

Management and Recovery of U.S. Federal Sea Scallop Fishery

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Sea scallops have undergone a remarkable recovery from an overfished state in the mid-1990s

1998: Landings of 12 million lbs, worth \$76 million

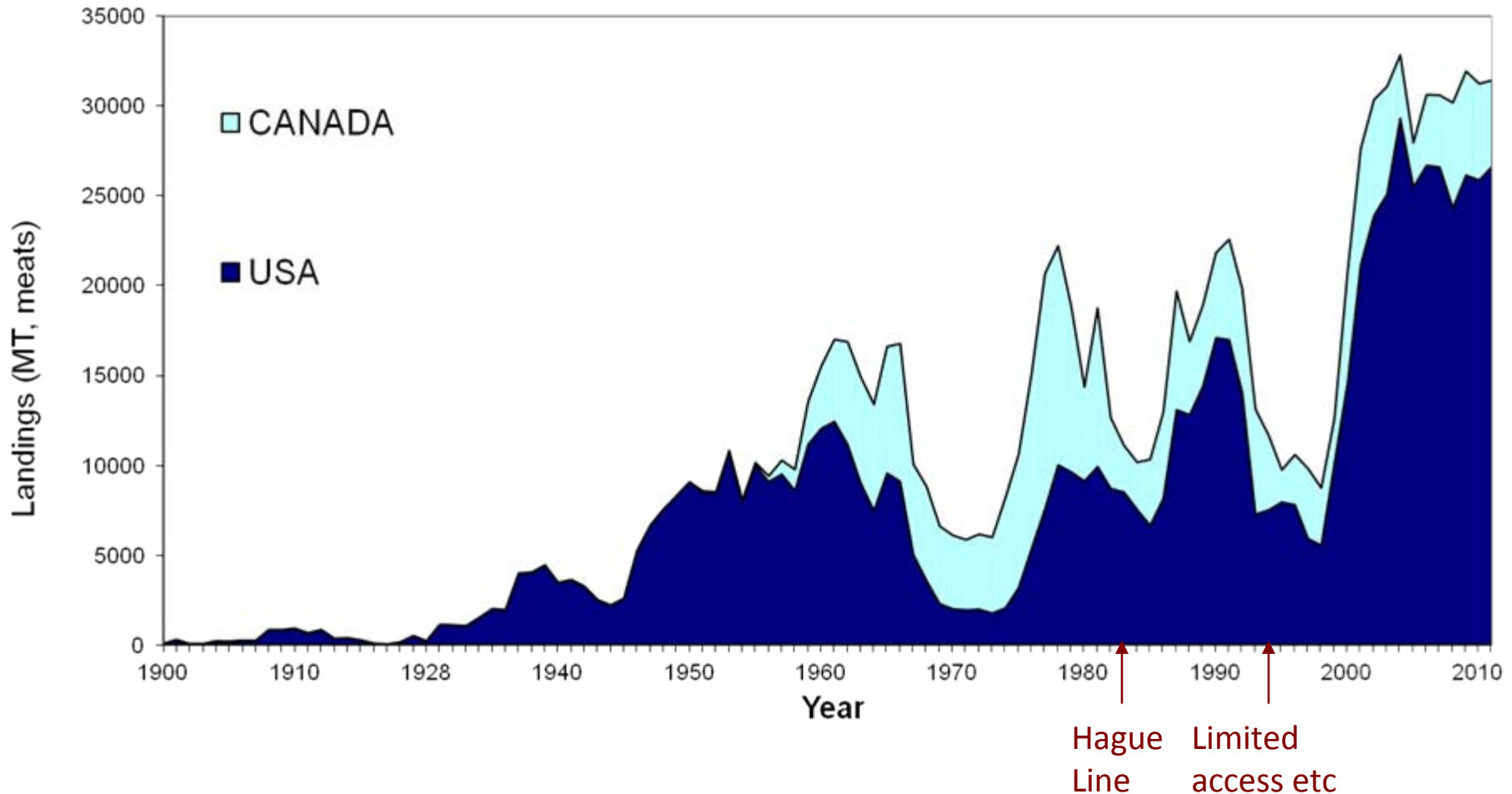
2011: Landings of 58 million lbs, worth \$579 million

Sea scallops are now the most valuable fishery in the US

How did this happen and what can we learn from this?

