Maine-New Hampshire

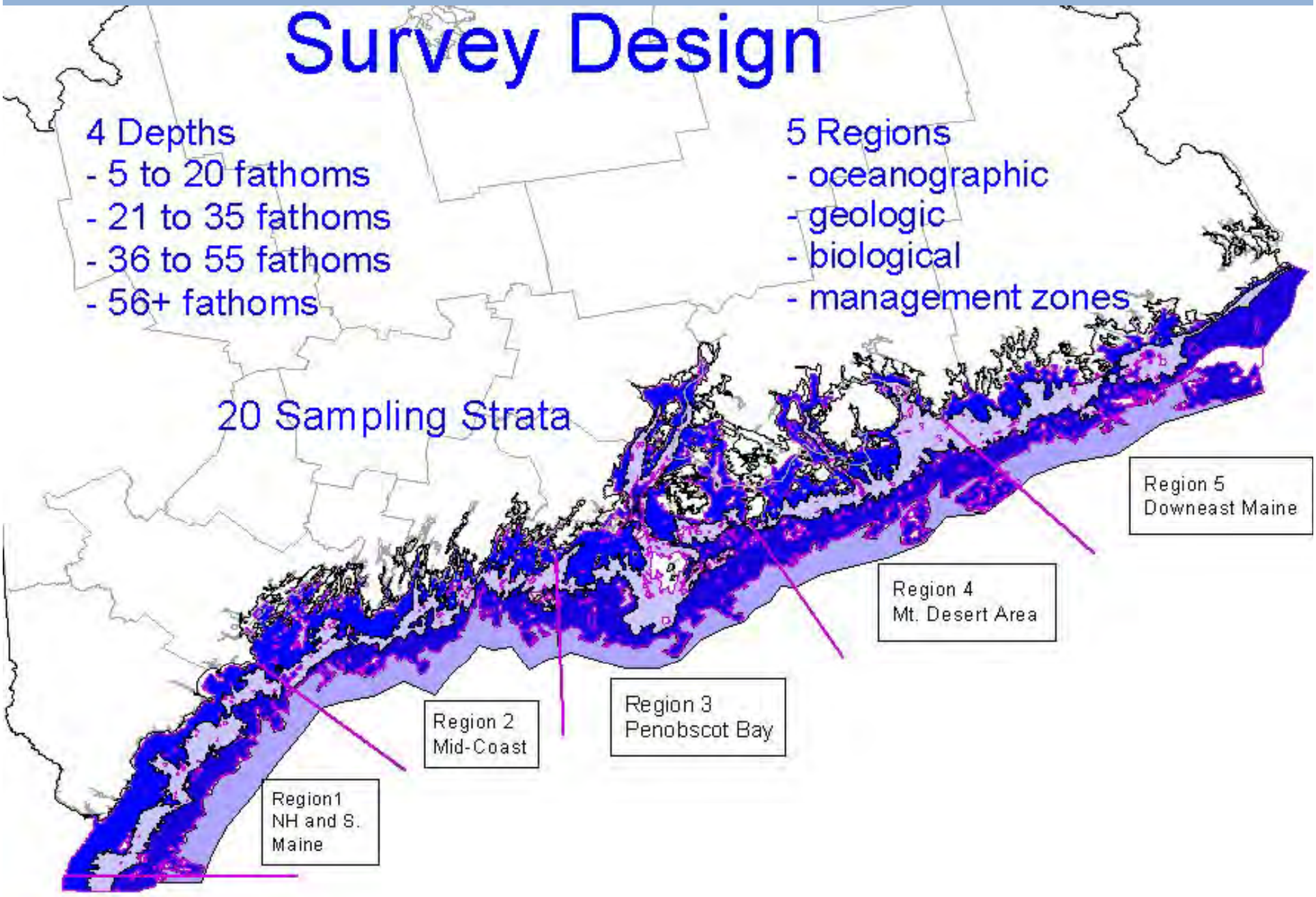
Inshore Trawl Survey

Survey Design

4 Depths
- 5 to 20 fathoms
- 21 to 35 fathoms
- 36 to 55 fathoms
- 56+ fathoms

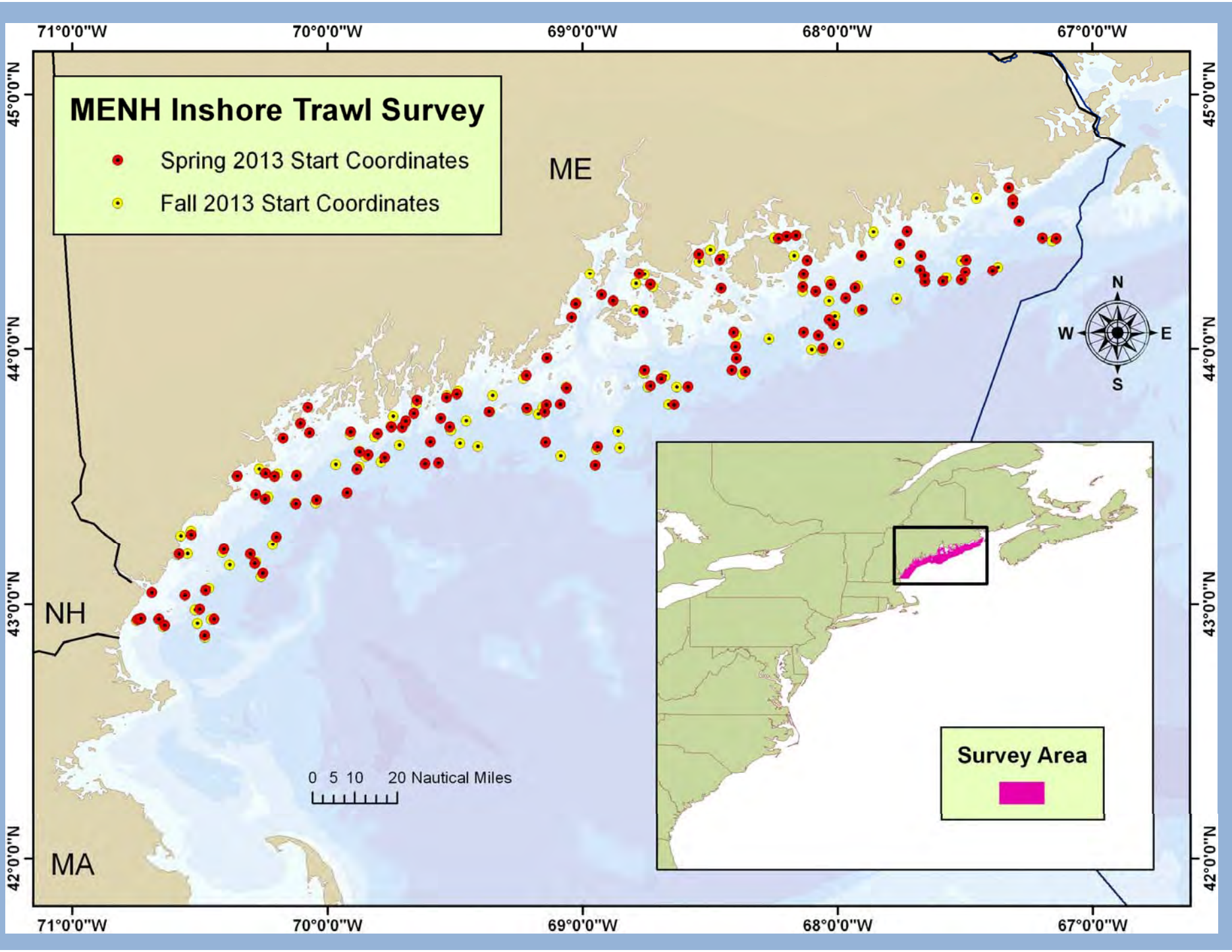
5 Regions
- oceanographic
- geologic
- biological
- management zones

20 Sampling Strata



Goals

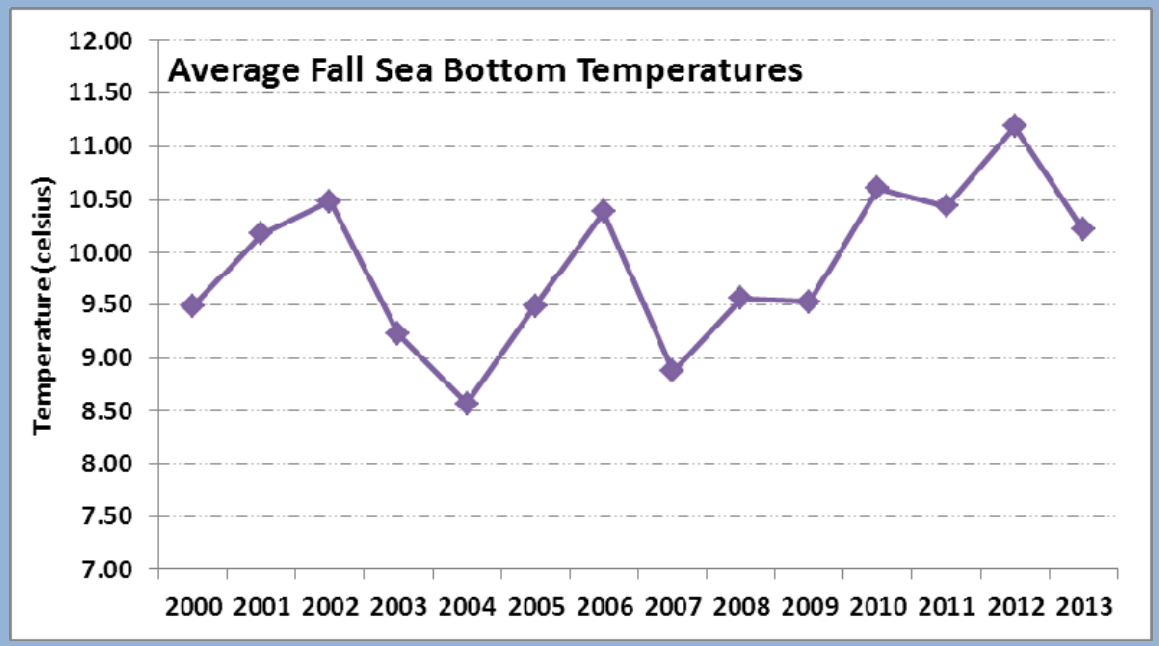
- To fill in an information gap in Maine and New Hampshire inshore waters
- To create a long-term fisheries-independent database
- To contribute to the interpretation of trends and patterns seen in other fisheries studies
- To foster collaborative research between scientists and the fishing industry

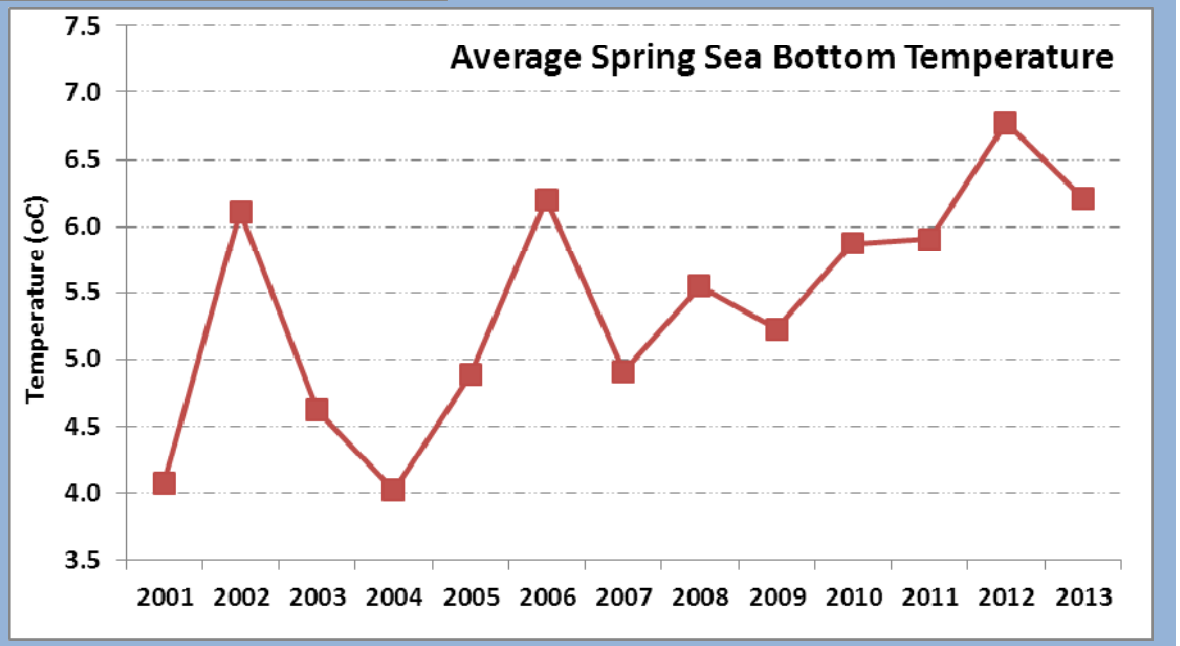

MENH Inshore Trawl Survey
Spring 2013 Start Coordinates
Fall 2013 Start Coordinates
ME
NH
MA
71°0'0"W
70°0'0"W
69°0'0"W
68°0'0"W
67°0'0"W
45°0'0"N
44°0'0"N
43°0'0"N
42°0'0"N
N
W
E
S
0 5 10 20 Nautical Miles
Survey Area

2013

- Spring Survey: Portsmouth, NH on May 6, 2013 through June 7, 2013, off Cutler, ME.
- 25 days, 113 tows completed, 97% of 100 random stations; 16 fixed.
- Fall Survey: Portsmouth, NH on September 23, 2013 through October 25, 2013, off Cutler, ME.
- 25 days, 96 tows completed, 85% of random; 11 fixed.

Temperatures

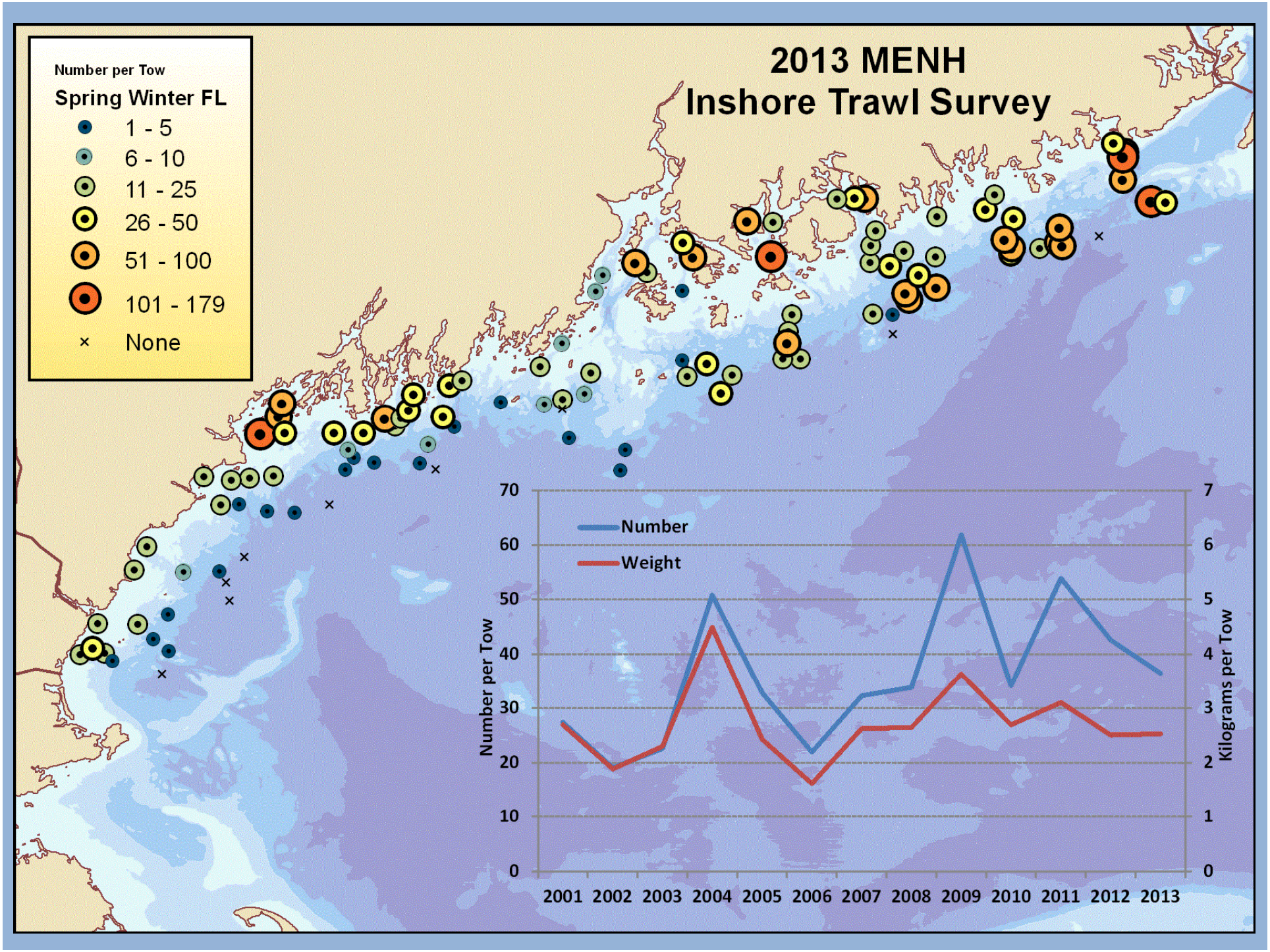


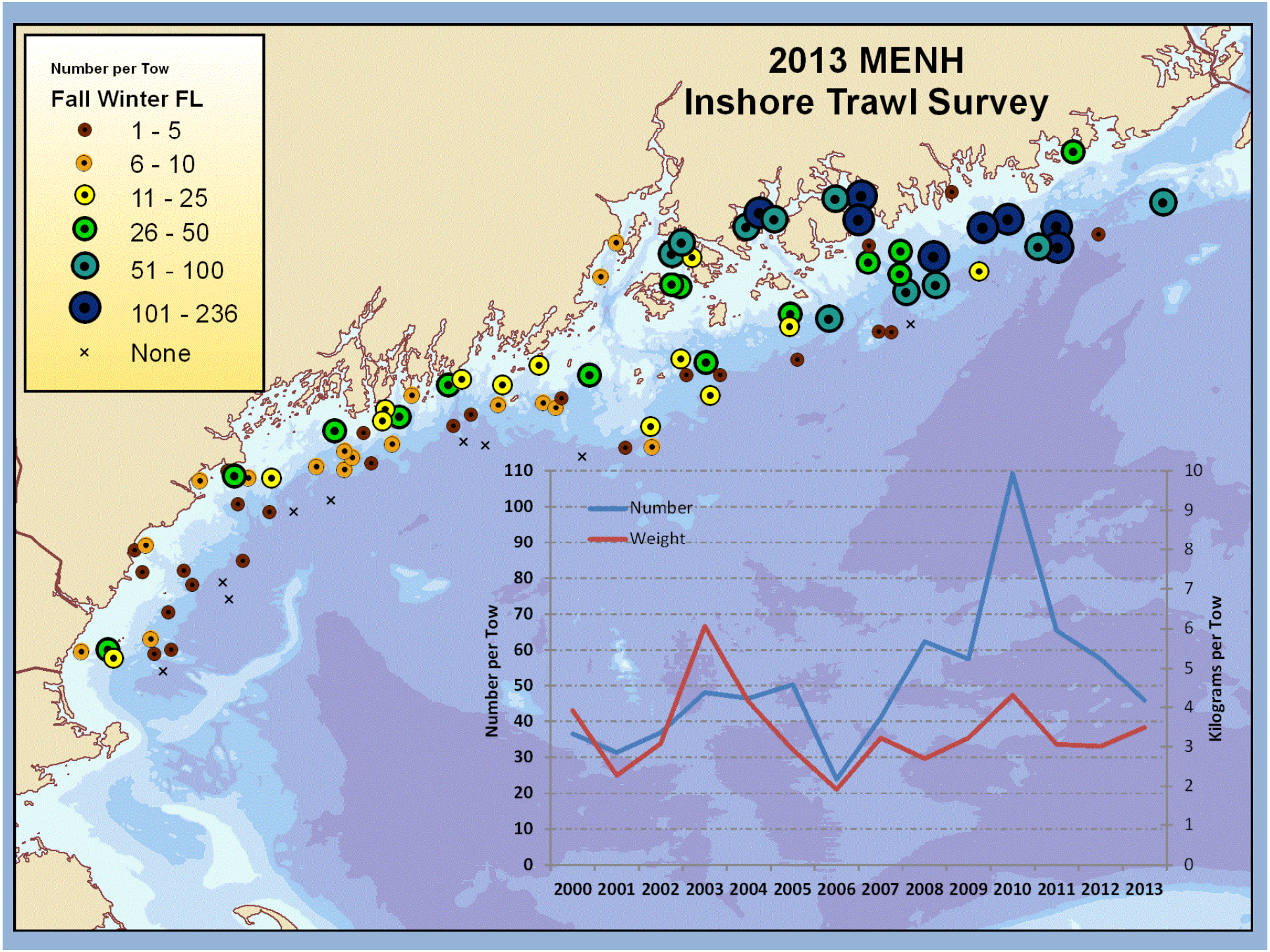


Biological Samples

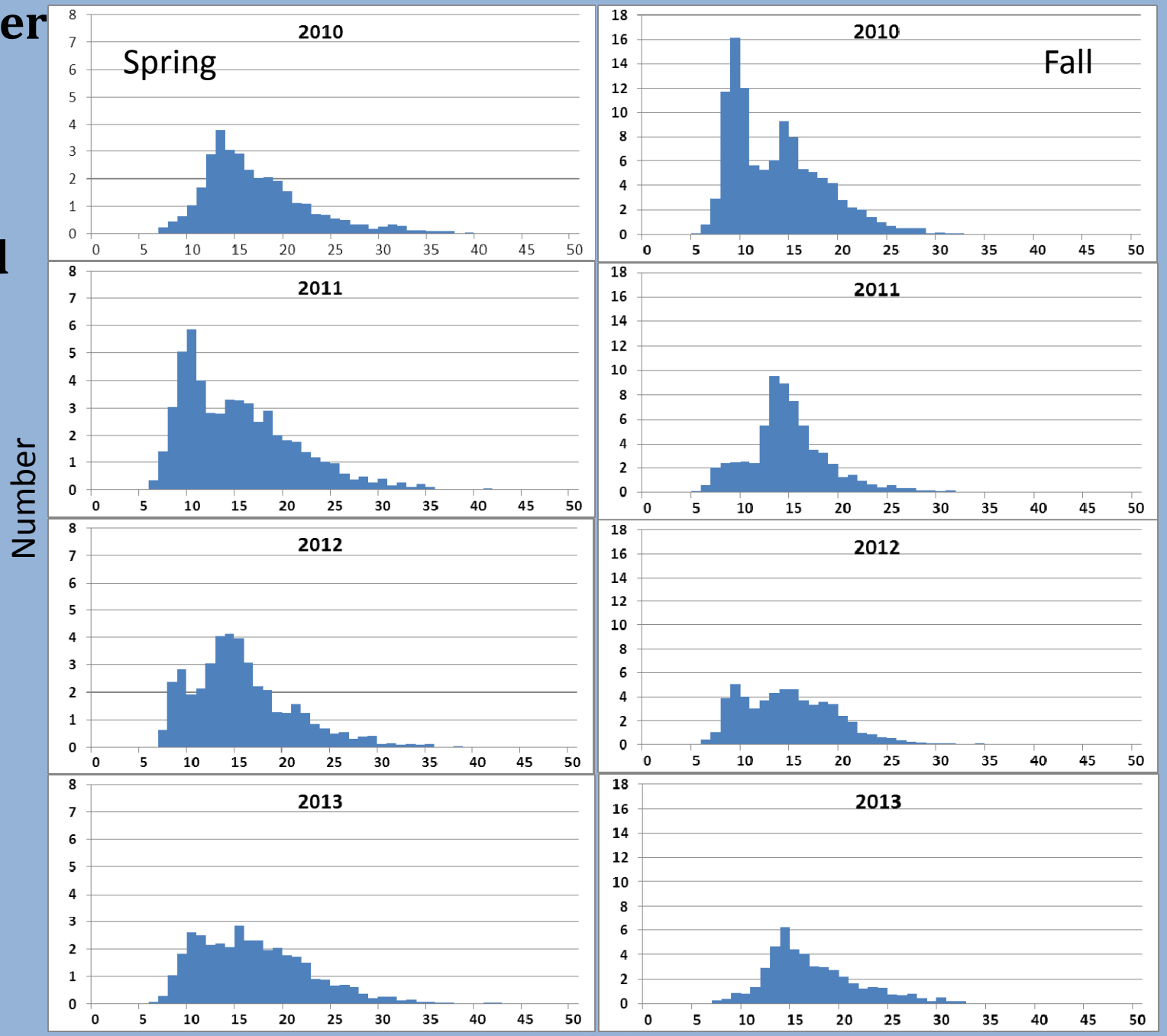
Number of Biological Samples Spring 2013				
Species	**Lengths**	**Sex and Maturity Stage**	**Otoliths**	**Food Habits**
American plaice	1948	447	320	NA
Atlantic cod	32	26	25	NA
Haddock	183	130	70	NA
Winter flounder	2796	762	420	NA
Yellowtail flounder	529	233	NA	NA

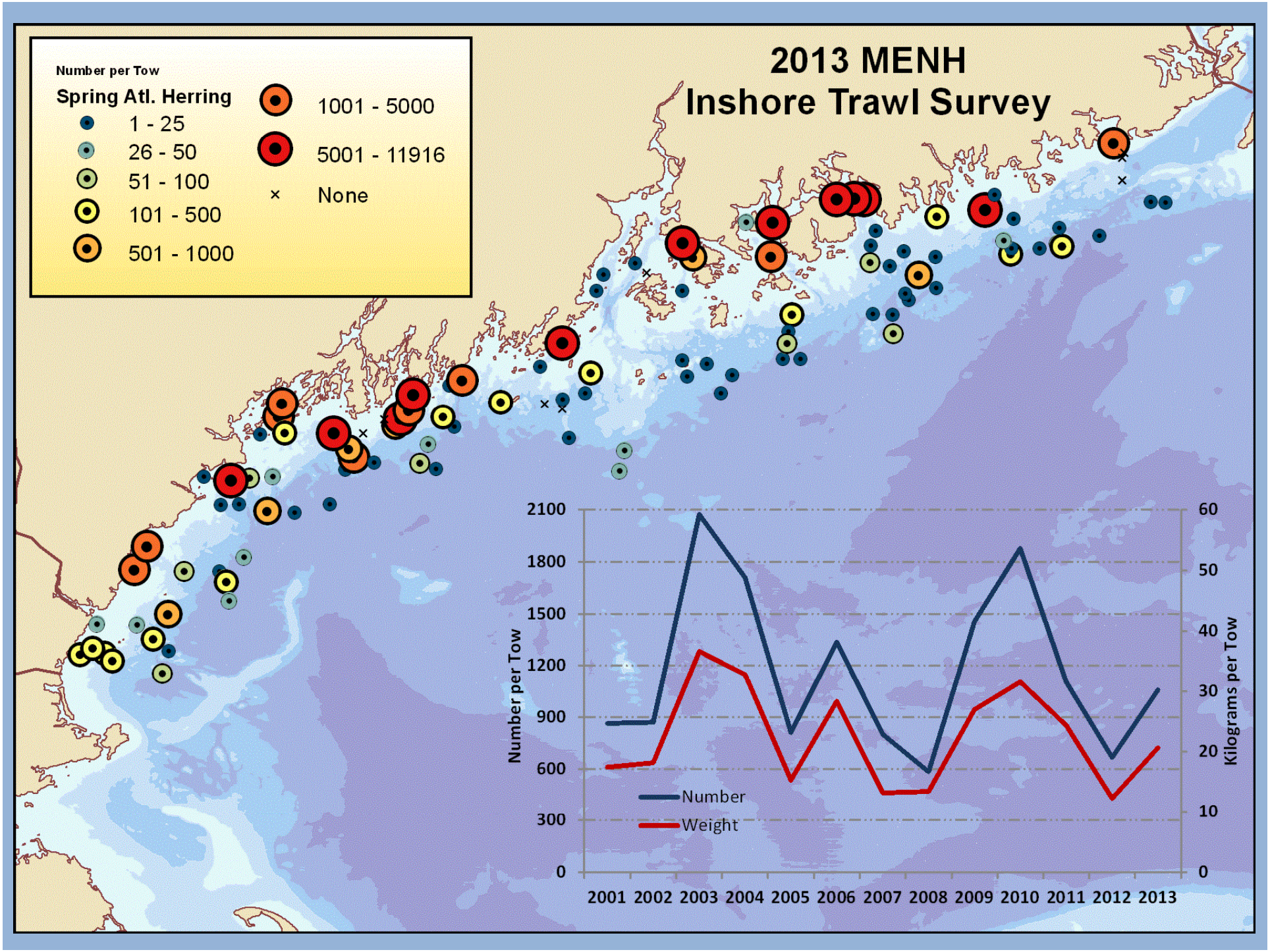
Number of Biological Samples Fall 2013				
Species	**Lengths**	**Sex and Maturity Stage**	**Otoliths**	**Food Habits**
Atlantic cod	12	11	11	NA
Haddock	1357	233	125	NA
Monkfish	79	66	NA	66
Witch flounder	250	190	130	NA
White hake	1090	443	260	NA

