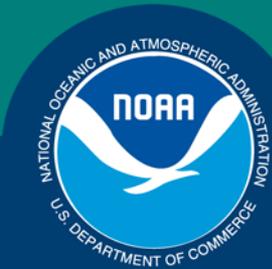


*Science, Service, Stewardship*



# Cooperative Research Bottom Longline Survey of Rocky Habitat in the central Gulf of Maine

Cooperative Research Branch

NOAA collaborators include personnel from:

Population Dynamics Branch

Oceans and Climate Branch

Ecosystem Surveys Branch

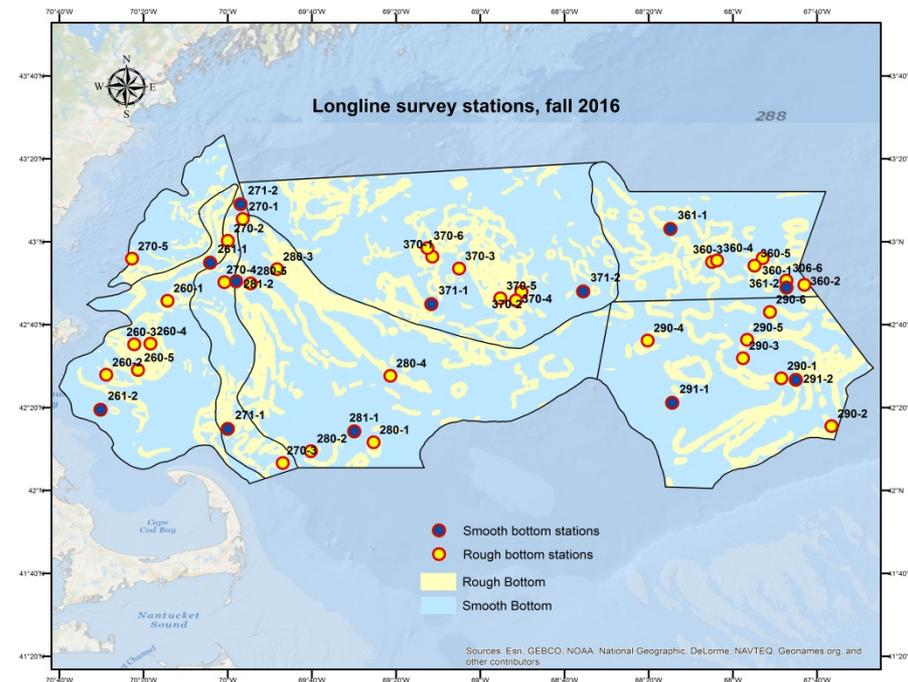
Population Biology Branch

GARFO Protected Resources Division

**NOAA  
FISHERIES  
SERVICE**

# Longline Survey Design

- Random-stratified design based on the NEFSC trawl survey
  - By depth/area: 6 strata in central Gulf of Maine
  - LLS further stratified by bottom type (i.e. rugosity index)
- Tub-trawl bottom longlines: 1000 (#12) hooks baited with squid
  - 2 commercial vessels
  - Spring & fall – 45 stations
  - 2hr soak - set across slack tide



# Survey Design

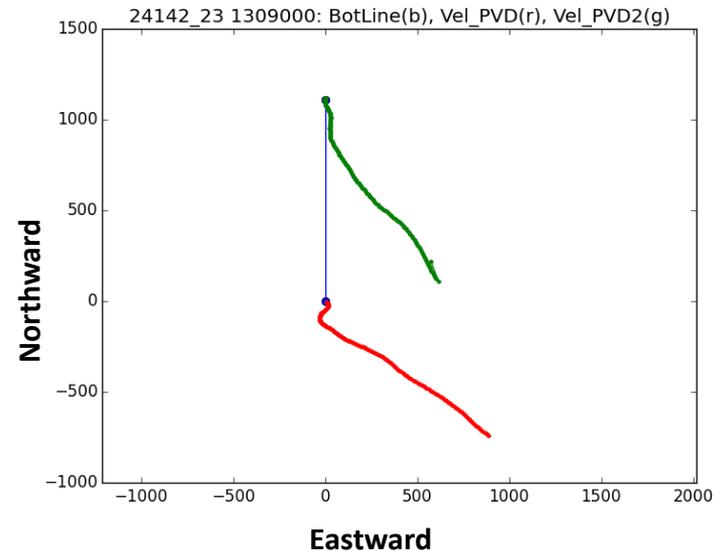
- Survey value: targets habitat that is difficult to sample
  - Different gear with different catchability
- Biggest advantage is compatibility with the trawl survey
  - 1 nm main line - comparable to distance of a survey tow
  - Run concurrently - biannually
  - Same strata (just further stratified)
  - Data stored/presented in similar format (schema on sole)
  - Facilitates integration into assessments



# Advanced Technology



- Current instruments: a collaboration with oceanography branch
  - Data on velocity and direction of flow over gear
  - Potentially improve our understanding of the 'area fished' by the LL gear
- Habitat videos to verify bottom type
  - Characterize substrate
  - Macro-invertebrate community

