

Land Use/Cover	Acres	%
Industrial	1,243	2
Agricultural	33,111	48
Wetlands	37	< 1
Protected Resource	6,134	9
TOTAL	69,085	100

9.1.4 Surface Water Hydrology and Water Management Practices

Most of the basin is poorly drained. Cow Pen Slough is the major drainage channel in the basin. The area has numerous small streams and is generally an area of artesian flow. The water table is at or near the surface throughout much of the basin. Natural drainage systems have been channelized and extensive ditch systems constructed to improve drainage. There are no streamflow gages in the Coastal Venice Basin.

9.1.5 Water Management Practices

The following describes the current urban and agricultural water management practices employed in this basin.

9.1.5.1 Urban Management Practices

Approximately 14% of the Coastal Venice Basin is classified as urban land, and approximately 23% of the basin is occupied by agricultural land uses. The urbanized areas of the Coastal Venice Basin are found primarily in Venice and the surrounding area, and southward along the Gulf coast. The discussion of urban management practices is divided into urban water uses and urban water discharges, including reuse. The water uses and water discharges are tabulated in the following descriptions.

Water Use

Urban water uses include public water supply, mining facilities, industrial operations, and recreational uses. Discussion of water use is limited to facilities with an average permitted quantity greater than 0.5 MGD. Water use information is from SWFWMD (1994). The Coastal Venice Basin is entirely within the SWFWMD.

