



ETree

Everglades Tree Island Indicator Web Application

Saira M. Haider¹, Craig van der Heiden², Marcel Bozas³, and Stephanie S. Romañach¹

1 - U.S. Geological Survey, 2 - Seminole Tribe of Florida, 3 - Miccosukee Tribe of Indians of Florida

April 2025

JEM



Project development



- USGS co-designed with the Miccosukee Tribe of Indians of Florida and Seminole Tribe of Florida
 - Craig van der Heiden, Kevin Cunniff, Marcel Bozas, and Jed Redwine
- Developed a dashboard mockup for the decision support tool
- Hosted meetings and workshop in fall 2022 to gather input from SFWMD, USACE, ENP, FWVS, and other agencies and institutions

Available at <https://sofia.usgs.gov/eden/etree>

ETree Overview



Tree island: *“Spatially discrete patches of woody vegetation embedded in a wetland landscape of contrasting vegetation type”*

- RECOVER Tree Island task team

- Easy-to-use visualizations
- Data downloads
- Near-daily hydrologic indicators for 400 tree islands
- Historical hydrologic indicators for 400 tree islands



Map Layers

Tree Islands Point Size
1 20

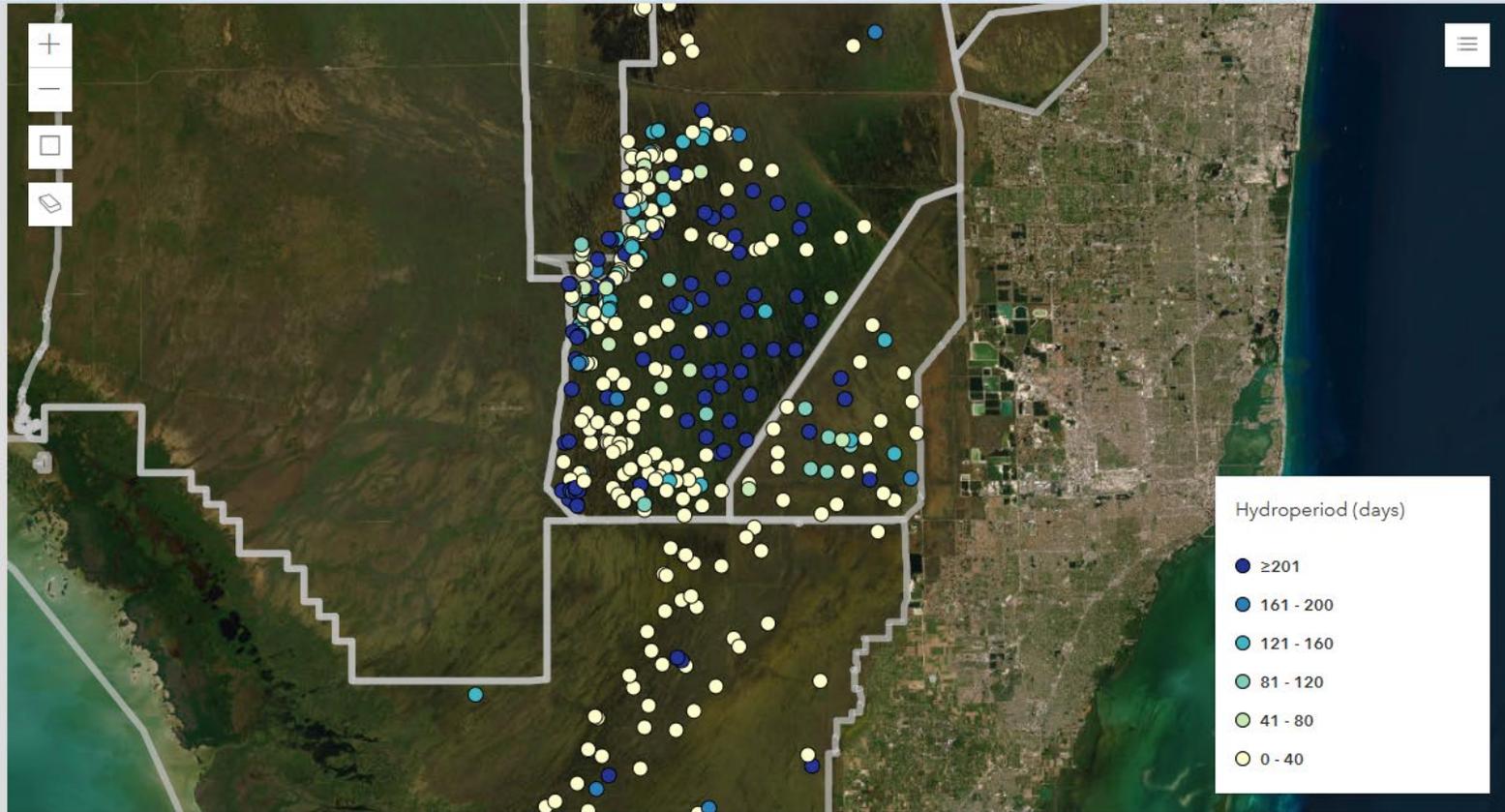
Show Management Areas

Quick Actions

Filter Islands by File ?

Tree Islands

Name
<input type="checkbox"/> 3A-1-1
<input type="checkbox"/> 3A-1-2
<input type="checkbox"/> 3A-1-3
<input type="checkbox"/> 3A_10_1
<input type="checkbox"/> 3A_10_2
<input type="checkbox"/> 3A_10_3
<input type="checkbox"/> 3A_10_4
<input type="checkbox"/> 3A_10_5
<input type="checkbox"/> 3A_11_1
<input type="checkbox"/> 3A_11_2
<input type="checkbox"/> 3A_11_3
<input type="checkbox"/> 3A_11_4
<input type="checkbox"/> 3A_11_5
<input type="checkbox"/> 3A_11_6
<input type="checkbox"/> 3A_11_7



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Select an island to view chart(s).

Displayed Metric ?

Hydroperiod

Time Range

Water Year

2001 2024

Near Daily

Mon March 31, 2025

Elevation Options

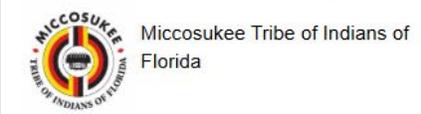
In situ ?

