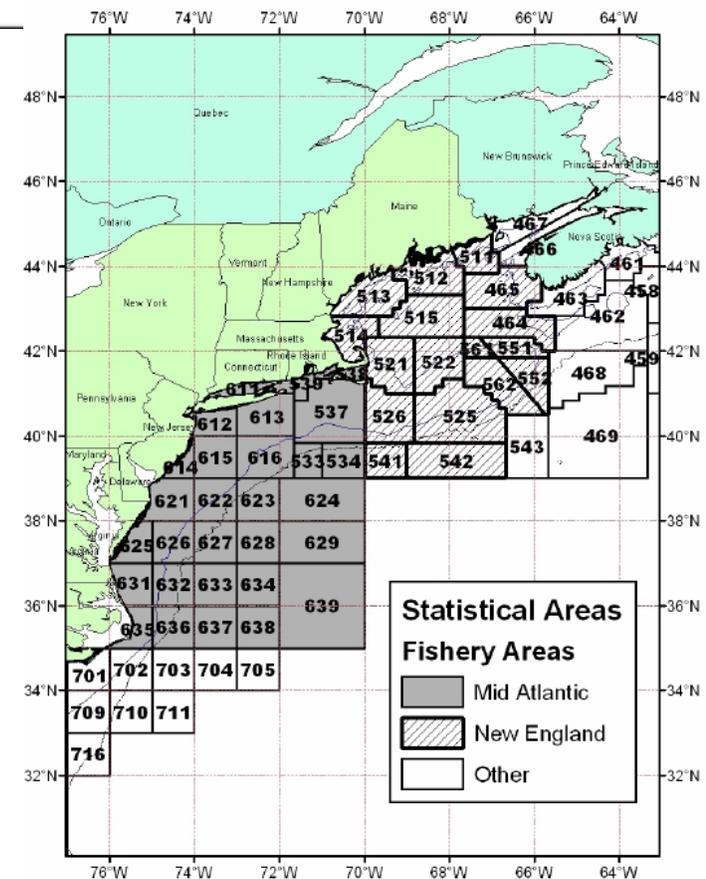


Figure 1. Small boats pair trawling in mid-water.

