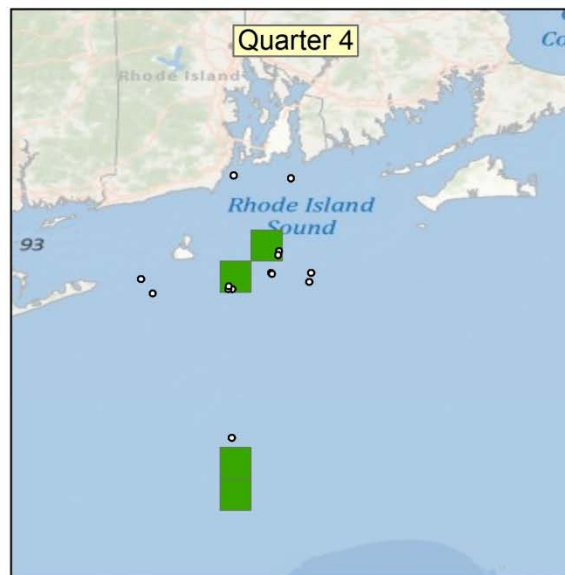
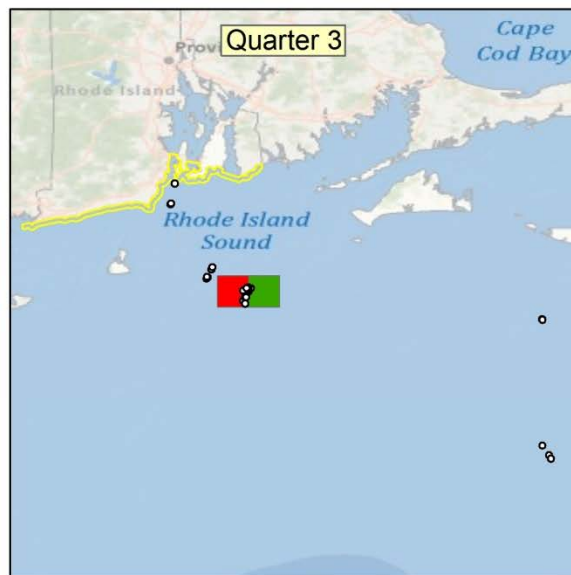
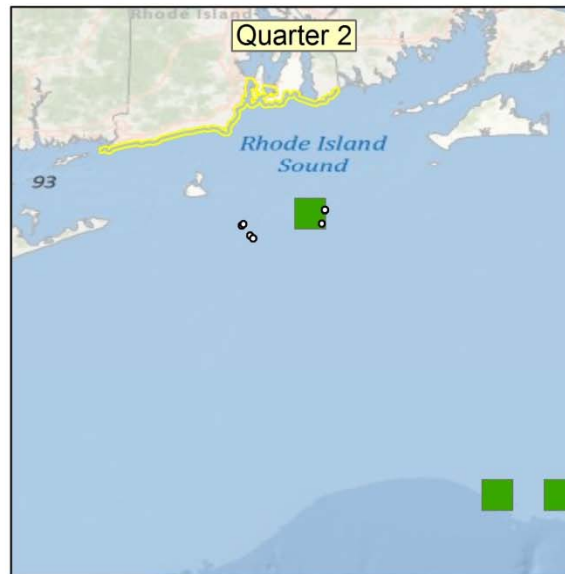
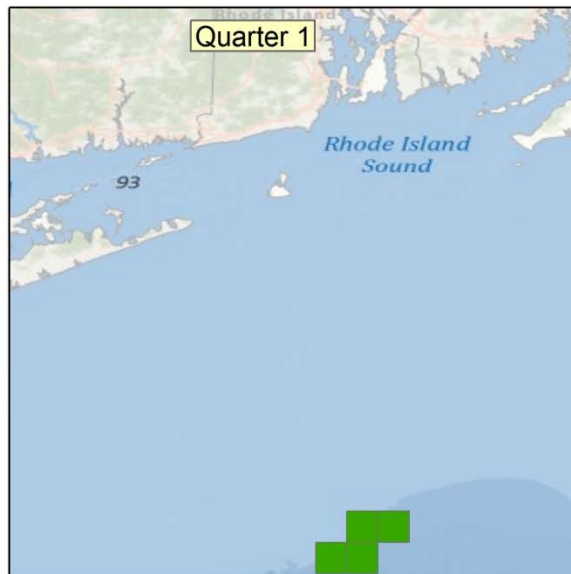


Summer Flounder Sector Allocation Pilot Program Comparative Analysis

2009 – 2011

Spatial Information and Discard Analysis

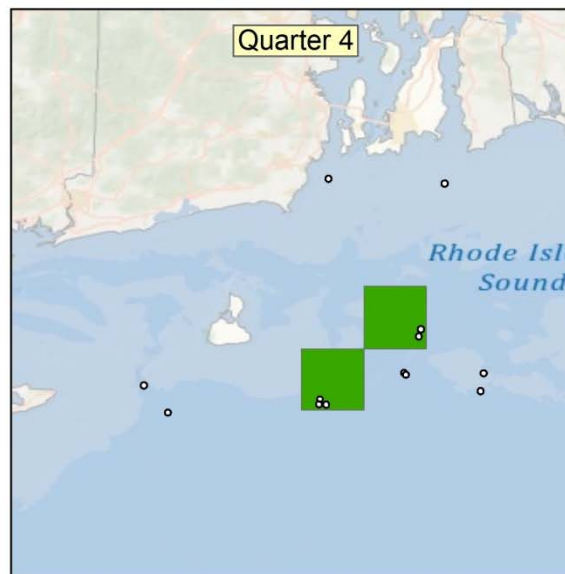
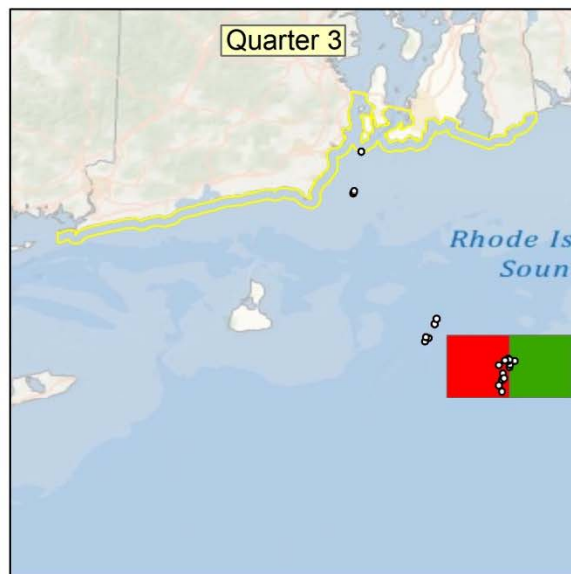
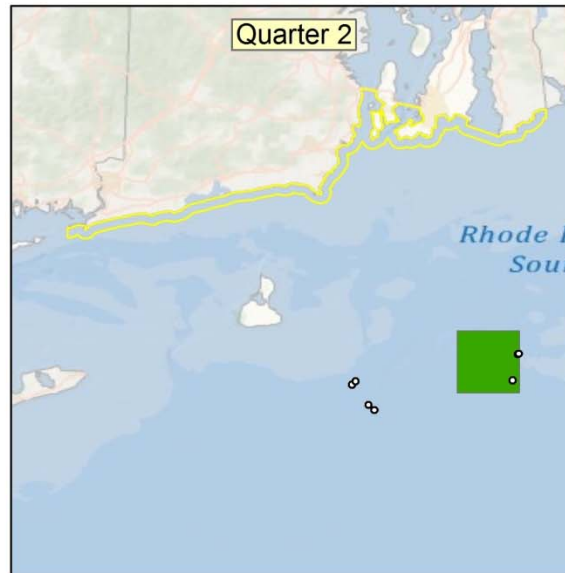
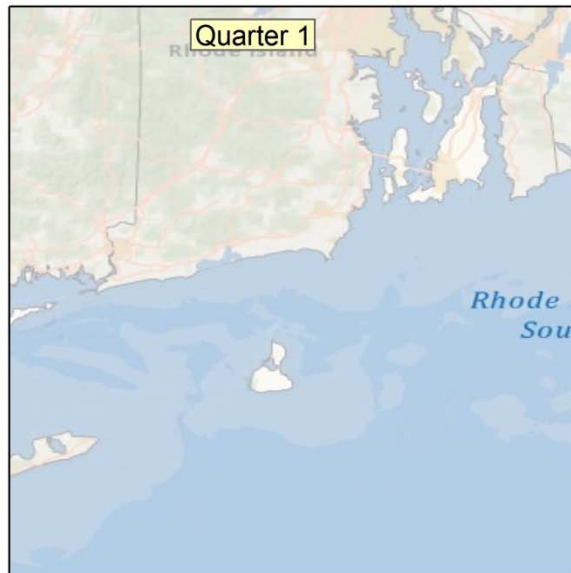
Silver Hake - 2009



Silver Hake Trawl 2009



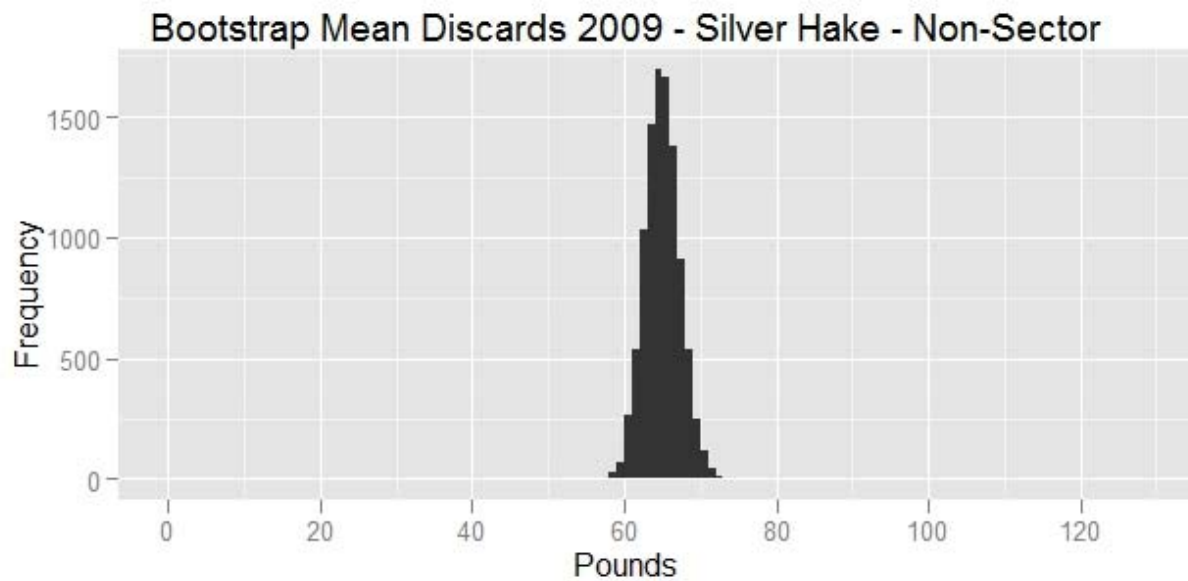
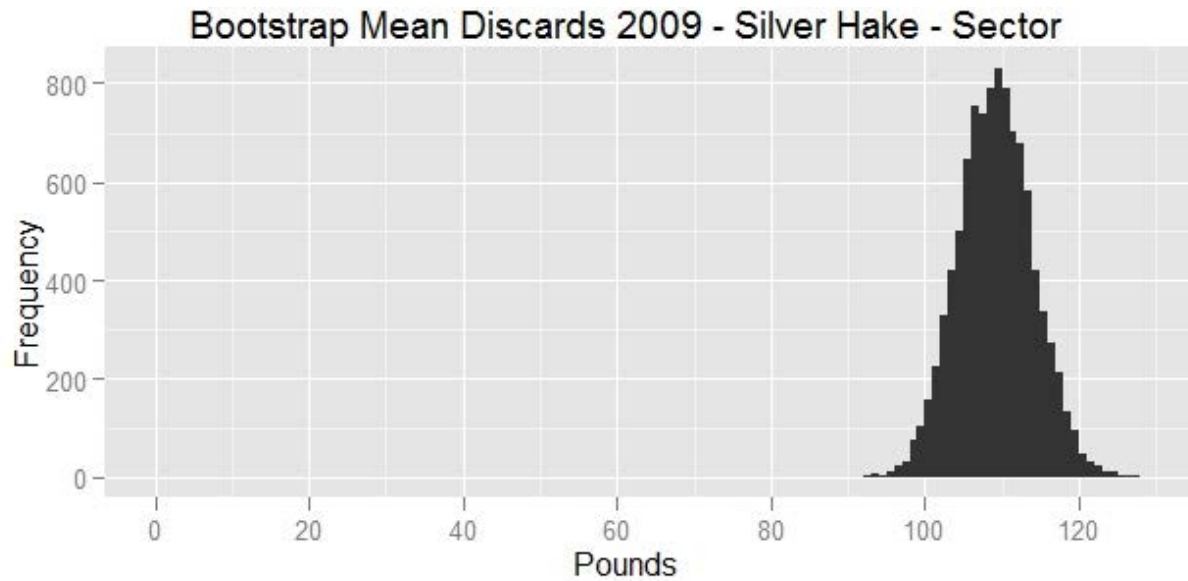
Silver Hake – Zoomed in - 2009



