New England Recreational Fisheries

Post-release Mortality

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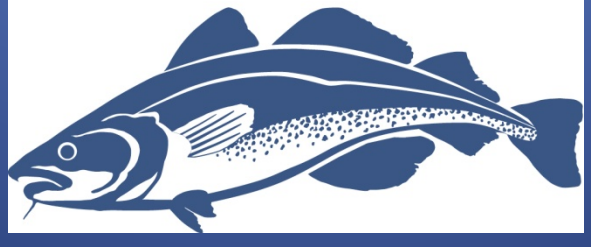
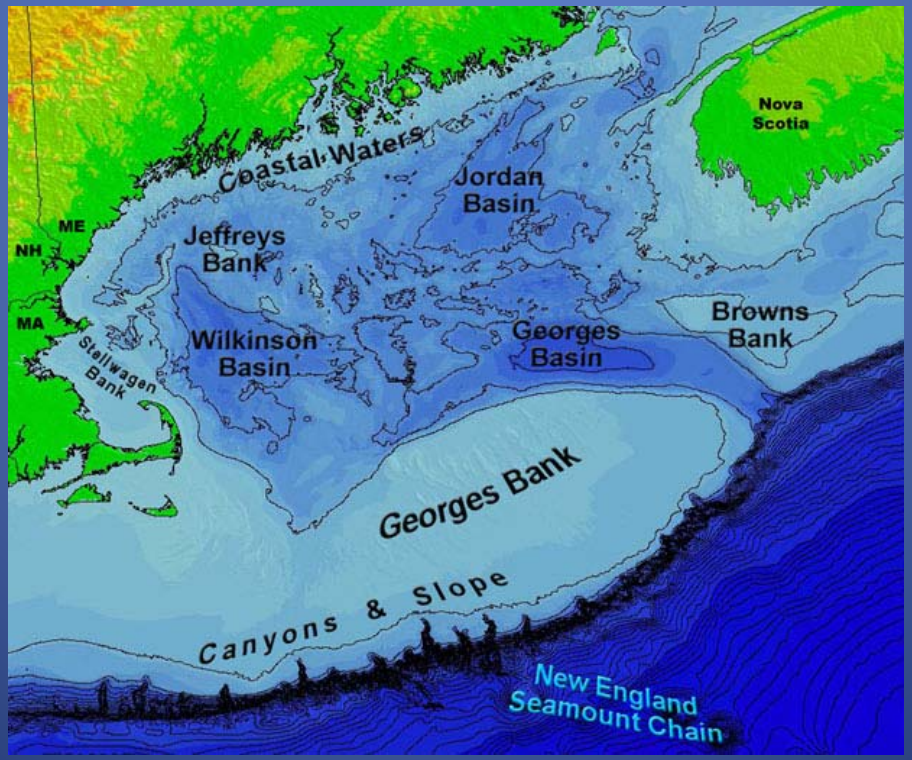


Primary Habitat

- The New England recreational fisheries take place largely in two distinct bio-geographic regions:
  - Gulf of Maine
  - Mid-Atlantic Bight (Northern edge)

The Gulf of Maine

- Characterized by colder deeper waters
- More plentiful high relief bottom features – glaciated coastline
  - Maine – Backside of Cape Cod

