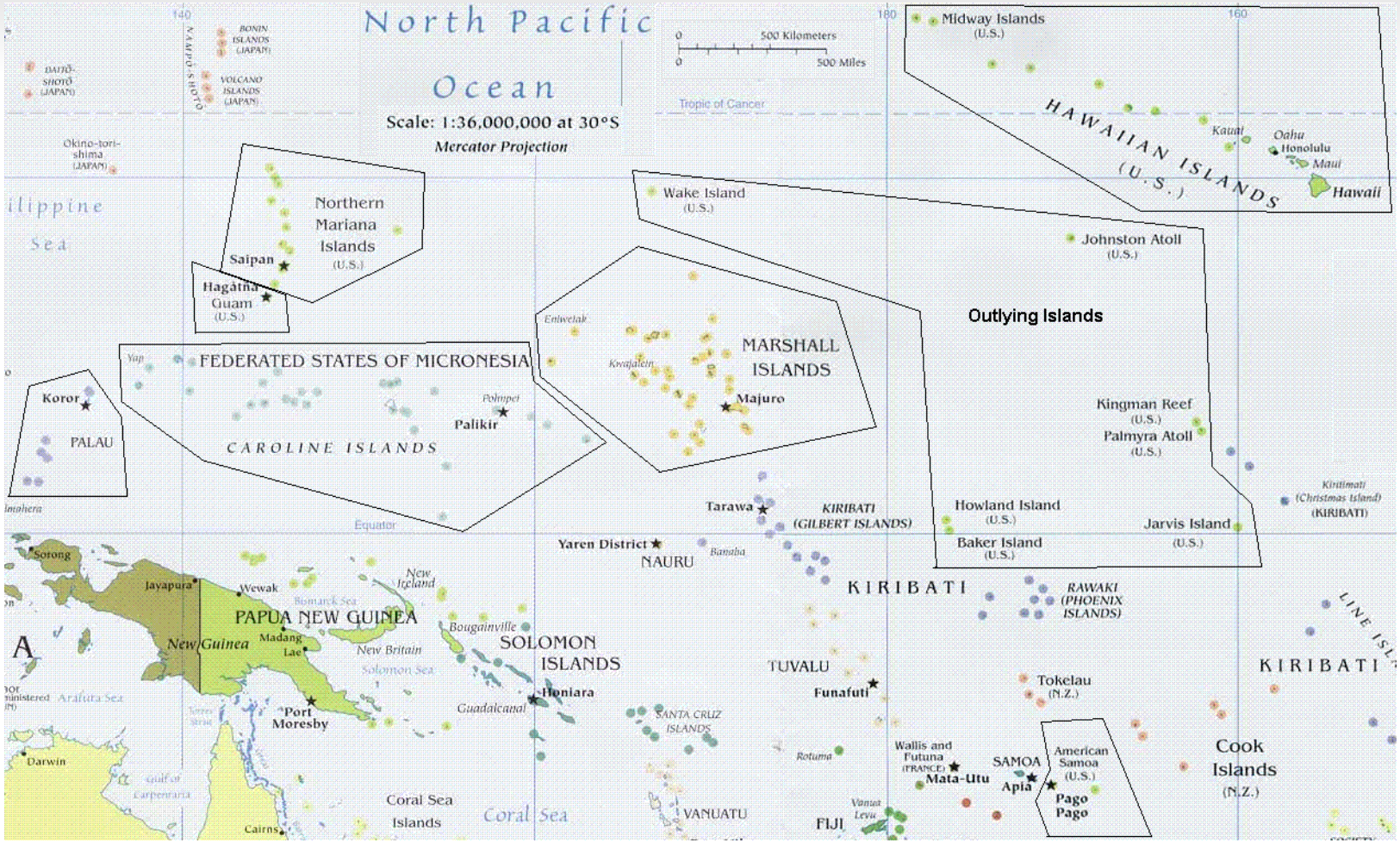
State Specific Training Module for the Pacific Islands Area 2023

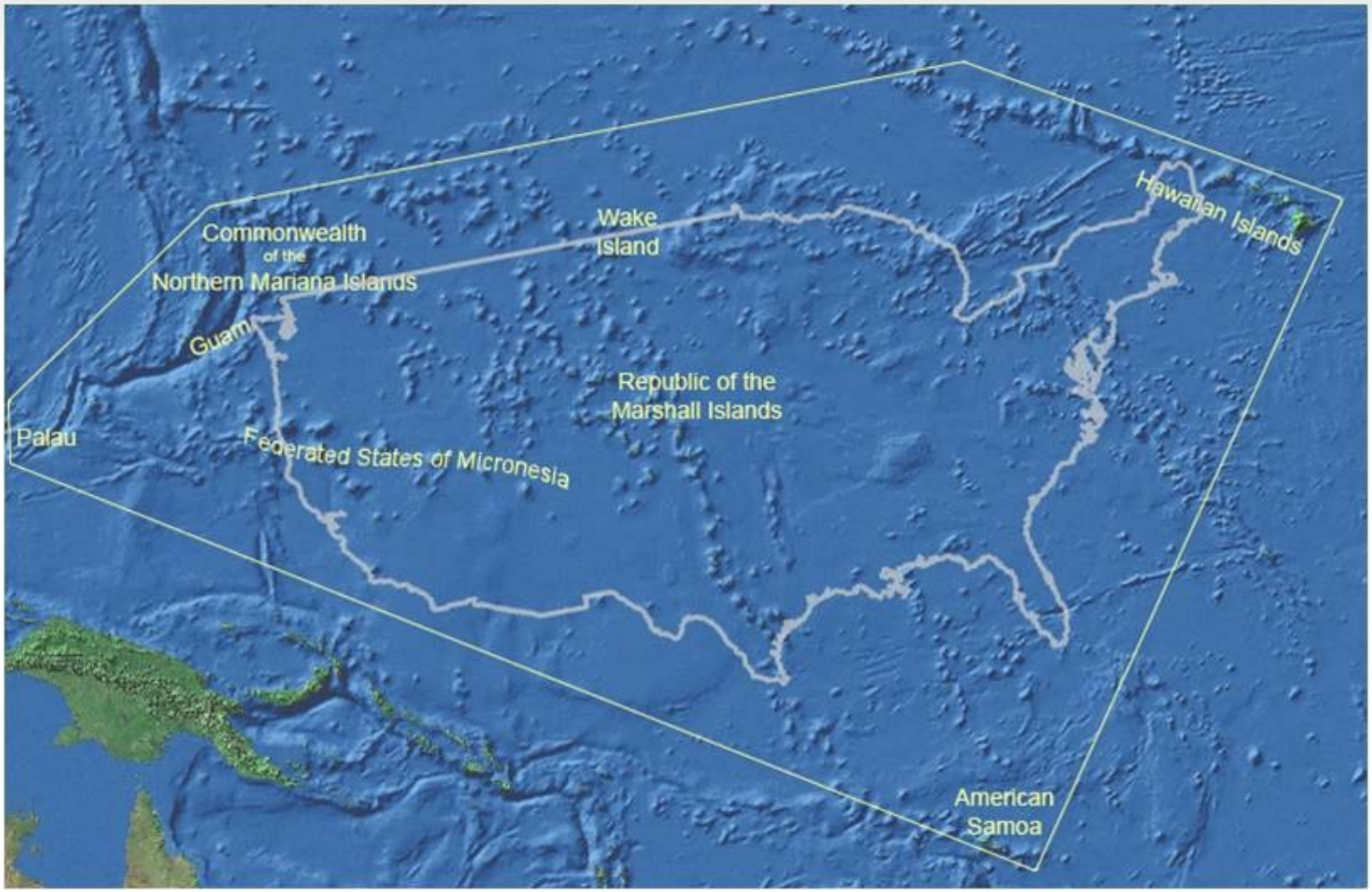
Purpose of this Module

This module will provide some general information that TSPs need to conduct conservation planning in Pacific Islands Area (PIA). This information is general in nature so the TSP may need to follow up with additional reading or training to make sure they have the knowledge, skill, licenses and certifications to conduct conservation planning in this state.

PIA Service Area



PIA Service Area Scale



PIA Field Office Locations

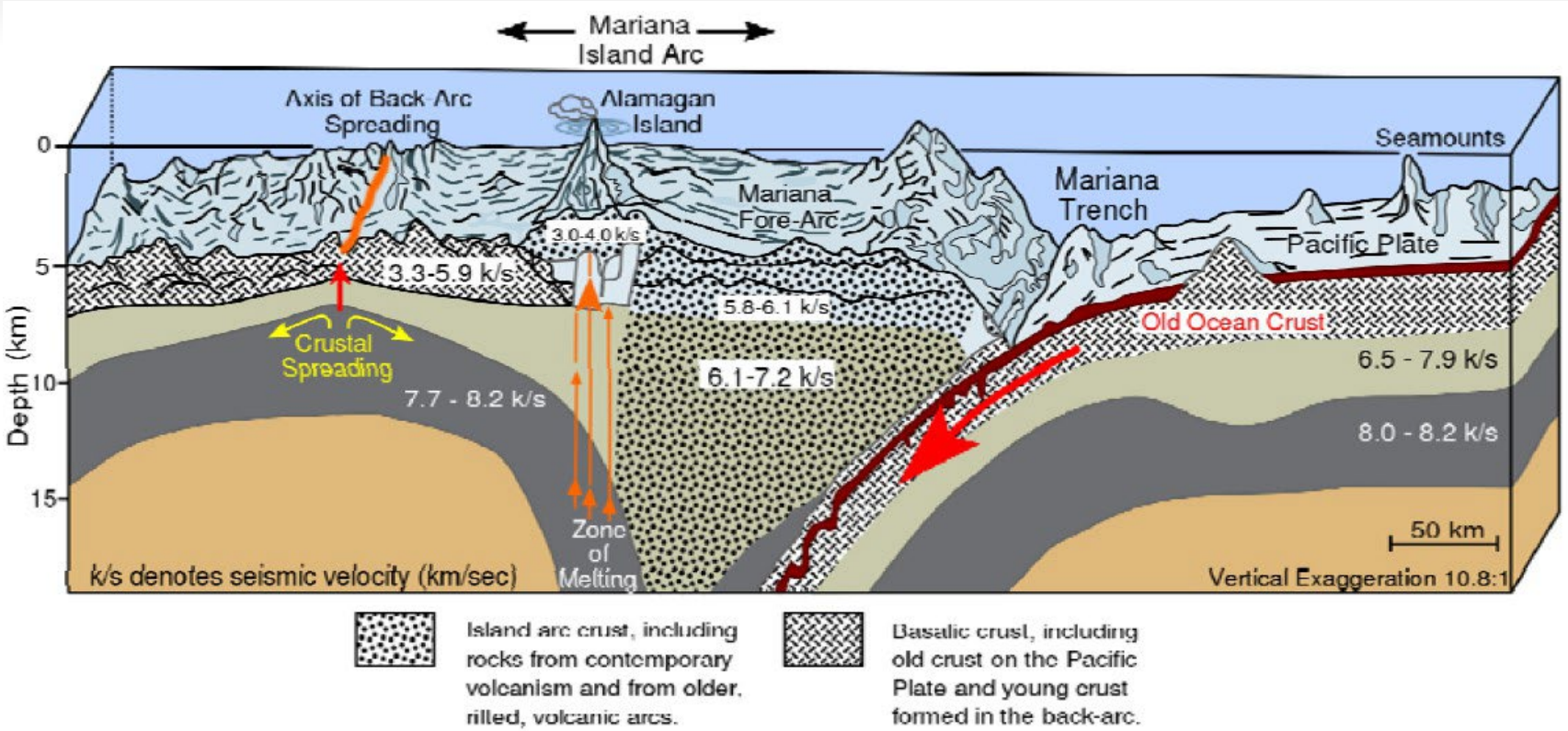
PIA - East

- Kauai – Lihue
- Oahu – Aiea
- Molokai – Hoolehua
- Maui – Kahului
- Hawaii Island – Kealakekua, Waimea, Hilo
- Pago Pago, American Samoa

PIA – West

- Barrigada, Territory of Guam
- Koror, Republic of Palau
- Pohnpei, Federated States of Micronesia
- Saipan (Serving Commonwealth of the Northern Mariana Islands – CNMI)

