

Respondent:

**Ohio Environmental Protection Agency
Rick Wilson
PTI & Agricultural Unit
Division of Surface Water
122 S. Front St.
Columbus, Ohio 43216**

rick.wilson@epa.state.oh.us
(614)-644-2032

Question From Summit Or From Audience Cards	Response
Is there a water quality problem with Grand Lake? Ohio EPA testing says it is one of the most degraded watersheds in the state.	<p>Absolutely Yes.</p> <p>The Grand Lake St. Mary's watershed drains approximately 171 square miles and includes two Assessment Units—Beaver Creek and Grand Lake St. Mary's. The watershed lies near the Ohio-Indiana border in west-central Ohio and consists of mostly agricultural land. OEPA has evaluated the biological health and water quality of the watershed and determined that several segments of the Grand Lake St. Mary's do not support designated aquatic life uses and the recreational use support.</p> <p>The aquatic life use impairments are believed to be a result of both poor habitat and elevated concentrations of various chemical parameters (e.g., nutrients). Other causes of impairment, such as habitat alterations, are not pollutants, however, these causes of impairment should be addressed and should be targeted during the implementation of pollution reduction strategies, (e.g. Total Maximum Daily Load (TMDL) planning).</p> <p>See graphic at link: http://www.epa.state.oh.us/dsw/documents/wabash2001_infographic.pdf</p>
Who regulates pollutants entering the tributaries of the Lake?	<p>Ohio EPA-Division of Surface Water (http://www.epa.state.oh.us/dsw/) regulates point sources of pollution, which include pipes, Concentrated Animal Feeding Operations (CAFOs) (defined by law as a point source), and other discreet conveyances of pollution to waters of the state. The Ohio Department of Natural Resources also regulates pollution from agricultural activities such as animal feedlots, animal waste management systems, crop production and silviculture.</p>
What are the waters of the State? - definition	<p>"Waters of the state" means all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and other bodies or accumulations of water, surface and underground, natural or artificial, regardless of the depth of the strata in which underground water is located, that are situated wholly or partly within, or border upon, this state, or are within its jurisdiction, except those private waters that do not combine or effect a junction with natural surface or underground waters.</p>
Ohio EPA water quality testing indicates the Grand Lake and	<p>See graphic at link: http://www.epa.state.oh.us/dsw/documents/wabash2001_infographic.pdf</p>

<p>Wabash River watersheds are two of the most degraded in the state. Why is this and how does the water quality in the lake compare to other lakes in similar heavy-agriculture watersheds? What criteria in particular is responsible for this most degraded status.</p>	<p>Very little Riparian Corridor exists along and very limited habitat exists in GLSM feeder tributaries.</p> <p>As such there is very limited processing of sediment or nutrients in GLSM feeder tributaries.</p> <p>This results in excessive nutrient load (usually associated with runoff from agricultural land and facilities) in terms of manure and fertilizer that runs off via surface and tile drainage where the flow is expedited downstream. In the absence of developed flood plain areas, there is very little to intercept and assimilate those pollutants before rapid transport to GLSM.</p> <p>Specific Criteria causing impairment: Direct Habitat Alterations-High magnitude source Nutrients-Nitrate, phosphorus, Nonirrigated Crop Production Animal Feeding Operations (NPS) Channelization - Agriculture Removal of Riparian Vegetation - Ag. Streambank Destabilization - Ag.</p> <p>A nearby lake/reservoir Indian Lake (Eutrophic) and is generally valued as a good recreational fishery. GLSM-Hypertrophic and is not as valued as a recreational fishery as other nearby reservoirs (e.g. Indian Lake, Lake Loramie)</p>
<p>The EPA currently is putting together a Total Daily Maximum Load (TMDL) study of Grand Lake and its watershed. Please explain what this study is, why it is being done and what the results of the study will be used for.</p>	<p>See TMDL info: http://www.epa.state.oh.us/dsw/tmdl/index.html</p> <p>The Total Maximum Daily Load (TMDL) program, established under Section 303(d) of the Clean Water Act (33 U.S.C. 1313), focuses on identifying and restoring polluted rivers, streams, lakes and other surface waterbodies. A TMDL is a written, quantitative assessment of water quality problems in a waterbody and contributing sources of pollution. It specifies the amount a pollutant needs to be reduced to meet water quality standards (WQS), allocates pollutant load reductions, and provides the basis for taking actions needed to restore a waterbody.</p> <p>The process contains four broad, overlapping phases:</p> <ul style="list-style-type: none"> • Assess waterbody health: biological, chemical, habitat • Develop a restoration target and a viable scenario • Implement the solution: inside/outside Ohio EPA • Validate to monitor progress: delist or relist. <p>The important themes of the process include reaching out to involve others - the public and other agencies - and focusing on the goal of bringing waters into attainment. To do this we will build on our past experiences and explore new technology and methods. Finally, we will use a quality improvement process to measure the effectiveness of TMDLs, both administrative and technical decisions, and adjust the process as needed.</p>
<p>The Ohio EPA has been doing water quality testing in recent</p>	<p>Ohio EPA has made extra effort to conduct sampling in the GLSM/Beaver Creek Watershed in order to get representative data for conditions during the</p>

