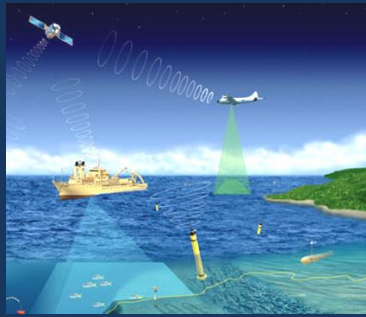




**INTERAGENCY WORKING GROUP ON**  
**Ocean and Coastal Mapping**

# IWG-OCM Update For NCSS



**Data Supporting Science  
and Sound Decision-Making**



**Ashley Chappell**

**January 9, 2018**

# NOAA IOCM Coordination Team Members

## National Environmental Satellite, Data and Information Service:

- NCEI

## National Marine Fisheries Service:

- Chesapeake Bay Office
- Office of Habitat Conservation
- Office of Science and Technology
- Regional Science Centers

## Office of Marine and Aviation Operations

- Fleet Working Group
- Data Manager

## Office of Oceanic and Atmospheric Research:

- Climate Program Office
- Office of Ocean Exploration and Research
- Sea Grant

## National Ocean Service:

- CO-OPS
- IOOS
- NOAA/UNH Joint Hydrographic Center
- National Centers for Coastal Ocean Science
- National Geodetic Survey
- NOAA Office For Coastal Management
  - National Estuarine Research Reserves
- Office of Coast Survey
- Office of National Marine Sanctuaries
- Office of Response and Restoration
- NOAA Coral Reef Conservation Program

## National Weather Service



**NOAA**

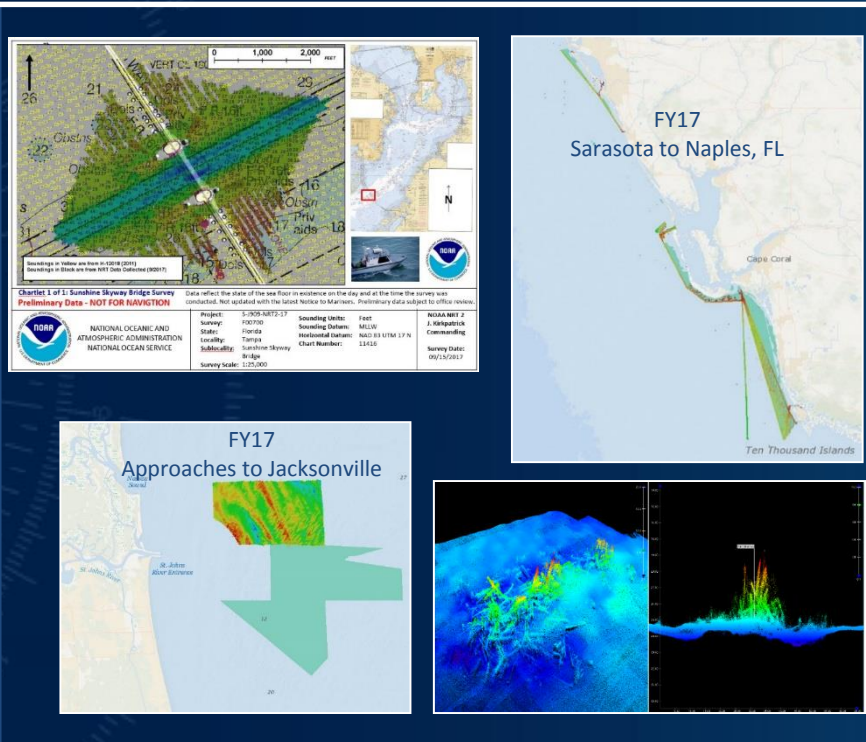
INTEGRATED OCEAN AND  
COASTAL MAPPING (IOCM)

UNITED STATES DEPARTMENT OF COMMERCE

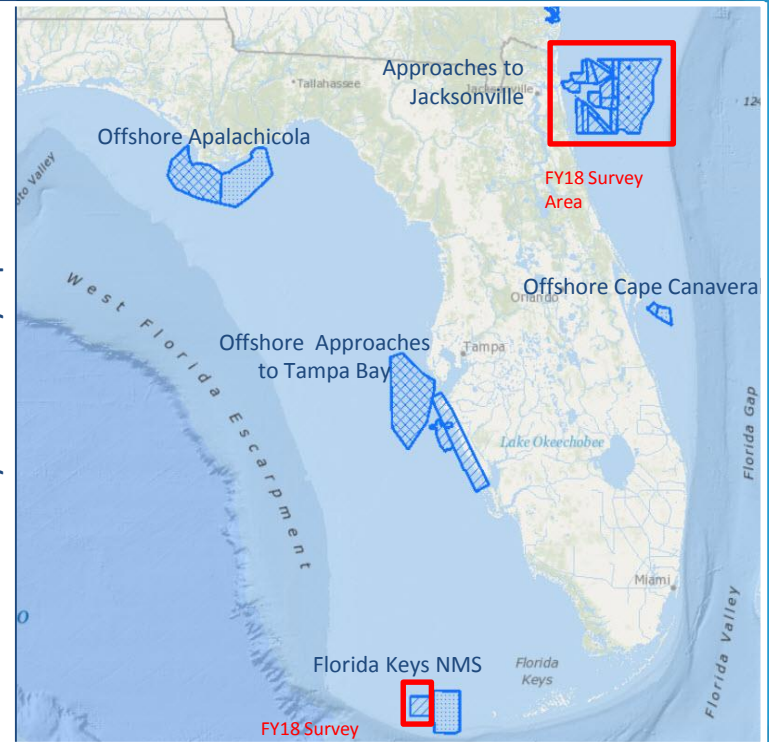
*“Map Once,  
Use Many Times”*

# NOAA's Office of Coast Survey Florida Based Hydrographic Survey Operations

OCS Completed 2017 Hydro Survey Ops

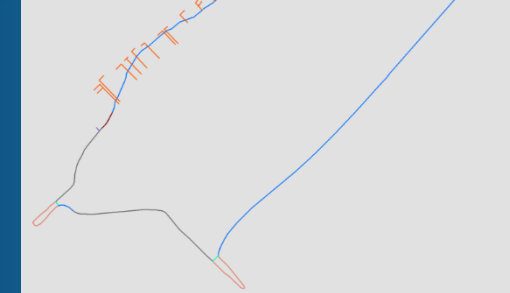
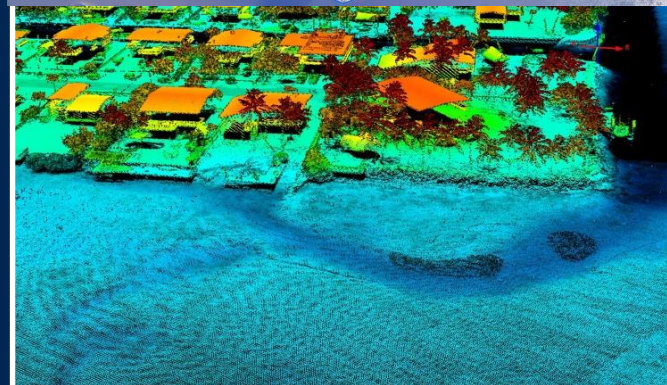
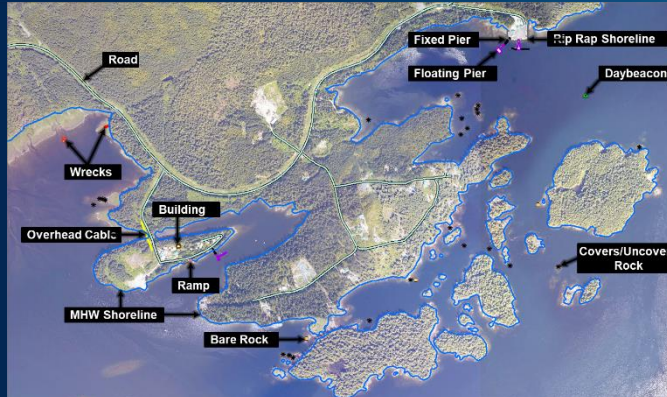


