COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

COASTAL RESOURCES MANAGEMENT PROGRAM

OFFICE OF THE GOVERNOR

SECTION 309 ASSESSMENT AND STRATEGY REPORT 2011-2015

MARCH 2011

Prepared by the Coastal Resources Management Office under award NA09NOS41901764260099 from the office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration. The statements, findings, conclusions, and recommendations are those of the authors and do not necessarily reflect the views of OCRM or NOAA.

Contents

Glossary of Acronyms and Terms 3

I. Introduction 4

II. Summary of 2006-2010 §309 Progress 5

III. Enhancement Area Assessment 7

A. Wetlands 8

B. Coastal Hazards 14

C. Public Access 22

D. Marine Debris 30

E. Cumulative and Secondary Impacts 35

F. Special Area Management Planning 40

G. Ocean Resources 45

H. Energy and Government Facility Siting 49

I. Aquaculture 54

Selected References 58

V. Strategy to Meet Priority Needs: FY 2011-2015 60

A. Amendment of CRM Wetlands Policy 61

B. Preliminary Exploration of Sea Level Rise as a Coastal Threat in the CNMI 65

C. Development of Highly Erodible Soils and Highly Permeable Soils APCs 71

D. Revision of Saipan Lagoon Use Management Plan 76

E. Five Year Budget by Strategy 80

V. Appendices 81

Appendix 1: Section 309 Assessment and Strategy Public Comments Received 81

Appendix 2: Microbiological Data (EPA 305b report) 82

Appendix 3: Draft Highly Erodible and Highly Permeable Soils APC Map 86

Glossary of Acronyms

ACOE	Army Corps of Engineers
APC	Area of Particular Concern
ARRA	American Recovery and Reinvestment Act (of 2009)
BMP	Best Management Practice
CAP	Conservation Action Plan
CELC(P)	Coastal and Estuarine Conservation (Program)
CNMI	Commonwealth of the Northern Marianas Islands
CMP	Coastal Management Program
CRI	Coral Reef Initiative
CRM	Coastal Resources Management (Office)
CSI	Cumulative and Secondary Impacts
CUC	Commonwealth Utilities Commission
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
DEQ	Division of Environmental Quality
DFW	Division of Fish and Wildlife
DLNR	Department of Lands and Natural Resources
DOD	U.S. Department of Defense
DPL	Department of Public Lands
EMO	Emergency Management Office
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
HPO	Historic Preservation Office
LAS	Local Action Strategies
MINA	Mariana Islands Nature Alliance
NMC CREES	Northern Marianas College - Cooperative Research Extension and Education Service
NOAA	National Oceanic and Atmospheric Administration (under United States Department of Commerce)
NOAA IOOS	NOAA Integrated Ocean Observation System
NPS	Nonpoint Source (Pollution)
NRCS	Natural Resource Conservation Service
OCRM	Office of Ocean and Coastal Resources Management
PacIOOS	Pacific Islands Ocean Observation System
PIRO	Pacific Islands Regional Office
PMRI	Pacific Marine Resources Institute
SAMP	Special Area Management Plan
SLUMP	Saipan Lagoon Use Management Plan
SSMP	Standard State Mitigation Plan
TNC	The Nature Conservancy
UOG WERI	University of Guam Water and Environmental Resources Institute

I. Introduction

CMPs should provide a brief summary of the Assessment and Strategy development and public review process. This section should include any background information to describe the coastal management and Section 309 program.

Section 309 of the Coastal Zone Management Act (CZMA), as amended in 1990 and 1996, established a voluntary coastal zone enhancement grants program to encourage states and territories to improve program efforts. The CZMA identifies nine coastal zone enhancement areas where work should be focused: wetlands, coastal hazards, public access, marine debris, cumulative and secondary impacts, special area management planning, ocean resources, energy and government facility siting, and aquaculture. In addition to these, endangered and threatened species and marine protected areas are considered priorities across all enhancement areas.

Under §309, the U.S. Secretary of Commerce is authorized to make awards to the CNMI Coastal Resources Management Office (CRM) to implement federally approved program changes that support objectives of one or more of the enhancement areas. To be eligible for funding, CRM must submit an appropriate §309 Assessment and Strategy document every five years.

This report is the fifth §309 assessment of the CNMI CZM Program, with prior evaluations done in 1993, 1997, 2001 and 2006. National guidance for the report was provided by the Office of Coastal Resources Management (OCRM) in the form of a questionnaire framework to facilitate consistency in responses from the many state and territorial programs, and to ensure that sufficient factual data was considered when developing a program strategy. Assessments and strategies for 2011-2015 were developed on the basis of information gained by survey questionnaires, research, interviews with resource managers in many agencies, public meetings, and written comments. Individuals from numerous government agencies, local NGOs and federal partners contributed to the information provided below. As such, the report provides a factual basis for our coastal management program priorities and a strategy framework to ensure program progress. The report was written to help our program recognize issues that may be affecting our coastal areas, identify areas where the CRM program can be strengthened, and determine the effectiveness of past efforts. A notice inviting comments was advertised to the public, government agencies and other interested parties in the local newspaper, on the CRM website and by email, with a comment period from 2 October - 2 December 2010. All responses were reviewed and considered for incorporation into the final document. A summary of responses can be seen in Appendix 1.

The 2011-2015 Section 309 assessment shows a need to maintain high priority of the Ocean Resources, Cumulative and Secondary Impacts and Wetlands enhancement areas, designate Coastal Hazards as a new high priority area, and designate Special Area Management Planning as a medium priority area. Other enhancement areas of Public Access, Marine Debris, Aquaculture and Energy and Government Facility Siting are important, but it has been determined that either the state already has effective management mechanisms for dealing with these coastal issues or that these areas will be most effectively addressed outside of CZM §309.

II. Summary of Completed Section 309 Efforts

CMPs should provide a brief summary of completed efforts under the Section 309 program since the last Assessment and Strategy. This section should clearly identify and summarize program changes and other major accomplishments completed under the previous Strategy. For program changes formally submitted to OCRM pursuant to the program change regulations at 15 CFR part 923, subpart H, note the date that the change was approved by OCRM. If the program intends to submit a formal program change for OCRM's review and approval, identify the expected submission date.

The CNMI Coastal Resources Management Office strives to meet coastal management needs in the CNMI and continues to make program changes to more effectively manage our coastal areas. In the preceding five years CRM and partner agencies including Division of Environmental Quality (DEQ), Department of Lands and Natural Resources (DLNR), Division of Fish and Wildlife (DLNR/DFW), the Historic Preservation Office (HPO), Commonwealth Utilities Corporation(CUC), Department of Public Works (DPW) and Department of Commerce have coordinated efforts to ensure that all coastal management issues are considered and properly addressed. Below is a brief summary of strategies that were implemented from 2006 -2010.

Ocean Resources

Strategy: Develop an Saipan Lagoon APC for managing all recreational sports in the lagoon as well as providing for future beach recreation facilities, boat launches, fishing piers, etc.

Numerous studies were completed in the last assessment period to update the Saipan Lagoon Use Management Plan (SLUMP). These included both a motorized sport impact study in the Saipan Lagoon and the *Oceanographic Survey, Shoreline Mapping and Preliminary Hydrodynamic Modeling Report, Saipan, CNMI* (SOPAC 2010). Aerial imagery to map lagoon and beach areas was obtained, and nearly 400 public access surveys were administered to inform the update of the SLUMP.

Cumulative and Secondary Impacts

Strategy: Coordinate with the Saipan Zoning Board to set up the zoning administration and undertake community planning projects

CRM successfully coordinated with the Saipan Zoning Administration in efforts to reinstate the Saipan Zoning Law. CRM staff played a major role in determining the style of permits that Zoning would require, in updating Zoning requirements and in planning for ongoing collaboration between CRM and the Zoning Board. A process was put in place to ensure that CRM participates in a pre-application meeting (or is provided a project plan to submit written comments) with Zoning permit applicants.

Special Area Management Planning

Strategy: Implement a Managaha Island Special Area Management Plan

CRM worked closely with the CNMI Department of Public Lands (DPL) and the main concessionaire on Managaha Island to revise the DPL permit and require the concessionaire to obtain a CRM

permit. Outcomes of the revised DPL permit and newly-obtained CRM permit include the requirement of the concessionaire to provide environmental education materials to all visitors (e.g. a free screening of CRM's "Dive, Snorkel, Protect" DVD and signs with information regarding coral reefs), and the improvement of the Managaha Island wastewater treatment system. In order to implement the Managaha Island Management Plan, CRM contracted SOPAC to create an erosion model of Managaha on which to base design of appropriate erosion control methods. CRM has since been conducting quarterly shoreline monitoring based on model's findings. In addition, CRM participated in the development of a tree planting plan for the island to ensure habitat protection.

Special Area Management Planning

Strategy: Develop a Rota Sabana Special Area Management Plan

CRM partnered with DLNR and the Luta Soil and Conservation District to begin implementation of existing habitat conservation management plans for the Rota Sabana area. Most notably, CRM has played (and continues to be involved) a major role in the ongoing revegetation efforts of the Talakhaya Badlands, especially by providing technical GIS assistance for the mapping of the management area. CRM Planners participated in the Conservation Action Planning (CAP) process to finalize a Talakhaya CAP in 2010.

Special Area Management Planning

Strategy: Develop a Laolao Bay SAMP

CRM Planners participated in the CAP process to finalize a Laolao management plan that is currently in the implementation phase. CRM co-coordinated many community stakeholder meetings and briefings during the development of this SAMP, ensuring local buy-in for upcoming conservation measures. CRM will continue to be involved in the implementation of this plan.

III. Section 309 Enhancement Area Assessment

This section should address the questions provided in Appendix A for each of the nine enhancement areas. The purpose of these questions is to determine the status of each enhancement area since the previous Assessment. The questions will also help to identify program changes needed to enhance the program's ability to meet enhancement area objectives. Answers should be succinct and can include the use of bullets as long as sufficient information is provided. Additional documentation, such as reports or studies directly related to an enhancement area objective, may be attached. CMPs should rely on existing data and information when possible to complete the enhancement area assessment. Each enhancement area should be ranked as high, medium, or low priority, based on the enhancement area assessment. While developing the assessment, CMPs should review the priorities identified in the previous Assessment and consider the objectives for each of the nine enhancement areas. Enhancement area priority ranking should reflect the suitability of Section 309, with its emphasis on program changes, for addressing the underlying issues. Ranking can also consider the enhancement area's priority for overall management of the coastal zone beyond the use of Section 309 funding. Pursuant to section 309(d)(1), the final determination of each program's priority enhancement areas rests with OCRM. However, this determination will be made in full consultation with CMPs during development of the draft Assessment and with due consideration of public comment.

Enhancement area assessments resulted from analyses of information gathered through survey questionnaires, interviews, public meetings, written comments, project reports, and the input of all key personnel from CNMI's CZM Program. The resulting assessments lead to priority ratings as follows. The term 'community' used in the below assessments is meant to mean island municipality. For the CNMI we consider only four communities: Saipan, Tinian, Rota and the Northern Islands.

A. Wetlands

Section 309 Programmatic Objectives

Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Please indicate the extent, status, and trends of wetlands in the coastal zone using the following table:

Wetlands Type	**Estimated historic extent** (acres)	**Current extent** (acres)	**Trends in acres lost since 2006** (Net acres gained & lost)	**Acres gained through voluntary mechanisms since 2006**	**Acres gained through mitigation since 2006**	**Year and source(s) of Data**
Tidal vegetated	Unknown	51.9 (21 ha)[1]	Unknown[2]	Unknown[2]	None	2004 CRM GIS data layers[3]
Tidal non-vegetated	Unknown	Unknown[1]	Unknown[2]	Unknown[2]	None	2004 CRM GIS data layers[3]
Non-tidal/ Freshwater	Unknown	730.9 (295.8 ha)	Unknown[2]	Unknown[2]	None	2004 CRM GIS data layers[3]
Other - Created	None	21.2 (8.6 ha)	n/a	None	None	2004 CRM GIS data layers[3]
Other (please specify)						

1. The 51.9 acres of tidal vegetated wetlands reported here does not distinguish between mudflat and adjacent mangrove forest, thus a portion should be considered tidal nonvegetated wetland.
2. There is no quantitative data available for this category.
3. 2004 CRM GIS data layers. *Saipan_04_wetlands, Saipan_04_constructed_wetlands*. Various other sources were consulted during the writing of this report, including *A Directory of Wetlands in Oceania* (1993), *Commonwealth of the Northern Mariana Islands (CNMI) wetlands report: State of the wetlands and recommendations for new wetlands policy* (2005), the *Hydrogeomorphic Functional Assessment: Depressional Wetlands of the CNMI* (2001) and 1989 U.S. Fish and Wildlife GIS maps.

2. If information is not available to fill in the above table, provide a qualitative description of information requested, including wetlands status and trends, based on the best available information.

Estimated Historic Wetlands Extent

It has been estimated that only 36% of original wetland acreage still exists. Approximate historical losses include: Garapan - 200 acres, San Roque - 50 acres, Flores Pond - 130 acres, Susupe Lake area- 200 acres, Kagman and Lower Base - 600a acres (*Saipan Comprehensive Wetlands Management Plan*, 1991). Most of the above losses occurred during the Japanese administration of the islands for agricultural purposes, although more recent historical losses include filling for U.S. military development.

Wetland Trends

Numbers reported above do not include acreage of stream systems of the CNMI, as USGS topographical maps that contain stream designations have not been analyzed for acreage. Given below is information supporting possible trends.

Tidal vegetated wetlands (assumed stable): It is easily observed that no developments within the Puerto Rico wetlands have taken place since 2006. As this is the only known tidal vegetated wetland area in the CNMI, it is assumed that there has been no gain or loss of wetlands in this category. As the now-closed Puerto Rico dump lies near this area, ongoing contamination of this wetland area and coastal waters is a concern.

Non-tidal/Freshwater wetlands (assumed stable): No major change in freshwater/non-tidal wetlands acreage has been noted since 2006. No developments have taken place within wetland boundaries, but there have been permitted developments near wetlands that have the potential to influence wetland function. As demand for irrigation/water usage has probably decreased with decreasing population, loss of non-tidal wetland due to water diversion and wetland pumping is not a major current concern. With regards to the Marpo/Makpo wetland in Tinian (the island's only freshwater source), this will be closely monitored as land changes occur.

3. Provide a brief explanation for trends.

No known changes in wetland acreage have occurred since 2006. However, this is based only on the fact that no developments or wetland fills have been permitted in the assessment period. CNMI does not currently employ any method to track changes in wetland acreage on private land, and it is worth noting that changes in wetland areas on private lands may have occurred. Because there have not been surveys done on any wetland areas (public or private) since 2004, it may be that the numbers reported above simply acknowledge that changes have not been quantified, not that they have not taken place.

Though wetland acreage at mitigation sites has not been lost, the majority of these man-made wetlands have not been properly maintained. Loss of open water due to exotic plant invasion and conversion of year-round wetlands to perennial wetlands due to sedimentation are considered threats to man-made wetland function. Overgrowth by *Phragmites karka* decreases open water habitat necessary for the Common Moorhen (*Gallinula chloropus guami*) and wetland vegetation overgrowth of scarlet gourd vine significantly degrades Nightingale Reed Warbler (*Acrocephalus luscinia*) habitat, both endangered birds. Mitigation wetlands in the CNMI include those cared for by local government agencies, federal government agencies (USDA NRCS) and private businesses. CRM is currently exploring ways (specifically, working with U.S. Army Corps of Engineers, who have concurrent jurisdiction over these wetland areas) to improve compliance with mitigation wetland maintenance requirements. The first step will be an on-the-ground survey of mitigation wetland areas to assess condition.

4. Identify ongoing or planned efforts to develop monitoring programs or quantitative measures for this enhancement area.

Continued monitoring of natural wetlands through our permitting/enforcement program, especially as development is proposed on lands adjacent to wetland areas, is ongoing. CRM intends to focus on enforcement of permit conditions for manmade wetlands in the coming year.

5. Use the following table to characterize direct and indirect threats to coastal wetlands, both natural and man-made. If necessary, additional narrative can be provided below to describe threats.

Type of threat	**Severity of impacts** (H,M,L)	**Geographic scope of impacts** (extensive or limited)	**Irreversibility** (H,M,L)
Development/Fill	High	Limited	High
Alteration of hydrology	High	Limited	Medium
Erosion	Medium	Extensive	Medium
Pollution	Medium	Limited	Low
Channelization	Low	Limited	Low
Nuisance or exotic species	Medium	Limited	High
Freshwater input	Low	Limited	Low
Sea level rise	Low	Limited	High
Other (please specify)			

Development/Fill: There have been numerous instances in the past where CRM has become aware of illegal filling of wetlands on private land. Though CRM does have a map of wetland areas, it is difficult to enforce regulations at some of the smaller wetland sites, especially those on private lands. With limited land space, especially on Saipan, private landowners are often reluctant to report filling activity. This may be partially due to a lack of knowledge regarding the importance of wetlands and/or misconceptions regarding CRM's permitting process. Though the government has tried to purchase remaining wetlands for public land, there are not adequate funds to compensate landowners and this program is currently halted.

Alteration of hydrology: CRM feels that the CNMI's wetlands are at high risk to altered hydrology due to illegal filling. As stated above, a lack of land for houses and agriculture has led to private landowners filling wetlands without permit. Further, with heavy rain much of the year, it has been found that wetlands are sometimes filled by landowners to redirect standing water from their private land.

6. Indicate whether the Coastal Management Program (CMP) has a mapped inventory of the following habitat types in the coastal zone and the approximate time since it was developed or significantly updated.

Habitat type	**CMP has mapped inventory** (Y or N)	**Date completed or substantially updated**
Tidal Wetlands	Yes	2004[1]
Beach and Dune	Yes	2004[1]
Nearshore	Yes	2004[1]
Other (please specify)		
1. 2004 CRM GIS data layers. *Saipan_04_wetlands,Saipan_04_constructed_wetlands*.		

7. Use the table below to report information related coastal habitat restoration and protection. The purpose of this contextual measure is to describe trends in the restoration and protection of coastal habitat conducted by the State using non-CZM funds or non Coastal and Estuarine Land Conservation

Program (CELCP) funds. If data is not available to report for this contextual measure, please describe below actions the CMP is taking to develop a mechanism to collect the requested data.

Contextual measure	**Cumulative acres for 2004-2010**
Number of acres of coastal habitat restored using non-CZM or non-Coastal and Estuarine Land Conservation Program (CELCP) funds	None
Number of acres of coastal habitat protected through acquisition or easement using non-CZM or non-CELCP funds	11.3 wetland acres[1]
1. This acquisition was funded through U.S. Fish and Wildlife Service to protect Common Moorhen and Nightingale Reed Warbler habitat.	

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the wetland management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	**Employed by state/territory** (Y or N)	**Significant changes since last assessment** (Y or N)
Wetland regulatory program implementation, policies, and standards	Yes	No
Wetland protection policies and standards	Yes	No
Wetland assessment methodologies (health, function, extent)	Yes	No
Wetland restoration or enhancement programs	Yes	No
Wetland policies related public infrastructure funding	Yes	No
Wetland mitigation programs and policies	Yes	No
Wetland creation programs and policies	No	No
Wetland acquisition programs	Yes	Yes
Wetland mapping, GIS, and tracking systems	Yes	No
Special Area Management Plans	Yes	No
Wetland research and monitoring	Yes	No
Wetland education and outreach	Yes	No
Other (please specify)		

2. For management categories with significant changes since the last assessment, characterize the change; specify whether it was a 309 of other CZM-driven change, and specify the funding source; and characterize the outcomes and effectiveness of the changes. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

Wetland acquisition programs

Since the last assessment, CNMI has successfully submitted a Coastal and Estuarine Land Conservation Plan. This plan was approved by NOAA and calls for acquisition priority for the following areas: Lake Susupe and its surrounding wetlands, Laolao Bay, Obyan Beach, the Talakhaya area (Rota), the area on Rota surrounding the Mochong Latte site, and several sensitive areas on Tinian, especially the area surrounding that island's water supply.

CRM submitted an application to CELCP in March 2009 to purchase two to three properties adjacent to and abutting Susupe Lake. The request for $200,000.00 (with a waived 1:1 match) was denied. As our application received priority listing in 2009 (though we were not chosen in the final review for funding), and no changes to the request needed to be made, the proposal was not resubmitted in 2010. We will be looking to the CELCP as a possible funding source in the upcoming years and have begun the process of updating our proposal for submission in April 2011. The CELC Plan and CELCP application were supported by the CZM Program.

Having an approved CELC Plan is an important step for wetland conservation in the CNMI. CRM now has access to funds that, especially in light of the current economic situation in the CNMI, may prove essential in acquiring conservation land.

Another program contributing to land conservation is the Saipan Upland Mitigation Bank, a DLNR/DFW effort. The motivation behind this project is the need to protect essential habitat for endangered species in the CNMI. Endangered bird surveys have been conducted on this land since 1999 and data shows that populations within the conservation area are stable. Future active restoration of the forest within the Saipan Upland Mitigation Bank and on other areas around the CNMI is in planning. DLNR/DFW also purchased the 11.3 acres of wetland habitat at Susupe Lake reported above with federal funding assistance. There are numerous private properties still surrounding Susupe Lake wetland area. There has been positive public feedback regarding the wetland acquisition program, but identifying properties available for purchase that provide non-fragmented wetland habitat has proven difficult.

3. Indicate whether the CMP has a habitat restoration plan for the following coastal habitats and the approximate time since the plan was developed or significantly updated.

