Section 309

Assessment and Strategy

Guam Coastal Management Program
Bureau of Statistics and Plans
2015-2019

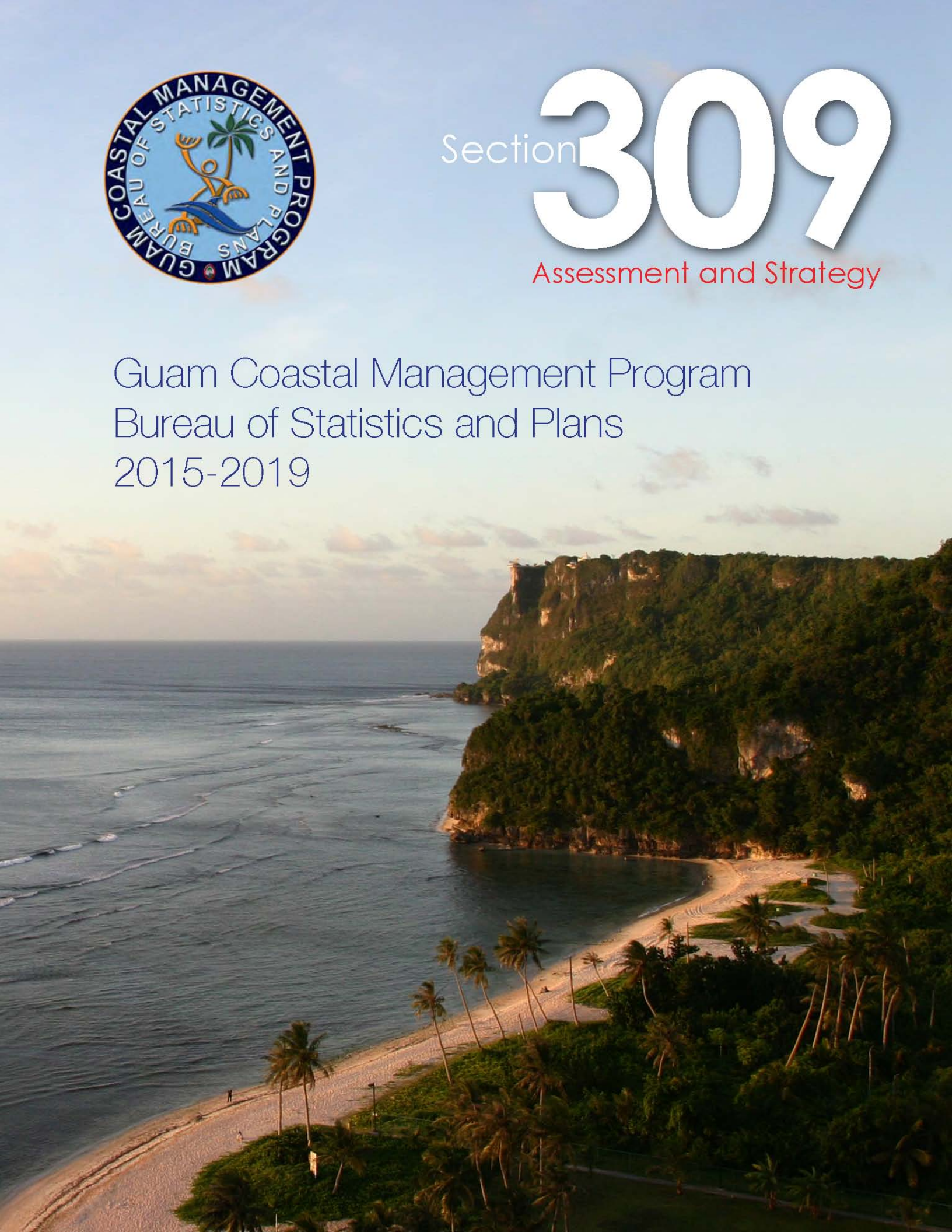

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Exhibit B: Public Comment Period Documents

Guam Coastal Management Program
Section 309
Assessments and Strategy
2015

Section 309 of the Coastal Zone Management Act (CZMA), as amended, encourages states and territories to develop program changes in one or more of nine coastal zone enhancement areas through a grant program. Rather than just changes to the manner that states and territories implement programs, the changes are made to federally approved CZM programs. These changes may include updates or revisions to state and territory enforceable policies and authorities. Such changes include the following activities that will enhance a state or territory's ability to achieve one or more of the coastal zone enhancement objectives:

1. A change to coastal zone boundaries;
2. New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/ understanding;
3. New or revised local coastal programs and implementing ordinances;
4. New or revised coastal land acquisition, management, and restoration programs;
5. 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,
6. 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.

Introduction

For nearly forty years, the Guam Coastal Management Program (GCMP) has worked to balance natural resource protection with economic growth. The GCMP works with a wide network of partners to manage coastal areas, develop watershed plans and establish outreach programs to address impacts to natural resources while balancing the pressures from an increasing demand for development.

GCMP previously completed assessment and strategy documents in 1991, 1997, 2001, 2006, and 2011. During the period from 2011 -2015, major personnel changes within the GCMP have resulted in a new focus with different priorities. A growing political emphasis on development, especially in relation to the military and tourism, two of Guam's most important economic sectors, has warranted some priority changes and numerous updates to 309 efforts. This 2015 update reflects the program's new direction.

Department of Defense Activity

During the development of the last 309 Assessment and Strategy, the Department of Defense's proposal to relocate 8,000 Marines and numerous military activities to Guam was a major concern for the program. Since 2011, however, the Defense Department has made significant changes to the original plan. At this time, Guam is expected to host 5,000 Marines and the overall military buildup will have a much smaller footprint. Additionally, the military activities to support this buildup will occur over a prolonged period of

time, resulting in very different concerns and impacts than those identified as part of the larger buildup proposal.

The Department of Defense has recently released a new plan which reduces the activities of the relocation to construction and operations of a main base (cantonment area), a family housing area, a live-fire training range complex and associated infrastructure to support these efforts. The revised buildup effort, as documented in the 2015 Record of Decision, significantly reduces the scope and potential impact of the relocation compared to what was originally proposed in the 2010 Final Environmental Impact Statement (EIS) Guam and Northern Marianas Island (CNMI) Military Relocation: Relocating Marines from Okinawa, Visiting Aircraft Carrier Berthing, and Army Air and Missile Defense Task Force. The 2015 action will consist of a cantonment at Naval Computer and Telecommunication Station (NCTS) Finegayan, family housing at Andersen Air Force Base (AAFB), and the Light Firing Training Range Centers (LFTRC) at AAFB-Northwest Field (NWF). Unlike the 2010 proposals, all the major activities will be located on Federal Property.

The selected alternative for the cantonment and family housing will require 1,751 acres of land. The LFTRC will require 338 acres of fast land and 3,701 acres to include submerged land for the surface danger zone. The facility will be located on federally held property; however a portion of the required land is under the management of the U.S. Fish and Wildlife Service (USFWS) at the Ritidian Unit of the Guam National Wildlife Refuge. The Department of Defense is negotiating with USFWS on continued management of and access to the Ritidian Unit. In addition, mitigation measures will be identified to address the loss of ecologically critical terrestrial resources.

Although not fully funded by the U.S. Congress and the Japan Government, efforts have begun to move forward with the projects identified in the 2015 ROD, the details and scope of which are still unclear. As such, GCMP's 2015 assessment reflects both the uncertainty of the immediate future and the need to prioritize 309 efforts to match the major concerns that will be associated with buildup activities and increase investment opportunities. This work also reflects concerns that arise due to the local government and private sector development that is already in progress.

It is anticipated that the military buildup and private sector development will result in fewer places to recreate. As such, public access also has been elevated to high priority. The buildup includes both terrestrial and coastal areas that will see some use restrictions due to proposed activities such as a firing range. The loss of use at some of these areas combined with increasing development outside "the fence" will only further compress access that many recreational or subsistence users are already concerned about. The high priority status will allow GCMP to focus its efforts on this important community concern.

Tourism

Tourism has been the backbone of Guam's economy for decades. While Japanese visitors have traditionally been Guam's most important market, the Government of Guam is working to attract more tourists from various locations in Asia and Russia. Local government and tourism industry representatives are trying to develop a China Visa Waiver Program and are working to increase arrivals from Russia. In the most recent Guam Hotel and Restaurant Association report, as of October 2015 Guam has 7,858 rooms with a 77% average occupancy rate. To support increasing arrivals, the tourism community, the Guam Economic Development Authority, and the Governor have a goal to attract 2 million tourists annually by 2020. This initiative is paired with a goal to increase Guam's hotel room inventory to 2,000 by year 2020. To achieve this increase, the government has developed new tax incentives to induce more capital investment in Guam.

Climate Change

The government of Guam continues to assess the potential effects of climate change on the island. Recognizing the need to address these impacts, the Governor issued an Executive Order in 2015 to create a Climate Change Task Force and mandate the creation of a vulnerability assessment and adaptation plan. The U.S. Department of Interior has initially funded a Climate Change Coordinator, who serves as a Special Assistant to the Governor, to support this effort. The Climate Change policy will look toward the future in developing strategies to address the impacts of climate change predicted for the island. This includes excessive rainfall, stronger tropical storms, drought, ocean acidification, coral bleaching, salt water intrusion, rising sea levels, storm surges, diseases, rising temperatures, increased migration and invasive species.

Other activities

Guam's population continues to grow and threats to the island's limited natural resource have increased as well. In addition to tourism and military activities, the island still receives large numbers of immigrants from neighboring Pacific islands. This reality may increase as a changing climate makes it more difficult for islanders to remain on their home islands. Escalating pressures on social systems, local infrastructure, and limited coral reef resources will be a primary concern for Guam during the next five years. The effects on tourism stemming from of geopolitical tensions associated with North Korea's continual pursuit of nuclear weapons and persistent banter of targeting Guam is unknown at this time. It is imperative that as Guam moves forward in updating any comprehensive plans that it ensure growth areas are in industries that will be in harmony with our natural environment.

309 Priorities

While the military buildup and increased tourism presents many economic opportunities for the community, they are accompanied by daunting challenges for our island's fragile natural resources. To address these emerging concerns, GCMP and its stakeholders identified the top 2 priority enhancement areas: **Cumulative and Secondary Impacts and Public Access,**

While Guam remains vulnerable to seismic, storm and other hazards, stakeholders agreed to reduce Coastal Hazards to a medium priority during this period due to more pressing issues and the opportunity for other programs to address some hazards concerns. Similarly, ocean resources were ranked medium priority, but many of the threats to these resources can be addressed by enhancements to other program areas such as cumulative and secondary impacts.

Energy and Government Facility Siting was considered a high priority during the previous assessment; however during this assessment period, it was considered a low priority due to major investments into renewables by the utility agencies. Aquaculture and marine debris remain a low priority.

Cumulative and Secondary Impacts remain a top priority

With the new leadership and staff at the GCMP, this 2015 update provides an opportunity to review the program's accomplishments as well as develop new strategies for handling challenges based a new perspective. The new tasks should improve GCMP's ability to help protect the island's fragile environment, incorporate sustainable practices and develop adaptive measures to address long range impacts from climate change and the pressure to meet aggressive development targets. Just as past assessments have

highlighted continuing growth and development, this assessment will note significant upcoming events and the general concern with cumulative and secondary impacts as projects occur.

In 2013, a GIS tool was developed to assist with assessing cumulative and secondary impacts to the Northern Guam Lens Aquifer. This recently developed tool will provide GCMP and policy makers a better understanding of the effects of activity to Guam's sole aquifer, especially as it relates to clearing and grating of limestone forests and altering northern Guam's hydrology. In addition to this tool, GCMP has broaden its use of other GIS viewers in the assessment phase of discharging their land use and natural resource planning controls.

Draft Sustainability Policy

The University of Guam's Center for Island Sustainability was awarded a grant from NOAA (Grant No. NA11NOS4190115) via the Bureau of Statistics and Plans Guam Coastal Management Program to create a draft policy paper guiding the island of Guam towards the incorporation of best practices for sustainable island development. The Center for Island Sustainability (CIS) identified stakeholders; identify topics and issues; gather and analyze relevant data; and present findings in a draft policy paper. This draft policy paper was presented to the stakeholders for feedback and submitted to the GCMP. The policy paper covered topics such as Energy, Transportation, Food Security, Infrastructure, and Water. The Draft Sustainability Policy prompted the conversation within the general public about what the requirements are for residents to satisfy their basic needs and strive toward a better quality of life while preserving our natural resources for the use of future generations.

Digital Atlas for Northern and Southern Guam

To assist GCMP and other natural resources agencies, the GCMP provided funds to the Water and Environmental Research Institute (WERI), University of Guam to expand its watershed GIS data tool. In 2010, the southern watershed atlas was developed as a repository for all data associated with the southern watershed. This tool proved to be extremely useful in compiling available digital GIS data. It soon became apparent that the Digital Atlas needed to be expanded to encompass the Northern portion of Guam in order to be complete. Having information for the northern watershed is critical. It is expected that the majority of new development will be occurring in the northern portion of Guam. This GIS-based digital repository and geo-database is the mainstay for collecting, digitizing, organizing, modeling and analyzing of data on aquifer and groundwater characteristics. It incorporated physical, environmental and socio-economic information relevant to northern watershed and impacts to the Northern Guam aquifer, its groundwater resources and ultimately the island's coral reefs resources. The information is available at *www.hydroguam.net.*

Guam Forest Legacy Act (Public Law31-173)

This is a relatively new law passed in 2012 that establishes the Guam Forest System for the protection and conservation of natural resources and natural habitats or ecosystems, open space, historic artifacts, and land for outdoor recreation and education. The law attempts to provide for an inventory of Guam's government lands that are suitable for forest management. Best management efforts will be implemented for land in the forest system. This new law supported efforts to protect undeveloped land that can be included in for conservation initiatives such as the US Forest Legacy Program and the Micronesia Challenge.

Summary Zone Changes (Public Law 21-82)
This law allows private property owners Of "A" (Agricultural) or "R-1" (Single Family Dwelling) zones that are two acres or less in size to apply for rezoning to either "R-1" or "R-2" (multiple-family dwelling) zone through a request to the Director of Department of Land Management. Although the law has been adopted for over 20 years, in the last five years, the Director has been more inclined to use this process rather than requiring land owners to follow the traditional zone change process that submits the application to the Application Review Commission for review. Directors have used this law to approve multi- family dwellings that are over 50 units. This law has been inconsistently applied and has contributed to developments that are located in areas with inadequate infrastructure that has led to an increase in flooding. It has also contributed to areas with poor planning and to CSI.

Approval of Routine Program Change
After 10 years of regularly submitting routine program changes, during this assessment period GCMP submitted critical program changes for approval. These changes provided much needed support for GCMP efforts:

1. Guam has enacted laws to establish Marine Preserves and promulgated rules to regulate activities within them. The establishment of the Marine Preserves enhances Guam's resource policy to preserve fragile areas and protect living marine resources. As such, the submitted changes fall under existing authority within the CMP and are not substantial as to require an Amendment.

2. Guam amended the Guam Environmental Protection Agency's Guam Soil Erosion and Sedimentation Control Regulations to impose requirements on those earth-moving activities which create accelerated erosion or a danger of accelerated erosion and which require planning and implementation of effective soil conservation measures.

3. Guam updated the Guam Environmental Protection Agency's Water Quality Standards

4. Guam authorized the Department of Agriculture to enact schedules for penalties and citations.

Guam Marine Preserves

The submitted routine changes to the Guam CMP appear in Sections 12201-12204 of Article 2 of Chapter 12 of Division 2 of 9 GAR (Public Law No. 24-21); Public Law No. 27-87; Chapter 63, Division 6, Title 5 GCA to Expand the Protection of Guam's Marine Resources (Add new definitions to § 63101 and add new §§ 63116.1 and 63116.2) and address Guam's resource policy Fragile Areas and Living Marine Resources namely the Marine Preserves and regulate activities within the Preserves.

These changes do not substantially change the uses subject to management, the special management areas, boundaries, the authorities and organization of the Guam CMP, or coordination, public involvement and the national interest. Although significant, the submitted changes provided further detail of the

Guam CMP consistent with 15 C.F.R. § 923.84. For example, the rules and regulations for the control of fisheries were implemented consistent with the Guam CMP resource policies to better protect fragile areas and living marine resources.

In 1997, after recent information had shown the near shore fishery declining, the Guam Legislature enacted measures to preserve local traditions and to protect the natural resource. The Department of Agriculture ("Agriculture") was delegated the responsibility to control and regulate the fishery resource of Guam. Agriculture revised the fishing regulations to better protect, conserve and preserve Guam's fishing resources.

The rules designate Marine Preserve Areas and apply special regulations to select marine preserves. To regulate activities in a marine preserve, the Guam Legislature delegated rule making authority to the Director of the Department of Agriculture to issue permits for public access and use consistent with the protection of species and habitats on Guam. In 2006, the Guam Legislature set out to strengthen the Department of Agriculture's regulatory authority to protect the marine preserves by codifying in law the purpose of marine preserves and statutorily banning activities within the marine preserves unless permitted by the Director of the Department of Agriculture.

The submitted routine changes fall within existing Guam authority and included in the Guam CMP and do not substantially change uses subject to management, authorities and organization, or special management areas in the coastal zone. The establishment of marine preserves and regulations to protect fragile areas and living marine resource fall under existing Guam CMP authority to control and regulate fish and game in and about Guam.

Guam Soil Erosion and Sedimentation Control Regulations

The submitted routine changes to the Guam CMP appear in Sections 10100-10114 of Chapter 10 of Division 2 of 22 GAR (Public Law No. 25-152) and address Guam's Development Policy Erosion and Siltation and Resource Policy Water Quality namely Guam's regulations on soil erosion and sedimentation control.

Guam Public Law No. 25-152 amended the Guam Environmental Protection Agency's Guam Soil Erosion and Sedimentation Control Regulations. These changes do not substantially change the uses subject to management, the special management areas, boundaries, the authorities and organization of the Guam CMP, or coordination, public involvement and the national interest. Although significant, the submitted changes provide further detail of the Guam CMP consistent with 15 C.F.R. § 923.84.

The purpose of the amendments is to expand GEPA's responsibilities to encompass the conservation of surface and groundwater resources and to protect, maintain and improve the quality and "potability" thereof. It is also the purpose of these regulations to manage nonpoint source pollution consistent with the latest "Guam Nonpoint Source Program", the Guam Erosion and Sedimentation Manual" guidelines and recommendations, the comprehensive approach set forth in Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990, "Protecting Coastal Waters", codified as 16 U.S.C. § 1455(b), and the "Guidance Specifying Management Measures for Sources of NonPoint Pollution in Coastal Waters" (EPA/840-B-92-002, dated January 1993) issued under the authority of Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 recommendations.

The regulations provide for permit application contents and authority to deny an application if there is reasonable cause that it may risk or endanger public health or environment. It amends the requirements for Erosion and Sediment Control Plans and provides for the protection of adjoining properties, public utilities, sink holes and other safety precautions. It also requires products to be submitted upon project completion and final inspection and approval. And lastly, it establishes fees, sets permit expiration timeframes, and defines protocols for stop orders, revocations and suspensions of permits.

The amended Soil Erosion and Sedimentation Control regulations submitted are routine changes that fall within existing Guam authority and included in the Guam CMP and do not substantially change uses subject to management, authorities and organization, or special management areas in the coastal zone.

Guam Environmental Protection Agency Water Quality Standards

The submitted routine changes to the Guam CMP appear in Sections 5101-5106 and its Appendices of Chapter 5 of Division 2 of 22 GAR (Public Law Nos. 26-32 and 26-113); and address Guam's Water Quality of its Resource Policy.

Guam Public Law Nos. 26-32 and 26-113 amended the Guam Environmental Protection Agency's Water Quality Standards. These changes do not substantially change the uses subject to management, the special management areas, boundaries, the authorities and organization of the Guam CMP, or coordination, public involvement and the national interest. Although significant, the submitted changes provide further detail of the Guam CMP consistent with 15 C.F.R. § 923.84.

A Groundwater Protection Zone Map has been developed and designates much of the land surface above Guam's principal source aquifer, the Northern Aquifer, for the protection of Resource Zone (G-1) waters and the Recharge Zone (G-2) waters. The amendment sets the water quality criteria for Groundwater G-1 and G-2. It also sets the numeric water quality criteria for marine and surface waters. It amends the effluent limitations and the petroleum storage facilities regulations. And it adds a new section on Water Quality Certification.

The amended Water Quality Standards submitted are routine changes that fall within existing Guam authority and included in the Guam CMP and do not substantially change uses subject to management, authorities and organization, or special management areas in the coastal zone.

Guam Department of Agriculture Authorization to Issue Citations for Fishing and Wildlife Natural Resources Violations

Guam Public Law No. 26-25 authorizes the Guam Department of Agriculture to issue citations. In 2001, the Guam Legislature enacted the legislation for more efficient prosecution of the illegal taking of fish and wildlife, and unlawful clearing of vegetation in order to protect Guam's natural resources.

Public Law No. 26-25 repealed and reenacted the previous penalty for violations. It is a routine change that falls within existing Guam authority and included in the Guam CMP and does not substantially change uses subject to management, authorities and organization, or special management areas in the coastal zone. NOAA approved the program changes in 2013.

II. Summary of Completed Section 309 Efforts

Setting the background for the upcoming period of rapid changes, GCMP has completed or initiated the following programs. These activities were developed in response to past assessments, including the most recent 2011 document.

1. Development of a Cumulative and Secondary Impact GIS Tool for Guam. *Funded under NA11NOS4190115, Section 309.*

The tool used GIS-based screening for Cumulative and Secondary Impacts for Development Projects in Northern Guam. Due to the anticipated growth in the local economy, increasing tourist numbers and the military buildup, there is tremendous pressure on the local government agencies to move quickly to approve development projects without carefully considering cumulative and secondary impacts to the environment and to the community. This tool will provide much needed data analysis and a decision-making tool for GCMP and the relevant government of Guam agencies. It will enable them to develop mechanisms to assess cumulative and secondary impacts and to determine the extent of the impacts to the island's natural resources. The GIS tool will also be made available to private developers to assess Cumulative and Secondary Impacts from proposed development. This project will focus on impacts from activities related to water quality from ground water and coastal waters. This project was recently developed and has not yet been made available to other government of Guam agencies and private developers.

2. Public Access Enhancement Funded under NA10NOS4190208

The GCMP staff led by the GIS Manager worked with multiple networking partners to develop and update public access maps. Meetings were held with various stakeholders to discuss the inventory of government parcels. A draft map was developed for further review by stakeholders. Meetings are scheduled with appropriate government of Guam Agencies including: the Department of Land Management (DLM); Chamorro Land Trust Commission (CLTC); Guam Ancestral Lands Commission (GALC); and Department of Parks & Recreation/Guam Historic Preservation Office (DPR/GHPO). They will be asked to provide their input in the determination of parcels with cultural and historical significance. Updates to the maps included publicly accessible parks and trails. CMP's Land Use Planning Program (LUPP) continues to update the map. The map produced from this project was to be expanded to develop a policy for Natural and Cultural Resources.

3. Updated Wetland Delineation Funded under NA10NOS4190208

Funds from this grant were used to compile, inventory and examine the various sources of wetlands and other datasets that can be used to accurately delineate and update Guam's GIS wetlands layer. This project would assist the GCMP in developing better policies and advocate for sound property development laws that would better protect, restore and enhance existing wetland areas and minimize development in the immediate surrounding areas. There have been many efforts to reduce sedimentation in coastal waters including the implementation of the soil erosion and sediment control regulations and the numerous reforestation projects in several of Guam's priority watersheds. Continual

updates of the wetlands data in a priority watershed will enable the GCMP to evaluate the effectiveness of these management measures.

The latest U.S. Fish and Wildlife Service National Wetlands layer, NOAA's Coastal Change Analysis Program (C-CAP) Land Cover and U.S. Forest Service vegetation cover and 2007 Guam LiDAR Survey data are the sources of data that were utilized to delineate and update the wetlands layer.

2011-2015 Status of Projects funded under section 309:

The following projects were funded by 309 funds but were not completed.

1. Public Access for Natural and Cultural Resources- NA12NOS4190167

This project was approved under NA12NOS4190167, however was not completed during the grant period. This project was funded under 309 funds. The Scope of Work was developed, however the project was not completed. The project proposed to hire a contractor to complete a survey to determine the public's attitudes about the state of public access for natural and cultural resources on Guam.

2. Tsunami Study – NA13NOS4190132

Although the Scope of Work for this project was developed, the project was not completed during the grant period. This project was funded with 309 funds. NOAA's Pacific Marine Environmental Laboratory had conducted a Tsunami Hazard Assessment for Guam in 2010. The GCMP grant was intended to complement this initial assessment.

Wetlands

Section 309 Enhancement Objective: Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands. §309(a)(1)

Note: For the purposes of the Wetlands Assessment, wetlands are "those areas that are inundated or saturated at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." [33 CFR 328.3(b)]. See also pg. 17 of the CZMA Performance Measurement Guidance[1] for a more in-depth discussion of what should be considered a wetland.

PHASE I (HIGH-LEVEL) ASSESSMENT: *(Must be completed by all states.)*

Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. Using provided reports from NOAA's Land Cover Atlas[2] or high-resolution C-CAP data[3] (Pacific and Caribbean Islands only), please indicate the extent, status, and trends of wetlands in the state's coastal counties. You can provide additional or alternative information or use graphs or other visuals to help illustrate or replace the table entirely if better data are available. Note that the data available for the islands may be for a different time frame than the time periods reflected below. In that case, please specify the time period the data represents. Also note that Puerto Rico and the Commonwealth of the Northern Mariana Islands (CNMI) currently only have data for one time point so will not be able to report trend data. Instead, Puerto Rico and CNMI should just report current land use cover for all wetlands and each wetlands type.

