UPDATING THE NATIONAL WETLAND INVENTORY IN US VIRGIN ISLANDS

EPA Wetlands Program Development Grant Region 2

Agenda

1. Introductions
2. NWI Overview
3. Project Objectives
4. Methods
5. Fieldwork
6. Results

Introductions DU and FWS

Evelyn Magner
DU Geospatial Analyst

Amanda Pachomski
USFWS Regional Wetlands Coordinator

Jes Skillman
DU Geospatial Manager

Introductions DPNR

Dr. Nicole F. Angeli
Director, Division of Fish & Wildlife
Government of Virgin Islands

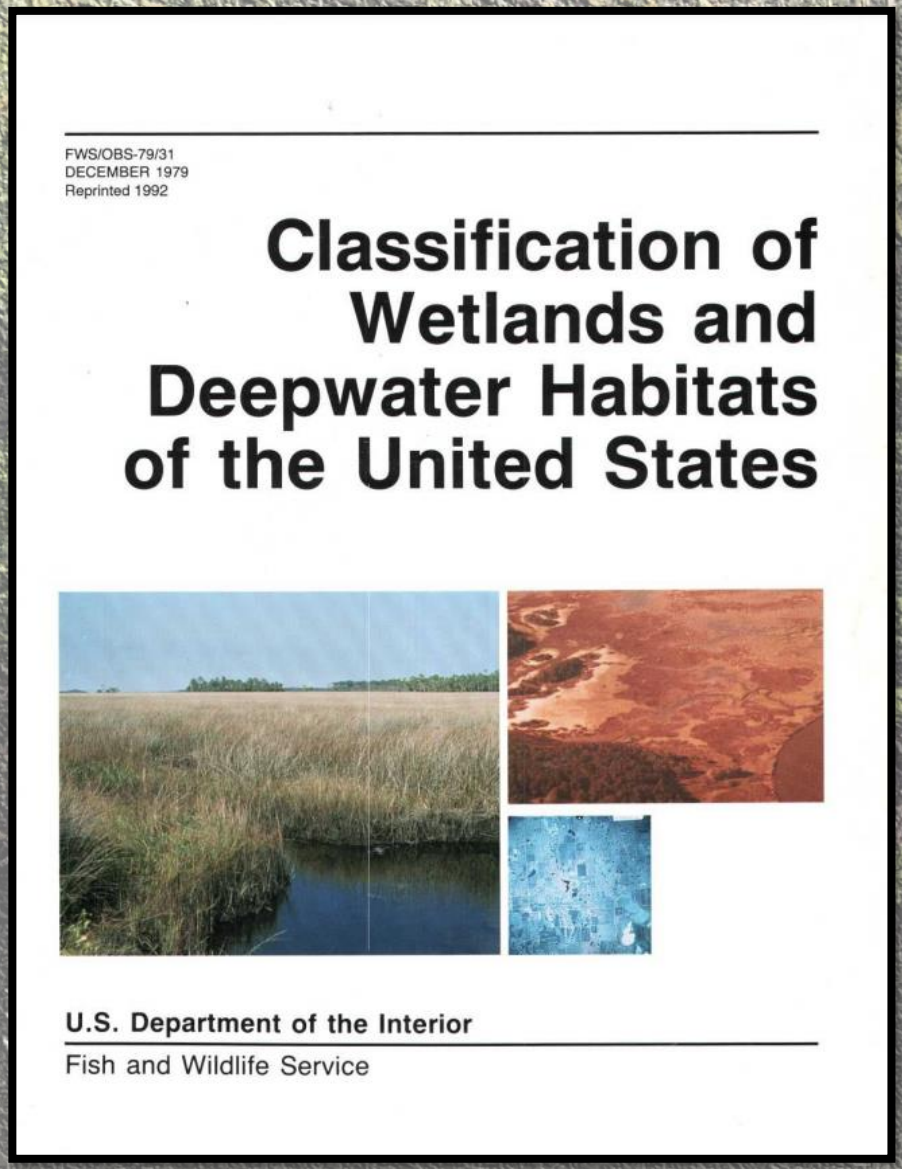
Sean Kelly
Wildlife Biologist

Julia Plotkin
Environmental Specialist

Victoria Beasley
Wildlife Biologist

National Wetland Inventory

- The authoritative map for US wetlands and deepwater habitats.
- Includes location, extent, and type of wetland.
- Supports science-based natural resource decision making.
- The FWS Wetlands Mapper Tool generates over 525,000 views annually.



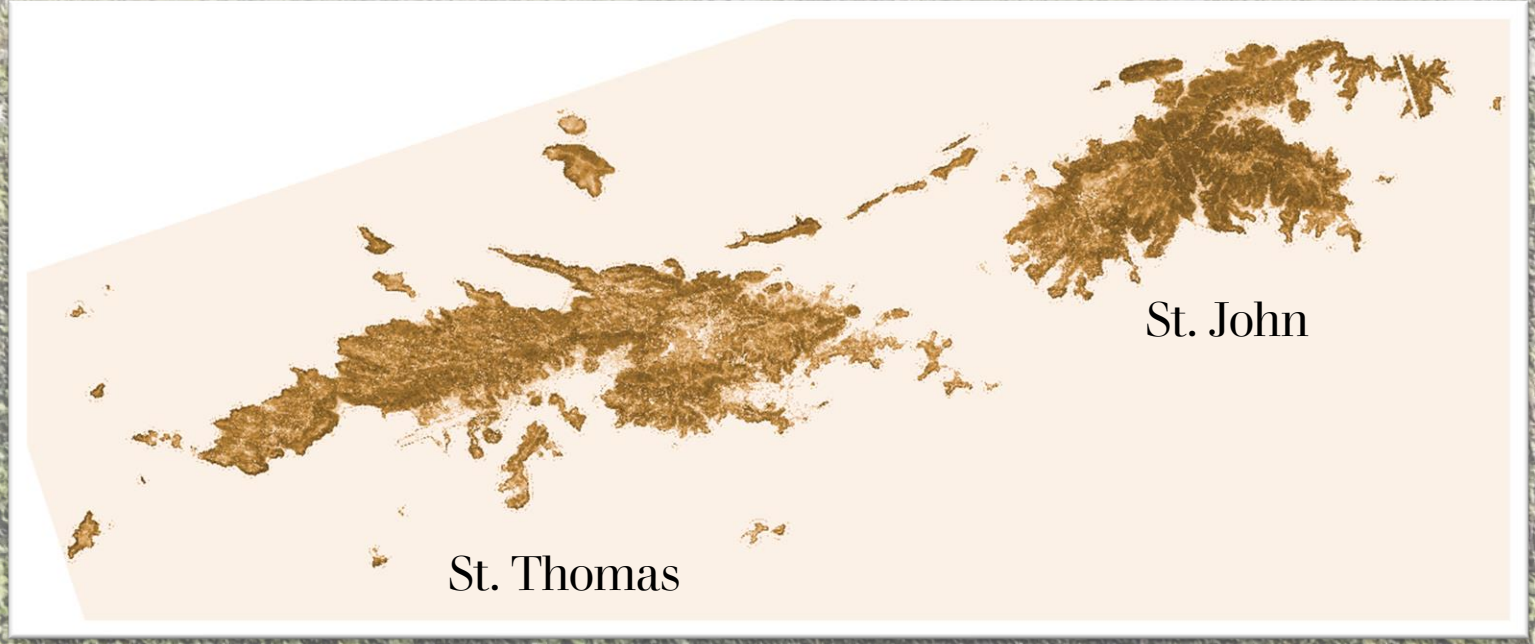
St. Thomas

St. John

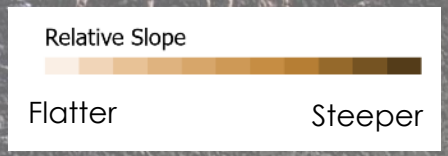
St. Croix

Project Goal

Create a National Wetland Inventory-compliant updated map of wetland habitats in the U.S. Virgin Islands.



