





DEP Agreement No. CM031

PHOTOINTERPRETATION KEY FOR THE 2011 INDIAN RIVER LAGOON SEAGRASS MAPPING PROJECT

Modified Deliverable 2.1



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Preface

The St. Johns River Water Management District (SJRWMD) in cooperation with the South Florida Water Management District (SFWMD) has contracted Dewberry for imagery acquisition and seagrass mapping for the Indian River Lagoon (IRL). The overall objective of this contract is to: A) acquire 2011 time appropriate aerial imagery of the entire Indian River Lagoon captured directly in digital format by the Vexcel UltraCamx sensor; B) produce a complete 2011 seagrass map primarily by photo-interpreting this newly acquired aerial imagery in soft-copy stereo along with ancillary ground truth data; and C) deliver the processed aerial imagery along with all files used in establishing the blocks in orthorectification and other processes.

The classification system used for this project was a modification of the Florida Land Use / Cover Classification System (FLUCCS), which was originally compiled by the Florida Department of Transportation, State Topographic Bureau.

The following Photointerpretation Key was developed in order to document the decisions and mapping conventions applied during the photointerpretation process. The key was used to help ensure that the photointerpretation was consistent throughout the project. It was designed to provide descriptions of the visual and spatial distribution characteristics of the classification types used for the project and to document any special mapping conventions that were developed. The key also serves to provide insight for future users into the rationale for the delineation and classification of seagrass habitats appearing within the database.

1) Classification Codes

5400 Unvegetated Bottom

9113 Seagrass, Patchy

<u>9116</u> Seagrass, Continuous

Continuous seagrass polygons are assigned the following percentages based on percent cover:

20% Continuous Seagrass

40% Continuous Seagrass

60% Continuous Seagrass

80% Continuous Seagrass

<u>NO SAV</u> Not Classified (land, islands, mangroves, etc)

2) Classification System

For each classification type listed herein, a definition is included along with a written description of the photosignature. The photosignature describes how each classification category appears on the digital natural color aerial photography from a photointerpretation perspective. Tone, color, shape, size, association, texture, and typical location are described. Also included is a photograph taken in the field and a digitized aerial photograph showing the photointerpreted delineations.

<u>Unvegetated Bottom</u> – FLUCCS code **5400**. Barren substrate with little or no perceptible seagrass (< 10%) or only algae.

Description

The 5400 classification has many different photosignatures and will depend on the characteristics of the area where it is occurring. These signatures can be divided into two distinctly different categories, which are dependent on depth.

Deepwater 5400 is usually a smooth, bluish-green color, but can sometimes appear dark blue or brown depending on water depth and turbidity levels. It can usually be found on the deeper edges of seagrass beds and in residential canals. Sometimes a deepwater 5400 polygon will be elongated and linear with straight edges, denoting a man-made channel dredged through a shallow water area (i.e. the Intracoastal Waterway and inlets).

The photosignature for the shallower water 5400 classification is usually a very smooth and flat area (i.e. sandbars). This signature can be many different colors depending on water depth and turbidity levels. If the water is relatively clear, the very shallow, sandy areas will appear white as opposed to the light green or turquoise of the slightly deeper sandy areas. Murky or tannin-stained water will create a gray or light brown colored photosignature respectively. Most of these types of 5400 polygons will be found on the shallower edges of seagrass beds, either along the shoreline or on the crest of a barrier-type seagrass bed.

Figures 1 through 3 show examples of Unvegetated Bottom.



Figure 1. Unvegetated Bottom – 5400.



Figure 2. Shallow unvegetated tidal flat – 5400.



Figure 3. Delineated aerial photograph showing FLUCCS 5400.

Seagrass, Patchy – FLUCCS code **9113**. Areas 0.25 acres or greater in size that consist of primarily (greater than 50%) bare bottom in which many small patches (each less than 0.25 acres) of seagrass are scattered, and where the seagrass patches are not interconnected. (For this study, the lower limit of what constitutes a seagrass bed is approximately 10% cover; areas with <10% cover are considered "unvegetated bottom.")

