

# CLEANING UP FLORIDA'S WATER

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## The Case for a Stronger Impaired Waters Rule



**Florida PIRG Education Fund**

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Brad Heavner, Florida PIRG Policy Analyst  
Marisa Visel, Florida PIRG Clean Water Associate  
Tony Dutzik, Florida PIRG Policy Analyst

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Florida PIRG Education Fund  
704 West Madison  
Tallahassee, FL 32304

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# EXECUTIVE SUMMARY

The Florida Department of Environmental Protection (DEP) has proposed a rule for implementation of the Total Maximum Daily Load (TMDL) provision of the Clean Water Act that would fail to address the contamination of many polluted waterways. The purpose of the “Impaired Waters Rule” is to identify all waterways that are contaminated and prioritize them for the development of cleanup programs. As proposed, however, many polluted waterways would be excluded from the list of impaired waters.

This report explores some of the proposed rule’s shortcomings:

**When data is limited, waterways with detections of contaminants at high levels are assumed to be clean until further testing is done.**

To be included on the list of impaired waters, assessments of contamination must be based on at least twenty tests within the previous five years. While it is certainly preferable to have this much data, the DEP cannot feasibly do this much testing for all relevant waterways.

Looking at thirteen common contaminants, only 33% of assessments (measurements of one contaminant in one water segment) currently have twenty or more tests over the past five years. To bring the other 67% up to twenty tests each, the DEP would need to conduct 192,000 new tests, six times the total amount of testing performed in the past three years.

**Some data is watered down by seasonal variety requirements.**

The proposed rule requires that assessments of nutrient over-enrichment contain data from all four seasons and assessments of all other contaminants

contain data from at least three seasons, and that impairment is determined by annual averages or annual exceedance rates. Since some contaminants are present at more dangerous concentrations in the summer than the winter, requiring tests in the winter dilutes evidence of problems that cause harm primarily in the summer.

- 35% of dissolved oxygen tests conducted in the summer from 1999-2001 violated standards, compared to only 7% of those conducted in the winter.
- 755 waterways were out of compliance for dissolved oxygen in at least one year from 1999-2001 when counting only samples taken in the spring and summer, but not when counting tests from throughout the year.
- Since 1996, 135 water segments have had average chlorophyll-a levels higher than standards when considering only tests in the spring and summer, but below standards when considering the annual average.

**Not all data is considered.**

The proposed rule would limit the DEP to using a U.S. EPA national water quality database as a nearly exclusive data source. While the DEP itself can effectively use this database to store data from its own testing, it cannot guarantee that other agencies will do the same. The U.S. Geological Survey, the Florida Department of Agriculture and Consumer Services, the Florida Department of Health, cities and counties, and drinking water suppliers all collect data that would be useful to the DEP in its assessments of water impairment. The DEP should be

required to consider all available data, including data obtained directly from these agencies.

The proposed rule also excludes data related to permit violations, contaminant spills, mixing zones, and discharges due to upsets or bypasses from permitted facilities. Water bodies impaired because of facilities violating permits and not brought into compliance would continue to deteriorate if they are not listed because such data is excluded from the DEP's analysis.

### **Many waterways burdened by excessive nutrients would not be cleaned up.**

The proposed rule provides insufficient guidance for the use of visually observed characteristics of nutrient pollution such as algal blooms and changes in vegetation. The rule contains only one highly specific condition under which polluted waterways must be placed on the list of impaired waters based on narrative data.

As explained above, the rule would also dilute evidence of contamination by requiring nutrient levels to be measured as annual averages with data from all four seasons.

### **The bar is too high to consider swimming areas polluted.**

The proposed rule requires the DEP to list swimming areas as impaired only if local health agencies issued at least 21 days of health advisories per year. Due to limited testing and delays in follow-up testing, few beaches have this many advisories, even when bacteria levels in the water regularly exceed health standards.

- The water at 121 Florida beaches tested above health standards at least once in 2000-2001, but no advisories were issued at 79 of these beaches (65%).

- Water tested above acceptable bacteria levels in more than 10% of tests at 17 beaches in 2000. At only two of those beaches were enough advisories issued to include the waterway on the list of impaired waters.

### **Most mercury contamination would be ignored.**

The proposed rule allows the DEP to consider fish consumption advisories only if they are based on data from the past seven years. Most fish consumption advisories are based on mercury testing that is more than seven years old. The Department of Health has determined that further testing is not needed because there is no reason to believe that mercury conditions have improved.

- Most of the 102 waterways on the 1998 list of impaired waters for mercury contamination would be removed from the list.
- The DEP has tested only five waterways in the entire state for mercury in the past three years.

The rule further limits the DEP to considering only mercury tests that were performed with a testing method that is so antiseptic and expensive that no commercial laboratory in Florida is certified to process the test.

### **All shellfish contamination would be ignored.**

The proposed rule contains a provision to place shellfish harvesting areas on a planning list for further study if the Department of Agriculture and Consumer Affairs establishes new harvesting restrictions, but no provision for the waterway ever to be placed on the list of impaired waters due to shellfish contamination. None of the 66 shellfish harvesting areas that have been closed at least once since

1995 would be listed as impaired based on shellfish testing.

**No cleanup program would be developed when unenforceable promises are made to address contamination.**

The proposed rule contains a provision that would prevent the DEP from including a waterway on the list of impaired waters if a pollution control program is proposed or in place that is expected to show progress toward meeting water quality goals in the future. This provision allows for the exclusion of polluted waterways from the list of impaired waters with no guarantee that they will be cleaned up and no mechanism for enforcement if they are not. Impaired waterways should be listed as impaired until they are no longer impaired.

### **Policy Recommendations**

Florida's proposed Impaired Waters Rule contains so many shortcomings and loopholes that the Department of Environmental Protection should construct a new rule from a fresh start. In so doing, the

DEP should incorporate the following structure and principles:

- Do not create a two-step process with an initial “planning list” of waterways for further study and a “verified list” of impaired waters. When waterways violate clear criteria, they should be placed on the list of impaired waters.
- Make significant changes in the data analysis guidelines to produce a precautionary mentality of listing a waterway when data suggests that it is impaired, rather than a hesitant mentality of doing nothing until it is absolutely certain that a waterway is excessively contaminated.
- Make clear improvements to the guidelines for listing waterways for impairment by nutrients and mercury, for listing swimming areas, and for listing waterways based on fish and shellfish advisories, as detailed below.
- Do not exempt waterways from the Impaired Waters List when pollution control programs are proposed or in place. Continue to list contaminated waterways as impaired until they are not impaired.

# INTRODUCTION: CLEAN WATER FOR A HEALTHY ECONOMY

Florida needs clean water.

Eleven million people visit our parks and recreational areas every year. The tourism industry brings in \$32 billion a year, and tourists spend \$48 billion once they get here.<sup>1</sup> Much of this activity centers around our beautiful beaches, rivers, and lakes.

Many Floridians spend their free time boating. Florida has the third highest number of boat registrations in the U.S. per year. We spend over a billion dollars on boat equipment each year. Marinas, boat yards, and boat manufacturers bring in \$3.5 billion per year.<sup>2</sup>

Florida also bills itself as the “Fishing Capital of the World.”<sup>3</sup> Commercial fishing is a \$7 billion industry.<sup>4</sup> Fishing employs 75,000 Floridians.<sup>5</sup>

Due to degraded water quality, these pillars of the state economy are already starting to fall into decline.

Under pressure from the industries that created this pollution, the Department of Environmental Protection has proposed regulations for implementation of the Clean Water Act that would allow this decline to continue.

These regulations have not been without controversy. When they were first proposed after having been long in the making, the U.S. EPA considered them far too lenient. A coalition of environmental groups — Florida PIRG included — took the matter to the courts. Since then, new leadership at the EPA has changed the agency’s tone and is no longer aiming to block the rule from going into effect as proposed. The lawsuit continues.

It has been clear from the start that many waterways known to be polluted would not be classified as such due to the proposed rule’s many restrictions. Florida’s Impaired Waters List would shrink dramatically, and many contamination problems would thus not be addressed.

Paper mills, electric utilities, phosphate miners, chemical companies, sewage plants, agribusiness, and other dirty industries would largely be able to continue business as usual under these regulations. Developers would be able to continue to pave more land and grow beyond the limits of urban infrastructure. All at the expense of cleaner industries.

The Clean Water Act sees none of this friction between competing industries. It is written to protect water quality, pure and simple. It established strict requirements for the regulation of water quality. But it requires implementation, and Florida’s efforts to take that step fail to comply with the legal requirements of the act.

For both of these reasons — maintaining a healthy economy and fulfilling plain legal obligations — the Florida DEP should go back to the drawing board and develop an Impaired Waters Rule that protects the health of Floridians and the strength of industries that depend on clean water. The outcome of these regulations will play a major role in determining which way Florida is going to grow — toward a healthy environment supporting clean industries or toward polluting industries and overdevelopment.



