State Specific Training Module for the

Caribbean Islands Area:

Puerto Rico, Virgin Islands of the U.S.
(St. Croix, St. Thomas, St. John)

Purpose of this Module

- This module will provide general information for Technical Service Providers (TSPs) that need to conduct conservation planning in the Caribbean Area (PR/USVI).

- 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, skills, licenses and certifications to conduct conservation planning in each territory.

NRCS Caribbean Area
Field Offices Reorganization Plan

Prepared with assistance from USDA-Natural Resources Conservation Service

53,000 0 53,000 106,000 159,000 212,000

Feet

Caribbean Field Office Locations

- **Arecibo** - Serving Arecibo, Barceloneta, Camuy, Dorado, Florida, Hatillo, Manatí, Quebradillas, Toa Baja, Vega Alta & Vega Baja
- **Caguas** - Serving Aguas Buenas, Caguas, Canóvanas, Carolina, Cataño, Cayey, Ceiba, Cidra, Culebra, Fajardo, Guaynabo, Gurabo, Humacao, Juncos, Las Piedras, Loiza, Luquillo, Naguabo, Rio Grande, San Juan, San Lorenzo, Trujillo Alto, Vieques & Yabucoa
- **Corozal** - Serving Aibonito, Barranquitas, Bayamón, Comerío, Corozal, Morovis, Naranjito, Orocovis & Toa Alta
- **Juana Díaz** - Serving Arroyo, Coamo, Guayama, Guayanilla, Juana Díaz, Maunabo, Patillas, Peñuelas, Ponce, Salinas, Santa Isabel & Villalba
- **Mayaguez** - Serving Añasco, Cabo Rojo, Guánica, Hormigueros, Lajas, Las Marías, Maricao, Mayagüez, Sabana Grande, San Germán & Yauco
- **Saint Croix Field Office** - Serving St. Croix, St. John, St. Thomas & Water Island
- **San Sebastián** - Serving Aguada, Aguadilla, Isabela, Lares, Moca, Rincón & San Sebastián
- **Utuado** - Serving Adjuntas, Ciales, Jayuya & Utuado

Island Information – Puerto Rico

- In 2020, Puerto Rico had a population of 3.26 million (M) people with a median age of 42.4 and a median household income of $21,058. Between 2019 and 2020 the population of Puerto Rico declined from 3.32M to 3.26M, a −1.89% decrease and its median household income grew from $20,539 to $21,058, a 2.53% increase.

- The 5 largest ethnic groups in Puerto Rico are White (Hispanic; 59%), Other (Hispanic; 18.6%), Black or African American (Hispanic; 11.2%), Two+ (Hispanic; 9.62%), and White (Non-Hispanic; 0.974%).

Island Information – Puerto Rico

- 94.6% of the households in Puerto Rico reported speaking a non-English language at home as their primary shared language. This does not consider the potential multi-lingual nature of households, but only the primary self-reported language spoken by all members of the household.

- The largest universities in Puerto Rico are NUC University (9,632 degrees awarded in 2020), Universidad Ana G. Mendez-Gurabo Campus (2,717 degrees), and University of Puerto Rico-Rio Piedras (2,535 degrees).

- In 2020, the median property value in Puerto Rico was $111,200, and the homeownership rate was 67.8%.

Island Information – Saint Croix

- St. Croix is the largest of the islands in the territory, while the capital Charlotte Amalie is located on St. Thomas.
- As of the 2020 United States Census, St. Croix's population was 41,004. The island's highest point is Mount Eagle, at 355 meters (1,165 ft). St. Croix's nickname is "Twin City", for its two towns, Frederiksted on the western end and Christiansted on the northeast part of the island.
- St. Croix lies at the easternmost point in the United States of America (USA) in the western hemisphere is St. Croix's Point Udall.
- The island has an area of 214.66 km2 (82.88 sq.mi.). The terrain is rugged, though not extremely so.
- Most of the east end is quite hilly and steep, as is the north side from Christiansted west. From the north-side hills, an even plain slopes down to the south coast; this was cultivated as the prime sugar land on the island.

Island Information – Saint Croix

- The hills of the western part of the island receive a good deal more rain than the east end; annual rainfall is overall extremely variable, averaging avg 40 inches (1,000 mm) a year.
- The east end of the island is a dry range with dryland vegetation, while the west end has tropical vegetation and palm trees.
- The island has multiple ecosystems in a small geographic area.
- Fairly severe and extended drought has always been a concern, particularly considering the lack of fresh ground water and lack of freshwater streams or rivers on the island.
- The island has a desalination plant, but most residential homes and businesses have built-in cisterns used to collect rainwater.
- St. Croix was once an agricultural center in the Caribbean but ended with the rapid industrialization of the island's economy in the 1960s.

Island Information – Saint Thomas

- The island has a land area of 32 sq.mi. (83 km2).
- The territorial capital and port of Charlotte Amalie is located on the island.
- As of the 2020 census, the population of St. Thomas was 42,261, about 48.5% of the total population of the U.S. Virgin Islands.
- The land was divided into plantations and sugarcane production became the primary economic activity.
- USA granted citizenship to the residents in 1927. The U.S. Department of the Interior took over administrative duties in 1931.
- In 1954, passage of the U.S. Virgin Islands Organic Act officially granted territorial status to the three islands.

Island Information – Saint Thomas

- St. Thomas has a tropical savanna climate with a drier season and a wetter season.
- The temperature is warm year-round, with January and February, the coolest months, having average highs of 85.1 °F and average lows of 72.3 °F. August has the highest average high of 90.1 °F, with July, August and September all having the highest average low at 78.1 °F.
- St. Thomas receives 38.9 in of precipitation annually over 163.6 precipitation days.
- November is the wettest month with 6.0 in of rain on average over 17.8 precipitation days, the most of any month. March is the driest month, receiving 1.1 in of rainfall over 8.1 precipitation days, the least of any month.

Island Information – Saint John

- St. John is 19.6 sq.mi. in area with a population of 3,881 (2020 census), St. John is the smallest of the three main U.S. Virgin Islands
- The largest St. John settlement is Cruz Bay with a population of 2,652.
- Since 1956, approximately 60% of the island is protected as Virgin Islands National Park, administered by the U.S. National Park Service.
- The economy is based predominantly on tourism and related trade.

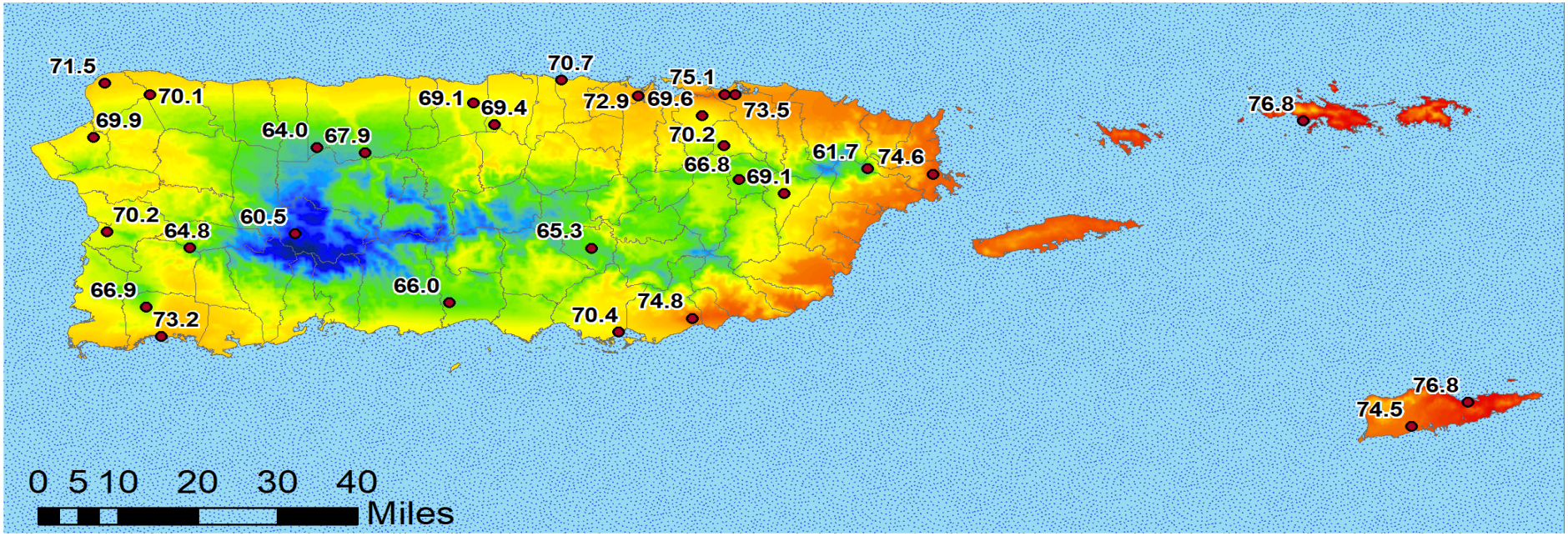
United States Department of Agriculture
Natural Resources Conservation Service

