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May 17, 2019

Senator Carson
Representative Tucker
Committee on Environment and Natural Resources
c/o Legislative Information Office
100 State House Station
Augusta, ME 04333

Re: *Friends of Casco Bay and Maine Ocean and Coastal Acidification (MOCA) Steering Committee testimony in support (with amendments) of LD 1679: An Act To Establish the Maine Climate Change Council To Assist Maine To Mitigate, Prepare for and Adapt to Climate Change (Governor's bill)*

Dear Senator Carson, Representative Tucker, and Distinguished Members of the Environment and Natural Resources Committee,

Introduction to Support for Bill with Amendments:

Friends of Casco Bay and the Steering Committee of the Maine Ocean and Coastal Acidification (MOCA) partnership submit the below testimony in support of LD 1679, An Act To Establish the Maine Climate Change Council To Assist Maine To Mitigate, Prepare for and Adapt to Climate Change (Governor's bill). We support the bill but recommend four amendments to better address the impacts of climate change to Maine's marine species and habitats. These amendments are set forth in the attached track-changes document and below:

- Amend Section 11 (38 MRSA § 578) - which requires the Council or Department to provide evaluation reports to this Committee and the Energy, Utilities and Technology (EUT) Committee - to also require reports to the Marine Resources Committee (MRC) and to authorize the MRC to make recommendations to this Committee.
- Amend Section 10 (38 MRSA §577-A) (8) to include recommendations for scientific monitoring and research to fill data gaps needed to spur action or evaluate remediation and adaptation strategies.
- Amend Section 10 (38 MRSA §577-A) (6) to specify that the Scientific Subcommittee should provide technical support to the working groups and should contemplate creating subgroups of experts to support the working groups.
- Amend Section 10 (38 MRSA §577-A) (1) to include representation by a fisherman and by an aquaculturist.

Who We are:

Friends of Casco Bay is a nonprofit marine stewardship organization dedicated to improving and protecting the environmental health of Casco Bay. We scientifically monitor and assess water quality, including parameters indicative of climate change and ocean acidification. We employ a Casco Baykeeper, who serves as the lead advocate, or eyes, ears and voice of the Bay. We engage in significant public outreach including citizen science and other actions to engage our members and volunteers in our work to improve the health of the Bay.¹

Maine Ocean and Coastal Acidification (MOCA) is a voluntary partnership formed to implement recommendations of the Ocean Acidification Study Commission authorized by the 126th Legislature (see [study commission's report](#)).² Friends of Casco Bay, the Island Institute, and Maine Sea Grant convened MOCA when the State failed to establish an on-going council to implement the Study Commission's recommendations. Friends of Casco Bay has served on the MOCA Steering Committee since its inception and as its Coordinator for the last two years. MOCA has been most effective as an interim forum for coordinating and sharing research among public and private entities and as an information exchange.

Testimony on the Marine Aspects of LD 1679:

We support the overall concept of working across sectors to mitigate and adapt to climate change. Because our expertise is with respect to the health of marine waters, we will confine our testimony to those aspects of the bill.

To paraphrase Governor Mills' inaugural address, we must act now. Climate change is already impacting Maine's fisheries and habitats:

- About a third of all carbon dioxide emitted into the atmosphere is absorbed by the ocean, where it mixes with sea water to form carbonic acid and lower pH. This process is known as ocean acidification. In Casco Bay, pH has dropped from 8 to almost 7.8 from 2000-2012. The pH scale is logarithmic, meaning that a decrease of an integer value changes the concentration by tenfold. Lower pH (more acidic water) can cause mollusk shells—including clams, oysters, and mussels—to pit and dissolve.
- Annual precipitation in Maine has increased six inches since 1895, and we are experiencing more intense storms that deliver excess nitrogen to marine waters. The nitrogen fuels algal and phytoplankton blooms. The blooms have immediate negative impacts on marine species. For example, we have seen thick mats of nuisance algae smother clams. In addition, as blooms die, they release carbon dioxide which mixes with sea water to form carbonic acid. This process is known as coastal acidification and also lowers the pH of our coastal waters.
- The temperature of Casco Bay rose about 1 degree Celsius (2.5 degrees Fahrenheit) from 1993 to 2018. Warmer ocean temperatures mean that green crabs are not dying back over the winter. The higher populations of green crabs prey on soft-shelled clams and other

¹ For more information about Friends of Casco Bay, please refer to our website: <https://www.cascobay.org/>.

² For more information about MOCA, please refer to: <https://www.seagrant.umaine.edu/extension/maine-ocean-and-coastal-acidification-partnership>.

mollusks. They also demolish eelgrass beds, a critical marine habitat. Rising ocean temperatures also cause shifts in species and can contribute to an increase in lobster shell disease.

- In 2016, we began measuring the amount of calcium carbonate available for mollusks and other organisms to build their shells. We learned that for most of the year, there is not enough calcium carbonate in the water for shell-building.

Prior to news that Governor Mills would introduce her comprehensive Climate Change Council bill, Representative Lydia Blume worked with MOCA to draft LD 1284: An Act To Create the Science and Policy Advisory Council on the Impact of Climate Change on Maine's Marine Species. The MRC held a hearing on that bill on April 2, about a month before the Governor's bill was printed.

135 people from Friends of Casco Bay, MOCA, and other entities submitted testimony in support of LD 1284. No one testified against the bill. The Environmental Priorities Coalition selected the bill as a priority; industry leaders such as Mook Sea Farm and the Maine Aquaculture Association supported the bill; and leading marine research institutes, including Gulf of Maine Research Institute, Island Institute, Downeast Institute, and University of Maine, offered their support. The Ocean Conservancy's CEO sent a letter of support and separately authorized retired Congressman Tom Allen to appear and testify on their behalf.³

Commissioner Keliher testified and asked the MRC to delay further consideration of LD 1284 because the Governor intended to incorporate it into her bill. The MRC honored that request. We have reviewed and support LD 1679; it incorporates most of the intent of LD 1284 but fails to require progress reports to the MRC and afford opportunities for the MRC to make recommendations to this Committee.

We respectfully request that you amend the bill in that respect, and consider and address the other suggested amendments and comments on the attached track-changes document. Thank you for your attention to our testimony.

