

SENATE . . . . . No. 2028

The Commonwealth of Massachusetts

PRESENTED BY:

Marc R. Pacheco

To the Honorable Senate and House of Representatives of the Commonwealth of Massachusetts in General Court assembled:

The undersigned legislators and/or citizens respectfully petition for the adoption of the accompanying bill:

An Act providing for the establishment of a comprehensive adaptation management plan in response to climate change.

PETITION OF:

NAME:	DISTRICT/ADDRESS:
Marc R. Pacheco	First Plymouth and Bristol
Frank I. Smizik	15th Norfolk
Stanley C. Rosenberg	Hampshire, Franklin and Worcester
Michael J. Barrett	Third Middlesex
William N. Brownsberger	Second Suffolk and Middlesex
Benjamin B. Downing	Berkshire, Hampshire, Franklin and Hampden
James B. Eldridge	Middlesex and Worcester
Brian A. Joyce	Norfolk, Bristol and Plymouth
Daniel A. Wolf	Cape and Islands
Kenneth J. Donnelly	Fourth Middlesex
Lori A. Ehrlich	8th Essex
Stephen Kulik	1st Franklin
Denise Provost	27th Middlesex
Robert M. Koczera	11th Bristol
Jason M. Lewis	Fifth Middlesex

**SENATE . . . . . No. 2028**

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By Mr. Pacheco, a petition (subject to Joint Rule 12) of Marc R. Pacheco, Frank I. Smizik, Stanley C. Rosenberg, Michael Barrett and other members of the General Court for legislation to provide for the establishment of a comprehensive adaptation management plan in response to climate change. Environment, Natural Resources and Agriculture.

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**The Commonwealth of Massachusetts**

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**In the Year Two Thousand Fourteen**  
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An Act providing for the establishment of a comprehensive adaptation management plan in response to climate change.

*Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:*

1 SECTION 1. The General Laws are hereby amended by inserting after chapter 210 the  
2 following chapter:-

3 Chapter 21P.

4 COMPREHENSIVE ADAPTATION MANAGEMENT PLANNING IN RESPONSE  
5 TO CLIMATE CHANGE.

6 Section 1. As used in this chapter the following words shall have the following meanings  
7 unless the context clearly requires otherwise:-

8 “Adaptation”, a response to climate change that seeks to increase the resiliency and  
9 reduce the vulnerability of Massachusetts’ built and natural environments and reduces the  
10 disaster risks that vulnerable human populations and resources will encounter due to such  
11 change.

12 “Executive office”, the executive office of energy and environmental affairs.

13 “Hazard mitigation”, an effort using nonstructural measures to reduce loss of life and  
14 property by lessening the impacts of major storms.

15 “Plan”, the comprehensive adaptation management plan.

16 “Resilience”, the ability to prepare for and adapt to changing conditions and withstand  
17 and recover rapidly from disruptions.

18 “Risk assessment”, evaluating and prioritizing known risks and their effects.

19 “Risk management”, making a decision and setting policy based on the knowledge  
20 acquired through risk assessment.

21 “Sustainability”, the establishment and maintenance of conditions under which humans  
22 and nature can exist in productive harmony and fulfill the social, economic and other  
23 requirements of present and future generations, including providing for the long-term viability  
24 of the people and economy of the commonwealth and its natural ecosystems, which requires  
25 consideration of the risks posed by climate change, the practicality of maintaining a long-term  
26 presence in the most vulnerable areas and the need to protect and restore natural ecosystems and  
27 their services.

28 “Vulnerable population”, a group of people especially at risk to impacts of major storms  
29 due to their location or because they are overburdened and lack resources or have less access to  
30 services.

31 Section 2. (a) Notwithstanding any general or special law to the contrary, the secretary of  
32 energy and environmental affairs and the secretary of public safety and security shall develop,  
33 draft and adopt a comprehensive adaptation management action plan. The plan shall be  
34 developed under the guidance of an interagency advisory committee and supported by technical  
35 subcommittees and staff as necessary. This plan shall include the following: the preliminary  
36 and final reports submitted by the advisory committee and vulnerability assessments prepared  
37 pursuant to this section Upon the adoption of the comprehensive adaptation management plan,  
38 all commonwealth certificates, licenses, permits, authorizations, grants, financial obligations,  
39 projects, plans, actions, and approvals for any proposed projects, uses, or activities in and by the  
40 commonwealth shall be consistent, to the maximum extent practicable, with the adopted plan.  
41 The plan shall be completed no later than two years after the effective date of this act and shall  
42 be updated every two years. The plan, and all updates, shall be filed with clerks of the house of  
43 representative and senate.

