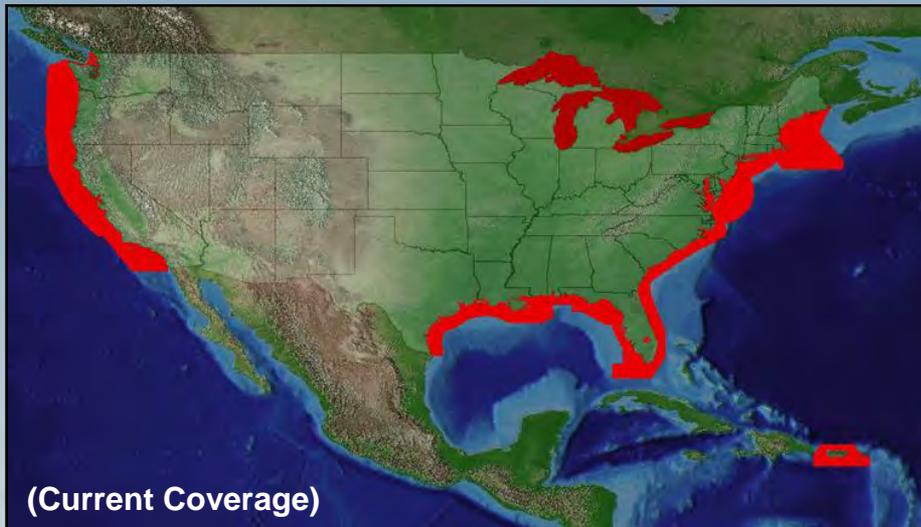
- Process national climatology model
- Evaluate maintenance strategy
- Product review
- Validation



VDatum: Mapping the Land-Sea Interface

Converts elevation data (heights and soundings) between different vertical datums

- All elevation data are referenced to a vertical datum.
- Many different vertical datums are used around the Nation.
- For elevation data sets to be blended together, they must be referenced to the **same** vertical datum.
- **VDatum provides a solution!**



VDatum is a Java application developed jointly by:

- National Geodetic Survey (NGS)
- Office of Coast Survey (OCS)
- Center for Operational Oceanographic Products & Services (CO-OPS)

The screenshot shows the NOAA VDatum website. The header includes the NOAA logo and the text 'NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION'. The main heading is 'VERTICAL DATUM TRANSFORMATION' with the subtitle 'INTEGRATING AMERICA'S ELEVATION DATA'. A navigation bar contains links for Home, About VDatum, Download, Docs & Support, and Contact Us. The main content area features a 'Welcome to VDatum!' message, a 'Download' button, and a list of features. The features section includes: Coordinate Systems (Geographic, UTM, State Plane Coordinates (SPC), and geocentric (ICRF)); Horizontal Datums (NAD27, NAD83 (1983), and NAD83 (HARN)); and Ellipsoidal Datums (NAD83, WGS84, ITRF88, ITRF99, ITRF90, NEOS 90, PNEOS 90, ITRF91, ITRF92, SID/MY 92, ITRF93, ITRF94, ITRF96, ITRF97, IGS97, ITRF2000, IGS00, IGS01, ITRF2005, IGS05, ITRF2008, IGS08, WGS84 (transit), WGS84 (G730), WGS84 (G873), WGS84 (G1150), NAD83(PAC00), NAD83(MAR00)). Other features listed include Orthometric Datums (NGVD29 and NAVD83), Tidal Datums (MLLW, MLW, DTL, MTL, MHW, and MHHW), and GEoid models (GEOID12A, GEOID09, GEOID06 (Alaska only), GEOID03, GEOID99, and GEOID96). The supported file format is text (ASCII), LOAR (.LAS) version 1.0 to 1.2, ESRI ASCII Raster (.ASC). The footer contains navigation links (Home, Site Map, Privacy, User Survey, Report an Error on This Page), web site owner information (National Ocean Service, NOAA, Department of Commerce), and a last modified date (05/14/2014 19:52:46).

<http://vdatum.noaa.gov/>



VDatum Update

- Currently updating San Francisco region (release in 2016).
- Foundational tidal data collection and processing to fill data gaps and areas of concern in 2016 and 2017 along entire West Coast.
- Foundational GPS observations on tidal benchmarks in 2016 and 2017.
- Update the entire West Coast Model for release in 2019.

<http://vdatum.noaa.gov/>



Partnerships



National Oceanic and Atmospheric Administration

NSRS positioning data provides the reference for **NOAA's nautical charts**, among many other geospatial applications.



Federal Emergency Management Agency

FEMA uses NSRS elevations to **determine flood zones** for the National Flood Insurance Program.



United States Army Corps of Engineers

USACE uses NSRS elevations to **determine levee heights** and positions in their Levee Safety Program.



