



Florida Department of Transportation Research

Evaluation of Pollution Levels Due to the Use of Consumer Fertilizers under Florida Conditions

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Many surface waters in Florida are polluted with excessive nitrogen and phosphorus. Applied as fertilizer to turf and landscape plants, excess nutrients are deposited into rivers, lakes, and other surface waters through stormwater runoff. These nutrients cause algal blooms and deplete oxygen levels. The Florida Department of Environmental Protection (FDEP) has established a program to implement Basin Management Action Plans (BMAPs) that address the reduction of pollutants in surface waters. BMAPs are designed to achieve compliance with pollutant loading limits established by the federal Total Maximum Daily Load (TMDL) regulation.

The Lower St. Johns River (LSJR) BMAP was adopted in 2008 in partnership with FDOT, local industry, cities, counties, the St. Johns River Water Management District, environmental groups, and other stakeholders. The LSJR BMAP identifies sources of nutrients that discharge both directly and indirectly into the Lower St. Johns River. It also identifies management strategies necessary to achieve nutrient TMDLs. The LSJR BMAP assigns nitrogen reduction responsibility to FDOT District 2 for nutrient loads associated with state roads and FDOT-managed stormwater treatment facilities. The plan directs FDOT to remove 18,472 pounds of nitrogen per year from stormwater runoff to meet its proportional share of the nitrogen reduction, or pay \$500,000 to \$1,000,000 per year for 20 years if unable to meet the reduction target.

In District 2, the standard practice was to apply fertilizer, at an annual rate of 500 pounds per acre, to the 15 feet adjacent to pavement edges of FDOT-maintained roads. The purpose of this practice was to ensure



Example of an algal bloom, Caloosahatchee River, June 2008

a healthy turf and prevent erosion. FDOT contracted with the University of Central Florida's Stormwater Management Academy to study how much of the nitrogen in the fertilizer was washing into surface waters. Using the results of the study, researchers determined that of the 112,020 pounds of nitrogen applied annually, 18,477 pounds wash into surface waters. This amount is slightly more than the load reduction target of 18,472 pounds identified in the LSJR BMAP. Consequently, FDOT determined that it could meet its TMDL target simply by ceasing to apply fertilizer to roadside vegetation. In addition FDOT is saving approximately \$150,000 per year in fertilizer and application costs.

The researchers hypothesize that the natural content of nitrogen in North Florida soils and the nitrogen deposition in rainfall are sufficient to accommodate discontinuation of fertilization without adversely affecting turf health. FDOT anticipates that other districts will apply the results of the Academy's research to meet nutrient reduction requirements.

FDOT Contact: Rick Renna, FDOT Office of Roadway Design
Principal Investigator: Manoj Chopra, University of Central Florida
For more information, visit <http://www.dot.state.fl.us/research-center>.