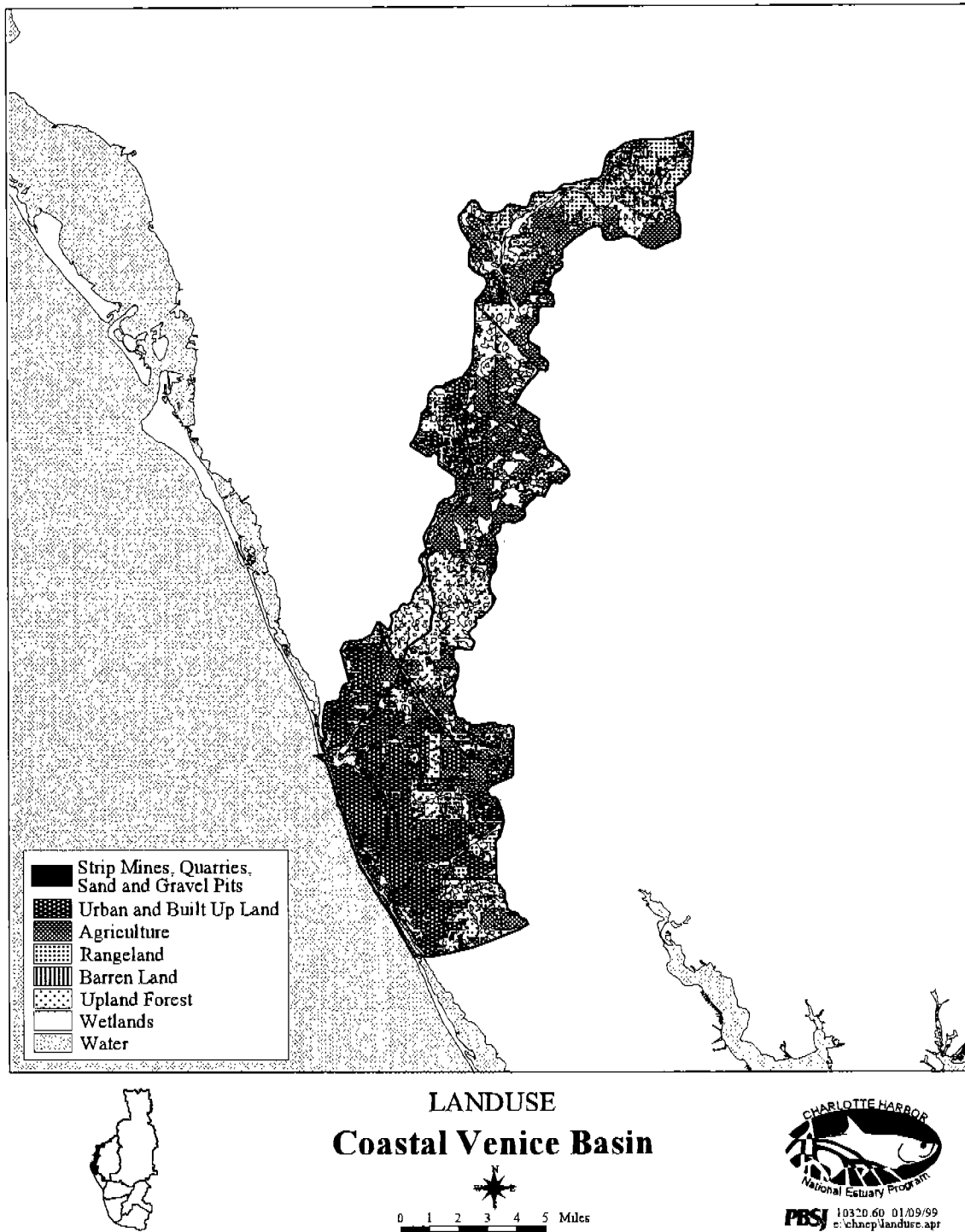


Figure 9-5. Existing land use map (SWFWMD, 1990; SFWMD, 1988) for the Coastal Venice Basin.

