Appendix C. Tech Sheets for Selected State SRR Resources

Tech sheets describing SRR resources are included in this appendix for the states of California, Massachusetts, and New Jersey.

Tech Sheet: California SRR Resources

Sustainable resilient remediation (SRR) is an optimized solution for the cleanup and reuse of hazardous waste sites that limits the negative environmental impacts, maximizes social and economic benefits, and creates resilience against the increasing threat of extreme weather events, sea-level rise, and wildfires. This tech sheet describes how California is promoting and integrating sustainability and resilience in remediation. To quickly find examples and best practices from other states and federal agencies, visit the ITRC SRR Team's webpage and click on the state resources map.	California has several laws, regulations, executive orders (EOs), and policies in place for climate adaptation and resilience, environmental justice, wildfires, and green remediation. This tech sheet summarizes these efforts. **Climate Resilience** In 2015, Governor Brown established EO B-30-15, which aims to reduce greenhouse gas (GHG) emissions and incorporate climate change impacts into planning and investment decisions. Further, this order requires the state Natural Resources Agency to update the state's climate adaptation strategy every 3 years. To read the complete EO and for more information, click here. The Natural Resources Agency's climate adaptation strategy, mentioned above, is called Safeguarding California. The last update was in 2018 and the next will be published in 2021. As stated in the 2018 update, the plan "builds on nearly a decade of adaptation strategies to communicate current and needed actions state government should take to build climate change resiliency." The Governor's Office of Planning and Research (OPR) published a climate resilience report titled Planning and Investing for a Resilient California: A Guidebook for State Agencies (2018). This report includes accounting for current and future climate conditions in infrastructure investment. OPR was directed to convene a technical advisory group to develop guidance to support implementation of the executive order (EO B-30-15). **Hazardous Waste Management Resilience Initiatives** Three hazardous waste management resilience initiatives in California are summarized below. The California Department of Toxic Substances Control (DTSC) and a team of federal, state, and local agencies evaluated impacts of the Woolsey Fire on conditions at the Santa Susana Field Laboratory site (state-led cleanup) and in nearby communities. The interim report summarizes work done to address concerns about the impact of the Woolsey Fire on the site and surrounding communities (DTSC 2018).

The Los Angeles Region Framework for Climate Change Adaptation and Mitigation: Potential Regulatory Adaptation and Mitigation Measures report looks at the impact of the effects of climate change on contaminated sites and underground storage tanks and how these effects can be considered in the agency's actions (LARWQCB 2019).

The San Francisco Bay Conservation and Development Commission's Adapting to Rising Tides project evaluated the current condition of shoreline and community assets and the stressors affecting them.

Wildfires

The State of California has multiple resources for wildfire prevention and response.

In 2019, the Governor's Office released a report called Wildfires and Climate Change: California's Energy Future. The strike force report sets out steps the state must take to reduce the incidence and severity of wildfires, including the significant wildfire mitigation and resiliency efforts the governor has already proposed. It renews the state's commitment to clean energy. It outlines actions to hold the state's utilities accountable for their behavior and potential changes to stabilize

California’s utilities to meet the energy needs of customers and the economy.

The California Public Utilities Commission requires wildfire mitigation plans from large or small and multijurisdictional utility companies and independent transmission owners in SB 901. Each of the participants also provides final action statements and resolutions. The commission issued a ruling on the wildfire mitigation plan templates and other related materials. Utilities also submitted progress reports in 2019.

Additionally, the Bureau of Land Management created a Microsoft PowerPoint presentation of its wildland fire response in 2015. The presentation includes details on organization and immediate response to wildland fires, emergency stabilization and rehabilitation responses, and case examples. A request for access may be required to view this document.

Green Remediation

The Department of Toxic Substances Control has a green remediation website to promote green remediation whenever possible. The site also explains green remediation and the DTSC’s interim advisory (2009), which introduces sustainability and life-cycle thinking and shows how these concepts can be incorporated into any stage of a cleanup project. The website provides additional resources as well.