Lidar ?

Metrics By Region

Area	Mean	SD
ENP	33	77
WCA 3A	99	117
WCA 3B	65	86

ETree was developed in cooperation with:



For any questions contact Saira Haider at shaider@usgs.gov

Features



Map Layers

Tree Islands Point Size
1 20

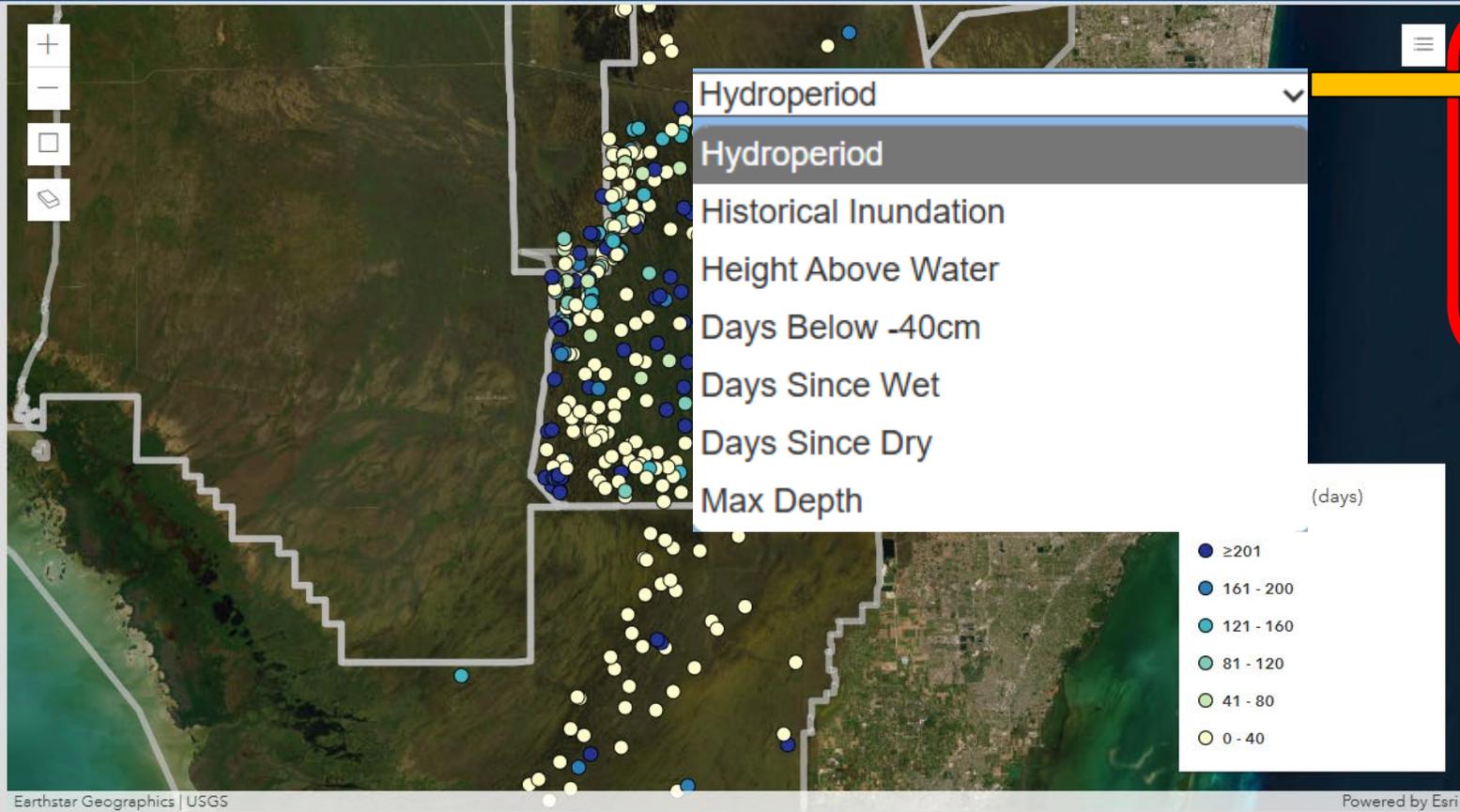
Show Management Areas

Quick Actions

Filter Islands by File ⓘ

Tree Islands

Name
<input type="checkbox"/> 3A-1-1
<input type="checkbox"/> 3A-1-2
<input type="checkbox"/> 3A-1-3
<input type="checkbox"/> 3A_10_1
<input type="checkbox"/> 3A_10_2
<input type="checkbox"/> 3A_10_3
<input type="checkbox"/> 3A_10_4
<input type="checkbox"/> 3A_10_5
<input type="checkbox"/> 3A_11_1
<input type="checkbox"/> 3A_11_2
<input type="checkbox"/> 3A_11_3
<input type="checkbox"/> 3A_11_4
<input type="checkbox"/> 3A_11_5
<input type="checkbox"/> 3A_11_6
<input type="checkbox"/> 3A_11_7



Hydroperiod

Hydroperiod

Historical Inundation

Height Above Water

Days Below -40cm

Days Since Wet

Days Since Dry

Max Depth

(days)

About

Displayed Metric ⓘ

Hydroperiod

Time Range

Water Year

2001 2024

2010

Near Daily

Mon March 31, 2025

Elevation Options

In situ ⓘ

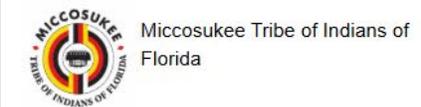
Lidar ⓘ

Metrics By Region

Area ⓘ	Mean	SD
ENP	33	77
WCA 3A	99	117
WCA 3B	65	86

Select an island to view chart(s).

