Ridge to Reef Climate Resilience Project

Territorial Climate & Infrastructure Workshop
Honolulu, Hawai`i
March 28, 2022

Austin J. Shelton, Ph.D.

Assistant Professor & Director
UOG Center for Island Sustainability and Sea Grant

GUAM GREEN GROWTH

13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND

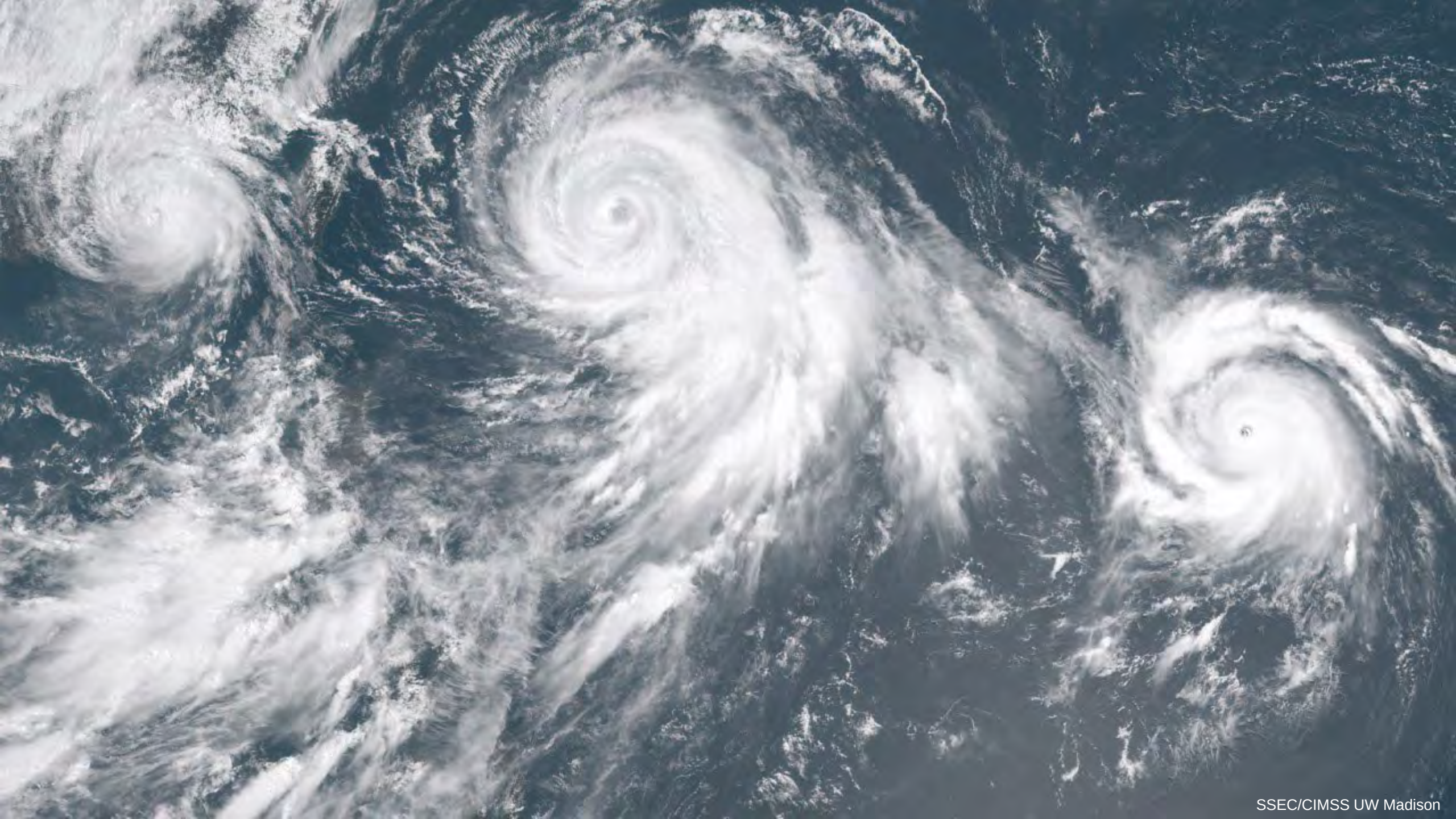
UNIVERSITY OF GUAM
UNIBETSEDÅT GUÅHAN

area: 210m^2 population: 154,000

375
coral
species

1000
reef fish
species

225
algae
species


SSEC/CIMSS UW Madison

"**More than a third** of Guam's coral reefs were killed by bleaching between 2013 and 2017"

-The Scientist, July 31, 2019

David Burdick


Guam Digital Atlas

LOCAL environmental stressors

Guam Digital Atlas


Bounce Back
XL Catlin Seaview Survey

Guam Ridge-to-Reef Climate Resilience Project

EXPAND, SCALE, REPLICATE

GUAM GREEN GROWTH

SUSTAINABLE DEVELOPMENT GOALS

Guam's most comprehensive public-private partnership ever created to achieve

our sustainable future


SUSTAINABLE DEVELOPMENT GOALS
1 NO POVERTY
6 CLEAN WATER AND SANITATION
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
HEALTHY & PROSPEROUS COMMUNITIES
EDUCATED, CAPABLE & COMPASSIONATE ISLAND
THRIVING NATURAL RESOURCES
SUSTAINABLE HOMES, UTILITIES & TRANSPORTATION
DATA & PUBLIC ENGAGEMENT
SUSTAINABLE ALLIANCES

Healthy and Prosperous Communities

Guåhan is the indigenous CHamoru name for Guam, meaning "we have", signifying abundance.

