Summary of a Workshop to Share and Improve Benthic Habitat Mapping Data Products

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National Marine Sanctuaries
Florida Keys

NCCOS | National Centers for Coastal Ocean Science

NOAA Coral Reef Conservation Program

Workshop Objectives

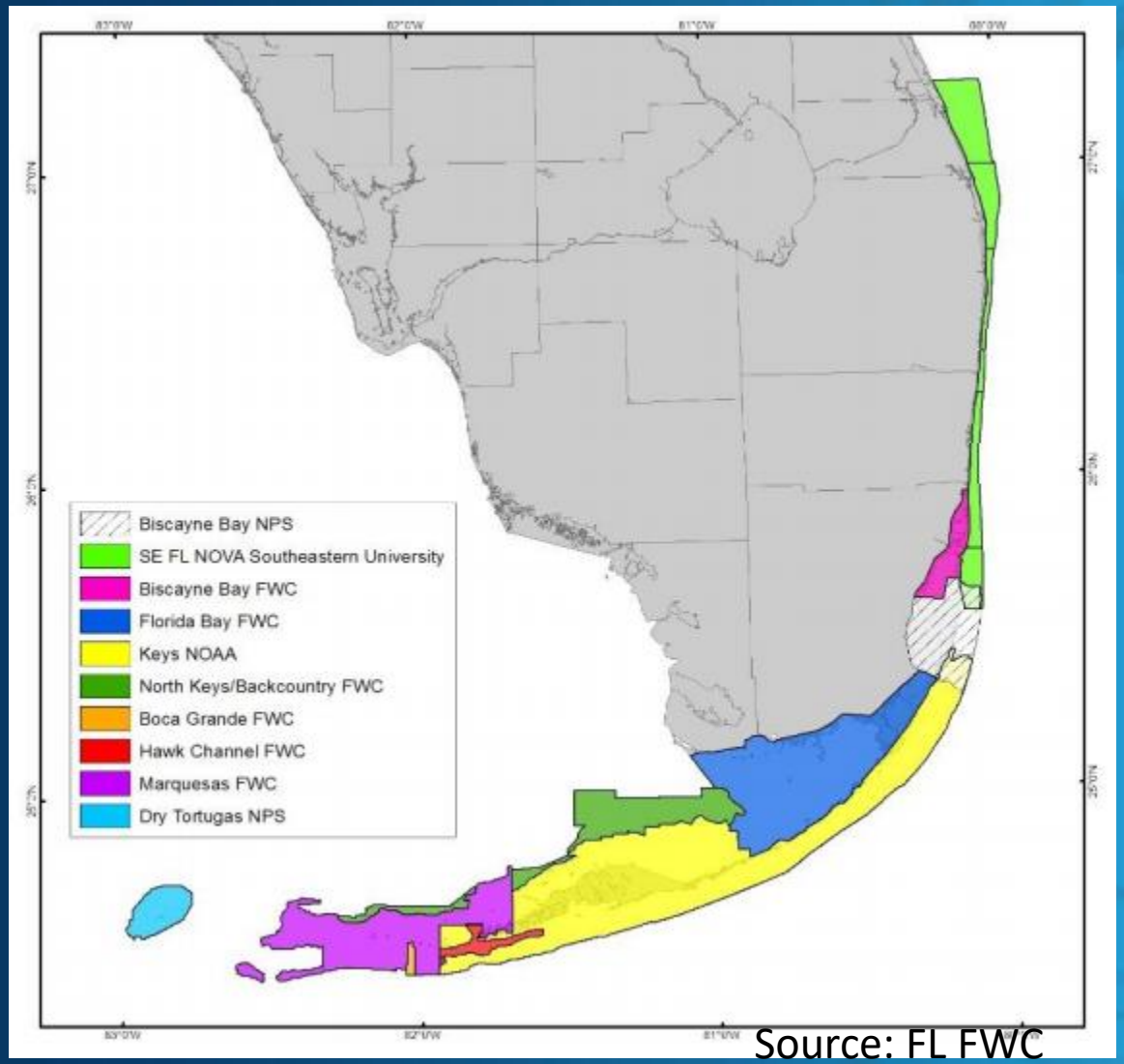
1. Demonstrate a new FKNMS Habitat Mapping Digital Atlas
2. Receive updates on partner mapping activities
3. Identify areas of interest for habitat classification existing data beyond current habitat maps
4. Identify areas for potential pre- vs. post-hurricane change
5. Identify gaps and priority planning for out-year mapping by NOAA and partners

Hosted 24 representatives from NOAA, NPS, FWC, USGS, TNC, academic partners

Habitat Mapping in the Florida Keys

- Long history of mapping coral reef habitats in the Florida Keys
- 2010-2015: Multi-agency effort to “Unify” habitat map products in the sanctuary
- Culminating in a Unified Florida Reef Tract Map
- **Version 2.0 released 2016**

http://ocean.floridamarine.org/IntegratedReefMap/UnifiedReefTract.htm



Source: FL FWC

Habitat Mapping in the Florida Keys

- Habitats delineated using satellite imagery
- Visually interpreting based on color, shape, “texture”
- Limited by water clarity and depth to accurately delineate some areas.
- Extensive coverage, but leaving gaps