Sincerely,



Ivy Frignoca
Casco Baykeeper
Friends of Casco Bay

Attachments:

05172019 FOCB Markup LD 1679
Friends of Casco Bay Testimony Support LD 1284
MOCA Testimony Support LD 1284
Allen Ocean Conservancy Testimony Support LD 1284

³ This link directs you to the testimony submitted in support of LD 1284:
http://www.mainelegislature.org/legis/bills/display_ps.asp?id=1284&PID=1456&snum=129&sec3#.

PLEASE NOTE: Legislative Information **cannot** perform research, provide legal advice, or interpret Maine law. For legal assistance, please contact a qualified attorney.

An Act To Establish the Maine Climate Change Council To Assist Maine To Mitigate, Prepare for and Adapt to Climate Change

Be it enacted by the People of the State of Maine as follows:

Sec. 1. 5 MRSA §12004-I, sub-§24-G is enacted to read:

24-G.

Sec. 2. 35-A MRSA §3210, sub-§§1-A and 1-B are enacted to read:

1-A. Percentage from renewable resources; 2030. By January 1, 2030, 80% of electricity consumed in the State must come from renewable resources.

1-B. Percentage from renewable resources; 2050. By January 1, 2050, 100% of electricity consumed in the State must come from renewable resources.

Sec. 3. 35-A MRSA §3210-C, sub-§3, as amended by PL 2017, c. 134, §2, is further amended to read:

3. Commission authority. The commission may direct investor-owned transmission and distribution utilities to enter into long-term contracts for:

A. Capacity resources;

B. Any available energy associated with capacity resources contracted under paragraph A:

(1) To the extent necessary to fulfill the policy of subsection 2, paragraph A; or

(2) If the commission determines appropriate for purposes of supplying or lowering the cost of standard-offer service or otherwise lowering the cost of electricity for the ratepayers in the State. Available energy contracted pursuant to this subparagraph may be sold into the wholesale electricity market in conjunction with solicitations for standard-offer supply bids;

C. Any available renewable energy credits associated with capacity resources contracted under paragraph A. The price paid by the investor-owned transmission and distribution utility for the renewable energy credits must be lower than the price received for those renewable energy credits at the time they are sold by the investor-owned transmission and distribution utility; and

D. Transmission capacity, capacity resources, energy or renewable energy credits pursuant to a regional procurement process in conjunction with other states.

The commission may permit, but may not require, investor-owned transmission and distribution utilities to enter into contracts for differences that are designed and intended to buffer ratepayers in the State from potential negative impacts from transmission development. To the greatest extent possible,

the commission shall develop procedures for long-term contracts for investor-owned transmission and distribution utilities under this subsection having the same legal and financial effect as the procedures used for standard-offer service pursuant to section 3212 for investor-owned transmission and distribution utilities.

The commission may enter into contracts for interruptible, demand response or energy efficiency capacity resources. These contracts are not subject to the rules of the State Purchasing Agent. In a competitive solicitation conducted pursuant to subsection 6, the commission shall allow transmission and distribution utilities to submit bids for interruptible or demand response capacity resources.

Capacity resources contracted under this subsection may not exceed the amount necessary to ensure the reliability of the electric grid of this State, to meet the energy efficiency program budget allocations articulated in the triennial plan as approved by the commission pursuant to section 10104, subsection 4 or any annual update plan approved by the commission pursuant to section 10104, subsection 6 or to lower customer costs as determined by the commission pursuant to rules adopted under subsection 10.

Unless the commission determines the public interest requires otherwise, a capacity resource may not be contracted under this subsection unless the commission determines that the capacity resource is recognized as a capacity resource for purposes of any regional or federal capacity requirements.

The commission shall ensure that any long-term contract authorized under this subsection is consistent with ~~the State's goals for~~ greenhouse gas reduction under Title 38, section ~~576~~~~576-A~~ and the regional greenhouse gas initiative as described in the state climate action plan required in Title 38, section 577.

By January 1st of each year, the commission shall submit a report to the joint standing committee of the Legislature having jurisdiction over energy and utilities matters on the procurement of transmission capacity, capacity resources, energy and renewable energy credits in the preceding 12 months under this subsection, the Community-based Renewable Energy Act and deep-water offshore wind energy pilot projects under Public Law 2009, chapter 615, Part A, section 6, as amended by Public Law 2013, chapter 369, Part H, sections 1 and 2 and chapter 378, sections 4 to 6. The report must contain information including, but not limited to, the number of requests for proposals by the commission for long-term contracts, the number of responses to requests for proposals pursuant to which a contract has been finalized, the number of executed term sheets or contracts resulting from the requests for proposals, the commission's initial estimates of ratepayer costs or savings associated with any approved term sheet, actual ratepayer costs or savings for the previous year associated with any procurement, the total ratepayer costs or savings at the time of the report and the megawatt-hours, renewable energy credits or capacity produced or procured through contracts. The report must also include a plan for the succeeding 12 months pertaining to the procurement of capacity resources, energy and renewable energy credits, including dates for requests for proposals, and types of resources to be procured.

Sec. 4. 35-A MRSA §3402, sub-§1, ¶A, as amended by PL 2009, c. 615, Pt. A, §2, is further amended to read:

A. Wind energy is an economically feasible, large-scale energy resource that does not rely on fossil fuel combustion or nuclear fission, thereby displacing electrical energy provided by these other sources and avoiding air pollution, waste disposal problems and hazards to human health from emissions, waste and by-products; consequently, wind energy development may address energy needs while making a significant contribution to achievement of the State's renewable energy and greenhouse gas reduction objectives, including those in Title 38, section ~~576576-A~~;

Sec. 5. 35-A MRSA §10104, sub-§4, ¶F, as repealed and replaced by PL 2013, c. 369, Pt. A, §13, is amended to read:

F. It is an objective of the triennial plan to design, coordinate and integrate sustained energy efficiency and weatherization programs that are available to all energy consumers in the State and to users of all fuel types. The plan must set forth the costs and benefits of energy efficiency programs that advance the following goals, and funding necessary to meet those goals:

- (1) Reducing energy costs, including residential heating costs;
- (2) Weatherizing substantially all homes whose owners or occupants are willing to participate in and share the costs of cost-effective home weatherization to a minimum standard of weatherization, as defined by the trust, by 2030;
- (3) Reducing peak-load demand for electricity through trust programs by 300 megawatts by 2020;
- (4) By 2020, achieving electricity and natural gas program savings of at least 20% and heating fuel savings of at least 20%, as defined in and determined pursuant to the measures of performance approved by the commission under section 10120;
- (5) Creating stable private sector jobs providing alternative energy and energy efficiency products and services in the State by 2020; and
- (6) Reducing greenhouse gas emissions from the heating and cooling of buildings in the State by amounts consistent with ~~the State's goals established in~~ Title 38, section ~~576576-A~~.

