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

Melanie Loyzim
Acting Commissioner,
Department of Environmental Protection

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

Co-Chairs, Maine Climate Council

HOW IS MAINE TACKLING CLIMATE CHANGE?

MAINE CLIMATE COUNCIL -- LD 1679

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

RENEWABLE PORTFOLIO STANDARD LD 1494

Increased RPS of 80% by 2030

Goal of 100% renewable power by 2050

SOLAR & DISTRIBUTED GENERATION LD 1711

Incentivizes at least 375 MW of distributed generation

Encourages small scale and community solar projects

HEATING

Initiative to install 100,000 new heat pumps by 2025 with a focus on low-income residents

WHAT IS THE MAINE CLIMATE COUNCIL?

CLIMATE COUNCIL GOALS

12.01.20
Climate Action Plan Delivered

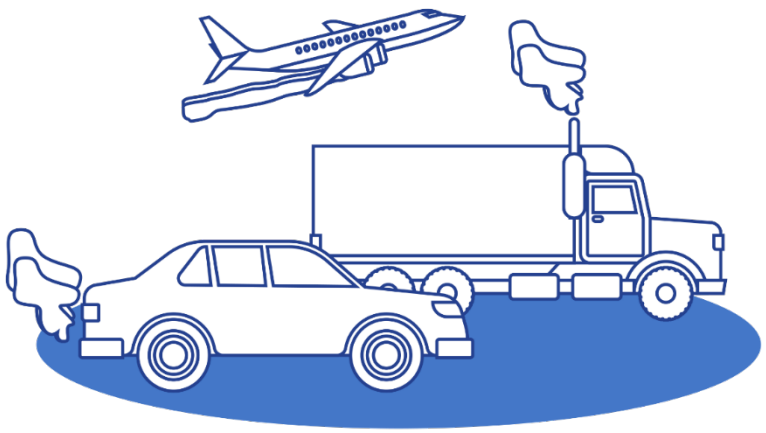
ACHIEVE STATE CARBON NEUTRALITY BY 2045

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.



54%

19%

11%

9%

7%

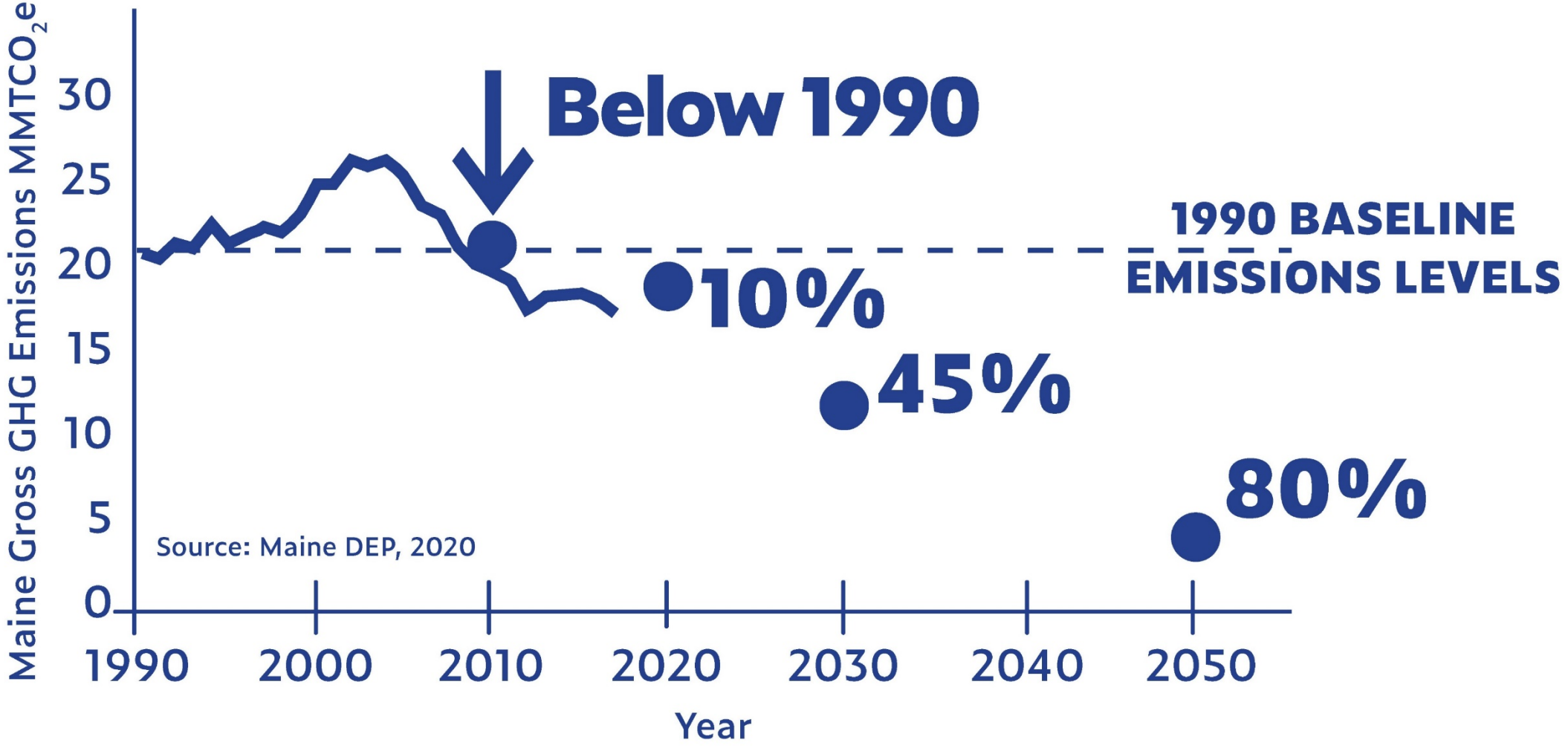
TRANSPORTATION · RESIDENTIAL · COMMERCIAL · INDUSTRIAL · ELECTRIC POWER

Data source: Maine Department of Environmental Protection 8th Biennial Greenhouse Gas Emissions Report

In Maine, most greenhouse emissions come from transportation, followed by residential, commercial and industrial sources. Finding ways to reduce them is a key goal of the Climate Council.

climatecouncil.maine.gov

Maine Greenhouse Gas (GHG) Emissions + Reduction Goals



Data source: Maine Department of Environmental Protection

The **39-member Maine Climate Council**, an assembly of scientists, industry leaders, bipartisan local and state officials, is responsible for **developing a Climate Action Plan** for Maine.

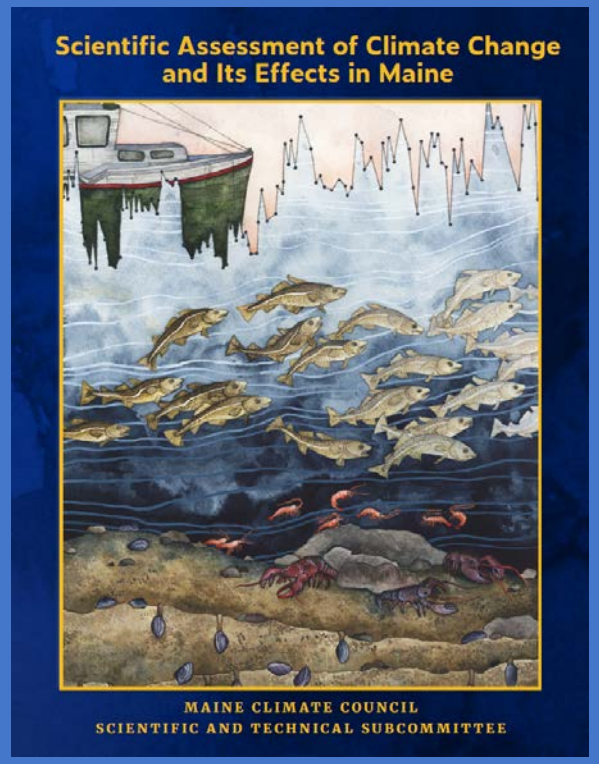
Six working groups comprised of 230+ volunteer members recommend strategies to the Council for achieving Maine's climate goals.

An expert **Scientific and Technical Subcommittee** is responsible for identifying the impacts of climate change in Maine.

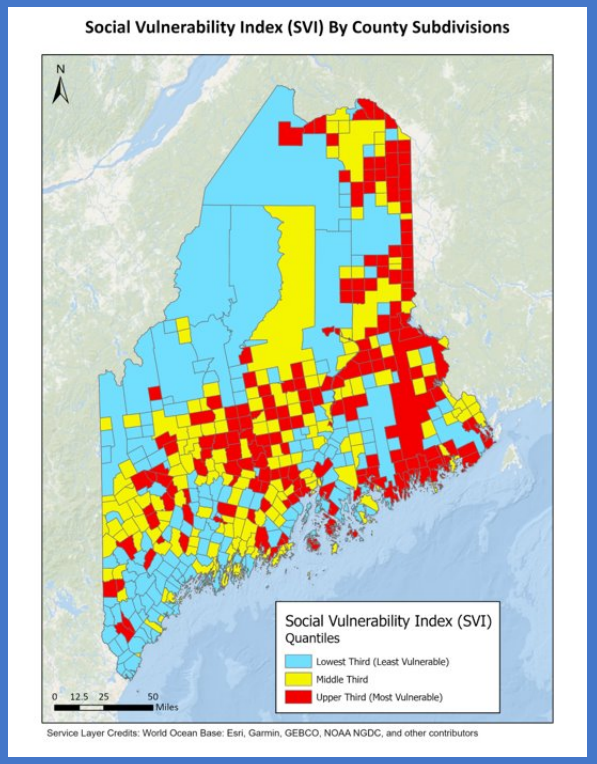
An **Equity Subcommittee** will support planning and implementation of climate strategies to ensure benefits across diverse populations of Maine people.

Maine Climate Council Reports

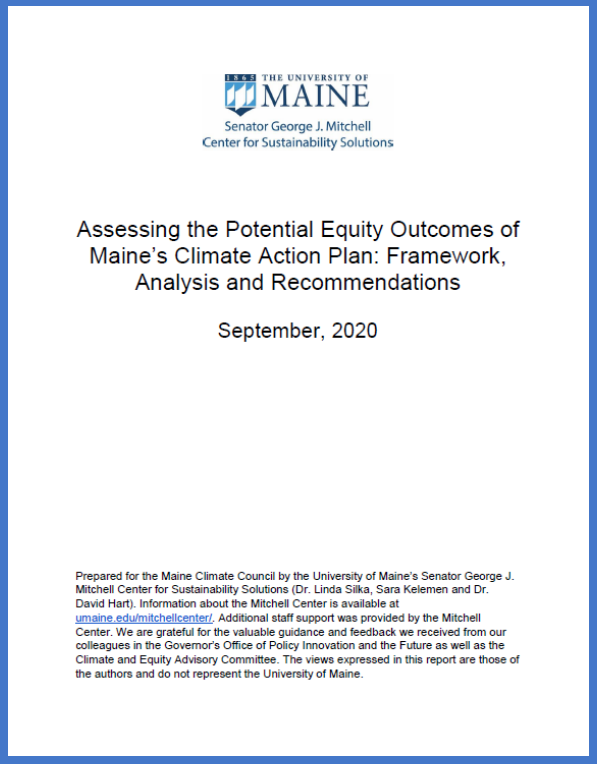
Download at climatecouncil.maine.gov



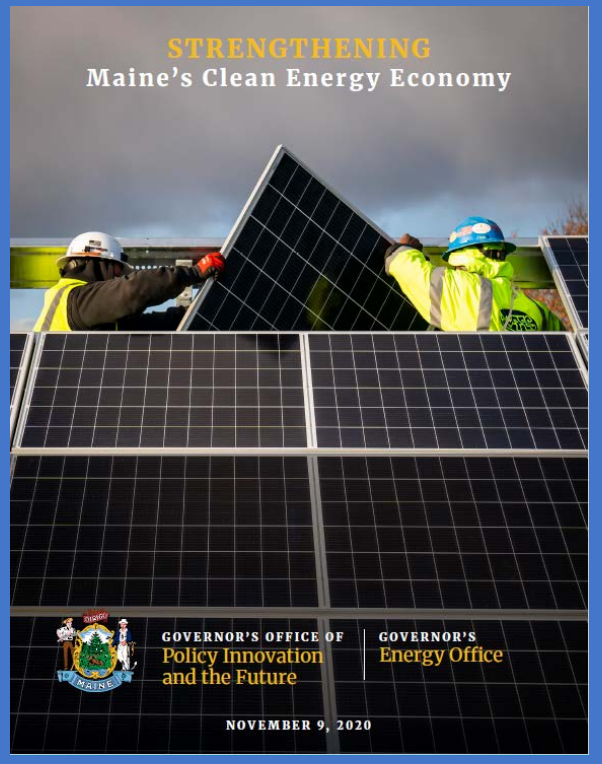
Scientific Assessment of Climate Change



Cost-Benefit Analysis & Greenhouse Gas Modeling



Equity Assessment of Draft Strategies

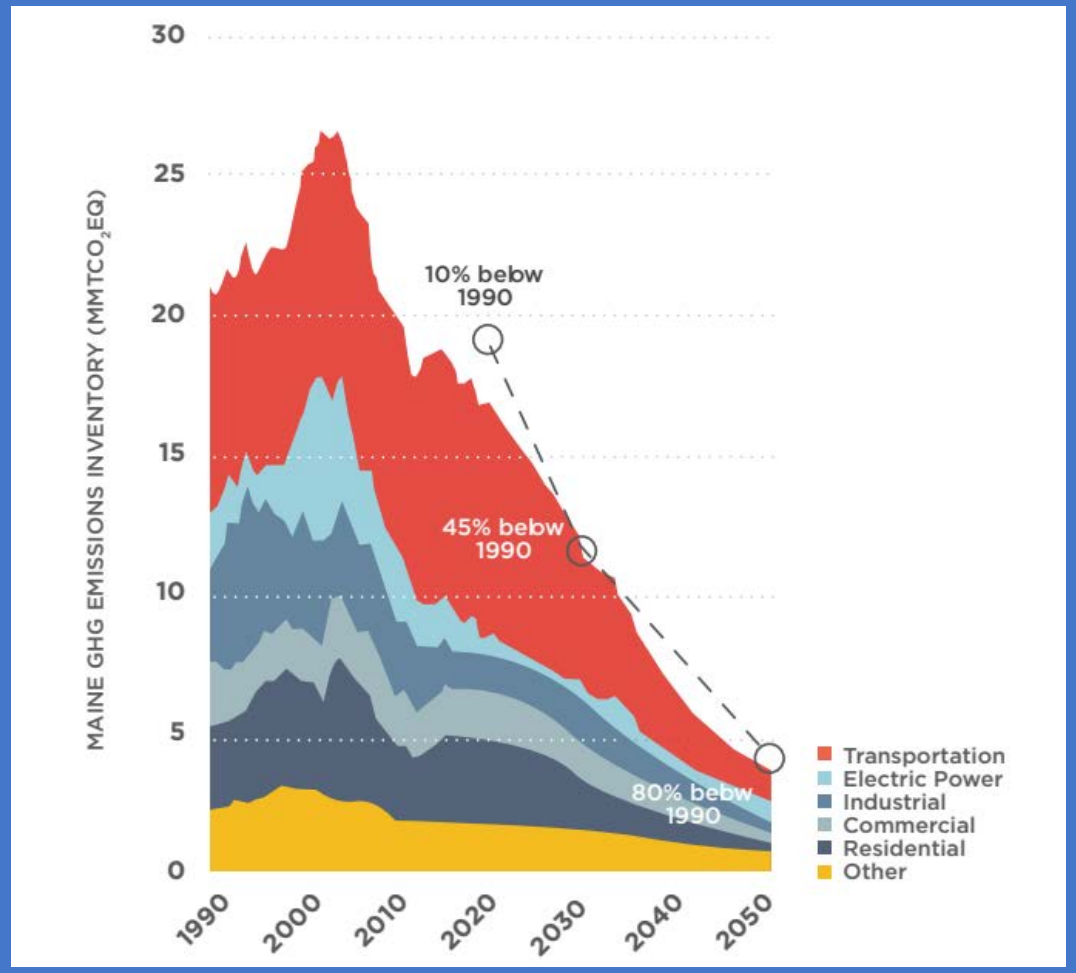


Strengthening Maine's Clean Energy Economy Plan

Emissions Modeling

Potential Pathway

- By 2030, total emissions are equal to the target of 45% 1990 levels
- Total emissions in 2050 are 82% below 1990 levels



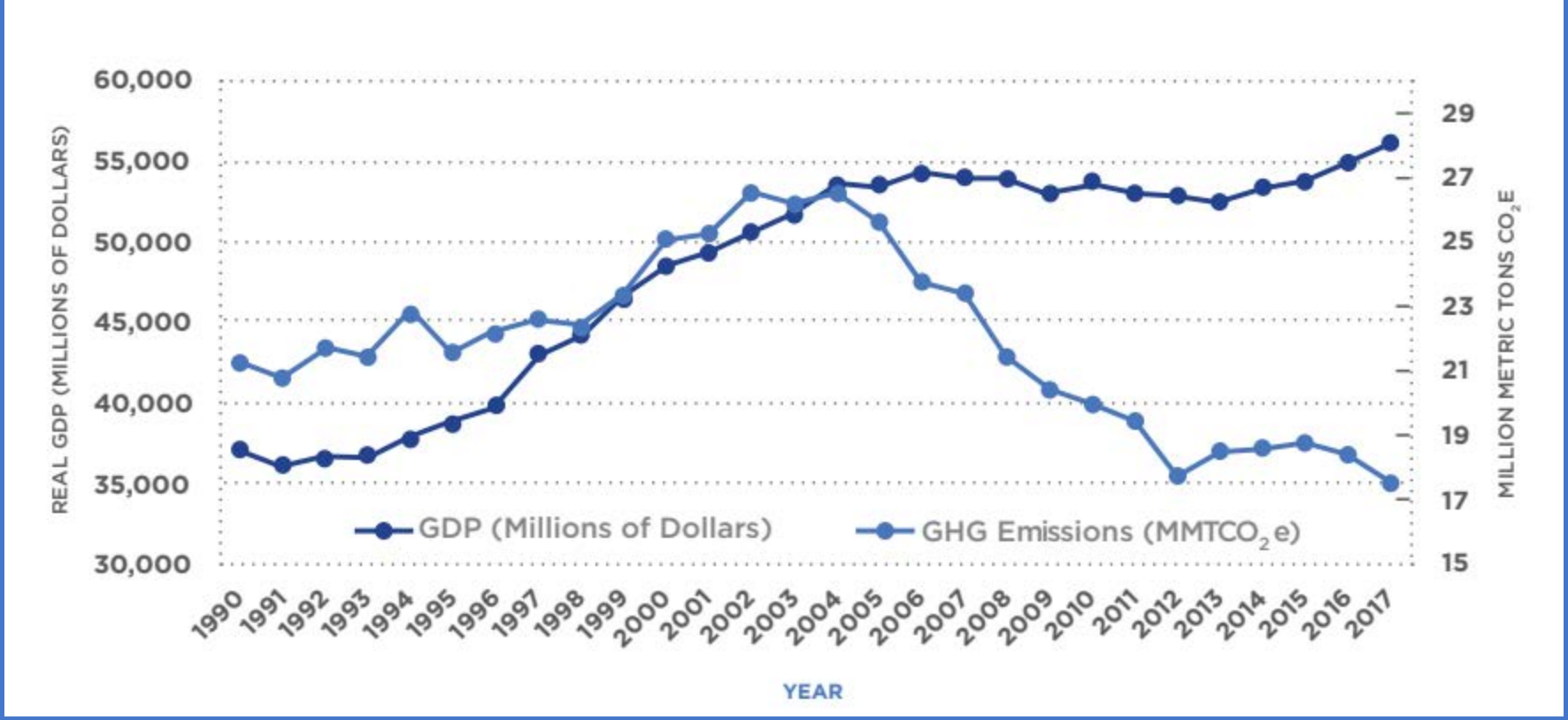
Data source: Synapse Energy Economics

SECTOR	2017 GHG Inventory ($MMTCO_2e$)	2030 Projected Emissions	2050 Projected Emissions
Transportation	8.57	5.19	1.10
Electric Power	1.03	0.39	0.70
Industrial	2.46	2.37	0.78
Commercial	1.71	1.31	0.36
Residential	3.00	1.83	0.30
Other	0.74	0.59	0.49
Total	17.51	11.68	3.73

Data source: Synapse Energy Economics

A potential pathway that utilizes the strategies proposed by the Maine Climate Council, including a transition over time to a largely electrified transportation and buildings sector, combined with a transition to a clean electricity sector, allowing for significant greenhouse emissions reductions.

Greenhouse Gas Emissions and Gross Domestic Product (GDP)



Data source: Maine Department of Environmental Protection 8th Report on Progress toward GHG Reduction Goals

Maine Climate Action Plan Goals

- Reduce Maine's Greenhouse Gas Emissions
- Make Maine more resilient to the impacts of climate
- Foster Economic Opportunity and Prosperity
- Advance Equity through Maine's Climate Response

Maine's 8 Climate Action Strategies

A. Embrace the Future of Transportation in Maine

D. Grow Maine's Clean Energy Economy and Good Jobs

G. Invest in Climate-Ready Infrastructure

B. Modernize Maine's Buildings

E. Protect Maine's Environment and Working Lands and Waters, Increase Carbon Sequestration

H. Engage People and Communities in Climate Impacts and Program Opportunities

C. Reduce Carbon Emissions the Energy and Industrial Sectors through Clean Energy Innovation

F. Build Healthy and Resilient Communities

Strategy A: Embrace the Future of Transportation in Maine

1. Accelerate Maine's Transition to Electric Vehicles
2. Increase Fuel Efficiency and Alternative Fuels
3. Reduce Vehicle Miles Traveled

Strategy B: Modernize Maine's Buildings

1. Transition to Cleaner Heating and Cooling Systems, Efficient Appliances
2. Accelerate Efficiency Improvements to Existing Buildings
3. Advance the Design and Construction of New Buildings
4. Advance the Design and Promote Climate-Friendly Building Products
5. "Lead by Example" in Publicly Funded Buildings

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

Strategy C: Reduce Carbon Emissions in Maine's Energy and Industrial Sectors through Clean-Energy Innovation

1. Ensure Adequate Affordable Clean-Energy Supply
2. Initiate a Stakeholder Process to Transform Maine's Electric Power Sector
3. Accelerate Emissions Reductions of Industrial Uses and Processes
4. Encourage Highly Efficient Combined Heat and Power Facilities

Reducing Carbon Emissions- Key Actions

Sector	Metric	2025	2030	2050
Transportation	Number of Light-duty EVs on the Road	41,000	219,000	904,000
	EV Share of New Light-duty Vehicle Sales	28%	85%	100%
	Reduction in Light-duty VMT per Vehicle	10%	20%	20%
	ZEV Share of New Heavy-duty Vehicle Sales	12%	55%	100%
	Reduction in Heavy-duty VMT per Vehicle	2%	4%	4%
Buildings	Number of Households with Retrofit Heat Pumps (installed after 2018) and Legacy Fossil Systems	80,000	130,000	26,000
	Number of Households with Whole-Home Heat-Pump Systems	35,000	116,000	487,000
	Newly Weatherized Householdsm (after 2019)	17,000	35,000	105,000
All	GHG Emissions (MMT)	14.50	11.67	3.72
	Emissions Reduction from 1990 Levels	32%	45%	82%

Strategy D: Grow Maine's Clean Energy Economy: Protect Our Natural-Resource Industries

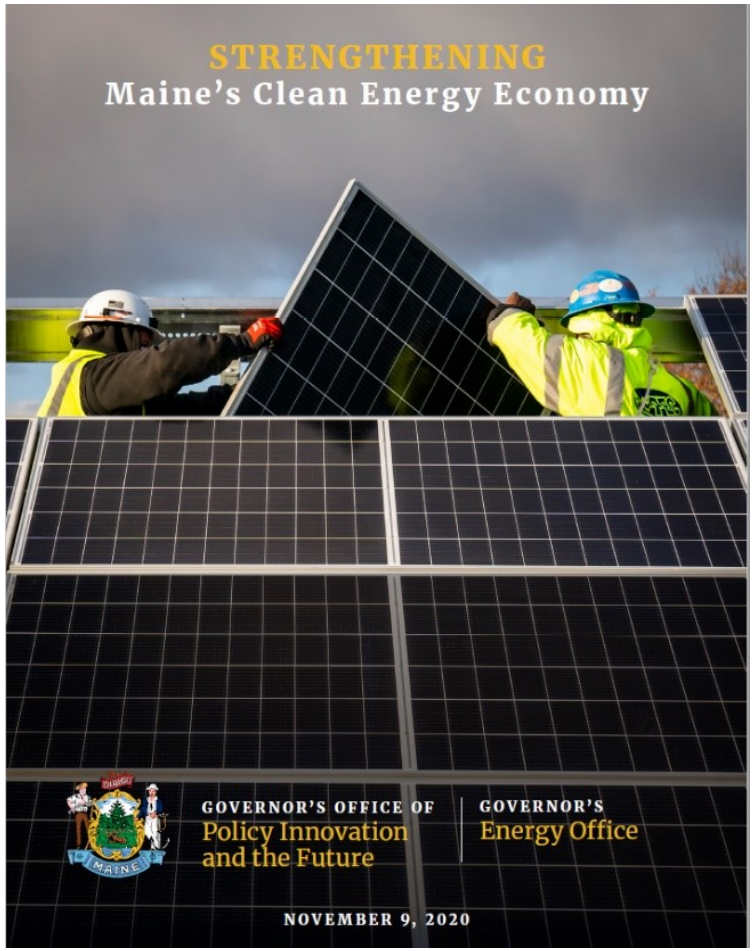
1. Take Advantage of New Market Opportunities
2. Grow Clean-Energy Jobs and Businesses in Maine

Grow Maine's Clean Energy Economy and Good Jobs
Strengthening Maine's Clean Energy Economy

Governor Mills' goal: 30,000 clean energy jobs by 2030

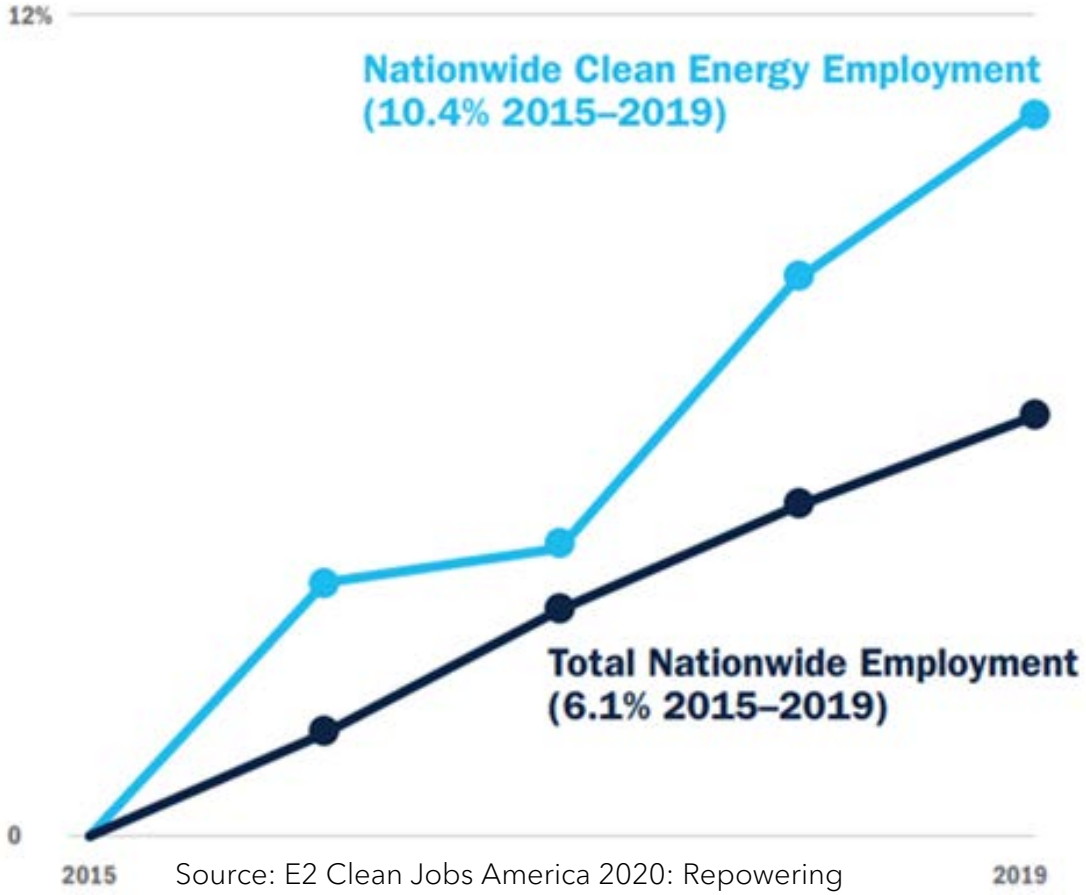
What is the clean energy economy?

