

Planning for sea-level rise: state-by-state

Prepared by Kirsten Howard
NOAA Coastal Management Fellow, NHDES Coastal Program
Compiled for the New Hampshire Coastal Risk and Hazards Commission
July 18, 2014

This research compilation describes statewide sea-level rise planning efforts in thirteen coastal U.S. states. For the purposes of this research, a statewide sea-level rise planning effort is defined as a multi-stakeholder effort, sanctioned by state government (whether legislature, executive order, or coordinated by a state agency) and focused on obtaining a better understanding of coastal risks from sea-level rise. Though the types of processes, findings, recommendations, and status of implementation vary across states, most efforts summarize the best available science and provide recommendations and/or guidance to improve coastal resilience in the face of climate change, with some emphasis on sea-level rise. The following elements are reviewed for each state: report source, year published, group in charge of publication, report/guidance/project purpose, sea-level rise projections, and next steps. States reviewed include: Maine, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland, Delaware, Virginia, North Carolina, Florida, California, and Oregon.

Maine

Source: [People and Nature Adapting to a Changing Climate: Charting Maine's Course](#)
(Phase One)

Published: February 2010

Group: Maine Department of Environmental Protection (DEP). Over 75 organizations, agencies, businesses, and public interest groups participated in a 35-member coordinating committee, or on one of four working groups that carried out initial assessments of Maine's vulnerability in the natural, coastal, built, and human/social environments.

Report purpose: In response to a bill passed by the Maine State Legislature, the DEP developed a report "to evaluate climate change adaptation options for the state." The Department presented the report, "People and Nature Adapting to a Changing Climate: Charting Maine's Course," which contained over 60 recommendations for action to plan for changes to Maine's climate, focused on a variety of sectors. The report emphasized the need for planning and action at the local level, and recognized that creation of an actionable state-level climate adaptation plan requires years of work and significant expenditure of resources to assure widespread acceptance and implementation. The report deals with climate impacts relevant to both coastal and inland communities.

Sea-level rise projections: sea-level rise is mentioned as a concern and risk, but no concrete values are noted from any scientific reports. Maine coastal vulnerabilities are

assessed using hypothetical sea-level rise scenarios but no concrete estimates are given. The University of Maine’s 2009 [Maine Climate Future](#) report estimates that Maine will likely see two feet or more sea-level rise by 2100. Sea-level rise vulnerability will vary along Maine’s coast because bedrock, which composes 50% of the coastline, is resistant to erosion, while the 50% of the coastline that is composed of bluffs, sand beaches, and vegetated wetlands is very sensitive to sea-level rise.

Next steps: In January 2012, DEP [sought permission](#) from the state legislature to continue using the Phase One document as a working adaptation plan for the state rather than focusing efforts on another Phase Two planning process. DEP explained that many of the recommendations were beginning to be implemented with limited resources from the stakeholders involved in the initial Phase One process and that focusing on a Phase Two plan would detract from implementation efforts.

Massachusetts

Source: [Sea-level rise: Understanding and applying trends and future scenarios for analysis and planning](#)

Published: December 2013

Group: Massachusetts Office of Coastal Zone Management

Report purpose: MA CZM received a NOAA grant to summarize the best available science about sea-level rise. The report also provided general guidance about selecting a sea-level rise scenario to conduct vulnerability assessments and make planning and policy decisions in vulnerable areas.

Sea-level rise projections:

Table 3. Relative sea level rise estimates for Boston, MA. Global scenarios were adjusted to account for local vertical land movement with 2003 as the beginning year of analysis.

