

ANIMAL ISSUES



Briefing

Total Maximum Daily Loads (TMDLs) in Indiana

*Jane Frankenberger,
Department of Agricultural and
Biological Engineering*

and

*Mark Thornburg,
Agricultural & Natural Resources
Policy and Regulations*

Purdue Extension

Knowledge to Go

1-888-EXT-INFO

Situation

Despite years of pollution control based on point source discharge limits, many water bodies in Indiana and the U.S. are still not clean enough to be considered “fishable and swimmable” according to the U.S. Environmental Protection Agency (EPA). Total Maximum Daily Loads, or TMDLs, are a way of dealing with those waterbodies that remain polluted even after the application of regulations to industries and sewage treatment plants located in the watershed. TMDLs were originally mandated by the Clean Water Act in 1972, but have been generally ignored until recent lawsuits brought by citizens’ groups forced states to take action. Most states, including Indiana, are currently monitoring their lakes and streams, and developing programs to implement TMDL programs in those that do not meet water quality standards.

The basic idea of a TMDL is that a stream or lake can take in a certain amount of a pollutant and still meet water quality standards. This total maximum amount of pollutant that will not impair the stream water, or TMDL, must not be exceeded by the combined total discharge of that pollutant from all sources of pollution into the watershed. These sources may include factories, sewage treatment plants, storm water runoff from cities, and—new to the regulatory framework—nonpoint sources such as runoff from agriculture. Rather than mandating what each source can discharge separately, regulators would look at the *total* load from all sources. This water quality-based approach to pollution control is new, emphasizing the end result (water that meets water quality standards) rather than the individual pollutant flows or the particular technology used to arrive there.

What We Know

TMDL development and implementation includes five components. Indiana has completed the first two and is proceeding to the actual development of TMDLs in some watersheds.

1. Identification of Impaired Waters

TMDLs are only considered where a water quality problem exists. Streams and lakes that do not meet standards (which in Indiana means supporting aquatic life, recreational use, and fish consumption) are put on the “303(d) list,” a list of impaired waterbodies mandated by Section 303(d) of the Clean Water Act. The Indiana Department of Environmental Management (IDEM) listed 208 waterbodies throughout the state that don’t meet standards. The names of the lakes and streams listed are available on the IDEM web site at <http://www.state.in.us/idem/owm/planbr/wqs/303d.htm> or by calling Dan Knowles (TMDL Coordinator) at (800) 451-6027 ext. 3-0480 or (317) 233-0480.

Each lake or stream is placed on the 303(d) list for specific pollutants that cause it to not meet water quality standards. Following is a list of these pollutants (known as “TMDL parameters”) with the number of lakes or streams impaired by each.

Pollutant	# Impaired	Pollutant	#Impaired
PCBs	101	Pesticides	8
Mercury	99	Oil and grease	3
Impaired Biotic Community	54	Copper	2
<i>E. coli</i>	49	Chlordane	2
Dissolved oxygen	19	PH	2
Cyanide	18	Nitrates	1
Ammonia	8	Endrin	1
Lead	8	Organics	1

Based on these parameters it appears TMDLs will not focus primarily on agriculture, although agriculture may be one of many sources for several parameters (e.g., *E. coli*, dissolved oxygen, ammonia, pesticides, nitrates). With further monitoring, however, other parameters may be identified which will then also require TMDLs. In particular, many waterbodies were found to violate the *E. coli* water quality standards, but were eliminated from the list because of quality assurance problems in the sample handling. It is therefore likely that many more water bodies will eventually also require TMDLs for *E. coli*.

2. Prioritization of the Impaired Waters

The 303(d) list of the 208 impaired waterbodies in Indiana was prioritized by taking into account criteria such as risk to human health and aquatic life; degree of public interest and support; and recreational, economic, and aesthetic importance of a particular waterbody. The impairment of 48 of the waterbodies was considered “high severity,” and three major areas were targeted for initial TMDL development: *Grand Calumet River* and *Indiana Harbor Canal* in Lake County; *Wildcat Creek* and its tributaries in Howard, Carroll, Tippecanoe, and Clinton Counties; and *Fall Creek* and *Pleasant Run* in Marion County. TMDLs for these waterbodies will be developed by the year 2000.

3. Development of TMDLs

For each TMDL parameter, IDEM must identify and quantify the probable sources and allocate allowable loadings from the contributing point and nonpoint sources in the watershed so that the water quality standards are attained. For example, potential sources of *E. coli* include combined sewer overflows, improperly functioning septic systems, and agricultural runoff from livestock. These sources must be quantified through stream monitoring, with diffusion and degradation of the pollutant accounted for as it travels down the stream using computer model simulations. Finally, various pollutant load reduction scenarios are to be modeled to compare their relative cost-effectiveness. Public meetings are to be held to discuss the various alternatives for reducing the total loading.

4. Implementation of Control Actions

Specific methodology for developing TMDLs is still being worked on by IDEM. Generally, point sources are already regulated through the National Pollutant Discharge Elimination System (NPDES) permitting process. If reducing nonpoint sources are the most cost-effective way to

reduce total loading of a pollutant to a waterbody, IDEM expects cost-sharing to be available for implementation of best management practices. Examples from other states suggest that “trading” of pollutant loading between point and nonpoint sources may be a good strategy, although specific plans have not yet been developed in Indiana. One scenario might include a waste treatment plant assisting agricultural producers in the watershed to implement best management practices to reduce overall loading as a more cost-effective alternative than constructing a new sewage treatment plant.

5. Determine Whether the Water Quality Now Meets Standards

Throughout the TMDL process, monitoring is a crucial element of water quality-based decision making. Water quality monitoring provides data for the evaluation of whether the TMDL and prescribed control actions protect or improve the environment.

What We Don’t Know

- Some question whether it is within the scope of EPA’s authority to apply TMDLs to agriculture under the language of the Clean Water Act. EPA, however, is proceeding under the assumption that TMDLs do apply. In fact, EPA has included TMDLs as one of the regulatory programs in the Animal Feeding Operation (AFO) Strategy.
- The TMDL process is still relatively new, and no clear road map exists to tell us how TMDLs will be developed and implemented. Thus it is unclear at this time exactly how agricultural producers will be affected. The first TMDL development (for Kokomo Creek) should be completed in 1999, and public meetings will be held in that watershed to debate where reductions will need to be targeted. These meetings will be important for clarifying various interests, and identifying potential solutions.
- Questions have also been raised as to whether sufficient data have been collected to accurately pinpoint water quality problems. The TMDL statute, however, specifically mandates “a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.” The lack of data is therefore unlikely to slow the process of TMDL implementation.

What We’re Doing

- We are following developments in TMDL strategies and implementation processes by keeping in touch with the regulatory agencies. We will inform producers of the process and its implementation in Indiana, and of the developments that may affect them.
- Numerous Purdue researchers are developing methods to improve water quality assessment, modeling, and protection. Our research and education programs help agricultural producers and others implement water quality protection strategies while maintaining economical levels of production.