"Where is that Place?" – The Creation of a Florida Gazetteer

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Abstract

The South Florida Water Management District in partnership with the U.S. Army Corps of Engineers, Jacksonville, has taken on the challenges of the largest ecological restoration project in the world--the Comprehensive Everglades Restoration Plan (CERP). The CERP partnership expects to commission nearly 70 "place-based" projects over the next 20 years. Due to the place-based nature of the restoration projects, CERP requires a standardized place name database that is spatially explicit and can be used to couple financial, electronic document management, and environmental monitoring computer systems. This place name database for CERP is the prototype for the Florida Gazetteer. The Prototype Florida Gazetteer geodatabase design is predicated on the USGS National Gazetteer (Geographic Names Information System [GNIS]), and is taking on the challenge of incorporating "footprints" for the places. The CERP partnership is working closely with the USGS to ensure compatibility of the Florida Gazetteer with the GNIS.

Background

The South Florida Water Management District (SFWMD) and the U.S. Army Corps of Engineers (USACOE), along with many program partners, are undertaking a one-of-a kind environmental restoration effort in south Florida. This restoration initiative, called the Comprehensive Everglades Restoration Program (CERP), is a long-term, multibillion dollar effort to "re-plumb" the Everglades in an attempt to restore natural systems throughout south Florida. The CERP partnership expects to commission nearly 70 "placebased" projects over the next 20 years that will collectively result in the implementation of the largest ecosystem restoration plan in history.

Due to the place-based nature of the restoration projects, CERP requires a standardized place name database that is spatially explicit and can be used to couple financial, electronic document management, and environmental monitoring computing systems. The place name database for CERP is called the Florida Gazetteer.

Nearly all of the projects in CERP will have a place name. In addition, these places will have "footprints" that can be mapped and maintained using geographic information system (GIS) technologies. By linking standardized place names with mapped boundaries, CERP can take full advantage of a GIS-based Florida Gazetteer to manage administrative and scientific data about projects implemented throughout the Program.

A gazetteer can be defined as a dictionary of named features that are categorized by feature types. The Federal government's feature type is a controlled vocabulary of categories that is managed by the USGS Geographic Names Board (GNB). The names and attributes of each name are managed in the Geographic Names Information System (GNIS). The GNB GNIS is the Nation's official repository of domestic geographic names information. During the 1980's the US GNB automated their gazetteer and began updating the names. In addition, GNIS began a modernization effort in 2000 to take

better advantage of available technology and they are shifting their efforts towards state partnerships. Three states (North Carolina, West Virginia and Louisiana) have "adopted" GNIS as their gazetteer and are beginning to work out procedures for providing regular updates to GNIS. In addition to the US GNB gazetteer, the General Bathymetric Chart of the Oceans (GEBCO) is responsible for undersea feature names. The Alexandria Digital Library (ADL) Project at the University of California in Santa Barbara (http://www.alexandria.ucsb.edu/) is the principle research institute on digital libraries and D-Lib Magazine (http://www.dlib.org) is the principle research journal. Lastly, ESRI has implemented a form of a gazetteer through the geography network (http://www.geographynetwork.com).

The United States Geological Survey (USGS) has created a national standard for place names through the GNIS. However, GNIS has limited utility for CERP in three ways:

• The last comprehensive update of GNIS for Florida was 1987;

• Feature class values specific to south Florida and the Everglades are not necessarily part of GNIS (e.g. tree islands, mangrove islands, spoil islands);

• GNIS does not currently have footprints – or actual boundaries – of the features housed in the database.

Although there are limitations, GNIS does provide a legitimate point of departure from which a Florida Gazetteer can be designed and deployed for CERP. The rationale for using components of the GNIS database structure is based upon several interviews and discussions with the USGS GNIS Coordinator and the Florida Geographic Names Board Liaison. Several discussion points illustrate areas of opportunity to make the Florida Gazetteer and GNIS compatible:

1. The USGS worked with the Florida Gazetteer Team to identify a set of core GIS layer and attribute definitions that will be transferable to GNIS.