OCS Planned Hydro Survey Ops: 2018 - 2020



# NOAA's Coastal Mapping Program

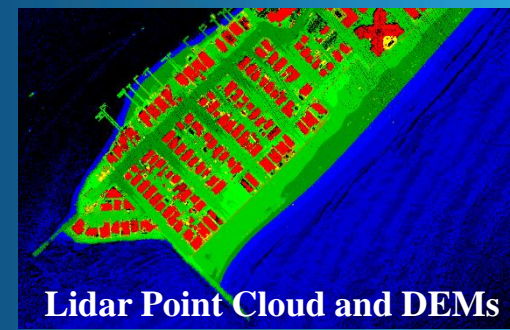
- Define the National Shoreline and nearshore elevation data
- NOAA nautical charts
- Other important applications:
  - Used in defining the United States' territorial limits
  - Coastal resource management
  - Storm surge and coastal flooding modeling
  - GIS analysis
  - Benthic habitat mapping
- Coastal Intelligence and Resiliency...  
Map once use many times!
- Emergency Response Imagery



Shoreline  
<https://www.ngs.noaa.gov/NSDE/>

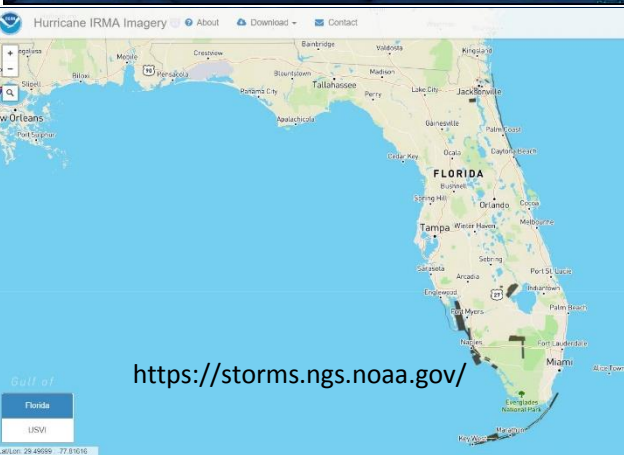
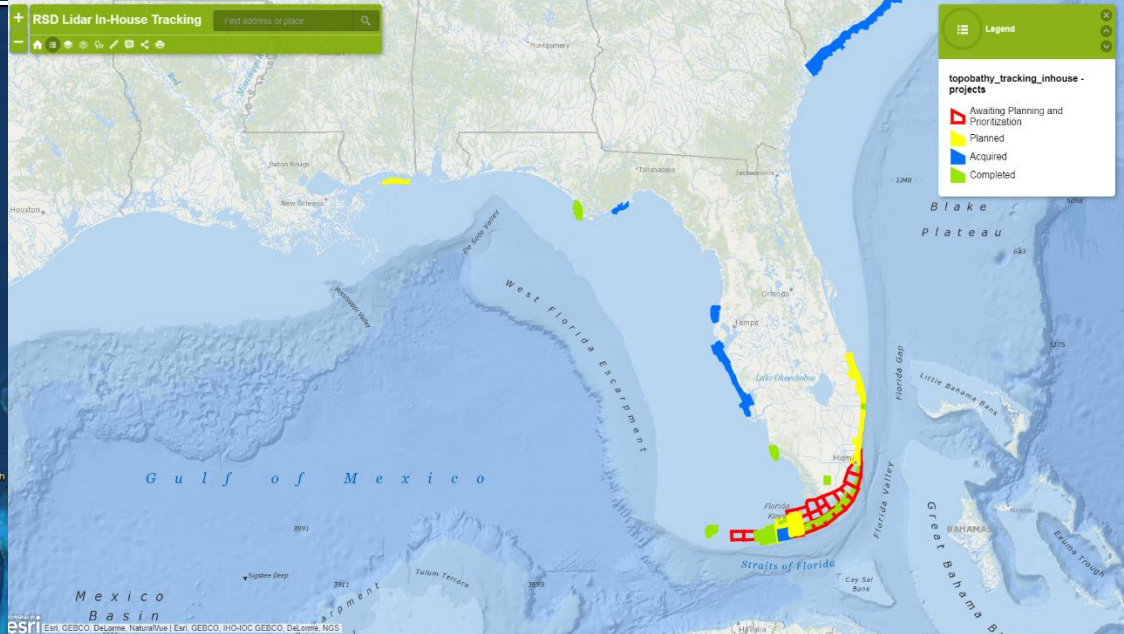
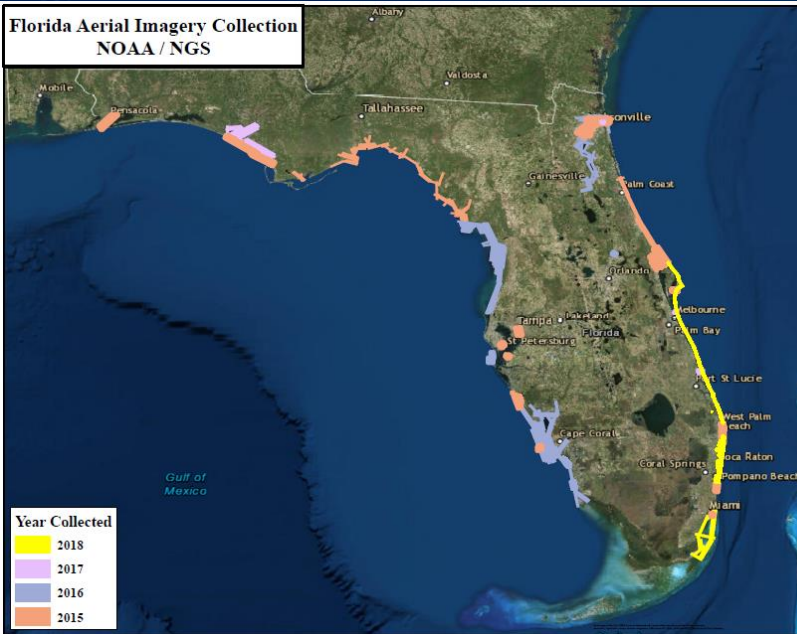


Ortho Mosaic Imagery  
<https://coast.noaa.gov/digitalcoast/>



Lidar Point Cloud and DEMs





**National Geodetic Survey (NGS) Topobathy 2018 Survey Plans**

- FL1703-TB-N Miami Intercoastal (Pompano)
- FL1701-TB-N Block D, E, F (Keys)
- FL1801-TB-N (Blocks H and I) (Keys)
- FL1802-TB-N (Highland Beach to Fort Pierce)

- 2015**
- Fort DeSoto
  - Marathon
  - Tampa Bay
  - Fort Lauderdale
  - Dry Tortugas

- 2016**
- Tarpon Springs
  - Key West
  - Everglades
  - Boca Grande
  - Marco Island
  - Sarasota
  - Keys Outer reef

- 2017**
- Keys Outer reef (continued and completed)
  - St. Joe
  - Apalachicola
  - ICW (a portion)
  - Dog Island
  - Rainbow River
  - Irma transects (over outer reef)
  - Desoto to Boca Grande

