# Summary of 2015 scallop survey results and preliminary projections for FY2016

**Deirdre Boelke, NEFMC Staff,**
**Scallop PDT Chair**

**Scallop AP and Committee**
**September 16 and 17, 2015**

New England
Fishery Management Council

# Summary of presentation

Part I

1. Summary of all available 2015 survey results
2. Review 2015 combined biomass estimates

Part II

1. Review of preliminary FW27 projections (access areas only)
2. Summary of PDT discussion to date

# Part I – Summary of 2015 survey results

- Very successful survey season – 4 separate surveys

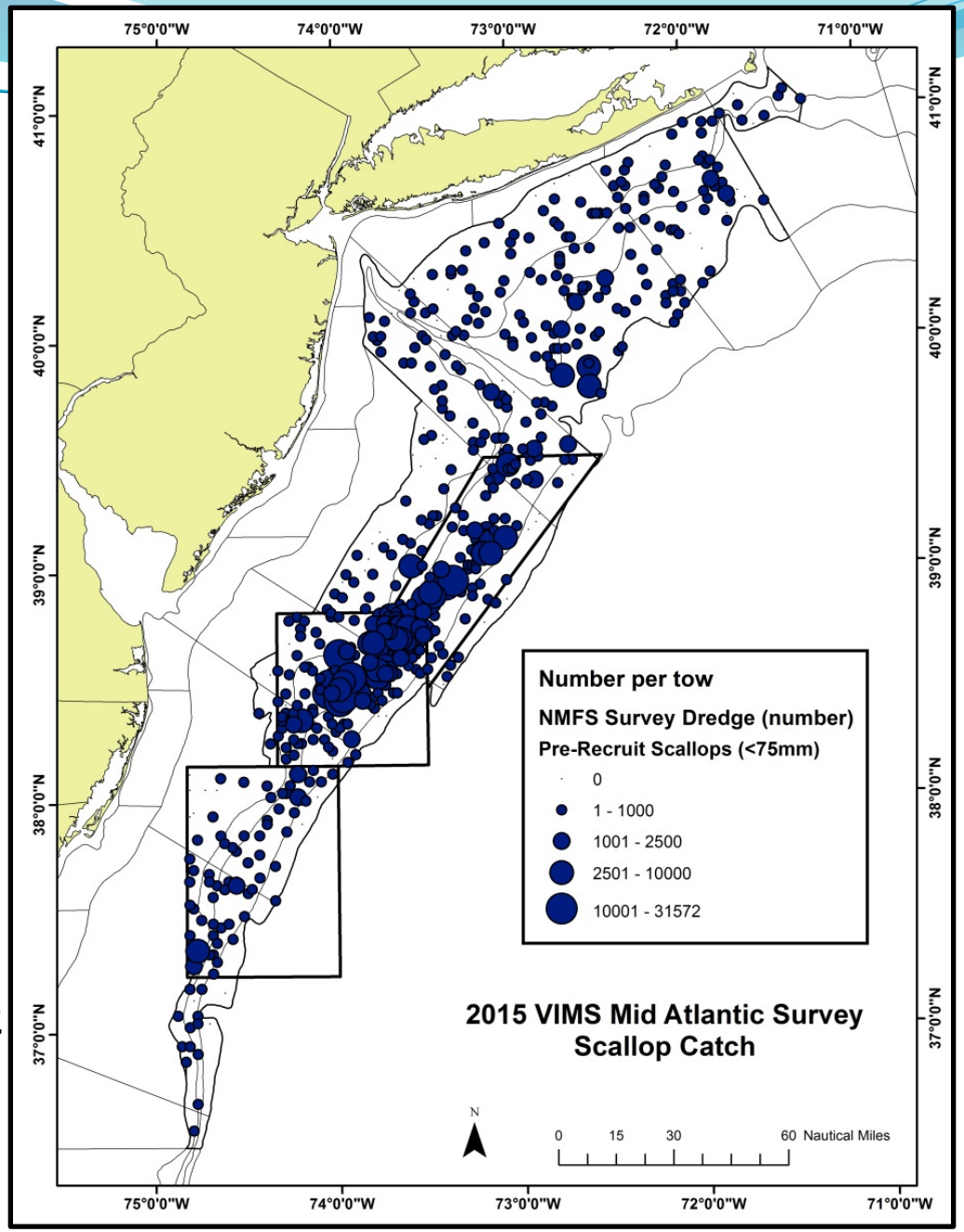
  1. VIMS dredge survey of MA;
  2. SMAST broadscale camera survey of GB and MA and intensive survey of CA2south;
  3. Habcam group v2 survey of NL and SF of GB;
  4. NEFSC dredge of GB and Habcam v4 of MA and GB

- Slides will give a brief overview of all surveys and major take home messages from each research group
- Very high level findings:

  1. Total biomass increased slightly from 2014 but dominated by small scallops – not ready for harvest
  2. Will be challenging to provide access to larger scallops found within high densities of small scallops

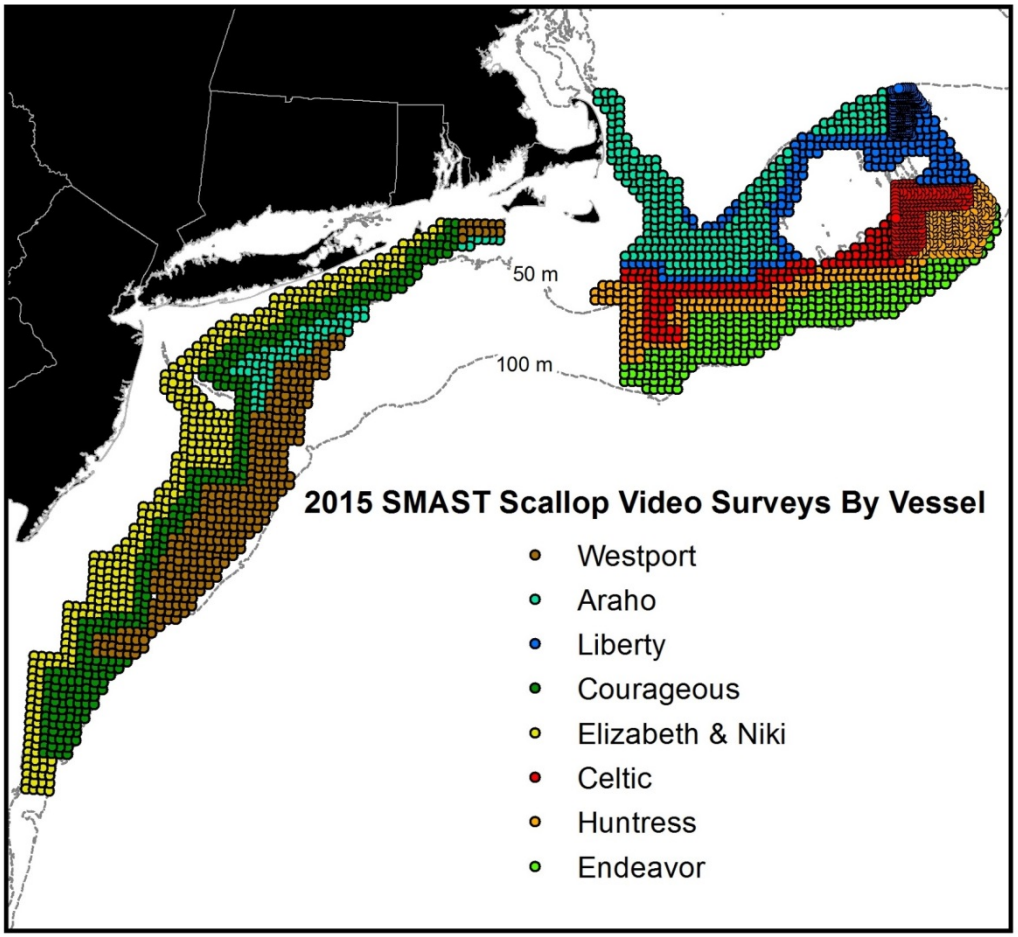
# VIMS survey

- Over 600 stations on 3 legs from mid-May to late June
- New sampling design – stratified random to increase precision
- Sampling intensity of SH:MW extended to monitor parasite
- Adult biomass in MA open areas relatively low
- High abundance of 2 year old throughout, but uncertain what that means 2-3 years in the future

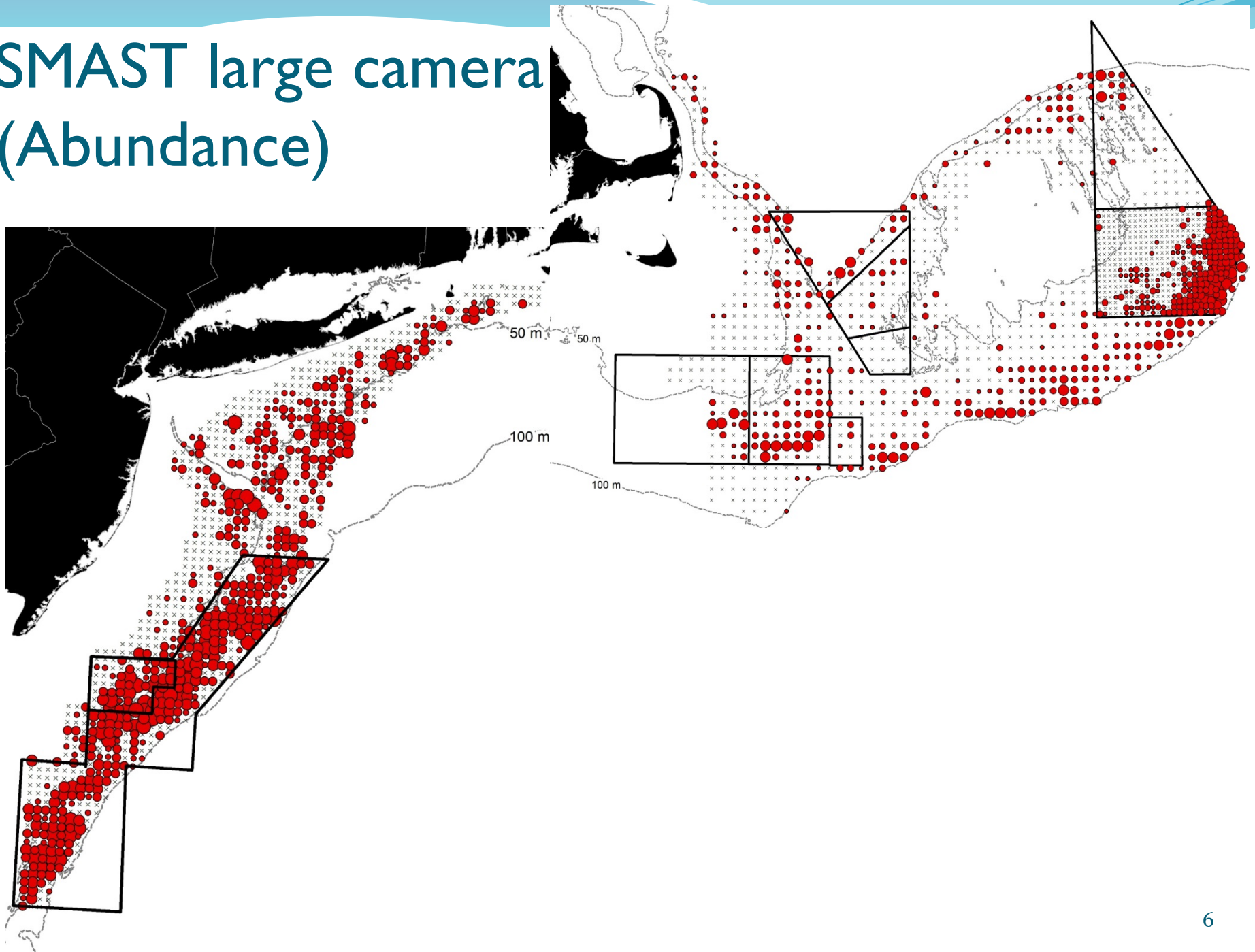


# SMAST survey

- 2 RSA projects (GB broadscale and CA2 south intensive)
- MA broadscale funded using reserve funds and industry donations
- Over 2,000 stations on 8 cruises from May 1 through late June
- New digital still camera used – data not available yet
- GB – 2014 and 2015 similar and recruits still there
- MA – rec has shifted to deeper waters. More scallops than ever but relatively low level of exploitable biomass.
- Going to be a real challenge to protect large number of small scallops and balance access to larger scallops

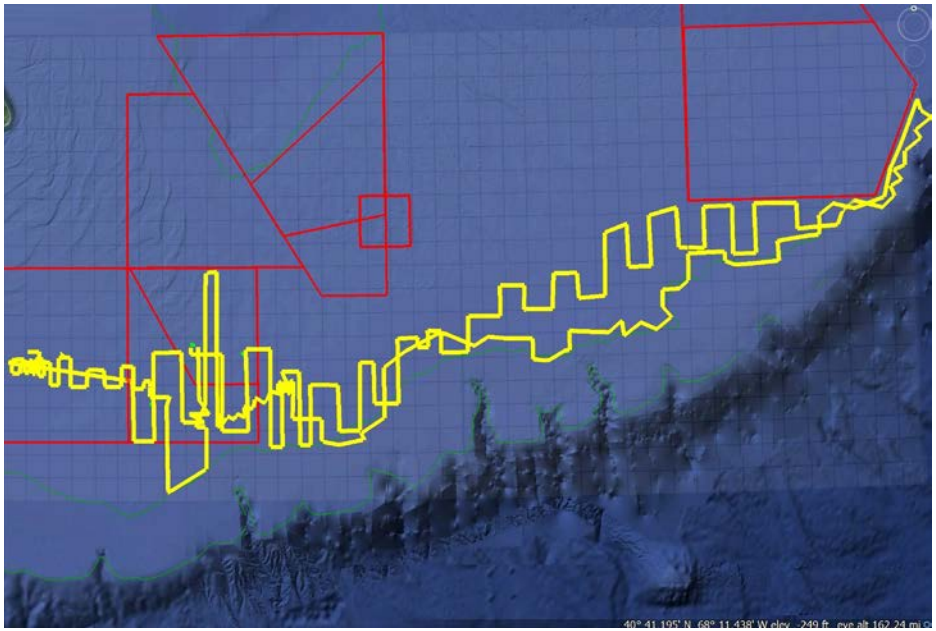


# SMAST large camera (Abundance)



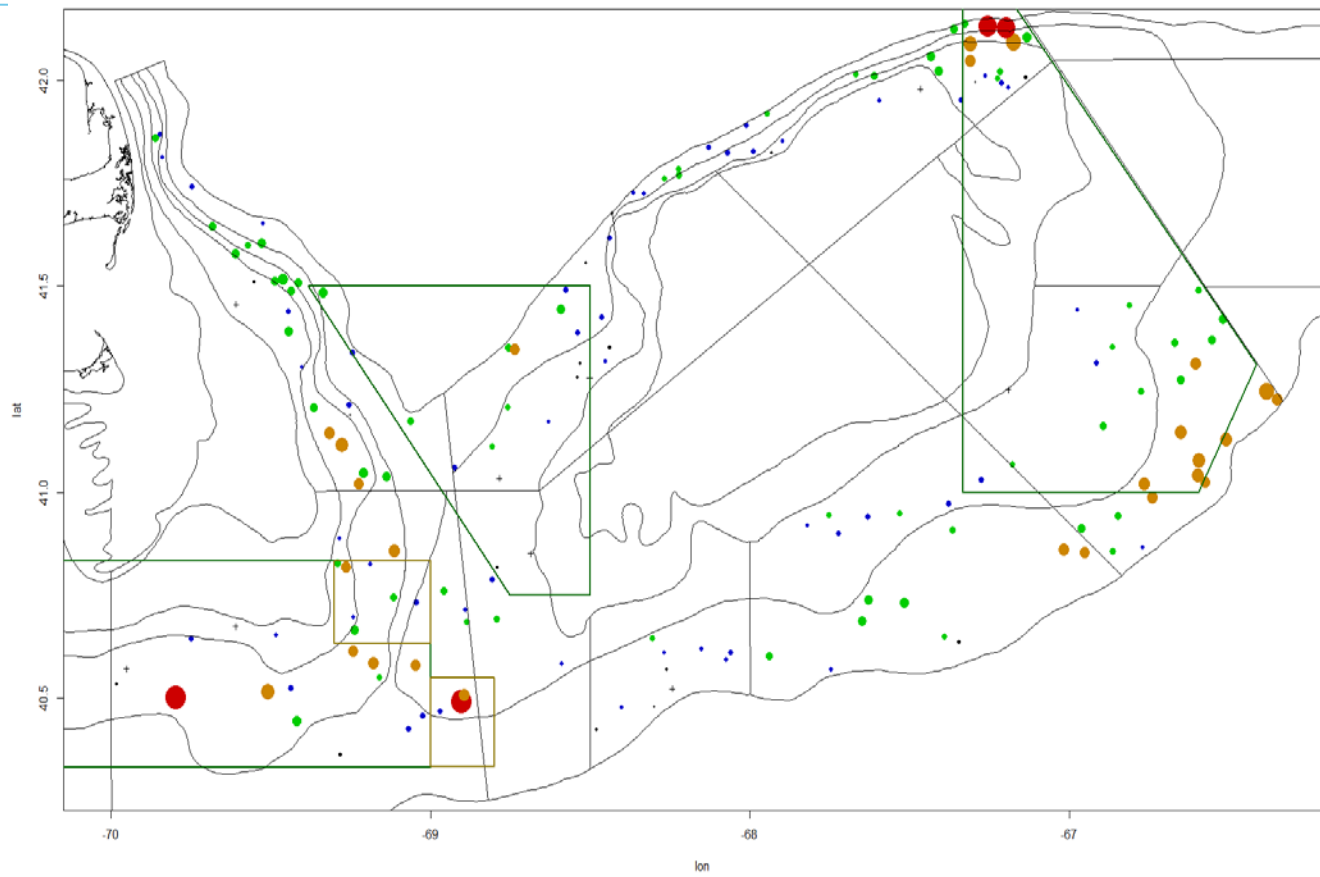
# Habcam Group

- 2 RSA projects (NL and SF of GB and fall survey of ETA)
- Heaviest concentration in middle of NL EFH closure and NL access south
- Growth slower than typical
- Major gains in yield if NL left alone for a year