Habitat Mapping in the Florida Keys

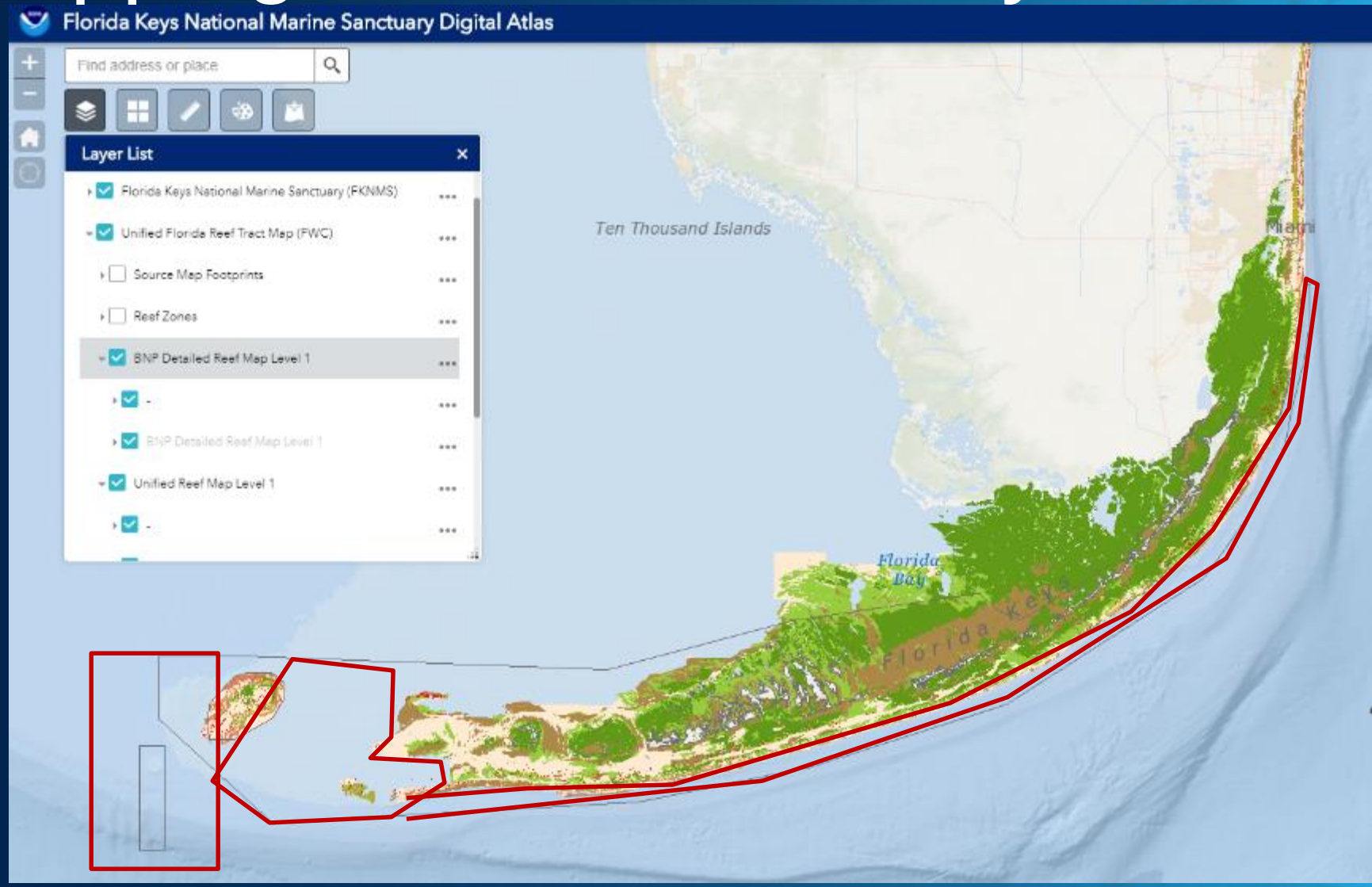
Remaining gaps

- Tortugas Banks

- Marquesas to Tortugas

- Outer Reef Bar

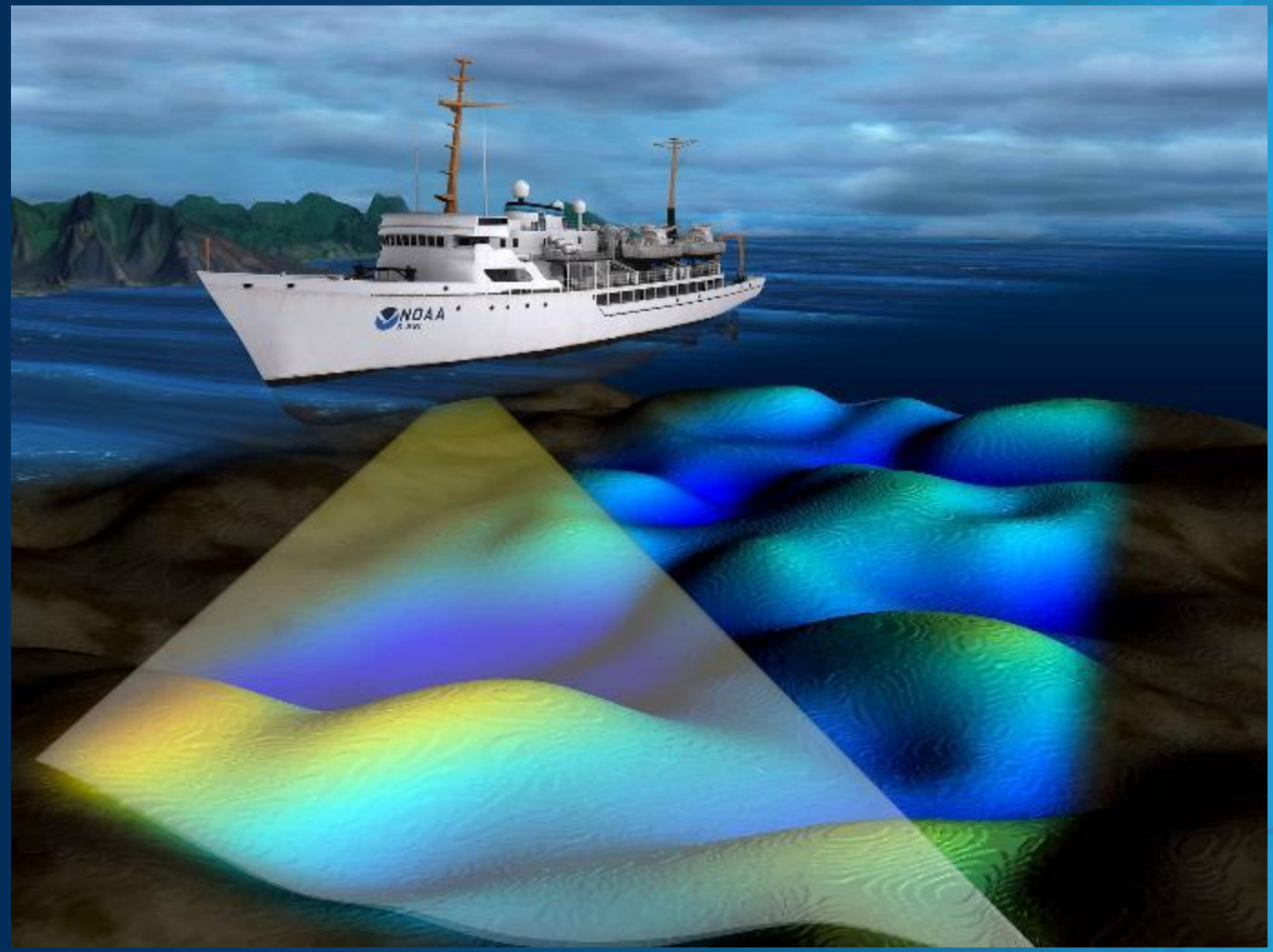
Multibeam and Lidar is best means to fill gaps



FKNMS-NCCOS joint effort to improve habitat mapping products*

2015-2017 Goals

- Inventory available multibeam echosounder (and Lidar) data in FKNMS
- Evaluate quality for interpreting to habitat classes
- Inventory benthic photographs to be used for ground validation
- Develop an online, public facing dataviewer for habitat mapping data and science support