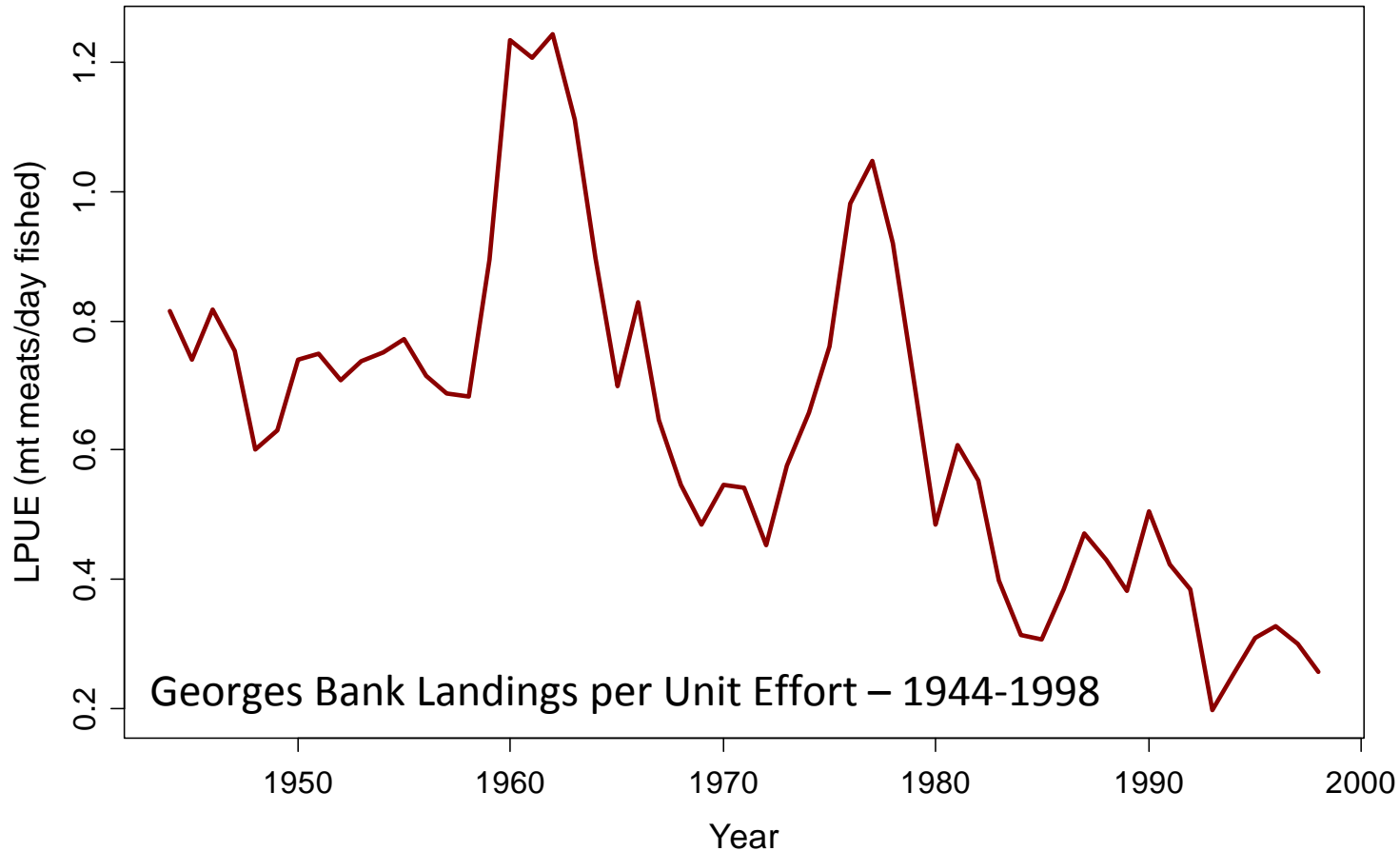
Sea scallop landings

North Carolina to Maine, including Georges Bank



Landings from 1960-2000 show “bust and boom” cycles.
Landings prior to 2001 all less than 40 million lbs.
Landings after 2001 all greater than 50 million lbs.

Catch per day fished (approximately proportion to exploitable biomass) Georges Bank, 1944-1998



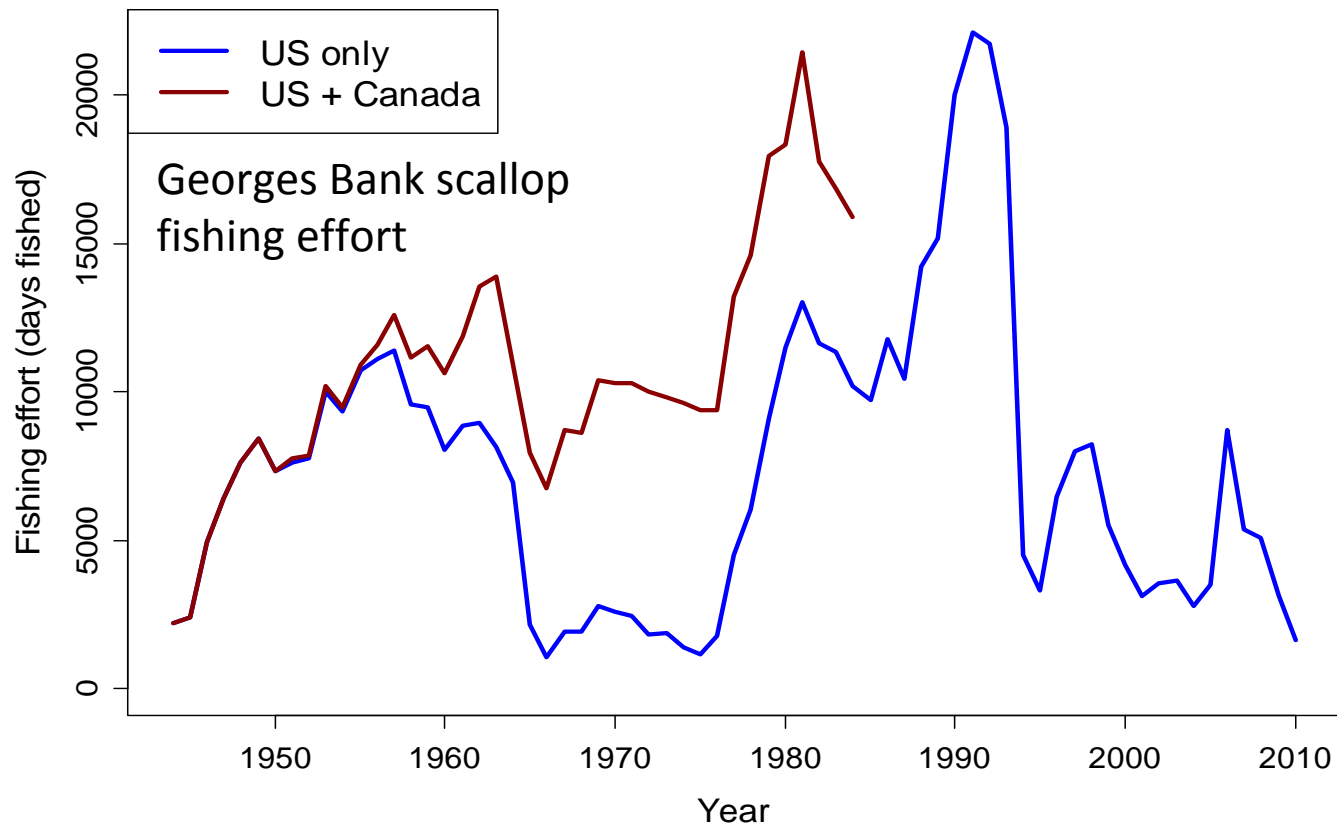
Long-term decline in catch rates due to “ratcheting-up” of fishing effort