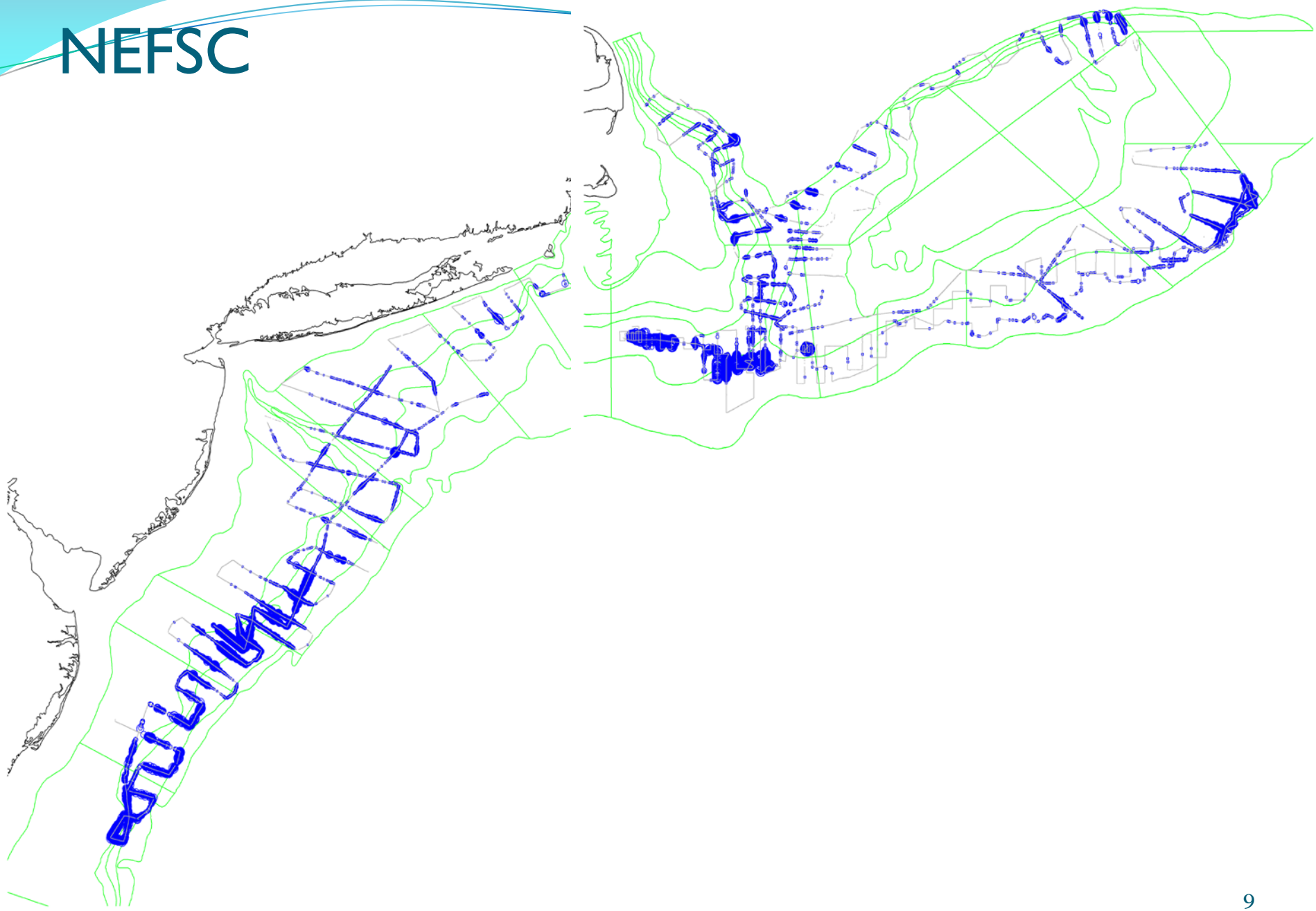


# NEFSC

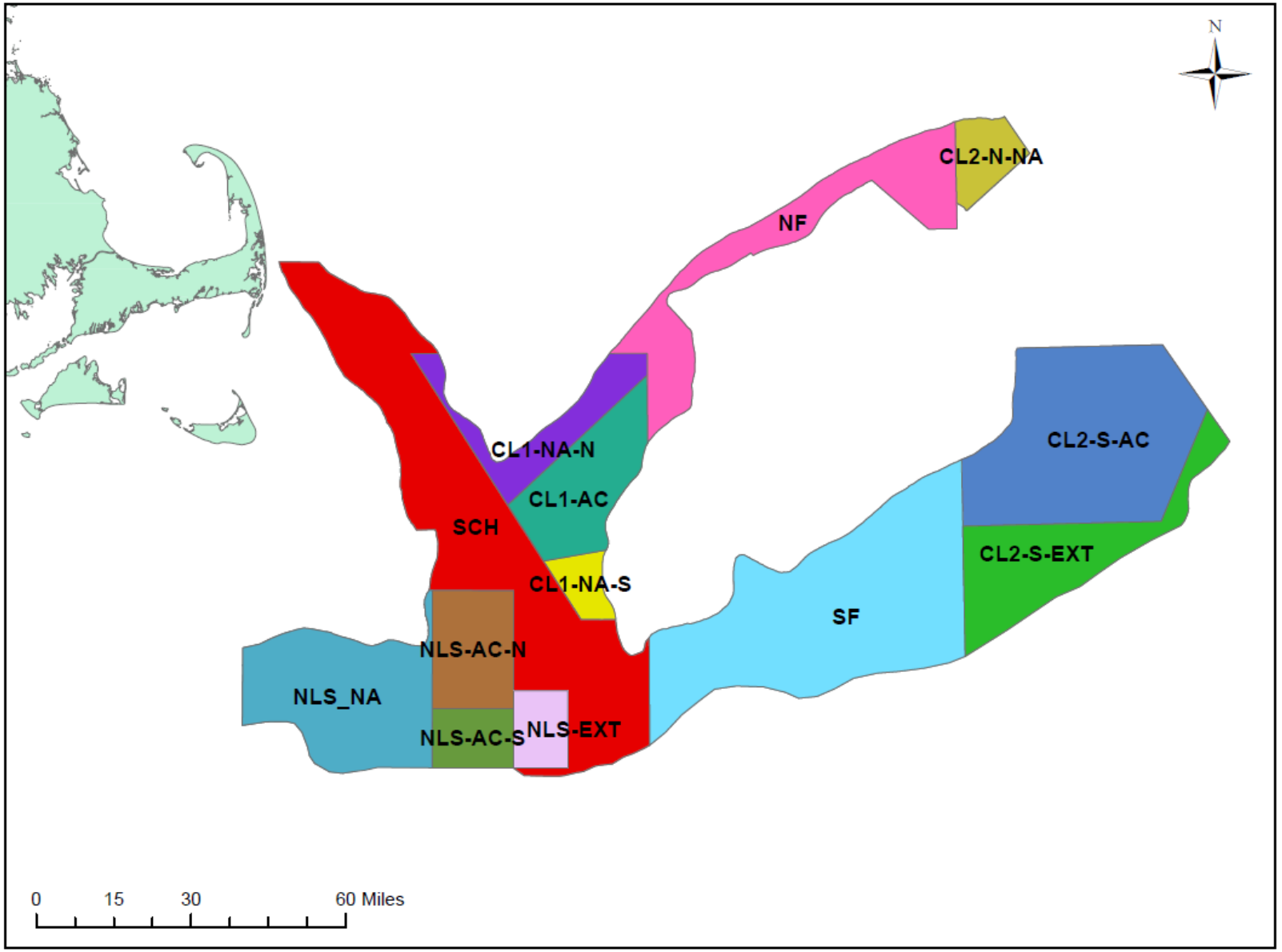
- 165 dredge tows on GB and Habcam v4 in both GB and MA
- No vessel or gear issues – more systematic than past
- Most habcam coverage ever
  8 million images and 4,000 km trackline
- Similar results to other surveys



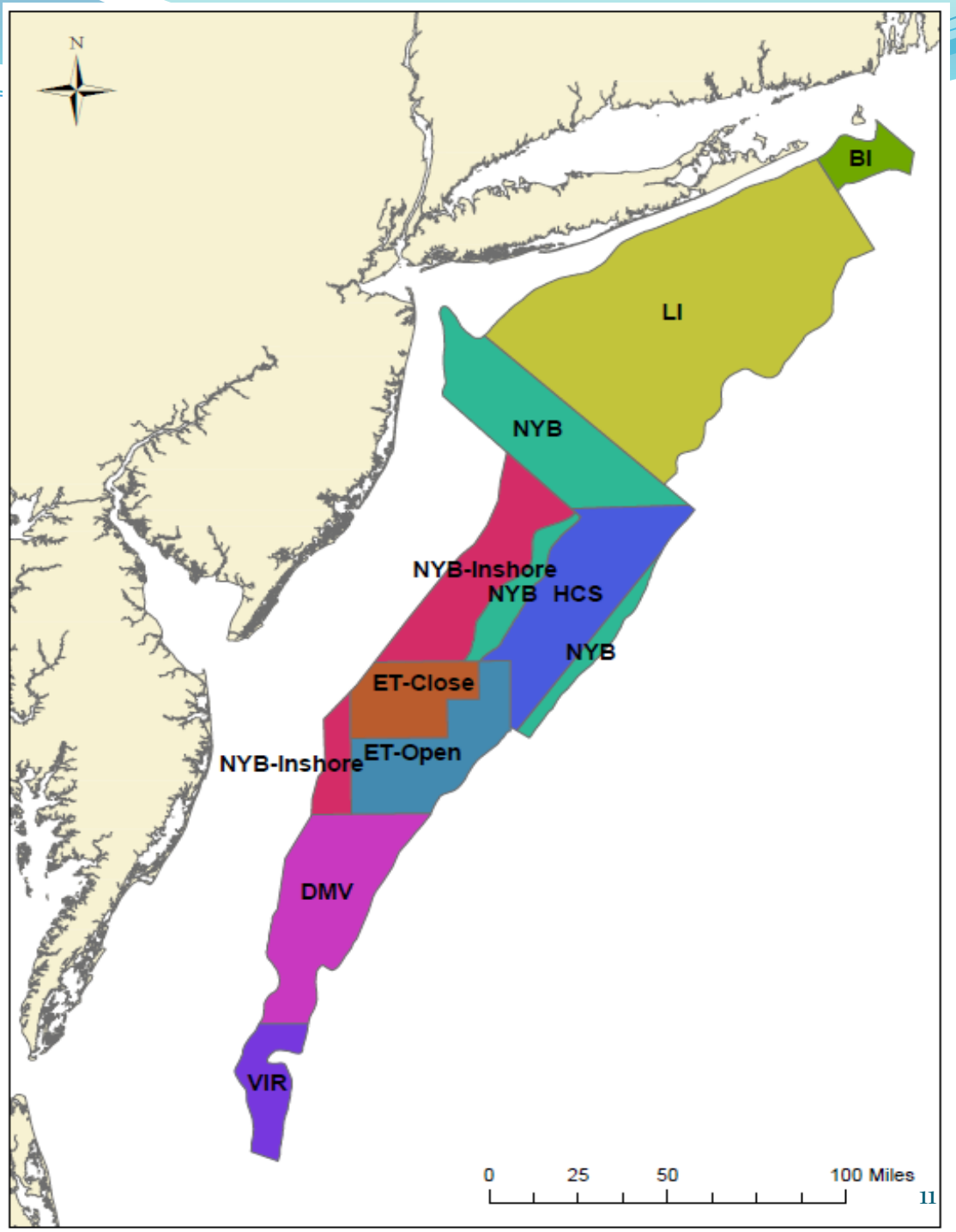
# NEFSC



# GB SAMS Areas for FW27



# MA SAMS Areas for FW27



| Georges Bank | Dredge | | | | SMAST Large | | | SMAST Small* | | HabCam (v2 and v4) | | | | Simple Mean | | IVWMean | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | BMS (mt) | SE | SEdref | #Sta | BMS (mt) | SE | #Sta | BMS (mt) | SE | BMS (mt) | SE | SEmod | Photos | BMS (mt) | SE | BMS (mt) | SE |
| CL1ACC | 229 | 75 | 75 | 9 | 546 | 230 | 40 | 479 | 171 | 2,083 | 120 | 208 | 3,509 | 952 | 106 | 449 | 67 |
| CL1NA | 2,063 | 798 | 799 | 9 | 5,270 | 3,144 | 25 | 1,144 | 896 | 8,739 | 1,337 | 1,337 | 2,256 | 5,357 | 1,170 | 3,885 | 670 |
| CL-2(N) | 5,923 | 2,087 | 2,091 | 14 | 3,787 | 1,571 | 13 | 1,327 | 430 | 4,706 | 235 | 471 | 1,629 | 4,805 | 886 | 4,688 | 441 |
| CL-2(S) | 9,805 | 3,092 | 3,099 | 19 | 6,320 | 676 | 432 | 9,916 | 1,123 | 6,542 | 183 | 654 | 8,162 | 7,556 | 1,079 | 6,511 | 465 |
| CL-2Ext | 12,202 | 7,763 | 7,767 | 11 | 3,033 | 627 | 51 | 879 | 217 | 5,180 | 114 | 518 | 3,427 | 6,805 | 2,603 | 4,330 | 399 |
| NLSAccN | 2,065 | 821 | 822 | 14 | 2,819 | 847 | 30 | 908 | 353 | 4,202 | 155 | 420 | 3,160 | 3,029 | 418 | 3,606 | 342 |
| NLSAccS | NS | | | | 4,528 | 2,013 | 12 | 8,450 | 3,820 | 23,849 | 1,029 | 2,385 | 732 | 14,189 | 1,560 | 12,566 | 1,538 |
| NLSNA | 8,174 | 7,698 | 7,699 | 5 | 9,510 | 3,934 | 58 | 14,700 | 5,761 | 66,706 | 8,051 | 8,051 | 1,367 | 28,130 | 3,938 | 18,382 | 3,212 |
| NLS-Ext | 7,093 | 8,486 | 8,487 | 2 | 143 | 82 | 15 | 0 | | 2,194 | 9 | 219 | 649 | 3,143 | 2,830 | 395 | 77 |
| South Channel | 11,940 | 7,803 | 7,811 | 39 | 4,528 | 1,200 | 47 | 2,023 | 427 | 10,524 | 1,684 | 1,684 | 12,224 | 8,997 | 2,693 | 6,631 | 970 |
| North Flank | 1,020 | 253 | 254 | 25 | 6,074 | 401 | 143 | 1,657 | 484 | 2,016 | 644 | 644 | 3,462 | 3,037 | 267 | 2,421 | 203 |
| South Flank | 2,757 | 798 | 800 | 23 | 5,745 | 1,578 | 139 | 1,117 | 371 | 7,805 | 299 | 781 | 6,654 | 5,436 | 645 | 5,388 | 527 |
| | | | | | | | | | | | | | | | | | |
| **GB Open** | **27,918** | **11,039** | **11,053** | **87** | **19,380** | **2,118** | **380** | **5,676** | **775** | **25,525** | **1,831** | **1,964** | **22,340** | **24,274** | **3,810** | **18,769** | **1,191** |
| **GB Total** | **63,269** | **16,381** | **16,430** | **170** | **52,303** | **6,132** | **1,005** | **42,600** | **7,126** | **144,547** | **8,435** | **8,795** | **47,231** | **91,436** | **6,631** | **69,249** | **3,885** |
| *Not used in estimation | | | | | | | | | | | | | | | | | |

| Mid-Atlantic | Dredge (VIMS) | | | | SMAST Large | | | | | HabCam (v4) | | | | Simple Mean | | IVWMean | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subarea | Bms | SE | SEdref | #Sta | Bms | SE | #Sta | | | Bms | SE | SEmod | Photos | Mean | SE | IVWM | SE |
| Block Island | 1,074 | 128 | 130 | 9 | 1,181 | 504 | 23 | | | 333 | 0 | 33 | 1,132 | 863 | 174 | 378 | 32 |
| Long Island | 19,805 | 959 | 1,038 | 161 | 12,512 | 2,439 | 313 | | | 26,231 | 2,067 | 2,623 | 14,234 | 19,516 | 1,243 | 20,674 | 901 |
| New York Bight | 8,557 | 499 | 527 | 73 | 8,445 | 2,105 | 124 | | | 10,093 | 466 | 1,009 | 9,653 | 9,032 | 798 | 8,886 | 447 |
| NYB inshore | 1,499 | 132 | 136 | 40 | 2,678 | 672 | 108 | | | 906 | 4 | 91 | 3,524 | 1,694 | 231 | 1,089 | 75 |
| Hud. Can. S | 16,187 | 1,024 | 1,074 | 81 | 15,698 | 1,961 | 122 | | | 14,666 | 1,495 | 1,495 | 8,794 | 15,517 | 897 | 15,669 | 845 |
| ET Access | 19,255 | 833 | 918 | 67 | 25,525 | 7,641 | 79 | | | 30,257 | 1,999 | 3,026 | 11,057 | 25,013 | 2,756 | 20,183 | 803 |
| ET Closed | 10,928 | 729 | 761 | 67 | 24,204 | 10,975 | 58 | | | 19,985 | 872 | 1,998 | 8,018 | 18,372 | 3,727 | 12,075 | 685 |
| Delmarva | 10,210 | 752 | 779 | 71 | 11,884 | 1,581 | 113 | | | 26,271 | 1,051 | 2,627 | 5,938 | 16,122 | 1,055 | 11,508 | 723 |
| Virgina | 128 | 14 | 14 | 15 | NS | | | | | NS | | | | 128 | 14 | 128 | 14 |
| | | | | | | | | | | | | | | | | | |
| **MA Open** | **31,063** | **1,096** | **1,260** | **298** | **24,816** | **3,329** | **568** | | | **37,562** | **2,119** | **2,812** | **28,543** | **31,232** | **1,505** | **31,155** | **1,009** |
| **MA Access (not including ETA Closed)** | **45,652** | **1,520** | **1,773** | **219** | **53,107** | **8,045** | **314** | | | **71,194** | **2,709** | **4,277** | **25,789** | **56,651** | **3,084** | **47,360** | **1,372** |
| | | | | | | | | | | | | | | | | | |
| **MA Total** | **87,643** | **2,011** | **2,138** | **584** | **102,127** | **14,009** | **940** | | | **128,742** | **3,548** | **5,495** | **62,350** | **106,256** | **5,067** | **90,590** | **1,835** |