USDA NRCS

Annual Normal Minimum Temperatures 1991-2020

Data Source: National Centers for Environmental Information

Map Created by The National Weather Service, San Juan WFO



N
W E
S

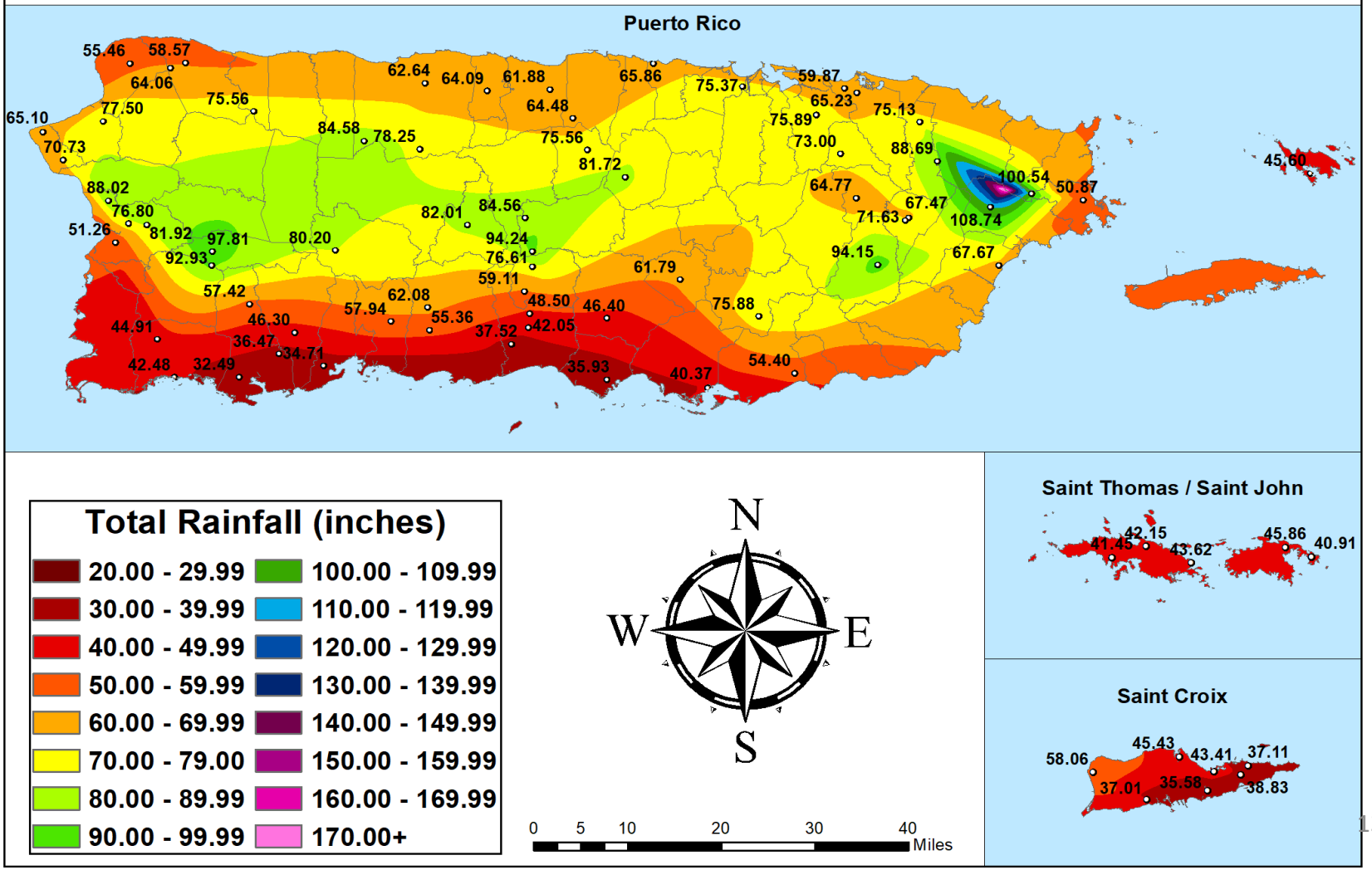
Temperature Range ºF

High : 80 65 Low : 50

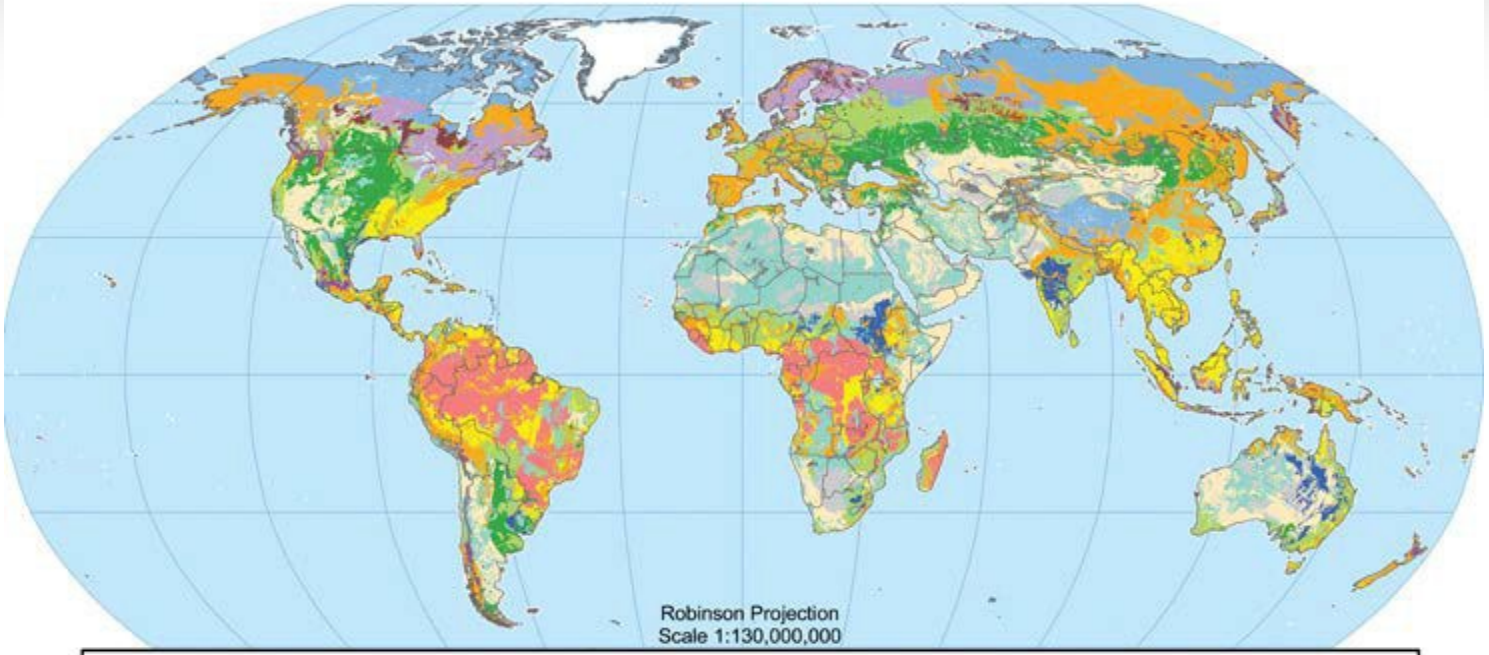
Mean Annual Rainfall 1991-2020

Data Source: National Centers of Environmental Information

Map Created by NWS San Juan WFO



Global Soil Regions



US Department of Agriculture
Natural Resources
Conservation Service

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

November 2005

Caribbean Data Maps

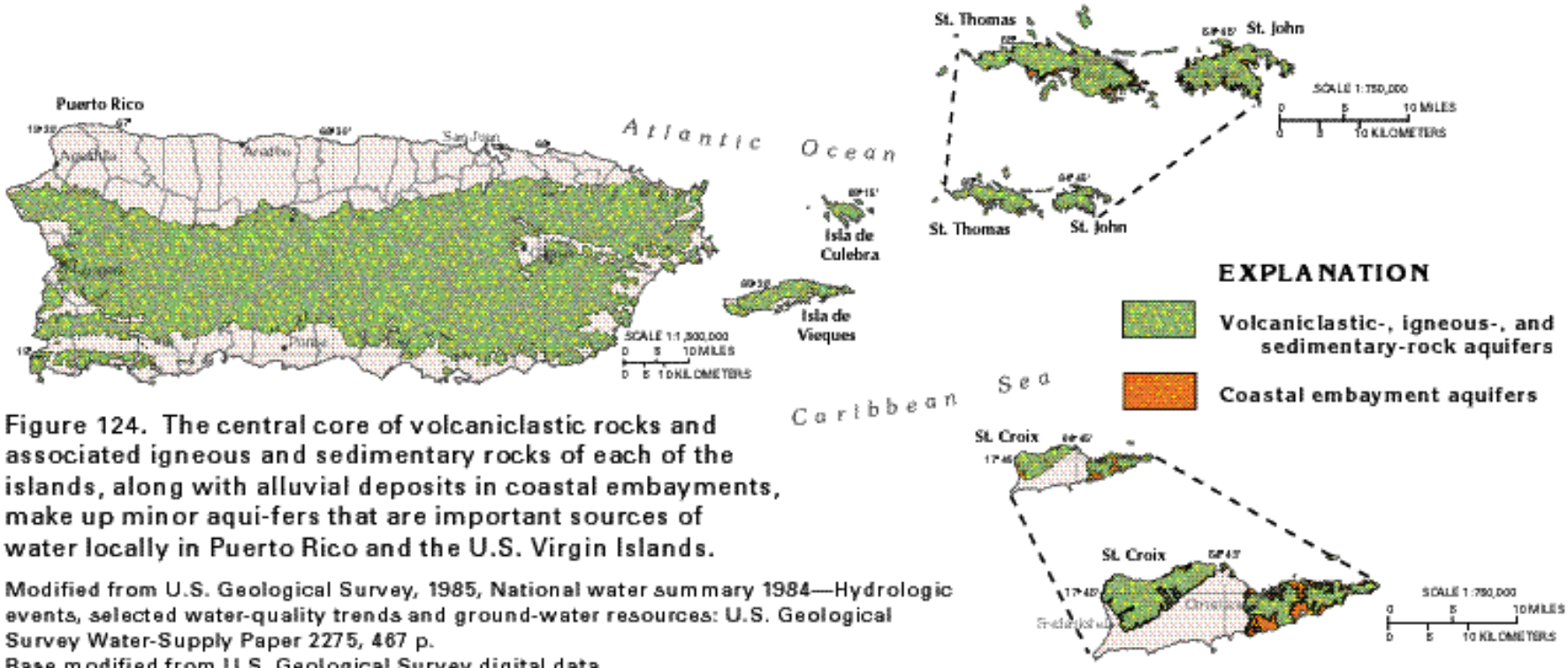


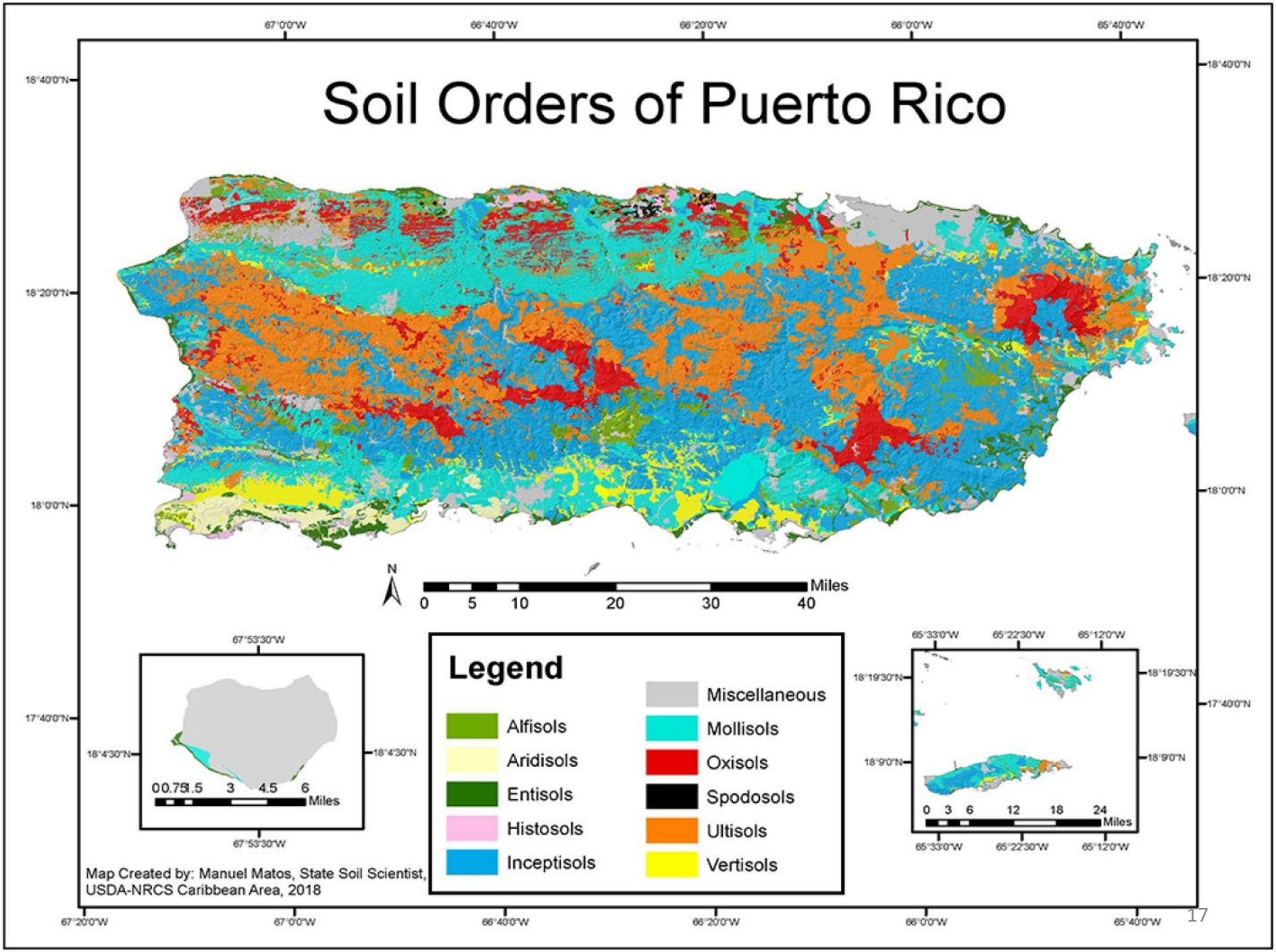
Figure 124. The central core of volcaniclastic rocks and associated igneous and sedimentary rocks of each of the islands, along with alluvial deposits in coastal embayments, make up minor aqui-fers that are important sources of water locally in Puerto Rico and the U.S. Virgin Islands.

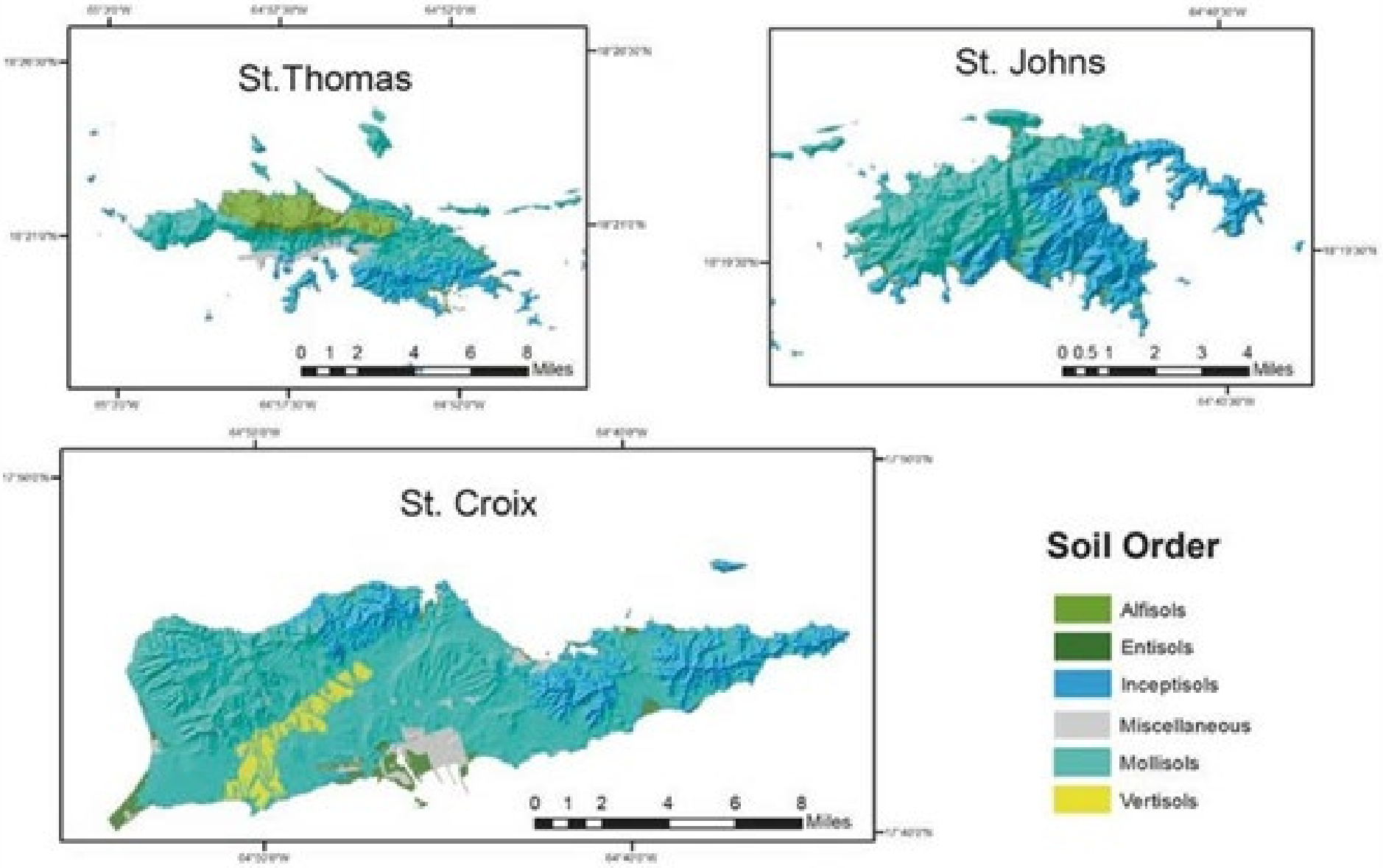
Modified from U.S. Geological Survey, 1985, National water summary 1984—Hydrologic events, selected water-quality trends and ground-water resources: U.S. Geological Survey Water-Supply Paper 2275, 467 p.
Base modified from U.S. Geological Survey digital data

Caribbean Area Soil Regions

There are twelve soil orders according to the U.S. Soil Taxonomy classification system - ten are found in the PR/USVI:

- **Histosols** are organic soils associated with coastal lowlands and wetland areas
- **Aridisols** are the soils of the arid or dry regions of the southwest PR
- **Mollisols** are the soils found mainly under grassland vegetation but in PR and USVI are associated with alluvial geomorphic landforms
- **Alfisols** are found under deciduous forest 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
- **Spodosols** are acid soils found in northern PR formed in sandy materials
- **Vertisols** are shrink-swell soils of the tropics
- **Entisols** are very young soils with minimal development
- **Inceptisols** are young soils with little profile with minimal diagnostic horizons.


Soil Orders of Puerto Rico
67°0'0"W
66°40'0"W
66°20'0"W
66°0'0"W
65°40'0"W
18°40'0"N
18°20'0"N
18°0'0"N
17°40'0"N
N
0 5 10 20 30 40
Miles
67°53'30"W
18°4'30"N
17°53'30"W
0 0.75 1.5 3 4.5 6
Miles
Legend
Alfisols
Aridisols
Entisols
Histosols
Inceptisols
Miscellaneous
Mollisols
Oxisols
Spodosols
Ultisols
Vertisols
65°33'0"W
65°22'30"W
65°12'0"W
18°19'30"N
18°9'0"N
0 3 6 12 18 24
Miles
Map Created by: Manuel Matos, State Soil Scientist,
USDA-NRCS Caribbean Area, 2018



Map Created by: Manuel Matos
State Soil Scientist/ State Geodata Coordinator
USDA-NRCS Caribbean Area, 2019

ALFISOLES



Los Alfisoles se desarrollan en regiones semiáridas y húmedas. Se forman del resultado de procesos de intemperización (degradación de los minerales), en donde ocurre translocación de los minerales de arcilla de la superficie y se acumulan en el subsuelo. Se forman principalmente debajo de bosques donde la cubierta vegetativa es mixta. Tienen más de 35 % de saturación de bases. Son suelos donde se puede producir la mayoría de los cultivos. Cubren alrededor del 3.6% de la superficie terrestre de la isla de Puerto Rico.

ARIDISOLES



Los Aridisoles son suelos que son demasiado secos para el crecimiento de plantas mesófitas (plantas intermedias). La falta de humedad restringe grandemente la intensidad de intemperización y limita los procesos de formación en la parte más alta de los suelos. En la mayoría de las veces acumulan yeso, sales solubles, carbonato de calcio, y otros materiales que son fácilmente lavados en ambientes húmedos. Los Aridisoles son comunes en la zona suroeste y áreas de laderas costeras al sur de la isla de Puerto Rico. Cubren alrededor del 1.1% de la superficie terrestre de la isla de Puerto Rico.

ENTISOLES



Los Entisoles son suelos que presentan poca o ninguna evidencia de desarrollo de horizontes y pedogénesis (formación de suelos). Son suelos donde el material parental fue depositado recientemente, o áreas donde los eventos de erosión o deposición ocurren con mayor rapidez que los procesos de formación de suelos. Los Entisoles en Puerto Rico se encuentran asociados a zonas áridas, escarpadas, playas, formación de dunas y planicies aluviales. Cubren alrededor del 4.% de la superficie terrestre de la isla de Puerto Rico.

ESPODOSOLES



Los Espodosoles se desarrollan del resultado de procesos de intemperización, en donde la materia orgánica en combinación con aluminio (en ocasiones óxidos de hierro) se remueven de la superficie, se transportan y acumulan en el subsuelo. Se forman principalmente en zonas húmedas, bajo vegetación de bosque y de material parental con textura gruesa. Son suelos ácidos y naturalmente de baja fertilidad. Cubren alrededor del 0.2% de la superficie terrestre de la isla de Puerto Rico.

INCEPTISOLES



Los Inceptisoles son suelos poco desarrollados y generalmente se forman en ambientes semi-áridos y húmedos. Son suelos con características variadas y pueden ocurrir en un rango amplio de climas. En la isla se encuentran mayormente asociados a paisajes con pendientes de alta inclinación y a los valles aluviales húmedos. Los Inceptisoles cubren alrededor del 30.5% de la superficie terrestre de la isla de Puerto Rico.

HISTOSOLES



Los Histosoles son suelos con alto contenido de materia orgánica. La mayoría están saturados por todo el año pero muy pocos se desarrollan en ambientes con buen drenaje. Se forman por la acumulación de material de residuos de plantas o animales descompuestos, donde la acumulación es mas rápida que la descomposición. Son suelos de suma importancia porque almacenan grandes cantidades de carbono. Si estos suelos se drenan y se exponen al aire se descomponen aceleradamente provocando subsidencia. Los Histosoles cubren alrededor del 0.5% de la superficie de la isla de Puerto Rico.

MOLISOLES



Los Molisoles son suelos de colores oscuros en la superficie y con cantidades de materia orgánica relativamente alta. Son suelos con alto contenido de nutrimentos esenciales para el crecimiento de las plantas y se consideran de alta fertilidad. Mayormente se forman bajo vegetación mixta y praderas. En Puerto Rico se pueden desarrollar en las regiones semi-áridas, valles aluviales húmedos y en la región del Carso. Los Molisoles cubren alrededor del 15.5% de la superficie terrestre de la isla de Puerto Rico.

OXISOLES



Los Oxisoles son suelos altamente intemperizados de regiones tropicales y subtropicales. Son caracterizados por tener mayormente minerales de baja actividad, como lo son el cuarzo, la Caolinita y los óxidos de hierro. Suelen tener poca diferenciación entre sus horizontes. Se desarrollan en superficies terrestres estables por mucho tiempo. En Puerto Rico se encuentran en la zona montañosa desarrollados de material residual (roca volcánica y metamórfica) y en depósitos aluviales entre los mogotes de la zona norte. Naturalmente ácidos y de baja fertilidad. Cubren alrededor del 7.8% de la superficie terrestre de la isla de Puerto Rico.

