Progress on 2013-2023 National Geodetic Survey Strategic Plan

Juliana Blackwell
Director, National Geodetic Survey

April 18, 2017

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.

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

Support the Users of the NSRS

Products delivered to date in FY 2017:

- **1.6** million survey mark datasheets
- **19+** million CORS datasets
- **1.4** million online geoid computations

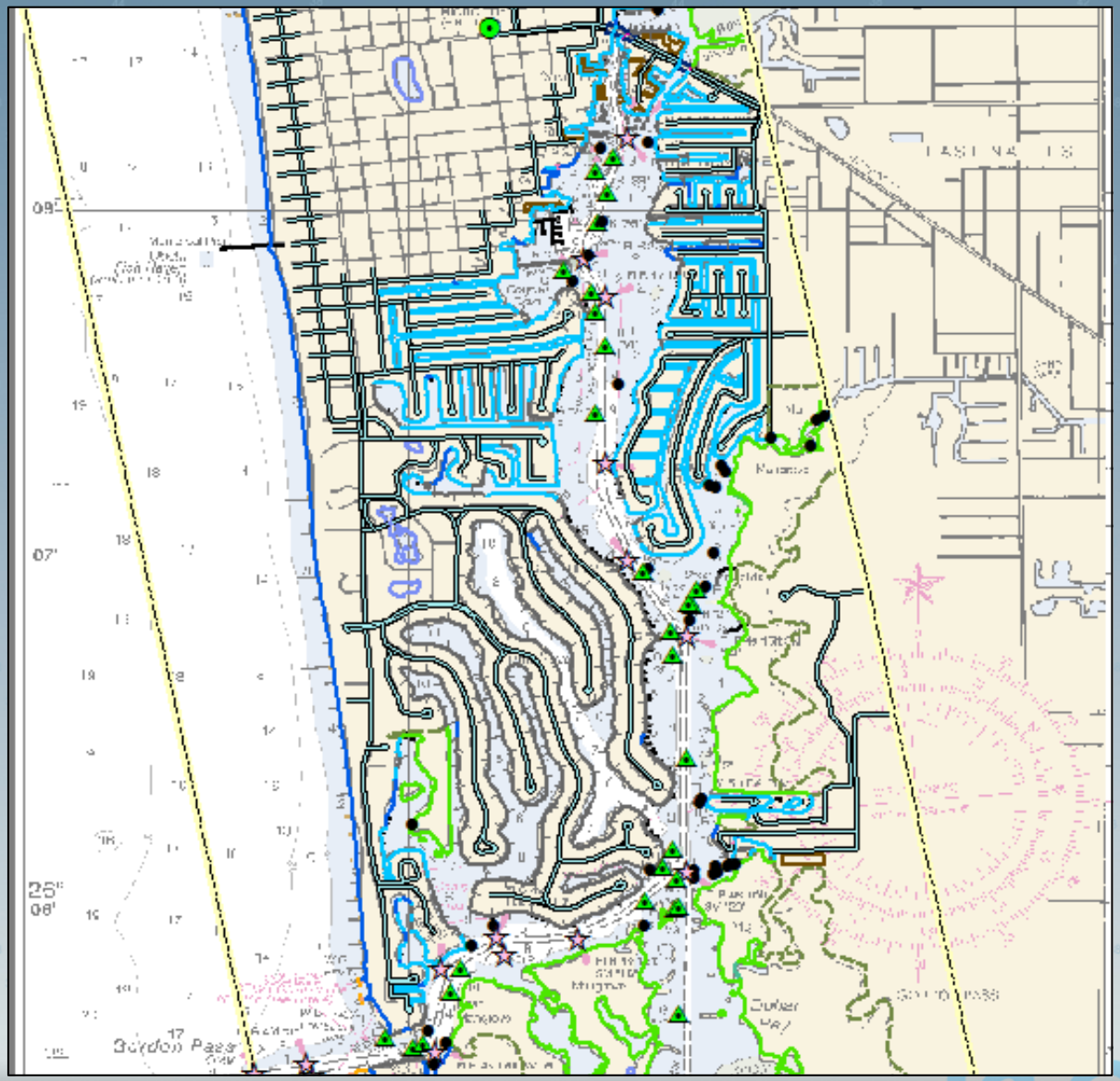
Support the Users of the NSRS

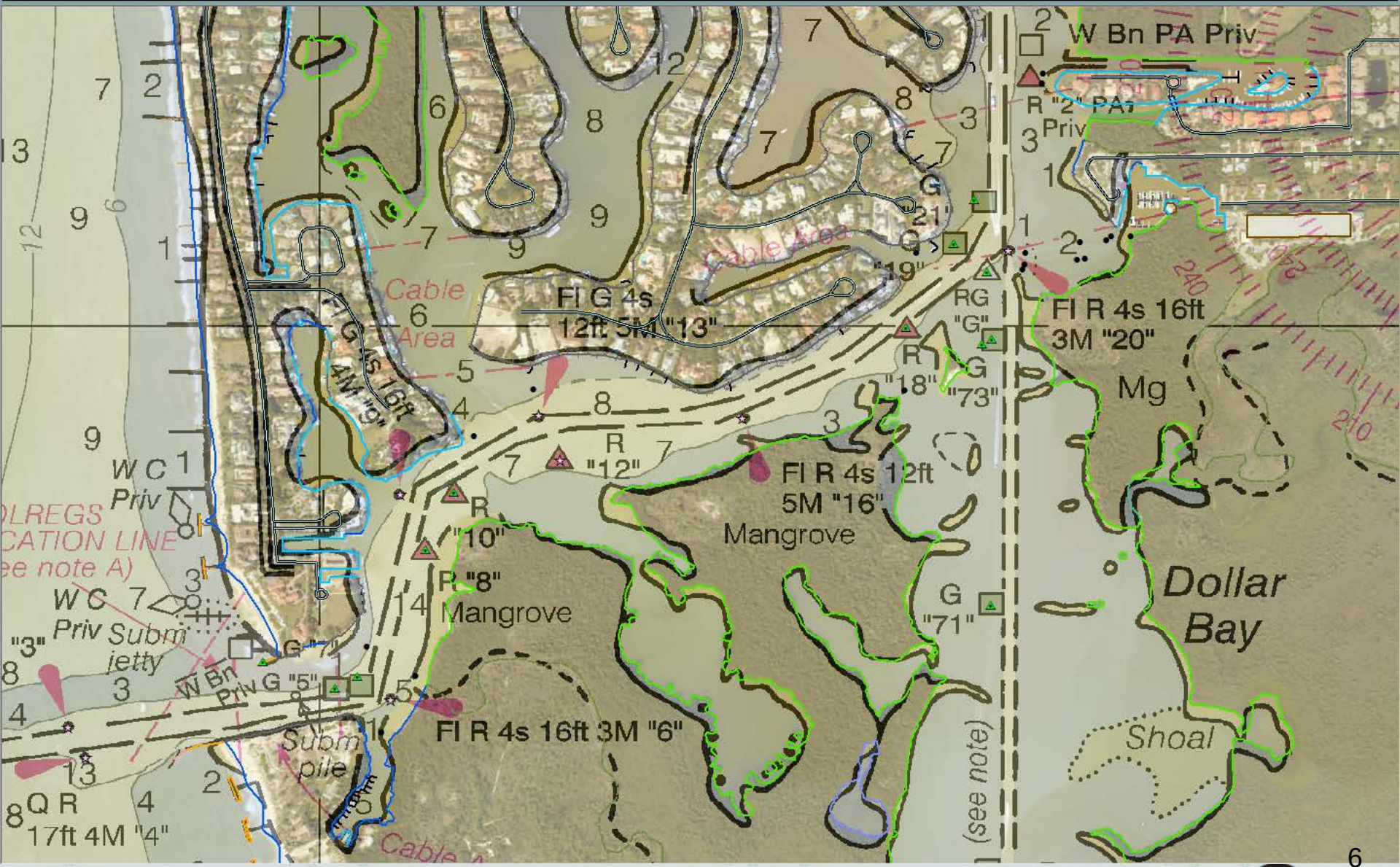
In FY 2016:

- **9,107** miles* of shoreline compiled (**5.5**% of US)
- **285+** nautical charts received updated shoreline
- **37** ports updated with new shoreline
- **35** ports analyzed for change (CSCAP)
- **400** sq nm of airborne lidar bathymetry data delivered
- **700** sq nm of airborne lidar bathymetry collected

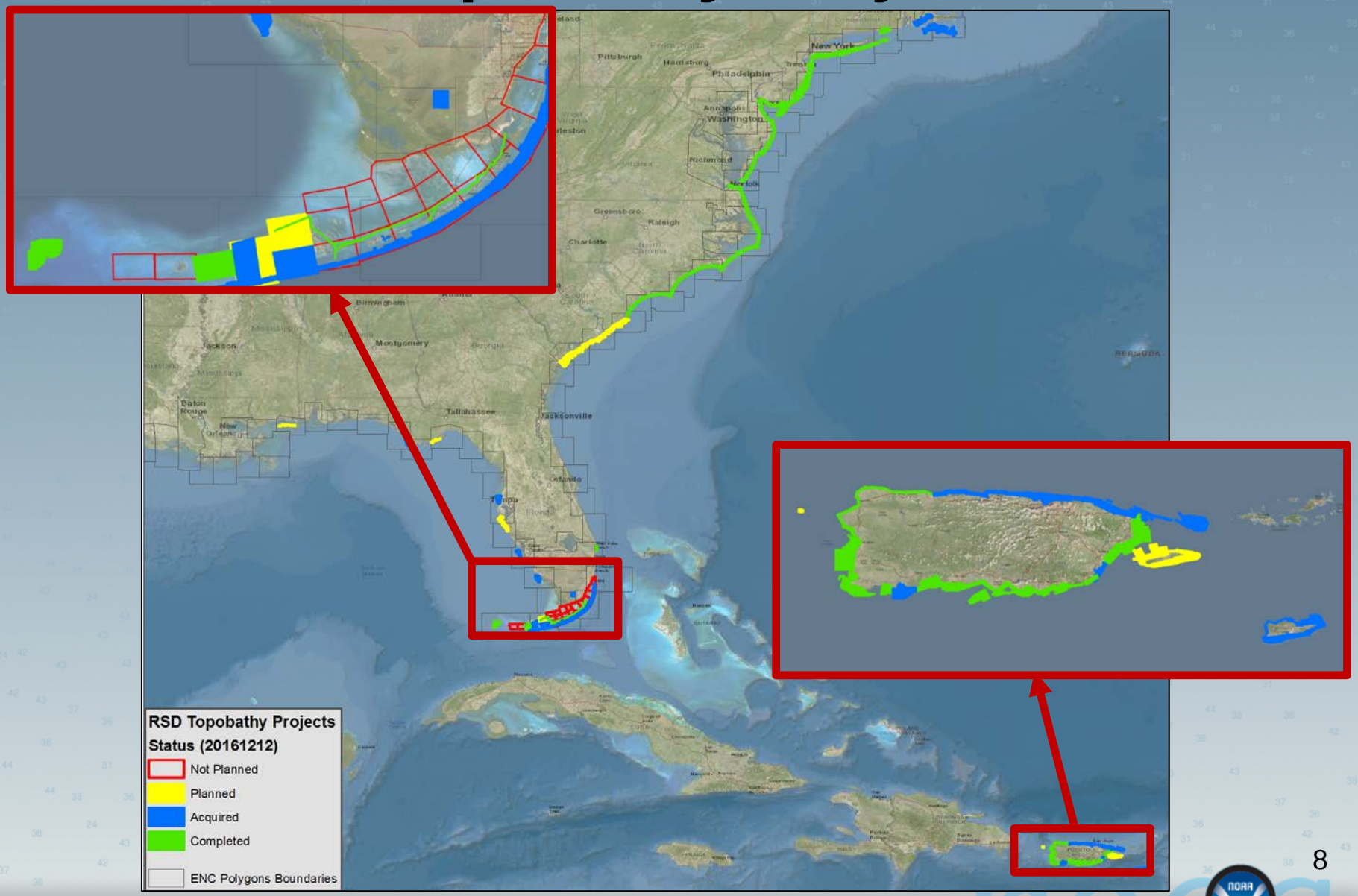
*miles measured at 1:80,000 scale

Shoreline Compilation




W Bn PA Priv
R "2" PA Priv
Fl G 4s
12ft 5M "13"
Fl G 4s 16ft
4M "9"
Cable Area
Cable
Area
G "21"
"19"
RG "G"
R "18"
G "73"
Fl R 4s 16ft
3M "20"
Mg
R "12"
Fl R 4s 12ft
5M "16"
Mangrove
R "10"
R "8"
Mangrove
G "71"
Dollar
Bay
Shoal
W C
Priv
W C
Priv Subm
jetty
"3"
G "7"
W Bn
Priv G "5"
Fl R 4s 16ft 3M "6"
Subm
pile
Q R
17ft 4M "4"
(see note)

