

## Table of Contents

APPENDIX A: Overview Agenda.....	1
APPENDIX B: Guam Climate Predictions Summary .....	3
APPENDIX C: Tumon Community Profile.....	5
APPENDIX D: Threat Action Models .....	6

## APPENDIX A: Overview Agenda

<b>March 10</b>	<b>Session One</b>
	<ul style="list-style-type: none"> <li>• Background and Overview of Agenda and Tools</li> <li>• Telling Your Climate Story <ul style="list-style-type: none"> <li>• Reviewing Factors that Make a Community Healthy or Unhealthy</li> <li>• Understanding weather and climate <ul style="list-style-type: none"> <li>○ Historical Timeline Exercise</li> <li>○ El Nino/ La Nina</li> </ul> </li> <li>• Understanding Climate Change <ul style="list-style-type: none"> <li>○ Causes of CC</li> <li>○ Predictions for Guam</li> <li>○ Seasonal Calendar Exercise</li> </ul> </li> </ul> </li> </ul>
<b>March 11</b>	<b>Session One</b>
	<ul style="list-style-type: none"> <li>• Telling Your Climate Story continued: <ul style="list-style-type: none"> <li>• What does Climate Change mean for the community? <ul style="list-style-type: none"> <li>○ How will these changes impact a healthy community?</li> <li>○ How these changes impact a threatened community –Cumulative Impacts</li> <li>○ Review of Guam specific CC scenarios and impacts</li> </ul> </li> <li>• Is There Anything We Can Do? <ul style="list-style-type: none"> <li>○ What are other communities doing?</li> <li>○ Adaptation Strategies <ul style="list-style-type: none"> <li>○ Introduction to additional tools for corals/fisheries &amp; coastlines</li> </ul> </li> </ul> </li> <li>• Drafting a Climate Story</li> </ul> </li> </ul>
<b>March 12</b>	<b>Session Two</b>

	<ul style="list-style-type: none"> <li>• Background and Overview of Agenda and Tools</li> <li>• Developing a Community Profile <ul style="list-style-type: none"> <li>• Community background</li> <li>• Prioritizing natural resource and social targets</li> <li>• Participatory mapping of community and its targets</li> </ul> </li> <li>• Review of site specific information/models provided by NOAA</li> <li>• Threat and Vulnerability Assessment Field Work Preparation <ul style="list-style-type: none"> <li>• Review Climate Change concepts and vocabulary</li> <li>• Review vulnerability assessment worksheets</li> <li>• Team preparation</li> </ul> </li> <li>• FIELD WORK (Afternoon) - Completing the Field Based Threat and Vulnerability Assessment for a community site (Umatic)</li> </ul>
<b>March 13</b>	<b>Session Two</b>
	<ul style="list-style-type: none"> <li>• FIELD WORK (Morning) - Completing the Field Based Threat and Vulnerability Assessment for a community site (Tumon)</li> <li>• Lunch Webinar – Saipan Vulnerability Assessment</li> <li>• Review vulnerability of targets and develop threat/action model to address root causes of threats and vulnerability – Prioritize actions</li> </ul>
<b>March 14</b>	<b>Session Two</b>
	<ul style="list-style-type: none"> <li>• Developing a Local Early Action Plan</li> <li>• Develop next steps to move climate change adaption forward in respective agency efforts and collectively</li> <li>• Report out to agency leaders (2hrs)</li> </ul>

## Guam- Climate Change Indicators & Impacts

	Key Messages	
	Indicator	Impacts
<b>Terrestrial</b>		
Surface Air Temperature	Increase: warmer land particularly at higher elevations	Terrestrial habitats, as well as human health, will be adversely affected as temperatures rise. Fire risk will increase.
Rainfall	Moderate increase: more rainfall, but with high interannual and interdecadal variability	Impact on freshwater supply will be limited.
Streamflow	Inconclusive	Inconclusive
Extremes - drought and heavy rains	Less and but more intense tropical cyclones, with high interdecadal variability	Episodic drought will continue to be a threat. Though perhaps less frequent, when they do strike the impacts of tropical cyclones will be more severe.
<b>Coastal</b>		
Sea Level	Moderate increase: rising mean sea level with high interannual and interdecadal variability	Incremental and episodic increases in tidal flooding of low-lying areas will occur in conjunction with incremental and episodic increases in mean sea levels.
Extremes - strong winds and high seas	Less and but more intense tropical cyclones, with high interannual and interdecadal variability. Changes in location of extra-tropical storm tracks.	When coupled with high water levels due to storms, rising sea levels will increase coastal flooding and erosion, damaging coastal infrastructure and habitat, and negatively affecting tourism.