2003-2005 Mid-water Trawl Marine Mammal Bycatch Estimates

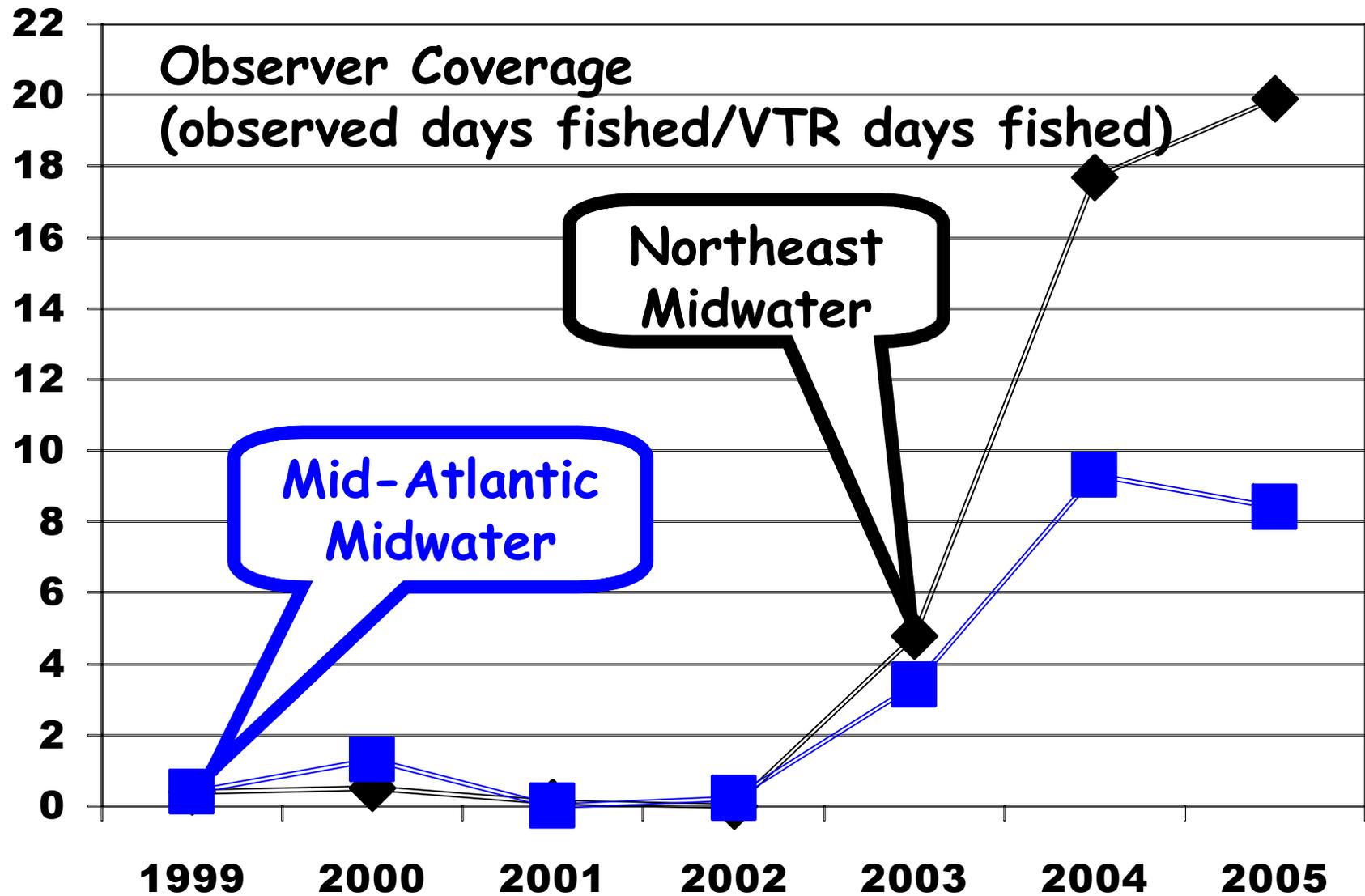
By
Debi Palka



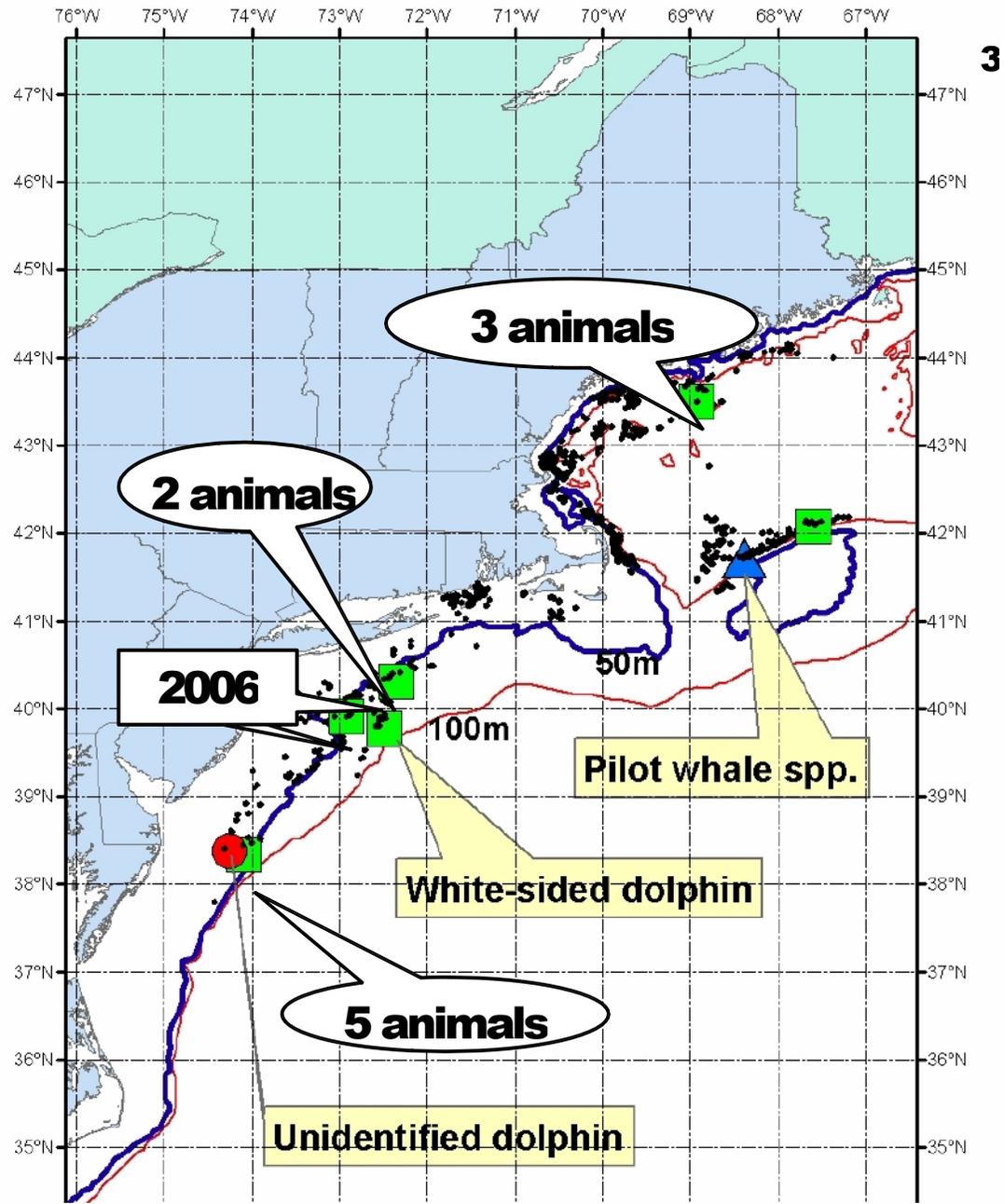
NEW

PBR and bycatch estimate (CV) average for 2001 - 2005

Species	Strategic ?	PBR	Total Bycatch	NE Bottom	NE Midwat	MidAtl Bottom	MidAtl Midwat	JV and TALFF
Common D.	No	1000	146 (0.11)	28 (0.13)	0	118 (0.13)	0	0
Pilot W. spp	No	249	158 (0.09)	19 (0.12)	1.5 (0.35)	35 (0.15)	6.5 (0.35)	11
White-sided D.	No	509	326 (0.12)	192 (0.13)	19 (0.35)	29 (0.11)	84 (0.35)	2
Harbor P.	yes	610	739 (0.16)	5+	0	0	0	0
Minke W.	?	19	2.8+	1+	0	0	0	0