Slope



U.S. Virgin Island NWI

- Wetland maps last updated in 2008
- Changes in water availability as well as extreme weather events (e.g. Hurricane Maria) have impacted wetland habitats.
- USVI has experienced extreme terrestrial changes due to historical agricultural practices and the introduction of non-natives

Great Salt Pond, St. Croix

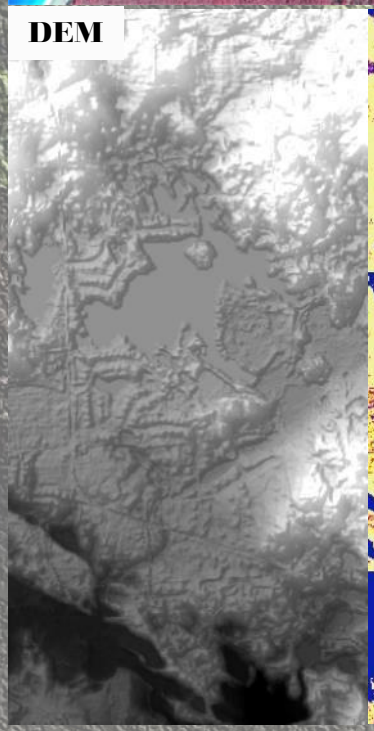
https://www.gotostcroix.com/wp-content/uploads/2021/03/STXEEMP_GreatSaltPond-FactSheet_2021.pdf
https://eastendmarineparkfriends.org/whats-up-with-great-pond/

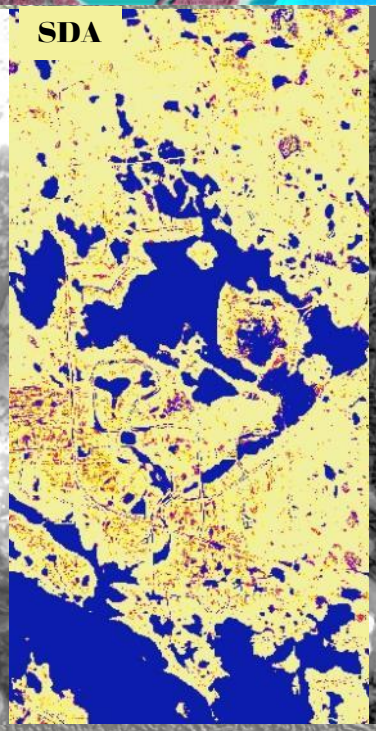
Methods

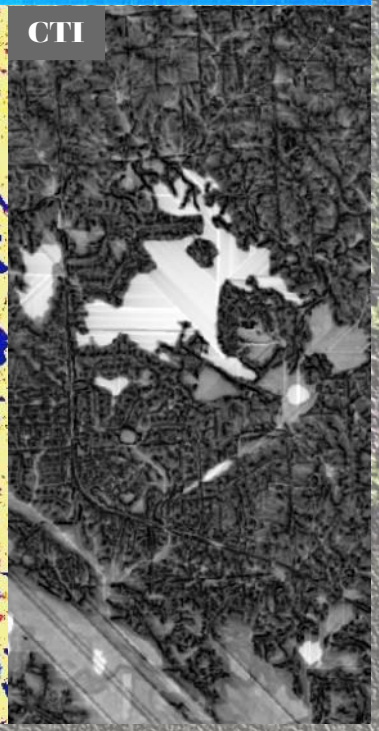
1. Collect most recent imagery and ancillary data
2. Field Work
3. Automated Ghut delineation
4. Manual Wetland and Deepwater Delineation
5. Quality Control

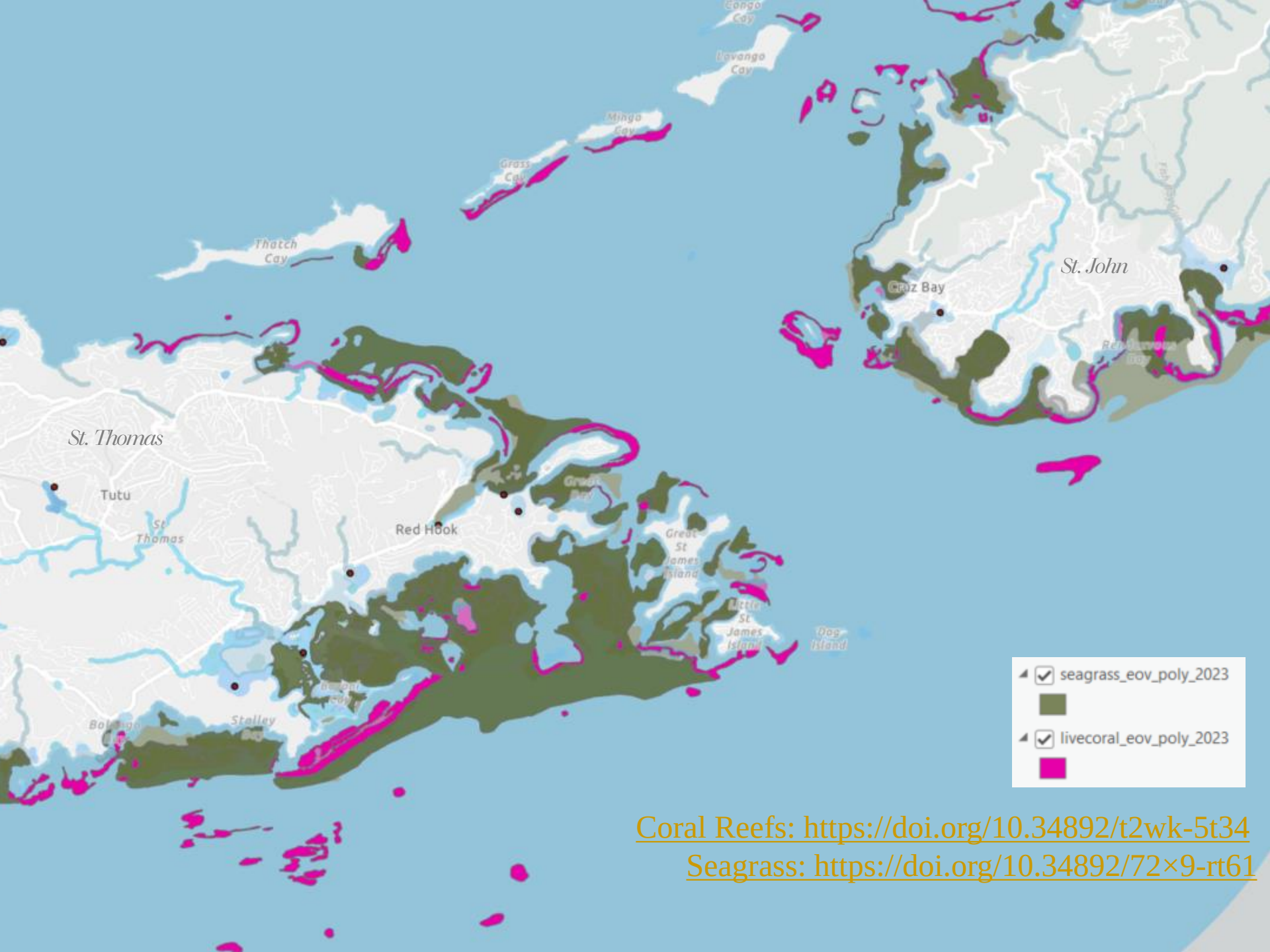
Imagery and Ancillary Data

- Base imagery is 1m 2021 NAIP Color Infrared Imagery
- Ancillary Aerial
  - Google Earth time series
- LiDAR and Derivatives – full project area coverage – Point cloud and 1m bare Earth DEM 2018
- EMODnet Seabed Habitats Product and Global Distribution of Coral Reefs