The trust shall preserve when possible and appropriate the opportunity for carbon emission reductions to be monetized and sold into a voluntary carbon market. Any program of the trust that supports weatherization of buildings must be voluntary and may not constitute a mandate that would prevent the sale of emission reductions generated through weatherization measures into a voluntary carbon market.

Except when specifically provided in the individual goals under this paragraph, the trust may consider expected savings from market effects not attributable to the trust as well as efforts by other organizations, including but not limited to federally funded low-income weatherization programs.

As used in this paragraph, "heating fuel" means liquefied petroleum gas, kerosene or #2 heating oil, but does not include fuels when used for industrial or manufacturing processes.

Sec. 6. 38 MRSA §574, sub-§§1-A to 1-C are enacted to read:

1-A. Climate action plan. "Climate action plan" means the state plan adopted under this chapter.

1-B. Gross annual greenhouse gas emissions. "Gross annual greenhouse gas emissions" means the total amount of greenhouse gases emitted by all sources within the State each year.

1-C. Net annual greenhouse gas emissions. "Net annual greenhouse gas emissions" means gross annual greenhouse gas emissions less the total amount of greenhouse gases absorbed each year by plants and natural ecosystems, including, but not limited to, trees, crops, soil and wetlands within the State.

Sec. 7. 38 MRSA §576, as enacted by PL 2003, c. 237, §1, is repealed.

Sec. 8. 38 MRSA §576-A is enacted to read:

§ 576-A. Greenhouse gas emissions reductions

1. Interim emissions levels. By January 1, 2030, the State shall reduce gross annual greenhouse gas emissions to at least 45% below the 1990 gross annual greenhouse gas emissions level.

2. 2050 annual emissions level. By January 1, 2050, the State shall reduce gross annual greenhouse gas emissions to at least 80% below the 1990 gross annual greenhouse gas emissions level.

3. Monitoring and reporting rules. By July 1, 2021, the department shall adopt rules to track and report to the Legislature on gross and net annual greenhouse gas emissions. As recommended by the Maine Climate Change Council, as established in Title 5, section 12004-I, subsection 24-G, or as determined necessary by the commissioner, the department shall adopt rules to ensure compliance with the levels established by and pursuant to subsections 1 and 2. These rules may establish a mechanism for crediting voluntary measures that quantifiably and reliably sequester additional carbon in forests, farms and coastal lands in the State or by the use of materials that sequester additional carbon. Rules adopted pursuant to this subsection are routine technical rules as defined in Title 5, chapter 375, subchapter 2-A.

Sec. 9. 38 MRSA §577, as enacted by PL 2003, c. 237, §1, is amended to read:

§ 577. Climate action plan; update

By July 1, 2004, the department, with input from stakeholders, shall adopt a state climate action plan to meet the reduction goals ~~specified in section 576~~ for greenhouse gas emissions. The action plan must address reduction in each sector in cost-effective ways and must allow sustainably managed forestry, agricultural and other natural resource activities to be used to sequester greenhouse gas

emissions. The department shall submit the action plan to the joint standing committee of the Legislature having jurisdiction over natural resources matters.

1. Update plan. By December 1, 2020, and every 4 years thereafter, the Maine Climate Change Council, as established in Title 5, section 12004-I, subsection 24-G and referred to in this section as "the council," with input from stakeholders, shall update the state climate action plan under this section and shall include in the plan strategies to meet the reduction levels specified in section 576-A.

2. Evaluation of strategies. In updating the climate action plan, the council shall evaluate strategies to reduce gross and net annual greenhouse gas emissions consistent with the reduction levels in section 576-A. The council shall quantitatively analyze and report on the technical feasibility and cost-effectiveness of each strategy. To fund the analysis and work of the council, the council may solicit and receive financial support from the public and from private and nonprofit organizations.

3. Mitigation strategies. The updated climate action plan must address climate change mitigation strategies. The council shall update mitigation strategies for reducing the emission of greenhouse gases in the State, including updating the strategies for greenhouse gas mitigation included in the plan and identifying new strategies by applying the latest scientific and technological information available related to climate change.

4. Adaptation and resilience strategies. The updated climate action plan must address the impacts of climate change upon the State and provide strategies and actions for climate adaptation and resiliency. These strategies must include implementation guidelines that:

- A. Prioritize the welfare of the State's citizens and visitors and recognize and foster the value of the State's natural resources;
- B. Encourage diversity, inclusion and equity;
- C. Provide education and training opportunities when appropriate;
- D. Build upon existing global, national and state plans and partnerships for addressing climate adaptation, emergency preparedness and disaster risk reduction;
- E. Encourage investments that prevent and proactively mitigate risk;
- F. Encourage, foster and utilize the most recent scientific and technical information available; and
- G. Incorporate means for measuring progress.

5. Effects of climate change. The updated climate action plan must provide the latest information on climate change effects in the State as well as the sectors, ecosystems and communities most at risk.

6. Submission of plan. The council shall submit the climate action plan and any recommended legislation to the joint standing committee of the Legislature having jurisdiction over natural resources matters. Upon receipt and review of the plan, the joint standing committee may report out a bill to the Legislature.