**15
observed
takes
during
January
2003 to
September
2006 in 8
hauls**



Steps in estimation method

- I. **Estimate bycatch rate and its level of variance [coefficient of variation (CV)]**

**bycatch rate = number of dead animals
unit of fishing effort**

Observer data used in this step

Steps in estimation method

II. Expand bycatch rate to entire fishery

Total bycatch estimate

= **bycatch rate** * **total effort**

= **no. of observed dead animals** * **total days fished**
observed days fished

Vessel Trip Report (VTR) data used for total effort (total days fished)

Predictor variables are observer data variables that were used to find gear characteristics/fishing practices that were correlated with bycatch

SPACE

- NE vs MidAtl
- State landed
- Statistical Area

ENVIRONMENTAL

- Bottom slope
- Bottom depth
- Sea surface temp
- Wind speed

TIME

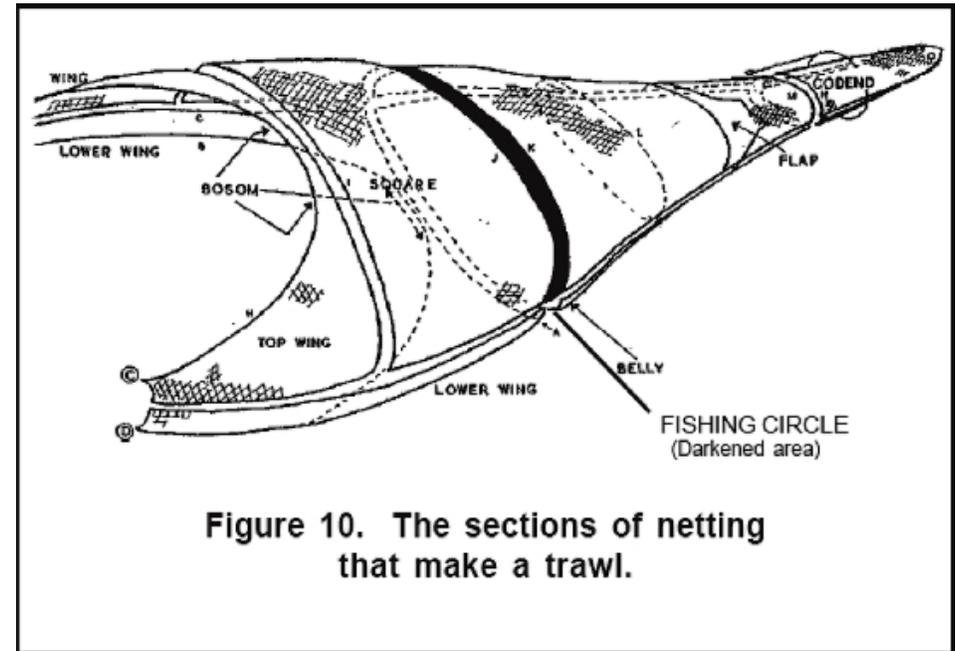
- Month
- Season
- Year

FISHING PRACTICES

- Tow speed
- Target species
- Pair vs single

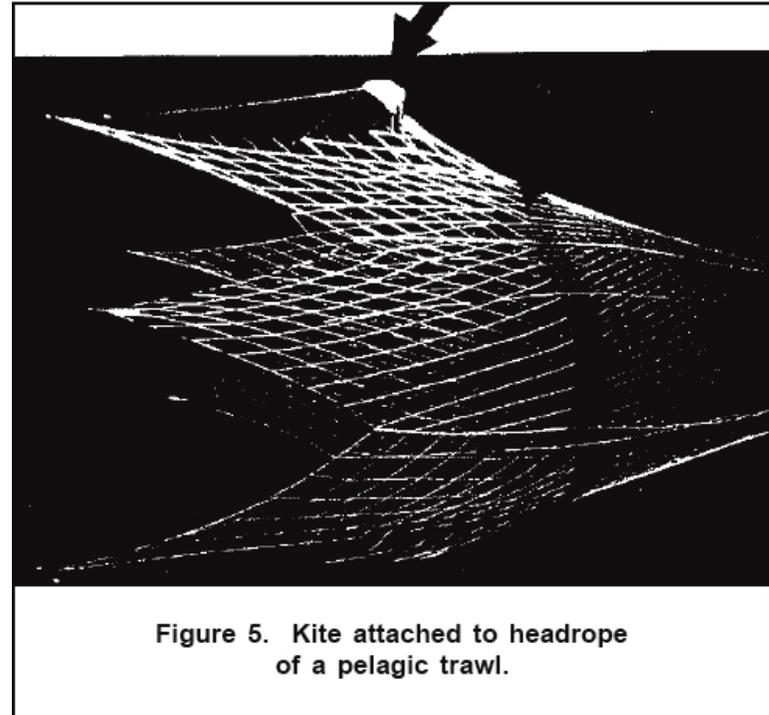
GEAR CHARACTERISTICS

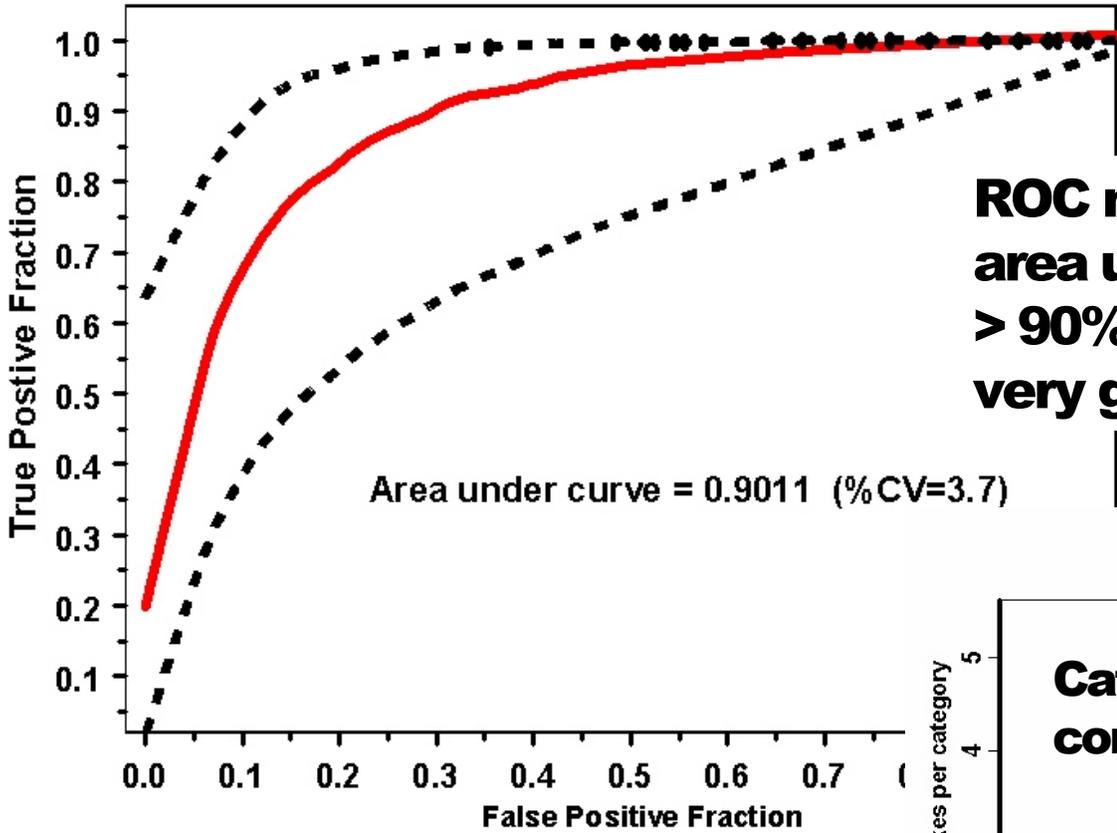
- **Net design**
- **Wireout**
- **Kite panels used**
- **Net material**
- **Codend material**
- **Codend liner used?**
- **Codend strengthen used?**
- **Codend chaffing lines used?**



Bycatch rate model

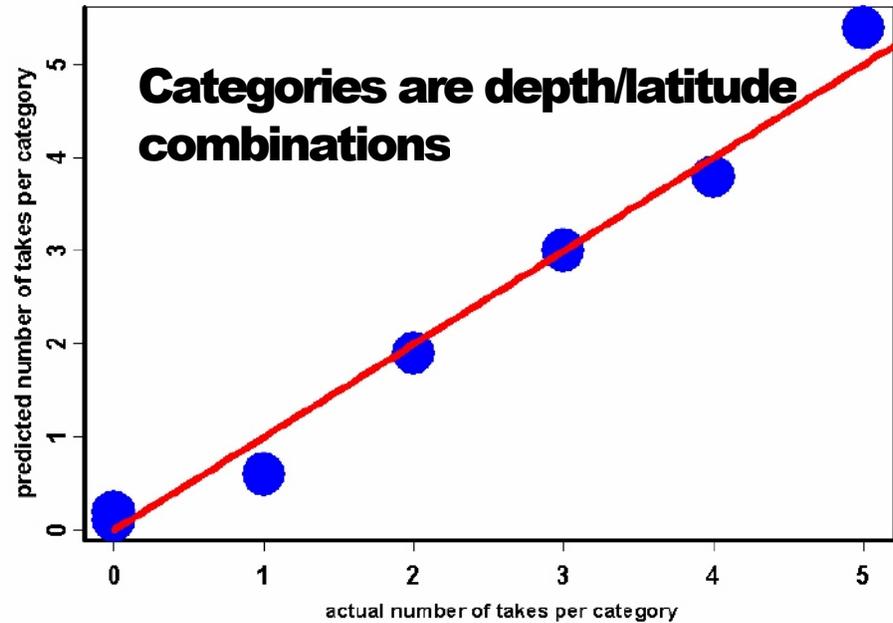
- **Used a quasi-Poisson logistic regression model**
- **Significant covariates were:**
 - **Latitude**
 - **Depth**
 - **Presence/absence of a kite panel**





Goodness-of-fit

ROC models that have area under the curve of > 90% are indicative of a very good fit.