Silver Hake Trawl 2009



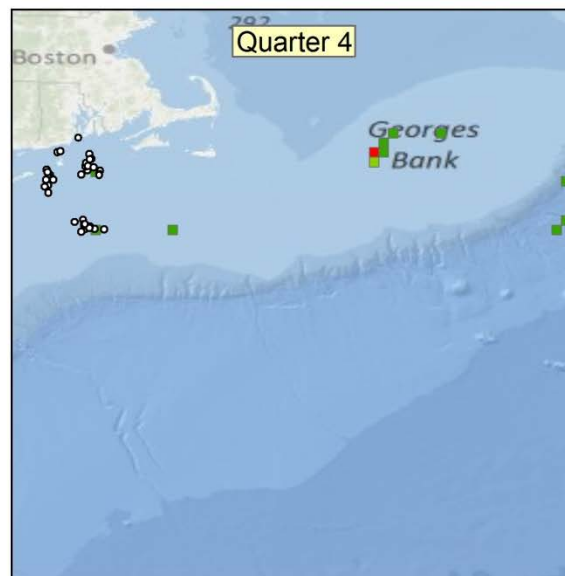
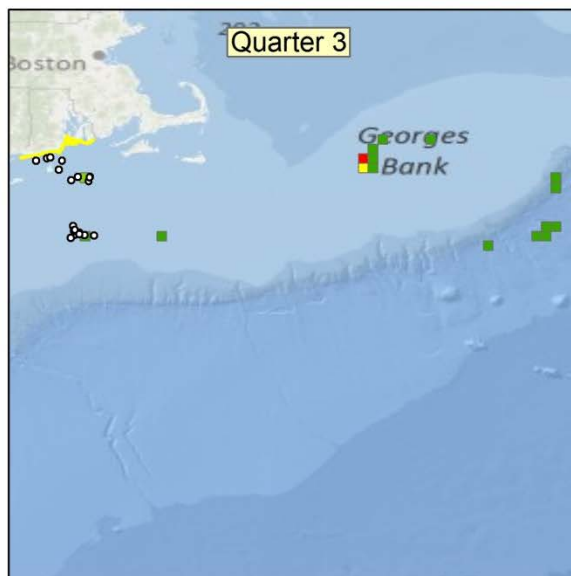
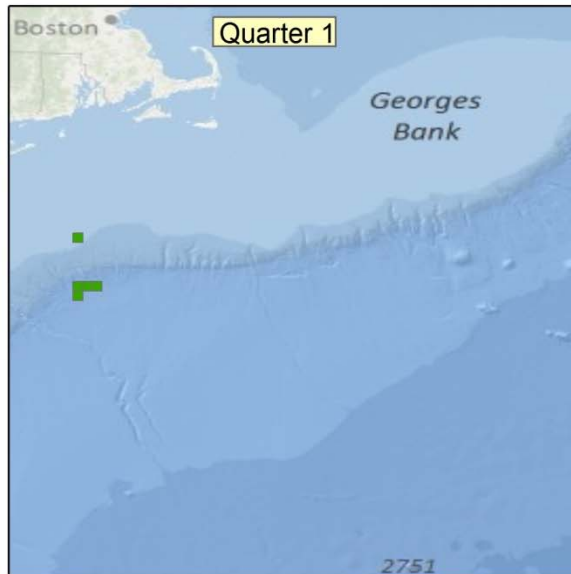
Silver Hake – Discards - 2009



Silver Hake – Discards - 2009

Quantiles					
5%		50%		95%	
Sector	Non Sector	Sector	Non Sector	Sector	Non Sector
101.2	61.4	109.2	64.9	117.3	68.8
Kruskal-Wallis Rank Sums Test					
P<0.001					

Silver Hake - 2010



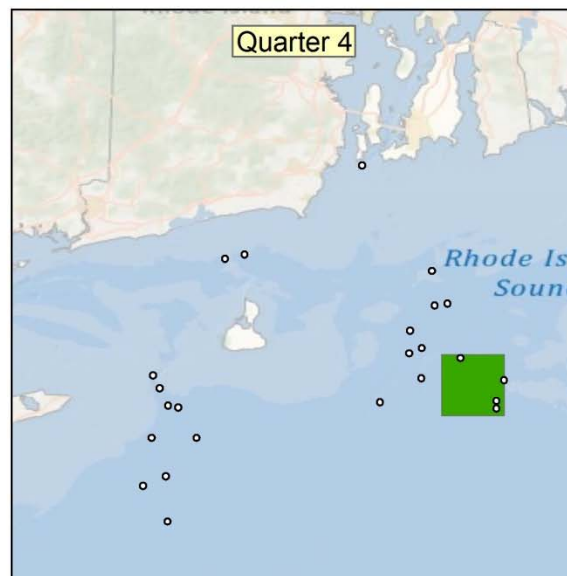
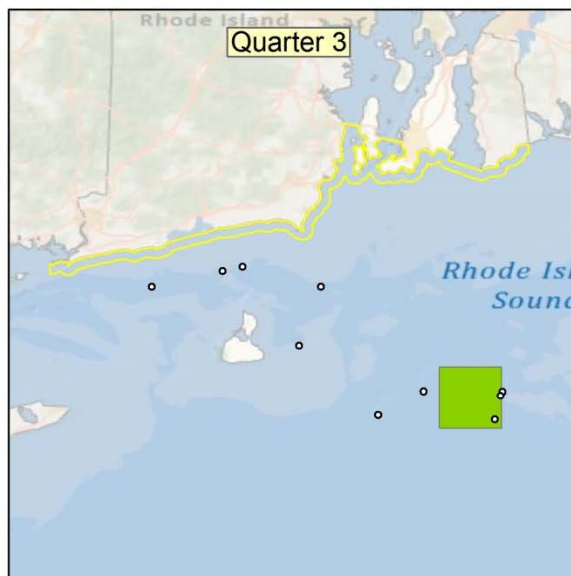
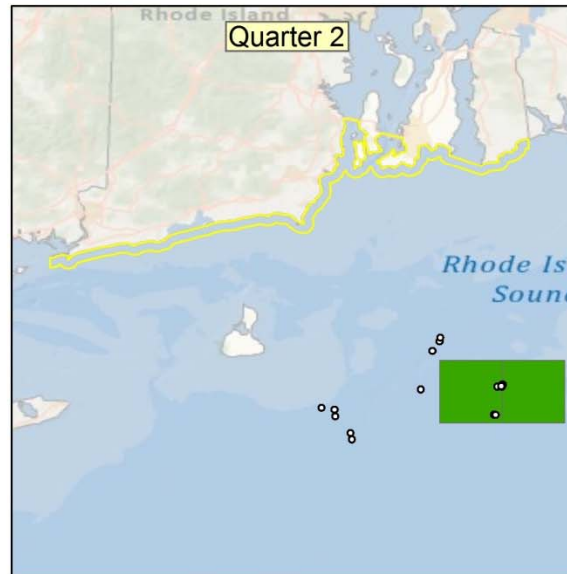
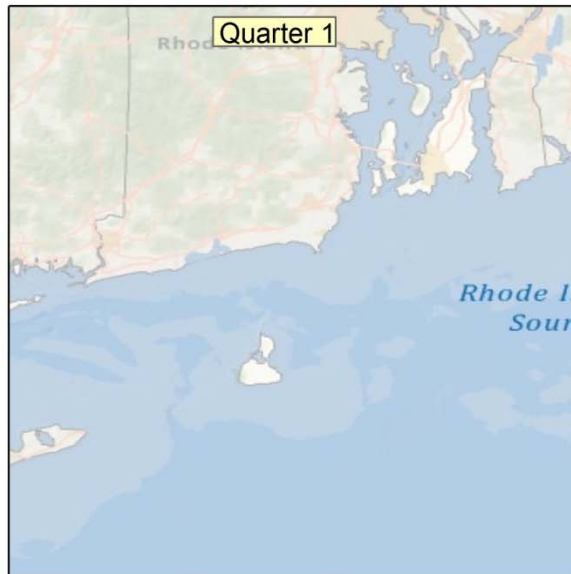
Silver Hake Trawl 2010