<p>months and in recent years to generate data that will be part of a Total Daily Maximum Load (TMDL) study of Grand Lake and the lake's watershed. Thus far, does this data show a particular time of the year when the amount of excess nutrients entering the lake is heavier than other times and if so, why is this. I don't just mean after specific rain events, but rather a time of the year or season.</p>	<p>varying flow regimes that occur. Samples have been collected at varying flow conditions – from low flow (non-runoff) through to high flow conditions.</p> <p>Keep in mind that pollutant LOAD is directly related to stream flow and pollutant concentration. One phenomenon that has been documented well in the GLSM watershed shows generally when flow increases so do the pollutant concentrations. So, the bulk of the annual load to GLSM occurs during runoff from land. Relating to nutrient impairment unassimilated and/or runoff vulnerable nutrients (via leaching to tiles or surface runoff) generally are the sources of the load.</p> <p>Periods of the year where nutrients are most likely to move from or through the soil profile include late fall, winter and early spring when temperatures inhibit processing of the nitrogen. Late spring, summer and early fall are periods where there is plant uptake, reduced saturation in field (i.e., less runoff...and lower stream flow). Likewise, there is generally less nutrient runoff in late spring, summer, and early autumn.</p>
<p>The Ohio EPA's water quality testing data gathered in 1997 resulted in the most degraded designation for the Grand Lake and Wabash River watersheds. That data is almost 10 years old. How accurate is this designation today?</p>	<p>The original monitoring was done in 1999. This was a very dry year. Ohio EPA again collected samples throughout the watershed in 2005 and 2006 at a wide variety of flow regimes.</p> <p>The designation and descriptors of impairment are still accurate today.</p>
<p>Let's say that agricultural producers resist participating and implementing BMPs. What are the next steps to regulation?</p>	<p>Where pollution or violations of Ohio's Water Quality Standards or Pollution Abatement Laws is documented from agricultural entities or operations, Ohio has programs in place to require fixes. ODNR-Division of Soil and Water Conservation implements Ohio's Pollution Abatement Laws and program. See link: http://www.dnr.state.oh.us/soilandwater/PALT.htm</p> <p>Generally, this program provides a means to enforce Pollution Abatement laws (i.e., where agricultural BMPs are not followed or installed). Similarly, Ohio EPA has the authority to enforce the Clean Water Act Water Quality Standards provisions where there are documented water quality standards violations from any entity (city, industry, livestock producer, or otherwise).</p> <p>Because it is evident that the nutrient load predominately comes from the dominate land use in the watershed (agriculture), there is a watershed-wide need for land-owners to participate in the TMDL process, understand the issues, and commit to work toward implementation of effective Best Management Practices. Examples of effective BMPs may include: tile drainage management, installation of assimilative wetlands in the headwaters, implementation of manure management plans per current standards, installation of waste storage vessels (i.e., elimination of open feedlots), riparian corridor restoration, and/or stream restoration.</p>
<p>What does the ODA regulate currently?</p>	<p>ODA Livestock Environmental Permitting Program currently regulates Concentrated Animal Feeding Facilities (CAFFs). They issue construction and operating permits for facilities that meet the definition of Large CAFFs (e.g. confine more than 1000 beef cattle, 700 mature dairy cows, etc.), as well as</p>

