Block Island Wind Farm
Lobster Ventless Trap Survey

Matt Griffin - Drew Carey

INSPIRE ENVIRONMENTAL

BLOCK ISLAND WIND FARM
America's First Offshore Wind Farm

BIWF Lobster Ventless Trap Survey

AIM: Assess impact of BIWF on local lobster resources

- CRMC Fisheries Advisory Board expressed need to better understand lobster use in the wind farm area before, during & post construction

- Protocol development
  - Coast-wide Ventless Trap Program
  - CRMC Fisheries Advisory Board
  - RIDEM, Division of Marine Fisheries
  - MA Division of Marine Fisheries
  - Power analysis study design assessment

- Collaborative effort with lobster industry

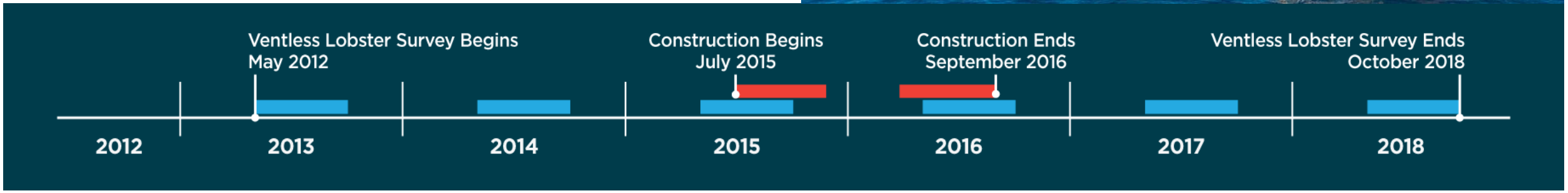
  Near Field: Bill McElroy

  Far Field: Lanny Dellinger

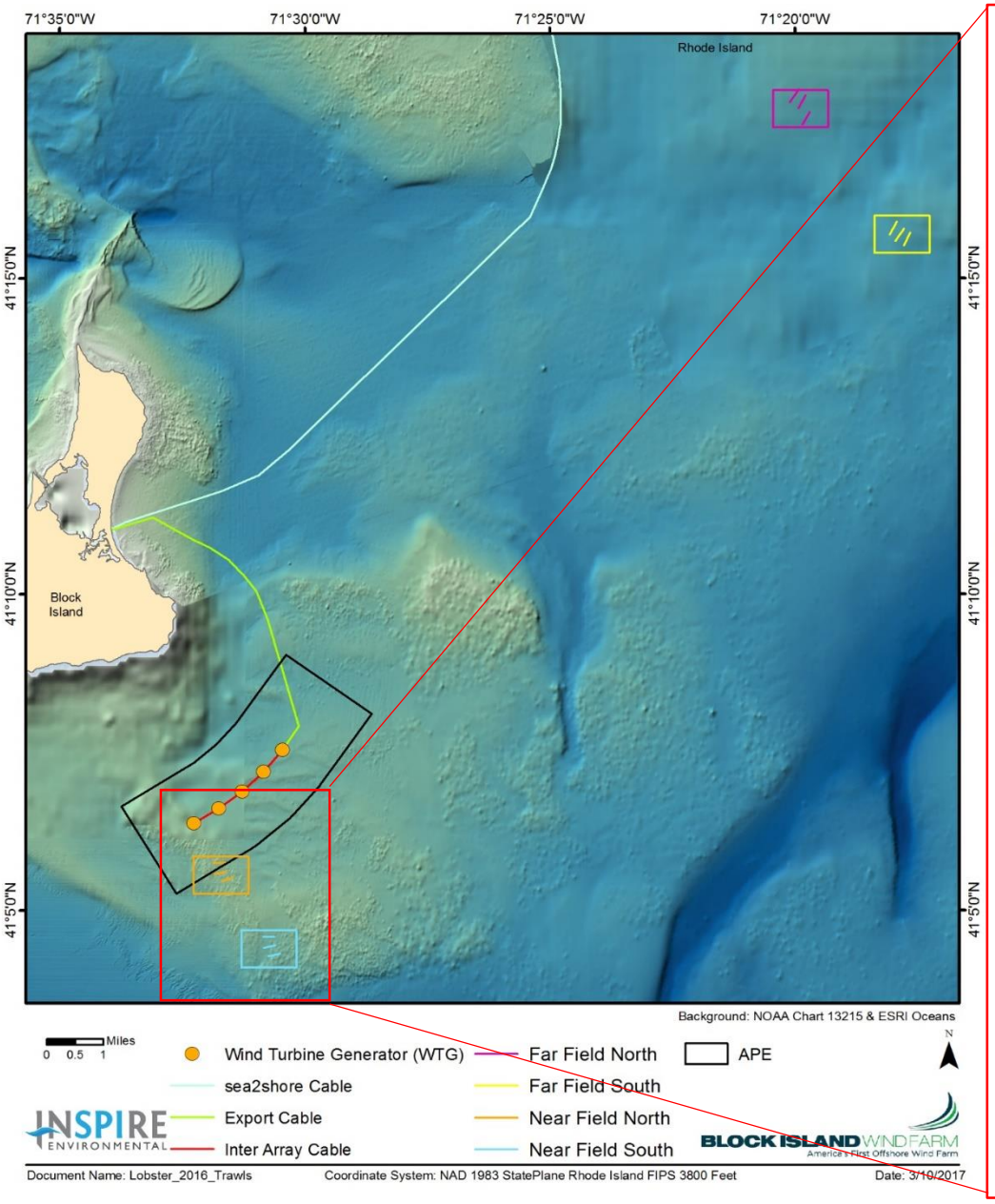
Survey Design

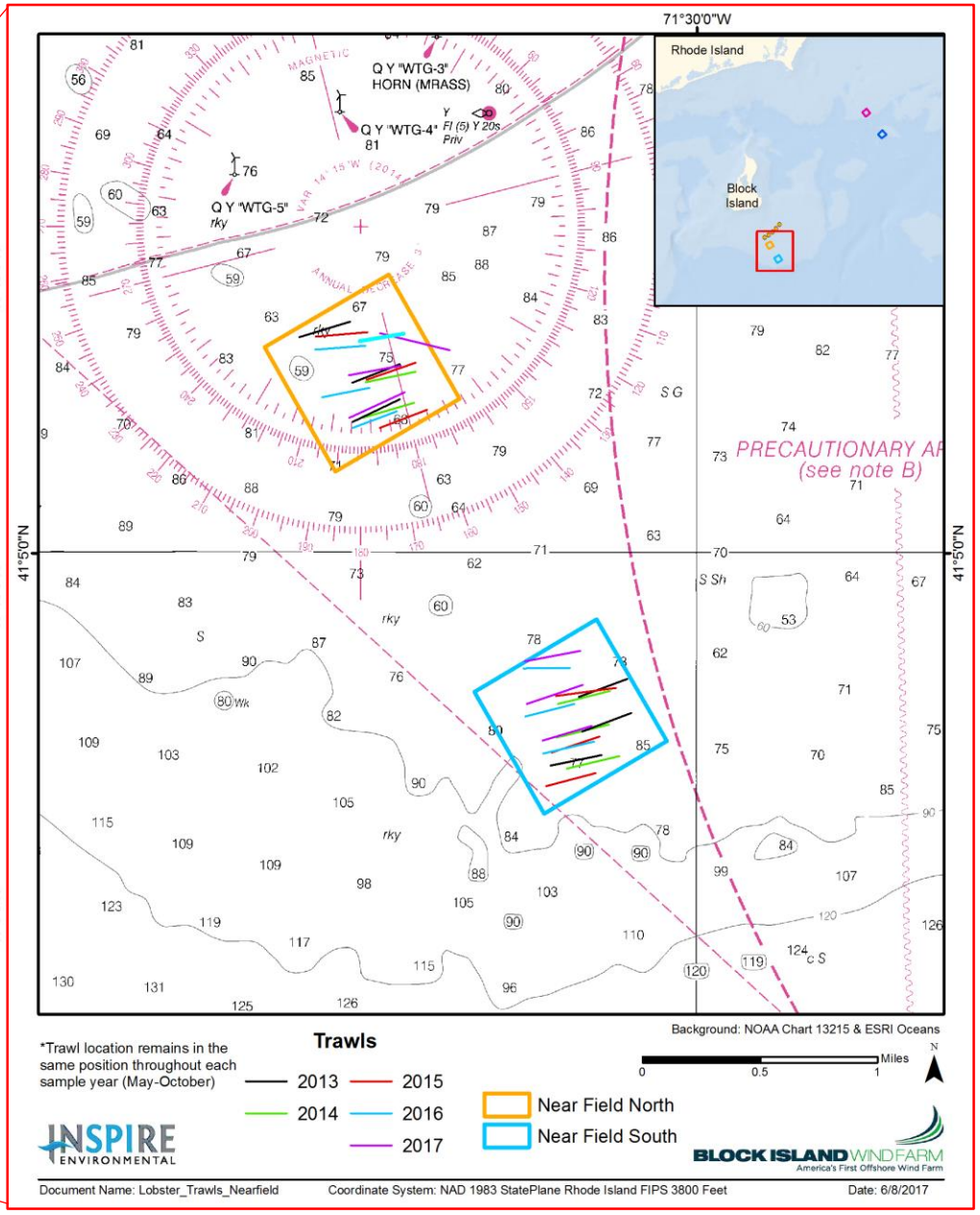
B.A.C.I. 2013 - 2018

- Two years pre construction
- Two years during construction
- Two years during operation
- Sampled 2x per month
- May – October



