



Climate Economics & Governance: The Long & Short of It



**NOAA
FISHERIES**

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With support from:

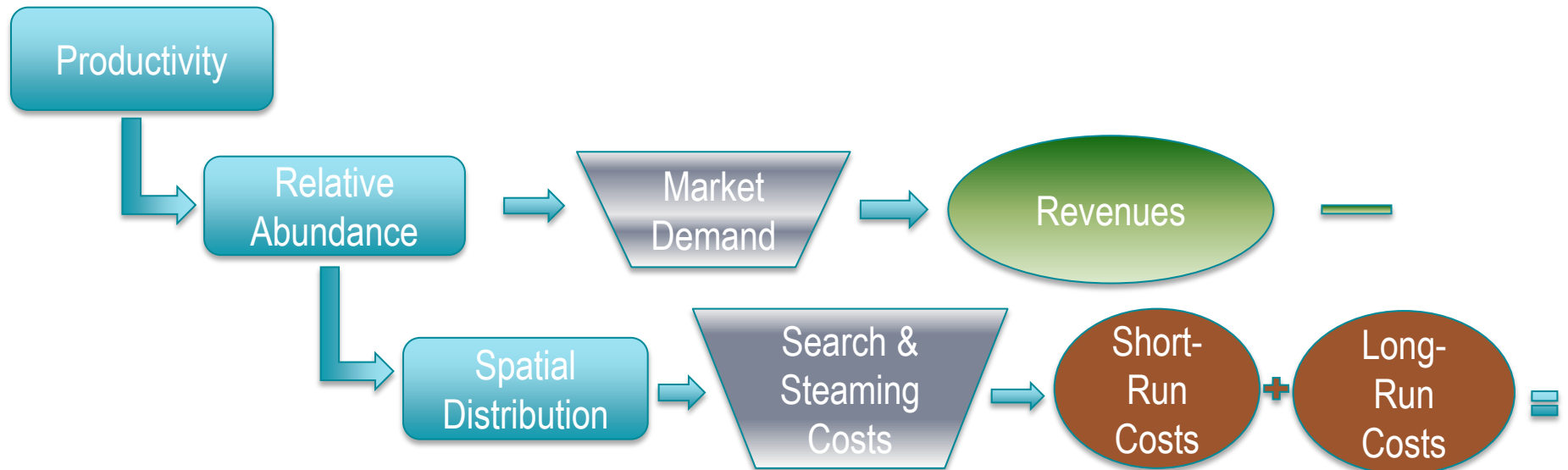
**Geret DePiper
Kate Farrow**

March 19, 2014

Outline of Presentation

- Economic Perspective
- Data
- Metrics
- Models
 - Short Run
 - FishSet toolbox
 - Long Run

