

Analysis of the Impacts of Alternate Management Measures on Vertical Line and Co-Occurrence Scores



Prepared for Atlantic Large Whale Take Reduction Team
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Funded by:
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Overview of Presentation

- Review updates to the vertical line model since January ALWTRT meeting
- Present updated baseline results
- Review main elements of proposals submitted by members of the TRT
- Analyze and compare proposals using the VL model
 - Change in vertical line deployed
 - Change in co-occurrence scores

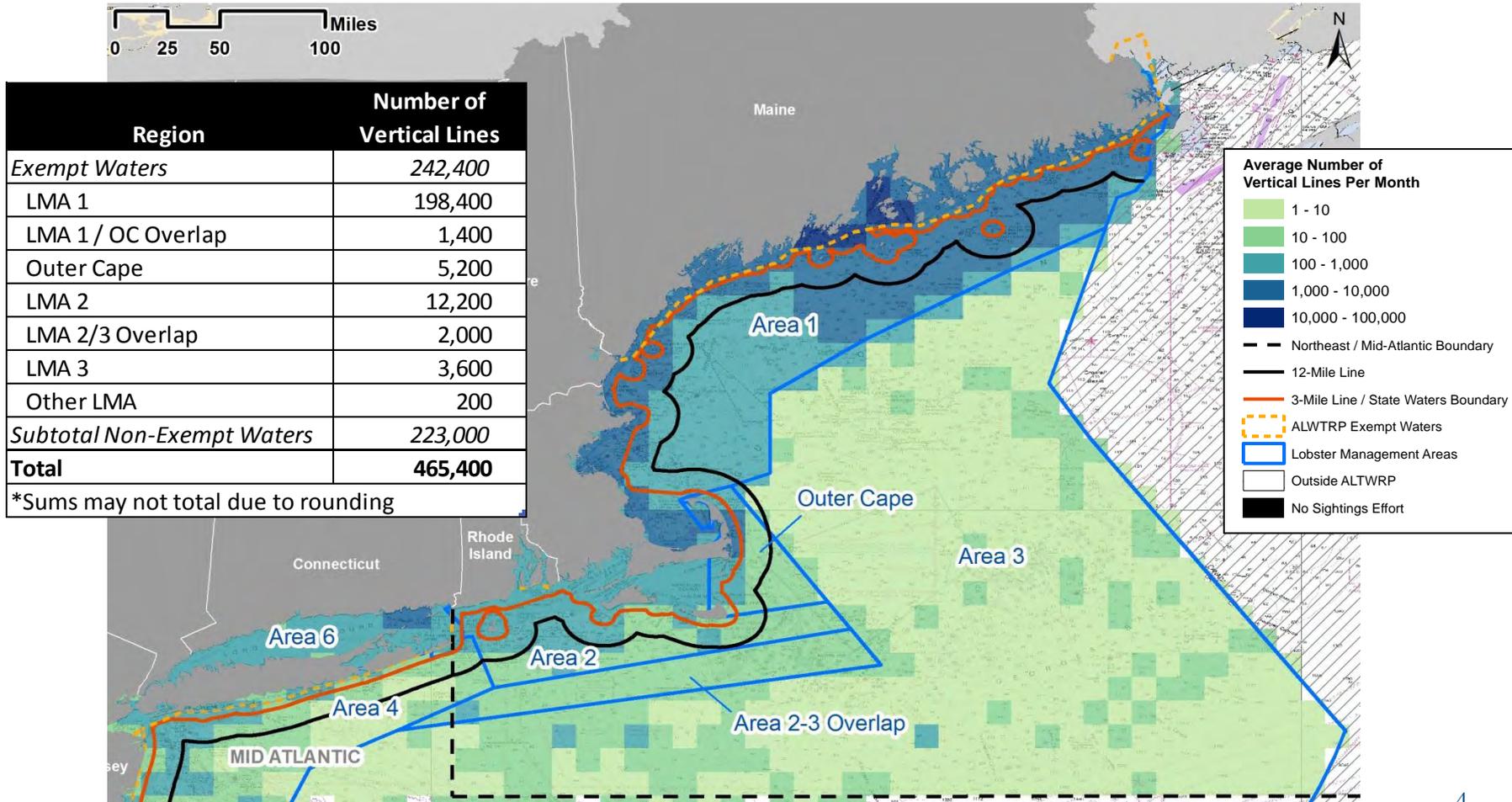
What's New Since the January TRT?

- NH and RI state data refined to better reflect mix of gear configurations in state waters
- Yields minor changes in baseline vertical line estimate (average number of lines in the water per month):
 - ~10,000 fewer vertical lines
 - ~ 6,000 fewer in non-exempt waters (LMA 1 and LMA 2)
 - ~ 2% decrease in baseline estimate for Northeast region
- Addition of GIS elements needed to analyze proposals (e.g., Maine 6-mile line, proposed closure areas, etc.)

Updated Baseline Results

2009/2010 Northeast Baseline (Average)

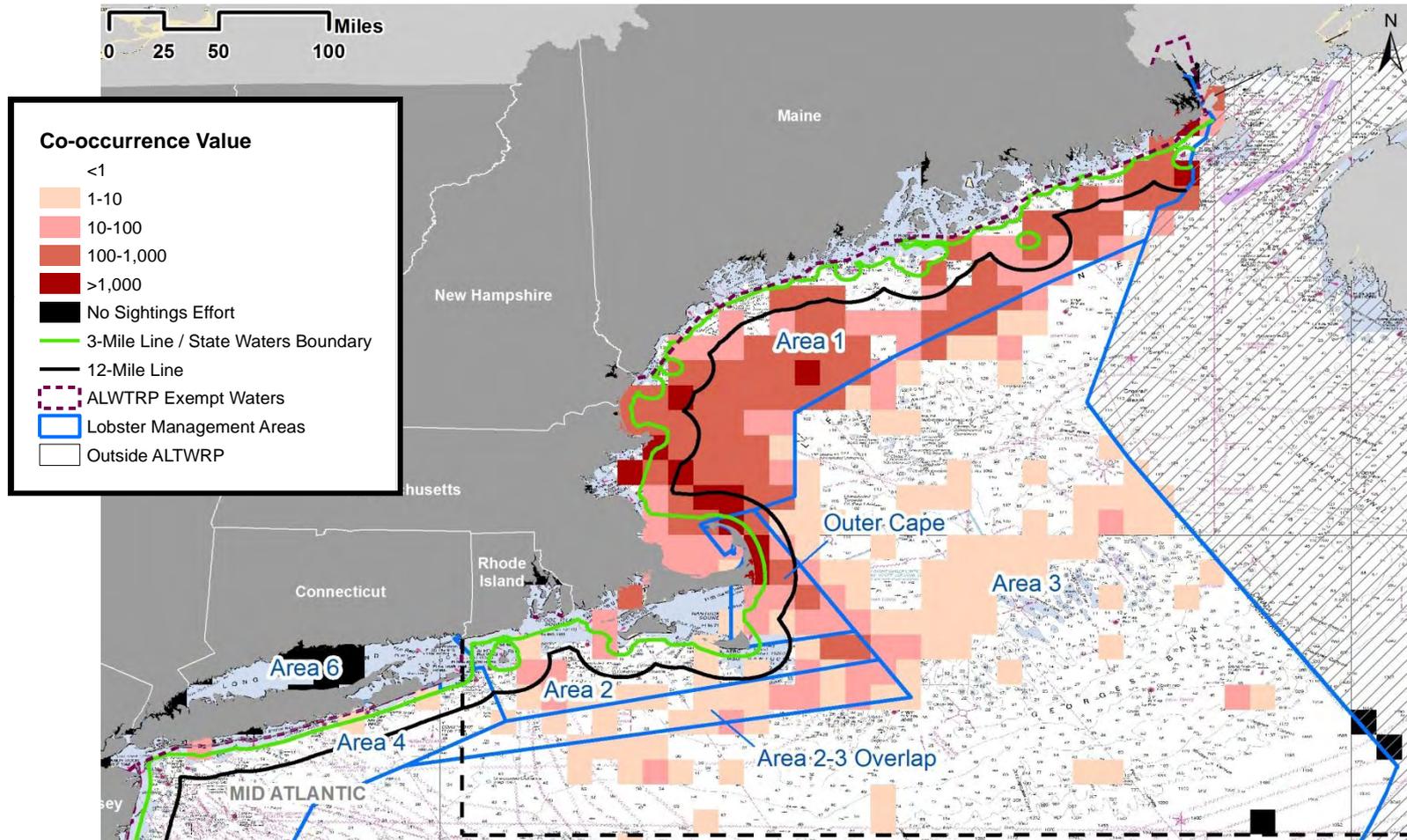
Estimated Number of Vertical Lines ~ All Fisheries



