Syllabus

May 31, 2012

This list will evolve as the Task Force identifies key issues for discussion

Program Updates

Based upon discussion of Recent Activities, identify recent program(s) and research the Task Force would like to learn more about.

Update SRP data from the 2007 water year

The P Task Force Phase I report published in 2010 includes loading data up to the 2007 water year. Provide a brief update on the loading data from the last 3-4 years.

Options for a reduction target/goal

Over the course of 2 or more meetings, the Task Force will learn and deliberate about different approaches for developing a target reduction goal or target for SRP.

Tile Drainage

Provide an overview of recent research results on tile drainage and drainage management structures.

Tools for Nutrient Management

Overview of status and recent developments related to soil tests, the Phosphorus Index, screening tools and promotional efforts to guide their use.

Section 8 — Discussion

The Task Force took a broad-based approach in analyzing the potential contributing factors related to the observed increasing dissolved phosphorus and the resurgence of algal blooms in the western basin of Lake Erie. The complexity of the dynamics of phosphorus as it moves over and through the land surface and its transport through water systems became readily apparent to the Task Force. As the group equipped itself with deeper knowledge about the interactions of phosphorus with soil and water, the group analyzed different sources of phosphorus and their potential for contribution to the algal blooms. While no modeling or monitoring efforts were undertaken on behalf of this analysis, the Task Force was able to assess different sources utilizing existing data and information to identify their relative contributions.

The following is a series of key observations made by the Task Force to support the conclusions included within this report. Much of what follows is detailed in the full narrative of this report. The following list intends to capture those elements believed to be critical to understanding the current situation and those elements that will have the greatest impact in reducing the delivery of DRP into the western basin of Lake Erie.

Relative Contributions

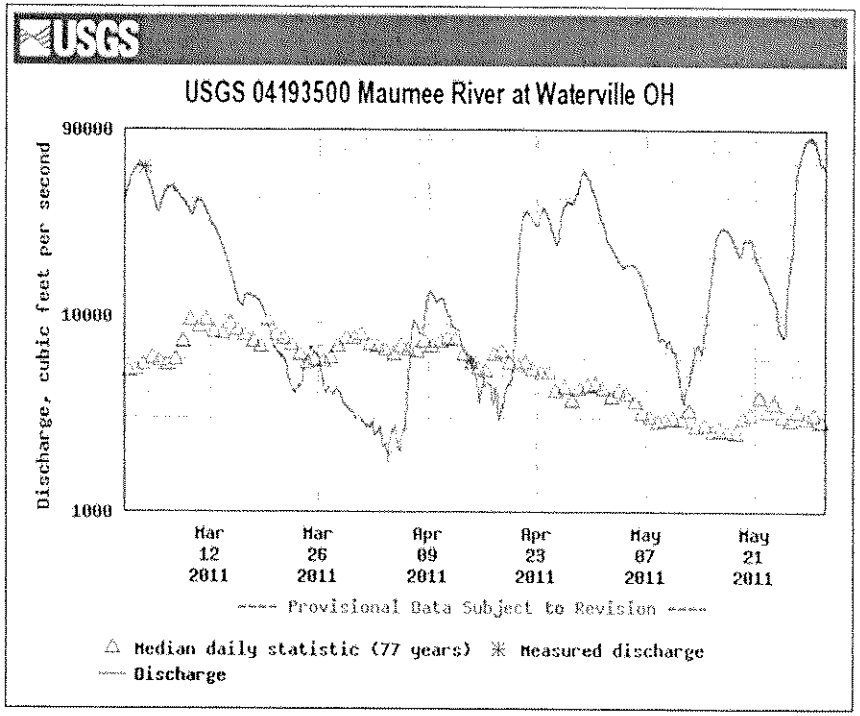
1. Point source discharges have remained consistent after a rapid drop in the 1970s. Historical discharge monitoring reports do not indicate any increases in phosphorus loadings. Point source loadings are not a major contributor to the increase in DRP.
2. Certain garden care products can contain high sources of phosphorus and can be potentially available to runoff to streams and watercourses. However, most products designed for lawn care have relatively low phosphorus levels. The runoff potential from any of these products is also highly dependent on management practices. Industry reductions in phosphorus content, better package labeling and improved application devices are all serving to minimize this potential even further. Lawn care products may be a contributing source with the potential for local impacts, but overall are not a significant contributor to algal blooms.
3. The invasive species of zebra and quagga mussels have altered the internal phosphorus cycle in the lake. Research continues to quantify this impact as models are being revised to account for the influence of mussels in the lake. While mussels may be having an influence on the internal cycling, the mussels are processing phosphorus input coming in from the rivers draining into Lake Erie. Once we realize reductions in phosphorus loadings, mussels may delay the response in the Lake, but researchers expect their influence will be short-lived.
4. While there are multiple contributors to phosphorus loading, currently the most significant is the result of runoff from agricultural nutrient applications. There is a lack of evidence that differentiates the relative contribution of commercial fertilizers and the land application of manure. Commercial fertilizer usage varies from year to year and its use outweighs the land application of manure or biosolids by a factor of two to one. Considering that agriculture accounts for about 59% of the land use in the Ohio Lake Erie basin, it follows that agricultural sources would contribute the greatest load. The significance is even more pronounced in the Maumee watershed where agricultural row crop land use ranges as high as 82%.