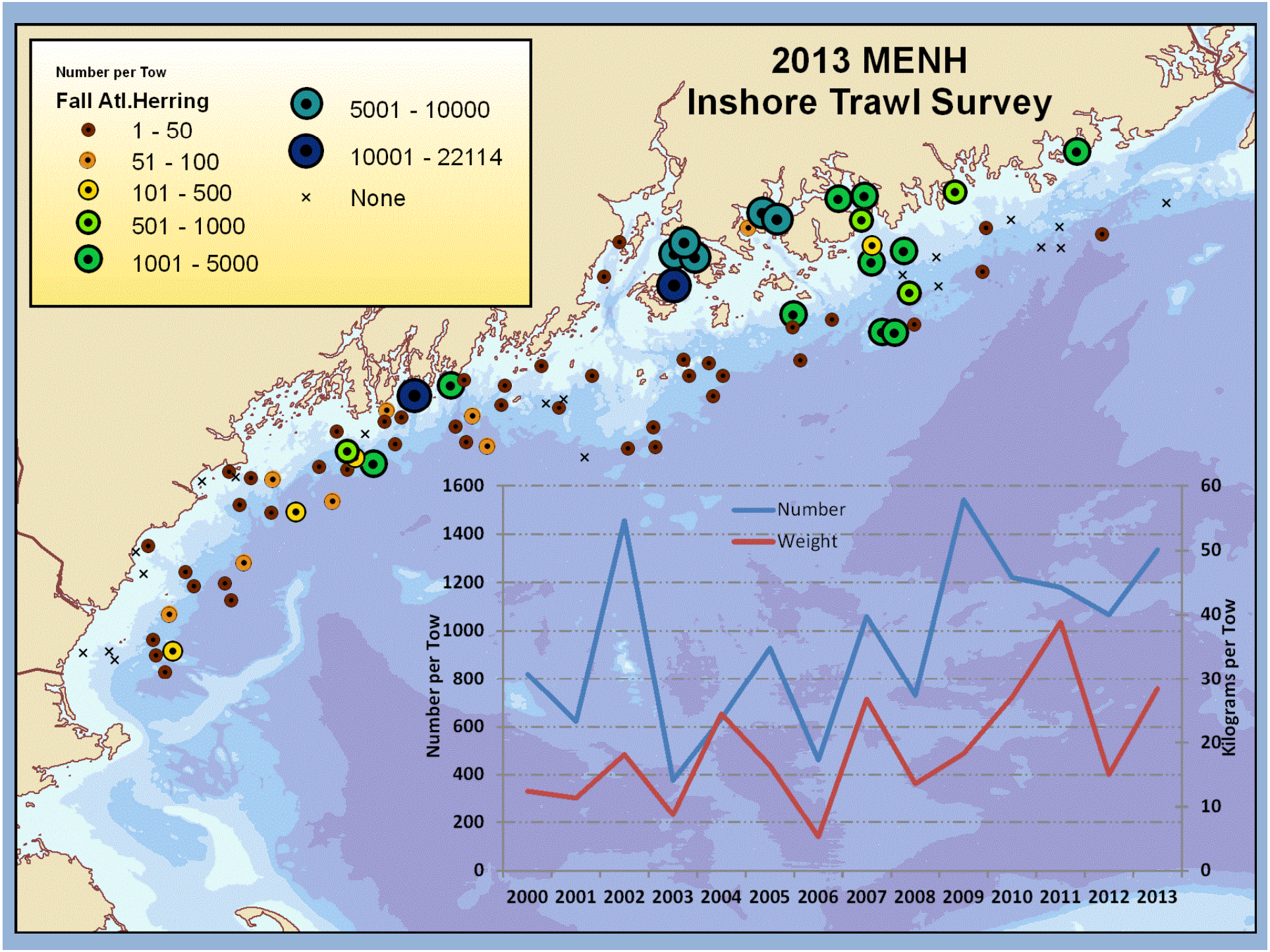

2013 MENH
Inshore Trawl Survey
Number per Tow
Spring Winter FL
1 - 5
6 - 10
11 - 25
26 - 50
51 - 100
101 - 179
None
Number
Weight
Number per Tow
Kilograms per Tow
0
10
20
30
40
50
60
70
0
1
2
3
4
5
6
7
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013


2013 MENH
Inshore Trawl Survey
Number per Tow
Fall Winter FL
1 - 5
6 - 10
11 - 25
26 - 50
51 - 100
101 - 236
None
Number
Weight
Number per Tow
Kilograms per Tow
0 10 20 30 40 50 60 70 80 90 100 110
0 1 2 3 4 5 6 7 8 9 10
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013

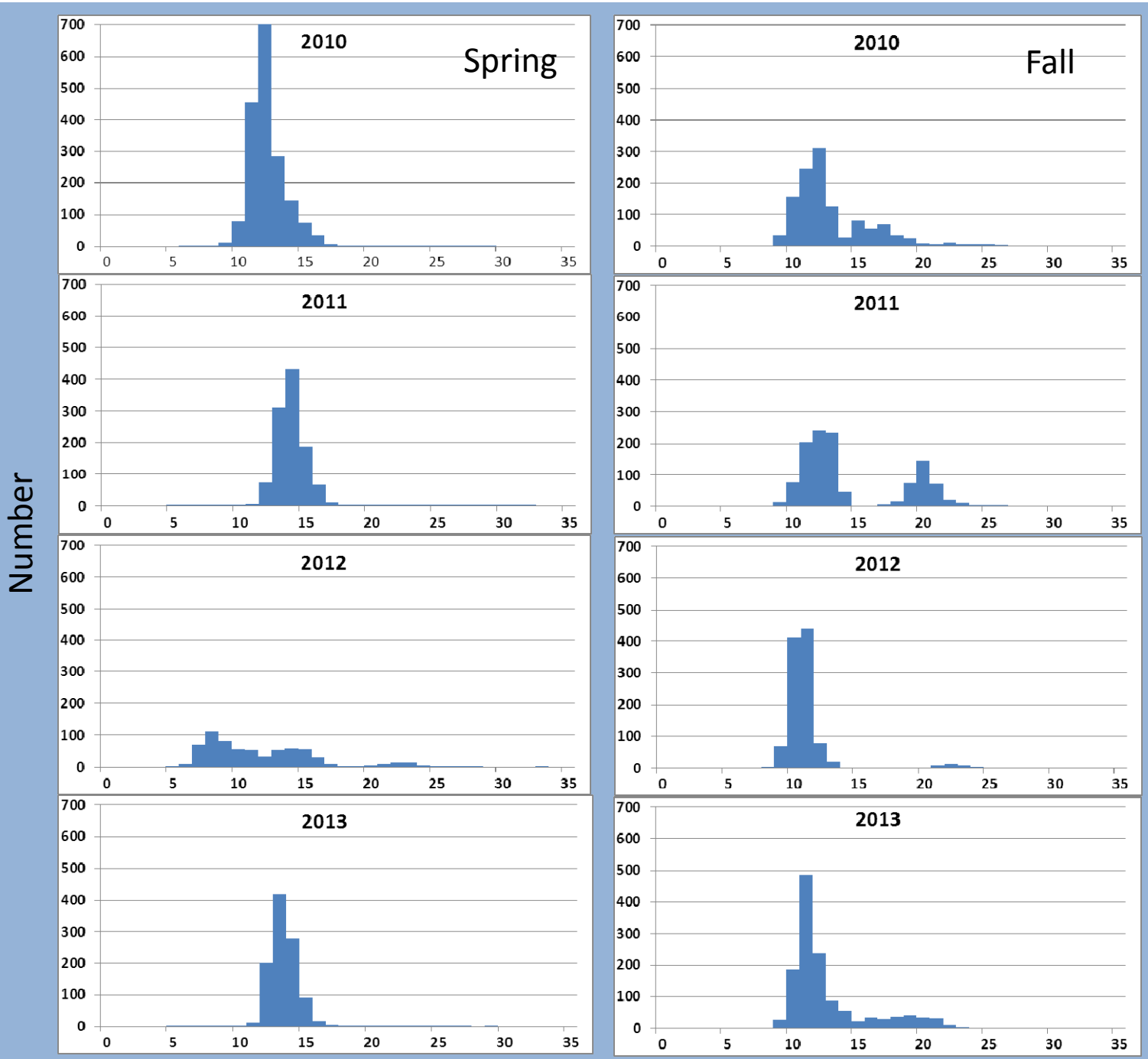
MENH Winter Flounder Catch at Length (Stratified Mean) Recent Surveys

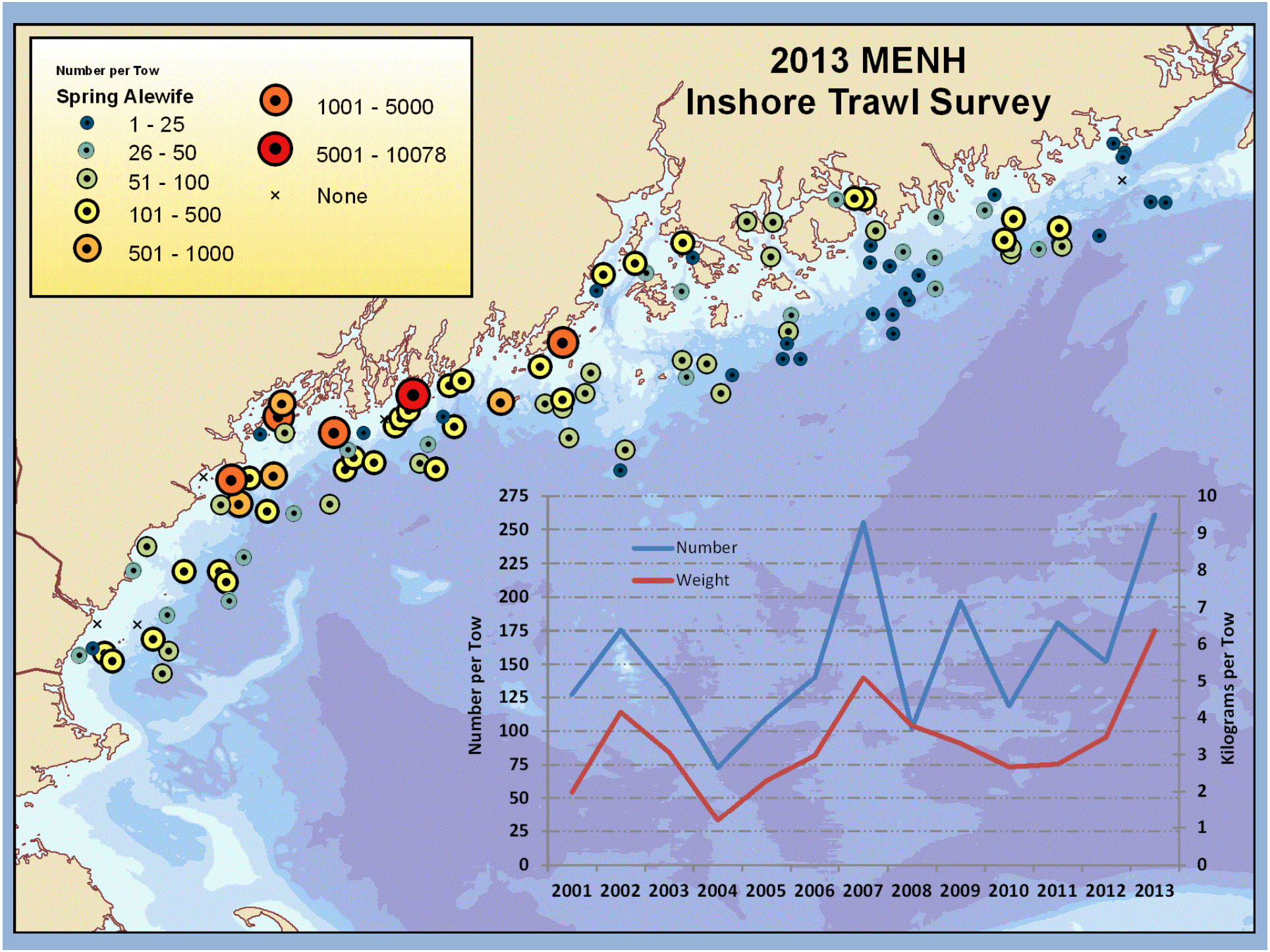


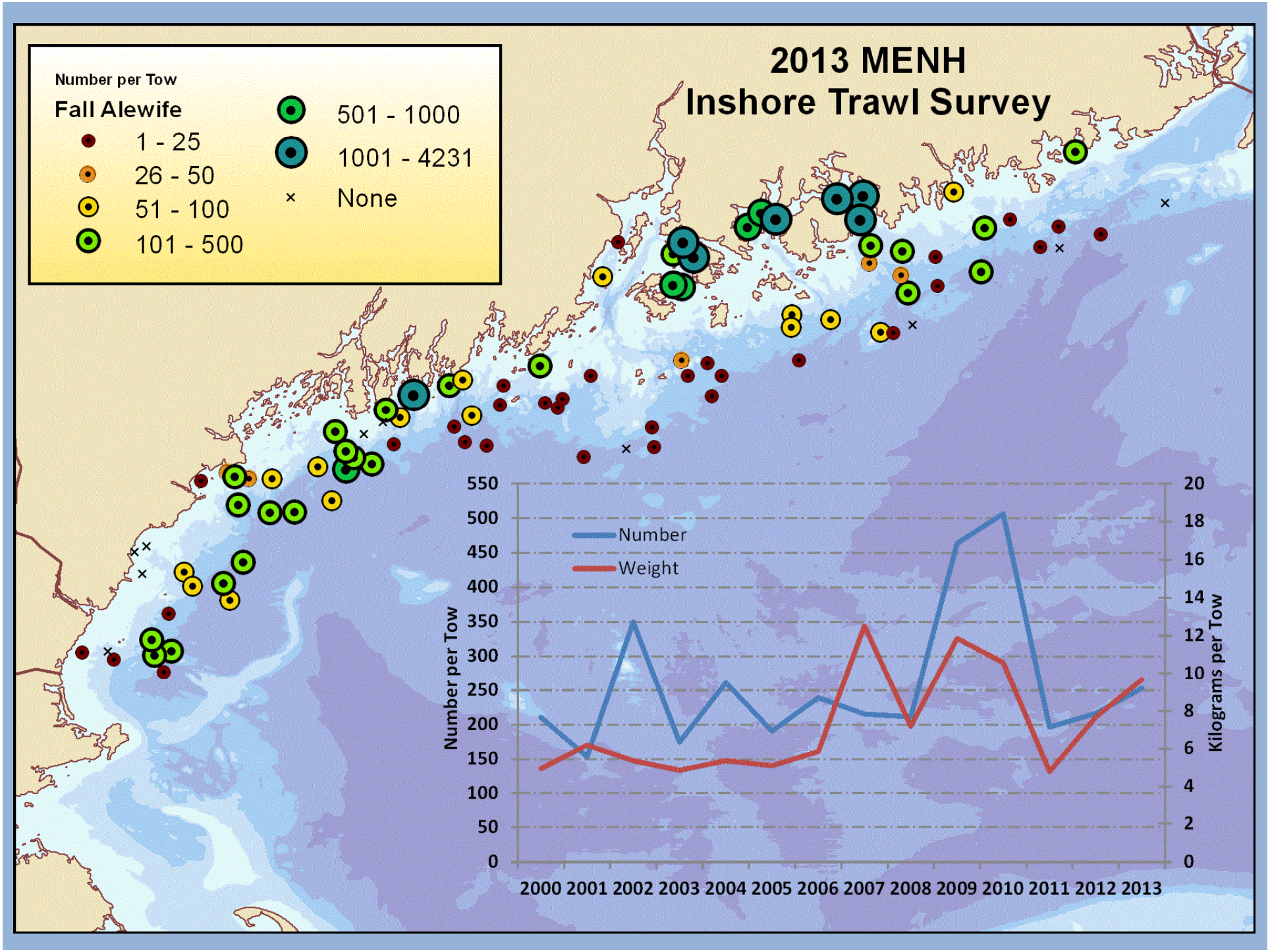

2013 MENH
Inshore Trawl Survey
Number per Tow
Spring Atl. Herring
1 - 25
26 - 50
51 - 100
101 - 500
501 - 1000
1001 - 5000
5001 - 11916
None
Number per Tow
Kilograms per Tow
2100
1800
1500
1200
900
600
300
0
60
50
40
30
20
10
0
Number
Weight
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013


2013 MENH
Inshore Trawl Survey
Number per Tow
Fall Atl.Herring
1 - 50
51 - 100
101 - 500
501 - 1000
1001 - 5000
5001 - 10000
10001 - 22114
None
Number
Weight
Number per Tow
Kilograms per Tow
0
200
400
600
800
1000
1200
1400
1600
0
10
20
30
40
50
60
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013

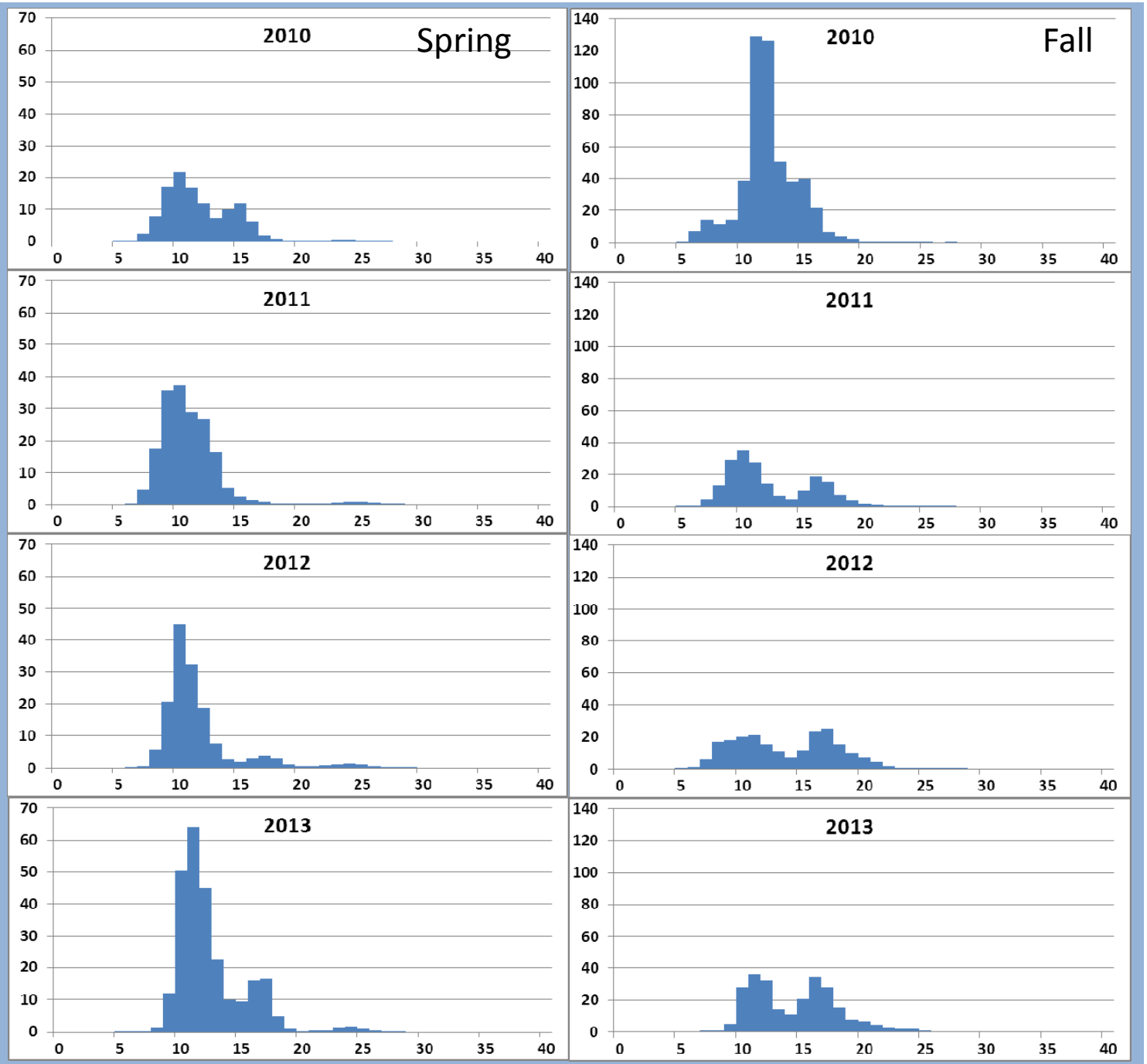
MENH Atlantic Herring Catch at Length Recent Surveys

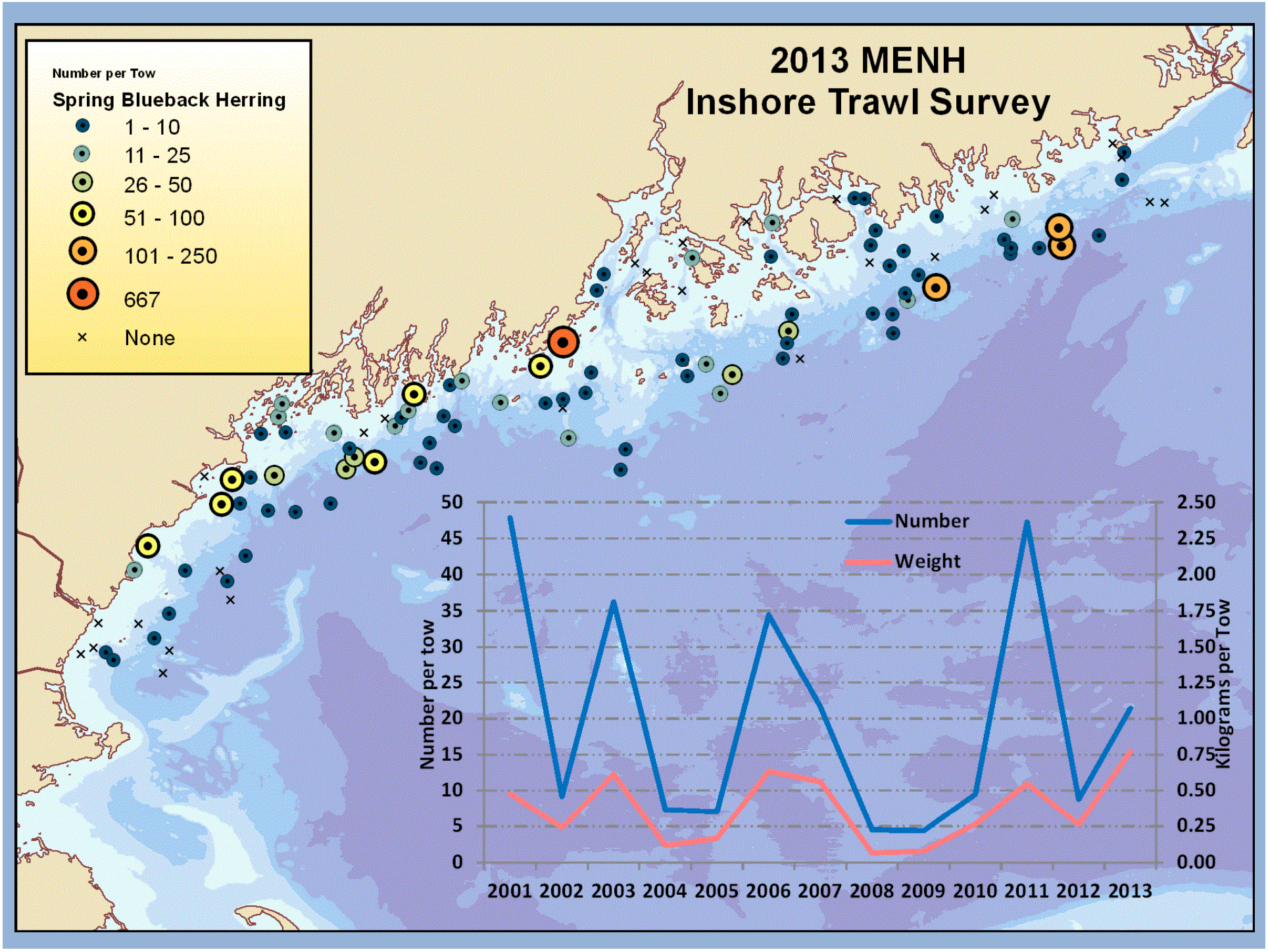


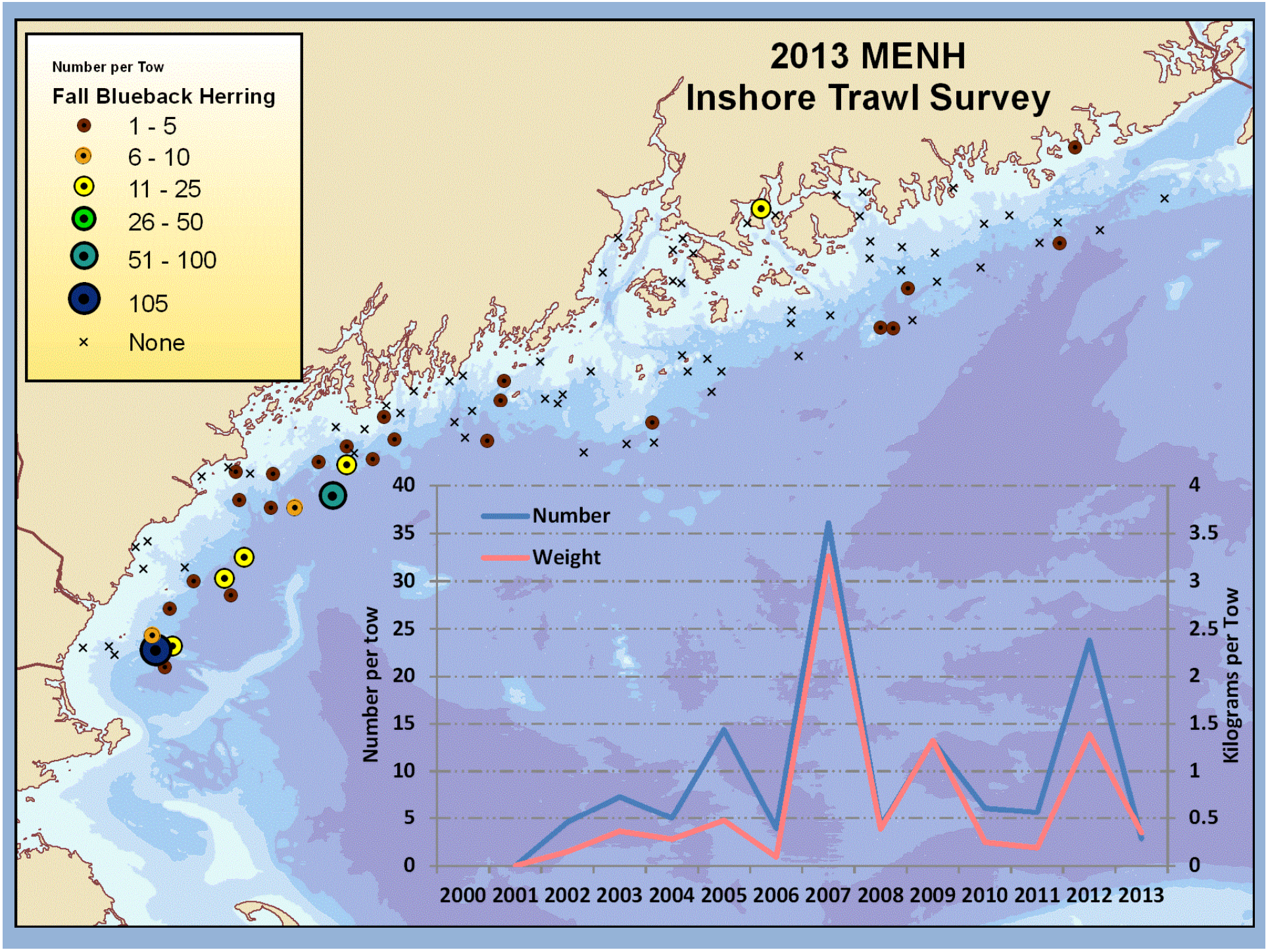

2013 MENH
Inshore Trawl Survey
Number per Tow
Spring Alewife
1 - 25
26 - 50
51 - 100
101 - 500
501 - 1000
1001 - 5000
5001 - 10078
None
Number
Weight
Number per Tow
Kilograms per Tow
0
25
50
75
100
125
150
175
200
225
250
275
0
1
2
3
4
5
6
7
8
9
10
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013