# Part II

1. Review of preliminary projections (access areas only)

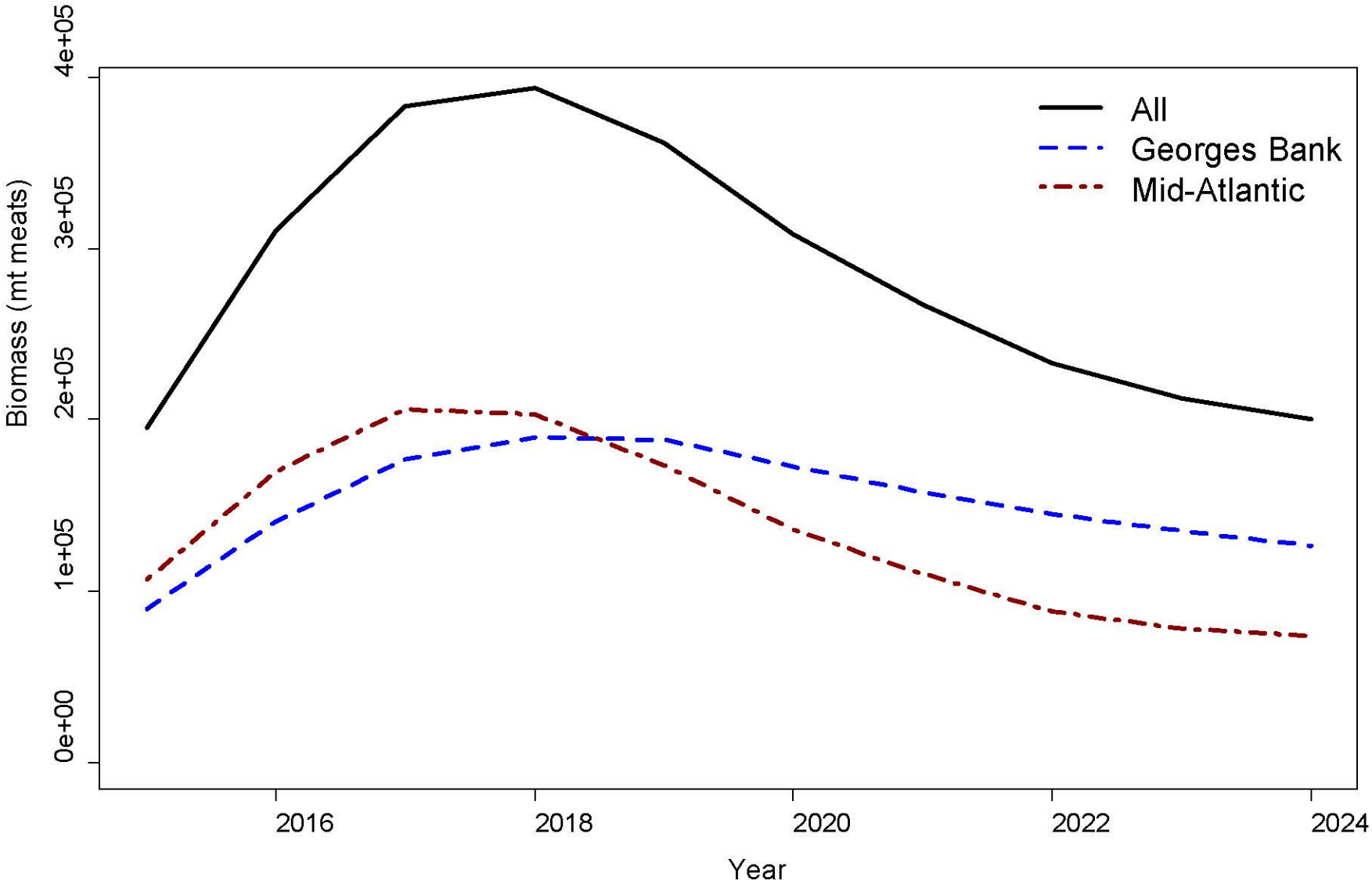
2. Summary of PDT discussion to date

# 1. Review of Preliminary Projections

- Update model with 2015 survey results
- Assume 2015 landing (About 38 million lbs.  22 mil from open areas and 16 mil from access areas)
- Keep "ETA closed"
- Set F = 0.4 in other MA access areas (megatron)
- CA1 and NL stay closed
- Identify some level of removal from CA2south (0.3)
- Set open area F = 0.48 (max)
- NL S open in 2017 and ET closed and NL N open in 2018

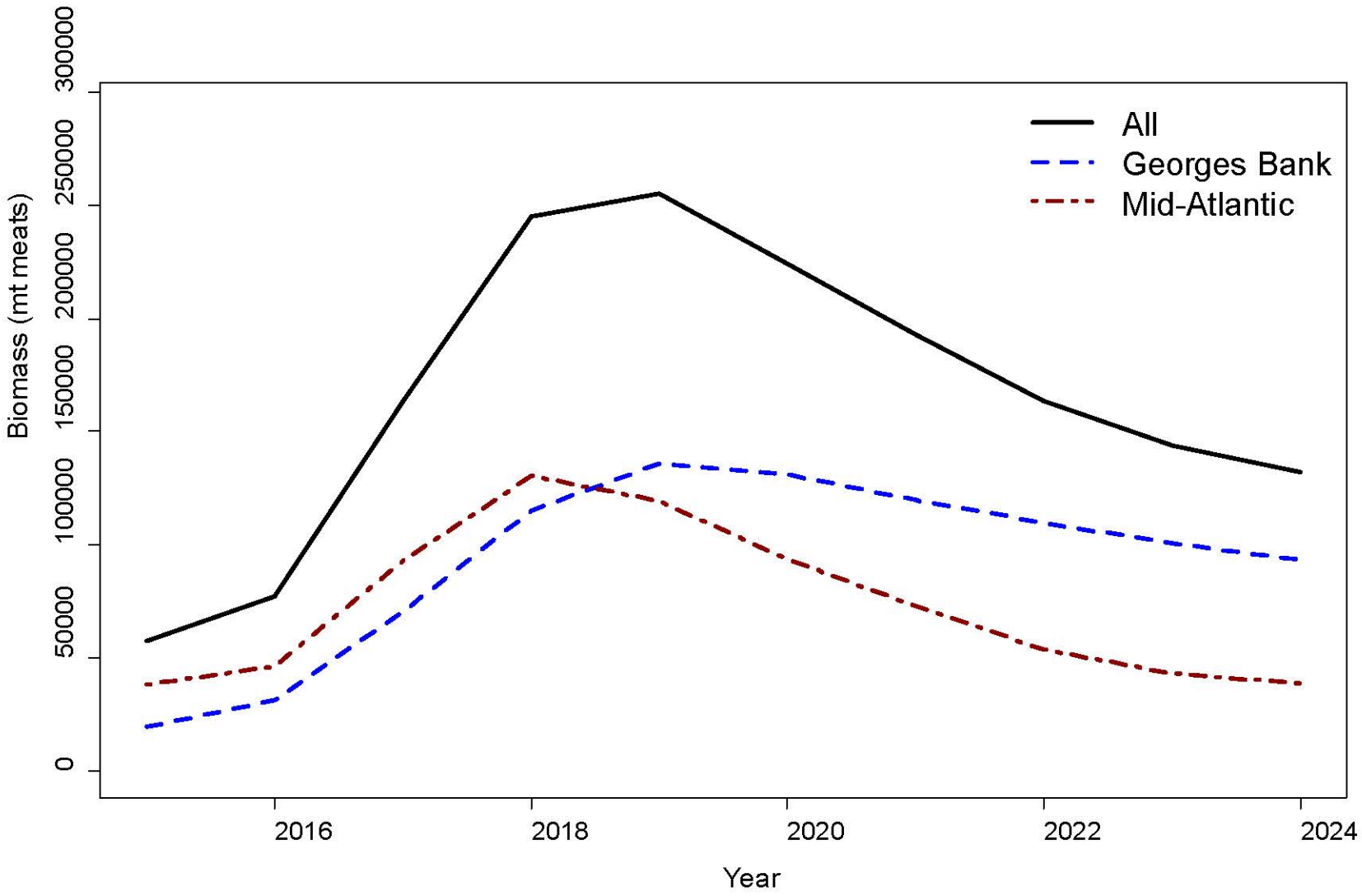
** Assumes no density dependence – overestimate biomass*

# Projected Biomass




** Assumes no density dependence – overestimate biomass*

# Projected Exploitable Biomass




** Assumes no density dependence – overestimate biomass*

# Projected Exploitable Biomass - 2016

| Mid-Atlantic | |
|---|---|
| Open | 12214 |
| HCSAA | 3991 |
| ETAA | 9637 |
| ET-CL | 10361 |
| Delmarva | 9851 |

| Georges Bank | |
|---|---|
| Open | 17758 |
| CL1-Acc | 743 |
| CL2-Acc | 3229 |
| NLS-N | 1857 |
| NLS-S | 1262 |
| NLS-Ext | 412 |
| CL1-NA | 2957 |
| CL2-NA | 3683 |
| NLS-NA | 6082 |

**Caveats:**

**AA landings more uncertain than usual**

1. Impacts of nematode uncertain
2. MA AA projections optimistic in past
3. Very high concentrations of small scallops - impacts on behavior uncertain and discard/inc. mortality uncertain

# Access Area Landings - 2016

F = 0.4 gives the following landings in 2016 (in mt meats):

HCAA: 1979

ET: 3832

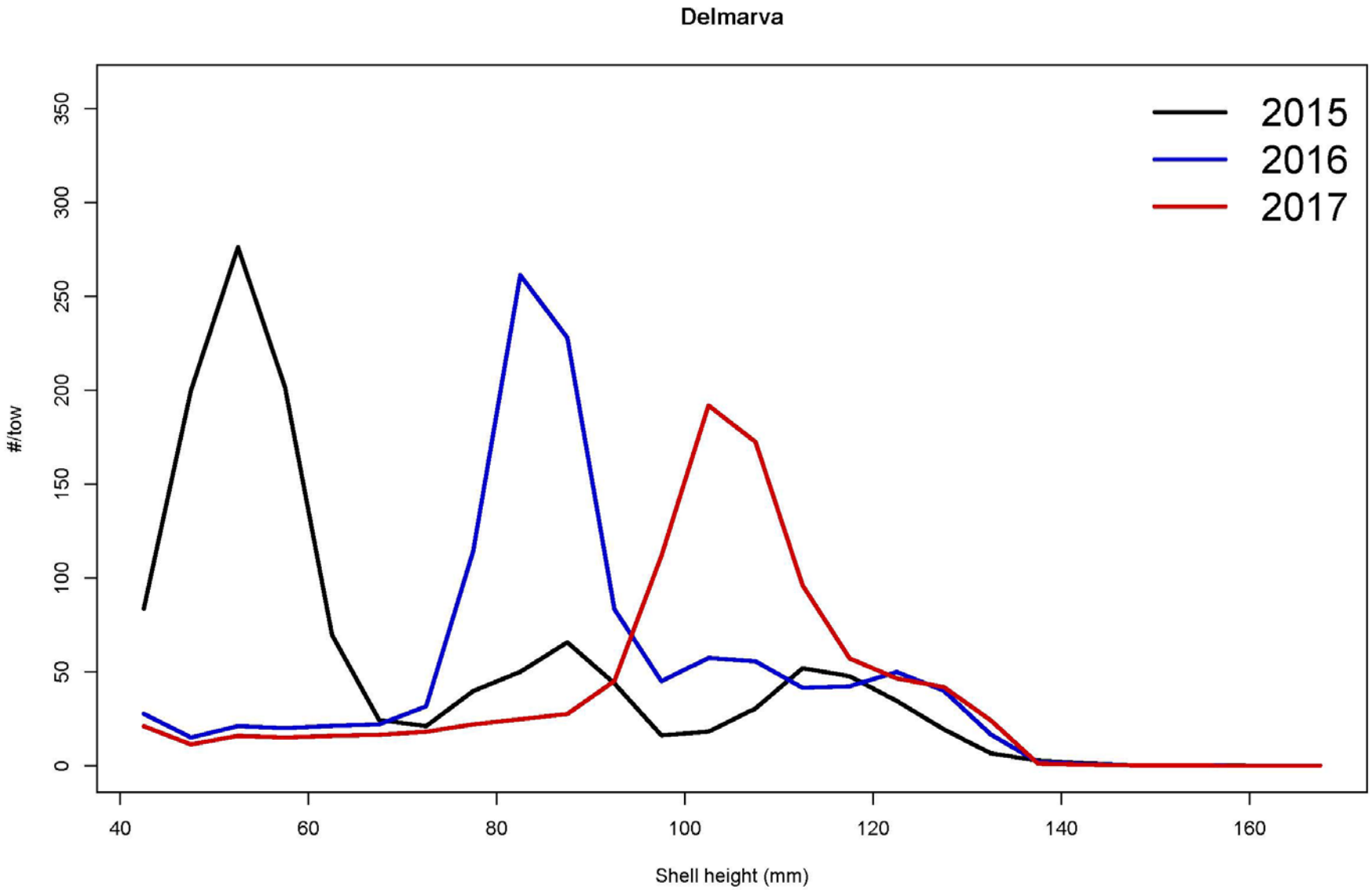
DMV: 4147

CL-2S: 1050

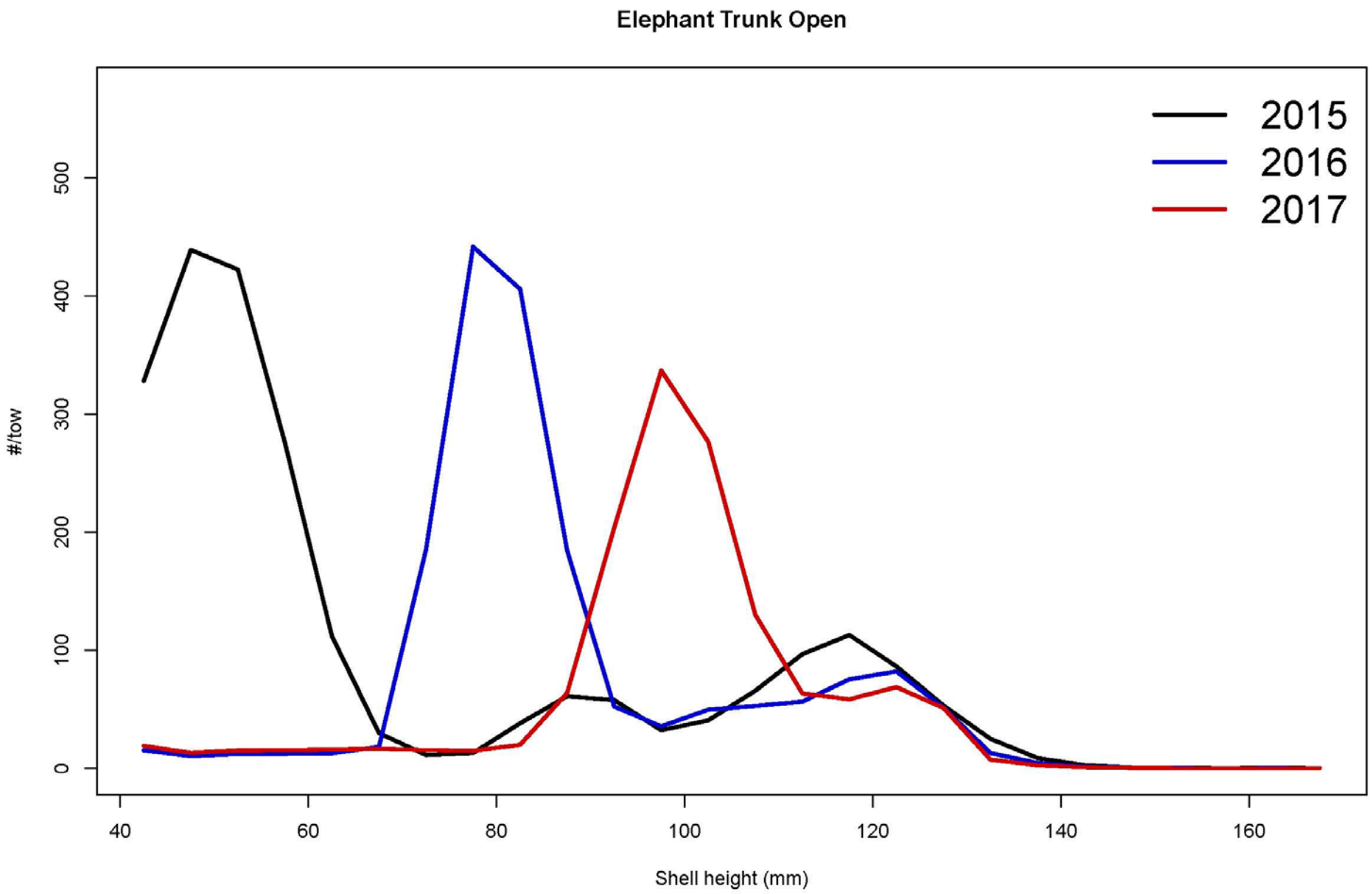
**Total: 11008**

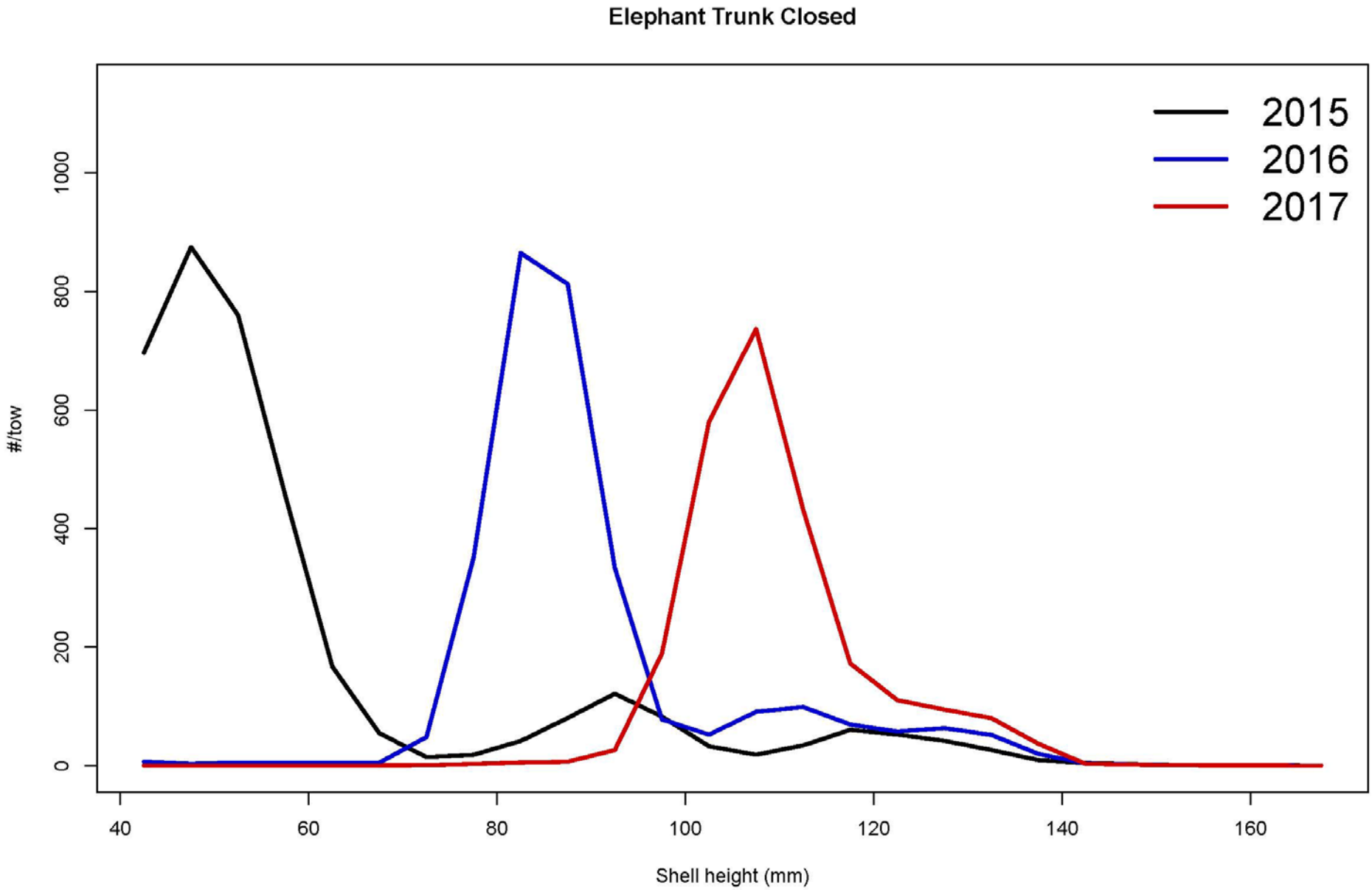
This is approximately 4 trips @ 17000 lbs/trip. However, it depends on 4000+ mt from Delmarva, which may not be available. Also, meat yields tend to fall as the shallower areas get depleted and bycatch of small scallops is a concern

