

CM-252
Task 2.1
LZ 228

Environmental Science & Engineering, Inc.



Florida Coastal Zone Management Program

COASTAL ZONE
INFORMATION CENTER

TURKEY CREEK WATERSHED MANAGEMENT PROGRAM
SUMMARY OF GIS ACTIVITIES FOR THE
WATER CONTROL DISTRICT OF SOUTH BREVARD,
1989 - 1990

CZM CONTRACT No. CM252

FINAL REPORT

December 1990

COASTAL ZONE
INFORMATION CENTER

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TC424, ES8 Feb 1990

EXECUTIVE SUMMARY

The Water Control District of South Brevard (WCDSB) maintains a large canal network, serving over 99 square miles of rapidly urbanizing area, which discharges to Turkey Creek and the Indian River Lagoon in East Central Florida. During 1988-90, the WCDSB has been creating a geographic information system (GIS) for their jurisdiction consisting of several different data coverages using PC ARC/INFO GIS software. This report summarizes the GIS activities performed during the 1989-90 grant year by the WCDSB and their GIS consultant, Environmental Science & Engineering, Inc. The GIS activities described in this report include complete stormwater outfall inventory and mapping as well as development of programs residing within the GIS that allow for permit tracking and outfall maintenance tracking by WCDSB staff.

The stormwater outfall inventory included over 1200 outfalls that were mapped and field verified. For each outfall its location (in several different formats), ownership, and outfall type were recorded. Engineering data about those outfalls were also collected and field verified where possible. This data was entered into the ARC/INFO GIS for the WCDSB as a data coverage and georeferenced to UTM section corner coordinates. An outfall maintenance tracking program was also developed to be utilized by WCDSB staff on a day-to-day basis. User-friendly, menu-driven programs were developed to allow the WCDSB staff quick and easy access to the outfall maintenance and engineering data for viewing and for updating.

A permit tracking program was developed for tracking permit status for canal structures as well as outfall structures. This program was also created to be user-friendly and menu-driven for use by the WCDSB staff on a daily basis. Permit numbers, location of the structure, permit status, dates of applications, inspections and permit approvals will be recorded for each structure as permits are entered into the system.

The WCDSB GIS will be used to support the District's day-to-day maintenance activities and to support geographic analyses needed in the creation of management plans for flood control and water quality. The PC ARC/INFO GIS will remain compatible with the Water Management Districts, the Marine Resources Council, the Florida Department of Environmental Regulation and numerous other public agencies with natural resource data coverages (which include the WCDSB geographic jurisdiction) that have been created in ARC/INFO.

I. INTRODUCTION

The Water Control District of South Brevard (WCDSB) maintains a large canal network, serving over 99 square miles of rapidly urbanizing area, which discharges to Turkey Creek and the Indian River Lagoon (See Figure A). As such, the WCDSB has jurisdiction over the major portion of the Turkey Creek Watershed. The WCDSB is responsible for the quality of water which passes through the canal system, into Turkey Creek, and on to the Indian River Lagoon, and must deal with increasing discharges to the canal system as development rapidly progresses.

The WCDSB is in the process of developing a long-term surface water management plan over the next few years. The plan is intended to provide short-term (1 year), near-term (5 year), and long-range (20 years plus) programs for flood control, water conservation, water quality enhancement, and operational and maintenance schedules. Plan development is limited primarily by funding availability and as such, the WCDSB intends to develop the plan over an extended period of time.

The WCDSB has participated in the Turkey Creek Watershed Management Program funded by the Florida Department of Environmental Regulation's Coastal Zone Management (CZM) Program since 1988. The purpose of the WCDSB's involvement in this program was to coordinate with other agencies and to supplement their own efforts in the ongoing development of a water management plan for the District to implement. To assist in accomplishing this objective, CZM program grant funds were used to develop a comprehensive Geographic Information System (GIS) for the WCDSB. During the 1988-89 grant year, several data layers were entered into the WCDSB GIS; some data obtained from other Turkey Creek Watershed Management Program participants and some data developed by the WCDSB themselves, according to their needs.

