



Noah  
Oppenheim



Rob Griffin,  
PhD



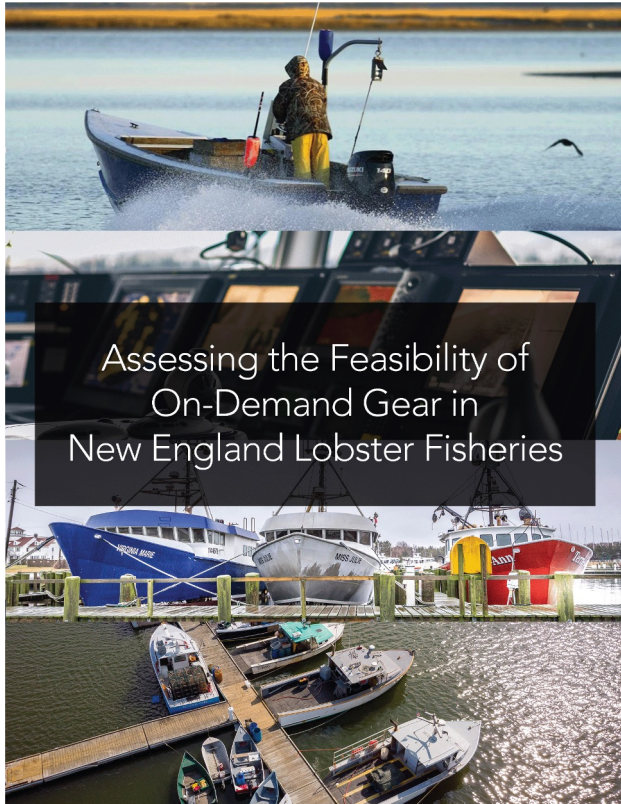
Andrew  
Goode, PhD

# Mass DMF on-demand fishing gear scoping project Phase II: Socioeconomic modeling of management scenarios in Massachusetts and adjacent federal waters



# Background - On-demand fishing gear project Phase I

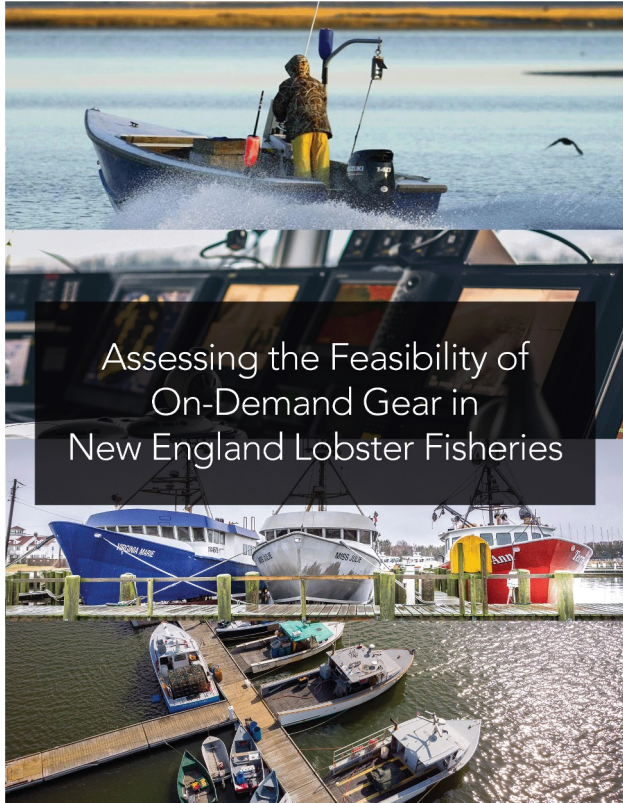
*to read the document visit [bit.ly/ropeless-report](http://bit.ly/ropeless-report)*



Engaged with stakeholders to understand and summarize:

- Existing **perceptions** of on-demand gear
- The **utility** of on-demand gear - how is it used and how does that relate to current practices?
- **Technological** aspects of on-demand gear
- **Legal and regulatory** issues
- **Socioeconomic** factors

# Background



## Assessing the Feasibility of On-Demand Gear in New England Lobster Fisheries

## Recommendations

- Lots of research to do
- Economic aspects are a key hurdle

“Massachusetts knows how many buoy lines everybody's got, so to extrapolate that out for all the fishermen and how many buoys they've got, how much it's going to cost, it's going to cost \$150 million probably, which is 50 or 60 million dollars more than the industry stocks in a year. So I don't think anybody can justify anything like that because of the costs, just the cost part of it.”

