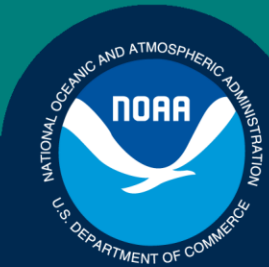


Science, Service, Stewardship



Regulatory Amendment 11

Speckled Hind and Warsaw Grouper Catch Data

Southeast Regional Office

St. Petersburg, Florida

June 14, 2011

**NOAA
FISHERIES
SERVICE**

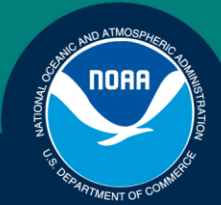


Reg. Amendment 11

May adjust regulations implemented by Amendment 17B to alleviate social and economic impacts while maintaining reduced bycatch of speckled hind (SH) and warsaw grouper (WG).

Questions:

1. What data are available?
2. Where are they caught (areas & depths)?
3. What species are caught with them?



Analytical Challenges

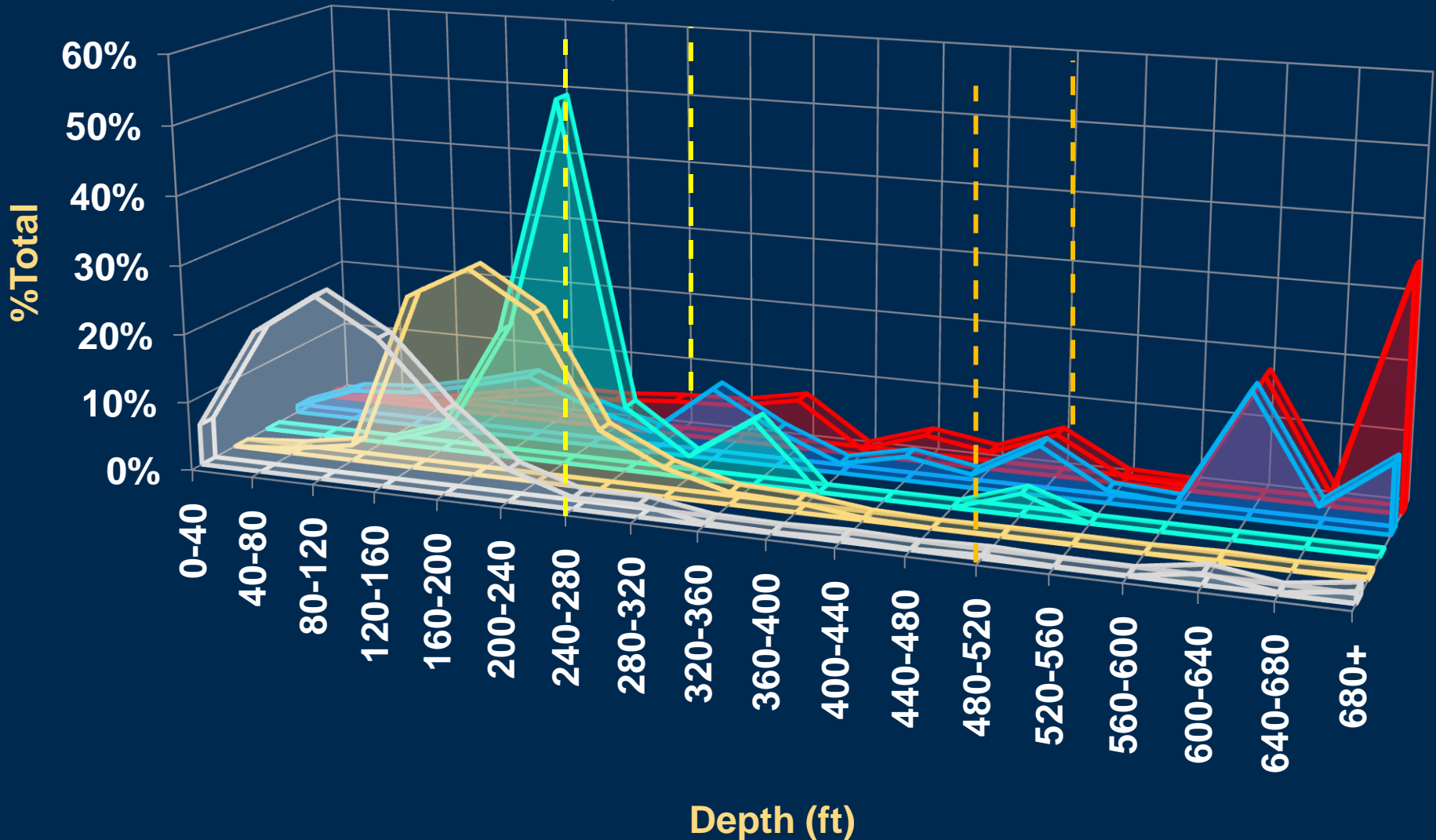
- **Limited fishery-independent sampling**
- **Few data available prior to 1992, no area or depth info.**
- **Post-1992 data biased by:**
 1. **Prohibition of sale**
 2. **Limited discard information**
 3. **Lack of depth-specific, spatially-resolved data**
 4. **Disproportional effort (limited >240 ft)**
 5. **Ontogenetic shifts in life history (habitat, depth)**

DATA SOURCE	YEARS	SPATIAL RESOLUTION	DISCARD INFO	DEPTH INFO
Commercial Logbooks	2001-2009	1° X 1° area	20% of records	2005-present
Headboat Logbook	1973-2009	Variable; broad to 0.17° X 0.17°	2004-present	None
Reef Fish Observer Program	2006-2009	Lat/Long (limited samples)	Yes	Yes
MARMAP	1977-2009	Lat/Long (limited samples)	Yes	Yes
ALS	1962-2009	State Sub-Regions	No	No
FL Trip Ticket	1986-1992	State Sub-Regions	No	No
GA & SC Trip Ticket	1989-2009	State Sub-Regions	No	No
NC Trip Ticket	1994-2010	State Sub-Regions	No	No

WHERE ARE THEY CAUGHT?

All Observations, Pooled Across Data Sources

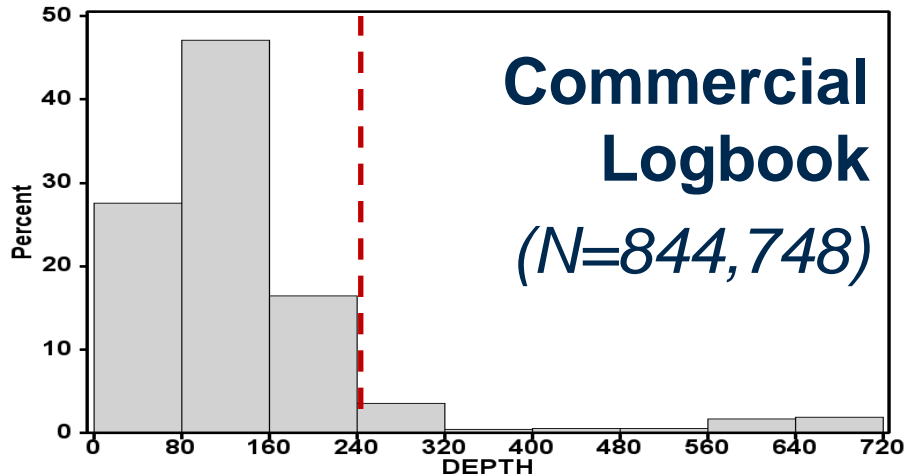
■ All Records (N=905458) ■ Speckled Hind (N=970) ■ Warsaw Grouper (N=32)
■ Blueline Tilefish (n=3480) ■ Snowy Grouper (n=10796)



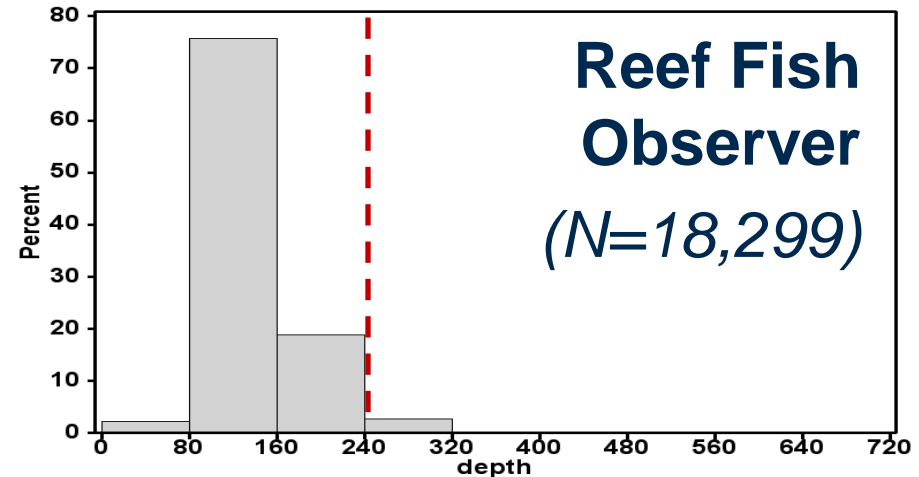
WHERE ARE THEY CAUGHT?