ULTISOLES



Los Ultisoles son suelos asociados a climas húmedos. Se forman por procesos de intemperización y formación de suelos intensos. Ocurren como resultado de la translocación de los minerales de arcilla y óxidos de hierro de la superficie y acumulándose en el subsuelo. Se forman debajo de bosques donde la cubierta vegetativa es mixta. Tienen menos de 35 % de saturación de bases. Son suelos ácidos donde la mayoría de los nutrimentos se encuentran en la superficie. Se encuentran en la zona montañosa húmeda y mayormente se utilizan para la producción de café, farináceos, frutas exóticas y cítricas. Los Ultisoles cubren alrededor del 18.8% de la superficie terrestre de la isla de Puerto Rico.

VERTISOLES



Los Vertisoles tienen un alto contenido de minerales de arcillas expansibles. Pueden sobrellevar cambios drásticos en volumen con cambios en contenido de humedad. Tienen grietas que se abren y cierran periódicamente y en sus perfiles pueden mostrar evidencia que el suelo ha estado en movimiento. Cuando están húmedos se expanden, provocando que el agua se mueva lentamente. En Puerto Rico están asociados a valles aluviales en zonas semi-áridas y húmedas. De fertilidad natural alta. Los Vertisoles cubren alrededor del 4.2% de la superficie terrestre de la isla de Puerto Rico.

GELISOLES

NO SE ENCUENTRAN EN PUERTO RICO



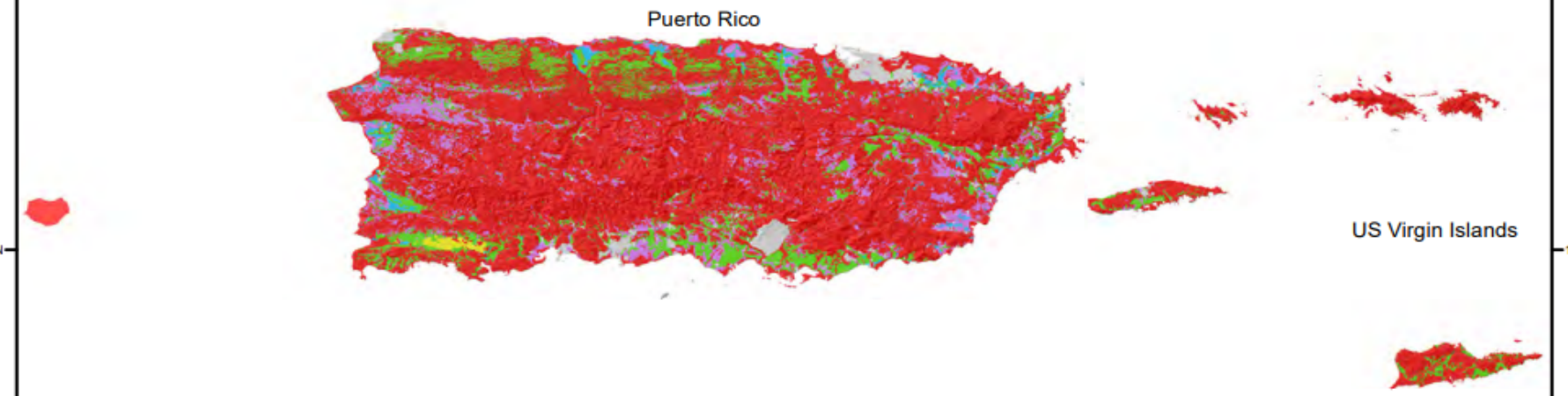
Los Gelisoles son suelos que tiene "permafrost" cerca de la superficie y se forman por procesos de crioturbación (alteración del suelo por procesos de congelamiento). Los Gelisoles son comunes en latitudes y elevaciones altas. A pesar que en Puerto Rico no se encuentran, ocupan el 9% de la superficie la tierra.

ANDISOLES

NO SE ENCUENTRAN EN PUERTO RICO


Los Andisoles se forman de ceniza volcánica reciente y generan minerales de poca estructura cristalina. Estos minerales pueden resultar con alta capacidad de retención de agua y nutrimentos. Pueden ser altamente productivos. Se encuentran áreas de moderada y alta precipitación. A pesar que en Puerto Rico no se encuentran, ocupan el 1% de la superficie la tierra.

Farmland Classification
USDA-NRCS Caribbean Region



Legend

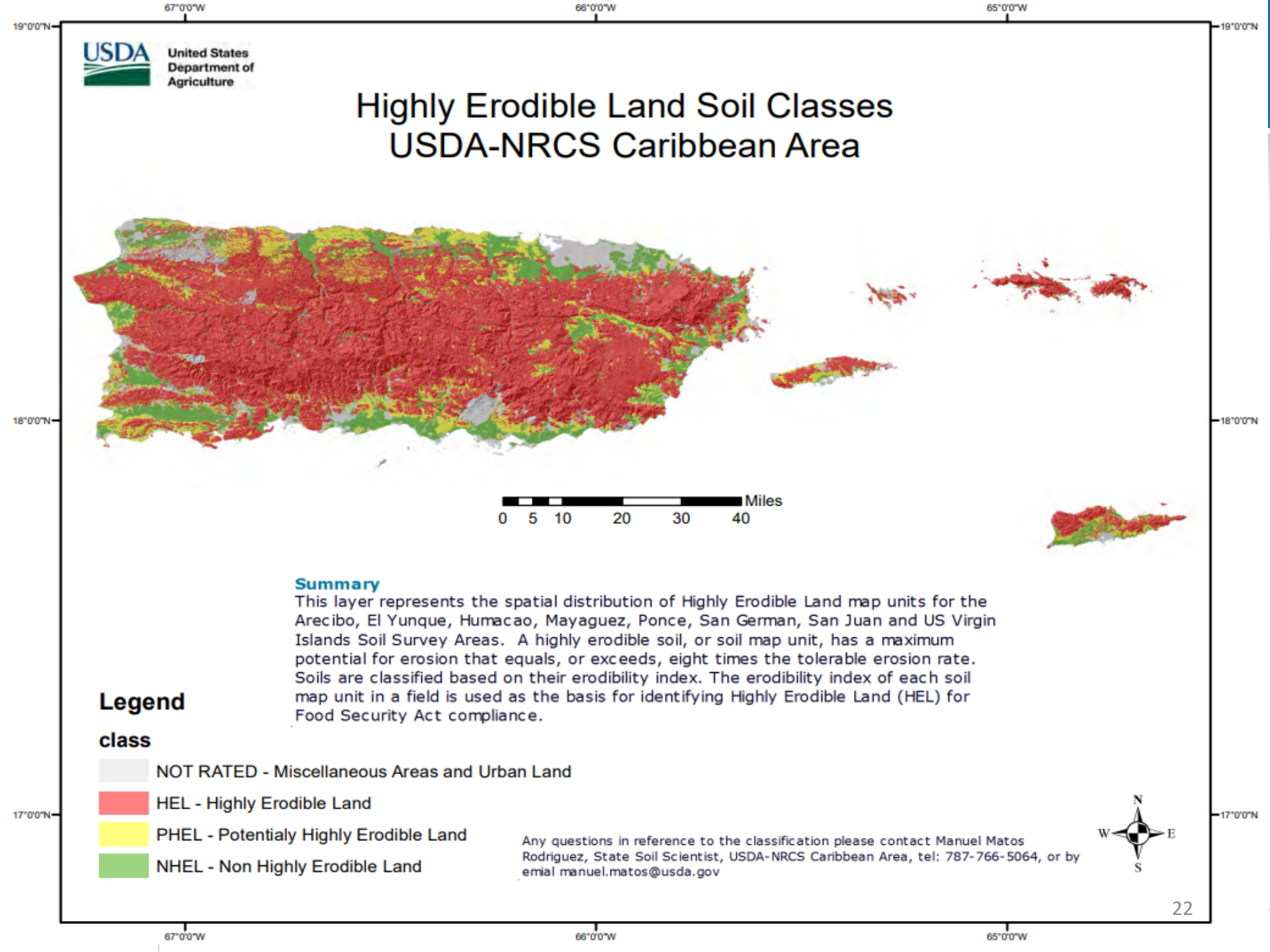
Farmland Classification

- Farmland of statewide importance, if irrigated
- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Not rated or not available

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

N W E S


67°0'0"W
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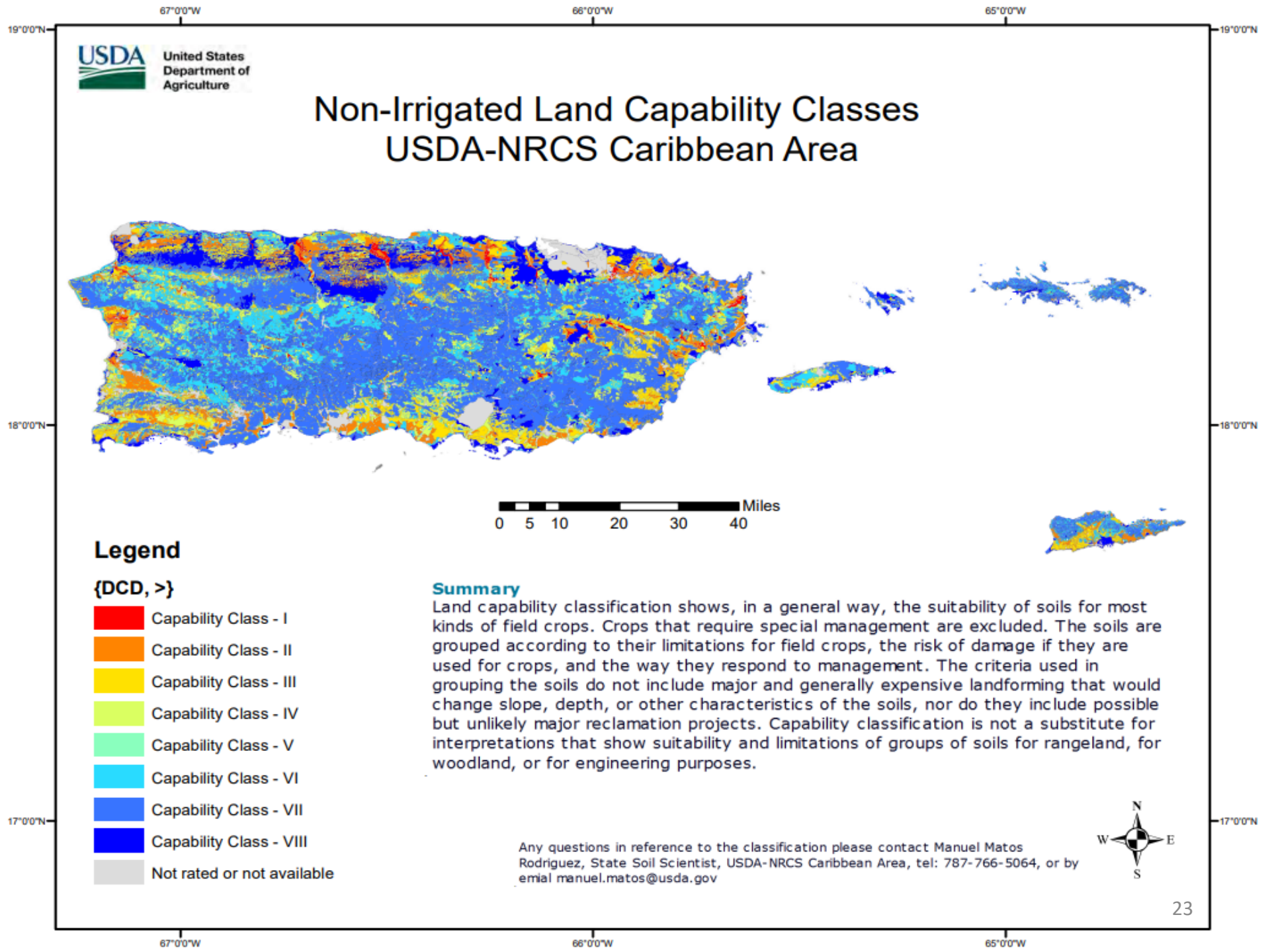
65°0'0"W
19°0'0"N
18°0'0"N
17°0'0"N
USDA
United States Department of Agriculture
Highly Erodible Land Soil Classes
USDA-NRCS Caribbean Area
Miles
0 5 10 20 30 40
Summary
This layer represents the spatial distribution of Highly Erodible Land map units for the Arecibo, El Yunque, Humacao, Mayaguez, Ponce, San German, San Juan and US Virgin Islands Soil Survey Areas. A highly erodible soil, or soil map unit, has a maximum potential for erosion that equals, or exceeds, eight times the tolerable erosion rate. Soils are classified based on their erodibility index. The erodibility index of each soil map unit in a field is used as the basis for identifying Highly Erodible Land (HEL) for Food Security Act compliance.
Legend
class
NOT RATED - Miscellaneous Areas and Urban Land
HEL - Highly Erodible Land
PHEL - Potentialy Highly Erodible Land
NHEL - Non Highly Erodible Land
Any questions in reference to the classification please contact Manuel Matos Rodriguez, State Soil Scientist, USDA-NRCS Caribbean Area, tel: 787-766-5064, or by emial manuel.matos@usda.gov
N
W
E
S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65°0'0"W
19°0'0"N
18°0'0"N
17°0'0"N
USDA
United States Department of Agriculture
Non-Irrigated Land Capability Classes
USDA-NRCS Caribbean Area
Miles
0 5 10 20 30 40
Legend
{DCD, >}
Capability Class - I
Capability Class - II
Capability Class - III
Capability Class - IV
Capability Class - V
Capability Class - VI
Capability Class - VII
Capability Class - VIII
Not rated or not available
Summary
Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations that show suitability and limitations of groups of soils for rangeland, for woodland, or for engineering purposes.
Any questions in reference to the classification please contact Manuel Matos Rodriguez, State Soil Scientist, USDA-NRCS Caribbean Area, tel: 787-766-5064, or by email manuel.matos@usda.gov
N
W
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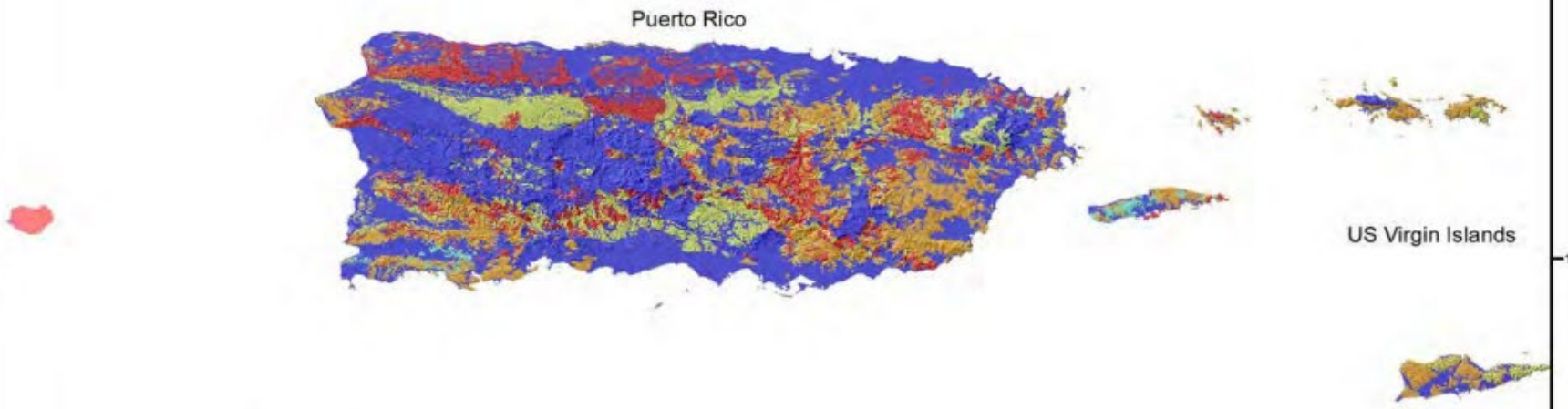
Soil Depth to Any Restrictive Layer
USDA-NRCS Caribbean Region



Description

A "restrictive layer" is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers.