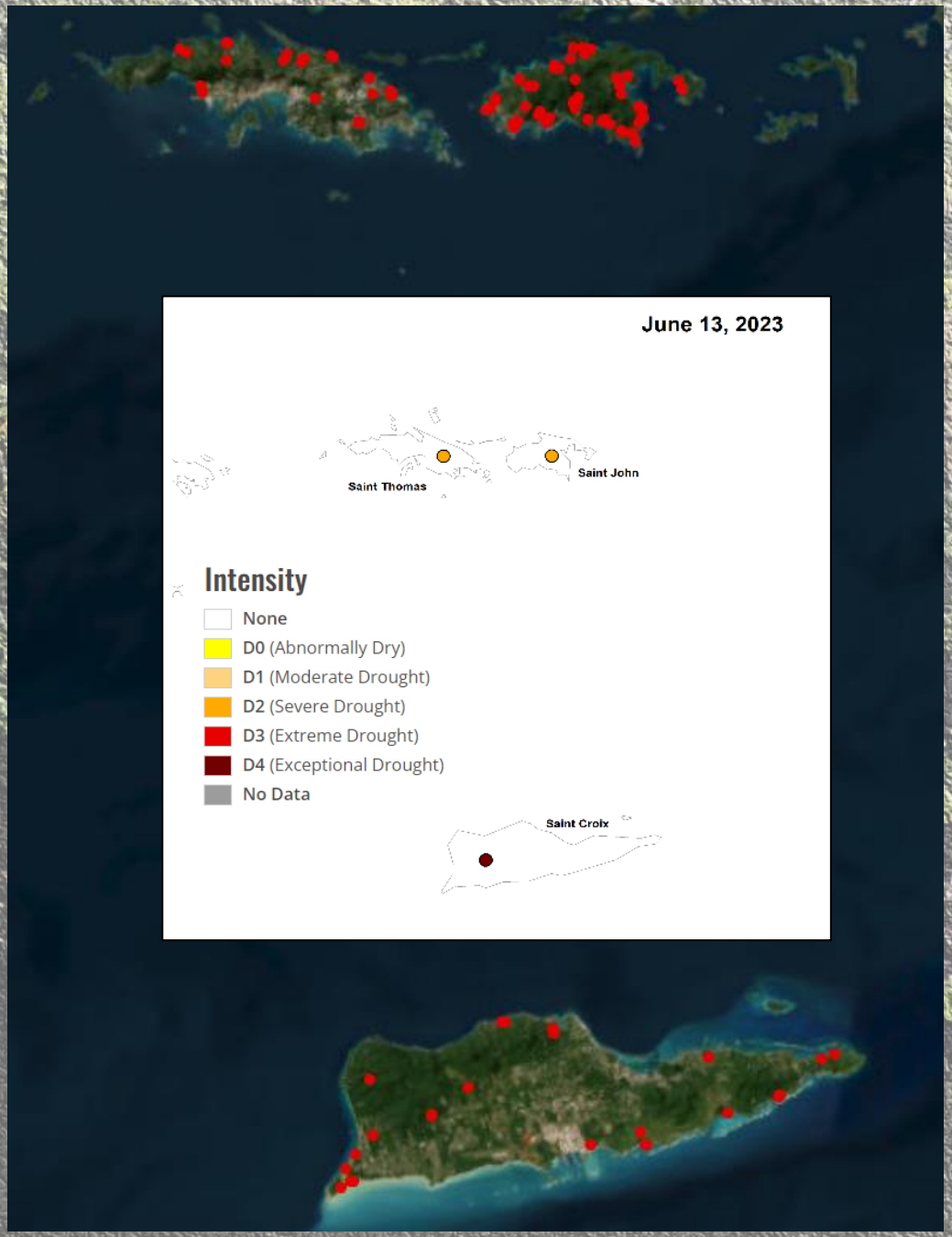




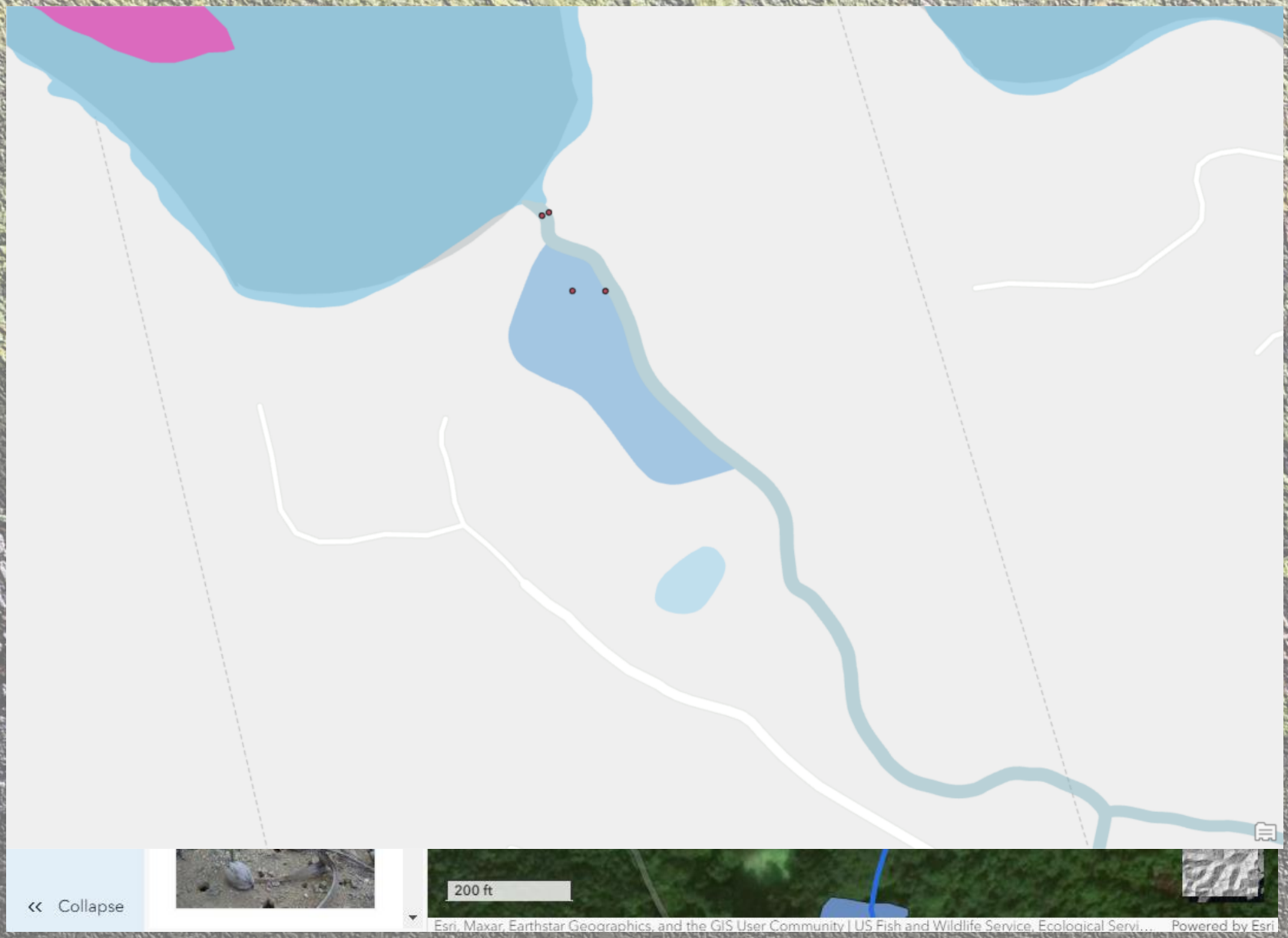
Coral Reefs: https://doi.org/10.34892/t2wk-5t34
Seagrass: https://doi.org/10.34892/72×9-rt61

Field Work (June 11 – 16, 2023)

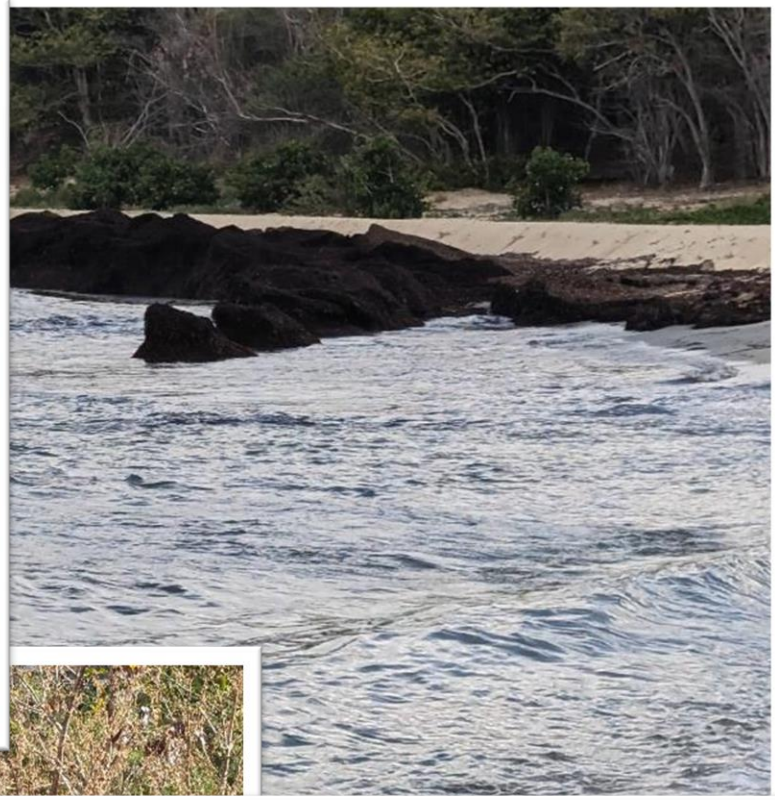
- ‘Reconnaissance’ of ground conditions via *roadside survey*
- Data collection with mobile devices with GPS location (iPads) and ESRI Field Maps app
- Joined by USVI DPNR and USFWS during fieldwork
- Fieldwork occurred during extreme and exceptional drought conditions.
- Collected 121 points, St. Croix 31, St. Thomas 30, St. John