Available data sources are biased towards depths <240 ft:

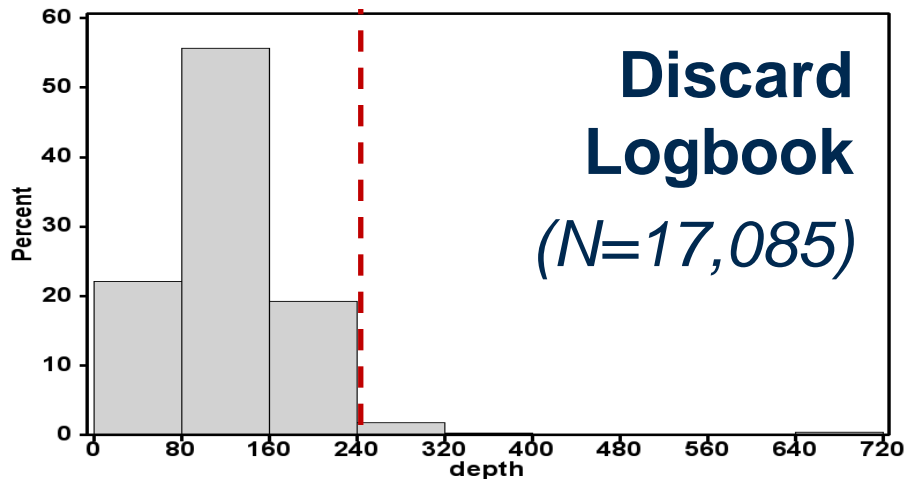
Histogram of All Reported Landings by Depth



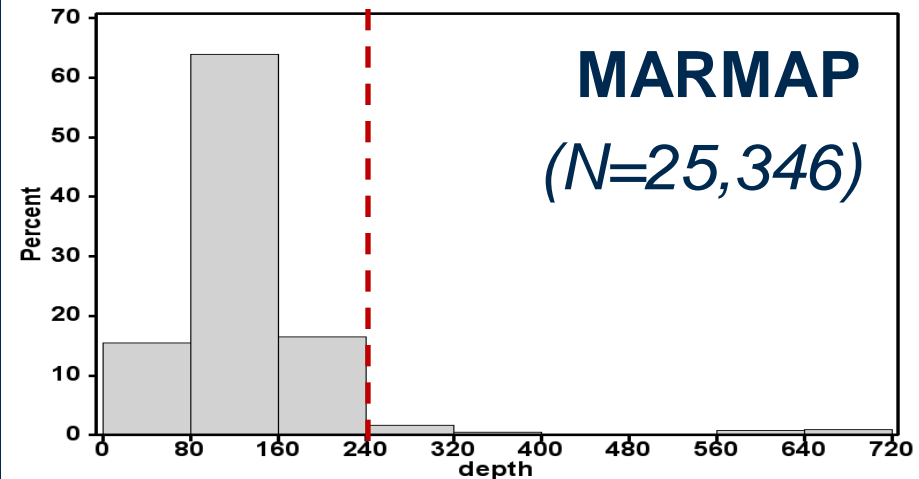
Histogram of All RFOP Encounters by Depth



Histogram of All Reported Discards by Depth



Histogram of All MARMAP Encounters by Depth



χ^2 / Fisher Exact Tests: Encounters of SH and WG are deeper than would be expected by sampling program's depth distribution.



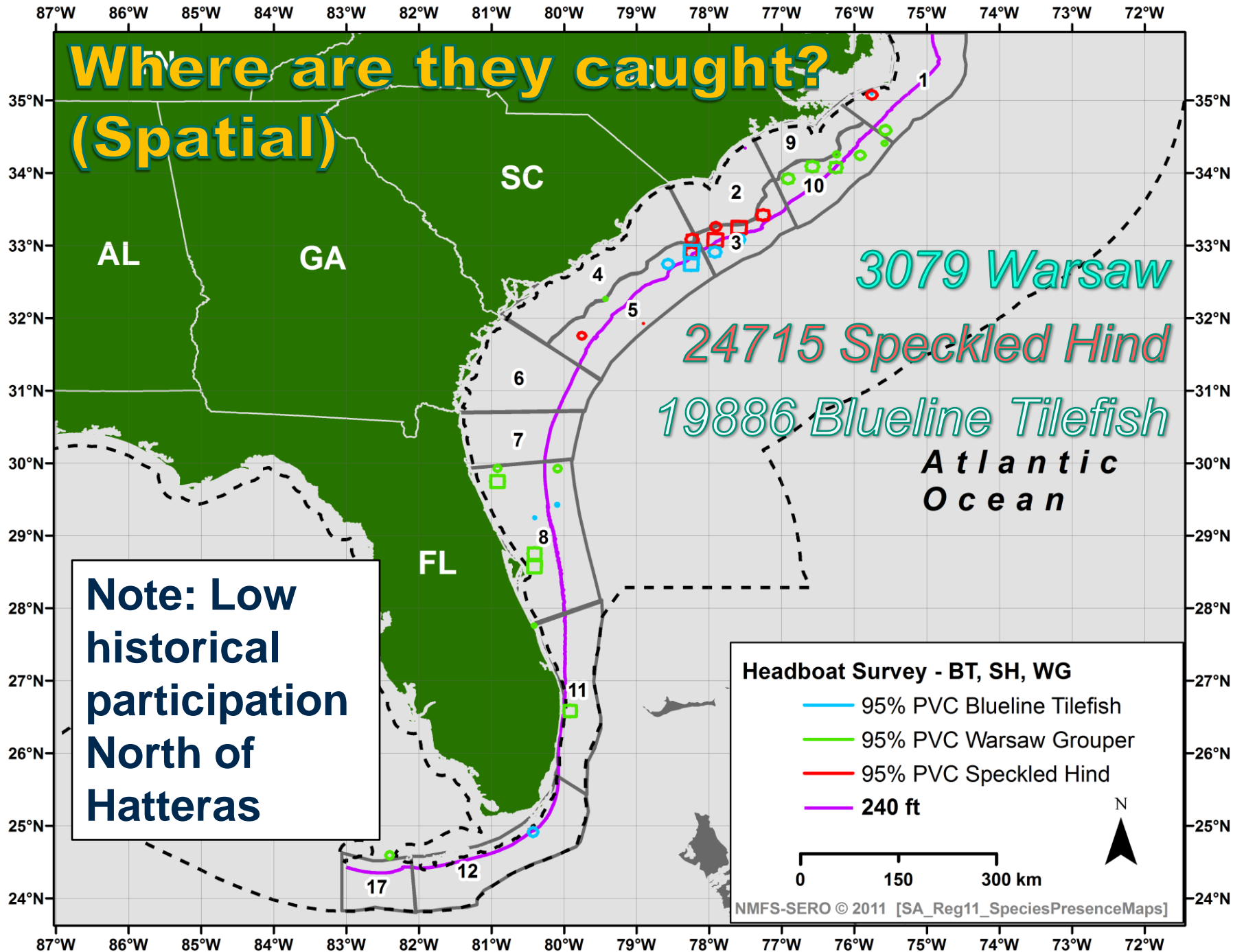
Where are they caught? (Depth)

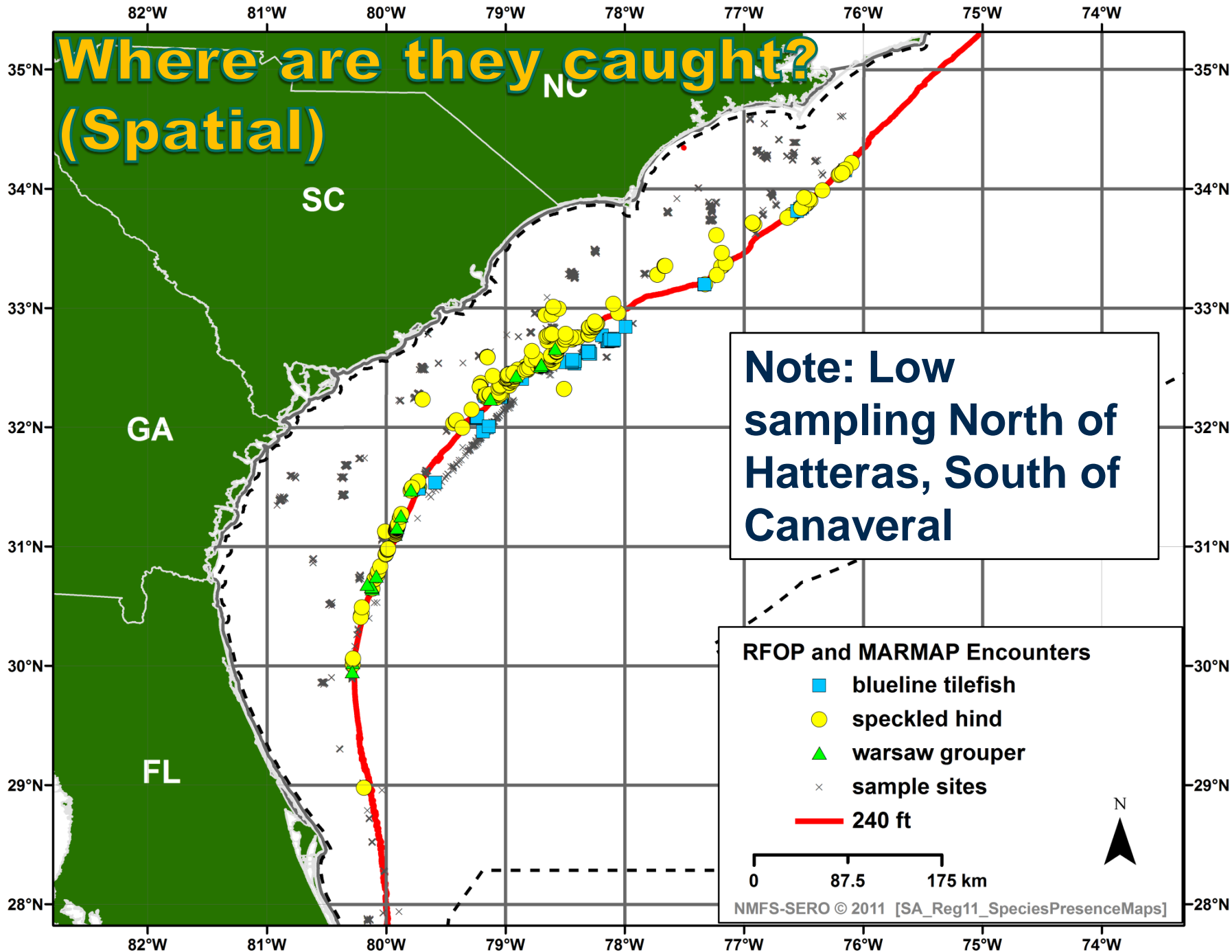
Infrequent observations of speckled hind (0-640 ft) and warsaw grouper (80-480 ft).