# THE CLEAN WATER ACT TMDL PROVISION

## History

When Congress originally crafted the 1972 Clean Water Act, it recognized that limiting pollution releases from factories, sewage treatment plants and other “point sources” might not be enough to restore the health of America’s waterways. To ensure that all pollution problems affecting waterways would be identified and addressed, Congress enacted Section 303(d) of the Clean Water Act, which required states to identify waterways that fail to meet water quality standards and create plans that would enable those waterways to support their traditional uses.

The centerpiece of Section 303(d) was a requirement that states establish a “pollution budget” – or total maximum daily load (TMDL) of pollutants – for each impaired waterway. Once such a budget was established, water pollution permit limits could be set that ensured that the designated daily load was not exceeded.

For more than a decade, however, Section 303(d) was all but ignored by EPA and the states. During the 1970s and 1980s, EPA and the states focused their limited resources on controlling point-source emissions of pollutants – a strategy that led to significant improvements in the quality of many rivers, streams, and lakes. But by the late 1980s, the pace of improvements began to slow. Thirty years after passage of the Clean Water Act, approximately 40 percent of America’s rivers, streams, and lakes remain unsafe for fishing, swimming, or other uses.

A major reason for this failing is the problem of nonpoint-source pollution — runoff from lawns, farms, parking lots, and construction sites that degrades water quality. Section 303(d) is one of only a few regulatory tools at the EPA’s

disposal with the potential to address nonpoint-source pollution, and its abandonment was a major flaw of early pollution control activities.

Section 303(d) and the TMDL provision began to be rediscovered in the mid-1980s. In 1985 – 13 years after passage of the Clean Water Act – EPA issued its first set of rules implementing the TMDL provision of the law. Those rules were revised in 1992.

Meanwhile, citizens and environmental groups were also rediscovering Section 303(d), and losing patience with the EPA and state environmental agencies for their failure to enforce it. Beginning in the late 1980s and continuing to the present day, environmentalists have filed numerous lawsuits seeking to begin or speed up enforcement of the TMDL provision. In at least twenty states, those lawsuits have led to court orders or consent decrees that require the U.S. EPA to establish TMDLs for waterways if state agencies fail or refuse to act.

Florida is one of those states. While the state had begun listing its impaired waters in 1992, progress toward developing TMDLs for those waterways was slow. In 1998, Earthjustice Legal Defense, representing several Florida environmental groups, filed suit against the EPA claiming that the agency had failed to enforce the TMDL provision.

In 1999, a consent decree was issued that required the EPA to establish TMDLs for 712 waterways by 2012 if the state fails to act. Some of the state’s most important and imperiled waterways – such as Lake Okeechobee and the Indian River Lagoon – received priority for immediate TMDL establishment as part of the settlement.<sup>6</sup> That same year, under pressure brought to bear by the lawsuit, the Florida Legislature adopted the

Watershed Restoration Act, which established the regulatory authority for the state to issue TMDLs and required the secretary of the Florida Department of Environmental Protection (DEP) to develop criteria for listing impaired waterways.<sup>7</sup> In May 2001, the DEP adopted its Impaired Waters Rule, which has since been challenged and is now the subject of this study.

But even as Florida was considering how to implement TMDLs, debate continued at the federal level. After four years of study, the Environmental Protection Agency in 2000 adopted a revised set of rules to implement Section 303(d). But before those rules could be put into action, Congress enacted a budget “rider” that prevented the agency from spending any money for that purpose in fiscal years 2000 and 2001. In 2001, the Bush Administration postponed implementation of the rules for another eighteen months. Some environmentalists have expressed concern that the Bush administration’s action is a prelude to an attempt to weaken enforcement of the law.

But in spite of its turbulent history and unsettled future, the immediate requirements of Section 303(d) of the Clean Water Act for the state are clear. Florida must identify and list waterways that do not meet water quality standards. It must do so according to EPA rules that have been in place, with minor modifications, for the better part of two decades. It must begin to devise plans to restore those waterways to health. And it must do so quickly in order to comply with the terms of the consent decree.

## Policy

The TMDL development process takes place in four steps. States must:

1. Create a report summarizing all water quality problems.
2. List the waters that exceed or are

expected to exceed established water quality standards and are not fully suitable for the purposes for which they have traditionally been used.

3. Set detailed water pollution limits (TMDLs) for those listed waters.
4. Allocate specific portions of the limits to identified sources and develop a plan for reducing pollution from these sources so that the limits and standards will be met in the future.

Section 305(b) of the Clean Water Act requires states to submit a water quality report to the U.S. Congress every other year. This report typically does not contain much detail on individual waterways, but provides summary information on water quality conditions statewide.

Section 303(d) of the Act calls on states to glean from their 305(b) report a list of waters that do not or are not expected to meet water quality standards for their designated uses. This process involves two steps:

- Determine the predominant use of the water body. The most common designations are fishing/shellfish harvesting, drinking water, and swimming/recreation.
- Compare water quality samples to established standards. These standards can be either numeric or narrative, and have different emphases for the different designated uses. For example, a water body with a recreational use will have water quality criteria calling for a stricter limit on fecal coliform bacteria than a fishing use.

The 303(d) list, commonly referred to as the Impaired Waters List, is submitted by the states to their regional EPA office for approval. The list is updated every two years. However, the EPA decided to waive the update requirement

for the year 2000 because the agency was in the process of formulating new rules for the TMDL process. The last update was in 1998; the next is scheduled for the fall of 2002.<sup>8</sup>

The state must set TMDLs for all prioritized water segments classified as “Water Quality Limited Segments,” defined as “Any segment where it is known that water quality does not meet applicable water quality standards and/or is not expected to meet applicable water quality standards even after the application of the technology-based effluent limitations required by 301(b) and 306 of the [Clean Water Act].”<sup>9</sup>

Once the list is established, the state uses water quality sampling and models to estimate exposure levels and determines how much pollution a water body can handle and still stay within the water quality standards. This pollution level is the Total Maximum Daily Load.

TMDLs are established by finding the sum of the following criteria for each impaired water body:

- **Load Allocation** – the existing or future nonpoint sources of pollution or natural background sources.<sup>10</sup>
- **Wasteload Allocation** – existing or future point sources of pollution.<sup>11</sup>
- **Margin of Safety** – the amount allotted to account for any unknown

variables concerning the relationship between the limits being set and the water quality.<sup>12</sup>

- **Seasonal Variation** – variability of flow and other water conditions.<sup>13</sup>

Once water quality agencies establish these detailed standards, they must implement them with a plan and a timetable for reducing pollution from specific sources. The state determines the pollution levels for each pollutant discharger as part of a “Basin Management Plan.” The plan includes a timeframe for implementing water quality control measures made necessary to achieve TMDL limits and benchmarks for evaluating the success of the plan. Finally, the state renews or issues new permits for dischargers along the waterway based on the TMDLs.<sup>14</sup>

A single cycle of the TMDL process in Florida operates on a five-year timeframe, and the starting point of this cycle is staggered for the various water basins so that different basins are in different stages of the process.

The TMDL program is the only existing regulatory tool that considers pollution discharges cumulatively, setting limits for the total pollution a water body can handle and ensuring that individual permit limits do not collectively exceed that standard.

# SHORTCOMINGS IN FLORIDA'S IMPAIRED WATERS RULE

**D**etermining which waterways are contaminated by which pollutants is an essential part of cleaning up Florida's water. If a polluted waterway is not listed as impaired, the state will not develop needed clean-up programs. And if pollution problems aren't addressed, in most cases they will only worsen over time. Even if the state does not have adequate resources to undertake all needed clean-up operations immediately, polluted waterways must be identified to make sure they do not become further degraded before restoration can take place.

Florida's Impaired Waters Rule does

not offer this protection. The rule contains numerous loopholes that will result in the exclusion of many polluted waterways from the list of impaired waters. Waterways previously identified as suffering from dangerous levels of pollution will fall off the list, and contamination problems not yet identified will go unnoticed.

For nearly all types of contamination, the rule has excessive requirements for the amount of data needed to conclude that problems exist. For some types of contamination, the rule sets the bar too high on what is an unacceptable level of pollution.

## Data Sufficiency Requirements

In an ideal world of infinite monitoring resources, all water quality management decisions would be based on an abundance of data collected under varying conditions over a long time period. In the real world, however, resources are limited and decisions must be based on available data. When the existing data shows clear evidence of contamination, water quality managers should assume that a problem exists unless and until further testing proves otherwise.

Florida's Impaired Waters Rule does the opposite. When the amount of testing in a particular area for a particular contaminant does not meet data sufficiency requirements, the rule requires managers to conclude that no problem exists until more data is gathered, even if

all the data that does exist indicates a severe problem.

Inclusion on the list of impaired waters should be dependent on the percentage of tests that exceed standards without requiring a minimum number of exceedances. DEP should set requirements for minimum amounts of testing in a separate water monitoring rule. Inclusion on the Impaired Waters List should be based on the best available data, even when that data is not as extensive as monitoring regulations require.

