

Building Strong Collaborative Relationships for a Sustainable Water Resources Future:

STATE OF RHODE ISLAND

SUMMARY OF STATE WATER PLANNING

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The findings contained in this report are based on the information collected from the literature search and interviews for this initiative and should not be construed as an official Department of the Army position, policy or decision unless so designated by other official documentation.

STATE OF RHODE ISLAND

1. STATE/REGIONAL WATER PLANNING STATUS

In 2004, recognizing that no single agency possessed the jurisdiction and capacity to fully address all of the issues pertaining to Rhode Island's bays, rivers, and watersheds, and their economic uses, the Rhode Island General Assembly created the Rhode Island Bays, Rivers, & Watersheds Coordination Team (Coordination Team). The mission of the Coordination Team is to foster inter-agency collaboration and ecosystem-based management for Rhode Island's waters and watersheds through the pursuit of shared strategic priorities developed via a strategic planning cycle termed the Systems-Level Plan. The Coordination Team is also mandated to balance and integrate environmental and economic values and programs, distinguishing it from similar efforts at inter-agency coordination in the states of Washington, New York, and California.

To fulfill its mandate the Coordination Team is charged with (1) "preparing and adopting by rule a systems-level plan" and (2) "coordinating the projects, programs, and activities carried out by the members of the team and its committees that pertain to the implementation of such plan". The systems-level plan (SLP) is intended to provide:

An ecosystem-based management approach to water and watershed management and water-reliant economic development that acknowledges and functions within contemporary networks of environmental governance, economic development, and, increasingly, energy management (Source [1]).

In July 2008, the Coordination Team released the first version of the *Bays, Rivers, and Watersheds Systems-Level Plan: 2009-2013* (Source [1]). The Systems-Level Plan (SLP) addresses five major challenges:

- Climate Change
- Waterfront, Riparian, and Coastal Development
- Watersheds and Water Quality and Supply
- Water-Reliant Economies
- Habitat Restoration and Aquatic Invasive Species

The SLP is divided into eight "policy domains" or strategic areas:

- Waterfront and Coastal Development
- Watersheds
- Rhode Island's Water-Reliant Economy
- Natural Hazards
- Freshwater Supply
- Water Quality
- Fisheries and Aquaculture
- Aquatic Habitats and Invasive Species

For each strategic area, the primary concerns and uncertainties are discussed, followed by a “Strategy Table” that outlines the objectives, strategies, and actions to be pursued over 4 to 5 years by the participating state agencies. The responsibility for implementing these strategies ultimately falls on the Coordination Team state agencies in partnership with Federal and local governments and other stakeholders.

In addition to the Coordination Team and the Systems-Level Plan, statewide water plans and policies are also the responsibility of the Department of Administration’s Division of Planning (DOP) Statewide Planning Program, which is “charged with preparing and maintaining plans for the physical, economic, and social development of the state; encouraging their implementation; and coordinating the actions of state, local and Federal agencies and private individuals within the framework of the state’s development goals and policies” (RIGL 42-11-10 and 12) (Source [2]). As noted below, the Division of Planning is also a member of the Coordination Team. The Statewide Planning Program resulted in the State Guide Plan, which includes the following water-related elements:

- #125 Scituate Reservoir Watershed Management Plan
- #162 Rivers Policy and Classification Plan
- #721 Water Supply Policies for RI
- #722 Water Supply Plan for RI
- #723 Water Emergency Response Plan
- #724 Drought Management Plan (Source [3])

2. RESPONSIBLE STATE AGENCIES/REGIONAL ENTITIES

The Rhode Island Bays, Rivers, and Watersheds Coordination Team consists of executives from seven state agencies and a chairperson appointed by the RI Governor and approved by the RI Senate pursuant GL 46-31-3. The chairperson, who serves as the point of contact for the Coordination Team, is:

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The seven state agency members are currently:

Kevin Flynn – Associate Director, RI Division of Planning
Michael Saul – Acting Executive Director, RI Economic Development Corporation
Jane Sherman and Guy Lefebvre – Co-Chairs, RI Rivers Council
Kenneth Burke – General Manager, RI Water Resources Board
Raymond Marshall, P.E. – Executive Director, Narragansett Bay Commission
W. Michael Sullivan, Ph.D. – Director, RI Department of Environmental Management

Michael M. Tikoian – Chair, RI Coastal Resources Management Council

These senior executive officials may appoint proxies to attend meetings of the Coordination Team and its subcommittees and work with the Chair on Team administration. The Chair is responsible for maintaining communications with agency leaders, as well as the RI Governors Office and the RI General Assembly regarding Coordination Team activities and accomplishments. The Coordination Team may call upon other state agencies to help fulfill its mission; of particular importance are the Department of Health, the Department of Transportation, and the University of Rhode Island.

3. WATER MANAGEMENT VISION AND GOALS

The SLP begins with a comprehensive vision statement (Source [1]):

In the future, Rhode Island's waters and coasts are fishable, swimmable, prosperous, and resilient, and state and local environmental and economic development policies are well-managed, integrated, and cost-effective.