- *Fixed gear fishery stakeholder*

# Background

	2015	2016	2017	2018	2019
Total Landings	16,956,310	18,467,688	17,218,843	18,439,451	16,794,038
Total Estimated Revenue	\$84,442,176	\$87,737,773	\$84,659,791	\$90,430,580	\$95,491,339
Total Estimated Net Revenue	\$18,670,165	\$19,398,822	\$18,718,280	\$19,994,201	\$21,113,135
Total Gear Replacement Cost	\$6,713,153	\$6,975,153	\$6,730,453	\$7,189,231	\$7,591,561

Summary of MA state and federal lobster harvest landed in Massachusetts, in real 2019 USD

# Phase II project

Incorporate economic aspects of phase 1:

- The **utility** of on-demand gear - how is it used and how does that relate to current practices?
- **Technological** aspects of on-demand gear
- **Socioeconomic** factors
- **Legal and regulatory** issues

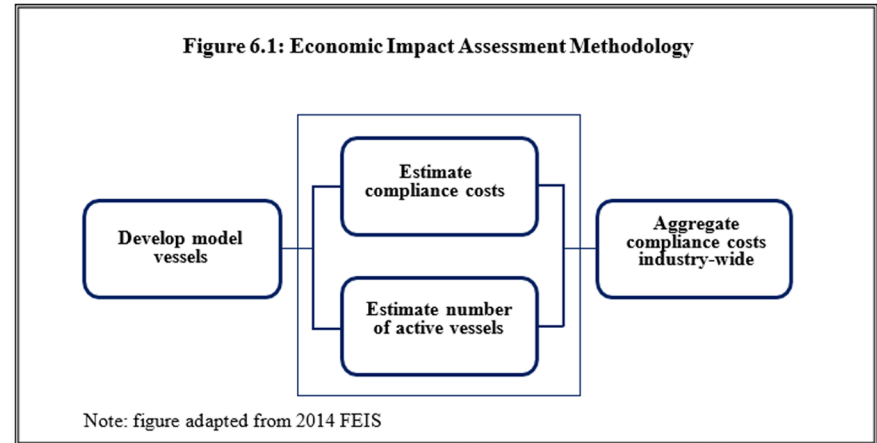


# Phase II project

## Tasks

- Develop model vessels
- Develop net revenue functions
  - Per model vessel class
  - Sensitive to on-demand gear for harvest/cost/effort
- Identify scenarios
- Estimate economic impact of scenarios
- Account for uncertainty

[Draft environmental impact statement - Atlantic large whale take reduction plan risk reduction rule](#)



# Shoreside on-demand gear and finances

Variable

Modified By

Source

Fishing gear purchase

Price, gear loss,  
scrap/sale value

Market prices

Insurance

Rate changes

Interviews with providers

Haul out/maintenance

# of haul outs and  
changes in gear work

Interviews with  
stakeholders

Ex-vessel price

Price

Lit review

Variable

Modified By

Source

Fishing gear purchase

Price, gear loss,  
scrap/sale value

Market prices

Check for updates

OPEN ACCESS

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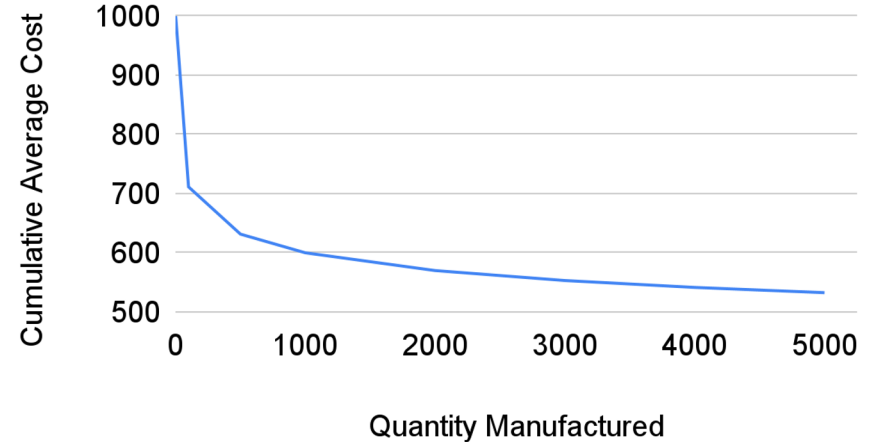
## Decline in on-demand fishing gear costs with learning