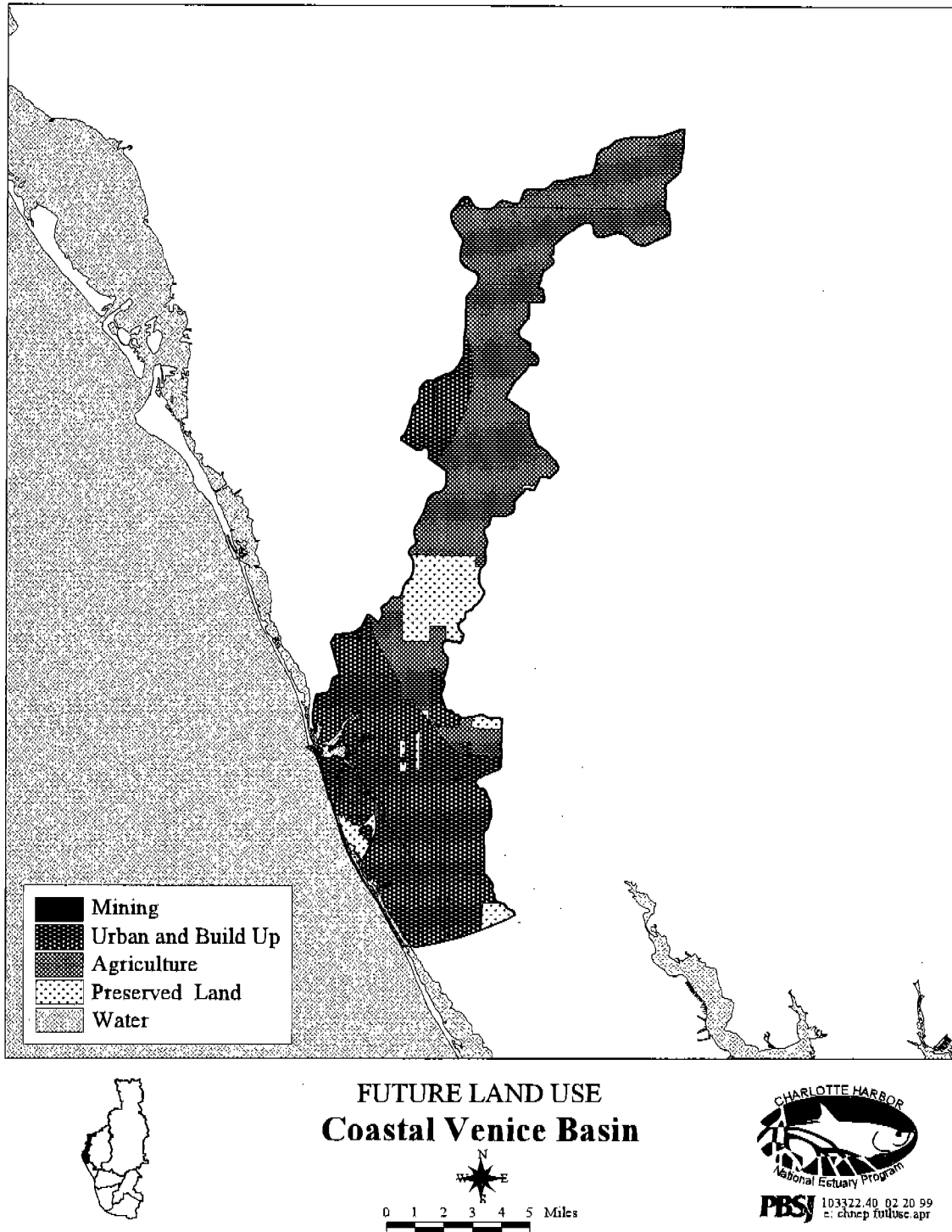


Figure 9-6. Future land use map (SWFRPC, 1990) for the Coastal Venice Basin.

Table 9-4 shows the public water supply facilities in the Coastal Venice Basin with permitted withdrawals of more than 0.5 MGD, as well as the withdrawal sources for the facilities. A discussion of the populations served by each plant, withdrawal amounts, and withdrawal methods follows.

Facility	Permitted Average Withdrawal (MGD)	Source
Venice Gardens Utility/Southern States	4.54	Intermediate, Floridan aquifers
City of Venice	5.09	Lower Intermediate, Upper Floridan aquifers

The Venice Gardens Utility/Southern States water treatment facility is a private utility which provides service to a 6,320-acre development south of Venice. In 1990, 14,061 people were provided with 1.8 MGD of water, from withdrawals of 2.17 MGD. The Intermediate aquifer provides water through 42 wells, with six wells withdrawing from the Floridan aquifer, with a total permitted average withdrawal of 4.54 MGD. Permitted average withdrawals from the Intermediate aquifer are 0.12 MGD, with 4.42 MGD from the Floridan aquifer.

The City of Venice operates the Intracoastal Wellfield and the eastern wellfield located in the Waterford Development. Eight wells in the Intracoastal Wellfield average 450 feet in depth and the one well in the eastern wellfield is 500 feet deep, all withdrawing from the Lower Intermediate and Upper Floridan aquifers. The permitted average withdrawal is 5.09 MGD, with a 1990 withdrawal of 4.21 MGD providing service to 18,079 people.

- Mining

There are no mining operations with water use greater than 0.5 MGD within the Coastal Venice Basin.

- Industrial

There are no industrial facilities with greater than 0.5 MGD water use within the Basin.

- Recreational

Golf courses and landscape (parks, medians, attractions, cemeteries, and other green areas) water use locations are not identified in SWFWMD (1997), so that no basin-specific water use may be

associated with these land uses. However, the document does provide water use by county for golf courses and landscape for that portion of the county within the SWFWMD. Sarasota County water use associated with golf courses for 1994 was 7.9 MGD, and landscape water use for the same time period was 0.4 MGD, for a total recreational use of 8.3 MGD for the county. In Manatee County, golf course water use was 3.0 MGD in 1994, and landscape water use was 0.1 MGD, totaling 3.1 MGD for the county.

