

A Climate of Change:

Preparing for an uncertain fishing future by bringing communities together with climate and marine scientists to understand predictive capabilities and information needs



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Photo credit: Joel Woods

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Community
Development

Economic
Development

Marine
Programs

Education
Programs

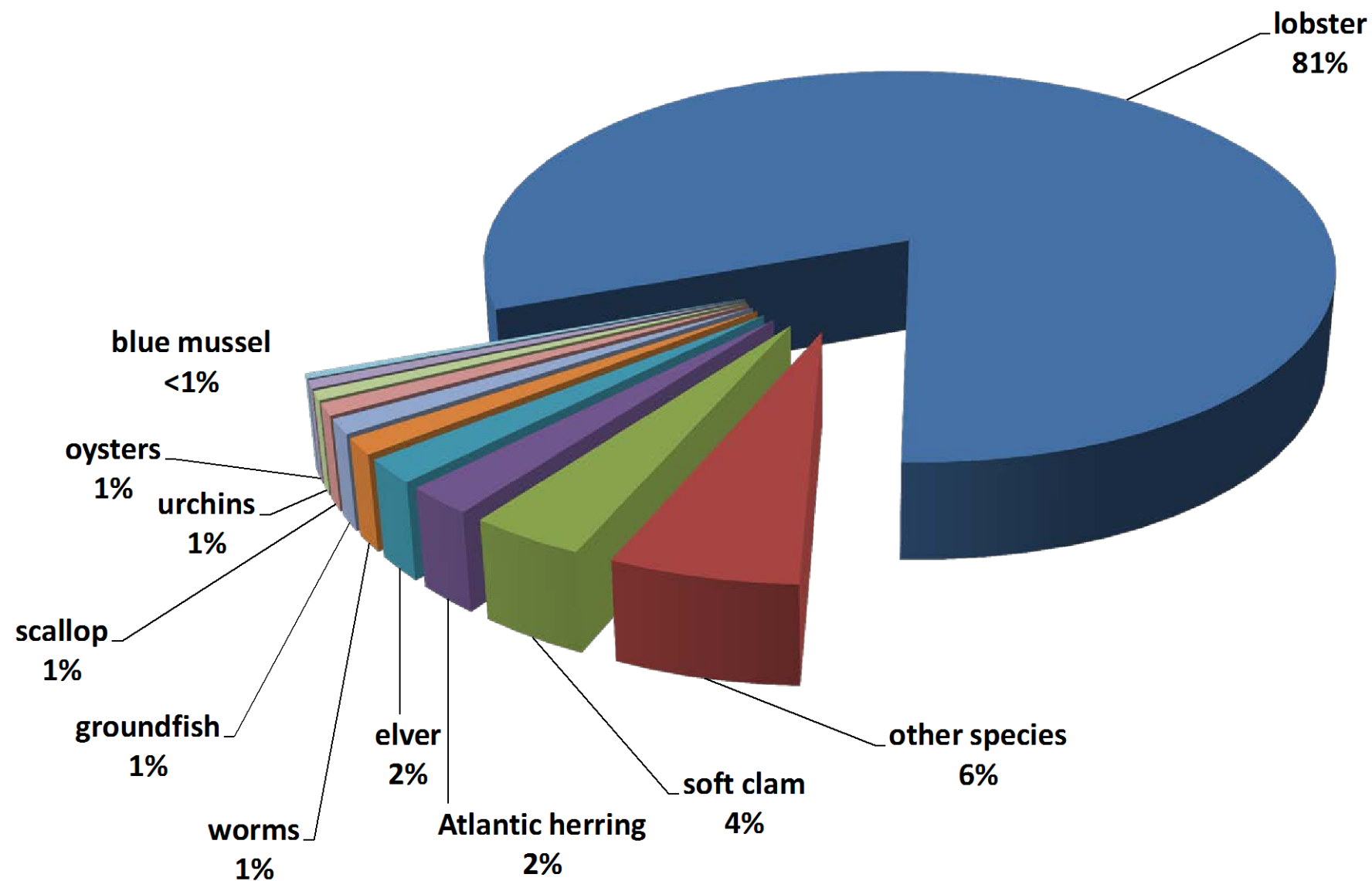
Community
Energy

Media



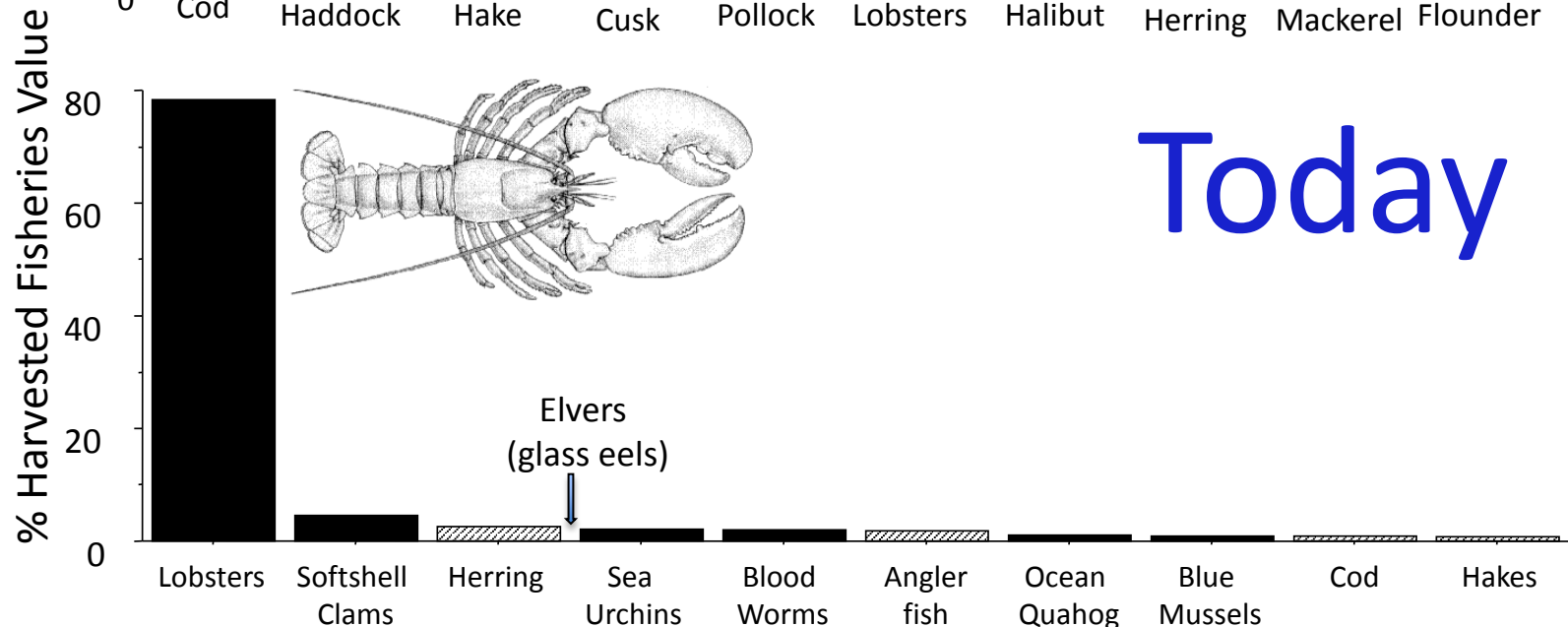
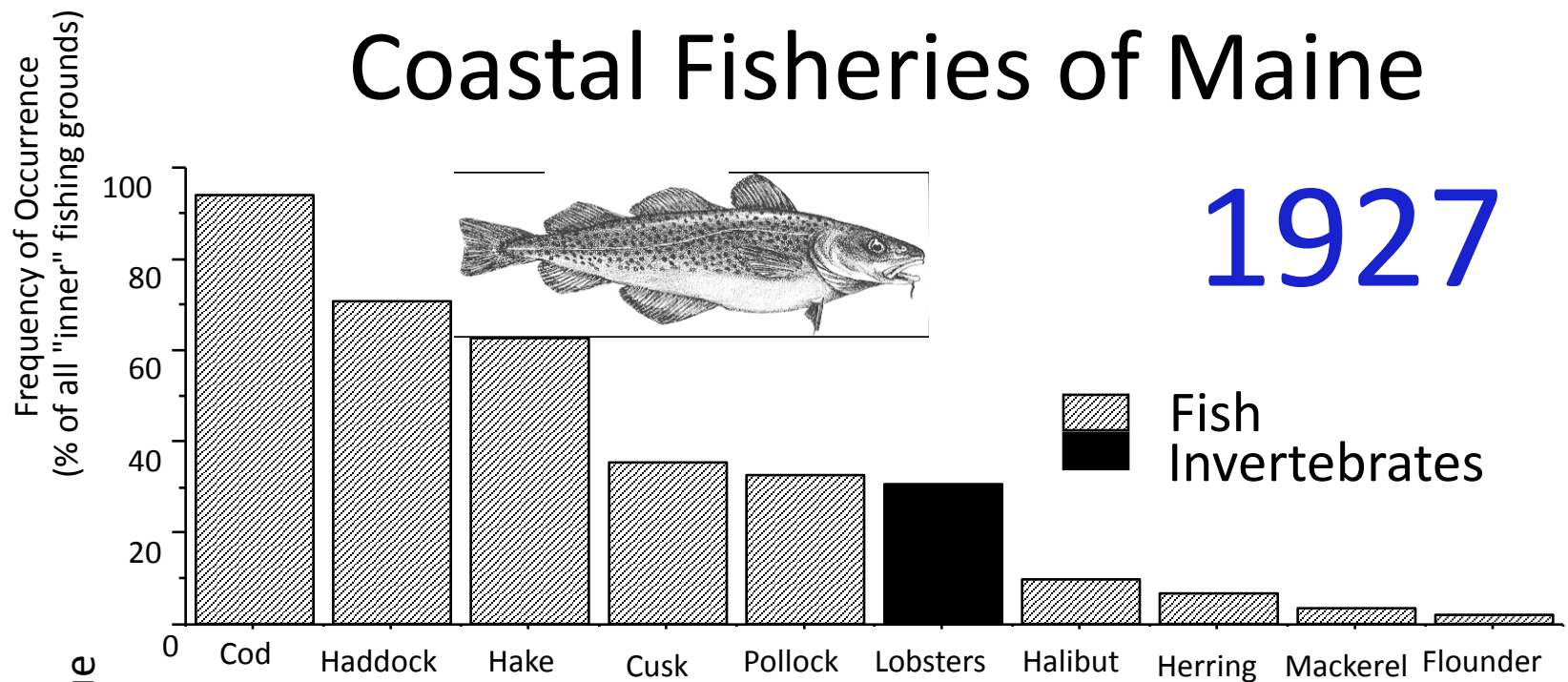
Preliminary 2015 Commercial Maine Landings By Ex-vessel Value