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Temporal Scales

- Near daily indicators
 - Updated along with EDEN surfaces on near daily time scale
- Historical indicators
 - Calculated over the Everglades water year (May 1st – April 30th) labeled by the end year
 - Date back to water year 2001



Near daily indicators

- **Hydroperiod:** Number of days over the past year that the tree island was covered by water
- **Days below -40 cm:** Number of days over the past year that water-levels were more than 40 cm below the elevation of the tree island head
- **Height above water:** Tree island height above water for the most recent date; negative values indicate water levels above the tree island
- **Maximum depth:** Maximum water depth over the tree island over the past year
- **Days since dry:** Number of days since the tree island was last dry, counting back up to 3 years
- **Days since wet:** Number of days since the tree island was last wet, counting back up to 3 years



Historical indicators

- **Hydroperiod:** Number of days in the water year that the tree island was covered by water
- **Days below -40 cm:** Number of days in the water year that water-levels were more than 40 cm below the max elevation of the tree island head
- **Height above water:** Mean tree island height above water over the water year; negative values indicate water levels above the tree island
- **Maximum depth:** Maximum water depth over the tree island during the water year
- **Historical inundation:** Quantile classification of mean hydroperiod from 2000 – 2023, into 4 bins: rare (0 days), low (1 – 31 days), medium (32 – 135 days), high (136 – 200 days), or very high (201 – 365)

Hydroperiod



Everglades Tree Island Indicator (ETree)

About

Map Layers

Tree Islands Point Size

1 20

Show Management Areas

Quick Actions

Filter Islands by File ?

Load a file

Save selected islands to file

Select All Islands

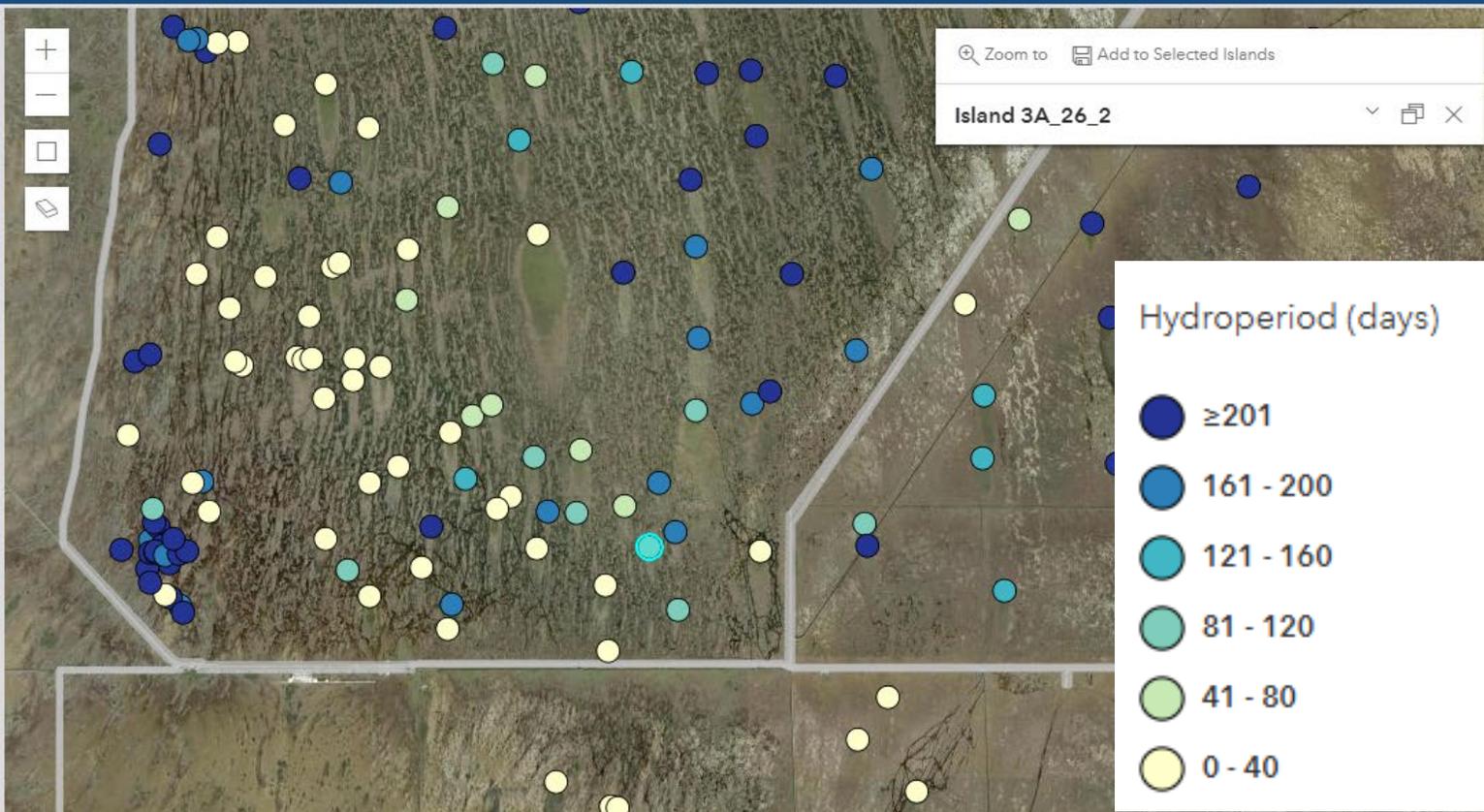
Clear Filter

Clear Selection

Tree Islands

Name

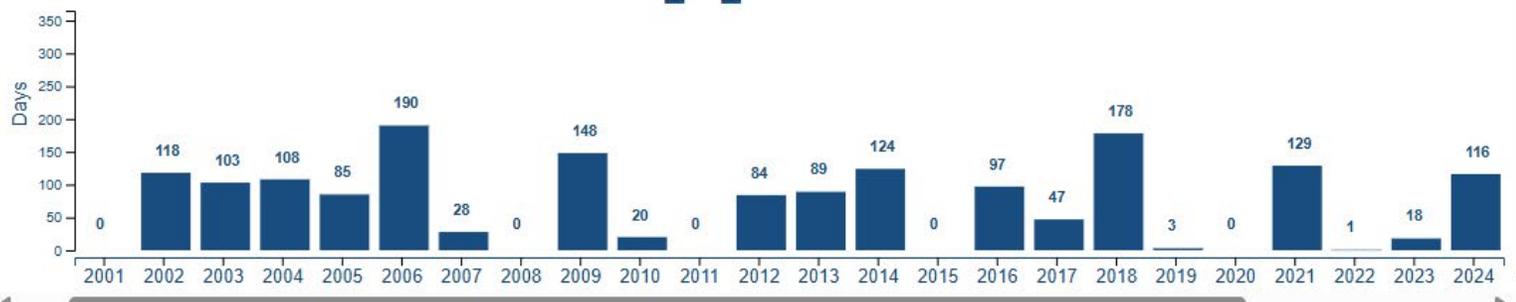
- 3A-1-1
- 3A-1-2
- 3A-1-3
- 3A_10_1
- 3A_10_2
- 3A_10_3
- 3A_10_4
- 3A_10_5
- 3A_11_1
- 3A_11_2
- 3A_11_3
- 3A_11_4
- 3A_11_5
- 3A_11_6
- 3A_11_7



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3A_26_2



Displayed Metric ?