Numerous socio-economic uses and values are thriving, including commercial and recreational fishing, recreational boating, renewable energy generation, ocean and bay monitoring, water-dependent transport and industry, maritime technologies, recreation and tourism.

State and regional governance of Rhode Island's waters and watersheds fully incorporates systems perspectives, particularly the principles of ecosystem-based management, and is based upon world-class programs in monitoring, research, education and outreach, and strategic planning and evaluation.

A high level of biodiversity and a wide range of marine, estuarine, and freshwater habitats are protected, restored, and managed holistically. Development along shorelines, waterfronts, and floodplains is designed to mitigate the risks of coastal storm hazards and sea-level rise, and increase community resilience. Rhode Island's bays, rivers, and watersheds are widely perceived as desirable, attractive places to live, work, and play, with clean water, exceptional beaches, abundant public access, thriving living resources, and vital harbors and waterfronts.

There are two overall goals of the SLP (Source [1]):

- *Develop and apply ecosystem-based management principles to protect and restore Rhode Island's fresh, estuarine and marine waters and watersheds, and the human and economic values that derive from them.*
- *Guide the development of Rhode Island's "water-reliant economy" so that natural resources, including renewable energy are utilized sustainably, and enhanced in their utilization.*

The SLP provides a set of guiding principles and strategies for achieving its vision and goals. It recognizes the need to employ systems-level management of the state’s water resources and their associated economic value in a sustainable manner. Figure 1 shows the relationships between the resources and values considered in the systems-level vision utilizing systems dynamics model framework. The emphasis on integrating the economic and environmental values of the state’s water resources is a unique aspect of the Coordination Team’s planning process and strategic priorities. The SLP recognizes that a significant portion of the state’s economy depends on its water resources. The term “water-reliant economy” is used throughout the SLP and refers to the sectors of the economy that depend either directly or indirectly on water resources.

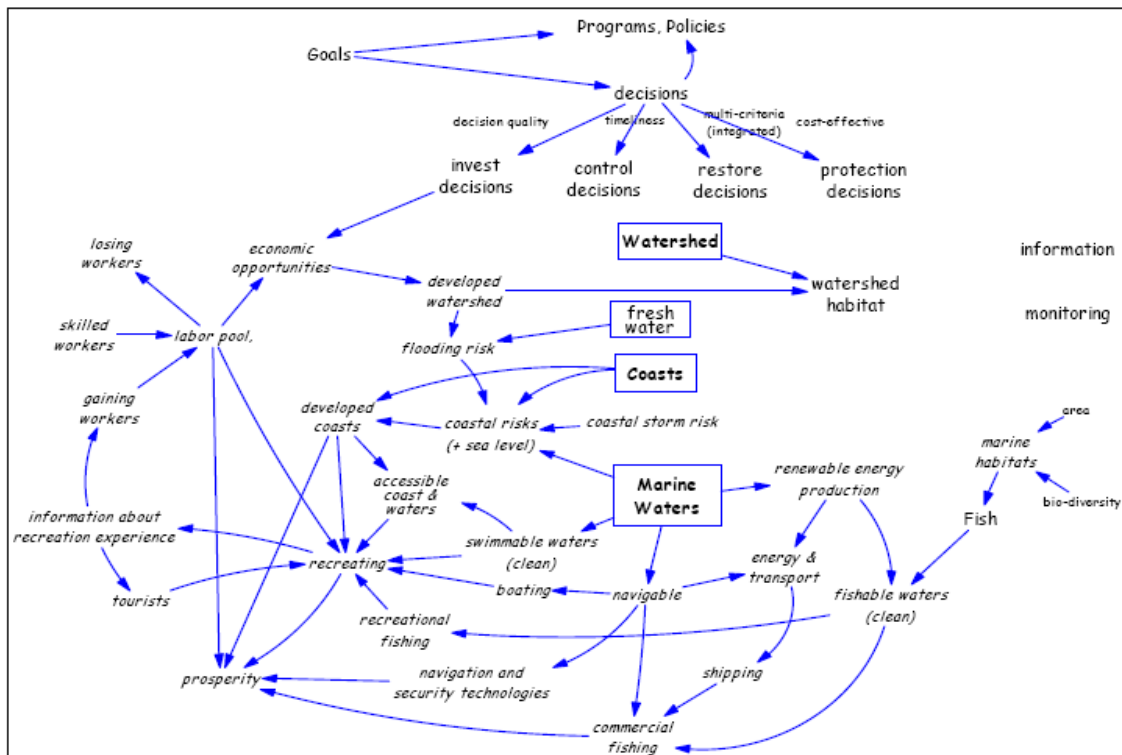


Figure 1. The Bays, Rivers, and Watersheds Systems-Level Vision (Source [1])

4. SCOPE OF WATER RESOURCES PLANNING AND MANAGEMENT

The SLP describes five major challenges that the state of Rhode Island faces:

- **Climate Change:** The state is highly vulnerable to the effects of climate change, especially *sea-level rise, intensifying coastal hazards, ambient water temperature increases, alterations in precipitation patterns and quantities, and alterations to terrestrial and aquatic ecosystems, habitats, and living resources* (Source [1]).
- **Waterfront, Riparian, and Coastal Development:** The state will *ensure that future coastal waterfront development and re-development upholds state interests in marine economic vitality, public access, and the protection and restoration of critical habitats and environmental qualities* (Source [1]).