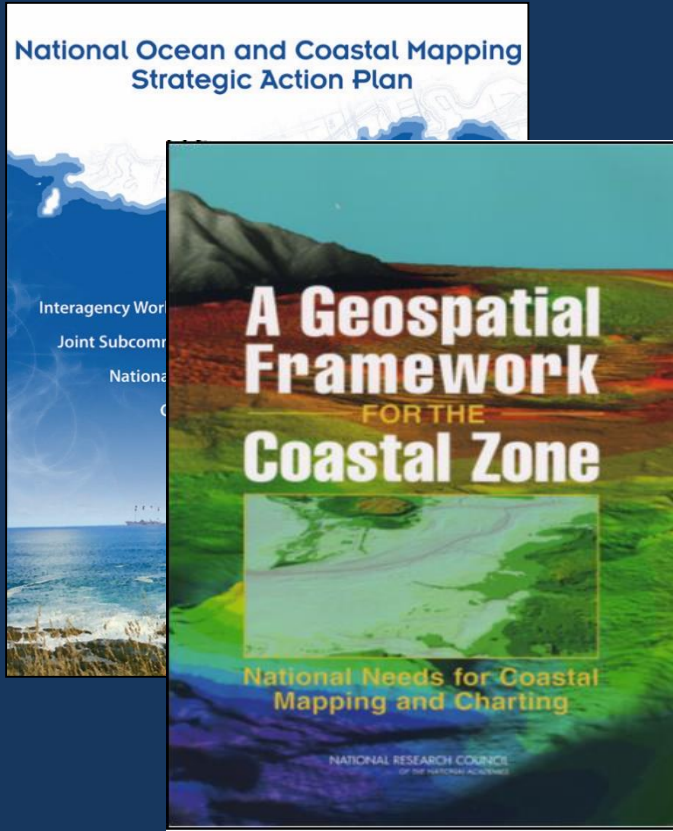


# The Interagency Working Group on Ocean and Coastal Mapping (IWG-OCM)

## WHO:

- NOAA
- USGS
- USACE
- NAVO
- BOEM
- NSF
- NGA
- USCG
- EPA
- FEMA
- NASA
- USDA

*and other appropriate  
Federal agencies  
involved in ocean and  
coastal mapping.*



- Co-chaired by NOAA, USGS, and USACE
- Charged with facilitating “the coordination of ocean and coastal mapping activities and avoid[ing] duplicating mapping activities...”



# INTERAGENCY WORKING GROUP ON *Ocean and Coastal Mapping*

## Recent Mandates

### Ocean and Coastal Mapping Integration Act, 2009:

- Validated NOAA's vision for IOCM
- Provided focus for interagency coordination
- Authorized previously ad-hoc efforts

### SOST implementation plans (stemming from NOP)

- Identifies mapping actions to meet OCMIA
- Provides long term road map
- Coordinates across mapping agencies

### National Strategy for the Arctic Region

- Identifies charting as an objective
- Coordination role

The term “ocean and coastal mapping” means the acquisition, processing, and management of physical, biological, geological, chemical, and archaeological characteristics and boundaries of ocean and coastal areas, resources, and sea beds through the use of acoustics, satellites, aerial photogrammetry, light and imaging, direct sampling, and other mapping technologies.



# INTERAGENCY WORKING GROUP ON *Ocean and Coastal Mapping*

## What is IOCM?

IOCM is *planning, acquiring, integrating, and managing* ocean and coastal geospatial data and derivative products for easy access and use by the greatest range of users.

### Three primary tasks:

1. Data Acquisition
2. End-to-End Data Management
3. Maximum Use and Re-Use of data



*Ocean and Coastal Mapping Integration Act of 2009*

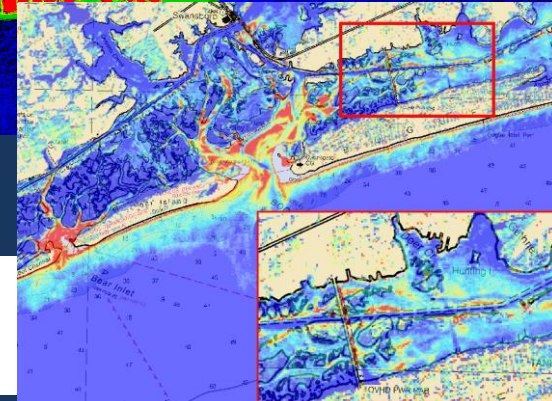
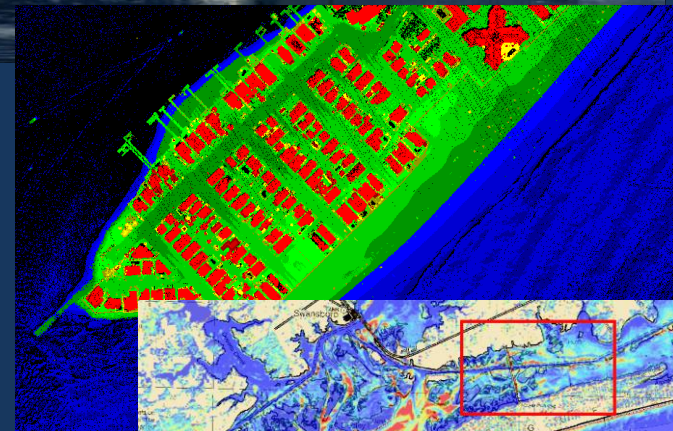


# Why coordinate & collaborate on Data Acquisition?

- Avoid costly duplication of effort
- Maximize survey time
- Meet science & mission requirements
- R&D on technology, techniques

## IOCM:

- Identifies mapped areas
- Improves planning
- Enables cross-agency collaboration



**NOAA**

INTEGRATED OCEAN AND  
COASTAL MAPPING (IOCM)  
UNITED STATES DEPARTMENT OF COMMERCE

# Why manage data?

- Enable Agency missions requiring scientific data
- Maximize use of data for multiple purposes
- Avoid costly data loss



- IOCM:
  - Ensures data collected are available for use
  - Processes data for multiple uses
  - Delivers bang for the buck