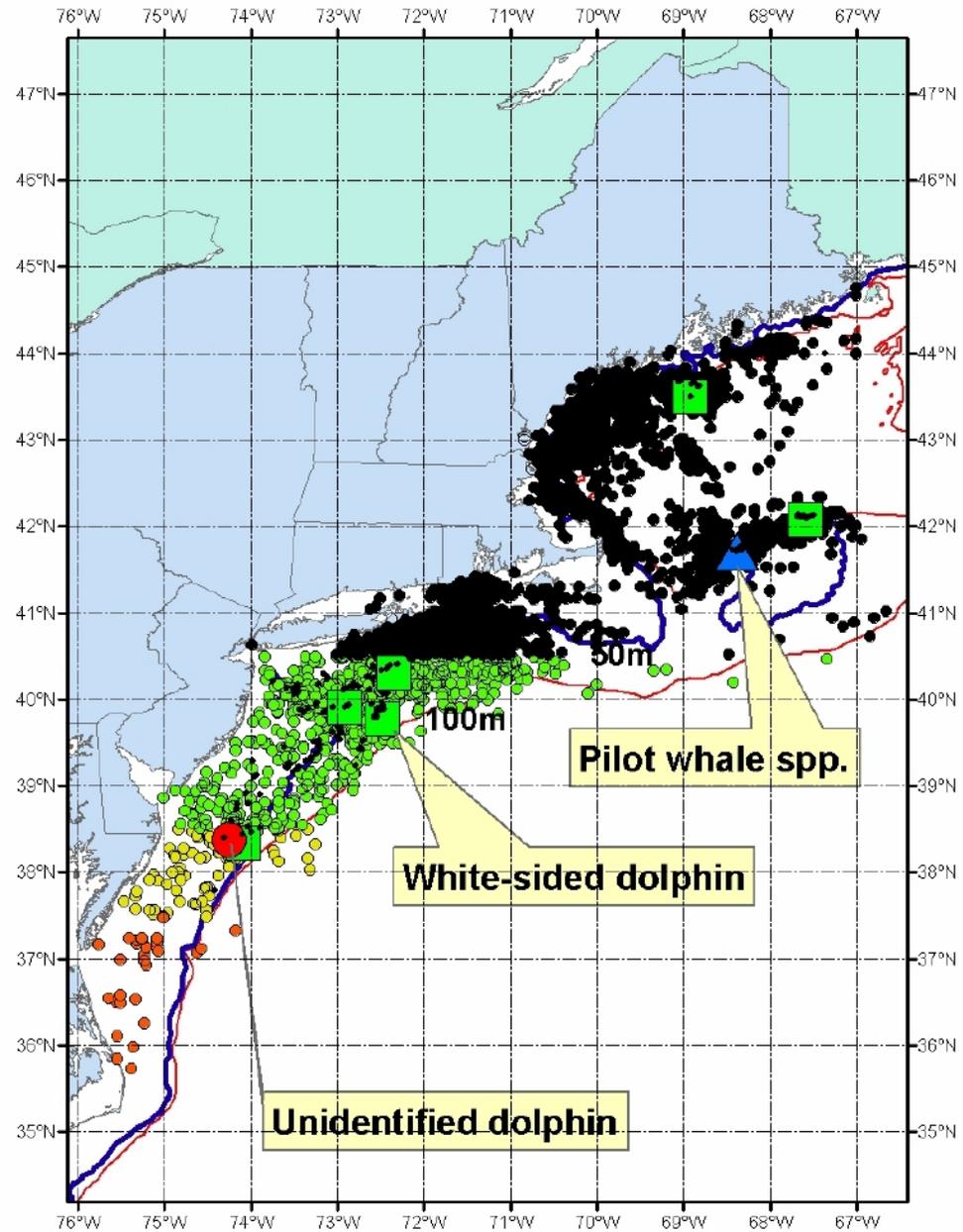
Latitude categories:

<37° 30'

37° 30' – 38° 30'

38° 30' – 40° 30'

>40° 30'