What Matters Economically

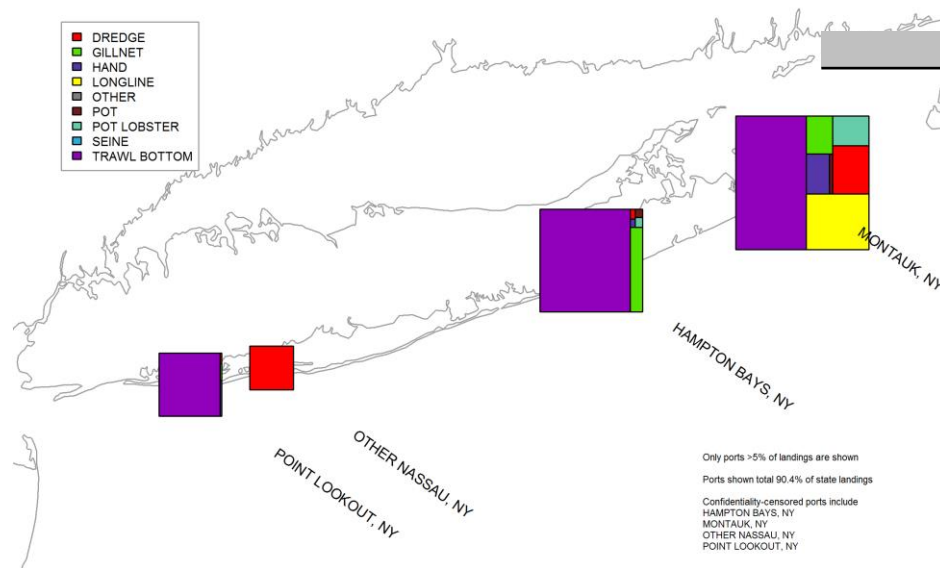


An Adapted Fishery

Data Example: Species, Gear, Port New York State

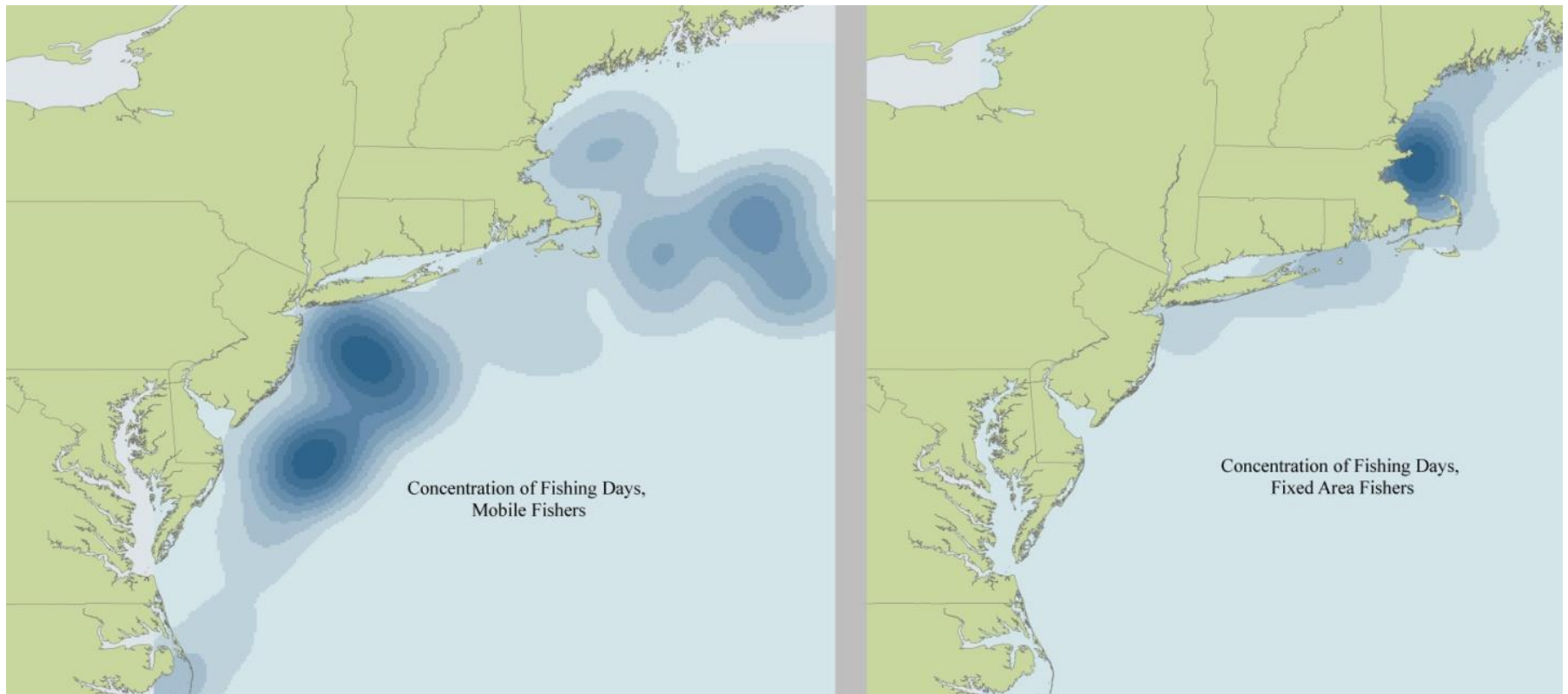
	2011 (thousands of dollars)
Total Landings Revenue	37,625
American lobster	1,398
Atlantic surf clam	ND
Eastern oyster	ND
Summer flounder	3,715
Loligo squid	7,249
Quahog clam	ND
Scup or porgies	2,549
Sea scallop	4,961
Softshell clam	ND
Tilefishes	4,525