Field Points Provided to USFWS

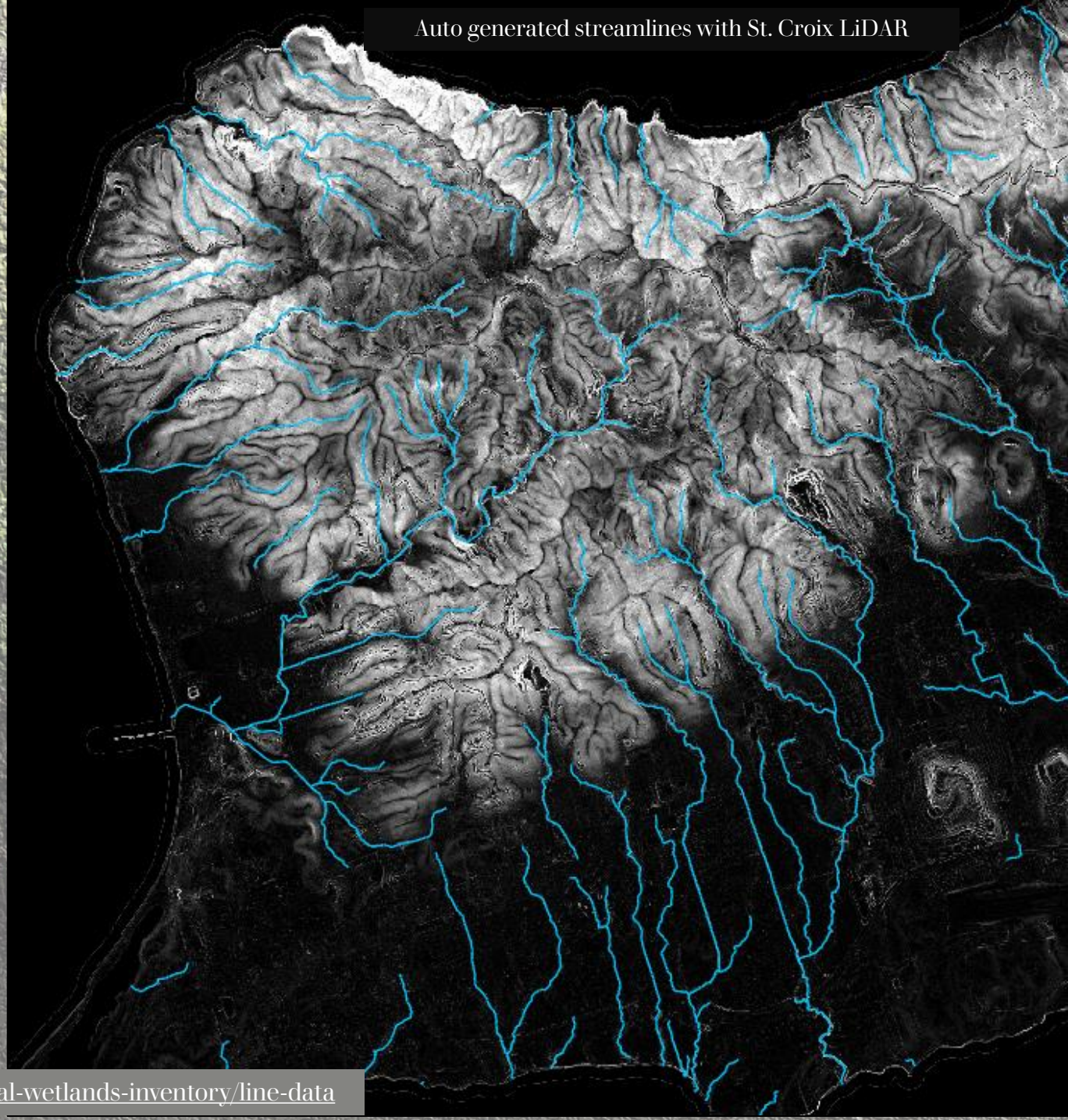


A few field pictures...



Riverine Features

- Intermittent /ephemeral riverine features (watercourses/ghuts)
- Generated via Elevation Derived Hydrography (EDH)
  - Flowlines generated from DEM
  - Linears buffered to polygons and attributed with a Cowardin classification code (e.g. R4SBC)



https://www.fws.gov/program/national-wetlands-inventory/line-data

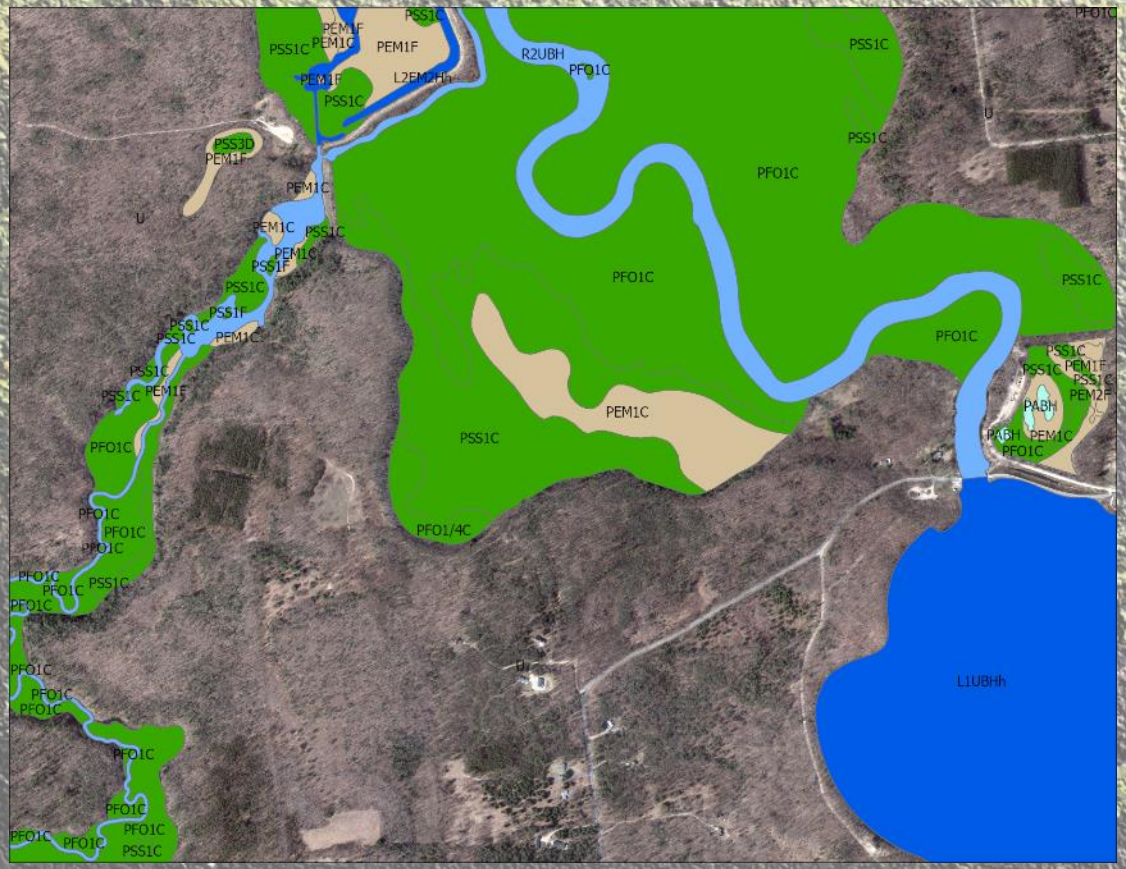
Photo Interpretation

1. Waterbodies

2. Buffer streamlines; clip or merge to waterbodies

3. Add wetlands boundaries; clip water features

4. Photo Interpretation Refinement and Quality Control



Quality Control

Manual QC

Automated QC Tools for topo errors, incorrect wetland codes, slivers, adjacent attributes

Data submitted at regular intervals to the USFWS Coordinator (July – November (2023)

Manual edits based on USFWS Comments (November – December 2023)

Data and metadata submitted for final QA with metadata (January 2024)