Hydroperiod

Time Range

Water Year

2001 2024

Near Daily

Wed April 09, 2025

Elevation Options

In situ ?

Lidar ?

Metrics By Region

Area ?	Mean	SD
ENP	97	131
WCA 3A	109	87
WCA 3B	102	103

Download Metrics Data

Download Metadata

ETree was developed in cooperation with:



Miccosukee Tribe of Indians of Florida

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Citations



Hydroperiod



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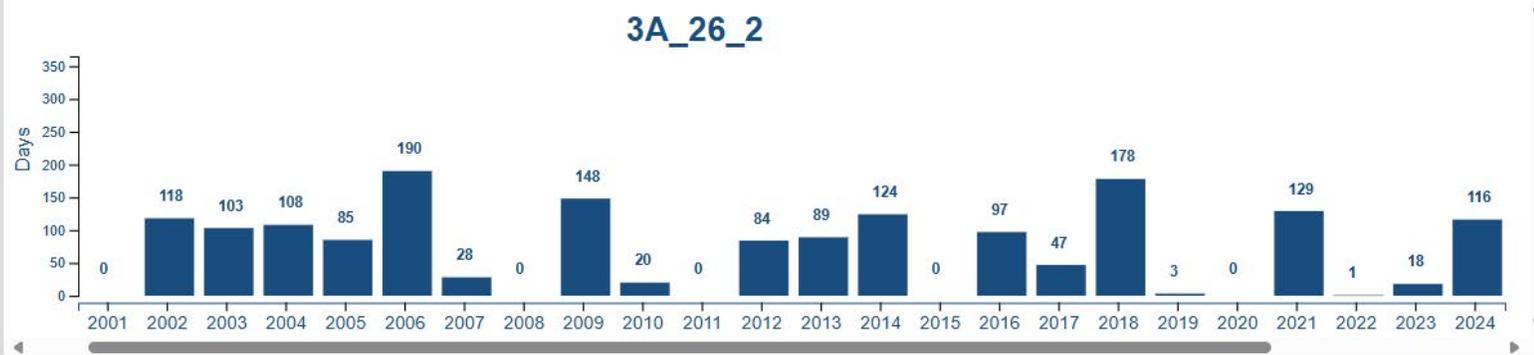
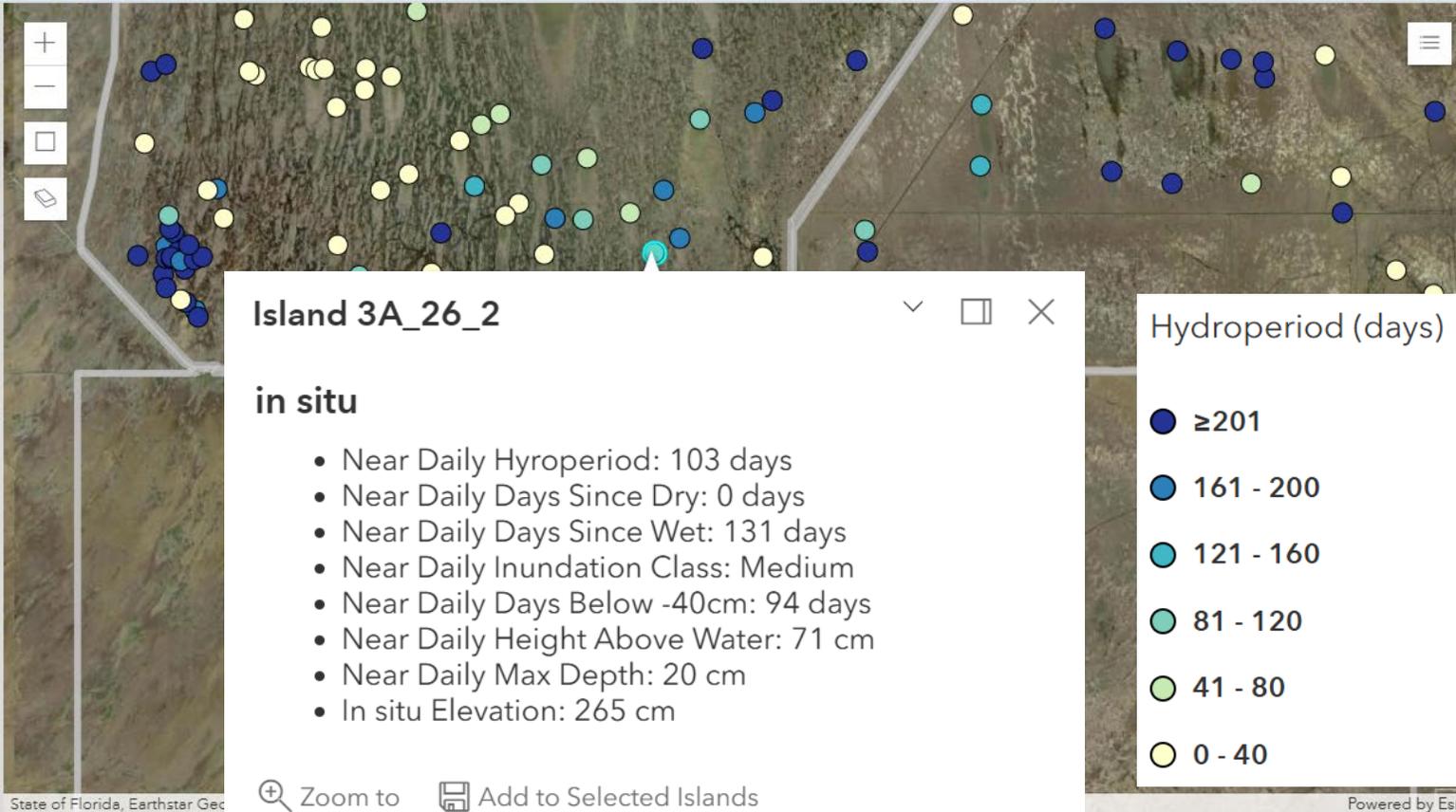
Show Management Areas

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Filter Islands by File ?