Federal fishery was “open access” until 1994

Managed by minimum meat count regulation only (1982-1994)

Large year classes temporarily increase catch rates, but also encourage new entrants into the fishery and more effort from existing vessels

Fishing effort peaked in early 1990s – fishery collapsed in 1994



Changes to management in 1994

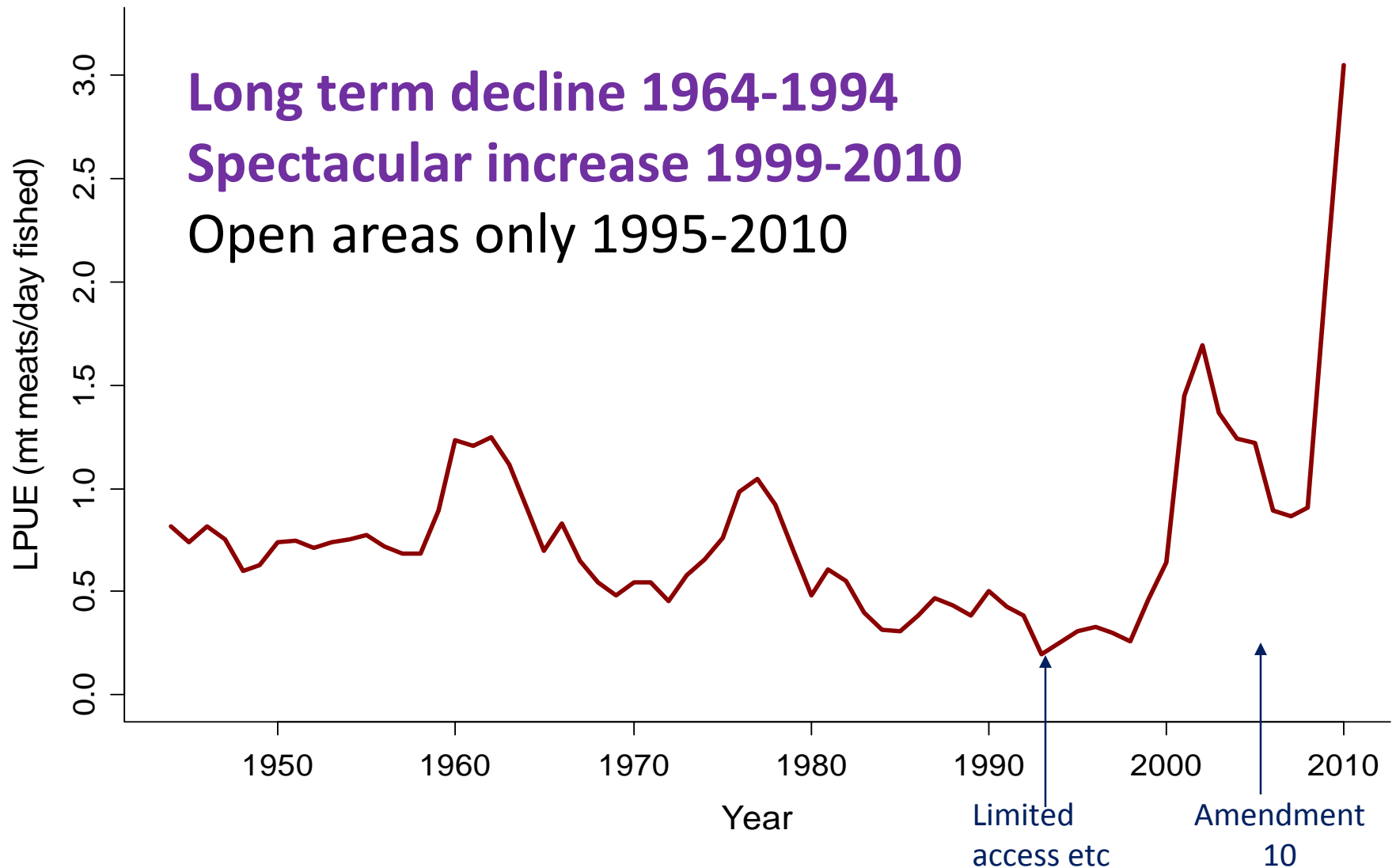
Fishery changed from open access to limited access, where vessels that had a history of fishing for scallops were given permits, but no new permits have been issued. Each permitted vessel was given a fixed number of days to fish.