In the ensuing prioritization of water bodies for TMDL development, those that have not been extensively tested can be given a lower priority. Deprioritizing a problem by excluding it from the list of impaired waters is not appropriate.

Failing to list waterways until a minimum amount of testing is performed provides a disincentive for testing, since in many cases more testing would likely lead to a documentation of problems that will then need to be addressed with limited resources. Listing waterways as impaired based on limited data would provide an incentive to do more testing.

### Data Quantity

Florida's Impaired Waters Rule has several requirements specifying that the DEP must base its decisions on minimum amounts of data collected within limited time frames. These requirements inhibit the DEP's ability to list impaired waters accurately.

*A water body must have a minimum of twenty samples.*

While twenty tests certainly provides a clearer picture than five or ten, the state simply does not have the resources to conduct this amount of testing for all rel-

**Table 1. Number of Assessments Meeting the Data Quantity Minimum**

Number of tests	Assessments	Pct. of Assessments
1-9	10,179	48%
10-19	4,042	19%
20+	7,156	33%

evant contaminants in all waterways. 6,446 water segments were tested for 13 contaminants covered in the 1998 Impaired Waters List.<sup>15</sup> Since not every water segment was tested for each contaminant, the total number of assessments — tests for one contaminant in one water segment — was 21,377. Only a third of these assessments contain twenty or more tests since 1996. Nearly half of them

## Terminology

*Assessment* as used in this report refers to analysis of one contaminant in one waterway. Since most waterways are tested for a variety of contaminants, waterways can have multiple assessments. Hence, saying that 100 assessments were out of compliance does not mean that 100 waterways were out of compliance, as some of those assessments may be for different contaminants in one water segment.

Assessments typically contain multiple *samples* or *tests* — the individual vials of water collected at a waterway or analysis of that water — taken over the span of months or years.

*Waterways* and *water segments* are used interchangeably. Most rivers, lakes, and estuaries have more than segment.

contain less than ten tests.

If additional testing were to be done for each of the assessments that currently have less than twenty tests, an additional 192,000 tests would be needed. This is six times the amount of testing conducted for these contaminants from 1999 through September 2001.

By requiring a minimum data quantity for waterways to move from the planning list to the verified list without any guarantee that additional testing will be done, polluted waterways listed on the planning list could remain there indefinitely, never making it to the veri-

fied list. Consequently, these waters would never be cleaned up.

*Impairment based on the exceedance of water quality standards can only use 5 - 7.5 years of data. Fish consumption advisories must be based on data from the past seven years.*

Assessments must exceed standards based on five years of data to be included on a preliminary list for further consideration (“the planning list”). If there are less than twenty tests, the proposed rule states that waters shall undergo further testing to reach a minimum sample size of twenty samples. This new data can be considered along with the five years of data, as long as the time period for all tests combined does not exceed 7.5 years.

Some water quality problems are known to be ongoing based on data more than 7.5 years old. Just because waterways have not been tested more recently does not mean that the problem has gone away. DEP should exclude older data only when newer data is available.

*Data indicating concentrations of pollution much higher than expected (“outliers”) identified through “statistical procedures” will be excluded.*

An outlier can be an indication of a spike in pollution. This poorly defined provision would allow for the exclusion of detections at high concentrations due to actual spikes in pollution. This should be better defined to assure that only data that is clearly erroneous is excluded.

Other data quantity requirements are covered below, including:

- *A seasonal variety requirement.*
- *Swimming areas will only be listed based on health advisories if those advisories are in effect for at least 21 days.*

**Table 2. Tests Needed to Satisfy Twenty Tests per Assessment Minimum**

Number of Tests	Assessments	Additional Tests Needed per Assessment	Total Tests Needed
1	3,022	19	57,418
2	1,681	18	30,258
3	1,120	17	19,040
4	792	16	12,672
5	785	15	11,775
6	915	14	12,810
7	708	13	9,204
8	677	12	8,124
9	479	11	5,269
10	858	10	8,580
11	502	9	4,518
12	695	8	5,560
13	217	7	1,519
14	270	6	1,620
15	226	5	1,130
16	255	4	1,020
17	308	3	924
18	430	2	860
19	281	1	281
<b>TOTAL</b>			<b>192,582</b>

### Seasonal Variety

Florida’s Impaired Waters Rule requires that no data be considered unless it includes samples collected in four out of four seasons for nutrients and three out of four seasons for all other contaminants.

As with the minimum data quantity requirements, it is in most cases beneficial to have a wealth of data collected under diverse conditions, but the lack of such diversity should not preclude judgment based on the data that does exist. Many waterways are known to be contaminated based on testing from one or two seasons. The Impaired Waters Rule

would discard this data and conclude that a waterway is not contaminated, even if all existing monitoring records indicate contamination at dangerous levels.

From 1999-2001, 1,078 assessments exceeded standards for metals at least once. Of these, 340 (32%) were only tested in one or two seasons.

In addition, the proposed rule requires the DEP to use annual average concentrations and five-year exceedance rates to determine impairment. For contaminants that are more likely to appear in higher concentrations in certain seasons, requiring an average of data from different seasons serves to water down evidence of problems that consistently occur in one or two seasons each year.

Low levels of oxygen in the water, for example, are more of a problem in the spring and summer than in the winter and

fall. 35% of dissolved oxygen tests in the summer from 1999-2001 were out of compliance, while only 7% of those in the winter were out of compliance. By requiring tests in at least three seasons, the rule is weakening the results of spring and summer testing. Exceedance rates may be within acceptable levels while many fish do not survive the summer months when oxygen levels in the water are low.

When counting only samples taken in the spring and summer, 3,928 waterways were out of compliance for dissolved oxygen in at least one year from 1999-2001. When counting tests from throughout the year, 3,173 were out of compliance. Hence, 755 waterways that had dangerously low levels of dissolved oxygen for half of the year would not be listed as impaired.

## Tampa Bay

Tampa Bay is Florida's largest open-water estuary, covering 400 square miles. One-sixth of the endangered manatees on the state's Gulf Coast find winter refuge in the warm-water outfalls of power plants bordering the bay. More than 500 dolphins live in the bay year-round, joining more than 200 species of fish and the state's largest and most diverse colonies of wading and shorebirds. Mangrove islands in the bay contain some of the most diverse and productive nesting colonies in North America, supporting approximately 40,000 nesting pairs of 25 bird species each season.



*Photo: Tampa Bay Estuary Program*

Over the years, Tampa Bay has also supported a thriving commercial fishing industry. However, between 1964 and 1990, commercial finfish harvests at Tampa Bay ports declined nearly 38 percent. The entire bay is off limits to commercial shellfish harvesting, and there are bans on the harvesting of several fish species from the bay.<sup>19</sup>

Tampa Bay is perhaps the waterway most impacted by low oxygen levels. But sections of the bay that show regular evidence of low oxygen would not be listed as impaired due to the Impaired Waters Rule's seasonal variety requirement.

Nine testing stations within Tampa Bay were out of compliance with dissolved oxygen standards when looking only at spring and summer tests but were within standards when considering tests from throughout the year. 43 out of 186 tests at these stations violated standards in the spring and summer, while only 4 out of 171 tests in the fall and winter violated standards.

Similarly, levels of chlorophyll-a, the rule's primary measure of nutrient over-enrichment, are typically higher in spring and summer than in winter. Algal blooms that kill fish in the summer may be ignored when water quality managers are only considering average annual levels. (See full analysis on page 23.)

### Confidence Levels

For a waterway to be listed as impaired for each contaminant, Florida's Impaired Waters Rule requires that standards are exceeded in 10% of samples with a 90% confidence level using binomial distribution. In other words, the state wants to be 90% confident that the contaminant would exceed its standard in the waterway at least 10% of the time if testing were to be constantly ongoing. When few tests have been done, as many as 26% of them must be exceedances to be certain that the waterway would always be out of compliance at least 10% of the time. Only after hundreds of tests are performed does the actual exceedance rate approach 10%.

Very few assessments have had testing frequencies numbering over 100 tests in the past five years. As noted above, most assessments don't have enough tests to be considered for impairment no matter what the exceedance rate. For qualified assessments (those with at least twenty tests), 23% have 25 or fewer, and thus need an exceedance rate of 20% to 26% to be considered impaired. 63% of all qualified assessments have forty or fewer tests, and thus need exceedance rates of 18% to 26% to be considered impaired. Hence, for most assessments, the ten percent standard for considering a water body impaired is not really ten percent; it is 18% to 26%.