7. Objectives. In identifying the preferred strategies to include in the updated climate action plan, the council shall give consideration to the following objectives:

A. Pursuing cost-effective, technologically feasible and equitable greenhouse gas emissions reduction pathways and adaptation and preparedness strategies, informed by scientific and technical expertise;

B. Pursuing actions that minimize deleterious effects, including those on low-income and moderate-income persons, to public health and the environment and that support economic sectors that face the biggest barriers to emissions reductions and creating, when feasible, additional employment and economic growth in the State;

C. Ensuring equity for all sectors and regions of the State and that the broadest group of residents benefit from the achievement of the levels in section 576-A and the long-term goal in section 576-A, subsection 2, with consideration of economic, quality-of-life and public health benefits;

D. Encouraging the use of natural solutions to reduce net annual greenhouse gas emissions and increase resiliency, such as solutions related to forests, farms and coastal lands in the State and materials that sequester carbon;

E. Maximizing involvement in interstate and regional initiatives and programs designed to reduce regional greenhouse gas emissions;

F. Supporting industries, technology and training that will allow workers and companies in the State to benefit from carbon reduction solutions through jobs and economic activity; and

G. Planning for adaptation and resilience strategies that will prepare the State's communities, infrastructure and industries for current and anticipated effects of climate change.

8. Use of existing data. In updating the climate action plan, the council shall draw upon existing state data and studies, including, but not limited to, analyses and data from the 2004 climate action plan and the 2010 adaptation plan developed by the department and the evaluations of the State's progress toward meeting greenhouse gas emissions levels under section 578, the comprehensive state energy plan pursuant to Title 2, section 9, subsection 3, paragraph C and the Efficiency Maine Trust's triennial plan pursuant to Title 35-A, section 10104, subsection 4.

9. Funding. The council may solicit and receive financial support, including funding from government agencies and private and nonprofit organizations and foundations.

Sec. 10. 38 MRSA §577-A is enacted to read:

§ 577-A. Maine Climate Change Council

The Maine Climate Change Council, referred to in this section as "the council," is created to advise the Governor and Legislature on ways to mitigate the causes of, prepare for and adapt to the consequences of climate change.

1. Membership. The council's membership consists of the following members:

A. Two members of the Senate, appointed by the President of the Senate, including one member of each of the 2 parties holding the most seats in the Senate;

B. Two members of the House, appointed by the Speaker of the House, including one member of each of the 2 parties holding the most seats in the House;

C. The Director of the Governor's Office of Policy and Management, or the director's designee;

D. The Commissioner of Administrative and Financial Services, or the commissioner's designee;

E. The Commissioner of Agriculture, Conservation and Forestry, or the commissioner's designee;

F. The Commissioner of Economic and Community Development, or the commissioner's designee;

G. The Commissioner of Environmental Protection, or the commissioner's designee;

H. The Commissioner of Inland Fisheries and Wildlife, or the commissioner's designee;

I. The Commissioner of Marine Resources, or the commissioner's designee;

J. The Commissioner of Transportation, or the commissioner's designee;

K. The Commissioner of Defense, Veterans and Emergency Management, or the commissioner's designee;

L. The Commissioner of Education, or the commissioner's designee;

M. The Commissioner of Health and Human Services, or the commissioner's designee;

N. The Director of the Governor's Energy Office, or the director's designee;

O. The director of the Efficiency Maine Trust, or the director's designee;

P. The director of the Maine State Housing Authority, or the director's designee; and

Q. Other members appointed by the Governor representing state interests affected by climate change or with expertise in climate change issues, including:

~~(1)~~ ~~(+)~~ One member to represent marine fisheries;

~~(+)~~(2) One member to represent aquaculture;

(2) One member to represent agriculture;

- (3) One member to represent municipal governments;
- (4) One member to represent the forestry industry;
- (5) One member to represent expertise in Maine's energy sector;
- (6) One member to represent Maine's tribes;
- (7) One member to represent building or construction trades;
- (8) One member to represent the manufacturing industry;
- (9) One member to represent organized labor;
- (10) Two members to represent business, including one member to represent small business;
- (11) Two members to represent environmental nonprofit organizations or private foundations, or both, with a focus on environmental issues;
- (12) Two members with expertise in climate change science, including a representative of the University of Maine System;
- (13) Two members with expertise in resilience, climate change adaptation, emergency management or disaster risk reduction;
- (14) One member to represent Maine's youth; and
- (15) Up to 2 other government or public members.

2. Terms. The term of a member appointed pursuant to subsection 1, paragraph Q is 2 years. At the end of a term, a member continues to serve until a successor is appointed.

3. Chair. The Governor shall appoint 2 cochairs from among the members serving pursuant to subsection 1, paragraphs C to M.

4. Removal. The Governor may remove an appointed member for incompetence, misconduct or failure to perform the duties of the position.

5. Steering committee. The council shall establish a steering committee composed of a subset of the council, including, but not limited to, the cochairs and working group chairs.

6. Scientific and Technical Subcommittee. The Scientific and Technical Subcommittee, referred to in this subsection as "the subcommittee," is established to identify, monitor,

study and report out relevant data 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 members of the subcommittee must include at least one member of the Senate and one member of the House of Representatives appointed by the presiding officer of the respective chamber of the Legislature and the legislative members must include members of both of the 2 political parties holding the most seats in the Legislature. The cochairs of the council shall appoint as members representatives of scientific and academic institutions, affected and involved businesses and industries, nonprofit organizations and foundations and federal, state and local governments and agencies.