	<p>smaller facilities that are referred by ODNR with a history of non-compliance. They also certify livestock managers that land apply large volumes of manure each year. See ODA program link: http://www.ohioagriculture.gov/pubs/divs/lepp/lepp-index.stm</p>
<p>Is there a difference in the water quality of streams in the Wabash watershed vs the Grand Lake?</p>	<p>Very similar issues exist in the Wabash River and its headwater tributaries in Ohio as exist in the feeder tributaries to GLSM. The only difference is that Wabash River does not flow into a lake. See the Infographic at: http://www.epa.state.oh.us/dsw/documents/wabash2001_infographic.pdf</p>
<p>Who is in a regulatory capacity to require compliance with pollution laws?</p>	<p>Ohio EPA requires compliance with the pollution laws under its Clean water Act authority, ODNR requires compliance with the agricultural pollution abatement laws, and ODA requires compliance with their laws related to pollution (e.g. concentrated animal feeding facility (CAFF) requirements).</p>
<p>I've witnessed a few instances where manure was running directly from a barn lot through a field and into a stream. Tell us what the regulatory remedy for that would be? And who would enforce it? Who would start the process?</p>	<p>Instances such as the one you describe seem to need containment, or redesign of the feedlot so that manure or manure laden runoff is contained. There are many instances similar to the one you describe that exist in your watershed and many other areas of Ohio. This office has documented several instances where this is the case, and has begun the enforcement process with several. There are many instances where once the issue is documented by a state or local agency as a violation of law, standards, etc., the entity takes immediate and appropriate measures to abate the problem (i.e., via nutrient management planning, installation of containment devices, purchase of equipment, etc.). In such cases, enforcement is not necessary. Where there becomes an accumulation of violations, or lack of progress toward remedy of the pollution problem, the State (either DNR-DSWC or Ohio EPA-DSW or in some cases ODA) has responsibility to enforce the rules and laws to abate such potential and existing pollution issues.</p>
<p>What is the status of the Wabash TMDL study</p>	<p>The Wabash TMDL is complete and available at the following link: http://www.epa.state.oh.us/dsw/tmdl/WabashRiverTMDL.html</p> <p>The TMDL for the Beaver Creek/GLSM report is currently being drafted. It is expected to be released to the public in 2007.</p> <p>Below are some general items one may expect to see discussed in the report.</p> <p>OEPA has evaluated the biological health and water quality of the watershed and determined that several segments of the Grand Lake St. Mary's do not support designated aquatic life uses and the recreational use support.</p> <p>As a result from the most recent surveys, in general, most locations need significant reductions in both nutrient and fecal coliform loads especially during high flow (including snow melt) and moist conditions. All stations with data from high flow periods display needed reductions of greater than 87 percent for total phosphorus, nitrate nitrogen, and fecal coliform bacteria. Several of these sites show significantly lower reductions (in some cases 0.0%) needed for nitrate nitrogen and fecal coliform bacteria during mid-range to low flow periods. As explained above, this may be indicative of pollutant loading that occurs primarily during runoff events. However, needed reductions for total phosphorus were relatively consistent (and high) across all flow regimes,</p>

	<p>potentially displaying both constant and weather related contributions.</p> <p>The 2006 Integrated Report assessment of available fish tissue data from Grand Lake St. Marys documented body burdens of one or more pollutants at levels exceeding the threshold level upon which Ohio Water Quality Standards human health criteria are based which resulted in listing as impaired for fish consumption.</p> <p>High Magnitude Cause: Direct Habitat Alterations</p> <p>High magnitude sources: Nonirrigated Crop Production Animal Feeding Operations (NPS) Channelization - Agriculture Removal of Riparian Vegetation - Ag. Streambank Destabilization - Ag.</p>
<p>What should producers know about the Clean Water Act of 1972-1974?</p>	<p>Growing public awareness and concern for controlling water pollution led to enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the Clean Water Act. The Act established the basic structure for regulating discharges of pollutants into the waters of the United States. It gave EPA the authority to implement pollution control programs such as setting wastewater standards for industry. The Clean Water Act also contains requirements to set water quality standards for all contaminants in surface waters. The Act made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions. It also funded the construction of sewage treatment plants under the construction grants program and recognized the need for planning to address the critical problems posed by nonpoint source pollution.</p> <p>Subsequent enactments modified some of the earlier Clean Water Act provisions. Revisions in 1981 streamlined the municipal construction grants process, improving the capabilities of treatment plants built under the program. Changes in 1987 phased out the construction grants program, replacing it with the State Water Pollution Control Revolving Fund, more commonly known as the Clean Water State Revolving Fund. This new funding strategy addressed water quality needs by building on EPA-State partnerships.</p> <p>Over the years, many other laws have changed parts of the Clean Water Act. Title I of the Great Lakes Critical Programs Act of 1990, for example, put into place parts of the Great Lakes Water Quality Agreement of 1978, signed by the U.S. and Canada, where the two nations agreed to reduce certain toxic pollutants in the Great Lakes. That law required EPA to establish water quality criteria for the Great Lakes addressing 29 toxic pollutants with maximum levels that are safe for humans, wildlife, and aquatic life. It also required EPA to help the States implement the criteria on a specific schedule.</p> <p><u>See: http://www.epa.gov/region5/water/cwa.htm</u></p> <p>FEDERAL WATER POLLUTION CONTROL ACT</p>