Carolyn Alkire\*

Environmental Assessment Services, LLC, (in support of the National Oceanic Atmospheric Administration, Northeast Fisheries Science Center), Richland, WA, United States

Gear entanglement and vessel collisions are the major known causes of injuries to the critically endangered North Atlantic right whale (*Eubalaena glacialis*) and

Cumulative Average Cost vs. Quantity Manufactured





Variable

Modified By

Source

Ex-vessel price

Price

Lit review



Ecological Economics

Volume 204, Part A, February 2023, 107661



Fisheries Research

Volume 182, October 2016, Pages 88-97



## The effect of eco-certification on demand: The case of MSC-certified Norway lobster

Anna Andersson <sup>a</sup> , Cecilia Hammarlund <sup>b</sup>

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<https://doi.org/10.1016/j.ecolecon.2022.107661>

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## From certification to recertification the benefits and challenges of the Marine Stewardship Council (MSC): A case study using lobsters

Lynda M. Bellchambers <sup>a</sup> , Bruce F. Phillips <sup>b</sup>, Mónica Pérez-Ramírez <sup>c, d</sup>



Marine Policy

Volume 34, Issue 5, September 2010, Pages 1103-1109



## The promise and pitfalls of Marine Stewardship Council certification: Maine lobster as a case study

Wendy Goyert <sup>a, 1</sup> , Raphael Sagarin <sup>a</sup> , John Annala <sup>b</sup>

### Consumers' Valuation for Lobster Harvested Using Ropeless Technology to Reduce Right Whale Entanglement and Extinction

Qiujie Zheng<sup>1</sup>, Rodolfo M. Nayga, Jr.<sup>2</sup>, Wei Yang<sup>3</sup>, Kanae Tokunaga<sup>4</sup>

<sup>1</sup>Maine Business School, Univ. of Maine, qiujie.zheng@maine.edu; <sup>2</sup>Department of Agricultural Economics, Texas A&M Univ., rnayga@tamu.edu; <sup>3</sup>Department of Agricultural Economics and Agribusiness, Univ. of Arkansas, way008@uark.edu; <sup>4</sup>Gulf of Maine Research Institute, ktokunaga@gmri.org. **Please do not cite without the authors' permission.**



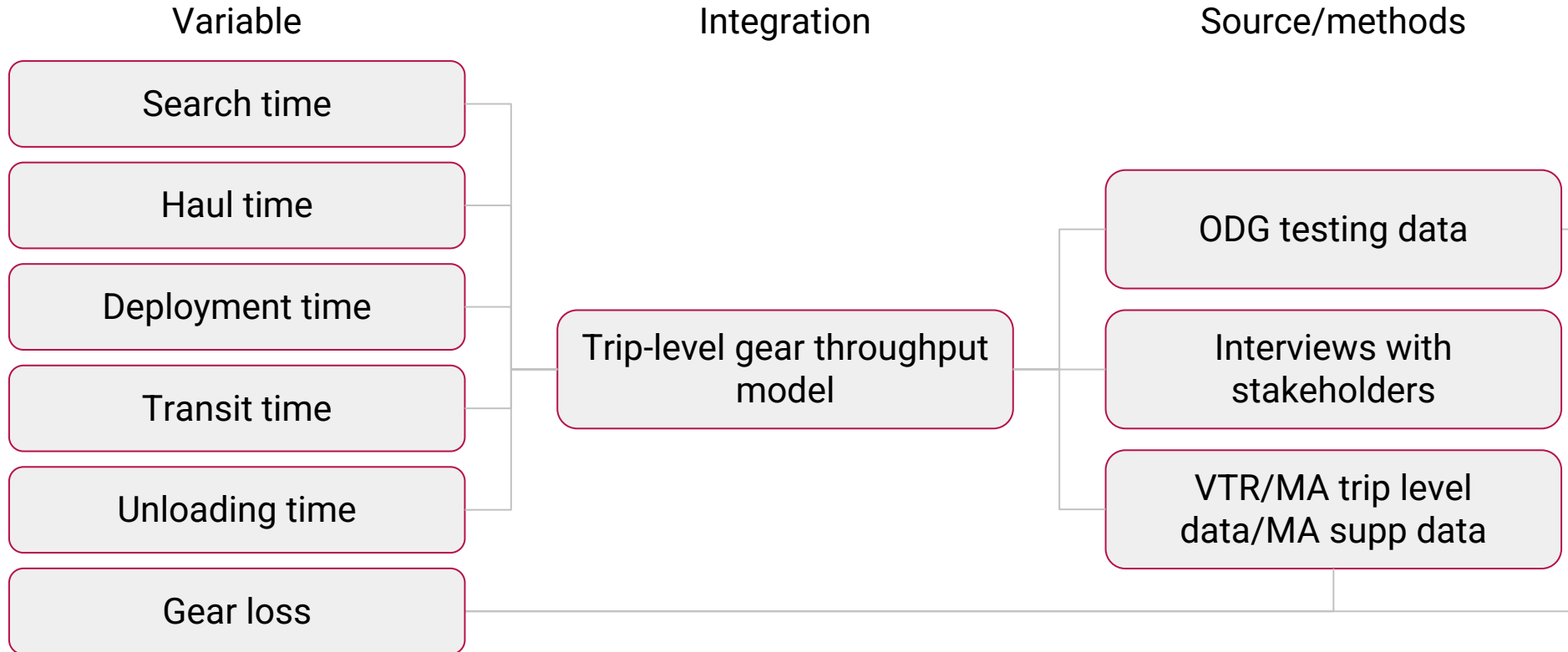
Division of Agriculture Research & Extension