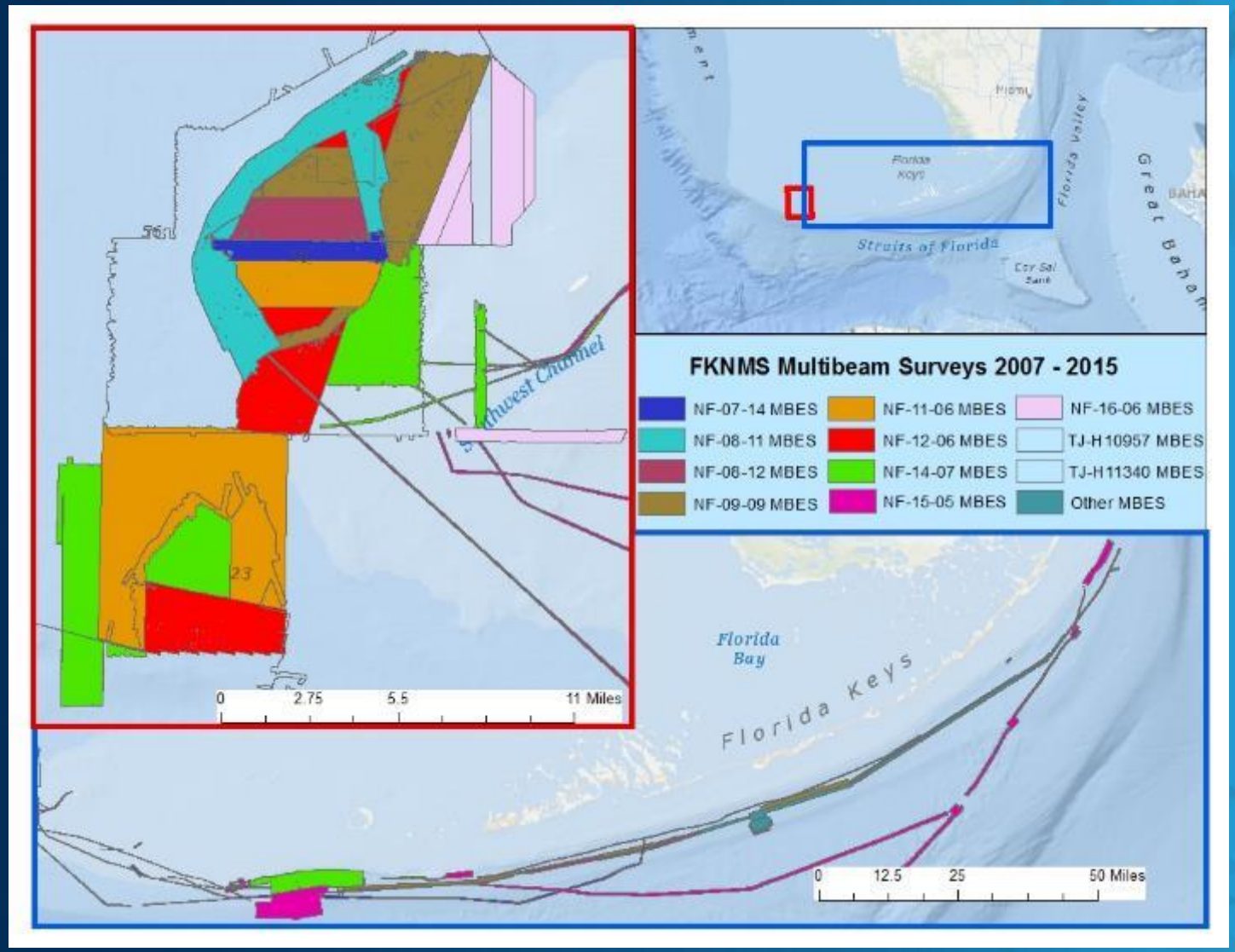
*Funded by NCCOS, FKNMS and CRCP

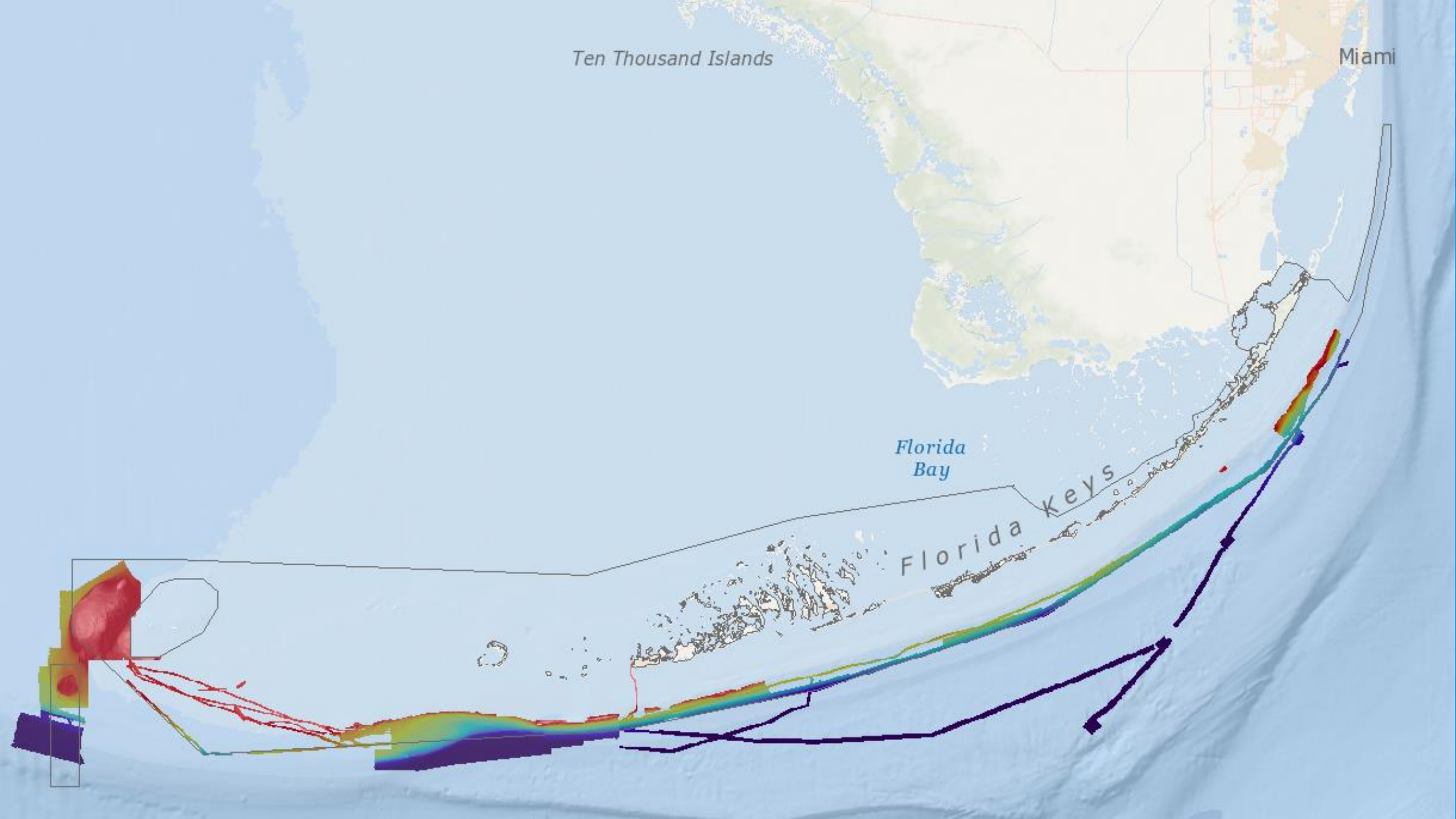
Archives of NOAA's seafloor surveys in FKNMS

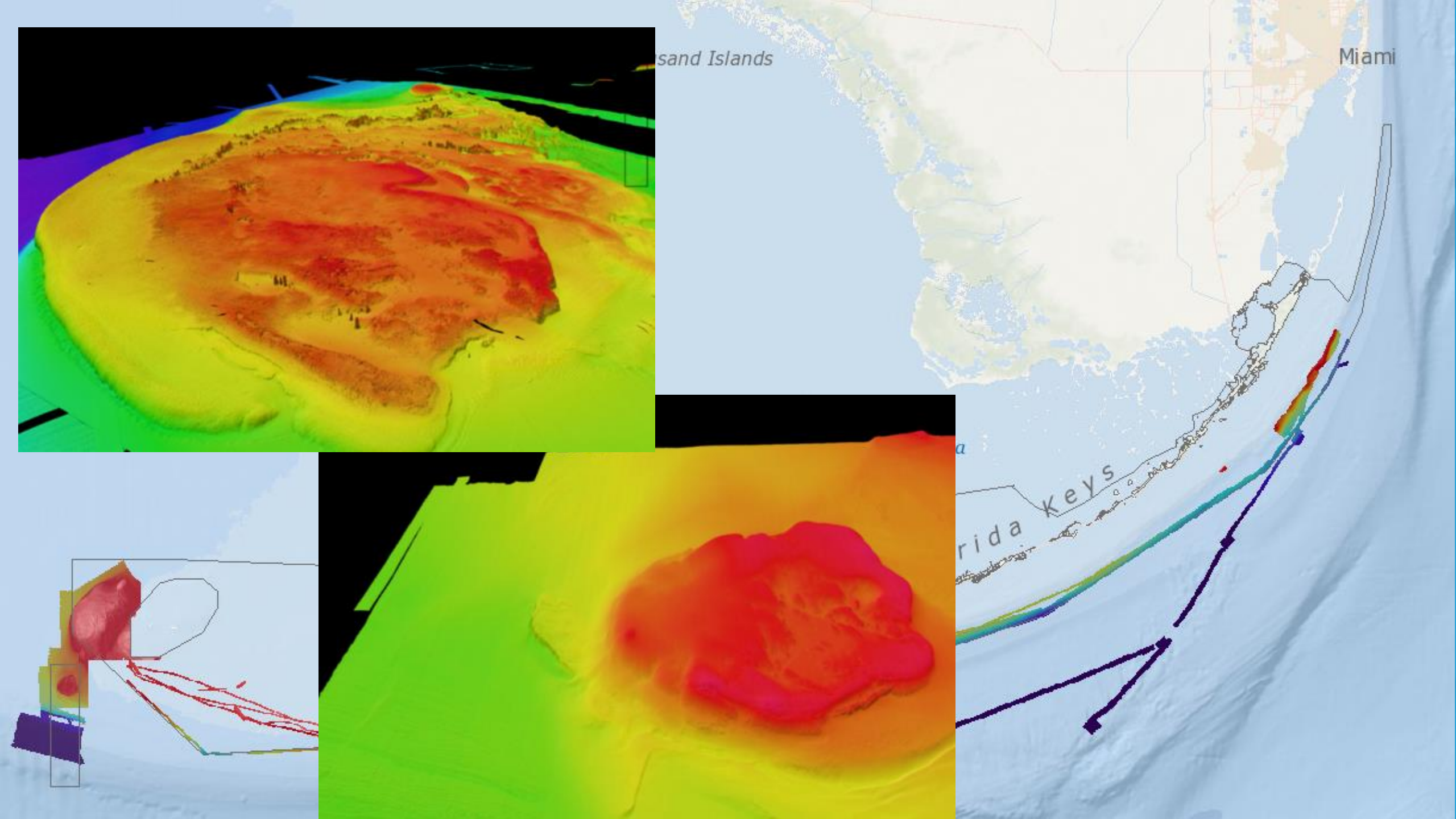
Challenges:

- Inconsistent data management during (and following) cruises
- Missing data sets or parts of data
- Mismatched tide data for correcting to standard water depth
- Mis-behavior of deep multibeam systems on NOAA Ship Nancy Foster in 2015 and 2016
- Varied survey coverage and effort between years