Coastal Wetlands Status and Trends		
Current state of wetlands in 2011 (acres)		
Percent net change in total wetlands (% gained or lost)*	from 1996-2011	from 2006-2011
	Information not available	0.56% increase
Percent net change in freshwater (palustrine wetlands) (% gained or lost)*	from 1996-2011	from 2006-2011
	Information not available	0.32% increase
Percent net change in saltwater (estuarine) wetlands (% gained or lost)*	from 1996-2011	from 2006-2011
	information not available	1.49% increase

[1] http://coastalmanagement.noaa.gov/backmatter/media/czmapmsguide11.pdf
[2] http://www.csc.noaa.gov/ccapatlas/. Summary reports compiling each state's coastal county data are provided on the ftp site.
[3] http://www.csc.noaa.gov/digitalcoast/data/ccaphighres

How Wetlands Are Changing*		
Land Cover Type	**Area of Wetlands Transformed to Another Type of Land Cover between 1996-2011 (Sq. Miles)**	**Area of Wetlands Transformed to Another Type of Land Cover between 2006-2011 (Sq. Miles)**
Development	500 acres – Dandan	No information available
Agriculture	None	0.03
Barren Land	None	0.03
Water	None	0.04

** Note: Islands likely have data for another time period and may only have one time interval to report. If so, only report the change in wetlands for the time period for which high-resolution C-CAP data are available. Puerto Rico and CNMI do not report.*

2. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends of coastal wetlands since the last assessment to augment the national data sets.

Since the last assessment, 309 funds were used to update the Wetland Delineation Maps using multiple data sources. Guam's wetland maps are developed from a variety of data sources with differing levels of accuracy. This project consolidated multiple data sets into the same projection using higher resolution data. Previous GIS wetland maps were reviewed and compared to the latest U.S. Fish and Wildlife Service National Wetlands layer, NOAA's Coastal Change Analysis Program (C-CAP) Land Cover, the U.S. Forest Service vegetation cover and the 2007 Guam LiDAR Survey data. Previous data sets were captured in disparate projections and varied in accuracy. The previous GIS wetland maps were digitized from existing hardcopy maps and from other hardcopy maps submitted by individual surveyors. The GIS data was then transformed to conform to the latest U.S. Fish and Wildlife Service National Wetlands layer and to match the other layers such as land cover and imagery.

The updated wetland maps were included in BSP's GIS website for distribution and to simplify the process for the GCMP, other government agencies and decision makers in identifying the location of wetlands when reviewing new policies and developing laws that are meant to protect, restore and enhance wetland areas and reduce development in the surrounding areas.

Management Characterization:

1. Indicate if there have been any significant changes at the state or territory level (positive or negative) that could impact the future protection, restoration, enhancement, or creation of coastal wetlands since the last assessment.

Management Category	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	N
Wetlands programs (e.g., regulatory, mitigation, restoration, acquisition)	N

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Although wetland maps have been updated using recent high resolution data, no significant changes have been made to wetland policy or programs since the last review.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High _____
Medium __X__
Low _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

The stakeholders did not feel that the level of priority for wetlands has changed significantly from the rank of the previous assessment. Wetlands remain a medium priority. There has not been any significant change in regulations or policies related to the management of wetlands.

Wetlands are regulated by both the United Sates Federal Government and the Government of Guam. The Guam Environmental Protection Agency (GEPA) is responsible for the management of wetlands. GEPA's "Guam Wetland Conservation Plan" was created to promote the national "No Net Loss" initiative of preserving the important value and functions of Guam's wetland resource. It serves as a wetland–specific guide for wetland conservation. The plan aims to promote conservation through an integrated education and training program for the community. GEPA combines this effort with watershed education that is supported by various federal and local government agencies, educational institutions, nongovernmental organizations and community members. In addition, wetlands are characterized in the

existing Conservation Actions Plans (CAP) and Watershed Management Plans for the priority watershed of Piti-Asan, Manell-Geus and Toguan.

To ensure the protection of Guam's wetlands, GEPA is responsible for coordinating wetland permits for proposed development. Both the federal and local governments play important roles in wetland permitting and protection. All federal identification, protection, and permitting (enforcement) concerns should be referred to the U.S. Army Corps of Engineers, Guam Office. The Guam Department of Agriculture, Department of Land Management, Bureau of Statistics and Plans and Guam EPA are all involved in local wetland protection and permitting. Field Wetland Identification services may be provided by the Guam Department of Agriculture, and Guam EPA to a limited extent, in that preliminary determination and guidance is offered. The Agency provides this service based on the special circumstances and primarily for enforcement and compliance purposes.

Wetlands are also protected through GEPA's Environmental Protection Plans (EPPs) and Erosion control permits to ensure clearing and grading does not impact wetlands and the surrounding area and that Best Management Practices are implemented. The EPP include the environmental protection measures that will be employed to reduce, minimize, or eliminate impacts or problems. EPP's may include erosion and sedimentation control requirements aimed at protecting the water quality of the closest body of water, fresh or marine.

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RESOURCES AND TOOLS:

Below are a few national resources and tools that may be useful in conducting your assessment or developing wetlands strategies. States likely have other state-specific resources, tools, and data that would be useful as well.

NOAA C-CAP Coastal Land Atlas

Online data viewer provides user-friendly access to regional land cover and land cover change information developed through NOAA's Coastal Change Analysis Program (C-CAP). The tool summarizes wetland change trends and can highlight specific changes of interest (salt marsh losses to open water, for instance). Users can investigate how land cover changed between 1996, 2001, 2006, and 2011. Although data are provided by county, NOAA staff members are able to help states and territories easily aggregate county data into a statewide summary.

Geographic Scope: Contiguous United States and Hawaii
Website: www.csc.noaa.gov/digitalcoast/tools/lca

NOAA Environmental Sensitivity Index Maps

Environmental Sensitivity Index (ESI) maps are designed to provide a concise summary of coastal resources at risk in case of an oil spill or other disaster. They characterize coastal and estuarine shorelines for several wetlands classes, and may be useful for resource characterization and assessment. ESI maps are periodically updated on a state-by-state basis, and are generally available in multiple formats (pdf maps, GIS layers, etc.)

Geographic Scope: All coastal states and territories

Website: http://response.restoration.noaa.gov/maps-and-spatial-data/environmental-sensitivity-index-esi-maps.html

NOAA High-Resolution C-CAP Data

Nationally standardized database of land cover information (developed using remotely sensed imagery) for the coastal regions of the United States. C-CAP products provide inventories of coastal intertidal areas, wetlands, and adjacent uplands. High-resolution C-CAP products focus on bringing NOAA's national mapping framework to the local level by providing data relevant for addressing site-specific management decisions. Although this product requires desktop GIS and some GIS technical skills, NOAA staff are able to help states analyze data to support wetlands assessment.

Geographic Scope: Targeted watershed and other hotspots in the Caribbean, Pacific Islands, and Monterey Bay, California

Website: www.csc.noaa.gov/digitalcoast/data/ccaphighres

CZMA Performance Measurement System Data

Annual CZMA performance measurement data for government coordination and habitat measures. Online database can be used to synthesize existing state and territory data reported during the assessment period.

Geographic Scope: All coastal states and territories

Website: www8.nos.noaa.gov/PMD/Login.aspx?ReturnUrl=%2fPMD%2fdefault.aspx

Coastal Wetland Review Reports

The Environmental Protection Agency-led Interagency Coastal Wetlands Workgroup organized seven Coastal Wetland Review meetings with stakeholders in coastal watersheds throughout the Mid-Atlantic, South Atlantic, North Atlantic, and Gulf of Mexico regions to collect information regarding stressors on coastal wetlands, local protection strategies, and key gaps that, if addressed, could help reverse the trend of wetland loss.

Geographic Scope: Select watersheds in the North Atlantic (Cape Cod Watershed); Mid-Atlantic (Delaware Bay, York River Watershed); South Atlantic (Middle/Lower Neuse River, Indiana River Lagoon); and Gulf Coast (East and West Galveston Bay, Mississippi Coastal Watershed)

Website: http://water.epa.gov/type/wetlands/cwt.cfm#reports (navigate to the "Coastal Wetlands Initiative" tab and scroll to the bottom of the page)

National Wetlands Inventory

The National Wetlands Inventory (NWI) is a series of topical maps that show wetlands and deep-water habitats. The goal of the NWI is to provide current geospatially referenced information on the status, extent, characteristics, and functions of wetland, riparian, deep-water, and related aquatic habitats in priority areas in order to promote the understanding and conservation of these resources.

Geographic Scope: Contains information for approximately 82 percent of the conterminous United States, 31 percent of Alaska, 100 percent of the windward islands of Hawaii, 62 percent of Puerto Rico and the U.S. Virgin Islands, and 100 percent of Guam and Saipan. Requires desktop GIS and some GIS technical skills.

Website: www.csc.noaa.gov/digitalcoast/data/nwi

National Wetlands Status and Trends Report

In 2013, the U.S Fish and Wildlife Service and NOAA released an updated report, *Status and Trends of Wetlands in the Coastal Watersheds of the Conterminous United States, to document trends in coastal*

wetland acreage from 2004 to 2009. The analysis concluded that more than 80,000 acres of coastal wetlands are being lost on average each year, up from about 59,000 acres lost per year in the previous study covering 1998 to 2004. A majority of this loss occurred in freshwater wetlands.

Geographic Scope: Coastal watersheds of the Atlantic, Great Lakes, Gulf of Mexico and Pacific
Website: www.fws.gov/wetlands/Documents/Status-and-Trends-of-Wetlands-In-the-Coastal-Watersheds-of-the-Conterminous-US-2004-to-2009.pdf

NOAA Habitat Priority Planner

The Habitat Priority Planner can be used in any geography to inventory specific habitat relevant to a study area. It assesses target habitat conditions with prepackaged spatial analysis. Analyzes "what if" scenarios, such as the impact of new development or how restoration might change habitat function. The tool creates maps, reports, and data tables to enhance communication and the decision-making process. Although it requires desktop GIS and some GIS technical skills, NOAA staff members are available to provide technical assistance.

Geographic Scope: Appropriate geographic scope should be based on the resolution and complexity of the data. The tool is built upon Esri's ArcGIS, so it will only run as fast as allowed within that software.
Website: www.csc.noaa.gov/digitalcoast/tools/hpp

NOAA Sea Level Rise Viewer

Displays potential future sea levels and provides simulations of sea level rise at local landmarks, including modeling potential marsh migration due to sea level rise. Overlays social and economic data onto potential sea level rise. Examines how tidal flooding will become more frequent with sea level rise.

Geographic Scope: Select regions currently available. More coming soon so check back.
Website: www.csc.noaa.gov/digitalcoast/tools/slrviewer

Coastal Hazards

Section 309 Enhancement Objective: 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. §309(a)(2)

Note: For purposes of the Hazards Assessment, coastal hazards include the following traditional hazards and those identified in the CZMA: flooding; coastal storms (including associated storm surge); geological hazards (e.g., tsunamis, earthquakes); shoreline erosion (including bluff and dune erosion); sea level rise; Great Lake level change; land subsidence; and saltwater intrusion.

PHASE I (HIGH-LEVEL) ASSESSMENT: *(Must be completed by all states.)*

Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. **Flooding:** Using data from *NOAA's State of the Coast* "Population in the Floodplain" viewer[4] and summarized by coastal county through NOAA's Coastal County Snapshots for Flood Exposure,[5] indicate how many people were located within the state's coastal floodplain as of 2010 and how that has changed since 2000. You may to use other information or graphs or other visuals to help illustrate.

Population in the Coastal Floodplain			
	2000	**2010**	**Percent Change from 2000-2010**
No. of people in coastal floodplain[6]	Not Available	Not Available	Not Available
No. of people in coastal counties[7]	154,805	159,358	2.9%
Percentage of people in coastal counties in coastal floodplain	Not Available	Not Available	Not Available

** The entire island is considered a coastal zone.*

2. **Shoreline Erosion** (for all states other than Great Lakes and islands; for Great Lakes and islands, see Question 5): Using data from *NOAA's State of the Coast* "Coastal Vulnerability Index,"[8] indicate the vulnerability of the state's shoreline to erosion. You may use other information or graphs or other

[4] http://stateofthecoast.noaa.gov/pop100yr/welcome.html. Note FEMA is in the process of updating the floodplain data. This viewer reflects floodplains as of 2010. If you know the floodplain for your state has been revised since 2010, you can either use data for your new boundary, if available, or include a short narrative acknowledging the floodplain has changed and generally characterizing how it has changed.

[5] www.csc.noaa.gov/digitalcoast/tools/snapshots

[6] To obtain exact population numbers for the coastal floodplain, download the Excel data file on the State of the Coast "Population in the Floodplain" viewer: http://stateofthecoast.noaa.gov/pop100yr/welcome.html. Summary population data for each coastal state is available on the ftp site.

[7] To obtain population numbers for coastal counties, see spreadsheet of coastal population and critical facilities data provided or download directly from http://www.csc.noaa.gov/digitalcoast/data/stics. Summary population data for each coastal state is available on the ftp site.

[8] http://stateofthecoast.noaa.gov/vulnerability/welcome.html (see specifically "Erosion Rate" drop-down on map). The State of the Coast visually displays the data from USGS's Coastal Vulnerability Index.

visuals to help illustrate or replace the table entirely if better data is available. *Note: For New York and Pennsylvania that have both Atlantic and Great Lakes shorelines, fill out the table below for the Atlantic shoreline only.*

Vulnerability to Shoreline Erosion		
Vulnerability Ranking	**Miles of Shoreline Vulnerable**[11]	**Percent of Coastline**[9]
Very low (>2.0m/yr) accretion	0.776 miles	0.00056
Low (1.0-2.0 m/yr) accretion)	Not Available	Not Available
Moderate (-1.0 to 1.0 m/yr) stable	0.735 miles	0.00052
High (-1.1 to -2.0 m/yr) erosion	Not Available	Not Available
Very high (<-2.0 m/yr) erosion	Not Available	Not Available

3. **Sea Level Rise** (for all states other than Great Lakes and islands; for Great Lakes and islands, see Question 5): Using data from *NOAA's State of the Coast* "Coastal Vulnerability Index",[10] indicate the vulnerability of the state's shoreline to sea level rise. You may provide other information or use graphs or other visuals to help illustrate or replace table entirely if better data is available. *Note: For New York and Pennsylvania that have both Atlantic and Great Lakes shorelines, fill out the table below for your Atlantic shoreline only.*

Coastal Vulnerability to Historic Sea Level Rise		
Vulnerability Ranking	**Miles of Shoreline Vulnerable**[11]	**Percent of Coastline**
Very low	Not Available	Not Available
Low	Not Available	Not Available
Moderate	Not Available	Not Available
High	Not Available	Not Available
Very high	Not Available	Not Available

4. **Other Coastal Hazards:** In the table below, indicate the general level of risk in the coastal zone for each of the coastal hazards. The state's multi-hazard mitigation plan is a good additional resource to support these responses.

Type of Hazard	General Level of Risk[11] (H, M, L)
Flooding (riverine, storm water)	H
Coastal storms (including storm surge)[12]	H

[9] To obtain exact shoreline miles and percent of coastline, mouse over the colored bar for each level of risk or download the Excel data file.
[10] http://stateofthecoast.noaa.gov/vulnerability/welcome.html (see "Vulnerability Index Rating" drop-down on map). The State of the Coast visually displays the data from USGS's Coastal Vulnerability Index.
[11] 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*
[12] In addition to any state- or territory-specific information that may help respond to this question, the U.S. Global Change Research Program has an interactive website that provides key findings from the 2014 National Climate Assessment for each region of the country, including regions for the coasts and oceans, and various sectors. The report includes findings related to coastal storms and sea level rise that may be helpful in determining the general level of risk. See http://nca2014.globalchange.gov/.

Type of Hazard	General Level of Risk[11] (H, M, L)
Geological hazards (e.g., tsunamis, earthquakes)	M
Shoreline erosion[13]	M
Sea level rise[13,14,15]	M
Great Lake level change[14]	N/A
Land subsidence	L
Saltwater intrusion	L
Other (please specify)	

5. If available, briefly list and summarize the results of any additional data or reports on the level of risk and vulnerability to coastal hazards within your state since the last assessment. The state's multi-hazard mitigation plan or climate change risk assessment or plan may be a good resource to help respond to this question.

In April 2014 an update to the State Hazard Mitigation Plan was completed. The plan gives managers guidance for reducing the loss of life and property, economic disruption, and disaster assistance costs associated with natural disasters. It also provides a source of pre-disaster mitigation funding to implement measures that will make the community more resilient to those natural disasters.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) have occurred that could impact the CMP's ability to prevent or significantly reduce coastal hazards risk since the last assessment.

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these that address:			
elimination of development/redevelopment in high-hazard areas[14]	Y	Y	N
management of development/redevelopment in other hazard areas	Y	Y	N
climate change impacts, including sea level rise or Great Lake level change	Y	Y	N
Hazards planning programs or initiatives that address:			
hazard mitigation	Y	Y	Y
climate change impacts, including sea level rise or Great Lake level change	Y	Y	Y
Hazards mapping or modeling programs or initiatives for:			
sea level rise or Great Lake level change	Y	Y	Y
other hazards			

[13] See NOAA State of the Coastal Vulnerability to Sea Level Rise Tool (select "Erosion Rate" from drop-down box) http://stateofthecoast.noaa.gov/vulnerability/welcome.html. The State of the Coast visually displays the data from USGS's Coastal Vulnerability Index.

[14] Use state's definition of high-hazard areas.

2. Briefly state how “high-hazard areas” are defined in your coastal zone.

High hazard areas are those areas that are defined and delineated as flood hazard zones by FEMA.

3. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Executive Order 2015-08, established a climate change adaptation policy and the creation of a Climate Change Task Force. Plans are now underway to undertake a vulnerability assessment that will inform a climate change adaptation plan. The U.S. Department of Interior has initially funded a Climate Change Coordinator, who serves as a Special Assistant to the Governor, to support this effort. The Climate Change policy will develop strategies to address impacts of climate change predicted for the island. This includes changing rainfall patterns, stronger tropical storms, drought, ocean acidification, coral bleaching, salt water intrusion, rising sea levels, storm surges, potential increases in certain diseases, rising temperatures, increased migration and invasive species.

In April 2014 an Update to the State Hazard Mitigation Program Plan was completed. The plan gives managers guidance for reducing the loss of life and property, economic disruption, and disaster assistance costs associated with natural disasters. It also provides a source of pre-disaster mitigation funding to implement measures that will make the community more resilient to those natural disasters.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	_____
Medium	__X__
Low	_____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Though Coastal Hazards remains a priority due to increasing concerns about climate change impacts and Guam’s vulnerability to seismic, storm and other hazards, it was lowered in rank to a medium priority along with wetlands and ocean resources. Input from stakeholders was a factor in this decision.

Discussions pertaining to the effects of flooding were focused on the need for better storm water management. Many of the stakeholders’ written comments suggested the adoption and implementation of best management practices for highway and other developments would go a long way towards reducing the adverse impacts of flooding. Additionally, it was pointed out that increased focus and funding for Climate Change would help reduce the need to focus limited Section 309 funds on

the coastal hazards priority area. Additionally, other focus areas such as in Cumulative and Secondary Impacts also address some of the concerns in the coastal hazards priority area. In light of this increased alternate funding it was decided to lower the priority of coastal hazards for Section 309 funding.

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RESOURCES AND TOOLS:

Below are a few national resources and tools that may be useful in conducting your assessment or developing coastal hazards strategies. States likely have other state-specific resources, tools, and data that would be useful as well.

Climate.gov

NOAA's Climate.gov provides science and information for a climate-smart nation. The "Supporting Decisions" is a clearinghouse of reports, resources, and decision-support tools for planners and policy leaders who want authoritative climate science information to help them understand and manage climate-related risks and opportunities.

Geographic Scope: Various by resource
Website: www.climate.gov

CZMA Performance Management System Data

Annual CZMA performance measurement data for coastal hazards measures. Online database can be used to synthesize existing state and territory data reported during the assessment period.

Geographic Scope: All coastal states and territories
Website: www8.nos.noaa.gov/PMD/Login.aspx?ReturnUrl=%2fPMD%2fdefault.aspx

National Climate Assessment Web Tool

The U.S. Global Change Research Program provides an interactive web tool to quickly view key findings from the 2014 National Climate Assessment. Data are summarized by region (including ones for oceans and coasts) and sector.

Geographic Scope: Entire United States (including territories)
Website: http://nca2014.globalchange.gov/

NOAA C-CAP Coastal Land Atlas

Online data viewer provides user-friendly access to regional land cover and land cover change information developed through NOAA's Coastal Change Analysis Program (C-CAP). Users can investigate how land cover changed between 1996, 2001, 2006, and 2011. Although data are provided by county, NOAA staff members are able to help states easily aggregate county data into statewide summary.

Geographic Scope: Contiguous United States and Hawaii
Website: www.csc.noaa.gov/digitalcoast/tools/lca

NOAA Coastal County Snapshots: Flood Exposure

Assesses a county's exposure and resilience to flooding. Analyzes a county's dependence on the ocean or Great Lakes for a healthy economy. Examines the benefits a county receives from its wetlands. Compares counties to each other or for regional analysis. Allows users to download a PDF report for the snapshot of their choice.

Geographic Scope: Coastal states only. Currently not available for territories.

Website: www.csc.noaa.gov/digitalcoast/tools/snapshots

NOAA High-Resolution C-CAP Data

Nationally standardized database of land cover information (developed using remotely sensed imagery) for the coastal regions of the United States. C-CAP products provide inventories of coastal intertidal areas, wetlands, and adjacent uplands. High-resolution C-CAP products focus on bringing NOAA's national mapping framework to the local level by providing data relevant for addressing site-specific management decisions. Although the data require desktop GIS and some GIS technical skills, NOAA staff members are able to help states analyze data to support wetlands assessment.

Geographic Scope: Targeted watershed and other hotspots in the Caribbean, Pacific Islands, and Monterey Bay, California

Website: www.csc.noaa.gov/digitalcoast/data/ccaphighres

NOAA Sea Level Rise Viewer

Displays potential future sea levels and provides simulations of sea level rise at local landmarks, including modeling potential marsh migration due to sea level rise. Overlays social and economic data onto potential sea level rise. Examines how tidal flooding will become more frequent with sea level rise.

Geographic Scope: Select regions currently available. More coming soon so check back.

Website: www.csc.noaa.gov/digitalcoast/tools/slrviewer

NOAA Spatial Trends in Coastal Socioeconomics

The Spatial Trends in Coastal Socioeconomics recompiles socioeconomic data to estimate demographic and economic attributes for a variety of important coastal management jurisdictions like watersheds, floodplains, coastal counties, and place-based coastal management programs. Currently available data sets include Demographics Trends (1970-2011) from the U.S. Census Bureau; Economic Trends (1990-2011) from the Bureau of Labor Statistics and Bureau of Economic Analysis; Demographic Projections (1970-2040) from Woods and Poole Economics, Inc.; and Critical Facilities (2012) from the Federal Emergency Management Agency.

Geographic Scope: Varies by data

Website: http://csc.noaa.gov/digitalcoast/data/stics

NOAA State of the Coast

The State of the Coast website fosters an increased awareness of the crucial importance of healthy coastal ecosystems to a robust U.S. economy, a safe population, and a sustainable quality of life for coastal residents. The site offers quick facts and more detailed statistics through interactive indicator visualizations. Visualizations focused on coastal hazards issues include Coastal Vulnerability to Sea Level Rise, Coastal Population in the Floodplain, and Federally Insured Assets in the Coastal Floodplain.

Geographic Scope: Generally all coastal states and territories but a few viewers may have more limited coverage

Website: http://stateofthecoast.noaa.gov/

Spatial Hazards Events and Loss Database for the United States (SHELDUS)

SHELDUS is a county-level hazard data set for the United States for 18 different natural hazard event types such as thunderstorms, hurricanes, floods, wildfires, and tornados. For each event, the database includes the beginning date, location (county and state), property losses, crop losses, injuries, and fatalities that affected each county.

Geographic Scope: All states (does not include territories)

Website: http://webra.cas.sc.edu/hvri/products/sheldus.aspx

Social Vulnerability Index

The Social Vulnerability Index (SoVI) 2006-2010 measures the social vulnerability of U.S. counties to environmental hazards. The index is a comparative metric that facilitates the examination of the differences in social vulnerability among counties. It shows where there is uneven capacity for preparedness and response and where resources might be used most effectively to reduce the pre-existing vulnerability. SoVI also is useful as an indicator in determining the differential recovery from disasters.

Geographic Scope: All states (does not include territories)
Website: http://webra.cas.sc.edu/hvri/products/sovi.aspx

U.S. Global Change Research Program Scenarios for Climate Assessment and Adaptation

The U.S. Global Change Research Program has developed several interactive scenario maps. Scenarios are ways to help understand what future conditions might be, with each scenario an example of what might happen under different assumptions. Scenarios are not predictions or forecasts, and no probabilities are associated with them. Instead, they provide a range of future conditions to bound uncertainty. Scenarios displayed include climate, sea level change, land use, and socioeconomic conditions. They are based on peer-reviewed, published sources, including materials prepared by the Intergovernmental Panel on Climate Change.

Geographic Scope: National
Website: http://scenarios.globalchange.gov/content/scenarios

Public Access

Section 309 Enhancement Objective: 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. §309(a)(3)

PHASE I (HIGH-LEVEL) ASSESSMENT: *(Must be completed by all states.)*

Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. Use the table below to provide data on public access availability within the coastal zone.