"Economic development, operations and supply chains in renewable energy and energy efficiency, that generate economic benefits, create high-quality jobs, and fight climate change."

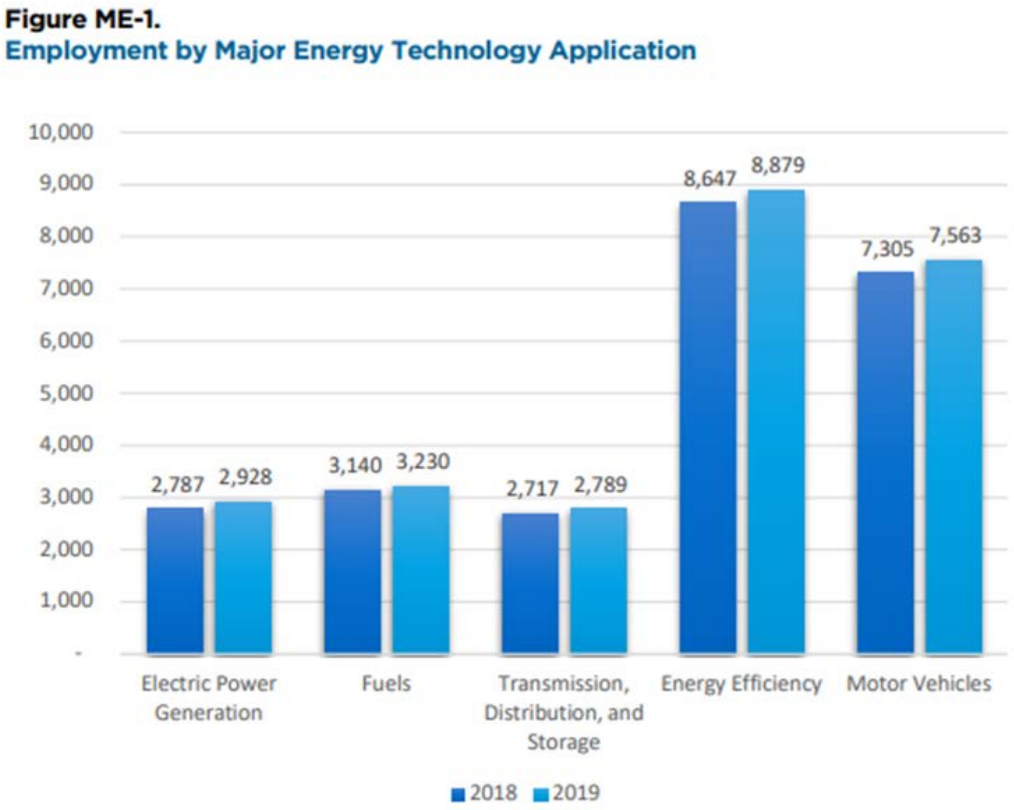


A FOUR-YEAR PLAN FOR CLIMATE ACTION
MAINE
WON'T WAIT
DECEMBER 2020
MAINE CLIMATE COUNCIL

Grow Maine's Clean Energy Economy and Good Jobs
Strengthening Maine's Clean Energy Economy



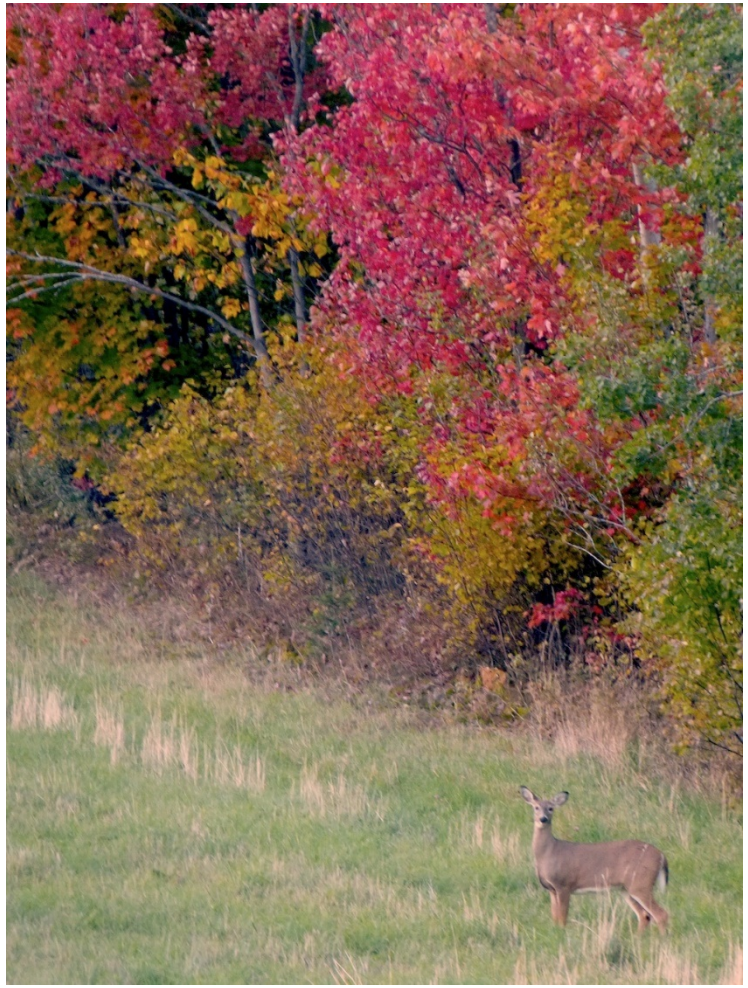
Source: E2 Clean Jobs America 2020: Repowering America's Economy in the Wake of COVID-19



Source: 2020 U.S. Energy & Employment Report (NASEO & Energy Futures Initiative)

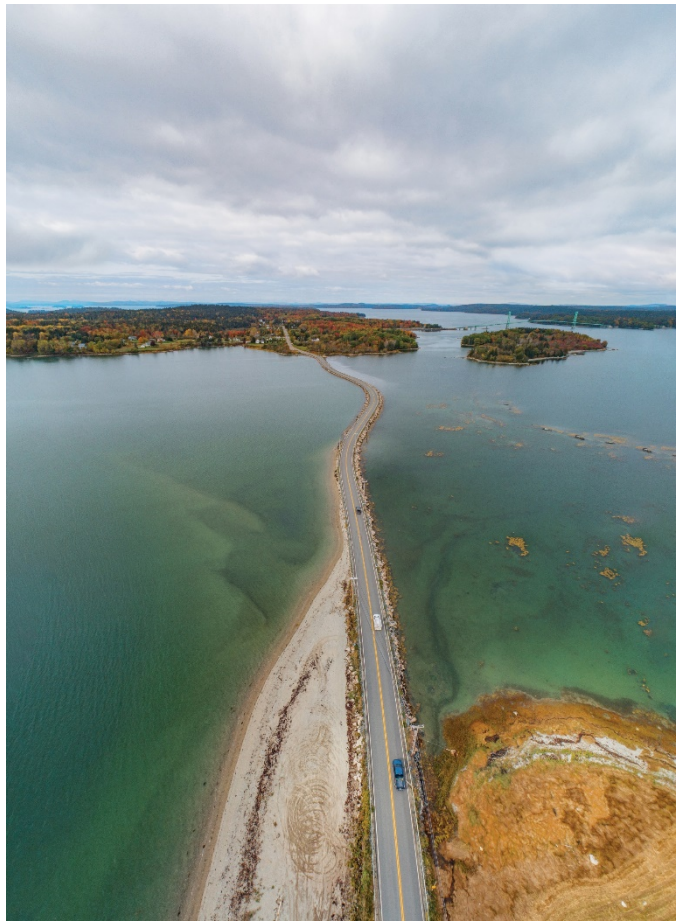
Strategy E: Protect Maine's Environment and Working Lands and Waters: Promote Natural Climate Solutions and Increase Carbon Sequestration

1. Protect Natural and Working Lands and Waters
2. Develop New Incentives to Increase Carbon Storage
3. Expand Outreach to Offer Information and Technical Assistance
4. Enhance Monitoring and Data Collection to Guide Decisions



Strategy F: Build Healthy and Resilient Communities

1. Empower Local and Regional Community Resilience Efforts
2. Adopt Official Sea-Level Rise Projections
3. Emphasize Resilience Through Land-Use Planning Tools
4. Strengthen Public-Health Monitoring, Education, and Prevention



Strategy G: Invest in Climate-Ready Infrastructure

1. Assess Climate Vulnerability and Provide Climate-Ready Design Guidance
2. Establish a State Infrastructure Adaptation Fund to support municipal and regional projects

Strategy H: Engage with Maine People and Communities about Climate Impacts and Program Opportunities

1. Raise Awareness About Climate-Change Impacts and Opportunities
2. Increase Public Education Offerings
3. Start the "Maine Climate Corps" for Climate-Related Workforce Development
4. Recognize Climate Leadership by Maine Businesses and Organizations

Implementing the Plan: Legislation and Executive Orders – First Session

- **Energy:** Energy legislation & solar program adjustments
- **Transportation**: Clean transportation roadmap plan
- **Forests/Sequestration**: Executive order signed to kick-off a task-force on a State Forest Carbon Program, put carbon neutrality goal in law
- **Resiliency Planning**: Sea Level Rise DEP legislation – science based process
- **Lead-By-Example Plan** and Implementation – saving money in state government and towns
- **HFC Phase-down** legislation
- Support **appliance standards** and **C-PACE** financing program
- **Study/process** on green finance opportunities; solar siting; land-use issues; power sector transformation

Implementing the Plan: Legislation and Executive Orders

Back to Work & Infrastructure Projects:

- **Municipal Infrastructure Program** – Local Infrastructure match; focus on matching FEMA $, adaptation and resiliency
- **Double the pace of weatherization**, support local efficiency projects
- Invest in additional **state and local infrastructure** – local culvert projects; multimodal transportation; wastewater and drinking water; broadband; heritage industry processing and innovation
- **Workforce training** program infrastructure – CTE's; Community Colleges; U Maine

Working & Natural Lands & State Parks

Implementation and Funding

- Implementation will **build on existing energy policies** (RPS), and **programs**, settlement dollars (VW, NECEC), and existing resources -- like Efficiency Maine incentives; DACF and Coastal Program grants; LIHEAP; and DOT projects.

- But the **plan will require - over time - significant and sustained investments**, well-financed programs, and properly-capitalized lending.

- Action will require **leveraging a variety of sources** – existing and new, private and public, local, state, and federal.

- Significant **federal activity and action**

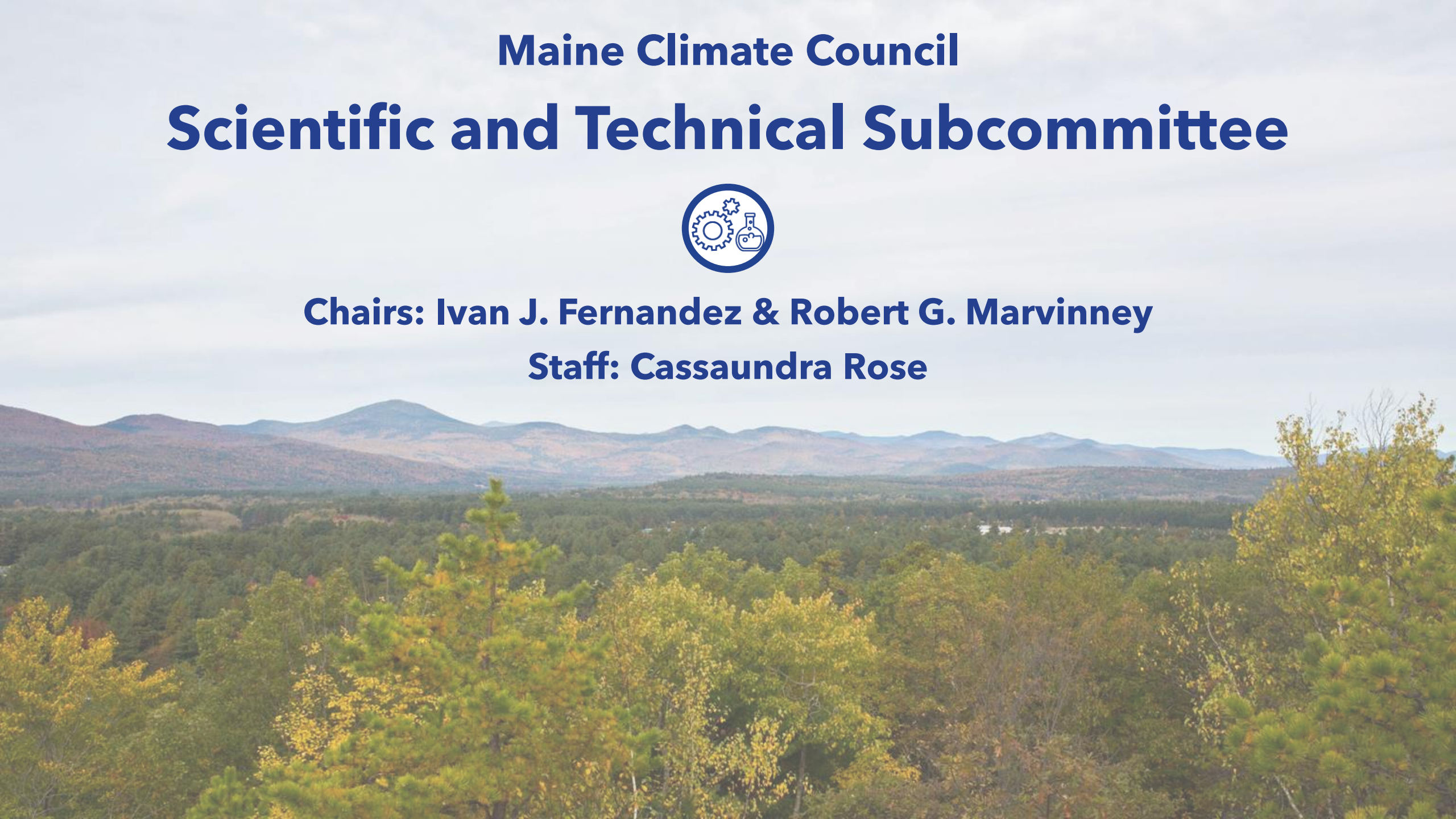
Learn More
& Read the Full Plan

@ climatecouncil.maine.gov


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

Maine Climate Council

Scientific and Technical Subcommittee



Chairs: Ivan J. Fernandez & Robert G. Marvinney

Staff: Cassaundra Rose

Legislative Responsibilities for the Scientific and Technical Subcommittee

1. Provide latest scientific assessment of direct and indirect effects of climate change in Maine
    - sea level rise projections to 2100
    - maps of Maine areas most vulnerable to impacts
    - identify critical scientific information needs
2. Options for quantifying carbon emissions and sequestration
3. Methods to build resilience and adaptation for Maine species

Maine Climate Council
Scientific and Technical Subcommitte

- 28 members - international reputations, extensive Maine experience
- Subcommittee work/Working Groups/State Agency engagement
- Initial Working Document Assessment – January 2020
- Final Assessment Report – August 2020
  - 370 pages
  - 37 co-authors (28 STS members + others)
  - 57 additional contributors noted in the acknowledgements

Scientific Assessment of Climate Change and Its Effects in Maine

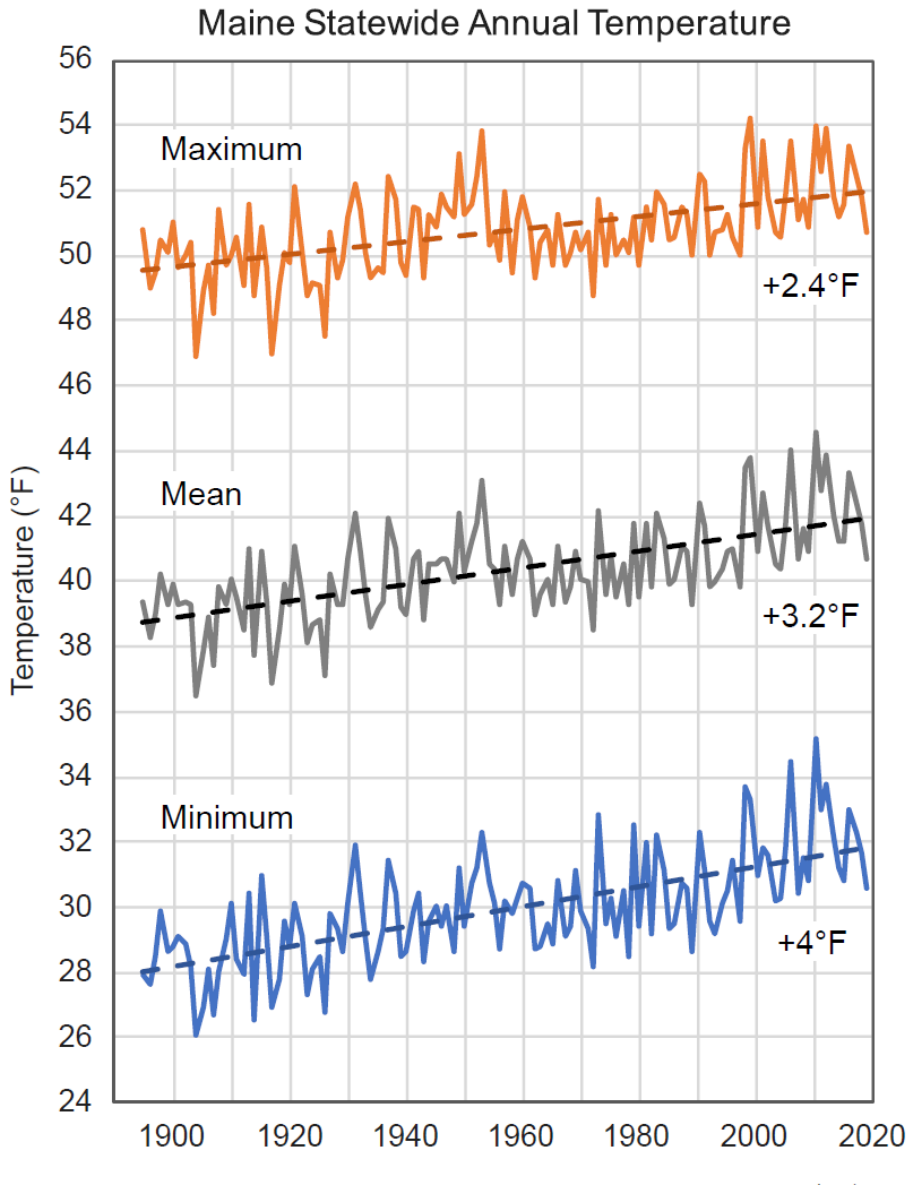
MAINE CLIMATE COUNCIL
SCIENTIFIC AND TECHNICAL SUBCOMMITTEE

TABLE OF CONTENTS

Key deliverables from the Scientific and Technical Subcommittee in this report:

- A summary of climate change impacts across the State,
- Sea level rise projections to 2100,
- An initial estimate of Maine's annual carbon budget,
- Identification of priority information and data needs, and
- Identification of methods to build resilience to climate change.

Maine's Climate is Warming



Maine's statewide mean annual temperature has increased by 3.2 °F (≈1.8 °C) since 1895.

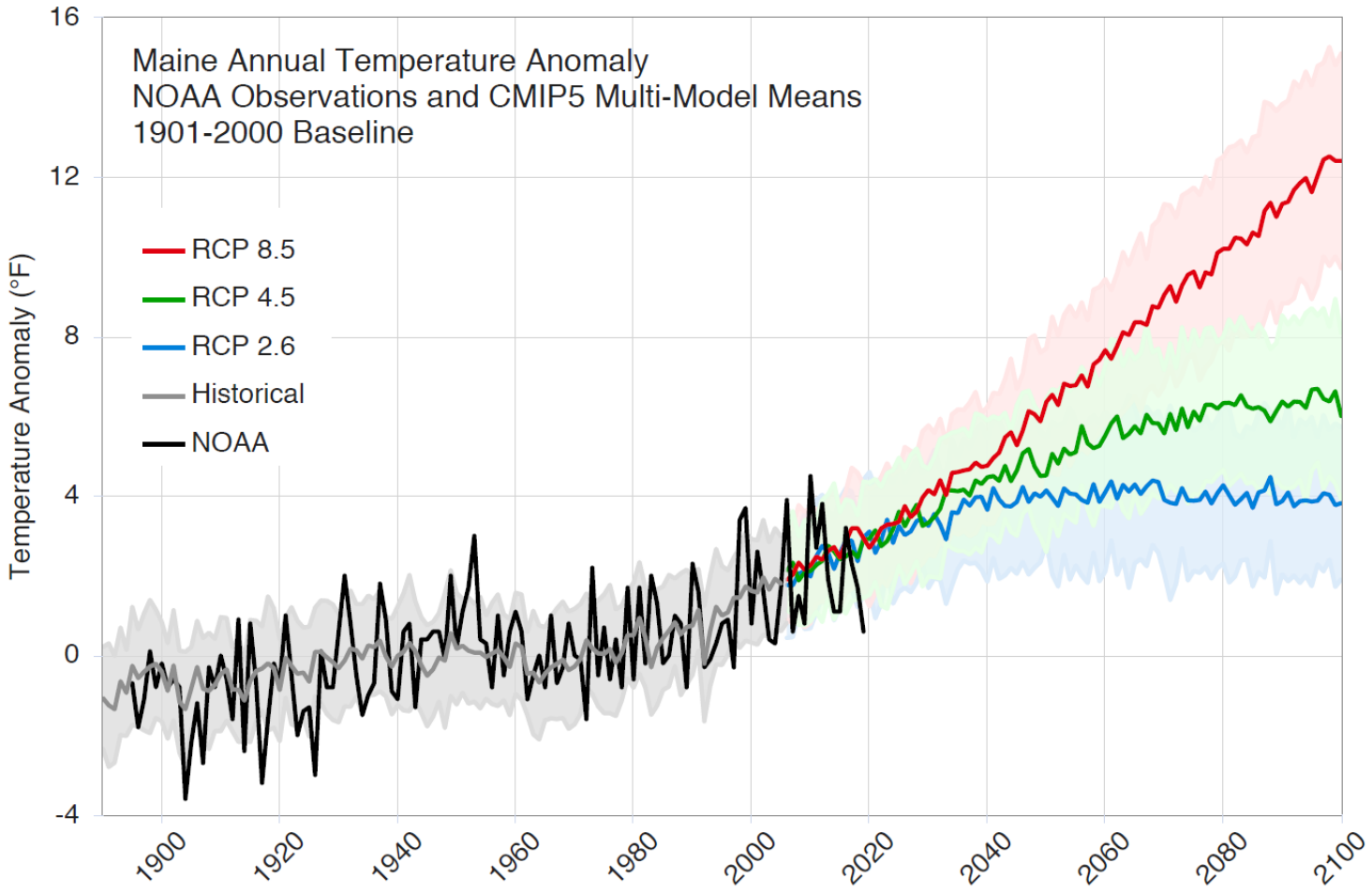
Minimum temperatures (overnight lows) have increased more than maximum temperatures (daytime highs) throughout the year.

Coastal climate areas have warmed slightly more (0.2 °F [≈0.1 °C]) than the interior of the State.

Winter (December-February) has seen the most warming of the four seasons.