Miles
100 50 0 100



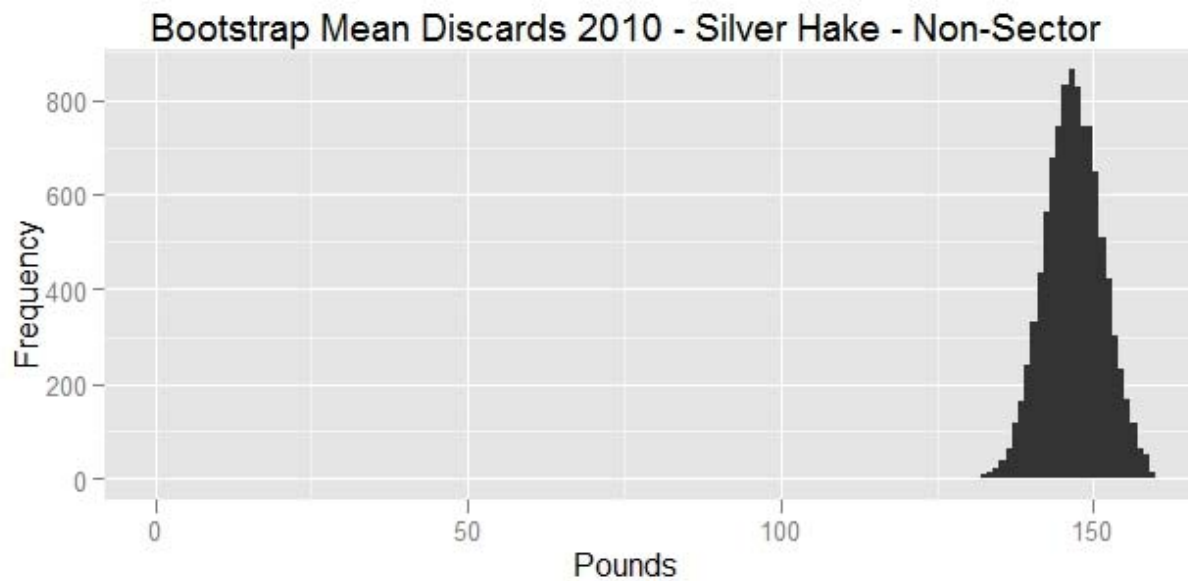
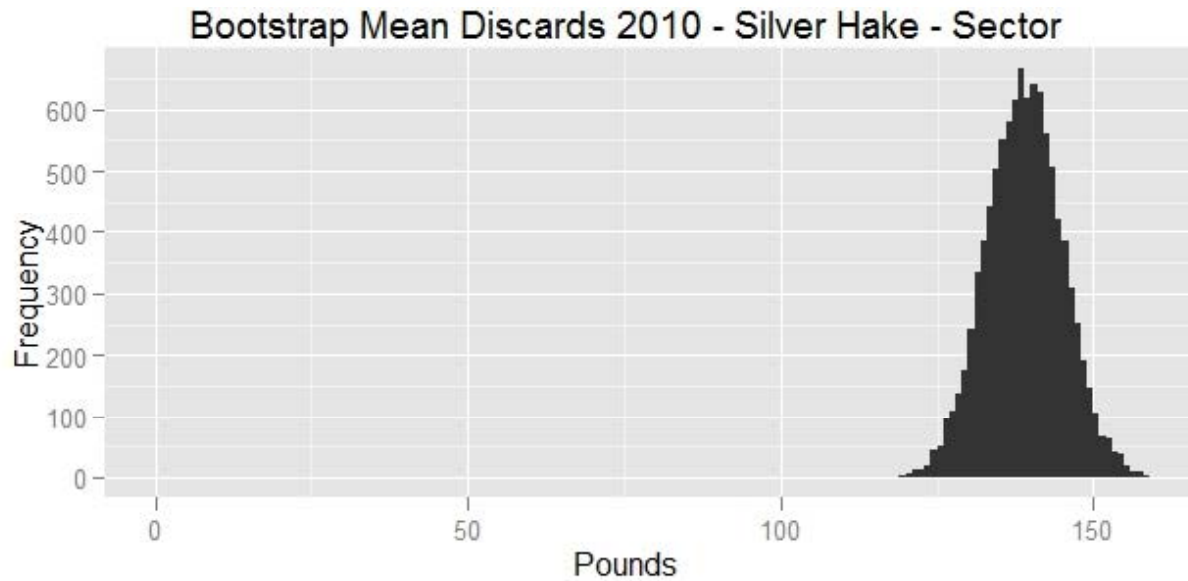
Silver Hake – Zoomed in - 2010



Silver Hake Trawl 2010



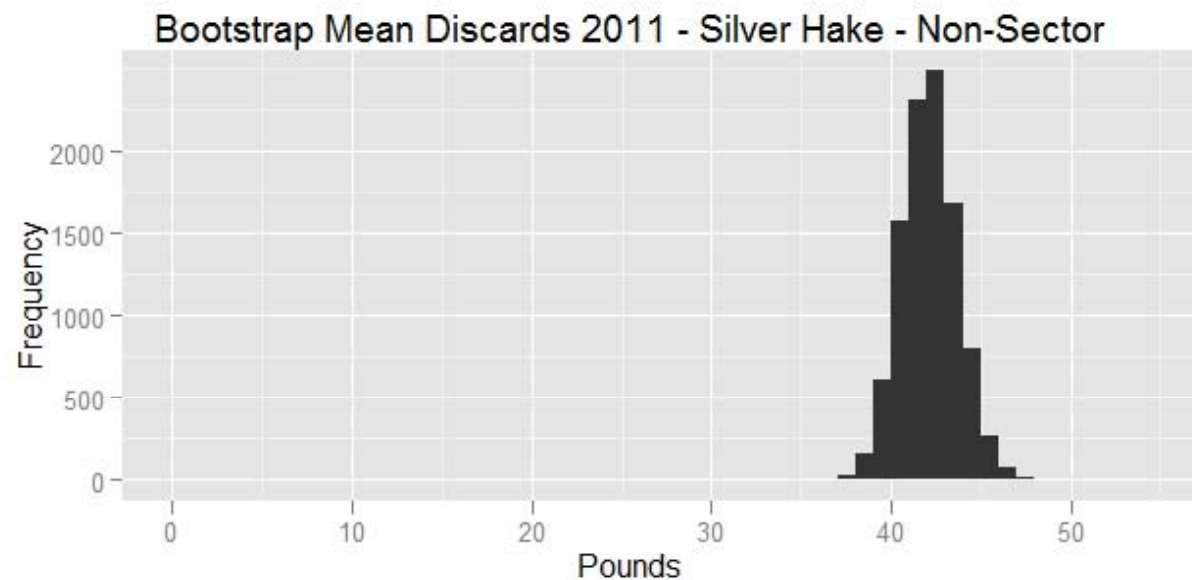
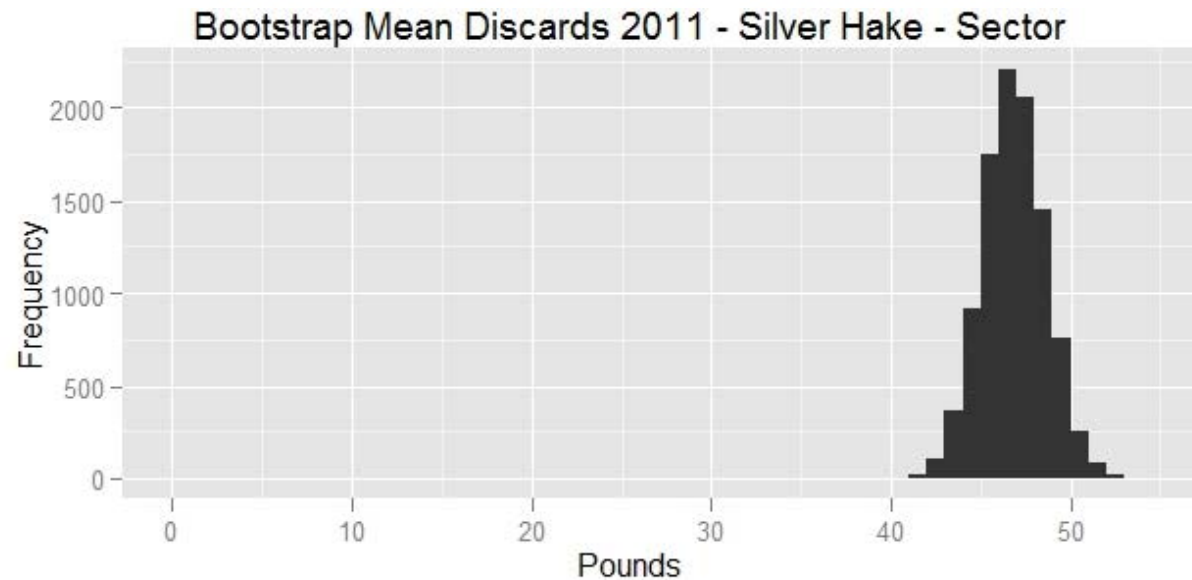
Silver Hake – Discards - 2010



Silver Hake – Discards - 2010

Quantiles					
5%		50%		95%	
Sector	Non Sector	Sector	Non Sector	Sector	Non Sector
129.1	139.3	139.0	146.9	149.0	154.8
Kruskal-Wallis Rank Sums Test					
P=0.002					

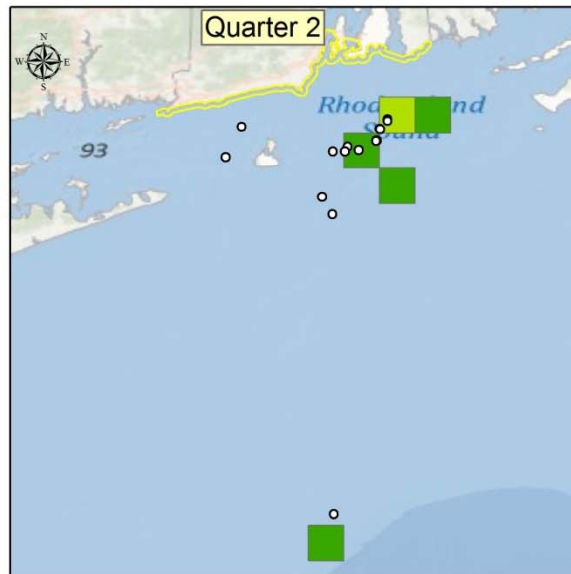
Silver Hake – Discards - 2011



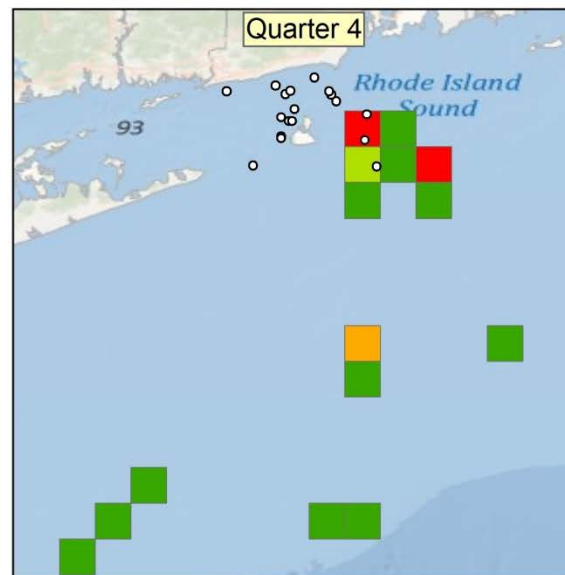
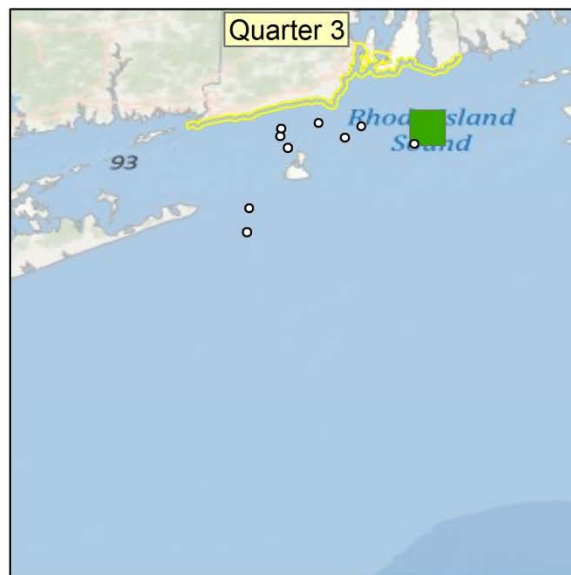
Silver Hake – Discards - 2011

Quantiles					
5%		50%		95%	
Sector	Non Sector	Sector	Non Sector	Sector	Non Sector
44.0	39.6	46.8	42.1	49.7	44.7
Kruskal-Wallis Rank Sums Test					
P<0.0001					