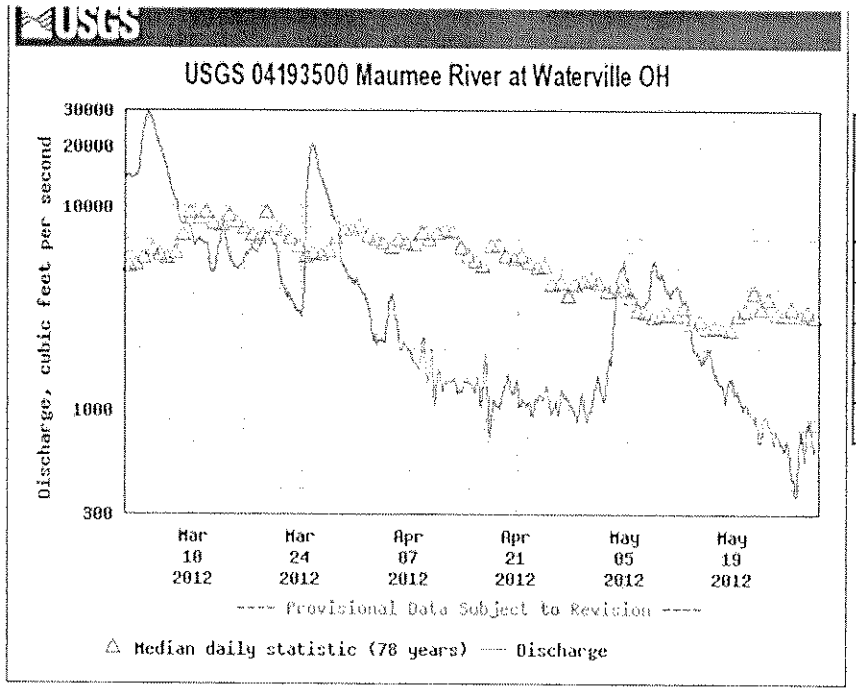
Agriculture

1. Overall, agricultural inputs are down (total number of animal units and lower sales of commercial fertilizer) yet the increases in dissolved reactive phosphorus tell us we need to manage the inputs we are putting into the system differently. There have been a multitude of changes in agriculture, all having an influence on the methods, amount, form, placement and timing of nutrient applications. The Task Force concludes that those recommendations that focus on the timing, amount and method of application of nutrient applications, will have the greatest beneficial potential for reducing the algal blooms in the western basin.
2. Although there are agronomic standards for the amount of phosphorus that soils need for fertility and crop yields, there is no database to track the frequency of soil tests and how the results are used to guide fertilizer application rates. The Task Force concluded that tools and indices need to be refined to account for crop fertility needs as well as environmental risk. Strategies that will improve nutrient management and reduce the runoff potential include improved soil test methodology, targeted education, consistent recommendations to producers and better follow-through on the recommendations made for phosphorus application.
3. Precision nutrient management utilizing management zones prepared from geo-referencing of crop production yield maps, soil maps and soil testing data has the potential to more accurately apply phosphorus where needed and to minimize over-application of phosphorus fertilizer.
4. There is no single agricultural practice that will result in a lowering of nutrient runoff. The reduction of DRP will require a system of best management practices that address the amount of commercial fertilizers and manures applied to fields, the methods of application and the practices that inhibit runoff delivery to local streams. The Task Force has developed a list of priority BMPs that have been identified as pivotal to reducing DRP. The list is included in Appendix B.