2. USGS is pursuing the delineation of footprints for features maintained in GNIS. Currently, GNIS only has state boundary footprints. GNIS will continue to maintain the traditional point feature, in addition to the footprint, since the point represents the legally defined location of the feature. GNIS is ready to accept footprints from the Florida Gazetteer and may modify its database structure to accommodate these footprint data.

3. The GNIS Coordinator will work with the Florida Gazetteer Team to accommodate additional "feature class" values required for the Florida Gazetteer. Examples of these feature class values could be tree island, Mangrove Island, or spoil island.

4. GNIS data are being served in the National Map. The National Map, while highly sophisticated, is built on a similar concept to the Florida Gazetteer's Visualization Tool.

5. USGS is pursuing the use of browser-based tools to upload data to GNIS via the Internet. These tools are anticipated to be forms and will not necessarily allow for online digitizing or other spatial data editing procedures. However, the logic used to create these tools may be applicable to the Florida Gazetteer Data Uploading & Access Prototype Application.

6. The Florida Geographic Names Board Liaison indicated that his role is to ensure

that the federal process for creating names is properly followed in Florida. The Florida Gazetteer Development Team investigated using the criteria from this process for the Uploading & Access Prototype Application to ensure compliance with these standards.

Due to the inter-departmental nature of the Florida Gazetteer, the Development Team undertook a rapid business functions assessment at the SFWMD. The objectives of this assessment were threefold:

1. Identify the business functions in the agency that can benefit from the use of a gazetteer.

2. Identify the user applications that can meet those needs.

3. Prioritize gazetteer applications that can be used to meet the daily business operations of SFWMD.

Protocols

There are three areas of responsibility relative to maintaining the Florida Gazetteer. These responsibilities include: 1) data creation; 2) data upload; and 3) data distribution. The Land Acquisition Department and Environmental Resource Assessment are being assigned data creation and uploading responsibilities since they generate and maintain spatial data as part of their current business processes. In addition, these business units have expressed an interest in standardizing spatial footprints and place names at the SFWMD. However, this list of "Florida Gazetteer contributors" can be expanded as new data stewards are identified and agree to contribute to the Florida Gazetteer. The GIS & Web Development Division is the business unit responsible for the overall project implementation and acts as a GIS clearinghouse for CERP and the SFWMD. Therefore, it has responsibilities in all Florida Gazetteer maintenance categories.