Island Formation



Cross-Section Sketch of Mariana Arc

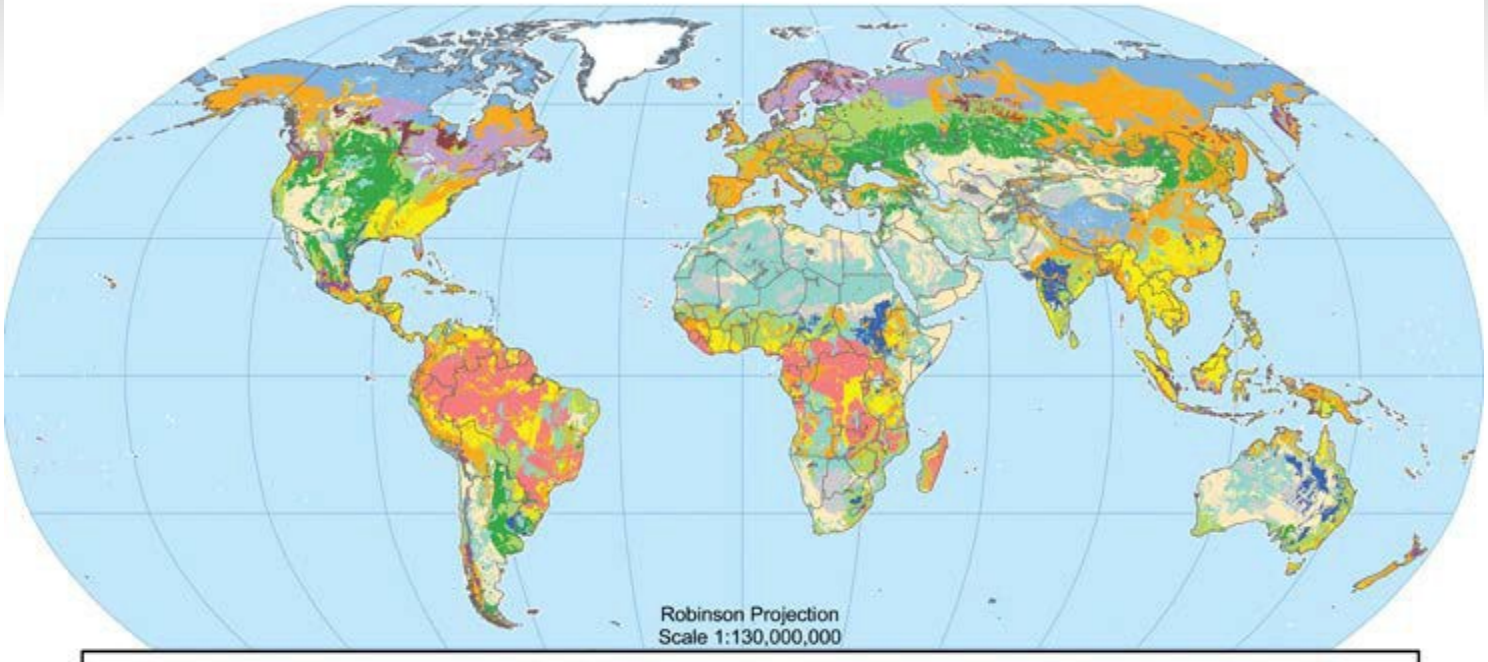
(After Hussong and Fryer, 1981)

Island Formation

- The Micronesian island group of the Mariana Islands forms a curving chain of 15 main islands located in an extremely tectonically active region of the western Pacific.
- The Mariana Islands are a classic example of an island arc formation. The islands formed as the Pacific Plate plunged below the Philippine plate resulting in the Marianas Trench.
- To the west of the subduction zone melting magma resulted in volcanic activity, which has subsequently built the base of the islands and continues to cause volcanic activity in the northern part of the island chain.
- In the north the islands are geologically young, having been formed within the last 5 million years. Their formation continues today with volcanic activity frequently observed on islands such as Anatahan (2005), Pagan (1993) and Farallon de Pajaros (1967).
- In the south the islands are older, with Guam being around 30 million years old. The southern islands are composed of volcanic rocks that have been overlain with coralderived limestone. Subsequent tectonic movements and changing sea levels have raised many of the islands in the south considerable heights above sea level forming terraces and high cliffs.

(Sources: http://www.oceandots.com/pacific/mariana/ & http://manoa.hawaii.edu/ctahr/tpalm/pdfs-marianas/pdfs/vol_one/2_soils_management/soils_guam_2010_notes.pdf)

Global Soil Regions



Soil Orders

Alfisols	Entisols	Inceptisols	Spodosols	Rocky Land
Andisols	Gelisols	Mollisols	Ultisols	Shifting Sand
Aridisols	Histosols	Oxisols	Vertisols	Ice/Glacier

US Department of Agriculture
Natural Resources
Conservation Service

Soil Survey Division
World Soil Resources
soils.usda.gov/use/worldsoils

November 2005

Global Soil Regions

There are twelve soil orders according to the U.S. Soil Taxonomy classification system. Of the twelve soil orders, eleven are found in the PIA. **Histosols** are organic soils associated with wet cold areas, **Aridisols** are the soils of the deserts or dry regions of the world, **Mollisols** are the soils found under grassland vegetation, **Alfisols** are found under deciduous forest in the temperate climates and savannah in the tropics, **Ultisols** are typically found in areas of high rainfall with a leaching environment, **Oxisols** are the weathered, red soils of the tropics, **Andisols** are recent soils formed from volcanic ash, **Spodosols** are acid soils of temperate coniferous forest ecosystems, **Vertisols** are shrink-swell soils of the tropics and sub-tropics, **Entisols** are young soils with minimal development, and **Inceptisols** are young soils with little profile with minimal diagnostic horizons.

Source: http://manoa.hawaii.edu/ctahr/tpalm/pdfs-marianas/pdfs/vol_one/2_soils_management/soils_guam_2010_notes.pdf

Soil Orders In Hawaii

Prepared by Ike Ikawa, Nguyen Hue and Russell Yost

College of Tropical Agriculture and Human Resources

University of Hawai'i at Mānoa

Andisol

Kula Series, Maui Hilo Series, Hawaii

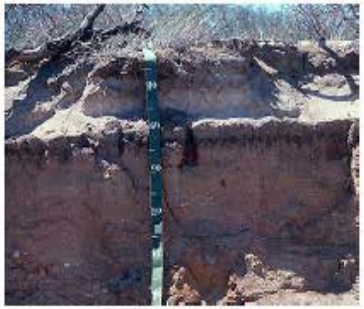
Andisols are soils derived from volcanic ash. The less weathered Kula soil on Maui is quite productive, while the Hilo soil on the Big Island is highly weathered and requires lots of fertilizers for crop production.

Aridisol

Kawaihae Series, Hawaii

Aridisols are soils of the arid areas or soils with high salt content. The Kawaihae soil of the Big Island has features of an arid area of light color, low organic matter, and shallow depth.

Entisol



Jaucas Series, Maui

Entisols are least-developed soils showing only a weak surface development. The calareous Jaucas soil on Maui is an example with sandy texture, and excessive drainage.

Histosol

Papai Series, Hawaii Alakai Series, Oahu

Histosols are organic soils with a high organic matter content in the surface horizon. The Papai soil on the Big Island has lost almost all of the surface organic matter (OM), but the Alakai soil atop Mt. Kaala on Oahu is high in OM.

Inceptisol

Kolekole Series, Oahu

Inceptisols are soils showing minimal development of soil horizons. The Kolekole soil on Oahu is an example.

Mollisol

Kawaihapai Series, Oahu Makawele Series, Kauai

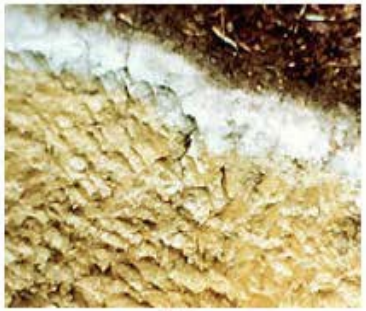
Mollisols are fertile soils with high organic C and high base saturation. Although the Kawaihapai soil on Oahu is dark, the Makawele soil on Kauai is red because of Fe oxides.

Oxisol

Halii Series, Kauai

Oxisols are the most weathered soils of the tropics with low nutrient holding capacity and high Fe and Al oxides. The Halii soil on Kauai is an example.

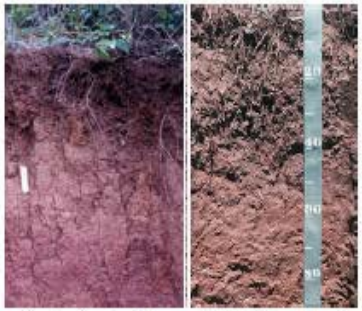
Spodosol-like soil



Oahu

Spodosols are soils with leached Al, Fe, and organic materials in the subsoil, showing a distinct layer.

Ultisol



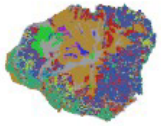
Alaeloa Series, Oahu Haiku Series, Maui

Ultisols are highly weathered infertile soils with clay accumulation in the subsoils. Examples are Alaeloa soil on Oahu and Haiku soil on Maui.

Vertisol

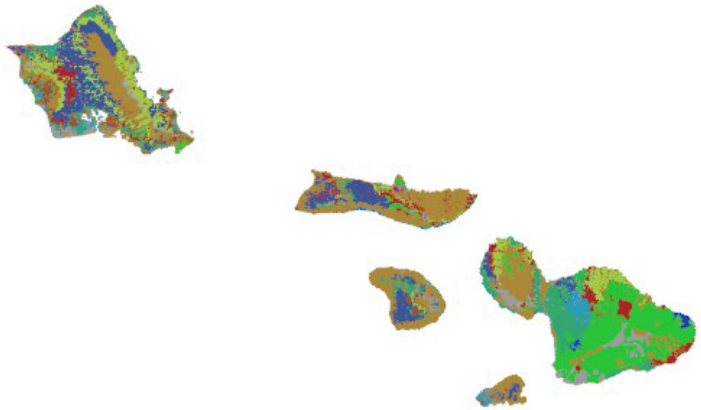
Lualualei Series, Oahu

Vertisols are soils that shrink when dry and swell when wet. They usually occur in valleys with poor drainage. They are fertile, but pose severe limitations for roads, housing, and related uses. The Lualualei soil on Oahu is an example.



SOIL ORDERS OF HAWAII

N

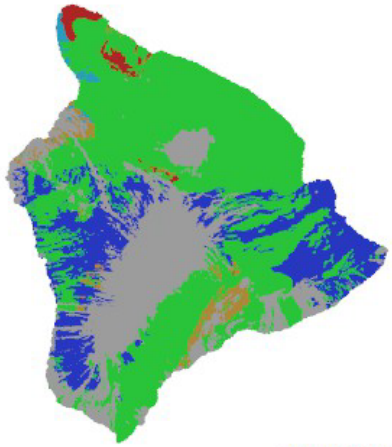


Legend

Soil Order

TAXONOMIC ORDER

- Andisols
- Aridisols
- Entisols
- Histosols
- Inceptisols
- Mollisols
- Oxisols
- Spodosols
- Ultisols
- Vertisols
- Misc Areas

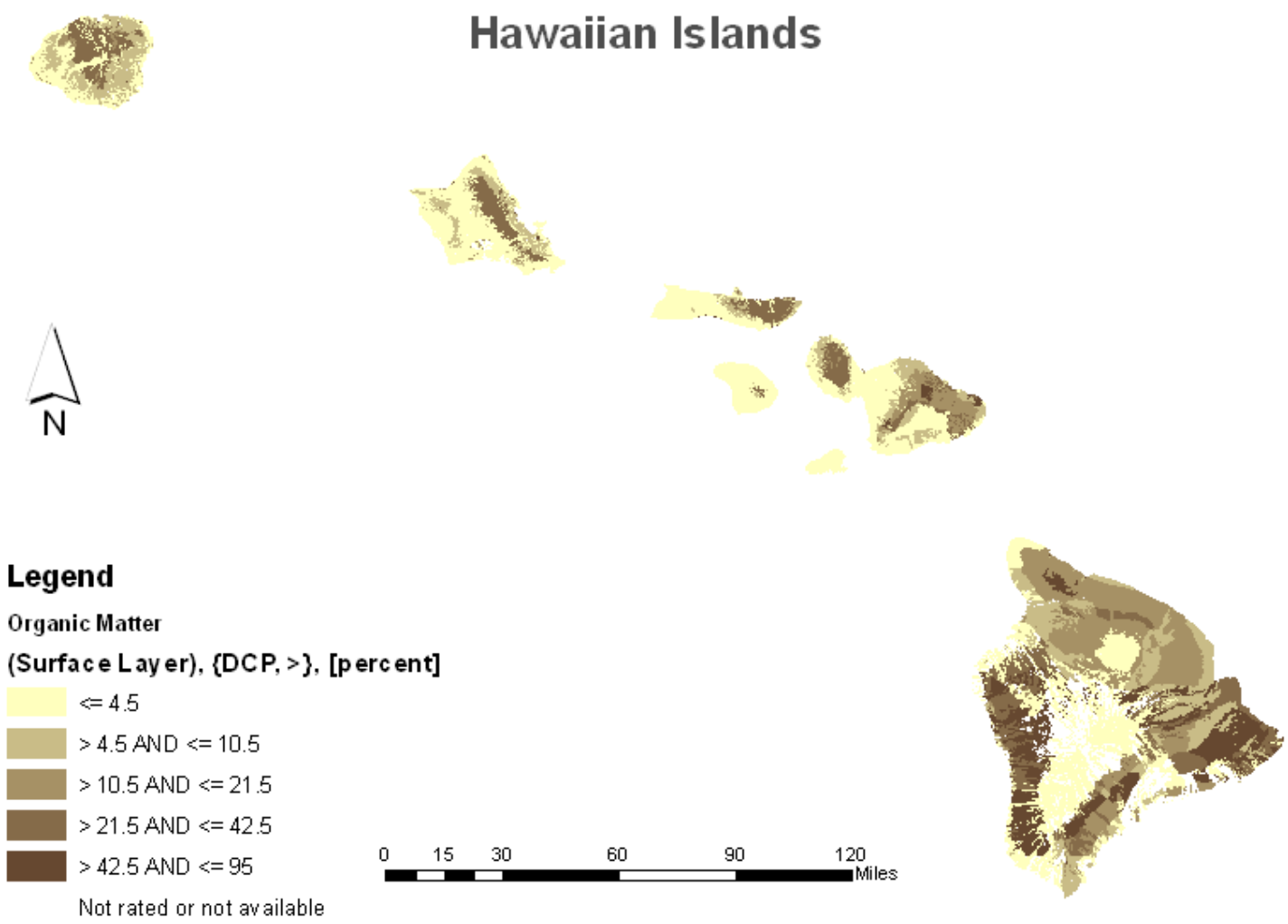


Map shows soil orders of the dominant component of each soil map unit.