2013 MENH
Inshore Trawl Survey
Number per Tow
Fall Alewife
1 - 25
26 - 50
51 - 100
101 - 500
501 - 1000
1001 - 4231
None
Number
Weight
Number per Tow
Kilograms per Tow
0
50
100
150
200
250
300
350
400
450
500
550
0
2
4
6
8
10
12
14
16
18
20
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013

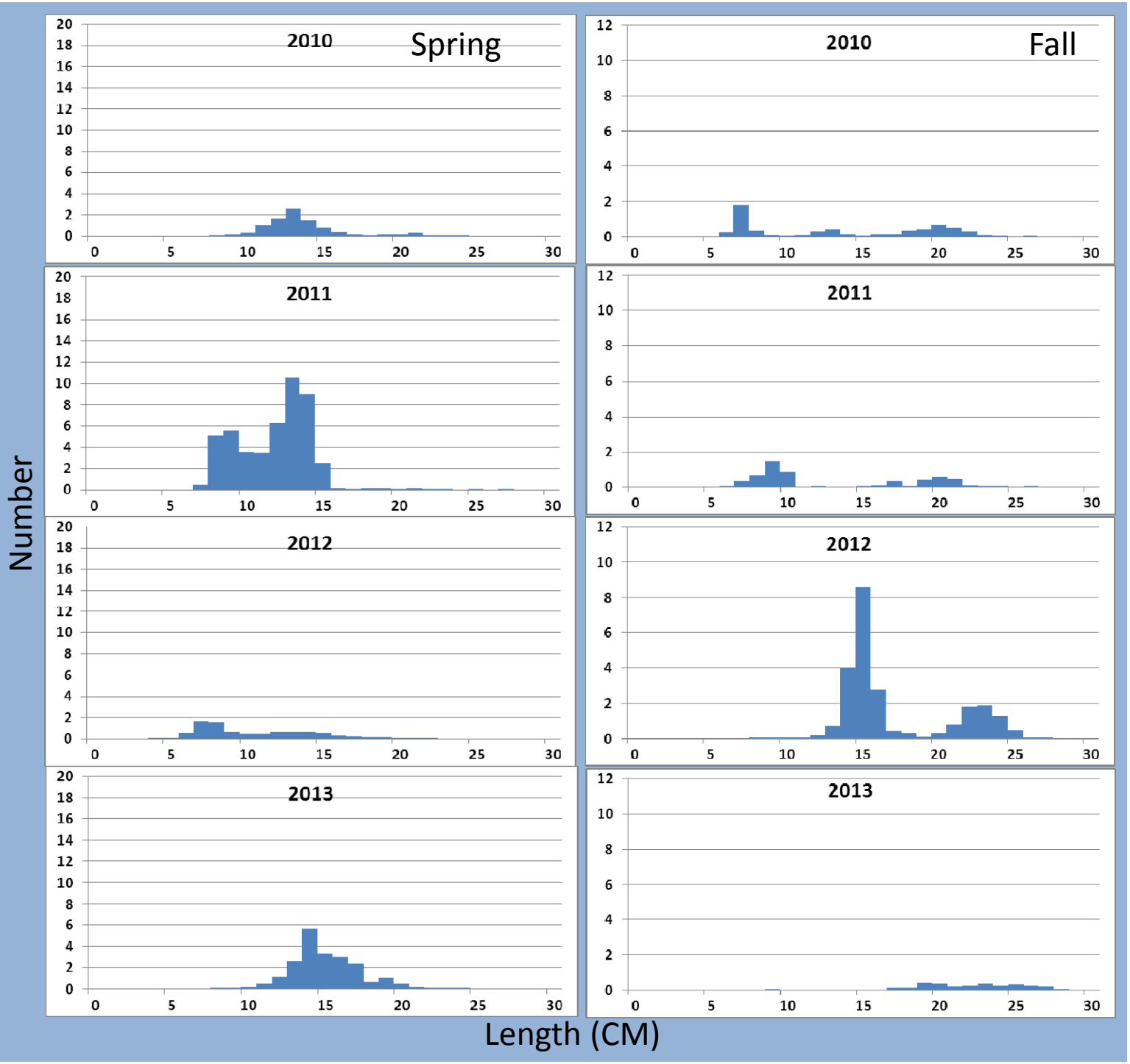
MENH Alewife Catch at Length - Recent Surveys

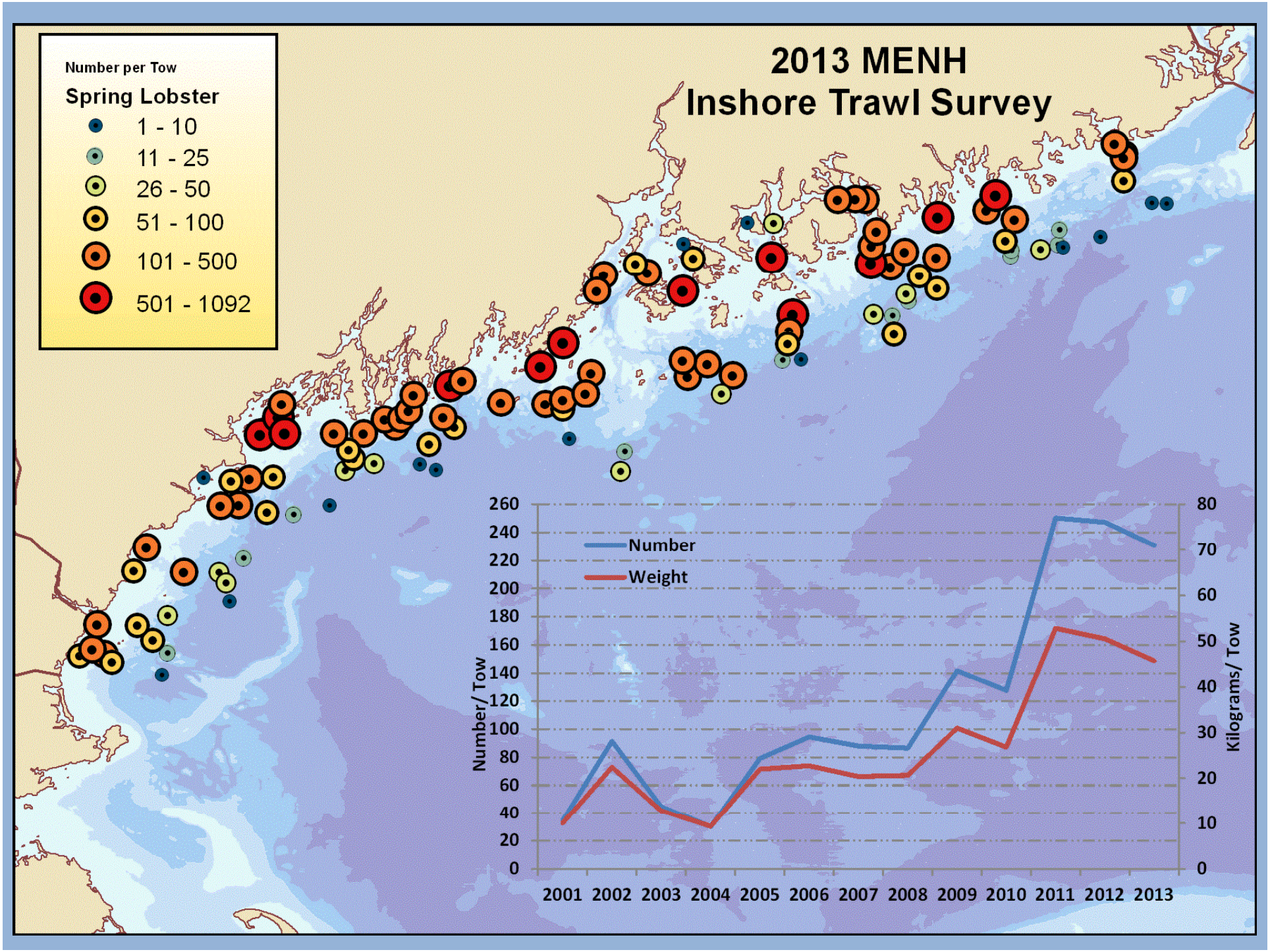



2013 MENH
Inshore Trawl Survey
Number per Tow
Spring Blueback Herring
1 - 10
11 - 25
26 - 50
51 - 100
101 - 250
667
None
Number
Weight
Number per tow
Kilograms per Tow
0
5
10
15
20
25
30
35
40
45
50
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
2.50
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013

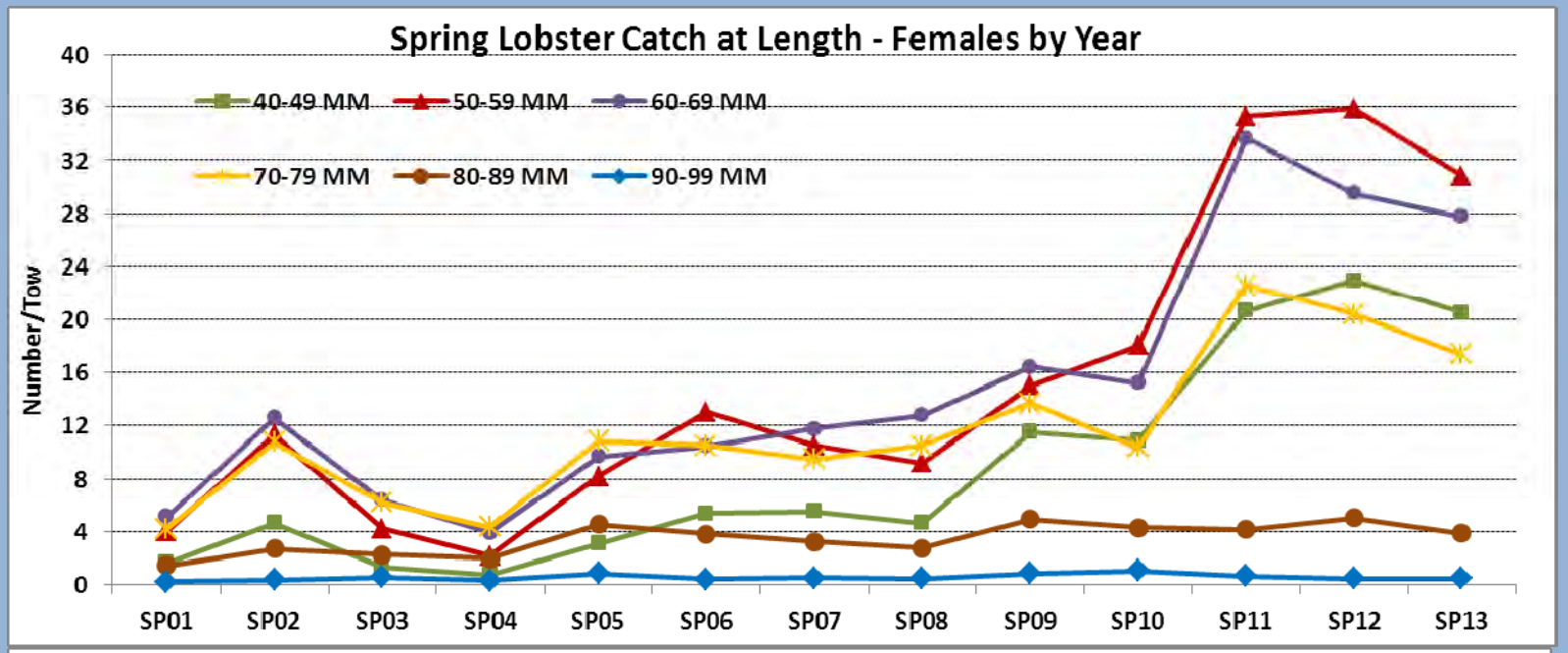

2013 MENH
Inshore Trawl Survey
Number per Tow
Fall Blueback Herring
1 - 5
6 - 10
11 - 25
26 - 50
51 - 100
105
None
Number
Weight
Number per tow
Kilograms per Tow
0
5
10
15
20
25
30
35
40
0
0.5
1
1.5
2
2.5
3
3.5
4
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013

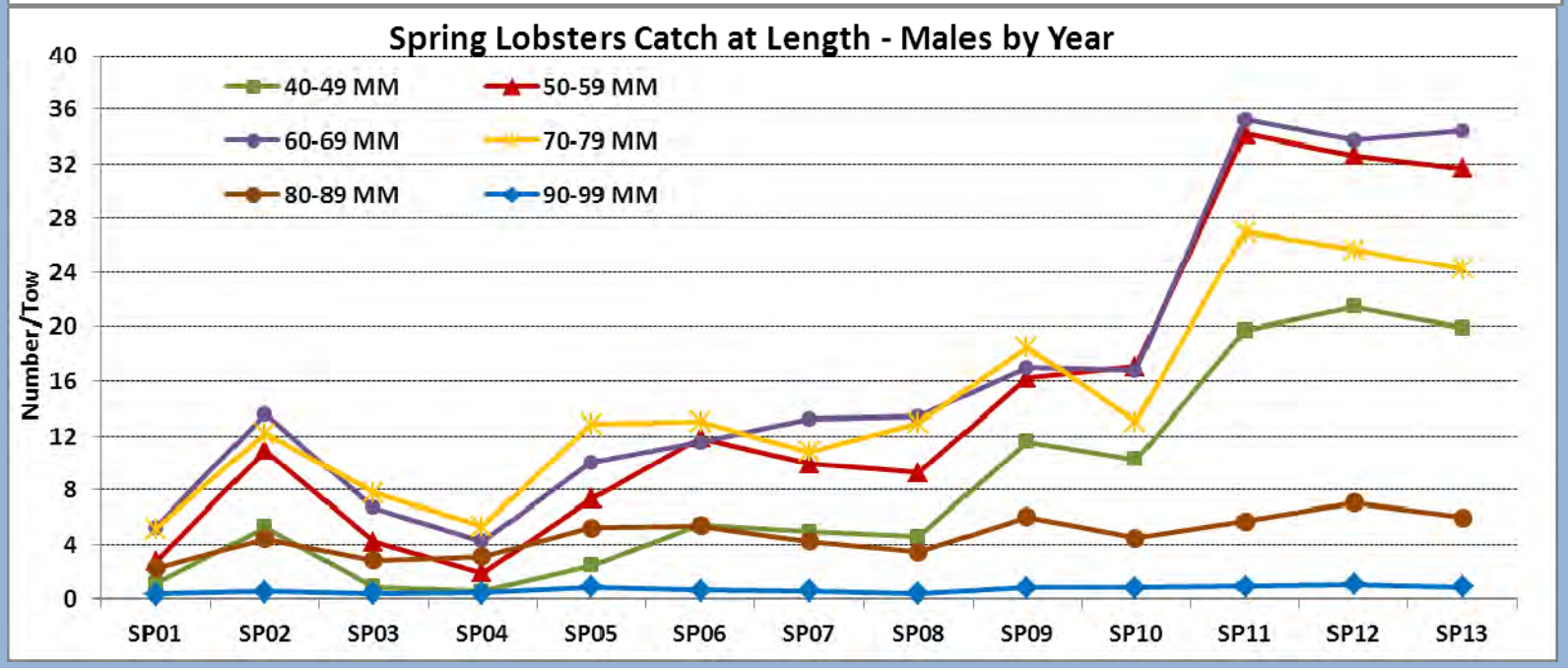
MENH Blueback Herring Catch at Length Recent Surveys

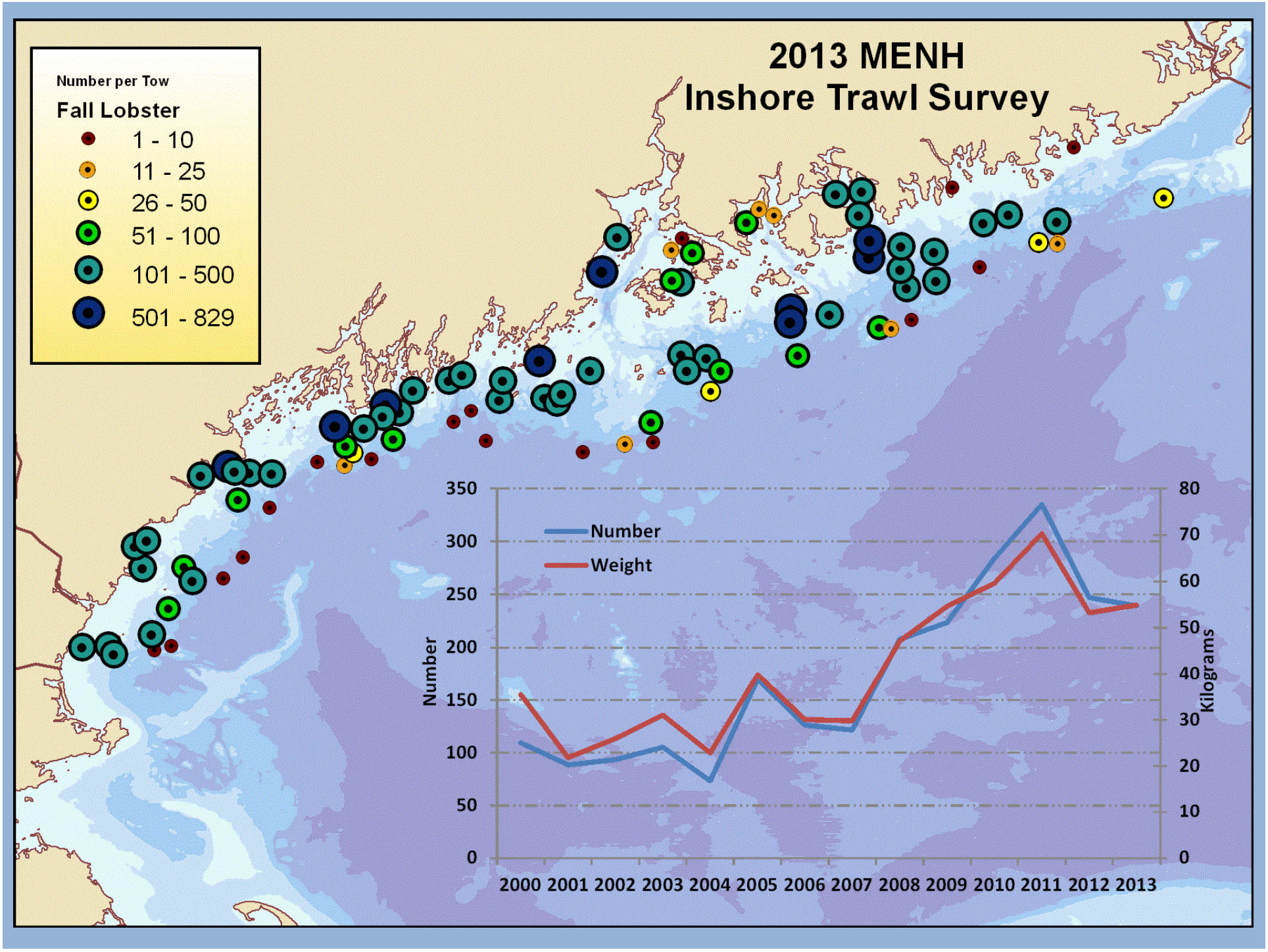


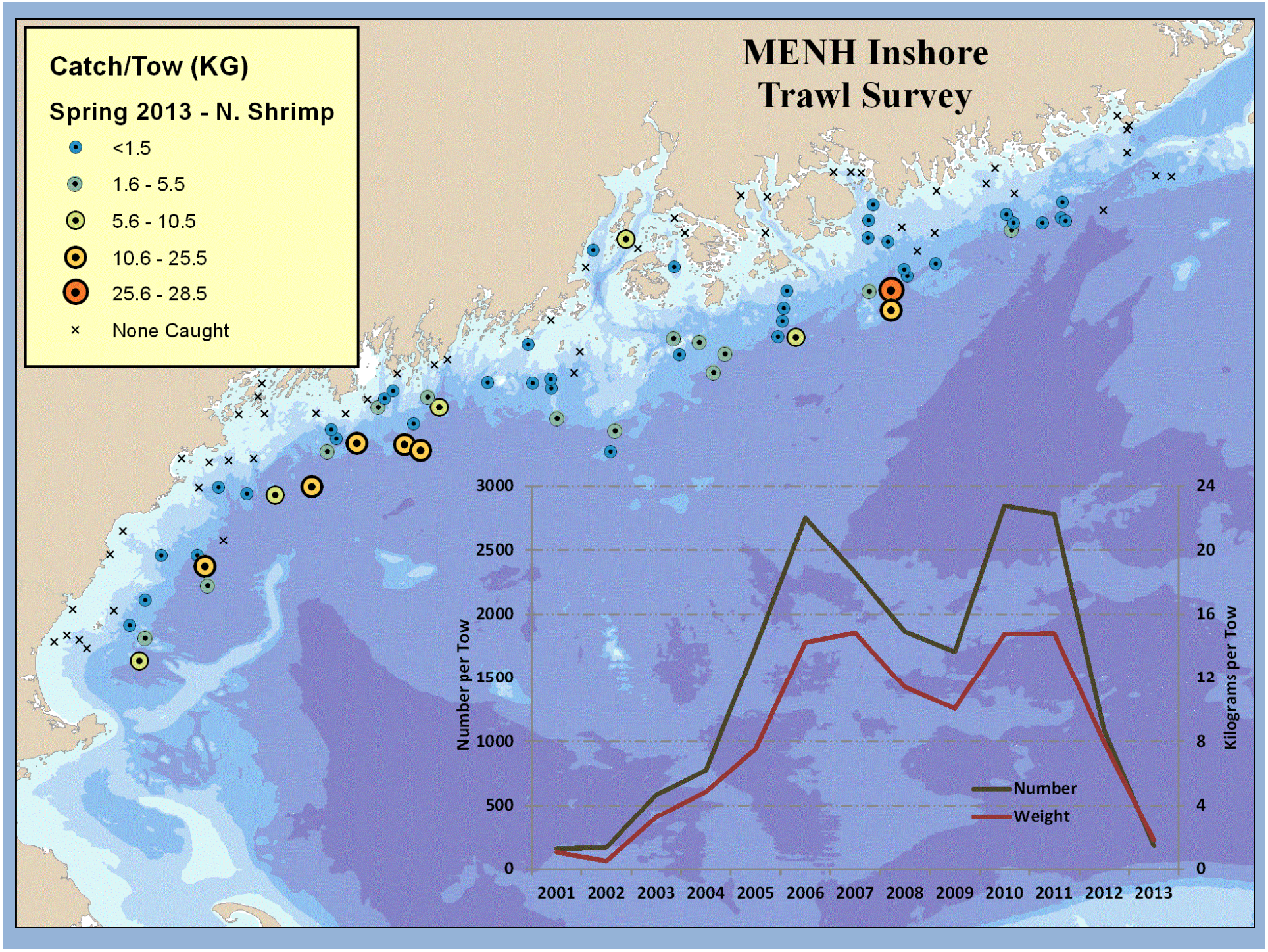

2013 MENH
Inshore Trawl Survey
Number per Tow
Spring Lobster
1 - 10
11 - 25
26 - 50
51 - 100
101 - 500
501 - 1092
Number
Weight
Number/ Tow
Kilograms/ Tow
0
20
40
60
80
100
120
140
160
180
200
220
240
260
0
10
20
30
40
50
60
70
80
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

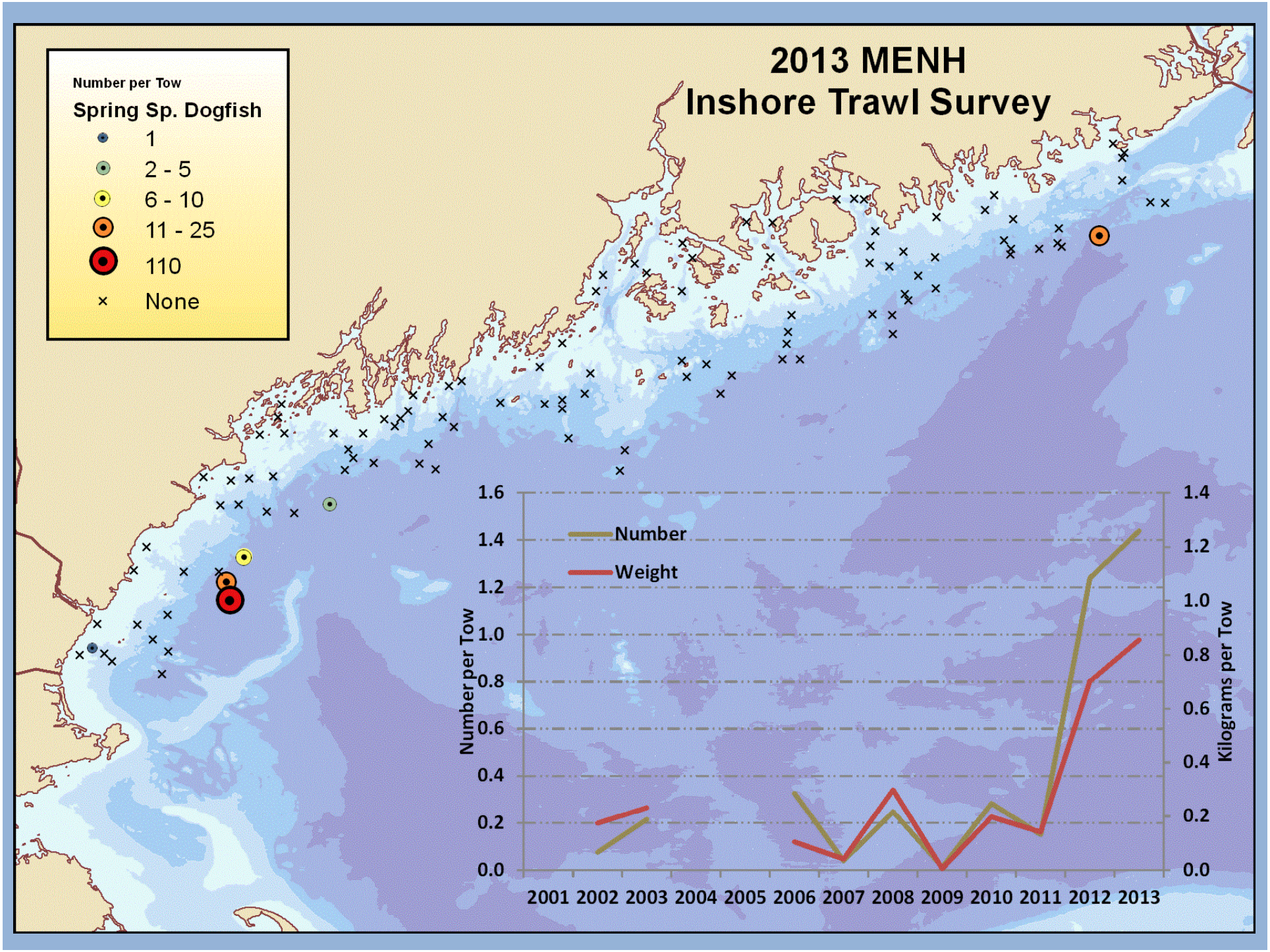
Catch at Length for Lobster – Selected Size Categories – Carapace Length