Total: \$616,522,118 as of 2/19/16



Coastal Fisheries of Maine

1927



Today

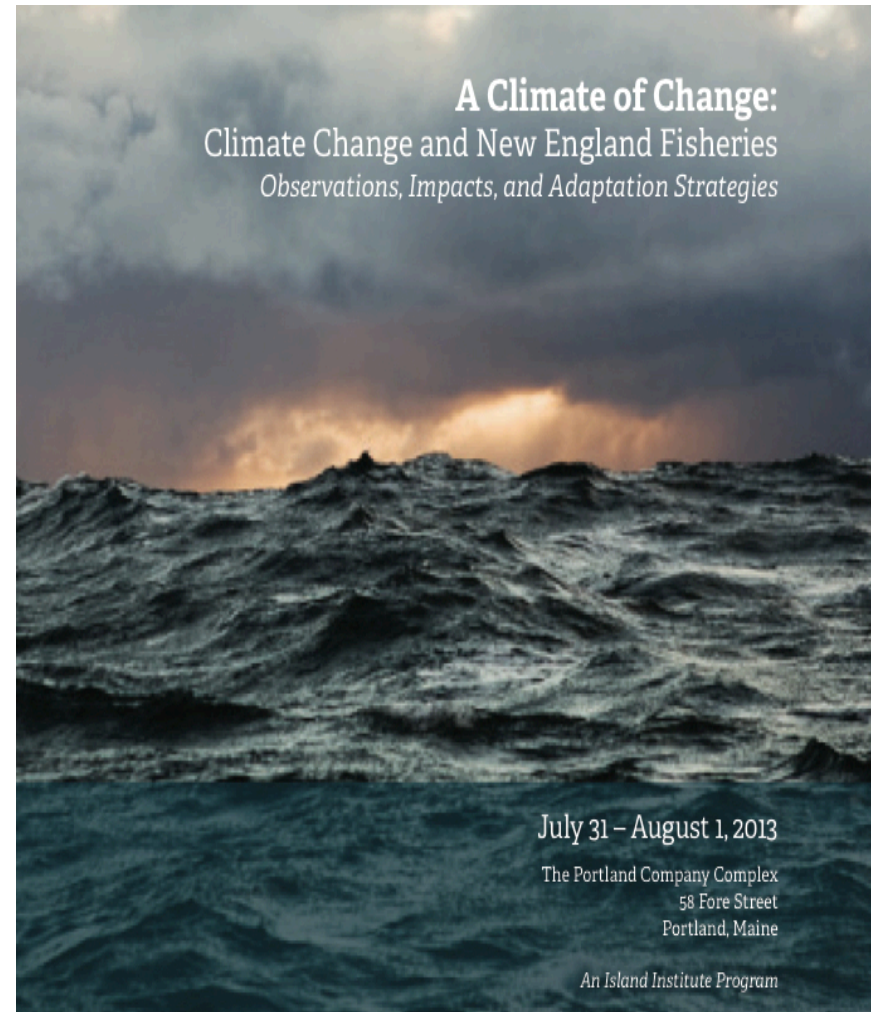
Harvested Species



Photo credit: Joel Woods

A Climate of Change- workshop series

- Hosted the 1st *Climate of Change* workshop in Portland on July 31 & Aug. 1, 2013



Experts call for greater urgency in adapting fisheries management to climate change

August 1

Message to Maine fishermen: Adapt to climate change

By Kirsten Sylvain, Special to BDN
Posted Aug. 02, 2013, at 9:38 a.m.

PORTLAND, Maine — John Bullard, northeast regional administrator of the National Oceanic and Atmospheric Administration Fisheries, sees climate change as not just a cause for immediate alarm, but also an opportunity.

"A crisis is a horrible thing to waste. It looks like a normal day out there, but it's not — it's not normal," Bullard said Thursday during the second day of the two-day first-ever Climate of Change conference, organized by the Rockland-based Island Institute, on the Portland waterfront.

OCEANS: Maine fishermen fear warmer waters spell 'beginning of the end' for lobster catch *(Tuesday, September 3, 2013)*

Elizabeth Harball, E&E reporter

Portland symposium highlights climate change

Conference looking at climate change, coastal industries

UPDATED 8:47 PM EDT Jul 31, 2013

Marine experts: Gulf of Maine has become a cod-forsaken place, endangering all fisheries

August 1

More than climate seen threatening Maine fisheries

Scientists at a Portland symposium say further study is needed to determine what is causing problems in the ocean.

By North Cairn ncairn@pressherald.com



By Seth Koenig, BDN Staff

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Posted July 31, 2013, at 4:43 p.m.