Revenue by Gear
New York 2007-2012



Individual Fishing Data Informs Fleet Dynamics

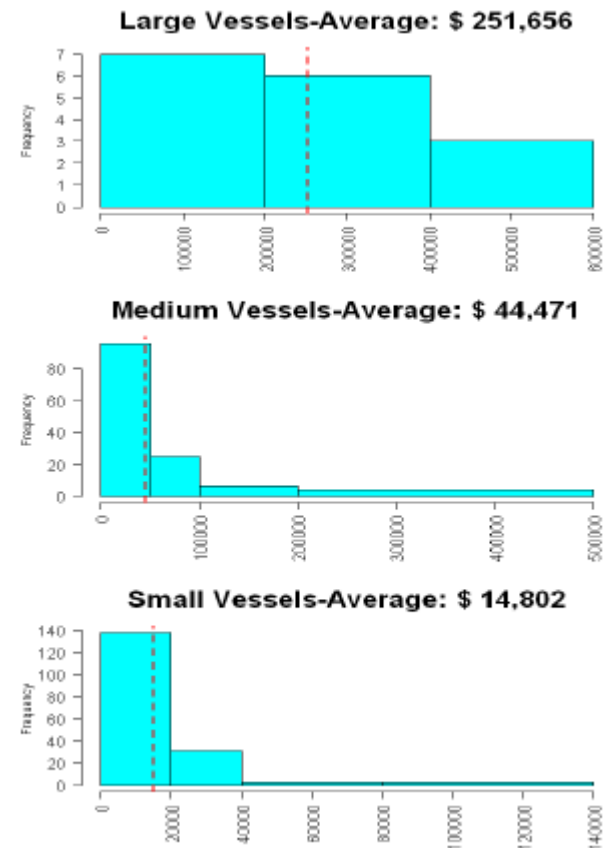
- Fixed vs. Mobile
 - Olson (2011)



Economic Data Collection

- Vessel fishing cost surveys
- Crew and Owners surveys

Fishing Business Costs





FishSET

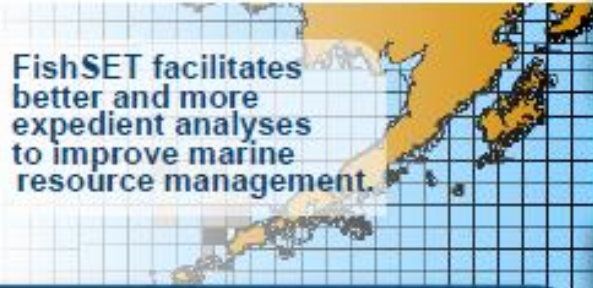
Spatial Economics Toolbox for Fisheries

FishSET's goal is to enable NOAA Fisheries economists and social scientists to better inform policy decisions by predicting how a variety of factors might influence fisher behavior.

Many modeling challenges exist. While predictive models are valuable tools for sustainable fisheries management and conservation, challenges to their development include preparing, integrating & updating many data sources, choosing appropriate models, and interpreting results.

FishSET provides:

1. **Superior data organization, analysis, and integration** for spatial models.
2. **Best management practices** for data, modeling, and model comparison.
3. **Many models in a single toolbox** for ease of model comparison and use. Combines several fisheries economics modeling approaches in one toolbox.



FishSET facilitates better and more expedient analyses to improve marine resource management.



What tools are in the FishSET toolbox?

Data Tools

Data Management & Integration Tool

Facilitates the development and integration of datasets for spatial modeling

Monte Carlo Tool

Simulates real fisheries data while preserving confidentiality, allowing better model testing and comparison.

Data Analysis & Mapping Tool

Enables graphical and geographic data viewing and prepares data for spatial modeling



Model Tools

Model Design & Selection Tool

Enables modeling of different combinations of variables and models

Modeling Tool

Runs standard, cutting-edge, and user-designed models

Model Comparison & Reporting Tool

Provides an extensive comparison of model performance and summarizes data, models, and results