Water Discharge and Reuse

Venice Gardens has two wastewater treatment plants. Plant 1 has a capacity of 1.3 MGD, and flow was 0.6 MGD in 1990, with 0.35 MGD of reclaimed water supplied to the Jacaranda West County Club that year. The remainder of the discharge is sent to percolation ponds. Plant 2, with a capacity of 1.0 MGD, had 0.4 MGD flow since 1986, with all discharge sent to percolation ponds (SWFWMD, 1992).

The City of Venice operates two wastewater treatment plants as well, the Venice plant and the Venice Eastside plant. The Venice plant is permitted for 2.8 MGD, with averages of 0.5 MGD after 1991. The Venice Eastside plant operates at approximately 1.5 MGD, supplying reclaimed water to the Waterford, Capri Isles, and Bird Bay golf courses and residential areas in Waterford (SWFWMD, 1992).

Table 9-5. 1990 estimated crop acreages, irrigation types, and water use in Manatee County.

Crop	Acreage	Irrigation Type -Acreage	Water Use (MGD)
Agronomic	2,000	Seepage 2,000	2.1
Row/Field Crops	24,200	Low volume 2,800 Seepage 20,900	77.0
Citrus	19,300	Overhead 965 Low Volume 13,510 Seepage 965	18.5
Nursery	2,175	Overhead 975 Low Volume 100 Seepage 1,100	14.6
Sod	3,200	Overhead 2,200 Low volume 1,000	6.4
Irrigated Pasture	1,450	Seepage 1,450	2.4

Table 9-5. 1990 estimated crop acreages, irrigation types, and water use in Manatee County.

Crop	Acreage	Irrigation Type - Acreage	Water Use (MGD)
TOTALS	52,325	Overhead 4,140 Low Volume 17,410 Seepage 26,415	121.0

9.1.5.2 Agricultural Management Practices

The Coastal Venice Basin consists mainly of forested uplands (22%), range lands (16%), and pasture (15%). In addition to pasture, other agricultural land uses include groves (1,421 acres), row and field crops (366 acres), and nurseries (67 acres). The basin contains approximately 63,500 acres (99 square miles) in Sarasota and Manatee counties.

Agricultural land use estimates for all major crops for 1990 in Manatee County are listed in Table 9-5, and for Sarasota County in Table 9-6, along with estimates of irrigated acreages for each of these crops and estimated water use.

Table 9-6. 1990 estimated crop acreages, irrigation types, and water use in Sarasota County.

Crop	Acreage	Irrigation Type - Acreage	Water Use (MGD)
Agronomic	200	Seepage 200	0.2
Row/Field Crops	3,100	Seepage 3,100	9.1
Citrus	1,800	Low Volume 1,530 Seepage 180	3.2
Nursery	220	Overhead 220	1.5
Sod	5,000	Seepage 5,000	10.0
Irrigated Pasture	555	Seepage 555	0.9
TOTALS	10,875	Low Volume 1,530 Seepage 9,035	24.9

9.2 Water Quality Conditions

No comprehensive data bases were identified which allowed a comprehensive assessment of long-term and current water quality conditions either during the development of the "Compendium of Existing Information" or while compiling background data for this subsequent "Synthesis of Existing Information".

9.3 Estimation of Pollution Potential

Nonpoint source loading of runoff, total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS) was estimated for each major basin and subbasin by computing nonpoint source pollution loads based on estimated rainfall, land use, and soil cover. The pollution load potential was estimated in order to assign priority to major basins and subbasins. Thus, the method development was focused on estimating relative loads in a consistent manner among subbasins to avoid biasing the evaluation of major basins and subbasins.

The detailed rainfall, SWFWMD 1990 land cover, and USDA soil data were used to estimate relative runoff discharge rates for the subbasins. Using a surface-fitting approach, rainfall values for each month were computed for the years 1970 to 1996. Runoff was calculated by multiplying the rainfall estimate by a literature-based runoff coefficient value for each parcel in the land cover and soil database. Runoff coefficients used for these analyses were specific for south Florida, varied by land use/cover and hydrologic soil group, and were adjusted for wet or dry season conditions. Hydrologic loadings were estimated on an "off the land" basis, and it was assumed that all runoff entered the estuary, regardless of whether pumps or gravity flow was used to discharge it from the subbasin.