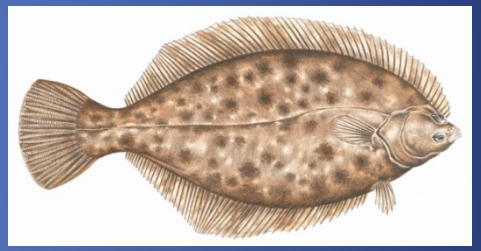


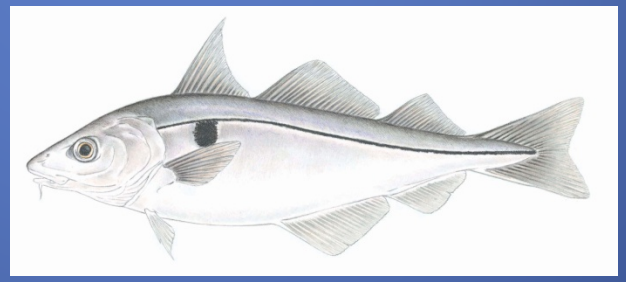
The Mid-Atlantic Bight

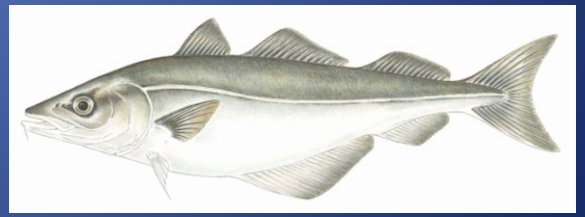
- Characterized by shallower warmer waters
- Less abundant high relief bottom features - deposition of glacial till and outwash and river system sediments through Long Island

Distinct Regional Fisheries

- Gulf of Maine = northern groundfish
- Managed under Northeast Multispecies
- Several other species (cusk, wolffish)

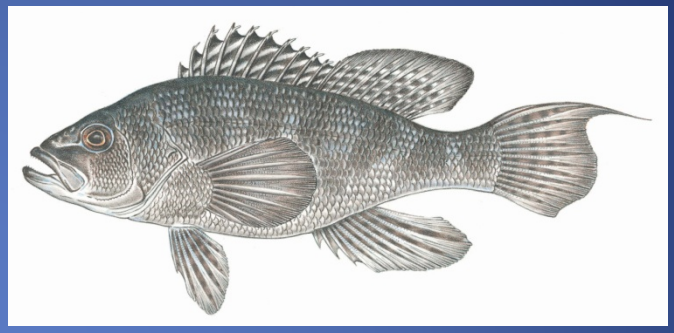


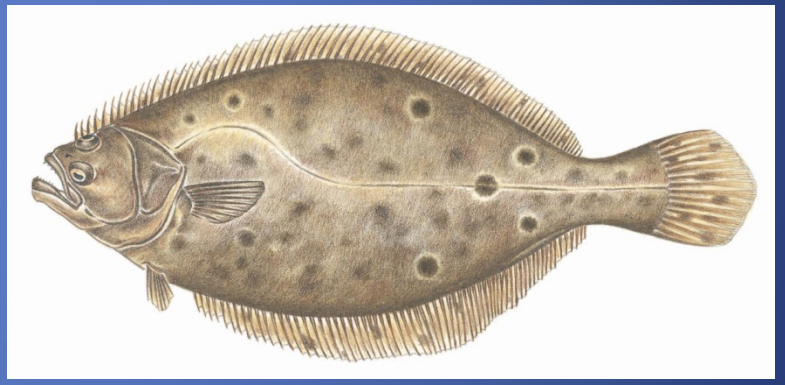


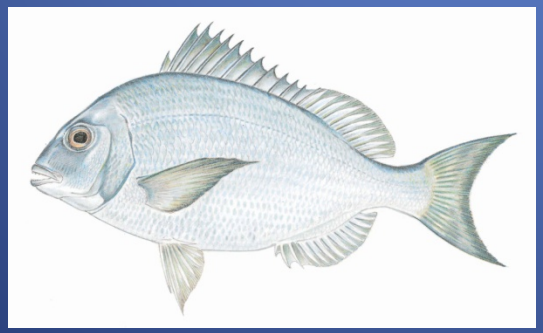


Distinct Regional Fisheries

- Mid Atlantic Bight
- Southern groundfish species = summer flounder, scup, black sea bass, tautog







Contiguous Species

- Striped bass, bluefish
- Pelagics
  - Bluefin tuna
  - Bonito
  - Little tunny

Recreational Release Mortalities Used in Recent Assessments

Species	Rec Release Mortality (%)
Tautog	2.5%
Striped Bass	9%
Summer Flounder	10%
Scup	15%
Bluefish	15%
Winter Flounder	15%
Black Sea Bass	25%
Atlantic Cod	30%
Pollock	100%
Haddock	100%
Acadian redfish	100%
Cusk	100%

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Atlantic Cod	?
Pollock	?
Haddock	?
Acadian redfish	?
Cusk	?