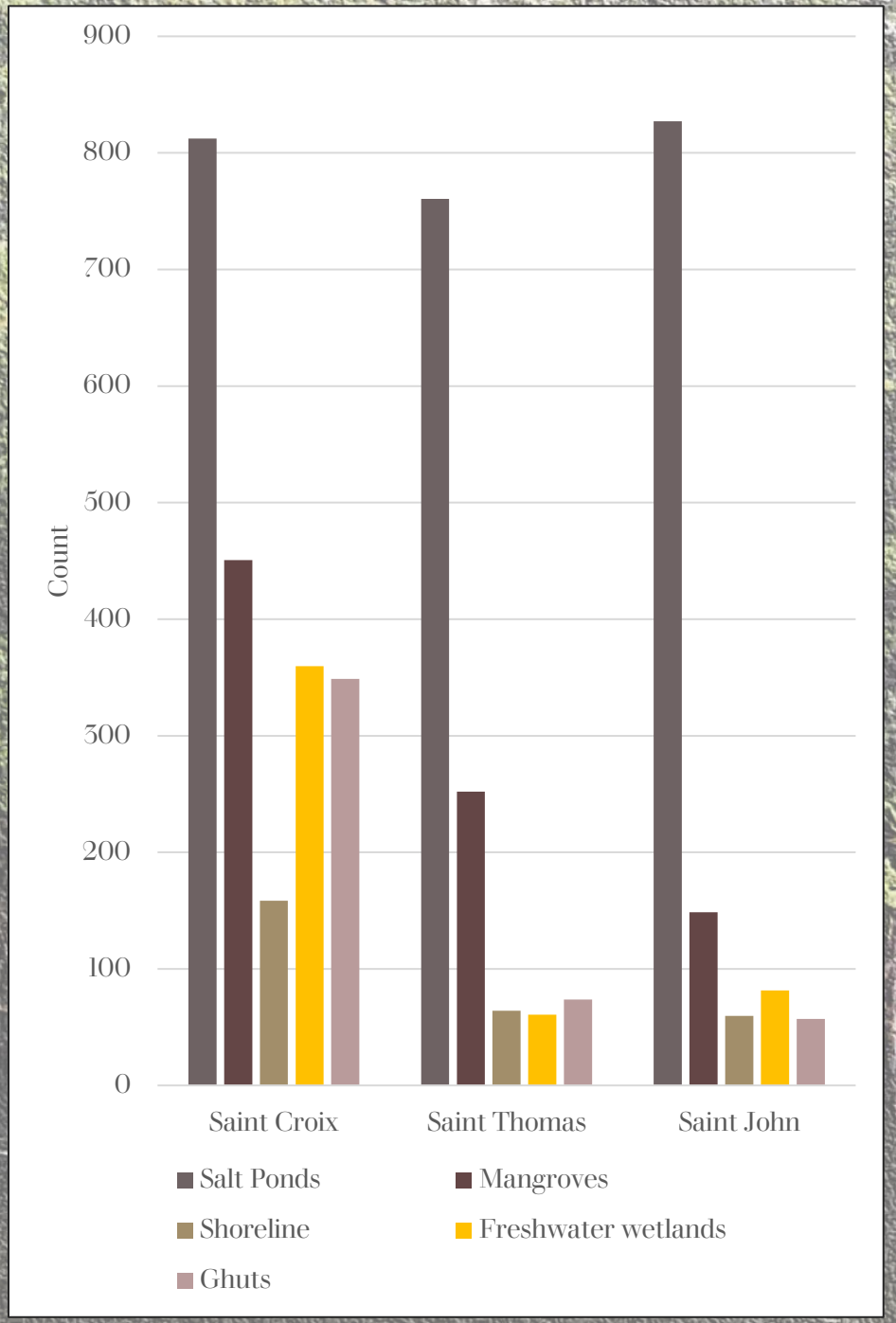
Data accepted and added to the national database (October 2024)

What was mapped

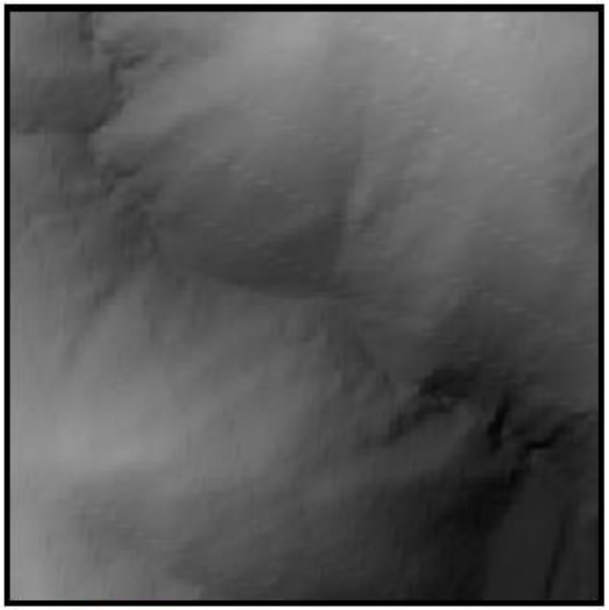
479.5 acres of 'ghuts'
125 acres of freshwater ponds (human-made)
235 acres of forested/shrubby wetland
80 acres of freshwater emergent wetland

65% features are estuarine or marine

Wetland Type	Count	Acres
Estuarine and Marine Deepwater	754	386995.1
Estuarine and Marine Wetland	443	1545.125
Freshwater Emergent Wetland	125	79.11623
Freshwater Forested/Shrub Wetland	77	235.0998
Freshwater Pond	128	124.7588
Riverine	318	479.5516
Grand Total	1845	389458.8



1.0.1 CIR



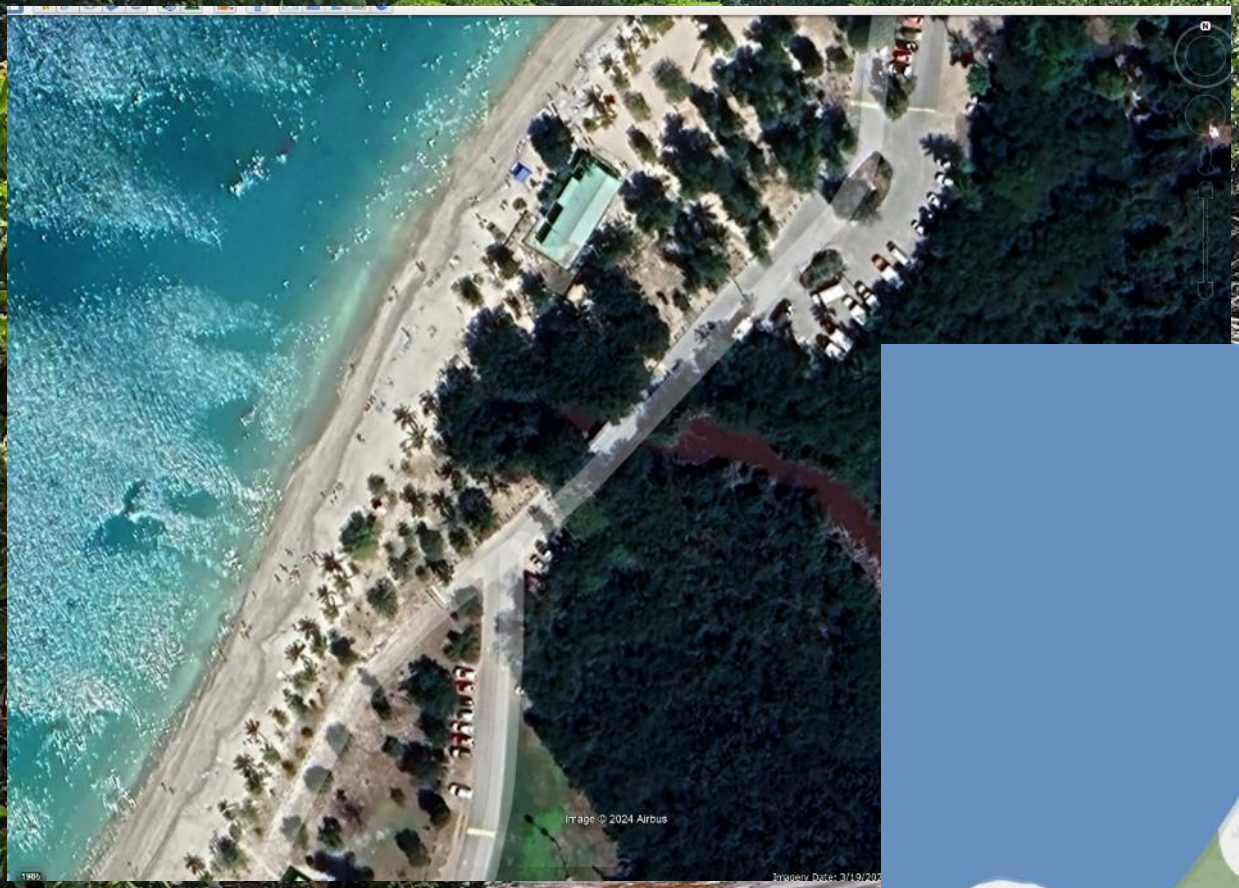
1.0.2 DEM

1.0.3 Field Picture

Intermittent Riverine, Seasonally Flooded R4USC(x)

Riverine channels that contain flowing water only part of the year. These ghuts start at high elevations and carry rainwater down to the ocean after large rain events. 467 acres.