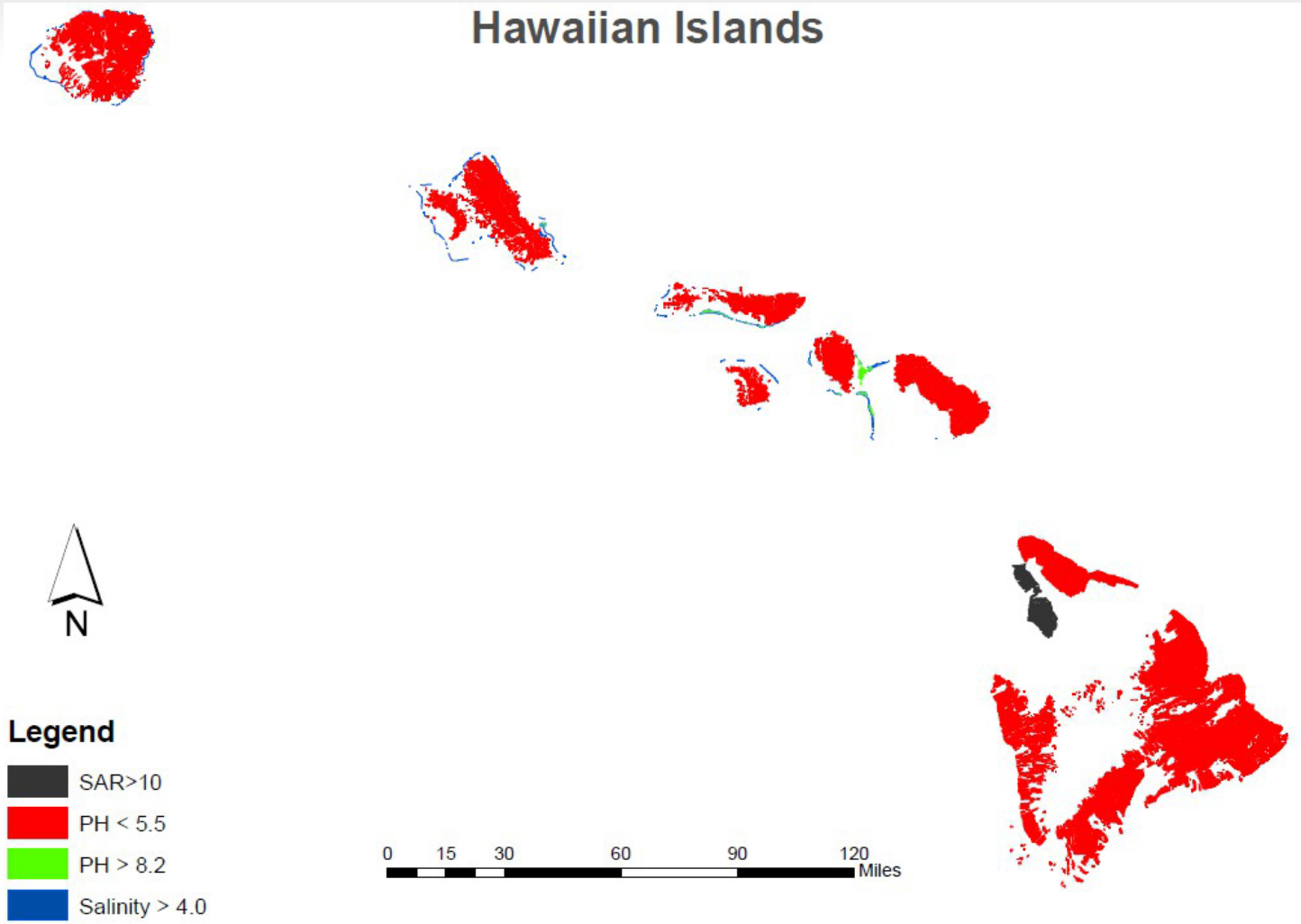
0 25 50 100 Miles

1:2,000,000

Soil Organic Matter

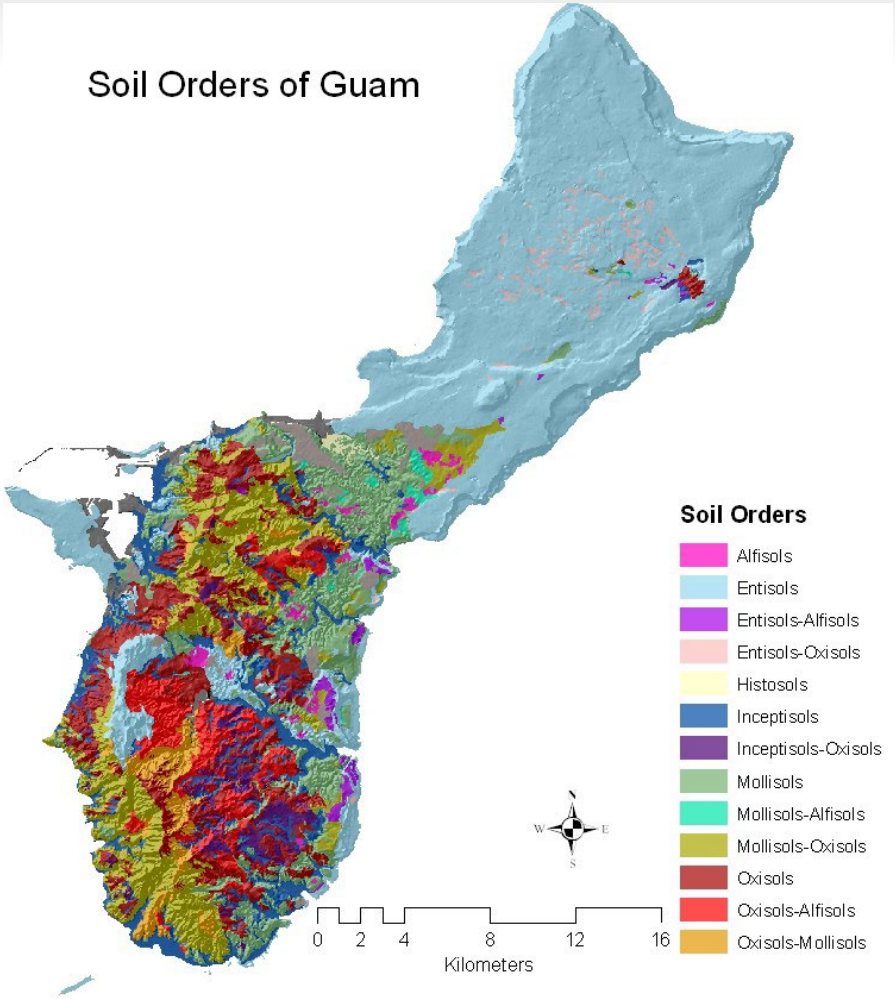


Soil pH and Salinity



Soil Orders of Guam

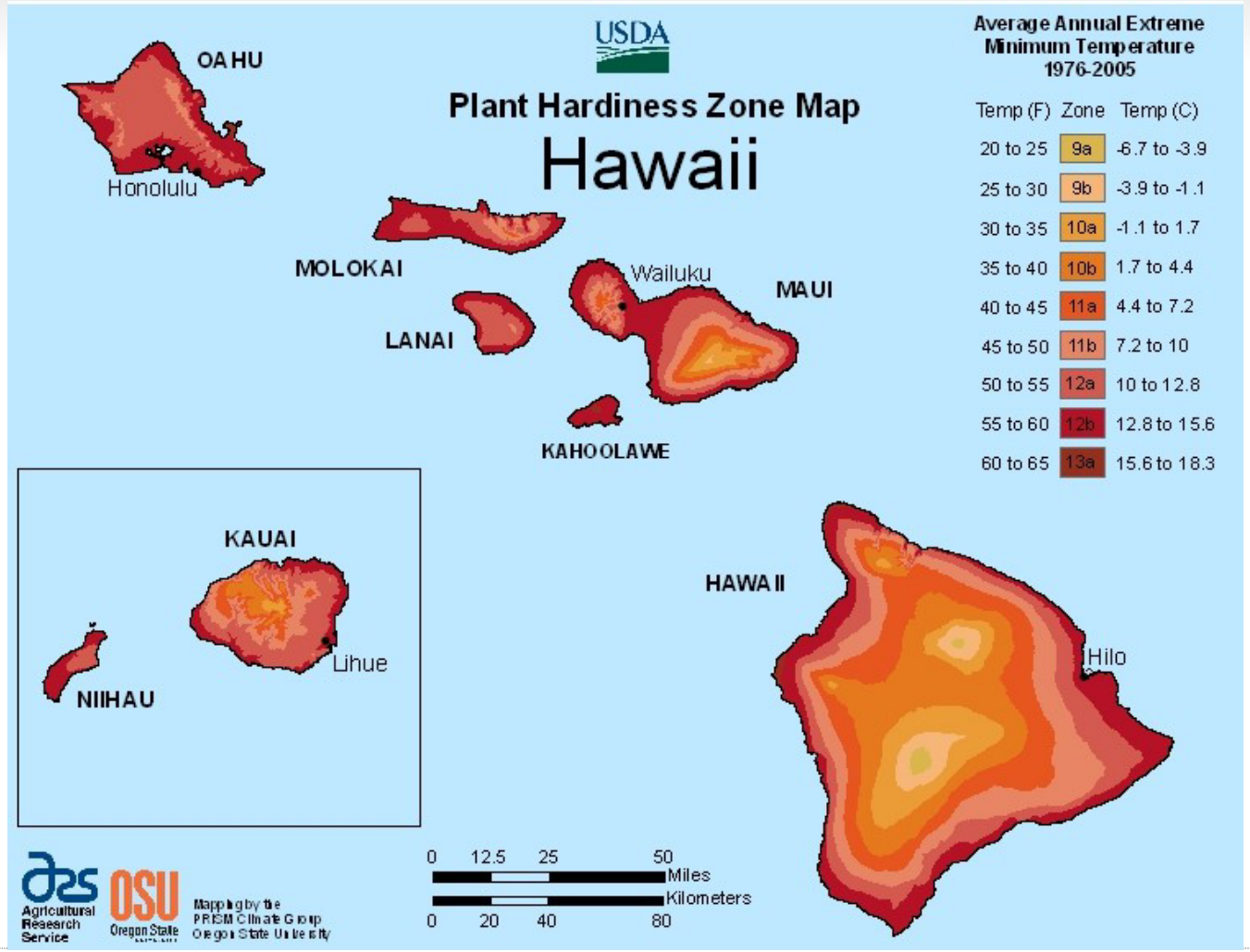
- The island of Guam consists of four soil orders with Entisols dominating the limestone plateau of Northern Guam and a mixture of Oxisols, Mollisols and Alfisols on the volcanic parent material of Southern Guam. Inceptisols are found in the bottom lands of southern Guam.
- Soils developed on the limestone plateau of northern Guam are uniform, but the soils developed on the volcanic parent material of southern Guam are more diverse and variable on the landscape.



