

Palm Beach County NPDES MS4 Assessment Program

The Palm Beach County Assessment Program uses the approved NPDES water quality monitoring plan and the mapped locations of Palm Beach County major outfalls to assess the effectiveness of the Stormwater Management Program (SWMP). The primary conveyance of stormwater in Palm Beach County is not the Municipal Separate Storm Sewer Systems (MS4s). The primary conveyance is the canals of the Central and Southern Flood Control Project, the many secondary canals systems of the 298 Districts (Drainage Districts created under Chapter 298 F.S.) and residential/commercial privately owned and operated drainage systems. Water quality in the canals is directly related to stormwater pollutant loadings. The assessment of pollutant loading from the MS4 can be determined by assessing changes in water quality in direct relation to the location of outfalls. A basin by basin, north to south, approach is used for this assessment.

The water quality data evaluated in this assessment was obtained from the latest IWR_Run 53. The IWR (Impaired Water Rule) database data receives the highest amount of data validation. Geometric means of total nitrogen (TN), total phosphorus (TP) and Chlorophyll a (CHLA) were calculated from the IWR_Run 53 period of record (approximately 2004-2016). The sites used are the approved NPDES water quality sites as sampled by the County along with two Broward County sites in the Hillsboro Canal as sampled by Broward County.

Palm Beach County contributes to the pollutant loading estimate provided in the NPDES Annual Report Year 3. However, this estimate does not include ambient water quality nor the locations of outfalls. Therefore, this alternative approach provides a clearer depiction of MS4 outfall pollutant loading impacts. The following is an evaluation of the water quality within the basins identified on the attached map. The map also provides a the geometric mean for Total Nitrogen, Total Phosphorous and Chlorophyll a.

- The C-18 basin is in northern Palm Beach County has an area of approximately 105.8 square miles. The land use is predominately wetland Natural Areas and some low density residential on the eastern portion of the basin. The primary water supply is from local rainfall. The C-18 Basin is not impacted by the Palm Beach County (PBC) MS4s; therefore, a discussion on assessing the effectiveness of the PBC Stormwater Management Plan within the C-18 Basin is unnecessary.
- The C-17 Basin is in northeast Palm Beach County and has an area of approximately 33.0 miles. The land use is a mix of residential and commercial. Unincorporated Palm Beach County comprises approximately only 10% of the basin, with the municipalities of West Palm Beach, Riviera Beach, Lake Park, Mangonia Park and Palm Beach Gardens comprising approximately 90%. Approximately 15 PBC major outfalls are located in the C-17 Basin serving PBC roadways. There are two NPDES water quality monitoring stations, 12A and C17S44, in the C-17 Canal. A review of the sampling data indicates