Regional Release Concerns

- Southern New England/Mid-Atlantic
  - Hook wounds/infection
  - Handling time
  - Thermal shock
  - Predation
- Gulf of Maine
  - Barotrauma
  - Thermal shock
  - Hook wounds/infection
  - Handling time
  - Predation

Data Poor Areas

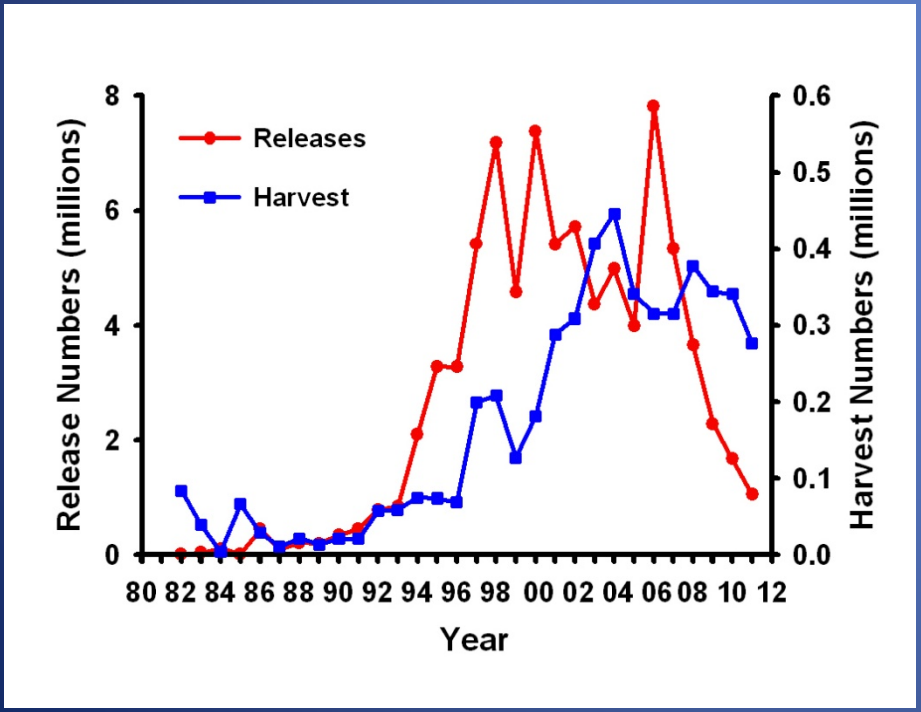
- Recreational release mortality in Northeast multispecies (groundfish) fishery

- Atlantic cod
- Haddock
- Pollock
- Acadian redfish
- Cusk

Striped Bass

- Largest recreational fishery in Massachusetts
- 1,346,773 fish landed in 2012*
- 967,056 fish released = 71.8% of total catch*
- 9% recreational release mortality = 87,035 dead fish*

* = preliminary MRIP data



Pollock

- Fishery very healthy and not overfished and no overfishing occuring
- 257,580 fish caught in 2012 in MA*
- 168,749 released*
- Assessment places 100% mortality on released fish
- Targeted when cod fishery closes
- No bag limit

Photo by Reel Deal Charters

Haddock

- Stock is not overfished but overfishing is occurring
- 120,046 recreational fish caught in MA in 2012*
- 54,462 released*
- Managers recently decided on increasing minimum size