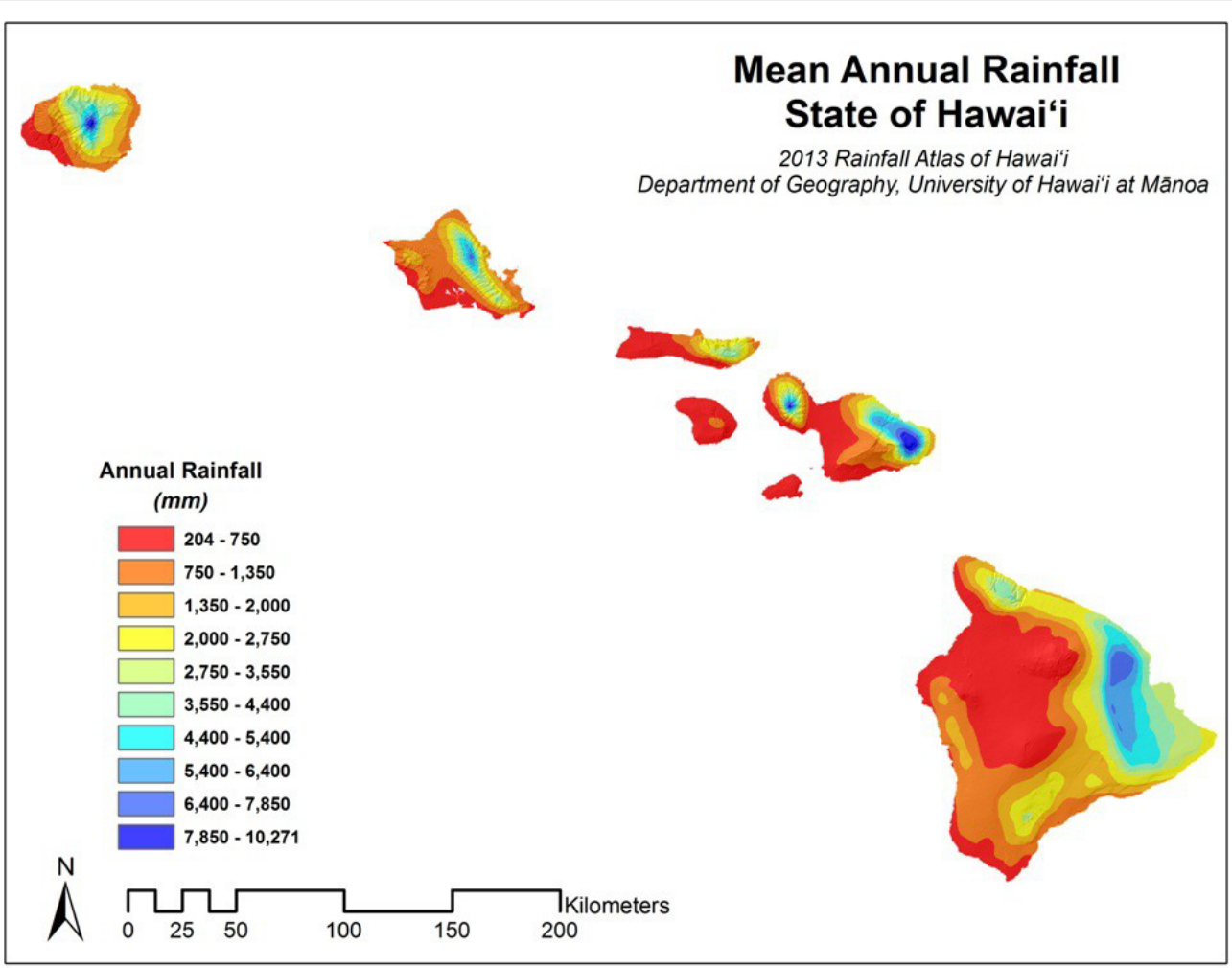
Soil Orders of Guam

- **Entisols** are weakly developed soils without B horizons. On Guam they are typically very shallow soils where depth to limestone bedrock ranges between 5 to 41 cm. They are moderately suited to grazing, but their rocky nature and susceptibility to drought can be problematic for pasture maintenance.
- **Mollisols** are fertile soils rich in organic matter and non-acid cations that develop under grassland landscapes. They are typically rich in montmorillonite clays and their pH ranges from 6.5 to 7.0. These are classified as very productive soils.
- **Alfisols** are moderately fertile soils that typically develop under savanna landscapes. They are characterized by clay accumulation in the B horizon, and moderate amounts of non-acid cations. These soils are moderately acidic with pH ranging from 5.5 to 6.5.
- **Oxisols** are highly weathered soils with low fertility that have developed from volcanic parent material in southern Guam. They typically acid to very acid with high soluble aluminum in the subsoil. These soils have a low capacity to supply key plant nutrients.
- **Inceptisols** are typically found in the bottom lands of southern Guam and they are formed from alluvial materials. They are typically relatively fertile soils with slightly acidic pH. However, when they occur in association with Oxisols on steep lands they are usually acid and infertile.

Hawaii Climate – Minimum Temperatures



Hawaii Climate – Mean Annual Precipitation



American Samoa Climate – Mean Annual Precipitation

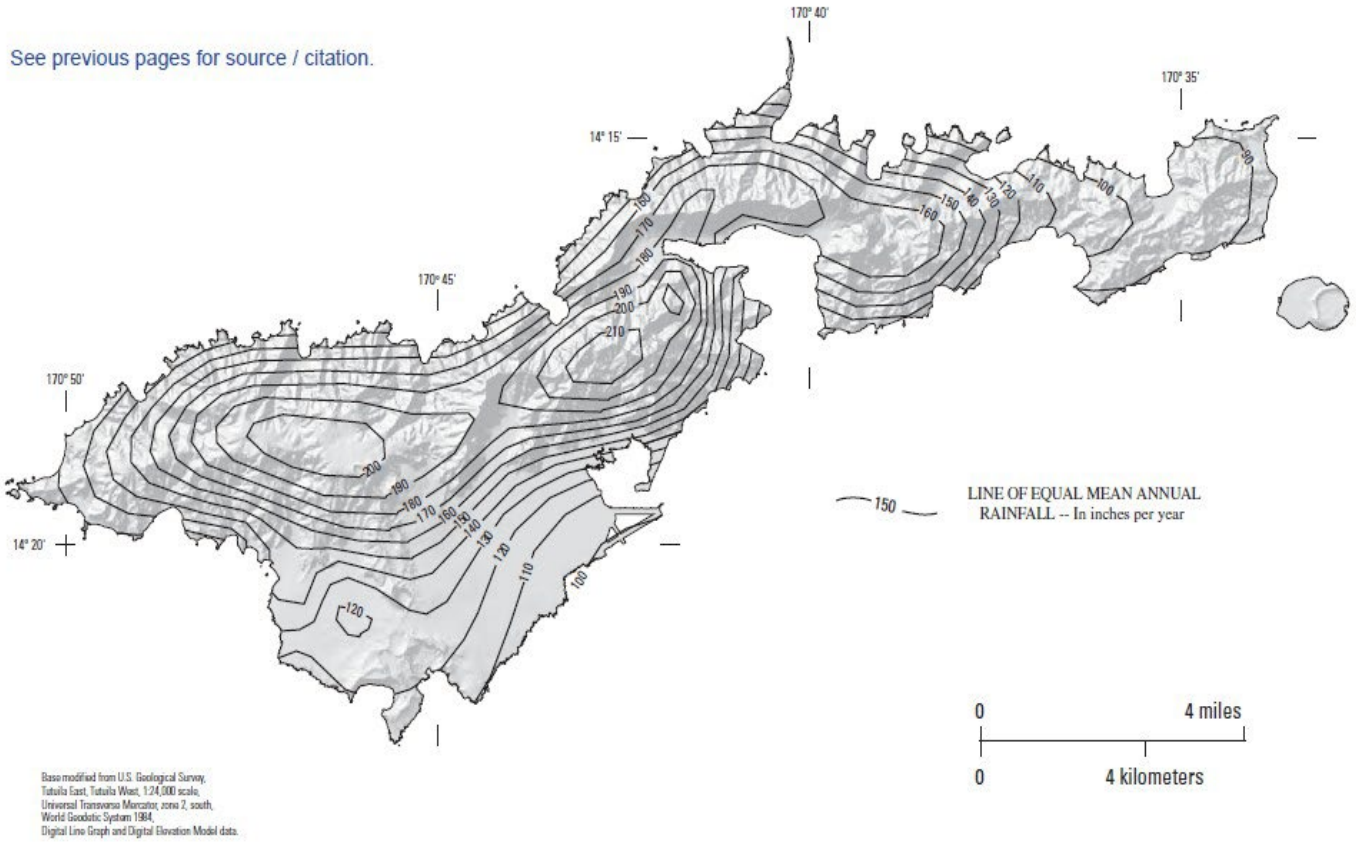
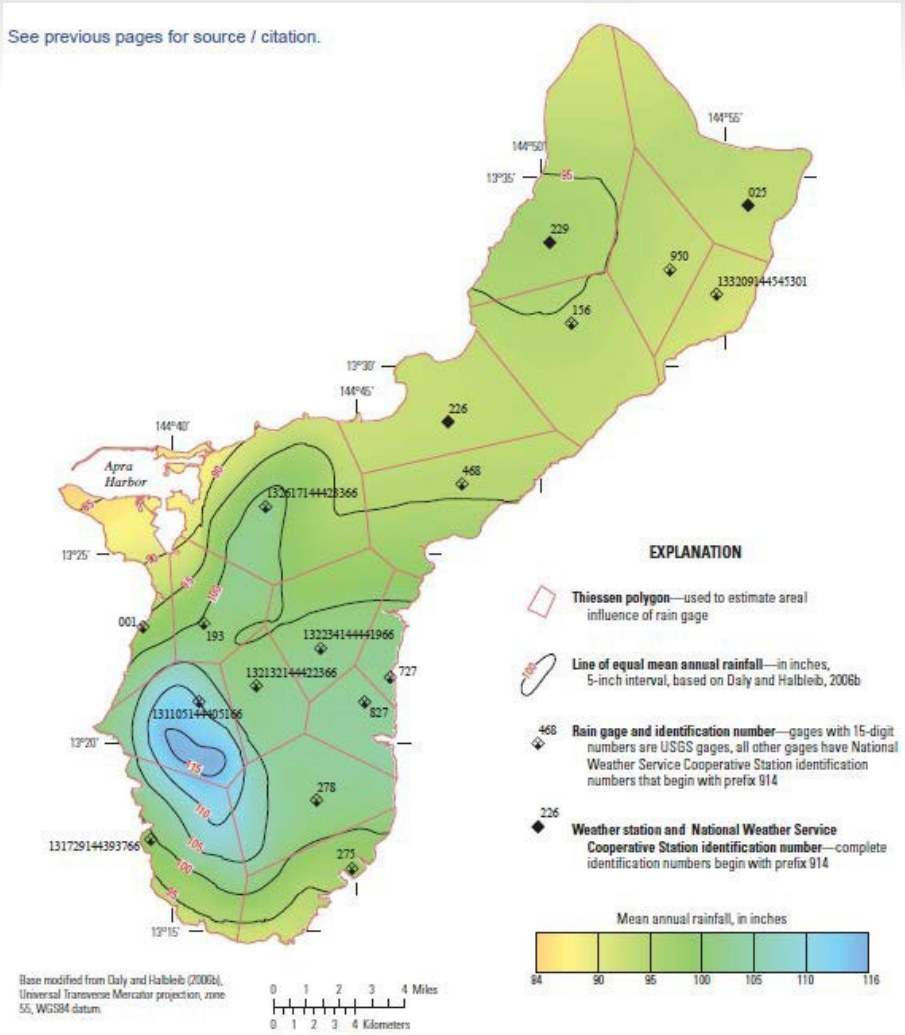
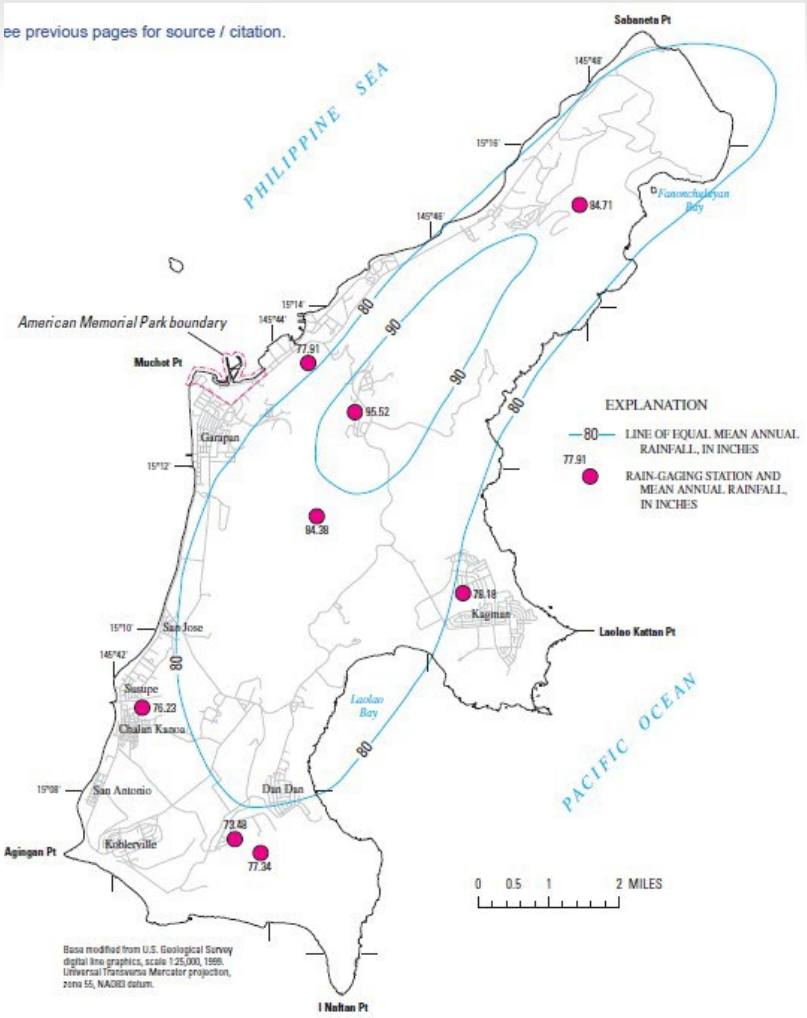


Figure 4. Mean annual rainfall on Tutuila, American Samoa, based on analysis of Daly and others (2006).