The confidence level is thus another way that the rule provides a disincentive for testing. If the exceedance rate in an assessment is consistently 15%, water quality managers will have to test the waterway 64 times before it is determined

**Table 3. Number of Assessments by Testing Amount**

Number of Tests	Exceedance Rate for Listing	Assessments	Pct. of Qualified Assessments
1-19	n/a	14,221	n/a
20-25	20%-26%	1,644	23%
26-32	19%-23%	1,568	22%
33-40	18%-21%	1,257	18%
41-47	17%-20%	506	7%
48-63	16%-18%	913	13%
64-96	15%-17%	798	11%
97-147	14%-15%	319	4%
148-288	13%-14%	117	2%
289-500	12%-13%	14	0.2%
501+	not specified	20	0.3%

## Oxygen Depletion

One of the problems that would be ignored most often by the seasonal variety requirement is low oxygen levels.

Low levels of dissolved oxygen in waterways can lead to fish kills. Without sufficient oxygen, fish show signs of stress and can suffocate. Oxygen depletion is frequently the result of algae die-offs that are part of the nutrient-fueled eutrophication process, but can also be exacerbated by the decay of plant and animal matter washed into waterways following heavy rains. Weather conditions, particularly the high temperatures and overcast conditions common during summer months, can further reduce oxygen levels.<sup>16</sup> South Florida receives between 150 and 200 reports of fish kills each year.<sup>17</sup>

Low levels of dissolved oxygen in drinking water can also be indicative of poor water quality and can lead to increased corrosion of metal pipes and to color and odor problems.<sup>18</sup>



## The St. Johns River

At 310 miles, the St. Johns River is Florida's longest river and one of its most unusual. The river's drop of only 30 feet from its headwaters to the sea makes it one of the "laziest" rivers in the world. It is also one of the few rivers in the United States that flows north. In periods of low water, tides may cause a reverse flow of the river as far as 160 miles upstream. Its slow-moving quality also contributes to its brownish color – caused by the release of tannic acid from trees along its banks – and makes it extremely difficult for the river to flush pollutants. Wildlife is abundant in and around the river, which provides a home to alligators, large-mouth bass, blue herons, bald eagles, and numerous other species.<sup>20</sup>

Nineteen water segments in Duval County that drain into the upper St. Johns River were out of compliance with dissolved oxygen standards when looking only at spring and summer tests but were within standards when considering tests from throughout the year. 51 out of 177 tests at these stations were below standards in the spring and summer, while only 2 out of 172 tests in the fall and winter were below standards.

There are also 254 assessments along the St. Johns River that have less than twenty tests in the past five years. This includes detections of metals above health standards at many points on the river, as well as nutrients at alarming concentrations and oxygen at dangerously low levels. None of these segments would be listed as impaired for these contaminants under the proposed Impaired Waters Rule due to its data quantity minimum requirement.



*photo credit: St. Johns River Water Management District*

to be impaired, an unusually high amount of testing. With limited resources, it is doubtful that the DEP will go so far to prove that a problem exists in every such case.

A better system would base all decisions on a flat 10% exceedance rate. This would be more effective at identifying all polluted waterways, and would provide an incentive for further testing. In such a system, if an assessment were to have an exceedance rate of 10% with only twenty tests performed, the department would more likely want to conduct further testing to ensure that standards are consistently exceeded in at least 10% of all tests.

Furthermore, the rule should contain provisions for the DEP to consider the severity of exceedances, the past history of exceedances, and the nature of the pollutant. If a waterway is contaminated by a pollutant in 8% of tests, but all of those exceedances are at severe levels, water quality managers should have the flexibility to make the determination that the waterway is impaired by that pollutant. Similarly, if a pollutant is particularly hazardous, like a carcinogen in a drinking water supply, the DEP should set the waterway on the course for TMDL development even if there are less than twenty tests for the pollutant at the time of evaluation.

## Data Retrieval

The rule only requires the DEP to use data obtained through the EPA's national STORET (Storage and Retrieval) database. Although STORET will become a very useful tool, the database was not maintained well until 1998. EPA itself cautions against using pre-1998 data from STORET. The DEP should therefore obtain data from the past ten years directly from other agencies in Florida.

In addition, the DEP will never be able to guarantee that other agencies are uploading their data to STORET. The rule allows the DEP to "consider" data that other agencies actively submit to it. But

since those agencies are not directly involved in the impaired waters listing process, they are not likely to build this transfer of data into their own plans. The DEP should be required to seek and obtain data directly from other agencies.

Some agencies regularly conducting water quality testing do not upload their data to STORET. The DEP should obtain and analyze all of this data for its determinations of impaired waters.

- The U.S. Geological Survey (USGS) has tested many Florida waterways as part of the National Water Quality Assessment. This data is particularly valuable as USGS uses sophisticated equipment that can accurately detect contaminants at trace levels.
- Drinking water suppliers test for contamination in their source waters. This is a large amount of data that would fill in many gaps for the DEP.
- The Florida Department of Agriculture and Consumer Services conducts regular tests of bacteria levels in shellfish harvesting areas.
- Cities and counties conduct water quality tests for specific projects and problems.

The DEP does not even send all of its own data to STORET. At present, the agency does not upload biological testing data to the database. This important information could therefore be excluded from the impaired waters listing analysis.

## Data from Spills and Bypasses

The TMDL provision of the Clean Water Act is commonly known as a way to control excessive runoff pollution, since runoff cannot be controlled by the permitting system set up for point-source discharges. But TMDLs achieve this by measuring maximum loads from point and nonpoint-sources combined.

Florida's Impaired Waters Rule would undermine this function by ignoring many point-source discharges.

The rule excludes data that is the result of permit violations, contaminant spills, or discharges due to upsets or bypasses from permitted facilities, and it prohibits the use of data collected in mixing zones downstream from effluent discharge points. Water bodies impaired because of facilities violating permits and not brought into compliance would continue to deteriorate if they are not listed because such data is excluded from the DEP's analysis.

Florida has a long history of lax permit

enforcement. Florida ranks 6<sup>th</sup> in the nation for the number of major industrial facilities in significant non-compliance of their permits and 10<sup>th</sup> in the nation for the number of major municipal facilities in significant non-compliance of their permits.<sup>21</sup>

Even if DEP were to issue more enforcement actions, the most common action is civil penalties, which do nothing to eliminate contamination that has already occurred. Bypasses may also be authorized under a permit. In concert with other discharges, a single bypass or spill can cause significant long-term impairment.

## Polluted Swimming Areas

Florida beaches are famous for their beauty. Whether you like to swim, surf, or just take the kids out to splash around, our ability to head to the beach is one of the greatest things about living in Florida. We should be able to enjoy our water recreation without the risk of getting sick from it.

### Health Risk

Swimming in waters contaminated by human or animal wastes can lead to severe health problems. Gastroenteritis, hepatitis, respiratory illnesses, and ear, nose, and throat problems can result from viral or bacterial infections caused by exposure to contaminated water. The threat can be particularly acute for children, the elderly, and those with weakened immune systems. Toxic algal blooms, such as red tides, have also been associated with skin, respiratory, and neurological ailments in humans.<sup>22</sup>

In 1997-98, a total of eighteen states including Florida reported 32 disease outbreaks resulting from contact with contaminated recreational water, causing illness in approximately 2,100 people.<sup>23</sup>

### The Loophole

Florida's Impaired Waters Rule stipulates that aquatic recreation areas will be listed as impaired if health warnings or advisories have been issued for a total of at least 21 days during a calendar year. This standard sets the bar far too high, especially considering that the process it depends on consistently understates problems.

In June 2000, Florida legislation created a statewide beach water quality monitoring program. Since then, local health agencies have been testing swimming areas for bacteria – enterococcus and coliform – that are indicators of the presence of pathogens and other bacteria.

The Florida Department of Health (DOH) encourages these agencies to issue health advisories when problems are repeatedly evident and requires them to submit the results to a central database.

The biggest shortcoming in the program is that local health agencies do not monitor beach water quality frequently enough, and the need to verify results leads to long delays in issuing advisories.

The U.S. EPA bases its health standards on a monitoring frequency of five samples every thirty days. As part of the DOH program, however, local health agencies only conduct routine tests every two weeks. In Florida, only 7% of beaches were tested at least once per week, according to a survey of water quality managers.<sup>24</sup>

Because testing normally only happens once every two weeks, contamination problems rarely become apparent as soon as they arise. The DOH also requires local agencies to conduct follow-up testing to confirm results whenever standards are exceeded. Due to this requirement and the time needed to conduct the testing, advisories are nearly always issued well after health agencies become aware of the contamination problem.

Beaches can have bacteria levels above health standards for up to thirteen days before routine testing occurs. Because it takes a day to get the results back from a lab, at least one day always passes before the problem is known. If follow-up testing is done the next day and the results are reported back the following day, two more days pass before an advisory is issued. If follow-up testing is not done immediately, the advisory will be delayed even further. If bacteria levels fall below standards at any point in this process, an advisory is never issued, as if the problem never occurred.

Water quality managers can also predict when bacteria levels will be high

based on rainfall conditions, and should issue “pre-emptive” advisories and closures when those conditions occur. However, only two counties in Florida have standards for pre-emptive closures or advisories based on heavy rainfall – Pinellas and Okaloosa.<sup>25</sup> And even if such advisories were issued in every county, the proposed rule only requires a water body to be listed as impaired if there are at least twelve weeks of pre-emptive advisories or closures. Waterways suspected of having intolerable levels of pollution for more than two months of the year could thus be considered clean.