Encounters more likely deeper than 160 ft.

Analysis confounded by:

1. Biased Sampling (area, depth, gear, self-reported)
2. 1992 Harvest Prohibition
3. Ontogenetic Migration
4. Rarity







SPATIAL DISTRIBUTION: FLORIDA Trip Ticket (1986-1992) & ALS (1962-2010)

ALS n=2145; FL-TT n=205

SPECKLED HIND	Unknown	Jacksonville	Canaveral	West Palm	Miami	Keys
Trip Ticket	79%	18%		1%	2%	
ALS		4%	12%	5%	8%	72%

ALS n=2309; FL-TT n=1731

WARSAW GROUPE	Unknown	Jacksonville	Canaveral	West Palm	Miami	Keys
Trip Ticket	20%	29%	32%	9%	3%	7%
ALS		3%	8%	2%	24%	64%



Trip Ticket Data

#Records	FL (1986-1992)	GA (2004-2009)	SC (1989-2009)	NC (1994-2010)
Speckled Hind	205	0	350	38
Warsaw Grouper	1,731	1	95	4



Where are they caught? (Spatial)

Dataset	North of Cape Hatteras, NC		South of Cape Canaveral, FL	
	Warsaw Grouper	Speckled Hind	Warsaw Grouper	Speckled Hind
ALS	0%	0%	4%	12%
Trip Ticket	0%	1%	24%	1%
Headboat Survey	0%	1%	5%	3%
MARMAP	0%	0%	0%	0%
RFOP	0%	0%	0%	0%
CLB	0%	2%	0%	5%



What is Caught Together?

Sale of SH and WG prohibited since 1992.

SAFMC species groupings report approaches focused on highly resolved bins of data for encounters of all species.

Reg-11 analyses use longer, less-resolved time series of data and cluster only positive trips (e.g., trips with encounter of SH or WG)

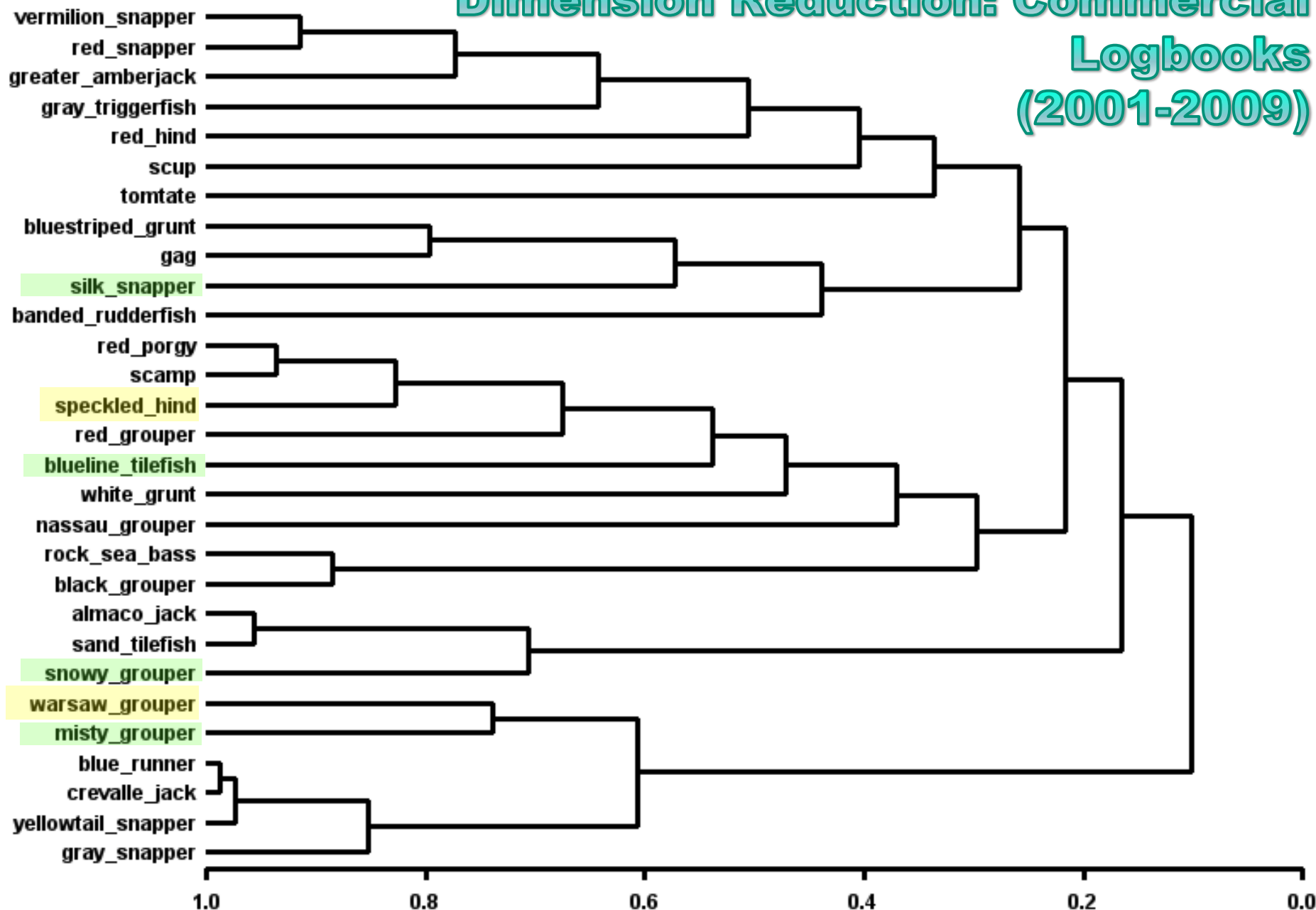
Clustering using HCA and Dimension Reduction

Top Co-Occurring Species

Rank	With Speckled Hind		With Warsaw Grouper	
	Commercial	Headboat	Commercial	Headboat
1	red porgy	vermilion snapper	red porgy	gray triggerfish
2	scamp	gray triggerfish	scamp	black sea bass
3	vermilion snapper	scamp	vermilion snapper	red snapper
4	greater amberjack	red porgy	greater amberjack	gag
5	red snapper	tomtate	speckled hind	gray snapper
6	gag	white grunt	red snapper	lane snapper
7	red grouper	knobbed porgy	gag	vermilion snapper
8	gray triggerfish	greater amberjack	gray triggerfish	tomtate
9	warsaw grouper	gag	red grouper	scamp
10	rock sea bass	red snapper	red hind	whitebone porgy
11	snowy grouper	black sea bass		greater amberjack
12	yellowtail snapper	whitebone porgy		red porgy
13	black grouper	almaco jack		red grouper
14	blue runner	bank sea bass		white grunt
⋮	⋮	⋮	⋮	⋮
	blueline tilefish (#22)	blueline tilefish (#32)	<i>No blueline tilefish</i>	blueline tilefish (#39)

Dimension Reduction: Commercial Logbooks (2001-2009)

