

MMA Public Health Committee

February 10, 2010

4pm – 6pm

Webinar Conference Call Dial in Number is: 1-877-669-3239; Access Code: 23011695
Webinar instructions provided in the body of the email invitation

AGENDA

- (5 min) **I. Welcome & Introductions** – Dr. Lani Graham, Co-Chair
- (5 min) **II. Acceptance of January 6, 2010 Minutes** (very brief minutes, due to the CME Program)
- ACTION**
(10 min) **III. Old Business** (Current Status of all PH resolutions passed at MMA Annual meeting)
- (20 min) **IV. Keep Me Well Initiative launched January 2010 & Physician Involvement** (MaineCDC)
(Recommended Actions?)
- (60 min) **III. Public Health Legislative Update** – Dr. Graham, Committee Co-Chair (Actions?)
- a. LD 1408, An Act to Establish the Universal Childhood Immunization Program (Kellie Miller)
 - b. Status of Environmental Issues – DEP Rules and various bills (Dr. Liebow and Members)
 - c. Update on impact of the proposed cut-backs on the Maine CDC (Maine CDC)
 - d. Sources of Revenue update to offset budget cuts discussion/approach
 - e. LD 1611, An Act to Ensure Humane Treatment for Special Management Prisoners
- (5 min) **IV. New Business**
Firearms in National Parks Regulation – Dr. Walworth
- VII. Adjourn**
-

2010 MEETING DATES: 4:00 –6:00 PM, Maine Medical Association

2010 Meeting Dates:

February 10	August 11
April 28	October 13
June 9	December 8

Maine Medical Association's 2010 Annual Session, September 10-12 in Bar Harbor at the Harborside Hotel & Marina.

MMA's Weekly Legislative Conference Calls occur every Thursday at 8pm through the end of April. The Conference call in number is: 1-877-669-3239, Access code: 23045263# . PHC members are welcome to participate.

The primary role of the MMA PHC is to support the MMA, our leadership and staff in enhancing the health of Mainers. The committee will address issues of healthy communities and clinical preventive services and should maintain an understanding of how core public health services, such as disease control, disaster response, environmental health, vital statistics and other public health data are provided in Maine.

**MAINE MEDICAL ASSOCIATION – PUBLIC HEALTH COMMITTEE
MEETING MINUTES
January 6, 2010**

MEMBERS PRESENT: Dr. Liebow, Dr. Maier, Dr. Danielson, Dr. Jennings, Dr. Dreyfus, Dr. Graham, Dr. Sewall, Paul Santomenna, Neil Ward, Dr. Jo Linder, Dr. Struba, Matt Prindiville and Ginger Jordon-Hillard

OTHERS PRESENT: Kellie Miller (staff)

TOPIC	DISCUSSION	ACTION/FOLLOW UP/RESULTS
<p>Welcome & Introductions</p> <p>The CME Program was changed to January 6th from December 9th due to Weather</p>	<p>Dr. Dreyfus opened the meeting at 4:00 pm, and introduced the speakers for the Public Health CME Program, entitled:</p> <p>“Our Public’s Health – Climate Change, Energy Efficient Hospitals/MESHnet and Environmental Toxins.</p> <p>Speakers included: Dr. Lani Graham, Dr. Syd Sewall, Paul Santomenna and Matt Prindiville</p> <p>Presentations encompassed environmental toxins and the pediatric environmental toolkit. The objectives of this two-hour primer for healthcare professionals were:</p> <ol style="list-style-type: none"> 1. Understand the effects of the leading environmental toxins on the public’s health (healthcare professionals and patients). 2. Become familiar with the Environmental Toxins Tool Kit and how it can be used in the clinical office, 3. Become knowledgeable on current State and Federal legislation concerning environmental toxins. 4. Understand what hospitals are/can be doing to increase their energy efficiency and environmental sustainability through the Maine Environmentally Sustainable Hospital Network (MESHnet) 	<p>Post video of Dr. Graham and CME program packet onto the MMA Public Health Webpage.</p> <p>Written comments to DEP on Chapters 880 and 881 Rules.</p> <p>Follow TOSCA on the Federal Level and reach out to our Senators on this issue.</p>

**MAINE MEDICAL ASSOCIATION – PUBLIC HEALTH COMMITTEE
MEETING MINUTES
January 6, 2010**

TOPIC	DISCUSSION	ACTION/FOLLOW UP/RESULTS
<p>2010 Committee Meeting Dates</p>		<p><u>2010 Meeting Dates:</u></p> <p>February 10 April 28 June 9 August 11 October 13 December 8</p>



Welcome to KeepMEWell



ASSESS YOUR HEALTH RISK

Are you ready to take the first step and learn more?

Use this tool to find out what you can do to improve your health and stay well.

Assess Your Health Risk.

Answer the questions about your health. This will take you only 10-15 minutes to complete. You will then get 3 reports that will help you take action and find local support. The assessment is for people 18 years and older living in Maine.

Find Healthcare Services. Learn where and how to find low cost healthcare services.



FIND HEALTHCARE SERVICES

Are you looking for low cost healthcare in your area?

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DRAFT

Dear Senator Collins (Snowe):

On behalf of the Maine Medical Association, we thank you for your opposition to Senator Lisa Murkowski's amendment to the debt limit bill (H.J.Res. 45) and ask that you remain opposed.

At its annual meeting in September 2009, the Maine Medical Association passed a resolution highlighting the public health importance of addressing the climate change crisis. We enclose this resolution which describes a number of action items including contacting your office to raise issues related to climate change. As you can see by reading this resolution, the health concerns are significant, for Maine, for our country and for the world. We view the Murkowski amendment as an attack on the Clean Air Act that would threaten public health and interfere with the essential push for comprehensive climate legislation currently underway in Congress.

The Clean Air Act is a law with a history in Maine and a nearly 40-year track record of cutting dangerous pollution to protect human health and the environment. The federal Environmental Protection Agency's (EPA's) authority to ensure that the largest power plants and factories reduce their global warming pollution and use cleaner energy is a critical component of this nation's strategy and commitment to address climate change. Senator Murkowski's amendment would block the EPA's ability to regulate these polluters and protect the health of the American public.

As you know, Maine is sometimes referred to as the "tailgate" of the nation because air pollution from the center of the country flows in our direction resulting in higher levels of air pollution than one might expect in a state where every effort has been made to control local sources. In the recent past Maine joined with other states to require the EPA to take action on air pollution. The health impact of years of lax federal air pollution regulation is clear in Maine. We must have health advisories on fish caught in Maine rivers and lakes due to mercury contamination. Hospital emergency room visits for vulnerable children and adults are triggered by ground level ozone in the summer. Much needed exercise is made more difficult.

We urge you to remain steadfast in your opposition to the Murkowski Amendment for the health of Maine people and the health of people everywhere.

Sincerely

NEW DRAFT

HP0984, LD 1408, item 1, 124th Maine State Legislature
An Act To Establish the Universal Childhood Immunization Program

An Act To Establish the Universal Childhood Immunization Program

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

Sec. 1. 5 MRSA §12004-G, sub-§15-B is enacted to read:

15-B.

Maine Vaccine Board

Sec. 2. 22 MRSA §1066 is enacted to read:

§ 1066. Universal childhood immunization program

1. Program established. The universal childhood immunization program is established to provide universal access to immunization to children from birth through age 18 in the State. The program is administered by the department for the purpose of expanding access to immunizations recommended by the advisory committee, maximizing public and private resources and lowering the cost of providing immunizations to children. The program is administered by the department and is overseen by the Maine Vaccine Board.

2. Definitions. As used in this section, unless the context otherwise indicates, the following terms have the following meanings:

A. "Advisory committee" means the Advisory Committee on Immunization Practices of the United States Department of Health and Human Services, Centers for Disease Control and Prevention, or its successor organization.

B. "Assessed entity" means a health insurance carrier or 3rd-party administrator.

C. "Board" means the Maine Vaccine Board established in subsection 3.

D. "Child" means a person from birth through 18 years of age who resides in the State.

E. "Fund" means the childhood immunization fund established in subsection 6.

F. "Health insurance carrier" means:

(1) An insurance company licensed in accordance with Title 24-A to provide health insurance. For the purposes of this section health insurance does not include insurance that covers accidental injury, specified disease, hospital indemnity, Medicare supplement, long-term care or other limited health insurance policies;

(2) A health maintenance organization licensed pursuant to Title 24-A, chapter 56;

(3) A preferred provider arrangement administrator registered pursuant to Title 24-A, chapter 32; or

(4) A nonprofit hospital or medical service organization or health plan licensed pursuant to Title 24.

H. "New vaccine" means a vaccine recommended by the advisory committee for which an initial federal contract price is established between October 1st and July 1st of a fiscal year.

I. "Program" means the universal childhood immunization program established in subsection 1.

J. "Provider" means a person licensed by this State to provide health care services to individuals and a partnership or corporation made up of those persons.

K. "Superintendent" means the Superintendent of Insurance.

L. "Third-party administrator" means any person licensed by the Superintendent as an administrator pursuant to Title 24-A, chapter 18.

3. Maine Vaccine Board. The Maine Vaccine Board is established pursuant to this subsection to oversee the program and perform the duties listed in paragraph D.

A. The board consists of 9 members.

(1) The commissioner shall serve as an ex officio, nonvoting member.

(2) The Governor shall appoint 8 members, as follows:

(a) Three representatives of health insurer carriers, appointed from a list of nominees submitted by a statewide association of health insurance carriers;

(b) Three representatives of providers in the State, appointed from a list of nominees submitted by statewide associations of providers, including primary care providers, allopathic and osteopathic physicians and nurse practitioners;

(c) A representative of self-insured health plans, appointed from a list of nominees submitted by statewide associations of self-insured employers; and

(d) A representative of pharmaceutical manufacturers, appointed from a list of nominees submitted by a statewide association of pharmaceutical manufacturers.

B. With the exception of the first-appointed members of the board listed in this paragraph, the term of an appointed member to the board is 3 years. Among the first-appointed members, the Governor shall appoint one representative of health insurance carriers and 2 representatives of

NEW DRAFT

HP0984, LD 1408, item 1, 124th Maine State Legislature
An Act To Establish the Universal Childhood Immunization Program

providers to terms of 2 years. A board member whose term has expired may serve until the appointment of the board member's successor.

C. The board shall elect a chair from among its members. Five members constitutes a quorum. Decisions of the board require the positive vote of 5 members.

D. The board shall perform the following duties: oversight of the provisions of this section, adoption of policies and procedures to administer the program and the fund, assessment under subsection 5, determination of vaccines to be covered by the program under paragraph E and assessment of penalties under subsection 6.

E. By January 1, 2011 and annually thereafter the board shall review the vaccines recommended by the advisory committee and shall determine the list of vaccines to be made available by the program during the succeeding year. The board shall review new vaccines and update the list of vaccines to be made available through the program on a timely basis. In determining which vaccines to make available through the program the board shall consider all vaccines recommended by the advisory committee that are available under contract with the United States Department of Health and Human Services, Centers for Disease Control and Prevention and shall base its decision on clinical analysis and cost benefit studies.

F. The department shall provide staff and administrative support for the board, shall annually present to the board for its review and approval information about the program and the costs associated with the program and shall administer the program and the fund.

4. Program requirements. The program shall make available to providers vaccines as determined by the board pursuant to subsection 3.

5. Assessments. By January 1, 2010 and annually thereafter, the board shall determine and collect the annual assessment for each assessed entity in accordance with this subsection. The board may assess interim assessments in accordance with this subsection. The board may require an assessed entity to report the number of covered life months for children covered by the entity in a manner and on a schedule as determined by the board. An assessment determination made pursuant to this subsection is an adjudicatory proceeding within the meaning of Title 5, chapter 375, subchapter 4.

A. Annual assessments must be determined and paid pursuant to this paragraph.

(1) The board shall determine the total costs of the program for the succeeding state fiscal year, may add a reserve for additional costs as determined by the board and shall credit any unexpended assessment collected in the prior year.

(2) The board shall determine the assessment for each assessed entity based on the ratio of member months for children covered by the assessed entity for the prior year to the total of covered life months of all children in the prior year.

(3) The board shall send notice of the assessment to each assessed entity by February 1, 2010 and annually thereafter.

(4) Each assessed entity shall pay the assessment determined in subparagraph 2 on the schedule determined by the board.

B. Interim assessments for new vaccines that are made available through the program must be determined and paid pursuant to this paragraph. The board shall calculate the program cost for the new vaccine by the first day of the calendar quarter following the establishment of the federal contract price. In determining the cost to the program and the assessment for each assessed entity and in collecting the assessments the board shall follow the procedures of paragraph A, subparagraphs 1 to 4.

6. Failure to pay assessment. If an assessment under subsection 4 is not paid on the due date established by the board, the provisions of this subsection apply.

A. The board shall notify each assessed entity that the entity has 90 days to pay the assessment or enter into an assessment payment plan approved by the board.

B. The board shall submit a report to the superintendent listing each assessed entity that has failed to pay an assessment as required by subsection 5.

C. If an assessed entity has not paid an assessment under subsection 4 within 6 months of the due date, the board may assess a fine of up to **125% ???** of the amount of the delinquent assessment. A fine paid under this subsection must be deposited into the fund.

D. The superintendent may suspend or revoke, after notice and hearing, the certificate of authority to transact insurance of any health insurance carrier or the license of a 3rd-party administrator that fails to pay an assessment under subsection 5, may assess a fine other than the fine required by this subsection and may take any other enforcement action authorized under Title 24-A, section 12-A to collect any unpaid assessment or fine.

6. Fund. The Childhood Immunization Fund is created as a nonlapsing dedicated fund ^[A1]to fund the program. The fund is administered by the department and overseen by the board. All assessments collected pursuant to this section must be deposited into the fund as well as interest on the balance in the fund and income from any other source directed to the fund. No portion of the fund may be used to subsidize other programs or budgets.

7. Rules. The department shall adopt rules to implement this section. Rules adopted pursuant to this subsection are routine technical rules pursuant to Title 5, chapter 375, subchapter 2-A. Board or department.

NEW DRAFT

HP0984, LD 1408, item 1, 124th Maine State Legislature
An Act To Establish the Universal Childhood Immunization Program

SUMMARY

This bill establishes the universal childhood immunization program to provide universal access to immunization to children from birth through age 18 in the State. The program is administered by the department for the purpose of expanding access to immunizations recommended by the United State Department of Health and Human Services, Center for Disease Control and Prevention, Advisory Committee on Immunization Practices, maximizing public and private resources and lowering the cost of providing immunizations to children. The program and the fund are overseen by the Maine Vaccine Board. The program is funded by assessments on health insurance carriers and 3rd-party administrators that are proportional to the number of covered life months for children covered by the entity as compared to the number of covered life months of children in the State.

Maine CDC Fiscal Impact

2008-2009 ~ LD 1408

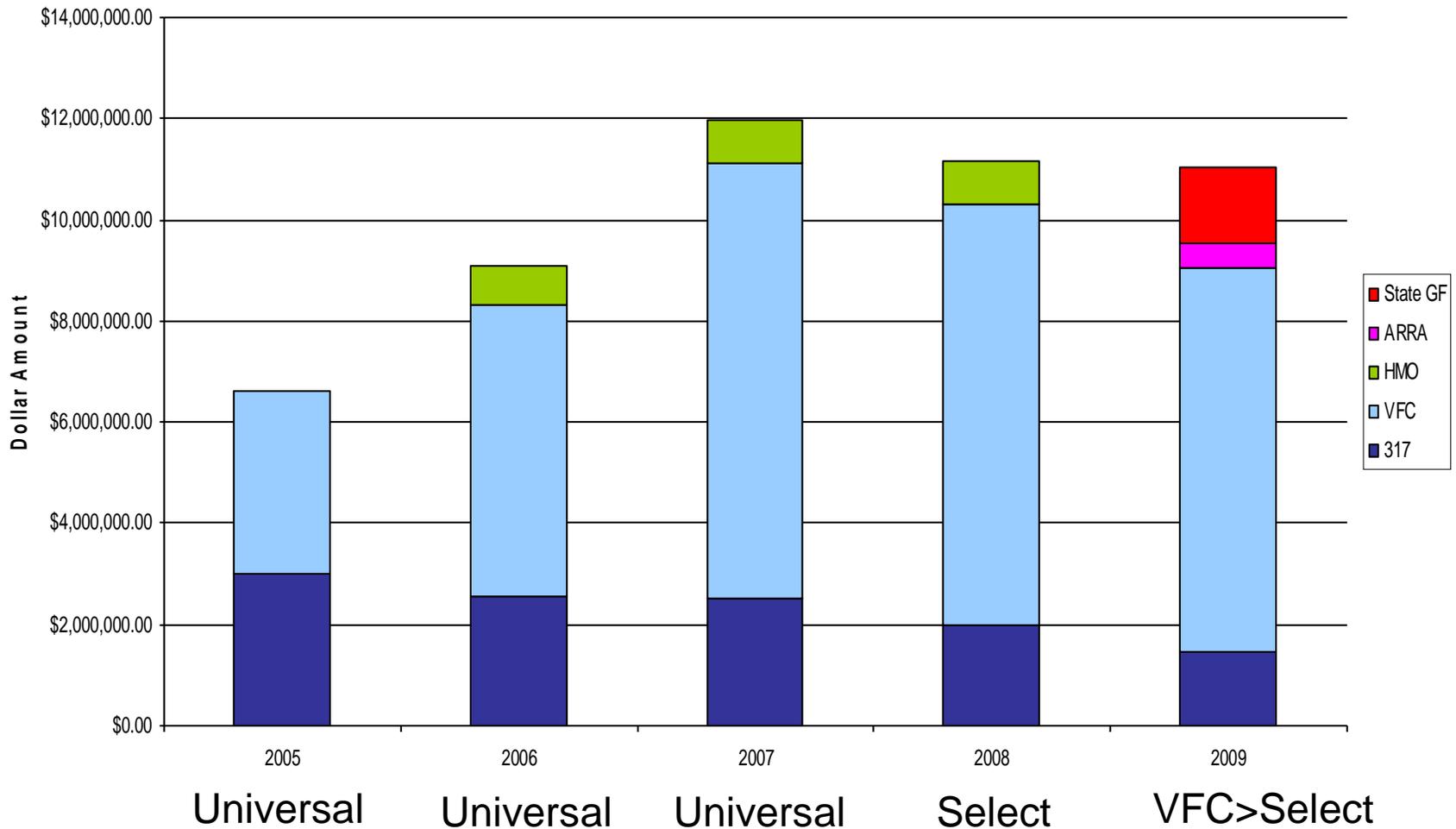
Universal Childhood Immunization

Projecting Vaccine Costs

- Population-based cost estimates are most effective for estimating vaccine costs
- Vaccine prices do fluctuate
- Combination vaccines, while overall cost effective, do cost more than single-antigen presentations.
- Increasing choice (brand choice or combo vaccine) in a universal program could over-obligate costs to the VFC program
- Wastage is a significant factor in controlling vaccine cost.