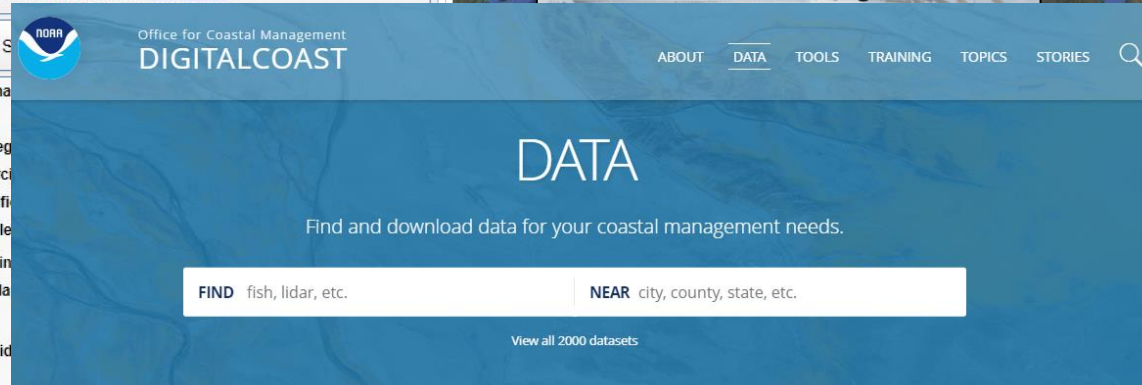
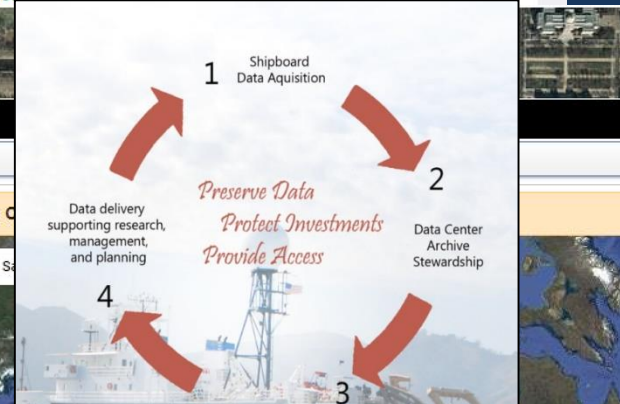
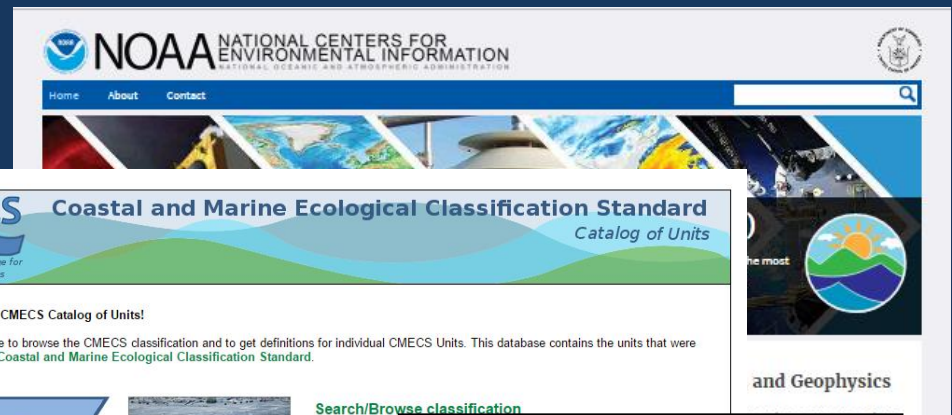
**NOAA**

INTEGRATED OCEAN AND  
COASTAL MAPPING (IOCM)  
UNITED STATES DEPARTMENT OF COMMERCE

*“Map Once,  
Use Many Times”*

# Data Stewardship, Access

- National Centers for Environmental Information
- Digital Coast
- Earth Explorer
- Rolling Deck to Repository
- Coastal and Marine Ecological Classification Standard
- Crowd-sourced Bathymetric Database



# Why re-use data?

- Scientifically sound decisions require data
- Data expensive to collect
- Scientific data management is cost-effective
  - 3-month study, 2000% return on investment
- IOCM:
  - Ensures data are available
  - Enables use/re-use of data
  - Supports scientific and management missions

**MarineCadastrre.gov**  
Maps Data Uses Tools News About  
An Ocean of Information  
A joint BOEM and NOAA initiative providing authoritative data to meet the needs of the offshore energy and marine planning communities.

**United States Interagency Elevation Inventory**  
IDENTIFY BASEMAP SHARE  
TOPONOMIC BATHYMETRIC CLEAR  
HIDE LAYERS HELP

**NOAA ENC Direct to GIS**  
Office of Coast Survey  
Home | How-To | FAQ | Contact Us

**PURPOSE**  
ENC Direct to GIS allows users to display, query, and download all available base editions of NOAA ENC® data in a variety of GIS/CAD formats, using Internet mapping service technology. Nautical chart features contained within a NOAA ENC provide a detailed representation of the U.S. coastal and marine environment. The data, updated weekly, is organized using S-57 object classes. Features in a single NOAA ENC are limited in that they only represent the geographic region that is depicted in that particular NOAA ENC cell. By aggregating nautical features from all NOAA ENC in the creation of GIS data, a continuous depiction of the U.S. coastal and marine environment is achieved.

**THREE SEARCH OPTIONS:**

- ◆ **Graphical Interface**  
Learn about the new graphical interface:  
[Find out what enhancements are available in version 10.1!](#)  
All object classes that are available in ENC Direct to GIS can be viewed and extracted in a variety of GIS/CAD formats. The download function is designed to provide seamless data in the geographic region of your view frame. If a feature extends beyond the view frame, the feature is clipped and exported to reflect what is in the view.
- ◆ **Textual Extraction Form**  
If you know the layers and the bounding box of the area you wish to obtain, use this extraction form to obtain your information.
- ◆ **Theme Layers**  
Six specific theme layers can be viewed or obtained for the entire United States.

Caution Note: The ArcGIS 10.1 server has known issues with the extraction tools that may cause a failure in obtaining data. Recommend selecting multiple smaller areas rather than one large area when extracting coastal features. If you need assistance in obtaining ENC data for your GIS project please send an inquiry and we will work with you on obtaining the dataset.

Please let us know if you have any comments, questions, or concerns by [submitting an inquiry](#). We will respond as soon as possible.

User Survey | Privacy Policy | Disclaimer | NOAA's National Ocean Service | NOAA | U.S. Department of Commerce  
Web site owner: NOAA Office of Coast Survey



# NOAA

## INTEGRATED OCEAN AND COASTAL MAPPING (IOCM)

UNITED STATES DEPARTMENT OF COMMERCE

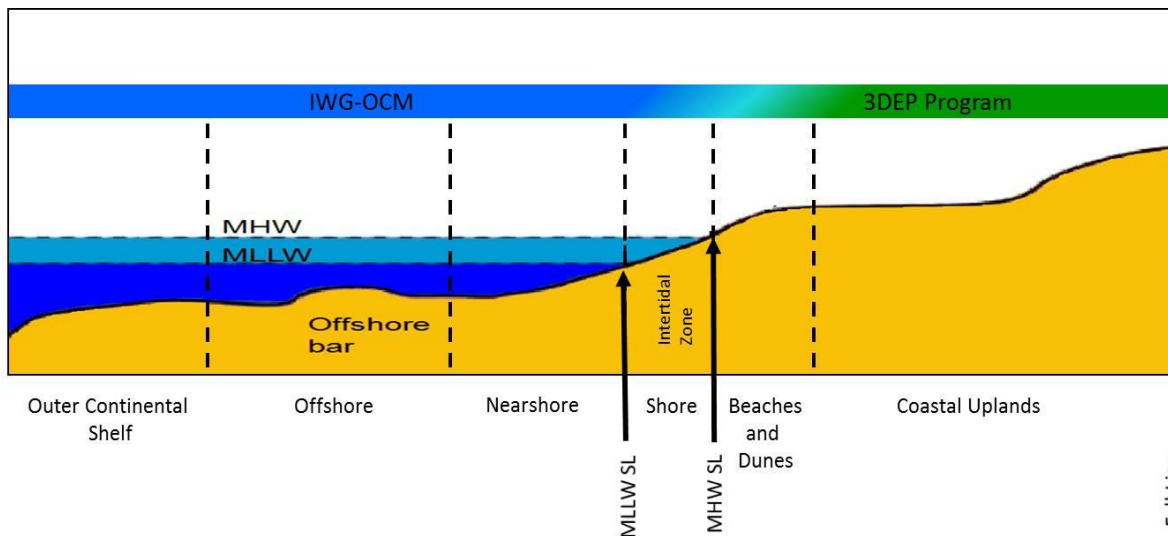
*“Map Once,  
Use Many Times”*

# National Coastal Mapping Strategy 1.0

## Coastal Lidar Elevation for a 3D Nation

### Components:

- Regional Coastal Mapping Summits for coordination
- Common standards – Bathymetry Quality Levels aka 3DEP topo QL's
- Whole life cycle approach to data
- R&D on new tools/techniques for data collection and use.

