Maine Climate Council Meeting

Council Co-Chairs:
Commissioner Melanie Loyzim &
Director Hannah Pingree

GOVERNOR'S OFFICE OF
Policy Innovation and the Future

MAINE DEPARTMENT OF
Environmental Protection

September 29, 2023

Governor Janet T. Mills

Maine Climate Council Meeting | September 29, 2023

Governors, Biden Administration Push to Quadruple Efficient Heating, AC Units by 2030

Maine Climate Council created by LD 1679

Governor's Bill sponsored by Senator David Woodsome overwhelming bipartisan support, signed June 2019

Maine Climate Council Members

Co-Chairs:

Hannah Pingree, Director of the Governor's Office of Policy Innovation and the Future

Melanie Loyzim, Commissioner of the Department of Environmental Protection

Members of the State Legislature:

Representative Christopher Kessler (D)

Representative Nathan Carlow (R)

Senator Stacy Brenner (D)

Senator Matt Harrington (R)

Representative of Maine's Tribes:

Ambassador Maulian Bryant, Penobscot Nation

Members of the Executive Branch, or their designees:

Amanda Beal, Commissioner of the Department of Agriculture, Conservation and Forestry

Dan Burgess, Director of the Governor's Energy Office

Judy Camuso, Commissioner of the Department of Inland Fisheries and Wildlife

Major General Doug Farnham, Commissioner of the Department of Defense, Veterans and Emergency Management

Kirsten Figueroa, Commissioner of the Department Administrative and Financial Services

Laura Fortman, Commissioner of the Department of Labor

Heather Johnson, Commissioner of the Department of Economic and Community Development

Patrick Keliher, Commissioner of the Department of Marine Resources

Pender Makin, Commissioner of the Department of Education

Bruce Van Note, Commissioner of the Department of Transportation

Jeanne Lambrew, Commissioner of Department of Health and Human Services

Maine Climate Council Members

Members of Quasi-Government Agencies:

Dan Brennan, Executive Director of the Maine State Housing Authority

Michael Stoddard, Executive Director of Efficiency Maine Trust

Members Representing Environmental Nonprofit Organizations or Foundations:

Alexander Buck, President, Horizon Foundation

Kate Dempsey, Maine State Director for The Nature Conservancy

Members with Expertise in Climate Change Science

Susie Arnold, Marine Scientist, Island Institute

Ivan Fernandez, Distinguished Professor at the University of Maine's Climate Change Institute & School of Forest Resources

Members with Expertise in Resilience, Climate Change Adaptation, Emergency Management, or Disaster Risk Reduction

Amy Landry, Executive Director of the Androscoggin Valley Council of Governments

Jay Kamm, Senior Planner, Northern Maine Development Commission

Maine Climate Council Members

Other Members

Noël Bonam, AARP Maine

Jessie Perkins, Executive Director of the Bethel Chamber of Commerce

Expert on State's Energy Sector: Ken Colburn

Representative of Municipal Government: Gary Lamb, City Manager, City of Hallowell

Representative of Small Business: Daniel Kleban, Owner of Maine Beer Company

Representative of Agriculture: Melissa Law, Owner of Bumbleroot Organic Farm in Windham

Representative of Building and Construction Trades: Matt Marks, Associated General Contractors of Maine

Representative of Manufacturing Industry: Jim Brooks, Environmental Manager for Sappi North America

Representative of Marine Fisheries: Bob Baines, Board Member, Maine Lobsterman's Association

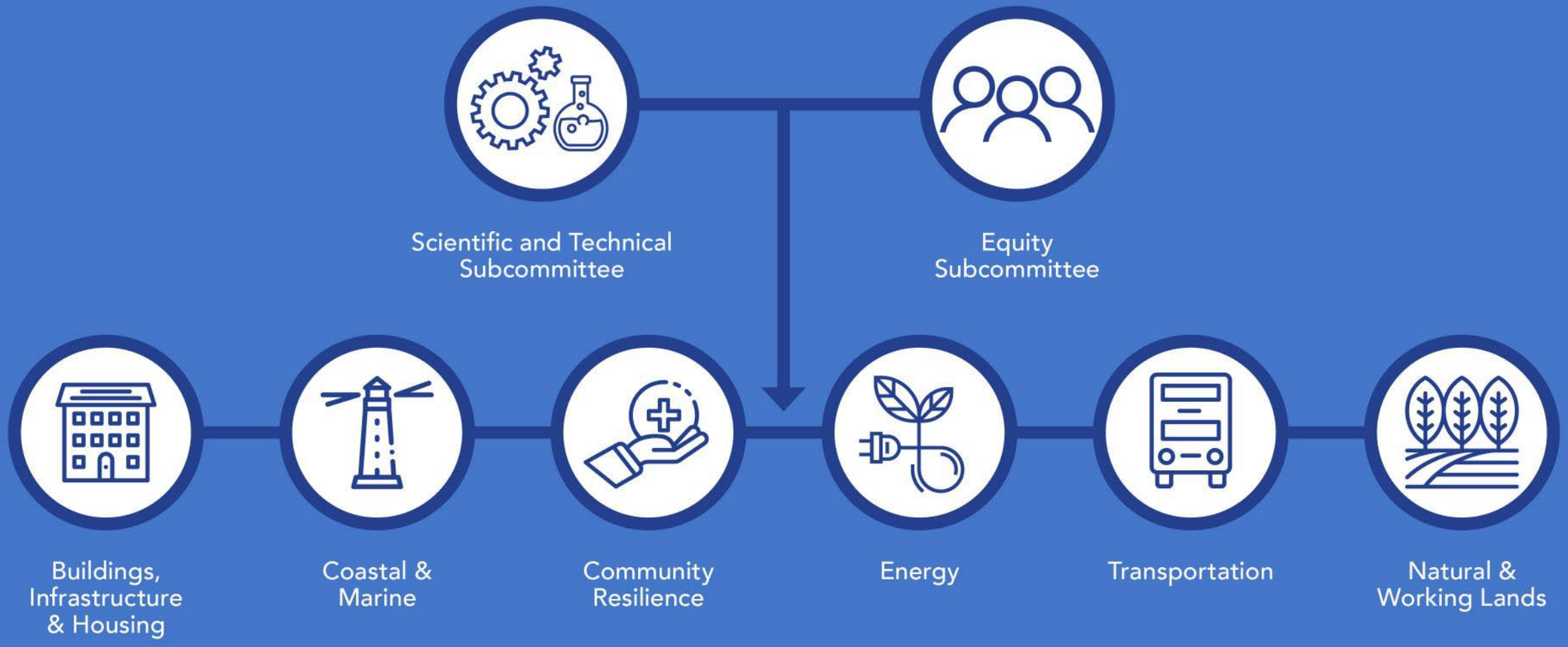
Representative of Large Business: Todd Bullen, Vice President of Retail Operations, Hannaford Supermarkets

Representative of Labor: Francis Eanes, Executive Director of the Maine Climate Labor Council

Representative of Forest Industry: Patrick Strauch, Executive Director of the Maine Forest Products Council

Representative of Maine Youth: Amara Ifeji, Maine Environmental Education Association

Maine Climate Council



MEETING AGENDA

9:10 a.m.
Welcome & Overview of Maine Won't Wait and Kick-Off of the next Maine Climate Council Planning Process

9:30 a.m.
State of the Climate in Maine: Presentation by the Scientific and Technical Subcommittee Co-chairs

10:10 a.m.
When Climate Comes Home: The Importance of Engaging Youth About Climate Impacts in Their Communities

10:30 a.m. BREAK

10:45 a.m.
How Climate Solutions are Creating Economic and Workforce Opportunities in Maine

11:00 a.m.
Panel: Mainers on the Frontlines of Climate Action

11:40 a.m.
Communities Leading on Climate: Community Resilience Partnership Overview and Future Steps

12:00 p.m. LUNCH

1:00 p.m.
Overview of the Upcoming Climate Action Planning Process

1:20 p.m.
Working Group Presentations

2:25 p.m.
Next Steps and Adjournment

2:30 p.m.
Optional: Working Group Introductory Meet-and-Greet Sessions

3:00 p.m.
End

CLIMATE COUNCIL GOALS

12.01.24
Updated Climate Action Plan Due

Achieve State Carbon Neutrality by
2045

Reduce Maine's Greenhouse Gas Emissions by Targets Outlined in State Law

45%
BELOW 1990 LEVELS BY 2030

80%
BELOW 1990 LEVELS BY 2050

ENSURE MAINE PEOPLE, INDUSTRIES, AND COMMUNITIES ARE RESILIENT TO THE IMPACTS OF CLIMATE CHANGE.

49%

21%

12%

12%

5%

TRANSPORTATION • RESIDENTIAL • COMMERCIAL • INDUSTRIAL • ELECTRIC POWER

Data source: Maine Department of Environmental Protection 9th Biennial Greenhouse Gas Emissions Report.
International bunker fuels (1%) are not depicted in the graphic above.

In Maine, most carbon dioxide emissions from fossil fuel combustion come from transportation, followed by residential, commercial and industrial sources.


A FOUR-YEAR PLAN FOR CLIMATE ACTION
MAINE
WON'T WAIT
DECEMBER 2020
MAINE CLIMATE COUNCIL

"*Maine Won't Wait* demonstrates the importance of planning in ensuring programming and policy decisions move the needle toward a more resilient future."

Maine's 4 Climate Action Plan Goals

1. Reduce Maine's greenhouse gas emissions
2. Make Maine more resilient to the impacts of climate change
3. Foster economic opportunity and prosperity
4. Advance equity through Maine's response

Maine’s 8 Climate Action Strategies

Embrace the Future of Transportation in Maine

Modernize Maine's Buildings

Reduce Carbon Emissions in the Energy and Industrial Sectors through Clean Energy Innovation

Grow Maine’s Clean Energy Economy and Good Jobs

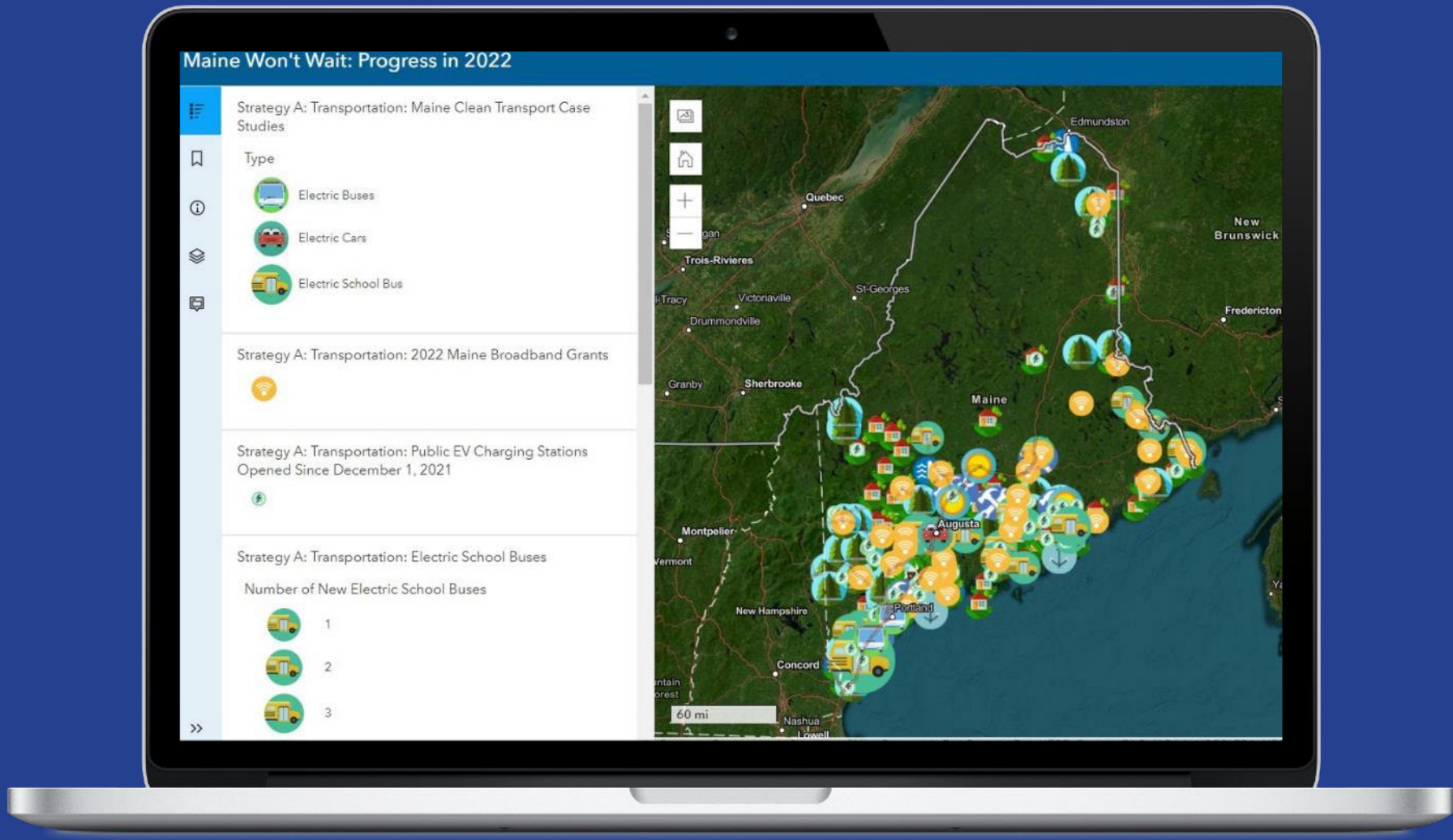
Protect Maine’s Environment and Working Lands and Waters, Increase Carbon Sequestration

Build Healthy and Resilient Communities

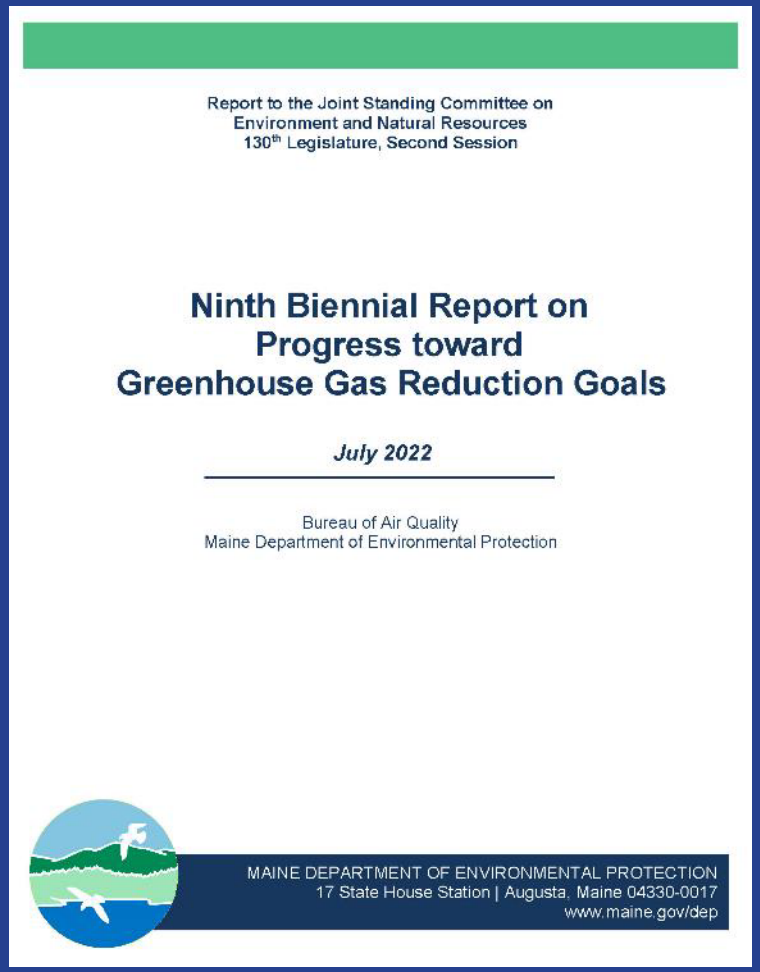
Invest in Climate-Ready Infrastructure

Engage People and Communities in Climate Impacts and Program Opportunities

Maine Won't Wait Dashboard



Maine DEP Emissions Report


Report to the Joint Standing Committee on
Environment and Natural Resources
130th Legislature, Second Session

Ninth Biennial Report on
Progress toward
Greenhouse Gas Reduction Goals

July 2022

Bureau of Air Quality
Maine Department of Environmental Protection

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 State House Station | Augusta, Maine 04330-0017
www.maine.gov/dep

- As of 2019, gross greenhouse gas (GHG) emissions in Maine were 25 percent lower than 1990 levels
- With continued progress in reducing gross GHG emissions, Maine is well-positioned to meet its goal of carbon neutrality by 2045

Inspiring Climate Action for Maine

MaineWontWait.org

2024 Plan Timeline

DEC 1, 2020

Maine Won't Wait Climate Action Plan Delivered to Legislature

MAY 2023

Governor Announces New and Returning Appointments to Climate Council

SEPT 2023 - JUNE 2024

Working Groups & Subcommittees Meet to Update Mitigation and Adaptation Strategies

SEPT 2024

Climate Council Meets to Consider and Adopt Strategies

DEC 1, 2024

Updated Climate Action Plan Delivered to Legislature

Maine Climate Council Meeting Poll

It’s December next year, we’ve completed the revision, and you’re really pleased with it. What are 3 words that describe it?

State of the Climate in Maine: Presentation by the Scientific and Technical Subcommittee Co-chairs

1. Ivan Fernandez, University of Maine
2. Stephen Dickson, Department of Agriculture, Conservation and Forestry
3. Susie Arnold, Island Institute

Maine Climate Council Scientific and Technical Subcommittee

In 2019, Public Law Chapter 476 established the Maine Climate Council and the Scientific and Technical Subcommittee (STS) within the Council **"to identify, monitor, study and report out to the council and to the working groups…findings and recommendations related to climate change in the State and its effects on the State's climate, species, marine and coastal environments and natural landscape and on the oceans and other bodies of water."**

The science of climate change in 2023?

1990

CLIMATE CHANGE

The IPCC Scientific Assessment

WORLD METEOROLOGICAL ORGANIZATION UNITED NA

INTERGOVERNMENTAL PANEL ON

CLIMATE CHANGE 1995

The Science of Climate Change

Contribution of Working Gro

to the Second Assessment Repor

Intergovernmental Panel on Clima

Climate Change 2001

The Scientific Bas

Contribution of Working Group II to the Thir

Report of the Intergovernmental Panel on Cl

2007

CLIMATE CHANGE 2

THE PHYSICAL SCIENCE BA

Working Group I Contribution to the Fourth Assessment

Report of the Intergovernmental Panel on Climate Change

2013

ipcc

INTERGOVERNMENTAL PANEL ON climate change

CLIMATE CHANGE 2013

The Physical Science Basis

Summary for Policymakers

WG I

WORKING GROUP I CONTRIBUTION TO THE

FIFTH ASSESSMENT REPORT OF THE

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

WMO UNEP

ipcc

INTERGOVERNMENTAL PANEL ON climate change

Climate Change 2021

The Physical Science Basis

WGI

Working Group I contribution to the

Sixth Assessment Report of the

Intergovernmental Panel on Climate Change

WMO UNEP

ipcc

INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP

The State of Knowledge about Climate Change

WGI

WGII

AR6 Climate Change 2
The Physical Science Bas

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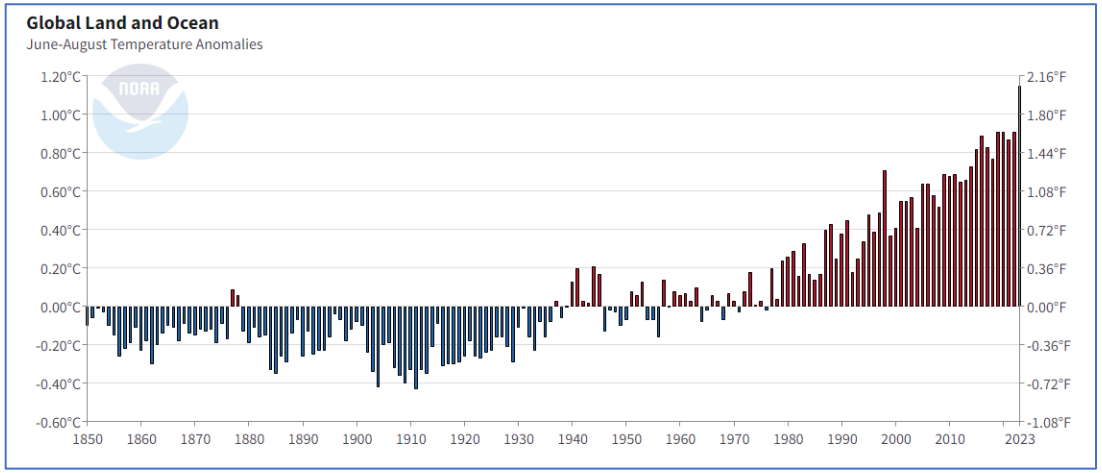
ging Climate

Climate Change and Land

Global Warming of 1.5 °C

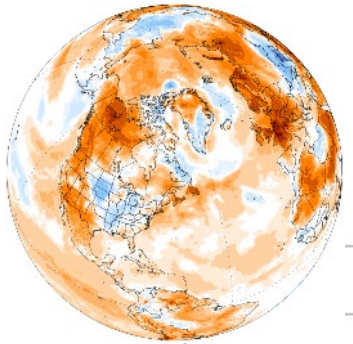
ipcc

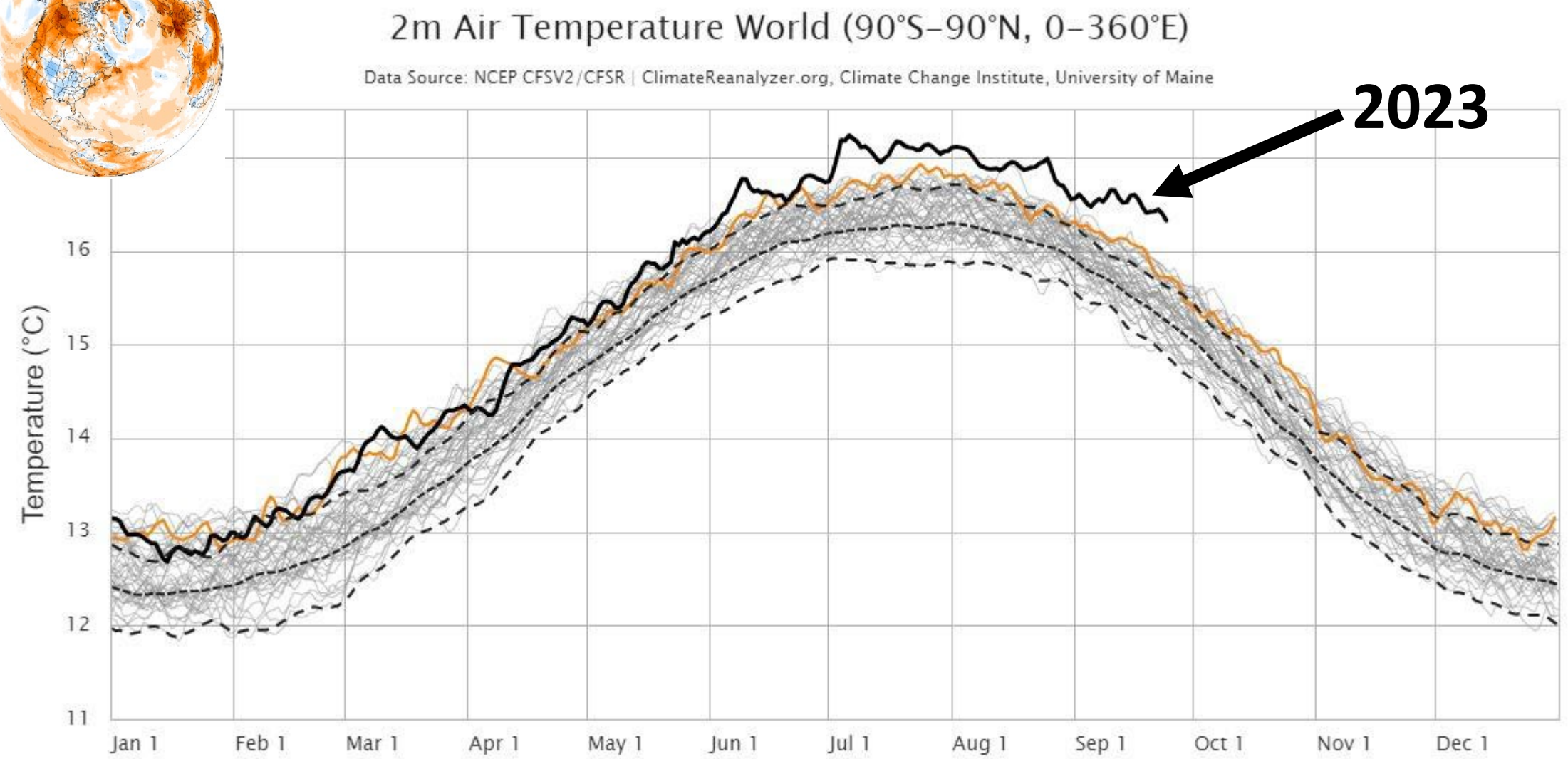
Global Land and Ocean Temperatures



- ✓ The past 9 years were the hottest 9 years on the planet in a 174 year record of measurement.
- ✓ August 2023 was the warmest August on record, and warmer than all other months except July 2023.
- ✓ Summer 2023 (JJA) was the hottest summer on record for the planet.
- ✓ Global sea surface temperatures hit record highs for 5 months running in August
- ✓ Global sea ice reached record lows.

Climate Reanalyzer





climatereanalyzer.org

Extreme heat

More frequent

More intense

Heavy rainfall

More frequent

More intense

Drought

Increase in some regions

Fire weather

More frequent

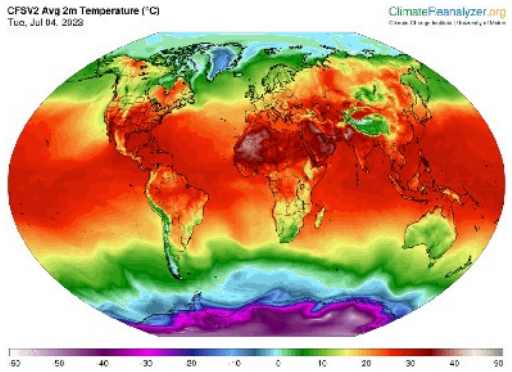
Ocean

Warming

Acidifying

Losing Oxygen

Maine – Summer 2023



Extreme Heat

Sept 8, 2023

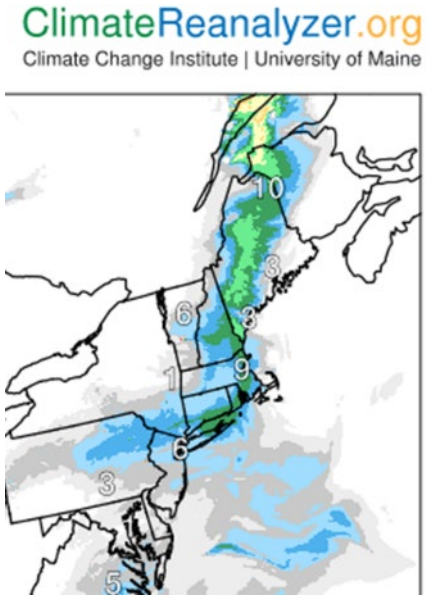
Schools Close Due to Extreme Heat

Heavy rainfall

June 29, 2023

Flooding and Road Washouts

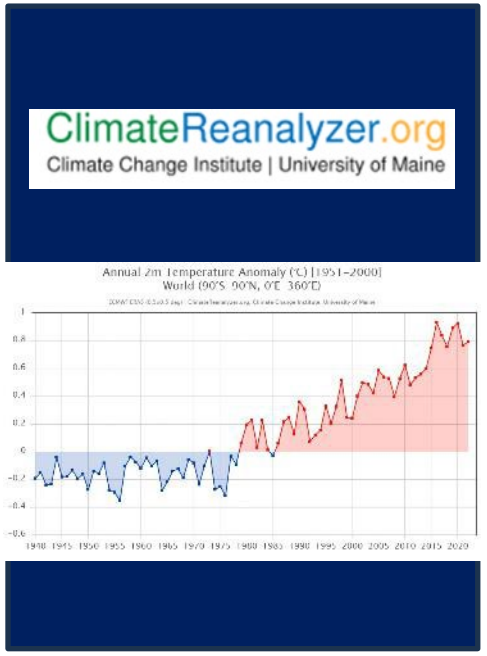
2023 2nd Wettest Summer on Record



Fire weather

July 19, 2023

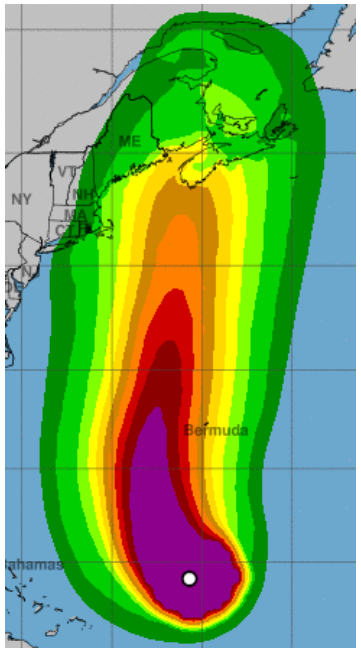
Western Smoke in Maine



Warming Gulf of Maine

2023

Record high temperatures in the North Atlantic



Tropical Storms

Sept 16, 2023

Hurricane Lee

Climate change…in the news?