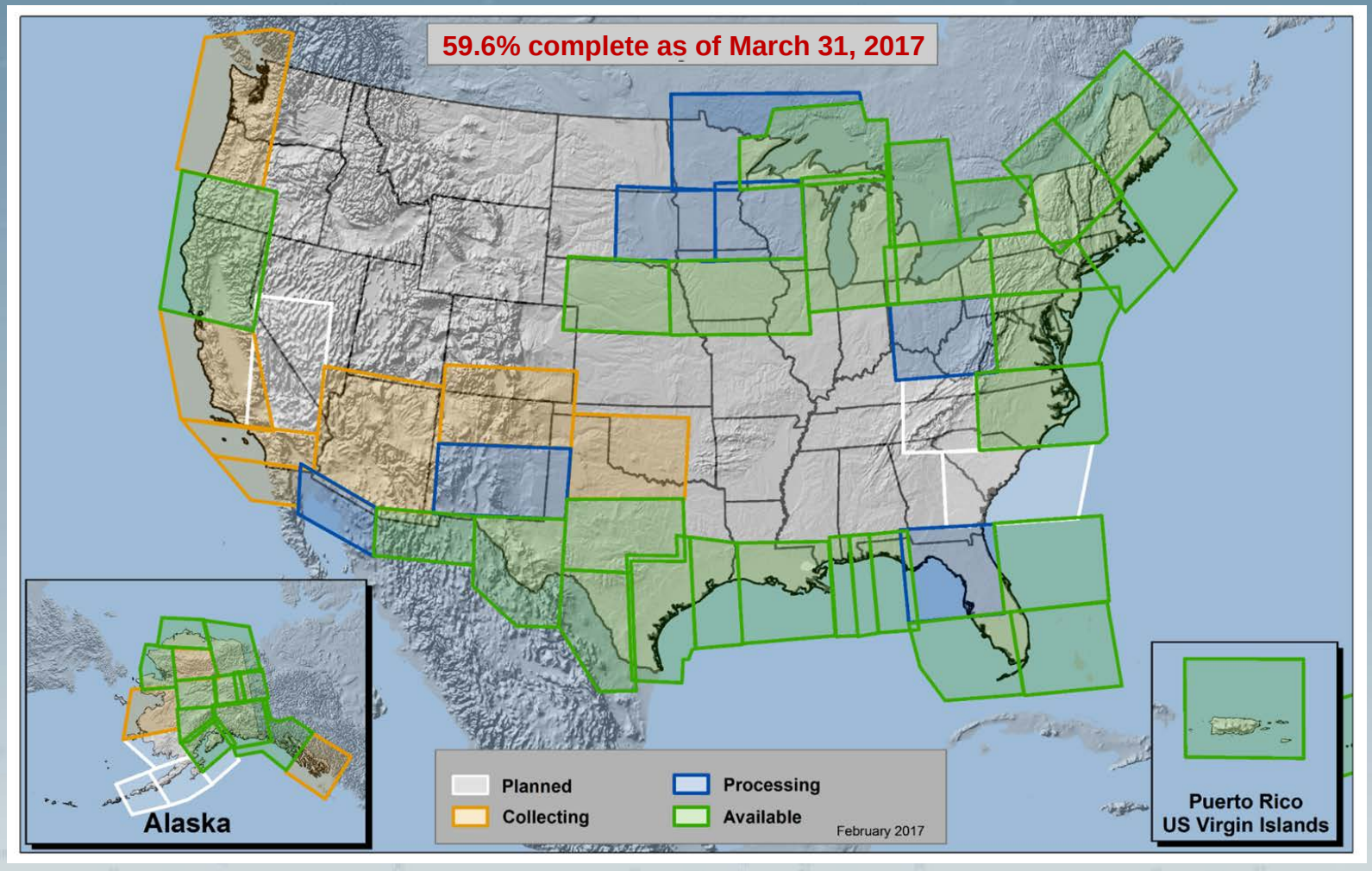
Topobathy Projects



Modernize and Improve the NSRS

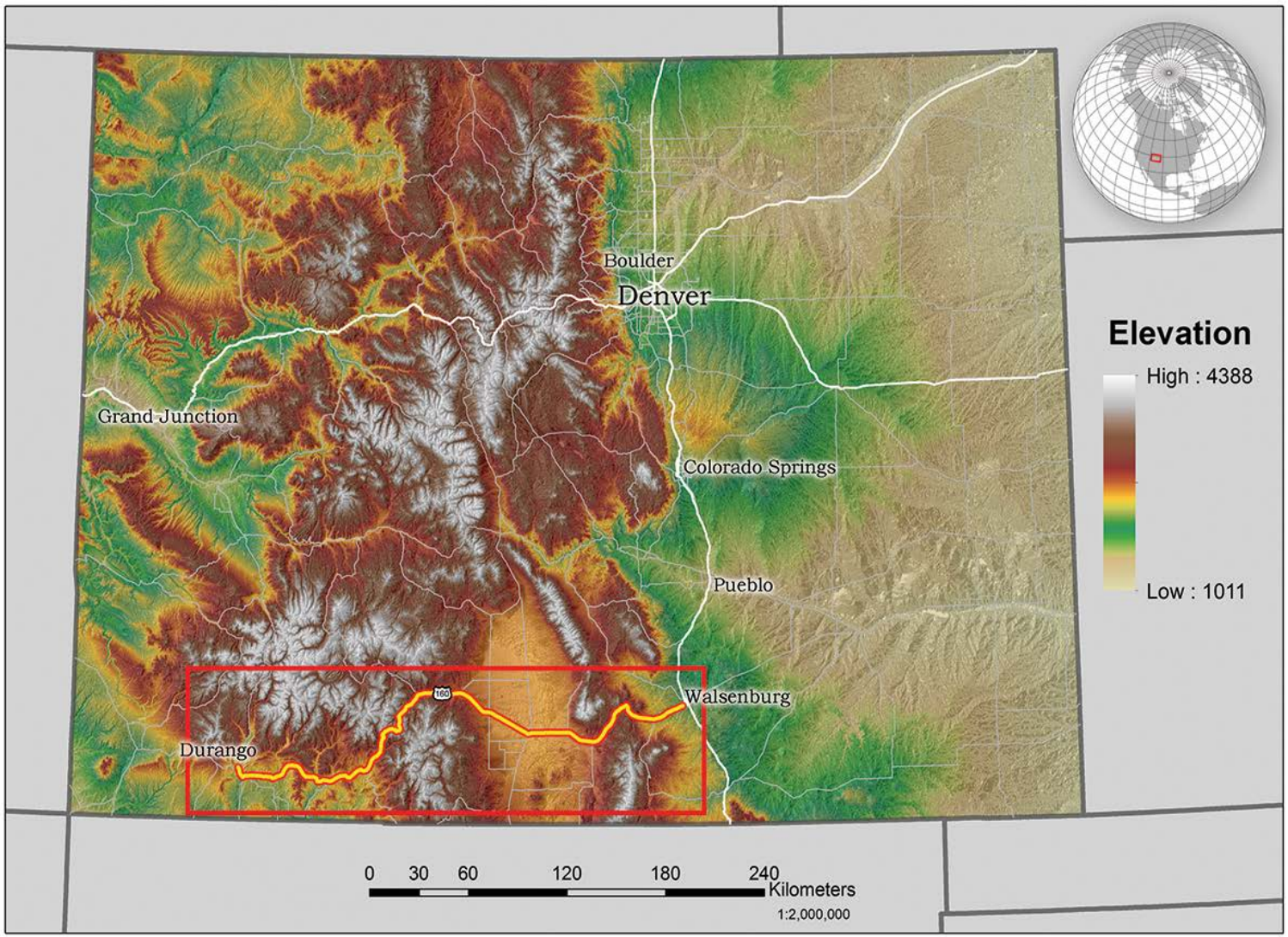
- Replace the geodetic datums
- Improve data submission
- Develop new toolkit
- Update surveying methodologies

