September 14, 2005

Research Data Reporting Requirements:
File Formats and Templates for Documenting Scientific Data

Everglades and Dry Tortugas National Parks
South Florida Natural Resources Center
U. S. Department of the Interior

TABLE OF CONTENTS

5. Appendices

Appendix A: Metadata Template Form and Instructions
Appendix B: Example Metadata Form
Appendix C: Coordinate Systems
Appendix D: National Map Accuracy Standards
Appendix E: SFNRC Custody/Responsibilities Policy
Appendix F: List of Acronyms

1. Introduction

1.1. Description

The Research Data Reporting Requirements (RDRR) are intended to detail the South Florida Natural Resources Center's (SFNRC) acceptable file formats and necessary documentation for submitting scientific data including; maps, images and physical as well as biological digital data sets. These requirements apply to deliverables that are generated from staff projects as well as research data delivered to Everglades and Dry Tortugas National Parks'. Documentation should be complete enough to allow future investigators to work with the data independently. These requirements supersede the Research Data Reporting Requirements policy, dated March 10, 1998. The protocol for data custody and access to data/information collected in scientific activities supported by federal government funds are in accordance with "EVER 5281-53: South Florida Natural Resources Center Data Custody and Data Responsibilities" policy (see Appendix E).

1.2 Types of Deliverables

Project deliverables and schedules are defined in the project Scope of Work (SOW), research permit, Project Management Plans (PMP) and contracts. The items in **Bold** type are described in this document. Deliverables also may include, but are not limited to, the following:

- *Reports*
- *Field Notes*
- ***Images***
- ***Maps***
- ***Models***
- ***Databases***
- *Voucher specimens*

1.3 Exclusions

The Research Data Reporting Requirements do not address how data are collected, analyzed, or managed at the project level. Standards for written reports (contact the science coordinator or permit officer) and voucher specimens (contact the museum curator) are available from the National Park Service representative associated with the project or can be obtained from the appropriate technical contact (section 2.2).

1.4 Goals and Objectives

Project-specific data are generally collected for a period of time defined in a PMP, SOW, cooperative agreement, or contract. The Research Data Reporting Requirements provide a standardized system for documenting databases, spreadsheets, maps, models as well as listing file formats acceptable for submitting data including digital images. It is the

intention of the SFNRC to implement a "user friendly" process for documenting digital data sets by providing a structure and the templates necessary for submissions. Digital versions of these templates are available for download from the SFNRC website http://www.sfnrc.ever.nps.gov.

2. Deliverables Requirements and Procedures

2.1 Requirements

It is expected that the data will be collected according to a schedule and following a protocol that is described in the SOW, project plan and research permit. It is the responsibility of the Principle Investigator (PI) and National Park Service Representative (i.e. COTR, staff) to ensure format policy and content requirements are in compliance for each project. Information not complying with these standards will not be accepted by the SFNRC as complete.

The South Florida Natural Resources Center and Everglades National Park (EVER) museum will serve as long-term central repositories for all deliverables. Images captured during a project to document scientific information will be treated in accordance with the Data Custody and Data Responsibilities Policy (Appendix E). All data must be provided to the SFNRC as stipulated by the SOW, project plan, permit and/or contract. The data must be provided in digital form, in the formats specified by the SFNRC and accompanied by full descriptive information about the study including the written report, data set(s) and metadata.

Any data that are not appropriately handled by the software types listed below must be discussed with the National Park Service Representative who will make a determination on a case-by-case basis in consultation with the researchers and database management staff. All metadata documentation requirements will still apply to these data, with appropriate modifications due to the nature of the data.

Any custom computer software developed with financial support from the SFNRC must also be provided at the end of a study. The complete source code in digital format and an executable version of the program(s) must both be provided. Full documentation describing what the software does, the major algorithms used, data requirements, et cetera, must accompany the software. In addition, a user's guide discussing all functions of the software must be provided. This requirement only includes major software development efforts, which result in a software product of continuing interest. It does not include minor software that a researcher may develop for his/her own limited use (e.g., for data file conversion).

2.2 Technical Assistance

Please contact the SFNRC technical support staff listed below at any time during this process with questions that may arise. We are here to help you comply with the terms of your project and to make compliance as easy as possible under the current regulations.

Contact: Janice Holly Lynch
Biological Database Manager
Daniel Beard Center
phone: 305-242-7867

Contact: Kevin Kotun
Physical Database Manager
South Florida Ecosystem Office
phone: 305-224-4229

Contact: Darrell Tidwell
Information Technologist
South Florida Ecosystem Office
phone: 305-224-4266

Contact: Tonya Howington, Ph. D.
 Science Coordinator
 South Florida Ecosystem Office
 phone: (305) 224-4241

Contact: Troy Mullins
GIS Specialist
South Florida Ecosystem Office
Phone: (305) 224-4288

Contact: Nancy J Russell
Museum Curator
Daniel Beard Center
phone (305) 242-7826

Contact: Bob Zepp
Permitting Office
Daniel Beard Center
phone (305) 242-7881

3. Digital Data Documentation and File Formats

3.1 Field Data Collection Forms

Field data collection forms are vital resources and they help other researchers and database managers understand your project. You can submit an example data collection form digitally or make a hardcopy for submission with your project.

3.2 Data Verification and Quality Assurance

The researcher should be aware that errors can arise from:

- human error in recording data
- human error in transcribing data and
- a variety of mechanical/sensor errors.

For example, manual effort is generally required to get data into electronic format. Any errors made during typing will accumulate in the permanent database unless the data are verified and errors are detected. By implementing a data verification practice, these errors can be reduced, if not eliminated. The methods that eliminate the most errors can be very time consuming, while the simplest methods will not be as efficient at detecting errors.

A description of the verification method and results will be included in the metadata accompanying the database. The extent of this information will vary depending on the kind of data. For chemical data, quality assurance steps are well developed and include analytical accuracy and precision and/or detection limits, as applicable. Standard references for methods or discussion of departures from standard methods should be provided in the written report. Some field biology sampling requires a simpler quality assurance protocol.

Data verification and quality assurance is therefore complex. We can not prescribe the exact methods needed for each case; however, we request that researchers apply the best methods possible to address the particular needs of their data collection process.

3.4 Metadata (detailed information about the data)

Metadata can be submitted using the minimum content standard using the template below (see Appendix A-B). This template is available in Microsoft Office Word format that can be downloaded from the SFNRC website http://www.sfnrc.ever.nps.gov.
It includes the minimum fields necessary to document biological, physical and spatial information. The metadata file for each data set will be referenced in the Code_project_Readme.doc as described below (section 3.5.1). Each time a data set is delivered to the SFNRC the metadata file shall accompany it (either a revised version or a copy as appropriate).

The recommended format for geospatial metadata is the current Federal Geographic Data Committee (FGDC) version. The recommended metadata authoring tool

is ArcCatalog. To learn more about getting started with the FGDC metadata program see http://geology.usgs.gov/tools/metadata/. For complete information on FGDC metadata see http://www.fgdc.gov. The metadata created will be delivered to the SFNRC in extensible markup language with an .XML extension. Several example FGDC-compliant metadata records and browse graphics may be reviewed at http://www.nps.gov/gis/data_info/. Specifications for the attributes and database tables attached or linked to the spatial data must be documented in the "Entity and Attribute Information" section of the FGDC metadata and include:

- Attribute Label (field name)
- Attribute Definition (field description)
- Valid values (Attribute Domain Values)

3.5 Digital Data (Documentation and Templates)

The description of the necessary elements and templates for submission are outlined below. This information including an example minimal metadata file can be downloaded from the website or obtained from the Biological Database Manager. Each completed project will include the verified Oracle or Microsoft Access database, Excel spreadsheet or import compliant file(s), metadata, field notes and Descriptive Documentation (see below) to be delivered on CD-ROM (s) or DVD(s).

3.5.1 Descriptive Document (CODE_project_Readme.doc) - Each database or spreadsheet will be submitted with this descriptive document containing information about the project and data. A text .txt, .pdf or Microsoft Word .doc, document describing the dataset will accompany each database submission to provide the necessary information for understanding the data submittal.   The CODE_project_readme.doc will list the names of the files submitted. Also include the data contact information, sensitivity for security purposes, information about vouchers, digital photographs, collection instruments and additional comments as appropriate.

In general, CODE will equal to Funding source, Agency code and/or project number associated with your project (i.e. PERMIT_miamibluebutterfly_Readme.doc CESI_alligator_Readme.doc or LWCF_bluebird_Readme.doc). **Details for each of the necessary files included in the CODE_project_Readme.doc are explained below followed by an example that can be used as a template.**

3.5.1.1 Data Dictionary (CODE_project_Data_Dict.doc) –This text or Microsoft Word document will describe the field names, primary key, field type, field size and description of any protocols used to derive data entered in fields within that column. Each field in the database will be defined by a clear and concise description. A field description includes a definition statement that clearly states the purpose of the field. The description can be used to further clarify any information about the field that may not be apparent by the field name alone. Especially when data are shared among multiple users, it is extremely important to write clear and concise field descriptions. Generally these definitions are documented in the database during table creation. Data dictionaries typically contain these field

definitions, along with field data type information. Microsoft Access has the ability to generate this file for you from your database (see Access help files).

3.5.3 Metadata (CODE_metadata.txt/doc/xml) - The database is described by completing the SRNRC metadata template in MS Word, or text format. See Appendix A-B for the complete template and example. You can cut and paste from other project reports and articles to supply most of the necessary information. If you are creating FGDC standard metadata your file extension will be .xml.

3.5.4 Database or Excel file (CODE_name.mdb, Code_name.xls) - Provide a copy of the MS Access/Excel or import compliant digital dataset. Each dataset will have its own set of documentation files. A clear and meaningful file name should be used that conveys the nature of the data, subject, and park unit represented. All data and related file names should not contain spaces or special characters. An underscore may be used to make field names more readable. The tables and field names should be designed to clearly define the data being stored (i.e. tbl_measure). A suggestion is to use the PRE_ROOT format, where PRE is a three-character prefix such as table "tbl" and eight-character ROOT is the root name or project name. Field names for spatial information should conform to ArcGIS field naming limitations.

3.5.5 Relational database schema - This is a very useful visual representation of the database showing relationships between tables. Provide this printed version in block format for .mdb files. You can generate the Schema for Microsoft Access databases utilizing the relationships tool and save it as a report (see Access help files).

3.5.6 EXAMPLE: LWCF_Birdrestor_Readme.doc (or .txt) or LWCF_Birdrestor.zip (optional) compressed file containing the following required information:

a. LWCF_Birdrestor.mdb (Oracle/MS Access database/Excel spreadsheet or format compliant files)

b. LWCF_Birdrestor_Dict.doc (data dictionary for database)

c. LWCF_Birdrestor_Metadata.txt - (see Appendix A-B for word metadata template)

   and/or

d. LWCF_Birdrestor_full.xml (OPTIONAL for biological and physical data; full FGDC metadata formats for if available)

e. Sensitivity: None of the data contained in this data set are considered sensitive.

f. Data Contact: Janice Holly Lynch, Biological Database Manager

Everglades and Dry Tortugas National Parks
South Florida Natural Resources Center
40001 State Road 9336
Homestead, Fl 33034
phone: 305-242-7867
fax: 305-242-7836

g. Vouchers: Voucher specimens were collected in the form of digital pictures 100 images in .jpeg are included on a separate CD-ROM with metadata created in Photoshop.

h. Digital Photographs: Digital photos were taken at data collection sites this project, 20 images are included with metadata created in ThumbsPlus and photo editing completed in Photoshop.

i. Instruments: GPS units, Garmin eTrex hand-held.

j. Comments: Included in separate file is LWCF_ImageSOP.doc detailing the Standard Operating Procedure for capturing voucher images for avian species of Wild Turkey and Bluebirds from digital formats.