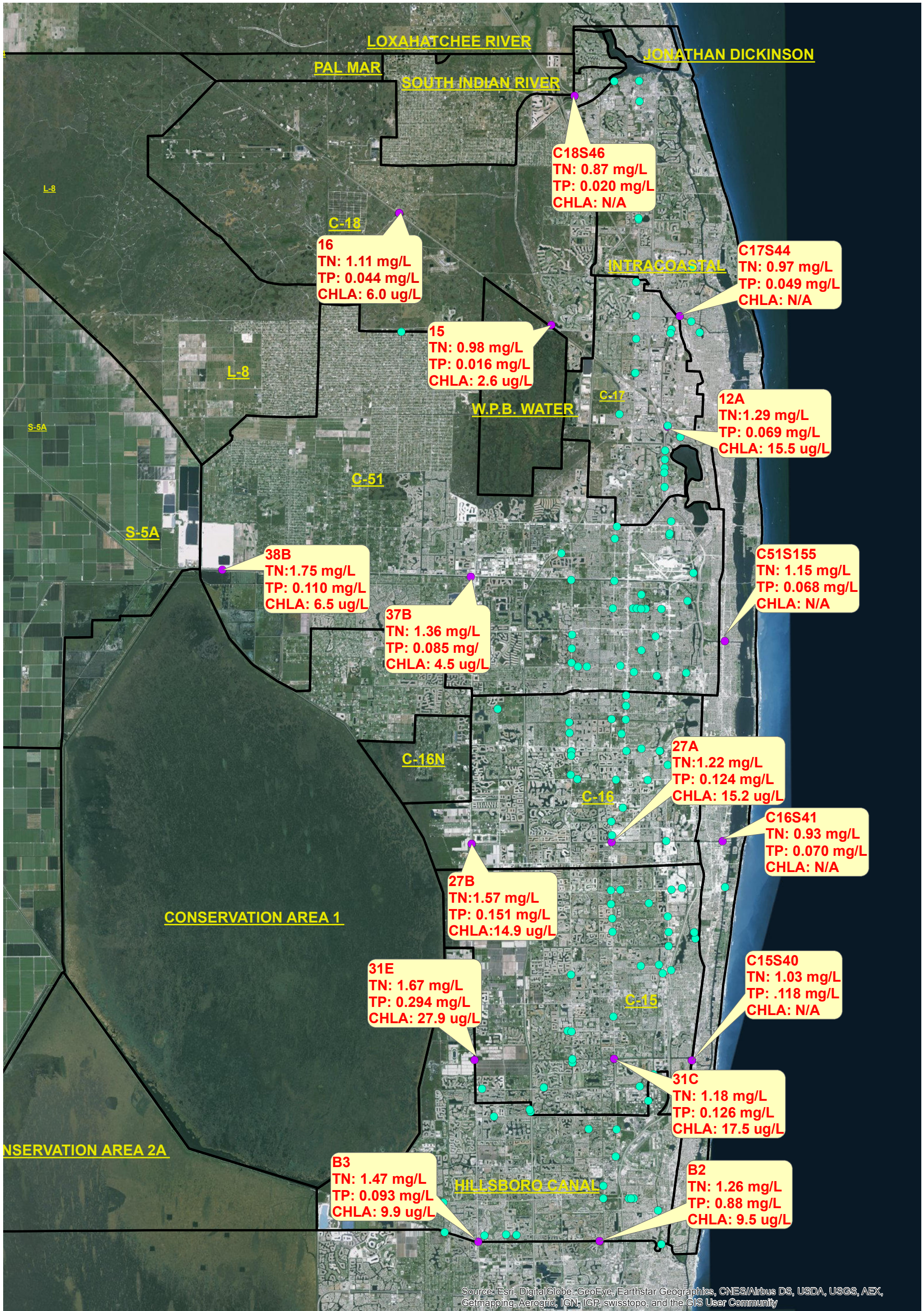
that water quality improves significantly south to north prior to discharge to tide. There are five PBC major outfalls discharging to the C-17 south of monitoring station 12A which has lesser water quality. However, a West Palm Beach canal, which receives the much of their municipal drainage west of the coastal ridge and predates stormwater treatment requirements, discharges into the C-17 Canal a quarter mile south of station 12A.