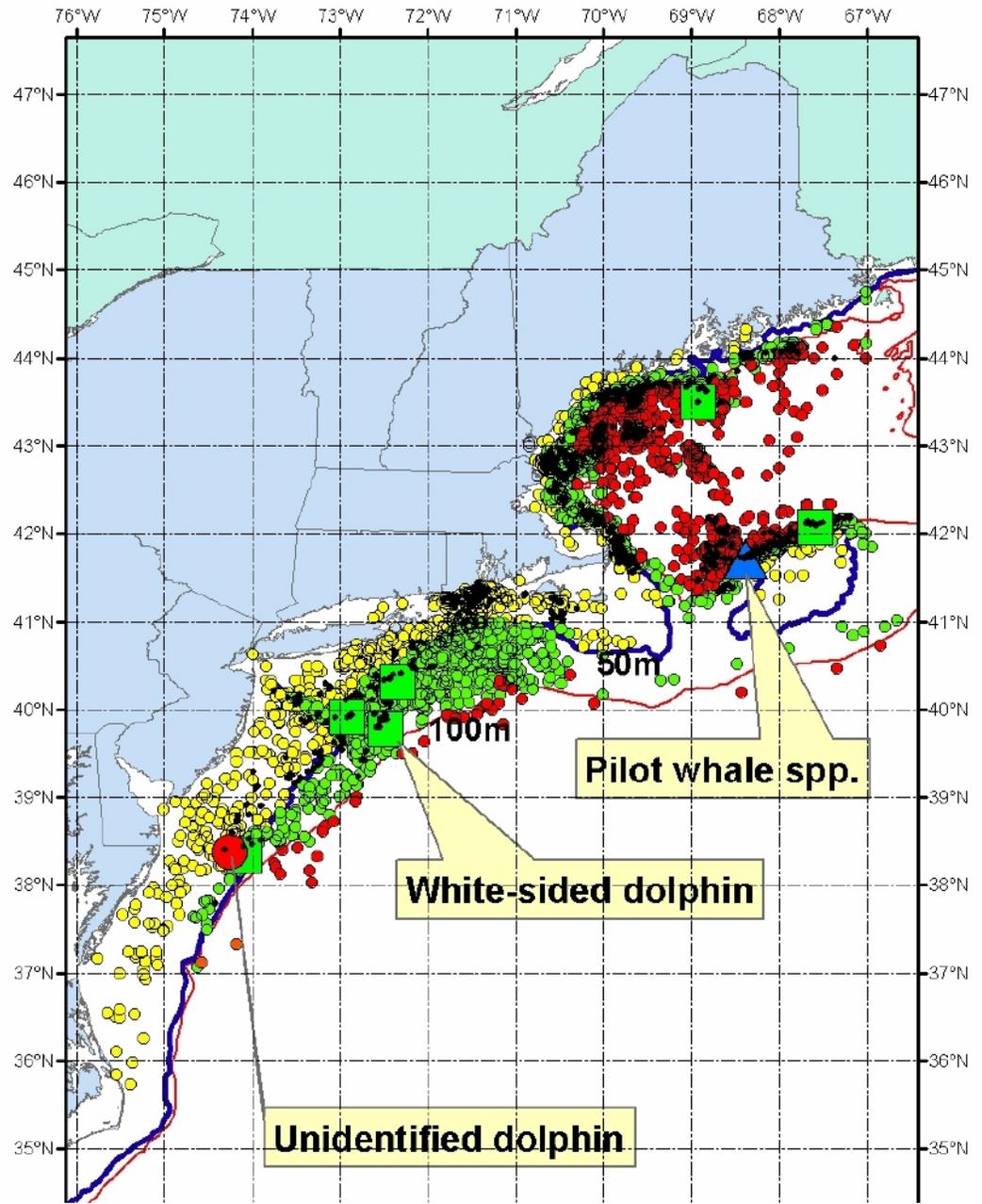


Depth categories:

0-50m

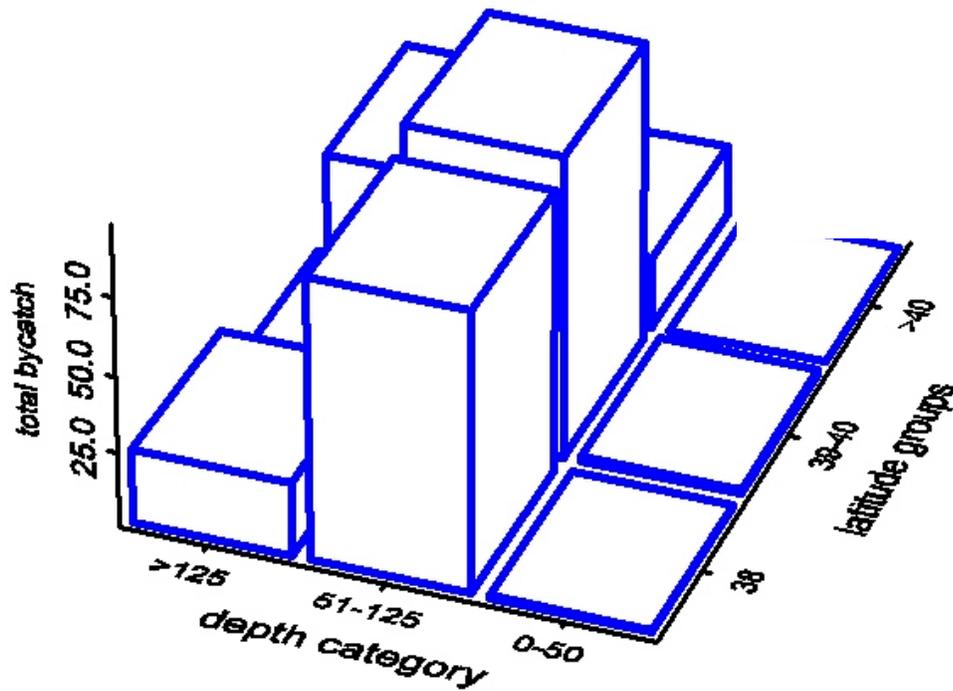
51-125m

>125m

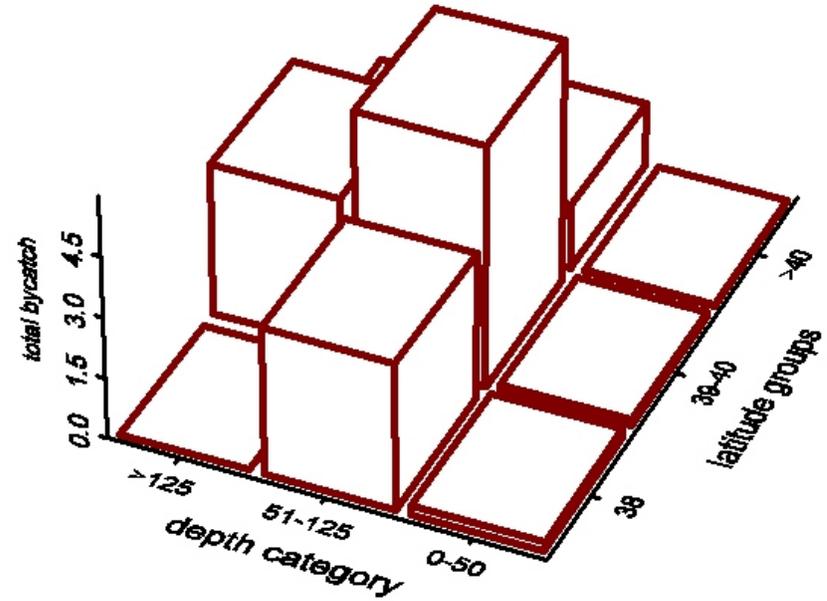


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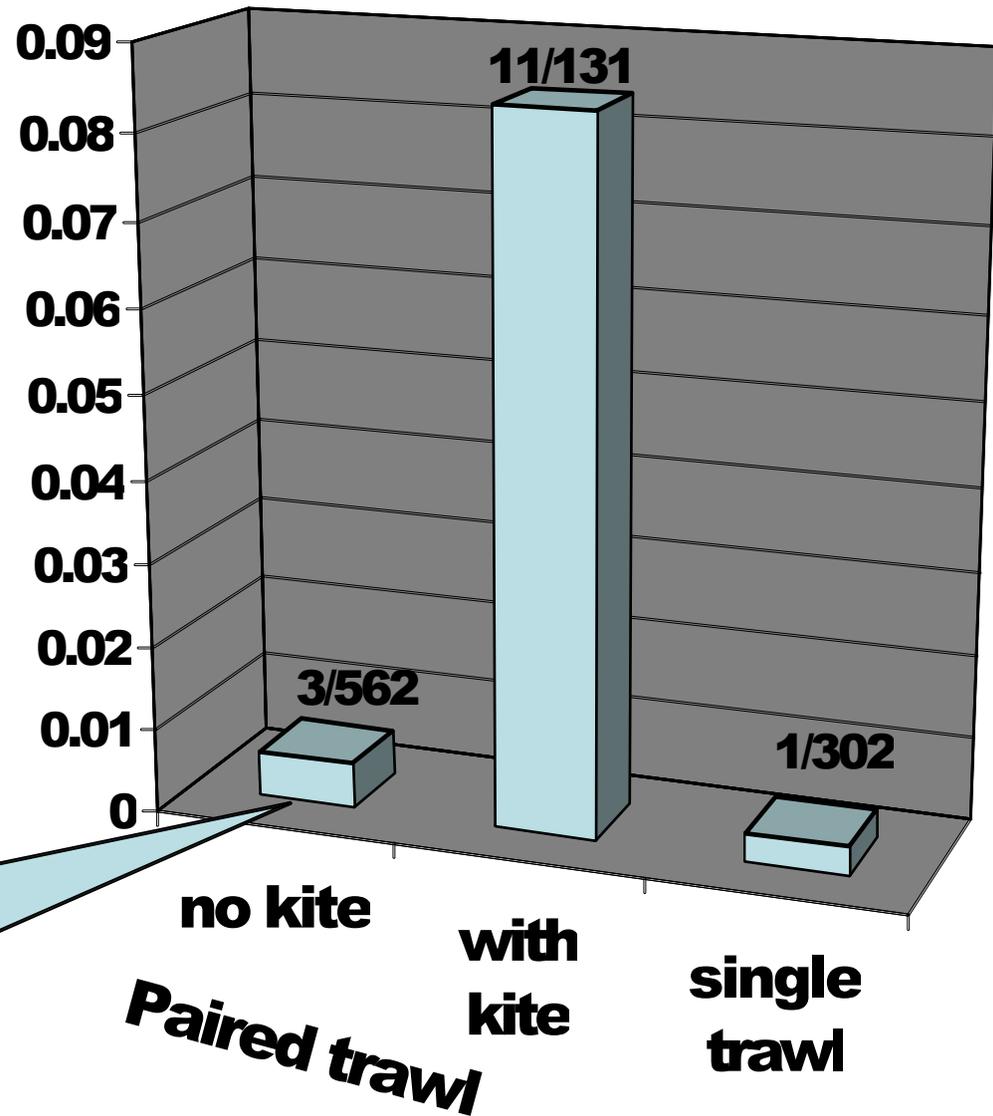
Paired Mid-water Trawls
 Total bycatch from 2003-05
 within each category