3.6 Spatial Information Standards

There are several ways in which spatial data can be represented in a GIS including points, lines, polygons, or rasters/images. Determining which representation(s) is appropriate for your study involves consideration of scale and study goals. Prior to data collection, this issue should be addressed and resolved in the project study plan in consultation with the project or GIS staff. For more information regarding Map Accuracy Standards see Appendix D.

3.6.1 File, Table and Field Naming Conventions- A clear and meaningful file, table and field names should be used that conveys the nature of the data, subject, and park unit represented. All data and related file names should not contain spaces or special characters. An underscore may be used to make names more readable. Field names should conform to ArcGIS field naming limitations.

3.6.2 Coordinate Systems- All spatial data collected or submitted shall be geo-referenced with projection information defined in the data file that is submitted.   All spatial data will be provided in the standard regional-scale projection(s). This will generally be UTM, NAD83. See Appendix C for details and exceptions.

3.6.3. Spatial Data File Formats

a. Vector Data
1. All vector data will be supplied as an-ArcINFO interchange file (*.E00) and/or ArcView Shapefile, or an ESRI ArcGIS Geodatabase compatible with the current version of ArcINFO.

2. ESRI ArcINFO Coverage/export file- Data developed in ArcINFO coverage format should be exported to an Arc Interchange file (.E00 file) (ArcGIS 8.x .E00 files should include the metadata .XML file from ArcCatalog). All coverages should be created as double precision data sets. If the data set was originally obtained in single precision, convert it to double precision before submitting. All coverages should be topologically clean and correct. All coverages will contain complete well defined projection information.

3. ESRI Shapefile- Shapefile format shall be used only if an ArcINFO coverage does not exist. The shapefile format includes at a minimum the .SHP, .DBF, .SHX and PRJ files. Shapefiles from ArcGIS files should include the metadata .XML and projection .prj files.

4. ESRI ArcGIS Geodatabase- Data delivered as an GDB shall be delivered as the Microsoft access .mdb that is the GDB. A geodatabase (short for geographic database) is a physical store of geographic information inside a relational database management system (RDBMS). A personal geodatabase is stored as a Microsoft Access file. The schema should be submitted.

b. Raster Data

1. All cell based data sets or grids will be supplied as an ArcINFO GRID and/or ArcINFO interchange file, compatible with the current version of ArcGIS. All geo-referenced digital aerial photography and imagery, are to be supplied either as a ERDAS Imagine File, 8 bit grayscale GeoTiff or 24 bit RGB GeoTiff, or a tagged image file format (.TIFF) files with any associated geo-reference information. Digital aerial photography and imagery may be acceptable in other data formats.

2. ArcINFO GRID File- This is the preferred format for non-imagery raster data. This is a ESRI format that supports 32-bit integer and 32-bit floating-point raster grids. Grids are useful for representing geographic phenomena that vary continuously over space and for performing spatial modeling and analysis of flows, trends, and surfaces such as hydrology. Generally, GRID themes should be delivered as .E00 files as stipulated above. It is recommended that large Grid themes be submitted as separate compressed workspaces because .E00 files may be extremely large and unwieldy. All data submitted in Grid format will have well defined projection information.

3. ERDAS Imagine- file Imagine files (.IMG) will contain well defined projection files associated with them. Pyramid files (.RRD) shall be included if available.

4. GeoTIFF v1.0- A raster format with geo-referencing stored in the header of the file. All data submitted in GeoTiff format will have well defined projection files associated with them.

5. TIFF- TIFF files must include world files and will have well defined projection files associated with them.

3.6.4 Digitizing - When digitizing features from maps or photographs, the source, scale, date, and methods (i.e., process steps) shall be recorded in the Metadata and listed in the CODE_project_Readme.doc. When using GPS collection, the GPS unit type, model, averaging method used for static surveying, error correction technique and GPS quality filters employed shall be recorded in the Metadata.

3.6.5 Scale and Spatial Resolution - All spatial data collected shall be analyzed for their spatial accuracy and shall meet or exceed the National Map Accuracy Standards for the appropriate scale (for more information see http://mapping.usgs.gov/standards/ and/or Appendix D). Longitude and Latitude coordinates for geographic data should be recorded to a minimum 5 significant digits to the right of the decimal point and stored in double precision attribute or database fields.

3.6.6 Attribute Data - Simple attribute data such as that used for map symbolization shall be delivered as part of the ArcGIS feature attribute table. Complex attributes shall be delivered in a well-structured relational database format as a Microsoft Access .MDB file using current versions of Microsoft Access. Map features and database records shall share a common unique identifier or primary key that relates the map feature to the table record

The ArcINFO coverage/shapefile format is not ideal for storage and management of complex relational data such as 1: many relationships and data normalization, NPS project managers may request that relational attribute data shall be stored either in a separate, well-structured relational database system or in a geodatabase data format.

3.6.7 Quality Assurance and Control (QA/QC)-Accuracy assessments of spatial and attribute data are project specific. QA/QC procedures will be documented by the contractor in the appropriate metadata sections and described in written reports.

3.6.8 Linked Documents - Project documents such as user manuals, detailed map unit descriptions, and site photographs can be linked to map features through "hot linking". Hot linking (hyper linking) allows the user to click a map feature and have a related document open and jump to the chapter associated with an attribute of that map feature. If an associated document is included with the intention of hot linking (hyper linking) the following is required:

a. HTML Documents (*preferred method*)
- The document(s) shall be an HTML formatted file.

o The document(s) will include a table of contents with separate listings and anchors for each "topic" or description that relates to a GIS feature.
o Include a separate tabular list of which "topics" correspond to each linking field value in the GIS theme (i.e. the key values for linking the document to the GIS).

b. Microsoft Word Documents (*for conversion to Windows Help Files*) - This option is strongly discouraged
o The document(s) shall be a Microsoft Word formatted file.
o The document(s) will include a table of contents with separate listings for each "topic" or description that relates to a GIS feature (e.g., extensive textual descriptions of each and every feature of a theme).
o Include a separate tabular list of which "topics" correspond to each linking field value in the GIS theme (i.e. the key values for linking the document to the GIS).

3.7 Imagery

The required image formats include JPEG/.JPG and .TIFF files. Digital cameras allow the user to select different image qualities for storage. The highest quality is typically an uncompressed .TIFF format and is the National Park Service standard for archiving. This format requires a great deal of space for storage and can limit the number of images you can save on your camera's storage device or CD-ROM. Cameras will usually allow for the storage of images in compressed JPEG format and that is also acceptable. The degree of compression or size of the captured images may also be selected. It is advisable to choose the physically largest image available (in terms of the horizontal and vertical resolution). Large images capture more detail and are better for voucher identification. It is best to choose medium to high quality JPEG formats so that image quality can be conserved.

Individual Images should include metadata; including photographer, copyright or sensitive information if applicable in addition to the information recorded by the camera when the image was taken. Include copies of digital images with descriptive file names on a separate CD-ROM's if necessary.

For vouchers the file name should be changed to include: species scientific name, individual identifying number, collection site description or reference code, and date of capture. Indicate in the CODE_project_Readme.doc if images are also used as voucher specimens or depict Sensitive Information (i.e.location of Threatened and Endangered species for your project). Images and graphics shall be organized in a file folder or directory structure that provides a logical hierarchical format.

If any linked graphics or digital photographs are included with the spatial data set, they should be in a format that is readable in ESRI's ArcGIS. The recommended image types that can be directly hot linked (hyperlinked) to a layer in ArcMap include; JPEG/.JPG and .TIFF. Map features with linked graphics/photographs should contain a GIS attribute field that records the relative directory path and file name. The suggested field name is "Images." Map layers should have meaningful names that relate to the map theme and its

attributes and digital image file names should be encoded with this value. Any file coding schemes that are used should be documented and included in the Data Dictionary document (section 3.5.2).

4. Transmission Options

4.1 Large Data Files

If your data files are large you may want to compress them using a program that creates a.zip file extension such as WinZip or provide several CD's or DVD's.

The following are the locations to transmit the deliverables to:

4.2. Mail

Mailing address:

National Park Service Representative/COTR NAME
Everglades National Park
South Florida Ecosystem Office
950 North Krome Avenue
Homestead, Florida 33030-4443

OR

National Park Service Representative/COTR NAME
Everglades National Park
Daniel Beard Center
40001 State Road 9336
Homestead, Florida 33034

Everglades and Dry Tortugas National Parks
South Florida Natural Resources Center Information Resources
Metadata Catalog Form
(Information detailing digital spatial, biological, physical, and/or modeling data)

Supply a digital version (.txt or .doc) of the following form for each data set. All fields must be completed if applicable or record N/A. Formal FGDC metadata will be accepted in place of this form if it is submitted in .xml format. For additional information regarding standardized metadata utilizing the FGDC standard contact the SFNRC Biological Database Manager.

NPS Information: FGDC Section 0

1. Unit code for Park(s): EVER   DRTO   BISC   BICY

> Everglades National Park EVER
> Dry Tortugas National Park DRTO
> Biscayne National Park BISC
> Big Cypress National Preserve BICY

2. **List the applicable Identification Numbers Associated with your Project**
> SFNRC Project ID:
> EVER Museum Accession:
> EVER Permit:
> NPS Cooperative or Interagency Agreement:
> National Park Service Funding Source:

Identification Information: FGDC Section 1

3. Originator: Indicate the party responsible for the data set. This is most commonly the organization that developed the data set. If a contractor developed the data set include that information below (#5). Who are the project participants including; the project lead or principal investigator (PI) and key field technicians.

> **Name:**
> Position:
> Affiliation:
> Address:
> Phone:
> Fax:
> E-mail:
>
> **Name:**
> Position:
> Affiliation:
> Address:

Phone:
Fax:
E-mail:

4. National Park Service Representative (COTR, Key Official) name if applicable:

5. List other contractors or organizations or individuals whom should get credit for data collection and/or analysis?

Name:
Position:
Affiliation:
Address:
Phone:
Fax:
E-mail:

6. Publication Date: The date that the data was published or otherwise made available, use the format: (XXXX year, XX month, XX day)

7. Data set Title: What is the complete title (no abbreviations please) of the project or data set?

8. Data Type: The *data type* is the physical (i.e., analog) or digital medium in which the data exist. For identification of the data type in the data set catalog, one of the acronym codes below may be used (see instructions for details):

Unorganized Database (e.g., unsorted files, etc.) ANAUNO   ANAORG   ANAUNO
DIGDB   DIGRAS   DIGVE   CGEODB   GEORAS   GEOVEC

Data Type: Point   Raster   Vector
Coordinate System: Albers   Geographic (Lat/Lon)   State Plane   UTM   Other

Datum: NAD27   NAD83   Other

9. Publishing: Will the data set, project, and/or research (or resulting analysis) be published or part of a larger publication? If so, what is the reference, **series name and issue identification**?

