

GIS and EAF

Fishery management,
current uses,
considerations and
data needs

Chad Demarest
NEFMC/NERO/NEFSC
EAF Project Leader

GIS and EAF

- New England Fishery Management Plans
- Spatial/temporal management
- Current GIS applications
- Ecosystem Approaches to Fisheries (EAF)
Considerations
- EAF data needs

NEFMC FMP's

- Northeastern Multi-species (groundfish)
 - Small mesh
 - Large mesh
- Atlantic Sea Scallops
- Monkfish
- Red Crab
- Atlantic Herring
- Skates
- Atlantic Salmon
- EFH

Other Pertinent FMP's

➤ MAFMC

- Bluefish (rec)
- Surf Clam/Ocean Quahog
- Squid/Mackerel/Butterfish
- Black Sea Bass/Scup/Summer Flounder
- Dogfish*

➤ ASMFC

- Northern Shrimp
- Lobster
- Striped Bass (rec)

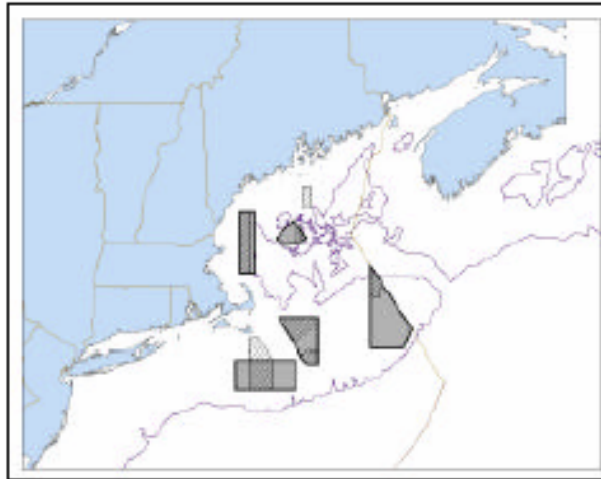
➤ Other

- Hagfish
- Pelagics

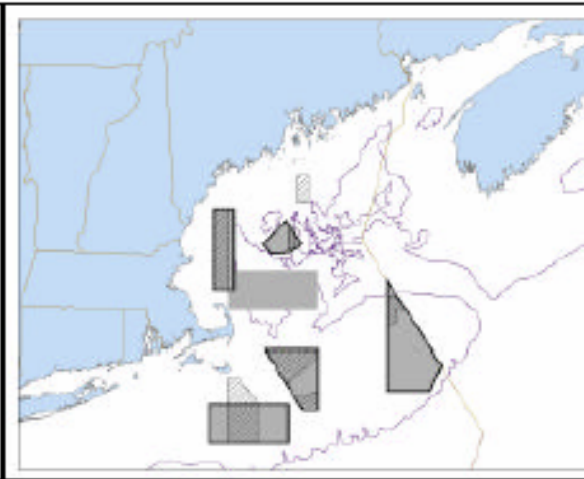
Spatial/Temporal Management

- Most NE fisheries employ tacit MPA approach w/ both spatial and temporal applications
 - Define MPA: no different from Marine Zoning
 - NEMS – Closed areas, seasonal closures, RGAs, RMAs, habitat closures, SAPs and on and on...
 - Scallops – Rotational management (13), including NEMS closed areas
 - Herring – Management areas (1A, 1B, 2, 3)
 - Monkfish – Management areas (Northern, Southern)
 - Red crab and skates are exceptions