Survey Design – Sample Area





Near Field

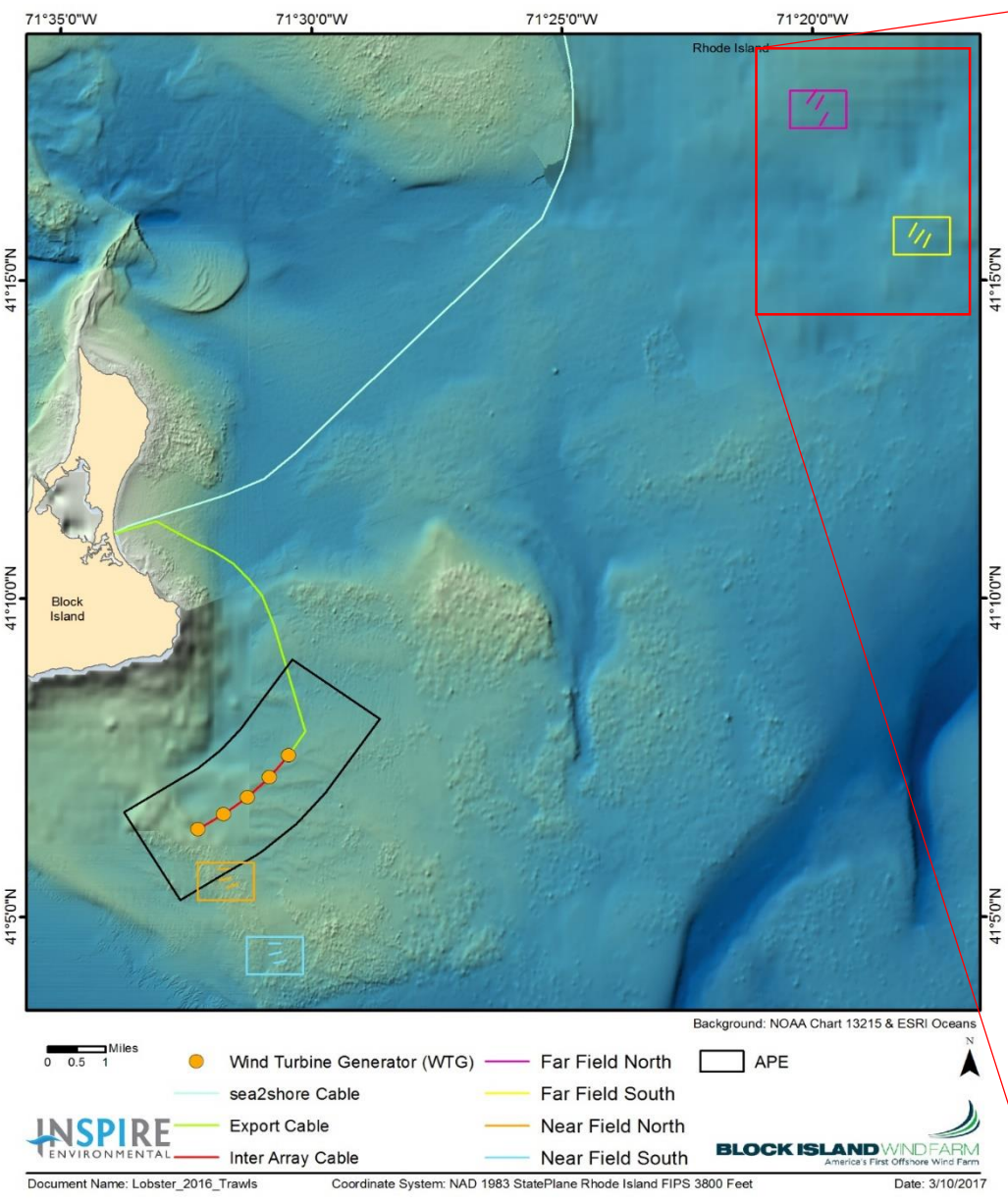
65’ – 90’

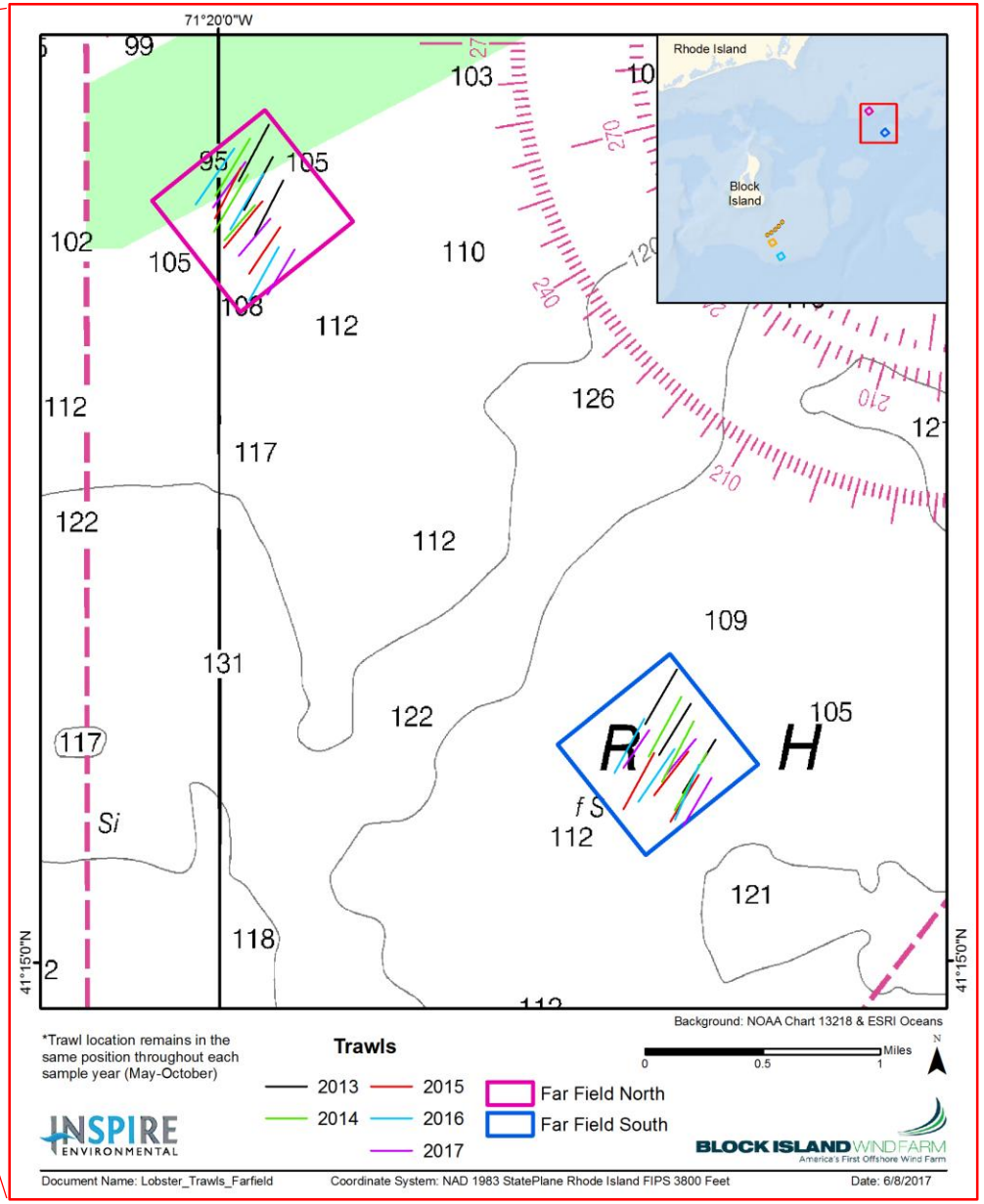
Coarse sand
Pebble
Cobble
Boulder

NN: ½ mi from turbines

NS: 2 ½ mi from turbines

Survey Design – Sample Area





Far Field

95’ – 115’