Tree Islands

	Name
<input type="checkbox"/>	3A-1-1
<input type="checkbox"/>	3A-1-2
<input type="checkbox"/>	3A-1-3
<input type="checkbox"/>	3A_10_1
<input type="checkbox"/>	3A_10_2
<input type="checkbox"/>	3A_10_3
<input type="checkbox"/>	3A_10_4
<input type="checkbox"/>	3A_10_5
<input type="checkbox"/>	3A_11_1
<input type="checkbox"/>	3A_11_2
<input type="checkbox"/>	3A_11_3
<input type="checkbox"/>	3A_11_4
<input type="checkbox"/>	3A_11_5
<input type="checkbox"/>	3A_11_6
<input type="checkbox"/>	3A_11_7



Displayed Metric ?

Hydroperiod

Time Range

Water Year

2010

2001 2024

Near Daily

Mon March 31, 2025

Elevation Options

In situ ?

Lidar ?

Metrics By Region

Area ?	Mean	SD
ENP	99	134
WCA 3A	110	89
WCA 3B	106	107

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Historical Inundation

Map Layers

Tree Islands Point Size

1 20

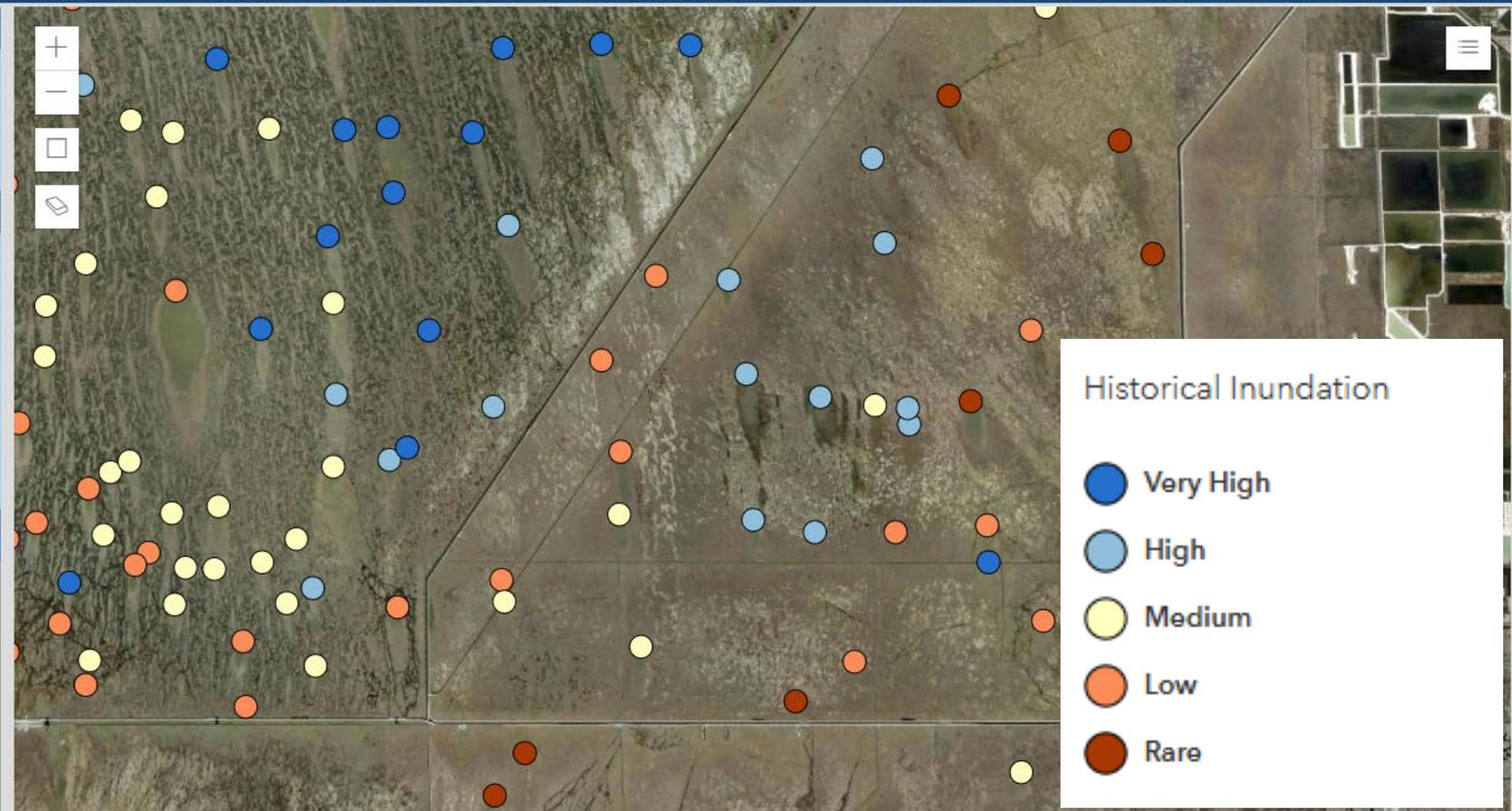
Show Management Areas

Quick Actions

Filter Islands by File ?

Tree Islands

Name
<input type="checkbox"/> 3A-1-1
<input type="checkbox"/> 3A-1-2
<input type="checkbox"/> 3A-1-3
<input type="checkbox"/> 3A_10_1
<input type="checkbox"/> 3A_10_2
<input type="checkbox"/> 3A_10_3
<input type="checkbox"/> 3A_10_4
<input type="checkbox"/> 3A_10_5
<input type="checkbox"/> 3A_11_1
<input type="checkbox"/> 3A_11_2
<input type="checkbox"/> 3A_11_3
<input type="checkbox"/> 3A_11_4
<input type="checkbox"/> 3A_11_5
<input type="checkbox"/> 3A_11_6
<input type="checkbox"/> 3A_11_7



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Charts only available for historic metrics.