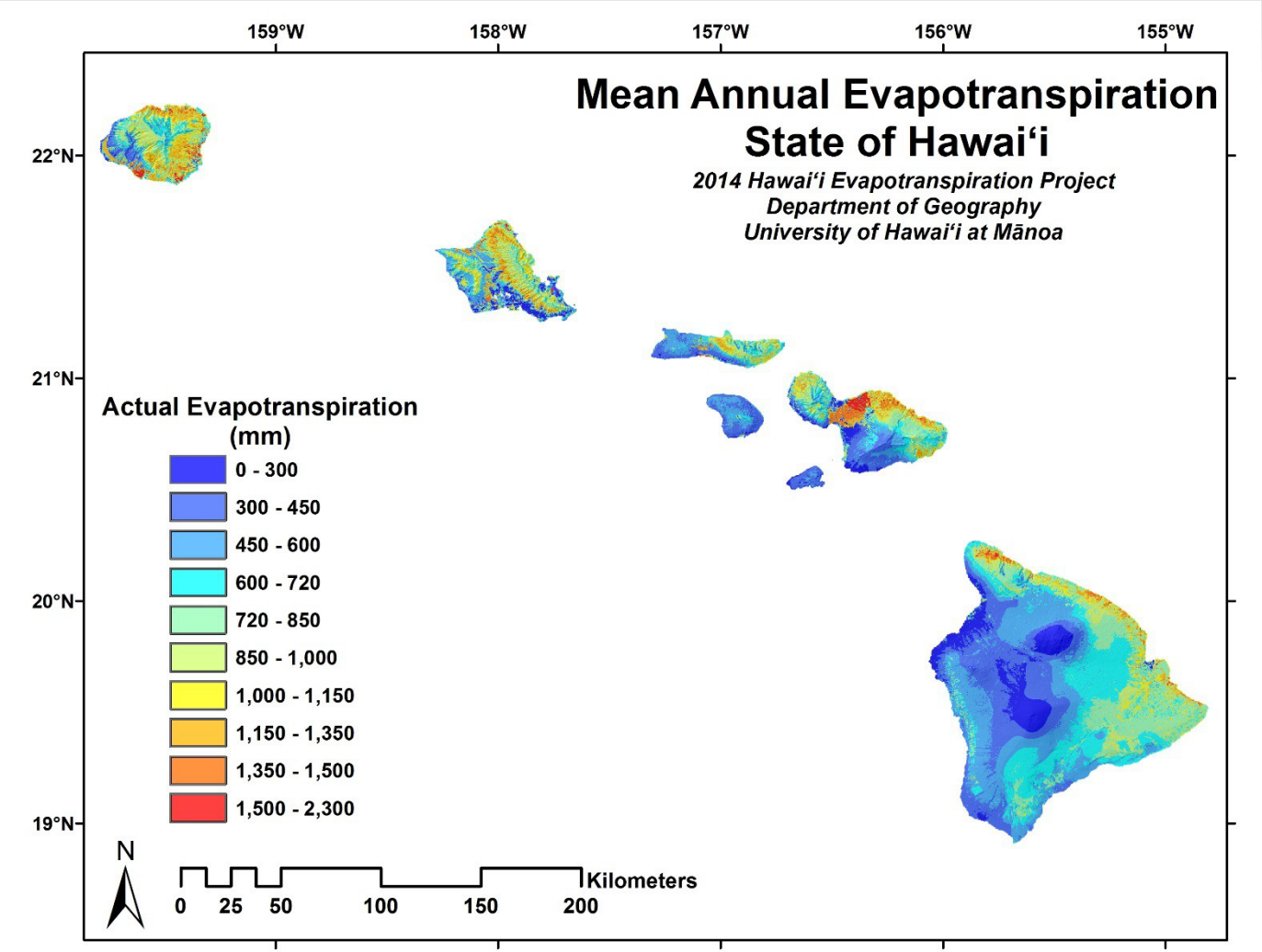
Guam Climate – Mean Annual Precipitation



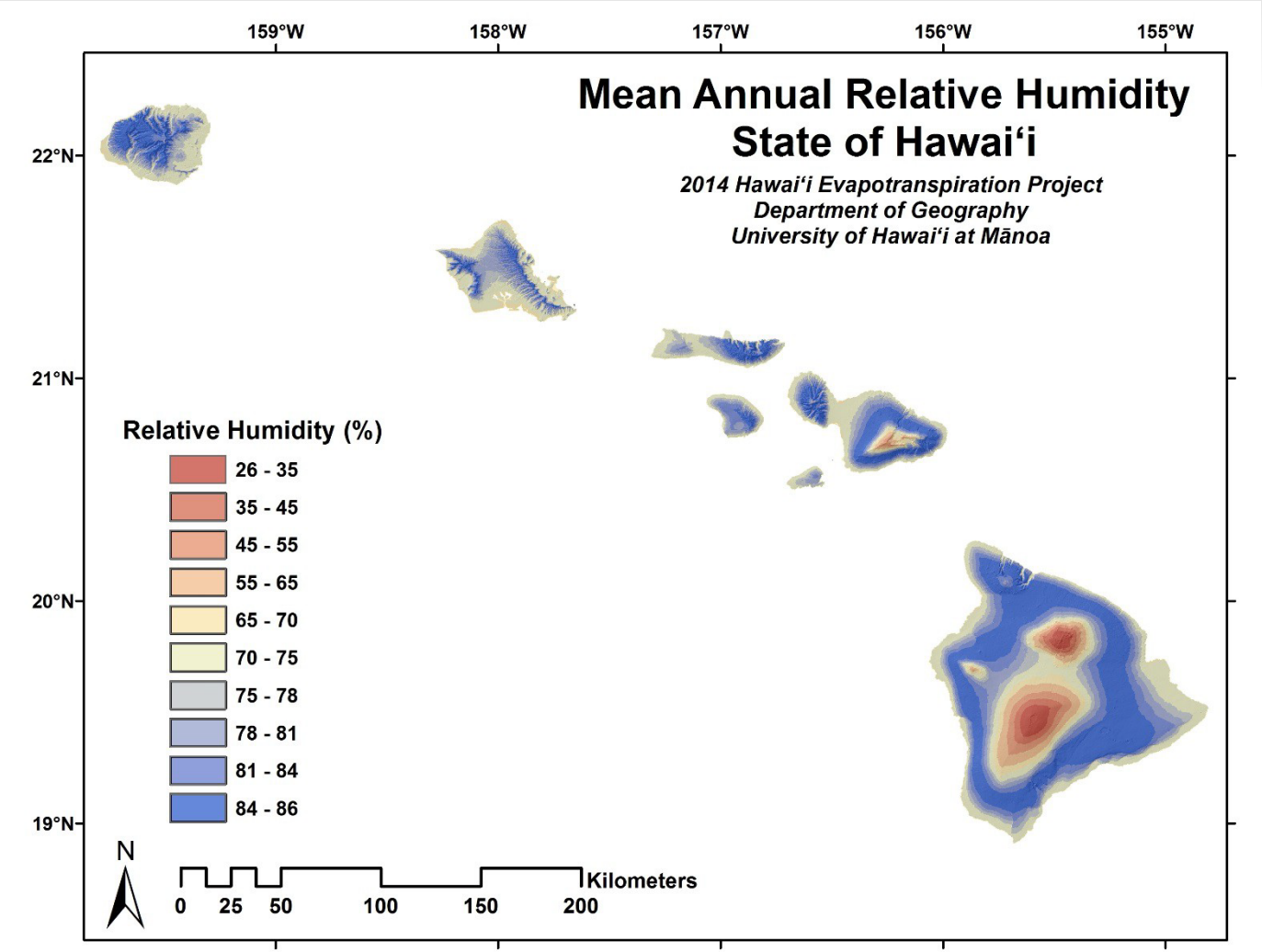
Saipan (CNMI) Climate – Mean Annual Precipitation



Hawaii Climate – Mean Annual Evapotranspiration

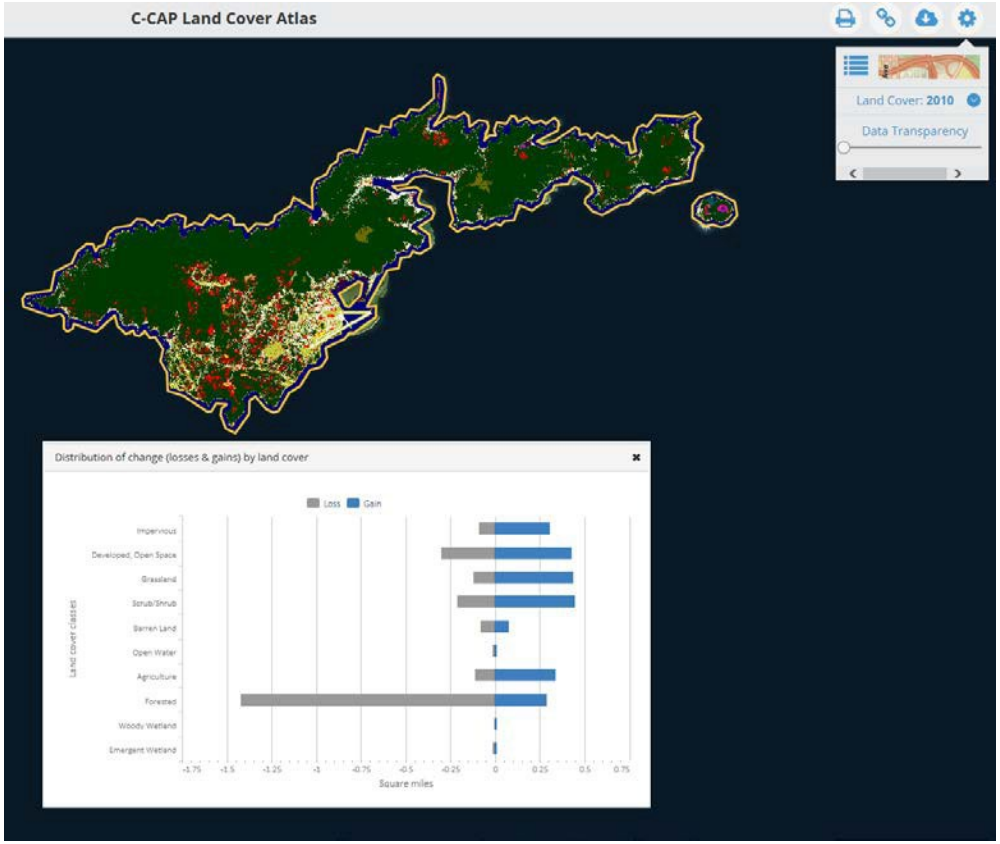


Hawaii Climate – Mean Annual Relative Humidity



NOAA Land Cover Atlas

http://www.coast.noaa.gov/ccapatlas/



Review of Major Land Ownership

The U.S. Department of Agriculture reports that HI has 7000 farms using a total of 1.13 million acres. The average farm size in HI is only 161 acres, while the rest of the nation averages about 418 acres per farm. Of the 1.13 million acres, only 15.4% of the land is considered cropland, while woodland accounts for 8.2% and permanent pasture or rangeland accounts for 68.2%.

Federation of American Scientists reports that 20.3% of HI's nearly 4.1 million acres are federally-owned. Federal agencies managing these lands include the U.S. Forest Service, National Park Service, US Fish and Wildlife Service, and Department of Defense.

Many farmers are part-time producers with outside employment. Approximately 48% of principal operators have a primary occupation outside of farming.

Conservation planning on private land may include a public component, however the opportunity for private individuals to construct permanent conservation practices on public lands is limited.

Agricultural Production

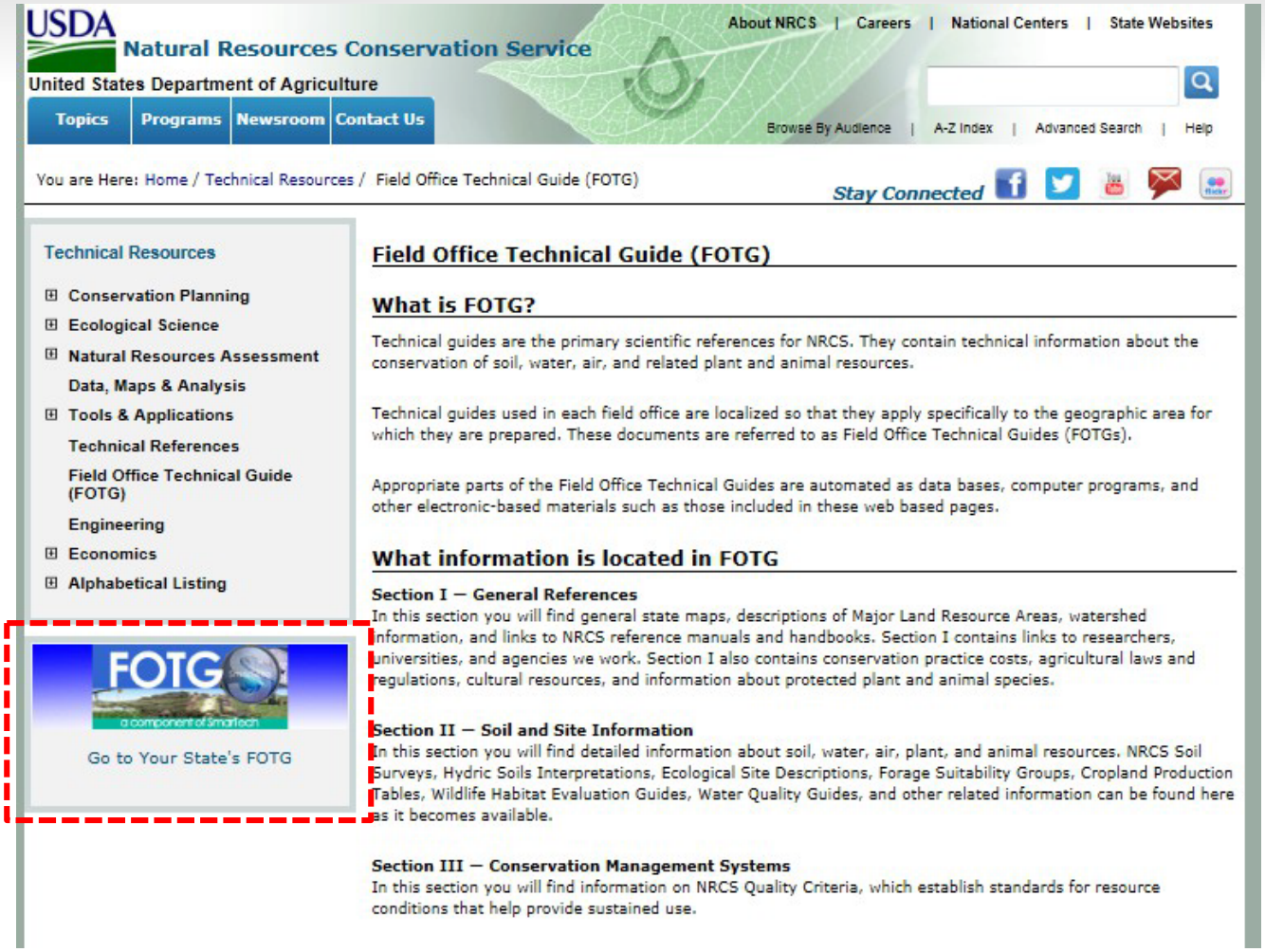
- History of Agriculture in Hawaii: http://hdoa.hawaii.gov/wp-content/uploads/2013/01/HISTORY-OF-AGRICULTURE-IN-HAWAII.pdf