Habitat type	**CMP has a restoration plan** (Y or N)	**Date completed or substantially updated**
Tidal Wetlands	No	n/a
Beach and Dune	No	n/a
Nearshore	No	n/a
Other (please specify)		

The majority of degraded wetlands in the CNMI are project sites where a structure (e.g. building, road) is currently sitting over a historical wetland site. Restoration of these areas is not viable at this time. CRM is focusing on the ongoing upkeep of mitigation wetlands that were created when the aforementioned wetlands were filled for development. There is small-scale restoration of tidal wetland habitat being carried out within American Memorial Park, where large-leafed mangrove saplings are being planted along areas that historically supported mangrove stands. The project aims to improve marine water

quality in the adjacent Saipan Lagoon, and educate park visitors on the importance of the mangrove habitat. This project is coordinated by the U.S. National Park Service.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the Coastal Management Program and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	**Select type of gap or need** (regulatory, policy, data, training, capacity, communication & outreach)	**Level of priority (H, M, L)**
Formal adoption of the drafted no-net loss wetland policy to ensure mitigation efforts are considering all wetland functions	Policy	High
Ground-truthed wetland boundary maps and evaluation of function for each wetland area	Data	Medium
Stronger government wetland acquisition program	Policy, Funding	Medium
Technical capacity within the CRM office	Capacity	Medium

<u>Enhancement Area Prioritization</u>

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)? Briefly explain the level of priority given for this enhancement area.

High. The Wetland enhancement area was given a high level of priority in 2006 and we propose to retain that level as projects from the previous assessment period are ongoing. The CNMI has relatively few wetland areas, making conservation of those areas a pressing need. Localized flooding and stormwater quality issues seen especially on Saipan will only be worsened by decreased wetland acreage and/or degraded function. Our remaining wetlands are home to numerous federally listed endangered species, including the Common Moorhen and the Nightingale Reed Warbler, only increasing the need for prudent conservation of these areas.

2. Will the CMP develop one or more strategies for this enhancement area? Briefly explain why a strategy will or will not be developed for this enhancement area.

Yes. There are several program needs that can be addressed through §309. CNMI CZM has worked through the last assessment period to adopt a CNMI no net loss wetland policy and will continue to work to realize this goal.

B. Coastal Hazards

Section 309 Programmatic Objectives

Prevent or significantly reduce threats to life and property by eliminating development and redevelopment in high-hazard areas, managing development in other hazard areas, and anticipating and managing the effects of potential sea level rise and Great Lakes level change

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Characterize the level of risk in the coastal zone from the following coastal hazards: (Risk is defined as: "the estimated impact that a hazard would have on people, services, facilities and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage." Understanding Your Risks: Identifying Hazards and Estimating Losses. FEMA 386-2. August 2001)

Type of hazard	**General level of risk** (H,M,L)	**Geographic Scope of Risk (Coast-wide, Sub-region)**
Flooding	Medium	Coast-wide
Coastal storms, including associated storm surge	High	Coast-wide
Geological hazards (e.g., tsunamis, earthquakes, volcanic eruption)	High	Coast-wide
Shoreline erosion (including bluff and dune erosion)	High	Sub-regions
Sea level rise and other climate change impacts	Unknown[1]	Coast-wide
Other (please specify)		
1. There has been no data collected regarding sea level rise vulnerability in the CNMI.		

2. For hazards identified as a high level of risk, please explain why it is considered a high level risk. For example, has a risk assessment been conducted, either through the State or Territory Hazard Mitigation Plan or elsewhere?

A Standard State Mitigation Plan (SSMP) was completed by the CNMI Emergency Management Office in 2010. Risk assessments for each of the following disasters were conducted during the writing of this report and high risk levels were designated.

Typhoon: Typhoons, tropical storms and associated storm surges have been a common occurrence throughout the history of the CNMI. These storm conditions have caused structural damages to buildings, utilities, roads, ports, boats, and the loss of agricultural crops. The damages from loss of electric power generation and distribution sources resulted in the loss of other essential services such as public water supply and public sewage waste disposal. Sustained winds for many hours caused extensive structural damages to residential buildings and some public and commercial buildings.

Earthquake: Earth tremors are common in the CNMI, and the potential for a major earthquake is high. The Mariana Islands are situated in a tectonically active region characterized by the northwestward subduction and underthrusting of the Pacific Plate beneath the Mariana Plate along the Mariana Trench, and the eastward spreading of oceanic crust from the Mariana Trough. The Mariana Trench is a breeding area for earthquakes, with 37 quakes registering 6.5 or more on the Richter scale recorded since 1900. The most recent earthquake events within the CNMI region occurred in the Maug region with an earthquake registering 5.4 on May 23, 2007 and another registering 4.7 on May 20, 2004, both around Maug approximately 445 miles north of Saipan. On August 14, 2002, an earthquake registering 6.5 occurred 57 statute miles east of Rota. On February 1998, the EMO seismographs recorded an earthquake with a 6.1 magnitude whose epicenter was near the island of Rota. In 1993 an 8.1 earthquake occurred on Guam, 120 miles south of Saipan, which caused considerable damage to a hotel in Guam and shook the Commonwealth. The overall occurrence rate for significant earthquakes, those that have resulted in fatalities, major injuries, or substantial damage to property and structures, within the CNMI has averaged four per decade during an 88-year period from 1902 to 1990. In recent history, there has not been a tsunami that has affected the CNMI. However, the potential for sedimentation building along the edges of the Marianas Trench and avalanching into the trench due to an earthquake could lead to a rapid and potentially large tsunami. This supports the high risk level assigned.

Shoreline erosion: With concentrated population centers very near erosion-prone zones, and with possible increasing risk of erosion due to sea level rise, erosion is considered a high risk in the CNMI. Numerous private and public structures are vulnerable to erosion-related infrastructure damage. Chronic and episodic shoreline erosion is being measured by CRM at fixed monitoring sites around the Saipan Lagoon to more adequately quantify this risk. Currently, CRM is proposing to begin mapping and monitoring erosion-prone beaches in collaboration with DLNR/DFW's sea turtle program.

For quantified erosion rates for Managaha Island or Micro Beach, please see pages 19-20.

3. If the level of risk or state of knowledge of risk for any of these hazards has changed since the last assessment, please explain.

The level of risk for flooding has been changed from high to medium, as is suggested in the 2010 CNMI SSMP. Though certain areas are designated to be within the 100-year flood zones, flooding risk for the CNMI is, on average, moderate. Although the geological composition of the islands allows for adequate saturation of rainfall in most parts of the islands, certain identified low-lying areas with poor drainage or those prone to storm surges have a moderate potential to be impacted by flooding conditions. Further, the continued development of urbanized centers that lack proper drainage or erosion control measure can contribute to the damaging impacts of floods.

Six areas on Saipan are prone to flooding and include Kanat Tabla, the San Roque village, the road at Tanapag, the lower base industrial area, Garapan/Putan Muchot, and the Chalan Kanoa-Lake Susupe area. In the Lake Susupe area, previous flooding events (specifically Typhoon Carmen in 1978) document water rising 5.4 feet above average within the lake. Annual precipitation in the Northern Mariana Islands is approximately 83 inches a year (CNMI Standard State Mitigation Plan, 2010).

4. Identify any ongoing or planned efforts to develop quantitative measures of risk for these hazards.

The CNMI has updated quantitative measures of risk for these hazards. As the EMO SSMP is revised every three years, risk assessments will be conducted again in 2013. CNMI's partnership with the

Federal Emergency Management Agency (FEMA) will ensure that coastal hazard maps, such as Flood Insurance Rate Maps (FIRMs) are updated as necessary.

In July 2010, representatives from NOAA IOOS and PacIOOS programs held a briefing at CRM to discuss a partnership between these programs and the CNMI natural resources agencies. Future work done with PacIOOS will expand our data collection capabilities, providing us the opportunity to conduct scientific ocean observation and coastal hazard outreach on a level currently not being done in the CNMI.

5. Use the table below to identify the number of communities in the coastal zone that have a mapped inventory of areas affected by the following coastal hazards. If data is not available to report for this contextual measure, please describe below actions the CMP is taking to develop a mechanism to collect the requested data.

For this analysis, four communities are considered for the CNMI - Saipan, Tinian, Rota and the Northern Islands. Mapped inventories are available in the 2010 CNMI SSMP.

Type of hazard	**Number of communities that have a mapped inventory**	**Date completed or substantially updated**
Flooding	3	2007[1]
Storm surge	3	2007[1]
Geological hazards (including Earthquakes, tsunamis, volcanic eruption)	3	2010[2]
Shoreline erosion (including bluff and dune erosion)	3	2010[2]
Sea level rise	none	n/a
Land subsidence	none	n/a
Other - Typhoon	3	2010[2]
Other (please specify)		

1. 2007 FEMA Flood Insurance Rate Maps
2. *2010 CNMI Standard State Mitigation Plan.* July 2010.

<u>Sea level rise</u>: In the strategy section of this report, CRM proposes to convene a climate change task force that will identify climate-related issues that may put CNMI at risk. One of these issues is expected to be sea level rise. In year three of the strategy, the working group will conduct a vulnerability assessment for lands of the CNMI. This assessment will eventually lead to localized sea level rise models for high risk areas. There are currently tide gauges in Garapan Harbor, Saipan and Apra Harbor, Guam that are collecting data to make sea level determinations for the Mariana Islands. Historical tide data is available for the years 1938-1940 (North Garapan Wharf) and 1991-1997 (USGS tide gauge in Tinian). The current tide stations are considered sufficient to evaluate relative projected future sea level rise.

<u>Land subsidence</u>: There are well-documented historic incidences of tectonic uplifting and subsidence in the CNMI (Jenson 2006, Keel 2004), most recently an account of subsidence due to magma withdrawal in the Anatahan caldera on the uninhabited island of Anatahan (Hilton *et al*, 2004). There are no known incidences of human-induced land subsidence in the CNMI. As such, data collection regarding subsidence is not a priority for CRM. A quality digital elevation model (DEM) for Saipan, Tinian and Rota is available to predict flooding that may, in the future, be associated with compaction and sinking of land levels. Localized land subsidence will be difficult to detect, but as CRM receives updated FEMA

FIRM maps, and monitors local reports of increased flooding risk, this issue will be revisited. Flood risk, especially in the Kagman and Isley areas, over large aquifers on Saipan, remains a concern for CRM.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	**Employed by state/territory** (Y or N)	**Significant changes since last assessment** (Y or N)
Building setbacks/ restrictions	Yes	Yes
Methodologies for determining setbacks	Yes	No
Repair/rebuilding restrictions	Yes	Yes
Restriction of hard shoreline protection structures	Yes	No
Promotion of alternative shoreline stabilization methodologies	Yes	No
Renovation of shoreline protection structures	Yes	No
Beach/dune protection (other than setbacks)	No	No
Permit compliance	Yes	No
Sediment management plans	Yes	Yes
Repetitive flood loss policies, (e.g., relocation, buyouts)	No	No
Local hazards mitigation planning	Yes	Yes
Local post-disaster redevelopment plans	No	No
Real estate sales disclosure requirements	Yes	Yes
Restrictions on publicly funded infrastructure	No	No
Climate change planning and adaptation strategies	No	No
Special Area Management Plans	No	No
Hazards research and monitoring	Yes	Yes
Hazards education and outreach	Yes	No
Other (please specify)		

2. For management categories with significant changes since the last assessment, characterize the change; specify whether it was a 309 of other CZM-driven change, and specify the funding source; and characterize the outcomes and effectiveness of the changes. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

Building Setbacks/Restrictions and Repair/Rebuilding Restrictions

The Saipan Zoning Law of 2008 (SLL 16-6) was signed on December 5, 2008 by Governor Benigno R. Fitial and is administered by the Zoning Board and Zoning Office. This is a non-CZM driven change.

The Zoning Law cites FEMA flood zone maps and CRM APC maps in its Shoreline and Floodplain Development regulations (Saipan Zoning Law, Sections 610 and 611), strengthening CRM regulations

to prevent damage due to coastal hazards. Saipan Zoning Administration are currently updating land use maps, taking into consideration the need to discourage development in coastal hazard zones. The law prohibits the repair or rebuilding of any structure that currently occupies space in an improper zone. For example, a damaged sea wall that falls within a known coastal hazard zone will not be permitted for repair or rebuild. Regulations in Section 610 and 611 of the Zoning Law apply to both commercial and residential developments.

Though the Saipan Zoning Law is relatively new, many changes have been seen. General beautification of Saipan has been noticed by all as Zoning Law prohibits unsightly placement of storefront signs and excessive lighting, and includes both landscaping and sidewalk requirements. The Law also requires new developments to include on-site drainage. The effectiveness of this Law is bolstered by the fact that one cannot receive a CNMI Business License without prior Zoning Administration approval. The Zoning Law has been especially effective at regulating industrial buildings (e.g. auto shops) that were formally routinely constructed in residential areas, tourist hot-spots and other inappropriate zones.

There are still minor discrepancies between CRM Regulations and the Saipan Zoning Law. Building height requirements, building and shoreline setbacks, density regulations and parking requirements differ slightly between the two. However, amended Zoning Law draft regulations state that in the case of concurrent jurisdiction, CRM regulations will be followed. These amendments are scheduled for vote on 12 April 2011.

Sediment Management Plan

An Erosion and Sediment Control Field Guide was published in 2009. This manual was made available to contractors and site inspectors in the CNMI and raises awareness regarding erosion management BMPs. For more information on the Erosion and Sediment Control Field Guide, see Cumulative and Secondary Impacts (page 38).

Local Hazards Mitigation Planning

As discussed above, the CNMI EMO updated their SSMP this year. The document summarizes hazard mitigation coordination among various agencies, lays out the CNMI disaster mitigation planning process, inventories assets within the CNMI including transportation systems, lifeline utility systems, hazardous materials facilities, and socially, culturally and environmentally important assets, contains a hazard profile and analysis for typhoon and strong winds, flooding, earthquake, volcanic eruption, tsunami, drought and wildfire, estimates probable loss attributable to each hazard, and contains the official CNMI hazard mitigation strategy. The SSMP also serves to coordinate the use of FEMA Hazard Mitigation Grant Program (HMGP) funding to support CNMI mitigation efforts (including efforts in CZM priority areas, such as coastal erosion, storm surge and sea level rise). This change was driven by non-CZM efforts.

The plan has been updated every three years since 2004 and continues to be an effective coastal hazard mitigation plan for the CNMI. As stated in the SSMP, the purpose of updating this document is to demonstrate the CNMI's goals, priorities, and commitment to reduce risks from natural hazards and to serve as a guide for State and local decision makers when they commit resources to reduce the potential impact of these identified hazards. This plan was approved by FEMA, making CNMI eligible to receive HMGP funding and other types of disaster assistance under the Stafford Act.

It was proposed by CRM during the interagency comment session of the draft SSMP that sea level rise projections be incorporated into the 2013 update. To assist EMO in realizing this goal and including maps of areas at-risk, CRM will need to take the lead in future data collection.

Real Estate Sales Disclosure Requirements

With implementation of the Saipan Zoning Law of 2008, buyers must be made aware of the zoning area that the property falls under. This aims to inform a potential buyer of what he/she may or may not do on the land. All information regarding location of wetlands and flood zones is recorded on property maps that can be requested by prospective buyer.

Hazards Research and Monitoring

CRM collaborated with the University of Hawaii Department of Geology and Geoscience to carry out an analysis of the erosion on Mañagaha Island (Mañagaha Island Shoreline Stability Assessment, 2007). A management plan was created with numerous options for action. For the study, the island was classified into four regions. The North end of the island showed accretion rates of 1-5 m per year since 1996; the NE and East shorelines showed coastal erosion at a rate of 0.5 - 4 m per year since 1996; the South and SW shorelines experienced episodes of both minor coastal erosion and accretion since 1996; and the beach directly North of the pier showed coastal erosion at less than 1 m per year since 1996. Due to the historic loss/gain cycle of coastal sand, and a thorough assessment of historic human disturbance at Mañagaha, the official recommendation was to continue observation and take no immediate action. The assessment provided scientific justification to prevent proposed coastal hardening of the islet's beaches, as a historic dynamic equilibrium of sand movement was seen. Monitoring will continue as this equilibrium may be disrupted as sea level rises at an accelerated pace, but it has been determined that invasive management measures to reduce or eliminate erosion are unnecessary. This was a CZM-driven change. Effectiveness can be seen in CRM's participation in ongoing shoreline monitoring of Mañagaha.

CRM continues to take part in shoreline monitoring of Micro Beach (within and adjacent to U.S. National Parks Service American Memorial Park) that began in 2004. Current data is showing a continuation of Western shore erosion and Northern shore accretion.

The Pacific Islands Applied Geoscience Commission (SOPAC) recently completed a current model and coastal change analysis for Saipan lagoon entitled *Oceanographic Survey, Shoreline Mapping and Preliminary Hydrodynamic Modeling Report, Saipan, CNMI* (SOPAC 2010). The model identifies current flow under varying tidal and wave conditions inside Saipan Lagoon and allows CRM to better delimit marine components of watersheds (i.e. where wastewater coming from drainages goes once it leaves shore) as well as the behavior and zone of influence of the Sadog Tasi sewer discharge in Tanapag Lagoon. Based on the model, SOPAC identifies potentially erosion prone areas in Saipan, areas of the shoreline that have seen net gain/loss over the past 10 years, and those areas that have shifted (gain then loss or the inverse) during that time period. This is a 309 driven change.

3. Use the appropriate table below to report the number of communities in the coastal zone that use setbacks, buffers, or land use policies to direct development away from areas vulnerable to coastal hazards. If data is not available to report for this contextual measure, please describe below actions the CMP is taking to develop a mechanism to collect the requested data.

For CMPs that use numerically based setback or buffers to direct development away from hazardous areas report the following:

Contextual measure	**Number of communities (n = 4, Saipan, Tinian, Rota, Northern Islands)**
Number of communities in the coastal zone required by state law or policy to implement setbacks, buffers, or other land use policies to direct develop away from hazardous areas.	Four
Number of communities in the coastal zone that have setback, buffer, or other land use policies to direct develop away from hazardous areas that are more stringent than state mandated standards or that have policies where no state standards exist.	None

For CMPs that do not use state-established numerical setbacks or buffers to direct development away from hazardous areas, report the following:

Contextual measure	**Number of communities**
Number of communities in the coastal zone that are required to develop and implement land use policies to direct development away from hazardous areas that are approved by the state through local comprehensive management plans.	None
Number of communities that have approved state comprehensive management plans that contain land use policies to direct development away from hazardous areas.	None

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	**Type of gap or need** (regulatory, policy, data, training, capacity, communication & outreach)	**Level of priority** (H,M,L)
Sea level rise projection data and incorporation of this data into the SSMP	Policy, data	High
Revision of coastal hazard APC maps (flooding zones V & VE in FEMA FIRM maps) to incorporate lands that may be prone to flooding under various sea level rise predictions	Regulatory, data	Medium
Rectifying discrepancies between Saipan Zoning Law of 2008 and CRM Regulations	Regulatory	Medium

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)? Briefly explain the level of priority given for this enhancement area.

High. CNMI is vulnerable to numerous coastal hazards and will continue considering proper planning and mitigation to be a high priority. With significant changes to coastal areas predicted by even conservative estimations of sea level rise, CRM feels that understanding the Commonwealth's vulnerability is of high importance.

2. Will the CMP develop one or more strategies for this enhancement area? Briefly explain why a strategy will or will not be developed for this enhancement area.

Yes. A strategy is proposed to address the lack of sea level rise projection data in the Commonwealth and begin including sea level projections in coastal hazard risk analyses.

C. Public Access

Section 309 Programmatic Objectives

Attain increased opportunities for public access, taking into account current and future public access needs, to coastal areas of recreational, historical, aesthetic, ecological, or cultural value

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Characterize threats and conflicts to creating and maintaining public access in the coastal zone:

Type of threat or conflict causing loss of access	**Degree of threat** (H,M,L)	**Describe trends or provide other statistics to characterize the threat and impact on access**	**Type(s) of access Affected**
Private residential development (including conversion of public facilities to private)	Low	A large percentage of CNMI's coastline is public land, and the legal right of private landowners to preclude shoreline access has rarely been exercised in the CNMI.	Unknown
Non-water dependent commercial/industrial uses of the waterfront (existing or conversion)	Medium	Multiple apartment buildings and restaurants currently stand in the shoreline zone.	Beach access recreational and fishing users, visual
Erosion	Medium	There are a couple known erosion hotspots in the CNMI.	Beach access - recreational and fishing users
Sea level rise	Medium	The extent of sea level rise threat is not well known, though we can predict some changes should we see even a small rise.	Boat access recreational and fishing users, existing shoreline access trails/roads
Natural disasters	High	Public access to beaches is threatened by typhoons, as are several structures that enhance public areas.	Beach Access recreational and fishing users
National security	Medium	Access may be effected in the future by possible military build-up activities in Tinian and in the Northern Islands (Pagan).	Unknown
Encroachment on public land	Low	This has not been a significant problem in the past.	Unknown
Other (please specify)			

Private residential development (including conversion of public facilities to private)

CRM acknowledges that public access, especially the restriction of public access by private property owners is an issue of great concern in many coastal states. Currently, all CRM permits contain a

condition that prohibits the restriction of public shoreline access in any way. Further, the permit requires that at least one public accessway through the property is identified which allows unobstructed access from the roadway to the public beach. These conditions are enforceable through CNMI Public Law 3-47.

2. Are there new issues emerging in your state that are starting to affect public access or seem to have the potential to do so in the future?

There are currently no major threats to public access in the CNMI. Current needs are in enhancing and maintaining shoreline areas in a way that protects fragile coastal habitat while allowing public access. In a recent survey done, several respondents noted that increased parking, more trash bins and more frequent trash/litter pick-up, and stronger enforcement of prohibited activities (such as illegal fishing, littering and disrupting the public) are needed. In the past years, many dive companies, local divers and tourists have commented and complained that there are not adequate mooring buoys to provide for dive operations. As such, many operations were forced to drop anchors directly on reef areas if they were to keep their operations open. CRM is currently involved in a project to install mooring buoys and reef lines and numerous dive sites around Saipan, making scuba access safer and less damaging to the coral reef resources. This effort is funded by NOAA, National Marine Fisheries Service (NMFS), while the moorings are fully maintained by CRM. Our office continues to focus on making beach improvements, such as the installation of bollards and placement of vegetation to prevent vehicle access to sandy areas which is a large factor in the degradation of the recreational value of CNMI's beaches, placement of interpretive signs on public beaches to improve visitor's experience, and pavement of roads and parking areas to limit sedimentation while improving access.