Meat count regulation replaced with gear restrictions, that gradually increased ring size from 3" in 1994 to 4" in 2004

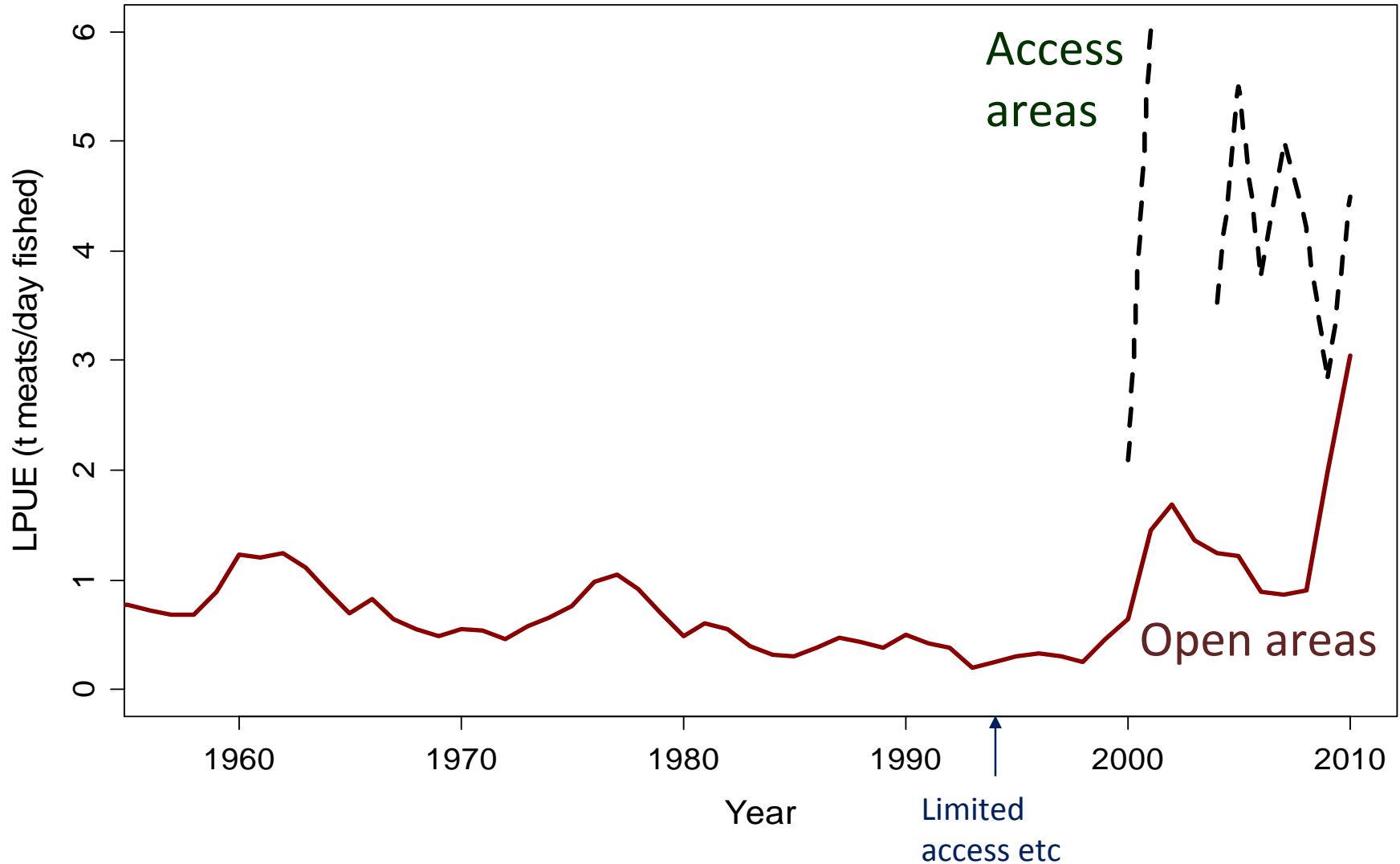
Crew size on vessels was restricted, usually to 7 men

Three large areas on or near Georges Bank were closed indefinitely to fishing to help rebuild groundfish and scallops