- Watersheds and Water Quality and Supply: The state will *maintain the well-being of freshwater ecosystems and ensure adequate, affordable, high quality drinking water supplies for Rhode Islands' citizens and businesses* (Source [1]).
- Water-Reliant Economies: Much of Rhode Island's economy is reliant on its water resources including tourism, commercial and recreational fisheries, aquaculture, and ocean renewable energy resources.
- Habitat Restoration and Aquatic Invasive Species: The state will *protect and restore freshwater, estuarine, and marine habitats, boosting their biodiversity and resilience to anthropogenic and environmental stressors* (Source [1]). Prevention of the spread of aquatic invasive species is also a major challenge.

The SLP is divided into eight strategic areas, or “policy domains,” each with its own set of goals to address these challenges. Each of these sections is discussed in detail below. The major goal statements for each policy domain are as follows (Source [1]):

- Waterfront and Coastal Development: *Rhode Island's shorelines and waterfronts will be characterized by balanced, well-designed development that accommodates marine-related industry, transportation, recreation, housing, and conservation.*
- Watersheds: *Rhode Island's watershed ecosystems will be healthy and their natural functions maintained.*
- Rhode Island's Water-Reliant Economy: *Rhode Island businesses that rely upon aquatic resources and/or waterfronts will thrive and have the opportunity to grow sustainably.*
- Natural Hazards: *Human life, property, infrastructure, and natural resources will be protected against the hazards of storms and floods.*
- Freshwater Supply: *Rhode Island will have ample, reliable safe fresh water supplies for the future.*
- Water Quality: *Rhode Island's fresh, estuarine, and marine waters will support aquatic habitats, biological diversity, and their traditional and emerging human uses.*
- Biodiversity: Aquatic Habitats and Invasive Species: *Rhode Island's freshwater, coastal, estuarine, and marine habitats will support healthy aquatic ecosystems for native fish and wildlife.*
- Fisheries and Aquaculture: *Rhode Island will maintain sustainable and vital freshwater and marine fisheries, as well as a diverse, thriving aquaculture industry.*

For each of the eight policy domains, the SLP describes the key concepts, uncertainties, objectives, and recommended strategies. At the end of each section is a “Strategy Table” which provides a concise summary of the objectives, strategies, actions, responsible agencies, and an expected time-frame (Figure 2). The responsibilities for implementing the actions listed in each Strategy Table fall on the appropriate state agencies, and not the Coordination Team. The Coordination Team simply provides guidance to the agencies on the strategies and actions needed to achieve the statewide systems-level vision.

Goal: Rhode Island's watershed ecosystems will be healthy and their natural functions maintained.

Objectives	Strategies: 2009-2013	Actions	Agencies lead agency in bold	Time Frame
Complete attainment of water quality standards and the prevention of water quality degradation for Rhode Island's rivers, streams, lakes and ponds.	Work with local governments to establish their most important priorities for protecting natural resources with strategies such as participation in a regional green space protection strategy.	Work with local governments to develop "community asset maps" that identify and prioritize natural, cultural, and recreational resources, including headwater tributaries and ground and surface water supplies.	DEM, DOP, CRMC	1-4 years
		Use community asset maps to educate communities on developing planning processes that consider natural, cultural, and recreational resources in comprehensive plans and development reviews.	DOP, DEM	Ongoing
		Integrate community asset maps into a single state GIS system.	DOP	1-5 years
	Establish and promulgate green development standards and land use techniques to protect fresh and marine water quality.	Expand technical assistance and seek additional financial support to help communities implement green development standards and land use techniques.	DEM, DOP, CRMC, RIRC	Ongoing
	Expand local and state-wide protection of riparian buffers, freshwater wetlands, brackish wetlands, and salt marshes.	Expand grants and technical assistance to protect and restore riparian buffers and wetlands, particularly in urban watersheds.	DEM, CRMC	Ongoing

Figure 2. Example Strategy Table for Watersheds (Source [1])

Many of the strategies described in the SLP originate from existing management plans from the various state agencies. Summaries of the key issues and existing strategies to address these issues are described below for each of the eight strategic areas.

Waterfront & Coastal Development

The Rhode Island Coastal Resources Management Council (CRMC) is the state agency responsible for managing coastal and waterfront development and re-development. Specifically, the CRMC “utilizes buffer zone regulations and water type designations to guide and regulate development” (Source [1]). Waterfront and coastal development is particularly vulnerable to climate change and sea level rise, which is expected to be as much as 3 to 5 feet by 2100 along the Rhode Island Coast. The 2008 report of the Coordination Team’s Economic Monitoring Collaborative estimated that Rhode Island’s marine trades were growing about 2.6 times faster than the growth rate of marine trades nationally. Rhode Island thus enjoys a robust growing marine trades sector that has benefited from the “clustering” of marinas, boat-builders and a wide variety of support services such as insurance, and yacht brokerage, as well as supportive state tax and development policies. The SPL recommends remediation and restoration of coastal brownfields in order to “meet demand for developable waterfront property” (Source [1]).