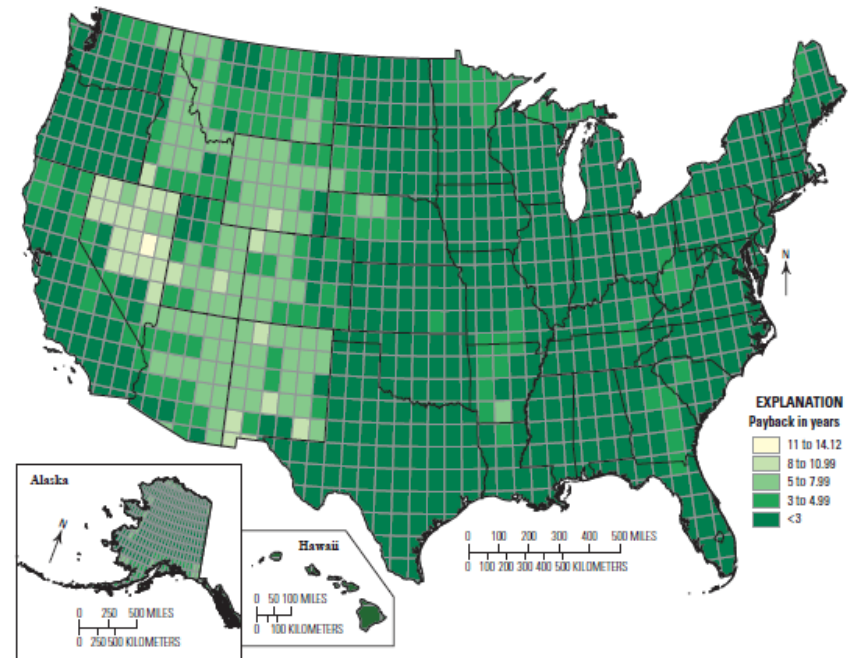


3D Nation?  
Refresh cycle?  
ROI?  
NEEA-like study?

# National Enhanced Elevation Assessment (NEEA)

A comprehensive inventory of user requirements and benefits for elevation data

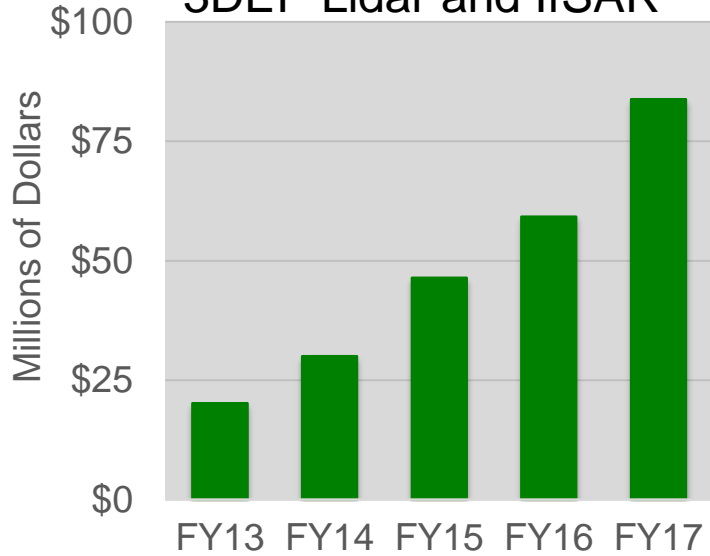
- Conducted in 2010 – 2012
- Data collection
  - 34 Federal Agencies
  - 50 States
  - Local Government, tribal, private, not-for-profits
- Results
  - 602 Mission critical activities that need significantly better data than are currently available
  - Between \$1.2 billion and \$13 billion in benefits annually
  - Increases in President's budget in FY14-17
  - <http://nationalmap.gov/3dep>



# 3DEP Growth - Partnerships To Date

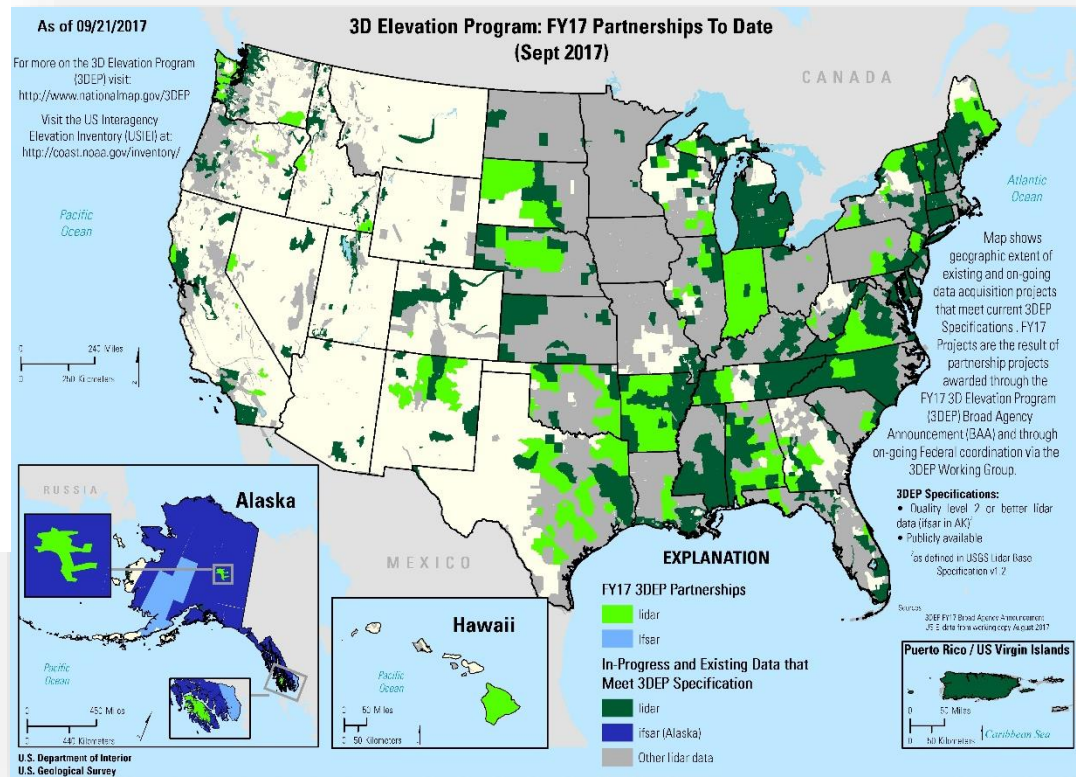
Strong coordination and increasing investments (FY13-17)

## 3DEP Lidar and IfSAR



- Between FY13 and F17, 3DEP data (lidar and IfSAR) have been contracted for 37% of the entire US
- Alaska IfSAR – 92% of state available or in work to date in FY17

## Map shows lidar from FY13 – FY17



In FY17, 3DEP data have been contracted for 11.4% of the Nation

# Updating User Requirements and Benefits for 3DEP



- Be able to assess new technologies against user requirements and identify the tradeoffs between different approaches
- Plan for the next round of 3DEP after nationwide coverage has been completed
- Improve our understanding and data about requirements and benefits at the state level for the existing and future program
- Improve our understanding of needs to guide development of the next generation of 3DEP Products and Services