44 (b) The plan shall include, but not be limited to: (i) a statement setting forth the  
45 commonwealth’s goals, priorities and principles for ensuring effective prioritization for the  
46 resiliency, preservation, protection, restoration and enhancement of the commonwealth’s built  
47 and natural infrastructure; (ii) a commitment to the adherence of sound management practices  
48 which shall take into account the existing natural, built and economic characteristics of the  
49 commonwealth’s most vulnerable areas and human populations; (iii) data on existing and  
50 projected impacts including, but not limited to, drought and temperature changes, inland flooding  
51 and sea level rise according to the best and latest data, forecasting and models; and (iv) a  
52 statement on the preparedness and vulnerabilities in the commonwealth’s emergency response

53 and infrastructure resiliency including, but not limited to, energy, transportation,  
54 communications, health and other systems.

55 (c) The plan shall demonstrate how the commonwealth shall: (i) adapt to climate change  
56 in a manner that minimizes harm to the built and natural environments; (ii) adhere to sound  
57 management practices, taking into account the existing natural, social, cultural, historic and  
58 economic characteristics of the planning areas; (iii) promote sustainable, smart development  
59 patterns that avoid and minimize new development in vulnerable locations and maximize the  
60 preservation of resilient forests, wetlands and riverine and coastal flood plains; (iv) integrate  
61 scientific monitoring into short-term and long-term plans and adapt to evolving knowledge and  
62 understanding of climate change science; (v) conserve habitat to support healthy fish, wildlife  
63 and plant populations and freshwater, forest and coastal ecosystem functions in a changing  
64 climate; (vi) manage species and habitats to protect ecosystem functions and provide sustainable  
65 cultural, subsistence, recreational and commercial use in a changing climate; (vii) conserve,  
66 protect and restore the most resilient natural areas in all ecosystems, including forests, freshwater  
67 and coastal systems; (viii) identify and capitalize on cross-cutting goals of adaptation planning  
68 and reducing emissions of greenhouse gases, including the co-benefits of protecting forests  
69 species preservation and carbon absorption; (ix) protect, strengthen and harden, where  
70 appropriate, critical infrastructure from the impacts of climate change; (x) reduce the  
71 vulnerability of the built environment to inland flooding and sea level rise; (xi) ensure that new,  
72 modified and existing construction is resilient and geodesign-based; (xii) ensure the availability  
73 of adequate equipment, fuel, food, water and other emergency supplies; (xiii) ensure that first  
74 responders and other critical personnel are able to communicate efficiently and have access to  
75 adequate resources; (xiv) ensure the availability of reliable real-time information for decision-  
76 makers; (xv) reduce the costs associated with disaster response and recovery; (xvi) minimize  
77 economic losses attributable to the impacts of climate change; (xvii) coordinate uses that include  
78 international, federal, state regional and local jurisdictions; (xviii) support the infrastructure  
79 necessary to sustain the economy and quality of life for the residents of the commonwealth; and  
80 (xvix) encourage public participation in decision making.

81 (d) The plan shall also demonstrate how the commonwealth shall: (i) increase alternative  
82 local renewable power sources that reduce dependence on centralized power plants and avoid  
83 outages, employing the use of appropriately-sited alternative local power, including distributed  
84 generation of electricity, using renewable sources, natural gas, and energy storage, consistent  
85 with chapter 169 of the acts of 2008; (ii) improve resiliency by protecting and restoring natural  
86 green infrastructure such as coastal and inland buffers, river corridors, flood plains and aquifers;

87 (iii) reduce the vulnerability of new development by incentivizing development in low-  
88 risk locations away from coastal and inland flood plains and discouraging new development in  
89 high-risk locations, especially on barrier beaches as designated by the office of coastal zone  
90 management; (iv) improve resiliency of structures through an update of the state building code to  
91 promote smarter, resilient building performance, as well as increased survivability;