In addition to coastal development, riverfront development “whether commercial, residential, or industrial, must proceed in a manner that preserves and restores freshwater wetlands or riparian buffers” (Source [1]). Low-impact development measures are recognized by both the CRMC and the Department of Environmental Management (DEM) as essential to minimize water quality degradation and stormwater runoff.

The CRMC, the RI Economic Development Corporation (EDC) and the DOP are the three state agencies responsible for fulfilling the two objectives in this area, which include (Source [1]):

- *Sufficient quantity and quality of industrial waterfront lands to foster marine and waterfront economic development.*
- *Waterfront, riverine, and coastal developments that incorporate design standards sensitive to the environmental and cultural values of their surroundings.*

Watersheds

The SLP defines a watershed “as the land area that collects and conveys water to a particular point along a waterway” (Source [1]). The SLP adopts a watershed-based approach that was first described in a 1999 report entitled the Rhode Island Watershed Approach Framework. Although “many observers are concerned about the lack of progress made toward the Watershed Approach’s recommendations by state and local government over the past ten years” (Source [1]), the SLP supports the watershed approach in the recommended goals and strategies for land use development. The SLP calls on local city and town planning boards to “prevent additional water quality and habitat degradation by improving land use controls via a state-wide watershed management framework” (Source [1]). The importance of local government participation is critical to the success of this issue since “Rhode Island’s cities and towns retain primary authority over land uses within their jurisdictions, their future growth decisions and the degree to which those decisions reflect watershed management policies will determine whether we achieve Rhode Island’s water quality and aquatic habitat protection goals” (Source [1]).

The SLP highlights the importance of controlling non-point source pollution through careful management of impervious cover during watershed development. Non-point source pollution is recognized as a major concern where “the cumulative effects of numerous small non-point sources over time will seriously degrade water quality and permanently alter aquatic habitats” (Source [1]). To control impervious cover, the SLP states that “policies and regulations that control [impervious cover], encourage wetland restoration and promote greenspace along our waterways, as provided in Land Use 2025, will contribute to water quality improvements and reductions in flood hazards” (Source [1]). The Land Use 2025 report was released in 2006 by the Rhode Island Division of Planning’s Statewide Planning Program and provides guidelines for minimizing the increase of impervious coverage by concentrating growth within

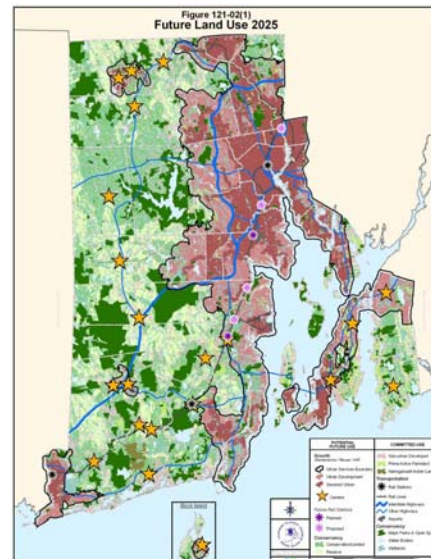


Figure 3. Land Use 2025 Vision for Future Land Use (Source [1])

“Urban Services Boundary,” promoting low-impact development, and the installation of permanent “Greenspaces” throughout urban, rural and waterfront areas (Source [4])

The SLP highlights the impact of land use changes on receiving water quality and notes that there has been a shortage of assistance by the state agencies such as DEM and DOP to local governments and zoning boards, which ultimately control changes in land use. “It is essential that local land use authorities have access to the information and assistance they need to plan responsibly, make informed decisions, and implement watershed protection strategies (Groundwater Protection Council, 2007) in conjunction with the goals established in Land Use 2025. Without such resources, any attempt to mandate improved watershed and land-use management by local government will falter” (Source [1]). A key recommendation of the SLP and the Coordination Team is the need to better integrate state and local planning efforts, with local planners making the decisions supported by information and guidance from state planners. The SLP acknowledges that inter-state cooperation is also necessary, especially with Massachusetts since it contains a significant portion of the Narragansett Bay watershed.

The DEM, DOP, and the RI Water Resources Board (WRB) are the primary agencies responsible for achieving the watershed strategy objectives, which include (Source [1]):

- *Complete attainment of water quality standards and the prevention of water quality degradation for Rhode Island’s rivers, streams, lakes and ponds.*
- *Future land-uses and development that fully protect and restore watershed resources, habitats, and freshwater resources.*

Rhode Island’s Water-Reliant Economy

A substantial portion of Rhode Island’s state economy is dependent on or related to its fresh and marine water resources. Significant challenges are expected due to “climate change, sea-level rise and intensifying worldwide demand for fossil fuel resources whose future global availability (and resulting price increases) may become more restricted than presently assumed by government and industry. Together, climate change and higher fossil fuel prices may necessitate urgent economic and management reforms and infrastructure re-development investments in order to maintain and grow Rhode Island’s water-reliant economy” (Source [1]).