University of Arkansas System



Science Education Community

# At sea on-demand gear and finances



# Trip-level gear throughput model

## MA Division of Marine Fisheries - Monthly Trip-Level Commercial Report

Name: John Doe Phone #: 508-123-4567  
 Permit ID #: 123456 Email: FVBigBug@Lobman.com  
 Port or Town Landed #1: Gloucester  
 Port or Town Landed #2: Salem

Vessel Name: FV Big Bug  
 Vessel Reg. or Doc. #: MS 9999 AA  
 Fishing from shore (please answer Yes or No)? No  
 Report Month & Year: July, 2020



**Port:** Port catch was landed  
**Stat Area\*:** 1 - 25 (see maps)  
**MNG Area\*:** LMA (1-3, OC) or DSGA (BB4, N7, etc.)  
**Gear code\*:** Code of gear type used  
**Depth Fished:** Average bottom depth in fathoms, 1 fathom=6 feet  
**Fishing Time:** Soak time - days for fixed gear; hours for mobile/hand gear  
**Gear Hauled:** # Traps/nets/hooks hauled in stat area or DSGA

**FIXED GEAR ONLY, gear & b-lines fields from start of trip**  
**Strings Hauled:** Number of strings/trawls hauled in stat area  
**Gear in area:** # Traps/nets in stat area  
**B-lines in area:** # Buoylines in stat area  
**Total Gear:** Total # traps/nets in the water, regardless of stat area  
**Total B-lines:** Total # buoylines in water, regardless of stat area  
**Ten Min. Square(s)\*:** 10 minute square(s) fished, fed permit only

**Catch Source:** Record trip as standard (S), carried (C), withdrawn from car (W), or aquaculture (A)  
**Disp Code\*:** Fate of landed catch  
**Tog CT:** Count of individual tautog landed