This report will summarize the activities undertaken for the 1989-90 CZM grant project. One of the major objectives of this year's project was to refine the existing GIS data on canal structures, to include all outfall structures within the WCDSB. Over 1200 outfalls were identified that discharge to the WCDSB canal system and therefore have a major impact on water quantity and water quality. Implementation of the water management options rely on the identification and description of these outfalls. The grant also funded the development of an outfall maintenance tracking system and a permit tracking system, residing within the GIS, which has enhanced WCDSB day-to-day operations. Last, but not least, the grant funded the development of a water quality monitoring plan (documented in a separate report) for the WCDSB, to be implemented when funds permit.

II. THE WCDSB GIS SYSTEM

The WCDSB Geographic Information System was developed and is maintained by the District's consultant, Environmental Science and Engineering, Inc. (ESE). The PC version of ARC/INFO is the GIS software used. Hardware consists of a Compaq 386 PC with a NEC/Multisync Plus monitor, a Calcomp digitizer, a Calcomp plotter, and a Panasonic printer. ARC/INFO has proven to be a versatile and important tool in managing the geographic data utilized by the WCDSB.

The data coverages stored on the ARC/INFO GIS for the WCDSB include the following:

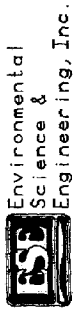
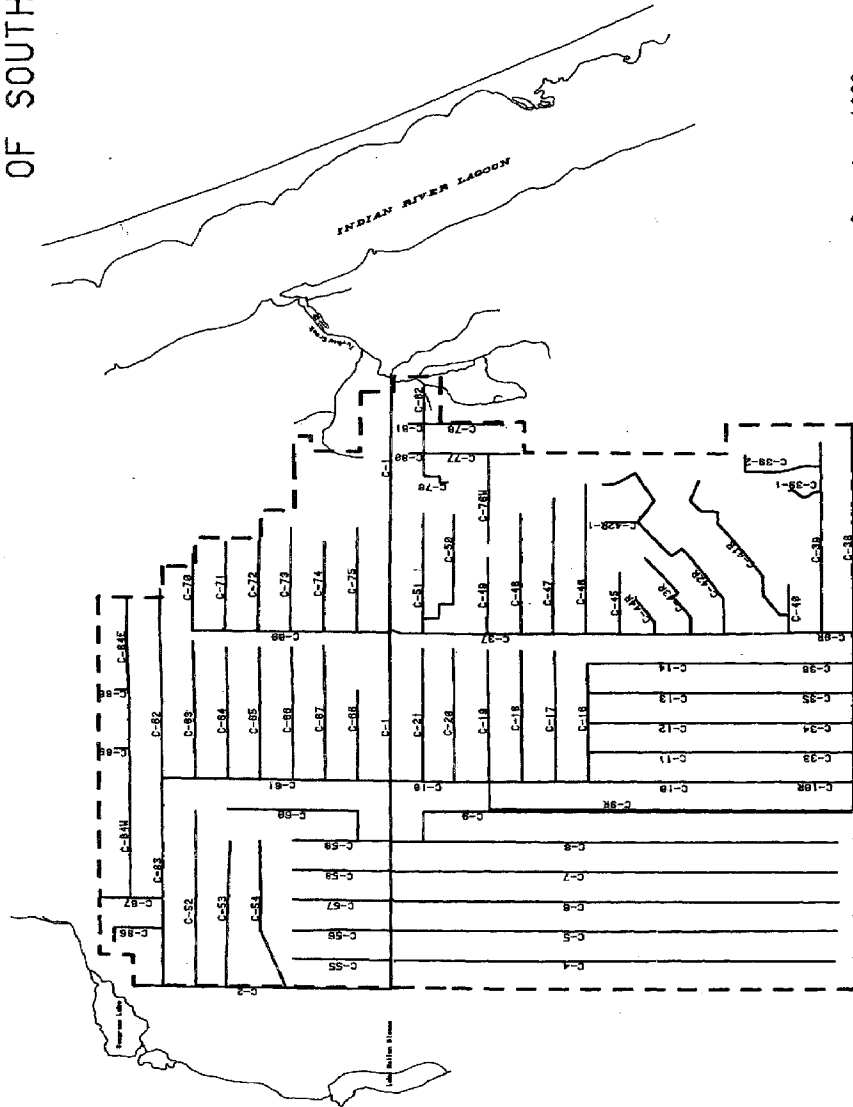
- Canal System Characterization
- Canal Structures
- Drainage Basin and Subbasin Boundaries
- Secondary Drainage Network
- Soils
- Land Use - 1986-87
- Topography (5' contours)
- Section Lines
- USGS Topographic Quadrangle Boundaries
- WCDSB Jurisdictional Boundary
- Locations of Canal Cross-sections
- Stormwater Outfalls to the Canal System
- USGS DLG Data of Hydrologic and Transportation Features