Scenario	2025		2038		2050		2063		2075		2088		2100	
	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
Highest	0.49	0.15	1.08	0.33	1.81	0.55	2.80	0.85	3.92	1.19	5.33	1.63	6.83	2.08
Intermediate High	0.36	0.11	0.73	0.22	1.19	0.36	1.80	0.55	2.47	0.75	3.32	1.01	4.20	1.28
Intermediate Low	0.24	0.07	0.43	0.13	0.65	0.20	0.92	0.28	1.21	0.37	1.55	0.47	1.91	0.58
Lowest (Historic Trend)	0.18	0.06	0.29	0.09	0.39	0.12	0.50	0.15	0.60	0.18	0.71	0.22	0.81	0.25
Range	0.31	0.09	0.79	0.24	1.42	0.43	2.30	0.70	3.32	1.01	4.62	1.41	6.02	1.83

The report notes that the data does not account for possible changes to ocean currents that may result in additional sea-level rise. The report also notes that thermal expansion and melting glacial ice sheets are projected to dominate any local changes in land movement by 2025 through 2050, suggesting that the lowest estimates are quite likely underestimates for this reason.

Next steps: Community vulnerability assessments funded through state grants, using the sea-level rise scenarios

Source: [Massachusetts Climate Change Adaptation Report](#)

Published: September 2011

Group: Executive Office of Energy and Environmental Affairs and the Climate Change Adaptation Advisory Committee, members included university scientists, state, federal, and regional government officials, local planners, environmental NGOs, utilities and other industry representatives

Report purpose: The report was mandated by the MA Global Warming Solutions Act of 2008 to lay out a framework for developing strategies to adapt to climate impacts, including sea-level rise. The report lays out the expected impacts, examples of areas already experiencing impacts, and some preliminary suggestions for strategies that could be used to better prepare and adapt. Among the many cross-cutting strategies, the report highlights a need to be adaptive and continually integrate the best available science, conduct vulnerability assessments, prioritize implementation efforts, support local communities, enhance emergency preparedness, encourage ecosystem-based adaptation, and ‘start now and be bold.’ The report lays out specific strategies for several sectors: Natural Resources & Habitat, Key Infrastructure, Human Health and Welfare, Local Economy and Government, and Coastal Zone and Oceans. Specific to sea-level rise and coastal storms, the report identifies strategies to protect and improve development, shoreline stabilization, and coastal ecosystems and habitats.

Next steps: EEA intended to use the report to evaluate potential strategies and work with stakeholders to prioritize them and assess feasibility of implementation. They planned to form a stakeholder group to explore mechanisms for addressing the potential impacts of climate change (such as sea-level rise) as part of EEA’s Massachusetts Environmental Policy Act (MEPA) review process. It is unclear if this progress has been made, but related progress has been made in some departments.

The EEA’s Department of Environmental Protection is [incorporating sea-level rise projections](#) into Chapter 91 of its regulations on waterfront structures and in the Wetlands Protection Act. Capital funds were allocated to MA CZM to administer two new grant programs focused on conducting [community vulnerability assessments](#) and [piloting green infrastructure projects](#). MassDOT is also [incorporating coastal flooding vulnerability](#) in planning for the Capital Artery—an important roadway in the state.

Rhode Island

Source: [Shoreline Change Special Area Management Plan](#) (Beach SAMP)

Published: ongoing

Group: Collaboration between the Rhode Island Coastal Resources Management Council (regulatory state agency), Rhode Island Sea Grant, and the University of Rhode Island

Project purpose: Planning tool designed to improve coastal resiliency through the collection of new data and the development of effective policies. The Beach SAMP is working to identify where and how the shoreline is changing and what is at risk from these changes, and will develop new—and improve existing—state coastal policies. The project will also provide practical guidance for communities adapting to short-term and

long-term shoreline change. In addition to sea-level rise, the Beach SAMP is also focusing on coastal erosion and storm flooding as key issues.

Sea-level rise projections: The Beach SAMP is using projections defined by the Coastal Resources Commission—3 to 5 feet by 2100.

Next steps: Complete the Beach SAMP with significant stakeholder engagement. No clear project timeline available in online materials.