**Dealer Sold To:** Company name and permit number of dealer catch was sold, please be specific.

\*See reverse for codes and notes

Start-End Date	Start - End Time	Port 1 or 2	Gear Code*	Stat Area*	MNG Area*	Depth Fished	Fishing Time	Gear Hauled	Strings Hauled	Gear in Area	B-lines in Area	Total Gear	Total B-lines	Ten Min. Square(s)*	Catch Source	Disp Code*	Species Code*	Quantity*	Unit*	Dealer Sold To (Name & Permit #)	Tog CT
7/12-12	0800-1300	1	760		CCB4		5 H								A	001	OYS	2100	CT	John Doe Dealer #9999	
7/13-13	0600-1500	2	160	19	1	35	5 D	250	25	350	70	800	160	XX YY	S	001	LOB	300	LB	Everyday Lobster #0000	
7/4-4	0500-1600	1	160	2	1	25	3 D	150	15	450	90	600	120		S	001	LOB	70	LB	Glouctah Lobstah #1234	
"	"	"	"	2	"	"	"	"	"	"	"	"	"	"	C	"	"	80	"	"	"
"	"	"	"	3	"	"	"	80	8	150	30	"	"	"	S	001	"	60	"	Glouctah Lobstah #1234	
7/5-5	0700-1100	1	620		N7		4 H							S	"	CLSO	120	"	C.A. Shellfish Co. #1111		
7/8-8	0500-1600	1	160	2	1	15	8 D	200	20	450	90	600	120		C	"	LOB	127	"	"	
"	"	1	"	3	"	"	8 D	50	5	150	30	"	"	"	"	"	"	58	"	"	
7/10-10	0500-1600	1	160	2	1	15	6 D	200	20	450	90	600	120		S	001	"	101	"	Glouctah Lobstah #1234	
"	"	1	"	3	"	"	6 D	50	5	150	30	"	"	"	"	"	"	72	"	Glouctah Lobstah #1234	
7/10															W	"	"	100	"	Glouctah Lobstah #1234	
7/12-12	0500-1100	2	300	3		5	6 H							S	"	STB	150	"	Salem Seafood #2222		
7/14-14	"	"	"	"	"	"	7 H							"	"	"	39	"	Salem Seafood #2222		
7/16-16	1200-1600	1	620		N7		4 H							"	"	CLSO	145	"	C.A. Shellfish Co. #1111		
7/17-17	0500-1600	1	160	2	1	15	7 D	220	22	450	90	600	120	"	"	LOB	273	"	Glouctah Lobstah #1234		
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	031	CRJ	10	CT	"	
7/18															W	001	LOB	85	"	Doe Retail Boat #9999	

Did Not Fish (check here):  Month(s) and Year: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Knowingly falsifying any information contained within this report constitutes the act of perjury and may result in a fine, imprisonment or loss of license (MGL, Chapter 130, Sections 2, 21, 33).

Submit by the 15th of following month by FAX: (617-727-3337), email (dmf.stats@mass.gov), or by mail: MA DMF, 30 Emerson Ave, Gloucester, MA 01930

Please email or call the Statistics Project at 978-282-0308 x101 with any questions.

Version Created 10/27/20

## 2021 FIXED GEAR SUPPLEMENTAL REPORT



COMMONWEALTH OF MASSACHUSETTS  
 DIVISION OF MARINE FISHERIES, ANNISQUAM RIVER MARINE FISHERIES STATION  
 30 EMERSON AVE, GLOUCESTER, MA 01930



PLEASE PRINT IN INK ONLY  
 If you have any questions, please contact the Statistics Project at (978) 282-0308.

MA COMMERCIAL PERMIT ID: \_\_\_\_\_  
 NAME (as it appears on permit application): \_\_\_\_\_ (Last) \_\_\_\_\_ (First) \_\_\_\_\_ (MI)

ADDRESS: \_\_\_\_\_ (No.) \_\_\_\_\_ (Street) \_\_\_\_\_ (City/Town) \_\_\_\_\_ (Zip Code)  
 PLEASE COMPLETE THIS SUPPLEMENTAL REPORT AND SUBMIT WITH YOUR PERMIT RENEWAL APPLICATION. THIS SHOULD BE COMPLETED BY ALL 2021 MA COMMERCIAL PERMIT HOLDERS HOLDING FIXED GEAR PERMITS OR ENDORSEMENTS WHOSE TRIP-LEVEL CATCH AND EFFORT INFO WAS REPORTED TO NMFS. BE SURE TO SIGN & DATE THIS REPORT.

Fixed gear permits and endorsements include: Lobster (coastal, offshore, seasonal), Gillnet, Fish Pot (conch, scup, sea bass). Fixed gear types: Lobster traps, conch pots, fish pots, and gillnets.