Forest Fire Evacuations in Chile

Heat Waves Across US, Europe, and Asia

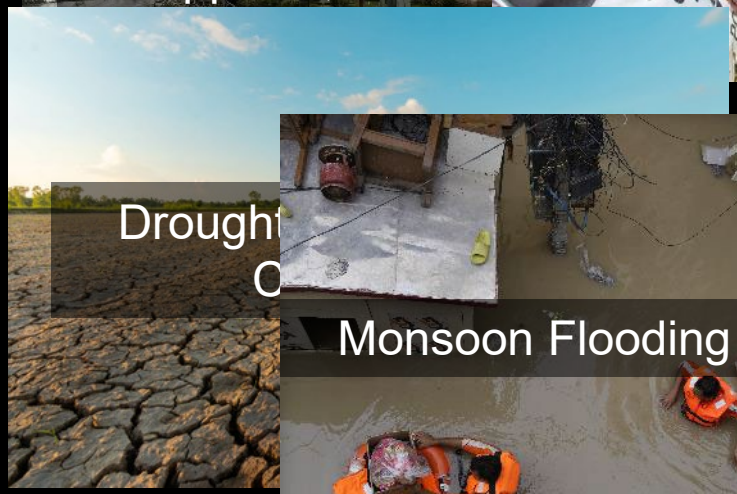
Wildfires Across Western Canada

Hurricane Idalia Florida

Tropical Storms Japan, Guam, th Philippines, and Ta

Flooding in Libya

Wildfire Lahaina, Hawaii



Drought C

Monsoon Flooding in Indi

Wildfires in Nova Scotia, Canada

Record Flooding in Vermont

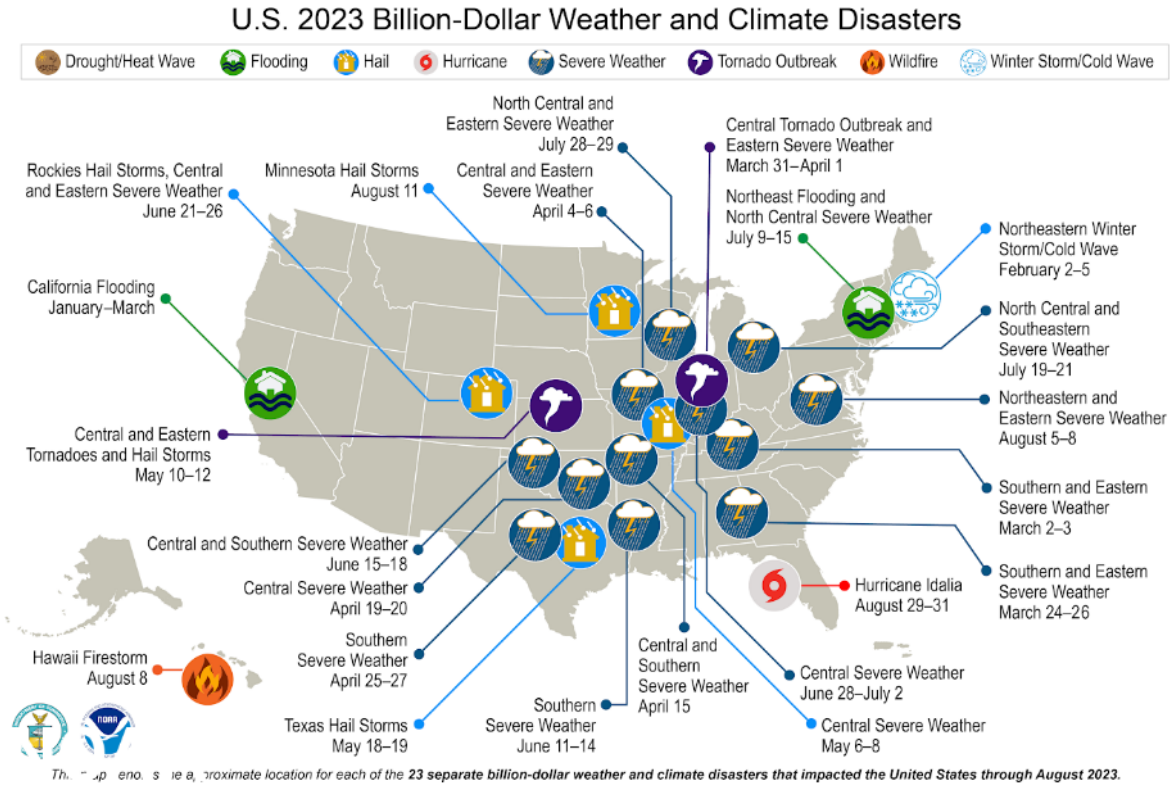
world weather attribution

- the cumulative severity of Québec's 2023 fire season to the end of July around 50% more intense
- Seasons of this severity at least 7X more likely to occur.
- Peak fire weather at least twice as likely and 20% more intense due to human-induced climate change

Heat waves like that of summer 2023:

	w/o climate	now
US/MEXICO REGION	Virtually impossible	1 in 15 years
SOUTHERN EUROPE	Virtually impossible	1 in 10 years
CHINA	1 in 250 years	1 in 5 years

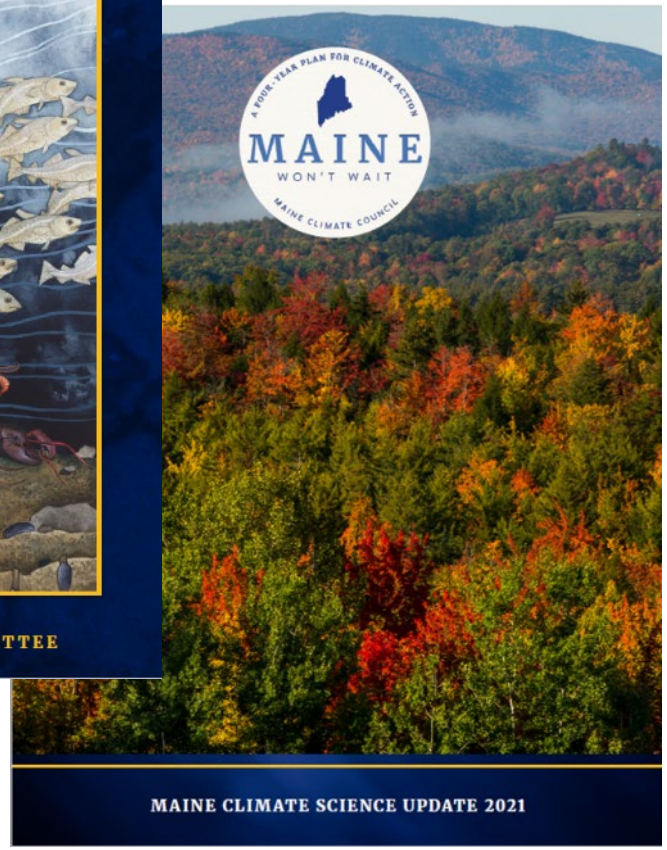
https://www.worldweatherattribution.org/



*Th... ...proximate location for each of the **23 separate billion-dollar weather and climate disasters that impacted the United States through August 2023.***

From January to September of 2023, the nation experienced 23 separate billion-dollar disasters, the largest number of billion-dollar disasters since records have been kept.

Maine Climate Science Assessment



Scientific Assessment of Climate Change and Its Effects in Maine

2024

A FOUR-YEAR PLAN FOR CLIMATE ACTION
MAINE
WON'T WAIT
DECEMBER 2020
MAINE CLIMATE COUNCIL

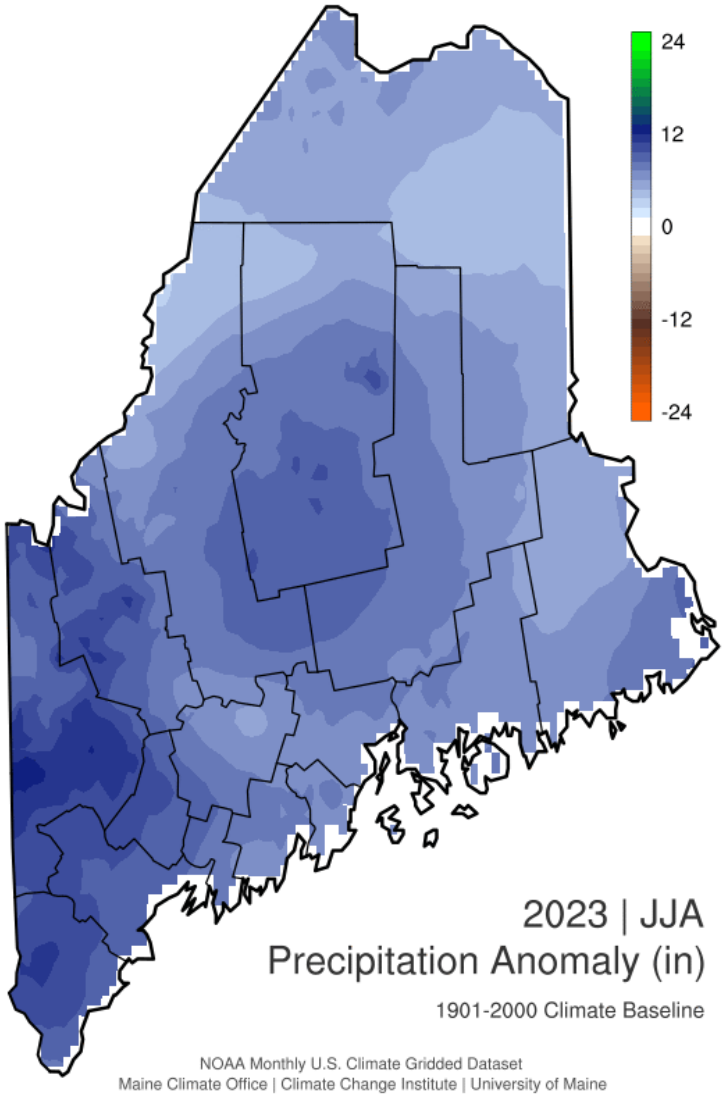
2023 Scientific Assessment Work

- River Flooding
- Droughts
- Groundwater
- Saltwater Intrusion

Precipitation Extremes

- **Rainfall Trends**
- **Flash Floods**
- **Flash Droughts**

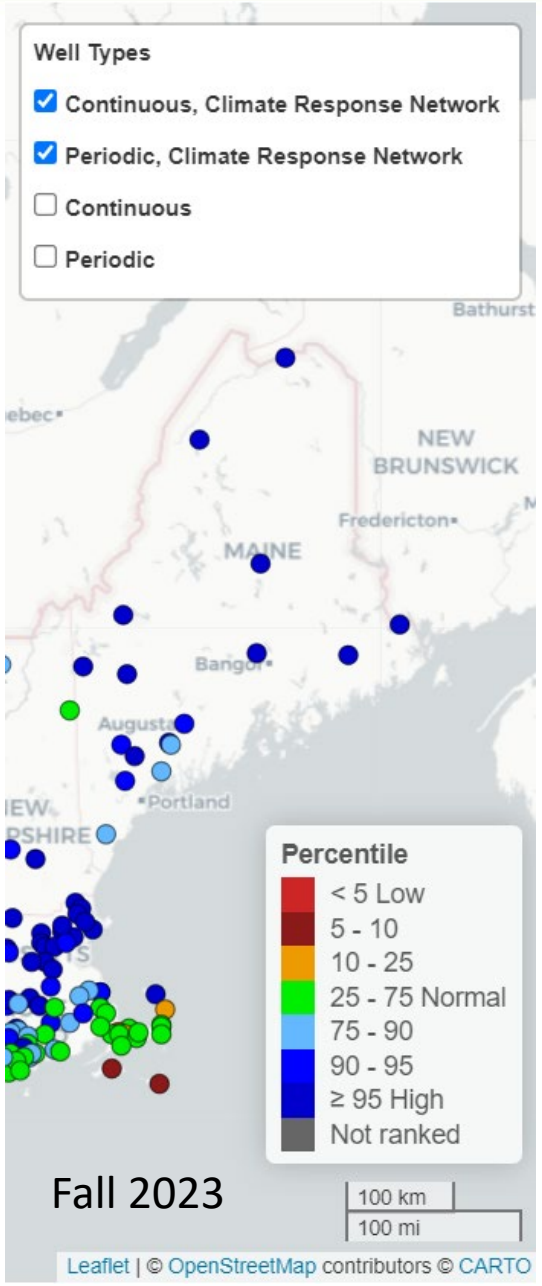
June 29, 2023 Macomber Hill Road, Jay, Maine



Groundwater Trends

- Monitoring Aquifers
- Droughts
- Dry Wells
- Saltwater Intrusion

National Groundwater Monitoring Network, USGS and MGS



2023 Scientific Assessment Work

- New Coastal Elevations
- Wave Runup Modeling
- Sea Level Rise
- Storm Surge

Hurricane Category 1 and 2 Inundation

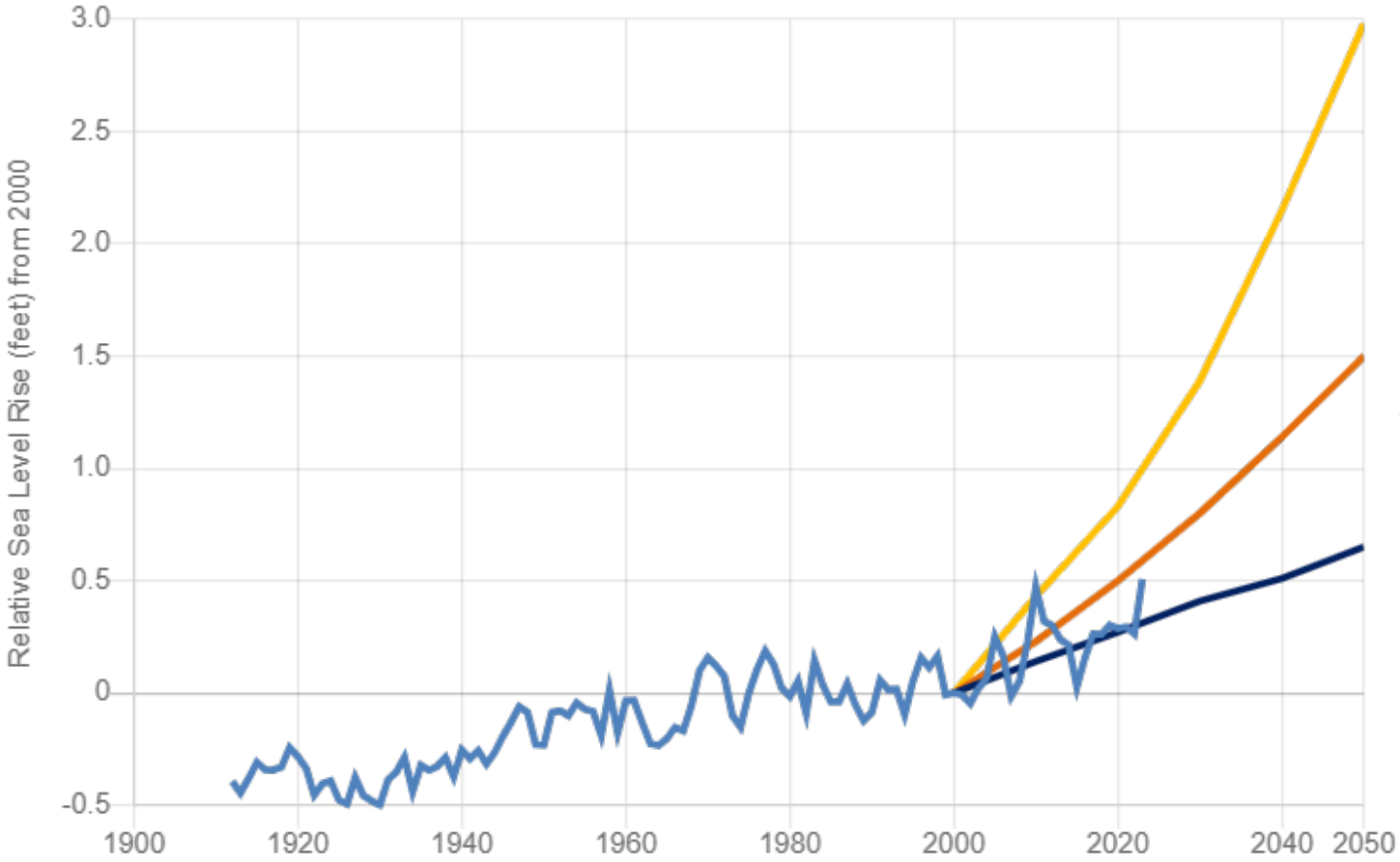
Storms, Surge, Surf & Sea Level

March 2, 2018
Goochs Beach
Seawall Impact,
Kennebunk,
B. Smith photo

Trends & Projections

- **Sea Level Rise**

King Tide, Bath, Maine,
October 28, 2011



1.5 feet by 2050

Maine Geological Survey Dashboard

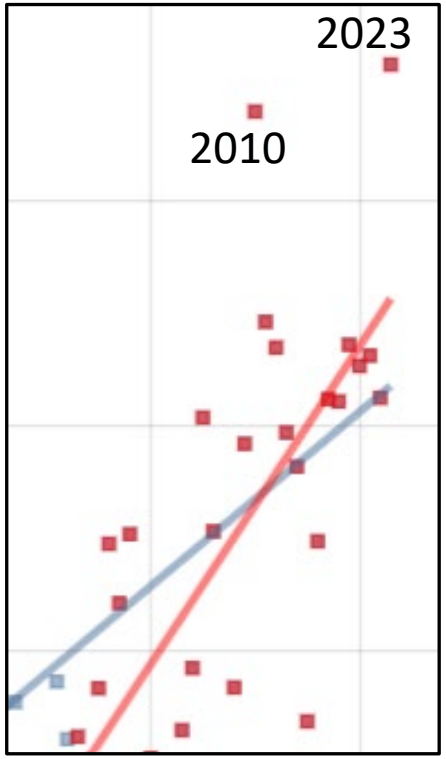
Portsmouth | Wells | Portland | Bar Harbor | Cutler | Eastport

Short Term Trend
(1993-2023)

3.53 mm/yr
or
1.16 ft/century

August 2023
was the
1st highest
August
water level since
1912

Learn More with the Maine Sea Level Rise Dashboard

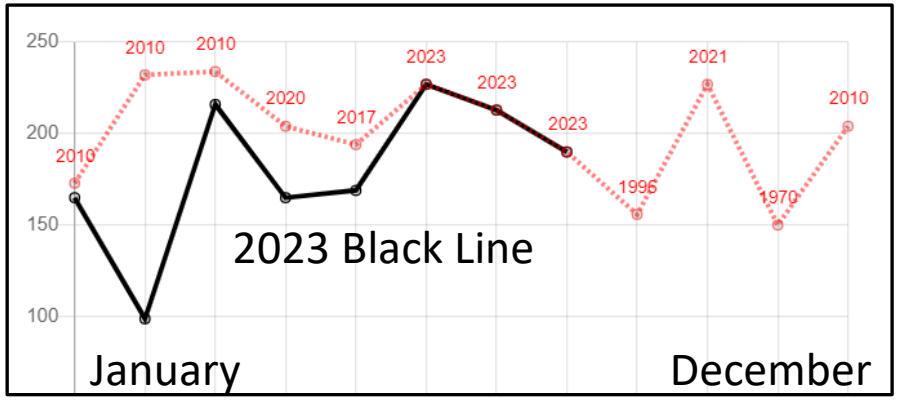


1987 – August 2023

Sea Level Rise Trends

Short Term (1993-2023)
3.53 mm/yr or 1.16 ft/century

Long Term (1912-2023)
1.94 mm/yr or 0.64 ft/century

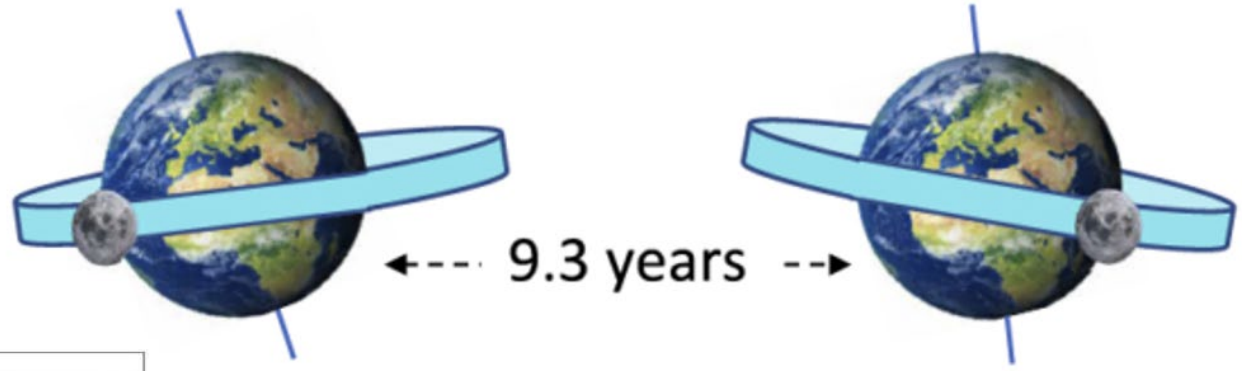


Vertical scale in millimeters

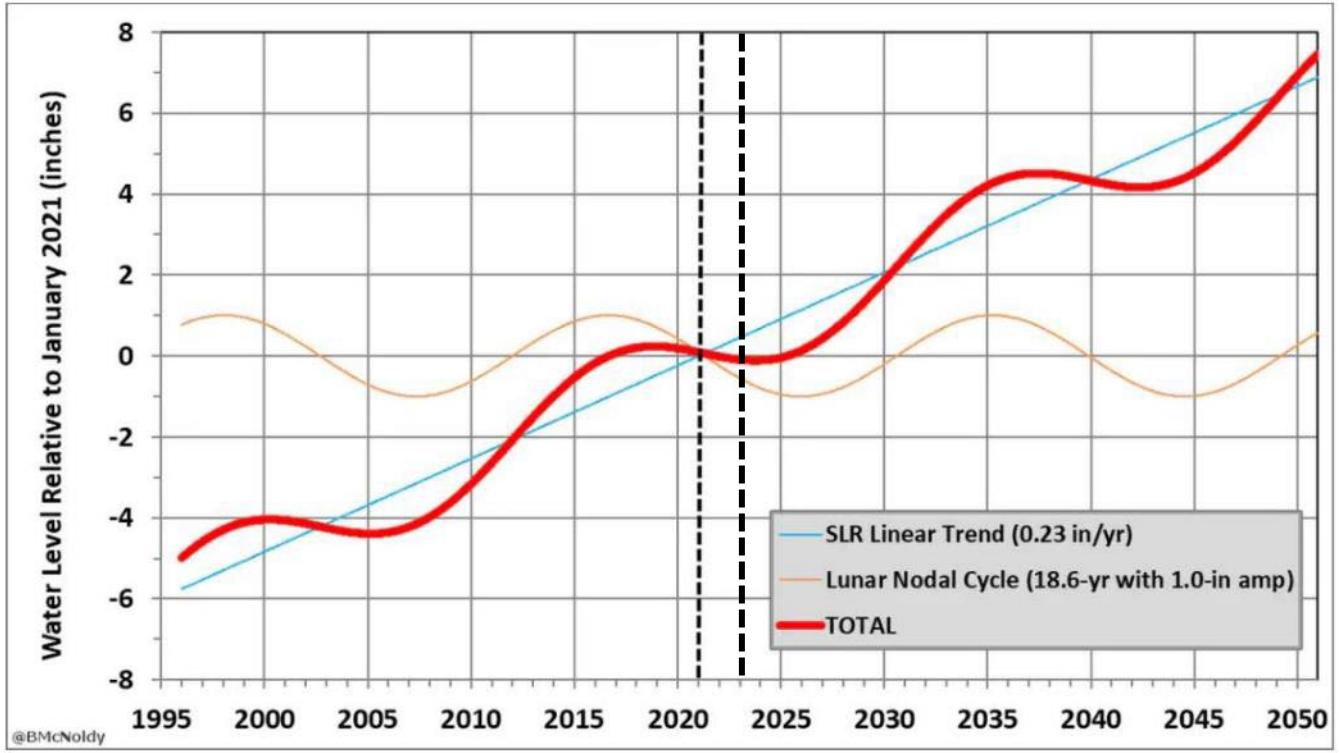
June 2023 water levels were 9 inches above the 1912-2022 average

Tides Vary with the Moon's Orbit

18.6-year **Lunar Nodal Cycle**- a natural cycle of the orbits of the Earth and the moon that exaggerates and mutes tides on Earth, and thus enhances or suppresses the effects of sea level rise



(Saintilan et al., Science Advances, 2022)



(Graphic: Brian McNoldy and PBS NewsHour, 2021)

By 2030 or sooner, the rate of sea level rise will likely rise significantly for over a decade.

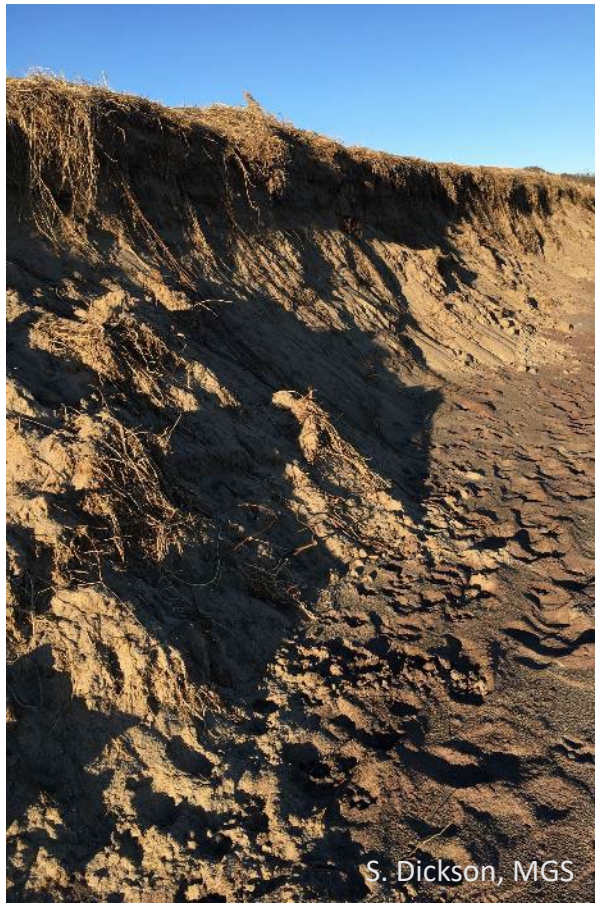
Nuisance flooding will increase faster.

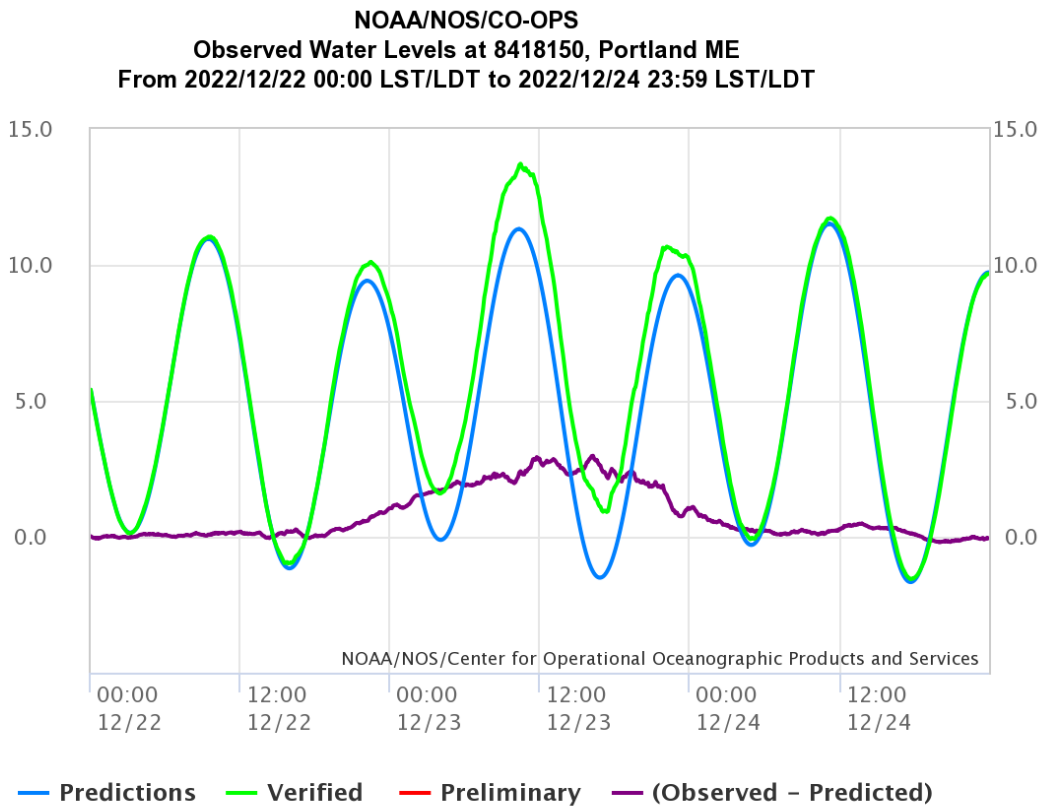
King Tides

- Nuisance Flooding
- SLR Brings King Tides More Often

Storm Surge

- December 23, 2022, Winter Storm Elliott – almost the “100-year” event
- Peak 13.7 feet at 10:30 a.m. on an 11.3-ft King Tide with a 2.4-ft surge





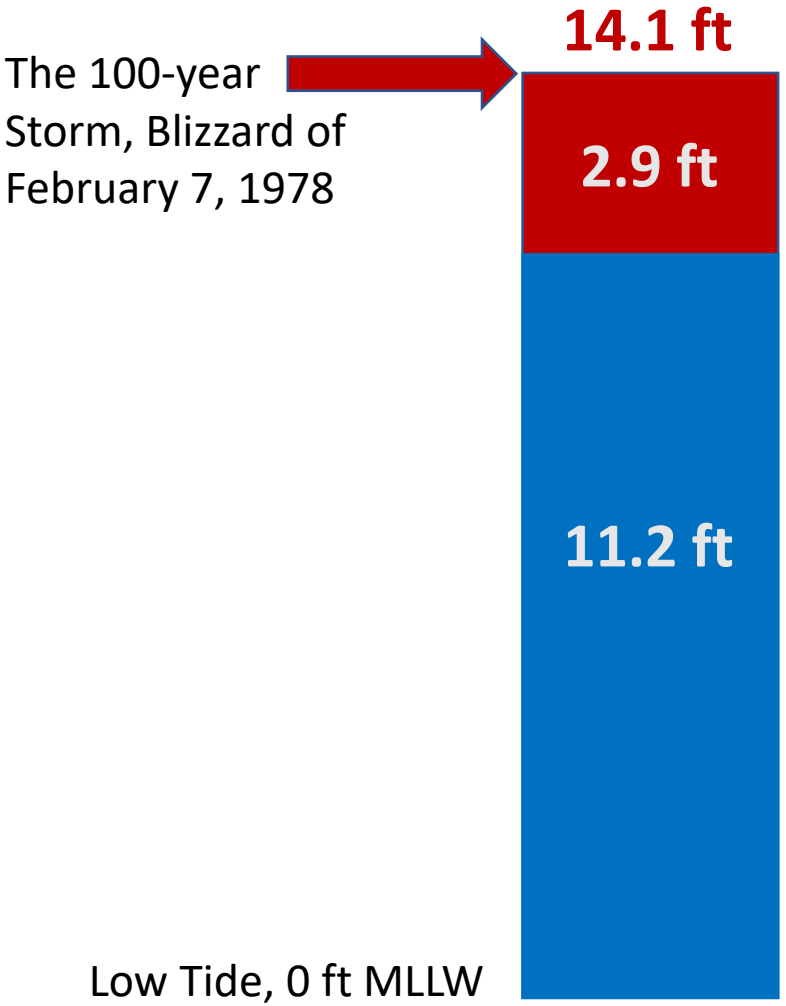
Storm Surge Probability

Portland Storm Surge Statistics
1912-2018 (at any tide)

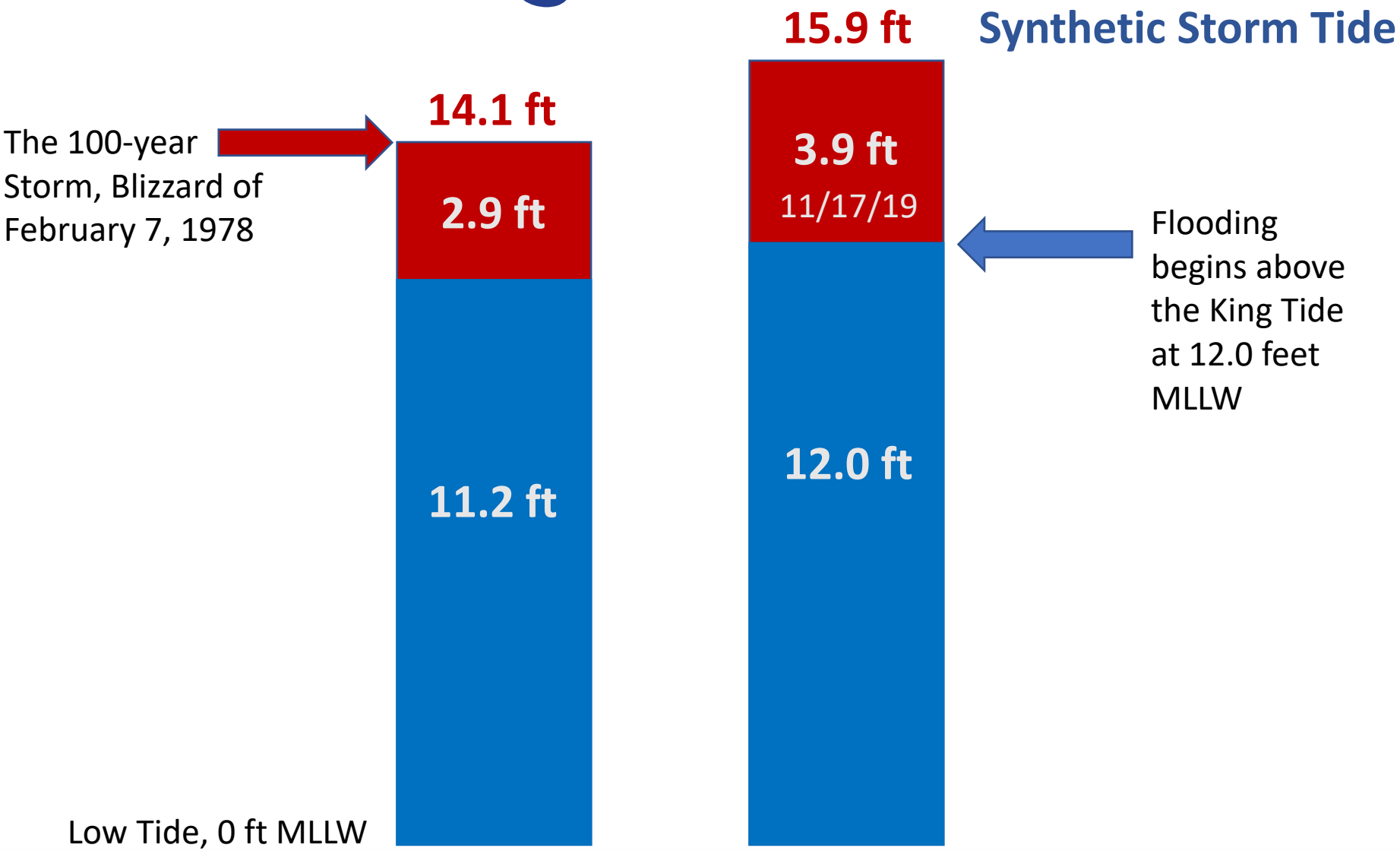
Recurrence Interval	% Annual Chance	Surge (ft)
1	100%	1.9
5	20%	3.0
10	10%	3.4
25	4%	4.0
50	2%	4.4
100	1%	4.8