The SLP divides the state’s water-reliant economy into three categories:

- **Water-dependent sector:** *This sector depends on waterbodies or their close proximity for its economic viability* (Source [1]). For example, marinas, fishing and aquaculture, water and sewer construction and management, etc.
- **Water-related sector:** *Waterbodies are a contributing component (either direct use or indirect use such as aesthetics), but this sector could function without direct access to them* (Source [1]). For example, navy research, water-based tourism, real estate development, marine trades, etc.

- Watershed sector: *This sector is defined by industries that rely on particularly large volumes of fresh water for production* (Source [1]). For example, manufacturing firms, industry production, etc.

These three sectors will benefit “in different ways from improved aquatic resource management and restoration, in terms of both enhanced environmental qualities and improved governance built upon [ecosystem-based management] systems perspectives” (Source [1]). The SLP highlights marine trades (e.g. ship-building, specialized marine services, waterfront infrastructure redevelopment and maintenance) as having potential for high economic growth, but are also vulnerable to competition from other coastal industries. Recreation and tourism has also been a large industry in the state, and would benefit from improvements in coastal marine assets. A survey of public recreation demand from 2002 indicated that “97 percent of respondents said that providing public beaches was either a somewhat or very important service of DEM” (Source [1]).

In order to support the state’s water-reliant economy, “Rhode Island’s state and municipal governments must design, finance, and implement renovations or expansions of infrastructure for water supply, wastewater and stormwater treatment, waterfronts, coastal shorelines, maritime navigation, and coastal roadways” (Source [1]). Planning of infrastructure improvements must also consider the potential future impacts of climate change and sea-level rise. Due to the numerous harbors, ports, and marinas along the state’s coastline, dredging of navigable channels is critical to facilitate maritime transportation and marina operations.

The DOP, DEM, CRMC, and Rhode Island Economic Development Corporation (EDC) are tasked with achieving the following objectives for the water-reliant economy strategy (Source [1]):

- Recreation and Tourism: *A thriving tourism industry based on world-class environmental and cultural assets. Diverse marine and freshwater recreational resources for RI’s citizens and visitors.*
- Boatbuilding, Shipbuilding, and Boating-Related Businesses: *Ensure that Rhode Island continues to be a world leader in marine trades.*
- Water-Based Transportation: *Expanded, competitive water-based transportation of people and goods to, from, and within Rhode Island.*
- Commercial Fisheries & Aquaculture: *Ensure viable businesses in commercial and recreational fishing, and in aquaculture.*

Natural Hazards

As discussed above, Rhode Island is highly vulnerable to sea-level rise and associated coastal flooding. “Floodplain boundaries are steadily expanding due to shoreline filling and infill development, sea-level rise, increased stormwater runoff and shoreline erosion” (Source [1]). Future development and infrastructure improvements must be cognizant of the increased flood risk in the future. The SLP recommends that the CRMC and the Rhode Island Emergency Management Agency (EMA) “should collaboratively increase

efforts to help local governments and related state programs develop and implement planning for natural hazard mitigation and storm and flood responses” (Source [1]).

In addition to coastal flooding, the increase in impervious area due to watershed development has increased river flooding risk. To alleviate this risk, the SLP recommends that existing DEM and CRMC initiatives “to promote wetland and riparian buffer restoration” must be adequately implemented. “Upgraded flood zone maps and other tools are essential for ensuring that redevelopment and new development are appropriately sited and permitted in order to mitigate property loss and destruction along Rhode Island’s rivers” (Source [1]).

The SLP reports that of 600 dams in the state, “approximately 204 are classified as ‘significant’ and ‘high hazard’ dams that have the potential to cause loss of life or extensive property damage in the event of their failure” (Source [1]). It is critical that all dams in the state be properly inspected and maintained to meet the DEM regulations, last updated in 2007.

The DEM, CRMC and EMA are responsible for achieving the following objective of the natural hazards strategy:

Significantly reduced natural hazard risks to coastal and riverfront residents, infrastructure, and development (Source [1]).

Freshwater Supply

Although Rhode Island has an abundance of freshwater resources, the SLP recognizes the need to ensure a reliable water supply system through capital investments of infrastructure and ensuring efficient water use. The Rhode Island Water Resources Board (WRB) was created by the Rhode Island General Assembly in 1967 to manage “the proper development, utilization and conservation of water resources. Its primary responsibility is to ensure that sufficient water supply is available for present and future generations, apportioning available water to all areas of the state, if necessary” (Source [5]). Figure 4 shows the geographic distribution of the primary drinking water sources.