Policy Tools

Policy Simulation Tool

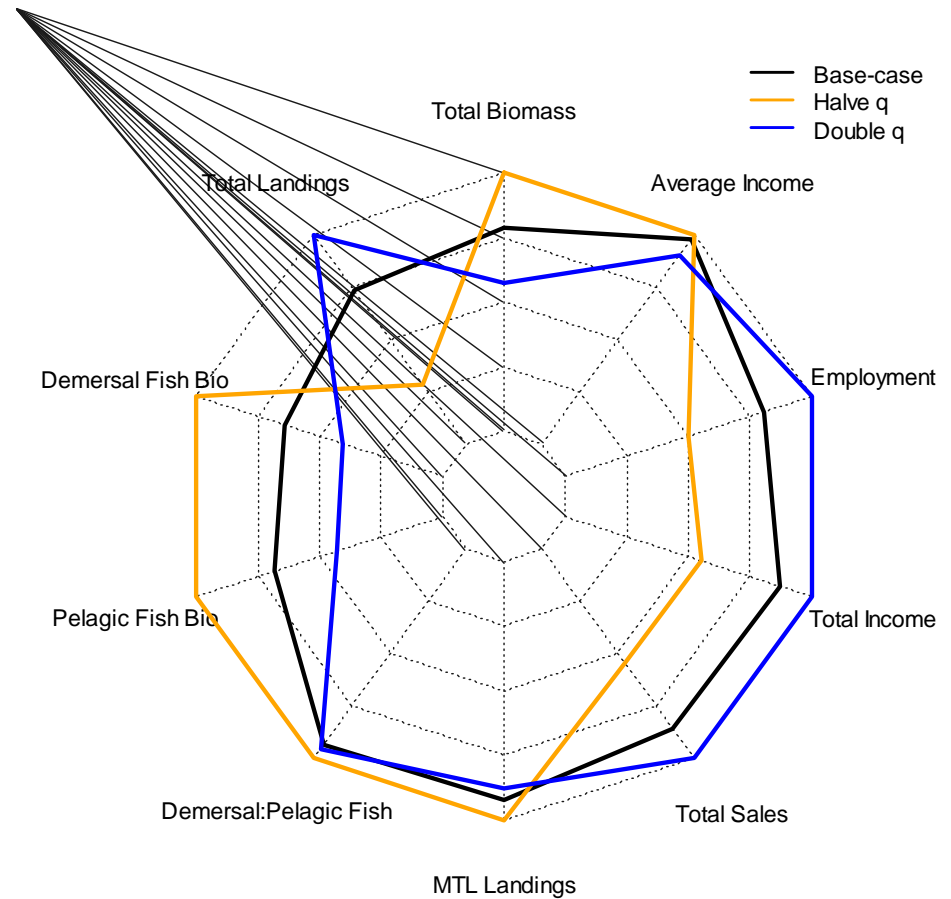
Predicts location choices and estimates policy impacts



To learn more, visit
www.st.nmfs.noaa.gov/humandimensions/fishset/index

Coupled Ecosystem and Economic Models

- Atlantis – Input/Output



LONGER TERM FLEET DYNAMICS



Long Term Dynamics: Challenges

- Current data and analyses designed to model fleet dynamics on a much shorter term time scale
 - Trips
 - Season
 - Annual
- Corresponds to time (and spatial) scale of management decisions
 - Annual or seasonal quotas
 - Area management



Short Term Fleet Dynamics

- Aggregation of Individual Decisions By Owners/Captains

Short run
fixed factors
that
influence
Individual
choices

Capital –
Vessel/Gear

Knowledge –
Owner/Captain/Crew

Community/Family
Traditions

Market
Conditions

Stock
Conditions

Port Location

Management
Regulation

Fish?

Yes

No

Target Species/Complex

A

B

Area

X

Y



In the longer run...

- Capital Replacement
 - Vessel and gear depreciates and needs replacement
 - Timing is critical
 - Heterogeneity in fleet re: where they are in the process
- New investment opportunities
- Even fishing ports come and go
- Decision to add port/expand port at state or local level
 - COE dredging and port maintenance decisions

But the ability to adapt

- Is dependent of the transition path to the new state
 - Gradual shift
 - Sudden transition
 - In an ecosystem framework, some gradual shifts, some sudden
- Can't replace capital or invest in new fishing method if you've been unsuccessful during the transition

Need Studies of Long Term Fleet Dynamics

- Examples exist of long term changes
 - Menhaden
 - Surf clam
- Hasn't been a priority
 - Demand is for short term dynamics to support fishery management decisions