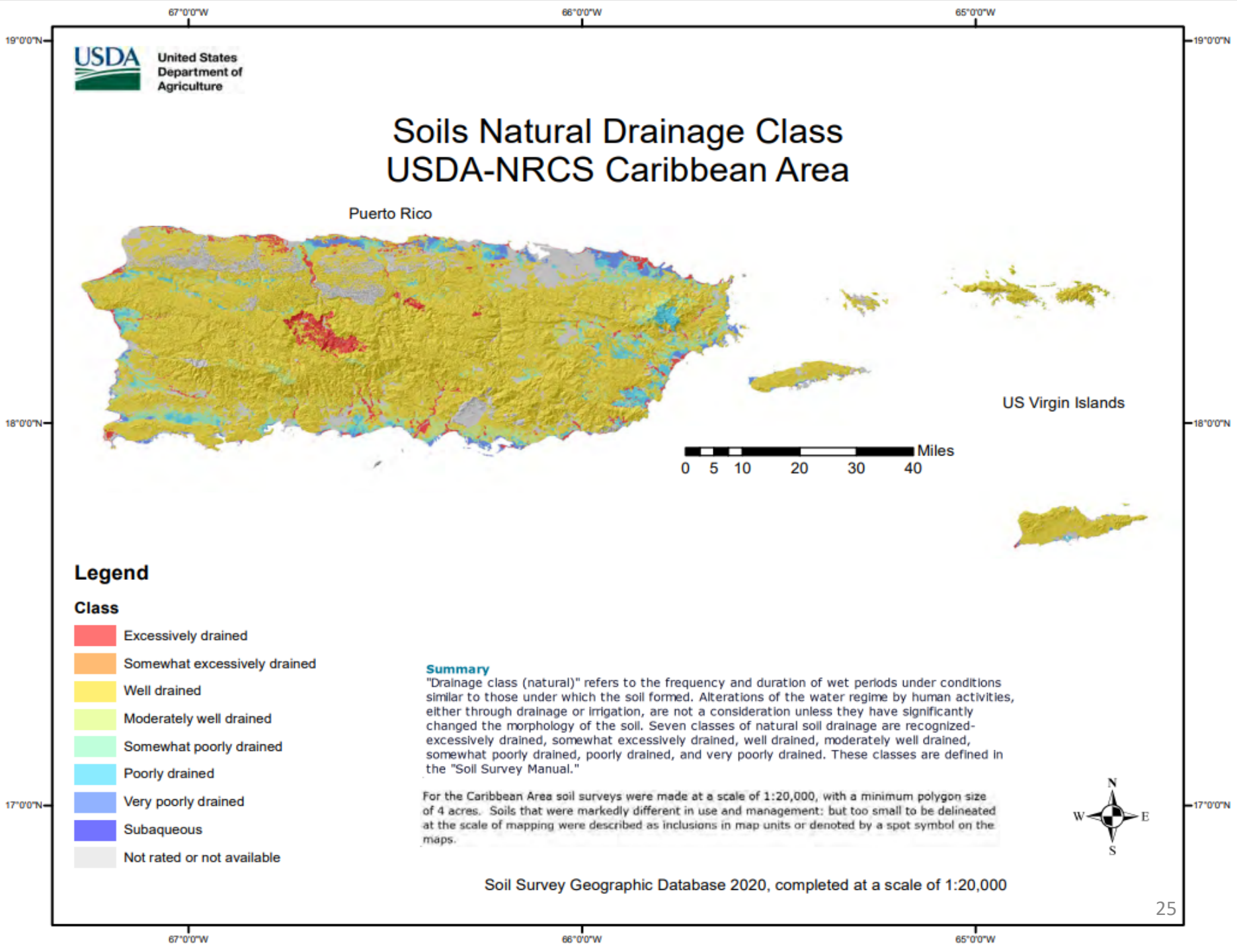
Legend

{DCP, <}, [cm]

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200

This theme presents the depth to any type of restrictive layer that is described for each map unit. If more than one type of restrictive layer is described for an individual soil type, the depth to the shallowest one is presented. If no restrictive layer is described in a map unit, it is represented by the "> 200" depth class.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.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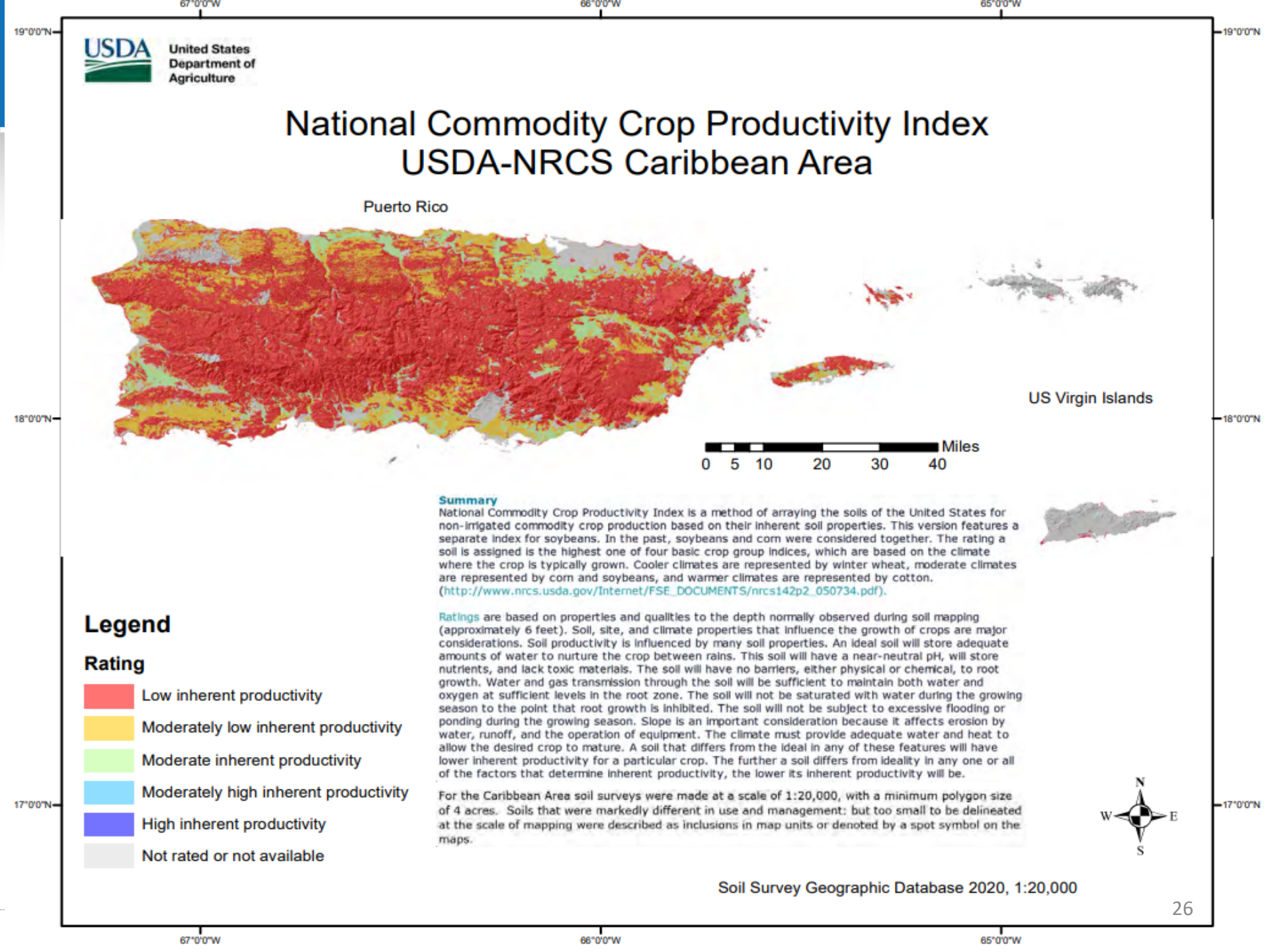
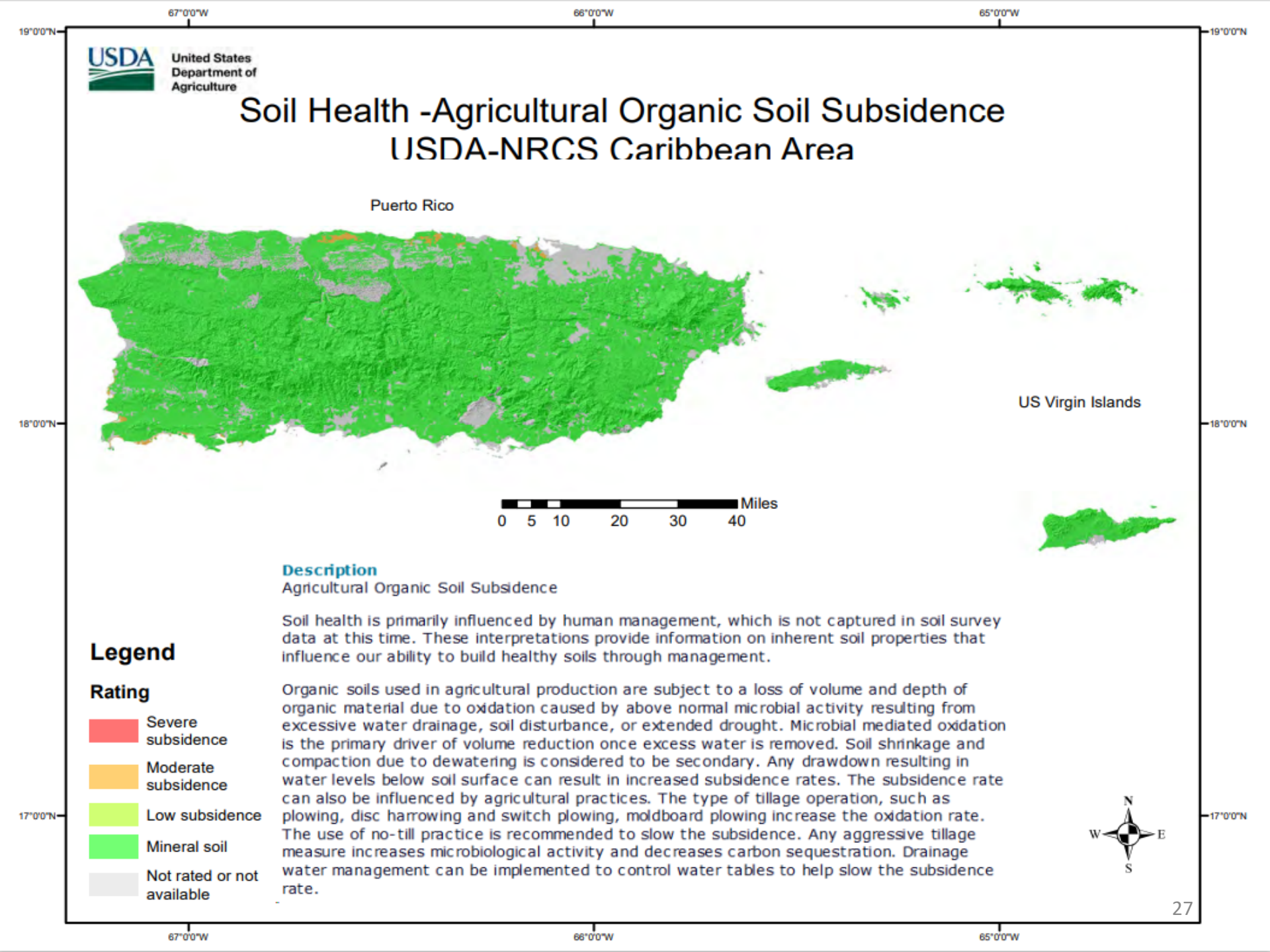
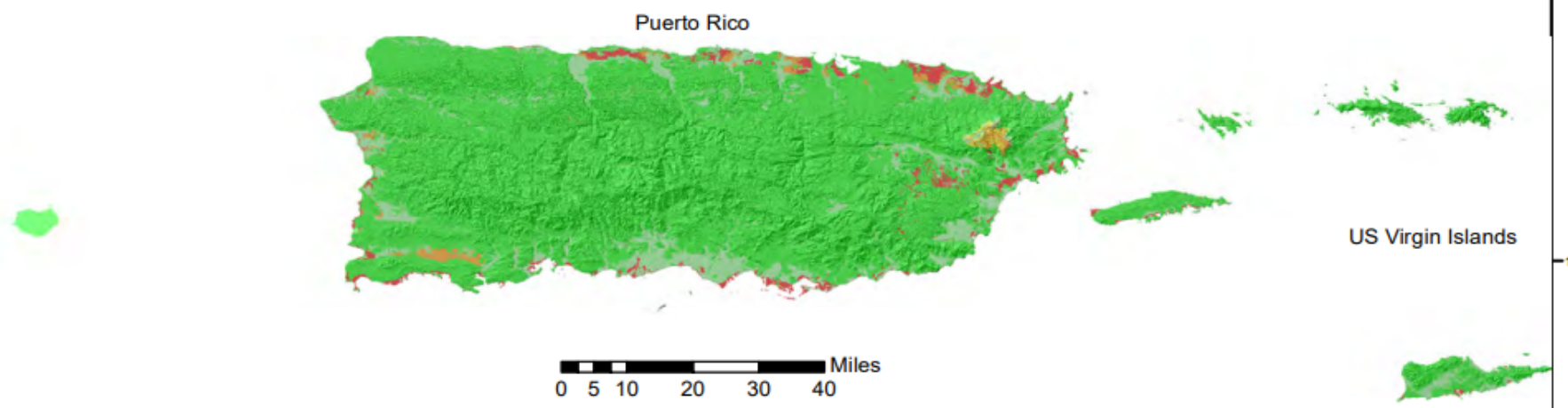
19°0'0"N
18°0'0"N
17°0'0"N
USDA
United States Department of Agriculture
Soils Natural Drainage Class
USDA-NRCS Caribbean Area
Puerto Rico
US Virgin Islands
Miles
0 5 10 20 30 40
Legend
Class
Excessively drained
Somewhat excessively drained
Well drained
Moderately well drained
Somewhat poorly drained
Poorly drained
Very poorly drained
Subaqueous
Not rated or not available
Summary
"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."
For the Caribbean Area soil surveys were made at a scale of 1:20,000, with a minimum polygon size of 4 acres. Soils that were markedly different in use and management: but too small to be delineated at the scale of mapping were described as inclusions in map units or denoted by a spot symbol on the maps.
N
W
E
S
Soil Survey Geographic Database 2020, completed at a scale of 1:20,000


USDA
United States Department of Agriculture
National Commodity Crop Productivity Index
USDA-NRCS Caribbean Area
Puerto Rico
US Virgin Islands
0 5 10 20 30 40
Miles
Summary
National Commodity Crop Productivity Index is a method of arraying the soils of the United States for non-irrigated commodity crop production based on their inherent soil properties. This version features a separate index for soybeans. In the past, soybeans and corn were considered together. The rating a soil is assigned is the highest one of four basic crop group indices, which are based on the climate where the crop is typically grown. Cooler climates are represented by winter wheat, moderate climates are represented by corn and soybeans, and warmer climates are represented by cotton. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_050734.pdf).
Ratings are based on properties and qualities to the depth normally observed during soil mapping (approximately 6 feet). Soil, site, and climate properties that influence the growth of crops are major considerations. Soil productivity is influenced by many soil properties. An ideal soil will store adequate amounts of water to nurture the crop between rains. This soil will have a near-neutral pH, will store nutrients, and lack toxic materials. The soil will have no barriers, either physical or chemical, to root growth. Water and gas transmission through the soil will be sufficient to maintain both water and oxygen at sufficient levels in the root zone. The soil will not be saturated with water during the growing season to the point that root growth is inhibited. The soil will not be subject to excessive flooding or ponding during the growing season. Slope is an important consideration because it affects erosion by water, runoff, and the operation of equipment. The climate must provide adequate water and heat to allow the desired crop to mature. A soil that differs from the ideal in any of these features will have lower inherent productivity for a particular crop. The further a soil differs from ideality in any one or all of the factors that determine inherent productivity, the lower its inherent productivity will be.
For the Caribbean Area soil surveys were made at a scale of 1:20,000, with a minimum polygon size of 4 acres. Soils that were markedly different in use and management: but too small to be delineated at the scale of mapping were described as inclusions in map units or denoted by a spot symbol on the maps.
Legend
Rating
Low inherent productivity
Moderately low inherent productivity
Moderate inherent productivity
Moderately high inherent productivity
High inherent productivity
Not rated or not available
N
W
E
S
Soil Survey Geographic Database 2020, 1:20,000
19°0'0"N
18°0'0"N
17°0'0"N
67°0'0"W
66°0'0"W
65°0'0"W