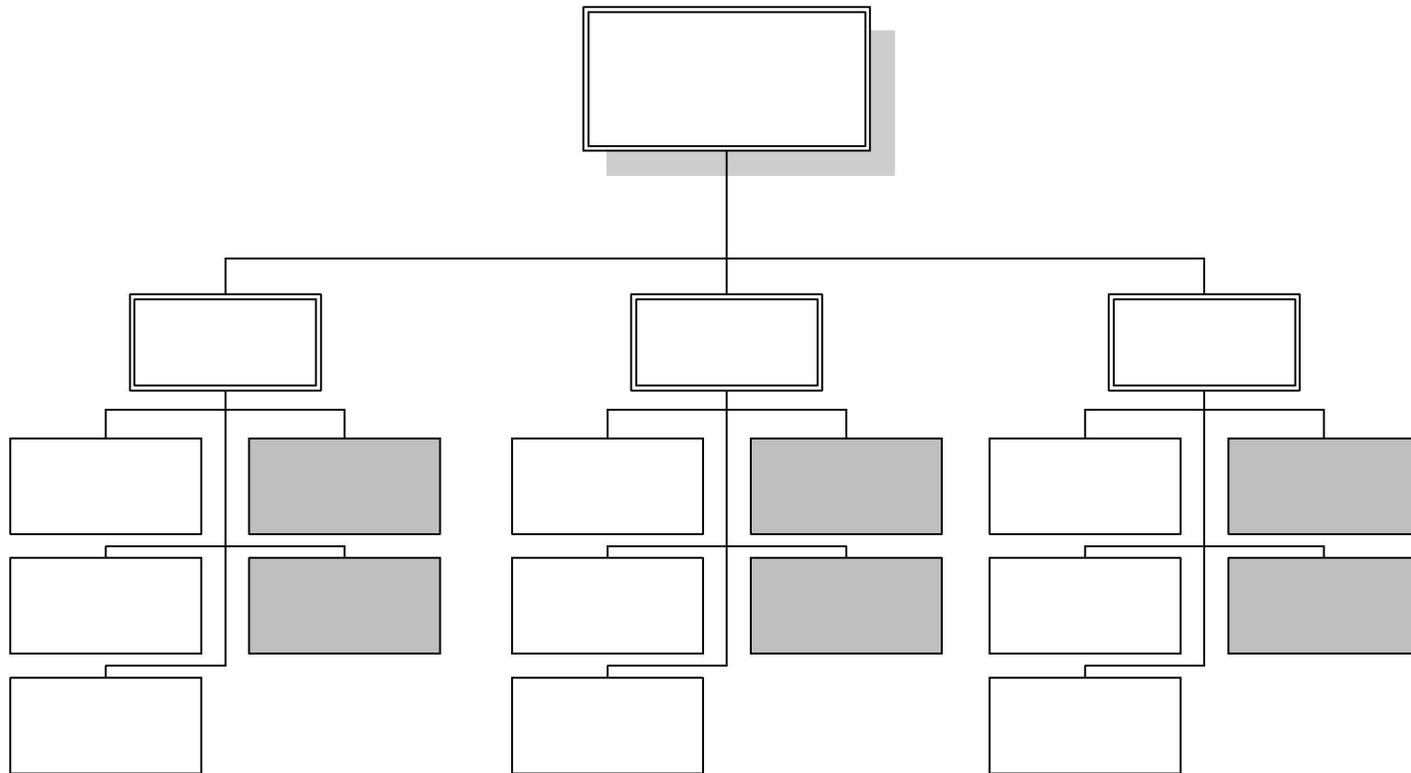
Maine CDC Childhood Vaccine Funding

Vaccine Funding 2005-2009



Projecting Staffing Needs

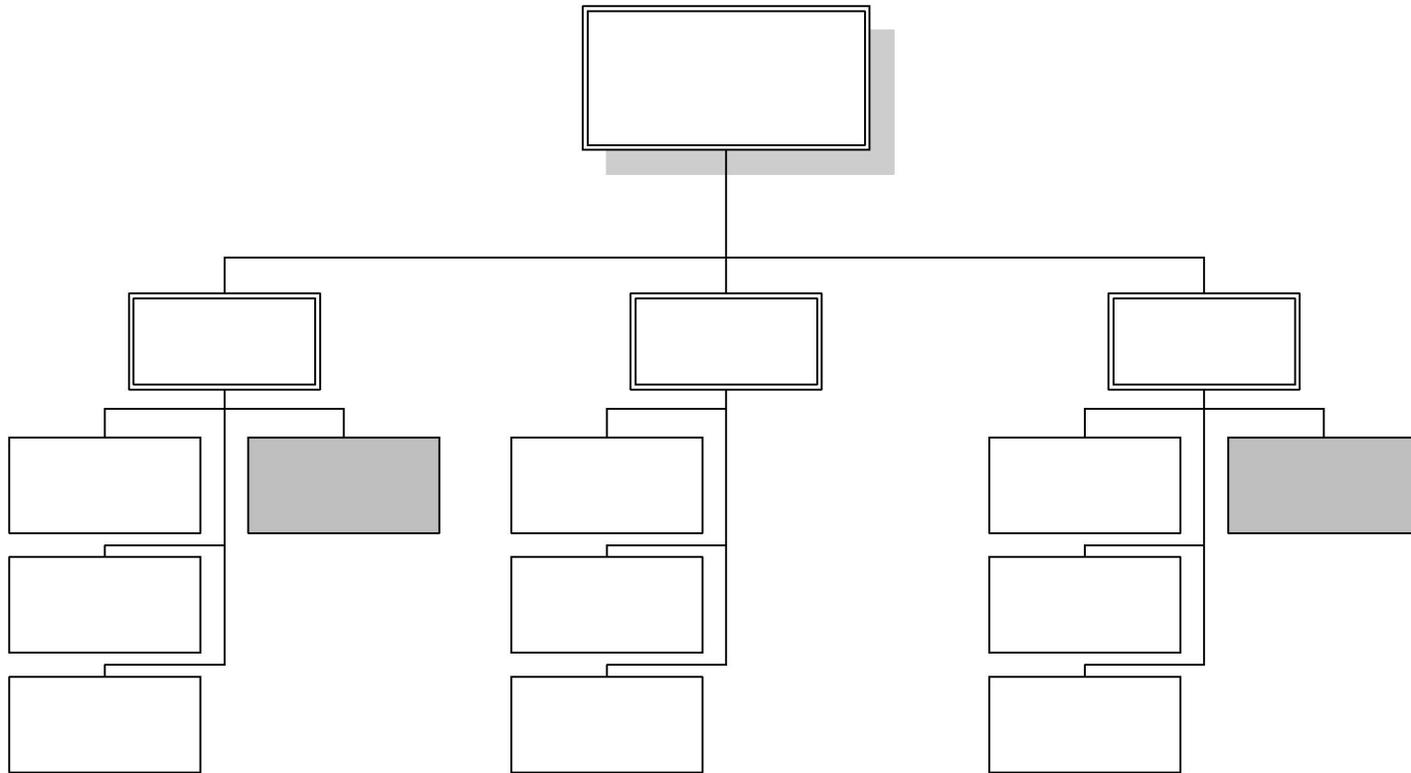
- Maine CDC/MIP staff currently 100% federally funded.
- Returning to Universal coverage will increase vaccine distribution by > 100% and is not possible with existing staff only.
- The MIP is currently understaffed (based on federal guidelines) and requires reorganization, which will not be dealt with here.
- Positions and funding requested in this fiscal note are for the RETURN TO UNIVERSAL IMMUNIZATION ONLY



This is a schematic representing the reasoning behind the initial fiscal note. This is not intended to represent actual positions or number of positions. This reasoning is of near duplication of functions within the program due to minimal economy of scale. This approach would be necessary if the assumptions on the next slide are not met.

Staffing Assumptions

- MIP will revise existing rules to mandate that providers use ImmPact 2
- Vaccine purchasing will follow a replenishment model (as previously with HMO, FHM and Currently with State GF).
- VFC and non-VFC vaccine will be tracked in the same ways.



This is a schematic representing the reasoning behind the current fiscal note. This is not intended to represent actual positions or number of positions. This reasoning is of fewer staff needs due to an economy of scale. This approach is possible if the assumptions on the previous slide are not met.

Positions Needed for Universal Immunization Program

- Planning and Research Associate I – (Range 20) – Vaccine Management
- Office Associate II – (Range 13) – Vaccine Management
- Provider Relations Specialist – (Range 19) – Consumer Services

Salary:	\$99,944
Fringe:	\$59,966
<u>All Other:</u>	<u>\$33,000</u>
Total:	\$192,910

How does the CMS maximum regional charge for vaccine administration relate to universal-purchase states?

The October 1994 Federal Register notice gives universal purchase states (states in which the vaccines are purchased by the state for all children in the state) the right to develop administration fees that differ from those established by CMS, provided they are reasonable. Therefore, universal purchase states are provided the flexibility to accept the maximum charges established by the Secretary or develop their own maximum charges. The maximum charges must be developed utilizing a reasonable methodology based on VFC section 1928(c)(2)(C)(ii) of the Social Security Act. The amount of the cap (maximum fee) is not required to be set in state law. However, the authority to set an amount must be based in state law. In either case, CMS gives state Medicaid agencies the option to establish and apply vaccine administration fees that are lower than the specified maximum regional charges if they provide assurances that Medicaid children have access to immunizations to the same extent as the general population.

CMS Regional Maximum fee in Maine is \$14.37

Additional Considerations

- Is the universal program mandatory?
- Is there cause to require registry participation in statute?
- Can we limit administration fee (to medicare rate) with rule-making authority in statute?
- Increasing rates will improve federal funding

PEOPLE AND NATURE ADAPTING TO A CHANGING CLIMATE: CHARTING MAINE'S COURSE

A Report to the Natural Resources Committee of the 124th Maine Legislature

I. INTRODUCTION: LEGISLATIVE CHARGE AND BASIS FOR ACTION

124th Maine Legislature, LD 460, "Resolve, To Evaluate Climate Change Adaptation Options for the State"

Sec. 1 Creation of stakeholder group; membership. Resolved: That the Department of Environmental Protection, referred to in this resolve as "the department," shall establish and convene a stakeholder group to evaluate the options and actions available to Maine people and businesses to prepare for and adapt to the most likely impacts of climate change. Convening this group to respond to climate change must not reduce continued strong state efforts to reduce greenhouse gas emissions. The department shall include in its stakeholder group and the evaluation process performed under section 2:

1. Representatives of business, industry and trade associations;
2. Representatives of nongovernmental organizations; and
3. State agencies with a current interest in these concerns and likely involvement in the implementation of recommendations.

The department must ensure that a balance of interests is represented in decision making. The department may ask the University of Maine and other higher education institutions to provide scientific and technical expertise to the stakeholder group; and be it further

Sec. 2 Evaluation. Resolved: That the department shall build upon the 2009 climate impact assessment by the University of Maine in evaluating the options available to Maine people and businesses for adapting to the likely environmental effects of climate change. That assessment concluded that climate change is already occurring in this State as a result of increased levels of greenhouse gases in the atmosphere and that, even with the greenhouse gas reduction goals set forth in the Maine Revised Statutes, Title 38, section 576, more thorough planning is necessary to identify and implement the State's responses to climate change in the areas of:

1. Ensuring sustainable opportunities for the development of greenhouse gas offset projects and low-greenhouse gas emission technologies and processes in the various sectors of Maine's economy;
2. Built infrastructure, including coastal and inland flooding effects on roads and facilities, heat effects in urban centers and beach scouring;
3. Habitat and fish and wildlife species, including the effects of invasive species, a lack of adequate conservation areas, a lack of connectivity between habitat and wildlife and inadequate wetlands protection;
4. Marine ecosystems;
5. Forests and forest management practices, including a higher incidence of pests and fires and a lack of biomass availability;
6. Agricultural and farming practices;
7. Human health, including increases in heat-related and vector-borne diseases;

8. Water supplies and drinking water; and
9. Emergency response systems and planning; and be it further

Sec. 3 Report. Resolved: That by February 27, 2010 the department shall report recommendations related to the evaluation under this resolve, along with any necessary implementing legislation, to the Joint Standing Committee on Natural Resources. The recommendations must be organized by the affected natural resource and economic sectors and may include proposals for legislation, modifications to existing rules and specific initiatives for one or more agencies to undertake in collaboration with stakeholder organizations to implement the recommendations. The Joint Standing Committee on Natural Resources is authorized to submit legislation related to the report to the Second Regular Session of the 124th Legislature; and be it further

Sec. 4 Funding of report. Resolved: That the department is authorized to accept public and private funds for the costs incurred to prepare the report under section 3. All funds received for these purposes must be deposited into the Maine Environmental Protection Fund established in the Maine Revised Statutes, Title 38, section 351 and must be used exclusively for purposes related to the preparation of this report.

In charging the Department of Environmental Protection to convene stakeholders and produce this Report, the Legislature directed the department to “build upon the 2009 climate impact assessment by the University of Maine....” That report, *Maine’s Climate Future: An Initial Assessment*, is a summary of current Maine-specific knowledge about climate change effects, and is based on both historic and recent observational data and research, and on projections for Maine’s future climate trends derived from scientific climate modeling.¹

There is abundant evidence that Earth’s global, and Maine’s local, climate is in the midst of significant change. As such, and regardless of disagreement over the causes of such change, there is a clear need to develop public policies to serve the ends of (1) responding to measurable change that is already occurring; and (b) planning for “the most likely impacts” of change that will occur in the future. Taken together, these actions are generally referred to as “adaptation” efforts. That is, they are “designed to reduce the vulnerability of natural and societal systems to the effects of climate change.”²

Adaptation refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate

¹ Jacobson, G.L., I.J. Fernandez, P.A. Mayewski, and C.V. Schmitt (editors). 2009. Orono, ME: University of Maine. It should be noted that stakeholders were not asked to endorse the validity of *MCF* and instead to take the information in it as a given. Not all stakeholder organizations or their memberships would necessarily agree with this.

² IPCC 2007 [\[complete citation needed\]](#).

change. An important asymmetry exists between adaptation and mitigation [actions to reduce the emissions of greenhouse gases]. Unlike mitigation, adaptation will in most cases provide local benefits, realized without long lead times. *Adaptation is the only response available for the impacts that will occur over the next several decades before mitigation measures can have an effect.*³

In evaluating the “options and actions available to prepare for and adapt to the most likely impacts of climate change,” the Department and stakeholders were aware that their decisions and recommendations were variously based on what is known and evident; on what is very likely; and on aspects of climate about which we need to know more. The “Guiding Principles and Unifying Themes” adopted by the stakeholders and presented below begin this way:

Although there is uncertainty as to the extent, rates and precise locations of change, we know that contemporary climate change is already affecting us, and will continue to do so. We have enough data to begin to act now, even as we gain understanding and capacity to respond more thoroughly over time. There are actions worth taking because they will benefit Maine regardless of the specific path of climate change. Society makes decisions to invest in preventive, responsive, or adaptive action based on uncertain risks all the time. The task is to balance the costs of responsive and preemptive action against the risks and potential costs of inaction.

While it is certain that there will be change, in many cases the form it takes may surprise us, and thus the responses we develop will need to be novel and may not have been tested before. Therefore, Maine needs to develop planning and management approaches that are agile, responsive and that build in an adaptive management approach. Adaptive strategies and actions will vary according to the vulnerability and adaptive capacity of a resource when comparing the cost of acting to the risk of future loss. For example, a natural beach cannot adapt in-place in a condition of sea level rise. Instead, this natural resource must be allowed to migrate with the sea if it is to survive. As a community, Maine needs to establish the policies and measures needed to balance choices between the value of the migrating resource (in this example, the beach) and the value of the resources in the path of migration such as residences or roads. In other scenarios, human-built resources and infrastructure will have such economic, cultural, historical, or functional value that significant, even heroic efforts may be warranted to ensure their preservation and adaptation. To be successful in building a climate-resilient Maine that accounts for such considerations in the present and for the future,

³ http://www.eoearth.org/article/Climate_adaptation

this decision making process requires a foundation of clear, well thought, and accepted policies such as those recommended below.

It is also worth pointing out that in comparison with actions taken to mitigate the emission of climate-change causing greenhouse gases, which often take place at the scale of state or Federal policy making and implementation, actions to *respond, adapt, and build resilience* to climate change impacts and effects occur very frequently at the local level and provide local benefits. A significant number of recommendations aim to provide resources for Maine communities to develop their own responses to current and anticipated climate change impacts. Municipalities in southern coastal Maine, in particular, have been jointly developing policies and plans for climate adaptation for several years, and representatives of Maine's cities, towns, and rural areas actively participated on the Coordinating Committee and each of the working groups.

II. STAKEHOLDER PROCESS

Following enactment of L.D. 460 on April 23, 2009, the Department convened an initial meeting of stakeholders (the Coordinating Committee) at the Chewonki Foundation on May 1.⁴ Professor George Jacobson, University of Maine Climate Change Institute, gave an initial presentation based on the *Maine's Climate Future* report. Participants also heard from Rhett Lamb, Chief Planner, City of Keene (NH), about the adaptation planning process recently initiated out by that city. The remainder of the meeting was devoted to review of the Department's proposed structure for the work ahead, culminating in a Report to the Natural Resources committee by February 27, 2010.

Four working groups were subsequently organized to consider likely climate change impacts, identify areas of vulnerability, and make recommendations back to the Coordinating Committee:

- Maine's Natural Environment
- Maine's Coastal Environment
- Maine's Built Environment
- Maine's Human and Social Environment

⁴ Agendas, working papers, minutes, and lists of attendees for all meetings associated with the stakeholder process can be found at <http://www.maine.gov/dep/oc/adapt/>. The Department also relied on the advice of an informal Steering Committee comprised of a small group representing business organizations, public interest groups, and the University of Maine.

Each group was comprised of members of the Coordinating Committee and representatives of other organizations and agencies who were invited based on their expertise, and recommendations for other stakeholders. Each working group met on four occasions between June 1 and November 15.⁵ The Coordinating Committee convened again on September 23 to review progress, and finally on January 25, 2010, to consider and endorse this Report.

The Department presents the Report as agreed upon by the stakeholders. In almost all cases, the Recommendations reflect a consensus among the stakeholders to move a particular item forward. While in some instances there was lack of agreement about specific language used to describe the need for action, there are only a few recommendations, which are clearly indicated, where not all stakeholders concurred.

Participating Organizations

* indicates Coordinating Committee

*American Council of Engineering Companies	Associated Builders and Contractors	Associated General Contractors of Maine
Bangor Hydro-electric Company		Casco Bay Estuary Partners
*Chewonki Foundation	*City of Biddeford	*City of Portland
City of Lewiston	Coastal Enterprises, Inc.	*FPL Energy / Nextera
Friends of Casco Bay	Grondin Construction	*Hannaford
Maine Aquaculture Association	Maine Association of Conservation Commissions	Maine Association of Conservation Districts
*Maine Association of Insurance Companies	*Maine Association of Planners	*Maine Audubon Society
*Maine Better Transportation Association	Maine Center for Public Health	*Maine Council of Churches
*Maine Chamber of Commerce	Maine Coast Heritage Trust	*Maine Forest Products Council
*Maine Innkeepers Association	Maine Medical Association	Maine Motor Transport Association
*Maine Municipal Association	*Maine Organic Farmers and Gardeners Association	Maine Potato Board
Maine Public Health Association	Maine Professional Guides Association	Maine Realtors Association
*Maine Real Estate and Development Association	Maine Rural Partners	*Maine Tourism Association
Maine Wastewater Control Association	Maine Water Utilities Association	Maine Wild Blueberry Association
*Manomet Center for Conservation Sciences	*Natural Resources Council of Maine	Passamaquoddy Tribe (Sipayik)
*Physicians for Social Re-	*Portland Chamber of	*Small Woodlot Owners

⁵ The exception was the Human/Social Environment group, which met three times.

sponsibility
Southern Maine Regional
Planning Commission
Town of Montville
U.S. Green Building Council,
Maine Chapter
White Brothers Contracting

Commerce
*SkiMaine Association
*The Nature Conservancy
Town of York

Association of Maine
Town of Edgecomb
*University of Maine
Wells National Estuary Reserve

State and Federal Agencies

Bureau of General Services
Department of Conservation

Department of Inland Fisheries and Wildlife
Land for Maine's Future

Maine Forest Service

Public Utilities Commission

Bureau of Insurance
Department of Economic and Community Development

Department of Marine Resources

Maine Center for Disease Control

Maine Emergency Management Agency

State Planning Office

Department of Agriculture
Department of Environmental Protection

Department of Transportation

Maine Drinking Water Program

Maine Geological Survey

United States Environmental Protection Agency

List of contributors

III. FINDINGS

A. Guiding Principles and Unifying Themes

From the beginning of the stakeholder process, participants have sought to identify and utilize principles on which they could agree to base their decisions and recommendations. As the work has proceeded, certain common themes have emerged across the boundaries of working groups. These are combined here as the basis for the participants' efforts, and presented as guidance for further policy development.

- ✓ The likely potential impacts of climate change have broad economic, biological and social implications across all sectors of Maine life. Although there is uncertainty about the specifics of how, where, and rates of as to the extent, rates and precise locations of change, we know that contemporary climate change is already affecting us, and will continue to do so. We have enough data to begin to act now, even as we gain understanding and capacity to respond more thoroughly over time. There are actions worth taking because they will benefit Maine regardless of the specific path of climate change. Society makes decisions to invest in preventive, responsive, or adaptive action based on uncertain risks all the time. The task is to balance the costs of responsive and preemptive action against the risks and potential costs of in-action.
- ✓ Maine's adaptation planning efforts must include the participation of individuals, government at all levels, business and industry, public interest groups, land owners, and government at all levels. Policy decisions at any level must be collaborative, transparent, and open to change as our knowledge increases and new circumstances present themselves.
- ✓ Maine's response to climate change will need to be on-going, incorporating new information and continuing to adapt and evolve. Consequently, data-gathering, monitoring, and assessment are critical tools that Maine must utilize to inform decision makers, resource managers, stakeholders, and the public. Our decisions must be founded on the best available scientific data. Consequently, Maine's planning must support continuing research, and we must strive to so we may provide accurate information about the pace and extent of change to the public. Meaningful communication of climate science and potential solutions is necessary to assist people throughout our state to take action.
- ✓ Maintaining healthy ecosystems is fundamental to our long-term success in meeting the challenges of a changing climate. Natural ecosystems provide services such as clean water, food, energy, coastal protection, and carbon sequestration, but these systems are likely to be increasingly vulnerable to climate impacts. Our efforts to build resilience for Maine's communities and people must go hand-in-hand with strategies that minimize impacts to the natural environment and losses of ecosystem services upon which we and Maine's natural resources depend.

- ✓ ~~Where we are unable to avoid climate-related stressors, limiting other~~ Reduction of other, compounding stresses that already exist is an effective form of adaptation to climate change. Our recommendations should specify which current stressors are likely to be exacerbated by climate change impacts. By taking a hard look at these, we may find ways to improve our adaptation methods and thus which, if mitigated, would benefit adaptation and promote resilience in natural and human systems.
- ✓ A changing climate will also present opportunities for Maine in many sectors and industries. Our planning must recognize and promote these opportunities, and develop incentives that will allow us to take advantage where possible.
- ✓ Although most climate change effects are incremental, some will be episodic, such as insect outbreaks in Maine's forests or greater impacts to coastal areas from combined sea level rise and increased storm intensity. Maine's adaptation efforts must work simultaneously to address slower-arriving impacts and those that are more acute. at both scales, and Maine must be positioned to respond to episodic events. Proactive infrastructure design, early detection, and well-developed response plans are among the steps needed to minimize future losses.
- ✓ To the extent possible, Maine's climate planning efforts should seek to avoid passing ~~on deferred~~ the potentially catastrophic costs of inaction to future generations. While we face serious limits on our current finances, the magnitude of cumulative cost over time must be considered. solely because of concerns about costs of proactive preparation. At the same time, Maine's plan should avoid passing on unfunded mandates to state agencies, ~~and~~ municipalities, and landowners. We want to reduce public costs while respecting private property rights and real estate values. [MCBI] This plan attempts to alert our agencies, businesses, communities – our neighbors – to the real and often imminent impacts of climate change, and demonstrates that effective planning is possible and cost effective.
- ✓ Planning for climate change adaptation will benefit from the participation of Maine's state, regional, and local entities in regional broad-based approaches that cross political boundaries at both the local (watersheds, habitats and estuaries) and state (Gulf of Maine; New England) scales.
- ✓ Maine already has laws, rules, regulations, and programs that address climate change and its consequences in some ways. We should avoid creating new programs or institutions, and instead focus on enabling existing ones to function better in the service of climate change adaptation goals, consolidating functions and re-evaluating policy where possible and appropriate.
- ✓ Some of Maine's communities and people will be disproportionately affected by climate change. Our planning and implementation efforts must include their participation, and take special account of their needs.
- ✓ Planning for climate change adaptation does not lessen Maine's responsibility to continue our efforts to reduce greenhouse gas emissions. Many of the actions to mitigate emissions go hand-in-hand with those needed to respond to climate changes we are already experiencing, and to build resilience for the expected climate future.