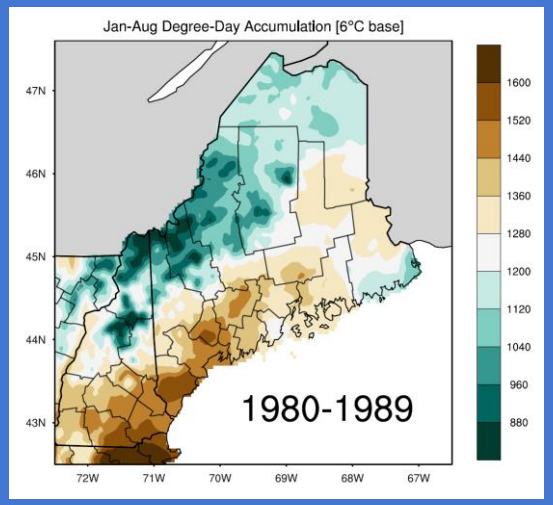
The six warmest years on record are the last six years.

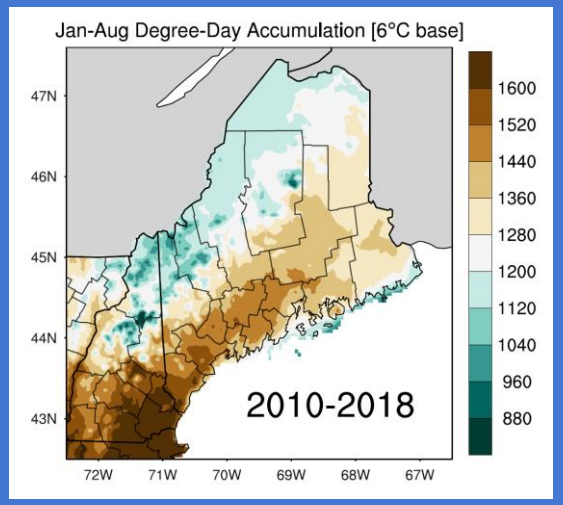
...with more warming in our future.

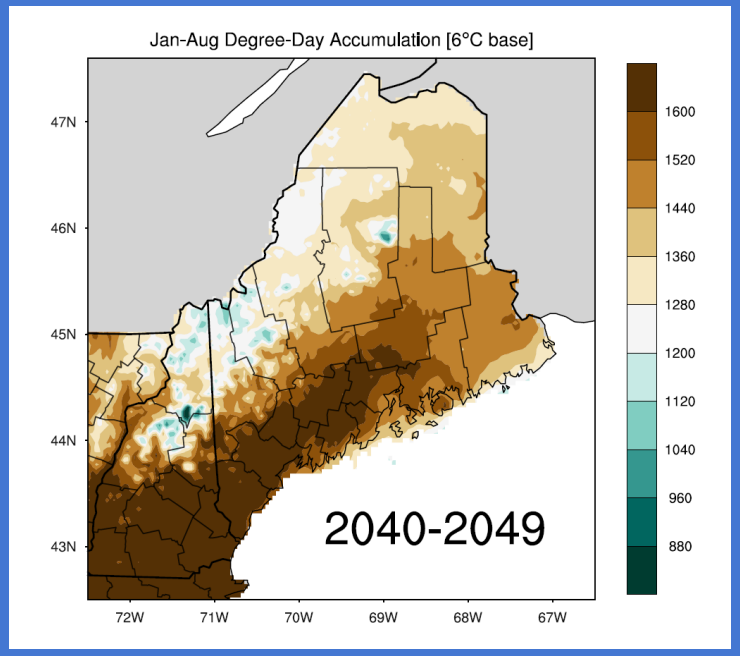


Climate model projections indicate that Maine's mean annual temperature will likely warm between 1 and 4 °F (0.6-2.2 °C) by 2050 and up to 10 °F (5.6 °C) by 2100 relative to a 2001-2018 climate baseline.

The future trajectory of warming is directly a function of the decisions we make about our fossil fuel and land use contributions to greenhouse gas emissions.





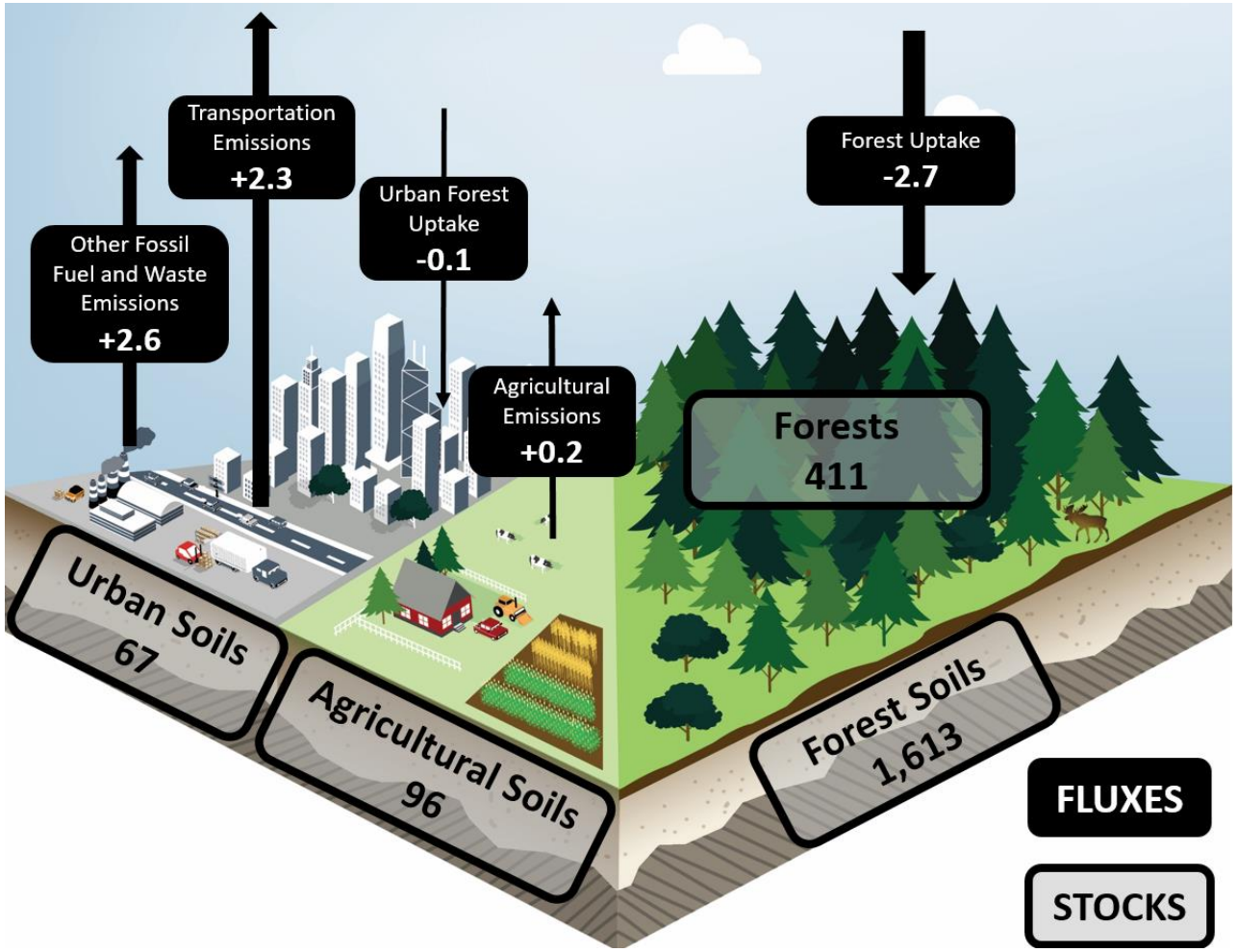


Human and Animal Health Risks

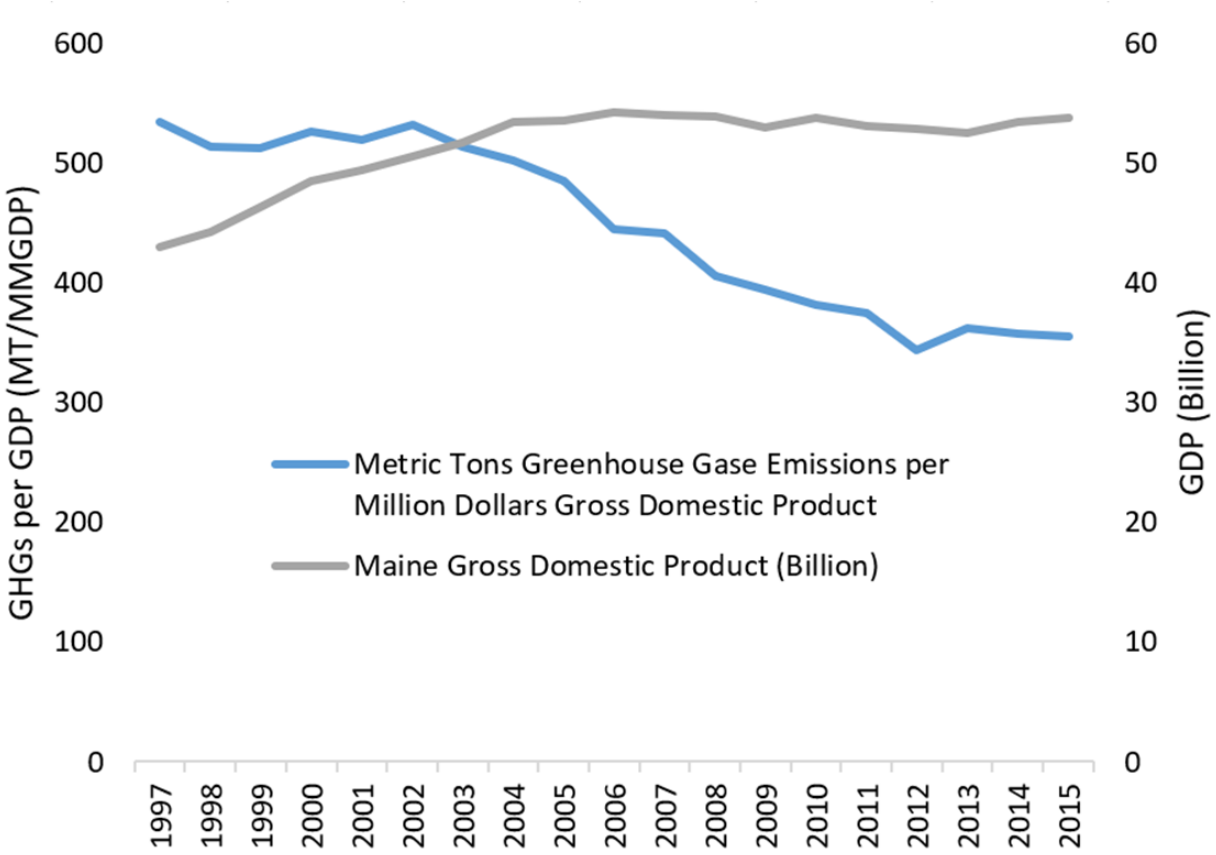
- Tick- and mosquito- borne diseases,
- “Extreme Heat” days and heat related illnesses,
- Drought and wildfire effects on water quality and respiratory health,
- Extreme weather risks to humans and animals,
- Vibrio bacterial infections in marine waters,
- Harmful Algal Blooms (HABs) in Maine lakes,
- Pollen impacts on human allergies,
- Stressors for mental health.

Maine Forest's and Maine's Annual Carbon Budget

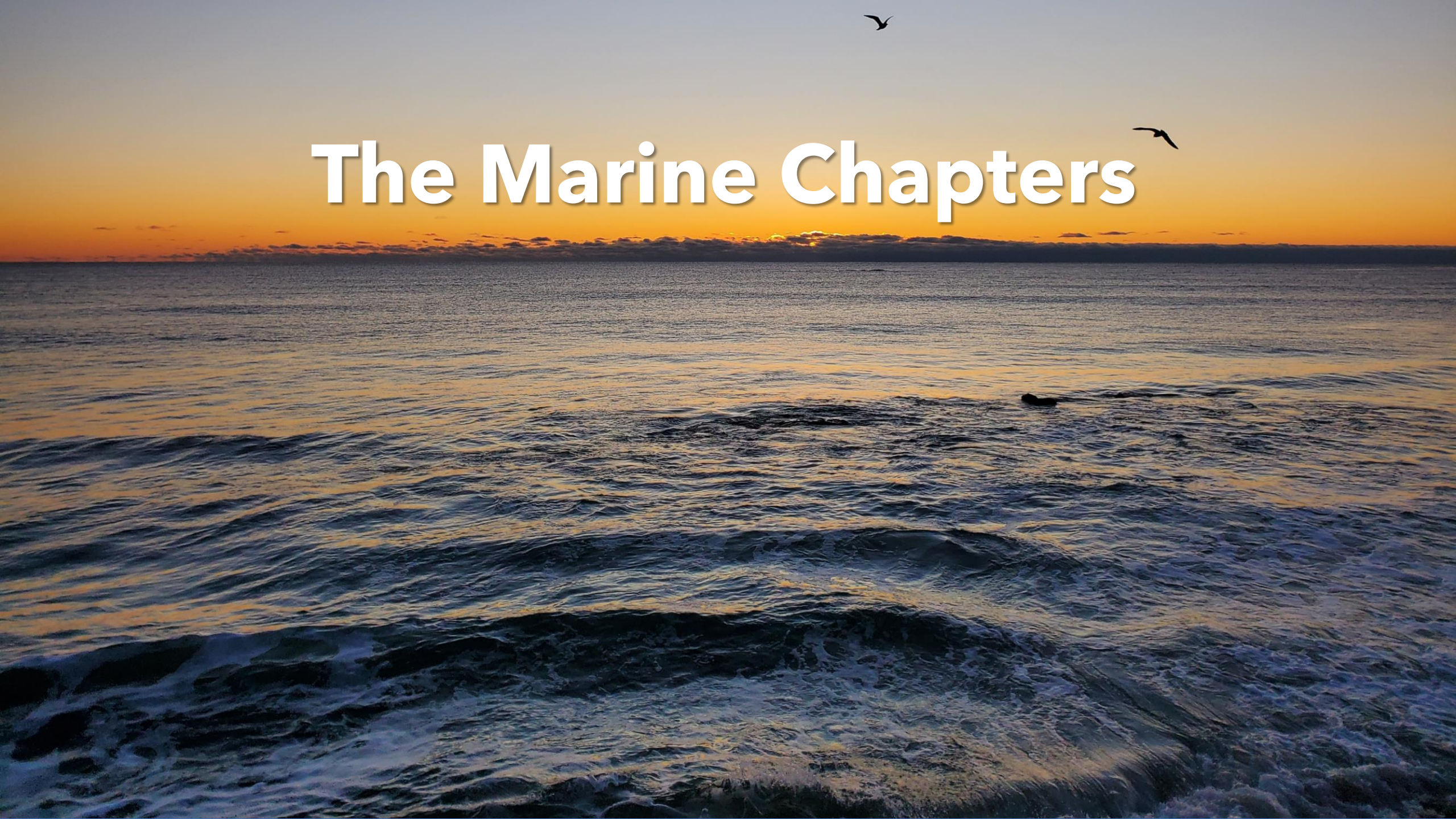
Carbon Pool	% of State's Annual Fossil Fuel Emission
Forest carbon stocks + annual growth	60%
Forest products	15%
Total forestry sector	75%
Net Land Sink	78%



Maine's Economy and Climate Change



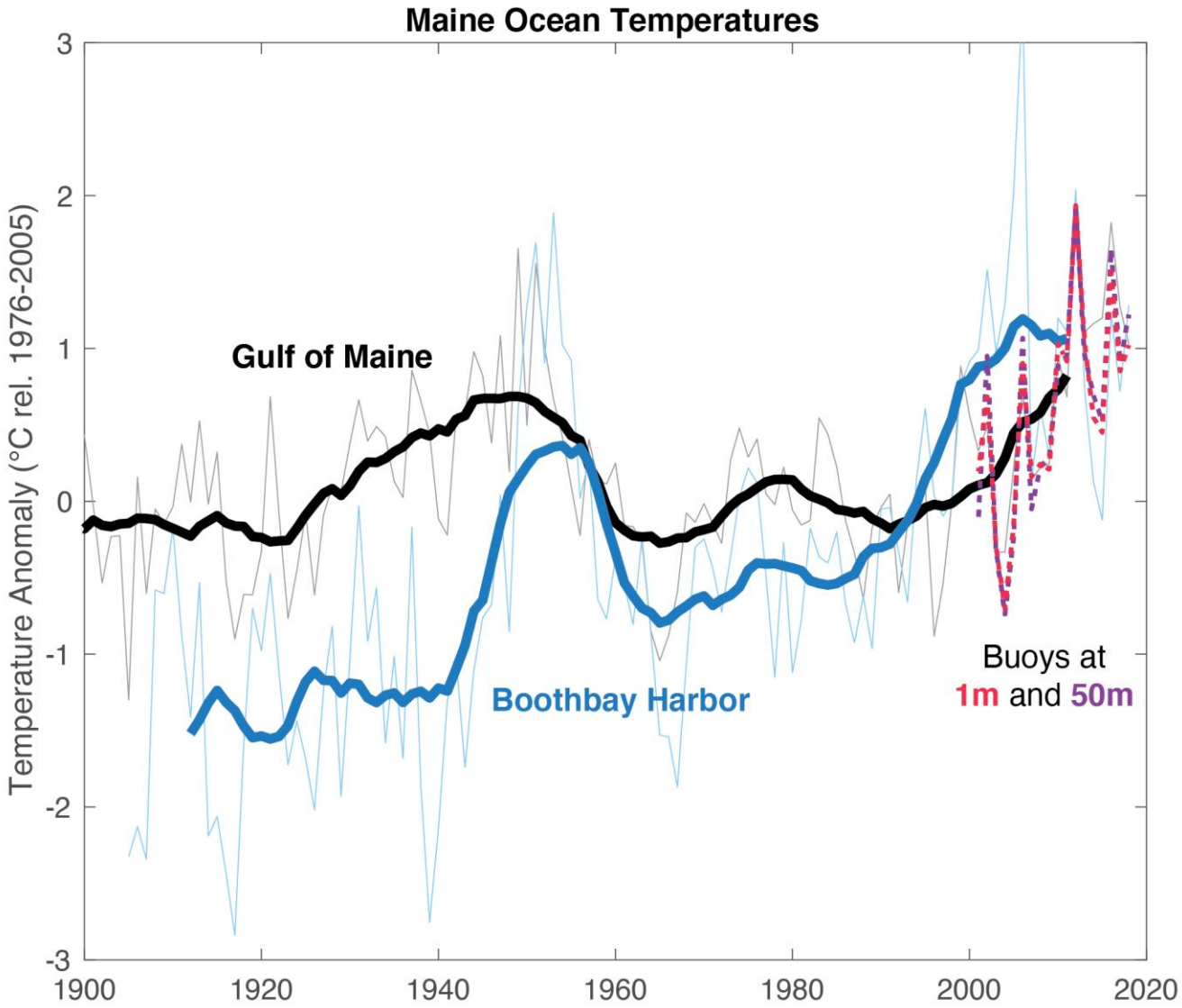
- Economic risks and opportunities
- Highlights the decoupling of GDP and GHG emissions
- Initial findings on *Natural Climate Solutions* in agriculture and forestry


The Marine Chapters

Ocean Temperature

The temperature of Gulf of Maine has exhibited a strong warming trend over the last 15 years.

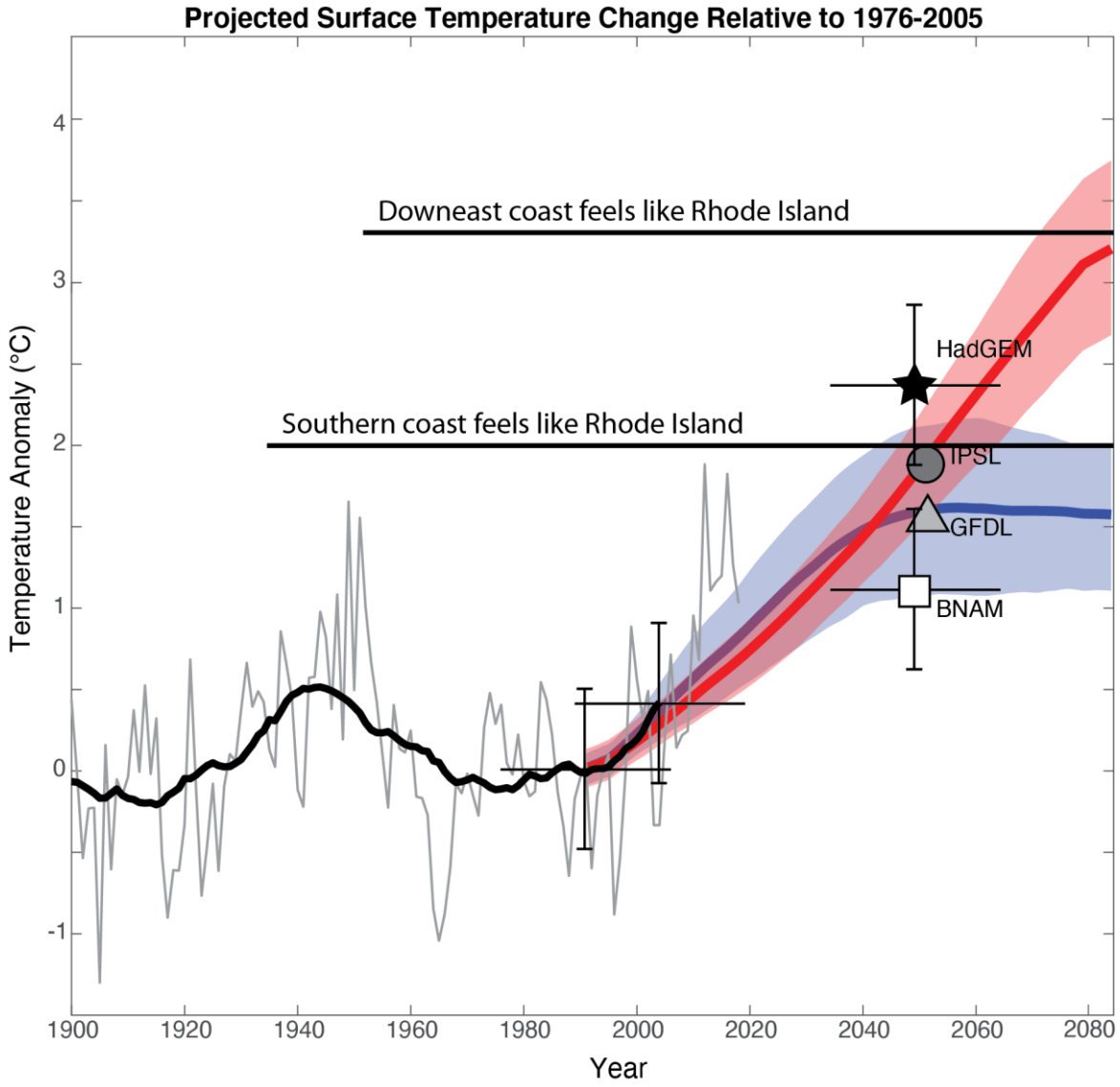
Under all climate scenarios, the Gulf of Maine will continue to warm through at least 2050.



Ocean Temperature

Beyond 2050, under a low-emission scenario, temperatures stabilize around 2.7 °F (1.5° C) above baseline.

Under the high-emission scenario, temperatures will exceed 5.4°F (3°C) above the baseline by the end of the century.

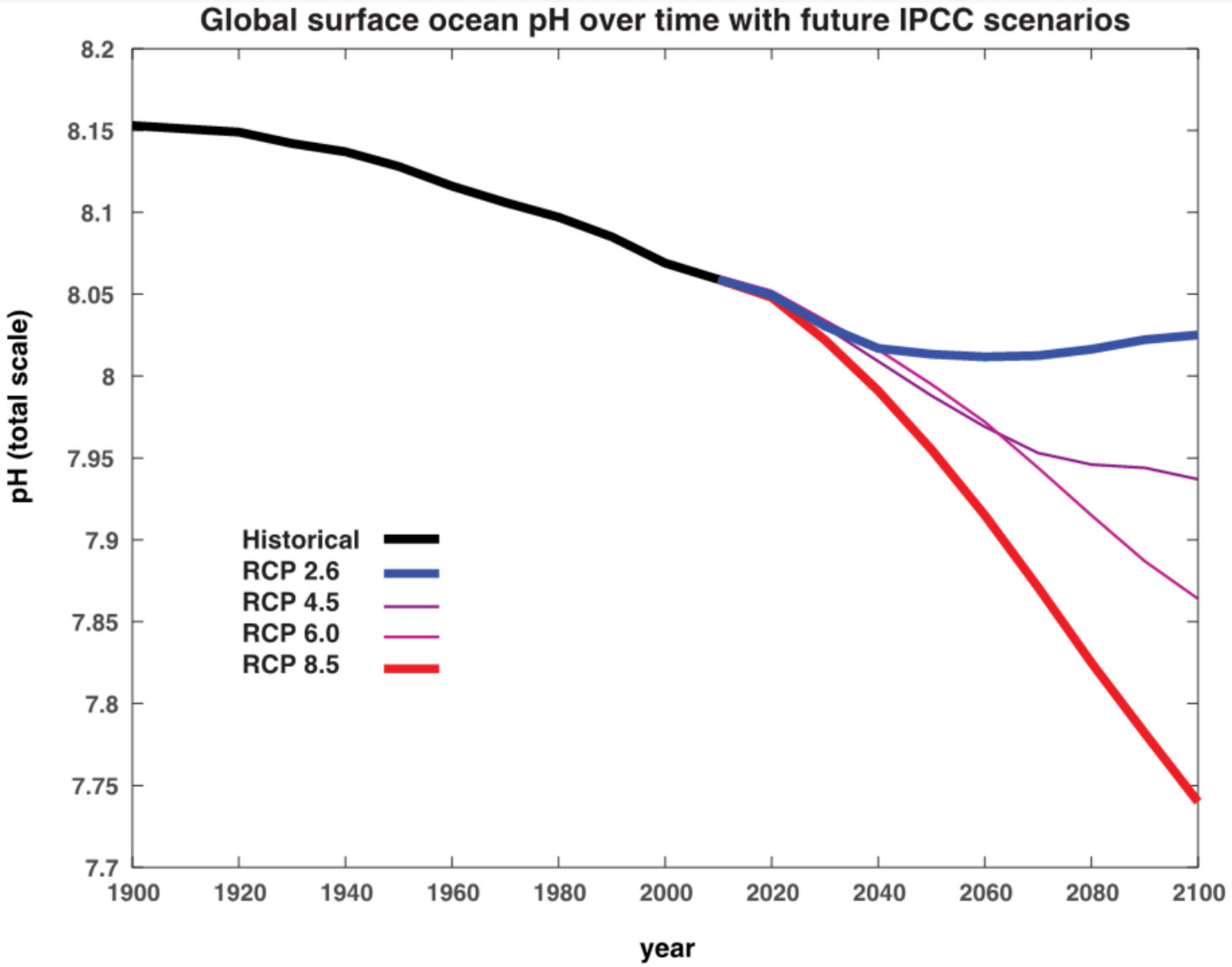


Ocean Acidification

Since 1800, the world's surface ocean pH has decreased from 8.2 to 8.1.

