



HCOM Video Workshop

13 May 2019 – Portsmouth, NH

Seth Ackerman

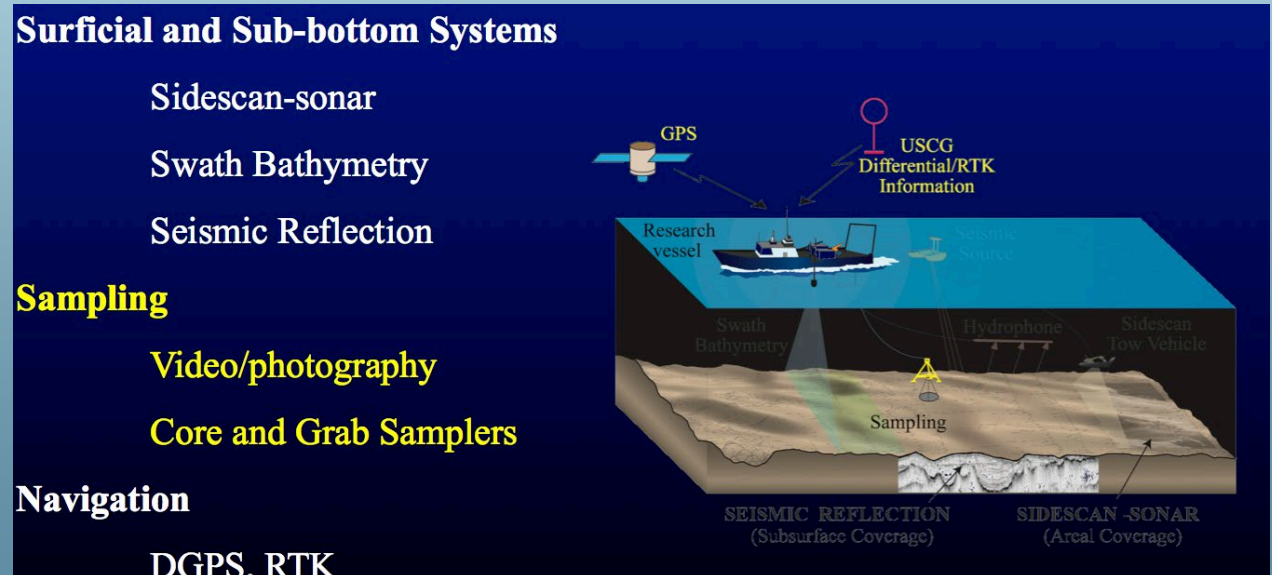
US Geological Survey

Woods Hole Coastal and Marine Science Center

Introduction: Use of Videos

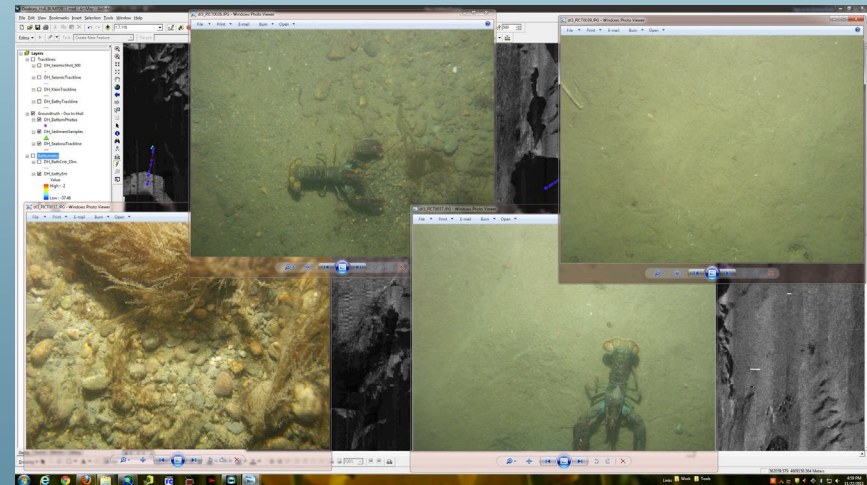
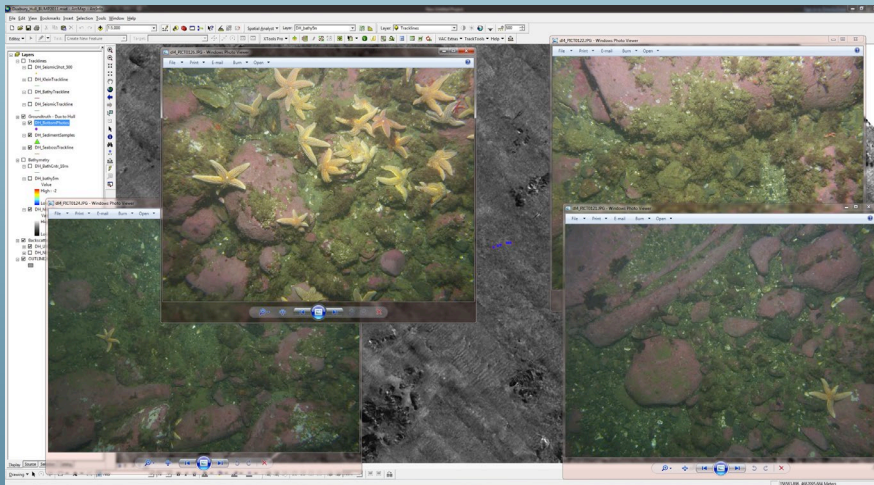
What....

- Videos typically used to ground-truth geophysical/acoustic survey data (bathy, backscatter and seismic reflection)
- Acquire videos concurrently with high-res photos and physical sediment samples. Usually immediately following an acoustic survey.