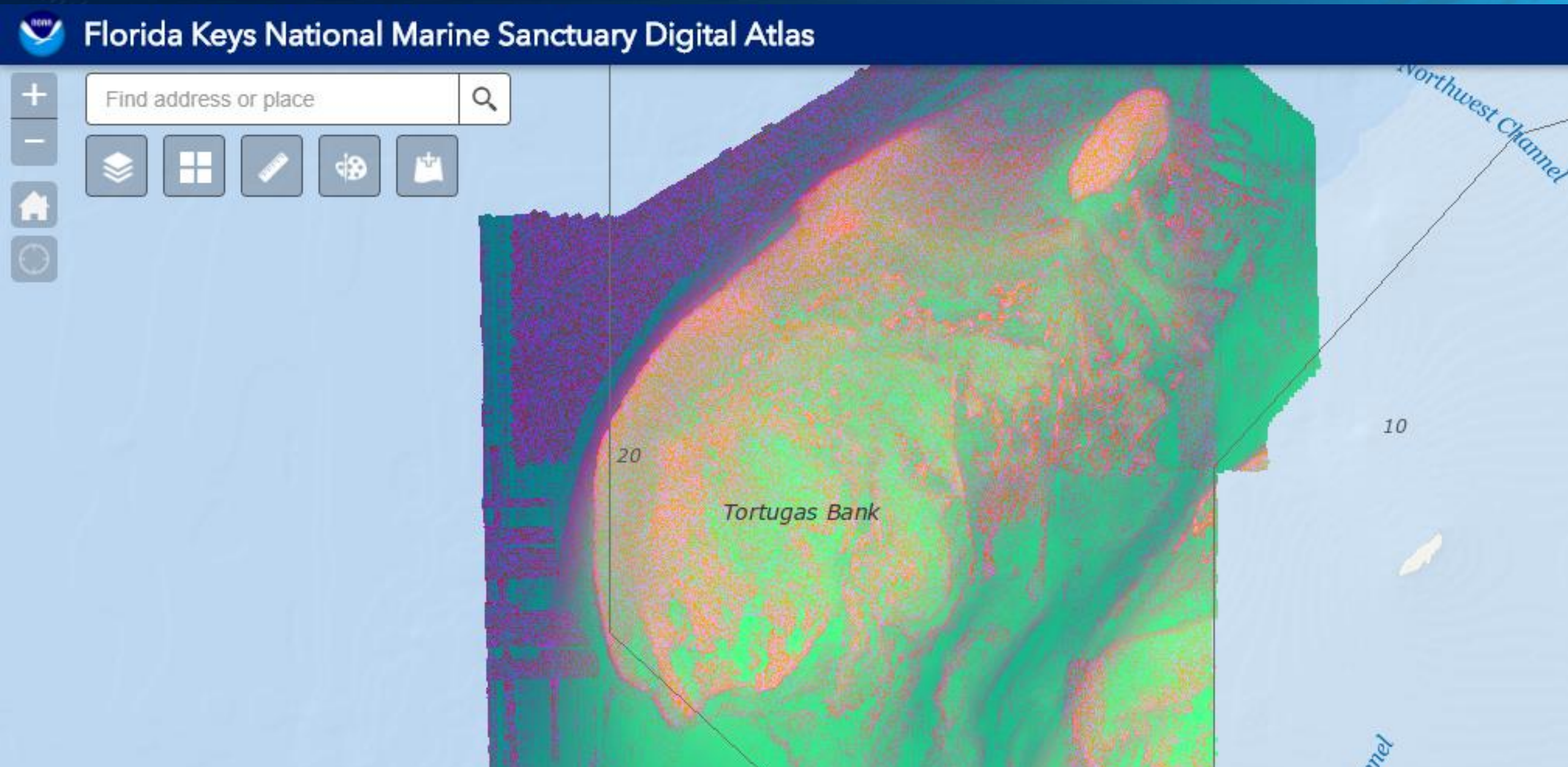
~1 year of effort to re-process into consistent vertical datum and correctly mosaic bathymetry (and backscatter) datasets



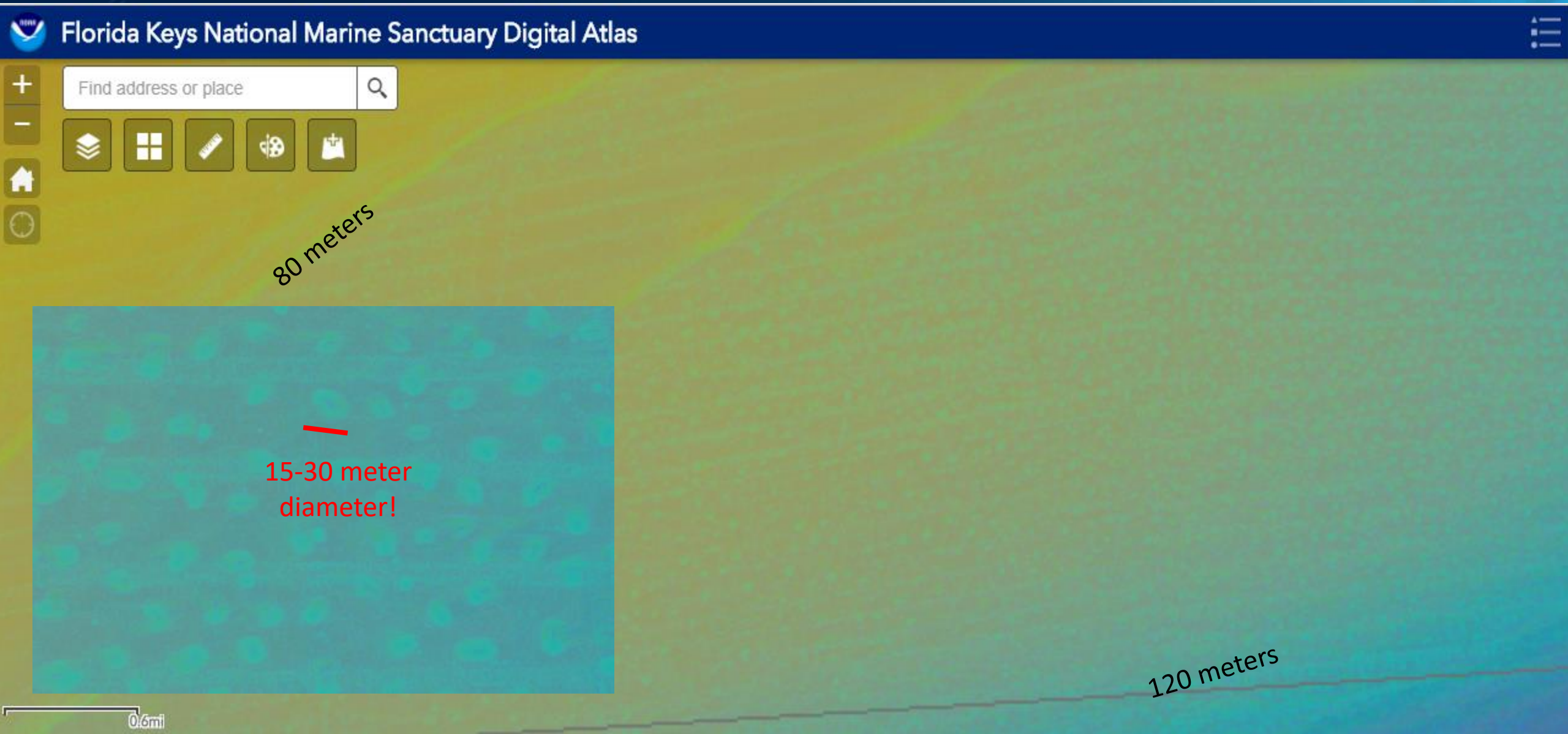

Ten Thousand Islands
Miami
Florida Bay
Florida Keys


sand Islands
Miami
rida Keys

Improved bathymetry indicates complex habitat types



. . . shows complex seafloor, interesting features



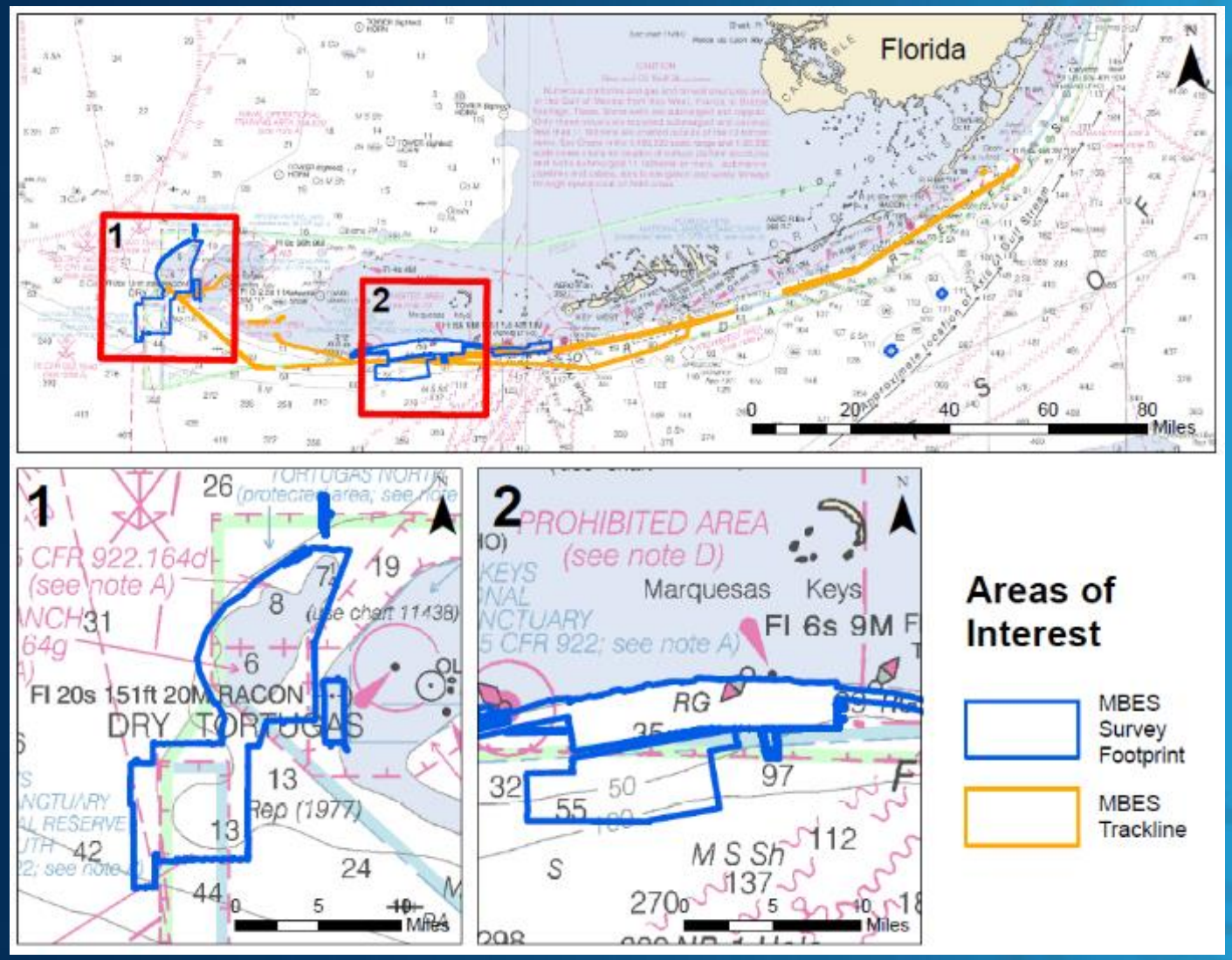
Inventory of benthic images for ground-validation