Even when bacteria levels are above health standards, some towns do not consistently issue advisories or close beaches.<sup>26</sup> DOH recommends that local health departments issue advisories or closures when bacteria levels exceed EPA recommended standards, but the decision to issue advisories and closures rests with the local agencies.

Despite these shortcomings, it is

important to list waterways as impaired based on beach closings and advisories. Testing is conducted on a regular basis throughout the state, providing useful information. But because the shortcomings in the health advisory system lead to a consistent understatement of the problem, the DEP should make its determination of impaired waters from a much smaller number of advisories and closures. Also, the DEP should conduct its own analysis of DOH data, counting problems from when they were first detected rather than when advisories were issued.

In addition to using DOH advisories data, the DEP can use exceedances of water quality standards from its own testing and testing by other agencies as a secondary measure of impairment at swimming areas. However, water quality managers must prove that the source of pollution is a chronic, human-induced source before listing the waterway. The proposed rule specifically excludes from consideration

**Table 4. Beaches Exceeding Bacteria Standards in 10% of Tests in 2000**

County	Beach	Tests	Tests Exceeding Enterococcus Standard	Exceedance Rate	21 Days or More of Advisories
Bay	Carl Gray Park	14	3	21%	–
Broward	George English Park	11	2	18%	–
Broward	Hallandale Beach	11	2	18%	–
Charlotte	Port Charlotte Beach West	13	2	15%	–
Manatee	Palma Sola South	14	3	21%	–
Monroe	Bahia Honda Bayside	12	2	17%	–
Monroe	Bahia Honda Oceanside	12	2	17%	–
Monroe	Curry Hammock State Park	13	2	15%	–
Monroe	Higgs Beach	11	2	18%	yes
Monroe	Rest Beach	5	2	40%	yes
Nassau	South End	12	2	17%	–
Palm Beach	Dubois Park	17	5	29%	–
Pinellas	Belleair Shores Intercoastal	13	2	15%	–
Sarasota	North Jetty Beach	16	3	19%	–
Taylor	Cedar Beach	11	4	36%	–
Taylor	Dekle Beach	11	3	27%	–
Taylor	Keaton Beach	11	3	27%	–

## North Shore Beach

North Shore Park runs along the eastern boundary of the North Shore neighborhood of St. Petersburg. Large open spaces, sports facilities, and a playground draw families to the park, where they can also enjoy the beach.<sup>34</sup>

North Shore Beach had 28 days of health advisories in 2000, but because some of those advisories were issued due to suspected bacteria levels from rainfall conditions without actual water sampling, this beach would not be listed as impaired under Florida's Impaired Waters Rule. Local health officials issued 13 days of advisories due to elevated bacteria and 15 days of preemptive advisories due to heavy rainfall between June and September 2000.



*photo credit: Florida PIRG*

data based on red tides, sewer line breaks, medical wastes, and any factors not related to chronic discharges of pollutants.

This exclusion has several problems:

- Contamination from ongoing natural sources, such as animal waste, is part of the overall contamination picture. Water quality managers need to know the baseline concentration of bacteria from non-human sources in order to determine an acceptable window of additional pollution that can occur while still keeping the waterway within overall contamination limits.
- The effects from spills and other one-time or periodic sources of pollution can be long-term, and also narrow the window of tolerable pollution.
- Red tides can be the result of chronic, human-induced pollution. Data associated with red tides should therefore always be included.
- Like the data quantity minimums, this provision creates a disincentive for further study. Waterways would not be considered impaired until

after a source analysis is completed. Water quality managers will likely not be in a rush to use limited department resources to prove that even more department resources will be needed for TMDL development and cleanup efforts. While delays happen, polluted waterways will not be listed as impaired.

### Extent of the Problem

The water at 121 Florida beaches in 26 counties tested above health standards in 2000-2001. No advisories were issued at 79 of these beaches (65%), according to the DOH database.<sup>27</sup> While some of these tests may have been false positives, others are cases where follow-up testing was not done, bacteria levels had declined by the time follow-up testing was done, or local agencies chose not to issue advisories despite evidence of contamination.

Water at 17 beaches tested above acceptable bacteria levels in more than 10% of tests in 2000.<sup>28</sup> At only two of those beaches were enough advisories issued to include the waterway on the list of impaired waters according to Florida's Impaired Waters Rule.<sup>29</sup>

## Dekle Beach, Cedar Beach, and Keaton Beach

The beaches located along Taylor County's "Nature Coast" south of Perry provide a wealth of recreational opportunities. Taylor County is one of only five in Florida where scalloping is still allowed, and Keaton Beach includes a 700-foot fishing pier and public boat ramp. Swimming and snorkeling are other popular activities.<sup>30</sup>

Bacteria levels at these beaches have repeatedly violated health standards. In 2000-2001, 11 tests at Dekle Beach, 10 tests at Cedar Beach, and 6 tests at Keaton Beach exceeded acceptable levels of enterococcus, out of 32 tests at each beach. The average enterococcus level of all tests over two years was 118 colonies/100ml (Most Probable Number (MPN)) at Cedar Beach and 117 MPN at Dekle Beach, higher than the 104 MPN standard for any single test.

Although DEP's own testing is very limited, it also indicates a bacteria problem in these areas. The only coliform tests since 1999 at coastal Taylor County were eight tests on one day in the Fenholloway River. The average level detected was 206 MPN, with 25% of samples over 400 MPN. These levels exceed water quality standards.<sup>31</sup>



*photo credit: steinhatchee.com*

## Dubois Park

Located in Jupiter in Palm Beach County, the 1,200-foot beach at Dubois Park is a favorite of parents. The beach is nicknamed "Mother's Beach" because its shallow swimming lagoons are great for children to play in. The 29-acre park also affords opportunities for fishing.

Ten of 43 tests at Dubois Park exceeded enterococcus standards in 2000-2001. This exceedance rate would trigger a listing if it were from data obtained via the national STORET database, but as the DEP is not instructed to look at the data behind beach health advisories, the water at Dubois Park would probably not be listed as impaired. In 2000, Dubois Park had 15 days of health advisories, short of the 21-day threshold.<sup>32</sup>

In DEP testing, eight out of 54 fecal coliform tests (15%) near Dubois Park were above 400 MPN. This is an exceedance of water quality standards, but is below the exceedance rate required by the confidence level provision of the proposed rule.<sup>33</sup>



*photo credit: South Florida Water Management District*

## Nutrient Runoff

When used responsibly, fertilizer makes agriculture highly productive and keeps our lawns green. When used excessively, however, nutrients from fertilizer are carried away by rainfall and irrigation. In addition, ranches and animal feedlots that don't take proper precautions allow nutrient-rich manure to escape into waterways. When these nutrients build up in the water, they lead to serious problems for wildlife, ecosystem vitality, and public health.

### Ecological Risk

Nutrient over-enrichment can lead to the rapid growth of algae and aquatic weeds in streams, lakes, estuaries, and coastal waters – a process known as eutrophication. When algae die, their decomposition can deprive waterways of oxygen, leading to fish kills. Some types of algae are themselves toxic to wildlife, while outbreaks of other toxic organisms – such as the dinoflagellate *Pfiesteria piscicida* – are also linked to nutrient over-enrichment. Excess sedimentation of dead algae and other organic matter can clog water intake pipes, reduce water flow in streams, and result in foul odors and smells in drinking water.

The impact on wildlife can be profound. Lake Apopka was once one of Florida's premier bass fisheries, but its bass population was decimated by a combination of chronic algal blooms, destruction of underwater flora and sedimentation caused, at least in part, by nutrient over-enrichment.<sup>35</sup> Other Florida lakes, such as Lake Okeechobee, have also shown signs of eutrophication.

The flow of nutrients through rivers and streams also has a negative impact on wildlife in estuaries and coastal waters, leading to the death of fish and other marine life from oxygen depletion, destruction of seagrass habitat, and possible

impacts on coral reefs. At least eight Florida estuarine systems demonstrate signs of eutrophication.<sup>36</sup>

### The Loophole

Florida's Impaired Waters Rule requires the DEP to use the annual average concentration of an indicator compound almost exclusively as the measure to determine whether a waterway is impaired by excessive nutrients. For streams and estuaries, the indicator is chlorophyll-a. For lakes, it is a combination of nitrogen, phosphorus, and chlorophyll called the trophic state index (TSI).

In addition to numeric standards, the rule should contain specific guidelines for including a waterway on the Impaired Waters List based on narrative information, including an imbalance of flora and fauna. Nutrient over-enrichment can lead to diminished species diversity and richness that is clear from careful observation, but for which the nutrient levels that caused the imbalance are difficult to measure.