Highest annual recorded storm surge was 3/3/1947

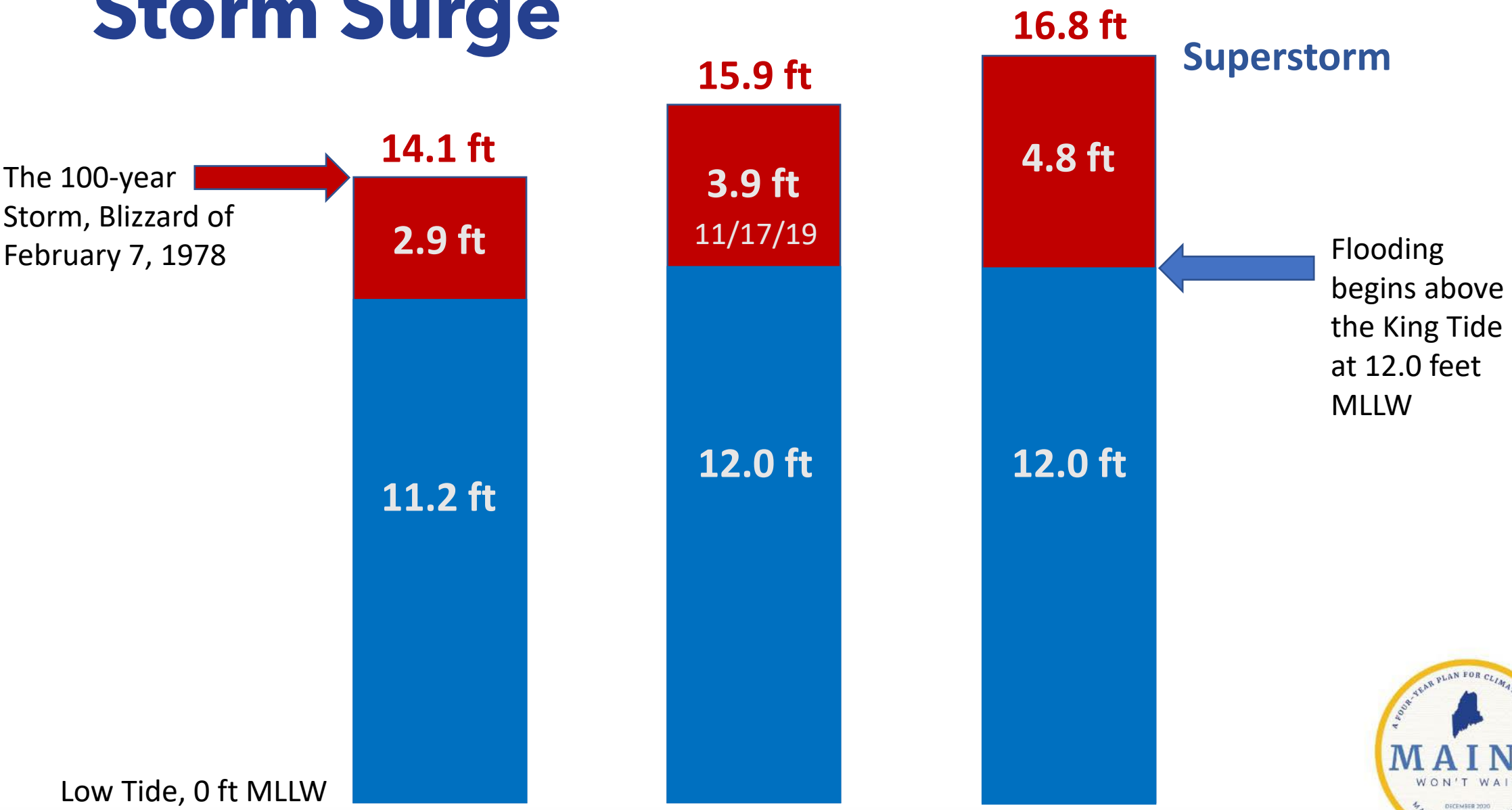
Storm Surge


14.1 ft
The 100-year Storm, Blizzard of February 7, 1978
2.9 ft
11.2 ft
Low Tide, 0 ft MLLW

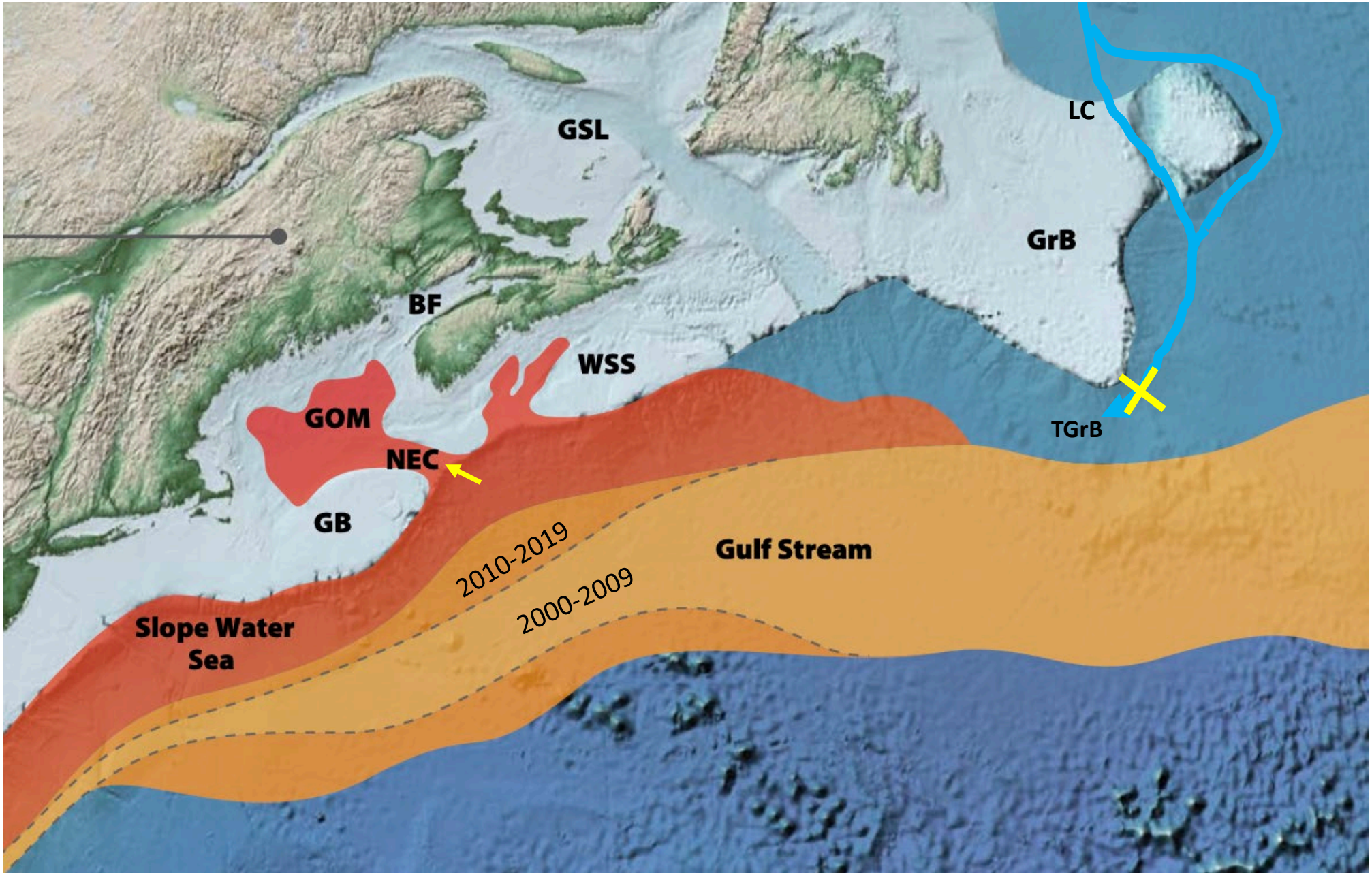
Storm Surge


15.9 ft
Synthetic Storm Tide
14.1 ft
The 100-year Storm, Blizzard of February 7, 1978
3.9 ft
11/17/19
2.9 ft
Flooding begins above the King Tide at 12.0 feet MLLW
12.0 ft
11.2 ft
Low Tide, 0 ft MLLW

Storm Surge

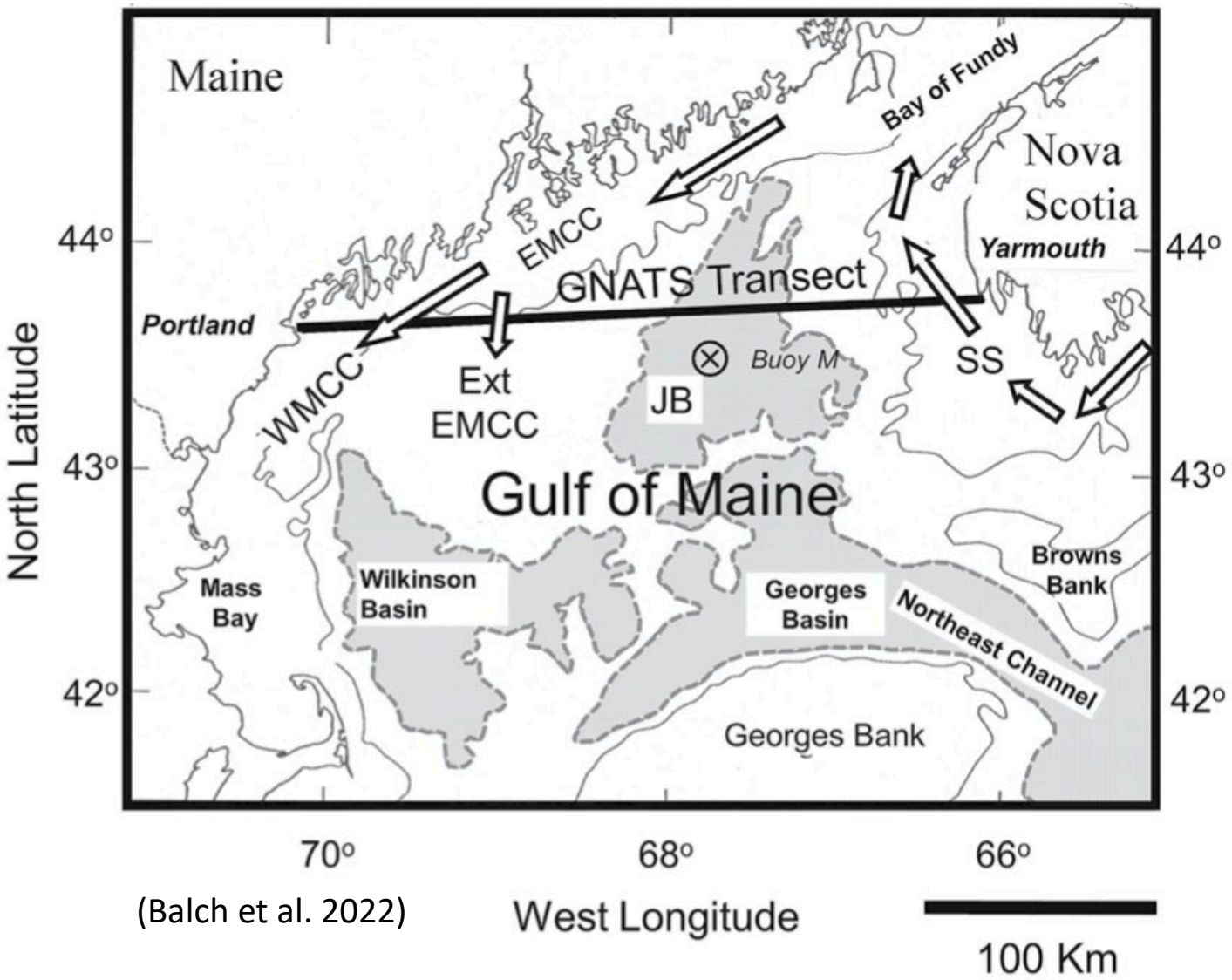

14.1 ft
2.9 ft
11.2 ft
The 100-year Storm, Blizzard of February 7, 1978
15.9 ft
3.9 ft
11/17/19
12.0 ft
16.8 ft
Superstorm
4.8 ft
12.0 ft
Flooding begins above the King Tide at 12.0 feet MLLW
Low Tide, 0 ft MLLW

Changes in Ocean Circulation = warmer water entering the Gulf of Maine

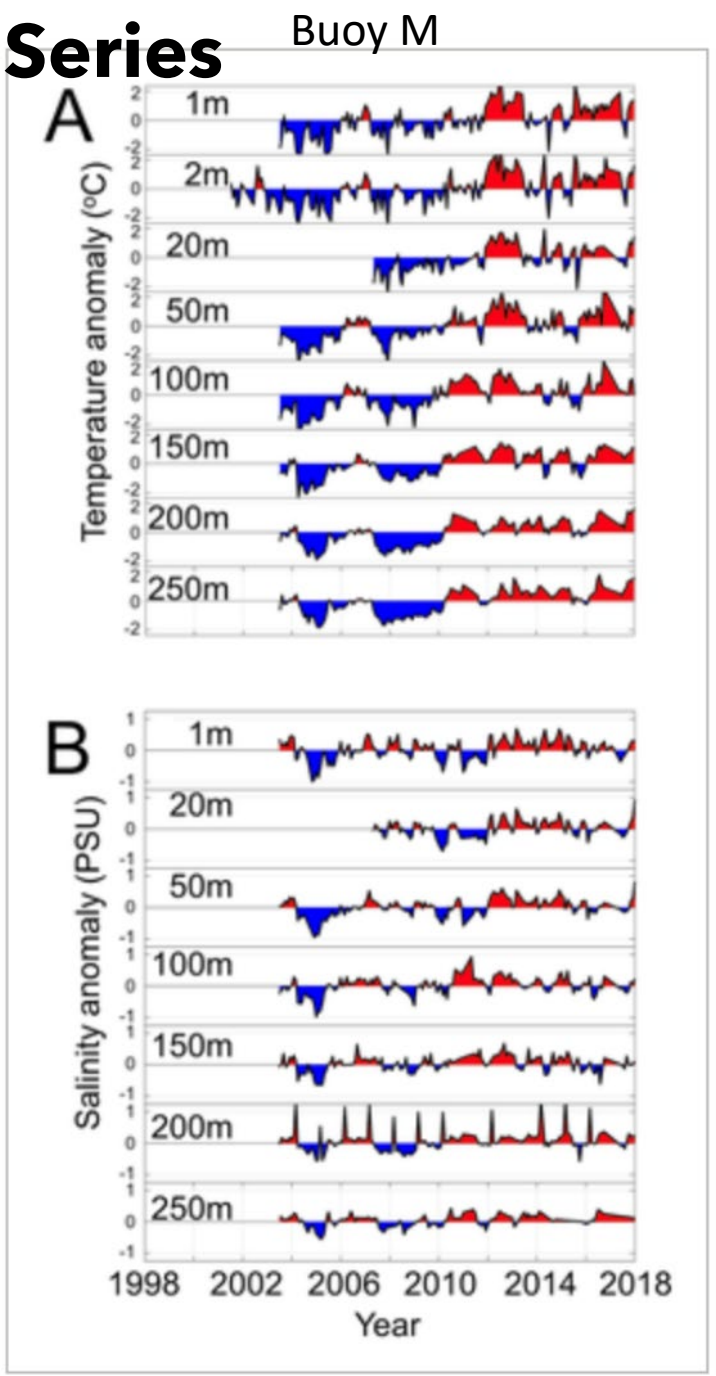


(figure modified from Meyer-Gutbrod et al.

20-yr Data Set- Gulf of Maine North Atlantic Time Series



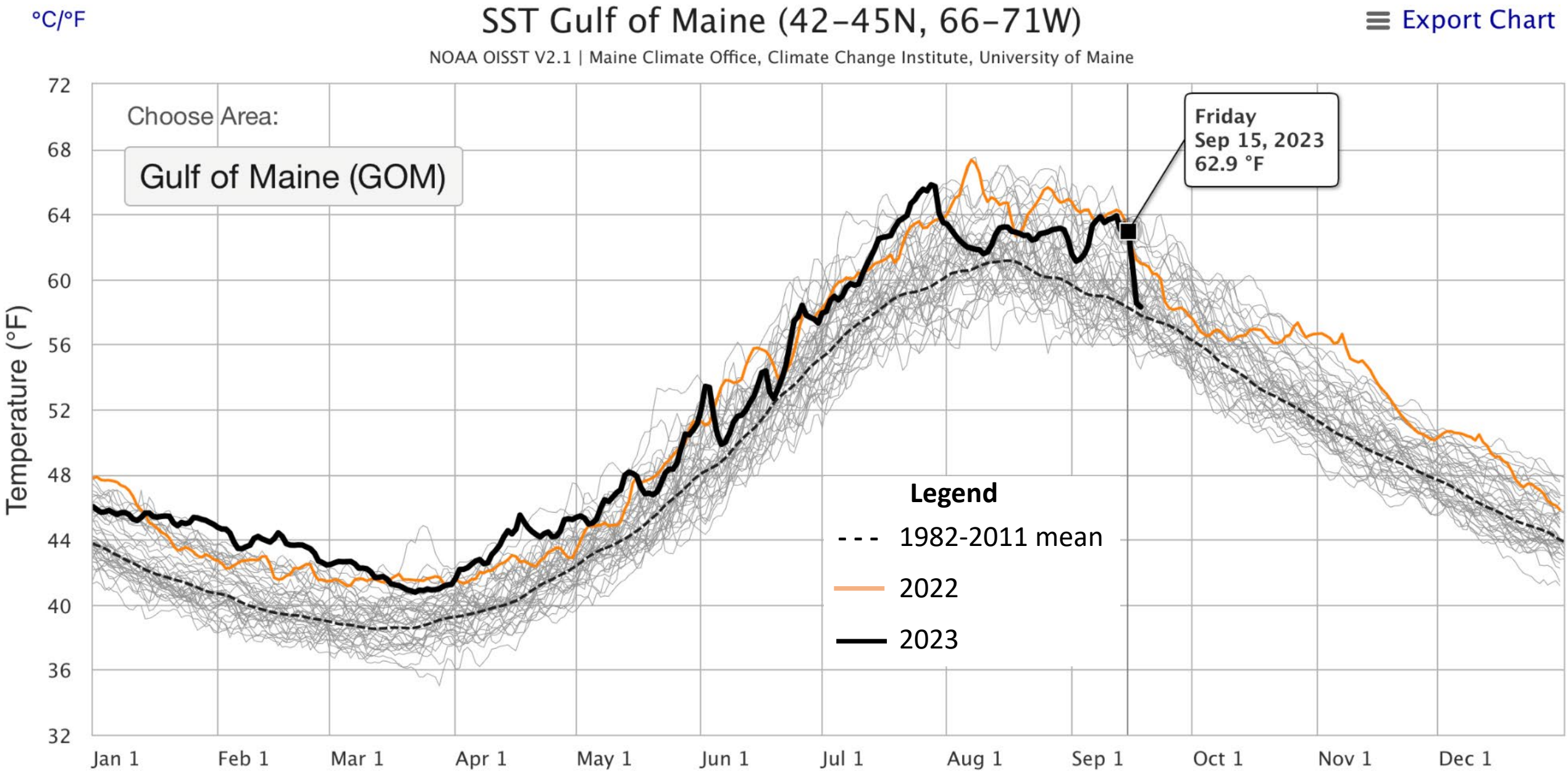
(Balch et al. 2022)



(Balch et al. 2022)

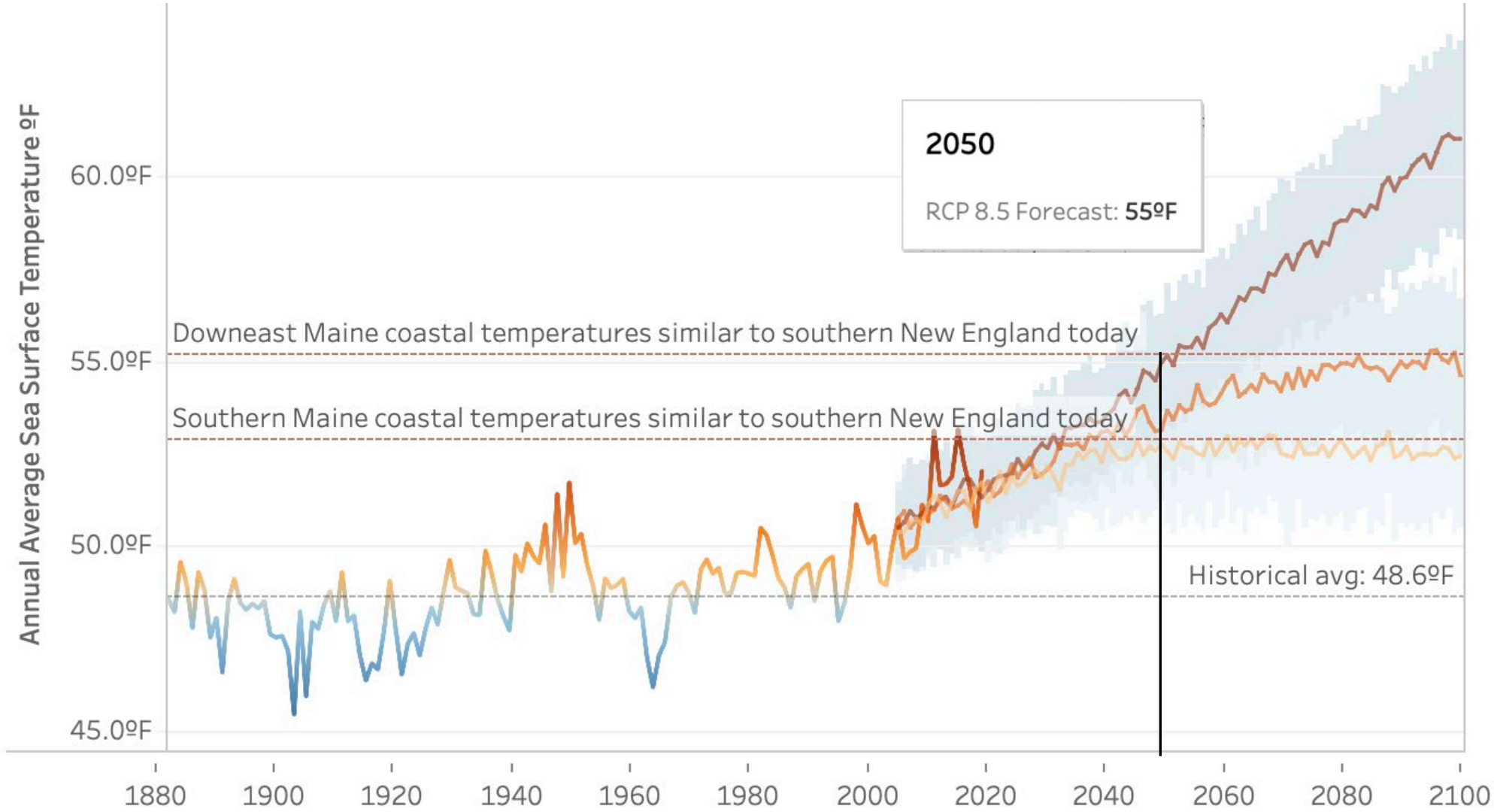
Also, Townsend et al. 2023- analysis of 19 years of Buoy M data

- abrupt influxes of warm, salty, low nutrient Gulf Stream Water into the interior of the Gulf
- a new baseline of warmer temperatures and higher salinities became established after 2010
- declining phytoplankton primary production – concerning signs at the base of the marine food web



https://mco.umaine.edu/climate/gom_sst/

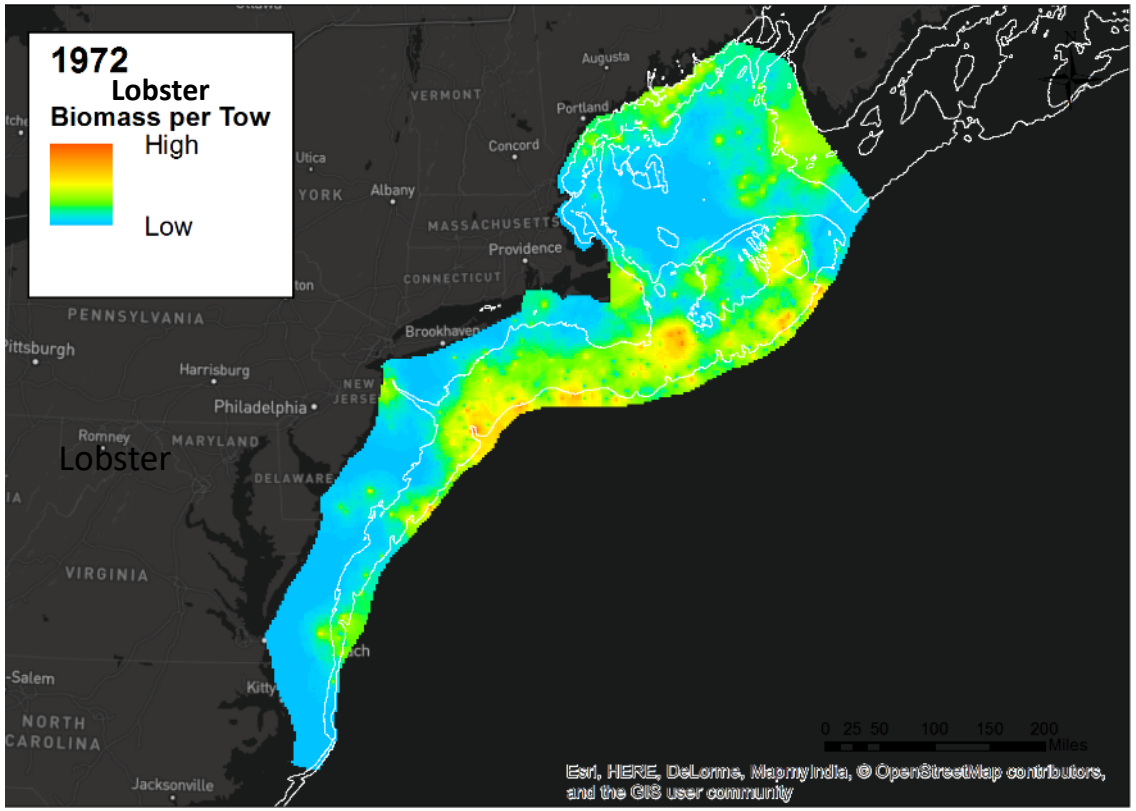
Ocean Temperature Trend since 1880 and Future Projections

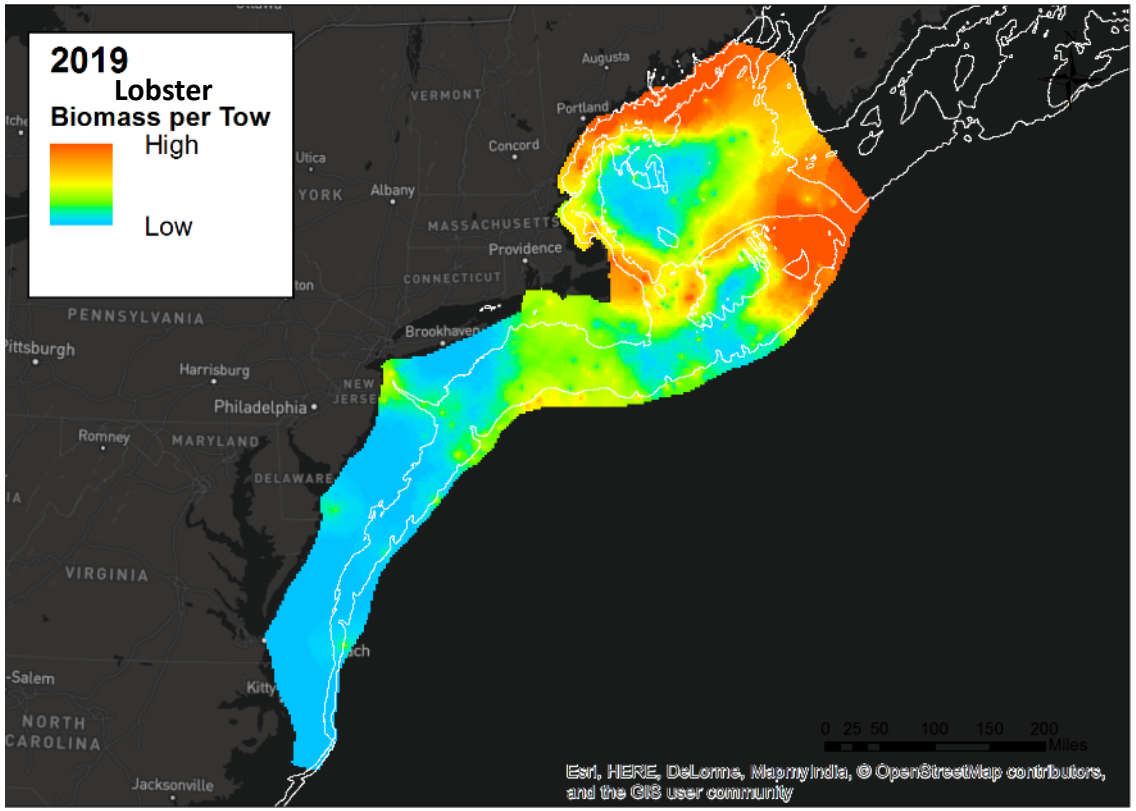


SOURCE: NOAA (sea surface temperatures); Maine State Climate Office (CMIP5 model forecasts).