- Ranking of Market Value of Ag Products Sold (2012 Census)
  1. Grains, oilseeds, dry beans, and dry peas (Sugarcane) 23.1% of total sales in the state (Ranked 37 in US)
  2. Fruits, tree nuts, and berries (Coffee, Macadamia Nuts, Tree Fruits) 23% of total sales in the state (Ranked 11 in US)
  3. Nursery, greenhouse, floriculture and sod 12.1% of total sales in the state (Ranked 31 in US)

- Rank of Top Crops within the US (2012 Census)
  - Coffee #1
  - Macadamia Nuts #1
  - Short-rotation woody crops #2
  - Sugarcane for Sugar #4

Source: https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_State_Level/Hawaii/

Review of Pacific Islands Area Field Office Tech Guide (FOTG)



Review of PIA FOTG Requirements

- Planning Criteria (see FOTG, Section III): http://efotg.sc.egov.usda.gov/efotg_locator.aspx

- Planners should be thoroughly familiar with the conservation practice standards that have been incorporated into the PIA FOTG (Section IV) and are being considered as part of the offered alternatives for addressing the client's resource concerns.

- Planners should also utilize the specifications, Operation and Maintenance (O&M) instructions and jobsheets that are available for the practices in the PIA FOTG Section IV.

Review of PIA Technical Note Requirements

- Planners should be thoroughly familiar with PIA technical notes that are to be used for inventory and analysis of resource concerns.
- PIA Technical Notes are found at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/pia/technical/?cid=nrcs142p2_037391
- Required PIA Technical Notes:
  - Resource Concern Checklists (see Conservation Planning Technical Note 1)
  - NRCS-CPA-52 Environmental Evaluation Worksheet (see Biology Technical Note 19)
  - Any additional as noted in the Conservation Planning Technical Note 1 or as applicable to the client's plan.

Review of Cropland Resource Concerns in PIA - Soil Erosion

- Soil Erosion is a primary concern when dealing with vegetable producers due to the frequency and intensity of tillage.
- Sheet and rill erosion are the primary concern, wind erosion can occur in some locations
- Typical Practices:
  - Cover Crop (340)
  - Residue Management, Reduced Till (345)
  - Conservation Crop Rotation (328)

Review of Cropland Resource Concerns in PIA - Depleted Soil Organic Matter

- Organic matter is easily lost from PIA soils due to the warm and moist climate. The oxidation of SOM is accelerated when tillage is introduced.

- Typical Practices:
  - Cover Crop (340)
  - Residue Management, Reduced Till (345)
  - Conservation Crop Rotation (328)

Review of Cropland Resource Concerns in PIA - Excessive Sediment in Surface Waters

- Erosion generally leads to sediment being lost to surface waters. Tilled cropland is often exposed to intense rainfall which can contribute to sediment plumes

- Typical Practices:
  - Cover Crop (340)
  - Residue Management, Reduced Till (345)
  - Conservation Crop Rotation (328)

Review of Farmstead Resource Concerns in PIA - Excessive Nutrients in Surface and Groundwater

- Animal feeding operations with a lack of infrastructure to properly collect, transfer, and store the associated waste is a nonpoint source of pollution found throughout PIA.
- These operations are typically small piggeries consisting of less than 5 AU's
- Typical Practices:
  - Composting Facility (317)
  - Roofs and Covers (367)
  - Waste Storage Facility (313)
  - Waste Separation Facility (632)
  - Waste Transfer (634)

Review of Forest Resource Concerns in PIA – Inadequate Structure and Composition

- Tree and shrub stocking may be too low, a canopy layer may be missing or inadequately represented, species diversity may be lower than desired, native ecosystem may need to be restored.
- An overstocked stand of desirable trees or tree regeneration is adversely affected by over-competition.
- Typical Practices:
  - Tree/Shrub Establishment (612)
  - Tree/Shrub Site Prep (490)
  - Forest Stand Improvement (666)
  - Fence (382)

Review of Forest Resource Concerns in PIA – Excessive Plant Pest Pressure

- Undesirable vegetation is present on the site including woody and herbaceous vegetation (may include noxious and invasive species). If left uncontrolled, it undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs.
- Typical Practices:
  - Tree/Shrub Establishment (612)
  - Tree/Shrub Site Prep (490)
  - Land Clearing (460)

Review of Range/Pasture Resource Concerns in PIA - Inadequate Feed and Forage

- Current grazing system exhibits undesirable and inefficient use of forage plants. Stocking rates are likely higher than the current level of production and needs management changes.
- Typical Practices:
  - Brush Management (314)
  - Herbaceous Weed Control (315)
  - Forage and Biomass Planting (512)
  - Range Planting (550)
  - Fence (382)
  - Prescribed Grazing (528)

Review of Range/Pasture Resource Concerns in PIA – Excessive Plant Pest Pressure

- Grazing systems have undesirable vegetation present on the site including woody competition and/or herbaceous plants (May also be noxious and invasive species). If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species.
- Current grazing system needs improved infrastructure to properly rotate livestock.
- Typical Practices:
  - Brush Management (314)
  - Herbaceous Weed Control (315)
  - Prescribed Grazing (528)

Review of Range/Pasture Resource Concerns in PIA - Inadequate Livestock Water

- Ranching operations with a lack of infrastructure to properly collect, transfer, and store livestock water.
- Current grazing system needs improved infrastructure in sufficient quantities at specific locations.
- Typical Practices:
  - Watering Facility (614)
  - Livestock Pipeline (516)
  - Water Harvesting Catchment (636)
  - Pumping Plant (533)
  - Heavy Use Area Protection (561)
  - Prescribed Grazing (528)

Assessment Tools – Grazing Lands

Range/Pasture Tech Note 4: Grazing Land Trend Worksheet

Ecological Site:				
Soil(s):				
Location:				
Cooperator:				
Initial Trend Determinations:		Date:	Conservationist:	
Plant Factors (circle as appropriate)				
	Forage Plant Relative Density	Dominant	Co-dominant	Sub-dominant
	Forage Plant Diversity	High	Moderate	Low
	Vigor of key forage plants	Good	Fair	Poor
	Seedlings and young forage plants	Many	Some	Few-None
	Dead, dying, or unhealthy plants	None-Few	Some	Many
	Plant residue and litter amounts	Abundant	Common	Rare-Absent
	Noxious, invasive, or undesirable plants	None-Few	Some	Many
Soil Factors (circle as appropriate)				
	Surface (sheet) erosion	Slight	Moderate	Severe
	Rills	None	Few	Many
	Gullies	None	Few	Many
	Soil crusting (non-biotic crusts)	Slight	Moderate	Severe
	Soil Compaction	Slight	Moderate	Severe
	Bare ground	Less than expected	Normal	More than expected
	Overall Soil Degradation	Slight	Moderate	Severe
Other Factors				
	Noxious, invasive, or undesirable species:			
	Percent canopy cover:			
Overall Trend Rating (circle as appropriate)				
TREND DIRECTION: Is there a detectable change in the plant community?				
	Is the current plant community moving toward or away from the historic climax plant community?			
	TOWARD	**NOT APPARENT**	**AWAY FROM**	***N/A - ESD not available***
	Is the current plant community moving toward or away from the *desired* plant community?			
	TOWARD	**NOT APPARENT**	**AWAY FROM**	

Range/Pasture Tech Note 4: Grazing Land Condition Scoresheet

Grazing Lands Condition Scoresheet - Standard for TROPICAL & SUB-TROPICAL Non-Irrigated Range & Pasture

Cooperator				**Date**				
Conservationist				**Pasture number(s)**				
Forage Suitability Group(s) or Ecological Site(s)								
Current Years Precipitation (circle one)		Above Normal	Normal	Below Normal				
Evaluate the site and rate each indicator based upon your observations. Scores for each indicator may range from 1 to 5. The worksheet will multiply the points x the weight to get weighted points, then sum the weighted points to determine overall grazing land condition score.								
Indicator/Weight	**1 Points**	**2 Point**	**3 Points**	**4 Point**	**5 Points**	**Points**	**Wt.**	**Wtd. Pts.**
1. Desirable Forage Plants *20% of score*	Desirable species <20% of stand. Weeds and/or woody non-desirable invasives are dominant. Undesirable woody vegetation canopy cover exceeds 35%.	Desirable species 20-40% of stand. Mostly weedy and/or woody non-desirable invasives present and expanding. Undesirable woody vegetation canopy cover is between 20 and 35%.	Desirable species 40-60% of stand. Weeds and non-desirable weedy grasses present but not dominant. Some invasive woody plants present. Undesirable woody vegetation canopy cover is between 10 and 20%.	Desirable species 60-80% of stand. Remainder mostly intermediates with few undesirables present. Undesirable woody vegetation canopy cover is less than 10%.	Desirable species exceed 80% of plant community with scattered intermediates. No undesirables present.		2.0	
3. Plant diversity *5% of score*	0-1 desirable forage species are present. Poor grazing distribution; plants are not evenly grazed. Most plant species are avoided by livestock.	1-2 forage species are present from one dominant functional group. Species distribution is patchy, and some species are avoided by livestock.	2 -3 dominant forage species are present from one dominant functional group ***OR*** 1 - 2 forage species each are present from two functional groups. None are avoided	3 - 4 forage species representing two functional groups are present with at least one being a legume. None are avoided. Well intermixed, compatible growth habit and comprable palatability.	4 - 5 forage species representing three functional groups are present with at least one being a legume. Well intermixed, compatible growth habit, and comparable palatability.		0.5	

https://efotg.sc.egov.usda.gov/references/public/HI/2020_Guide_to_Pasture_Condition_Scoring.pdf

Assessment Tools - Wildlife

Biology Tech Note 9: Hawaii Stream Visual Assessment Protocol

- Use when streams are present
- Assessment Guide compares benchmark to planned conditions

Hawaii Stream Visual Assessment Protocol

Biology Tech Note 22: At-Risk Species and Habitats Lists

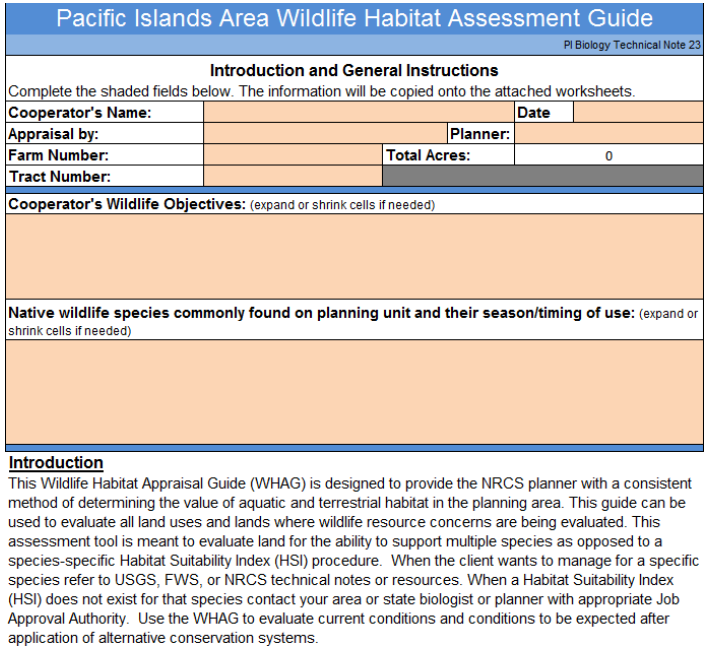
- Lists of "At-Risk" animal and plant species and "Rare and Declining Habitats" for locations in the PIA

https://efotg.sc.egov.usda.gov/#/state/HI/documents/section=1&folder=65127

Assessment Tools - Wildlife

Biology Tech Note 23:
Wildlife Habitat Assessment Guide

- Use for all land uses where wildlife habitat is a RC.
- Assessment Guide compares benchmark to planned conditions
- Assessment Guide can also be used to assist in decision making
- To meeting planning criteria:
  - Score of 0.5 or higher



Pacific Islands Area Wildlife Habitat Assessment Guide

PI Biology Technical Note 23

Introduction and General Instructions

Complete the shaded fields below. The information will be copied onto the attached worksheets.