- The C-51 Basin is in east central Palm Beach County has an area of approximately 164.3 square miles. The land use is a mix of residential, commercial and agricultural. Unincorporated Palm Beach County comprises approximately 35% of the basin, with the municipalities of Wellington, Loxahatchee Groves, Royal Palm Beach, Greenacres, Haverhill, Palm Springs, Lake Clark Shores, West Palm Beach and Lake Worth comprising approximately 65%. Approximately 29 PBC major outfalls are located the C-51 Basins (west and east basins) primarily serving PBC roadways. There are three NPDES water quality monitoring stations, 38B, 37B and C51S155 in the C-51 Canal. There is a significant gradient in water quality with higher nutrient levels decreasing to lower nutrient levels from west to east, prior to discharge to tide. This gradient is an inverse relationship to the locations of PBC outfalls. The C-16 Basin is in east central Palm Beach County has an area of approximately 52.8 square miles. The land use is predominately residential with commercial and agricultural land uses as well. Unincorporated Palm Beach County comprises approximately 65% with the municipalities of Lake Worth, Lantana, Boynton Beach, Hypoluxo and Atlantis comprising approximately 35%. Approximately 27 PBC major outfalls are located the C-16 Basin serving PBC roadways. There are three NPDES water quality monitoring stations, 27B, 27A and C16S41 in the C-16 Canal. There is also a noticeable gradient in water quality, with higher nutrient levels decreasing to lower nutrient levels from west to east, prior to discharge to tide. This gradient is also an inverse relationship to the locations of PBC outfalls.
- The C-15 Basin is in southeastern Palm Beach County has an area of approximately 74.6 square miles. The land use is residential, commercial and agricultural. Unincorporated Palm Beach County comprises approximately 60% with the municipalities of Boynton Beach, Delray Beach, and Boca Raton the remaining 40%. There are three NPDES water quality monitoring stations, 31E, 31C and C15S40 in the C-15 Canal. Again, there is a noticeable gradient in water quality, higher nutrient levels to lower nutrient levels from west to east, prior to discharge to tide. This gradient is an inverse relationship to the locations of PBC outfalls.
- The Hillsboro Basin is in southeastern Palm Beach County and northeastern Broward County and has an area of approximately 102.5 square miles, 40.2 square miles of which are in Palm Beach County. The land use is predominately residential with commercial and a small portion of agricultural. There are two Broward County water quality monitoring stations, Broward 3 and Broward 2 in the Hillsboro Canal. There is a modest gradient in water quality from west to east. This gradient not particularly representative

to the locations of PBC outfalls, as the other basins. Water quality in the Hillsboro Canal is more indicative of water moving out of the Everglades Agricultural Area (EAA) than PBC major outfalls.

The water quality depicted on the enclosed map is worthy of further discussion. In the C-51, C-15 and C-16 Basins the westernmost water quality stations exhibit the poorest water quality. Total nitrogen is 1.75 mg/L, 1.57 mg/L and 1.67 mg/L, respectively. Total phosphorus is 0.110 mg/L, 0.151 mg/L and 0.294 mg/L, respectively. This is highly eutrophic water. There are no PBC outfalls in this area. The easternmost stations, after the water has moved through areas served by the majority of PBC outfalls, is much improved. Total nitrogen is 1.15 mg/L, 0.93 mg/L and 1.03 mg/L, respectively. Total phosphorus is 0.068 mg/L, 0.070 mg/L and 0.118 mg/L, respectively. Other parameters are of diminished importance. For example, heavy metals are rarely detected and when detected the concentrations do not near the water quality standards.

This PBC NPDES MS4 Assessment demonstrates that water quality is of a poor quality where no PBC outfalls are present and that water quality improves as the water moves into areas served by PBC outfalls. Clearly, the PBC outfalls are not adding to, but reducing stormwater pollutant loadings. The likely explanation is that PBC drainage systems and private drainage systems are providing stormwater treatment, via structural and nonstructural BMPs. Stormwater treatment (structural BMPs) of the first inch of runoff has been required since 1982 (Chapter 62-25 F.A.C.). The PBC drainage systems constructed prior to 1982 have been reconstructed/retrofitted to provide stormwater treatment. The Palm Beach County SWMP includes stormwater treatment systems, street sweeping, construction site inspections, public education and other BMPs. The PBC drainage systems serve primarily PBC roadways. The vast majority of residential developments in unincorporated Palm Beach County are privately owned and operated drainage systems. These drainage systems typically utilize wet detention stormwater management lakes and discharge into a 289 Drainage District canal. Palm Beach County has required planted littoral zones to enhance water quality in stormwater management lakes since 1992. Annually, the attached map will be updated to verify the Palm Beach County's SWMP effectiveness.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community