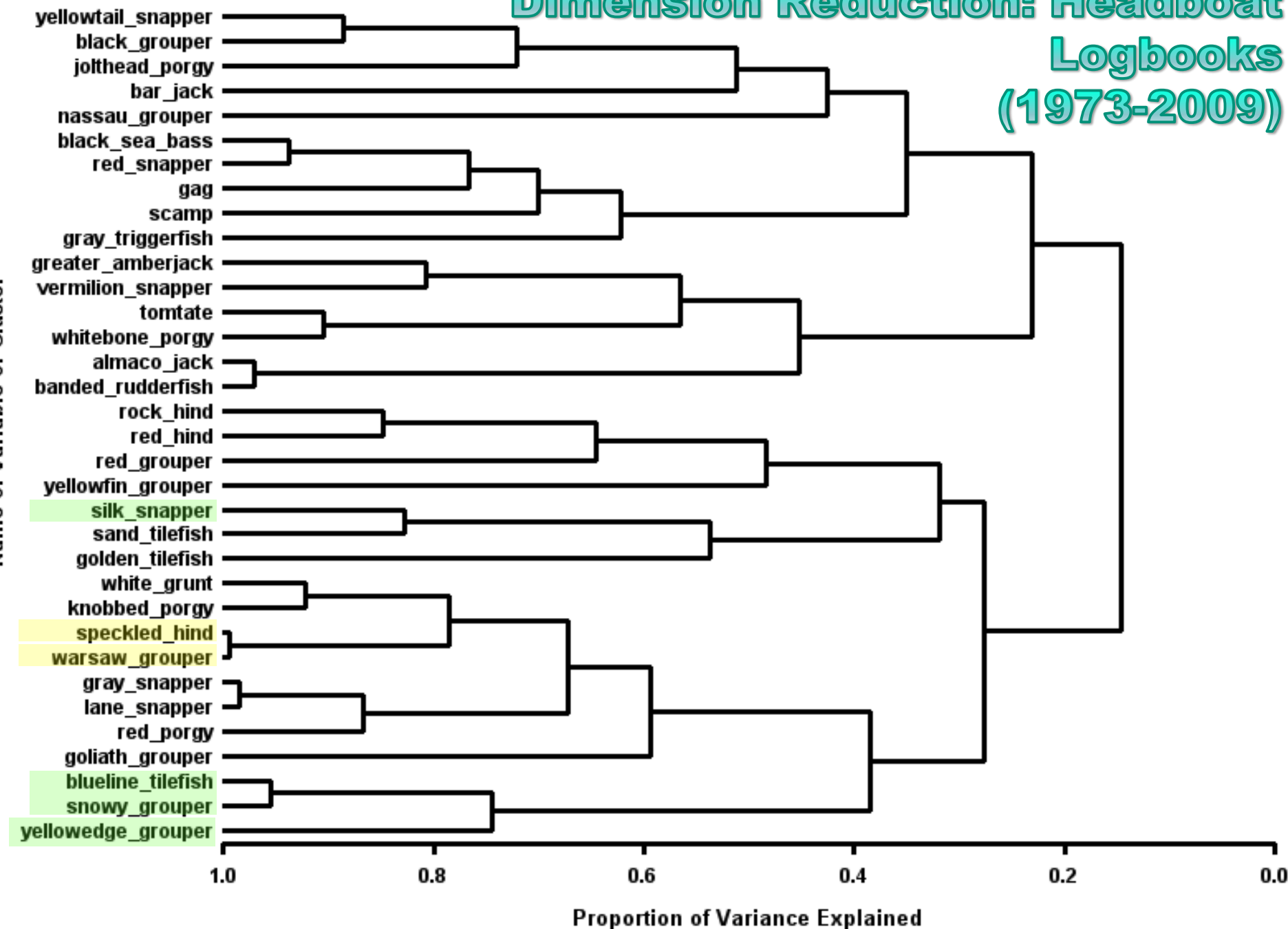
Name of Variable or Cluster



Proportion of Variance Explained

Dimension Reduction: Headboat Logbooks (1973-2009)

Name of Variable or Cluster





What is Caught Together?

Speckled hind and warsaw grouper closely associated

Low association with blueline tilefish or snowy grouper

Warsaw grouper associated with misty grouper, shallow-water groupers.

Speckled hind associated with vermilion snapper, red grouper, scamp, porgies and grunts.

Conclusions

1. What data are available?

Extremely limited prior to 1992 prohibition of sale

Post-1992 data heavily biased (area, depth, under-reporting)

2. Where are they caught (area & depths)?

SH predominantly SC to south of Hatteras

WG mostly off FL and NC

Higher odds of encounter in >240 ft depth

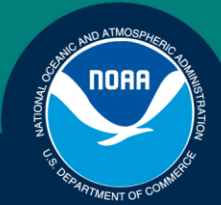
3. What species are caught with them?

Low association with blueline tilefish, snowy grouper

CAVEATS:

Deep-water undersampled + under-reporting bias

Ontogenetic migration



Evaluation of Alternatives in Reg. Amendment 11

1. No action

- + Low reported catches of warsaw grouper, speckled hind
- Most reported catches inside 240 feet.

2. Allow harvest of blueline tilefish >240 ft depth contour

- + Low association with blueline tilefish
- + Few reported warsaw grouper, speckled hind >240 ft
- Increased odds of encountering WG and SH >240 ft



Evaluation of Alternatives in Reg. Amendment 11

- 3. Allow harvest of blueline tilefish >240 ft in North Carolina**
 - + Low association with blueline tilefish in available data
 - Odds of encountering WG or SH increase >240 ft
 - High WG (HBS) and SH (MARMAP) encounters off NC

- 4. Allow harvest of blueline tilefish >240 ft north of Cape Hatteras, NC**
 - + Few reported WG and SH >240 ft north of Hatteras
 - + Substantial blueline tilefish landings north of Hatteras
 - + Blueline tilefish may occupy different habitats vs. SH & WG



Evaluation of Alternatives in Reg. Amendment 11

- 5. Exclude blueline tilefish from >240 ft depth closure south of Cape Canaveral**
 - + Low association in available data with blueline tilefish
 - + Blueline tilefish may occupy different habitats vs. SH & WG
 - Some evidence of WG catches in SEFL and Keys

- 6. Open closed area >500 ft.**
 - + Extremely low reported catches WG (~3%) or SH (~1%)
 - +/- High snowy grouper (~60%), blueline tilefish (~40%) catch



Evaluation of Alternatives in Reg. Amendment 11

- 7. Allow harvest of snowy grouper >240 ft depth contour**
 - + Low association with snowy grouper in available data
 - The majority snowy grouper landings (67%) >500 ft depth
 - Increased odds of WG and SH encounters >240 ft

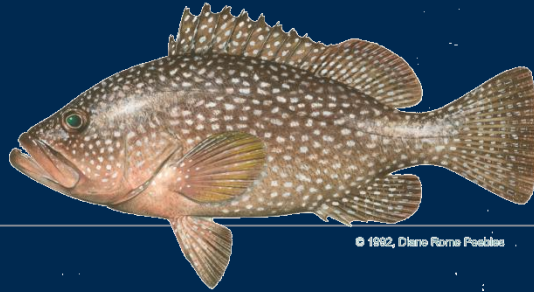
- 8. Allow harvest of snowy grouper >240 ft depth contour off North Carolina**
 - + Low association with snowy grouper in available data
 - High WG (HBS) and SH (MARMAP) encounters off NC



Evaluation of Alternatives in Reg. Amendment 11

9. **Allow harvest of snowy grouper >240 ft depth contour north of Cape Hatteras**
 - + Low association with snowy grouper in available data
 - + Few reported WG and SH >240 ft north of Hatteras
10. **Exclude snowy grouper from the deepwater closure south of Cape Canaveral**
 - + Low association in available data with snowy grouper
 - Some evidence of WG catches in SEFL and Keys

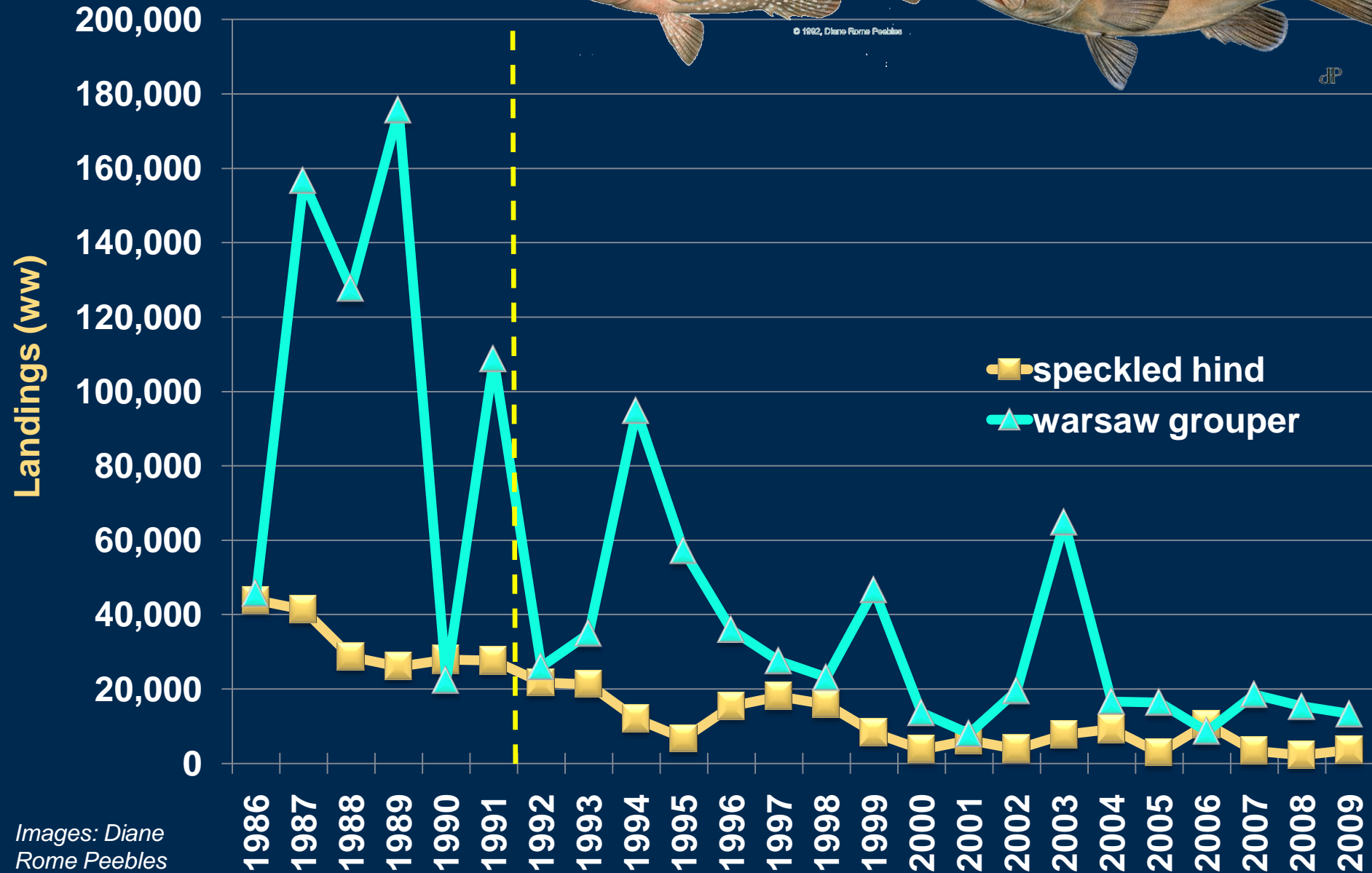
Questions?



