# PART I - INTRODUCTION

In recent years, it has become increasingly clear that the nation's coastal waters have serious water quality problems. Virtually everywhere, the problems result from what is commonly called ***polluted runoff*** or ***nonpoint source pollution***. These terms both refer to pollutants that enter a body of water as a result of water flowing over the surface of the land, such as rainfall, irrigation or snowmelt. Common nonpoint source pollutants include soil, fertilizers, animal wastes, oil, grease, litter, lawn clippings, and home lawn care chemicals. These and other pollutants end up in public waters all across the country.

The consequences of nonpoint source pollution are all too well known: increased risk of disease from water recreation, algae blooms, fish kills, destroyed aquatic habitats, and turbid waters. Some polluted runoff results from natural causes. Most, however, results from people's activities on the land and water. Much nonpoint source pollution is preventable.

The importance of coastal water quality to the State of Hawaii cannot be overstated. Water quality is vital to Native Hawaiian cultural practices; leisure and recreation, such as swimming, boating, snorkeling, SCUBA diving, and surfing; tourism and economic strength; ecosystem and species health and diversity; fishing and other food-gathering activities; and research and technology. This document does not elaborate on why protecting water quality is important. Rather, its purpose is to describe existing mechanisms and proposed additional or revised mechanisms that will serve to restore impaired waterbodies and protect the overall water quality that is so vital to our State.

Geneology of Section 6217, CZARA: Between 1972 to 1974, the U.S. Congress passed several significant laws to protect the nation's environment. These included: the National Environmental Policy Act; the Marine Mammal Protection Act; the Marine Protection, Research, and Sanctuaries Act; the Endangered Species Act; the Federal Safe Drinking Water Act; the Clean Water Act; and the Coastal Zone Management Act.

In 1987, Congress amended the Clean Water Act (CWA) to place new emphasis on controlling polluted runoff. Section 319, CWA, for example, requires states to develop nonpoint source pollution control programs and submit assessment and management plans. Section 303(d), CWA, requires each state to identify waterbodies not achieving water quality standards [water quality limited segments (WQLSs)], categories and subcategories of nonpoint source pollutants, and state water pollution control programs. Section 305(b), CWA, requires states to monitor water quality.

In 1990, the U.S. Congress enacted the Coastal Zone Act Reauthorization Amendments (CZARA), modifying the Coastal Zone Management (CZM) Act of 1972. CZARA added a new Section 6217, entitled "Protecting Coastal Waters," requiring states with CZM programs to develop and implement coastal nonpoint pollution control programs to be approved by the federal National Oceanic and

Atmospheric Administration (NOAA) and Environmental Protection Agency (EPA). Federal funding for approved programs will come from EPA, under Section 319, CWA, and NOAA under section 306 of the CZM Act. To receive these funds, states must provide matching funds for their programs.

Section 6217, CZARA, seeks to strengthen links between federal, State, and local coastal zone management and water quality programs in order to protect coastal water quality from nonpoint source pollution and restore polluted waterbodies. To achieve this goal, Section 6217 requires states to implement management measures developed by EPA ["(g) measures"], or comparable alternatives developed by individual states, to control polluted runoff. In addition, Section 6217 requires states to develop, if necessary, additional management measures to help achieve and maintain applicable water quality standards. To receive approval from NOAA and EPA, each state must submit a coastal nonpoint pollution control program management plan. The purpose of this management plan is to describe the mechanisms and programs that are currently being implemented or need to be implemented in order to address the management measures for the control of polluted runoff.

