

### 3. Peace River

This chapter presents a compilation and synthesis of information regarding the Peace River Basin portion of the Charlotte Harbor NEP area. The following sections provide:

- a characterization of the physical setting, including topographic, geologic, soils, and land use descriptions of the basin;
- a review of the rainfall and hydrologic characteristics of the basin;
- a review of the water management practices and water uses within the basin;
- a summary of current and historical water quality conditions; and
- an estimation of pollution potential from nonpoint and point sources within the basin.

#### 3.1 Physical Setting

The following sections provide a characterization of the Peace River Basin, a major tributary to Charlotte Harbor Estuary System (Figure 3-1). These sections include physiographic, topographic, geologic, hydrologic, and land use descriptions of the basin.

The Peace River Basin includes portions of eastern Sarasota, Manatee, and Hillsborough counties, parts of central and southern Polk County, most of Hardee and DeSoto counties, part of northern Charlotte County, and western portions of Highlands County. The basin has a drainage area of 2,350 square miles (Foose, 1986). The Peace River headwaters are a group of lakes in northern Polk County. The river then flows south for about 75 miles through Polk, Hardee, DeSoto, and Charlotte counties. The major tributaries of the Peace River include Peace, Saddle, Horse, Charlie, and Shell Creeks. The Peace River is divided into nine subbasins for this report:

- Peace River above Bartow,
- Peace River above Zolfo Springs,
- Peace River above Arcadia,
- Lower Peace River,
- Payne Creek,
- Charlie Creek,