However, Guam currently imports over 90% of what we consume. Achieving sustainable development would be impossible without a healthy community that can meet its basic needs. Reducing poverty and hunger, addressing our health and well-being, and innovating ways to promote local industries are essential for a healthy and prosperous community.

GUAM GREEN GROWTH

G3 Dashboard
www.guamgreengrowth.org

Guam Forest Action Plan
2020 – 2030

4/28/2021

Guam Department of Agriculture

Forestry & Soil Resources Division

Mangilao, Guam

Christine Camacho Fejeran, Division Chief

Guam Department of Agriculture

Forestry and Soil Resources Division

163 Dairy Road

Mangilao, Guam 96913

Prepared by

GUAM FOREST ACTION PLAN ADVISORY COMMITTEE


DEPTOFAGR
FORESTRY
DEPTOFAGR
FORESTRY

GUAM WILDLIFE ACTION PLAN

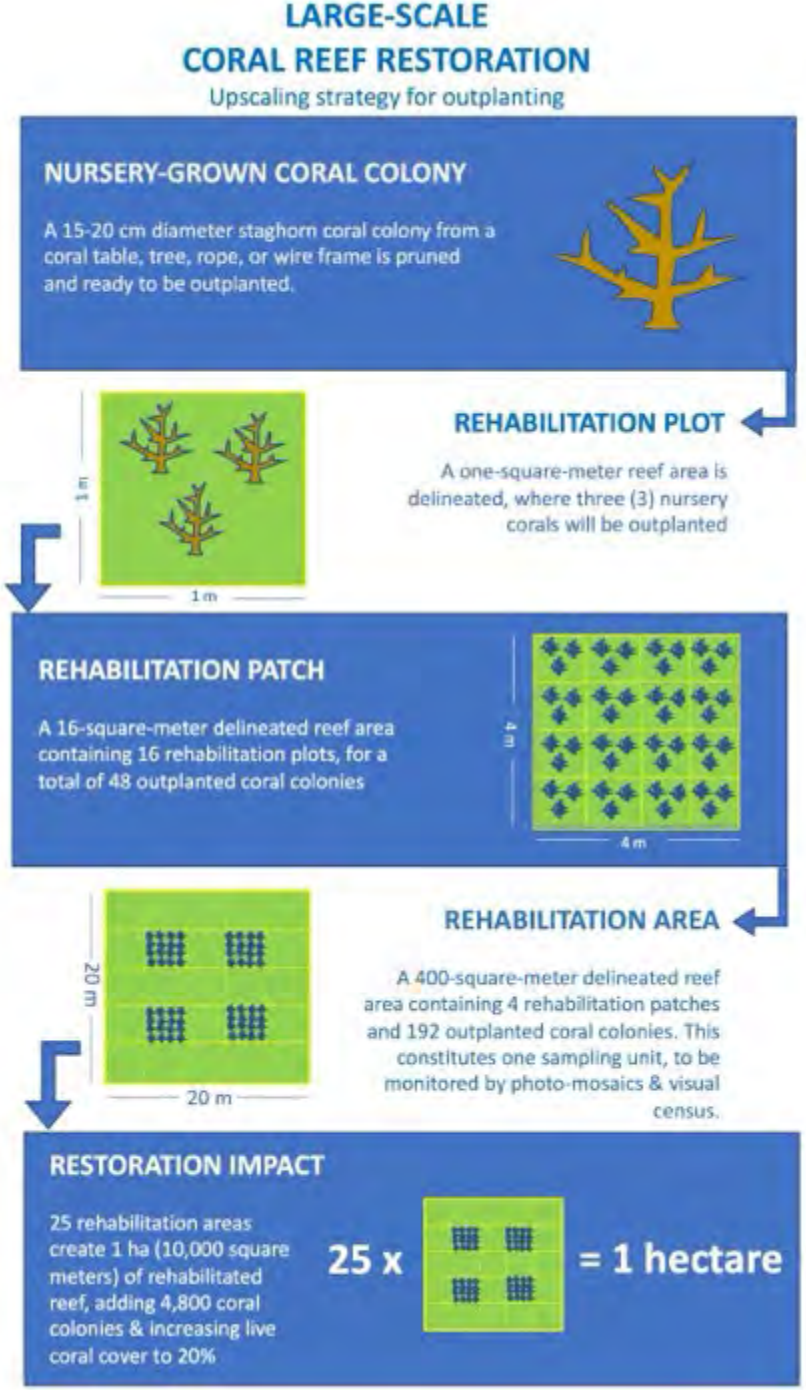
(GWAP)