Flooded Ghut, Magens Beach



1.0.1 CIR

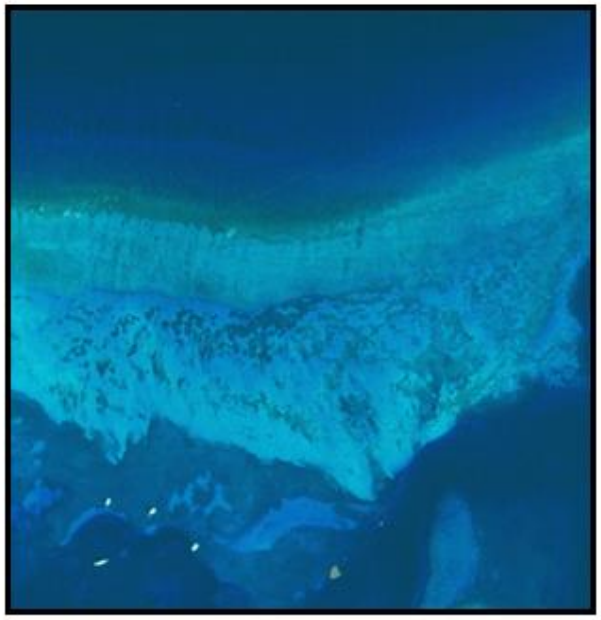
1.0.2 DEM

1.0.3 Field Picture

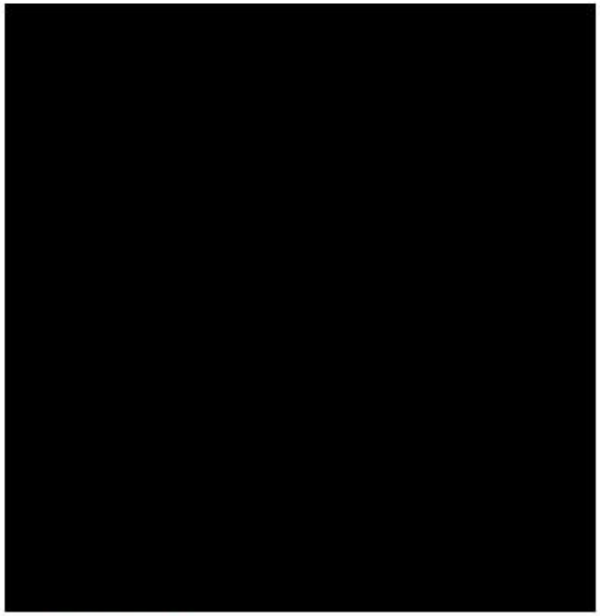
M1UBL
Subtidal Marine

Open ocean with sand bottom.

366,260 acres



1.0.1 CIR



1.0.2 DEM

M1RFL
Subtidal Marine

Reefs in open ocean.

8,369 acres

1.0.1 CIR

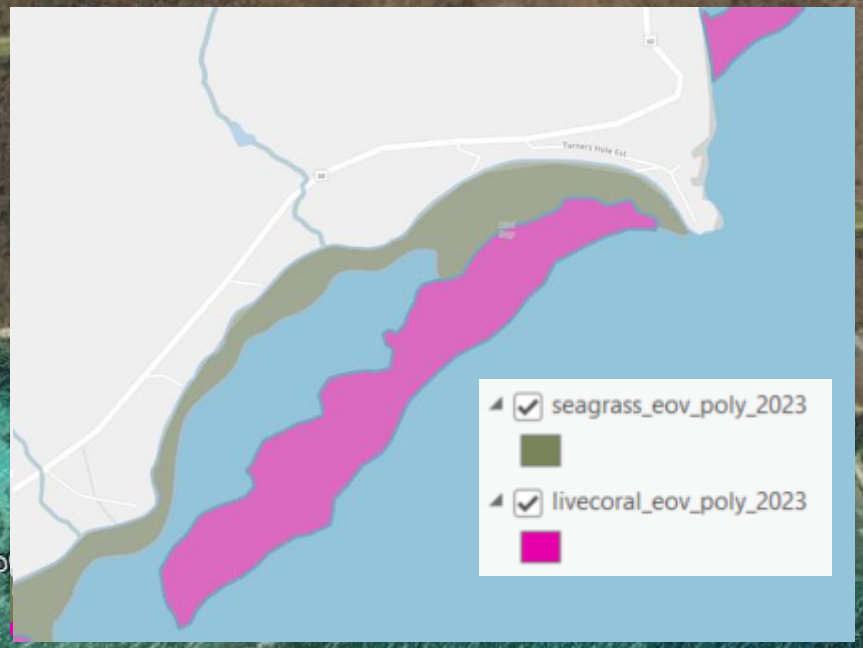
1.0.2 DEM

1.0.3 Field Picture

M1AB3L

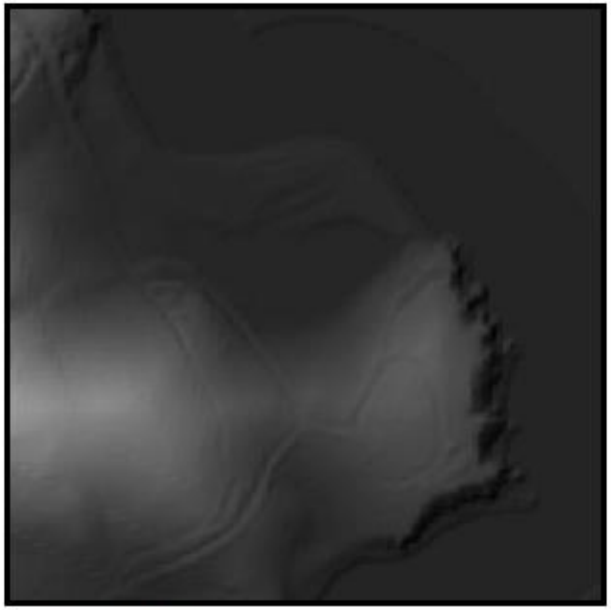
Seagrass rooted in open ocean.
10,214 acres

Seagrass, Woodcottage Bay (St. Croix)



S Shore Rd
Woodcottage Bay
S Shore Rd
Rod Bay
Sunkissed Villa
m Bay

3.0.1 CIR



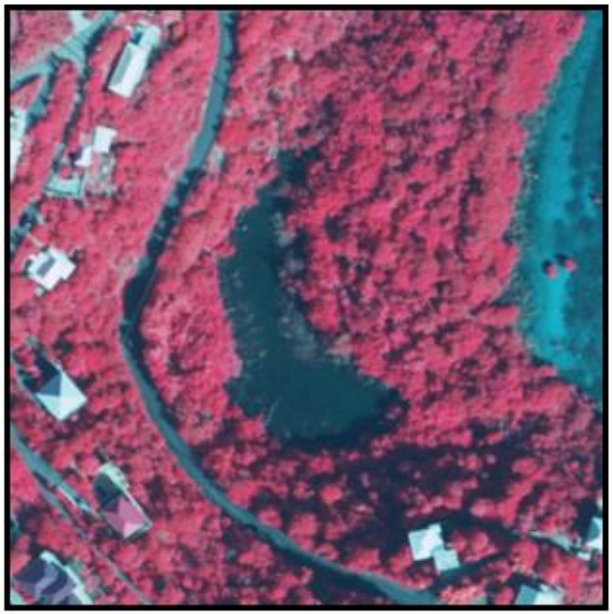
3.0.2 DEM

3.0.3 Field Picture

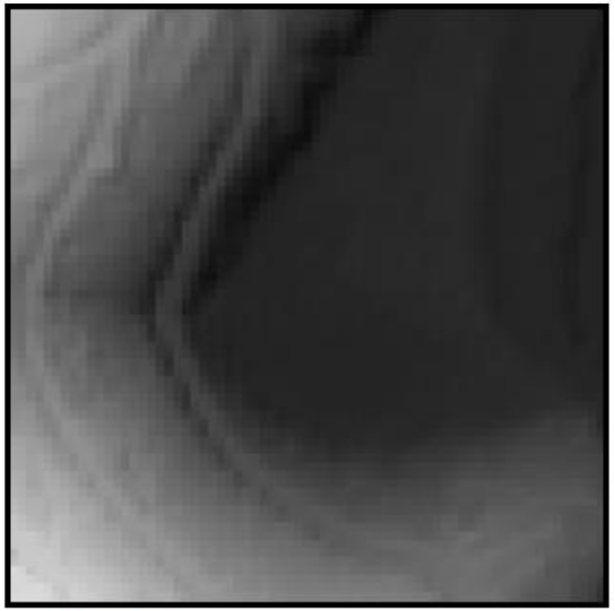
E1UBL

Permanent saltwater ponds located in flat coastal areas.

689 acres



1.0.1 CIR



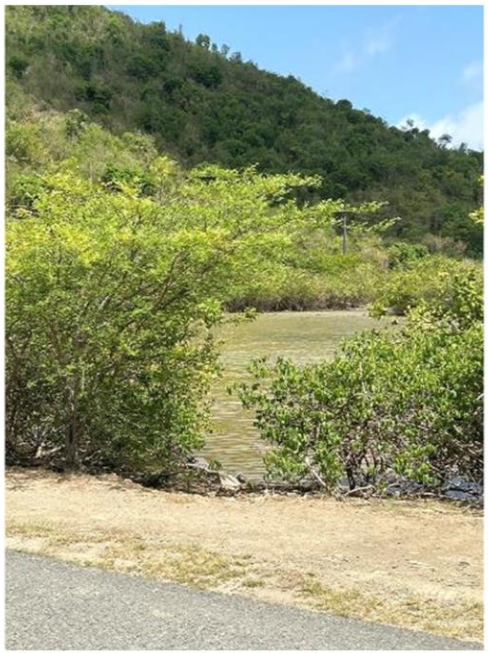
1.0.2 DEM

1.0.3 Google Earth Image (3/2021)

E2USN/M

Coastal saltwater ponds that dry up at regular (M), or irregular intervals (N) usually during the dry season. May be able to gauge this in yearly Google Earth Imagery.