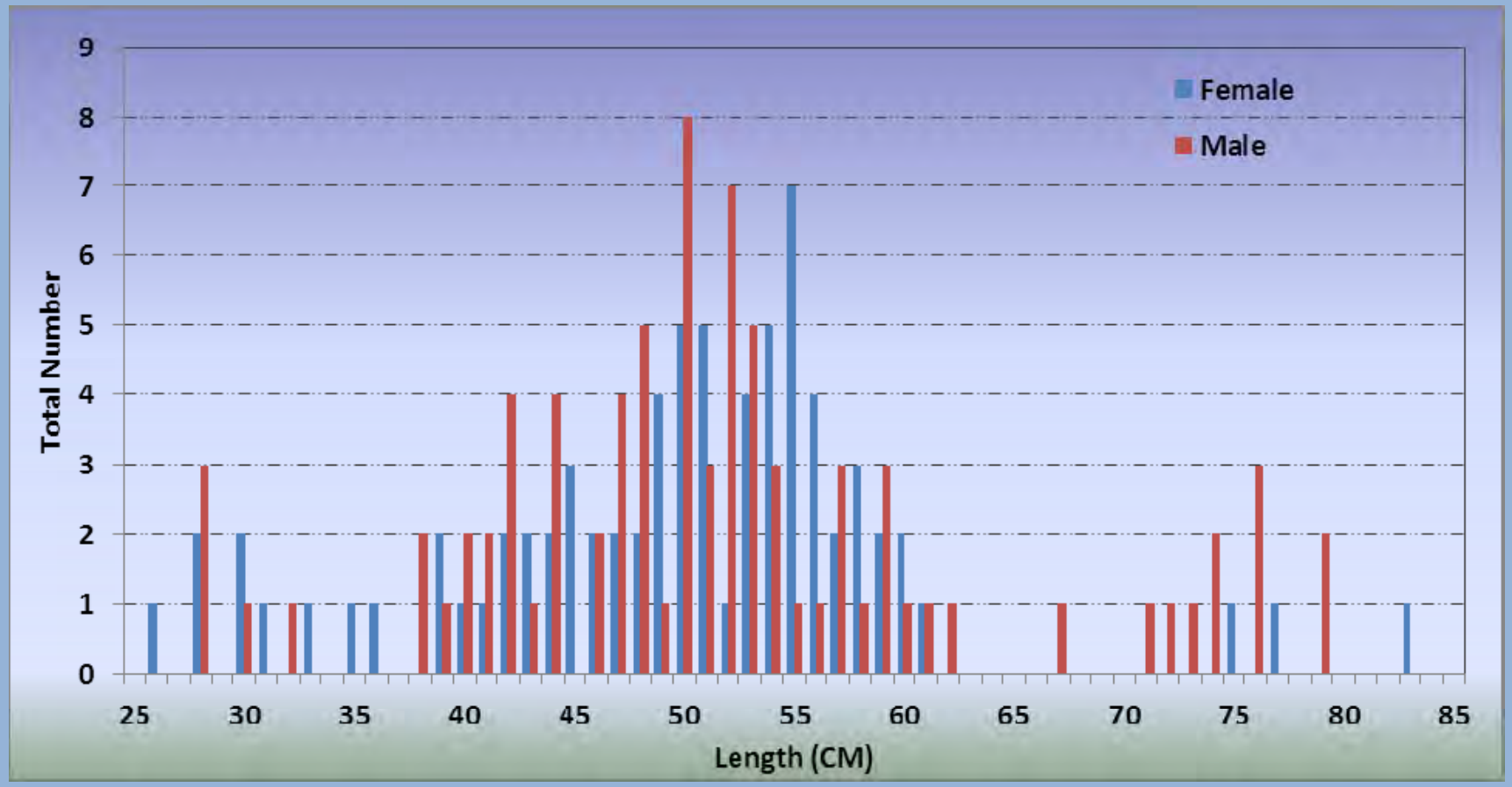


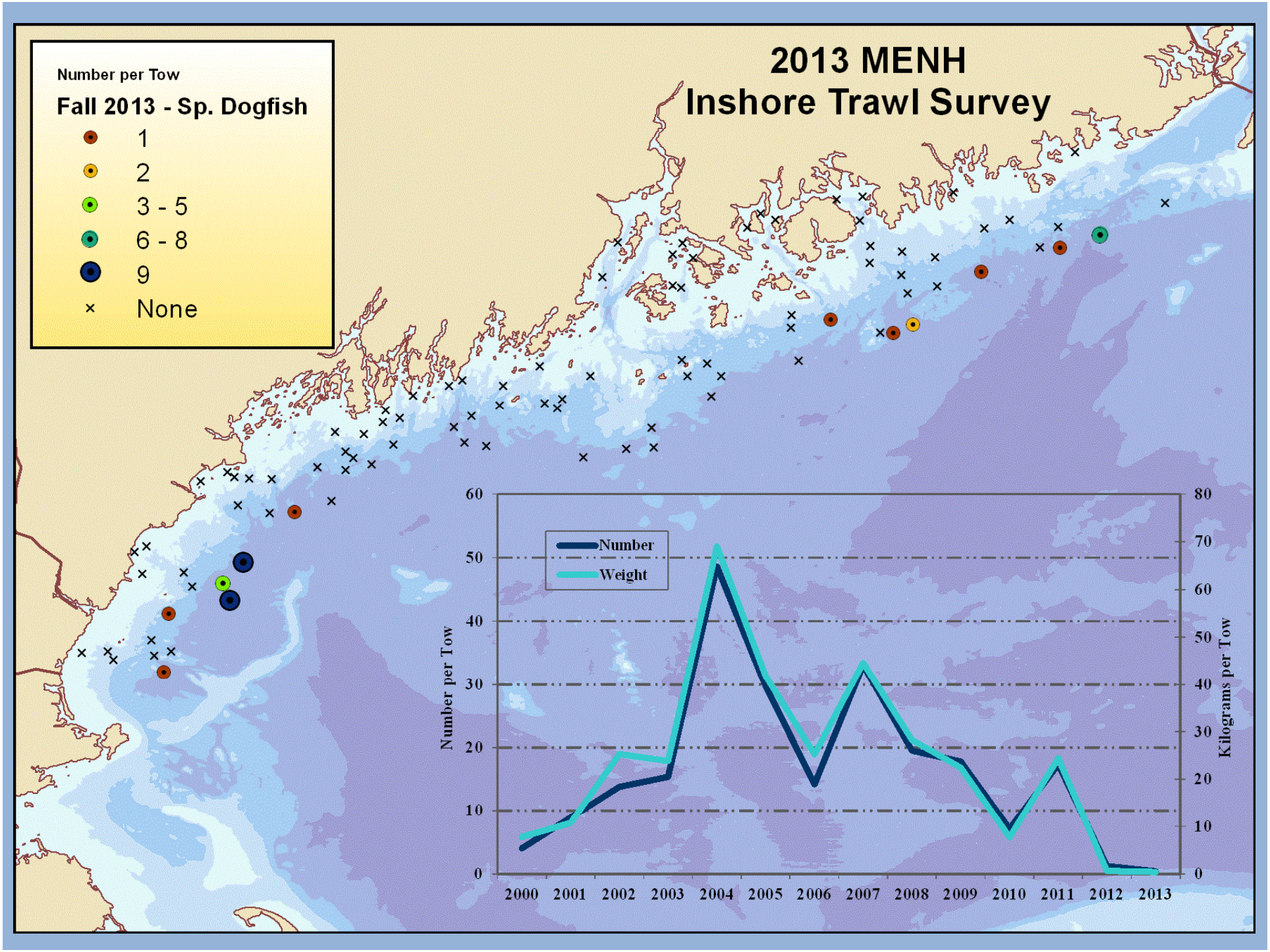

2013 MENH
Inshore Trawl Survey
Number per Tow
Fall Lobster
1 - 10
11 - 25
26 - 50
51 - 100
101 - 500
501 - 829
Number
Weight
Number
Kilograms
350
300
250
200
150
100
50
0
80
70
60
50
40
30
20
10
0
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013


MENH Inshore
Trawl Survey
Catch/Tow (KG)
Spring 2013 - N. Shrimp
<1.5
1.6 - 5.5
5.6 - 10.5
10.6 - 25.5
25.6 - 28.5
None Caught
Number per Tow
Kilograms per Tow
3000
2500
2000
1500
1000
500
0
24
20
16
12
8
4
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Number
Weight

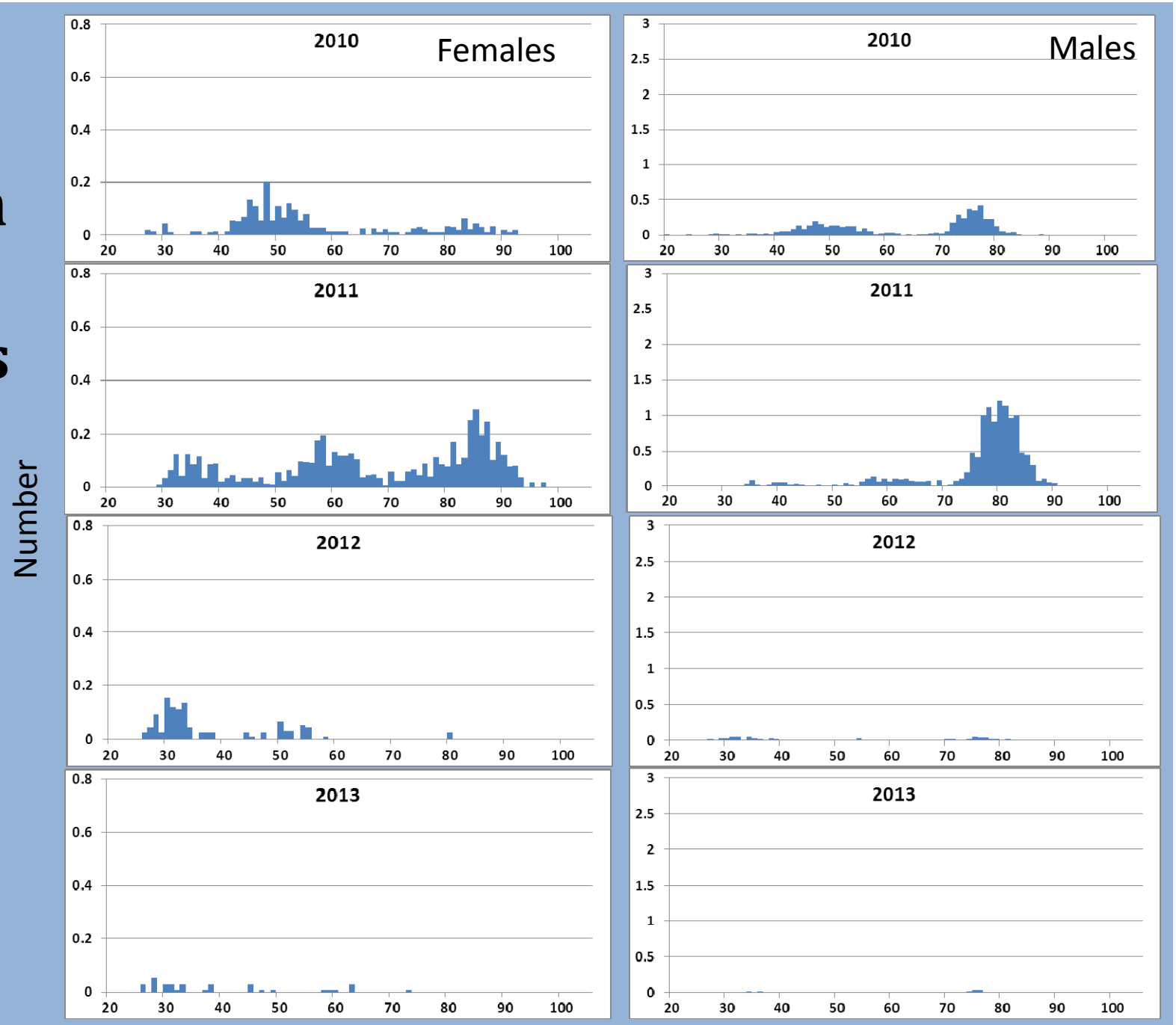

2013 MENH
Inshore Trawl Survey
Number per Tow
Spring Sp. Dogfish
1
2 - 5
6 - 10
11 - 25
110
None
Number
Weight
Number per Tow
Kilograms per Tow
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013

Spring 2013 Spiny Dogfish Lengths
All individuals




2013 MENH
Inshore Trawl Survey
Number per Tow
Fall 2013 - Sp. Dogfish
1
2
3 - 5
6 - 8
9
None
Number
Weight
Number per Tow
Kilograms per Tow
0
10
20
30
40
50
60
70
80
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

Spiny Dogfish Fall Surveys



ME-NH Inshore Trawl Survey Data Uses

- WINTER FLOUNDER – 2009 and 2012 GARM III updates, 2011 stock assessment (SARC 52), 2014 ASMFC FMP review.
- AMERICAN LOBSTER – ASMFC stock assessments, 2009 and 2014.
- HADDOCK – GARM III updates in 2009 and 2012 and upcoming assessment (SARC 59).
- NORTHERN SHRIMP – fishing season advice since 2005, stock assessment 2014 (SARC 58).
- BUTTERFISH – abundance data for setting ACL to MAFMC in 2013, stock assessment in 2014 (SARC 58).
- WHITE HAKE – GARM III updates in 2009 and 2012, stock assessment in 2012 (SARC 56).
- ATLANTIC COD - 2011 and 2012 GOM cod stock assessment review (SARC 53 & 55), 2009 and 2012 GARM III updates.
- SILVER HAKE, RED HAKE, AND LOLIGO SQUID assessments (SARC 51) in 2010
- MONKFISH – stock assessments (SARC 50) in 2010.
- POLLOCK – stock assessment (SARC 50) in 2010, GARM III updates 2012.
- ACADIAN REDFISH, YELLOWTAIL FLOUNDER, WITCH FLOUNDER, ATLANTIC HALIBUT, WINDOWPANE FLOUNDER, AND AMERICAN PLAICE in 2009 and 2012 for GARM III updates
- ATLANTIC HERRING – quota advice since 2003, stock assessment 2012 (SARC 54)
- AMERICAN SHAD AND RIVER HERRING - 2006 - ASMFC technical committee for management plan review.
- SEA SCALLOP - Maine area management measures in 2008 and 2012/13.

Massachusetts Division of Marine Fisheries
Inshore Bottom-Trawl Survey
2013

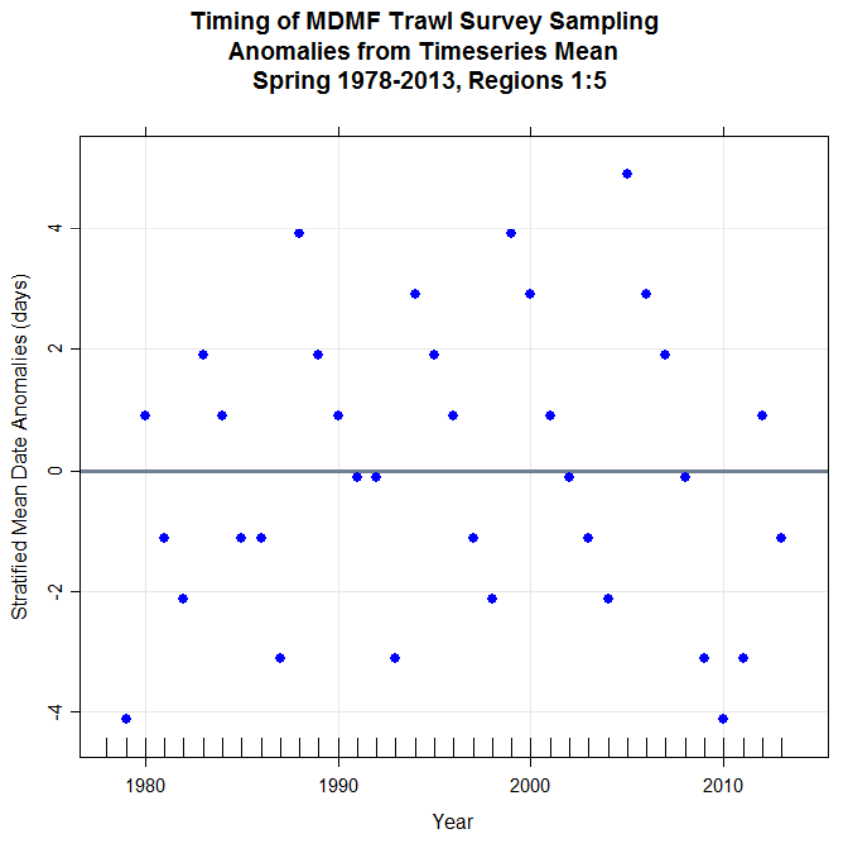
NEAMAP Board
February 5, 2014

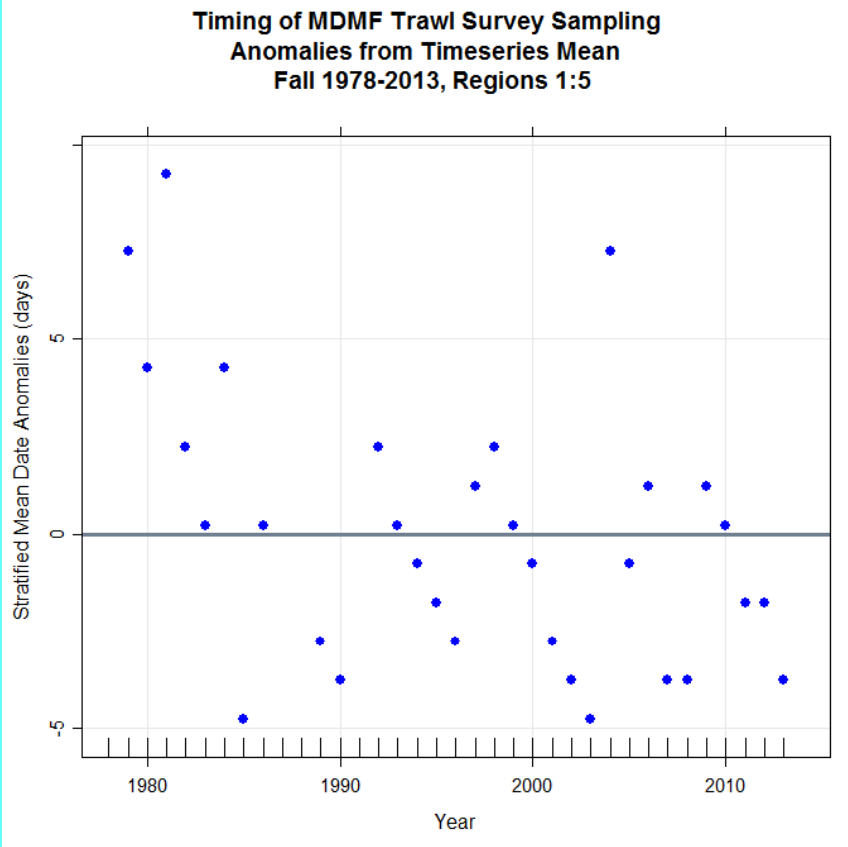
MarineFisheries
Commonwealth of Massachusetts

U.S. FISH & WILDLIFE SERVICE

SPORT FISH RESTORATION

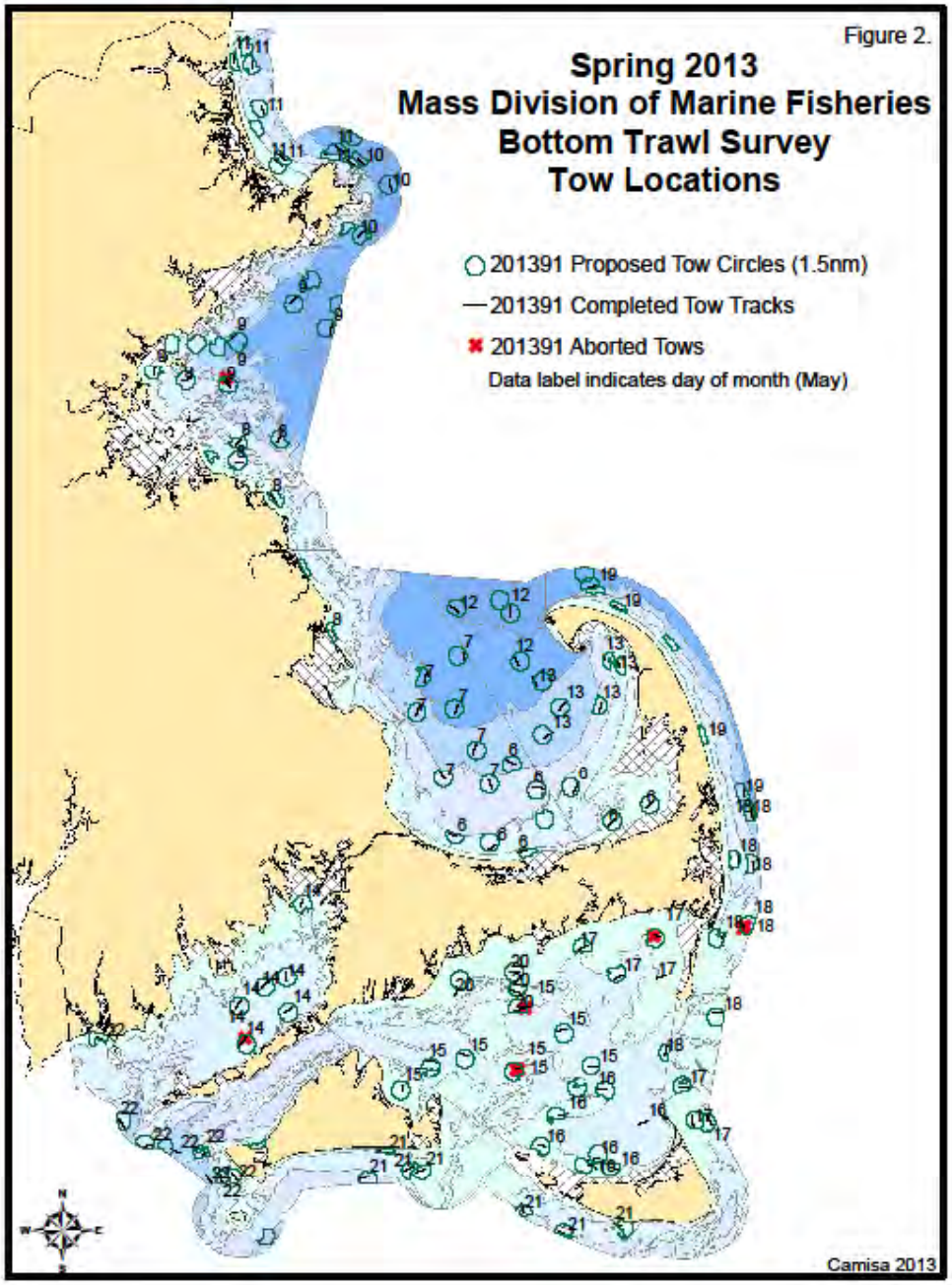
Survey Timing





No changes in protocol in 2013.

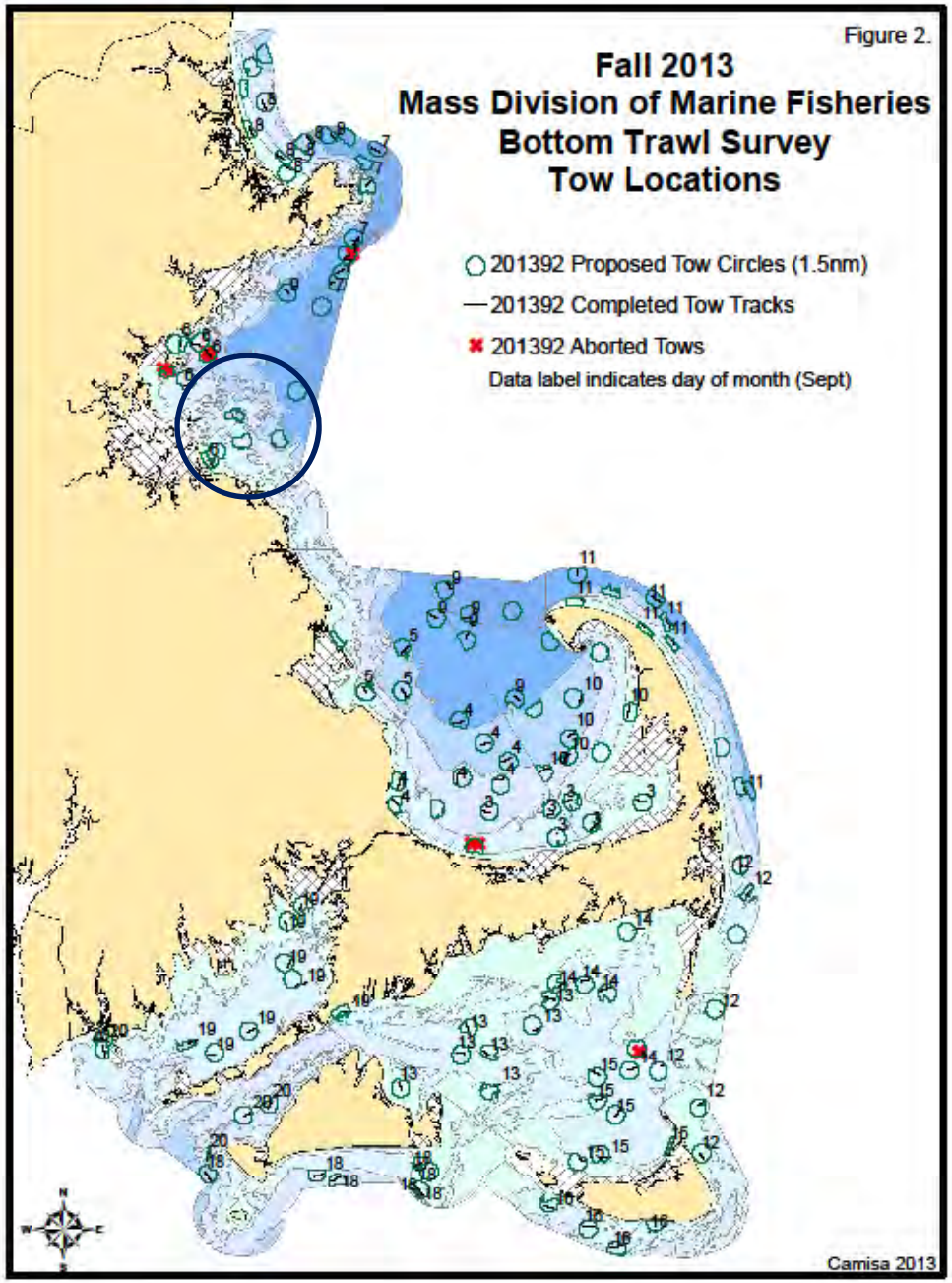
The 2013 surveys were conducted within the historical range of dates.



