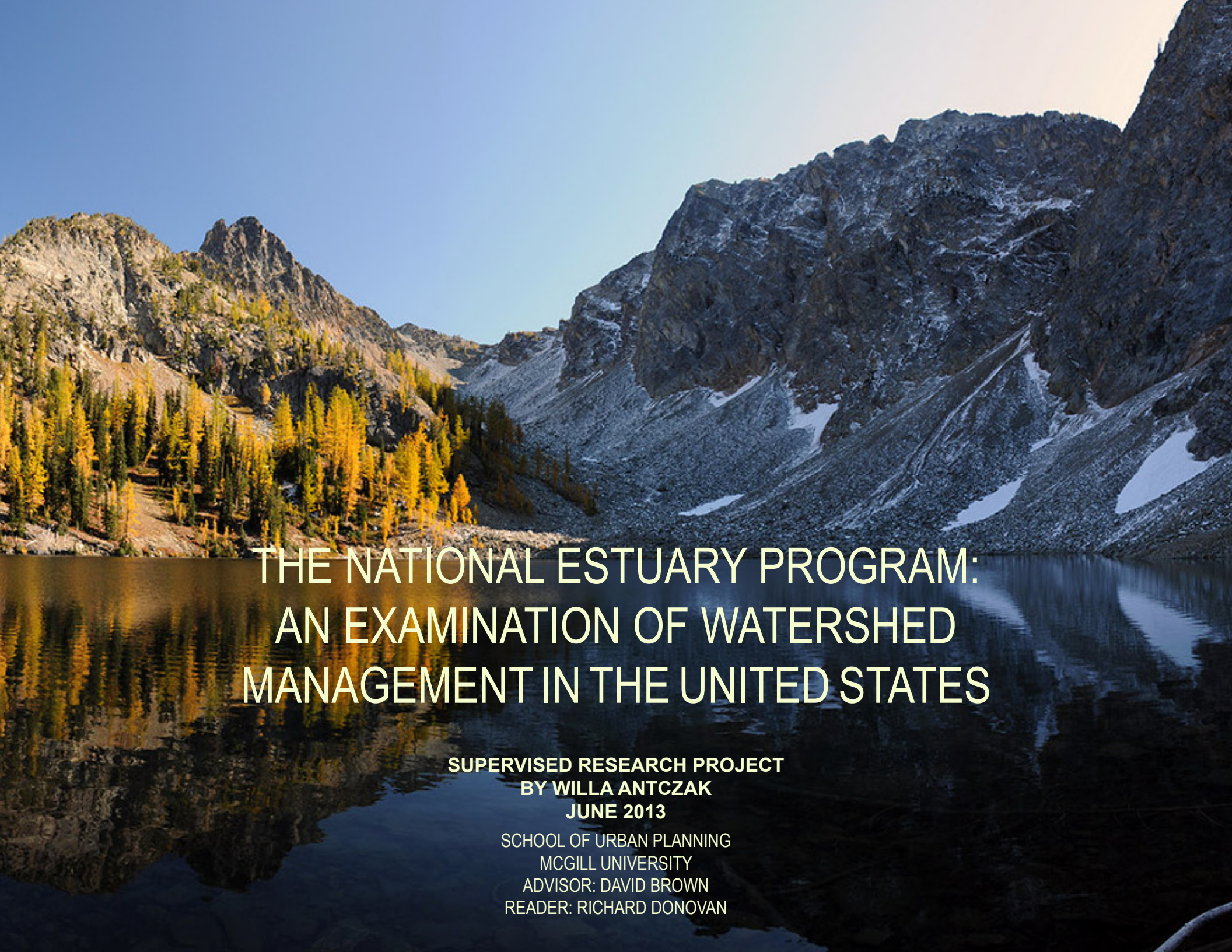


THE NATIONAL ESTUARY PROGRAM: AN EXAMINATION OF WATERSHED MANAGEMENT IN THE UNITED STATES

SUPERVISED RESEARCH PROJECT
BY WILLA ANTCZAK
JUNE 2013

SCHOOL OF URBAN PLANNING
MCGILL UNIVERSITY
ADVISOR: DAVID BROWN
READER: RICHARD DONOVAN

ABSTRACT

Watersheds are important for numerous reasons; they provide habitats for diverse marine, animal, plant and human life in addition to supporting local ecosystem health through flood protection, and the filtering of toxic pollutants. Human populations are posing a serious threat to watersheds and estuarine systems around the world. In 1987, the United States Environmental Protection Agency established the National Estuary Program (NEP). This voluntary ecosystem based watershed management program seeks to protect and manage water quality and coastal resources (Imperial and Hennessey 1996). There are currently 28 estuaries recognized by the NEP throughout the United States. The emergence of ecosystem-based watershed management is relatively recent therefore more research is needed regarding these organizations in terms of their function, structure, and how to ensure their long-term success.

This SRP begins with a discussion of the current condition of U.S. watersheds and then examines the literature regarding the concept of watershed management in the U.S., in both the historical and institutional context, followed by an examination of the NEP in terms of strategy, program structure, process and plan implementation. One NEP case study, the Puget Sound Partnership (PSP), is then examined to investigate the implementation of the organization's Action Agenda. The SRP concludes with a discussion of how information and resources are shared among NEPs, how the PSP collaborates with preexisting watershed management organizations in the Puget Sound Region, and the most significant challenges the PSP and other NEPs face.

Les bassins versants sont importants pour plusieurs raisons : ils servent d'habitat à une variété d'espèces marines, d'animaux, de végétaux et d'hommes, en plus de contribuer à la santé de l'écosystème local en prévenant les crues et en filtrant les agents polluants. Les populations humaines constituent cependant une sérieuse menace pour les bassins versants et les systèmes estuariens dans le monde. C'est pourquoi, en 1987, l'Agence de Protection Environnementale des États-Unis a créé le Programme National pour les Estuaires (NEP). Ce programme volontaire de gestion des écosystèmes de bassin versant vise à protéger et contrôler la qualité de l'eau et des ressources côtières (Imperial and Hennessey 1996). Il existe présentement 28 estuaires reconnus par le NEP à travers les Etats-Unis. L'émergence des systèmes de gestion des bassins versants est relativement récente, c'est pourquoi plus de recherches sont nécessaires pour comprendre la structuration et le fonctionnement de ces organisations, ainsi que la façon de s'assurer de leur succès sur le long terme.

Ce SRP débute par une discussion sur l'état actuel des bassins versants américains, suivie d'une revue de littérature par rapport au concept de gestion des bassins versants aux Etats-Unis, d'un point de vue historique et institutionnel. Cette revue de littérature est suivie par un examen du NEP en termes de stratégie, de structure du programme, de processus et de mise en œuvre du plan. L'étude de cas d'un des programmes du NEP, le Pudget Sound Partnership (PSP) met ensuite en lumière la mise en œuvre des objectifs d'action (Action Agenda) de l'organisation. Ce SRP se conclue par une discussion sur le partage d'information et de ressources entre les NEPs, la manière dont le PSP collabore avec les organismes de gestion des bassins versants préexistants dans la région de Pudget Sound, et les principaux défis que le PSP ainsi que les autres NEPs rencontrent.

ACKNOWLEDGEMENTS

First and foremost, I would like to thank my advisor Dr. David Brown for his valuable suggestions during the planning and development of this research project. His willingness to give his time so generously has been very much appreciated. I would also like to thank Richard Donovan for his constructive comments that helped to fine-tune the content of this paper. Finally, I would like to express my gratitude to Milan Nevajda and my friends/classmates at the McGill School of Urban Planning for their help and encouragement for the successful completion of this project.

CONTENTS

CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS AND ACRONYMS

AA	Action Agenda
ANEP	Association of National Estuary Programs
CBNRM	Community Based Natural Resource Management
CCMP	Comprehensive Conservation Management Plan
CCR	Coastal Condition Report
CHB	Citizens for a Healthy Bay
CWA	Clean Water Act of 1972
DOI	U.S. Department of the Interior
ESA	Endangered Species Act of 1973
FWS	Fish and Wildlife Service
HUC	Hydrologic Unit Code
LAE	Large Aquatic Ecosystem
LID	Low Impact Development
MC	Management Conference
MUA	Multiple Use Act of 1964
NCA	National Coastal Assessment
NCCR	National Coastal Condition Report
NEP	National Estuary Program
NEPA	National Environmental Policy Act of 1969
NOAA	National Oceanic and Atmospheric Administration
OWOW	U.S. EPA's Office of Wetlands, Oceans and Watersheds
PA	U.S. Environmental Protection Agency
PSA	Puget Soundkeeper Alliance
PSAT	Puget Sound Action Team
PSP	Puget Sound Partnership

ABBREVIATIONS AND ACRONYMS

PSWQA	Puget Sound Water Quality Authority
SCS	Soil Conservation Service
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
WA	Wilderness Act of 1964
WPA	Water Pollution Act of 1948
WPA	Water Protection Act of 1954
WQA	Water Quality Act of 1965
WRPA	Water Resources Planning Act of 1965

SECTION

1.0 INTRODUCTION AND OVERVIEW

1.1 The Current Condition of United States Watersheds

A recent national water quality survey showed that 42% of the nation's stream length is in poor biological condition and 25% is in fair biological condition (EPA Office of Water 2012). Poor biological condition means that the water is too polluted for fishing, swimming and other recreational uses. The pollution is primarily caused by the presence of silt, sewage, disease-causing bacteria, fertilizer, toxic metals, oil and grease. In addition to water pollution, fish populations are also impacted with nearly 40% of the fish in North American freshwater (streams, rivers and lakes) found to be vulnerable, threatened or endangered (Jelks 2008).

The pressures being exerted on the watersheds through overfishing, pollution and envrionmental and climate change are increasing (Costanza 1998). The influence of climate change on watershed processes is critically important to understand and to manage for now and in the future, as these functions directly determine human well-being in terms of public health, the economy, communities, and cultures (Pike et al. 2009). Watersheds are important for many reasons as they support the overall health of the environment, both human and natural. They provide carbon storage, a habitat for fish, amphibians, birds, insects, as well as recreational opportunities. They are also essential to reduce climate change impacts through flood protection, vulnerability to invasive species, and future land use changes (EPA Office of Water 2012).

The Environmental Protection Agency in the United States has worked to improve water quality over the last forty years. With nearly ninety federal funding programs for watershed protection, numerous water policies, such as the Clean Water Act (CWA) of 1972 and programs like the National Estuary Program (NEP) of 1987 (US EPA NEP 2013). While these initiatives have been instrumental in bringing about awareness and fostering support for healthy watersheds, there is still a great deal of work to be done.

1.2 Scope and Research Arena

Watersheds are complex, dynamic, and continuously changing. They generate “conditions of extreme uncertainty and presents challenges for the design and management of governance systems” (Imperial and Hennessey 1996, 116). These challenges include everything from cost, scale and capacity, to availability of information, institutional constraints, and consistency in data collection and monitoring (integration with an existing system) (Slocombe 1993; Imperial and Hennessey 1996).

Over the past decade there has been a significant rise in watershed management initiatives and partnerships throughout the United States (S. Born and Genskow 2006; Kenney et al. 2000; Koontz and Elizabeth Moore 2004). These initiatives vary in their “institutional arrangements which include informal, ad-hoc coalitions, formally structured interagency agreements, loosely configured citizen dominated efforts, state and federal agencies, and formally incorporated non-profit organizations” (S. Born and Genskow 2006, 57). These watershed management initiatives also vary in terms of their missions, local issues, organizational structures, and funding strategies. In their article titled, Organizational Dynamics of Watershed Partnerships (2006), Born and Genskow identify several characteristics that are typical of watershed management initiatives, which are:

- They use watershed boundaries (at various scales) as units for analysis and management.
- They address a more comprehensive scope of issues, including water quality, water use, habitat, and goals related to healthy ecosystems.
- Multiple local and non-governmental interests participate meaningfully and share influence over decisions.

- Their decision-making processes draw upon
- Biophysical science as well as social and economic information and local knowledge, including perspectives on previous management efforts and site-specific contextual information.
- They are oriented toward collaborative planning and problem solving, which promotes consensual, negotiative discussions and specific situation-appropriate management actions that focus on watersheds.

The National Estuary Program

One program in particular, the United States Environmental Protection Agency's National Estuary Program (NEP) is a "network of voluntary community-based programs that safeguard the health of important ecosystems across the country" (US EPA NEP 2013). The program was created in 1987 under Section 320 of the Clean Water Act (CWA) Amendment and is administered by the EPA's Office of Wetlands, Oceans, and Watersheds (OWOW) (Imperial and Hennessey 1996). The establishment of the NEP was influenced by "public alarm over beach closures, fish kills, contaminated shellfish beds, and a general sense of deteriorating coastal environments" (EPA Office of Water 2012). In addition, there was an increasing awareness of the effects of nonpoint source pollution related to coastal growth and development. This awareness was a result of a "new appreciation of an incredibly rich and varied resources, at an increasing risk from cumulative activities in coastal watersheds" (EPA Office of Water 2012).

The U.S. Congress acknowledged that coastal watersheds are too complex to be addressed by one entity alone and that "in order to achieve both the long-term protection of water quality and living resources as

well as the fundamental fishable, swimmable goals of the Clean Water Act, the participation of those most affected by environmental decisions was critical" (EPA Office of Water 2012). The collaborative approaches of the Great Lakes and Chesapeake Bay Programs in managing local watersheds and estuaries, spurred the development of the NEP.

The main goal of the ecosystem-based NEP is to protect and restore the water quality and ecological integrity of estuaries of national significance (US EPA NEP 2013). The NEP recognizes that stakeholders must have a "major role in deciding how to protect and restore their estuaries…that state and local partners are at the forefront of carrying out activities affecting estuaries, and that they needed to be an integral partners in the decision-making process" (EPA Office of Water 2012). The main role of the EPA was to provide "technical and financial assistance, management guidance, and the organizational vehicle to foster the growing partnerships" (EPA Office of Water 2012). There are currently 28 estuary programs in 18 states and the Commonwealth of Puerto Rico, located throughout the Atlantic, Gulf and Pacific. The Puget Sound Partnership: Leading Puget Sound Recovery (PSP) was designated as one of the 28 estuaries of National Significance under Section 320 of the CWA (US EPA NEP 2013), during the first phase of NEP implementation in 1987.

1.3 Rationale for Study

Watersheds play an increasingly significant role in natural resource management. There are approximately 130 estuaries in the United States and the number of watershed partnerships has been steadily increasing over the last thirty years. Local NEPs, and the partnerships forged within, have produced many significant programmatic and environmental improvements (water.epa.gov). Watershed initiatives produce numerous documents and plans, conduct studies and workshops, and engage local stakeholders (EPA Office of Water 2012). While local circumstance play a significant role in a watershed initiatives mission and strategy, information sharing is necessary and there is significant value to members of these initiatives who may learn more about other programs addressing similar complex environmental issues with innovative solutions (Leach and Pelkey 2001). Watershed initiatives are diverse in their approaches; therefore additional research is needed regarding the function, organizational structure, and complexities (Leach and Pelkey 2001; Sabatier, Focht, et al. 2005a).

The NEP facilitates the creation of the Comprehensive Conservation Management Plans (CCMP) for each NEP and yet many of these programs are facing difficulties with the actual implementation. Of the 28 NEPs, 22 have completed their CCMPS and are in the implementation phase, while the other 6 are still in the development process (EPA Office of Water 2012; Bearden 2001). Research on the NEP is limited and does not go beyond the development of the CCMP to assess on-the-ground management and implementation (Mandarano 2004). It is important to go beyond the CCMP and evaluate the efforts of NEPs.

This SRP seeks to answer the following questions:

- Why are watersheds important and why should they be protected?
- What is the history of watershed management in the United States?
- What is collaborative watershed management and what are the main characteristics?
- What is the purpose EPA's National Estuary Program and how does it operate?
- What are the characteristics of estuary management programs?
- What is the organizational structure of Puget Sound Partnership?
- What is the funding structure and member composition?
- How is the partnership managed?
- How does the PSP collaborate with its partners in the Puget Sound Region?
- Does the PSP share information with other NEPs, if so, how?
- What are the strengths and weaknesses of the NEP and Puget Sound Partnership's planning process, if any?
- What are the most significant challenges facing the NEP and Puget Sound Partnership in terms of project implementation?

In addition to addressing the questions above, this SRP presents a comprehensive review of the published literature primarily from comprehensive review of the published literature primarily from Tobin 1990; Kenney 1997; Kenney 1999; Kenney et al. 2000; Woolley and McGinnis 1999; S. and G. Born 2001; Leach and Pelkey 2001; Lubell et al. 2002; Clark, Burkardt, and King 2005; Sabatier et al. 2005b; Hibbard and Lurie 2007. This review of the literature will provide the background of watershed management through its evolution and development.

This research can be used by current and future watershed initiatives in the United States to understand 'regional patterns', 'organizational similarities', and may facilitate coordination among watershed

management organizations (Clark, Burkardt, and King 2005, 298).

This project addresses the environmental planning community, specifically watershed management partnerships. The results of this research will be valuable to support the longer-term sustainability and progress of watershed partnerships. Results from this research will help determine the needs of watershed management initiatives to adapt to environmental conditions, both in the present and future. By addressing the questions above this SRP seeks to identify how watershed management has evolved over time and provide a snapshot of the current efforts being made through the EPA's National Estuary Program, specifically in Washington's Puget Sound.

This supervised research project (SRP) will proceed in three phases. The first consists of the literature review to gain a better understanding of the forms and functions of the watershed management initiatives throughout history. Through this review of the literature four fundamental characteristics of estuary management strategies will be identified. The second phase will include a review of the strategy, program structure, process and implementation of the National Estuary Program. Followed, by the final section, which will specifically examine the Puget Sound Partnership through a review of the literature, research, and semi-structured interviews with employees of the PSP as well individuals with first hand experience with the organization to provide a snapshot of their efforts.

SECTION

2.0 LITERATURE REVIEW

2.1 Natural Resource Management: The Watershed Defined

Many communities throughout the United States are being affected by the loss of wetlands, poor water quality, and ineffective watershed management (Guehlstorf and Hallstrom 2012). The United States is facing an ecological crisis "exemplified by the sharp decline in native species diversity (such as wild salmon) and ecosystem health" (Woolley and McGinnis 1999, 578; Noss et al. 1995). The concern for these communities is not only focused on the natural environment and good water quality, but also on the health, lives and livelihoods of the individuals that rely on these watersheds. Natural resource management, in the U.S., can be traced back to the western frontier in the late 19th century.

The concept of managing natural resources is essential to maintain both human and environmental health. There are many varied approaches to natural resource management, however, in recent years with the emergence of collaborative community-based initiatives, there has been a major shift towards assessing and solving problems at the eco-system/ watershed scale (Kenney et al. 2000).

Currently, the United States EPA classifies eleven different categories of natural resources and features that should be "inventoried and mapped because they add to the quality of life for residents", for both present and future generations (United States Environmental Protection Agency: Green Communities: Natural Resources 2012). These features include: wetlands, rivers, lakes and streams, drinking water resources, threatened and endangered species, prime farmland, agricultural and soil conservation, coastal resources, floodplains, air quality, environmentally sensitive areas, climate/meteorological, and mineral resources. These features are monitored through a combination of local, state and federal programs and organizations. Of the eleven features listed above, more than half of them are directly related to watersheds.