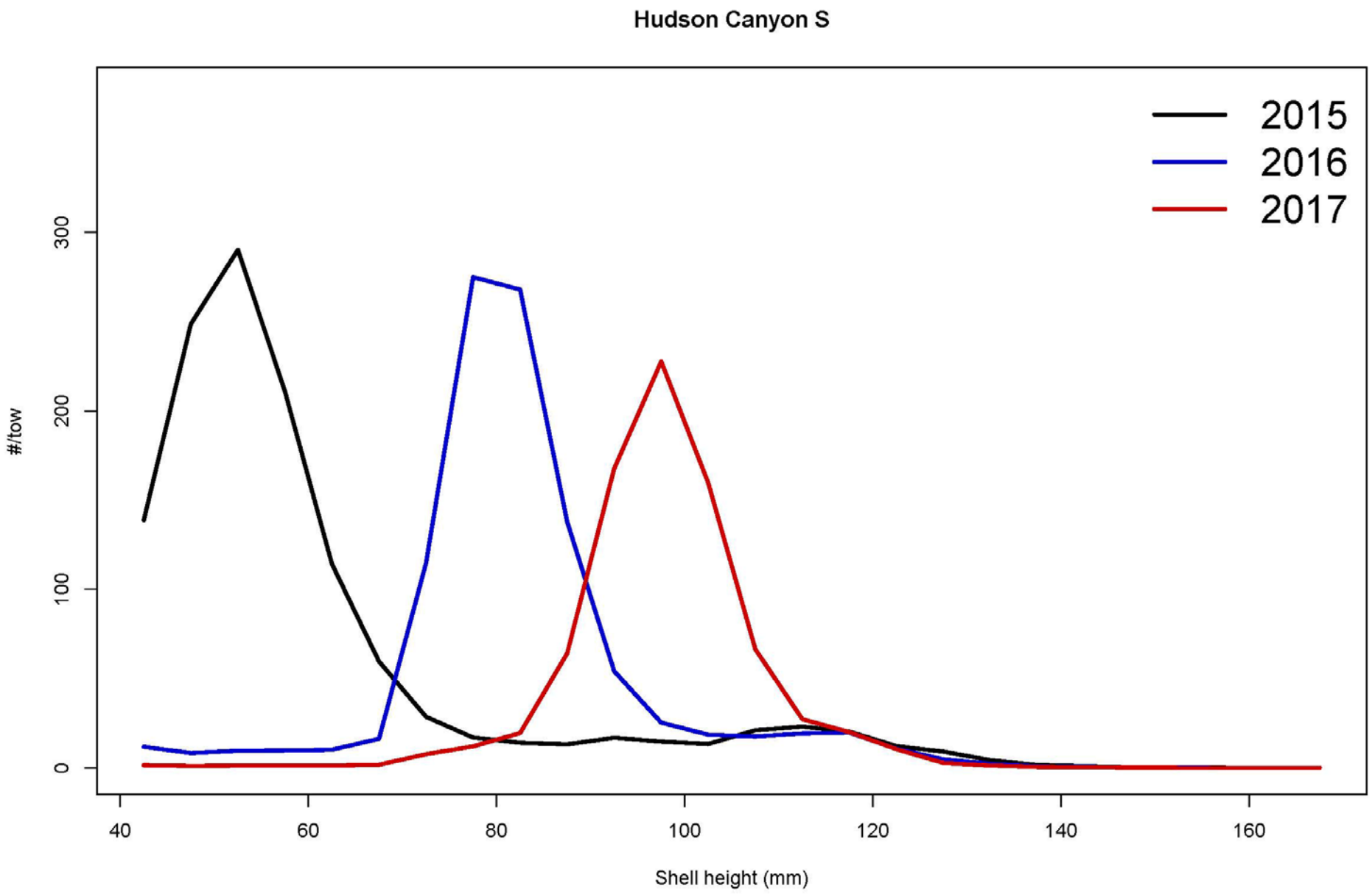
3 trips (~7500 mt) could be obtained assuming only 600 mt from Delmarva and would have a good margin of safety



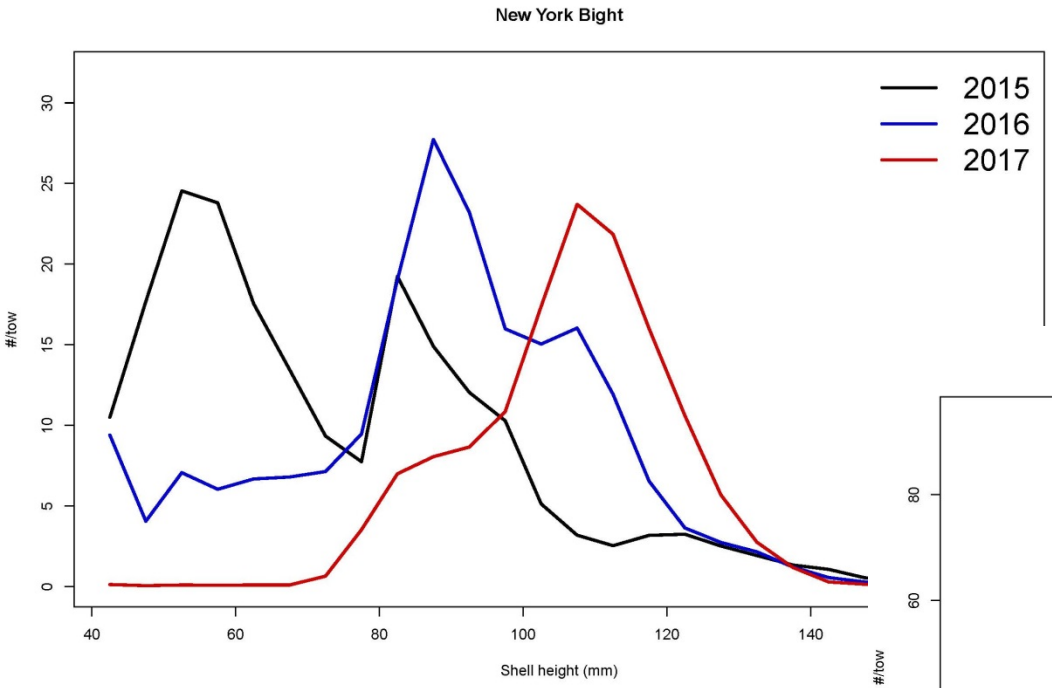

*Note: These projections only based on one simulation – not 1,000 runs*
*Final projections may be different using range of assumed recruitment etc.*

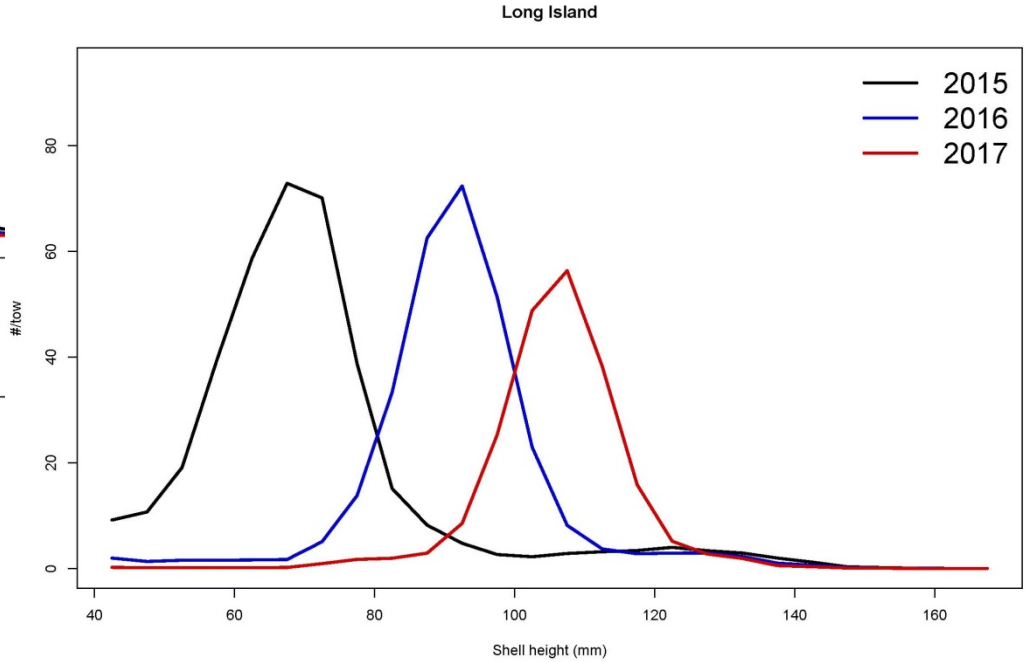

Elephant Trunk Open
2015
2016
2017
#/tow
0
100
200
300
400
500
40
60
80
100
120
140
160
Shell height (mm)

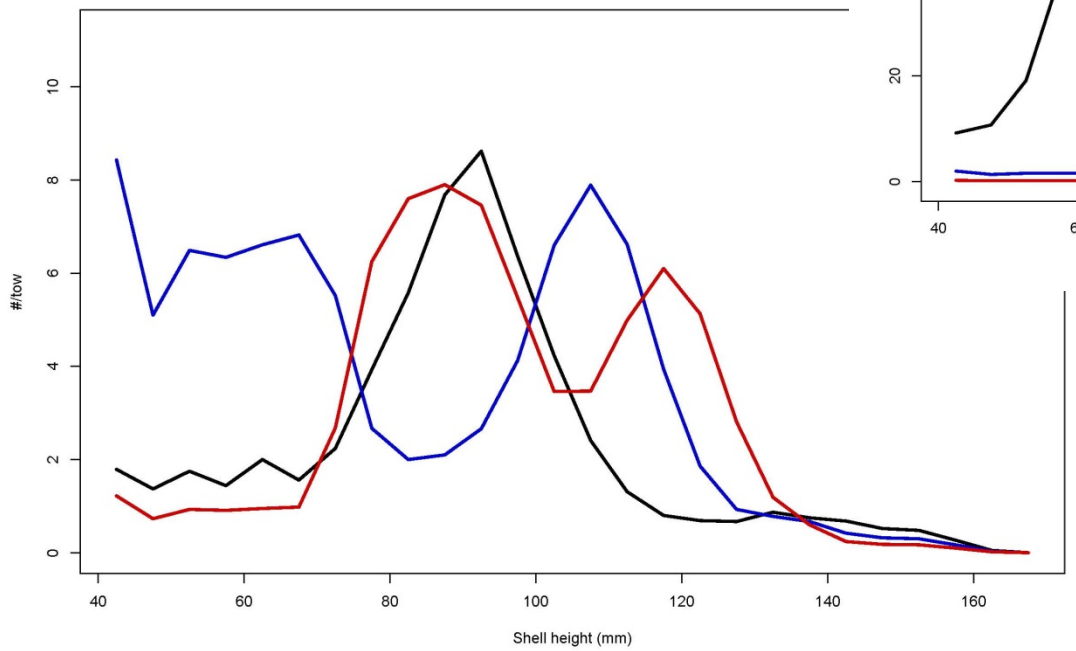

Elephant Trunk Closed
2015
2016
2017
#/tow
0
200
400
600
800
1000
40
60
80
100
120
140
160
Shell height (mm)

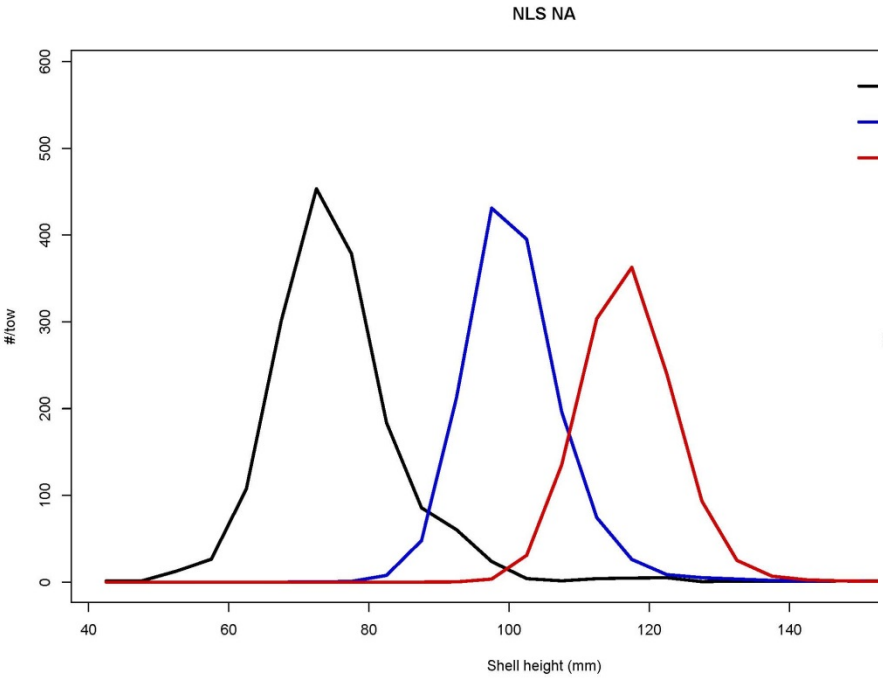

Hudson Canyon S
2015
2016
2017
#/tow
0
100
200
300
40
60
80
100
120
140
160
Shell height (mm)