By 2100, ocean pH is expected to drop by 0.05-0.33 pH units.

Ocean and coastal acidification will most heavily impact those marine organisms that produce calcium carbonate to build shells.

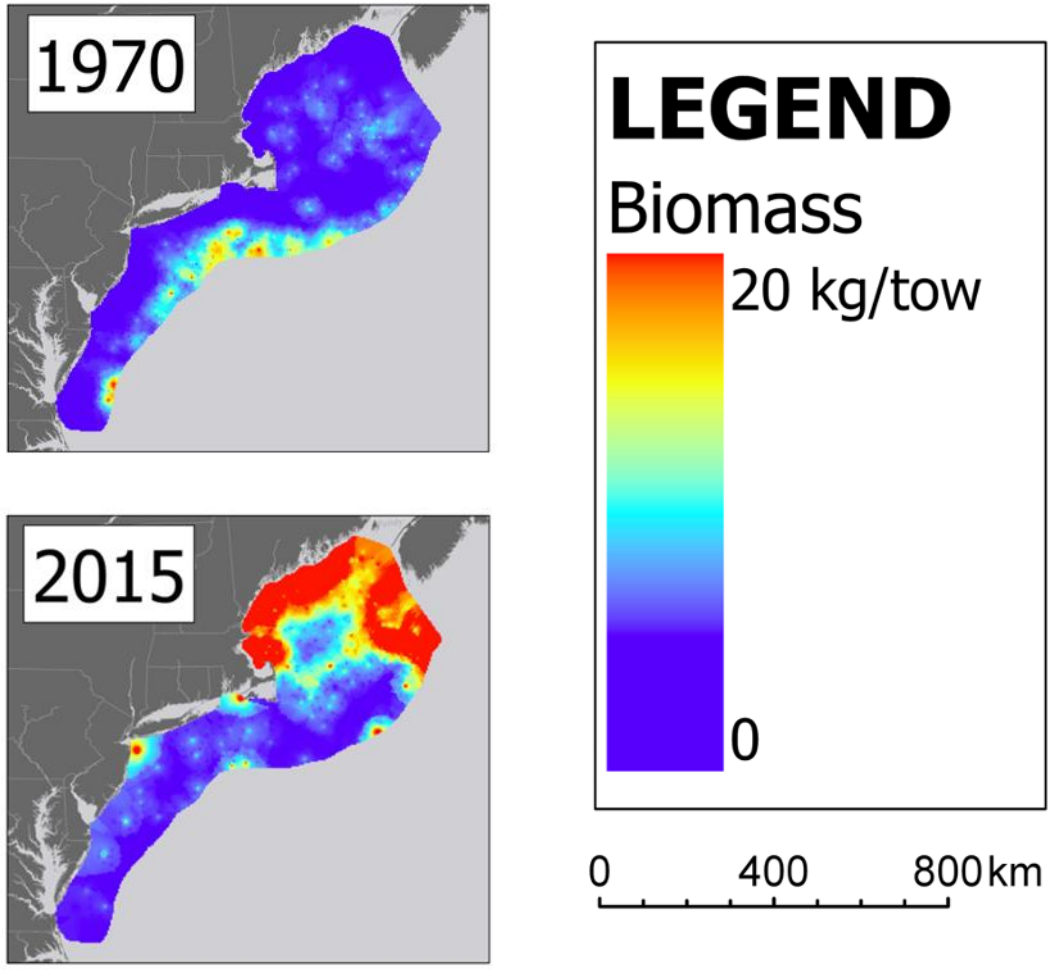


Marine Ecosystems

Ocean warming is a key driver in the northward shift of commercial and noncommercial species.

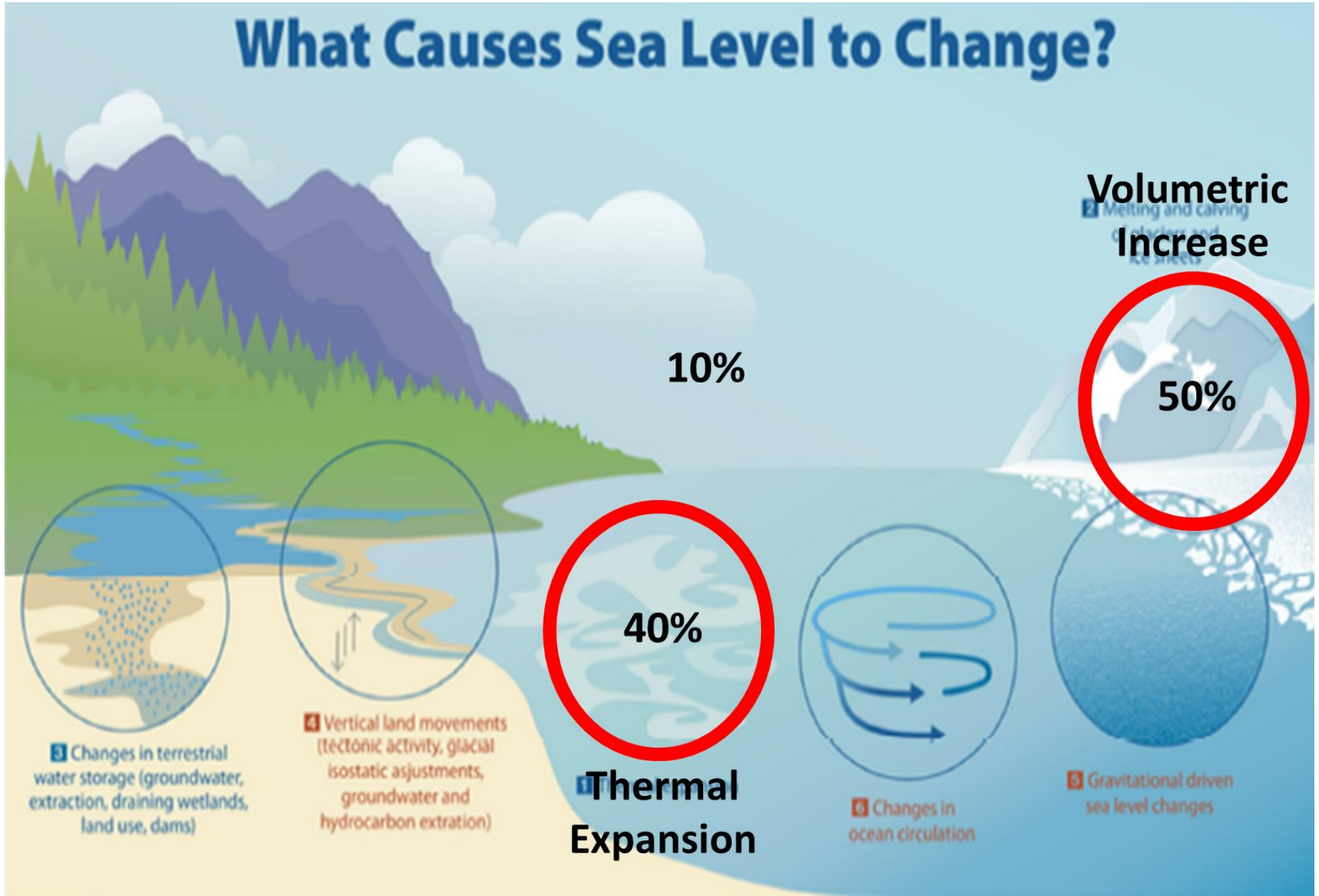
Given Maine's dependence on marine resources, ecotourism, and maritime industries, ecosystem changes may have a high impact.

The interactive effects on coastal ecosystems of ocean warming, ocean acidification, or sea level rise are not known.



Sea-level Rise

Sea-level rise (SLR) is primarily caused by thermal expansion of the ocean and increased volume from melting land-based ice.

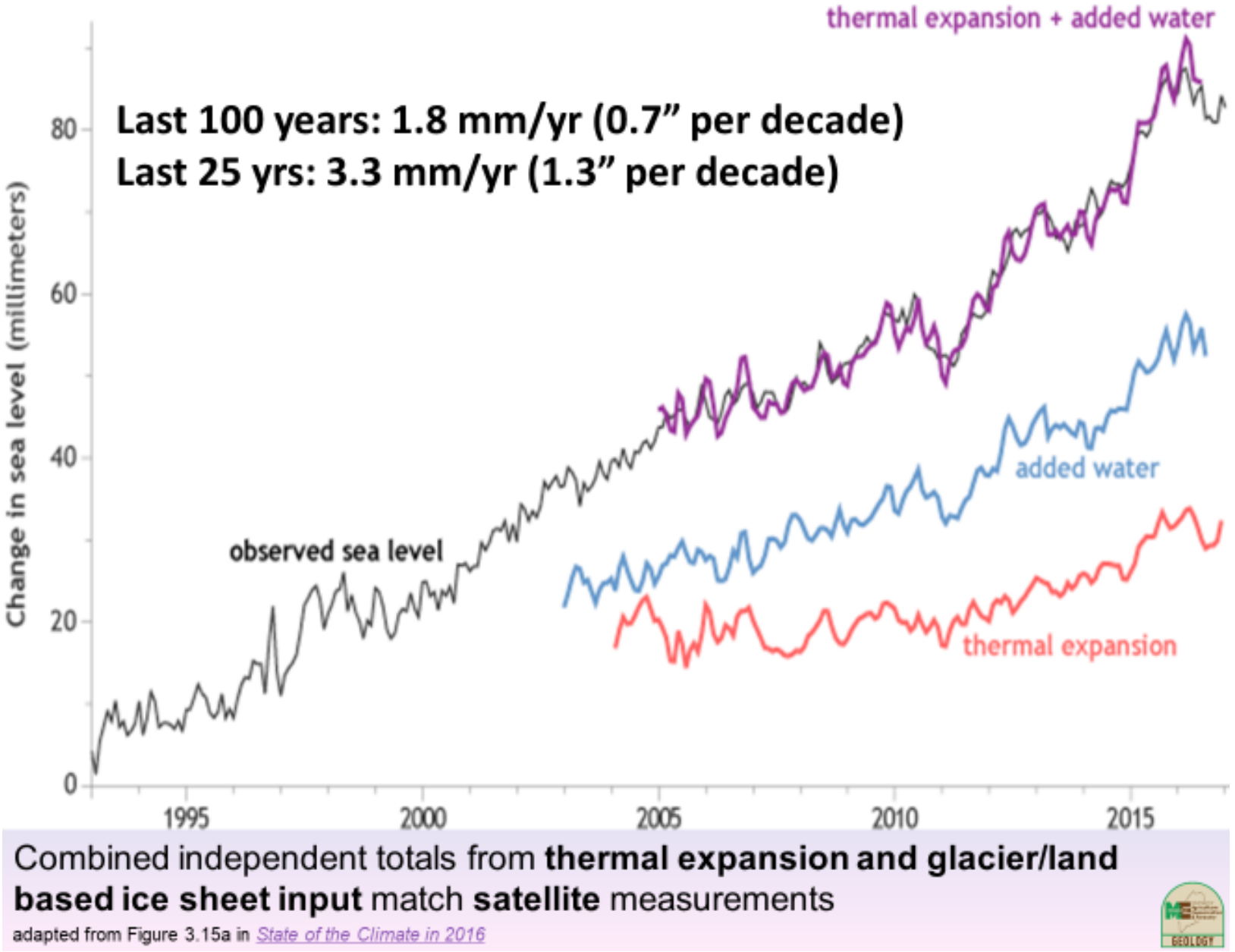


Black line: Observed sea level via satellite altimeter since 1993

Red line: thermal expansion

Blue line: added water, mostly due to glacier melt.

Purple line: independent estimates added together match the observed sea level.



Combined independent totals from **thermal expansion and glacier/land based ice sheet input** match **satellite** measurements

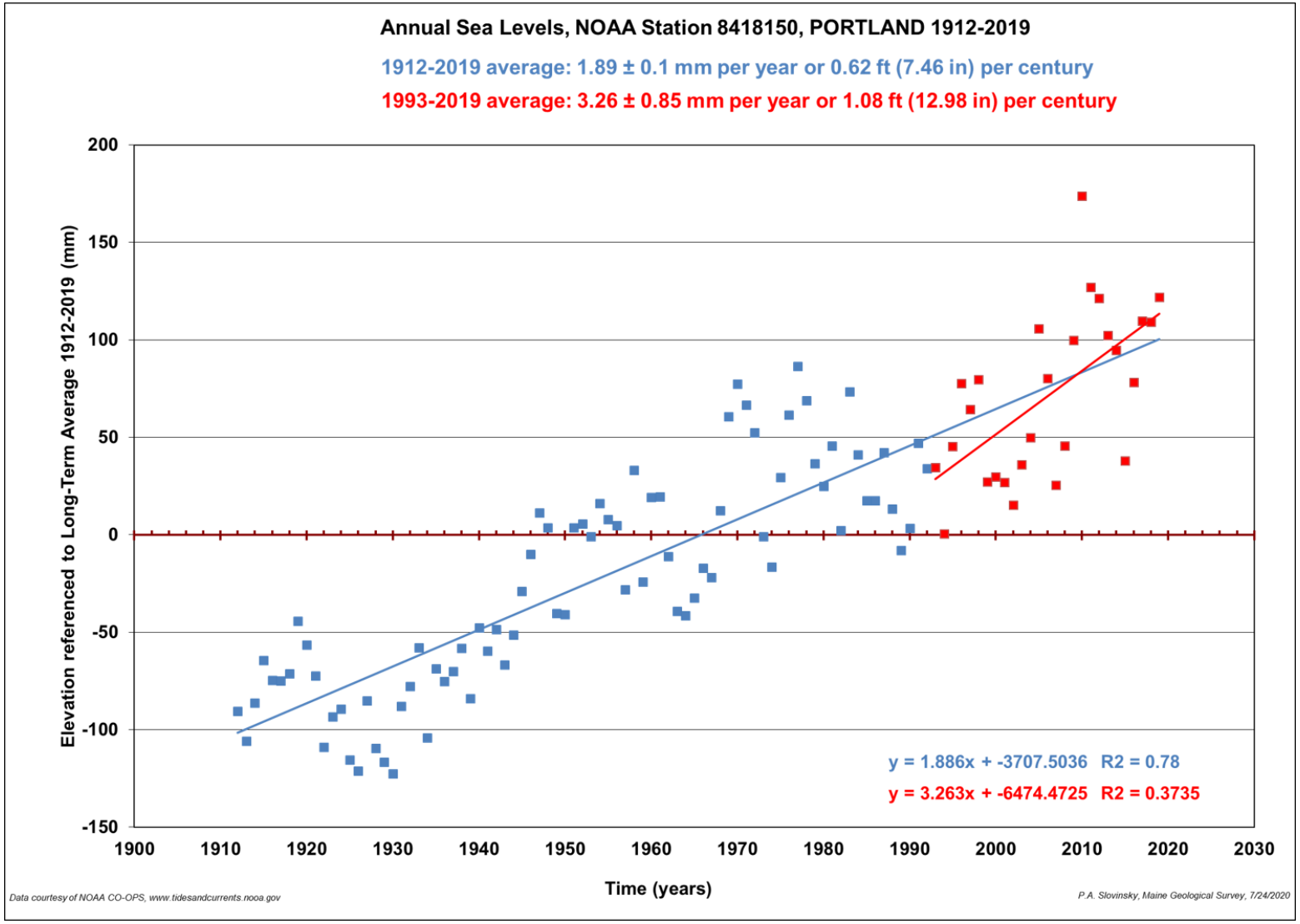
adapted from Figure 3.15a in *State of the Climate in 2016*

Sea-level Rise

Over the past 5,000 years, relative SLR in Maine was comparatively slow – less than 3.6 inches/century.

The Portland tide gage has a continuous record of sea level since 1912.

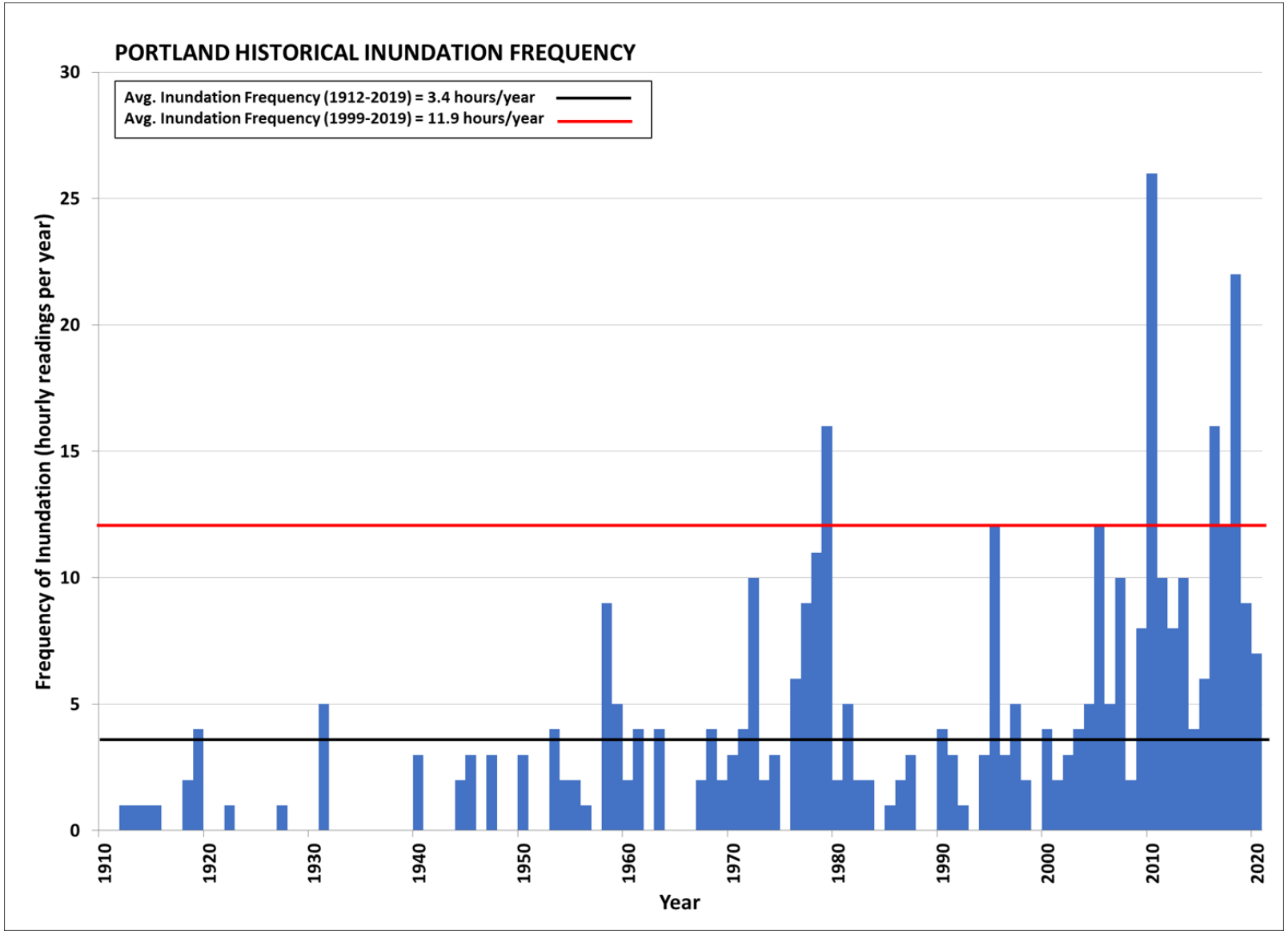
Since 1912, SLR at Portland has been 7.4 inches/century. For the past 25 years, the rate has been 12.4 inches/century.



Nuisance Flooding – a consequence of SLR

Portland tide gage data from 1912-2019 indicates that the 12-foot flood stage has been met or exceeded 3.4 times per year on average.

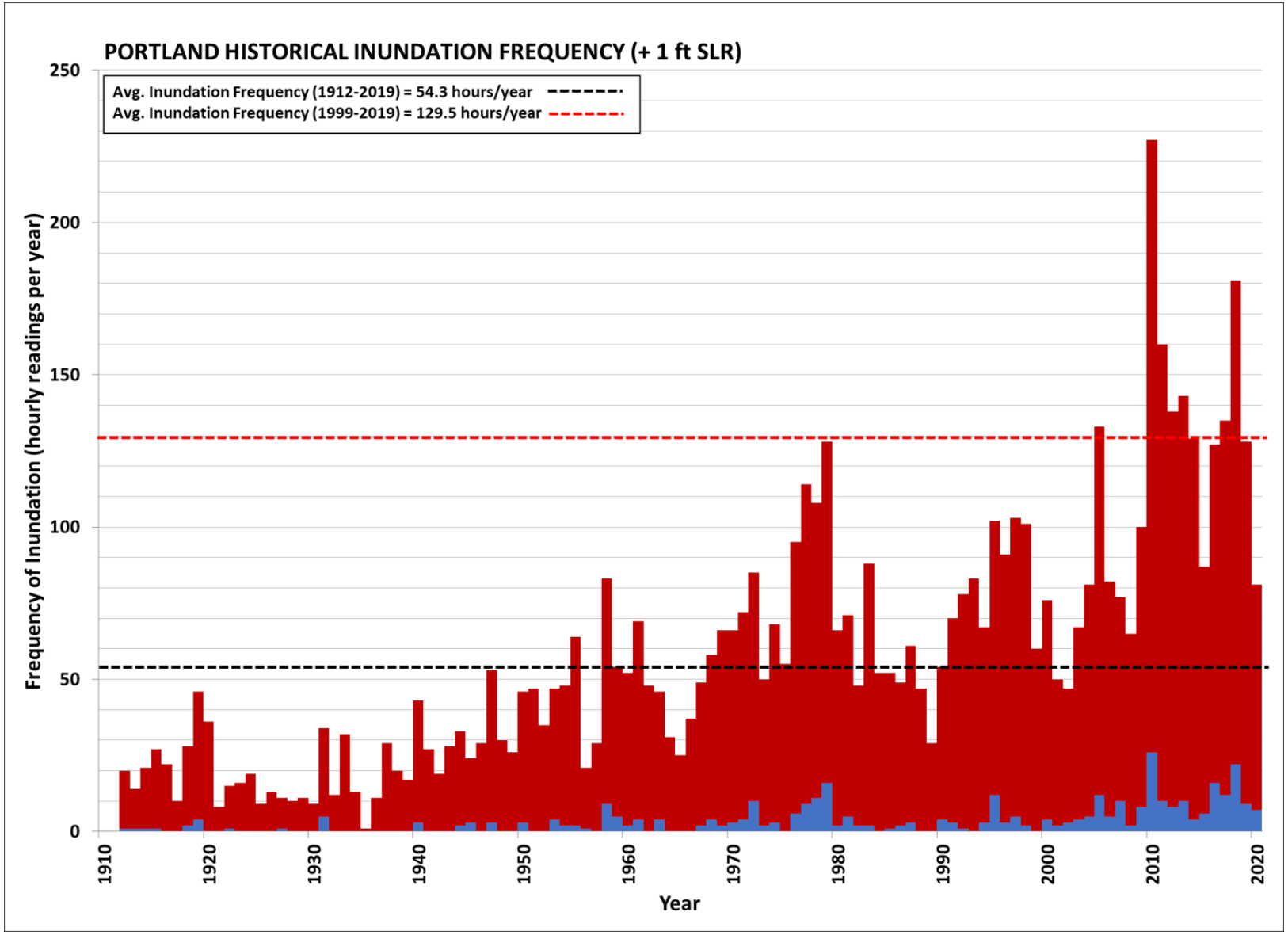
From 2009-2019 the flood stage has been exceeded around 12 times per year.



Nuisance Flooding – a consequence of SLR

With one foot of SLR, the flood stage would have been exceeded around 54 times per year.

This is more than a fifteen-fold increase in flood frequency.

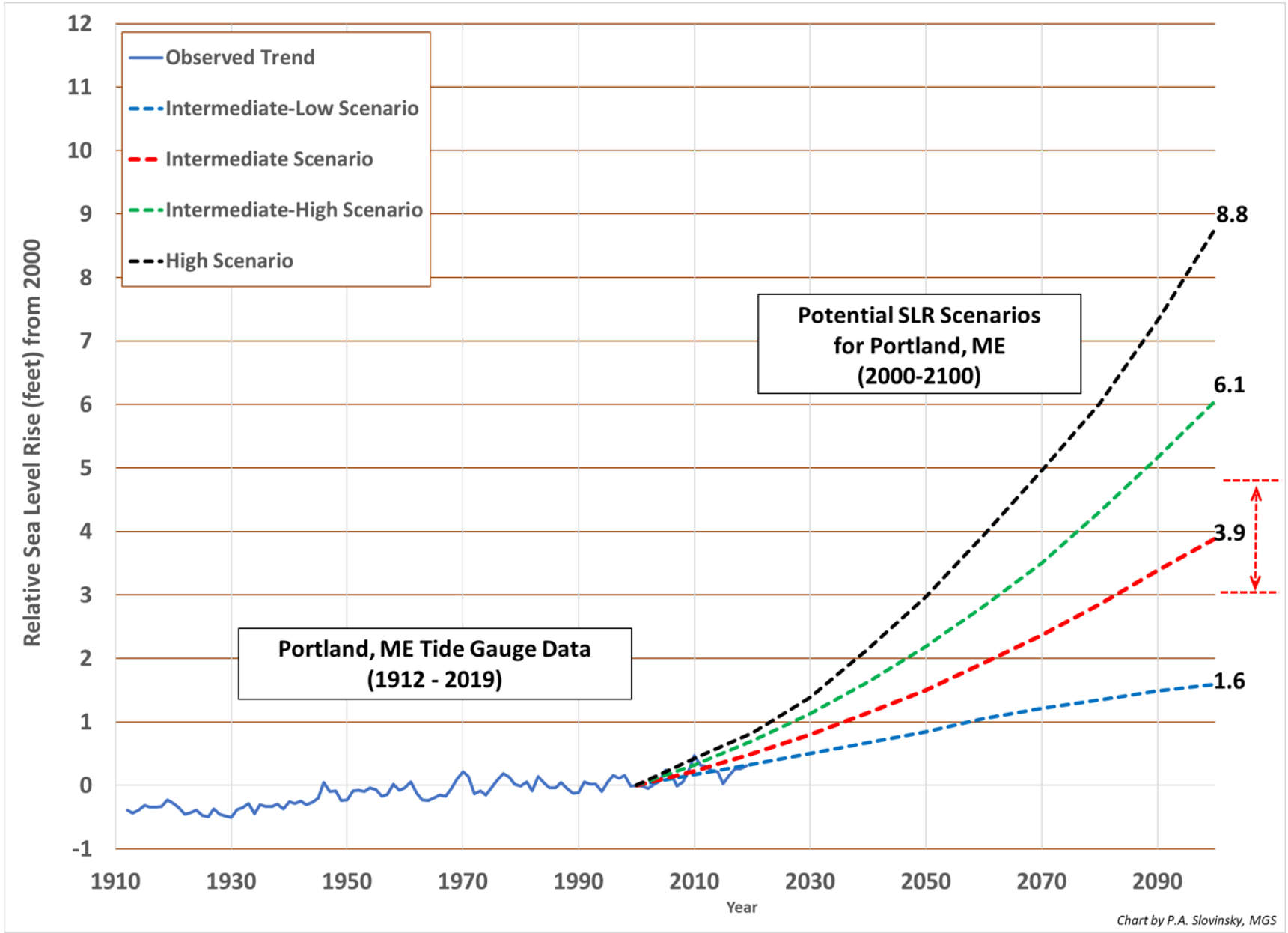


Potential Sea-level Rise Scenarios for Portland

Dashed lines represent the 50% probability of being met or exceeded under each scenario.