Irregularly Dry Coastal Salt Pond (E2USN), St. John

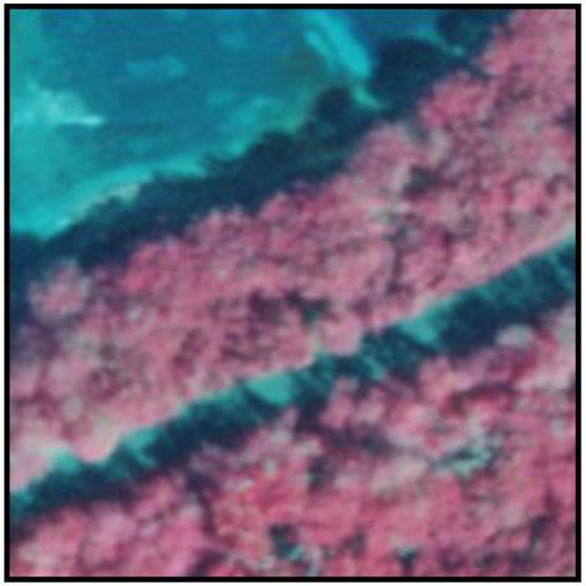


Mangroves

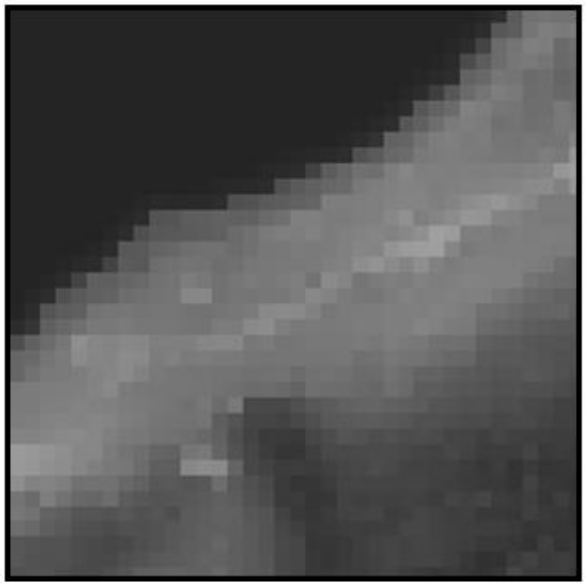
White (buttonwood) mangrove (*Laguncularia racemosa*)

Black mangrove (*Avicennia germinans*)

Red mangrove (*Rhisophora mangle*)



1.0.1 CIR

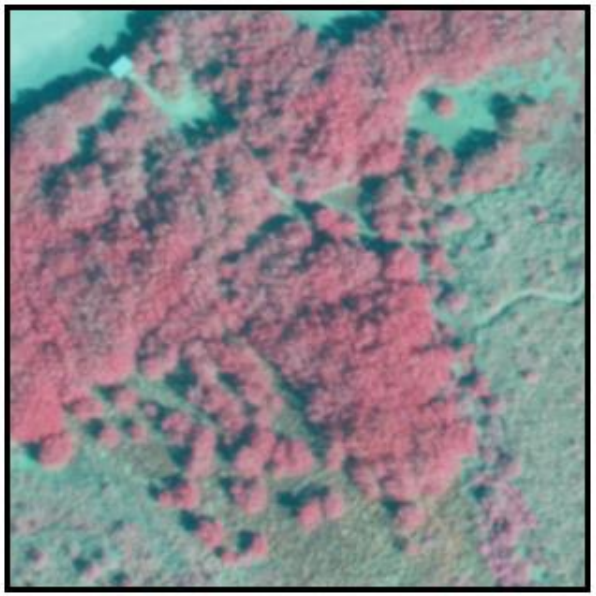


1.0.2 DEM

1.0.3 Field Picture

E2SS3P

Irregularly flooded (buttonwood white) mangrove stands 367 acres



1.0.1 CIR

1.0.2 DEM

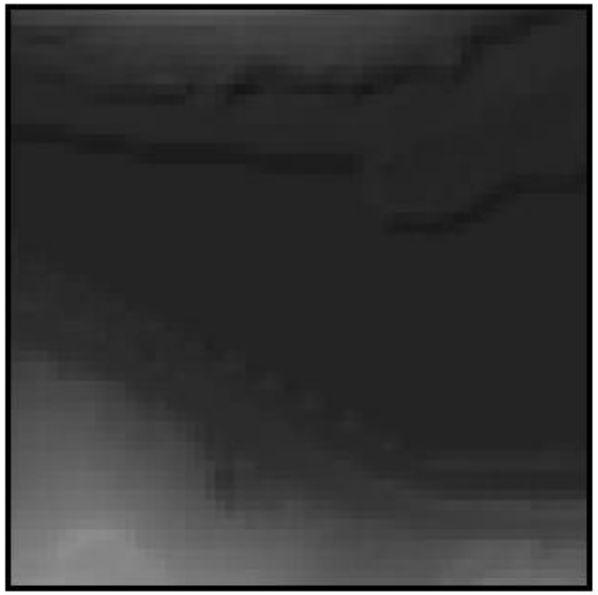
1.0.3 Field Picture

E2SS3N

Regularly flooded mangroves (buttonwood, black) mangrove stands

349 acres

1.0.1 CIR



1.0.2 DEM

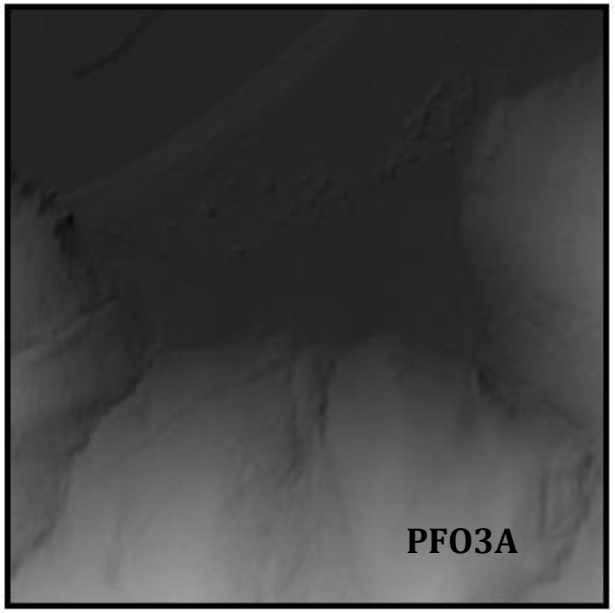
1.0.3 Field Picture

E2SSM

Irregularly exposed mangroves (red or black)