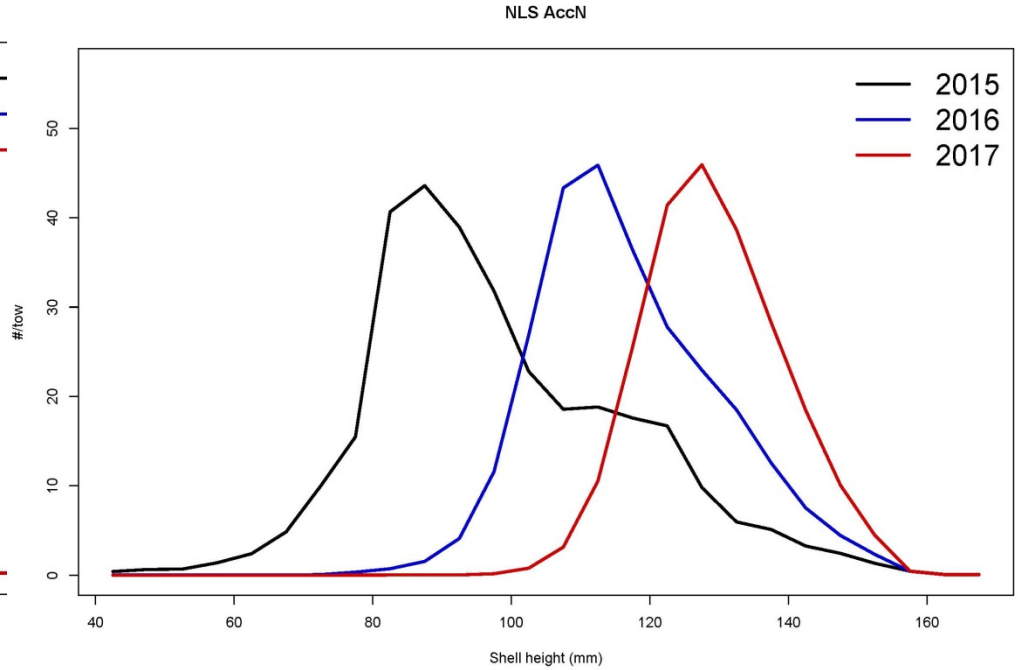
# MA Open Areas

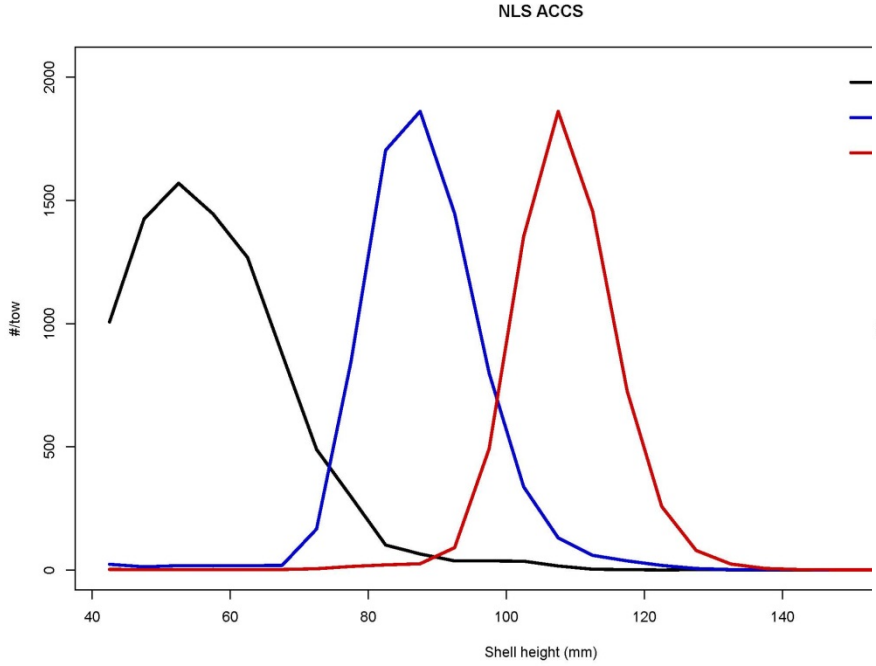


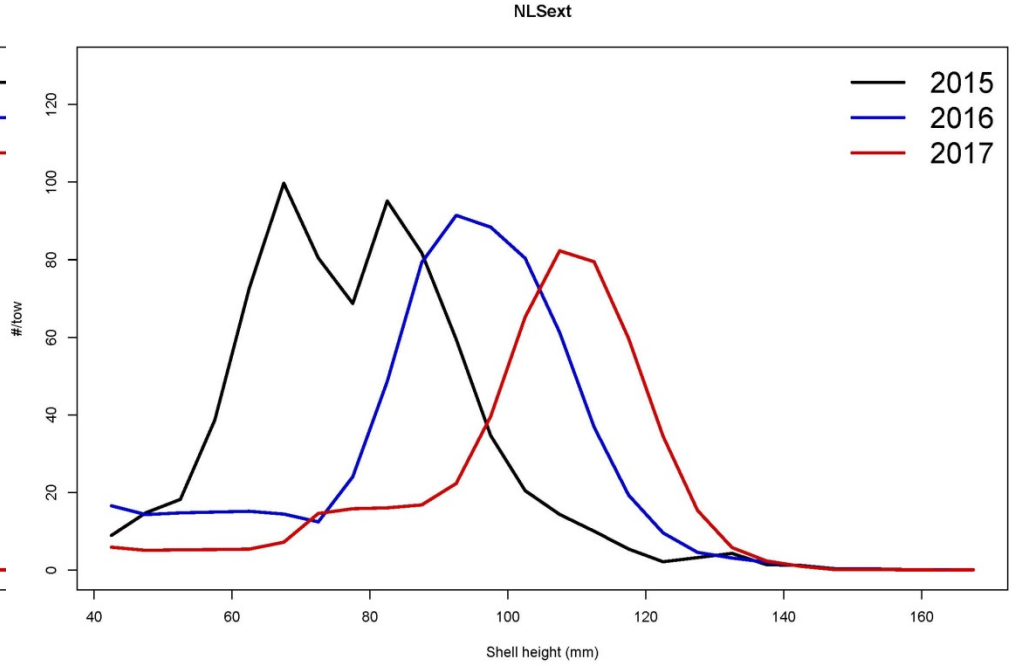



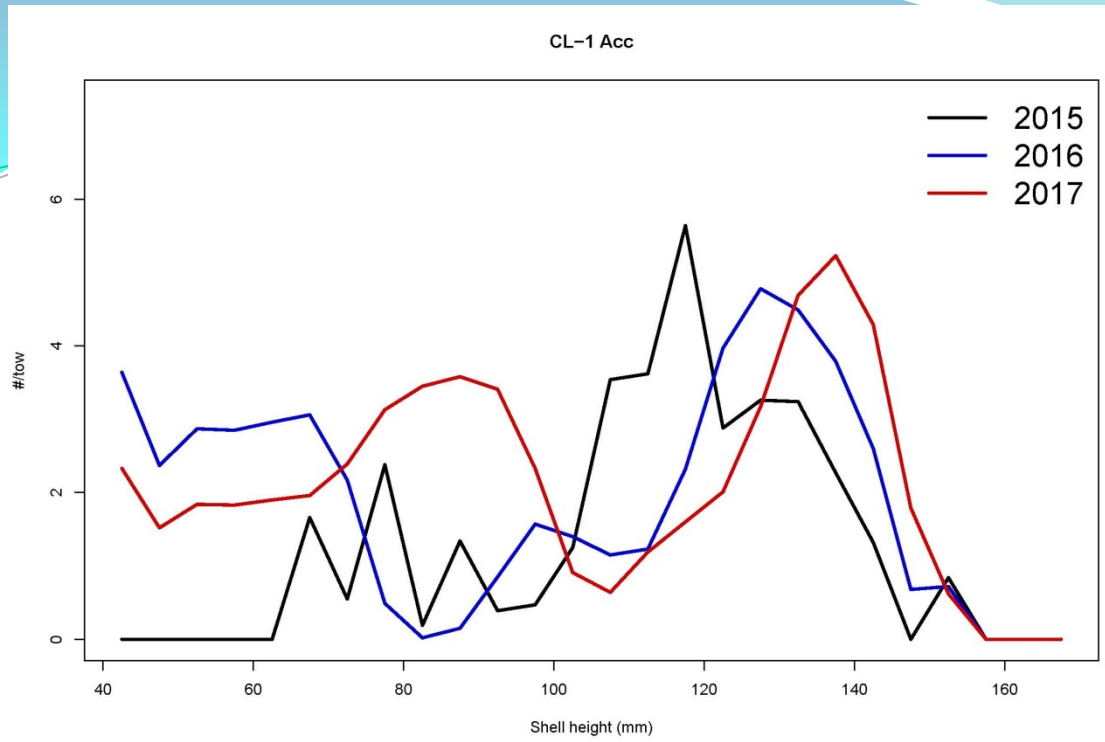

NLS NA
#/tow
0
100
200
300
400
500
600
40
60
80
100
120
140
Shell height (mm)

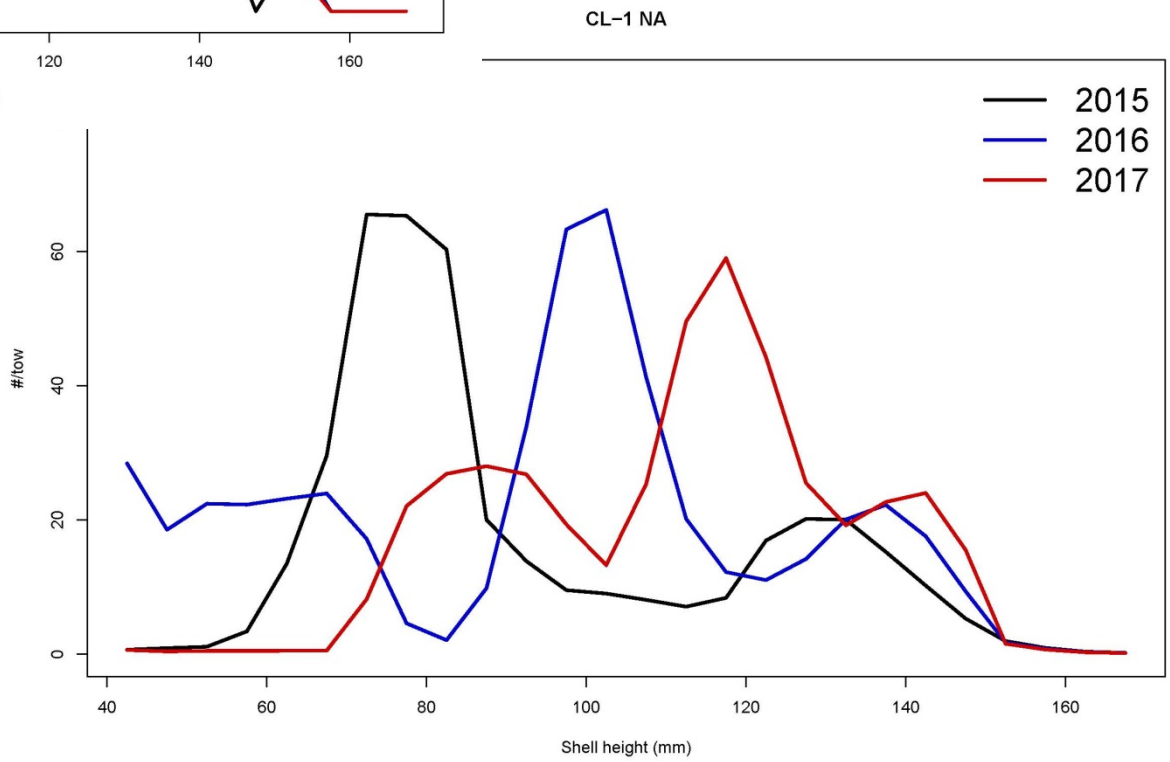

NLS AccN
2015
2016
2017
#/tow
0
10
20
30
40
50
40
60
80
100
120
140
160
Shell height (mm)


NLS ACCS
#/tow
0
500
1000
1500
2000
40
60
80
100
120
140
Shell height (mm)

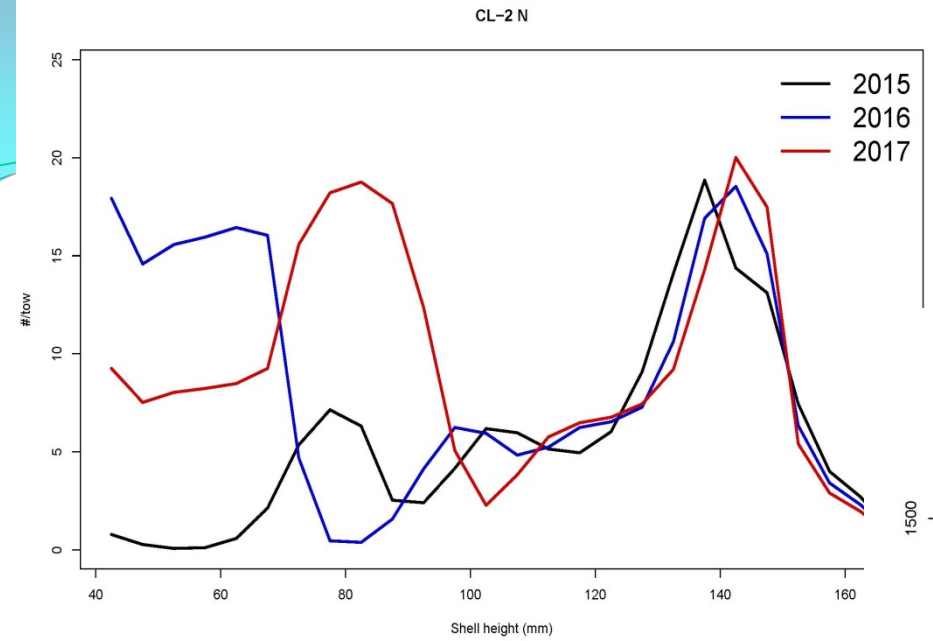

NLSext
2015
2016
2017
#/tow
0
20
40
60
80
100
120
40
60
80
100
120
140
160
Shell height (mm)