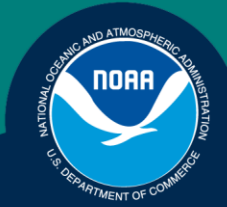
© 1992, Diane Rome Peebles



JP



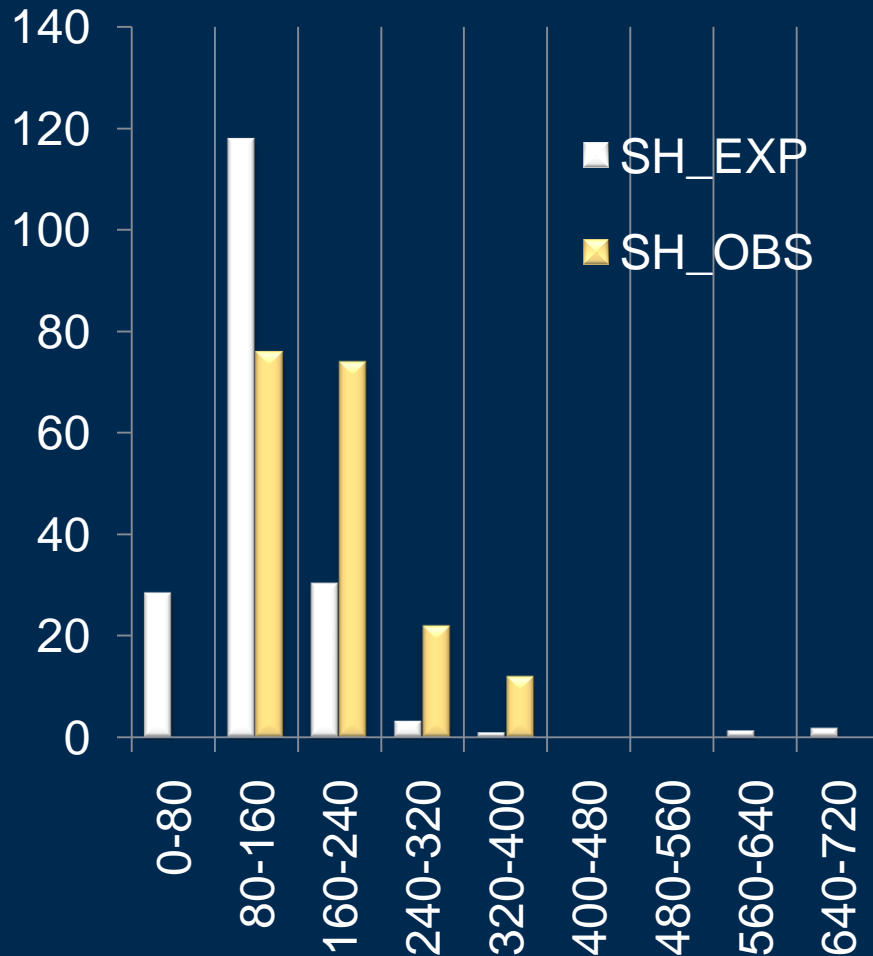
**NOAA
FISHERIES
SERVICE**



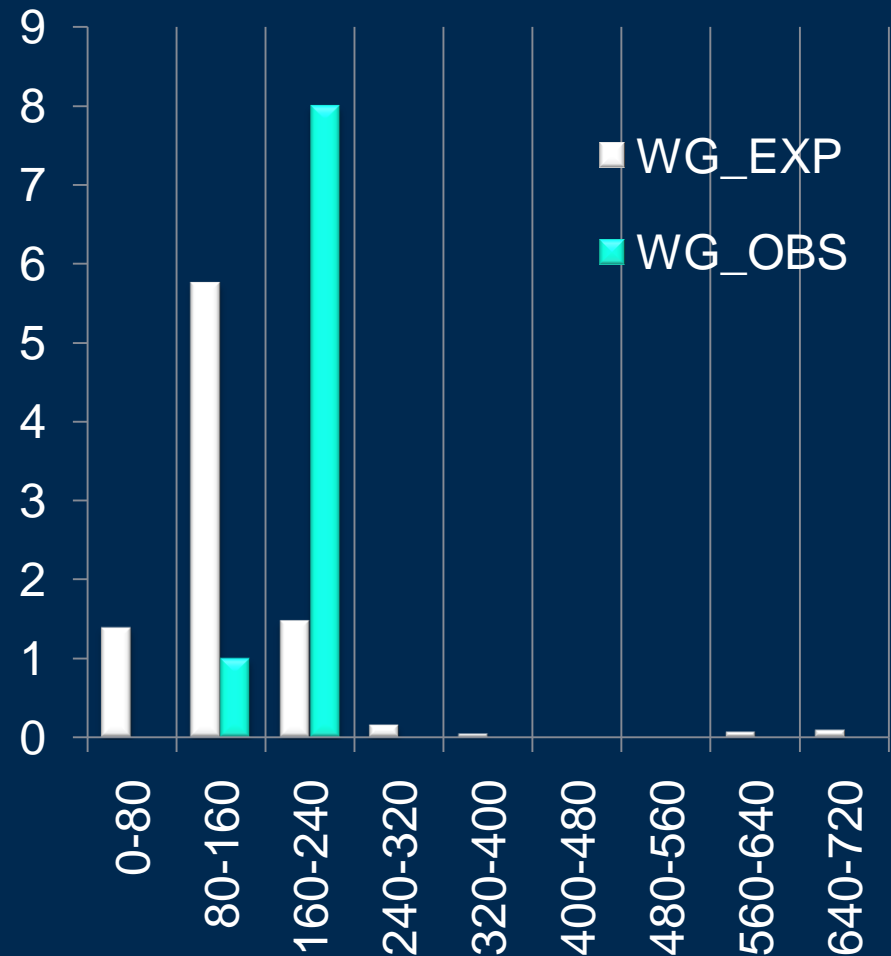
RESULTS: MARMAP (1977-2009)

NOTE: Fishery-independent; Limited gears and sets for DWG.

Speckled Hind ($N=184$)*



Warsaw Grouper ($N=9$)*

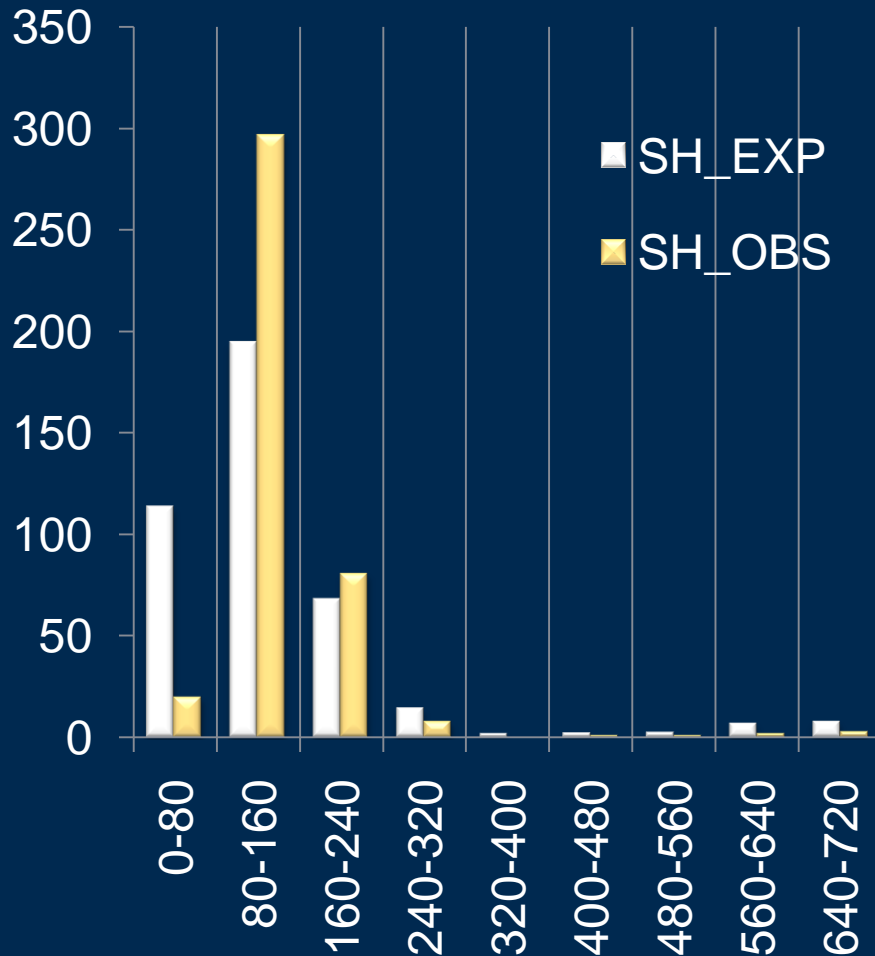


*Significantly different distribution ($p<0.05$)

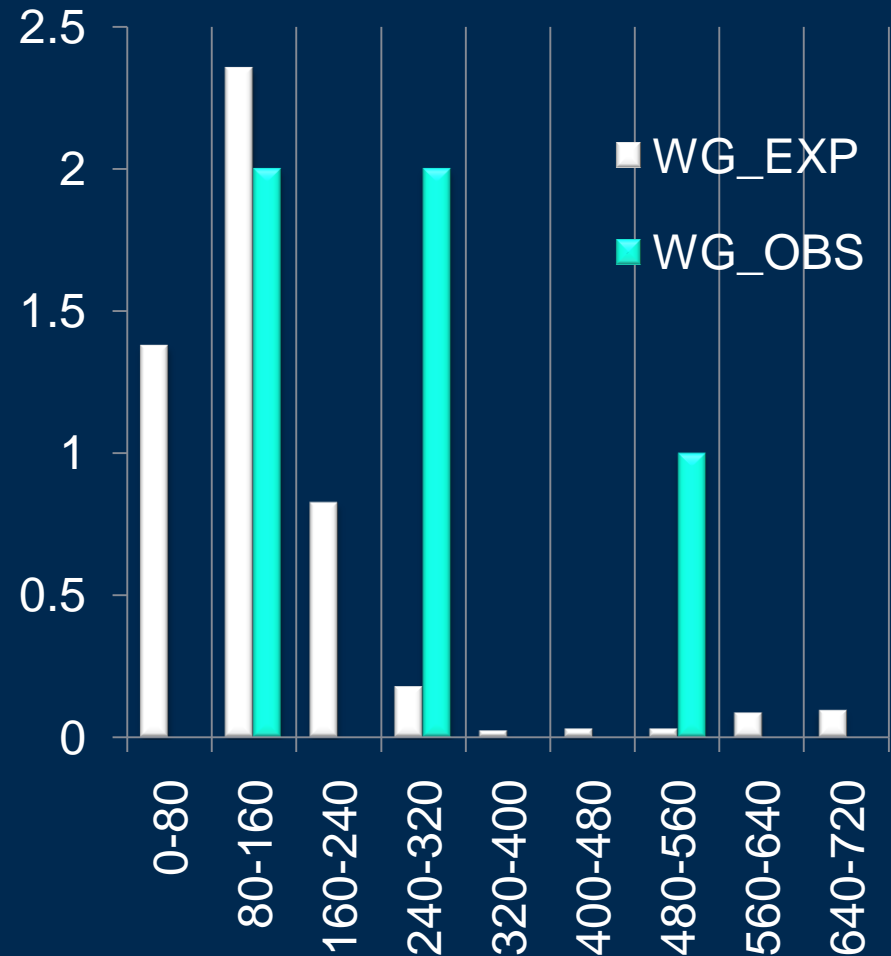
RESULTS: Commercial Logbook

NOTE: 1992 Harvest Prohibition would impact these results.