In carrying out its duties, the subcommittee:

- A. Shall meet at least every 6 months beginning no later than October 1, 2019 and establish an annual work plan;
- B. May seek the advice of experts in fields related to its duties, including providing scientific and technical support to the working groups;
- C. May create subgroups, including subgroups of experts to support the working groups, to provide data and recommendations on specific subtopics related to the subcommittee's duties;
- D. Shall review the direct and indirect effects of climate change, including, but not limited to, air temperature changes, ~~and changes to our marine and coastal ecosystems such as~~ sea level rise, ocean and coastal acidification, warming ocean temperatures, increased precipitation and changes in salinity and dissolved oxygen concentrations;
- E. Shall review, study and analyze existing scientific literature and data on the direct and indirect effects of climate change and how those effects have directly or indirectly affected communities and public health, ~~coastal and marine environments-ecosystems~~ and species, agriculture and forestry and ecosystems and species in the State;
- F. Shall identify critical scientific data and knowledge gaps pertaining to the data and monitoring of state-based climate changes ~~-and~~ impacts and recommend methods for monitoring;
- G. Shall identify and monitor the factors contributing to the effects of climate change, including, but not limited to, the effects caused by coastal and ocean acidification, rising ocean temperatures and changes in salinity and dissolved oxygen concentrations;
- H. Shall identify methods and protocols to mitigate direct and indirect effects of climate change on the State's species ~~and ecosystems~~;
- I. Shall establish science-based sea level rise projections for the State's coastal areas by December 1, 2020 and update them at least every 4 years;
- J. Shall create maps that indicate the areas of the State that may be most affected by storm surges, ocean and river flooding and extreme weather events and make these maps publicly

available on a website maintained by the Department of Agriculture, Conservation and Forestry, Maine Geological Survey; and

K. Shall analyze and identify options for quantifying carbon sequestration and emissions associated with biomass growth, management and utilization in upland and marine environments.

7. Working groups. The council shall establish the following working groups:

- A. A transportation working group;
- B. A coastal and marine working group;
- C. A buildings, infrastructure and housing working group;
- D. A working lands and ecosystems working group;
- E. An energy working group; and
- F. Other working groups as needed.

Each working group must include at least one member of the Senate and one member of the House of Representatives appointed by the presiding officer of the respective chamber of the Legislature and the legislative members must include members of both of the 2 political parties holding the most seats in the Legislature. The cochairs of the council shall appoint as members representatives of scientific and academic institutions, affected and involved businesses and industries, nonprofit organizations and foundations and federal, state and local governments and agencies.

Each working group shall meet at least every 6 months, beginning no later than October 1, 2019 and shall establish an annual work plan.

8. Consideration of subcommittee and working group actions by council. The council shall consider and prioritize actions of the Scientific and Technical Subcommittee established in subsection 6 and the working groups established in subsection 7, including:

- A. Developing the State's climate action plan in accordance with section 577;
- B. Developing recommendations for legislation;
- C. Soliciting input from members of the public when developing the State's climate action plan and communicating with the public on progress and actions;
- D. Developing broad public and private partnerships with local, state and federal agencies;
- E. Addressing any disproportionate impacts of climate change on low-income and vulnerable communities;
- F. Assessing the impacts that climate change may have on the State's economy, revenues and investment decisions;

Comment [IF1]: Developing recommendations regarding monitoring including assessing the state of current monitoring, assessing data gaps, and recommending future research.

G. Assessing the need for utilities and other public and private service providers throughout the State to adjust their operating practices and investment strategies to increase their resiliency to climate change impacts;

H. Maximizing infrastructure, energy and new technologies for mitigation and adaptation options that come from state sources or create jobs in the State, or both;

I. Assessing the impacts that climate change may have on agriculture, aquaculture, fishing, forestry and other natural resource-based industries in the State and how those industries might best adapt to preserve those industries and the communities they support;

J. Recommending short-term and long-term strategies to mitigate the causes of and prepare for and adapt to the consequences of climate change;

K. Developing a plan to encourage and prepare for transitions in transportation, including both low-carbon and no-carbon technologies, and the changes in infrastructure required to accommodate those technologies, as well as infrastructure changes required as the result of climate disruption;

L. Developing and recommending strategies to address and prepare for marine, coastal and coastal watershed hazards, including, but not limited to, ocean and coastal acidification, increased storm surges, extreme precipitation and other extreme weather events, projected sea level rise and increased river flooding and storm water runoff and the risks such hazards pose to municipalities, the coastal economy and state assets;

M. Developing and supporting new and existing programs, codes and incentives that encourage increased energy efficiency and lower carbon emissions from the State's public and private buildings and businesses;

N. Assisting local governments and other constituents in supporting regional and community-scale climate vulnerability assessments and the development of specific strategies and integration of specific strategies into local plans and ordinances;

O. Encouraging programming in State Government and in municipal governments that allows the State to lead the way in demonstrating initiatives that reduce carbon emissions;

P. Establishing comprehensive and accountable annual working group work plans that set annual goals and performance benchmarks and prioritize new and existing climate change mitigation, preparedness actions and initiatives and report these out to stakeholders and the public;

Q. Convening regular steering committee, working group and full council meetings to ensure that sufficient progress is being made across all sectors and communities in the State; and

R. Considering other related matters as the council determines to be necessary.

9. Funds. The council and the Scientific and Technical Subcommittee established in subsection 6 and its working groups established in subsection 7 may solicit and receive financial support, including funding from government agencies, nonprofit organizations and foundations and other entities, to fulfill their responsibilities under this section.

Comment [IF2]: Contemplate a strategy to harmonize solicitation of funds so there is no competition between the various work group, subcommittee and council for funds.

Sec. 11. 38 MRSA §578, as amended by PL 2013, c. 415, §5, is further amended to read:

§ 578. Progress evaluation

~~By January 1, 2006 and by that date every 2 years thereafter, the~~The Maine Climate Change Council, established under section 577-A, or the department, shall evaluate the State's progress toward meeting the reduction goals specified in section 576, ~~review the cost effectiveness of the actions taken toward meeting the reduction goals and shall amend the action plan as necessary to ensure that the State can meet the reduction goals~~576-A and progress toward implementing the climate action plan in section 577. The department shall submit a report of its evaluation to the joint standing committee of the Legislature having jurisdiction over natural resources matters, the joint standing committee having jurisdiction over marine resources, and the joint standing committee of the Legislature having jurisdiction over utilities and energy matters by ~~January 1, 2016~~December 1, 2022 and by that date every 2 years thereafter. The council, or the department, may recommend other metrics to share the progress on climate mitigation and adaptation strategies with the Legislature and public. The joint standing committee of the Legislature having jurisdiction over natural resources matters is authorized to report out legislation relating to the evaluation ~~to the second regular session of any Legislature.~~ The joint standing committees of the Legislature having jurisdiction over utilities and energy matters and over marine resources may make recommendations to the joint standing committee of the Legislature having jurisdiction over natural resources matters regarding that legislation. ~~Starting no earlier than January 1, 2008, the department may recommend to the joint standing committee of the Legislature having jurisdiction over natural resources matters that the reduction goals specified in section 576 be increased or decreased.~~

Sec. 12. Meetings of Scientific and Technical Subcommittee. Notwithstanding the Maine Revised Statutes, Title 10, section 577-A, subsection 6, paragraph A, the Scientific and Technical Subcommittee of the Maine Climate Change Council shall meet at least 4 times before July 1, 2020.

