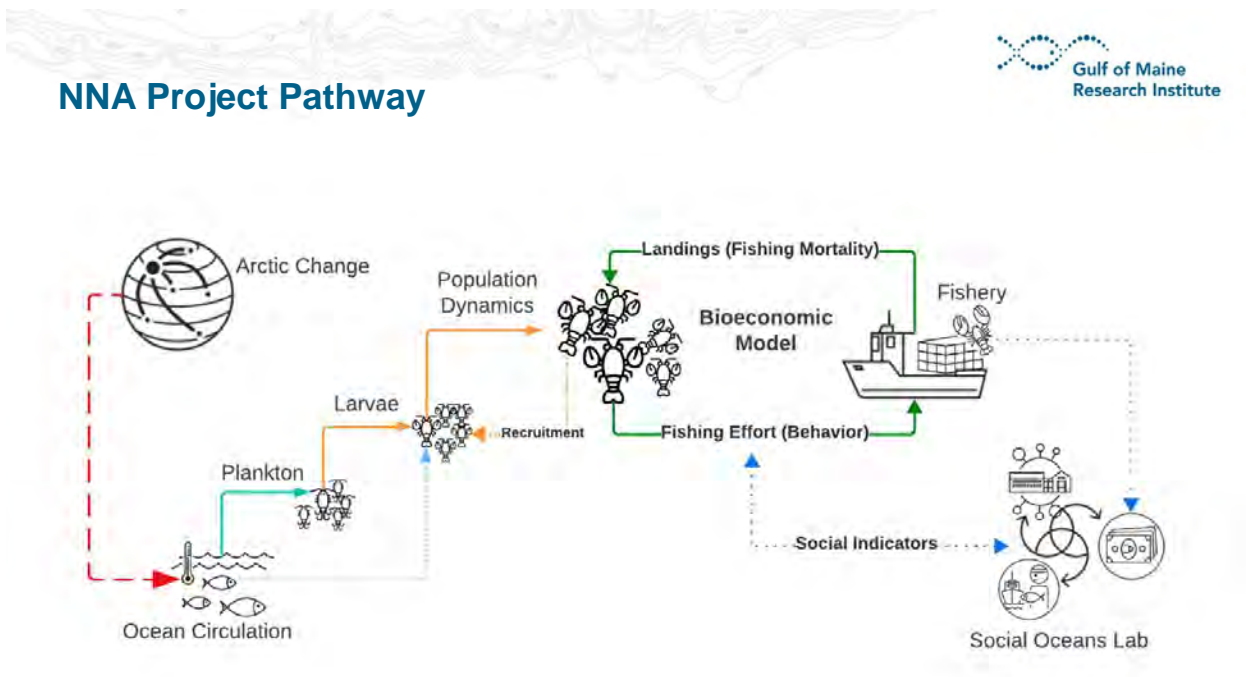


Fuzzy Cognitive Mapping (FCM) Mental Models for Lobster Fishery Agent Based Model (ABM)

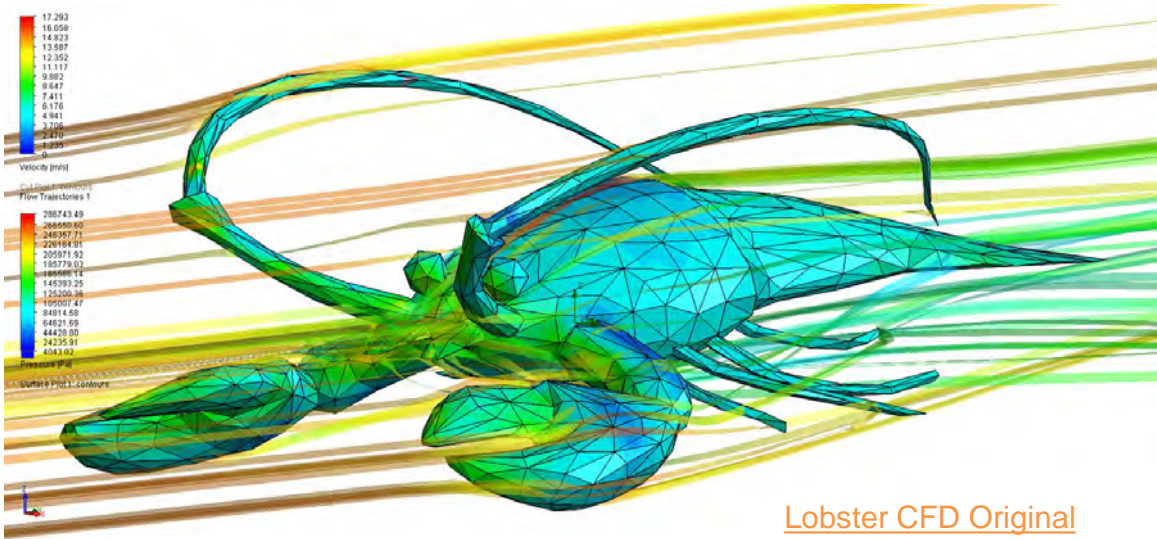
NSF NNA All Hands Meeting Update 11/21/2024
Jay Kim | Kanae Tokunaga