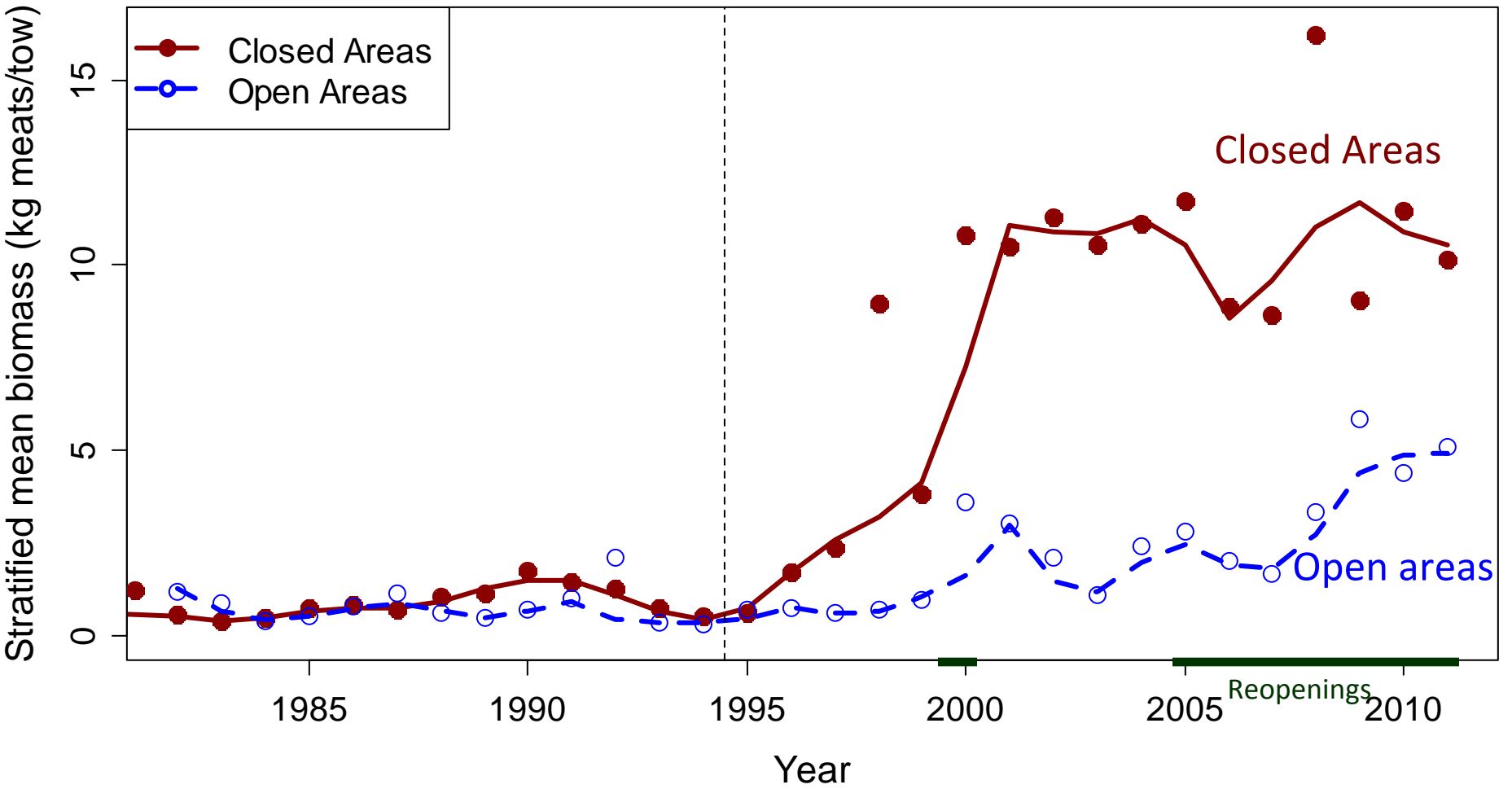
Catch per day fished (approximately proportion to exploitable biomass) U.S. Georges Bank, 1944-2010



Georges Bank fishery catch rates, included reopened "access areas"