SUMMARY

This bill:

1. Establishes the Maine Climate Change Council to assist Maine to mitigate, prepare for and adapt to climate change;
2. Provides that by January 1, 2030 80% of electricity consumed in the State must come from renewable resources and by January 1, 2050 100% of electricity consumed in the State must come from renewable resources;
3. Updates the greenhouse gas emissions reductions required in statute; and
4. Requires that the state climate action plan be updated by December 1, 2020 and every 4 years thereafter.



April 2, 2019

Senator Miramant
Representative McCreight
Marine Resources Committee
c/o Legislative Information Office
100 State House Station
Augusta, ME 04333
MAR@legislature.maine.gov

Re: Friends of Casco Bay testimony in support of LD 1284: An Act To Create the Science and Policy Advisory Council on the Impact of Climate Change on Maine's Marine Species

Dear Senator Miramant, Representative McCreight, and Distinguished Members of the Marine Resources Committee,

Friends of Casco Bay submits this letter in full support of LD 1284: An Act To Create the Science and Policy Advisory Council on the Impact of Climate Change on Maine's Marine Species. Friends of Casco Bay is a nonprofit organization dedicated to improving and protecting the health of Casco Bay. We have been monitoring the health of the Bay for nearly 30 years. We also have played a leadership role in Maine's efforts to address the impacts climate change on the marine environment.

Based on our data and the data of colleagues, we know Maine's marine waters are changing fast due to climate change. Those changes are harming our marine species. We must act now to slow the rate of change, understand what we can save through adaptation, and prepare for some inevitable losses. LD 1284 provides a comprehensive framework to achieve these goals.

LD 1284 was born out of a meeting last November hosted by the Maine Ocean and Coastal Acidification (MOCA) partnership¹ and attended by many of Maine's top marine researchers, DEP and DMR staff, members of the original ocean acidification study commission formed by the legislature in 2014,² about 20 members of Maine's coastal caucus, commercial fishermen and sea farmers, and others. Friends of Casco Bay helped organize the meeting. The group discussed

¹ The Maine Ocean and Coastal Acidification (MOCA) partnership is a completely voluntary, unfunded network of over 200 people and organizations dedicated to better understanding and addressing the impacts of ocean acidification and climate change on Maine's marine waters and species. This group has existed since 2016 and has attempted to coordinate research and keep a dialogue going about how to address ocean acidification. See <https://www.seagrant.umaine.edu/extension/maine-ocean-and-coastal-acidification-partnership>.

² This legislature created an Ocean Acidification Study Commission in 2014 that issued a report to the legislature in 2015. See <https://www.maine.gov/legis/opla/oceanacidificationmtgmatrls.htm> for information on the commission and the report.

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what we had learned since 2014 and what actions we need to take now. Their two recommendations were to: (1) create an advisory council on the impacts of climate change on Maine's marine species and (2) create an action plan to bridge the gap between the 2014 study commission and now. MOCA is working on a proposed action plan that we hope will inform the work of the marine advisory council.

It is up to this Legislature to create the recommended advisory council. It may do so with this Marine Resources Committee's recommendation that LD 1284 ought to pass as written or ought to be incorporated into the Governor's climate change council structure. The text of LD 1284 was developed by Representative Blume with the aid of MOCA. Its scope and format flow from work since 2014 and recommendations of some of the state's top marine scientists. Governor Mills's proposed climate change council is intended to include subcommittees on marine and coastal environments and on science. We have been told that many elements of LD 1284 have been incorporated into the Governor's proposed council bill, but have not yet seen it.

The most important consideration for this Committee is to ensure that the intent of LD 1284 is not diluted or ignored. The impacts of climate change on our iconic marine waters and species are here and must be addressed now. The necessary science must be done by researchers with expertise in monitoring marine environments. Policies must be designed by marine experts that contemplate impacts on our fisheries and those who depend upon them.

By way of example, here are some ways climate change is impacting Maine's marine waters and fisheries:

- About a third of all carbon dioxide emitted into the atmosphere from the burning of fossil fuels is absorbed by the ocean where it mixes with sea water to form carbonic acid, lowering the pH of the ocean. This is ocean acidification and is evident in Casco Bay where pH dropped from 8 to almost 7.8 from 2000-2012. The pH scale is logarithmic, meaning that a decrease of an integer value changes the concentration by a tenfold. Lower pH can cause mollusk shells—including clams, oysters, and mussels—to pit and dissolve.
- Precipitation in Maine has increased six inches since 1895, and we have more intense storms that deliver excess nitrogen to our waters. The nitrogen fuels algal and phytoplankton blooms. The blooms have immediate negative impacts on marine species. For example, we have seen thick mats of nuisance algae smother clams. In addition, as blooms die, they release carbon dioxide which mixes with sea water to create carbonic acid. This is coastal acidification and also lowers the pH of our coastal waters.
- The temperature of Casco Bay rose about 1 degree Celsius (2.5 degrees Fahrenheit) from 1993 to 2018. Warmer ocean temperatures mean that green crabs are not dying back over winter. The higher populations of green crabs prey on soft-shelled clams and other mollusks. They also demolish eelgrass beds, a critical marine habitat. Rising ocean temperatures also cause shifts in species and can contribute to an increase in lobster shell disease.
- In 2016, we began measuring the amount of calcium carbonate available for mollusks and other organisms to build their shells. We learned that for most of the year, there is not enough calcium carbonate in the water for shell-building.

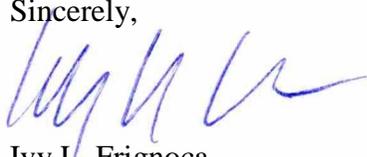
We have attached our Bay Paper on Climate Change to provide more information on why we must act now.