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



https://www.geodesy.noaa.gov/GRAV-D/

Geoid Slope Validation Survey



NSRS Modernization

New Geometric Reference Frames ("Horizontal")

The Old:

The New:

NAD 83(2011) → The North American Terrestrial Reference Frame of 2022 (NATRF2022)

NAD 83(2011) → The Caribbean Terrestrial Reference Frame of 2022 (CTRF2022)

NAD 83(PA11) → The Pacific Terrestrial Reference Frame of 2022 (PTRF2022)

NAD 83(MA11) → The Mariana Terrestrial Reference Frame of 2022 (MTRF2022)

NSRS Modernization

New Geopotential Datum ("Vertical")

	The Old:
Orthometric Heights	NAVD 88
Normal Orthometric Heights	PRVD 02
	VIVD09
	ASVD02
	NMVD03
	GUVD04
Dynamic Heights	IGLD 85
Gravity	IGSN71
Geoid Undulations	GEOID12B
Deflections of the Vertical	DEFLEC12B

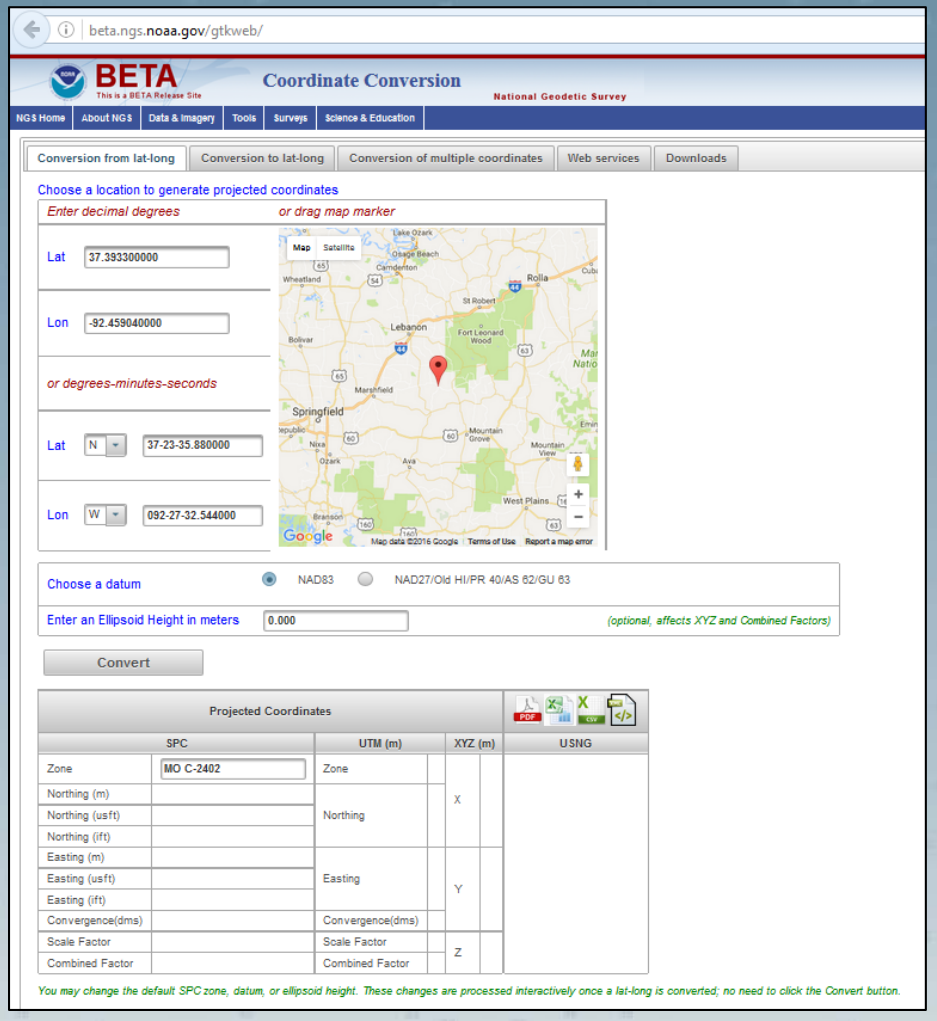
The New:

The North American-Pacific Geopotential Datum of 2022 (NAPGD2022)