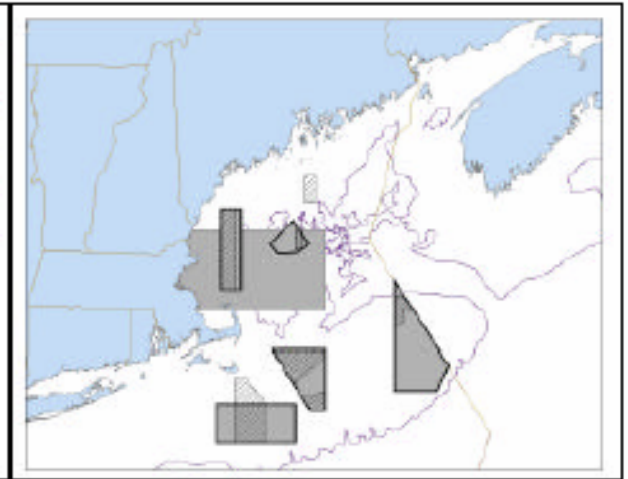
NEMS rebuilding and habitat closures



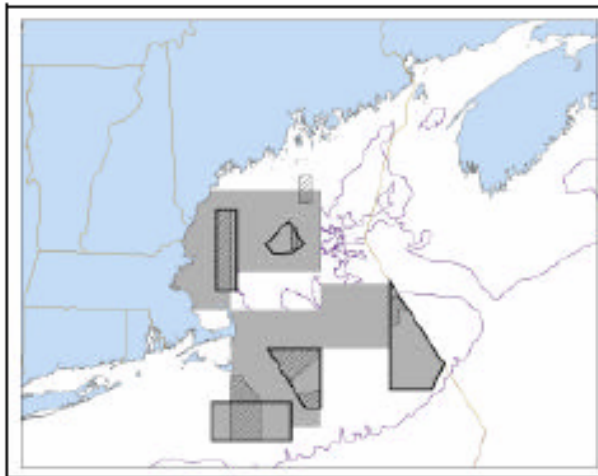
Year Round



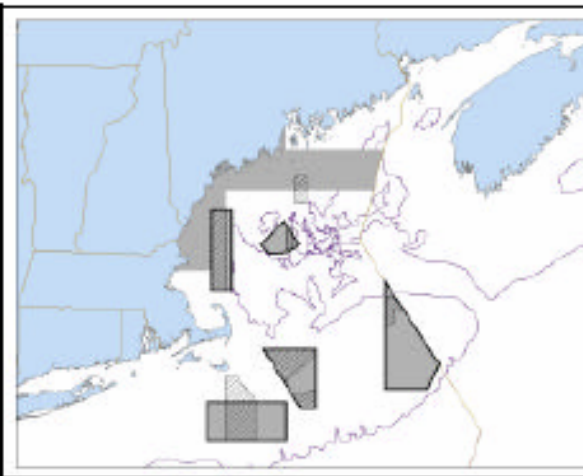