The intermediate-low scenario has a high probability of being exceeded under high emissions scenarios.

Scenario data from the U.S. Army Corps of Engineers Sea Level Change Calculator (2019). Based on multiple peer-reviewed reports.

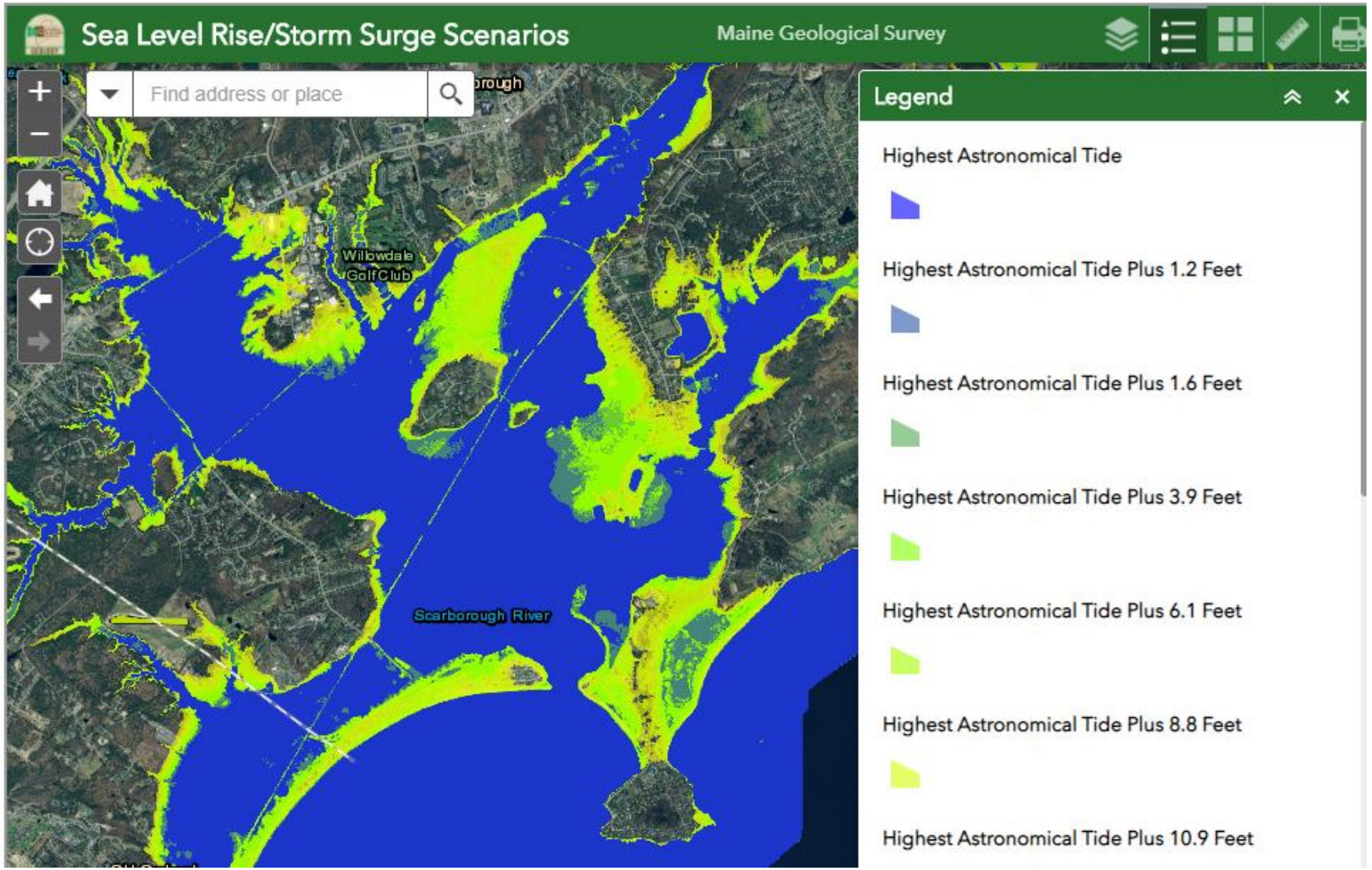


Sea-level Rise

Maine Geological Survey Sea-level Rise/Storm Surge mapping portal.

SLR scenarios are mapped across the entire coast of Maine.

https://www.maine.gov/dacf/mgs/hazards/slr_ss/index.shtml



Sea-level Rise Policy Recommendation

1. Commit to manage for a likely range of sea-level rise associated with the intermediate scenario.

- Sea level may rise between 1.1 and 1.8 feet by 2050, and potentially between 3.0 and 4.6 feet by 2100.

2. Prepare to manage for a likely range of sea-level rise associated with the high scenario.

- Sea level may rise between 2.6 and 3.2 feet by 2050, and potentially between 7.7 and 9.3 feet by 2100.

BASIC AND APPLIED RESEARCH PRIORITIES

A. Cross-cutting Priorities

- Historical and predicted climatology
- Effects on humans and ecosystems
- Life-Cycle and Benefit/cost assessments
- Maine's carbon cycle

B. Targeted Priorities

- Marine coastal and riverine flooding
- Forest bioproducts (e.g., nanocellulosics, CLT);
- Farm and food system vulnerabilities.

C. Monitoring Priorities

QUESTIONS AND DISCUSSION


GOVERNOR'S
Energy Office
Dan Burgess, Director

Energy Working Group Members

Co-chairs: Dan Burgess, Governor's Energy Office;
Ken Colburn, Energy and Climate Expert

Kurt Adams, Summit Utilities

Beth Ahearn, Maine Conservation Voters

Phil Bartlett, Maine Public Utilities Commission

Matt Beck, IBEW 1837

Representative Seth Berry, Maine State Legislature

Tony Buxton, Preti Flaherty

Steve Clemmer, Union of Concerned Scientists

Greg Cunningham, Conservation Law Foundation

Senator Paul Davis, Maine State Legislature

Evelyn deFrees, Maine Department of Labor, MCC Member

Carrie Gilbert, Daymark Energy Advisors

Ben Gilman, Maine State Chamber of Commerce

Marty Grohman, E2Tech

Abigayle Hargreaves, University of Maine, Youth Representative

Barry Hobbins, Office of the Public Advocate

Andy Lubershane, Energy Impact Partners

Katryn Mitchell, SEARCH

Jeremy Payne, Maine Renewable Energy Association

Julie Rosenbach, City of South Portland

Jeff Saucier, McCain Foods USA, Inc.

Rich Silkman, Competitive Energy Services, LLC

Eric N. Stinneford, Central Maine Power Company

Michael Stoddard, Efficiency Maine Trust

Robert Stoddard, Power Market Economics, LLC

Jeff Thaler, University of Maine

Sarah Tracy, Pierce Atwood LLP

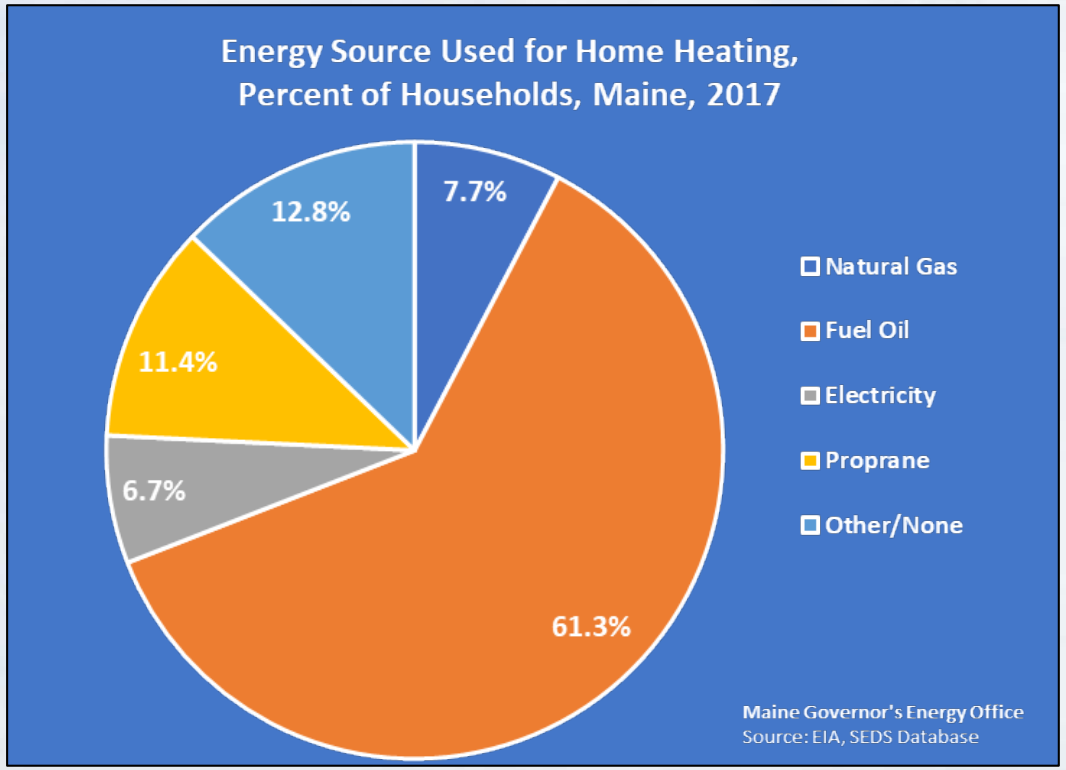
Jake Ward, University of Maine

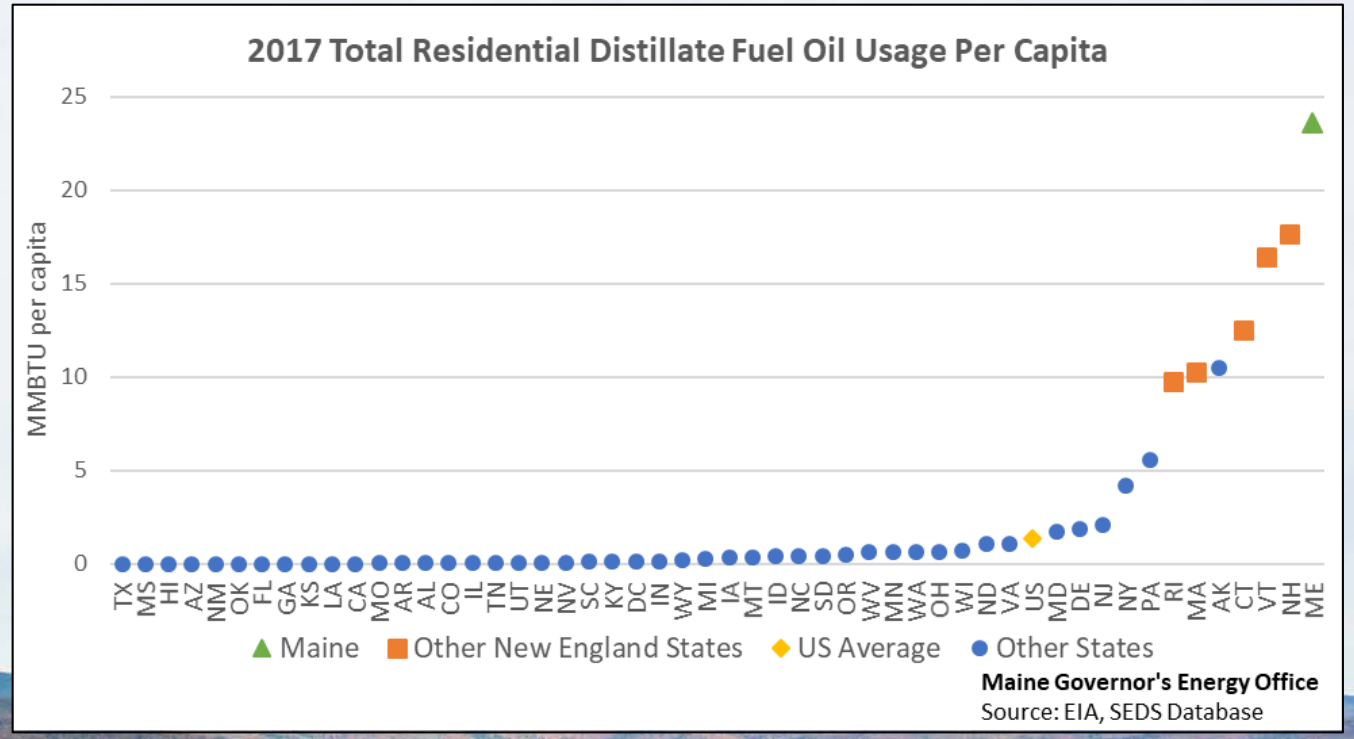
Tom Welch, Energy Policy Expert

Strategy C: Reduce Carbon Emissions in Maine's Energy and Industrial Sectors through Clean-Energy Innovation

1. Ensure Adequate Affordable Clean-Energy Supply
2. Initiate a Stakeholder Process to Transform Maine's Electric Power Sector
3. Accelerate Emissions Reductions of Industrial Uses and Processes
4. Encourage Highly Efficient Combined Heat and Power Facilities

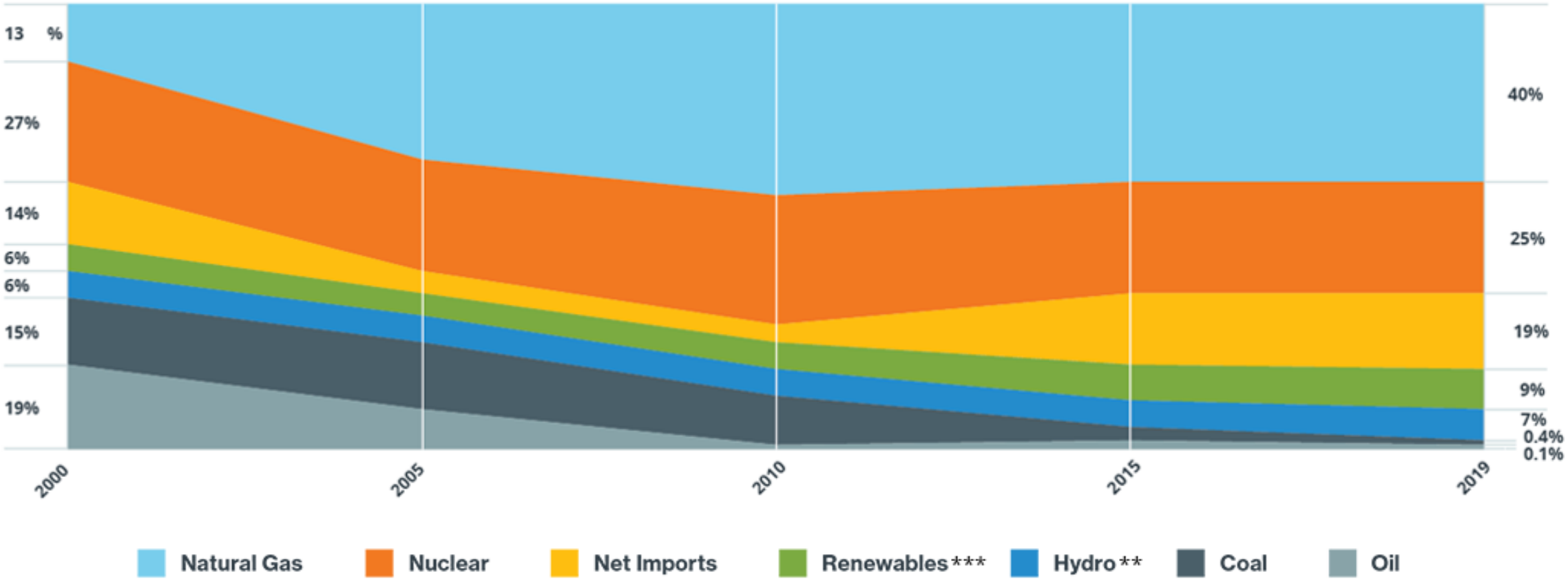
MAINE, NEW ENGLAND & U.S. HOME HEATING DATA





Background Photo by Mike Lewinski on Unsplash

Percentage of Total Electric Energy by Resource Type



*Data are subject to adjustments. This chart approximates the amount of generation by individual fuels used by dual-fuel units, such as natural-gas-fired generators that can switch to run on oil and vice versa. Before 2016, generation from such units was attributed only to the primary fuel type registered for the unit.

**Includes pondage, run-of-river, and pumped storage.

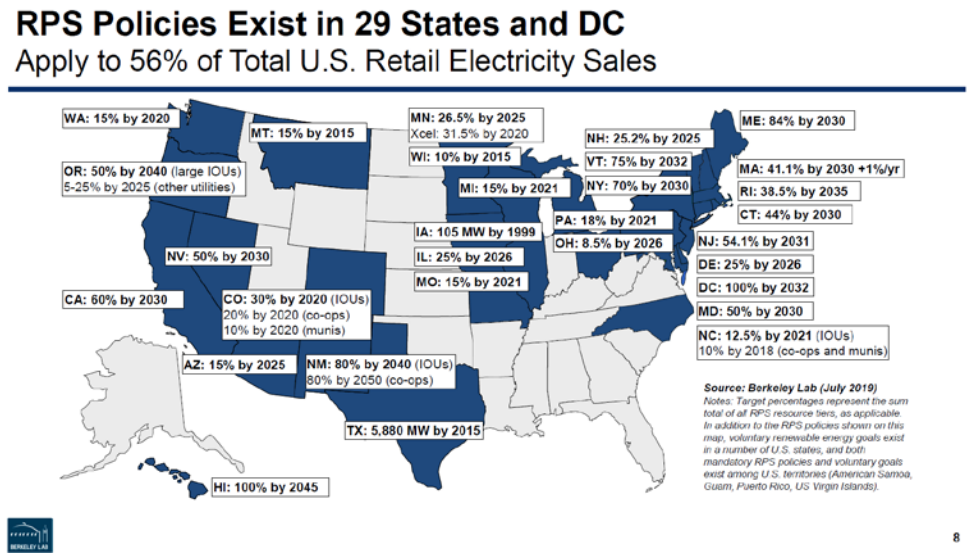
***Renewables include landfill gas, biomass, other biomass gas, wind, grid-scale solar, municipal solid waste, and miscellaneous fuels. Hydro is not included in this category primarily because the various sources that make up hydroelectric generation (i.e., conventional hydroelectric, run-of-river, pumped storage) are not universally defined as renewable in the six New England states.

Source: ISO New England

Renewable Portfolio Standard

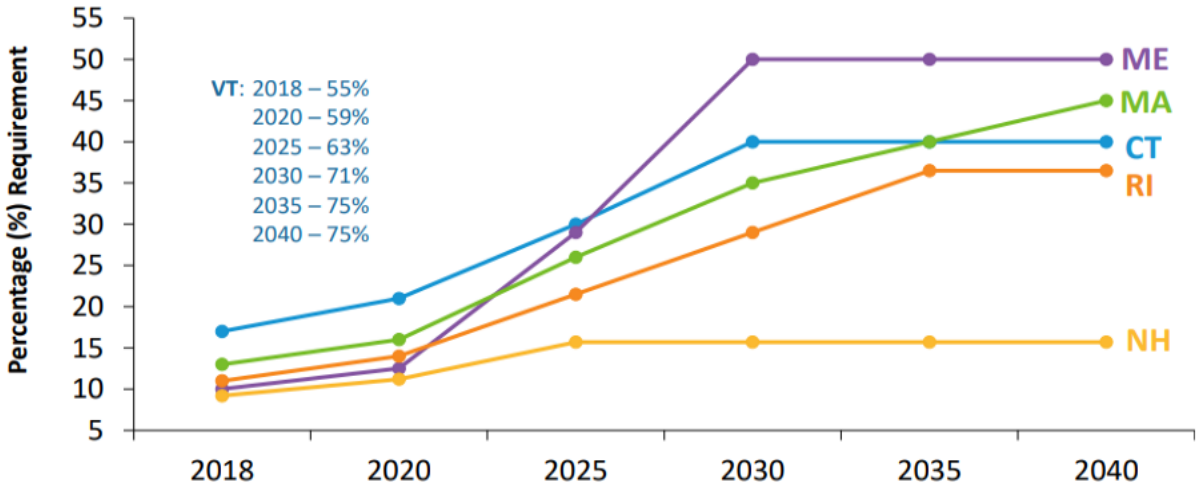
Tranche 1 Procurement

- 17 renewable projects, ~9.5% of electric load
- Reduce greenhouse gas emissions by appx. 500,000 tons per year, create hundreds of jobs and contribute millions of dollars to Maines economy



Tranche 2 Procurement

- Issued January 15, 2021
- Roughly 4.5% of State electric load
- Bids due March 18, 2021



Source: ISO New England

RPS Study due February 2021

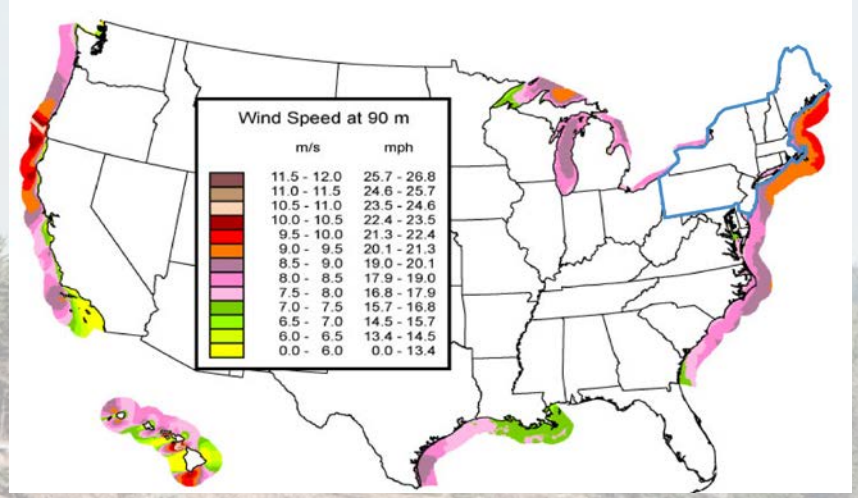
Energy Modeling Results – 2030

Resource/Emission	2020	Sustained Policy Baseline	Decarbonization Policy
Wind (TWh)	2.4	2.9	2.9
Wind (MW)	880	1,037	1,037
Solar (TWh)	0.2	2.5	2.5
Solar DG (MW)	59	614	614
Solar non-DG (MW)	26	857	857
Storage (MW)	16	16	16
DR (MW)	102	125	125
Generation-based GHG Emissions ($MMTCO_2$)	0.8	0.2	0.4

***not pathway scenario**

Ensure adequate affordable clean energy supply to meet Maine's 100% RPS goal and any increased load

- Consider **renewable procurement(s)** to match **clean energy supply** with load growth considering GEO study.
- Set achievable targets for cost effective deployment of technologies such as **offshore wind**, **distributed generation**, and **energy storage**, and outline the policies, including opportunities for pilot initiatives.
- Siting guidelines to minimize impacts.