Connecticut

Source: [Shoreline Preservation Task Force Report](#)

Published: January 2013

Group: Shoreline Preservation Task Force

- Members include elected official in the state legislature as well as several non-governmental stakeholders who provided technical expertise

Report purpose: Outline the findings of the Shoreline Preservation Task Force which was a bipartisan effort to study and make legislative recommendations on storm impacts on shoreline homeowners and businesses. The Task Force was also charged with looking at the impact of climate change on efforts to preserve shoreline communities. The Task Force held several public hearings and meetings. The recommendations focus on DEEP and coastal structures, municipalities and land use regulation, insurance and real estate, climate change and sea-level rise, education and information resources, financial assistance for property owners, open space and protected lands, and building code.

Sea-level rise projections: No projections are mentioned in the report, however recommendations do focus on improving existing science and scenario mapping as well as allowing planners to use NOAA sea-level rise projections.

Next steps: The report was presented to the Speaker of the House. As of May 2013, four bills had emerged from the Task Force's work, including a bill that passed with only two no votes on the House floor. Public Act 13-15, "An Act Concerning Sea-level rise and the Funding of Projects by the Clean Water Fund" allows the Commissioner of DEEP to "to include the feasibility of implementing measures that can mitigate sea-level rise" in the scope of work that the state's Clean Water Fund considers. The Clean Water Fund generally funds wastewater treatment facilities and projects.

Source: [Connecticut Climate Change Preparedness Plan](#)

Published: draft form in 2011, finalized in 2013

Group: Connecticut Department of Energy and Environmental Protection (DEEP)

Plan purpose: DEEP released the Climate Change Preparedness Plan as required by state legislation passed in 2008. The Plan laid out recommendations for adapting to the impacts expected from climate change across a variety of sectors. The Plan also identifies vulnerable areas for a variety of industries and ecosystems. It includes research to assess existing vulnerabilities, identifies additional research needs, and makes recommendations

for policy changes and planning best practices to consider sea-level rise and other impacts.

Sea-level rise projections: The Plan used a number of scientifically rigorous regional climate studies that were deemed sufficient for the initial planning efforts of the Plan. However, the Plan makes a recommendation to develop Connecticut-specific sea-level rise projections that are more useful for local planning and decision-making. The projections referred to in the Plan are from the New York City Panel on Climate Change 2009 report which estimates sea-level rise of between 12-23 inches by 2100 under a conservative scenario and 41-55 inches by 2100 under a 'Rapid Ice Melt Sea-level rise' scenario.

Next steps: DEEP plans to use the strategies and recommendations in the Plan to accomplish several goals over the next 18 months, including incorporating sea-level rise and other hazards considerations into several existing plans and processes. See the full list here:

http://www.ct.gov/deep/cwp/view.asp?a=4423&Q=528012&deepNav_GID=2121#actions

New York

Source: [NYS2100 Commission Recommendations to Improve the Strength and Resilience of the Empire State's Infrastructure](#)

Published: 2013

Group: NYS2100 Commission, convened by Governor Cuomo and composed of a wide variety of stakeholders from government, NGOs, and businesses

Report purpose: In the wake of Hurricane Sandy, the Commission reviewed the vulnerabilities faced by the State's infrastructure systems, and developed specific recommendations that can be implemented to increase New York's resilience in five main areas: transportation, energy, land use, insurance, and infrastructure finance.

Sea-level rise projections: The report contains no projections, but identifies the risks associated with sea-level rise and the need to consider impacts as they relate to infrastructure.

Next steps: The Governor also created the NYS Ready and NYS Respond Commissions focused on recommendations for preparing and responding to emergencies in effective ways. All three Commissions are tasked with finalizing recommendations and assisting to implement them. New York's Infrastructure Bank was created after Hurricane Sandy pursuant to the recommendations of the NYS 2100 Commission, to coordinate infrastructure development and investment during the recovery and beyond. The bank will centralize New York's infrastructure planning to maximize funding efficiency, rather than making funding decisions on a project-by-project basis. This approach will allow the state to prioritize projects and initiatives that strengthen critical infrastructure to withstand future threats, such as high winds and flooding among other impacts. The bank combines federal disaster relief funds and state funds, and can leverage those funds to

encourage private investments to finance resiliency improvements to the state's infrastructure.