Displayed Metric ?

Historical Inundation

Time Range

Water Year

2001 2024

Near Daily

Wed April 02, 2025

Elevation Options

In situ ?

Lidar ?

Metrics By Region

Area ?	Mean	SD
ENP	N/A	N/A
WCA 3A	N/A	N/A
WCA 3B	N/A	N/A

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Citations

Height above water

Map Layers

Tree Islands Point Size
1 20

Show Management Areas

Quick Actions

Filter Islands by File *i*
 Load a file

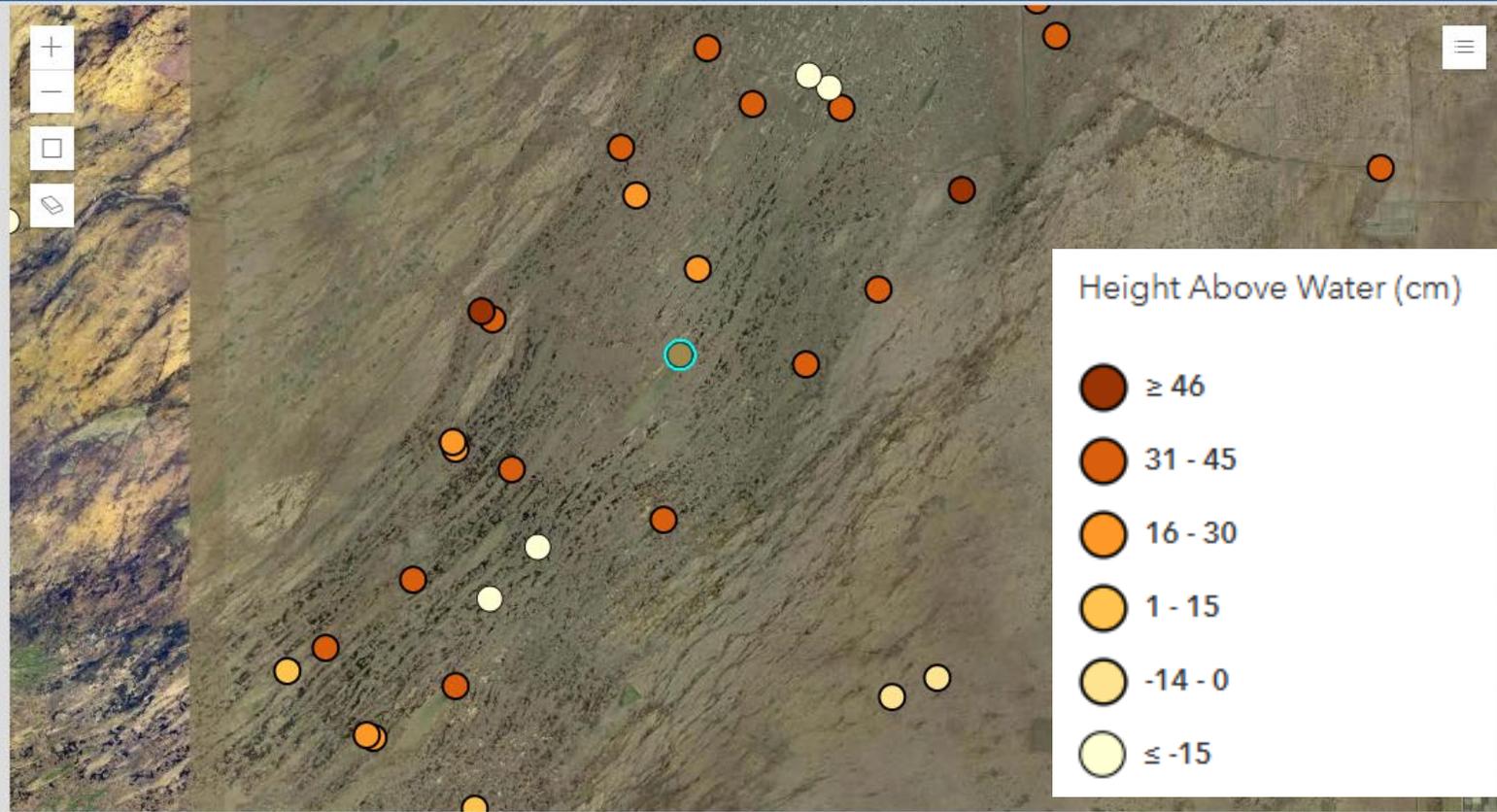
Save selected islands to file

Select All Islands

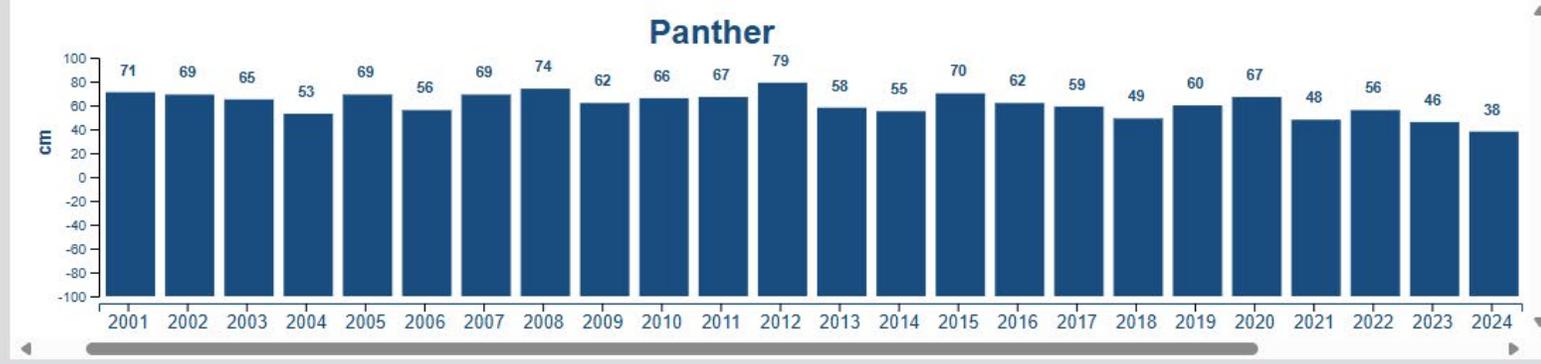
Clear Filter Clear Selection

Tree Islands

Name
<input type="checkbox"/> GW1-3
<input type="checkbox"/> GW1-4
<input type="checkbox"/> GW1-5
<input type="checkbox"/> GW1-6
<input type="checkbox"/> GW1-7
<input type="checkbox"/> Irongrape
<input type="checkbox"/> Manatee
<input type="checkbox"/> Mosquito
<input checked="" type="checkbox"/> Panther
<input type="checkbox"/> Satin
<input type="checkbox"/> SS-05
<input type="checkbox"/> SS-06
<input type="checkbox"/> SS-07
<input type="checkbox"/> SS-10



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Displayed Metric *i*

Height Above Water

Time Range

Water Year
2001 2024

Near Daily
Wed April 09, 2025

Elevation Options

In situ *i*

Lidar *i*

Metrics By Region

Area <i>i</i>	Mean	SD
ENP	24	28
WCA 3A	10	23
WCA 3B	7	36

Download Metrics Data

Download Metadata

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Citations

Saving the data



Map Layers

Tree Islands Point Size

1 20

Show Management Areas

Quick Actions

Filter Islands by File ?