Source: NREL

Initiate a Power Sector Transformation Stakeholder Process

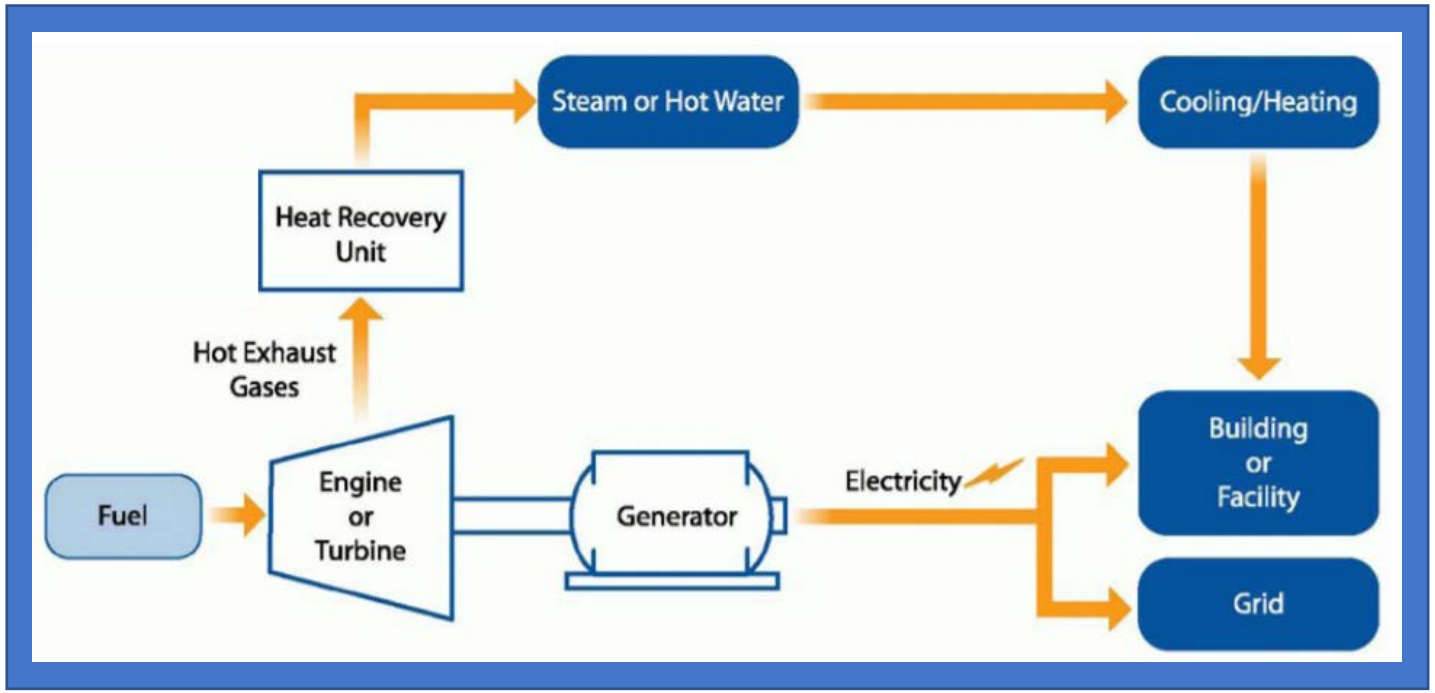
- Establish a comprehensive stakeholder process in to examine the transformation of Maine's electric sector and facilitate other recommendations of the Maine Climate Council.
- **Target transformation of and planning for Maine's electric sector** to achieve Maine's GHG reduction requirements and MCC recommendations.
- Ensure that beneficial electrification and clean energy and climate goals are accomplished in the most **efficient and effective way.**

Areas of analysis include:

- Utility Structure
- Load Management / Flexibility
- Data/Information Access
- Non-wires Alternative (NWA)
- Distributed Energy Resources (DERs)
- Efficient and Equitable Cost Allocation
- Regional Collaboration
- Changes in Law and Regulation

Encourage highly efficient combined heat and power (CHP) production facilities

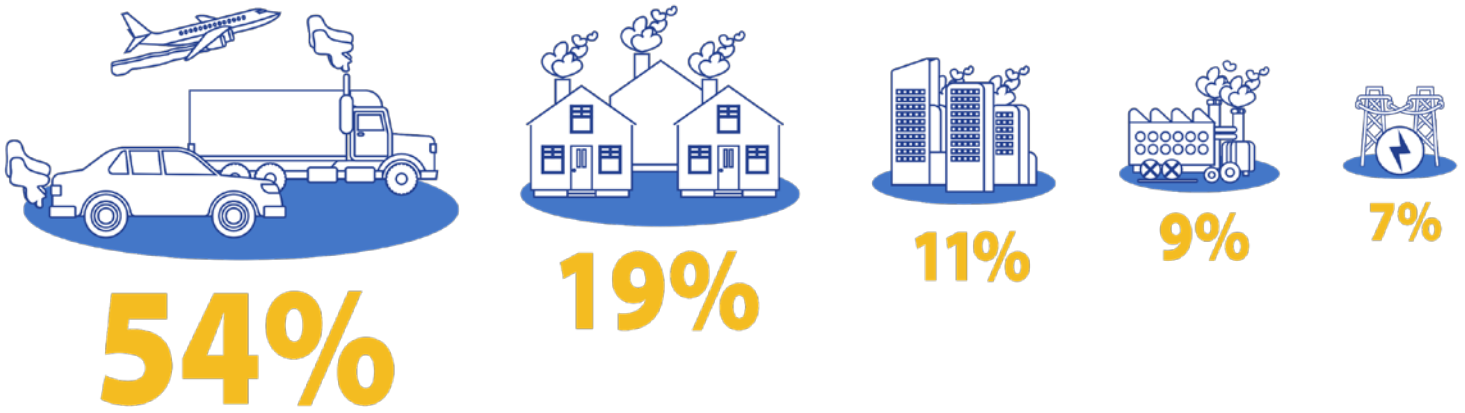
- CHP units, **use energy twice --** to generate heat and electricity -- reducing energy waste and **avoiding additional energy cost and emissions**.
- Analyze policies**,** including the potential for long-term contracts, needed to **advance new highly efficient combined heat and power production facilities** that achieve significant net greenhouse gas reductions.



Source: U.S. Department of Energy, Combined Heat and Power Technology Fact Sheet Series

Accelerate Emissions Reductions of Industrial Uses and Processes

- Launch an **Industrial Task Force** to collaboratively partner with industry and stakeholders to consider innovations and incentives to manage industrial emissions through 2030 and reduce total emissions by 2050.



Background Photo by Dylan Gillis on Unsplash

Buildings, Infrastructure, and Housing Working Group Members

Co-chairs:

Kathleen Meil, Maine Conservation Voters

Michael Stoddard, Efficiency Maine Trust

Senator David Woodsome, Maine State Legislature

Senator Bill Diamond, Maine State Legislature

Representative Dick Campbell, Maine State Legislature

Representative Denny Keschl, Maine State Legislature

Kay Aikin, Introspective Systems

Naomi Beal, PassivHaus Maine

Ellen Belknap, SMRT

Scott Brown, Maine Department of Education

Laney Brown, Iberdrola Solutions

Dan Burgess, Governor's Energy Office

Elaine Clark, Maine Dept. of Administrative and Financial Services

Dan Dixon/Keisha Payson, University of Maine/Bowdoin College

Steve Hudson, Preti Flaherty Beliveau & Pachios

Rick Karg, Residential Energy Dynamics, LLC

Jerry Livengood, Bangor Natural Gas Company

Daniel Kleban, Maine Beer Company

Jeff Marks, Acadia Center

Suzanne McDonald, Island Institute

Don McGilvery, Maine State Housing Authority

Steve McGrath, Maine Energy Marketers Association

Matt Nazar, City of Augusta

Rozanna Patane, Town of York

Greg Payne, Maine Affordable Housing Coalition

Cordelia Pitman, Wright-Ryan Construction, Inc.

Steve Shaler, University of Maine

Jason Shedlock, Maine Building & Construction Trades Council

Jesse Thompson, Kaplan Thompson Architects

Dylan Voorhees, VEIC

Ania Wright, College of the Atlantic; Maine Youth for Climate Justice, Youth Representative

Maine Greenhouse Gas (GHG) Emissions by Sector

54%

19%

11%

9%

7%

Transportation • Residential • Commercial • Industrial • Electric Power

Source: Maine DEP, 2020

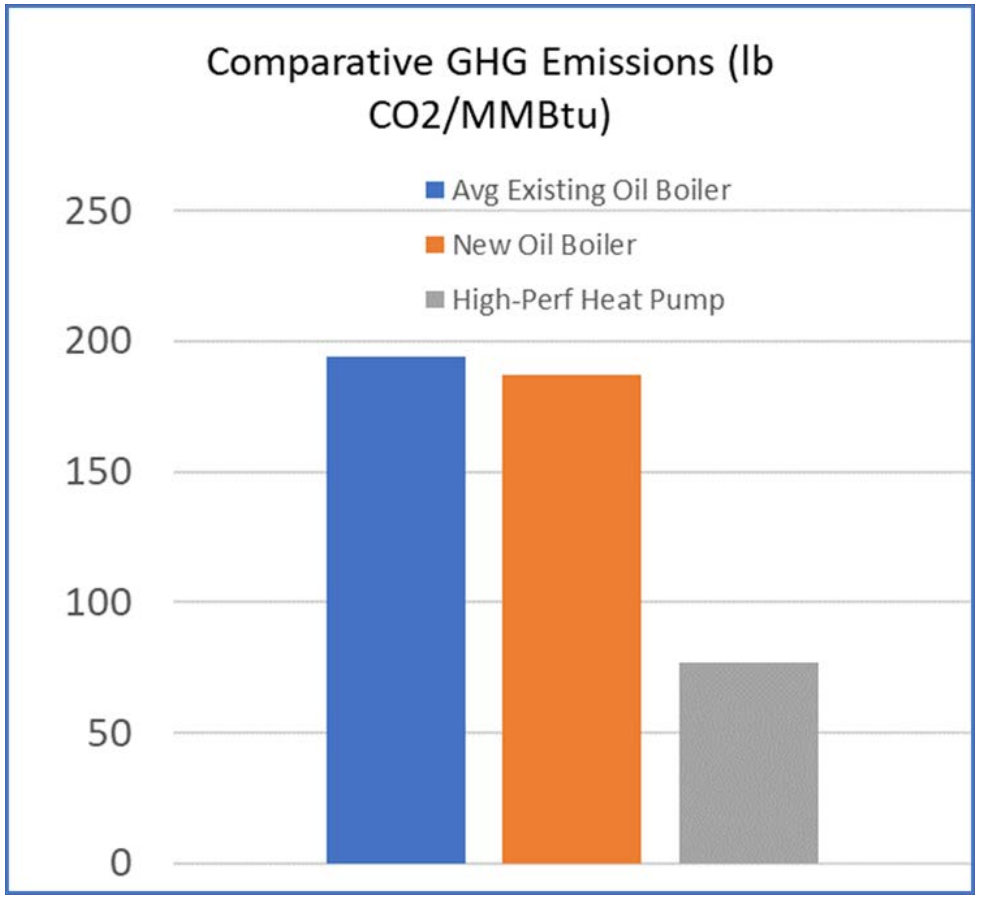
Buildings, Infrastructure + Housing Working Group

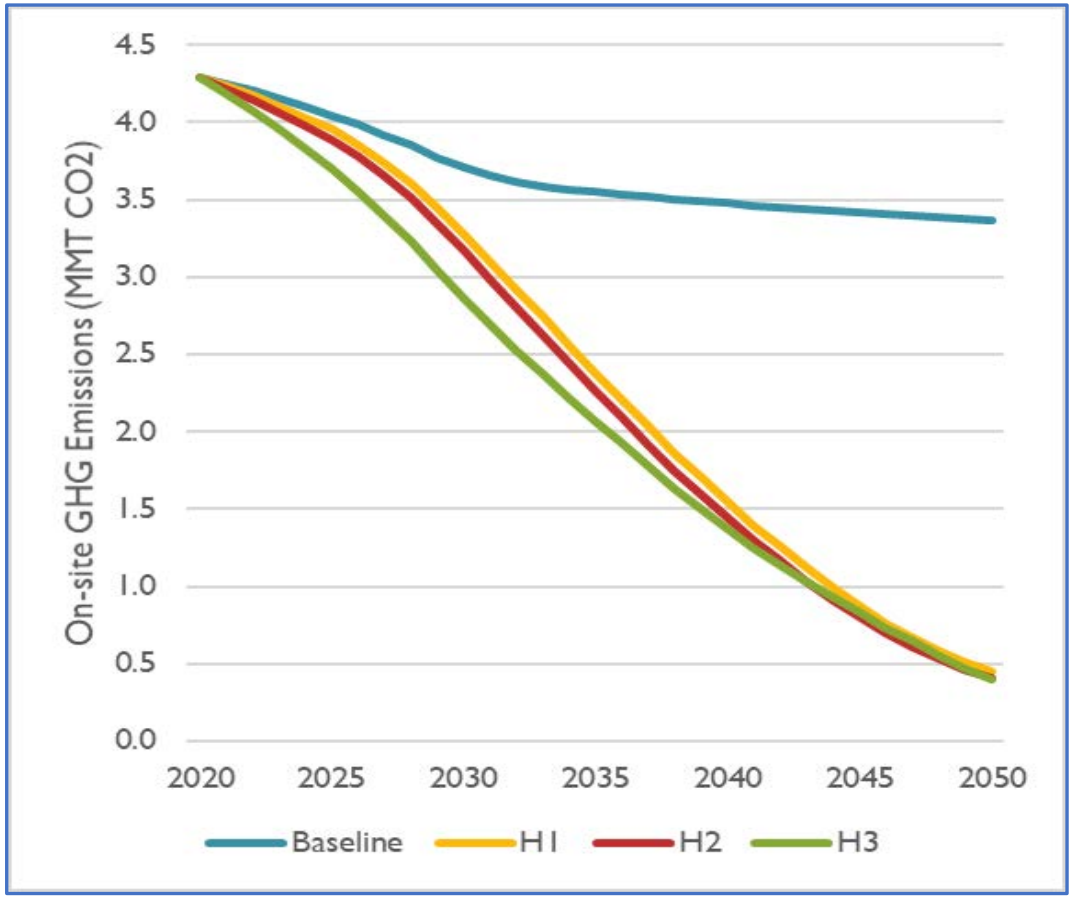
Climate Strategy Recommendations

1. Improve the Design and Construction of New Buildings
2. Transition to Cleaner Heating and Cooling Systems
3. Improve the Efficiency and Resiliency of Existing Building Envelopes
4. Lead-by-Example in Publicly-Funded Buildings
5. Accelerate the Decarbonization of Industrial Processes
6. Modernize and Optimize the Electric Grid

Transition to Heat Pumps Lowers GHG by Displacing Fossil Fuels

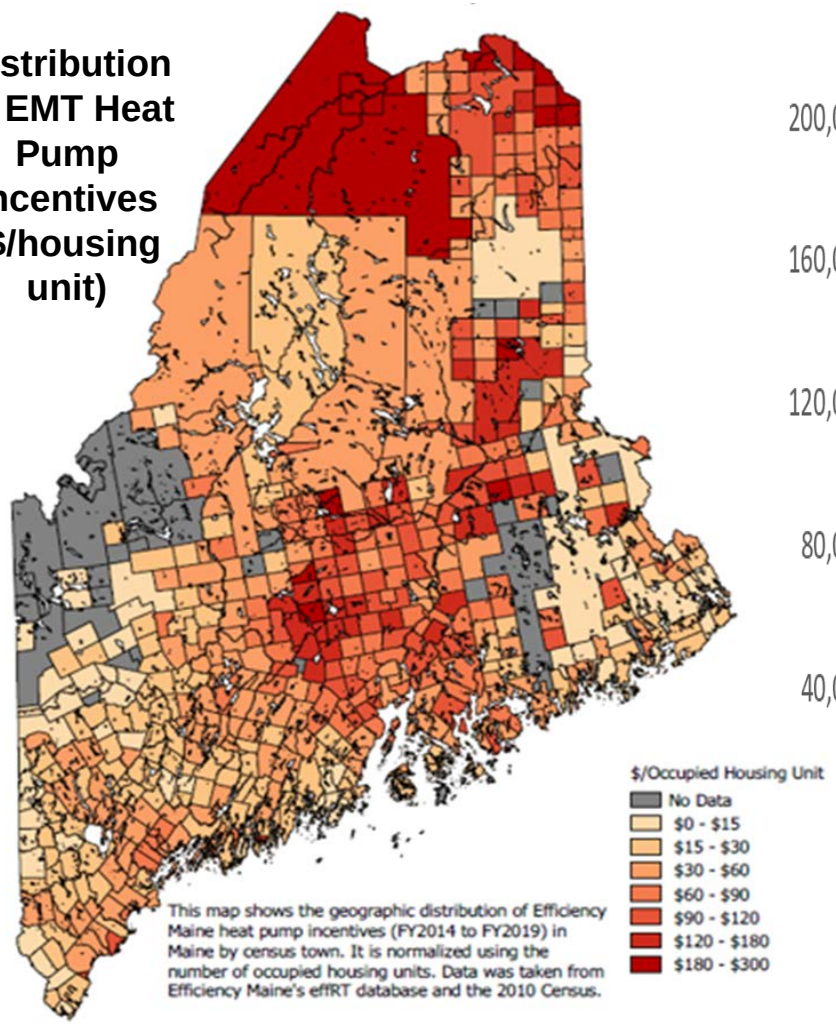
3 Modeled Scenarios for Residential & Commercial Heating:
H1 – 90% Electric Heat Pumps by 2050;
H2 – H1 + 20% Weatherization of homes by 2050;
H3 – Hybrid Electric HP (2/3) and Renewable Gas/Fuel (1/3)

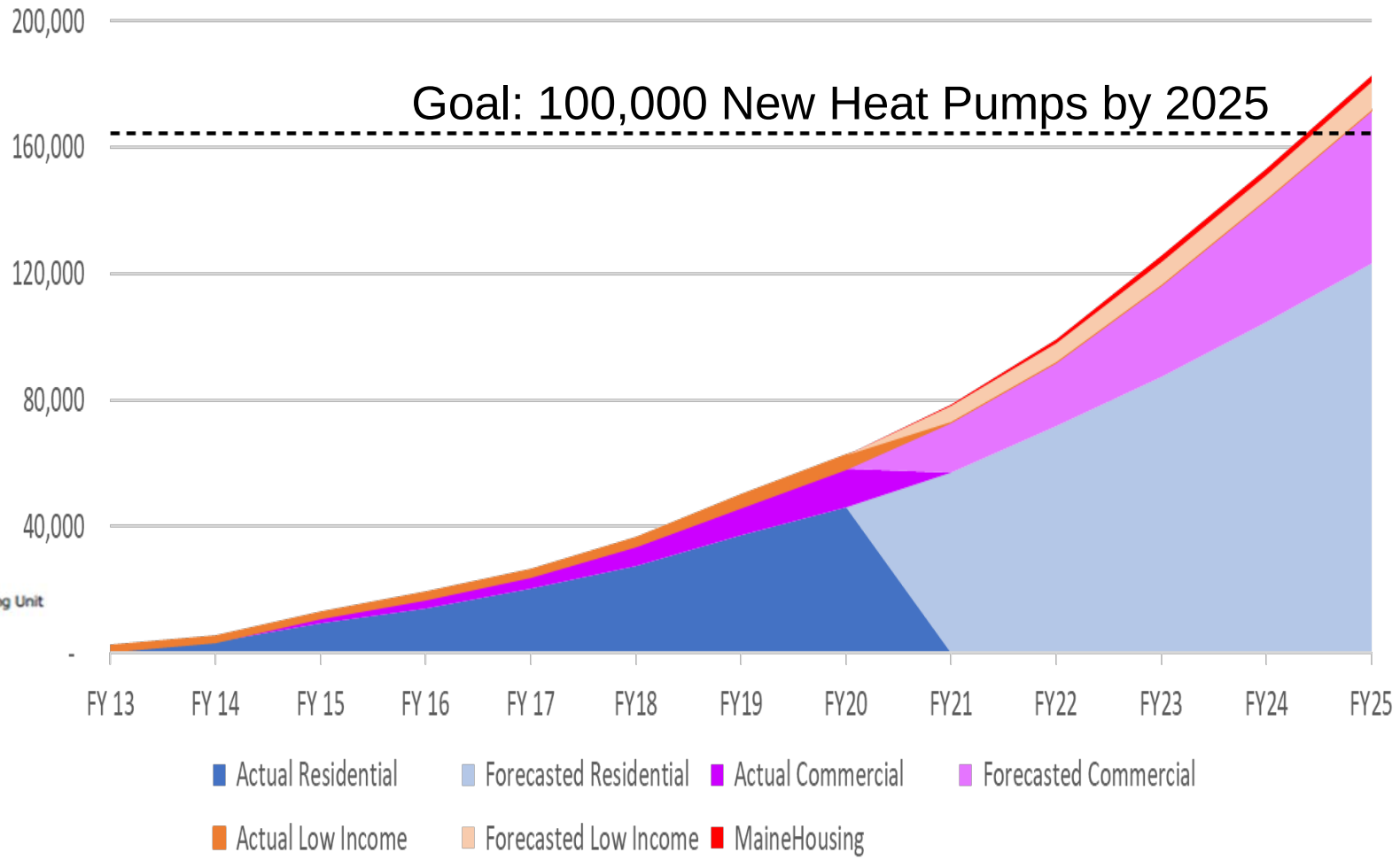




On our way – ME is #1 in Beneficial Electrification for Heating

Distribution of EMT Heat Pump Incentives ($/housing unit)





Embrace the Future of Transportation in Maine

Accelerate Maine's transition to electric vehicles (EV)

- Put 41,000 light-duty EVs on the road in Maine by 2025 and 219,000 by 2030
- Statewide EV Roadmap
- Policies, incentives, pilot programs to encourage adoption of EVs and alternative-fuel vehicles

Increase fuel efficiency and alternative fuels

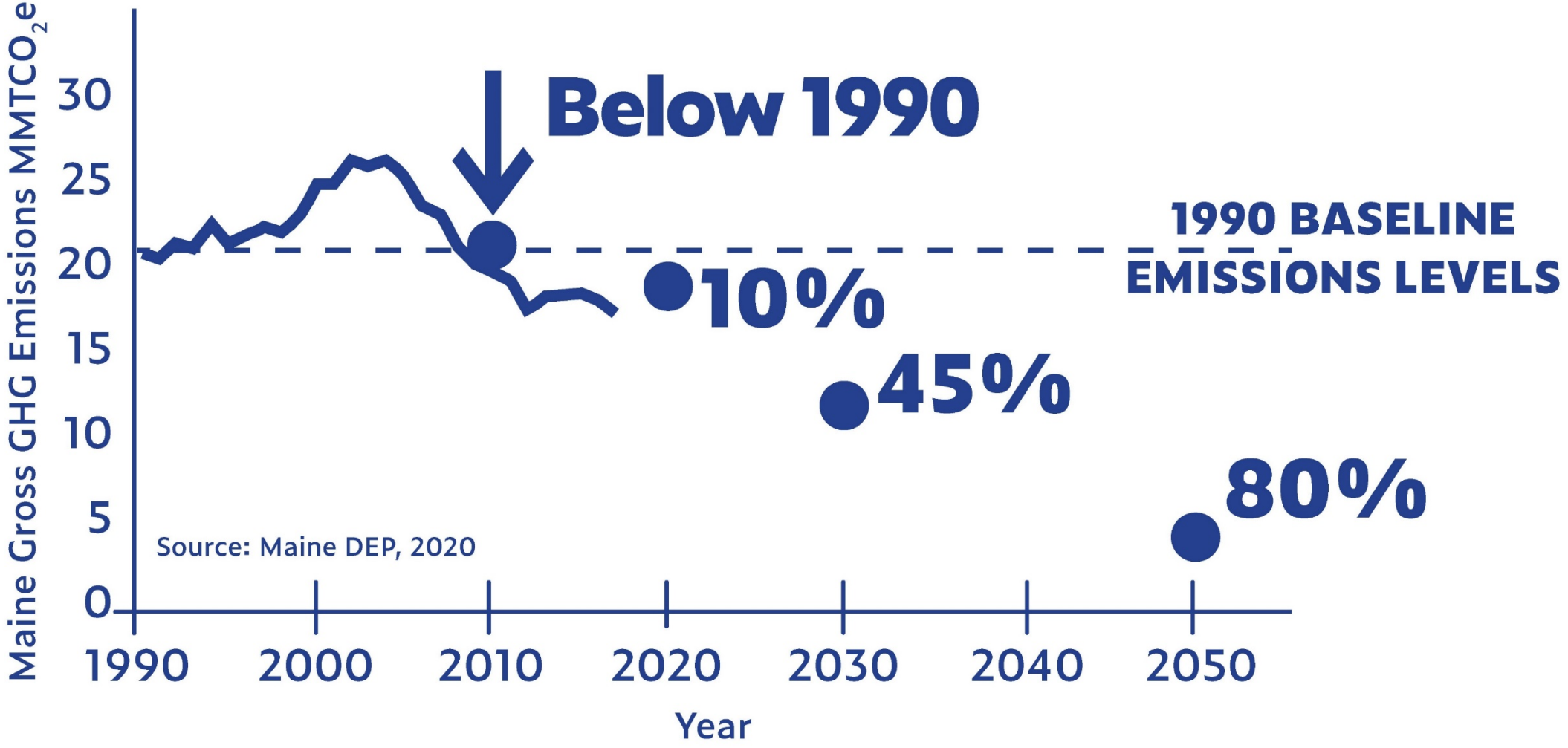
- Support increased federal fuel efficiency programs
- EPA SmartWay
- Local biofuel and biodiesel production and use

Reduce Vehicle Miles Traveled (VMT)

- Reduce light-duty VMT by 10% by 2025 and 20% by 2030
- Highspeed broadband
- Land-use policies
- Rideshare


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

Maine Greenhouse Gas (GHG) Emissions + Reduction Goals



Data source: Maine Department of Environmental Protection

CLIMATE COUNCIL GOALS

12.01.20
Climate Action Plan Delivered

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.

Maine Climate Council

PROCESS TIMELINE

June 2019
Governor signs LD 1679, establishing Maine Climate Council

Sept 2019
Governor appoints Maine Climate Council members; MCC launches

Oct 2019 - June 2020
Working Groups & Scientific + Technical Subcommittee Meet Monthly to Develop Mitigation & Adaptation Recommendations, Characterize Climate Impacts

June 2020 - Dec 2020
Maine Climate Council Considers & Selects Final Strategies for State Climate Action Plan

Dec 1, 2020
State Climate Action Plan Delivered to Legislature

climatecouncil.maine.gov

The **39-member Maine Climate Council**, an assembly of scientists, industry leaders, bipartisan local and state officials, is responsible for **developing a Climate Action Plan** for Maine.

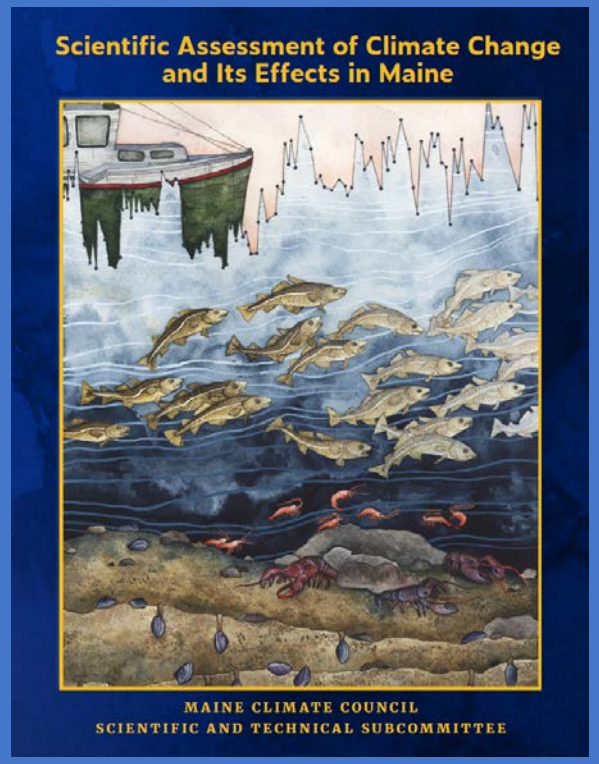
Six working groups comprised of 230+ volunteer members recommend strategies to the Council for achieving Maine's climate goals.