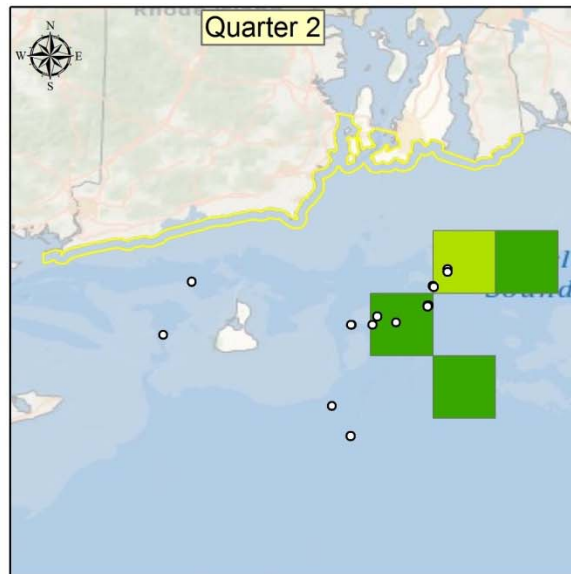
Scup - 2009



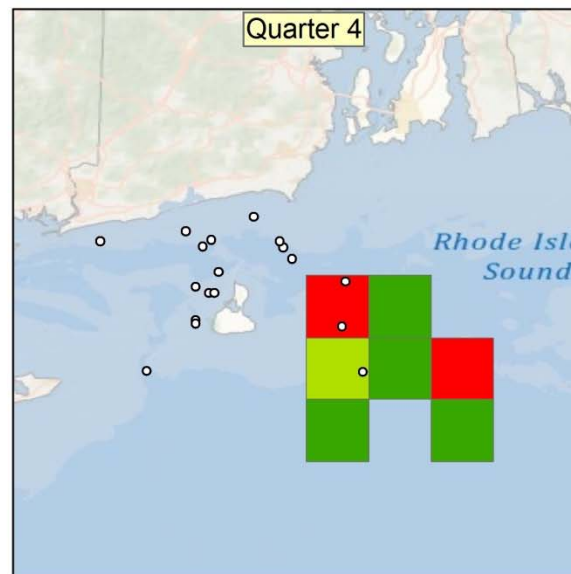
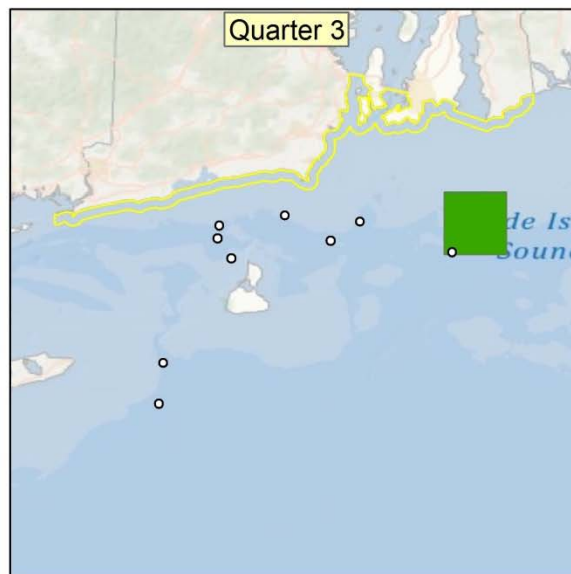
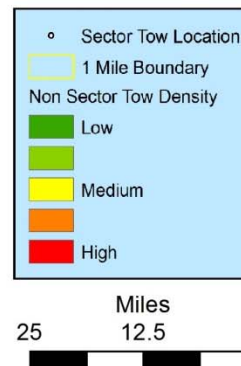
Scup Trawl 2009



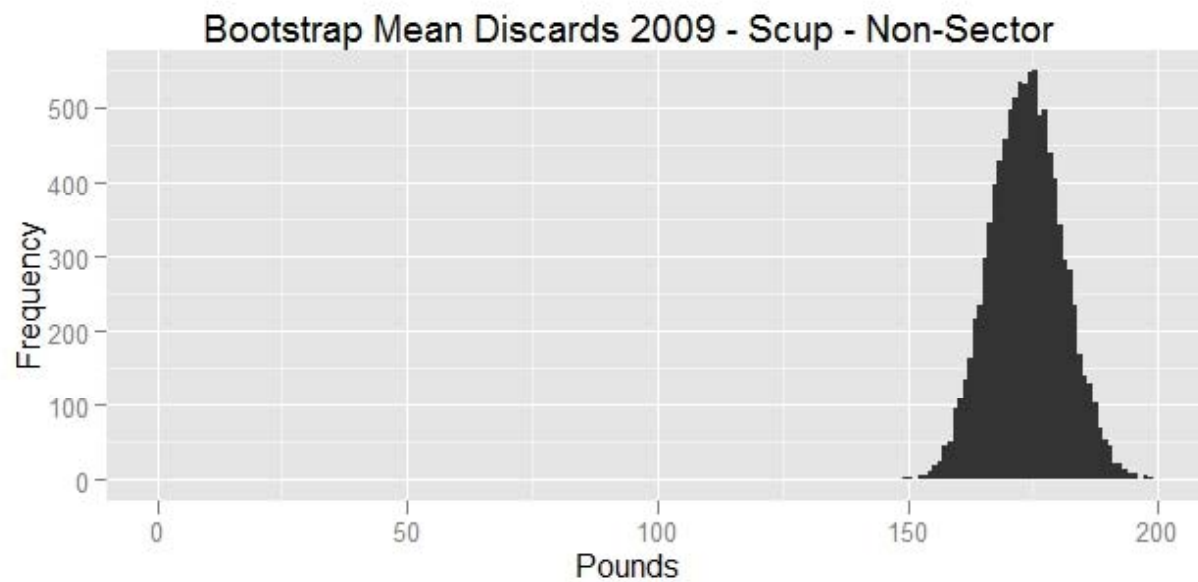
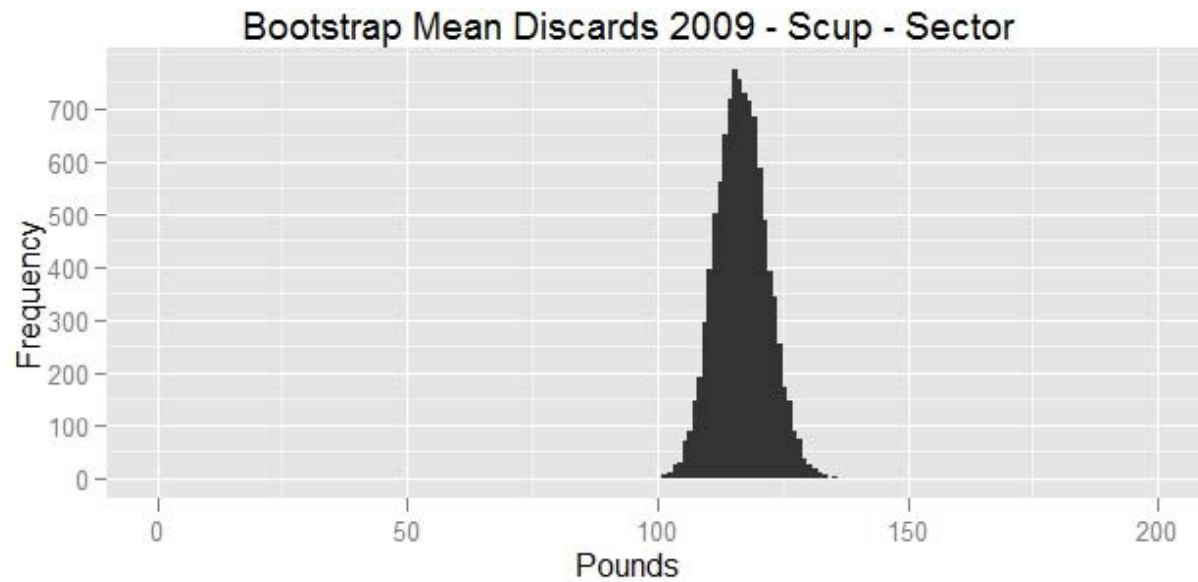
Scup – Zoomed in - 2009



Scup Trawl 2009



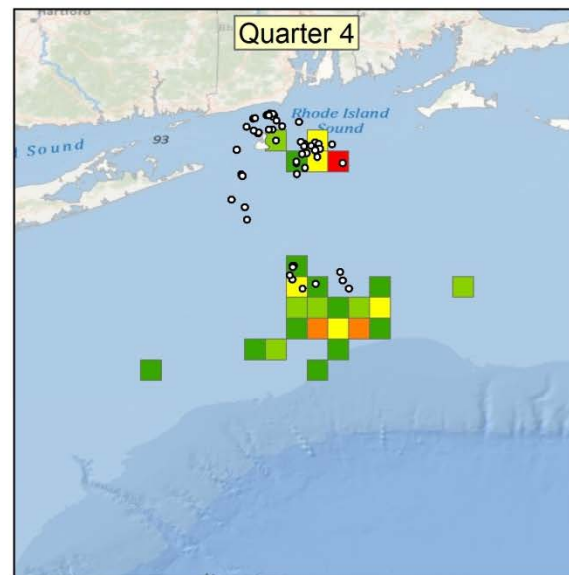
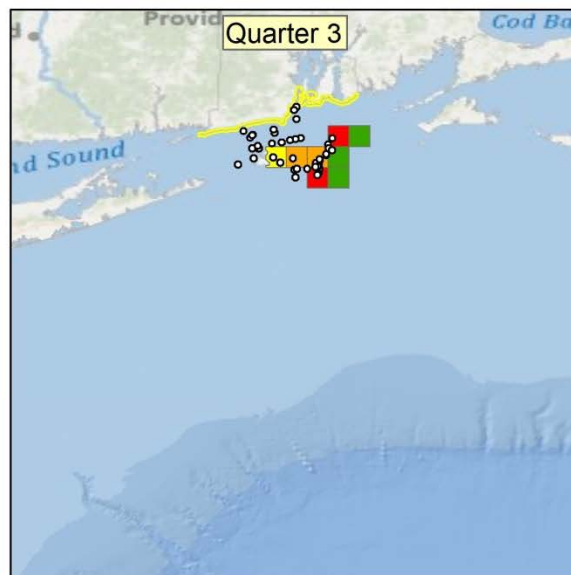
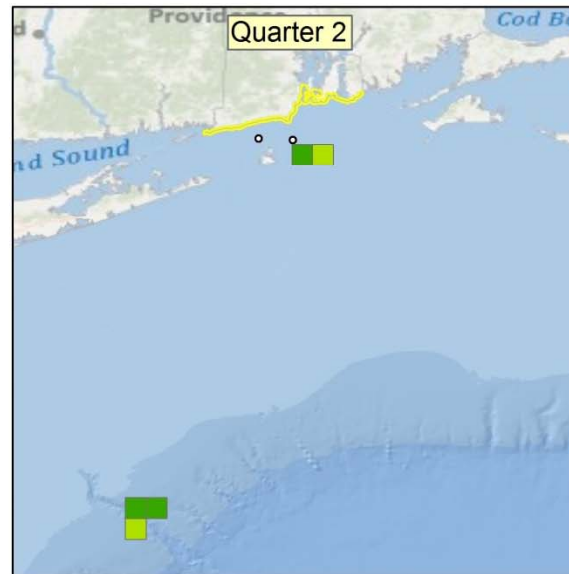
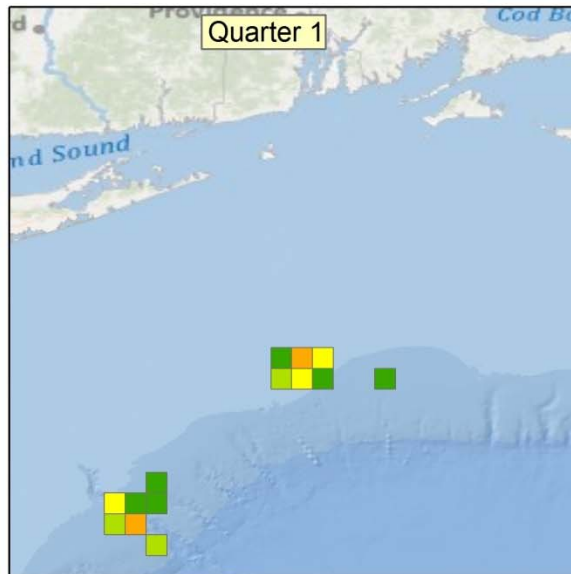
Scup – Discards - 2009