3. Use the table below to report the percent of the public that feels they have adequate access to the coast for recreation purposes, including the following. If data is not available to report for this contextual measure, please describe below actions the CMP is taking to develop a mechanism to collect the requested data.

Contextual measure	**Survey data**
Number of people that responded to a survey on recreational access	219
Number of people surveyed that responded that public access to the coast for recreation is adequate or better.	211
What type of survey was conducted (i.e. phone, mail, personal interview, etc.)?	Personal questionnaire
What was the geographic coverage of the survey?	Saipan Island
In what year was the survey conducted?	2009

The data presented above was collected by AmeriCorps volunteers as part of an effort that targeted users of Saipan Lagoon. The numbers reported correspond to responses to a recreational use survey. Though only 3.7% of the public feel that they do not have adequate access to coastal areas, the survey yielded useful information regarding what activities the public feels should be encouraged, regulated or prohibited in public coastal areas. Other information that the surveys provide include suggestions for public coastal area improvements, hazards experienced on coastal public land and forms of transportation being used to access coastal areas.

A separate survey was given to fishermen and to commercial users/tourist operators. Though these surveys yielded useful information regarding types of facilities commonly used and facilities respondents would like to see in the future, a specific question was not asked regarding public access.

4. Briefly characterize the demand for coastal public access within the coastal zone, and the process for periodically assessing public demand.

There is a strong demand for public access to the shoreline in the CNMI. Recreational use of beaches is high, with residents using beaches for picnicking, swimming, surfing, playing sports, scuba dive/snorkeling access, and for relaxing. Canoe clubs store their boats at Kilili Beach and use that area for launching and hosting occasional races. Scuba divers use several established locations such as Laolao Bay and Obyan Beach heavily, and a few other more remote sites less frequently. Tourists primarily stay near the big hotels in Garapan and Susupe, and having adequate beach access for visitors is a necessity for the CNMI's tourism economy. As the demand for public access to Mañagaha Island is very high, a SAMP was created to address any conflicts that have arisen. In addition to the recreational and tourism use, numerous subsistence and small-scale commercial fishers operate along Saipan's western coast and along both the Rota and Tinian coasts. The fishers use boat ramps frequently and also launch boats or wade into the lagoon from the shore. The need for public access to the shoreline is currently monitored through communication with users' groups, direct observation by the CRM enforcement team and by occasional public surveys which include questions regarding public access.

(this space was left blank for formatting purposes)

5. Please use the table below to provide data on public access availability. If information is not available, provide a qualitative description based on the best available information. If data is not available to report on the contextual measures, please also describe actions the CMP is taking to develop a mechanism to collect the requested data.

Types of public access	**Current number(s)**	**Changes since last assessment (+/-)**	**Cite data source**
Number of acres in the coastal zone that are available for public (report both the total number of acres in the coastal zone and acres available for public access)	Total acres in the coastal zone (total CNMI land acreage) - 112,951.9 acres Total acres available for public access - unknown	No significant change	Current CRM GIS files
Miles of shoreline available for public access (report both the total miles of shoreline and miles available for public access)	Total shoreline miles: 222.5 miles (Saipan - 49.9 miles Tinian/Aguigan - 34 miles Rota - 35.2 miles, Northern Islands - 96.1 miles)	No significant change	2010 CNMI Integrated 305(b) and 303(d) Water Quality Assessment Report
Number of State/County/Local parks and number of acres	30 local parks in the CNMI (Saipan-16, Tinian-6, and Rota-8) The parks total about 20 acres.	No significant change	2004 Performance Measures Pilot Project, personal communication with CRM Rota, Tinian
Number of public beach/shoreline access sites	57 (Saipan-29, Tinian-12, Rota-1, Northern Islands-6)	No significant change	1992 Shoreline Access Guide to Saipan and the 2004 Performance Measures Pilot Project
Number of recreational boat (power or non-power) access sites	There are 9 public boat ramps in the CNMI (Saipan-6, Rota-2, Tinian-1).	No significant change	2004 Performance Measures Pilot Project, personal communication with CRM Rota, Tinian
Number of designated scenic vistas or overlook points	13 (Saipan-8, Tinian-2, Rota-3)	No significant change	2004 Performance Measures Pilot Project, personal communication with CRM Rota, Tinian
Number of State or locally designated perpendicular rights-of-way (i.e. street ends, easements)	There are 10 demarcated rights-of-way to shorelines areas in the CNMI (Saipan-9, Rota-1). All lessees of public land, most notably large hotels, must provide shoreline access.	No significant change	2004 Performance Measures Pilot Project, personal communication with CRM Rota, Tinian

Number of fishing access points (i.e. piers, jetties)	There are 5 public fishing piers (Saipan-2, Rota-2, Tinian-1).	No significant change	2004 Performance Measures Pilot Project, personal communication with CRM Rota, Tinian
Number and miles of coastal trails/boardwalks	There are 6 boardwalks/walkways in the CNMI (Saipan-3 [7.6 miles], Tinian-2, Rota-1).	+1, Rota West Harbor fishing pier	2004 Performance Measures Pilot Project, personal communication with CRM Rota, Tinian
Number of dune walkovers	CNMI has no dune areas that require walkovers.	n/a	n/a
Percent of access sites that are ADA compliant access	There are 6 disabled access routes on Saipan.	No significant change	1992 Shoreline Access Guide to Saipan
Percent and total miles of public beaches with water quality monitoring and public closure notice programs	83 sites[1] are monitored and have public closure notice programs. No mileage data is currently available.	No change	2010 CNMI Integrated 305(b) and 303(d) Water Quality Assessment Report
Average number of beach mile days closed due to water quality concerns	83 sites are sampled for microbiological data (using enterococci levels to indicate possible contamination) to determine if a beach closure is necessary. Of these sites, 63 yielded at least one sample that triggered a beach advisory (closure) in 2009. Of the sites that had one or more advisory, the percentage of samples that led this ranged from 2%-79%.[2,3]	See footnote[2]	2010 CNMI Integrated 305(b) and 303(d) Water Quality Assessment Report

1. DEQ has recently made changes in the way they assess the state of Commonwealth waters. Coastal water quality is now assessed and reported in terms of segments of shoreline based on established CNMI watershed units, where each segment may contain multiple individual monitoring stations. Further, for the first time, this report also includes the ten northern CNMI islands, as well as streams, wetlands, and lakes, although the CNMI has yet to institute an organized, regularly scheduled monitoring program for these classes of waters.
2. CNMI has seen significant improvements in water quality, particularly in Saipan. Since 2007, five of Saipan's seventeen coastal segments (12.7 miles) have been removed from the "impaired" list for recreational use (microbiological violations) and four segments (14.9 miles) have been removed from the aquatic life support impairment list due to improvements in water quality and biological indicator data. However, 86.2 miles (or 39%) of the Commonwealth coastline remains impaired for various reasons. *Source: 2010 Commonwealth of the Northern Marianas Islands Integrated 305(b) and 303(d) Water Quality Assessment Report.*
3. Please see Appendix 2 (page 87) for a full report of beach closure data, 2006-2009.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	**Employed by state/territory** (Y or N)	**Significant changes since last assessment** (Y or N)
Statutory, regulatory, or legal system changes that affect public access	Yes	No
Acquisition programs or policies	Yes	Yes
Comprehensive access management planning (including GIS data or database)	No	No
Operation and maintenance programs	Yes	Yes
Alternative funding sources or techniques	Yes	No
Beach water quality monitoring and pollution source identification and remediation	Yes	No
Public access within waterfront redevelopment programs	No	No
Public access education and outreach	Yes	Yes
Other (please specify)		

2. For management categories with significant changes since the last assessment, characterize the change; specify whether it was a 309 of other CZM-driven change, and specify the funding source; and characterize the outcomes and effectiveness of the changes. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

Acquisition Programs of Policies

For information regarding CNMI's land acquisition programs, please see Wetlands (page 12).

Operation and Maintenance Programs

CRM partners with DPL, DLNR/DFW and DLNR/Parks and Recreation to upkeep areas used by the public. Significant changes in the last assessment period include the continued removal of sand accretion at the Sugardock boat launching point and the maintenance of Sugardock dredging. We are pleased to note that CRM's removal of the partially-submerged wall next to the boat ramp seems to be helping to decrease sediment buildup which impedes public access to the ramp. Maintenance projects are partially CZM-funded and partially funded by partner agencies.

Public Access Education and Outreach

Several projects have been done in the last five years to increase public access-related education. Signs have been placed at two known green turtle (*Chelonia mydas*) nesting beaches describing the biological importance of and threats facing federally endangered turtles. These signs were installed as a continuation of the Walk It, Don't Drive It campaign to discourage the public from driving on the beach, damaging fragile habitat. The campaign was initiated to increase compliance with CNMI public law No. 11-61 which prohibits any motor vehicle from entering or going upon any beach area (those areas of unconsolidated deposits along the shore with their seaward boundary being at the

low water mark or reef flat platform level extending in a landward direction not less than 150 feet). All CRM permits contain a condition that requires the permitted entity to abide by this law. If a person holding a CRM permit is found operating any motor vehicle in the beach zone, CRM is able to enforce this condition by revoking the permit or issuing a fine. However, the public law does not allow any agency the authority to enforce this regulation if a non-permit holder is found driving on the beach. CRM has approached the appropriate authorities in the past to amend this law, and will continue encouraging the appointment of an authorized enforcing body.

A mandatory marine sports forum was held in June 2007 for all permitted marine-based tourism ventures. The workshop provided to permit holders a better understanding of the importance of observing environmental laws and regulations that are in place. The event was a success, drawing participants from all marine sports sectors and covering topics from coral reef ecology to safe operation of motorized marine vehicles. The forum provided a venue for CRM to make public our intent to revoke permits for those operators that are not abiding by environmental regulations. Prior to the workshop, CRM published the "CNMI Marine Operators Handbook" which was handed out to all participants and is still used as an effective method of notifying any and all marine sports operators of laws and regulations in place. Funding for both the workshop and handbook came from CRM program income, a non-CZM source.

3. Indicate if your state or territory has a printed public access guide or website. How current is the publication and/or how frequently is the website updated? Please list any regional or statewide public access guides or websites.

The *Shoreline Access Guide to Saipan* dates to 1992 and is limited to the island of Saipan. The booklet includes 32 shoreline access points and the corresponding recreation possibilities at each, facilities and amenities, detailed maps, and photographs. Also included in the booklet are boating access points and hotel shorelines. This booklet is currently being updated by CRM with funding from the Coral Reef Initiative (CRI), and will be a comprehensive inventory of coral reef-related recreational facilities on Saipan. This update will be completed in 2011. A brochure with the listing of Saipan's snorkeling and diving sites is posted to CRM's website (http://www.crm.gov.mp/pubs/15.pdf). The CNMI Department of Public Lands (DPL) has a list of lessees of public lands on their website, but do not have a clear map of public access points.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	**Type of gap or need** (regulatory, policy, data, training, capacity, communication & outreach)	**Level of priority** (H,M,L)
Updated data for public access acreage	Data	Medium
Public awareness regarding EPA water quality beach closures	Communication & Outreach	Low
Regulations to protect public access on public and private lands	Regulatory	Medium

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)? Briefly explain the level of priority given for this enhancement area.

Low. Though there is a high demand for public access throughout the CNMI, especially in Saipan, there are few threats to this access. As the CNMI depends heavily on tourism and must maintain a high level of public access to compete with other destinations, CRM has in place adequate regulations to ensure public access is not hindered. In the upcoming years, we will focus on improving access areas in ways that minimize negative impact to coastal resources. There are numerous plans in place for road improvements, drainage improvements to decrease road blockages, sign and bollard placement, and maintenance of access areas. As plans are already in place for these projects, public access has been given a low 309 priority. Though a serious concern in the past, solid waste disposal in public areas is gradually improving. CRM participates in and organizes several beach clean-up efforts and assists the Mariana Islands Nature Alliance (MINA) with their marine debris reduction campaign. In 2008, CRM enforcement staff expanded their patrol hours to include weekends. Through this increased enforcement presence, regulation compliance in public areas has improved and we expect this improvement to continue as outreach reaches more individuals. We feel that the past work and completion of a public access survey supports the change from a medium priority in 2006 to a low priority for this assessment.

2. Will the CMP develop one or more strategies for this enhancement area? Briefly explain why a strategy will or will not be developed for this enhancement area.

No. Currently, our office needs funding to implement public access improvement plans that have already been created (Laolao Bay, Obyan Beach, Sugardock access area), and securing this funding and implementing these plans will be priority in the next five years. Several program needs and gaps are noted above, but will not be addressed by 309 efforts. As DEQ addresses water quality issues, efforts to publicize beach closure data are being led by that office. CRM staff will assist DEQ as is necessary. Similarly, DPL is working to update maps that detail public and private land areas. CRM staff are currently looking into ways to update CRM regulations to allow enforcement staff the ability to issue on-site fines and citations, thus addressing any need for still stronger enforcement of laws to prohibit driving within the shoreline zone and littering. Stronger enforcement of these laws and continued implementation of the projects discussed above will address needs that were publically identified through the access survey discussed in the assessment.

D. Marine Debris

Section 309 Programmatic Objectives

Reducing marine debris entering the Nation's coastal and ocean environment by managing uses and activities that contribute to the entry of such debris

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. In the table below, characterize the significance of marine debris and its impact on the coastal zone.

Source of marine debris	**Extent of Source** (H,M,L)	**Type of impact** (aesthetic, resource damage, user conflicts, other)	**Significant changes since last assessment** (Y or N)
Land Based -Beach/Shore Litter	High	Aesthetic, resource damage, public health risk, threat to wildlife (e.g. marine turtles)	No
Land Based – Dumping	Medium	Aesthetic, resource damage, public health risk, threat to wildlife (e.g. marine turtles)	No
Land Based – Storm Drains and Runoff	High	Resource damage, public health risk	No
Land Based – Fishing Related (e.g. fishing line, gear)	Low	Resource damage	No
Ocean Based – Fishing (Derelict Fishing Gear)	Low	Resource damage	No
Ocean Based – Derelict Vessels	High	Aesthetic, resource damage	No
Ocean Based – Vessel Based (cruise ship, cargo ship, general vessel)	Low	Resource damage	No
Hurricane/Storm	Low	Resource damage	No
Other (please specify)			

2. If information is not available to fill in the above table, provide a qualitative description of information requested, based on the best available information.

Each year, the CNMI participates in The Ocean Conservancy's International Coastal Cleanup. Marine debris collected in 2010 were recorded by category and total weight was quantified (6,280 lbs in Saipan). Many of the "extent of source" designations above correspond to the relative amount of trash collected in each general category during the ICC. Records recording derelict vessels were also reviewed to determine the extent of vessel debris, and resource managers at numerous agencies were consulted to further determine relative threats in the CNMI.

3. Provide a brief description of any significant changes in the above sources or emerging issues.

There have been no noted changes in the above sources of marine debris since 2006.

3. Do you use beach clean-up data? If so, how do you use this information?

As part of the ICC, first conducted in Rota in 2006 and in Saipan and Tinian in 2009, the CNMI annually records beach cleanup data. In addition, DEQ keeps data from each of their monthly Clean-up Brigades and a variety of other clean-ups that they spearhead with community groups and schools. Finally, Mariana Islands Nature Alliance (MINA) keeps record of the amount of trash picked up from each of their beach trash/recycle bins as part of a NOAA Marine Debris initiative. Over time, we will see trends in the amount of trash being collected from our beaches. This data can be used to guide management decisions regarding marine debris and to help educate the public on the extent of the marine debris issue in the CNMI.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	**Employed by state/territory** (Y or N)	**Employed by local governments** (Y, N, Uncertain)	**Significant changes since last assessment** (Y or N)
Recycling requirements	No	No[1]	No
Littering reduction programs	Yes	No	Yes
Wasteful packaging reduction programs	Yes	No	Yes
Fishing gear management programs	Yes	No	No
Marine debris concerns in harbor, port, marine, & waste management plans	Yes	No	No
Post-storm related debris programs or policies	No	No	No
Derelict vessel removal programs or policies	Yes	No	Yes
Research and monitoring	Yes	No	No
Marine debris education & outreach	Yes	No	Yes
Other (please specify)			
1. Local government in the CNMI is taken to refer to the Mayor's Offices of Saipan, Tinian, Rota and the Northern Islands. Communities smaller than the island (for example, a village) do not have separate law-making bodies.			

2. For management categories with significant changes since the last assessment, characterize the change; specify whether it was a 309 of other CZM-driven change, and specify the funding source; and characterize the outcomes and effectiveness of the changes. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

Litter Reduction Programs and Marine Debris Education and Outreach

Since the last assessment, MINA has received a Marine Debris Grant from NOAA. This includes the placement of trash and recycling bins at highly visited beaches around Saipan. Each bin was

"adopted" by a local business or organization who funds the weekly trash removal. CRM sponsored three recycling bins for November 2010 - November 2012 and will continue to support this project financially and with technical support. The MINA campaign aims to improve compliance with CNMI Public Law 6-37, the Commonwealth Litter Control Act of 1989. Under this law, numerous agencies are authorized to issue $200.00-$500.00 fines for any violation. However, it has been seen that enforcing bodies are not willing to fine an individual $200.00 (the minimum penalty) for littering. CRM is working to lower the minimum penalty, thereby making this law more realistic to enforce. In addition, MINA coordinates in numerous outreach programs which include working with student volunteers who conduct education at local schools. In addition, CRM and DEQ have printed a very popular "Marine Debris Timeline" poster that has been distributed to teachers throughout the CNMI.

The results from MINA's recycling and outreach programs are extremely promising. In the first two months after the bins were installed at eight Saipan beaches, almost 7,000 lbs. (over three metric tons) of waste has been collected-45 percent of which was recycled. As of December 2010, there were fourteen bins around Saipan.

Wasteful Packaging Reduction Programs/No Need Bag Campaign

In the last assessment period, CRM partnered with the DEQ led Green Business Initiative (GBI). The GBI focused on encouraging shoppers to use reusable bags in place of plastic bags and has worked to encourage local shops to promote the use of these bags. "Celebrity Bagging" events took place at a number of stores during which customers were given a free reusable bag if they agree to use it the next time they go shopping. The GBI was funded by DEQ through funds from EPA and CRI.

- As a result of the GBI, the largest chain of grocery stores on Saipan agreed to provide a discount to all shoppers who bring their own re-usable bags with them when they shop.
- Over 2,000 re-usable shopping bags were given out to the community at "celebrity" bagging events and other outreach opportunities.
- A short (5 question) "pre-campaign" survey is being developed for the vendors at Saipan's twice weekly farmer's market. The survey will ask questions such as how many plastic bags they give away a day. The survey will be followed by re-usable bag mini-campaign at the markets where people will receive a free bag upon agreeing to use it every time they shop at the market. This mini-campaign will be followed up by a post-campaign survey to measure the change in the number of plastic bags given away by vendors every day.

Recently, the GBI was refocused and has become the No Need Bag campaign which was launched to further reduce the volume of single-use bags that are consumed in the CNMI. The campaign relies on partnerships with local grocery stores that promote the use of reusable shopping bags. In addition to educating individuals and businesses, this campaign aims gather public support for single-use bag reduction legislation which is currently in the draft phase.

Derelict vessel removal programs or policies

CRM was awarded a grant to remove the Nam Sung, a derelict vessel on Rota and the Nago 15, a vessel on Saipan. In addition, work is currently underway to develop a plan to remove the Charito, a derelict vessel in the Saipan lagoon. A series of derelict and deteriorated Trust Territory of the Pacific Islands-era barges and landing craft on Rota are also being considered for removal. The

funds for the Rota project came from NOAA's Marine Debris Program. To fund the removal of the Charito, CRM is currently both partnering with the U.S. Coast Guard and using CZM funding.

The successful removal of the Nam Sung from the Rota coast has encouraged CRM to begin to plan removal of other vessels. Future removal of derelict vessels on Rota, Saipan and Tinian is a priority that will be addressed in upcoming years.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	**Type of gap or need** (regulatory, policy, data, training, capacity, communication & outreach)	**Level of priority** (H,M,L)
Education regarding waste reduction, packaging reduction, and recycling options	Communication and Outreach	Medium
Lack of transfer waste facilities/drop-off stations	Infrastructure	High
Increased education and outreach on Tinian and Rota	Communication and Outreach	Low

Lack of Transfer Waste Facilities/Drop-off Stations

Saipan has approximately 40,000 residents, but only one waste/recycling transfer station, in addition to facilities at the Marpi Sanitary Landfill. As there is no municipal trash collection system, residents are required to deliver all trash to either the transfer station or to the landfill, both places which are quite far from major residential areas. Often residents are not willing to make the long trip and practice illegal dumping on back roads and beach areas. As such, CRM believes that illegal dumping is a major contributor to marine debris in the CNMI and will best be confronted by addressing the lack of waste transfer facilities.

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)? Briefly explain the level of priority given for this enhancement area.

Low. Marine debris issues are widespread throughout the Pacific and CNMI is certainly not an exception. However, many advances in CRM and the CNMI's response to marine debris have taken place in the previous five years. As we continue to carry out new outreach efforts, we will monitor effectiveness and make changes as necessary. We envision these changes to enable current education programs to emphasize waste reduction and recycling options (as seen in a currently airing CRM public service announcement series outlining recycling options) and to expand the programs to schools and offices in Tinian and Rota. Public attitude changes that lead to a measurable reduction in marine debris will take many more years. With our current education efforts facilitating these long-term changes, CRM proposes a low priority level for this enhancement area.

2. Will the CMP develop one or more strategies for this enhancement area? Briefly explain why a strategy will or will not be developed for this enhancement area.