Revised

JANUARY 10, 2019
GUAM DIVISION OF AQUATIC AND WILDLIFE RESOURCES
Department of Agriculture
Government of Guam
163 Dairy Road
Mangilao, Guam 96913
671-735-0281/94
671 734-3154

Guam Coral Reef Resilience Strategy

December 2018



Guam Coral Reef Restoration Action Plan

September 3, 2021

Reef restoration planning team:

- Whitney Hoot (team lead) - Guam Coral Reef Initiative, Bureau of Statistics and Plans
- Marie Auyong - NOAA Coral/Coastal Liaison for Guam
- Frank Roberto - Division of Aquatic and Wildlife Resources, Guam Dept. of Agriculture
- Jesse Cruz - Environmental Monitoring and Analytical Services Division, Guam Environmental Protection Agency
- Dr. Laurie Raymundo - Marine Laboratory, University of Guam
- Dave Burdick - Marine Laboratory, University of Guam

Project Description

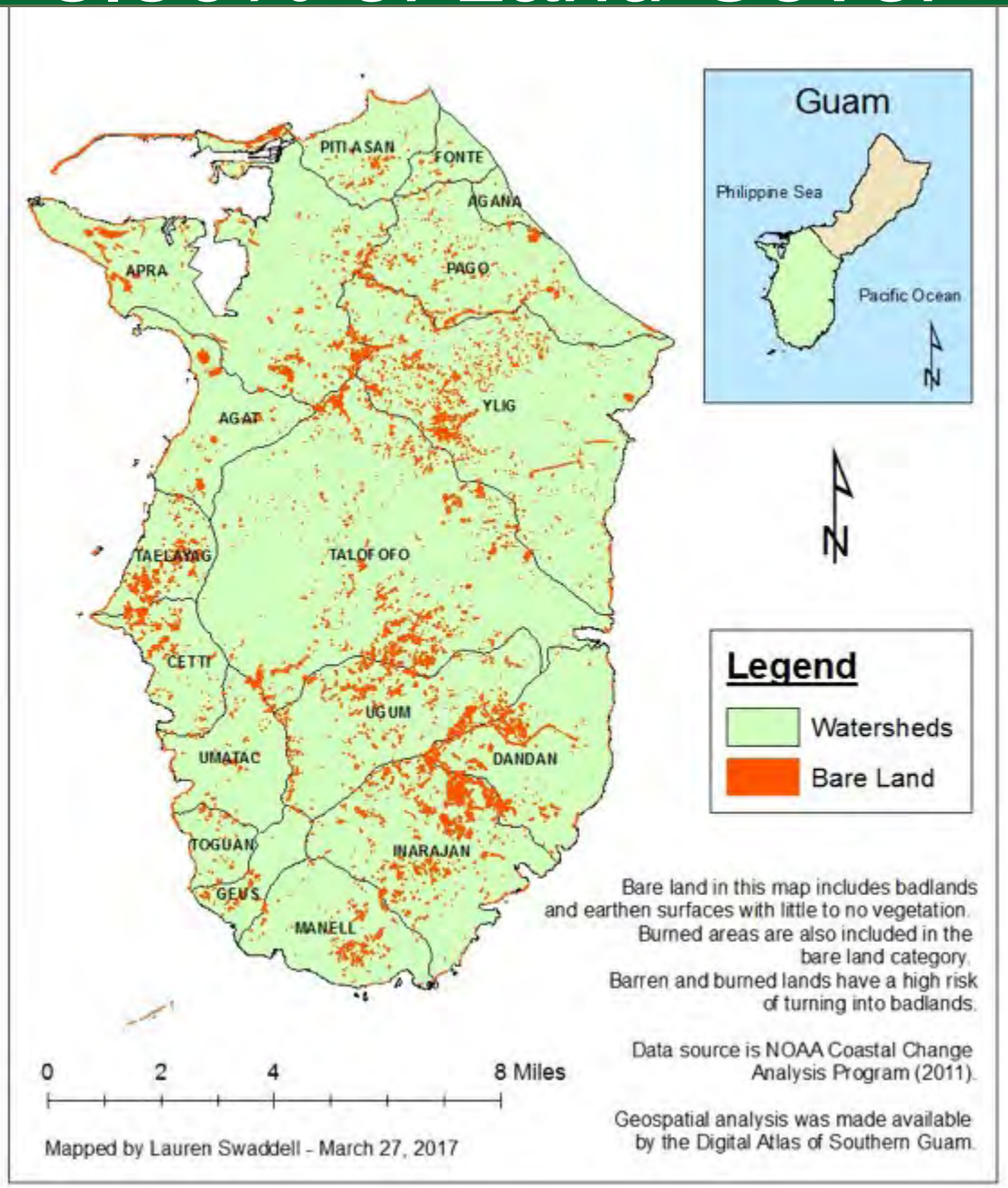
Development of Guam's draft action plan for coral reef restoration was led by a core local team of six individuals representing a variety of relevant government entities and the University of Guam. Additional stakeholders were consulted and engaged throughout the process to incorporate additional areas of expertise. The restoration action plan will be a living document that is frequently updated to ensure effectiveness of ongoing restoration efforts and responsiveness to changes in ecological and management conditions. This plan complements the Guam Reef Resilience Strategy (2019), a document intended to guide coral reef management and conservation efforts on Guam from 2019-2025. Increased reef response and restoration is one of five target outcomes for coral reef management outlined in the Guam Reef Resilience Strategy.