Speckled Hind ($N=413$)*



Warsaw Grouper ($N=5$)

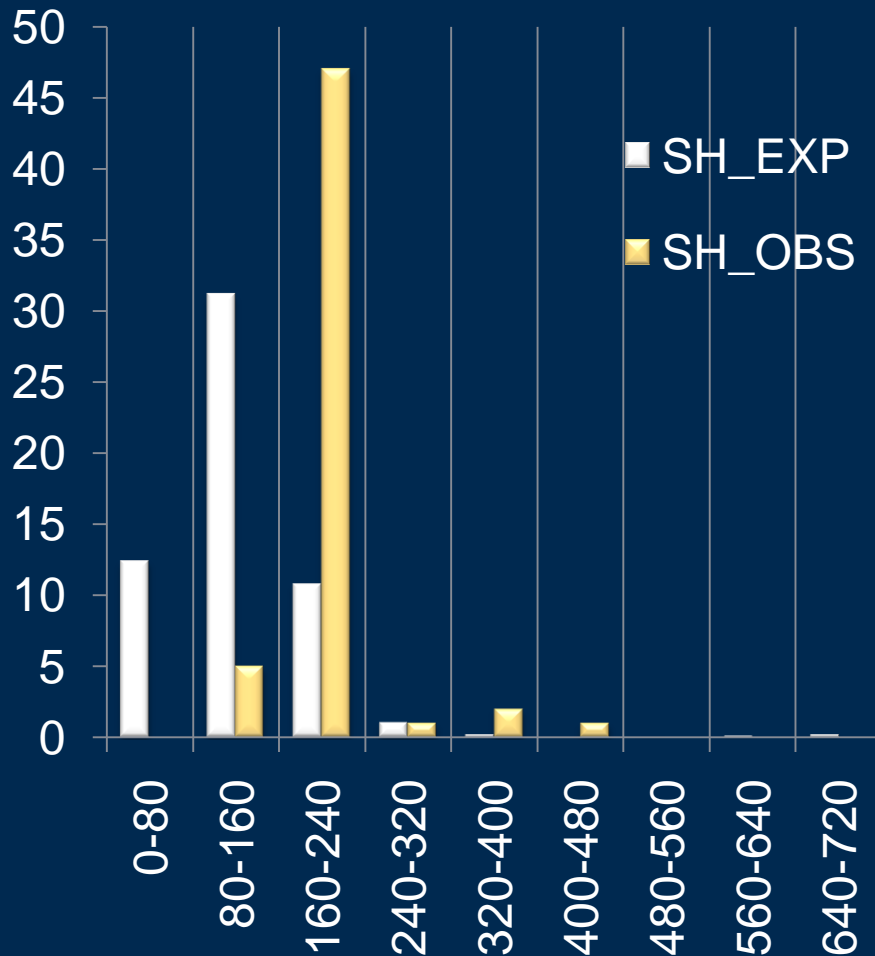


*Significantly different distribution ($p < 0.05$)

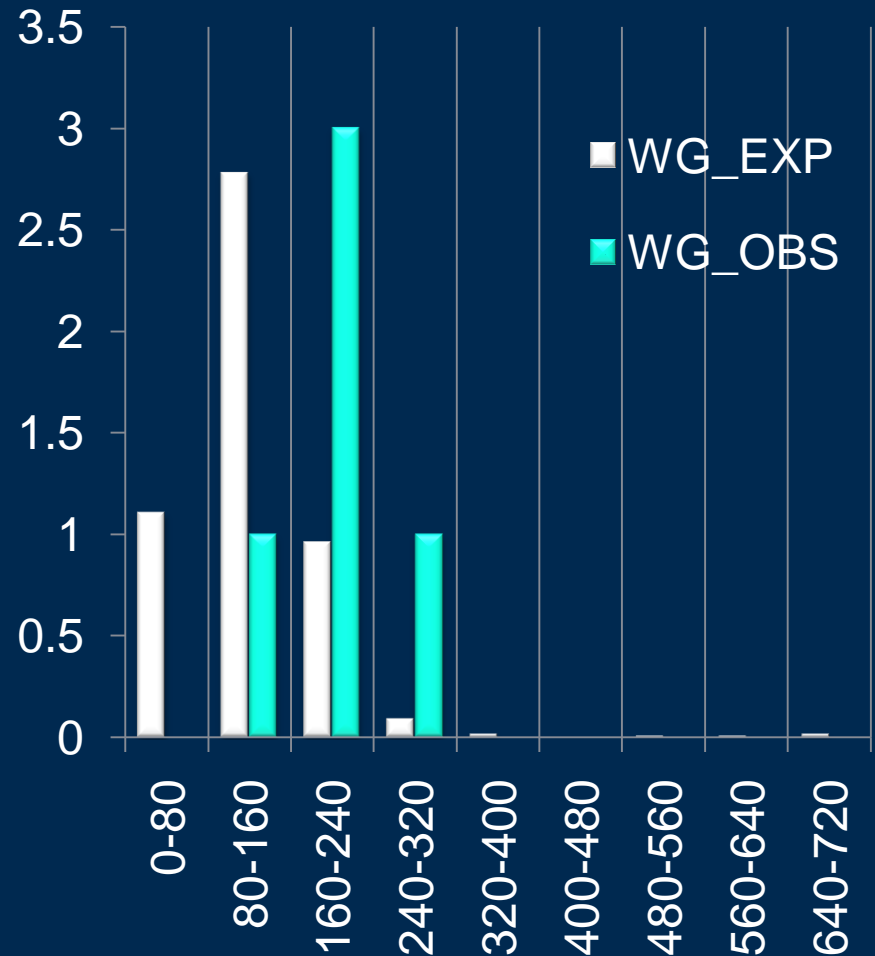
RESULTS: Discard Logbook

NOTE: Only 20% of commercial fishery (self-reported).

Speckled Hind ($N=56$)*



Warsaw Grouper ($N=5$)

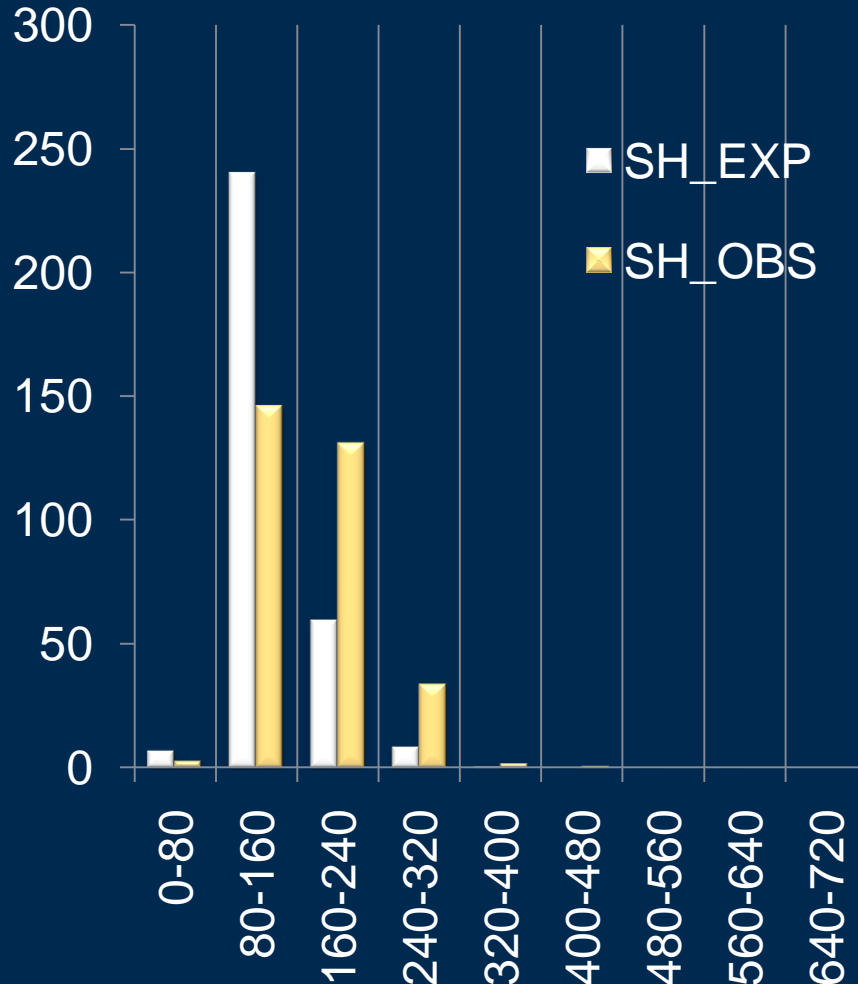


*Significantly different distribution ($p<0.05$)

