# The Vegetation of Everglades National Park: Final Report

Natural Resource Report NPS/SFCN/NRR—2021/2256

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## Summary

The Everglades National Park vegetation mapping project is part of the Comprehensive Everglades Restoration Plan (CERP). It is a cooperative effort between the South Florida Water Management District (SFWMD), the United States Army Corps of Engineers (USACE), and the National Park Service Vegetation Mapping Inventory Program (NPS VMI). The goal of this project is to produce a spatially and thematically[1] accurate vegetation map of Everglades National Park (EVER) prior to the completion of restoration efforts associated with CERP. This spatial product will serve as a record of baseline vegetation conditions for the purpose of: (1) documenting changes to the spatial extent, pattern, and proportion of plant communities within EVER as they respond to hydrologic modifications resulting from the implementation of the CERP; and (2) providing vegetation and land-cover information to NPS park managers and scientists for use in resource management, research, and monitoring.

The vegetation map of EVER covers an area of 4,482.2 square kilometers (1.108 million acres [ac]) and consists of four mapping regions: Region 1 – Shark River Slough/Long Pine Key; Region 2 – The Southeast Saline Everglades; Region 3 – The Southwest Coastal Everglades; and Region 4 – The

[1] Accuracy of the map label to the reference data.

Northwest Coastal Everglades. Region 1 was mapped by the SFWMD and USACE while Regions 2-4 were mapped by the South Florida Caribbean Network (SFCN).

Photo-interpretation on the map was performed by superimposing a 50 × 50-meter (164 × 164-feet [ft] or 0.25 hectare [0.61 ac]) grid cell vector matrix over stereoscopic, 30 centimeters (11.8 inches) spatial resolution, color-infrared aerial imagery, acquired by the SFWMD in 2009, on a digital photogrammetric workstation. Photo-interpreters identified the dominant community in each cell by applying majority-rule algorithms, recognizing community-specific spectral signatures, and referencing an extensive ground-truth database. The dominant vegetation community within each grid cell was classified using a hierarchical classification system developed for this project. Additionally, photo-interpreters categorized the absolute cover of invasive species and cattails (*Typha* sp.) detected as either: Sparse (10–49%), Dominant (50–89%), or Monotypic (90–100%).

The map contains a total of 286 discreet thematic classes with Short Sawgrass Marsh (75,956 ha, [19.7%] ); Graminoid Freshwater Prairie (62,076 ha [12.3%]) and Mixed Mangrove Forest-Mixed (47,599 ha [5.3%] being the most common vegetation types mapped. Marsh vegetation classes are the most common community types found withing the vegetation map. They account for 186,551 ha (48.3%) of the terrestrial mapped area[2]. Forest communities (18.0%), followed by Scrub (17.8%) and Shrublands (12.8%) are the next most common community types mapped. Map accuracy, based on 1,014 randomly selected  accuracy assessment points, is estimated at 89.2% with a lower 90$^{th}$ Percentile Confidence Interval of 87.4%.

# Content

The geospatial data for the Everglades National Park vegetation map is stored in an ArcGIS file geodatabase (EVER_VegMap_v20200930). This geodatabase is the latest version as of 18 May 2021 and contains eight feature classes:

- *EVER_VegMap_Boundary*
- *EVER_VegMap_Cattails*
- *EVER_VegMap_Disturbance*
- *EVER_VegMap_Invasive_Species*
- *EVER_VegMap_Land*
- *EVER_VegMap_Regions*
- *EVER_VegMap_Vegetation*
- *EVER_VegMap_Vegetaion_Dissolve*

The *EVER_VegMap_Boundary* feature class contains one record delineating the bounding area for the Everglades National Park vegetation map. The *EVER_VegMap_Cattails* feature class shows the distribution of cattails (*Typha* sp.) throughout the mapping area and quantifies the absolute cover of cattails within each grid cell as either Sparse (10%-49%), Dominant (50%-89%), or Monotypic (90%-100%). Blank grid cells indicate that cattails are either not present within the grid cell or below the

[2] A total of 620.8 square kilometers (153,394 ac) of bays, lakes, and other open water features are not included in the percent area calculation for each thematic class.

minimum detectable threshold value of ten percent. The *EVER_VegMap_Disturbance* feature class documents any evidence of disturbance as either anthropogenic, fire, or windstorm. Blank grid cells indicate that the grid cell showed no evidence of disturbance. The *EVER_VegMap_Invasive_Species* feature class shows the distribution of several invasive species and quantifies the absolute cover of these two species within each grid cell as either Sparse (10%-49%), Dominant (50%-89%), or Monotypic (90%-100%). Blank grid cells indicate that either invasive species are not present or are below the minimum detectable threshold value of ten percent. The *EVER_VegMap_Land* feature class contains one record delineating the terrestrial portion (land area) of the mapping area. The *EVER_VegMap_Vegetation* feature class contains the vegetation data for each grid cell within the mapping area. It contains 1,792,886 records and 18 attributes (Table 1). The attributes represent grid cell specific information regarding the dominant community type identified. The *EVER_VegMap_Vegetaion_Dissolve* represent the same vegetation information stored in the previously described feature class (see Table 1). However, vegetation codes have been merged (dissolved) to reduce the number of total records to 286 (unique vegetation classes) and to speed up the geoprocessing time needed to load the Everglades National Park vegetation map for display purposes.

The base imagery used to make the vegetation map is stored as four two-meter spatial resolution rasters in a separate ArcGIS geodatabase (EVER_VegMap_CERP2009_Imagery.gbd).

Table 1: Description of attributes in the EVER_VegMap_Vegetation feature class

| Attribute | Description |
|---|---|
| OBJECTID | ESRI default (ID). |
| SHAPE | ESRI default (polygon). |
| Region | Grid cell Region designation |
| Cell_ID | Grid cell unique identification. |
| VegCode | Vegetation code from classification system. |
| VegCode Level | Indicates the level of detail (hierarchy) associated with the vegetation code within the classification system. Community specificity increases with increasing level of detail. |
| Name | The long name associated with the vegetation code (VegCode) attribute (see classification system). |
| L1_name | Level 1 classification name (see classification system). |
| L2_name | Level 2 classification name (see classification system). |
| L3_name | Level 3 classification name (see classification system). |
| L4_name | Level 4 classification name (see classification system). |
| L5_name | Level 5 classification name (see classification system). |
| L6_name | Level 6 classification name (see classification system). |
| L7_name | Level 7 classification name (see classification system). |
| Area_ha | Area of each grid-cell in hectares |
| Area_ac | Area of each grid-cell in acres. |
| Shape_Length | ESRI default (shape perimeter m) |
| Shape_Area | ESRI default (shape area $m^2$) |

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