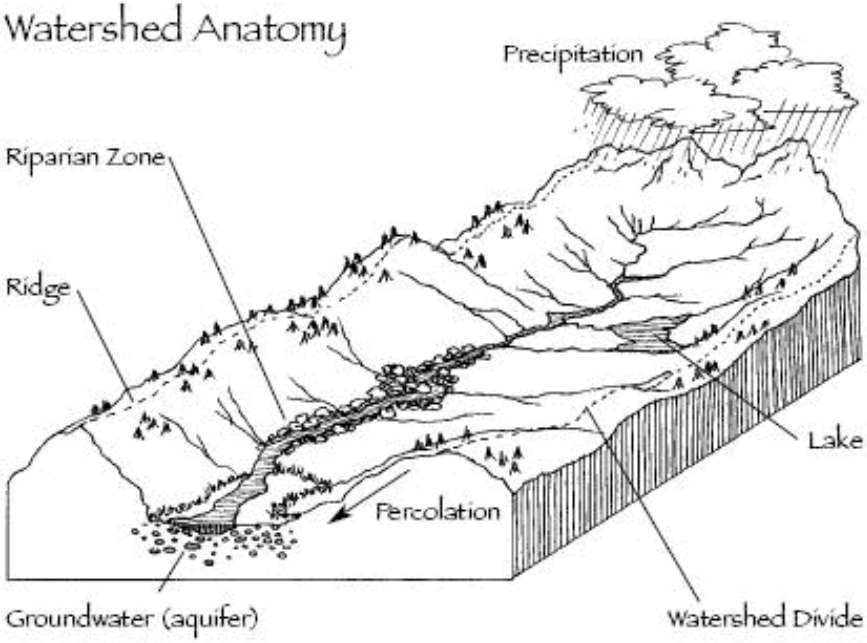


Figure 1- Illustrative example of a watershed. Source: Lane Council of Governments

Watersheds in the US are not single-use resources, the EPA states that watersheds supply drinking water, provide recreation and respite, and sustain life (Sabatier, Lubell, et al. 2005, 183). There are many varying definitions for the concept of a watershed; however, in this paper the term will be defined as an "area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course" (EPA Office of Water 2012). A watershed can encompass several types of land that drain into common waterways, such as a stream, lake, estuary, wetland, aquifer or ocean (Figure 1).

Watersheds vary in shape and size, and cross over county, state and national boundaries. The EPA designates 2,267 watersheds In the United States (EPA Office of Water 2012). Each of these watersheds is identified with an eight digit "Hydrologic Unit Code" (HUC) which is used to record the associated data (EPA Office of Water 2012). An estuary is a type of watershed, which is defined as a place that includes "a partially enclosed body of water along the coast where freshwater from a river mixes with saltwater from the ocean…they come in all shapes and sizes…and are often known as bays, sounds, lagoons, harbors, or inlets" (US EPA NEP 2013).

In their article, *Building Local Capacity for Stewardship and Sustainability: The Role of Community-Based Watershed Management in*

Chilliwack, British Columbia (1998,1), Litke and Day discuss the specific resources and benefits that are associated with watersheds and estuaries, which are:

- They provide surface and groundwater for consumptive and in stream uses.
- They support agriculture, human settlement, forestry, recreation, and aggregate extraction.
- They absorb and assimilate solid and liquid waste discharges from many different sources.
- Communities derive educational, aesthetic, and spiritual value from watershed features.
- They provide significant fish and wildlife habitat and other ecosystem values.
- They provide hydroelectricity sources and transportation corridors.

Watersheds are an enormously important interconnected resource that provides numerous human and environmental benefits (Litke and Day 1998).

2.2 Watershed Management: Historical and Institutional Context

In order to understand the concept of watershed management, in the United States, it is important to examine the historical and institutional context. The watershed concept emerged during the Progressive Era, with a strong focus on economic development. During the Federal/New Deal Era the primary focus shifted to environmental protection, although economic development was still of importance.

The Environmental Era focused primarily on water quality and habitat protection relying heavily on litigation. The Collaborative Era emerged as a watershed management concept, which "draws many of its features from the past, but seeks to balance the many conflicting goals and interests of multiple parties" (Sabatier, Focht, et al. 2005a, 50).

The following eras of environmental management are primarily drawn from Sabatier, Weible and Ficker's chapter in Swimming Upstream: Collaborative Approaches to Watershed Management (Sabatier, Focht, et al. 2005a)*

The Manifest Destiny Era (Pre-1890)

The time period prior to the 1890s, post-Civil War, is characterized by an absence of watershed management in the United States. It was during this time that natural resources were thought of and valued in terms of capacity for economic development. During this period of rapid growth, natural resources were used and misused for everything from power generation to waste disposal, without any consideration of environmental protection or conservation.

* The following eras were drawn from Sabatier, Weible and Ficker's chapter in Swimming Upstream: Collaborative Approaches to Watershed Management, 2005a.

The Progressive Era (1890-1924)

It was during this era that the early concept of the watershed emerged and was generally accepted. While economic development was still supported, strong efforts were made to correct the environmental degradation of the Manifest Destiny Era. In 1908, President Roosevelt stated that, “every river system, from its headwaters in the forest to its mouth at the coast, is a single unit and should be managed as such” (Report to Congress of the Inland Waterways Commission 1908; Sabatier, Focht, et al. 2005a, 26). There were numerous reforms and Roosevelt’s focus on land conservation and the creation of national forest reserves respected watershed boundaries, in an effort to protect water supplies.

The watershed management approach of the Progressive Era was characterized by a top-down decision making structure which relied upon agency experts and granted a large amount of regulatory power to the government. This Era also used a “multiple-use approach that balanced economic and environmental objectives” (Sabatier, Focht, et al. 2005a, 30).

The Federal/New Deal Era (1925-1964)

It was during this time period that the concept of the watershed and the importance of water quality were further developed. This time period included both the Great Depression and World War II. Due to this economic crisis there was an overarching focus was on economic development rather than resource protection. There was increasing awareness of the impacts of upstream agricultural land use practices on water quality and flooding, however, it did not receive a great deal of attention from the Corps of Engineers or downstream residents. It was not until the late 1950s and early 1960s that water quality truly became a focus (Sabatier, Focht, et al. 2005a). It was during this time that the government began to play a role in water pollution control, through the development of various programs and legislation. Although, much of the

decision-making still relied upon “experts”, specifically engineers, state, local and federal agencies were also involved through consultation (Sabatier, Focht, et al. 2005a).

Several government programs and other legislation were created during this time period, such as: the Soil Conservation Service 1935 (SCS), the Water Pollution Act of 1948 (WPA), the Watershed Protection Act of 1954 (WPA), the Multiple Use Act of 1964, the Wilderness Act of 1964 (WA), and the Water Resources Planning Act of 1965 (WRPA) (Sabatier, Focht, et al. 2005a). Together these programs and Acts focused primarily on federal land and sought to develop flood control solutions, protect watersheds, monitor water quality, and reduce pollution by changing land use practices. There was little concern by the federal government with resource protection on private lands; therefore water quality was almost entirely a local concern (Sabatier, Focht, et al. 2005a).

The Environmental Era (1965-1986)

Prior to 1965, federal water pollution legislation included a few small grant programs for technical assistance in addition to a process for inter-state consultation for shared water basins. The Environmental Era, in the mid-1960s, began with a change in the attitudes of both the general public and policy leaders in the following ways: priority was given to environmental value as opposed to economic development, a growing distrust in governmental experts in federal agencies, and a distrust of state and local governments as they were susceptible to the influence of economic interest groups (Sabatier, Focht, et al. 2005a, 37).

There was political pressure from certain industries not to impose particular legislation that would be damaging. Many governmental agencies did not have the legal authority or the financial resources to address local water pollution issues. There was a widespread belief that economic interest groups controlled federal natural resource regulatory

agencies, such as: timber harvesting firms controlling the Forest Service, and industrial and municipal polluters directing water pollution agencies (Sabatier, Focht, et al. 2005a, 38). There were four important legislations passed during the Environmental Era which include, the 1965 Water Quality Act, the National Environmental Policy Act of 1969 (NEPA), the Endangered Species Act of 1973 (ESA), and the 1972 Water Pollution Control Act Amendments established a system that involved:

- Federal mandates to state agencies to set water quality standards and adopt implementation plans that were subject to federal agency EPA review; states that performed well were then subject to less federal review.
- The enhancement of state capacity through a variety of federal grant programs, as well as incentives to increase state funding of their own pollution control programs.

The WQA of 1965 represented a transition legislation, which strengthened various grant programs and helped states establish water quality standards (Sabatier, Focht, et al. 2005a, 41). State and local pollution control funding has since increased as well as state expenditures on water quality, which went from $52 million in 1972, to $976 million in 1986, and $1.9 billion in 1994 (Sabatier, Focht, et al. 2005a, 39).

The Environmental Era was marked by a great deal of litigation in natural resource protection, which resulted in confrontation, and competition in the search for solutions. While legal gridlock was slowing down the work of environmental initiatives there was growing support for collaborative management. “The growth of environmental groups and their skills and success in litigation, NEPA and similar state legislation acclimatized agency officials to interacting with stakeholders, the traditional practice of backroom planning was becoming increasingly untenable, and the capacity building strategy targeted at the state and local agencies meant that by the mid-1980s, state

agencies and local water districts had the expertise to participate in collaborative negotiations with their federal counterparts" (Sabatier, Focht, et al. 2005a, 41). Through these intense, and often long-term negotiations, the interactions of the involved groups lead to the emergence of collaborative watershed management.

The Watershed Collaboration Era (1987-Present)

The Watershed Collaboration Era began in the late 1980s and has continued through present day. The current era promotes the use of environmental mediation due to the widespread belief that the heavy litigation and legislation of the Environmental Era was generally ineffective in addressing important watershed issues (S. Born and Genskow 2006; Kenney 1999; Tobin 1990; Sabatier, Focht, et al. 2005a). The current era is characterized by a more holistic approach, which involves "multiple stakeholders that represent diverse interests" (Sabatier, Focht, et al. 2005a, 50), working together in the decision-making process. These multiple stakeholders represent diverse interests and concerns. They include both experts and non-experts, which integrate scientific and local knowledge to address the concerns of a wide range of stakeholders (Sabatier, Focht, et al. 2005a, 50). "It is not unusual to find local governments coordinating with federal or state agencies to implement watershed restoration projects initiated by a watershed partnership" (Sabatier, Focht, et al. 2005a, 50). According to the EPA's Office of Wetlands, Oceans, and Watersheds (OWOW) it is essential that governmental agencies, businesses, communities, and individuals be involved in meeting environmental goals (U.S. Environmental Protection Agency and Office of Water 2001, 25; Sabatier, Focht, et al. 2005a, 43).

Advances in technical data collection, water monitoring practices, and community outreach through social media and web based media have led to both more reliable information and socially inclusive environments which empowers interested parties.

2.3 Watershed Management Partnerships

Water quality, flood control, fish and wildlife habitat, as well as water supply have been managed by single-function federal and state agencies for the past century (Sabatier, Lubell, et al. 2005, 3). Each of these agencies has been pursuing different legal mandates and missions. For the most part, decision-making is technocratic with public involvement typically incorporated through public hearings and comment periods to address final details of agency proposals. These agencies usually focus on different types of pollution sources or a specific area within a watershed as opposed to the whole watershed itself (Sabatier, Lubell, et al. 2005, 3).

In recent years, the major shift in natural resource management, at the watershed scale has brought about a new focus on collaborative, locally driven, and decentralized institutional arrangements (Clark, Burkardt, and King 2005; Kenney 1997; S. Born and Genskow 2006). Watershed management is a form of community based natural resource management (CBNRM), which primarily focuses on the environment, but also includes the local economy and community. This form of watershed management is 'highly participatory' (M. Hibbard and Lurie 2007, 892) and seeks to "alter the top-down, environment over economy approach of the contemporary environmental regulatory framework by infusing decentralized decision making, stakeholder collaboration and citizen participation" (Hibbard and Madsen 2003, 703). At the same time implementing the plans and solutions of watershed management initiatives is linked to governmental support. "There is a myth that the watershed movement consists of spontaneous, bottom-up, local efforts that find alternatives to the rigidity of intransigent bureaucracies and one-size-fits-all…solutions" (Getches 1998).

By broad definition a watershed management organization is characterized by a "long-term effort involving a diverse group of stakeholders that seek to manage and resolve issues regarding watershed resources through the development of strategies and/or

implementation of policies" (Leach and Pelkey 2001, 380). A watershed management initiative represents a collective effort to organize on behalf of interested stakeholders, concerned area citizens, and relevant public agencies (Clark, Burkardt, and King 2005). These collective efforts are aimed at improving the status or management of the water resources within a geographic area primarily defined by the contours of a localized catchment base (Kenney 1999).

Watershed management practices include an variety of actions ranging from changes in land-use regimes, the statutorily sanctioned commercial and recreational activities, alteration of vegetative covers, changes in uses, water quality monitoring, development and application of flow models and regimes, education, community outreach, integrated thinking, and promotion of holistic land and water stewardship (Kenney 1997).

Many organizations partner with federal, state and regional government agencies, academic institutions, area non-profits, local governments, and stakeholders. The stakeholders are often from, "a variety of governmental levels and jurisdictions, have joined with nongovernmental stakeholders to seek innovative and pragmatic solutions to the problems associated with resource degradation and overuse" (Leach and Pelkey 2001). While there are many commonalities among these initiatives they also offer a variety of structures and functions, tailored to the unique institutional and physical qualities of the particular region (Kenney 2008).

Many of these organizations and initiatives are joining forces and creating partnerships to address and manage local watersheds. As of January 2013, the U.S. EPA's watershed organization database contained over 3500 organizations located throughout the United States, which does not include a significant number of additional nonprofits and community-based organizations (EPA Office of Water 2012). Many watershed organizations are self-organized, by local

stakeholders, and often rely on public agencies both for support as well as "financial and technical assistance" (Thomas 1999, 544).

Watershed organizations collaborate with numerous partners, local, regional, and federal, as a way to share resources and information. "Centralized and unresponsive agencies, like the Forest Service, tend to be unreliable partners" (Thomas 1999, 544). Many organizations and initiatives, both public and private, have come into existence aimed at managing these watersheds.

Watershed management initiatives go by many names, including, committees, councils, advisory groups and task forces (S. Born and Genskow 2006; Leach and Pelkey 2001). Watershed groups can be distinguished from watershed partnerships because they are typically more 'homogenous' and involve individuals with similar viewpoints from the onset (Cook 2000; Leach and Pelkey 2001). Partnerships can be formal and commissioned by the government (e.g. the Puget Sound Partnership) as well as more informal organizations (Leach and Pelkey 2001) with a more diverse group of stakeholders.

The number of watershed management initiatives and partnerships has increased greatly since the 1990s. The recent development of watershed management partnerships is partially attributed to state and federal agencies providing financial support and resources to the organizations as well as granting decision-making power to the local level (Leach and Pelkey 2001). The Department of Agriculture's Environmental Quality Incentive Program and the EPAs Clean Water Act Section 319 and 205 grants, provide millions of dollars in federal money available to local watershed groups (Leach and Pelkey 2001). These partnerships employ more of a bottom-up democratic and proactive method to watershed management, as opposed to a top-down agency controlled approach (Leach and Pelkey 2001).

William Leach and Neil Pelkey state that governments have struggled with the "challenges of interagency coordination and the public's ambiguous and conflicting desires surrounding water resources" (2001, 378). For example, the National Environmental Policy Act requires a "minimal level of public input for certain types of projects…however, this input often comes late in the process, after the proponent is already committed to a particular course of action" (Leach and Pelkey 2001, 378).

The purpose of watershed partnerships is to bring multiple diverse stakeholders to the table early on in the process, to work together to identify the key areas of concern, thereby avoiding the occurrence of late input and involvement. Watersheds are now, for the most part, being viewed as a place based ecological entity as well as a socioeconomic and political unit that can be utilized for management planning, conservation strategies, and implementation purposes (Clark, Burkardt, and King 2005).

Watershed management initiatives form partnerships to address complex 'collective action' issues (Lubell et al. 2002, 3). The intent of these partnerships is to improve the condition and management of the water and natural resources within a watershed (Clark, Burkardt, and King 2005). Watershed partnerships offer "potential benefits to both environmental and economic interests. For environmental interests, watershed partnerships address problems that are outside the scope of centralized regulation, such as habitat destruction and non-point source pollution. For economic interests, watershed partnerships allow the adoption of flexible policy-tools for addressing environmental impacts in a cost-effective manner while reducing the threat of ever more stringent regulatory policies" (Lubell et al. 2002, 2). Watershed partnerships are appealing because they offer a multifaceted approach to complex issues

Many watershed management partnerships began forming in the 1980s, and in the literature there have been many attempts to define the formation of

collaborative watershed partnerships (Woolley and McGinnis 1999; Leach and Pelkey 2001). Watershed partnerships are largely self-directed and place-based collections of public and private stakeholders who operate by and large outside of traditional government processes or decision-making forums. They typically employ collaborative mechanisms of group interaction and communication, characterized by open debate, inclusive and consensus-based decision-making, flexibility, adaptability, and voluntary action (Leach and Pelkey 2001; Kenney et al. 2000). A watershed partnership can be defined as:

"A primarily self-directed and locally focused collection of parties, usually featuring both private and intergovernmental representatives, organized to jointly address water-related issues at the watershed level or a similarly relevant physical scale, normally operating outside of traditional governmental processes or forums, and typically reliant on collaborative mechanisms of group interaction characterized by open debate, creativity in problem and solution definition, consensus decision-making, and voluntary action" (Kenney et al. 2000, 2).

Watershed partnerships typically seek diverse stakeholders with varying skills and interests, which creates an environment for collaboration and expertise on various aspects of the project (Leach and Pelkey 2001). Stakeholders often include local environmental groups, local landowners, federal and state agencies, and the local government. There is a strong commitment to open stakeholder communication from the onset, often times before the specific problem has been identified, because it is important to foster consensus and avoid litigation.

2.4 Watershed Governance

Over the last two decades a new strategy of governing, called “collaborative governance” has developed. “Policy makers and researchers have long advocated collaborative governance as a means to improve the natural environment “ (Biddle 2011, 2). Collaborative governance is, “an inclusive, interactive public policy approach involving three or more organizations/ individuals who collectively resolve disputes over resource management” (Biddle 2011, 2; Ansell and Gash 2008).

The term collaborative governance refers to any “local, state, or federal effort to solve an environmental problem within partnerships among public, private, and nonprofit organizations where collaborative partnerships are the primary feature” (Biddle 2011, 3). Collaborative governance brings multiple stakeholders together to engage in consensus-oriented decision making relating to public policies and issues within a broadly defined issues area, such as environmental management (Ansell and Gash, 2008; Leach et al., 2002; Biddle 2011). The aim is to make better decisions by sharing information and achieving a more comprehensive understanding of the problem (Wondolleck and Yaffee 2000; Biddle 2011).

Watershed partnerships and the use of collaborative governance has become a common governmental strategy for addressing problems associated with common or publicly-shared resources. These partnerships aim to allow for the adoption of innovative and flexible policy tools that address environmental problems in a more cost-effective manner” (Genskow, Born, 2006; Biddle, 2011). A basic premise of a watershed partnership is that through collaborative governance, larger-scale and more holistic goals are achievable that may not have been within the reach of a single organization working alone (Lubell et al. 2002; Imperial 2005; Biddle, 2011). In addition, watersheds span multiple

jurisdictional boundaries and geographical borders, therefore collaborative governance has been identified as an approach for achieving cross-jurisdictional congruence and agreement (Imperial, 2005; Mandarano, 2008; Biddle, 2011).

Not all collaborative governances are alike, they differ in structure (Koontz and More, 2004), levels of organizational participation (Hooper 2006), and outputs (Margerum, 2008). Watershed partnerships represent a hybrid form of collaborative governance involving multiple stakeholders generally within federal, state, and local regulatory agencies, as well as non-profits and private landowners (Biddle, 2011).

The next section examines the US EPA's National Estuary Program (NEP), which is a voluntary watershed management program. The NEP supports an ecosystem-based collaborative approach to watershed management through the creation of partnerships, which provide communities with access to additional resources, both technical and non-technical, to reach a larger audience, and to have an increased presence within their watershed (EPA Office of Water 2012). The NEP also plays an important role in creating a web of watershed organizations helping to both spread information among themselves and with the general public.

SECTION

3.0 THE NATIONAL ESTUARY PROGRAM

32

3.1 Program Overview

The National Estuary Program (NEP) was created in 1987 through the Water Quality Act (WQA) and is administered by the U.S. EPA's Office of Wetlands, Oceans and Watersheds (OWOW) (Imperial and Hennessey 1996). It is a voluntary, ecosystem based program "that provides federal funds and technical assistance to estuary projects that facilitate a collaborative, consensus-based planning process" (Imperial and Hennessey 1996, 118). Consensus based planning is defined as "an array of practices in which stakeholders, selected to represent different interests, come together for face-to-face, long-term dialogue to address a policy issue of common concern" (Innes and Booher 1999, 413). This process seeks consensus, as opposed to majority rule, which promotes discussion and the search for solutions based on stakeholder interests and not predetermined positions (Innes and Booher 1999). The overarching goal is to "incorporate many interests and find solutions offering mutual gain" (Innes and Booher 1999, 413).