Ocean		
Sea Surface Temperature	Increase: warmer ocean with moderate interannual and interdecadal variability	Increased bleaching and disease outbreaks in coral reefs. Along with existing stressors, this will adversely impact coral reef fish communities.
Upper Ocean Heat Content/Stratification	Increase in heat content. Decrease in stratification.	Changes in the distribution of tuna and other fisheries.
Ocean Chemistry (acidification)	Increase: more acidic ocean (decreasing Aragonite saturation state).	Reduced coral growth and health. Along with existing stressors, this will adversely impact coral reef fish communities.
Threats to food and water security, infrastructure, health, and safety on low-lying islands are expected to lead to increasing human migration to high islands, adding to stress on high island social, economic, and environmental systems		

## APPENDIX C: Tumon Community Profile

The Village of Tumon is located on the west coast of Guam and extends from the Hilton Hotel out to Two Lovers' Point and in to Marine Drive. There are approximately 9000 residents who live in Tumon. However, there are also approximately 100,000 tourists visiting Tumon each month or 1.2 million per year.

Most residents of Tumon are employed by the service industry or high income professionals such as military, doctors, lawyers, contractors, ice skaters, zoo keeps, teachers. There are also those who are Talaya (hook and line fishing). There are several active social groups in the area including recreational water users, church groups, political parties, service clubs (Lions/ Rotary), Guam Visitors Bureau, GHRA, Chamber, JFK, St. Johns.

The main stakeholders in Tumon include the Guam hotel and restaurant association, Guam visitors bureau, Chamber, Rotary (4 clubs), Recreation users—Paddlers, Long-term residents, and short-term residents (military, ice skaters). However, decision are made in Tumon through the Mayor and council. Some decisions are also legislated. Guam Visitors Bureau (GHRA too) provide input to decisions. Regulatory and infrastructure decisions are made through respective agencies including (DPW, GLUC, GSPC, EPA, GWA, DAWR, SHPO, Parks and rec, forestry) Economics (hotel development) Resource management

There are a variety features in Tumon that are strong and provide benefits to the community. It is a strong economic driver (from tourism) for the community and the island. There is a marine protected area that is improving resource health. There are also a gathering areas, parks, and recreational areas used by residents and tourists. Shops and restaurants are present and provide a wide variety of entertainment. Transportation around Tumon is easy as it is pedestrian friendly with sidewalks and include a trolly service. While Tumon is a high density development area, it has a strong representation of a business community in the area, and offers community events for all Guam residents.

The main threats or problems in Tumon include limited parking, Enforcement issues, invasive Coconut rhino beetle, Stormwater / flooding / and bacteria issues, XXX, Public access / parking challenges, Development issues, Chemical use / improper use, Beach maintenance, Vegetation removal, Recreation user impacts (physical damage), Coral bleaching, Drunks and crime and illegal dumping, and Seawalls.

Some improvement projects are underway and include sewer upgrades and infrastructure (including funding), hotels improvement at managing green waste, Recycling, Outreach, education resource signage, Tumon better than other villages in litter, LAC.

## APPENDIX D: Threat Action Models

TUMON INFRASTRUCTURE THREAT ACTION MODEL				
Actions	Root causes of Threats and Vulnerability	Non- Climate Threats and Climate Vulnerability	Target	Impacts
Improve / maintain existing infrastructure	Poor planning / execution	Insufficient infrastructure	Stormwater drainage	Increased flooding
Enhance other / upland means of drainage / regular maintenance	Lack of capacity (infrastructure)	Social vulnerability	Sewage infrastructure	Overwhelmed storm drains
Controlled development (master plan) "periodic review"	Too much water from roofs (little open space)	High rain events		Decrease in tourism
Carrying capacity (keep up with master plan)	Limited land and funding resources			Pandemic / disease
Educate kids	Political interference	High / med exposure		Degraded marine reserve
Educate voters to elect effective community leaders	Short-term thinking / planning	Moderate sensitivity		
Require / enforce stormwater regulations	Enforcement (lack of ability to fine violators / not pass through CCU)	Medium--economic driver		
		High dependence		