10. Publication place:

11. NPS Nature Bibliography Identification (NatureBIB ID) number (optional):

12. Online Linkage: Full data distribution URL if the **data** are available online

anywhere.

13. Online Linkage: Full URL if the **report** is available online anywhere.
 Link URL:

14. If the data is available on the **SFNRC Share Drive or Oracle Server**, what is the path name?

15. Abstract: Include a concise description of the data.

16. Purpose: A summary of the intentions for developing the dataset

17. Methods: Briefly summarize your field and laboratory methods (cut & paste from other documents! If you used existing protocols or methods, list the references).

18. Collection: The data will be developed primarily through:

        a) Field visits?

        b) Remote instrumentation (*i.e.* temperature recorders, etc)?

        c) Existing data sources (please list)?

        d) Other (explain)?

19. Online Linkage for metadata file: Full URL for the **metadata** file if it is available online anywhere.

20. Time period of Content: The relevant date(s) of the data content. For example the data may have been gathered in June but the report was not completed and published until February. Use the format: year, month, day

    Begin Date: End Date:

    Multiple Dates:

21. Progress: Planned   In-work   Complete

22. Update Frequency: Continually __ Daily __ Weekly __ Monthly __ Annually __
    As Needed__ Biannually __ Irregular __ None Planned __ Unknown __

23. Spatial Domain of Dataset: Approximate center of the study area must be determined.

        N. Latitude (Dec. Degrees):
        W. Longitude (Dec. Degrees):
        E. Longitude (Dec. Degrees):
        S. Latitude (Dec. Degrees):
        UTM Zone (Optional):

        W. Easting:
        E. Easting:
        N. Northing:
        S. Northing :

Coverage of Everglades National Park:
In
Out
In&Out
Other

Coverage of Dry Tortugus National Park:
In
Out
In&Out
Other

Coverage of Biscayne National Park:
In
Out
In&Out
Other

Coverage of Big Cypress National Preserve
In
Out
In&Out
Other

24. Layers Table or Layer Names. For a composite data set of several Geographic Information System (GIS) layers or database tables, the names of the multiple data record types may be listed. This field allows composite data sets to be listed as a coherent unit in the catalog without separate entries, but careful documentation of all tables/layers is essential for this scheme to be practical and useful for future reference.

Source/Attribute, Table/Layer Name,   Optional Table Page(s), Scale or resolution

25. Subject of data set: From the list below choose the main subject of the data set.

26. Keyword terms: From the list below, note the most appropriate categories from the list below for search features in the metadata catalog.

Air Quality	Hydrology (ground)
Archeology	Hydrology (surface)
Assessment/ Decision Support	Hydrology modeling
Basic Research	Ichthyology
Botany	Integrated Pest management
Climatology	Invertebrates
Coastal/Marine systems	Lake ecology
Contaminants/ Haz. Mat.	Limnology
Ecology	Mammalogy
Ecology modeling	Marl Prairie
Entomology	Management/Administration
Environmental monitoring	Microbiology
Environmental impact	Minerals Management
Erosion/Sedimentation	Oceanography
Estuary	Ornithology
Exotic species- animals	Paleontology
Exotic species- Plants	Petrology/mineralogy
Fire	Recreation/Aesthetics
Fisheries Management	Restoration- Cultural
Flood Management/History	Restoration- Natural
Forestry/ tree islands	Ridge and Slough
Fungi	Sedimentology/ Stratigraphy
Geo-Hazard (chemical)	Sociology
Geo-Hazard (physical)	Soil science
Geographic Information System	Tectonics
Geochemistry	Threatened/Endangered animals
Geohydrology	Threatened/Endangered plants
Geology- coastal	Water quality
Geology- fluvial	Water quantity
Geology- general	Water rights
Geology- structural	Watershed management
Geomorphology	Wetlands
Geophysics	Wildlife management
Herpetology	Zoology
History	

27. Place Keywords: List regional (general) and local references (specific) for location of your project.

28. Species: What species or communities will be examined?

Taxonomy: List species names using ITIS as the taxonomic authority
http://www.itis.usda.gov/ insert information here.

29. Where vouchers collected: Y   N

30. Access Constraints for Sensitive data: archeological   paleological
 T&E species   sensitive to collection   legally restricted

31. Cross Reference Citation Information: For more information about the dataset title from Dataset Citation. Related documentation.

Originator
Publish date
Title
Online Linkage URL

32. Analytical Tool: Will you use a model or other analytical tool to develop your data set?

Tool Access Information
Tool contact
Tool citation

33. Data Verification/Validation: What measures will you take to make certain that your data set is as nearly correct as possible?

34. Quality: Unknown   None   +Ver+Val   +Ver   +Val   +Meta

Comments about data quality:

Advice: Do you have any advice for potential users of the data set?

Distribution Information: FGDC Section 6

35. Data Distribution Contact: Individual or organization that distributes data.

Name:
Position:
Affiliation:
Address:
Phone:
Fax:
E-mail:

36. Data Format : Paper   Access   Oracle   SQL Server   Excel   ASCII   Images (list extension such as .jpg)   ESRI compliant   other

37. Transfer size: mb

Metadata Reference: FGDC Section 7

38. Metadata Date: The date that the metadata is written or completed. Use a date format of XXXX year, XX month, XX day.

39. Metadata Contact: (Your Name):

Name:
Position:
Affiliation:
Address:
Phone:
Fax:
E-mail:

Instructions for the Metadata Form

This section contains generalized instructions for completing the data set catalog entry form.

NPS Information: FGDC Section 0

1. Unit code for Park(s): Place an X next to the appropriate parks EVER Everglades National Park DRTO Dry Tortugas National Park, BISC Biscayne National Park, BICY Big Cypress National Park.

2. SFNRC Project ID: The project identification should be assigned a unique, park-based value.

Identification Information: FGDC Section 1

3. Originator: For data that were generated by park staff or contractors/cooperators or other sources list the name, affiliation, position, and contact information should appear in the provided spaces. This is most commonly the organization that developed the data set.

4. National Park Service Representative (COTR, Key Official) name if applicable: Indicate the NPS staff person assisting with project.

5. List other contractors or organizations or individuals whom should get credit for data collection and/or analysis?

6. Publication Date: The date that the data was published or otherwise made available, use the format: year, month, day

7. Data set Title: Enter a complete project title with no abbreviations. The title should be sufficiently distinct for a search in the catalogue to direct the data explorer to the proper data set.

8. Data Type: The *data type* is the physical (i.e., analog) or digital medium in which the data exist. For identification of the data type in the data set catalog, one of the acronym codes below may be used:

Spatially Georeferenced Data sets

Digital Raster Data (e.g., GRID, GRASS etc.): GEORAS

Digital Vector Data (e.g., ARC, etc.): GEOVEC

Digital Database (e.g., ACCESS, ASCII, personal geodatabase): GEODB

Non-georeferenced Data sets

Digital Raster Data (e.g., SURFER, scanned maps etc.): DIGRAS

Digital Vector Data (e.g., .dwg, .dxf etc.): DIGVECD

Digital Database (e.g., ACCESS, ASCII): DIGDB

Analog (i.e. Hardcopy) Data sets

Organized Database (e.g., field forms, tables, etc.) ANAORG

Unorganized Database (e.g., unsorted files, etc.) ANAUNO

9. Publishing: Will the data set, project, and/or research (or resulting analysis) be published or part of a larger publication? If so, what is the reference, **series name and issue identification**?

10. Publication place: list location of publisher

11. NPS Nature Bibliography Identification If your project is within the NPS system you can request a bibliographic citation number for the National Park Service Inventory and Monitoring Nature Bibliographies database (optional).

12. Online Linkage: Full data distribution URL if the **data** are available online anywhere.

13. Online Linkage: Full URL if the **report** is available online anywhere.
 Link URL:

14. Where is the file located on a **SFNRC Share Drive or Oracle Server** network, PC, data disk, list path name.

15. Abstract: Brief description of the data set. The description must be concise and direct. Descriptions should focus on the data. One usually exceeds the size limit in the first draft but will quickly be able to pare it down to the basic facts and write a concise yet complete description of the data set.

16. Purpose: A summary of the intentions for developing the dataset

17. Methods : Briefly summarize your field and laboratory methods (cut & paste from other documents! If you used existing protocols or methods, list the references).

18. Collection: Describe how the data were developed, site visits, remote instrumentation (*i.e.* temperature recorders, etc), existing data sources, etc.

19. Online Linkage for metadata file: Full URL for the **metadata** file if it is available online anywhere.

20. Time period of Content: The overall time span of the data set and any periods of record should be recorded if time gaps with no data collection occurred. For one-time-only studies, the single year must be listed and more details may be given in multi-dates/notes or in the data set description. For multi-time data sets, a list of the start and end dates of each period should be given. Use the format: year, month, day.

21. Progress: Place an "x", Bold or Underline text, next to the appropriate stage the data is in; **Planned** a data set in the planning/implementation/collection stage, **In-work** data are still being added to the data set, <u>Complete</u> data is no longer being collected or planned for collection.

22. Update Frequency: Place an "x", Bold, or Underline text, next to the interval at which new data are appended to the data set (i.e. daily, biannually).

23. Spatial Domain of Dataset: The *longitude* and *latitude* of the approximate center of the study area must be determined for geospatial referencing. If the centroid of the park is the center of the study area, the location may be obtained from the table in the appendix. Otherwise, the centroid location must be determined from a map. Lat/Lon must be in decimal degrees (DD)--not degrees, minutes, and seconds (DMS). To convert DMS to DD, the minutes must first be divided by 60 and the results by 3600. Then the degrees, converted minutes, and converted seconds are summed. If known include the UTM Zone, of the Data Set Study Area. If UTM Northing and Easting values are available, needed, or desired for the approximate center of the study area, they are entered here. If the centroid of the park is the center of the study area, this location may be obtained from the table in the appendix. Otherwise, the centroid location must be determined from a map.

Were Data may have been collected *inside* (IN) or *outside* (OUT) of the park boundary, and the study area may have included places inside the park as well as outside park boundaries (INandOUT)?

24. Layers Table or Layer Names: For a composite data set of several Geographic Information System (GIS) layers or database tables, the names of the multiple data record types may be listed. This field allows composite data sets to be listed as a coherent unit in the catalog without separate entries, but careful documentation of all tables/layers is essential for this scheme to be practical and useful for future reference.

List: Source/Attribute, Table/Layer Name, Optional Table Page(s), Scale or resolution. The data dictionary that Access software generates is acceptable.

25. Subject of data set: Select the main Subject for the data set from the list provided below.

26. Keyword terms: From the list below, note the most appropriate categories from the list below for search features in the metadata catalog.