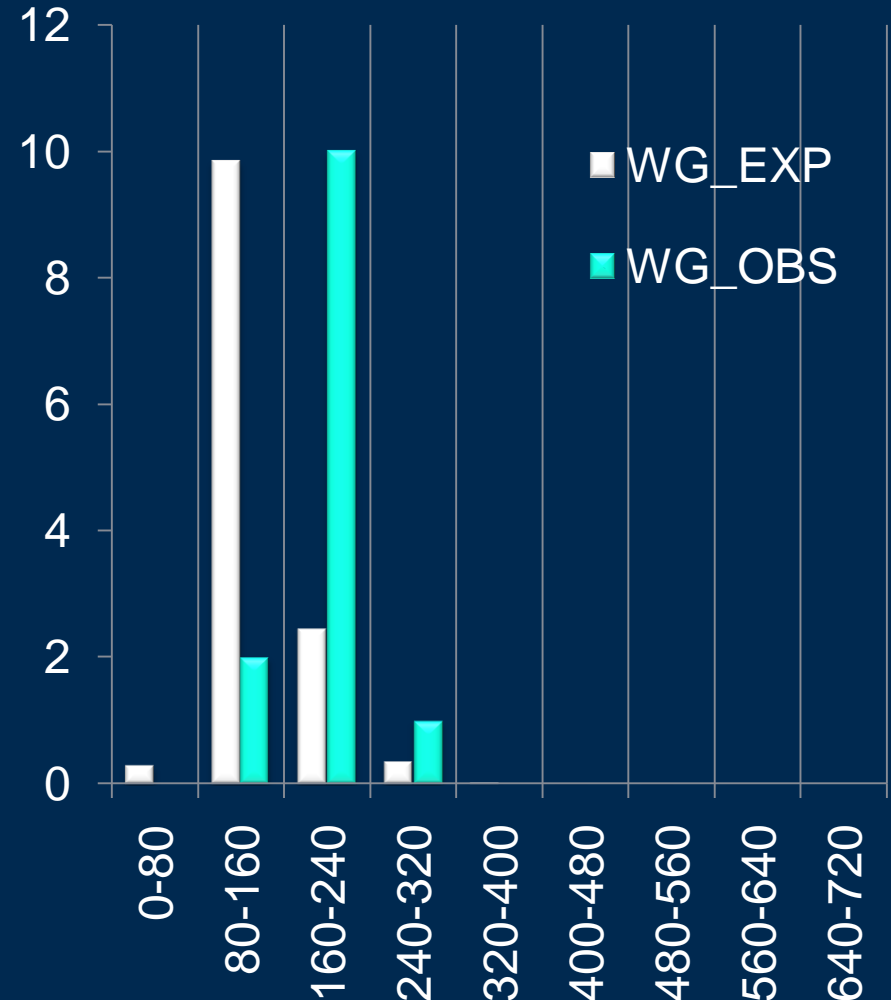
RESULTS: Reef Fish Observer

NOTE: Voluntary program, limited sampling at >240 ft.

Speckled Hind (N=317)*



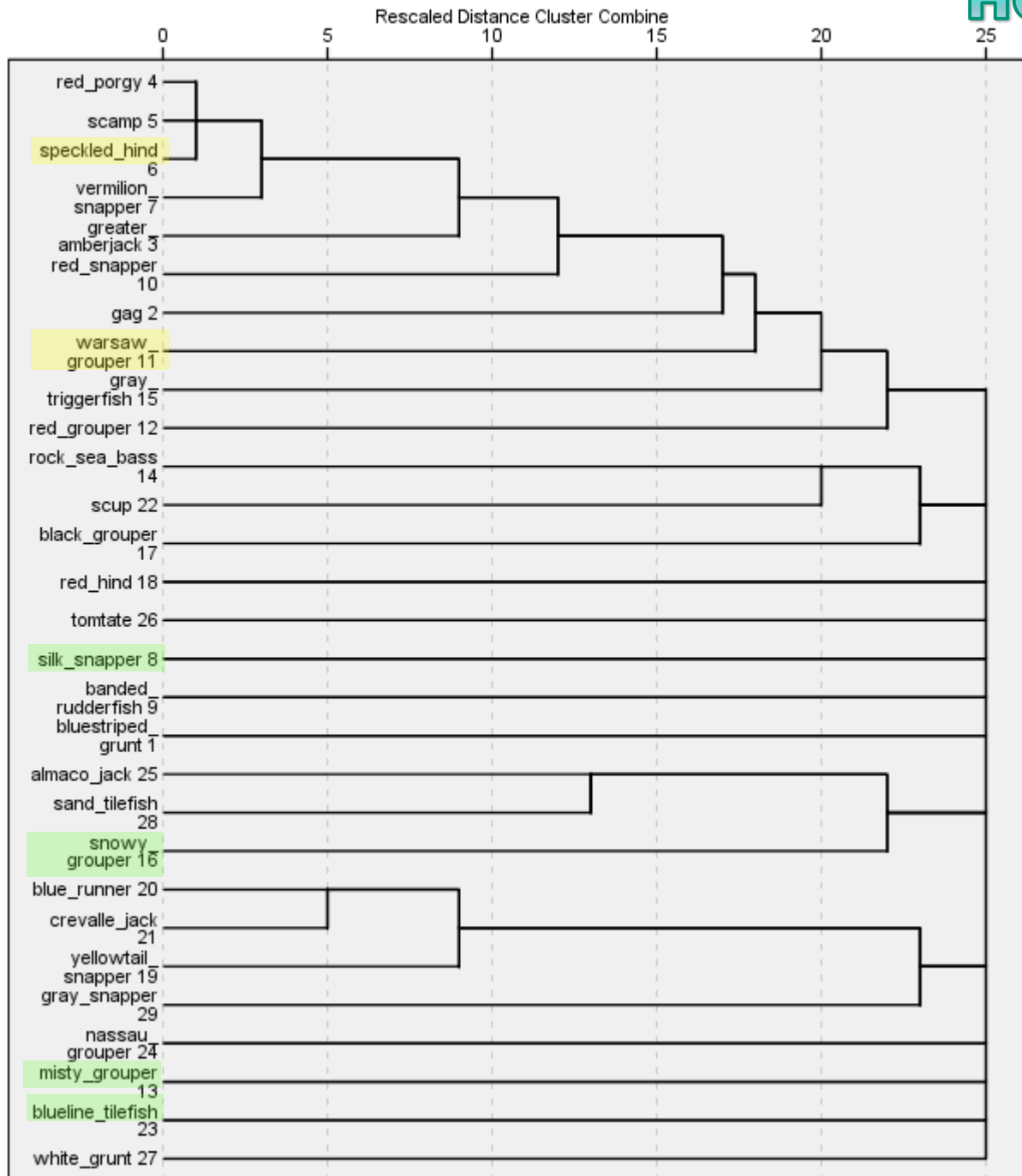
Warsaw Grouper (N=13)*



*Significantly different distribution ($p < 0.05$)

Dendrogram using Average Linkage (Between Groups)

HCA: Commercial Logbooks (2001-2009)



HCA: Positive Trips

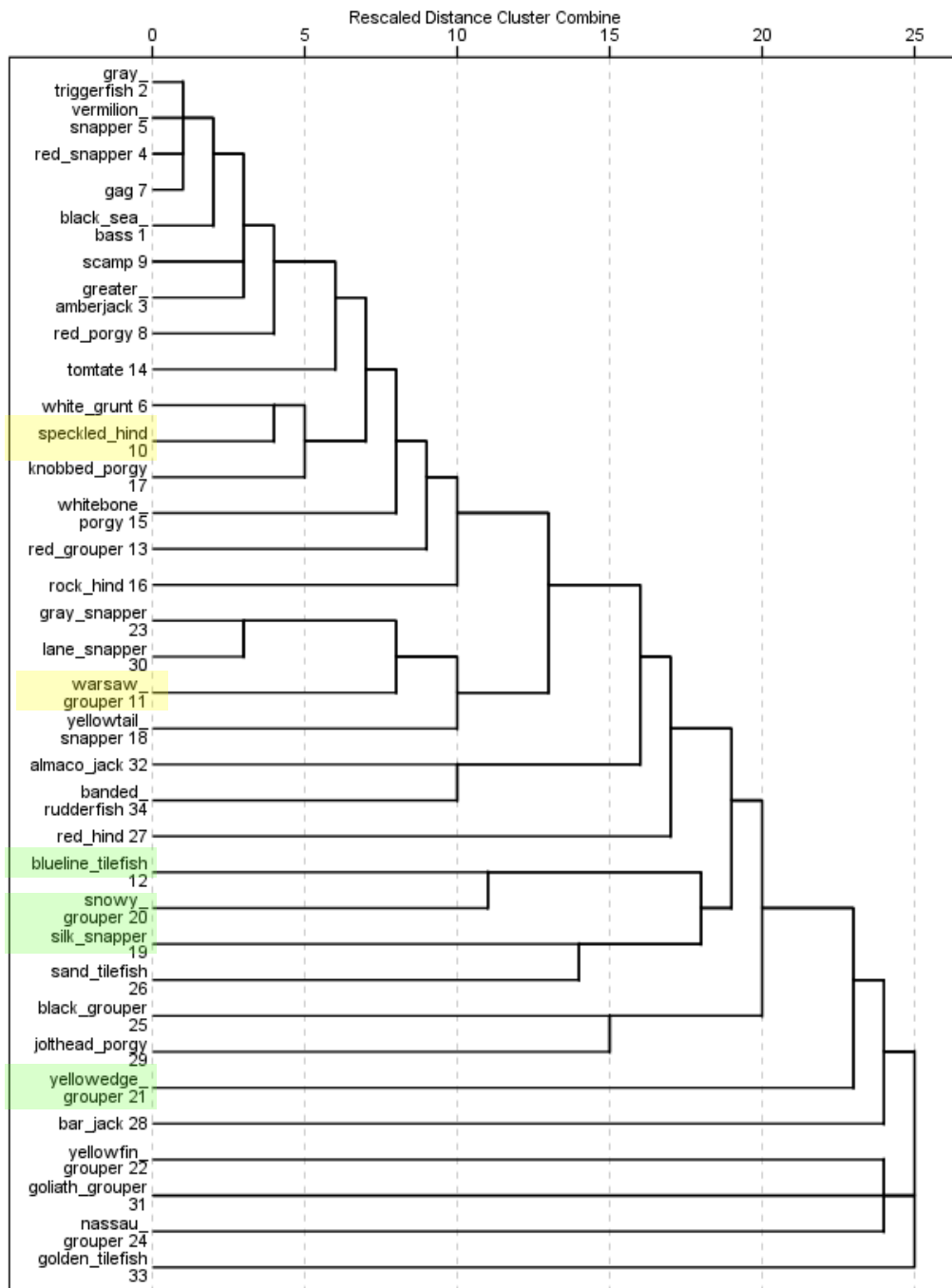
Aggregation:
Year, Month, Trip,
Area

Linkage Method:
Average

Similarity Measure:
Sorenson

Transformation:
Binary

Dendrogram using Average Linkage (Between Groups)