Updated Baseline Results

2009/2010 Northeast Baseline (Average)

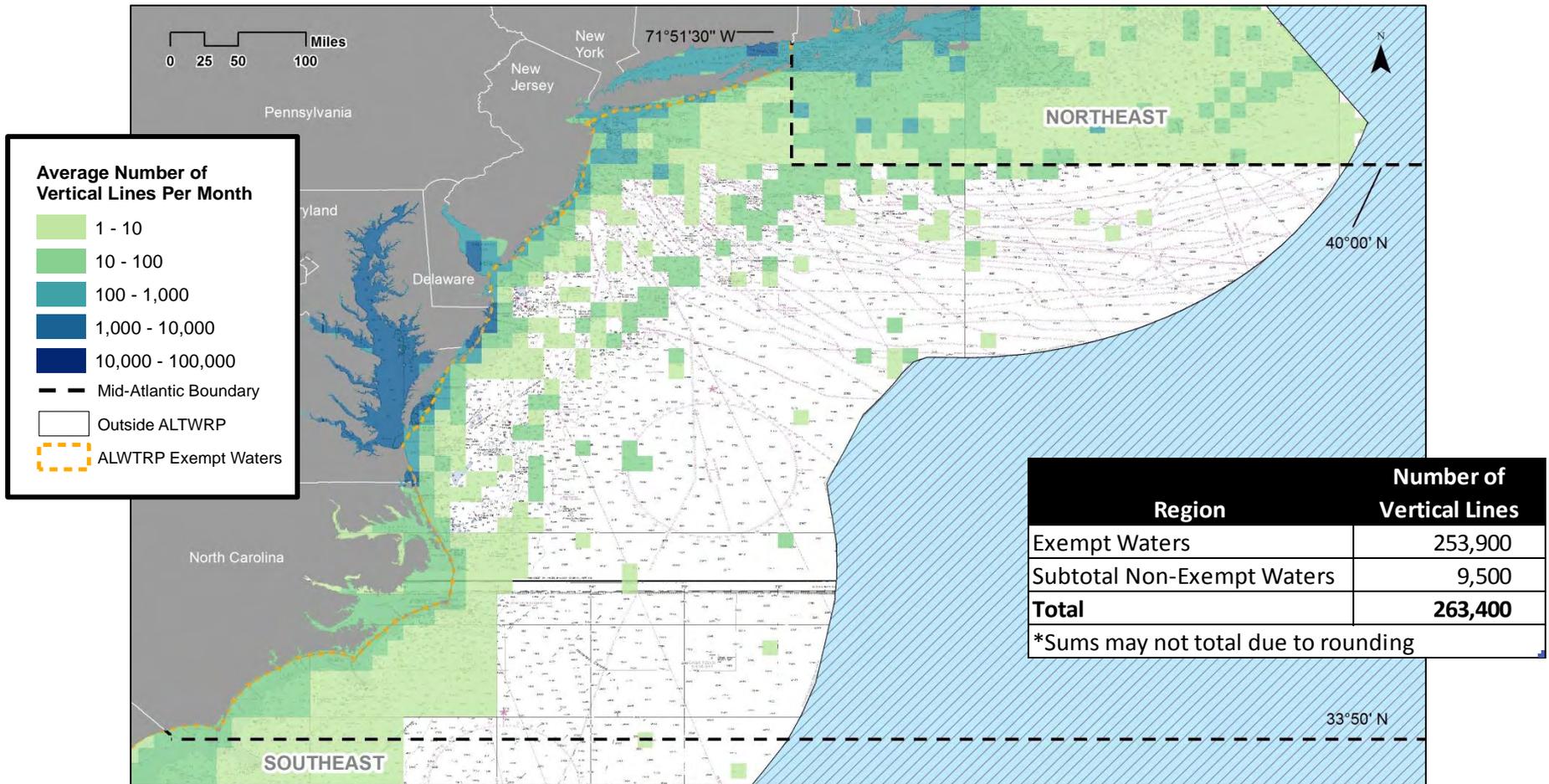
Co-occurrence of Vertical Lines & Right/Humpback Whales ~ All Fisheries



Updated Baseline Results

2009/2010 Mid-Atlantic Baseline (Average)

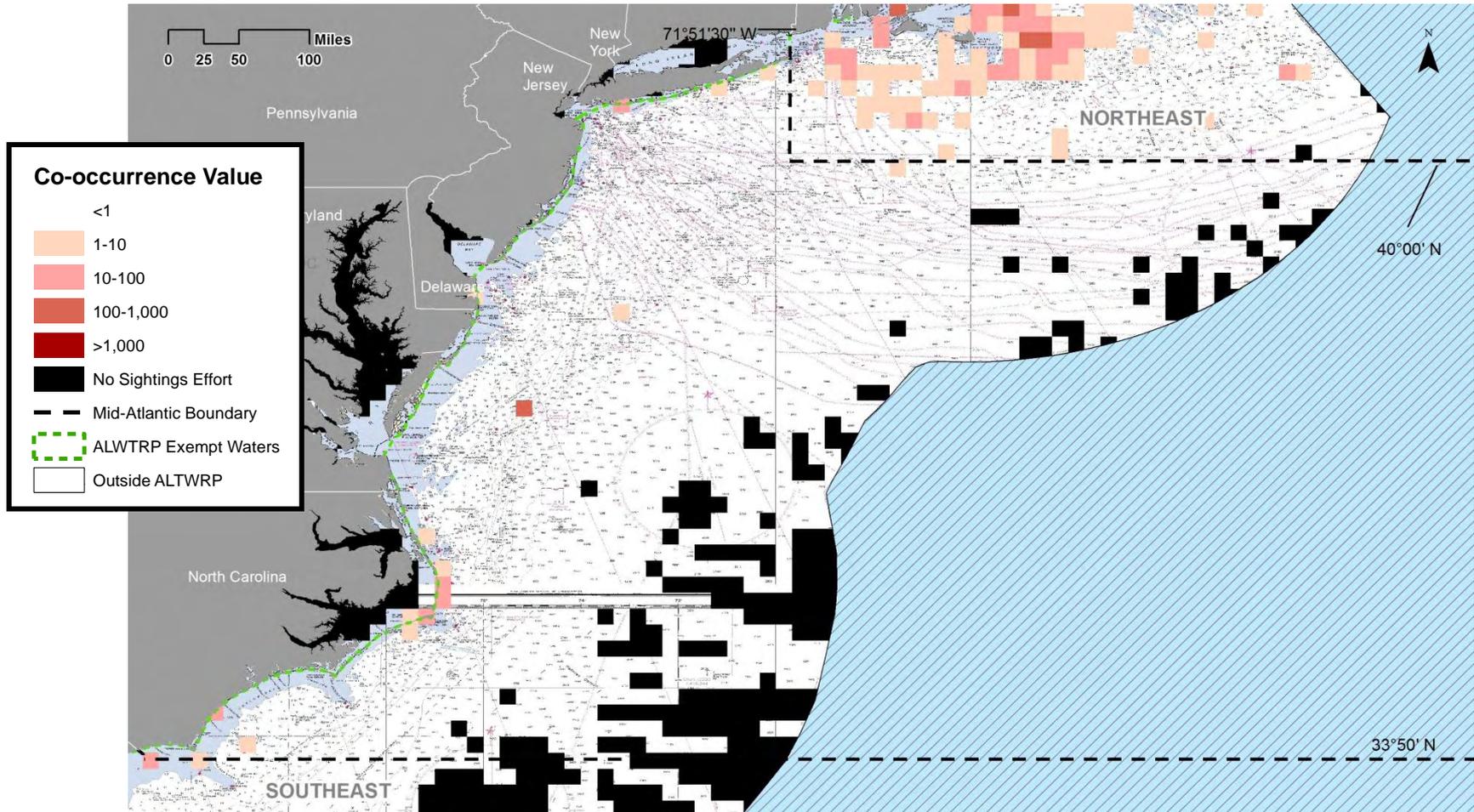
Estimated Number of Vertical Lines ~ All Fisheries