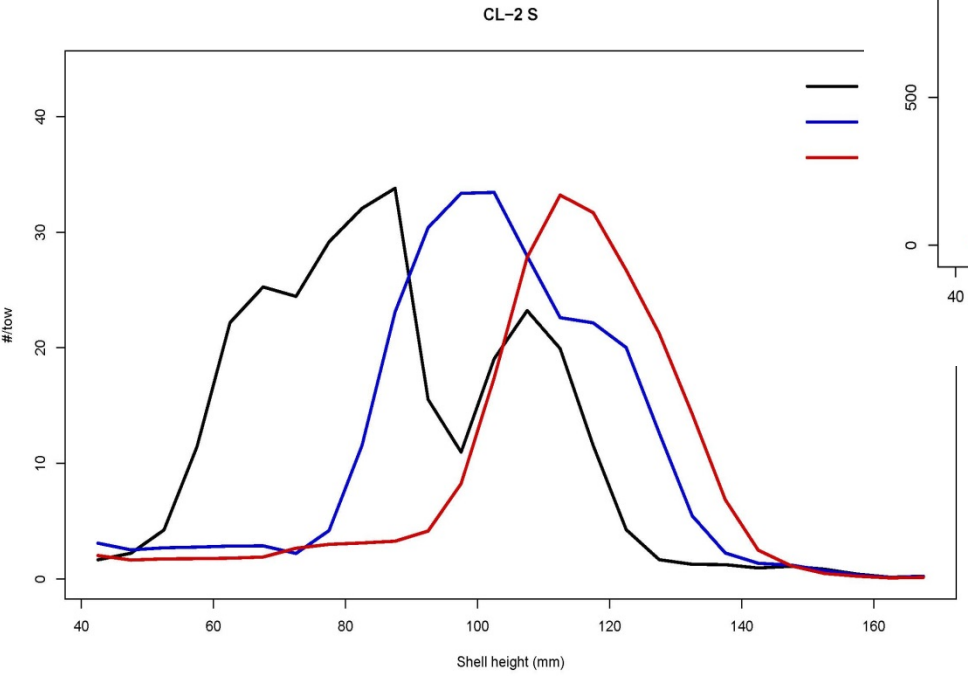
# Closed Area I

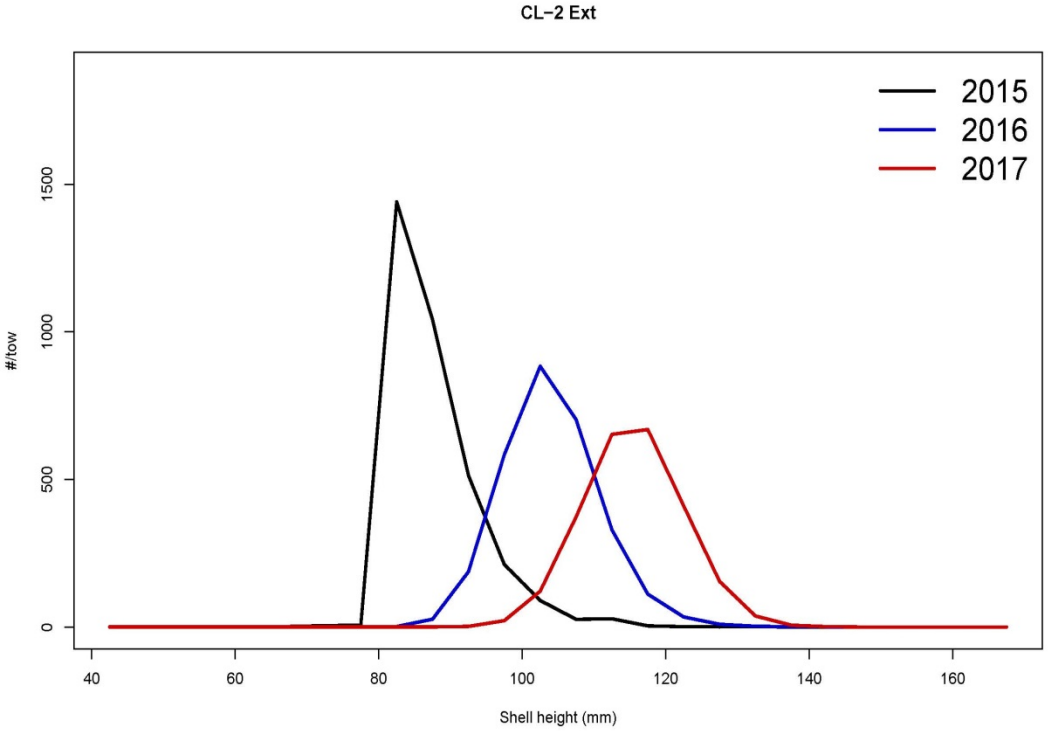


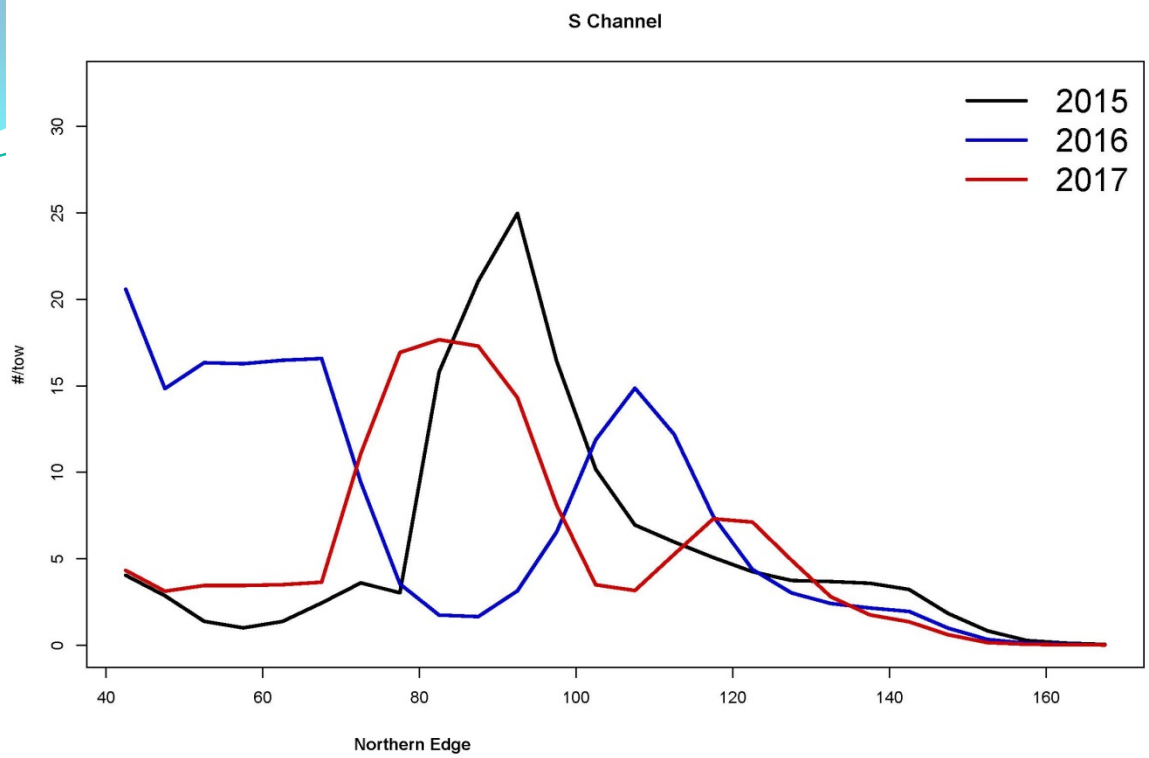
# Closed Area II

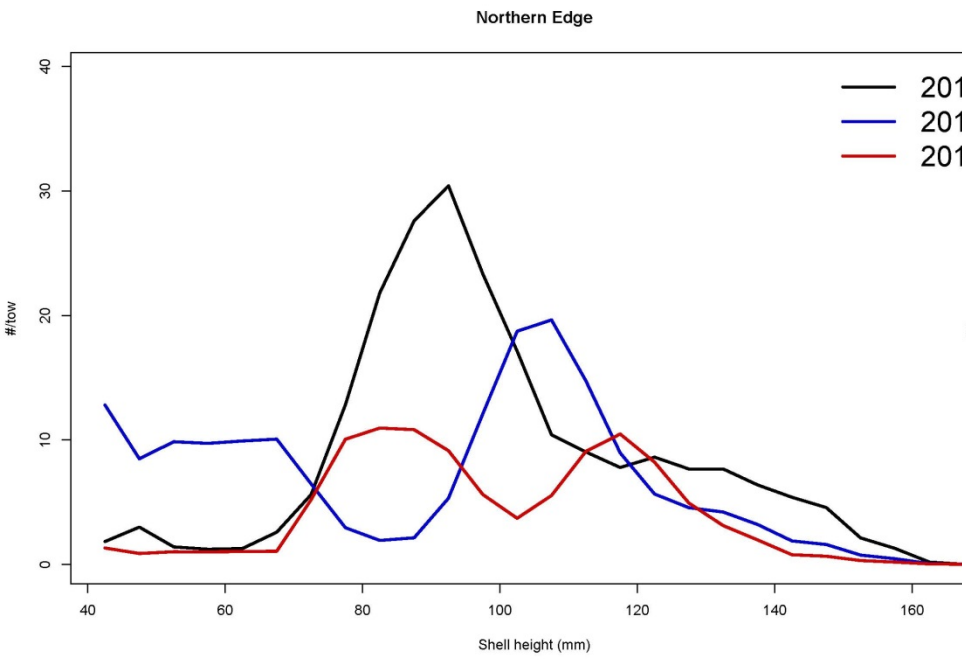


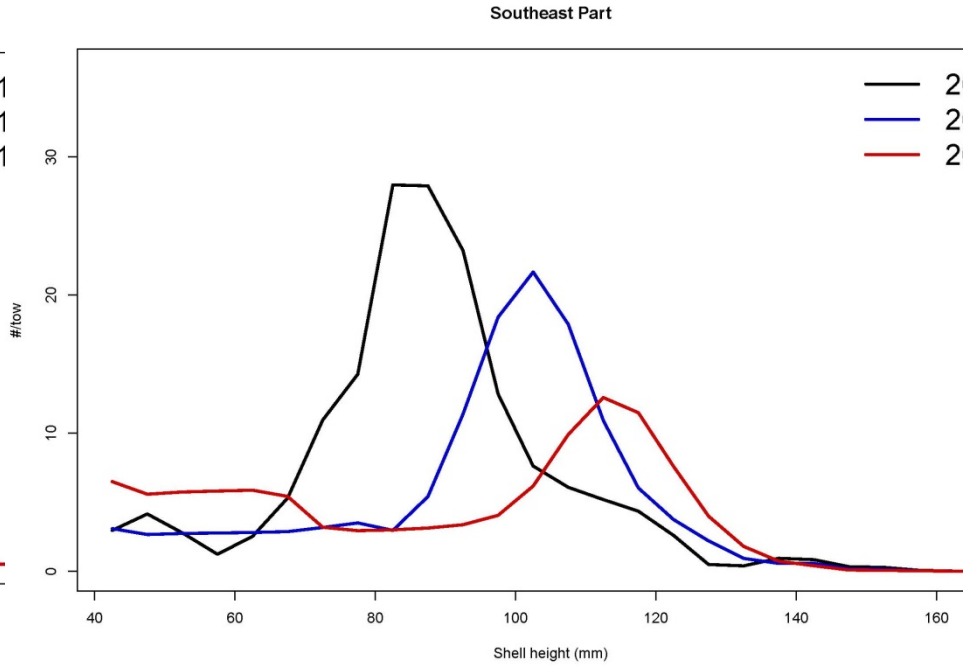



# GB Open Areas



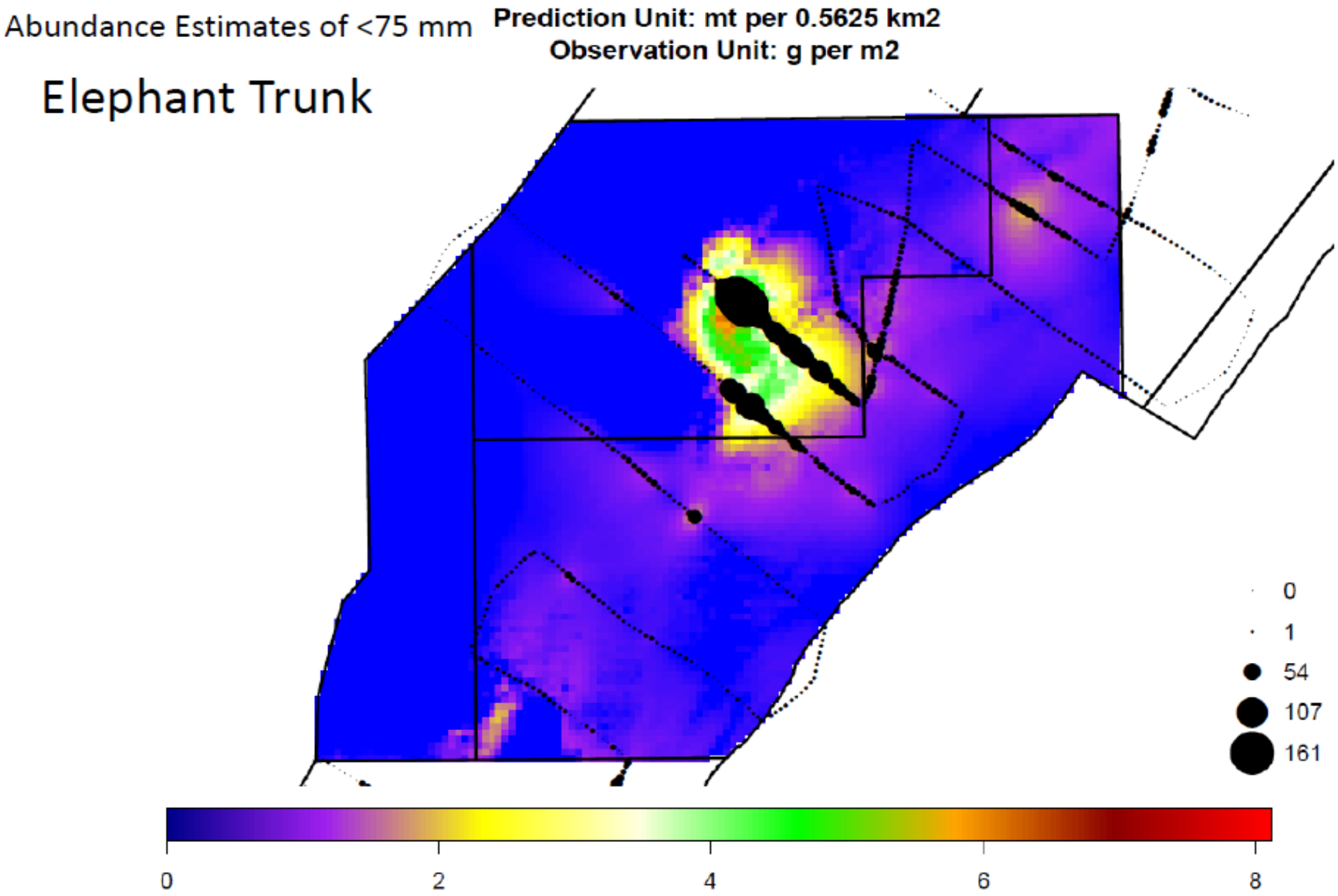
# Part II – PDT Discussion to date

- Projection of OFL and total landings not complete yet – but probably in ballpark of 2015 levels
- Supportive of 3 Access Area trips with continued flexibility to fish within all 3 MA areas – especially if additional measures are taken to protect small scallops
- If interest in access in CA2 south may provide a trip for half the fleet – may be concerns about YT bycatch
- Recommend leaving NL closed in 2016 – highly productive area that has history of producing large scallops if given time

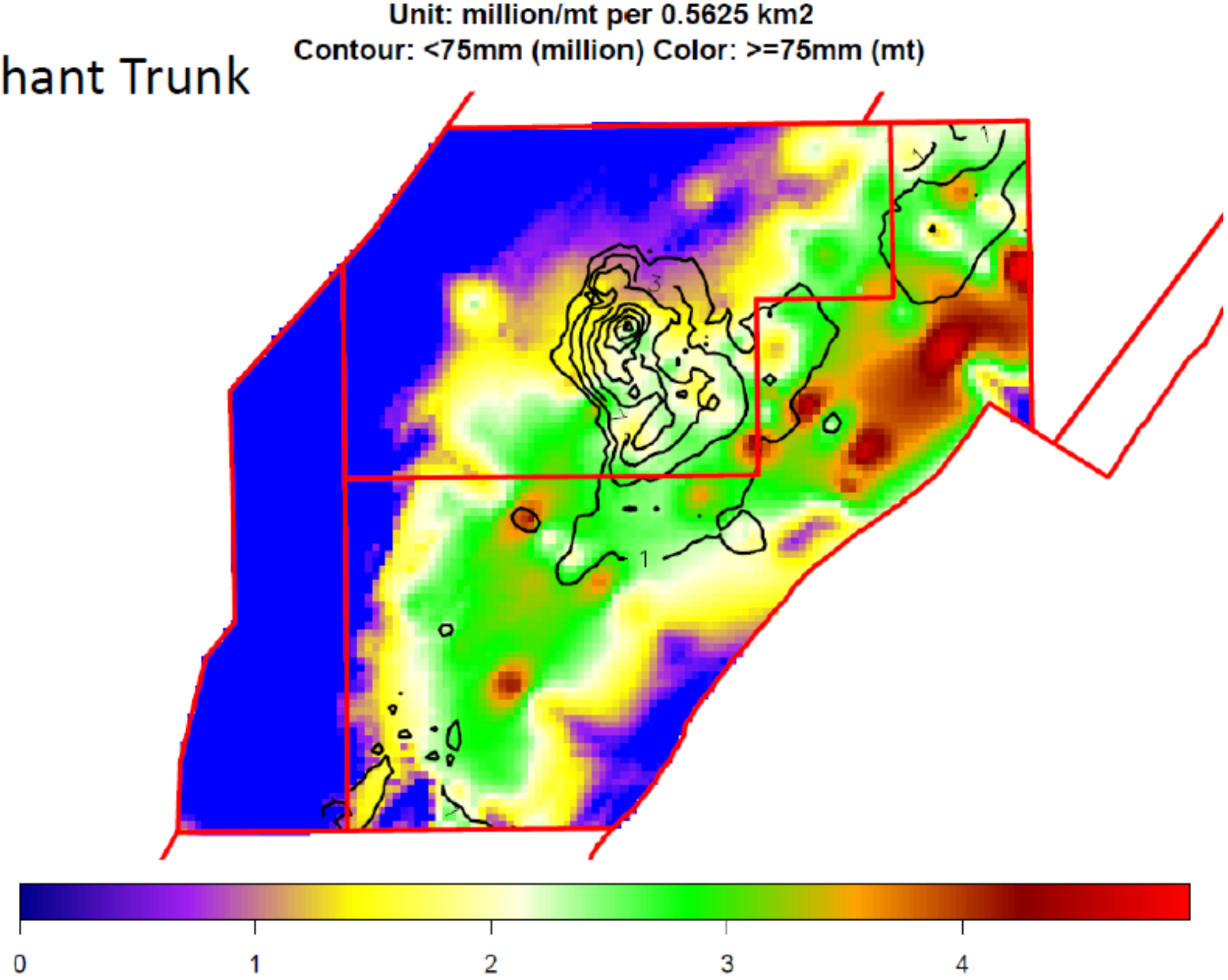
# Questions for AP about alternatives to potentially develop further in FW27

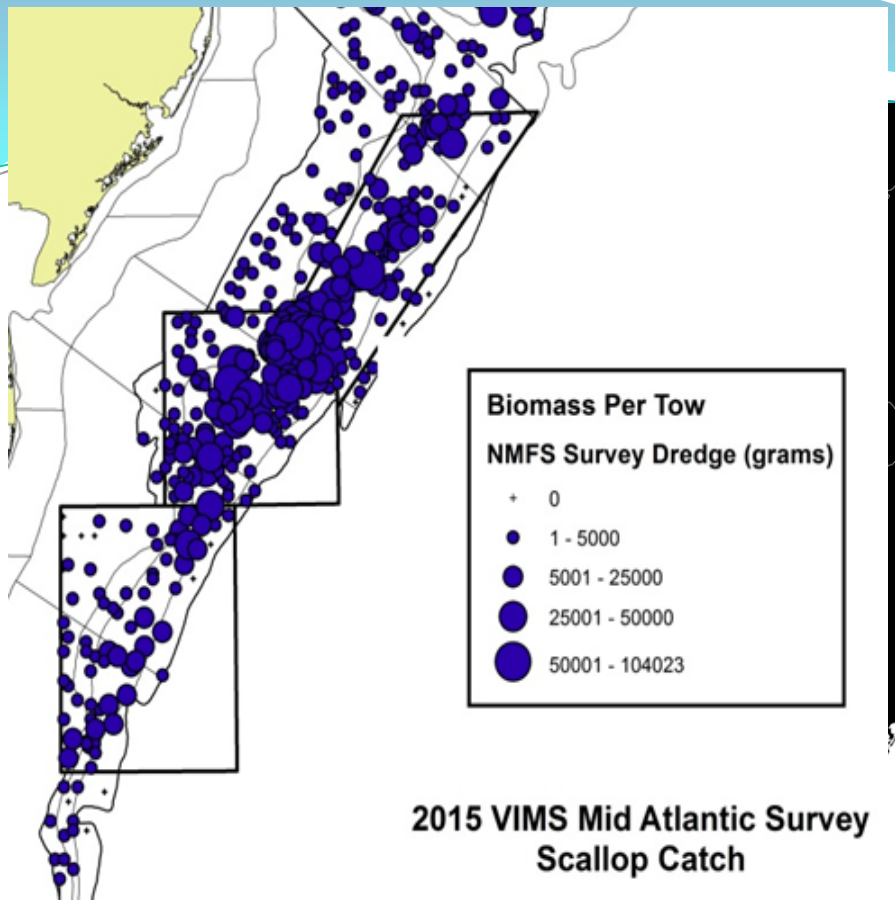
- Input on potential **expansion of ETA closed** to the south to further protect high concentrations of small scallops – maybe after August 1 to provide some access (5 months)
- Hard to separate out small scallops in HC – maybe **close HC on August 1** to allow fishing for 5 months then protect small scallops for the remainder of the year
- Revisit **closing CA2 south extension** considered in FW26
- Potential **access in part of CA2 south and CA2 south extension** – but leave rest closed – boundary ideas?