Hawaii's Coastal Nonpoint Pollution Control Program Management Plan: This Hawaii coastal nonpoint pollution control program management plan seeks to meet the program components required under Section 6217, CZARA. This part describes Hawaii's environment, defines the program's management area, and highlights types and sources of nonpoint source pollution in Hawaii. Part II outlines mechanisms for coordinating the coastal nonpoint pollution control program. Part III describes the means of implementing the management measures for agriculture, forestry, urban, hydromodification, and marina activities, and for the protection and restoration of wetland and riparian areas. Part IV summarizes the requirements for developing additional management measures, describes the State's threatened and endangered waterbodies, and outlines the requirements for technical assistance. Part V describes the opportunities for public participation in the program development and implementation processes, and highlights public educational efforts throughout the State. Part VI outlines the federal, State, and local agencies that play a role in implementing the coastal nonpoint pollution control program. Part VII describes the State's monitoring efforts. Part VIII is a glossary. Part IX provides references.

## 1. Hawaii's Environment

Hawaii, the fiftieth state, possesses unique geographical, economic, and cultural features. The Hawaiian islands are shield volcanoes formed by lava flows that have eroded to varying extents. Rainfall from the interior parts of the islands have created streams that carved out steep valleys and gulches. The geographic isolation of the islands kept them free from human contact until the first Polynesians settled in the islands approximately 1,300 years ago.

During the nineteenth century, Hawaii's economy grew from a subsistence to a global economy, dependent on international trade. Sandalwood harvesting, whaling, and sugar production fueled this transformation. In the twentieth century, sugar and pineapple production, military expenditures, and tourism have dominated the economy. The decline of large-scale sugar and pineapple plantations, and in military expenditures positions tourism as the State's major industry as the islands head into the 21st century.

**1.a. Geography**

The Hawaiian Islands are the most isolated archipelago in the world, stretching over 1500 miles near the center of the Pacific Ocean. Eight major and 124 minor islands make up the Hawaiian Island chain. The main islands of Niihau, Kauai, Oahu, Molokai, Maui, Lanai, Kahoolawe, and Hawaii make up over 99% of the State's total land area of 6,425 square miles and most of its 1,052 miles of coastline. The rest are collectively known as the "Northwestern Hawaiian Islands" and make up only 6 square miles of land area. There is no land area in Hawaii that is more than 29 miles from the ocean (DBEDT 1994).

The islands are part of a partially exposed volcanic mountain range. All the islands in the archipelago were formed successively, starting with the northwest islands and progressing southeast to Hawaii. Kauai, approximately 3 million years old, is the oldest of the major islands, displaying advanced erosion of its mountain ranges, extensive fringing coral reef development offshore, and numerous sandy beaches along its coast. At the southeastern end of the chain is the island of Hawaii, still growing as a result of volcanic activity, with gently sloping but tall peaks, relatively little soil over one-third of the island, poorly developed coral reefs, and few sandy beaches.

Hawaii's subtropical climate has a normal average annual temperature of 77_ F and average annual rainfall of approximately 73 inches. Rainfall varies dramatically by specific location from as much as 444 inches per year at Mt. Waialeale on Kauai to less than 9 inches per year at Kawaihae on Hawaii. Most of the year, trade winds blow clouds against the northeast sides of Hawaii's mountains, giving windward areas substantially more rain than leeward areas.

Watersheds in Hawaii: Unlike the contiguous U.S., the islands of Hawaii have no major river basin systems comparable, for example, to the Missouri River or Ohio River basins. Each of the major islands is a discrete hydrological system of streams and related drainage areas. Furthermore, each hydrographic area consists of a large number of small watersheds generally not larger than one or two square miles and river courses not longer than a few miles. Typically, watersheds are steep, with highly permeable volcanic rocks and soils, and short, flashy streams.

The Hawaii CZM Program recently commissioned a project to delineate the watersheds of the eight main Hawaiian Islands (GDSI 1994). The watersheds were delineated in a format compatible with the State's geographic information system (GIS), and this information has been incorporated into the GIS. The maps delineate 614 watersheds ranging in size from less than 0.1 acre (one tenth of an

**Figure I-1**

**Watershed Delineations**

acre) to over 53,000 acres. (See Figure I-1 for general map.) The distribution of watershed sizes is quite skewed. Of Hawaii's 614 delineated watersheds, 566 (about 92%) are less than 2,000 acres (about 3.1 square miles), and 594 (about 97%) are less than 4,000 acres (about 6.2 square miles). Many of these small watersheds are undeveloped and drain the steep *pali* cliffs on the windward sides of the islands. A far smaller fraction of the watersheds are developed and, therefore, contain land uses that would need extensive management under the coastal nonpoint pollution control program.