Tech Sheet: Massachusetts SRR Resources

Sustainable resilient remediation (SRR) is an optimized solution for the cleanup and reuse of hazardous waste sites that limits the negative environmental impacts, maximizes social and economic benefits, and creates resilience against the increasing threat of extreme weather events, sea-level rise, and wildfires. This tech sheet describes how Massachusetts is promoting and integrating sustainability and resilience in remediation. To quickly find examples and best practices from other states and federal agencies, visit the ITRC SRR Team's webpage and click on the state resources map. The Sustainable Remediation FAQs answers basic questions about sustainable remediation and state programs that support SSR, including the Massachusetts Contingency Plan (MCP) and Brownfields programs. The Massachusetts Department of Environmental Protection (MassDEP) issues postclosure use permits for solar and wind installations on closed and capped landfills. To date, the agency has approved more than 100 projects rated more than 220 megawatts, the largest Brightfields program in the U.S.	Massachusetts has established laws and executive orders (EOs) with ambitious goals to combat climate change and incorporate resilience in infrastructure and remediation. The state maintains a climate action website with links to supporting regulations, programs, and policies. **Laws** In 2008, Massachusetts enacted the Green Communities Act and the Global Warming Solutions Act (GWSA). The GWSA made Massachusetts one of the first states with a comprehensive regulatory program to address climate change and one of the most robust climate change laws in the nation. **Executive Orders** In 2014, an EO was enacted requiring secretariats to take action in promoting environmental justice. The EO requires new strategies that promote positive impacts in environmental justice communities and focus on several environmental justice initiatives. In 2016, Massachusetts Governor Charlie Baker issued EO 569, Establishing An Integrated Climate Change Strategy For The Commonwealth. Among other things, the EO required the state to "make new and existing efforts to mitigate and reduce greenhouse gas (GHG) emissions and build resilience and adapt to the impacts of climate change," as well as to "coordinate efforts…to strengthen the resilience of our communities, prepare for the impacts of climate change, and prepare for and mitigate damage from extreme weather events." **Regulations** In 2014, the Massachusetts Contingency Plan (MCP) was amended and included the promotion of green approaches for the assessment and remediation of regulated sites. The relevant provisions include eliminating or reducing total energy use, air emissions, water use, materials consumption, and damage to ecosystems. Although there are no specific sustainability The Sustainable Remediation FAQs answers basic questions about sustainable remediation and state programs that support SSR, including the Massachusetts Contingency Plan (MCP) and Brownfields programs. The Massachusetts Department of Environmental Protection (MassDEP) issues postclosure use permits for solar and wind installations on closed and capped landfills. To date, the agency has approved more than 100 projects rated more than 220 megawatts, the largest Brightfields program in the U.S. requirements in the MCP, the MCP recognizes energy consumption and other factors that are relevant to sustainability as considerations in remedy selection. In particular, 310 CMR 40.0858(4) requires an evaluation of the following: • "the relative consumption of energy resources in the operation of the alternatives, and the externalities associated with the use of those resources" • "costs of environmental restoration, potential damages to natural resources, including consideration of impacts to surface waters, wetlands, wildlife, fish and shellfish habitat." The promotion and application of green approaches for the assessment and remediation of oil and hazardous disposal sites (per the 2014 amendments to the MCP) are consistent with the commonwealth's mandates to improve energy efficiency, reduce emissions, and expand renewable energy resources where practicable. In 2019, additional MCP amendments were proposed to require the consideration of "anticipated impacts associated with climate change" on "risk of harm to health, safety, public welfare or the environment during any foreseeable period of time" at waste sites. These changes will be final in 2021, and further guidance is being developed. **Guidance** MassDEP provides guidance on recommended approaches to maximize the net environmental benefit when conducting remediation under the MCP. Signed in 2014, the purpose of the guidance is to support environmental professionals in their consideration and use of greener approaches for site assessment and remediation that eliminate or reduce the environmental footprint of cleanup activities to the maximum extent possible. The focus of such approaches includes addressing five core elements or factors for reducing the environmental footprint of a cleanup: • minimizing total energy use while maximizing renewable energy • minimizing emissions of GHGs and other air pollutants • minimizing water use and impacts to water resources • reducing, reusing, and recycling materials and waste • avoiding or reducing adverse impacts to ecosystems and land resources

Funding Sources

The Municipal Vulnerability Preparedness grant program provides support for communities to identify climate change vulnerabilities, prioritize critical actions, and build community resiliency and follow-on grants to fund projects.