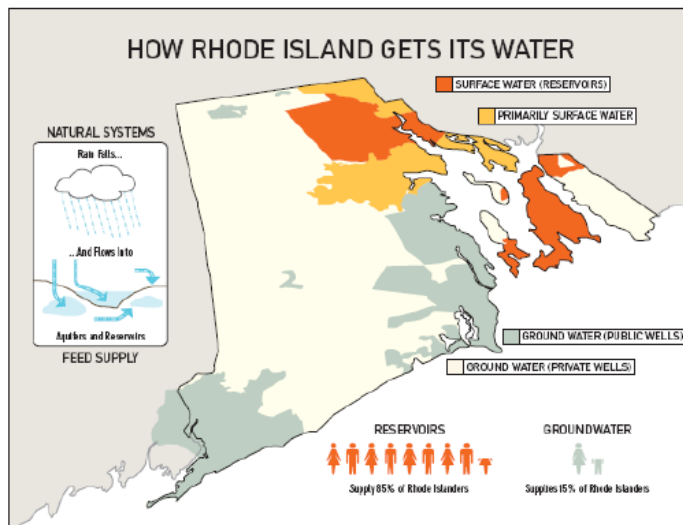


Figure 4. Overview of Drinking Water Supply Sources
(Source [1])

The WRB created the Water Allocation Program Advisory Committee (WAPAC) in 2002 to develop a water allocation program for the state. WAPAC led to the adoption of the Priority Water Uses Policy by the WRB in 2004 “to establish the framework for a full-fledged, statewide water allocation program” (Source [1]). This document provided the following recommendations (Source [1]):

- *Adopt a Priority Water Use Policy.*
- *Create a Water Management System using a Watershed Approach.*
- *Continue the detailed Water Resources Inventory and expand the Water Use Data Reporting System.*
- *Establish a Water Allocation Program Implementation Team*
- *Establish a separate WRB/DEM/USGS Partnership to be known as the Streamflow Working Group to address streamflow issues such as: aquatic base flow and the further development of a statewide streamflow gaging network.*
- *Establish an Education and Outreach Program.*

The *Priority Water Uses Policy* is similar to the State Guide Plan Element #721 – Water Supply Policies, the key objective of which is “to develop long range policies that protect water quantity and quality in the most cost-effective and environmentally sound manner” (Source [6]).

Although there are sufficient freshwater resources available “that for most of the year provide sufficient quantity to meet human needs and support natural systems,” the SLP recognizes that long-term systems-level planning is necessary to ensure sustainable use of reliable, ample drinking supplies. The impacts of climate change on precipitation patterns and freshwater availability are uncertain and could be severe. The SLP includes a lengthy discussion of strategies to ensure reliable water supply and efficient water use and recommends demand management strategies such as “changes in plumbing hardware and/or usage habits to affect the amount of water used” (Source [1]).

The WRB, DOP, DEM, and municipal water suppliers are responsible for achieving the objectives of the freshwater supply strategy which include (Source [1]):

- *Sustainable use and protection of the state’s freshwater resources.*
- *Reliable water supplies*
- *Efficient water use*

Water Quality

Water quality is an essential component of the SLP since many of the resources and economic values included in the systems-level vision (Figure 1) depend on achieving the water quality objectives. The DEM Office of Water Resources administers the state’s water quality program through regulation, permitting, and education. The SLP states that “despite considerable investment in water pollution controls, further actions to abate both point and non-point sources of pollution are needed to restore the beneficial uses of the state’s waters and ensure sustainable marine and aquatic ecosystems for future generations” (Source [1]).

Coastal and estuarine water quality is suffering from major impacts due to “bacterial contamination, low dissolved oxygen and nutrient enrichment” (Source [1]). Sources of pollution include wastewater discharges, combined sewer overflows, stormwater runoff and septic system leakage. For freshwater, the major concerns are focused on non-point source pollution from impervious surfaces and land use changes. “Pathogens and biodiversity are the major causes of impairment in rivers and streams. Sources of pollution include treated wastewater discharges, combined sewer overflows, stormwater discharges and septic systems” (Source [1]). In addition, some lakes and ponds are impaired by invasive aquatic species, excess nutrients and low dissolved oxygen.

The SLP highlights numerous information gaps such as insufficient data for 51 percent of the state’s river miles to reliably assess water quality conditions, lack of information on fish tissue contamination such as mercury. The state is undertaking Total Maximum Daily Load (TMDL) studies, but has completed them for only a fraction of the impaired waterbodies.

The impacts of wastewater treatment facility (WWTF) discharges on Rhode Island’s rivers and Narragansett Bay are significant. DEM is targeting these point sources to reduce nutrient loads to rivers and estuaries. In addition, in the fall of 2008 the Narragansett Bay Commission (NBC) completed and began operating a major combined sewer overflow (CSO) abatement facility to reduce CSO discharges into the Providence River, with additional CSO abatement facilities in design.

Stormwater is also a major pollutant source that is driven by increases in impervious cover. The SLP indicates that “given the density and pattern of development in the state, strategies to address stormwater management must involve both prevention of stormwater discharges from new development and abatement of existing discharges in urbanized watersheds” (Source [1]). Local governments must work in concert with DEM to minimize stormwater discharge through the implementation of best management practices, low impact development, and sound land use management.