Because many of the components of Hawaii's coastal nonpoint pollution control program go beyond the scope and resources of government agencies, communities in individual watersheds will play important roles in helping to implement the program.

Hawaiian Ahupua'a: The Hawaiian ***ahupua'a*** is a traditional ancestor of the modern-day watershed concept. The court of the Hawaiian Kingdom described the *ahupua'a* principle of land use in the case of In Re Boundaries of Pulehunui, 4 Haw. 239, 241 (1879) as follows:

> A principle very largely obtaining in these divisions of territory [*ahupua'a*] was that a land should run from the sea to the mountains, thus affording to the chief and his people a fishery residence at the warm seaside, together with the products of the high lands, such as fuel, canoe timber, mountain birds, and the right of way to the same, and all the varied products of the intermediate land as might be suitable to the soil and climate of the different altitudes from the sea soil to mountainside or top.

The Hawaiians consider the land and ocean to be integrally connected and that the *ahupua'a* also include the shoreline, as well as inshore and offshore ocean areas such as fishponds, reefs, channels, and deep sea fishing grounds. *Ahupua'a* were further divided into subzones, in both the land areas and sea areas (from Handy, Handy and Pukui, 1972: 54-56):

Mauka - land areas
*kuahiwi*, mountain range
*wao akua*, forests of the gods
*wao kele*, rain forests
*wao kanaka*, forests accessible by man
*wao la'au*, inland forested region
*kahawai*, please having water, valleys
*ko kula uka*, upland slope
*ko kula kai*, seaward slope
*ko kaha kai*, shoreline

Makai - sea areas
*pu'eone*, sandy edge, inshore dune, sand bar
*po'ina nalu*, point where the waves break
*kai kohola*, reef lagoon
*kai pualena*, yellowish sea at the mouth of a stream
*kai ele*, dark sea
*kai uli*, deep blue sea
*kai popolohua mea a Kane*, purplish-blue, reddish brown sea of Kane, far reaches of the immeasurable sea

Because many people associate themselves with the *ahupua'a* in which they live, this traditional watershed concept will also play an important role in the implementation of the coastal nonpoint pollution control program.

Streams in Hawaii: Hawaii does not have major river systems like those found on the U.S. mainland. Rather, it has numerous streams, the majority of which are active only during heavy rainfall. Hawaii has about 350 perennial streams on the five largest islands. The longest stream in the State is 33 miles in length. Typically, streams occur on the steep northeast slopes of the islands. A significant percentage of these perennial streams have some form of water diversion. On Oahu, for example, 53% of the perennial streams have been diverted (C&C of Honolulu 1990). Hawaii's flashy and perennial streams flow directly into the sea or into small drainage basins (MacDonald, *et. al.* 1983).

Stream flows consist of all the waters which accumulate and travel in a stream channel. Flows include direct surface runoff, bank storage, and groundwater seepage. Direct surface runoff comes from rainfall that moves over land and into the stream. In Hawaii, direct surface runoff is associated with a particular storm and rarely lasts more than a few days. Bank storage is the infiltration that remains near the surface above the unsaturated zone and drains by gravity into the stream. Groundwater seepage is infiltration which accumulates in a saturated aquifer passing through an unsaturated zone. Once in a zone of saturation, groundwater moves seaward unless it is interrupted by a stream channel which acts as a drain (DLNR 1992b, p. 175).

For the purposes of the coastal nonpoint pollution control program, the following definitions will be used.