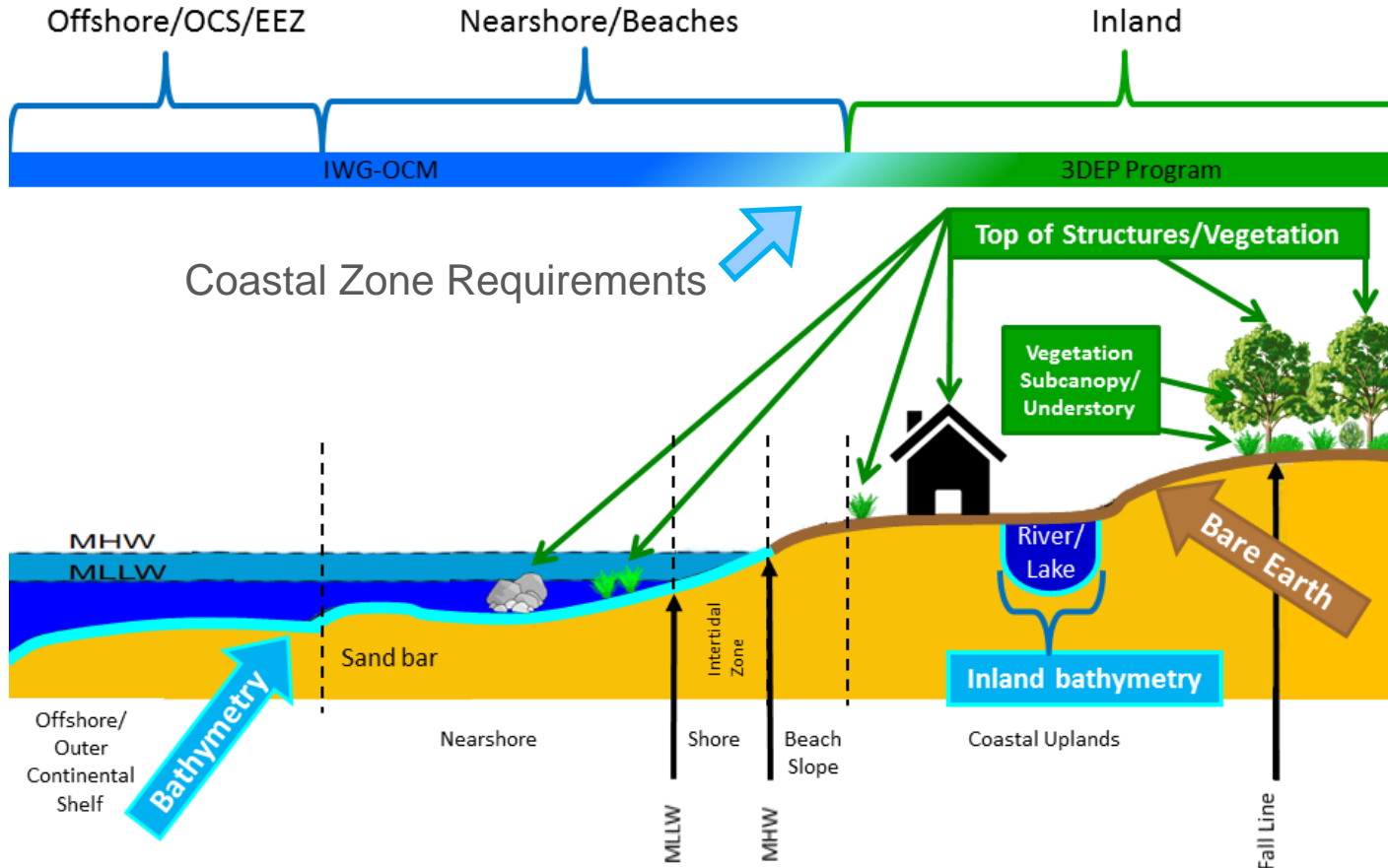
# Mapping a 3D Nation: Requirements and Benefits Study Goals

## Understand 3D Data Requirements

- Refresh NEEA for the years beyond the initial 8-year acquisition program
- Understand inland, nearshore, and offshore bathymetric data requirements and benefits
- Understand how requirements and benefits dovetail in the coastal zone
- Sensor agnostic/Technology Neutral
  - Focused on need for, and value of, elevation data