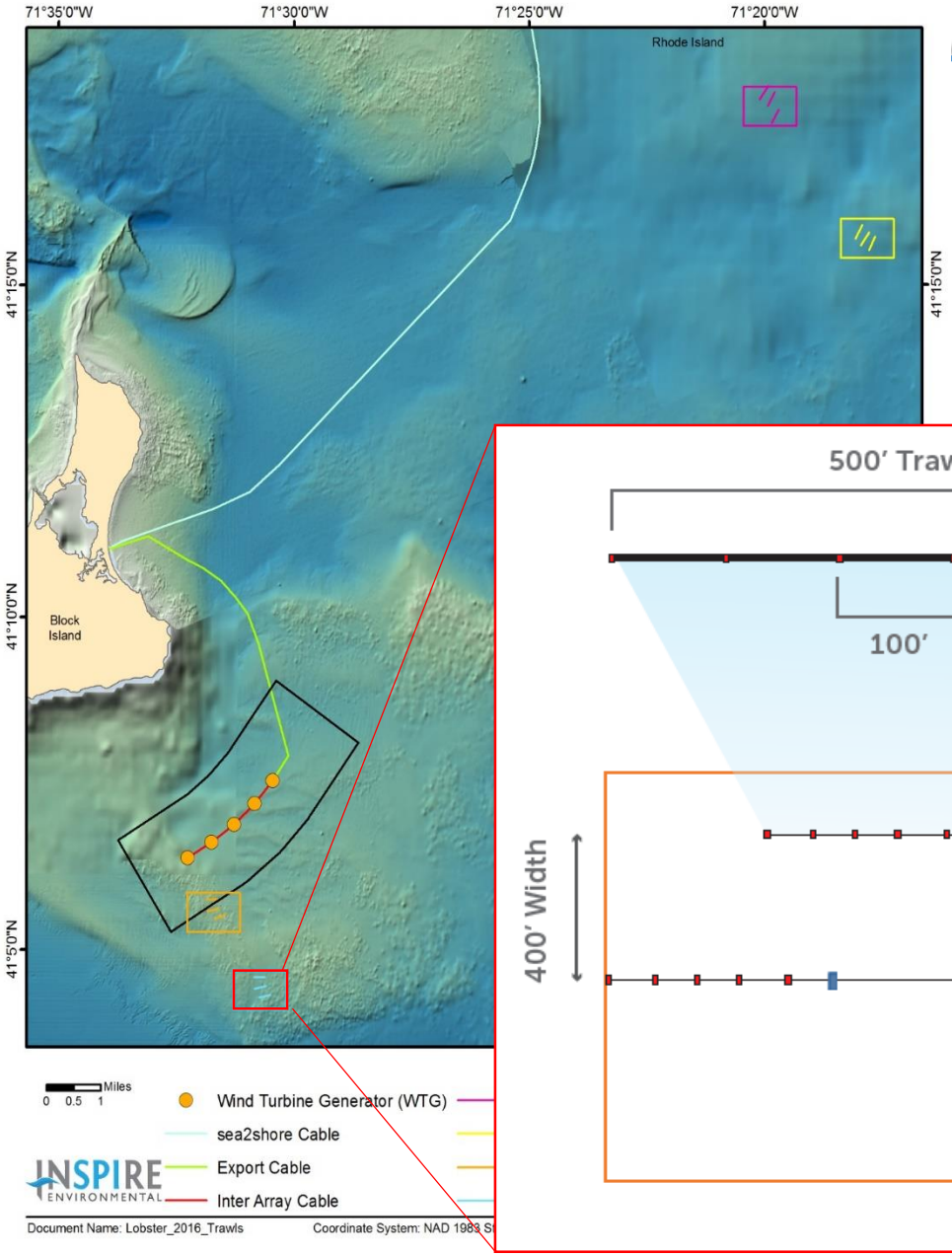
Sand
Fine sediment

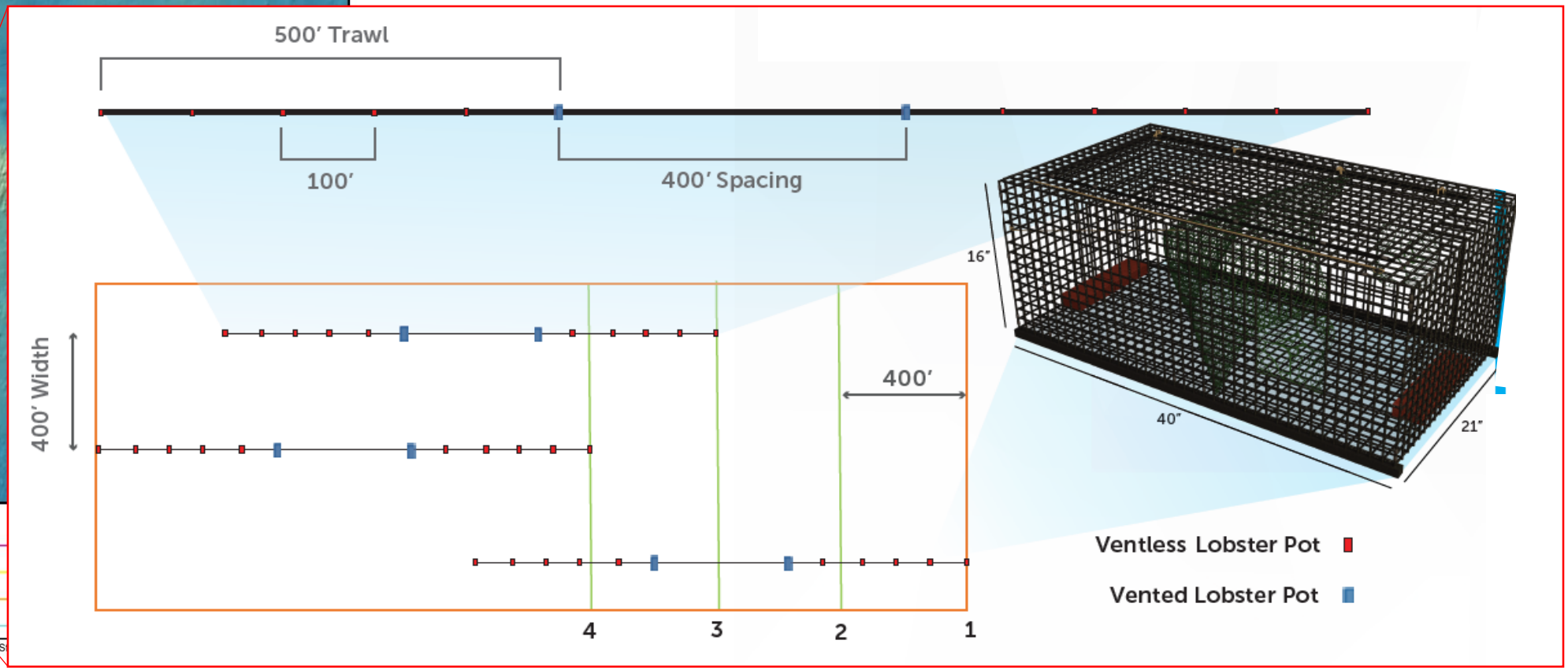
~15 mi from turbines

Survey Design – Block Layout

- Three 12 pot trawls
- 10 ventless traps
- 2 vented traps
- Baited with skate

- Sampled 2x per month
- 5-night soak





Environmental Data Collection – Each Block

- Temperature
  - HOBO loggers on traps in each block
  - Bottom temperature every 10 minutes
  - Downloaded monthly

- Wind speed & direction
- Wave height
- Air temperature

Biological Data Collection – Every Trap

Voice recorded data

Lobster

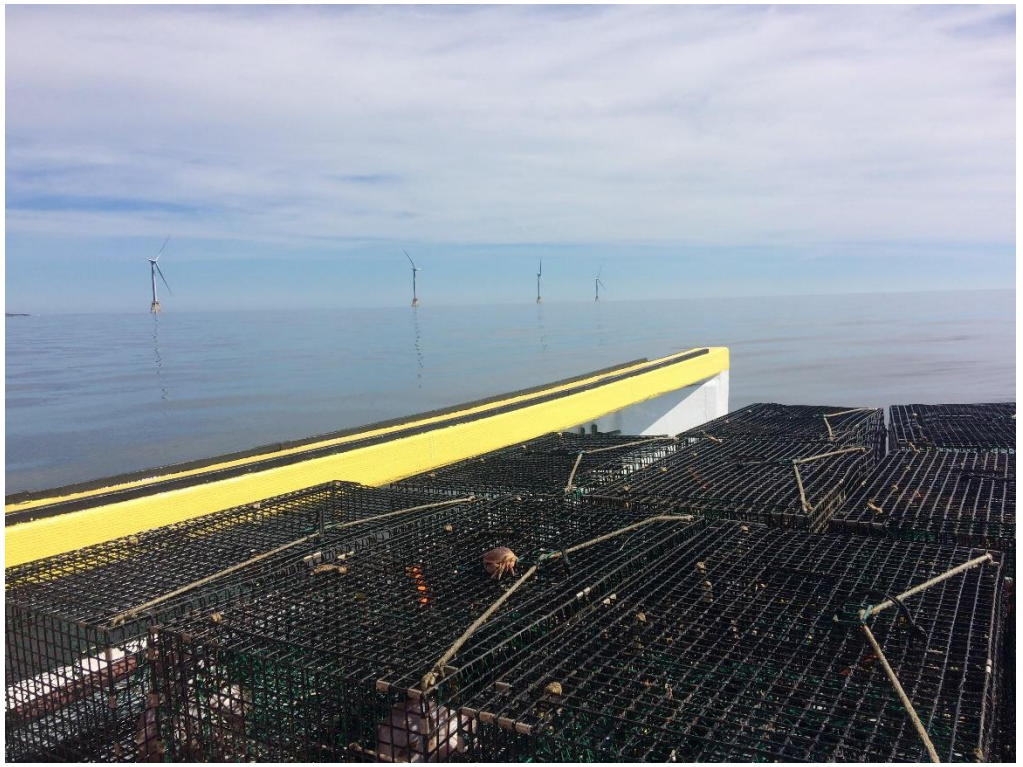
- Sex: M/F
- Carapace length: nearest 1/10th mm
- Egg status: presence, absence, spent
- Disease prevalence: minor, moderate, severe
- Shell hardness: hard, soft
- Cull status
- V-notch: presence, absence, new

Biological Data Collection – Every Trap

Voice recorded data

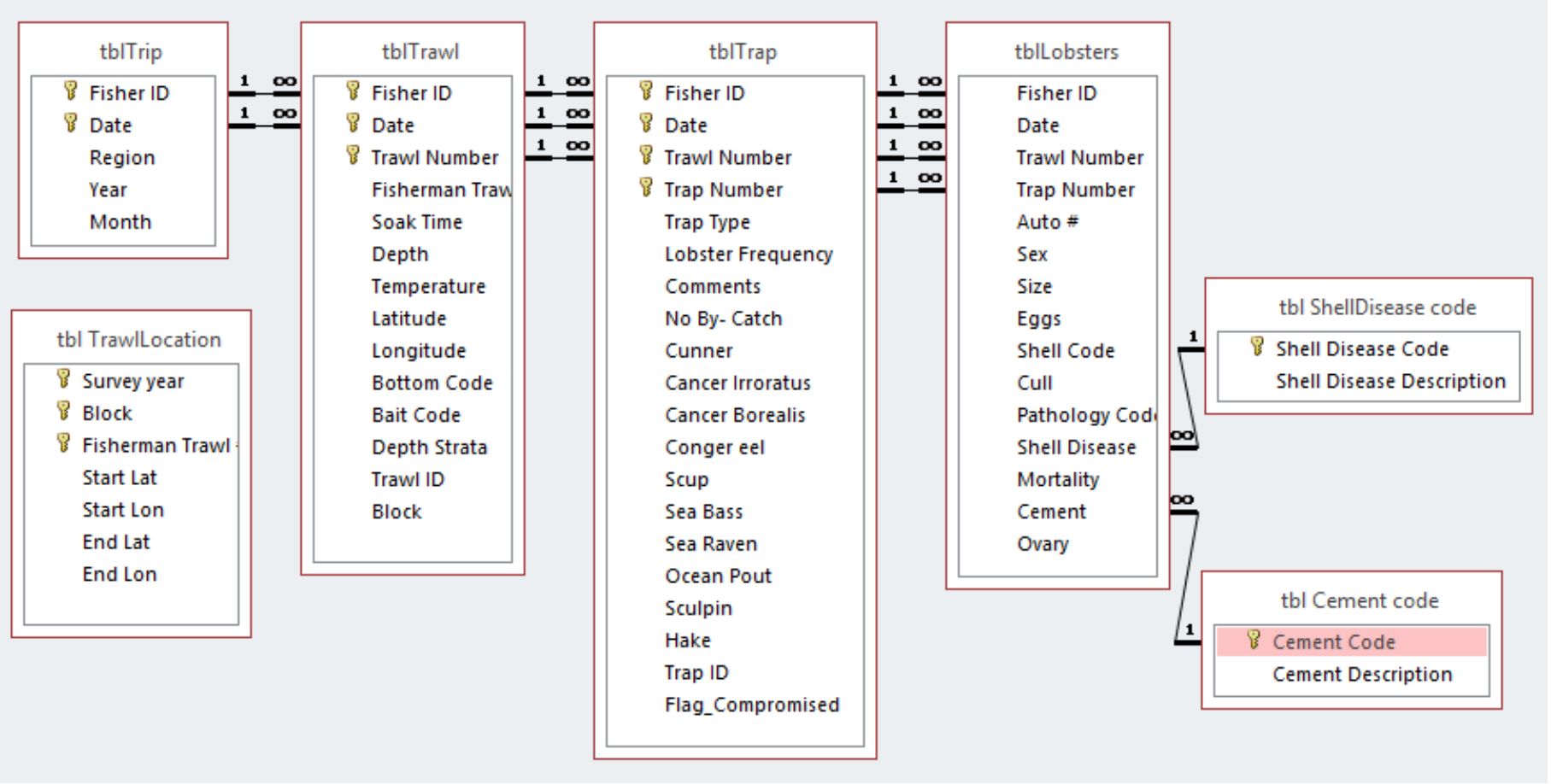
By-catch

- Enumerate all crab species
- Carapace length: 5 jonah and 5 rock crabs
- Enumerate all species
- Fork or total length of all finfish