Updated Baseline Results

2009/2010 Mid-Atlantic Baseline (Average)

Co-occurrence of Vertical Lines & Right/Humpback Whales ~ All Fisheries



Updated Baseline Results

2009/2010 Southeast Baseline (Average)

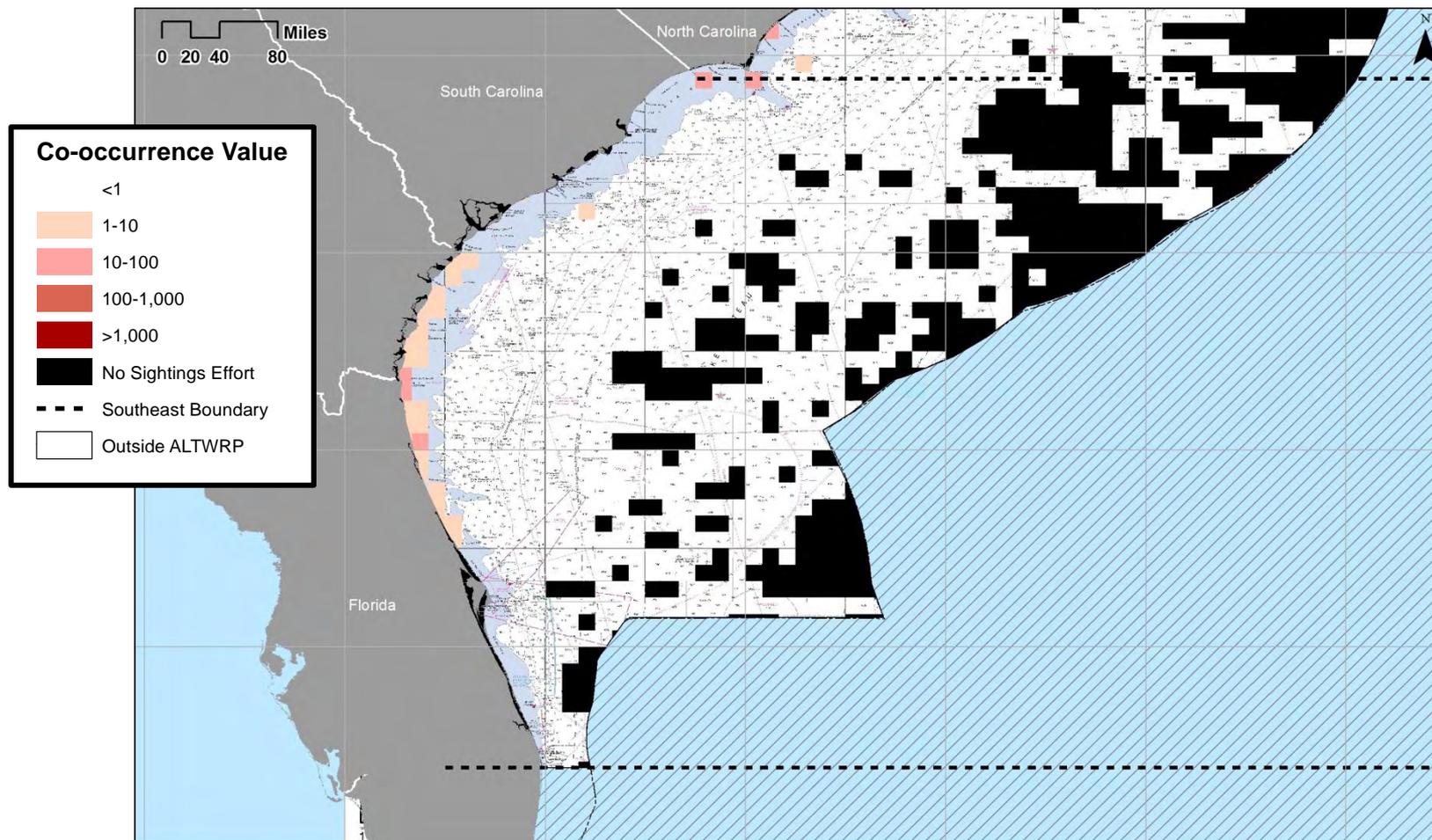
Estimated Number of Vertical Lines ~ All Fisheries



Updated Baseline Results

2009/2010 Southeast (Average)

Co-occurrence of Vertical Lines & Right/Humpback Whales ~ All Fisheries



Vertical Line Management Proposals

- NMFS Northeast
- Maine DMR #1
- Maine DMR #2
- New Hampshire DFG
- Massachusetts DMF
- Rhode Island DEM
- Jordan Basin Closure (Kraus, et al.)
- CCB to GSC Closure (Kraus, et al.)
- CCB Closure (Young, et al.)
- Jeffreys to Cashes Ledge Closure (Young, et al.)
- GSC Sliver Closure (Young, et al.)