March



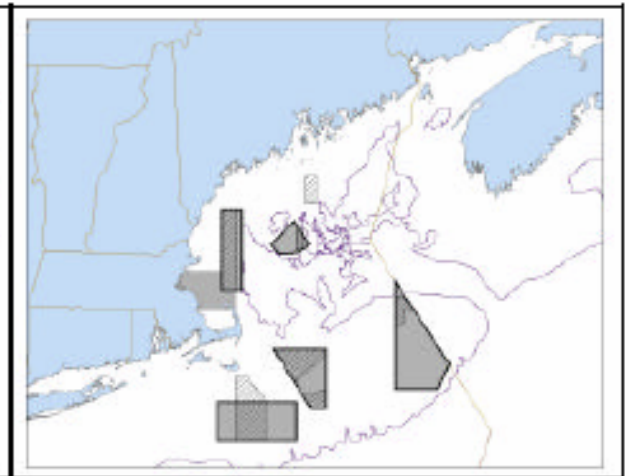
April



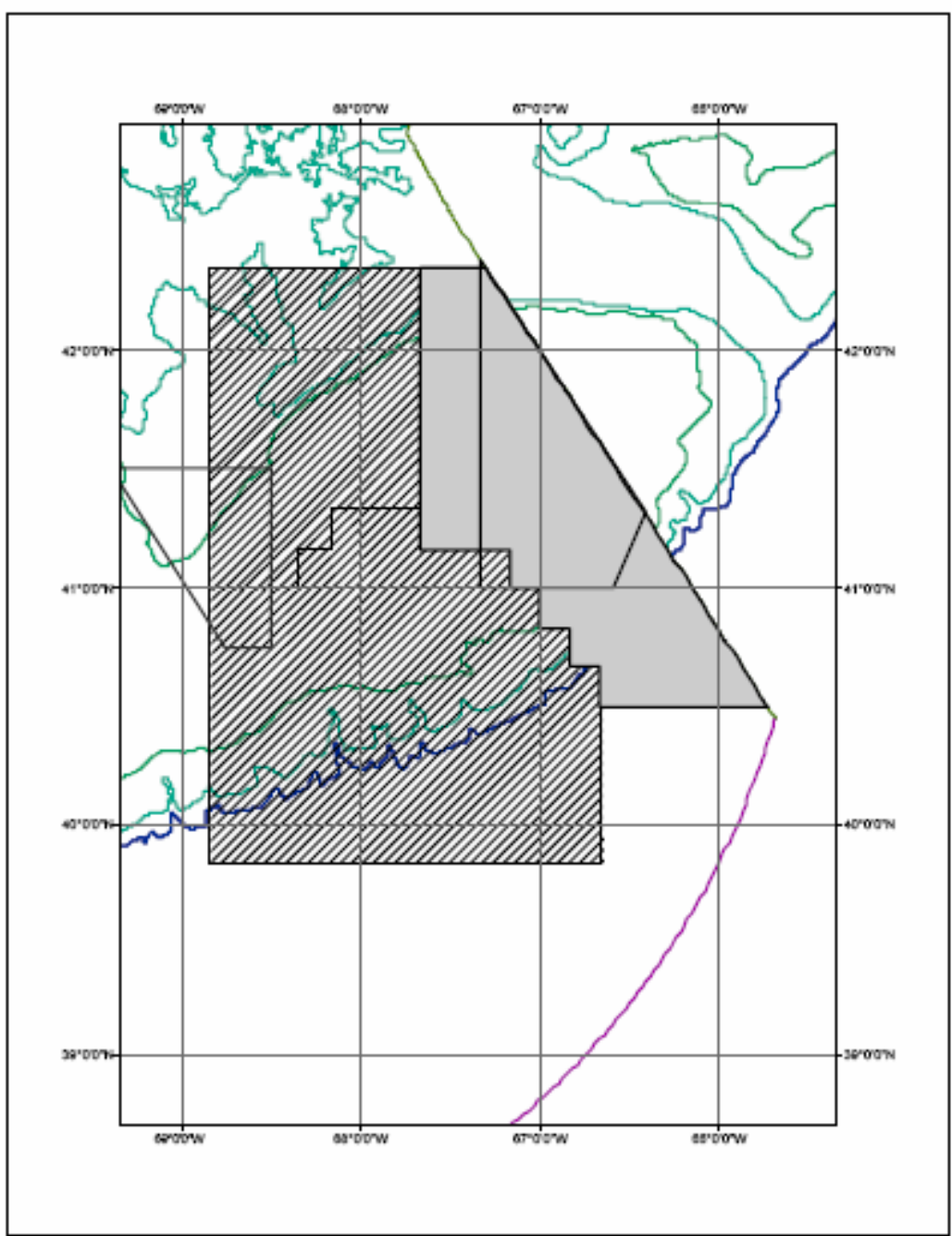
May



June



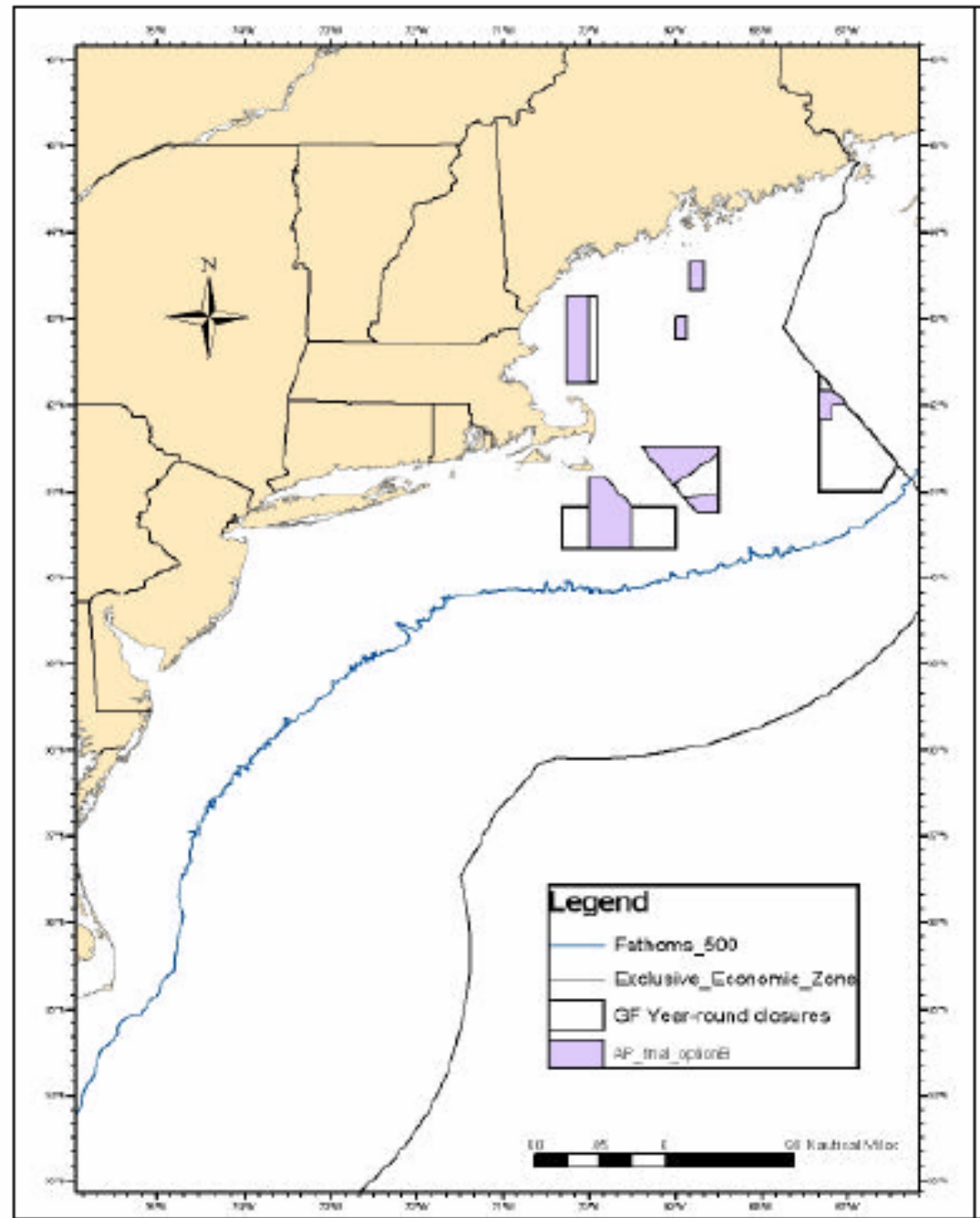