Formerly at: https://climatecouncil.maine.gov/maine-climate-science-dashboard

Changing Distribution and Abundance of Species





https://oceanadapt.rutgers.edu

PRIMARY RESEARCH ARTICLE

Global Change Biology WILEY

First published: 25 July 2019 | https://doi.org/10.1111/gcb.14778

The brighter side of climate change: How local oceanography amplified a lobster boom in the Gulf of Maine

Andrew G. Goode | Damian C. Brady | Robert S. Steneck | Richard A. Wahle

Maine Lobster

POUNDS(millions)*

VALUE(millions)

MILLIONS OF POUNDS

MILLIONS OF DOLLARS

0 20 40 60 80 100 120 140

$0 $50 $100 $150 $200 $250 $300 $350 $400 $450 $500 $550 $600 $650 $700 $750 $800

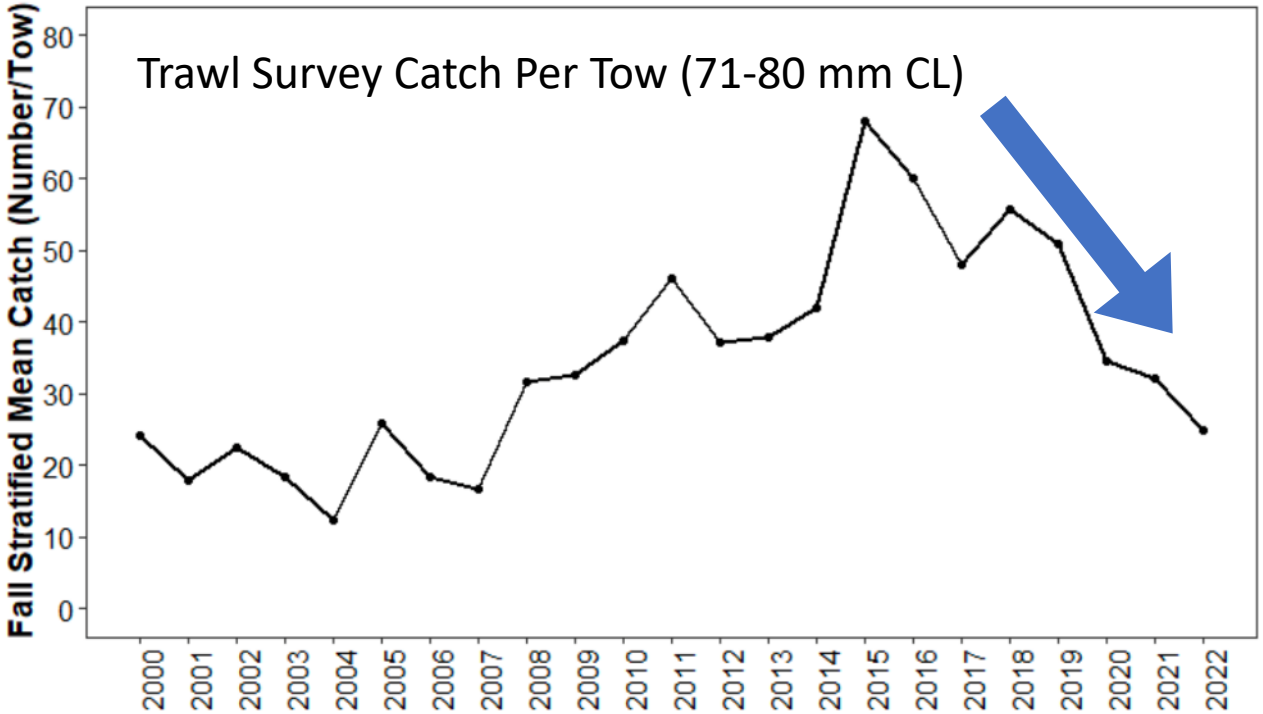
1950 1954 1958 1962 1966 1970 1974 1978 1982 1986 1990 1994 1998 2002 2006 2010 2014 2018 2022*

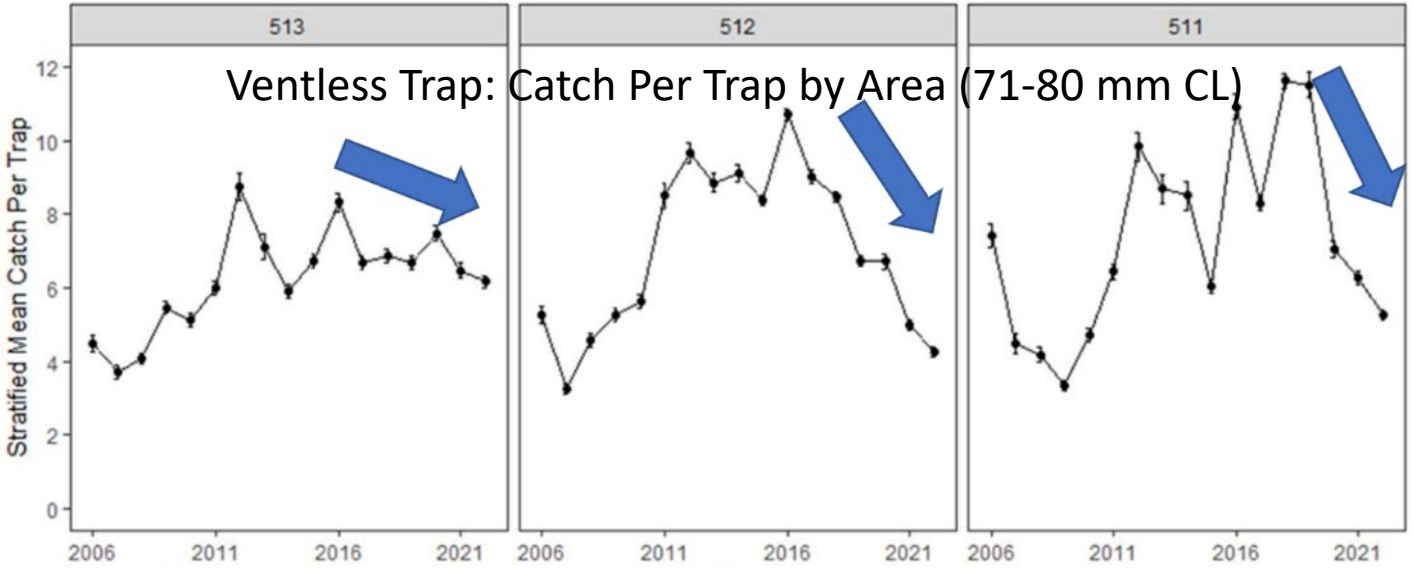
YEAR

Last updated 2/22/2023

*2022 preliminary data

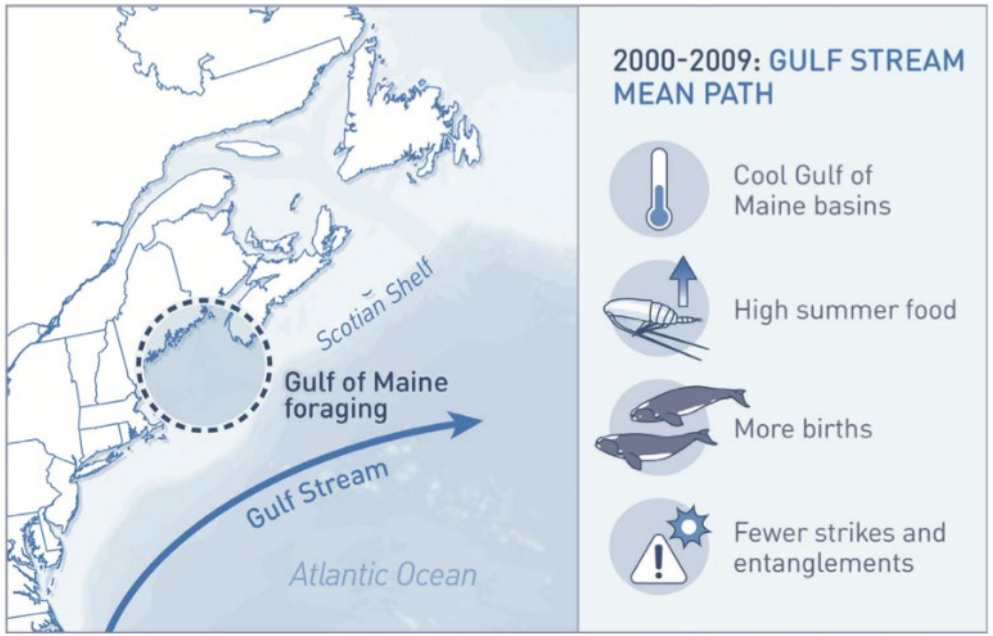
Sublegal Lobster Survey Results Over Time- Downward Trends

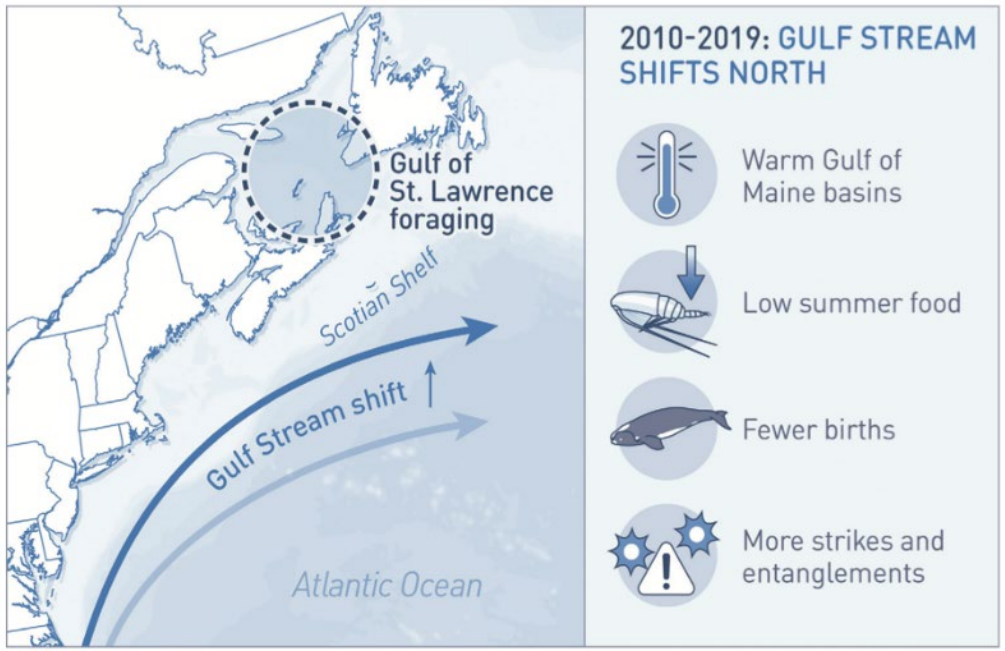


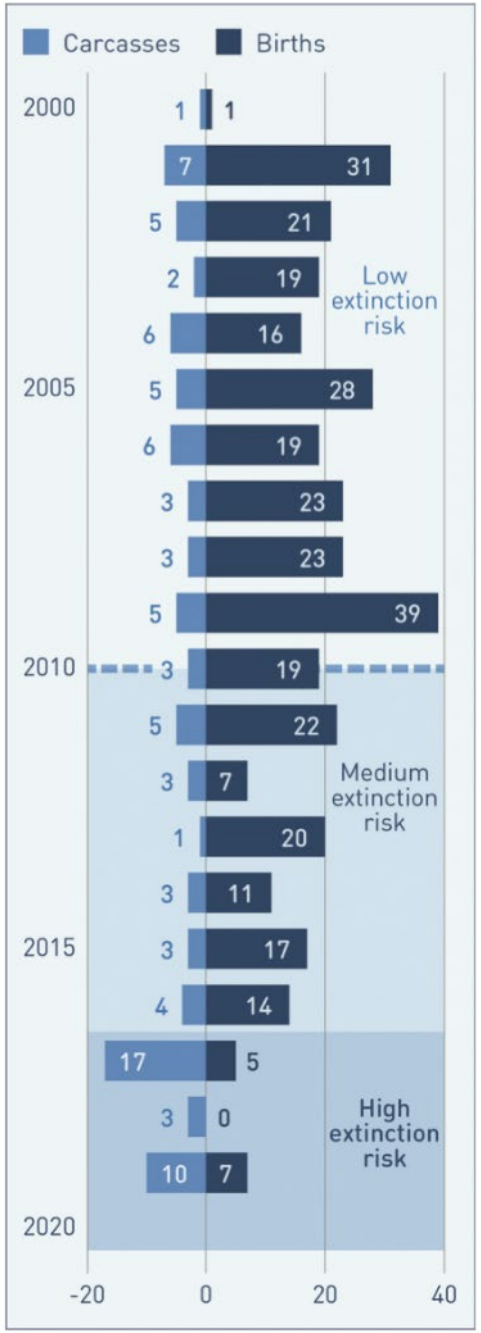


(data from Maine DMR)

Impacts of Changing Ocean Conditions on the North Atlantic Right Whale



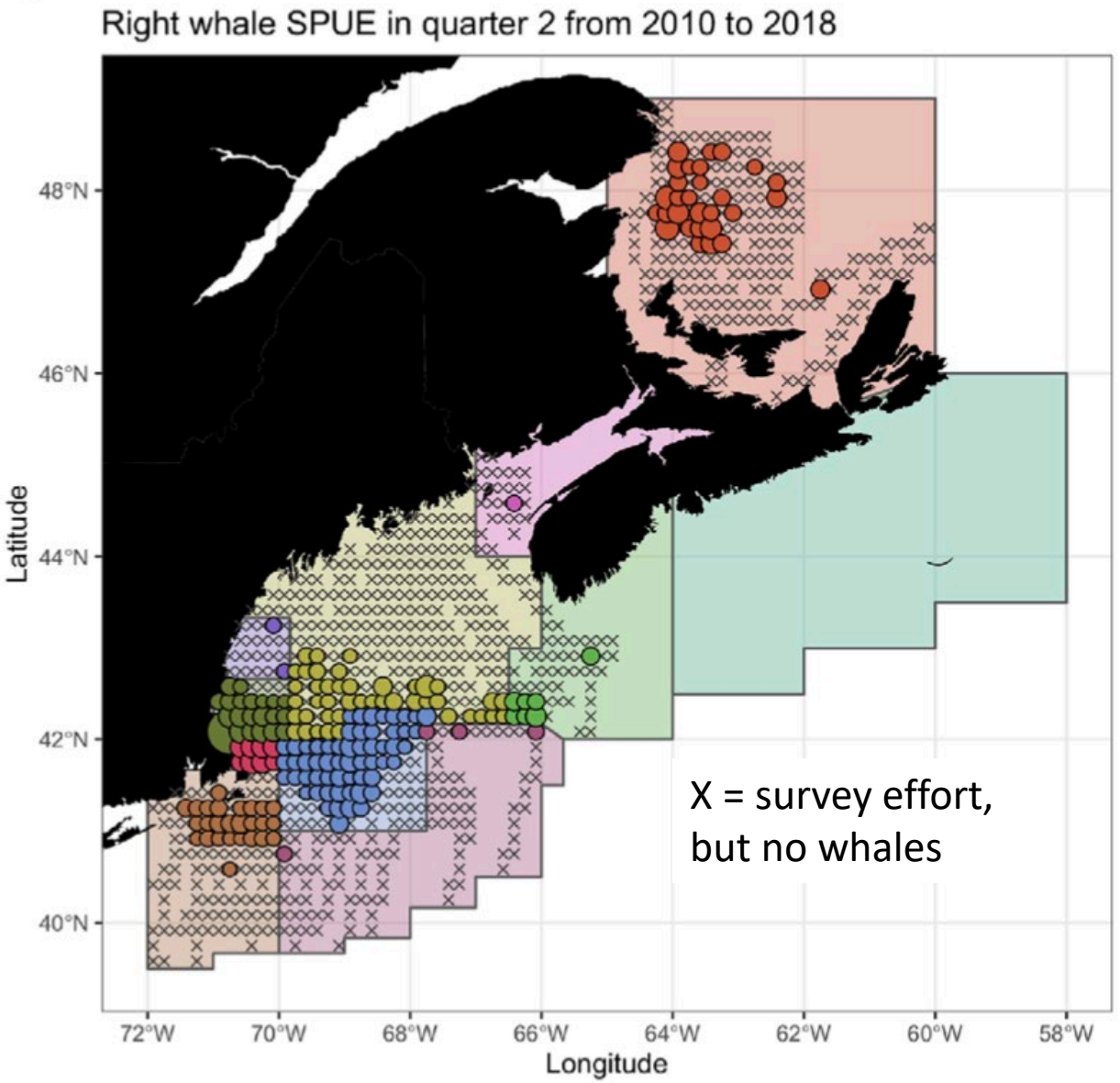




- With reduced prey, right whales began moving beyond traditional feeding grounds in the Gulf of Maine. By 2015, showing up in Gulf of St. Lawrence where there were not protections in place
- 2017 unusual mortality event
- With less food, calving rates decline

(summary from Meyer-Gutbrod et. al 2021)

Right whales are a cautionary tale for management of a protected species in a changing ocean



(Meyer-Gutbrod et al. 2022)

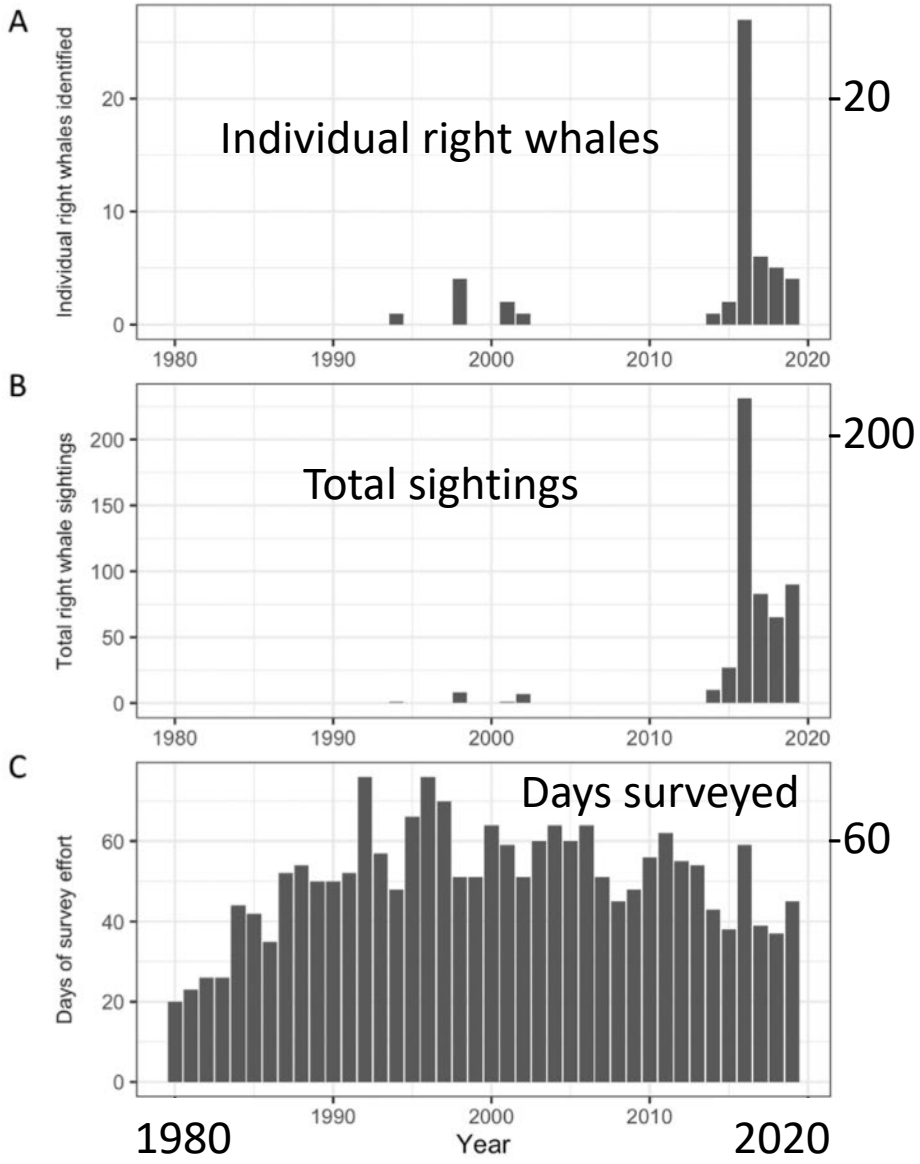


Fig. 5. Time series of Mingan Island Cetacean Study (**A**) individual right whale identifications, (**B**) total right whale sightings, and (**C**) survey effort from 1980 to 2019 in the Jacques Cartier Passage, Gulf of St. Lawrence.

Biden-Harris Administration Announces $82 Million for Endangered North Atlantic Right Whales

September 18, 2023

Monitoring and Modeling: $35.8 Million

- $17.2 million will go toward passive acoustic monitoring along the U.S. East Coast
- $3.5 million will go toward a satellite tagging monitoring program, in addition to $5.6 million for high resolution satellite artificial intelligence
- $5.2 million will be used for modeling advancements

Vessel Strike Reduction efforts: $20.1 Million

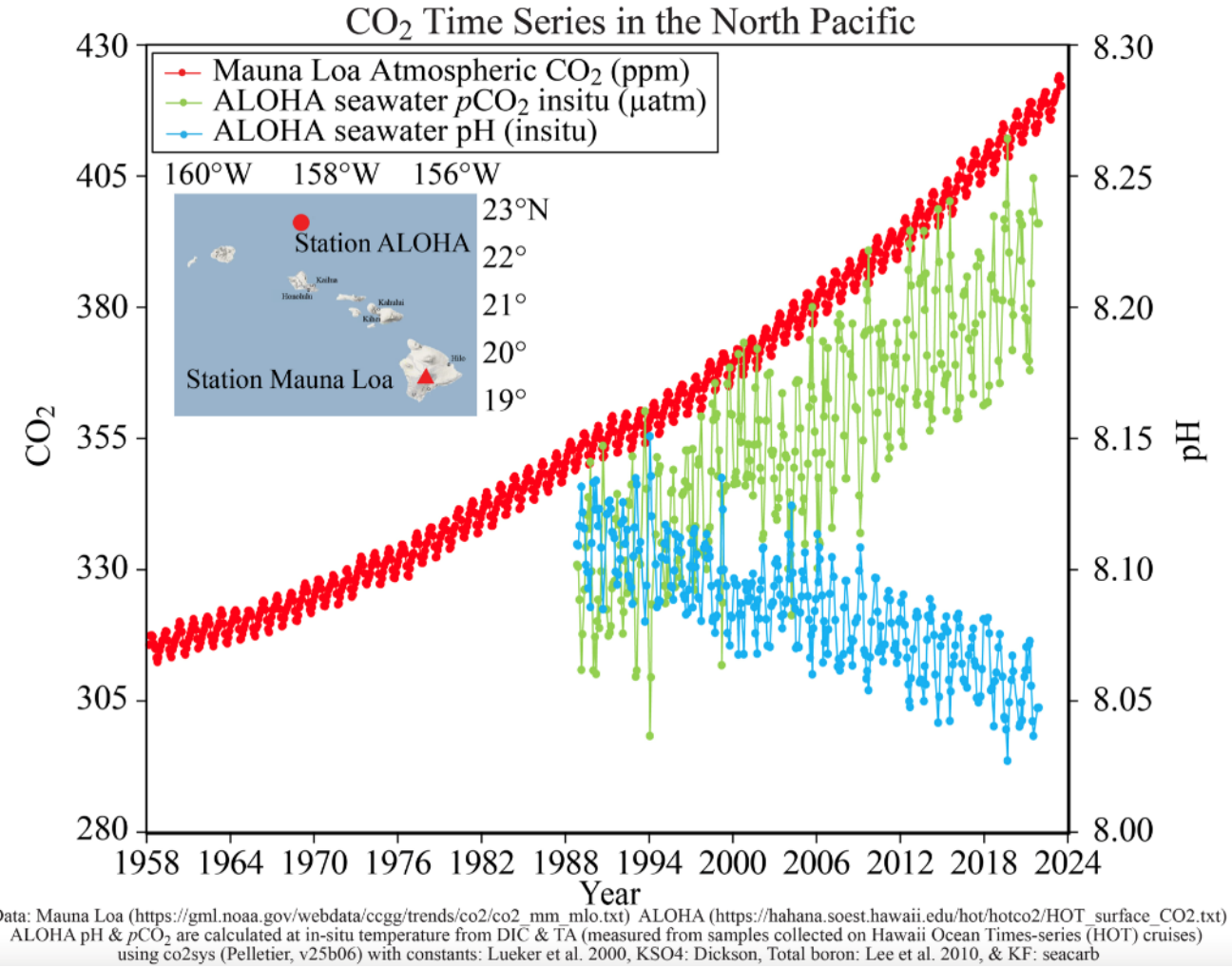
- $16.7 million will be dedicated to whale detection and avoidance technology development

On-Demand Fishing Gear: $17.9 Million

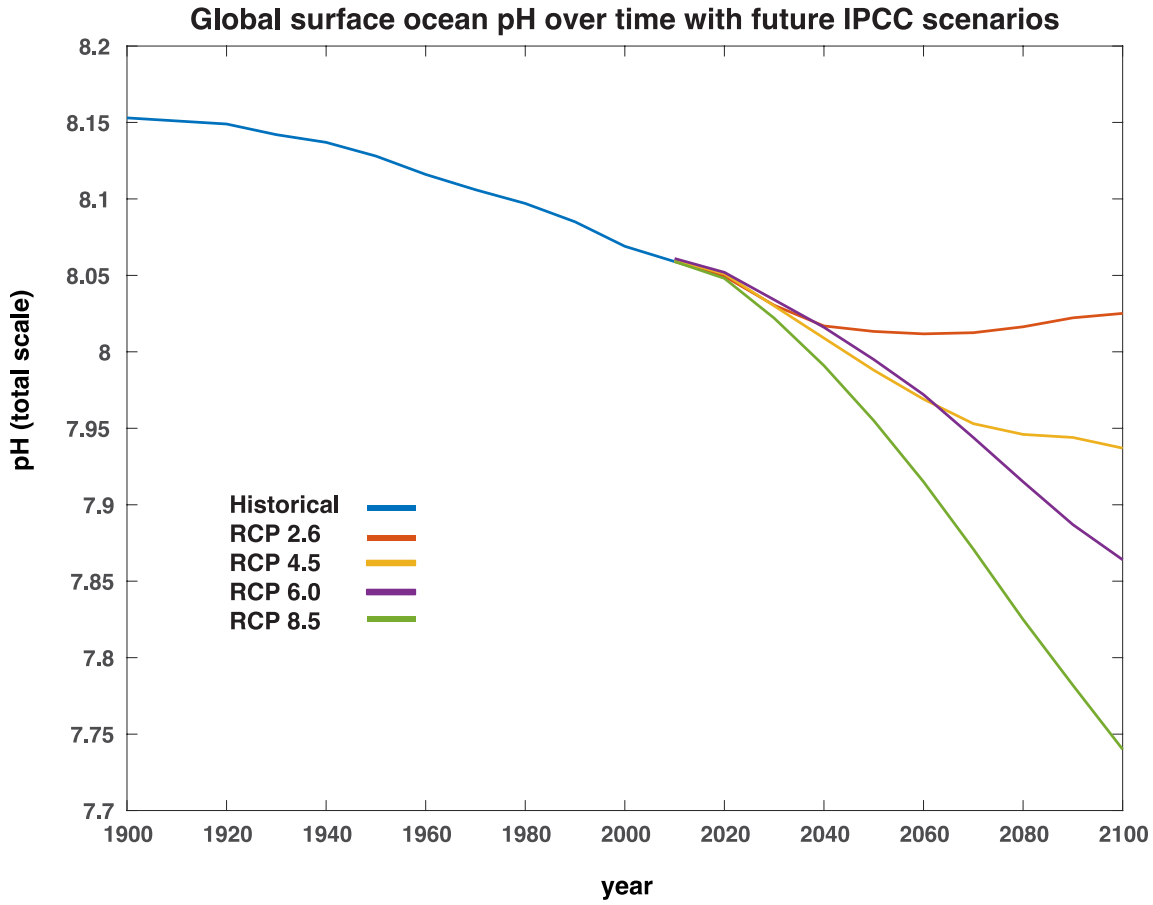
- Developing interoperability standards
- Training for use of systems
- Additional support

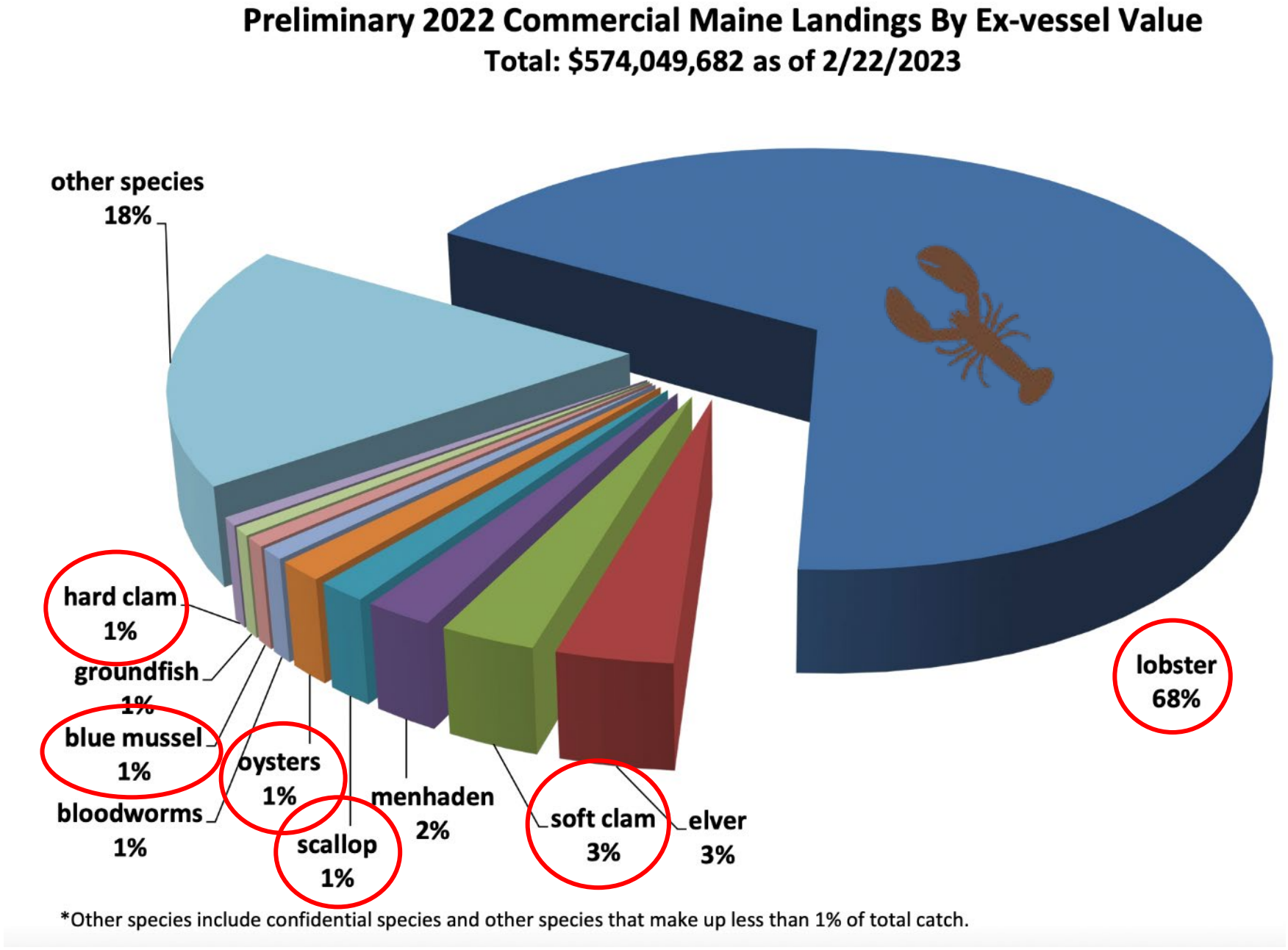
Enforcement Efforts: $5 Million

Changes in Ocean Acidification



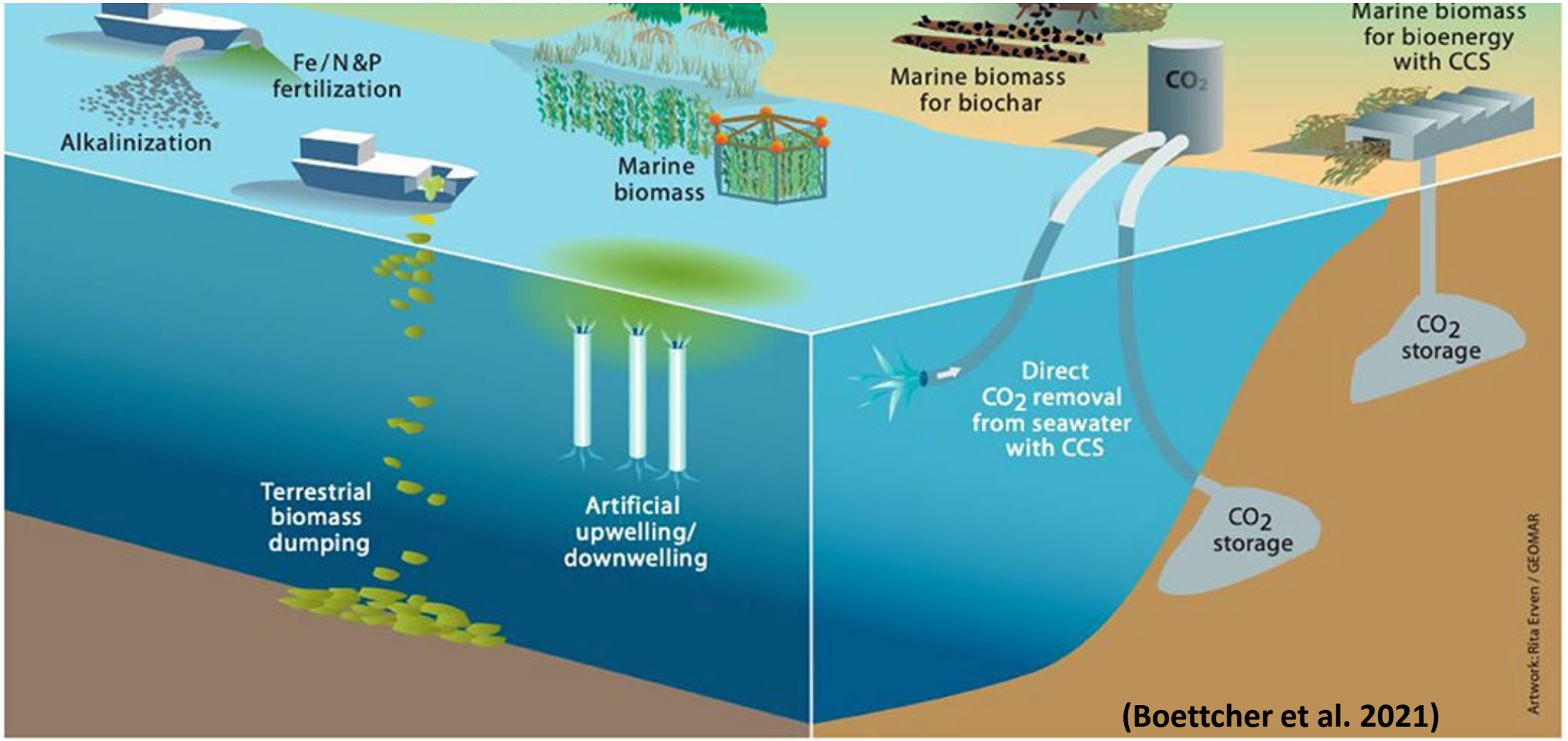
Data: Mauna Loa (https://gml.noaa.gov/webdata/ccgg/trends/co2/co2_mm_mlo.txt) ALOHA (https://hahana.soest.hawaii.edu/hot/hotco2/HOT_surface_CO2.txt)
ALOHA pH & pCO_2 are calculated at in-situ temperature from DIC & TA (measured from samples collected on Hawaii Ocean Times-series (HOT) cruises)
using co2sys (Pelletier, v25b06) with constants: Lueker et al. 2000, KSO4: Dickson, Total boron: Lee et al. 2010, & KF: seacarb





- ~75% of Maine's fisheries (by landings value) are shell producing species, including lobster, clams, scallops, urchins, oysters, and mussels

The FY23 National Oceanographic Partnership Program (NOPP) mCDR funding opportunity supports 17 projects that advance mCDR research



(Boettcher et al. 2021)

LOCAL & STATE > Posted **September 22** | Updated **September 22**

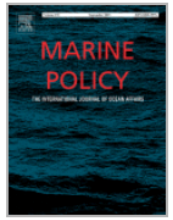
Kelp connection: Maine studies seaweed's power to slow climate change

While Maine already measures the green carbon storage capacity of its forests, it is one of the first states to consider the potential seaweed has to store carbon when it breaks apart and falls to the ocean floor.