The DEM and NBC are the primary agencies responsible for fulfilling the following water quality strategy objectives (Source [1]):

- *Significant progress toward meeting all water quality standards for RI waters, including attainment of fishable, swimmable water quality in upper Narragansett Bay and the Blackstone River by 2015.*
- *Significantly improved water quality in sensitive coastal regions including the south shore coastal ponds, state beaches, and Greenwich Bay.*
- *Restoration of shellfish resources in historically closed areas throughout Rhode Island’s estuarine and marine waters.*

Fisheries and Aquaculture

“Commercial fishing has been a mainstay of Rhode Island’s economy since the state’s inception and continues to play an important role in Rhode Island’s economy” (Source [1]). The SLP highlights the need to maintain a sustainable stock for lobster, shellfish, and marine finfish. Overfishing and pollution are contributing to the decline of offshore fisheries, which in turn strongly impacts Rhode Island’s water-reliant economy. Nine species are considered overfished, meaning the fish population has dropped below the threshold necessary to maintain a self-sustaining stock. Better fisheries management is critical to bring these stocks back to a sustainable level.

Management of Rhode Island’s marine fisheries was reformed in 2004 with the passing of a framework for DEM and the Marine Fisheries Council “to better manage Rhode Island’s marine fishers” (Source [1]). Future management will employ sector-based approaches “where fishing fleets are given greater say in how stock quotas are consumed” (Source [1]).

The DEM is in the process of designating cold- and warm-water freshwater fisheries throughout the state. This designation will lead to more specific water quality standards appropriate for the two types of fisheries.

Marine aquaculture is an important industry with high growth potential due to the “high quality shellfish culturing environments...in Rhode Island’s coastal lagoons and salt ponds” (Source [1]). However, “high labor, energy and land-side costs” will threaten this industry, along with the commercial finfish industry. The SLP supports expansion of shellfish aquaculture, as does the CRMC which is the lead permitting authority for marine and freshwater aquaculture operations.

DEM and CRMC are charged with achieving the following fisheries and aquaculture strategy objectives (Source [1]):

- *Sustainable and profitable commercial fish harvests*
- *A flourishing Rhode Island aquaculture industry that respects traditional commercial fisheries and cultures.*

Biodiversity: Aquatic Habitats and Invasive Species

The SLP recognizes that while Rhode Island has not suffered from the effects of invasive aquatic species such as zebra mussels and the Chinese mitten crab, it must recognize that “aquatic invasive species (AIS) are second in importance only to habitat destruction as a cause of declining biodiversity” (Source [1]). DEM and CRMC have conducted rapid assessments and surveys of AIS. As a result, the DEM has released the Rhode Island Aquatic Invasive Species Management Plan which outlines “detailed management strategies for (1) coordination and communication; (2) monitoring; (3) education, outreach, and training; (4) research and development; (5) planning and assessments; (6) prevention and control; and, (7) legislation and regulation” (Source [1]).

The SLP also discusses the loss of coastal and estuarine eelgrass habitat, which is critical to many estuarine ecological functions. Many of the dams and other water control structures on Rhode Island rivers have resulted in the loss of anadromous fish runs. The SLP calls for inter-agency collaboration, especially between DEM and CRMC, for habitat restoration of both the marine and freshwater environments. The SLP recommends a three-phase ecological restoration approach (Source [1]):

- Restoration: *reactivating hydrological and related landscape or ecological processes*
- Rehabilitation: *re-introducing key species or species groups*
- Reallocation: *the establishment of different, unanticipated system trajectories leading to new ecosystems or new ecosystem states.*

The DEM, CRMC, and Narragansett Bay Estuary Program (NBEP) are responsible for achieving the aquatic habitat and invasive species strategy objective (Source [1]):

Enhanced aquatic biodiversity due to successful AIS control and habitat restoration and conservation.

5. PARTNERSHIPS, STAKEHOLDER, AND PUBLIC INVOLVEMENT

The SLP development process was a “top-down” approach to integrated water resources planning. The mandate and basic requirements for the SLP was established first by the RI General Assembly, and the SLP development process itself was led by the Coordination Team Chair and an ad hoc planning group of state officials and Coordination Team standing committee chairs. Public input on SLP drafts was solicited through direct contact with key stakeholders on the Coordination Team standing committees and the Coordination Team agencies themselves. While limited in scope, the public review process generated substantial input from a variety of stakeholders. Nevertheless, the SLP has been criticized for being a “top-down” process. It is felt that there are substantial opportunities for public and stakeholder engagement in the SLP implementation process, particularly given the desire of the Coordination Team to partner with other state agencies and Federal and local governments for SLP implementation.

In addition, there are several mandated mechanisms for public input. The Coordination Team is mandated to hold at least one public hearing each year “to solicit public comment on the annual work plan and annual work plan budget” (RIGL 46-31-6(e)). A Public Advisory Committee is established “to advise the coordination team on the development and implementation of the systems-level plan, and the preparation of annual work plans and annual work plan budgets” (RIGL 46-31-9(c)).

The Coordination Team also created the Science Advisory Committee “to advise the coordination team on research priorities, technical matters, and best management practices” (RIGL 46-31-9(b)). The Science Advisory Committee includes members from local universities, non-profit organizations, and environment-related businesses.