Public Access Status and Trends			
Type of Access	**Current number[15]**	**Changes or Trends Since Last Assessment[16]** (↑, ↓, –, unknown)	**Cite data source**
Beach access sites	211	Lack of enforcement in protecting public access under existing statute. Examples are loss of unpermitted use of Santos Memorial Park Piti and Family Beach on Cabras Islands. Private property owners are building or installing fences to zero lot property line and not adhering to the 3 meter public access setback.	Observation
Shoreline (other than beach) access sites	99	No updates available	N/A
Recreational boat (power or nonmotorized) access sites	8	Loss of Ylig Boat Launch site in Yona	PNC News - DPW Press release July 12 2011 and Interview with DPW Director July 14, 2014
Number of designated scenic vistas or overlook points	14	No updates available. However it should be noted that other than these 14 scenic vistas there are other scenic vistas not considered as part of the park inventory but nevertheless important to the local community.	Department of Parks and Recreation
Number of fishing access points (i.e. piers, jetties)	8	No change	Observation

[15] Be as specific as possible. For example, if you have data on many access sites but know it is not an exhaustive list, note "more than" before the number. If information is unknown, note that and use the narrative section below to provide a brief qualitative description based on the best information available.

[16] If you know specific numbers, please provide. However, if specific numbers are unknown but you know that the general trend was increasing or decreasing or relatively stable or unchanged since the last assessment, note that with a ↑ (increased), ↓ (decreased), – (unchanged). If the trend is completely unknown, simply put "unknown."

Public Access Status and Trends			
Type of Access	**Current number**[15]	**Changes or Trends Since Last Assessment**[16] (↑, ↓, –, unknown)	**Cite data source**
Coastal trails/ boardwalks	No. of Trails/ boardwalks Not Available Miles of Trails/boardwalks Not Available	Recent legislation authorizing the sale of bull cart trails to adjacent private property owners may result in the loss of public access.	Guam Legislature website and local news sources
Number of acres parkland/open space	Total sites 184 Sites per miles of shoreline Not Available	1,461.93 acres of DPR Parks, National Parks System 926 acres.	Department of Parks and Recreation 2006 Comprehensive Outdoor Recreation Plan
Other (please specify)		26,872 reef acres, 1,721 lagoon acres	

2. Briefly characterize the demand for coastal public access and the process for periodically assessing demand. Include a statement on the projected population increase for your coastal counties.[17] There are several additional sources of statewide information that may help inform this response, such as the Statewide Comprehensive Outdoor Recreation Plan,[18] the National Survey on Fishing, Hunting, and Wildlife Associated Recreation,[19] and your state's tourism office.

   The population within the state's coastal shoreline counties is projected to increase by _six__ percent between 2010 and 2020. (2010 Census on Population and Housing: Guam) The change in population from 1990 to 2000 (159,358) was 2.9 percent. The current projections will be influenced by the approved Military Buildup. According to the 2015 SEIS for the Guam and Northern Marianas Military Relocation the projected increase in population will be 5.6% for the years 2021-23.

3. If available, briefly list and summarize the results of any additional data or reports on the status or trends for coastal public access since the last assessment.

The Comprehensive Outdoor Recreation Plan was completed by the Department of Parks and Recreation in 2006. The associated survey of park users did have as a comment need for better access to facilities. Note that facilities, in this case, also includes seashore parks.

[17] See NOAA's Coastal Population Report: 1970-2020 (Table 5, pg. 9): http://stateofthecoast.noaa.gov/coastal-population-report.pdf

[18] Most states routinely develop "Statewide Comprehensive Outdoor Recreation Plans", or SCROPs, that include an assessment of demand for public recreational opportunities. Although not focused on coastal public access, SCORPs could be useful to get some sense of public outdoor recreation preferences and demand. Download state SCROPs at www.recpro.org/scorps.

[19] The National Survey on Fishing, Hunting, and Wildlife Associated Recreation produces state-specific reports on fishing, hunting, and wildlife associated recreational use for each state. While not focused on coastal areas, the reports do include information on saltwater and Great Lakes fishing, and some coastal wildlife viewing that may be informative and compares 2011 data to 2006 and 2001 information to understand how usage has changed. See www.census.gov/prod/www/fishing.html.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if there have been any significant state- or territory-level management changes (positive or negative) that could impact the future provision of public access to coastal areas of recreational, historical, aesthetic, ecological, or cultural value.

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	Y	Y
Operation/maintenance of existing facilities	Y	Y	Y
Acquisition/enhancement programs	N	N	N

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

During 2013, public access signs were updated along major public access routes in the Tumon and Tamuning area. Through partnerships with GVB, DPW, and DPR, beach access was mapped and standardized signs were installed at various locations.

The Santos Memorial Park Pavilion in the village of Piti was improved by the installation of a rain garden to reduce flooding and storm water. This allowed for the preservation of existing beach access.

3. Indicate if your state or territory has a publically available public access guide. How current is the publication and how frequently it is updated?[20]

Public Access Guide	Printed	Online	Mobile App
State or territory has? (Y or N)	Y	N	N
Web address (if applicable)	N/A	N/A	N/A
Date of last update	N/A	N/A	N/A
Frequency of update	N/A	N/A	N/A

[20] Note some states may have regional or local guides in addition to state public access guides. Unless you want to list all local guides as well, there is no need to list additional guides beyond the state access guide. However, you may choose to note that the local guides do exist and may provide additional information that expands upon the state guides.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	__H__
Medium	_____
Low	_____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Over the years the issue of public access to the ocean shore has come up on numerous occasions as an important concern. At the stakeholder meeting, members from various government agencies and organizations ranked the issue as holding high priority, especially when considering that the impending military buildup and associated increases in private development will very likely impose further restrictions to the shore.

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RESOURCES AND TOOLS:

Below are a few national resources and tools that may be useful in conducting your assessment or developing public access strategies. States likely have other state-specific resources, tools, and data that would be useful as well.

CZMA Performance Measurement System Data

Annual CZMA performance measurement data for public access. Online database can be used to synthesize existing state or territory data reported during the assessment period.

Geographic Scope: All coastal states and territories

Website: www8.nos.noaa.gov/PMD/Login.aspx?ReturnUrl=%2fPMD%2fdefault.aspx

EPA Swimming Season Statistics

The Environmental Protection agency (EPA) tracks annual beach monitoring and closure information through its beach program. The most recent data available is for the 2012 season.

Geographic Scope: All coastal states and territories

Website: http://water.epa.gov/type/oceb/beaches/2012_season.cfm

National Survey on Fishing, Hunting, and Wildlife Associated Recreation

The U.S. Census partners with the U.S. Fish and Wildlife Service to present information on individuals involved in fishing, hunting, and other wildlife-associated recreation, such as wildlife observation, photography, and feeding. Data include states in which these activities occurred; number of trips taken; days of participation; and expenditures for food, lodging, transportation, and equipment. While not focused on coastal areas, the reports do include information on saltwater and Great Lakes fishing and some coastal wildlife viewing. The 2011 reports compare 2011 data to 2006 and 2001 survey results to understand how usage has changed.

Geographic Scope: All states (territories not included)

Website: www.census.gov/prod/www/fishing.html

Outdoor Recreation Trends and Futures

The U.S. Forest Service routinely conducts a national study of outdoor recreation trends as part of the Renewable Resources Planning Act Assessment. The 2010 study (released in 2012) reviews past trends in outdoor recreation participation by Americans, describes current outdoor recreation participation patterns, compares patterns across regional and demographic strata, describes recreation activity participation on public and private lands, and provides projections of outdoor recreation participation out to the year 2060.

Geographic Scope: National summaries only (no state-specific data provided)

Website: www.srs.fs.usda.gov/pubs/gtr/gtr_srs150.pdf

Outdoor Recreation for Northern United States

Presents more regionally-specific data from the Outdoor Recreation Trends and Futures survey but also compares to other regions.

Geographic Scope: Focused on Northeast, Mid-Atlantic (Maryland north), and Great Lakes, although includes information on entire country as well.

Website: www.fs.fed.us/nrs/pubs/gtr/gtr_nrs100.pdf

Statewide Comprehensive Outdoor Recreation Plans

Most states regularly develop Statewide Comprehensive Outdoor Recreation Plans (SCORPs). While each SCORP varies by state, at a minimum, the plan must (1) identify outdoor recreation issues of statewide importance; (2) evaluate demand, i.e., public outdoor recreation preferences; and (3) evaluate the supply of outdoor recreation resources and facilities.

Geographic Scope: All states (territories not included)

Website: http://www.recpro.org/scorps

TrailLink

The Rails-to-Trails Conservancy includes an interactive map interface that identifies rail trails, including mileage, for each state. While not limited to the coastal zone, or even coastal counties, this information could be useful to get a sense of the other types of trails and walkways that exist in the coastal zone.

Geographic Scope: All states (territories not included)

Website: www.traillink.com/

Marine Debris

Section 309 Enhancement Objective: Reducing marine debris entering the nation's coastal and ocean environment by managing uses and activities that contribute to the entry of such debris. §309(a)(4)

PHASE I (HIGH-LEVEL) ASSESSMENT: *(Must be completed by all states.)*
Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. In the table below, characterize the existing status and trends of marine debris in the state's coastal zone based on the best available data.

Source of Marine Debris	Existing Status and Trends of Marine Debris in Coastal Zone		
	Significance of Source (H, M, L, unknown)	**Type of Impact**[21] (aesthetic, resource damage, user conflicts, other)	**Change Since Last Assessment** (↑, ↓, –, unknown)
Land-based			
Beach/shore litter	H	Aesthetic, Resource damage, health	No change
Dumping	H	Aesthetic, Resource, Health	Increase
Storm drains and runoff	H	Aesthetic, resource damage, health	Increase
Fishing (e.g., fishing line, gear)	M	Aesthetic, Resource damage	No change
Other (please specify)			
Ocean or Great Lake-based			
Fishing (e.g., derelict fishing gear)	L	Resource Damage	No change
Derelict vessels	L	Resource Damage	Decrease
Vessel-based (e.g., cruise ship, cargo ship, general vessel)	L	Resource Damage	No change
Hurricane/Storm	H	Aesthetic, Resource Damage	No change
Tsunami	L	Aesthetic, Resource damage, health	No change
Other (please specify)			

[21] You can select more than one, if applicable.

2. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends or potential impacts from marine debris in the coastal zone since the last assessment.

NOAA's Marine Debris program has been established. Outreach and education programs have been initiated. Collaboration with the Guam Nature Alliance, an outreach and education group supported by local, federal, NGOs and private citizens.

Data continues to be collected on shoreline debris during the annual International Coastal Cleanup and other shoreline clean-up efforts. The International Coastal Clean Up remains one of the largest volunteer community events for the island with over 4,000 participants. Aluminum cans, cigarette butts and plastics bottles remain the most collected items found at the 20 sites. There has been a reduction in fishing lines from 414 in 2011 to 296 in 2012.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if there have been any significant state- or territory-level management changes (positive or negative) for how marine debris is managed in the coastal zone.

Management Category	**Employed by State/Territory** (Y or N)	**CMP Provides Assistance to Locals that Employ** (Y or N)	**Significant Changes Since Last Assessment** (Y or N)
Marine debris statutes, regulations, policies, or case law interpreting these	N	N	N
Marine debris removal programs	N	N	Y

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes and likely future outcomes of the changes.

NOAA has supported an outreach and education program for marine debris. In partnership with the UOG Sea Grant program, public service announcements have been aired on local television stations. Guam presently does not have laws that address the removal of derelict vessels. During storm events, coral reefs are susceptible to damage from vessels hitting coral reefs. The concern over the last assessment period is due largely to no local legislation or enforcement methods to address removal.

Limited GCMP funds are directed to marine debris removal. GCMP efforts include providing supplies in exchange for data related to debris collected. In addition, the Lieutenant Governor's Island Beatification Task Force, Matson Shipping, GEPA marine debris, and other organizations conduct periodic beach and river cleanup activities. Over the years, the community has increased efforts to address this issue.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	_____
Medium	_____
Low	__X__

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Stakeholders expressed their concern over the lack of local legislation to address derelict vessels that contribute to marine debris. Over the last few years, the number of abandoned and derelict vessels has increased. During storm events, these vessels cause damage to coral reefs and the marine environment. There is currently no pending legislation for dealing with abandoned or derelict vessels.

NOAA has funded a Marine Debris education and outreach program. The University of Guam Sea Grant program has developed public outreach material to support the Marine Debris Program.

Over the last few years, there has been an increase from community groups to address marine debris by having regular shoreline clean ups. GCMP support this effort by providing gloves, trash bags and other supplies. GCMP request that community groups, the Island Beatification Task Force, GEPA Marine Debris program provide general data on the amount and types of debris collected.

Although, marine debris is a critical issue, it remains low priority. Issues related to marine debris such as removal of abandon vessels or derelict vessels are handled by federal agencies. Due to lack of appropriate laws and policies, Government of Guam agencies are not able to fund activities to address these issues. Although this issue is important, the GCMP and the other natural resources agencies are not in a position to move legislation forward including identifying local funding to support the removal of vessels. At this time, other priorities are more urgent given the current conditions and limited resources.

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RESOURCES AND TOOLS:

Below are a few national resources and tools that may be useful in conducting your assessment or developing marine debris strategies. States likely have other state-specific resources, tools, and data that would be useful as well.

CZMA Performance Measurement System Data

Annual CZMA performance measurement data for marine debris. Online database can be used to synthesize existing state or territory data reported during the assessment period.

Geographic Scope: All coastal states and territories

Website: www8.nos.noaa.gov/PMD/Login.aspx?ReturnUrl=%2fPMD%2fdefault.aspx

NOAA Marine Debris Program

The NOAA Marine Debris Program supports national and international efforts to research, prevent, and reduce the impacts of marine debris. The program coordinates and supports marine debris activities within NOAA and with other federal agencies, and uses partnerships to support projects carried out by state and local agencies, tribes, nongovernmental organizations, academia, and industry. The program also provides funding opportunities for projects that address marine debris.

Geographic Coverage: National and international

Website: http://marinedebris.noaa.gov/

Ocean Conservancy Marine Debris Monitoring Program Final Report

The National Marine Debris Monitoring Program, conducted by Ocean Conservancy and funded by the Environmental Protection Agency, was designed to standardize marine debris data collection in the United States using a scientifically valid protocol to determine marine debris status and trends. The study analyzed marine debris from three specific sources: land-based, ocean-based, and general (marine debris that cannot be distinguished as a land-based or ocean-based source). The study was conducted over a five-year period between September 2001 and September 2006.

Geographic Coverage: Regional (except for Great Lakes and Pacific territories)

Website:

http://act.oceanconservancy.org/site/DocServer/NMDMP_Report_April_2008.pdf?docID=4601

West Coast Marine Debris Database

The West Coast Marine Debris Database provides comprehensive access to information on West Coast marine debris including beach cleanups and derelict gear removal.

Geographic Coverage: Washington, Oregon, and California

Website: http://debris-db.westcoastoceans.org/

Cumulative and Secondary Impacts

Section 309 Enhancement Objective: 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. §309(a)(5)

PHASE I (HIGH-LEVEL) ASSESSMENT: *(Must be completed by all states.)*
Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. Using National Ocean Economics Program Data on population and housing,[22] please indicate the change in population and housing units in the state's coastal counties between 2012 and 2007. You may wish to add additional trend comparisons to look at longer time horizons as well (data available back to 1970), but at a minimum, please show change over the most recent five year period (2012-2007) to approximate current assessment period.

Trends in Coastal Population and Housing Units				
Year	**Population**		**Housing**	
	Total (# of people)	% Change (compared to 2002)	Total (# of housing units)	% Change (compared to 2002)
2000	154,805	2.85%	47,677	5.72%
2010	159,358		50,567	

Note: National Ocean Economics Program Data is not available for Guam. Data cited in the table above is based on the Census of Population and Housing data published by the Bureau of Statistics and Plans and corresponds to the decennial censuses conducted in 2000 and 2010.

2. Using provided reports from NOAA's Land Cover Atlas[23] or high-resolution C-CAP data[24] (Pacific and Caribbean Islands only), please indicate the status and trends for various land uses in the state's coastal counties between 2006 and 2011. You may use other information and include graphs and figures, as appropriate, to help illustrate the information. Note that the data available for the islands may be for a different time frame than the time periods reflected below. In that case, please specify the time period the data represents. Also note that Puerto Rico and the Commonwealth of the Northern Mariana Islands (CNMI) currently only have data for one time point so will not be able to report trend data. Instead, Puerto Rico and CNMI should just report current land use cover for developed areas and impervious surfaces.

[22] www.oceaneconomics.org/. Enter "Population and Housing" section. From drop-down boxes, select your state, and "all counties." Select the year (2012) and the year to compare it to (2007). Then select "coastal zone counties." Finally, be sure to check the "include density" box under the "Other Options" section.
[23] www.csc.noaa.gov/ccapatlas/. Summary data on land use trends for each coastal state is available on the ftp site.
[24] www.csc.noaa.gov/digitalcoast/data/ccaphighres. Summary data on land use trends for each coastal state is available on the ftp site.

Distribution of Land Cover Types in Coastal Counties		
Land Cover Type	**Land Area Coverage in 2011** (Square Miles)	**Gain/Loss Since 2006** (Square Miles)
Developed, High Intensity	20.29	1.09
Developed, Low Intensity	N/A	N/A
Developed, Open Space	22.74	0.43
Grassland	41.53	0.25
Scrub/Shrub	18.07	0.33
Barren Land	4.41	-2.00
Open Water	20.40	0.06
Agriculture	0.96	-0.25
Forested	95.17	0.06
Woody Wetland	4.78	0.08
Emergent Wetland	1.53	-0.05

Note that Land Area Coverage is shown in square miles and not acres as originally indicated by the template. Also, the comparison year is 2005 and not 2006. 2006 data for Guam is not available.

3. Using provided reports from NOAA's Land Cover Atlas[25] or high-resolution C-CAP data[26] (Pacific and Caribbean Islands only), please indicate the status and trends for developed areas in the state's coastal counties between 2006 and 2011 in the two tables below. You may use other information and include graphs and figures, as appropriate, to help illustrate the information. Note that the data available for the islands may be for a different time frame than the time periods reflected below. In that case, please specify the time period the data represents. Also note that Puerto Rico and CNMI currently only have data for one time point so will not be able to report trend data. Unless Puerto Rico and CNMI have similar trend data to report on changes in land use type, they should just report current land use cover for developed areas and impervious surfaces.

Development Status and Trends for Coastal Counties			
	2006	**2011**	**Percent Net Change**
Percent land area developed	18.06	18.72	3.67%
Percent impervious surface area	8.35	8.83	5.7%

** Note: Islands likely have data for another time period and may only have one time interval to report. If so, only report the change in development and impervious surface area for the time period for which high-resolution C-CAP data are available. Puerto Rico and CNMI do not need to report trend data.*

How Land Use Is Changing in Coastal Counties	
Land Cover Type	**Areas Lost to Development Between 2006-2011** (Square Miles)
Barren Land	0.49 square miles
Emergent Wetland	Not Available
Woody Wetland	Not Available
Open Water	0.01 square miles
Agriculture	0.06 square miles

[25] www.csc.noaa.gov/ccapatlas/. Summary data on land use trends for each coastal state is available on the ftp site.
[26] www.csc.noaa.gov/digitalcoast/data/ccaphighres. Summary data on land use trends for each coastal state is available on the ftp site.

Scrub/Shrub	0.57 square miles
Grassland	0.53 square miles
Forested	1.87 square miles

** Note: Islands likely have data for another time period and may only have one time interval to report. If so, only report the change in land use for the time period for which high-resolution C-CAP data are available. Puerto Rico and CNMI do not report.*

4. Using data from NOAA's State of the Coast "Shoreline Type" viewer,[27] indicate the percent of shoreline that falls into each shoreline type.[28] You may provide other information or use graphs or other visuals to help illustrate.

Shoreline Types	
Surveyed Shoreline Type	**Percent of Shoreline**
Armored	15%
Beaches	35%
Flats	0%
Rocky	44%
Vegetated	6%

5. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the cumulative and secondary impacts of coastal growth and development, such as water quality and habitat fragmentation, since the last assessment to augment the national data sets.

Through 309 grant funds, GCMP commissioned the University of Guam's Water and Environmental Research Institute to develop a GIS tool to help assess cumulative and secondary impacts to the Northern Guam Lens Aquifer. This tool will provide GCMP and policy makers a better understanding of the impact to Guam's sole source aquifer especially as it related to clearing and grading of native limestone forest.

The Department of Agriculture, Forestry Division recently updated the forestry data set to determine high value forest area. Information from this data is used to determine critical areas for habitat restoration.

Since the previous assessment period, there have been many efforts to reduce sedimentation into coastal waters including the implementation of the soil erosion and sediment control regulations and the numerous reforestation projects in several of Guam's priority watersheds. Updating and delineating wetlands in priority watersheds enables the GCMP to evaluate the effectiveness of these management measures. Data is being collected to determine if BMPs are effective in improving the health of Guam's wetlands.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if there have been any significant state-level changes (positive or negative) in the development and adoption of procedures to assess,

[27] http://stateofthecoast.noaa.gov/shoreline/welcome.html

[28] Note: Data are from NOAA's Environmental Sensitivity Index (ESI) Maps. Data from each state was collected in different years and some data may be over ten years old now. However, it can still provide a useful reference point absent more recent statewide data. Feel free to use more recent state data, if available, in place of ESI map data. Use a footnote to convey data's age and source (if other than ESI maps).

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, since the last assessment.

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	N	N	N
Guidance documents	Y	Y	Y
Management plans (including SAMPs)	Y	Y	Y

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

The Department of Public Works developed the Draft Guam Road Network Storm water Implementation Plan to address storm water issues along Guam's major highways. BMP for road networks were developed for use on road construction projects.

During the last assessment, Watershed Management Plans were developed for the Piti-Asan and Manell-Geus watersheds. More recently, GCMP began collecting data for the Toguan watershed. In addition to watershed plans, Conservation Action Plans for some areas have also been prepared to identify sites within the watershed that are in need of restoration and mitigation. GCMP has also included some socioeconomic data to support management decisions to facilitate a more cohesive approach to improve watershed health.

In Manell-Geus, the community was interested in reducing flooding problems. One contributing factor is invasive bamboo within the riparian corridor; managers are considering options to control bamboo to improve habitat, reduce flooding and help decrease streambank erosion events.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High __X__
Medium _____
Low _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

During the meetings with stakeholders, many expressed a high degree of concern about the long-term lack of proactive action regarding storm water management. Understanding the impacts of increased development, and more specifically the associated higher volumes of storm water, has become a priority due to growing economic, social and environmental effects. Although limited efforts have been made to educate the construction community to develop effective post-construction best management practices (BMPs) to address storm water and erosion impacts, little has been done to improve or enforce existing pre and post construction storm water management regulations. Stakeholders were interested in developing education programs on the existing storm water regulations and their relationship to the local economy and the natural environment.

Cumulative and Secondary Impacts continue to be a high priority as the island addresses food security concerns by expanding opportunities for farming. The United States Department of Agriculture (USDA) and the Guam Department of Agriculture (DoAg) are taking steps to protect critical agricultural resources to ensure the island can support increase food production. Stakeholders agree that a set of policies for incentivizing the preservation of suitable farmland is a growing necessity.

Soil erosion and sedimentation is one of the most serious and neglected sources of nonpoint source pollution on Guam. Its negative effects can be seen throughout Guam's rivers and streams and have contributed greatly to the degradation of our stream banks and surrounding reef ecosystem. In the north, it contributes to negative impacts on our sole aquifer system and our tourism hub known as Tumon Bay. The implementation of the Cumulative and Secondary Impacts tool within planning controls regulating development will help quantify this nonpoint source pollution concern in northern Guam.

With the relatively rapid increase in both private and public development from the military buildup, the government of Guam lacks the necessary data to develop policies to address natural resource losses resulting from the cumulative and secondary impacts associated with development from the buildup and other drivers. It is expected that cumulative impacts will result from the removal of large tracts of native forest. This includes loss or conversion of native habitat. This may negatively impact the recovery of Endangered Species Act (ESA) wildlife, decrease the capacity of the recharge areas of the aquifer, and result in a loss of culturally important terrestrial resources.

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RESOURCES AND TOOLS:

Below are a few national resources and tools that may be useful in conducting your assessment or developing strategies for cumulative and secondary impacts of development. States likely have other state-specific resources, tools, and data that would be useful as well.

EPA National Coastal Condition Report IV

The report describes and rates the ecological and environmental conditions in U.S. coastal waters. Information is summarized on a national and regional basis. The latest report, released in 2012, reports on data collected from 2003 to 2006.

Geographic Scope: National and regional
Website: http://water.epa.gov/type/oceb/assessmonitor/nccr/index.cfm

NOAA C-CAP Coastal Land Atlas

Online data viewer provides user-friendly access to regional land cover and land cover change information developed through NOAA's Coastal Change Analysis Program (C-CAP). The tool summarizes land use change trends. Users can investigate how land cover changed between 1996, 2001, 2006, and 2011. Although data are provided by county, NOAA staff members are able to help states easily aggregate county data into statewide summary.

Geographic Scope: Contiguous United States and Hawaii

Website: www.csc.noaa.gov/digitalcoast/tools/lca

NOAA High-Resolution C-CAP Data

Nationally standardized database of land cover information (developed using remotely sensed imagery) for the coastal regions of the U.S. C-CAP products provide inventories of coastal intertidal areas, wetlands, and adjacent uplands. High-resolution C-CAP products focus on bringing NOAA's national mapping framework to the local level by providing data relevant for addressing site-specific management decisions. Although the data require desktop GIS and some GIS technical skills, NOAA staff members are able to help states analyze data to support wetlands assessment.