ELSEVIER

Marine Policy

Volume 155, September 2023, 105747



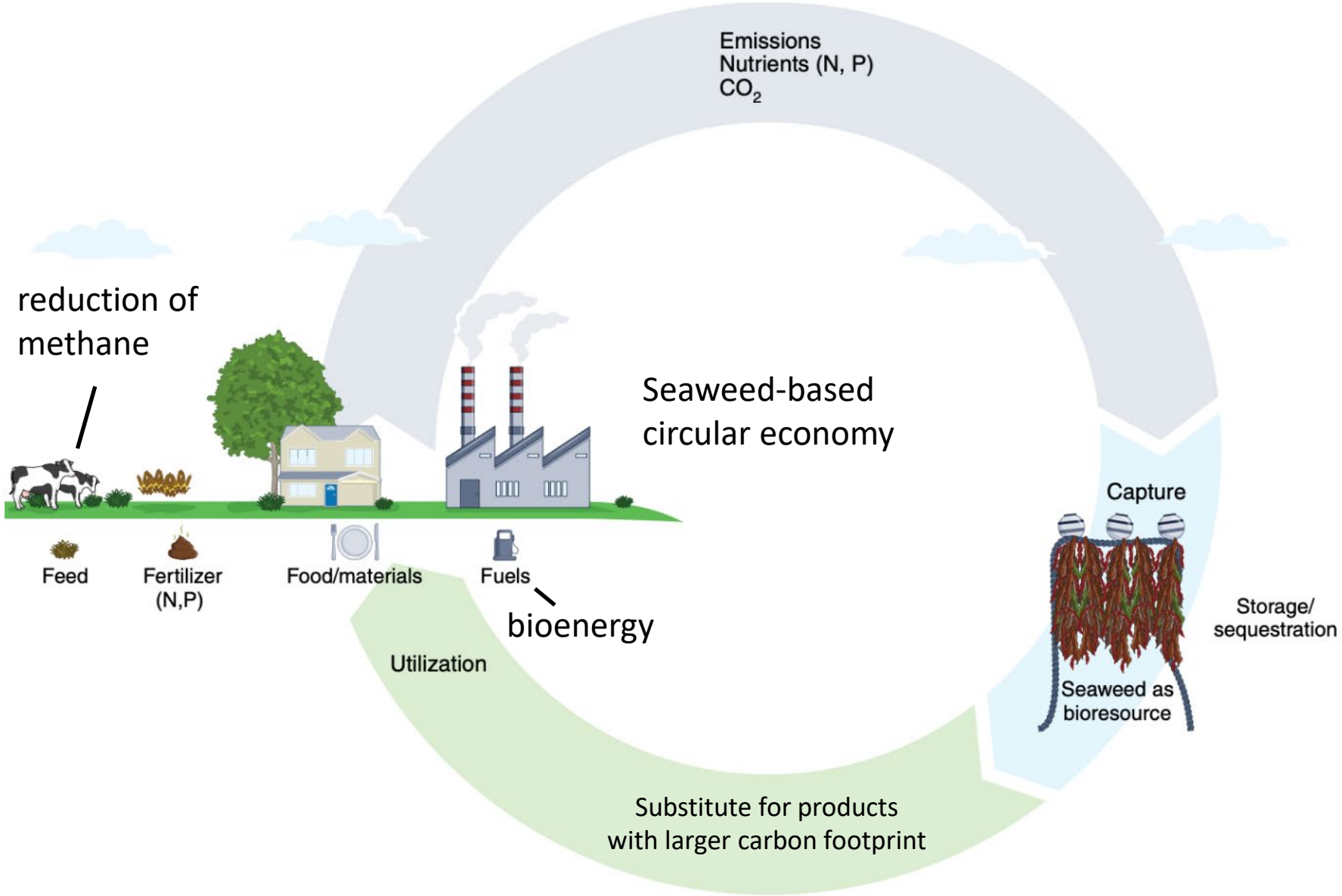
Full length article

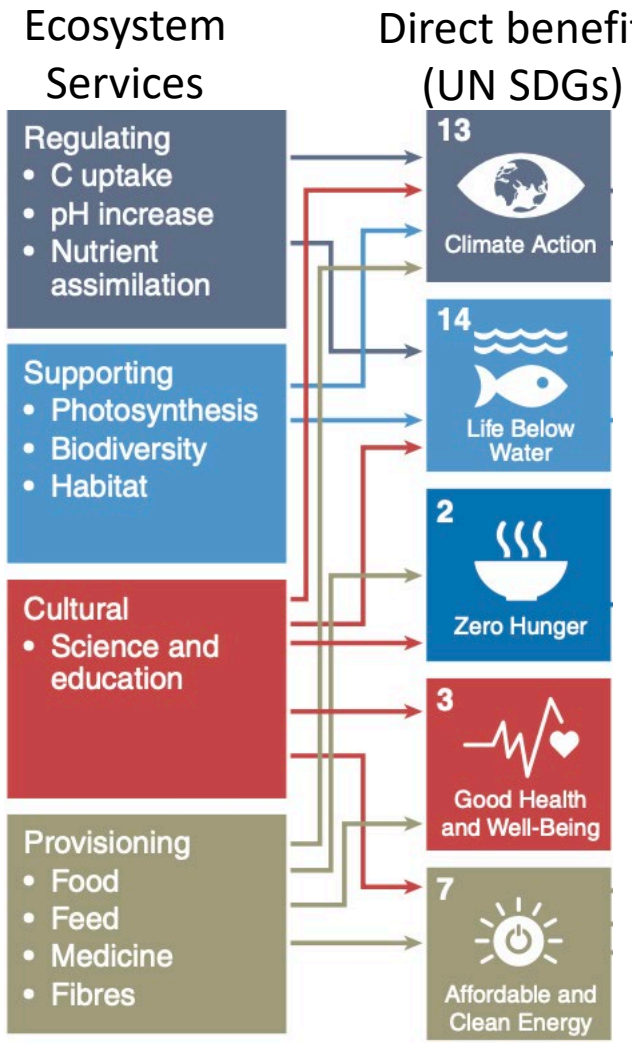
Seaweed blue carbon: Ready? Or Not?

Rod Fujita [a], Simona Augyte [b], Jennifer Bender [c], Poppy Brittingham [d], Alejandro H. Buschmann [e], Max Chalfin [f], Jamie Collins [a g], Kristen A. Davis [h], John Barry Gallagher [i], Rebecca Gentry [j], Rebecca L. Gruby [k], Kristin Kleisner [l], Monica Moritsch [m], Nichole Price [n o], Loretta Roberson [p], John Taylor [q], Charles Yarish [r]

Advances in Climate Services of Farmed Seaweeds

-potential for climate action in Maine

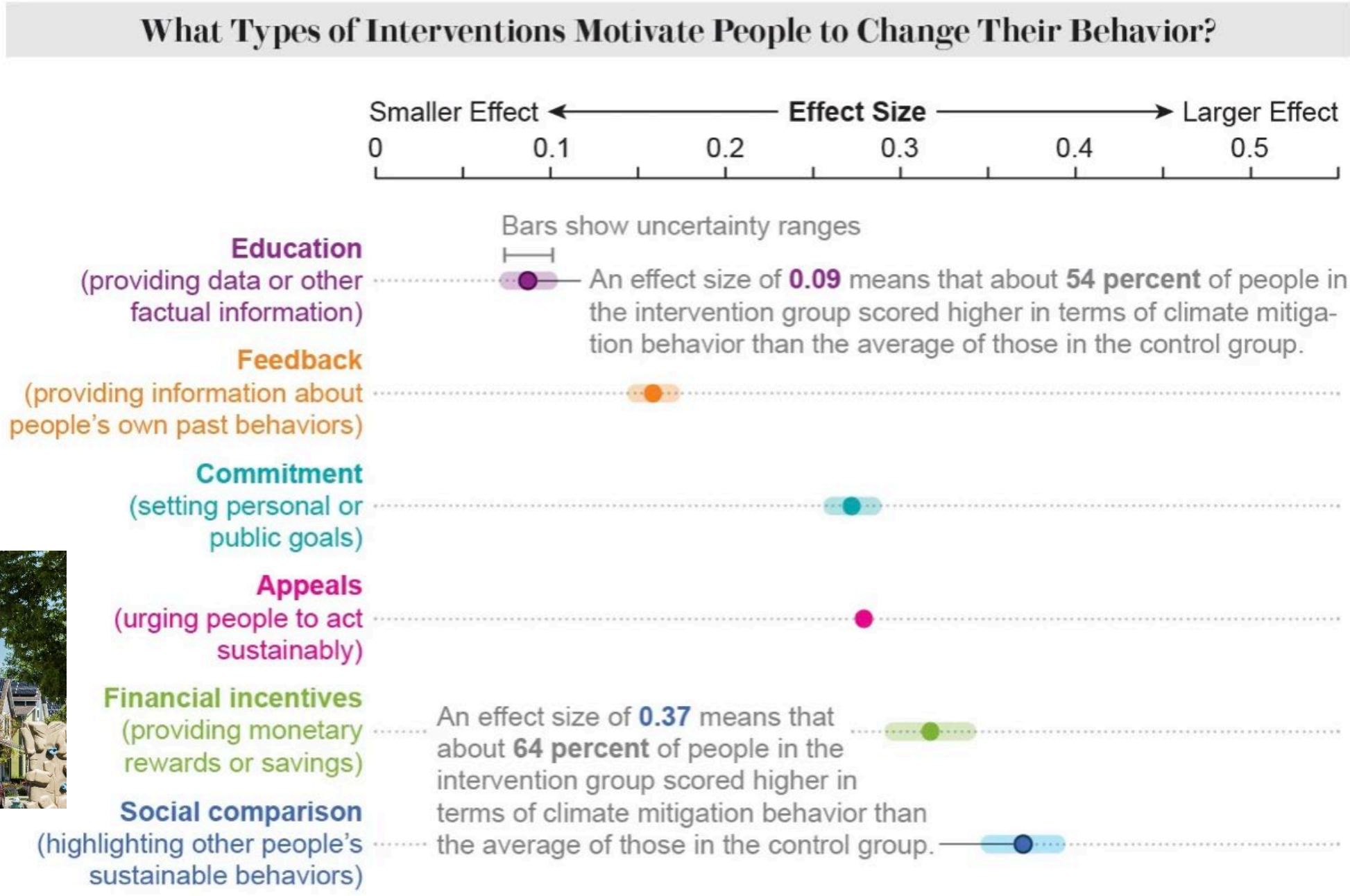




(Modified from Duarte et al. 2021)

In Conclusion

- This is not inclusive of all climate science topics STS will address in the next assessment
- Importantly- more social science perspectives



(Credit: Amanda Montañez; Source: Bergquist et al. 2023)

Thank you!

Questions?

When Climate Comes Home: The Importance of Engaging Youth About Climate Impacts In Their Communities

Amara Ifeji
Youth Representative
for the Maine Climate Council

Maine Climate Council Meeting | September 29, 2023

Youth Representatives of Working Groups & Subcommittees

Amara Ifeji, Maine Climate Council & Equity Subcommittee
Alyssa Soucy, Science and Technical Subcommittee
Audrey Hufnagel, Energy Working Group
Ainsley Morrison, Community Resilience Working Group
Kaethe Rice, Natural & Working Lands Working Group
Jasmine Lamb, Buildings, Infrastructure & Housing Working Group
Deb Paredes, Buildings, Infrastructure & Housing Working Group
Natalie Johnson, Coastal & Marine Working Group

Video: When Climate Change Comes Home

Panel:

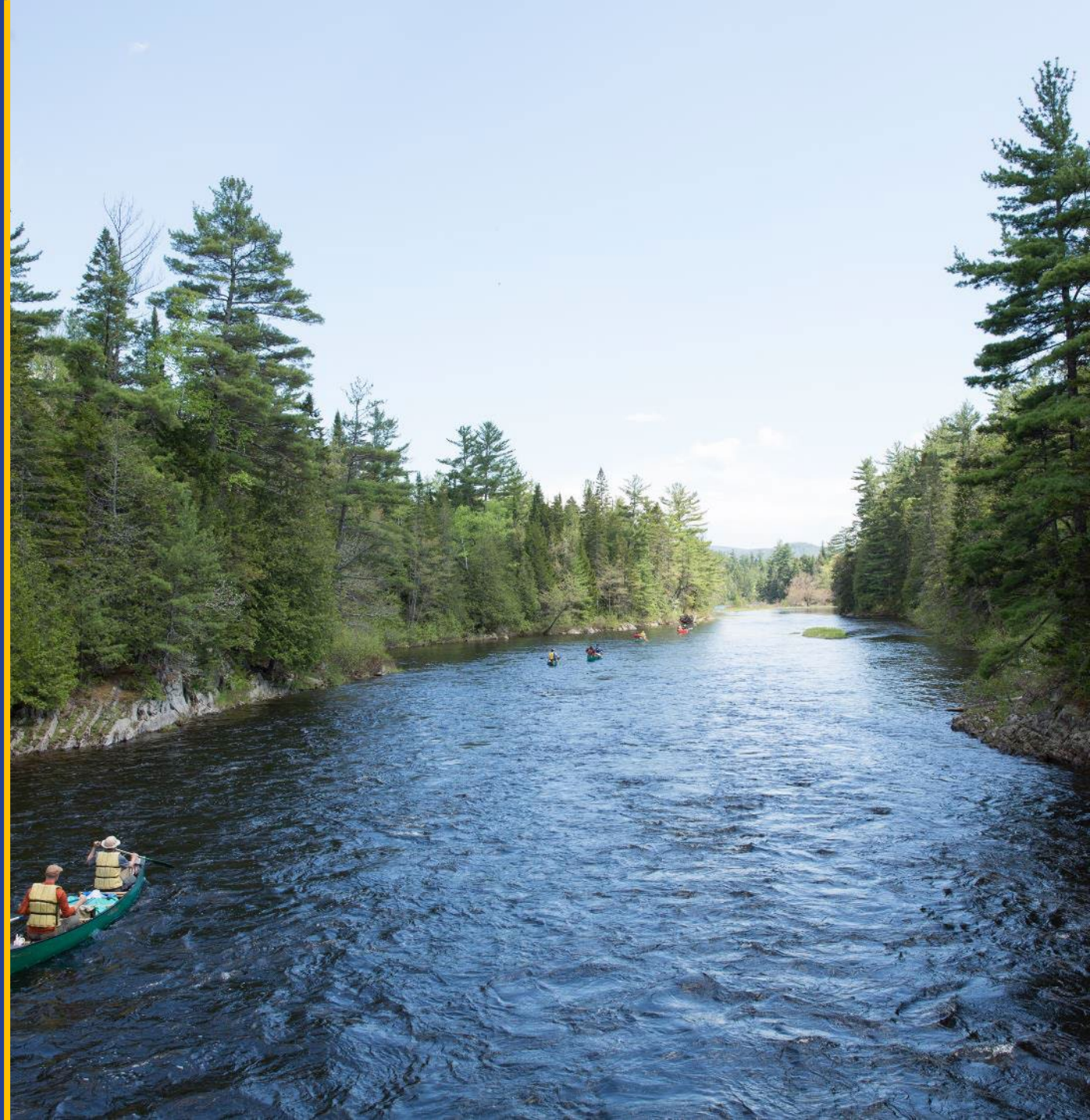
When Climate Comes Home: The Importance of Engaging Youth About Climate Impacts In Their Communities

Rob Taylor & Ken Baker,
Science Teachers & Envirothon Advisors

Leah Burgess & Brenden Veilleux,
Spruce Mountain High School

Dan Wilson & Owen Schwab,
University of Maine Orono

Break until 10:45



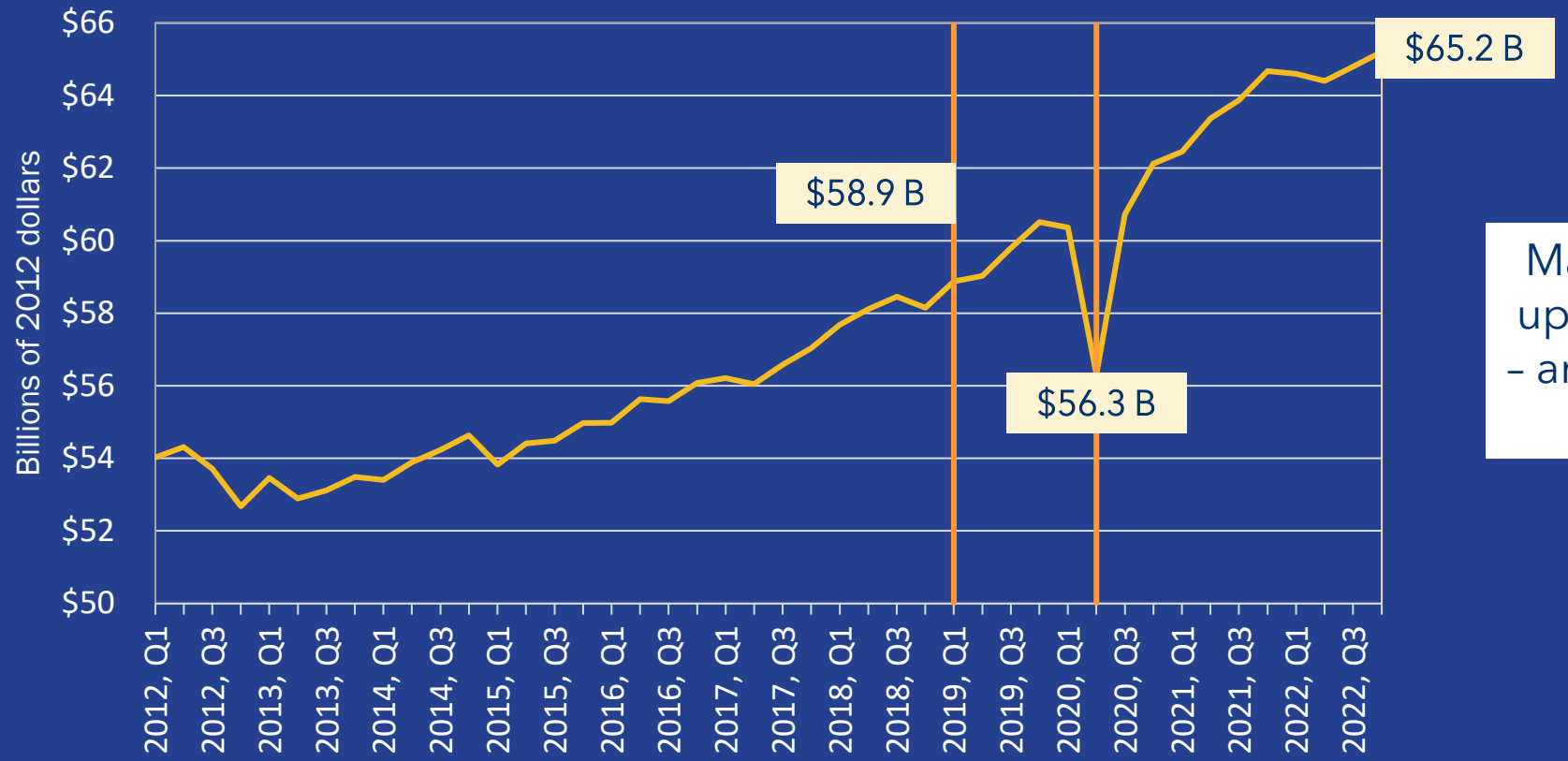
How Climate Solutions are Creating Economic and Workforce Opportunities in Maine

Heather Johnson, Commissioner
Department of Economic and Community Development
Maine Climate Council

Maine Climate Council Meeting | September 29, 2023

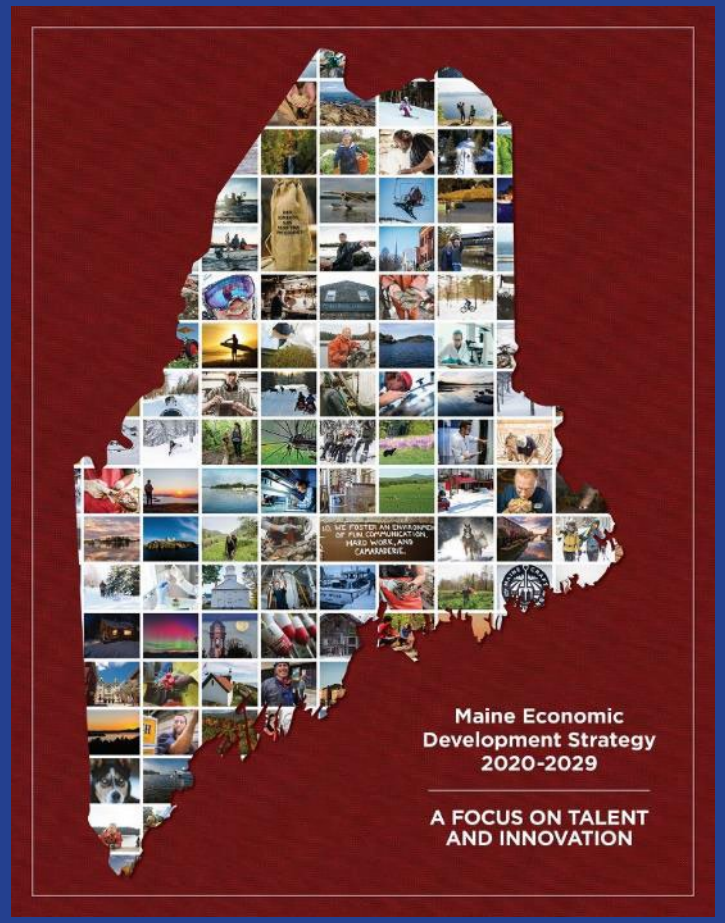

WISCASSET OLD GENERAL STORE
MORE PARKING REAR STORE

Maine's Economic Output



Maine's real economic output is up 11% since beginning of 2019 – and up 16% from pandemic low in mid-2020

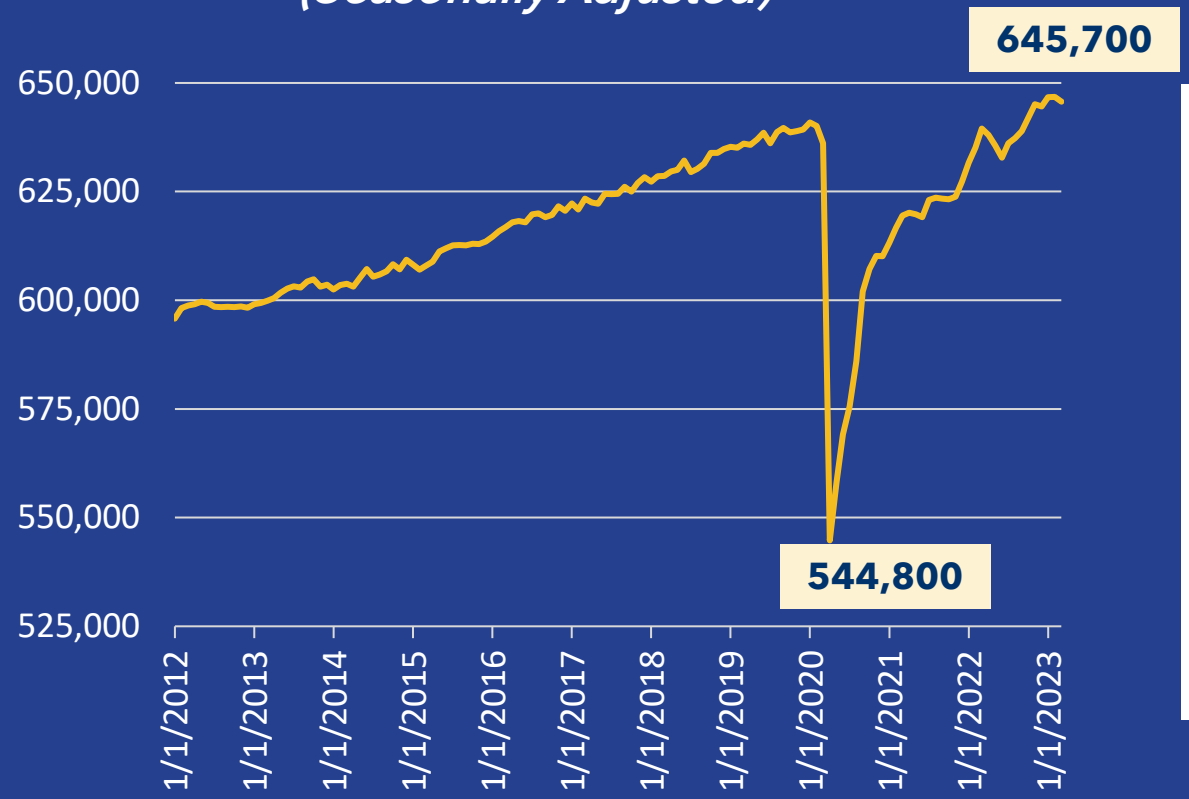
Maine's 10-year Economic Strategy



"While a changing climate offers enormous challenges for our economy, there is also **opportunity to create solutions** that will position Maine as an economic leader in innovative technologies.

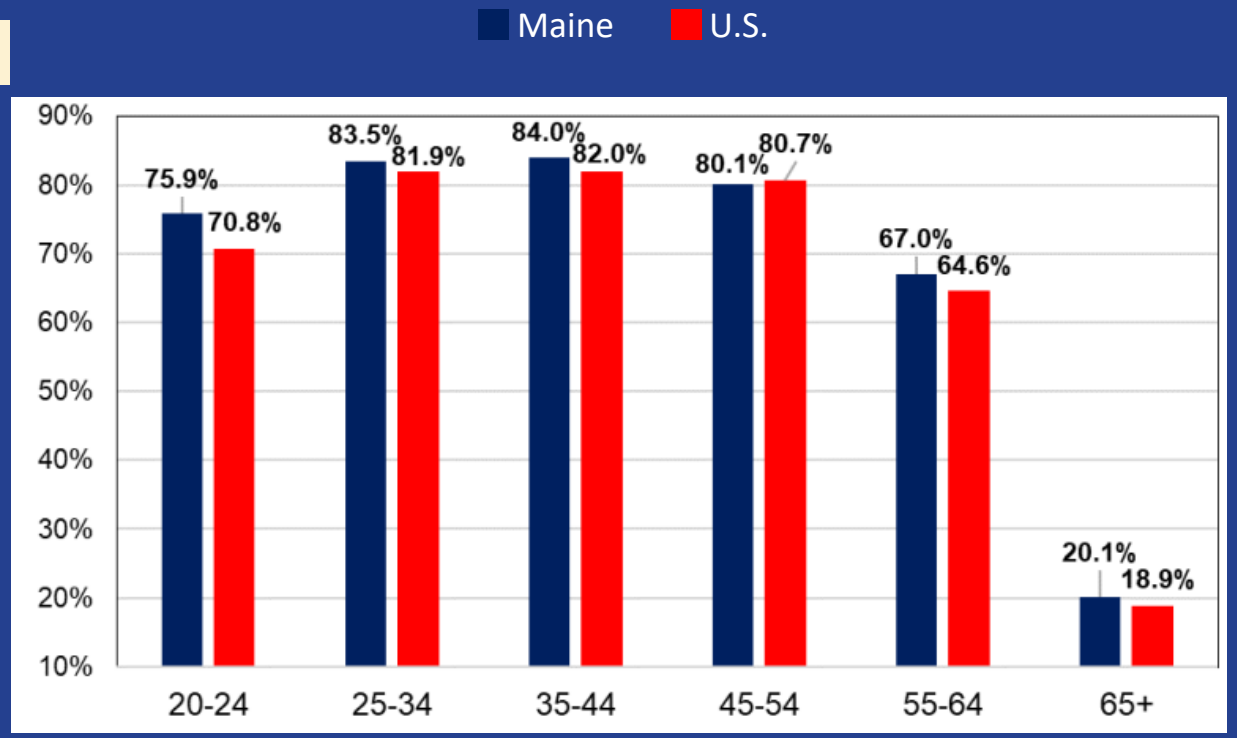
Renewable energy, energy efficiency and safe and traceable food production will create business opportunities and good jobs in some of our heritage industries, while also supporting energy and climate goals."