Cooperator's Name:		**Date**	
Appraisal by:		**Planner:**	
Farm Number:		**Total Acres:**	0
Tract Number:			

Cooperator's Wildlife Objectives: (expand or shrink cells if needed)

Native wildlife species commonly found on planning unit and their season/timing of use: (expand or shrink cells if needed)

Introduction

This Wildlife Habitat Appraisal Guide (WHAG) is designed to provide the NRCS planner with a consistent method of determining the value of aquatic and terrestrial habitat in the planning area. This guide can be used to evaluate all land uses and lands where wildlife resource concerns are being evaluated. This assessment tool is meant to evaluate land for the ability to support multiple species as opposed to a species-specific Habitat Suitability Index (HSI) procedure. When the client wants to manage for a specific species refer to USGS, FWS, or NRCS technical notes or resources. When a Habitat Suitability Index (HSI) does not exist for that species contact your area or state biologist or planner with appropriate Job Approval Authority. Use the WHAG to evaluate current conditions and conditions to be expected after application of alternative conservation systems.

https://efotg.sc.egov.usda.gov/#/state/HI/documents/section=1&folder=65127

Forest, Pasture and Range inventory – transects or plots

Forestry/ agroforestry Tech Note 23: Transects and Fixed Radius Plots for Tree/Shrub Inventory

https://efotg.sc.egov.usda.gov/#/state/HI/documents/section=1&folder=64887

Transect data and data summary	
Cooperator name	
Reader	
Recorder	
Planner	
Date	
Slope (%)	
Cover type code or Field No.	
Cover type or Field acres	

Transect sample criteria:	
Total/combined length (ft.)	
Width (ft.)	
Point step interval (ft.)	
Point steps sampled	0
Total transect area (acres)	0
% of type or field acres sampled	0.0
Scenario intensity calculator	Light

				Initial Site Vegetation Condition				
					Stem tallies			
Scientific name	Common name	Plant form	Control %	Point step tallies	DBH ≤ 4.0" count	DBH 4.1-8.0" count	DBH 8.1-16.0" count	DBH ≥ 16.1" count
				-	-	-	-	-
				-	-	-	-	-
				-	-	-	-	-
				-	-	-	-	-
				-	-	-	-	-
Totals: percent cover (cell F40) or stems per acre (cells G40-J40)				0	0.0	0.0	0.0	0.0
Portion of totals to be controlled (cut, spray, doze, mow etc.)								

Good veg. cover types for transects

Good veg. cover types for fixed radius plots

Resource Concerns – Humans (Cultural Resources)

- Cultural Resources Training Modules 7 and 8 specifically designed for PIA is strongly recommended for conservation planning in PIA.
- The PIA is a diverse area that is rich with cultural resources.
- For more information on the PIA cultural resources planning process:
  https://efotg.sc.egov.usda.gov/#/state/HI/documents/section=1&folder=65129
- Be sure to ask the landowner/lessee if:
  - they know of any land modifications on the land
  - they know of any cultural resources on the land
  - any cultural practitioners/local people have requested access to the land and why

Examples of Cultural Resources - Hawaii

Dryland Field Systems – One of the major contributions of recent Hawaiian archaeology has been the study of these leeward field systems, and the demonstration of their importance within the Hawaiian economy.

In dryland fields, permanent field boundaries of stone and earth called **kuaiwi** were constructed running parallel to the slope. Also terraces and mounds and planting depressions were built to control erosion and to retain water. Much labor was expended on weeding, mulching, and other kinds of crop-tending activities.

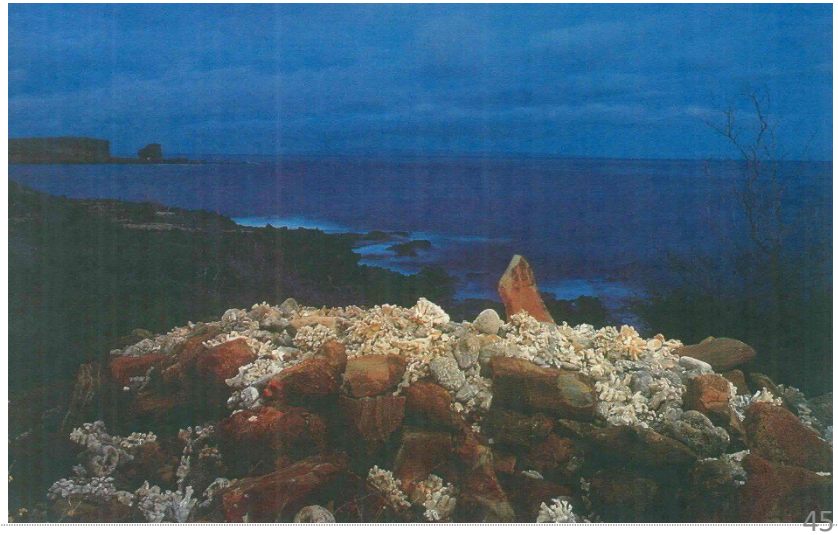
The most important crop was sweet potato, although in areas with greater rainfall dryland taro was also important. Other dryland crops included sugarcane, gourds, bananas, ti, and paper mulberry (wauke).

Examples of Cultural Resources - Hawaii

Religious/Ceremonial Structures

Heiau

Shrines



platforms, enclosures, altars, upright stones

Petroglyphs

Examples of Cultural Resources - Hawaii

Religious/Ceremonial Structures - Heiau and shrines constitute ceremonial structures upon which offerings (like coral and shell fragments, waterworn cobbles) are made. Another common type of shrine is the *ko'a*, where fisherman made offerings to assure bountiful yields. As to temples proper, there are *heiau* built to the gods of fertility and intended to assure agricultural abundance. These temples exhibit a wide range of construction types – including walled enclosures, stepped terraces and a combination thereof – and exhibit a wide variety of sizes. Other *heiau* include healing temples and *pu'uhonua*, or places of refuge. The most complex and largest of all temples were the *luakini heiau*, those dedicated to Ku, the god of war, and where human sacrifices were offered by the chiefs for success in war.

Examples of Cultural Resources - Hawaii

Petroglyphs - not especially common and most occur on the leeward sides of the islands and on the young, flat expanses of pahoehoe lava, on cliff faces, and on boulders and in lava tubes. The highest number of petroglyphs are on Hawaii Island.

Burials - Probably the most sensitive type of cultural resource in Hawaii today. Burial caves are a common type of interment, but burial in sand and earth are the most common and widespread burial practices. Burials were sometimes marked on the surface by stone terraces, mounds, or platforms. Heiau burials were places for high ranking chiefs and also for sacrificial victims.

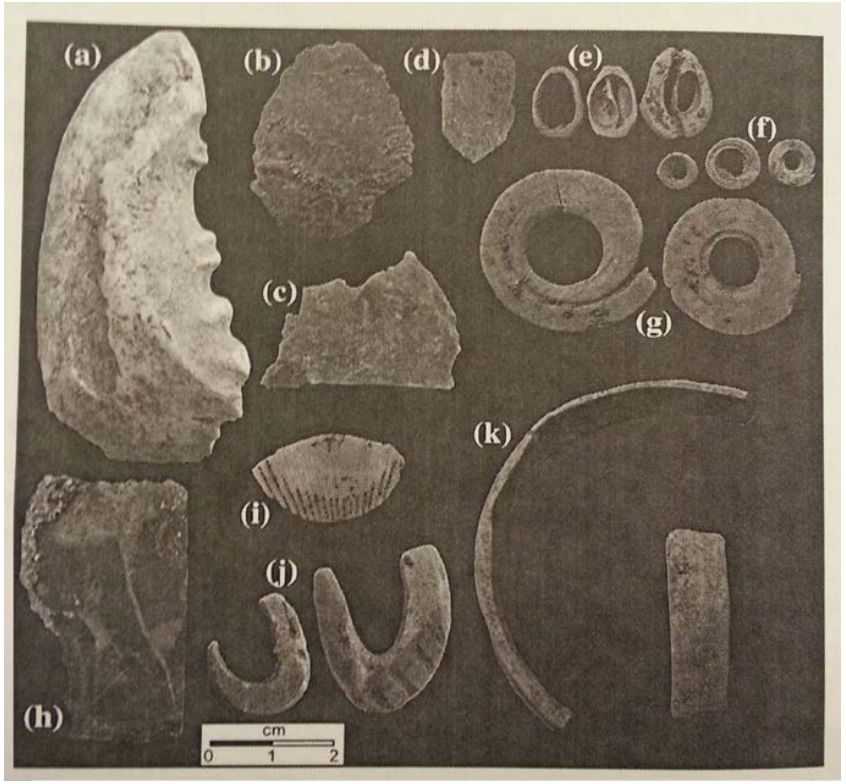
*It is important to be mindful that under Hawaii state law (HRS §6E-43, Hawaii Revised Statutes Chapter 6E-43), all burial sites are significant and shall be preserved in place unless SHPD approves removal/reinterment. *

Examples of Cultural Resources - PIA West

Pottery – Small, thin earthenware bowls & jars; Red-slipped; Decorative motifs (rare)

Stone and Shell artifacts -

Adze, chisels, and utilized flakes; Fishing hooks; Beads, bracelets, and pendants.

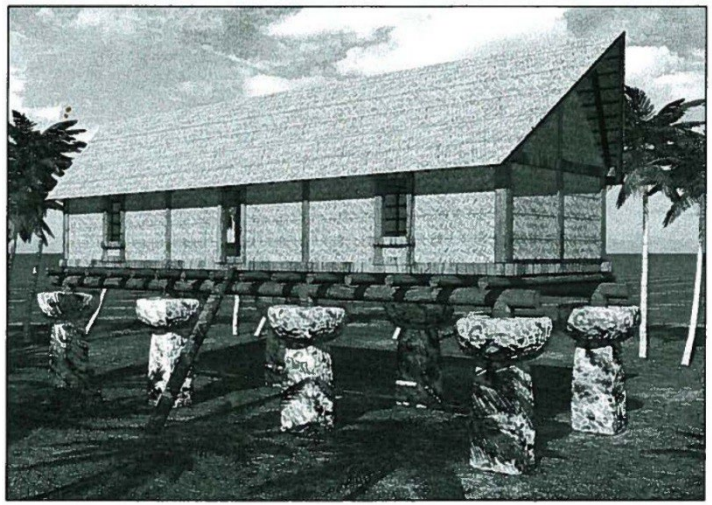


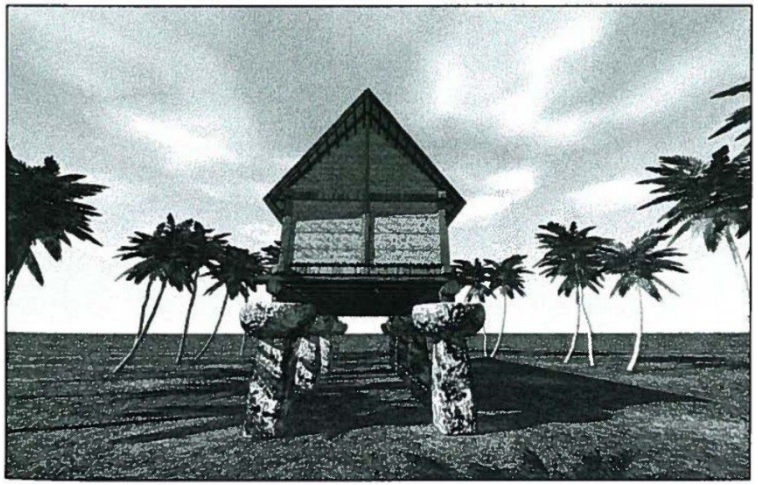
Examples of Cultural Resources - PIA West

Latte

Pillars – *haligi*

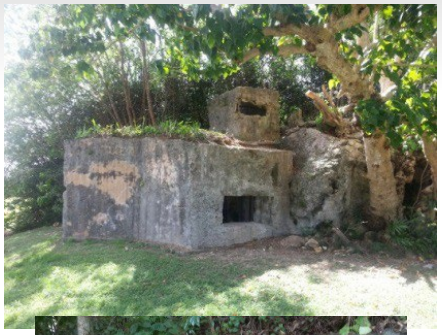
Capstones - *tasa*





Examples of Cultural Resources - PIA West

WWII



Top Conservation Practices in the PIA

Code	Practice
484	Mulching
382	Fence
614	Watering Facility
528	Prescribed Grazing
590	Nutrient Management
516	Livestock Pipeline
490	Tree & Shrub Site Preparation
328	Conservation Crop Rotation
449	Irrigation Water Management
380	Windbreak/Shelterbelt Establishment
561	Heavy Use Area Protection
315	Herbaceous Weed Control
441	Irrigation System, Microirrigation
340	Cover Crop
645	Upland Wildlife Habitat Management
314	Brush Management
512	Forage and Biomass Planting
612	Tree/Shrub Establishment
430	Irrigation Pipeline
327	Conservation Cover
601	Vegetative Barriers

Review of State FOTG Requirements

Vegetative Practices

- Refer to the Vegetative Guide and Planting Practices jobsheet located in Section IV, Combined Practice Jobsheets folder for planning of planting practices (Alley Cropping (311), Conservation Cover (327), Cover Crop (340), Critical Area Planting (342), Field Border (386), Forage and Biomass Planting (512), Grassed Waterway (412), Hedgerow Planting (422), Herbaceous Wind Barriers (603), Multi-Story Cropping (379), Range Planting (550), Riparian Forest Buffer (391), Riparian Herbaceous Cover (390) Silvopasture Establishment (381), Tree/Shrub Establishment (612), Vegetative Barrier (601), and Windbreak/Shelterbelt Establishment (380)) in the PIA. Species selection is highly variable across the PIA, so this tool must be utilized for jobsheet design.
- Refer to the Plant Control, Clearing and Cutting Practices jobsheet located in Section IV, Combined Practice Jobsheets folder for planning of: Brush Management (314), Forest Stand Improvement (666), Fuel Break (383), Herbaceous Weed Control (315), Land Clearing (460), Tree/Shrub Pruning (660), Tree/Shrub Site Prep (490), and Windbreak/Shelterbelt Renovation in the PIA.