Given that climate change already is harming marine species, we must create a climate change marine advisory council as a means to act now in a concerted and coordinated manner.

For the above reasons, we respectfully request that the Committee unanimously recommend that LD 1284 ought to pass. In the alternative, the Committee should ensure that LD 1284 is meaningfully incorporated into the Governor's climate change council structure in a manner that does not dilute the intent of LD 1284.

Thank you for considering our testimony.

Sincerely,



Ivy L. Frignoca
Casco Baykeeper
Friends of Casco Bay



Climate Change Science and Data

- The climate is changing faster than expected. Greenhouse gases, such as carbon dioxide and methane, are the culprits. The burning of fossil fuels for homes, industry, and transportation releases almost 10,000 million metric tons of carbon dioxide into the atmosphere every year.
- Carbon dioxide is changing not only our climate, but also the chemistry of the ocean. About 30% of the carbon dioxide we release into the atmosphere is absorbed by the ocean. In marine water, carbon dioxide decreases pH and increases acidity through a process known as **ocean acidification**.
- Excess nitrogen from sewage treatment plants, polluted stormwater, and fertilizers, is also adding carbon dioxide into nearshore waters through a process known as **coastal acidification**. Nitrogen can fertilize massive algal growth in our waters. When the algal blooms die, decomposition depletes the area of life-giving oxygen and releases carbon dioxide, acidifying the water.

The impacts of climate change are evident right here in Casco Bay:

Warmer Waters: Friends of Casco Bay has been tracking water temperatures for over 25 years. On average, our data show a 2.5° F increase in water temperatures since 1993.

Sea Level Rise: As water warms, it expands, and the sea encroaches on our coastline. Coastal observers and property owners are reporting an increase in erosion.

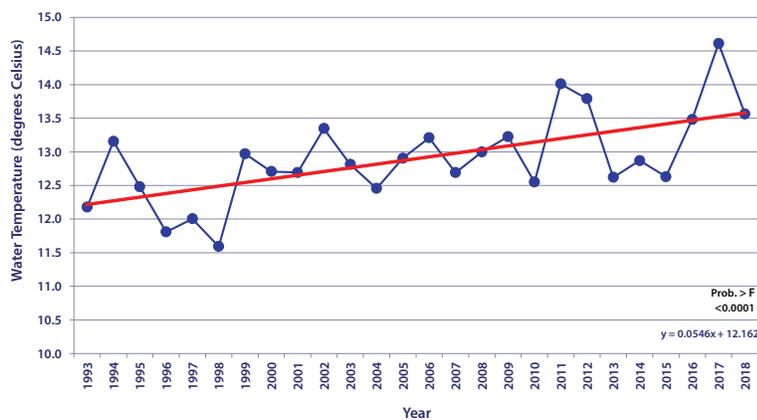
Increasing Precipitation: Maine has seen a six-inch average increase in annual precipitation since 1895, further threatening coastal properties.

Threats to the Ocean Food Web: More carbon dioxide in our waters means there is less shell-building material (calcium carbonate) for clams, mussels, and oysters, as well as for tiny critters at the base of the ocean food chain. The saturation state of calcium carbonate is a key measurement of shell-building material for many organisms.

Shell formation becomes more difficult when the amount of available calcium carbonate falls below a 1.5 saturation state. Our recent data indicate that for nearly half the year, levels of calcium carbonate in Casco Bay are not sufficient for shell-building.

Rising Water Temperatures

Friends of Casco Bay Sentinel Site Temperature Data
May through October Annual Averages



On average, water temperatures in Casco Bay have risen 2.5°F (1.4°C) since 1993.

What do these changes mean for Casco Bay?

- As marine waters become more acidic, we can anticipate more pitting or dissolution of the shells of many commercially viable species in Casco Bay.
- Rising water temperatures are linked with shell disease, directly impacting our lobster fishery and tourism industries.
- Climate change is bad news for clams because green crabs – which eat juvenile shellfish – thrive in warming waters.
- The distribution and population of marine species in the Gulf of Maine are shifting. Scientists and lobstermen are documenting the shift in distribution of Maine's iconic lobsters north and east.
- Copepods are tiny crustaceans that are the main food source for juvenile lobsters. In laboratory experiments, copepods raised in conditions that simulate the climate changes occurring in the Gulf of Maine were less fatty. With a less healthful diet, young lobsters must divert energy from growth and resisting disease to finding enough food to survive.



Research Associate Mike Doan with our Continuous Monitoring Station. The station houses a number of instruments that collect data on carbon dioxide, temperature, salinity, oxygen, chlorophyll, and pH, hourly, 365 days a year. This large quantity of data is necessary to accurately track changes in the Bay from climate change, including ocean and coastal acidification.

What is Friends of Casco Bay doing?

We helped form the Maine Ocean and Coastal Acidification Partnership (MOCA) to coordinate climate change research and policy change work. MOCA is a diverse coalition of researchers, policy experts, lawmakers, aquaculturalists, and seafood harvesters. We are working to create an action plan for Maine to protect the health of our coastal waters.

We have worked to introduce a bill, LD 1284, *Science and Policy Council on the Impact of Climate Change on Maine's Marine Species*, which is making its way through the current legislative session. The bill will create a council with a mission to evaluate ocean and coastal acidification and the impacts of climate change on Maine's marine species and to make statewide policy recommendations.

LD 1284 has been selected by the Environmental Priorities Coalition, a group of 34 environmental organizations, as one of its five priority bills to address climate change in Maine.

Our Water Reporter volunteers are recording observations of how the Bay is changing. These observations strengthen our advocacy efforts as these reports are shared with regulators, legislators, and other decision makers, alerting them to conditions in the Bay.

Friends of Casco Bay's mission is to improve and protect the environmental health of Casco Bay. Home to the Casco **BAYKEEPER**[®], we are a founding member of the international **WATERKEEPER**[®] ALLIANCE.

What can you do?