October/November



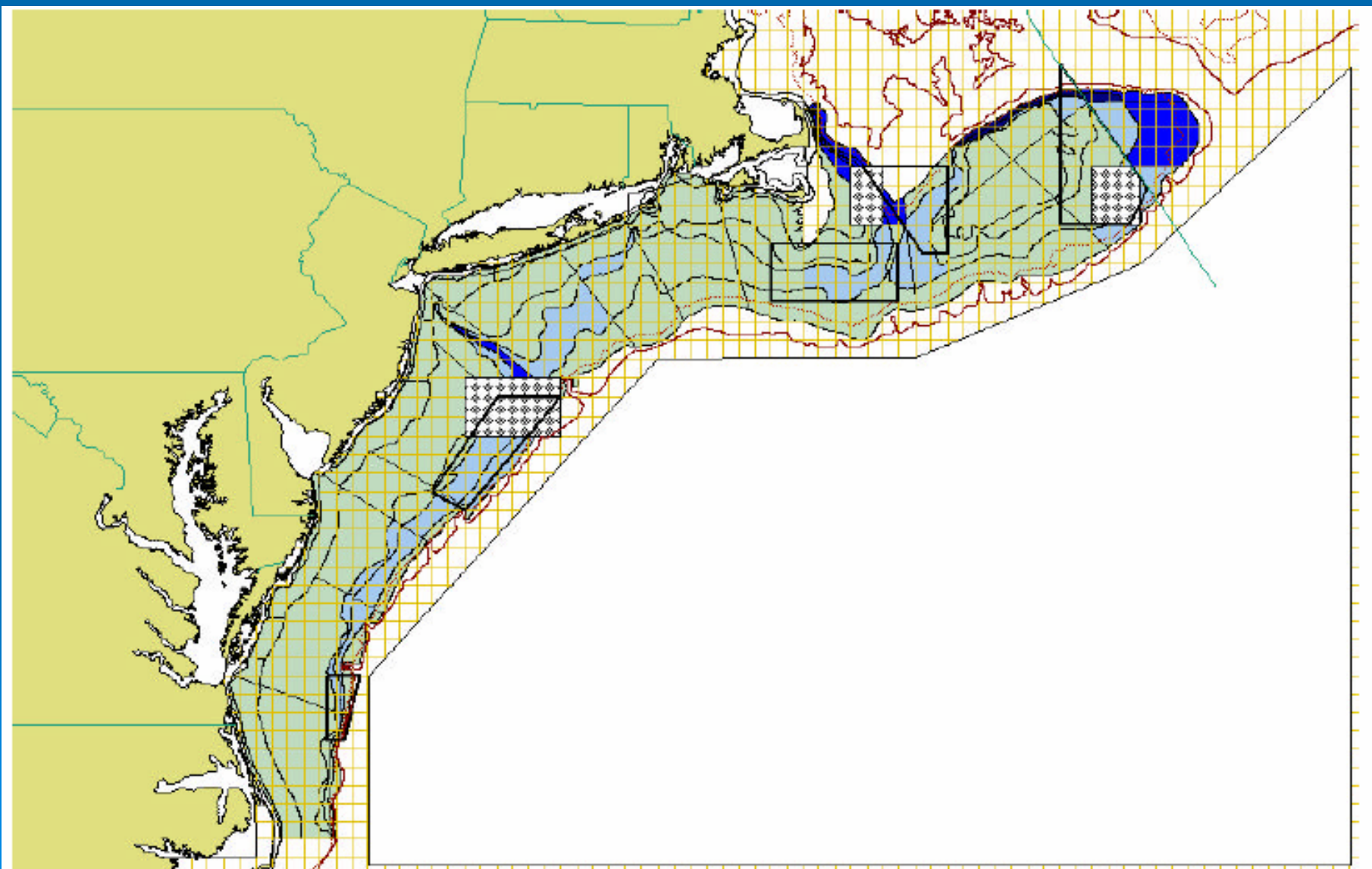
NEMS US/Canada Resource Sharing Understanding area

Habitat Closures

(all mobile,
bottom-
tending
gears)