92 incorporate into all coastal planning data and plans of the office of coastal zone  
93 management designed to help coastal communities address the challenges arising from storms,  
94 floods and sea level rise resulting from climate change and provide a menu of tools for  
95 successful coastal flood plain management; provided, however, that the program shall identify  
96 current and future hazard areas, assess risks, improve regional, local and public understanding of  
97 hazards and promote sound planning, policy and adaptation measures to reduce vulnerability and  
98 increase resilience along the coast; (v) strengthen harbors so they can better withstand future  
99 major storms through conservation or restoration of natural systems, plus the building or  
100 construction of barriers systems where needed; (vi) strengthen the Massachusetts Bay  
101 Transportation Authority system to better withstand major storms by flood-proofing commuter  
102 rail, subways and bus depots with vertical roll-down doors, vent closures, inflatable bladders,  
103 upsized fixed pumps and other appropriate technologies, including providing backup power  
104 sources; (vii) strengthen fuel delivery systems to better withstand future major storms by  
105 building in redundancies into the fuel system and providing generators and pumping systems that  
106 shall be readily deployable; provided, however, that gas stations in strategic locations shall be  
107 required to have onsite backup power capacity to protect residents from temporary disruptions in  
108 fuel supply; (viii) strengthen utilities that can better withstand major storms whereby the  
109 department of public utilities shall require utilities to submit detailed implementation plans to  
110 harden their facilities, including raising substation walls and elevating transformer installations;

111 (ix) redesign, as necessary, the commonwealth's power system so that the electrical  
112 power grid and the structures that control can better withstand future major storms to ensure  
113 effective performance and ratepayer protection; (x) strengthen wastewater infrastructure that can  
114 better withstand major storms, flooding and storm surges so that existing wastewater treatment  
115 plants are repaired and mitigated to withstand higher flood levels; (xi) prepare for storm disasters  
116 through collaboration and coordination among regional, local, state and federal authorities,  
117 nongovernmental organizations and the private sector and an array of skilled first responders and  
118 a network of civilians ready to help residents during an emergency; (xii) establish uniform  
119 training and protocols for all emergency personnel; (xiii) build on the vital role that the  
120 Massachusetts National Guard plays in emergency response by providing additional specialized  
121 training in key emergency response areas like power restoration, search and rescue, heavy  
122 equipment operation, crowd management and public safety where the guard's scale, skills and  
123 equipment can have a unique and powerful impact on restoring power faster, saving lives and  
124 other critical areas; (xiv) in conjunction with the American Red Cross, establish a statewide  
125 volunteer network to mobilize and organize volunteers based on their skills, interests and  
126 resources; (xv) ensure that the necessary skills and expertise are available and can be mobilized  
127 to effectively support rapid restoration of essential services and infrastructure, through a civilian  
128 emergency response corps made up of technical and trades personnel, including electricians,  
129 pipefitters, line workers, landscapers, public works personnel, civil engineers and debris removal  
130 tradespeople, who can be trained, certified, credentialed and deployed to perform disaster  
131 response and recovery-related tasks as part of a well-coordinated public-private-sector

132 partnership; (xvi) appoint a Massachusetts Emergency Management Agency-coordinated  
133 emergency response task force composed of chief logistics officers from key industry sectors to  
134 establish a plan in advance of a major storm for the distribution of food, water and other supplies  
135 and to execute the plan in a declared emergency; (xvii) establish a citizen education campaign  
136 focused on preparing all residents as in-house first responders; (xviii) expand the vulnerable  
137 population database to ensure that first responders, outreach workers and healthcare and human  
138 services personnel can find and serve those who may need assistance before, during and after  
139 storm emergencies, including senior residents, persons with disabilities, infants and children and  
140 people with chronic medical conditions; (xvix) require that during a storm emergency, cell phone  
141 networks and other communications systems are strengthened to ensure that first responders and  
142 residents do not lose the ability to communicate fully and instantly; (xx) develop a program to  
143 allow mass text messages to be sent to all wireless phones in a chosen geographic area; (xxi)  
144 explore establishing a 1-stop disaster recovery communications hub that is integrated with social  
145 networking, mobile messaging and chat tools using all available means to reach residents; and  
146 (xxii) ensure that lines of authority are clear and officials have the authority to react rapidly to  
147 emergency situations in a coordinated fashion.