B. “Most Likely Impacts of Climate Change”

Based on the climate variables considered in the *Maine’s Climate Future* report, the stakeholders determined that the following impacts on Maine of a changing global climate should be used in order to plan. In general, the word “impacts” refers to observable or foreseeable changes in a wide range of natural phenomena that can reasonably be attributed to climate change. For example, sea-level rise is one observable impact of climate change. We use effects to describe the consequences of one or more impact, such as, “greater demand for energy for cooling is a likely effect of increasing average summer temperatures and more frequent severe heat events.” However, because of the inherent complexity of earth’s climate system, and human perceptions of those changes, the distinction between impacts and effects is not always a precise one.

Here, then, are the impacts and primary effects of climate change most often cited in this report:

- ✓ Changes in air temperature (increase/decrease)
- ✓ Changes in weather, including
 - Storm events and other weather extremes
 - Changes in timing and extent of precipitation (rain, snow)
 - Seasonal shift and variation in temperature and precipitation
 - Variability in patterns and intensity of winds
- ✓ Oceanic changes, including
 - Sea-level rise
 - Changes in oceanic circulation patterns
 - Changes in ocean temperature
 - Changes in seawater chemistry, nutrient levels
- ✓ Terrestrial fresh water changes, including
 - Changes in seasonal flow regimes and volumes
 - Changes in temperature
 - Changes in freshwater chemistry, nutrient levels
- ✓ Terrestrial ecosystem changes, including
 - Changes in the terrestrial water balance
 - Changes in carbon sequestration and/or release rates
 - Changes in the reflectivity of the land surface
 - Changes in the timing of biological processes and seasons

None of these occur in isolation, since together they make up what we call “climate:” “the statistical collection of average weather conditions at a given place....”⁶ Further, the interactions among them can be very complex so that, for example, an increase in global air temperature over time causes the thermal expansion of sea-water, one of the components of sea-level rise. Similarly, a shift in the timing of rain/snow events may combine with increased precipitation, resulting in greater runoff in Maine’s watersheds, although accelerated forest growth due to warming and increased CO₂, combined with higher evapotranspiration⁷ could actually reduce freshwater runoff.

The Legislature’s use of the phrase “most likely” impacts recognizes that any adaptation planning must acknowledge the uncertainties inherent in determining the extent and timing of climate change. As the Nobel-laureate physicist Neils Bohr put it, “Prediction is very difficult, especially about the future.”⁸ *Maine’s Climate Future* describes some of the limitations that the basic complexity of the earth’s climate system, the current state of our knowledge, and the limitations of our models place on us.⁹ *MCF*, and thus this report, relies on the global-scale Fourth Assessment of the Intergovernmental Panel on Climate Change (2007), as refined whenever possible by regional and Maine-specific research data.

In following the legislative mandate to “evaluate the options and actions available to Maine people and businesses,” the stakeholders followed the model commonly used by scientists and policy makers, and assessed natural and human systems and structures for their vulnerability, sensitivity, and adaptive capacity. Here is a convenient summary of these terms:

Climate scientists define vulnerability as the extent to which a natural or social system is susceptible to sustaining damage from climate change. Vulnerability is a function of the (1) sensitivity of a system to changes in climate (the degree to which a system will respond to a given change in climate, including beneficial and harmful effects), (2) adaptive capacity (the degree to which adjustments in practices, processes, or structures can moderate or offset the potential for damage or take advantage of opportunities created by a given change in climate), and (3) the degree of exposure of the system to climatic hazards. Resilience is a counter-weight to vulnerability—a resilient system or population may experience

⁶ *MCF* 9.

⁷ Define

⁸ Cited *MCF* 14.

⁹ *Ibid.* In particular, all the models project a range of future variation that depends on the extent to which further emissions of climate-changing greenhouse gases are lowered in coming decades.

the disturbances caused by climate variability and change, but has the capacity to adapt.¹⁰

The result of this assessment in the working groups led to the drafting of recommendations to address those areas identified as of most immediate concern, and/or greatest long-term significance for Maine.

¹⁰ http://www.eoearth.org/article/Climate_adaptation. Emphasis added.

IV. RECOMMENDATIONS

Most of the recommendations that follow were developed in the working groups noted above. A few, indicated with an asterisk *, were developed by DEP and/or other state agency staff to bring specificity to ideas discussed by stakeholders but not formally presented, or suggested by individual stakeholders after the end of the workgroup process. All were reviewed by the Coordinating Committee, and there was agreement that they should be included. In cases where not all stakeholders could support a recommendation, their reasons are given. In a few cases, the stakeholders agreed on an area of strategic importance, but were unable to identify specific recommendations for action at this time. It is intended that these be developed as adaptation planning continues.

The reader will note that very similar recommendations occur in more than one section below. While these could have been combined into several “Recommendations Applying to All Sectors (Section A), this would have taken them out of the context of other recommendations specific to a given sector. Cross-references to related recommendations are provided.

Not all recommendations include specific implementation mechanisms or proposals for funding. The stakeholders recognize that all recommendations will require the identification and expenditure of resources to be implemented, and did not wish the agreed-upon *ideas* to be disregarded at this point in Maine’s ongoing climate adaptation planning process solely because of cost considerations. Needless to say, any decision to take action on a particular recommendation will need to weigh the costs and potential benefits.

Most recommendations are presented as actions that would begin to address the broader strategies in a “no regrets” manner: that is, they are actions worth taking regardless of the specific course of likely climate change, and are intended to add value to Maine by addressing challenges that are already present, such as improving Maine’s state-wide disaster response system.

The stakeholders agreed that “a changing climate will also present opportunities for Maine in many sectors and industries. Our planning must recognize and promote these opportunities, and develop incentives that will allow us to take advantage where possible.” A number of such opportunities were identified, although in general they have not developed into specific recommendations thus far. They are presented throughout

this section in the form of call-out boxes, and will need to be evaluated further as the planning process continues to determine how to take best advantage of them.

A. Recommendations Applying to All Sectors

A.1 Adaptation Planning

Responding to current and expected challenges associated with climate change in Maine, and building resilience and adaptive capacity for the future, is in many ways a connected and iterative series of planning activities. In each area of concern, individuals, interest groups, government entities, and others will need to collaborate to identify natural and human system resources that may be sensitive or vulnerable to, or at risk from, likely climate impacts and effects. Based on best available historic information, current monitoring data, and predictive models, these groups should then establish policies that form the basis for adaptation response(s); develop planned actions that respond to the anticipated challenges; identify the resources needed to implement those responses, and go on to put them into effect.

Strategy A.1.1 Develop a Maine Climate Change Adaptation Plan

Several stakeholders suggested the sub-title of this Report, “Charting Maine’s Course,” to indicate the importance of further and continuing action to meet the intent of the Legislature. The work of the stakeholders over the past nine months has generated substantial momentum toward building a climate-resilient Maine that needs to be recognized and continued. However, the stakeholders ~~also recognize~~ are also aware that we have only ~~initiated~~ begun this effort. Review of already-completed ~~similar climate adaptation~~ plans in other states, most notably Washington and Maryland, demonstrates the following:

- § Accurate assessment of the risks associated with climate change and the vulnerability of particular human and natural systems is fundamental to planning for a changing climate future. However, the tools, methods, and policy frameworks for such assessment still need to be developed in many cases.
- § Since many of the climate change impacts for which states are preparing will occur over the course of decades, and are likely to require major resource investments, and policy and regulatory changes, careful and prudent long-term planning is necessary in all sectors and at many scales of decision-making. This is despite the fact that climate change that we are already experiencing is

at the same time changing the way we live today. Thus, many of the recommended actions in these plans focus on the establishment of planning processes that will subsequently produce actionable recommendations across a range of time-scales.

- § Many recommended actions will require funding mechanisms and cross-jurisdictional cooperation over long periods of time in order to be implemented. Identifying how this can be accomplished requires economic analysis and planning that may take several years to complete.
- § Many of the actions needed to create climate-resilient communities and natural systems will be carried out at a local level. Adaptation planning requires that local authorities and citizens have access to accurate information about likely climate impacts specific to their location, and the tools and resources that will ~~allow them to participate~~support them in their own planning processes, establishment of local adaptation policies, and efforts to build adaptive capacity.

Thus, the creation of an actionable state-level climate adaptation plan typically requires two to three years of work, and significant expenditure of resources, in order to assure wide-spread acceptance and implementation. While the present report identifies key strategies and initial recommendations that Maine should adopt in order to address the “most likely impacts of climate change,” further effort will be needed to develop additional, and more specific, recommendations to be implemented in the years ahead.

It is highly probable that pending Federal legislation will, over time, generate revenue that states may utilize for climate change-related activities, including both the mitigation of greenhouse gases, and response / adaptation to current and future climate change conditions. Separate Federal funding in other related areas, such as habitat restoration, is also likely. *In order to qualify for, and take effective advantage of, such funding opportunities, Maine will need to have in place a comprehensive adaptation plan that is substantially more detailed than the current Report, and will need to demonstrate a coordinated capacity to administer and utilize such funds.*

LD 860 specifies that “state agencies with a current interest in these concerns and likely involvement in the implementation of recommendations” be included in developing this Report. Thirteen different executive branch and related agencies have actively participated in this process, and the stakeholders are agreed that further adaptation planning requires a high level of ongoing coordination and cooperation

among these, with their Federal agency counterparts, and with similar agencies in other states.

As indicated in Section IV.D, comprehensive planning for climate change impacts must rest on sound analysis of the economic impacts of potential actions, particularly to compare the costs of “no action” against specific actions that would accomplish goals that are worthwhile for Maine under any climate scenario. The New England Environmental Finance Center at the University of Southern Maine is currently developing innovative tools for this purpose that should be available for use by local and state planners in 2010.¹¹

Finally, the active participation and leadership of private sector and public interest groups, together with the available expertise of the University of Maine, has been a key factor in bringing about this Report. If further efforts are to be productive, this “coalition of partners” must be maintained.

With these considerations in mind, the stakeholders and Department propose

Recommendation A.1.1.1 Complete a Climate Change Adaptation Plan for Maine

There are several options for implementing this recommendation that the Natural Resources Committee may wish to consider. The stakeholders agree that some structure should be found within Maine state government that would

- § provide a central coordinating function for the completion of a plan able to meet Federal requirements;
- § act as a “lead agency” for continuing implementation of Maine’s plan; and
- § maintain a coalition of partners from the public, including local government, private and public interest group sectors.

An existing statutory entity, such as the Energy Resources Council or Land and Water Resources Council, could assume responsibility for this effort. If so, it could task DEP with chairing and staffing the continuing effort, since taken as a whole, the activities associated with developing Maine’s response and resilience to climate change impacts are fundamental to DEP’s statutory mission and consistent with its operational functions. DEP already has statutory responsibility for implementation of 38 MRSA §§ 574-579, Maine’s Climate [mitigation] Action Plan, which overlaps substantially with likely actions on adaptation. Alternatively, the legislature could extend and expand the current authority of LD 460 by charging DEP to continue its efforts, specifying the participation of vari-

¹¹ See below, D.1.1 (p.)

ous executive agencies, and by instituting statutory requirements for the delivery of a comprehensive plan.

Regardless of approach, the stakeholders recommend that all state agencies be required to name a climate change liaison to the coordinating committee led by DEP. Further, the legislature should require the delivery of a completed plan to the Natural Resources committee by a date certain in the first session of the 125th Maine State Legislature. [Since the stakeholders recognize that any such plan will need to be continuously updated to reflect better and more specific Maine climate data as well as taking into account the actual course of global climate change, it may be useful for the plan to combine a proposal for an ongoing climate adaptation planning framework with the first of a projected series of five-year action plans containing specific recommendations.](#)^[MCB2]

The charge to the continuing entity between 2/27/10 and 3/31/11 ^[MCB3](possible date for delivery of a completed ~~comprehensive~~ Plan to the Natural Resources Committee) would include the following:

- § Where the current report has already identified actionable recommendations, *development of specific implementation steps* together with estimates of cost, sources of needed funding, necessary legislative action, etc.;
- § In those areas in the present report where the stakeholders have identified significant vulnerability and strategic direction, but which are still in need of specific recommendations, *development of those recommendations*, together with implementation plans as above;
- § *Economic analysis* of the costs of ~~action~~ [implementing adaption strategies](#) compared with ~~“business as usual”~~ [no action](#)” for key aspects of Maine’s communities, natural resources, and overall economy;
- § [Identifying a mechanism by which progress on recommendations would be tracked](#);
and
- § *Identifying additional opportunities* that Maine could take advantage of in a changed and changing climate.

[As will be noted in several of the recommendations below, there are needs in most areas for new or continuing multi-stakeholder groups to develop strategies and management approaches that allow flexibility in the face of changing circumstances. It will be up to whatever continuing entity has responsibility for overall planning to assure that the work of these groups is fully integrated into Maine’s adaptation effort.](#)

A.2 Data, Monitoring, and Assessment

Developing public policy and making decisions to allocate resources to address the likely impacts of climate change requires confidence in the scientific and technical data informing the process. This Report has its origins in the language of LD 460 to “build upon the 2009 climate impact assessment by the University of Maine in evaluating the options available to Maine people and businesses for adapting to the likely environmental effects of climate change.” ~~That document, *Maine’s Climate Future: An Initial Assessment*¹², is a summary of current Maine-specific knowledge about climate change effects, and is based on both historic and recent observational data and research, and on projections for Maine’s future climate trends derived from scientific climate modeling.~~¹³

~~The~~ In order to assure that Maine’s climate adaptation planning will continue to benefit from robust, scientifically-sound data, the stakeholders have clearly identified on-going and enhanced environmental monitoring, data gathering (including vulnerability inventories and risk assessments in all sectors), and modeling / forecasting as a set of key strategies for Maine. As noted in the “Guiding Principles and Unifying Themes”

Maine’s response to climate change will need to be on-going, incorporating new information and continuing to adapt and evolve. Consequently, data-gathering, monitoring, and assessment are critical tools that Maine must utilize to inform decision makers, resource managers, stakeholders, and the public. Our decisions must be founded on the best available scientific data, and Maine’s planning must support continuing research.

A description of these strategies follows.

Strategy A.2.1 *Integrate Current Systems for Environmental Monitoring that Support Climate Change Adaptation Activities and Address Monitoring Gaps.*

Much of what we know already about the current environmental effects of climate change is the result of data gathered through direct observation over extended periods of time. Global observational records of temperature and sea level change, for example, are key variables in the models used for climate change research. However, adaptation planning at the state and local level needs information that is specific to our geographical

¹² citation

¹³ Modeling is a numerical representation of the climate system based on the physical, chemical and biological properties of its components, their interactions and feedback processes, and accounting for all or some of its known properties.

location. For instance, one of the key indicators for Maine is the measured increase in sea level over the past century, as ~~tracked~~ measured by the Portland tide gauge. Existing monitoring programs at the Federal and state levels include examples such as USGS surface and groundwater programs; the National Atmospheric Deposition program [NOAA?]; the US Forest Service Forest Inventory and Analysis; and environmental monitoring programs in the US Environmental Protection agency and various state agencies. Each of these helps us to understand the status and trends of ecosystems in Maine. However, some factors that we now know are the result of climate change are not being systematically tracked, such as ocean acidification or flashiness of streams following more frequent and severe storms. Furthermore, there are few on-going monitoring programs designed to show us the impacts on or responses of natural systems or trends in related human responses

Currently, there is not a program to integrate these resources in order to develop the aggregated and synthesized information that supports climate change adaptation and opportunity planning. Further, there is an identified need for key research sites, and ecological observatories, to develop additional indicators such as soil moisture deficit and drought stress, that will tell us how Maine ecosystems are responding to climate change and why. Because it's especially difficult to predict the impacts of climate change on large systems, long-term monitoring will continue to be vital.

Recommendation A.2.1.1 Identify existing monitoring systems that support climate change adaptation and policy initiatives, determine the accessibility of climate change related data from these systems, identify critical climate change related measurement programs that are currently lacking and appropriate strategies to address them, and improve the integration of monitoring data in support of climate change decision making.¹⁴ Those ecosystem identified as most vulnerable to climate change impacts, such as coastal salt marshes and beaches, and cold water streams that provide habitat for critical species, or those that provide essential ecosystem services such as wetlands and barrier beaches and shellfish harvest areas, should be priorities for such monitoring.

Recommendation A.2.1.2 Maine's scientific community, under the leadership of the University of Maine, should identify thresholds in a range of natural sys-

¹⁴ Among other possibilities, there may be a need to improve weather station coverage in Maine to assure accurate monitoring data in the different climate zones noted in *MCF* (15).

tems such as thresholds of ocean water acidity for sensitive marine organisms, thresholds of drought stress for crops and forest species that reduce yields or invoke declines, or thresholds of warming that create new opportunities for human diseases in Maine that were previously inhibited by our cold climate, all of which that have the potential to cause abrupt changes in ecosystems that are able to produce significant risks / hazards.

***Recommendation A.2.1.3** Maine, in cooperation with the USGS, should re-constitute and expand the river stream gauging network to monitor long and short term trends in flow in order to improve resource allocation and emergency response preparedness. There is an additional need to build and expand monitoring of snowpack conditions, ice conditions, lake levels, groundwater levels. Long term, dedicated support needs to be provided for this task.

Strategy A.2.2 *Continue and Expand Efforts to Gather Data Needed to Assess Maine's Climate Vulnerability*

Although the distinction isn't rigid, if we understand "monitoring" to refer primarily to tracking the effects of climate change on ecosystems and other aspects of the natural environment, then "data gathering" can be used to describe the collection of information about the existing (primarily human) environment in order to identify at-risk systems and structures. Existing data sets, such as current flood-plain maps, will need to be periodically evaluated to determine if they are still an accurate reflection of on-the-ground conditions. All such efforts will require approaches coordinated among different agencies, and if the data are subsequently to be used for regulatory purposes, the processes involved must be transparent and open to challenge.

Recommendation A.2.2.1 Improve mapping and characterization of sea level rise vulnerability for all Maine coastal areas. Specifically, obtain and process high resolution LiDAR [Light Detection and Radar] topographic mapping data for the entire coast, and use these to create base digital elevation models to update current shoreline HAT [Highest Annual Tide] maps and 100-year floodplain maps based on updated storm frequency data. Develop projected inundation models for likely expected SLR and alternative SLR scenarios.¹⁵ Evaluate the need for revisions to municipal shoreland zoning maps in the coastal zone based on better resolution. Over the longer term, develop a methodology to regularly update

¹⁵ Needs a note on the extent to which this is already underway.

actual and predicted tide/storm heights, create overlays that indicate future floodplains and account for dynamic processes, and make this information available to all state and local agencies.

***Recommendation A.2.2.2**^[MCB4] Through incentives and additional enabling structures as needed, encourage use of these data by multiple towns that share a common river (as for instance through river corridor commissions) or beach and bay system to develop regionally consistent zoning and coordinated emergency response plans.

Strategy A.2.3

Modeling

The climate system can be represented by models of varying complexity. That is, for any one component or combination of components in the system, such as seasonal wind patterns, a spectrum or hierarchy of models can be identified. These may differ in such aspects as the number of spatial dimensions, the extent to which physical, chemical or biological processes are explicitly represented, or the degree to which observational data are used to develop factors in the model. Coupled Atmosphere-Ocean General Circulation Models (AOGCMs), such as those used by the University of Maine in *MCF*, provide a generally comprehensive representation of the climate system ~~that is near the most comprehensive end of the spectrum currently available as a whole~~. Climate models are applied as a research tool to study and simulate the climate, and for operational purposes, including monthly, seasonal and inter-annual climate predictions.¹⁶ The development of regional and smaller-scale models is moving ahead rapidly, and will offer much better spatial resolution to support policy development based on state-level data.

Recommendation A.2.3.1 Improve mapping and characterization of likely storm and precipitation impacts to Maine's watersheds and riverine flood zones. Specifically, obtain LIDAR data for known significant riverine floodplains, and develop better models for precipitation impacts by updates to national Precipitation Frequency maps [often identified as "TP 40"] for New England.¹⁷ Enhance exist-

¹⁶ From the IPCC Fourth Assessment [check title]: http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_appendix.pdf. For further information about these models and their limitations, see *MCF* 14.

¹⁷ Currently, the Northeast Climate Research Center at Cornell University is engaged in work that will produce a similar result. TP 40 maps are based on the historic record, and are used to de-

[ing University of Maine efforts to develop predictive models such as those for precipitation at the watershed and regional levels. Over the longer term, develop protocols for using these data to delineate resource protection areas and provide modeling for stream flow events in watersheds to assist in design of road crossings.](#)

A.3 Information and Awareness

The enormous amount of information on climate change at the global, national, and regional scales, and the sheer volume of new, [sometimes conflicting, data and information](#) that arrives daily in the media and on the worldwide web, makes it difficult for interested Maine people and decision makers to sort and utilize climate information specific to our state.

Strategy A.3.1 Maine Citizens, Businesses, Public Interest Groups, and Government Entities Must Have Access to Reliable and Relevant Information About Climate Change Impacts. [\(see also D.1.1.3\)](#)

There is an identified need for Maine to develop systems that encourage collection, coordination, assimilation, and dissemination of climate change data, and to produce commonly understood and consistent messages about the impacts of climate change.

