Sea Grant’s
American Lobster Initiative

Addressing critical knowledge gaps about the American lobster and its iconic fishery in a dynamic and changing environment
American Lobster Initiative
The American lobster supports one of the largest and most economically valuable single-species fisheries in the United States.1 From harvesters and dealers to the restaurant and tourism sectors, thousands of people across the Northeast depend on a healthy and prosperous lobster fishery.

The American lobster’s ocean habitat, however, is changing drastically. Rising ocean temperatures are a major concern for the growth and survival of lobsters. Changes in the food web, ocean chemistry (ocean acidification), and available habitat present additional challenges. The Sea Grant American Lobster Initiative (ALI) is working to better understand how these changes affect the American lobster and its iconic fishery. The ALI’s long-term goal is to increase the industry’s resilience to new challenges through collaborative research.

Funded by the National Oceanic and Atmospheric Administration’s National Sea Grant College Program, the ALI has two components — the American Lobster Research Program and the Northeast Regional Lobster Extension Program. Together, the programs discover and share new knowledge with industry members and resource managers from Maine to New York.

ALI by the numbers
The National Sea Grant Program has invested more than $8 million in the ALI:

$2 million each year, from 2019–2022
$6.5 million to fund 24 research projects
$1.5 million to fund Sea Grant extension projects in six states

The American Lobster Initiative has engaged more than:

40 contributing institutions
60 researchers
25 graduate and undergraduate students
20 industry and management partners
20 Sea Grant professionals


Research
From New England to Downeast Maine, the environmental conditions that influence how lobsters grow and where they go are dynamic and changing quickly. Understanding the rate and scale of these changes is important for fisheries management. The ALI is also supporting research to help lobstermen prepare for changes in regulations.

The National Sea Grant Office is currently funding 24 research projects to help us better understand:

Lobster biology and ecology
- Growth, maturation, larval development, and impacts of ocean acidification;
- Distribution and abundance, including ecosystem shifts; and
- Interactions with other species.

Lobster fishery management and technology
- Socio-economic lessons learned from the southern New England stock decline;
- Development of gear technology;
- Barriers to bringing gear to commercial scales; and
- Bait alternatives.

The ALI supports teams of researchers and research partnerships between state agencies, academia, and industry. The Research Program priorities are informed by listening sessions with regional fishing industry partners; state and federal fisheries managers; and university, state, and federal fisheries researchers.

Extension
Sea Grant extension programs in six Northeast states work together to support and enhance the American Lobster Research Program. Extension agents ensure that industry and management partners across the region have the opportunity to contribute to and benefit from ALI research. Through industry interviews, social science efforts, stakeholder meetings, and multimedia science communication products, extension agents work to expand awareness of the effects of biological, social, and environmental change on lobster and its fishery. Broadly, the Extension Program aims to:

- Increase understanding of biological, economic, and social impacts of ecosystem change in the region;
- Identify attributes of a resilient lobster industry;
- Identify research, technical assistance, and outreach needs; and
- Increase opportunities for cross-sector collaboration.

The ALI Extension Program strives to be nimble and respond to emerging lobster-related issues and challenges.
American Lobster Initiative Research and Extension Projects

**Projects**

- **Connecticut Sea Grant** (Conception), **2019** • Sea Grant Northeast Regional Lobster Extension Program: Connecticut

- **Maine**
  - Gulf of Maine Research Institute (Mills), **2019** • Resilience, adaptation, and transformation in lobster fishing communities
  - Gulf of Maine Research Institute (Tokunaga), **2019** • Fish less, earn more: assessing maximum economic yield effort levels in Gulf of Maine’s lobster fishery
  - Maine Sea Grant (Harrington), **2019** • Sea Grant Northeast Regional Lobster Extension Program: Maine
  - University of Maine (Brady), **2019** • Projecting climate-related shifts in American lobster habitat and connectivity
  - University of Maine (Wahle), **2019** • Linking the Gulf of Maine pelagic food web to lobster recruitment dynamics

- **Wells National Estuarine Research Reserve** (Goldstein), **2019** • Potential Influence of increased water temperatures on the distribution of female American lobsters and shifts in larval recruitment

- **Department of Marine Resources** (Waller), **2020** • Testing and developing effective non-invasive female maturity assessment methods and protocols

- **Gulf of Maine Research Institute (Mills), 2020** • Understanding and improving spatial distribution projections for lobster

- **University of Maine (Golet), 2020** • Incorporating changes in thermal habitat and growth to improve the assessment of American lobster stocks and spatial distribution

- **University of Maine (Stoll), 2020** • Defining indicators of resilience in the American lobster fishery

- **Department of Marine Resources** (Staples), **2022** • Integrating and evaluating non-traditional gear technologies to reduce the risk to whales from fixed-gear fisheries

- **Gulf of Maine Lobster Foundation (Pelletier), 2022** • Providing the lobster industry new gear technology in response to regulatory and environmental changes

**Massachusetts**

- **Massachusetts Division of Marine Fisheries** (Pugh), **2019** • Growth in large offshore lobsters: addressing a critical data gap in the US Lobster Stock Assessment

- **Woods Hole Sea Grant** (Rheuban), **2019** • Sea Grant Northeast Regional Lobster Extension Program: Massachusetts

- **Massachusetts Department of Fish and Game** (Pugh), **2020** • Understanding the cause of low dissolved oxygen in Cape Cod Bay and initiating a hypoxia warning system for the lobster fishery

- **University of Massachusetts (Jordaan), 2020** • Bait alternative development and future visioning in the New England lobster fishery

- **Woods Hole Oceanographic Institution** (Pineda), **2020** • Surface convergences: a critical pelagic microhabitat for American lobster postlarvae?

**New Hampshire**

- **New Hampshire Sea Grant** (Bradt), **2019** • Sea Grant Northeast Regional Lobster Extension Program: New Hampshire

- **Atlantic Offshore Lobstermen’s Association** (Henninger), **2020** • Assessing the broad-scale distribution and abundance of lobster larvae and their potential food sources

- **New Hampshire Fish and Game** (Carlton), **2021** • The influence of season and temperature on the distribution and abundance of juvenile lobsters

**New York**

- **New York Sea Grant** (Clemenson), **2019** • Sea Grant Northeast Regional Lobster Extension Program: New York

- **Stony Brook University** (Chen), **2021** • How warming waters could change the American lobster stock dynamics under different management regulations

**Rhode Island**

- **Rhode Island Sea Grant** (Cygler), **2019** • Sea Grant Northeast Regional Lobster Extension Program: Rhode Island

- **University of Rhode Island** (Collie), **2020** • Early life history of American lobsters in coastal southern New England waters

**Virginia**

- **Virginia Institute of Marine Sciences** (Rivest), **2019** • Effects of multiple stressors on American lobster reproduction, egg development, and emerging larvae

**Northeastern University** (Grabowski), **2021** • Investigating the impacts of range-expanding species to the American lobster fishery

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For additional information on the ALI, questions, or comments, please contact Amalia Harrington (amalia.harrington@maine.edu), the Northeast Regional Lobster Extension Program Coordinator based at Maine Sea Grant.