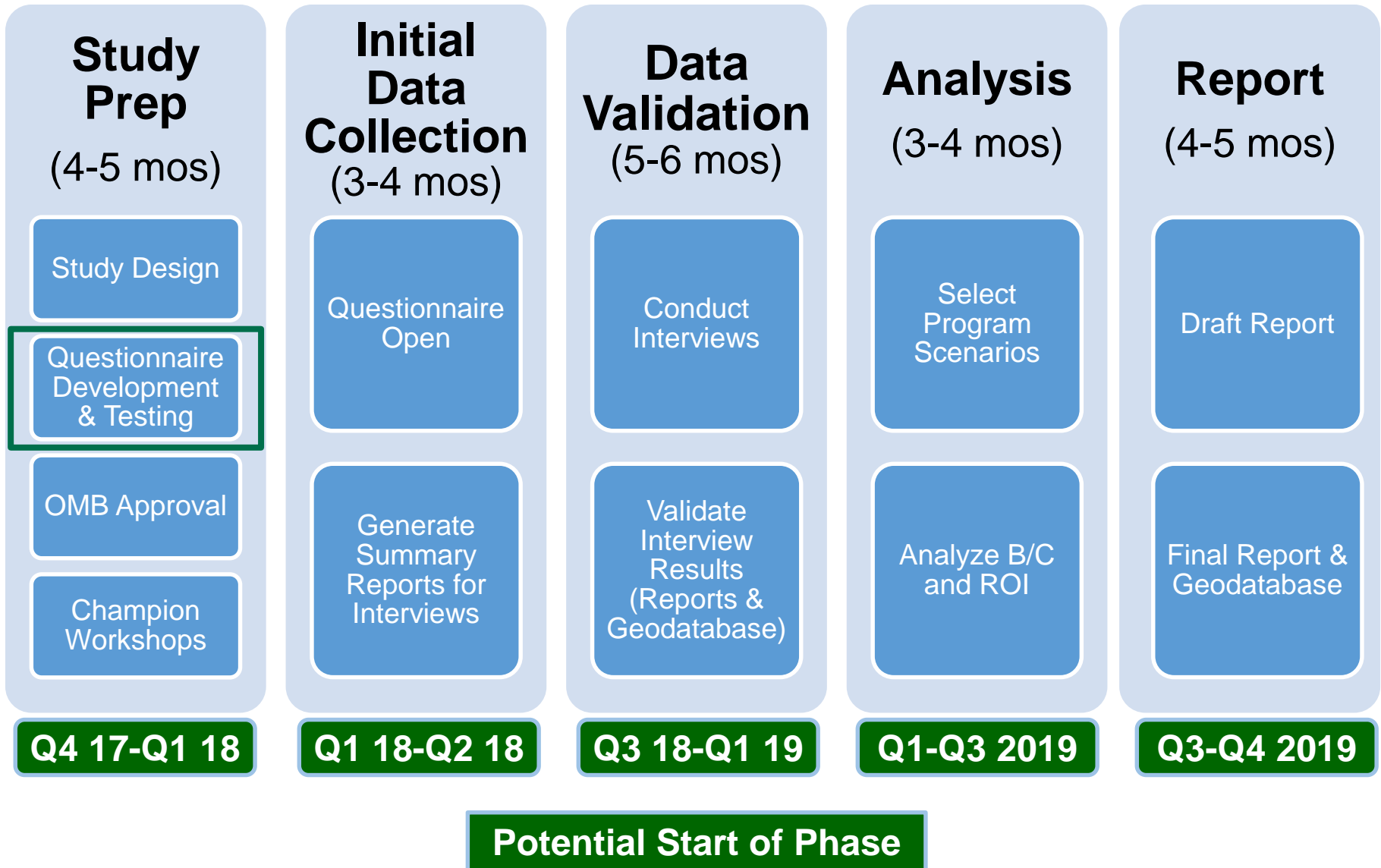
# 3D Nation Study Context

Inland, Nearshore, Offshore and Topo, Bathy, Topo/Bathy



Technology Neutral Approach

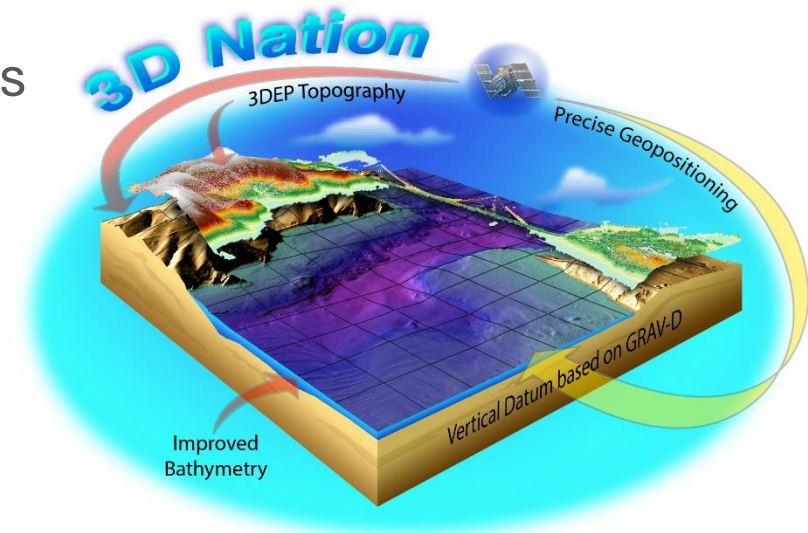
# Study Phases - Draft Timeline



# 3D Nation Stakeholders

Federal, State, Local, Non-Profit, Private, & Academia

- Federal departments and agencies
- Federal commissions or committees
- 50 states plus D.C. and territories
- Local, regional, and Tribal stakeholders
- Non-profits
- Private/commercial
- Academia



# State Agency Participant Types

- Archaeology/cultural heritage
- Biological survey
- Coastal resource management/Coastal zone management
- Economic and community development
- Emergency management
- Energy
- Environmental protection/management
- Fisheries management/aquaculture
- Forestry/rangeland management
- Geology
- GIS
- Habitat management
- Mining
- Natural resources/conservation
- Oil and gas
- Permitting/planning
- Recreation
- Regulatory
- State university
- Transportation
- Water management/resources
- Water quality
- Wildlife management

**State Champions will help identify participants**

# Local and Regional Participant Types

- Tribal entities
- Local government agencies
- Integrated Ocean Observing System (IOOS) regional associations
- Metropolitan and/or regional councils/districts
- Port authorities
- Regional commissions or councils
- Scientific and research organizations
- Non-profits

# What We Need Your Help With

- Take the survey
- Get the word out to your colleagues and associates
- Identify study participants and their contact information
- Help with questionnaire – invitations and follow ups with non-respondents if needed
- Participate in follow up interviews/workshops
- Help gain consensus on responses
- Review and sign off on validated responses



# U.S. Federal Mapping Coordination Site

- IWG-OCM and 3DEP agencies are using Seasketch tool to share info on acquisition plans, data needs, coordination
- Additional tools available for use – forums, sketching

The screenshot displays the U.S. Federal Mapping Coordination Site interface. The top left features the NOAA logo and the text "U.S. Federal Mapping Coordination A Collaboration Site for Fed'l and Partner Mapping Data Acquisition". The top right includes the "seasketch" logo, language options (English), "take a tour", "help", and "Sign" buttons. The main map area shows a coastal region with labels for "Pamlico Sound", "Hatteras Canyon", "Ostow Bay", and "Long Bay". The map includes various data layers such as topographic and topobathymetric lidar, acoustic/sonar data, and digital imagery. A search bar is located above the data layers list. The data layers list includes categories like "Mapping Projects: Planned (Funded) and Ongoing", "Alaska and Arctic Projects (All Stages)", "Existing Data: Inventories, Collections, etc. (not comprehensive)", "UAS Pilot NERRS Grand Bay", and "Southern California Seafloor Research Consortium". The bottom of the page contains the URL "http://fedmap.seasketch.org" and the text "Powered by Esri and SeaSketch".

U.S. Federal Mapping Coordination  
A Collaboration Site for Fed'l and Partner Mapping Data Acquisition

seasketch

English take a tour ? help Sign

Data Layers My Plans Participate

Data Layers Basemap Legend & Ordering

Search layers by name or keyword

Mapping Projects: Planned (Funded) and Ongoing

- Topographic Lidar
- Topobathymetric Lidar
- Acoustic/Sonar (Hydro, Bathy, Water Column, etc)
- Digital Imagery
- Other (eg. HTEM, DEM, CSCAP, EPA NCCA)
- NOAA FY16-17 Fleet Allocation Plans
- NOAA NMFS Plans 2017 through 2019

Alaska and Arctic Projects (All Stages)

- Alaska/Arctic

Existing Data: Inventories, Collections, etc. (not comprehensive)

- Select layers; more due diligence needed to assess overlaps

UAS Pilot NERRS Grand Bay

- GRAND BAY NERR

Southern California Seafloor Research Consortium

- Existing SoCal Bathymetry
- SCSR Workshop 2015
  - Workshop AOIs 2015
  - CINMS Priority AOIs Workshop 2015
  - Priority Areas 2017

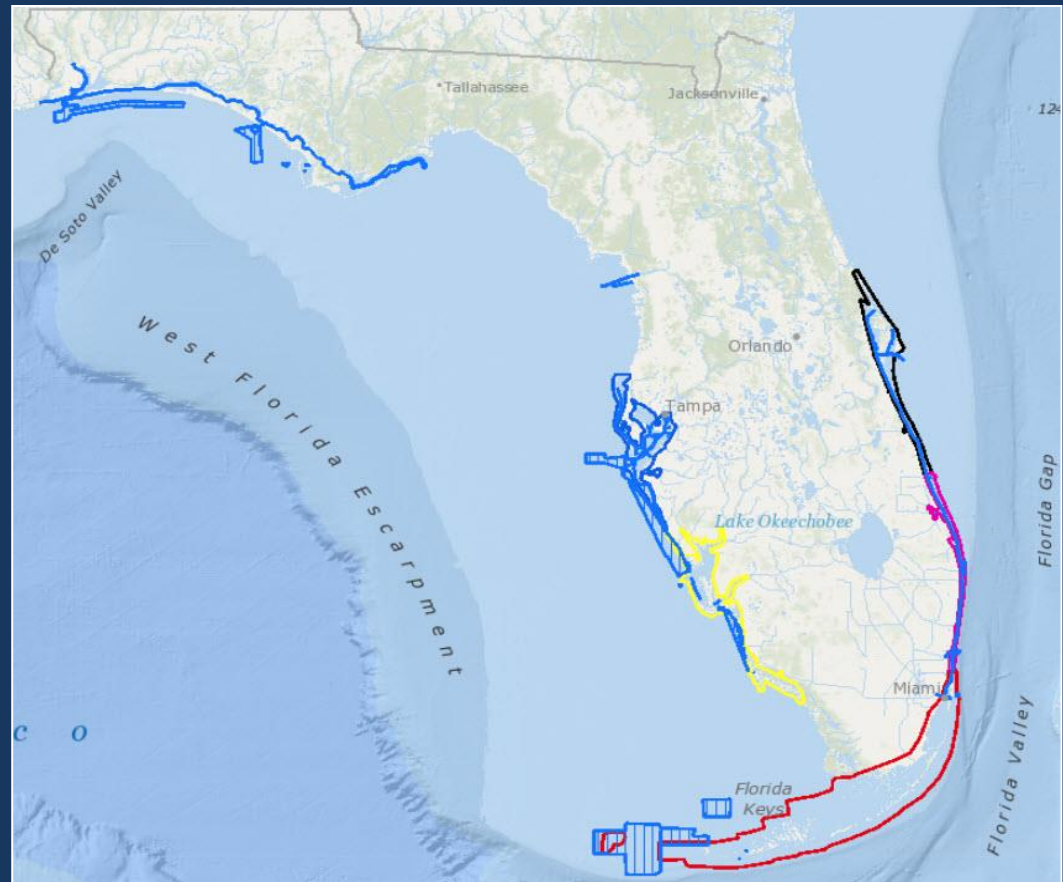
Esri, GEBCO, IHO-IOC GEBCO, DeLorme, NGS | Esri, GEBCO, DeLorme, NaturalVue | ryan freed... Powered by Esri and SeaSketch