Solicitation sent to federal, state and academic partners

Photos or video clips

Requirements:

- Referenced to geographic coordinates and time
- Organized! (by station/ref)
- Prefer down looking or panorama
- Metadata on project
- Nice-to-haves:
  - Images/stations classified into habitat types

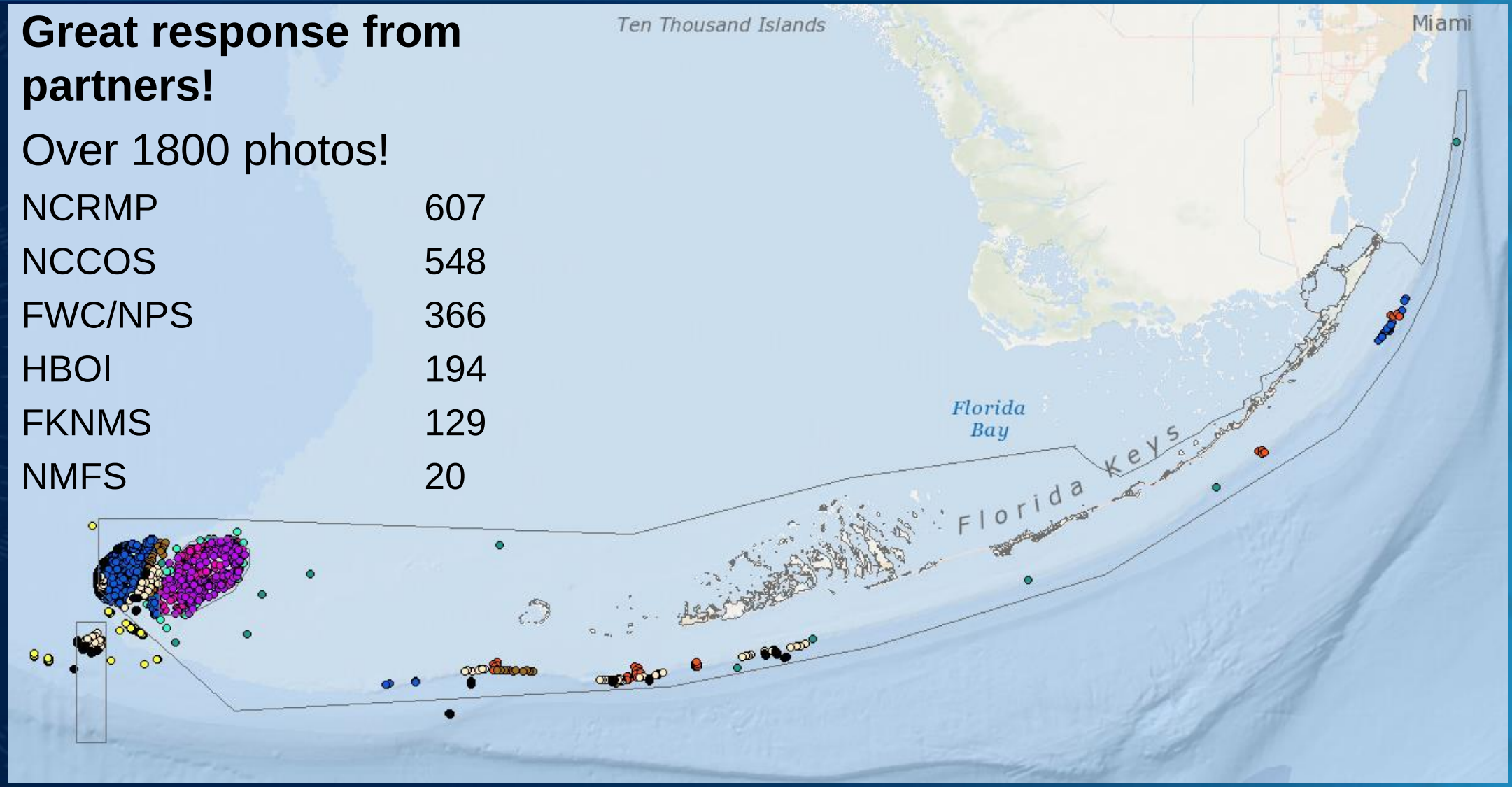


Inventory of benthic images for ground-validation

Great response from partners!

Over 1800 photos!

NCRMP	607
NCCOS	548
FWC/NPS	366
HBOI	194
FKNMS	129
NMFS	20



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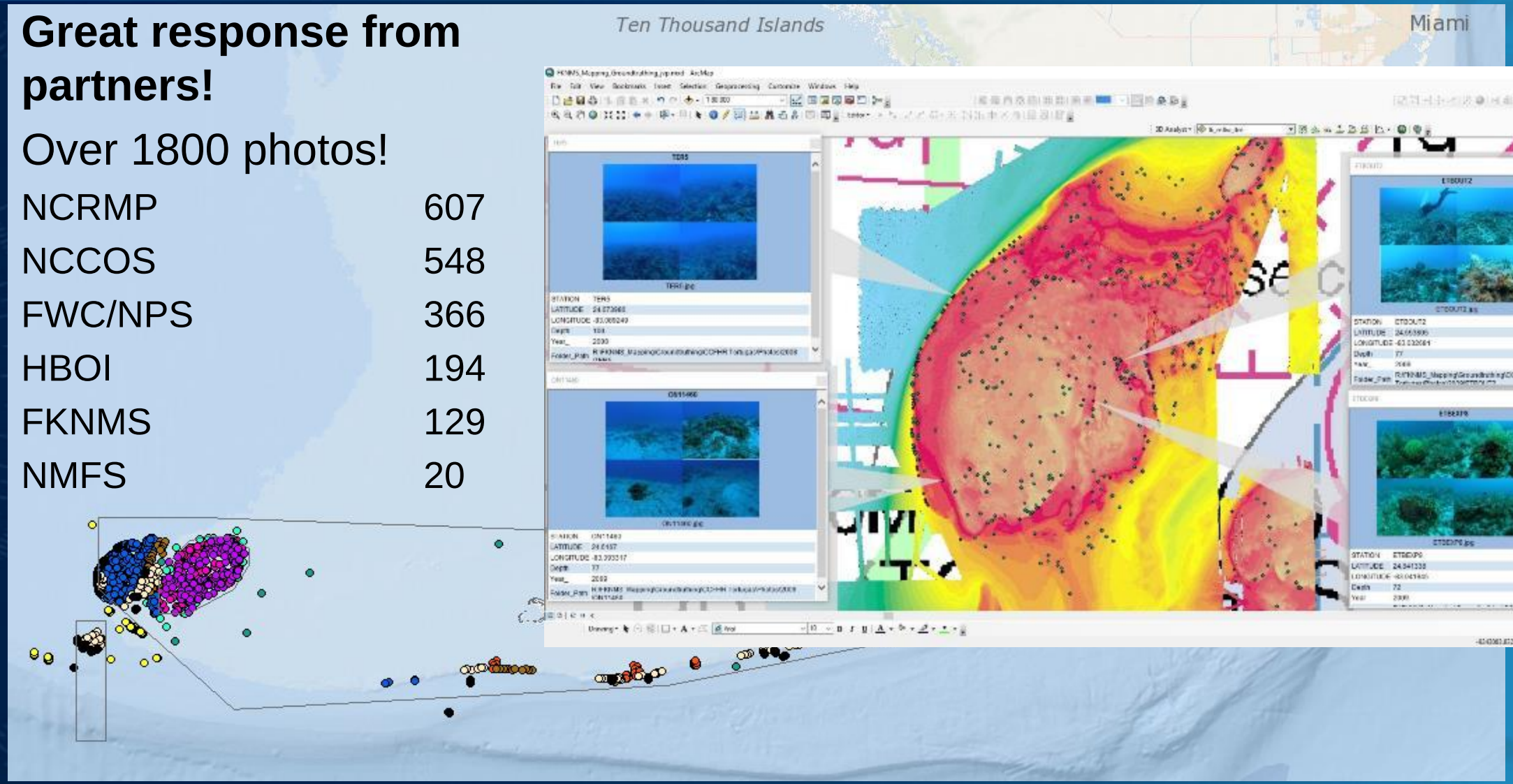
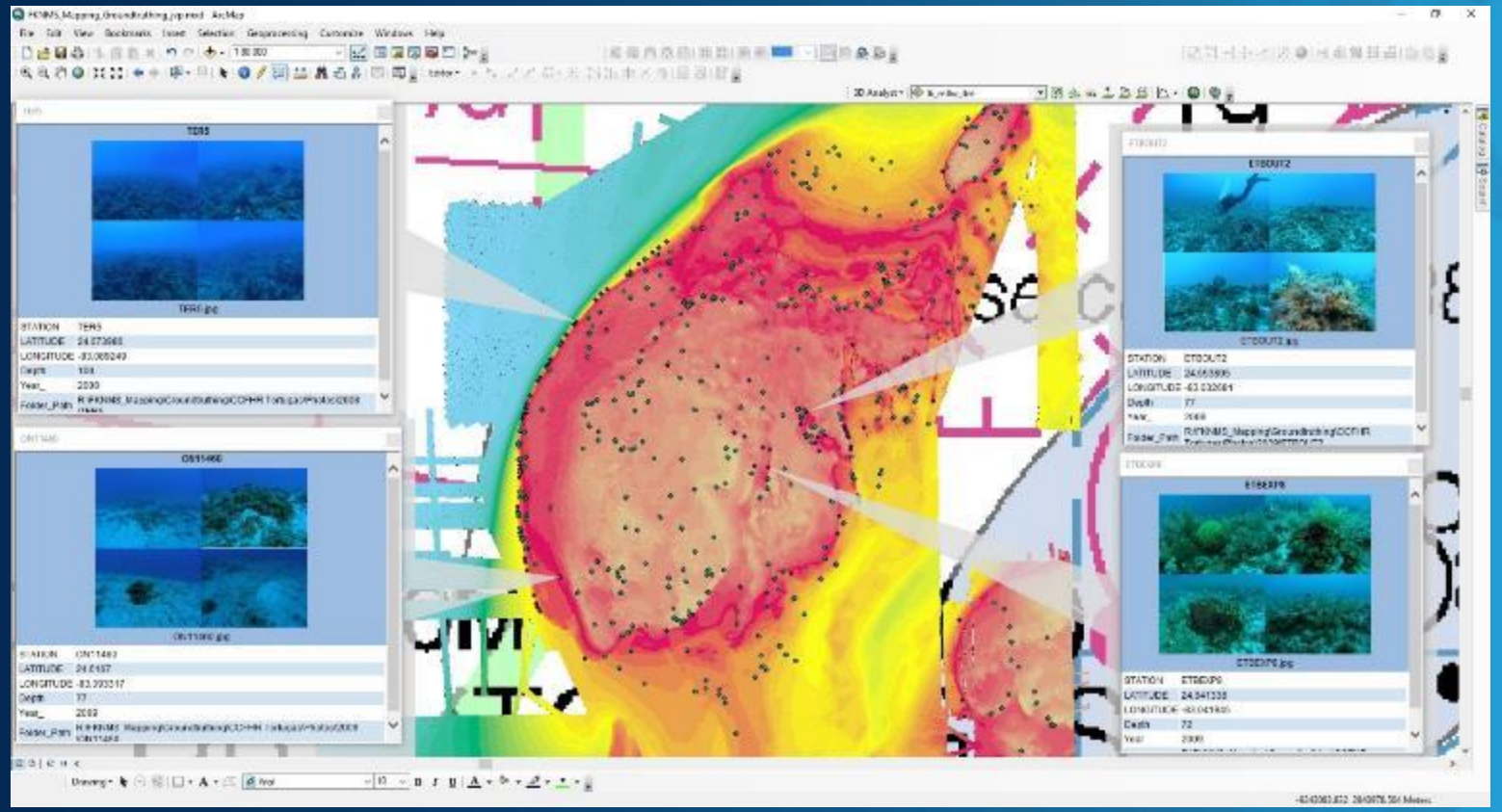