- A ***stream*** is any natural water course in which water usually flows in a defined bed or channel, whether or not the flow is constant, uniform, or uninterrupted, and regardless of whether the stream has been altered or channelized. In distinguishing between a stream and other water features such as gullies, the most significant feature of a stream is the existence of a streambed that has graded or sorted deposits consisting primarily of sand, gravel, and boulders.
- A ***perennial stream*** carries water all the time.
- An ***intermittent stream*** carries water most of the time but ceases to flow occasionally because evaporation or seepage into its bed and banks exceed the available streamflow. For the purposes of this management measure, intermittent streams will also include:
  - ***ephemeral streams*** that carry water only after rains; and
  - ***interrupted streams*** that carry water generally through their length but may have sections with dry streambeds.

Hawaii classifies surface waters as "inland" or "marine" and water below land as "groundwater." Inland waters include streams and lakes and account for 25 square miles of area. There are only four lakes in the State. Marine waters include embayments, open coastal waters, and oceanic waters (DOH 1990a). Hawaii has substantial groundwater resources. Ninety percent of public water

supplies come from basal aquifers. The principal source of freshwater for the State is the Ghyben-Herzberg lens which floats on denser salt water beneath the islands (University of Hawaii 1983).

The chemical quality of Hawaii's surface waters is excellent (DOH 1993a, p. VIII-1; DLNR 1992b, p. 193) near the headwater, as evidenced by low conductivity, but surface waters can accumulate significant amounts of dissolved solids, nutrients, and bacteria from groundwater discharge, sewage effluent, industrial wastes, irrigation practices, and urban runoff before reaching the ocean. At lower elevations, the ecosystems of many natural streams have been adversely affected by channel modification, diversion of flows for irrigation, and the introduction of exotic species.

Hawaii's Soils: The soils in Hawaii are mainly of volcanic origin. To a minor extent, they are of coralline origin, or are a mixture of the two materials. Volcanic soils include volcanic ash, residual, alluvial, and colluvial soils. Most soils in Hawaii have been formed from basaltic and, to some extent, andesitic lavas and derivatives such as cinders and ash (MacDonald *et.al.* 1983). In relatively small areas near the ocean, soils have been derived from marine deposits or reef rocks. The age of the surface layer varies from a few months to many thousands of years, depending on the history of volcanic activity. This age factor, combined with the varied climatic conditions of the islands, has produced soils that differ widely in their stages of development (Masa Fujioka & Associates 1995). (See pp.20-28 of Masa Fujioka & Associates 1995 and USDA-NRCS Soil Surveys for greater information on Hawaii's soils.)

**1.b. Land Uses and Ownership**

The State has 4,100,000 acres of land, of which 1,419,000 acres are in forest, 923,000 acres are in pasture, 347,000 acres are in crops, and 157,000 acres are in urban or developed areas. Twelve percent of the total land area is too steep for development. (University of Hawaii 1983; DBEDT 1994)

The State of Hawaii owns 29.8%, the Federal government owns 8.4%, and private landowners (mostly a few large landowners) own 61.8% of all lands. The State leases one-fourth of its lands, principally for pasture and sugarcane production. The Department of Hawaiian Home Lands manages 187,413 acres in trust for the Hawaiian people. These lands may be exempt from most State and county land use laws, rules, and ordinances. Chapter 205, Hawaii Revised Statutes (HRS), places all land in the State into four districts - Conservation, Agriculture, Urban, and Rural. These districts comprise 47.6% (1,959,000 acres), 47.6% (1,956,000 acres), 4.6% (188,000), and less than 1% (10,000 acres), respectively, of all land in the State (University of Hawaii 1983; DBEDT 1994).