There are two primary areas for state and federal coordination with respect to the Florida Gazetteer. First, coordinating and performing quality assurance procedures on the naming of geographic features. Second, protocols for transferring Florida Gazetteer footprints and attribute data from the SFWMD to the USGS. There is no formal procedure in place to name geographic features in Florida. Likewise there is no procedure in place to transfer geospatial footprint data to the GNIS in ESRI feature dataset format. However, the key players for both of these coordination scenarios include the Florida Gazetteer contributors, the FGNB Liaison, the GNIS Coordinator, and the federal GNB.
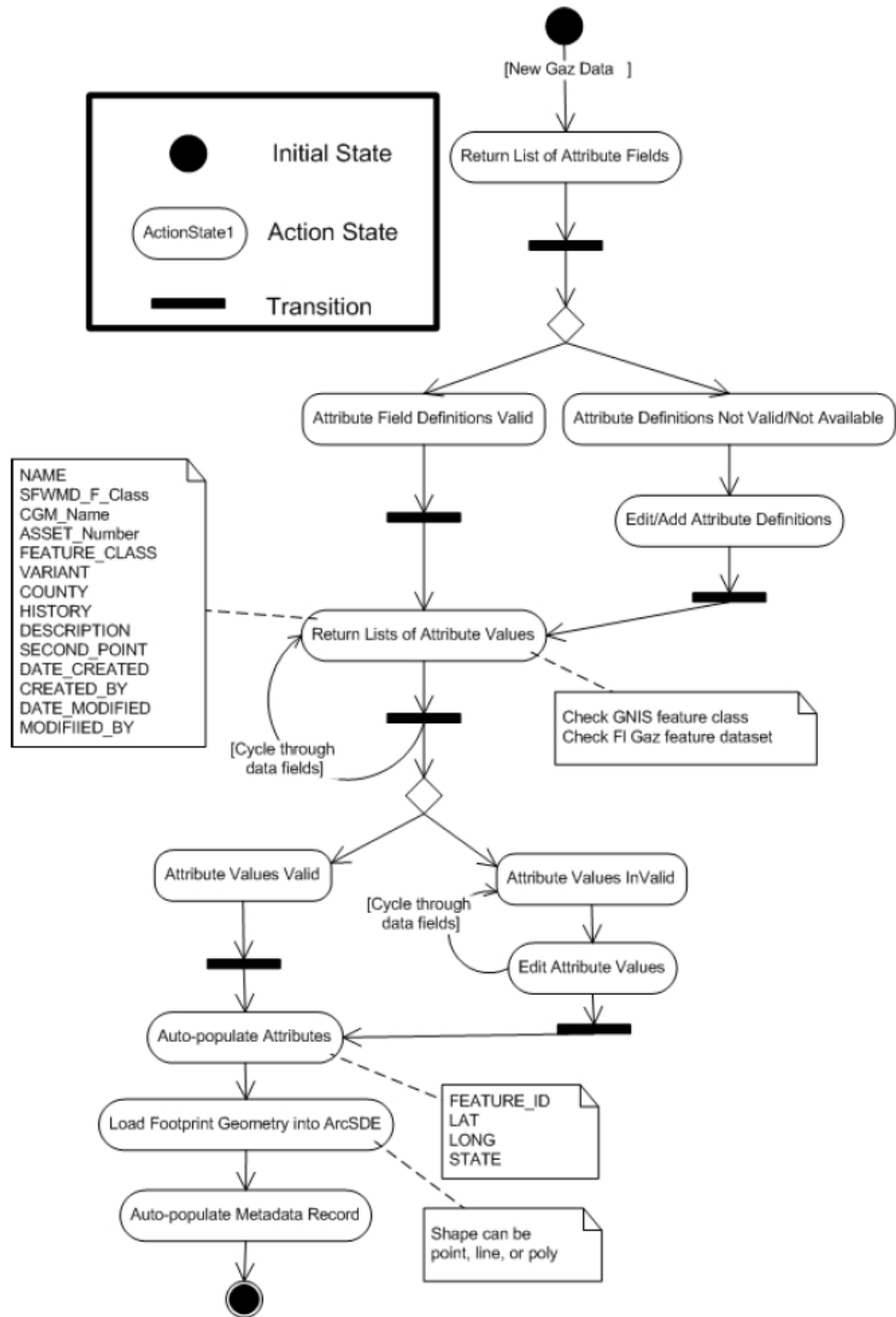
Florida Gazetteer Data Transfer Protocol (DRAFT)
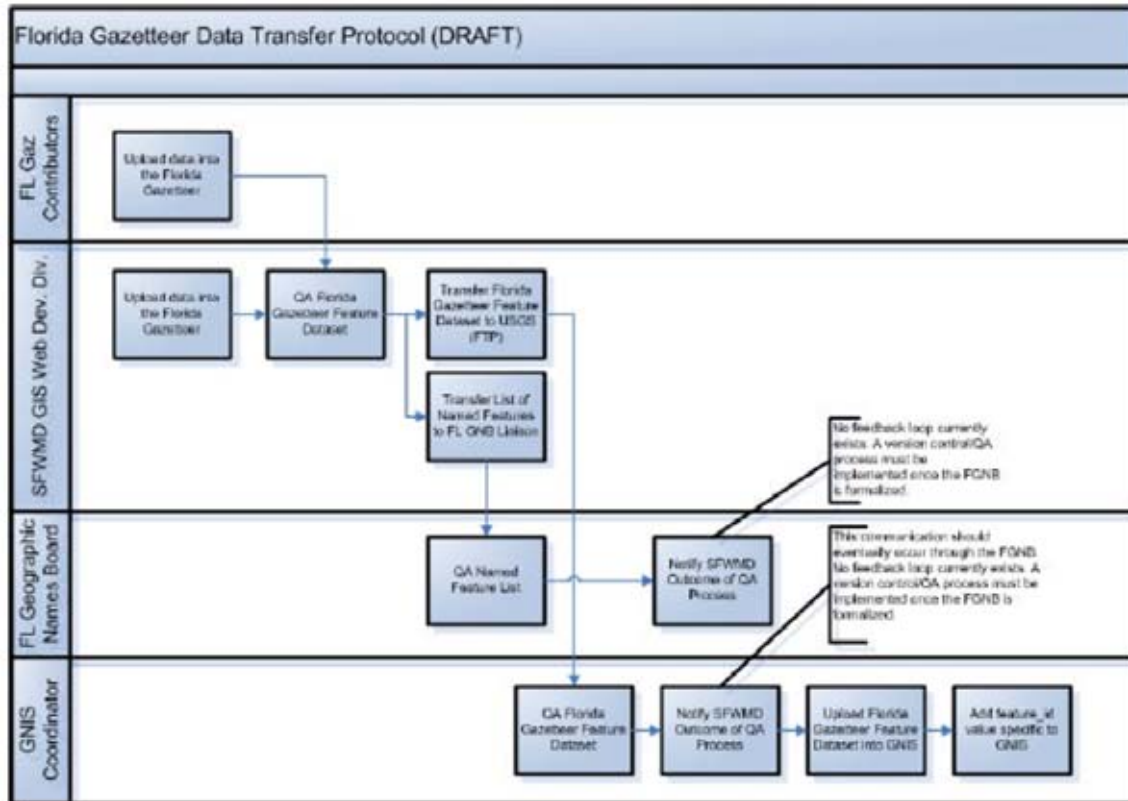
Data Uploading Application

