



## Surface Water Quality Assessment in Florida: The 305(b) Report and 303(d) List <sup>1</sup>

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### Introduction

The federal Clean Water Act (CWA) requires each state, including Florida, to conduct water quality assessments to determine whether its streams, lakes and estuaries are sufficiently “healthy” to meet their designated uses. This information is updated and reported every 2 years to the U.S. Environmental Protection Agency (EPA). The EPA compiles all of the state reports to prepare the biennial National Water Quality Inventory. This process is mandated by section 305(b) of the CWA, and the state reports are commonly referred to as 305(b) Reports.

In Florida, the 305(b) Report is also a primary source of information for the eventual development of the draft “Impaired Waters” list for the state. An impaired water is defined by the State of Florida (proposed Chapter 62-303 Florida Administrative Code) as a water body or water body segment that does not meet its applicable water quality standards, due in whole or in part to discharges of pollutants from point or nonpoint sources. Subsection 303(d) of the CWA requires each state to submit to the EPA a list of waters not meeting water quality standards or not supporting their designated uses. The approved list of impaired waters is also known as the 303(d)

List. Each state is required to develop total maximum daily loads (TMDL), which specify limits for the addition of pollutants responsible for water quality impairment, for all water bodies on its 303(d) List.

The current 303(d) List for Florida, which was based largely upon the 1996 305(b) Water Quality Assessment Report, was approved by the EPA in 1998. The map in Figure 1 highlights the Florida watersheds designated as “impaired”, according to the current 303(d) List. As required by EPA, Florida will submit a revised 305(b) Report and an updated 303(d) List during 2002. While the DEPs proposed rule for the Identification of Impaired Waters (Chapter 62-303) has been challenged, DEP plans to use the assessment methodologies provided in the proposed rule as the basis for both the 305(b) Report and the 303(d) List.

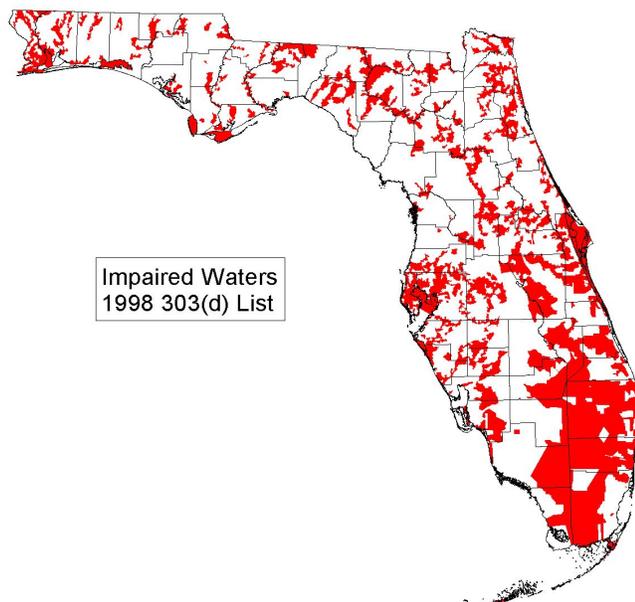
### Causes of Water Quality Degredation

The major sources of water quality impairment in Florida can be grouped into five general categories: urban stormwater, agricultural (including silviculture) runoff, domestic wastewater, industrial wastewater and hydrologic modifications.

1. This document is SL 192, one of a series of the Soil and Water Science Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Published February 2002. Visit the EDIS Web Site at <http://edis.ifas.ufl.edu>.

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## Development of the 2000 305(b) Report



**Figure 1.** Florida watersheds designated as "impaired" (shaded areas), based on the currently approved (1998) 303(d) List of impaired waters. Source: Florida Department of Environmental Protection.