Recommendation A.3.1.1 [All state agencies that regulate or provide support to various economic sectors, business activities, municipal land use and land trust planning efforts, or public service infrastructure should be charged with identifying likely climate change effects specific to those groups, and then work with affected entities to develop and disseminate information that will build awareness of the need to plan for these impacts. For example, Maine DEP should develop materials specific to publically-owned wastewater treatment facilities \(POTW's\) that assist such facilities to consider the effects of increasedchanging precipitation and/or SLR on their infrastructure, and support decisions needed for capital planning, disaster mitigation, etc.](#)

termine how much rainfall to account for in designing and installing stormwater management systems such as culverts and struts. The current TP 40 maps are generally regarded to be substantially out-of-date, and thus underestimate current needs without regard to likely potential increases in number and intensity of precipitation events.

Recommendation A.3.1.2 The University of Maine should continue its effort to establish a Maine climate information and coordination office to link information and resources from the University, other climate scientists in Maine and elsewhere, and Maine DEP and other agencies. The office would coordinate information on climate initiatives being carried out by public and private research institutions; develop an inventory of existing environmental monitoring programs (see A.1.1), and make information available to the public and decision makers at all levels of government in Maine.

Recommendation A.3.1.3 Identify a group of “leading indicators”, and Maine’s position along those gradients of change where known, is a high priority. This would offer the public and local officials a short, concise climate change “dashboard” in ordinary language specific to Maine.¹⁸ The foundation for this is already found in *Maine’s Climate Future*, and the University of Maine, Maine DEP, and others should coordinate this effort.

A.4 Planning and Coordinating Maine’s Adaptation Efforts

A.4.1 Public Sector Planning

As previously noted, responding to current challenges associated with climate change in Maine, and building resilience and adaptive capacity for the future, is in many ways a connected series of planning activities. In each area of concern, individuals, interest groups, government entities, and others identify natural and human systems that may be sensitive or vulnerable to, or at risk from, likely climate impacts and effects. Based on best available historic information, current monitoring data, and predictive models, they then develop planned responses to the anticipated challenges, identify the resources needed to implement those responses, and, in the best case situation, go on to put them in place as monitoring and assessment of new data demonstrate their need (i.e., “monitor → plan → adapt”). As noted above, this is particularly important at the local level where specific actions will be implemented that directly affect Maine people.

¹⁸ Dials on the dashboard would likely include, for instance, a sea-level indicator showing measured historic change and projected height, with a mark for most recent data; and a similar representation of temperature in Maine’s different climate zones. See *MCF 21*, 13 for examples.

Strategy A.4.1 *Develop and Disseminate Tools that will Allow Local and Regional Planning Authorities to Initiate and Implement Their Own Adaptation Planning Processes*

In order to address the many issues outlined in this Report, such as risk assessment of local infrastructure, potential changes to land use practices and regulations, protection of vulnerable habitat, or effects on local public health delivery systems, additional resources will be needed to provide support and technical assistance for climate adaptation planning. In York County, inter-jurisdictional cooperative planning for climate change is already well-established, including compilation of examples of “best practice” that cities and towns can use to build resilience from coastal hazards.

Recommendation A.4.1.1 The State Planning Office should convene stakeholders to develop, and subsequently distribute technical assistance materials to support the development of local adaptation plans. that is linked to Growth Management Act requirements^{[JA5].}_[MCB6]

Recommendation A.4.1.2 Maine should re-institute the provision of State Planning Office grants to municipalities and quasi-municipal entities, specific to local climate adaptation planning. Grants should emphasize inter-local collaboration in planning efforts. *Would require legislative action to fund. Could be initiated as a pilot effort using non-state grant funding.*

Recommendation A.4.1.3 The State Planning Office should coordinate the multiple ongoing efforts to develop materials for building climate change awareness at the local level and among organizations such as the Maine Association of Conservation Commissions to insure that a consistent message is being delivered and that resources are being used as efficiently as possible.

Strategy A.4.2 Foster Regulatory Approaches that Utilize Multi-agency and Public / Private Collaboration to Address Climate Change Adaptation Issues

Existing laws and regulations govern a wide range of actions that may be taken to address existing preparedness, or to build resilience and adaptive capacity. Most were designed and written prior to the emergence of climate change concerns, and thus did not consider potentially significant effects of climate change on rare species, priority habitats, and other important natural resources. Furthermore, these laws and regulations

often conflict and/or overlap. It will be important for Maine to develop ways to refine these to incorporate climate change adaptation issues without compromising their original purpose and intent. At the same time, there is a need to address impediments to regulatory change that hinder long-term decision making.

[Recommendation A.4.2.1](#) [Assess, revise, and as necessary integrate existing legislation and rules¹⁹ to assure their strength and applicability in the context of projected climate change effects. This may include a state designation of high-risk areas.](#)^[MCB7]

[Recommendation A.4.2.2](#) [State regulatory agencies should review, and revise as necessary, regulations that may make it difficult for municipal and private interests to carry out appropriate adaptation measures. Revisions should provide opportunities for a reasonable degree of flexibility so that municipalities can implement creative approaches that integrate state and local climate adaptation and community sustainability goals.](#)

[Strategy A.4.3](#) [Establish and Utilize a Policy Framework at the Federal, State, and Local Level that Recognizes the Inter-connected Nature of Climate Adaptation Impacts, Effects, Research, and Planning Needs](#)

[Recommendation A.4.3.1](#) [Maine's federal and state legislators should advocate for Federal climate change legislation and appropriations that provide Maine with resources to support the critical monitoring, research, information exchange, and adaptation planning uniquely applicable to Maine. This would both preserve the values of Maine's natural resources and economy, and provide the framework necessary to identify and develop new opportunities that should also be part of Maine's adaptation strategy.](#)

A.5 Build Capacity in the Private Sector to Address Climate Change Adaptation

[As you can see, we're in need of suggestion for strategies here] [CS suggestion: Private sectors should be encouraged to work at the local level and engaged with state-led programs. They should also identify "climate change liaisons".](#)

¹⁹ Likely regulations include the Natural Resources Protection Act, Site Location of Development Act, Maine Endangered Species Act, Sand Dune rules, Shoreland Zoning rules, and flood plain management rules.

A.6 Integrate Adaptation Planning into A Climate Action Plan for Maine 2004

[CAPM], Maine's Existing Mitigation Plan

LD 460 specifies that, "[c]onvening this group to respond to climate change must not reduce continued strong state efforts to reduce greenhouse gas emissions." As the Third Biennial Report on Progress toward Greenhouse Gas Reduction Goals to the Natural Resources Committee (2010) points out, preliminary analysis through 2008 suggests that Maine's emissions are approaching the statutory target of a return to 1990 levels. However, not all of this progress can be attributed to the implementation of policies adopted in the 2004 Plan. In the context of the current Report, it is imperative that Maine's climate adaptation planning identify actions that serve both to mitigate and respond to climate change impacts and effects.

A number of the recommendations in this Report meet this standard, in several different areas as follows:

Energy Production and Efficiency

A primary strategy area in CAPM involves the more efficient use, and replacement, of greenhouse gas-emitting energy sources. For example, improvements to infrastructure energy codes; weatherization of Maine's aging domestic housing stock, and upgrading of energy-intensive capital equipment such as sewage treatment motors all decrease the demand for fossil energy. Similarly, development of alternative and renewable energy sources such as wind and biomass can serve to increase the reliability of Maine's energy transmission grid. At the same time, such actions serve related adaptation purposes, as indicated by the following strategies:

Strategy B.1.3 *Review and Modify Design Standards to Account for Likely Climate Impacts*

Strategy B.1.5 *Strengthen Existing Municipal Water Management Programs.*

Strategy B.1.6 *Assess the Climate Change Vulnerability of Maine's Energy and Telecommunications Networks*

Strategy B.3.1 *Assure that Maine's Urban Housing Stock...is Resilient to Likely Climate Impacts*

Transportation and Land Use

Recommendation B.2.3.1 *Assess Potential Risks to, and Opportunities for, Maine's Rail System*

Forests and Agriculture

The forestry section of Maine's mitigation plan focuses on actions to preserve and enhance Maine's forests and timberlands in the interest of carbon sequestration and the production of sustainably-grown wood for biomass energy and long-lived products. It also notes the increasing pressure from development that has converted forests to other uses in recent years. As indicated below in this Report, maintenance of the forest is a key element in assuring ecosystem services necessary to the support of wildlife and fish in a changing climate regime, and to water quality for human use. Since over 90% of our forests are privately owned it will be important to not just regulate adaptation, but provide landowner incentives and support to keeping Maine's land forested. Thus, there are explicit links to

Strategy B.3.2 *Maintain and Enhance Urban and Community Forests*

Strategy C.3.1 *Build Maine's Knowledge Base on Potential Climate Impacts to the Forest Environment, with recommendations on pest and pathogen management, and ongoing research on changes in species composition, etc.*

Strategy C.4.1 *Include Climate Change Effects on Wildlife and Habitat in Land Conservation Planning and Decision-making, with accompanying recommendations*

Strategy C.4.2 *Expand Current Efforts to Maintain and Restore Critical Wildlife Habitat and Assure Connectivity.*

Maine's agricultural resources have an identified role in mitigating the effects of greenhouse gases, including practices to enhance carbon sequestration through different cultivation techniques, and increasing production of locally-grown food to limit emissions associated with food product transportation. These match well with adaptation strategies such as

Strategy C.5.1 *Build Research and Cooperative Extension Capacity particularly to identify and test new varieties more apt to thrive in a changed and changing agricultural climate that would also be available as locally-grown substitutes for crops from "away," thus increasing Maine's food security.*

B. Maine's Communities and People

B.1 Built Infrastructure

The built environment of Maine includes what we generally think of as “human infrastructure:” the things we construct to provide us with shelter, places in which to work and do business, and common services such as transportation, [safe drinking water](#), [wastewater treatment](#), and energy. These are critical to our society, so that climate impacts that may disrupt them will have real impact on our daily lives. At the same time, they represent those sectors of our economy in which we have the greatest financial investment, such that we are already accustomed to calculating the risks associated with potential damage, and making decisions to mitigate or offset that risk. [Replacing old, outworn and inadequate infrastructure is a common and ongoing state-level and municipal activity. Planners must weigh all of the risks, needs and competing projects against available resources when developing plans to improve current infrastructure and develop resilience to potential future climate change effects.](#)

~~All~~[Most of](#) the likely foreseeable climate change impacts [identified above in section III.B](#) would affect the built environment to a greater or lesser extent. In assessing risk and vulnerability, stakeholders were aware that Maine's [adaptive capacity](#) to respond to climate stress in this area is [comparatively](#) high: that is, our society can take actions to protect our built infrastructure, although in some cases the costs will be significant, [and in certain instances, prohibitive](#). In other cases, particularly in the coastal zone [and in riverine floodplains, property owners and government at all levels will be faced with difficult infrastructure choices, including the possibility that](#) it may be most cost-effective in the long term to move or abandon [certain structures and infrastructure](#) at risk of severe damage due to sea-level rise ~~combined with~~[and](#) severe weather threat.

In addition to the vulnerabilities associated with the coastal zone, other concerns or areas of high risk due to climate effects are

- § [The functioning](#) of residential, institutional, and commercial structures due to heat effects and/or severe storms and flooding;
- § [Stability of roadways and highways from the impacts of increased intensity and volume of storm events especially on streams in built up areas;](#)
- § Saltwater intrusion into [public and](#) private coastal drinking water systems, and groundwater contamination from inundation (sea level and inland precipitation) of septic systems;
- § Management of common drinking water systems due to increased seasonal variability and weather extremes;
- § [Stormwater and wastewater infrastructure](#), especially carrying capacity during extremely heavy rain events;

§ Energy and telecommunications capacity due to weather extremes.

[In summary, it is probably fair to say that all our structures and infrastructure, from single-family residences to state-wide energy transmission systems, will, over time, need to be assessed / evaluated within the framework of their vulnerability to the likely impacts and effects of climate change.](#)

“Much of our infrastructure for water delivery, wastewater transport, and transportation is not designed to handle the predicted increase in intense precipitation events” (MCF 25). In order to address these challenges, the working groups identified the following strategies applicable to both vertical and linear infrastructure²⁰:

Strategy B.1.1 Inventory and Assess Public Infrastructure Vulnerability

A recent bi-coastal survey of property owners and municipal officials regarding attitudes and barriers toward climate action identified vulnerability assessment as the highest need.²¹ Maine must develop a framework for identifying and cataloging infrastructure elements at risk of likely foreseeable climate change impacts and effects. This task will include the development of risk assessment tools specific to various infrastructure categories (e.g., wastewater treatment plants; stormwater systems) using a range of climate metrics [and environmental scenarios](#). [Local government involvement will be essential to a comprehensive and equitable approach, and to assure local support of suggested policies and processes.](#)

Recommendation B.1.1.1 [A state-level task force should be convened to develop and disseminate a method to](#) inventory and map all public [drinking](#) water supply systems, waste water treatment facilities, and locations where public linear infrastructure [such as roads or sewer systems](#) intersect surface waters in order to assess vulnerability to increased flows and storm events associated with likely climate change impacts.²² [This should include vulnerability assessment tools that could be used by local authorities.](#)

Recommendation B.1.1.2 The State Planning Office, [local partners](#), and other [state and local](#) agencies should identify, assess and catalogue pier, harbor, and

²⁰ Linear (or horizontal) infrastructure is comprised of systems that support water management (drinking and waste water, surface flows and stormwater); power distribution; and ground-installed telecommunications. Transportation infrastructure is considered in the next section (B.2).

²¹ Citation

²² A recent informal review of available data, which are likely incomplete, identified over 28,000 such intersection points.

waterway infrastructure likely to need elevation or improvement as a result of sea level rise [SLR], more frequent severe weather, and related climate effects. Existing SHIP [\[Small Harbor Improvement Program\]](#), [FEMA](#) and DOT grants could [potentially](#) be leveraged to support this effort [and identify priorities](#). [Where public assets are involved, a priority list based on vulnerability should be established to direct allocation of available funds](#). [When prioritizing infrastructure for adaptation with public funds, project funding should follow protocols established to implement climate change adaptation plans and policies](#).

Recommendation B.1.1.3 Establish a state-level approach that brings FEMA, MEMA, MaineDOT, [the State Planning Office](#) and [municipalities](#) together to identify and prioritize [public](#) infrastructure replacement based on climate adaptation considerations. [Current regulatory and permitting processes may need to be evaluated and adjusted to account for jurisdictional overlap, and to allow for preservation and adaptation of priority infrastructure.](#)^[MCB8]

***Recommendation B.1.1.4** [The Maine Department of Education should include considerations of likely climate change impacts, particularly higher average temperatures at the beginning and end of the school year, in school design and renovation criteria and funding formulas, and work with local authorities to identify older school buildings that may need to account for warmer temperatures.](#)

Strategy B.1.2 Support Continuing Regional and State Efforts to Update Key Monitoring, Mapping, Assessment and Planning Tools
[See A.2.2.1-3](#)

Strategy B.1.3 Review and Modify Infrastructure Design ~~and Insurance Standards~~ to Account for Likely Climate Impacts.

[P](#)ortions of Maine’s built infrastructure are already overdue for upgrading or replacement. [R](#)enovated and/or new structures must be designed to meet expected climate effects. Current design standards must be systematically re-evaluated to this end. Key areas include:

§ [P](#)romoting overall improvements to Maine’s residential housing stock that account for the likelihood of more extreme [weather](#) events, flooding, etc. Increase the adaptive capacity of buildings to be more “self sufficient” during variable climate extremes

through [design modifications such as passive](#) climate control, rainwater capture, [or septic and sewage control. Methods could include revisions and additions to pending state building codes, modification of land use regulations, etc.](#)

- § Review and revise [design standards](#) for significant types of infrastructure such as wastewater treatment facilities, stormwater management systems, etc. [Further development of adaptation standards should strive for compatible and complementary land use and building regulations at local, state and federal levels to allow](#) ~~Encourage~~ innovative technologies [and approaches](#) to better manage significant precipitation events and sea level rise.
- § Add sea level rise benchmarks, siting criteria, and risk reduction guidelines to coastal facility planning.

Recommendation B.1.3.1 Engineering to Lessen Stormwater [and](#) Wastewater Nutrient Effects on Ecosystems: **see C.2.2.2**

~~**Recommendation B.1.3.2**^[MCB9]—The Bureau of Insurance in the Department of [Administrative and Financial Services, Professional and Financial Regulation](#) together with the Maine Emergency Management Agency and the State Planning Office, should develop / modify insurability data used in setting insurance policies and rates to include climate change adaptation criteria. [The agencies may also consider the costs and benefits of requiring greater disclosure of climate change risks to investors by all insurance companies operating in the State of Maine.](#)~~

Recommendation B.1.3.3 ^[MCB10] [Anticipate and establish protocols for preserving at-risk infrastructure that is identified for adaptation in-place.](#)

Strategy B.1.4 *Continue to Develop Policies and Regulations that Restore, Maintain, and Improve the [Resiliency](#) ~~Resilience~~ of Natural Systems, particularly on the Coast, to Climate Change Impacts and Effects [see C.2.1]*

***Recommendation B.1.4.1** [Review and revise Building Codes and Plumbing Codes to anticipate effects of climate change. For example, recent revisions of the plumbing code allow for less system to water table distance for certain systems, which could compromise system if water tables become shallower.](#)

Strategy B.1.5 Continue and Strengthen Existing Municipal Water Management Programs Through Enhanced State Revolving Fund Funding and Development of Innovative Approaches

New approaches might include identification of possibilities for, and resources needed to allow, inter-connection of neighboring ~~public drinking, waste, and storm water infrastructure utilities~~ to increase capacity and build in redundancy. Such initiatives, if undertaken, would also have immediate benefits in any severe weather event or other emergency.

* * * * *

Maine's linear infrastructure also includes the energy transmission and telecommunications networks, and, as the 1998 ice-storm reminds us, these can be extremely vulnerable to the effects of weather. Given that one of the likely foreseeable impacts of climate change is more frequent ice-storm events, as warmer early winter temperatures produce less snow and more ice, there is a clear need for Maine to assess vulnerability in this area of infrastructure. At the other extreme of the climate year, the forecast of more frequent and more acute heat events is expected to put increased demand on the electricity grid. Finally, predicted decreases in the depth of annual snow pack ~~in the western mountains are likely to may~~ have an impact on the large electric generation reservoirs that produce much of Maine's renewable power depending on the ability to adapt storage regimes and increased seasonal precipitation with demand.

Strategy B.1.6 Assess the Climate Change Vulnerability of Maine's Energy and Telecommunications Networks.

This could be accomplished by a legislative request to the Public Utilities Commission to undertake a review, with stakeholder input, similar to that carried out in 2009 by Maine-DOT [see p.]. Such an evaluation might also include an assessment of the vulnerability of the various energy generation and transmission systems current and projected for Maine, including wind and biomass; and appraisal of the usefulness of distributed generation projects to provide back-up and redundancy in view of the likelihood for more frequent severe storms. Another potential area of action would be to develop strategies to reduce the vulnerability of transmission systems, including burial of transmission lines.

B.2 Transportation

It's easy to visualize the effects on surface transportation systems of likely foreseeable climate impacts. In recent years, a number of extreme precipitation events have washed out roads and bridges that had previously been considered more than ade-

quately engineered. Coastal storms have ~~produced pictures of~~ inundated roadways with stormwater and sediment, and have ~~or sand-covered roads and~~ snapped street lamps. Some climate change projections for Maine predict that such extreme weather events will become more common in the future.

The key areas of transportation infrastructure that are most at risk to climate change are culverts, struts, and drainage ditches, and their vulnerability is predominantly related to precipitation and storm events (and, along the coast, ~~to overlaid on~~ sea-level rise impacts).²³ At the same time transportation-related infrastructure can exacerbate negative impacts of climate change effects on drinking water quality and quantity and on natural systems, especially wetlands and streams. Unless structures are well designed and maintained they are likely to impede the resilience of natural systems and their ability to adapt. Infrastructure failure can degrade water quality, quantity, and fish and wildlife populations as sediment and blockages impact the critical movement of fish, wildlife, sediment, and nutrients through streams and degrade instream and shoreline habitat. Extremes in weather and temperature already increase the need for fish and wildlife in and along streams and rivers to find refuge from flow and temperature extremes. Thus, the management of water has the highest priority in assuring preparedness and building resilience to likely climate change effects in the transportation system.

Maine's state-level road transportation system is well-positioned to respond to current climate impacts and build ~~resiliency~~Resilience for the future. Maine's Department of Transportation has included considerations of climate in its long-range planning processes for several years, and recently completed a study, "Climate Change and Transportation in Maine," which addresses strategies to build adaptive capacity in the system. As the authors point out,

Many of these projected impacts already occur with noticeable frequency. ... Many of the issues associated with climate change are expected to be more intense versions of the same problems MainedOT already deals with effectively. This will allow the department to incorporate short-term and long-term adaptation strategies on a gradual basis....²⁴

However, only about ___% of Maine's roads are within MaineDOT's span of control.²⁵ The majority of the roads Mainers use on a daily basis are maintained by municipalities

²³ While bridges might be expected to occur in this list, MaineDOT has recently inspected all bridges with a span greater than 20 ft. and is currently in the midst of modifications to deal with scour. Thus, the stakeholders' assessment is that this area has lower current priority.

²⁴ Maine DOT Environmental Office, 10/14/09, pp. 2,3.

²⁵ Actual mileage data needed here.

or are privately owned. These structures are not well inventoried, and have not been surveyed for vulnerability to increased waterflow. Local officials are generally aware of areas of greatest stress during severe storms, but if projections of more frequent and intense wet weather come to pass, much of this infrastructure may be at risk.