Management Practices

- The PIA Nutrient Management (590) conservation practice standard requires that nutrient management plans be approved by an NRCS Certified Nutrient Management Specialist.
- The PIA Integrated Pest Management (595) conservation practice standard requires that nutrient management plans be approved by an NRCS Certified Integrated Pest Management Specialist.
- See info on Threatened and Endangered species for implementing practices that may affect listed species on site
- NRCS recommended stubble heights and rest periods for most key grazing species in PIA are listed in the Prescribed Grazing (528) specification.

Engineering Practices

- Conservation practices that specifically require engineering services in planning, design, and installation are identified in Title 450, National Handbook of Conservation Practices, as having engineering discipline leadership from the Conservation Engineering Division, and subsequently in PIA FOTG Section IV, Conservation Practices Standards. Engineering for conservation practices where malfunction or failure would adversely affect public health, safety, or property is commonly regulated by the States and requires Professional Engineering services.

Review of Federal Laws

Clean Water Act (CWA):

See Conservation Planning Technical Note 6 – Pacific Islands Area Permits Matrix and Biology Technical Note 19 – NRCS-CPA 52 Environmental Evaluation for more information.

National Historic Preservation Act:

As a federal agency providing funding for Farm Bill projects, NRCS makes determinations of effect on cultural resources during the planning phase of conservation practices and coordinates with the State Historic Preservation Office as necessary.

Endangered Species Act:

See Biology Technical Note 18 – Endangered and Candidate Species Compliance Process and Biology Technical Note 19 – NRCS-CPA 52 Environmental Evaluation for more information.

- Guam and CNMI – there are 15 listed plant and animal species
- Hawaii

Review of Federal Laws

Endangered Species Act:

See Biology Technical Note 18 – Endangered and Candidate Species Compliance Process and Biology Technical Note 19 – NRCS-CPA 52 Environmental Evaluation for more information.

Listing Status by Taxon Group and General Habitat

All Island Groups (Hawaiian Islands, Mariana Islands, American Samoa, Remotes)

Taxon Group	Total Species	E	T	Total Listed	PE	PT	Total Prop	C	Total Critical Habitat	Final	Prop	F/P
Terrestrial												
Ferns and Allies	**19**	16	0	**16**	0	0	**0**	3	**23**	12	5	6
Flowering Plants	**417**	391	11	**402**	0	0	**0**	15	**365**	217	71	77
Forest Birds	**34**	32	0	**32**	0	0	**0**	2	**7**	5	2	0
Sea Birds	**4**	2	1	**3**	0	0	**0**	1	**0**	0	0	0
Water Birds	**10**	9	0	**9**	0	0	**0**	1	**0**	0	0	0
Mammals, Bat	**5**	2	1	**3**	0	0	**0**	2	**1**	1	0	0
Crustaceans	**5**	2	0	**2**	0	0	**0**	3	**1**	1	0	0
Insects	**30**	19	1	**20**	0	0	**0**	10	**18**	17	1	0
Snails	**51**	44	1	**45**	0	0	**0**	6	**4**	1	3	0
Arachnids	**1**	1	0	**1**	0	0	**0**	0	**1**	1	0	0
Terrestrial Sub Total	576	518	15	533	**0**	**0**	0	43	420	255	82	83

Taxon Group	Total Species	E	T	Total Listed	PE	PT	Total Prop	C	Total Critical Habitat	Final	Prop	F/P
Marine												
Mammals, Seal	**1**	1	0	**1**	0	0	**0**	0	**2**	0	1	1
Mammals, Cetacean	**6**	6	0	**6**	0	0	**0**	0	**0**	0	0	0
Reptiles, Sea Turtle	**6**	4	2	**6**	0	0	**0**	0	**0**	0	0	0
Corals	**51**	0	0	**0**	3	48	**51**	0	**0**	0	0	0
Marine Sub Total	64	11	2	13	**3**	**48**	51	0	2	**0**	1	1
Total	**640**	**529**	**17**	**546**	**3**	**48**	**51**	**43**	**422**	**255**	**83**	**84**

https://efotg.sc.egov.usda.gov/#/state/HI/documents/section=1&folder=65127

Invasive Species

- Executive Order 13112: states that “a Federal agency shall not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction and spread of invasive species in the U.S. or elsewhere." Remember that invasive species can include plants, fish, animals, insects, etc.
- Range/Pasture Tech Note 3 - Invasive Plant Fact Sheets https://efotg.sc.egov.usda.gov/#/state/HI/documents/section=1&folder=65126
- Weeds of Hawaii: http://www.ctahr.hawaii.edu/invweed/weedsHi.html

PIA Certifications

Comprehensive Nutrient Management Plans (CNMP) and Nutrient Management

- As of January 2015, there are no specific state licensing or certification requirements for individuals developing CNMPs or nutrient management plans in the PIA.
- For information on NRCS PIA certification, see Exhibit D: https://efotg.sc.egov.usda.gov/#/state/HI/documents/section=1&folder=65305
- NRCS Knowledge and Training Requirements for developing Comprehensive Nutrient Management Plans (CNMPs) are listed here: https://efotg.sc.egov.usda.gov/#/state/HI/documents/section=4&folder=-161

- Pest Management Conservation Systems

  For information on NRCS PIA certification, see Exhibit F:

  https://efotg.sc.egov.usda.gov/#/state/HI/documents/section=4&folder=-115

Review of PIA Laws Pertaining to NRCS Engineering Conservation Practices

Hawaii Administrative Rules Statute Title 16, Professional Engineers, Architects, Surveyors and Landscape Architects, Chapter 115, Engineering, Section 16-115-2 defines the term “Engineering”.

Guam Contractors Association Business Regulations Statute Title 22, PROFESSIONAL ENGINEERS, ARCHITECTS AND LAND SURVEYORS, Chapter 32, Engineering, Section 32106 defines the term “Engineering”.

Conservation practices deemed as “engineering” by NRCS, **may be considered “engineering”** by the Hawaii Board of Professional Engineers (HBPE, http://cca.hawaii.gov/pvl/boards/engineer/) or the Guam Board of Registration For Professional Engineers, Architects & Land Surveyors (Guam-PEALS, http://guam-peals.org/).

Review of Laws for Pacific Islands Area - East

- For required permits, see Conservation Planning Technical Note 6 – Pacific Islands Area Permits Matrix https://efotg.sc.egov.usda.gov/#/state/HI/documents/section=1&folder=3309
- The Guide to the Implementation and Practice of the Hawaii Environmental Policy Act is listed here: https://files.hawaii.gov/dbedt/erp/OEQC_Guidance/2012-GUIDE-to-the-Implementation-and-Practice-of-the-HEPA.pdf
- American Samoa Environmental Regulations are listed here: http://www.epa.as.gov/list-of-regulations
- American Samoa Renewable Energy Committee: http://www.asrec.net/

Review of Laws for Pacific Islands Area - East

Office of Environmental Quality Control

Act 152, signed by Governor on July 1, 2021, transferred and renamed the department of Health, Office of Environmental Quality Control to the "**Environmental Review Program"** (ERP), within the Office of Planning and Sustainable Development. ERP's new site is:

https://planning.hawaii.gov/erp/

For environmental health related issues, please contact the appropriate Environmental Health Administration branches and offices directly: https://health.hawaii.gov/about/health-topics/#environmental.

Review of Laws for Pacific Islands Area - West

- For required permits, see Conservation Planning Technical Note 6 – Pacific Islands Area Permits Matrix https://efotg.sc.egov.usda.gov/#/state/HI/documents/section=1&folder=3309
- The Territory of Guam Environmental Laws are listed here: http://epa.guam.gov/rules-regs/statutes/
- Commonwealth of the Northern Marianas Islands (CNMI) Environmental Laws are listed here: https://www.deq.gov.mp/regulations.html
- The Federated States of Micronesia Environmental Laws are listed here: https://www.sprep.org/att/IRC/eCOPIES/Countries/FSM/62.pdf
- The Republic of Palau Environmental Laws are listed here: https://www.palaugov.pw/eqpb/#:~:text=In%201981%2C%20the%20Republic%20of,that%20would%20achieve%20the%20desired
- The Republic of the Marshall Islands Environmental Policy is found here: https://www.sprep.org/attachments/Climate_Change/RMI_NCCP.pdf

Additional References

- TSP information for the PIA is found at: http://www.nrcs.usda.gov/wps/portal/nrcs/main/pia/technical/cp/tsp/
- College of Tropical Agriculture and Human Resources – University of Hawaii: http://www.ctahr.hawaii.edu/Site/PubList.aspx?key=Soil%20and%20Crop%20Management
- State of Hawaii, Division of Aquatic Resources (DAR): http://dlnr.hawaii.gov/dar/

Expected TSP Workflow

- TSP certified conservation planner candidates must complete one field-reviewed RMS plan for a conservation management unit.
  - If the TSP Certified Conservation Planner candidate is a resident of one of the islands within the PIA, the TSP should notify the PIA TSP coordinator that a RMS plan has been completed.
  - The TSP Coordinator will work with the PIA Assistant Director for Technology (ADT) to identify an NRCS Certified Conservation Planner so that a field review of the RMS plan may be completed.
  - The candidate will be accompanied to the field by the NRCS Certified Conservation Planner to meet with the plan decision-maker.
  - The candidate will be expected to demonstrate competency in the planning process, to include the appropriate resource assessment tools, and plan development.
  - After a field review of the conservation plan has been completed, the conservation plan and review documents will be submitted to the ADT for concurrence by the PIA Director. The plan will be submitted with a letter from the reviewer acknowledging the field review and recommendation for certification.

Expected TSP Workflow

- Upon certification, subsequently developed conservation plans will be submitted for review by the District Conservationist (DC) at the local USDA Service Center.
- TSPs will work with the local District Conservationist to make sure the proper plan documentation has been prepared, including the completion of an environmental evaluation utilizing the NRCS-CPA-52
- TSPs obtaining the national certified conservation planner designation will be certified to conduct conservation planning in all States where they have completed the State-specific training module.

Expected TSP Workflow

Maintaining Certification

- Each TSP certified conservation planner designation will be reviewed at least once every 3 years by the State Conservationist, Director, or designee, in the TSP's resident State.
- The review will be based on conservation plans completed by the TSP in the resident State during the time period being reviewed.
- Conservation plans reviewed may be progressive, so an RMS planned level of treatment is not required.
- If a TSP did not do any work in the resident State during the review period, the review will be completed by a State where the TSP did work during the review period.
- If a TSP has not developed any conservation plans in the past 3 years, a new plan must be prepared for review.

Certificate of Completion

After viewing the State Specific Training module, please print and sign the completion certificate on the following slide.

The certificate is your acknowledgement that based on the information provided in this module, you have the proper knowledge, skills and ability to conduct planning in this state.

Send the signed certificate to the State TSP Coordinator. Copy the below link to your browser for a list of State TSP Coordinators.

https://www.nrcs.usda.gov/sites/default/files/2023-10/SP_Coordinators-Backups_09.05.2023%20.pdf

STATE SPECIFIC TRAINING MODULE COMPLETION CERTIFICATE

I, _____, hereby verify I have viewed and understand the
TSP Name

content of the Pacific Islands State Specific Training Module and affirm I have the knowledge, skills and ability to conduct conservation planning services within the NRCS Pacific Islands Area.

_____ _____

TSP signature Date

Non-Discrimination Statement

Non-Discrimination Policy

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To File a Program Complaint

If you wish to file a Civil Rights program complaint of discrimination, complete the USDA Program Discrimination Complaint Form, found online at http://www.ascr.usda.gov/complaint_filing_cust.html, or at any USDA office, or call (866) 632-9992 to request the form. You may also write a letter containing all of the information requested in the form. Send your completed complaint form or letter to us by mail at U.S. Department of Agriculture, Director, Office of Adjudication, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9419, by fax at (202) 690-7442, or email at program.intake@usda.gov

Persons with Disabilities

Individuals who are deaf, hard of hearing or have speech disabilities and you wish to file either an EEO or program complaint please contact USDA through the Federal Relay Service at (800) 877-8339 or (800) 845-6136 (in Spanish).

Persons with disabilities, who wish to file a program complaint, please see information above on how to contact us by mail or by email. If you require alternative means of communication for program information (e.g., Braille, large print, audiotape, etc.), please contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

All Other Inquires

For any other information not pertaining to civil rights, please refer to the listing of the USDA Agencies and Offices.