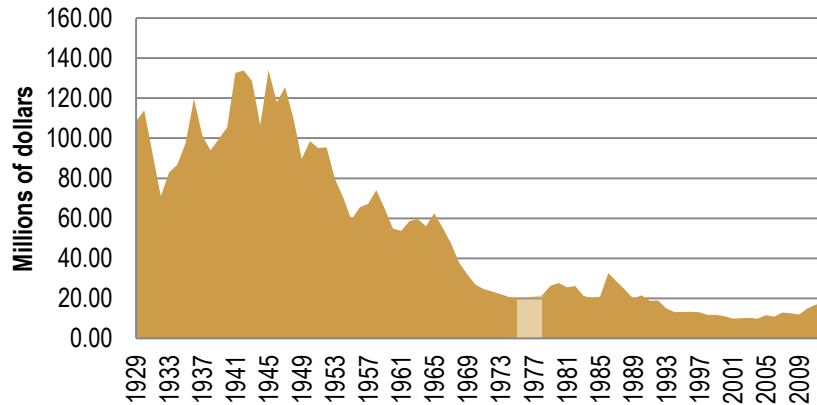


Study of Shifting Fleets

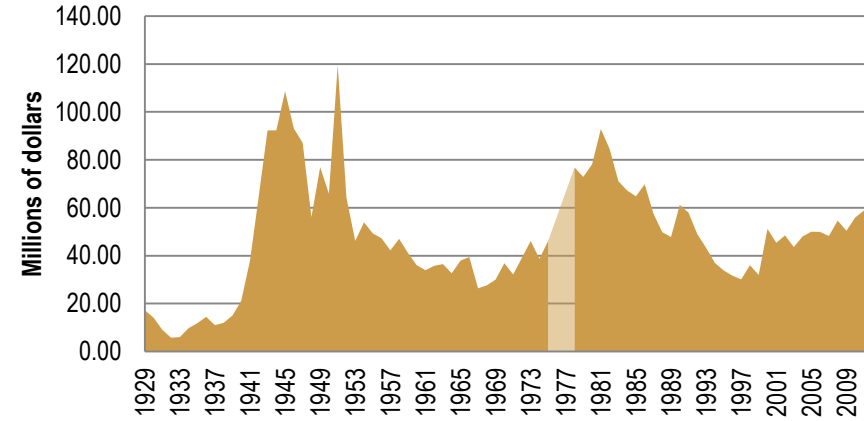
- Has overall landings and value changed?
 - Gradually, quickly?
- Composition of landings and value changed?
- Events
 - End of WWII
 - Foreign Fleets
 - MS-FCMA
 - Regime Shifts
 - Coastal Gentrification
 - **Climate Change**
 - Coastal Eutrophication
 - Dams
 - Dam Removal
- Long terms shifts in fleets?

