Fact Sheet:
The Impaired Waters with TMDLs National Geospatial Dataset

Background: the Clean Water Act, impaired waters and TMDLs

The goal of the Clean Water Act (CWA) is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters". Under section 303(d) of the CWA, states, territories, and authorized tribes, collectively referred to in the Act and here as "states," are required to develop lists of impaired waters. A state's 303(d) impaired waters list is comprised of all waters where required pollution controls are not sufficient to attain or maintain applicable water quality standards. The law requires that states establish a prioritized schedule for waters on the lists and develop Total Maximum Daily Loads (TMDLs). A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of the load reduction needed from various sources of the pollutant. Most TMDLs are technical documents that summarize the analysis and lay the groundwork for beginning to plan restoration. Over 40,000 TMDLs have been developed, and the number is continually increasing.

EPA consolidates states' 303(d) listing and TMDL development information into the Assessment and TMDLs Tracking and Implementation System (ATTAINS), providing publicly available information on over 40,000 tracked waters and access to impaired waters data at local and national scales. Impaired waters data in tabular format appear online at www.epa.gov/waters/ir and as geographic information systems (GIS) datasets (see Figure 1) available for download at http://epamap32.epa.gov/radims/.
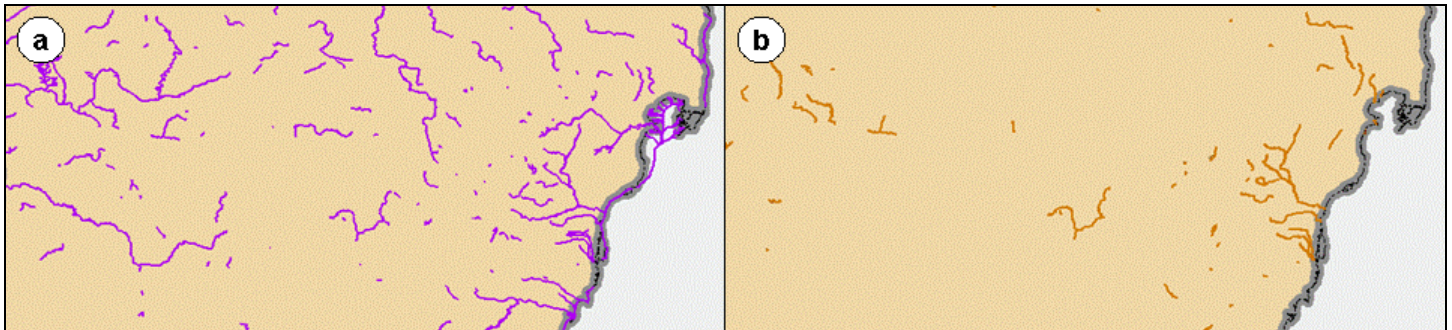

Figure 1: Mapped data on impaired waters (a) and impaired waters with one or more TMDLs (b) are available online from EPA.

Geospatial data on impaired waters and TMDLs

National geospatial datasets on impaired waters are produced and periodically updated by EPA using state-reported data. The GIS versions of state 303(d) lists are provided to EPA by states after the lists are approved and finalized. EPA compiles the state datasets, reconciles differences in format, and indexes the data to the National Hydrography Dataset Plus (NHD*Plus*) to provide a nationally consistent reference. The indexed datasets are housed in EPA's Reach Address Database (RAD), including the ***2002 Impaired Waters Baseline National Geospatial Dataset*** containing impaired waters as of the 2002 baseline reporting year, and the ***303(d) Listed Impaired Waters National Geospatial Dataset*** that includes more recent state GIS data (from variable dates) available as of mid-2008. The RAD also provides dynamic access to individual state or watershed-level data downloads as these become available. Figure 1a is an example of GIS data based on impaired waters reported as of the 2002 baseline year used in EPA Strategic Plan tracking.

Based on widespread interest in GIS data on impaired waters, EPA has developed ***The Impaired Waters with TMDLs National Geospatial Dataset*** that identifies all impaired waters for which at least one TMDL has been developed. Figure 1b is an example from this dataset, showing the waters with TMDLs for the same set of impaired waters shown in Figure 1a. This dataset is available through the RAD for public download and is updated periodically as resources permit. Starting with the shapefiles of impaired waters, this new dataset was developed by relating all mapped, impaired waters to all information on existing TMDLs. To appear in this dataset, impaired waters must have been mapped and at least one of their impairment causes must have been addressed by a TMDL. Users should note, however, that the dataset cannot encompass all waters with all TMDLs, because numerous TMDLs are completed before their state GIS data are finalized and new TMDLs are continually being developed. Nevertheless, the dataset provides a valuable spatial record of the availability of thousands of TMDLs that can be used in the GIS environment. These spatial data can be related to tabular information, such as pollutant types or water body names, extracted from ATTAINS.