All of these data coverages were developed during the 1988-89 CZM grant year, with the exception of the stormwater outfalls coverage. The development of the outfalls coverage under the 1989-90 CZM grant year will be discussed in the next section.

III. DEVELOPMENT OF THE STORMWATER OUTFALL DATA COVERAGE

The first step in developing the stormwater outfall coverage for the WCDSB was to collect the necessary data and to field verify where possible. Outfall data collection activities began with the verification of data on the outfalls owned by the General Development Corporation (GDC). These outfalls were documented and mapped in a report prepared by CAS Engineering in 1985. The outfall locations were identified by lot and block numbers for the GDC developments. The maps that accompanied the CAS report were inaccurate and were in the form of several blue-line plat maps. Therefore, in order to digitize these outfalls into the WCDSB GIS, they had to be remapped on Brevard County section tax assessor maps. The outfalls were mapped according to their lot and block data and field verified by WCDSB personnel where possible. Additional outfalls outside the GDC developments had to be field surveyed by the District's surveyor and were also mapped on the County section tax assessor maps by scaling off the survey notes. This data was also field verified by WCDSB staff.

WATER CONTROL DISTRICT OF SOUTH BREVARD



Environmental
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December 1990

Figure A

Prepared for the Water Control District of South Brevard

Once the outfalls were mapped on the section base maps, they were digitized into the WCDSB GIS utilizing the PC ARC/INFO GIS software. The outfalls were mapped into one continuous coverage of the WCDSB and georeferenced by section corner UTM coordinates.

Permit data on the outfalls were gathered together by WCDSB staff and then entered into the GIS as attribute data. Engineering attribute data available for all outfalls were also entered into the GIS and field verified by WCDSB staff as time permitted. There were over 1200 identified outfalls contributing stormwater runoff to the WCDSB canal system. See Figure B for the GIS map plot of the WCDSB outfall coverage.

The WCDSB staff will continue to maintain this large outfall coverage on a day-to-day basis. PC INFO database software will be used by the WCDSB staff within the WCDSB offices to update and enter outfall data. ESE staff have created user-friendly programs that are menu-driven to enable the WCDSB staff to work with PC INFO on this outfall data with minimum software training. As new outfall permits come in or as outfall data are modified, the WCDSB staff can easily update or add to this database in tabular format. The accompanying digital map will also be updated on a periodic basis within ARC/INFO so that the graphics represent all current tabular outfall updates.

IV. OUTFALL MAINTENANCE TRACKING SYSTEM

As the outfall coverage outlined above is maintained by WCDSB staff, the attribute data attached to each outfall can be accessed through simple menu-driven programs developed by ESE specifically for the WCDSB office. These user-friendly menus were developed so that WCDSB personnel can use them in performing database queries such as updating or viewing the outfall and canal structure data. This system will allow the WCDSB staff immediate access to up-to-date data on the canal system and the structures within it. And they can pull that information out in several different formats and for specific geographic areas of the WCDSB. The data will be accessible to WCDSB staff on a daily basis for field work purposes including outfall maintenance and canal maintenance. Any new outfall structures will be mapped by ESE in the ARC portion of ARC/INFO and then the WCDSB staff will enter the new outfall attribute data into the INFO database.