Air Quality	Hydrology (ground)
Archeology	Hydrology (surface)
Assessment/ Decision Support	Hydrology modeling
Basic Research	Ichthyology
Botany	Integrated Pest management
Climatology	Invertebrates
Coastal/Marine systems	Lake ecology
Contaminants/ Haz. Mat.	Limnology
Ecology	Mammalogy
Ecology modeling	Marl Prairie
Entomology	Management/Administration
Environmental monitoring	Microbiology
Environmental impact	Minerals Management
Erosion/Sedimentation	Oceanography
Estuary	Ornithology
Exotic species- animals	Paleontology
Exotic species- Plants	Petrology/mineralogy
Fire	Recreation/Aesthetics
Fisheries Management	Restoration- Cultural
Flood Management/History	Restoration- Natural
Forestry/ tree islands	Ridge and Slough
Fungi	Sedimentology/ Stratigraphy
Geo-Hazard (chemical)	Sociology
Geo-Hazard (physical)	Soil science
Geographic Information System	Tectonics
Geochemistry	Threatened/Endangered animals
Geohydrology	Threatened/Endangered plants
Geology- coastal	Water quality
Geology- fluvial	Water quantity
Geology- general	Water rights
Geology- structural	Watershed management
Geomorphology	Wetlands
Geophysics	Wildlife management
Herpetology	Zoology
History	

27. Place Keywords: Location refers to the geographic position of the data set. Descriptive term(s), place name(s), site(s), etc. (e.g., Taylor Slough, Pine Island Campground etc.) should be used. If the data set covers relatively few sites throughout the park, parkwide should be chosen but other place names or some details should also be provided in the data set description.

28. Species: List species name(s) using Integrated Taxonomic Information System (ITIS) as the taxonomic authority http://www.itis.usda.gov/. For each scientific name, ITIS will include the authority (author and date), taxonomic rank, associated synonyms and vernacular names where available, a unique taxonomic serial number, data source information (publications, experts, etc.) and data quality indicators. Expert reviews and changes to taxonomic information in the database will be tracked. Geographic coverage

will be worldwide with initial emphasis on North American taxa. From the website attach the ITIS report as .xml with this document.

29. Where vouchers collected: Yes or No

30. Access Constraints for Sensitive data: The deliberate withholding of publicly owned information is valid only when data are specifically protected under existing law. The locations of caves/caverns and archeological sites on federal lands have this level of protection. **Sensitive information** such as the location of rare, threatened, endangered species, critical habitats and species sensitive to collection will not be made available to the public on SFNRC or NPS Service-wide websites.

31. Cross Reference Citation Information: Documents that relate to the data set must be listed. Although some projects may have an extensive document list, the list must be shortened for the data set catalog. The list may include brief titles, project proposals, published protocols, work plans, significant reports, analyses, IAR/RMP IDs, etc.

32. Analytical Tool: List the models or other analytical tools used to develop your data set including: Tool Access Information, Tool contact, Tool citation.

33. and 34. Data Verification/Validation: The *quality* field is essential, and the answer regarding data quality must be accurate. The identification of any data sets that have not been critically reviewed is very important. Selections for the data set catalog are listed below. What measures will you take to make certain that your data set is as nearly correct as possible? There is space to describe any additional data quality information and any advice for potential users of the data set.

Condition	Value	Attributes
Unknown	UNKNOWN	quality of the data including verification and validation attempts is unknown
Not ver/val	None	data are known to be unverified and unvalidated
Verification	+VER	*formally* verified as an accurate transcription of the original source (usually field forms)
Validation	+VAL	*formally* checked for out-of-range errors, spelling (sitecodes, names), correct dates, and logic errors (e.g., a 2 foot high tree with a 6 foot dbh)
Metadata	+META	data were fully documented to meet the applicable metadata standard

Distribution Information: FGDC Section 6

35. Data Distribution Contact: Individual or organization that distributes data.

> **Name:**
> Position:
> Affiliation:
> Address:
> Phone:
> Fax:
> E-mail:

36. Data Format: The format(s) in which the data set resides (e.g., software version, digital file, or analog format(s) used to manage the data) must be specified. Place "x" next to the format(s) your data is stored in such as paper, Access, SQL Server, ESRI compliant.

37. Transfer size: Include the transfer size of file in megabytes.

Metadata Reference: FGDC Section 7

38. Metadata Date: The date that the metadata is written or completed. Use a date format of XXXX year, XX month, XX day.

39. Metadata Contact: (Your Name): The data set contact person field is the person and position to which inquiries about the data set can be directed. The person filling in this catalog entry should be the contact person for this data set. Provide the name, position, and contact information in the provided space.

Everglades and Dry Tortugas National Parks
South Florida Natural Resources Center Information Resources
Metadata Catalog Form- Example
(Information detailing digital spatial, biological, physical, and/or modeling data)

Supply a digital version (.txt or .doc) of the following form for each data set. The numbers in brackets after each field name indicate the character limit for that field. All fields must be completed if applicable or record N/A.

NPS Information: FGDC Section 0

1. Unit code for Park(s): EVER **X** DRTO_____BISC___BICY_____

Everglades National Park EVER
Dry Tortugas National Park DRTO
Biscayne National Park BISC
Big Cypress National Preserve BICY

2. List the applicable Identification Numbers associated with your project
SFNRC Project ID: (20)#   **FY99-Research-013** and/or
EVER Museum Accession:
EVER Permit:
NPS Cooperative or Interagency Agreement:
National Park Service Funding Source:

Identification Information: FGDC Section 1

3. Originator: Indicate the party responsible for the data set. This is most commonly the organization that developed the data set. If a contractor developed the data set include the information below. Who are the project participants including; the project lead or principal investigator (PI), COTR and project participants.

> **Investigator Name**
> **Institution**
> **Institution Address**
> **Investigator Phone**
> **Investigator Fax**
> **E-mail**

> **Investigator Name**
> **Institution**
> **Institution Address**
> **Investigator Phone**
> **Investigator Fax**
> **E-mail**

4. National Park Service Representative (**COTR)** name if applicable:

Sonny Bass, Wildlife Biologist Everglades National Park

5. List other contractors or organizations or individuals whom should get credit for data collection and/or analysis?

Cooperator Name
Institution
Institution Address
Cooperator Phone
Cooperator Fax
E-mail

Cooperator Name
Institution
Institution Address
Cooperator Phone
Cooperator Fax
E-mail

6. Publication Date: The date that the data was published or otherwise made available, use the format: year, month, day:

2003

7. Data set Title (90): What is the title of the project or data set?

Status and Conservation of the American Crocodile in Florida: Recovering an Endangered Species While Restoring an Endangered Ecosystem

8. Data Type: The *data type* is the physical (i.e., analog) or digital medium in which the data exist. For identification of the data type in the data set catalog, one of the acronym codes below may be used (see instructions for details):

Unorganized Database (e.g., unsorted files, etc.) DIGDB

9. Publishing: Will the data set, project, and/or research (or resulting analysis) be published or part of a larger publication? If so, what is the reference, **series name and issue identification**?

Mazzotti, F.J. and M.S. Cherkiss. 2003. Status and Conservation of the American Crocodile in Florida: Recovering an Endangered Species While Restoring an Endangered Ecosystem. University of Florida, Ft. Lauderdale Research and Education Center. Tech. Rep. 2003. 41 pp.

10. Publication place:

University of Florida, Ft. Lauderdale Research and Education Center.

11. NPS Nature Bibliography Identification (NatureBIB ID) number (optional):

N/A

12. Online Linkage: Full data distribution URL if the **data** are available online anywhere.

N/A

13. Online Linkage: Full URL if the **report** is available online anywhere.
Link URL:
N/A

14. If the data is available on the **SFNRC Share Drive or Oracle Server**, what is the path name?
N/A

15. Abstract (250): Include a concise description of the data.

This is a summary of the total number of crocodile nests, successful nests, and hatchlings marked or the three nesting colonies in South Florida. Including: Growth and survival of the American crocodile in South Florida. American crocodile nesting success and predation on artificial and natural substrates in Everglades National Park over a 30 year period. Dispersal of crocodiles from the three nesting colonies in South Florida. Relative risks for crocodiles at three nesting colonies in South Florida. Relocation information for the American Crocodile in South Florida. Mortality information for the American Crocodile from 1997-2001. Hurricanes and tropical storms impacting crocodile habitat in South Florida 1975-2001.

16. Purpose: A summary of the intentions for developing the dataset

No new data was collected for this project. The data compiled and summarized in this report is the result of more than 25 years of research and monitoring of the American crocodile in Florida sponsored by the U.S. Department of the Interior, U.S. Army Corps of Engineers, the Florida Fish and Wildlife Conservation Commission and Florida Power and Light Company.

1. **Compile and provide databases on captures and nests of the American crocodile in Florida in a format compatible with National Park Service standards.**
2. **Identify and describe access to relevant regional environmental databases (e.g. rainfall, water levels, and salinities).**
3. **Identify and describe population and habitat models for American crocodiles in Florida.**
4. **Evaluate databases for long-term trends and between site comparisons.**
5. **Make recommendations for restoration success criteria and endangered species recovery.**
6. **Recommend standardized protocols for research and monitoring.**

17. Methods (250)**:**   Briefly summarize your field and laboratory methods (cut & paste from other documents! If you used existing protocols or methods, list the references).

Historical Data Sets. **-- A list of historic and current alligator projects and data sets will be compiled by sending a questionnaire to FFWCC, NPS, USFWS, University researchers, and private consultants who are currently or who have conducted research on alligators in south Florida. The questionnaire will ask for the project title, type of data, project dates, project PIs and current addresses, location and**

form of data (e.g. field notes, computer file etc.), and a list of reports in which the data are used. Each project will be evaluated as to the relevance of the data to restoration success criteria, modeling, and monitoring efforts, the amount of data, and the effort needed to get the data into a usable form. Based on the above information the projects will be ranked in order of importance.

18. Collection (140)**:**
Will the data be developed primarily through:

      a)   Field visits?

      b)   Remote instrumentation (*i.e.* temperature recorders, etc)?

      c)   Existing data sources (please list)?

      d)   Other (explain) **This was a data mining project: Florida Fish and Wildlife Conservation Commission, Florida Power and Light Turkey Point and University of Florida**

19. Online Linkage for metadata file: Full URL for the **metadata** file if it is available online anywhere.
      N/A

20. Time period of Content: The relevant date(s) of the data content. For example the data may have been gathered in June but the report was not completed and published until February. Use the format: year, month, day

      Begin Date: **1975**   End Date: **2001**

      Multiple Dates (140):

21. Progress: Planned   In-work   **<u>Complete</u>**

22. Update Frequency: Continually __ Daily __ Weekly __ Monthly __ Annually __
     As Needed__ Biannually __ Irregular __ None Planned __ **Unknown X**

23. Spatial Domain of Dataset: Approximate center of the study area must be determined.

1. **West_Bounding_Coordinate: -81.30333**
   East_Bounding_Coordinate: -80.262125
   North_Bounding_Coordinate: 25.847113
   South_Bounding_Coordinate: 24.696994

Coverage (6) of Everglades National Park:
In
Out
In&Out   **X Wetland systems of South Florida**
Other

24. Layers Table or Layer Names. (200). For a composite data set of several Geographic Information System (GIS) layers **or database tables**, the names of the multiple data record types may be listed. This field allows composite data sets to be listed as a coherent unit in the catalog without separate entries, but careful documentation of all tables/layers is essential for this scheme to be practical and useful for future reference.