No. The Marine Debris priority level is low and a strategy will not be developed under this enhancement area. CRM will continue to be active in derelict vessel removal using data layers obtained by CRM that show placement of vessels and place a priority level for removal of each. On-the-ground removal, as is necessary, will not fall under §309 funding. A strategy for ongoing marine debris education is not necessary as current programs will be continued and improved upon throughout the next assessment period.

E. Cumulative and Secondary Impacts

Section 309 Programmatic Objectives

Development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Identify areas in the coastal zone where rapid growth or changes in land use require improved management of cumulative and secondary impacts (CSI) since the last assessment. Provide the following information for each area:

Geographic area	**Type of growth or change in land use**	**Rate of growth or change in land use** (% change, average acres converted, H,M,L)	**Types of CSI**
Garapan Watershed, Saipan	Development and increased impervious cover. Closing of garment factories leaving behind persistent sources of contamination.	High	Stormwater and sewage runoff, surface pollutants entering lagoon, increasing impervious cover
Saipan Lagoon	Continually changing tourism and recreational use developments.	High	Nutrification, increased stress from recreational use, increased land-based sediment load, persistent contamination from unregulated dump sites from WWII to present (recent research shows heavy metal contamination in the lagoon)
Makpo (Marpo) Watershed, Tinian	Increasing threat of NPS contaminating water source due to development	Medium	Agricultural and other surface pollutants entering groundwater and flowing to marine water
Northern Islands	Continued and proposed (Pagan) military use.	Medium	Impacts relating to DOD use, homestead developments, feral animal impacts, possible pozzolan mining
Talakhaya-Sabana Watershed, Rota	Widespread burning of the Talakhaya badland area.	Medium	Increased soil erosion, decrease in vegetative cover due to burning, stormwater runoff, increased threat of invasive species (Cuban Slug)

Laolao Bay, Saipan	Continued use by divers, fishermen and the public. Burning of upland badland and forested areas.	Medium	Increased soil erosion due to recreational use, damage to coral reefs
Obyan Beach, Saipan	Continued use by divers, fishermen and the public.	Medium	Increased soil erosion due to recreational use, damage to coral reefs, threat to marine turtle nesting habitat
Tinian Island	Expected development due to military build-up.	Medium (Expected change)	Increased impervious surface on island leading to increased stormwater runoff and subsequent sedimentation, increased risk of chemical contamination, threat to marine turtle nesting habitat
Tinian and Rota Islands	Increase in population and/or waste produced	Low	Contamination due to the lack of a sanitary landfill on either island

Tinian Island Proposed Military Build-up: Although Tinian has had an ongoing and sporadic military presence since the end of World War II, expected military expansion in the region will certainly have an impact. The expansion will likely include relocation of thousands of military personnel to Guam and an increase in training exercises conducted in the CNMI. Tinian and Pagan (Northern Islands) have been identified by the US military as areas in which to significantly increase exercises. Major anticipated projects in Tinian include the construction of a rifle KD range (91m X 914m), a combat pistol range (50m X 46m), an automatic field firing range(200m X 500m), and a platoon battle course(600m X 1,200m). Preferred locations for the developments are in the central part of Tinian, but are expected to have a significant environmental and social effects across the island. Notably, increased impervious surfaces will have an effect on stormwater runoff and groundwater recharge. All developments are planned to occur on land that is leased from the CNMI government to the U.S. military. CRM has reviewed all Environmental Impact Statements released by the U.S. DOD and will remain informed of build-up plans. As contracts are awarded for specific build-up projects, and designs are finalized, CRM will monitor progress and take steps to minimize widespread environmental impacts.

2. Identify sensitive resources in the coastal zone (e.g., wetlands, waterbodies, fish and wildlife habitats, critical habitat for threatened and endangered species) that require a greater degree of protection from the cumulative or secondary impacts of growth and development. If necessary, additional narrative can be provided below to describe threats.

Sensitive resources	**CSI threats description**	**Level of threat** (H, M, L)
Coral Reefs/Reef Fish Habitat	Sedimentation, nutrification/algal overgrowth, damage due to constant recreational use, marine debris, localized overfishing, heavy metal contamination	High
Seagrass areas	Development, recreational use of beaches, contaminated wastewater runoff, heavy metal contamination	High

Wetlands	Filling and draining due to development, encroachments that reduce wetland function and values, invasive species	Medium
Ground water aquifers	Pollution, reduced infiltration, over-pumping	Medium
Endangered bird and bat habitat	Development encroaching on critical habitat, pollution of land and water sources, invasive species	High
Sea Turtles	Development encroaching on critical habitat, increased public use of nesting beaches, poaching and lack enforcement of Endangered Species Act regulations	Medium
Native forest areas	Conversion to agricultural land, development pressure, damage due to feral ungulates	Medium

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management Categories	**Employed by state/territory** (Y or N)	**Significant changes since last assessment** (Y or N)
Regulations	Yes	Yes
Policies	Yes	No
Guidance	Yes	Yes
Management Plans	Yes	Yes
Research, assessment, monitoring	Yes	Yes
Mapping	Yes	No
Education and Outreach	Yes	Yes
Other (please specify)		

2. For management categories with significant changes since the last assessment, characterize the change; specify whether it was a 309 of other CZM-driven change, and specify the funding source; and characterize the outcomes and effectiveness of the changes. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

Regulations

Signed into law December 5, 2008, by Governor Fitial, the Saipan Zoning Law of 2008 (SLL 16-6) is administered by the Zoning Board (see Coastal Hazards (page 18) for general information on the Zoning Law). Numerous sections of the law address the need to control and reduce cumulative and secondary impacts. By regulating development through the zoning law, it is hoped that cumulative impacts of various land uses (e.g. agriculture, industry) are reduced and managed. Section 604(h) lays out requirements for sustainable architecture that aim to reduce energy use in both commercial and residential buildings. Sections 605(a) and 607(b)(7) require developments to preserve open space and construct planned neighborhoods in such a way to retain sensitive natural areas and features. Similarly, Section 607(d) aims to minimize area of impervious surface (e.g. driveways) and retain green space to reduce stormwater runoff. Lastly, Section 618(d) requires any development to

finance the connection of that development to a public sewer line if it is available. This intends to reduce the use of private septic tanks that often overflow and cause water contamination issues. Throughout the Zoning Law, the CRM and DEQ requirements to implement stormwater control on-site any development are reinforced.

Guidance

DEQ published an Erosion and Sediment Control Field Guide in 2009 designed specifically for contractors in the CNMI involved in clearing, grading, stockpiling, and other earth moving activities at all construction sites. To help contractors implement Erosion and Sediment Control (E&SC) Standards of the 2006 CNMI/Guam Stormwater Manual, this guide explains why E&SC is an important part of the construction process, summarizes E&SC practice design, installation, and maintenance tips, outlines inspection and project closeout considerations, serves as a reference for use in the field, relies primarily on graphical illustrations for multi-lingual users. This change was driven by collaborative DEQ and CRM efforts and funded by the CNMI Coral Reef Initiative (CRI).

After a workshop associated with release of the field guide, CRM permit staff noticed that the use of silt fencing has increased and that more fences are properly installed. The field guide could be more effective if it were more widely available to all contractors and developers.

Management plans and Research, assessment and monitoring

CRM is working to complete revisions to the Saipan Lagoon Use Management Plan (SLUMP). The document is expected to address user conflict issues and update and clarify regulatory and management authority over aspects of coastal ecosystem management. Numerous studies have been done as part of this project. For more information, see SAMP (pages 42-43).

An assessment of Mañagaha's shoreline erosion was done in collaboration with the University of Hawaii. For more information on this study, please see Coastal Hazards (pages 19-20).

The University of Guam/Water and Environmental Resources Institute (UoG WERI) performed sediment and biota metal contamination surveys in Saipan Lagoon, funded by the U.S. Geological Society (*Impact of a coastal dump in a tropical lagoon on trace metal concentrations in surrounding marine biota: A case study from Saipan, CNMI, 2009)*. The studies identified areas of elevated lead and mercury in lagoon sediments and some evidence of bioaccumulation in biota. In one case, elevated mercury was tracked to the site of a former medical waste incinerator. Advisories to reduce consumption of certain fishes in Garapan area were publicized. Other investigation of sources is ongoing.

Education and Outreach

Since 2009, CRM's Education and Outreach branch, in collaboration with DEQ, has been actively conducting "Ridge to Reef" lessons to elementary classrooms around the islands. This curriculum stresses watershed-based thinking that encourages participants to consider how land issues are affecting marine habitats. As part of the Ridge to Reef program, nonpoint source pollution facts and solutions to the issues are discussed. This is a CZM-driven change, funded partially through Section 309 and partially through the NOAA CRI.

Ridge to Reef camps have become very popular around the CNMI. All camps that have taken place in the last two summers have been filled to capacity.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	**Type of gap or need** (regulatory, policy, data, training, capacity, communication & outreach)	**Level of priority** (H,M,L)
Information dissemination of stormwater management BMPs to business owners	Communication and Outreach	Medium
Formal adoption of a Highly Erodible Soils APC	Regulatory	High
Development and adoption of road design standards to mitigate stormwater runoff	Policy, Regulatory	Medium

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)? Briefly explain the level of priority given for this enhancement area.

High. CRM proposes to relist the CSI enhancement area as a high priority despite progress made by the adoption of zoning regulations for Saipan. The impacts of public and private development, the tourism industry and military land usage is still of high concern to the CZM program. In the past, particular focus has been placed on NPS pollution from stormwater runoff and poor treatment of sewage in the CNMI. As island development continues and comprehensive drainage system and sewage system upgrades lag behind, CSI are not expected to decrease. New regulations, guidance, outreach and large-scale infrastructure retrofits are necessary to address this priority area. A new project, funded through CRI, aims to educate business owners on stormwater best management practices by disseminating BMP plans and by constructing several pilot projects to serve as models for the business and construction sectors. As CSIs threaten the coral reefs and water quality that Saipan's tourism industry depends on, this area is a priority for many agencies and will continue to be a CRM focus.

2. Will the CMP develop one or more strategies for this enhancement area? Briefly explain why a strategy will or will not be developed for this enhancement area.

Yes. A strategy for this enhancement area will not be developed at this time. We are putting a high priority on formally adopting the drafted Highly Erodible Soils and Highly Permeable Soils APCs. A strategy was written to ensure that this is completed within a reasonable time frame.

F. Special Area Management Planning

Section 309 Programmatic Objectives

Preparing and implementing special area management plans for important coastal areas

"The Coastal Zone Management Act (CZMA) defines a Special Area Management Plan (SAMP) as "a comprehensive plan providing for natural resource protection and reasonable coastal-dependent economic growth containing a detailed and comprehensive statement of policies; standards and criteria to guide public and private uses of lands and waters; and mechanisms for timely implementation in specific geographic areas within the coastal zone. In addition, SAMPs provide for increased specificity in protecting natural resources, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas, including those areas likely to be affected by land subsidence, sea level rise, or fluctuating water levels of the Great Lakes, and improved predictability in governmental decision making."

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Identify geographic areas in the coastal zone subject to use conflicts that can be addressed through special area management plans (SAMP). Also include areas where SAMP have already been developed, but new issues or conflicts have developed that are not addressed through the current plan. If necessary, additional narrative can be provided below.

Geographic Area	Major conflicts	Is this an emerging or a long-standing conflict?
Garapan Tourist District/Garapan Watershed	Declining water quality in the Saipan Lagoon, tourism and related development, poor wastewater drainage and sewage system, erosion from roads and residential development in the upper watershed, insufficient parking	Long-standing
Laolao Watershed/ Laolao Bay	Uplands, unpaved roads, and streambed erosion; land owners and hunters; tourist divers; fishermen; endangered species; coral reefs and marine environment.	Long-standing (SAMP Developed, in implementation phase)
Saipan Lagoon	Motorized and non-motorized recreation; sediment-heavy stormwater runoff entering lagoon; point source pollution from sewage overflows and closed industrial facilities; demand for boat launches and recreational access	Long-standing (SAMP in revision)
Talakhaya/ Sabana (Rota)	Burning; Erosion; Endangered species;	Long standing (SAMP in progress)
Tinian	Military Build-up, Makpo Watershed which includes the island's water source and significant agricultural land	Emerging
Northern Islands	Endangered species conservation; military activities; conservation areas; feral animal damage (ungulates and rodents), possible new homestead development, lack of data regarding wildlife and marine resources.	Long-standing (conflict on Pagan Island is emerging)

Limestone and old-growth forest (Saipan, Tinian, Rota)	Destruction/clearing of forest for homesteads, farms, developments, endangered species essential habitat concerns	Long-standing
Undeveloped Shoreline	High development pressure, endangered species essential habitat	Long-standing
Puerto Rico/ Commercial Seaport area	General environmental quality due to industrial and port development, proper closure of the Puerto Rico dump	Long-standing (Puerto Rice dump stopped being used in February 2003)
Karstland and Permeable Soil areas	Pollution of groundwater resources and secondary impacts on coastal water and habitats	Long-standing

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. Identify below any special management areas in the coastal zone for which a SAMP is under development or a SAMP has been completed or revised since the last Assessment:

SAMP title	**Status** (new, revised, or in progress)	**Date approved or revised**
Bird Island Wildlife Conservation Area and Bird Island Marine Sanctuary	New	July 11, 2007
Kagman Wildlife Conservation Area and Forbidden Island Marine Sanctuary	New	July 11, 2007
Laolao Bay Conservation Action Plan	New	January 2009
Saipan Lagoon Use Management Plan	In-Progress	Projected completion date is September 2011
Talakhaya Sabana Management Plan (Rota)	New	February 2011
Northern Islands Marine Monument	In-Progress	N/A

2. For management categories with significant changes since the last assessment, characterize the change; specify whether it was a 309 of other CZM-driven change, and specify the funding source; and characterize the outcomes and effectiveness of the changes. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

Laolao Bay

Since the last assessment a Conservation Action Plan (CAP) has been developed for Laolao Bay. The plan expands on strategies laid out in the US Coral Reef Task Force Local Action Strategy for the area. It is a cooperative effort between local stakeholders and resource management agencies including: CRM, DEQ, DLNR/DFW, HPO, MINA, The Nature Conservancy (TNC). Though the CAP has not led to the adoption of any additional enforceable policies, the plan emphasizes the need for collaboration between resource agencies and the Attorney General's Office to increase compliance

with existing laws and regulations. The CAP calls for CRI sponsorship of a neighborhood "Tasi Watch" (Ocean Watch) program that will enable a local group to partner with regulatory agencies to provide on the ground monitoring for violations. Other CAP-outlined tasks include the improvement of fisheries regulation and the extension of a moratorium on the take of sea cucumbers.

Following the development of this plan, DEQ was successful in securing an ARRA grant to address identified issues facing the area. The ARRA funds granted to DEQ for this project are being administered by NOAA. The project, which is currently in progress, includes revegetation of upland areas, paving of certain sections of the road, the construction of ponding basins and stream crossings, and significant education and outreach efforts, including a social marketing campaign to be done in collaboration with SeaWeb. The Laolao project has engaged many volunteers and community members during public meetings, volunteer revegetation efforts, and reef flat monitoring signaling community backing of the project and likely leading to further successes.

Bird Island Wildlife Conservation Area and Bird Island Marine Sanctuary and Kagman Wildlife Conservation Area and Forbidden Island Marine Sanctuary

Neither the Bird Island Wildlife Conservation Area and Marine Sanctuary or the Kagman Wildlife Conservation Area and Forbidden Island Marine Sanctuary are newly established protected areas. The primary change in both is the adoption of detailed management plans developed by DLNR/DFW. The plans designate which uses are compatible with the mandates of laws and regulations, which uses will require permits, and which uses will not be allowed. Included in the document's text is the area's enabling legislation (Public Law 12-46) and all regulations that apply within the boundaries of both conservation areas. Also included are management goals, objectives and strategies, and recommendations for implementation. As established in April 2001 through PL 12-46, DLNR/DFW holds management and enforcement authority of these conservation areas.

Saipan Lagoon Use Management Plan (SLUMP)

CRM has been working, through §309 and other funding sources, since the last assessment to complete an updated SLUMP, last revised in 1997. Since 2006, resource use and public access surveys have been administered to establish a specific list of needs to be addressed in the 2010 update of the SLUMP. To obtain the necessary information to develop the update, CRM collaborated with the Pacific Islands Applied Geoscience Commission (SOPAC) to carry out a lagoon current model and shoreline erosion analyses. NOAA funds are currently being used to collect necessary information through the Saipan Lagoon Recreation Impact Assessment and the Resilience in Lagoon *Acropora* Habitats studies. The CNMI coral reef monitoring program completed the mapping of lagoon habitats (last completed in 1986) and is now monitoring nearshore seagrass and *Acropora* coral habitats as indicators of ecosystem health. Locally-driven and contracted evaluation of currents within the lagoon have improved understanding of source and sink areas for point source and nonpoint source pollution. Evaluation of heavy metal contamination of beaches and lagoon biota have highlighted areas of concern for future mitigation activities and gaps that need to be addressed. Major partners include US Army Corps of Engineers, SOPAC, NOAA Coral Reef Conservation Program, NOAA Pacific Islands Regional Office (PIRO), DEQ, DFW, UOG WERI, and the Pacific Marine Resources Institute (PMRI).

The SLUMP plan provides guidance to permit managers and identifies specific regulation changes that are necessary to ensure that all marine sports operators and lagoon resource users are being

adequately regulated to protect public access and important marine ecosystems. Further, improved characterization of lagoon environments - biological, chemical and physical - have all identified previously unrecognized issues in the lagoon and improved CRM's ability to identify management issues and target management efforts toward appropriate priority areas. For example, the SLUMP identified the need and allowed placement of moorings to protect coral reef fisheries habitat in the lagoon while protecting historical airplane and ship wrecks. CRM expects that the newly updated SLUMP, which will include lagoon current models that link point sources of pollution (i.e. stormwater drainages) to areas of impaired water quality, will underline the need for updated stormwater regulations and improved stormwater and sewage discharge infrastructure.

Marianas Trench Marine National Monument

The Marianas Trench Marine National Monument consists of 95,216 square miles of submerged lands and waters of the Mariana Archipelago. It includes three units: the Islands Unit, the waters and submerged lands of the three northernmost Mariana Islands; the Volcanic Unit, the submerged lands within 1 nautical mile of 21 designated volcanic sites; and the Trench Unit, the submerged lands extending from the northern limit of the Exclusive Economic Zone of the United States in the Commonwealth of the Northern Mariana Islands (CNMI) to the southern limit of the Exclusive Economic Zone of the United States in the Territory of Guam. No waters are included in the Volcanic and Trench Units, and CNMI maintains all authority for managing the three islands within the Islands Unit (Farallon de Pajaros or Uracas, Maug, and Asuncion) above the mean low water line.

Presidential Proclamation 8335 established the Marianas Trench Marine National Monument in January 2009 and assigned management responsibility to the Secretary of the Interior, in consultation with the Secretary of Commerce. The Interior Secretary placed the Mariana Trench and Volcanic Units within the National Wildlife Refuge System, and delegated its management responsibility to the Fish and Wildlife Service. The Secretary of Commerce, through the National Oceanic and Atmospheric Administration, has primary management responsibility for fishery-related activities in the waters of the Islands Unit. The Proclamation also requires the Secretaries to establish a Mariana Monument Advisory Council to provide advice and recommendations on the development of management plans and management of the monument. The Council is to include at a minimum three officials of the CNMI government and one representative each from the Department of Defense and the U.S. Coast Guard. As the monument designation took place in early 2009, the management of the area is still being thought-out and developed.

Talakhaya/Sabana, Rota

For several years DLNR in Rota has worked to revegetate the badlands in Talakhaya. In 2010, in partnership with Rota Mayor's Office, CRM, DEQ, DLNR/DFW, the Natural Resources Conservation Service (NRCS) and TNC, the agencies began a process to create a Conservation Action Plan (CAP) for the area, much like the plan in place for Laolao on Saipan. The plan focuses on addressing erosion and sedimentation problems within the Talakhaya watershed area and managing marine resources for fishing use. In addition to the work put into management planning, CNMI Governor Benigno R. Fitial signed House Bill 15-6 into P.L. 15-8 in January 2008, making the Talakhaya watershed a no-take wildlife conservation area. The plan is largely funded by the CNMI CRI. There is a possible need for long-term protection of the Sabana forest area, upland of the Talakhaya region. The need for this protection will be monitored as the Talakhaya CAP is implemented. The CAP was completed in February 2011.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy).

Gap or need description	**Type of gap or need** (regulatory, policy, data, training, capacity, communication & outreach)	**Level of priority** (H,M,L)
Development of a Garapan SAMP	Policy, Outreach	High
Frequent revision of SLUMP	Policy, Data	Medium

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)? Briefly explain the level of priority given for this enhancement area.

Medium. Numerous SAMPs were completed (or nearly completed) in the last assessment period and implementation of these SAMPs (outside of §309 funding) is a current priority within our office. However, addressing issues within the Garapan urban area and watershed has been made a priority for CRM, DEQ and the Coral Reef Initiative. Due to the varied land uses, stakeholders and issues facing the degraded Garapan watershed, it will take collaboration between numerous agencies to develop a sufficient management plan to restore water quality to the lagoon surrounding Garapan urban area and lay a foundation for sustainable land use in the future. CRM is making the SAMP enhancement area a medium priority as we see the importance that the allocation of our resources will play in the creation of this management plan.

2. Will the CMP develop one or more strategies for this enhancement area? Briefly explain why a strategy will or will not be developed for this enhancement area.

Yes. We are proposing a strategy to ensure that the SLUMP is revised in a timely matter recognizing the rapidly changing user groups operating in Saipan Lagoon. By updating the SLUMP on a regular basis, CRM is able to determine if additional policies and/or regulations are necessary (as identified by public survey and by resource agencies) to adequately protect Saipan Lagoon while providing for many forms of public access. In previous updates, the SLUMP has laid out recommended legislation and regulation amendments for CRM to pursue in order to improve management within the lagoon area. Though the plan does not create enforceable policy or give new authority to any regulating body, it does provide guidance to the CRM permitting and enforcement staff to most effectively regulate activities within the lagoon.