Photo by NH Fish and Game

Acadian Redfish

- Not overfished and overfishing not occurring
- Extremely susceptible to barotrama
- Slow-growing and long lived
- Median age at maturity of 5.5 years for both males and females
- 16,424 fish caught in MA in 2012*
- 5,364 fish released*
- Potential target as other species decline

Photo by Tim Tower

Cusk

- No recreational size or bag limit in GOM
- All fish exhibit significant barotrauma
- Increased pressure due to lack of other species
- 17,842 fish caught in MA in 2012*
- 5,897 fish released*
- Another species that is targeted when others decline

Photo by Islander Private Charters

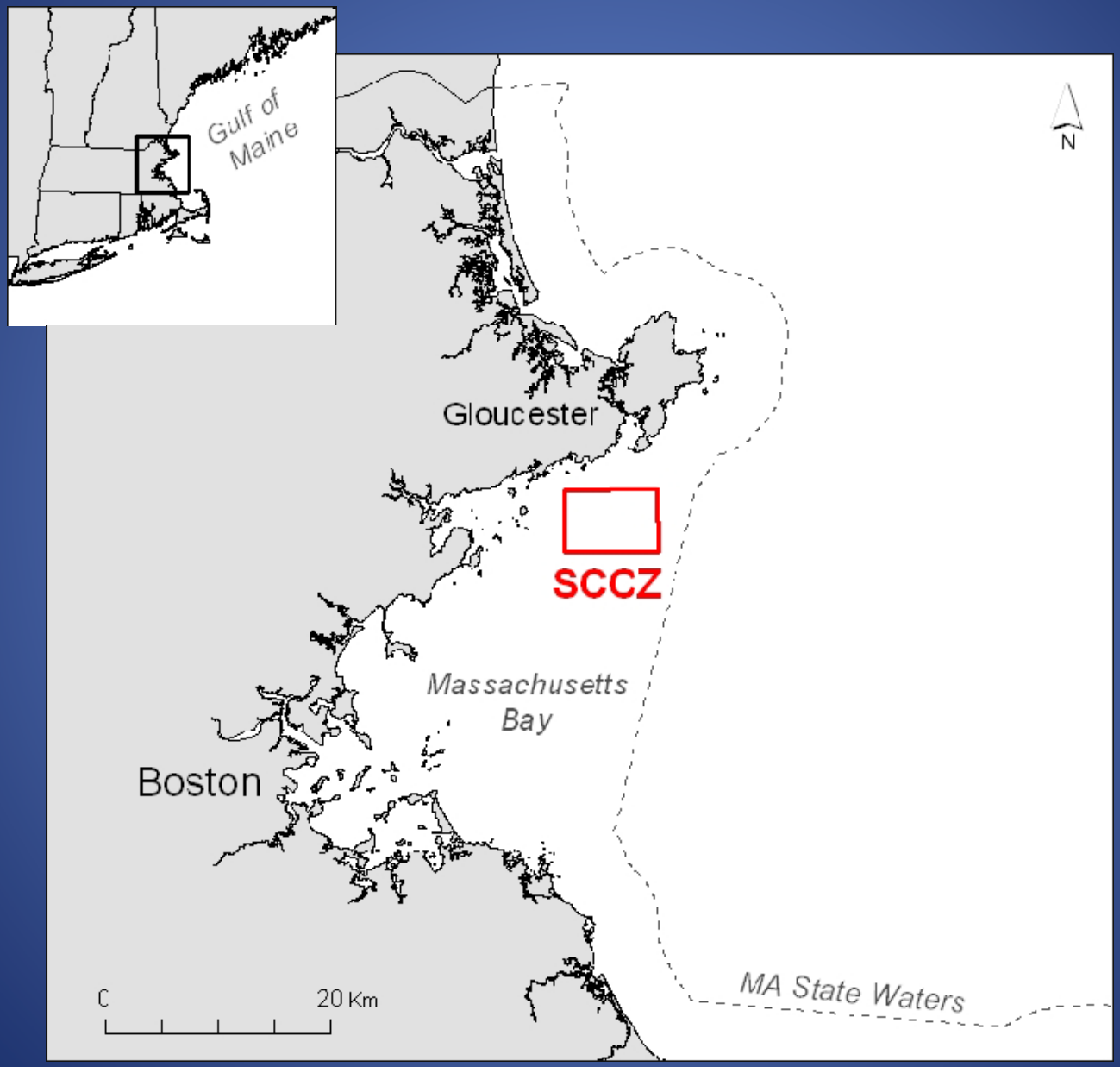
Atlantic Cod

- Stock is overfished and overfishing is occuring
- 26% cut to the quota in 2012
- 77% cut to the quota in 2013
- 374,108 fish caught in MA in 2012*
- 194,131 fish released = 51.9% released*
- 100% recreational release mortality was used for the assessment

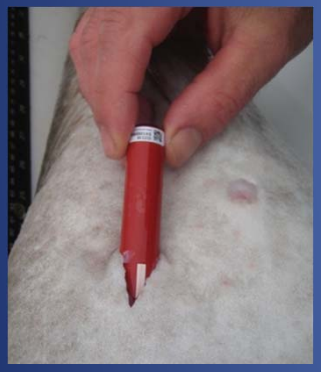
Need a Better Number

- Previous cod release studies used cages to return fish to depth
  - Alter natural behavior
  - Reduce predation
  - Eliminate ability to regulate buoyancy
- Mortality numbers not used
- MADMF Examined recent and ongoing research