Single Mid-water Trawls
 Total bycatch from 2003-05
 within each category

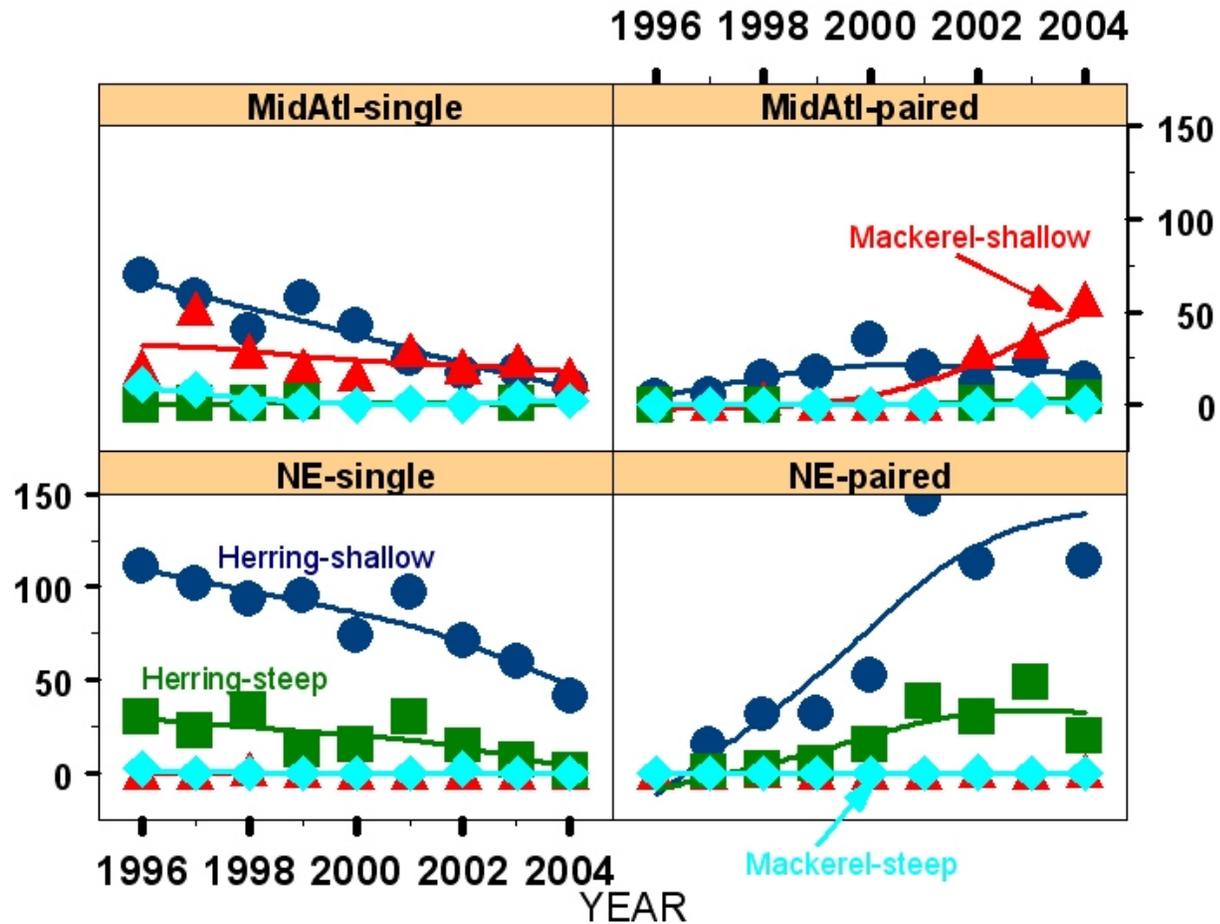


Bycatch rate for hauls with and without kite panels



3 observed takes per 562 observed hauls from pair trawls that did not have a kite panel

Patterns of fishing effort



Bycatch estimates in the mid-water trawl fisheries

Species	2003	2004	2005	Avg
White-sided D.	NE: 24	19	15	19
	MA: 51	105	97	84
Pilot W. spp.	NE: 1.9	1.4	1.1	1.5
	MA: 3.9	8.1	7.5	6.5



Questions?

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