Source: Response to Climate Change in New York State: The Integrated Assessment for Effective Climate Change Adaptation Strategies in New York State (ClimAID) [Synthesis Report](#)

Published: 2011

Group: New York State Energy Research and Development Authority (NYSERDA) together with Columbia University, The City University of New York, and Cornell University

Report purpose: Provide decision-makers with the best available science and information about the state's vulnerability to climate change and facilitate development of adaptation strategies. The report focuses on a range of sectors, including coastal zones. The report includes recommendations for adaptation strategies as well as an adaptation guidebook and an economic analysis of climate impacts and adaptation in the state.

Sea-level rise projections: The 2007 IPCC report predicts sea-level rise of 1-5 inches by 2030, 5-12 inches by 2060, and 8-23 inches by 2090 for New York State. Incorporating ice melt into the projections increases the projections to 37-55 inches by 2090. The report recommends consideration of ice melt in sea-level rise estimates and highlights the need for more research.

Next steps: Unclear

Source: [Sea-level rise Task Force Final Report](#)

Published: 2010

Group: NY State Sea-level rise Task Force, led by the Department of Environmental Conservation with members from various government agencies and planning organizations

Report purpose: The task force was created through state legislation in 2007 and charged with preparing a report that addresses the issue of sea-level rise in New York State, including recommendations for an action plan to protect coastal communities and natural resources from rising sea levels. The Task Force included the recommendation to adopt official sea-level rise values to help coordinate statewide efforts.

Sea-level rise projections: very similar to the projections presented in the ClimAID report described above

Next steps: No clear next steps, aside from suggesting that the State Legislature implement the Task Force recommendations. Hurricane Sandy hit New York less than one year after this report was presented to the Legislature.

New Jersey

Source: [Coastal Community Vulnerability Assessment Mapping Protocol](#) and the [Getting to Resilience Questionnaire](#); All available on www.njadapt.org website

Published: 2011, website created in 2014

Group: mixed collaboration between NJ Office of Coastal Management, Jacques Cousteau National Estuarine Research Reserve, Rutgers University, Sustainable Jersey, NJ Future, and others

Report purpose: Followed the 2006 “Confronting Climate Change in New Jersey” Summit, which recommended that a better understanding of coastal vulnerabilities was needed. The Protocol and Questionnaire are intended to help coastal decision-makers understand and address the full spectrum of factors that influence community resilience. These tools can be used to inform and improve state and local policies and regulations, spur interagency collaboration and educate the public on natural hazards in their community. The project occurred within one government office rather than as a statewide, multi-stakeholder effort across government departments, but does provide statewide sea-level rise and vulnerability assessment guidance.

Sea-level rise projections: Over the next century, sea levels are predicted to rise between 0.5- 1.5 meters (~1.6 - 4.9 feet) along the New Jersey shore. While there are numerous sea-level rise projections available, the NJOCM suggests that communities utilize a 0.5, 1.0, and/or 1.5 meter scenario when modeling sea-level rise. The Protocol emphasizes that sea-level rise is one of many variables to consider when computing coastal vulnerability, and that storm surge, exposure, and other factors need to be integrated.

Next steps: A new mapping and resource website was created recently through grant funding from NOAA and the NJ Recovery Fund: www.njadapt.org. Organizations are assisting communities to create coastal vulnerability assessments and begin using the information to improve plans and policies. The NJ OCRM, NJ Sea Grant, the Jacques Cousteau National Estuarine Research Reserve, and NJ Future have begun assisting more than 20 communities to develop [vulnerability assessments](#) and other plans, especially in the aftermath of Hurricane Sandy. The multitude of Hurricane Sandy grants and efforts, and associated progress, are difficult to track at this point in time. The Rutgers University Climate Adaptation Alliance also seems to be an active participant in both science and policy research and projects, but information is limited online. The State requires that communities use a 1-ft freeboard regulation for new structures, and some communities have increased that requirement locally.