Data Flow – Reporting

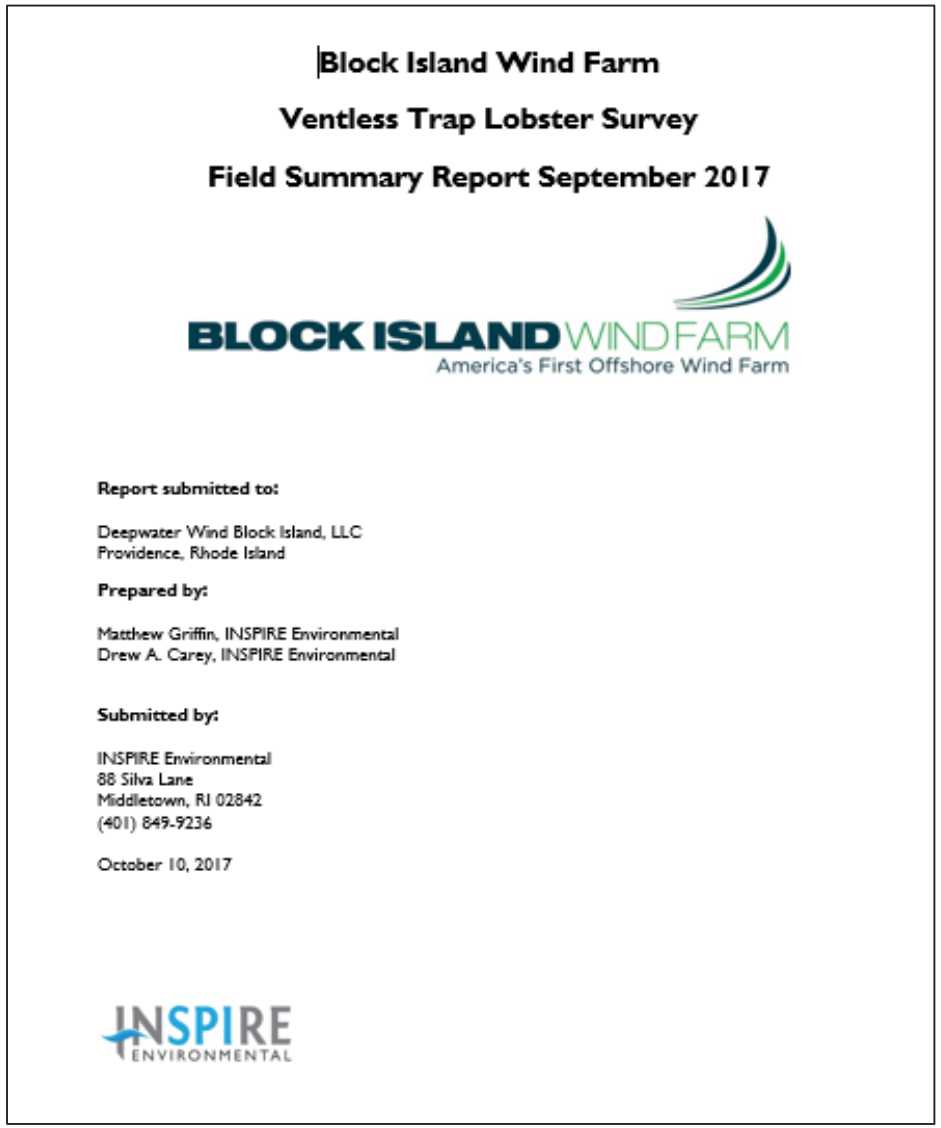
- Microsoft Access
- Internal QC
- Provided to RIDEM annually



Data Flow – Reporting

- Microsoft Access
- Internal QC process
- Provided to RIDEM annually

- Monthly cruise reports
- Annual Report
  - Summary data
- Final report
  - Post 2018 survey



Block Island Wind Farm

Ventless Trap Lobster Survey

Field Summary Report September 2017

BLOCK ISLAND WIND FARM
America's First Offshore Wind Farm

Report submitted to:

Deepwater Wind Block Island, LLC
Providence, Rhode Island

Prepared by:

Matthew Griffin, INSPIRE Environmental
Drew A. Carey, INSPIRE Environmental

Submitted by:

INSPIRE Environmental
88 Silva Lane
Middletown, RI 02842
(401) 849-9236

October 10, 2017

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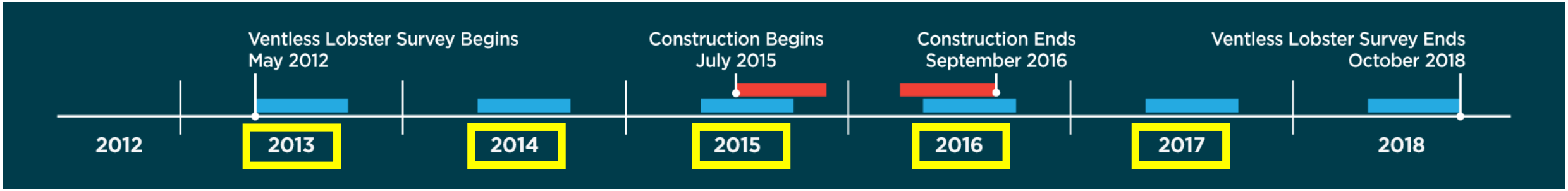
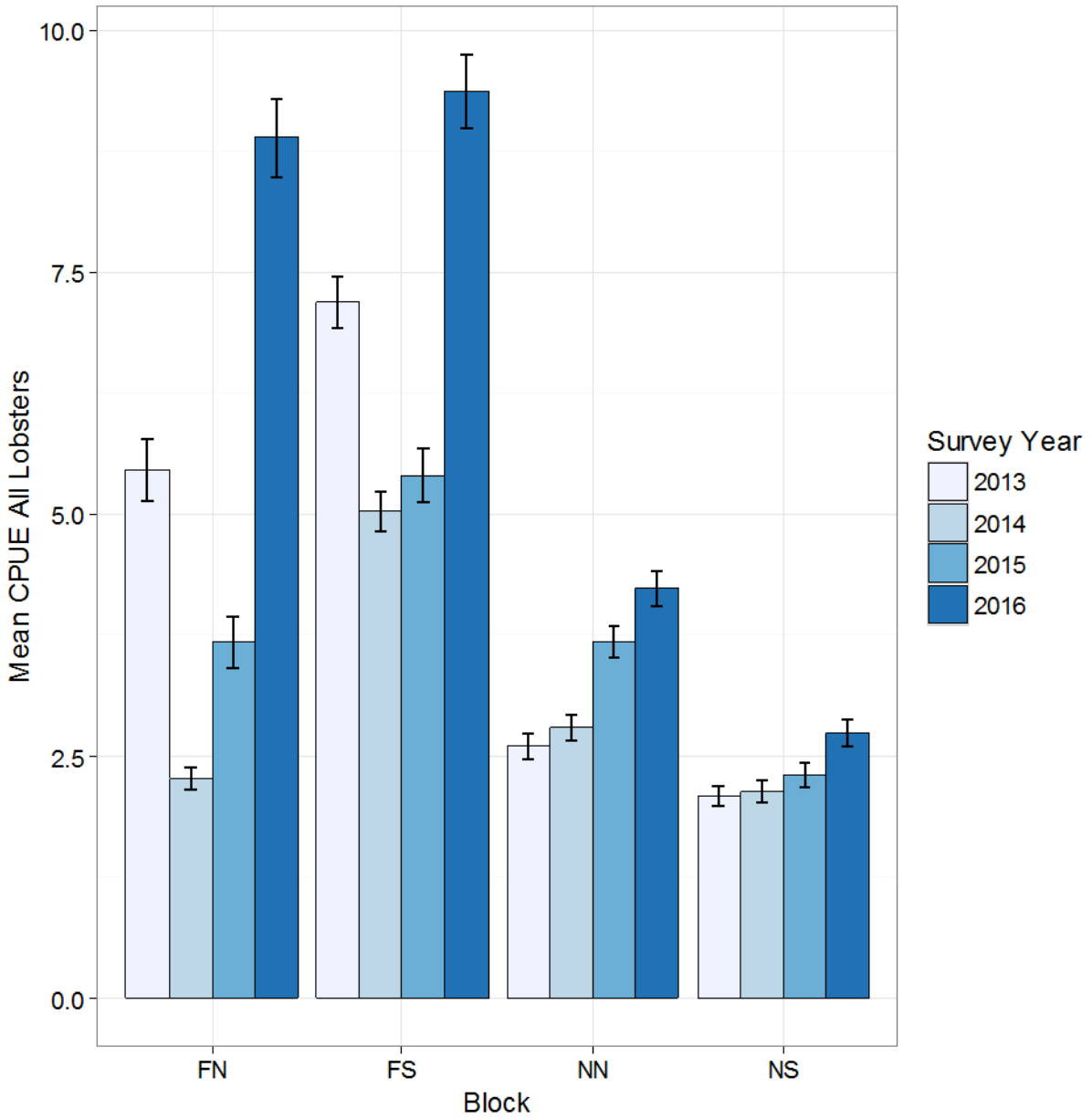
Completion Summary



- Five survey years completed: 2013 - 2017
- 120 survey cruises
- 8,640 traps sampled
- 36,676 lobsters sampled
- 120,590 by-catch individuals recorded

Relative Lobster Abundance



2014

Bonferroni Adjusted P-Values for Differences Between Blocks Within Years

	Mean ± SE	Block FS	Block FN	Block NN	Block NS
Block FS	5.04 ± 0.20		<< 0.001	<< 0.001	<< 0.001
Block FN	2.79 ± 0.14			0.23	1.00
Block NN	2.27 ± 0.12				<< 0.001
Block NS	2.14 ± 0.12				