The rule states that narrative information “shall also be considered” in addition to the primary measures of chlorophyll levels and TSIs, but gives only one specific measure by which the narrative information would lead to listing the waterway as impaired. It stipulates that streams will be listed if “Algal mats are present in sufficient quantities to pose a nuisance or hinder reproduction of a threatened or endangered species.” The presence of algal mats should be a basis for listing if they present a threat to any species, not only endangered and threatened species. Also, there are many conditions of nutrient impairment of streams, lakes, and estuaries that can be judged by narrative criteria in addition to algal mats in streams. The rule should contain specific guidelines for all such conditions.



## Sarasota Bay

Sarasota Bay supports a multi-million dollar tourism industry, with swimming, fishing and boating among the most popular activities. But tourist and residential development



*photo credit: Chap Percival*

has also created problems as the construction of concrete seawalls, dredging of seagrass beds, and an increase in pollution have degraded the habitat of local fish populations. While the bay supports populations of clams, oysters, and crabs, all but a small portion is off-limits to commercial shellfishing due to pollution problems.

The bay also supports a wide variety of marine and bird species. More than 100 bottlenose dolphins are year-round residents of the bay, endangered West Indian manatees spend part of the year there, and sea turtles nest on

the bay's beaches. Herons, egrets, ibis, bald eagles, white and brown pelicans, and various shorebirds all reside in the bay area.<sup>39</sup>

A national survey of nutrients in estuaries by NOAA in 1999 showed Sarasota Bay to be one of the nation's estuaries most impaired by eutrophication. Although the study found only moderate impairment based on chlorophyll-a levels, it revealed dangerously high levels of epiphyte algae and toxic algal blooms, which NOAA considers equally valid indicators of eutrophication.<sup>40</sup> Since Florida's Impaired Waters Rule considers only chlorophyll levels, and the chlorophyll levels for Sarasota Bay in the STORET database are even lower than in the data for the national study, Sarasota Bay may not be included on the Impaired Waters List for nutrient impairment.

Also, suspended chlorophyll-a levels are not a valid measure to determine nutrient impairment in streams and estuaries. In lakes, which do not flush out each year, measuring the chlorophyll from suspended algae like phytoplankton provides a good measure of total algae. In streams and estuaries, suspended algae flushes out each year even if the waterway suffers from nutrient over-enrichment. However, excessive nutrients is still a problem in streams and estuaries, as it can lead to the build-up of algae attached to rocks, known as "benthic algae." Excessive benthic algae can lead to

some of the same problems as excessive phytoplankton.

Furthermore, the rule requires that a waterway have data from all four seasons to be assessed for chlorophyll-a. This will cause many problems to be unacknowledged in two ways: waterways that exceed standards in data from less than four seasons will not be assessed at all, and waterways that consistently exceed standards in the summer months but not as an annual average will be judged to be free of excessive nutrients.

2,709 water segments were tested for chlorophyll-a in 1996-2001.<sup>37</sup> 360 of

them (13%) exceeded chlorophyll-a annual average standards. Of these, 150 (42%) were not tested in all four seasons in at least one of the years in which the annual average standard was exceeded. Thus, 42% of waterways with excessive nutrients could be considered unimpaired because of the lack of data from four seasons.

Waterways suffering from nutrient over-enrichment can also go undetected by the four season provision if there is a problem in some seasons but not in others. Chlorophyll tends to be present at higher levels in warmer months. In the winter chlorophyll levels tend to be lower. Thus, taking an average of the data collected in all four seasons can be greatly misleading. Algae blooms that kill fish and vegetation in the summer may be ignored when water quality managers only consider average annual levels.

## Extent of the Problem

Since 1996, 121 water segments have had average chlorophyll-a levels higher than standards when considering only tests in the spring and summer, but below standards when considering the annual average.

109 waterways were below standards based on an annual average but in exceedance of standards based on testing only in the spring and summer for one year between 1996-98. Ten waterways had this discrepancy for two of the three years. Two waterways had this discrepancy for all three years.

Eight out of 44 U.S. estuaries identified by the National Oceanic and Atmospheric Administration (NOAA) as exhibiting persistently high eutrophic conditions are in Florida. NOAA expects eleven of the twelve Florida estuaries that are moderately or highly impaired by eutrophication to worsen by 2020.<sup>38</sup>

## Choctawhatchee Bay

Choctawhatchee Bay in the Panhandle is fed by a nearly 5,350 square mile watershed encompassing much of northwest Florida and southern Alabama. The 27-mile-long bay provides opportunities for commercial and sport fishing, boating, camping, and scenic views. Coastal areas in Okaloosa and Walton counties are increasingly becoming destinations for visitors drawn to the bay's white sand beaches.<sup>41</sup>

All three segments of Choctawhatchee Bay that were tested regularly in the spring and summer of 1999-2001 tested above acceptable levels for chlorophyll looking only at spring and summer water samples.

Five of the six measures of eutrophication in NOAA's 1999 national estuaries study were moderately or highly problematic for Choctawhatchee Bay. Epiphyte and toxic bloom data showed high impairment, and chlorophyll-a, low dissolved oxygen, and loss of submerged aquatic vegetation all showed moderate impairment. Only the macroalgae measure was within limits for the bay.<sup>42</sup> According to the STORET database, however, average chlorophyll-a levels for Choctawhatchee Bay over the past five years are well within acceptable standards.



photo credit: Florida State Archives

## Mercury-Laden Fish

The accumulation of mercury in aquatic ecosystems is a problem that has been building for a long time and is steadily worsening. Power plants and incinerators release mercury into the air, where it clings to moisture and falls to waterways with rainfall. Some of the mercury in Florida's water comes from facilities in the state, and some comes from plants far beyond its borders.

### Health Risk

Mercury from power plants, incinerators, and other sources finds its way into water largely through atmospheric deposition. Mercury is then converted by bacteria into toxic methylmercury, which accumulates in fish tissue. Methylmercury is toxic to the fetal brain and exposure in

the womb can cause learning deficiencies and delay mental development in children.<sup>43</sup> Other studies have linked a history of mercury exposure with neurological problems, heart disease, and Alzheimer's disease in adults.<sup>44</sup>

The Food and Drug Administration advises pregnant women and women considering pregnancy to eat no more than twelve ounces of seafood per week and to completely avoid larger fish species – such as shark, swordfish, and king mackerel – that accumulate greater amounts of mercury in their tissues.<sup>45</sup> A committee of the National Academy of Sciences has recently encouraged FDA to tighten that standard, and the state of Massachusetts has urged pregnant women to avoid consuming fish from any of the state's rivers and lakes.

## Lake Kissimmee

The third-largest lake in Florida, Lake Kissimmee has long offered some of the best freshwater fishing in the state, with populations of largemouth bass, crappie, chain pickerel, and bluegill. More than 200 species of birds also reside in the area around the lake, including bald eagles, snail kites, and whooping cranes.<sup>49</sup>

A health advisory is in effect for limited consumption of fish from Lake Kissimmee due to mercury contamination. As the water has not been tested since 1992, however, the lake would be removed from the list of impaired waters.



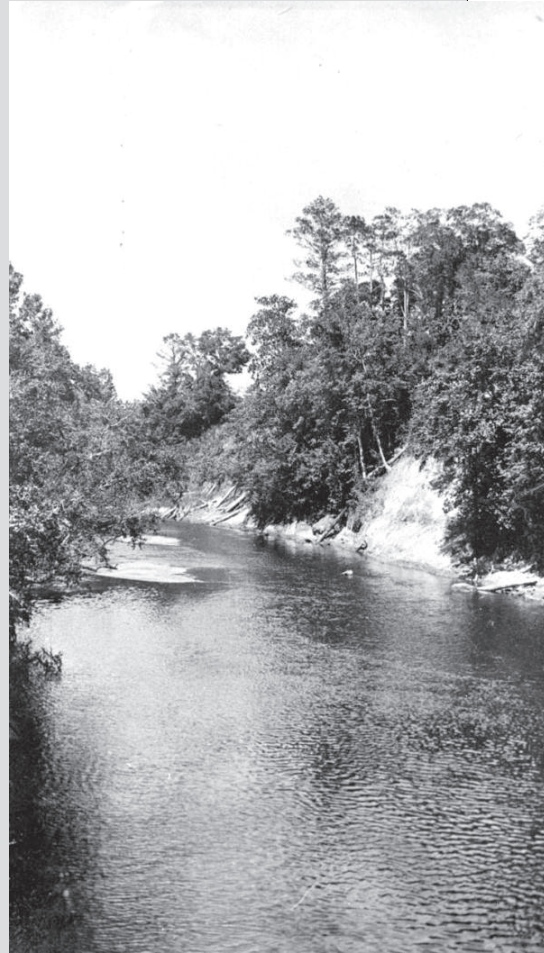
*photo credit: South Florida Water Management District*

## Ochlockonee River

The Ochlockonee River near Tallahassee is a popular spot for both canoeing and fishing, especially for visitors of the Ochlockonee River State Park. Anglers can catch both freshwater and saltwater species, including largemouth bass, perch, trout, and redfish.<sup>50</sup>

Lake Talquin, an 8,200-acre man-made reservoir created in the 1920s by the damming of the Ochlockonee River, has traditionally also been popular with anglers. However, sediment and nutrient flow into the lake has contributed to eutrophic conditions that have reduced the quality of fishing.<sup>51</sup>

The Florida Department of Health advises limited consumption of fish from the Ochlockonee River and Lake Talquin due to mercury contamination. As they have not been tested for mercury in the past seven years, however, they would be removed from the Impaired Waters List for mercury impairment.