Other

1. DRP loading to Lake Erie has been increasing by large amounts since the mid-1990s and is now reaching historical highs after dropping substantially during the late 1980s and early 1990s. While there has not been any significant change in rainfall, there have been significant increases in fall and winter runoff. There has been less snow so that now a moderate winter rain can generate significant runoff as a result of frozen ground and little to no plant uptake. Changing seasonal patterns of rainfall and runoff have thus contributed to the increased runoff of dissolved phosphorus to Lake Erie.
2. Stream corridors can provide assimilative capacity for the uptake of in-stream nutrients in stream runoff, but these are primarily localized benefits to stream condition. There are no specific recommendations on developing the assimilative capacity through the restoration of stream corridors. The focus of the Task Force was to address the increase in algal blooms and the Task Force has concluded that addressing upland measures will yield the most beneficial results.
3. Although DRP is increasing in other monitored tributaries in Ohio (e.g., the Cuyahoga and Grand Rivers), the much higher loads from the Maumee and Sandusky make them higher priority watersheds for reducing impacts to Lake Erie. The concentrations and loads from the Maumee and Sandusky are higher than most other monitored tributaries in the entire Midwest region.
4. Based on historical evidence, we know that whenever we can reduce the DRP loads into the system, the conditions in Lake Erie will respond accordingly. Reductions in DRP inputs could result in near-term responses in ecosystem condition, particularly in the nearshore. Open lake responses may take longer (up to 10 years).





A comparison of spring discharge, loads and concentrations between 2011 and partial 2012 for the Maumee River at Waterville

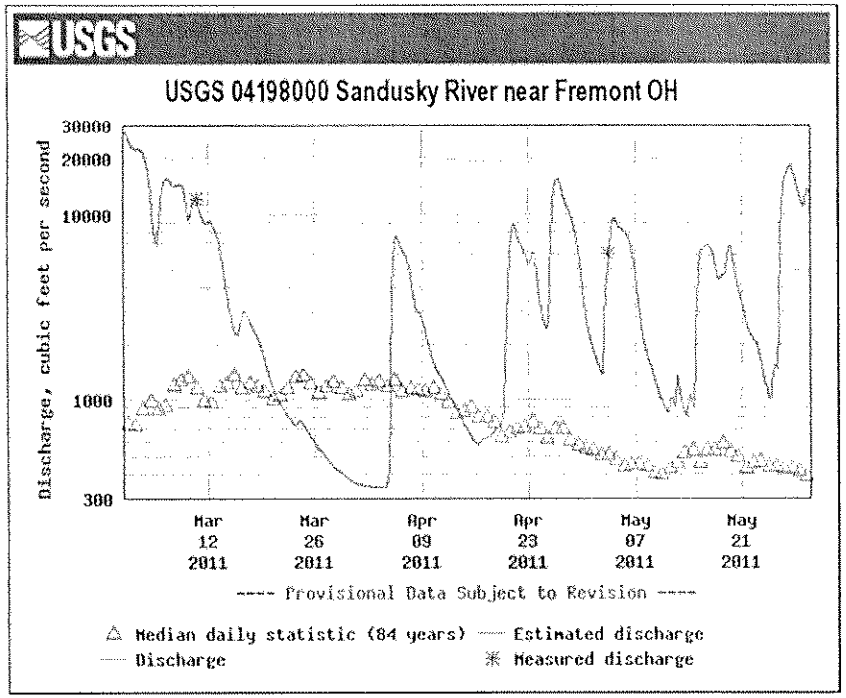
... based on USGS daily discharge.