2015

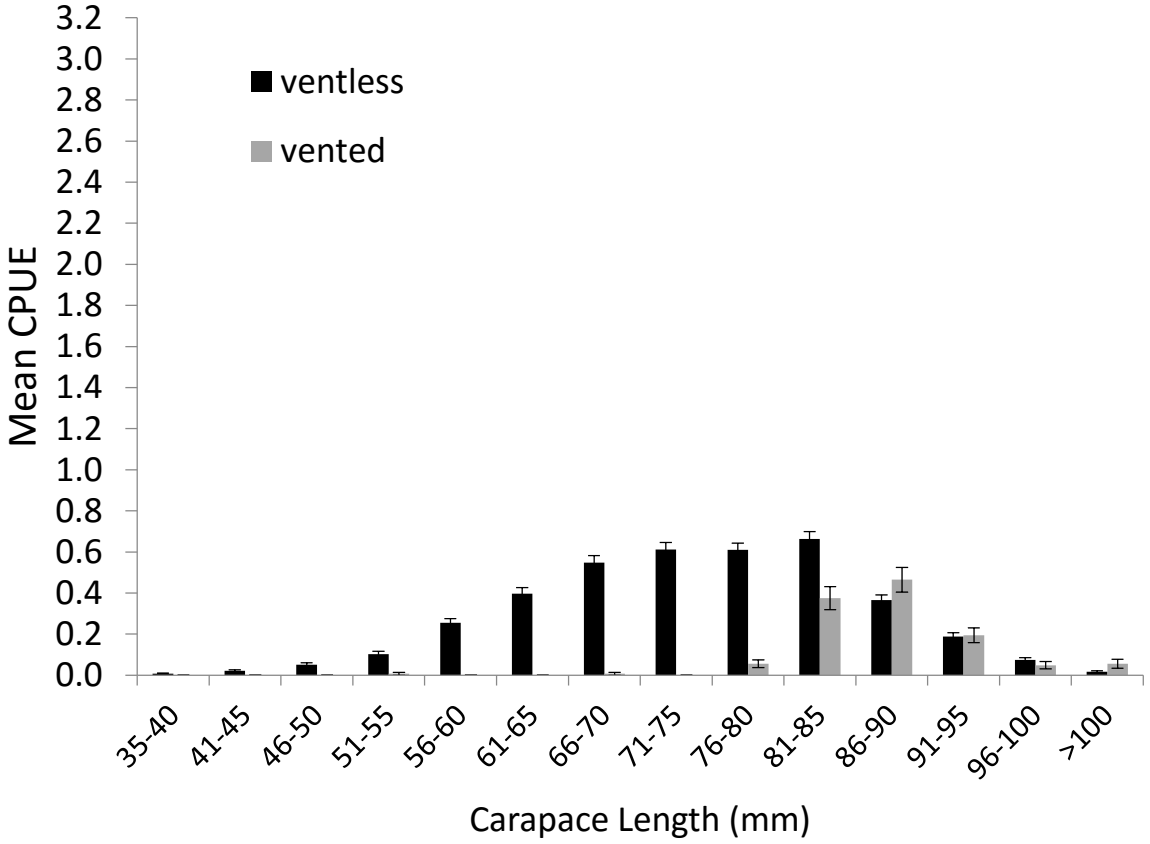
	Mean ± SE	Block FS	Block FN	Block NN	Block NS
Block FS	5.40 ± 0.27		<< 0.001	<< 0.001	<< 0.001
Block FN	3.66 ± 0.26			1.00	<< 0.001
Block NN	3.67 ± 0.16				<< 0.001
Block NS	2.28 ± 0.12				

2016

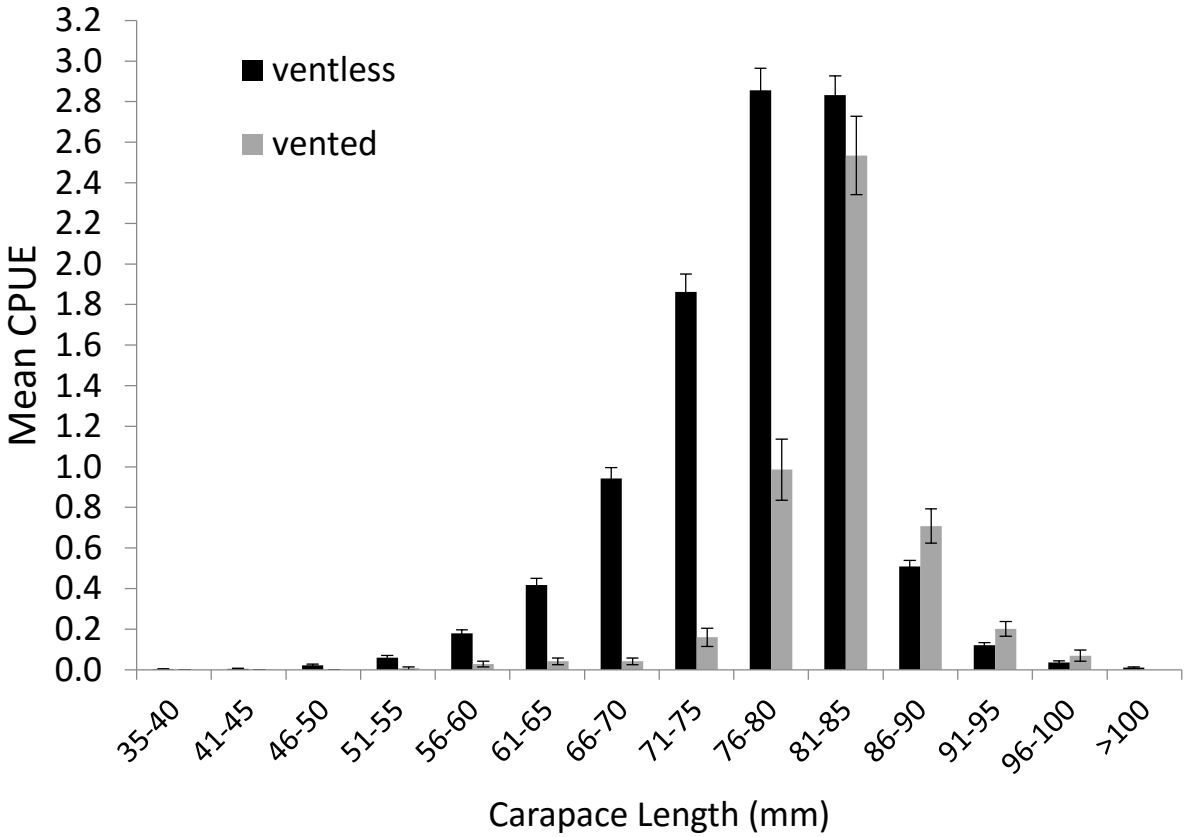
	Mean ± SE	Block FS	Block FN	Block NN	Block NS
Block FS	9.37 ± 0.39		1.00	<< 0.001	<< 0.001
Block FN	8.90 ± 0.41			<< 0.001	<< 0.001
Block NN	4.24 ± 0.18				<< 0.001
Block NS	2.74 ± 0.14				