105 acres

2.2.1 CIR



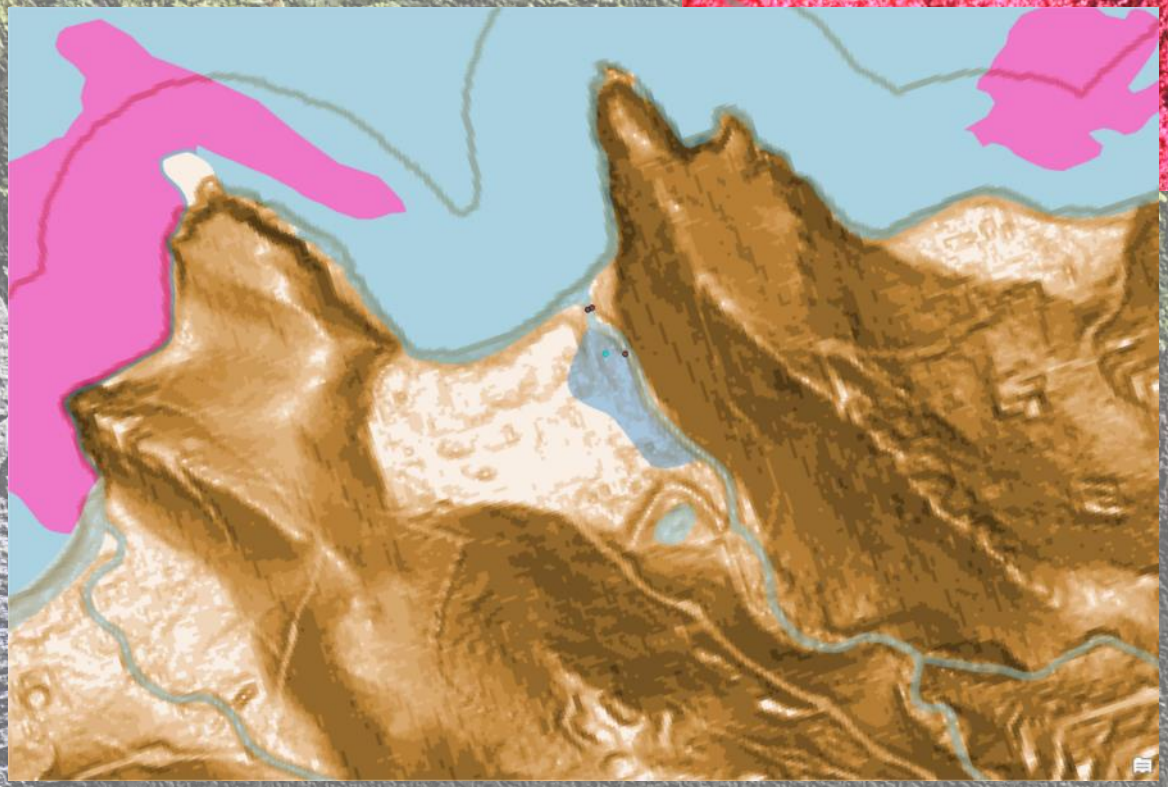
2.2.2 DEM

2.2.3 Field Picture

PFO3A

Forested Wetlands flooded after large rain events. Water tolerant non-mangrove species
66 acres

Slope and NAIP CIR View



2.0.1 CIR

2.0.2 DEM

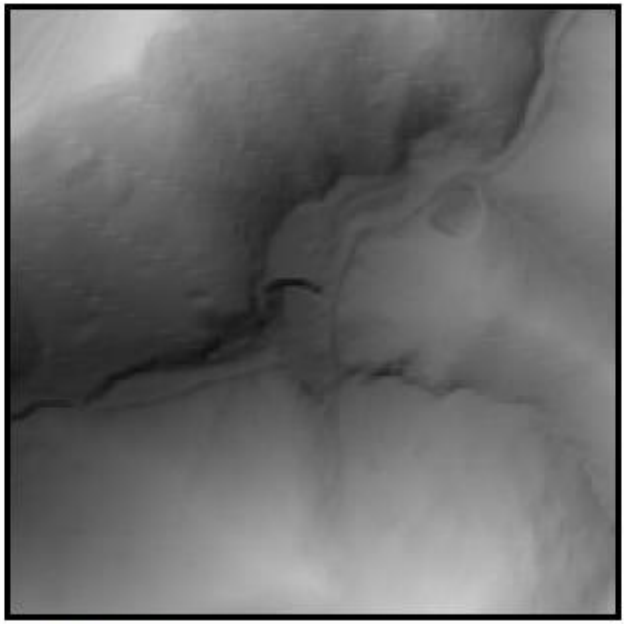
2.0.3 Field Picture

PUBHx or PUBHh

Excavated or impounded freshwater ponds.

48 acres

2.1.1 CIR



2.1.2 DEM

2.1.3 Field Picture

PUBCx or PUBCh

Seasonally flooded ponds, often in dammed portions of ghuts

70 acres

Thank you!

U.S. VIRGIN ISLANDS
DEPT. OF PLANNING AND NATURAL RESOURCES

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

U.S.
FISH & WILDLIFE
SERVICE
DEPARTMENT OF THE INTERIOR

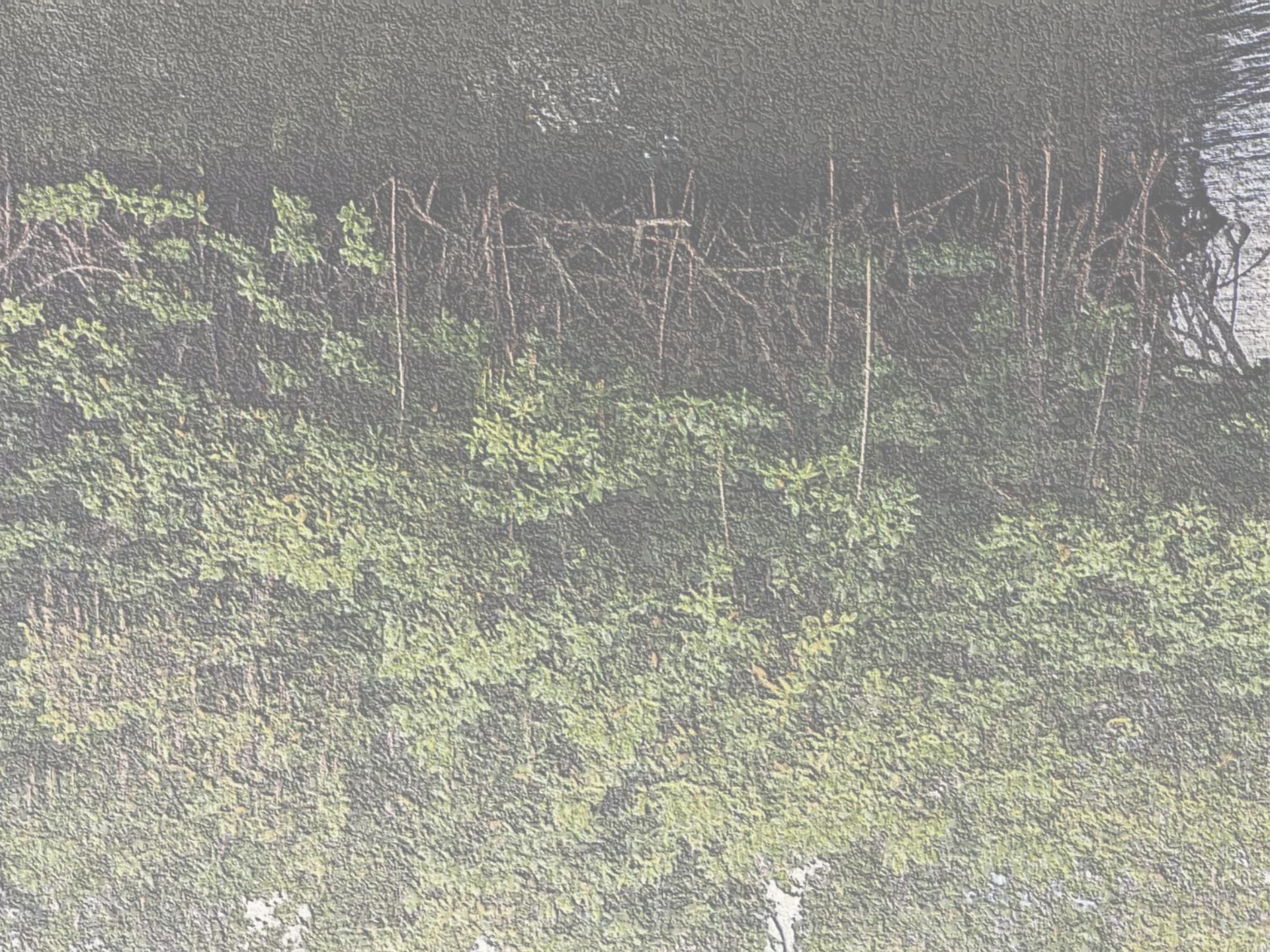


Table 4. TMU and PA† Requirements

	Lower 48 States, Hawaii, & Territories *	Estuarine & Lacustrine Deepwater **	Alaska (Including Deepwaters)
TMU	0.5 acres (0.2 ha)	1.0 acres (0.4 ha)	5.0 acres (2.0 ha)
Feature Accuracy (Wetland Identification)	98%	98%	98%
Attribute Accuracy (FGDC Wetlands Classification)	85%	85%	85%

Table 5. Horizontal RMSE Accuracy Requirements

	Lower 48 States, Hawaii, & Territories *	Estuarine & Lacustrine Deepwater **	Alaska (Including Deepwaters)
Horizontal RMSE Accuracy	5m	15m	25m

*Includes the lower 48 states, Hawaii, District of Columbia, Trust Territories, Puerto Rico, and the Virgin Islands. Estuarine and lacustrine deepwater habitats are excluded. Alaska is also excluded.

**Includes the Estuarine and Lacustrine deepwaters of the lower 48 states, Hawaii, District of Columbia, Trust Territories, Puerto Rico, and the Virgin Islands. Alaska is excluded.

Great Pond Byp
62
624
Hill St
Hill St
Southside Rd
Southshore Rd Magen's Bay Rd
Sea View Dr
David Oliver Dr
Tamarind Dr
Corry Dr
Sunset Dr
Southshore Rd
Great Pond
Great Pond Bay