DATA DICTIONARY CROC_datadic.doc

Florida Fish and Wildlife Conservation Commission:
Capture File (FWC CAP), Table 2
• CLIP- By the clipping of tail scutes in a prescribed manner, each crocodile was given an individual identification number.
• OWNER (DR)- Represents the institution responsible for marking the crocodile, where DR is the double right tail scute. An eight in this field means that Paul Moler or someone under his supervision marked the crocodile (Figure 1).
• S/DL/DR- Represents the specific tail scutes that were cut on each individual. The S stands for the single row of scutes, DL and DR represent the double left and right rows of tail scutes, respectively (Figure 1).
Ex. Clip=000206 and was caught by FWC. The eighth (8) double right scute would be cut to denote this. To represent the #000206 the sixth (6) double right scute, second (2) double left scute and no single scutes would be cut.
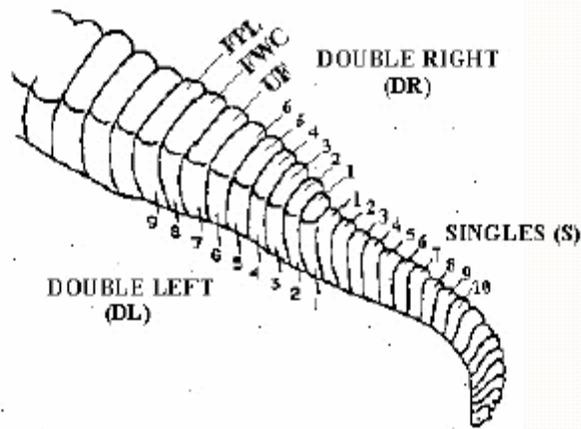
Figure 1. Scute configuration used with FWC captures.

- **TOE_TAG- This method of marking was not used by the FWC, therefore this field will have no data (ND).**
- **DATE- The date the crocodile was captured.**
- **HATCHLING- A yes or no indicates whether or not the animal captured was a hatchling.**
- **RECAPTURE- A yes or no indicates whether or not the animal has been previously captured.**
- **HATCH_DATE- If present, this indicates the hatching date.**
- **LOCATION- This denotes the specific location where the crocodile was captured.**
- **TL_CM- Total length (TL), measured in centimeters, from the tip of the snout to the tip of the tail on the ventral side.**
- **SVL_CM- Snout vent length (SVL), measured in centimeters, from the tip of the snout to the posterior end of the cloacal vent.**
- **MASS_G- Total weight of the crocodile, measured with a Pesola scale and recorded in grams.**
- **AIR- Temperature of the air at the site of capture, measured in degrees Celsius.**
- **WATER- Temperature of the water surface, at the site of capture, measured in degrees Celsius.**
- **SALINITY- Salinity of the water surface, measured with a hand refractometer on a scale of 0–100 ppt (parts per thousand).**
- **SEX- Determined by probing the cloaca.**
- **NEST- If present, represents the nest the crocodile hatched out of.**
- **COMMENTS- Information that was recorded at the time of capture, this can include physical characteristics of the animal captured and/or environment.**

Nest File (FWC NEST), Table 3

- **YEAR- Year the nest was active.**
- **LOCATION- Location of the nests monitored. For this file all nests are from CLNWR.**
- **TOTAL # NESTS- Total number of nests observed in a particular year.**
- **# Successful Nests- Number of successful nests in a particular year.**
- **# Hatchlings Marked- Number of hatchlings marked in a particular year, from all nests.**
- **Owner- Represents who found and monitored the nests. The following codes were used for each of the institutions involved in monitoring: Frank Mazzotti (University of Florida), 7, Paul Moler (Florida Fish and Wildlife Conservation Commission), 8 and at the Turkey Point Power Plant, 9.**

Abbreviations

ABBREVIATION	STANDS FOR
BHH	BASIN HILLS
BHM	BASIN HILLS MAIN
BHN	BASIN HILLS NORTH
BHS	BASIN HILLS SOUTH
CNL	CANAL
CRL	CROCODILE LAKE
CSC	CARD SOUND CANAL
CSR	CARD SOUND ROAD
DAN	DANIA
DOR	DEAD ON ROAD
DRB	DEERING BAY
ENT	ENTRANCE
OCR	OCEAN REEF
SCC	SNAPPER CREEK CANAL
SHO	SHORELINE
TPP	TURKEY POINT

Turkey Point (TP) Power Plant, Florida Power and Light

Capture File (TP CAP), Table 4

- **CLIP-** By the clipping of tail scutes in a prescribed manner, each crocodile was given an individual identification number. This is true for captures during the period from 1978 to 1997. From 1997 to the present this field corresponds to a numbered pit tag that was inserted under the skin. In addition to the pit tag, each crocodile was also scute clipped with a cohort mark, denoting the year it was first marked (Figure 1).
- **OWNER (DR)-** Represents the institution responsible for marking the crocodile, where DR is the double right tail scute. A nine in this field means the crocodile was marked by an individual from the Turkey Point Power Plant (Figure 1).
- **S/DL/DR-** Represents the specific tail scutes that were cut on each individual. For the years from 1978 – 1997 the S stands for the single row of scutes, DL and DR represent the double left (10's) and double right (100's) rows of tail scutes, respectively. From 1997 on, the DL, DR and S scutes represent the cohort (year) the crocodile was captured and marked (Figure 1).

Ex.1 from 1979-1997, clip=355 was caught by the Turkey Point staff, the ninth (900)double right scute would be cut to denote this. To represent the #355 the third (300) double right scute, fifth (50) double left scute and the fifth (5) single scute would be cut. Ex.2 for animals captured from 1997 on, cohort 1997, the ninth (90) DL, ninth (900) DR and the seventh (7) S would be cut.

- **TOE_TAG-** This method of marking was not used by TP, so this field will have no data (ND).
- **DATE-** The date the crocodile was captured.
- **HATCHLING-** A yes or no indicates whether or not the animal captured was a hatchling.
- **RECAPTURE-** A yes or no indicates whether or not the animal had been previously captured.
- **HATCH_DATE-** If present, this indicates the hatching date.
- **LOCATION-** Denotes the specific location where the crocodile was captured. For this database, the abbreviations are read as follows. Example: B26SXN5, would be read as Berm 26 section 5.
- **TL_CM-** Total length (TL), measured in centimeters, from the tip of the snout to the tip of the tail, on the ventral side.
- **SVL_CM-** Snout vent length (SVL), measured in centimeters, from the tip of the snout to the posterior end of the cloacal vent.

- **MASS_G-** Total weight of the crocodile, measured with a Pesola scale and recorded in grams.
- **AIR-** Temperature of the air at the site of capture, measured in degrees Celsius.
- **WATER-** Temperature of the water surface, at the site of capture, measured in degrees Celsius.
- **SALINITY-** Salinity of the water surface, measured with a hand refractometer on a scale of 0–100 ppt (parts per thousand).
- **SEX-** Determined by probing the cloaca.
- **NEST-** If present, this represents the nest the crocodile hatched out of.
- **COMMENTS-** Information that was recorded at the time of capture, this can include physical characteristics of the animal captured and/or environment.
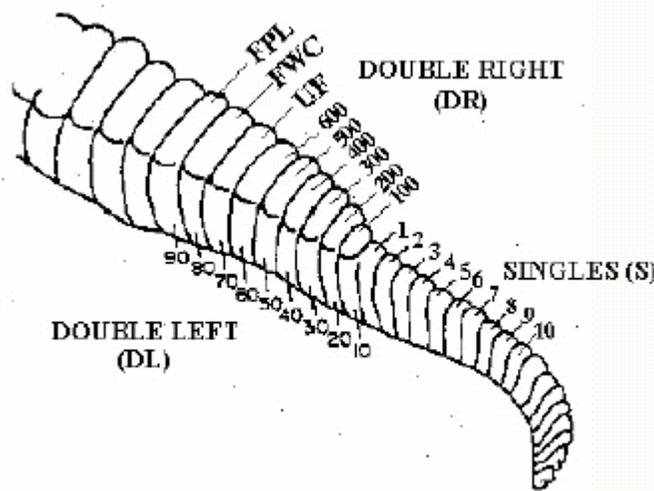

Figure 1. Scute configuration used with FPL captures.

Nest File (TP NEST), Table 5

- **NEST ID-** Nests are given an identification number, this corresponds to either the year the nest was monitored or the location of the nest.
- **OWNER-** Represents who found and monitored each nest. The following codes were used for each of the institutions involved in monitoring: Frank Mazzotti (University of Florida), 7, Paul Moler (Florida Fish and Wildlife Conservation Commission), 8 and at the Turkey Point Power Plant, 9.
- **YEAR-** The year the nest was active.
- **LOCATION-** The location of the nest site. For this database, the abbreviations are read as in the following. Example: B26SXN5, would be Berm 26 section 5. The berms are numbered from 1 - 31 counting from right to left.
- **FATE-** Indicates the fate of the nest. The following were used to represent a successful (S) nest, a failed (F) nest and a depredated (P) nest.

Abbreviations

ABBREVIATION	STANDS FOR
B	BERM
BAY	BISCAYNE BAY
BSI	BOY SCOUT ISLAND
CNL	CANAL
C106	C-106
C107	C-107
CANA	OTHER CANALS

CCS	CANAL COOLING SYSTEM
CSC	CARD SOUND CANAL
DC	DISCHARGE CANAL
EFC	EAST FINGER CANAL
GC	GRAND CANAL
ISL	ISLAND
ID	INTERCEPTOR DITCH
L31	L-31
LSP	L-SHAPED POND
MISC	MISCELLANEOUS
MLCN	MODEL LAND CANAL NORTH
MLCS	MODEL LAND CANAL SOUTH
MLLE	MODEL LAND CANAL EAST
MOAT	MOAT
MTC	MET TOWER CANAL
MTR	MET TOWER ROAD
NC	NORTH COLLECTOR
NEST	NEST SITE SURVEY
NPS	NORTH PUMP STATION
NTC	NORTH TEASE CANAL
PDC	PALM DRIVE CANAL
POC	POINT OF CAPTURE
RC	RETURN CANALS
S20A	S-20-A
SANCT	SANCTUARY AREA
SC	SOUTH COLLECTOR
SDC	SEA-DADE CANAL
SID	SOUTH INTERCEPTOR DITCH
SPS	SOUTH PUMP STATION
STC	SOUTH TEASE CANAL
SXN	SECTION
TC	TEST CANALS
TUR	TURTLE POINT
WFC	WEST FINGER CANAL
YOY	YOUNG OF YEAR