Source: [New Jersey Climate Change Trends and Projections Summary](#)

Published: 2011

Group: New Jersey Climate Change Adaptation Task Force, led by the NJ Department of Environmental Protection and Sustainable New Jersey

Report purpose: Provide a summary of best available climate science for New Jersey from a multi-stakeholder group

Sea-level rise projections: The group used IPCC 2007 sea-level rise projections and incorporated ice sheet melting patterns to conclude that sea level is projected to rise from 0.5 to 1.8 meters (20 to 71 inches) by 2100 over 1990 levels. The upper limit for the end of the 20th century is constrained by melting ice to be less than 2 m (79 inches). A linear extrapolation in New Jersey showed an 80 cm (31 inch) global rise by 2100, therefore the report concluded New Jersey should plan for at least 1 m (39 inches) of rise, including the effects of subsidence, by the end of the 21st century, but clarified that the 2014 IPCC projections would provide updated information and should be used.

Next steps: Unknown. Activities conducted under the Task Force umbrella seem limited after 2011, possibly due to Hurricane Sandy.

Maryland

Source: [Updating Maryland’s Sea-level rise Projections](#)

Published: June 2013

Group: Scientific and Technical Working Group of the Maryland Commission on Climate Change, a group of scientific sea-level rise experts

Report purpose: Mandated by a December 2012 Executive Order on Climate Change and “Coast Smart” Construction. The EO requires State agencies to consider the risk of coastal flooding and sea-level rise to capital projects and to site and design such projects to avoid or minimize associated impacts. In addition, Section 7 of the order directs: “The Scientific and Technical Working Group shall review the sea-level rise projections in the Maryland Climate Action Plan (2008) and shall provide within 180 day of the effective date of this Executive Order, updated projections based on an assessment of the latest climate change science and federal guidance.” A scientific update was determined necessary due to criticisms that the 4th IPCC Assessment was conservative in its sea-level rise estimates because it did not consider the accelerating polar sea ice melt in calculations. Additionally, a new, statistical rather than process-based modeling approach to predicting sea-level rise.

Sea-level rise projections: The updated projections predict sea-level rise for 2100 in a low emissions scenario of 2.1 feet and in a high emissions of 5.7 feet. The best estimate predicts sea-level rise of 3.7 feet by 2100. These estimates are significantly higher than those presented in the 2008 report (2100 low emissions: 2.7 feet, high emissions: 3.4 feet). The report also predicts a best estimate of 1.4 feet of sea-level rise by 2050.

Maryland Relative Sea-level Rise	Thermal (m)	Glaciers (m)	Greenland (m)	Antarctica (m)	Dynamic (m)	VLM (m)	Relative SLR	
							meters	feet
2050 best	0.10	0.05	0.03	0.09	0.09	0.075	0.4	1.4
2050 low	0.04	0.05	0.02	0.04	0.07	0.065	0.3	0.9
2050 high	0.19	0.06	0.05	0.16	0.10	0.085	0.7	2.1
2100 best	0.24	0.13	0.10	0.30	0.17	0.15	1.1	3.7
2100 low	0.10	0.12	0.08	0.10	0.13	0.13	0.7	2.1
2100 high	0.46	0.17	0.17	0.58	0.19	0.17	1.7	5.7
Land ice change fingerprint scale factors		0.9	0.5	1.25				

Next steps: This scientific update replaces the projections presented in the Comprehensive Strategy and is being used to implement the strategy.

Source: [Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change: Phase 1 Sea-level rise and Coastal Storms](#)

Published: August 2008

Group: Maryland Commission on Climate Change, Adaptation and Response Working Group, chaired by the Maryland Department of Natural Resources (ARWG)

Plan purpose: The Adaptation and Response Working Group of the Maryland Commission on Climate Change was charged by Executive Order to develop the Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change. The Executive Order calls for the Strategy to outline specific policy recommendations for reducing the vulnerability of the state's natural and cultural resources and communities to the impacts of climate change, with an initial focus on sea-level rise and coastal hazards, including shore erosion and coastal flooding. This report lays out the specific priority policy recommendations of the ARWG to address short-and long-term adaptation and response measures, planning and policy integration, education and outreach, performance measurement, and, where necessary, new legislation and/or modifications to existing laws.