2013 Spring Survey

100 stations were completed. All 100 stations are considered representative and acceptable for assessment of all species.

One assigned station not completed in each of three strata (11, 16, and 25).



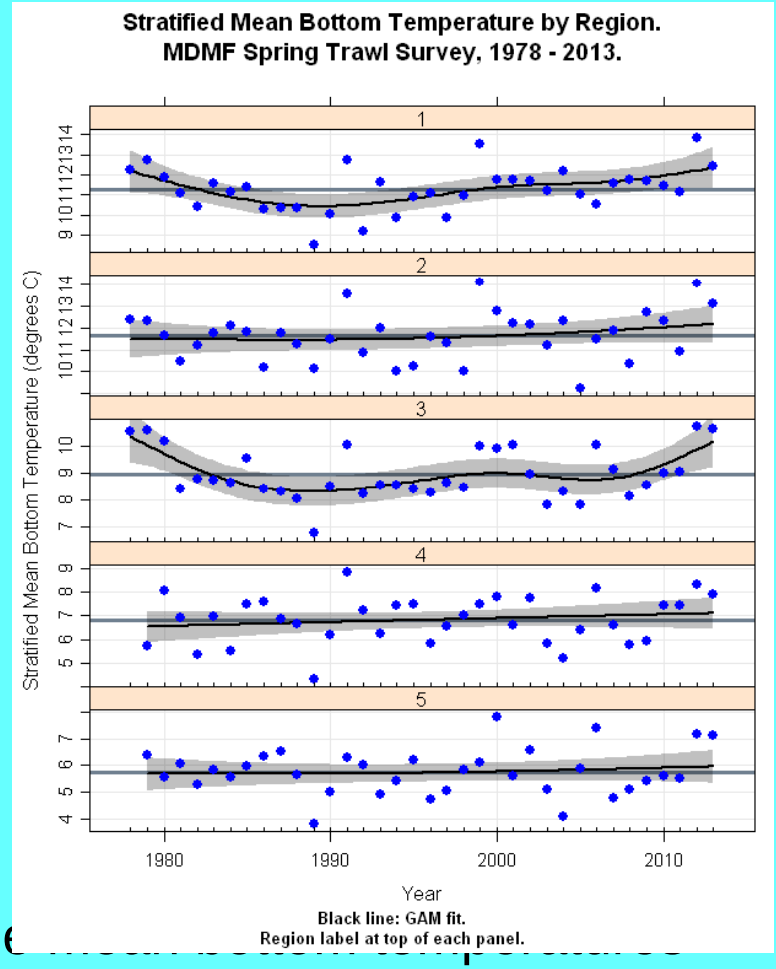
2013 Fall Survey

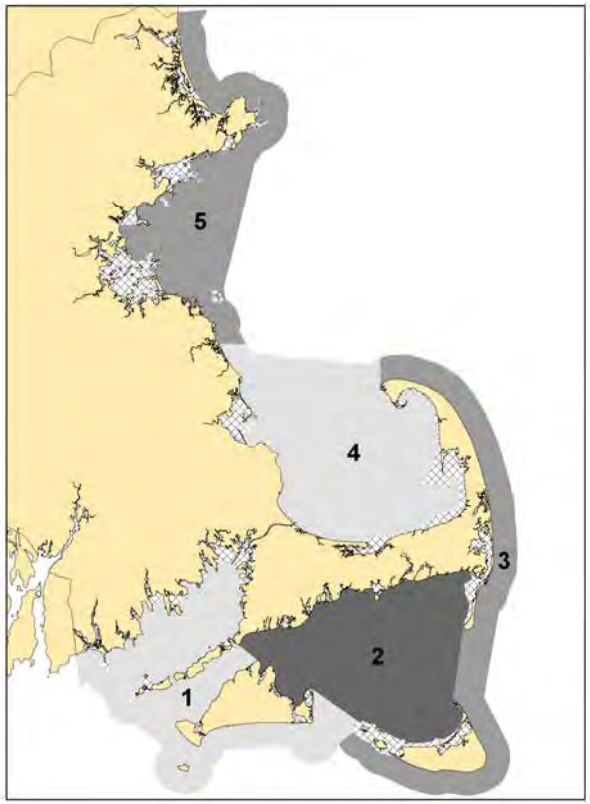
98 completed stations are considered acceptable for assessment of all species. 2 stations are accepted for spiny dogfish only.

Five of six sites in southern portion of Massachusetts Bay could not be surveyed due to lobster gear at advertised sites.

Three assigned stations were not completed successfully; one each in strata 16, 32, and 34.

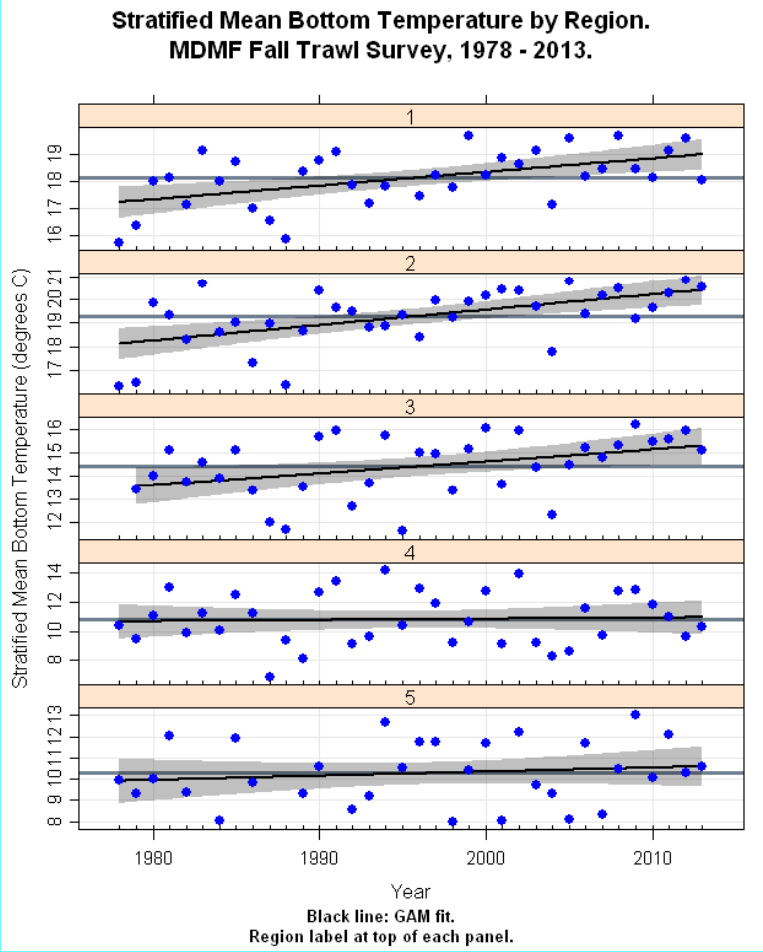
Observed Bottom Temperatures – Spring Survey

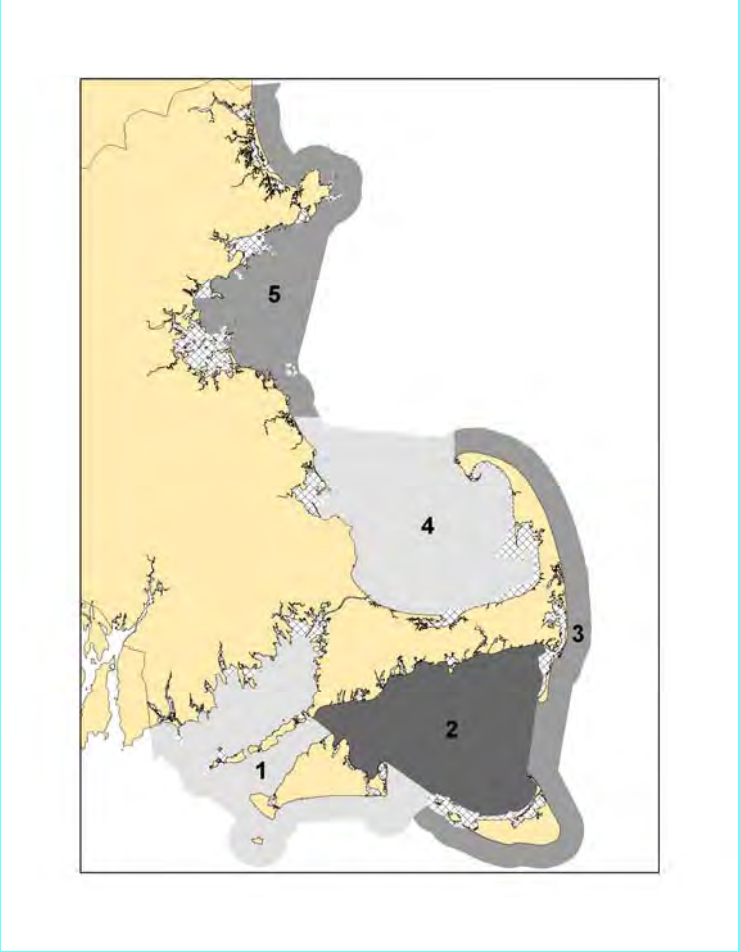




The [illegible] observed on the 2013 spring were above the median in all regions.

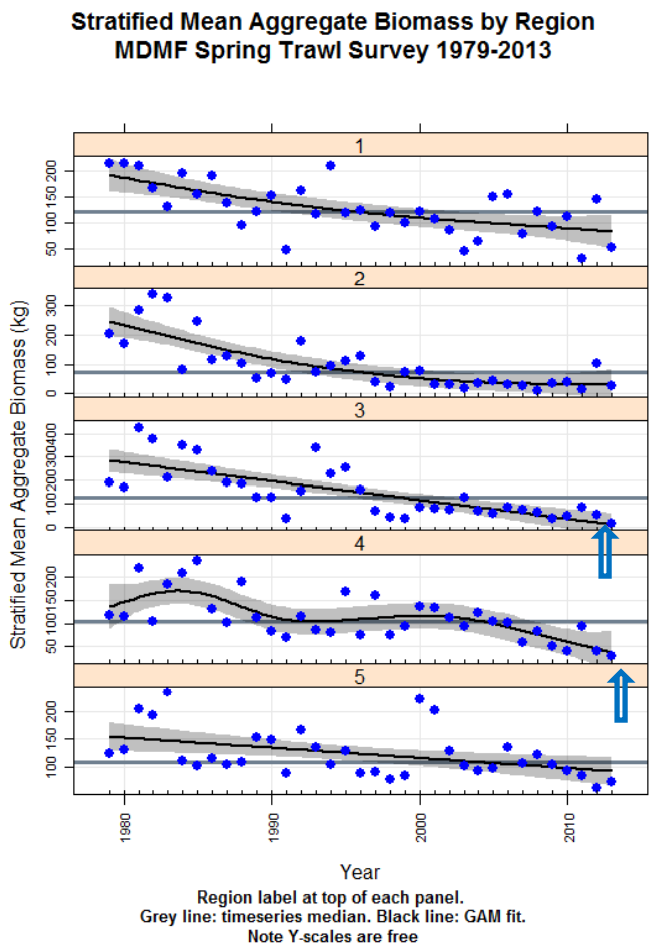
Observed Bottom Temperatures – Fall Survey

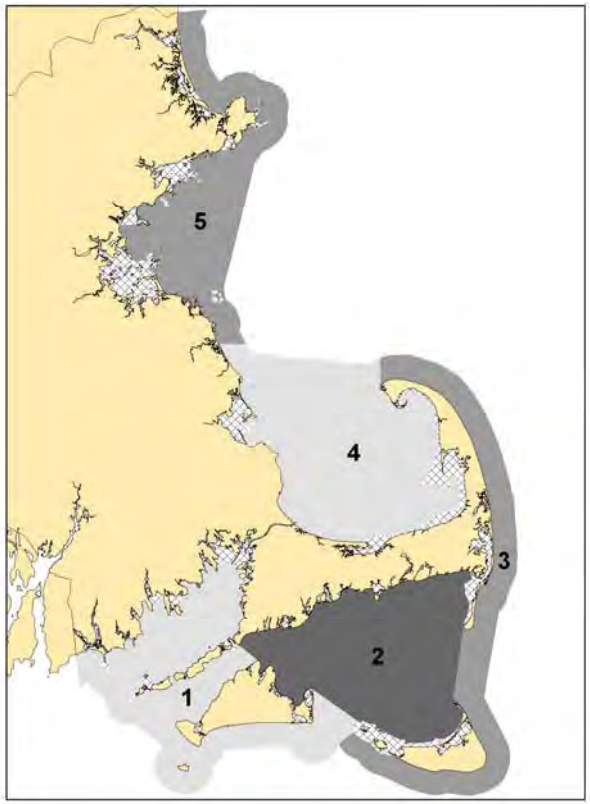




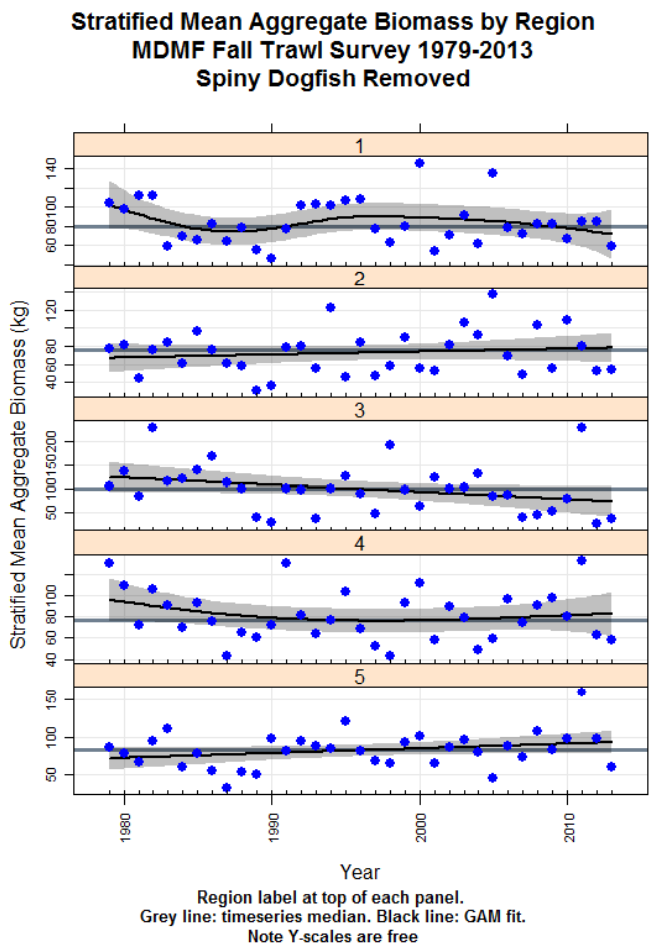
The fall 2013 mean bottom temperature observations were within the timeseries range in all regions.

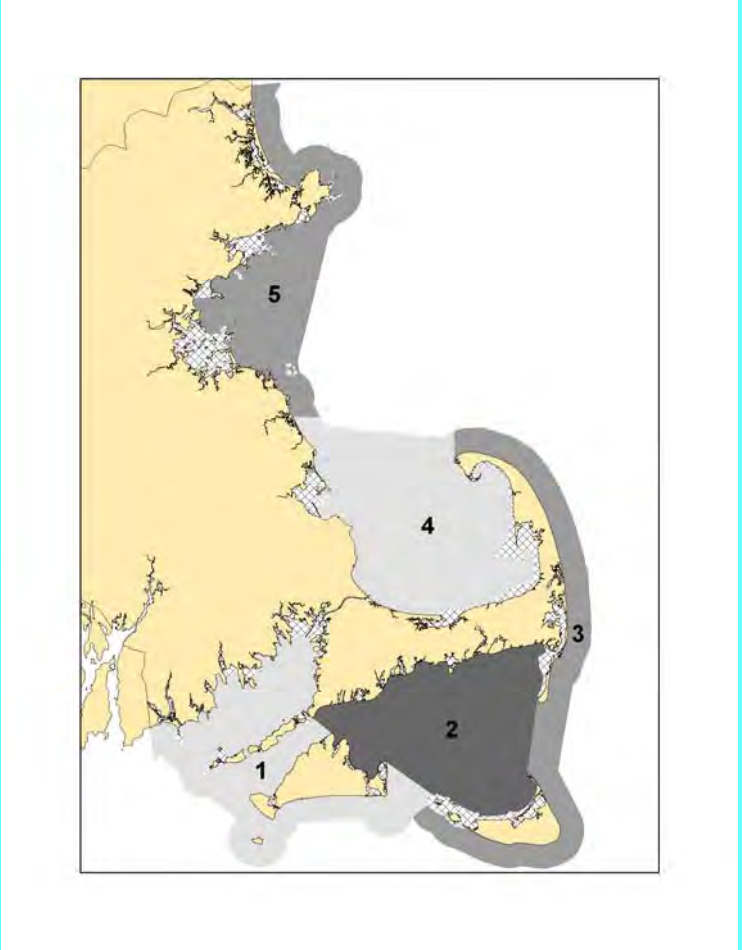
Regional Trends in Aggregate Biomass





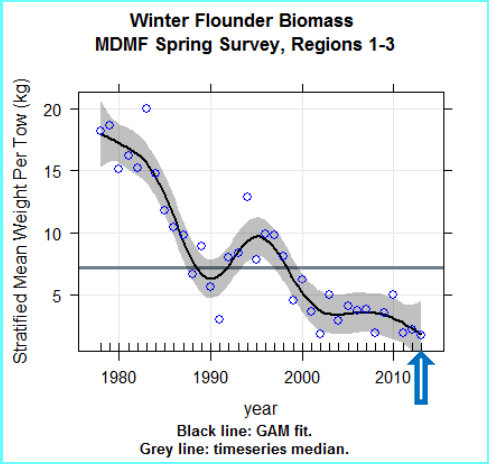
Regional Trends in Aggregate Biomass

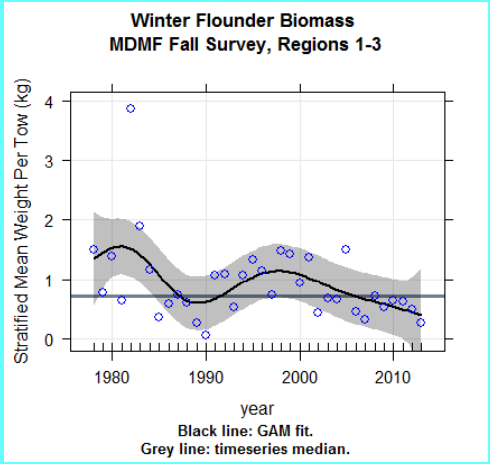


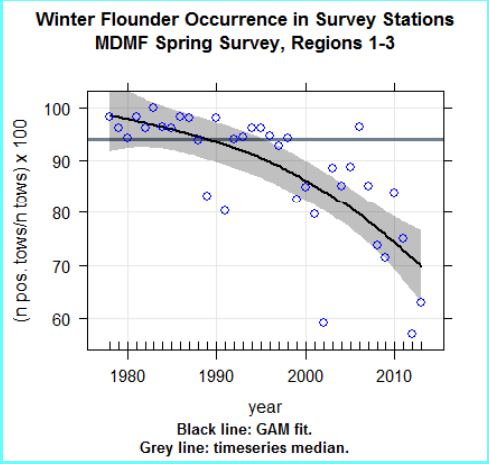


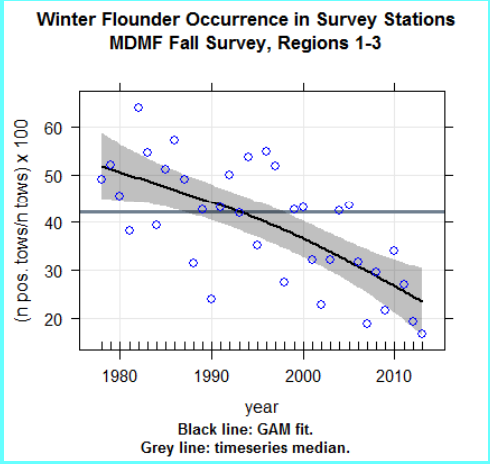
Indices 1978 – 2013.