- Includes GEOID2022

Beta Geodetic Toolkit

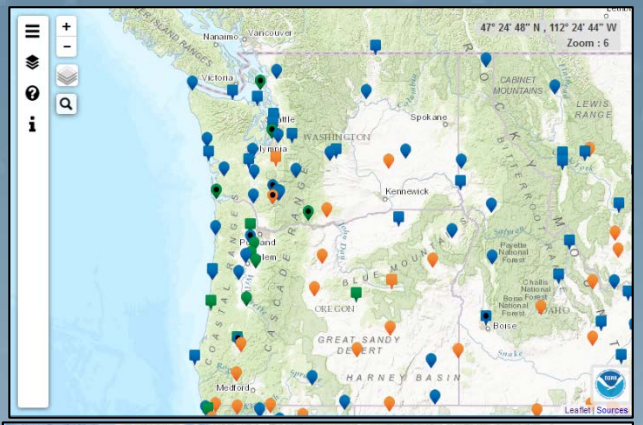
- Web service
- Coordinate conversions between latitude and longitude and
  - State Plane Coordinates
  - Universal Transverse Mercator
  - XYZ
  - US National Grid
- Will soon include NADCON5 with many improved transformations from the US Standard Datum to NAD83(2011)



https://beta.ngs.noaa.gov/gtkweb/

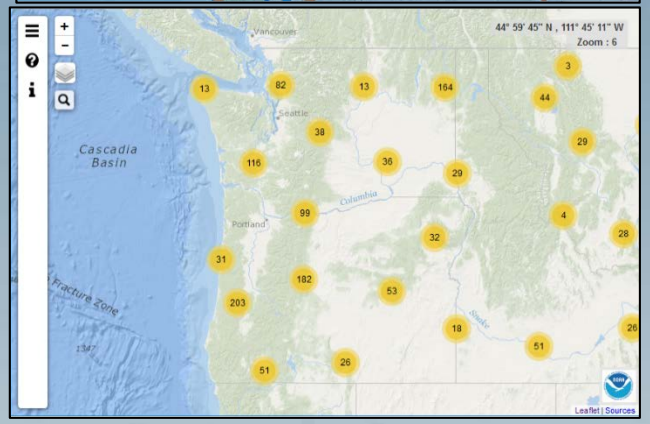
Beta Mapping Applications

Responsive design, mobile friendly



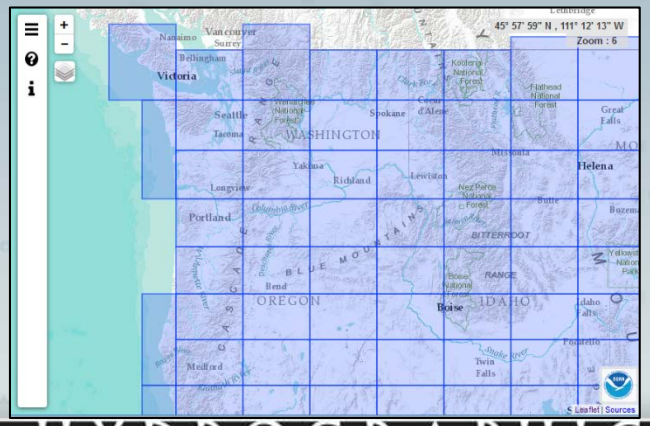
CORS Map