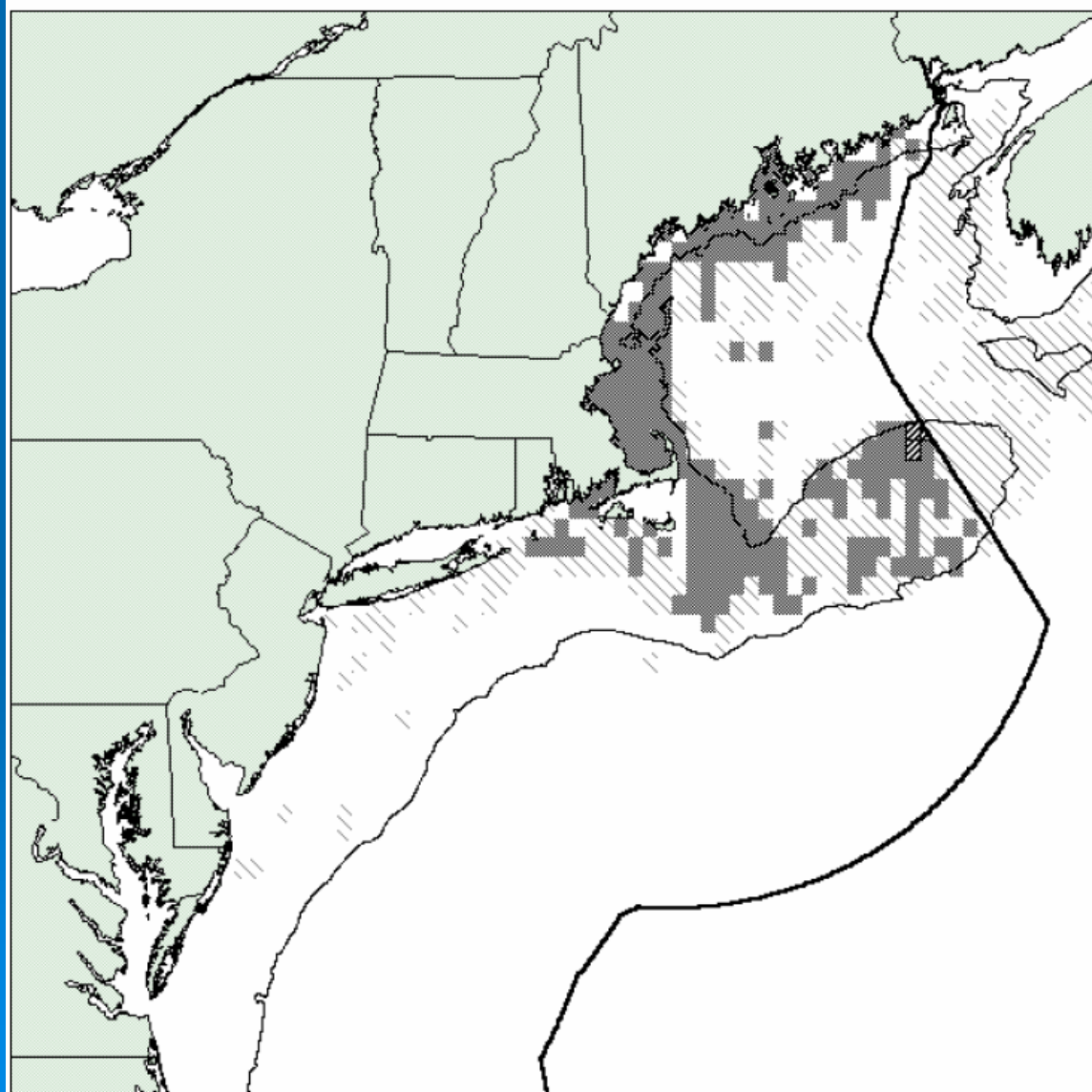
Scallop rotational management areas



Current GIS Applications

- Mapping in management documents
 - Spatial management