67°0'0"W
66°0'0"W
65°0'0"W
19°0'0"N
18°0'0"N
17°0'0"N
USDA
United States Department of Agriculture
Soil Health -Agricultural Organic Soil Subsidence
USDA-NRCS Caribbean Area
Puerto Rico
US Virgin Islands
Miles
0 5 10 20 30 40
Description
Agricultural Organic Soil Subsidence
Soil health is primarily influenced by human management, which is not captured in soil survey data at this time. These interpretations provide information on inherent soil properties that influence our ability to build healthy soils through management.
Organic soils used in agricultural production are subject to a loss of volume and depth of organic material due to oxidation caused by above normal microbial activity resulting from excessive water drainage, soil disturbance, or extended drought. Microbial mediated oxidation is the primary driver of volume reduction once excess water is removed. Soil shrinkage and compaction due to dewatering is considered to be secondary. Any drawdown resulting in water levels below soil surface can result in increased subsidence rates. The subsidence rate can also be influenced by agricultural practices. The type of tillage operation, such as plowing, disc harrowing and switch plowing, moldboard plowing increase the oxidation rate. The use of no-till practice is recommended to slow the subsidence. Any aggressive tillage measure increases microbiological activity and decreases carbon sequestration. Drainage water management can be implemented to control water tables to help slow the subsidence rate.
Legend
Rating
Severe subsidence
Moderate subsidence
Low subsidence
Mineral soil
Not rated or not available
N
W
E
S

Hydric Soil Rating By Mapunit
USDA-NRCS Caribbean Region



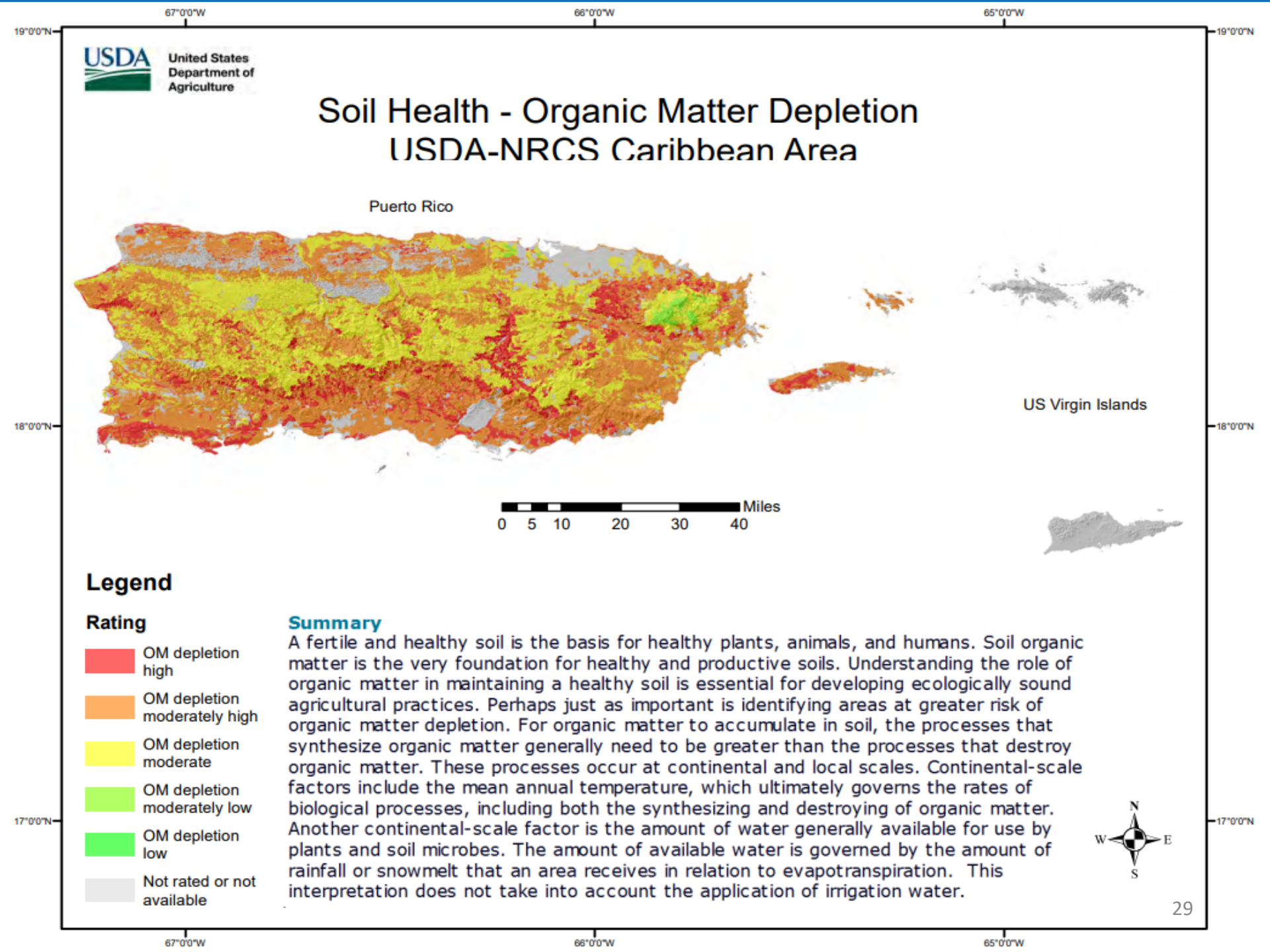
Legend

HydrcRatng

- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

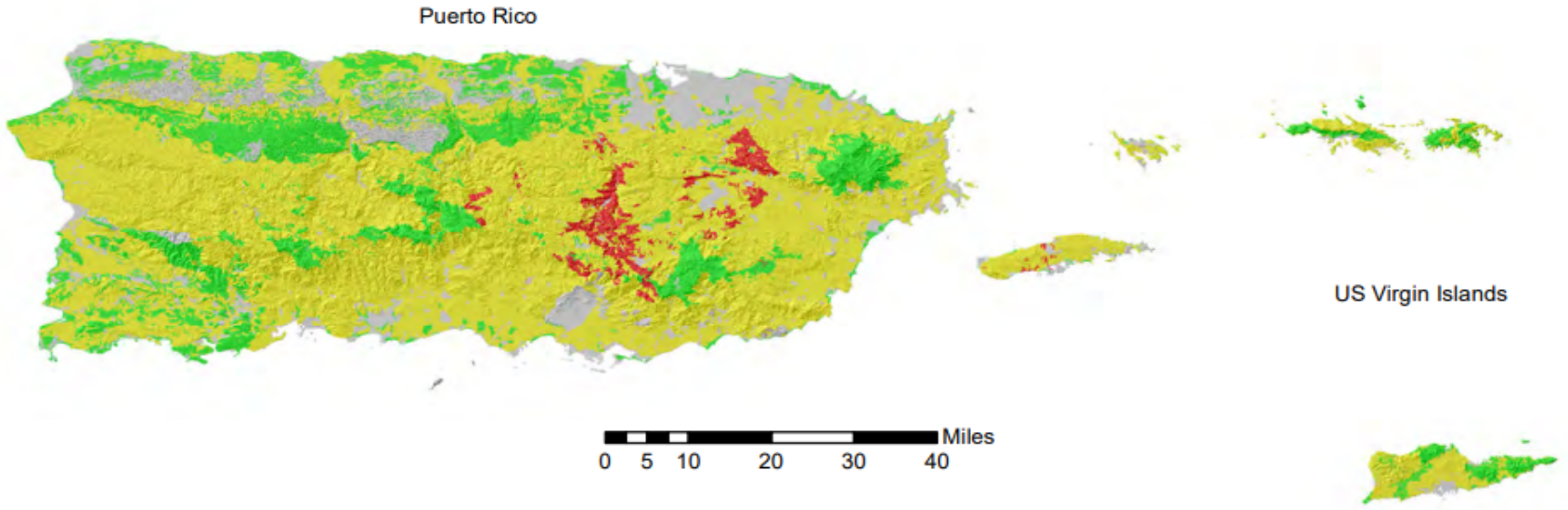
Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.


67°0'0"W
66°0'0"W
65°0'0"W
19°0'0"N
18°0'0"N
17°0'0"N
USDA
United States Department of Agriculture
Soil Health - Organic Matter Depletion
USDA-NRCS Caribbean Area
Puerto Rico
US Virgin Islands
Miles
0 5 10 20 30 40
Legend
Rating
OM depletion high
OM depletion moderately high
OM depletion moderate
OM depletion moderately low
OM depletion low
Not rated or not available
Summary
A fertile and healthy soil is the basis for healthy plants, animals, and humans. Soil organic matter is the very foundation for healthy and productive soils. Understanding the role of organic matter in maintaining a healthy soil is essential for developing ecologically sound agricultural practices. Perhaps just as important is identifying areas at greater risk of organic matter depletion. For organic matter to accumulate in soil, the processes that synthesize organic matter generally need to be greater than the processes that destroy organic matter. These processes occur at continental and local scales. Continental-scale factors include the mean annual temperature, which ultimately governs the rates of biological processes, including both the synthesizing and destroying of organic matter. Another continental-scale factor is the amount of water generally available for use by plants and soil microbes. The amount of available water is governed by the amount of rainfall or snowmelt that an area receives in relation to evapotranspiration. This interpretation does not take into account the application of irrigation water.
N
W
E
S

USDA United States Department of Agriculture

Soil Health - Soil Susceptibility to Compaction
USDA-NRCS Caribbean Area



Summary

Soils are rated based on their susceptibility to compaction from the operation of ground-based equipment for planting, harvesting, and site preparation activities when soils are moist. Soil compaction is the process in which soil particles are pressed together more closely that in the original state. Typically, the soil must be moist to be compacted because the mineral grains must slide together. Compaction reduces the abundance mostly of large pores in the soil by damaging the structure of the soil. This produces several effects that are unwanted in agricultural soils since large pores are most effective at transmitting water and air through the soil. Compaction also increases the soil strength which can limit root penetration and growth. The ability of soil to hold water is adversely affected by compaction since the large pores hold water. The degree of compaction of a soil is measured by its bulk density, which is the mass per unit volume, generally expressed in grams per cubic centimeter.