HCA: Headboat Logbooks (1973-2009)

Positive Trips Only

Aggregation:
 Year, Month, Trip, Area

Linkage Method:
 Average

Similarity Measure:
 Sorenson

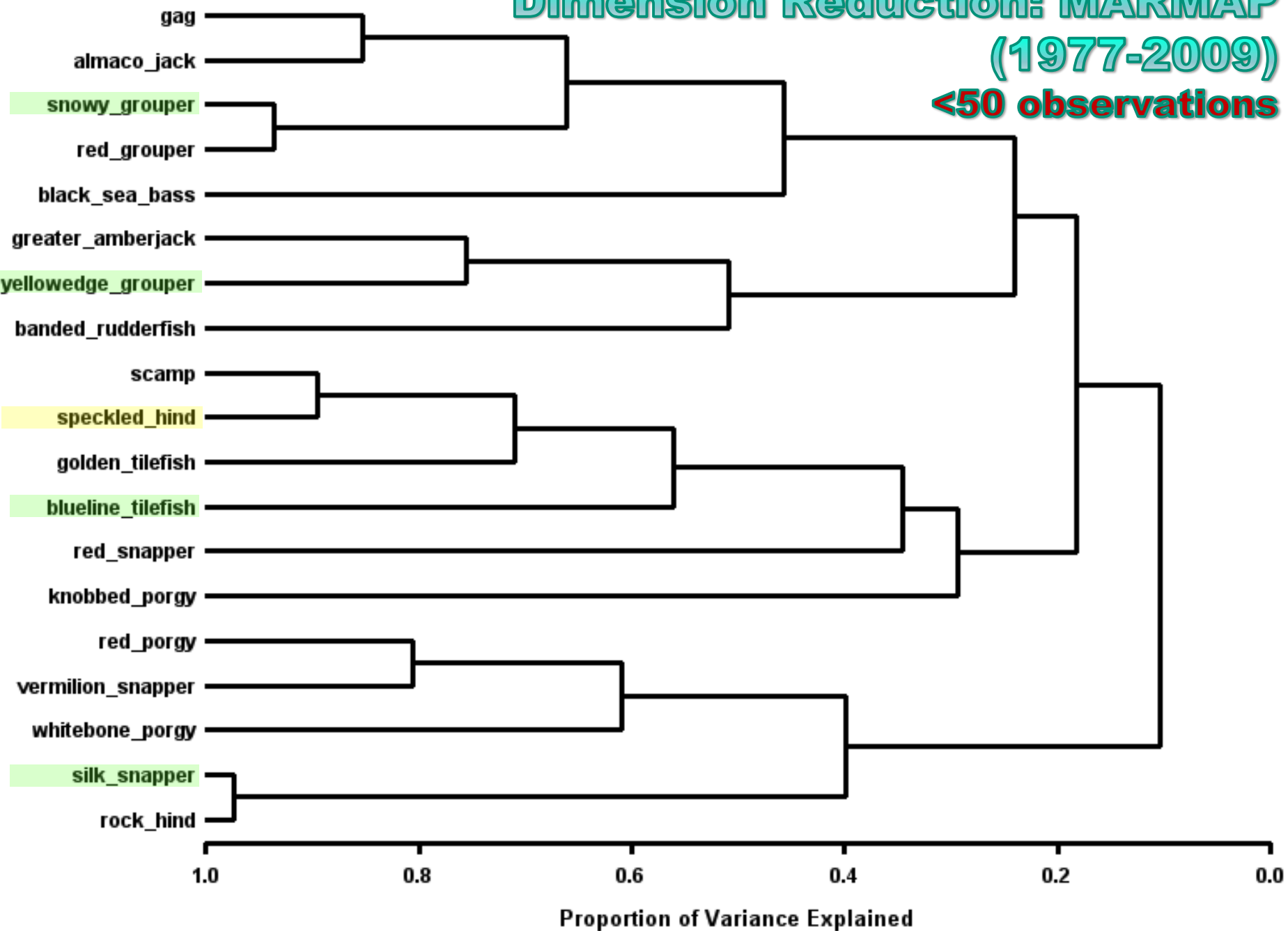
Transformation:
 Binary

Principle Components Clustering of SAFMC MARMAP Landings by Set (VERTICAL LINE)

Dimension Reduction: MARMAP
(1977-2009)

<50 observations

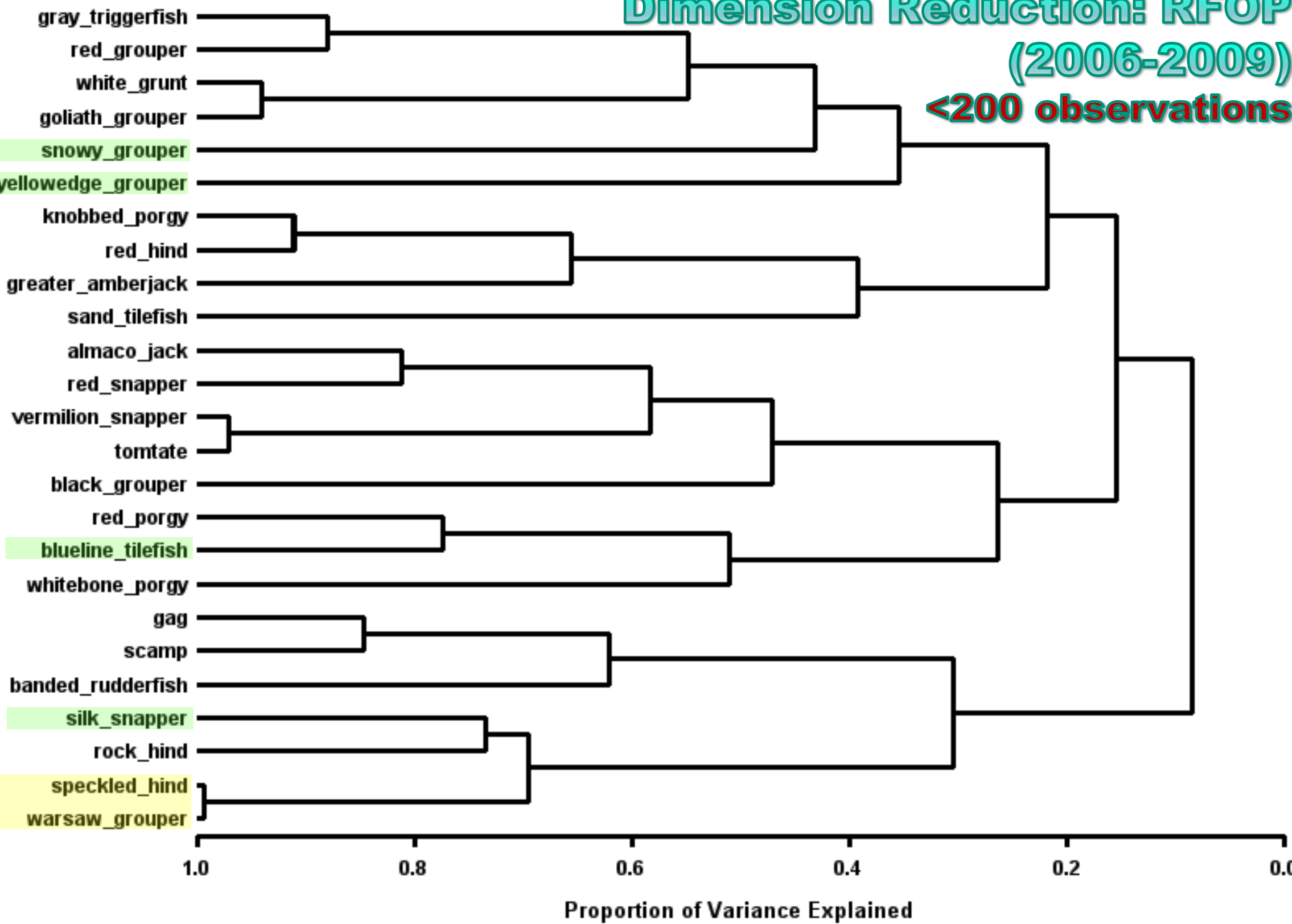
Name of Variable or Cluster



Principle Components Clustering of BINARY SAFMC Reef Fish Observer Landings by Set

Dimension Reduction: RFOP
(2006-2009)

<200 observations



WHERE ARE THEY CAUGHT?

All Observations, Pooled Across Data Sources