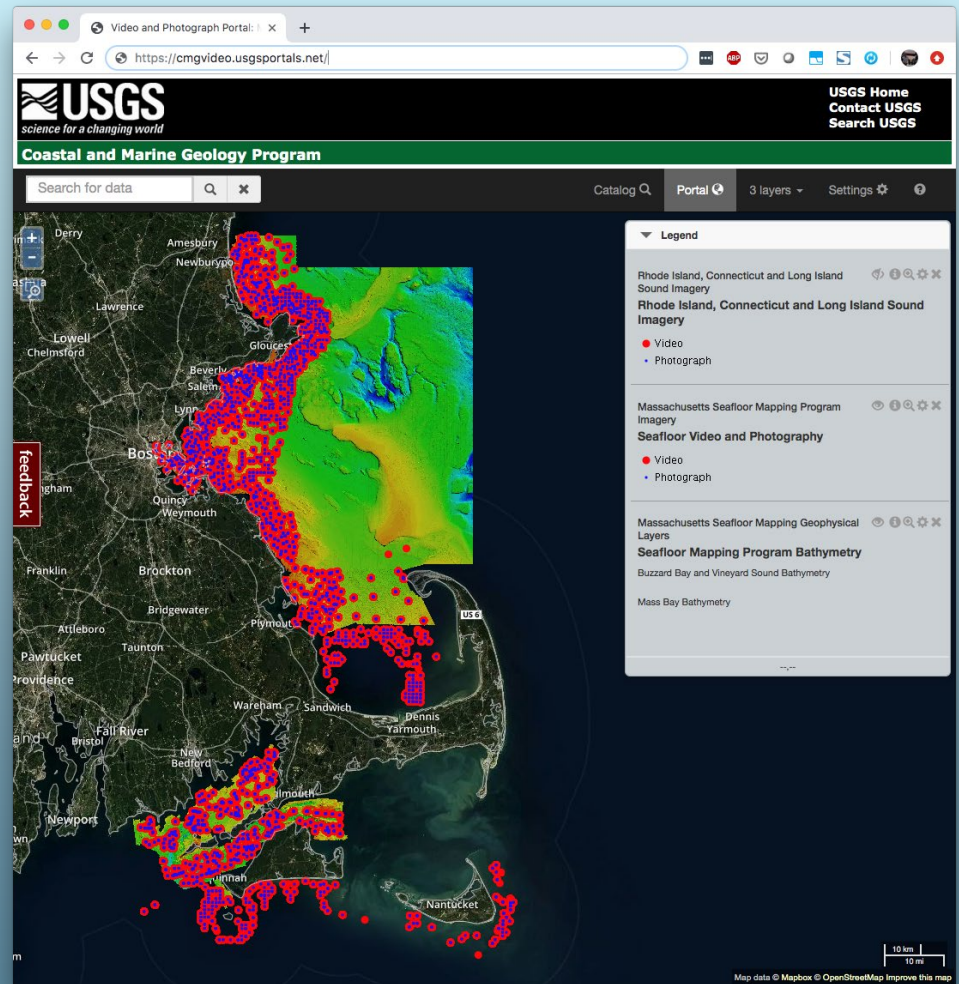
What....

- Videos typically used to ground-truth geophysical/acoustic survey data (bathy, backscatter and seismic reflection)
- Acquire videos concurrently with high-res photos and physical sediment samples. Usually immediately following an acoustic survey.



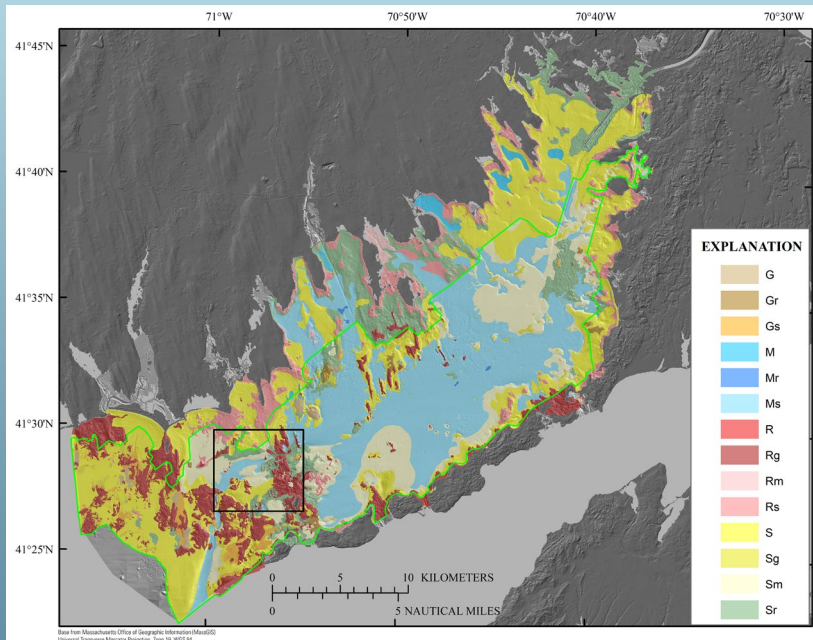
Where

- Video surveys conducted with geophysical surveys
 - Coastal Massachusetts
 - Gulf of Maine
 - Long Island Sound
 - Coastal New Jersey
 - Connecticut River
 - Lake Michigan
 - Mid-Atlantic Coast