 - Impact's analysis
- EFH designation mapping
 - Survey data/abundance at life stage

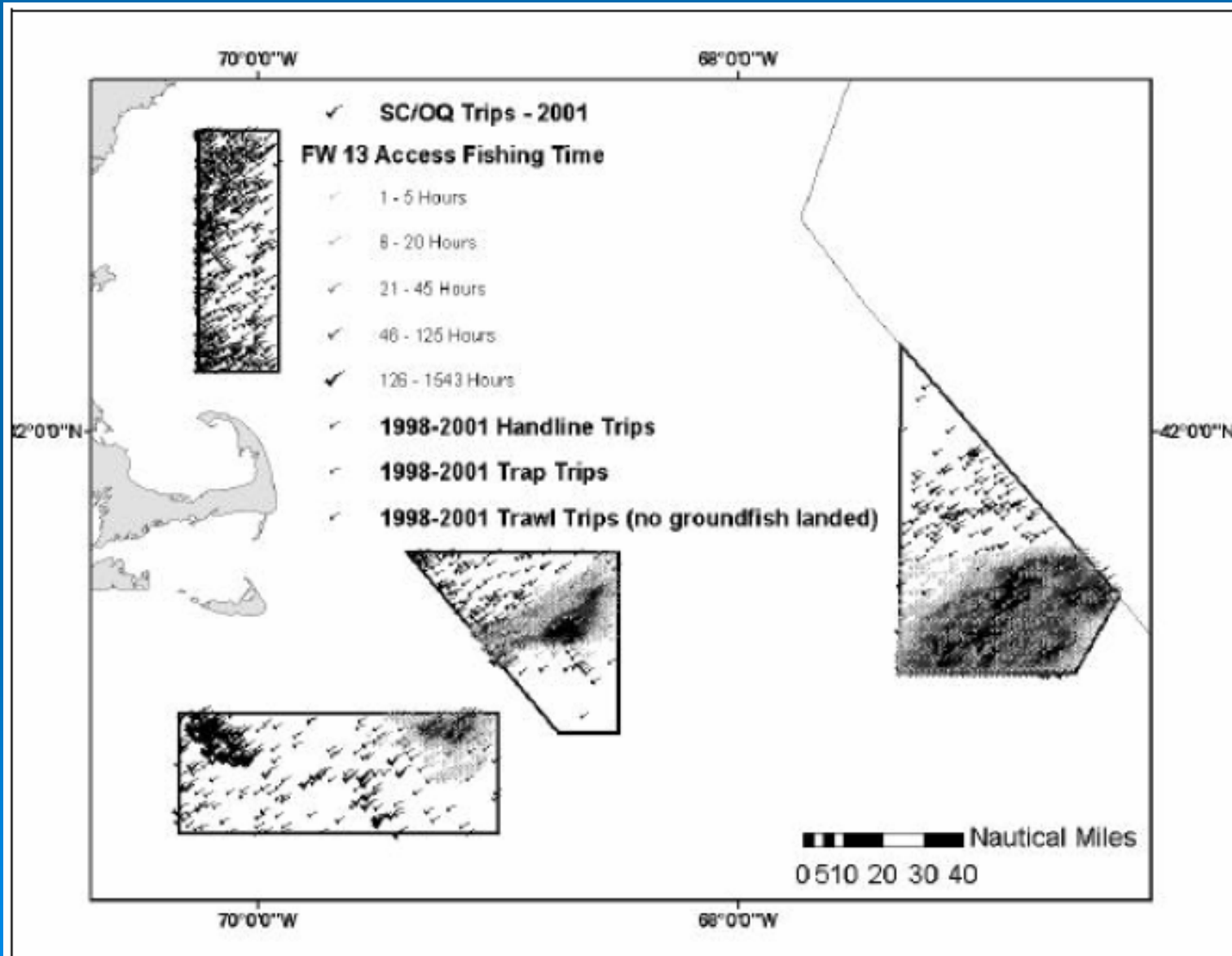
EFH designation Atlantic cod - juveniles