**1.c. Resources/Economy**

In 1990, the population of Hawaii was 1,108,229 people, with a growth rate estimated to be slightly over two percent per year. Of the total State population, 986,172 residents live in urban areas (89%) and 122,058 residents (11%) live in rural areas. The City and County of Honolulu, which encompasses the island of Oahu, has the largest population of all the islands and the highest percentage of

urban population. There are 836,231 people on Oahu, with 806,429 (96.4%) in urban areas and 29,802 (3.6%) in rural areas. Hawaii County, which encompasses the island of Hawaii, has 120,317 residents, of which 73,343 (61%) live in urban areas and 47,182 (39%) live in rural areas. Kauai County, which includes the islands of Kauai and Niihau, has the highest percentage of rural residents. Of 51,177 residents, 28,264 (55%) live in urban areas, while 22,913 (45%) live in rural areas. Maui County, which includes the islands of Molokai, Lanai, and Maui, has 100,504 residents, with 78,343 (78%) in urban areas and 22,161 (22%) in rural areas.

The 1992 Gross State Product for Hawaii was $29 billion. In 1990, tourism ($9.4 billion), defense ($3.2 billion), sugarcane production ($329 million), and pineapple production ($216 million) were the State's major industries. In 1993, 6.1 million visitors came to Hawaii, with an average daily visitor count of 148,800 (DBEDT 1994).

In 1992, there were 4,500 farms in Hawaii, occupying 1.7 million acres and generating $435 million in crop sales. Sugar, with $154 million in sales, covered the largest acreage, followed by pineapple, with $102 million in sales. Flowers and nursery products generated $70 million in sales, while macadamia nuts generated $33 million. Other diversified crops include coffee, fruits, vegetables, and taro, which collectively produced $176 million in sales. Livestock operations accounted for $88 million in sales (DBEDT 1994).

Forests, fisheries, and minerals are other major resources. Forest and water reserves occupy 1.7 million acres, with 700,000 acres in timberlands. In 1993, 3,836 commercial fishers landed 25 million pounds of fish with a value of $60 million. Aquaculture aggregate value was $7 million. Mineral production, mostly cement and crushed stones, was valued at $135 million in sales (DBEDT 1994).

Hawaii has valuable coastal ecosystems, including wetlands, reef flats, embayments, sheltered coves, sand beaches, and coral reefs. Because of Hawaii's geographical isolation, hundreds of species of flora and fauna found nowhere else in the world occupied the islands in historical times. The increase in alien species brought to the islands, especially over the past two hundred years, has seriously reduced native species populations. The *Federal Register* lists more than 500 species and subspecies of native fauna and flora for inclusion on endangered, threatened, or extinct organisms lists (DBEDT 1994; OSP 1990).

Hawaii has a significant number of recreational areas, many of which depend on good water quality. Of the 56 miles of sandy beaches in the State, for example, 24.4 miles are considered accessible, safe, and suitable for swimming. There are more than 1,600 recognized surfing sites around the State. Hawaii also has facilities to moor over 3,000 recreational vessels. Additionally, the State has 7 national parks, 76 State parks, and 569 county parks. Almost half of the peak weekend recreational activities in Hawaii occur at offshore or shoreline areas (DBEDT 1994; NOAA and DPED 1978).

**1.d. Culture**

Historians estimate that more than 300,000 Hawaiians occupied the Hawaiian Islands when Captain James Cook first arrived in 1778. During the 19th century, the population of native Hawaiians declined sharply because of diseases brought by the growing number of American and European missionaries and merchants. Also during the 19th century, sugar plantation owners brought indentured Chinese laborers to work on their plantations. By the early 20th century, sugar and pineapple plantation owners began to replace these workers with Japanese, Portuguese, Puerto Rican, Korean, and Filipino contract laborers. Since then, other immigrant groups, namely Samoans, have come to Hawaii in increasing numbers.

The major ethnic groups in Hawaii are Caucasians (24%), Japanese (20%), Filipinos (11%), and Chinese (5%). Persons of mixed race are the largest population group, making up 31% of the population, including part-Hawaiians who make up 20%. Filipinos are the fastest growing ethnic group. The presence of these and other ethnic groups leads to a remarkable variety of religious backgrounds and affiliations, cultures and customs, and languages and dialects in Hawaii (DBEDT 1994).