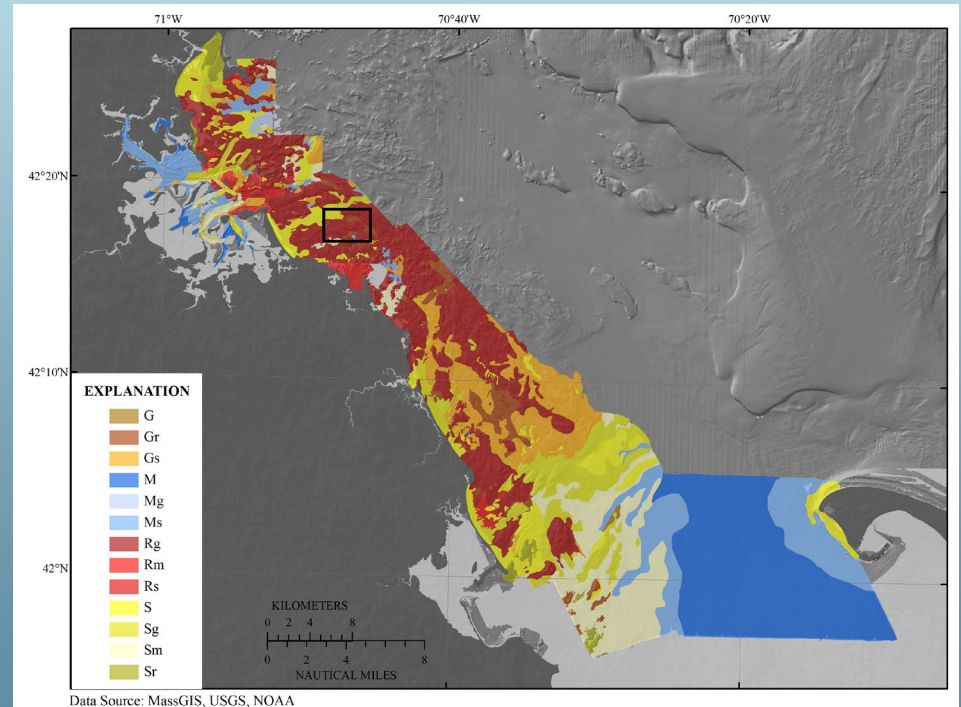


Why

- Seafloor texture, composition and character to inform the regional geologic framework and ultimately to provide data for modeling and monitoring coastal change.