https://beta.ngs.noaa.gov/corsmap/



OPUS Share Map

https://beta.ngs.noaa.gov/opusmap/

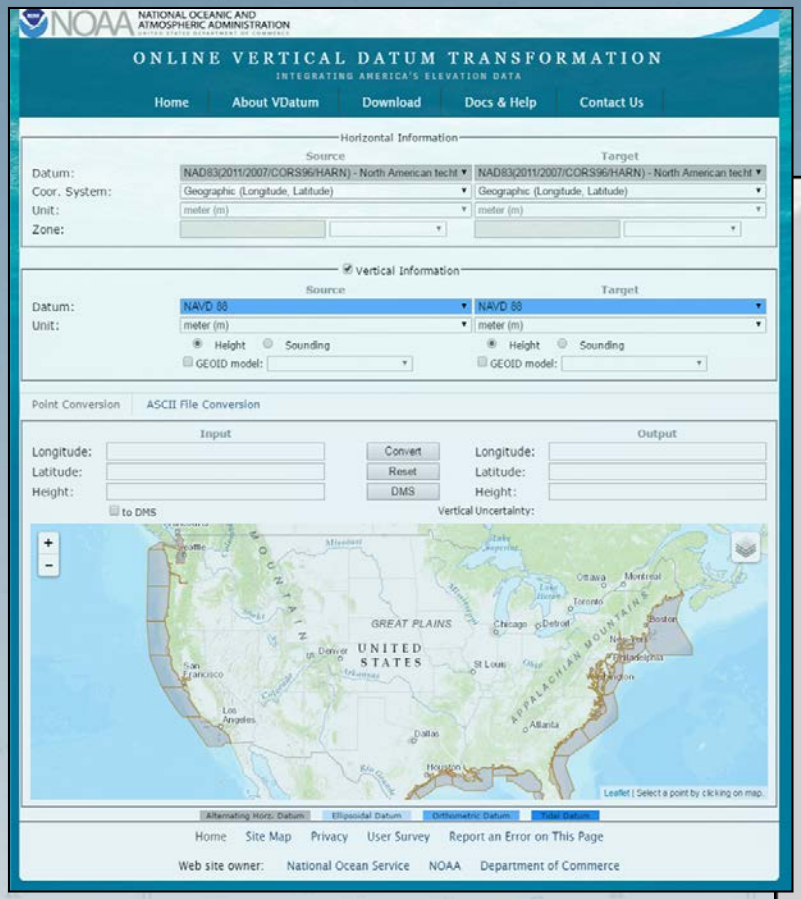


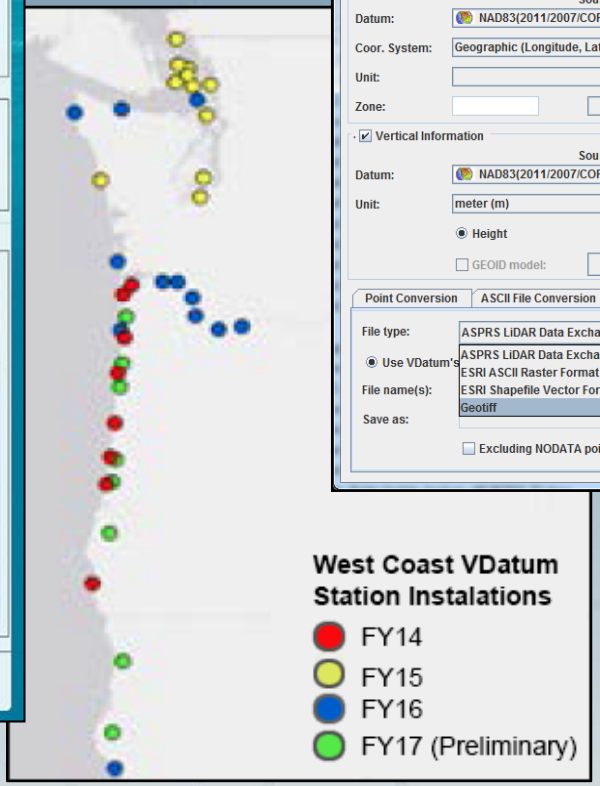
Geodetic Control Diagrams

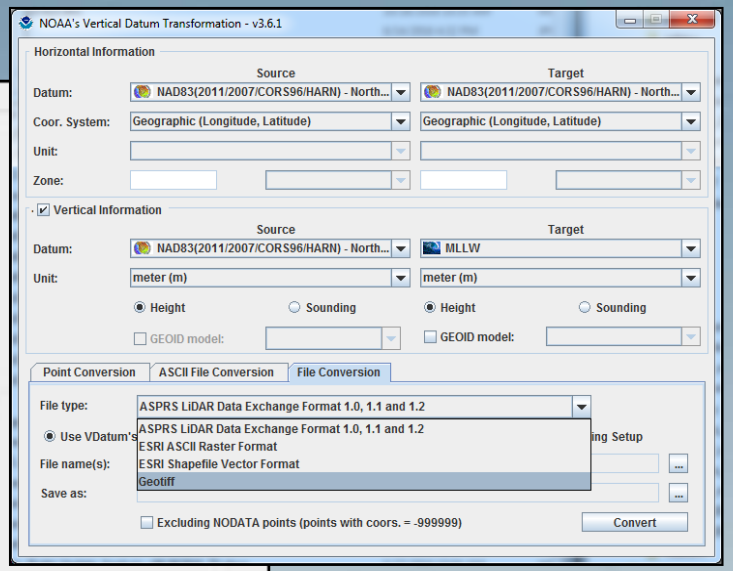
https://beta.ngs.noaa.gov/gcd/

VDatum Tool

Integrating America's Elevation Data







https://vdatum.noaa.gov/

Expand the NSRS Stakeholder Base

- Outreach and education
- University engagement
- Integrated Ocean and Coastal Mapping (IOCM)

Geospatial Summit

April 24-25, 2017

Attend in person or by webinar!