The four standing committees of the Coordination Team provide abundant opportunities for public interests to be involved with the Team and SLP implementation, including

representatives from Massachusetts, educators, scientists, user groups, and key Federal agencies such as the Natural Resources Conservation Service and the U.S. Environmental Protection Agency (EPA) Region I.

The state also maintains partnerships with various Federal agencies. For over 30 years, DEM has worked with the U.S. Geological Survey (USGS) through monitoring and modeling projects and provides support for the USGS stream gage network in Rhode Island. DEM also works with the U.S. EPA on water quality and other Clean Water Act issues. There is collaboration between DEM and the Natural Resource Conservation Service (NRCS) involving agricultural issues, particularly in the southern part of the state where water conflicts exist between the agricultural industry and other water users. The National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service (NWS) work with the state to provide drought monitoring and forecasts.

6. PLAN IMPLEMENTATION STRATEGY

The Coordination Team must develop Annual Work Plans that “prescribe the necessary projects, programs, and activities [that] each member of the team shall perform for the following fiscal year to implement the SLP” (RIGL 46-31-6). The Annual Work Plans will consist of “significant program products including proposed regulations, grant solicitations, schedules for production of environmental documents, and project selection processes” (Source [1]). The Annual Work Plans will also “include recommendations for the allocation of appropriated funds among agencies” (Source [1]). The first Annual Work Plan for FY 2009 and 2010 was released in early 2009.

While the SLP and Coordination Team are responsible for identifying the strategies and actions required to achieve its objects, the implementation of these actions falls on other state agencies as well as local governments. The regulatory and jurisdictional authorities necessary for SLP implementation reside with the Coordination Team member agencies, other state agencies, and Federal and local governments.

7. OUTCOMES ASSESSMENT PROCESS

The SPL states that “systems approaches to environmental management and economic development such as [ecosystem-based management] demand comprehensive systems understanding based upon scientific knowledge, continuous baseline monitoring and indicator-based trend analysis, and evaluation of program outputs and outcomes that emphasizes learning and adaptivity” (Source [1]).

The Coordination Team works with two statewide “collaboratives” devoted to economic and environmental monitoring and assessment. The Coordination Team recognizes that the monitoring of natural resources and aquatic ecosystems and of the region’s water-reliant economy needs to proceed in an integrated manner in order to achieve its system-level vision. The two monitoring collaboratives are required to develop baseline conditions and report back to the Coordination Team every 2 to 3 years on the current conditions. With this feedback, the Coordination Team can adjust the types and priorities of its recommended strategies in the Annual Work Plans.

The Environmental Monitoring Collaborative is charged with developing “baselines, protocols, guidelines, and quantifiable environmental indicators” (Source [2]) including coastal land use impacts, physical properties such as temperature and salinity, nutrients, dissolved oxygen, bacteria, flow and circulation patterns, biodiversity, and presence of nuisance species. This Collaborative works in consultation with the Scientific Advisory Committee to ensure that the monitoring strategies are scientifically sound.

The Economic Monitoring Collaborative is charged with developing “baselines, protocols, guidelines, and quantifiable indicators for assessing the economic health and performance of the water cluster” (Source [2]). The “water cluster” refers to the various industries and businesses that are reliant on the state’s water resources. Indicators may include gross state product and employment from the water cluster, and public expenditures for infrastructure to support the water cluster. The Economic Monitoring Collaborative released its first report on baseline economic conditions in the state to the Coordination Team in 2007 (Source [7]).

8. NEEDS, CHALLENGES AND CRITICAL PRIORITIES – INTERVIEW INSIGHTS

The greatest challenge Rhode Island faces is the lack of funding and resources for implementation of the SLP. The recent economic crisis has had a severe impact on the state government budget, which has resulted in major cuts to state agencies in both personnel and funding. There is great concern that although the state has developed a strong statewide comprehensive plan, it lacks the resources to implement it.

Another major issue in Rhode Island is that much of the water that flows into the state, and ultimately into Narragansett Bay, originates in Connecticut and Massachusetts. These jurisdictional issues require interstate cooperation, which can be facilitated by Federal agencies. Restoration and protection of Narragansett Bay is a top priority for the state, but will require cooperation with its neighboring states to reduce pollutant loads.

With regard to water supply, Rhode Island is concerned with adding backup and redundancy to its current supply systems. Although the state generally has a surplus of water, future changes from population growth and climate change could lead to shortages. Adding backup supplies could avoid these shortages.

To address these issues, Rhode Island sees great opportunity in working with Federal agencies, specifically the Army Corps of Engineers (ACOE). The state sees ACOE as being in a unique position through its responsibilities in the Department of Defense and as an environmental management and regulatory agency. Currently, there is more collaboration with the USGS, EPA, NRCS and NOAA in Rhode Island. However, the state believes the ACOE could play an important role in statewide water planning. Specifically, there is the potential for collaboration with ACOE in the development of a hydrologic model of the Pautuxet Basin and Scituate Reservoir.

9. REFERENCES

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