NMFS Northeast Proposal

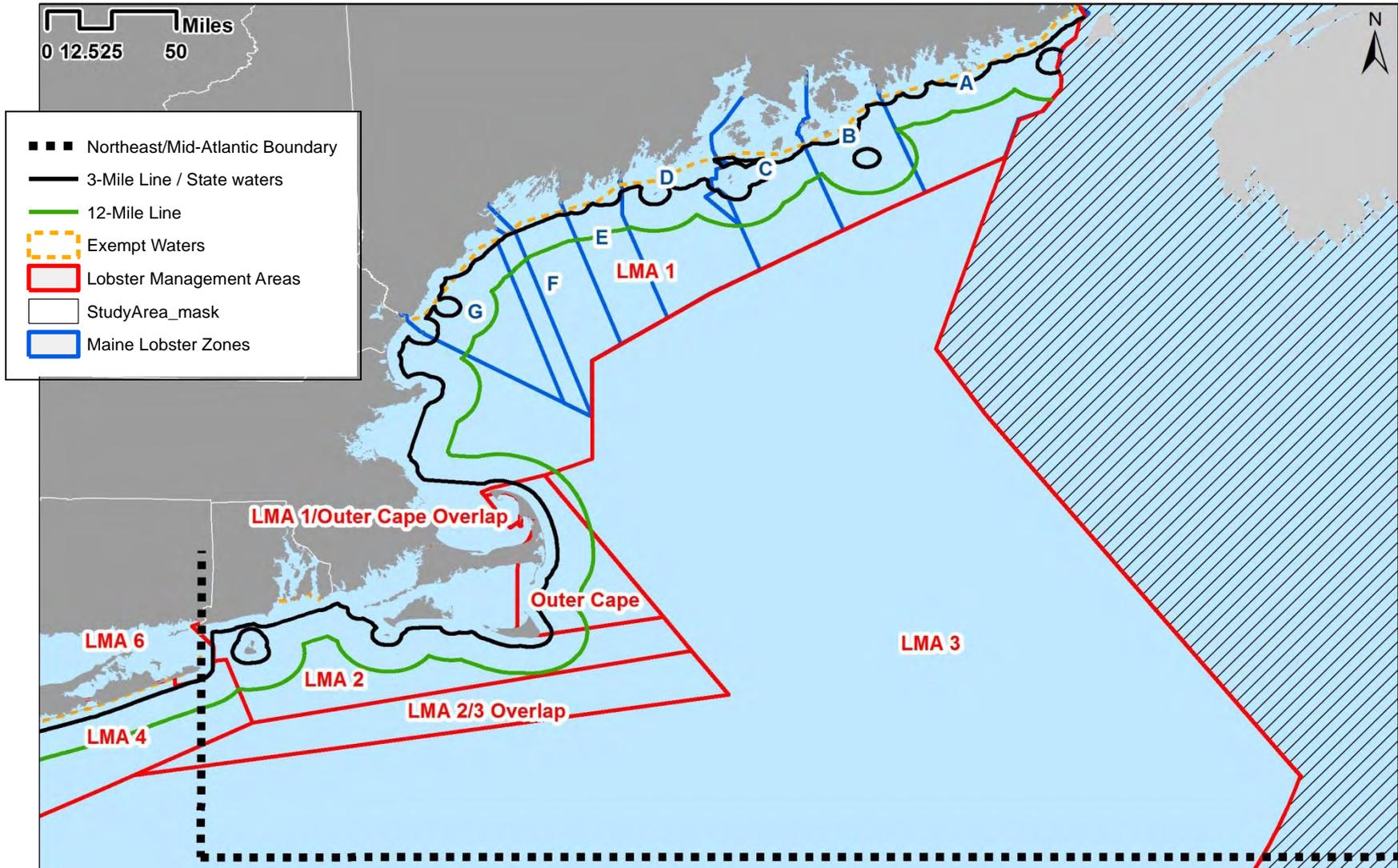
Proposed Management Measures

Northeast Area (miles)	Minimum Traps/Trawl	Number of Endlines
Maine A (non-exempt state waters)	2	1
Maine B (non-exempt state waters)	3	1
Maine C (non-exempt state waters)	3	1
Maine D (non-exempt state waters)	3	1
Maine E (non-exempt state waters)	2	1
Maine F (non-exempt state waters)	4	1
Maine G (non-exempt state waters)	2	1
Maine A (3-12)	5	1
Maine B (3-12)	5	1
Maine C (3-12)	5	1
Maine D (3-12)	5	1
Maine E (3-12)	5	1
Maine F (3-12)	10	2
Maine G (3-12)	10	2
Maine A (12+)	10	2
Maine B (12+)	10	2
Maine C (12+)	10	2
Maine D (12+)	10	2
Maine E (12+)	10	2
Maine F (12+)	20	2
Maine G (12+)	20	2

Northeast Area (miles)	Minimum Traps/Trawl	Number of Endlines
LMA1/OC Overlap (0-3)*	2	1
OC (0-3)*	2	1
LMA 1 (0-3)*	3	1
LMA 2 (0-3)*	3	1
LMA 1 (3-12)	10	2
LMA 2 (3-12)	10	2
LMA 3 (3-12)	10	2
OC (3-12)	10	2
LMA 1 (12+)	20	2
LMA 2 (12+)	20	2
LMA 2/3 Overlap (12+)	20	2
LMA 3 (12+)	20	2
OC (12+)	20	2

*Includes Massachusetts state waters more than 3 miles from shore

NMFS Northeast Proposal



Impact of NMFS Northeast Proposal

- Change in vertical line use measured on an annual basis relative to baseline conditions in non-exempt waters
- Vertical line impacts:

Region	Annual Change in the Number of Vertical Lines Deployed (Percent)
LMA 1	-37.0%
LMA 1 / OC Overlap	-42.8%
Outer Cape	-51.2%
LMA 2	-25.9%
LMA 2/3 Overlap	-23.8%
LMA 3	-3.9%
Other LMA	0.0%
Total Northeast	-36.1%
Total Coastwide	-34.2%

Impact of NMFS Northeast Proposal

- Change in co-occurrence score measured on an annual basis relative to baseline conditions in non-exempt waters
- Change in co-occurrence score:
 - Northeast region: -34.6%
 - Coastwide: -34.3%

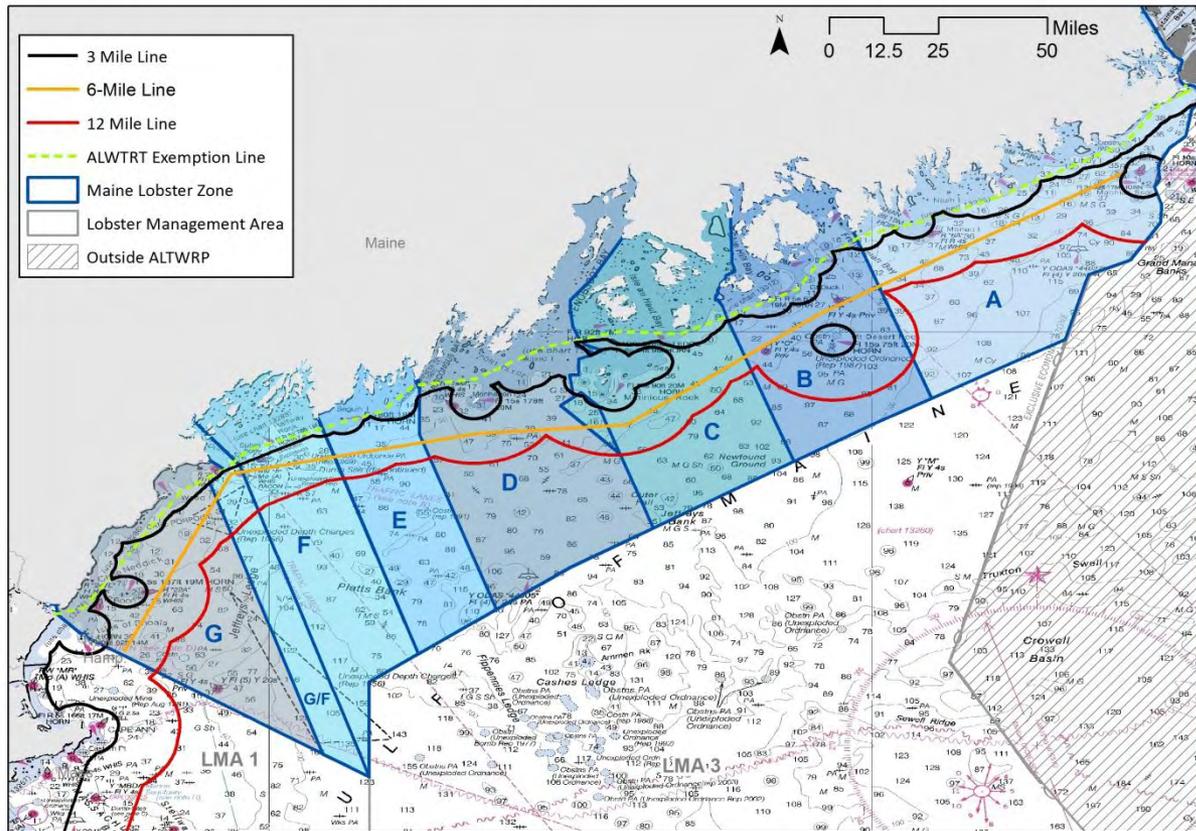
Maine DMR Proposal #1

	Proposed Trawl Minimums		
	State Waters (Non-Exempt)	3-6 Miles	6+ Miles
Maine Zone A	2	3	10
Maine Zone B	2	3	10
Maine Zone C	2	3	10
Maine Zone D	2	3	10
Maine Zone E	2	3	10
Maine Zone F	2	3	20
Maine Zone G	2	3	20

- Trawls of 5 or less fished with one endline; longer trawls fished with two endlines
- Analysis assumes NMFS proposal in effect elsewhere in Northeast

Maine DMR Proposal #1

Maine State and Federal Nearshore Waters



Impact of Maine DMR Proposal #1

- Vertical line impacts:

Region	Annual Change in the Number of Vertical Lines Deployed (Percent)
LMA 1	-29.0%
LMA 1 / OC Overlap	-42.8%
Outer Cape	-51.2%
LMA 2	-25.9%
LMA 2/3 Overlap	-23.8%
LMA 3	-3.9%
Other LMA	0.0%
Total Northeast	-29.0%
Total Coastwide	-27.5%

Change > NMFS Northeast	
Change < NMFS Northeast	

- Change in co-occurrence score:
 - Northeast region: -34.6%
 - Coastwide: -34.3%
- Relative to NMFS proposal, results reflect:
 - Less stringent trawling requirements 0-6 miles from shore
 - More stringent requirements in 6-12 mile range

Maine DMR Proposal #2

	Proposed Trawl Minimums			
	State Waters (Non-Exempt)	3-6 Miles	6-12 Miles	12+ Miles
Maine Zone A	2	3	5	15
Maine Zone B	2	3	5	15
Maine Zone C	2	3	5	15
Maine Zone D	2	3	10	15
Maine Zone E	2	3	10	15
Maine Zone F	2	3	10	15
Maine Zone G	2	3	10	15

- Zones F/12+ and G/12+ will use a 20-trap trawl minimum from November through February
- Trawls of 5 or less fished with one endline; longer trawls fished with two endlines
- Analysis assumes NMFS proposal in effect elsewhere in Northeast

Impact of Maine DMR Proposal #2

- Vertical line impacts:

Region	Annual Change in the Number of Vertical Lines Deployed (Percent)
LMA 1	-30.6%
LMA 1 / OC Overlap	-42.8%
Outer Cape	-51.2%
LMA 2	-25.9%
LMA 2/3 Overlap	-23.8%
LMA 3	-3.9%
Other LMA	0.0%
Total Northeast	-30.4%
Total Coastwide	-28.8%