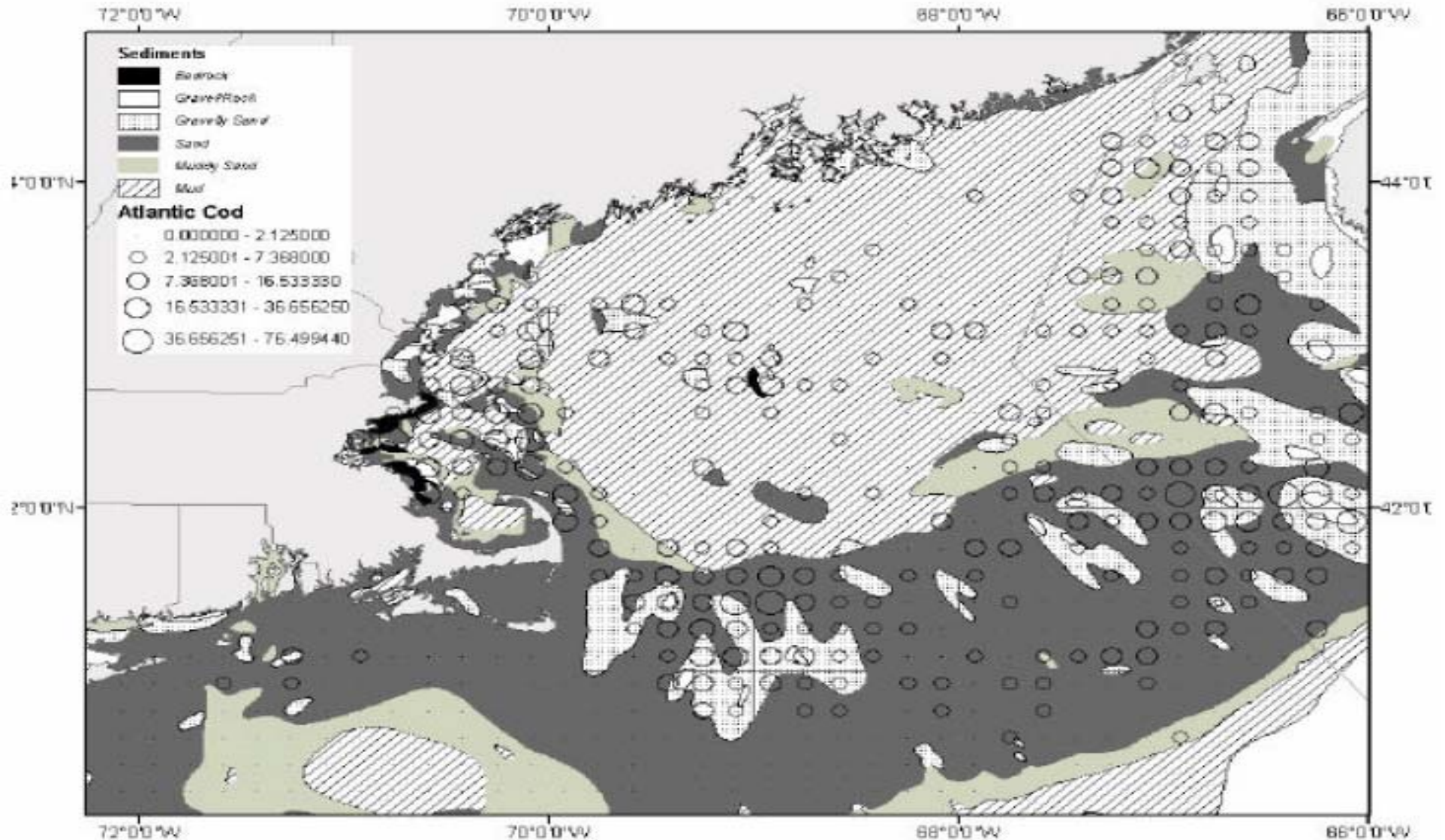
Current GIS Applications (con't)