Before developing this action plan, the local planning team - with input from other relevant experts and decision makers - established three priority goals for reef restoration on Guam:

Goal 1: The structure and function of coral reef communities are restored to enhance reef resilience to thermal stress. This goal addresses the need for coral reef restoration to address the structure and function of coral reef communities, including biodiversity (species richness and evenness, morphological diversity), structural complexity/rugosity, benthic composition, coral size structure, habitat provision, etc. Optimizing these traits of coral communities will enhance the resilience of coral reef ecosystems to the impacts of thermal stress, i.e. coral bleaching and resulting mortality. Guam's

GUAM geology

3.56% of Land Cover



Up to 50% of total soil erosion


@UOGSeaGrant

R. Gavenda, USDA NRCS PIA


@GuamCoral


J. Lawrence, USDA NRCS PIA


@GuamCoral


@GuamCoral


Guam PDN


Sea Grant
University of Guam
GROW
GUAM RESTORATION OF WATERSHEDS
GUAM GREEN GROWTH
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND


Sea Grant
University of Guam
COMMUNITY HEALTHY LIVING


MONTH 1


MONTH 2


MONTH 30
HUMATAK
PROJECT

GROW

GUAM RESTORATION OF WATERSHEDS

UNIVERSITY OF GUAM
CENTER FOR ISLAND SUSTAINABILITY

Sea Grant
University of Guam

USDA

FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE

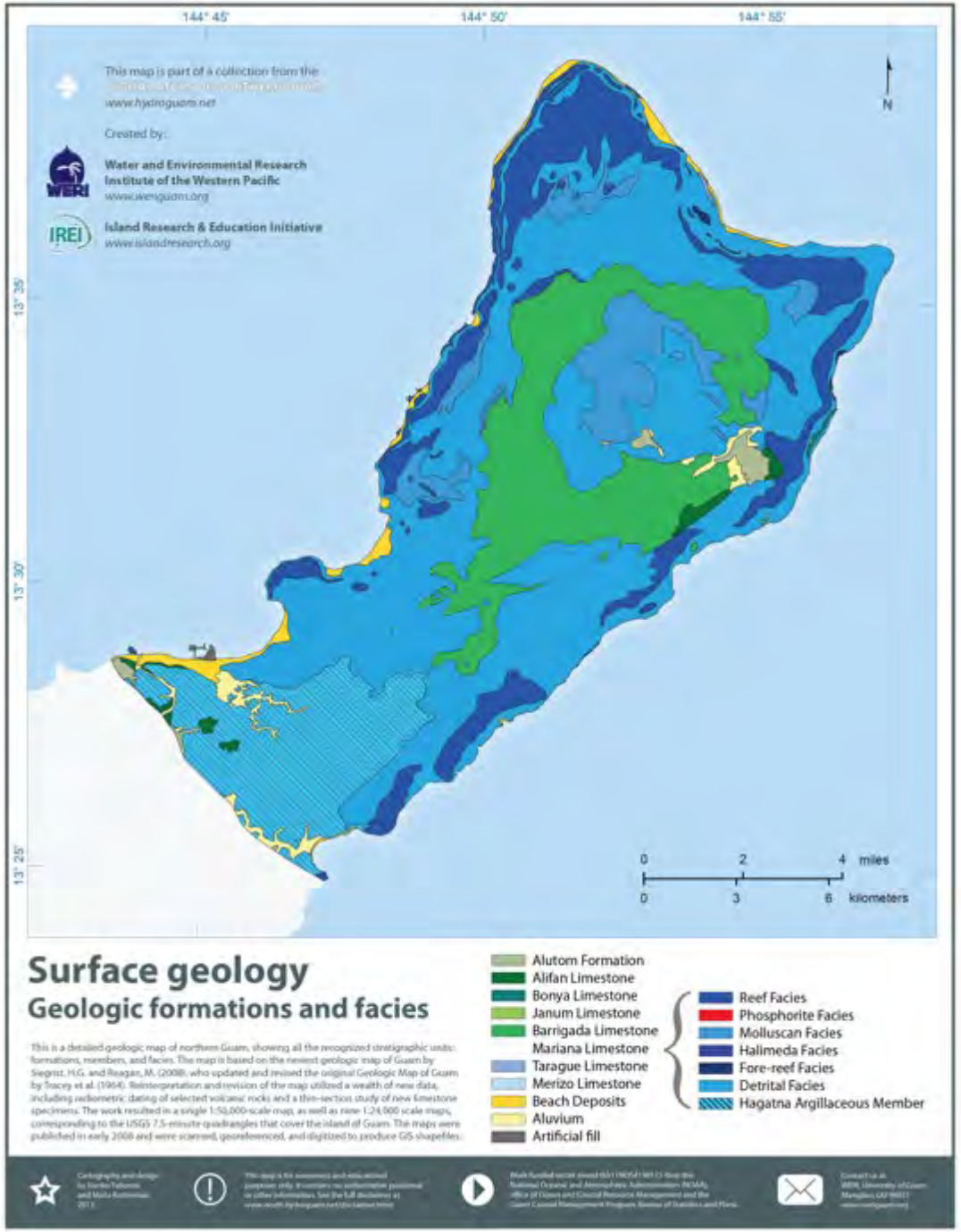
NSF

GUAM
EPSCoR

SEAS
Islands Alliance

NOAA HABITAT BLUEPRINT
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Manell-Geus, Guam


144° 45'
144° 50'
144° 55'
13° 35'
13° 30'
13° 25'