Relative Lobster Abundance

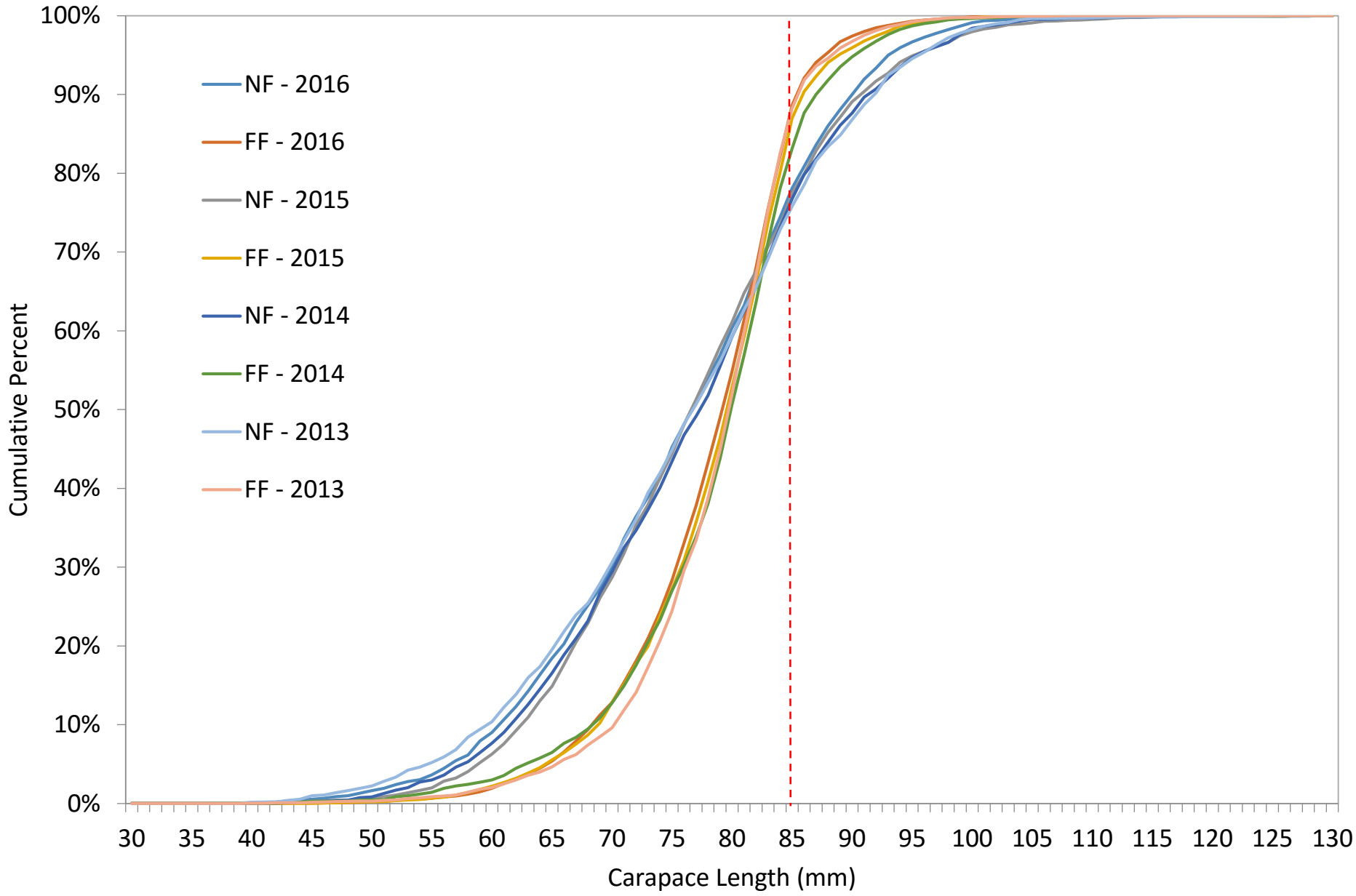
Near Field - 2016



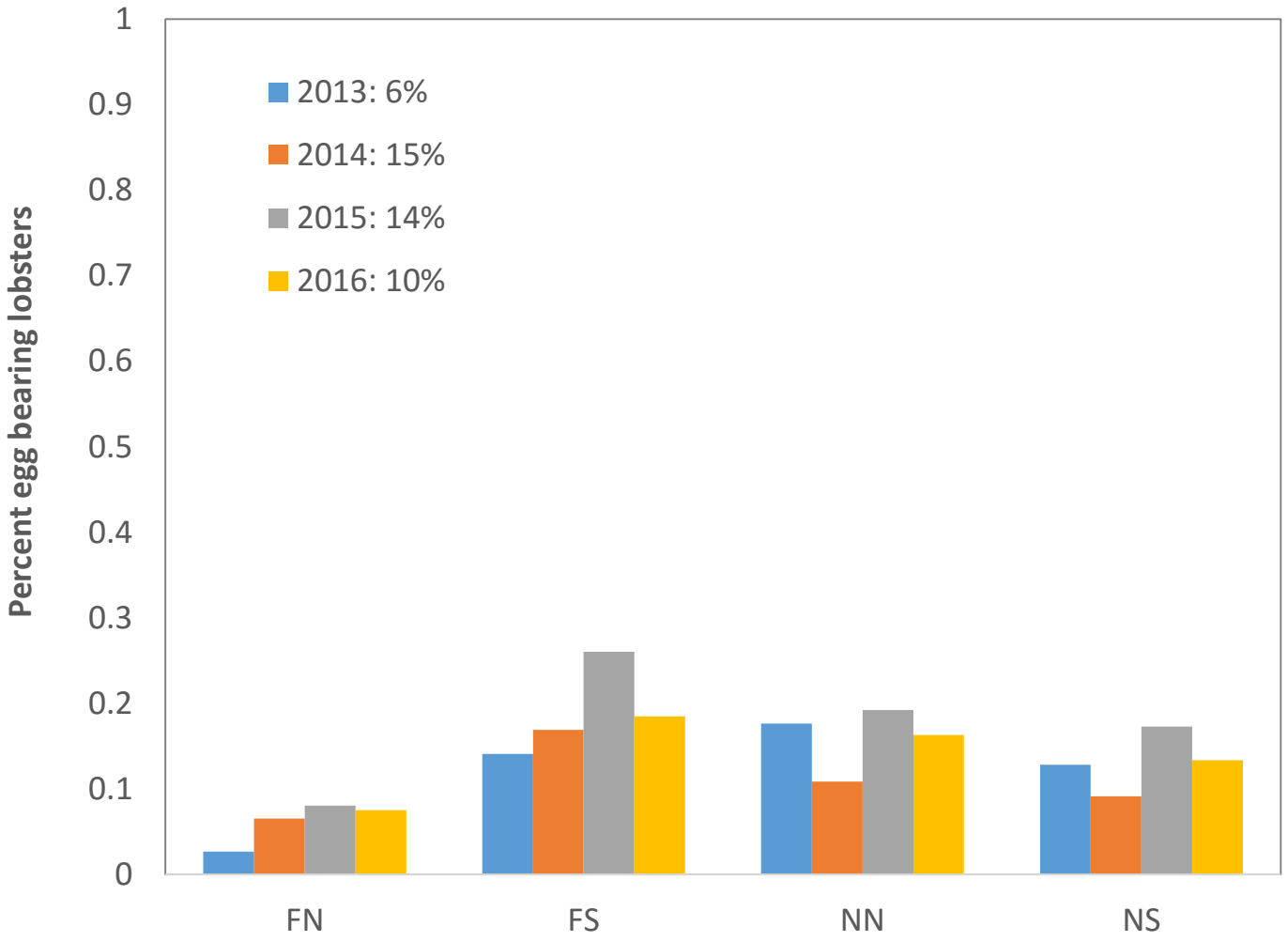
Far Field - 2016

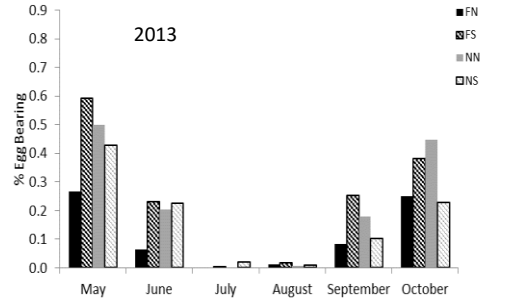


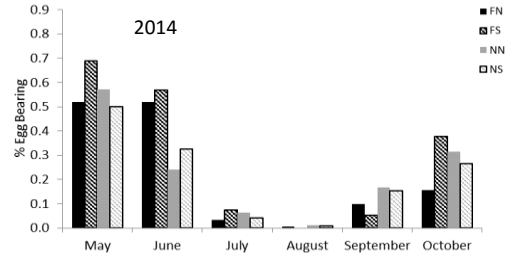
Lobster Cumulative Length Frequency

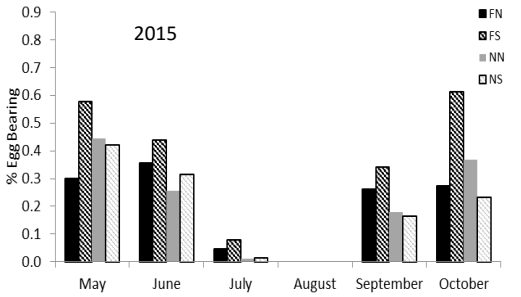


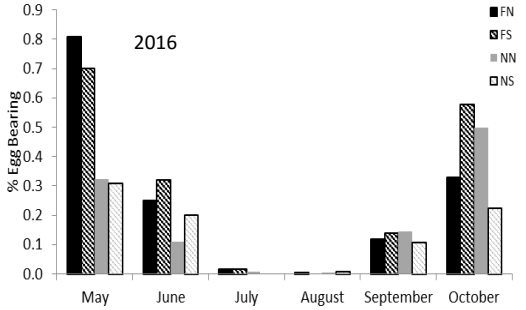
Percent Egg Bearing Lobsters



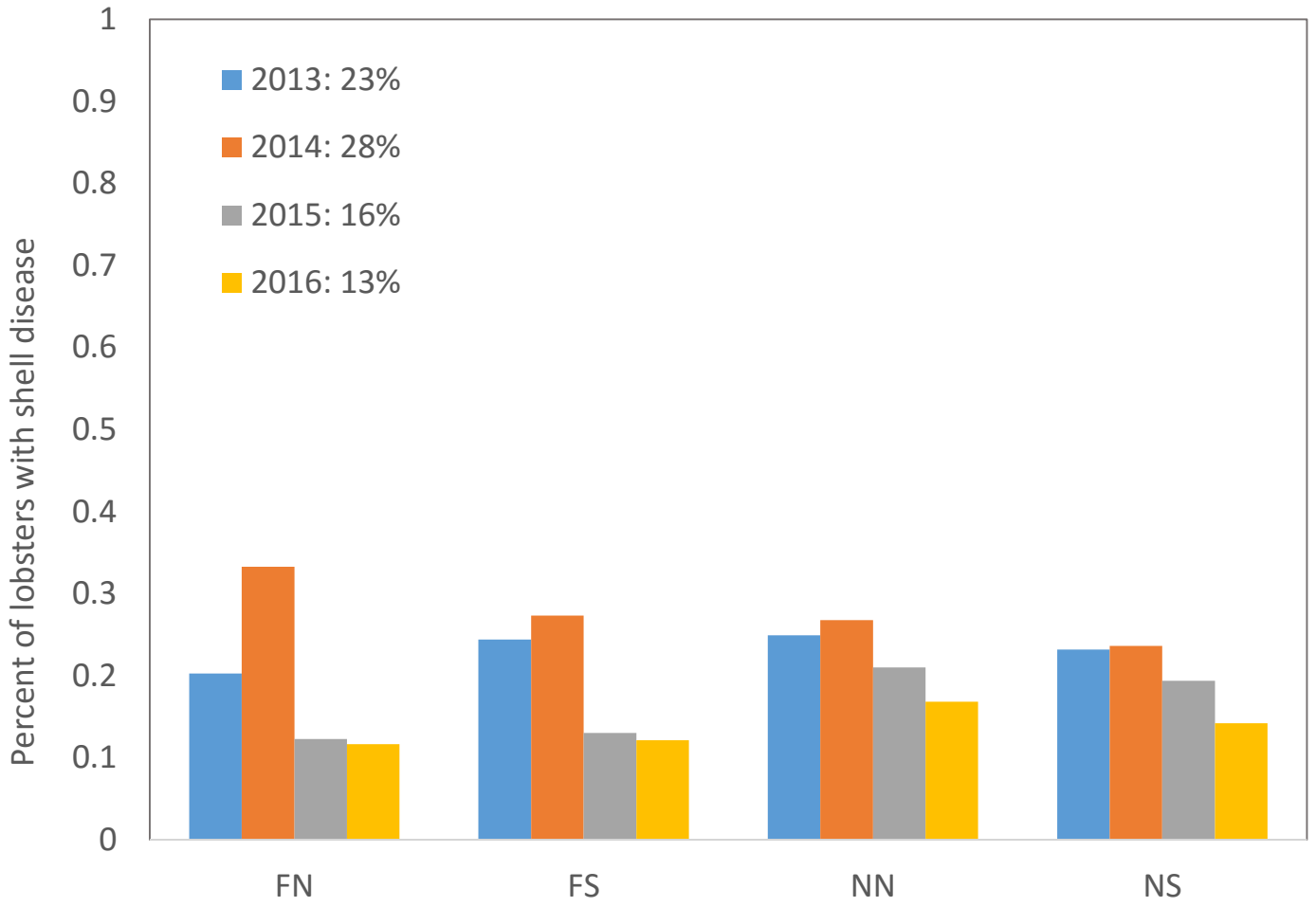


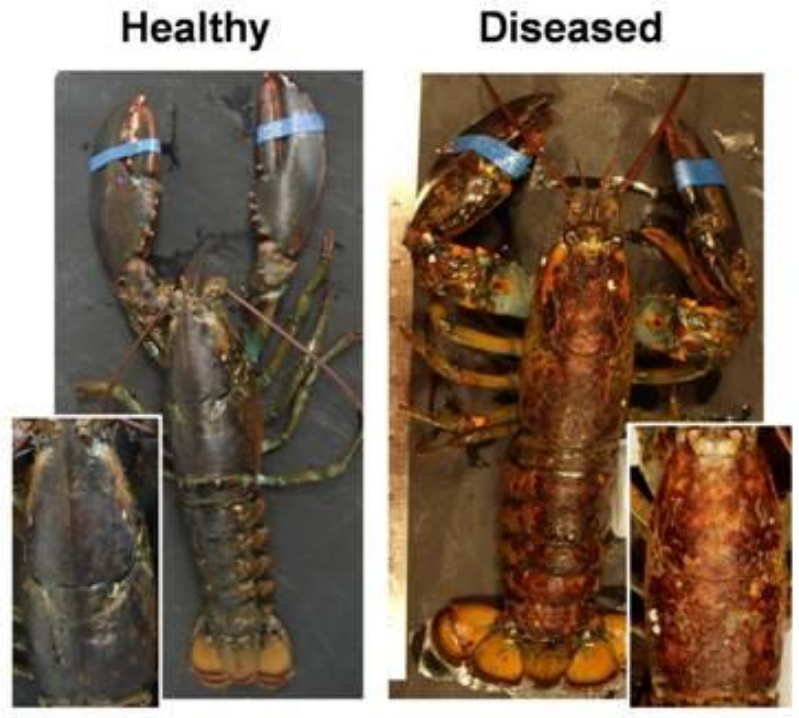






Shell Disease – presence/absence



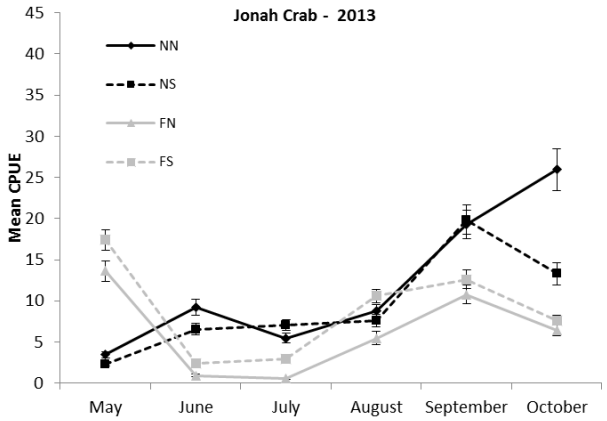


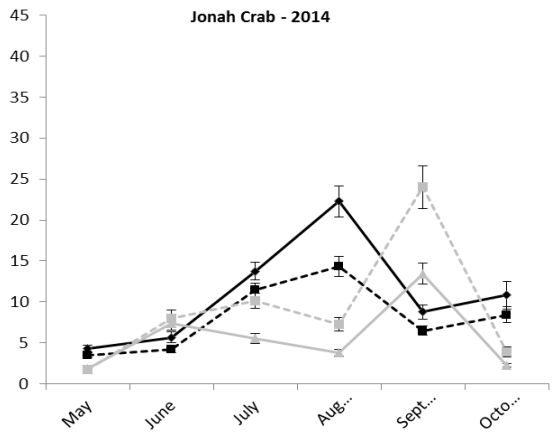
Severity	Prevalence