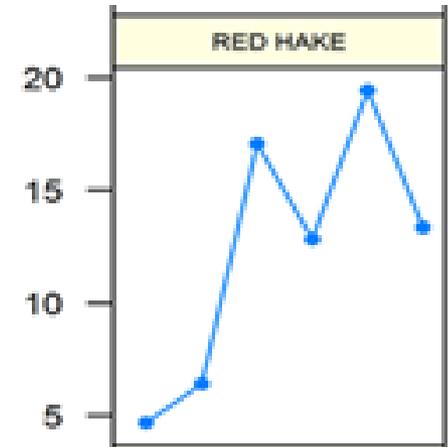
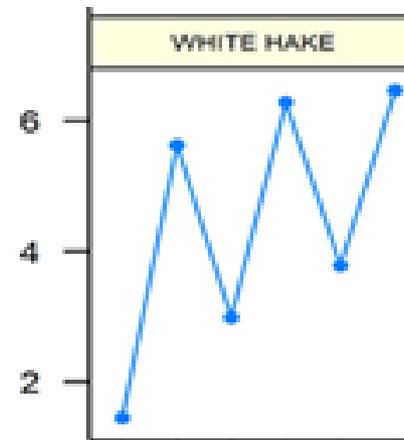
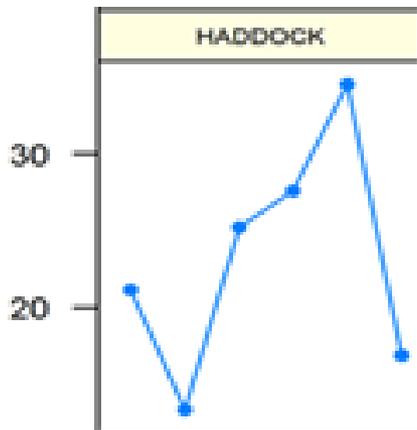


- Exploring potential of NOAA ships' acoustic data to improve classification of bottom type

# Longline Indices of Abundance

- 8 species captured at levels sufficient to provide a primary (cusk) or ancillary index of abundance:
  - Soon have enough years to explore trends, 2018 will be year 5
  - Dogfish, cod, haddock, white hake, red hake, cusk, barndoor and thorny skate
  - Borderline species for an index: pollock, smooth & little/winter skate

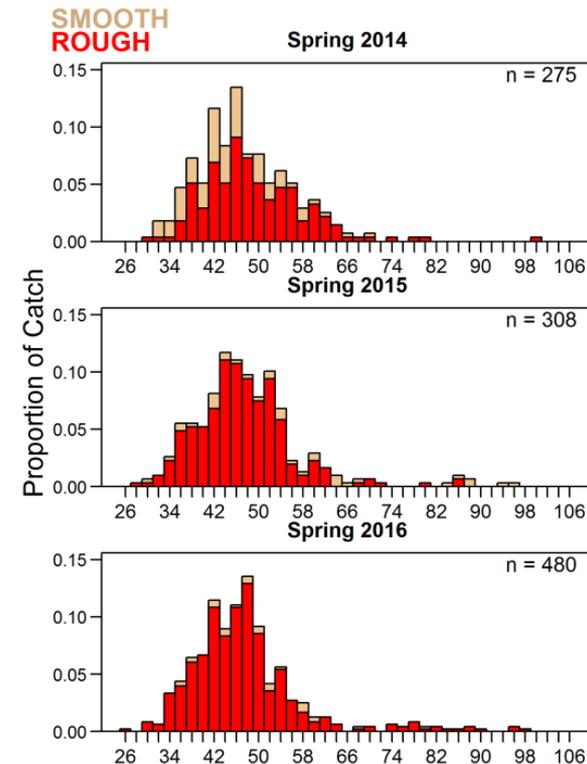
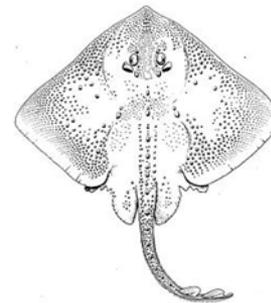
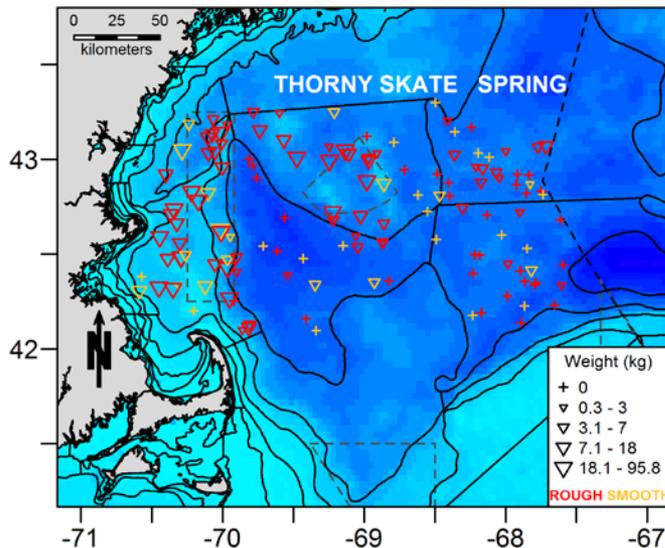
rough bottom  
stratified mean #/set  
spring/fall 3 years



- Some other species LLS may provide additional biological or habitat data (esp. data poor species) and limited abundance info
  - Halibut, wolffish, tilefish

# Filling Gaps: Data Poor Species

- Thorny skate: NOAA species of concern & candidate species
  - LLS included in data ref. doc. for status evaluation
  - Additional habitat, length, biological data



- Other data poor or candidate species:
  - Cusk, several skates, halibut, wolffish, tilefish
  - Data types and value vary: some have low encounter rates

# Other Products & Collaborations

- Supplementary age and maturity sampling
  - Supplement age-length keys
  - Supporting detailed life-history studies
- Current meter provides data to validate bottom currents in the FVCOMM model
  - SMAST model: estimates currents at multiple depth layers
- Supporting research of external researchers including those doing work supported by GARFO
  - New England Aquarium, U. Mass Dartmouth & Boston, U. Maine
- **Tech memo in center review: design, implementation, results**



# Questions

- LLS provides a cooperative platform to fill data gaps
- Additional opportunities for data collection & collaboration exist