State Projects

Charles River Natural Valley Storage Area

More and more communities are employing green infrastructure and conserving surrounding

watersheds to improve resilience to changing climates. Increased development around Boston, Massachusetts, in the past decades eliminated many wetlands and increased roadways, parking lots, and other impervious surfaces. A series of dams along the Charles River historically controlled flooding, but these dams had insufficient capacity for large precipitation events, which have become more common. Rather than build more dams at great environmental, social, and economic costs, the U.S. Army Corps of Engineers, the city, and surrounding communities agreed to protect the remaining wetlands by creating the Charles River Natural Valley Storage Area. These wetlands provide critical green infrastructure, deliver flood resilience to the city, and expand recreational amenities for the entire region (Cassin 2019).

Massachusetts Climate Change and Hazardous Waste Site Screening

The Sustainable Remediation Forum (SURF), EcoAdapt, MassDEP, and researchers at Boston University collaborated to develop a simple model and GIS tools to evaluate the potential vulnerability of a subset of 6,001 high-interest MassDEP-listed sites based on their locations relative to FEMA flood hazard map zones, NOAA hurricane surge zones, and NOAA sea-level rise projections. The assessment also included site remediation status, key environmental parameters, and community parameters such as population density, proportions of elderly and children, percent of minority populations and median household income, and proximity of schools and hospitals. Vulnerability results include a unique combination of site exposure, site sensitivity, and community sensitivity parameters. The research marks a first step in informing community leaders, state agencies, and remediation managers of the potential vulnerabilities of hazardous waste sites due to climate change impacts (Mielbrecht and Tarrio 2019).

Resilient MA – Climate Change Clearinghouse for the Commonwealth

Resilient MA – Climate Change Clearinghouse for the Commonwealth is a web portal to thousands of resources on climate change and resilience. Documents and links available include, but are not limited to, the following:

- Massachusetts Clean Energy and Climate Plan for 2020 is an implementation plan for reducing GHG emissions (dated 12/31/2015).
- Massachusetts State Hazard Mitigation and Climate Adaptation Plan, dated September 2018, accounts for projected changes in precipitation, temperature, sea-level rise, and extreme weather events to position Massachusetts to effectively reduce the risks associated with natural hazards and the effects of climate change.
- Massachusetts Climate Change Projections – Statewide and for Major Drainage Basis, March 2018, provides simulations on temperature, precipitation, and sea-level rise through the end of the century using the latest climate models.
- Global Warming Solutions Act Dashboard: Massachusetts' Progress towards Reducing Greenhouse Gas Emissions by 2020 shows Massachusetts' progress toward the goals of the act, which was signed in August 2008.

Tech Sheet: New Jersey SRR Resources

Sustainable resilient remediation (SRR) is an optimized solution for the cleanup and reuse of hazardous waste sites that limits the negative environmental impacts, maximizes social and economic benefits, and creates resilience against the increasing threat of extreme weather events, sea-level rise, and wildfires. This tech sheet describes how New Jersey is promoting and integrating sustainability and resilience in remediation. To quickly find examples and best practices from other states and federal agencies, visit the ITRC SRR Team's webpage and click on the state resources map.	On October 29, 2012, the Northeast was hit by Superstorm Sandy. The storm caused major flooding in several cities along the northeast coastline, including most of coastal New Jersey. The flooding caused widespread power outages and fires, destroyed homes, and took lives. The reality of the devastation showed that planning and preparing for future extreme weather events must be prioritized. New Jersey has developed policies and passed regulations, statutes, and executive orders (EOs), taking specific actions to address sustainability and resilience at contaminated sites. This tech sheet summarizes these efforts. **Guidance** The New Jersey Department of Environmental Protection (NJDEP) first addressed the issue of resilience at contaminated sites in 2016 with the publication of the technical guidance Planning for and Response to Catastrophic Events at Contaminated Sites. This document was created to provide licensed site remediation professionals, the party responsible for conducting the remediation, and property owners guidance to help them prepare for, respond to, and recover from catastrophic events. The guidance addressed the following topics: • planning for resilience when designing and implementing site remedies • retrofitting vulnerable sites to decrease the disruption to existing systems • establishing communication networks, chain-of-command structures, and procedures to be used during catastrophic events • reviewing lessons learned • reassessing systems to be better prepared for future catastrophic events