Minor	73%
Moderate	15%
Severe	12%

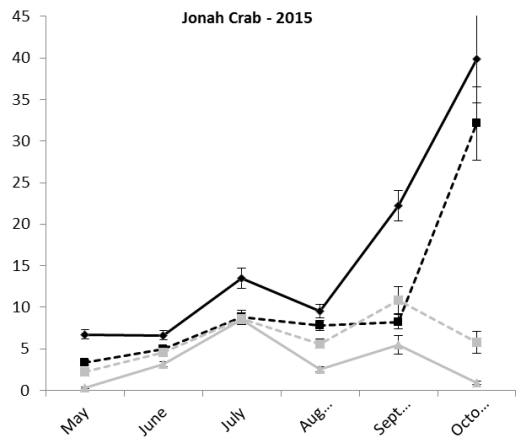
By-catch

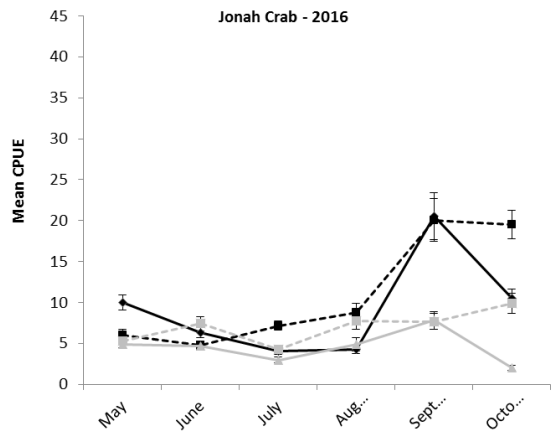
Species	No. Collected
Jonah crab	74,848
Rock crab	35,191
Sea bass	5,564
Cunner	1,222
Conger eel	1,218
Ocean Pout	951
Scup	832
Hake	578
Sea Raven	152
Sculpin	34

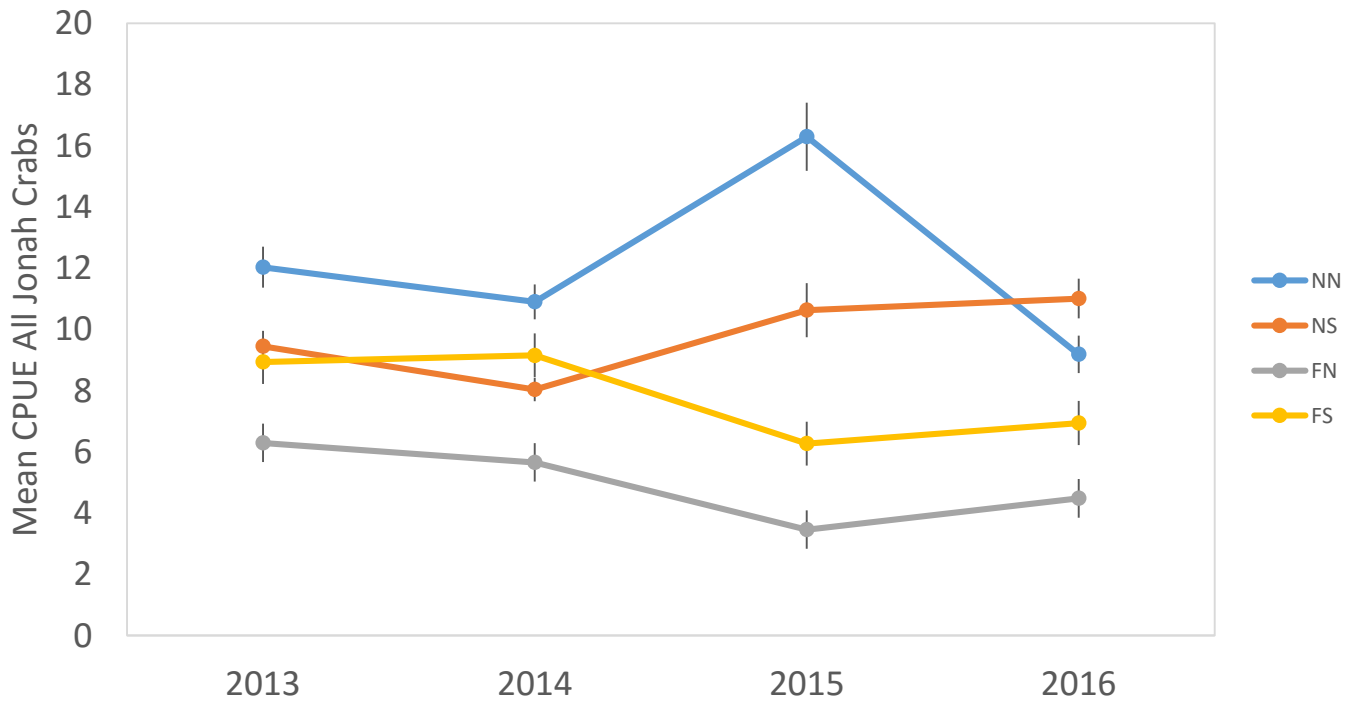
Jonah Crab


Jonah Crab - 2013
Mean CPUE
NN
NS
FN
FS
May
June
July
August
September
October

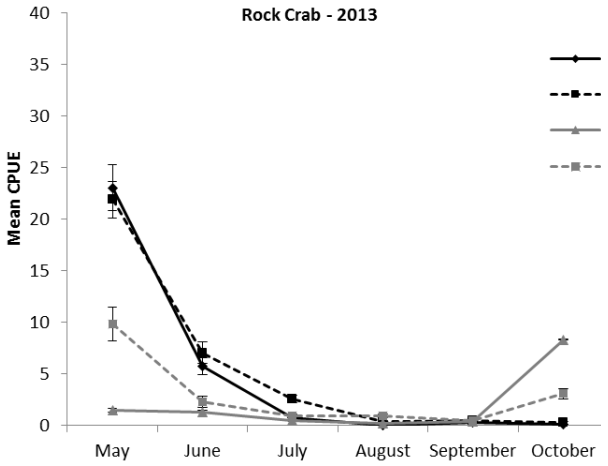

Jonah Crab - 2014
May
June
July
Aug...
Sept...
Octo...

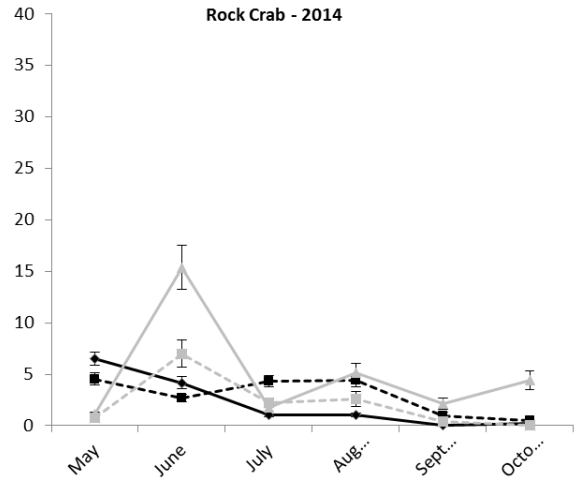

Jonah Crab - 2015
May
June
July
Aug...
Sept...
Octo...