- EFH adverse impacts minimization
 - Fishing impacts
 - Spatial fishing effort data mapping
 - VTR
 - VMS
 - CG sighting
 - Hangs/snags mapping
 - Assemblage/guild/canary species mapping
 - Surface sediment mapping (Pope *et al.*)
 - Multi-beam mapping (Stellwagon Bank, Jeffries Ledge, GOM)
 - SMAST visual mapping
 - Non-fishing impacts
 - Very limited mapping

Fishing effort data (VTR)



Surficial sedimentation w/ Atlantic cod abundance



Current GIS Applications (con't)

➤ Social Science initiatives

- Coastal communities interactive mapping
 - Fisheries and census data synthesis
- County business patterns
- Input/Output modeling

➤ Network analysis – Atlantic herring

- From fish-in-the-net to market to end-user
- Employment, regional impact, multi-fishery impacts

Current GIS Applications (con't)

➤ Personal use GIS

- JPEG production/display
 - Raw data (VTR, survey, observer)
 - Aggregation (TMS, QDS, Management areas)
- Geographic dataset manipulation
 - From and back into SAS


➤ Council-level users

- Four of eight analysts relatively high-end users
- Primarily mapping for JPEGs and database manipulation
- Very little analysis/modeling

EAF Considerations

1. EAF is not a goal, it's a means to achieving a goal
2. We manage fisherman – extraction is the only variable we directly influence
3. EAF may enhance SS management, not supplant it

EAF data needs

- Species & stock distribution data from scientific surveys
 - Larval, juvenile & adult life stages
 - Spatial presence within water column
 - Benthic habit information
 - Sediment type
 - Depth contours
 - Oceanographic information
 - Current dynamics
 - Salinity
 - Temperature
 - Larval transport
- 

EAF data needs (con't)

➤ Food web

- Geographic / seasonal information on predator-prey interactions
- Location of phyto- and zooplankton blooms (primary production)
- Fisheries catch information
- Fisheries effort information

➤ Designated areas

- Fishery management areas
- Marine Sanctuaries
- Jurisdictional / political boundaries
- Disposal sites
- Shipping lanes
- Valuable cultural sites

EAF data needs (con't)

- Non-fishing activities
 - All fluid discharge sites
 - All watersheds
 - Non-fluid disposal sites
 - Water transportation facilities and patterns
 - Concentrations of non-point source discharge
 - Locations of other activities that affect the marine environment
- Economic /social
 - Location of fishing communities
 - Geographic characterization of economic dependence on fishing activities (including non-consumptive uses)
 - Location of major support infrastructure
 - Market distribution system
 - Areas where stakeholders reside
 - Population areas