Total Nonfarm Employment Maine
(Seasonally Adjusted)



Jobs have surpassed pre-pandemic high of 640,900 in January 2020

Labor Force Participation by Age, 2021



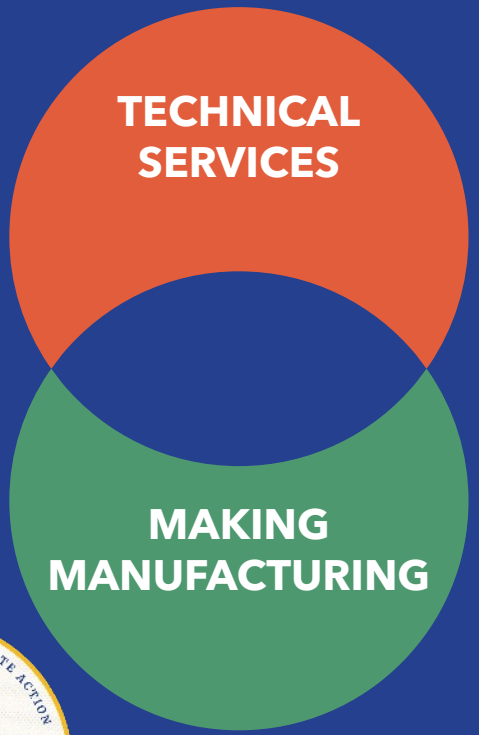
Among core working age population, Maine outperforms US

Maine's 10-year Economic Strategy

Grow wages by 10%	• Baseline (2019), $45,370 • Actual (2021), $50,644 • Difference Made ⬆ 11.6%
Increase productivity by 10%	• Baseline (2017), $88,804 • Actual (2020), $97,759 • Difference Made ⬆ 8%
Attract 75,000 to Maine's Talent Pool	• 2019 Projections: 65,000 labor force decline • Net migration Actual (2022): 21,200 • Difference Made: 700,000 (Goal), 692,000 (2022 Actual)

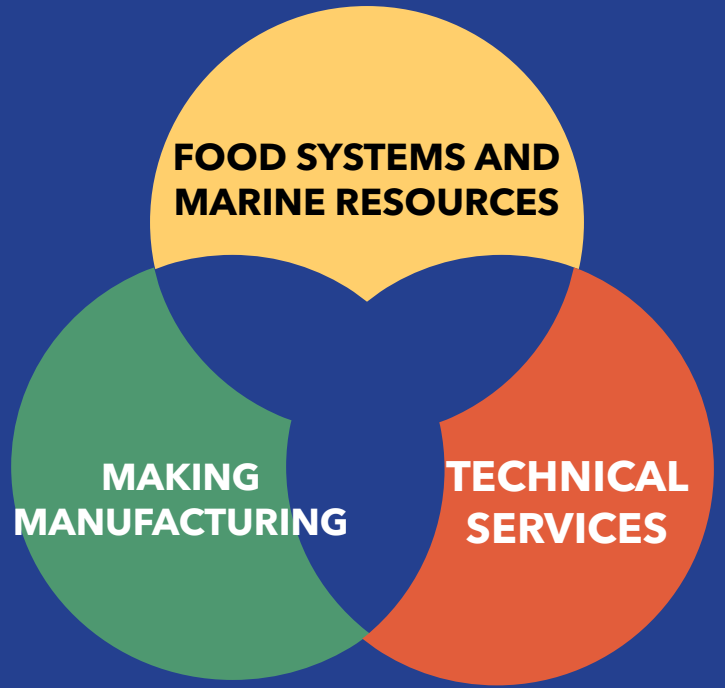
Maine's economic opportunities are climate opportunities

Clean Energy
On and offshore wind power
Tidal power
Battery development
Solar development



Bio-based alternatives
Advanced building materials
Bioplastics
Biofuels

Safe, climate-responsible food
Finfish veterinary services
Shellfish vaccines
Testing for exports
Sustainable aquaculture innovations



Opportunities

- **Emerging industries**
- **New resources:** Federal funding, Dirigo business incentives, and other opportunities
- **Concurrent planning:** 10-year plan, Maine workforce strategy, *Maine Won't Wait*
- **Workforce**

Thank you & questions

Contact our Department:

Victoria Foley

Victoria.Foley@Maine.gov

207-592-1623

Panel:

Mainers On The Frontlines of Climate Action

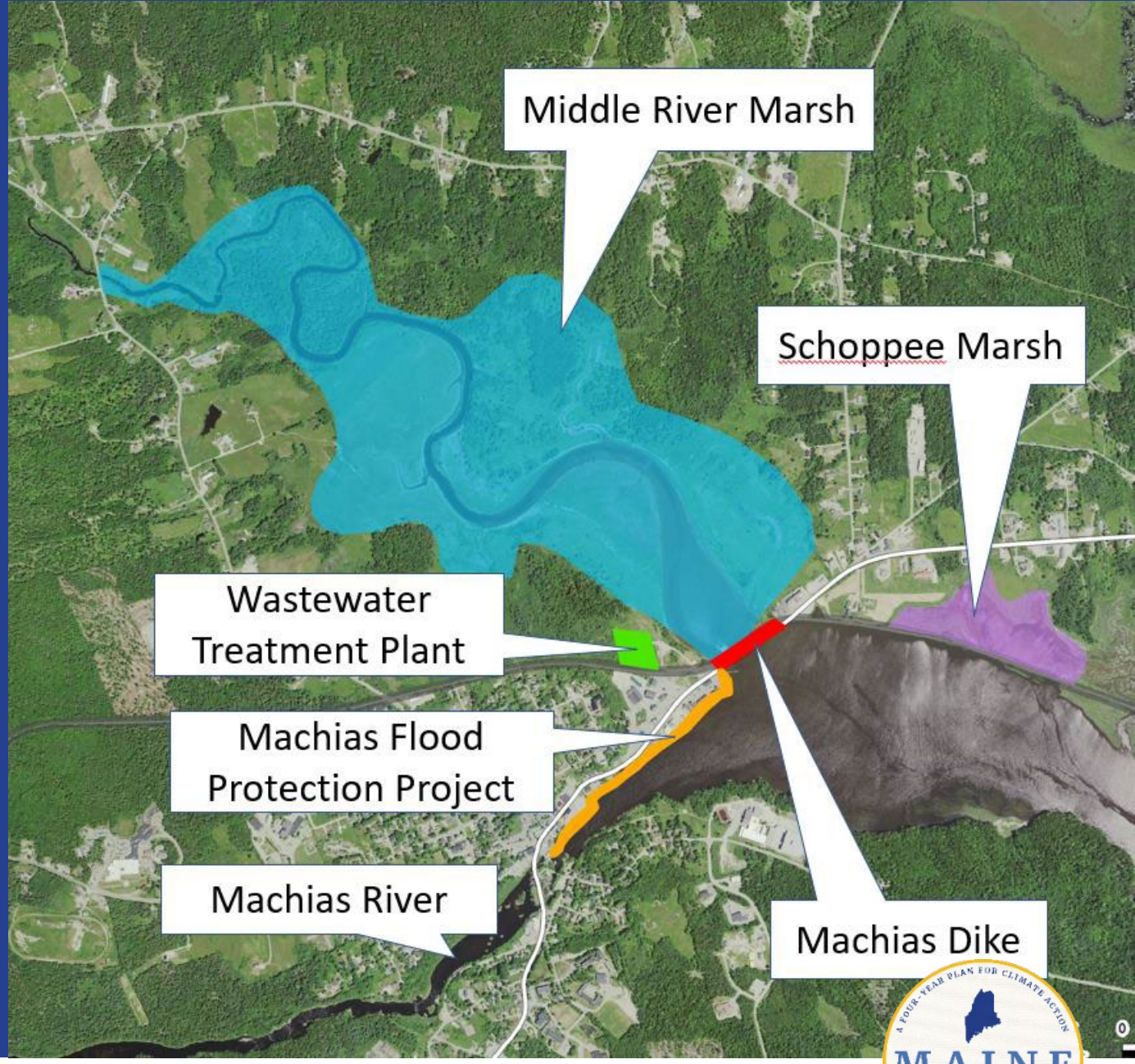
Moderated by Ambassador Maulian Bryant,

Maine Climate Council, Equity Subcommittee

- **Bill Kitchen,** Town Manager, Machias
- **Jasmine Lamb,** Founder, Pleasant Point Resilience Citizens Committee
- **Bob Baines,** Fisherman and kelp farmer
- **Bridget Kahn,** Interim assistant director, Portland Adult Education

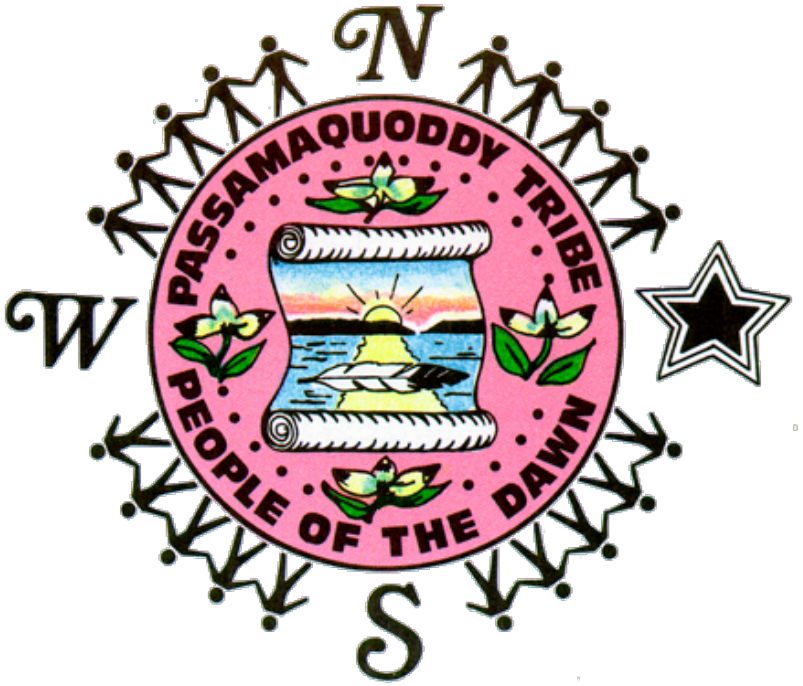
Bill Kitchen

Town Manager, Machias



Jasmine Lamb

Founder, Pleasant Point Resilience Citizens Committee



Bob Baines

Fisherman and kelp farmer

Bridget Kahn

Interim assistant director, Portland Adult Education

Video: Communities Leading on Climate

www.youtube.com/@MaineClimateCouncil

Community Resilience Partnership

Community Solar project in Limestone, Maine

Maine Won't Wait Recommendation:

Provide state leadership for robust technical assistance and funding to communities by 2024 to support local and regional climate-resilience initiatives.

Increased Funding for Communities

$3 million per year in the biennial budget for **grants and technical assistance** to:

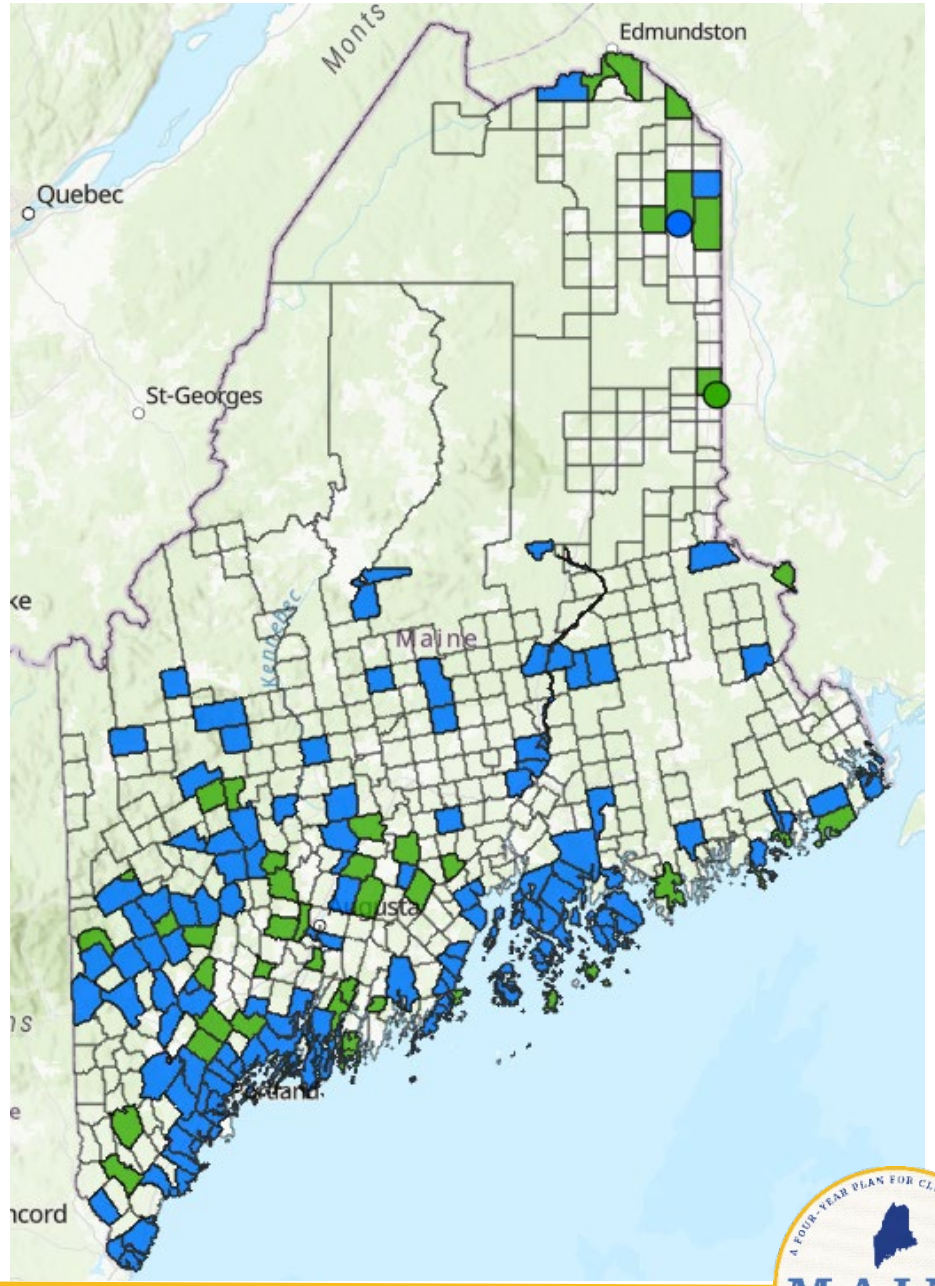
- **reduce carbon emissions**,
- **transition to clean energy**, and
- **become more resilient** to climate change effects such as to extreme weather, flooding, rising sea levels, public health impacts, and more.

Town and state leaders in Norway, Maine

174 participating communities

129 eligible for grants

45 working toward enrollment



New Grant Announcements

53 communities awarded **$2.4 million** in grant funds.

Abbot*
Bath
Berwick*
Bowdoinham
Bridgton
Camden
Casco*
Cranberry Isles*
Danforth*
Eliot*
Ellsworth*
Enfield* & Howland*
Eustis*
Freedom*
Fryeburg*
Garland*
Gorham*
Hallowell
Harpswell
Hartford*
Long Island*
Mariaville*
Mount Desert & Tremont
North Haven* & Vinalhaven
Northport*
Norway
Ogunquit*
Old Orchard Beach*
Otisfield
Passamaquoddy Indian Township* & Pleasant Point
Penobscot Nation*
Phillips*
Phippsburg*
Portland
Rangeley*
Rockland
Sedgwick*
Skowhegan*
South Portland
South Thomaston*
Southwest Harbor*
Standish*
Stonington*
Sumner*
Topsham
Vassalboro*
Westport Island
Wilton*
York*

*Denotes first-time applicant

COMMUNITY RESILIENCE PARTNERSHIP

- **Join at anytime**
- **Self-enroll or get help from a Service Provider**

5 Steps to Enroll

1. Complete self-evaluation
2. Hold a community workshop
3. Prioritize community actions
4. Adopt municipal resolution
5. Submit completed materials

Ashley Krulik
Community Resilience Program Manager
ashley.krulik@maine.gov | (207) 816-2717

Break for Lunch until 1PM

Process to Update the Climate Action Plan

Maine Climate Council Meeting | September 29, 2023

2024 Plan Timeline

DEC 1, 2020

Maine Won't Wait Climate Action Plan Delivered to Legislature

MAY 2023

Governor Announces New and Returning Appointments to Climate Council

SEPT 2023 - JUNE 2024

Working Groups & Subcommittees Meet to Update Mitigation and Adaptation Strategies

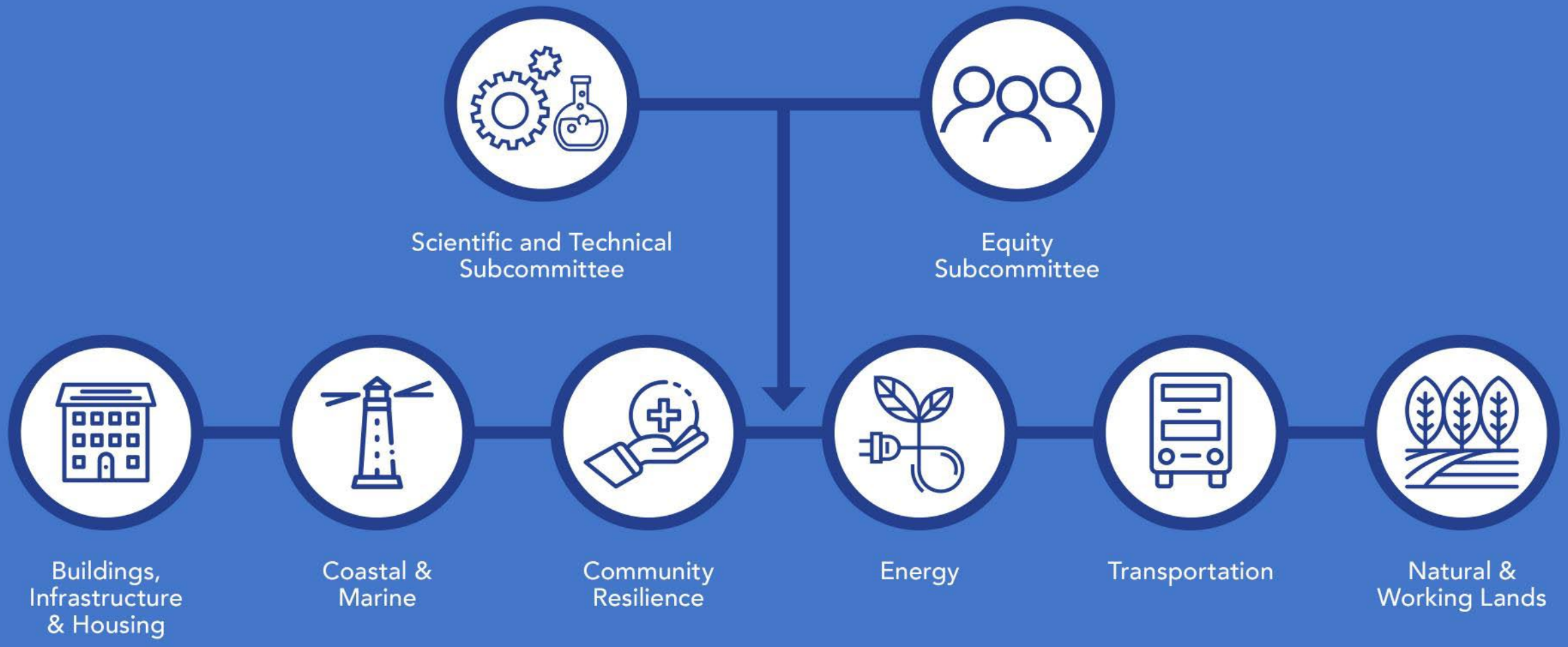
SEPT 2024

Climate Council Meets to Consider and Adopt Strategies

DEC 1, 2024

Updated Climate Action Plan Delivered to Legislature

Maine Climate Council



EPA Climate Pollution Reduction Grants (CPRG) Program

- **Planning grants: Maine will receive $3 million for additional analysis to inform climate action planning**
  - Outreach and engagement including disadvantaged communities
  - Emissions modeling and benefits analysis
  - Workforce analysis
  - Sector specific analysis including buildings, medium heavy duty vehicles, fleet electrification, land use, waste
  - Intersections with federal funding
- **Implementation grants: $4.75 B competitive funds**

Maine Climate Council Meeting Poll

Which of these outreach and engagement strategies have you found most helpful?

How the Maine Climate Council will hear from you

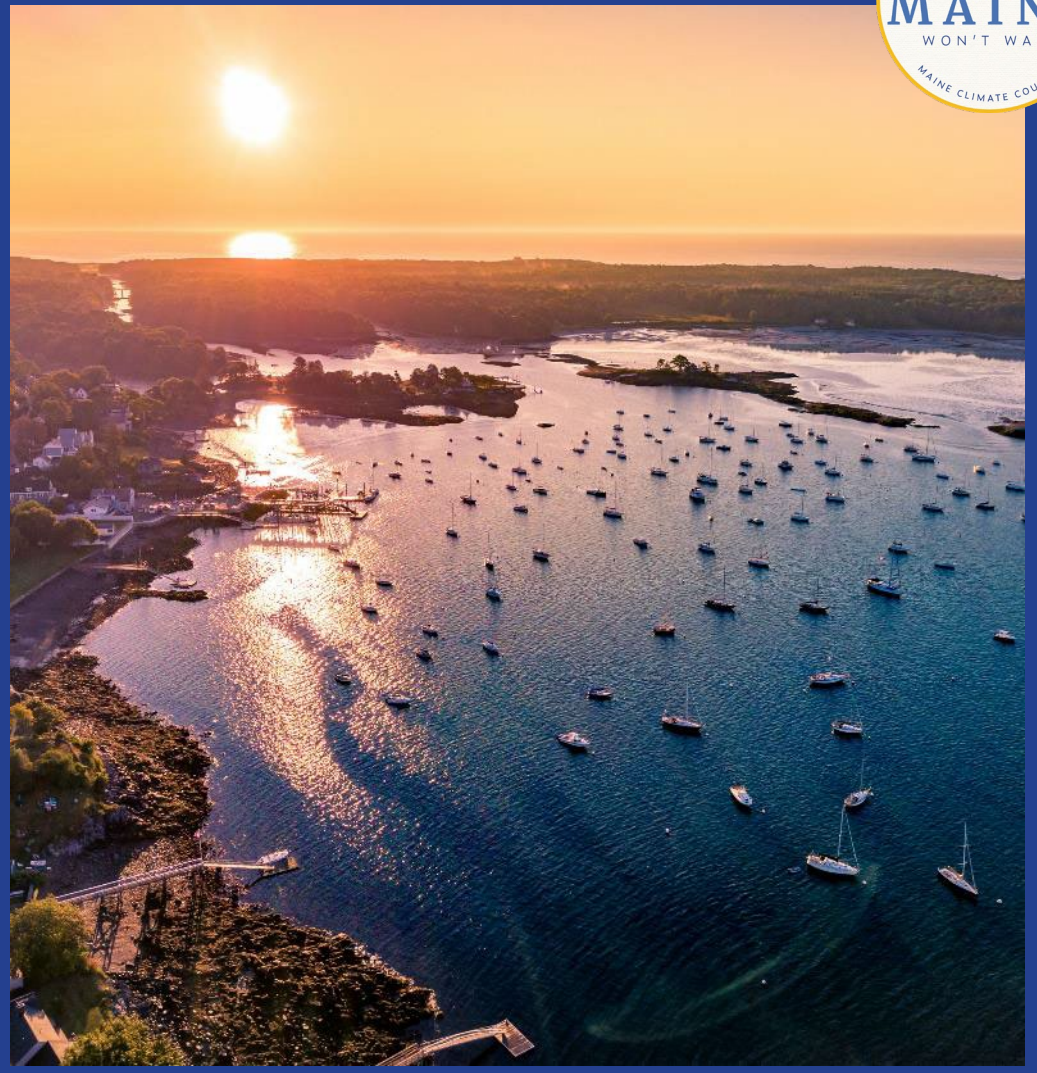
1. Working Group Meetings
   - Diverse membership representing communities, organizations, and industries across Maine
   - Meetings with stakeholders relevant to each working group
2. Engaging with members of disadvantaged communities
   - GOPIF is seeking a disadvantaged community outreach and engagement coordinator through a request for proposals (RFP) – currently open on Maine.gov
   - Organizations that work with priority populations can sign up to be listed as outreach partners
3. Helping young people participate in the climate planning process
   - NEW Youth Climate Engagement Fellow
4. Follow the Maine Climate Council
   - Subscribe to the Maine Climate Council Newsletter
   - Follow us on social media

maine.gov/future/climate/council

Questions?

Working Groups

Highlights, Challenges and Opportunities



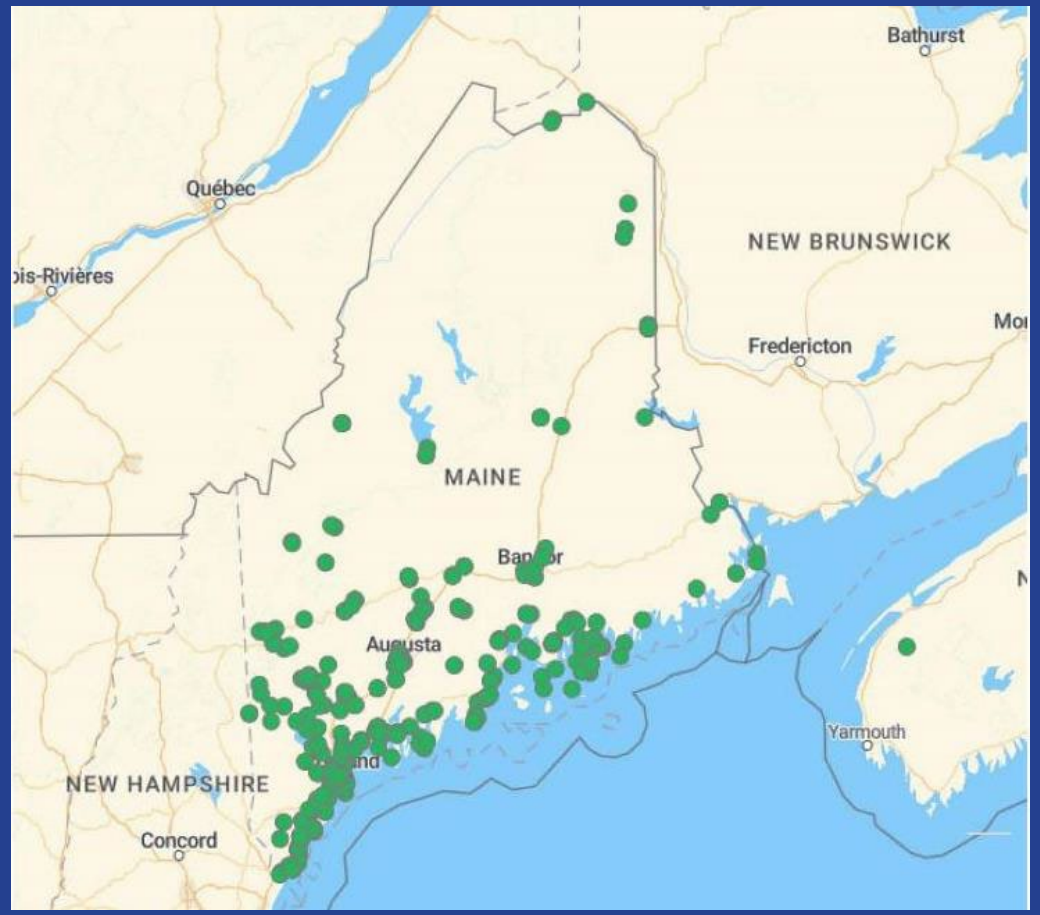
Maine Climate Council Meeting | September 29, 2023

Transportation Working Group

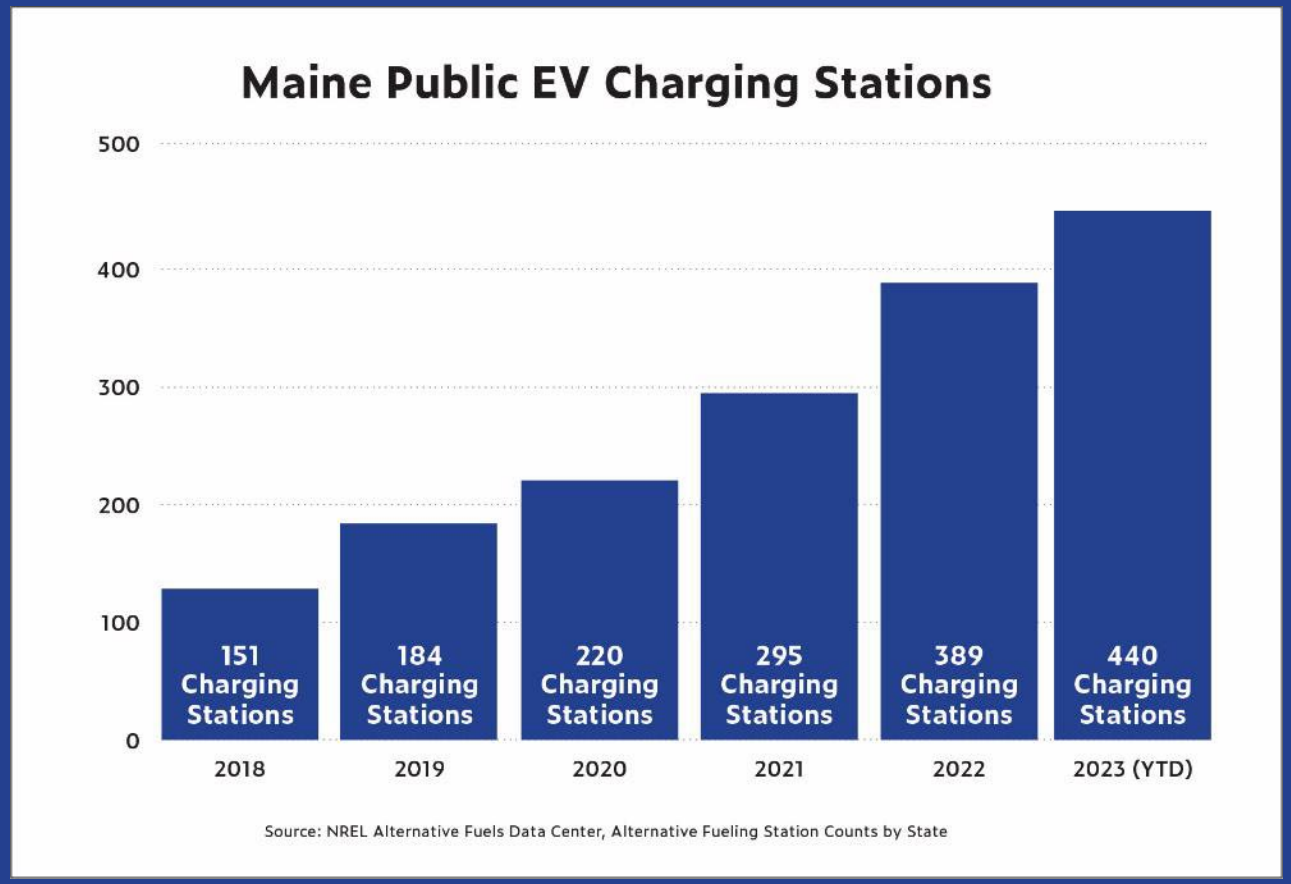
Co-Chairs:

Joyce Taylor, Maine Department of Transportation & Jeff Crawford, Maine Department of Environmental Protection

Accelerating EV Charging Deployment



Existing Level 2 and DC Fast Chargers, September 2023 (Alternative Fuels Data Center)



Accelerating EV Charging Deployment

2023 EV Charging Plan

- Submitted Plan to Federal Highway Administration outlining the implementation of National Electric Vehicle Infrastructure (NEVI) funds

Recharge Maine

- The state's initiative to create a convenient, reliable, and accessible EV charging network
- Identifies state-funded chargers, held to strict performance standards, including 97% uptime

Recent Awards

- 7 new DC fast charging (DCFC) sites funded by NEVI (Bangor, Augusta, Route 1 Downeast)
- 5 new DCFC sites funded by MJRP (northern and eastern Maine)

Available funding sources:

Maine Jobs and Recovery Plan (MJRP):	$8M
National Electric Vehicle Infrastructure: (NEVI) program	$18M
Charging and Fueling Infrastructure (CFI) grant program:	Applied for $15M

Recharge Maine
State EV Charging Network

Readying the workforce to repair and service EVs

Southern Maine Community College and Washington County Community College launch EV repair certification courses

EV technician training at Kennebec Valley Community College funded through Clean Energy Partnership at Governor's Energy Office (GEO)

GEO applied for grant to support EV charging and EV workforce development through Department of Energy Ride & Drive Electric program

Medium and Heavy-Duty Electrification

Transit Buses

Fleet transition planning

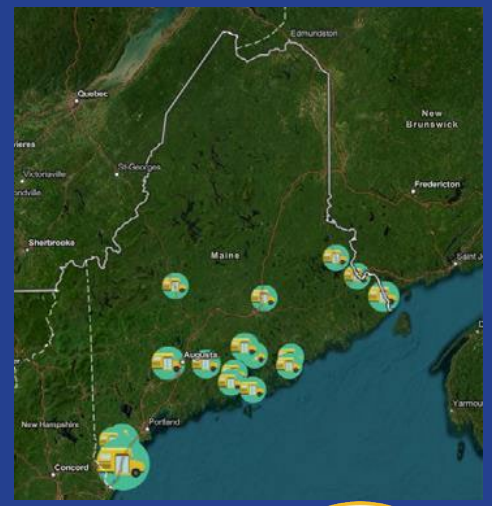
- Best practice summary for transit vehicle electrification
- Individual fleet analyses and plan development for transitioning transit agencies to electric and/or hybrid vehicles (8 plans complete and 4 ongoing)

Maine's transit agencies have 4 electric buses in service and 2 more ordered

Community Connector in the Bangor area awarded funding to upgrade their facility to accommodate future electric bus charging

School Buses

Maine schools were awarded 34 electric buses through EPA's Clean School Bus Program *(#4 in the country per capita for awards)*



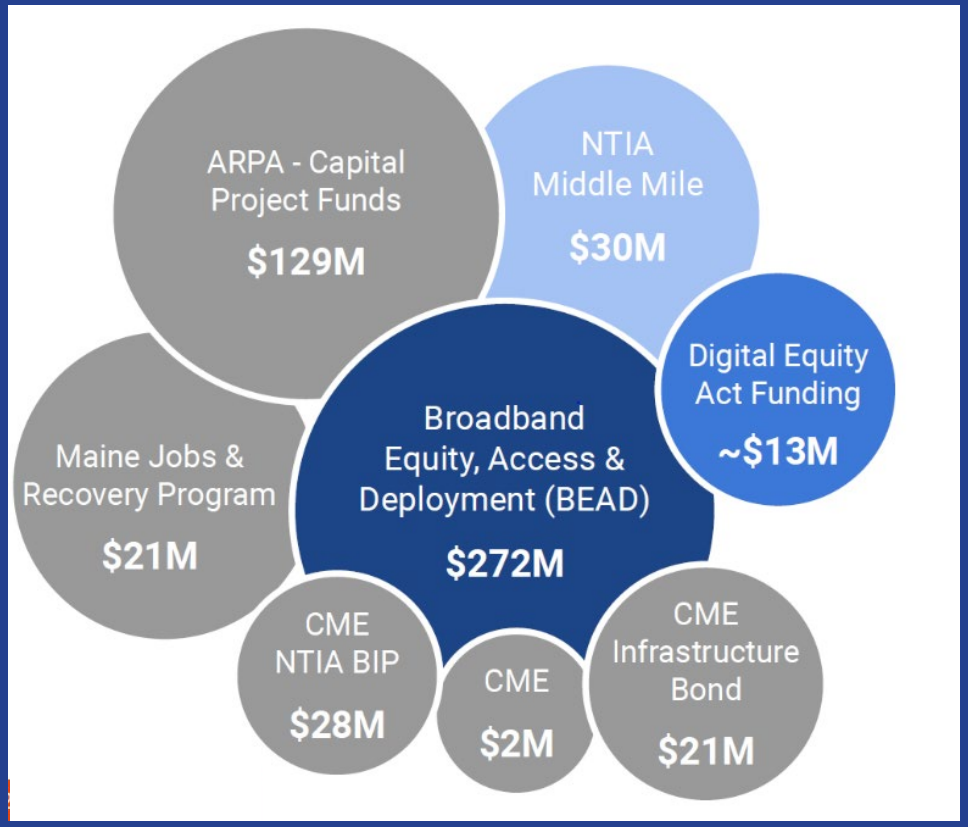
Mount Desert Island High School electric school bus, Maine's first!

