



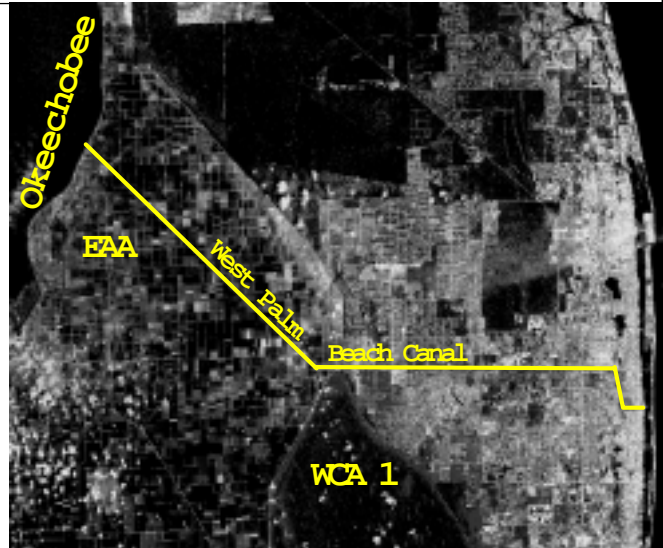
Southeast District  
Assessment and Monitoring Program

**Ecosummary**  
**West Palm Beach Canal**

July, 1999



**Summary:** *The West Palm Beach canal is a man-made water conveyance designed to provide flood protection and water supply. Current water quality status: IMPAIRED.*



Palm Beach Canal. After it passes the south side of the Palm Beach International Airport, the West Palm Beach Canal turns south for a short distance and then turns east again to empty into the Lake Worth Lagoon.

The West Palm Beach Canal, also known as the C-51 Canal, was originally dug in the early 1900's to lower Lake Okeechobee and drain a part of the Everglades in order to farm the land. This area is now known as the Everglades Agricultural Area (EAA). Today's West Palm Beach Canal is part of the Central and South Florida flood control system.

The Lake Worth Lagoon is about 20 miles long, a half a mile wide, and 8 feet deep, and constitutes the major estuarine resource of Palm Beach County. Historical fresh water releases into the Lake Worth Lagoon resulted in accumulation and sedimentation of suspended solids

The West Palm Beach Canal starts at Canal Point along Lake Okeechobee, and flows southeast to "Twenty Mile Bend". This stretch of the canal runs through and provides drainage for sugarcane in the Everglades Agricultural Area. At Twenty Mile Bend the West Palm Beach Canal joins Ocean Canal, and runs alongside the northern boundary of the Loxahatchee National Wildlife Refuge. Further east, the L-8, L-40, and L-7 canals drain into it. As it enters the coastal urban area, the West Palm Beach Canal receives stormwater runoff from the cities of Royal Palm Beach and Haverhill to the north and Wellington and Palm Springs to the south. The Acme Drainage District, Indian Trail Improvement District, and the Lake Worth Drainage District all drain into the West



*The WPB Canal passes through and drains expansive areas of agriculture.*

which in turn resulted in an impaired benthic macroinvertebrate community. Sediments from varying locations within the lagoon were found to contain elevated concentrations of lead (from leaded gas), zinc, copper, cadmium, and chromium (from motor vehicles and runoff from paved roads and parking lots), derivatives of petroleum (mostly from diesel fuel), and PCB's (from electrical transformers). Also, sporadic fresh water releases foster an unstable salinity regime in the Lagoon which prevents the establishment of normal estuarine biota.

The combined effects of discharge from the West Palm Beach canal have had a significant adverse impact on the Lake Worth Lagoon. There is a severely impaired zone one half mile north and south from where the West Palm Beach Canal discharges into the Lake Worth Lagoon.

Eutrophication of Florida's estuaries has been associated with ulcerated fish, fish kills, declining fisheries resources, decline of submerged aquatic vegetation, and extensive and frequent algae blooms. Nitrogen is generally the chief limiting nutrient in estuaries and coastal waters. Nitrogen is transported in water in various forms, namely organic nitrogen (nitrogen tied up in proteins and other carbonaceous decaying or living matter) and inorganic nitrogen (nitrogen dissolved in water as either ammonia, nitrate or nitrite nitrogen). The West Palm Beach Canal delivers a very heavy load of readily assimilable inorganic nitrogen to the Lake Worth estuary, and contributes to its algae blooms and other problems. Average inorganic nitrogen concentration in the canal 1975 - 1985 was a very high 0.559 mg/l (0.278 mg/l as ammonia nitrogen plus 0.281 as nitrate-nitrite nitrogen); however, inorganic nitrogen content appears to be decreasing, presumably due to better controls and BMP implementation in the basin. Although remaining unacceptably high, average inorganic nitrogen (1994-1998) is 0.216 mg/l. Total phosphorus has also decreased from an average of 0.188 mg/l (1975-1985) to an average of

0.091mg/l (1994-1998). Although these apparent 50% reductions in nutrient concentrations are encouraging, further water quality improvements are needed to protect the estuary.

Dissolved oxygen is maintained in a water body either through oxygen production by aquatic plants or through the air/water interface. It is unlikely that a constructed



*Trash and weeds trapped behind a bridge over the West Palm Beach canal.*

water body, like the West Palm Beach Canal, with its small surface to cross-sectional area ratio, would consistently meet dissolved oxygen standards developed for natural water systems. In addition, there is an ongoing aquatic weed control program which is necessary to allow the canal to fulfill its design objective (transport water efficiently), but exacerbates dissolved oxygen problems due to decaying plant material. Indeed, the dissolved

oxygen regime of the West Palm Beach Canal has averaged around 3.7 mg/l throughout the period 1975-1998 (the standard is 5.0 mg/l minimum).

The Army Corps of Engineers plans to put in a control structure to divert most of the drainage from the West Palm Beach Canal's western basin. Storm water treatment facilities are also planned that will improve water quality from the basin before it enters the Loxahatchee Wildlife Refuge.

**For more information:** Contact the Southeast District Surface Water Quality section in Port St. Lucie at 561/871-7662, or by email: [GREG.GRAVES@.DEP.STATE.FL.US](mailto:GREG.GRAVES@.DEP.STATE.FL.US)