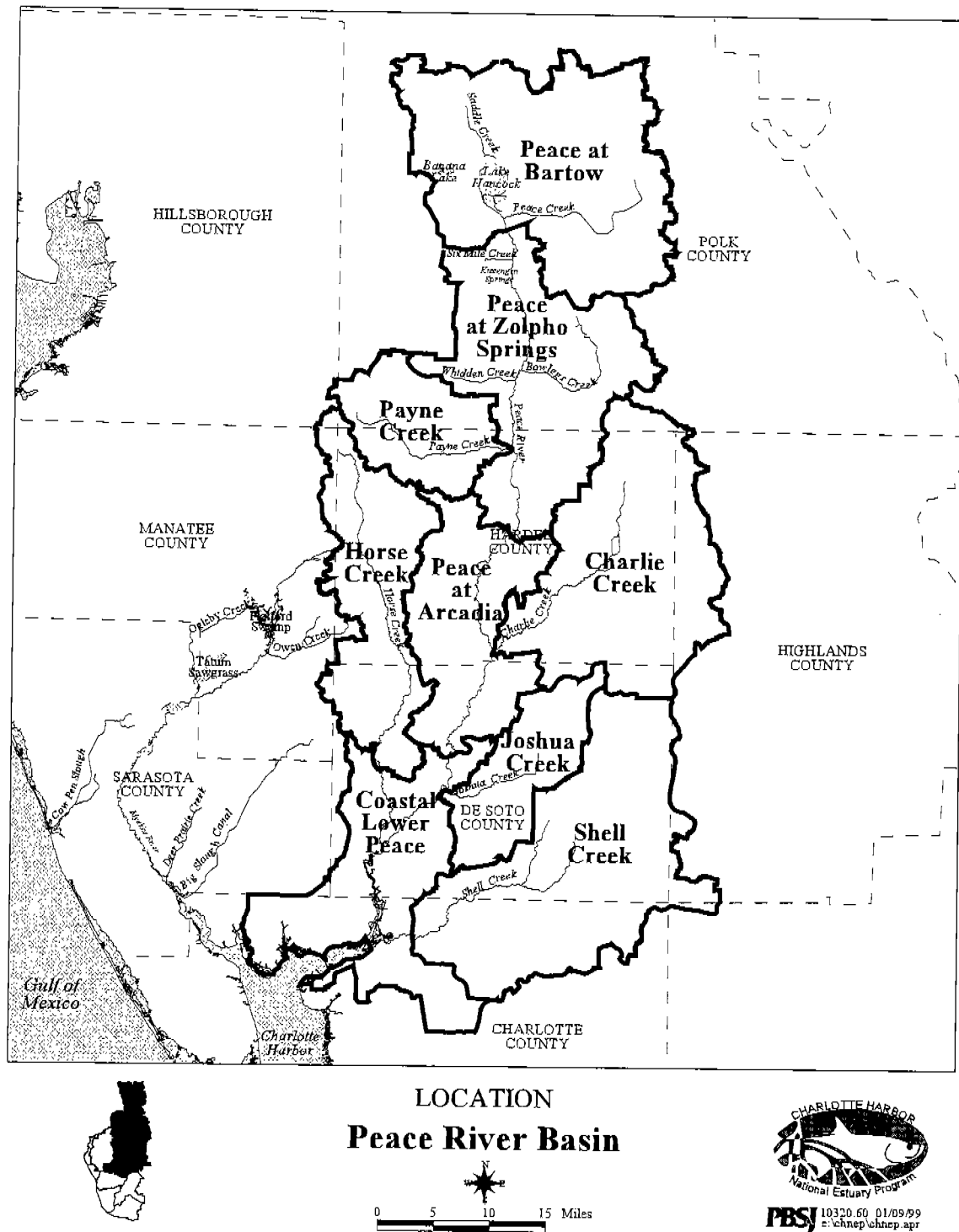


Figure 3-1. Location of Peace River Basin in the Charlotte Harbor NEP study area.

- Horse Creek,
- Joshua Creek, and
- Shell Creek.

### 3.1.1 Physiography

This section describes the topography, geology, soils, and land use in the Peace River Basin.

#### 3.1.1.1 Topography

The Peace River flows from the physiographic provinces of the Polk Uplands southwest through the DeSoto Plain and in to the Gulf Coastal Lowlands where it enters Charlotte Harbor. The Polk Upland has gently rolling, sometimes hilly terrain and land-surface elevations range from over 200 feet above MSL near the headwaters to sea level at the mouth.

The Peace River drains the southern portion of Green Swamp, is a blackwater system and has high concentrations of organic acids originating in the swamp and surrounding forests. The river flows between the Polk Highlands to the east and the Central Highlands to the west. Occasionally, the river valley narrows and bluffs occur along the banks, most frequently between Zolfo Springs and Gardner in Hardee County. Low limestone bluffs are also located near Limestone Creek.

The DeSoto Plain occurs at about 60 to 85 feet above MSL, the boundary of which approximates the Sarasota-Manatee county line. Lakes are less common on the DeSoto Plain, a result of more recent karst topography and younger Wicomico Terrace surfaces. Although the DeSoto Plain is generally steep enough for a distinct drainage network, lands between river and creek valleys are relatively flat and support a variety of wetlands

The Peace River channel is well-defined at normal water level stages. Downstream from Arcadia, the floodplain widens and the channel braids. The marsh and swamp areas of the floodplain may reach a mile in width, smaller than those along the Myakka.

Many of the lakes in the headwaters area are linked by stems of canals, many of which have fixed or operable control structures. Some canals provide continual flow between lakes; in others, flow occurs only under high-water conditions.

#### 3.1.1.2 Geology

The upstream portion of the Peace River is geologically similar to the Myakka River, described above. The Floridan aquifer system is the primary source of groundwater supply, although nearer the coast it is highly mineralized. In these areas, the surficial aquifer system and the intermediate

Hawthorn aquifer are the primary sources of groundwater supply. Historically, the upper portion of the Peace River Basin appears to have been an area of widespread upward leakage and artesian flow from the intermediate Hawthorn layer (Hammett, 1988).

### 3.1.1.3 Soils

The National Resource Conservation Service (NRCS) county soil reports and map provided most of the information discussed in this section. Within the Peace River Basin, flatwoods soils are the most dominant natural soil type. These are generally nearly level soils with 0 to 2% slopes, poorly drained, sandy, and have a high water table. They occur throughout the watershed predominantly as combinations of Myakka, Smyrna, and Immokalee soils series.

Patterns in HSG designations for the Peace River Basin are similar to those described for the Myakka River basin. Approximately 65% of the soils in the watershed are B soils (fairly well drained) (Tables 3-1 through 3-3 and Figure 3-2). Although many of these reflect the artificial drainage features in the basin, D soils comprise approximately 15% of the soils in the basin (poorly drained), while less than 9% are A (well-drained), and less than 12% are C (less well-drained).

Nearly 50% of Polk County in the northern portion of the Peace River Basin is underlain by upland soils. The Arents-Hydraquents-Neilhurst soils have been strip mined for phosphate or silica sands. Candler-Tavares-Apopka soils are characteristic of uplands and are moderately sloping, excessively to moderately well-drained, sandy, and underlain by loamy or clay material.