148 (e) The plan shall include the following sequential steps: (i) a preliminary report (ii) an  
149 inventory and vulnerability assessment of the natural and built assets of the commonwealth  
150 subject to the threat of climate change, (iii) a final report

151 (f) The secretary of energy and environmental affairs and the secretary of public safety  
152 and security shall convene a technical advisory committee on the risks associated with climate  
153 change including, but not limited to, the risks associated with temperature changes, drought and  
154 increased precipitation and coastal and inland flooding. The advisory committee shall be chaired  
155 by the secretaries, or their designees, and shall be comprised of representatives with expertise in  
156 the following areas: (1) coastal zone and river flooding and erosion; (2) hydrological and  
157 hydraulic modeling; (3) natural hazard preparedness and mitigation; (4) sea level and storm  
158 surge projections; (5) risk measurement and reduction; (6) emergency management planning;  
159 and (7) scenario planning. The advisory committee shall, within 6 months from the effective  
160 date of this act complete an preliminary report which shall include:

161 (A) a set of combined sea-level rise and coastal and river storm-surge scenarios;

162 (B) estimates of risk levels of each scenario occurring by 2030, 2050 and 2100;

163 (C) estimates of flood water levels in coastal and flood plain and river front areas under  
164 each scenario which shall reflect appropriate local information such as local uplift and  
165 subsidence, and coastal erosion rates;

166 (D) estimates based on hydrological and hydraulic modeling of coastal and flood plain  
167 and river front flood water levels in each scenario in historically coastal areas now currently  
168 protected by dams, including river basins;

169 (E) develop scenario planning and the capability to explore policy options for guiding  
170 where to build, what to build and how to strengthen communities in areas of greatest  
171 risk; and

172 (F) identify critical buffer areas of coast and forests and flood plains that serve to  
173 significantly reduce vulnerability to climate related impacts, to guide priorities for state, regional,  
174 and local land protection initiatives.

175 (G) an immediate compilation and prioritization of strategies and actions, derived from  
176 the climate adaptation report prepared under section 9 of chapter 298 of the acts of 2008, that  
177 could be implemented immediately, including but not limited to: the establishment of goals and  
178 outcomes; the identification of existing legal authorities under which actions can take place and  
179 recommend new authorities where they do not already exist; designation of lead state agencies  
180 and partners; and, prioritization, timeframe and potential costs of recommendations. The  
181 preliminary report shall serve as the basis for vulnerability assessments which state agencies and  
182 public utilities shall develop for their portfolio of assets. For the purposes of this paragraph,  
183 “state agencies” shall include all executive agencies including, without limitation, the  
184 Massachusetts Department of Transportation, the department of environmental protection, the  
185 department of capital asset management and maintenance, the department of conservation and  
186 recreation, the department of public utilities, the department of public health, the Massachusetts  
187 Emergency Management Agency and independent and quasi-public agencies including, but not  
188 limited to, the Massachusetts Bay Transportation Authority, the Massachusetts Water Resources  
189 Authority and the Massachusetts Port Authority, and public utilities shall include energy  
190 generation and transmission, solid waste, drinking water, wastewater and stormwater and  
191 telecommunication utilities serving areas identified in the initial report as subject to material risk  
192 of flooding.

193 The vulnerability assessments shall classify the economic losses over time associated  
194 with each major asset for each flooding scenario as unacceptable, non-critical or immaterial. For  
195 assets exposed to material risk of unacceptable losses, the vulnerability assessment shall include  
196 order-of-magnitude cost-estimates for: (i) measures to protect the assets from flooding; (ii)  
197 measures to make the assets flood resilient; and (iii) removal and relocation of the assets from  
198 flood-exposed coastal and river areas. Estimates shall also be prepared for the economic, social  
199 and environmental damages if no adaptation actions are taken. Qualitative benefit-cost  
200 discussions of projected social impacts of flood prevention versus flood resilience shall also be  
201 included. This shall include consideration of avoided costs associated with guiding new  
202 development away from vulnerable locations and maintaining the water-absorbing capacity of  
203 the natural forested landscape.

204 The vulnerability assessments shall be submitted to the advisory committee within 12  
205 months of the completion of the preliminary report. The advisory committee shall create a final

206 report based on the findings of the preliminary report and vulnerability assessments within 3  
207 months of the completion of the vulnerability assessments. The final report shall include but not  
208 be limited to: (a) the establishment of goals and outcomes; (b) the identification of existing legal  
209 authorities under which actions can take place and recommend new authorities where they do not  
210 already exist; (c) designation of lead state agencies and partners; and, (d) prioritization,  
211 timeframe and potential costs of recommendations.

212 The secretary of energy and environmental affairs and the secretary of public safety and  
213 security shall conduct a public hearing before issuing the plan. The plan must be issued within 24  
214 months of the effective date of this act and shall file the same with the clerks of the senate and  
215 house of representatives.

216 Section 3. The plan shall encourage and provide guidance to regional planning agencies  
217 to proactively address the unavoidable consequences of climate change and provide a process for  
218 local and regional climate vulnerability assessment and adaptation strategy development.