Sea-level rise projections: Maryland sea levels have risen 1 foot in the past 100 years, more than double the global average, due to local land subsidence. By the end of the century, accelerated melting could produce a relative sea-level rise of 2.7 feet under the lower emissions scenario to 3.4 feet under the higher emissions scenario. Note: these projections were updated in a more recent report, described above.

Next steps: According to Maryland's Climate Change webpage, a variety of projects designed to implement components of the strategies is well underway and additional efforts have been identified as high-priorities for early action.

*Note: though not included here, Maryland first published a sea-level rise strategy in 2000, making it one of the first states to actively begin thinking about this issue. The state Department of the Environment also provides extensive guidance to communities on floodplain management, including a [model ordinance](#) for communities to adopt that requires new buildings to be constructed at least two feet above base flood elevation.

Delaware

Source: [Preparing for Tomorrow's High Tide](#) Executive Summary

Published: September 2013

Group: Delaware Sea-level rise Advisory Committee; members included representatives from state agencies, state legislature, coastal counties, and non-governmental stakeholders. The committee was staffed by the Delaware Coastal Programs Section of the Department of Natural Resources and Environmental Control.

Report purpose: The Committee final report lays out 55 recommendations for preparing for sea-level rise as well as a list of guiding principles for adaptation action on the ground. The recommendations identify several policies and plans at state and local levels that should incorporate sea-level rise considerations.

Sea-level rise projections: A technical workgroup established by DNREC in 2009 reported that by 2100, this acceleration of sea-level rise rates could cause the level of Delaware's oceans, bays and tidal rivers to rise between 1.6 feet (0.5 meters) and 4.9 feet (1.5 meters) above their present levels.

Next steps: A [Delaware Executive Order](#) was passed in September 2013 following the release of this report setting up the Delaware Committee on Climate and Resiliency. The Order also focuses on three recommendations from the Preparing for Tomorrow's High Tide report—it emphasizes the need to reduce greenhouse gas emissions, directs state agencies to consider climate change impacts in the siting and design of state-funded projects, and it requires that state agencies develop strategies to improve the resiliency of state operations and facilities with a focus on using natural systems and green infrastructure; share best practices with local governments; and reach out to residents and businesses about risks and adaptation strategies. The Delaware Coastal Programs is charged with implementing additional recommendations over the next several years. A workshop was planned to be held some time in 2014.

Virginia

Source: [Final Report: A Climate Change Action Plan](#)

Published: December 2008

Group: Governor's Commission on Climate Change

Plan purpose: Mandated by Executive Order. In addition to summarizing the best available science, the report focuses recommendations primarily on greenhouse gas emissions reduction targets.

Sea-level rise projections: The Action Plan summarized general sea-level rise predictions for the Chesapeake Bay, but no specific localized analysis was conducted for Virginia, which is named as one of the most vulnerable states in the country due to fast-paced local land subsidence combined with global sea-level rise. The Chesapeake Bay Program's Scientific and Technical Advisory Committee projects that sea levels in the Chesapeake Bay region will be 0.7-1.6 meters (2.3-5.2 feet) higher by 2100.

Next steps: The Commission on Climate Change was disbanded and this report was taken out of the public domain for several years for political reasons. In the meantime, several regional sea-level rise and coastal protection efforts, including regional sea-level rise mapping, continued to be funded through federal grants and non-profits. In July 2014 Governor McAuliffe signed an Executive Order to reconvene a Climate Change and Resiliency Update Commission, made up of state agency employees, elected officials, and business and environmental NGO representatives among others. The Commission will evaluate progress on the 2008 Climate Action Plan recommendations and issue an updated Final Report by July 2015. It remains to be seen if the Commission will update

the sea-level rise projections—regional reports for the highly vulnerable Hampton Roads area predict up to 7.5 feet of sea-level rise by 2100 under a high emissions scenario.