1



2

Lobster Fishery Simulation

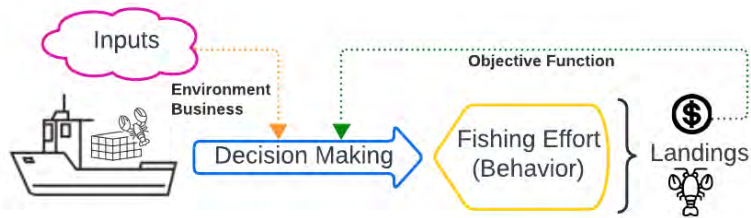


Lobster CFD Original

3

Lobster Fishery Decision Making

Complex feedback of decision making and human behavior that manifests as *fishing effort*



Scaled up to # active vessels, per region, per month, over years

4

Fuzzy Cognitive Mapping (FCM)



Mental Models of lobster fisher decision making concerning lobster fishing

“What are the important factors (variables) that influence the decisions you make when you go fishing (fishing behavior)?”

“What changes (in self or environment) need to happen in order for you to change your behavior (make different decisions)?”

- Daily fishing decision on the water
- Long term business strategies
- Priorities and trade-offs
- Key variables and points of change

- participatory learning and mapping method
- *Semi-quantitative* metrics from *qualitative variables*
- Structured or open ended *group discussion* and *collective learning*

5

Focus Group and Individual Interviews



Semi-structured, using *Mental Modeler*

- **NNA All Hands**; Nov 21, 2024; *Portland, ME, USA*
 - Practice Focus Group
- **Lobster Town Meeting**; Jan 28, 2025; *Bar Harbor, ME, USA*

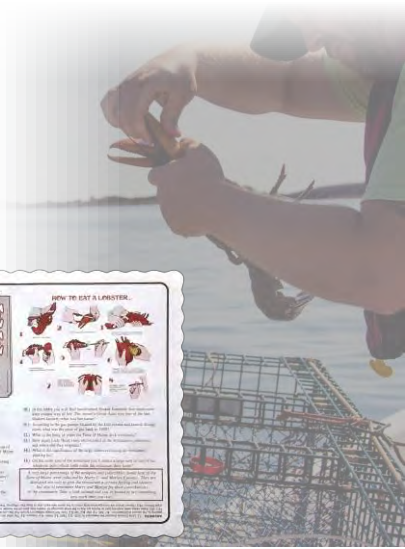
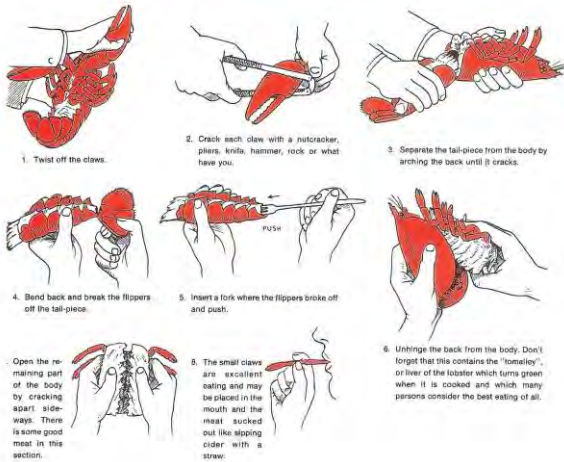
Engagement during

- **CLRN Annual Meeting**; Dec 18, 2024; *Moncton, NB, CA*
- **Maine Fishermen’s Forum**; Feb 28, 2025; *Rockland, ME, USA*