# 1. Expansion of ETA? After Aug 1?

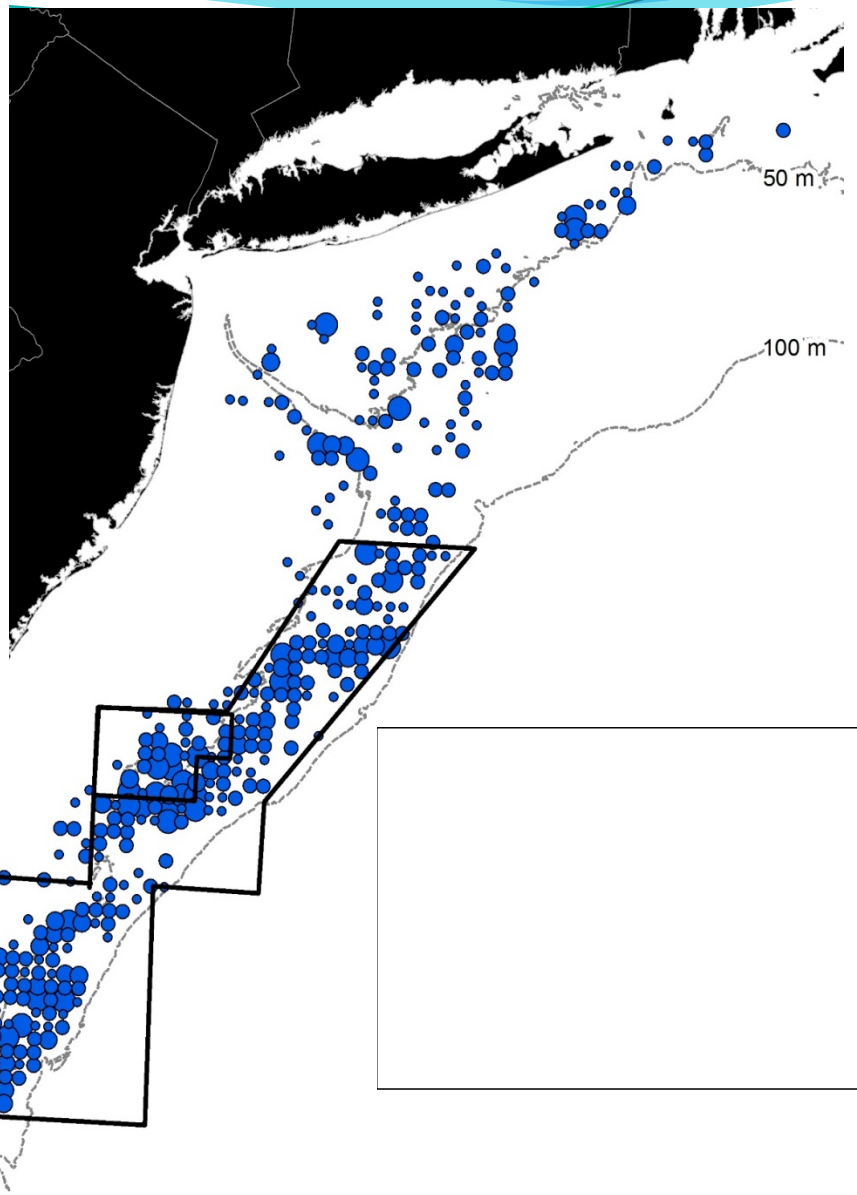


# Elephant Trunk



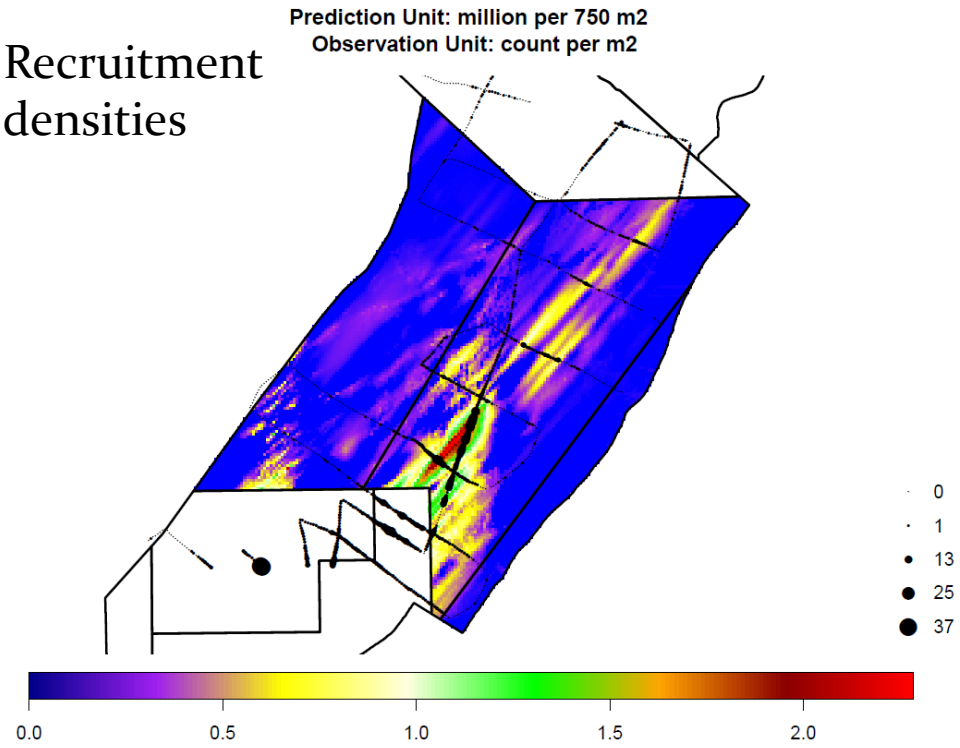


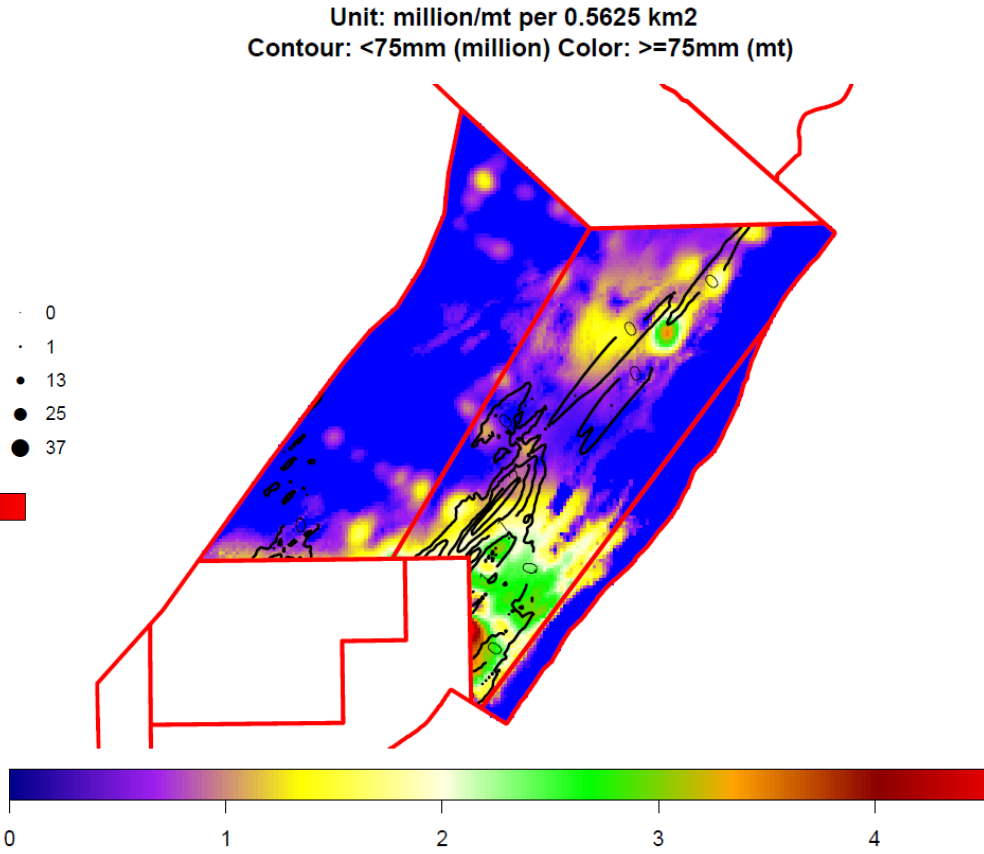

2015 VIMS Mid Atlantic Survey
Scallop Catch



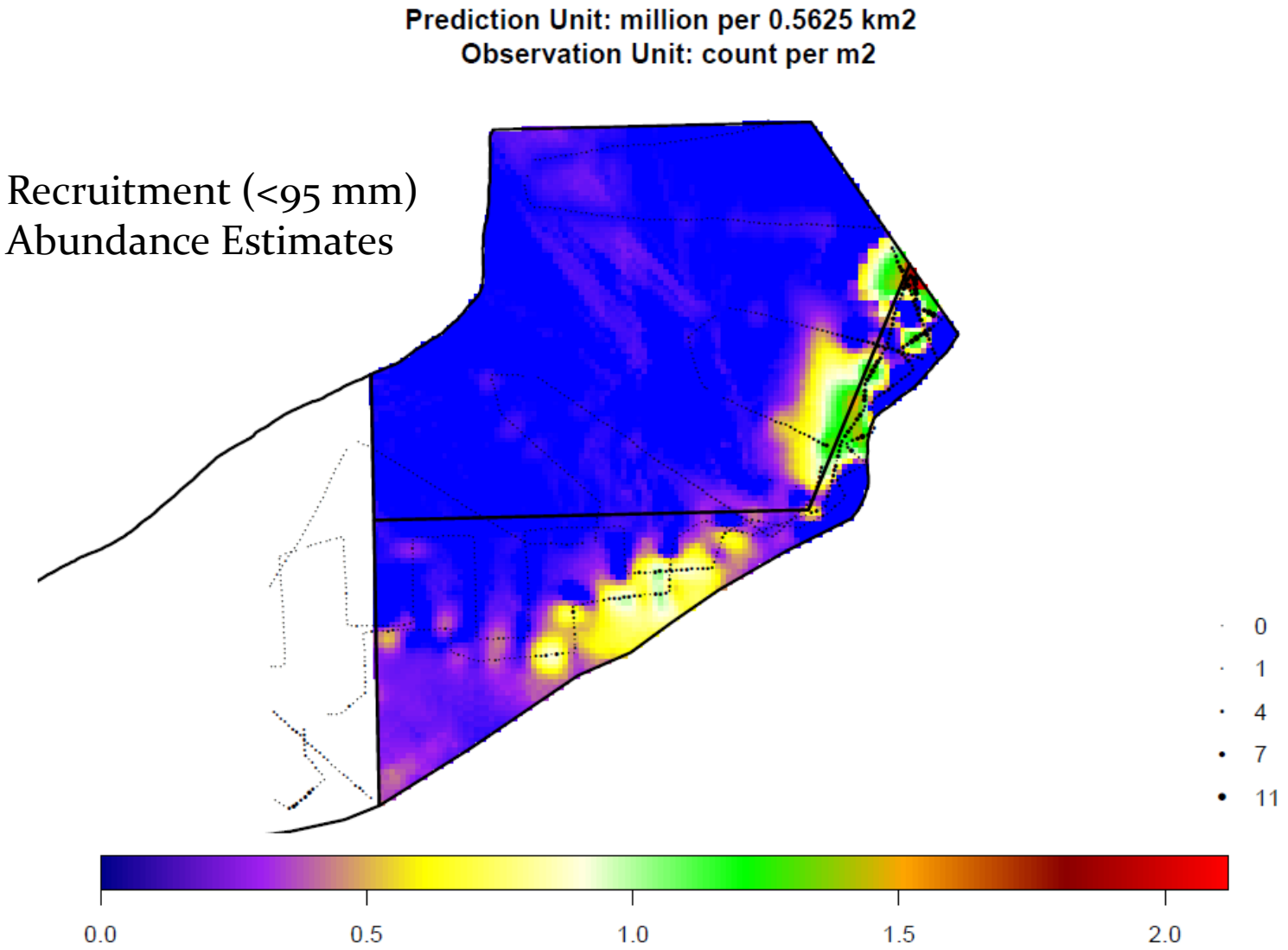
# 2. Close HC August 1?

Recruitment densities



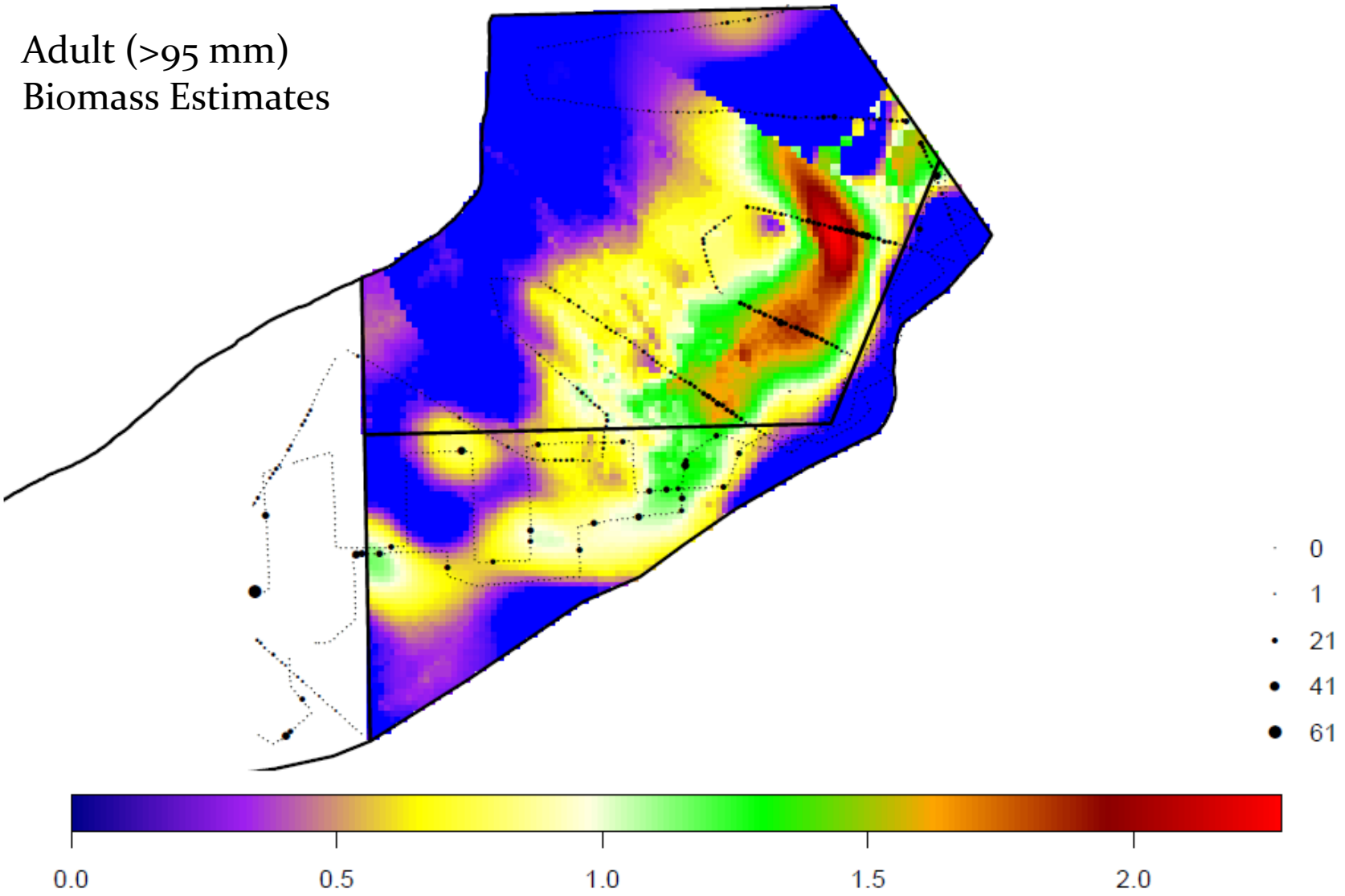



# 3. Expand CA2 south  4. Split access?

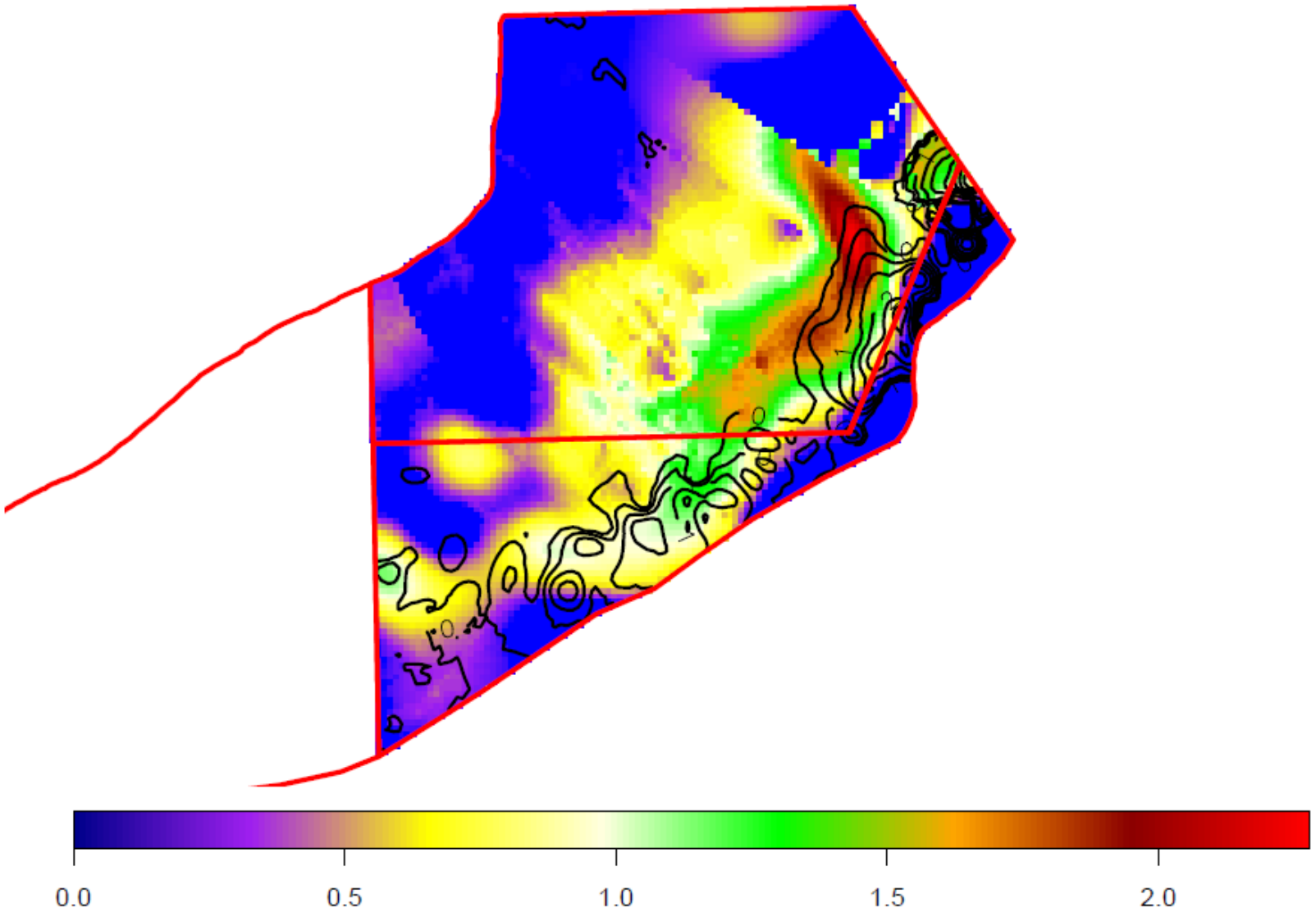


Prediction Unit: mt per 0.5625 km2
Observation Unit: g per m2

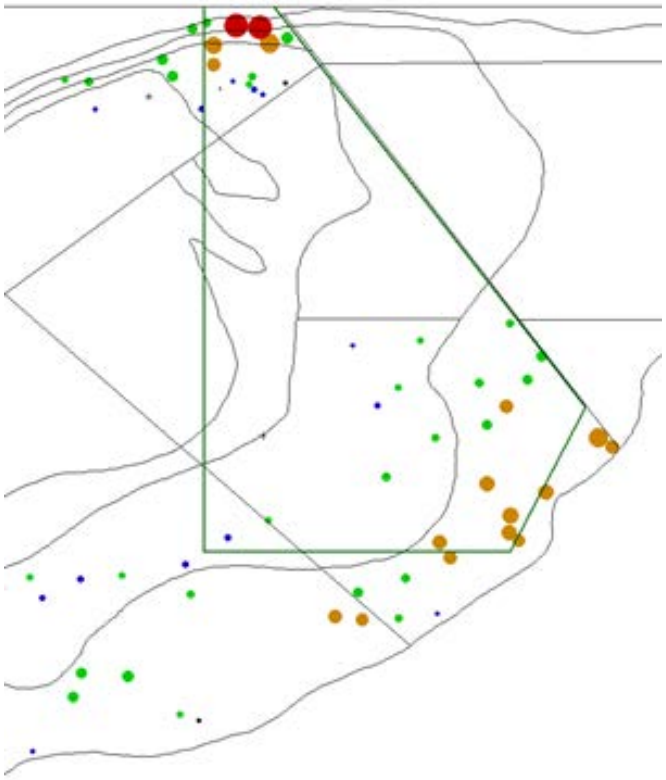
Adult (>95 mm)
Biomass Estimates

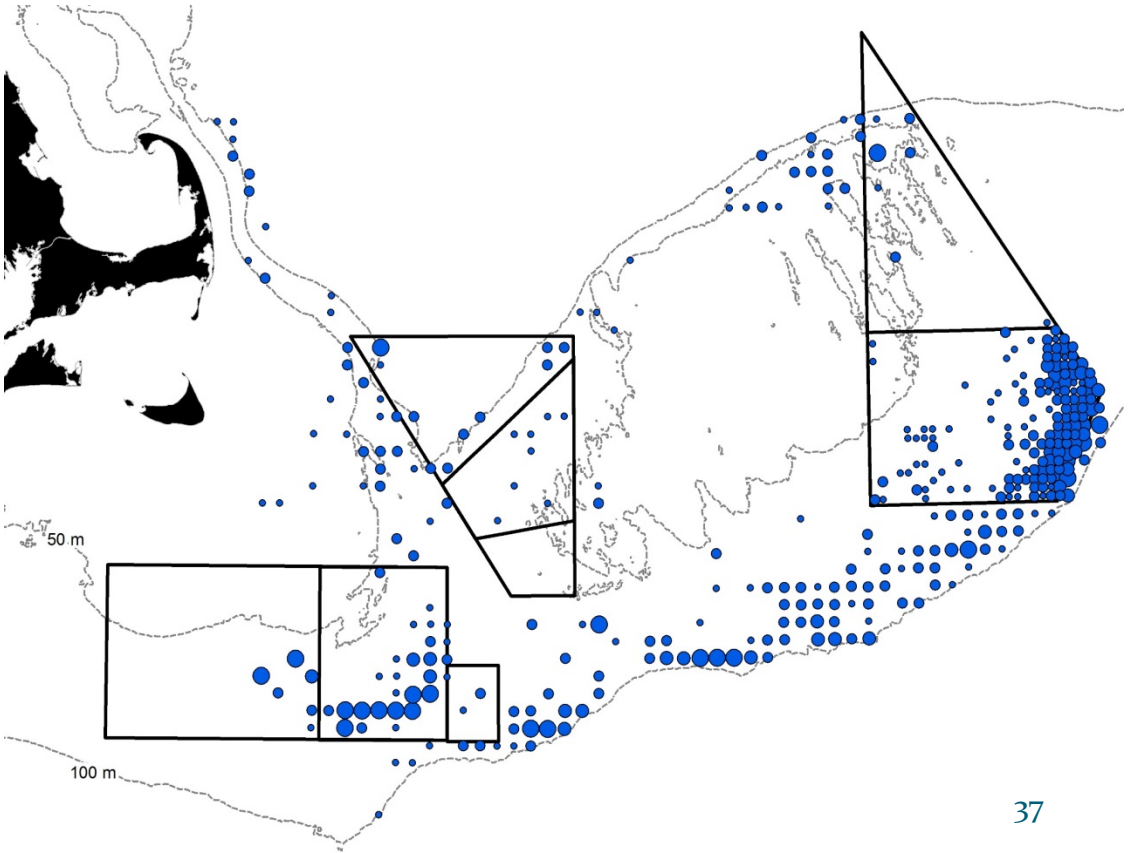


Unit: million/mt per 0.5625 km2
Contour: <95 mm (million)  Color: >95 mm (mt)