See Appendix A for sample screen dumps of the user-friendly menus developed for the WCDSB staff to utilize in updating and adding new outfall attribute data. Option 1 on the first menu allows the operator to pull up on the screen the basic data on an outfall (stored in the main database file for outfalls). This basic data which is stored for every outfall in the WCDSB includes the following:

- A. Location: by Section, Township & Range
 by Nearest street or other
 geographic feature
 by GDC lot and block numbers
- B. Type of Outfall - pipe or channel
- C. Ownership information
- D. Other remarks about the outfall
- E. The date the data on this outfall were last updated.

Appendix B shows the input form with example data which comes to the screen when the operator calls up basic outfall information.

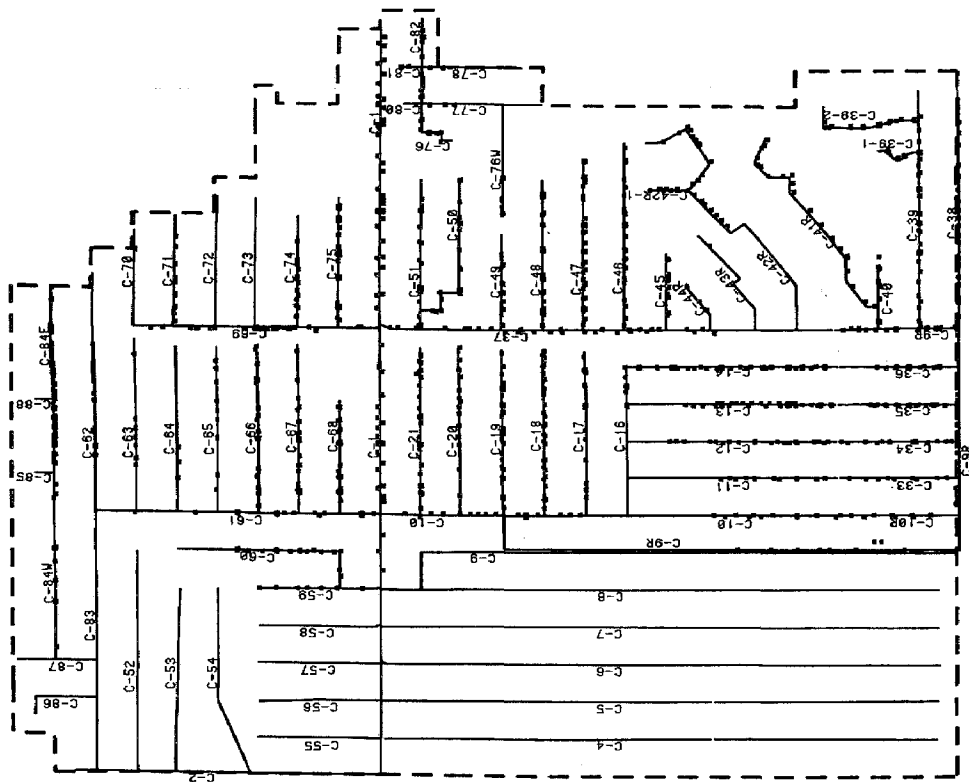
Options 2 and 3 on the first menu let the operator select for detailed engineering data on either a particular outfall channel or outfall pipe. Separate expansion data files and input forms were created for each type of outfall allowing for different engineering information to be held on outfall channels as opposed to outfall pipes. The source of each engineering data item is also recorded into the database to inform WCDSB personnel of the original source from which the data were entered. These input forms with example data are also shown in Appendix B.

Help screens are also available to the WCDSB staff from several of the menus which provide online assistance in using the menu program and input forms. The staff will be able to tab through the input forms and change or add to the existing data if they choose the Update option on the menus. This automatically updates the outfall database in INFO and allows the WCDSB staff to keep updating the data on each outfall as new information becomes available or as new outfall permits come in to the WCDSB. If they choose the View option on the menus, they can only view the existing data, but cannot change it. This helps eliminate data destruction by erroneous key strokes when the person simply wants to view the data for a particular outfall.