North Carolina

Source: [North Carolina Sea-level rise Assessment Report](#)

Published: 2010

Group: NC Coastal Resources Commission voluntary Science Panel on Coastal Hazards, made up of academic and federal research scientists

Report purpose: To summarize the best available science on sea-level rise for North Carolina. The report incorporated IPCC projections, ice melt projections, and local tide gauge data to account for subsidence. The final projections were intended as planning guidance provided by the Coastal Resources Commission to communities.

Sea-level rise projections: Best available science predicted between 15 inches and 55 inches of sea-level rise for the state. The Coastal Resources Commission recommended that communities plan for 39 inches (1 meter) of sea-level rise by 2100.

Next steps: The NC General Assembly passed [Bill 819](#) in 2012 which required the Coastal Resources Commission to reevaluate the climate science and present a new projection no later than March 30, 2015. Bill 819 stipulates that the Coastal Resources Commission maintains the sole authority to define a sea-level rise rate for regulatory purposes in the future, however the Commission is prohibited from setting a sea level rate for regulatory purposes prior to July 1, 2016. The Bill requires that the Commission use peer-reviewed science and present different sea level rates for different parts of the state. Ultimately, Coastal Resources Commission staff reflected that they should have presented a range of sea-level rise projections for communities to use as guidance for planning purposes. The new projections will not necessarily be a planning mandate for communities. Currently, coastal communities have the authority to plan (or not plan) for any rate of sea-level rise they determine to be appropriate. In the meantime, significant efforts to protect coastal communities are underway in the state, including green infrastructure projects that test the efficacy of living shorelines and beach renourishment.

Florida

Source: [Statewide Community Resiliency Initiative: Planning for Sea-level rise](#)

Timeframe: 2011-2016

Group: Florida Department of Economic Opportunity and the Community Resilience Focus Group, composed of multiple stakeholders from local, regional, state and federal government, academia, NGOs, and the business community

Project purpose: This five-year initiative will examine the statewide planning framework and determine how to best integrate adaptation into the existing process as well as how to coordinate adaptation efforts statewide. In addition, the initiative will vet guidance by developing adaptation plans for two pilot communities. The purpose of preparing pilot plans is to evaluate planning guidance, modeling and vulnerability analysis

methodologies for statewide application, determine effective modes for communicating risks, and deliver technical assistance to support adaptation to a diverse audience.

Sea-level rise projections: Sea-level rise projections vary across Florida but projections provided by the [Southeast Florida Regional Climate Change Compact](#) Unified Sea-Level Rise Projection for Southeast Florida (2011) are displayed below:

Projected Sea Level Rise	Estimated Time Occurrence
1 foot	2040-2070
2 feet	2060 - 2115
3 feet	2078 - 2150

Next steps: In 2011, the State Legislature passed the Community Planning Act, giving local governments the authority to create "[Adaptation action areas](#)" or "adaptation areas" as an optional comprehensive plan designation for areas that experience coastal flooding and are vulnerable to the related impacts of rising sea levels for the purpose of prioritizing funding for infrastructure needs and adaptation planning. Local governments that adopt an adaptation action area may consider policies within the coastal management element to improve resilience to coastal flooding. As a result, many strong regional/county-based efforts have begun to be implemented in Florida, including the Southeast Florida Regional Climate Change Compact.

California

Source: California [Sea-level rise Policy Guidance](#)

Published: March 2013

Group: The Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT)

- Members include a wide variety of state agencies
- Led by the California Ocean Protection Council

Policy guidance purpose: The California Sea-level rise Policy Guidance was developed in response to a 2008 Executive Order from Governor Schwarzenegger that directed state agencies to plan for sea-level rise and coastal impacts. The document provides guidance for incorporating sea-level rise into planning and decision making for projects in California, specifically providing resources and recommendations to enhance consistency across state agencies as they develop their own processes for planning for sea-level rise. The guidance lays out eight recommendations. The guidance recommends using the National Research Council (NRC) 2012 sea-level rise projections as a starting point for planning, but also explains that agencies and others should also consider context when choosing a sea-level rise value to plan to—including timeframes, adaptive capacity, and risk tolerance.