Change > NMFS Northeast	
Change < NMFS Northeast	

- Change in co-occurrence score:
 - Northeast region: -36.0%
 - Coastwide: -35.7%
- Relative to NMFS proposal, results reflect:
 - Less stringent trawling requirements 0-6 miles from shore
 - Less stringent requirements in Zones F & G 12+ miles from shore
 - More stringent requirements in Zones A, B, & C 12+ miles from shore
 - More stringent requirements in Zones D & E 6+ miles from shore

New Hampshire DFG Proposal

- Would exempt NH state waters from vertical line reduction measures
- Analysis assumes NMFS proposal in effect elsewhere in Northeast
- Vertical line impacts:

Region	Annual Change in the Number of Vertical Lines Deployed (Percent)
LMA 1	-36.8%
LMA 1 / OC Overlap	-42.8%
Outer Cape	-51.2%
LMA 2	-25.9%
LMA 2/3 Overlap	-23.8%
LMA 3	-3.9%
Other LMA	0.0%
Total Northeast	-35.9%
Total Coastwide	-34.0%

Change > NMFS Northeast	
Change < NMFS Northeast	

- Change in co-occurrence score:
 - Northeast region: -34.5%
 - Coastwide: -34.2%

MA DMF Proposal

- MA DMF proposal notes how state policies have fostered attrition in fixed gear fisheries and raises a number of concerns with NMFS' strawman proposal
- Would exempt MA state waters from NMFS' trawling requirements
- Argues a reduction in trap allocations proposed as part of ASMFC Addendum XVIII will yield a reduction in vertical line use:
 - Reduction in trap allocations phased in over next 6 years
 - Anticipate 25% reduction in traps fished in waters south of Cape Cod
- Proposes state closure of CCB Critical Habitat from Feb. 1 through Apr. 30, for a two-year test period
- Analysis of impacts assumes:
 - MA state waters exempt from trawling requirements
 - Addendum XVIII yields a 25% reduction in trap use in LMA 2
 - Closure of CCB CH fully in effect; prompts no relocation of gear to other waters
 - NMFS proposal in effect elsewhere in Northeast

Impact of MA DMF Proposal

- Vertical line impacts:

Region	Annual Change in the Number of Vertical Lines Deployed (Percent)
LMA 1	-33.9%
LMA 1 / OC Overlap	-0.4%
Outer Cape	-2.1%
LMA 2	-14.2%
LMA 2/3 Overlap	-24.8%
LMA 3	-3.9%
Other LMA	0.0%
Total Northeast	-31.2%
Total Coastwide	-29.6%

Change > NMFS Northeast	
Change < NMFS Northeast	

- Change in co-occurrence score:
 - Northeast region: -26.8%
 - Coastwide: -26.6%
- Results for LMA 2 and LMA 2/3 Overlap reflect assumed impact of Addendum XVIII

RI DEM Proposal

- Raises concerns with the ability of RI vessels, particularly smaller vessels, to accommodate longer trawls
 - Would exempt RI state waters from NMFS' trawling requirements
 - In LMA 2 (12+), would impose a minimum of 15 traps per trawl, rather than NMFS' proposed 20 trap-per-trawl minimum
- Argues the reduction in trap allocations proposed as part of ASMFC Addendum XVIII will yield a reduction in vertical line use:
 - 50% reduction in trap allocation for LMA 2 over six years
 - 25% reduction in trap allocation for LMA 3 over ten years
- Analysis of impacts assumes:
 - RI state waters exempt from trawling requirements; minimum of 15 traps per trawl in LMA 2 (12+)
 - Addendum XVIII yields a 50% reduction in trap use in LMA 2 and a 25% reduction in trap use in LMA 3
 - NMFS proposal in effect elsewhere in Northeast

Impact of RI DEM Proposal

- Vertical line impacts:

Region	Annual Change in the Number of Vertical Lines Deployed (Percent)
LMA 1	-37.0%
LMA 1 / OC Overlap	-42.8%
Outer Cape	-51.2%
LMA 2	-36.3%
LMA 2/3 Overlap	-49.4%
LMA 3	-24.1%
Other LMA	0.0%
Total Northeast	-37.2%
Total Coastwide	-35.2%

Change > NMFS Northeast	
Change < NMFS Northeast	

- Change in co-occurrence score:
 - Northeast region: -35.0%
 - Coastwide: -34.8%
- Results driven by assumptions regarding the impacts of Addendum XVIII

Impact of Combined State Proposals

- Assumes Maine DMR Proposal #1
- Vertical line impacts:

Region	Annual Change in the Number of Vertical Lines Deployed (Percent)
LMA 1	-25.8%
LMA 1 / OC Overlap	-0.4%
Outer Cape	-2.1%
LMA 2	-9.6%
LMA 2/3 Overlap	-24.8%
LMA 3	-24.1%
Other LMA	0.0%
Total Northeast	-24.1%
Total Coastwide	-22.8%

Change > NMFS Northeast	
Change < NMFS Northeast	

- Change in co-occurrence score:
 - Northeast region: -27.0%
 - Coastwide: -26.8%
- Results reflect 25% reduction in trap use in LMA 2, LMA 3, and LMA 2/3 Overlap

Summary of State Proposals

- Vertical line impacts:

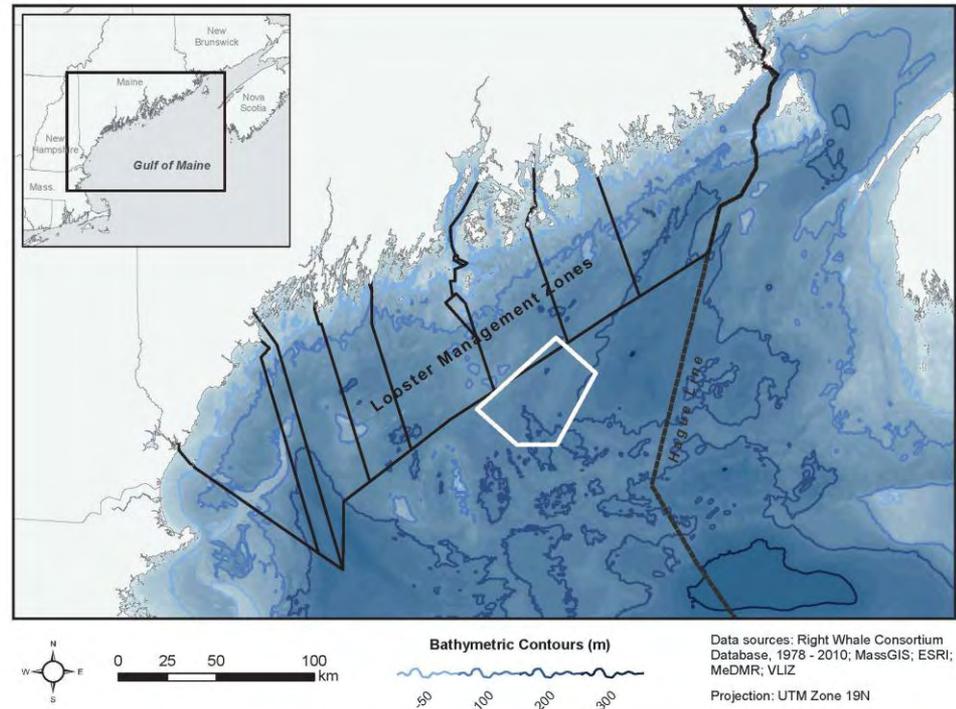
Region	NMFS Northeast	Maine DMR 1	Maine DMR 2	NH DFG	MA DMF	RI DEM	State Proposals Combined
LMA 1	-37.0%	-29.0%	-30.6%	-36.8%	-33.9%	-37.0%	-25.8%
LMA 1 / OC Overlap	-42.8%	-42.8%	-42.8%	-42.8%	-0.4%	-42.8%	-0.4%
Outer Cape	-51.2%	-51.2%	-51.2%	-51.2%	-2.1%	-51.2%	-2.1%
LMA 2	-25.9%	-25.9%	-25.9%	-25.9%	-14.2%	-36.3%	-9.6%
LMA 2/3 Overlap	-23.8%	-23.8%	-23.8%	-23.8%	-24.8%	-49.4%	-24.8%
LMA 3	-3.9%	-3.9%	-3.9%	-3.9%	-3.9%	-24.1%	-24.1%
Other LMA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Northeast	-36.1%	-29.0%	-30.4%	-35.9%	-31.2%	-37.2%	-24.1%
Total Coastwide	-34.2%	-27.5%	-28.8%	-34.0%	-29.6%	-35.2%	-22.8%