- Tell your legislators to support **LD 1284** to create a science and policy advisory council to address the impacts of climate change on Maine's marine species.
- Sign up to get updates on the bill and other efforts of Friends of Casco Bay. Email keeper@cascobay.org or go to cascobay.org and click "Get our emails" at the top of the homepage.
- Join Water Reporter. Your observations combined with those of other volunteers around the Bay will provide a better understanding of changing conditions: cascobay.org/water-reporter.
- You can help improve and protect Casco Bay by maintaining a healthy yard without pesticides and fertilizers. Learn more at cascobay.org/bayscaping.
- Volunteer with Friends of Casco Bay. Sign up at cascobay.org/volunteer.
- Support our work at cascobay.org/donate.
- Find more ways to help at cascobay.org/help-casco-bay.

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LD 1284

Senator Miramant, Representative McCreight, and members of the Marine Resources Committee, I'm Richard Nelson, now a retired lobsterman out of Friendship. I found that fishing for over 35 years inspired me to fully appreciate the opportunity to make a good living amongst the beauty and the bounty provided by Maine's natural environment. Not many of those years could pass by without entertaining thoughts of how I could "pay it back," seeking out ways to learn about and protect our marine environment while keeping it accessible to fishermen and their communities. My efforts progressed from small, collaborative science projects on the water, involvement in ocean energy issues, and through several years, monitoring the regional ocean planning process in the Northeast. In more recent years I served on the Legislature's Maine Ocean Acidification Commission, and afterwards, the steering committee of the Maine Ocean and Coastal Acidification Partnership (MOCA). It is their hat I'd be wearing today, if only an unfunded volunteer organization could afford hats. Let's step back for a moment, to 2014, when many of us, legislators included, had the opportunity to peruse some of the charts of the time that hoped to point out the effects climate change was having on the world's oceans. The ones that showed it a dark red in the Gulf of Maine indicating water temperatures rising faster than most of the world. Or the ones where the purple indicated Maine's high susceptibility to acidification. Others in the country, and the rest of the world as well, wondered, and still do, what we here in Maine were going to do to get a handle on this. That year the 126th Legislature showed foresight in getting us started with its' OA Study Commission. Not only did it set us in motion, but did so with a good cross sector panel representing legislators, agencies, scientists, NGOs, fishermen, and aquaculturists. That format allowed the selection process to give us some legislators that were also scientists or lobstermen, agency and NGO folk that were scientists, even scientists that were aquaculturists, and vice versa. Not all wore multiple hats, but enough to expand the scope and give even more weight to science on the panel. Although the resulting report was successful and recognized beyond our borders, we in Maine showed reluctance to follow through on the report's recommendations. That bit of history is now where it belongs, behind us. Some of the same people involved came together afterwards to form the aforementioned MOCA partnership in an effort to sustain the momentum and keep OA research in the forefront of people's attention. Last year's MOCA Summer meeting, held at Bowdoin College, had scientists from University of Maine, Bigelow Labs, and Maine DMR updating us on their research on lobsters in the context of warming and OA. There they revealed a deep underlying connectivity of effects between copepods and their ability to make lipids, with larval lobsters, and even on to the herring and right whales who also depend on them. I couldn't help but think back to these revealing studies while at this year's Fisherman's Forum, where they again became cohesive undercurrents to the main issues presented by the lobster industry; the whales, the herring, and lobster recruitment. Finding out what climate effects are true drivers of change in our oceans and shores is what this is all about, and sharing that knowledge both with you, as decision-makers, and the people of Maine. We at MOCA recommend passage of LD 1284. Thank you.

Richard Nelson
Friendship, Maine
Maine Ocean and Coastal Acidification Partnership
fvpescadero@yahoo.com

LR 510: An Act To Create a Science and Policy Advisory Council on the Impacts of Climate Change on Maine's Marine Species, Marine Resources Hearing, April 2, 2019

Testimony of Tom Allen for Ocean Conservancy

Senator Miramant, Representative McCreight, Members of the Committee:

My name is Tom Allen. I am here to represent Ocean Conservancy in support of this important legislation. During my 12 years in Congress I relied on Ocean Conservancy for advice on fisheries and climate legislation, because of its proven expertise at understanding how science can help guide public policy. I worked closely with them on an ocean acidification research bill and others. I have now served on Ocean Conservancy's Board of Directors for 9 years, the last 2.5 as co-chair.

Ocean Conservancy has 120,000 members in the U.S. In Maine we have 875 members and over 5300 online activists who have signed our suggested letters to legislators. We actively supported the creation of the Maine Ocean Acidification Commission in 2014. Rep. Lydia Blume's proposal is an essential next step to deal with the coming impact of climate change on Maine's economy, culture and environment.

The Gulf of Maine is warming faster than 99% of the rest of the world's ocean waters--a northerly shift in the Gulf Stream may be a factor. Warmer ocean water accelerates sea level rise and drives finfish and shellfish to colder northern waters. Ocean acidification is a growing threat to species with calcified shells, including mollusks (clams, mussels, oysters, scallops and periwinkles) and crustaceans (shrimp, crabs and perhaps eventually lobster).

Research over several decades has confirmed that the ocean is becoming increasingly acidic in lockstep with increased carbon dioxide in the atmosphere. The chemistry is simple: carbon dioxide combines with water to form carbonic acid. Ocean acidification from carbon emissions can also be accelerated by coastal acidification stimulated by eutrophication from agricultural and wastewater runoff.

Ocean Conservancy is engaged with U.S. and global challenges to a healthy ocean, including the rapidly warming Arctic, fisheries on both coasts, and plastic waste (especially in Southeast Asia). We are focused on three areas on the Atlantic Coast: Maine, the Chesapeake, and Florida. All three are especially vulnerable to rising sea levels, ocean acidification and resulting threats to their coastal economies.

How Maine adapts to the coastal and maritime impact of climate change can help other states with similar issues. Carbon emissions have been changing ocean chemistry for over a century. This Legislature needs policies that will reduce carbon emissions. However, as I try to peer into the future, I believe forest fires will continue to burn California, hurricanes will devastate our southern states, and floods will grow in size and destructiveness elsewhere. But in Maine, in the next 25-50 years, the principal adverse climate impact will probably be along our coast, our cities and towns, our fisheries, our culture and way of life here on the edge of the Gulf of Maine.

I hope and believe that the members of this committee will do everything you can to help Maine adapt to and manage that impact. LR 510 is a very good start. Thank you.