No strategy is proposed for the development of the Garapan SAMP, as this is a project that will be led by CRM partners, DEQ and TNC. CRM will participate fully in the creation of the management plan and consider all tasks within the plan as future priorities. It is expected that the implementation of various tasks within the SAMP (e.g. amendment of CNMI stormwater regulations) will be a strategy in the next §309 Assessment and Strategy report.

G. Ocean Resources

Section 309 Programmatic Objectives

Planning for the use of ocean resources

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. In the table below characterize ocean resources and uses of state concern, and specify existing and future threats or use conflicts.

Resource or use	**Threat or use conflict**	**Degree of threat** (H,M,L)	**Anticipated threat or use conflict**
Coral Reefs	NPS, physical damage, probable sea temperature rise	High	Identified areas of localized propeller scarring from boat transfer activities, increased number of bleaching warnings
Marine Resources	Invasive species	High	Aquaculture development initiatives, Increases in shipping due to military buildup.
Offshore Fisheries	Overfishing by foreign fleets	Medium	Possible undocumented take of endangered species, increased pressure on fisheries
Nearshore Fisheries	Overfishing, habitat degradation, heavily polluted lagoon water	High	Lack of comprehensive management plan, no size or catch restrictions on most fishery-targeted species, indication of accumulation of heavy metals in some taxa
Commercial Shipping	Dredging impacts	Medium	Continued need to dredge Sugar Dock, possible need to dredge Lighthouse Channel, lack of invasive species management plan
Recreation	High-intensity use	Medium (primarily on Saipan)	Damage to habitat from snorkelers, propeller scarring from boat transfer activities
Construction and Agriculture	Sedimentation, NPS, chemical outputs to the sea	High	Homestead development projects under-regulated, possible installation of major septic field on Tinian, secondary road maintenance
Aquaculture	Invasive species, chemical contaminants, nutrient pollution, disease	Medium	USDA funded extension program is actively promoting non-indigenous taxa for the purposes of aquaculture

2. Describe any changes in the resources or relative threat to the resources since the last assessment.

There have been no changes in the resources, and changes in the degree of threat assigned in this report reflect changing priorities within CNMI's CZM program rather than any drastic changes in the relative threats.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	**Employed by state/territory** (Y or N)	**Significant changes since last assessment** (Y or N)
Comprehensive ocean management plan	No	No
System of Marine Protected Areas	Yes	Yes
Regional comprehensive ocean management program	No	No
Regional sediment or dredge material management plan	No	No
Intra-governmental coordination mechanisms for Ocean management	Yes	No
Single-purpose statutes related to ocean resources	Yes	No
Comprehensive ocean management statute	No	No
Ocean resource mapping or information system	Yes	Yes
Ocean habitat research, assessment, or monitoring programs	Yes	Yes
Public education and outreach efforts	Yes	Yes
CNMI Coral Reef Local Action Strategy	Yes	No
Other (please specify)		

2. For management categories with significant changes since the last assessment, characterize the change; specify whether it was a 309 of other CZM-driven change, and specify the funding source; and characterize the outcomes and effectiveness of the changes. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

System of Marine Protected Areas

The CNMI MPA program oversees the management of 6 sanctuaries in the CNMI (5 on Saipan, 1 on Rota). Four of the six of these areas are no-take MPAs, where no extraction of living resources is allowed. The remaining two are single-species MPAs, one of which protects *Trochus* sp. and the other, all sea cucumber species.

For information on significant changes that have occurred in the CNMI's system of marine protected areas, please see SAMP (pages 40-44).

Ocean resource mapping or information system

NOAA-led MARAMP cruises (2003,2005,2007) have nearly completed near-shore bathymetric mapping of nearshore areas in the Marianas. This has led to the unexpected consequence of technically-savvy fishermen increasing bottomfish exploitation of previously unrecognized drop-offs and pinnacles. The mapping has also provided a base layer that will provide input into current models and area management plans. Using this bathymetry, the South Pacific Geosciences Commission (SOPAC) was contracted to conduct an erosion assessment and develop a current model that will allow refinement of coastal hazards maps, SAMP planning (such as marine protected areas) and improve management related actions such as oil spill responses. These changes were funded through the U.S. CRI.

Ocean habitat research, assessment, or monitoring programs

The Coral Reef Program funded long-term monitoring efforts continue to refine our understanding of land-ocean connectivity in the Marianas. Partnerships with NOAA Coral Health and Monitoring Program and the NOAA Pacific Islands Ocean Observation System have resulted in increased capacity to monitor ocean conditions on Saipan. Ocean monitoring capabilities are ongoing and constantly evolving, always building on previous efforts.

Public education and outreach efforts

In 2007, CRM kicked-off a community outreach campaign in collaboration with RARE Pride. Focusing on the endemic Yellow Crowned Butterfly Fish, education has been done in hundreds of school classrooms since 2009 regarding this animal, the health of our marine ecosystems and ways that individuals can protect the coral reefs. By performing before and after surveys to gauge public knowledge, opinion and behavior change, the success of this campaign has been well-documented. Nearly all surveys showed that the campaign has made a positive impact and has influenced behavior changes that will safeguard our reef. CZM funding in §306 is used for this campaign.

CNMI contributed to the 2008 US state of the Reef Report, which provided an overview of CNMI's reefs in particular. This allows for increased public availability of scientific reports documenting issues and findings regarding the CNMI's coral reef resources. The compilation of CNMI's section of the report was achieved through non-CZM funding sources.

CNMI Coral Reef Local Action Strategy

No changes have been made to the Coral Reef Local Action Strategies (LAS). Local Action Strategies have been an example of adaptive management with local priorities (such as local NPS programs) driving management recommendation, which in turn allowed the leveraging of additional funding to address needs. However, the original LAS approach has shifted to an "integrated, place based management" paradigm entitled Conservation Action Planning (CAP) with Laolao Bay on Saipan and Talakhaya on Rota remaining priority sites that are receiving substantial management attention from a range of funding sources and management authorities. Both of these CAPs have allowed successful competition for additional funding through ARRA and the Coral Program to address CZM

related management issues. CAPs are used to further address coral reef areas that are of particular concern in the Commonwealth and that are not specifically addressed within the LAS document. The CRM program does, however, continue to implement the existing LAS. For further discussion of CAPs developed since 2008 and funding sources and outcomes, see SAMP (pages 40-44).

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	**Type of gap or need** (regulatory, policy, data, training, capacity, communication & outreach)	**Level of priority** (H,M,L)
Development of a comprehensive ocean management plan	Policy	High
Increased collaboration between federal agencies and territorial government regarding ocean resources	Regulatory	High
Increased knowledge of invasive species threats to the CNMI, stronger policy and public outreach regarding the threat of invasive species introduction	Policy	High

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)? Briefly explain the level of priority given for this enhancement area.

High. CZMP proposes to retain a high priority for the Ocean Resources enhancement area. Though progress has been made in the last ten years, traditional resource conflicts still exist and are being amplified by new development, changing climate and an ever-high demand for fisheries resources. Research, planning and government collaboration is necessary to ensure appropriate use of the resources of CNMI waters.

2. Will the CMP develop one or more strategies for this enhancement area? Briefly explain why a strategy will or will not be developed for this enhancement area.

Yes. This assessment report has identified many program gaps that CRM feels can be addressed with a single strategy which we are proposing under the §309 Ocean Resources enhancement area. Following the lead of the Hawaii CZM Program, CRM feels that the development of a comprehensive CNMI Ocean Resources Management Plan (ORMP) will work to address invasive species, marine debris, intra-agency conflict, and ocean resource use issues. The ORMP will provide either regulation or guidance on development, activities, or uses of areas under CNMI's jurisdiction. In this way, it will be an expansion/complement to the existing CRM Lagoon and Reef APC. Work in the previous ten years has been leading up to this assessment period where we feel that we have the information needed to develop this management plan. Implementation of this strategy will be a high priority in the next assessment period, addressing issues summarized in numerous enhancement areas.

H. Energy and Government Facility Siting

Section 309 Programmatic Objectives

Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities and Government facilities and energy-related activities and Government activities which may be of greater than local significance

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. In the table below, characterize the types of energy facilities in your coastal zone (e.g., oil and gas, Liquefied Natural Gas (LNG), wind, wave, Ocean Thermal Energy Conversion (OTEC), etc.) based on best available data. If available, identify the approximate number of facilities by type.

Type of Energy Facility	**Exists in CZ** (# or Y/N)	**Proposed in CZ** (# or Y/N)	**Interest in CZ** (# or Y/N)	**Significant changes since last assessment** (Y or N)
Oil and gas facilities	Yes [1]	No	No	No
Pipelines	A one-mile pipeline exists from the port terminal to the CUC power plant in Lower Base. Pipeline will be replaced in 2011.	No	No	No
Electric trans-mission cables	Electric transmission and distribution circuits - 453 km of circuits in Saipan, Tinian and Rota.	No	No	No
LNG	No	No	No	No
Wind	No	No	Yes	No
Wave	No	No	Yes	No
Tidal	No	No	Yes	No
Current (ocean, lake, river)	No	No	Yes	No
OTEC	No	No	Yes	No
Solar	No	No	Yes	No
Other - Waste to Energy Gasification	No	No	Yes	No
Geothermal	No	No	Yes	No
Other (please specify)				

1. Power generation facilities exist in the CNMI as follows:
Saipan - 54 MW capacity between four power plants
Rota - 4.4 MW capacity; 3 MW generator capability (Independent power producer, Rota Resort)
Tinian - 17.8 MW capacity

2. Please describe any significant changes in the types or number of energy facilities sited, or proposed to be sited, in the coastal zone since the previous assessment.

There have been no significant changes in the energy facilities sited or proposed to be sited since the last assessment in 2006. Energy generation facilities are oversized for the current energy use in the CNMI, so no energy facility growth is expected to be seen in the near future (pers. communication with Executive Director, CUC). There are hopes that renewable energy generation will eventually result in the replacement of diesel engine fired base load.

3. Does the state have estimates of existing in-state capacity and demand for natural gas and electric generation? Does the state have projections of future capacity? Please discuss.

The Commonwealth Utilities Commission (CUC) has estimated in-state available capacity as of October 2010 at 58 MW on Saipan, 17.8 MW on Tinian and 4.4 MW on Rota. Estimated 2010 peak demands are 45 MW on Saipan (down from 72 MW in 2002), 1.8 MW on Rota and 5.2 for Tinian.

4. Does the state have any specific programs for alternative energy development? If yes, please describe including any numerical objectives for the development of alternative energy sources. Please also specify any offshore or coastal components of these programs.

The CUC has long been working to develop a renewable energy portfolio, but no major developments have been made. Though there is interest shown from CUC and CNMI Division of Energy in various alternative energy sources, none are currently being pursued due to lack of funding, personnel and overall project viability. Among alternative energy sources that have been considered by the CNMI government and the CUC, gasification (waste to energy conversion) and OTEC are currently being most seriously considered. The CNMI also has significant geothermal resources that may be the focus of future alternative energy efforts.

CUC currently encourages distributed generation of renewable energy via a net-metering program for all customers to potentially expand renewable energy use. A statutory revision has been drafted for the local legislature to attract prospective renewable energy investment in the CNMI, as the existing law discourages this type of project. CUC is posed to invited proposers in four areas: wind, solar, gasification and geothermal energy. ARRA and the Energy Office continues to fund energy efficiency improvements at power plants (pers. communication with Executive Director, CUC).

5. If there have been any significant changes in the types or number of government facilities sited in the coastal zone since the previous assessment, please describe.

No significant changes in the type or number of government facilities sited in the coastal zone has occurred. Since the last assessment CRM has issued nine major permits for government facilities. The most notable of these were the closure of the Puerto Rico Dump, permitted in December 2008, and the Tinian Municipal Solid Waste Landfill permitted in 2008, but not yet started. Future government facility sitings are likely to include a Rota Municipal Solid Waste Landfill.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. Does the state have enforceable policies specifically related to energy facilities? If yes, please provide a brief summary, including a summary of any energy policies that are applicable to only a certain type of energy facility.

Any energy-related facility must meet all requirements of the Saipan Zoning Law. These include, but are not limited to, safety code setbacks, possible building and/or site design requirements, and landscaping requirements. Specific requirements for geothermal facilities are given under requirements for renewable energy facilities in Section 704 of the Zoning Law. The Governor must certify for geothermal facility that (1) the location is one of a few practicable access points to the renewable energy resource, (2) the construction and operation of the facility must be cost-effective compared to the utility's avoided cost of generation, and (3) the facility will be of substantial importance to the functioning of a cost-effective electric utility system. Similarly, the Saipan Zoning Law was amended to include specific requirements for wind energy facilities. Wind energy facilities must comply with Saipan Zoning Law turbine design, wind tower height and setbacks, FAA regulations, paint and finish requirements, lighting requirements, signs and advertising requirements, system maintenance regulations, proper designation of unauthorized access areas, and shadow/flicker affect rules.

2. Please indicate if the following management categories are employed by the State or Territory and if there have been significant changes since the last assessment:

Management categories	**Employed by state/territory** (Y or N)	**Significant changes since last assessment** (Y or N)
Statutes or regulations	Yes	Yes
Policies	Yes	No
Program guidance	Yes	Yes
Comprehensive siting plan (including SAMPs)	No	No
Mapping or GIS	Yes	No
Research, assessment or monitoring	Yes	No
Education and outreach	Yes	No
Other (please specify)		

3. For management categories with significant changes since the last assessment, characterize the change; specify whether it was a 309 of other CZM-driven change, and specify the funding source; and characterize the outcomes and effectiveness of the changes. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

Statutes or Regulations

The Saipan Zoning Law was adopted in 2008 and has since taken effect. The law limits the development of nonrenewable energy facilities (with conditional use permit) to designated industrial or rural zoning districts and allows renewable energy facilities (with conditional use permit) in all zoning districts. For information on the Zoning Law, see Coastal Hazards (page 18).

Program Guidance

The CNMI DPW, Division of Energy adopted the first CNMI Tropical Energy Code which became effective on August 27, 2009. The adoption and implementation of this code was necessary as a requirement for grant funding for the CNMI pursuant to the American Recovery and Reinvestment Act (ARRA) of 2009. The code seeks to ensure that the construction of new buildings incorporates the fundamentals of energy-efficient technologies to minimize energy use (CNMI Tropical Energy Code, 2009). This code was funded through a 2009 ARRA grant awarded to the CNMI Division of Energy.

Enforcement of the energy code has been difficult as developers protect new charges they are facing to bring building plans into compliance, but it is beginning to meet less resistance and has been implemented in several new buildings (pers. communication with Director, Div. of Energy).

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	**Type of gap or need** (regulatory, policy, data, training, capacity, communication & outreach)	**Level of priority** (H,M,L)
Education and Outreach regarding personal and business reductions in energy use	Communication and Outreach	Low
Permit requirements for large-scale alternative energy facilities (e.g. windmill farms, geothermal energy infrastructure)	Regulatory	Low

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)? Briefly explain the level of priority given for this enhancement area.

Low. Because there is no projected expansion of or addition to energy facilities in the CNMI, this enhancement area will not be a priority area in the next five years. Though multiple government facilities have been permitted, and others are proposed, the current CRM regulations and DEQ Earthmoving permit regulations will be adequate to process these developments as the need arises.

2. Will the CMP develop one or more strategies for this enhancement area? Briefly explain why a strategy will or will not be developed for this enhancement area.

No. Though we would like to see additional education and outreach done regarding energy use reduction, the Division of Energy will be leading this effort. A §309 Strategy is not necessary at this time to ensure that energy-use is included in the numerous outreach activities that our office participates in.

Similarly, though the CNMI remains interested in several sources of alternative energy, most notably waste-to-waste gasification, geothermal energy, solar, wind and tidal power, the current economic situation and the difficulties facing the CUC make it very unlikely that these alternatives sources will be exploited in the next assessment period. CRM will remain aware that current regulations may not be adequate to permit large scale alternative energy facilities and will address this program gap when the need arises.

I. Aquaculture

Section 309 Programmatic Objectives

Adoption of procedures and policies to evaluate and facilitate the siting of public and private aquaculture facilities in the coastal zone, which will enable States to formulate, administer, and implement strategic plans for marine aquaculture

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Generally characterize the private and public aquaculture facilities currently operating in your state or territory.

Type of existing aquaculture facility	Describe recent trends	Describe associated impacts or use conflicts
Tilapia culture with recirculating production systems	Tilapia aquaculture has been slowly growing since 2006. Recent developments include one small-scale farmer recently installing a hatchery system to produce fry for commercial sale.	Introduction of *Oreochromis niloticus* - the red Thai Variety and the Pearl White Variety - have been identified for most permanent bodies of freshwater on Saipan. Presence of breeding Tilapia in saltwater influenced drainages is indicative of possible intrusion of Tilapia into marine waters. Discharge of low quality water and waste from tilapia facilities.
Marine shrimp culture with recirculating production systems	Shrimp aquaculture has been slowly growing since 2006.	Discharge of low quality water and solid waste from shrimp facilities.
SPF (specific-pathogen free) shrimp broodstock culture	Export of broodstock to Asia is undertaken by Saipan's largest commercial producer shrimp. This began in 2009.	Discharge of low quality water and solid waste from shrimp facilities.
Aquaculture demonstration projects	The project began in 2009. Due to a lack of funding, the project was dismantled in early 2010.	Severe threat of invasive species introduction, as cultivated varieties are non-native. Quarantine protocols were ignored and non-native species were being cultivated in the marine environment.

The table below summarizes general trends in the CNMI aquaculture industry from 2002 to 2007.

Activity	2002	2007
Aquaculture Farms	5	5
Ponds	3	15
Tanks	11	51
Quantity Sold (lbs)	2,700	33,350
Sales	$ 6,150	$66,725

Figure 1: The 2007 U.S. Agriculture Census Statistics for CNMI aquaculture production. (http://www.wia.gov.mp/downloads/Final_CEDS_Report.pdf)

Management Characterization

Purpose : To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	**Employed by state/territory** (Y or N)	**Significant changes since last assessment** (Y or N)
Aquaculture regulations	Yes	Yes
Aquaculture policies	Yes	Yes
Aquaculture program guidance	Yes	Yes
Research, assessment, monitoring	No	No
Mapping	No	No
Aquaculture education & outreach	No	No
Other (please specify)		

2. For management categories with significant changes since the last assessment, characterize the change; specify whether it was a 309 of other CZM-driven change, and specify the funding source; and characterize the outcomes and effectiveness of the changes. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

Aquaculture regulations

CRM considers aquaculture a major citing and it is subject to CNMI Water Quality Standards Regulations, Earthmoving and Erosion Control Regulations, Wastewater Treatment and Disposal Rules and Regulations, Underground Storage Tank regulations, Well Drilling and Well Operations Regulations and CNMI Air Pollution Control Regulations through DEQ. DLNR/DFW currently issues permits for importation of live aquatic species from outside the Commonwealth, for collection of juvenile or undersize species for aquaculture purposes and for export of aquaculture products.

Saipan Zoning Law of 2008 (see Coastal Hazards, page 18) defines aquaculture as "the raising and collection of fish, shellfish, and algae for food. This use may include retail sale of produce raised at the site". The law limits aquaculture developments to Industrial and Agricultural zoning districts without conditional permit and to Rural and Mixed Commercial zoning districts with conditional permit. This law prohibits any aquaculture development existing in a nonconforming zone from expanding or renovating any facilities.

Effectiveness of the regulations put on development of aquaculture facilities by Saipan Zoning Law is currently hard to gauge. No aquaculture development has been permitted since the Zoning Law of 2008 went into effect.

Aquaculture Policies

Throughout the previous assessment period, the CNMI government has been developing strategic economic plans for the country. In 2009, a formal Economic Restoration Summit was sponsored by

the CNMI Department of Commerce and the Commonwealth Development Authority where participants acceded that the CNMI should pursue and nurture four alternative industries in order to diversify the local economy: agriculture, aquaculture, calling centers and educational tourism. It has been made government policy to encourage development within these industries, giving reason to believe that aquaculture may experience an increase in funding and interest during the next assessment period. This was not a 309 driven change.

The Comprehensive Economic Development Strategic Plan 2009-2014 for the U.S. Commonwealth of the Northern Mariana was released in November of 2009 and there has been little to no change in aquaculture industry as yet due to this policy. The plan summarizes the economic state of the CNMI and proposes plans to develop, among other industries, aquaculture.

Aquaculture program guidance

Under Public Law 15-43, which became effective January 14th, 2007, Northern Marianas College Cooperative Research Extension and Education Service (NMC-CREES) is mandated to be the lead authority in aquaculture development for the CNMI. NMC-CREES conducts research, extension and educational activities for aquaculture development. Section 4, subsection 102 of the Act stipulates that the NMC-CREES shall establish a Commonwealth Aquaculture Development Plan and that the plan shall include building and operating an aquaculture facility in the Commonwealth.

The Commonwealth Aquaculture Development Plan is currently in draft form. The plan puts high priority on further tilapia and marine shrimp aquaculture and medium priority on development of marine finfish, freshwater crustacean, giant clam and milkfish industries. The development of the plan was strongly supported by the CNMI government and the implementation will most likely be as well. Recently (2009) the CNMI Department of Commerce sponsored an economic summit which identified aquaculture as one of the 4 new pillars of the economy. It remains to be seen whether the adoption of this plan will impact the rate of aquaculture development in the CNMI, but there is a strong possibility that aquaculture and/or mariculture will become a larger economy in the CNMI in the upcoming years. This was not a 309 or CZM driven change. As the plan is still in its draft phase, any outcome has not yet occurred. It is expected that this plan will result in an expansion of the aquaculture industry in the CNMI.