Regulations and Statutes

In 2018, the NJDEP addressed sustainability at contaminated sites in its Technical Requirements for Site Remediation, which states that the NJDEP "encourages the use of green and sustainable practices during the remediation of contaminated sites" (N.J. Admin. Code § 7:26E-1.9, NJDEP 2018). Although not a strong directive, it incorporated green and sustainable practices into the lexicon of site remediation in New Jersey and encouraged their consideration at contaminated sites during remediation.

A year later, the state incorporated green and sustainable remediation (GSR) into its statutes when the Site Remediation Reform Act was amended. The Brownfields statute (C.58:10B-12.1) amendment states:

The department [NJDEP] shall encourage the use of green and sustainable practices during the remediation of a contaminated site. The use of green and sustainable practices shall not alter the requirement that the remediation be protective of the public health and safety and of the environment.

Once passed as law, the NJDEP determines what constitutes "encouragement" through the rule-making process.

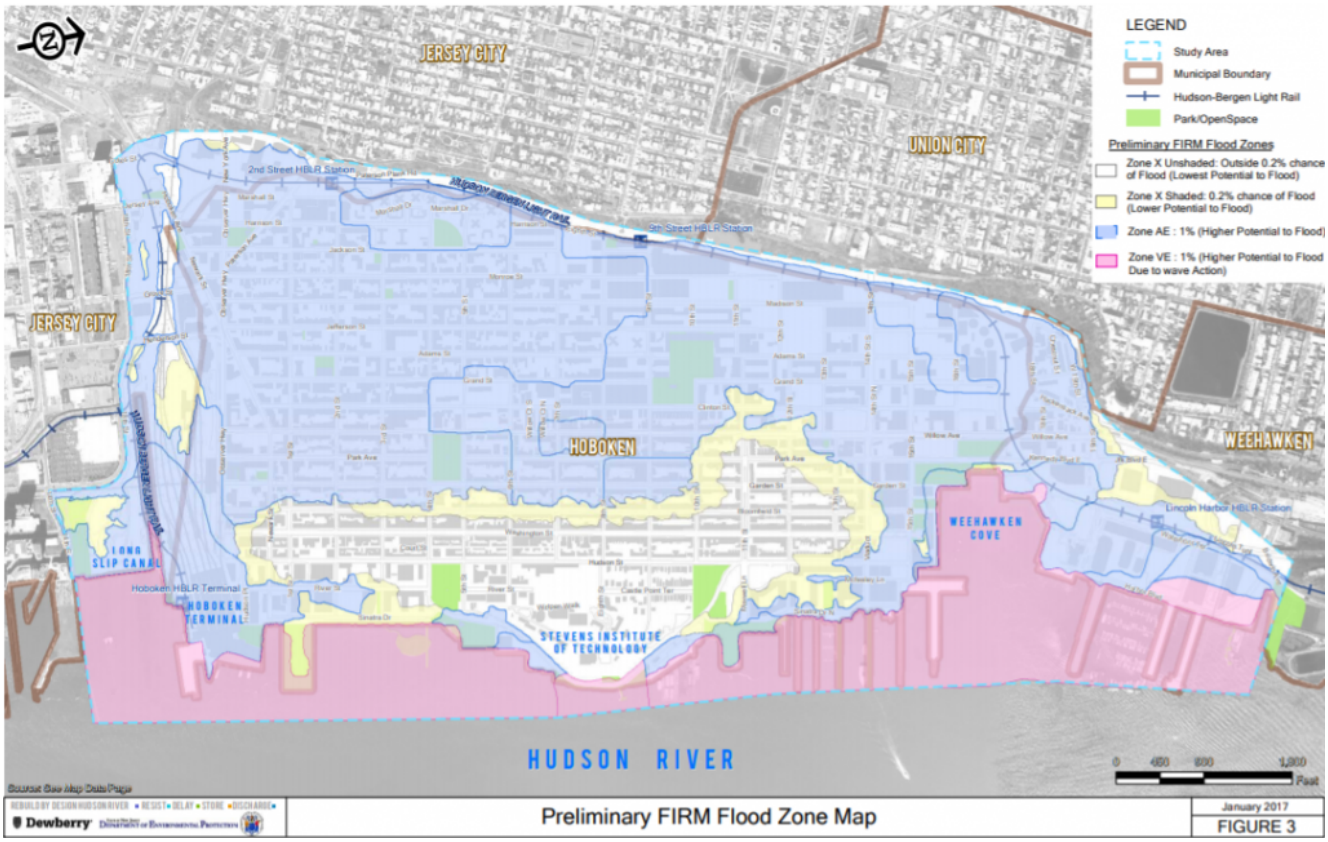
Executive Orders (EOs)