Geographic Scope: Targeted watershed and other hotspots in the Caribbean, Pacific Islands region, and Monterey Bay, California

Website: www.csc.noaa.gov/digitalcoast/data/ccaphighres

NOAA Environmental Sensitivity Index Maps

Environmental Sensitivity Index (ESI) maps are designed to provide a concise summary of coastal resources at risk in case of an oil spill or other disaster. They characterize the type of shoreline (armored, vegetated, beach, etc.) and may be useful for resource characterization and assessment. ESI maps are periodically updated on a state-by-state basis, and are generally available in multiple formats (pdf maps, GIS layers, etc.)

Geographic Scope: All coastal states and territories

Website: http://response.restoration.noaa.gov/maps-and-spatial-data/environmental-sensitivity-index-esi-maps.html

NOAA Impervious Surface Analysis Tool

The Impervious Surface Analysis Tool (ISAT), a custom suite of easy-to-use scripts for ArcGIS, is used to calculate the percentage of impervious surface area within user-selected geographic areas, such as watersheds, municipalities, and subdivisions. ISAT uses imperviousness values to categorize areas as having good, fair, or poor water quality. A correlation between an increase in impervious surfaces and a decrease in water quality has been well established, and ISAT users may find the information derived from ISAT helpful in predicting how different management scenarios might impact local water quality. The tool calculates the percent impervious area and total impervious surface area of each selected polygon, categorizes polygons to represent conditions of good, fair, and poor water quality based on calculated imperviousness, and incorporates land cover change scenarios to examine how changes influence impervious surfaces. Although it requires desktop GIS and some GIS technical skills, NOAA staff members are able to help states analyze data to support wetlands assessment.

Geographic Scope: Appropriate geographic scope should be based upon the resolution and complexity of the data. The tool is built on Esri's ArcGIS, so it will only run as fast as allowed within that software.

Website: www.csc.noaa.gov/digitalcoast/tools/isat

NOAA OpenNSPECT Data

OpenNSPECT is the open-source version of the Nonpoint Source Pollution and Erosion Comparison Tool to investigate potential water quality impacts from development, other land uses, and climate change. OpenNSPECT was designed to be broadly applicable. When applied to coastal and noncoastal areas alike, the tool simulates erosion, pollution, and their accumulation from overland flow. The tool provides estimates and maps of surface water runoff volumes, pollutant loads, pollutant concentrations, and total sediment loads, helps users identify areas that might benefit from changes to proposed development strategies, and provides a means to analyze "what if" land use change scenarios. Although it requires desktop GIS and some GIS technical skills, NOAA staff members are available to provide technical assistance.

Geographic Scope: Appropriate geographic scope should be based upon the resolution and complexity of the data. The tool is a plugin for open source MapWindow GIS.

Website: www.csc.noaa.gov/digitalcoast/tools/opennspect

CZMA Performance Measurement System Data

Annual CZMA performance measurement data for coastal community development. Online database can be used to synthesize existing state and territory data reported during the assessment period.

Geographic Scope: All coastal states and territories

Website: www8.nos.noaa.gov/PMD/Login.aspx?ReturnUrl=%2fPMD%2fdefault.aspx

NOAA State of the Coast

The State of the Coast website fosters an increased awareness of the crucial importance of healthy coastal ecosystems to a robust U.S. economy, a safe population, and a sustainable quality of life for coastal residents. The site offers quick facts and more detailed statistics through interactive indicator visualizations. Visualizations focused on coastal population, overall coastal health, shoreline type, and nutrient pollution, and others may help inform the cumulative and secondary impacts assessment.

Geographic Scope: Generally all coastal states and territories but a few viewers may have more limited coverage.

Website: http://stateofthecoast.noaa.gov/

Special Area Management Planning

Section 309 Enhancement Objective: Preparing and implementing special area management plans for important coastal areas. §309(a)(6)

The Coastal Zone Management Act 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."

PHASE I (HIGH-LEVEL) ASSESSMENT: *(Must be completed by all states and territories.)*
Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. In the table below, identify geographic areas in the coastal zone subject to use conflicts that may be able to be addressed through a special area management plan (SAMP). This can include areas that are already covered by a SAMP but where new issues or conflicts have emerged that are not addressed through the current SAMP.

Geographic Area	Opportunities for New or Updated Special Area Management Plans
	Major conflicts/issues
Coral Reefs /Bays/ Lagoons/ Shoreline	Overharvesting, near-shore development, increased recreation, poor fishing practices, storms, shoreline erosion, flooding, non point pollution
Aquifer Recharge Area	Agriculture, development, overuse, military build-up
Fragile Areas (wetlands, limestone forest, wildlife habitats and historic sites)	Development, Military, Ancestral Lands and Chamorro Land Trust needs, water sports and tropical beach recreation, and outright vandalism, graffiti and theft of historic properties in historic sites.
Priority Watersheds (Piti-Asan, Manell-Geus, Pago Bay, Ugum, Fouha, Toguan)	Fires, poor land management, increasing development, flooding, invasive species

2. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends of SAMPs since the last assessment.

Marine Preserves

Guam enacted a law allowing the Department of Agriculture to create "EcoPermits" to monitor non-fishing activities in the island's five marine preserves. However, the department and its partners, including GCMP, have not been able to finalize and adopt Eco Permit rules and regulations. The marine preserves continue to limit direct harvest of fish and other marine species, these areas are currently open to virtually all types of other activity. The intent of the preserves is to protect both species and habitats, so controls on non-harvest activity are intended to become part of the management system for these protected areas. To support the draft rules and regulations, the Department of Agriculture hired a consultant to complete a study on "Limits for Acceptable Change" for the Piti Bomb Holes and Tumon Bay preserves. This study attempted to delineate zones for various levels and types of recreational use within these bays. Although the study was complete, Department of Agriculture has had a difficult time incorporating the findings into the Eco Permit draft Rules and Regulations.

The Chamorro Land Trust Commission recently completed a master plan for the properties within their inventory. The leases are given for residential and agriculture use by indigenous Chamorros. The period of the lease is 99 years. The CLTC can also lease properties in their inventory for commercial use to fund infrastructure and other administrative costs. Recently the CLTC has completed a master plan for their properties and have started to develop community plans for large tracts of land.

Aquifer Recharge Area: The Northern Guam Lens serves as a source of potable water for 80% of the island's population. Under the Safe Drinking Water Act, the aquifer has been designated a sole source aquifer. After several years of monitoring and research by the University of Guam's Water and Environmental Research Institute (WERI) and the Guam Waterworks Authority (GWA), Guam EPA has determined that the Norther Guam Lens Aquifer is not subject to a "Ground Water Under Direct Influence" (GWUDI) designation.

Guam Wellhead Protection Plan. The Guam Waterworks Authority completed an inventory and assessment of all of its water wells. The study identified wells that are potentially in high sensitive areas that need close monitoring to ensure that land activities do not impact water extracted from these wells. The plan and GIS maps were provided to the Department of Land Management and the Chamorro Land Trust Commission. Activities from potential development may have contaminated these wells. Recently the Chamorro Land Trust has been issuing agricultural and residential leases. The CLTC and GWA have agreed not to lease properties within 300 feet of the wells.

Guam Forest Legacy Act. Enacted under Public Law31-173, this new law passed in 2012 establishes the Guam Forest System for the protection and conservation of natural resources and natural habitats or ecosystems, open space, historic artifacts and land for outdoor recreation and education. The law attempts to provide for an inventory of Guam's government lands that are suitable for forest management. Best management efforts will be implemented for land in the forest system.

Imagine Guam. The Governor has assigned a Special Assistant to develop a community plan to develop polices for Guam's future. "Imagine Guam" is a 50-year strategic vision for Guam. The strategic vision includes strategic plans for social services, food security, cultural and historic, transportation, economy, environment, green space and sustainability.

Concepts from the 2009 "North and Central Land Use Plan" are incorporated in the land development portion of Imagine Guam.

Long Term Coral Reef Monitoring Program. Coral Reef Monitoring is being completed through a comprehensive monitoring program funded by the Coral Reef Initiative Funds. Guam's monitoring plan builds upon the work already accomplished through past NOAA Coral Reef Ecosystem Monitoring grants. It incorporates existing programs and uses modified versions of techniques developed for the five long-term monitoring sites and coral disease monitoring conducted by researchers at the UOG Marine Lab (funded by CRI Monitoring grant funds). Their objective is to collect comprehensive data from permanent sites around the island of Guam.

The primary goals of the Guam Coral Reef Monitoring Plan are to:

- Determine the status and trends in selected coral reef ecosystem indicators to better inform the resource manager's decision making process and increase the effectiveness of natural resource management on Guam.
- Provide managers with early notice of abnormal conditions of selected resources to encourage effective mitigation measures and reduce the costs of management.
- Provide data to better understand the dynamic nature and condition of the island's coastal ecosystems.
- Allow natural resource agencies to meet certain legal and congressional mandates related to coastal resource protection.
- Measure progress towards performance goals.

Results will be available in late 2016. The monitoring program will provide data on the effectiveness of best management practices and lead to policy development for areas of special concern.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if there have been any significant state- or territory-level management changes (positive or negative) that could help prepare and implement SAMPs in the coastal zone.

Management Category	**Employed by State or Territory** (Y or N)	**CMP Provides Assistance to Locals that Employ** (Y or N)	**Significant Changes Since Last Assessment** (Y or N)
SAMP policies, or case law interpreting these	Y	Y	N
SAMP plans	Y	Y	Y

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Historic district of Hagåtña. The Hagåtña Redevelopment Authority recently completed a master plan for Hagåtña, the capital of Guam. The plan identified commercial tourist districts and includes improvements to the area as part of the preparation for the 2016 Festival of Pacific Arts. Some of these improvements include developing the Agana River, the construction of the new Guam Museum, upgrades to the Chamorro Village complex, walkways and infrastructure.

The Guam Waterworks Authority finalized the Wellhead Protection Plan. The plan assessed all existing GWA well locations and determined risk factors associated with poor land use practices. It was determined that majority of GWA's wells are in high risk areas. As a result, discussions have begun with the Chamorro Land Trust Commission to ensure that vacant government property within a 300-foot radius of a well will no longer be leased out.

Continued implementation of the Watershed Plan. The Piti-Asan and Manell-Geus watershed management plans were completed during the previous assessment. Work to address threats in the watershed continues. Most watershed work is performed by GCMP staff in support of coral funded projects. NOAA is also coordinating with local and federal partners to undertake extensive watershed management actions in support of Manell-Geus as a coral priority site and a NOAA Habitat Blueprint focus area.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	__X__
Medium	_____
Low	_____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

During the stakeholder meeting we learned that the SAMP continues to be a high priority. Community planning continues to be important to ensure that sensitive environmental areas are better managed and protected. During this assessment, watershed management, including storm water management was of critical concern. In addition, protection of native forest habitats is critical to protecting biodiversity, conserving important habitat and safeguarding the health of Guam's sole source aquifer.

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RESOURCES AND TOOLS:

Below are a few national resources and tools that may be useful in conducting your assessment or developing SAMP *strategies. States likely have other state-specific resources, tools, and data that would be useful as well.*

Davis, Braxton. 2004. "Regional Planning in the U.S. Coastal Zone: A Comparative Analysis of 15 Special Area Plans." *Ocean and Coastal Management*. Volume 47, Pages 79 to 94.

Geographic Scope: National
Website: www.sciencedirect.com/science/article/pii/S0964569104000225

Imperial, Mark. 1999. "Analyzing Institutional Arrangements for Ecosystem-Based Management: Lessons from the Rhode Island Salt Ponds SAM Plan." *Coastal Management.* Volume 27. Pages 31 to 56.

Geographic Scope: Rhode Island, but lessons broadly applicable
Website: www.ingentaconnect.com/content/tandf/ucmg/1999/00000027/00000001/art00002?crawler=true

Lane Council of Governments. 1992. "Hints on Preparing a Comprehensive Wetland Management Plan." Lane Council of Governments, Lane, Oregon.

Geographic Scope: National
Website: www.rice.edu/wetlands/Reports/R12_1.html

Ocean and Great Lakes Resources

Section 309 Enhancement Objective: Planning for the use of ocean [and Great Lakes] resources. §309(a)(7)

PHASE I (HIGH-LEVEL) ASSESSMENT: *(Must be completed by all states and territories.)*
Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. Understanding the ocean and Great Lakes economy can help improve management of the resources it depends on. Using Economics: National Ocean Watch (ENOW),[29] indicate the status of the ocean and Great Lakes economy as of 2010, as well as the change since 2005, in the tables below. Include graphs and figures, as appropriate, to help illustrate the information. Note ENOW data are not available for the territories. The territories can provide alternative data, if available, or a general narrative, to capture the value of their ocean economy.

Status of Ocean and Great Lakes Economy for Coastal Counties (2010)				
	Establishments (# of Establishments)	**Employment** (# of Jobs)	**Wages** (Millions of Dollars)	**GDP** (Millions of Dollars)
Living Resources	N/A	N/A	N/A	N/A
Marine Construction	N/A	N/A	N/A	N/A
Marine Transportation	N/A	N/A	N/A	N/A
Offshore Mineral Extraction	N/A	N/A	N/A	N/A
Tourism & Recreation	N/A	N/A	N/A	N/A
All Ocean Sectors	N/A	N/A	N/A	N/A

Change in Ocean and Great Lakes Economy for Coastal Counties (2005-2010)				
	Establishments (% change)	**Employment** (% change)	**Wages** (% change)	**GDP** (% change)
Living Resources	N/A	N/A	N/A	N/A
Marine Construction	N/A	N/A	N/A	N/A
Marine Transportation	N/A	N/A	N/A	N/A
Offshore Mineral Extraction	N/A	N/A	N/A	N/A
Tourism & Recreation	N/A	N/A	N/A	N/A
All Ocean Sectors	N/A	N/A	N/A	N/A

[29] www.csc.noaa.gov/enow/explorer/. If you select any coastal county for your state, you receive a table comparing county data to state coastal county, regional, and national information. Use the state column for your responses.

Guam's ocean economy is derived from fishing, tourism and recreation. There are no marine construction, marine transportation, or off shore mineral extraction activities and industries on Guam.

The Coral Reef Valuation Study was completed in 2007. The objective of the study was to determine the comprehensive economic valuation of the Guam's coral reefs and associated resources. The study looked at how Guam's economy benefits directly and indirectly from ocean resources. Data was collected for fisheries, others non-extractive activities such as water recreation and tourism, cultural and traditional uses, and education and research. The process also considered some indirect uses, such as shoreline and infrastructure protection.

The study has helped decision makers and the public gain a better understanding of the importance of coral reefs to Guam's economy. This information can also be used to assist in determining mitigation activities for coral damage. The study reported that Guam's reefs contribute $127 million toward Guam's economy annually. The report has not been updated since 2007.

Type of reef-related value	**Economic value (*million $/year*)**	**Economic value *(% of total*)**
Tourism	$94.63	74.30%
Diving and snorkeling	$8.69	6.80%
Fishery	$3.96	3.10%
Amenity	$9.60	7.50%
Coastal protection	$8.40	6.60%
Biodiversity	$2.00	1.60%
Total Economic Value	$127.28	99.90%

Source: Table E.5 Economic Value of Guam Coral Reefs. University of Guam Marine Laboratory Technical Report No. 116.March 2007

Guam's economy is heavily dependent on its Tourism economy. Guam has had record tourist arrivals from Japan, Korea, China, and Russia. This year it is expected that Guam 1.3 million tourists will visit Guam.

Fishing is another ocean industry that supports the economy of Guam. In addition to its contribution to the cash economy, fishing is important as a cultural practice and for subsistence for many local families. Below are tables from the latest fishing related industry statistics, both offshore and inshore. There has been an increase in the catch levels over the last year of data collected compared to previous years.

Annual Offshore and Inshore Creel Survey, Guam: Fiscal Years 2003 to 2013 [Metric Tons]

Bureau of Statistics and Plans, Government of Guam, 2013 Statistical Yearbook

Description	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003
Total	597.2	340.1	553.8	431.2	425.8	354.6	300.7	332.2	233.6	428.7	432.2
Offshore Fisheries	424.5	257.1	405.4	399.4	402.3	313.4	253.2	271.4	194.0	385.2	367.0
Trolling	367.6	202.4	264.1	329.3	322.3	247.1	204.8	215.5	139.6	311.7	272.0
Bottom fishing	26.4	22.7	40.3	25.0	39.3	27.6	29.3	40.9	28.6	28.2	38.0
Nighttime Jigging	3.1	8.5	8.1	4.5	5.8	1.3	0.9	0.8	1.0	1.2	1.0
Spearfishing	19.5	10.5	42.5	31.0	27.2	26.0	14.3	8.7	20.1	38.0	37.0
Hand/Gill Net Fishing	7.4	9.1	42.3	7.9	7.0	7.4	3.8	5.0	4.0	5.3	18.0
Other	0.5	4.0	8.1	2.0	0.7	4.1	0.1	0.5	0.7	0.8	1.0
Inshore Fisheries	82.7	83 1	48.4	31.8	23.5	41.2	47.5	60.8	39.6	43.5	65.2
Hook and Line	20.1	43.4	72.6	2.6	5.6	13.2	16.2	16.5	11.0	14.3	21.9
Cast net	44.6	14.9	64.4	3.5	5.8	6.4	3.2	20.1	3.8	5.4	8.7
Gillnet	12.1	16.1	4.6	23.9	2.9	9.8	9.8	7.3	10.0	3.5	5.8
Surround/Drag Net	1 0.3	2.7	0.1 1.	3 2.0	1.3	2.0	1.4	2.4	2.6	3.1	1.7
Spearfishing	2.9	3.0	3.0	0.8	1.0	7.8	11.7	10.9	7.5	15.3	25.9
Hooks and Gaffs	1.9	3.3	0.6	0.3	6.4	1.5	4.0	2.5	4.1	0.6	0.3
Other	0.1	0.1	0.5	0.5	0.2	0.6	1.2	1.1	0.6	1.3	0.9

Source: Division of Aquatic and Wildlife Resources, Department of Agriculture, Government of Guam

Table 2-23. Annual Transshipment, Guam: CY 2009 to 2013

Bureau of Statistics and Plans, Government of Guam, 2013 Statistical Yearbook

Species	2013		2012		2011		2010		2009	
	No. Pieces	Kilograms	No. Pieces	Kilograms	No. Pieces	Kilograms	No. Pieces	Kilograms	No. Pieces	Kilograms
TOTAL	76,154	2,046,956	74,554	2,411,046	62,208	2,016,602	60,937	1,897,760	85,012	2,904,242
Tuna (Total)	72,070	1,862,998	70,319	2,222,150	59,724	1,897,447	57,419	1,726,062	82,453	2,782,058
Albacore	2,604	47,684	1,738	29,111	1,271	22,037	1,262	23,179	262	5,234
Bigeye	47,174	1,379,499	44,212	1,691,446	35,948	1,343,368	26,948	987,638	43,668	1,826,634
Blue Fin Tuna	0	0	0	0	0	0	0	0	2	248
Yellow Fin	22,292	435,815	24,369	501,593	22,505	532,042	29,209	715,245	38,521	949,942
Non-Tuna (Total)	4,084	183,958	4,235	188,896	2,484	119,155	3,518	171,698	2,559	122,184
Black Marlin	0	0	69	2,968	785	36,265	767	36,645	633	31,043
Blue Marlin	2,379	103,136	1,743	78,517	1,106	53,517	2,077	98,240	1,209	59,642
Other	0	0	0	0	35	760	0	0	0	0
Other Non Tuna	35	640	235	3,552	0	0	5	105	237	4,546
Red Marlin	0	0	0	0	0	0	0	0	3	127

Striped Marlin	0	0	0	0	0	0	0	0	1	60
Swordfish	959	49,663	885	45,844	359	19,166	34,893	34,893	453	25,612
Wahoo	0	0	19	911	0	0	0	0	1	47
White Marlin	711	30,519	1,284	57,104	199	9,447	1,815	1,815	22	1,107

2. In the table below, characterize how the threats to and use conflicts over ocean and Great Lakes resources in the state's or territory's coastal zone have changed since the last assessment.

Significant Changes to Ocean and Great Lakes Resources and Uses	
Resource/Use	**Change in the Threat to the Resource or Use Conflict Since Last Assessment** (↑, ↓, –, unknown)
Resource	
Benthic habitat (including coral reefs)	Increase
Living marine resources (fish, shellfish, marine mammals, birds, etc.)	Increase
Sand/gravel	Unknown
Cultural/historic	Increase
Other (please specify)	
Use	
Transportation/navigation	No Change
Offshore development[30]	Unknown
Energy production	Unknown
Fishing (commercial and recreational)	Increase
Recreation/tourism	Increase
Sand/gravel extraction	Unknown
Dredge disposal	Unknown
Aquaculture	No Change
Other (please specify)	

3. For the ocean and Great Lakes resources and uses in Table 2 (above) that had an increase in threat to the resource or increased use conflict in the state's or territory's coastal zone since the last assessment, characterize the major contributors to that increase.

Major Contributors to an Increase in Threat or Use Conflict to Ocean and Great Lakes Resources												
Resource	**Major Reasons Contributing to Increased Resource Threat or Use Conflict** (Note All that Apply with "X")											
	Land-based development	Offshore development	Polluted runoff	Invasive species	Fishing (Comm & Rec)	Aquaculture	Recreation	Marine Transportation	Dredging	Sand/Mineral Extraction	Ocean Acidification	Other (Specify)

[30] Offshore development includes underwater cables and pipelines, although any infrastructure specifically associated with the energy industry should be captured under the "energy production" category.

Example: Living marine resources		*X*	*X*	*X*	*X*	*X*		*X*	*X*			
Fishing (commercial and recreational)	X		X	X*	X							Overfishing
Recreation/tourism	X		X									

Guam is monitoring invasive species for both fishing and recreation. The University of Guam Marine Laboratory, Guam EPA and the Department of Agriculture- Division of Aquatic and Wildlife Resources are documenting the increase of *Chaetomorpha* problem along the east coast of Guam. The algae were first identified on the south side of Cocos Island. Within a span of a year, the problem had spread from the southern tip of Guam to the entire eastern side of the island. UOGML has a grant to determine the cause of the rapid growth.

4. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends of ocean and Great Lakes resources or threats to those resources since the last assessment to augment the national data sets.

Guam has not updated the Status of the Reefs Report since the 2008. The Coral Reef Monitoring Program has a few years' worth of data for several established monitoring sites and baseline data for several new ones. The monitoring team will first focus on a comprehensive analysis of that data. However, it will require a much larger effort to then coordinate a Status of the Reefs Report update that incorporates all available data since 2008.

While there isn't an official Status of the Reefs Report, there was significant mortality associated with coral bleaching events in 2013 and 2014 and low tide exposure associated with the ongoing El Niño event appears to have resulted in some mortality as well. The analysis of a substantial amount of data collected during the 2013 bleaching event is complete, but the final numbers will not be available for several months. Preliminary numbers indicate that over 80% of all species were affected, nearly half of all colonies were affected, and that some corals that are dominant in shallow, wave-exposed waters around much of the island (e.g., Acropora, Pocillopora, and Montipora) were hit particularly hard, with 30-50% mortality. A subset of the locations surveyed during the 2013 bleaching event will be analyzed in an effort to get an idea of how much additional mortality may have occurred during the 2014 bleaching event and to see if there are any sign of recovery.

In addition, the staghorn thickets around the island were assessed to determine how they were impacted by the bleaching events. It is estimated that approximately 50-60% of all of Guam's staghorn corals perished as a result of those events. Anecdotally, much of that mortality occurred during the 2014 event, which, while of a lower severity and duration, seemed to have caught the corals in a weakened state after they managed to persist through the 2013 event. It didn't take more than 2-3 weeks of unusually warm water to desolate them.

When analysis has been completed, Guam’s monitoring data should be able to support a concerning trend in fishery. Increased reports of fishing in the MPAs have triggered efforts to increase enforcement. Unfortunately, there are a limited number of Conservation Officers. There is a major concern that very heavy fishing activity is being carried out by a well-organized and apparently well-funded group of fishermen. This combined with inadequate enforcement activity may have impacted the preserves. Regardless of the state of the preserves, the rest of the island has been substantially impacted by

increasing fishing pressure, including what is perceived by the fishing community as a large increase in commercial fishing. Limited data is available to validate these observations.

Guam Water Quality Standards for Recreational Waters. Guam EPA submitted revised standards that were based on data for tropical environments. The water quality standards for recreational waters are monitored by Guam EPA. Approval is pending.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if any significant state- or territory-level changes (positive or negative) in the management of ocean and Great Lakes resources have occurred since the last assessment?

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	Y	N
Regional comprehensive ocean/Great Lakes management plans	Y	N	Y
State comprehensive ocean/Great Lakes management plans	Y	N	Y
Single-sector management plans	N	N	N

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Pacific Islands Regional Planning Body. Guam is a member of the Pacific Island Regional Planning Body. A regional plan is presently in draft form. The plan's goal is intended to assist with regional management of coastal and marine areas of the Pacific. The plan will address issues related to economic, social, environmental, security, conservation, and sustainable use of natural and cultural resources for the region.

Meetings with the members and stakeholders were held in 2013 and 2014. A Stakeholder Engagement Plan and a Charter have been developed. A workshop was held on Foundation for Ocean Planning, Human Use and Habitat Characterization for stakeholders. The "Practitioners Guide to Managing Ocean Resources through Coastal and Marine Spatial Planning" is also available.

Guam Marine Protected Areas (MPAs): Limits of Acceptable Change. The Department of Agriculture conducted a study to determine impacts on non-fishing areas for the Tumon MPA and Piti Bomb holes

MPA. This effort was to support the Eco Permit progress. The Limits of Acceptable Change identified areas for marine activities other than fishing within the MPA.