Preparing for an Uncertain Fishing Future:

Bringing communities together with climate and marine scientists
to understand predictive capabilities and information needs

A workshop in the Island Institute's *Climate of Change* series, December 18, 2014

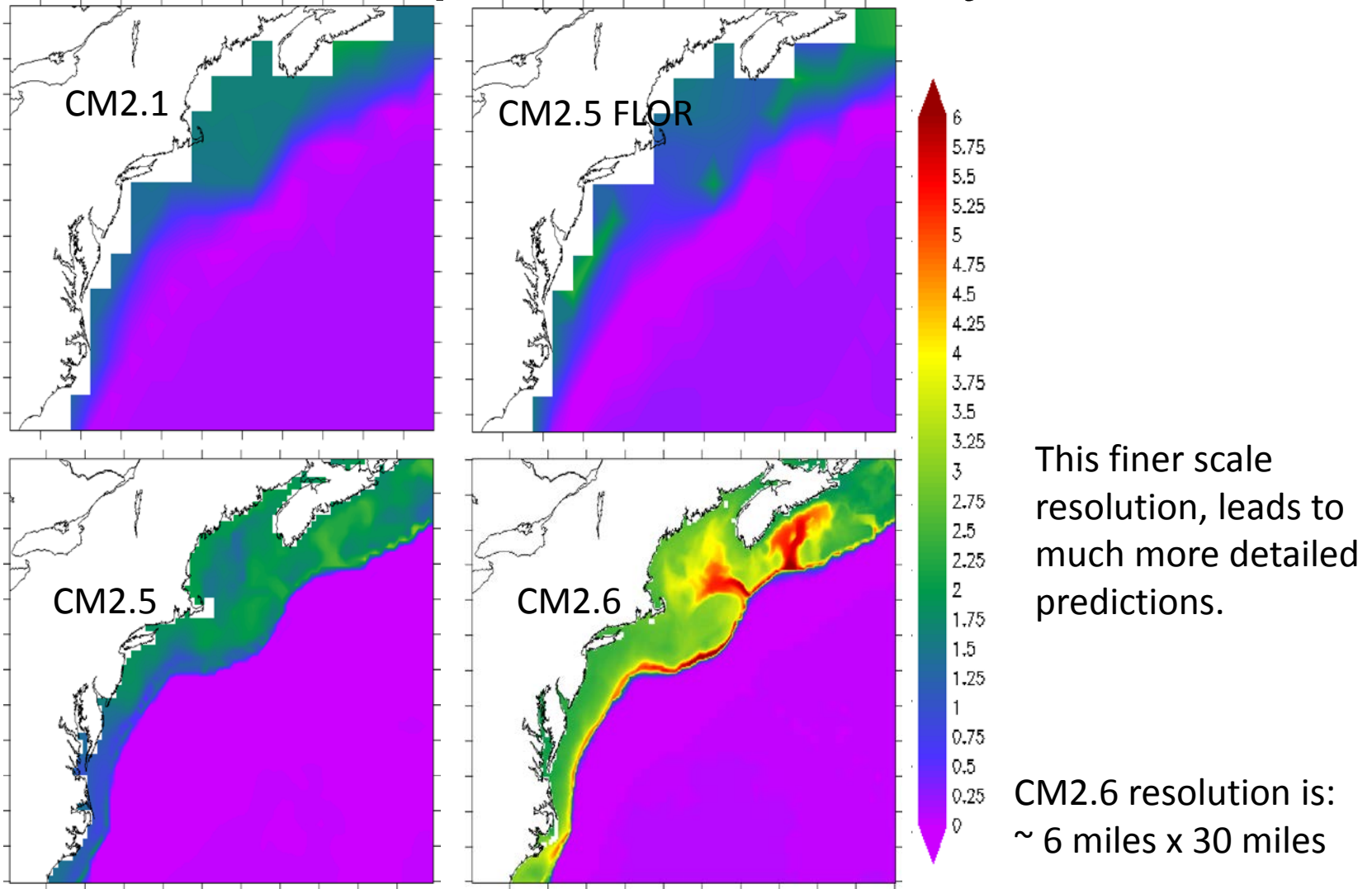
Organized by the Island Institute and co-hosted with Maine Coast Fishermen's Association, Maine Lobstermen's Association, and Cape Cod Commercial Fishermen's Alliance. Facilitated by Laura Taylor Singer, SAMBAS Consulting LLC

Overview of the Workshop

Maine's fishermen make investments in their communities and businesses every season. Because fishermen are keen observers of the natural world, they regularly make business decisions based on shifting environmental conditions. However, the Gulf of Maine is changing at a rapid rate and in ways never before seen by today's fishermen. Seasonal forecasting and longer-term projections can suggest time frames over which changes may occur. While we know that these projections will not be able to 'predict' the future, through an understanding of likely future conditions in the Gulf of Maine they can provide insights relevant to the business decisions that people are making today.