Scup – Discards - 2009

Quantiles					
5%		50%		95%	
Sector	Non Sector	Sector	Non Sector	Sector	Non Sector
108.7	162.0	116.7	173.8	125.5	185.9
Kruskal-Wallis Rank Sums Test					
P=0.498					

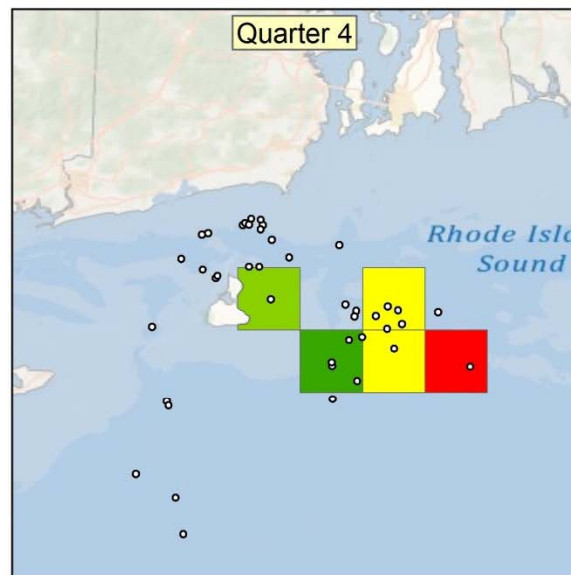
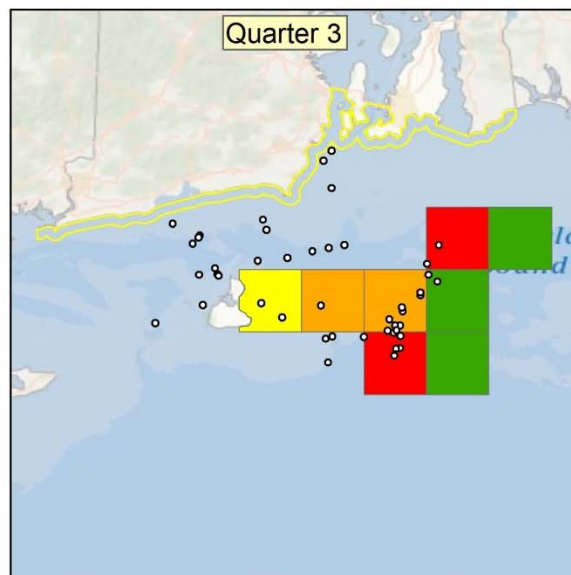
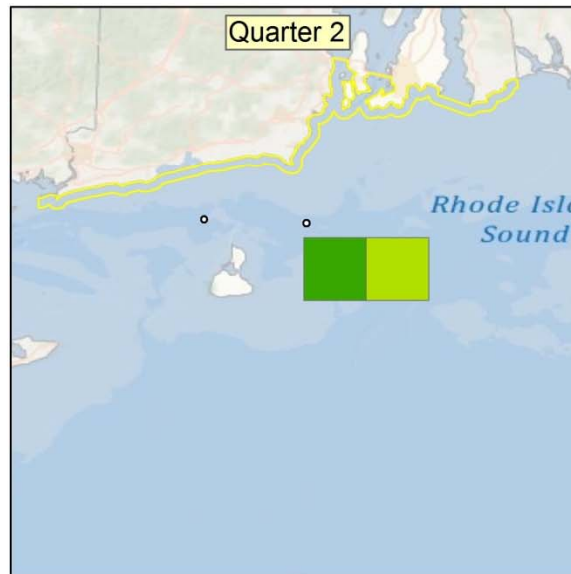
Scup - 2010



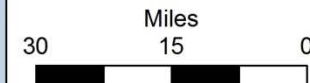
Scup Trawl 2010



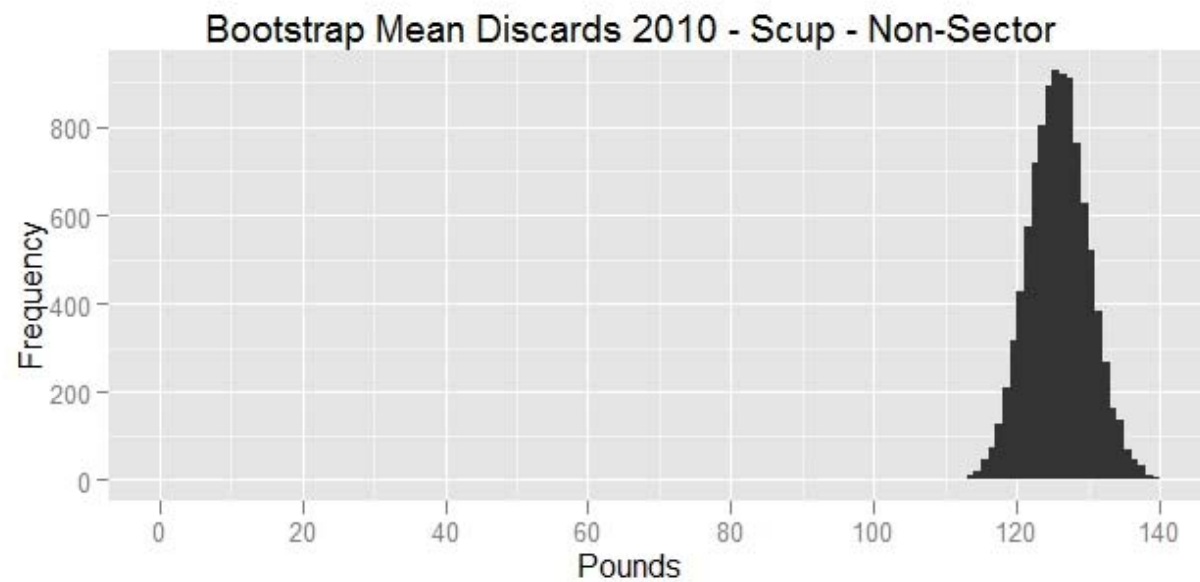
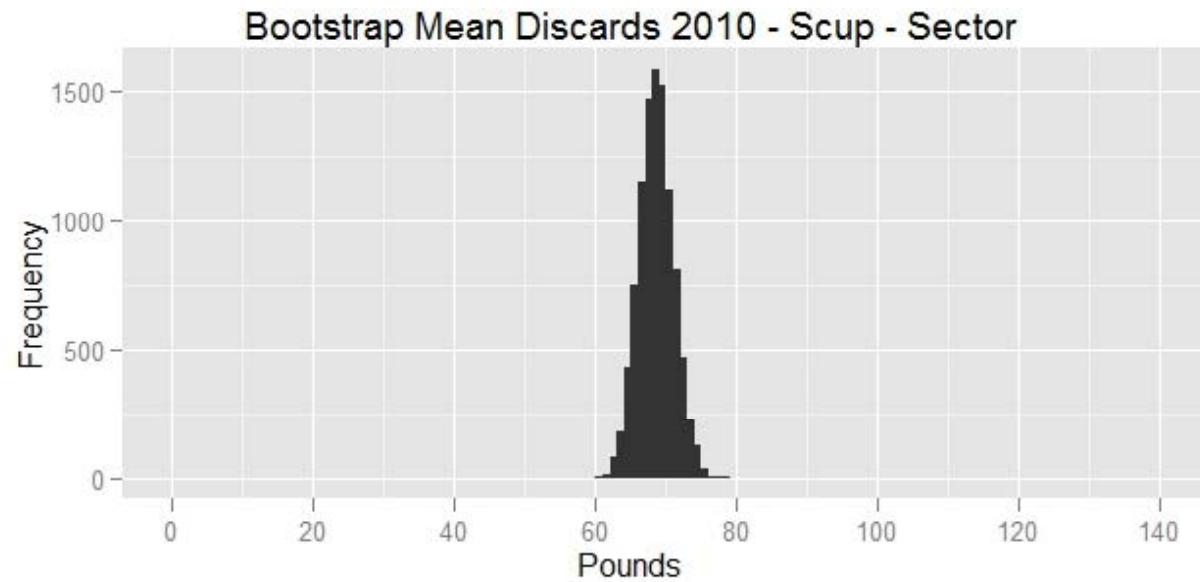
Scup – Zoomed in - 2010



Scup Trawl 2010



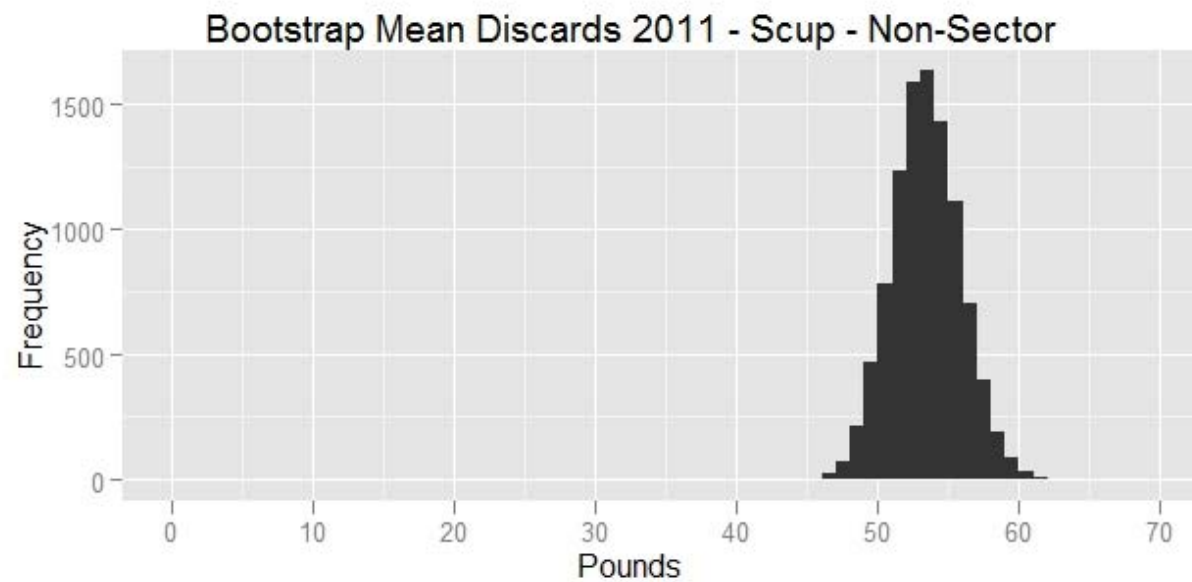
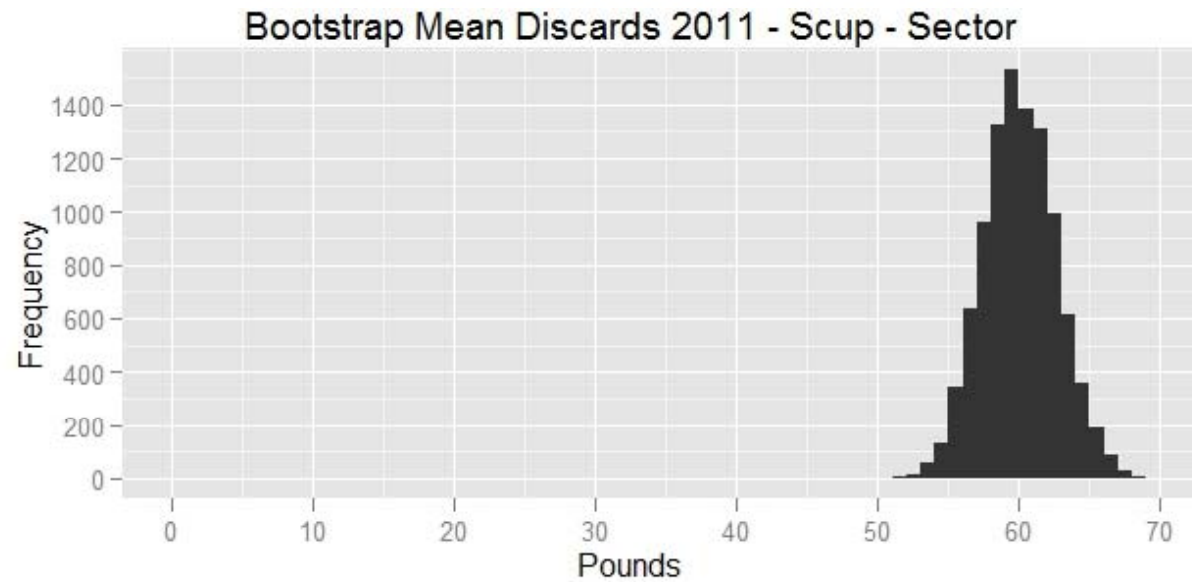
Scup – Discards - 2010