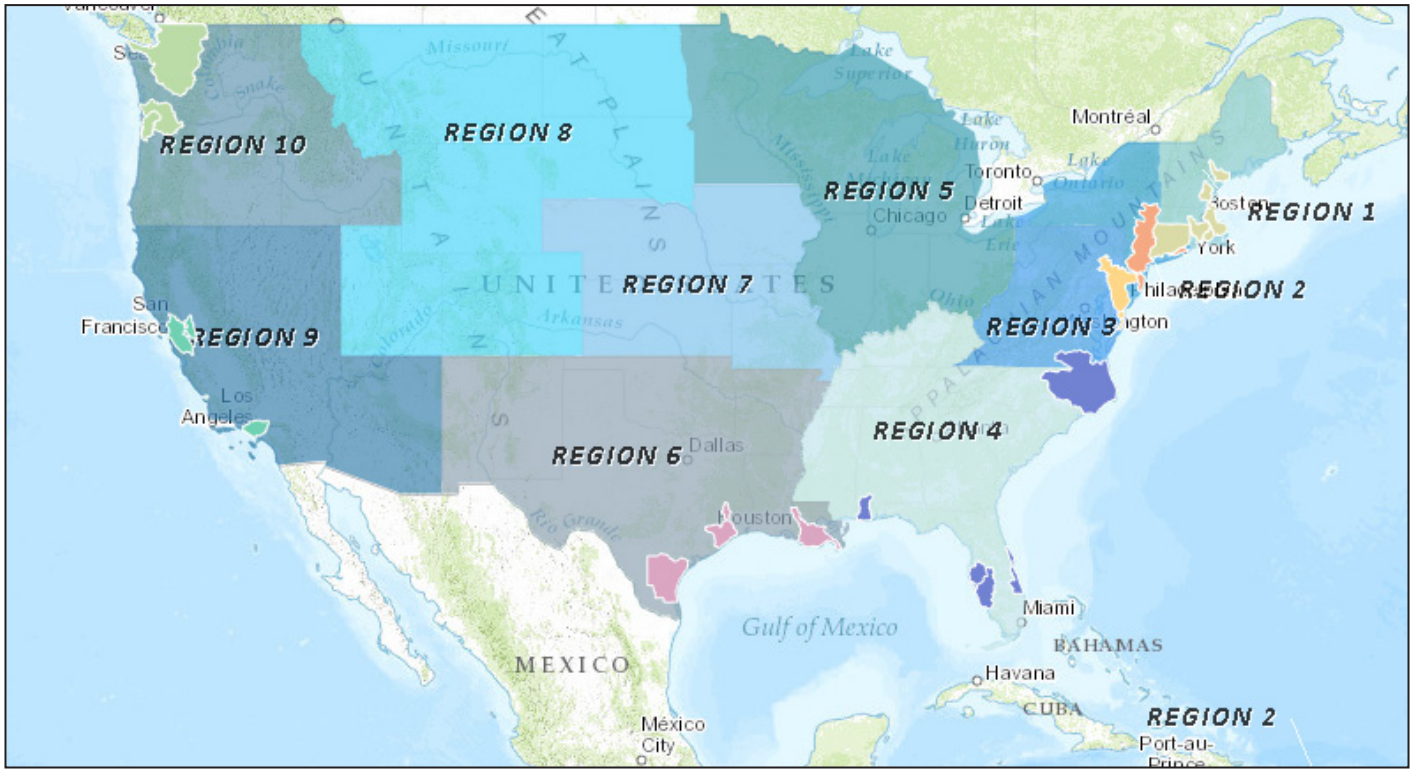


Figure 2- NEP Regions. Source: NEP Website

First Tier (1985-86)	Second Tier (1987)	Third Tier (1990)	Fourth Tier (1992)	Fifth Tier (1995)
Buzzards Bay Project; MA	Delaware Bay; DE, NJ, PA	Barrataria-Terrebonne; LA	Corpus Christi; TX	Barnegat Bay; NJ
Narragan-sett Bay Project; RI	Delaware Inland Bays; DE	Casco Bay; ME	Peconic Bay; NY	Charlotte Harbor; FL
Long Island Sound Study; CT, NY	Galveston Bay Nation-al Estuary Program; TX	Indian River Lagoon; FL	San Juan Harbor; PR	Columbia River; OR, WA
Puget Sound Part-nership; WA	Sarasota Bay; FL	Tampa Bay; FL	Tillamook; OR	Maryland Coastal Bays; MD
Albermarle-Pamlico Estuary Study; NC	Santa Monica Bay Restoration Project; CA			Morro Bay; CA
San Francis-co Estuary Program; CA				Mobile Bay; AL
				New Hampshire Estuaries; NH

Table 1- 28 National Estuary Programs. Source: Imperial and Hennessey, 1996, p. 118

As previously stated, in Section 1, there are currently 28 estuary initiatives, in 10 regions (Figure 2), in the United States (Table 1; Figure 3). These estuary programs have been created throughout five phases (26 years in total), and are located in 18 states and the Commonwealth of Puerto Rico (Imperial and Hennessey 1996).

Figure 3- NEP Study Areas. Source: ANEP

The 28 initiatives vary in terms of ecosystem characteristics, jurisdictional complexity, and the causes of ecologic stress (EPA Office of Water 2012; Imperial and Hennessey 1996). The NEP provides seven "statutory requirements" (Imperial and Hennessey 1996, 118), in their enabling legislation, which will be discussed in the following sections. These requirements are flexible and meant to support the individual estuaries.

The following sections describe the selection process, the strategy, the program structure and planning process, project implementation and how the NEP monitors each of the 28 programs. The NEP requires, under Section 320 of the CWA, for each estuary initiative to develop and implement a Comprehensive Conservation and Management Plan (CCMP). "The CCMP is a long-term plan that contains specific targeted actions designed to address water quality, habitat, and living resource challenges in its' estuarine watershed" (EPA Office of Water 2012). The CCMP is developed through the Management Conference (MC), which can take up to three years, and is organized when the individual NEP is established. The MC process includes multiple stakeholders such as community members, local, state, and Federal agencies, as well as with non-profit and private sector entities. The MC relies upon a consensus-building approach and a collaborative decision-making process to ensure that the CCMP is "uniquely tailored to the local environmental conditions, is based on local input, and supports local priorities" (US EPA NEP 2013).

3.2 Estuary Selection

There are many watersheds throughout the United States. To be selected for the National Estuary Program (NEP), estuary programs must be established organizations in order to be nominated by state governors and then approved by the EPA (Perry 1998). In some cases, estuaries that "have received considerable attention with respect to scientific research, legislative protection, and public support and involvement are given priority over estuaries with less developed conservation programs" (Perry 1998, 3). The reason for this is to avoid putting time and resources into identifying basic environmental issues, but rather to, take an established estuary program that has done the initial work of identifying the environmental problems and provide a setting that "facilitates collaborative, consensus-based management" (EPA Office of Water 2012; Perry 1998). The estuary projects that are part of the NEP are "nationally significant and threatened by pollution, development, or overuse" (Imperial and Hennessey 1996, 119). The estuary nominees must contain the following elements:

1. Demonstrate that the estuary complies with the given definition of an estuary.
2. Provide a rationale as to why the estuary should be protected by describing why it is valuable economically, ecologically, recreationally, educationally and scientifically.
3. Identify the most prominent problems in the estuary using scientific data and how these issues are affecting the value.
4. Identify members of the proposed local NEP and show that the membership includes required parties.
5. Identify a state or local agency with the necessary infrastructure to oversee the program.
6. Provide evidence of state and local support in addition to public support for the program (Perry 1998; EPA Office of Water 2012).

The estuaries "that have substantial economic and ecological value" (Perry 1998, 2), will significantly impact nationwide estuary restoration efforts, and already receive support for their efforts from state and local agencies are given priority over other nominees (Perry 1998).

3.3 The Strategy

The NEP helps established organizations develop a CCMP that addresses three key management areas, which are: water and sediment quality, living resources, and land use and water resources (EPA Office of Water 1992; Imperial and Hennessey 1996). The CCMP is developed through a "planning process that emphasizes problem definition and flexibility in the selection of issues: the Management Conference (MC)" (Imperial and Hennessey 1996). The NEP facilitates and supports cooperation and collaboration among various stakeholders in the community to form the MC (Perry 1998). The primary goal of the CCMP is to address the issues specific to the estuary and improve both the management of water quality, and the ecosystem as a whole (Imperial and Hennessey 1996).

The NEP organizes a MC for each estuary project when it is accepted into the program. The MC provides a forum for consensus building and problem solving for stakeholders (EPA Office of Water 1992). In order to develop consensus on the management actions, which ensure implementation of the CCMP, the MC uses "many forms of information gathering, public education, and public involvement" (Imperial and Hennessey 1996, 119). "The individual State/EPA Conference Agreements, negotiated and signed at the start of each NEP Management Conference, contain milestones and commitments for pursuing these goals…these activities result in a CCMP for the estuary" (EPA Office of Water 1992).

The MC requires that project participants work collaboratively to identify the problems that exist within the estuary, examine the current management strategies and frameworks, and outline the actions that can be taken to address priority issues (EPA Office of Water 1992).

3.4 The Program Structure

The MC is the "functional, administrative, and institutional structure of an estuary project" (Imperial and Hennessey 1996, 119). The participants of the various advisory and decision-making committees contain members from appropriate federal, state, and local government officials; representatives from the scientific and academic committees; industry representatives; and concerned members of the general public (Imperial and Hennessey 1996, 119) (Figure 4).

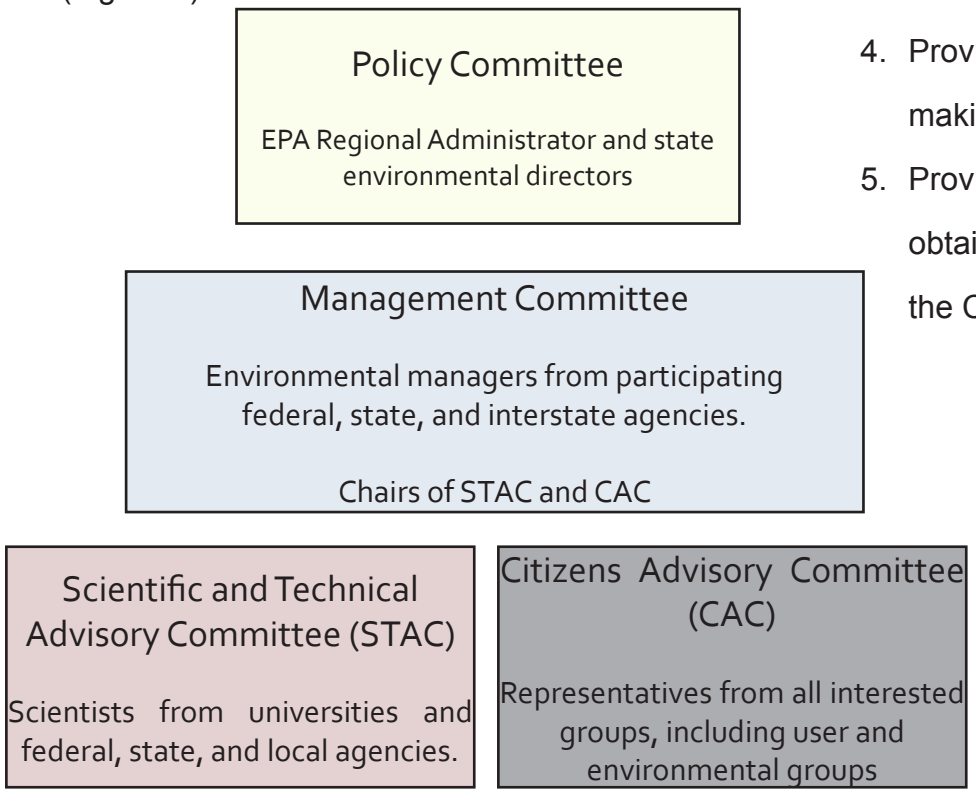


Figure 4- Management Conference Structure. Source: NEP

The MC seeks to address the following five areas, which are drawn from Imperial and Hennessey (1996; 119):

1. Stimulate the transfer of scientific, technical, and management experience and knowledge among management conference participants;
2. Enhance awareness of the environmental problems by both the general public and decision makers;
3. Provide opportunities to discuss and propose solutions to environmental problems;
4. Provide a way to synthesize input in decision-making processes; and,
5. Provides a forum for building partnerships and obtaining commitments necessary to implement the CCMP.

The CCMP must be realistic in terms of fiscal restrictions and time restraints while addressing the needs of the involved groups. While there are similarities between MCs they typically vary in terms of structure depending upon the size of the estuary program, the specific areas of concern and local issues (Imperial and Hennessey 1996).

The MC is given three years to develop the CCMP and is typically organized into four committees: the Policy Committee, Management Committee, Technical, Advisory Committee, and the Citizens Advisory Committee. The Policy Committee is the head of the MC and usually consists of “EPA representatives, governors, and top state agency officials” (Imperial and Hennessey 1996, 120) and oversees the Management Committee. The Management Committee focuses on consensus building and is comprised of “state water quality and natural resource management agencies and the regulatory community, as well as representatives of the general public and interest groups” (Imperial and Hennessey 1996, 120). The Management Committee focuses on the local environmental issues, aids the Policy Committee in their decision-making process, and works to complete and approve the CCMP (Imperial and Hennessey 1996). The MC seeks to involve local stakeholders as well as members of the public into the CCMP development process.

3.5 The Process

The NEP's process consists of an "interrelated series of federally mandated steps that promote rational, watershed-based planning for addressing problems that impact an estuary" (Imperial and Hennessey 1996, 121). The MC and CCMP differs with each estuary program, however, the NEP includes in the following four phases: 1) problem identification, 2) characterization of environmental problems, 3) development of a CCMP, and 4) CCMP implementation (EPA Office of Water 2012; Imperial and Hennessey 1996). These phases are not entirely sequential, but rather take place simultaneously in a continuous process allowing for flexibility in CCMP development.

The NEP process aims to "identify priority problems and formulate action plans to address them" (Imperial and Hennessey 1996, 120). The four phases of the NEP process (Imperial and Hennessey 1996) require diverse stakeholder and public participation in order to identify and prioritize environmental problems (Figure 5). When the stakeholders reach consensus on the most important issues they then begin to identify and design strategies to address the issues. These strategies must be realistic tangible goals. The "conference members then design action plans appropriate for meeting those goals" (Perry 1998, 3). The CCMP is comprised of several Action Plans to address the environmental issues. Implementation of the CCMP varies between estuary programs as the needs and Action Plans vary in terms of specific needs and costs (Imperial and Hennessey 1996).

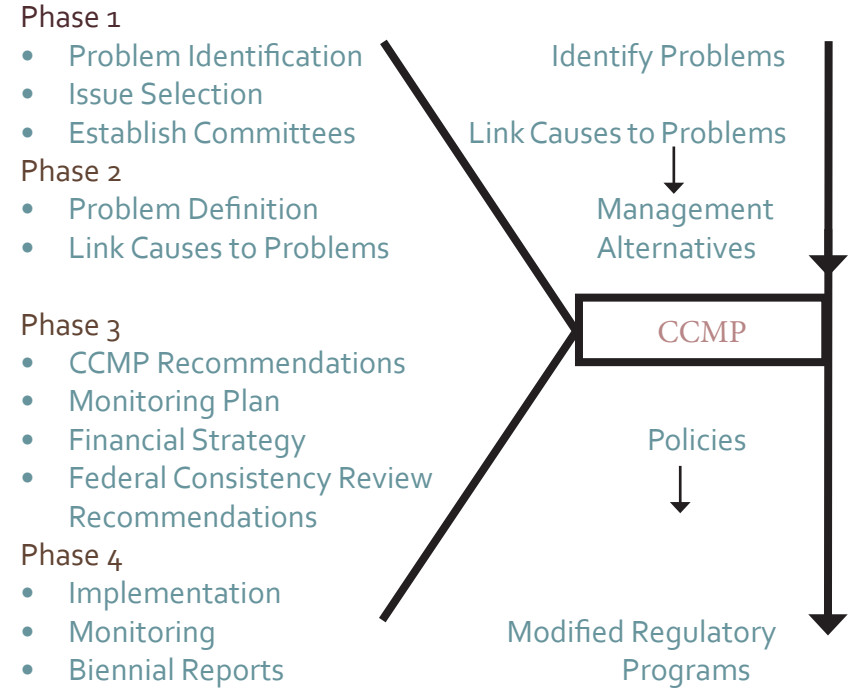


Figure 5- NEP Planning Phases for CCMP. Source: Leach and Pelkey 2001.

3.6 Implementation

The completed CCMP must include detailed action plans and monitoring programs, including the required funding. CCMP serves as a mechanism for integrating federal, state, and local efforts into the management of the estuary and its contributing watershed (Imperial and Hennessey, 1996, 123). The EPA provides 75% of the costs to develop the CCMP and state governments are expected to provide 25% non-federal match (EPA Office of Water 2012; Perry 1998). However, upon completion of the CCMP the EPA funding is reduced and the funding sources identified during the MC are used to address the Action Plans. A large portion of the funding comes from "federal and state grants, local governments, existing restoration programs and from fines and court settlements associated with estuary conservation regulations" (Perry 1998, 3). The NEP relies on the fact that the estuary projects have pre-existing funding mechanisms in place because it is beneficial for the projects to partner with other local organizations.

Prior to 1995 NEPs were given up to five years of EPA funding to finalize their CCMP, however, this has since changed and NEPs are now required to complete their CCMP within three years. This is in part due to the fact that NEPs are now able to refer to the process of earlier programs CCMPs. Due to the fact that estuaries share many of the same environmental issues and concerns and have access to many of the same technical programs, such as Geographic Information System software (GIS), they are able to draw from each others work and share resources through the Association of National Estuary Programs (ANEP) (Perry 1998).

3.7 NEP Reports

The NEP has been in existence for twenty-six years and is considered to be one of the EPAs most successful watershed programs. “The NEP demonstrates the effectiveness of a stakeholder driven, collaborative process to address water quality problems to target habitat restoration” (U.S. EPA NEP CCR 2007, 26). Since the year 2000, it has “restored and protected over 1.3 million acres” (US EPA OWOW 2013), however, 37% of NEP estuaries in the United States are currently in poor condition. The success of the NEP relies upon the success of the individual estuary projects; therefore it is the responsibility of the individual NEPs to monitor their effectiveness and to prioritize local issues.

The Clean Water Act requires the EPA to report periodically on the current conditions of the nation’s estuaries and NEPs (U.S. EPA NEP CCR 2007). Therefore, the EPA relies upon the individual NEPs to provide data, however, the problem is that “the NEPs and their partners use different approaches for data collection” (U.S. EPA NEP CCR 2007, 26) and have been established at different times and therefore may not have enough data collected.

There are many ways to measure the progress of an NEP, therefore the “EPA, the National Oceanic and Atmospheric Administration (NOAA), the U.S. Geological Survey (USGS), the U.S. Department of the Interior (DOI), and the U.S. Department of Agriculture (USDA) agreed to participate in a multi-agency effort to assess the condition of all U.S. estuaries, including the NEP estuaries” (U.S. EPA NEP CCR 2007, 26). A different approach was used which relied upon “nationally consistent monitoring surveys” (U.S. EPA NEP CCR 2007, 26) to avoid the issues regarding the different sampling methods and incomparable data. The result of the monitoring surveys was compiled into a series of reports called the National Coastal Condition Reports (NCCR) (U.S. EPA NEP CCR 2007).

The first NCCR, published in 2001 (NCCR I), examined available data from 1990-1996 (from the EPA, NOAA, DOI, and USDA) and stated that 70% of the nations estuarine resources were in fair condition (U.S. EPA NEP CCR 2007). The second report was published in 2004 (NCCR II), and used data from 1997-2000 (from the EPA, NOAA, FWS, and USGS as well as several state, regional and local organizations) and stated that 100% of the estuarine area in the United States was in fair condition (U.S. EPA NEP CCR 2007).