University of Florida

Capture File (UF CAP), Table 6
- **CLIP- By the clipping of tail scutes in a prescribed manner, each crocodile was given an individual identification number. The individual identification numbers for the UF captures follow a counting format. For the period 1978 – 1979 marking was done according to the illustration below (Figure 1). Starting in 1980 scutes were cut in a different configuration, which is currently in use today (Figure 2).**
- **OWNER (DR)- Represents the institution responsible for marking the crocodile, where DR is the double right tail scute. A seven in this field means that Frank Mazzotti or someone under his supervision marked the crocodile (Figure 2).**
- **S/DL/DR- Represents the specific tail scutes that were cut on each individual. The S stands for the single row of scutes, DL and DR represent the double left (10's) and right (100's) rows of tail scutes (Figure 2). Ex. Clip=355 and was caught by UF/National Park Service. The seventh (700) double right scute would be cut to denote this. To represent the #355 the third (300) double right scute, the fifth (50) double left scute and the fifth (5) single scute would be cut as well. The tenth (10) single scute was cut to denote numbers that are in the one thousands.**
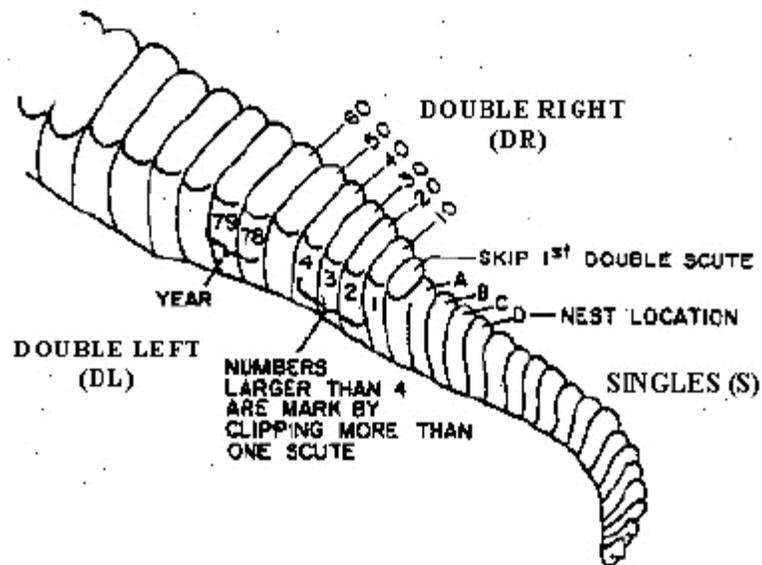
Figure 1. Scute configuration used with UF captures for 1978 – 1979.
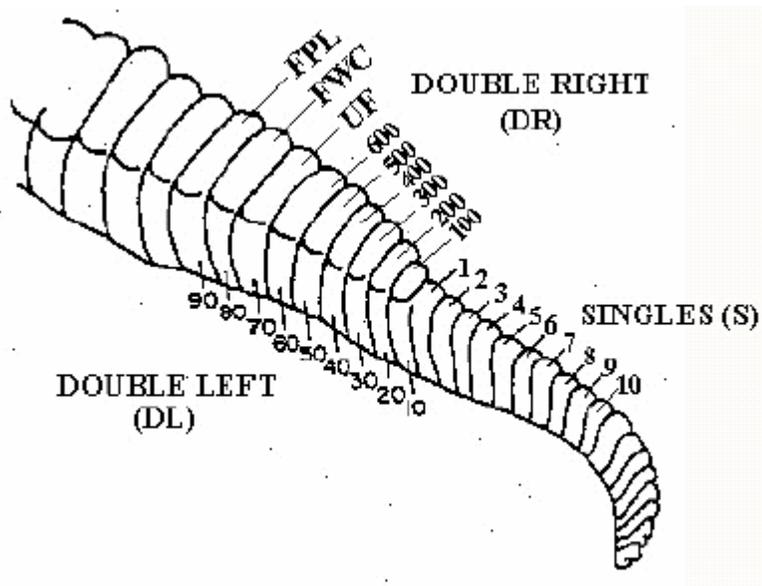
Figure 2. Scute configuration used for UF captures 1979 to the present.

- **TOE_TAG- Originally crocodiles were marked with an external numbered tag in the webbing of the foot in addition to the cutting of scutes. However, this no longer occurs and therefore no data (ND) will be present in this field for most of the capture database.**
- **DATE- The date the crocodile was captured.**
- **HATCHLING- A yes or no indicates whether or not the animal captured was a hatchling.**
- **RECAPTURE- A yes or no indicates whether or not the animal had been previously captured.**
- **HATCH_DATE- If present, this indicates the hatching date.**
- **LOCATION- This indicates the specific location where the crocodile was captured.**

- **TL_CM- Total length (TL), measured in centimeters, from the tip of the snout to the tip of the tail, on the ventral side.**
- **SVL_CM- Snout vent length (SVL), measured in centimeters, from the tip of the snout to the posterior end of the cloacal vent.**
- **MASS_G- Total weight of the crocodile measured with a Pesola scale and recorded in grams.**
- **AIR- Temperature of the air at the site of capture, measured in degrees Celsius.**
- **WATER- Temperature of the water surface, at the site of capture, measured in degrees Celsius.**
- **SALINITY- Salinity of the water surface, measured with a hand refractometer on a scale of 0–100 ppt (parts per thousand).**
- **SEX- Determined by probing the cloaca.**
- **NEST- If present, this represents the nest the crocodile hatched out of.**
- **COMMENTS- Information that was recorded at the time of capture, this can include physical characteristics of the animal captured and/or environment.**

Nest File (UF NEST), Table 7

- **NEST ID- Nests are named for their location.**
- **OWNER- Represents who found and monitored each nest. The following codes were used for each of the institutions involved in monitoring: Frank Mazzotti (University of Florida), 7, Paul Moler (Florida Fish and Wildlife Conservation Commission), 8 and at the Turkey Point Power Plant, 9.**
- **YEAR- The year the nest was active.**
- **LOCATION- The location of the nest site.**
- **FATE- Indicates the fate of the nest. The following were used to represent a successful (S) nest, a failed (F) nest and a depredated (P) nest.**

Helicopter Survey Files (UF HELI), Table 8

- **DATE- The date of the helicopter survey.**
- **TIME- The time of the survey.**
- **LOCATION- The specific location of the survey.**
- **SIZE (m)- The size of the crocodile observed, in meters.**
- **TYPE OF SURVEY- Type of transportation used for the survey.**
- **HABITAT- A description of the specific habitat surveyed.**
- **AIR TEMP (C)- Temperature of the air at the site of the survey, measured in degrees Celsius.**
- **H20 TEMP (C)- Temperature of the water surface, at the site of the survey, measured in degrees Celsius.**
- **WAVES (cm)- Height (top of wave to bottom of trough) of the waves, estimated in centimeters.**
- **SALINITY (ppt)- Salinity of the water surface, measured with a hand refractometer, on a scale of 0–100 ppt (parts per thousand).**
- **H20 DEPTH (m)- Depth of the water at the survey site measured in meters.**
- **COMMENTS- Any information that was recorded at the site of the survey.**

Egg File (UF EGG), Table 9

- **DATE- The date of the nest survey**
- **NEST- The specific location of the nest**
- **LENGTH (mm)- Length of the egg in millimeters**

- **WIDTH(mm) – Width of the egg in millimeters.**
- **WEIGHT (g)- Weight of the egg in grams.**
- **SALINITY (ppt)- Salinity of the water surface, measured with a hand refractometer, on a scale of 0–100 ppt (parts per thousand).**
- **H20 TEMP (C)- Temperature of the water adjacent to the nest, measured in degrees Celsius.**
- **H20 DEPTH (cm)- Water depth adjacent to the nest, measured in centimeters.**
- **WAVES - Wave action**
- **WIND SPEED (mph)- Wind speed, measured in miles per hour and direction.**
- **COMMENTS- Any information that was recorded at the site of the nest.**
- **COLLECTOR- Individual who collected data.**

Abbreviations

ABBREVIATION	STANDS FOR
AHP	ARGYLE HENRY POND
ALB	ALLIGATOR BAY
BBB	BLACK BETSY BEACH
BBH	BLACK BETSY HOLE
BBK	BLACK BETSY KEY
BBP	BLACK BETSY POINT
BDI	BIRD ISLAND
BRL	BEAR LAKE
BRR	BEAR LAKE ROAD
BRS	BARNES SOUND
BWC	BUTTONWOOD CANAL
CAS	CAPE SABLE
CCB	COCOA BEACH
CCP	COCOA POINT
CDC	CARD SOUND CANAL
CDS	CARD SOUND
CHB	CHAPMAN FIELD BORROW PIT
CHC	CHAPMAN FIELD CANAL
CHF	CHAPMAN FIELD
CLB	CLUBHOUSE BEACH
CLK	CLUB KEY
CNL	CANAL
COB	COOT BAY
CRK	CREEK
CRL	CROCODILE LAKE NATIONAL WILDLIFE REFUGE
CTB	CAT TRACK BEACH
CUL	CUTHBERT LAKE
DAL	DALRYMPLE'S
DCO	DAVIS COVE
DCR	DAVIS CREEK
DES	DEAD STORK
DRB	DEERING BAY
DRK	DEER KEY
E	EAST
EAK	EAGLE KEY
ECA	EAST CAPE
ECC	EAST CAPE CANAL
ECD	EAST CREEK POND
ECP	EAST CAPE PLUG

ECR   **EAST CREEK**
FLB   **FLAMINGO BOAT BASIN**
FLM   **FLAMINGO**
FLP   **FOX LAKE POND**

25. Subject of data set: From the list below choose the main subject of the data set.

Assessment/ Decision Support

26. Keyword terms (70): From the list below, note the most appropriate categories from the list below for search features in the metadata catalog.

Air Quality	Hydrology (ground)
Archeology	Hydrology (surface)
Assessment/ Decision Support	**Hydrology modeling**
Basic Research	Ichthyology
Botany	Integrated Pest management
Climatology	Invertebrates
Coastal/Marine systems	Lake ecology
Contaminants/ Haz. Mat.	Limnology
Ecology	Mammalogy
Ecology modeling	Marl Prairie
Entomology	Management/Administration
Environmental monitoring	Microbiology
Environmental impact	Minerals Management
Erosion/Sedimentation	Oceanography
Estuary	Ornithology
Exotic species- animals	Paleontology
Exotic species- Plants	Petrology/mineralogy
Fire	Recreation/Aesthetics
Fisheries Management	Restoration- Cultural
Flood Management/History	Restoration- Natural
Forestry/ tree islands	Ridge and Slough
Fungi	Sedimentology/ Stratigraphy
Geo-Hazard (chemical)	Sociology
Geo-Hazard (physical)	Soil science
Geographic Information System	Tectonics
Geochemistry	Threatened/Endangered animals
Geohydrology	Threatened/Endangered plants
Geology- coastal	Water quality
Geology- fluvial	Water quantity
Geology- general	Water rights
Geology- structural	Watershed management
Geomorphology	**Wetlands**
Geophysics	Wildlife management
Herpetology	Zoology
History	

27. Place Keywords: List regional (general) and local references (specific) for location of your project.

South Florida
Turkey Point
Crocodile Lake National Wildlife Refuge

Homestead
Everglades National Park
Crocodile Lakes Wildlife Refuge

28. Species: What species or communities will be examined?

American crocodile (*Crocodylus acutus*)

Taxonomy: List species names using ITIS as the taxonomic authority
http://www.itis.usda.gov/ insert information here.