- Change in co-occurrence score:

Region	NMFS Northeast	Maine DMR 1	Maine DMR 2	NH DFG	MA DMF	RI DEM	State Proposals Combined
Northeast	-34.6%	-34.6%	-36.0%	-34.5%	-26.8%	-35.0%	-27.0%
Coastwide	-34.3%	-34.3%	-35.7%	-34.2%	-26.6%	-34.8%	-26.8%

Jordan Basin Closure Proposal

- Submitted by Kraus, et al.
- Would close “hot spot” section of Jordan Basin from Nov. 1 to Jan. 31
- Closure would apply to all ALWTRP fisheries
- Analysis assumes NMFS proposal in effect elsewhere in Northeast
- Analysis examines impacts with and without relocation of affected gear



Impact of Jordan Basin Closure Proposal

- Average number of vessels affected during closure: 4 per month
- Vertical line impacts:

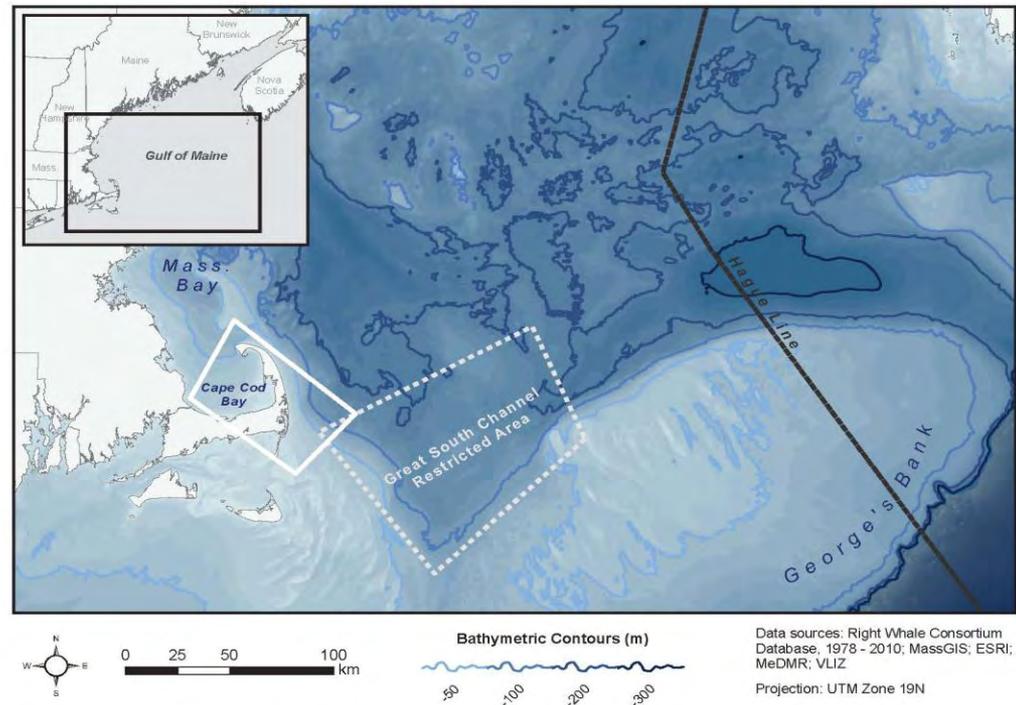
Region	Annual Change in the Number of Vertical Lines Deployed (Percent)	
	Assuming Relocation of All Affected Gear During Closure	Assuming Removal of All Affected Gear During Closure
LMA 1	-37.0%	-37.0%
LMA 1 / OC Overlap	-42.8%	-42.8%
Outer Cape	-51.2%	-51.2%
LMA 2	-25.9%	-25.9%
LMA 2/3 Overlap	-23.8%	-23.8%
LMA 3	-2.8%	-4.0%
Other LMA	0.0%	0.0%
Total Northeast	-36.1%	-36.1%
Total Coastwide	-34.2%	-34.2%

Change > NMFS Northeast	
Change < NMFS Northeast	

- Change in co-occurrence score:
 - Northeast region: -34.7% (Relocation); -34.9% (Removal)
 - Coastwide: -34.4% (Relocation); -34.8% (Removal)

CCB to GSC Closure Proposal

- Submitted by Kraus, et al.
- Would close Cape Cod Bay, off Race Point and east of Cape to Great South Channel, from Feb. 1 to Apr. 30
- Closure would apply to all ALWTRP fisheries
- Analysis assumes NMFS proposal in effect elsewhere in Northeast
- Analysis assumes that closure does not prompt relocation of gear to other waters



Impact of CCB to GSC Closure Proposal

- Average number of vessels affected during closure: 11 per month
- Vertical line impacts:

Region	Annual Change in the Number of Vertical Lines Deployed (Percent)
LMA 1	-37.0%
LMA 1 / OC Overlap	-43.2%
Outer Cape	-51.7%
LMA 2	-26.0%
LMA 2/3 Overlap	-23.8%
LMA 3	-3.9%
Other LMA	0.0%
Total Northeast	-36.1%
Total Coastwide	-34.2%

Change > NMFS Northeast	
Change < NMFS Northeast	

- Change in co-occurrence score:
 - Northeast region: -34.8%
 - Coastwide: -34.6%

Impact of Combined Kraus et al. Proposals

- Assumes relocation of all affected gear in Jordan Basin
- Vertical line impacts:

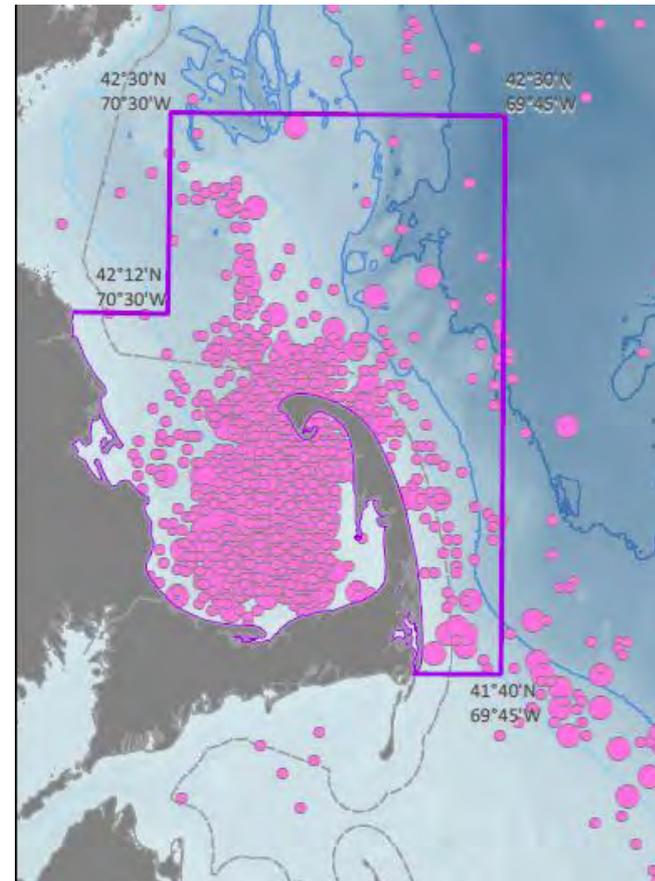
Region	Annual Change in the Number of Vertical Lines Deployed (Percent)
LMA 1	-37.0%
LMA 1 / OC Overlap	-43.2%
Outer Cape	-51.7%
LMA 2	-26.0%
LMA 2/3 Overlap	-23.8%
LMA 3	-2.8%
Other LMA	0.0%
Total Northeast	-36.1%
Total Coastwide	-34.2%

Change > NMFS Northeast	
Change < NMFS Northeast	

- Change in co-occurrence score:
 - Northeast region: -34.9%
 - Coastwide: -34.7%

CCB Closure Proposal

- Submitted by Young, et al.
- Would close Cape Cod Bay, off Race Point and east of Cape, from Jan. 1 to Apr. 30
- Would apply to all ALWTRP fisheries
- Analysis assumes NMFS proposal in effect elsewhere in Northeast
- Analysis assumes that closure does not prompt relocation of gear to other waters