This map is part of a collection from the
www.hydroguam.net
Created by:
Water and Environmental Research
Institute of the Western Pacific
www.weriguam.org
Island Research & Education Initiative
www.islandresearch.org
N
0 2 4 miles
0 3 6 kilometers
Surface geology
Geologic formations and facies
This is a detailed geologic map of northern Guam, showing all the recognized stratigraphic units: formations, members, and facies. The map is based on the newest geologic map of Guam by Siegrist, H.G. and Reagan, M. (2008), who updated and revised the original Geologic Map of Guam by Tracey et al. (1964). Reinterpretation and revision of the map utilized a wealth of new data, including radiometric dating of selected volcanic rocks and a thin-sections study of new limestone specimens. The work resulted in a single 1:50,000-scale map, as well as nine 1:24,000 scale maps, corresponding to the USGS 7.5-minute quadrangles that cover the island of Guam. The maps were published in early 2008 and were scanned, georeferenced, and digitized to produce GIS shapefiles.
Alutom Formation
Alifan Limestone
Bonya Limestone
Janum Limestone
Barrigada Limestone
Mariana Limestone
Tarague Limestone
Merizo Limestone
Beach Deposits
Aluvium
Artificial fill
Reef Facies
Phosphorite Facies
Molluscan Facies
Halimeda Facies
Fore-reef Facies
Detrital Facies
Hagatna Argillaceous Member

Low Impact Development Solutions for Yigo Flood Zones

By: Jackpem Chen, Anthony Luces, Ervin Pascual, Makisimino Veimau
University of Guam, School of Engineering
CEE404 Senior Design I - Fall 2021

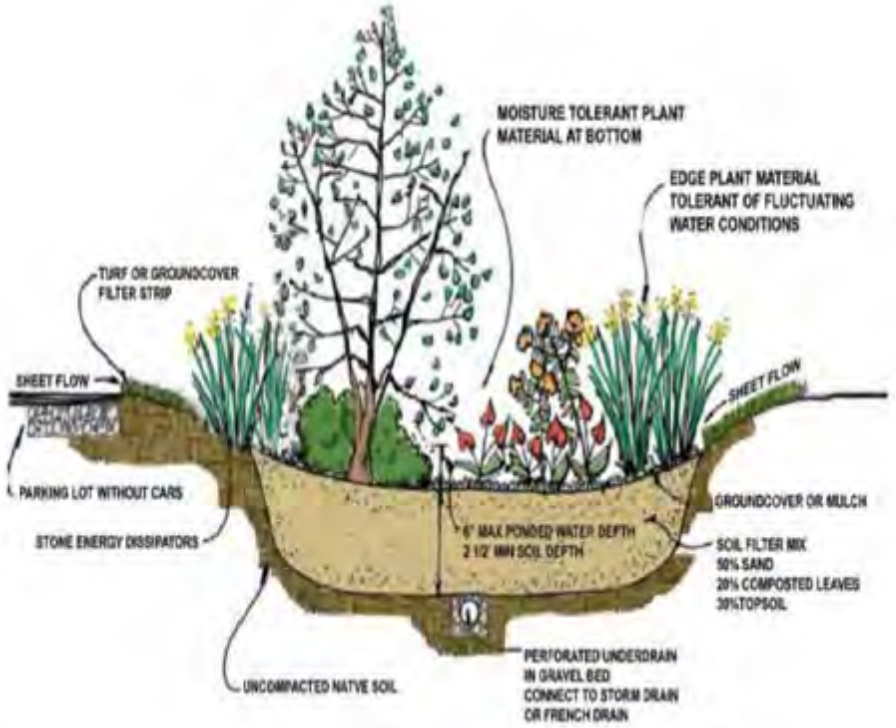
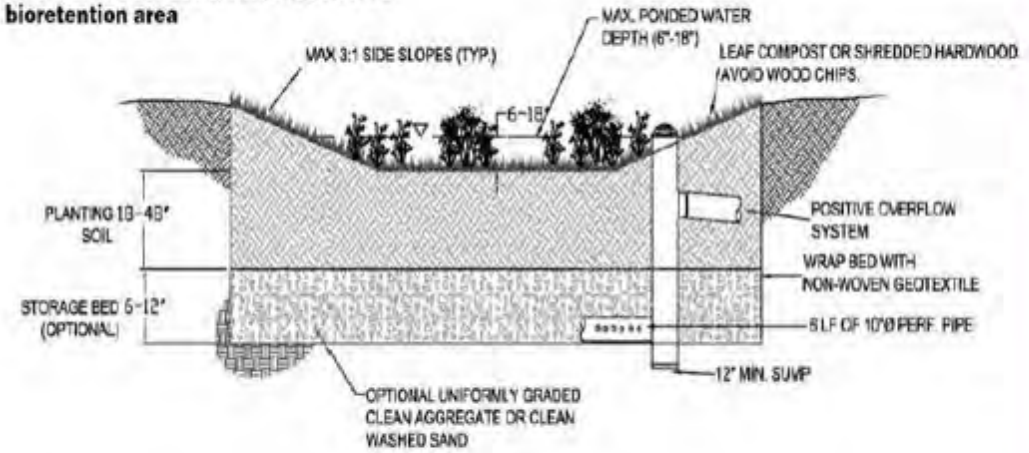