Strategy B.2.1 ~~Complete an~~Develop a Method to Inventory Roadways, Culverts, Struts, and Related Infrastructure at All Jurisdictional Levels, and Overlay This Information onto NOAA and FEMA Maps of Floodways, Coastal Inundation Zones, etc.

Compiling this information will require substantial resources and a specific implementation plan, including development of standard assessment and inventory tools that are made available to municipalities and private road owners; determination of watershed characteristics that pose the greatest risks to transportation structures; and creation of a common repository for the information with protocols to assure continual updating and dissemination to utilities for planning purposes.

As recommended above (A.2.2.1-2), acquisition of LIDAR data for Maine would be greatly beneficial to MaineDOT, and thus to the taxpayers and traveling public in Maine. LIDAR will make available high resolution elevation data over a large portion of the state, including coastal areas and the most heavily populated and developed areas. MaineDOT is responsible for countless road-waterway crossings. LIDAR data will make it possible to complete preliminary design procedures for these structures while minimizing the need for on-the-ground site visits. A critical element in waterway crossing design is assessment of high flow carrying capacity and flooding potential. LIDAR will provide additional data that is not ordinarily collected in the design process that will contribute towards improved assessments of flooding potential. MaineDOT projects crossing surface water bodies, wetlands, and coastal marshes often have the potential for imposing environmental impacts. LIDAR data will allow MaineDOT to assess these potential impacts at an earlier stage in the process while avoiding the need to collect the usual amount of project-specific data. This will result in cost savings and better project design.

Recommendation B.2.1.1 Maine DOT should initiate development and distribution of inventory/assessment tools; provide information to local jurisdictions on potential climate change impacts related to routine maintenance and repair, and capital improvement planning; and provide technical assistance to local entities for modifying existing road structures to mitigate current effects.

Strategy B.2.2 Develop or Update Transportation Infrastructure Design Standards that Take Into Account Best-Available Calculations of Recent-Historical and Projected Storm Hydrology [see also Recommendation C.4.2.4]

This effort may also determine methods for identifying the need, and setting priorities, to raise, retrofit, relocate, and/or consider abandonment of (where re-engineering is too costly), [roadways and](#) structures at risk of climate change effects.

Recommendation B.2.2.1 (if we have one)

Maine's rail system shares vulnerability to likely climate effects similar to the road system, and faces the challenge of greater constraints on available remedies because of less-flexible siting.

Recommendation B.2.3.1 Maine DOT should conduct a comprehensive assessment of potential risks to, [and opportunities for](#), the state's rail system associated with climate change impacts, and develop standards for upgrading to projected future conditions. [Privately-owned rail companies should be invited to join this effort as stakeholders.](#)

[CALLOUT BOX: an enhanced rail system/service has the potential of reduce the emissions "cost" of transportation and at the same time reduce vulnerability to storm-caused system disruption\[P11\].](#)

B.3 Urban Areas

[In a rural state such as Maine, urban areas hold particular importance as the centralized locations for economic, medical, educational and transportation services. Likewise, as cultural destinations, downtowns play a vital role in the state's creative, hospitality, and tourism economies. Climate change impacts will be felt acutely in urban areas and corresponding adaptive strategies need to accommodate the unique needs of cities and town centers. Furthermore, improvements to cities and established town centers have capacity to benefit large numbers of people, create transportation efficiencies, and combat the eroding influence of sprawl on the rural landscape. The adaptation of cities, particularly Maine's coastal cities, will be a crucial challenge in the State's climate change future. In addition to the following strategies, other areas for future strategic development include:](#)

- [Development of policies for protection of and accessibility to vital urban service centers, especially during emergency events \(see B.8\)](#)
- [Protection of areas of state cultural significance such as urban and village waterfronts and historical structures of state significance](#)

Strategy B.3.1 Assure that Maine’s Urban Housing Stock, Including Multi-Family and Public Housing Units, Is Resilient to Likely Climate Change Effects

Maine’s residential housing stock is frequently identified as among the oldest in the country.²⁶ This is [as true in urban areas that grew originally as industrial communities from which the industries have departed as in rural areas](#). ~~As is the case elsewhere in the state, s~~Such housing [frequently](#) does not meet current standards for weatherization, energy efficiency, and ventilation. [It is important, especially for Maine’s multi-family residential housing stock, to retrofit these structures for increased passive survivability so, in the event of an emergency, the building remains safe and habitable until services can be restored](#). As Maine seeks to update and improve its housing toward the recently-announced goal of 100% weatherization by 2030, a goal that will reduce energy use and thus Maine’s contribution to greenhouse gas emissions, it is vital that renovations take climate change impacts [and related human health risk](#) into account.

Recommendation B.3.1.1 [see also B.1.3, [B.6.2.1](#)] The Maine State Housing Authority, with the assistance of the Maine Green Building Council, the Maine Chapter of the American Council of Engineering Companies, and other stakeholders, should be charged to develop tools to assess the climate vulnerability of older (> 30 years) public and multi-family housing, and make recommendations for renovation standards that account for this.

Strategy B.3.2 Maintain and Enhance Urban and Community Forests
CALL-OUT BOX: [link to mitigation, improvement of local environment, etc.](#)
[When most people think about the “Maine forest,” the image in mind is likely to be of unbroken miles of woodland. But as population growth and development continue to transform some of this acreage for residential and commercial uses, Maine’s urban and community forests will have increased importance in responding to climate change. These forests can contribute to mitigating greenhouse gas emissions by absorbing and](#)

²⁶ Reference

sequestering carbon dioxide; they can play a crucial role in offsetting the “urban heat island” effect of increased summer temperatures; and they support community well-being as outdoor recreation space. Since they are also vulnerable to climate stressors such as new pests and pathogens, and damage from severe storm events, there is a clear need to assure their continued vitality.

***Recommendation B.3.2.1** The Maine Forest Service in the Department of Conservation should develop a strategic plan for the maintenance and enhancement of urban and community forests in the light of anticipated climate change effects. The plan should include recommendations for

- Increasing financial and technical support to municipalities to improve street tree planting and maintenance, and community forest management;
- Inventorying, and developing as needed, resources for pest and pathogen early detection, outbreak planning, and response to catastrophic weather events;
- Making incremental changes in street tree species composition and diversity
- Outreach to homeowners, municipalities, and others in support of these efforts.

B.4 Land Use and Land Use Planning

Most Maine people have a strong attachment to the land they live on and enjoy, and strong opinions about the regulation of its use. How Maine citizens, businesses, and communities account for most likely climate impacts in development and land use planning is likely to be an ongoing process of considering data and forecasts, assessing vulnerability at a local level, and developing public policy with the understanding that today's decisions will undoubtedly need to be revisited on a regular basis. An important consideration will be how to integrate planning for adaptation to climate change into existing planning approaches and requirements.

Strategy B.4.1 Develop Approaches to Encourage Planning for Resilient Communities into the Existing Comprehensive Planning Process

***Recommendation B.4.1.1** SPO should include elements of planning for Resilience in the face of likely climate change effects in Chapter 208, the Comprehensive Plan Rule. Until data is available to support specific analysis at the municipal level, these elements of Chapter 208 would not be used to determine consistency of a comprehensive plan but rather serve to start the conversation at

[the local level and will help inform community planning decisions](#) in the different regions of the state.

Strategy B.4.2 Develop a Series of Models for Adaptive Land use Planning for Decision-Makers at all Jurisdictional Levels

Maine’s local municipalities, [land trusts](#), regional planning commissions, and state-level agencies such as the Land Use [Planning-Regulatory Commission \(DOC\)](#) and [SPO Land Use Team](#) each have a role to play in the planning necessary to meet existing climate-related challenges and build future resilience. Local conservation commissions [and land trusts](#), where they exist, can help lead efforts to encourage towns to undertake appropriate planning, and to work directly with ~~resident~~ landowners [to identify low-lying undeveloped coastal uplands and floodplain areas that have the potential to support wet-land migration resulting from SLR and increased storm flows.](#) ~~Municipal and regional to implement local open space plans.~~ Their decisions must be based on climate change risk assessment to inform both existing development and growth management. [Maine’s growth management act currently requires towns to address marine resources, water resources, critical natural resources, transportation, municipal facilities, and future land use plans. Each has a clear nexus to climate change adaptation.](#) Models and planning tools should distinguish between existing developed areas, ~~and~~ those that may be considered for development, [and rural areas](#).

Recommendation B.4.2.1 Over the longer term, Maine should develop ~~potential-systematic~~ approaches and incentives for [conservation and/or](#) purchase of property that allows for [ecosystem protection, landscape connectivity, natural retreat of wetlands in response to SLR,](#) ~~retreat~~ and response to inland inundation risk. [Some of these will be identified at the municipal level or by local land trusts that have incorporated climate change adaptation concerns into their strategic conservation plans.](#)

Recommendation B.4.2.2 ~~A collaborative effort of state officials and public interest groups~~The existing “Beginning with Habitat” [collaborative effort](#) should develop ~~ways to empower~~[incentives for](#) municipalities [and landowners](#) to develop local open space plans responsive to adaptation needs. [At the same time,](#) the state [should](#) invest in [Land for Maine’s Future \(LMF\)](#) or similar programs to assist

towns in the long-term protection of key landscape linkages or undeveloped [low-lying](#) coast line [and other vulnerable areas and habitats](#). **See also C.4.1**

Strategy B.4.3 [Coastal Adaptation: Establish a Continuing State-Level Effort to Set-Develop Policy, Prepare For, and Create Resilience to, the Most Likely Foreseeable Impacts of Climate Change on the Maine Coast](#)

The coastal zone has a unique set of challenges and opportunities associated with climate change effects to require dedicated attention. ~~While much of planning and implementation will rest in the hands of regional commissions and local authorities, there is a clear need for a state-wide strategy and standards for land use and development. Planning for climate change effects will have to take place at all levels of government. There is a clear need for state-wide strategy and standards~~^[MCB12] ~~for land use and development supported by regional planning to determine regional needs with specific implementation steps developed at the local level, each level nesting into the other.~~

Recommendation B.4.3.1 Maine should develop ~~a uniform-standardized set of~~ criteria for assessing coastal communities and infrastructure for response and resilience to likely climate impacts, including a mechanism for evaluating vulnerability. ~~These should recognize the unique ecological, social, and economic qualities of different areas of the coast, and should be used to guide investments in infrastructure repair, protection, and land conservation and restoration.~~

Recommendation B.4.3.2 Maine Geological Survey should [periodically](#) evaluate the adequacy of current ~~regulatory~~ setback [requirements for beaches and bluffs](#) on current maps, and review / update existing policies and best management practices to promote “soft” ^[MCB13] ~~solutions~~ and minimize armoring of eroding [beaches and bluffs](#) so as to ~~maximize sediment recruitment and transport~~ [allow appropriate erosion and transport to naturally nourish beaches, estuaries, and sand bars.](#)

Recommendation B.4.3.3 The State Planning Office and the Department of Environmental Protection, [in collaboration with municipalities and landowners](#), should jointly review current [state-level](#) limitations and prohibitions on development in coastal areas, particularly for beach/dune areas, and make recommen-

dations to align policies and incentives so that public funds would not be available to underwrite expansion or rebuilding in hazard areas [without appropriate evaluation and necessary engineering to withstand climate impacts and effects](#).

[See also D.1.2.1.](#) Other areas for potential action would include:

- § Reforming National Flood Insurance Program administration to discourage reconstruction in hazard areas;
- § [Establish policies to allow significant infrastructure to be maintained with adequate standards for engineering and redevelopment.](#);
- § Development of a plan to reduce existing built infrastructure on beaches and dunes, and/or provide incentives to promote “softer” solutions to prevent destruction. Such a plan could identify resources that could be used for strategic buy-outs of at-risk property. **[See also C.2.1.2](#)**;
- § Develop a property insurance premium structure that reflects actual local risk ([see B.1.3](#))
- § Review of existing regulations and flood plain management rules toward an integrated regulatory scheme that incorporates climate change issues [and emerging trends](#), and clarifies municipal and state responsibilities.
- § Establishment of [adaptation](#) policies for state-owned properties and investments [MCB14]in the coastal zone;
- § Identification of incentives / disincentives applicable by the financial services industry to reflect costs and benefits of coastal infrastructure investments under conditions of climate change;
- § Economic development planning that ~~includes opportunities for beaches to migrate~~[allows for the natural migration of beaches](#).
- § [Review of potential protective zoning for lands likely to become coastal wetlands under projected two-foot sea level rise. \(In effect ,extending the concepts currently applied to beach rebuilding to the upper edge of salt marshes\)](#)

[Recommendation B.4.3.4](#) [See C.2.1.2, coastal acquisition.](#)

B.5 Rural Communities and People

In recent years, as Maine’s population distribution has shifted significantly toward urban and suburban areas in the south and west of the state, partially as a result of shrinkage in the traditional natural resource industry employment base, smaller towns and rural areas have seen a decline in their capacity to provide public services. Maine’s regional planning commissions and councils of government also appear to be less active in predominantly rural areas. In addition, planning at the local level is often not as strong in rural communities and small towns as in larger municipalities. As a result, it may be valuable to consider the particular needs of rural communities and people in the face of likely climate change impacts, in order to assure equal access to tools and resources needed to build resilience into their local structures, systems and economies. It should be noted, however, that some smaller communities may enjoy an advantage in resilience because of strong social ties and traditions of self-reliance.

Strategy B.5.1 Assess the Climate Change-Related Needs of Smaller Communities and Rural Areas of Maine, and Assure Resources and Technical Assistance to Build Adaptive Capacity

Recommendation B.5.1.1 The Maine Emergency Management Agency [MEMA] should develop assessment guidelines for local use to evaluate community all-hazards vulnerability and emergency preparedness, both current and future in light of climate change. MEMA and County Emergency Management Agencies should continue to provide technical assistance to rural communities in emergency preparedness, and build on existing social networks and relationships to optimize resilience. [See also B. 8].~~should conduct an assessment of disaster preparedness in Maine’s rural areas, and make recommendations to the Legislature regarding resources needed, and steps to be taken, to build response capacity and resilience. The study should include particular attention to development of regional response systems.~~

B.6 Health and Social Well-being

Climate change presents a serious threat to the public’s health. According to the authors of *Maine’s Climate Future*, temperature and precipitation are likely to increase across the state in the 21st century, and these changes “threaten to decrease air quality, increase the spread of animal and microbial sources of disease, and increase danger

from extreme weather events.”²⁷ As a result, the medical, public health, and social services communities have particular responsibilities for identifying threats to Maine’s people, and for leading the effort to prepare for, and adapt to, the likely consequences. To be able to plan for adaptation and prevent negative impacts on the health of Maine’s residents, it will be necessary to design and develop systems to measure and monitor climate-related health effects, identify those populations which may be most vulnerable, and respond to climate-related public health emergencies effectively. The following strategies and recommendations have been developed by Maine’s public health agencies and stakeholders in order to address this need.

Strategy B.6.1 *Evaluate the Ability of Existing Public Health Surveillance and Tracking Systems to Assess Existing and Emerging Climate Change-related Health Threats.*

This effort would involve enhancing existing surveillance systems to include those climate-related health threats that are insufficiently covered by existing systems, and would require additional resources.

Recommendation B.6.1.1 Review existing data and current research to ensure that climate-related health concerns, such as expanding and emerging vector-borne diseases, exacerbation of respiratory symptoms due to increasing temperatures or air pollutant levels, and increasing algal blooms and water-borne disease outbreaks due to increasing temperature and precipitation, are known and understood.

Recommendation B.6.1.2 Pilot-test proposed indicators for climate change-related health effects based on existing indicators developed by the Council for State and Territorial Epidemiologists²⁸, as part of the Maine Center for Disease Control’s (ME-CDC) Environmental Public Health Tracking program. In specific, indicators for heat-related morbidity and mortality should be constructed, and the utility of other proposed indicators of climate change-related health effects should be evaluated.

²⁷ MCF 58

²⁸ English, PB, AH Sinclair, Z Ross, et al. *Environmental Health Indicators of Climate Change for the United States: Findings from the State Environmental Health Indicator Collaborative*. Environmental Health Perspectives, [117\(11\): Nov 2009](#).

~~Build climate change vulnerabilities into the universal wellness initiative currently being implemented by Maine Centers for Disease Control and Healthy Maine, and built a bridge to the Environmental Public Health Tracking program.~~

Strategy B.6.2 Identify highest-risk to public health emergencies likely to result from climate change effects, and develop specific state- and local-level plans to respond.

~~**Recommendation B.6.2.1**—Maine CDC should convene a Heat Emergency Task Force to review requirements and guidelines for, and status of existing infrastructure to respond to, heat emergencies, including related air quality issues. This effort should include MEMA and DEP. [SoM15]~~

Strategy B.6.3 Develop Preventive and Responsive Measures to Address Behavioral Health Issues associated with Climate Change Impacts and Stressors such as Disaster Trauma.

Recommendation B.6.3.1 Maine CDC should develop resources, and provide training, for health providers (including local health officers) on behavioral emergency preparedness. This effort should ~~build on existing crisis intervention services to~~ develop new models that include ~~disaster response curricula, and that assist Maine people to~~ assist the establishment of guidelines and methods for ~~introducing mental health resilience~~ at the community level ~~to promote successful adaptation to the effects of a changing climate. to develop “mental health resilience.”~~

~~*Strategy B.6.4* — *Develop and disseminate health and wellness information to health providers and Maine citizens that identifies climate and climate-related stressors as health issues in order to build awareness and promote community response.* [SoM16]~~

~~**Recommendation B.6.4.1**—Maine public health agencies should build on current health information systems by reviewing existing materials and distribution methods to assure that climate-related concerns such as vector-borne diseases; pulmonary problems likely to be exacerbated by climate changes such as increased heat events; water-borne diseases resulting from emergency loss of drinking and wastewater infrastructure, etc., are known and understood.~~

Strategy B.6.4 Over the Longer Term, Adapt the Built Environment to Mitigate the Impacts of Climate Change on Human Health see B.1.3

* * * * *

In addition to strategies to address the effects of climate change on public health and welfare systems in general, stakeholders noted that Maine has particular vulnerable populations and communities of special concern when viewed through the lens of climate. These include:

- § Elders
- § Indigenous people
- § Children
- § Refugees and migrants

§ Disabled / handicapped

§ Low income groups

Any of these may be disproportionately affected by one or more climate change impacts since they are already vulnerable due to factors unrelated to climate. For example, many of Maine’s indigenous people, as pointed out in *Maine’s Climate Future*, depend heavily on agriculture, forest products, and tourism, changes to any of which may put traditional Indian economies and cultural identity at risk.²⁹ Similarly, the elderly and very young are likely to experience health impacts more intensely because of their compromised or less-developed immune and disease-resistance systems. Many of these groups have [less](#) access to information and resources that would otherwise allow them to be proactive in preparing for climate-related natural disasters and weather events, [and associated health risks](#).

Stakeholders pointed out that any strategic response to the needs of these populations needs to be undertaken in a way that assures their integration into the wider overall scheme of planning and response, rather than being treated strictly as having “special needs.”

Strategy B.6.5 *Assure that the Needs of Maine’s Communities of Special Concern are Accounted For and Integrated Into Climate Adaptation Planning*

Components of such a strategy would include actions such as:

- § Identifying specific groups and communities at the highest potential risk
- § Providing climate adaptation information that takes into account differences in perceptions and cultural norms about health to relevant advocacy organizations
- § Developing methods to assure that health and social service providers are aware of the [particular-special](#) climate change-related needs of these communities / populations
- § Engaging the Governor’s Office of Multi-cultural Affairs to assist in planning.

B.7 Recreation and Tourism

All of the likely changes to Maine’s climate will affect recreation and tourism, a major contributor to the state’s economy. The industry and outdoor users have already observed changes in seasonality (such as earlier ice-out dates on lakes and ponds, and shifts to later-season snowfall), and as overall warming increases, there is a high likelihood that Maine may become the “last refuge” in the Northeast for winter sports enthusi-

²⁹ *MCF* 35-38.

asts. On the other hand, as summer temperatures and heat-related air quality [concerns](#) increase, some people may be [less](#) able to take advantage of outdoor recreation opportunities.

Maine already has a multi-faceted and highly-developed approach to land conservation that allows public access for recreation in addition to other primary purposes such as habitat protection and maintenance of working forests.

Strategy B.7.1 *Assure that All State Programs [Involved in](#) Acquisition of, or Access to [and Use of](#), Public Lands Include Climate Change Adaptation in Planning and Decision-making [see also C.4]*

[As conditions change, Maine's public lands such as parks, wildlife refuges, conservation areas, and eco-reserves may experience changes that would dictate changes in the way they are accessible and used. For instance, later onset of cold winter temperatures with resulting rain instead of snow may limit the period of motorized access to some areas. Similar conditions would likely increase the vulnerability of some areas to damage from use. The state's land managers will need to account for these changes.](#)

[***Recommendation B.7.1.1** State agencies and programs responsible for the use of public lands should collaborate in developing a long-range plan to account for likely climate change impacts.](#)

Strategy B.7.2 *Develop and Implement Strategies to Raise Climate Change Awareness in the Recreation and Tourism Sector.*

Since many businesses in this sector are small [and independent, they may not have access to up-to-date information about likely climate change effects on their industry.](#)³⁰

CALL OUT BOX: Lots of opportunities. [Develop, prioritize ITS trail system enhancements to allow for year round multi-use motorized recreation \(so in years and areas with not enough snow for snowmobiles there is still infrastructure that can work for ATVs?\)](#)

[***Recommendation B.7.2.1** The Office of Tourism in the Department of Economic and Community Development should initiate an effort with representatives of the various sectors of the industry to identify and respond to their needs for information that will assist them to build business resilience to climate change.](#)

* * * * *

A significant share of out-of-state tourism is centered in the coastal zone, which faces the particular challenges associated with sea-level rise in addition to those likely to

³⁰ For a short summary of both positive and negative impacts, see *MCF* 48-50.

be experienced inland. For example, as summer heat increases, demand for ocean-front recreation may increase at the same time that some beaches lose capacity due to [erosion and SLR](#), and others experience more frequent closures due to bacteria caused by stormwater run-off and wastewater overflow.