Foster and others, 2014

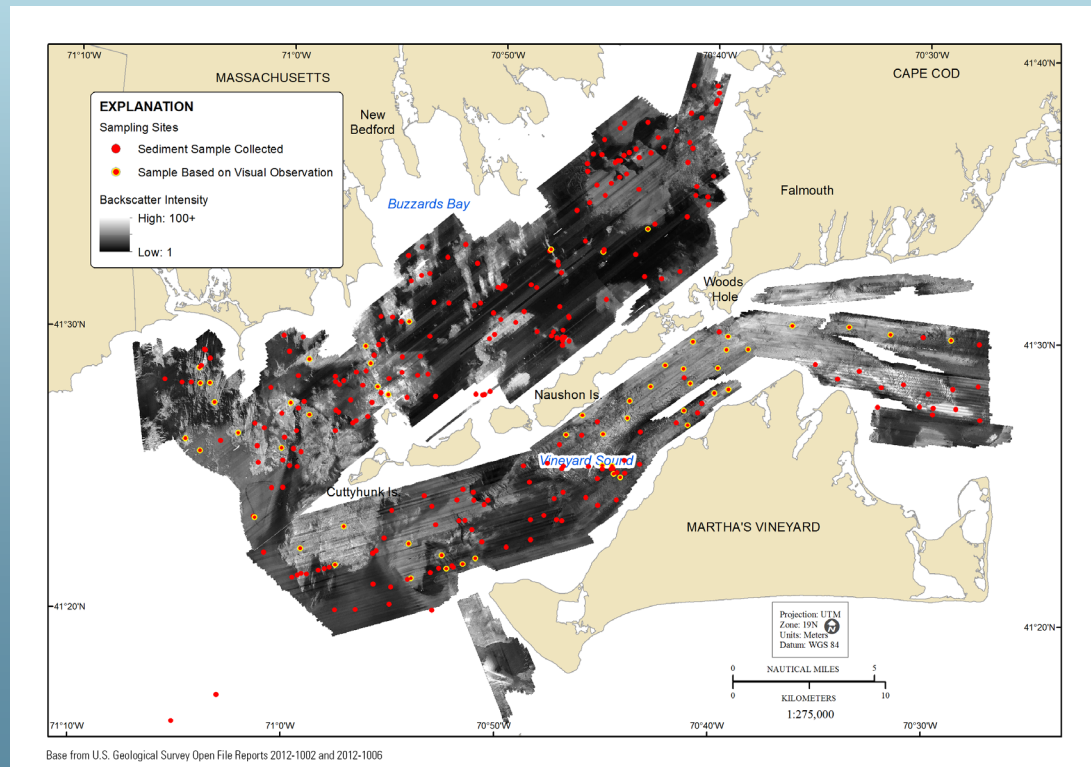


Pendleton and others, 2012

Sampling Design and Execution

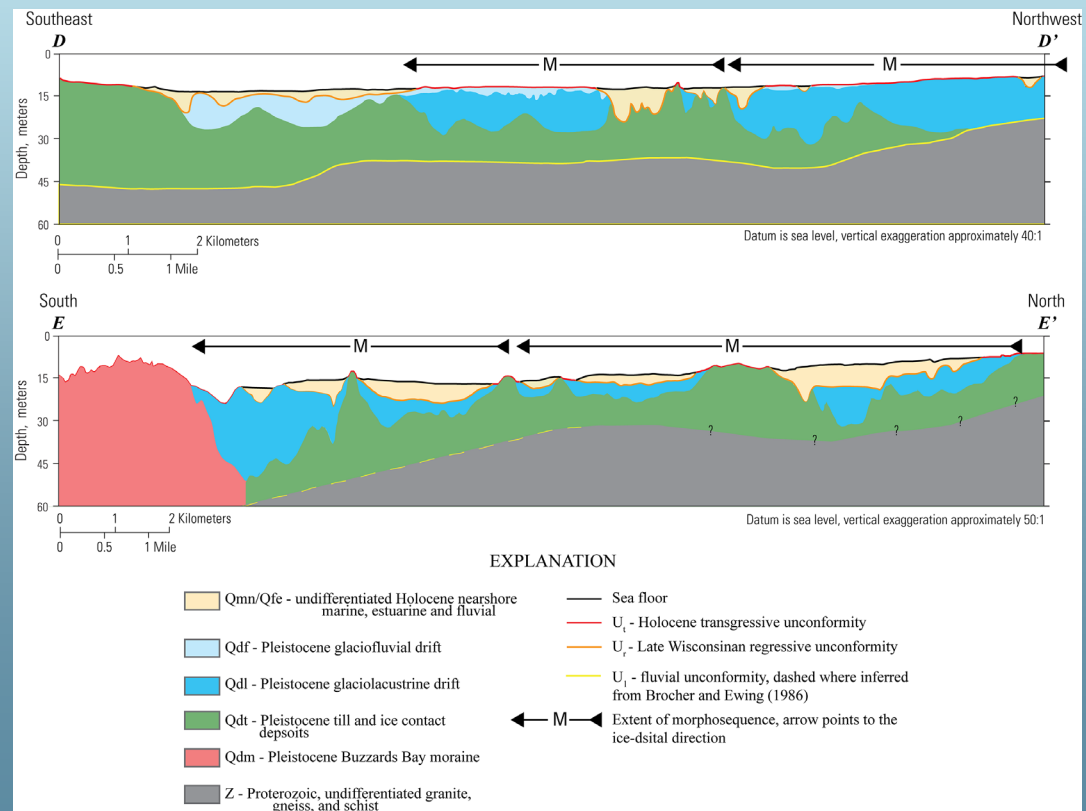
Preparation

- Sampling design is guided by the preliminary products of the acoustic survey (e.g., backscatter, bathymetry, seismic imagery).
- In some cases, the design is coordinated with partner agencies or academic collaborators.
- Limitations – water depth, water clarity, navigation hazards...



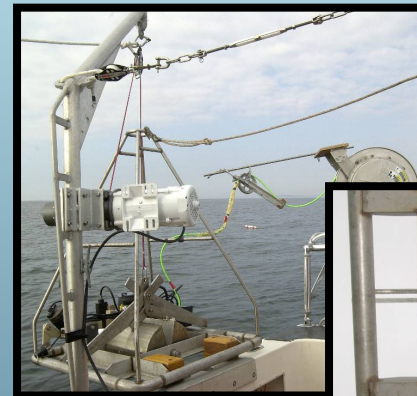
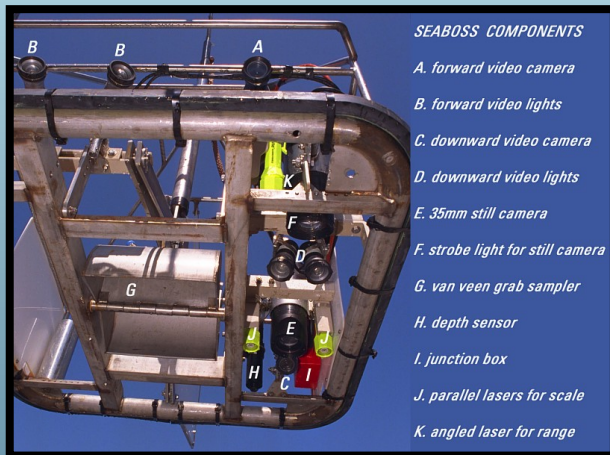
Preparation

- Sampling design is guided by the preliminary products of the acoustic survey (e.g., backscatter, bathymetry, seismic imagery).
- In some cases, the design is coordinated with partner agencies or academic collaborators.
- Limitations – water depth, water clarity, navigation hazards...



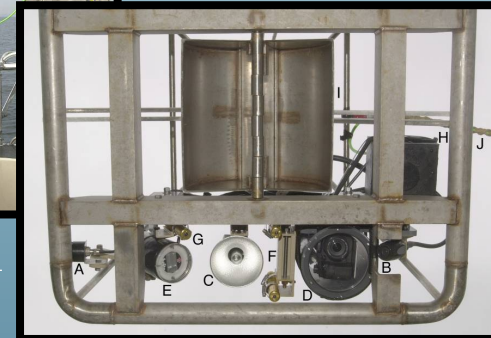
Execution

- SEABed Observation & Sampling System (SEABOSS)
 - Rugged stainless steel frame with a modified Van Veen grab sampler; digital still and video cameras; lighting and optional sensors.
 - Imagery is viewable topside in real-time.



Mini-SEABOSS components:

- A. forward video camera;
- B. downward video camera;
- C. video light;
- D. digital still camera and housing;
- E. strobe light;
- F. parallel lasers for scale;
- G. laser for ranging;
- H. junction block;
- I. van Veen grab sampler;
- J. multi-conducting cable



Execution

- Video
 - Seaviewer 6000 HD Sea Drop Camera (HD-SDI)
 - Convergent Design Odyssey7 video recorder
 - Timecode generator, video text overlay system
 - GPS into audio channel of the video
- Photo
 - Nikon D300
 - GoPro
- Lighting
 - Keldan dive lights
 - Photosea strobe
- GPS
 - At deploy point