I. PRIMARY VESSEL: List the vessel associated to this permit in 2021. If vessel changed in 2021, list the latest vessel.

Boat Name	Reg/Doc Number	Length (ft)	Home Port	Value of Vessel (\$)

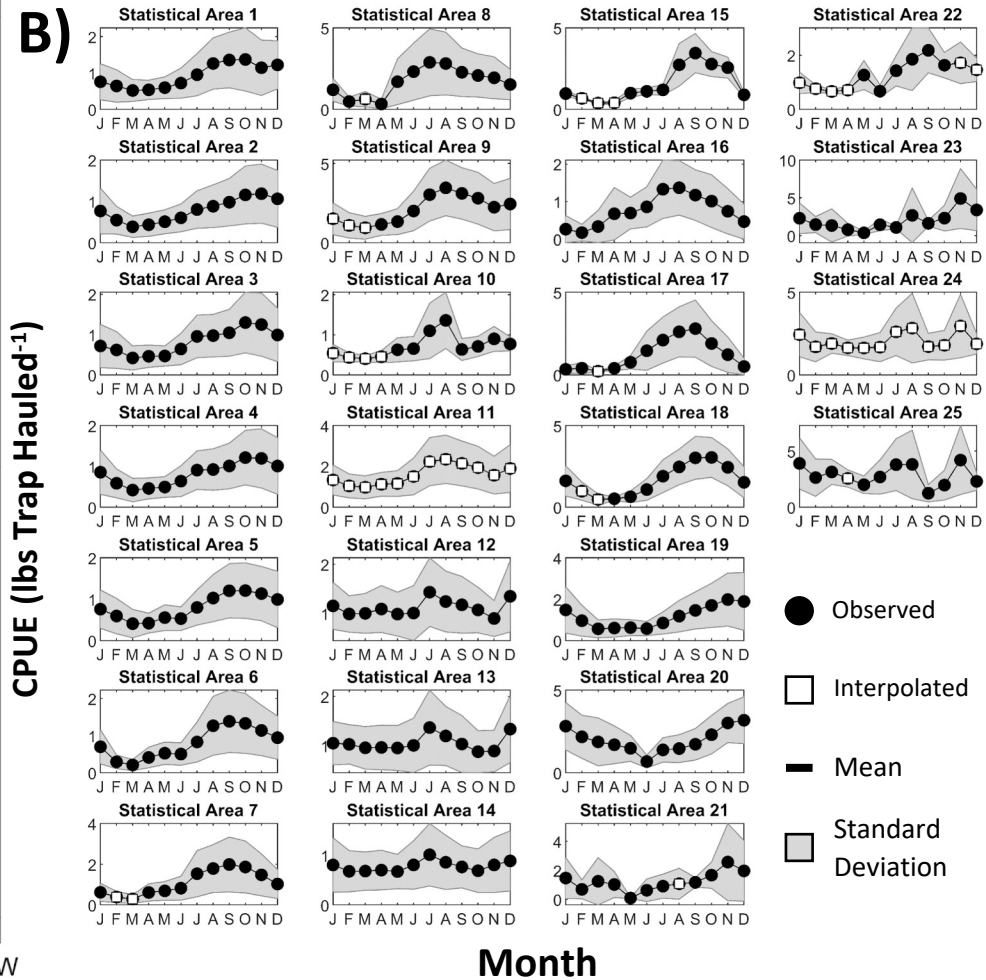
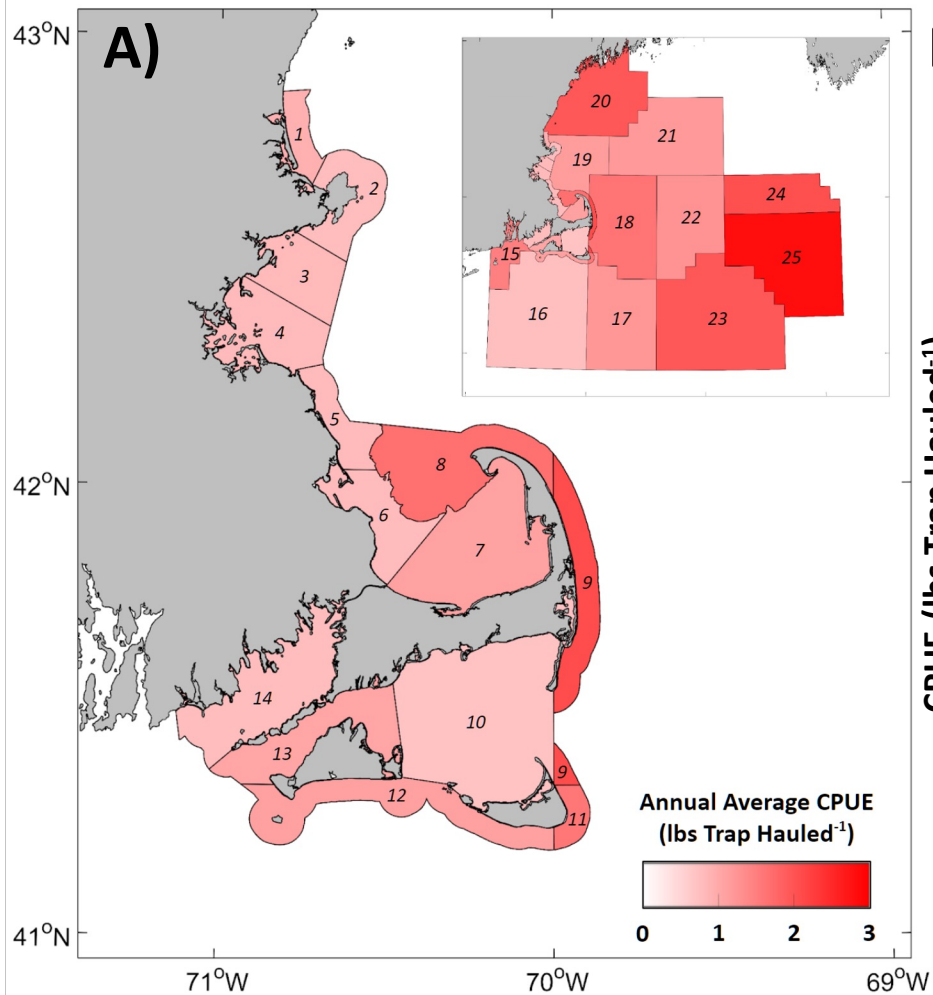
II. If you DID NOT FISH fixed gear in 2021, please check the box, and then skip items III and IV.   
 III. MAXIMUM BUOY LINES and AVERAGE TRAPS PER TRAWL: List the maximum number of buoy lines in the water at any one time during each month and average traps per trawl for that month for each gear type fished in 2021.  
 -- Max Buoy Line example: If you set 50 10-trap trawls with 2 buoy lines per trawl, the max buoy lines for that month would be 100.  
 -- Average Traps per Trawl examples: Enter 1 if you haul all singles. Enter 10 if you have an average of 10 traps per trawl, etc.

GEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Lobster Pots	Max Buoy-lines											
	Avg Traps/Trawl											
	Max Buoy-lines											
Sea Bass Pots	Max Buoy-lines											
	Avg Traps/Trawl											
	Max Buoy-lines											
Scup Pots	Max Buoy-lines											
	Avg Traps/Trawl											
	Max Buoy-lines											
Conch Pots	Max Buoy-lines											
	Avg Traps/Trawl											
	Max Buoy-lines											
Gillnets	Max Buoy-lines											
	Avg Traps/Trawl											
	Max Buoy-lines											

IV. LOBSTER FISHERMEN ONLY: Please fill out Items A - D below for the calendar year 2021.  
 A. BAIT: Total amount (in dollars) spent on bait: \$ \_\_\_\_\_  
 B. TRAP VALUE: Estimate the average value of ONE lobster trap including rope and buoy: \$ \_\_\_\_\_  
 C. EMPLOYMENT: Counting yourself, what was the maximum number of people employed on your vessel at any one time? -- For example, if you employed one steerman, you would answer two (2). \_\_\_\_\_  
 D. FUEL: Total gallons of fuel used for the year while fishing: Gasoline: \_\_\_\_\_ Diesel: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
 Knowingly falsifying any information contained within this report constitutes the act of perjury and may result in a fine, imprisonment or loss of license (MGL, Chapter 130, Sections 2, 21, 33).

PLEASE COMPLETE AND SUBMIT WITH PERMIT RENEWAL



# Trip-level gear throughput model

Variable

Search time

Haul time

Deployment time

Transit time

Unloading time

Trip duration

Day trip?  
Multiday trip?

Outcome

Gear hauled



# How to scale up

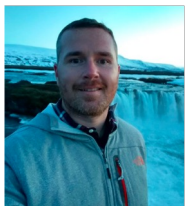
## Tasks

- Develop model vessels
- Develop net revenue functions
  - Per model vessel class
  - Sensitive to on-demand gear for harvest/cost/effort
- Identify scenarios
- **Estimate economic impact of scenarios**
- **Account for uncertainty**
- **SK Southeast Black Sea Bass**





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Thank you