Historically, water quality problems in Florida were associated primarily with domestic and industrial point sources. These are specific, identifiable (i.e., "out of the pipe") sources of pollution discharged to surface waters. Due to the development of new wastewater treatment technologies and implementation of stricter regulatory controls, point source pollution effectively has been reduced in Florida. Nonpoint sources now account for most of the water quality problems in the state. Nonpoint source (NPS) pollution is typically associated with stormwater runoff in either urban or rural areas. Surface runoff can transport significant amounts of contaminants—including sediment, nutrients, pathogens, pesticides, heavy metals, oil and grease—from multiple sources into streams, lakes, and estuaries. Because Florida is so populous and has grown so rapidly, an increasing share of the state's NPS pollution is caused by runoff from residential development and urban expansion, although agricultural activities continue to generate significant NPS pollution in many areas.

The 2000 305(b) Report for Florida was developed using a four-step approach: watershed assignment and classification, database development, data analysis, and designated use determination. A total of 5,126 watersheds were delineated within the state for the purpose of water quality evaluation; however, sufficient data were available to fully assess only 2,625 watersheds, or approximately half the total. In each watershed, the primary waterbody, typically one major- or minor-named waterbody, was identified. Each waterbody was identified as either a stream, blackwater stream, lake, estuary, or spring. Waterbody identification is important because it determines which water quality index is to be applied in the assessment.

Each waterbody in the state has a designated use, or functional classification. The five classes of surface waters in Florida and their designated uses are as follows:

- Class I: Potable water supplies
- Class II: Shellfish propagation or harvesting
- Class III: Recreation, propagation, and maintenance of a healthy, well- balanced population of fish and wildlife
- Class IV: Agricultural water supplies
- Class V: Navigation, utility, and industrial use

Standards and water quality criteria have been established for each class of waterbody under Chapter 62-302 of the Florida Administrative Code.

Three sources of data were used for the water quality assessment procedure: (1) water chemistry data from EPA's STORET (STORage and RETrieval) database, (2) biological data (aquatic macroinvertebrate population and diversity) from the FDEP Biological Database, and (3) the Department of Health's fish consumption advisory data, which documents unsafe levels of mercury in fish tissue. The water chemistry data were used to calculate a Water Quality Index (WQI) for each stream, blackwater stream, and spring, and a Trophic State

Index (TSI) for each lake and estuary. The methodology developed in (proposed) Chapter 62-303 does not use the TSI to assess estuarine waters. The WQI was determined from water clarity, dissolved oxygen, oxygen-demanding substances, nutrients, and coliform bacteria. The TSI reflects the potential for algal or aquatic weed growth, and is determined from nutrients and chlorophyll levels. Water quality data for each waterbody were also examined to determine the frequency with which the criteria for its designated use were exceeded during the preceding 5 years.

The final water quality analysis for each watershed was based on 4 assessment values:

1. WQI (for streams) or TSI (for lakes or estuaries)
2. Biological data
3. Exceeded standards for conventional pollutants (e.g., sediments, nutrients)
4. Exceeded standards for heavy metals

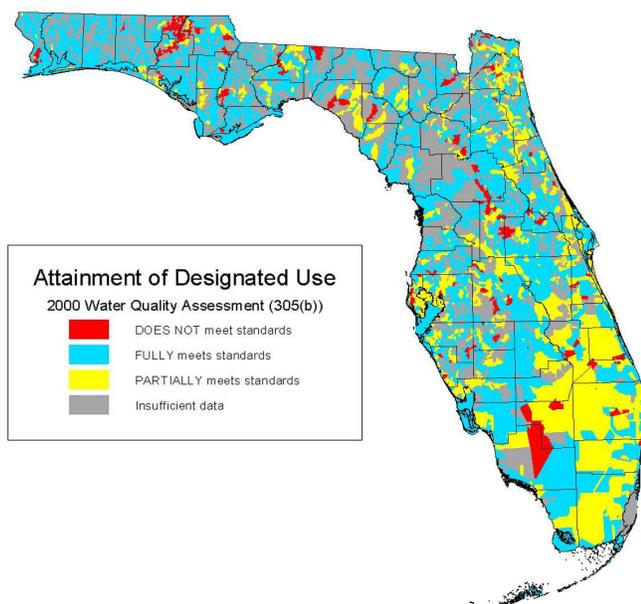
A simple averaging technique was used to derive a single, overall water quality rating. The result was a good, fair, or poor rating representing the current status for each watershed with sufficient data for assessment. In order to assign a ranking to each watershed pertaining to the degree of support for designated use, confidence levels were established for the datasets used in the calculation of the water quality rating. The final outcome of this procedure was a use designation determination falling into one of 3 categories: (1) fully meets use designations, (2) partially meets use designations or (3) does not meet use designations. The 305(b) designated use determinations have historically had indirect regulatory significance because they were the primary basis for Florida's 303(d) List of waters requiring TMDL development. However, as mentioned previously, future 305(b) assessments will be based on the new assessment methodology in Chapter 62-303, F.A.C.