NGS Regional Advisor Program


Mark Armstrong
Northwest


Pam Fromhertz
Rocky Mountain


Dave Zenk
Northern Plains


John Ellingson
Great Lakes


Dave Conner
Appalachian


Dan Martin
Northeast


Dana Caccamise
Pacific Southwest


Brian Ward
Central Plains


Bill Stone
Southwest


Dan Prouty
Southern Plains


Denis Riordan
Gulf Coast


Scott Lokken
Mid Atlantic


Nic Kinsman
Alaska


Ed Carlson
Pacific

Hawai'i

Guam and
N. Mariana
Islands

American Samoa

Puerto Rico

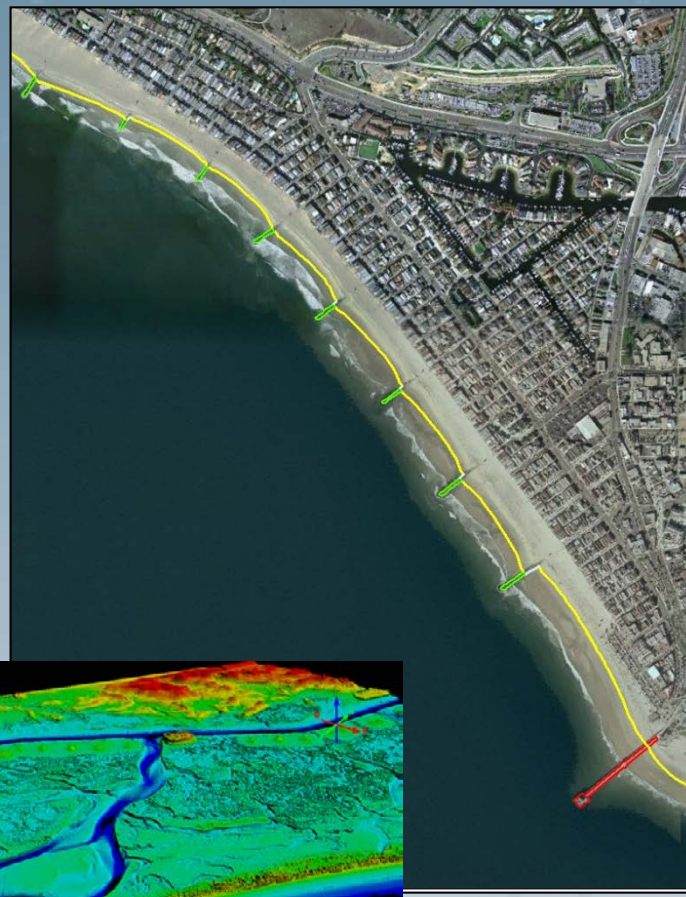
U.S. Virgin
Islands

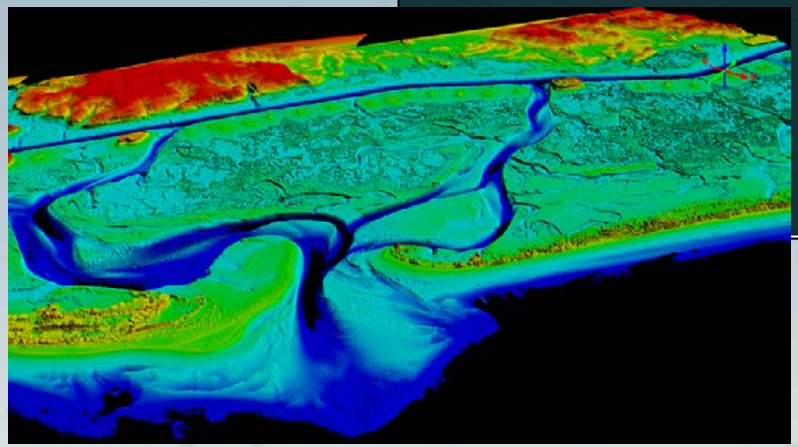
Current Advisors

University Engagement

NGS Coastal Mapping Program

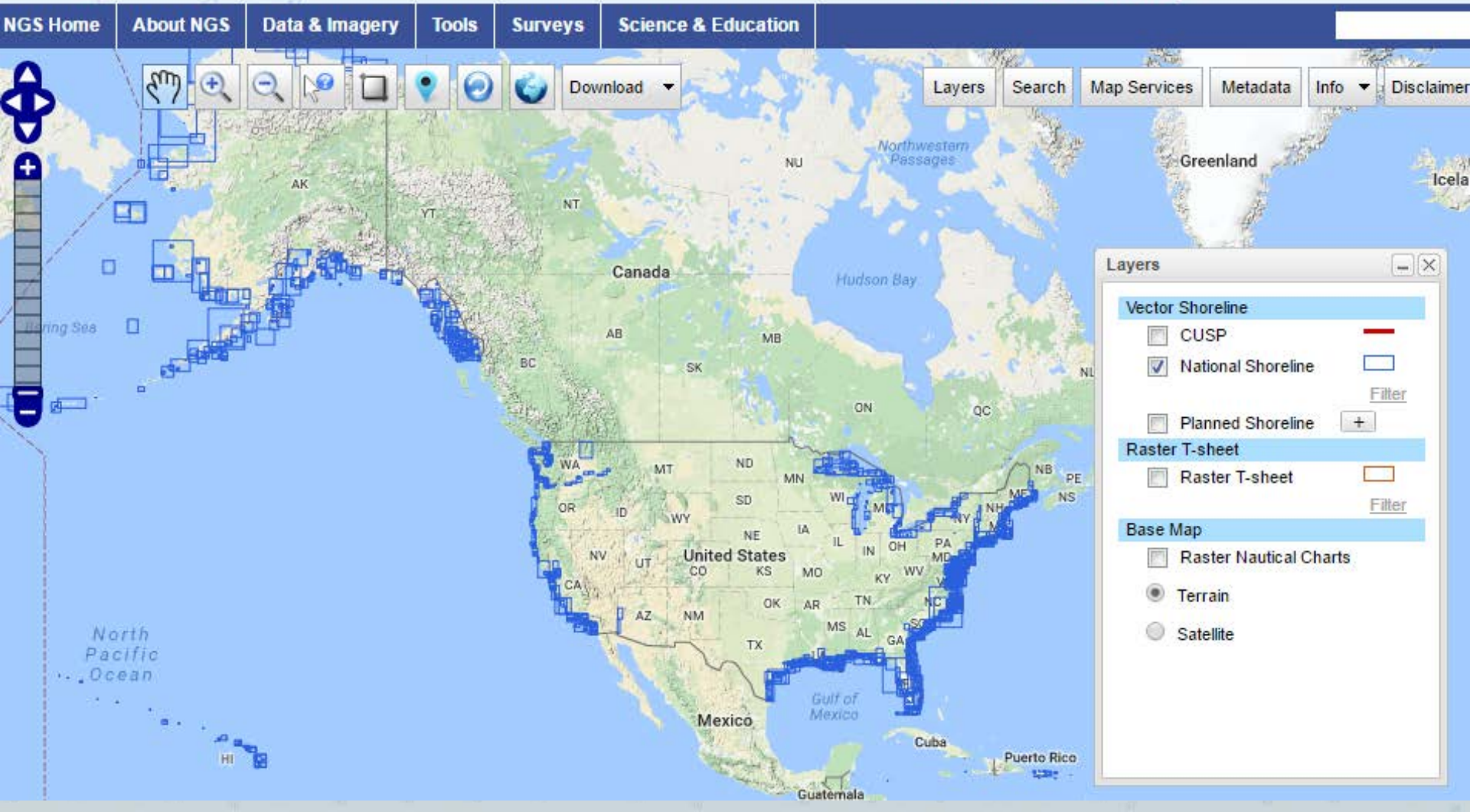
- Defines the National Shoreline and provides nearshore elevation data
- NOAA nautical charts updates
- Other important applications:
  - Used in defining U.S. territorial limits
  - Coastal resource management
  - Storm surge and coastal flooding modeling
  - GIS analysis
  - Benthic habitat mapping