Figure 7.6
Schematic of a technically engineered bioretention area



Source: Prince George's County Bioretention Manual with modifications by Cahill Associates, 2004

Preliminary Design

- 1 Year Event - Treat Water Quality

  (NPDES, On Sit Absorb Dirty)

  ------> Raingarden

- 5 Year Event - Minor Event - Water Management
  (Drain Water, Keep Water Sit On Rain Garden)

  ------> Infiltration Pat

- 100 Year Event - Risk Management

  (Protect Property from Flood, Reduce Flood Risk)

  ------> FEMA Flood Plan

Preliminary Solution: Yigo McDonalds

- Natural Channel leading into rain garden

Proposed

Current

Preliminary Solution: Chalan La Chanch

1. Trench & implement bioswale and rain garden

Proposed

Current

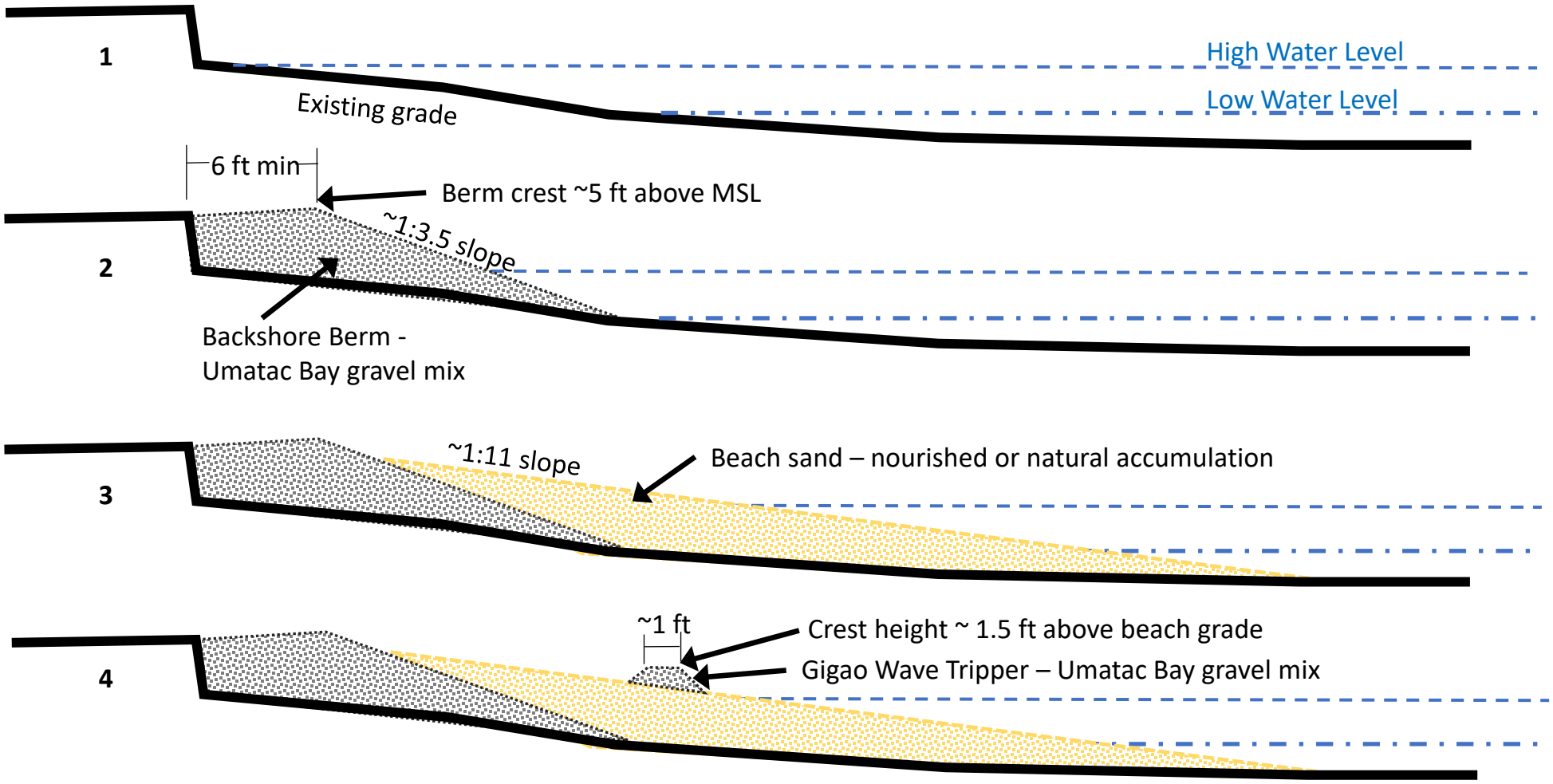

TENJUDO
SPA


Bureau of
Statistics & Plans
Sagan Planu Siha Yan Emfotmasion

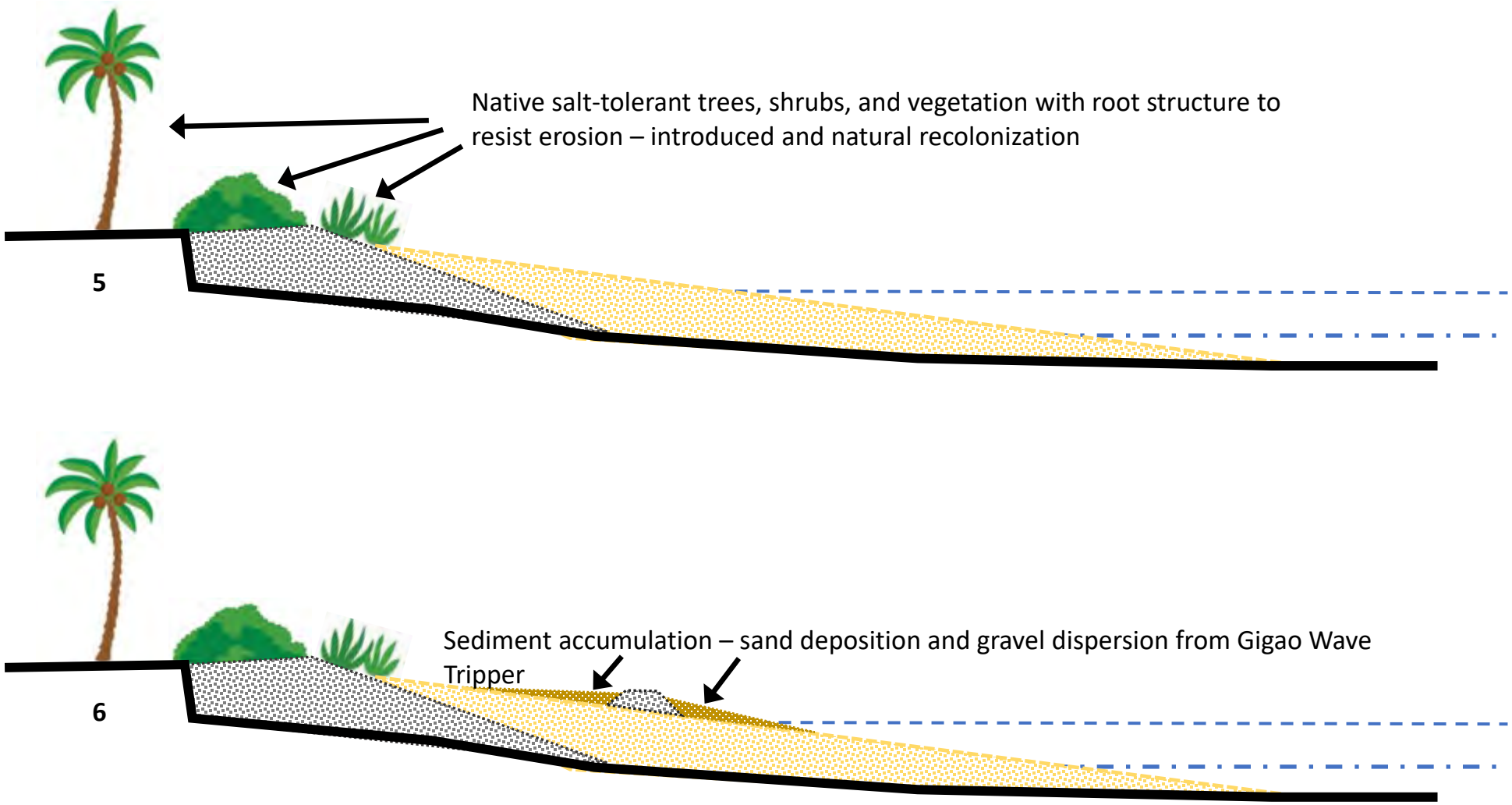
Guam Coastal Erosion and Nature-based Living Shoreline Solutions