Load a file

Save selected islands to file

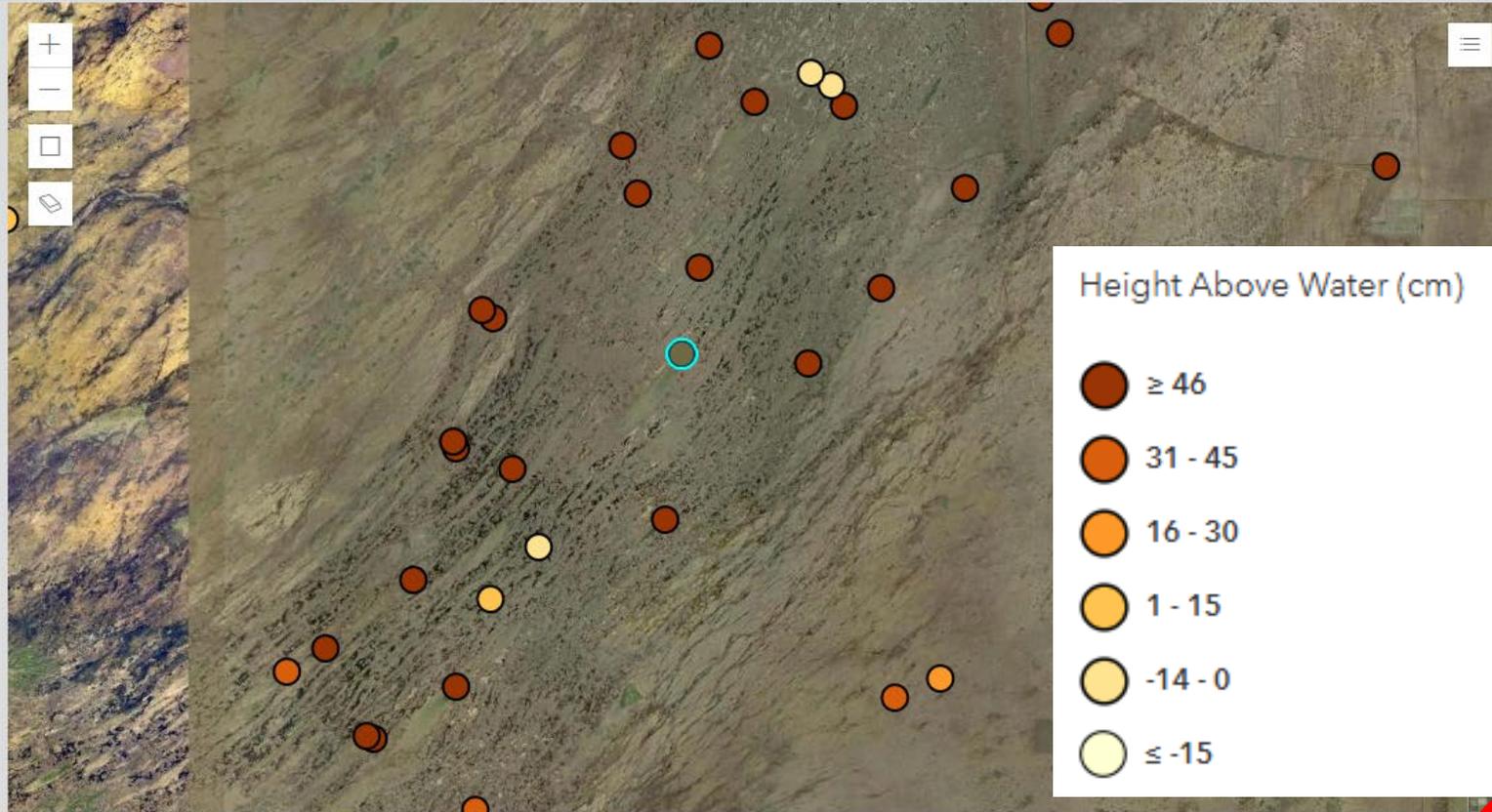
Select All Islands

Clear Filter

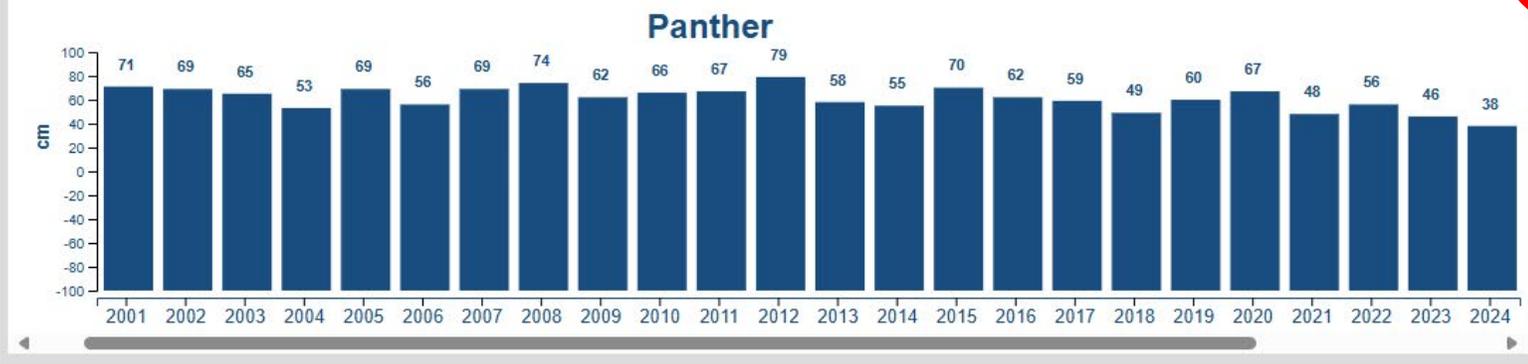
Clear Selection

Tree Islands

	Name
<input type="checkbox"/>	Gumbo
<input type="checkbox"/>	GW1-2
<input type="checkbox"/>	GW1-3
<input type="checkbox"/>	GW1-4
<input type="checkbox"/>	GW1-6
<input type="checkbox"/>	Irongrape
<input type="checkbox"/>	Manatee
<input type="checkbox"/>	Mosquito
<input checked="" type="checkbox"/>	Panther
<input type="checkbox"/>	Satin
<input type="checkbox"/>	SS-05
<input type="checkbox"/>	SS-06
<input type="checkbox"/>	SS-07
<input type="checkbox"/>	SS-10



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Displayed Metric ?

Height Above Water

Time Range

Water Year
2001 2024

Near Daily
Wed April 09, 2025

Elevation Options

In situ ?

Lidar ?

Metrics By Region

Area ?	Mean	SD
ENP	N/A	N/A
WCA 3A	N/A	N/A
WCA 3B	N/A	N/A

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Micosukee Tribe of Indians of Florida

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Citations

USGS
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Filter file - Allows a previously saved set of tree islands to be uploaded

Step 1: Select the tree islands of interest

The screenshot shows the Everglades Tree Island Indicator (ETree) interface. The 'Quick Actions' section is highlighted with a red box, containing the following elements:

- Filter islands by file (with a dropdown arrow)
- Load a file (button)
- Save selected islands to file (button)
- Select All Islands (button)
- Clear Filter (button)
- Clear Selection (button)

The 'Tree Islands' section at the bottom displays a list of island names:

Name
3A-1-1
3A-1-2
3A-1-3
3A_10_1
3A_10_2
3A_10_3
3A_10_4
3A_10_5
3A_11_1
3A_11_2
3A_11_3
3A_11_4

The map shows a satellite view of the Everglades with numerous tree islands represented by colored circles (white, blue, cyan). A black polygon highlights a specific area of interest. The interface includes map controls (zoom in/out, pan, and a location pin) and a footer with the text 'State of Florida, Earthstar Geographics | USGS' and 'Select an island to view ch'.

Filter file - Allows a previously saved set of tree islands to be uploaded

Step 2: Click “Save”, choose a location on your computer, and name the file.