	<p>(33 U.S.C. 1251 et seq.) SEC. 101. (a) The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.</p>
<p>You (Rick Wilson, Ohio EPA)-Division of Surface Water collected stream samples of tile and surface runoff on Dec. 27, 2005. What did those sample results conclude? What was the cause?</p>	<p>I along with water quality sampling crews from OEPA-Northwest District Office have collected numerous samples in the GLSM watershed during many differing flow regimes (low flow to high flow runoff events).</p> <p>In one instance, the samples collected from GLSM fed tributaries showed very well that the load of pollutants (especially, phosphorus and nitrogen compounds) entering the south side of GLSM was on the order of 100 times greater on the day I sampled (Dec. 27, 2005 --during thaw of predominately agricultural land) than the low-flow (non-runoff) days prior to December 25, 2006 when the stream flow rates were approximately 20 times lower than the day I sampled. These results have been discussed and presented to watershed stakeholders extensively. Descriptive slides and data can be provided upon request.</p>
<p>Does EPA have the authority to just prohibit winter application of manure all together, regardless of frozen or non frozen ground? What would lead EPA to that action?</p>	<p>Ohio EPA does not have the broad authority to prohibit winter land application of manure across the board. To prohibit all winter land application for those CAFOs that are clearly within our permitting authority would require more data and justification than we currently have. Ohio EPA would need to better document water quality degradation from manure spread on non-frozen ground, and weigh the alternatives for a sustainable system of handling manure from animal feeding operations. It is more likely that the first step would be to recommend and work toward voluntary abstinence from winter application in a designated watershed where we have documented impacts in the winter (e.g. as part of the TMDL implementation) and evaluate the results over a period of time. If abstaining from applying manure on frozen and/or snow covered ground resulted in documented improved water quality, that information could be used for developing mandatory requirements – but those mandatory requirements would still only apply to the operations under Ohio EPA authority. For long term improvements, it is important for Ohio EPA to work with other agencies, local groups, citizens, and producers to increase the voluntary actions and, if necessary, revise standards enforced by agencies that may have broader impacts (e.g. the pollution abatement laws). We believe there has been some good progress in that direction in the past couple of years, with the changes in the NRCS nutrient management standard and increased cooperation and awareness related to this issue.</p>
<p>If the water is regulated by the EPA, can the water be treated to reduce algae or add oxygen back into the water? Examples of treatment: 1.) Aeration for oxygen? A. Water circulation B. Pumping air into the water 2.) Chemically? A. Barley Straw B. other techniques</p>	<p>The best approach is to keep the nutrients out of the water. Generally, the nutrient loading in this watershed occurs during high flow or runoff events, so treatment is not really an option watershed wide. However, where there are dry weather discharges of manure or otherwise highly polluted material, removal of the material from waters of the state, aeration and recirculation are means by which the acute affects of the spill can be mitigated.</p> <p>Unaltered river systems where there is little impact from anthropogenic sources (i.e., human influences) generally are self-cleaning and cyclically assimilate nonpoint source pollutants. In the case of GLSM watershed, many of the processes that river systems use have been altered significantly in the following ways:</p>

	<p>1) Nutrient load from agricultural land is significantly higher than what these small tributaries to and GLSM can handle.</p> <p>2) Extensive tile drainage, channelization and absence of riparian corridor along headwater tributaries to GLSM significantly reduces the ability of the headwater tributaries to assimilate the nutrient load entering them. Once into GLSM, the nutrients (both soluble and particulate) have a long residence time. Algal blooms in the lake have become commonplace and are caused by excessive nutrient inputs to GLSM and the effects of eutrophication (caused by photosynthesis ...sunlight and nutrients).</p>
<p>I have heard several panelists refer to ammonia, nitrogen & phosphate running into the lake. Where does that come from primarily? Are we talking about manure or septic failures or residential fertilizing? Please clarify.</p>	<p>The samples collected by Ohio EPA suggest the majority of nutrient load comes from the predominant land use in the watershed, agriculture. Samples have been collected from area streams at various flow regimes. During low flow in streams (where only point source discharge pollution such as municipalities, and failing residential systems would show up) we have found minimal load contribution. However, when we sample during watershed wide runoff conditions, we see very high loads of nutrients from agricultural fields and some facilities. In fact, Rick Wilson showed during presentations in Mercer and Darke County where from one day to the next (low flow to runoff conditions, the load of nutrient pollution entering GLSM watershed stream systems increase by >100 fold.</p>
<p>Would completion of the sewer on the north side of the lake help water quality?</p>	<p>Where there is potential to eliminate sanitary wastewater discharges from residences to the lake or tributaries of the lake, such nutrient and pathogen reductions would further help the water quality of the lake. The key is to address the sources of nutrient where they are the greatest contribution. The north side of GLSM represents a very small fraction of the GLSM watershed area.</p>