**Table 3-1. Hydrologic Soil Types in the Peace River Basin: Peace at Bartow, Peace at Zolfo Springs, and Peace at Arcadia Subbasins.**

Soil Type	Peace at Bartow		Peace at Zolfo Springs		Peace at Arcadia	
	Acres	%	Acres	%	Acres	%
A	78,869	31.8	39,985	20.2	3,357	2.6
B	74,847	30.2	73,249	37.0	95,718	74.7
C	33,899	13.7	23,553	11.9	9,628	7.5
D	60,130	24.3	61,024	30.8	19,480	15.2
TOTAL	247,745	100.0	197,810	100.0	128,184	100.0

The small distributary system near the mouth of the Peace River, in Charlotte County, also includes Peckish-Estero-Isles tidal and barrier island soils (poorly drained mucky fine sands). Low sandy ridges with 0-5% slopes occur near the mouth of the Peace River along Prairie Creek and are composed of Orsino-Daytona complex of well-drained marine sands. These soils are deep and

moderately well-drained in thick beds of marine sands. At the mouth of the Peace River, there are Matlacha soils of mixed sands and shell and limestone fragments in altered areas immediately landward the sand flats.

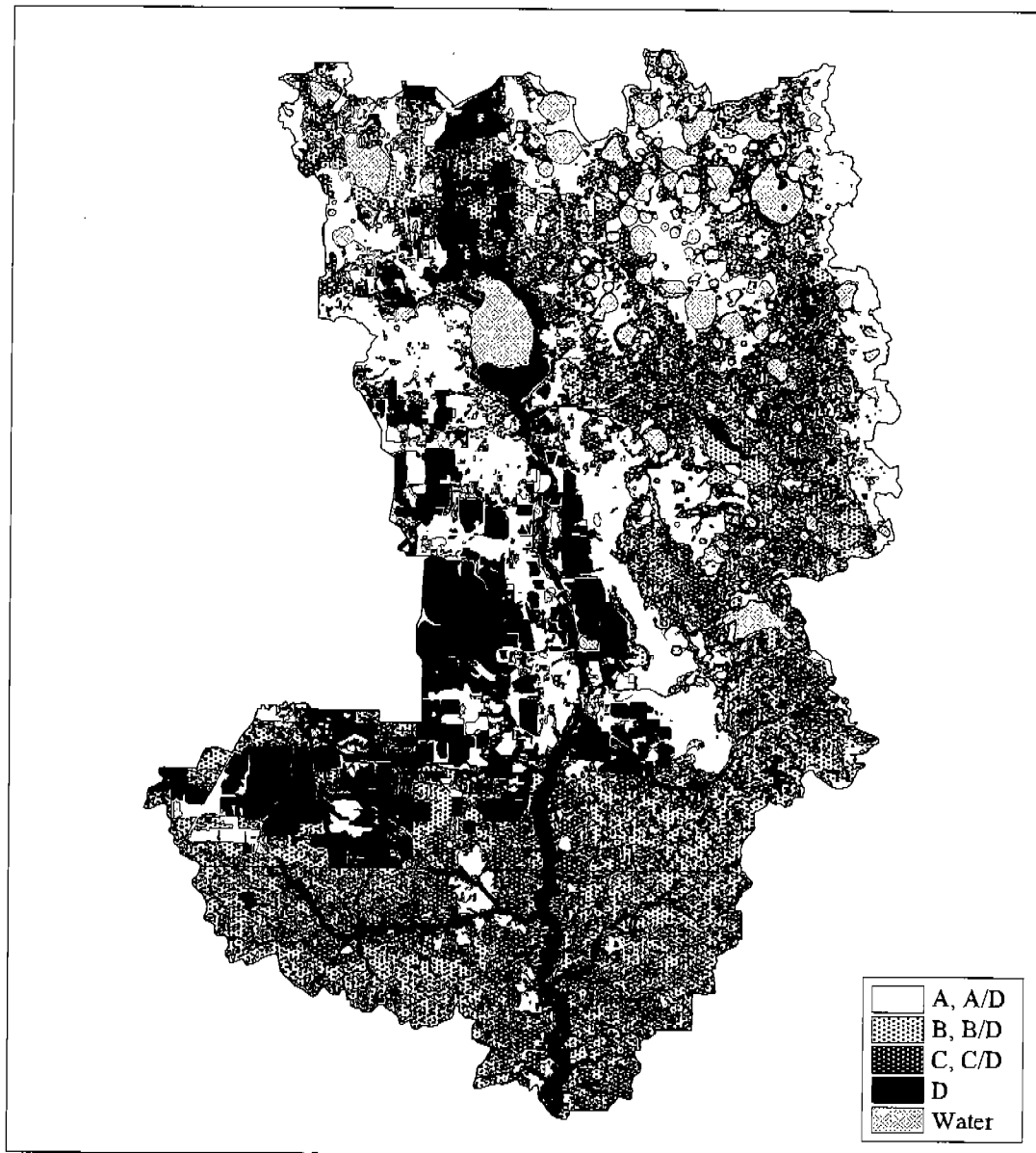
Soils adjacent to the Peace River itself are generally of the Chobee series combined with another wetland soil type. This soil is deep, has nearly level slopes of 0-1%, is very poorly drained and occurs in depressions with high water tables. In Polk and DeSoto counties, Nittaw-Kaliga-Chobee and Bradenton-Felda-Chobee soil series occur, and include organic substrates of marshes and swamps on clayey marine sediments. In Hardee County, Bradenton-Felda-Myakka soils are similar, but occur on loamy marine sediments more characteristic of flatwoods, but not marshes and swamps.