The "Predictive Capabilities Workshop" brought together a diverse group of climate and marine scientists, fishermen, and other marine stakeholders to provide practical links between current climate projection work and the real world issues facing Maine's fishermen and coastal communities. Participants learned about climate models and other forecasting methods and also heard perspectives about the issues facing fishermen as they adapt to future changes in the Gulf of Maine (GOM).

Sea Surface Temperature ~ 2.5 to 3.5 °C & Bottom Temp. ~ 3 to 6 °C by 2080



Bottom Temperature – Projection (1% CO₂ per year);
Years (61-70) – (1-10)

Gulf of Maine Lobster Forecasting

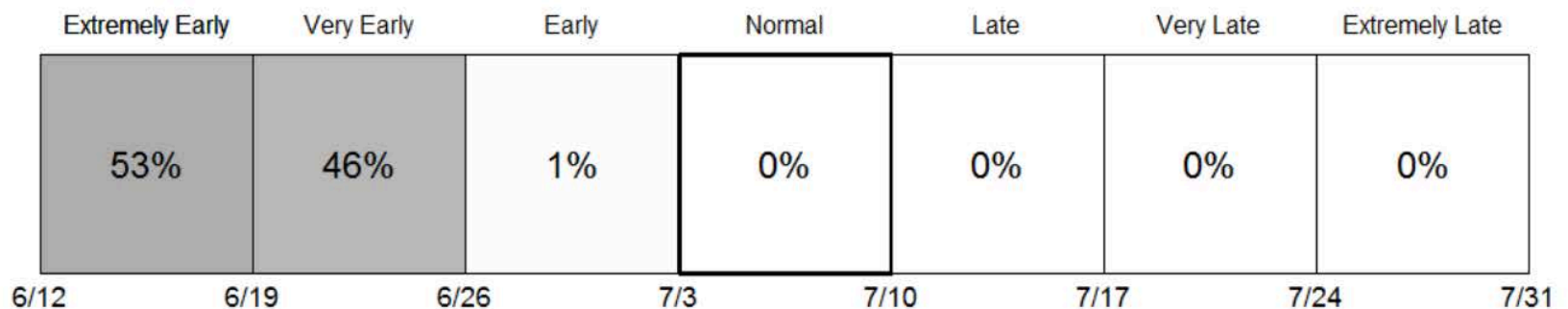
Project Overview

We are forecasting the timing of when the Maine lobster fishery will shift into its high-landings mode for the summer. Our goal is to provide 2-3 months advance notice of this uptick so that the lobster industry can prepare appropriately for the high-landings period.