SNE Winter Flounder

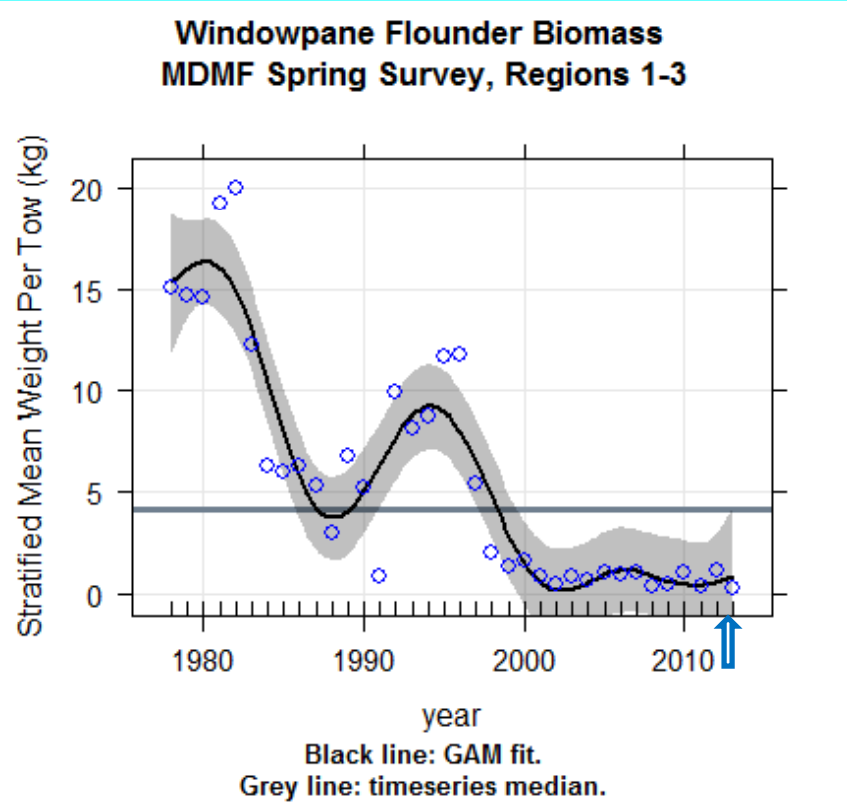


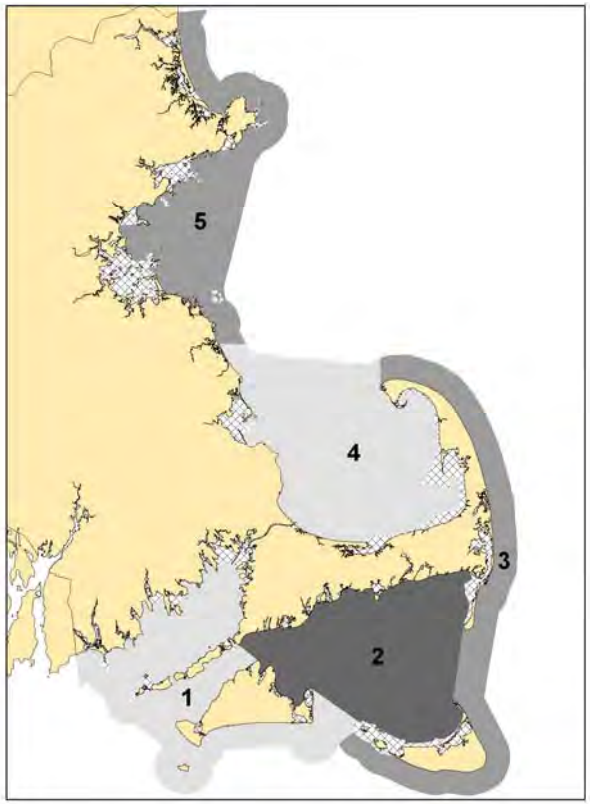




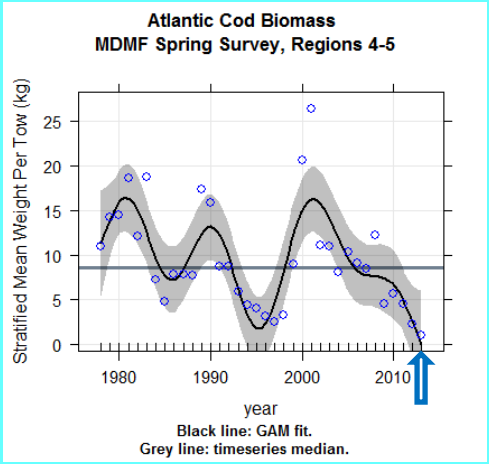


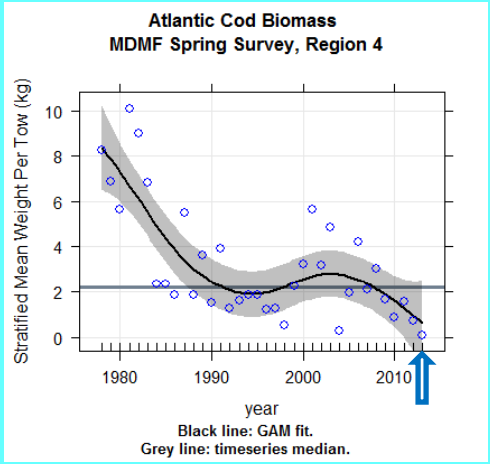
Windowpane flounder – SNE

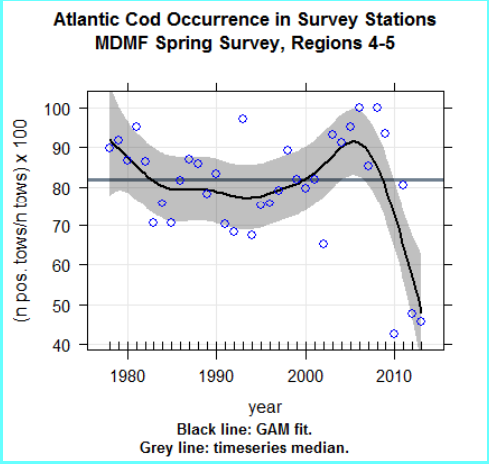


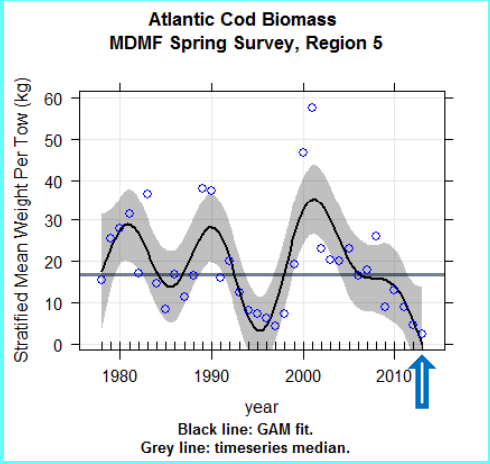


Atlantic Cod

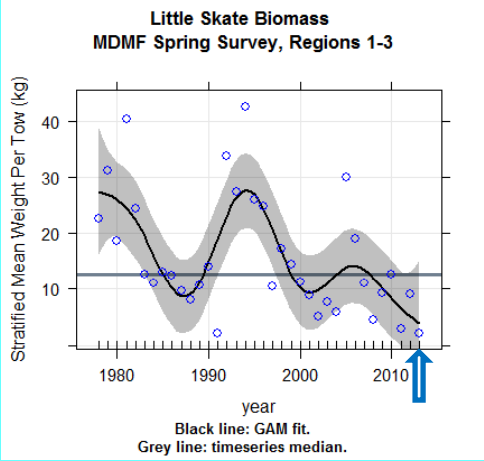


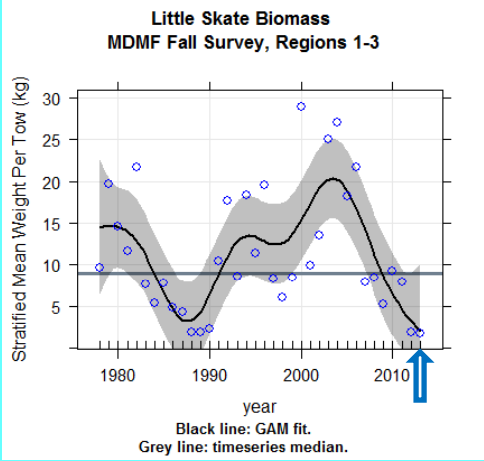


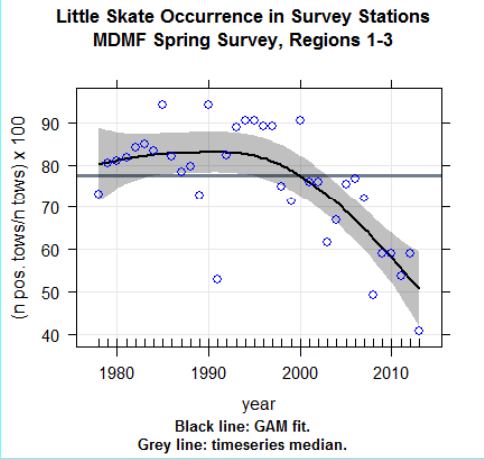


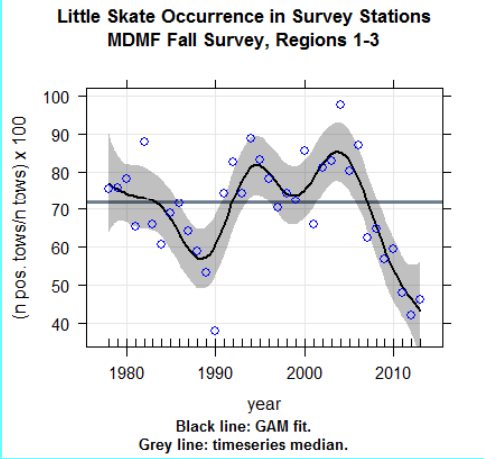


Little Skate – SNE

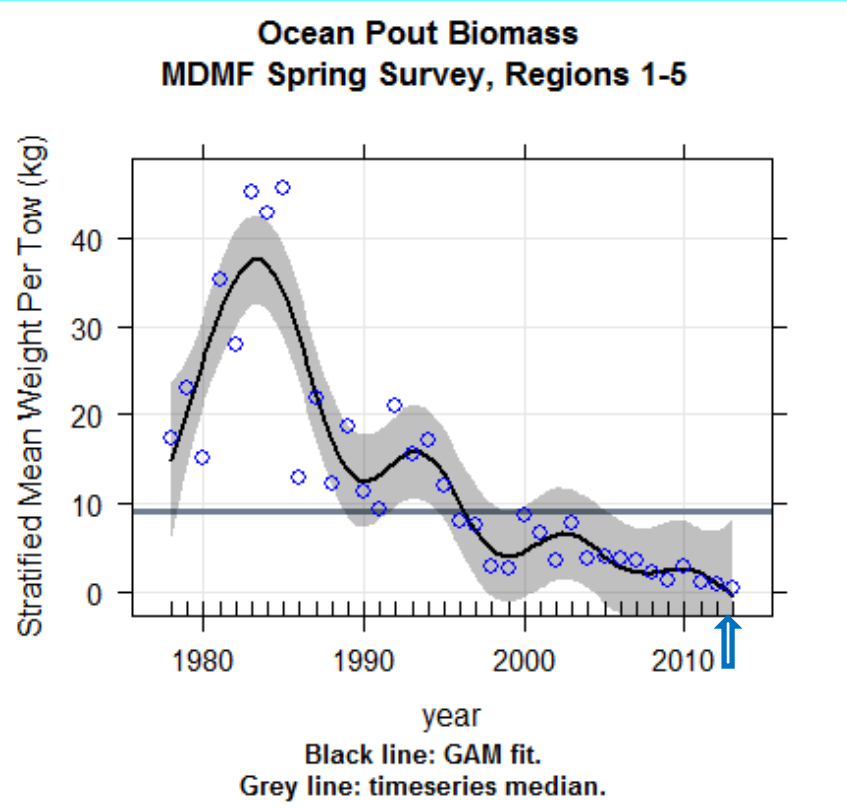


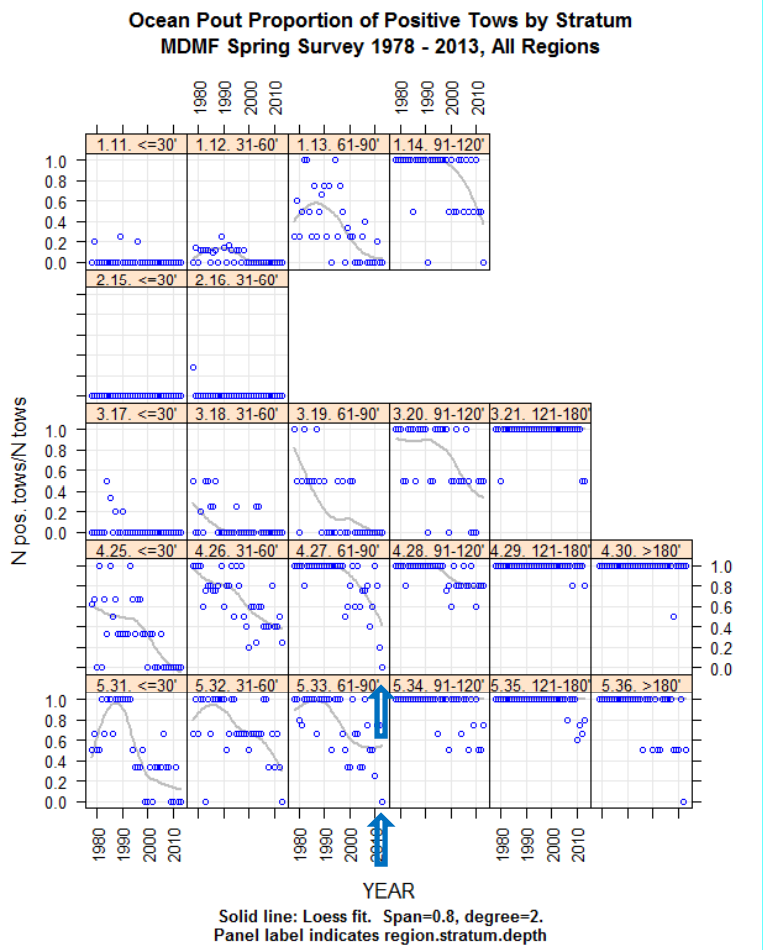




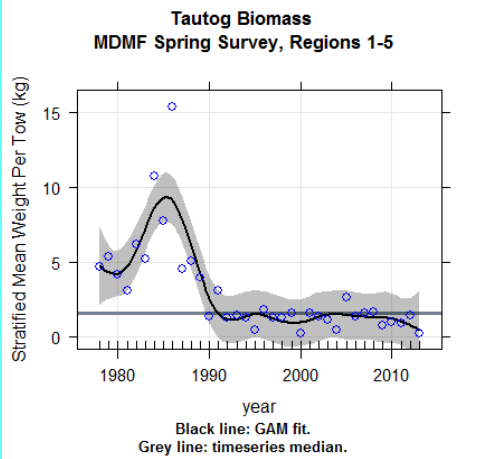


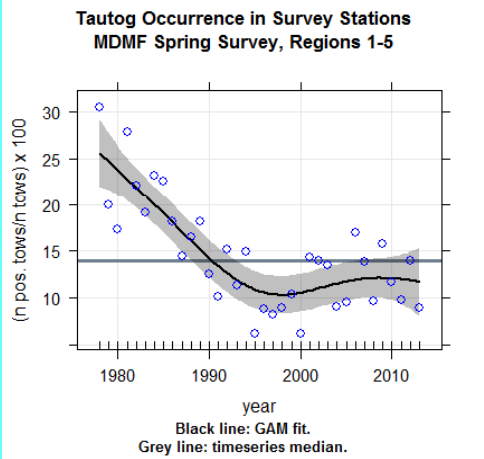
Ocean Pout

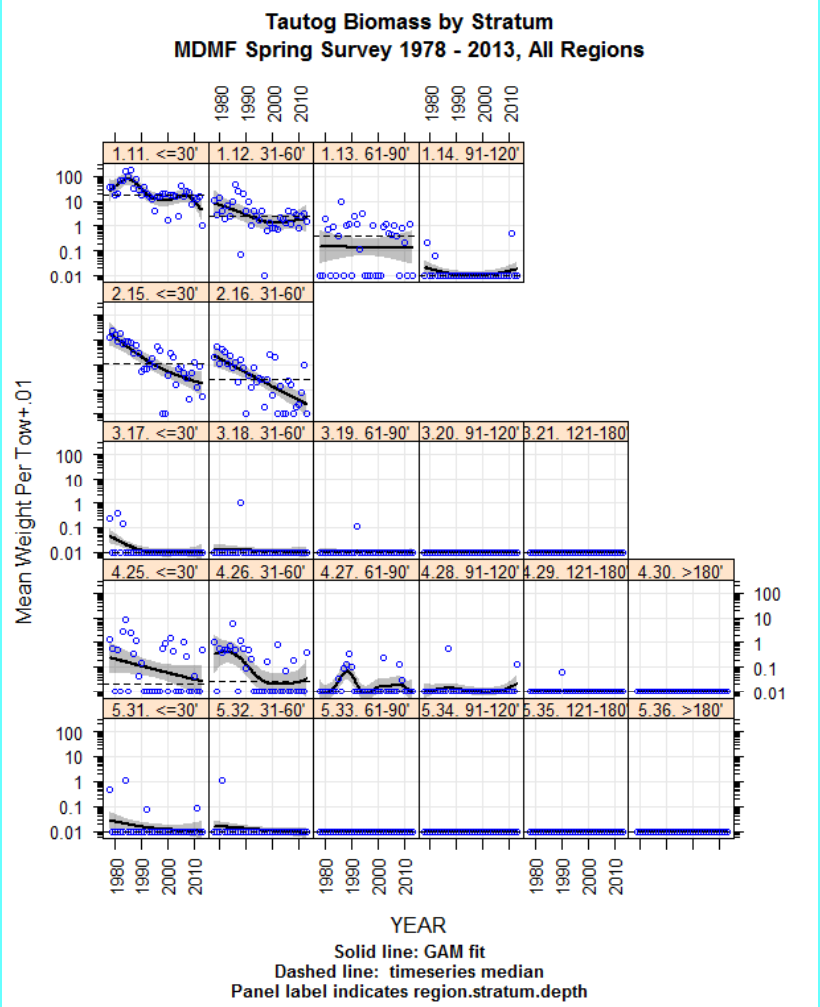

Ocean Pout Biomass
MDMF Spring Survey, Regions 1-5
Stratified Mean Weight Per Tow (kg)
0
10
20
30
40
1980
1990
2000
2010
year
Black line: GAM fit.
Grey line: timeseries median.


Ocean Pout Proportion of Positive Tows by Stratum
MDMF Spring Survey 1978 - 2013, All Regions
1.11. <=30'
1.12. 31-60'
1.13. 61-90'
1.14. 91-120'
2.15. <=30'
2.16. 31-60'
3.17. <=30'
3.18. 31-60'
3.19. 61-90'
3.20. 91-120'
3.21. 121-180'
4.25. <=30'
4.26. 31-60'
4.27. 61-90'
4.28. 91-120'
4.29. 121-180'
4.30. >180'
5.31. <=30'
5.32. 31-60'
5.33. 61-90'
5.34. 91-120'
5.35. 121-180'
5.36. >180'
N pos. tows/N tows
YEAR
Solid line: Loess fit. Span=0.8, degree=2.
Panel label indicates region.stratum.depth

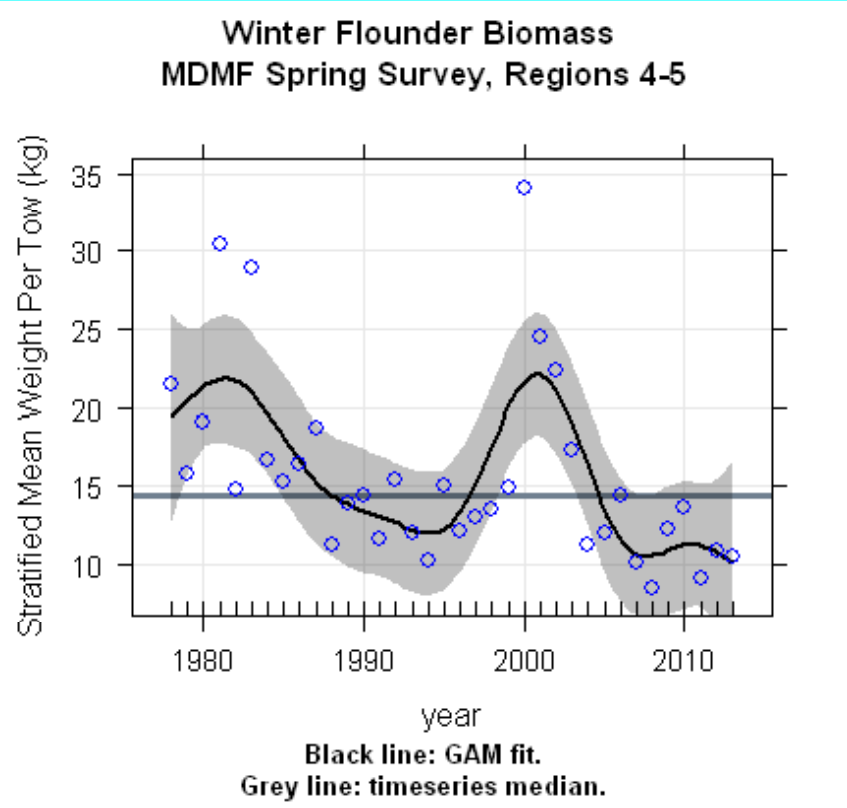
Tautog

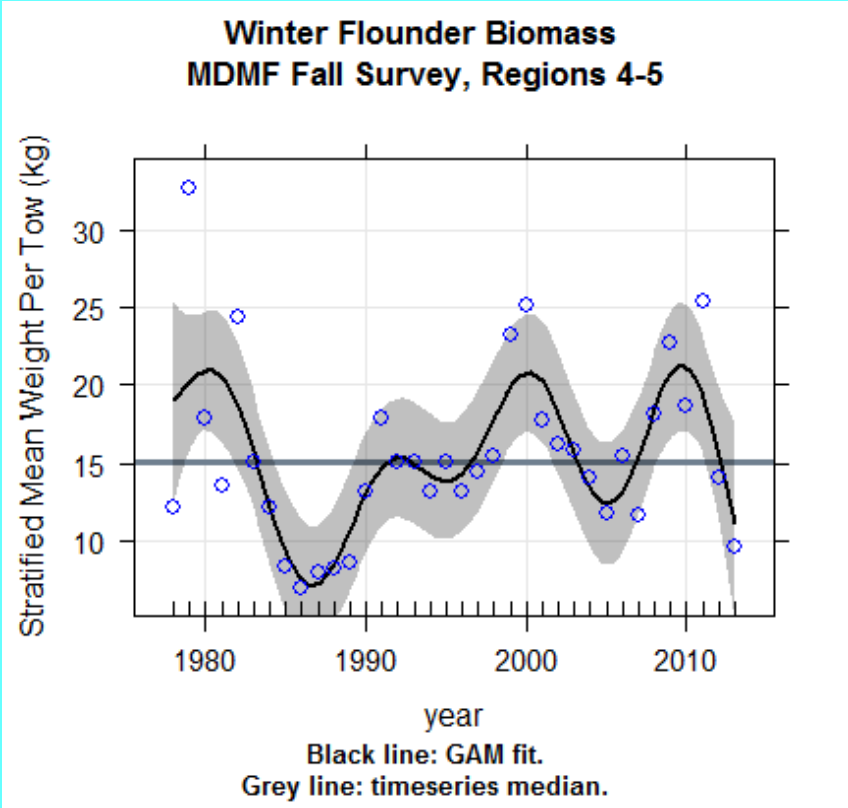

Tautog Biomass
MDMF Spring Survey, Regions 1-5
Stratified Mean Weight Per Tow (kg)
0
5
10
15
1980
1990
2000
2010
year
Black line: GAM fit.
Grey line: timeseries median.


Tautog Occurrence in Survey Stations
MDMF Spring Survey, Regions 1-5
(n pos. tows/n tows) x 100
10
15
20
25
30
1980
1990
2000
2010
year
Black line: GAM fit.
Grey line: timeseries median.

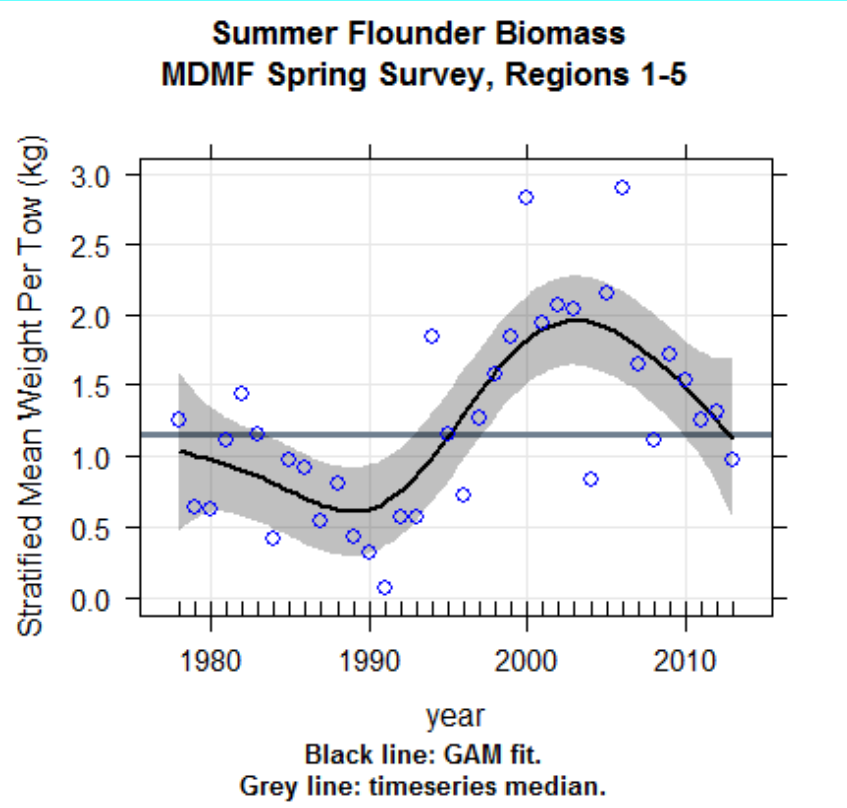

Tautog Biomass by Stratum
MDMF Spring Survey 1978 - 2013, All Regions
Mean Weight Per Tow+.01
1.11. <=30'
1.12. 31-60'
1.13. 61-90'
1.14. 91-120'
2.15. <=30'
2.16. 31-60'
3.17. <=30'
3.18. 31-60'
3.19. 61-90'
3.20. 91-120'
3.21. 121-180'
4.25. <=30'
4.26. 31-60'
4.27. 61-90'
4.28. 91-120'
4.29. 121-180'
4.30. >180'
5.31. <=30'
5.32. 31-60'
5.33. 61-90'
5.34. 91-120'
5.35. 121-180'
5.36. >180'
0.01
0.1
1
10
100
1980
1990
2000
2010
YEAR
Solid line: GAM fit
Dashed line: timeseries median
Panel label indicates region.stratum.depth

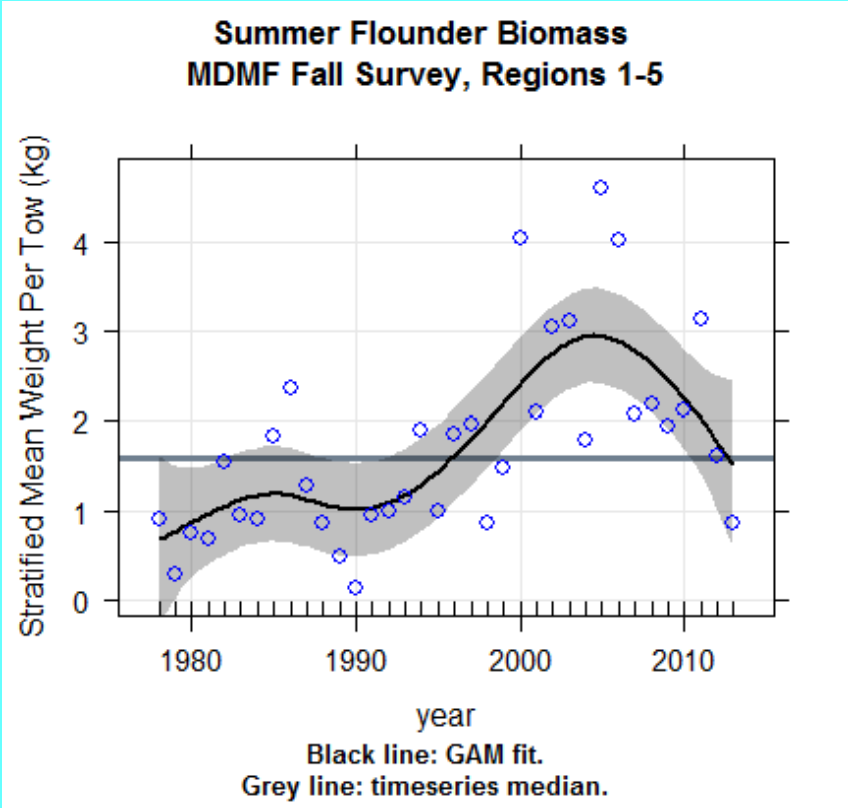
Winter Flounder - GOM



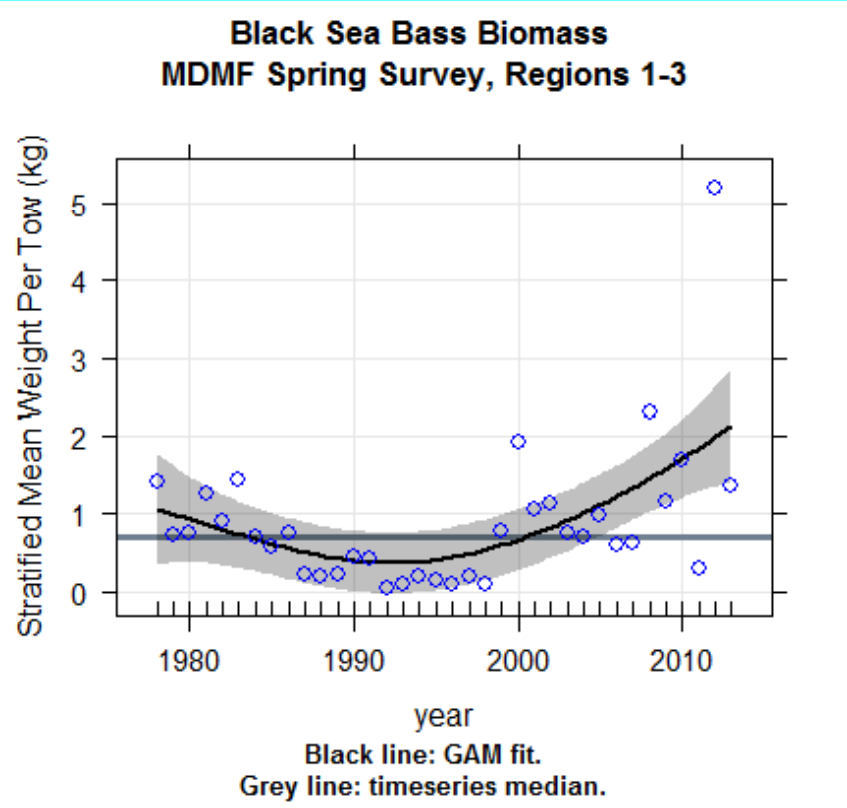


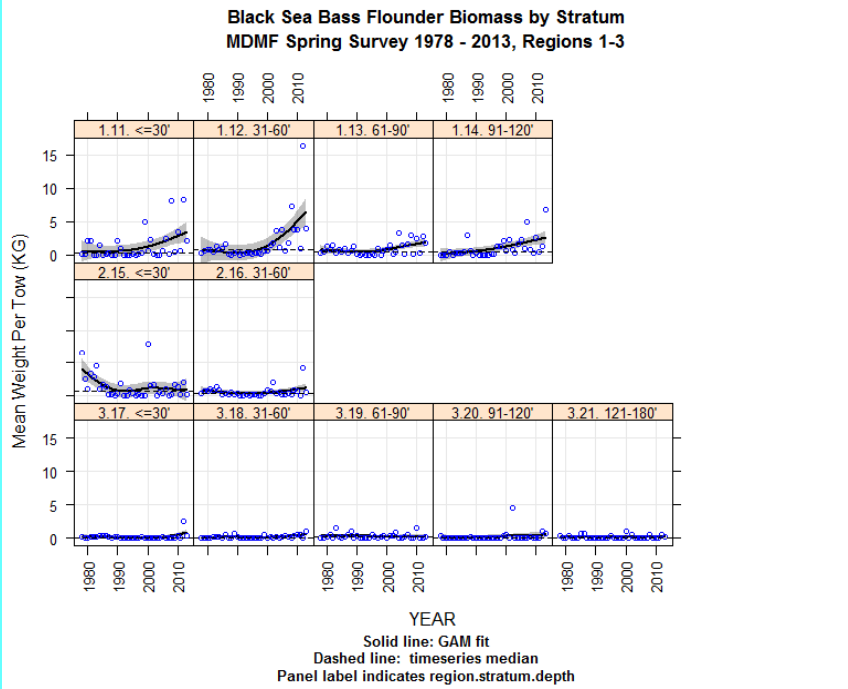
Summer Flounder



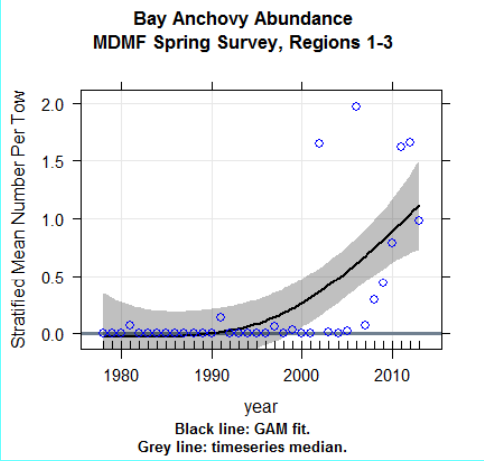


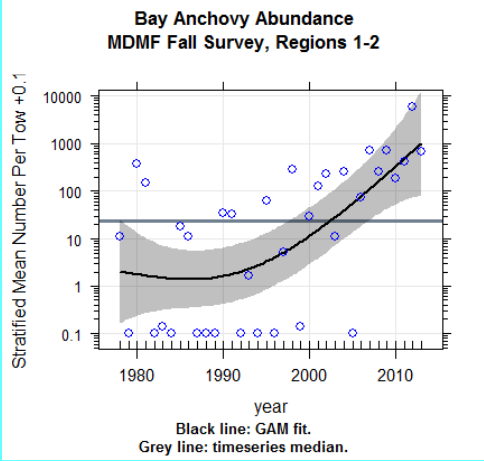
Black Sea Bass

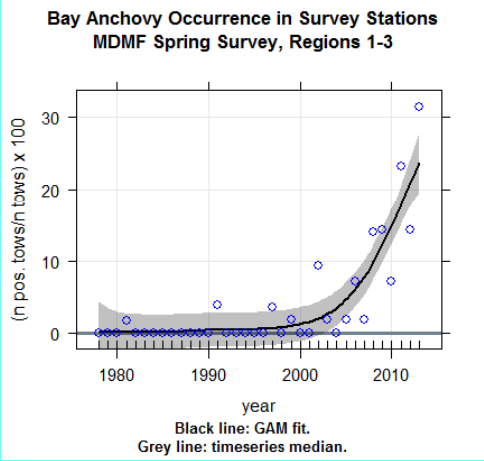


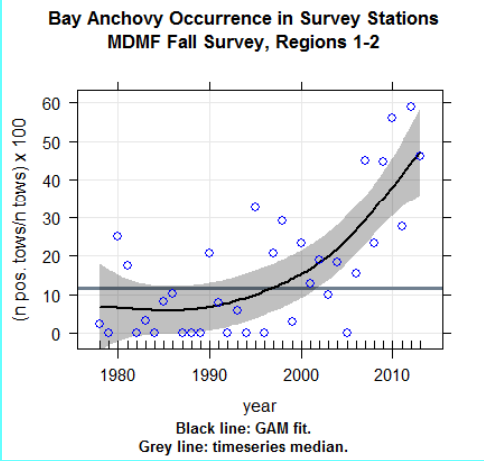


Bay Anchovy

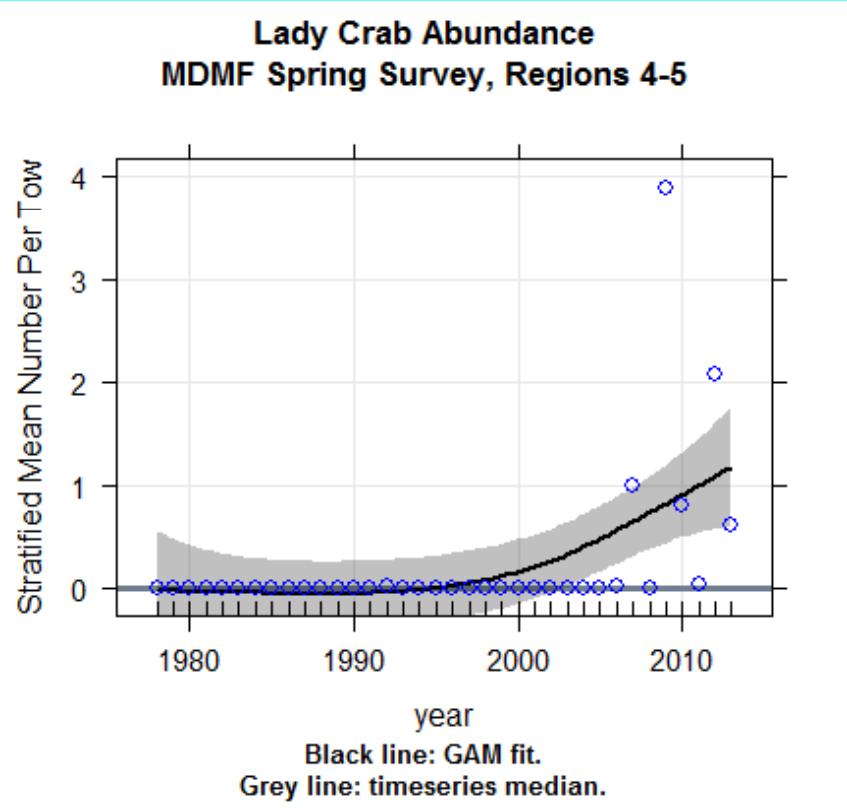

Bay Anchovy Abundance
MDMF Spring Survey, Regions 1-3
Stratifiec Mean Number Per Tow
2.0
1.5
1.0
0.5
0.0
1980
1990
2000
2010
year
Black line: GAM fit.
Grey line: timeseries median.