Western Pacific Regional Fisheries Management Council: the Western Pacific Regional Fisheries Management Council (WesPac) is a federal organization tasked with managing and implementing laws governing fishing within the exclusive economic zone of U.S. Pacific jurisdictions, including Guam and the Commonwealth of the Northern Marianas in Micronesia. During this assessment period, WesPac was working with the community of Merizo in developing a community-based management plan.

Micronesia Challenge: Governor Calvo continues to support the regional conservation initiative. During this assessment period, marine, terrestrial and social economic measures groups have met to agree on the data that will be collected to show progress for the Micronesia Challenge (MC) in each jurisdiction. Guam developed a communication and marketing plan for the MC. A partnership with Guam Hotel and Restaurant Association will help raised funds for the MC endowment. The endowment will provide sustainable funding for required conservation work.

Other regional management programs include: The U.S. All Island Coral Reef Initiative Coordinating Committee, Micronesian Chief Executive Council, Pacific Island Regional Ocean Body and the Western and Central Pacific Fisheries Commission are regional coordinating bodies.

3. Indicate if your state or territory has a comprehensive ocean or Great Lakes management plan.

Comprehensive Ocean/Great Lakes Management Plan	State Plan	Regional Plan
Completed plan (Y/N) (If yes, specify year completed)	N	N
Under development (Y/N)	N	Y
Web address (if available)	N/A	www.pacificislandsrpb.org
Area covered by plan	N/A	Pacific Islands

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High _____
Medium __X__
Low _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Ocean resources are essential to the continuance of the community. Although oceans are critical, stakeholder did not consider it a high priority for 309 funding. Issues such management of marine resources, non point sources of pollution, and areas of concern are addressed through other priority areas such as SAMP. Issues of concern included legislation to address bio-prospecting, Government of Guam ownership of mineral extraction rights, transparency in ocean disposal data, impact from wastewater and storm water, and GIS data for ocean mapping.

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RESOURCES AND TOOLS:

Below are a few national resources and tools that may be useful in conducting your assessment or developing strategies for ocean and Great Lakes Resources. States likely have other state-specific resources, tools, and data that would be useful as well.

BOEM Environmental Studies Program

The Bureau of Ocean and Energy Management's (BOEM) Environmental Studies Program develops, conducts, and oversees world-class scientific research specifically to inform policy decisions regarding development of Outer Continental Shelf energy and mineral resources. Research covers physical oceanography, atmospheric sciences, biology, protected species, social sciences and economics, submerged cultural resources, and environmental fates and effects.

Geographic Scope: Specific to each study
Website: www.boem.gov/Studies/

MarineCadastre.gov Viewer

This data viewer provides the baseline information needed for ocean planning efforts, particularly those that involve finding the best location for renewable energy projects. Users pick the ocean geography of their choosing and quickly see the applicable jurisdictional boundaries, restricted areas, laws, critical habitat locations, and other important features. With the national viewer, potential conflicts can be identified and avoided early in the planning process, and users can visually analyze and explore geospatial data for marine spatial planning activities and find direct access to authoritative marine cadastral data from federal and state sources.

Geographic Scope: National
Website: www.csc.noaa.gov/digitalcoast/tools/mmc

NOAA Assessment of Existing Information on Atlantic Coastal Fish Habitats

This project reviewed over 500 published sources of information on habitat condition indicators, threats, and conservation actions for U.S. Atlantic coastal waters and watersheds. Results are available via web query tools and a published NOAA technical memo.

Geographic Scope: Atlantic coastal waters, from Maine to Florida
*Websites (*query tools): www8.nos.noaa.gov/bhv/spatbibindex.html; tech memo: http://ccma.nos.noaa.gov/publications/nccostechmemo103.pdf

NOAA Coastal County Snapshots: Ocean Jobs

Provides a snapshot of the economic value of ocean and Great Lakes jobs within a coastal county.

Geographic Scope: Coastal states only. Currently not available for territories.
Website: www.csc.noaa.gov/digitalcoast/tools/snapshots

NOAA Economics: National Ocean Watch Data (ENOW)
The effective management of coastal resources requires an understanding of the ocean and Great Lakes economy. This tool allows users to interact with ENOW data, which describe six economic sectors that depend on the oceans and Great Lakes: living resources; marine construction; marine transportation; offshore mineral resources; ship and boat building; and tourism and recreation. Users can discover which sectors are the largest in various parts of the county, which sectors are growing and declining, and which account for the most jobs, wages, and gross domestic product. They can view up to four counties, states, or regions to compare trends or the makeup of their ocean and Great Lakes economies. The ENOW Explorer's interface is designed to allow users who are familiar with economic data to interact with and view data and trends. The tool provides the highest level of interaction with ENOW data short of downloading the full data set.

Geographic Scope: National and regional
Website: www.csc.noaa.gov/digitalcoast/tools/enow

NOAA Essential Fish Habitat Mapper
The Essential Fish Habitat Mapper is an online tool that displays essential fish habitat, and habitat areas of particular concern, established under provisions in the Magnuson-Stevens Fishery Conservation and Management Act. The tool also includes areas where steps have been taken to minimize the impact that fisheries have on essential fish habitat, including anchoring restrictions, required fishing gear modifications, and bans on certain types of gear. Users can query information from multiple fishery management plans at once to view habitat maps and lists of species for a specific location. The tool displays habitat maps and species lists for specific locations, queries spatial information from multiple fishery management plans at once, and provides links to text descriptions and data inventories, including related fishery management plans, federal regulations, and data and metadata download.

Geographic Scope: National and regional
Website: www.csc.noaa.gov/digitalcoast/tools/efhmapper

OceanData.gov
The National Ocean Council's portal for data, information, and decision tools to support people engaged in regional marine planning for the future use of the ocean, coasts, and Great Lakes.

Geographic Scope: National and regional
Website: http://www.data.gov/ocean/community/ocean

U.S. Marine Protected Areas Mapping Tool
The U.S. Marine Protected Areas (MPAs) mapping tool is an online application designed to help users visualize MPA boundaries and provide access to MPA Inventory data. This mapping tool provides data on over 1,600 MPAs nationwide, offering easy access to spatial boundaries, conservation-based classification data, and site management information. Managers, scientists, and the public will find a detailed picture of the type, abundance, and distribution of MPAs throughout the United States, gaining an increased understanding and technical capacity for ocean resource protection, management, and stewardship. The tool visualizes patterns and characteristics of MPAs throughout the United States and filters the MPA Inventory in various ways to show only certain MPAs with specific attributes.

Geographic Scope: National and regional
Website: www.csc.noaa.gov/digitalcoast/tools/mpaviewer

Energy and Government Facility Siting

Section 309 Enhancement Objective: 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. §309(a)(8)31

PHASE I (HIGH-LEVEL) ASSESSMENT: *(Must be completed by all states and territories.)*
Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. In the table below, characterize the status and trends of different types of energy facilities and activities in the state's or territory's coastal zone based on best available data. If available, identify the approximate number of facilities by type. The MarineCadastre.gov may be helpful in locating many types of energy facilities in the coastal zone.

Status and Trends in Energy Facilities and Activities in the Coastal Zone				
Type of Energy Facility/Activity	**Exists in CZ**		**Proposed in CZ**	
	(# or Y/N)	Change Since Last Assessment (↑, ↓, –, unknown)	(# or Y/N)	Change Since Last Assessment (↑, ↓, –, unknown)
Energy Transport				
Pipelines[32]	Y	Unknown	N	Unknown
Electrical grid (transmission cables)	Y	Unknown	N	Unknown
Ports	Y	N	N	Y
Liquid natural gas (LNG)[33]	N	N	Y	Y
Other (please specify)				
Energy Facilities				
Oil and gas	Y	Y	Y	Y
Coal	N	N	N	N
Nuclear[34]	N	N	N	N
Wind	N	Y	Y	Y
Wave[35]	N	N	N	N
Tidal[36]	N	N	N	N

[31] CZMA § 309(a)(8) is derived from program approval requirements in CZMA § 306(d)(8), which states:
"The management program provides for adequate consideration of the national interest involved in planning for, and managing the coastal zone, including the siting of facilities such as energy facilities which are of greater than local significance. In the case of energy facilities, the Secretary shall find that the State has given consideration to any applicable national or interstate energy plan or program."
NOAA regulations at 15 C.F.R. § 923.52 further describe what states need to do regarding national interest and consideration of interests that are greater than local interests.
[32] For approved pipelines (1997-present): www.ferc.gov/industries/gas/indus-act/pipelines/approved-projects.asp
[33] For approved FERC jurisdictional LNG import/export terminals: www.ferc.gov/industries/gas/indus-act/lng/exist-term.asp
[34] The Nuclear Regulatory Commission provides a coarse national map of where nuclear power reactors are located as well as a list that reflects there general locations: www.nrc.gov/reactors/operating/map-power-reactors.html
[35] For FERC hydrokinetic projects: www.ferc.gov/industries/hydropower/gen-info/licensing/hydrokinetics.asp

Status and Trends in Energy Facilities and Activities in the Coastal Zone				
Type of Energy Facility/Activity	**Exists in CZ**		**Proposed in CZ**	
	(# or Y/N)	Change Since Last Assessment (↑, ↓, –, unknown)	(# or Y/N)	Change Since Last Assessment (↑, ↓, –, unknown)
Current (ocean, lake, river) [36]	N	N	N	N
Hydropower	N	N	N	N
Ocean thermal energy conversion	N	N	N	N
Solar	Y	Y	Y	Y
Biomass	N	N	N	N
Other (please specify)	N	N	Y	Y

2. If available, briefly list and summarize the results of any additional state- or territory-specific information, data, or reports on the status and trends for energy facilities and activities of greater than local significance in the coastal zone since the last assessment.

The Port Authority of Guam (PAG) has been modernizing and expanding its facilities in anticipation of the planned Military Buildup since approximately 2008. In April of 2008 the Port Authority of Guam unveiled its updated master plan which set the road map for the upgrade of its facilities to world class standards. Up until these recent upgrades, not much had changed since the Commercial Port was constructed in 1969. According to PAG's website "The master plan, which will modernize the Jose D. Leon Guerrero Commercial Port, calls for nearly $200 million in capital improvement upgrades to the 34-year-old facility." The modernization program is supposed to address Guam's organic growth as well as the anticipated increased cargo volume resulting from the relocation of the U.S. Marines and their dependents from Okinawa Japan to Guam. The PAG has also received a grant from the Maritime Administration for some of this modernization.

With regards to growth in other port related facilities, there have been occasional visits from cruise ships that stop on Guam for a day excursion. But cruise ship port calls do not seem to be a regular route for these ships. They are predominantly incidental stops when transiting long distances, such as between Japan and Australia. A senator in the Guam Legislature has taken an interest in growing the cruise ship industry. This will require additional modernization of facilities to provide the necessary infrastructure to accommodate a proper terminal, customs stations, visitor amenities, and other related services commensurate with the anticipated growth of the cruise industry. The Pacific Association of Travel Agents (PATA) has undertaken a feasibility study and expects to release its finding at its annual summit in May 2016. According to Nate Denight, General Manager for GVB, early findings from PATA were that a “regional cruise ship based here in Guam would be a great opportunity,” and that “there were a lot of strengths and opportunities that we had for hosting that. It would create a whole new industry that we didn’t have.”

The Guam Power Authority’s (GPA's) Integrated Resource Plan of 2013 provides a comprehensive report on the status and trends of energy facilities for Guam. The plan proposes utilizing Liquid Natural Gas (LNG) as an alternative fuel. LNG was considered as an alternative fuel type for both GPA’s existing oil-fired facilities (which would be converted to burn natural gas) as well as new combined cycle options. However, when the additional costs to develop the waterfront and other necessary infrastructure for the storage and delivery of LNG were taken into consideration, the Public Utilities Commission (PUC),

which establishes rates, were not in support of GPA's proposed switch to LNG. Additionally, a new Consolidated Commission on Utilities (CCU) was elected and have also not supported GPA's LNG proposal unlike the past CCU members. The matter of LNG use is still under consideration by both the PUC and CCU.

GPA's Tanguisson power plant was mothballed in 2014. Additionally, in mid-2015, Cabras power plants 3 and 4 experienced a catastrophic explosion rendering them unusable. Plans for repair or alternatives have not yet been finalized.

The "other" type of energy facility listed above includes GPA's proposed combined cycle generators intended to utilize multiple types of fuel and incorporates newer technologies to run more efficiently.

3. Briefly characterize the existing status and trends for federal government facilities and activities of greater than local significance[36] in the state's coastal zone since the last assessment.

According to the SEIS, the approved Military Relocation to Guam will develop facilities to support the 5000 marines and 1300 dependents being relocated to Guam over the course of 12 years. Much of the development for housing and training will occur in northern Guam. The increased demand in power is predicted to be 5.7 megawatts.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) that could facilitate or impede energy and government facility siting and activities have occurred since the last assessment.

Management Category	**Employed by State or Territory** (Y or N)	**CMP Provides Assistance to Locals that Employ** (Y or N)	**Significant Changes Since Last Assessment** (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	N	Y
State comprehensive siting plans or procedures	N	N	N

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Legislation was introduced in 2008 that required Guam's utility agencies to shift 25% of its power sources toward renewable energy sources. Guam's first solar power plant opened for business in

[36] The CMP should make its own assessment of what Government facilities may be considered "greater than local significance" in its coastal zone, but these facilities could include military installations or a significant federal government complex. An individual federal building may not rise to a level worthy of discussion here beyond a very cursory (if any at all) mention).

October 2015 by NRG Renew LLC. The Plant is located on a 160 acre site in the Layon area of Inarajan village. It is capable of producing 25.6 megawatts of power with full direct sunlight. This is supposed to be enough to power 6000 to 10,000 homes. However, when the sun sets there is no power storage capacity for the energy produced from the plant. This fact is being addressed by another project that will add storage capacity. Another similar solar power plant that was planned for development is still under consideration.

Additionally, the Guam Power Authority has completed the installation of a 60-m meteorological monitoring tower in the COTAL conservation area in Yona. Its purpose is to collect wind data for one year, presumably to aid in studying the feasibility of harvesting wind for power generation.

There has been a general trend toward distributed generation such as small scale solar systems on homes and businesses. It is anticipated that this will affect the demand and need for large sites for generation projects. These changes also are driven by law and policy that incentivizes energy efficient appliances, solar installations, etc. The Guam Commission on Consolidated Utilities have capped the number of customers using renewables, especially solar, that can apply for credit for producing individual power and selling it back to the Guam Power Authority as a means of managing individual power production and demand.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	_____
Medium	_____
Low	__X__

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

There has been a significant increase in the number of companies offering solar energy services and financing solutions for the residential and private institution customer. So much so that GPA has been trying to assess and address the potential impacts of this increased adoption of solar energy on their customer base.

This increased adoption of solar energy has been driven partly by government policies that allow programs like net metering. Net metering provides the benefit of selling unused power generated by homeowners back to GPA. This reduces the energy bills of the respective buyer. Also, innovative financing solutions to purchase solar energy solutions by some solar firms have allowed many homeowners to afford what was previously out of reach for many.

Additionally, DOD worldwide has committed to the adoption of alternative energy. This is the case with current facilities and the proposed military buildup. The Final SEIS for the Guam and CNMI Military

Relocation 2105 state "the proposed Marine Corps installation would partner with JRM to achieve renewable energy mandates through either an installation or regional approach using large-scale solar photovoltaic, wind, and/or other renewable resources. A portion of the power demand would be satisfied by power generated from renewable energy sources, to include photovoltaic solar panels on rooftops and approximately 20 acres (8 ha) within the cantonment and/or family housing footprints proposed for ground-mounted photovoltaic panels."

In the past Energy and Government Facility Siting was considered a high priority. However during this assessment period, this issue has not been a priority for the GCMP due to major investments into renewables by utility and other government agencies, private institutions and homeowners.

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RESOURCES AND TOOLS:

Below are a few national resources and tools that may be useful in conducting your assessment or developing energy and federal government facilities strategies. States likely have other state-specific resources, tools, and data that would be useful as well.

BOEM Environmental Studies Program
The Bureau of Ocean and Energy Management's (BOEM) Environmental Studies Program develops, conducts, and oversees world-class scientific research specifically to inform policy decisions regarding development of Outer Continental Shelf energy and mineral resources. Research covers physical oceanography, atmospheric sciences, biology, protected species, social sciences and economics, submerged cultural resources, and environmental fates and effects.

Geographic Scope: Specific to each study
Website: www.boem.gov/Studies/

U.S. Energy Information Administration
The U.S. Energy Information Administration collects, analyzes, and disseminates independent and impartial energy information to promote sound policy making, efficient markets, and public understanding of energy and its interaction with the economy and the environment. The site includes a wealth of information on energy demand, use, and production (nationally, by region, and by energy sector).

Geographic Scope: National and regional
Website: www.eia.gov

FERC Projects
The Federal Energy and Regulatory Commission (FERC) has authority over electricity, natural gas (including LNG), and hydropower and hydrokinetic projects. The site has information on current and pending projects as well as market demands.

Geographic scope: National
Website: www.ferc.gov/for-citizens/projectsearch/SearchProjects.aspx

GSA Lists of Federally Owned and Leased Facilities
The Government Services Agency (GSA) maintains a national list of all federally owned and leased facilities in each state.

Geographic scope: National
Website: www.iolp.gsa.gov/iolp/NationalMap.asp

MarineCadastre.gov Viewer
This data viewer provides the baseline information needed for ocean planning efforts, particularly those that involve finding the best location for renewable energy projects. Users choose an ocean geography and quickly see the applicable jurisdictional boundaries, restricted areas, laws, critical habitat locations, and other important features. With the national viewer, potential conflicts can be identified and avoided early in the planning process, and users can visually analyze and explore geospatial data for marine spatial planning activities and find direct access to authoritative marine cadastral data from federal and state sources.

Geographic Scope: National
Website: www.csc.noaa.gov/digitalcoast/tools/mmc

NOAA Economics: National Ocean Watch Data (ENOW)
The effective management of coastal resources requires an understanding of the ocean and Great Lakes economy. This tool allows users to interact with ENOW data, which describe six economic sectors that depend on the oceans and Great Lakes: living resources; marine construction; marine transportation; offshore mineral resources; ship and boat building; and tourism and recreation. Users can discover which sectors are the largest in various parts of the county, which sectors are growing and declining, and which account for the most jobs, wages, and gross domestic product. They can view up to four counties, states, or regions to compare trends or the makeup of their ocean and Great Lakes economies. The ENOW Explorer's interface is designed to allow users who are familiar with economic data to interact with and view data and trends. The tool provides the highest level of interaction with ENOW data short of downloading the full data set.

Geographic Scope: National and regional
Website: http://www.csc.noaa.gov/digitalcoast/data/enow

Aquaculture

Section 309 Enhancement Objective: 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. §309(a)(9)

PHASE I (HIGH-LEVEL) ASSESSMENT: *(Must be completed by all states and territories.)*
Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. In the table below, characterize the existing status and trends of aquaculture facilities in the state's coastal zone based on the best available data. Your state Sea Grant Program may have information to help with this assessment.[37]

Type of Facility/Activity	Status and Trends of Aquaculture Facilities and Activities		
	# of Facilities[38]	Approximate Economic Value	Change Since Last Assessment (↑, ↓, –, unknown)
Current data not available but a survey by Dept. of Agriculture is ongoing.	3 (In 2013 State Statistical Yearbook, BSP)	$460,500 (In 2013, State Statistical Yearbook, BSP)	According to interviews with government officials the number of large farms may have decreased but smaller backyard operations have increased.

2. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends or potential impacts from aquaculture activities in the coastal zone since the last assessment.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if there have been any state- or territory-level changes (positive or negative) that could facilitate or impede the siting of public or private aquaculture facilities in the coastal zone.

[37] While focused on statewide aquaculture data rather than just within the coastal zone, the *Census of Aquaculture* (www.agcensus.usda.gov/Publications/2002/Aquaculture/) may help in developing your aquaculture assessment. The 2002 report, updated in 2005, provides a variety of state-specific aquaculture data for 2005 and 1998 to understand current status and recent trends. The next census is scheduled to come out late 2014 and will provide 2013 data.
[38] Be as specific as possible. For example, if you have specific information of the number of each type of facility or activity, note that. If you only have approximate figures, note "more than" or "approximately" before the number. If information is unknown, note that and use the narrative section below to provide a brief qualitative description based on the best information available.

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Aquaculture comprehensive siting plans or procedures	Y	N	N
Other aquaculture statutes, regulations, policies, or case law interpreting these	Y	N	N

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High _____
Medium _____
Low __X__

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

At the initial stakeholder meeting the results of voting on the areas of enhancement areas that should be considered a priority did not rank as a high priority issue.

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RESOURCES AND TOOLS:

Below are a few national resources and tools that may be useful in conducting your assessment or developing aquaculture strategies. States likely have other state-specific resources, tools, and data that would be useful as well.

NOAA Office of Aquaculture
The Office of Aquaculture fosters sustainable aquaculture that will create employment and business opportunities in coastal communities; provide safe, sustainable seafood; and complement NOAA's comprehensive strategy for maintaining healthy and productive marine populations, species, and ecosystems and vibrant coastal communities.
Geographic Coverage: National and regional
Website: www.nmfs.noaa.gov/aquaculture/index.htm

USDA Census of Aquaculture

The U.S. Department of Agriculture publishes the Census of Aquaculture. The census provides a variety of state-specific aquaculture data for 2005 and 1998 to understand current status and recent trends. The next census is scheduled to come out late 2014 and will provide 2013 data.

Geographic Coverage: National

Website: www.agcensus.usda.gov/Publications/2002/Aquaculture/

Appendix B: Phase II Assessment Templates

Complete Phase II assessments, using the templates in this section, only for enhancement areas that are identified as high priority for the CMP after the Phase I (high-level) assessments.

Note: Identifying an enhancement area as a high priority does not necessarily mean the CMP would be required to develop a strategy for the enhancement area given other priority enhancement areas and available resources.

Public Access

In-Depth Resource Characterization:

Purpose: To determine key problems and opportunities to improve the CMP's ability to increase and enhance public access opportunities to coastal areas.

1. Use the table below to provide additional data on public access availability within the coastal zone not reported in the Phase I assessment.

Public Access Status and Trends			
Type of Access	**Current number**[39]	**Changes or Trends Since Last Assessment**[40] (↑, ↓, –, unknown)	**Cite data source**
Access sites that are ADA compliant[41]	No. of Sites (A survey is underway to capture this information) Percent of Sites	Most major parks and formally established shoreline access trails have ADA compliant parking stalls. In general shoreline access parks and trails lack wheelchair ramps and other ADA compliant infrastructure.	Observation of parks and phone conversation with director of Dept. of Integrated Services for Individuals with Disabilities

2. What are the three most significant existing or emerging threats or stressors to creating or maintaining public access within the coastal zone? Indicate the geographic scope of the stressor, i.e., is it prevalent throughout the coastal zone or are specific areas most threatened? Stressors can be private development (including conversion of public facilities to private); non-water-dependent commercial or industrial uses of the waterfront; increased demand; erosion; sea level rise or Great Lakes level change; natural disasters; national security; encroachment on public land; or other (please specify). When selecting significant stressors, also consider how climate change may exacerbate each stressor.

	Stressor/Threat	**Geographic Scope** (throughout coastal zone or specific areas most threatened)
Stressor 1	Critical Facility Security - security regulations, military activities, Establishment of Surface Fire Danger Zone, etc.	Adjacent to Department of Defense (DOD) Facilities and Commercial Port of Guam
Stressor 2	Private Development	Throughout the coastal zone
Stressor 3	Local Government agencies inaction of public access violations	Various locations, e.g. Gun Beach, Santos Memorial Park, Port Authority Beach, Family Beach Cabras Island, Loss of Ylig Bay Yona Boat Launch access

[39] Be as specific as possible. For example, if you have data on many access sites but know it is not an exhaustive list, note "more than" before the number. If information is unknown, note that and use the narrative section below to provide a brief qualitative description based on the best information available.

[40] If you know specific numbers, please provide. However, if specific numbers are unknown but you know that the general trend was increasing or decreasing or relatively stable/unchanged since the last assessment, note that with a ↑ (increased), ↓ (decreased), – (unchanged). If the trend is completely unknown, simply put "unknown."

[41] For more information on ADA see www.ada.gov.

3. Briefly explain why these are currently the most significant stressors or threats to public access within the coastal zone. Cite stakeholder input and/or existing reports or studies to support this assessment.

Military facilities occupy about a third of the island and this loss of public access to the general public is significant. When government of Guam agencies deny public access it exacerbates the problem. This includes the Port Authority of Guam restricting parts of the Commercial port of Guam not essential for National Security or port operations. Also, in the village of Piti where the Commercial Port is located, the Mayor of Piti denies access to a seashore park without a permit. No passive recreational use occurs in this park.

Another stakeholder-reported incident of public access denial to the ocean shore occurred on Sunday September 13, 2015 at the Governor Joseph Flores Park at Ypao Beach. The two parking lots for the park were closed to the general public. Parking in the area is already very limited. Apparently, there was a private function at the park. This closure of the park is especially significant for various reasons. For one it is the largest and most frequented beach park that is located close to the large urban populations in northern and central Guam. Secondly, it is located in Tumon, the center of tourism on Guam. These 2 factors make the park the most popular and probably most utilized public beach park on island. Large events open to the general public and tourists are held here quite often. But the closure of the entire park for an event held by a private company is atypical.

4. Are there emerging issues of concern, but which lack sufficient information to evaluate the level of the potential threat? If so, please list. Include additional lines if needed.