Scup – Discards - 2010

Quantiles					
5%		50%		95%	
Sector	Non Sector	Sector	Non Sector	Sector	Non Sector
64.6	119.1	68.6	125.8	72.7	132.8
Kruskal-Wallis Rank Sums Test					
P=0.292					

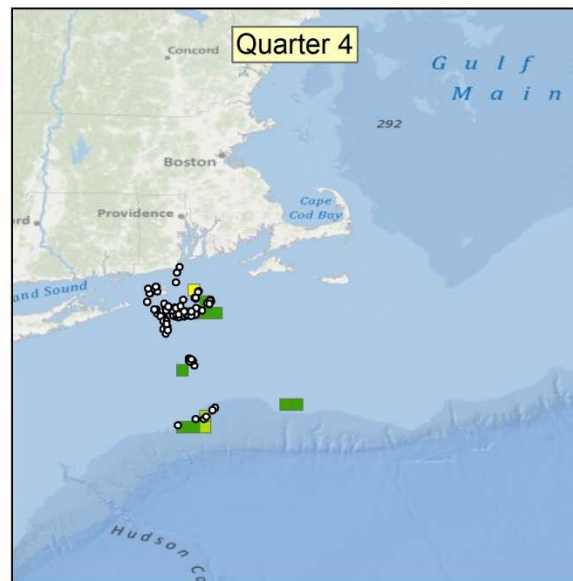
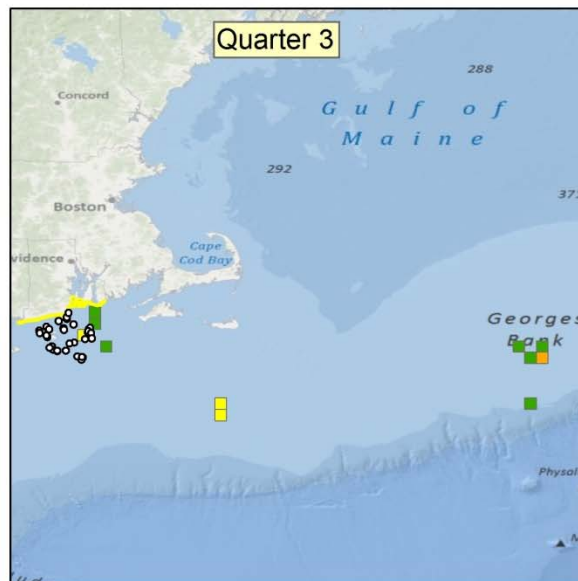
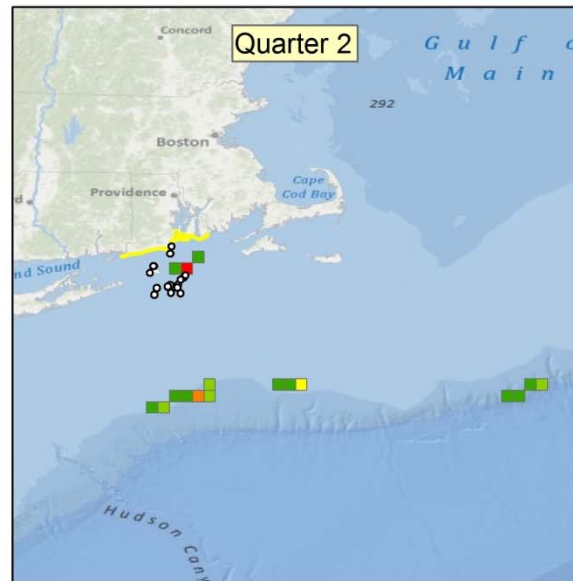
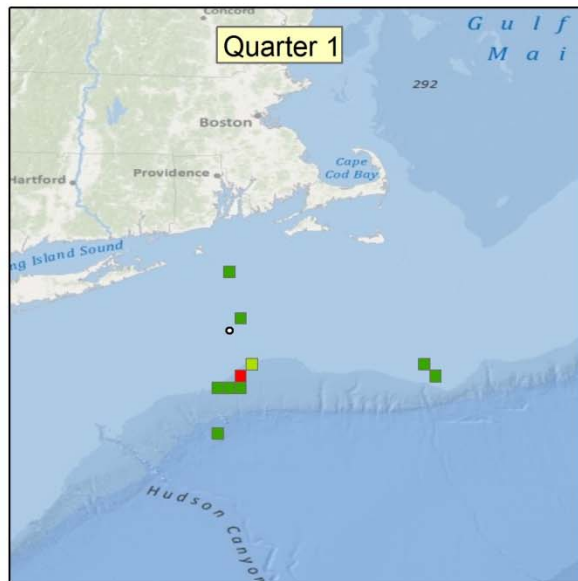
Scup – Discards - 2011



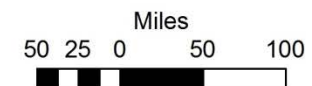
Scup – Discards - 2011

Quantiles					
5%		50%		95%	
Sector	Non Sector	Sector	Non Sector	Sector	Non Sector
55.9	49.5	60.0	53.4	64.4	57.5
Kruskal-Wallis Rank Sums Test					
P=0.004					

Summer Flounder - 2009

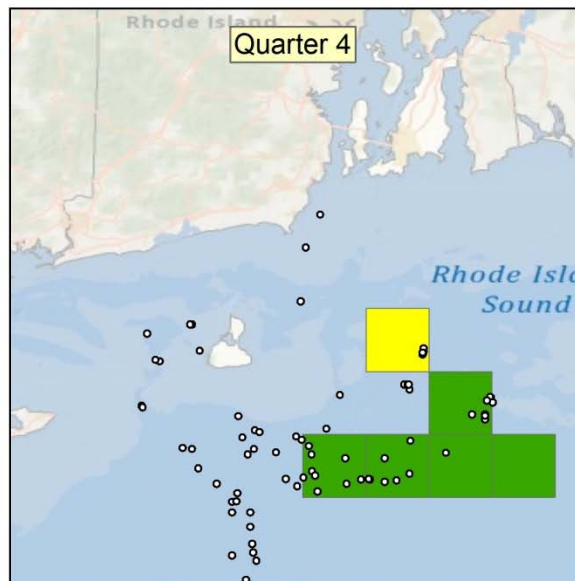
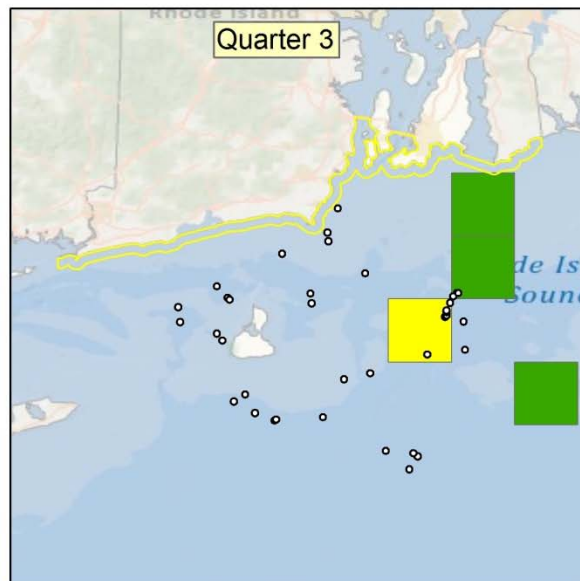
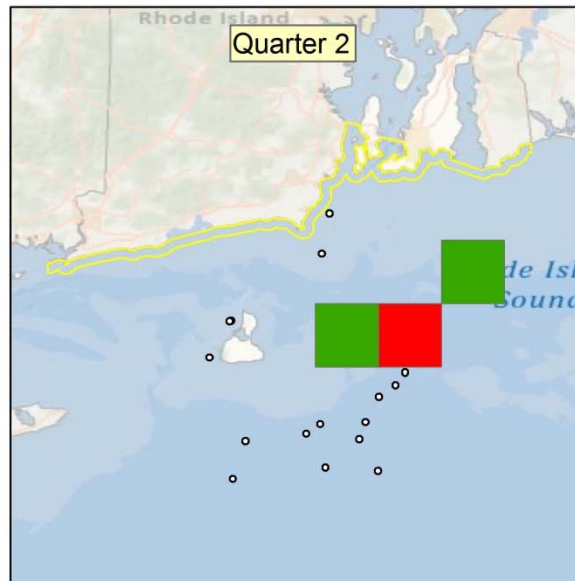
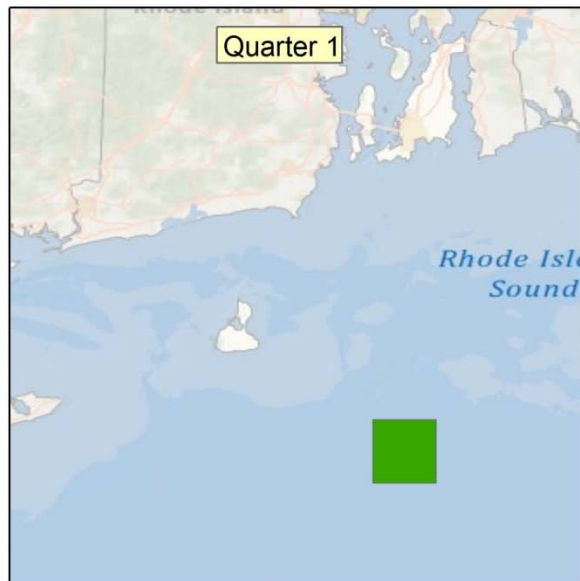


Summer Flounder
Trawl 2009



- Sector Tow Location
- 1 Mile Boundary
- Non Sector Tow Density
 - Low
 - Medium
 - High