## Water Quality Assessment for 2000

Figure 2 shows the use designation determinations for assessed watersheds in Florida, based on the 2000 305(b) Report. Overall, most of the watersheds were determined to have acceptable surface water quality, although a number of problem areas exist across the state. In general, most of the water quality problems were found in highly urbanized central and south Florida. Water quality in the more sparsely populated northwest and west-central sections of the state is better than in other areas. Problems are evident around the densely populated, major urban centers, including Jacksonville, Orlando, Tampa, Pensacola, and the southeastern Florida coast. Poor water quality not associated with urban areas was also found in basins with intense agricultural and industrial use.

Overall, FDEP assessed 10,158 miles of rivers and streams, 2,624 square miles of lakes, and 4,037 square miles of estuaries. Of the assessed waters, 69 percent of total river miles, 53 percent of total lake areas, and 78 percent of total estuarine areas fully supported their designated use. Another 25 percent of river miles, 42 percent of lake areas, and 20 percent of estuarine areas only partially supported their designated use.

Sufficient data were available to evaluate long-term trends (over ten years) in water quality for 945 waterbodies. Most (about 72 percent) showed no significant trends, while 20 percent improved and 8 percent worsened. The improvements generally resulted from wastewater treatment plant upgrades or new regional wastewater plants and NPS controls in Tampa, Orlando, and several other cities. Twenty waterbodies showed worsening trends caused by both point and nonpoint sources. Of 321 lakes assessed, 20 percent showed an improving trend, 22 percent showed a declining trend, and 58 percent remained the same. Water quality declines were generally attributed to NPS pollution, while water quality improvements were commonly associated with elimination of wastewater discharges.



**Figure 2.** Surface water quality assessment (by watershed) for Florida, based on the most recent (2000) 305(b) Report. Source: Florida Department of Environmental Protection.

## Status of the 305(b) Report and 303(d) List

The 305(b) Report for Florida can be considered a “work in progress,” not only because of changes in water quality status for many of the state's waterbodies, but also due to refinements in many phases of the water quality assessment process, including sampling and monitoring techniques and data analysis, and to the increased availability of reliable data. Consequently, there is some discrepancy between the current 303(d) Impaired Waters List (Figure 1), which is based on the 1996 305(b) Report, and the current 305(b) List with respect to water quality impairment for some of the state's watersheds. As stated earlier, Florida's 303(d) List will be revised and re-submitted to EPA during 2002. This list will be based on the 2002 305(b) Report, and as such will reflect many of the changes made since the 1996 report, although “delisting” of waterbodies from the 303(d) List will require formal

approval from EPA. Updated protocols for water quality assessment are contained in the revised draft of the Impaired Waters Rule for Florida (Chapter 62-303 of the Florida Administrative Code). These will be used in the development of Florida's revised Water Quality Assessment (305(b)) Report to be submitted to EPA during the second quarter of 2002.

## References

Information used to prepare this document was compiled from electronically-published material from the Florida Department of Environmental Protection and the U.S. Environmental Protection Agency. More information can be found at the following EPA and FDEP web sites:

<http://www.dep.state.fl.us/water/tmdl/index.htm>

<http://www.dep.state.fl.us/water/watersheds/index.htm>

<http://www.epa.gov/OWOW/TMDL/>