**Table 3-2. Hydrologic Soil Types in the Peace River Basin: Lower Peace, Payne Creek, and Charlie Creek Subbasins.**

Soil Type	Lower Peace		Payne Creek		Charlie Creek	
	Acres	%	Acres	%	Acres	%
A	3,001	1.8	7,247	9.0	3,536	1.7
B	121,414	73.8	38,361	47.9	132,137	62.6
C	13,605	8.3	8,969	11.2	52,286	24.8
D	26,610	16.2	25,544	31.2	23,064	10.9
TOTAL	164,631	100.0	80,122	100.0	211,023	100.0

**Table 3-3. Hydrologic Soil Types in the Peace River Basin: Horse Creek, Joshua Creek, and Shell Creek Subbasins.**

Soil Type	Horse Creek		Joshua Creek		Shell Creek	
	Acres	%	Acres	%	Acres	%
A	1,205	0.9	205	0.3	1,920	0.8
B	113,489	83.6	67,654	87.4	194,880	83.1
C	10,039	7.4	2,879	3.7	13,881	5.9
D	11,044	8.1	6,661	8.6	23,729	10.1
TOTAL	135,777	100.0	77,398	100.0	234,410	100.0



**HYDROLOGIC SOIL GROUPS**  
**Peace River Basin (Upper)**

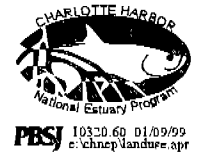


Figure 3-2. Hydrologic Soil Group designations for the Upper Peace River Basin.