Local Government agencies' inaction to uphold public access is an emerging trend that is alarming considering that a local public access statute exists. One example is Family Beach in Apra Harbor located on lands under the jurisdiction of the Port Authority of Guam. For many years after the military returned Hotel Wharf and adjacent lands, public access to the sheltered waters of Apra Harbor via Family Beach was a given. Apra Harbor is the largest sheltered body of water where recreational water and subsistence activities such as boating, sailing, snorkeling, diving, gleaning and fishing normally occur. After the horrific events of September 11, such public access was severely restricted. Yet a sizeable portion of the Family Beach area has been leased to tour operators, many of whom are owned by foreign nationals and all of whom cater to non-US citizen visitors. Therefore, the legitimate denial of public access to the Family Beach area based on Homeland Security concerns is not supported by the leasing practices of the Port Authority of Guam.

The Mayor of Piti has continually vehicle access to Santos Memorial Park unless a permit is obtained for use. This park was once under the jurisdiction and authority of the Department of Parks and Recreation (DPR) in which access to the shore was unrestricted. DPR is also the agency tasked with enforcing local Public Access to the Ocean shore law. The Piti Mayor was given jurisdiction and authority of the park. Previously, DPR had left the park open for passive recreational use without a permit.

Other seashore parks in Merizo and Yona have also been subsequently transferred to their respective mayors. Fortunately these parks have not been closed to passive recreational use under their current village mayors. However, if one considers the Piti Mayor's actions despite local statutes, it is not a guarantee that they or a future mayor will not close the parks unless permit is obtained.

Loss of public access to certain ocean areas due to military training activities are also another emerging issue. This is especially relevant now due to increased military activities associated with the buildup and other anticipated military training. One example noted in the *Final SEIS Military Buildup 2015* is that "there would be access restrictions to the lands and submerged lands within the Surface Danger Zone (SDZ) while the range is in use." The land and submerged lands are those of the Guam National Wildlife Refuge (GNWR) located in the Ritidian Point area of Northern Guam. The SDZ's would extend out approximately 3 miles from the shoreline. Much of the area affected by the SDZ's public access restrictions would be visitors to the GNWR, fishing boats off Ritidian Point or transiting to other fishing grounds. The Final SEIS states "the training schedule at the LFTRC would prohibit public access to federal submerged land, representing a new long-term restriction on public access. The submerged lands are valued for recreational activities and access to important fishing sites, as described in Section 5.5.7, Recreational Resources. Additionally, "As described in Section 3.6.3, Approach to Analysis, new access restrictions placed on non-DoD populations is a potentially significant adverse impact."

Emerging Issue	Information Needed
Local Government agencies inaction to protect public access	Legal determination that the actions of agencies in closing parks, beaches or access trails to passive recreational use is not violation of local public access to the ocean shore statute; Parks or recreational area utilization data such as number of users, types and locations of use activity (snorkeling, windsurfing, paddling, fishing, etc.), and number impacted by military activities
Loss of public access to certain ocean areas due Military training	How to reduce number and times of training days to reduce adverse effects on the local community

In-Depth Management Characterization:
Purpose: To determine the effectiveness of management efforts to address identified problems related to the public access enhancement objective.

1. For each additional public access management category below that was not already discussed as part of the Phase I assessment, indicate if the approach is employed by the state or territory and if significant changes (positive or negative) have occurred at the state- or territory-level since the last assessment.

Management Category	Employed by State/Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Comprehensive access management planning	Y	Y	Y
GIS mapping/database of access sites	Y	Y	Y
Public access technical assistance, education, and outreach (including access point and interpretive signage, etc.)	Y	Y	Y
Other (please specify)			

2. For management categories with significant changes since the last assessment, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information.
    a. Describe significant changes since the last assessment;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Comprehensive Public Access Management Planning
A public access plan was under development by the GCMP between 2012 and 2013. A draft final was developed for review by the administrator, however, large attrition of GCMP staff stalled the plan's finalization and eventual implementation. The plan should be either finalized or revised and eventually adopted as an element of the Guam Comprehensive Development Plan.

As part of the planning effort a public opinion survey and more detailed inventory and mapping of public access sites and trails was undertaken. The results and data have not yet been published.

Education and Outreach
During the last assessment period, GCMP and partner agencies installed public access signs in the villages of Tumon and Tamuning. These areas are the island's most developed and populated areas. Many of the public access easements needed to have adequate signage for the public to be aware of their existence. The project was CZM funded and directed.

GCMP has been involved in these access issues during the past assessment periods by developing a plan, mapping and inventorying access, installing signage and conducting an opinion survey. A change in

authority or legislation to adequately address concerns about public coastal access that may be necessary to prevent further erosion of public access to coastal sites.

Increasing capacity at the DPR to truly enforce Public Access laws should be the first strategy to be explored. The other option would be to revise policy and introduce legislation to expand that responsibility to the GCMP and the Department of Land Management. Additionally, proposals for more stringent penalties for violations of existing access laws and clearer regulations specifying how public access laws are applied should be a consideration.

Better enforcement and clearer penalties for violations are essential to preserving and enhancing public access. The GCMP will continue to work with the Guam Visitors Bureau, the Guam Hotel and Restaurant Association, the Department of Land Management, and the Department of Parks and Recreation to improve enforcement and monitor these efforts.

3. Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the state's management efforts in providing public access since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the state's management efforts?

There have been no formal studies conducted to illustrate the effectiveness of the state's management efforts in providing public access since the last assessment. There was an informal one designed as part of the comprehensive planning undertaken by the GCMP but, unfortunately, the information was not formalized into a published document. Any future studies and regulatory findings should result in a publication of a Citizens Guide to Pubic Access to the Ocean Shore.

Identification of Priorities:

1. Considering changes in public access and public access management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve the effectiveness of its management effort to better respond to the most significant public access stressors. *(Approximately 1-3 sentences per management priority.)*

   Management Priority 1: <u>Complete and Adopt the Public Access Plan</u>

   Description: The Public Access plan that GCMP was working on should be completed and implemented. This should also include a public and private opinion survey on the issue and other recommendations to either strengthen enforcement or revise policy. In addition, clear enforcement mechanisms should be articulated in consultation with the regulatory agencies of the Government of Guam that include but may not be limited to the Department of Land Management, Department of Parks and Recreations, the Mayors Council of Guam, the Port Authority of Guam, and the Guam Visitors Bureau.

   Management Priority 2: <u>Introduce Legislation that strengthens public access law and provides funding for some improvements</u>

Description: The local Public Access law needs to be strengthened to prohibit denial of public access by government of Guam agencies to individuals or groups without a reasonable justification. Boat launch sites should be included as public access points. Public access without a permit for recreational uses should be allowed. Additionally, legislation introduced recently allows for the sale and/or deletion of "bull cart trail easements" to adjacent private property landowners. Some of these are public access paths. These should be identified and protected.

Management Priority 3: Engage the Department of Defense in programs that allow more public access

Description: There are many ocean shore areas adjacent to DOD facilities that are of cultural and natural significance to the local community. Programs that allow locals conditional access to these areas should be developed. Additionally, public access to certain oceans areas is closed by DOD for training purposes. Large ocean areas off Ritidian Point where the Military Buildup firing range will be located will be closed to public access while in use. The military should be engaged to reduce the frequency and scheduled times of closure to reduce negative impacts for the local users, who are predominantly fishermen.

2. Identify and briefly explain priority needs and information gaps the CMP has to help it address the management priorities identified above. The needs and gaps identified here do not need to be limited to those items that will be addressed through a Section 309 strategy but should include any items that will be part of a strategy.

Priority Needs	**Need?** (Y or N)	**Brief Explanation of Need/Gap**
Research	Y	Opinion Survey of perception of public access should be conducted
Mapping/GIS	Y	Continual updates to the status of public access sites needed i.e. real time map viewers indicating DoD closed submerged lands due to active Surface Fire Danger Zone or other danger classifications.
Data and information management	Y	Scheduled updates to the status of public access sites needed
Training/Capacity building	Y	DPR and other agencies need more capacity and training on addressing the community's public access needs and keeping an updated access plan and inventory. Community should also be trained on public access rules and regulations.
Decision-support tools	Y	Public Access Map viewers will allow easy access to GIS data to help identify a public access site.
Communication and outreach	Y	There seems to be a need to communicate and outreach with government agencies and the legislature more on the importance of public access. This includes opposing or revising legislation like the sale of bull cart trails that may result in the loss of public access trails.
Other (Specify)		

Enhancement Area Strategy Development:

1. Will the CMP develop one or more strategies for this enhancement area?

Yes ___Y__
No _____

2. Briefly explain why a strategy will or will not be developed for this enhancement area.

Public access to the ocean shore is one of those quality of life indicators that a community values its natural resources and therefore their access to those resources. There is a need to address some of the emergent issues affecting public access to protect the public's right to access their ocean shore and its associated resources.

Cumulative and Secondary Impacts

In-Depth Resource Characterization:
Purpose: To determine key problems and opportunities to improve the CMP's ability to address cumulative and secondary impacts of coastal growth and development.

1. What are the three most significant existing or emerging cumulative and secondary stressors or threats within the coastal zone? Indicate the geographic scope of the stressor, i.e., is it prevalent throughout the coastal zone or are there specific areas that are most threatened? Stressors can be coastal development and impervious surfaces; polluted runoff; agriculture activities; forestry activities; shoreline modification; or other (please specify). Coastal resources and uses can be habitat (wetland or shoreline, etc.); water quality; public access; or other (please specify). When selecting significant stressors, also consider how climate change may exacerbate each stressor.

	Stressor/Threat	**Coastal Resource(s)/Use(s) Most Threatened**	**Geographic Scope** (throughout coastal zone or specific areas most threatened)
Stressor 1	Storm water Runoff	Coral reef, aquatic resources, water quality, Northern Guam Lens Aquifer	Throughout the island
Stressor 2	Coastal Development	Habitat (Shorelines) native forest, wetlands, public access, aquifer	Throughout CZ, especially Northern Guam and Tumon MPA
Stressor 3	Invasive Species	Native forest- terrestrial habitat	Throughout the island

2. Briefly explain why these are currently the most significant cumulative and secondary stressors or threats from coastal growth and development within the coastal zone. Cite stakeholder input and/or existing reports or studies to support this assessment.

The most significant cumulative and secondary stressors are primarily due to increased development and inadequate storm water management systems. Unfortunately, as the military buildup progresses and as the Asia economy continues to improve, pressure to approved development projects will continue to increase. This has the potential to yield negative effects ranging from loss of water quality to loss of coral reef and terrestrial habitats.

In addition, the C-CAP data indicates an increase by more than 5 percent in the area of impervious surface although the total developed area increased by only 3 percent. This suggests that the style of development is shifting such that there is a greater rate of increase for impervious surface, leading to a number of new or exacerbated challenges. This change in the type of development could potentially be a significant factor in CSI.

Due to the comparatively small size of Guam's geography, any development is likely to produce cumulative and secondary impacts.

Over the last few years, Guam has seen an increase in invasive species. Although, Guam is already well-known for the Brown Tree Snake, the Coconut Rhino Beetle and the Little Fire Ants have become established nuisances that are systematically destroying our coconut trees and native forest.

Recently, the lack of upgrades to the storm water infrastructure necessary to support continued development in Tumon became increasingly evident with the unprecedented flooding that occurred in Tumon during the heavy rainfall experienced in the summer of 2015. This is a result of outdated storm water rules and regulations, a lack of enforcement of rules, poor maintenance of infrastructure, and other contributing factors. The Guam Economic Development Authority is supporting augmenting the existing ponding basin capacity and diverting the overflow to a culvert that discharges directly into the Tumon MPA. This issue demonstrates the importance of understanding CSI from increase in impervious surfaces. In addition, the decision makers need evidence that corals will be impacted from this project.

During the stakeholder meeting, especially as a result of storm water management issues, CSI was rated almost unanimously as a high priority.

3. Are there emerging issues of concern, but which lack sufficient information to evaluate the level of the potential threat? If so, please list. Include additional lines if needed.

Emerging Issue	Information Needed
Impact from storm water runoff to corals	Scientific studies, historic information, data translated including identification of type, location and quantities of contaminants carried by storm water into coral reef systems; determination of the effect of common storm water contaminants such as organics or petrochemicals on various stages of coral development
Impact from invasive species to native forest	Scientific studies, historic information, data including extent of change of native forest by invasive species, eradication for specific species such as coconut rhino beetle, and fire ants; ways to identify problems before it is too late. Policies related to importation of plants from other locations. Education for Custom and Border control personnel in identifying invasive species.
Impact to traditional practices and community	Managers need to have tools to address concerns in a manner that addresses environmental and social needs. Stormwater rules and regulations need to be updated to include best management practices for post construction.

In-Depth Management Characterization:
Purpose: To determine the effectiveness of management efforts to address identified problems related to the cumulative and secondary impacts enhancement objective.

1. For each additional cumulative and secondary impact management category below that is not already discussed as part of the Phase I assessment, indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) have occurred since the last assessment.

Management Category	**Employed by State or Territory** (Y or N)	**CMP Provides Assistance to Locals that Employ** (Y or N)	**Significant Changes Since Last Assessment** (Y or N)
Methodologies for determining CSI impacts	Y	Y	N
CSI research, assessment, monitoring	Y	Y	N
CSI GIS mapping/database	Y	Y	Y
CSI technical assistance, education and outreach	Y	Y	N
Other (please specify)			

2. For management categories with significant changes since the last assessment, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information.
    a. Describe significant changes since the last assessment;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Through a Memorandum of Understanding with WERI, GCMP utilized 309 funds to develop a management tool that will determine Cumulative and Secondary Impacts (CSIs) on the northern part of the island's environment due to present and future activities. The management tool includes a GIS Land Development Assessment Tool using Life Cycle Assessment modeling with an Inventory Analysis. The GIS Land Development Assessment Tool compiles all land information and produces a report as a preliminary assessment. Sustainable development is pursued through a method called Life Cycle Assessment with an Inventory Analysis of environmental burdens and their toxicity potentials. The project focused on impacts from activities related to the quality of groundwater.

3. Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the state's or territory's management efforts in addressing cumulative and secondary impacts of development since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the state and territory's management efforts?

A better understanding how to properly evaluate Cumulative and Secondary Impacts is sorely needed. It is difficult for decision makers and developers to understand the need to determine potential impacts to

marine and terrestrial resources from a single proposed development. CSIs are not addressed in current permitting processes. However, CSI will continue to be problematic until mechanism to assess CSIs and enforceable regulations are implemented.

Guam also needs: updates for its fishery and harvest regulations based on more current sources of information about populations and ecosystem health; a tool to measure impact from loss native forest and habitats; effective training for contractors and workers on best practices for specific local conditions; and more outreach programs for existing regulations, impacts on habitat, and BMPs or alternatives.

Identification of Priorities:

1. Considering changes in cumulative and secondary impact threats and management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve the effectiveness of its management effort to better assess, consider, and control the most significant threats from cumulative and secondary impacts of coastal growth and development. *(Approximately 1-3 sentences per management priority.)*

   Management Priority 1: Policy for Incorporating CSI into Development Review Applications

   Description: Determining the CSI for development projects must be considered during the review process. Knowing the potential problems that would result from the construction of a project would require a change in policy. To accomplish this management's priority should be to understand the gaps and barriers in order to determine the effectives of permitting and enforcement controls in order to determine the integration of appropriate CSI training and decision support tools.

   Management Priority 2: Data collection and analysis tool for marine resources

   Description: To determine impact, data collection and analysis for marine resources needs to be performed. The CSI tool developed by WERI addressed CSI based on terrestrial resources and the impact to the northern Guam aquifer. A similar CSI tool to address impacts to marine resources is also needed.

   Management Priority 3: Determining the economic impacts from lack of enforcement of regulations

   Description: It has been difficult to explain to decision makers the importance of understanding CSI resulting from a project. When considering the impact, it may be helpful to determine the economic impact in addition to the impacts to the resource.

2. Identify and briefly explain priority needs and information gaps the CMP has to help it address the management priorities identified above. The needs and gaps identified here do not need to be limited to those items that will be addressed through a Section 309 strategy but should include any items that will be part of a strategy.

Priority Needs	Need? (Y or N)	Brief Explanation of Need/Gap
Research	Y	Need to assess the effectiveness of planning and regulatory controls of implementing CSI in the screening and analysis of a development project. Research impact of storm water to marine ecosystems
Mapping/GIS	Y	Critical data layers needed are required. Layers such as land cover change, areas susceptible to flooding, building types, zoning, and infrastructure,
Data and information management	Y	Data plan to ensure data is available in formats critical for analysis. Data formats must have user friendly interfaces that can be represented in various formats such as graphs and charts. Better ways to find tools that have been developed. Information in forms that planners, reviewers, etc. will actually use. Ease of use and easy to format into reports.
Training/Capacity building	Y	Training for policy makers, planners, engineers, and permitting agency officials for determining CSI impacts in easy to understand formats.
Decision-support tools	N	WERI developed a CSI GIS tool. Development of a CSI tool for marine resources
Communication and outreach	Y	Education to industry professionals, contractors, policy makers and decision makers on what is CSI and importance when considering impact.
Other (Specify)		

Enhancement Area Strategy Development:

1. Will the CMP develop one or more strategies for this enhancement area?

   Yes __X___
   No _____

2. Briefly explain why a strategy will or will not be developed for this enhancement area.

This was the most important priority reflected in the comments from the stakeholders. As development pressures increase, Guam's development policies lack any requirement to assess CSI from proposed development. In addition, education of CSI is critical. Having updated data to support analysis of CSI is essential to mitigating loss of habitat. A strategy that leads to a policy change will be developed based on identified management priorities.

See Phase I of assessment for CSI for more detail.

Special Area Management Planning

In-Depth Resource Characterization:
Purpose: To determine key problems and opportunities regarding the preparation and implementation of special area management plans for important coastal areas.

1. What are the one to three most significant geographic areas facing existing or emerging challenges that would benefit from a new or revised special area management plan (SAMP) or better implementation of an existing SAMP? For example, are there areas where existing management approaches are not working and could be improved by better coordination across multiple levels of government? What challenges are these areas facing? Challenges can be a need for enhanced natural resource protection; use conflicts; coordinating regulatory processes or review; additional data or information needs; education and outreach regarding SAMP policies; or other (please specify). When selecting significant challenges, also consider how climate change may exacerbate each challenge.

	Geographic Scope (within an existing SAMP area (specify SAMP) or within new geographic area (describe new area))	**Challenges**
Geographic Area 1	Coral Reefs including Guam's MPA	Lack of enforcement, shore development, increased recreation, poor fishing practices, storms, outdated storm water regulations
Geographic Area 2	Fragile Areas (limestone forest and terrestrial habitat)	Development, limited areas for reforestation efforts, use conflict, coordinating regulatory processes
Geographic Area 3	Priority Watersheds	Additional data needed to complete watershed plans for remaining priority watersheds, need for enhanced natural resource protection, education and outreach

2. Briefly explain why these are currently the most significant challenges that may require developing a new SAMP, or revising or improving implementation of an existing SAMP. Cite stakeholder input and/or existing reports or studies to support this assessment.

   Coral Reefs: The issues and challenges to coral reef areas have been identified repeatedly from stakeholders throughout this assessment. Regulations and enforcement of existing MPAs remain a challenge. A new approach needs to be explored to identify more effective enforcement practices and management of the MPAs to ensure the protection of aquatic habitat. To provide for additional management, the "Limits of Acceptable Change" proposals need to be implemented.

   Fragile Areas: As the economy improves, valued forest and other fragile areas require establishing a SAMP. This will require coordination among the agencies tasked with reviewing and approving development projects. The Guam Department of Agriculture has already completed an inventory identifying high valued forests. This needs to be accompanied by a new SAMP that puts into place proper management practices to conserve these forests including reforestation and habitat recovery measures.

Priority Watersheds: Although a watershed plans have been completed for Piti-Asan and Manell-Geus, the remaining watershed plans remain pending. Additional data is needed to complete those plans in order to enhance the protection of these natural resources. In addition, watershed plans can include identifying areas that contain suitable soil for farming.

3. Are there emerging issues of concern, but which lack sufficient information to evaluate the level of the potential threat? If so, please list. Include additional lines if needed.

Emerging Issue	Information Needed
Identifying farm land	Land ownership, soil information
Storm water management in urban areas	Updated regulations, system-wide approach to determine solution to storm water management
Chamorro Land Trust Commission (CLTC) leasing land to developers designated as conservation area	Areas previously designated as conservation, such as Lajuna, Yigo are now being slated for irreversible commercial lease – i.e. quarrying. Needs include legal status of old conservation plans, conflicting authorities of different agencies, and a determination of "control" for existing conservation areas. Identification of high priority sites for parent trees for restoration efforts, seed banks for community use, and status of indigenous/endemic species on local government lands. Legislation that formally sets aside CLTC land for conservation. .

In-Depth Management Characterization:
Purpose: To determine the effectiveness of management efforts to address identified problems related to the special area management planning enhancement objective.

1. For each additional SAMP management category below that was not already discussed as part of the Phase I assessment, indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) have occurred since the last assessment.

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
SAMP research, assessment, monitoring	Y	Y	N
SAMP GIS mapping/database	Y	Y	Y
SAMP technical assistance, education, and outreach	Y	Y	N

Other (please specify)			

2. For management categories with significant changes since the last assessment, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information.
    a. Describe significant changes since the last assessment;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

During this assessment period, Guam Waterworks Authority completed its Well Head Protection Plan. This plan included GIS maps and land use activity data for 121 of its wells. This project was not funded by 309. The data that was collected for each well was utilized to conduct a risk assessment which concluded that most of GWA's wells used for drinking water were located in areas where land use activities and nonpoint source pollution may cause contamination. This plan was shared with the Chamorro Land Trust Commission for reference when leasing properties for residence and agricultural activities. 309 funds were not used for this project.

3. Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the state's or territory's special area management planning efforts since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the state's or territory's management efforts?

Storm water management is an emerging issue. We need a better understanding the hydrodynamics of developed areas in order to design better storm water infrastructure solutions and implement more effective management practices. Additional information can be found under CSI.

In order to determine whether existing BMPs are effective, there is a need for baseline historical data digitized into a GIS platform with analysis tools and updated remote sensing data.

Guam Marine Preserves are considered under SAMPs. There is a need for quantifying illegal activities in the preserves, quantification of uses and conflicts to support implementation of eco-permit and limits of acceptable change. To strengthen the continued support for the MPAs, understanding the extent of illegal fishing and user conflict will inform decision makers on the importance of supporting enforcement and educational programs.

Identification of Priorities:

1. Considering changes with coastal resource protection or coastal use conflicts within defined geographic areas, special area management planning activities since the last assessment, and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve their ability to prepare and implement special area management plans to effectively manage important coastal areas. *(Approximately 1-3 sentences per management priority.)*

Management Priority 1: Developing Special Area Management Plans for Tumon to manage storm water.

Description: Storm water management was the topic stakeholders were most concerned with during this assessment. This management priority would develop a SAMP for Tumon that seeks to better manage storm water in this urban area and resolve current flooding issues.

Management Priority 2: Developing Special Area Management Plans for agricultural properties under the management of the Chamorro Land Trust.

Description: An emerging issue is the protection and management of valuable farm land. To ensure food security, a SAMP would be developed for properties under the Chamorro Land Trust Commission that are determined to be most suitable for farming and the protection of high valued conservation areas. Department of Agriculture and CLTC should identify areas for the implementation of Forest Legacy Act, to address the need for conservation of critical terrestrial habitats

Management Priority 3: Develop watershed plans for additional priority watersheds.

Description: Watershed plans for priority watersheds needs to be completed. This effort will provide opportunities for communities to have input into managing natural resources in their watershed. Basic land use information and historic data are needed to improve the development of watershed plans.

2. Identify and briefly explain priority needs and information gaps the CMP has to help it address the management priorities identified above. The needs and gaps identified here do not need to be limited to those items that will be addressed through a Section 309 strategy but should include any items that will be part of a strategy.

Priority Needs	**Need?** (Y or N)	**Brief Explanation of Need/Gap**
Research	Y	Understanding source and amount of storm water directly entering Tumon Bay. Innovative solutions to manage storm water in low lying areas and areas at sea level. Impact from climate change and sea level rise to infrastructure located underground and to hotels. Pilot project to test innovative products such as pervious cement to manage flooding.
Mapping/GIS	Y	Update GIS data to include land use and impervious surface. Location of storm water infrastructure, land ownership, shoreline change.
Data and information management	Y	Historic data. Access to GIS data. Better data management that include scheduled updates to data sets.
Training/Capacity building	Y	Training on storm water BMP for contractors
Decision-support tools	Y	GIS based tools for determining areas of future growth. 3-D modeling for siting of future development, and determining increase flooding potential.
Communication and outreach	Y	Information translated for the public to understand the impact of additional pervious surfaces.

Other (Specify)		

Enhancement Area Strategy Development:

1. Will the CMP develop one or more strategies for this enhancement area?

   Yes ____
   No ___X__

2. Briefly explain why a strategy will or will not be developed for this enhancement area.

Storm water and watershed planning were issues that were highly important to the stakeholders. These concerns could be addressed either through the cumulative and secondary impacts category, or through special area management planning. The program will address these concerns via CSI, as this provides broader coverage and a more holistic policy approach than the SAMP category, which necessarily has a narrower focus.

Guam Coastal Management Program

Section 309 Strategy

Summary

The Guam Coastal Management Program has participated in numerous "309 Assessment and Strategies Development" efforts; however the 2015 assessment and strategy may be one of the most critical periods since the program's conception. This assessment and strategy is part of a larger initiative to evaluate the effectiveness of the program. The long range goal is to determine whether the GCMP should continue to remain a networking program or if it is better suited to meet the demands of its stakeholders by engaging in permitting functions. The current strategies will give the GCMP an opportunity to address critical issues with a new and different approach to strengthening the coastal program and pave the way for changes that will best benefit the community.