NMC-CREES sponsored the Open Ocean Cage Culture Symposium on January 26-27, 2011 to begin discussions regarding open water cage aquaculture in the CNMI. The workshop was attended by more than 200 people, and included presentations from aquaculturists around the Pacific, and individuals representing regulatory agencies. Stating reasons such as high utility costs for onshore aquaculture, relatively pristine ecosystems outside of Saipan's coral reefs, and CNMI's proximity to the East Asian markets, aquaculture experts from NMC-CREES emphasized open ocean cage aquaculture as a very viable economic opportunity in Saipan. CRM will continue to participate in meetings and workshops that will further clarify the direction that open water aquaculture will take in the upcoming years.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	**Type of gap or need** (regulatory, policy, data, training, capacity, communication & outreach)	**Level of priority** (H,M,L)
Stronger intra-agency (and inter-agency between CRM Rota, Saipan and Tinian) coordination regarding aquaculture permitting	Regulatory/Outreach	Medium
Enforcement staff training to properly assess permit compliance at aquaculture facilities	Training/Capacity	Low
Regulations sufficient to permit future off-shore cage farming aquaculture developments	Regulatory	Medium

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)? Briefly explain the level of priority given for this enhancement area.

Low. To date, there is only one large-scale aquaculture program in the CNMI, but we expect this to change within the next five years. Through current CRM regulations, all aquaculture are considered major sitings. It is known that even the small-scale aquaculture in the CNMI poses a real environmental risk, especially in the discharge of low quality effluent runoff and possibility of exotic organism introduction to fresh and marine waters. With the growing interest in aquaculture, there is a need for CRM to closely monitor emerging issues surrounding aquaculture programs. However, with the current economic environment we do not expect to see developments (such as open ocean cage farming) that fall outside of CRM's regulations. As the direction that aquaculture will take in the next years becomes more clear, CRM will revisit this possible need.

2. Will the CMP develop one or more strategies for this enhancement area? Briefly explain why a strategy will or will not be developed for this enhancement area.

No. The CNMI is able to adequately address aquaculture development through standing regulations, and has not developed a strategy in this enhancement area. Through the upcoming years, CRM will work to ensure that regulations are properly conveyed to other agencies and to the public. An online permit tracking system that is currently underway will hopefully prove an effective way to disseminate information regarding aquaculture regulations and any emerging concerns. Furthermore, aquaculture and especially the threat of aquatic invasive species will be given consideration under the proposed Ocean Resources strategy to develop a comprehensive CNMI Ocean Resources Management Plan.

Selected References

Berger, Gayle M., Gourley, John and Schroer, Greg. September 2005. CNMI Division of Fish and Wildlife. *Comprehensive Wildlife Conservation Strategy for the Commonwealth of the Northern Mariana Islands.*

Burr, S.E. *et al*. 2005. *Commonwealth of the Northern Mariana Islands (CNMI) wetlands report: State of the wetlands and recommendations for new wetlands policy.*

CNMI Coastal Resources Management. 1992. *Shoreline Access Guide to Saipan*.

CNMI Coastal Resources Management Office. June 2006. *2006 CNMI Section 309 Program Improvements Assessment and Strategy Report.*

Coral Reef Conservation Program. 2008. *CNMI's Coral Reef Management Priorities*. http://coralreef.noaa.gov/aboutcrcp/strategy/reprioritization/managementpriorities/.

CNMI Department of Public Works, Energy Division. August 2009. *CNMI Tropical Energy Code* in the *Commonwealth Register.* Volume 31, No. 8.

CNMI Division of Environmental Quality, prepared by Horsley Witten Group. April 2009. *CNMI Erosion and Sediment Control Field Guide: Version 1.0 for Contractors and Site Inspectors.*

CNMI Division of Fish and Wildlife, prepared by Schroer, Greg of Resources Northwest Consultants, LLC. May 2007. *Management Plan for the Bird Island Wildlife Conservation Area and Bird Island Marine Sanctuary.*

CNMI Division of Fish and Wildlife, prepared by Schroer, Greg of Resources Northwest Consultants, LLC. May 2007. *Management Plan for the Kagman Wildlife Conservation Area and Forbidden Island Marine Sanctuary.*

CNMI Division of Fish and Wildlife, prepared by Schroer, Greg of Resources Northwest Consultants, LLC. April 2005. *Management Plan for the Managaha Marine Conservation Area.*

Commonwealth Economic Development Strategic Planning Commission, CNMI Department of Commerce, Office of the Governor. 2009. *Comprehensive Economic Development Strategic Plan 2009-2014 for the U.S. Commonwealth of the Northern Mariana Islands.*

CNMI Emergency Management Office and AMC Consulting Company. July 2010. *Standard State Mitigation Plan.*

CNMI Saipan and Northern Islands Legislative Delegation. *Saipan Zoning Law of 2008: 10 CMC§ 3511, PLL 16-6.* http://zoning.gov.mp/pubs/170.pdf

Davis, Mary M. 2001. *Hydrogeomorphic Functional Assessment: Depressional Wetlands of the CNMI.*

Denton, G.R.W. *et al*. 2009. *Impact of a coastal dump in a tropical lagoon on trace metal concentrations in surrounding marine biota: A case study from Saipan, Commonwealth of the Northern Mariana Island (CNMI).* Marine Pollution Bulletin 58, pg. 424-431.

Fletcher, C.H., Barbee, M., Dyer, M., Genz, A., Vitousek, S., 2007. *Mañagaha Island Shoreline Stability Assessment, Report to the Coastal Resources Management Office, Commonwealth of the Northern Mariana Islands, Saipan*, 90 p.

Gombos, Meghan and Herrmann, Kathleen. CNMI Division of Environmental Quality. January 2009. *Laolao Bay Conservation Action Plan.*

Hilton, David R. *et al*. 2004. *The 2003 Eruption of Anatahan.* MARGINS Newsletter, edition 12.

Houk, Peter et al. Bearden, Brian, ed. CNMI Division of Environmental Quality. 2010. *Commonwealth of the Northern Marianas Islands Integrated 305(b) and 303(d) Water Quality Assessment Report.*

Jenson, John *et al*. 2006. *Karst of the Mariana Islands: The interaction of tectonics, glacio-eustasy, and freshwater/seawater mixing in island carbonates* Geological Society of America Special Papers 404, p. 129-138.

Keel, Thomas, Mylroie, John and Jenson, John. 2004. *Preliminary Report on the Caves and Karst of Rota (Luta), CNMI.* Water & Environmental Research Institute of the Western Pacific University of Guam, Technical Report No. 105.

Northern Marianas College: Cooperative Research Extension and Education Service. June 2010. *Draft CNMI Aquaculture Development Plan.*

Scott, D.A. (ed.) 1993. *A Directory of Wetlands in Oceania*. IWRB, Slimbridge, U.K. and AWB, Kuala Lumpur, Malaysia.

Title 15, Chapter 10: Coastal Resources Management Rules and Regulations. Public Law 3-47. Commonwealth Register Vol. 26, No. 05. May 2004.

United States Department of Agriculture, Natural Resources Conservation Service, Pacific Islands Area West. July 2007. *Conservation Plan: Island of Rota.*

US Fish and Wildlife Service, 1989. *National Wetlands Inventory, Map of Saipan.*

IV. Strategy to Meet Priority Needs

FY 2011 - FY 2015

Upon compilation of the prior enhancement area assessments, the CNMI CZM Program has determined that improvements and/or changes are necessary in several areas, and has developed the following strategies.

A. Amendment of CRM wetlands policy

I. Issue Area(s)

The proposed strategy or implementation activities will support the following priority (high or medium) enhancement area(s) (check all that apply):

- ☐ Aquaculture
- ☐ Cumulative and Secondary Impacts
- ☐ Energy & Government Facility Siting
- ✓ Wetlands
- ☐ Coastal Hazards
- ☐ Marine Debris
- ☐ Ocean Resources
- ☐ Public Access
- ☐ Special Area Management Planning

II. Program Change Description

A. *The proposed strategy will result in, or implement, the following type(s) of program changes (check all that apply):*

- ☐ A change to coastal zone boundaries;
- ✓ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;
- ☐ New or revised local coastal programs and implementing ordinances;
- ☐ New or revised coastal land acquisition, management, and restoration programs;
- ☐ New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,
- ✓ New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management.

B. *Describe the proposed program change(s) or activities to implement a previously achieved program change. If the strategy will only involve implementation activities, briefly describe the program change that has already been adopted, and how the proposed activities will further that program change. (Note that implementation strategies are not to exceed two years.)*

This strategy is a continuation of a project presented in the previous §309 report. Since 2006, it has been determined that many CRM regulation amendments (in addition to the wetland regulations proposed here) are necessary. As such, drafted wetlands legislation and regulation amendments will not be adopted until all amendments to the CRM regulations are prepared (these include revisions to CRM's permit process, amendments to clarify regulations prohibiting the removal of aquatic vegetation, and clarifications regarding the difference between major and minor siting permits, among others).

CRM will adopt regulations to clearly state CRM jurisdiction over all isolated wetlands and more adequately define wetland areas. Also added to the CRM regulations will be a definition for the word "mitigation" and a sequential mitigation policy to use as guidance when considering permit requests. This will included a requirement to mitigate for all wetland functions, e.g. endangered species habitat, pollutant filtration, storage and conveyance of flood waters, and public recreation activities.

III. Need(s) and Gap(s) Addressed

Identify what priority need the strategy addresses, and explain why the proposed program change or implementation activities are the most appropriate means to address the priority need. This discussion should reference the key findings of the Assessment and explain how the strategy addresses those findings.

By amending regulations, CRM will address the high priority need to formalize wetland mitigation requirements and move closer to achieving the goal of no net loss of wetland function in the CNMI. Specific regulations for amendment include Section 9 (iii): Wetland and Mangrove APC Management Standards and (iv) Wetland and Mangrove APC Use Priorities. Wetlands on public land have been shown to be at the highest risk of development. By amending legal regulations to include mitigation requirements, CRM will ensure that any new development will take the full suite of impacted wetland function into consideration. Further, by amending regulations to include a sequential mitigation policy, CRM will be able to require, within legal authority, that a "no impact option" is considered for all developments taking place within or immediately adjacent to known wetland areas. Legal action is the only way to adequately address this priority need, as amended regulations will give CRM the authority to enforce a no net loss policy, buffer zone and mitigation requirements.

IV. Benefit(s) to Coastal Management

Discuss the anticipated effect of the program change or implementation activities including a clear articulation of the scope and value in improved coastal management and resource protection.

Wetlands in the CNMI provide invaluable habitat for federally-recognized endangered species, floodwater conveyance and storage functions, and purification functions that safeguard water quality in coastal areas which are heavily utilized for fishing and recreation and provide a unique recreation experience for tourists and locals alike. Destruction of the CNMI's remaining wetland areas could lead to serious and very costly consequences such as increased flooding vulnerability in certain areas, a decrease in recharge to ground water supplies, and a higher risk of coastal water contamination due to compromised wetland filtration function. As such, it is of utmost importance that the wetland areas that are yet undeveloped or filled be preserved to fulfill important ecological functions. Amended regulations proposed here will allow for CRM to effectively conserve these wetland areas while working toward an eventual increase, through mitigation projects, in wetland acreage and function in the CNMI.

V. Likelihood of Success

Discuss the likelihood of attaining the proposed program change and implementation activities. The state or territory should address: 1) the nature and degree of support for pursuing the strategy and the proposed change; and, 2) the specific actions the state or territory will undertake to \maintain or build future support for achieving and implementing the program change, including education and outreach activities.

The likelihood of success for this strategy is high. In July 2005, AECOS, Inc. submitted a final report to CRM after an extensive study on the state of CNMI's wetlands and the current wetland policies and

laws. The report lays out recommended policy changes and amendments that should be adopted for optimal protection of wetlands. These reports were used to draft all regulation amendments that are being proposed with this strategy. This strategy is simply acknowledging that CRM drafted all wetland regulation amendments as proposed in the last assessment period and still plans to move forward with adoption of these legal measures.

Once CRM regulations are amended, outreach activities will be conducted to ensure that the public and private sectors are aware of CRM's wetland policy and laws. This public outreach may take the form of newspaper or radio announcements, personal informational letters to all known construction and consulting companies, person communication with private landowners holding lands with known wetlands, updates to the soon-to-be-completed CRM permit application database, and/or an online website announcement.

There are no foreseen obstacles to implementation of this strategy, as all amendments have been drafted. The work plan below shows specific final steps that will be taken to ensure that this strategy is completed in the proposed time period. As is specified in the CZMA §1531: Coastal Resources Management Regulatory Powers - Permit Process, and the CNMI Administrative Procedures Act , six CRM Agency members (DEQ, DLNR, HPO, CUC, Dept. of Commerce, and DPW)must approve any changes to CRM regulations. All agency member representatives have been consulted in the drafting of wetland regulations and are in agreement with the changes. Final adoption now requires only the formal review of the proposed regulations and formal approval of the changes. CRM does not anticipate that this will be an obstacle to implementation.

VI. Strategy Work Plan

Using the template below, provide a general work plan that includes the major steps necessary for achieving the program change and/or implementing a previously achieved program change. The plan should identify significant projected milestones/outcomes, a schedule for completing the strategy, and budget estimates. If an activity will span two or more years, it can be combined into one entry (i.e., Years 2-3 rather than Year 2 and then Year 3). While the annual outcomes are a useful guide to ensure the strategy remains on track, OCRM recognizes that these benchmarks may change some over the course of the five-year strategy due to unforeseen circumstances. The same holds true for the annual budget estimates. If the state intends to fund implementation activities for the proposed program change, describe those in the plan as well. Further detailing of annual tasks, budgets, benchmarks, and work products will be determined through the annual award negotiation process.

Total Years: 2
Total Budget: $43,443
Final Outcome(s) and Products: Amended CRM regulations to more clearly define wetland and ensure optimal protection of CNMI's remaining wetlands.

> **Year(s):** 2011
> **Description of activities:**
> May 2011: CRM will provide one electronic and one hard copy of all proposed CRM Regulation amendments (including changes to wetland regulations) to each of six CRM Agency members (DEQ, DLNR, HPO, CUC, Dept. of Commerce, and DPW).
>
> July 2011: Upon review of the regulations by Agency representatives, a meeting will be held to discuss the amendments and for CRM personnel to hear any comments or suggestions.

August 2011: Suggestions and comments will be considered and changes to the proposed regulations will be made. This second draft will be sent back to all CRM Agencies for approval.

October 2011: Upon approval by all six CRM Agencies, the proposed regulations will be submitted to the Commonwealth Register and made available for public comment (30-day period). Any comments received will be considered by CRM personnel and appropriate changes will be made.

November 2011: A final draft of the proposed regulations will be send to each of six CRM Agency members for final approval.

December 2011: The CNMI Governor will sign the final document, finalizing adoption of the proposed regulations.

Outcome(s): Adoption of the all draft regulation amendments.
Budget: $21,468

Year(s): 2012
Description of activities: Public outreach to ensure the public and private sectors are aware of all changes made to wetland regulations.
Outcome(s): Public compliance with the newly adopted no net loss policy.
Budget: $21,975

VII. **Fiscal and Technical Needs**

A. Fiscal Needs: *If 309 funding is not sufficient to carry out the proposed strategy, identify additional funding needs. Provide a brief description of what efforts the applying agency has made, if any, to secure additional state funds from the legislature and/or other sources to support this strategy.*

The majority of funds necessary to carry out this strategy reflect the Nonpoint Source Pollution Coordinator's salary. Section 309 funds will also be used for supplies (2012) to allow for completion of all tasks. In addition, CRM will make approximately $3,000 of printing and advertising funds available through our program income (or federal fund savings) for public outreach aspects of the strategy. This will be sufficient to complete all tasks.

B. Technical Needs*: If the state does not possess the technical knowledge, skills, or equipment to carry out the proposed strategy, identify these needs. Provide a brief description of what efforts the applying agency has made, if any, to obtain the trained personnel or equipment needed (for example, through agreements with other state agencies).*

All technical knowledge and skills are present within our program.

B. Preliminary exploration of sea level rise (and associated climate change impacts) as a coastal threat in the CNMI

I. Issue Area(s)

The proposed strategy or implementation activities will support the following priority (high or medium) enhancement area(s) (check all that apply):

- ☐ Aquaculture
- ✓ Cumulative and Secondary Impacts
- ☐ Energy & Government Facility Siting
- ☐ Wetlands
- ✓ Coastal Hazards
- ☐ Marine Debris
- ✓ Ocean Resources
- ✓ Public Access
- ☐ Special Area Management Planning

II. Program Change Description

A. *The proposed strategy will result in, or implement, the following type(s) of program changes (check all that apply):*

- ☐ A change to coastal zone boundaries;
- ☐ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;
- ☐ New or revised local coastal programs and implementing ordinances;
- ☐ New or revised coastal land acquisition, management, and restoration programs;
- ✓ New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,
- ✓ New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management.

B. *Describe the proposed program change(s) or activities to implement a previously achieved program change. If the strategy will only involve implementation activities, briefly describe the program change that has already been adopted, and how the proposed activities will further that program change. (Note that implementation strategies are not to exceed two years.)*

As a Pacific island chain, CNMI's coastline and natural resources are vulnerable to impacts of climate change, particularly rising sea levels. If levels rise even to conservative estimates, coastal flooding will be exacerbated, shoreline erosion will be increased, and certain public and private lands will become submerged. These changes will impact private landowners, marine and terrestrial ecosystems and the Commonwealth economy. The Coastal Zone Management Act states, "because global warming may result in a substantial sea level rise with serious adverse effects in the coastal zone, coastal states must anticipate and plan for such an occurrence." The following strategy aims to fulfill the responsibility of

CRM, under the Coastal Zone Management Act, to proactively plan for climate change adaptation and mitigation. Working from the US Global Change Research Program's "Global Climate Change Impacts in the US" report, CRM will focus on three phenomena - 1)likely decreasing availability of freshwater resources, 2) communities, infrastructure and ecosystems becoming more vulnerable to inundation due to both sea level rise (SLR) and coastal storms, and 3)effects of climate change on coastal and marine ecosystems that will likely have large-scale consequences for tourism and fisheries.

To date, public agencies in the CNMI have not put forth any substantial or coordinated effort to predict impacts of SLR and to incorporate these threats into coastal management planning. CRM recognizes the need to begin planning for SLR response, and proposes to conduct a Risk and Vulnerability Analysis for Saipan, considering impacts of SLR on coastal hazards such as flooding and storm surge. This strategy lays out steps that will be taken to gain the necessary knowledge to consider SLR as a factor in determining flooding and inundation threat in the CNMI Standard State Mitigation Plan (SSMP). Tasks here will lead to the inclusion of areas at elevated threat to SLR or other climate change effects into CRM's Coastal Hazards APC, ensuring that this strategy will lead to an enforceable policy. In this way, it is a step to enable CRM to protect the CNMI's population, built and natural environments from coastal hazards related to climate change.

In addition, CRM feels a need for more accessible and understandable resources regarding climate change to be available to the public. This strategy calls for a survey to gauge public knowledge and attitudes regarding climate change. The results of this survey will guide the development of an outreach campaign to educate the CNMI's residents on the threats of climate change, highlighting potential impacts in the CNMI (stressing both economic and non-economic impacts on coastal areas) and summarizing ways that the general public can help to mitigate these threats. The outreach campaign aims to secondarily target business groups and government agencies, and describe ways to decrease greenhouse gas emissions and set a strong example of environmental stewardship for the public.

III. Need(s) and Gap(s) Addressed

Identify what priority need the strategy addresses, and explain why the proposed program change or implementation activities are the most appropriate means to address the priority need. This discussion should reference the key findings of the Assessment and explain how the strategy addresses those findings.

CRM has actively participated in the Emergency Management Office's development of the Standard State Mitigation Plan and is committed to providing up-to-date information needed to accurately predict risk levels and coastal hazard threats. In the past two updates, however, it has become clear that a lead role must be taken to incorporate SLR projections and predicted climate change impacts into the plan and ensure that mitigation and response measures to coastal inundation, increased risk of flooding and an increased rate of coastal erosion are included. Two gaps in the CZM program were identified in the Coastal Hazards assessment, both of which are addressed here. The completion of this strategy will lead to the incorporation of SLR in the SSMP and will work to provide CRM with the necessary information to update the Coastal Hazards APC maps to include areas that may be at elevated risk to the impacts of climate change.

IV. Benefit(s) to Coastal Management

Discuss the anticipated effect of the program change or implementation activities including a clear articulation of the scope and value in improved coastal management and resource protection.

The effects of climate change are largely recognized as pressing threats in the Pacific islands and around the world. Decreases in freshwater resources, SLR and associated coastal land inundation, marine ecosystem degradation and increasing pressure on fisheries resources due to coral bleaching and ocean acidification, and increased risk of tropical storms and flooding are all currently seen in small island nations of the Pacific. It is of utmost importance that coastal states and territories seriously consider climate change adaptation and mitigation options.

The implementation of this strategy is a first step for the CNMI in planning for and easing the potential negative effects of a changing climate. Many stakeholders that CRM plans to engage are members of under-staffed and over-tasked agencies. It has been difficult in the past to move the issue of climate change to the forefront of management and coastal hazards planning. By convening a climate change working group, CRM can effectively open interagency discussion on the topics of climate change and increased coastal hazards associated with rising sea levels. Public outreach campaigns will enable CRM to create educational documents that are understandable and accessible to the general public. By doing this, CRM hopes for increasing public support as the CNMI moves into years of adaptation and mitigation project implementation.

V. Likelihood of Success

Discuss the likelihood of attaining the proposed program change and implementation activities. The state or territory should address: 1) the nature and degree of support for pursuing the strategy and the proposed change; and, 2) the specific actions the state or territory will undertake to \maintain or build future support for achieving and implementing the program change, including education and outreach activities.