V. PERMIT TRACKING SYSTEM

Existing permit data available for all canal structures and outfall structures were entered into the GIS database as attribute data. Permit data included ownership, permit status, dates of construction, notification, inspection and approval, etc. This database will be kept up-to-date by WCDSB staff in-house in a manner similar to that described above for outfalls. User-friendly menus for this permit tracking system were also developed by ESE for WCDSB staff. See Appendix C for sample menus from the permit tracking program. Option 1 of the main menu allows the operator to update or add basic permit information in the master permit file. Each permit in this file is keyed by a structure ID

OUTFALL STRUCTURES IN THE WCDSB



December 1990

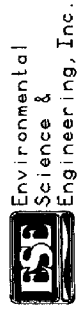


Figure B

Prepared for the Water Control District of South Brevard

number to the outfalls coverage (map) or to the canal structure coverage (map).

The data that are included in the master permit file are as follows:

- A. Permit number (assigned by the WCDSB)
- B. Permit application number (assigned by the WCDSB)
- C. Type of structure permitted - canal structure, outfall structure, or utility crossing
- D. Status of the permit - application stage, structure under construction, or permitted structure under maintenance
- E. Canal reach the permit is located on
- F. Section, Township & Range for the permit location
- G. Date that the data on the permit were last updated

The permit tracking program also allows the operator to bring to the screen additional data on the permit depending on whether the permit is in the application stage, the construction phase, or is established and is being maintained. This additional data includes mostly dates on which important tasks surrounding the permit or permitted structure have been completed or are due to be completed. Appendix D consists of the different input forms (with sample data) that can be brought to the computer screen by the WCDSB as part of the permit tracking program. This permit tracking system enables WCDSB personnel to have immediate access to permit data and to find out the status of any given permit on the current date of inquiry. It also allows WCDSB personnel to keep track of structure inspections and maintenance in an efficient and cost-effective manner.

VI. SUMMARY

The need for a computerized data management system has become apparent to the WCDSB staff over the last few years as the geographic data and tabular data needed to manage the District has become more numerous and more complex. It is the District's intent to continue to manage much of this data with the PC ARC/INFO geographic information system. Not only is this technology the state-of-the-art for data management purposes, but the GIS data will always be available and up-to-date for future geographic analyses that the District may want to undertake. Geographic analyses of watershed characteristics such as soils and landuse

will be useful to stormwater management and water quality monitoring. Geographic monitoring and tabular queries of outfall locations, canal reaches and other canal structure locations will assist in day to day canal and structure maintenance activities of District personnel and will also assist in stormwater management and water quality monitoring activities. Permit data for all WCDSB structures and outfalls will be kept up-to-date on the GIS through the permit tracking system. This will allow for geographic analysis of permit status in addition to the straightforward data management purposes of such a system. Storage of all this data in the GIS provides numerous opportunities for analyzing and viewing several different types of data and their relationship to one another for specific geographic areas of interest. Use of the PC ARC/INFO GIS also allows the District to remain compatible with all water management districts in the State (and several private data generators) for data exchange purposes and for complementary management of the District's canal system and the District's discharges to waters of the State.

APPENDICES

- A - Outfall Program - Sample Menus
- B - Outfall Program - Input Forms with Sample Data
- C - Permit Tracking Program - Sample Menus
- D - Permit Tracking Program - Input Forms with Sample Data

APPENDIX A

OUTFALL PROGRAM - SAMPLE MENUS

12/06/1990
11:49:30

*** PLEASE SELECT AN OPTION: ***

Enter 1 for OUTFALLS - MAIN FILE Data

Enter 2 for CHANNELS Data

Enter 3 for PIPES Data

Enter 8 for HELP on using this Program

Enter 9 to QUIT the Program OUTFALLS.PROG

our choice -->

* MAIN FILE DATA *

12/06/1990
11:51:19

Enter 1 to VIEW by ESE STRUCTURE ID
Enter 2 to VIEW by MODELING STRUCTURE ID
Enter 3 to UPDATE by ESE STRUCTURE ID
Enter 4 to UPDATE by MODELING STRUCTURE ID
Enter 8 for HELP on using this Section
Enter 9 to RETURN to MAIN MENU