Reducing Vehicle Miles Traveled (VMT)

- Statewide Active Transportation Plan
- Promoting active transportation through updates to MaineDOT programs
  - Department reassessing speed limit setting; Village program
  - Gateway treatments; Complete Streets update in spring 2024 to encourage safe and accessible streets and highways
  - E-bike pilots
    - Bikeshare program in Portland; 15 e-bikes for demonstrations at public or corporate events; other initiatives with state agencies around workforce transportation
- Diversifying commuting options
  - GOMAINE relaunch (eliminated 2M vehicle miles since 2022)
  - Workforce transportation pilots – working with employers to identify innovative options
- Land Use Planning - encouraging housing density, especially in community "growth areas" and for affordable housing through the passage and implementation of LD 2003 which includes requirements to allow increases in housing density and creates a new Housing Opportunity Program and Fund to support community planning for smarter growth

Reducing VMT through historic investments in broadband infrastructure

Maine Connectivity Authority: expanding access to reliable, high-speed and affordable internet service statewide

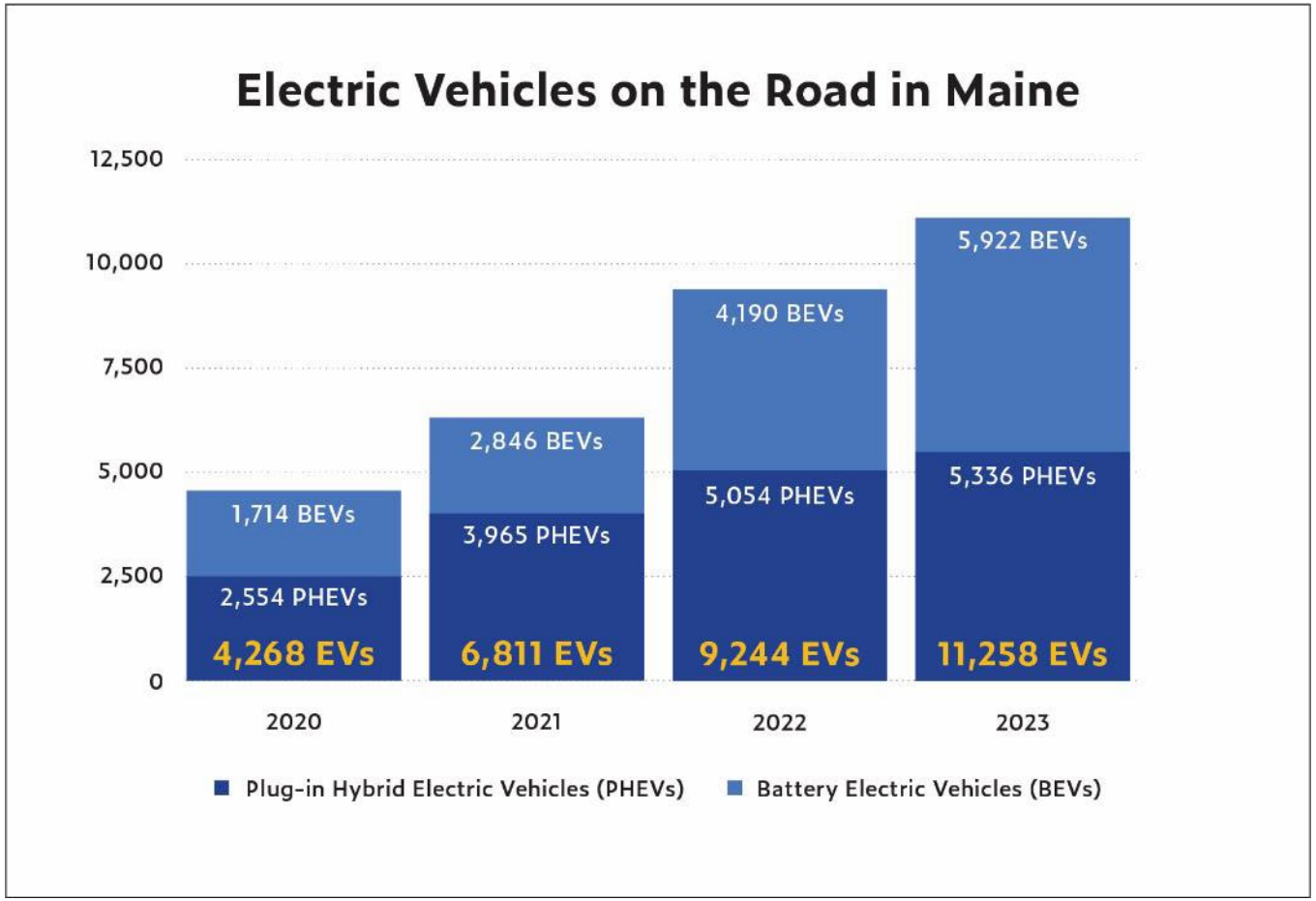


$315 M awarded to Maine through the Bipartisan Infrastructure Law, building on nearly $200M from other federal and state funding sources to deploy high-speed broadband across Maine.

- High-speed, affordable broadband supports telecommuting, remote education, telehealth, and access to online services to reduce travel
- Also supports connected energy systems and devices to increase technology opportunities in rural areas and efficiency

Challenges and Opportunities

1. Continue to support EV adoption, including increasing support for adoption for low- and moderate-income Mainers
2. Encourage electrification of medium and heavy-duty vehicles
3. Continue to support policies that reduce vehicle miles traveled (VMT)
4. Investigate marine and aviation alternative fuel opportunities



Maine Climate Council Meeting Poll

What should the Transportation Working Group absolutely not forget as it starts the update process?

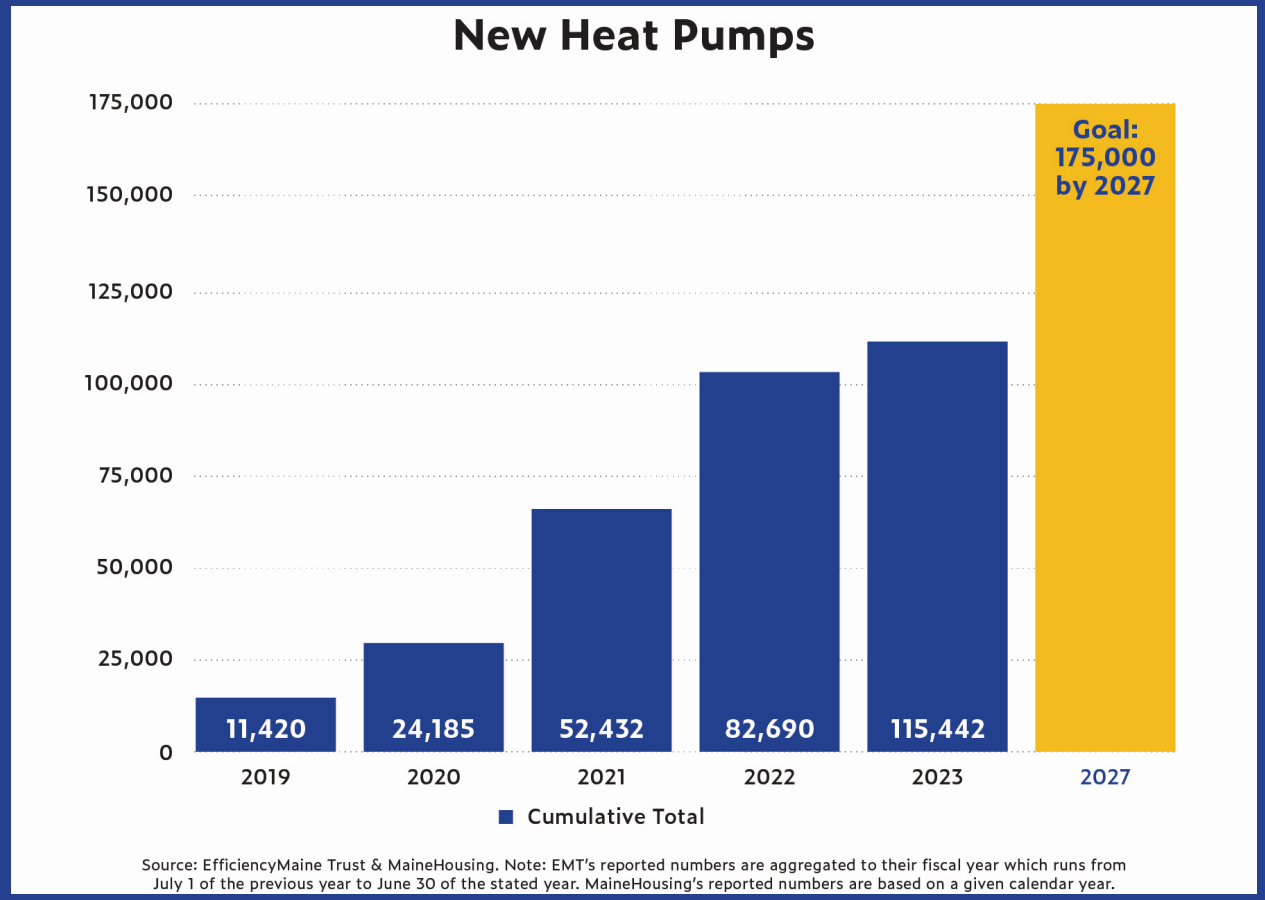
Building, Infrastructure, and Housing Working Group

Co-Chairs:
Kathleen Meil, Maine Conservation Voters
& Michael Stoddard, Efficiency Maine Trust

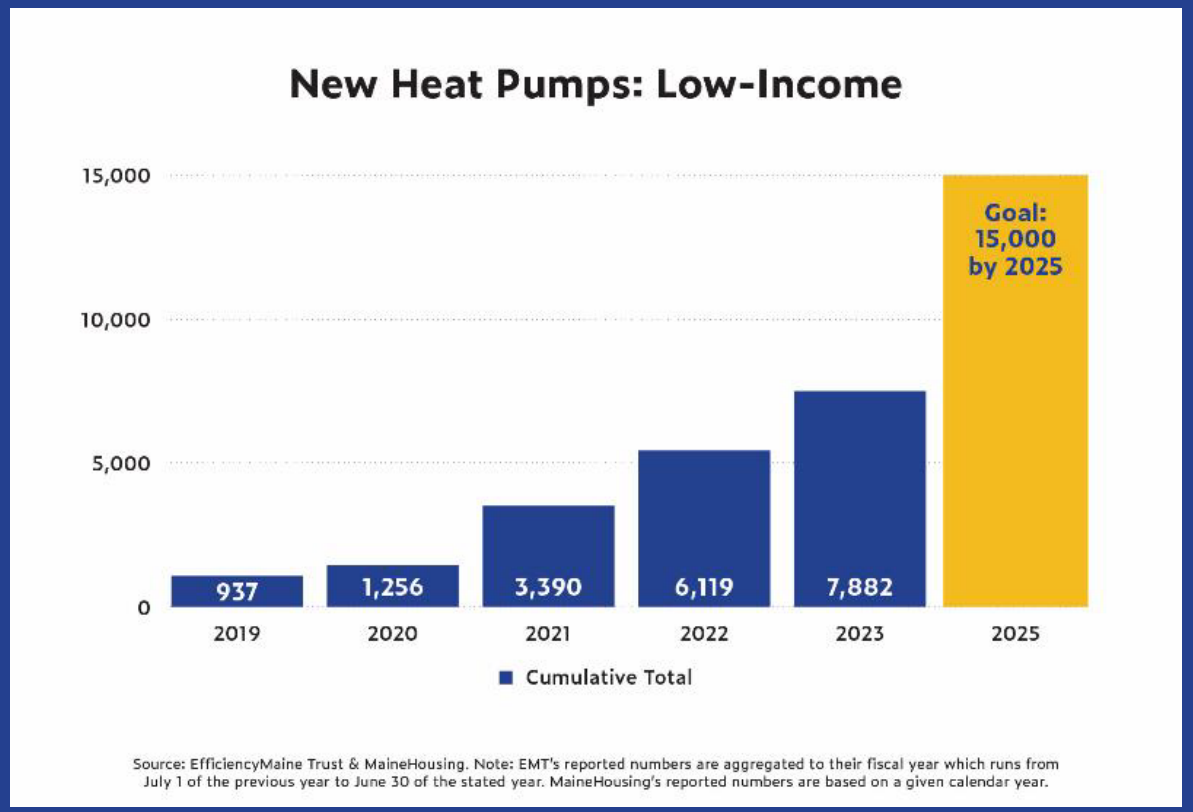
Maine Leads the Nation in Heat Pump Deployment:

- Governor's 100,000 goal by 2025 met two years early
- New 175,000 additional heat pump goal set for 2027 – doubling the pace of progress (322,000 installed by 2027)
- Maine Community College has trained 1 of 3 installers since 2019, huge growth of small businesses
- Next phase will focus on increasing pace of low income, municipal, and small business installations

Heat Pump goal reached and new targets set

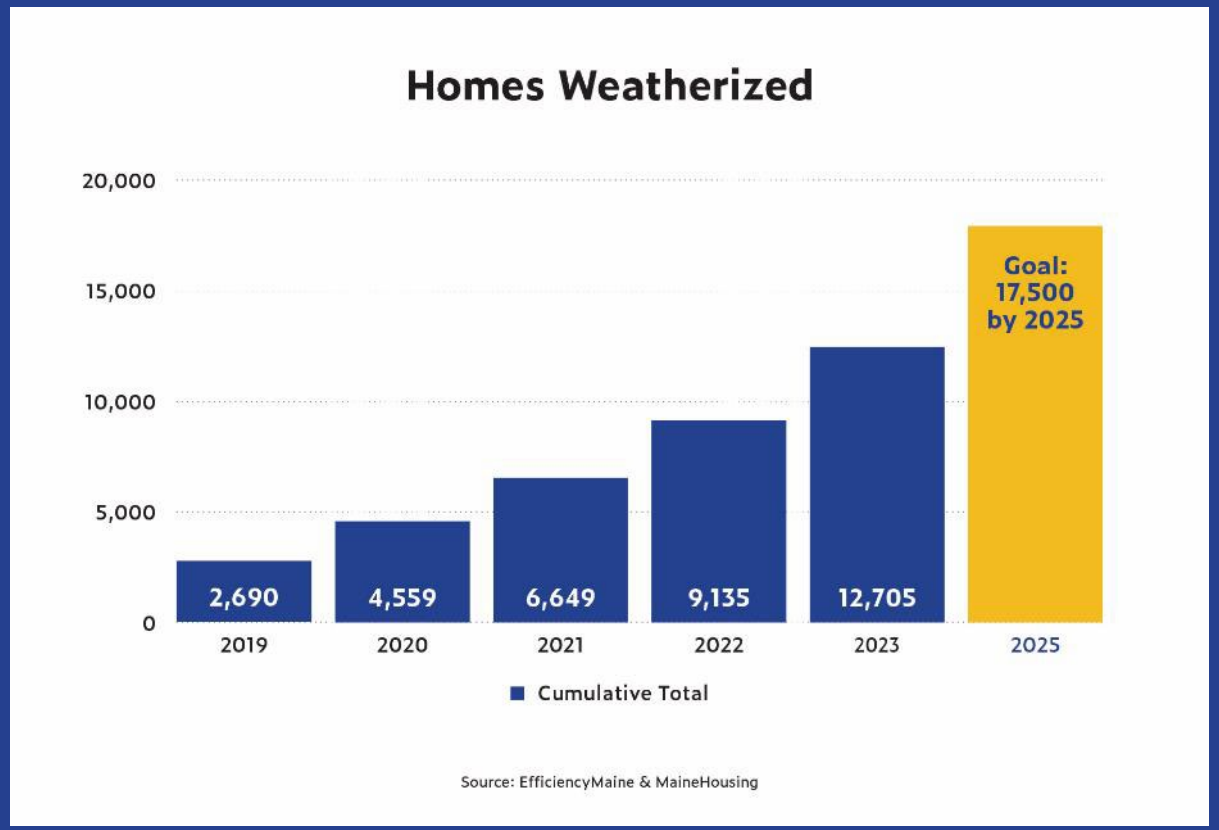


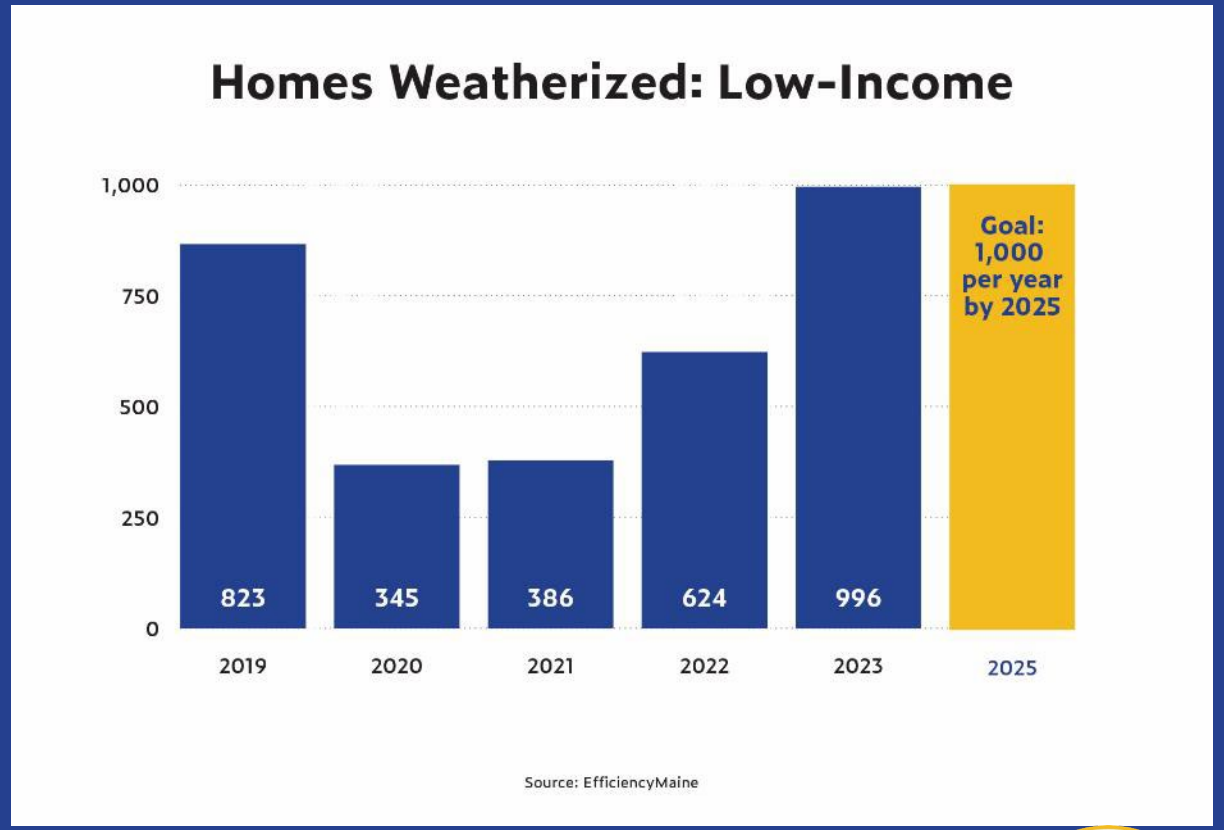
Source: EfficiencyMaine Trust & MaineHousing. Note: EMT's reported numbers are aggregated to their fiscal year which runs from July 1 of the previous year to June 30 of the stated year. MaineHousing's reported numbers are based on a given calendar year.



Source: EfficiencyMaine Trust & MaineHousing. Note: EMT's reported numbers are aggregated to their fiscal year which runs from July 1 of the previous year to June 30 of the stated year. MaineHousing's reported numbers are based on a given calendar year.

Homes Weatherized: On pace for 2025 goal





Accelerate Efficiency Improvements to Existing Buildings

New State and federal investments in energy efficiency

- $50 million for low-income, hospitality, congregate housing, manufacturing, and municipal/school energy efficiency projects through the Maine Jobs & Recovery Plan (administered by Efficiency Maine)
- $31 million for low-income weatherization from the federal Bipartisan Infrastructure Law (administered by MaineHousing)
- $71 million expected to come to Maine from US Department of Energy for home energy rebates through the Inflation Reduction Act

New investments in building energy efficient affordable housing

- Maine Jobs and Recovery Plan: $50 million for new energy efficient affordable homeownership and rental housing
- Additional $70 million in new investment from the most recent state budget for new energy efficient affordable rental housing
- All projects must be energy efficient, electrified heating, and EV/PV ready

Advance the design and construction of new buildings

- Maine Technical Building Codes and Standards Board is adopting the **2021 International Energy Conservation Code (IECC)** including an updated stretch code for residential and commercial buildings and the **American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1-2019** standard into the Maine Uniform Building and Energy Code (MUBEC)
- MaineHousing adopted the most recent energy building codes (2021 IECC) for new construction and is required by a new law to achieve passive house standard equivalency in all new construction by 2024

Helping schools pursue climate action that saves money and improves student outcomes

- 2023-2024 state budget includes:
  - Green Schools Director position at Department of Education to coordinate between climate education, facilities, and transportation teams
  - Also supports technical assistance for building and transportation decarbonization in schools

Challenges and Opportunities

1. Continue progress in weatherization, heat pumps
2. Advance energy efficient building codes
3. Continue improving energy efficiency in affordable housing, schools, and public buildings
4. Develop more financing options to support energy efficiency and clean energy goals
5. Manage the impact of building loads on the grid

Maine Climate Council Meeting Poll

What should the Buildings, Infrastructure and Housing Working Group absolutely not forget as it starts the update process?

Energy Working Group

Co-Chairs:
Dan Burgess, Governor's Energy Office
Ken Colburn, Energy Expert

Maine's Climate and Clean Energy Targets:

REDUCE GREENHOUSE GAS EMISSIONS	TRANSITION TO CLEAN ENERGY	ACHIEVE CARBON NEUTRALITY	CREATE CLEAN ENERGY JOBS
45% BELOW 1990 LEVELS **BY 2030**	**80%** **RENEWABLE BY 2030**	**2045**	**30,000** **BY 2030**
80% BELOW 1990 LEVELS **BY 2050**	**100%** **CLEAN BY 2040**		

Maine Energy Policy Requirements

- **Renewable Portfolio Standard**
  - 80% of electricity delivered in Maine to be renewable by 2030
  - Supports hydroelectric, biomass, tidal, waste-to-energy, wind, and solar
  - Targeted support for new and existing resources including solar, wind, biomass, hydro, and wood-fired CHP

- **Offshore Wind**
  - Goal of 3,000 megawatts from the Gulf of Maine by 2040
  - GEO to establish procurement schedule and process with stakeholder input

- **Energy Storage**
  - Goal of 400 megawatts by 2030
  - GEO to develop procurement program for up to 200 megawatts

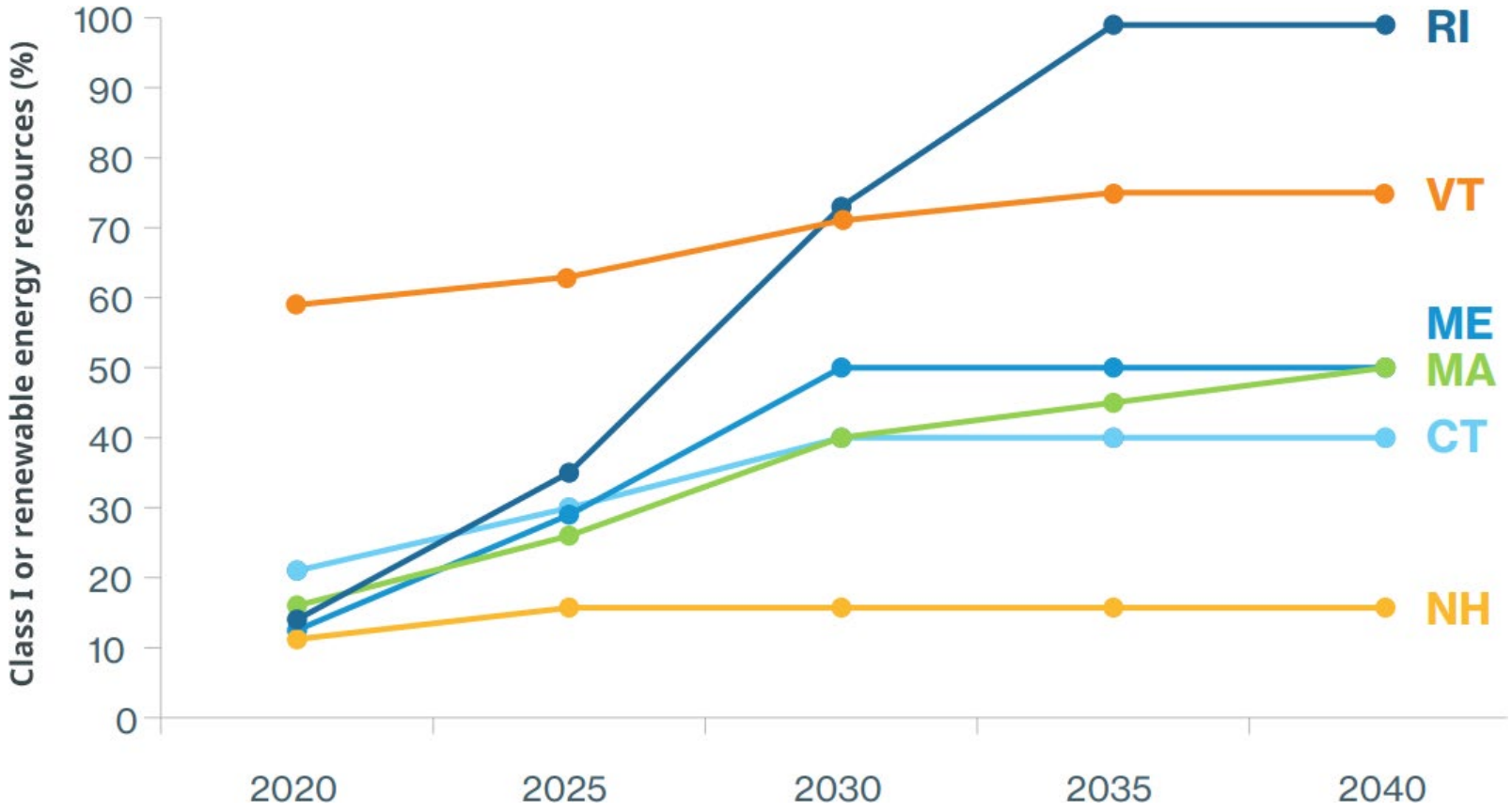
- **Solar**
  - Goal of 750 megawatts of distributed generation
  - GEO to implement distributed solar and storage program
  - Targeted procurement for solar on contaminated lands

- **Electrification**
  - Oil dependence reduction
  - Electrification of heating and transportation to achieve emissions reduction requirements

Every state in New England has Renewable Portfolio Standard (RPS) requirements that promote renewable energy development.