6

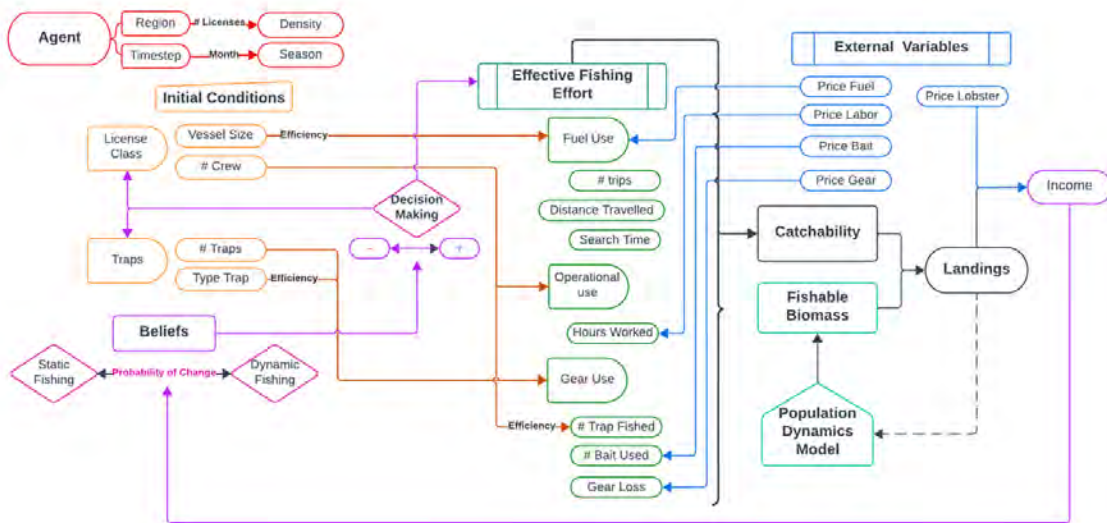
NNA All Hands Practice Focus Group

How To Eat a Maine Lobster



9

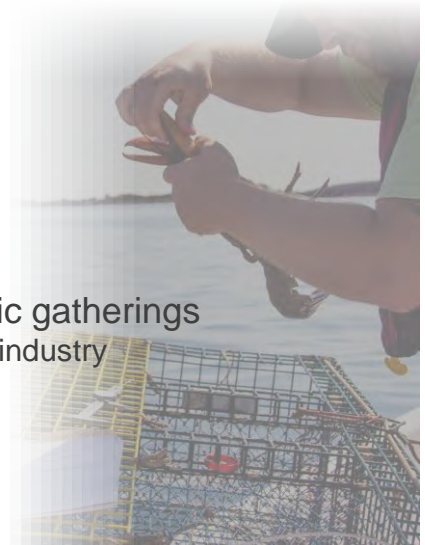
Lobster ABM Framework (preliminary)



10

Follow-up Industry Survey

- For parameterization of variables
 - Direction and scale of change in behavior
 - Weights of variables
 - Capture larger patterns of behavior in industry
- Broad survey - rely on network partners
 - ALI
 - CLRN
- Research meetings, industry meetings, public gatherings
 - Opportunities to build network and buy-in from industry
 - Industry participation in research



11

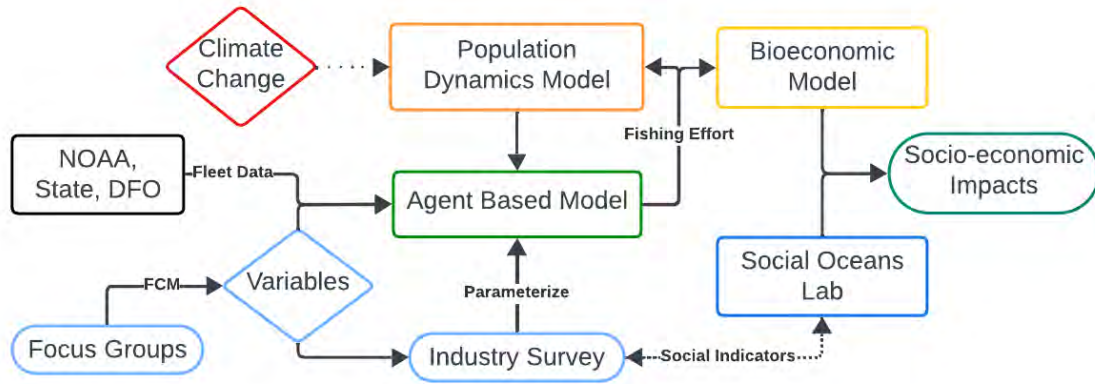
Project Timeline

11	12	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	
		Data Collection • Lobster Town Hall • Fishermens Forum						ABM vs 1										ABM vs 2		
		Data Analysis									Survey Prep				Data Analysis					



12

Concept Summary



jkim@gmri.org | jaeheon.kim@maine.edu | ktokunaga@gmri.org