Monthly-specific pollutant loading estimates for TN, TP, and TSS were computed for each individual parcel of unique land use and soil within a subbasin. Loadings were computed using land use specific pollutant concentration estimates specific for south Florida. Pollutant concentrations reported in the literature have widely varying values, and this resulted in an increased level of uncertainty in the absolute values of the load estimates. However, more intensively developed land uses such as medium and high density residential and intensive agriculture clearly have a higher potential for TN, TP, and TSS loading to the estuary, and the pollutant load prioritization of subbasins for this study reflects these load source patterns. Existing domestic and industrial point sources within the basin are also listed and their potential impacts discussed.

Unless otherwise indicated, the following estimates were rounded to the nearest 1 thousand acres, 1 million cubic meters of discharge, and 1 ton of pollutant load. For purposes of discussion, urban land uses were operationally defined as residential, commercial, industrial, mining, institutional, transportation, and utilities. Agricultural land uses were operationally defined as pasture, groves,

feedlots, row and field crops, and nursery. Undeveloped land uses were defined as range lands, barren lands, upland forests, and wetlands.

9.3.1 Load Estimates for Coastal Venice Basin

The total estimated annual runoff discharge for the Coastal Venice Basin was 82 million cubic meters from 51,000 contributing acres. The estimated annual pollutant loads were 225 tons of TN, 50 tons of TP, and 3,401 tons of TSS.

Similar to the Estero Bay Basin, the Coastal Venice Basin was defined as primarily undeveloped land (47%). The 24,000 acres of undeveloped land contributed 28 million cubic meters of runoff, 100 tons of TN, 26 tons of TP, and 1,149 tons of TSS per year. Table 9-7 presents the loads from runoff by land use.

Developed lands in this subbasin were reported as 11,000 acres of agricultural lands and 15,000 acres of urban lands. The agricultural lands were estimated to contribute 39 tons of TN, 11 tons of TP, and 157 tons of TSS per year. The urban lands were estimated to contribute 86 tons of TN, 13 tons of TP, and a relatively large 2,096 tons of TSS. The TSS from urban runoff was primarily attributed to medium and high density residential development and commercial land use.

9.3.2 Pollution Source Inventory

This point source inventory for the Coastal Venice Basin describes the numbers, locations, and discharge capacities of domestic and industrial point sources within the Coastal Venice Basin. The

Table 9-7. Total nitrogen, total phosphorus, total suspended solids, and hydrologic load by land use type within the Coastal Venice Basin.

Land Use Type	TN		TP		TSS		Hydrologic Load	
	tons/yr	% of subbasin	tons/yr	% of subbasin	tons/yr	% of subbasin	m ³	% of subbasin
Low Density Residential	6	3%	1	2%	62	2%	3,100,913	4%
Medium Density Residential	26	11%	4	8%	386	11%	10,317,003	13%
High Density Residential	34	15%	6	12%	1,060	31%	14,932,540	18%
Commercial	10	5%	1	3%	404	12%	4,967,239	6%
Industrial	2	1%	0	1%	98	3%	949,417	1%
Mining	0	0%	0	0%	12	0%	221,216	0%
Institutional, Transport., Util.	8	4%	0	1%	74	2%	6,041,697	7%
Range Lands	32	14%	16	32%	162	5%	11,248,798	14%
Barren Lands	0	0%	0	0%	2	0%	145,293	0%
Pasture	32	14%	10	19%	102	3%	10,833,521	13%

Table 9-7. Total nitrogen, total phosphorus, total suspended solids, and hydrologic load by land use type within the Coastal Venice Basin.