Go to Screen Version

Crocodylus acutus Cuvier, 1807
Taxonomic Serial No.: 174361

Taxonomy and Nomenclature

Kingdom:	**Animalia**
Taxonomic Rank:	**Species**
Synonym(s):	**Crocodilus floridanus Hornaday, 1875**
Common Name(s):	**American crocodile [English]**
	American Crocodile [English]
	caiman de la costa [Spanish]
	Central American alligator [English]
	cocodrilo [Spanish]
	Cocodrilo americano [Spanish]
	lagarto [Spanish]
Taxonomic Status:	
Current Standing:	**valid**
Data Quality Indicators:	
Record Credibility Rating:	**verified - standards met**

Taxonomic Hierarchy

Kingdom	**Animalia -- Animal, animals, animaux**
Phylum	**Chordata -- chordates, cordado, cordés**
Subphylum	**Vertebrata -- vertebrado, vertebrates, vertébrés**
Class	**Reptilia Laurenti, 1768 -- "répteis", "reptiles", "Reptiles"**
Order	**Crocodilia -- alligators, caimans, crocodiles, Crocodilians, crocodilians, crocodilo, gavials, jacaré**
Family	**Crocodylidae -- Crocodiles, crocodiles**
Genus	**Crocodylus Laurenti, 1768 -- crocodiles, Crocodiles**
Species	**Crocodylus acutus Cuvier, 1807 -- American crocodile, American Crocodile, caiman de la costa, Central American alligator, cocodrilo, Cocodrilo americano, lagarto**

References

Expert(s):	
Expert:	**Roy W. McDiarmid**
Notes:	**U.S. Geological Survey, Biological Resources Division, Patuxent Wildlife Research Center**
Reference for:	***Crocodylus acutus***
Other Source(s):	
Source:	**Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, database (version undefined)**
Acquired:	**2000**
Notes:	**CONABIO: (http://www.conabio.gob.mx/)**
Reference for:	***Crocodylus acutus***
Source:	**Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, database (version undefined)**
Acquired:	**2001**
Notes:	**CONABIO: (http://www.conabio.gob.mx/)**
Reference for:	**Cocodrilo americano [Spanish]**
Source:	**NODC Taxonomic Code, database (version 8.0)**
Acquired:	**1996**
Notes:	
Reference for:	***Crocodylus acutus***

Publication(s):

Author(s)/Editor(s): **Banks, R. C., R. W. McDiarmid, A. L. Gardner, and W. C. Starnes**
Publication Date: **2004**
Article/Chapter Title:
Journal/Book Name, Vol. No.: **Checklist of Vertebrates of the United States, the U.S. Territories, and Canada, draft (2004)**
Page(s):
Publisher:
Publication Place:
ISBN/ISSN:
Notes: **As-yet (2004) unpublished manuscript from 1998**
Reference for: *Crocodylus acutus*, **American Crocodile**

Author(s)/Editor(s): **Banks, R. C., R. W. McDiarmid, and A. L. Gardner**
Publication Date: **1987**
Article/Chapter Title: **Checklist of Vertebrates of the United States, the U.S. Territories, and Canada**
Journal/Book Name, Vol. No.: **Resource Publication, no. 166**
Page(s): **79**
Publisher: **United States Department of the Interior Fish and Wildlife Service**
Publication Place: **Washington, D.C., USA**
ISBN/ISSN:
Notes:
Reference for: *Crocodylus acutus*

Author(s)/Editor(s): **Flores-Villela, Oscar / McCoy, C. J., ed.**
Publication Date: **1993**
Article/Chapter Title: **Herpetofauna Mexicana: Lista anotada de las especies de anfibios y reptiles de México, cambios taxonómicos recientes, y nuevas especies**
Journal/Book Name, Vol. No.: **Carnegie Museum of Natural History Special Publication, no. 17**
Page(s): **iv + 73**
Publisher: **Carnegie Museum of Natural History**
Publication Place: **Pittsburgh, Pennsylvania, USA**
ISBN/ISSN: **0-911239-42-1**
Notes:
Reference for: *Crocodylus acutus*

Author(s)/Editor(s): **King, F. W., and R. L. Burke, eds.**
Publication Date: **1989**
Article/Chapter Title:
Journal/Book Name, Vol. No.: **Crocodilian, Tuatara, and Turtle Species of the World: A Taxonomic and Geographic Reference**
Page(s):
Publisher: **Association of Systematics Collections**
Publication Place: **Washington, D.C., USA**
ISBN/ISSN: **0-942924-15-0**
Notes:
Reference for: *Crocodylus acutus*

Geographic Information

Geographic Division:	**Caribbean**
	Middle America
	North America
	South America
Jurisdiction/Origin:	**Continental US, Native**
	Mexico, Native

Comments

Comment:	**Banks et al. (2003) note: Endangered throughout range**

Date Generated:
Thu Sep 8 2005 08:32:33 MDT

29. Where vouchers collected: Y **N**

30. Access Constraints for Sensitive data: archeological   paleological
T&E species   sensitive to collection   legally restricted

31. Cross Reference Citation Information: For more information about the dataset title from Dataset Citation. Related documentation.

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Stoneburner, D.L., and J.A. Kushlan. 1984. Heavy metal burdens in American crocodile eggs from Florida Bay. J. Herp. 18:192-193.

32. **Analytical Tool:** Will you use a model or other analytical tool to develop your data set?

    Some of the data collected uses these models:
    C-111 Basin alternative water delivery models for Taylor Slough/C-111 Basin.

    Mazzotti, F.J., and L.A. Brandt. 1995. A biological assessment of the effects of the C-111 Final Report. Department of Wildlife Ecology and Conservation, University of Florida, Gainesville, FL.

    Across Trophic Level System Simulation by US Geological Survey
    Richards, P. M., and D. L. DeAngelis, 2000. Population modeling of the American crocodile (*Crocodylus acutus*) for conservation and management in Florida. Greater Everglades Ecosystem Restoration Science Conference. Abstracts. p 146.

33. **Data Verification/Validation** (80): What measures will you take to make certain that your data set is as nearly correct as possible?

    Each agency was responsible for reviewing, proofing and editing data.

34. **Quality:**   **+Ver**

    Comments about data quality:

    Each agency was responsible for reviewing, proofing and editing data.

    Advice: Do you have any advice for potential users of the data set?

    This project was a Data mining effort review of original studies would be valuable when analyzing data.

    Related data sets include:

Paul Moler, Florida Fish and Wildlife Conservation Commission, Crocodile capture data
Paul Moler, Florida Fish and Wildlife Conservation Commission, Crocodile nesting data
Joseph Wasilewski, Florida Power and Light Turkey Point, Crocodile capture data
Joseph Wasilewski, Florida Power and Light Turkey Point, Crocodile nesting data
Frank J. Mazzotti, Ph D.and Michael S. Cherkiss, University of Florida, Crocodile capture data
Frank J. Mazzotti, Ph D. and Michael S. Cherkiss, University of Florida, Crocodile nesting data
Frank J. Mazzotti, Ph D.and Michael S. Cherkiss, University of Florida, Crocodile helicopter survey data
Frank J. Mazzotti, Ph D.and Michael S. Cherkiss, University of Florida, Crocodile egg data
Hydrological data obtained from Everglades National Park, South Florida Water Management District and Southeastern Research Center, Florida International University
Dispersal of crocodiles, Data from Mazzotti (personal observation), Wasilweski (unpublished) and Moler (unpublished).

Distribution Information: FGDC Section 6

35. Data Distribution Contact: Individual or organization that distributes data.

Contact Name (s)
Contact Institution
Institution Address
Contact Phone
Contact Address
Contact E-mail

36. Data Format (80): Paper   Access   Oracle   SQL Server   **Excel**

A CD was submitted with data, appendices, and document

37. Transfer size: 4.450 mb

Metadata Reference: FGDC Section 7

38. Metadata Date: The date that the metadata is written or completed. Use a date format of year, month, day.

2007-07-10

39. Metadata Contact: (Your Name):

This metadata was compiled for the SFNRC by:

SFNRC Representative Name

Appendix C: **COORDINATE SYSTEMS**

Projection specifications shall be approved by the Project Manager.

Park Unit Data Standard: In general, the standard projection for most park-level GIS layers is Universal Transverse Mercator with the following parameters:

•	Projection	Universal Transverse Mercator
•	Zone	Zone value
•	Datum	North American Datum 1983
•	Spheroid	GRS 1980
•	False Easting	0
•	False Northing	0
•	Units	Meters

Appendix D. **NATIONAL MAP ACCURACY STANDARDS**
http://mapping.usgs.gov/standards/

Map Accuracy Standards
Fact Sheet FS-171-99 (November 1999)

Map Accuracy

An inaccurate map is not a reliable map. "X" may mark the spot where the treasure is buried, but unless the seeker can locate "X" in relation to known landmarks, the map is not very useful.

The U.S. Geological Survey (USGS) publishes maps and other products at high levels of accuracy. Dependability is vital, for example, to engineers, highway officials, and land-use planners who use USGS topographic maps as basic planning tools.

As a result, the USGS makes every effort to achieve a high level of accuracy in all of its published products. An important aim of its accuracy control program is to meet the U.S. National Map Accuracy Standards.

National Map Accuracy Standards

To find methods of ensuring the accuracy of both location (the latitude and longitude of a point) and elevation (the altitude above sea level), the American Society for Photogrammetry and Remote Sensing - an organization actively involved in the science of making precise measurements from photographs (photogrammetry) and acquiring information from aerial photographs and satellite image data (remote sensing) - set up a committee in 1937 to draft accuracy specifications. Sparked by this work, agencies of the Federal Government, including the USGS, began their own inquiries and studies of map accuracy standards. In 1941, the U.S. Bureau of the Budget issued the "United States National Map Accuracy Standards," which applied to all Federal agencies that produce

maps. The standards were revised several times, and the current version was issued in 1947. (The standards are printed at the end of this factsheet.)

As applied to the USGS 7.5-minute quadrangle topographic map, the horizontal accuracy standard requires that the positions of 90 percent of all points tested must be accurate within 1/50th of an inch (0.05 centimeters) on the map. At 1:24,000 scale, 1/50th of an inch is 40 feet (12.2 meters). The vertical accuracy standard requires that the elevation of 90 percent of all points tested must be correct within half of the contour interval. On a map with a contour interval of 10 feet, the map must correctly show 90 percent of all points tested within 5 feet (1.5 meters) of the actual elevation.

All maps produced by the USGS at 1:250,000 scale and larger are prepared by methods designed to meet these accuracy standards and carry the statement, "This map complies with National Map Accuracy Standards." Exceptions to this practice involve areas covered by dense woodland or obscured by fog or clouds; in those areas, aerial photographs cannot provide the detail needed for precise mapping. The USGS tests enough of its maps to ensure that the instruments and procedures the Survey uses are producing maps that meet the U.S. National Map Accuracy Standards.

How the Survey Maintains Map Accuracy

In 1958, the USGS began systematically testing the accuracy of its maps. Presently, accuracy testing is performed on 10 percent of the mapping projects at each contour interval as a method of controlling overall quality. It is rare for a 7.5-minute map to fail the test, but this happens on occasion.

In testing a map, the USGS experts select 20 or more well-defined points; a typical point would be the intersection of two roads. Positions are established on the test points by field teams using sophisticated surveying techniques to determine positions from aerial photographs. Field survey methods are the only tests accepted for official accuracy testing. Positions must be obtained by surveys of a higher accuracy. Vertical tests are run separately to determine precise elevations. The mapped positions are checked against the field and (or) photogrammetrically determined positions results. If the map is accurate within the tolerances of the U.S. National Map Accuracy Standards, it is certified and published with the statement that it complies with those standards.

By such rigorous testing of some of its maps, the USGS is able to determine that its procedures for collecting map information ensure a high level of map accuracy.