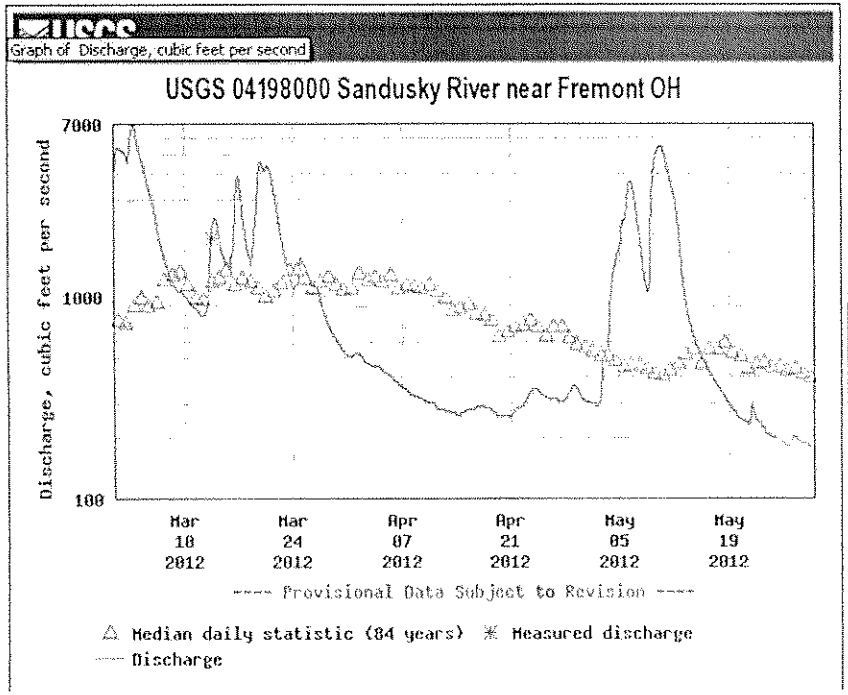
Maumee River at Waterville		CFS-days
2011-03-01 to 2011-05-28		1,750,890
2012-03-01 to 2012-05-28		404,084

... based on Heidelberg tributary loading program.

Maumee River at Waterville

	Total Spring Loads 2011, 3/01 thru 6/30		Partial Spring Loads 2012, 3/01 thru 5/22		2012 partial load as % 2011 total load
Parameter	FWMC, mg/L	Load, mtons	FWMC, mg/L	Load, mtons	
SS	192	937,508	199	185,887	19.8%
TP	0.462	2,280	0.408	380	16.7%
DRP	0.086	429	0.065	60	14.1%
Nitrate-N	4.85	24,148	3.06	2,857	11.8%





A comparison of spring discharge, loads and concentrations between 2011 and partial 2012 for the Sandusky River at Fremont

... based on USGS daily discharge.

Sandusky River at Fremont	CFS days
2011-03-01 to 2011-05-28	447,605
2012-03-01 to 2012-05-28	109,460

... based on Heidelberg tributary loading program.

Sandusky River

	Total Spring Loads 2011, 3/01 thru 6/30		Partial Spring Loads 2012, 3/01 thru 5/22		2012 partial load as % 2011 total load
Parameter	FWMC	Load, mtons	FWMC	Load, mtons	
SS	270	321,965	328	85,024	26.4%
TP	0.575	685	0.557	144	21.1%
DRP	0.100	120	0.058	15	12.5%
Nitrate-N	3.90	4,646	4.03	1,044	22.5%