Groves	4	2%	1	1%	20	1%	1,864,569	2%
Feedlots	1	0%	0	0%	2	0%	27,223	0%
Nursery	0	0%	0	0%	8	0%	125,586	0%
Row and Field Crops	2	1%	1	2%	25	1%	650,772	1%
Upland Forests	68	30%	10	19%	985	29%	16,198,069	20%
TOTAL	225	100%	50	100%	3,401	100%	81,623,855	100%

inventory provides a relative assessment of the pollution potential from point sources within the basin. Point source inventory information was obtained from the Florida Department of Environmental Protection (FDEP) databases for domestic and industrial point sources, as discussed previously.

Wastewater treatment plant discharges for those plants in the Coastal Venice Basin with greater than 1.0 MGD were previously described, using information from SWFWMD (1992). The following discussion uses only the FDEP databases, as previously described.

The FDEP databases list 23 domestic point sources and seven industrial point sources within the Coastal Venice Basin (Tables 9-8 and 9-9). Three of the domestic point sources are listed as being in a county not in the Coastal Venice Basin. The remaining 20 domestic point sources and all seven of the industrial point sources are in Sarasota County (Figure 9-7).

Domestic point sources discharge capacities total 7.43 MGD, with 2.25 MGD of this sent to reuse. For the seven industrial point sources, only one has its discharge capacity listed, of 0.39 MGD. Three of the other industrial point sources are listed as having discharge going to reuse.

Table 9-8. Domestic point sources in the Coastal Venice Basin.

Facility Name	County	Discharge Capacity (MGD)	Receiving Waterbody
VENICE - ISLAND BEACH - WWTP	Sarasota	2.8	
SADDLEBROOK DEVELOPMENT	Pasco	0.24	
WESLEY CHAPEL SUBREGIONAL	Pasco	0.17	
NORTHWOOD AWT	Pasco	0.25	Wetlands System
SOUTH COUNTY ANNEX	Sarasota	0.01	
NOKOMIS ELEM SCH	Sarasota	0.02	
BEE RIDGE WRF	Sarasota	1.5	
KING'S GATE CLUB WWTP	Sarasota	0.05	Percolation Ponds
PALM & PINES MHP WWTP	Sarasota	0.01	
LAKE VILLAGE MHP	Sarasota	0.05	

Table 9-8. Domestic point sources in the Coastal Venice Basin.

Facility Name	County	Discharge Capacity (MGD)	Receiving Waterbody
FLORIDA PINES MHC	Sarasota	0.01	
VENICE RANCH MHP WWTP	Sarasota	0.04	
CIRCLEWOODS WWTP	Sarasota	0.08	
MISSION VALLEY GOLF & COUNTRY CLUB	Sarasota	0.01	
JAPANESE GARDENS MHP WWTP	Sarasota	0.05	
JAPANESE GARDENS MHP WWTP	Sarasota	0.05	
FAIR WINDS CONDOMINIUM	Sarasota	0.02	
MANASOTA BEACH GARDENS	Sarasota	0.01	
LYONS COVE CONDO	Sarasota	0.01	
SUPER BOWL INC	Sarasota	0.01	
KING'S GATE RVP WWTP	Sarasota	0.04	
GULFVIEW UTILITIES	Sarasota	0.05	
VENICE GARDENS WWTP	Sarasota	1.95	Spray Irrigation

Table 9-9. Industrial point sources in the Coastal Venice Basin.

Facility Name	County	Discharge Capacity (MGD)	Receiving Waterbody
KWALITY KWIK LAUNDRY	Sarasota		Drainfield
GULF OLDSMOBILE-PONTIAC, INC.	Sarasota		None -Recycled
SINGELTARY CONCRETE	Sarasota		None -Recycled
SNOWBIRDLAND VISTAS, INC	Sarasota		
SARASOTA COUNTY EDR DIW	Sarasota		
FLORIDA MINING & MATERIALS/LITRELL	Sarasota		
VENICE, CITY OF - R/O PLANT	Sarasota	0.39	