## 2. Coastal Nonpoint Pollution Control Program Management Area

Hawaii has recognized the need to coordinate management of all land and water areas of the State in order to protect its coastal resources. Thus, Hawaii's coastal zone management area is defined in Chapter 205A-1, HRS, to include "all lands of the State and the area extending seaward to the limit of the State's police power and management authority, including the United States territorial sea." Obviously, as a state comprising relatively small islands of volcanic origin, virtually all land areas of the State drain to the ocean. Therefore, for the purposes of the coastal nonpoint pollution control program, its management area will parallel the coastal zone management area of the State.

## 3. Types and Sources of Nonpoint Pollution in Hawaii

Nonpoint sources of pollution in Hawaii include sediments, nutrients, toxic chemicals, pathogens, acidity, and freshwater inflows. Sediments from eroded soils increase turbidity in coastal waters and can accumulate on critical habitats such as coral reefs. Researchers have estimated the sediments generated by each island to be 182,944 tons/year for Hawaii, 294,300 tons/year for Kauai, 138,320 tons/year for Lanai, 207,020 tons/year for Maui, 214,560 tons/year for Molokai, and 102,700 tons/year for Oahu, for a total of 1,139,844 tons per year (Technical Committee on Nonpoint Source Pollution Control 1978). Nutrients, including fertilizers, washed into coastal waters may lead to eutrophication -- the increased decomposition of organic materials in coastal waters leading to a depletion of oxygen. Toxic chemicals, including metals, petroleum-based products, and pesticides, can pose a significant risk to coastal water quality and marine

organisms. Coastal waters containing significant amounts of pathogens -- disease-causing organisms such as bacteria, viruses, and parasites -- pose a threat to humans health. Acidic waters are unusual in the State, although volcanic activity on the island of Hawaii causes some waters to be acidic. This type of polluted runoff is natural and will not be addressed by the coastal nonpoint pollution control program. Freshwater inflows are unique to Hawaii, stemming primarily from the seepage of fresh groundwater through porous lava rocks and tubes into the ocean and are also considered a natural source of runoff (DOH 1990a).

Land-based activities are the primary source of polluted runoff problems statewide. Agricultural, forestry, urban, marina, and hydromodification activities cause most of these problems. Storms and heavy rains generate runoff which picks up the nonpoint sources of pollution associated with these activities and carries them downstream to the coastal waters. In addition, when land-based activities degrade wetlands and riparian areas, they damage important natural areas that would otherwise absorb and filter polluted runoff before it reaches coastal waters.

(a) Agriculture: Agricultural activities, such as soil disturbances, grazing, nutrient and pesticide applications, irrigation, and cane washing contribute significant amounts of nonpoint source pollutants to coastal waters, especially during heavy rains. Agricultural activities are major sources of sediments, nutrients, toxic chemicals (pesticides, herbicides, and insecticides), and pathogens (DOH 1990a; DOH 1975; University of Hawaii 1969).

Sediment is the most prevalent and visible source of polluted runoff from agricultural lands. The amount of rainfall, erodibility of soils, slopes, field layout, cultivation practices, conservation practices, and vegetation cover are factors that determine the amount of soil erosion (with attached nutrients and pesticides) from agricultural lands. In 1992, the U.S. Department of Agriculture identified 38,900 acres of cultivated land in Hawaii that are "highly erodible" and required conservation practices to be implemented on these lands to reduce the potential for soil erosion (USDA 1992). Improper grazing management techniques in several areas have also resulted in high erosion rates (DOH 1990a).

(b) Forested Lands: Erosion from commercial silviculture activities can lead to increased sedimentation of surface and coastal waters. Pathogens from and erosion caused by feral pigs on forested lands also contribute to polluted runoff. Silvicultural operations may damage riparian areas, increasing or decreasing natural stream flows and harming important habitats. Excessive debris from these operations may increase the organic matter in both surface and coastal waters, which depletes dissolved oxygen, and may also disrupt stream flows. Nutrients from forestry fertilizers, including nitrogen and phosphorus, and chemicals used in silvicultural operations may accumulate in surface and coastal waters. Because there are no large-scale commercial forestry operations taking place in the State at this time, polluted runoff from forestry is not currently considered a major water quality problem in Hawaii. However, management measures for forestry are addressed in this document because, with increasingly

silvicultural activities, forestry has the potential to generate increasing amounts of polluted runoff.