Description

The photosignature for the 9113 classification usually has a rough texture when viewed through a stereoscope and is bluish-gray to almost black depending on water depth and turbidity. Patchy seagrass polygons can be found on the deeper and shallower edges of continuous seagrass beds or can be large and expansive and cover the entire bed. The actual seagrass beds will look like small circular colonies that are close enough together to be combined into a seagrass polygon. These areas can occur because of new growth on a previously unvegetated substrate, or within areas of previously continuous seagrass that is deteriorating due to changing water conditions such as salinity, turbidity, and temperature or pollution levels.

Figures 4 and 5 show examples of Patchy Seagrass.



Figure 4. Patchy Seagrass – 9113.



Figure 5. Delineated aerial photograph showing FLUCCS 9113.

<u>Seagrass, Continuous</u> – FLUCCS code **9116**. The dominant feature of these seagrass beds is that they are continuous in nature, with interconnected areas of seagrass. These beds may contain many small interspersed patches of sparsely vegetated or unvegetated bottom. The dense aspect means that the area should contain more vegetated bottom than unvegetated bottom, and thus at least 50-60% of the area with this FLUCCS code should contain seagrass. Only sand patches greater than 0.25 acres should be distinguished within a continuous bed. Species composition is not mapped.

Description

The photosignature for 9116 is smoother than that of 9113 but still has some texture. It also can be bluish-gray to almost black, but has only a few areas of open bottom showing through to interrupt the continuous signature. 9116 usually can be found in the center of large, healthy seagrass beds and sometimes runs parallel to the shoreline for hundreds of meters. These larger beds usually have some sparse growth between the continuous areas (i.e. they are not always composed of a uniform thickness, but are still considered continuous).

Figures 6 and 7 show examples of Continuous Seagrass.



Figure 6. Continuous Seagrass – 9116.



Figure 7. Delineated aerial photograph showing FLUCCS 9116.

Continuous Seagrass Density Percentages

Description

A density percentage will be assigned to each continuous (9116) seagrass polygon based on the best visual estimation by a photo interpreter. Each continuous seagrass polygon will be assigned one of the following density percentages: 20% or less, 40%, 60%, 80% or more.

Figures 8 through 10 show examples of seagrass density in the field.



Figure 8. Continuous Seagrass – 80% or more seagrass density



Figure 9. Continuous Seagrass – 60% seagrass density



Figure 10. Continuous Seagrass – 40% seagrass density

Seagrass Density Percentage Calculations

Figures 11 through 14 show examples of density percentages as applied to delineated Continuous Seagrass beds. These images should be used as a guide for assigning density percentages.





Not Classified (Land, islands, mangroves, etc) - NO SAV

Land for the Indian River Lagoon mapping project includes all covertypes that are not included within the other classification types (e.g. Upland, Mangroves). Mainland, islands and other land normally above the high tide line are also considered Land. The line delineating the water\land interface may be formed anywhere between the extreme low and extreme high tide marks.

Figures 15 and 16 show examples of NO SAV areas.



Figure 15. Mangrove hammock – NO SAV.



Figure 16. Delineated aerial photograph showing NO SAV.

3) Photointerpretation Delineation Guidelines

The following guidelines are provided as a means of standardizing photointerpretation:

- **A.** Photointerpretation shall exercise extra care especially on the deep edge of seagrass beds. "Real" changes should be made regardless of the minimum mapping unit (MMU).
- **B.** Outer boundaries of beds are more important than density categorization within beds.
- **C.** The minimum mapping unit is 0.25 acres (0.1 ha). It is more important to map individual small isolated patches than similar sized patches that are part of a large matrix. Care shall be taken in mapping small areas of seagrass when only a small amount of seagrass is present, e.g., around a spoil island.
 - (1) When deciding whether an area with patches of seagrass is one polygon of patchy seagrass or individual seagrass polygons, apply guideline C above with a MMU of 0.25 acres. Err on the side of lumping except in areas where small patches are the only seagrass present.

(2) If an area has only a few patches, each <0.25 acres: include the polygon of patchy seagrass if the total seagrass area is >0.25 acres. Err on the side of including these rather than excluding them.