There is an increasingly large network of support agencies and documents that will guide the CNMI as we begin to address climate change. Notably, the NOAA OCRM has recently published a web-based guide to help coastal states and territories begin planning for climate change impacts. This and other guidance documents were used in the development of this strategy and will be used throughout implementation. CRM has worked with the NOAA Coastal Services Center and with NOAA-supported Integrated Ocean Observing System programs. These partnerships will help to provide CRM the technical support that we may require. Many coastal states, and increasingly, Pacific islands have begun addressing climate change and SLR. CRM will not ignore these ongoing efforts, but will rather use all examples of successful (and unsuccessful) approaches to guide our management planning.

CNMI EMO fully supports this strategy and will be consulted throughout the implementation of this project. Along with a diverse group of other stakeholders, CRM expects EMO to strongly support all tasks included in this strategy.

VI. Strategy Work Plan

Using the template below, provide a general work plan that includes the major steps necessary for achieving the program change and/or implementing a previously achieved program change. The plan should identify significant projected milestones/outcomes, a schedule for completing the strategy, and budget estimates. If an activity will span two or more years, it can be combined into one entry (i.e., Years 2-3 rather than Year 2 and then Year 3). While the annual outcomes are a useful guide to ensure the strategy remains on track, OCRM recognizes that these benchmarks may change some over the course of the five-year strategy due to unforeseen circumstances. The same holds true for the annual budget estimates. If the state intends to fund implementation activities for the proposed program change,

describe those in the plan as well. Further detailing of annual tasks, budgets, benchmarks, and work products will be determined through the annual award negotiation process.

Total Years: 5
Total Budget: $439,514
Final Outcome(s) and Products: A major product of this strategy will be CNMI-specific SLR models and sea level projections that can be used by natural resource and emergency management planners. In addition, CRM expects that one outcome of the established Climate Change Working Group will be a document that details major anticipated effects of climate change in the CNMI and gives preliminary assessments of areas that may be at elevated risk. Data from a survey detailing the public's knowledge and attitudes regarding climate change will lead to the development and implementation of an outreach campaign to educate the CNMI on possible effects of climate change and adaptation methods.

Year(s): 2011
Description of activities: CRM will begin to explore funding sources that will be necessary to complete the work in later years of this strategy. Notably, CRM will apply to host a CZM Fellow during the years of 2012-2014 to assist with implementation of this strategy.
Outcome(s): Though CRM is unable to predict whether funding will be granted to continue to implement this strategy, the outcome of work in 2011 will include submitted applications and contacts with funding agencies and organizations.
Budget: $37,064

Year(s): 2012
Description of activities: A CNMI Climate Change Working Group (CCWG), made up of stakeholders from CNMI and federal government agencies, private companies, and interested members of the public, will be convened. An initial meeting of this group will serve to further identify larger threats that the group will work to address, and determine the individuals and groups that are best suited for future adaptation planning activities.
Outcome(s): The CCWG will be the CNMI's first working group dedicated to climate change adaptation and mitigation. The group will serve as a source of information, a network through which projects can be effectively implemented, and a venue for a diverse group of stakeholders to offer opinions regarding the appropriate actions for CNMI to be taking regarding climate change.
Budget: $36,050

Year(s): 2013
Description of activities: Subsequent meetings of the CCWG will occur this year to examine individual threats (e.g. coastal lands inundation) by researching trends in the past regarding the phenomenon, and compiling all relevant local and global data. Next, the group will determine what areas of the CNMI are vulnerable to any particular threat and will further explore the reasons for this vulnerability. This may be elevation, the presence of critical fish and wildlife habitat, a high population density, especially of low income families, buildings of high economic or cultural value, the existence of critical government infrastructure, degraded wetlands or other ecosystems, or numerous other variables. The information will serve two purposes: 1) to be provided to a contractor in later steps of the strategy who will compile a Risk and Vulnerability Analysis (RVA) for the CNMI which includes the identification and assessment of critical facilities and infrastructure that would be affected by SLR, flooding, and storm surge; 2) to be used for public education and later to begin planning for mitigation

activities. The assessment will be based on the current best available information, but will be presented to the public as a working document, as resource managers will be continually adapting the vulnerability assessment as more information becomes available.

Outcome(s): The group will complete a Climate Change Vulnerability Assessment as is detailed in *Adapting to Climate Change: A Planning Guide for State Managers*, steps 2.1-2.4 (NOAA OCRM, 2010). This will give an initial picture (to be elaborated after SLR models are developed) of how the CNMI may be effected by climate change.
Budget: $80,000

Year(s): 2013
Description of activities: A public survey regarding climate change will be conducted to gain insight on knowledge, attitudes and behaviors of CNMI citizens. Demographic information that will supplement U.S. Census data will be collected to be used as we consider areas at an increased threat due to economic status. The surveyors will analyze all data and create a list of outreach campaign recommendations to be used by CRM staff in the next step of this strategy.
Outcome(s): The Climate Change Working Group will have the knowledge to carry out an education and outreach campaign to most effectively educate CNMI citizens on the effects of climate change and SLR. A outreach campaign plan will be provided to CRM to effectively disseminate information on climate change to the public.
Budget: $10,000

Year(s): 2014
Description of activities: An education and outreach campaign will be carried out across the CNMI regarding the effects of climate change, and ways that we can work to mitigate these changes and adapt to new conditions. The campaign will aim to make easily-understandable information available to all groups, from schools to government agencies to private citizens. Outreach may take the form of posters and other printed materials, school visits, radio and/or television public service announcements, an information public forum, or other educational events. We also hope to utilize the very popular annual CRM tide-calendar to provide information on climate change.
Outcome(s): The outcome of the education campaign will be increased knowledge among agencies, school children and the general adult public regarding climate change threats and adaptations.
Budget: $38,200

Year(s): 2015
Description of activities: To improve the Climate Change Vulnerability Assessment (completed in Year 1 of the strategy), CRM will provide for the development of a full Risk and Vulnerability Analysis and SLR scenarios and simulations in the CNMI. Models will be created to detail 20-, 50- and 100-year projections for high, medium and low levels of climate change. We expect that a contractor will base these models on the Intergovernmental Panel on Climate Change's (IPCC) projections, but will adapt the models to account for local conditions. This will be done using existing SHOALS LiDAR data to calculate inundation schedules in hours of flooding per year (note: LiDAR data will require a certain amount of processing). Sea level models will most likely be based on local tide gauge history (existing data set), forward projections of tide, and water level variability. SLR projection maps can

then be overlaid with other maps such as roads, essential services infrastructure, or oil/gas structures. These models will be made available to the public and will be provided (along with the vulnerability assessment) to the CNMI Emergency Management Office for the development of the 2016 SSMP.
Outcome(s): The initial outcome of this task will be nine SLR models, specific to the CNMI, based on different time frames and levels of climate change. The SLR models will inform a full, research-backed Risk and Vulnerability Analysis.
Budget: $238,200

VII. **Fiscal and Technical Needs**

A. Fiscal Needs: *If 309 funding is not sufficient to carry out the proposed strategy, identify additional funding needs. Provide a brief description of what efforts the applying agency has made, if any, to secure additional state funds from the legislature and/or other sources to support this strategy.*

CRM expects to seek outside funding. CZM §309 funding will provide for salaries of staff who are working to realize this strategy. We will look especially to the Coastal Resilience Networks Program and the NOAA Climate Program Office as possible sources of funding for services and technical needs that are not found with CRM. Though applications were not submitted for FY2011 grant announcements under these programs, CRM has begun preparations to submit a proposal to be considered for the FY2012 funding competitions.

B. Technical Needs*: If the state does not possess the technical knowledge, skills, or equipment to carry out the proposed strategy, identify these needs. Provide a brief description of what efforts the applying agency has made, if any, to obtain the trained personnel or equipment needed (for example, through agreements with other state agencies).*

The implementation of this plan will require technical assistance from outside of the CNMI program. CRM also expects that a person to develop and conduct a public survey, specific to the CNMI and climate change impacts in the Pacific, may be necessary. We will be involving Saipan NOAA Field Office personnel and possibly staff at other regional NOAA offices for assistance in carrying out the vulnerability assessment. Lastly, technical assistance will be required to carry out the tasks proposed for year three of the strategy. CRM hopes to use NOAA's contract vehicle to hire an individual of group qualified to develop sea level rise models for the CNMI.

C. Development of highly erodible soils and highly permeable soils APCs

I. Issue Area(s)

The proposed strategy or implementation activities will support the following priority (high or medium) enhancement area(s) (check all that apply):

- ☐ Aquaculture
- ✓ Cumulative and Secondary Impacts
- ☐ Energy & Government Facility Siting
- ☐ Wetlands
- ☐ Coastal Hazards
- ☐ Marine Debris
- ☐ Ocean Resources
- ☐ Public Access
- ✓ Special Area Management Planning

II. Program Change Description

A. *The proposed strategy will result in, or implement, the following type(s) of program changes (check all that apply):*

- ☐ A change to coastal zone boundaries;
- ☐ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;
- ☐ New or revised local coastal programs and implementing ordinances;
- ☐ New or revised coastal land acquisition, management, and restoration programs;
- ✓ New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,
- ☐ New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management.

B. *Describe the proposed program change(s) or activities to implement a previously achieved program change. If the strategy will only involve implementation activities, briefly describe the program change that has already been adopted, and how the proposed activities will further that program change. (Note that implementation strategies are not to exceed two years.)*

This project is a repeat of a proposed strategy in the 2006 Section 309 Assessment and Strategy report. CRM proposes to adopt two additional APCs - Highly Erodible Soils and Highly Permeable Soils. By adopting the proposed regulations, CRM will ensure that any development taking place in the APC (as is defined below) will be required to obtain a CRM permit rather than only a CNMI Earthmoving and Erosion Control Permit as is currently required. This will work to better ensure that any development

that has the potential to significantly affect natural hydrology or cause adverse impacts due to erosion and sedimentation be properly considered and, if permitted, required to implement appropriate BMPs.

The proposed Highly Erodible Soils APC will be defined as areas identified in the United States Department of Agriculture (USDA) Soil Conservation Service Soil Survey for the CNMI that pose a moderate to severe erosion hazard. The current soils map will be adopted with the proposed regulation. Management standards in the drafted regulation state that "(1) proposed projects that will produce a significant level of soil erosion and sedimentation will be prohibited; and (2) proposed projects that require land clearing, but do not employ erosion control BMPs will be prohibited".

The proposed Highly Permeable Soils APC will be defined Group A or B in the USDA Soil Conservation Service Soil Survey for the CNMI. The current soils map will be adopted with the proposed regulation. Management standards in the drafted regulation state that "(1) All projects must maintain or enhance quality and quantity of groundwater and aquifer recharge; (2) preserve natural hydrology; (3) maintain natural environmental conditions and the land's capacity to produce or support vegetation; (4) prohibit discharge of hazardous materials, waste, littler, debris, sewage, petroleum products, sediment, and the destruction of productive habitats; and (5) preserve, maintain, and prohibit significant adverse impacts to caves, speleothems, karst lands, and associated ecosystems and historical artifacts".

Please see Appendix 3 (page 91) for a draft map of Saipan showing Highly Erodible Soils and Highly Permeable Soils APCs.

As with wetland regulation amendments, draft regulations are complete, but awaiting adoption. Official adoption will be considered and authorized by a board of CRM partner agencies, including DEQ, HPO, DLNR, CUC, Dept. of Commerce, and DPW. As CRM has additional regulation amendments that are awaiting adoption, the addition of the Highly Erodible Soils APC and Highly Permeable Soils APC will be adopted only when the additional amendments are complete and available for Board consideration. To keep these important regulation changes as a CRM priority, we are resubmitting this project for the 2011-2015 assessment period.

III. Need(s) and Gap(s) Addressed

Identify what priority need the strategy addresses, and explain why the proposed program change or implementation activities are the most appropriate means to address the priority need. This discussion should reference the key findings of the Assessment and explain how the strategy addresses those findings.

It is clear from the Cumulative and Secondary Impacts assessment and from numerous other CNMI priority setting documents (Coral Reef LAS, Laolao Bay and Talakhaya CAPs, CNMI Nonpoint Source Pollution Program goals) that sedimentation is one of the top threats that marine ecosystems in the CNMI are facing. Unplanned developments upon highly erodible soils that do not include proper stormwater management measures, gravel roads that do not properly divert runoff to vegetated areas, and unpermitted forest clearing on public and private land have left the CNMI extremely vulnerable to runoff issues. As such, one of the major needs identified in this report is the need for further regulation of land clearing and development taking place upon certain soil types. By expanding CRM APC jurisdiction to include these highly erosion-prone areas, we will address this gap in regulation.

IV. Benefit(s) to Coastal Management

Discuss the anticipated effect of the program change or implementation activities including a clear articulation of the scope and value in improved coastal management and resource protection.

Deforestation and development on steeply sloped areas and in areas with highly erodible soil has led to significant sediment loading in CNMI waters. One way to better ensure that developments in the future are well-planned and include management practices to decrease erosion and sedimentation is to regulate development in certain areas and on certain soil types within the CRM permitting program. By developing the proposed APC, which encompasses these erosion-prone areas, CRM hopes to stem improper land use and steer developments away from areas that will increase current sedimentation loads. The development of this APC aims to directly affect the health of coral reefs and other marine ecosystems in the long-term.

V. Likelihood of Success

Discuss the likelihood of attaining the proposed program change and implementation activities. The state or territory should address: 1) the nature and degree of support for pursuing the strategy and the proposed change; and, 2) the specific actions the state or territory will undertake to \maintain or build future support for achieving and implementing the program change, including education and outreach activities.

The likelihood of success for this strategy is high. All regulation amendments that are being proposed with this strategy are drafted and are ready for submission to the Commonwealth Register. CRM does not expect the proposed amendments to be controversial.

Once regulations are amended to include the new APC, CRM will conduct numerous outreach activities to ensure that the public and private sectors are aware of the changes. This public outreach may take the form of newspaper or radio announcements, personal informational letters to all known construction and consulting companies, personal communication for private landowners holding lands within the newly delineated APC area, updates to the soon-to-be-completed CRM permit application database, and/or an online website announcement.

The work plan below shows specific final steps that will be taken to ensure that this strategy is completed in the proposed time period. As is specified in the CZMA §1531: Coastal Resources Management Regulatory Powers - Permit Process, and the CNMI Administrative Procedures Act , six CRM Agency members (DEQ, DLNR, HPO, CUC, Dept. of Commerce, and DPW)must approve any changes to CRM regulations. All agency member representatives have been consulted in the drafting amended APC regulations and are in agreement with the changes. Final adoption now requires only the formal review of the proposed regulations and formal approval of the changes.

VI. Strategy Work Plan

Using the template below, provide a general work plan that includes the major steps necessary for achieving the program change and/or implementing a previously achieved program change. The plan should identify significant projected milestones/outcomes, a schedule for completing the strategy, and budget estimates. If an activity will span two or more years, it can be combined into one entry (i.e., Years 2-3 rather than Year 2 and then Year 3). While the annual outcomes are a useful guide to ensure the strategy remains on track, OCRM recognizes that these benchmarks may change some over the course of the five-year strategy due to unforeseen circumstances. The same holds true for the annual budget estimates. If the state intends to fund implementation activities for the proposed program change,

describe those in the plan as well. Further detailing of annual tasks, budgets, benchmarks, and work products will be determined through the annual award negotiation process.

Total Years: 2
Total Budget: $43,443
Final Outcome(s) and Products: The final outcome of this project will be the adoption of the proposed Highly Erodible Soils and Highly Permeable Soils APCs and addition of these to CRM's official regulations. A second outcome will be the public and private sectors being aware of the new updated CRM regulations.

Year(s): 2011
Description of activities:
May 2011: CRM will provide one electronic and one hard copy of all proposed CRM Regulation amendments (including the addition of the proposed highly erodible soils and highly permeable soils APC) to each of six CRM Agency members (DEQ, DLNR, HPO, CUC, Dept. of Commerce, and DPW).

July 2011: Upon review of the regulations by Agency representatives, a meeting will be held to discuss the amendments and for CRM personnel to hear any comments or suggestions.

August 2011: Suggestions and comments will be considered and changes to the proposed regulations will be made. This second draft will be sent back to all CRM Agencies for approval.

October 2011: Upon approval by all six CRM Agencies, the proposed regulations will be submitted to the Commonwealth Register and made available for public comment (30-day period). Any comments received will be considered by CRM personnel and appropriate changes will be made.

November 2011: A final draft of the proposed regulations will be send to each of six CRM Agency members for final approval.

December 2011: The CNMI Governor will sign the final document, finalizing adoption of the proposed regulations.

Outcome(s): Adoption of the all draft regulation amendments.
Budget: $21,468

Year(s): 2012
Description of activities: Public outreach to ensure the public and private sectors are aware of changes made to APC areas.
Outcome(s): Public compliance with Highly Erodible Soils and Highly Permeable Soils APC regulations.
Budget: $21,975

VII. Fiscal and Technical Needs

A. Fiscal Needs: *If 309 funding is not sufficient to carry out the proposed strategy, identify additional funding needs. Provide a brief description of what efforts the applying agency has made, if any, to secure additional state funds from the legislature and/or other sources to support this strategy.*

Section 309 funding, supplemented by CRM program income, is expected to be sufficient to carry out the proposed strategy. The adoption of the proposed APC and the subsequent public outreach will be done concurrently with the same tasks outlined in the "Amendment of CRM wetlands policy" strategy. Funding needs outside of §309 include approximately $3,000 of CRM program income to publicize new regulation changes (2012).

B. Technical Needs*: If the state does not possess the technical knowledge, skills, or equipment to carry out the proposed strategy, identify these needs. Provide a brief description of what efforts the applying agency has made, if any, to obtain the trained personnel or equipment needed (for example, through agreements with other state agencies).*

The state possesses all technical knowledge and skills to carry out the proposed strategy.

D. Revision of the Saipan Lagoon Use Management Plan

I. Issue Area(s)

The proposed strategy or implementation activities will support the following priority (high or medium) enhancement area(s) (check all that apply):

- ☐ Aquaculture
- ✓ Cumulative and Secondary Impacts
- ☐ Energy & Government Facility Siting
- ☐ Wetlands
- ☐ Coastal Hazards
- ☐ Marine Debris
- ☐ Ocean Resources
- ☐ Public Access
- ✓ Special Area Management Planning

II. Program Change Description

A. *The proposed strategy will result in, or implement, the following type(s) of program changes (check all that apply):*

- ☐ A change to coastal zone boundaries;
- ☐ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;
- ☐ New or revised local coastal programs and implementing ordinances;
- ☐ New or revised coastal land acquisition, management, and restoration programs;
- ✓ New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,
- ☐ New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management.

B. *Describe the proposed program change(s) or activities to implement a previously achieved program change. If the strategy will only involve implementation activities, briefly describe the program change that has already been adopted, and how the proposed activities will further that program change. (Note that implementation strategies are not to exceed two years.)*

The Saipan Lagoon Use Management Plan is scheduled to be revisited and updated by CRM every five years to ensure that studies cited are up-to-date and applicable to current management issues. The five-year update will include a review of all studies, an update of any data sets that can be supplemented by data from long term monitoring efforts and addition of any new information that is necessary to address emerging user issues. Though it is difficult to determine at this time what studies may be necessary in 2015 to address user conflicts, CRM expects to revisit the ongoing issue of shoreline erosion and assess the health of sea grass beds in known boat transfer areas. As part of the next SLUMP

update, CRM will contract an individual or firm to review relevant lagoon use and pollutant/wastewater discharge regulations, and provide CRM with a list of recommended changes. The SLUMP will then directly influence the enforceable regulations which fall under the CRM Lagoon and Reef APC and likely effect wider stormwater regulations.

III. Need(s) and Gap(s) Addressed

Identify what priority need the strategy addresses, and explain why the proposed program change or implementation activities are the most appropriate means to address the priority need. This discussion should reference the key findings of the Assessment and explain how the strategy addresses those findings.

This strategy addresses an anticipated need to update the 2010 SLUMP report in 2015. The management plan clearly calls for update every five years to ensure that the plan is positively influencing management decisions and adequately addressing lagoon user issues. The plan corresponds with the Saipan Lagoon and Garapan Tourist District/Garapan Watershed sections of the Resource Characterization table in the SAMP enhancement area assessment (page 40). The assessment identifies conflicts such as impacts from motorized and non-motorized recreation, sediment-heavy stormwater runoff, high demand for boat launches and recreational access, cumulative impacts of tourism and related development and insufficient non-beach parking. The SLUMP aims to address these conflicts and aide resource managers in regulating use and development to meet both ecological and economic needs. The updated SLUMP will be a guidance document available to permit managers who interpret regulations with the CRM Lagoon and Reef APC, and contain recommendations for any policy changes necessary.

IV. Benefit(s) to Coastal Management

Discuss the anticipated effect of the program change or implementation activities including a clear articulation of the scope and value in improved coastal management and resource protection.

CNMI depends heavily on ocean resources and there is a large demand for these within the Saipan Lagoon region. This region, offshore from the most extensive development on the island, has become increasingly degraded due to improper use and possible overuse. The lagoon is heavily used for a variety of recreation activities such as jet skis, banana boats, fishing, swimming, sail boarding, kite boarding, boating, snorkeling and diving. The abatement of long-term and emerging user conflict between various tourism types, indigenous uses, public access, commercial and economic development, the marine transportation industry and conservation have long been a focus of the CZM program. To address this issues, CRM developed the first SLUMP in 1984 as a guiding document to better assess and permit various uses. The plan was updated in 1997 and a 2011 update is in the final states of revision. It has been very apparent during the 2011 update that the plan needs to be revisited every five years for the document to be useful to resource managers. We estimate that the next update will begin in 2014. The SLUMP allows resource management personnel access to information on lagoon current flow, water quality, stormwater input and erosion models, heavy metal bio-contamination data, improved characterization of benthic habitats within the lagoon, and a clear picture of overall ecosystem health. The SLUMP has also allowed CRM and other agencies to identify priority issues and to pursue management projects that effectively target these issues. With timely updates to the SLUMP plan, it will continue to be a valuable resource within the CZM program.