Legend

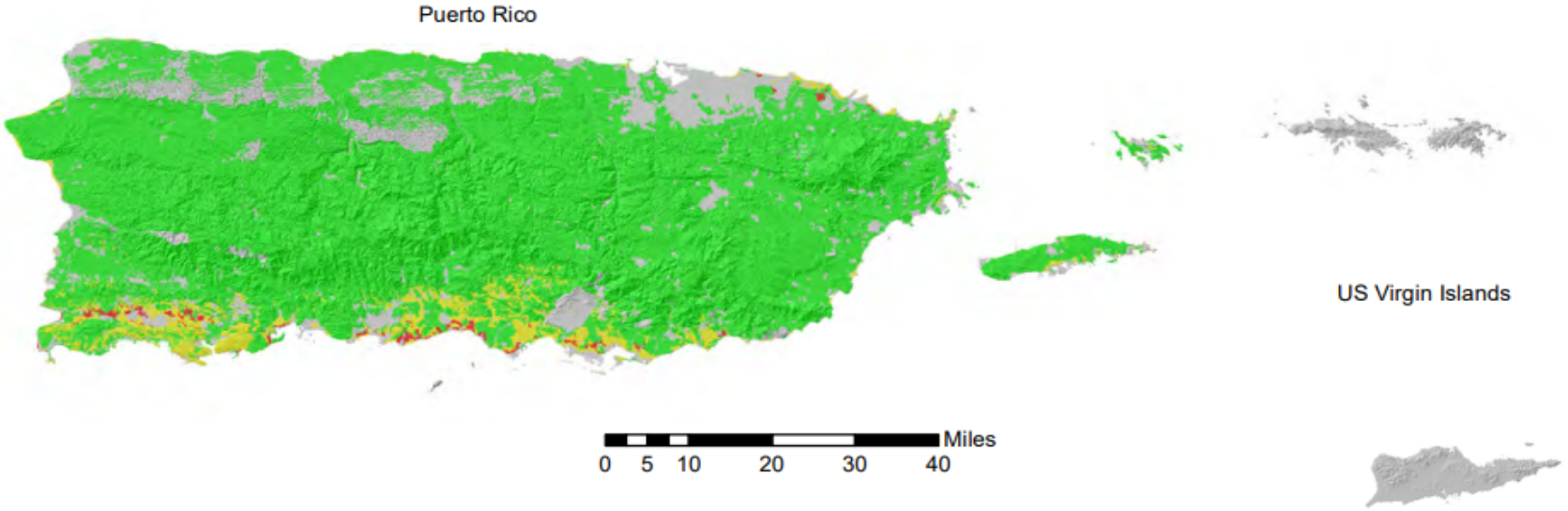
Rating

- High
- Medium
- Low
- Not rated or not available

N W E S

USDA United States Department of Agriculture

Soil Health - Surface Salt Concentration
USDA-NRCS Caribbean Area



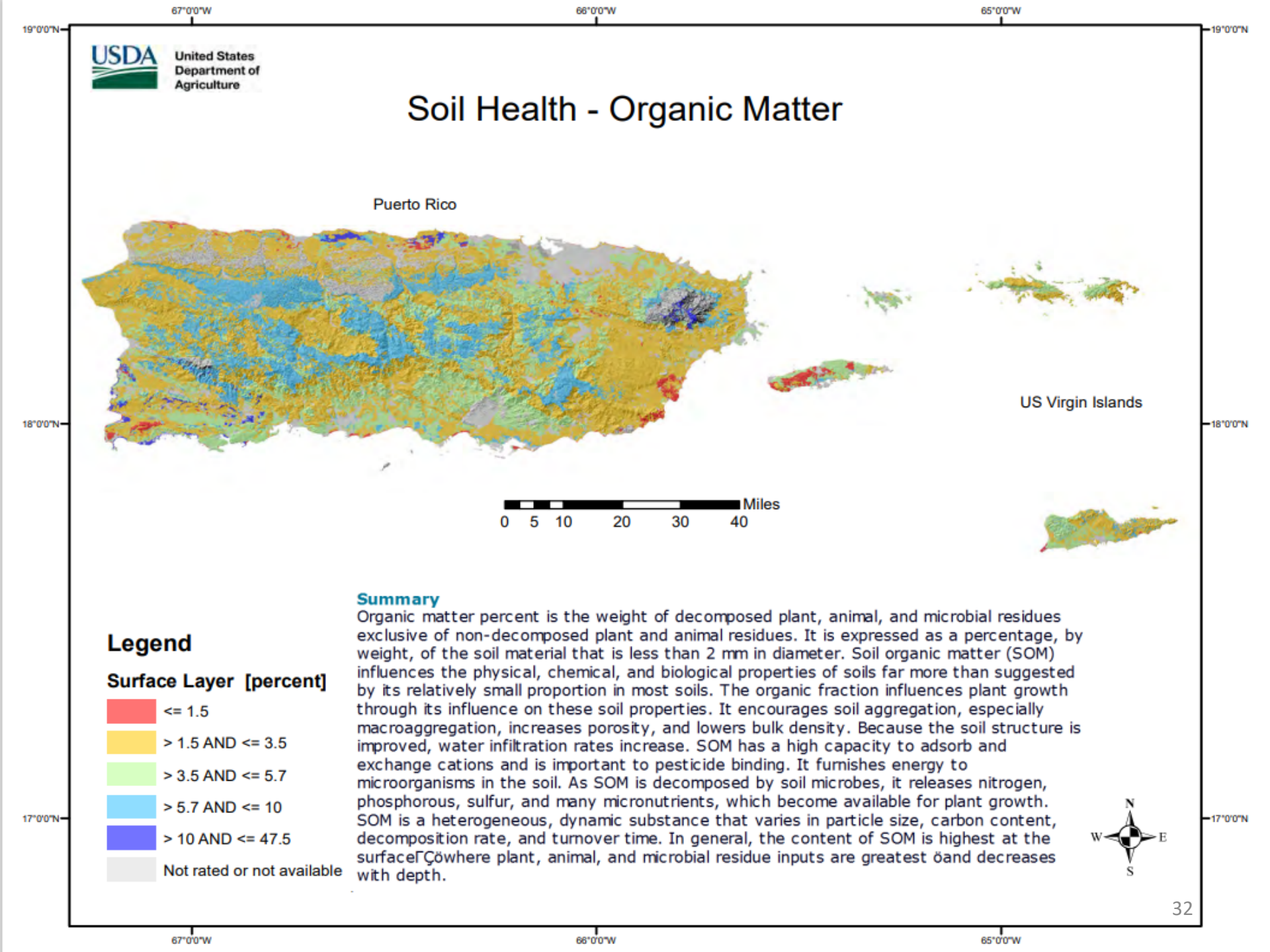
Legend

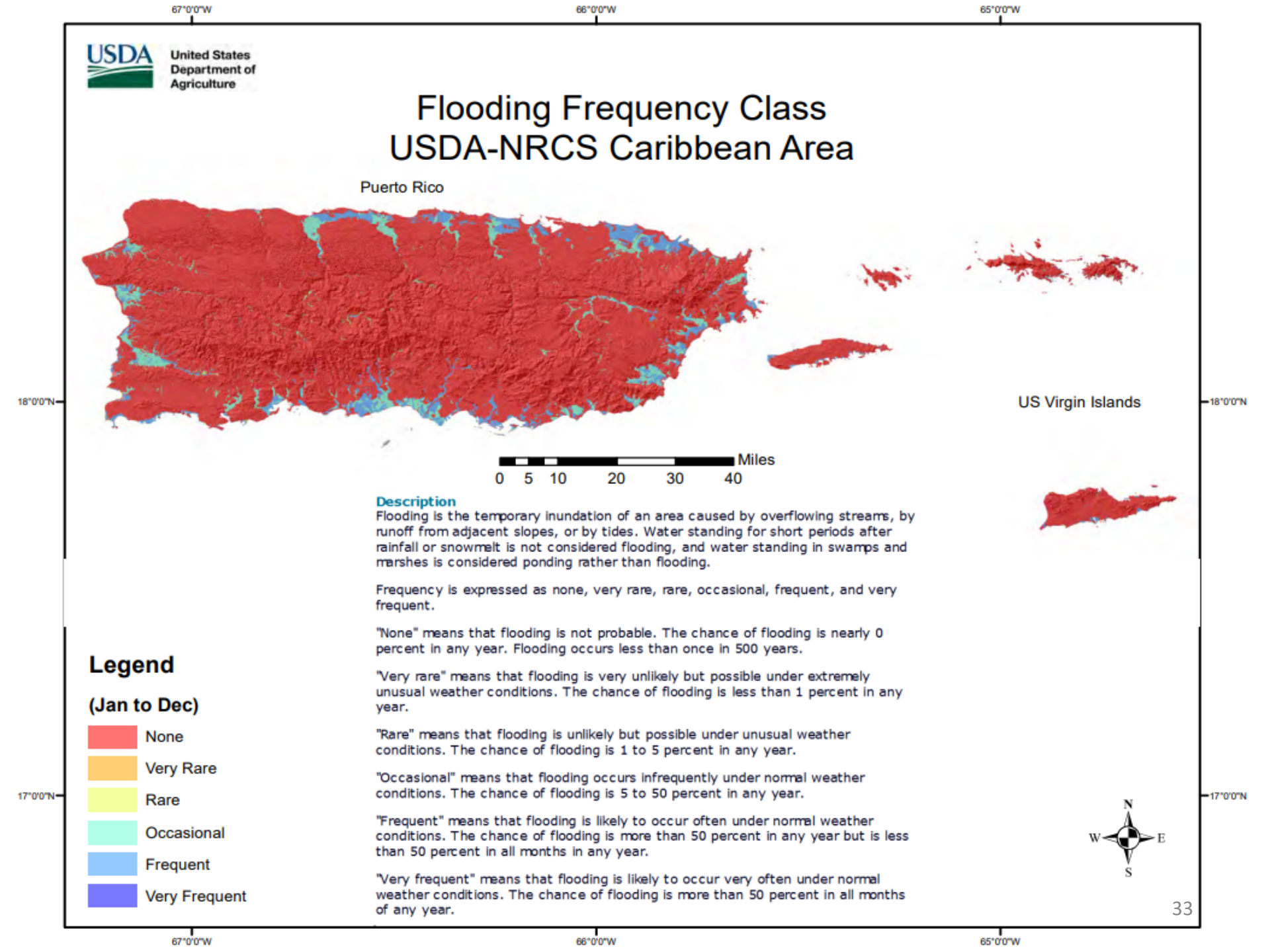
Rating

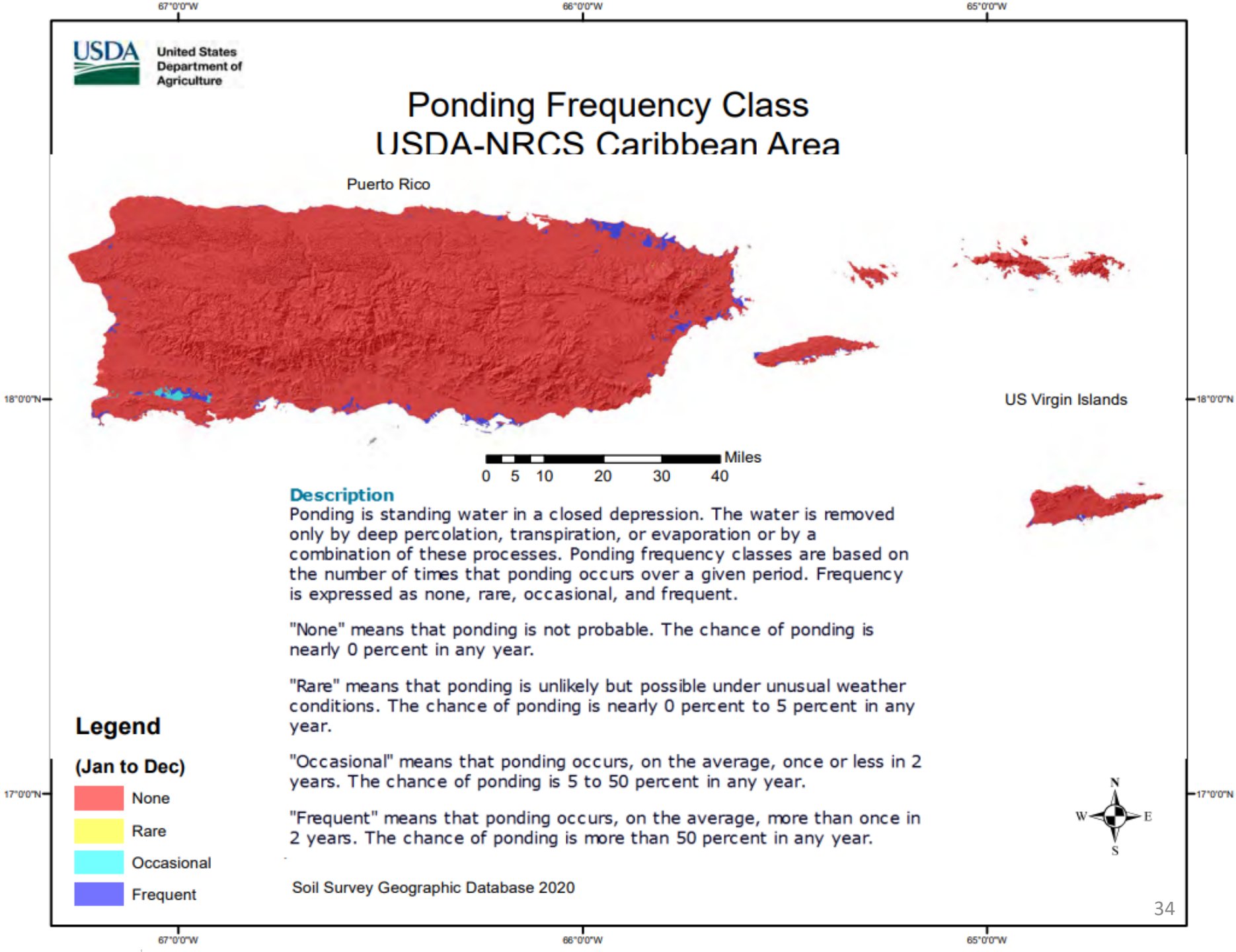
- High surface salinization risk or already saline
- Surface salinization risk
- Low surface salinization risk
- Not rated or not

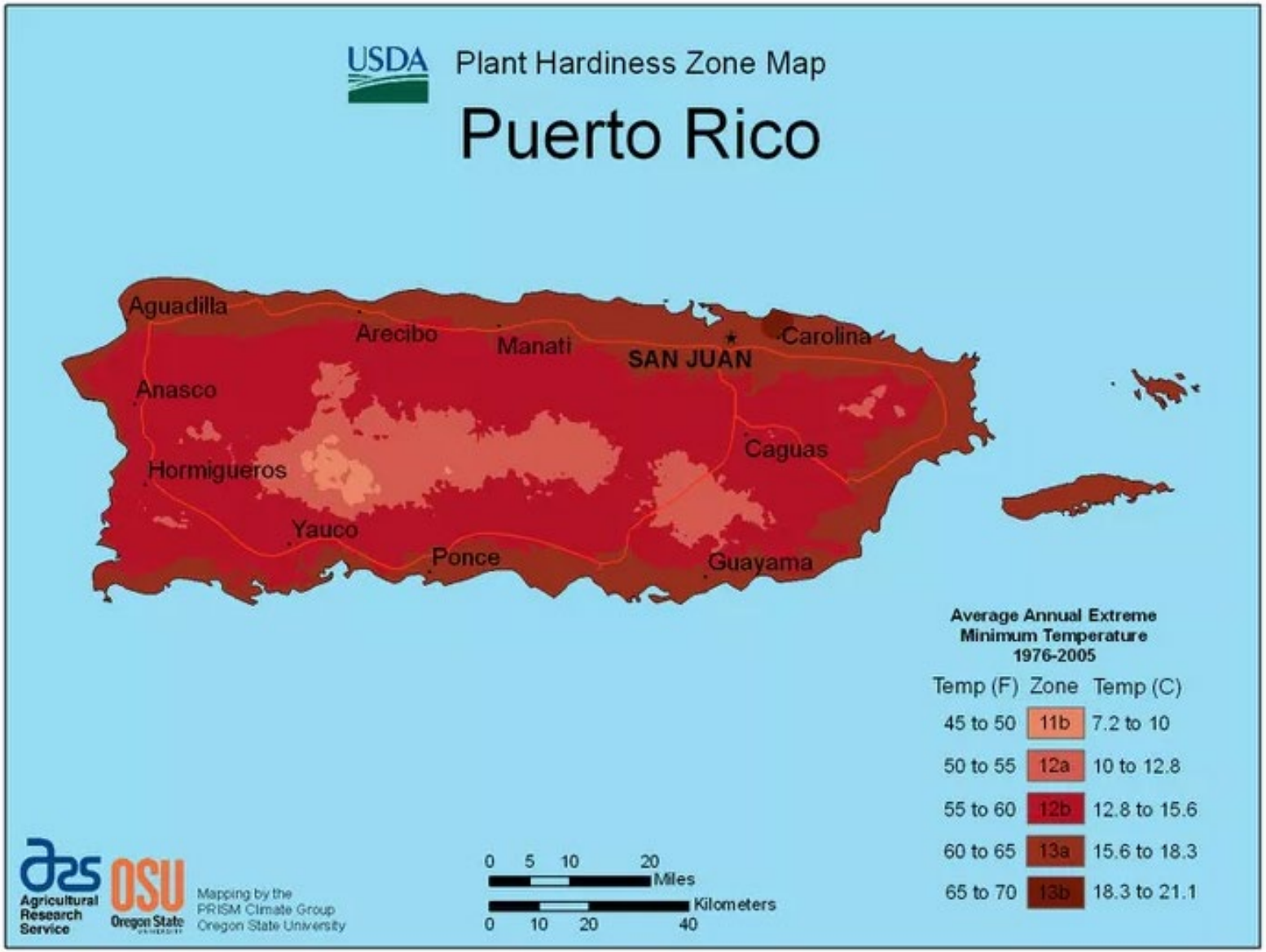
Summary

Soil health is primarily influenced by human management, which is not captured in soil survey data at this time. These interpretations provide information on inherent soil properties that influence our ability to build healthy soils through management. Salts of sodium, calcium, potassium, and magnesium are produced by the weathering of minerals in soils. Some salts can be added to the surface due to aeolian deposition. Excess salts can be concentrated in soils when precipitation is sufficient to move salts within the soil but of insufficient quantity to move the salts out of the soil. Salts move downward with percolating precipitation from the generally convex recharge areas of the landscape to the generally concave discharge areas. Net water movement can be upward in these areas due to evapotranspiration or water movement may be more or less horizontal due to restrictive layers or differences in water transmission rates. Excessive salt concentration in the surface of soil is detrimental to the germination and growth of crops due to the osmotic effects of the ions.


67°0'0"W
66°0'0"W
65°0'0"W
19°0'0"N
18°0'0"N
17°0'0"N
USDA
United States Department of Agriculture
Soil Health - Organic Matter
Puerto Rico
US Virgin Islands
0 5 10 20 30 40
Miles
Legend
Surface Layer [percent]
<= 1.5
> 1.5 AND <= 3.5
> 3.5 AND <= 5.7
> 5.7 AND <= 10
> 10 AND <= 47.5
Not rated or not available
Summary
Organic matter percent is the weight of decomposed plant, animal, and microbial residues exclusive of non-decomposed plant and animal residues. It is expressed as a percentage, by weight, of the soil material that is less than 2 mm in diameter. Soil organic matter (SOM) influences the physical, chemical, and biological properties of soils far more than suggested by its relatively small proportion in most soils. The organic fraction influences plant growth through its influence on these soil properties. It encourages soil aggregation, especially macroaggregation, increases porosity, and lowers bulk density. Because the soil structure is improved, water infiltration rates increase. SOM has a high capacity to adsorb and exchange cations and is important to pesticide binding. It furnishes energy to microorganisms in the soil. As SOM is decomposed by soil microbes, it releases nitrogen, phosphorous, sulfur, and many micronutrients, which become available for plant growth. SOM is a heterogeneous, dynamic substance that varies in particle size, carbon content, decomposition rate, and turnover time. In general, the content of SOM is highest at the surfaceΓÇöwhere plant, animal, and microbial residue inputs are greatest öand decreases with depth.
N
W
E
S

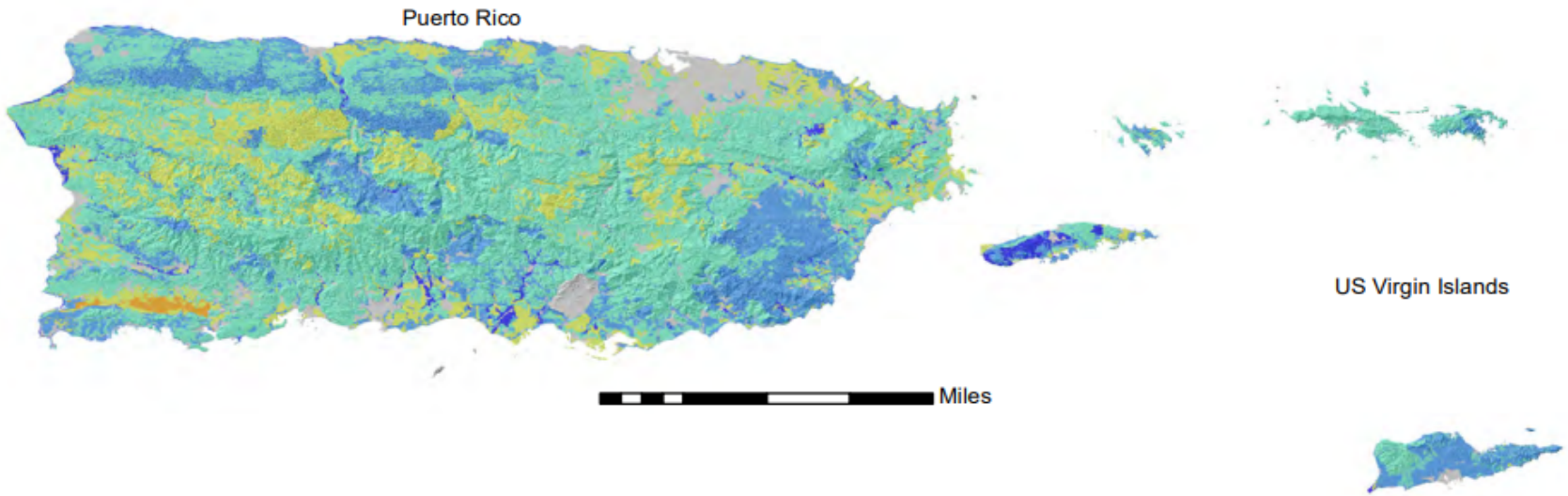

67°0'0"W
66°0'0"W
65°0'0"W
USDA
United States Department of Agriculture
Flooding Frequency Class
USDA-NRCS Caribbean Area
Puerto Rico
US Virgin Islands
18°0'0"N
17°0'0"N
Miles
0 5 10 20 30 40
Description
Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.
Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.
"None" means that flooding is not probable. The chance of flooding is nearly 0 percent in any year. Flooding occurs less than once in 500 years.
"Very rare" means that flooding is very unlikely but possible under extremely unusual weather conditions. The chance of flooding is less than 1 percent in any year.
"Rare" means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1 to 5 percent in any year.
"Occasional" means that flooding occurs infrequently under normal weather conditions. The chance of flooding is 5 to 50 percent in any year.
"Frequent" means that flooding is likely to occur often under normal weather conditions. The chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year.
"Very frequent" means that flooding is likely to occur very often under normal weather conditions. The chance of flooding is more than 50 percent in all months of any year.
Legend
(Jan to Dec)
None
Very Rare
Rare
Occasional
Frequent
Very Frequent
N
W
E
S