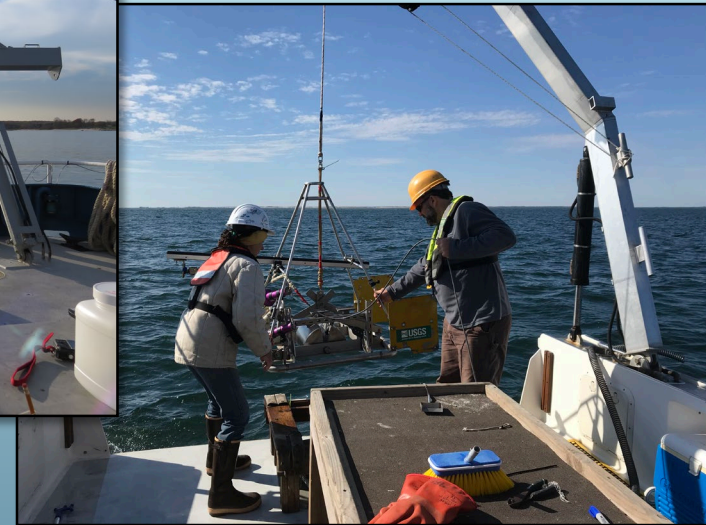
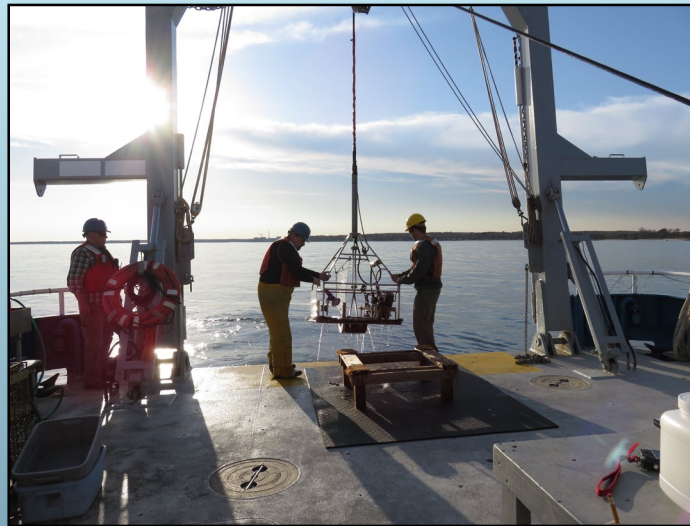
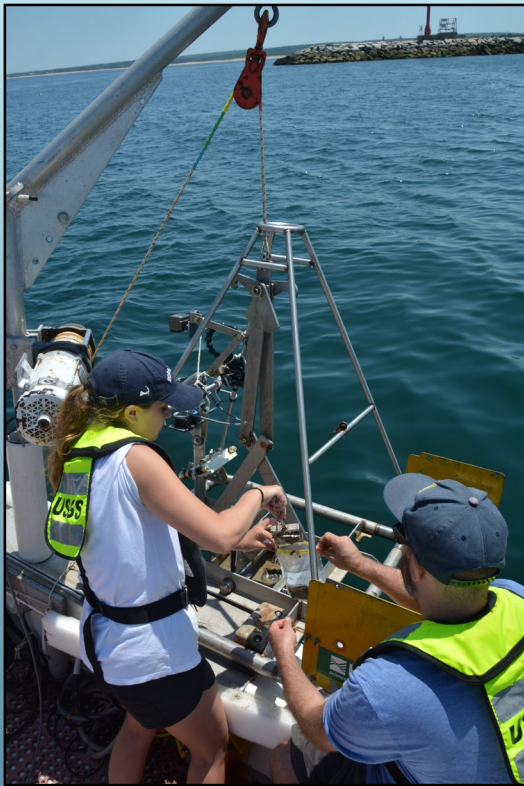
Execution

- R/V Connecticut – May 2018



Execution

- Various SeaBOSS configurations for all types of vessels



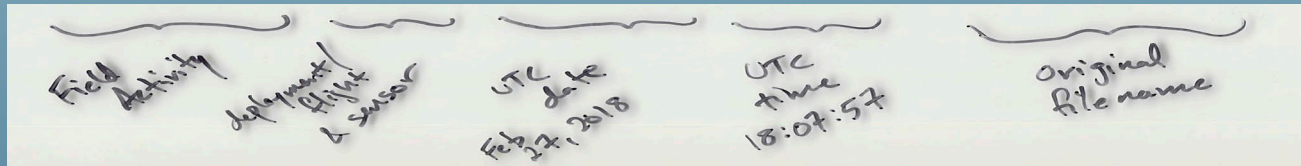
What worked well, and what didn't

- ***Logistics plan*** (*prepare for the unexpected*) is ***incredibly important*** to a successful survey.
 - site/vessel visit ahead of time
 - Pre-survey planning with everyone involved
 - clear chain of command/communication
 - realistic expectations
 - good sampling site naming scheme
 - document as much as you can when you're surveying
 - take pictures of everything (both in and ***out*** of the water)
- Include eye-catching outreach/social media component
 - see above... take pictures of everything

Data Management

- File management hierarchy
 - Project
 - field activity
 - data type
 - sensor (camera)
 - Sometimes organized by day
- Use UTC date and time
- File-naming system

2018015FA_f03r01_20180227T180757Z_CLIP0000457.mp4

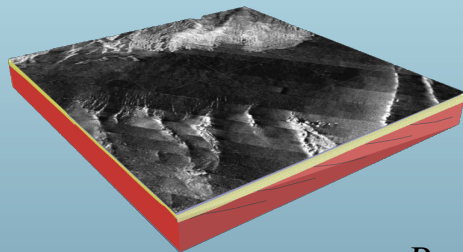


Data Analysis

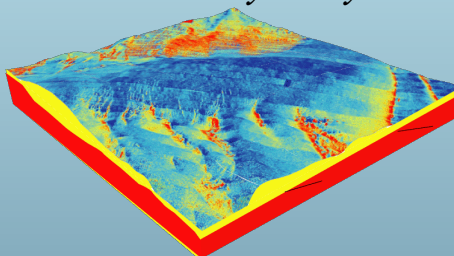
Approach

- Geologic mapping – manual process integrating all the data layers (bathy, backscatter, seismic, samples, photos & videos)