Strategy B.7.3 [Utilize Existing Data, and Develop Specific Models, to Assist the Coastal Tourism Industry in Responding and Adapting To Climate Variability.](#)

[Coordination among tourism officials, industry, economist, natural resource agencies, and state and local planners will be needed to develop these approaches.](#)

[Recommendation B.7.3.1](#) [Suggestions??](#)

B.8 Emergency Management

Emergency management and disaster response are a fundamental responsibility of government at all levels. Response to severe weather events causing flooding or power outages, for example, is standard for local municipalities and emergency services, utilities, and for state- and Federal-level management agencies. However, given the reasonable expectation of more frequent and more intense weather events in coming years, with a corresponding increase in demand for emergency response services, the stakeholders are agreed on the need for a careful evaluation of Maine's current capacity in this area, and for planning to meet critical needs in the future.

[Efforts are currently underway to address known areas for improvement in emergency planning and response. These efforts include development of regional response capacity, which encompasses facilities, equipment and trained personnel. It will be critically important to continue these and related initiatives into the future, to ensure a continuing ability to respond effectively to more – and more severe -- weather-related emergencies.](#)

Strategy B.8.1 *Create Comprehensive Assessment Tools that All Levels of Government Can Use to Build [Resilience](#) into Emergency Management and Response Systems*

Recommendation B.8.1.1 Develop and distribute to local jurisdictions and services tools that will allow them to evaluate the potential effects of climate change-related impacts on their emergency response capacity [and critical infrastructure](#). Examples include:

- § Hospitals and other health-care delivery facilities;

- § Assessment of local road systems that may be at risk of impeding emergency or disaster response due to weather;
- § Assessment of municipal response providers' communications and delivery capacity under extreme conditions.

Strategy B.8.2 Continue to Improve Cooperative Efforts among Agencies at All Levels to Assure Needed Redundancy in Disaster / Severe Weather Situations

Recommendation B.8.2.1 ~~Improve~~ Continue to improve interactions among Federal, State, and local emergency services planners and providers to promote regional and statewide response and recovery capacity.³¹ Specific ongoing initiatives to support this recommendation include:

- Adoption of a statewide mutual aid agreement.
- Standardized response training to support mutual aid.
- Enhancement of interoperable communications systems.
- Development of regional emergency shelter system(including the ability to serve those with disabilities, and to protect domestic pets);
- Development of mutual aid systems with the other States and eastern Canadian provinces.
- Development in cooperation with FEMA of debris management, resource allocation and deployment plans.
- Supporting FEMA initiatives to build comprehensive catastrophic disaster plans in partnership with the State.

~~—Possible methods include:~~

On the open waters, the effects of storms and other weather extremes will affect shipping, ferry service, recreational boating, and fisheries, and will probably increase the demand for marine safety services and rescues.

Recommendation B.8.2.2 Maine's congressional delegation should be asked to work with other regional delegations to submit a request to Congress for increased funding for the Northeast Regional Coastal Ocean Observing System (NERAMOOS), and to add in-shore monitoring, to maintain and enhance weather and water quality forecasting capacity.

³¹ This would build on PL 2009 c. 175, calling for the creation of a statewide mutual aid/emergency assistance network, to include climate change impacts.

Recommendation B.8.2.3 see B.5.1.1

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C. Maine's Environment and Natural Resources

C.1 The Gulf of Maine

As it is today, the Gulf of Maine has a profound effect on Maine's climate, weather, quality of life for wildlife and humans, and economy. *Maine's Climate Future* puts it this way:

The Gulf of Maine is one of the most productive ecosystems in the world, supporting commercial and recreational fishers with a combined annual value to the US economy in excess of \$1 billion and providing upwards of 26,000 jobs. The coastal zone of Maine is home to the majority of the state's population and, as the destination for millions of visitors, contributes significantly to the tourism economy (17).

In this section, the focus will be on the Gulf itself, particularly offshore, with an emphasis on marine life. Note, however, that climate impacts in this area will be mirrored in the coastal zone, the subject of the next section.

Those impacts with the likelihood of most significant impact to the ocean are

- § Changes in ocean circulation patterns, especially open ocean current changes that have an impact on the transport of deep cold waters into the Gulf from the Atlantic;
- § Changes in seawater chemistry, including nutrient levels [and acidification](#);
- § [Changes in amount of freshwater delivery to the Gulf from melting ice in the Arctic, which would impact stratification and in turn productivity](#);
- § Changes in seawater temperature; [and](#)
- § [Changes in off-shore wind patterns, a matter of importance in light of current efforts to utilize wind energy](#)

Given the extreme complexity of ocean chemistry, it is not yet clear just what changes such as acidification, calcification, or nutrient transport and availability will have on the marine ecosystem and the species it supports. We know that these are already stressed by other human impacts, especially stormwater runoff, which may be exacerbated by climate change. The entire marine foodweb is expected to undergo changes in both plant and animal species, including the increased risk of invasive species, with corresponding changes to Maine's ocean fishery.

Strategy C.1.1 [Develop a Monitoring Strategy for Key Marine Climate Change Indicators](#)

~~Maine, in collaboration with other Gulf of Maine stakeholders in the United States and Canada, including the federal government, the Gulf of Maine Council on the Marine Environment, the fishing industry, and public interest groups, must develop a comprehensive monitoring strategy for key climate change indicators.~~ Such a strategy should include establishing a frame-

work for coordinating the exchange of scientific knowledge, data collection protocols, regulatory issues, etc., among all interested parties [in the United States and Canada](#).

[Resources are badly needed to initiate and maintain a suite of monitoring programs in the marine environment. For the estuarine and marine ecosystems, climate change affects the physical and chemical properties of Gulf of Maine waters, which in turn alters physiological processes, food webs, and distribution and migration patterns of marine organisms. Robust monitoring programs are needed to monitor atmospheric and water properties, circulation patterns, distribution and abundance of marine organisms \(phytoplankton to marine mammals and sea birds, including invasive species\), changes to habitats, etc. \(e.g., maintenance and expansion of the Northeast Regional Coastal Ocean Observing System \(NERACOOS\) buoys and CODAR systems; Maine-New Hampshire Inshore Trawl Survey, DMR's volunteer phytoplankton monitoring program for Harmful Algal Blooms, and numerous other monitoring programs\). The recent Gulf of Maine Council on the Marine Environment proposal for a Gulf of Maine Restoration and Conservation Initiative could provide the multi-jurisdictional means to address region-wide monitoring needs.](#)

Recommendation C.1.1.1 Maine's academic institutions, public interest groups, and state agencies should establish a working group of experts to catalogue and evaluate existing data / research efforts, and identify significant information gaps to which research should be directed.

Recommendation C.1.1.2^[MCB17] Maine's Department of Marine Resources and other agencies [involved in ocean monitoring](#) should undertake new efforts to restore and retain state-level expertise in marine biology.

Recommendation C.1.1.3 Maine should provide resources for the efforts of the Marine Invasive Species Working Group [\(where does this live?\)](#) to improve long-term monitoring for invasive species in the Gulf of Maine.

Strategy C.1.2 Develop and Advocate for more Adaptive / Resilient Fisheries Management

[Changes in distribution and abundance of marine species are likely. Yet current fisheries management systems present obstacles to flexibility in target species or gear](#)

on the part of any individual fisherman. This adds to the social and economic vulnerabilities of Maine coastal communities. Actions to address this strategy must be multi-jurisdictional.

*Recommendation C.1.2.1 Do we have one?

C.2 Coastal Ecosystems

“The 4,000-plus miles of the Maine coast encompass a wide array of ecosystem types, from salt marshes and sandy beaches to steep cliffs and mountains to numerous bays, inlets, harbors and estuaries (MCF 21).” This section focuses on the likely climate change impacts to that morphology³² and to the natural system populations that live there. The effects of climate change to the human and built environment in the coastal area were discussed in section B.1.

The anticipated rise in sea level (SLR), ~~continuing the accelerating beyond the~~ observed increases during the last century, is ~~a-the~~ primary ~~consideration concern~~ in ~~thinking about planning~~ how Maine’s coast could become more resilient.³³ As noted before, the effects of higher sea surface levels will be compounded by the increase in significant storm events. In addition, increases in precipitation that result in greater stormwater runoff have a coastal impact because most of the additional runoff reaches the major rivers that flow through and into estuaries and wetlands, bringing with it sediments and pollutants.

Strategy C.2.1 Continue to Develop Policies and Regulations that Restore, Maintain, and Improve the ResiliencyResilience of Natural Systems, particularly on the Coast, to Climate Change Impacts and Effects [see B.1.x]

Everywhere on the landscape, but particularly on the coast, land forms and water flows are constantly in flux. For instance, the erosion of riverbanks and coastal bluffs produces sediments that change the course of waterways and nourish fresh and saltwater wetlands over time. Since changes such as these are sometimes disadvantageous to human infrastructure and development, we have been responsible for attempting to resist or mitigate these effects through construction of seawalls, dikes, dams, hardened channels, and the like for hundreds of years. However, this effort to interfere with natu-

³² “Morphology” refers generally to the range of landforms.

³³ See above, p. x, for a discussion of the extent of anticipated SLR.

ral processes frequently has unintended consequences. There is strong scientific evidence that wetlands of all sorts, for example, act as buffers and sponges for the overflow of water from the increasingly impervious human environment, protecting our communities and structure from flood damage. Thus, as climate effects such as SLR (with a corresponding increase of “Highest Annual Tides” on ~~much of~~ Maine’s coast) and severe storms drive beaches, dunes, marshes, and wetlands “inland,” these protective resources may be unable to migrate to new locations. In some areas, Maine risks losing the benefits of systems that provide ~~where they can provide not only~~ protection for our communities, ~~but as well as~~ vital habitat for a wide range of marine and terrestrial species.

Recommendation C.2.1.1 A working group of state agencies (MGS, SPO, DEP, MR, IFW, DOC), in consultation with other stakeholders, should ~~be charged with compiling an inventory of current natural ecosystem buffers along the Maine coast~~continue efforts to identify (1) undeveloped low-lying coastal areas for wetland migration through updated mapping and evaluation of coastal marshes, dune systems, and other wetland types having the capacity to buffer against storm events; and (2) undeveloped uplands that protect these systems and offer potential for eventual inland migration of these systems. The inventory should identify potential areas of loss and gain, including economic, ecological, and cultural value, and ~~recommend design and/or enhance~~ robust monitoring systems such as the southern Maine volunteer beach profiling program to track change and vulnerability over time. Continued support should be provided for the work already underway at the Maine Natural Areas Program and Maine Geological Survey to identify landscapes to which tidal wetlands are likely to migrate in response to SLR.

Recommendation C.2.1.2 Maine should develop a state-level policy for protective zoning, conservation, and land acquisition in coastal areas that will allow for the movement of natural areas and species in response to anticipated climate effects. Such a policy should include metrics to identify priority locations based on best scientific forecasts of highest risk of loss from SLR and related impacts, and promote opportunities for state and local partnerships to develop creative approaches to respond to anticipated climate effects. See also B.4.3.4.

Recommendation C.2.1.3 The Maine Geological Survey, [Departments of Marine Resources, IFW, and Transportation](#), and the State Planning Office should study, and report to the Natural Resources Committee with recommendations concerning, strategies and methods to [prioritize and fund removal of](#) existing tidal restrictions ~~in order to~~[where this would](#) promote natural system maintenance, and [avoid-reduce](#) damage to associated coastal infrastructure. Such a study should also consider issues of fish passage.

Strategy C.2.2 Develop New State-level Standards for Terrestrial Non-point Source Pollution

[These will need to take into account likely increases in sea level rise and precipitation in order to diminish the risk of additional pollution, including toxic and nutrient loading in the Gulf.](#) Runoff of both eroded sediments and human-generated pollutants increases the nutrient load in the off-shore and near-shore areas of the Gulf of Maine, disturbing the ecosystem which serves as the base of the marine foodweb, and contributing to the increased occurrence of [harmful](#) algal blooms which threaten human and marine life. For example, in the summer of 2009, a number of short-nosed sturgeon, a Federal endangered species, were determined to have died as a result of [eating shellfish contaminated with](#) algal [biotoxins](#) in the Kennebec estuary.

Recommendation C.2.2.1 Maine's Department of Environmental Protection should ~~be charged to develop Total Maximum Daily Load (TMDL) determinations for criteria other than bacteria that would apply to particular estuarine waters and watersheds.~~continue the development of marine and freshwater nutrient criteria, [including consideration of potential climate change effects on nutrient levels.](#)

Recommendation C.2.2.2 Maine should improve design standards for the engineering of stormwater runoff and wastewater treatment systems to [account better for extreme events and](#) lower overall pollutant and nutrient loads reaching the Gulf of Maine. [MCB18]

Strategy C.2.3 [Continue to Build Maine's Knowledge Base on Potential Climate Impacts to Riverine and Coastal Fisheries](#)

[Monitoring and detection are critical to developing an understanding of climate change impacts on nearshore and riverine habitats and species which are critical to the productivity of the Gulf of Maine ecosystem. Clam flats, eel grass beds and other critical habi-](#)

tat are likely to suffer from impacts such as warming (air and water), acidification, and pollution associated with extreme precipitation events. While not all of these are preventable, these environments will be more likely to survive if we reduce stresses over which we do have some control, such as siltation, eutrophication, and overharvest.

***Recommendation C.2.3.1** Maine should maintain and develop ongoing monitoring programs to assess changes in the status of diadromous and coastal marine resources.

***Recommendation C.2.3.2** Maine should expand its capacity to monitor and assess threats to coastal marine resources and the industries that depend on them, such as harmful algal blooms and invasive species.

C.3 Forest Resources

Forested lands cover approximately 90% of Maine, and the forest products industry has been ~~an icon of~~ central to the Maine economy for generations. In recent years, our working forests ~~have are~~ recovering from ~~overharvesting and~~ the effects of ~~the~~ spruce budworm epidemic of the 1970's -1980's and concurrent salvage and presalvage harvesting. ~~such that the increase in~~ Growth in Maine forest ~~biomasss~~ each year currently is balanced with or exceeds harvest in all regions of the state, and the average growth to harvest ratio is 1.15 ~~exceeds the volume removed for timber, pulp, and other uses.~~³⁴ In other words, Maine's forest cover is now more extensive than at any time since 1760.³⁵ At the same time, since growing forests remove carbon dioxide from the atmosphere and sequester the carbon, the forest has an increasingly vital role in mitigating CO₂ emissions caused by human activity. As a result, there will be an increasing emphasis in coming decades on keeping Maine's forestlands intact, and on forest management practices that increase carbon storage while at the same time producing sustainable and renewable biomass for wood products and energy.

A strong forest economy is intimately linked to the retention of forest ecosystems. As is highlighted in sections C. 4 and C.6, the forest environment provides essential ecosystem services besides fiber production and carbon sequestration such as providing

³⁴ Laustsen, K. 2009. 2006 Mid-Cycle Report on Inventory and Growth of Maine's Forests. Maine Forest Service: Augusta, ME.
http://www.maine.gov/doc/mfs/pubs/midcycle_inventory_rpt.html

³⁵ Table 2 from Irland, Lloyd C., Maine's Forest Area, 1600-1995: Review of Available Estimates. Maine Agricultural and Forest Experiment Station Miscellaneous Publication 736. February, 1998.

~~that support~~ wildlife habitat and biodiversity, and ~~plays a key role in~~ maintaining the supply and integrity of freshwater resources. This section focuses on the forest products industry, to which the effects of greatest concern are

§ Any combination of impacts that influences the migration into Maine of pests and pathogens that have not historically been present, or increases the efficacy of those that have;

§ Overall changes in temperature and seasonality affecting forest composition as species currently at the southern edge of their range retreat, and those at their northern species boundary become part of Maine's forest;

§ The possibility that wood product harvesting equipment will need to be retooled to work effectively on increasingly saturated soils as the extent and duration of winter frozen ground changes.

CALL OUT BOX: Changes in species composition can have positive impacts^[UF19]

Strategy C.3.1 Continue to Build Maine's Knowledge Base on Potential Climate Impacts to the Forest Environment

As with other sectors, monitoring and detection will continue to play a key role in responding to climate change. Of particular importance are tracking the introduction and spread of pest and pathogens, the virulence of native and introduced pests, changes in forest condition that precede critical compositional and functional change (e.g., phenology, growth rates, nutrient cycling), the physical climate trends of the forest (e.g., local temperatures, snow depths, frost penetration, soil moisture), and ultimately evidence of species shift. At the same time, there are needs for a regional monitoring network to detect and track pest and pathogen occurrences, and for increased outreach to landowners and the public on identification of, and responses to, pest/pathogen, forest growth and species migration changes.

Recommendation C.3.1.1 Initiate a state-level planning process for pest and pathogen management over the long term. *This will require rebuilding Maine's scientific and resource management capacity in this area.* The planning process should include the development of "off the shelf" plans that anticipate, and allocate resources to respond quickly to, likely specific pest / pathogen outbreaks.

Recommendation C.3.1.2 The University of Maine, in partnership with industry, should ~~establish and secure funding for an~~[expand](#) ongoing research effort to assess the likely impacts of climate change on Maine's forest industries by (a) updating growth and yield models for current and projected forest species; [\(b\) modeling future forest conditions and productivity for different climate scenarios;](#) [\(c\) identifying forest practices likely to protect forest productivity, and decrease vulnerability to climate change-related stresses;](#) and (d) assessing the position of the Maine forest products industry in the global marketplace.

Strategy C.3.2 Increase Maine's Capacity to Respond to Future Hydrological Change: Forest Roads and Stream Crossings: see C.6.1^[MCB20]

C.4 Wildlife and Biodiversity

As Maine people come to grips with the likely foreseeable impacts and effects of climate change, their focus is frequently on our neighbors, businesses, and communities. Yet the real context of adapting to climate change is the entirety of the natural world, and this challenge reminds us of the inter-connectedness of life on our planet.

When we consider the likely impacts on Maine's natural environment and the species that inhabit it, the following concerns stand out:

- § Changing seasonal variation and increase in temperature will have particularly acute effects on plant and animal species that are dependent on relatively small, isolated, or distinct ecosystems, or that exist in Maine at the current boundary of their historic range
- § Human influences on the natural environment, such as land development, natural resource harvesting, and environmental pollution, both in Maine and elsewhere (for migratory species that pass through Maine or spend a portion of their life cycle here) ~~have~~[are](#) already ~~stress~~[ing](#)~~ed~~ a multitude of species independent of climate effects³⁶;
- § The influence on habitat and native species of new pests and pathogens, [increased efficacy of existing pests/pathogens,](#) and invasive species, will be exacerbated as the climate changes;
- § Aquatic ecosystems are particularly vulnerable to shifting parameters associated with hydrologic change (extremes of high and low flows, increasing temperature) and extreme weather events resulting in erosion of sediments and nutrient loading;

³⁶ For example, moose and bear have adapted well to the current management of the northern working forest while white-tailed deer have declined in the same region.

§ Asynchrony in the timing of natural events (such as earlier blooming of plants to the detriment of species that depend on these for food but [are not yet present](#))³⁷ is [already](#) producing changes in [ecosystem function and](#) species composition in particular ecosystems.

Strategies and recommendations in this area are closely related to those in each of the other portions of this “Environment and Natural Resources” section.

Strategy C.4.1 Include Climate Change Effects on Wildlife and Habitat in Land Conservation Planning and Decision-Making.

There is a clear need to [evaluate-incorporate](#) the impact of climate change [into](#) conservation objectives, and to include evaluation of the potential contribution [of land conservation plans](#) to adaptation and habitat resilience ~~that acquisitions and use plans can contribute efforts~~. Among the factors to be included are maintenance of connectivity among habitats, terrestrial and aquatic; integration of wildlife management strategies across working forest, farms, and reserve lands; and climate considerations in the design, layout, construction, and management of recreational roads and trails. [Beginning with Habitat \[BwH\], in partnership with Manomet Center for Conservation Sciences, is undertaking a climate change vulnerability assessment for Maine’s 213 wildlife “Species of Greatest Conservation Need” and Maine’s listed threatened and endangered plant species, and Maine’s rare natural community types. This information will be used to update Maine’s State Wildlife Action Plan and will inform municipal, landowner, and land trust outreach efforts through BwH.](#) ~~Currently, the Natural Areas program of Maine’s Department of Conservation is looking to align its efforts with those of the “Beginning with Habitat subcommittee” in developing a ‘Climate Change Vulnerability Index’ for rare species and natural communities in Maine.~~

Recommendation C.4.1.1 Update current state-level land use plans [and conservation priorities](#) using “Beginning with Habitat” at state, regional, and local scales to [evaluate risks of](#) reduce habitat loss and degradation [and implement appropriate solutions to](#) maintain terrestrial and aquatic [ecosystem](#) connectivity.

Recommendation C.4.1.2 Increase land and water conservation funding for projects that are focused on adaptation to climate change; [and ensure funding for the continued coordination of inventory, prioritization, data management, outreach, and restoration project development to mitigate current and future impacts](#)

³⁷ Also called “phenological change:” see p.