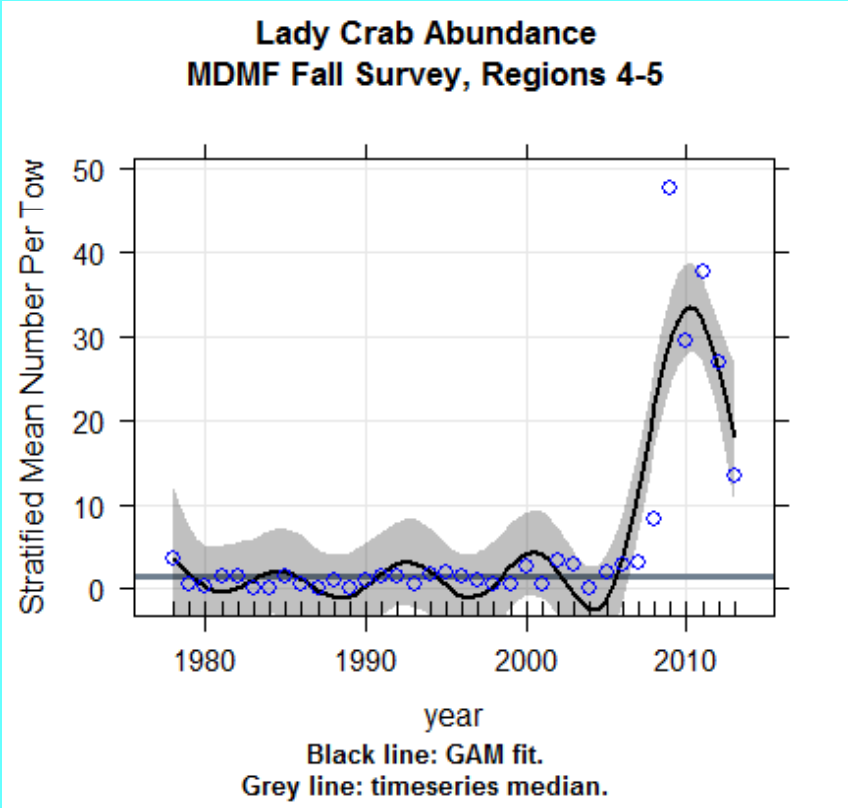

Bay Anchovy Abundance
MDMF Fall Survey, Regions 1-2
Stratified Mean Number Per Tow +0.1
10000
1000
100
10
1
0.1
1980
1990
2000
2010
year
Black line: GAM fit.
Grey line: timeseries median.


Bay Anchovy Occurrence in Survey Stations
MDMF Spring Survey, Regions 1-3
(n pos. tows/n tows) x 100
30
20
10
0
1980
1990
2000
2010
year
Black line: GAM fit.
Grey line: timeseries median.

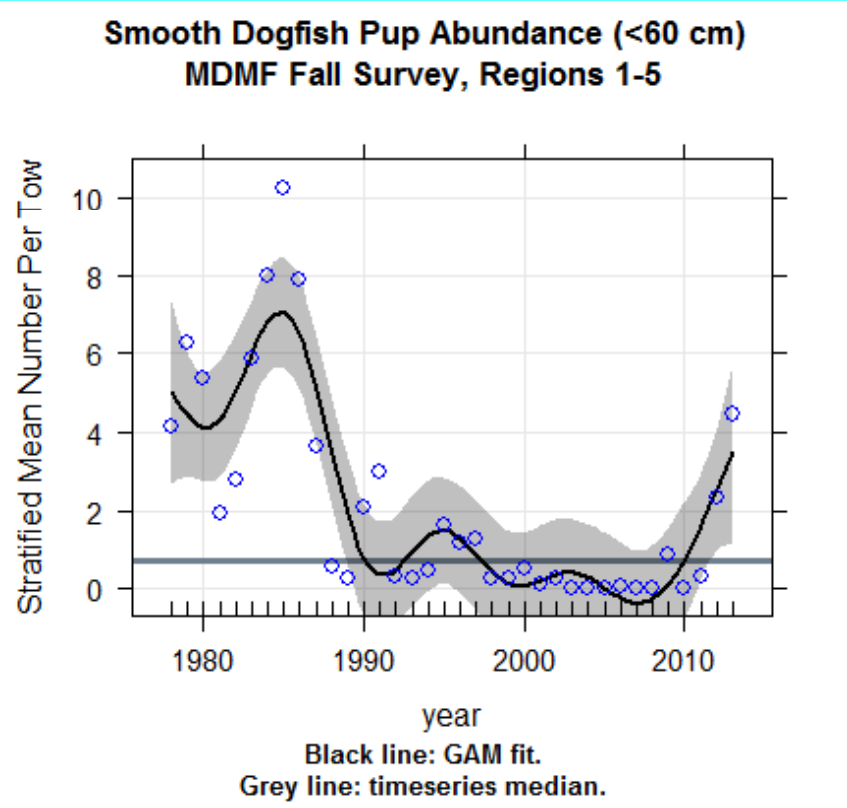

Bay Anchovy Occurrence in Survey Stations
MDMF Fall Survey, Regions 1-2
(n pos. tows/n tows) x 100
60
50
40
30
20
10
0
1980
1990
2000
2010
year
Black line: GAM fit.
Grey line: timeseries median.

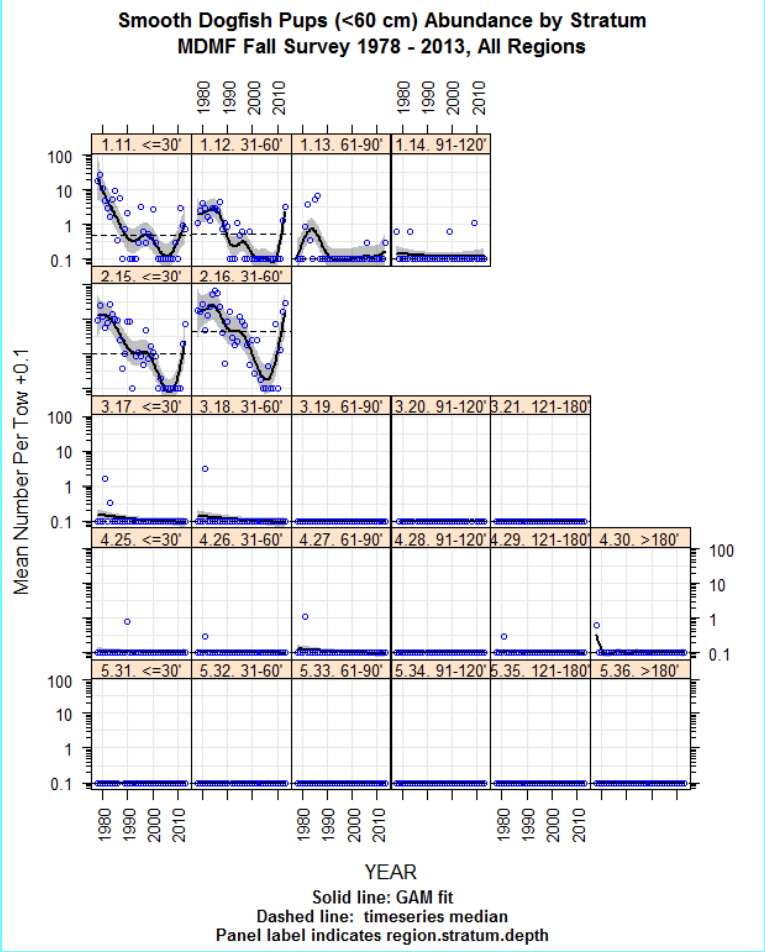
Lady Crab


Lady Crab Abundance
MDMF Spring Survey, Regions 4-5
Stratified Mean Number Per Tow
0
1
2
3
4
1980
1990
2000
2010
year
Black line: GAM fit.
Grey line: timeseries median.

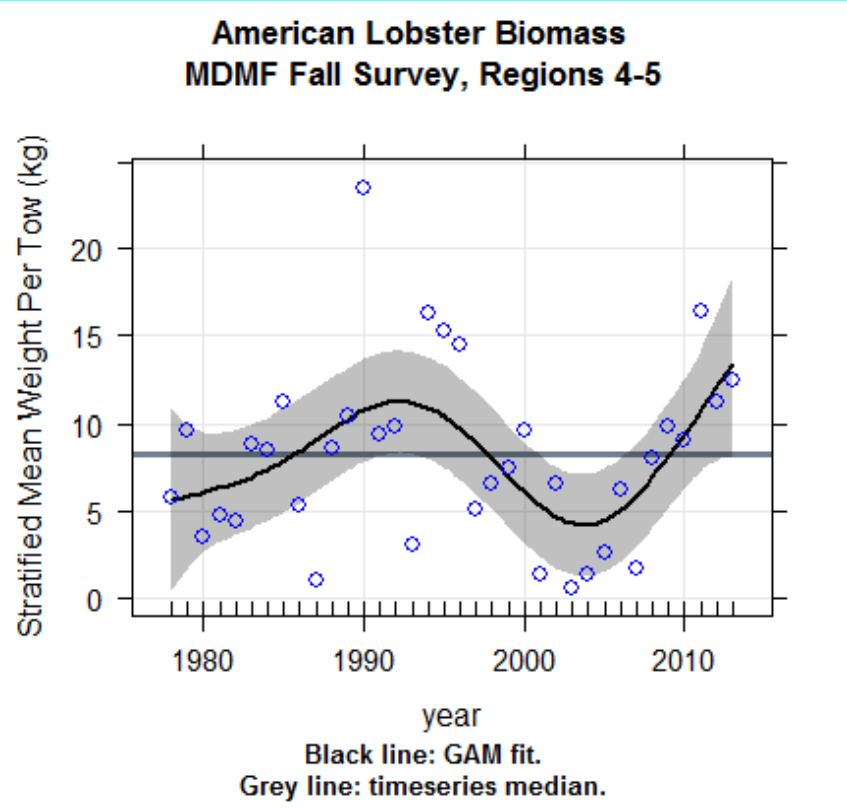

Lady Crab Abundance
MDMF Fall Survey, Regions 4-5
Stratified Mean Number Per Tow
0
10
20
30
40
50
1980
1990
2000
2010
year
Black line: GAM fit.
Grey line: timeseries median.

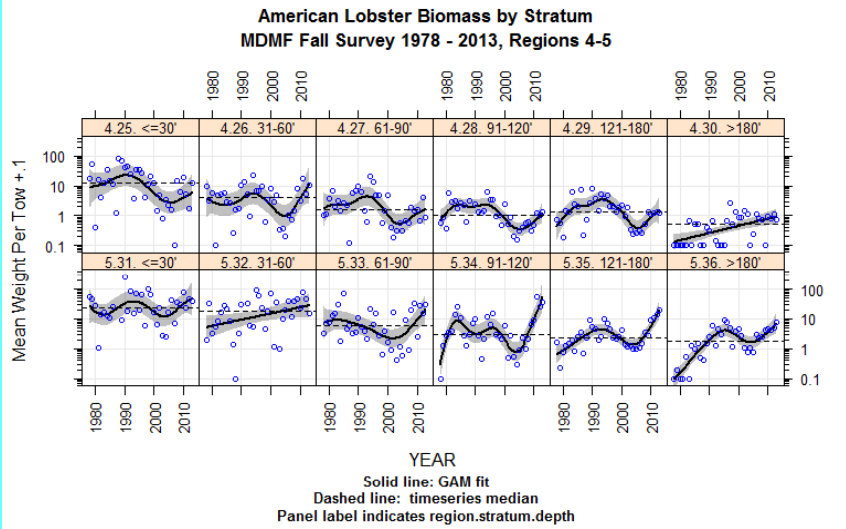
Smooth Dogfish Pups



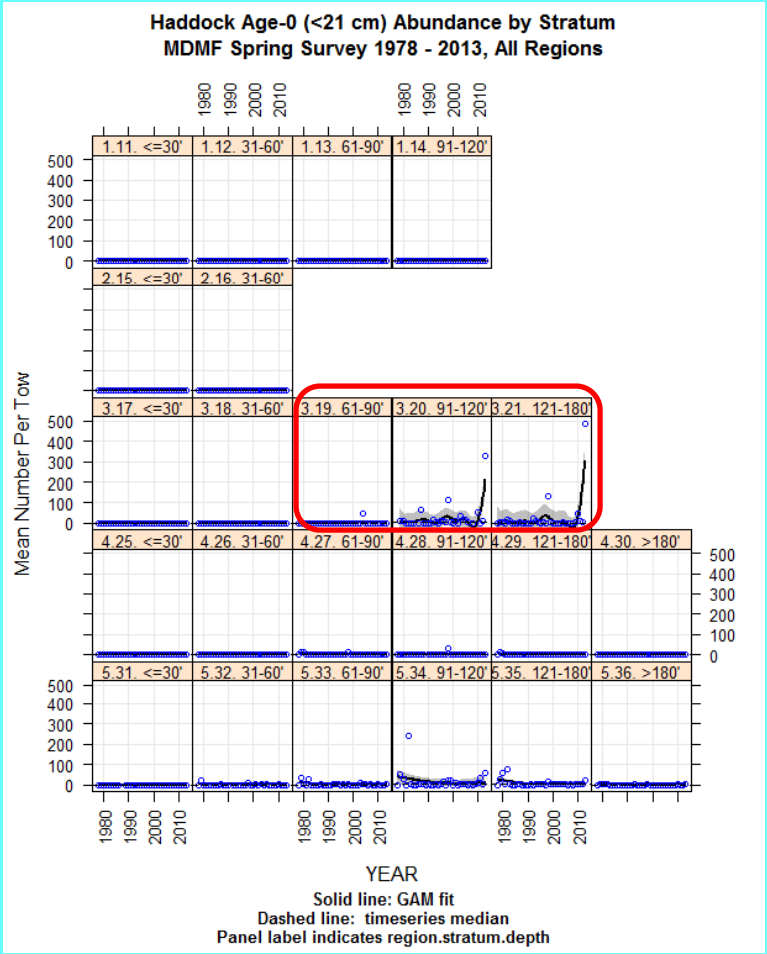


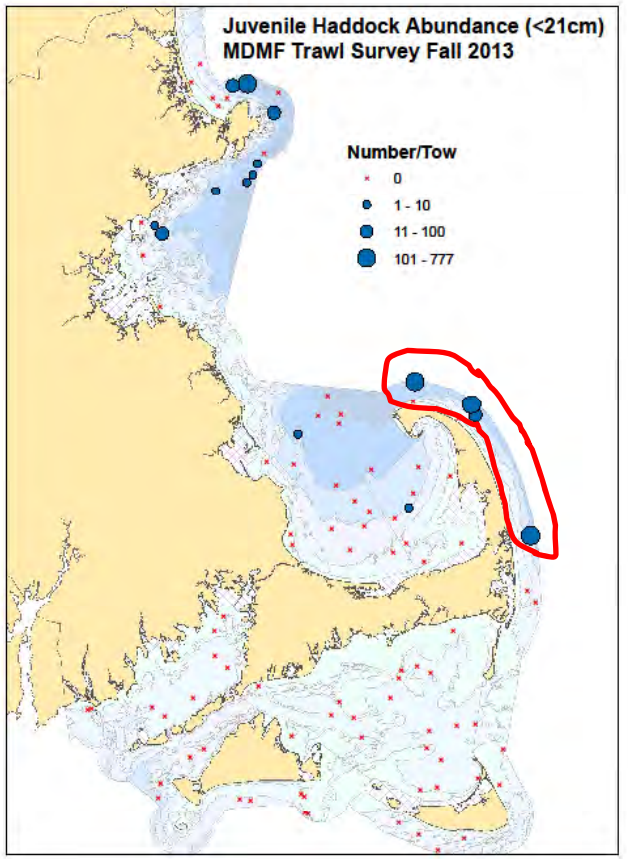
American Lobster - GOM



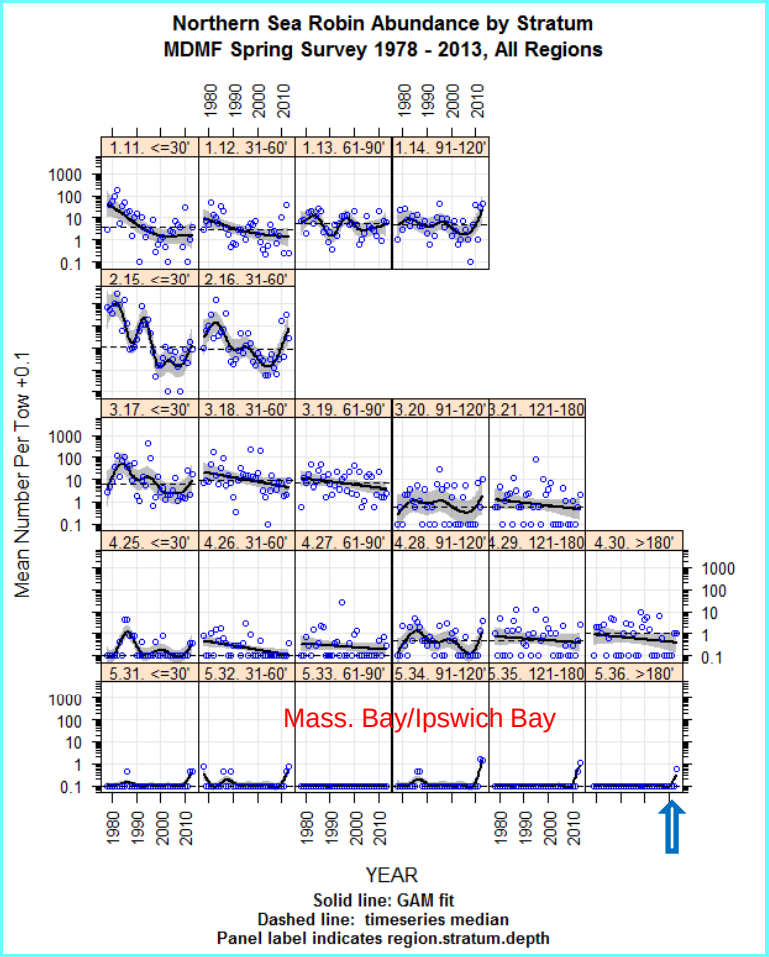


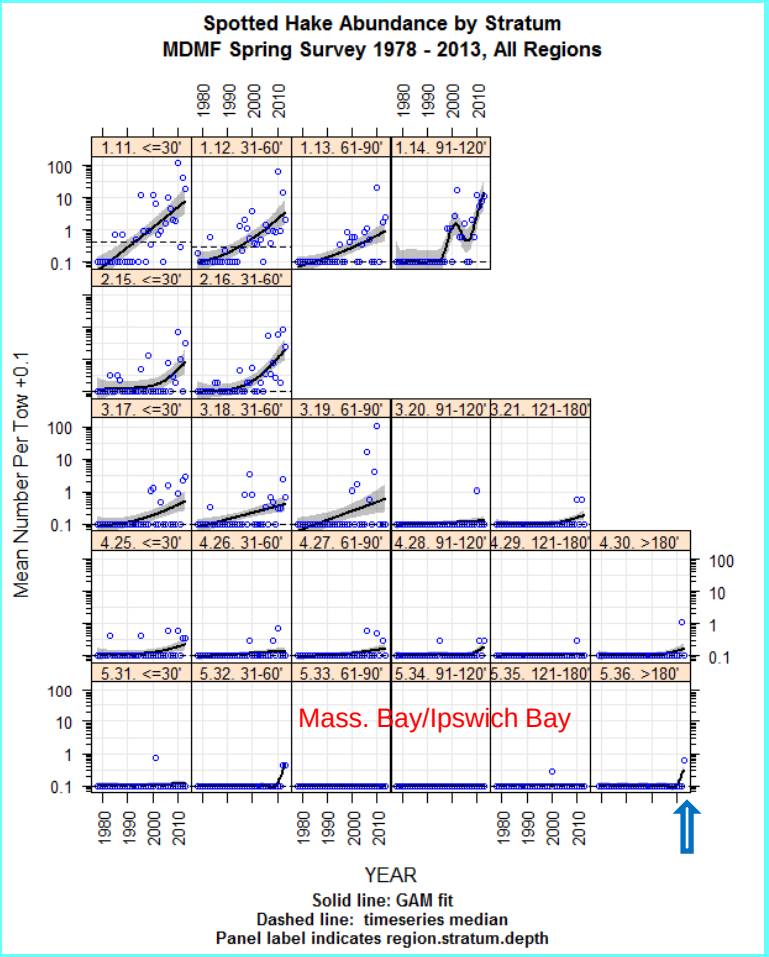
Haddock


Haddock Age-0 (<21 cm) Abundance by Stratum
MDMF Spring Survey 1978 - 2013, All Regions
1.11. <=30'
1.12. 31-60'
1.13. 61-90'
1.14. 91-120'
2.15. <=30'
2.16. 31-60'
3.17. <=30'
3.18. 31-60'
3.19. 61-90'
3.20. 91-120'
3.21. 121-180'
4.25. <=30'
4.26. 31-60'
4.27. 61-90'
4.28. 91-120'
4.29. 121-180'
4.30. >180'
5.31. <=30'
5.32. 31-60'
5.33. 61-90'
5.34. 91-120'
5.35. 121-180'
5.36. >180'
Mean Number Per Tow
YEAR
Solid line: GAM fit
Dashed line: timeseries median
Panel label indicates region.stratum.depth

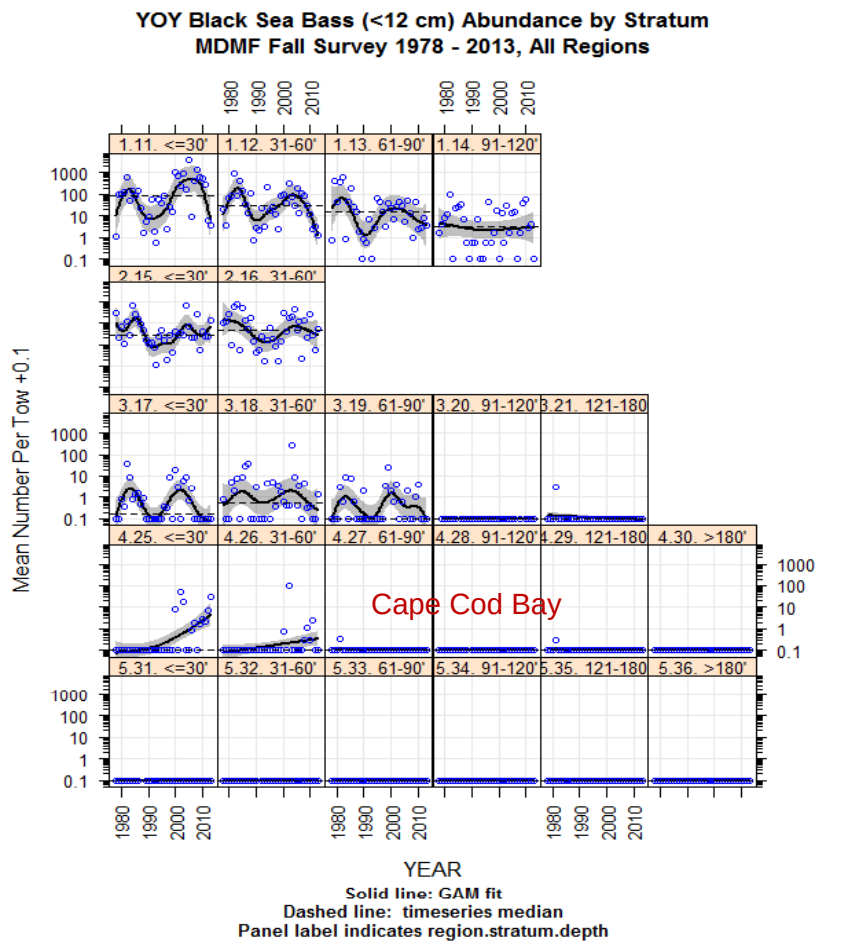

Juvenile Haddock Abundance (<21cm)
MDMF Trawl Survey Fall 2013
Number/Tow
0
1 - 10
11 - 100
101 - 777

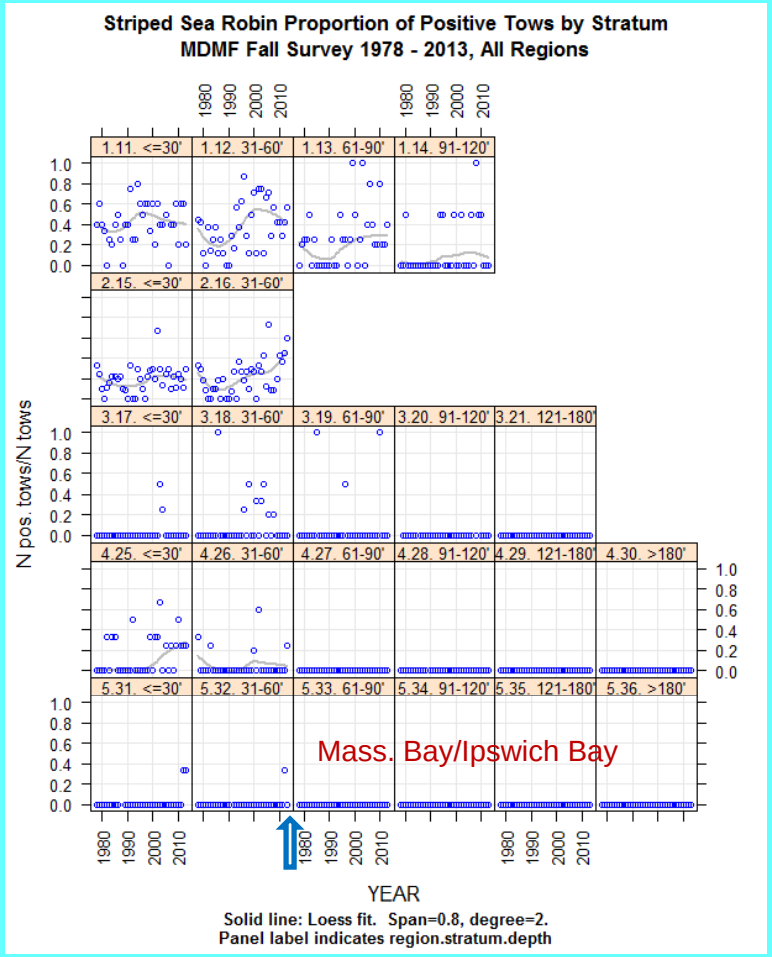
Range expansions observed in the spring survey.