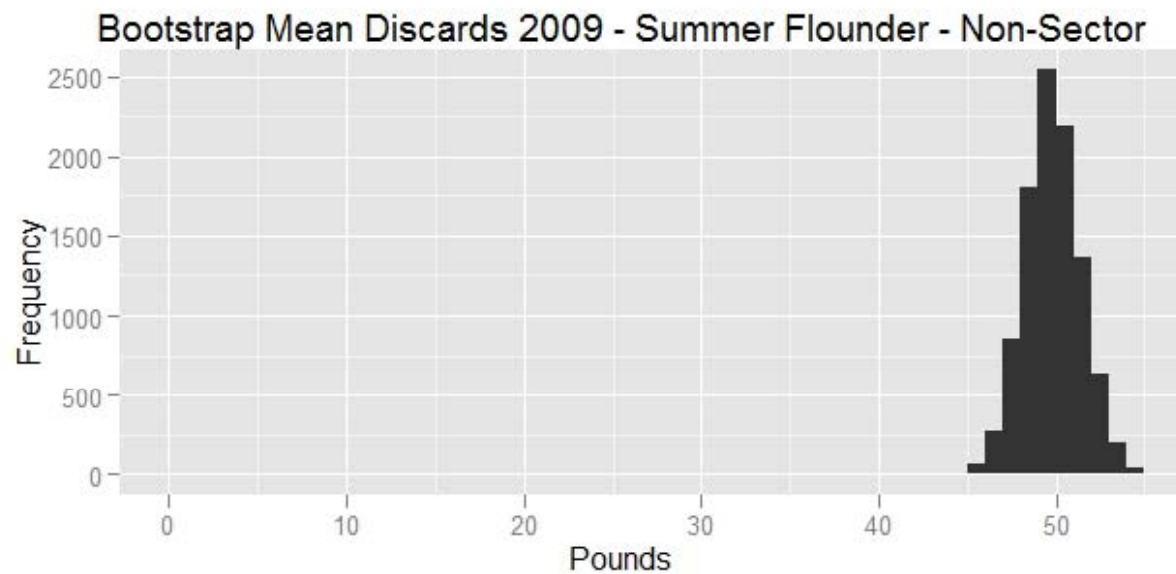
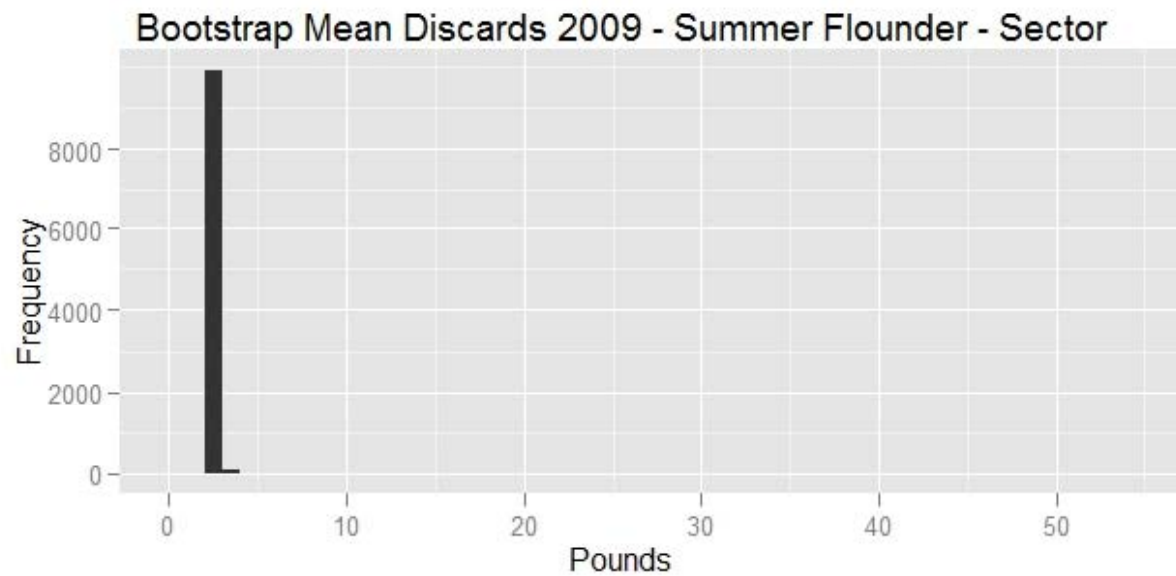
Summer Flounder – Zoomed in - 2009



Summer Flounder
Trawl 2009



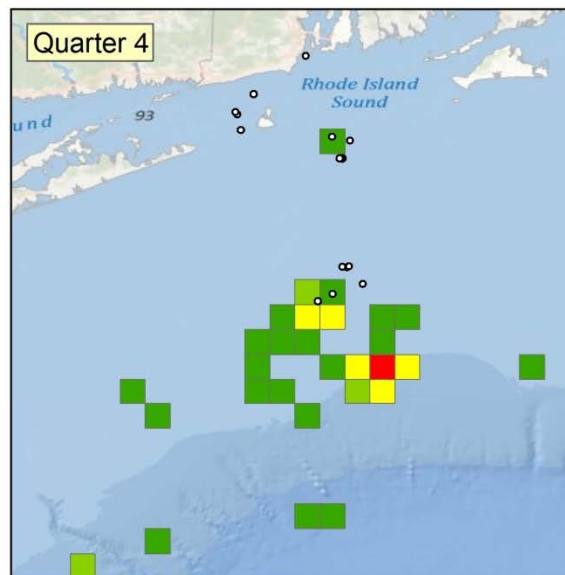
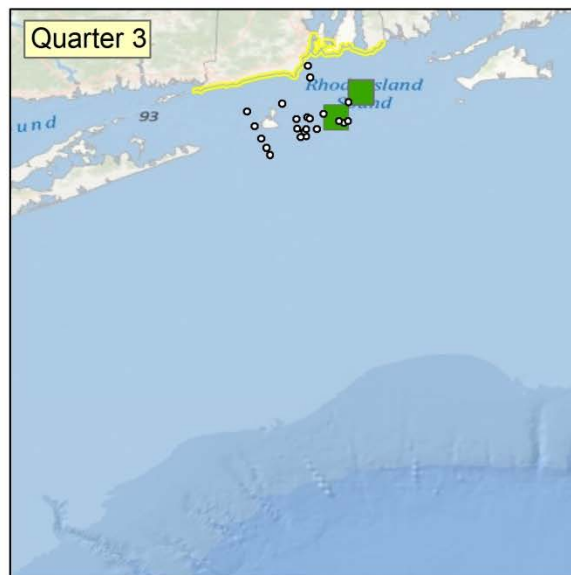
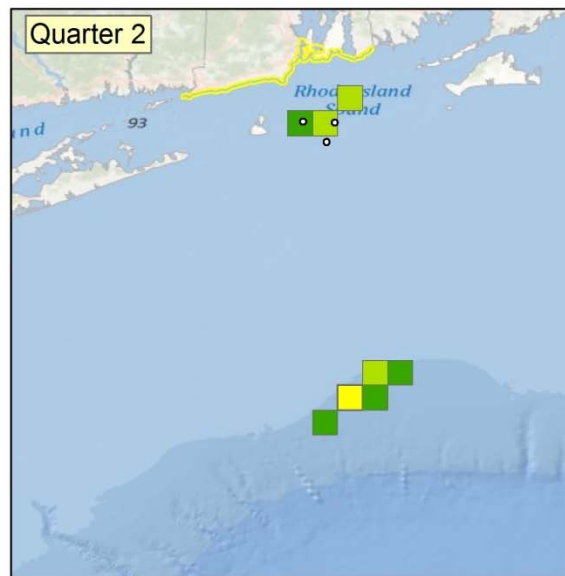
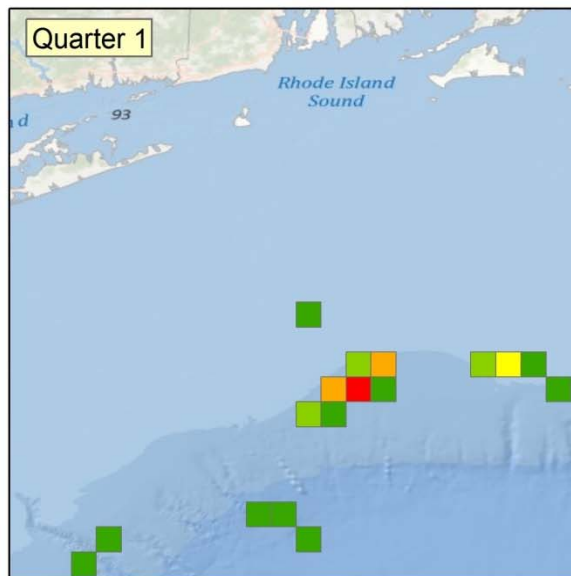
Summer Flounder – Discards - 2009



Summer Flounder – Discards - 2009

Quantiles					
5%		50%		95%	
Sector	Non Sector	Sector	Non Sector	Sector	Non Sector
2.4	47.3	2.6	49.8	2.9	52.5
Kruskal-Wallis Rank Sums Test					
P<0.0001					