An expert **Scientific and Technical Subcommittee** is responsible for identifying the impacts of climate change in Maine.

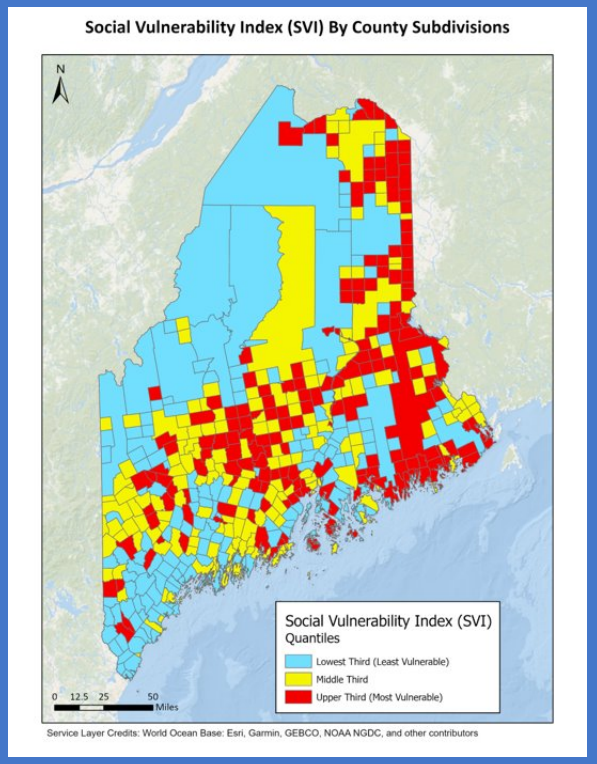
An **Equity Subcommittee** will support planning and implementation of climate strategies to ensure benefits across diverse populations of Maine people.

Maine Climate Council Reports

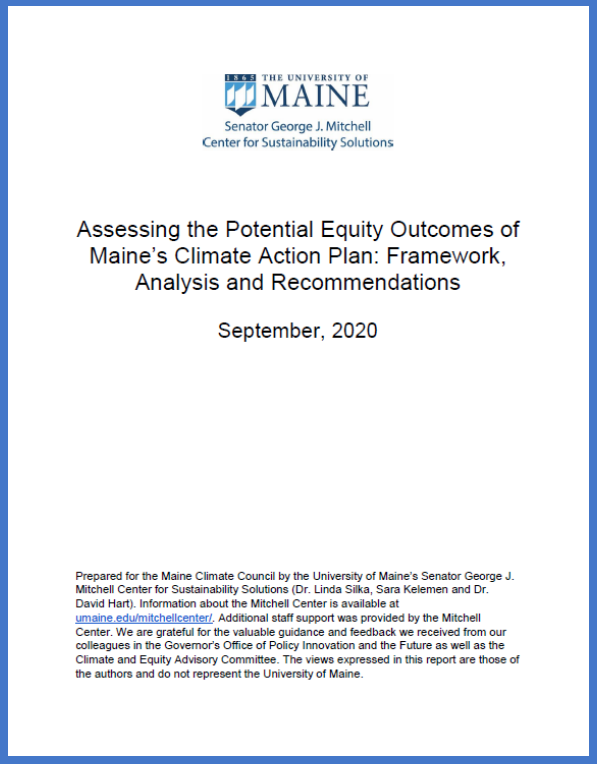
Download at climatecouncil.maine.gov



Scientific Assessment of Climate Change



Cost-Benefit Analysis & Greenhouse Gas Modeling

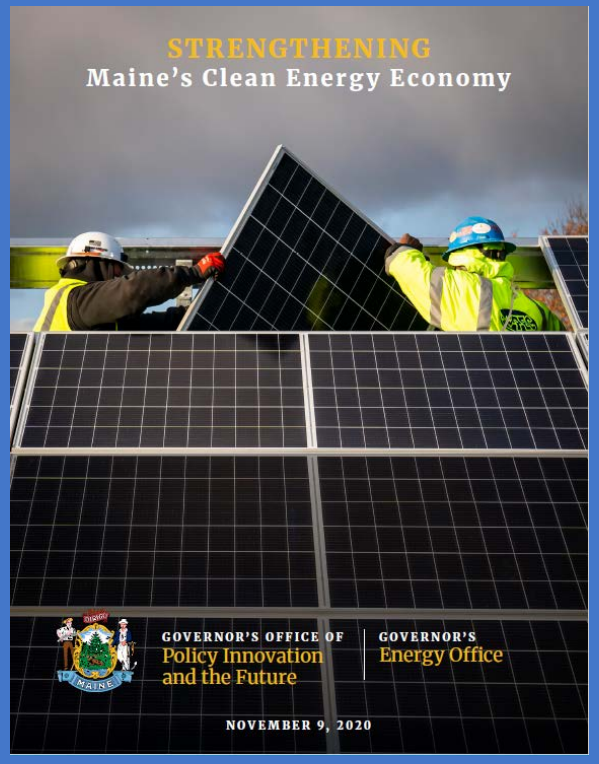

THE UNIVERSITY OF MAINE
Senator George J. Mitchell Center for Sustainability Solutions

Assessing the Potential Equity Outcomes of Maine's Climate Action Plan: Framework, Analysis and Recommendations

September, 2020

Prepared for the Maine Climate Council by the University of Maine's Senator George J. Mitchell Center for Sustainability Solutions (Dr. Linda Silka, Sara Kelemen and Dr. David Hart). Information about the Mitchell Center is available at umaine.edu/mitchellcenter/. Additional staff support was provided by the Mitchell Center. We are grateful for the valuable guidance and feedback we received from our colleagues in the Governor's Office of Policy Innovation and the Future as well as the Climate and Equity Advisory Committee. The views expressed in this report are those of the authors and do not represent the University of Maine.

Equity Assessment of Draft Strategies



Strengthening Maine's Clean Energy Economy Plan

Maine Climate Action Plan Goals

- Reduce Maine's Greenhouse Gas Emissions
- Make Maine more resilient to the impacts of climate
- Foster Economic Opportunity and Prosperity
- Advance Equity through Maine's Climate Response

Maine's 8 Climate Action Strategies

A. Embrace the Future of Transportation in Maine

D. Grow Maine's Clean Energy Economy and Good Jobs

G. Invest in Climate-Ready Infrastructure

B. Modernize Maine's Buildings

E. Protect Maine's Environment and Working Lands and Waters, Increase Carbon Sequestration

H. Engage People and Communities in Climate Impacts and Program Opportunities

C. Reduce Carbon Emissions the Energy and Industrial Sectors through Clean Energy Innovation

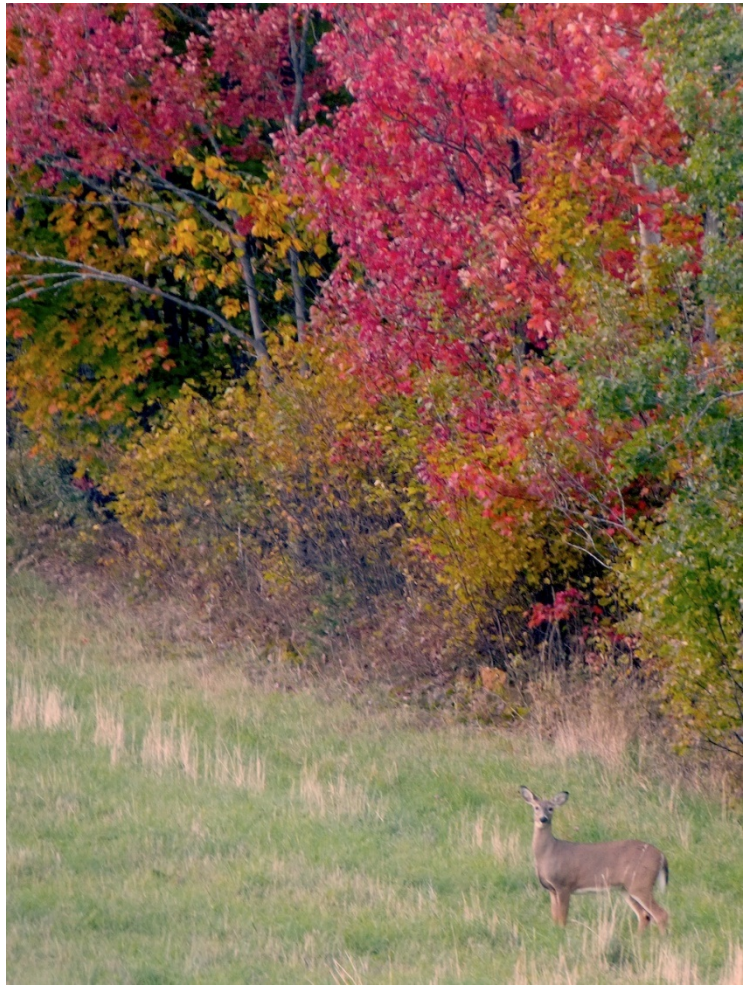
F. Build Healthy and Resilient Communities

Strategy D: Grow Maine's Clean Energy Economy: Protect Our Natural-Resource Industries

1. Take Advantage of New Market Opportunities
2. Clean-Energy Jobs and Businesses in Maine

Strategy E: Protect Maine's Environment and Working Lands and Waters: Promote Natural Climate Solutions and Increase Carbon Sequestration

1. Protect Natural and Working Lands and Waters
2. Develop New Incentives to Increase Carbon Storage
3. Expand Outreach to Offer Information and Technical Assistance
4. Enhance Monitoring and Data Collection to Guide Decisions



Natural & Working Lands Working Group Members

Co-chairs: Commissioner Amanda Beal, Department of Agriculture, Conservation and Forestry

& Tom Abello, Governor's Office

Senator Cathy Breen, Maine State Legislature

Representative Mary Anne Kinney, Maine State Legislature

Doug Baston, Town of Alna

Mark Berry, The Nature Conservancy

Hannah Carter, University of Maine

Phillip DeMaynadier, Maine Department of Inland Fisheries and Wildlife

Tom Doak, Maine Woodland Owners

Molly Docherty, Maine Department of Agriculture, Conservation and Forestry

Eliza Donoghue, Maine Audubon

Dana Doran, Professional Logging Contractors of Maine

Maureen Drouin, Maine Conservation Voters

Ivan Fernandez, University of Maine

Ellen Griswold, Maine Farmland Trust

Juan Hernandez, USDA Natural Resources Conservation Service

Ruby Jovin, Grace Pond Farm

Melissa Law, Bumbleroot Organic Farm

Ellen McAdam, McDougal Orchards

Heather Spalding, Maine Organic Farmers and Gardeners Association

Pat Strauch, Maine Forest Products Council

Carol Weymouth, Maine Association of Conservation Districts

Dave Struble, Maine Forest Service (retired)

Karin Tilberg, Forest Society of Maine

Nate Webb, Maine Department of Inland Fisheries and Wildlife

Andy Whitman, Manomet

Natural + Working Lands Working Group

Working Group Process

1. **Held monthly Working Group meetings and additional sub-group meetings (November 2019 to June 2020)**

2. **Extraordinary participation and engagement by Working Group members and the public**

3. **2-week public comment period was open in May**
   - **93 comments received**
   - **All WG members reviewed comments and determined what to incorporate into NWL strategies**

4. **Recommendations to MCC to consider for adoption and inclusion in Maine's Climate Action Plan**

Community and Economic Resilience Opportunities

Natural climate solutions can be <u>good business for Maine</u>

Our natural and working lands are the base for multiple sectors of our economy, including agriculture, forestry, outdoor recreation and tourism

Forests, farmlands, and natural areas (including wetlands) provide essential ecosystem services such as carbon sequestration, drinking water protection, flood hazard protection, and wildlife habitat

CLIMATE CHANGE OPPORTUNITIES

Sequester more carbon and offset Maine's emissions

Time-tested methods both effective and save $

Active management of forest/ag land for climate outcomes will bring Maine closer to its goal of carbon neutrality

Currently, Maine's working forests, natural lands and agricultural lands are estimated to capture ~13 million metric tons of CO2 per year, or 75% of Maine's GHG emissions.

Our lands are threatened by climate change and sprawl

- Temperature and precipitation changes will affect forest composition
- Impacts to habitat and biodiversity of plant and animal species
- Increasing risk of wildfires
- New pests, diseases and invasives threaten forest health and crops
- Extreme wet weather events cause erosion, soil loss and water quality issues
- Loss of forest and farmland to development (approximately 10,000 acres/year) erodes our potential for carbon sequestration, and the multiple benefits working lands provide

Natural & Working Lands Strategies

- STRATEGY # 1 Conserve working and natural lands and waters through a dedicated, sustained funding source to support a robust forest products and agricultural economy, increase carbon storage opportunities, avoid future emissions, and enhance climate adaptation and resilience
- STRATEGY # 2 Create new and update existing financial incentives and support for private land management and infrastructure that supports climate mitigation and adaptation
- STRATEGY # 3 Provide technical assistance on natural climate solutions to landowners, land managers, and agricultural producers
- STRATEGY # 4 Update and refocus state programs and policies to address climate mitigation and resilience
- STRATEGY # 5 Strengthen research and development, and monitoring of climate mitigation and adaptation practices

STRATEGY #1 Protect and conserve working and natural lands and waters through a dedicated, sustained funding source to support a robust forest products and agricultural economy, increase carbon storage opportunities, avoid future emissions, and enhance climate adaptation and resilience

- **Maintain Working Lands**
- **Invest in Natural Resource Based Economy**
- **Conserve valuable habitats**

75% of Maine's emissions are captured by forests, natural and agricultural lands annually

STRATEGY #2 Create new and update existing financial incentives and support for private land management and infrastructure that supports climate mitigation and adaptation

- **Capture more carbon on small woodlots**
- **Update current use tax policy**
- **Support for forestry and agriculture best management practices**
- **High-efficiency wood heating systems using wood fuels that produce the lowest possible carbon emissions**
- **“Wildlife-friendly” infrastructure for road crossings and bridges**
- **Investment in local food systems**

93% of land in Maine is privately owned

STRATEGY #3 Provide technical assistance on natural climate solutions to landowners, land managers, and agricultural producers

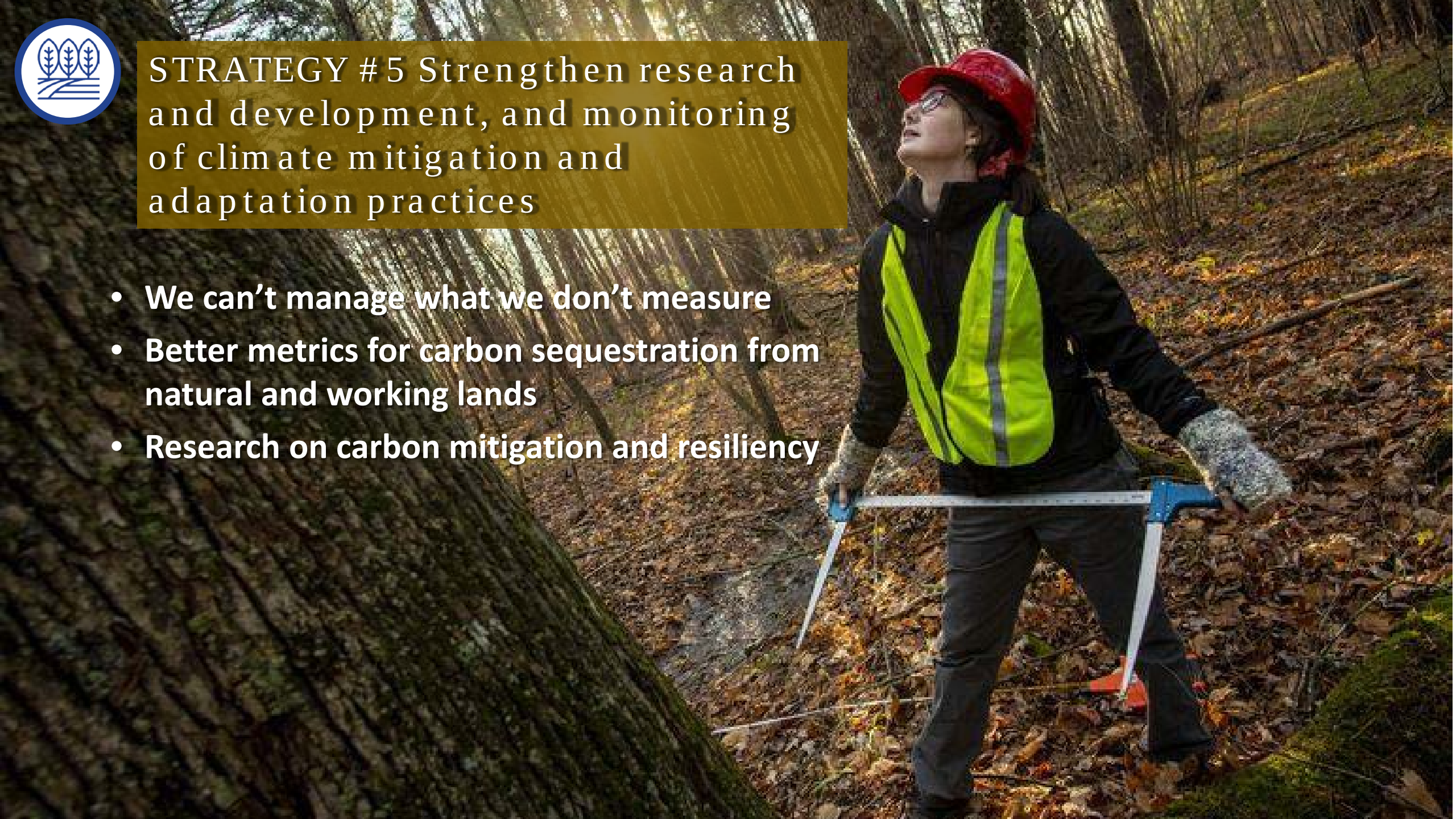
- **Outreach to landowners and land managers**
- **Encourage climate-friendly practices**
- **Coordinate with service-providers**

STRATEGY #4 Update and refocus state programs and policies to address climate mitigation and resilience

- **Lead by example**
- **Effective environmental review and permitting**
- **Coordinated land use planning to address climate issues**
- **Marketing innovative wood-based technology**
- **Education and outreach**

"Maine people are working to break the cycle, and state government will lead by example. Wherever possible, we will make buildings more energy efficient and we will tap into renewable energy, helping us fight climate change and saving taxpayer money in the long-run." – *Gov. Janet Mills*

STRATEGY #5 Strengthen research and development, and monitoring of climate mitigation and adaptation practices



- We can’t manage what we don’t measure
- Better metrics for carbon sequestration from natural and working lands
- Research on carbon mitigation and resiliency

Maine Climate Council

Natural and Working Lands Working Group

Healthy forests, soils, and natural areas will:

- **Sequester more carbon**
- **Increase resiliency to climate change**
- **Create new economic opportunities for Maine businesses and workers**

Long-term Next Steps

- Maine Climate Council Metrics Reporting
- DEP Biannual Emissions Report
- Quarterly MCC Meetings
- Working Group & Subcommittees meet
- Inter-agency Natural Resource department workgroup
- New Plan Every 4 Years
- Ongoing processes – stakeholders, legislature, rule-making


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

Community Resilience Planning, Public Health & Emergency Management Working Group Members

Co-chairs: **Judy East**, Land Use Planning Commission; **Dr. Nirav Shah**, Maine Center for Disease Control and Prevention; **Rebecca Boulos**, Maine Public Health Association; **Anne Fuchs**, Maine Emergency Management Agency

Senator David Miramant, Maine State Legislature

Senator Marianne Moore, Maine State Legislature

Rep. Genevieve McDonald, Maine State Legislature

Rep. Beth O'Connor, Maine State Legislature

Anne Ball, Maine Downtown Center

Andrew Barton, University of Maine

Bruce Berger, Maine Water Utilities Association

Lance Boucher, American Lung Association

Howard Carter, City of Saco

Joe Chappell/Margaret Cushing, Cumberland County Emergency Management Agency

John Egan, Coastal Enterprises, Inc.

Bob Faunce, Town of Damariscotta

Elsie Flemings/Katie Freedman, Healthy Acadia

Kristina Ford, Town of Boothbay

David Gardner, Maine Department of Transportation

Steven C. Golieb, Town of Millinocket

Mark Green, Downeast Community Partners

Nancy Hasenfus, Retired physician

Gwen Hilton, Maine Land Use Planning Commission

Chace Jackson, American Heart Association

Tora Johnson, University of Maine at Machias

Eileen Johnson, Bowdoin College

Debbie Johnson, Maine Department of Economic and Community Development

Nan Johnson, Federal Emergency Management Agency

Kohl Kanwit, Department of Marine Resources

Chuck Lubelczyk, Maine Medical Center Research Institute

Jessie Perkins, Bethel Area Chamber of Commerce

Patricia Pinto, AARP Maine

Michael Plaziak, Maine Rural Water Association

Hayley Prevatt, City of Portland Public Health

Grainne Shaw, Sagadahoc County Emergency Management Agency

Abbie Sherwin, Southern Maine Planning and Development Commission

Anna Siegel, US Youth Climate Strikes, Youth Rep.

Ray Sisk/Leticia vanVuuren, Knox County Emergency Management Agency

Peter Slovinsky, Maine Geological Survey

Lisa Sockabasin, Wabanaki Public Health

Charlie Soltan, Soltan Bass, LLC

Esperanza Stancioff, University of Maine/Maine Sea Grant

Marla Stelk, Association of State Wetland Managers

Michele Walsh, Maine Department of Agriculture, Conservation and Forestry

Maine's 8 Climate Action Strategies

A. Embrace the Future of Transportation in Maine

D. Grow Maine's Clean Energy Economy and Good Jobs

G. Invest in Climate-Ready Infrastructure

B. Modernize Maine's Buildings

E. Protect Maine's Environment and Working Lands and Waters, Increase Carbon Sequestration

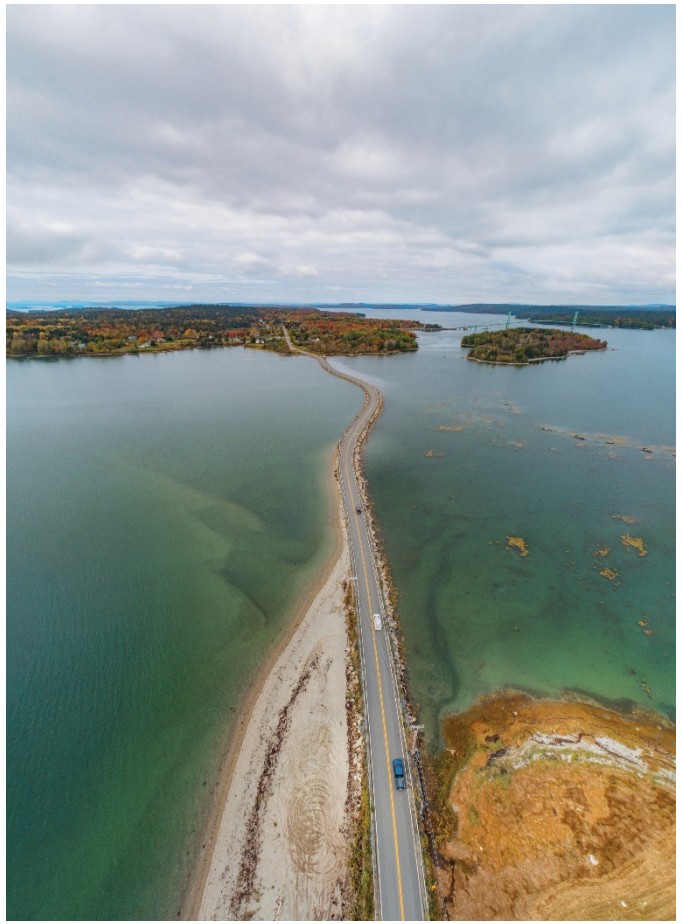
H. Engage People and Communities in Climate Impacts and Program Opportunities

C. Reduce Carbon Emissions the Energy and Industrial Sectors through Clean Energy Innovation

F. Build Healthy and Resilient Communities

Strategy F: Build Healthy and Resilient Communities

1. Empower Local and Regional Community Resilience Efforts
2. Adopt Official Sea-Level Rise Projections
3. Emphasize Resilience Through Land-Use Planning Tools
4. Strengthen Public-Health Monitoring, Education, and Prevention



STRATEGY #1 Initiate a Comprehensive Review of Maine Laws to Achieve Resilience & Economic Security in the Face of Climate Change

Update Maine laws to promote community resilience

- 9 DRAFT sub-strategies on land use and water use rules

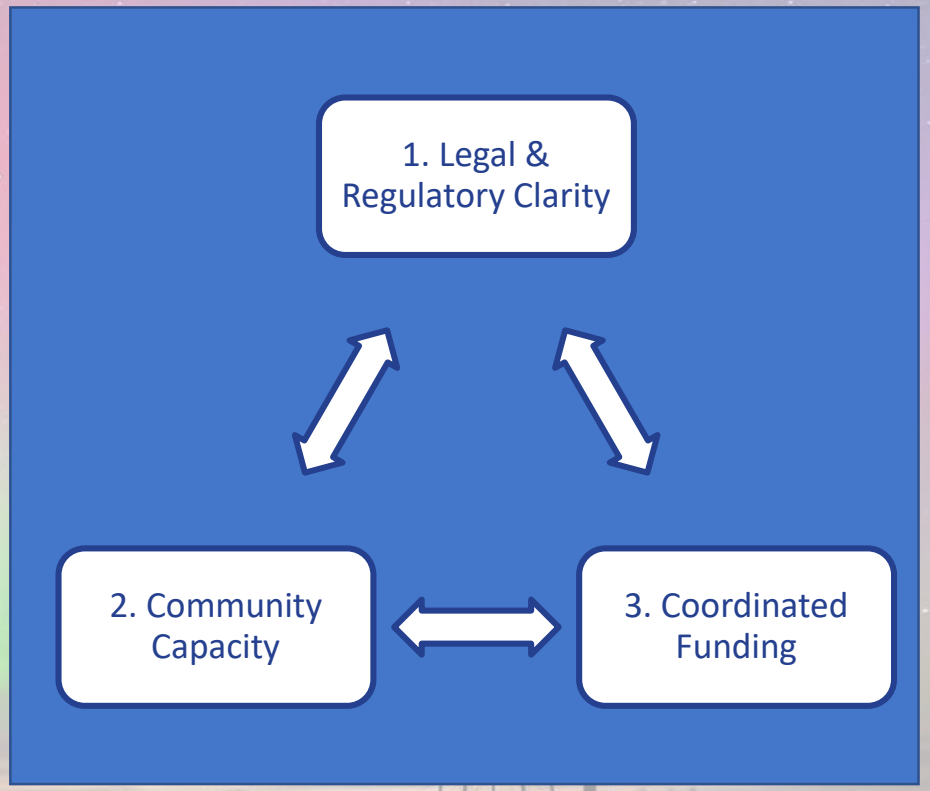
Consistent and science-based definitions