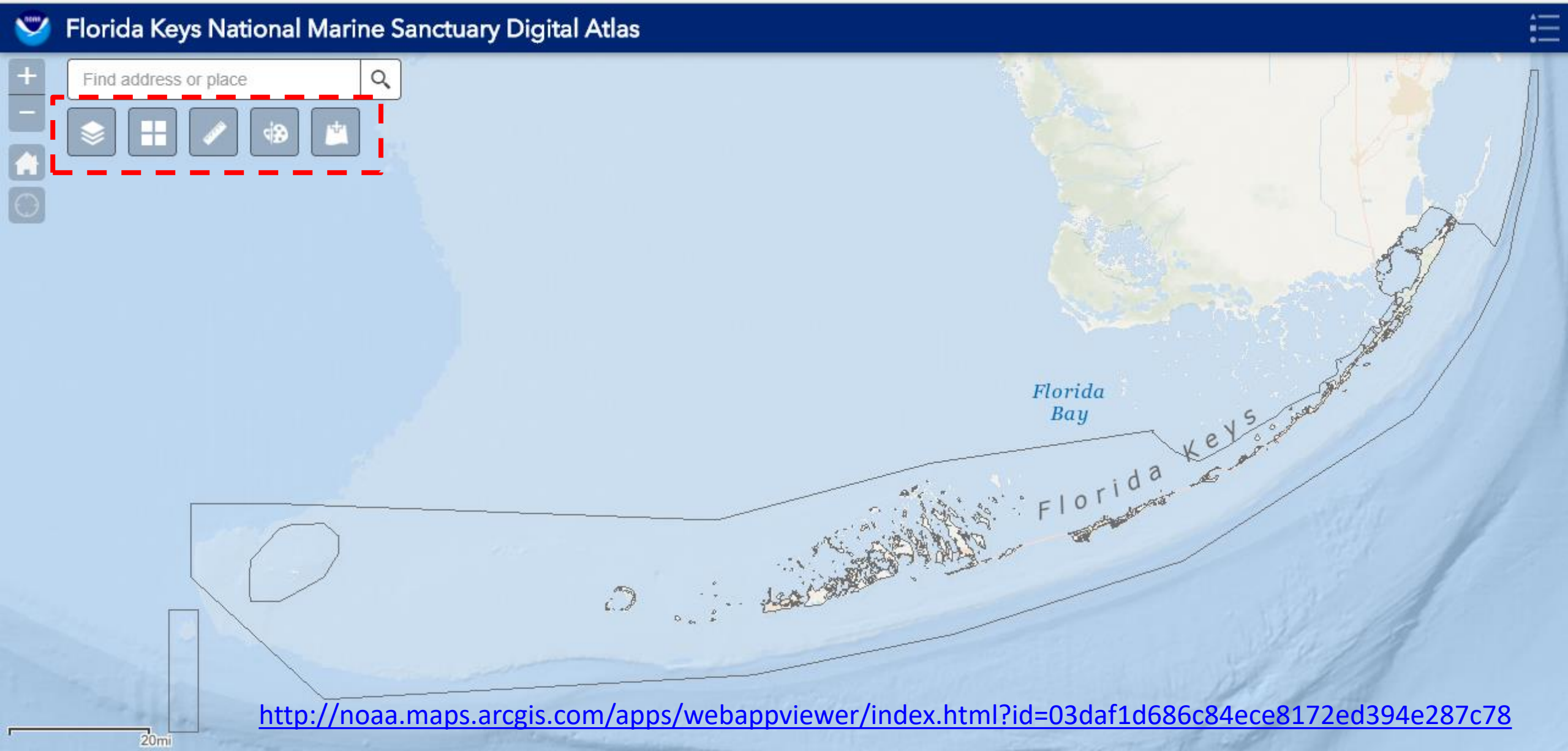
The FKNMS Habitat Mapping Digitial Atlas

Criteria

- Platform-free/web based
- Viewable and rapidly rendered raster layers
- Point/click to view photos and videos within web interface
- Able to add external data layers, drawings, and measurements