Summer Flounder - 2010



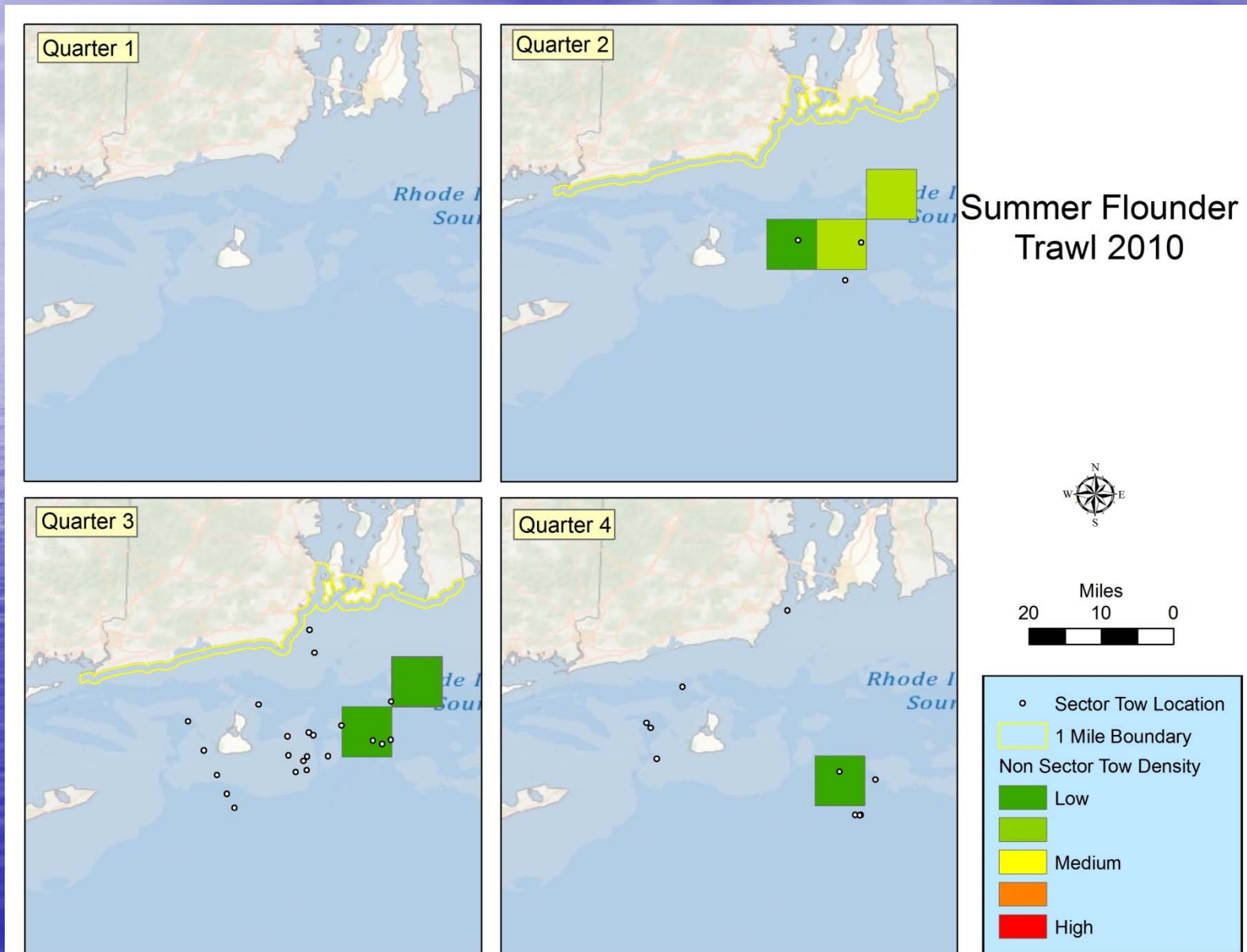
Summer Flounder
Trawl 2010



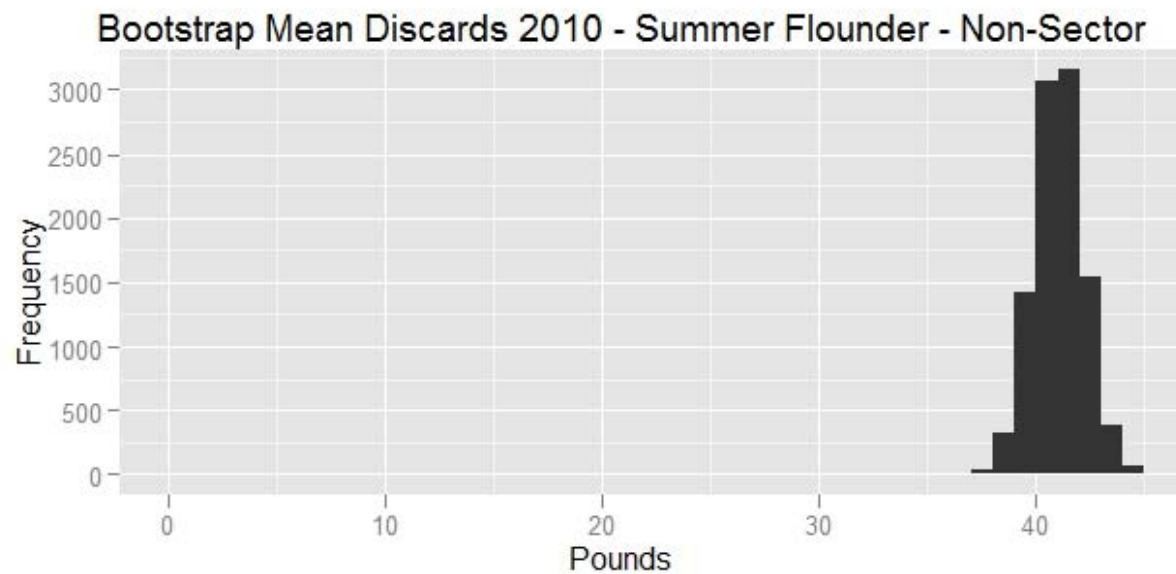
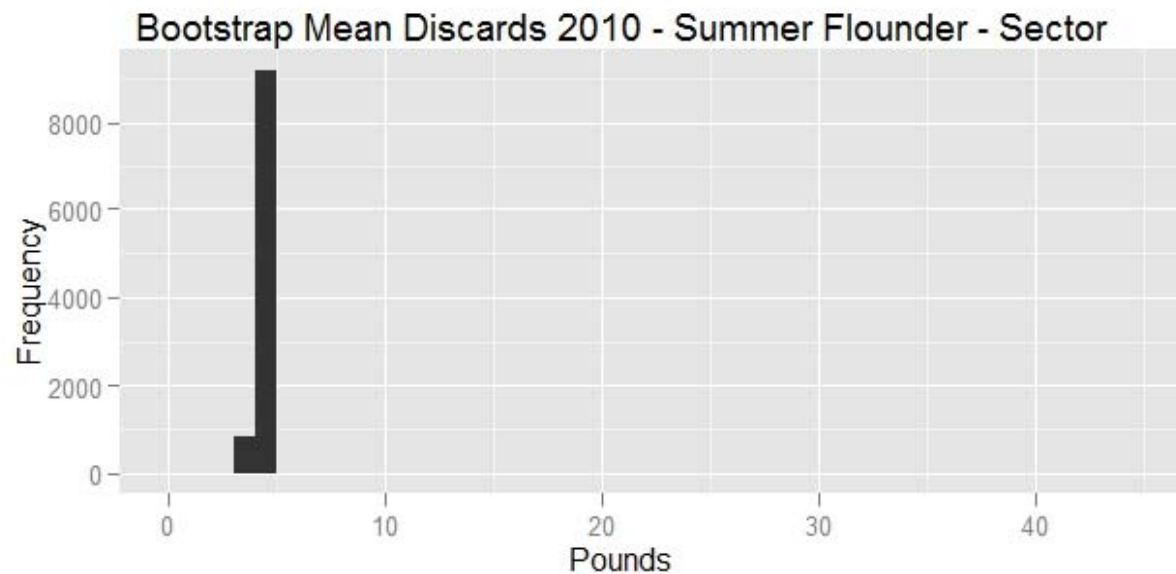
Miles
50 25 0



Summer Flounder – Zoomed in - 2010



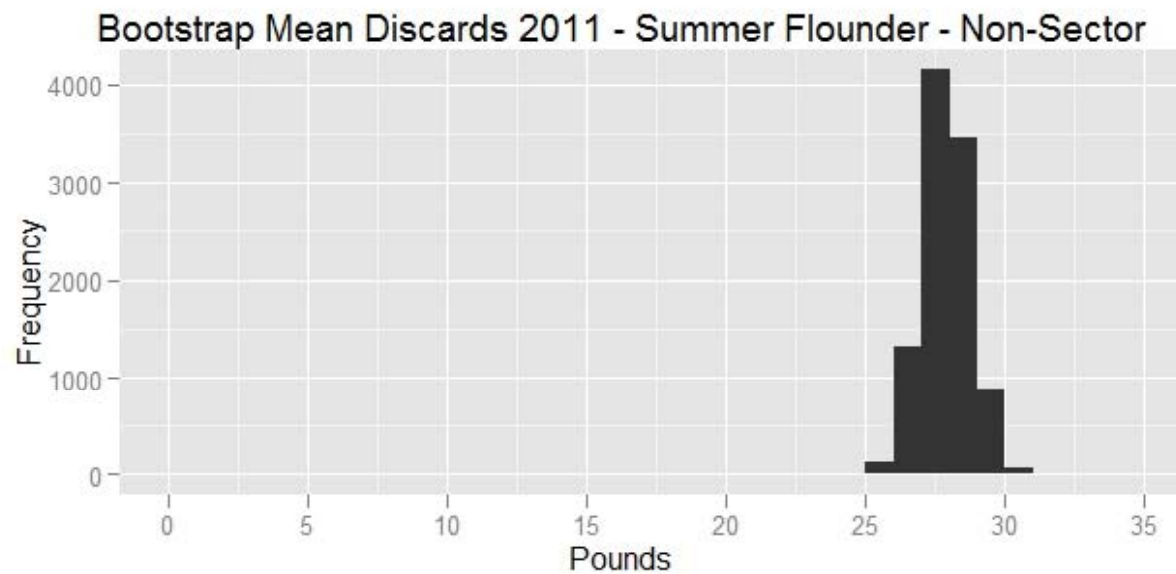
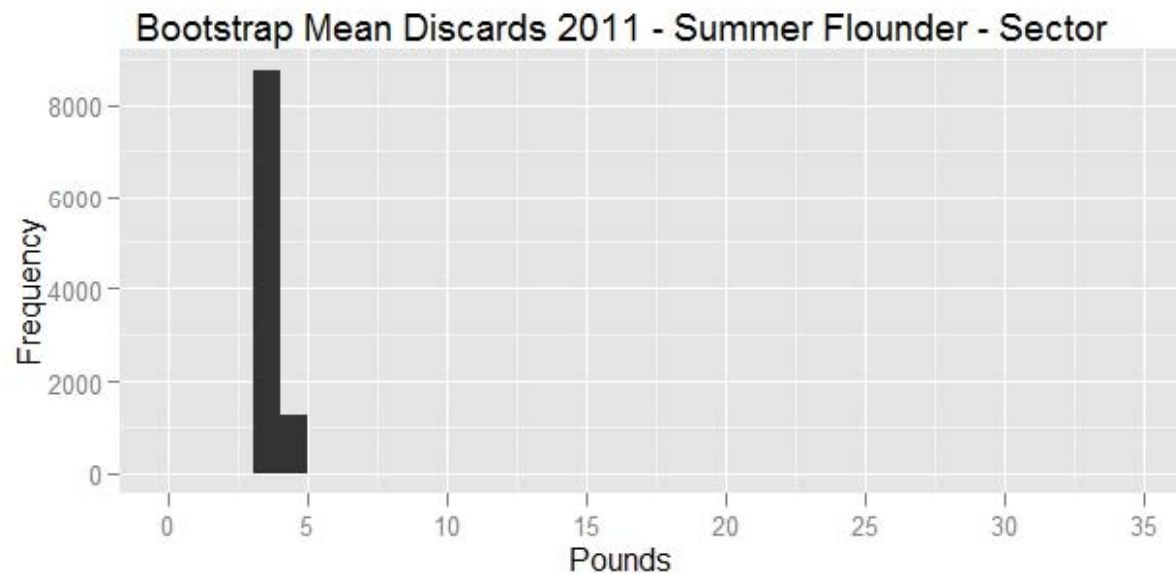
Summer Flounder – Discards - 2010



Summer Flounder – Discards - 2010

Quantiles					
5%		50%		95%	
Sector	Non Sector	Sector	Non Sector	Sector	Non Sector
4.0	39.2	4.2	41.0	4.4	43.0
Kruskal-Wallis Rank Sums Test $P < 0.0001$					

Summer Flounder – Discards - 2011



Summer Flounder – Discards - 2011

Quantiles					
5%		50%		95%	
Sector	Non Sector	Sector	Non Sector	Sector	Non Sector
3.4	26.5	3.8	27.9	4.1	29.3
Kruskal-Wallis Rank Sums Test $P < 0.0001$					

Conclusions

- Silver hake, discards changed year to year and in magnitude, with inconsistencies between statistical tests
- Scup, statistical significance of difference changed from year to year, between tests, and magnitude changed dramatically between years
- Most noticeable result in summer flounder:
 - This was species governed by pilot regulations
 - Difference consistent between tests and years
 - Magnitude of the difference was high
- Sector program: effective decreasing discards of summer flounder, does not effect discards of other species

Appreciation

- I would like to acknowledge and extend appreciation to:
- Chris Parkins and Laura Skrobe, URI
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- East West Technical Services LLC
- Dan Costa, Kevin Smith, Lindsey Dulude, Nichole Ares, Pat Brown, Chris Mortimer, Rich Russ, Nicole Travisono, Eric Schneider, John Lake, Barbara Somers, Ivan Mateo