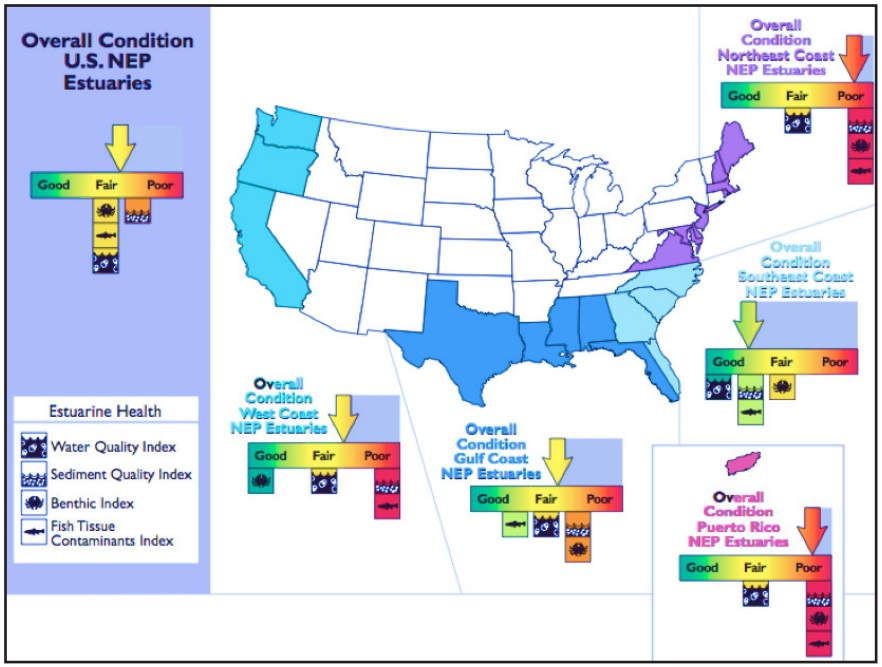


Figure 6- Overall Condition of U.S. NEP Estuaries. Source: 2007 NEP Coastal Condition Report

The most recent National Estuary Program Coastal Condition Report (NEP CCR), published in 2007, is different from the previous two reports because it focuses specifically on the condition of the 28 NEP estuaries. The NEP CCR relies upon two types of monitoring data for each individual NEP, the first is "data collected as part of the EPA's National Coastal Assessment (NCA)" and secondly, "data collected by each of the individual NEPs of by the NEP in partnership with interested stakeholders, including state environmental agencies, universities, or volunteer monitoring groups" (U.S. EPA NEP CCR 2007, 27). Data collected for the NEP Coastal Condition Report, from 2007, was from 1,239 sites within NEPs from 1997-2003 (Figure 6). This report showed that "only the water quality index for the Southeast Coast region and the benthic index for the West Coast region were rated good" (U.S. EPA NEP CCR 2007, 4). Based on the data collected for the CCR, the overall condition of the nation's estuaries is rated fair, with 37% rated poor (U.S. EPA NEP CCR 2007).

The EPA currently reviews each of the NEP estuary programs every three years. The Clean Water Act of 2011, S.1313, requires a more rigorous evaluation through the use of "performance measures and goals" (U.S. EPA NEP CCR 2007). The evaluation "is intended to assist program managers, in both EPA and the approved estuary program, in their efforts to identify whether goals of the CCMP are being achieved and to provide insight as to whether the management plan is successful, whether the management approaches are appropriate, where to focus efforts, and to identify impairments that may be preventing improvements" (U.S. EPA NEP CCR 2007). NEPs are required to regularly update their CCMPs throughout the years, for several reasons:

- Address the fact that many NEPs have never updated their CCMPS
- Ensure that each estuary program acknowledges and accounts for any changes in its CCMP, such as new impairments or newly recovered habitats
- Ensure that stakeholder will continue to be active partners in the restoration and protection of the estuary through involvement in the CCMP updates
- Include an evaluation process that enhances accountability and develops a CCMP that reflects program evaluation results (U.S. EPA NEP CCR 2007).

It is typically the responsibility of the NEPs to maintain public relations, program coordination and opportunities for consensus building after the CCMP is completed (Perry 1998, 5).

In response to the "ecological crisis" (Woolley and McGinnis 1999, 578) facing the watersheds in the United States the NEP was created to provide local watershed initiatives with the guidance and resources they require. It is acknowledged in the literature that watershed partnerships are an important aspect of natural resource management (Kenney 1999; Imperial and Hennessey 1996; Leach and Pelkey 2001). However, few have examined the existing NEPs and

their individual CCMPs, programs and plans as they are being developed across the United States.

Comparing NEPs is difficult because they vary in terms of their focus, organizational structure, funding mechanisms, stakeholder involvement and community outreach and interaction. NEPs are long-term endeavours as they "often pursue multiple activities over a span of many years to address an array of social, economic, and ecological issues" (Leach, Pelkey, and Sabatier 2002, 652). As a result it is difficult to choose one yardstick to measure their progress in addressing the Action Areas outlined in their CCMPs as well as achieving improved water quality (Leach, Pelkey, and Sabatier 2002). In the 2004-2006 National Estuary Program Implementation Review Report (2008), the 28 NEPs were reviewed to determine progress implementing their respective CCMPs and continued eligibility for funding under Section 320 of the CWA (U.S. EPA NEP: 2004-2006 IR Report 2008). All of the 28 NEPs have proved eligibility and are at various stages of CCMP implementation.

The National Estuary Program was evaluated in a 1992 study which examined the characteristics that make up the strategy of a coastal resource management program to identify strengths and weaknesses (Imperial and Hennessey 1996). The same criteria of characteristics was used in a later study, by the same authors, in a 1996 article titled, An Ecosystem-Based Approach to Managing Estuaries: An Assessment of the National Estuary Program, by Imperial and Hennessey. The authors identify several key objectives that can be used to analyze strengths and weaknesses of coastal management programs. The authors outline four characteristics to evaluate the NEP, which are:

1. The program should address problems ecologically by keeping the focus on programs on the ecological unit, crossing jurisdictional boundaries if necessary, and focusing on issues important to resource users and citizens.
2. The program should be collaborative and involve appropriate political actors, including federal, state

and local governments, public and private sector organizations, and local community members.

3. The program should improve existing regulations and planning capacities by addressing problems not covered by other laws, strengthening existing law, and strengthening existing organizations.
4. Economic, and sociocultural constraints by choosing issues of strategic importance, not overstretching staff and budget, prioritizing problems and implementation actions, and developing implementable management plans (Imperial and Hennessey 1996, 124).

Strengths	Weaknesses
Ecological unit is the watershed	No long-term planning component
Strong public participation	Program is resource intensive
Consensus-based decision making	Limited implementation funding may impede implementation process
Strong focus on capacity building	Institutional obstacles may hinder implementation of the CCMP
Use of demonstration projects	
Flexibility in program development	
Relatively high capacity for learning	
Clear role for science	

Table 2- Strengths and Weaknesses of NEP. Source: Imperial and Hennessey 1996, 132

Through this study it was determined, that while the long-term success of NEP projects is not definite, the program's process seems promising (Imperial and Hennessey 1996). "The EPA sheds the traditional command-and-control approach of the EPA in favor of a consensus-based multipurpose, multiprogram approach, which attempts to manage estuaries and their surrounding watersheds as ecologic systems" (Imperial and Hennessey 1996, 132). The table below shows the main strengths and weaknesses of the NEP program and planning process (Table 2).

SECTION

4.0 METHODOLOGY

4.1 Research Approach and Program Examination

The Puget Sound Partnership (PSP) was chosen for case study because it is one of the largest estuaries in the country, and was one of the first NEPs established with the first tier in 1987. The PSP, like many of the NEPs, has dealt with barriers to CCMP implementation. The PSP, a state watershed management agency, completed their first CCMP (referred to as the Action Agenda) in 2008, with an adaptation released in 2012. Reviewing one watershed initiative allowed for a more in-depth, detailed review, which is preferred to a broad survey of NEPs. Standard case study protocol (Yin 2009) was used in this research to examine a range of qualitative data sources.

The PSP is examined to understand (a) how was the organization formed, (b) what is the organizational structure, (c) what are the main goals of the Action Agenda, (d) how is the Action Agenda implemented and monitored, (e) does the PSP share information with other NEPs, if so, how, (e) what are the most significant challenges in terms of organizational structure, funding, and project implementation how does the PSP collaborate with its partners.

These questions have been addressed through semi-structured interviews, a review of relevant documents, brochures, studies, programs and management plans. Semi-structured interviews were conducted over a one-month period, with employees of the Puget Sound Partnership, the Association of National Estuary Programs, and two local watershed initiatives, Citizens for a Healthy Bay and Puget Soundkeeper Alliance. The two local watershed initiatives were established before the PSP and were chosen to examine the collaborative relationship with the PSP. The titles and names of the interviewees will be kept anonymous, aside from the name of their organization. These interviewees were specifically chosen through online research, based on their involvement, understanding and knowledge of

the PSP. Due to geographic location, interviewees were initially contacted by email and interviews were conducted by phone for a duration of 30-60 minutes. Each of the interviews had a different set of questions (See Appendix I for Interview Questions), with the main goal being to explore the main challenges the PSP faces regarding the implementation of the Action Agenda, to understand how information is shared among NEPs, and how the PSP collaborates with other watershed management organizations in the Puget Sound Region.

Results of this research will contribute to the literature on the PSP and the implementation of their Action Agenda. Examining the PSP through intereviews, and extensive online research and document review provides a snapshot of exactly how the state agency operates, the programs they are implementing, where progress is being made and their collaboration with other local watershed management organizations.

SECTION

5.0 THE PUGET SOUND PARTNERSHIP

50

5.1 The Puget Sound Partnership Overview

NEP Region	Location	Year Established	Area (km2)
Region 10, Western	Washington	1987	42,791

Figure 7- Puget Sound and Georgia Basin. Source: Environment Canada Website

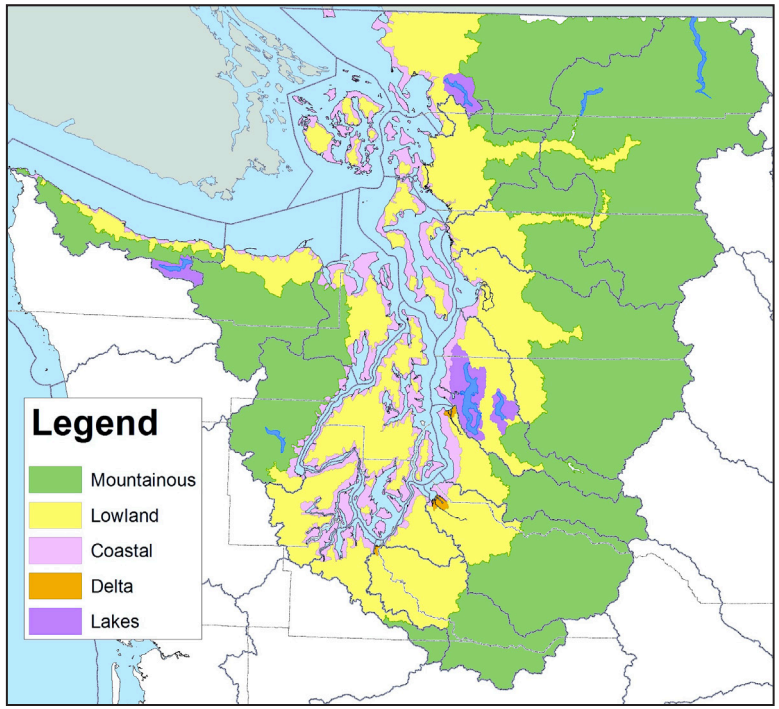
The Puget Sound is located in Washington State, in the Northwestern United States, and is the second largest estuary in the United States, the Chesapeake Bay is the largest (Puget Sound Partnership: State of the Sound Report 2012). The Puget Sound-Georgia Basin watershed extends from the Campbell River in northern British Columbia, Canada, to the Nisqually River in Central Western Washington in the U.S. (Figure 7; Figure 8). Due to the geographic location of the watershed federal and local governments acknowledge the need to work across political boundaries (U.S. EPA OWOW PSP 2013). There are numerous agreements and initiatives that support this combined effort, with the goal of protecting and managing the Puget Sound ecosystem (U.S. EPA OWOW PSP 2013).

The Puget Sound has a population of 4.3 million people, with approximately "two-thirds of Washington State's population" (Puget Sound Partnership: State of the Sound Report 2012, 2) living in the 12 counties bordering the Sound, including 1.6 million

people that live in 90 cities and towns directly bordering the Sound (Department of Ecology: State of Washington 2008). The Sound is threatened by a growing human population resulting in continued urban sprawl, and by the year 2020 the population of the Puget Sound basin is projected to be more than five million people (U.S. EPA NEP CCR 2007, 322).

Continued human development has resulted in negative environmental impacts. “Three-quarters of its saltwater marsh habitat have been eliminated through dikes and drainage systems, and 90% of the estuaries and wetlands have been lost or degraded… we have removed over 70% of our old growth forests in the past 50 years and armored over one-third of our shorelines”(Puget Sound Partnership: State of the Sound Report 2012, 8).There are new roads being built, shorelines paved and fish populations and timber supplies overharvested (Puget Sound Partnership: State of the Sound Report 2012). Tourism in the Sound provides $9.5 billion in travel spending and 88,000 related jobs (Department of Ecology: State of Washington 2008).The Sound is a significant West Coast trade port; in 2003 the port facilities of the Sound handled more than 64 million tons of cargo (U.S. EPA NEP CCR 2007; U.S. EPA OWOW PSP 2013). “About 70% of all jobs and 77% of total income in the state come from the Puget Sound basin” (Puget Sound Partnership: State of the Sound Report 2012, 2). Recreational and commercial fishing are valued at more than $60 million a year, while the average annual recreational and commercial value for Puget Sound shellfish is more than $85 million per year (Department of Ecology: State of Washington 2008).

Figure 8- Puget Sound Biophysical Environment. Source: NEP Website



However, economics are not the only reason to save the Sound. There are also more personal reasons for wanting to protect the Sound, including "common sense, spiritual values, treaty rights, and the (our) deep need for connection to the natural world each play an important part in motivating residents (us) to restore and protect the Puget Sound" (PSP 2007-2012 Legacy and Lessons Learned Report, 6).

The Puget Sound- Georgia Basin was designated as a Large Aquatic Ecosystem (LAE), by the Council of Large Aquatic Ecosystems in 2008, joining nine other geographic-based efforts that "focus on protecting and restoring the health of critical aquatic ecosystems" (U.S. EPA Council of Large Aquatic Ecosystems 2011; Figure 9).

The Puget Sound is located in EPA Region 10 which is "addressing threats to this valuable ecosystem through several interrelated efforts, such as: participation in the Puget Sound national Estuary Program (NEP) Management Conference, coordination of relevant federal and trans-boundary (with Canada) activities, implementation of EPA's applicable programmatic authorities, and fulfillment of our trust responsibilities to the 19 Federally-recognized Tribes in the greater Puget Sound Basin" (U.S. EPA Council of Large Aquatic Ecosystems 2011).

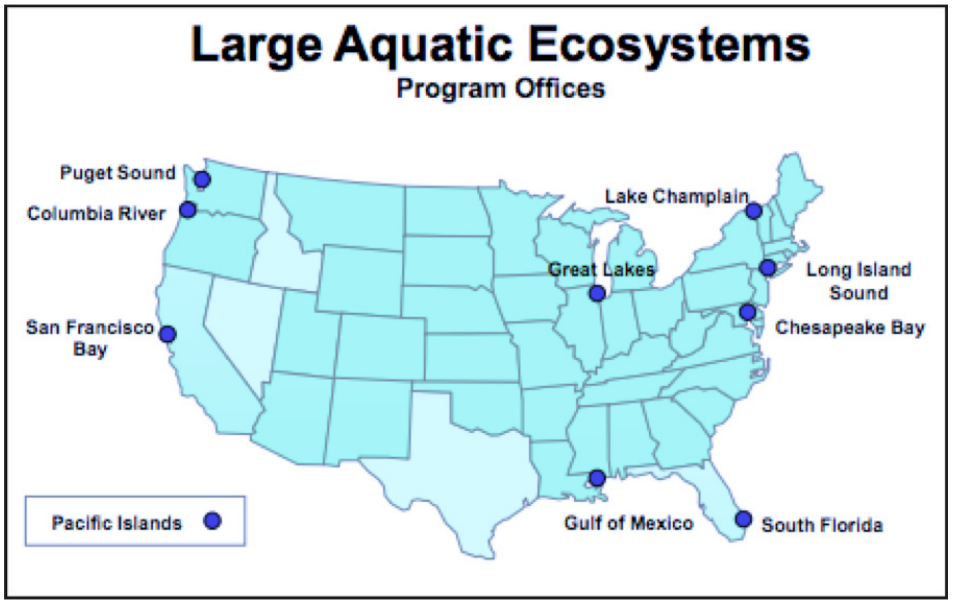


Figure 9- LAE Program Offices. Source: U.S. EPA Council of Large Aquatic Ecosystems 2011

Origins of the Watershed Effort

The Puget Sound was originally recognized as an estuary of national importance in 1987, through the Clean Water Act, when the Puget Sound Water Quality Authority (PSWQA) became part of the National Estuary Program. The PSWQA was succeeded by the Puget Sound Action Team (PSAT) and in 1991 the first CCMP was developed and approved, however, the identified action items were not entirely addressed and a large portion of the interventions did not materialize (U.S. EPA NEP Region 10 2013).

As a result, in 2007, the Puget Sound Federal Caucus was established to improve the "federal coordination" (U.S. EPA OWOW PSP 2013), organization and implementation of federal efforts to restore and conserve the Puget Sound Ecosystem. The Caucus included thirteen federal agencies, which created a Memorandum of Understanding to demonstrate their commitment and document the collaborative work to restore the Puget Sound (U.S. EPA OWOW PSP 2013).

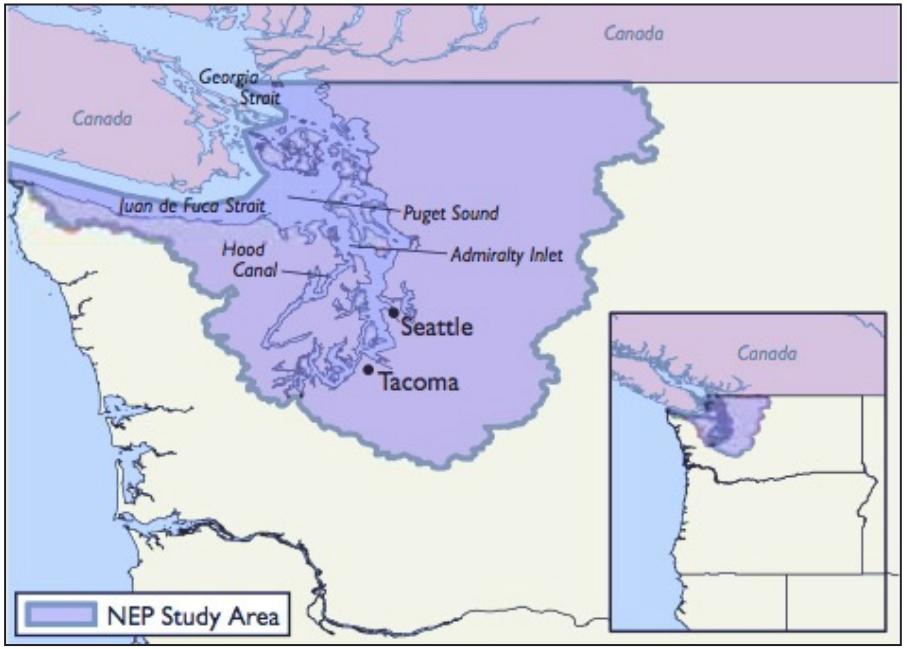


Figure 10- Puget Sound Partnership Study Area. Source: NEP Website

International agreements were created with Canada to address specific issues like, air quality, migratory birds, trans-boundary waters and the transport of hazardous waste, which "provide the foundation for the Joint Statement of Cooperation on the Georgia Basin and Puget Sound Ecosystem, signed by the Administrator of the EPA and Minister of Environment Canada in 2000" (U.S. EPA Council of Large Aquatic Ecosystems 2011).