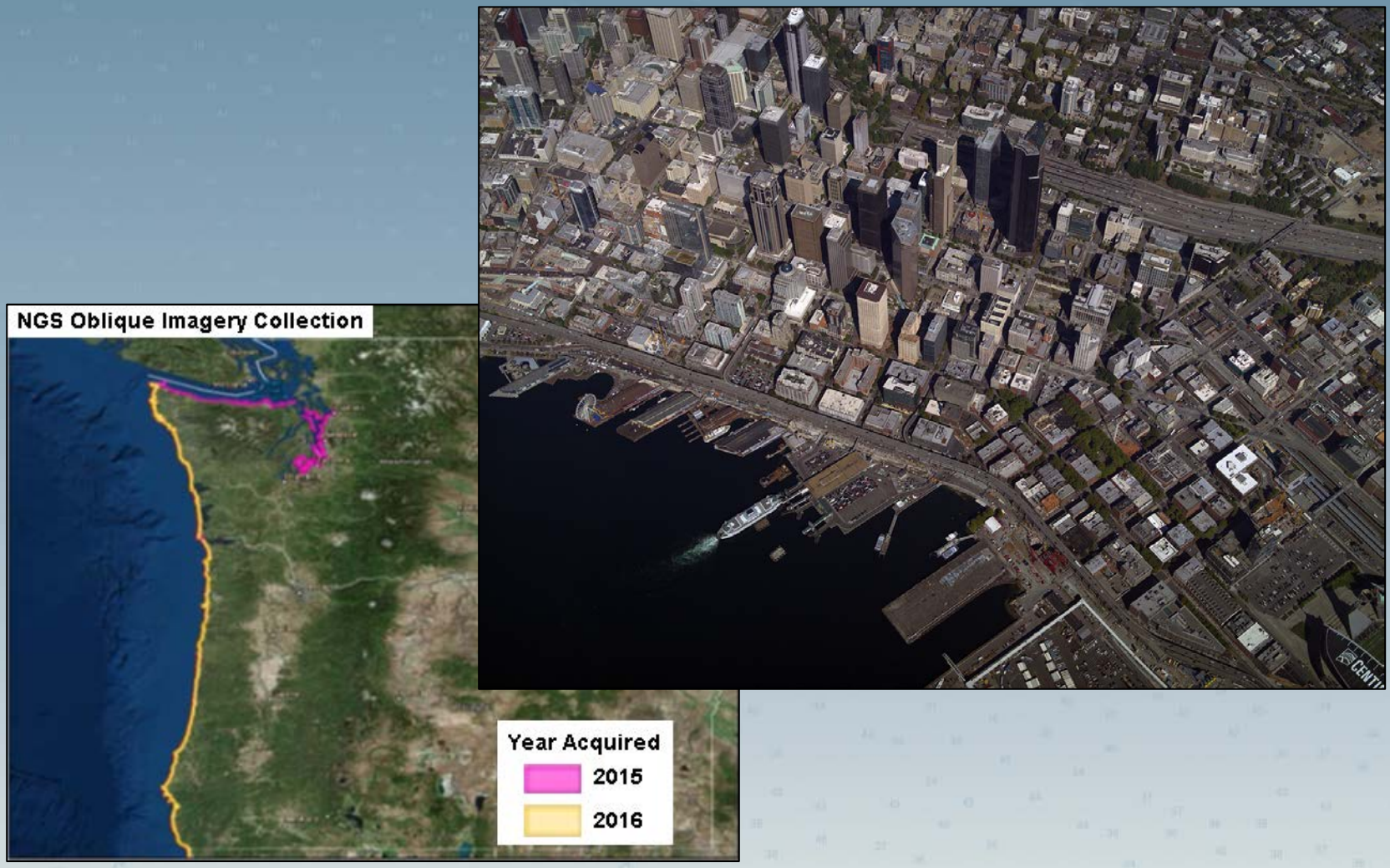
NOAA Shoreline Data Explorer

National Geodetic Survey



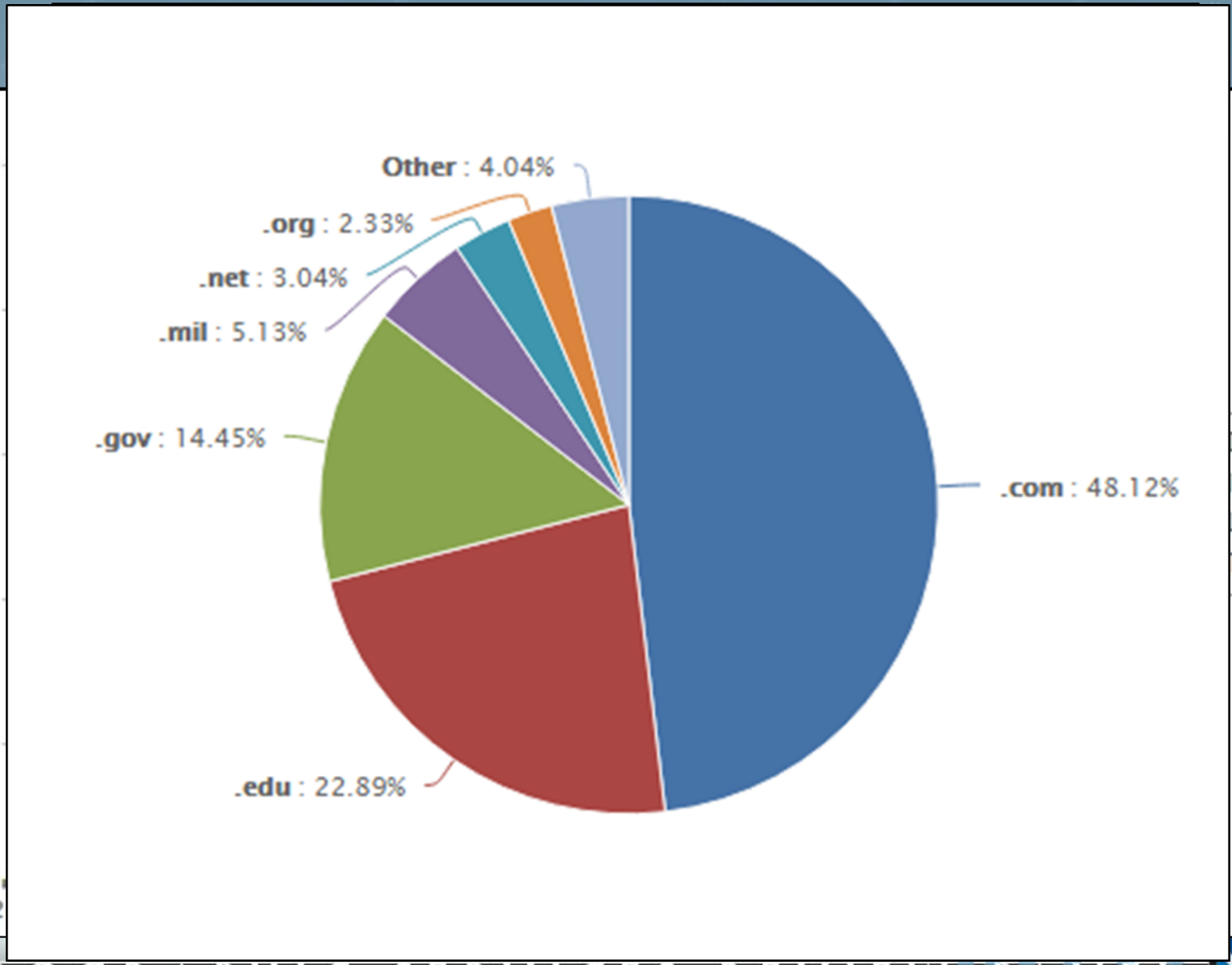
https://www.ngs.noaa.gov/NSDE/

Northwest Oblique Imagery



https://geodesy.noaa.gov/storm_archive/coastal/viewer/

Stakeholder Growth



NGS Partnerships

Research
Modeling, Survey Methodologies, Sensor Development, Cloud Processing by **Contractors, Cooperative Institutes, Grantees, Visiting Scientists**

Data Collection
Shoreline, Topobathy Lidar, CORS, GRAV-D, Geodetic Control by **Contractors, CORS Partners, Academia, Surveyors, Federal and State Agencies, Private Citizens**

Product Development
Data Processing, Compilation, Data Management by **Contractors, Third Party Vendors**

Product Distribution
Data Ingestion by **Federal, State and Local Agencies, GIS Community, Academia, Third Party Vendors**

Resource Allocation