The GCMP recognized that many areas in the assessment are critical. For this Assessment and Strategy, the Guam Coastal Management Program has identified ~~strategies for~~ three high priority areas, three medium priority areas and three low priority areas. The high priority areas include **Public Access, Cumulative and Secondary Impacts and Special Area Management.** The medium priority areas are **Coastal Hazards, Wetland, and Ocean Resources**. Low priority areas are **Energy and Government Siting, Marine Debris and Aquaculture.**

Not all strategies identified in the 2011's 309 effort were completed, however they still remain relevant and important to the program. Through discussions with stakeholders, previous projects identified in the Public Access strategy and the Cumulative and Secondary Impacts strategies remain important to the overall goals of the GCMP and its networking partners. Many of the gaps identified in priorities are difficult to address due to limited personnel, the reduction of federal funds, but more particularly, by nearly complete change in personnel at GCMP with no succession planning, leaving the new staff to reestablish relationships with networking partners in order to determine the niche GCMP will carry out in coastal restoration, conservation, and management rather than duplicating their efforts.

The projects identified in the strategy will be phased over several years and over several grant cycles. The strategy will concentrate on the high priority areas listed above. GCMP section 309 funds will not be used for projects under Coastal Hazards, Wetland, and Ocean Resources, Energy and Government Siting and Aquaculture.

In 2006, Guam was preparing for the large scale military buildup which would relocate an estimated 8,000 Marines, their dependents and other military personnel to Guam. However in 2015, that military buildup was drastically reduced to only 5,000 marines over a longer period of time. Although not as large as once expected, the increase in military development has added to additional opportunities for Guam's economy to grow. Our current administration does not want to rely solely on military develop to boost the island's economy, and has made concerted effort to market Guam to Asian investors to diversify our tourism based economy. The Administration's goal is to have an additional 2,000, or 21% increase in hotel rooms constructed by 2020. Our highest priorities reflect the impacts and concerns that are associated with these activities, which will have tremendous effects on coastal resources during this phase of increased development and population growth.

Public Access to cultural and natural resources remains a top priority. Stakeholders were concerned with lack of polices or confusion on authority for enforcement of existing policies that ensure access to natural resources for recreation, subsistence and cultural practices. As such, GCMP will undertake a project to develop and implement a comprehensive Public Access Management Plan (PAMP). The PAMP shall complete an inventory of existing Public Access (PA) corridors which shall also be added to GCMP's GIS map archive. The PAMP shall incorporate an inventory and analysis of all current statutes, programs and policies and provide recommendations for revisions that will strengthen the protection and enhancement of current PA corridors and development of new corridors as opportunities arise. Presently there is much debate as to who is responsible for enforcement of public access. Although the Department of Parks and Recreation can enforce access along beaches, the Departments of Land Management and the Public Works also have enforcement authority. It is expected that the work done through this strategy will lead to clarification of who is responsible and update the enforcement of access.

Although recommended during the last assessment period, a GIS tool to assist with determining impact from development was completed, however, new policy to integrate it into regulatory permitting was not done. The government of Guam currently has no mechanism in place requiring private developers to consider these impacts and submit to the local regulatory processes. Given the many pressures on the island's limited natural resources, such a policy remains long overdue. Before this can be done, a complete assessment of the application development review and the building permit process will be performed. At a minimum, the new policy will include a method to assess cumulative and secondary impacts, as well as best management practices to provide a mechanism to prevent such impacts to the greatest extent possible. The second phase of this strategy will provide direction for future goals of the GCMP.

These projects and ongoing work through both GCMP programs and our network of partners will help carry Guam through the next several years, as the program evolves and additional staff are brought into the program. As such, GCMP's 2015 Section 309 Assessment and Strategies focuses on projects that are critically needed in their respective enhancement areas.

Task 2
"Development of Comprehensive Public Access Management Plan (PAMP)"

I. Issue Area(s)

The proposed strategy or implementation activities will support the following high-priority enhancement areas *(check all that apply)*:

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

II. Strategy Description

A. The proposed strategy will lead to, or implement, the following types 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. ***Strategy Goal: Develop a comprehensive Public Access Management Plan (PAMP) and adopt the plan as an element to the Guam Comprehensive Development Plan. The PAMP shall complete an inventory of existing Public Access (PA) corridors which shall also be added to GCMP's GIS map archive. The PAMP shall incorporate an inventory and analysis of all current statutes, programs and policies and provide recommendations for revisions that will strengthen the protection and enhancement of current PA corridors and development of new corridors as opportunities arise. Additionally, any changes to public access policies, statutes or rules recommended by the plan shall be submitted to the appropriate agency or governing body for adoption.***

State the goal of the strategy for the five-year assessment period. The goal should be the specific program change to be achieved or be a statement describing the results of the project with the expectation that achieving the goal would eventually lead to a program change. For strategies that implement an existing program change, the goal should be a specific implementation milestone. For example, work with three communities to develop revised draft comprehensive plans that consider future sea level rise or, based on research and policy analysis, present proposed legislation on wetland buffers to state legislature or consideration. Rather than a lofty statement, the goal should be achievable within the time frame of the strategy.

C. Describe the proposed strategy and how the strategy will lead to and/or implement the program changes selected above. 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).

Thus far, public access statutes and regulations have largely been un-enforced. We surmise that this may be due in part to the lack of a singular authority for oversight and enforcement, insufficient resources to enforce existing laws, and inconsistency in the application of public access laws. However, with the military buildup plans threatening to further reduce public access, the time may be ripe to readdress these issues and seek adequate solutions. This strategy will accomplish this by first engaging a variety of stakeholders to measure their perceptions of the current state of public access and to gather information about what types of improvements they would like to see. Second, this strategy will perform a detailed analysis of existing laws and issues pertaining to public access with the goal of drafting new or revised legislation and regulations or standard operating procedures for adoption in order to close those gaps. Third, a Public Access Management Plan (PAMP) will be completed with the involvement of permitting agencies and developers. Finally, the plan will be submitted for adoption as part of the Guam Comprehensive Land Use Plan. A Citizens guide to public access will be produced.

The first priority of this strategy is to obtain stakeholder input on the status of public access to the ocean shore. It would be best to gather input using various methods including informal focus group discussions and formal surveys. The methods used should account for a potentially wide range of interest in the subject that will result from the reality that high frequency users of ocean resources will likely be more well-informed about the issues while occasional recreational users who utilize well established public parks exclusively may not be aware of any public access issues. This input would need to be conducted early on in the strategy, even prior to the detailed analysis of laws is performed and the PAMP developed. This will ensure that critical information introduced by stakeholders is available during the analysis and planning phases of this strategy.

The Department of Parks and Recreation, currently mandated to enforce compliance with the local public access statutes, will be invited to partner with the GCMP for the execution of this strategy and throughout the entire life of the project. Other agencies involved in permitting development projects, most especially development in and adjacent to the seashore reserve, will be included in the initial stakeholder consultations and in the analysis of policies, statutes, regulations and standard operating procedures. They will also be consulted in drafting any revisions to such. The most crucial agencies are the Department of Land Management (Planning Division) and Department of Public Works (Building Permits and Rights of Way).

Second, a crucial part of the PAMP development will be to perform a detailed inventory of existing public access statutes, regulations, programs and standard operating procedure to analyze their effectiveness. This information will be used to draft and submit proposed changes to those existing public access statutes, regulations,' programs and standard operating procedures to the appropriate government agency or body to make the changes necessary to improve public access.

Persistent issues with public access are clear indicators that more needs to be done to safeguard access rights. For the most part, compliance is lackluster and evidences the fact that preserving public access to the ocean shore is not a commonly shared community value. For example, certain

local government instrumentalities regularly deny access to the ocean shore by restricting access to public parks. The reason given is the lack of resources to maintain and protect park grounds. Other agencies invoke security of critical facilities and infrastructure as their justification. While these can sometimes appear to be reasonable causes for public access denial, little effort is made to try to accommodate the preservation of public access. Identifying all applicable laws and regulations, understanding how they are implemented, and analyzing the gaps will go a long way toward designing a more effective approach to ensuring, protecting and managing public access.

Third, to address the issues identified by stakeholders, a comprehensive Public Access Management Plan (PAMP) will be developed. This plan development task was part of the previous Section 309 Assessment but was never fully completed due to a shift in priorities by new management at the time. Additionally, according to the agency mandated with ensuring compliance with the local public access laws, it is widely accepted knowledge that enforcement suffers due to a lack of sufficient funding and resources. As part of the development of the PAMP, new and adequate sources of funding need to be identified so that a comprehensive, well-designed plan can be submitted to the Governor of Guam for eventual submittal to the Guam Legislature for adoption as an element of the Guam Comprehensive Development Plan. . However, certain aspects of the PAMP should also be implemented to start improving public access without any additional funding from the legislature or Federal grant sources. For example of a gap area that could be improved without additional funding may be 'improved agency coordination'.

Additionally, the development of a "Friends or Protectors of Public Access" program that can take advantage of the community's desire to protect, maintain and enhance their PA corridors could also be undertaken without additional funding. Such a program could allow for adoption of specific PA corridors by community organizations or neighborhoods. This adoption could also include occasional cleanup and monitoring that would address the most serious problem of dumping of trash.

One issue whose resolution may be beyond the scope of the PAMP, or at least its ability to influence a positive final outcome, is the issue of public access ocean use restrictions. Traditionally, public access has referred to a land easement which provides access to the ocean shoreline or coastal shore. However, this definition has been found to be lacking in light of ongoing federal activities. One example of this is found in the loss of use of ocean resources proposed by the military's live fire training range which would create a surface danger zone over ocean area beyond the physical training area. While not specifically a land easement issue, the restriction of use in the proposed ocean area deprives the public from the enjoyment of that ocean area for periods of time that will be defined unilaterally by the Department of Defense. There is currently no requirement for coordination of those live fire training schedules with the local government or the general public and there is no guarantee that the training schedule will provide for the least amount of public deprivation.

While the PAMP or indeed any local legislation may likely have no force and effect with regards to ocean public access issues related to military activities without court proceedings, it would be prudent for the PAMP to at least identify the issue and proffer some recommended course of action that could start the process of resolution. For example, it could start with evaluating how the denial of ocean and shoreline access by both local and the military agencies contravenes the spirit and intent of the Public Trust Doctrine. Resolving how to bring these entities into compliance is an issue that should be examined in the PAMP together with a detailed analysis.

In order to measure the potential adverse impacts of these denials, data on the actual utilization of beachside parks, coastal shores and oceans needs to be collected. The potential methods of collecting such data for future use should also be addressed in the PAMP.

The PAMP should also include a 5-year plan that will prioritize the installation and maintenance of standardized signage in a conspicuous place marking the locations of public access easements. Typically, public access easements are provided by developers as a condition for development. Where no existing development is in place, the government should be required to pursue funding in their budgets to install such standardized signage.

The fourth priority of this strategy is to develop a public outreach and education program. This part of the strategy should follow the completion of the PAMP. A Citizens Guide to Public Access publication should include maps of the locations of public access corridors, a list of the community benefits from public access, and a simplified summary of the PAMP should be made available to the public for free. A GIS Web viewer will also be produced. This would include both printed material distributed at relevant locations and digital materials posted on an easily accessible website. It should include information regarding whom to call to report a violation, contact information for various private advocacy groups, and any other related information that will help the public to better advocate for themselves. The printed and digital maps of public access corridors are critical to educating the public about their locations. Especially since signs do not exist to identify the lesser known corridors and trails. And while this may not result in a net gain of public access corridors, it would almost assuredly result in a net increase in the utilization and enjoyment of existing ones.

Also the Department of Defense (DoD) should be engaged in an effort to mitigate the adverse impacts of their activities on the local community's ability to access and enjoy the ocean shore and ocean area. DoD has developed a public access program for historical and cultural sites located on military property, however the plan has not been met with much enthusiasm since it requires a bureaucratic and cumbersome application process that can take a long time to approve. Additionally, the plan only allows for the accommodation to a list of 25 cultural and historical sites. It does not necessarily allow for access to the ocean shore. In this case, access is highly controlled and the tedious process is a formidable disincentive for the use of those areas.

Finally, a training program for relevant government agencies, engineers, developers and other interested organizations and individuals should be initiated to ensure that those involved in the various processes of public access compliance are aware of the new rules and proposed laws. The training program will result in the development of standard operating procedures (SOP) to make it clear how and when to require public access during the permit phase for coastal development. The SOP is key for the permitting agency that receives the coastal development application.

III. Needs and Gaps Addressed

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

The first part of the strategy addresses the need for an up-to-date Public Access Management Plan and a map of where those public access corridors exist. This is necessary in order to revamp the existing statutes, regulations, and programs into a comprehensive law that can be better enforced and that can be disseminated for public consumption so that everyone has easy access to the information necessary for them to be aware of their own public access rights.

Additionally, the PAMP and subsequent proposed legislation submitted for adoption will serve to address the gap in compliance by the government of Guam itself. As cited in the assessment, various instrumentalities of the government of Guam have in the past or continue to violate public access laws by restricting access periodically or perpetually to the ocean shore for reasons significantly less critical than national security. Often times, these restrictions are employed for the convenience of one or more government parties.

The local community has long felt that a consistent program that allows the public to freely access areas of cultural significance within DoD property should be made available. While the strategies proposed in this plan may have little capacity to directly resolve this issue, it will serve to educate the public and inform them of all the natural resources from which they are prohibited from enjoying. And quite possibly, if enough of public truly wish to have their inherent rights restored, the local government will be incentivized to do much more to compel the DoD to ease or completely remove its restrictions.

IV. Benefits to Coastal Management

Discuss the anticipated effect of the strategy, including the scope and value of the strategy, in advancing improvements in the CMP and coastal management, in general.

If successful, the strategies employed to enhance Public Access, will help to bring the GCMP to the forefront of preserving ocean resources for communities to use responsibly. In the past, issues related to the loss of public access have been the clamor of a few activists and special interest groups. This is, in part, the reason there has been little improvement in the laws over the years and the enforcement thereof.

By collaborating with stakeholders, researching existing laws and developing a PAMP to address existing shortcomings and drafting comprehensive legislation complete with funding identification, the GCMP will demonstrate that it does have the capacity and clout to influence the proper management of our island resources.

Additionally, when engaging the DoD on public access to ocean resources, GCMP through the Coastal Management Act can exert its legal muscle to be able to compel the DoD to change or reduce its adverse impacts on public access. In general this improves the perception of GCMP as an agency that not only works to preserve the environment and the enjoyment of its use, but that also has the juridical authority to impose its mandate.

V. Likelihood of Success

Discuss the likelihood of attaining the strategy goal and program change (if not part of the strategy goal) during the five-year assessment cycle or at a later date. Address the nature and degree of support for pursuing the strategy and the proposed program change and 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 development of the Public Access Management Plan (PAMP) and possible revisions to local statutes can be considered low-hanging fruit that has a high likelihood of success. The GCMP staff's previous attempt to develop a Public Access Management Plan with associated mapping was stalled during the last assessment period at the draft completion stage. Unfortunate circumstances resulted in the loss of multiple GCMP staff, including the former administrator, at a critical time in the plan's development. This resulted in the Plan not being completed. At this time however, the current management and staff have made a commitment to completing this strategy.

It is anticipated that there will be a high degree of local community support from fishermen, sports and fishing organizations, and casual recreational users. Additionally, the Department of Parks and Recreation (DPR), the government of Guam agency mandated with public access compliance, is in support of the completion of this strategy.

Possible opponents would be certain Government of Guam agencies that may have conflicting mandates, private property developers, and the DoD. One common argument made by these critics is that restriction results in preservation. They cite that many of the well-utilized public access corridors are littered with trash and often neglected. While the statement is certainly true in many cases, it addresses a separate concern of the GCMP. The right of every member of the public to enjoy the common resources of the land, and in this case, the ocean shore, is not contingent on the public's ability to care for and maintain that access. This argument is tantamount to the government restricting household family size commensurate to its household income. While this practice has been employed in other countries around the world, it is certainly not an American ideology and would not pass constitutional muster.

Instead, some solutions would be for the PAMP to articulate a plan for funding enforcement and to sustain an ongoing public education and outreach program and a separate public access maintenance program that would include the maintenance of appropriate signage.

VI. Strategy Work Plan

Using the template below, provide a general work plan that includes the major steps that will lead toward or achieve a program change or implement a previously achieved program change. If the state intends to fund implementation activities for the proposed program change, describe those in the plan as well. The plan should identify a schedule for completing the strategy and include major projected milestones (key products, deliverables, activities, and decisions) 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 milestones are a useful guide to ensure the strategy remains on track, OCRM recognizes that they may change somewhat over the course of the five-year strategy unforeseen circumstances. The same holds true for the annual budget estimates. Further detailing and adjustment of annual activities, milestones, and budgets will be determined through the annual cooperative agreement negotiation process.

A. Strategy Goal: Develop and Implement the Public Access Management Plan (PAMP), including: inventorying and analyzing existing statutes, regulations and programs; mapping all known public access corridors; recommended revisions to public access laws; identifying funding source for enforcement and maintenance of public access corridors.

Total Years: 2
Total Budget: $140,000.00

Year: 1
Description of activities: Stakeholder Engagement and Survey

Input would be gathered using various methods including informal focus group discussions and formal surveys. The methods used should account for a potentially wide range of interest in the subject. The following list of stakeholders would be contacted: Dept. of Parks and Recreation, Dept. of Land Management Planning Division, Dept. of Public Works Building Permits and Rights of Way Divisions, National Parks Service, U.S. Fish and Wildlife NW Refuge, Dept. of Defense, Historic/Cultural organizations, natural resources/environmental organizations, hiking, fishing, and water recreation organizations.

Activity Goals: To engage and inform all stakeholders who have an interest in the public's access to the ocean shore about the project and seek their input; To Gather information on of their perception of the status of public access from stakeholders and members of the general public.

Objectives:

1. Develop SOW and Research design for this project.
2. Conduct outreach meetings to introduce the PAMP project and gather input from stakeholders.
3. Engage Govt. of Guam agencies like DPR in becoming an active partner in the project.
4. Conduct a survey of the wider community for their views on various issues related to the public's access to the ocean shore. Such information should include but not be limited to the frequency of use, types of activities, areas most used, their perception of the status of public access and issues affecting access.
5. Compile data gathered from stakeholders for use in the next phase of the project.
6. Draft written report documenting the findings of this phase of the project.

Major Milestone(s):

Milestone	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
SOW and RFP completed and published	X	X		
Contract awarded			X	
First draft of Informal Focus Group discussions and formal survey design submitted for review and comment				X
Survey conducted and information compiled		X	X	
First draft of survey results submitted for review and comment			X	
Final Draft of survey results submitted				X

Budget: $35,000.00

Year: 1
Description of activities: Conduct a Detailed Inventory and Analysis of the Relevant Policies, Statutes, Regulations and Programs Affecting Public Access

A crucial part of the development of a public access management plan will be to perform a detailed inventory of existing public access policies, statutes, regulations and programs to analyze their effectiveness and to draft revisions as necessary for submittal to the appropriate government bodies for adoption

Activity Goals:
Perform a detailed inventory of existing public access policies, statutes, regulations and programs to analyze their effectiveness and Draft proposed changes for adoption.

Objectives:

1. Maintain/secure services from the Attorney General of Guam to provide legal assistance in compiling the policy inventory
2. Conduct data gathering of existing public access policies, statutes, regulations and programs.
3. Conduct detailed analysis of the effectiveness of existing public access statutes, regulations and programs and draft report on results for review. This should include how are they implemented and what are the gaps.
4. Draft recommended revisions necessary to policies, statutes, regulations, programs and standard operating procedures.
5. Draft written report documenting the results of this phase of the project including revisions of policies, statutes, regulations, programs and standard operating procedures.

Major Milestone(s):

Milestone	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
AG Services Secured	X			
Contract/Work Request awarded	X			
First Draft of Detailed Analysis research design and plan submitted for review and comment		X		
Finalized Research design and plan approved together with designs for any required collateral material		X		
First Draft of Detailed Analysis submitted for review and comment			X	
Final Draft of Detailed Analysis submitted for Acceptance				X

Budget: $35,000.00

Year: 2
Description of activities: Develop Public Access Management Plan (PAMP)

Activity Goals:
Develop a management plan for public access.

Objectives:

1. Develop SOW and contract for PAMP Development.
2. Identify the various policies, local and federal, restricting public ocean access and what strategies may be undertaken to reduce their footprint and adverse impacts on the local community's rights of access to the ocean
3. Establish government steering committee for:
    1) Overseeing policy, statute, regulation, program and SOP review;
    2) Directing drafting of revisions for submittal; and
    3) Providing support for the adoption and implementation of revisions

1. Identify new sources of funding to support the PAMP.
2. Identify new programs that can be established that can support PA with or without funding, example includes adopt a PA corridor or award for outstanding maintenance of a corridor.
3. Establish methodology, and SOP for collecting data on PA usage and denials of access.
4. Develop a 5 year sign installation and maintenance plan.

5. Draft and finalize PAMP.

Major Milestone(s):

Milestone	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
SOW and RFP completed and published	X			
Contract awarded		X		
Establish government steering committee		X	X	X
Draft PAMP submittals			X	
Finalized PAMP accepted by GCMP and recommendations implemented or adopted as policy, law or regulations				X

Budget: $40,000.00

Year: 2
Description of activities: Develop Public Education and Outreach Program

Guide maps of the locations of public access corridors, a list of the community benefits from public access, and a simplified summary of the PAMP will be made available to the public for free. Additionally, a website application of public access corridors possibly using existing ArcGIS Server software licenses would be developed. So the activity would include development of both printed material distributed at relevant locations and digital materials posted on an easily accessible website.

Activity Goals:
To develop printed and digital materials that can educate the public about the locations of corridors, and benefits of maintaining and protecting them. Also a brief summary of relevant laws and statutes will be included.

Objectives:
1. Draft SOW and contract for developing a public education and outreach program.
2. Determine what types of educational and outreach strategies and material will be employed and where they are best suited to be deployed.
3. Determine what types of information will be used on printed and digital materials.
4. Develop materials for review, finalize and deploy.

Major Milestone(s):

Milestone	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
SOW and RFP completed and published	X			
Contract awarded	X			
Contractors submits plan with budget and quantities for various media types		X		
Draft designs of various products (written/digital/website) submitted for first review		X		
Re-Submit revised designs of various products and plan for production for Government approval			X	
Collateral materials delivered and/or installed			X	
Website goes live			X	
After action report delivered and all items accepted by government				X

Budget: $30,000.00

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 CMP has made, if any, to secure additional state funds from the legislature and/or from other sources to support this strategy.

309 funds will be used for this strategy. To reduce the cost, the GCMP will provide data support and coordination with the consultant. In addition, some of the work including the GIS map of public access easements has largely been completed in previous years. To be effective GCMP will be responsible for networking with government of Guam agencies and networking partners to develop recommendations for improving statutes, policies, and regulations.

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

It is expected that the GCMP will hire a consultant to perform the work specified in the strategy. The GCMP staff will provide coordination and logistic support for the evaluation and assessment phase. The GCMP will assist with the required public outreach to obtain public support for any Public Access policy changes that may result from this strategy.

VIII. Projects of Special Merit (Optional)

If desired, briefly state what projects of special merit the CMP may wish to pursue to augment this strategy. Any activities that are necessary to achieve the program change or that the state intends to support with baseline funding should be included in the strategy above. The information in this section will not be used to evaluate or rank projects of special merit and is simply meant to give CMPs the option to provide additional information if they choose. Project descriptions should be kept very brief (e.g., undertake benthic mapping to provide additional data for ocean management planning). Do not provide detailed project descriptions that would be needed for the funding competition.

Task 1
"Cumulative and Secondary Impact in the Development Review and Permitting Process"

I. Issue Area(s)

The proposed strategy or implementation activities will support the following high-priority enhancement areas *(check all that apply)*:

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

II. Strategy Description

A. The proposed strategy will lead to, or implement, the following types 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. ***Strategy Goal: The goal of this strategy is to develop a policy and guidance process to evaluate Cumulative and Secondary impacts from storm water to coastal resources within 2 critical watersheds. This strategy will address two of the high priority areas CSI and SAMP and will be completed in two phases over a period of three years. During the assessment phase, the impact of storm water to coastal resources was one of the highest concerns in both in urban areas such as Tumon (Tamuning proper) and rural areas such as Merizo and Umatac. However it was not clear how GCMP would assess CSI for storm water and implement a CSI policy as part of its environmental review process. As described in the assessment, any changes to the development and review process which introduces additional burden to an already over-burdened system would most likely be met with resistance and criticism by both property developers and permitting agencies whom are already struggling to meet the current demand. Therefore, Phase 1 of our strategy will include a comprehensive evaluation of existing data, management plans, studies, regulations (both local and federal) and CSI policy as well as an assessment of the effectiveness of planning and regulatory controls concerning development and natural resource protection... This phase will also include the review of environmental permits that have been approved***

by GCMP over the last 10 years in order to examine whether gaps in policy and critical data may have led to flooding in the selected watersheds.

Phase 2 will focus on developing actionable evaluation processes and policies for implementing CSI into GCMP's review of NEPA, EIS, NPDES, FCD and the ARC applications and other planning controls in the development process. Our objective is not to discourage new development, but to ensure that the evaluation of the effects of storm water is an integral part of the CSI so that Best Management Practices (BMPs) are identified during the planning phase of development in order to help avoid undesirable impacts. To implement this strategy, we will need to establish a methodology and most importantly, publish a guidance document with a user-friendly decision support tool to assist developers and permitting agencies with standardizing their assessments of CSI related to the impacts from storm water.