The screenshot shows the Everglades Tree Island Indicator (ETree) application interface. On the left, there are controls for Map Layers (Management Areas Transparency, Tree Islands Point Size) and Quick Actions (Filter islands by file, Save selected islands to file, Select All Islands, Clear Filter, Clear Selection). The Tree Islands list is visible at the bottom left. A 'Save As' dialog box is open over the map, showing the file path 'This PC > Downloads > filter_test' and the file name 'my_favorite_tree_islands'. The 'Save as type' is set to 'Text (*.txt;*.xml;*.xsl;*.text;*.xslt;*.xslx;*.xslm;*.sh;*.html;*.ics;*.mjs;*.js;*.shtml;*.xml;*.csv;*.css;*.shtm;*.htm)'. Red circles highlight the 'Save selected islands to file' button, the file path, the file name, and the 'Save as type' dropdown.

Name
3A-1-1
3A-1-2
3A-1-3
3A_10_1
3A_10_2
3A_10_3
3A_10_4
3A_10_5
3A_11_1
3A_11_2
3A_11_3
3A_11_4

Filter file - Allows a previously saved set of tree islands to be uploaded

Step 3: The next time you want to filter to your set of tree islands, click “Load” and navigate to your saved file.

The screenshot shows the Everglades Tree Island Indicator (ETree) application interface. On the left, there are control panels for 'Map Layers' (Management Areas Transparency, Tree Islands Point Size) and 'Quick Actions'. The 'Quick Actions' panel includes a 'Filter islands by file' section with a dropdown menu showing 'my_favorite_tree_isla' and a 'Load a file' button circled in red. Below this is a 'Tree Islands' list with various island names like '3A-1-1', '3A-1-2', etc. An 'Open' file explorer window is overlaid on the right, showing the 'Downloads' folder with a file named 'my_favorite_tree_islands.txt' circled in red. The 'Open' button in the file explorer is also circled in red. The background shows a map of the Everglades with tree islands marked.

Name	Date modified	Type	Size
my_favorite_tree_islands.txt	11/27/2023 2:06 PM	Text Document	1 KB

Name
3A-1-1
3A-1-2
3A-1-3
3A_10_1
3A_10_2
3A_10_3
3A_10_4
3A_10_5
3A_11_1
3A_11_2
3A_11_3
3A_11_4

Progress & Next Steps



- Participating in RECOVER tree island task force to develop a tree island performance indicator
- In coordination with the task force, collaborating with Mike Ross and Lael Licht (FIU) with the goal of integrating new indicator(s) or vegetation binning into ETree
- Challenges:
 - Elevation data
 - Any update to elevation data has to be available for all 400 tree islands



Thanks!

Questions?

shaider@usgs.gov

ETree website:



<https://sofia.usgs.gov/eden/etree>