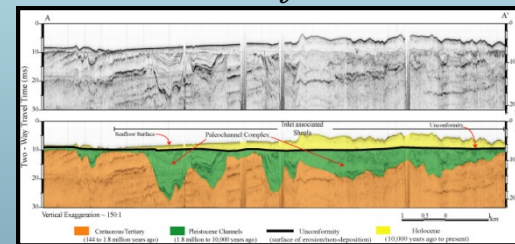
Sidescan Sonar



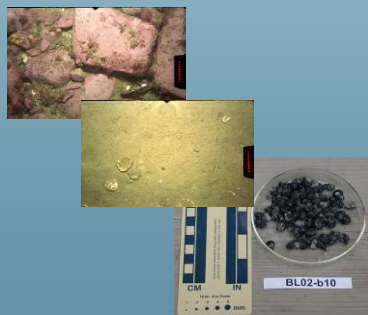
Swath Bathymetry



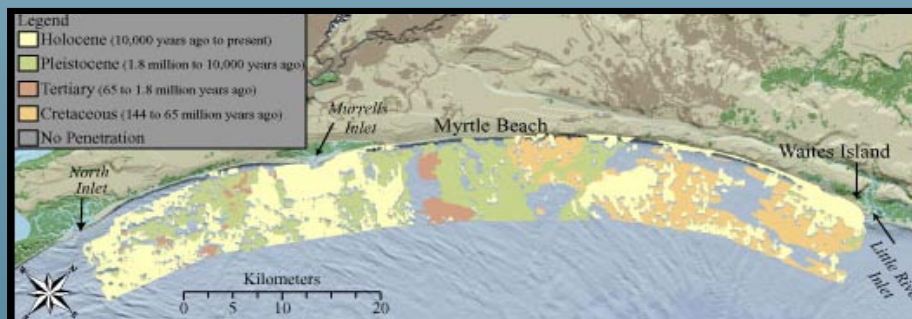
Seismic Reflection



*Bottom Video
and Photographs
Samples*

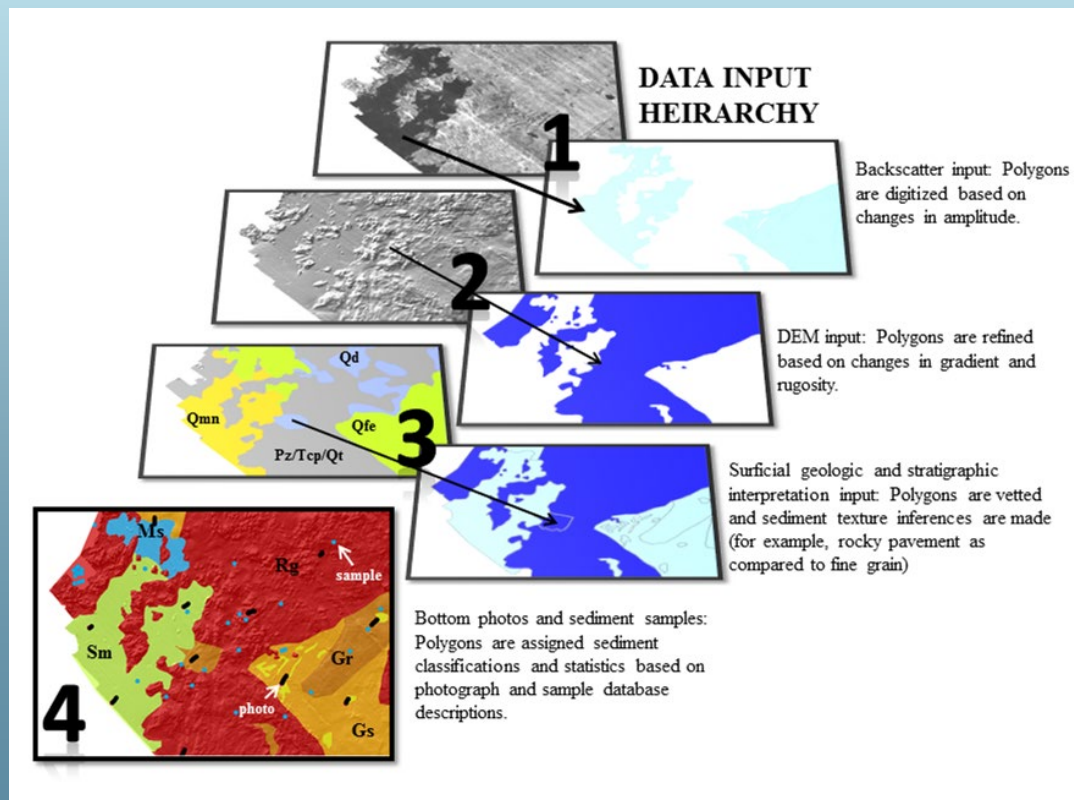


*Sediment Core and
Grab Samples*



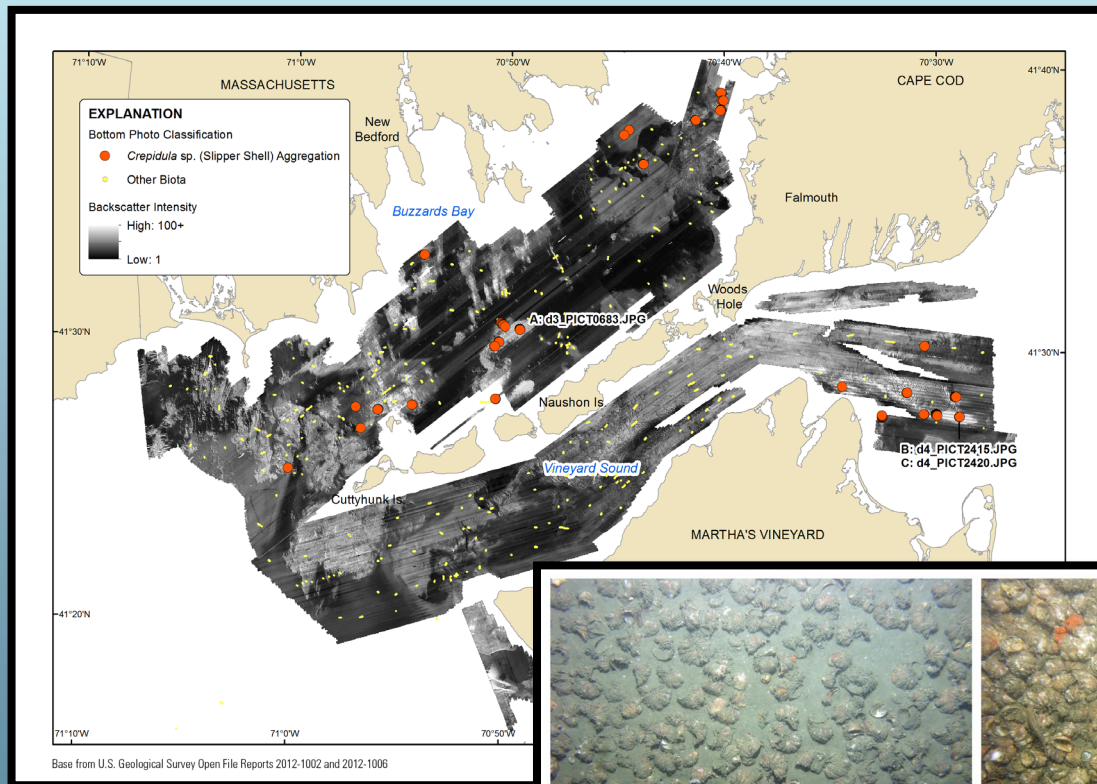
Approach