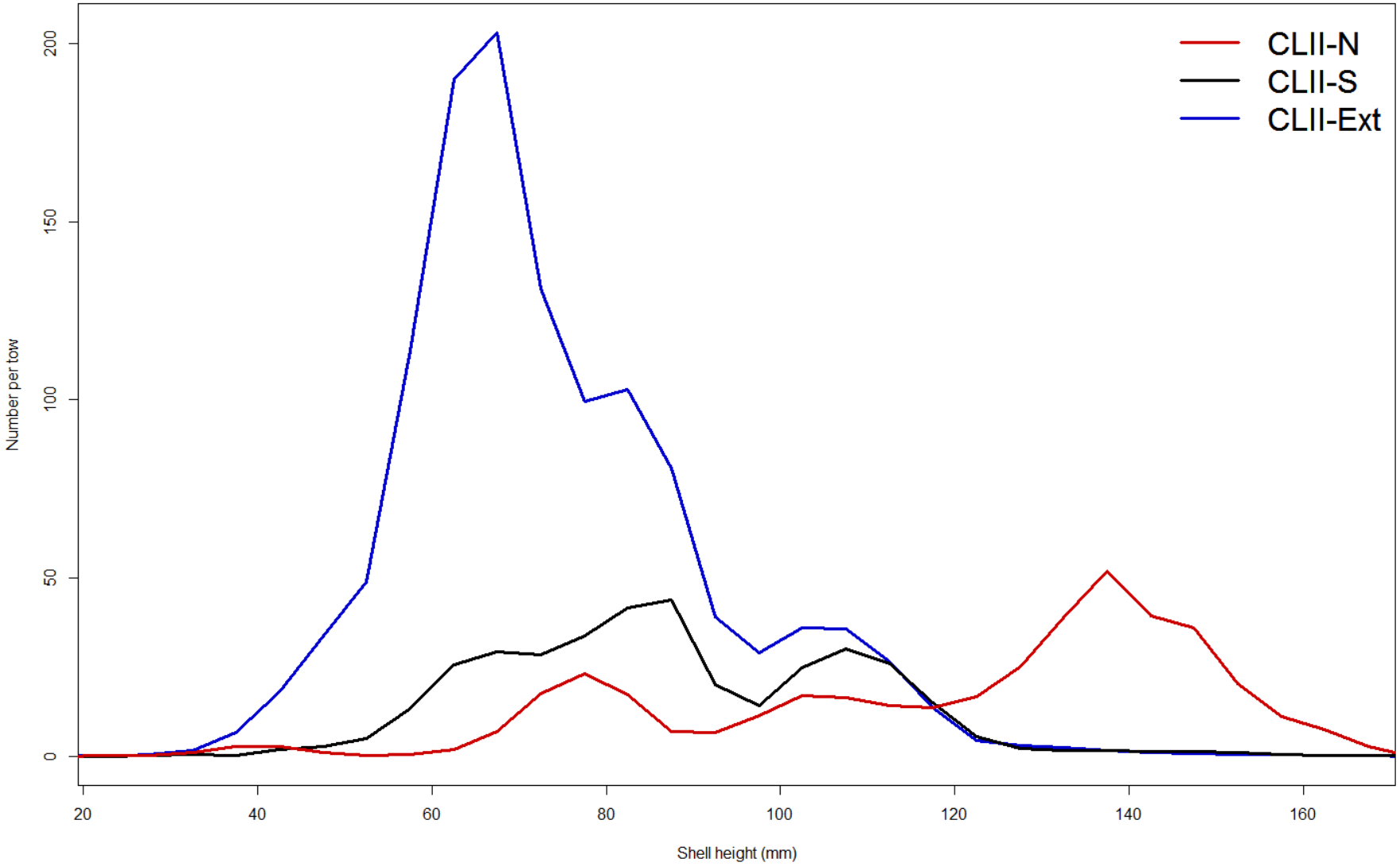


# NEFSC – Dredge survey - Biomass

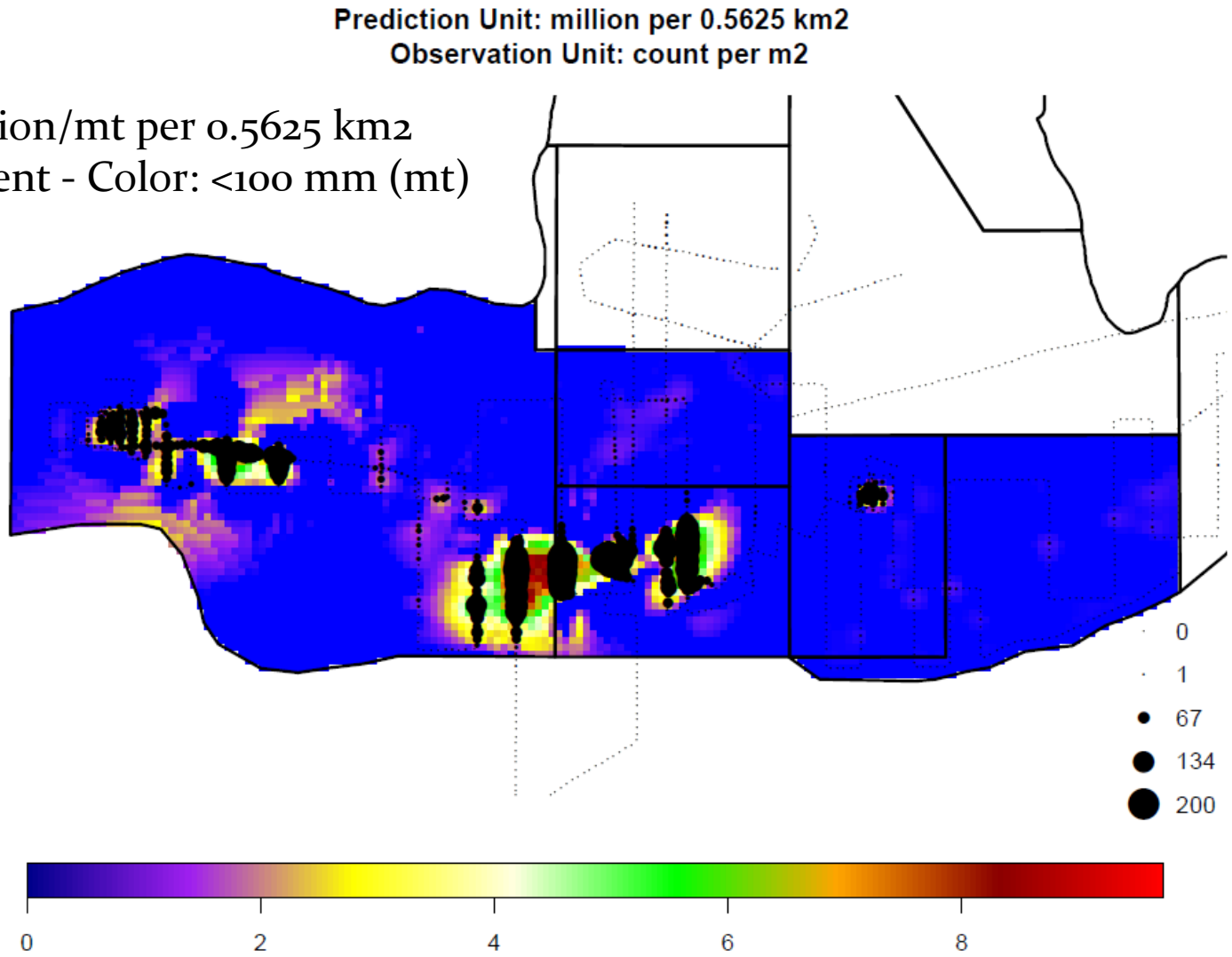




# NEFSC Dredge survey

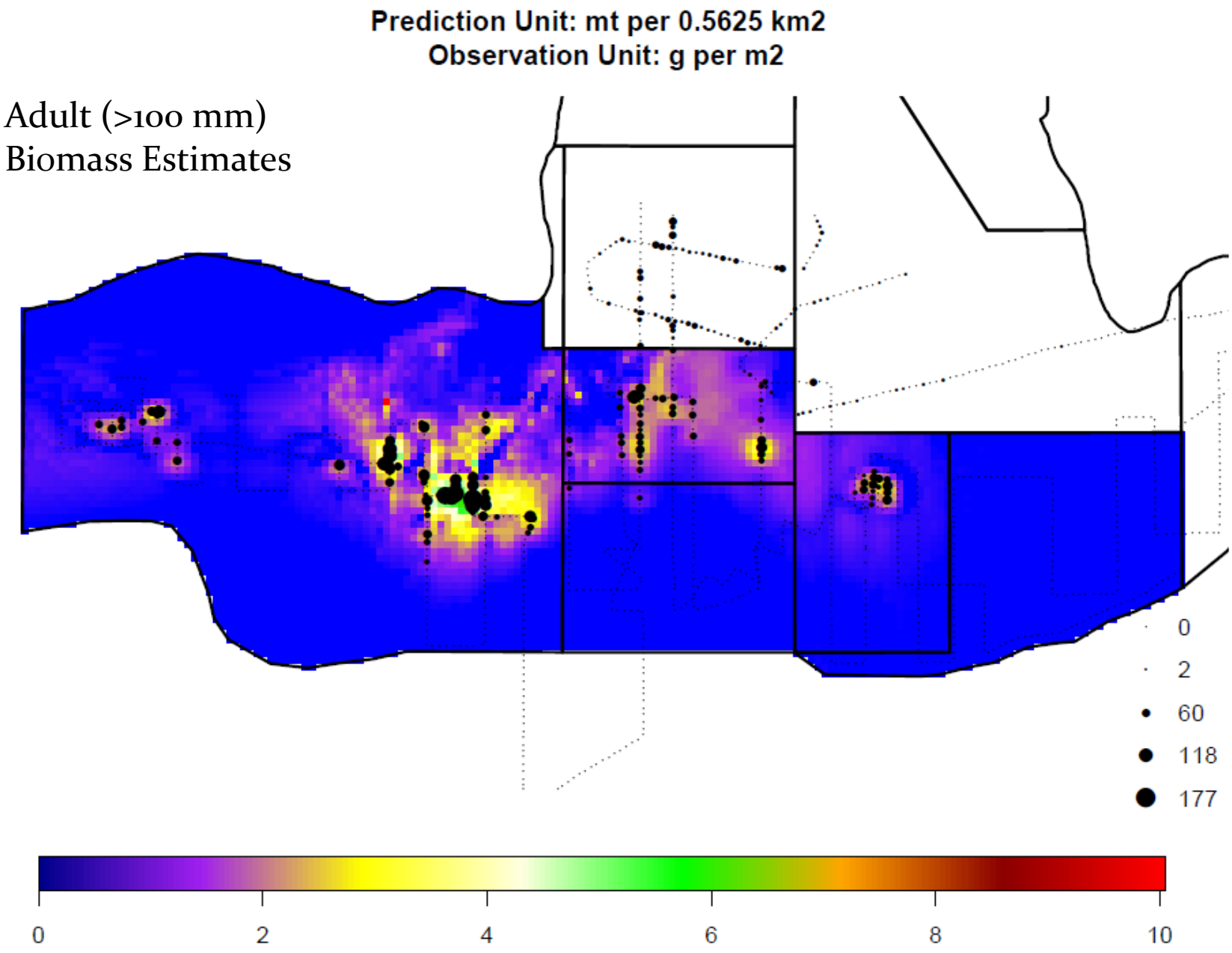


# More info on NL

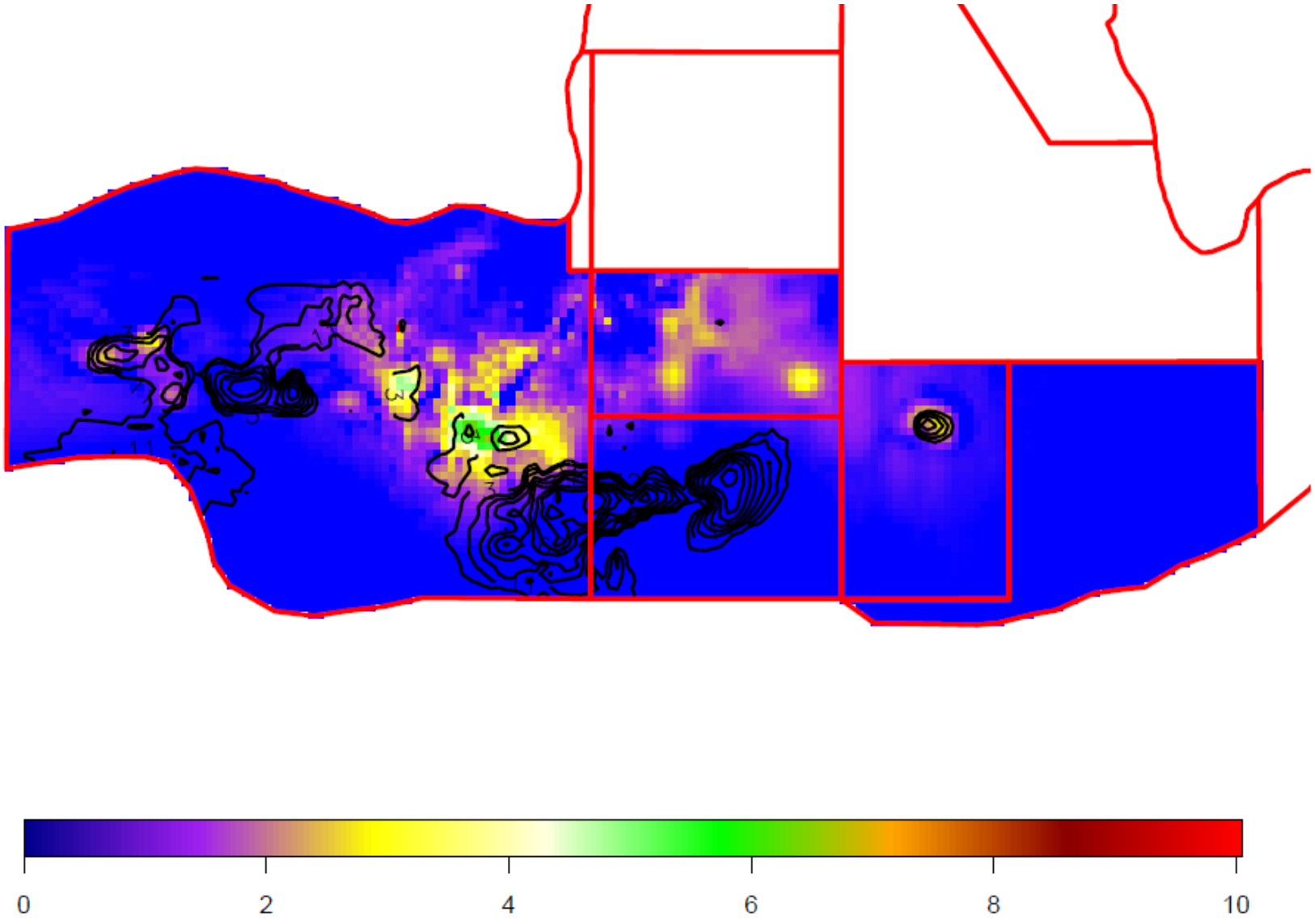



Unit: million/mt per 0.5625 km2
Recruitment - Color: <100 mm (mt)

Adult (>100 mm)
Biomass Estimates



Unit: million/mt per 0.5625 km2
Contour: <100 mm (million)  Color: >100 mm (mt)



# What's next?

- PDT will refine basic projection run – more work needed on open area projections – need to adjust LPUE function to determine DAS allocations
- PDT will develop other alternatives based on AP input today
- 2 PDT meetings scheduled in October to develop alternatives and complete analyses
- Mid-November AP and Cmte review and select preferred alternative – November 18 and 19
- Final Council Action – December 1-3, 2015
- FW27 implementation in April 2016