A step further – linking TMDL maps to TMDL documents

The following example shows how a user can access impaired waters information, mapped waters with TMDLs, and TMDL documents for the same location, all through EPA data systems. Grand River, Michigan appears as an impaired water in Figure 1 (see also Figure 2). Online data from ATTAINS reveal that this water body's LIST ID is MI082816H and its causes of impairment include pathogens, organic enrichment and sediment. Two TMDL documents have been completed and their TMDL IDs are 9498 and 9499; 9499 alone is used in the example below.
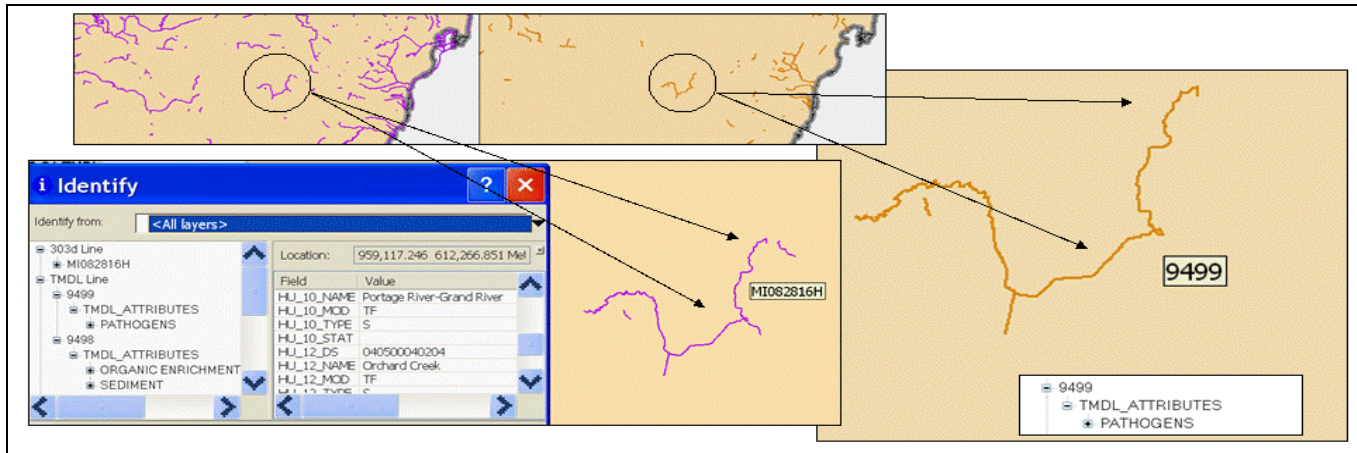

Figure 2: Grand River, Michigan example of a water body mapped as impaired (purple) as well as having a TMDL (orange).
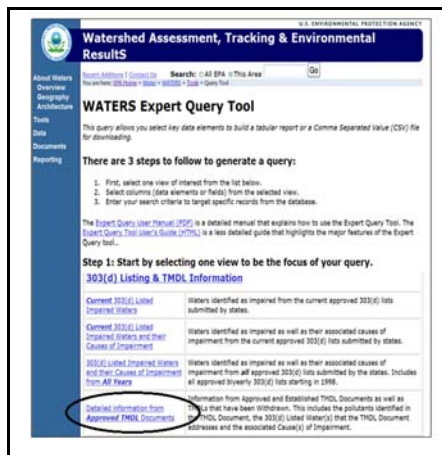

Figure 3: An online search for TMDL 9499

Having found the TMDL ID 9499, the user goes online to the EPA's Expert Query tool (Figure 3) at www.epa.gov//waters/tmdl/expert_query to obtain the TMDL document. Note that Expert Query can also be used to search for other information about the Grand River by selecting one of the views about 303(d) information and using the LIST ID number instead of the TMDL ID number. The user follows the directions online, and selects the columns TMDL ID and ASSOCIATED TMDL DOCUMENTS, at a minimum (Figure 4), which then returns a hot link for TMDL ID 9499.
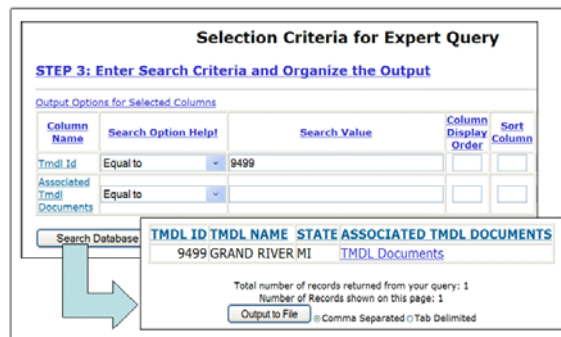

Figure 4: The hot link to the TMDL document is located

The user then clicks on the TMDL Documents hot link returned by the search and is brought to a menu of the documents available as PDF files for download. For the Grand River, both the official EPA decision document and the TMDL report document (Figure 5) are available as PDF files. TMDL and decision documents for the other two Grand River impairments are also available through searching under TMDL ID 9498.

For more about TMDLs and impaired waters data, visit:

EPA TMDL home: www.epa.gov/owow/tmdl
ATTAINS: www.epa.gov/waters/ir
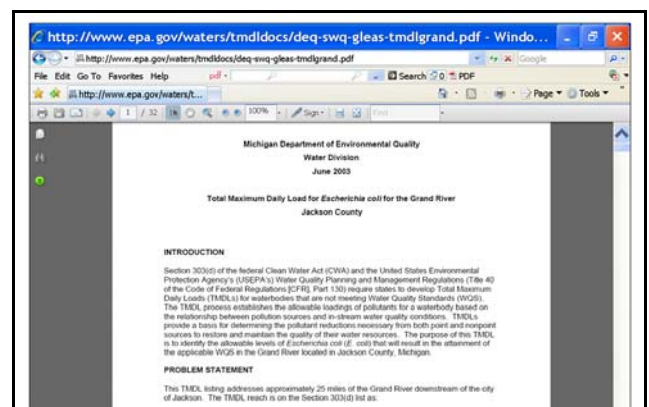**Data Downloads:** http://epamap32.epa.gov/radims/
TMDL Results: www.epa.gov/owow/tmdl/results

Figure 5: The Grand River Pathogens TMDL document