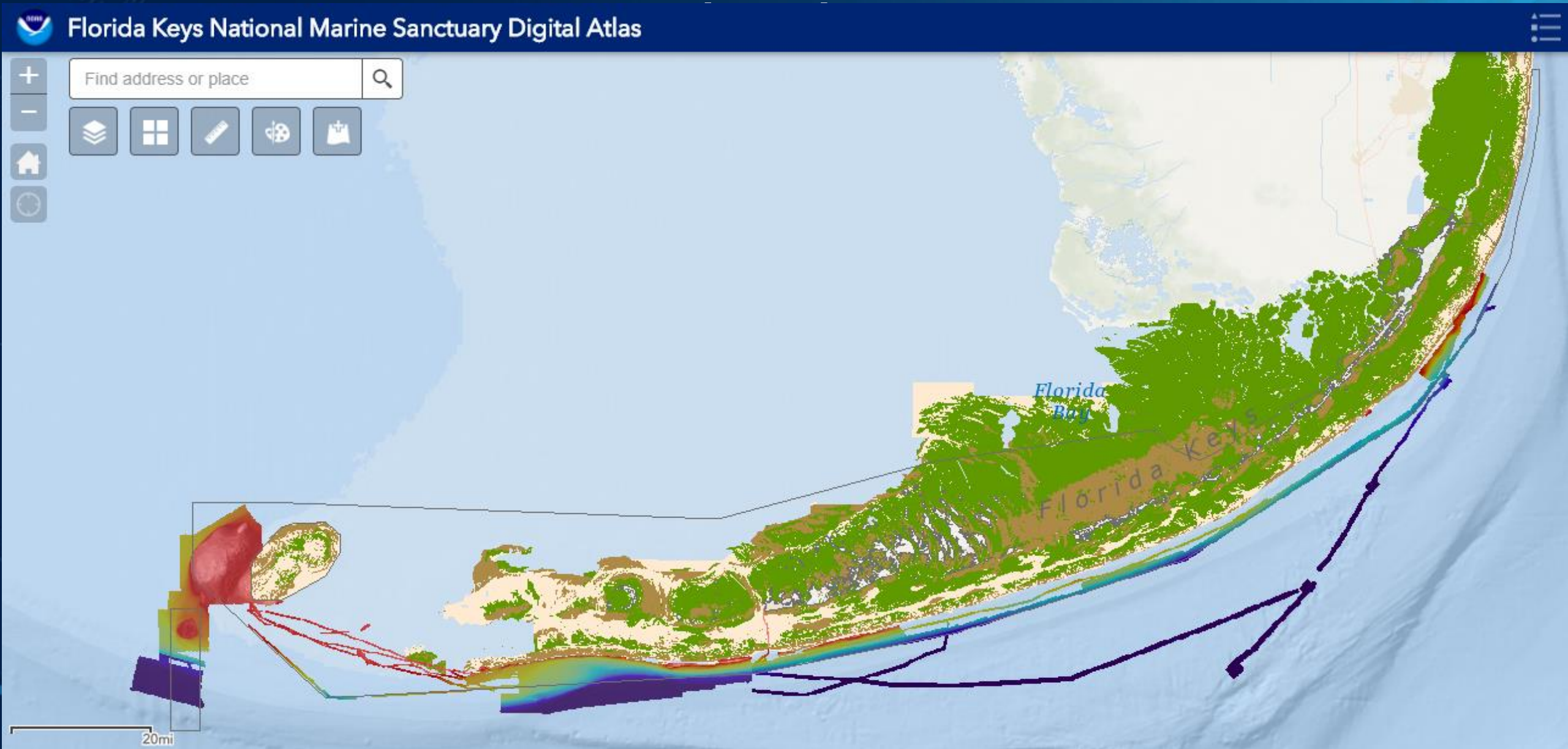
FKNMS Habitat Data Atlas



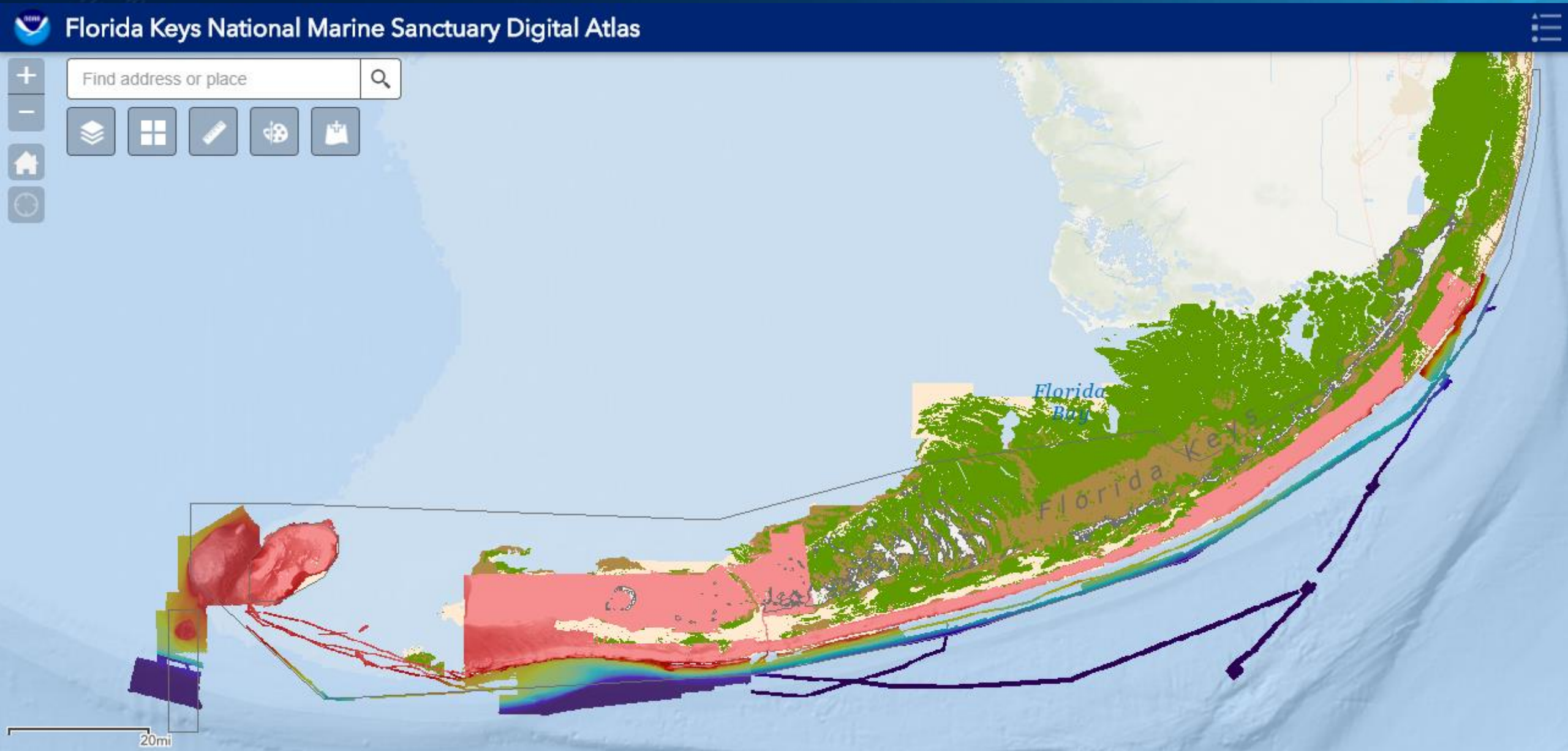
http://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=03daf1d686c84ece8172ed394e287c78