67°0'0"W
66°0'0"W
65°0'0"W
USDA
United States Department of Agriculture
Ponding Frequency Class
USDA-NRCS Caribbean Area
Puerto Rico
US Virgin Islands
18°0'0"N
17°0'0"N
Miles
0 5 10 20 30 40
Description
Ponding is standing water in a closed depression. The water is removed only by deep percolation, transpiration, or evaporation or by a combination of these processes. Ponding frequency classes are based on the number of times that ponding occurs over a given period. Frequency is expressed as none, rare, occasional, and frequent.
"None" means that ponding is not probable. The chance of ponding is nearly 0 percent in any year.
"Rare" means that ponding is unlikely but possible under unusual weather conditions. The chance of ponding is nearly 0 percent to 5 percent in any year.
"Occasional" means that ponding occurs, on the average, once or less in 2 years. The chance of ponding is 5 to 50 percent in any year.
"Frequent" means that ponding occurs, on the average, more than once in 2 years. The chance of ponding is more than 50 percent in any year.
Legend
(Jan to Dec)
None
Rare
Occasional
Frequent
Soil Survey Geographic Database 2020
N
W
E
S


USDA Plant Hardiness Zone Map
Puerto Rico
Aguadilla
Arecibo
Manati
SAN JUAN
Carolina
Anasco
Caguas
Hormigueros
Yauco
Ponce
Guayama
Average Annual Extreme Minimum Temperature 1976-2005
Temp (F) Zone Temp (C)
45 to 50 11b 7.2 to 10
50 to 55 12a 10 to 12.8
55 to 60 12b 12.8 to 15.6
60 to 65 13a 15.6 to 18.3
65 to 70 13b 18.3 to 21.1
Agricultural Research Service
OSU Oregon State University
Mapping by the PRISM Climate Group Oregon State University
0 5 10 20 Miles
0 10 20 40 Kilometers

USDA United States Department of Agriculture

Soils Saturated Hydraulic Conductivity (Ksat)
USDA-NRCS Caribbean Area



Legend

(All Layers) (um/s and in/hr)

- Very Low (0.0 - 0.01) (0.0 - 0.0014)
- Low (0.01 - 0.1) (0.0014 - 0.014)
- Moderately Low (0.1 - 1) (0.014 - 0.14)
- Moderately High (1 - 10) (0.14 - 1.41)
- High (10 - 100) (1.41 - 14.17)
- Very High (100 - 705) (14.17 - 99.90
- Not rated or not available

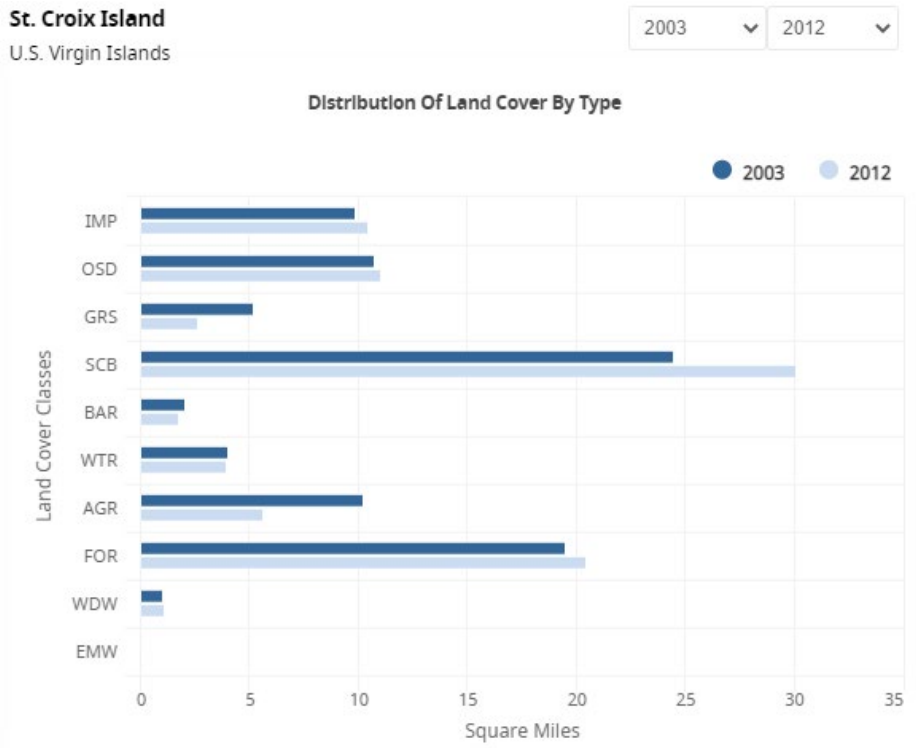
Summary
Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

N W E S

Soil Survey Geographic Database 2020

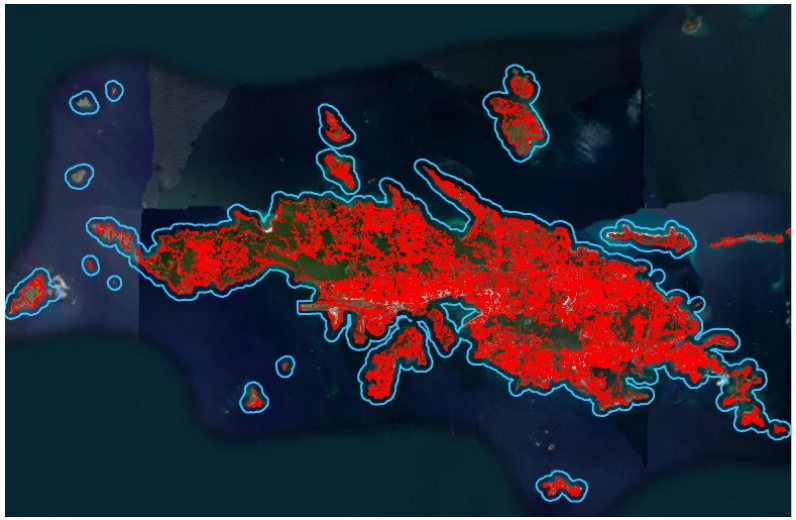
NOAA Land Cover Atlas

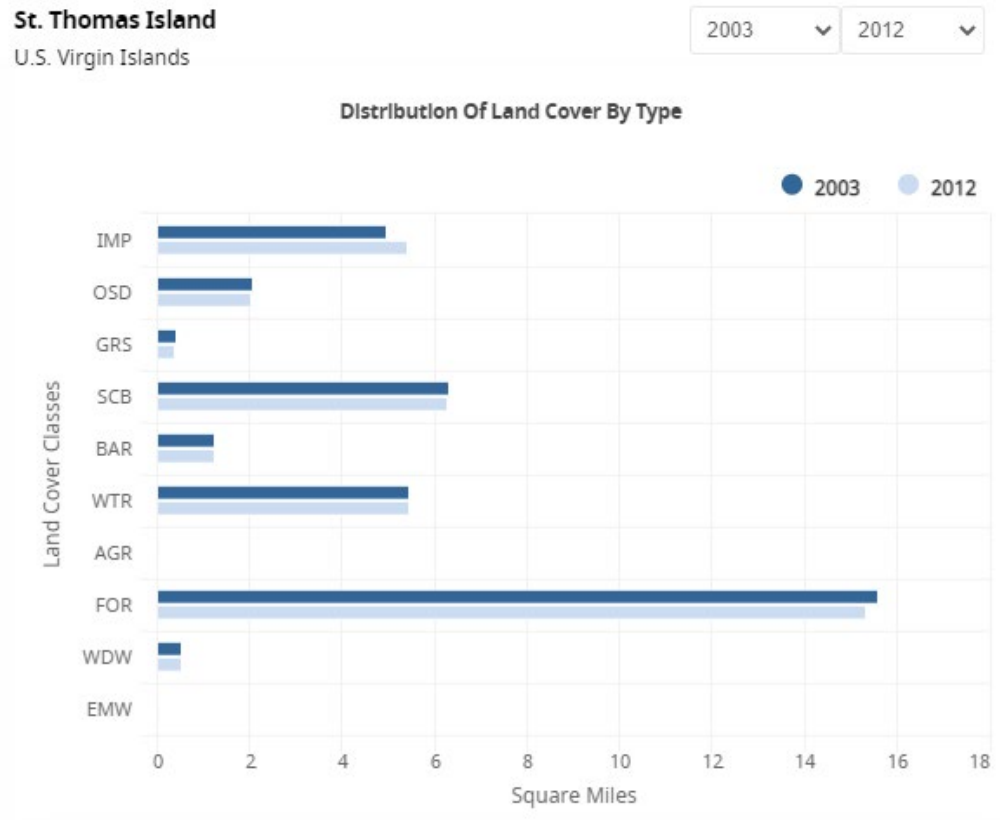
http://www.coast.noaa.gov/ccapatlas/



NOAA Land Cover Atlas

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





Review of Major Land Ownership

- The U.S. Department of Agriculture (USDA) reports that PR has 8230 farms using a total of 487,775 acres, and the USVI 565 (461 STX, 160 STT/STJ) farms using 9,324 total acres.

- The average farm size in PR is only 59.3 acres, and 16.5 acres USVI while the rest of the nation averages about 418 acres per farm.

- In PR, only 11.4% of the total 2.2 million acres of land is considered cropland (2018 AgCensus).

Review of Major Land Ownership

- 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.

Review of Major Land Uses

Caribbean Area	Puerto Rico	St. Croix	St. Thomas/ St. John
Cropland harvested	81,674	1,248	126
Other cropland	297,700	854	393
Pastureland or grazing land	50,274	5,389	150
Woodland	31,574	354	333
Other land	26,554	422	54
Total Acreage	487,775	8,269	1,056
Total # Farms	**8,230**	**461**	**104**

Agricultural Production

- History of Agriculture in Caribbean: https://www.fao.org/3/ca4726en/ca4726en.pdf?eloutlink=imf2fao

- Market Value of Ag Products Sold (2018 Census)
  - Puerto Rico $485.1M ($58,937 per farm)
  - USVI $3.34M ($5,902 per farm)

- Rank of Top Crops within the U.S. (2012 Census)
  - Puerto Rico – Coffee, Pineapple, Plantains, Bananas, Grain/Field Crops, Root crops, Dairy, Beef, Hogs
  - USVI – Vegetables, Fruits/nuts, Nursery Crops, Cattle, Hogs, Poultry, Eggs, Milk, Fish

United States Department of Agriculture
Natural Resources Conservation Service

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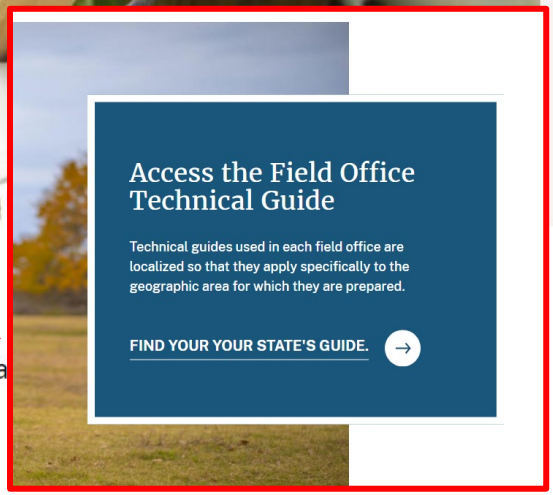
USDA Natural Resources Conservation Service
U.S. DEPARTMENT OF AGRICULTURE

Search

CONSERVATION BASICS | GETTING ASSISTANCE | PROGRAMS & INITIATIVES | RESOURCES | NEWS & EVENTS | CONTACT

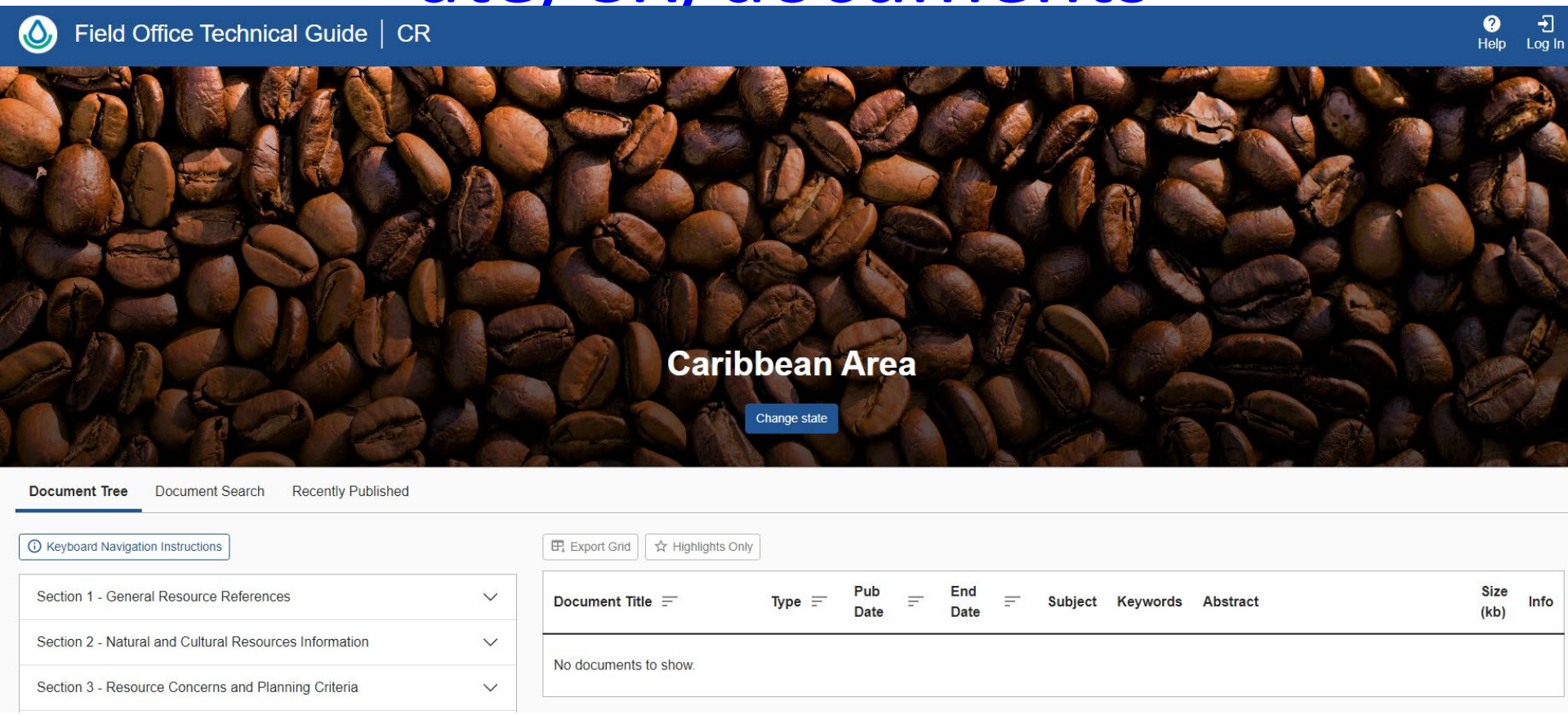
Field Office Technical Guide (FOTG)



Home › Resources › Field Office Technical Guide (FOTG)

Technical guides are the primary scientific references for NRCS. They contain technical information a
related plant and animal resources.

https://efotg.sc.egov.usda.gov/#/state/CR/documents



Review of PR/USVI FOTG Requirements

- Planning Criteria (see FOTG, Section III): https://efotg.sc.egov.usda.gov/references/public/CR/National_Resource_Concerns_and_Planning_Criteria_list_2020.pdf

- Planners should be thoroughly familiar with the conservation practice standards that have been incorporated into the PR/USVI 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 PR/USVI FOTG Section IV.

Review of Cropland Resource Concerns in PR/USVI - 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 PR/USVI - Depleted Soil Organic Matter

- Organic matter is easily lost from PR/ USVI 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 PR/USVI - 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 PR/USVI - Excessive Nutrients in Surface & 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 PR/USVI.