2023:

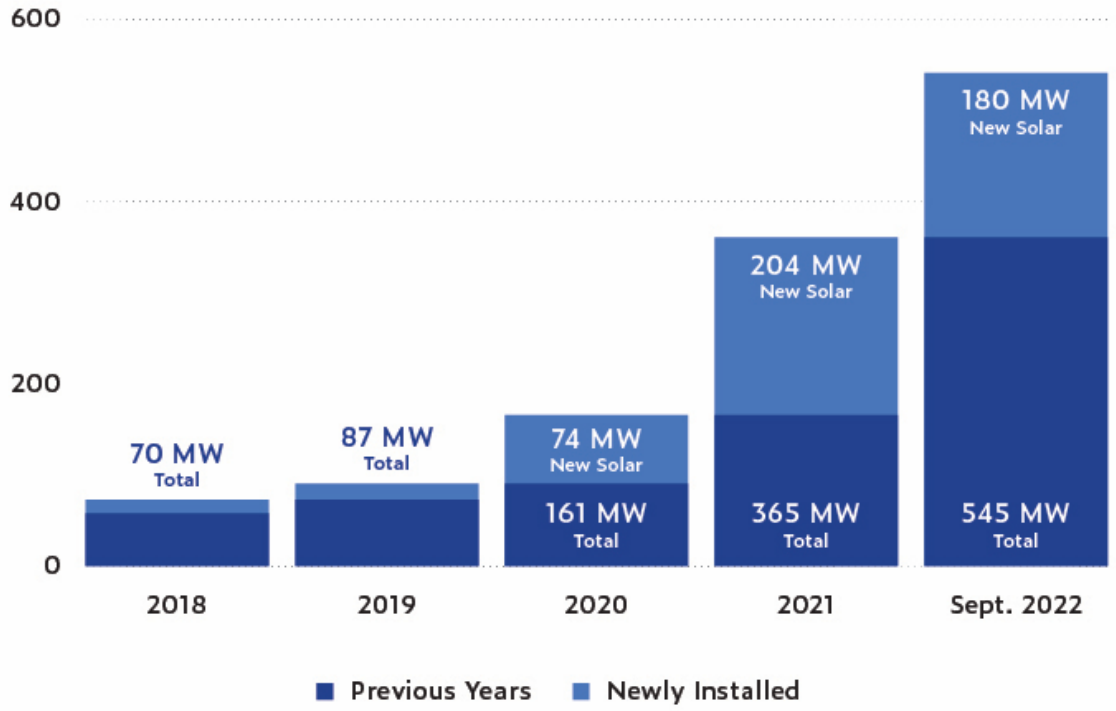
Gov. Mills set a new goal of 100% clean energy by 2040



New England states' renewable portfolio standard (RPS) requirements for Class I (new) renewable energy resources.
Source: ISO New England

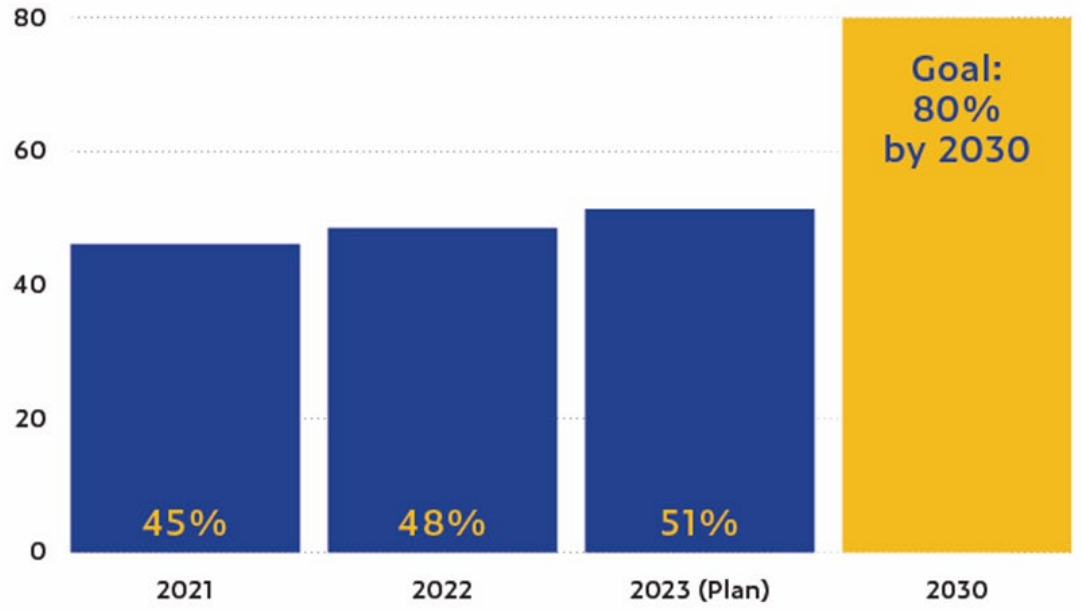
Accelerating Pace of Clean Energy Deployment

Solar Capacity Installed in Maine (Megawatts)



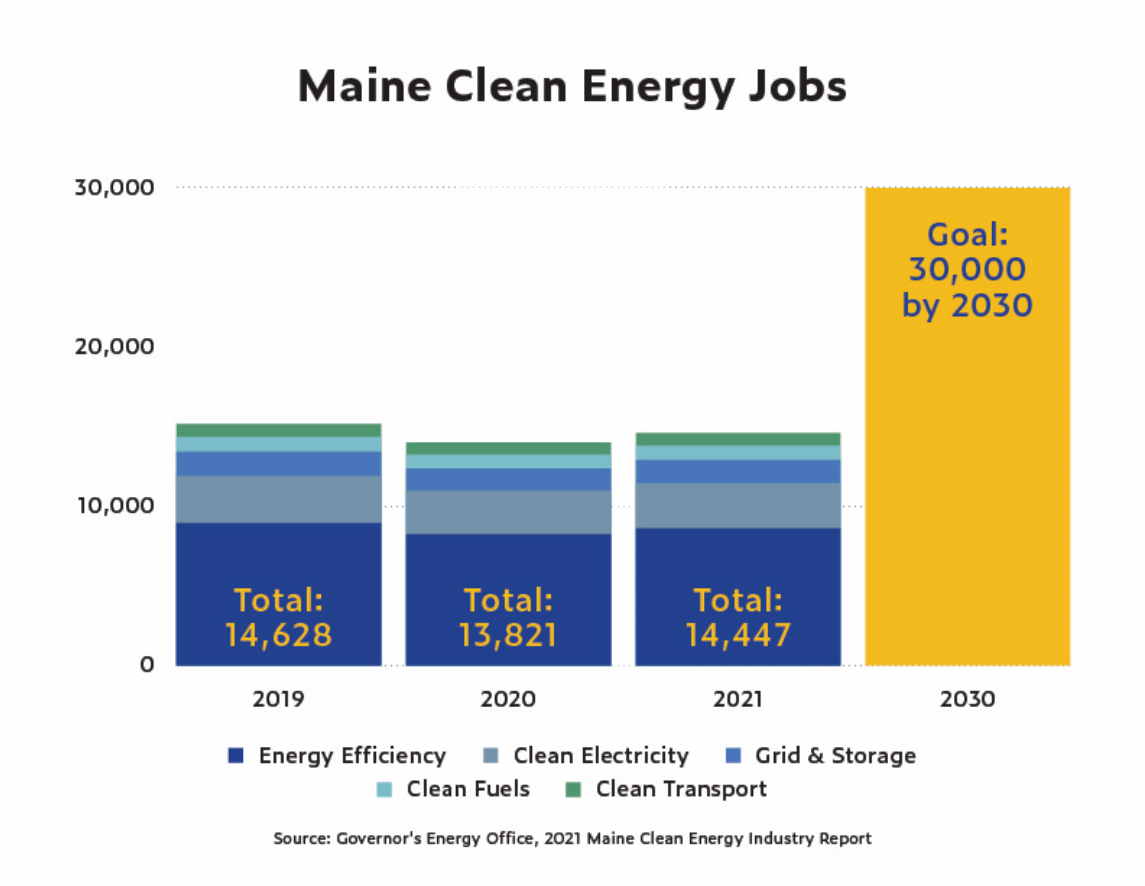
Source: Maine Governor's Energy Office: Solar

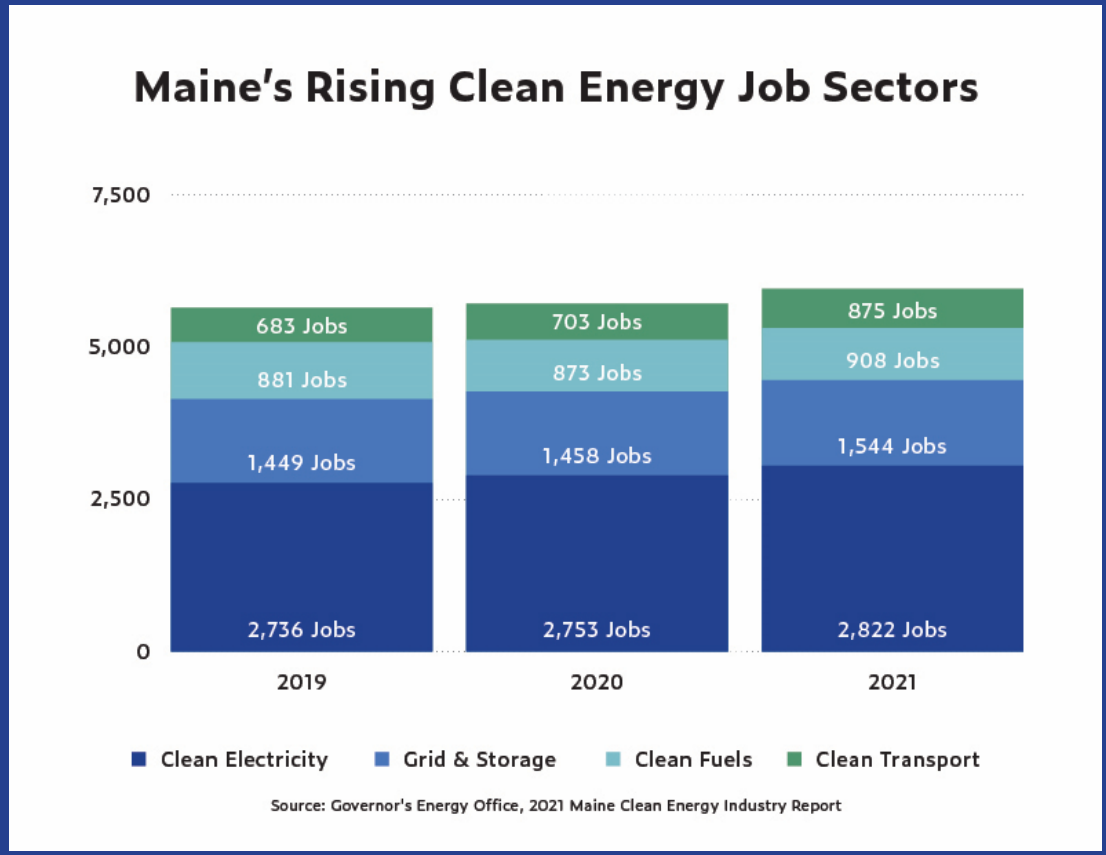
Maine Renewable Electricity (Percent of Load)



Source: Governor's Energy Office

Clean Energy Jobs (Total and By Sector)





Maine's Clean Energy Partnership has awarded $2.5 million in grants to nine entities to advance clean energy workforce development.

Industrial Efficiency

Per recommendations of *Maine Won't Wait*, an **Industrial Task Force** has been formed to provide a venue to further explore collaboration and innovation in this difficult to decarbonize sector.

The 130th Legislature established the **Wood-fired Combined Heat and Power Program** directing the Maine Public Utilities Commission to procure renewable energy from highly efficient combined heat and power (CHP) projects.

The 131st Legislature modified and expanded the size of the program to bolster Maine's forest products industry and support the heating and energy needs of the state's industrial facilities.

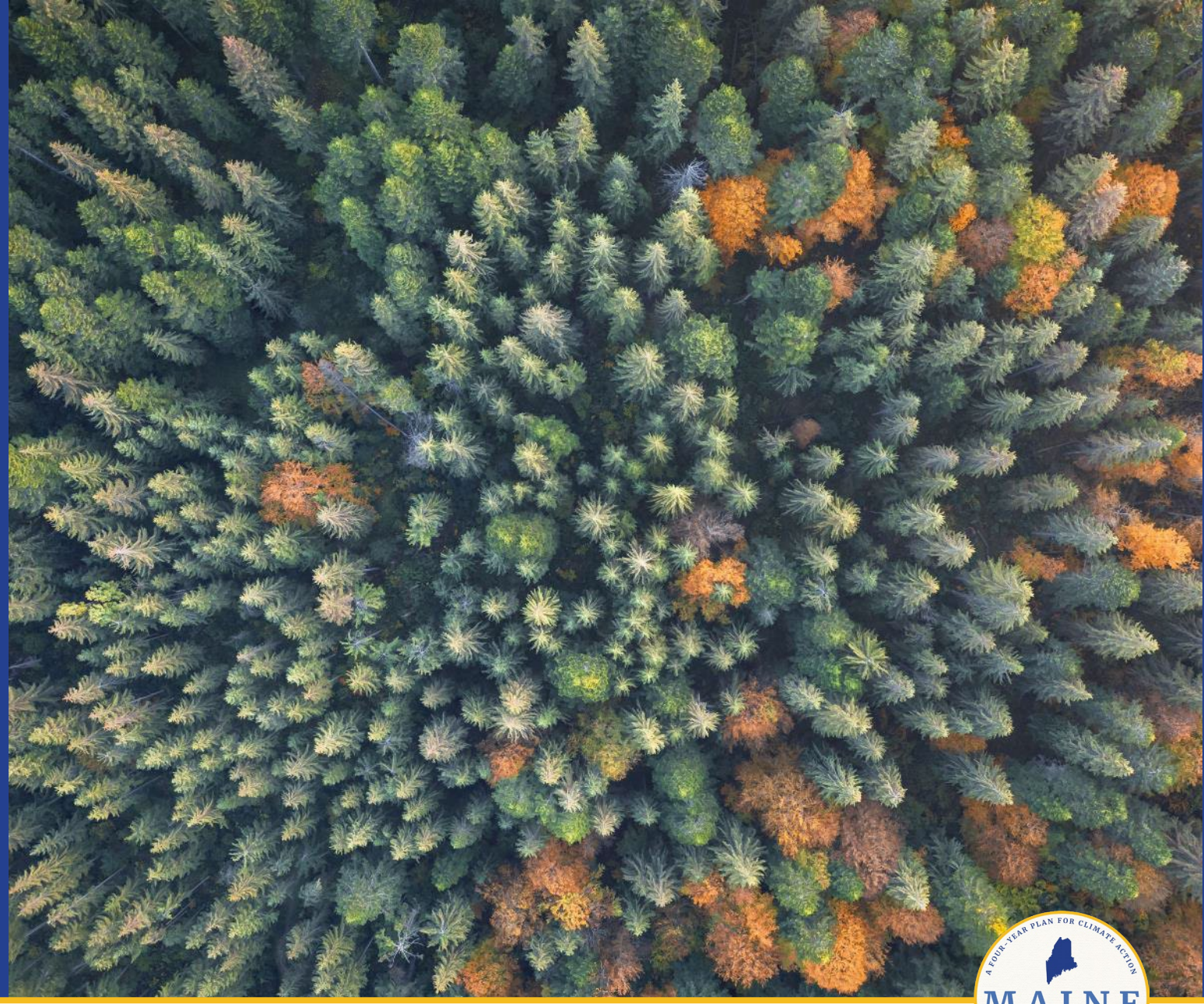
Challenges and Opportunities

1. New goal: 100% clean energy by 2040 – comprehensive energy planning process underway
2. Ensuring Maine households and businesses have access to clean, affordable, reliable and adequate energy in the coming decades
3. Optimizing the value of grid resources as demand grows through adoption of distributed energy resources, grid planning, and demand management strategies
4. Building the workforce to support a clean energy transition

Maine Climate Council Meeting Poll

What should the Energy Working Group absolutely not forget as it starts the update process?

Natural & Working Lands Working Group

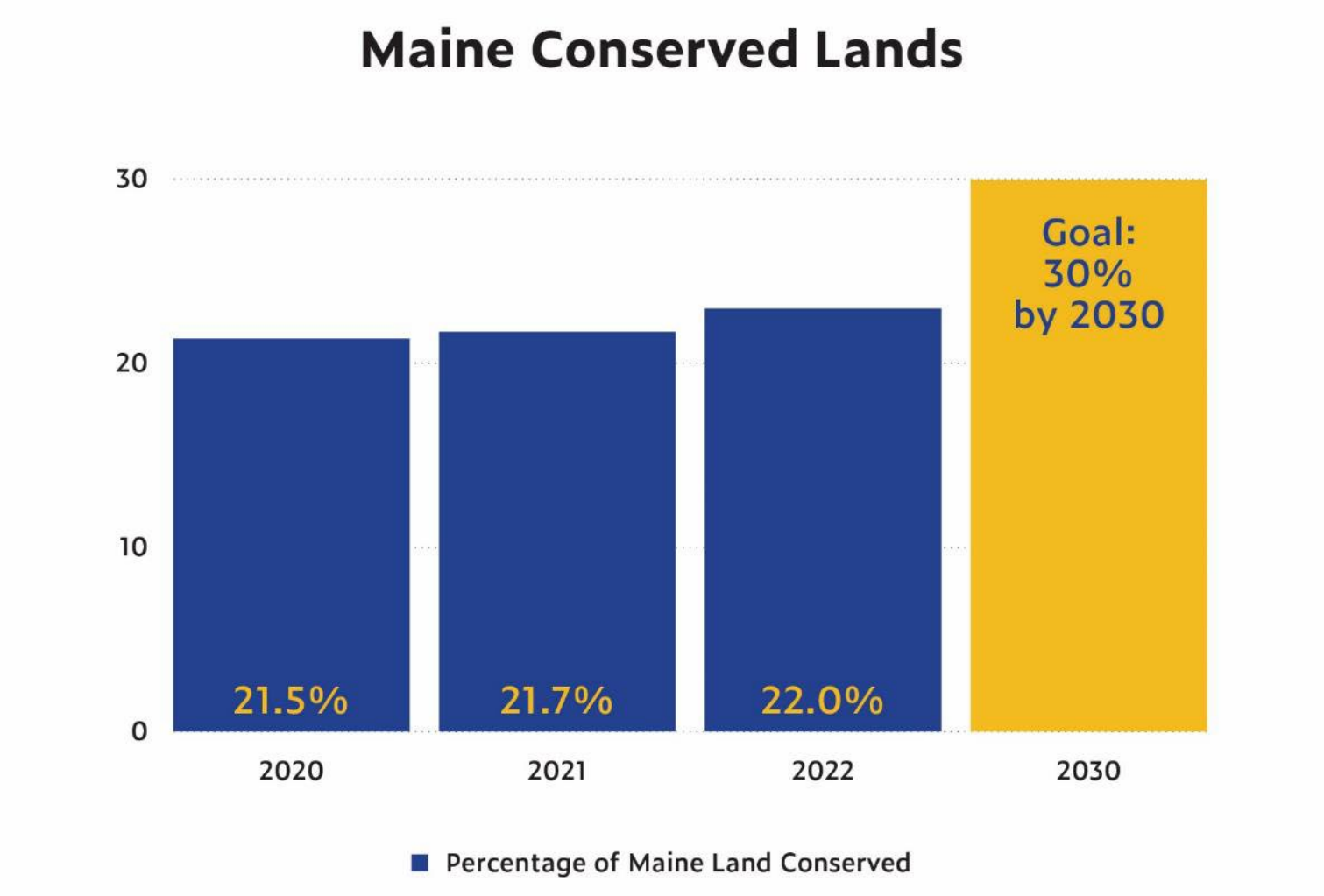


Co-Chairs:

Amanda Beal, Commissioner, Department of Agriculture, Conservation and Forestry

Tom Abello, Legislative Director, Office of the Governor

Target: Conserve 30% of Maine's natural and working lands by 2030



Maximizing Conservation Funding Opportunities

- Historic investment of $40 million in Land for Maine's Future program funding
- Increased allocations of federal funding
- Strong collaborations with local and statewide partners

Target: Increase the amount of food consumed in Maine from state food producers to 30% by 2030

- Harnessing opportunities to invest in Maine's food system
- Increasing access to Maine food through the Emergency Food System
- Institutional commitments to sourcing in-state

Target: Increased carbon sequestration in natural and working lands

- Forest Carbon Task Force recommendations
- Healthy Soils Program
- Soil Carbon Study (DACF, DIFW, UMaine)
- Invest in carbon friendly forest practices and products

Challenges and Opportunities

1. Continue progress towards Maine's land conservation goals
2. Increase in-state consumption of Maine-produced food
3. Increase carbon sequestration in natural and working lands

Maine Climate Council Meeting Poll

What should the Natural and Working Lands Working Group absolutely not forget as it starts the update process?

Coastal & Marine Working Group

Co-Chairs:
Carl Wilson, Department of Marine Resources
& Curt Brown, Ready Seafood Company

Investing in Resilient Culverts

$35 M in four federal discretionary grant awards through Bipartisan Infrastructure Law (BIL) for culvert replacement that will help fish passage and transportation infrastructure in Maine (DMR and DOT)

- Provides for Atlantic salmon, alewives, and other sea-run fish to return to historic habitat supporting Maine's heritage fishing industries
- Will be resilient to storms and flood events, which ensures residents and emergency services are able to access these communities

Sharing Climate Science through the Maine Climate Science and Information Exchange (MCSIE) at the University of Maine

- The Maine Climate Science Information Exchange (MCSIE) was established at the University of Maine in 2022 to support coordination between Maine's scientific community and decision-makers
- Online research inventory launching in fall of 2023
- Focuses on agriculture and food systems, forests, forest products, marine resources, and coastal communities

Investing in Maine's Working Waterfront and Fisheries

- **2022: Maine Seafood Dealer and Processor COVID-19 Response and Resilience Grant Program (SDPP)**
  - Committed nearly $16 million in federal funds, including $10 million from the Maine Jobs and Recovery Plan; Administered by Maine Technology Institute
  - Helping seafood dealers and processors in Maine recover from the COVID-19 pandemic
- **Seafood Economic Accelerator (SEA Maine) developing a roadmap to create economic growth and resilience in Maine's seafood economy**

North Atlantic Right Whales and Lobster

- Lack of data and high uncertainty for the Gulf of Maine in risk assessments led to significant proposed management actions that would impact the lobster and gillnet fisheries
- Federal funds will:
  - Document the presence of north Atlantic right whale (NARW) and lobster fishery in the GOM
  - Support development a risk model based on better data on NARW presence and fishing effort
  - Monitor the ecosystem necessary to support NARW
  - Develop strategies and technology to minimize any risk

Opportunities for Sequestering Carbon

New report from US Environmental Protection Agency (EPA) estimates Maine sequesters 22% of New England's "blue carbon"

2022-2023 surveys by Maine DEP show declines in eelgrass area in Casco Bay and Midcoast region in recent years.

DEP marine unit eelgrass work in Casco Bay" (A. Brewer, DEP)

Challenges and Opportunities

1. Support science and monitoring needed for climate informed decision-making
2. Incorporate climate adaptation into state marine policies
3. Support continued investments to support adaptation and resilience in the marine economy and infrastructure
4. Explore opportunities to encourage blue carbon sequestration and marine co-benefits

Maine Climate Council Meeting Poll

What should the Coastal and Marine Working Group absolutely not forget as it starts the update process?

Community Resilience Working Group

Co-Chairs:

Judy East, Department of Agriculture, Conservation and Forestry

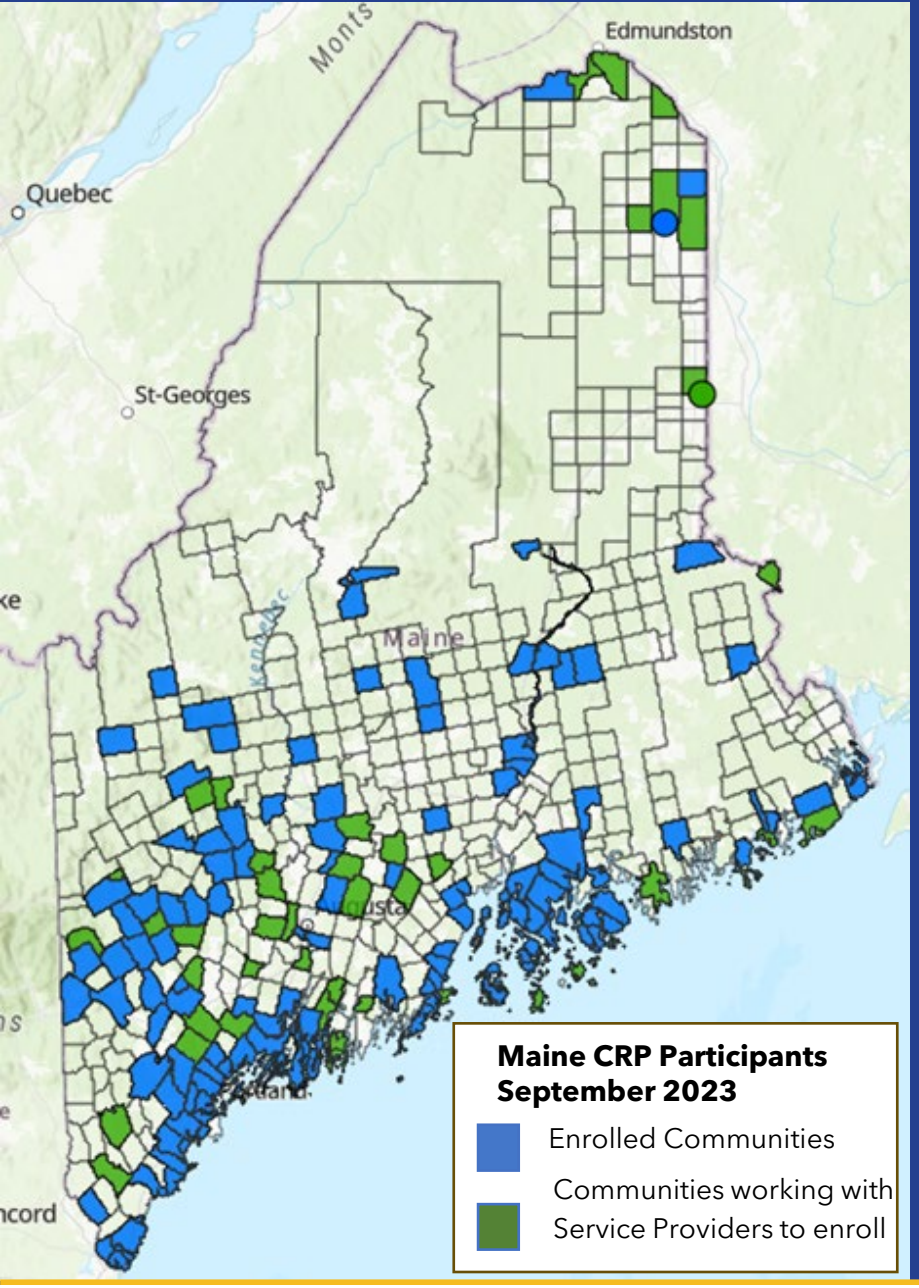
Rebecca Boulos, Maine Public Health Association & Samuel Roy, Maine Emergency Management Agency


PEOPLE IN JAY FIGURE OUT NEXT STEPS
AFTER STORM CAUSES SIGNIFICANT DAMAGE
HAPPENING
NOW
WMTW
8
abc

Preparing for Sea-Level Rise and Inland Flooding

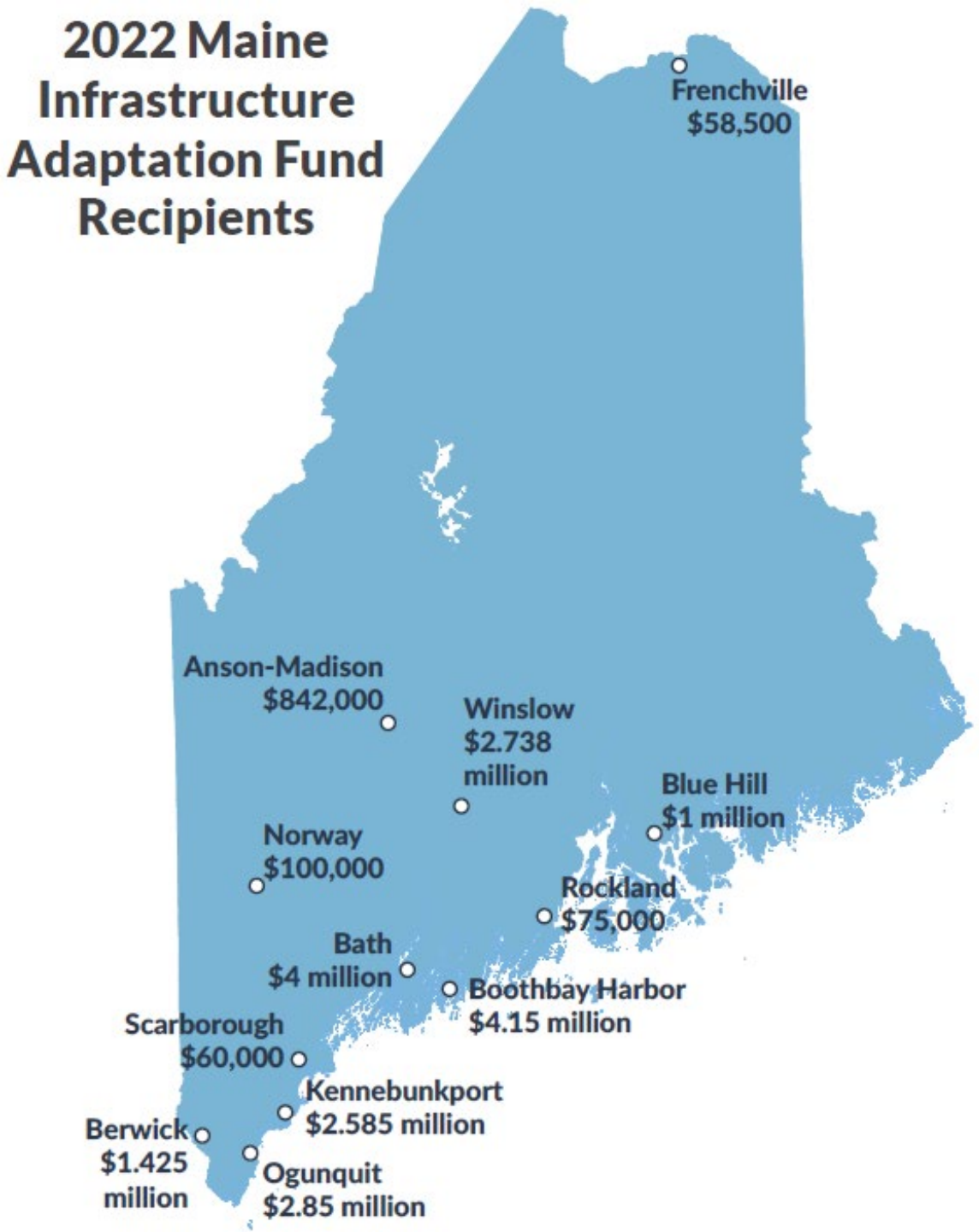
- Statutory and rule changes in multiple agencies to incorporate sea level rise and climate resilience
- MaineDOT is developing a coastal flood risk model for storms and projected sea level rise
  - Preliminary results: 2024
- The state will receive $1 M from FEMA to conduct a Vulnerability Assessment of state assets to climate impacts

The Maine Climate Council recommends that the state consider committing to manage for 1.5 feet of relative sea-level rise by 2050, relative to the year 2000, and 3.9 feet of sea-level rise by the year 2100.



Providing technical assistance and funding for local climate action through the Community Resilience Partnership

- 174 participating communities
  - 129 fully enrolled
  - 45 working on enrollment with Service Providers
- Focus on Socially Vulnerable Communities



Investing in Climate Ready Infrastructure through the Maine Infrastructure Adaptation Fund

- In 2022, awarded ~$20 M to 12 communities to protect vital infrastructure
- 2023-2024 biennial budget: $7 M for culverts, project development, and cost-share grants
- Significant state and federal investments in infrastructure, including wastewater and drinking water programs

Helping communities take action on climate change through Maine Climate Corps

Climate Corps programs take action in 8 areas:

- coastal zone
- transportation
- energy
- land and freshwater preservation
- housing
- community resilience
- education
- public health

First Climate Corps Program: Downeast Community Partners (DCP)

- **Counties Served:** Hancock and Washington
- 4 full-time Climate Corps members
- Conduct energy audits and provide energy efficiency education

Challenges and Opportunities

1. Goals and metrics to track our adaptation progress
2. Long-term adaptation funding and financing
3. Invest in tools and technical assistance for communities
4. Prepare for climate risks
   - Psychological resilience
   - Integrating resilience planning with emergency management
   - Begin the tough conversations around "getting out of harm's way"

Maine Climate Council Meeting Poll

What should the Community Resilience Working Group absolutely not forget as it starts the update process?

Intersecting Issues

1. Workforce and economic opportunity including innovative forest products
2. Waste emissions
3. Land use planning
4. Education

Questions?

Next Steps and Adjournment

Take our survey!

maine.gov/future/climate/council

Optional: Working Group Introductory Meet-and-Greet Sessions

- Transportation Working Group – Washington, 2nd floor
- Buildings, Infrastructure and Housing Working Group – Oxford, 1st floor
- Energy Working Group – Waldo, 2nd floor
- Natural and Working Lands Working Group – Somerset, 2nd floor
- Coastal and Marine Working Group – Lincoln, 1st floor
- Community Resilience Working Group – Hancock, 1st floor


A FOUR-YEAR PLAN FOR CLIMATE ACTION
MAINE
WON'T WAIT
DECEMBER 2020
MAINE CLIMATE COUNCIL