New Jersey Governor Murphy signed EO 89 on October 29, 2019, on the seventh anniversary of Superstorm Sandy. The order directed the state, through the NJDEP, to develop a statewide climate change strategy to guide decisions and policies across state government. The EO also formed a Climate and Flood Resilience Program within the NJDEP and created the Interagency Council on Climate Resilience to promote the long-term mitigation, adaptation, and resilience of New Jersey's economy, communities, infrastructure, and natural resources.

The state's chief resiliency officer is the head of the newly formed Climate and Flood Resilience Program within NJDEP. The divisions and bureaus are responsible for addressing climate impacts that threaten the safety of the residents of New Jersey, including preventing or mitigating climate impacts at hazardous sites in flood zones.

As an example, the Bureau of Climate Resilience Planning provides planning and technical support to New Jersey's communities to help residents make informed decisions about climate resilience. The bureau is responsible for coordinating NJDEP policies, programs, and activities to plan for the impacts and the associated hazards of climate change and promote public awareness of climate change science. Coordinating with other programs such as the Site Remediation and Waste

Management Program is part of the work.



A hazardous waste screening technical environmental study of Hoboken, NJ, and portions of two surrounding cities found 343 state historic and historic hazardous waste sites within the study area (NJDEP 2017).

Funding Sources

Incorporating SRR into state-funded response actions has many benefits, including contributing toward state-mandated climate and sustainability goals to reduce emissions and waste generation and planning for extreme weather events that may compromise a remedy at a contaminated site. New Jersey has several funding programs that can be used for SRR projects, including the following.

Office of Natural Resource Restoration

This office within NJDEP can provide funding for natural restoration projects that may also play a role in the sustainability and resiliency of a remediation project. A project example is the Harrison Avenue Landfill (that is, Cramer-Hill Waterfront Park), where funding was provided to institute a living shoreline, bolstering over 3,000 feet along the Delaware River in the City of Camden.

Hazardous Discharge Site Remediation Fund (HDSRF)

The HDSRF grants and loans are available to public entities, private entities, and nonprofit organizations that perform remediation pursuant to NJDEP's Site Remediation Program requirements. The HDSRF is funded through a constitutionally dedicated portion of the New Jersey Corporate Business Tax and is administered through a partnership between the NJDEP and the New Jersey Economic Development Authority (NJEDA). The NJDEP evaluates an applicant's preliminary eligibility requirements and the estimated remediation costs. Upon the NJDEP's recommendation for funding, the NJEDA evaluates an applicant's financial status, determines grant or loan eligibility, and awards funding.

Environmental Infrastructure Trust

New Jersey's Environmental Infrastructure Trust provides financial assistance through the Clean Water State Revolving Fund Program. Projects eligible for funding include nonpoint source pollution and stormwater management projects.

RGGI Strategic Funding

The NJDEP, Board of Public Utilities, and the NJEDA published a strategic funding plan for investing the state's auction proceeds from the Regional Greenhouse Gas Initiative (RGGI). New Jersey plans to invest an estimated $80 million each year (between 2020 and 2022) in programs that reduce greenhouse gas emissions, drive forward projects that boost clean energy and create jobs, protect the health of residents in environmental justice communities, and increase the resiliency of coastal communities. Information about specific funding opportunities will be released periodically through this website.