*photo credit: Department of Environmental Protection*

## The Loophole

Aquatic life in many Florida waterways has accumulated dangerous amounts of mercury. In the early 1990s, the Florida Department of Health (DOH) tested waters throughout the state to determine which waterways were polluted at unsafe levels. They issued health warnings on eating fish from these waters, all of which are still in effect.

The DOH is no longer testing widely for mercury because they assume that the problem areas are at least as bad as they were when the last round of testing was done. Power plants and incinerators are

still continuing business as usual. The DOH has no intention of withdrawing the health warnings.

Florida's Impaired Waters Rule limits decisions on impairment from mercury to considering only data from the past seven years. This one requirement will result in the removal of nearly every mercury-contaminated waterway from the list of impaired waters.

Furthermore, the rule stipulates that the only type of mercury test water quality managers can consider uses a technology that is prohibitively expensive. No commercial laboratory in Florida is

certified to process the results of this testing method. While this is a precise test that can detect metals at very low concentrations, other technologies can accurately detect mercury at levels that are known to be harmful.

The DEP should consider the older data from the Department of Health, and should allow the consideration of the results from common mercury testing technologies.

### **Extent of the Problem**

Mercury contamination in fish is widespread in Florida's inland waterways. Approximately one million acres of the Everglades system and another million acres of freshwater in the state contain fish with elevated mercury levels.<sup>46</sup>

The 1998 Impaired Waters List contained 102 water segments due to mercury contamination. Nearly all of these would be removed from the list.

Fifty lakes, 29 rivers, 5 estuaries, 4 fish management areas, 2 national wildlife refuges, most of the Everglades, and the Gulf of Mexico all have no consumption

or limited consumption advisories in effect. Because most of these listings are based on data that is more than seven years old, very few of the waterways would make it onto the list of impaired waters. The exception is the Everglades, parts of which continue to be tested for mercury due to scientific interest in the extremely high level of mercury contamination there.

The amount of mercury testing conducted by the DEP has plummeted in recent years. Only five waterways in the entire state were sampled for mercury in 1999-2001. No sampling station on those waterways has been tested more than twice in the past three years.

Earlier mercury testing indicated significant contamination. Mercury was detected in 36% of tests from 1990-97. 28% of tests showed concentrations of mercury higher than health standards.<sup>47</sup>

As part of a nationwide water quality study, the U.S. Geological Survey (USGS) tested for mercury in fish tissue and sediment in 31 counties throughout Florida in 1992-96. In this study, 100% of mercury tests were positive.<sup>48</sup>

## Contaminated Shellfish

Florida bays are filled with delicious oysters, clams, and mussels. Floridians should be able to enjoy this bounty of the sea without fear of health damage.

### Health Risk

Contaminated shellfish can cause health problems in a variety of ways. Paralytic shellfish poisoning (PSP), amnesic shellfish poisoning (ASP), diarrhetic shellfish poisoning (DSP), and neurotoxic shellfish poisoning (NSP) are caused by the accumulation of poisons produced by toxic algae (such as those in red tides). Shellfish feed upon the algae and the toxins become concentrated in their tissue. PSP and related diseases can cause symptoms ranging from nausea and vomiting to neurological problems, respiratory paralysis, and death.<sup>52</sup>

Shellfish have also been found to harbor harmful organisms such as salmonella and campylobacter, and viruses such as the Norwalk virus and hepatitis A, which enter the water along with sewage and are stored within shellfish tissues. University of Arizona researchers found salmonella in 50 to 70 percent of the clam and oyster samples they tested from bays and rivers in Oregon and North Carolina during 2001. They found campylobacter in about 10 to 15 percent of the samples.<sup>53</sup> Salmonella, campylobacter, and the Norwalk virus are responsible for food poisoning. Cooking shellfish kills all three of the organisms. However, because oysters are frequently consumed raw, the public health threat is significant.

A 1998 study found that the harvesting of shellfish is limited in 78 percent of Florida's 1.4 million acres of classified shellfish growing waters due to concerns about contamination.<sup>54</sup> Such limitations

have an economic cost as well; a 1997 outbreak of *Pfiesteria* in Chesapeake Bay was estimated to have cost Maryland \$43 million in seafood sales revenues.<sup>55</sup>

### The Loophole

Because monitoring for all pathogens is not possible, aquaculture managers measure fecal coliform bacteria as an indicator of the presence of human pathogens. The Florida Department of Agriculture and Consumer Services (DACS) has an extensive testing program to monitor the bacteria content of waterways. When bacteria levels exceed standards, the area is closed to shellfish harvesting until bacteria levels decline.

The DEP should use the raw data collected by DACS and the advisories issued by DACS in its decisions on whether to list waterways. They propose to do neither.

If waterways fail to meet bacteriological water quality standards for shellfish support, they will be placed on the state's planning list for further study. But Florida's Impaired Waters Rule contains no provision for the waterway to be moved to the Impaired Waters List if contamination is verified. There is therefore no mechanism whatsoever for waterways to be listed for failure to meet shellfish standards.

### Extent of the Problem

Sixty-six shellfish harvesting areas have been closed due to high bacteria levels at least once since 1995. Forty of them have been closed for an average of at least thirty days per year.<sup>56</sup> None of these waterways would be put on the list of impaired waters under the current Impaired Waters Rule.

## Indian River Lagoon

The 156-mile-long Indian River Lagoon is the most ecologically diverse estuary in North America, hosting more than 2,200 species of animals and 2,100 species of plants. Its location in a transition area between temperate and tropical zones contributes to this diversity of life. Nearly one-third of the nation's manatee population lives in the lagoon or migrates through it seasonally. The lagoon serves as a spawning and nursery ground for many species of fish and shellfish, and its ocean beaches provide one of the densest sea turtle nesting areas in the Western Hemisphere.

The lagoon is also one of Florida's primary visitor attractions and a major engine of the local economy. It is the most popular fishing destination in Florida, luring more than one million anglers to the region annually, and generates \$300 million annually in fisheries revenues. Along with nearby coastal waters, the lagoon accounts for half of Florida's Atlantic Coast fish catch, and 15 percent of the nation's clam harvest. The lagoon contains five state parks, four federal wildlife refuges, and a national seashore.

The ecological importance of the Indian River Lagoon extends far beyond its barrier islands. Many of the commercially valuable fish species of the South Atlantic region depend on the health of the lagoon for their survival. The North Atlantic right whale uses the lagoon and other nearby coastal areas in Florida and Georgia as its exclusive calving habitat. Several

types of animals – such as the Atlantic salt marsh snake and some subspecies of the Florida scrub jay – can only be found in the lagoon and its surrounding area.<sup>57</sup>

There is currently a health advisory for mercury contamination of Indian River Lagoon, advising people to eat limited quantities of fish from the lagoon. Children and women of child bearing age are especially advised to limit their consumption of this fish.

The Indian River Lagoon is also an area of

frequent shellfish harvesting closures. Five areas of the lagoon have had closures every year for the past seven years. One part of the lagoon has had 675 days of closures since 1995.

No areas of the Indian River Lagoon would be listed for impairment by mercury or bacteria under the current Impaired Waters Rule.



*photo credit: South Florida Water Management District*

**Table 5. Shellfish Harvesting Areas  
with Highest Average Annual Closures**

Area	Days of Closures Since 1995	Average Annual Days of Closures
Sarasota Bay	1,167	167
East Bay Section 2	987	141
Lower Tampa Bay	957	137
Choctawhatchee Bay Eastern	956	137
Lemon Bay	947	135
Myakka River	794	113
Pine Island Sound Eastern	753	108
Body D	736	105
Wakulla County Zone 1	715	102
Gasparilla Sound	696	99
North Bay Eastern	680	97
Pine Island Sound Western	679	97
Indian Lagoon Zone Z	675	96
Body F Zone 1	615	88
East Bay Section 1	586	84
North Bay Western	581	83
Choctawhatchee Bay Central	573	82
South Volusia Zone 1	548	78
Apalachicola Bay West 3	530	76
Boca Ciega Bay	501	72
Apalachicola Bay West 1	486	69
Cedar Key Zone B	447	64
Ochlockonee Bay	434	62
Apalachicola Bay East	427	61
Apalachicola Bay West 2	416	59
South St. Johns	402	57
Horseshoe Beach	396	57
North St. Johns	378	54
Ten Thousand Islands	370	53
Indian Lagoon Zone Y	357	51
St. Joseph Bay	350	50
Escambia Bay	329	47
South Volusia Zone 2	325	46
South Banana River	306	44
East Bay	300	43
Wakulla County Zone 2	284	41
Indian Lagoon Zone B	263	38
Indian Lagoon Zone X	254	36
Withlacoochee Bay	232	33
Citrus County	208	30



## Apalachicola Bay

Apalachicola Bay is a resource of national and global importance. It has been recognized by UNESCO as an International Biosphere Reserve and by the federal government as a National Estuarine Reserve. The Apalachicola basin has the highest density of reptiles and amphibians in the United States and Canada, and includes the largest natural stand of tupelo trees in the world. It receives large numbers of migratory birds and provides a home for many endangered species, including three varieties of sea turtle, the West Indian manatee, and more than 100 plant species.