- These operations range from 100 AU Dairies to small piggeries consisting of less than 15 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 PR/USVI - 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 ecosystems 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 PR/USVI - 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, undesirable vegetation may 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 PR/USVI - 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)
  - Fence (382)
  - Prescribed Grazing (528)

Review of Range/Pasture Resource Concerns in PR/USVI – 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)

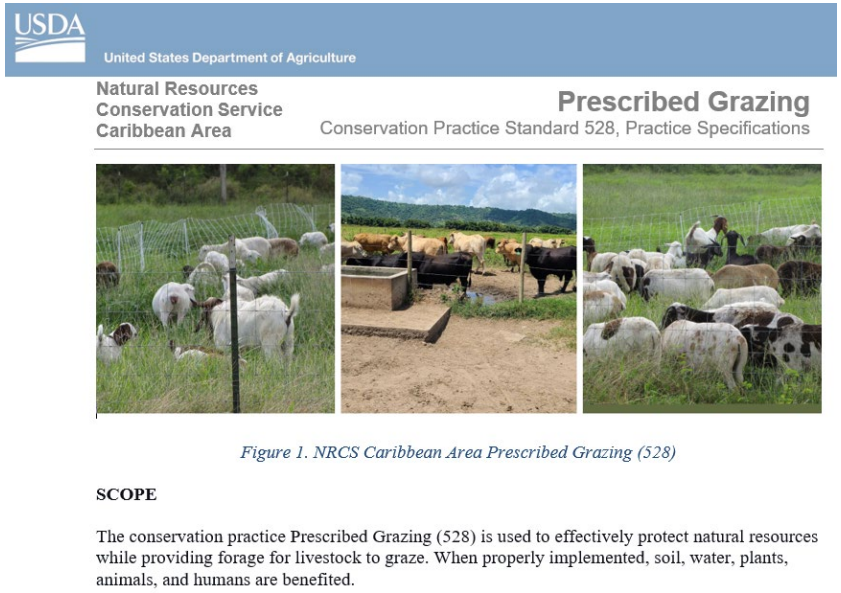
Review of Range/Pasture Resource Concerns in PR/USVI - Inadequate Livestock

- Ranching operations with 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

Prescribe Grazing CPS 528

https://efotg.sc.egov.usda.gov/api/CPSFile/34883/___



USDA
United States Department of Agriculture

Natural Resources Conservation Service
Caribbean Area

Prescribed Grazing
Conservation Practice Standard 528, Practice Specifications

Figure 1. NRCS Caribbean Area Prescribed Grazing (528)

SCOPE

The conservation practice Prescribed Grazing (528) is used to effectively protect natural resources while providing forage for livestock to graze. When properly implemented, soil, water, plants, animals, and humans are benefited.

Pasture Condition Score

https://efotg.sc.egov.usda.gov/references/public/CR/Copy_of_National_PCS_Score_sheet.xls

Operator:				Date:		
Evaluator:				Pasture ID:		
Soil(s), ESD(s) and or FSG(s):				Livestock type:		
Current Season's Precipitation (check one)	Above Normal		Normal		Below Normal	
Seasonal Temperature Trend (check 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. Sum the indicator scores to determine overall pasture condition score.						Score
Indicator	1 Point	2 Points	3 Points	4 Points	5 Points	Points
Percent Desirable Plants* (Dry Weight; for Livestock Type)	Desirable species <20% of stand.	Desirable species 20 – 40% of stand.	Desirable species 41 – 60% of stand.	Desirable species 61 – 80% of stand.	Desirable species exceed 80% of stand.	
Percent Legume by Dry Weight	<5% OR >50% bloating legumes.	5-10% legumes OR >40% bloating legume.	11-20% legumes.	21-30% legumes.	31-40% legumes. No grass loss; grass may be increasing.	
Live (includes dormant) Plant Cover	Less than 40% is live leaf canopy. Remaining is either dead standing material, or bare ground.	40-65% is live leaf canopy. Remaining is either dead standing material, or bare ground.	66-80% live leaf canopy. Remaining is either dead standing material, or bare ground.	81-95% live leaf canopy. Remaining is either dead standing material, or bare ground.	More than 95% live (non-dormant) leaf canopy. Remaining is either dead standing material, or bare ground.	

Assessment Tools - Wildlife

SVAP2

https://efotg.sc.egov.usda.gov/references/Public/OK/NWCC_99-1_Stream_Visual_Assessment_Protocol.pdf

United States Department of Agriculture

Natural Resources Conservation Service

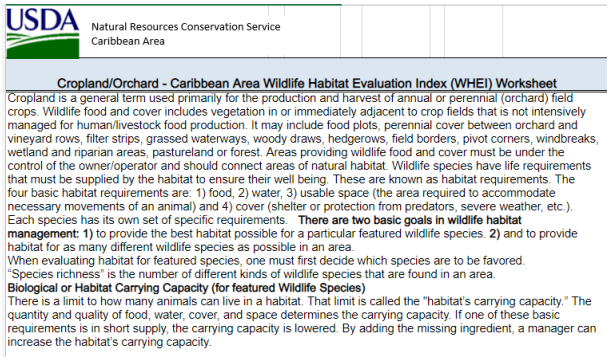
National Biology Handbook

Subpart B—Conservation Planning

Part 614 **Stream Visual Assessment Protocol Version 2**

WHEI (eFOTG Sec 1 Tools)

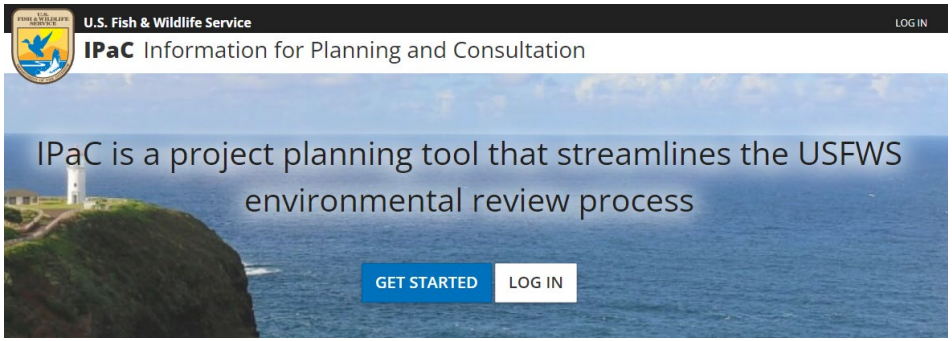
https://efotg.sc.egov.usda.gov/#/state/CR/documents/section=1&folder=42921



USDA Natural Resources Conservation Service
Caribbean Area

Cropland/Orchard - Caribbean Area Wildlife Habitat Evaluation Index (WHEI) Worksheet

Cropland is a general term used primarily for the production and harvest of annual or perennial (orchard) field crops. Wildlife food and cover includes vegetation in or immediately adjacent to crop fields that is not intensively managed for human/livestock food production. It may include food plots, perennial cover between orchard and vineyard rows, filter strips, grassed waterways, woody draws, hedgerows, field borders, pivot corners, windbreaks, wetland and riparian areas, pastureland or forest. Areas providing wildlife food and cover must be under the control of the owner/operator and should connect areas of natural habitat. Wildlife species have life requirements that must be supplied by the habitat to ensure their well being. These are known as habitat requirements. The four basic habitat requirements are: 1) food, 2) water, 3) usable space (the area required to accommodate necessary movements of an animal) and 4) cover (shelter or protection from predators, severe weather, etc.). Each species has its own set of specific requirements. **There are two basic goals in wildlife habitat management: 1)** to provide the best habitat possible for a particular featured wildlife species. **2)** and to provide habitat for as many different wildlife species as possible in an area.
When evaluating habitat for featured species, one must first decide which species are to be favored.
"Species richness" is the number of different kinds of wildlife species that are found in an area.
Biological or Habitat Carrying Capacity (for featured Wildlife Species)
There is a limit to how many animals can live in a habitat. That limit is called the "habitat's carrying capacity." The quantity and quality of food, water, cover, and space determines the carrying capacity. If one of these basic requirements is in short supply, the carrying capacity is lowered. By adding the missing ingredient, a manager can increase the habitat's carrying capacity.



Resource Concerns – Human Concerns

- For more information on the PR/USVI human resources: https://efotg.sc.egov.usda.gov/references/public/CR/EconomicSocial_CPA52_HelpSheet_CB_rev10052022.pdf

- 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

Resource Concerns – Humans (Cultural Resources)

- NRCS must conduct a historic preservation review of the land to be affected by a proposed project prior to its implementation. NRCS must comply with **Section 106 of the National Historic Preservation Act** to determine if the undertaking could harm historically significant resources.

- For more information on the PR/USVI cultural resources EFOTG Section 2: https://efotg.sc.egov.usda.gov/#/state/CR/documents/section=2&folder=12718

- AgLearn Cultural Resources Training Modules 7 and 8 specifically designe d for PR/USVI is strongly recommended for conservation planning in PR/USVI.

Examples of Cultural Resources - PR/USVI

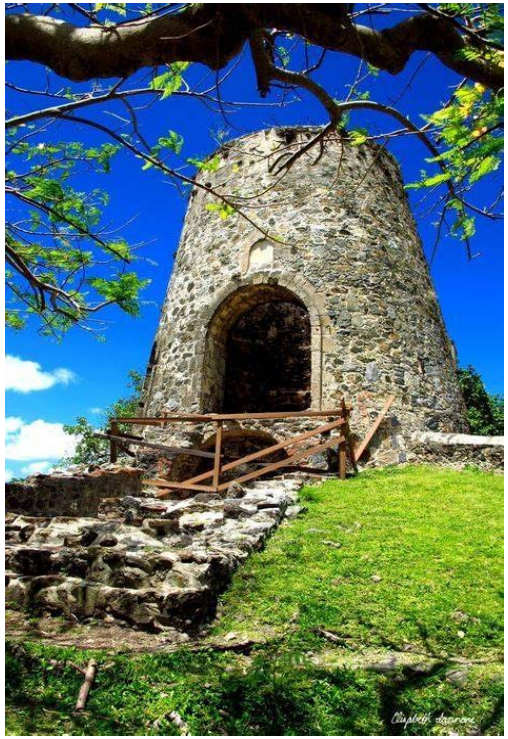
Pottery: Ceramic fragments, usually of earthenware, that were part of plates, bowls, pans, some with slip and/or decorative motifs.

Stone and Shell artifacts: Fragments of adzes, chisels, knifes, flakes, fishing hooks, beads, bracelets, and pendants, among others.

Examples of Cultural Resources - PR/USVI

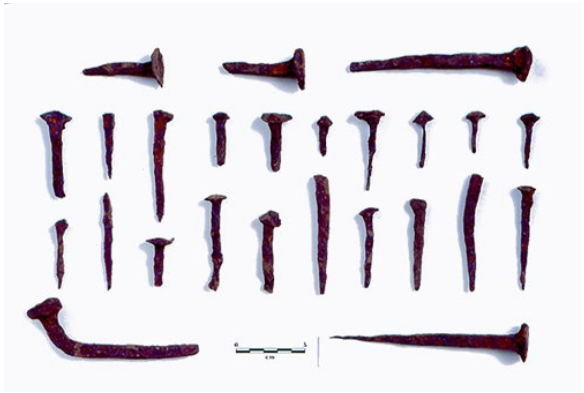
Colonial and modern periods (16th to 20th century)

Mills, culverts, bridges, chimneys, rests of machinery, canals, etc.



Resource Concerns – Humans (Cultural Resources)

Colonial and modern periods (16th to 20th century)
Nails, fragments of ceramics, metals, personal use articles, tableware, etc.



Review of State FOTG Requirements

- **Vegetative Practices**

- Refer to the Vegetative Guides and Planting Practices Jobsheet located in FOTG 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 PR/USVI. Species selection is highly variable across the PR / USVI, so this tool must be utilized for jobsheet design.
- 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 PR/USVI.

Review of State FOTG Requirements

Management Practices

- The PR/USVI Nutrient Management (590) conservation practice standard requires that Comprehensive nutrient management plans be approved by an NRCS Certified Nutrient Management Specialist.
- The PR/USVI 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 PR/USVI are listed in the Prescribed Grazing (528) specification.

Review of State FOTG Requirements

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 PR/USVI 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.

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.

Review of PR/USVI Laws Pertaining to NRCS Conservation Practices

Both PR and the USVI have professional boards;

- To set standards of qualifications, education, training, and experience for persons engaged in the fields of Agronomy, Architecture, Engineering and Land Surveying.
- To promote high standards of professional performance for those persons working in the profession.

Review of PR/USVI Laws Pertaining to NRCS Agronomic Conservation Practices

In Puerto Rico, Law No. 20-1941, as amended, **regulates the practice of the profession of Agronomist in Puerto Rico** and the Board of Examiners

To apply for license https://www.estado.pr.gov/juntas-examinadoras/agronomos

For revalidation, exam, licenses and license renewal dates, you must enter the website http://www.didaxispr.com.

Conservation practices deemed as “Agronomic” and/or “Grazing” by NRCS, **may be considered “Agronomy”** by the Puerto Rico Agronomy Board

Review of PR/USVI Laws Pertaining to NRCS Engineering Conservation Practices

- In Puerto Rico, Professional Engineers, Architects, Surveyors and Landscape Architects,

Professional Engineers

- Law number 173 of August 12, 1988 (Download), as amended (in 1997, Law 185; 1998, Law 74, 1999, Laws 047 and 104) is known as the "Law of the Examining Board of Engineers, Architects , Surveyors and Landscape Architects of Puerto Rico". The purpose of this law is to regulate the practice of engineering, architecture, surveying and landscape architecture in Puerto Rico, providing, among other things, for the registration and licensing of persons trained as such and for the certification of engineers, architects , surveyors and landscape architects in training.

Review of PR/USVI Laws Pertaining to NRCS Engineering Conservation Practices

Professional Engineers (PR)

- RECIPROCITY AND COMITY LICENSES FOR ENGINEERS AND SURVEYORS
  - Application for license of engineer or surveyor by reciprocity
  - Application for license of engineer or surveyor for special work
- LICENSES FOR ENGINEERS AND SURVEYORS
  - Application for initial license of engineers and surveyors
  - Application for renewal of license of engineers and surveyors
  - Application for license renewal for engineers and surveyors with RPA

Review of PR/USVI Laws Pertaining to NRCS Engineering Conservation Practices

- In USVI, Professional Engineers, Architects, Surveyors and Landscape Architects,

Professional Engineers (USVI)

- Government of the U.S. Virgin Islands- DEPARTMENT OF LICENSING AND CONSUMER AFFAIRS
  - All persons interested in becoming a licensed Architect, Engineer or Land Surveyor in the Virgin Islands who are not registered in any other U.S. jurisdiction will be required to sit the respective national examinations.
  - Engineers and Land Surveyors applicants are required to pass both the NCEES Fundamentals of Engineering (FE) exam and the NCEES Principles & Practice of Engineering (PE) exam. Architect applicants are to pass all sections of the ARE.

Review of PR/USVI Laws Pertaining to NRCS Engineering Conservation Practices

Professional Engineers (USVI)

LICENSURE BY RECIPROCITY

- A person holding a valid license or certificate issued by a state or territory of the United States or by a foreign country may upon application be registered in the Virgin Islands.
- The foreign country must have a national registration board of scope and standing corresponding to the National Council of Architectural Registration Boards and the National Council of State Boards of Engineering Examiners.

Review of PR/USVI Laws Pertaining to NRCS Engineering Conservation Practices

Architects and Landscape Architects (PR)

- Law No. 173 of August 12, 1988 (Download), as amended: Law No. 185 of December 26, 1997 (Download); Law 138 of July 25, 2000 (Download); Law No. 333 of December 29, 2003 (Download); Law No. 180 of December 7, 2007 (Download).
- Regulation No. 7717 of July 2, 2009, Regulation of the Examining Board of Architects and Landscape Architects (Download). Regulation No. 8380 of August 9, 2013, Regulation of Continuing Education (Download)

Review of PR/USVI Laws Pertaining to NRCS Engineering Conservation Practices

Architects and Landscape Architects (PR)

- For information related to deadlines to apply for exams or register, please call the Auxiliary Secretary of Examining Boards.
- For the application deadlines for the exam to be offered on the computer and the deadline to register, you can do it directly at www.clarb.org .
- You can also access www.clarb.org for reference manuals, statistics, study resources, and additional detailed information about this professional exam.

* Council of Landscape Architectural Registration Boards/Landscape Architecture Registration Examination

Review of PR/USVI Laws Pertaining to NRCS Engineering Conservation Practices

- Conservation practices deemed as *"engineering"* by NRCS, may be considered "engineering" by the Puerto Rico Board of Professional Engineers or the USVI Board of Registration For Professional Engineers, Architects & Land Surveyors

Additional References

- TSP information for the PR / USVI is found at: https://www.nrcs.usda.gov/getting-assistance/technical-assistance/technical-service-providers

- College of Agriculture and Mechanical Arts - University of Puerto Rico: www.UPRM.edu

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 PR/USVI, the TSP should notify the PR/USVI TSP coordinator that an RMS plan has been completed.
  - The TSP Coordinator will work with the PR/USVI 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 PR/USVI 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://techreg.sc.egov.usda.gov/RptStateContact4Admin.aspx

STATE SPECIFIC TRAINING MODULE COMPLETION CERTIFICATE

I, _____ hereby verify I have viewed and understand the content of *[enter state name]* State
TSP Name

Specific Training Module and affirm I have the knowledge, skills, and ability to conduct conservation planning services in this state.

_____ _____

TSP Signature Date

Non-Discrimination Statement

Non-Discrimination Policy

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To File an Employment Complaint

If you wish to file an employment complaint, you must contact your agency's EEO Counselor within 45 days of the date of the alleged discriminatory act, event, or in the case of a personnel action. Additional information can be found online at http://www.ascr.usda.gov/complaint_filing_file.html

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.