our choice -->

* CHANNEL DATA *

12/06/1990
11:50:23

Enter 1 to VIEW by ESE STRUCTURE ID

Enter 2 to VIEW by MODELING STRUCTURE ID

Enter 3 to UPDATE by ESE STRUCTURE ID

Enter 4 to UPDATE by MODELING STRUCTURE ID

Enter 8 for HELP on using this Section

Enter 9 to RETURN to MAIN MENU

Enter choice -->

* PIPES DATA *

12/06/1990
11:50:50

Enter 1 to VIEW by ESE STRUCTURE ID
Enter 2 to VIEW by MODELING STRUCTURE ID
Enter 3 to UPDATE by ESE STRUCTURE ID
Enter 4 to UPDATE by MODELING STRUCTURE ID
Enter 8 for HELP on using this Section
Enter 9 to RETURN to MAIN MENU

our choice -->

This program was created for use by the Water Control District of South Brevard to allow automated entry, updating, and viewing of INFO database records. The records are from the Main Outfalls datafile, as well as the related datafiles of pipes and channels.

Use of the program is straightforward. The user will be presented with a menu and must make a selection by typing in the appropriate number for the choice required. If an invalid entry is made (accidentally or purposely), the user is told such and requested to choose again.

Valid Option Numbers to choose from the menus are 1-9. Option 9 from any menu will always return to the previous menu (in the case of sub-menus) or exit from the program (in the case of the main menu). Option 8 will always bring up a help screen (like the one you are reading). If the help screen has more than one page, a page number will be noted at the bottom center of the screen (as below).

By pressing the Return or Enter key now.

{page 1}

MORE?

MORE?

As you have demonstrated, pressing [ENTER] at the " More? " prompt will bring up the next page of help (after the final page, you will be returned to the menu you came from).

NOTE: When used in these help files, [ENTER] stands for carriage return (the key marked Enter or Return on the right side of the keyboard)

If you have any questions or problems, please contact:

Paula Sheldon, M.S.

or

Douglas Pickell, P.E.

Environmental Science and Engineering, Inc., telephone number 407-240-1288.
Good luck and happy database-ing!!

{page 2}

MORE?

APPENDIX B

OUTFALL PROGRAM - INPUT FORMS WITH SAMPLE DATA

IS THIS RECORD ACCEPTABLE (Y,N,Q,L OR E) >

OUTFALL STRUCTURE DATA

ESE STRUCTURE ID: 3302084

MODELING STRUCTURE ID:

TYPE OF OUTFALL: P

LOCATION: STREET: DRAINAGE ROW

LOT: 16

UNIT: 51

BLOCK: 2747/TR B

OWNER: GDC

REMARKS: 4 PIPES HERE - POND #321

DATE OF LAST DATA RECORD UPDATE: 06/12/90

IS THIS RECORD ACCEPTABLE (Y,N,Q,L OR E) >

CHANNEL DATA

ESE STRUCTURE ID: 6202174

MODELING STRUCTURE ID:

LOCATION: WASHINGTON ST.

OWNER:

CHANNEL TYPE:

RIGHT SIDE SLOPE: 0 ft H : 1 ft V

SOURCE:

LEFT SIDE SLOPE: 0 ft H : 1 ft V

SOURCE:

BOTTOM WIDTH OF CHANNEL: 6 feet

SOURCE:

SOURCE: F

INVERT ELEVATION: 20.60 feet MSL

SOURCE: F

REMARKS: ROAD CROSSING

DATE OF LAST DATA RECORD UPDATE:06/11/90

I THIS RECORD ACCEPTABLE (Y,N,Q,L OR E) >

OUTFALL PIPES DATA

ESE STRUCTURE ID: 3302084

MODELING STRUCTURE ID:

LOCATION: DRAINAGE ROW

OWNER: GDC

TYPE OF PIPE(S): CMP

SOURCE: D

SPAN OF PIPE(S): 36 inches

SOURCE: D

RISE OF PIPE(S): 36 inches

SOURCE: D

LENGTH OF PIPE(S): 45 feet

SOURCE: D

PIPE INVERT-UPSTREAM: 13.16 feet MSL SOURCE: D

PIPE INVERT-DOWNSTREAM: 12.90 feet MSL SOURCE: D

REMARKS: 4 PIPES HERE - POND #321

DATE OF LAST DATA RECORD UPDATE: 06/12/90

APPENDIX C

PERMIT TRACKING PROGRAM - SAMPLE MENUS

12/06/1990
13:08:57

*** PLEASE SELECT AN OPTION: ***

- 1 - Structure PERMITS - MASTER FILE Data
- 2 - APPLICATIONS for Permitting Structures
- 3 - Permits of Structures under CONSTRUCTION
- 4 - MAINTENANCE of Permitted Structures
- 8 - Review HELP on using this Program
- 9 - QUIT the Program PERMIT.PROG

Enter Your choice -->

* MASTER FILE DATA *

12/06/1990
13:10:13

- 1 - Choose a Data Record to VIEW
- 2 - Choose a Data Record to UPDATE
- 3 - ADD a New Data Record
- 8 - review HELP on using this Section
- 9 - RETURN to the MAIN MENU

Enter your choice -->

* APPLICATIONS for Permitting Structures *

12/06/1990
13:09:28

- 1 - Choose a Data Record to VIEW
- 2 - Choose a Data Record to UPDATE
- 8 - review HELP on using this Section
- 9 - RETURN to the MAIN MENU

Enter your choice -->

* Permitted Structures Under CONSTRUCTION *

12/06/1990
13:09:51

- 1 - Choose a Data Record to VIEW
- 2 - Choose a Data Record to UPDATE
- 8 - review HELP on using this Section
- 9 - RETURN to the MAIN MENU

Enter your choice -->

* MAINTENANCE of Permitted Structures *

12/06/1990
13:10:35

- 1 - Choose a Data Record to VIEW
- 2 - Choose a Data Record to UPDATE
- 8 - review HELP on using this Section
- 9 - RETURN to the MAIN MENU

Enter your choice -->

* VIEW A DATA RECORD *

12/06/1990
13:21:56

- 1 - Find Record by ESE STRUCTURE ID
- 2 - Find Record by PERMIT Number
- 3 - Find Record by APPLICATION Number
- 9 - RETURN to the PREVIOUS MENU

Enter your choice -->

* UPDATE A DATA RECORD *

12/06/1990
13:12:44

- 1 - Find Record by ESE STRUCTURE ID
- 2 - Find Record by PERMIT Number
- 3 - Find Record by APPLICATION Number
- 9 - RETURN to the PREVIOUS MENU

Enter your choice -->

his program was created for use by the Water Control District of South Brevard to allow automated entry, updating, and viewing of INFO database records. The records are from the Master Permits datafile, as well as the related expansion datafiles for permit applications, permitted structures under construction, and permitted structures under maintenance.

Use of the program is straightforward. The user will be presented with a menu and must make a selection by typing in the appropriate number for the choice desired. If an invalid entry is made (accidentally or purposely), the user is told such and requested to choose again.

Valid Option Numbers to choose from the menus are 1-9. Option 9 from any menu will always return to the previous menu (in the case of sub-menus) or exit from the program (in the case of the main menu). Option 8 will always bring up a help screen (like the one you are reading). If the help screen has more than one page, a page number will be noted at the bottom center of the screen (as below).

Try pressing the "Return" or "Enter" key now.

{page 1}

MORE?

MORE?

As you have demonstrated, pressing [ENTER] at the " MORE? " prompt will bring up the next page of help (after the final page, you will be returned to the menu you came from). If you do not desire to view additional pages, enter 'N' and you will immediately return to the menu without going through the remaining pages.

NOTE: When used in these help files, [ENTER] stands for carriage return (the key marked Enter or Return on the right side of the keyboard)

If you have any questions or problems, please contact:

Paula K. Sheldon, M.S.

or

Douglas A. Pickell, P.E.

at Environmental Science and Engineering, Inc., telephone number 407-240-1288.
Good luck and happy database-ing!!