Original coverage of Unified Reef Map

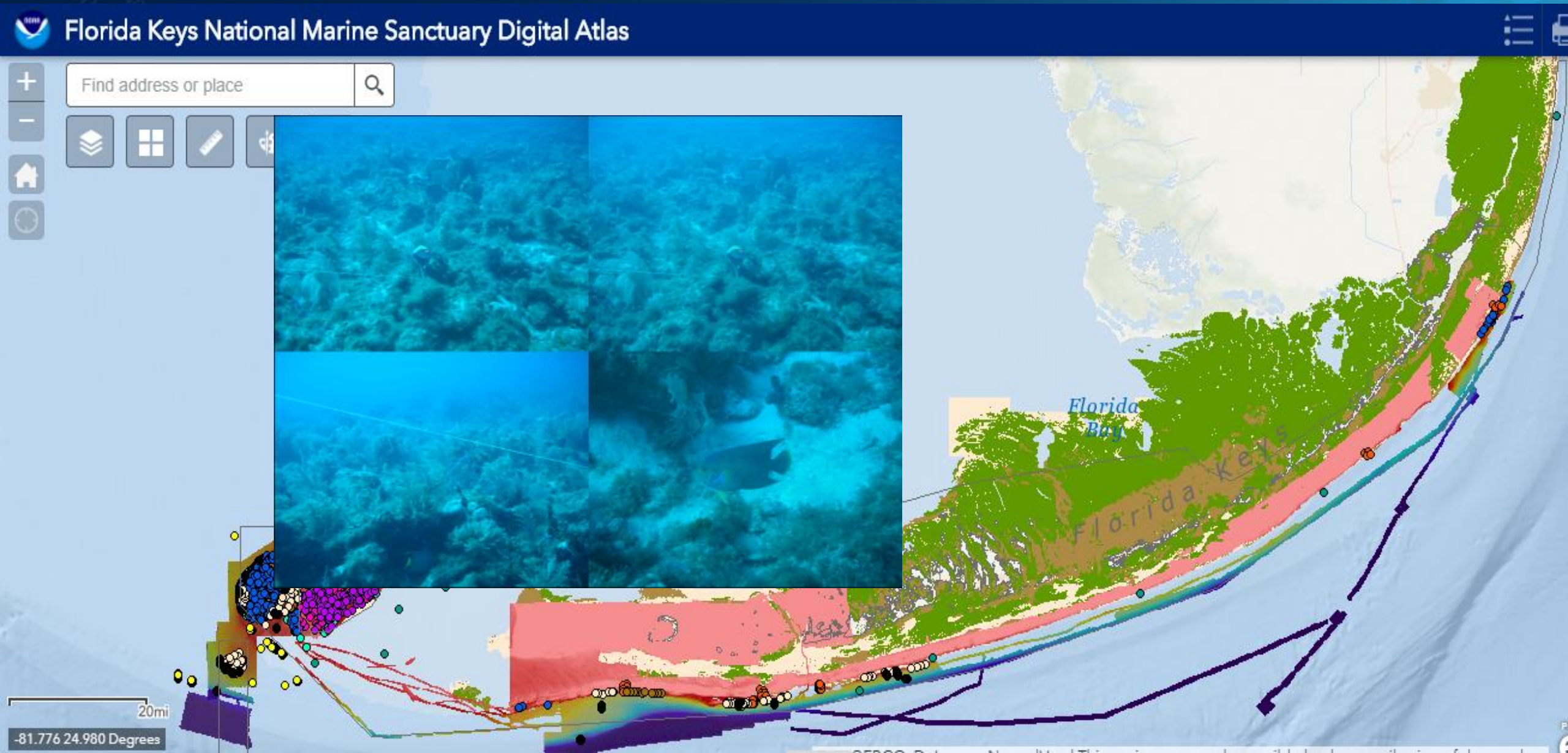
. . .now with more extensive multibeam



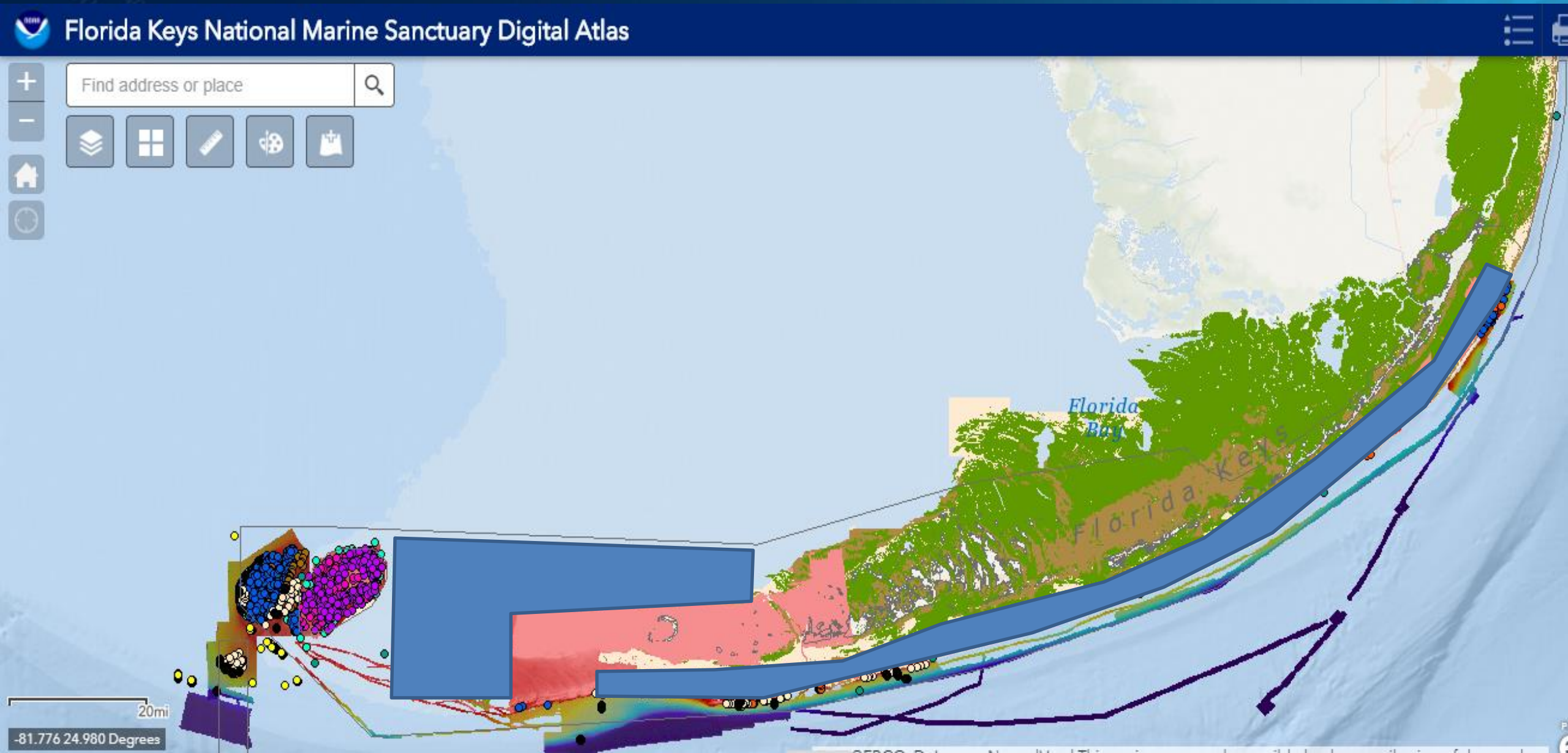
. . . and the latest topo-bathymetric lidar



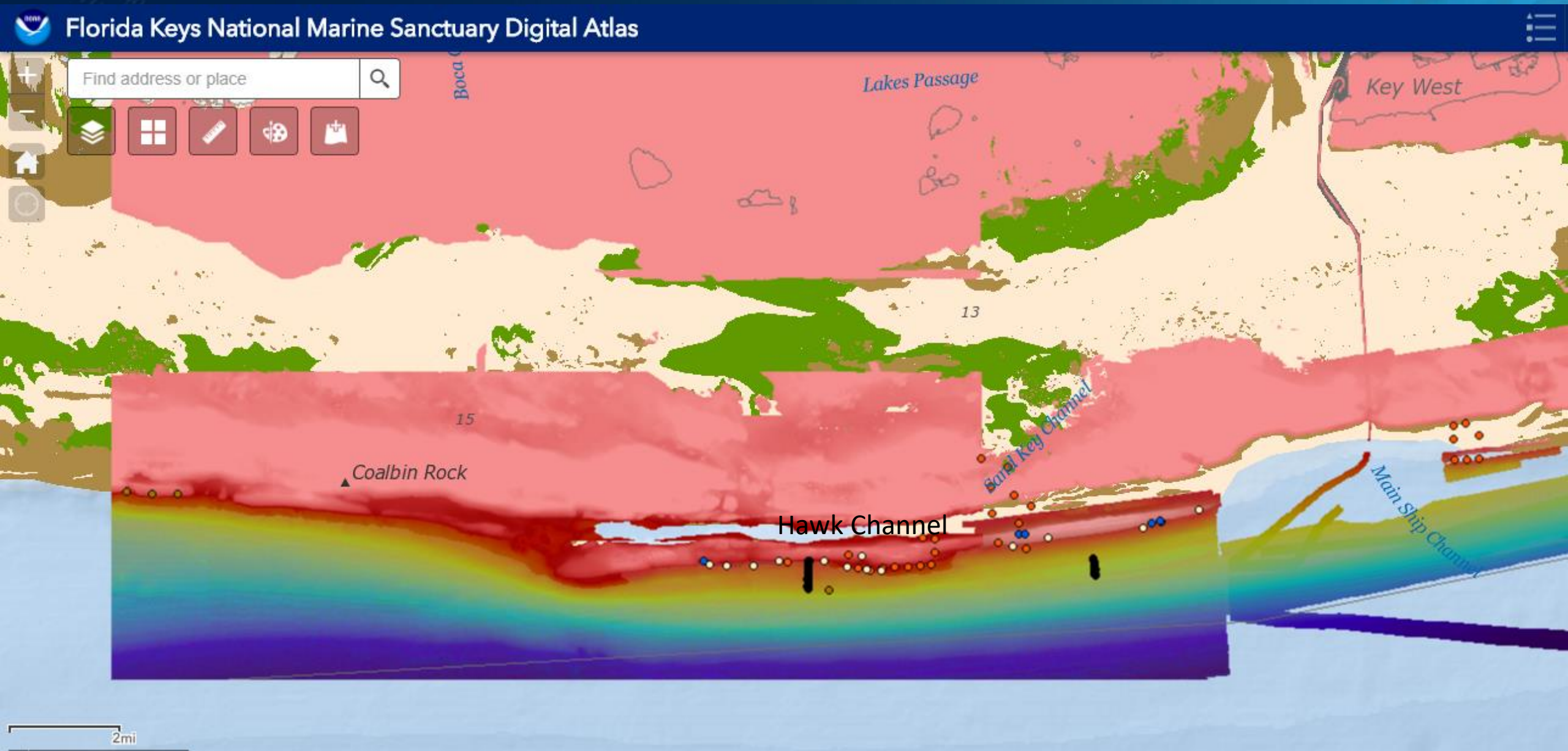
. . . with photos to verify the habitats



NOAA project to fill 400 sqmi in 2018!



Remaining gaps between lidar and multibeam



Outcomes from yesterday's workshop

Outcome

- Communication between mappers and users should continue!
- Still plenty of gaps! (But new lidar and multieam projects in near future!)
- New insights into research and management needs for seafloor habitat maps
- Identified classification schemes that meet science and management requirement

Our Charge

- Develop initial habitat classes with new multibeam (and lidar)
- Summarize management needs and develop a plan to fill gaps
  - Hawk Channel
  - Outer reef bar (18-35m)
  - Deep snapper and grouper habitats (35-500m)