Closed and open area biomass on Georges Bank from NEFSC sea scallop survey



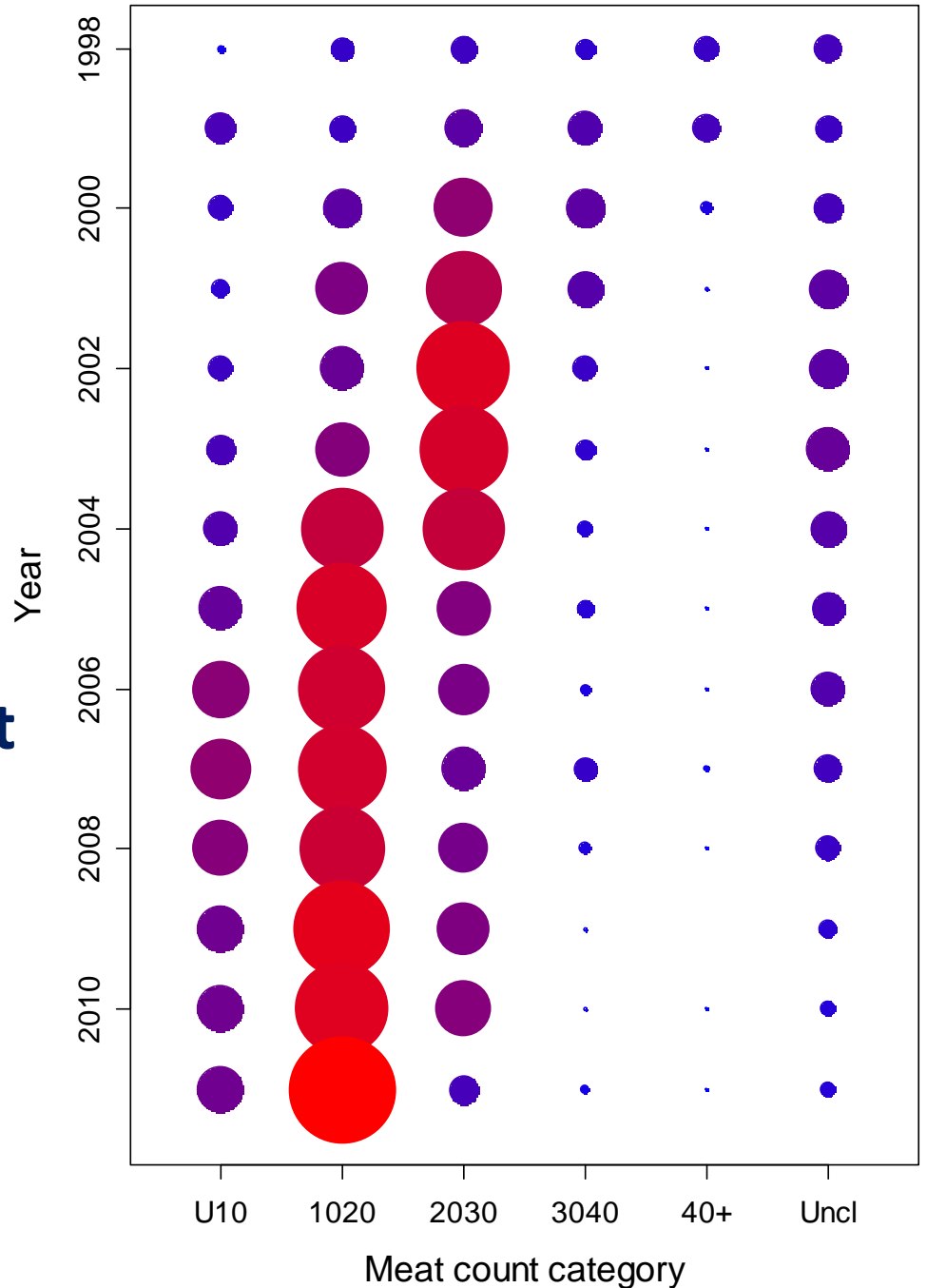
NEFSC Sea Scallop Survey

Northern edge, Closed Area II



Effort restrictions, increases in ring size and rotational access to closed areas worked together to roughly double the size of a typical landed scallop meat