- Current research was not originally designed to examine release mortality

Study Area


Gulf of Maine
N
Gloucester
SCCZ
Massachusetts Bay
Boston
0
20 Km
MA State Waters

Tagging Work



- Tagging study of behavior and movements of a spawning aggregation in Mass Bay
- 2000+ cod have been tagged & released since 2009
  - T-bars, DSTs, acoustic tags
- “release condition” of each fish was noted:
  - 1 = vigorous; 2 = injured; 3 = dead

Total Recreational Discard Mortality Rate

All Sizes

Release condition	Number of Fish	Percent of Catch	Mortality Rate
1 (uninjured)	1842	87.4%	5.1%
2 (injured)	134	6.4%	94.8%
3 (dead)	131	6.2%	100.0%
Total	2107	100.0%	16.7%

< 24“

Release condition	Number of Fish	Percent of Catch	Mortality Rate
1 (uninjured)	378	85.0%	5.1%
2 (injured)	24	5.4%	95.8%
3 (dead)	43	9.6%	100.0%
Total	445	100.0%	19.0%

Factors biasing mortality estimate upward

- All Fish
  - livewell confinement
  - spawning stress
- Injured Fish
  - 100% reporting rate
  - 0% tag shedding rate
- Uninjured Fish
  - stress from surgery

Factors biasing mortality estimate downward

- All Fish
  - Reeled in slowly, handled with care
  - Jigs only, no swallowed hooks
- Uninjured Fish
  - All acoustic tagged fish were >24” in length