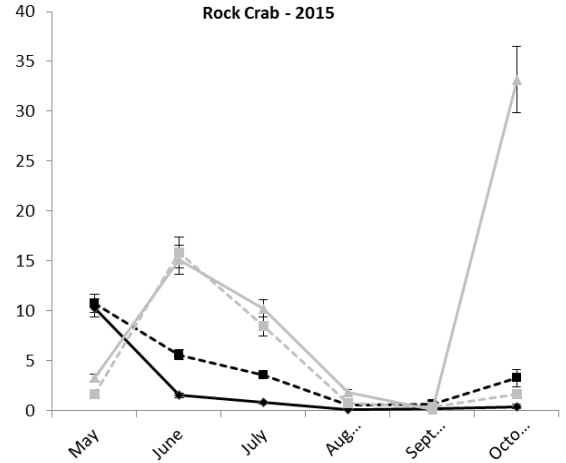

Jonah Crab - 2016
Mean CPUE
May
June
July
Aug...
Sept...
Octo...

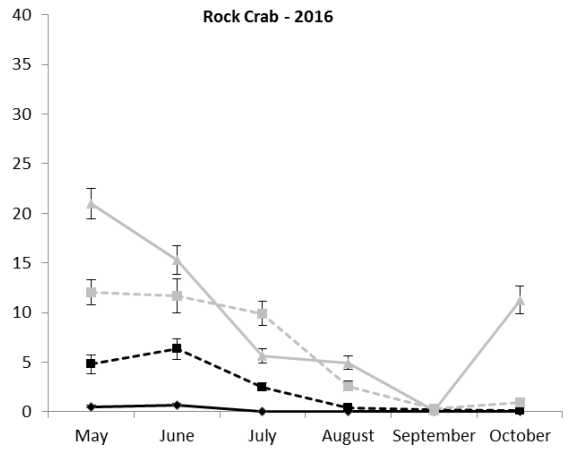

Mean CPUE All Jonah Crabs
2013
2014
2015
2016
NN
NS
FN
FS

Rock Crab


Rock Crab - 2013
Mean CPUE
40
35
30
25
20
15
10
5
0
May
June
July
August
September
October


Rock Crab - 2014
40
35
30
25
20
15
10
5
0
May
June
July
Aug...
Sept...
Octo...


Rock Crab - 2015
40
35
30
25
20
15
10
5
0
May
June
July
Aug...
Sept...
Octo...


Rock Crab - 2016
40
35
30
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20
15
10
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0
May
June
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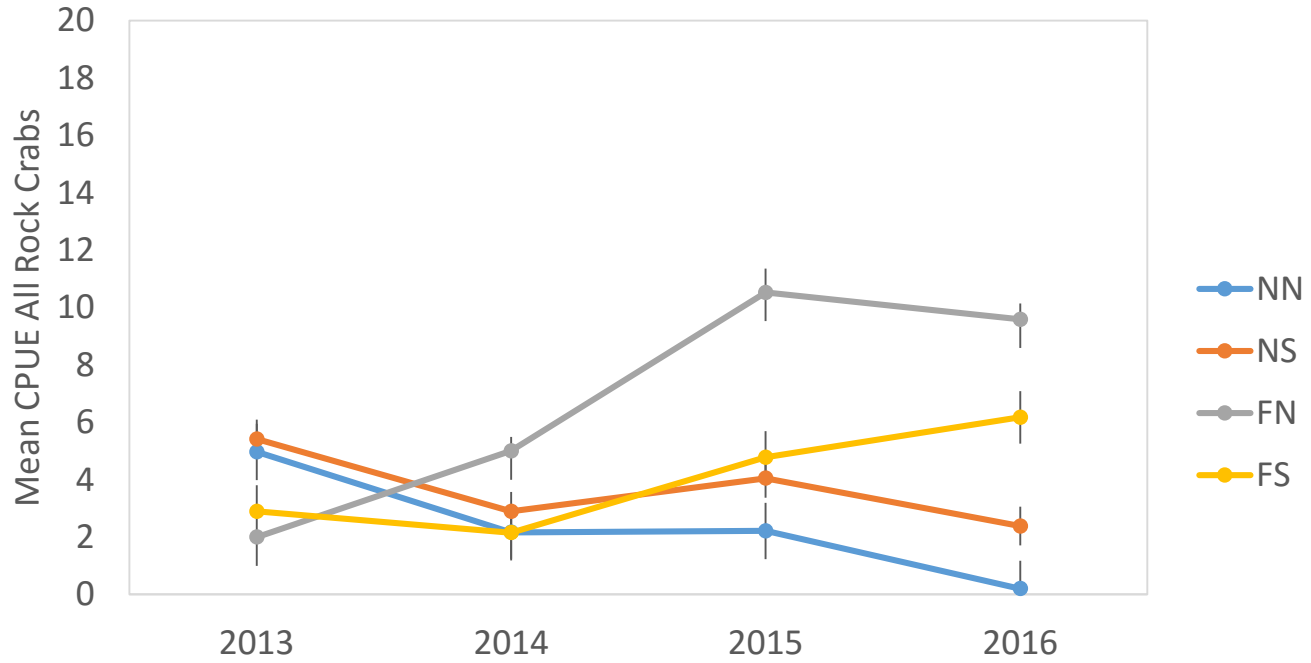
October

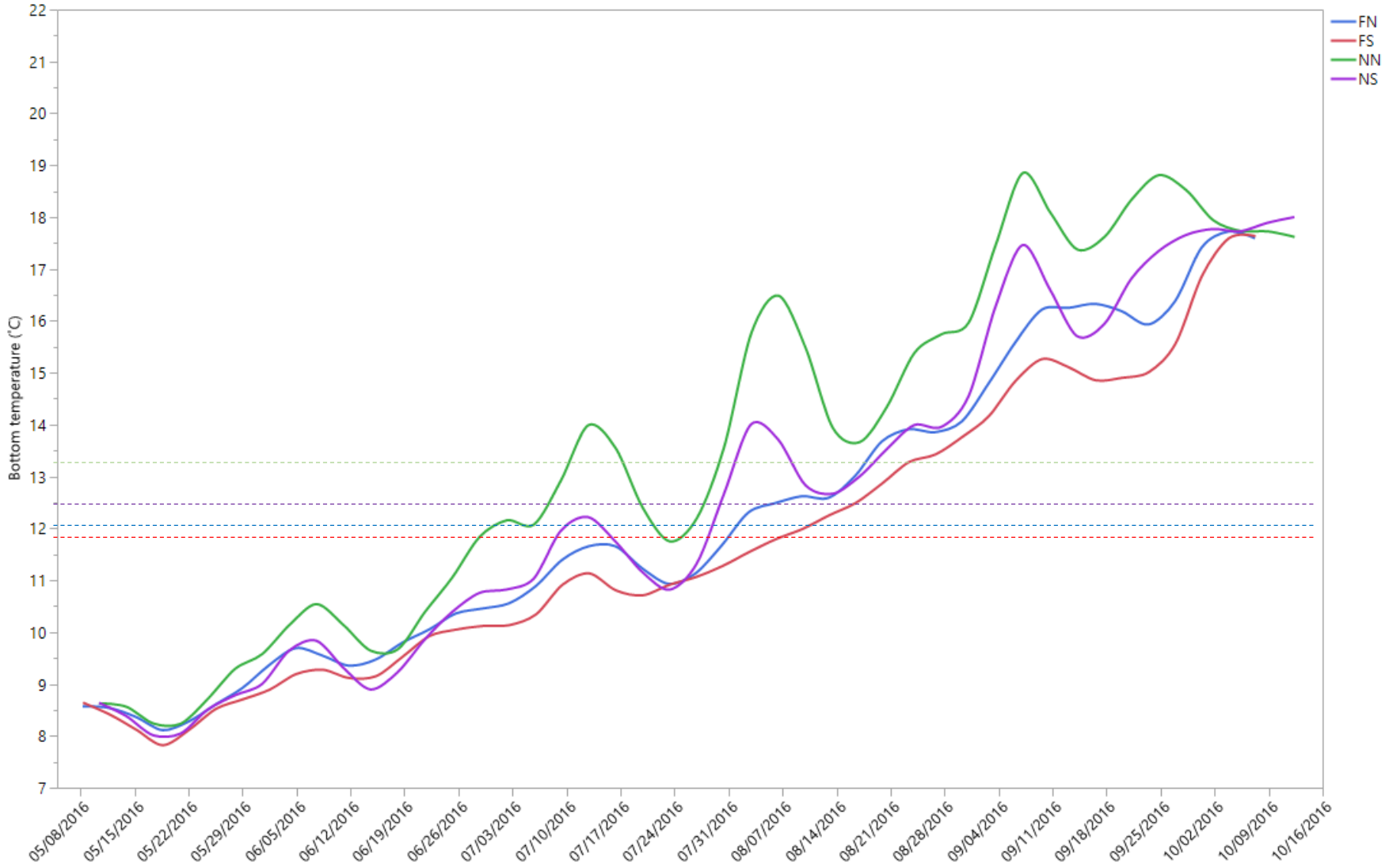

Mean CPUE All Rock Crabs
20
18
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
NN
NS
FN
FS

Bottom Water Temperature

All Years Combined

Block	NN	NS	FN	FS
Mean	55.6	54.6	53.9	53.5
Min	40.0	40.4	39.7	39.5
Max	70.7	68.5	66.5	66.3

Block	NN	NS	FN	FS
Mean	13.1	12.5	12.2	12.0
Min	4.4	4.7	4.3	4.1
Max	21.5	20.3	19.2	19.0



Next Steps

- **2018 survey season**
  May – October

- **Final Synthesis Report**
  - Analyze difference in catch characteristics between the before, during and after construction periods.
  - Spring 2019

Acknowledgements

RI CRMC Fisheries Advisory Board
RI DEM
Deepwater Wind
Bill McElroy
Lanny Dellinger
Brian Jenkins
Lorraine Brown-Read
Jill Johnen