At the same time, in 2007, the Washington State Legislature and Governor Christine Gregoire adopted the Revised Code of Washington, (RCW) 90.71.370(3), which created the Puget Sound Partnership (PSP) (Figure 10). This new state agency was responsible for creating the 2020 Action Agenda to "identify the effort required to protect and restore the Sound, to determine and measure accountability, to use money efficiently, and to promote public awareness and build support for changing practices that negatively affect the viability of the Sound" (Puget Sound Partnership: State of the Sound Report 2012, 9). Due to the fact that this is an enormous task, it was important to have one central organization, the PSP, to develop and manage the recovery effort collaboratively.

The purpose of the PSP was not only to work collaboratively with Federal agencies but also to reinvigorate the efforts of the previous CCMP of 1991, through the creation of the Action Agenda, which focuses on improving the health of the Puget Sound based on clear science and measurable goals by the year 2020. The PSP was also created to ensure transparency and accountability for achieving results "including performance, and the efficient use of money spent on the Puget Sound…and promote public awareness and communication to build support for a long-term strategy" (PSP Action Agenda 2012).

Figure 11- Puget Sound From the Seattle Space Needle, WA. Source: Commons.wikimedia.org

5.2 Structure and Function of the Puget Sound Partnership

The following section will examine the PSP through the MC and Action Agenda, organizational structure, programs, and collaborative actions, funding and monitoring systems. This section will also incorporate the interviews with PSP staff members and other watershed management organizations.

The Development of the Action Agenda

The EPA approved the Partnership's first Action Agenda in 2008, after checking for consistency with the NEP, and accepted it as the new CCMP for the Puget Sound. The Action Agenda serves as the CCMP for Puget Sound under the EPA's National Estuary Program (U.S. EPA OWOW PSP 2013). The Action Agenda was created collaboratively through public forums, citizen and scientific input (PSP Action Agenda 2008). The process of developing the first Action Agenda included 75 presentation to local businesses and community organizations, numerous pubic workshops attended by over 1,600 people, and 11,182 public comments received in writing or online regarding the Partnership's work (PSP Action Agenda 2008). When the PSP was created and began developing the first Action Agenda of 2008, the Washington State Legislature in agreement with Governor Gregoire, established six goals for the Partnerships to achieve by 2020, which are as follows (Chess, Jo Hance, and Gibson 2000, 1):

1. A healthy human population supported by a healthy Puget Sound that is not threatened by changes in the ecosystem;
2. A quality of human life that is sustained by a functioning Puget Sound ecosystem;
3. Healthy and sustaining populations of native species in Puget Sound, including a robust food web;
4. A healthy Puget Sound where freshwater, estuary, near shore, marine, and upland habitats are sufficient to sustain people, fish, and wildlife, and

the natural functions of the environment;

5. Fresh and marine waters and sediments of a sufficient quality so that the waters in the region are
6. Safe for drinking, swimming, shellfish harvest and consumption, and other human uses and enjoyment, and are not harmful to the native mammals, fish, birds, and shellfish of the region (PSP Action Agenda 2008).
7. The Partnership was then required to develop "measurable outcomes for each goal…specifically describing what will be achieved, how it will be quantified, and how progress toward outcomes will be measured" (PSP Action Agenda 2008; Appendix II: Action Agenda Goals/Outcomes). The 2008 Action Agenda contains over two hundred pages and examines the state of the Sound and serves as the 'roadmap' (U.S. EPA OWOW PSP 2013) to manage ecosystem health.

The 2008 Action Agenda concentrates on four main categories, which identify the specific focus areas of the PSP initiatives. The first is Freshwater and Terrestrial Protection, which includes agricultural land, floodplains, salmon recovery and fresh water flows. The second is Marine and Nearshore Protection and Restoration and includes shoreline protection, working waterfronts and public access, biodiversity and invasive species. The third is Pollution Prevention and Cleanup, which includes strategies to reduce polluted runoff, oil spill interventions and wastewater management. The fourth and final category is Strategic Leadership and Collaboration which is the core work of the PSP and its partners regarding the development and implementation of science and ecosystem monitoring systems and setting goals and priorities to promote sustainability and stewardship (Puget Sound Partnership 2013; Figure 11).

The Partnership's most recently adapted Action Agenda, which contains over six hundred pages, was released in 2012 and builds upon and improves the Action Agenda of 2008, by simplifying the structure of the document which provides the base for future plans to transition to an online format (PSP Action Agenda 2012).

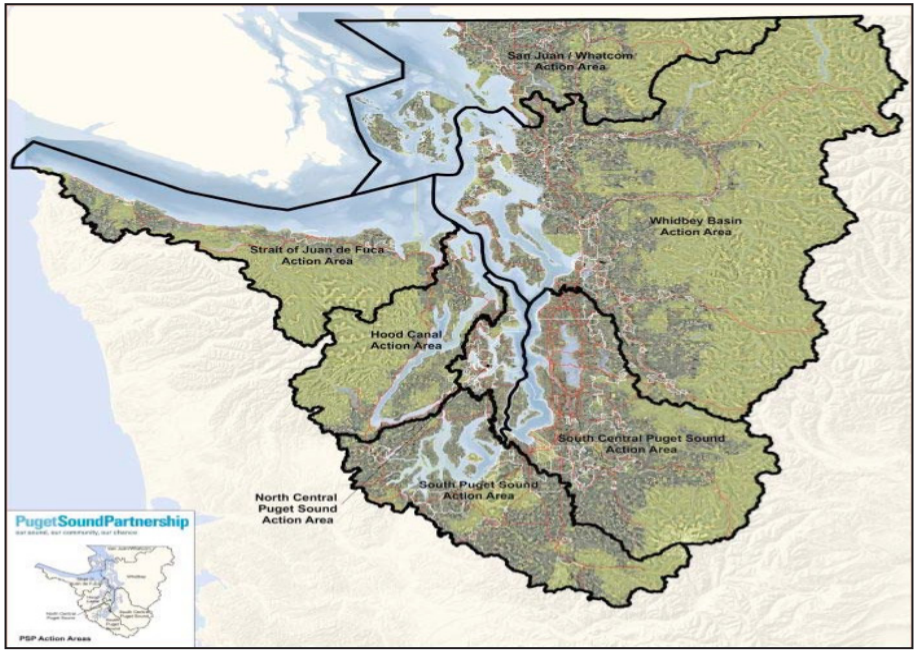


Figure 12- PSP Action Areas. Source: PSP Action Areas

The newly adapted Action Agenda goes far beyond the 2008 Action Agenda, which "was pieced together rapidly to meet deadlines spelled out in the law that created the Partnership" (Kitsap Sun 2012). The 2012-2013 Action Agenda provides realistic interventions, targets and goals that can be used as a roadmap in the future.

The 2012 Action Agenda prioritizes the most current pressing needs of the Puget Sound and contains three specific strategies that allow for more precision to evaluate environmental conditions. The three specific strategies are, (1) to prevent pollution related to stormwater runoff, (2) protect and restore the natural habitat in and around the Sound, and (3) the recovery of shellfish beds (PSP Action Agenda 2012; Figure 12).

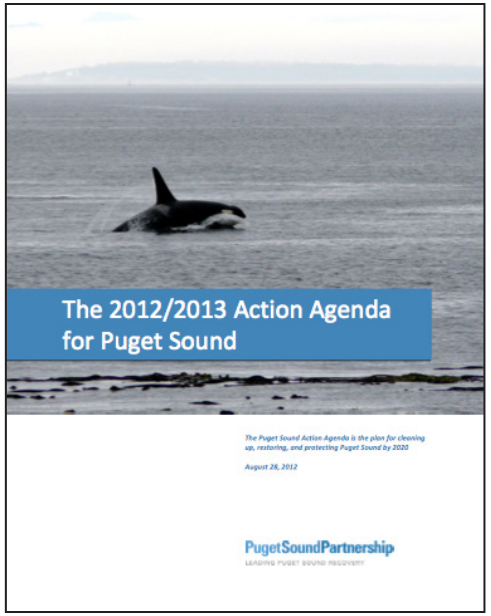


Figure 13- PSP 2012/13 Action Agenda. Source: PSP Website

The Partnership: Organizational Structure

The PSP involves a "community effort of citizens, governments, tribes, scientists and businesses working together to restore and protect the Puget Sound" (Puget Sound Partnership, 2013). The Partnership works with local stakeholders, government and non-government agencies to address issues of water quality and ecosystem health in the Puget Sound region. The PSP itself is comprised of a staff of over forty individuals, a Leadership Council, Ecosystem Coordination Board, and Science Panel (Figure 13; Appendix III- PSP Organizational Chart). The PSP has several programs and teams working to implement the Action Agenda, which are*:

1. The Executive Management Team- General management and strategic leadership.
2. The Finance and Administration Team- Responsible for financial and administrative operations regarding the Action Agenda through management of agency's budget, contracts, grants, purchasing, information technologies and facilities.
3. The Performance Management Team- Oversee and work collaboratively with stakeholders to assess the health of the Sound and evaluate the effectiveness of the Partnership's ecosystem recovery programs in the Action Agenda.
4. The Planning and Policy Team- Develops, manages, adapts, and updates the Action Agenda.
5. The Technical Program- Provides analysis and advice on ecosystem recovery programs primarily Action Agenda strategic priorities and agency priorities.
6. The Science and Monitoring Program Team- Develops a strategic science program; prepare biennial science work plans and updates; compiles, synthesizes and provides information on the effects of recovery actions; facilitates the Partnership's use of an adaptive management framework to revise Action Agenda implementation strategies.
7. The Ecosystem and Salmon Recovery team- Works with salmon

* The eight team and program descriptions were taken directly from the Puget Sound Partnership's Program Descriptions (Puget Sound Partnership 2013)

recovery watershed groups, tribes, state agencies, federal agencies, local governments, and non-profits to implement the Puget Sound Salmon Recovery Plan.

8. The Public Engagement and Board Operations Team- Responsible for leading the social strategies of the Action Agenda, providing agency communications and supporting work of the agency's boards. This team also manages ECO Net, a regional coalition of environmental outreach practitioners, to advance public awareness and beneficial practices by Puget Sound residents, agency communications including news media, web, publications and social media applications. This team also supports and facilitates the work of the Leadership Council, Science Panel and Ecosystem Coordination Board (Puget Sound Partnership 2013).

There are three federal agencies represented on the Partnership's Ecosystem Coordination Board and four scientists on the Science Panel (PSFC). The Leadership Council is the governing body of the PSP consisting of 7 members, appointed by Governor Chris Gregoire, successors to the original council will each serve four year terms. The Ecosystem Coordination Board advises the Puget Sound Partnerships Leadership Council on its responsibilities, and is comprised of 27 individuals representing specific interests around the Sound. The Science Panel, comprised of 9 members, provides expertise and advice used to support the efforts of the PSP and develop the comprehensive plan. Members are appointed by the Leadership Council, and chosen from top scientists in Washington State (Puget Sound Partnership).

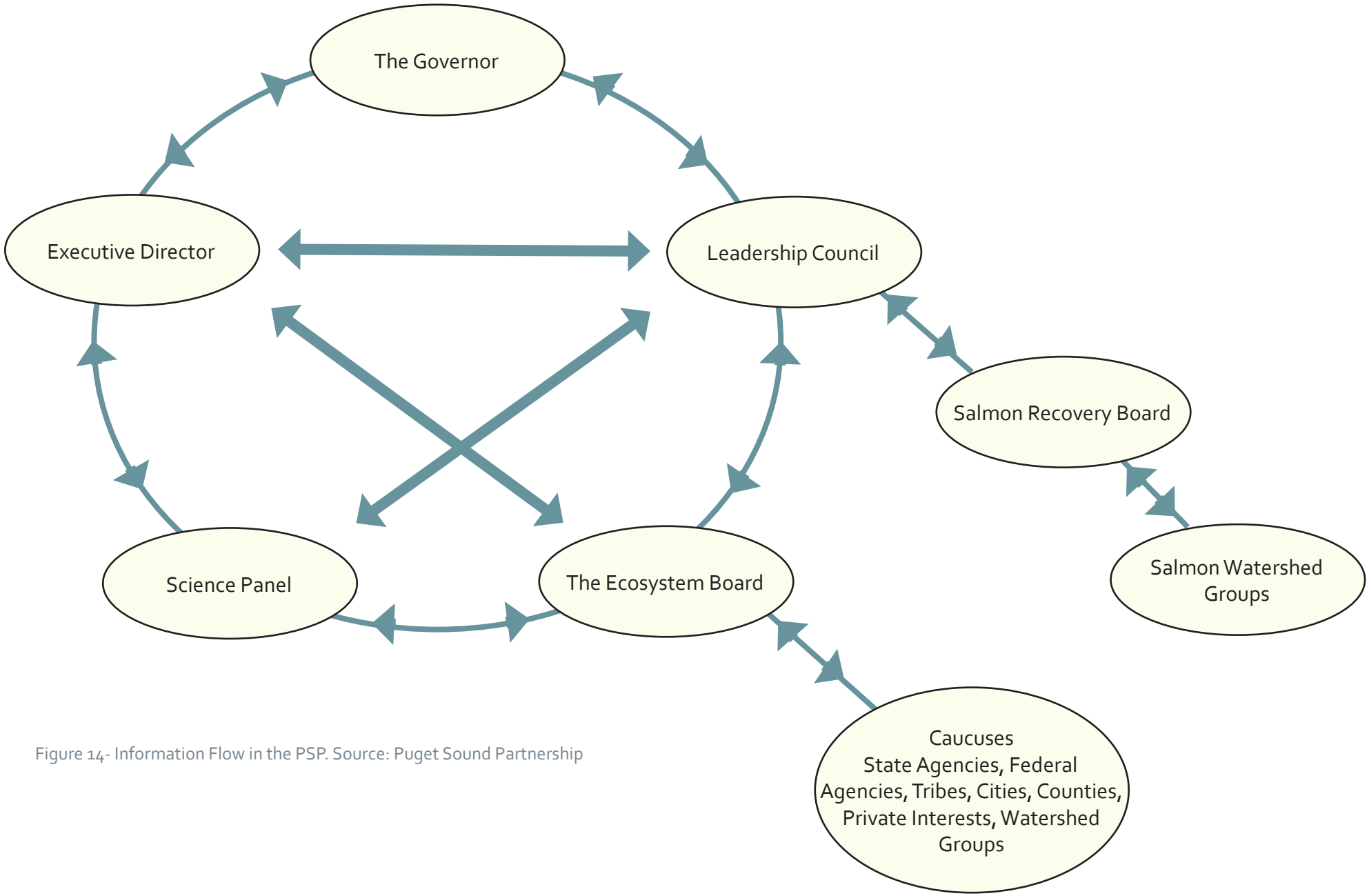


Figure 14- Information Flow in the PSP. Source: Puget Sound Partnership

Collaboration

The PSP has 750 partners across 12 counties and 110 cities working together on various initiatives throughout the Sound (PSP: State of the Sound Report 2012). The Partnership coordinates a "dizzying array of partners" (PSP 2007-2012 Legacy and Lessons Learned Report, 7). These partners include: state and federal agencies, tribes, cities, counties, private interests, caucuses, academia, businesses, citizens, watershed groups, non-governmental organizations, and West Coast and Canada (PSP 2007-2012 Legacy and Lessons Learned Report). "People and organizations initially came to the recovery effort with varying levels of trust and mutual respect, histories of conflict, and in some cases, cynicism about change…varying levels of commitment to the missions, and with vastly different motivations" (PSP 2007-2012 Legacy and Lessons Learned Report, 7). The Partnership has worked to "earn the trust and support of those who had been working on Sound restoration for many years, and who wanted coordination but feared more bureaucracy"(PSP 2007-2012 Legacy and Lessons Learned Report, 8).

The PSP has coordinated more than "500 Puget Sound environmental outreach organizations into a collaborative network called ECO Net (Education, Communication, and Outreach Network), to support members through training, collaboration, and shared resources" (PSP 2007-2012 Legacy and Lessons Learned Report, 16). The PSP also created STORM (Stormwater Outreach for Regional Municipalities), which is "a regional group of stormwater professionals from Puget Sound basin cities and counties…established to help local jurisdictions manage new permit requirements from the Washington Department of Ecology. Members share brochures, posters, research, and other materials, and mentor smaller jurisdictions and newer members" (PSP 2007-2012 Legacy and Lessons Learned Report, 20). In addition, the PSP developed an "open-sourced brand" to help promote regional awareness for the Sound, using the tag line "Puget Sound Starts Here" (PSP 2007-2012 Legacy and Lessons Learned Report, 16). Local organizations can use the tag line to promote recognition and support the coordinated effort to raise awareness.

The PSP's 2007-2012 Legacy and Lessons Learned Report discussed the need to coordinate and include local watershed groups that have been actively working in the both Puget Sound Region and the greater State of Washington* prior to the establishment of the PSP. The PSP does not collaborate with all NGOs in the region. Two organizations in particular, the Citizens for a Healthy Bay and the Puget Soundkeeper Alliance, were interviewed regarding their relationship with the PSP.

Citizens for a Healthy Bay (CHB), established in 1990, is a small non-profit (501 (c) (3)), with a mission to, " engage(s) citizens to clean up, restore and protect Commencement Bay, its surrounding waters and natural habitat" (PSP 2007-2012 Legacy and Lessons Learned Report, 16). Like all watershed management organizations, CHB faces significant barriers to their efforts. One of the constant and always challenging barriers is the lack of adequate funding. Currently, CHB funding comes from several sources such as the State of Washington, City of Tacoma, Pierce County, six different foundations, and the U.S. EPA, which provides the only Federal funding they receive. Another barrier is the lack of awareness and visibility of the organization to the public due to the fact that they do not have an advertising budget, and do not use the PSP tag line.

When the PSP was created in 2007, CHB was excited at the prospect of a huge local resource to local watershed management efforts, both financially and in terms of bringing about awareness to the important of improving the environmental quality of the Sound. Having already been in existence for seventeen years, CHB expected the PSP to connect with them and other effective organizations in the area, already working on the Sound, however this was not the case. CHB has not received any funding from the PSP, nor shared technical information (Citizens for A Healthy Bay Interview 2013). Ironically, the PSP office building is located 150 yards, across a small waterway, from the CHB building, yet it has been very difficult for CHB to establish a working relationship (Citizens for A Healthy Bay Interview 2013).

CHB continues to engage on a variety of projects and agrees that the PSP has been very effective in addressing their own large-

* Through an inventory of the U.S. EPA's Adopt Your Watershed Program, there are 93 watershed groups working in the State of Washington including CHB and Soundkeeper). These groups vary in terms of organizational structure, focus, funding mechanisms and member composition. This list is neither comprehensive nor complete but indicates the prevalence of initiatives in the State.

scale projects that are financially demanding. These projects include stormwater management improvements, salmon habitat restoration, and the funding of research studies. CHB classifies the work of the PSP as "higher-level" in terms of projects because they are typically outside of the work scope of smaller organizations like CHB that do not have large funding budgets (Citizens for A Healthy Bay Interview 2013).