United States Geological Survey

USGS uses the NSRS to geospatially reference their **Topographic Maps and interior water data** for the nation.



National Geospatial Intelligence Agency

NSRS gravity data contributes to **NGA's geospatial mission**.



Technical Mapping Advisory Council (TMAC)

Initiating Legislation

Biggert-Waters Flood Insurance Reform Act of 2012
Homeowner Flood Insurance Affordability Act of 2014



Mission

To provide counsel to FEMA on the most optimal strategies towards the identification, assessment and management of flood hazards.

Membership:

Federal (FEMA, USGS, USDA, NOAA, USACE), Regional, State, and Local

Deliverables

1. Provide the FEMA Administrator with an annual report to improve the effectiveness of National Flood Insurance Program (NFIP) risk management processes and products.
2. Provide FEMA with a review of the NFIP process, and
3. Provide the FEMA Administrator by the October 1, 2015 with a report containing recommendations for future conditions risk assessment and modeling.

<https://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/technical-mapping-advisory-council>

NGS Workforce Update

Since July 2014, NGS has hired 11 employees:

- 6 Geodesists
- 2 Physical Scientists
- 3 IT Specialists

10 Geodesist recruitments in progress

NGS Workforce Development Opportunity: Full-Time University Training for non-thesis Master of Science degree in Geodetic Science at the Ohio State University (Fall 2015)



NGS Geodetic Advisor Program

Pacific Southwest (includes CA and NV)

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Dana Caccamise



Pacific Southwest Regional
Geodetic Advisor

NGS Geodetic Advisor Program

The **NGS Geodetic Advisor Program** currently provides either a **NOAA employee** (jointly funded by NOAA and the state) **or a designated coordinator** residing in the state.

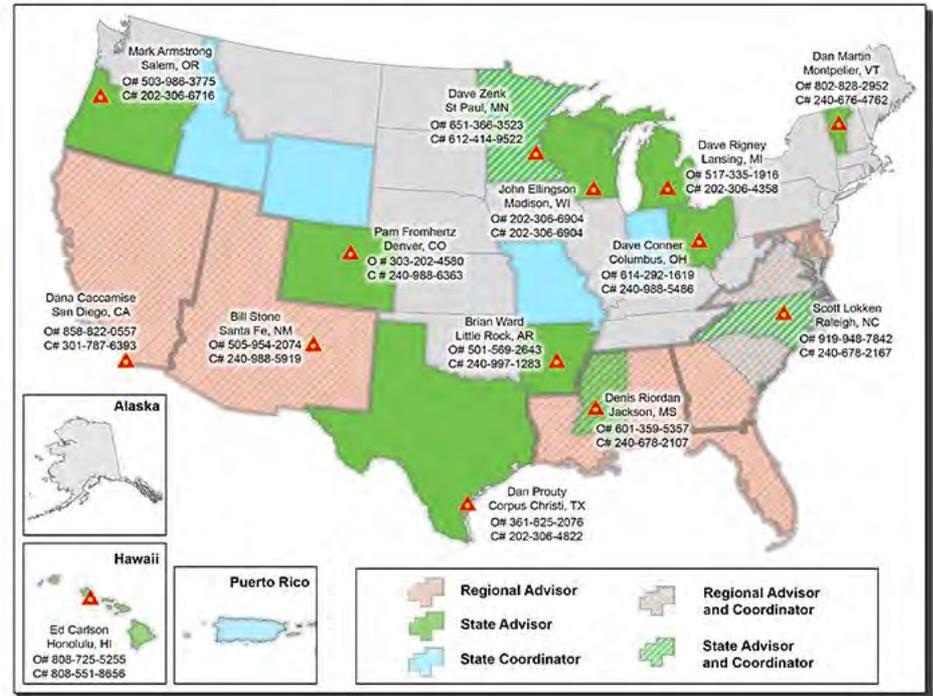
Geodetic advisors **guide and assist** the state's geodetic and surveying programs.

Advisor program is **transitioning** to a regional approach, meaning more coverage but fewer advisors.

Current Regional Advisors:

- Gulf Coast (LA, MS, AL, FL)
- Southwest (UT, AZ, NM)
- Pacific SW (CA, NV)
- Mid-Atlantic (DE, GA, MD, NC, SC, VA)

NGS is currently planning for the transition from the State Advisor program to a regional advisor program. For more information please check out the [Transition to Regional Program Web Page](#)



The **NGS State Geodetic Advisor Program** is a cost-sharing program that provides a liaison between NOAA and the host state, usually with a jointly-funded NOAA employee residing in the state to guide and assist the state's geodetic and surveying programs.

NGS also fosters a **State Geodetic Coordinator Program** wherein a participating state designates an employee to be its State Geodetic Coordinator, acting as a liaison between the state and NGS.

<http://www.geodesy.noaa.gov/ADVISO>
[RS/](#)