- Parts of the data integration process can be done in GIS and other software
- Photos and especially videos are a challenge to work with spatially
- Developing tools for data management and analysis of imagery
- Work with partners to classify imagery



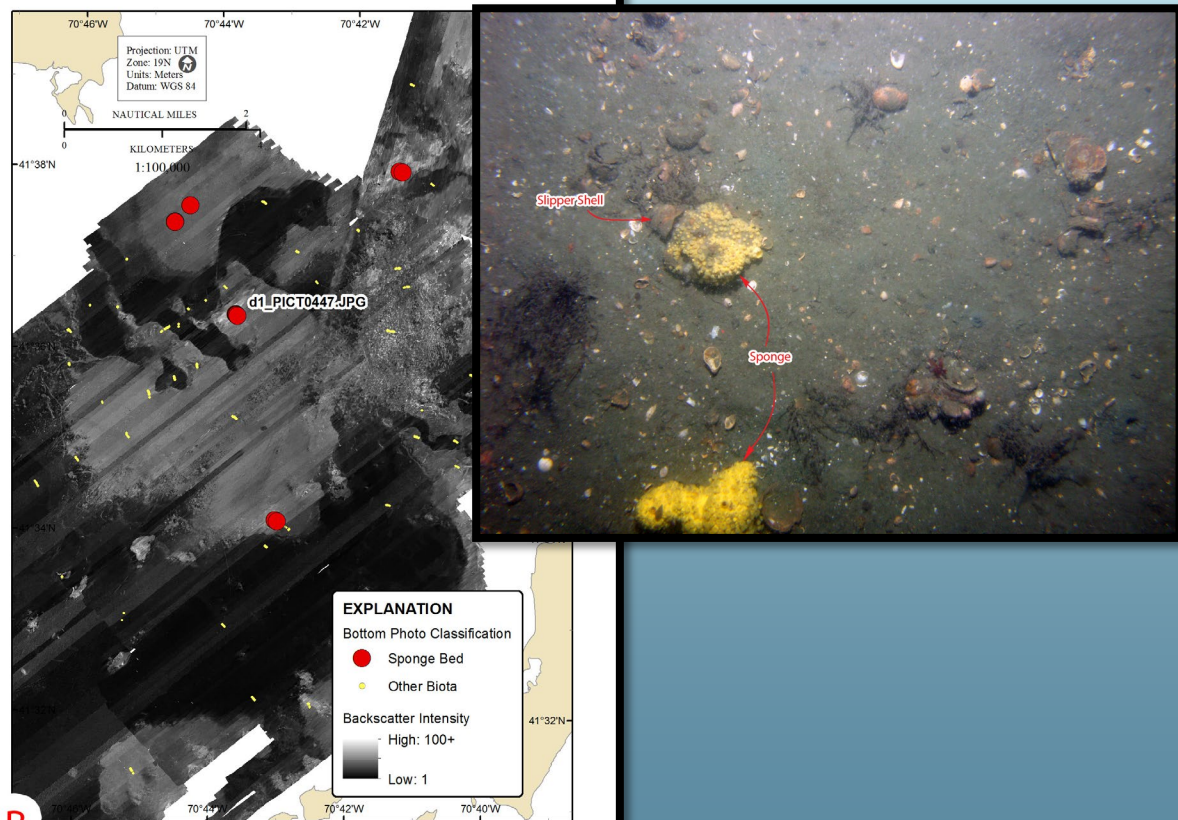
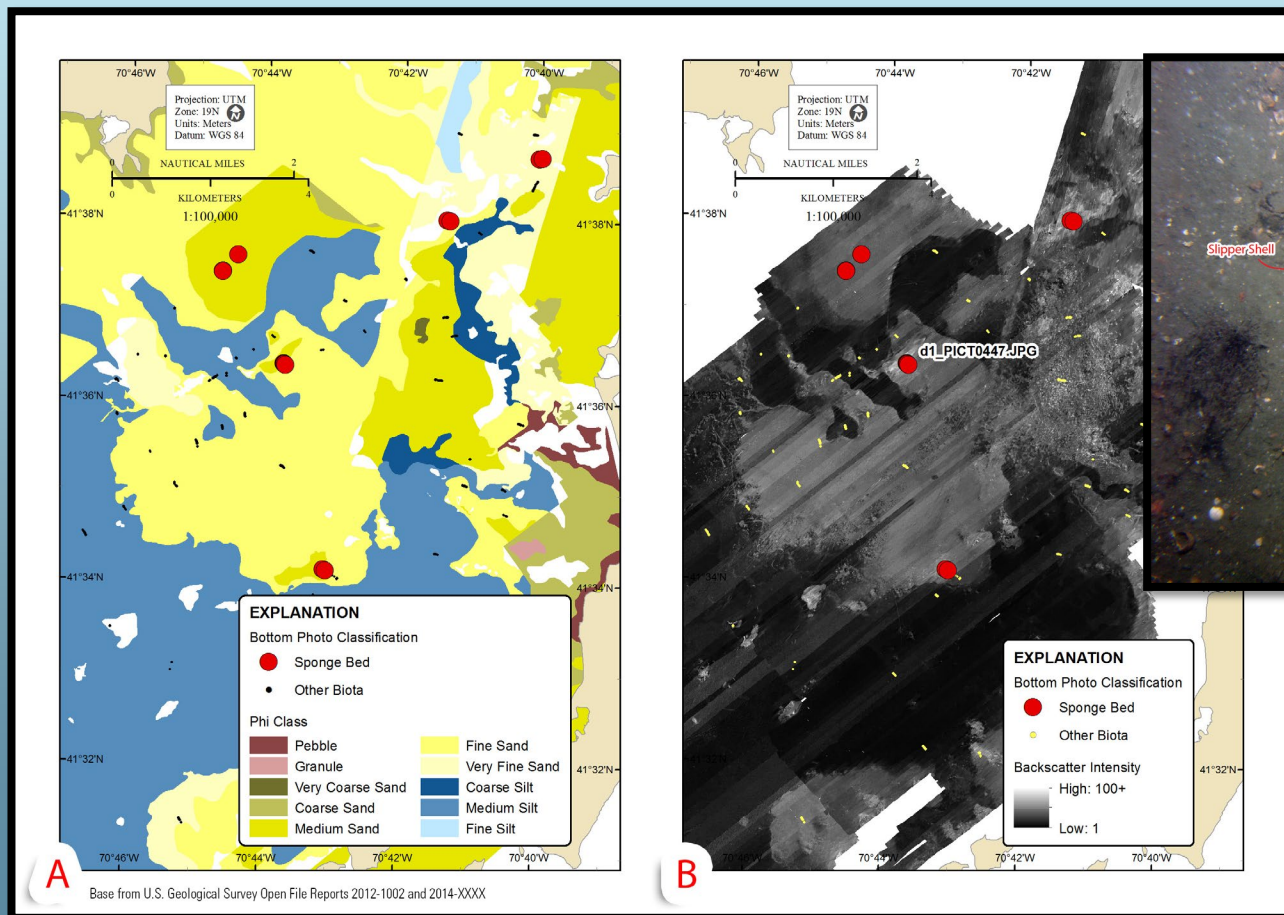
Approach