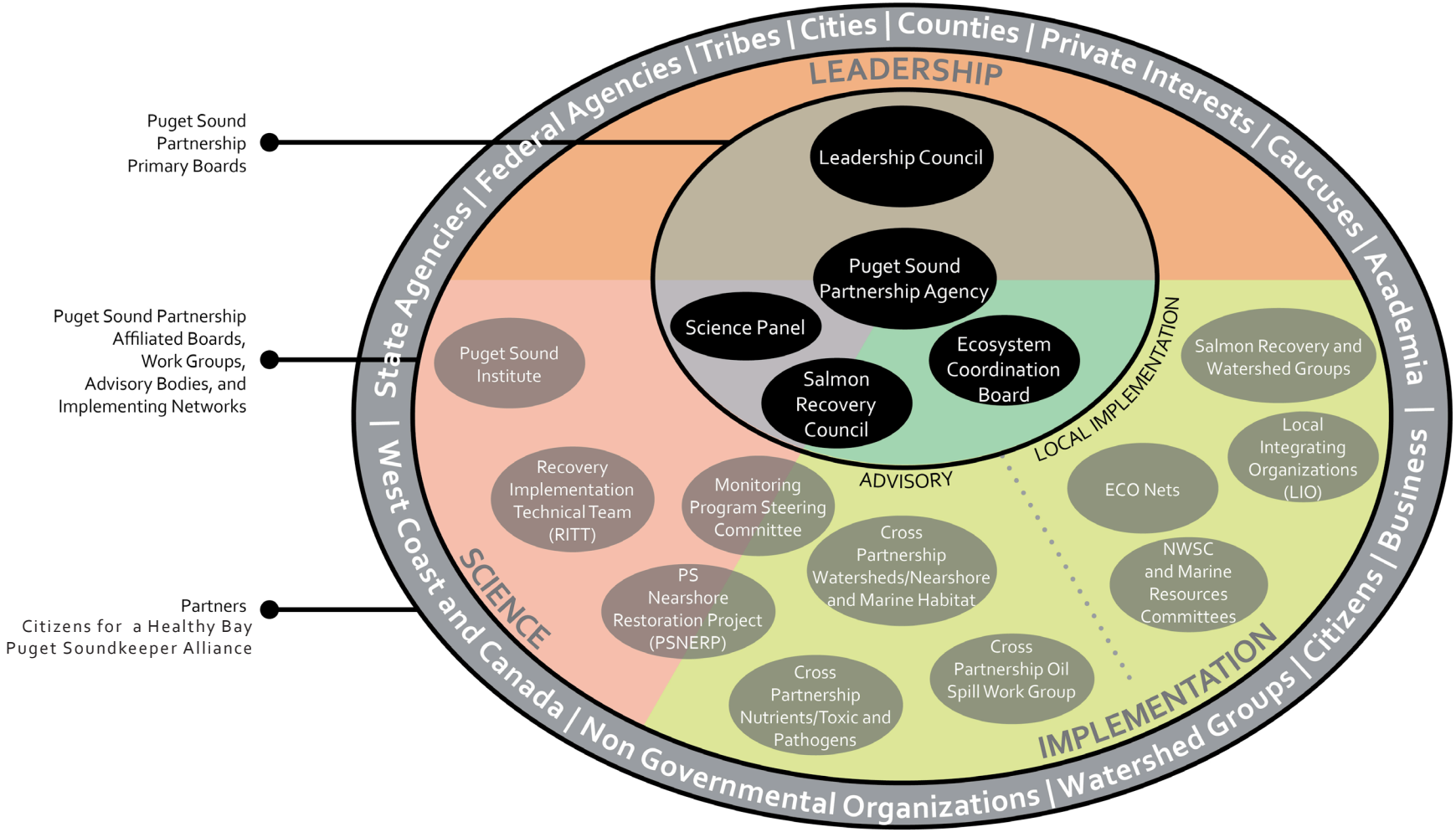
CHB feels that there are enough projects and tasks for everyone to play a role in restoring the health of the Sound. CHB focuses on more hands-on projects, such as removing invasive species, monitoring and patrolling the Sound for signs of pollution, and engaging with the community through both educational outreach and volunteer opportunities.

Another local watershed initiatives, The Puget Soundkeeper Alliance (Soundkeeper) is a non-profit, established in 1984, and was "the first grassroots citizens' organization to focus exclusively on protecting the marine environment of the Puget Sound" (Puget Soundkeeper Alliance 2012). The organization was a "founding member of the international Waterkeeper Alliance, a national movement founded by Robert F. Kennedy Jr., which is today, one of the fastest growing environmental movement(s) in the world with over 200 licensed Waterkeepers on six continents" (Puget Soundkeeper Alliance 2012). Soundkeeper monitors the Sound with kayaks and boats to patrol the waters and a network of active volunteers that detect and report pollution on a weekly basis (Puget Soundkeeper Alliance 2012).

In addition to monitoring, training seminars, and community outreach, Soundkeeper is also heavily involved with the enforcement of the Clean Water Act and often times have 1-10 active lawsuits at any given time (Puget Soundkeeper Alliance Interview 2013). Soundkeeper performs technical reviews of permits from the Washington Department of Ecology to ensure clear language and content. When the final permit is released, if Soundkeeper does not agree with the content, they will take the issue to appeals court and seek their proposed changes through legal action.

Soundkeeper was involved in the development of the Action Agenda through a review of the content and submission of comments. However, aside from this interaction there is relatively no relationship with the PSP. They get their information about PSP projects from the Partnership's website (Puget Soundkeeper Alliance Interview 2013).

Figure 15- PSP Interaction Diagram: Organization and Partner Structure. Source: PSP Website



There has been frustration from many watershed initiatives in the area regarding the work of the PSP, and their role as a state agency. Soundkeeper, like many other organizations, feels as though there is room for improvement in the relationships and collaborative work of the PSP (Puget Soundkeeper Alliance Interview 2013) (Appendix IV: Organization Interaction Table).

Funding Structure

Through the National Estuary Program the EPA provides funding to the PSP, which has designated Lead Organizations (Washington State agencies) for each of the four categories of ecosystem protection and restoration (Table 3).

Lead Organization	Focus	Amoung of Funding Received
Dept. of Ecology	Toxics and nutrients reductions and prevention	$12.3 million
Dept. of Ecology	Protection of at-risk watersheds	$14.2 million
Dept. of Health	Pathogen reduction and prevention	$12.2 million
Dept. of Fish and Wildlife	Marine and nearshore habitat restoration and protection	$12.2 million
Northwest Indian Fisheries Commission	Support implemenation of Action Agenda strategies	$12.2 million
Puget Sound Partnership	Oversee implementation of Action Agenda and stewardship of Puget Sound	$14.5 million
Total		$77.5 million

Table 3- EPA Funding for PSP. Source: PSP

The designated Lead Organization for each category is then required to award and manage "contracts and sub-awards to provide financial assistance for projects implementing priority actions relating to the applicable area of emphasis" (U.S. EPA NEP Region 10 2013). The Lead Organizations create and implement the PSP Action Agenda through six-year strategies, which focus on four categories of ecosystem protection and restoration (Puget Sound Partnership 2013).

The Lead Organizations invest in projects that support the identified strategies in the Action Agenda (U.S. EPA NEP Region 10 2013). The EPA provides funding for the four categories, $48.4 million for the first three years and additional funding over the full six-years if necessary. The Lead Organizations make investments, which focus on the implementation of the 2012 PSP Action Agenda. The Washington State Department of Ecology and the Washington State Recreation and Conservation Office provide grant funding totaling over $60 million each year to Puget Sound organizations and projects (Washington Department of Ecology: PSP Federal Grants 2013; Washington State Recreation and Conservation Office 2013).

5.3 Action Agenda Implementation

Performance Management

The PSP works has developed several systems to track and manage the progress of the implementation of the Action Agenda. Other organizations, like Puget Soundkeeper Alliance, also use these online resources to learn about PSP projects and keep up to date on the work being done. These systems and processes include: Vital Signs, Puget Sound Project Atlas, Action Agenda Report Card, State of the Sound, Open Standards, and GMAP (Puget Sound Partnership 2013).

Vital Signs

The PSP monitors the implementation of the Action Agenda through a number of initiatives. One example is the Dashboard Vital Signs (PSP Action Agenda 2012), which were developed to "easily communicate to the public about a small set of ecologically important and socially resonant indicators that collectively reflect the status of the ecosystem and progress towards meeting the statutory goals for ecosystem recovery" (Puget Sound Partnership: State of the Sound Report 2012, 14). The dashboard indicators were specifically chosen "to represent all recovery goals, major ecological domains such as freshwater, marine waters, terrestrial habitats, and key ecological attributes such as population size and condition" (Puget Sound Partnership: State of the Sound Report 2012, 16). The indicators will be adapted to the constantly changing needs of the Sound and data sources.

Figure 16- PSP Vital Signs. Source: PSP

The Vital Signs allow for the current status of Action Agenda items, in terms of progress and measures the impacts on the health of the Sound. Through reliable data collection, using specific targets, the PSP will have a baseline to then be able to track and manage progress over time (Puget Sound Partnership: State of the Sound Report 2012; Figure 14).

The Puget Sound Project Atlas

The PSP worked with an engineering firm, Esri Partner GeoEngineers Inc. of Seattle, and EPA funding to develop the Project Atlas, "a web-based GIS performance accountability application with a dashboard interface that could display specific project locations, project details, progress toward completion, and related project costs" (ESRI: ArcNews 2012). The Project Atlas was launched in February 2012 and currently includes over 600 projects, with a combined total funding of over $368 million.

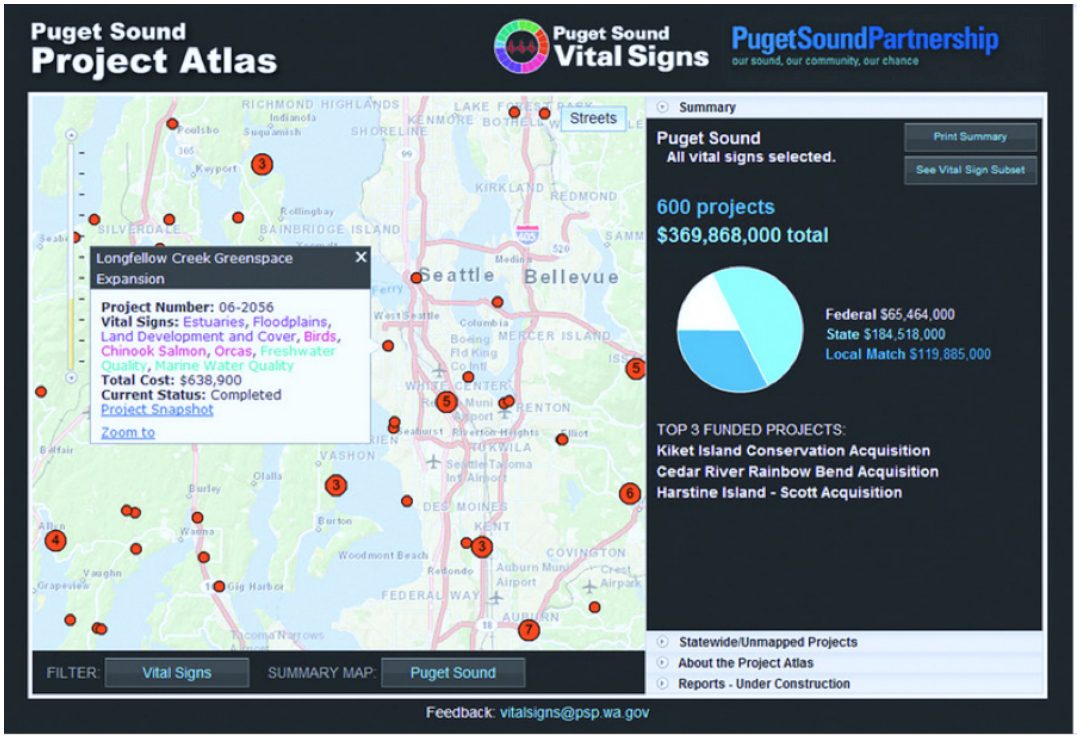


Figure 17- PSP Project Atlas.
Source: PSP

The Atlas was developed to integrate new data sources, from projects from the EPA and NOAA in the future (ESRI: ArcNews 2012). Alana Knaster, Director of Performance Management for the Partnership, comments, "the Vital Signs link in the Project Atlas will enable performance management staff to report more comprehensively on all the efforts in Puget Sound that are targeted toward specific resources. Information in the atlas, paired with monitoring data on ecosystem indicators, will support decisions on our progress in meeting 2020 recovery targets" (ESRI: ArcNews 2012). The Atlas allows for complete transparency regarding the projects the Partnership engages in and provides a platform for future projects to be added (Figure 15).

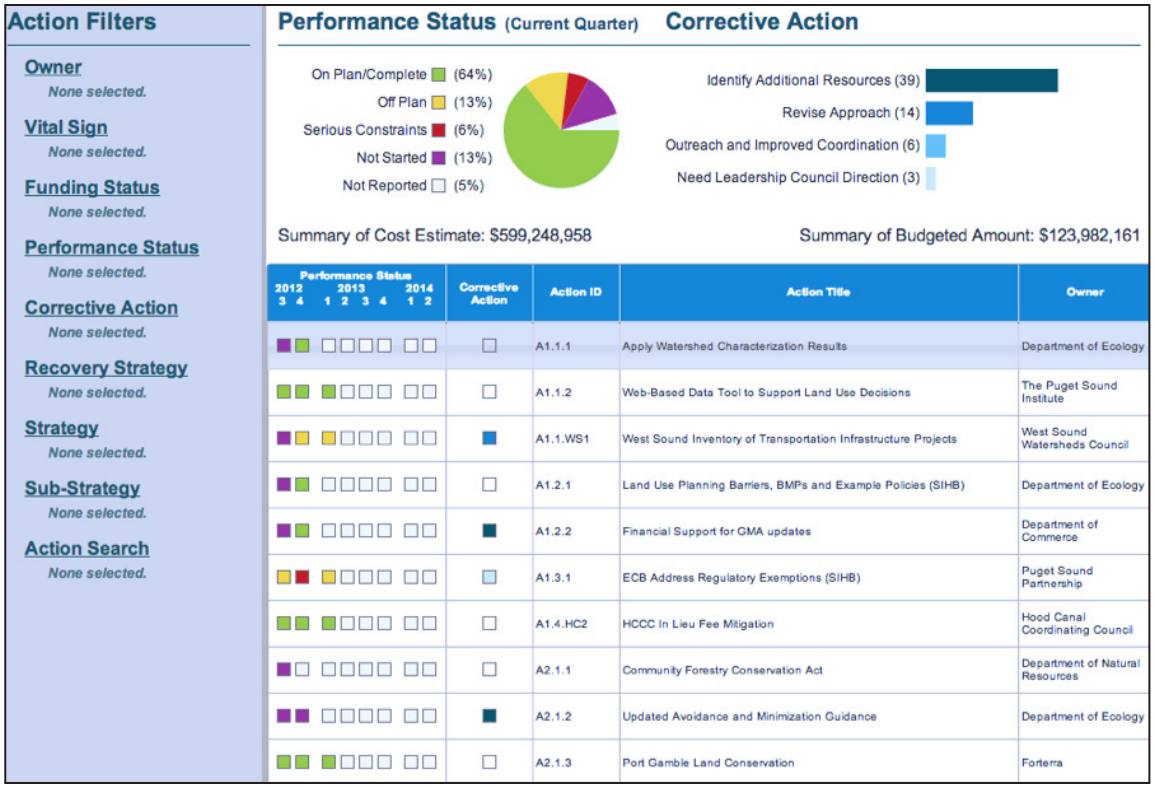
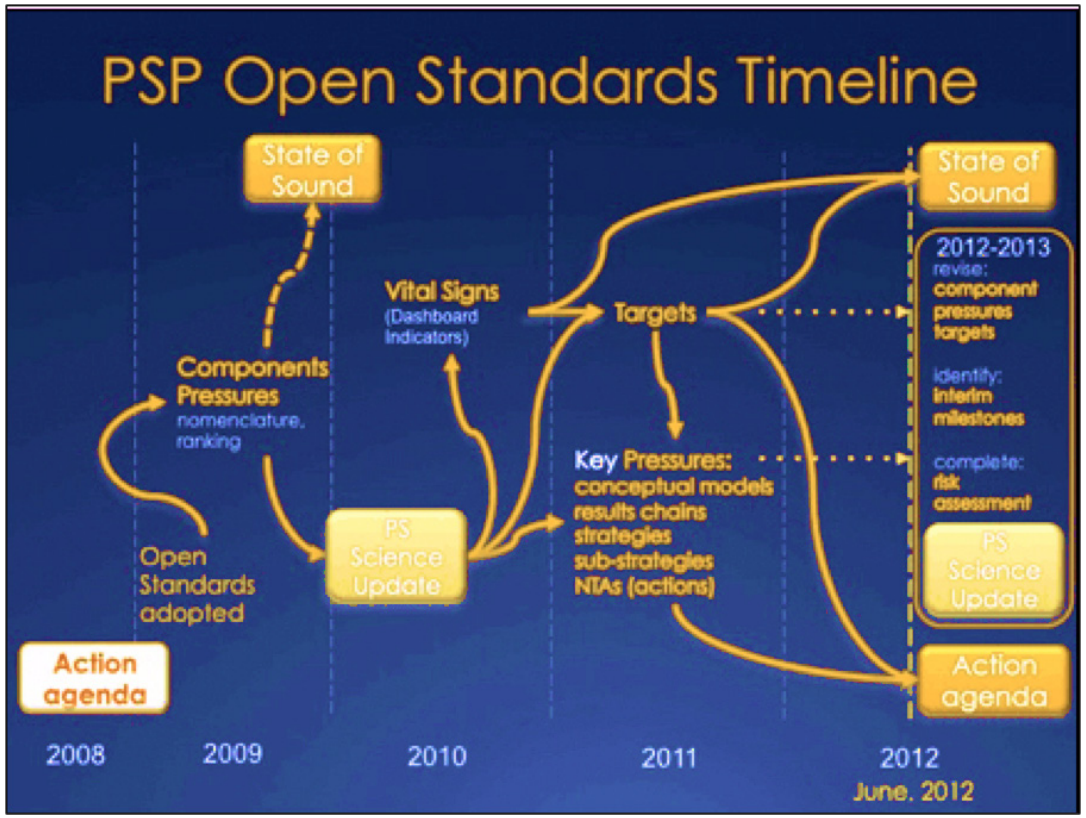


Figure 18- PSP Action Agenda Report Card. Source: PSP

The Action Agenda Report Card

The main purpose of the Action Agenda Report Card is to clearly display the progress on the implementation of the Action Agenda, identify why progress may not be on track, and to then identify the actions necessary to address these issues. The Report Card is an online tool that is available to the general public and tracks 199 Near Term Actions, showing for each: current status, essential milestones and performance measures, and any differences between the funding necessary to complete a task versus the funding that is actually budgeted (Figure 16). The Report Card is updated on a quarterly basis up (Olympic Peninsula Environmental News 2013).



Open Standards

Figure 19- PSP Open Standards. Source: PSP

In 2009, the PSP adopted Open Standards of the Practice of Conservation (Open Standards), "to develop the adaptive management framework …used to support recovery planning on multiple scales throughout the region" (Puget Sound Partnership 2013; Figure 17). The Open Standards "include specific steps for deciding how to: represent stakeholder interests in an ecosystem, identify and rate pressures on the system, build conceptual cause and effect models of how strategies and actions can address these pressures and ecosystem components, and identify expected results that form the basis for evaluating progress toward ecosystem recovery" (Puget Sound Partnership 2013). Open Standards were used to update the Action Agenda, beginning in 2010, to revise strategies and actions and develop monitoring programs (Puget Sound Partnership 2013).