Factual Errors

There are other kinds of errors in mapmaking. Names and symbols of features and classification of roads or woodlands are among the principal items that are subject to factual error. Mapmakers cannot apply a numerical value to this kind of information; they must rely on local sources for their information. Sometimes the local information is wrong. Sometimes names change or new names and features are added in an area. The USGS

cartographers and editors check all maps thoroughly and, as a matter of professional pride, attempt to keep factual errors to a minimum.

"Errors" resulting from selection, generalization, and displacement are necessary results of mapping complex features at reduced scales. In congested areas, large buildings may be plotted to scale and the smaller buildings may have to be omitted; in showing buildings of irregular shape, small wings, bays, and projections usually are disregarded, and the outline is shown in general form. At map scale, it may not be possible to show each of several closely spaced linear features in its correct position. In such cases, one feature, such as a railroad, is positioned in its true location and others, such as parallel roads or rivers, are displaced the minimum amount necessary to make each symbol legible or are omitted to make the highest priority symbol legible.

United States National Map Accuracy Standards

With a view to the utmost economy and expedition in producing maps that fulfill not only the broad needs for standard or principal maps, but also the reasonable particular needs of individual agencies, the Federal Government has defined the following standards of accuracy for published maps:

1. Horizontal accuracy. For maps on publication scales larger than 1:20,000, not more than 10 percent of the points tested shall be in error by more than 1/30 inch, measured on the publication scale; for maps on publication scales of 1:20,000 or smaller, 1/50 inch. These limits of accuracy shall apply to positions of well-defined points only. Well-defined points are those that are easily visible or recoverable on the ground, such as the following: monuments or markers, such as bench marks, property boundary monuments; intersections of roads and railroads; corners of large buildings or structures (or center points of small buildings). In general, what is well-defined will also be determined by what is plottable on the scale of the map with-in 1/100 inch. Thus, while the intersection of two roads or property lines meeting at right angles would come within a sensible interpretation, identification of the intersection of such lines meeting at an acute angle would not be practicable within 1/100 inch. Similarly, features not identifiable upon the ground within close limits are not to be considered as test points within the limits quoted, even though their positions may be scaled closely upon the map. This class would cover timber lines and soil boundaries.
2. Vertical accuracy, as applied to contour maps on all publication scales, shall be such that not more than 10 percent of the elevations tested shall be in error by more than one-half the contour interval. In checking elevations taken from the map, the apparent vertical error may be decreased by assuming a horizontal displacement within the permissible horizontal error for a map of that scale.
3. The accuracy of any map may be tested by comparing the positions of points whose locations or elevations are shown upon it with corresponding positions as determined by surveys of a higher accuracy. Tests shall be made by the producing agency, which shall also determine which of its maps are to be tested, and the extent of such testing.
4. Published maps meeting these accuracy requirements shall note this fact in their legends, as follows: "This map complies with National Map Accuracy Standards."

5. Published maps whose errors exceed those aforestated shall omit from their legends all mention of standard accuracy.
6. When a published map is a considerable enlargement of a map drawing (manuscript) or of a published map, that fact shall be stated in the legend. For example, "This map is an enlargement of a 1:20,000-scale map drawing," or "This map is an enlargement of a 1:24,000-scale published map."

To facilitate ready interchange and use of basic information for map construction among all Federal mapmaking agencies, manuscript maps and published maps, wherever economically feasible and consistent with the use to which the map is to be put, shall conform to latitude and longitude boundaries, being 15 minutes of latitude and longitude, or 7.5 minutes, or 3.75 minutes in size.

Appendix E: EVER 5281-53 EVERGLADES AND DRY TORTUGAS NATIONAL PARKS POLICY MEMORANDUM, SFNRC CUSTODY AND DATA RESPONSIBILITIES POLICIES

The following policy memorandum concerns the procedures adopted by the SFNRC, EVER, for the control, management, collection, archiving, processing, and reporting of environmental data collected as part of the SFNRC's operations, including all scientific activities supported by federal government funds. The goal is to assure that data are available as information resources to authorized users in the scientific community, as soon as practicable, while assuring that the quality assurance protocols, documentation and computer archiving procedures associated with data base development, are completed. An important second purpose is to define custody and access protocols for scientists having interests in the use and publication of the data. The Director of the SFNRC administers this policy, for the Superintendent of EVER.

General Guidelines and Assumptions

The research, monitoring, and resource management data collected by EVER staff (permanent, term, or temporary), while in their official capacity, are considered EVER property, and therefore, subject to procedures for custody, availability, and data management responsibility under National Park Service (NPS) policy and federal law. Similar procedures apply to cooperators and contractors, who conduct research for EVER and use government funds or other forms of government support to perform or assist in the collection, analysis, and publication of data collected as part of their research.

Guidelines for data collection, custody, and responsibility recognize that the data collected are important to several constituencies. The primary objectives of the data collection by the SFNRC personnel and cooperators are directly or indirectly related to the conservation and management of the natural and cultural resources of EVER. Therefore, the data must be available to the SFNRC for its research, monitoring, or resource management activities.

The value of the data to the principle investigators is also recognized. Researchers, who have written proposals, acquired funded support, or developed a research design or plan for collection of the data, have the professional obligation to analyze the data and publish the results in progress or annual reports due to the agency, according to specifications described in cooperative agreements or contracts. Even where such work is done by agency employees, and not via contract or cooperative agreement, these same concerns apply. All such official agreements contain the provision that the data collected by the investigators, become the property of the United States government, and thus, all rights of publication and control or use of data belongs to the SFNRC, EVER, and collection of data does not imply rights of ownership, use, or conveyance outside the terms of this policy. However, the SFNRC recognizes the interests of and desire by researchers and principle investigators to have some control in the technical use, access, and publication of data collected as part of a project in which they were involved or managed.

Publication of results in scientific journals is expected and considered by most scientists to be an integral part of the scientific process. Therefore, principle investigators

shall, and indeed must, have the opportunity to analyze, interpret, and prepare the data for publication as reports, articles, or other written products that bear their names as authors.

Time Lapse between Data Collection and Open Custody

In this section, guidelines are provided for determining when data collected by or for EVER, move from a stage when they are primarily under limited control of the principle investigator ("limited custody"), to a stage when the data are available more generally to other investigators, agencies, and the public ("open custody"). EVER recognizes that the scientists, in charge of data collection associated with a specific project, should have reasonable rights of control of the use of data by other individuals and institutions for a reasonable period of time to allow for the initial analysis and publication of results. However, the custody and access privileges vary, to the extent allowed by the Freedom of Information Act (FOIA), other applicable laws, and this policy, according to the category of data collected.

Three categories of data are hereby recognized: 1.) inventory and monitoring data, collected primarily by SFNRC staff or paid contractors; 2.) project-specific data (for assessment, analysis, or research purposes), collected by SFNRC staff; and 3.) project data collected by investigators from other governmental agencies, universities, and private organizations or companies.

In all cases, the SFNRC requires users, of data collected with federal government support, to formally recognize in all written reports and publications and oral presentation of the data, the individuals and agencies that collected the data.

Inventory and monitoring data are collected routinely, often with the assumption that collection continues indefinitely. Although these data sometimes are the subject of published papers or reports, more often they are used by modelers and other scientists as part of a specific investigation or task that is organized around a specific schedule and for production of reports.

It is the policy of EVER that inventory and monitoring data are made available to non-agency investigators upon request. Before these data are made available, however, the SFNRC shall complete quality assurance procedures, data documentation, and, where a schema exists, entry of the data into the SFNRC's ORACLE database management system. In addition, the SFNRC shall regularly produce reports, which summarize trends in inventory and monitoring data for a recent period of time. The frequency of these reports may vary from quarterly to annual depending on parameter and sampling intervals. The reports present only quality-assured and error-checked data in summarized form. In many cases, these data may be available in both hard copy and digital format. The SFNRC reserves the right to delay filling data requests (except where required by law) made for data not yet described in reports, until SFNRC staff or cooperators have completed these important preliminary steps. In most cases, this process will take from one to several months, depending on available time and resources. The SFNRC shall not make data available that have not been quality-assured and error-checked, except under exceptional circumstances as approved by the SFNRC's Director or EVER's Superintendent, or as required by law.

Project-specific data generally are collected for a period of time defined in a project proposal, scope-of-work, cooperative agreement, or contract. Each of these instruments will contain data custody specifications that are in accord with this policy. In all cases, reporting of data in progress and annual reports submitted to the NPS as part of the scope-of-work, agreement, or contract follows a schedule given in the contract.

For all projects, including multi-year projects, supported by NPS funds, EVER's policy is that scientists will be given up to one year after the project conclusion, to have the SFNRC retain data under limited access and for the principle investigator to be provided this time to publish in the refereed literature those data collected with NPS support. During this period, the agency will agree to limit access by others to the data to the extent allowed by the FOIA, or other legal requirements (such as court ordered discovery proceedings), during that period, unless the investigator agrees otherwise. Submission of a paper, to a peer reviewed journal on the topic of the research or project, shall be deemed by the SFNRC to meet and fulfill the SFNRC's agreement to limit data access in order to allow the principle investigator an opportunity to publish.

One year after project completion, unless circumstances warrant exception and further arrangements are mutually agreed upon in writing, to the extent allowed under the FOIA, the data shall be considered to be in the open custody category, meaning that, upon request, data become generally accessible to other investigators, agencies, and the public. Should any confusion or disagreement develop regarding the formal end or final date of a project, the SFNRC's Director shall have the sole and final determination regarding project conclusion and report and publication due dates. Requests for extensions must be made in writing to the SFNRC's Director with a justification for the extension.

For multi-year contracts and cooperative agreements, submission of papers to peer-reviewed journals at an interval of every 18-24 months is strongly encouraged, but not required. Ideally, annual reports, which are required under terms of the cooperative agreement or contract, are written such that conversion to a journal manuscript should be straightforward. Annual reports are considered by EVER to be public documents that can be distributed to interested scientists. The annual report may be considered citable and recognition of the report should be made formally in any other report or publication using information presented in the report. All principle investigators of multi-year projects must understand, that should they decide not to publish at intervals during the project, and choose to wait until the end of the project to publish, the SFNRC may not agree to extend the one year period after project completion for publication.

Because cooperative agreements mandate that the SFNRC cooperate with non-NPS investigators in accomplishing tasks, SFNRC and non-NPS investigators have some flexibility in determining authorship, choice of journal, and other aspects of publishing a paper. If NPS staff is not participating as co-authors, the agency may only recommend an appropriate journal for publication. However, if the agency agrees to help defray publication expenses, choice of journals will be mutually determined.

Appendix F. LIST OF ACRONYMS

CESI   Critical Ecosystem Studies Initiative
CMT   Center Management Team (SFNRC's Director, Deputy Director, and Branch Chiefs)
COTR   Contracting Officer's Technical Representative
RDRR   Research Data Reporting Requirements
DOI   Department of Interior
EVER   Everglades National Park
FGDC   Federal Geographic Data Committee
GIS   Geographic Information System
GPS   Global-Positioning System
LAN   Local Area Network
NPS   National Park Service
PI   Principle Investigator
PMP   Project Management Plan
SFNRC   South Florida Natural Resources Center
SOW   Scope of Work