Minimize the compliance burden on

- Applicants, permitting & compliance staff, local regulators

Enable development in areas identified by communities

Coordinate change with robust technical assistance and training



STRATEGY #2 Improve Delivery System of Technical Assistance on Resilience to Municipalities

Expand state technical assistance to communities

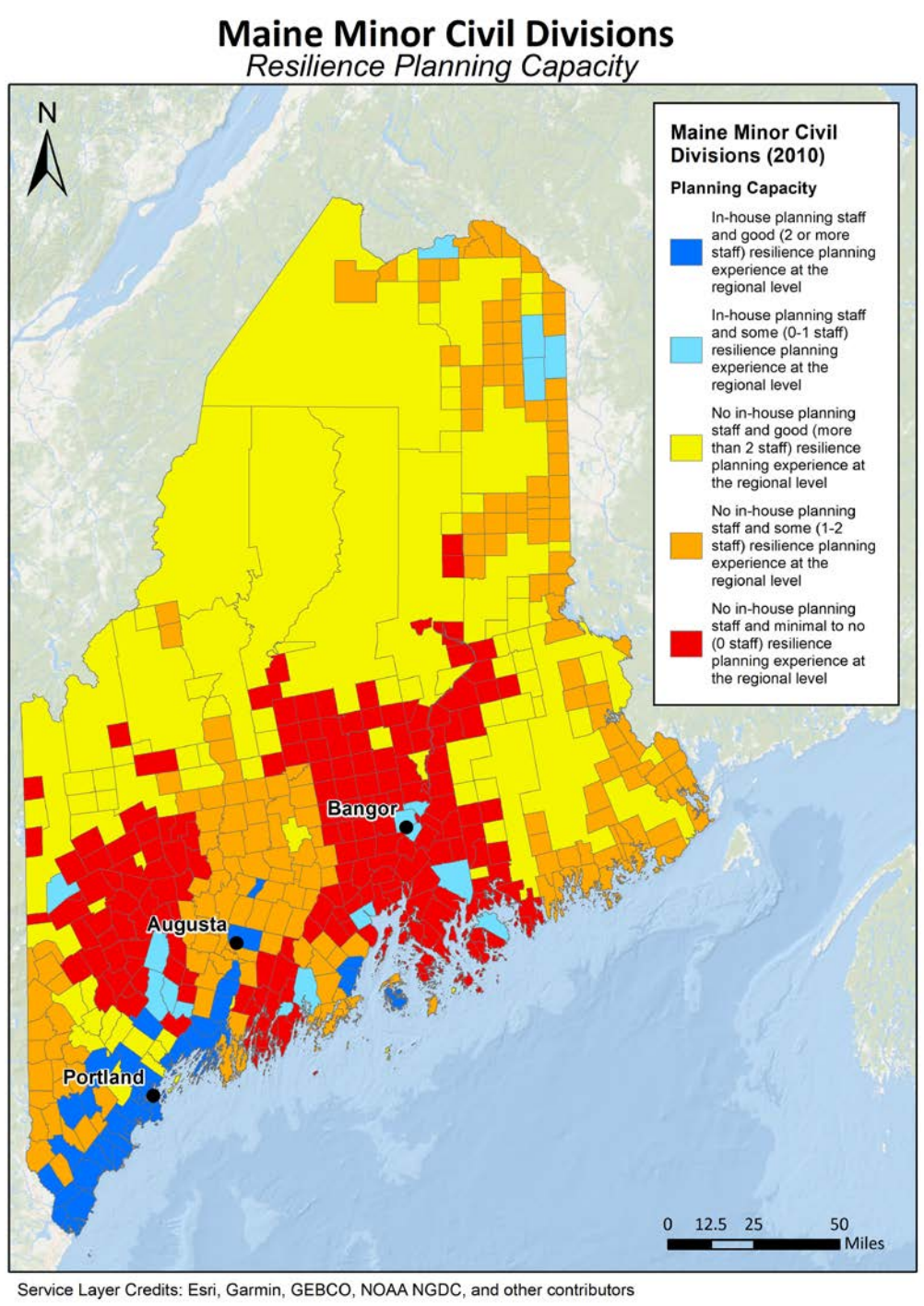
- Designate agency resilience officers to coordinate assistance
- Train and certify code enforcement officers

Support regional delivery of technical assistance

- Provide training to and by regional planning organizations
- Promote sharing of knowledge and tools among communities

Seek efficiencies in the creation and delivery of assistance

- Leverage expertise in the nonprofit, private, and academic sectors



STRATEGY #2 Improve Delivery System of Technical Assistance on Resilience to Municipalities

Use existing governing structures and processes

- Integrate resilience into existing plans, regulations, and governance
- Incentivize municipalities to designate resilience officers

Support municipalities to understand the impacts of a changing climate

- Scale technical assistance to different community types & sizes

Provide a clearinghouse for data, tools, funding sources, and case studies

One size does not fit all

Don’t reinvent the wheel,
but DO air up the tires

Community Resilience, Public Health + Emergency Management Working Group

Climate Strategy Recommendations

Community Resilience Planning

1. Comprehensive Review of Maine Laws to Achieve Resilience and Economic Security in the Face of Climate Change
2. Improve Delivery System of Technical Assistance on Resilience to Municipalities
3. Funding Mechanisms to Achieve Resilience

Public Health

4. Improve Public Health Behavior Related to Climate Impacts Through Investments in Public Health Monitoring and Education
5. Conduct Public Education About Climate Change Health Effects and Resources
6. Reduce Impacts from High Intensity Weather Events
7. Improve Health Systems' Capacity to Mitigate & Adapt to Climate Change

Emergency Management

8. Develop a State Infrastructure Climate Adaptation Fund

Maine's 8 Climate Action Strategies

A. Embrace the Future of Transportation in Maine

D. Grow Maine's Clean Energy Economy and Good Jobs

G. Invest in Climate-Ready Infrastructure

B. Modernize Maine's Buildings

E. Protect Maine's Environment and Working Lands and Waters, Increase Carbon Sequestration

H. Engage People and Communities in Climate Impacts and Program Opportunities

C. Reduce Carbon Emissions the Energy and Industrial Sectors through Clean Energy Innovation

F. Build Healthy and Resilient Communities

Strategy G: Invest in Climate-Ready Infrastructure

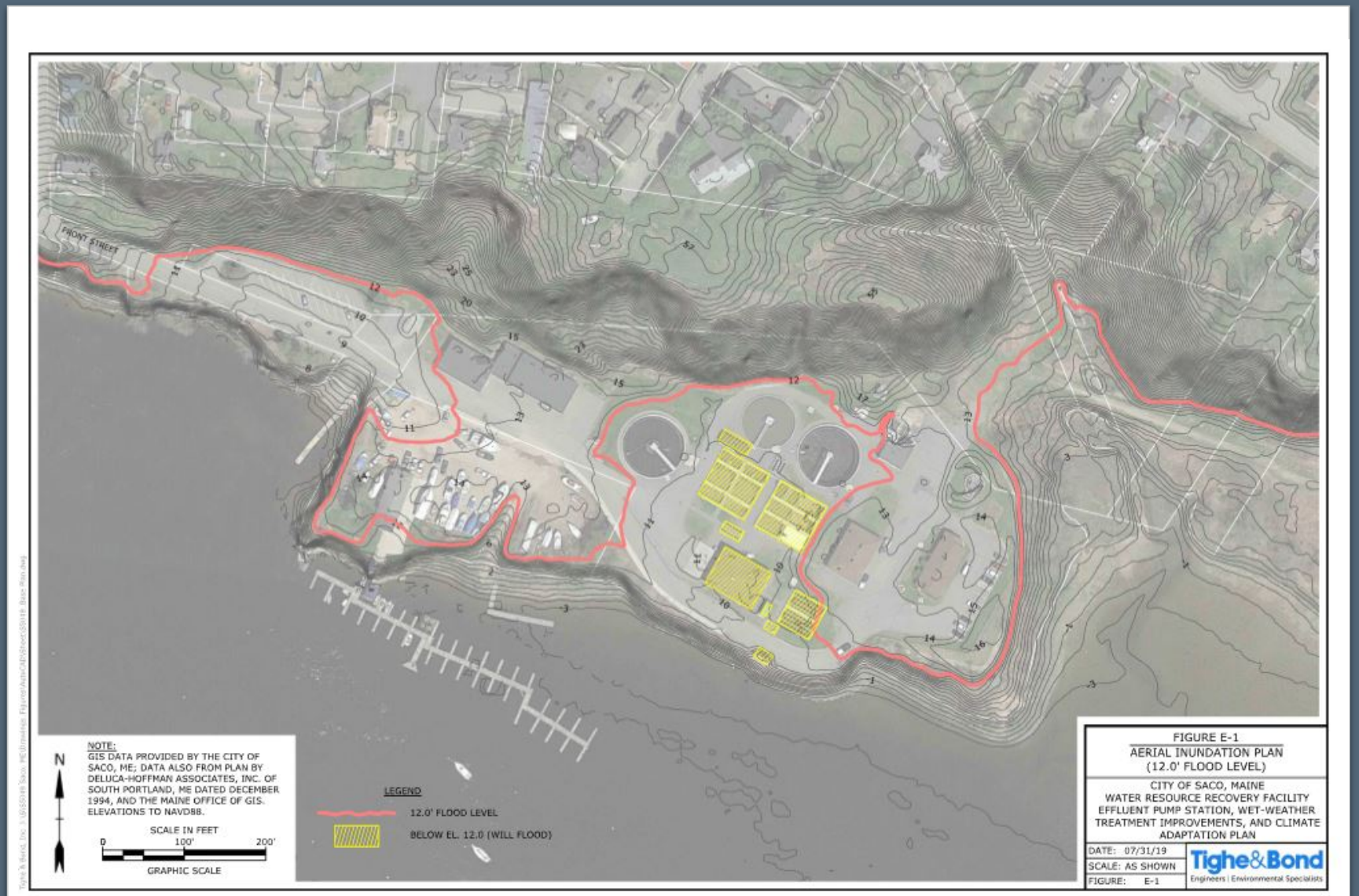
1. Assess Climate Vulnerability and Provide Climate-Ready Design Guidance
2. Establish a State Infrastructure Adaptation Fund to support municipal and regional projects

STRATEGY #8 State Infrastructure Climate Adaptation Fund

- **Enables municipalities funds to meet local cost share requirements of federal funding programs.**
  - Increased execution of large and small adaptation projects resulting in avoided disaster dollars
  - Increased use of federal grant programs for large infrastructure projects, resulting in less stress on rate and tax payers

- **Incentivizes further mitigation**
  - Increased participation in hazard mitigation and climate adaptation planning
  - Increased participation in the National Flood Insurance Program
  - Increased participation in Community Rating System

Providing a state infrastructure funding opportunity encourages the "whole-community" approach.



Saco Water Resource Recovery Facility

Engineering Analysis:
$80,000

Proposed Adaptation:
$10,800,000

Cost of Doing Nothing:
$14,300,000 - $43,000,000

Maine's 8 Climate Action Strategies

A. Embrace the Future of Transportation in Maine

D. Grow Maine's Clean Energy Economy and Good Jobs

G. Invest in Climate-Ready Infrastructure

B. Modernize Maine's Buildings

E. Protect Maine's Environment and Working Lands and Waters, Increase Carbon Sequestration

H. Engage People and Communities in Climate Impacts and Program Opportunities

C. Reduce Carbon Emissions the Energy and Industrial Sectors through Clean Energy Innovation

F. Build Healthy and Resilient Communities

Strategy H: Engage with Maine People and Communities about Climate Impacts and Program Opportunities

1. Raise Awareness About Climate-Change Impacts and Opportunities
2. Increase Public Education Offerings
3. Start the "Maine Climate Corps" for Climate-Related Workforce Development
4. Recognize Climate Leadership by Maine Businesses and Organizations

Maine Won't Wait – ME's Climate Action Plan

Coastal/Marine Recommendations

Coastal and Marine Working Group Co-chairs: Kathleen Leyden, DMR and Heather Leslie, University of Maine

Joint Standing Committee on Environment and Natural Resources - January 2021

Credit: Island Institute

OUR STRATEGIES: CREATE NEW OPPORTUNITIES

Mitigating and adapting to climate change creates new opportunities for Maine coastal communities and marine-dependent businesses

Technical assistance delivers information businesses and towns need to plan and adapt	Nature-based solutions protect communities, create jobs, preserve green space, save $	New and emerging seafood opportunities	Climate resilience creates new jobs, products for Maine ports
			

STRATEGY 1. **Track climate impacts to support decision making**

- Establish a state-level Climate Collaborative for Coastal and Ocean Monitoring

- Collect, assess, and share information on how climate change is affecting Maine's coastal and marine areas to support adaptive decision making

- Leverage existing programs led by the state, non-profits, academic communities and citizen scientists.

Credit: C. Enterline, J. Anderson

STRATEGY 2. **Provide technical assistance and outreach**

- In coordination with the monitoring collaborative…
  - The **Coastal and Marine Information Exchange** will provide coastal and marine stakeholders with accessible, relevant information and decision support tools
  - The **Maine Seafood Business Council** will provide Maine's seafood harvesters, shoreside businesses, and working waterfronts with information and tools to support operational decisions, capital investments, and long-range planning to implement climate adaptation and mitigation strategies

Credit: B. McGreavy

STRATEGY 3. **Enhance mitigation by conserving and restoring coastal habitats**

- Determine blue carbon stocks and mitigation values by conducting a comprehensive coastwide survey.
- Encourage blue carbon habitat conservation and restoration through formal carbon sequestration incentives or carbon permit program
- Achieve blue carbon mitigation by managing, conserving and restoring tidal marsh, eelgrass, and seaweed habitats

Credit: J Hagan
Back River saltmarsh
between Georgetown and Arrowsic

STRATEGY 4. **With nature-based solutions, promote climate-adaptive ecosystem planning and management**

- Foster climate-adaptive planning in marine, coastal, and inland areas for the State and municipalities
- Promote nature-based solutions for climate challenges that impact coastal rivers, shorelines, and coastal and marine habitats
- Conserve and restore ecosystems to foster resiliency
- Strengthen stormwater management tools

Credit: S. Moore

STRATEGY 5. **Manage for resiliency of Maine's fisheries and aquaculture industries**

- Information support
- Market support and business resilience
- Evaluate how regulations can better address environmental change while recognizing the need for stability

Credit:
J Waller, J. Hagan

STRATEGY 6. **Climate-Ready Working Waterfronts**

- Develop ways to finance infrastructure improvements.
- Invest public funds wisely.
- Improve guidance and technical assistance for municipalities and business owners.
- Reform and improve regulatory and non-regulatory approaches for waterfront redevelopment.
- Continue conversations about marine emissions, Green Ports, renewable energy

photo: Maine Marine Trades Association

photo: Island Institute, Islesford solar array

Additional Resources

Maine Won't Wait – A Four Year Plan for Climate Action, December 2020

https://www.maine.gov/future/sites/maine.gov.future/files/inline-files/MaineWontWait_December2020.pdf

Maine Climate Council - Coastal and Marine Working Group, Full Report, June 2020

https://www.maine.gov/future/sites/maine.gov.future/files/inline-files/CoastalMarineWG_FinalStrategyRecommendations_June2020.pdf

Climate Change and Maine Farms

Melissa Law, Bumbleroot Organic Farm
Maine Climate Council
Natural and Working Lands Working Group

How were Maine farms impacted by climate change in 2020?

- Drought
- Unexpected frost dates
- Extreme weather events - hail storms, high winds, intensified rain & snow events

Which led to...

- Infrastructure damage
- High pest & pathogen presence
- Reduced yields and crop loss
- Financial losses
- Farmer stress

What does the future of farming look like?

- Shifting seasons
- Hotter days (and nights)
- Increased pest & disease pressure
- Unpredictable weather patterns
- Increased storm frequency & intensity
- Flooding and erosion
- Wetter wet years, drier dry years

Farmland Protection

- Prevents increased emissions resulting from development
- Supports rural economies (jobs!)
- Food security for Maine communities
- Conserves biodiversity
- Ensures that future generations of farmers have access to farmland

(Current bill: Land For Maine's Future Program)

Incentives for Climate-friendly Practices

- Carbon sequestration, increased water holding capacity & reduced erosion through soil health practices
- Healthier crops and higher yields
- Healthier animals and people
- Farm viability and resilience
- Reduced emissions through on-farm efficiency & renewable energy use

(Current bill: Maine Healthy Soils Program)

Technical Assistance

- Resources and tools to help farmers identify & assess climate risks
- Adaptation planning and preparation
- Improved land management practices
- Business viability, resilience, and profitability

Research, Innovation, and Monitoring of Climate Impacts

- Support the growth and stability of Maine food systems
- Help farmers identify and understand mitigation and adaptation techniques
- Increase resilience of our ecosystems
- Protect Maine lands, waters & species
- Understand carbon storage capacity on farms and in soils

Outreach, Engagement and Education for Maine People & Communities

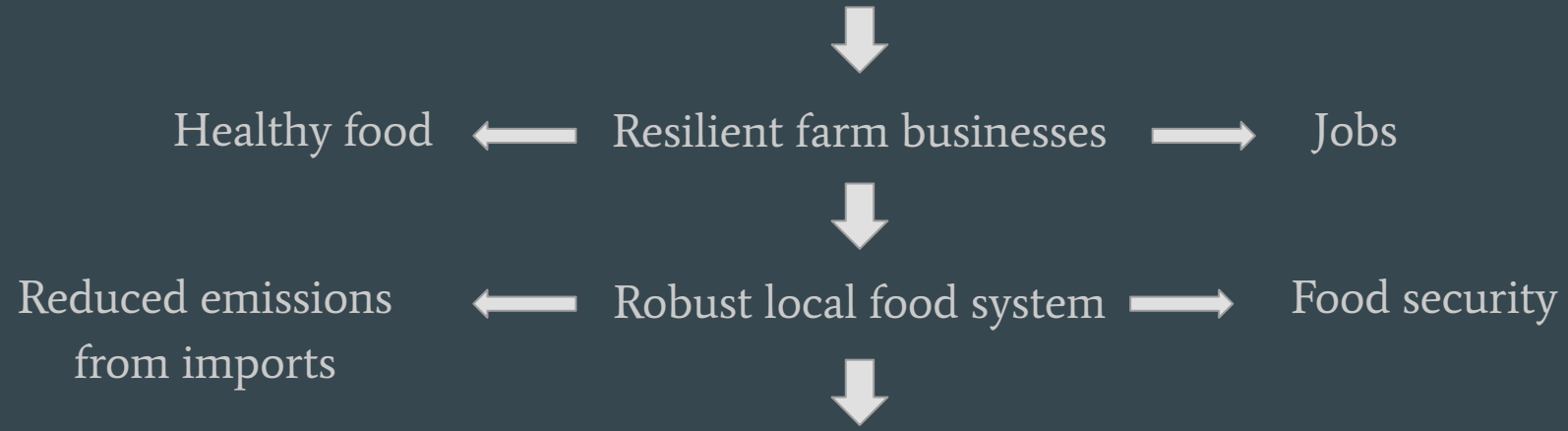
- Equity-based outreach to Mainers
- Implementation of public PK-12 climate education programs
- Maine Climate Corps and climate-related workforce development
- Climate Leadership Council

Strengthening Our Local Food System

- Creates jobs, supports local food producers and our local economy
- Provides fresh, healthy food to Maine people, communities and institutions
- Reduces our dependence on food transported thousands of miles (GHG emissions!)
- Reduces vulnerability to supply chain instability
- Food security for our state

Building Resilience Through Farming

Investments in farmland protection, soil health practices, climate adaptation on farms



Resilient Maine communities

It's all about respect.

For the land. For yourself. And for everyone that experiences Maine's abundant natural resources before or after you. And if you enjoy the outdoors, from hiking and camping to snowshoeing and snowmobiling, you probably think our mountains, waters and forests are just as worthy of respect as we do. Whether you're venturing out into Maine's abundant public or private lands, a state park

PLEDGE TO EMBRACE OUR PLACE

AS A VISITOR OR LOCAL RESIDENT, WE ARE ASKING YOU TO JOIN US IN THE EMBRACE OUR PLACE PLEDGE

The Embrace Our Place pledge helps us communicate our community values to newcomers and visitors. At the heart of our values, is a desire for a collective action to ensure we preserve this unique place. By offering the Embrace Our Place pledge, we are inviting you to be part of our shared experience here in the Mahoosuc Region. We can all play our part, and the collective sum of our actions will shape our future.

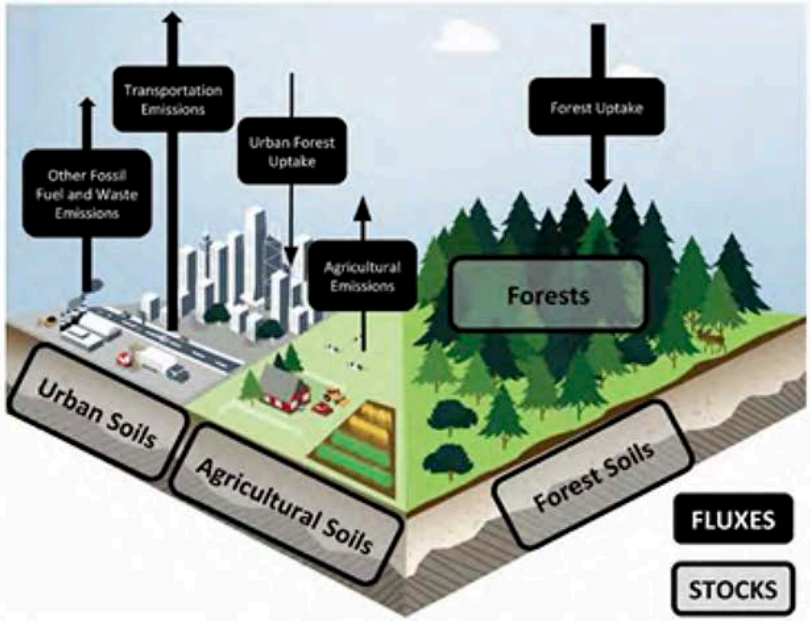
WE INVITE YOU TO EMBRACE OUR COMMUNITIES AND WAY OF LIFE, TODAY AND INTO THE FUTURE.

Maine's forests are full of opportunities

Patrick Strauch, Executive Director
Maine Forest Products Council

Maine Forest's Importance to State's Annual Carbon Budget

Carbon Pool	% of State's Annual Fossil Fuel Emission
Forest carbon stocks + annual growth	60%
Forest products	15%
Total forestry sector	75%
Net Land Sink	78%



CURRENT & EMERGING WOOD PRODUCTS

SAWN TIMBER

Sawn Timber will continue to be a critical component of Maine's forest economy. Demand in the US is largely driven by the number of housing starts, which is expected to continue to strengthen. Lumber is the foundation of forest land ownership and the final product of long-term forest management.

PULP AND PAPER MANUFACTURING

Pulp and Paper Manufacturing continues to be the leader in contributing to Maine's forest economy. Maine's paper mills are shifting production away from print media and into tissue, labeling and packaging grades of paper.

ORIENTATED STRAND BOARD (OSB)

Orientated Strand Board (OSB) is an alternative to plywood. It is used extensively as a structural panel in construction. This technology is produced by two major facilities in Maine.

LAMINATED VENEER LUMBER (LVL)

Laminated Veneer Lumber (LVL) is an engineered wood product used in residential construction that uses layers of dried wood veneer. No manufacturing currently exists in Maine.

MEDIUM DENSITY FIBERBOARD (MDF)

Medium Density Fiberboard (MDF) is a reconstituted wood-based panel product, manufactured from pulpwood and sawmill residues. Over the past 20 years, laminate flooring and modern furniture has become a major end use for MDF. No manufacturing capacity exists in Maine.

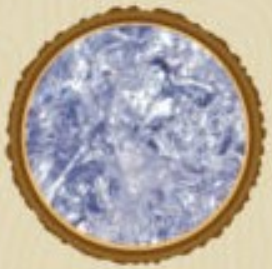
Current Wood Products

CROSS-LAMINATED TIMBER

Cross-laminated Timber is an engineered wood product that is especially well-suited for buildings between 6-18 stories tall. It is very early in the growth curve in North America and rapid growth is expected. Two CLT facilities have announced they will be opening in Maine.

CELLULOSIC SUGARS

Cellulosic sugars are a platform chemical for bioplastics such as Polylactic acid, Lactic acids which can be used as a preservative in food and beverages, and Succinic acid which is used in resins and coatings.Cellulosicsugars are a platform chemical for bioplastics such as Polylactic acid, Lactic acids which can be used as a preservative in food and beverages, and Succinic acid which is used in resins and coatings.



NANOCELLULOSE

Nanocellulose consists of incredibly light and strong fibers that can be used in a variety of applications, from coatings for packaging papers to high performance textiles and medical products. The University of Maine is a global leader in the R&D of nanocellulose applications.

PYROLYSIS OIL

Pyrolysis oil is a liquid fuel produced from wood, that can be used in heat and power production to substitute for fossil-based-oil.

DISSOLVING PULP

Dissolving Pulp can be made into textiles (Viscose) and competes with cotton and synthetics (nylon and acrylic). There are no facilities with this capability currently in Maine.

INSULATING WOOD FIBER

Insulating wood fiber composites is an alternative wood based insulating product for homes.

Emerging Wood Products

Innovation in the next generation of wood manufacturing facilities