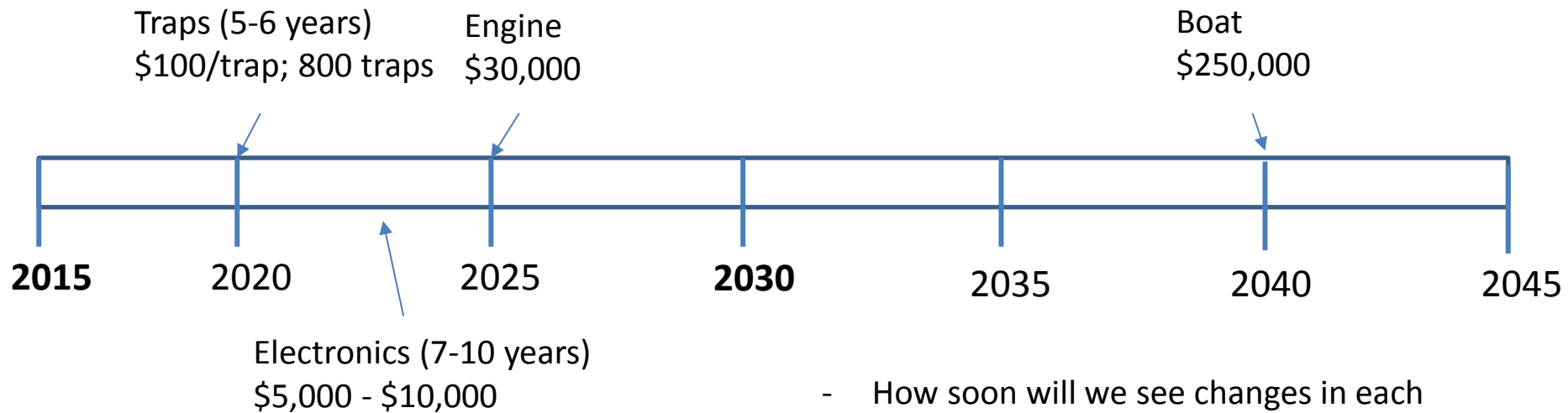


2016 Forecast

March 16 Forecast



Fishermen's Decision-Making Timelines



- How soon will we see changes in each fishery?
- How and when is OA going to impact lobster?
- Which species are coming? When?
- What is the plan for licensing new fisheries?

Envisioning the Gulf of Maine in 2030

Climate

- Warmer
- Fresher
- More precipitation
- Sea level rise and erosion
- Stronger storms
- Acidification
- More stratified?

Ecosystem

- Less lobster in southern Maine
- New fishery species from south
- Predator-prey changes
- Primary production changes
- More invasive species
- More disease
- Different marine mammals
- OA impacts

Fisheries

- Rapid response capability
- Ecosystem-based management
- Migration of permits
- Larger vessels going further offshore
- Merge regional councils
- Negotiations between states & with Canada
- Conflicts for ocean space due to more ocean energy, shipping, cruise traffic, aquaculture, sand & gravel mining, oil drilling

Incorporating Climate and Community into Regional Ocean Planning

NORTHEAST OCEAN DATA

Maps and data for ocean planning in the northeastern United States

[HOME](#) [MAPS »](#) [DATA »](#) [ABOUT »](#)



HUMAN DIMENSIONS



AQUACULTURE



RECREATION



COMMERCIAL FISHING



MARITIME COMMERCE



ENERGY



CULTURE

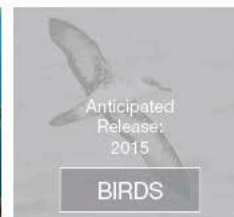
MARINE LIFE



MAMMALS & TURTLES

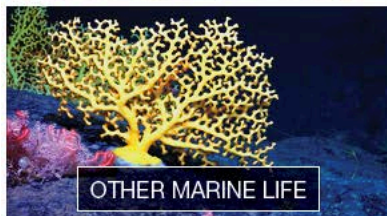


FISH & SHELLFISH

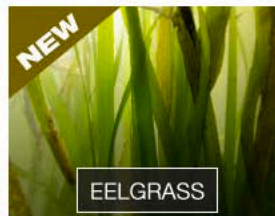


Anticipated
Release:
2015

BIRDS



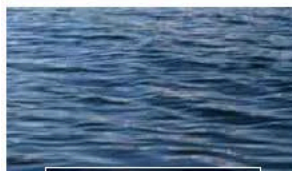
OTHER MARINE LIFE



NEW

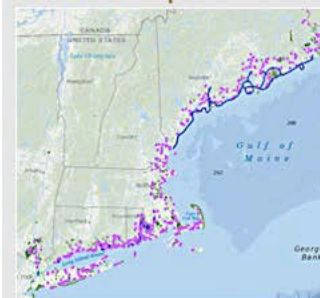
EELGRASS

ENVIRONMENT



Anticipated
Release:
Winter 2015

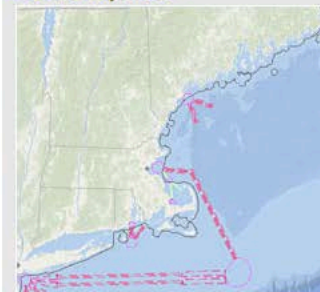
Featured Map



Recreation Areas

Boat launches, water trails, beaches, parks, nature preserves, and other recreation areas.