TUMON SHORELINE THREAT ACTION MODEL				
Actions	Root causes of Threats and Vulnerability	Non-Climate Threats and Climate Vulnerability	Target	Impacts
<b>Identify &amp; empower community champions &amp; leaders</b>  Identify leaders of orgs in the community to partner with Work with mayor's office and church to id couple leaders in the community	Importation of construction materials	Loss of vegetation	Shoreline	Erosion (loss of beach)
	Political interference (top down)	Improper development practices		Loss of habitat Reduced food source from animals
<b>Stop spot changes</b>  Write legislation	Shift of values (cultural loss)	Stormwater flooding		Loss of beach access/parking Nutrient load to water
	Increased population and tourism	Beach raking		Increased algae blooms
<b>Conservaton easement program for coastal area</b> Promote NRCS easement program	Lack of understanding / Apathy			
<b>Update water / land use regulation plans</b> Hire qualified attorney to review and update regulations	Coconut rhino beetle	CLIMATE Storm surge		
	Lack / low enforcement (selective)	Hotter weather		
<b>Importation mangagement improvement</b> Eradication	New hotel ownership	Chronic flooding		
<b>Improve enforcement</b>  Hire qualified engineers for regulatory agencies	Economic short-term benefit			
<b>Education / barrier removal</b> Offer regular cultural/envir events Tying cultural awareness with conservation in printed materials	Algae blooms			
	Aesthetics			
Business commity (triple bottom line)				
Political leaders				
New developments				
Alternatives or other development area				
Prioritize areas for protection				
Work with GEDA to develop incentives for shoreline preservation				





UMATAC CORAL THREAT ACTION MODEL				
Actions	Root causes of Threats and Vulnerability	Non-Climate Threats and Climate Vulnerability	Target	Impacts
Stream bank stabilization	Loss of cultural practices	Sedimentation	Coral reef	Decrease in coral (diversity, growth, reproduction)
Unland revegetation	Lack of awareness	Algal blooms / overgrowth		Decrease in coral cover
Stormwater management	Upland fires	Coral bleaching		Loss of fish habitat
Manage wildfire threat	Terrestrial invasive species			Loss of food source
Riparian buffers	Improper road construction	CLIMATE		Loss of traditional fishing
Managing herbivorous fish stocks	Stream flooding	Wetter wet season		Rise in health issues
Community education	Cost / proximity / regulation / enforcement	Ocean acidification		Decrease in fishing safety
	Fishing (food, supplemental \$)	Sea surface temperature increase		Lack of open space for coral settlement
	Agat-Umatac Road			
	Erosion			
	Setic / Toguan			

UMATAC UPLAND FOREST THREAT ACTION MODEL				
Actions	Root causes	Threats	Target	Impacts
Awareness program for hunters and residents	Lack of enforcement will	Fire	Upland habitat	Loss of cultural practices
Quantify cost of fires (response, health, services)	Low priority of Ags to prosecute	Coconut rhino beetle		Health
Community water towers	Lack of staff capacity in AG focus on higher priority issues	Invasive species		Economy
Engage prosecution / judiciary division better				Erosion
PDN article (roundtable to change arson law)	Culturally prized meat	CLIMATE		Poor water quality
Hire more conservation officers--Fire towers / surveillance points	Lack of enforcement capacity	Flooding (wetter wet season)		Loss of soil fertility
Sever penalties (brownbag with the judges)	Food	Drought (drier dry season)		
Elevate cultural value	Lack of enforcement (hard to prosecute)			
Pass biosecurity fee	High value			
Issue citation by COs	Apathy			
	People just like to burn			All areas exposed
	Poachers			High sensitivity
	Lack of awareness of environment			Low adaptive capacity
				Low term medium impact
	Lack of green waste management plan			Low adaptive capacity
	Improper green waste disposal			High cultural dependence
				High social vulnerability
	DoAg biosecurity division			
	Lack of Micronesia bio-security management plan			
	Lack of Guam invasive species management plan			
	Fragile system in weakened state			
	No natural seed dispersal			
	Lack of management capacity to revegetate			