Some Port Dynamics: 1920-2012

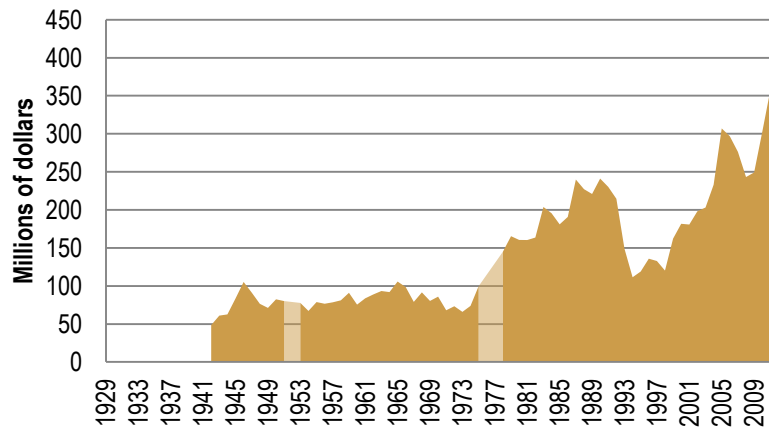
Boston, MA



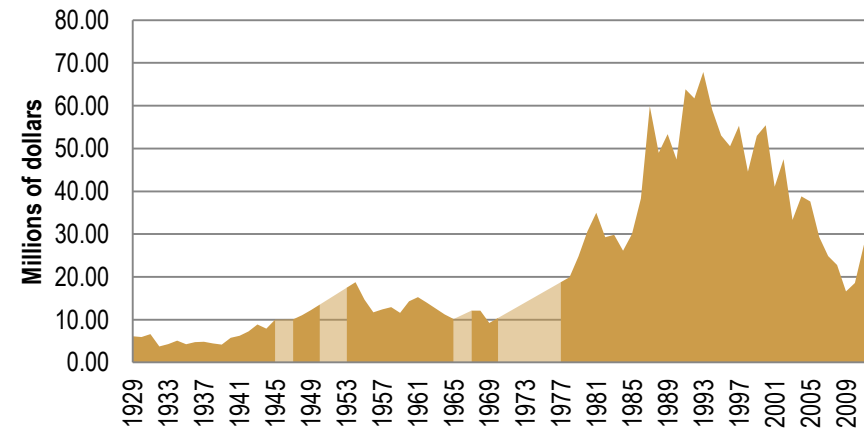
Gloucester, MA



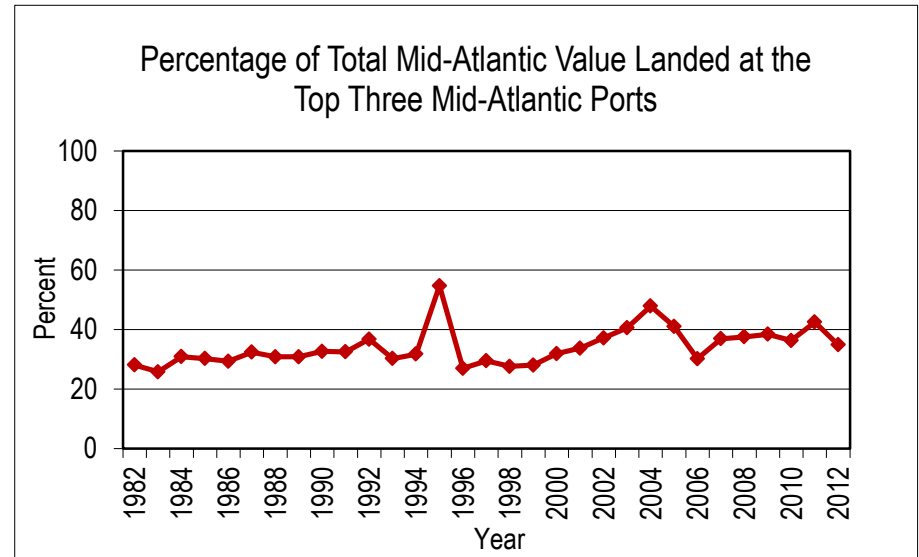
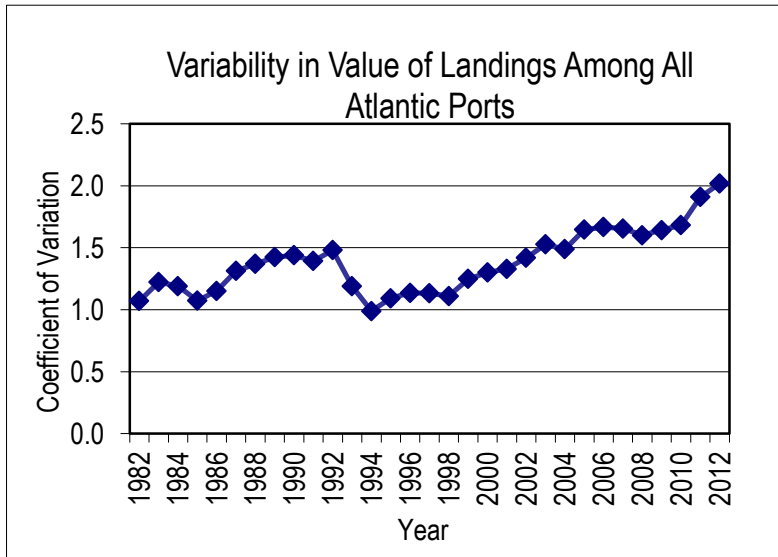
New Bedford, MA



Portland, ME



More Port Dynamics



Management and Governance Implications

- Needs Discussion Like We're Having Here
- For Example: Catch Shares
 - Help Industry Adjust?
 - Asset value for investment financing
 - Shares can be traded to newly adapted fleet
 - Hinder Industry Adjustment?
 - Tied to species, could lose value if species declines

Concluding Comments

- Significant challenge to address in a declining budget world when information demands are to support current management actions
- Different types of data and analyses are needed than is what is currently collected
- Need to determine actionable items that will make this investment in research worthwhile

Questions?