[on stream connectivity. Build climate change considerations into existing criteria and scoring systems for all conservation funding.](#)

Recommendation C.4.1.3 Assess and modify, as needed, the state's Ecological Reserves Monitoring Plan to address habitat questions related to climate change. Evaluate the vulnerability of the state's Ecological Reserves to climate change, and incorporate climate change into the criteria for [selection and design of](#) new Ecological Reserves.

Strategy C.4.2 Continue and Expand Current Efforts to Maintain and Restore Critical Wildlife Habitat and Assure Connectivity

Various federal and state agencies and public interest groups are already active in this area. For example, Acadia National Park has submitted a number of proposals as part of their climate adaptation planning process to assess potential impacts to coldwater fisheries, wetlands, and coastal estuaries. [BwH is in the final stages of a statewide habitat connectivity assessment that will inform state, regional, and local land use decisions. Additionally, BwH is partnering on a multi-state and province effort to identify strategic conservation options to maintain habitat connectivity across the northern Adirondacks from NY to NB.](#)

[Large-scale efforts to inventory stream crossings for fish passage Maine have been underway for several years in Maine. The largest is Maine Forest Service project with assistance from USFWS, IF&W, and The Nature Conservancy to inventory road-stream crossings in the Penobscot River Watershed. Several thousand crossing have been inventoried showing that about 50% are severe barriers to fish and wildlife movement because they are undersized, perched, damaged or unmaintained. Many of these are also clearly hazards for future transportation. Some of the other efforts are taking place for the Ossipee, Presumpscot, Royal, Sheepscot, Narraguagus, and Machias Rivers.](#)

[The data from these efforts is being compiled and analyzed to determine the most at-risk crossings and those that block the most and best habitat for important wildlife species, such as Atlantic salmon and Eastern brook trout. The USFWS Gulf of Maine Project leads a multi-partner effort to assess these data and modeling the best restoration/renovation projects.](#)

In 2009 at the direction of Governor Baldacci, state, federal and NGO partners developed the Maine Stream Connectivity Task Force. The mission of the Task Force is to work collaboratively to improve the passability of Maine's streams for fish, wildlife, and ecosystem processes. There are subcommittees developing solutions for data collection, analysis, and management, and others that help prioritize crossings for upcoming restoration projects. There are millions of federal dollars that pass by the state of Maine for stream restoration because we lack well-developed supported projects. This committee hopes to improve our restoration efforts and funding.

Recommendation C.4.2.1 Maine's state agencies involved in this area should collaborate with the University of Maine, public interest groups, and others involved in this work, including federal agencies and academic researchers, to continue development and improvement of systems to monitor the health of native wildlife systems and species, and track the spread of invasive species that may emerge in Maine as a result of climate change.

~~**Recommendation C.4.2.2** The Maine Department of Inland Fish and Wildlife should update the State Wildlife Action Plan (SWAP) and other related state plans to assure qualification for federal and private funding for adaptation efforts. This should include refinement of vulnerability assessments for species and their habitats.~~

Changes to culverts and other water management infrastructure increase the ability of species to move and withstand more extreme streamflow events. [See also B.2.2]

Recommendation C.4.2.2 Improve state-federal-local coordination [JA21] in the use of funds, expertise, and capacity building to implement adaptation projects such as culvert and bridge work using existing and new programs.

Recommendation C.4.2.3 Develop, modify as needed, and streamline state regulations that support aquatic organism passage and natural stream flow, and facilitate restoration of impaired flow[P22].

Though many species travel in and along riparian habitats, others travel through terrestrial habitats. Roads and their traffic, particularly heavily traveled roads, are barriers to wildlife movement inhibiting their ability to adapt to habitat changes due to climate change.

[Recommendation C.4.2.4](#) [Maine state agencies should collaborate with towns to use Beginning with Habitat’s nearly complete habitat connectivity maps to identify priority crossings and develop strategies to restore or maintain wildlife crossings at the state and local levels.](#)

C.5 Agriculture

Representatives from Maine’s agricultural sector approach the likelihood of climate-change driven effects with, perhaps, a more sanguine view than some others. For, as they say, farmers have always needed to adapt to changing conditions, on both a year-to-year and longer term basis. Among the most likely climate change impacts, they identify seasonal shift, including warmer temperatures and changing precipitation patterns as those for which near- and long-term planning is most important. The effects of these changes with which they are most concerned are

- § The spread into Maine agriculture of pests and pathogens not traditionally considered in pest management strategies;
- § Water and stormwater (erosion) management, particularly given the likelihood of both precipitation excess at some seasons, and soil moisture deficits at others;
- § The potential for crop and farm infrastructure damage from storm events.

[CALLOUT BOX: New crop and market opportunities](#)

[CALLOUT BOX: something on demand, food security based on local food demand/availability: encourage local food networks, year-round farmers markets, and availability of local food in supermarkets](#)

[CALLOUT BOX: Relationship between carbon storage as mitigation, and ag opportunities.](#)

[\[UF23\] In order to build resilience, mitigate risk, and take advantage of opportunities, the stakeholders have identified the following:](#)

Strategy C.5.1 Build Research and Cooperative Extension Capacity

New strategies for pest management, identification of new crop varieties likely to be productive under a new climate regime, and conservation and land management practices to deal with both excess and deficits of soil water will be needed by farmers in all parts of the state. Development and deployment of these “best practices” will depend on [ongoing agency efforts to identify management, market, and policy opportunities to enhance the agricultural sector, as well as funding for research and outreach \(e.g., Cooperative Extension\) to achieve and promote these goals.](#)

Strategy C.5.2 Increase Flexibility of Existing Federal Funds Use

Federal conservation and related funds are a cornerstone of existing programs on which Maine farmers depend. There is an identified need to re-target these programs to be more responsive to regional and state needs.

Recommendation C.5.2.1 Review and re-open the current Cooperative Working Agreement between the State of Maine and the Natural Resources Conservation Service of the Department of Agriculture, and negotiate maximum flexibility in the allocation of Federal funds, and application of Federal rules, in order to address climate change adaptation challenges.

Strategy C.5.3 Evaluate Maine's Water Management Strategies in the light of Likely Climate Change [\[and see below, C.6.1\]](#)

Areas to be addressed include assuring support for irrigation; development of standards for water management that include environmentally sound withdrawal; availability of working capital for irrigators; and resources needed to provide technical assistance.

C.6 Water Resources

Fresh water—lakes, rivers, streams, groundwater—could be said to define the quality of Maine's inland landscape and environment just as surely as the ocean does for the coast. The significant watersheds associated with rivers flowing from mountains to sea convey snowmelt and rainwater that Mainers use for drinking, to produce electricity, ~~and to convey wastes~~ [and for recreation](#). Ground and surface waters are vital to agriculture. As noted above in section B.1, there is extensive infrastructure associated with management of water resources, including stormwater; and terrestrial, freshwater, and marine ecosystems are dependent on the quality of these waters (sections C. 1, 2, 4).

Each of these sometimes competing uses will experience the impacts of climate change. Among the most significant challenges identified by stakeholders are:

- Potential saltwater intrusion into [public and](#) private coastal [drinking](#) water systems due to sea-level rise;
- Septic system failures from increased soil saturation following storm events, leading to ground [and surface](#) water contamination;
- Loss of coldwater habitat (streams and lakes) for key species [such as brook trout](#);
- Increased erosion, degradation, and other effects of extremes in streams and rivers;

- Effects on hydropower storage capacity due to lessening of winter snowpack [and changing flow regime affecting the timing and magnitude of hydropower supply.](#);
- [Competition for water use among different interests, particularly if agricultural irrigation needs increase due to adoption of new crops better suited to a changed climate;](#)
- [Altered](#) water quality in certain source [waters.](#)
- [Changing patterns of evaporation and recharge from rain events.](#)
- [Increased demand by agriculture and domestic use, potentially at the time of least availability. Development of additional water storage infrastructure should be anticipated.](#)

Strategy C.6.1 Increase Maine's Capacity to Respond to Future Hydrological Change and Assure Water Availability for Fish, Wildlife, and Human Uses [see also B.1. ; C.3.2; C.4. ;C.5.3]

Understanding the changing hydrology of Maine is critical to developing responses to climate change impacts that we are already experiencing, and to building resilient infrastructure for the future.

Recommendation C.6.1.1 The Maine Geologic Survey, assisted by the University of Maine [and the United States Geological Survey \[USGS\]](#), should convene a Task Force to review the current understanding of Maine's hydrological future, and identify what steps the state should take to increase forecasting and modeling of these effects in light of climate change. Such as task force could consider the establishment of a permanent state Office of Water Resources. [Building on the DWP's existing Source Water Assessment Program](#), plans should be developed to address issues such as threats to road crossings and forest road networks; impacts to drinking water resources and systems; changes to water storage used for electricity generation; maintenance of base flows for fish and wildlife, and for agriculture, etc. Other activities should include review of and recommendations to modify existing regulations governing water use, stream flow, etc., [including periodic review of the aquatic base flow equations used in Chapter 587 of the DEP's Rules, "Stream Flow and Water Level Rule,"](#) to assure their capacity to assist in building [resilience](#).

Recommendation C.6.1.2 The Maine Geological Survey, [USGS](#), and the Drinking Water [Program \[DWP\]](#) of Maine Department of Health and Human Services should be tasked with modeling aquifers and groundwater flows in the coastal zone to inventory the vulnerability of public and private water systems to

saltwater intrusion under the conditions of progressive SLR. They should also develop and recommend for adoption state-level policies and priorities for [state](#) investments in drinking water infrastructure in the risk areas.

Strategy C.6.2 Maintain and Enhance Existing Source Water Monitoring Programs

[See Recommendation A.2.1.3](#)

D. Maine's Economy in a Changing Climate

The effects of climate change impacts on Maine's economy at both the local and state-level scales, and the costs of responding, are not yet well understood. [This argues for taking action on a "no regrets" basis: for example, improving stormwater and wastewater infrastructure to protect water quality in any eventuality.](#) Among the factors that decision-makers will need to consider going forward are:

- The extent to which forecasts of particular impacts such as [sea level rise](#) are robust enough to rely on, particularly when planning long-term capital expenditures;
- The effect of existing and proposed policies on potential economic choices. For instance, policies and regulations that limit the potential for armoring existing structures may increase the [short-term](#) costs of potential [property relocation or loss from storms](#) [but decrease long-term costs of living in vulnerable areas](#);
- The likely costs of [non-action](#) as compared with those associated with particular adaptation responses;
- The [very real](#) potential for economic gains in particular sectors.

The New England Environmental Finance Center [NEEFC] at the Muskie School, University of Southern Maine, is undertaking significant work in this area, focused particularly on analysis of likely climate effects on the economy of Maine's southwestern coast.³⁸ The Center is also developing tools that local jurisdictions will be able to apply [to planning best approaches to mitigate existing climate vulnerabilities and build future resilience.](#)

Strategy [D.1](#)

Continue to Refine and Make Available to Maine's Communities, Businesses, and Governments Tools to Support Economic Analysis of the Most Likely Foreseeable [Effects](#) of Climate Change.

***Recommendation [D.1.1](#)** [NEEFC, in collaboration with the State Planning Office, the Maine Municipal Association, and other stakeholders, should continue to identify and develop additional tools that planners can use to support economic decision-making related to climate change.](#)

³⁸ See, for example, Charles S. Colgan and Samuel B. Merrill, "The Effects of Climate Change on Economic Activity in Maine: Coastal York County Case Study," *Maine Policy Review* 17/2 (2008): 66-79.

MAINECARE: VITAL TO MAINE PEOPLE AND MAINE'S ECONOMY

The proposed budget cuts to MaineCare come at too great a cost.

The cost to Maine's healthcare system

"The fact is that, in addition to pain and suffering of specific individuals, when people don't get the care they need, they get sicker and require more expensive care. This puts more strain on the system overall. We all pay in the long run. Certainly there will be very painful cuts, but Maine should do as we have in the past, and as other states are now doing, namely consider reasonable sources of revenue to prevent serious harm to the most vulnerable and avoid additional costs to the health care system."

**Lani Graham, M.D. on behalf of the
Maine Medical Association**

The cost to Maine's economy

"Because state spending on Medicaid is matched generously by federal dollars (over two to one), the proposed cuts in state Medicaid will take many more dollars out of the state economy than the size of the cuts. This will likely result in further job losses in the state, and cost the economy more than a well-crafted tax increase to maintain Medicaid spending and keep the federal matching funds."

**John Fitzgerald, Bowdoin College's
William D. Shipman Professor of Economics**

The cost to Maine people

"I was struggling years ago when my older children were very young because I had an undiagnosed, untreated mental illness – I fell apart. My family suffered. I ended up in a shelter. But since then with the help of my therapist I've been able to function well, raise my children, and still be part of a community as well as work or volunteer. Without consistent support from my therapist I would end up in the hospital."

Diane Clark, MaineCare Consumer

The cost to services for people with mental illness

"The proposed limits on mental health services are a serious erosion of the state's commitment to provide adequate mental health services within the community. The magnitude of these cuts will result in serious harm to individuals in need of mental health services, and the savings, if any, will evaporate as conditions worsen and people need more acute services."

**Dan Wathen, Esq., Court Master for
the AMHI Consent Decree**

The cost to services for seniors

"The state budget should be a reflection of our shared values and priorities for the people of Maine. Many seniors need just a small amount of help to stay safely at home, but this budget will ruin the fragile support systems that our seniors rely on to live independently. Without this help, we'll see more people forced from their homes. These short-sighted cuts to home care services, MaineCare, and Drugs for the Elderly (DEL) will ultimately lead to greater costs for the State and worse health outcomes for seniors."

Nancy Kelleher, State Director, AARP

The cost to Maine's shared values

"The choices before you may appear to be economic, but they are moral decisions as well. You are determining to what extent our society will care for the most vulnerable among us – those who are often politically voiceless and vulnerable. We respect your conscientious efforts as our lawmakers as you grapple with difficult decisions, but we must also trust that you will use the responsibility of your office to ensure that people in Maine will receive the health care they need when they experience difficult times."

**The Rev. Jill Saxby, Executive Director,
Maine Council of Churches**

Cuts to MaineCare compromise the health of Maine people and Maine's economic recovery.

Raise the tobacco tax...

...for the Health of Maine's Children

Tax Increase Per Pack	Youth Smoker Decline	Youth Alive Today Who Won't Become Smokers	Smoking-Affected Births Avoided over Five-Years
\$1.00	-11%	8,500	1,300

...for the Health of Maine's Adults

Tax Increase Per Pack	Current Adult Smokers Who Would Quit	Adult Smoking Caused Deaths Avoided
\$1.00	4,600	3,900

...for the Health of Maine's Economy

Tax Increase Per Pack	Five-Year Heart-Stroke Health Savings (Millions)	Five-Year Pregnancy and Birth Savings (Millions)	Additional New Cigarette Tax Revenue (Millions/Year)	Overall Long-Term Health Savings (Millions)
\$1.00	\$2.4	\$2.2	\$26.2	\$192.5

Health Policy Partners



Current State Cigarette Tax Rate: 200 cents per pack
State Cigarette Tax last raised: September 19, 2005



Data compiled by Campaign for Tobacco-Free Kids, Washington, DC
Document prepared by Health Policy Partners of Maine
December 2009

BRUNSWICK TIMES RECORD

Protect kids, raise tobacco tax by \$1

Published:

Tuesday, February 2, 2010 2:12 PM EST

Anti-smoking advocates argue persuasively that raising Maine's tobacco tax by \$1 per pack not only will deter a greater number of teens from smoking, it also will encourage adults to quit and add tax revenues to fund programs in the Department of Health and Human Services now facing budget cutbacks.

Before lawmakers dismiss this budget proposal out of hand, we encourage them to do the math. For the health of Maine's children who might be tempted to take up smoking, for adults who already are smoking and for our state's economy, this tax increase comes up as a winner.

A coalition of anti-smoking groups in Maine, which includes ACCESS Health and the American Cancer Society, estimates that adding another \$1 to the current \$2-a-pack tobacco tax would generate an additional \$26.2 million annually for the state. Considering the hue and cry from Mainers over spending reductions in social services, that additional revenue could mitigate some of the cuts being considered in the Health and Human Services budget.

But coalition members say the strongest reason for implementing a \$1 increase in the state's tobacco tax is that it will accomplish these public health goals:

- Keep 8,500 young Mainers from becoming smokers.
- Help 4,600 smokers quit.
- Save 3,900 adults from a tobacco-related death.
- Save \$192.4 million in long-term health costs.

Importantly, the proposed increase would be applied not only to cigarettes, but also to little cigars and loose tobacco — thereby increasing the average cost of those products and making them less tempting as a cheaper alternative to cigarettes. Doing so in Maine would be consistent with recent steps taken by Congress in Washington to “equalize” federal taxes on tobacco and move towards closing the pricing loophole the tobacco industry uses to promote small flavored cigars, smokeless tobacco or roll-your-own cigarettes to young people.

Rebecca Farnham, youth advocacy program coordinator with ACCESS Health, says there's a strong correlation between cigarette tax increases and the rate of teen smoking. From a high of almost 40 percent of Maine teens smoking in 1997, the rate had steadily declined for a decade as taxes increased, reaching 14 percent in 2007 (two years after a \$2-per-pack cigarette tax was imposed in Maine). Five years later, with Maine's cigarette tax now being the second lowest in New England, our youth smoking rates increased for the first time since 1997, climbing to 18.1 percent.

“Raising the tax will have a significant effect,” she says. “If a pack of cigarettes is \$7 or \$8 a pack, that has huge implications.”

Megan D. Hannan, director of government relations and advocacy for the American Cancer Society, says raising the tobacco tax by \$1 also will encourage even more adults to quit smoking. Dedicating \$1 million of the anticipated revenue derived from the tax increase to the state's HelpLine (1-800-207-1230) will boost the direct counseling and nicotine replacement therapy services that currently help 10 percent to 12 percent of smokers calling that toll-free number to finally quit.

Raising the tobacco tax is solid health policy. The proposal before lawmakers offers an opportunity to save lives, lower health costs and boost state revenues. We think the time is right to take this step to discourage smoking in our state.



When it comes to Raising the Price of Tobacco Products, Don't Be Fooled By Tobacco Industry Scare Tactics

"Young adult smokers are the only source of replacement smokers.
If younger adults turn away from smoking, the industry must decline..."
(1984 RJReynolds Report)

Tobacco industry arguments against tobacco tax increases don't stand up to scrutiny:

- **CROSS-BORDER SALES:** Whether a function of Maine's size, population centers, or the price of gasoline, tax stamp data for New Hampshire shows very clearly that Maine tobacco tax increases do not increase New Hampshire tobacco sales (all states are different – Massachusetts tax increase DO affect sales in New Hampshire) *See Chart #1*
- **INTERNET SALES:** With the exception of premium cigars, Maine's new delivery sales law has made it illegal to deliver tobacco products to unlicensed locations in Maine. In addition, a federal bill to eliminate internet sales has passed the House and is being considered in the Senate.
- **REVENUE PATTERNS:** Tobacco tax increases do not result in lost or unstable revenue. Every time Maine's cigarette tax is increased, tax revenue increases sharply. As fewer kids smoke and smokers quit or smoke less, revenue then declines very gradually and predictably, but never below levels prior to the tax increase. In fact, data shows that cigarette tax revenue is more stable and predictable than revenue from corporate income taxes.
See Chart #2
- **SMUGGLING:** Most Maine people are law-abiding citizens. Factors associated with smuggling (cultural acceptance, very large cities, existing networks) simply aren't present in Maine. A comparison of tax stamp sales with consumption data support the belief that smuggling is not a serious issue here.

We all have a stake in helping Maine kids resist tobacco use. Healthy families and lower health care costs are the building blocks of a thriving economy. Maine's future prosperity depends on our ability to drastically reduce preventable diseases and the stranglehold of health costs that accompany them.