The purpose of the Data Uploading Application is to assist Gazeteer contributors in adding named places with their corresponding spatial footprint and attribute data to the GIS database. This application consists of thee use cases:

• Use Case #1: Provide contributors with the ability to load spatial data into ArcSDE;

• Use Case #2 Check and populate the appropriate GNIS-compliant data into the attribute tables;

• Use Case #3: Populate the associated metadata record.

The activities associated with these use cases are depicted in the following figure.

[New Gaz Data]

Initial State — ActionState1 Action State — Transition

Return List of Attribute Fields

Attribute Field Definitions Valid | Attribute Definitions Not Valid/Not Available

Edit/Add Attribute Definitions

NAME
SFWMD_F_Class
CGM_Name
ASSET_Number
FEATURE_CLASS
VARIANT
COUNTY
HISTORY
DESCRIPTION
SECOND_POINT
DATE_CREATED
CREATED_BY
DATE_MODIFIED
MODIFIIED_BY

Return Lists of Attribute Values

Check GNIS feature class
Check FI Gaz feature dataset

[Cycle through data fields]

Attribute Values Valid | Attribute Values InValid

[Cycle through data fields]

Edit Attribute Values

Auto-populate Attributes

FEATURE_ID
LAT
LONG
STATE

Load Footprint Geometry into ArcSDE

Auto-populate Metadata Record

Shape can be point, line, or poly

This application was written using ArcObjects within the Microsoft .NET framework. It is embedded within an ArcMap Map Document File and populates an ArcSDE 8.3 geodatabase.