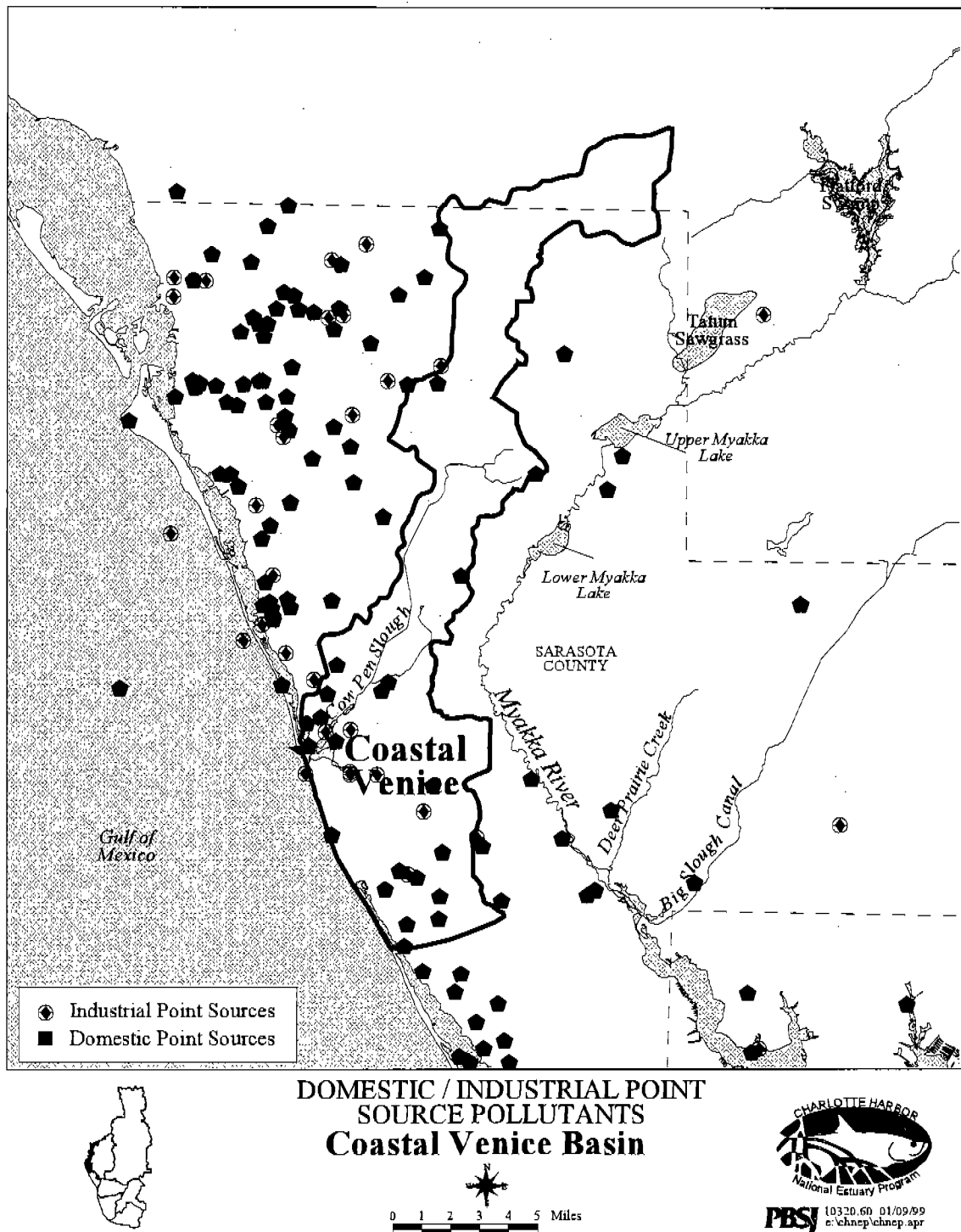


Figure 9-7. Location of domestic and industrial point sources in the Coastal Venice Basin.