New Cod Release Mortality Study

Bill Hoffman
Micah Dean

Dr. John Mandelman

Dr. James Sulikowski
Connor Capizzano

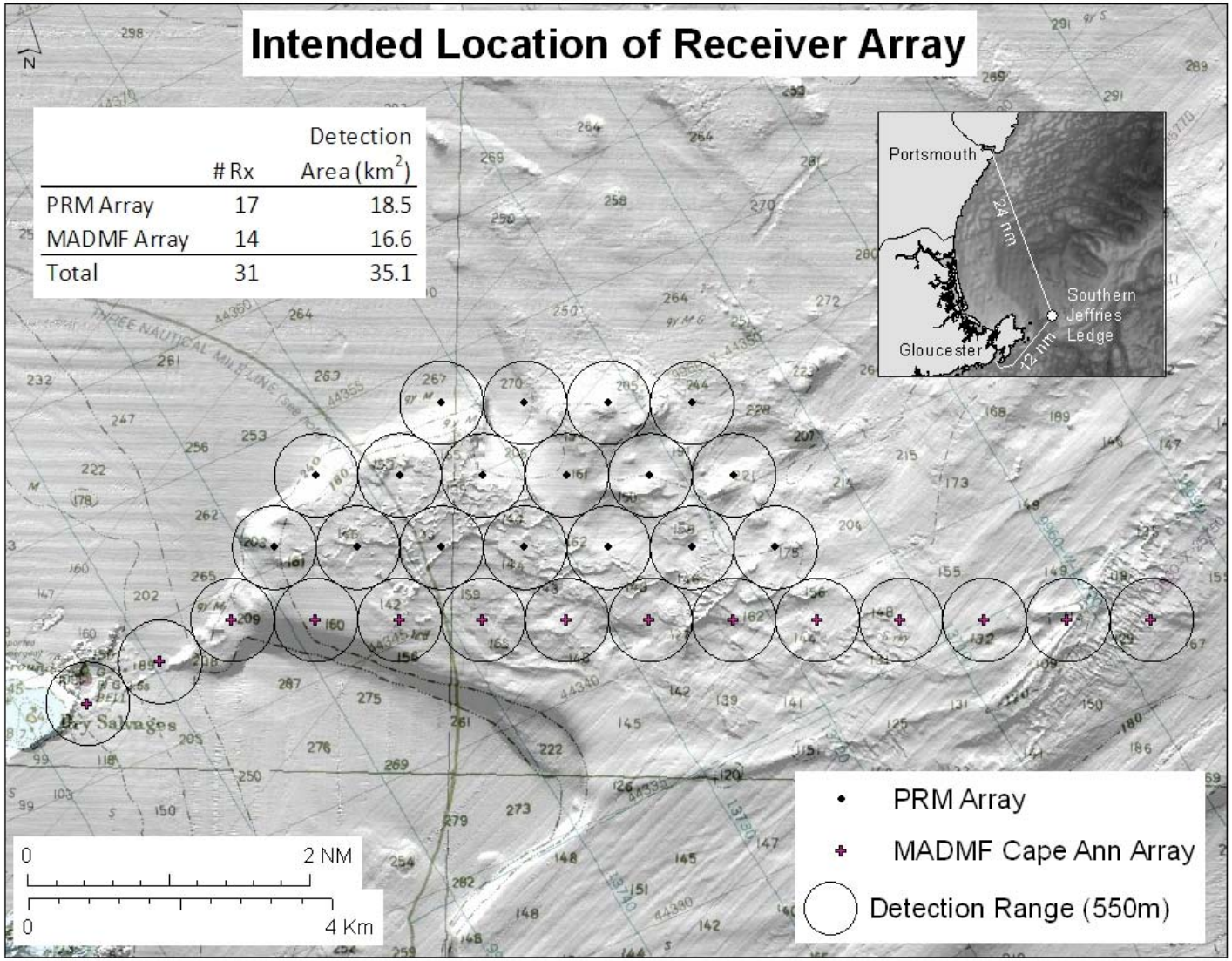
Doug Zemekis

Mike Palmer

New Cod Release Mortality Study

- Study focused on tagging sub-legal size fish
- Multiple depths will be used
- Sampling will be during peak fishing activity months
- Most common gear types will be used
  - J-hooks with bait
  - Jigs with teasers
- Anglers of varying ability/skill level will be used
- Goal is to come up with a recreational release mortality statistic that will used by assessment biologists

New Cod Release Mortality Study



Where Are We?

- Substantially more work has been completed on the Mid-Atlantic/Southern New England species

- Species more common to the GOM (primarily groundfish) have many gaps in release mortality data