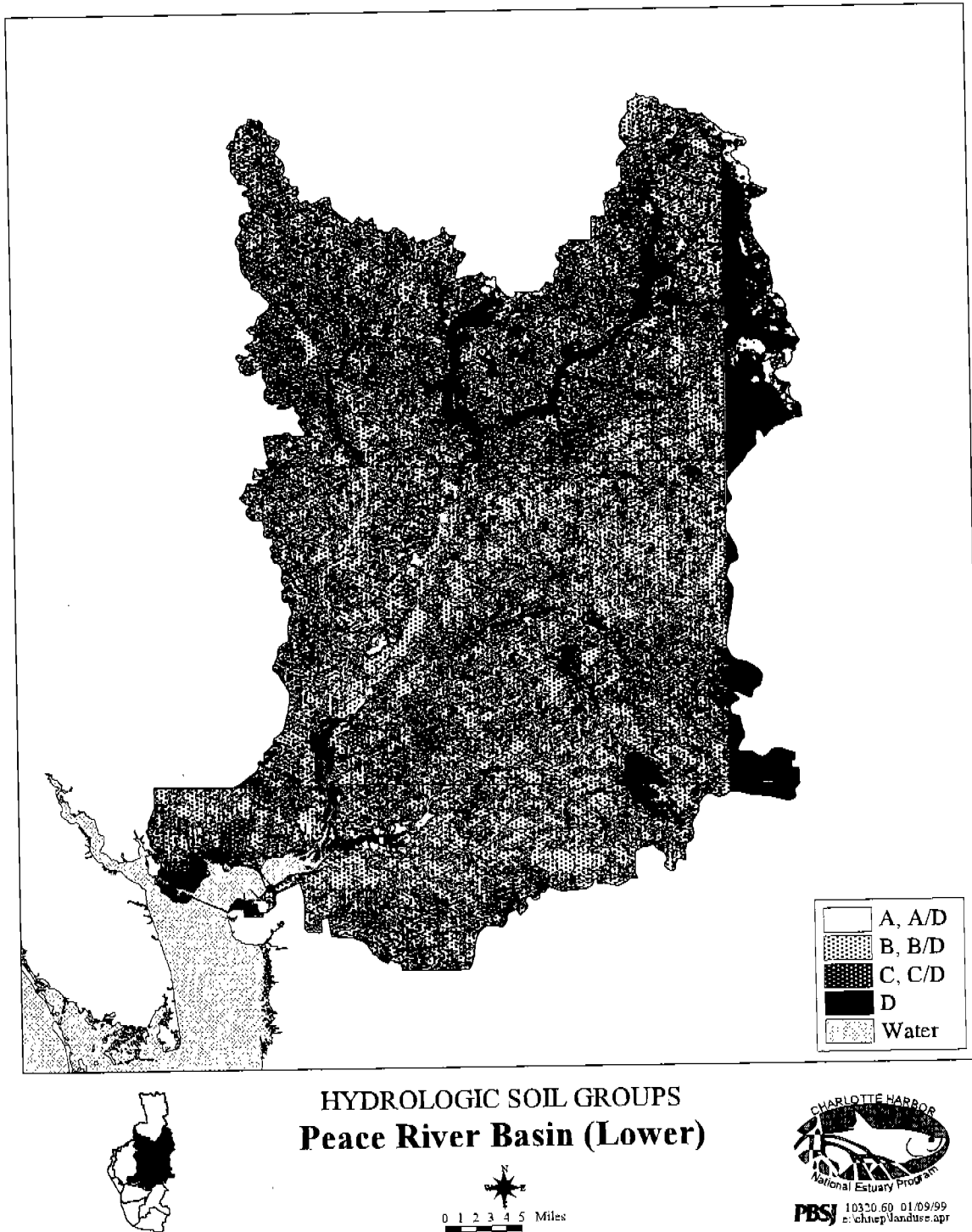


Figure 3-2. Hydrologic Soil Group designations for the Lower Peace River Basin.

### 3.1.2 Rainfall

Data from no fewer than four rain gages were used in calculating amounts of rainfall for each of the subbasins (Figure 3-3). Total annual precipitation and average monthly precipitation for the nine subbasins are presented in Figures 3-4 through 3-12.

Since 1970, the minimum average total annual precipitation has ranged from 32 inches (Lower Peace) to 38 inches (6 of the 9 subbasins). Maximum values ranged from 64 inches at the Peace at Bartow station in 1985 to 76 inches in the Joshua Creek subbasin in 1983. Maximum peaks consistently occurred in 1983.

Average monthly precipitation was highest for the wet season (summer) and lowest in the winter for all the basins. Rainfall was highest from June to September, and wet season monthly average values ranged from 5.6 to 8.2 inches. Average monthly rainfall values were lowest during November and ranged from 1.4 inches (Lower Peace) to 2 inches (Payne Creek), and average values did not exceed 3.4 inches through May. Two subbasins, Peace at Bartow and Peace at Zolfo Springs, had peak average monthly precipitation in July, compared with June for the other subbasins.

Analyses of the rainfall records conducted by Coastal Environmental (1996) indicated a rainfall deficit has occurred in all three Peace River subbasins above Arcadia. The estimated annual percent decline in rainfall ranged from 0.32%/year at Arcadia to 0.41%/year at Bartow.

### 3.1.3 Existing and Future Land Use

Land use data were obtained from SWFWMD, SFWMD, and the Southwest Florida Regional Planning Council (SWFRPC). Although other sources of data were available for various portions of the Charlotte Harbor NEP study area, these data sources provide a complete and consistent coverage for the entire study area.

The major urban areas in the Peace River Basin include Lakeland, Winter Haven, Bartow, Punta Gorda, Port Charlotte, and Arcadia. The river empties into the harbor at Port Charlotte, a part of the Charlotte Harbor Aquatic Preserve and Charlotte Harbor State Reserve, near Punta Gorda, Florida. Portions of the Peace River have been named Outstanding Florida Waters, designated as a Recreational Canoe Trail, and Payne Creek, a tributary to the Peace, has been designated a Special Feature Site. In addition, the Peace River corridor of the Charlotte Harbor Aquatic Preserve contains many recreation sites.

Existing and Future Land Use GIS Coverages for the Charlotte Harbor NEP Area are not always consistent in land use codes and coverages. Existing Land Use Coverage presented in this document is a combination of 1990 Southwest Florida Water Management District (SWFWMD) and 1988 South Florida Water Management District (SFWMD) land use data. Land Use data from