V. Likelihood of Success

Discuss the likelihood of attaining the proposed program change and implementation activities. The state or territory should address: 1) the nature and degree of support for pursuing the strategy and the proposed change; and, 2) the specific actions the state or territory will undertake to \maintain or build future support for achieving and implementing the program change, including education and outreach activities.

The 2011 update of the SLUMP has been a time-consuming and resource intensive project, but the result will be a comprehensive and very usable management plan for the Saipan Lagoon. Because long-term monitoring is in place within the lagoon and we propose to update the plan much more frequently, we expect the 2015 update to be successful within the time frame indicated. Although we cannot be sure what updates will be necessary in 2015, we expect that data will be updated, new studies may be undertaken to increase our knowledge of the biological, chemical and physical characteristics of the lagoon, and an updated user survey will be administered. Emerging issues and data gaps will be monitored and noted over the next five years to ensure that CRM is prepared to successfully implement the proposed strategy.

VI. Strategy Work Plan

Using the template below, provide a general work plan that includes the major steps necessary for achieving the program change and/or implementing a previously achieved program change. The plan should identify significant projected milestones/outcomes, a schedule for completing the strategy, and budget estimates. If an activity will span two or more years, it can be combined into one entry (i.e., Years 2-3 rather than Year 2 and then Year 3). While the annual outcomes are a useful guide to ensure the strategy remains on track, OCRM recognizes that these benchmarks may change some over the course of the five-year strategy due to unforeseen circumstances. The same holds true for the annual budget estimates. If the state intends to fund implementation activities for the proposed program change, describe those in the plan as well. Further detailing of annual tasks, budgets, benchmarks, and work products will be determined through the annual award negotiation process.

Total Years: 2
Total Budget: $143,600
Final Outcome(s) and Products: The final product of the project will be an updated Saipan Lagoon Use Management Plan that meets CRM's needs and provides scientifically-backed guidance for managing various user groups within Saipan Lagoon.

> **Year(s):** 2014
> **Description of activities:** A committee within CRM will be convened to review the 2010 SLUMP and make recommendations for any updates and additions necessary. As part of the review, a user survey will be conducted to give CRM a clear picture of emerging user conflicts in the Saipan Lagoon area (e.g. conflict between various marine sports operations). Included in this survey will be an extensive set of interviews to identify any needs perceived by individual community members, various government agencies, business owners, etc. Lastly, any funding necessary (outside of 309 funds) to update the document will be identified and secured.
> **Outcome(s):** CRM will have a clear idea of any additional studies and/or data collection necessary to update the SLUMP and will have access to necessary funding.
> **Budget:** $56,800

Year(s): 2015
Description of activities: The SLUMP update committee will oversee any contracted studies that will be carried out to add information to the management plan, perform data analysis on long-term data sets that will be updated, and develop strategies to address any emerging issues identified in the Saipan Lagoon area.
Outcome(s): CRM will publish a 2015 edition of the SLUMP, to be used as a guiding document within the CZM program.
Budget: $86,800

VII. Fiscal and Technical Needs

A. Fiscal Needs: *If 309 funding is not sufficient to carry out the proposed strategy, identify additional funding needs. Provide a brief description of what efforts the applying agency has made, if any, to secure additional state funds from the legislature and/or other sources to support this strategy.*

The SLUMP update will be completed with §309 funds augmented by other federal funds. 309 funds will cover staff salaries and supplies associated with the project. Other costs (non-federal) are contractual and include $15,000 for an update of the Saipan Lagoon user survey, and an estimated $45,000 to cover professional services for any technical studies that are deemed necessary.

B. Technical Needs*: If the state does not possess the technical knowledge, skills, or equipment to carry out the proposed strategy, identify these needs. Provide a brief description of what efforts the applying agency has made, if any, to obtain the trained personnel or equipment needed (for example, through agreements with other state agencies).*

We expect that there may be technical skills or equipment necessary for the SLUMP update that are not found within CRM. NOAA PIRO, University of Guam WERI and outside contractors continue to be essential partners to CNMI's CZM program in the completion of technical and scientific studies such that are necessary to gain a useful picture of Saipan Lagoon.

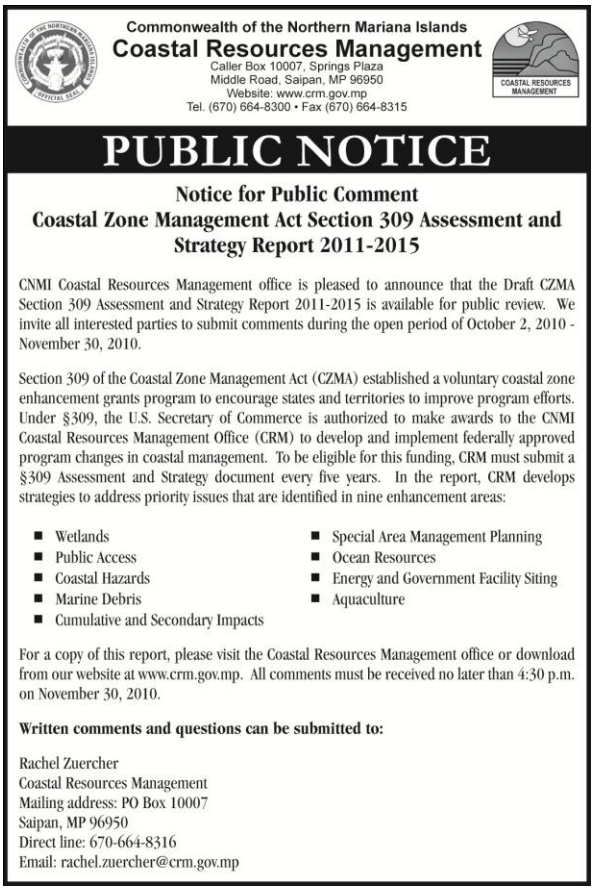
E. Five Year Budget Summary by Strategy

At the end of the Strategy section, please include the following budget table summarizing your anticipated Section 309 expenses by strategy for each year.

Strategy Title	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Funding
Amendment of CRM wetlands policy	**$21,468**[1]	**$21,975**				**$43,443**
Preliminary exploration of sea level rise as a coastal threat in the CNMI	**$37,064**	**$36,050**	**$80,000**	**$38,200**	**$38,200**	**$229,514**
			$10,000[2]		**$200,000**	**$210,000**
Development and Adoption of Highly Erodible Soils and Highly Permeable Soils APCs	**$21,468**	**$21,975**				**$43,443**
Revision of Saipan Lagoon Use Management Plan				**$41,800**	**$41,800**	**$83,600**
				$15,000	**$45,000**	**$60,000**
Total Funding	**$80,000**	**$80,000**	**$80,000**	**$80,000**	**$80,000**	**$400,000**
			$10,000	**$15,000**	**$245,000**	**$270,000**

1. The numbers in white boxes indicate expected CZMA Section 309 funds to be spent on the project.
2. The numbers in the light grey boxes indicate funding from other sources expected to be necessary to complete the project. This funding will come from CRM program income and from other grant sources.

Appendix 1: Public Involvement Advertisements and Comments Received



Commonwealth of the Northern Mariana Islands
Coastal Resources Management
Caller Box 10007, Springs Plaza
Middle Road, Saipan, MP 96950
Website: www.crm.gov.mp
Tel. (670) 664-8300 • Fax (670) 664-8315

COASTAL RESOURCES MANAGEMENT

PUBLIC NOTICE

Notice for Public Comment
Coastal Zone Management Act Section 309 Assessment and Strategy Report 2011-2015

CNMI Coastal Resources Management office is pleased to announce that the Draft CZMA Section 309 Assessment and Strategy Report 2011-2015 is available for public review. We invite all interested parties to submit comments during the open period of October 2, 2010 - November 30, 2010.

Section 309 of the Coastal Zone Management Act (CZMA) established a voluntary coastal zone enhancement grants program to encourage states and territories to improve program efforts. Under §309, the U.S. Secretary of Commerce is authorized to make awards to the CNMI Coastal Resources Management Office (CRM) to develop and implement federally approved program changes in coastal management. To be eligible for this funding, CRM must submit a §309 Assessment and Strategy document every five years. In the report, CRM develops strategies to address priority issues that are identified in nine enhancement areas:

- Wetlands
- Public Access
- Coastal Hazards
- Marine Debris
- Cumulative and Secondary Impacts
- Special Area Management Planning
- Ocean Resources
- Energy and Government Facility Siting
- Aquaculture

For a copy of this report, please visit the Coastal Resources Management office or download from our website at www.crm.gov.mp. All comments must be received no later than 4:30 p.m. on November 30, 2010.

Written comments and questions can be submitted to:

Rachel Zuercher
Coastal Resources Management
Mailing address: PO Box 10007
Saipan, MP 96950
Direct line: 670-664-8316
Email: rachel.zuercher@crm.gov.mp

A notice for public comment for the CZMA Section 309 Assessment and Strategy Report 2011-2015 was advertised to the public, government agencies and other interested parties in the local newspaper, on the CRM website, and by email. The comment period was open from 2 October - 30 November 2010 and was extended for government agencies.

Comments were received from only one agency, the Commonwealth Utilities Corporation, and were reviewed and considered for incorporation into the final document. Comment points were all in reference to the Energy and Government Facility Siting assessment area, and are summarized as follows:

1. The assessment does not discuss the ongoing net-metering program that CUC operates to encourage customers to self-generate using renewable sources.

2. The assessment does not mention a statutory revision pending in the local legislature that will encourage investment in renewable energy, especially in the following areas: wind, solar, gasification and geothermal.

3. Note that a Tinian Wastewater Treatment Plant is not a likely government facility siting to occur in the near future.

4. Note that CUC is working with ARRA and the CNMI Division of Energy to make supply side (energy efficiency) improvements at power plants.

CUC also provided updated generator output capacity values, updated peak demands in Saipan, Rota and Tinian for 2010, and a breakdown of distance of transmission and distribution cables in the CNMI.

Appendix 2: Microbiological Contamination Beach Advisory Data, 2008-2009

ENTEROCOCCI 2008	Site ID Names	Total number of samples	Total number of Violations	Percent Violation (%)
LOCATION (Saipan)				
Wing Beach	WB 01	50	2	4
Pau-Pau Beach	WB 02	50	1	2
Nikko Hotel	WB 03	50	2	4
San Roque School Beach	WB 04	50	7	**14**
Plumeria Hotel	WB 05	50	2	4
Aqua Resort Hotel	WB 06	50	1	2
Tanapag Meeting Hall	WB 07	50	18	**36**
Central Repair Shop	WB 08	50	17	**34**
Sea Plane Ramp	WB 09	50	0	0
DPW Channel Bridge	WB 10	50	43	**86**
South Puerto Rico Dump	WB 11.2	50	35	**70**
Smiling Cove Marina	WB 12	50	1	2
American Memorial Park Drainage	WB 12.1	50	20	**40**
Outer Cove Marina	WB 13	50	0	0
Micro Beach	WB 14	50	6	**12**
Hyatt Hotel	WB 15	50	1	2
Dai-Ichi Hotel	WB 16	50	0	0
Drainage #1 (Dai-ichi drainage)	WB 17	50	10	**20**
Samoa Housing	WB 18	50	4	8
Hafa-Adai Hotel	WB 19	50	20	**40**
Drainage #2 (Hafa-Adai Hotel drainage)	WB 20	50	23	**46**
Garapan Fishing Dock	WB 21	50	25	**50**
Garapan Beach	WB 22	50	3	6
Drainage #3 (Garapan Beach Drainage)	WB 23	50	24	**48**
Chalan Laulau Beach	WB 24	50	1	2
San Jose Beach	WB 25	50	0	0
Civic Center Beach	WB 26	50	2	4
Diamond Hotel Beach	WB 27	50	1	2
Grand Hotel	WB 28	50	1	2
Community School Beach	WB 29	50	1	2
Sugar Dock	WB 30	50	33	**66**
CK Dist #2 Drainage	WB 31	50	16	**32**
CK Dist #4 Lally Beach	WB 32	50	3	6

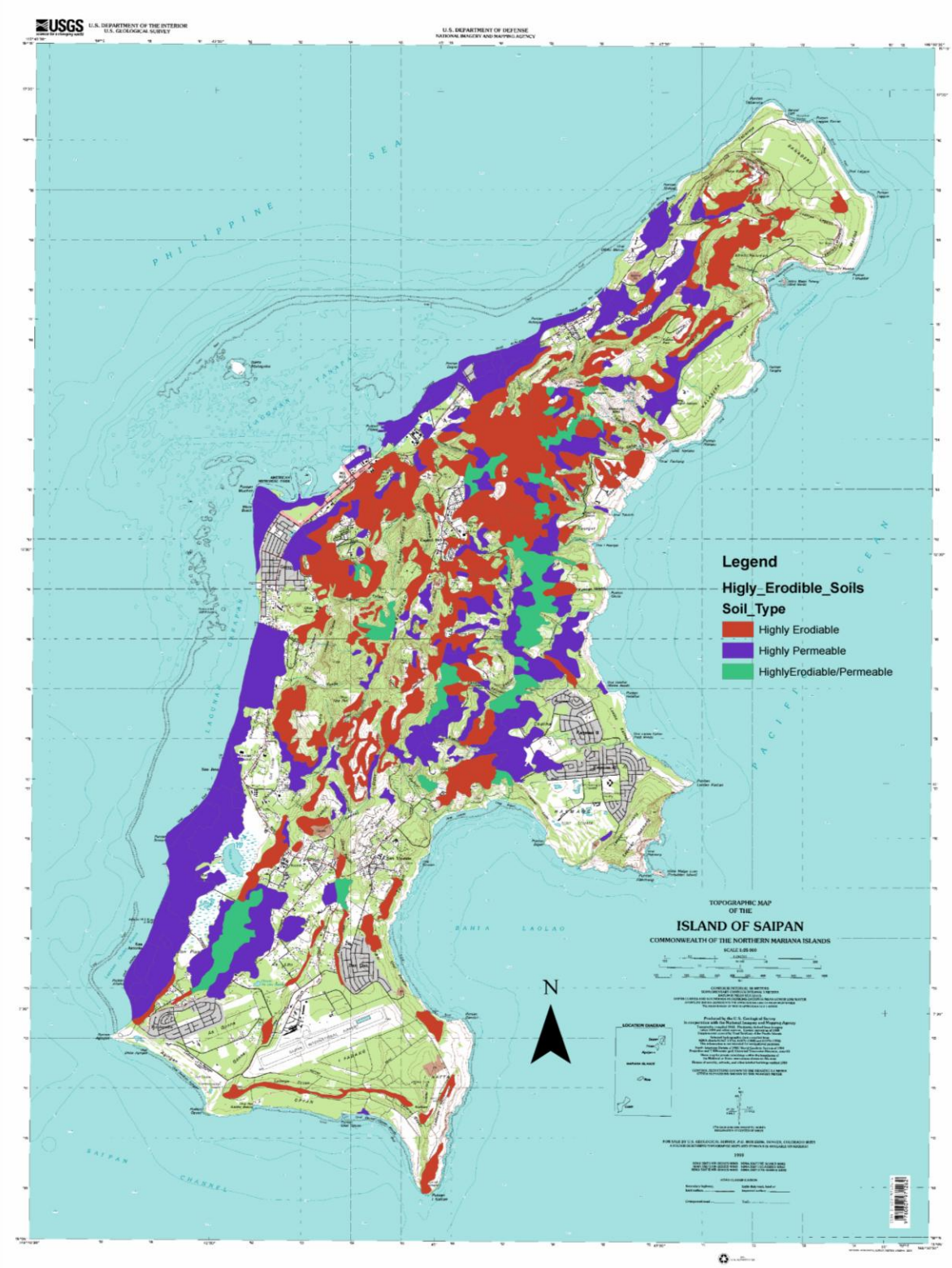
Chalan Piao Beach	WB 33	50	2	4
Hopwood School Beach	WB 34	50	3	6
San Antonio Beach	WB 35	50	2	4
PIC Beach	WB 36	50	3	6
San Antonio Lift Stn.	WB 37	50	11	**22**
Grotto Cave	NEB 01	30	0	**0**
Bird Island Beach	NEB 02	30	1	3.33
Jeffrey's Beach	NEB 03	30	11	**36.67**
Hidden Beach	NEB 07	30	9	**30**
Old Man By the Sea	NEB 04	30	3	**10**
Marine Beach	NEB 05	30	4	**13.33**
Tank Beach	NEB 06	30	3	**10**
North Laolao Beach	SEB 02	30	4	**13.33**
South Laolao Beach	SEB 03	30	11	**36.67**
Obyan Beach	SEB 04	30	1	3.33
Ladder Beach	SEB 05	30	0	0
Unai Dangkolo	SEB 06	30	4	**13.33**
ENTEROCOCCI 2009	**Site ID Names**	**Total number of samples**	**Total number of Violations**	**Percent Violation (%)**
LOCATION				
Wing Beach	WB 01	52	3	5.77
Pau-Pau Beach	WB 02	52	5	9.62
Nikko Hotel	WB 03	52	3	5.80
San Roque School Beach	WB 04	52	5	9.62
Plumeria Hotel	WB 05	52	0	0
Aqua Resort Hotel	WB 06	52	2	3.85
Tanapag Meeting Hall	WB 07	52	20	**38.46**
Central Repair Shop	WB 08	52	29	**55.77**
Sea Plane Ramp	WB 09	52	0	0
DPW Channel Bridge	WB 10	52	41	**78.85**
South Puerto Rico Dump	WB 11.2	52	26	50
Smiling Cove Marina	WB 12	52	6	**11.54**
American Memorial Park Drainage	WB 12.1	52	26	50
Outer Cove Marina	WB 13	52	1	1.92
Micro Beach	WB 14	52	4	7.69
Hyatt Hotel	WB 15	52	2	3.85
Dai-Ichi Hotel	WB 16	52	4	7.69
Drainage #1 (Dai-ichi drainage)	WB 17	52	5	9.62

Samoa Housing	WB 18	52	1	1.92
Hafa-Adai Hotel	WB 19	52	10	**19.23**
Drainage #2 (Hafa-Adai Hotel drainage)	WB 20	52	9	**17.31**
Garapan Fishing Dock	WB 21	52	33	**63.46**
Garapan Beach	WB 22	52	5	9.62
Drainage #3 (Garapan Beach Drainage)	WB 23	52	17	**32.69**
Chalan Laulau Beach	WB 24	52	2	3.85
San Jose Beach	WB 25	52	4	7.69
Civic Center Beach	WB 26	52	1	1.92
Diamond Hotel Beach	WB 27	52	3	5.77
Grand Hotel	WB 28	52	3	5.77
Community School Beach	WB 29	52	2	3.85
Sugar Dock	WB 30	52	19	**36.54**
CK Dist #2 Drainage	WB 31	52	13	**25**
CK Dist #4 Lally Beach	WB 32	52	3	5.77
Chalan Piao Beach	WB 33	52	4	7.69
Hopwood School Beach	WB 34	52	1	1.92
San Antonio Beach	WB 35	52	3	5.77
PIC Beach	WB 36	52	3	5.77
San Antonio Lift Stn.	WB 37	52	5	9.62
Grotto Cave	NEB 01	27	1	3.70
Bird Island Beach	NEB 02	27	2	7.41
Jeffrey's Beach	NEB 03	27	7	**25.93**
Hidden Beach	NEB 07	27	6	**22.22**
Old Man By the Sea	NEB 04	27	5	**18.52**
Marine Beach	NEB 05	27	3	**11.11**
Tank Beach	NEB 06	27	1	3.70
North Laolao Beach	SEB 02	27	5	**18.52**
South Laolao Beach	SEB 03	27	4	**14.81**
Obyan Beach	SEB 04	27	4	**14.81**
Ladder Beach	SEB 05	27	2	7.41
Unai Dangkolo	SEB 06	27	10	**37.04**

ENTEROCOCCI 2008	**Site ID Names**	**Total number of samples**	**Total number of Violations**	**Percent Violation (%)**
LOCATION (Rota)				
Coral Garden	R1	26	5	**19.23**
Kokomo Beach Club	R2	24	2	8.33
Mobil Storm Drainage	R3	26	3	**11.54**

East Harbor Dock	R4	21	1	4.76
Teweksberry Beach	R5	26	1	3.85
West Harbor Marina	R6	26	3	**11.54**
Dist #2 Storm Drain	R7	26	3	**11.54**
Dist #1 Storm Drain	R8	26	0	0
Veterans Memorial	R9	26	0	0
Teteto Beach	R10	26	0	0
Guata Beach	R11	26	0	0
Swimming Hole	R12	26	0	0

ENTEROCOCCI 2008	Site ID Names	Total number of samples	Total number of Violations	Percent Violation (%)
LOCATION (Tinian)				
Unai Masalok Beach	T1	29	2	6.90
Unai Dangkolo	T2	29	1	3.45
Unai Babui	T3	29	2	6.90
Unai Chulu	T4	29	0	0
Leprosarium I	T5	29	2	6.90
Leprosarium II	T6	29	2	6.90
Tachogna Beach	T7	29	0	0
Taga Beach	T8	29	0	0
Harbor	T9	29	0	0
Kammer Beach	T10	29	0	0

ENTEROCOCCI 2008	Site ID Names	Total number of samples	Total number of Violations	Percent Violation (%)
LOCATION (Managaha)				
Dock	MG 01	28	0	0
Swimming Area A	MG 02	28	0	0
Swimming Area A	MG 03	28	0	0
Swimming Area B	MG 04	28	1	3.57
Managaha Beach	MG 05	28	0	0
Managaha Beach	MG 06	28	0	0
Managaha Beach	MG 07	28	2	7.14
Beach Near Statue	MG 08	28	1	3.57
Managaha Beach	MG 09	28	0	0
Managaha Beach	MG 10	28	0	0
Next to Dock	MG 11	28	0	0

Appendix 3: Draft Highly Erodible Soils and Highly Permeable Soils APC Maps