

**PROJECT DESCRIPTION**

This satellite image map was produced by the U.S. Geological Survey (USGS) Land Characteristics from Remote Sensing Project (Jones and Desmond 1998). The objective of the project is to develop and apply innovative remote sensing and geographic analysis techniques to map and monitor the distribution of vegetation characteristics that are important in hydrologic and biologic processes. As part of this research, data from many airborne and satellite imaging systems have been georeferenced and processed to facilitate data fusion and analysis. This map was created using image fusion techniques developed through the project. When joined with several other maps also distributed as USGS Miscellaneous Investigations Series Publications (Jones et al 2001, Thomas and Jones 2002), 1:100,000-scale image map coverage is complete from the southern edge of Lake Okeechobee to Florida Bay. These maps were designed to meet a variety of research, management, and education needs (Jones et al 2003). Support for the project comes through the auspices of the USGS Geographic Analysis and Monitoring, and Greater Everglades Priority Ecosystems Science Programs.

**DATA DESCRIPTION**

The satellite images for this map were recorded January 27, 2000, just 10 days prior to those used for the other image maps in the series, by the enhanced thematic mapper (ETM) sensor on the Landsat 7 satellite. It records seven multispectral bands and 1 panchromatic channel. This image map includes spectral bands 3 (630-690 nanometers, red), 4 (775-900 nanometers, near infrared), and 5 (1,550-1,750 nanometers, middle-infrared) and the panchromatic band (500-900 nanometers, green to near infrared). The spatial resolution of the input data is 30 m by 30 m for the multispectral bands and 15 m by 15 m for the panchromatic band. The imagery was georectified using ground control points identified on USGS digital orthophoto quadrangles and on the panchromatic imagery. The panchromatic data were resampled to 7.5 m by 7.5 m resolution and enhanced by filtering (10x10) filter with 75-percent add-back) and tone stretching. Then, the spatial information in the panchromatic data was combined with the color information of the multispectral data through a wavelet transform-based image fusion technique (Lemeshevsky, 1999). This data fusion process attempts to preserve the spectral fidelity while sharpening the spatial resolution. To best match the tones in previous image maps, tones output from this process were further enhanced through histogram evaluation and contrast stretching. Panchromatic enhanced multispectral bands 5, 4, and 3 are shown in red, green, and blue respectively on the image map. The image map meets National Mapping Accuracy Standards for 1:100,000-scale maps.

**IMAGE INTERPRETATION**

The combination of a number of surface characteristics such as land cover type, vegetation density, vegetation condition (i.e., growing or dormant), soil type, and water depth dictates the amount and composition of light reflected to the satellite sensor and, therefore, the brightness, texture, and color shown on the image. Image map subsets that illustrate the variety of land surface types and vegetation assemblages in the region are:

-  Cypress forest
-  Cypress wet prairie
-  Mangrove
-  Pasture
-  Cropland
-  Road clearing
-  Suburban lawn
-  Golf course
-  Urban
-  Quarry

**REFERENCES**

Jones, J.W., and Desmond, G.B. 1998. Land characterization for hydrologic modeling in the Everglades, in *Applications of Remote Sensing in Hydrology*, National Water Resources Institute, Saskatoon, p. 123-129.

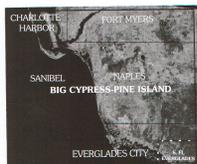
Jones, J.W., Thomas, J.C., and Desmond, G.B. 2001. South Florida Everglades, USGS Miscellaneous Investigations Series Map I-2742, Reston, Va.

Jones, J.W., Thomas, J.C., Genzalez, A., Henkel, H. 2003. The South Florida Satellite Image Map Series: A Tool for Research, Monitoring, and Education, in *Joint Conference on the Science and Restoration of the Greater Everglades and Florida Bay Ecosystem*, Palm Harbor, FL, p. 294-296.

Lemeshevsky, G.P. 1999. Multispectral multisensor image fusion using wavelet transforms: Visual information processing, SPIE 3716, Perik, S., and Juday, R., eds., p. 214-222.

Thomas, J.C., and Jones, J.W., 2002. Northern Florida Everglades, USGS Miscellaneous Investigations Series Map I-2756, Reston, Va.

**IMAGE MAP LOCATION AND CORRESPONDING 1:100 000 - SCALE MAPS INDEX**



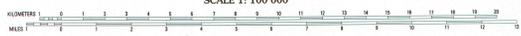
Universal Transverse Mercator Projection  
and 10 000-meter grid zone 17  
World Geodetic System 1984

SCIENTIFIC INVESTIGATIONS MAP  
SIM-2842

Available in electronic form at <http://sofia.usgs.gov>.

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SCALE 1: 100 000



Authors: John W. Jones and Jean-Claude Thomas  
South Florida project coordinator: Gregory B. Desmond,  
Eastern Regional Geography, Reston, VA.

Other contributors: Kelly Feitner, Janet Halverson, Lori Yung,  
EROS Data Center, Sioux Falls, SD,  
Greg Matheson, David Dee, George Delinski,  
Alden Warren, Eastern Regional Geography,  
Reston, VA.



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