Much of the increased landings is due to this effect

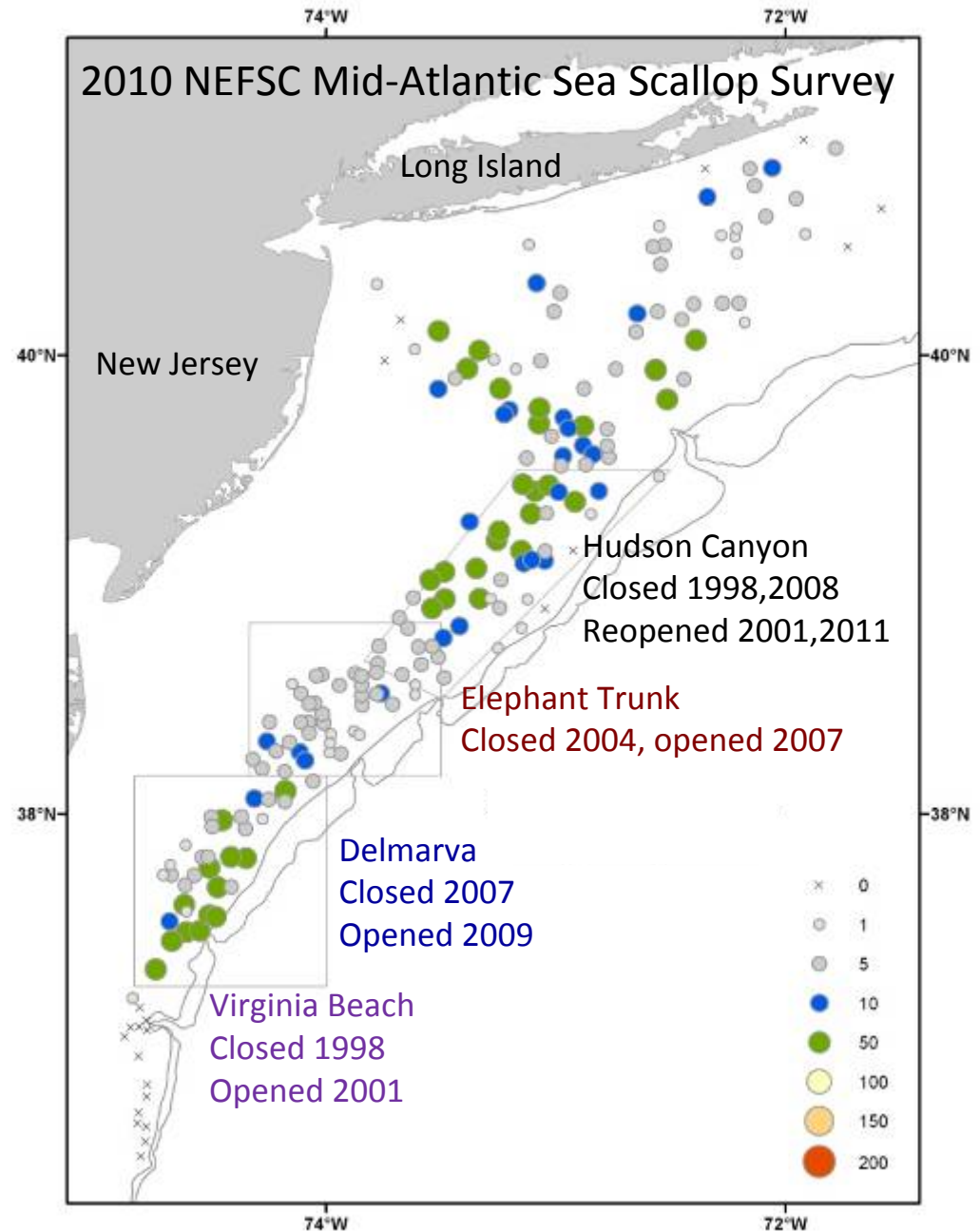


Adaptive rotational management for Mid-Atlantic sea scallops began in 1998

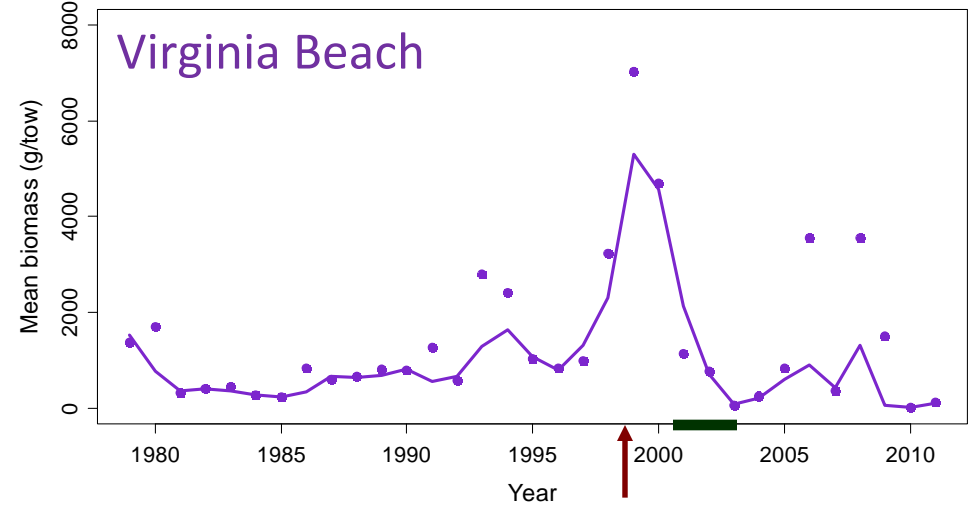
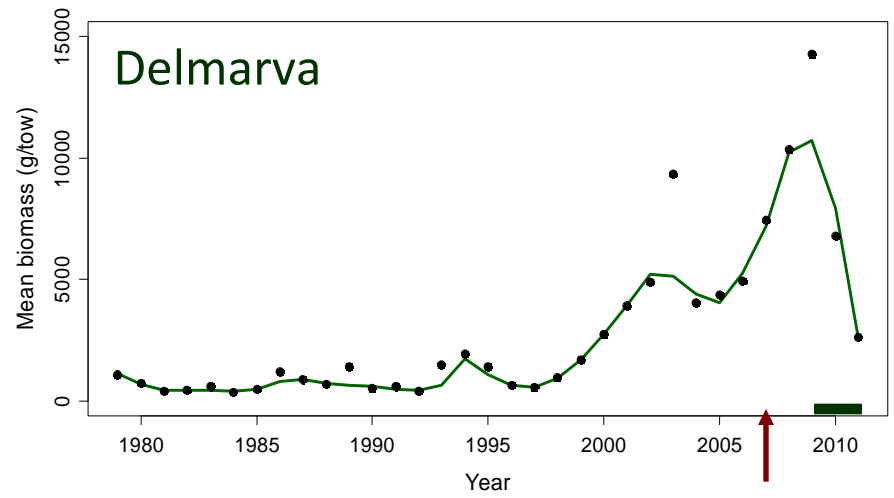
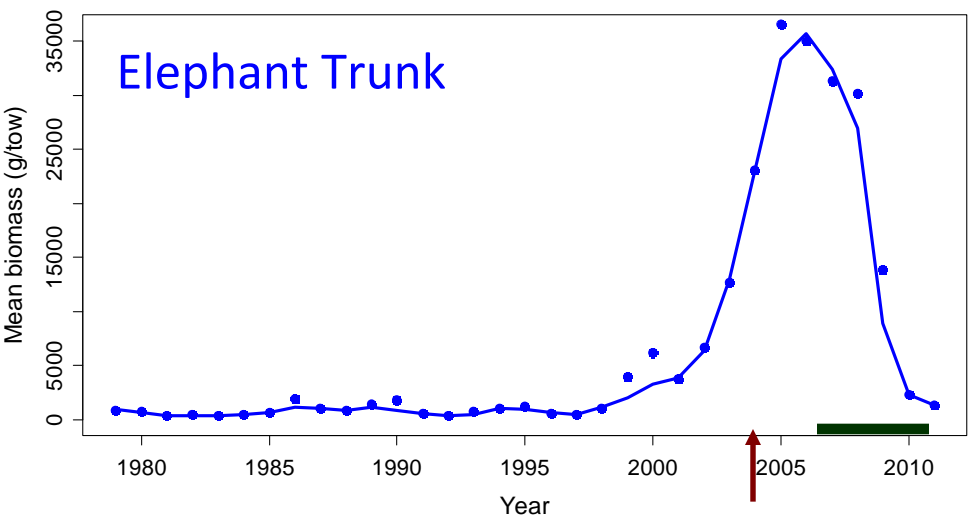
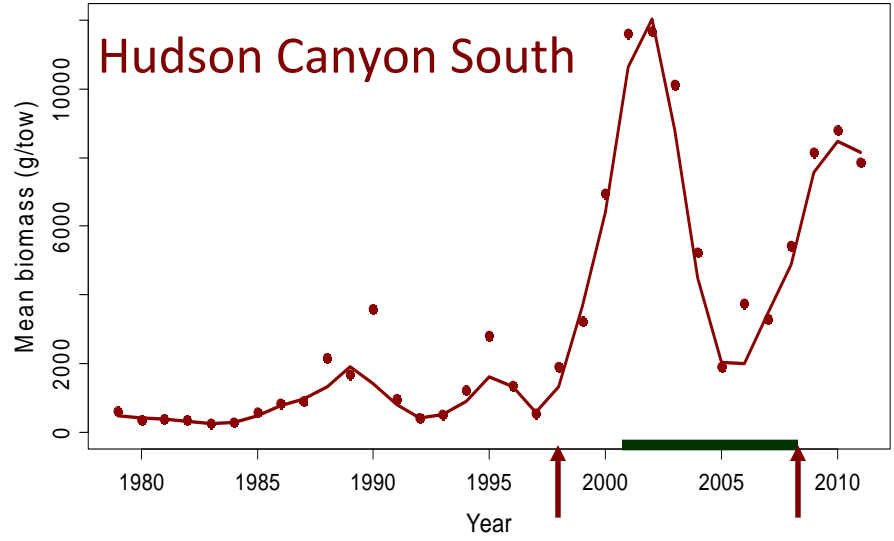
Areas were closed for 2-3 years when high densities of small “seed” scallops were detected in an area, in order to allow the seed to grow to a larger size before harvesting