Visualization Application

The purpose of the Visualization Application is allow SFWMD and USACE access to Florida Gazetteer data. It is deployed as an Intranet Application within the CERP Zone. The Visualization Application consists of two use cases:

• Use Case #1: Provide users with simple map display and query tools;

• Use Case #2 Provide users with the ability to query based upon place name.

This browser-based application was built using ArcIMS technology that includes pan, zoom, and identify tools. Place name querying was accomplished through custom ASP.NET code using C#.
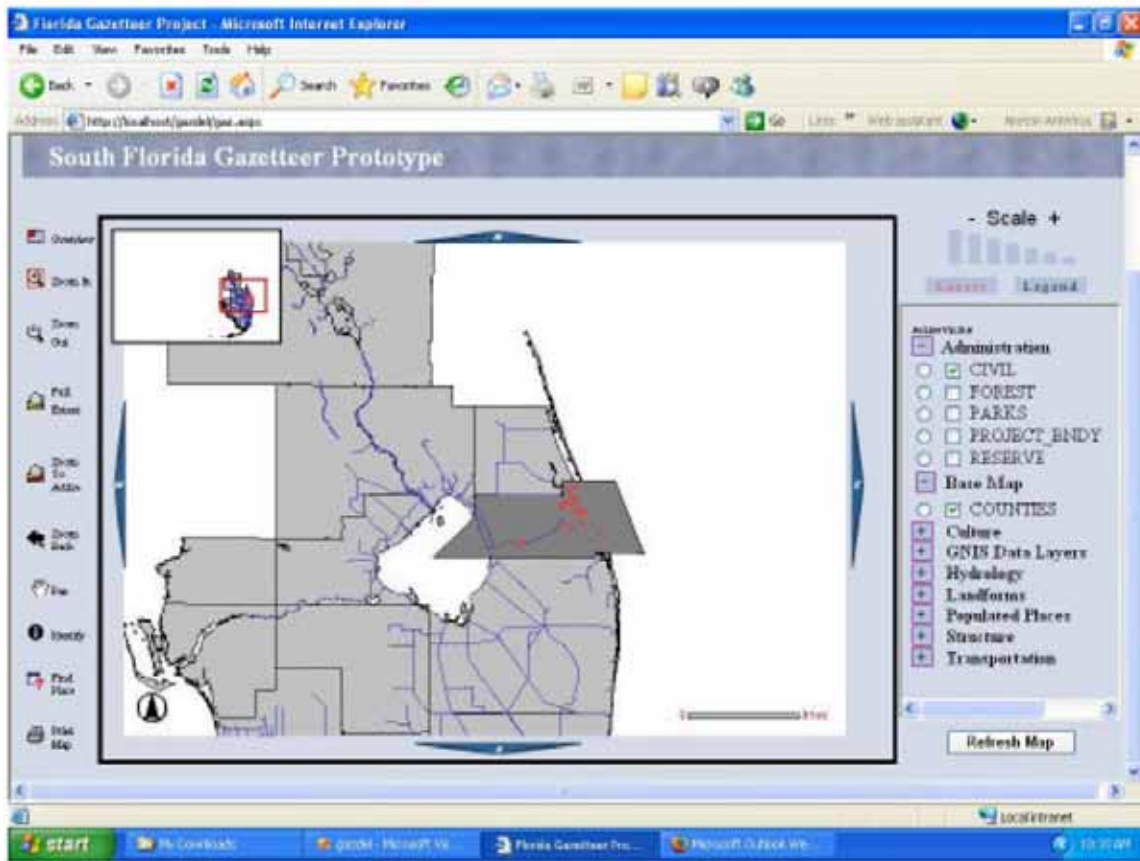
Next Steps

The SFWMD and USACE are currently populating the Florida Gazetteer geodatabase with additional features and place names. In addition, the Development Team is addressing the issue of maintaining the "history" of a place using the spatial footprint data as they change over time.

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