**Don't Be Fooled by Tobacco Industry Scare Tactics:
Raise the Price of Tobacco Products and Help Protect Maine Kids**

CHART # 1:

New Hampshire's Per Capita Cigarette Sales
 (Source: Orzechowski and Walker, *The Tax Burden on Tobacco*, vol. 41, 2006)

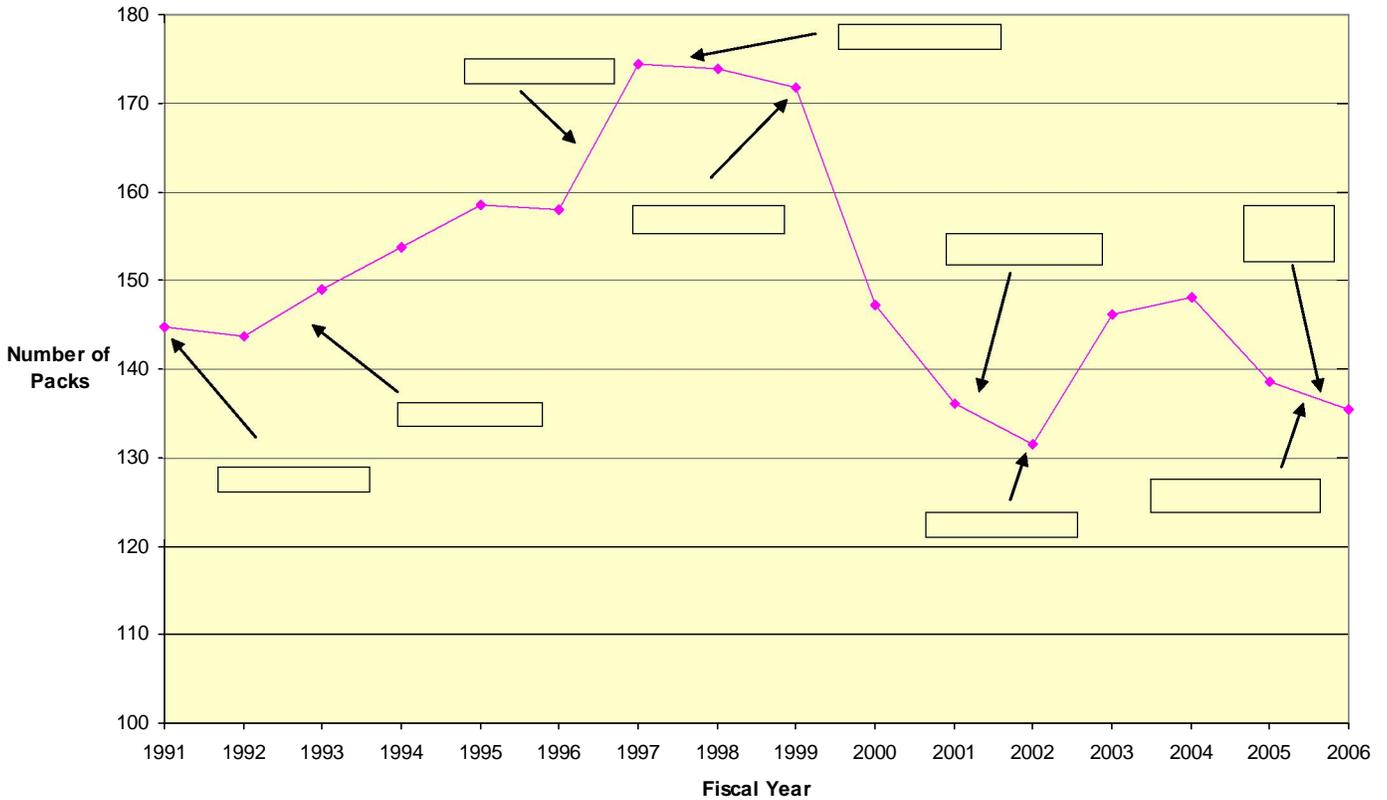
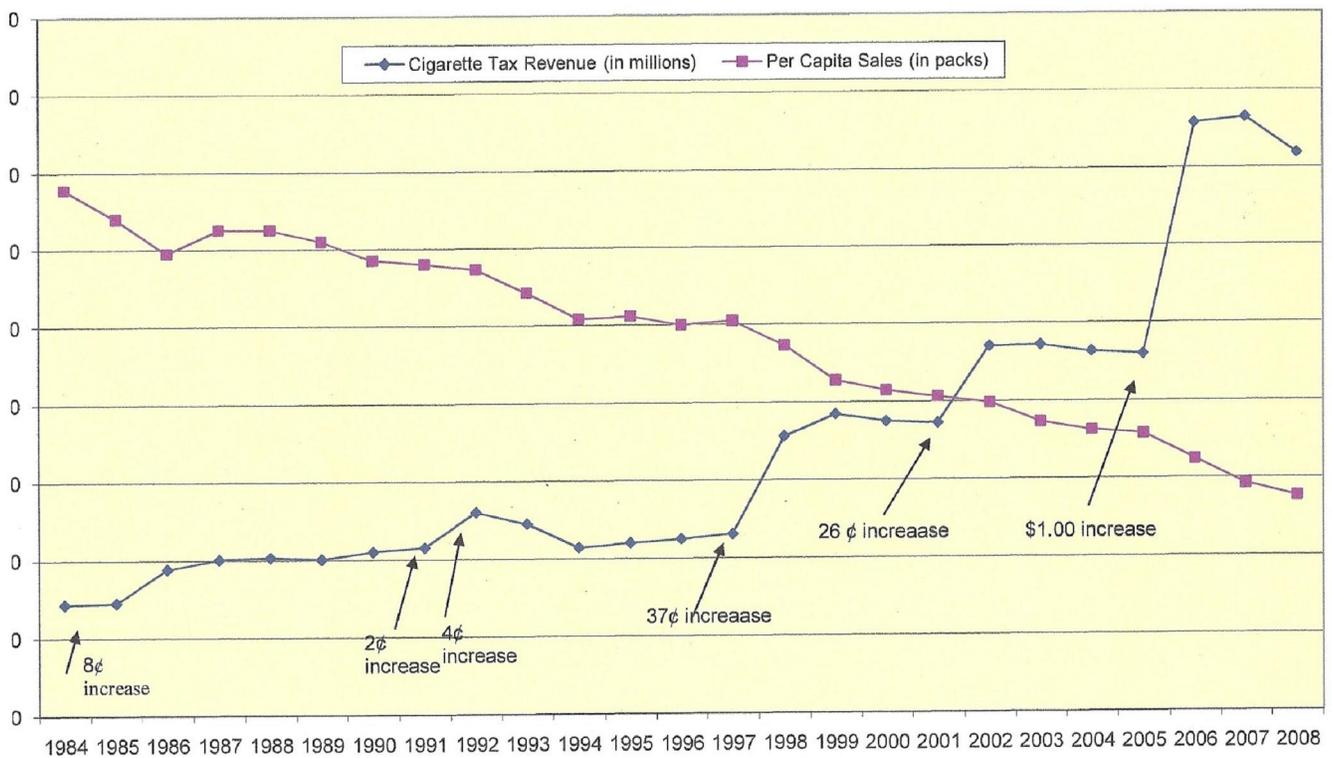


CHART #2:

Maine Cigarette Tax Revenue vs. Per Capita Sales 1984-2008
 Source: Orzechowski and Walker, Vol. 43, 2008



Health Policy Partner of Maine

11 Parkwood Drive

Augusta, ME 04330

<http://www.mcd.org/hpp/>

PRESS STATEMENT

Statement of Dennise Whitley

Director of Advocacy and Public Relations, American Heart Association in Maine

(207) 461-3101

Responding to the Health and Human Services Committee Recommendation to Raise Maine's Tobacco Taxes

It's exciting to know that more Maine kids got a shot at good health today. Thanks go to members of the Legislature's Health and Human Services Committee. Their recommendation to raise Maine's tobacco taxes as part of this year's state budget is a big step towards getting Maine back on track.

The sad news is that Maine has fallen behind. Our youth smoking rates have risen for the first time since 1997. Our cigarette tax is now the second lowest in New England. And we have yet to close the loopholes that allow loose tobacco and so-called "little cigars" from being priced far lower than cigarettes.

If we're serious about building a future for our kids that includes good jobs and healthy lives, we've got to break the cycle of tobacco addiction. The costs of preventable diseases are crippling Maine businesses and taking a heavy toll on families. We spend over \$600 million on tobacco-related health costs every year in Maine while watching 2400 of our family, friends, and neighbors die early from using tobacco.

It's heartening to see lawmakers recognize tobacco taxes for what they really are – a powerful public health tool that helps kids resist tobacco use and helps current smokers quit or cut back. The fact is, raising Maine's cigarette tax by \$1 a pack, and equalizing the tax on all other tobacco products, is a win-win for Maine people, Maine businesses, and Maine's economy.

We know tobacco companies will do everything they can to make sure the tax increase doesn't happen, including scare tactics that simply aren't supported by the data. But it's time for Maine to regain our place as a national leader in protecting our kids. Health Policy Partners is proud of Maine lawmakers for standing up to the tobacco industry and their relentless efforts to get our young people hooked on their deadly products.

We urge the Maine Legislature to include a \$1 increase in Maine's tobacco taxes as part of the state budget. Our young people are counting on you!

LSJ Op/Ed - Cigarettes and the state of Maine

From : Carol Kelly <carolkelly12@msn.com>

Mon, Feb 01, 2010 08:57 AM

Subject : LSJ Op/Ed - Cigarettes and the state of Maine



To : amaclean@mainemed.com, awesthoff@mainedo.org, bqinn@heart.org, Becky Birrell Smith <Becky.Birrell.Smith@gmail.com>, dwhitley@heart.org, emiller@lungne.org, Eileen silvestri <Eileen.silvestri@cancer.org>, Emily bugbee <Emily.bugbee@anthem.com>, harrik2@mainehealth.org, jolinder@maine.rr.com, JaspeJ@mainehealth.org, Kelley Daniel <Kelley.Daniel@cancer.org>, kmiller@mainemed.com, kperkins@mcd.org, koflaherty@tobaccofreekids.org, LEWISK1@mainehealth.org, medwards@lungne.org, Maureen Leary <Maureen.Leary@Cancer.org>, spauld@mmc.org, Megan Hannan <Megan.Hannan@cancer.org>, 'Nicole Witherbee' <nwitherbee@mecep.org>, 'Don Cookson' <don.cookson@gmail.com>

Cc : 'Dervilla McCann' <meisterncn@aol.com>

<http://www.sunjournal.com/content/coldmccaj012610>

LEWISTON SUN JOURNAL

Cigarettes and the state of Maine

By Dervilla McCann MD

Jan 31, 2010 12:01 am

In my practice as a cardiologist in Maine, I have developed a true appreciation for the appalling results of tobacco addiction. Some of my most frustrating conversations take place with people who have already had one heart attack, or cancer, but still feel they cannot face life's stresses without cigarettes as their drug for anxiety.

Once the addiction has started, it is a demonic adversary. We know one of the most effective weapons against this expensive blight is to prevent young smokers from starting. Thankfully, past state legislative action and tobacco taxes have helped. When I came to Maine in 1996 to begin a medical practice, I was horrified to learn that Maine had one of the highest rates of teen smoking in the nation, at almost 40 percent. The associated cost to the state for illness associated with cigarette use was astronomical. Then in 1998, Maine was awarded money arising from a lawsuit brought against the tobacco industry. Research on smoking habits, public service programs and steadfast legislative resolve to use the money for health-related purposes, combined with an increase in the cigarette tax helped turn the tide. In 2008, our teen smoking rates had fallen to a low of 14 percent. Maine's effective program to reduce smoking was a national model. Unfortunately, that was then, and this is now.

This year, the teen smoking rate in Maine increased for the first time since 1997. Maine's yearly report card from the American Lung association has gone from straight A's to a mixed report with C's in prevention, cessation and tobacco taxes. Last year's expenditures for smoking-related illness in Maine topped \$600 million, more than our current painful budget shortfall.

Tobacco taxes are first and foremost a powerful public health tool. We've learned by tracking the data for over 20 years that increasing cigarette taxes has great impact on youth smokers, preventing them from becoming the "replacement smokers" that the tobacco industry must enlist in order to stay in business. I've read the arguments against cigarette taxes — that they are "regressive, penalizing the poor," or they "create unstable tax revenues" or "encourage smuggling from New Hampshire."

I've looked at the data for the state of Maine and none of these arguments hold up under scrutiny. What is truly regressive about tobacco is the chronic illness and increased poverty that addiction creates among users. Maine tax revenues from cigarettes have steadily increased over time, and have helped to reduce state expenditures for smoking related illnesses. At the same time, sales data from New Hampshire proves that Maine's past tax increases do not result in significant cross-border sales.

Adversaries to increasing the tax on cigarettes trumpet that Maine already has a very high tax. The truth? We have the second lowest cigarette tax in New England. I am sympathetic to the cry for "no new taxes," but the reality is that if we don't take every opportunity to reduce costly chronic disease, we will never get health costs under control and we will all pay higher and higher health care bills down the road. We're already seeing the devastating effect this trend has on Maine families and businesses.

When we set aside all the tobacco industry scare tactics, raising the price of cigarettes successfully discourages young people from starting to smoke, creates a strong incentive for current smokers to stop, and delivers a consistent revenue stream to state coffers that can help protect jobs and prevent cuts to town and school budgets.

We need a one dollar increase in the cigarette tax that is applied to all tobacco products equally, making it much more expensive to buy loose tobacco and little cigars (both of which are currently taxed at rates significantly lower than cigarettes, making them an appealing alternative to kids). A one dollar increase will keep 8,500 Maine youths from becoming smokers and help 4,600 current smokers to quit. It will save 3,900 lives and \$192 million in tobacco-related health costs, and that's good for families and good for our struggling businesses.

When I query my patients about it, those who smoke are some of the strongest advocates for additional barriers. They want to quit. Raising the tobacco tax helps them to do it.

Dr. Dervilla McCann is a physician practicing in Auburn. She is chairwoman of Health Policy Partners of Maine.



RESOLUTION to PROTECT KIDS and SUPPORT MAINE COMMUNITIES

WHEREAS, we all have a stake in helping Maine kids resist tobacco use. Healthy families and lower health care costs are the building blocks of a thriving economy. Maine's future prosperity depends on our ability to drastically reduce preventable diseases and the stranglehold of health costs that accompany them.

WHEREAS, the Fund for a Healthy Maine helps Maine people stay healthy. The Fund for a Healthy Maine is Maine's share of the 1999 national tobacco settlement. It works to prevent disease and promote good health by reducing tobacco use and substance abuse, improving oral health care, providing affordable and high quality child care, supporting school-based health centers, building Maine's community public health infrastructure, and so much more.

WHEREAS, Maine is falling behind. Maine used to be a leader helping kids resist tobacco use, but Maine's cigarette tax rate is now the second lowest in New England. New data shows that Maine's youth smoking rates have increased for the first time since 1997. For every three kids who smoke regularly, one will die early. For many young people, higher prices could make the difference between addiction and a life free of tobacco-related disease.

WHEREAS, the Fund for a Healthy Maine is always at risk during budget shortfalls. The Fund for a Healthy Maine is not taxpayer dollars. Rather, it is a golden opportunity for Maine to reduce high-cost preventable disease that puts such a financial burden on families and businesses. Cuts to the Fund for a Healthy Maine are simply short-sighted. Studies show that every \$1 invested in preventing disease results in a savings of \$7.50 in health costs.

WHEREAS, the toll of tobacco addiction is devastating to businesses and families. Tobacco use causes 2400 deaths and \$602 million in health costs every year in Maine. These costs are spread across the health system, leading to higher insurance premiums for individuals and businesses, and higher costs of care for everyone.

WHEREAS, the tobacco tax is a powerful public health tool. A \$1 increase in the price of cigarettes will:

- keep 8500 of today's youth from becoming smokers, help 4600 smokers quit, and save 3900 adults from a tobacco-related death,
- save \$192 million in health costs and help reduce the stress on our health care system,
- raise at least \$26 million in revenue to protect jobs and support Maine's local communities, and
- build a healthy and productive workforce.

WHEREAS, when Maine people are healthy, we all benefit. Children are better students, workers are more productive, health costs are reduced, and families and businesses can prosper.

THEREFORE, BE IT RESOLVED that the following organization strongly endorses all efforts to raise Maine's cigarette tax by \$1 per pack and to prevent cuts to the Fund for a Healthy Maine and its essential disease prevention and health promotion programs.

Organization

Contact

Date

You may sign-on to this resolution by emailing Tina Pettingill at tinapettingill@gmail.com

FW: MI Workshop

From : Dave McDermott <DMcDermott@MayoHospital.com>

Tue, Feb 02, 2010 09:17 PM

Subject : FW: MI Workshop

To : Kellie Miller <kmiller@mainemed.com>, Gordon Smith <gsmith@mainemed.com>

 1 attachment

Can we get a blurb about this program on Motivational Interviewing out in next week's Weekly Update? It aligns with our work on youth obesity and prevention efforts, and can be seen as a way to increase effective communications with kids and adults.

Thanks.

Dave

David B. McDermott, MD, MPH, CPE, FAAFP
Medical Director of Emergency Services
Mayo Regional Hospital
www.mayohospital.com

President
Maine Medical Association
www.mainemed.com
@mmapresident

897 West Main Street
Dover-Foxcroft, Maine 04426-1029
Phone: (207) 564-4443
Fax: (207) 564-4323
dmcdermott@mayohospital.com

From: Joan Orr [mailto:Jorr@mcph.org]
Sent: Tuesday, February 02, 2010 10:03 AM
To: Dave McDermott
Cc: Jennifer Pelletier
Subject: MI Workshop

Hi Dave,
Hope all is well with you?

As you know, MYOC has linked up with Let's Go Healthcare to continue to support and expand our work. Attached is a promotional flyer on MI and below is an introductory note from Tory. We thought this might interest the MMA and wondered if you would please have someone forward it to the membership? Any help you can provide to spread the word is greatly appreciated.

Best,
Joan

Let's Go Healthcare is committed to developing unique provider learning opportunities to help prevent, identify and treat childhood overweight. To further that goal, I am very excited to forward to you an invitational flyer and registration form [attached] for Motivational Interviewing for Clinicians to Promote Healthy Behavior and Healthy Weight.

Let's Go has secured an exceptional and extremely knowledgeable speaker for this workshop. Joining us is Keri Bolton Oetzel, PhD, MPH, LPC. Maine is very fortunate and grateful to have her visit to share her experience. This is a fabulous opportunity to learn from a national expert on effective communication [motivational interviewing] with children and families around healthy behaviors / healthy weight. Keri is a licensed clinical counselor who has worked with children, adolescents and families for over 10 years. She is the Communication Trainer at Envision New Mexico. Her primary role there is to train providers how to communicate with children and parents about increasing healthy lifestyles.

I know how very busy you are and how hard it is to get time away from your practice. However, the skills being offered at this session are critically important. This training is invaluable—not only to help in your obesity prevention work but very applicable to other patient issues. While this

type of session has been presented in the past, the more exposure one has, the better you can become—especially by attending a workshop with Keri. I strongly encourage you to attend. This is one workshop you do not want to miss.

To allow for as many participants as possible, workshops are being offered in Portland, Augusta and Bangor. FMI—check out the flyer to find the date and location that works best for you.

Tory Rogers, MD



MI Flyer JO.pdf
118 KB

**Jacob Gerritsen MD, FACP
55 Clay Brook Rd
Camden ME 04843
Email: jacobg@roadrunner.com**

Dear Members of the MMA Legislative and Executive Committees,

As a fellow member of the MMA and as a past President of this esteemed organization I am asking for your support of the above bill.

I'll get straight to why I think the MMA should support this bill:

Our role as physicians is to minimize suffering, mental as well as physical. The current practice of giving the prison administrators total control and say over how they use solitary confinement is resulting in needless suffering by making mentally ill prisoners worse off mentally and by actually causing mental illness by excessive use of this practice.

In addition this practice results in recidivism being quite high, as these prisoners are less likely to be able to adapt to living in the outside world after release, which then affects the general community.

In an ideal world we would try to implement the recommendations of the Commission on Safety and Abuse in America's Prisons, issued in 2006; but for now we can start by lobbying in favor of this first step.

Thanks for your consideration.

Background Information

The issue of solitary confinement received broad exposure with the article written last year by Massachusetts surgeon and Medical School Professor Dr. Atul Gawande. In it he vividly describes research showing the importance of socialization in primates starting with monkeys and going on to research in babies. He describes the experiences of Terry Anderson, the journalist who was held captive by Hezbollah for 7 years in Lebanon as well as that of Frank Reed who was a schoolteacher and who was also captured by them. Frank became psychotic after 4 months in solitary. POW's who had been held in solitary confinement reported that they found social isolation to be as tortuous and agonizing as any physical abuse they had suffered. He reports studies that show diffuse brain wave slowing in EEG's of prisoners after a week in solitary.

The UN Human Rights Committee says use of prolonged solitary confinement constitutes torture.

It is unclear how many prisoners in solitary confinement become psychotic. Stuart Grassian, a Boston psychiatrist, has interviewed more than two hundred prisoners in solitary confinement. In one in-depth study, prepared for a legal challenge of prisoner-isolation practices, he concluded that about a third developed acute psychosis with hallucinations.

Dr Gawande's article points out that extensive use of solitary in the US is a relatively new phenomenon starting with the 1980's building boom of so-called supermax units.

Maine is no exception. While Maine on a percentage basis incarcerates a relatively low percentage of its population, it isolates 5-8 % of its prison population in solitary, a distinction it share with 5 other states. In fact Maine gets mentioned in his article for having more prisoners in solitary than in all of England, where beginning in the nineteen-eighties, they gradually adopted a strategy that focused on preventing prison violence rather than on delivering an ever more brutal series of punishments for it, with impressive results.

The Bill in Question:

LD: 1611: An Act To Ensure Humane Treatment for Special Management Prisoners

This can be summarized as follows:

This bill establishes minimum standards for the humane treatment of special management prisoners of the Department of Corrections. As defined in this bill, a "special management prisoner" is a prisoner assigned to one of several high-risk categories and confined in a secure special management unit. **(i.e. solitary)**

The minimum standards established in this bill include limiting a prisoner's confinement to a special management unit to 45 days unless it is determined at a hearing that the prisoner has committed or attempted to commit a sexual assault, an escape from confinement or an act of violence within the previous 45 days. The bill also prohibits the confinement of prisoners with serious mental illness to a special management unit and requires that a special management prisoner determined to be suffering from serious mental illness be removed from the special management unit within 7 days.

The bill also prohibits corporal punishment of special management prisoners and the use of chemical agents or instruments of physical restraint on special management prisoners. The bill also prohibits the Commissioner of Corrections, to the extent permitted by an interstate compact in effect at the time, from transferring a prisoner to an out-of-state facility unless the administrator of that out-of-state facility has agreed in writing to

adhere to the provisions of this section with respect to the treatment of that prisoner, and requires the commissioner to return that prisoner to Maine if those standards are not met.

The bill also requires the Commissioner of Corrections to maintain a current list of all special management prisoners and requires the board of visitors of each correctional facility to annually conduct a comprehensive review of the policies, standards and treatment of special management prisoners to determine the effectiveness of those policies and standards and the degree to which the treatment of special management prisoners complies with the law. The board is required to include its findings in its annual report to the joint standing committee of the Legislature having jurisdiction over criminal justice and public safety matters.

The bill also requires the Commissioner of Corrections to review the status of all special management prisoners in the State to determine whether prisoners confined to special management units should remain in those units and to ensure that prisoners held in special management units more than 45 days receive a hearing under the provisions of this bill. The commissioner is also required to review all policies in effect on the effective date of this bill relating to special management prisoners and update those policies as necessary to conform to the law.