(c) Urban Areas: Urban areas are primary sources of pathogens and sediments in coastal waters. Wastewater, stormwater runoff, and cesspool seepage can be major sources of pathogens and inorganic solids; construction activities can be major sources of sedimentation. These activities can increase turbidity and eutrophication rates in coastal waters, and decrease dissolved oxygen levels and aquatic life.

Other nonpoint source pollutants from urban areas include nutrients (organics, sulfates, sulfides, and phosphates) and toxic chemicals (heavy metals, oil, grease, gasoline, and pesticides). Many of these pollutants originate from household, lawn, and backyard activities. Wastewater and stormwater wash them into coastal waters. Stormwater runoff also washes pollutants from roads and industrial areas into coastal waters. In most urban areas, flood control structures channel stormwater directly into the ocean. These discharges may create imbalances in salinity which limit the growth of coral reefs (DOH 1990a; MBA International 1993; DOH 1975; University of Hawaii 1969).

(d) Marinas and Recreational Boating: The major source of nonpoint pollution associated with marinas and recreational boating is wastes discharged from vessels. These wastes include organic and inorganic materials, petroleum products, and paint shavings. Other activities, such as boat washing and painting, deposit pollutants into marinas (DOH 1990a; DOH 1975).

(e) Hydromodifications (Channelization, Channel Modification, Dams, and Streambank and Shoreline Erosion): As of 1990, over 19% of Hawaii's 376 perennial streams had been altered in some way (DLNR 1990). Urban development resulting from population growth and the expansion of diversified agriculture may lead to more hydromodifications throughout the State. These modifications to flowing water affect wetlands, riparian habitats, and other coastal ecosystems. Stream channelization in urban areas increases runoff flows into coastal waters such as Hilo Bay and Kaneohe Bay. Nutrients and sediments, previously filtered out by riparian areas, now pollute the waters in these bays.

## 4. Hawaii's Coastal Nonpoint Pollution Control Program Development

The goal of Hawaii's coastal nonpoint pollution control program is to protect coastal waters from polluted runoff. Maintaining good water quality throughout the State is important to Hawaii's economy and way of life. To attain this goal, the CZM Program seeks to coordinate all programs within the State designed to control polluted runoff. It seeks to manage significant land and water use activities in the coastal zone that may contribute to polluted runoff.

A priority of the coastal nonpoint pollution control program development process has been to develop a comprehensive program that is realistic and implementable

in Hawaii. To date, the CZM Program has undertaken the following activities in developing the coastal nonpoint pollution control program:

- established working and focus groups to assist in the program development process (See Part V for a detailed description of the composition and activities of these groups.);
- held public informational meetings and made presentations around the State to educate the public about the program requirements;
- contracted consultants to conduct research necessary for program development and to write a preliminary draft program management plan which was the basis for this draft coastal nonpoint pollution control program management plan;
- facilitated agency and public review and comment on this draft management plan; and
- revised the management plan based on agency and public comments, and prepared responses to public comments.

The CZM Program and DOH will now submit the coastal nonpoint pollution control program management plan to EPA and NOAA for their review and approval.

During the next year, the State intends to develop an implementation plan that will specify how each of the recommendations described in this management plan will be accomplished, quantify fiscal and human resources needed to implement program changes, prioritize implementation, and establish timelines for implementation subject to availability of resources. It will also identify lead agencies and their roles, and provide draft language, as necessary, to enable these program changes. In addition, funding sources must be identified and internal agency work plans developed before implementation of new coastal nonpoint pollution control program components can occur. The implementation plan will be developed with extensive input from federal, State, and county agencies, non-governmental organizations, and interested individuals, using a number of mechanisms for public participation.