219 Section 4. There shall be established and set up on the books of the commonwealth a  
220 regional comprehensive adaptation management plan grant program. The program shall provide  
221 financial assistance to regional planning agencies for the development and implementation of  
222 plans at the regional levels of government. The regional plans shall include, but not be limited to:  
223 (i) plans for a step-by-step process for regional climate vulnerability assessment and adaptation  
224 strategy development; (ii) a definition of regional impacts by supporting communities  
225 conducting climate vulnerability assessments; and (iii) an understanding of regional  
226 characteristics, including regional environmental and socioeconomic characteristics.

227 Section 5. Regional grants shall be administered by the executive office. Regional grants  
228 shall be designed to reduce community risks and hazards as a result of climate change. Regional  
229 grants shall advance regional and local efforts to adapt land use, zoning, infrastructure, policies  
230 and programs to reduce the vulnerability of the built and natural environment to changing  
231 environmental conditions as a result of climate change. State agencies shall prioritize the  
232 protection of identified inland as well as coastal vulnerable locations not yet built upon.

233 Section 6. The executive office may acquire by purchase from willing sellers, land  
234 abutting or adjacent to areas subject to the ebb and flow of the tide or on barrier beaches or in  
235 velocity zones of flood plain areas, on which structures have been substantially and repeatedly  
236 damaged by severe weather, for conservation and recreation purposes.

237 Section 7. Prior to the acquisition of any land under this act, the executive office shall  
238 develop a conservation and recreation management plan for any such land after consultation with  
239 the city or town in which the land is located. The management plan shall set forth the priority,  
240 description and location of lands to be acquired, and any land management agreement reached  
241 between said agency and municipality for local responsibility to carry out the development and  
242 management of said property. All land acquired pursuant to this chapter shall be deemed to have



243 been acquired for protection of the people in their right to conservation, development, and  
244 utilization of natural resources.

245 Section 8. No land shall be acquired under this act until after a public hearing has been  
246 held by the executive office in the municipality in which the land is situated to consider the  
247 management plan. The mayor and city council in a city or the board of selectmen, planning board  
248 and conservation commission, if any, of a town shall be notified of such hearing.

249 Section 9. If the executive office deems it necessary to make appraisals, surveys,  
250 soundings, borings, test pits or other related examinations to obtain information to carry out this  
251 act, the executive office or its authorized agents or employees may, after due notice by registered  
252 mail, enter upon lands, water and premises, not including buildings, to make such appraisals,  
253 surveys, soundings, borings, test pits and other related examinations as it may deem necessary or  
254 convenient for the purposes of this act and such entry shall not be a trespass. The executive  
255 office shall provide reimbursement for any injury or actual damages resulting to the lands,  
256 waters and premises caused by any act of its authorized agents or employees and shall, so far as  
257 possible, restore the lands to the same condition as prior to making such appraisals, surveys,  
258 soundings, borings, test pits or other related examinations.

259 Section 10. The executive office may expend such sums as may be available from any  
260 source to carry out section 2, including expenses in connection therewith and the cost of planning  
261 therefore and for the development, redevelopment or improvement thereof.

262 Section 11. This act shall be in addition to any other bond authorization, appropriation or  
263 authority to acquire land available to any agency of the commonwealth.

264 Section 12. The executive office, acting for and on behalf of the commonwealth, may  
265 lease to cities and towns, on a form approved by the attorney general, for not more than 25 years,  
266 certain property conveyed to the commonwealth under section 2, section 6, or by the federal  
267 emergency management agency under 42 USC 4001, section 1362 of Pub. L. 90-448, as  
268 amended, for use as conservation and recreation areas. Leases shall be in such form and contain  
269 such provisions as the secretary of environmental affairs shall determine, including such terms  
270 and conditions which are necessary to comply with laws relative to the protection of barrier  
271 beaches. Lands shall be leased upon the express conditions that the land shall be used for  
272 conservation and recreation purposes only, that no permanent structures shall be erected and a  
273 reversionary clause that requires the lease to be terminated if the leased land is used in violation  
274 of this act.

275 Section 13. In consideration for the granting of a lease authorized in section 12, a city or  
276 town shall agree to maintain the acquired land as a clean, safe and orderly conservation or  
277 recreation area.

278           Section 14. Pursuant to its authority under section 40 of chapter 131 of the General  
279   Laws, the commissioner of environmental protection shall, within 180 days of the effective date  
280   of this act, promulgate rules regulating the dredging, filling or altering of land subject to coastal  
281   storm flowage.