Sea-level rise projections: The State of California supported the preparation of the 2012 National Research Council’s Report, Sea-level rise for the Coasts of California, Oregon and Washington: Past Present and Future, which is currently considered the best available science on sea-level rise for California. The report contains sea-level rise projections for three time periods over the coming century for north and south of Cape Mendocino.

Table 1. NRC Sea-Level Rise Projections for California (NRC, 2012)

TIME PERIOD	NORTH OF CAPE MENDOCINO	SOUTH OF CAPE MENDOCINO
2000 – 2030	-4 – +23 cm (-1.56 – 9 inches)	4 – 30 cm (1.56 – 11.76 inches)
2000 – 2050	-3 – + 48 cm (-1.2 – 18.84 inches)	12 – 61 cm (4.68 – 24 inches)
2000 – 2100	10 – 143 cm (3.6 – 56.28 inches)	42 – 167 cm (16.56 – 65.76 inches)

Next steps: The guidance will be revised as science on sea-level rise improves.

Source 2: California Coastal Commission [Draft Sea-level rise Policy Guidance](#) Executive Summary

Published: October 2013 (public comment period ended February 2014, final guidance to be released soon)

Group: California Coastal Commission, State of California Natural Resource Agency

Policy Guidance purpose: The Draft Policy Guidance provides step-by-step guidance (not regulation) on how to address sea-level rise in new and updated Local Coastal Programs (LCPs) and Coastal Development Permits (CDPs) according to the policies of the California Coastal Act. The guidance document lays out several principles for addressing sea-level rise in the coastal zone as well as six steps to incorporate sea-level rise and adaptation planning in new and amended LCPs. The guidance document also lays out five steps to incorporate sea-level rise and adaptation planning into CDPs, which are required for most new development in the Coastal Zone. The guidance stipulates that most permit applications already incorporate sea-level rise into their hazards assessment, but this guidance lays out a clear process to facilitate the application process and minimize risk. The California Coastal Commission makes it clear that the document is for guidance only; it is not regulation.

Sea-level rise projections: See the NRC sea-level rise projections for California presented in Table 1 above.

Next steps: Before finalizing the Draft Sea-level rise Policy Guidance, the California Coastal Commission will incorporate input from the public comment period as well as several public hearings. The Final Policy Guidance is expected to be released soon. As LCPs and CDPs begin incorporating sea-level rise considerations, the California Coastal Commission has committed to providing technical expertise and other support.

Note: In addition to the state guidance and the California Coastal Commission guidance, several state agencies in California are releasing sea-level rise strategies and guidance documents. The two presented are two of the main examples, but a couple more resources can be found here: http://resources.ca.gov/climate_adaptation/.

Oregon

Source: [Sea-level rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future](#)

Published: 2012

Group: National Research Council

Plan purpose: Update sea-level rise science for the West Coast states

Sea-level rise projections:

Newport, Oregon:

2030: 6.8cm ± 5.6 Range: -3.5cm–22.7cm

2050: 17.2cm ± 10.3 Range: -2.1cm–48.1cm

2100: 63.3cm ± 28.3 Range: 11.7cm–142.4cm

*Range is the mean of the low and high emissions scenarios for the 2007 IPCC report

Next steps: Sea-level rise is a long-term priority issue in Oregon, but because of the natural uplift along the coast, impacts will be low in the near future. A few groups in Oregon are evaluating the issue over the long-term. The Oregon Climate Change Research Institute was established by state legislature to improve science for the area. Several general action goals related to sea-level rise are listed the [Oregon Climate Change Adaptation Framework](#) published in 2010. More immediately pressing coastal hazards include the risk for earthquakes and associated tsunamis as well as coastal erosion from storms and development—many of these planning efforts are led by the Oregon Coastal Management Program.