Impact of CCB Closure Proposal

- Average number of vessels affected during closure: 134 per month
- Vertical line impacts:

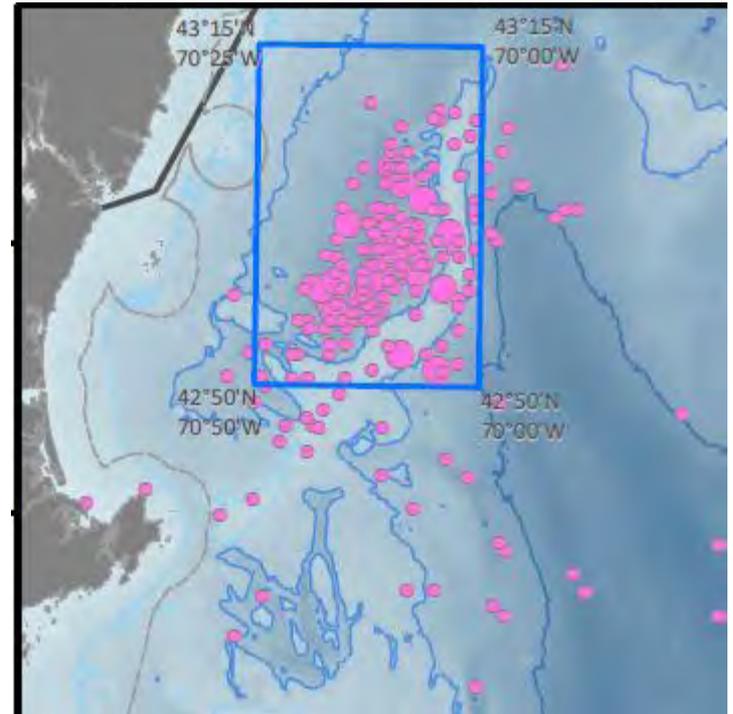
Region	Annual Change in the Number of Vertical Lines Deployed (Percent)
LMA 1	-38.0%
LMA 1 / OC Overlap	-43.3%
Outer Cape	-51.7%
LMA 2	-25.9%
LMA 2/3 Overlap	-23.8%
LMA 3	-3.9%
Other LMA	0.0%
Total Northeast	-36.9%
Total Coastwide	-35.0%

Change > NMFS Northeast	
Change < NMFS Northeast	

- Change in co-occurrence score:
 - Northeast region: -37.0%
 - Coastwide: -36.7%

Jeffreys to Cashes Ledge Closure Proposal

- Submitted by Young, et al.
- Would close the area from Jeffreys Ledge toward Cashes Ledge from Oct. 1 to Jan. 31
- Would apply to all ALWTRP fisheries
- Analysis assumes NMFS proposal in effect elsewhere in Northeast
- Analysis examines impacts with and without relocation of affected gear



Impact of Jeffreys to Cashes Ledge Closure Proposal

- Average number of vessels affected during closure: 70 per month
- Vertical line impacts:

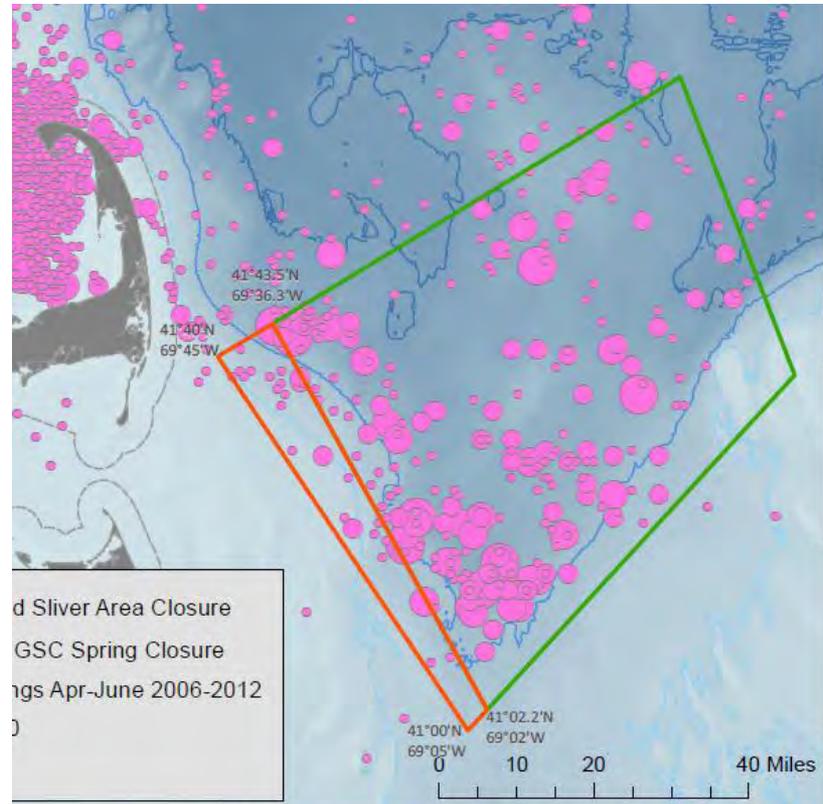
Region	Annual Change in the Number of Vertical Lines Deployed (Percent)	
	Assuming Relocation of All Affected Gear During Closure	Assuming Removal of All Affected Gear During Closure
LMA 1	-37.0%	-37.4%
LMA 1 / OC Overlap	-42.8%	-42.8%
Outer Cape	-51.2%	-51.2%
LMA 2	-25.9%	-25.9%
LMA 2/3 Overlap	-23.8%	-23.8%
LMA 3	-3.9%	-3.9%
Other LMA	0.0%	0.0%
Total Northeast	-36.0%	-36.5%
Total Coastwide	-34.1%	-34.6%

Change > NMFS Northeast	
Change < NMFS Northeast	

- Change in co-occurrence score:
 - Northeast region: -34.7% (Relocation); -38.7% (Removal)
 - Coastwide: -34.4% (Relocation); -38.6% (Removal)

GSC Closure Proposal

- Submitted by Young, et al.
- Would close Great South Channel “sliver area”, from Apr. 1 to June 30
- Would only affect gillnet fishery (trap/pot already prohibited)
- Analysis assumes NMFS proposal in effect elsewhere in Northeast
- Analysis assumes that closure prompts relocation of gear to surrounding areas (north, south, and east)



Impact of GSC Closure Proposal

- Average number of vessels affected during closure: 3 per month
- Vertical line impacts:

Region	Annual Change in the Number of Vertical Lines Deployed (Percent)
LMA 1	-37.0%
LMA 1 / OC Overlap	-42.8%
Outer Cape	-51.2%
LMA 2	-26.0%
LMA 2/3 Overlap	-23.7%
LMA 3	-3.9%
Other LMA	0.0%
Total Northeast	-36.1%
Total Coastwide	-34.2%

Change > NMFS Northeast	
Change < NMFS Northeast	

- Change in co-occurrence score:
 - Northeast region: -34.6%
 - Coastwide: -34.3%

Impact of Combined Young et al. Proposals

- Assumes relocation of all affected gear for Jeffreys and GSC proposals
- Vertical line impacts:

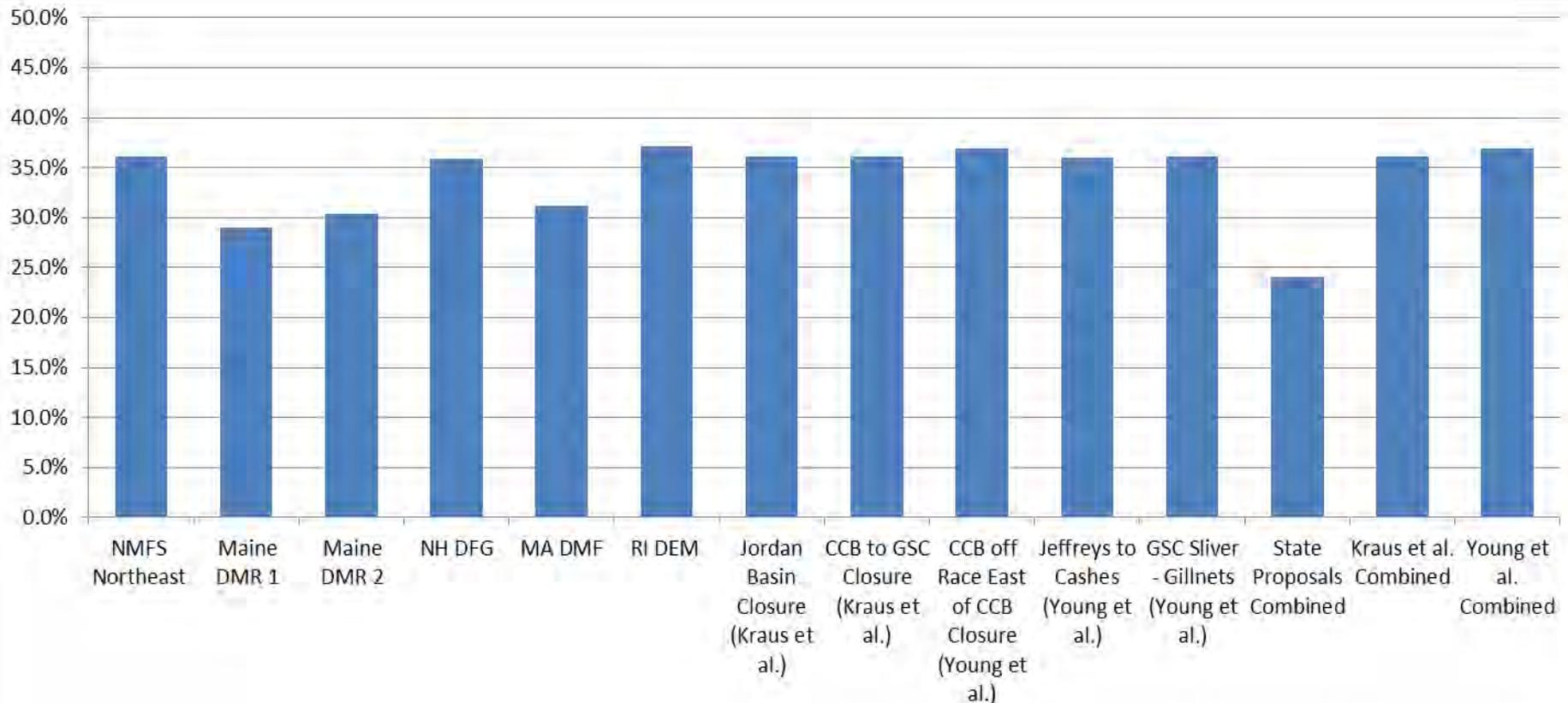
Region	Annual Change in the Number of Vertical Lines Deployed (Percent)
LMA 1	-37.9%
LMA 1 / OC Overlap	-43.3%
Outer Cape	-51.7%
LMA 2	-26.0%
LMA 2/3 Overlap	-23.7%
LMA 3	-3.9%
Other LMA	0.0%
Total Northeast	-36.9%
Total Coastwide	-35.0%

Change > NMFS Northeast	Light Blue
Change < NMFS Northeast	Yellow

- Change in co-occurrence score:
 - Northeast region: -37.2%
 - Coastwide: -36.9%

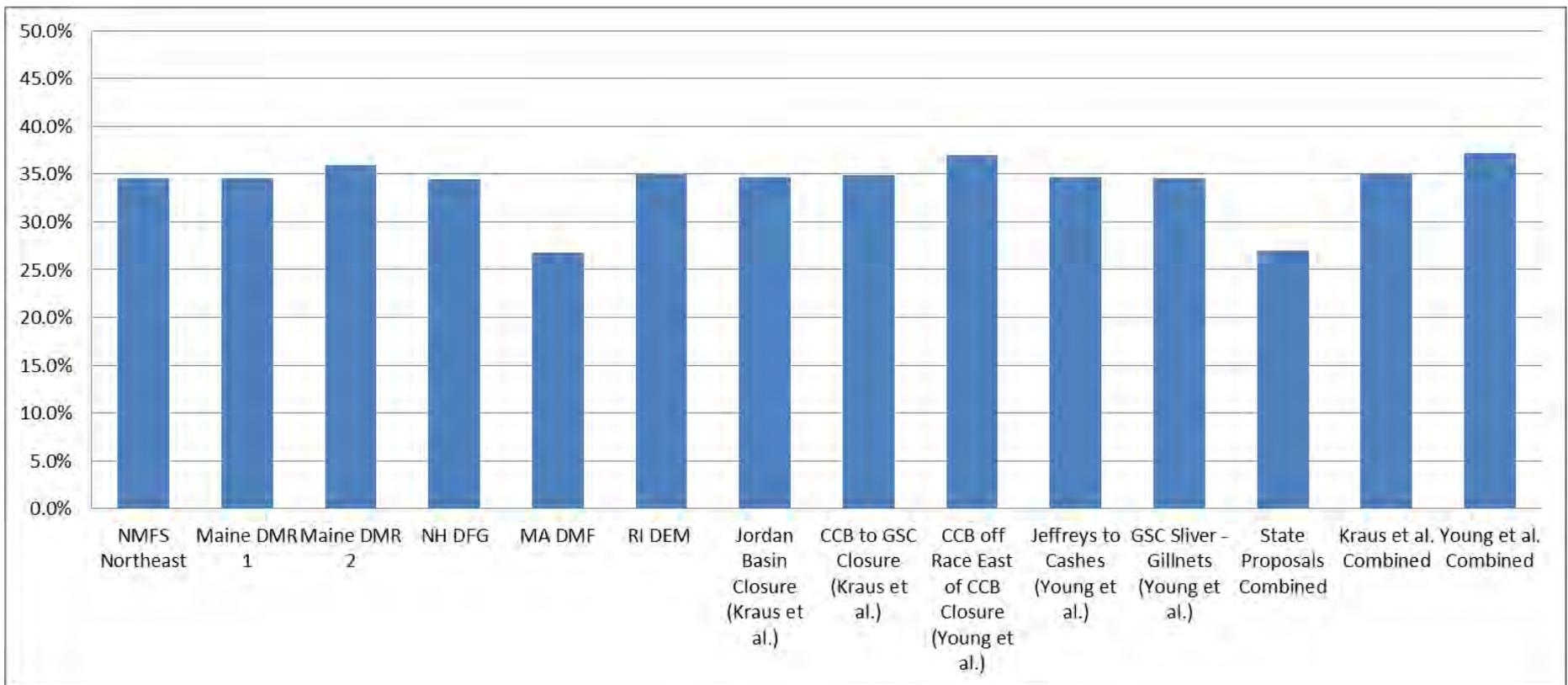
Summary of Impacts

- Percentage reduction in vertical line, Northeast waters:



Summary of Impacts

- Percentage reduction in co-occurrence score, Northeast waters:



Summary of Impacts

Proposal	NMFS	ME #1	ME #2	NH	MA	RI	Jordan Basin	CCB to GSC	CCB (Young)	Jeffreys	GSC Sliver	NORTHEAST REGION		COASTWIDE		
												% Change in VL	% Change in Co-Oc.	% Change in VL	% Change in Co-Oc.	
NMFS	X												-36.1%	-34.6%	-34.2%	-34.3%
ME #1	X	X											-29.0%	-34.6%	-27.5%	-34.3%
ME #2	X		X										-30.4%	-36.0%	-28.8%	-35.7%
NH	X			X									-35.9%	-34.5%	-34.0%	-34.2%
MA	X				X								-31.2%	-26.8%	-29.6%	-26.6%
RI	X					X							-37.2%	-35.0%	-35.2%	-34.8%
Jordan Basin (Kraus)	X						X						-36.1%	-34.7%	-34.2%	-34.4%
CCB to GSC (Kraus)	X							X					-36.1%	-34.8%	-34.2%	-34.6%
CCB (Young)	X								X				-36.9%	-37.0%	-35.0%	-36.7%
Jeffreys (Young)	X									X			-36.0%	-34.7%	-34.1%	-34.4%
GSC Sliver (Young)	X										X		-36.1%	-34.6%	-34.2%	-34.3%
NMFS + All State	X	X	X	X	X	X							-24.1%	-27.0%	-22.8%	-26.8%
NMFS + Kraus et al.	X						X	X					-36.1%	-34.9%	-34.2%	-34.7%
NMFS + Young et al.	X								X	X	X		-36.9%	-37.2%	-35.0%	-36.9%