{page 2}

DAP

MORE?

APPENDIX D

PERMIT TRACKING PROGRAM - INPUT FORMS WITH SAMPLE DATA

WCDSB MAIN PERMIT DATA

STRUCTURE ID: 0101037

APPLICATION NO.: 283

CANAL REACH: 0

PERMIT NO.: MT-43-85

S-T-R: 35-28-36

STATUS OF PERMIT: A
(A - Application)
(C - Construction)
(M - Maintenance)

TYPE OF STRUCTURE: OF
(OF - Outfalls)
(CS - Canal Structures)
(UT - Utility Crossings)

DATE OF LAST DATA RECORD UPDATE: 03/22/90

WCDSB PERMIT APPLICATIONS

STRUCTURE ID: 0101037

APPLICATION NO.: 283

CANAL REACH: 0

PERMIT NO.: MT-43-85

S-T-R: 35-28-36

TYPE OF STRUCTURE: OF

DATE OF RECEIPT: 01/13/91

(OF - Outfalls)

(CS - Canal Structures)

60-DAY NOTIFICATION: 03/14/91

(UT - Utility Crossings)

APPROVED: N - (Y)es of (N)o

DATE OF LAST RECORD UPDATING - MASTER PERMITS: 03/22/90 APPLICATIONS: 01/13/91

WCDSB PERMITS UNDER CONSTRUCTION

STRUCTURE ID: 0100002

APPLICATION NO.: 2

CANAL REACH:

PERMIT NO.:

S-T-R: 34-28-37

TYPE OF STRUCTURE: CS

DATE OF PERMIT APPROVAL: 03/13/91

(OF - Outfalls)

(CS - Canal Structures)

(UT - Utility Crossings)

CONSTRUCTION START DATE: 03/31/91

COMPLETE DATE: 06/24/91

EXTENSION DATE: 06/30/91

FINAL INSPECTION DATE: 07/01/91

DATE OF LAST RECORD UPDATING - MASTER PERMITS: 03/21/90 CONSTRUCTION: 07/02/91

WCDSB PERMITS UNDER MAINTENANCE

STRUCTURE ID: 0101037

APPLICATION NO.: 283

CANAL REACH: 0

PERMIT NO.: MT-43-85

S-T-R: 35-28-36

TYPE OF STRUCTURE: OF

(OF - Outfalls)

REQUEST FOR MAINTENANCE: Y - (Y)es of (N)o

(CS - Canal Structures)

PRELIMINARY INSPECTION: Y

(UT - Utility Crossings)

LENGTH OF MAINTENANCE PERIOD - START: 11/15/91 END: 11/15/96

FINAL INSPECTION: N

DATE OF ACCEPTANCE: 11/11/91

EXPIRATION DATE: 08/31/97 EXTENSION DATE: / /

DATE OF LAST RECORD UPDATING - MASTER PERMITS: 03/22/90

MAINTENANCE: 11/16/91

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7. Author(s) Paula K. Sheldon, Environmental Science & Engineering, Inc.		8. Performing Organization Rept. No. CM - 252	
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		11. Contract(G) or Grant(G) No. (C) NA89AA-D-CZ 228 (G)	
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<p>The Water Control District of South Brevard (WCDSB) maintains a large canal network, serving over 99 square miles of rapidly urbanizing area, which discharges to Turkey Creek and the Indian River Lagoon in East Central Florida. During 1988-90, the WCDSB created a geographic information system (GIS) for their jurisdiction consisting of several different data coverages using PC ARC/INFO GIS software. This report summarizes the GIS activities undertaken during the 1989-90 grant year by the WCDSB. These activities include complete stormwater outfall inventory and mapping as well as development of programs residing within the GIS that allow for permit tracking and outfall maintenance tracking by WCDSB staff. The WCDSB GIS will be used to support the District's day-to-day maintenance activities and to support development of long-range management plans for flood control and water quality.</p>			
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