- Working with partners to characterize the biota of survey areas



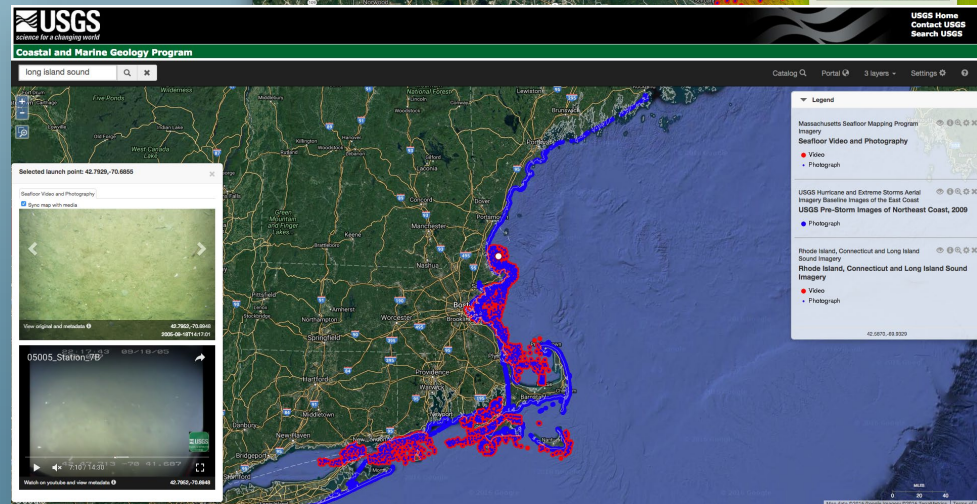
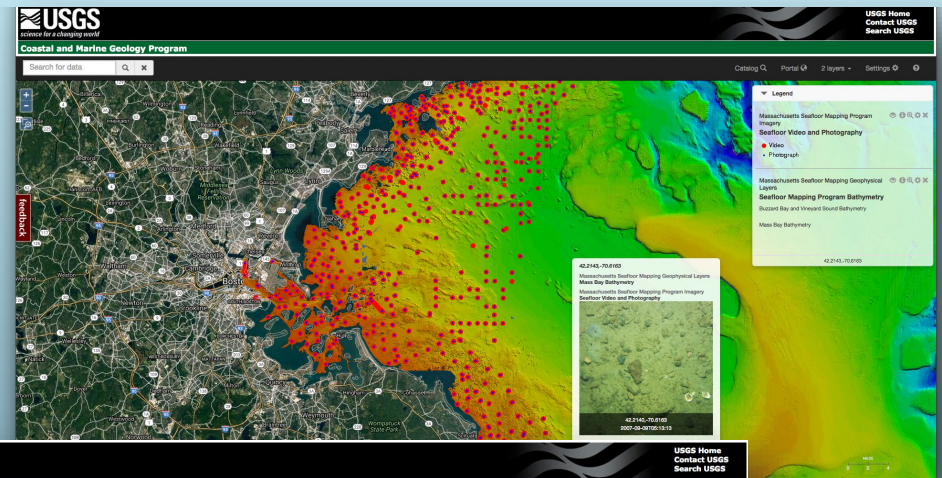
Approach

- Working with partners to characterize the biota of survey areas



Results

- USGS CMGP Video and Photograph Portal
 - <https://cmgvideo.usgsportals.net>
- 2019-2021 new CMGP Imagery Data System to serve Video/Photo Portal, Coastal Change Hazards Portal and others.



What worked, and what didn't ...

- Video Portal makes data accessible that was hidden away in data libraries or researchers' offices.
- We're always looking to streamline the process and find/develop tools that will increase productivity and availability of our data for other uses.
- Working to increase functionality of our existing data portals.