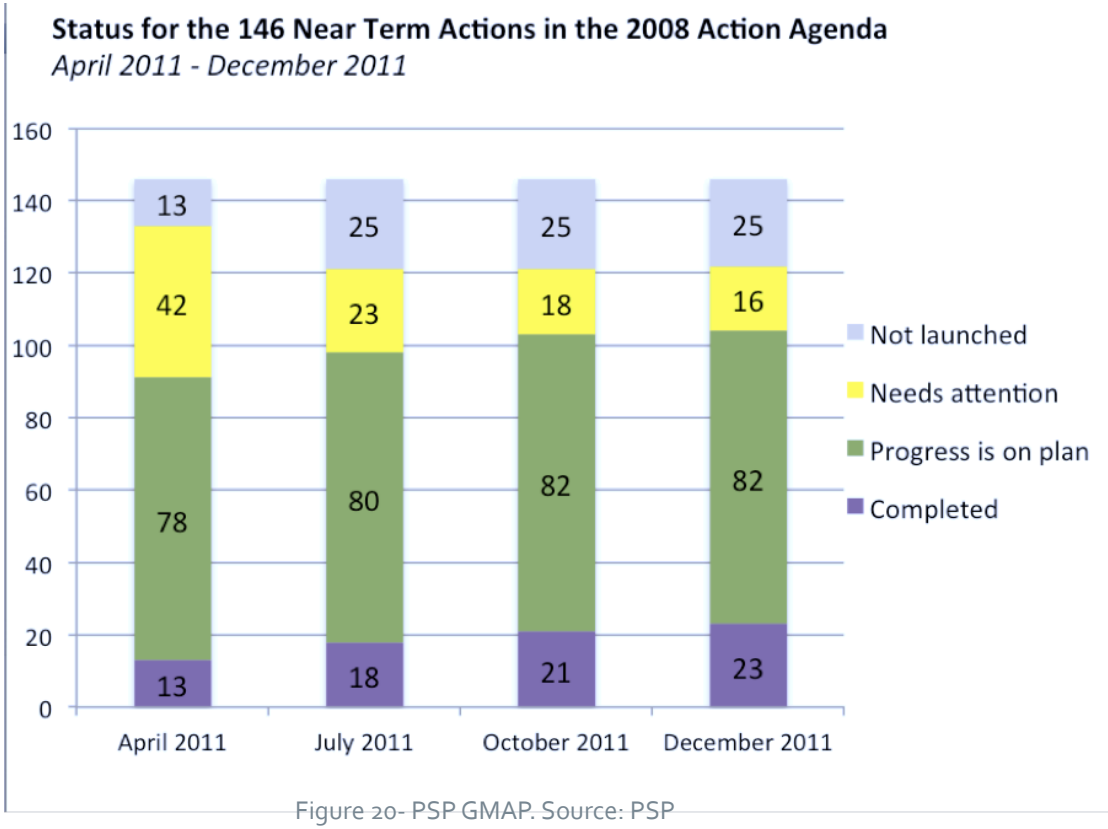


Figure 20- PSP GMAP. Source: PSP

GMAP

Washington's Government Management Accountability and Performance (GMAP) program is "a best practice approach to leaders reviewing and improving the performance of government agencies in select areas of greatest concern to State's leaders… GMAP ensures accountability by publicly measuring performance" (Puget Sound Partnership 2013). The GMAP data for the Action Agenda is updated quarterly, and tracks the progress on implementation. The GMAP program is led by the State's Governor and provides a review of the PSP's work and project implementation allows for more directedness in terms of highlighting areas that need attention (Figure 18).

The State of the Sound Report and Monitoring Efforts

The PSP prepares a State of the Sound report (SOSR) every two years to provide the legislature and public on the status of the restoration efforts as well as the use of funding (Puget Sound Partnership: State of the Sound Report 2012). The 2012 SOSR combined with the 2012 Action Agenda identify the areas of highest priority and the actions necessary to continue moving forward (Puget Sound Partnership: State of the Sound Report 2012). The SOSR states that "based on the results seen to date, progress has not been sufficient to meet the 2020 recovery targets" (Puget Sound Partnership: State of the Sound Report 2012, 10). Only two-thirds of the actions identified as critical in 2008 have been completed, therefore habitat restoration and conservation is not happening as the PSP planned.

Of the twenty-one indicators, "two showed clear progress, five showed mixed results (only a portion of the targets were met or targets were met in one or more geographic areas), seven demonstrated no progress, and seven were considered incomplete because there was no data or because targets had not been adopted or were still in development" (Puget Sound Partnership: State of the Sound Report 2012, 12).

NEP Resource Sharing: Association of National Estuary Programs

The Association of National Estuary Programs (ANEP), established in 1987, is a non-profit organization "dedicated to promoting responsible stewardship and a common vision for the preservation and restoration of our nation's bays and estuaries" (ANEP 2013). As previously stated, funding is always an issue for NEPs, but it is important that NEPs share information and resources (ANEP Interview 2013). ANEP works with the directors of all 28 NEPs to help with technology transfers, resource sharing, manage and oversee the grant process, and works closely with NEPs through surveys and inter-organizational communication to identify the main issues they are facing.

This information is then incorporated into the two NEP conferences that ANEP hosts twice each year. One conference is held in the fall and takes place at one of the NEPs so that members can learn about specific issues that are being addressed and various projects that are underway. The second conference, held in the spring, does not takes place in a specific location, but is aimed at addressing certain content that is valuable to NEPs, and offers an opportunity to interface with the EPA and listen to speakers from other organizations like the National Oceanic and Atmospheric Administration (NOAA) (ANEP Interview 2013).

A study completed by ANEP focused on NEPs compliance to the CWA. The U.S. EPA and the Washington State Department of Ecology claimed that the city of Seattle and King County were violating the federal Act by “discharging raw sewage and other pollutants into local waters” (The Seattle Times 2013). On April 17, 2013, after years of negotiations by local, state, and federal officials, the city of Seattle and King County “agreed to make a total of $1.46 billion in sewer-system upgrades to reduce the amount of polluted water that enters the Puget Sound and other waterways, under settlements reached with the federal government” (The Seattle Times 2013; Table 4).

5.4 Challenges and Strengths

The State of the Sound Report, 2012, identifies several barriers to implementation and recovery of the Puget Sound. These barriers include: insufficient funding and staff resources, insufficient data, lack of attention to on-the-ground implementation, the need for strategic approaches to public engagement, regulatory loopholes and constraints (Salmon Recovery), and making unpopular decisions (Puget Sound Partnership: State of the Sound Report 2012).

Strategies	Cost Estimate	Estimated Budget	Estimated Funding Gap
A Freshwater	$443,832,000[2]	$38,533,000	$405,299,000
B Marine & Nearshore	$31,879,000	$19,271,000	$12,608,000
C Pollution	$104,089,000	$50,194,000	$53,895,000
D Leadership	$5,583,000	$5,154,000	$409,000
E Funding Strategy	$13,884,000	$10,831,000	$3,053,000
TOTAL	$599,247,000	$123,983,000	$475,264,000

Table 4 - Three-year Near Term Actions for 2012 Action Agenda. Source: PSP

The PSP has determined that there is a budget gap for implementing the 2012 Action Agenda of approximately $475 million (Table 4). “This gap does not include any of the costs of ongoing programs in the region nor the future costs for stormwater protection and other infrastructure projects” (Puget Sound Partnership: State of the Sound Report 2012, 12).

There are additional barriers to Action Agenda implementation that the PSP is working to address. Many local residents do not see the negative impacts of human activity such as stormwater management issues and habitat loss; therefore they do not believe that the initiatives of the PSP are truly important. It is also difficult because the PSP cannot be too negative when educating the public about the environmental issues of the Sound, so it is important to find a balance. Therefore, it is difficult to garner their support (PSP Interview 2013). Additionally, the PSP lacks regulatory power, both to secure funding as well as in terms of

environmental standards. When funding is difficult to obtain it is a challenge to get stakeholders and local community members to the table, to incentivize them to join the effort. The PSP tries to educate people, highlight the good work being done, and keep a high level of engagement through meetings and outreach.

Successes

Since establishment in 2007, the PSP has had many successes both through the programs it supports as well as the projects it spearheads. In 2010, "the region completed 565 restoration projects, supporting nearly 7,476 jobs. By combining efforts and focusing on priorities, more than 2,440 acres of habitat have been protected, and 70 miles of streams and rivers have been restores" (PSP 2007-2012 Legacy and Lessons Learned Report, 8). In 2010, Washington also became the first state to approve a bill to phase out copper brake pads. The copper in the brake pad dust is toxic to aquatic life and was being washed into the streams and rivers that flow into the Sound. This important legislation was introduced by the PSP and state Department of Ecology (PSP 2007-2012 Legacy and Lessons Learned Report). One of the most significant problems facing the Puget Sound is stormwater runoff; therefore the PSP has worked to implement low impact development (LID) strategies through the Washington Department of Ecology. The Department of Ecology has amended municipal stormwater permits to require LID where feasible which has greatly reduced water pollution in the region (U.S. EPA: Challenges 2013).

SECTION

6.0 DISCUSSION AND CONCLUSION

77

6.0 Discussion and Conclusion

The Puget Sound Partnership, like all other watershed management organizations across the county, is addressing complex issues. The PSP was established six years ago, and in that time has spearheaded many projects, and worked to develop both the 2008 Action Agenda and the revised Action Agenda of 2012-2013. Additionally, the PSP has worked to promote transparency in their efforts and developed innovative project-tracking tools that are available to the public. The PSP also seeks to work collaboratively, when possible, with “all levels of government, tribes, businesses and citizens groups in its charge to lead and coordinate efforts to protect and restore the Puget Sound” (Kitsap Sun 2012). The PSP, like almost all other NEPs and watershed management organizations, is facing the challenge of insufficient funding, which is preventing the implementation of the Action Agenda in its entirety. However, this is something that will always be an issue, therefore the PSP continues to adapt and follow its mission to improve the health of the Sound (PSP Interview 2013). There is room for improvement in the collaborative efforts of the PSP, both CHB and Soundkeeper would like to have a working relationship with the PSP and feel supported in their efforts. The PSP was developed to coordinate restoration efforts of the Sound, and while a great deal of important work is being done, more support for other watershed organizations in the area would strengthen the mission to improve the health of the Sound.

There is an enormous amount of work to be done on the Sound and currently the PSP and local watershed partnerships operate on different levels, engaging in projects of various scales. Local watershed organizations vary in size, funding, member composition and projects undertaken, however, they are all working under the same guiding mission, to improve water quality and reduce negative environmental impacts.

The PSP is significantly larger than any other watershed organization in the region, therefore, it makes sense that is has been assigned the role to primarily focus on large-scale projects. The PSP, which is not competing for the same funding with smaller watershed initiatives, could support local organizations through financial assistance. The PSP receives significant amounts of funding and primarily uses this to tackle large-scale financially intensive projects.

The PSP has developed several Performance Management Systems to share information with the public, however, more attention could be paid to collaborating on projects with local organizations to increase their access to monitoring data. It is impossible for one organization to monitor and manage restoration initiatives for the entire Puget Sound alone. There a hundreds of organizations working in the Sound and it would be in the best interest of the PSP to share information.

The National Estuary Program will continue to grow, in accordance with sufficient federal funding and ANEP works to share information among NEPs. A recent change to NEP policy gives NEPs three years, instead of five that were offered previously, to complete their CCMPs due to the fact that they can work off the documents of previous NEPs that have already completed their MCs and CCMPs. NEPs address many of the same environmental issues, as do most watershed management organizations. While the work of NEPs and watershed management organizations is unique to the geographic location/watershed, these issues include habitat restoration, water pollution, monitoring issues, grant management, technical data collection and insufficient funding. It should be the role of NEPs to support smaller watershed management organizations in their regions, as they have the resources and capacity.

Limitations

The limitations to this research mainly stem from the challenges of remote research. It would have been very interesting and added to the content had I been able to conduct interviews in person and visit the Puget Sound Partnership, and learn about their work on the ground. It was challenging to connect with interviewees, schedule interviews and often required several emails and phone calls before something was arranged. Another limitation/challenge is the fact that I am not a hydrologist, and often times much of the research content was technical data. It was challenging to understand, but also to determine which aspects should be incorporated into the paper.

Areas for Future Research

It is important to acknowledge that NEPs have different organizational structures, funding strategies, and are housed in various ways, which can generally be categorized by the following five areas: EPA offices, universities, state agencies, local governments and non-profits. The NEP is one particular program but there are many areas for future research regarding both the relationships among state agency programs and NGO watershed management organizations, and NGOs themselves. Areas of future research could address the following questions: how do smaller, non-profit, watershed initiatives collaborate with NEPs? What is the relationship? Are there ways for smaller non-profits to receive more support from NEPs? And if so, what kind of support would be most beneficial? Can the PSP find ways to collaborate with local watershed management organizations that are not currently partners? The long-term success of the program depends on the continued commitment, participation, and resources of the stakeholders in each locality (Bearden 2001), therefore

it would be interesting to examine how NEPs maintain stakeholder involvement? The National Estuary Program will continue to grow therefore it is important continue research on the individual programs.

In addition, the issues that arise regarding climate change are an area of future research. Climate has changed over the last 100 years, a trend that will continue (Pike et al. 2009). Many areas will see accelerated snow melt and increased water levels in the winter. Currently, practical management responses to climate change are not well formalized, as the focus of the last few years has largely been on protecting and understanding what the future might hold. “As a next step, the development of effective climate change management responses will likely involve local-level strategies that result in both short and long term benefits to ecosystems and society beyond climate change applications. The selection of such a suite of approaches may be the best chance to ensure the effective stewardship of watershed resources and associated values in the future” (Pike et al. 2009, 736)

Conclusion

In conclusion, watersheds and, more specifically, estuaries are incredibly important environments ecologically, economically, and socially. This research contributes to the limited research on NEPs after the development of the CCMP, and provides a snapshot of the PSP during the implementation process. This research also supports NEPs in the sharing of information and resources and promotes information sharing among NEPs, as well as watershed management organizations more generally. This SRP also contributes to the literature by providing additional content regarding the specific inner-workings of the

PSP and how the agency fits into the larger watershed management framework. The PSP, like many other NEPs, is facing barriers in the implementation of the CCMP. It is beneficial for NEPs and other watershed management organizations to learn about other projects and initiatives.

It is important for the general public to have a basic understanding of the evolution of watershed management in the U.S., as well as learn about the various programs that exist. It is also important to understand how watershed partnerships operate, the challenges they face, and the successes they've had. It is also important for citizens to get involved with their local watershed organizations and support their initiatives. There are programs that provide information regarding watershed initiatives throughout the country, such as the EPA's Adopt Your Watershed Program. The program website database allows individuals to enter their zip code, or search on an interactive map, and produce a list of all the local watershed management organizations in a specific geographic location. This list includes the organization name, the mission, contact information, and links to the individual websites. The website serves as a platform for local people to learn about initiatives in their area and learn about opportunities to get involved. I hope that this research explains the evolution and importance of watershed management and provides a snapshot of the structure of the NEP and the efforts being made by the PSP.

APPENDIX I: INTERVIEW QUESTIONS

Interview #1
Organization: Puget Sound Partnership

1. Can you tell me about the External Affairs Director position?
2. What is the member composition of the PSP?
3. Can you tell me about some of the PSP's community partners?
4. How important is collaboration in your organization's programs and accomplishments?
5. How is the organization funded? What are the main sources?
6. If state or federal agencies, academic institutions, or other organizations were to provide assistance for the PSP what type of assistance would be most useful? (i.e. funding; grants; technical assistance; technical information on prioritizing projects)
7. What are some of the projects the PSP is currently involved in?
8. In terms of updating the Action Agenda, what is the decision making process?
9. What are the most significant issues and challenges facing the PSP in terms of Action Agenda implementation?
10. What are the most significant watershed management challenges your organization is currently working to address? How are they prioritized?
11. The 2012/13 Action Agenda identifies key ongoing programs, local priorities for different areas around the Sound, and more than 200 specific actions that must be implemented over the next two year to stay on track, Is the PSP on track with the recovery targets?

Interview #2
Organization: Association of National Estuary Programs

1. Can you tell me about the Deputy Director position?
2. The ANEP website is under construction, therefore, I was only able to gather limited information, can you tell me about the establishment, mission, and organizational structure? How many employees?

3. What is the main purpose of ANEP? How does it function?
4. Do you begin working with NEPs from the moment they are established? Are you present at the Management Conference?
5. Do you work with all NEPs in equal capacity?
6. How much do you influence the development and implementation of the CCMP?
7. What are the most pressing needs of the NEPs?
8. What kind of assistance do you provide?
9. How do NEPs share resources and information? How do you encourage communication among NEPs?
10. How do you bring consistency to the estuarine data collection and management?
11. If state or federal agencies, academic institutions, or other organizations were to provide assistance to NEPs what type of assistance would be most useful? (i.e. funding; grants; technical assistance; information on prioritizing projects)
12. Would NEPs benefit for additional support from the federal government?
13. How do different initiatives operate in parallel?

Interview #3 & 4
Organizations: Citizens for a Healthy Bay; Puget Soundkeeper Alliance

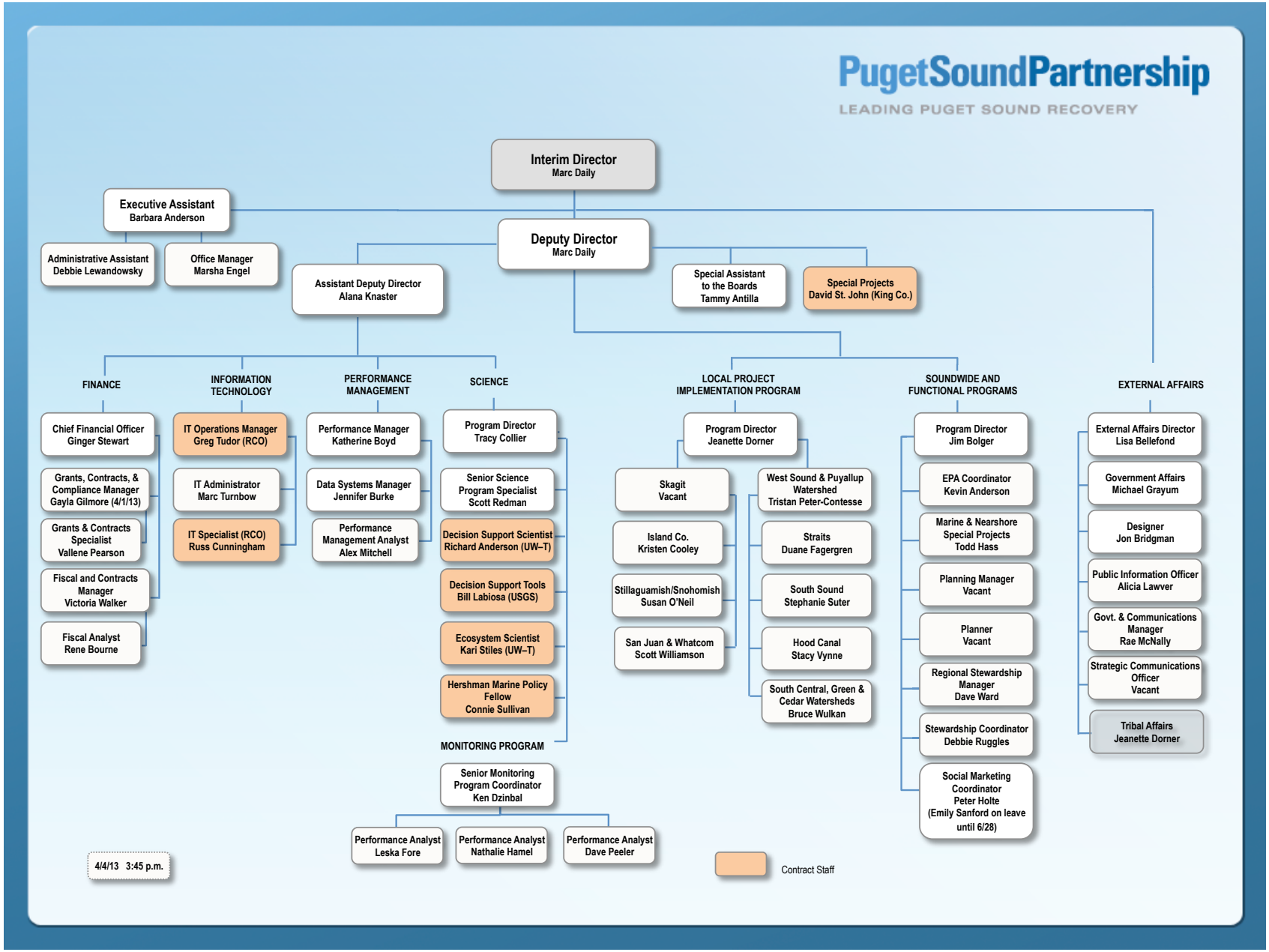
1. Tell me a little bit about your role within the organization?
2. How is (CHB; Soundkeeper) organized? How many employees? Member composition?
3. Who are the collaborative partners of (CHB; Soundkeeper)?
4. What is the main purpose of (CHB; Soundkeeper)? How does it function?
5. What are your main funding sources? Do you receive money from the PSP?
6. What are some of the most significant projects undertaken by the (CHB; Soundkeeper)?
7. What are the most significant barriers to your efforts? How are you working to address these barriers?
8. (CHB; Soundkeeper) established in (1990; 1984), PSP in 2007, what is the relationship between (CHB; Soundkeeper) and the PSP? i.e. funding; grants; technical assistance; information on prioritizing projects
9. Is (CHB; Soundkeeper) present for the MC or have input for the Action Agenda?