The bay also has extraordinary economic value, supporting one of the most productive fisheries in the United States. Apalachicola Bay produces 13 percent of the nation's oysters, as well as large amounts of shrimp, crab, scallops, and finfish. Its fishing industry – which employs between 65 and 80 percent of the local population – brings at least \$14 million annually into the local economy. Tourists, lured by the area's numerous sport-fishing opportunities as well as by the beauty of its beaches and wild lands, also contribute to the economy.<sup>58</sup>

Ten shellfish harvesting areas in the Apalachicola Bay system have had closures since 1995. Five of them have been closed at least once in

each of the past seven years. Four of them have had more than 400 days of closures since 1995. None of these areas would be listed as impaired under the proposed Impaired Waters Rule.



*photo credit: University of South Carolina*

## Unenforceable Cleanup Promises

The proposed Impaired Waters Rule states that contaminated waters will not be listed if “reasonable assurance is provided that, as a result of existing or proposed technology-based limitations and other pollution control programs under local, state, or federal authority, they will attain water quality standards in the future and reasonable progress towards attainment of water quality standards will be made by the time the next 303(d) list is scheduled to be submitted to EPA.” This provision allows for the exclusion of polluted waterways from the list of impaired waters with no guarantee that they will be cleaned up and no mechanism for enforcement if they are not.

In the prioritization of which impaired

waters to develop TMDLs for first, it would be reasonable to give waterways a lower priority if there is documentable evidence that ongoing cleanup efforts will be successful in the near future. But to consider it unimpaired before that cleanup succeeds is untruthful. As long as the waterway is impaired, it should be included on the Impaired Waters List.

If there were such a provision for the prioritization of impaired waterways, there would need to be a clear definition of what must be done to provide reasonable assurance that this progress will occur and a time limit by which the water body will be expected to attain water quality standards.

# POLICY RECOMMENDATIONS

Florida's proposed Impaired Waters Rule is riddled with shortcomings and loopholes. This report explores some of these shortcomings, but others are just as important. These shortcomings are so numerous that the Florida Department of Environmental Protection should take a wholesale approach to recreating the rule from the ground up. In so doing, it should incorporate the following mechanisms and principles.

## Planning List

The state should not create a two-step process with an initial "planning list" of waterways for further study and a "verified list" of impaired waters. When waterways violate clear criteria, they should be placed on the list of impaired waters. If subsequent investigation reveals that there is not sufficient contamination to warrant listing, a waterway can be removed from the list.

## Data Analysis

Significant changes are needed to produce a precautionary mentality of listing a waterway when data suggests that it is impaired, rather than a hesitant mentality of doing nothing until it is absolutely certain that a waterway is excessively contaminated. These changes include the following.

- Include a waterway on the Impaired Waters List whenever the exceedance rate for a contaminant is above 10%, regardless of the number of tests performed. This will encourage further testing for those assessments that are near the threshold.
- Make the 10% exceedance rate the consistent threshold for classifying a waterway as impaired. Do not use confidence levels with binomial distribution which discourage testing.

- Exclude data more than 7.5 years old only when more recent data is available to determine impairment.
- Clearly define conditions under which "outliers" in the data can be eliminated.
- Do not require seasonal variety. If data exists from one or two seasons that indicates ongoing contamination, list the waterway as impaired.
- For contaminants that are worse in particular seasons, do not require annual averages or annual exceedance rates to be the only measure of contamination. Specifically, measure chlorophyll levels as averages of tests in the spring and summer. For dissolved oxygen, measure the exceedance rate of tests only in the spring and summer.
- Require the DEP to examine data from all agencies conducting water quality sampling in Florida. Do not require that this data be obtained through the U.S. EPA's STORET database.
- Do not require the DEP to discard data associated with permit violations, contaminant spills, mixing zones, or discharges due to upsets or bypasses of permitted facilities. Many of these violations are ongoing and will continue to cause the contamination of waterways if not properly addressed.
- Do not exclude reliance on the best professional judgment of state employees and other professionals who are trained to make determinations of water quality based on information from a variety of sources.

## **Nutrients**

- Establish clear conditions under which narrative data will lead to the inclusion of polluted waterways on the Impaired Waters List.
- Allow the measurement of benthic algae as an indicator of nutrient over-enrichment in streams.
- Determine impairment based on tests of chlorophyll levels conducted in the spring and summer only.
- Use the more protective criteria in Florida's existing water quality standards (§62-302.530).

## **Swimming Areas**

- Classify waterways as impaired based on fewer than 21 days of health advisories per year.
- Analyze the raw data behind health advisories from the Florida Department of Health (DOH) and local health agencies. Apply the same 10% exceedance rate standard to this data as to all other data.
- DOH should encourage all local health agencies to adopt standards for pre-emptive advisories based on rainfall conditions known to cause a high likelihood of excessive bacteria.

- Do not exclude data based on red tides, sewer line breaks, medical wastes, and any factors not related to chronic discharges of pollutants.

## **Mercury**

- Allow consideration of testing data that is more than seven years old when newer data does not exist.
- Allow consideration of the results of common mercury testing methods.

## **Shellfish**

- Include all waterways that have had significant closures of shellfish harvesting areas due to high bacteria levels on the Impaired Waters List.
- Analyze the raw data from the Department of Agriculture and Consumer Affairs and apply the 10% exceedance rate standard to it.

## **Exemption**

- Do not exempt waterways from the Impaired Waters List whenever pollution control programs are proposed or in place. Continue to list contaminated waterways as impaired until they are not impaired.

# METHODOLOGY

All water quality testing data not otherwise cited is from an analysis of data from the U.S. EPA's STORET databases. Data from 1990-98 is from the Legacy STORET database. Data from 1999-2001 is from the Modern STORET database and covers testing through September 2001. Statistics on testing over the past five years actually cover five years and nine months – January 1996 through September 2001. This results in an understatement of data insufficiency problems.

This data contains records from all agencies that have uploaded data to STORET. One-third of the records are from the DEP. Another 29% are from the South Florida Water Management District. The rest are from an assortment of 25 other agencies.

This data includes tests of the following contaminants. These contaminants account for 84% of all impairments on Florida's 1998 Impaired Waters List.

- chlorophyll-a
- nitrogen
- phosphorus
- dissolved oxygen
- coliforms
- mercury
- lead

- iron
- un-ionized ammonia
- cadmium
- silver
- copper
- selenium

Figures indicating limited testing throughout this report are based on the data in STORET. In many cases more testing was done by agencies other than the DEP, but the results were not uploaded to STORET. Since the proposed rule limits the DEP to using only STORET data as its primary data source, other data is likely not to be considered in the development of the Impaired Waters List. DEP data managers claim that the data from all sampling conducted by the DEP has been uploaded to STORET.<sup>59</sup>

Agencies conducting water quality monitoring often test one water sample using more than one screening method, and enter the results from each test as separate records. To avoid such duplications, only records of the most common testing method for each contaminant were analyzed. For most contaminants, there is one method that accounts for nearly all records.

**Table 6. Agency Records in STORET**

Agency	Number of Records	
	1996-98	1999-2001
Brevard County	12	
City of Orlando	7,156	
Dade County	480	
Duval County	3,531	
Env Protection Comm of Hillsborough County		21,028
Environmental	6,540	
FL Game and Fresh Water Fish	1,444	
Florida Dept. of Environmental Protection	160,041	52,052
Hills County	30,720	
Jacksonville Elec Auth	1,175	
Lake County	381	
Loxahatchee River District	3,243	2,423
National Park Service	692	
NW Florida Water District	992	
Orange County	18,674	
Pinellas County	55	572
Polk County	12,048	
Reedy Creek Improvement Dist	1,111	
Sarasota County	7,502	
Save the Bay Associations	1,781	
South Fla Water Mgmt Dist	186,598	
St. John's River Water Mgmt Dist	84,676	
Suwannee River Water Mgmt Dist	13,173	
SW Florida Water Mgmt Dist	14,223	
US Forest Service	860	
Volusia Env Health Lab	15,014	
Watershed Action Vol	248	
<b>TOTAL</b>	<b>572,370</b>	<b>76,075</b>

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