# Hurricane Season 2017

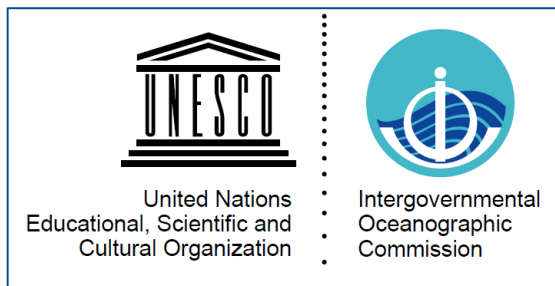
## Hurricane Supplemental Funding Request-- *Pending*

- NOAA Hurricane Supplemental Funding Request pending approval through Congress
  - \$20M Pres Request
  - \$40M House Mark
- Outlined/highlighted areas in graphic represent impacted areas from Hurricane Irma and interagency priorities for mapping
- Collaborative effort involving NOAA's OCS, NGS, CO-OPS, IOOS and other partner agencies and stakeholders
- Coordinated recovery mapping effort that brings the full suite of NOAA navigation, observation and positioning capabilities to impacted areas

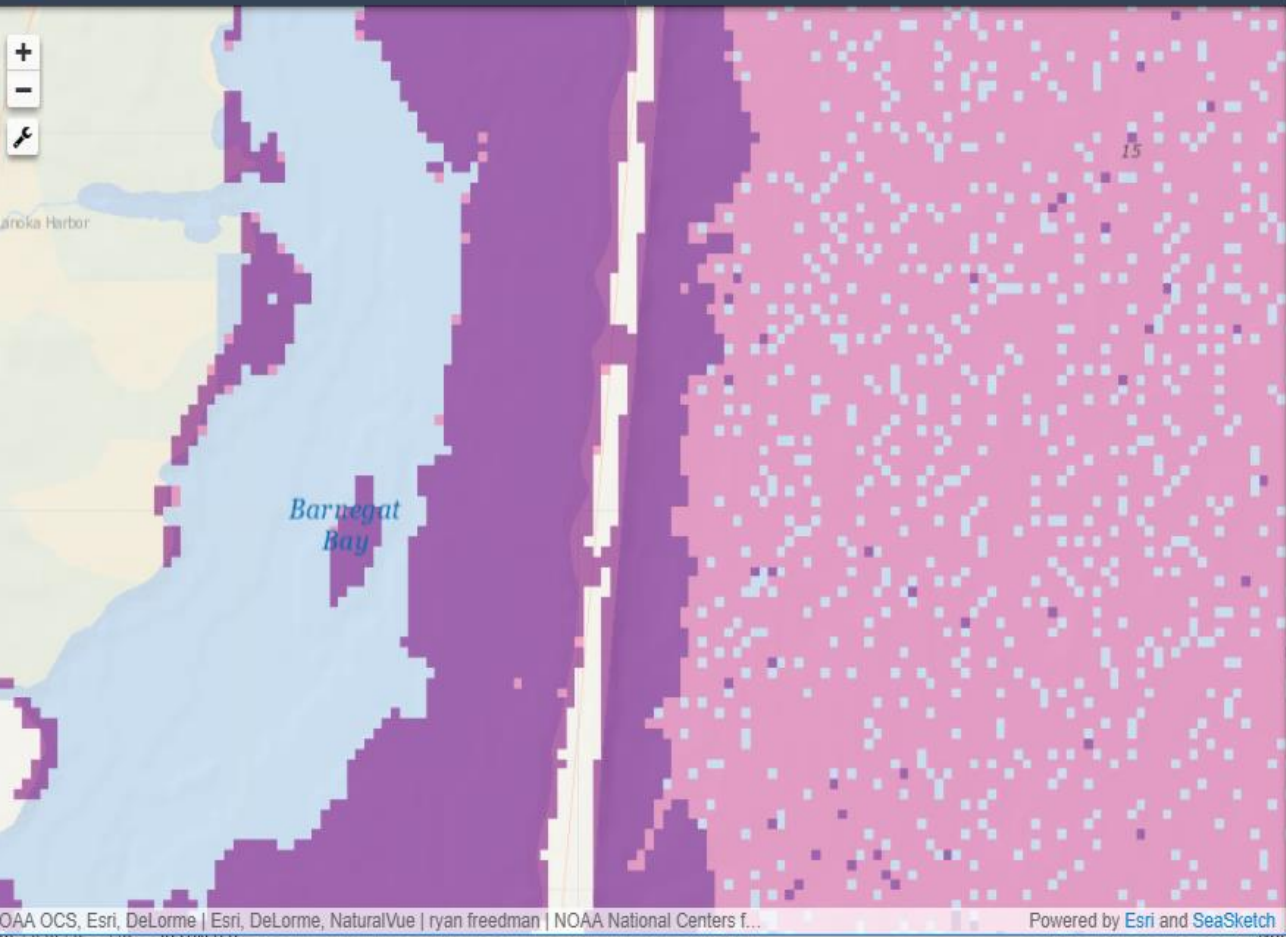


# SEABED 2030

Seabed 2030 is a global initiative led by the General Bathymetric Chart of Oceans (GEBCO) Guiding Committee and The Nippon Foundation with the aim to facilitate *the complete mapping of the ocean floor by the year 2030.*



# Bathymetric Gap Analysis



**Data Layers** My Plans Participate

Data Layers Basemap Legend & Ordering

Search layers by name or keyword

hurricane season 2017 impact, response, and recovery  
Mapping Priorities post-Harvey, Irma, Maria for collaboration

- NOAA
- NPS Hurricane AOIs 2017
- USGS
- State
- USFWS

Demo Layers

- Texas Seagrass Viewer
- Presentation Layers

Seabed 2030

- NOAA Bathymetric Gap Analysis for Seabed 2030

The United States Bathymetry Gap Analysis is a map service providing visual access to the local sounding density derived from all modern bathymetric data holdings at NOAA's National Centers for Environmental Information (NCEI) and Office for Coastal Management (OCM).

← Tips →  
Layer metadata, order, and opacity settings are found in the legend





- Participate in the IWG-OCM
- Coastal/Ocean Mapping Strategy
- 3D Nation Questionnaire
- Define and share clear requirements for mapping data
  - Locations
  - Specifications
  - Classification schemes
- Make data accessible via archives and portals



**INTERAGENCY WORKING GROUP ON**  
***Ocean and Coastal Mapping***

# Questions?

**Ashley.Chappell@noaa.gov**  
**240.429.0293**