APPENDIX II: ACTION AGENDA GOALS/OUTCOMES

1 of 13 pages of Action Agenda Goals/Outcomes

GOAL	DESIRED OUTCOME	INDICATOR
1. A healthy human population supported by a healthy Puget Sound that is not threatened by changes in the ecosystem. Short name: A healthy human population	Fish and shellfish are safe for people to eat	Marine fish consumption advisory
		Acres and trends in shellfish commercial growing area closures
		Shellfish closures and biotoxin levels for paralytic shellfish poison (PSP)
		Shellfish closures and biotoxin levels for domoic acid
		Shellfish consumption advisory
		Freshwater fish consumption advisory
	Air is healthy for people to breathe	Washington Air Quality Advisory (WAQA) index
		Air quality – particulates
	Freshwaters are clean for drinking	Drinking water quality in public water systems
		Groundwater quality for drinking water
	Marine and freshwaters are clean for contact	Percent of swimming beaches that meet safe swimming standards at all times during the summer
2. A quality of human life that is sustained by a functioning Puget Sound ecosystem. Short name: Human well-being	Aesthetic values, opportunities for recreation, and access for the enjoyment of Puget Sound are continued and preserved	Puget Sound recreational shellfish harvests
		Puget Sound recreational finfish harvests
		Puget Sound non-harvest recreational activity
		Puget Sound publicly accessible or owned shoreline
	Upland and marine resources are adequate to sustain the treaty rights, as well as the cultural, spiritual, subsistence, ceremonial, medicinal needs, and economic endeavors of the tribal communities of Puget Sound.	Puget Sound commercial Indian finfish and shellfish harvest
	The Puget Sound ecosystem supports thriving natural resource and marine industry uses such as agriculture, aquaculture, fisheries, forestry, and tourism.	Puget Sound commercial finfish and shellfish harvest, wild and aquaculture
		Scenic and sightseeing water transportation
		Marinas
		Puget Sound timber harvest
		Puget Sound land in farms
	The Puget Sound's economic prosperity is supported by and compatible with the protection and restoration of the ecosystem.	
	Explanatory variables related to human well-being	Total population
		Developable land
3. Healthy and sustaining populations of native species in Puget Sound, including a robust food web	Viable marine, nearshore, freshwater, and terrestrial biological communities exist into the future and biodiversity is maintained	Species Listed under Federal Endangered Species Act (ESA)
		Species of Concern on State list
		Species on Conservation Concern
		Marine benthic infaunal community structure
		Terrestrial breeding bird count
		Marine bird mortality

APPENDIX III: PSP ORGANIZATIONAL CHART



APPENDIX IV: ORGANIZATION INTERACTION TABLE

Organization	Mission	Resources	Strategies	Challenges
PSP Established 2007 Tacoma, WA	Community effort of citizens, governments, tribes, scientists and businesses working together to restore and protect the Puget Sound	• State Agency • Federal, state, private funding • Lead coordinating entity for the managment of Puget Sound	• Develop Action Agenda • Create Puget Sound tag line for other organizations to use • Develop online tracking tools to promote transparency • Create monitoring programs- ECO Nets, STORM	• Keeping people engaged • Maintaining funding • No regulatory power • Lack of community outreach
CHB Established 1990 Tacoma, WA	Engages citizens to clean up, restore and protect Commencement Bay, its surrounding waters and natural habitat	• Non-profit 501 (c)(3) • 6 full-time staff • 500 active volunteers • Own/operate 22ft bay patrol boat • Funding: Federal EPA, State of WA, City of Tacoma, Pierce County, 6 foundations (Boeing Company)	• Utilize community involvement- daily boat bay patrol • Works closely with Puyallup river watershed group • Focused on nonpoint source pollution • Student programs to test water in Tacoma and surrounding areas	• Funding • No money for adverstising budget- low visibility • Very difficult to estabish relationship with PSP
Puget Soundkeeper Alliance Established 1984 Seattle, WA	Protect and preserve the waters of the Puget Sound by monitoring, cleaning up and preventing pollutatns from entereing its waters	• Non-Profit 501 (c)(3) • 5 full-time employees, 4 part time • Active member participation • Funding primarily from foundations and local businesses (e.g. Aveda- raised $100,000 this year)	• Watchdog organization • Out on water monitoring • Very focused on policy • Enforce Clean Water Act • Review permits- involved with WA Dept. of Ecology • Typically 5-10 lawsuits pending at a time	• Work can be burdensome, not always seen in positive light, but important to have well written permits • Constant work to enforce Clean Water Act

Source: Telephone interviews with PSP, CHB, and Soundkeeper and online research. Conducted by Willa Antczak

WORKS CITED

ANEP. 2013. "Association of National Estuary Programs." http://www.nationalestuaries.org/.

ANEP Interview. 2013. "Association of National Estuary Program: Deputy Director."

Ansell, Chris, and Alison Gash. 2008. "Collaborative governance in theory and practice." Journal of Public Administration Research and Theory 18 (4) (October): 543+. Expanded Academic ASAP.

Bearden, David. 2001. "National Estuary Program: A Collaborative Approach to Protecting Coastal Water Quality". CRS Reports for Congress. National Library for the Environment. January 12. http://cnie.org/NLE/CRSreports/Wetlands/wet-9.cfm

Biddle, Jennifer C. 2011. "Does Collaborative Governance Lead to Environmental Improvements? The Critical Elements Affecting Watershed Partnerships' Capacity to Achieve Their Goals". Ph.D., United States -- Virginia: George Mason University. http://search.proquest.com.proxy1.library.mcgill.ca/pqdtft/docview/897112808/abstract/13C6044408E435B6F20/58?accountid=12339

Born, Stephen and Genskow. 2001. "Toward Understanding New Watershed Initiatives: A Report from the Madison Watershed Workshop, July 20-21, 2000". Madison: University of Wisconsin-Extension.

Born, Stephen, and Kenneth Genskow. 2006. "Organizational Dynamics of Watershed Partnerships: A Key to Integrated Water Resources Management." Journal of Contemporary Water Research and Education (153) (December): 56–64.

Chess, Caron, Billie Jo Hance, and Ginger Gibson. 2000. "Adaptive Participation in Watershed Management." Journal of Soil and Water Con servation 55 (3): 248.

Citizens for a Healthy Bay. 2013. "Citizens for a Healthy Bay." http://www.healthybay.org/.

Citizens for A Healthy Bay Interview. 2013. "Citizens for a Healthy Bay."

Clark, Brad T. B. T., Nina N. Burkardt, and Dawn D. King. 2005. "Watershed management and organizational dynamics: nationwide findings and regional variation." Environmental management 36: 297–310. 68543069; 15995892. Environmental Impact Statements; Environ mental Sciences and Pollution Management; GeoRef; Materials Research Database; ProQuest SciTech Collection.

Cook, E. 2000. "A General Ecology of Watershed Groups in California". Master's Thesis, Department of Environmental Science and Policy: University of California, Davis.

Costanza, Rober, Francisco Andrade, Paula Antunes, and Marjan van den Belt. 1998. "Principles for sustainable governance of the oceans." Science (Washington) 281 (5374): 198-199.

Department of Ecology: State of Washington. 2008. "Focus on the Puget Sound." https://fortress.wa.gov/ecy/publications/publications/0601006.pdf.

EPA Office of Water. 1992. "United States Environmental Protection Agency National Estuary Program Guidance Comprehensive Conservation and Management Plans: Content and Approval Requirements". Government. U.S. Government Printing Office: EPA Office of Water. http://www.gpo.gov/fdsys/pkg/CZIC-qh541-5-e8-n38-1992/html/CZIC-qh541-5-e8-n38-1992.htm.

———. 2012. "EPA Office of Water." United States Environmental Protection Agency. March 6. http://water.epa.gov/type/watersheds/whatis.cfm.

ESRI: ArcNews. 2012. "Project Atlas Promotes Transparency and Progress for Puget Sound Restoration." Summer. http://www.esri.com/news/arcnews/summer12articles/project-atlas-promotes-transparency-and-progress.html.

"Federal Grants: Saving Puget Sound Washington Department of Ecology." 2013. Accessed March 9. http://www.ecy.wa.gov/puget_sound/grants_fed.html.

Getches, David. 1998. "Some Irreverent Questions About Watershed-Based Efforts: What Does It Take for a Watershed Initiative to Be Successful?" Chronicle of Community 2 (3): 28–34.

Guehlstorf, Nicholas, and Lars K. Hallstrom. 2012. "Environmental Reviews And Case Studies: Participatory Watershed Management: A Case Study from Maritime Canada." Environmental Practice 14: 143–153. Environmental Impact Statements; Environmental Sciences and Pollution Management; GeoRef; Materials Research Database; ProQuest Central; ProQuest SciTech Collection.

Hibbard, M., and S. Lurie. 2007. "Some Community Socio-economic Benefits of Watershed Councils: A Case Study from Oregon." Journal of Environmental Planning and Management 49: 891–908.

Hibbard, Michael, and Jeremy Madsen. 2003. "Environmental Resistance to Place-Based Collaboration in the U.S. West." Society & Natural Resources 16 (8): 703–718.

Hooper, Bruce. 2006. "Integrated Water Resources Management: Governance, Best Practice, and Research Challenges." Journal of Contemporary Water Research & Education 135 (1): 1–7.

Imperial, Mark T. 2005. "Using Collaboration as a Governance Strategy: Lessons From Six Watershed Management Programs." Administration & Society 37 (3) (July): 281–320.

Imperial, Mark T., and Timothy M. Hennessey. 1996. "An Ecosystem-based Approach to Managing Estuaries: An Assessment of the National Estuary Program." Coastal Management 24 (2): 115–139.

Innes, Judith E., and David E. Booher. 1999. "Consensus Building and Complex Adaptive Systems: A Framework for Evaluating Collaborative Planning." Journal of the American Planning Association 65: 412.

Jelks, H.L. 2008. "Conservation Status of Imperiled North American Freshwater and Diadormous Fishes." Fisheries 33: 372–407.

Kenney, Douglas S. 1999. "Analysis of Institutional Innovation in the Natural Resources and Environmental Realm: The Emergence of Alterna tive Problem-Solving Strategies in the American West". Boulder: University of Colorado School of Law: Natural Resources Law Center.

Kenney, Douglas S. 1997. "Resource Management at the Watershed Level: An Assessment of the Changing Federal Role in the Emerging Era of Community-Based Watershed Management: Report to the Western Water Policy Review Advisory Commission." The Commission: 198.

———. 2008. "Residential Water Demand Management: Lessons from Aurora, Colorado." Journal of American Water Resources Association 44 (1).

Kenney, Douglas S., Sean T. McAllister, William H. Caile, and Jason S. Peckham. 2000. The New Watershed Resource Book. Boulder, Colorado: Natural Resources Law Center.

Kitsap Sun. 2012. "New Action Agenda Approved for Puget Sound." Kitsap Sun. August. http://www.kitsapsun.com/news/2012/aug/09/new-action-agenda-approved-for-puget-sound/.

Koontz, Tomas M., and Johnson Elizabeth Moore. 2004. "One size does not fit all: Matching breadth of stakeholder participation to watershed group accomplishments." Policy Sciences 37: 185–204.

Leach, William D., and Neil W. Pelkey. 2001. "Making Watershed Partnerships Work: A Review of Empirical Literature." Journal of Water Resources Planning & Management 127: 378.

Leach, William D., Neil W. Pelkey, and Paul A. Sabatier. 2002. "Stakeholder partnerships as collaborative policymaking: Evaluation criteria ap plied to watershed management in California and Washington." Journal of Policy Analysis and Management 21 (4): 645–670.

Litke, S., and J. C. Day. 1998. "Building Local Capacity for Stewardship and Sustainability: The Role of Community-based Watershed Manage ment in Chilliwack, British Columbia." Environments 25: 1–9.

Lubell, Mark, Mark Schneider, John T. Scholz, and Mihriye Mete. 2002. "Watershed Partnerships and the Emergence of Collective Action Institutions." American Journal of Political Science 46 (1) (January 1): 148–163.

Mandarano, Lynn Ann. 2004. "Protecting habitats: New York-New Jersey Harbor Estuary Program. Collaborative planning and scientific infor mation". University of Pennsylvania. http://search.proquest.com.proxy2.library.mcgill.ca/pqdtft/docview/305149306/abstract/13D7556A1814D9E7F8E/3?accountid=12339.

Mandarano, Lynn A. 2008. Evaluating Collaborative Environmental Planning Outputs and Outcomes. Restoring and Protecting Habitat and the New York-New Jersey Harbor Estuary Program Journal of Planning Education and Research. 27: 456-468.

Margerum, Richard D. 2008. "A Typology of Collaboration Efforts in Environmental Management." Environmental Management 41 (4) (April): 487–500.

Noss, Reed F., Edward T. (Edward Terhune) LaRoe, J. Michael Scott, and United States. National Biological Service. 1995. Endangered Ecosystems of the United States [microform] : a Preliminary Assessment of Loss and Degradation / by Reed F. Noss, Edward T. LaRoe III, and J. Michael Scott. Biological Report. Washington, D.C. ; 28. Washington, D.C. : U.S. Dept. of the Interior, National Biological Service.

Olympic Peninsula Environmental News. 2013. "Update from The Puget Sound Partnership." Olympic Peninsula Environmental News. February 27. http://olyopen.net/2013/02/27/update-from-the-puget-sound-partnership/.

Perry, Laura. 1998. "The National Estuary Program: a Community-Based, Whole-System Approach to Restoring U.S. Estuaries." Student On-Line Journal Department of Horticultural Science 3 (3). Restoration and Reclamation Review. http://conservancy.umn.edu/bitstream/58971/1/3.3.Perry.pdf.

Pike, Robin, Katrina Bennett, Todd Redding, Arelia Werner, David Spittlehouse, R.D. Moore, Trevor Murdock, Jos Beckers, Brian D. Smerdon, Kevin Bladon, Vanessa Foord, David Campbell, and Peter Tschaplinski. 2009. "Climate Change Effects of Watershed Process in British Columbia." Historial Trends in British Columbia. http: www.gov.bc.ca

PSP 2007-2012 Legacy and Lessons Learned Report. "PSP 2007-2012 Legacy and Lessons Learned Report." http://www.psp.wa.gov/downloads/LegacyBook_103_425apm_01_14_13_rev3.pdf.

PSP Action Agenda 2008. "Puget Sound Partnership Action Agenda 2008."

PSP Action Agenda 2012. "Puget Sound Partnership Action Agenda 2012/13."

PSP Interview. 2013. "Puget Sound Partnership."

Puget Sound Partnership. 2013. "Puget Sound Partnership." http://www.psp.wa.gov/index.php.

Puget Sound Partnership: State of the Sound Report. 2012. "2012 State of the Sound: A Biennial Report on the Recovery of the Puget Sound". Tacoma, Washington. http://www.psp.wa.gov/downloads/SOS2012/sos2012_110812pdfs/SOS2012_ALL_110812.pdf.

Puget Soundkeeper Alliance. 2012. "Puget Soundkeeper Alliance." Puget Soundkeeper Alliance. http://www.pugetsoundkeeper.org/about-us/.

———. 2013. "Interview Puget Soundkeeper Alliance."

"Recreation, Conservation, and Salmon Grant Programs - Washington State Recreation and Conservation Office." 2013. Accessed March 9.

http://www.rco.wa.gov/grants/index.shtml.

"Report to Congress of the Inland Waterways Commission." 1908. U.S. Inland Waterways Commission. Washington, D.C.: U.S. Inland Waterways Commission.

Sabatier, Paul A., Will Focht, Mark Lubell, Zev Trachtenberg, Arnold Vedlitz, and Marty Matlock, ed. 2005a. Swimming Upstream: Collaborative Approaches to Watershed Management. The MIT Press.

———. 2005b. "Collaborative Approaches to Watershed Management." In Swimming Upstream: Collaborative Approaches to Watershed Management, 3–23. The MIT Press.

Sabatier, Paul A., Mark Lubell, William D. Leach, and Neil W. Pelkey, ed. 2005. "Measuring and Explaining the Success of Watershed Partnerships." In Swimming Upstream: Collaborative Approaches to Watershed Management, 171–200. The MIT Press.

Slocombe, D. Scott. 1993. "Implementing ecosystem-based management." Bioscience 43 (9) (October): 612.

The Seattle Times. 2013. "Seattle, King County Settle with EPA over Water Pollution." The Seattle Times. April 16. http://seattletimes.com/html/localnews/2020793560_csosettlementxml.html.

Thomas, Craig W. 1999. "Linking Public Agencies With Community-Based Watershed Organizations: Lessons From California." Policy Studies Journal 27: 544–564.

Tobin, Richard J. 1990. The Expendable Future: U.S. Politics and the Protection of Biological Diversity. Durham, N.C.: Duke University Press.

U.S. Environmental Protection Agency and Office of Water. 2001. Office of Wetlands, Oceans and Watersheds: A Watershed Decade. Washington, D.C.: U.S. Environmental Protection Agency Office of Water.

U.S. EPA Council of Large Aquatic Ecosystems. 2011. "Puget Sound-Georgia Basin: Large Aquatic Ecosystem (LAE)." http://water.epa.gov/type/oceb/upload/Puget-Sound-LAE-fact-sheet.pdf.

U.S. EPA NEP CCR. 2007. "National Estuary Program Coastal Condition Report." http://water.epa.gov/type/oceb/nep/index.cfm#tabs-4.

U.S. EPA NEP Region 10. 2013. "National Estuary Program in Region 10." http://yosemite.epa.gov/r10/ecocomm.nsf/watershed+collaboration/nep.

U.S. EPA NEP: 2004-2006 IR Report. 2008. "National Estuary Program: 2004-2006 Implementation Review Report." http://water.epa.gov/type/oceb/nep/upload/2008_07_09_estuaries_pdf_2004-2005_irreportfinal_6_19_08.pdf.

U.S. EPA OWOW PSP, OW. 2013. "Puget Sound (NEP Profile)." Accessed February 22. http://water.epa.gov/type/oceb/nep/programs_ps.cfm.

"United States Environmental Protection Agency: Green Communities: Natural Resources." 2012. Government. http://www.epa.gov/greenkit/ natural.htm.

US EPA NEP, NEP. 2013. "Estuaries and Coastal Watersheds." Accessed April 10. http://water.epa.gov/type/oceb/nep/index.cfm.

US EPA, OW. 2013. "Challenges and Approaches." Accessed February 28. http://water.epa.gov/type/oceb/nep/Challenges.cfm.

US EPA OWOW, Office of Wetlands. 2013. "National Habitat Goals & Annual Results." http://www.epa.gov/owow_keep/estuaries/pivot/habitat/progress.htm.

Wondolleck, Julia M., and Steven Lewis Yaffee. 2000. Making Collaboration Work: Lessons From Innovation In Natural Resource Management. Island Press.

Woolley, John T., and Michael Vincent McGinnis. 1999. "The Politics of Watershed Policymaking." Policy Studies Journal 27: 578–594.

Yin, Robert. 2009. Case Study Research: Design and Methods. Vol. 5. Applied Social Research Methods Series. Washington D.C.: SAGE.

COVER AND SECTION IMAGES

Cover: Around the Puget Sound. Credit: www.ar15.com
Section 1: Texas Mission-Aransas National Estuarine Reserve. Credit: NOAA
Section 2: The Pokegama Bay-Lake Superior National Estuarine Research Reserve. Credit: NOAA
Section 3: Narragansett Bay National Estuarine Research Reserve, Rhode Island. Credit: NOAA
Section 4: Wells Reserve Barrier Beach Trail. Credit: wellsreserve.org
Section 5: A pod of orcas and Puget Sound ferry. Credit: blog.seattleaquarium.org
Section 6: Puget Sound sunset. Credit: travelphotoadventures.com
Final page: Puget Sound. Credit: ewertnaturephotography.com