For the first several years after reopening, fishing access to the area is limited, so not to deplete the area too soon

There have been four rotational closures in the Mid-Atlantic area
Hudson Canyon South,
Elephant Trunk,
Delmarva,
Virginia Beach

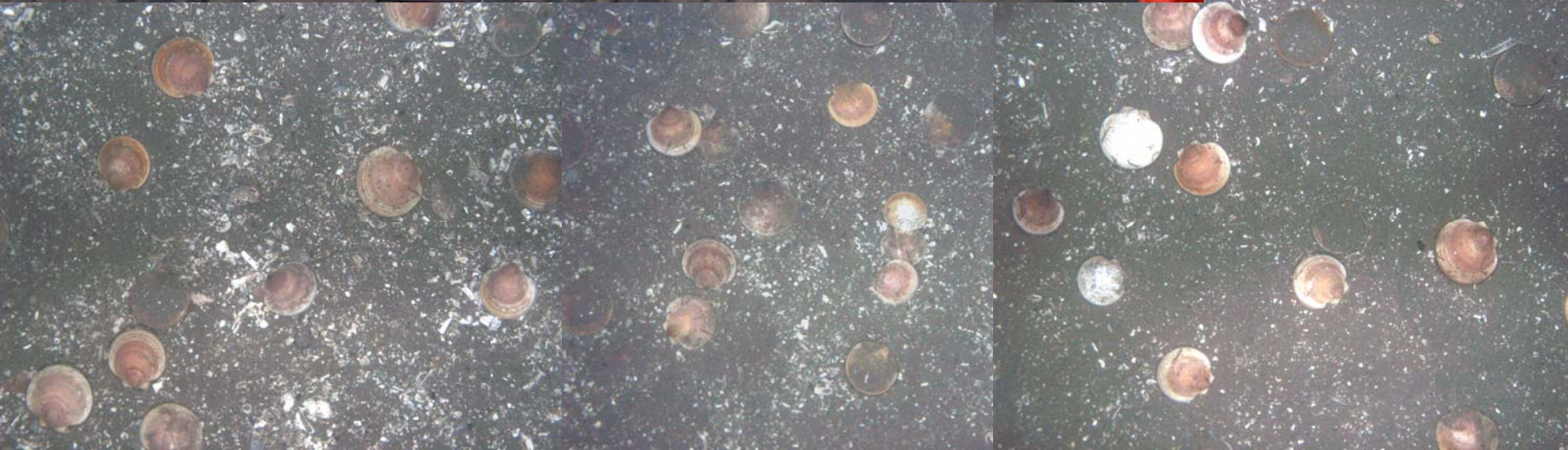


Rotational area biomass in Mid-Atlantic





Dredge
catch and
underwater
Habcam
photos in
the Elephant
Trunk
Access Area,
2007



Conclusions - What doesn't work

Open access encourages new effort when fishing is good, resulting in overfishing – taking scallops before they can grow to the best sizes for harvesting, and possibly reducing recruitment

Mean meat count regulations insufficient to prevent overfishing and loss of potential yield

Conclusions - What does work

Limited access prevents increases in effort when there are large year classes, and hence overfishing

Ring size regulations help prevent catching small scallops

Rotational closures allow scallops to grow to full size before harvesting

All these measures are effective, but work better together

Recovery from overfishing takes several years – federal fishery first showed signs of recovery in 1996 (closed areas) and 1999 (open areas) - fully rebuilt in 2001

THE END?