Range expansions observed in the fall survey.





First encounters on 2013 fall survey.

Photo credit: Florida Fish and Wildlife Conservation Commission (FWC)

Any questions?

NEAMAP SNE/MA Report to NM Board February 2014

- Accomplishments
- Additions to Sampling
- Sample Results
- Issues and Challenges

NEAMAP SNE/MA Accomplishments

- Field Collections - sampled 150 sites for each of the spring & fall cruises
- Ageing - processed nearly all samples collected through 2012, about halfway through 2013 (>35,300 ages assigned)
- Diet - processed all samples through Spring 2013, samples from Fall 2013 nearly complete (>43,500 stomachs examined)
- Stock Assessments - supplied data for assessments of 6 species

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NEAMAP SNE/MA Accomplishments (cont.)

- Implemented new onboard data collection system (FEED)
- Engaged in 10 collaborative sample collection efforts
- Attempted Longfin Squid Efficiency Experiment – led to valuable trawl video from fall cruise
- Participated in Black Sea Bass ageing exchange – to be finalized in the near future

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Virginia Institute of Marine Science

NEAMAP SNE/MA
Additions to Sampling

- Horseshoe Crab Sex & Maturity Stage
- Longfin Squid Sex & Maturity Stage
- American Lobster Ageing Structure
- Atlantic menhaden & summer flounder gonad sampling (for fecundity)
- Butterfly Rays Priority “A” Species
- PAR Profiles for Each Tow
- Trawl Video

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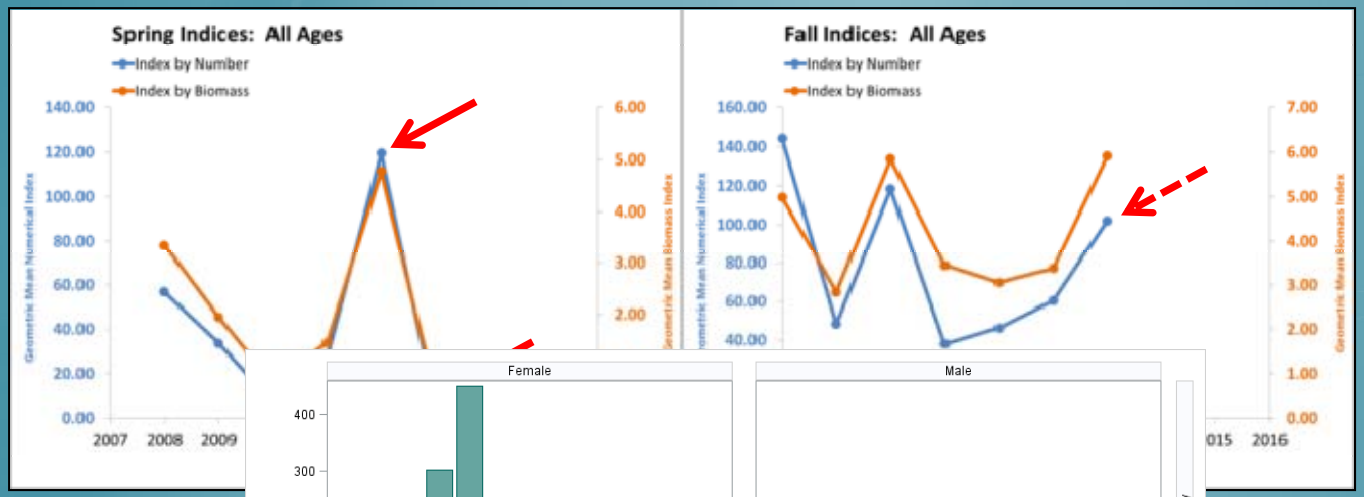
Virginia Institute of Marine Science

NEAMAP SNE/MA Sample Results

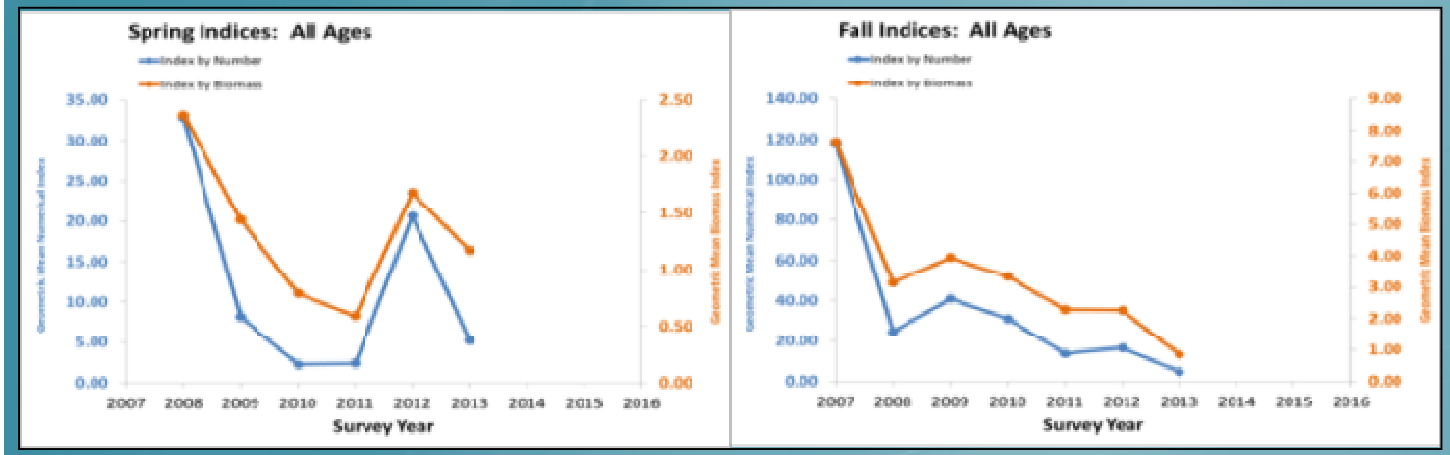
Longfin Squid



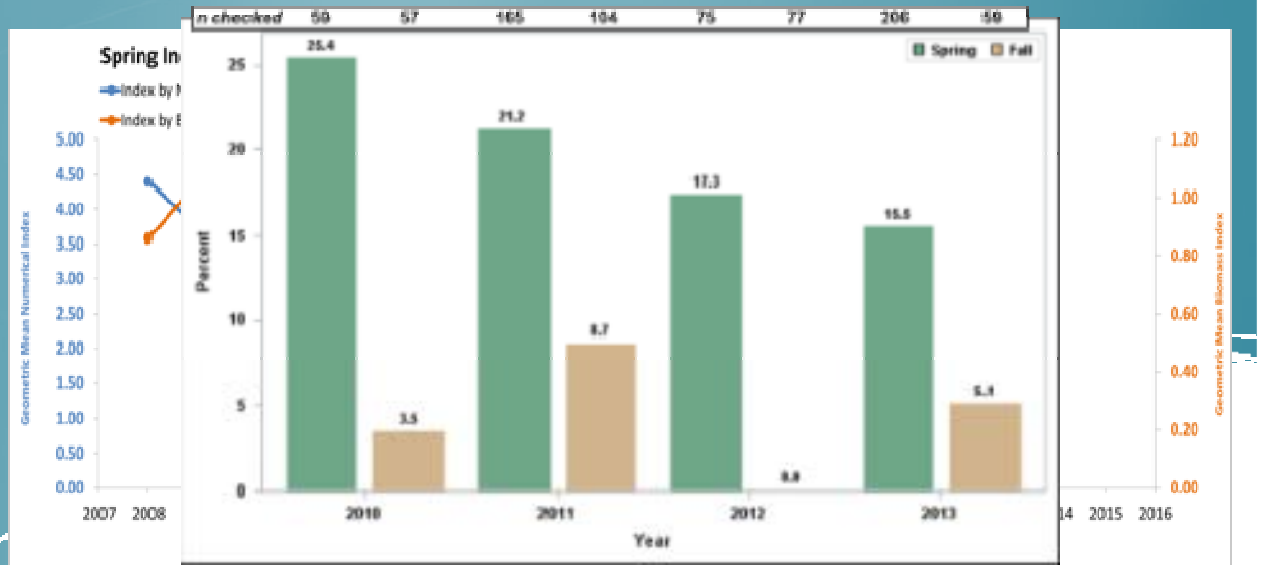
William & Mary
Institute of Marine Science

NEAMAP SNE/MA Sample Results

Scup

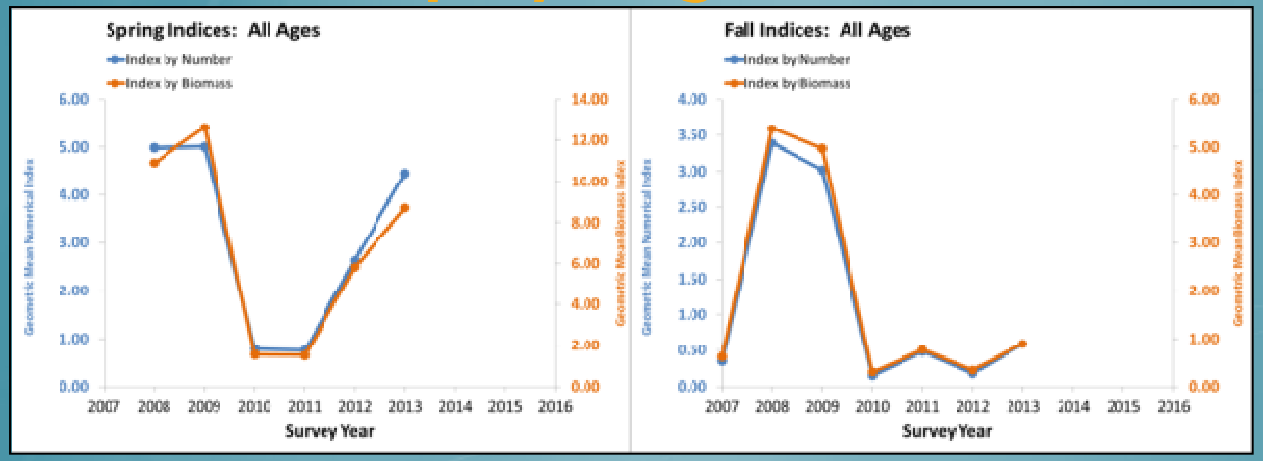


American Lobster



NEAMAP SNE/MA Sample Results

Spiny Dogfish



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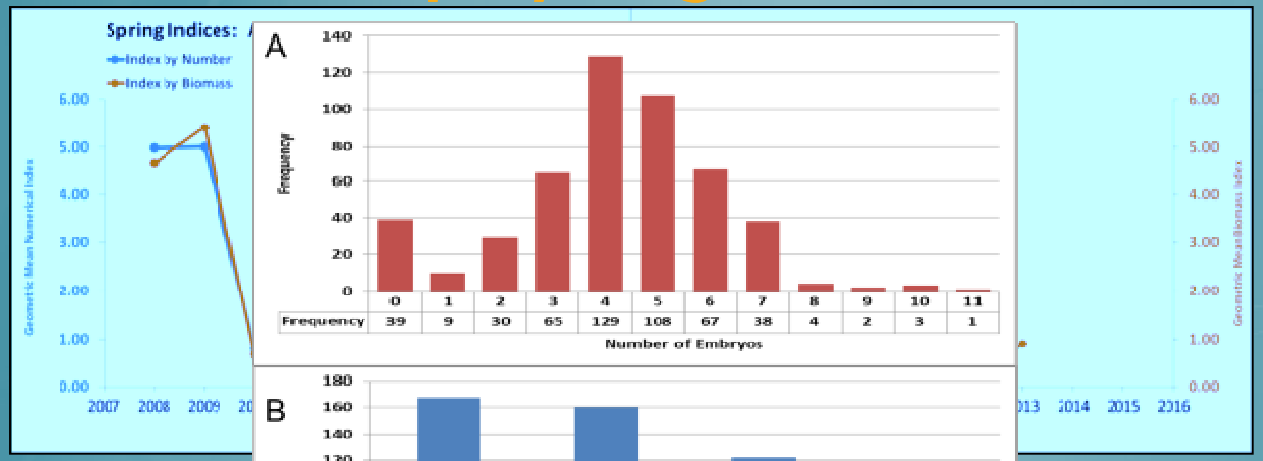
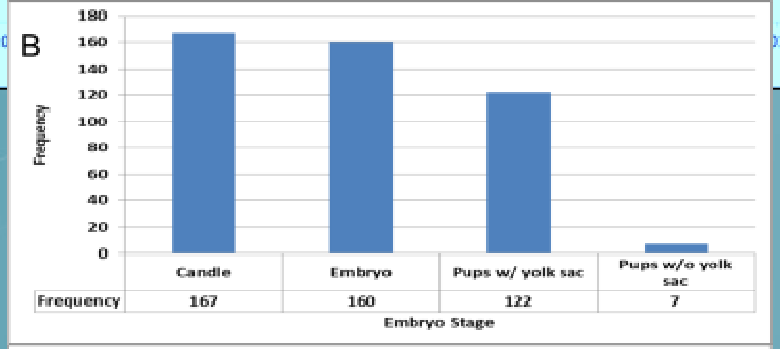
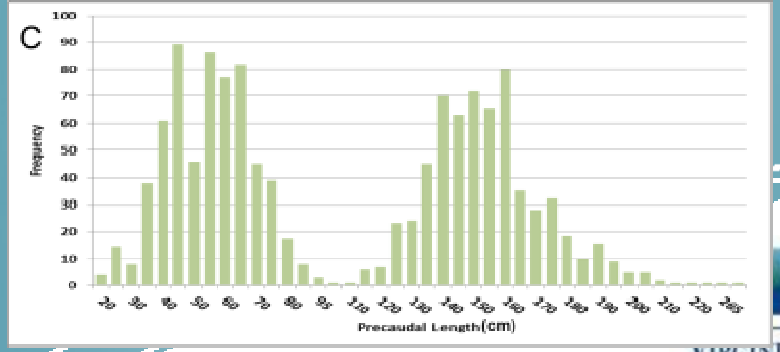
NEAMAP SNE/MA Sample Results

Spiny Dogfish







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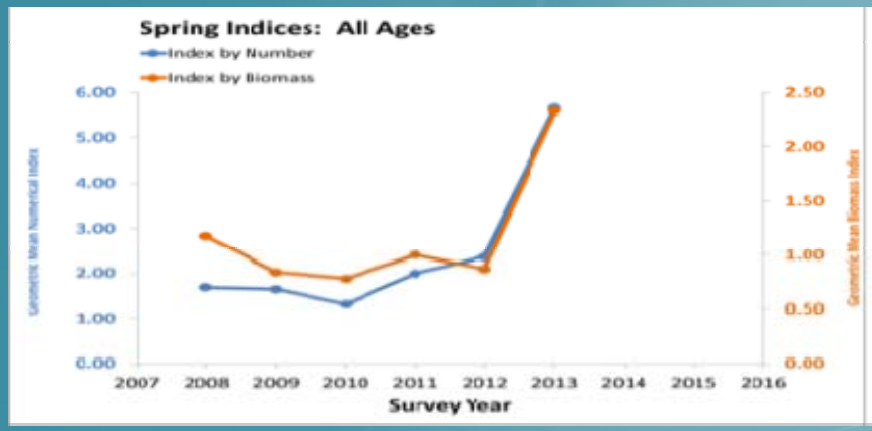
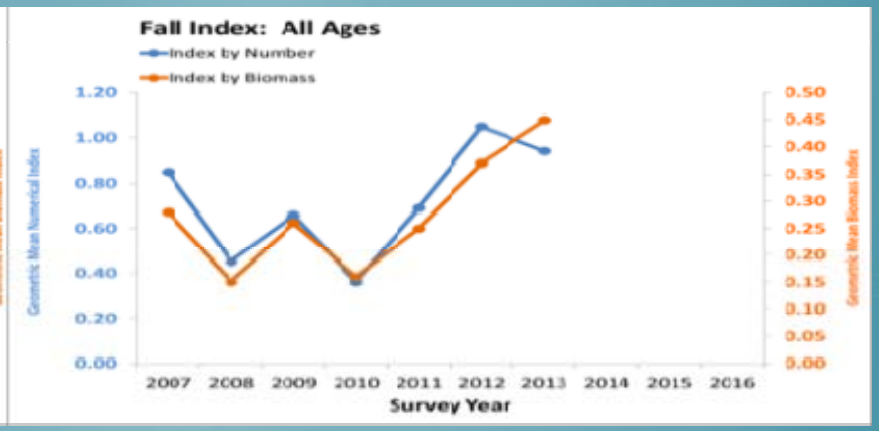
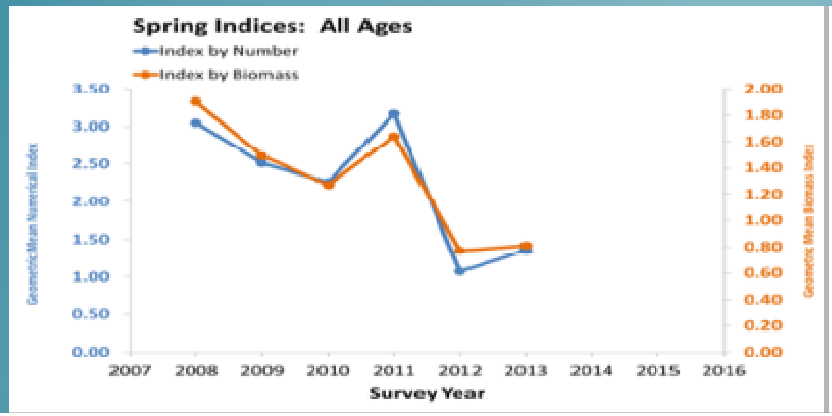
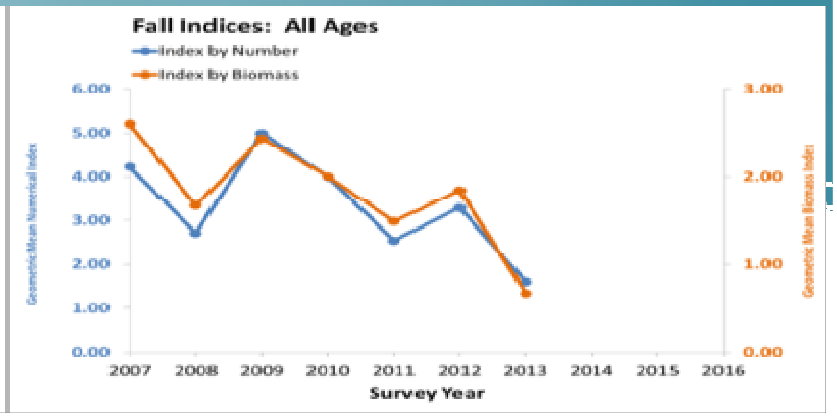
Black Sea Bass





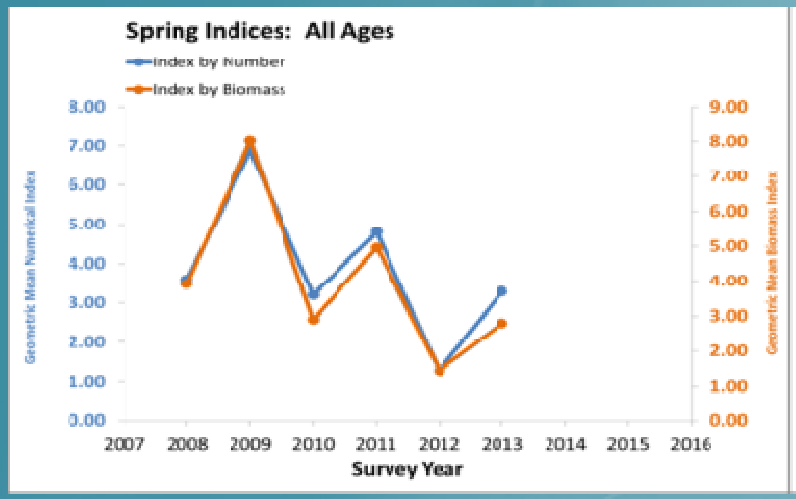
Summer Flounder

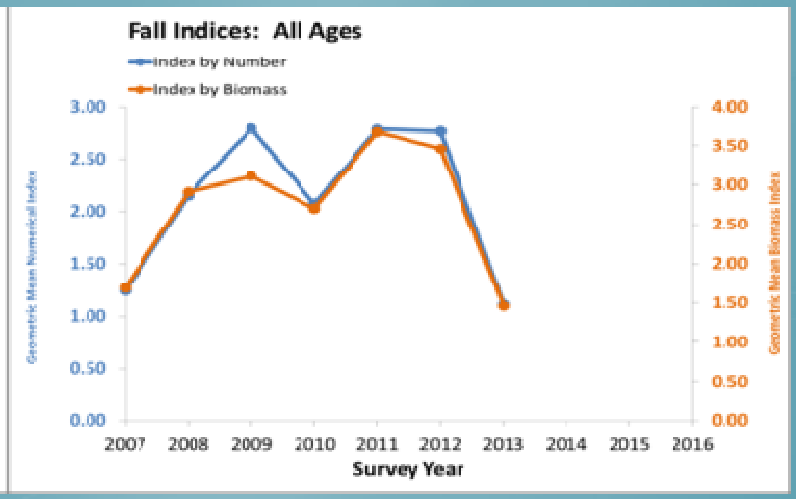




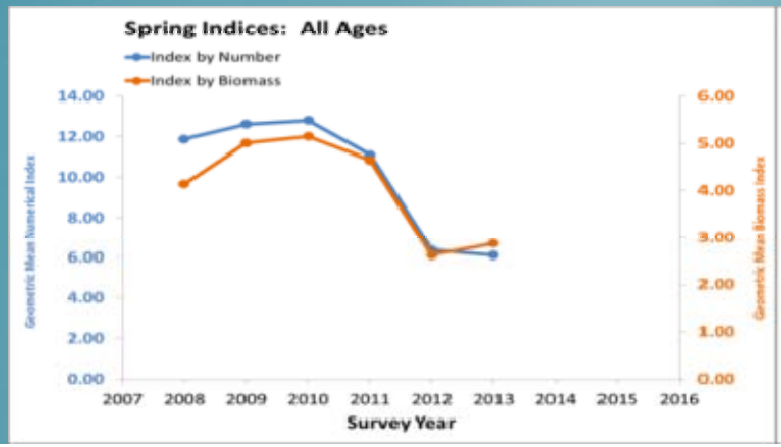
NEAMAP SNE/MA Sample Results

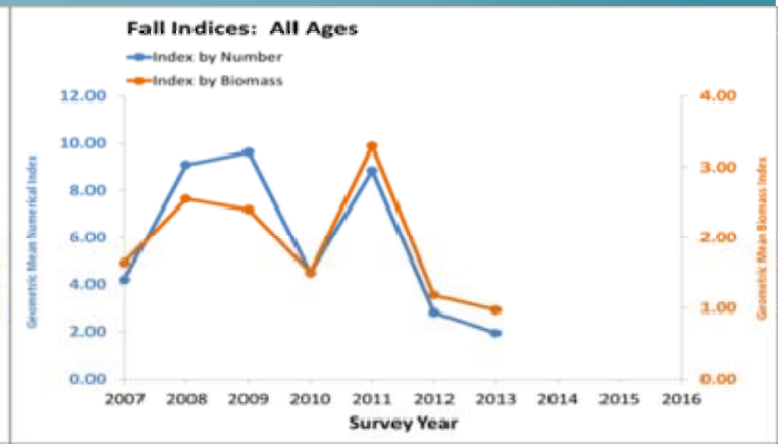
Horseshoe Crab





Winter Flounder





NEAMAP SNE/MA
Issues & Challenges

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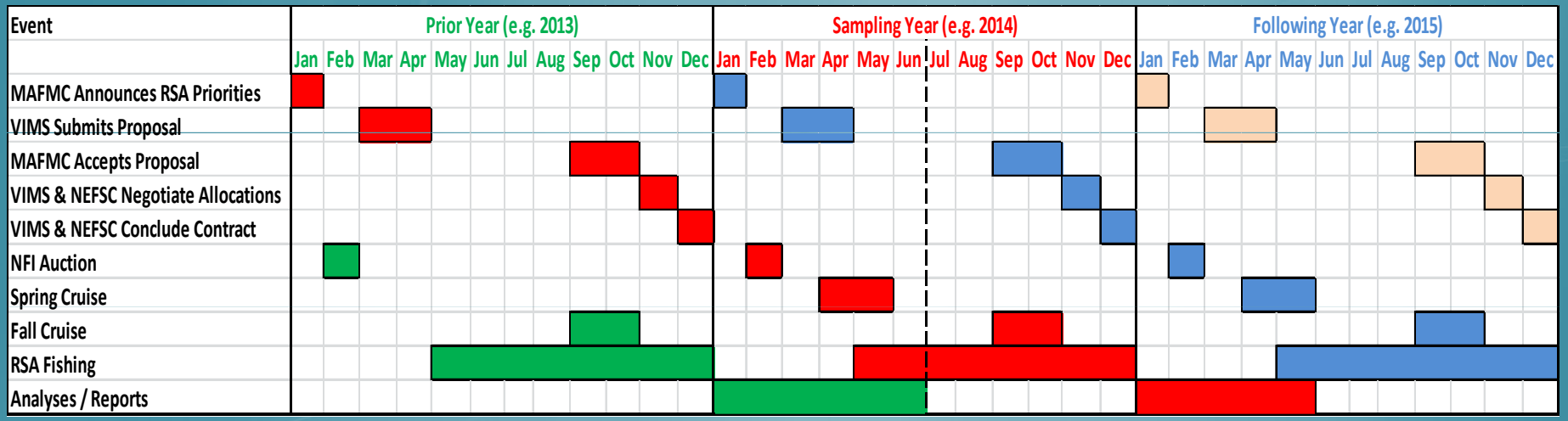
NEAMAP SNE/MA Issues & Challenges RSA Timeline



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Issues & Challenges
RSA Issues

- Real and Perceived Auction Difficulties:
  - Permitting
  - Violations

- Auction Changes:
  - Potentially Decreased Prices
  - Smaller Number of Boats
    (Decreased Industry Support? / Fewer and Less Diverse Pool of "Investors")

- Increasing Demand to Diversify RSA Projects

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