Data Explorer



LAUNCH THE DATA EXPLORER

The [Data Explorer](#) provides maps of all available datasets. Any combination of data can be viewed on a single map.

What's Next?

Northeast Ocean Data adds data, maps, and website enhancements on a rolling basis. Find out what's currently in development.

Thank you.

www.IslandInstitute.org/climateofchange

Questions?



A Climate of Change- video series

Short documentaries on the impacts of climate change and ocean acidification on fishing communities- <http://www.islandinstitute.org/program/marine-programs/climate-change>

Part 1: Warming waters in the Gulf of Maine

Part 2: Ocean acidification in Alaska

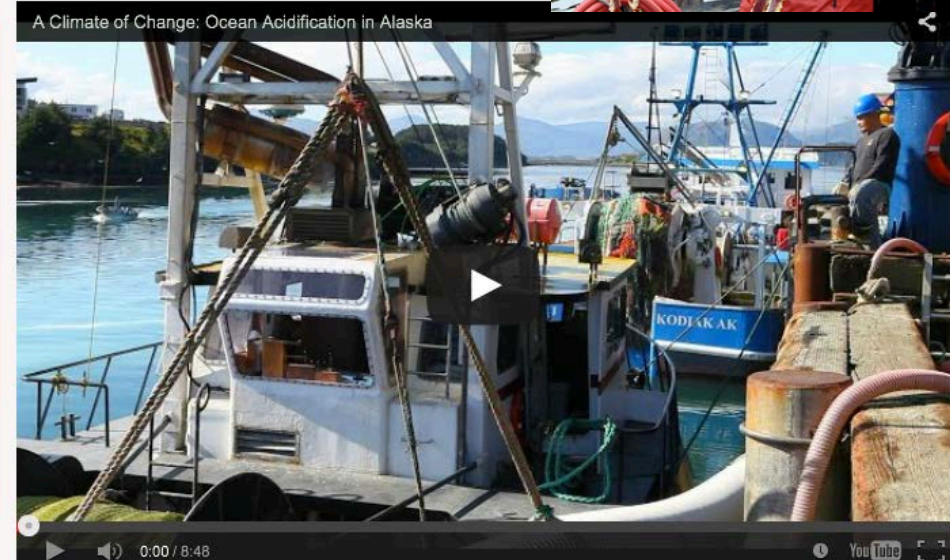
PART 1: WARMING WATERS IN THE GULF OF MAINE

Scientists, managers, and fishermen have all begun to discuss how we can and should be planning for the inevitable, but unpredictable, climate impacts on the marine ecosystem.



PART 2: OCEAN ACIDIFICATION IN ALASKA

Ocean acidification is a global problem, but its impact Arctic. The state of Maine is looking towards Alaska and experiences of fishermen there.



A Climate of Change- video series

Short documentaries on the impacts of climate change and ocean acidification on fishing communities- <http://www.islandinstitute.org/program/marine-programs/climate-change>

Part 3: Fisheries collapse and adaptation in Appalachicola oyster fishery

PART 3: COLLAPSE AND ADAPATATION IN THE APALACHICOLA OYSTER FISHERY

In early 2014, Mainers traveled to Appalachicola, Florida, once home to one of the most valuable oyster fisheries in the country, to see what happens when a fishery collapses completely and what the community is doing to adapt and revitalize itself.



Part 4: The future of shellfish and seaweed aquaculture in Maine

Not yet available online



Gulf of Maine Sea Surface Temperature:

Since 1982:
~1°C every 40 years

Since 2004:
~1°C every 4 years