State the goal of the strategy for the five-year assessment period. The goal should be the specific program change to be achieved or be a statement describing the results of the project with the expectation that achieving the goal would eventually lead to a program change. For strategies that implement an existing program change, the goal should be a specific implementation milestone. For example, work with three communities to develop revised draft comprehensive plans that consider future sea level rise or, based on research and policy analysis, present proposed legislation on wetland buffers to state legislature or consideration. Rather than a lofty statement, the goal should be achievable within the time frame of the strategy.

C. Describe the proposed strategy and how the strategy will lead to and/or implement the program changes selected above. 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.)

Guam's visitor industry goal is to increase annual tourist arrivals to two million by 2020. In their anticipation of being able to take advantage of the resulting boom to our economy, developers are proposing increasing numbers of medium to large scale residential and commercial projects. Furthermore, they are no longer concentrating only on existing developed areas but have now turned their attention to southern Guam. Impacts from past poor land use practices, aging infrastructure that cannot accommodate increased impervious surfaces, inefficient management of storm water, and increasing effects from invasive species coupled with increasing demands to improve natural resources are driving a new focus on storm water. Managers are seeking better ways to evaluate a project's potential storm water impact and new methods for leveraging existing permitting processes involving the GCMP to prevent or mitigate negative impacts.

This strategy will apply to environmental reviews that GCMP is directly involved with, including the review of NPDES permits, EIS/EA, NEPA, Federal Consistency Determination (FCD) and development reviewed by the local Application Review Committee (ARC). GCMP is a member of the ARC and provides comments on private property projects that require approval for land use variances, conditional use variances and zone changes. Requiring analyses of CSI will be and has been difficult to incorporate into the building permit process, primarily because GCMP is not party to that process and because reducing storm water impact is most effective if addressed early on in the planning and design phase. To address this, GCMP will reach out to its networking partners, especially those involved with the building permit process, to use a CSI assessment tool to review project plans, collect

data and provide recommendations to land owners to reduce the impact from smaller development. This is especially important for areas with limited storm water infrastructure.

Multiple smaller developments in a concentrated area may have the same impact as larger scale development. Working with networking partners involved with the building permit process to use the proposed CSI assessment tool will assist agencies in understanding the holistic impact from a series of small developments in a concentrated area rather than just the individual impacts from each project, especially in areas with limited infrastructure.

This strategy's main goal will focus developing a CSI policy and clear guidance on how to appropriately evaluate storm water as part of the CSI assessment.

The current environmental review process for new development does not provide for a clear method to assess cumulative and secondary storm water impacts. We will need to develop a storm water impact assessment process that links primary, secondary and cumulative impacts to the GCMP's existing environmental review. As it stands, each proposed development is reviewed as a singular, isolated activity without any regard for its contribution to the aggregate impact to such components as water demand, storm water runoff, traffic, reduced permeable surfaces, etc.

Although CSI assessment is required under the EIS/EA, NEPA and the FCD it is often difficult for developers and the GCMP to appropriately link storm water impacts to CSI and determine what information is required to make this determination. This strategy aims to provide the process and guidance for GCMP to effectively evaluate projects for CSI. But for the program to be more effective, the GCMP will need to work more directly with its networking agencies to help them understand the process and the need for CSI in the building permit process and to help them provide recommendations to developers for better managing the impacts from storm water.

Unfortunately, the Application Review Committee process does not explicitly require any CSI assessment for storm water or other types of impacts and even if it did, the ARC only covers a fraction of development activity on island. Moreover, the ARC is only an advisory committee to the decision making body known as the Guam Land Use Commission, whom by statutory design can decide contrary to the recommendations of the ARC. With the anticipation of increasing development in both northern and southern Guam, CSI analyses would go a long way toward improving planning and regulatory decisions. Having a clear policy will ensure that appropriate best management practices are implemented and that data will be available for determining the future carrying capacity for infrastructure and natural resources management. To be most effective, having a clear understanding of storm water impacts in the evaluation of CSI can improve GCMP's review of the project and reduce impacts to coastal resources especially in areas of particular concern and fragile ecosystems.

This strategy will be completed in two phases over a period of three years, using the Tamuning/Tumon and the Manell-Geus watersheds as case studies. These two critical watersheds were selected to demonstrate how CSI impacts highly developed urban areas as well as less developed, mostly residential rural areas. Tumon Bay is the center of the island's tourism industry, as well as one of five marine protected areas with unique marine ecosystems; Manell-Geus is home to a sparsely developed and relatively traditional local community that still relies extensively on its natural resources. The two provide useful case studies because they are socially, geologically and ecologically

distinct areas that may offer insight on what information and analysis will be useful in evaluating development.

Rainfall in recent years has highlighted serious flooding issues in urbanized and rural areas throughout the island. This was most notable in the northern watershed that includes Tamuning/ Tumon, as well as in the southern, rural villages of Umatac and Merizo. From the assessment discussions, stakeholders were very concerned with the effectiveness of existing zoning, improperly designed infrastructure and storm water regulations resulting in flooding that impact coral reefs and other natural resources adjacent to Guam's MPAs.

During Phase I, an in-depth evaluation of existing data, watershed delineation, watershed management studies, storm water management policies, development regulations, any relevant studies and approved projects that influence flooding in the Tamuning/Tumon and the Manell-Geus watershed and assessment of the effectiveness of planning and regulatory controls concerning development and natural resource protection will be conducted. This phase will require extensive data collection and analyses of past approved development applications that have been reviewed under FCD, NPDES, EA/ EIS and the ARC. This evaluation will include critical data such as watershed boundaries, topography, hydrology, soil type, sources of pollutants, stressors, zoning, land use, existing land use, sensitive habitat, and location of existing infrastructure, if storm water infrastructure available in the area, rainfall, floodplain, and other pertinent data. For applications approved between 1990 and 2017, some of the comparisons can be done through available 1993 orthophotos and topography maps and updated maps completed in 2016. Using tools such as C-CAP or N-SPECT will be used to fill in the data gaps. The percentage of impervious surface over the period from 1990 to 2017 in both watershed will also be included if data is available. Data related to past storm water impact is critical to determining the impact from rain events. This data should be readily available from various sources.

Boundaries for the Tamuning/Tumon Watershed will also need to be defined that takes the built environment into account. This boundary delineation will determine how much of the development in upper Tumon impacts flooding in the lower Tumon basin.

The strategy will look at two watersheds that are very different. This will enable the products and CSI tools to be developed to address each one's unique aspects. It is expected that there may be a need to approach each watershed differently and thus using them as case studies should help the GCMP develop guidance and tools suitable for multiple applications and assist in cataloging the most relevant BMPs based on the intensity of development in the watershed.

During phase 1, the evaluation of the available data, studies and existing GCMP permitting policies will help GCMP to understand what information is needed in order to do a thorough review for storm water impacts and determine simple "lessons learned".

It is expected that the outcomes of Phase I include all available data and a data gap analysis that can be used for the development of the decision support tool and the CSI Guidance document.

For the Tamuning/Tumon Watershed (Urban areas) additional information such as boundary delineation of the appropriate boundary maps, approved projects not yet under construction, listings

of proposed projects, schedules of upgrades to existing infrastructure, percentage of permeable surface to impervious surface, and any water quality data for Tumon bay will need to be collected.

For Manell-Geus Watershed (Rural areas) additional information such as schedules for infrastructure improvements, NOAA's Blueprint project, results of bamboo removal project, and water quality data for coastal areas adjacent to the Manell-Geus watershed will be needed.

Phase II of this strategy is the development of policy for storm water in the CSI. An outcome of this strategy will be a decision support tool and guidance document for developers to implement CSI into GCMP's development review process. Phase II will focus on the development of the tool, the guidance document, the development of the policy and education of the tool to GCMP staff and its networking partners.

Phase 2 will look at what is required to develop the CSI policy and how it can be shared with networking partners for use in their review and permitting activities.

This phase may take up to two years to complete, however this is a critical phase of the strategy that will lead to a better understanding and a standardized process for evaluating CSI in existing environmental and development applications. Understanding this process and how to evaluate CSI will ensure that GCMP can appropriately provide guidance to developers during the early phases of the project. We will include training of GCMP staff and networking partners on using the storm water CSI decision support tool and guidance criteria for evaluating the long term impacts of the proposed project. This includes providing BMP recommendations and mitigation measures to protect fragile ecosystems and reduce shoreline erosion.

Similar to the Procedure Guide for Achieving Federal Consistency with GCMP, the guidance document will include a step by step process to review storm water impact in the evaluations of CSI. The guidance document will consist of relevant questions that will need to be answered by the applicant. The responses will help guide the GCMP staff on determining the impact of storm water. It may be necessary for GCMP to consult with storm water professionals such as the Center for Watershed Protection to determine appropriate questions that can be addressed by the developer as part of the environmental review. Question involving such matters as the hydrology of the area, the potential stressors such as pollutants, proximity to critical fragile environments, size and scope of the project, and other similar questions would be of importance to the assessment.

The storm water CSI policy and guidance document will include:

- Types of data and background information required to assess storm water impacts
- Methodology to analyze storm water impacts in urban and rural watersheds
- Linking of direct and indirect impacts
- Checklist as a tool to determine CSI
- Assess the potential cumulative impacts
- Report the results of the cumulative impact analysis
- Assess the need for mitigation
- Recommendations on Mitigation measures and BMPs

The new CSI decision support tool will be similar to the one developed to assess the impact of development on Guam's aquifer. The tool can be based on appropriate data and map consequences similar to the way a decision tree works. The tool will be based on the guidance document's required data and responses. This user friendly tool will provide a road map for understanding CSI based on critical data such as the amount of impervious surfaces, existing infrastructure available, topography, etc. The tool will help users gain a better grasp of the total impact to the environment from storm water if a particular development was constructed without mitigation. The tool can proposed potential outcomes and appropriate BMPs.

As part of the scope of work for the development of the decision support tool, a general review of installed practices and maintenance needs will be completed so agencies and developers know what BMPs make sense.

The CSI policy and guidance document will include determining the percentage of impervious surface that would result from a new development and if the proposed BMP and mitigation plans would offset the impact from the development. If the impact is greater than the proposed BMPs, the guidance will assist the reviewer on determining appropriate measures to be designed into the project that may reduce storm water impacts.

The guidance document will provide recommendation for BMPs and mitigation measures for the proposed development that can be incorporated in the final design.

It is critical that the guidance document be user friendly. A reviewer checklist that can easily be used by GCMP staff, networking partners and developers and consultants could be part of the guidance document.

As identified in 309 Assessment-stakeholders were very concerned about the lack of understanding of CSI and its lack of meaningful consideration in the current review of proposed developments. Stakeholders identified this strategy as:

Management Priority 2: <u>Process for Incorporating CSI into GCMP review process for GCMP related Development Applications</u>

Description: Determining the CSI for development projects must be considered during the review process.

After consultation with NOAA, the strategy will focused on GCMP existing environmental review for development for two critical watersheds. Working in the two diverse watersheds can offer guidance on the level of analysis required for watershed throughout the island.

Although not involved in the building permit process, GCMP is involved in review and consultation of large scale development and critical projects that have impact to Guam's coastal resources. This strategy will identify opportunities for initiating discussions and continued consultation with the developers to include mitigation measures during the planning stages of the project to avoid contributing to flooding in the area and negative impacts to fragile ecosystems and shoreline erosion.

To be effective and to provide confidence in assess CSI impact, training is required to not only GCMP staff but to networking partners, policy makers, Guam Land Use Commission (GLUC) members, developers and stakeholders. The decision support CSI tool should be made available to everyone interested in using the tool. Having as many people aware of the GIS tool and how to use it may lead to make better development decisions and a protection of critical natural resources.

III. Needs and Gaps Addressed

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

CSI was the most important priority reflected in the comments from the stakeholders. As development pressures increase, there is a need to better understand how to use the development review process to mitigate potential storm water impacts. Originally, stakeholders wanted to have a strategy that addressed a Special Area Management Plan (SAMP) for Tumon; however, because the time allowed for implementation of a strategy is limited, it was determined that the main issue of storm water effects in specific areas would be addressed in this proposed strategy.

Environmental review is already a complicated process even for experienced developers and for those involved with reviewing the applications. Little, if any, data is collected on the impacts both to natural resources and to the economy. Moreover, developments are often reviewed based on their individual impacts with no consideration for the systemic and cumulative impacts of surrounding developments. For example, a single large development that would generate two acres of impervious surfaces, may be required to set aside an area for a ponding basin. But eight separate one-quarter acre developments constructed over a period of time in the same area may not trigger the same requirement for a ponding basin, even if the same amount of impervious surface is created.

While certain environment reviews require CSI assessment, the process and the evaluation methodology is unclear. Although a DECISION SUPPORT tool that identifies CSI impacts to the Northern Guam Lens Aquifer has been developed, it is not widely used, due to both limited distribution of the tool and a need for more training so staff are comfortable with it. By providing more guidance on storm water and CSI to developers and reviewers, we can have a simpler user-friendly tool be the impetus for newer and better CSI tools to be developed.

CSI tool and guidance documents can assist GCMP and its networking partnering in determining if proposed development will potentially change the flow of water along impervious surfaces. As part of the assessment, stakeholders were concerned with long term impacts resulting from a permitting process that does not require a comprehensive evaluation of CSI, especially regarding impacts from reducing native forests and lack of storm water management that leads to increased coastal erosion and reduced water quality that will degrade coral reefs.

CSI is not very well understood yet because it involves many “moving parts” for which there is little available historical data. By providing a guidance document that clarifies how to assess storm water impacts to CSI as an environmental consideration, we can begin the process of gathering data, changing mindsets and in time, the GCMP and its networking partners can help develop guidelines for truly sustainable development, even in light of climate change.

During the stakeholder meeting, recurrent flooding in Tumon and in southern Guam was of high concern. Developing storm water management policies specific to these geographic areas was suggested as something that the coastal program should investigate. This strategy will be implemented in watersheds that share significant flooding problems, but are otherwise quite different. Poor storm water management and enforcement, lack of appropriate storm water drainage systems, lack of data and corresponding evaluation of the area, lack of alternatives to resolve the issues, and limited land for retention basins have been identified as contributors to the flooding problems seen around the island.

IV. Benefits to Coastal Management

Discuss the anticipated effect of the strategy, including the scope and value of the strategy, in advancing improvements in the CMP and coastal management, in general.

The strategy will provide the GCMP and its networking agencies with an opportunity to enhance the review of proposed developments and focus on the causes and contributors to flooding and other storm water management concerns. As GCMP changes its focus, this strategy will provide an opportunity to better support networking agencies involved in environmental review and ARC application review, identify opportunities to incorporate CSI into the process, link the approval programs' resource and development policies included in the federal consistency determination process with criteria for review, and establish appropriate land use controls and mitigation measures to protect valuable coastal resources.

A reviewer checklist will provide a tool to ensure data provided by the applicant is appropriate and adequate for review purposes. CSI may be evaluated differently for development in urban areas susceptible to flooding, especially in the Tumon area, and in rural areas like Manell-Geus where investment into infrastructure is less likely. However this strategy outcome will provide a consistent manner for evaluation and assessment. GCMP will engage with communities in implementing innovative approaches to reducing threats to the marine resources by managing storm water in areas where there are increases in impermeable surfaces. BMP and mitigation measures will be determined prior to the building permit phase. This strategy will provide for additional requirements when building in flood prone areas close to marine resources. Additional design criteria may need to be incorporated into plans of individual development as well as upgrades to infrastructure to ensure the developer is in compliance with regulatory requirements such as those identified in NDPES permits. Recommendations such as the ones described in the "Island Stormwater Practice Design Specification" prepared by Center of Watershed Protection and the Horsley Witten Group for GCMP, GEPA and NOAA, can be required as appropriate.

V. Likelihood of Success

Discuss the likelihood of attaining the strategy goal and program change (if not part of the strategy goal) during the five-year assessment cycle or at a later date. Address the nature and degree of support for pursuing the strategy and the proposed program change and 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 creation of policies that may affect developers and private landowners will always be the subject of criticism and, to some degree, controversy. However, given the increase in flooding and the reduction of native forest, the need to have clear guidance on reviewing CSI for GCMP reviews are major concerns of stakeholders. CSI has never been more apparent than today and the public will likely support the effort to protect resources, particularly with the current increase in variance request for major developments, especially if there is a clear process and if recommendations are at the front of the planning process for the project.

To build wider support for the proposed strategy, GCMP will work with existing partners, including community groups. Further, more local groups are becoming actively involved in environmental protection projects and many youth groups are taking a new interest in resource conservation. Additional public outreach and education will allow GCMP to build on this interest and garner support for measures to conserve natural resources.

As part of this strategy, numerous in-depth discussions with stakeholder, GLUC members, agency directors, policy makers, consultants, and developers must be conducted. The success of this strategy and implementation of CSI policy will require time to understand the data and resulting project analysis. But understanding what CSI is, what its tangible value is and how it can be efficiently applied under existing GCMP review processes will ultimately reduce impact to natural resources from storm water and provided for better informed decisions.

This strategy will support what is already part of the GCMP review process thru the land use planning mandates under Territorial Planning; however a formal CSI process will be adopted by the Director of the Bureau of Statistics and Plans in the Bureau's Standard Operation Procedures. It is expected that the CSI policy can be formally adopted through an Executive Order and eventually a program change can be adopted into the GCMP enforceable policies.

For this strategy to be successful, education and understanding of the CSI from storm water is critical. Workshop and trials using the decision support tool and the guidance document will help users understand how to conduct an appropriate evaluation.

Working with the leadership of the Bureau, the Office of the Governor, and critical networking partners, the policy will be implemented through an Executive Order. This will allow for education of the policy to be understood by the development community. It is also critical that all stakeholders including contractors, developers, and consultants are engaged in the implementation of the Executive Order for this policy to be effective. The GCMP will need to work with a variety of partners and organizations to educate the community on the need for the policy and the available tools that can aid in reducing impact from storm water especially to critical natural resources. After implementation of the policy, after a period of at least two years, GCMP will work the Guam Legislature in adopting the policy through appropriate legislation. Once approved, GCMP will complete a program change to include these policies as part of the GCMP's enforceable policies.

VI. Strategy Work Plan

Using the template below, provide a general work plan that includes the major steps that will lead toward or achieve a program change or implement a previously achieved program change. If the state intends to fund implementation activities for the proposed program change, describe those in the plan as well. The plan should identify a schedule for completing the strategy and include major projected milestones (key products, deliverables, activities, and decisions) 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 milestones are a useful guide to ensure the strategy remains on track, OCRM recognizes that they may change somewhat over the course of the five-year strategy unforeseen circumstances. The same holds true for the annual budget estimates. Further detailing and adjustment of annual activities, milestones, and budgets will be determined through the annual cooperative agreement negotiation process.

Strategy Goal: Develop a policy and guidance document to implement CSI into the GCMP review of NEPA, EIS/EA, FCD, and ARC application
Total Years: 3
Total Budget: $210,000

Year: 1
Description of activities: Phase I: Gathering of Critical Data. Evaluation of data required for the strategy and review of past approved projects in the two watersheds

Major Milestones:

Milestones/Activities	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Develop scope of work and RFP that includes an assessment of the effectiveness of planning and regulatory controls concerning development and natural resource protection, evaluating existing data, and determining gaps including data, policy, procedures, etc. in the GCMP environmental review process.	X			
Select contractor and finalize contract		X		
Work with networking agencies and other stakeholders to identify and gather appropriate data. Engage all stakeholders in discussions on the link of storm water and primary, secondary and cumulative impacts in watersheds.		X	x	
Output: Evaluation of all available data required for Phase II, gap analysis, obtain pertinent data, discussion with stakeholders on the CSI policy. Workshop will also obtain critical feedback on additional data requirements and tools required to include CSI into GCMP review.				X

Budget: $70,000

Budget Category	Amount
Contractual Gathering of on all required data needed for the guidance document and DECISION SUPPORT tool to include data gap analysis. Simple GIS application for watersheds as a means to organize the data.	$50,000
Contractual Workshops to educate and obtain feedback from consulting, developers, industry professionals on incorporating CSI into the permitting process. Workshop can include feedback on where data can be obtained. Workshops are intended to be used to teach GCMP and networking staff, policy makers, stakeholders, developers how to use the tool and to provide concrete mechanism with data to support the decision to inform decision makers on consequences of proposed development.	$20,000
Total	$70,000

Year: 2 and 3
Description of activities: Phase II: Developing a User Friendly Guidance Document and Decision Support Tool for CSI; Conduct Training, Education and Community Education

Major Milestones:

Milestones/Activities	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	5th Qtr	6th Qtr	7th Qtr	8th Qtr
Develop scope of work and RFP that includes incorporating CSI into the GCMP review and ARC	X							
Select contractor and finalize contract		X						
Develop policy and guidance document regarding how to evaluate flooding and CSI into the GCMP review process. Determine the role of CSI in the review criteria. Develop GIS tool for storm water impacts in CSI.				X		X	X	
Develop CSI policy that integrates cumulative and secondary impact concepts in the evaluation of project review related to potential flooding and land-use planning					X	X		
Create simple decision support tool for the CSI.						X	X	
Training workshops and materials for GMP Staff and networking partners.							X	X
Conduct training workshops, training material and printed materials.							X	X
Work with networking agencies and other stakeholders including on the development of the policy, the implementation of the Executive Order and the utilization of the decision support tool	X	X	X	X	X	X	X	X

Budget: (Year 2 and 3) $140,000

Budget for Year 2: $70,000

Budget Category	Amount
Year 2: Contractual – Consultant services with storm water experts to help GCMP collaborate with networking agencies and other stakeholder to develop the policy and guidance criteria to assess storm water in the CSI into GCMP review process. Output: Guidance Document to assess Storm water impact as part of CSI in GCMP review	$70,000
Total	$70,000

Budget for Year 3: $70,000

Budget Category	Amount
Year 3: Contractual: Consultant services to develop decision support tool for storm water CSI. Output: Decision support tool for CSI Contractual – Development of Workshop and Training material for CSI Guidance. Consultant services to assist GCMP in conducting 5 workshops for developers, consultants, networking partners, community organizations and village meetings in Tamuning/Tumon and Umatac Merizo. This will include advertisement, venue, workshop presentation materials and other incident materials. Output: Printing of 500 copies of Guidance Document to Assess Storm water as part of CSI in GCMP review	$40,000 $20,000 $10,000
Total	$70,000

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 CMP has made, if any, to secure additional state funds from the legislature and/or from other sources to support this strategy.

309 funds will be used for this strategy. To reduce the cost, the GCMP will provide data support and coordination with the consultant. To be effective GCMP will be responsible for networking with government of Guam agencies and networking partners to actively be engaged in the development of the CSI policy that will be incorporated into the permitting process.

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

It is expected that the GCMP will hire a consultant to develop the strategy with experience in storm water management and CSI. The GCMP staff will provide coordination and logistic support for the evaluation and assessment phase. The GCMP will provide logistic support, however the consultant will conduct the workshops, produce all workshop material and print at least 5,000 hard copies of the CSI policy and environmental review and ARC process requirements that may result from this strategy.

VIII. Projects of Special Merit (Optional)

If desired, briefly state what projects of special merit the CMP may wish to pursue to augment this strategy. Any activities that are necessary to achieve the program change or that the state intends to support with baseline funding should be included in the strategy above. The information in this section will not be used to evaluate or rank projects of special merit and is simply meant to give CMPs the option to provide additional information if they choose. Project descriptions should be kept very brief (e.g., undertake benthic mapping to provide additional data for ocean management planning). Do not provide detailed project descriptions that would be needed for the funding competition.

5-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	**Year 1 Funding**	**Year 2 Funding**	**Year 3 Funding**	**Year 4 Funding**	**Year 5 Funding**	**Total Funding**
Task 1: "Cumulative and Secondary Impact in the GCMP Environmental and Development Review and Permitting Process"			$70,000	$70,000	$70,000	$210,000
Task 2: "Public Access Strategy"	$70,000	$70,000				$140,000
Total Funding						**$350,000**

Exhibit A: Stakeholder Meeting Documents

The following pages contain various attachments evidencing the work that was involved in developing this report.

We began by establishing a list of stakeholders whose professional work involved at least one of the nine enhancement areas that the Section 309 Assessment is concerned with. We then invited each individual on the list to attend a large-group stakeholder meeting held at one of the conference rooms at the Governor's Complex in Adelup. The attachments include:

- A sample of the invitation letter
- A copy of the meeting program
- A copy of the meeting sign-in roster
- Copies of the slide presentation delivered at the meeting
- Summary transcription of the issues discussed and voting results*
- Copies of the written comments received from the stakeholders at the end of the meeting
- Transcripts (in summary format) of the audio recording of the stakeholder meeting
- The soft copy of this report also includes an audio recording of the meeting

** At the end of the stakeholder meeting, we asked stakeholders to vote on their top three enhancement areas which they felt should have the highest priority.*

Stakeholder input was used as a guideline for the Section 309 Assessment and Strategies write-up. Additionally, their input into what laws, policies, and procedures have changed since the last assessment was completed was extremely helpful in compiling a comprehensive listing.

Exhibit B: Public Comment Period Documents

When the full Section 309 draft was completed, it was published for a 30-day public comment period. The following exhibits contain:

- Copies of the newspaper advertisements published on February 5, 2016 and February 10, 2016
- A copy of the draft document cover sheet indicating the other locations where hardcopies could be inspected and where a softcopy could be downloaded for free
- Instruction for submitting comments that accompanied the draft report made available to the public
- Comments that were received from GCMP staff

Note that no public comments were submitted.