Umatac Bay

Nimitz Beach Park – Conceptual Design



Nimitz Beach Park – Conceptual Design

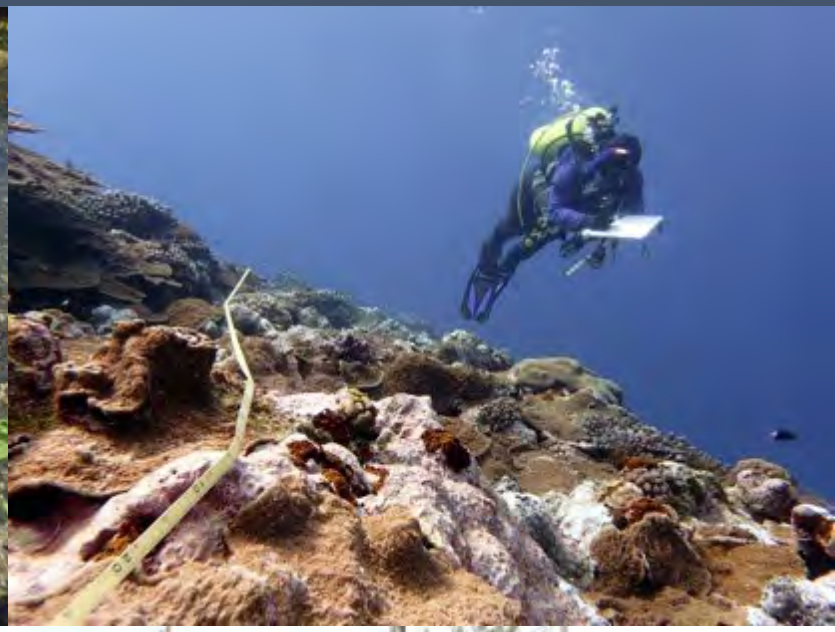


Building a Ridge to Reef Framework for Guam

Summary of planned activities for the 2-year project

Project PI:
Dr. Peter Houk
UOGML
peterhouk@gmail.com

Developing a Framework to assess Ridge to Reef Ecosystem Health in Guam



GUAM GREEN GROWTH

WORKFORCE DEVELOPMENT


GUAM GREEN
GROWTH
CONSERVATION CORPS
STEP
INTO YOUR
NEW OFFICE.
UNIVERSITY OF
GUAM
UNIBETSEDÅT GUÅHAN

7 AFFORDABLE AND CLEAN ENERGY

100% Renewable Energy by 2045

Public Law 35-46


SPEED LIMIT
35
GUAM GREEN
GROWTH
ISLAND
IMPROVEMENT
AHEAD


GUAM GREEN GROWTH
CONSERVATION CORPS
IMPACTS FOR OUR SUSTAINABLE FUTURE
JUNE 23, 2021 - NOVEMBER 19, 2021
70,516
CANS COLLECTED & RECYCLED
2,024
FOOD CROPS PLANTED
4,149
TOTAL VOLUNTEER HOURS
2,890
TREES PLANTED
578
XLARGE BAGS OF TRASH PICKED UP
690
FEET OF EROSION CONTROL DEVICES BUILT
693
FLUORESCENT BULBS CHANGED TO LED
211
WHITE GOODS & BULKY WASTE REMOVED
641
SOLAR PANELS INSTALLED
10
ACRES OF LAND PREPPED FOR REFORESTATION PROJECTS
400
FEET OF CHAIN OF LOVE REMOVED
212
INVASIVE BAMBOO STALKS REMOVED
19
ROADSIDE CLEANUPS
9
PAINTING PROJECTS (MURALS, BUS STOPS, SAFETY BARRICADES, ETC.)
6
BEACH CLEANUPS
UNIVERSITY OF GUAM
UNIBETSEDÅT GUAHAN
www.guamgreengrowth.org

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CENTER FOR ISLAND SUSTAINABILITY

Sea Grant
University of Guam

Austin Shelton, Ph.D.

Director of CIS & Sea Grant

G3 Steering Committee Co-Chair

+1 (671) 735-5631

shelton@uog.edu

@GuamCoral