Ohio Lake Erie Phosphorus Task Force Meeting Minutes
July 17, 2007
Riffe Center, Columbus, OH

Meeting Objective: *The focus of this meeting was examining how phosphorus moves on the land. Various aspects of soil tests, drainage, transport mechanisms and historical inputs on agricultural lands were presented and discussed.*

Task Force Chair Gail Hesse facilitated the introductions, provided meeting logistics and recapped the May 23 meeting (minutes as well as all presentations and handouts are available at www.epa.state.oh.us/dsw/index.html). She welcomed Nick Basta and Libbey Dayton from OSU who would be providing an in depth presentation on soil tests later in the meeting.

Julie Weatherington-Rice brought two samples of *Lyngbya wollei* that had been collected from Maumee Bay. One sample had been dried and was passed around for task force members to examine. The other sample was still wet, opened very briefly and closed to prevent permeating the room with the stench. Later in the meeting Julie presented photos of the algal conditions up along Maumee Bay. She is working with Sandy Bihn to hold public workshops around NW Ohio to raise awareness of the issues impacting the western basin.

Norm Fausey provided a presentation on the work of ARS in the drainage and transport of phosphorus in several agricultural systems. He presented historical information that had been collected in Castalia from 1969 – 1978, data from a wetland treatment system in Defiance County, and data from their current work in Upper Big Walnut Creek. Measurements were taken for SRP, TP, sediment and nitrogen. They looked at surface and subsurface runoff and found that SRP was higher in the subsurface runoff than surface runoff. This raised the question as to whether it was more important to manage surface or subsurface water transport. Either way, there is a need to manage runoff to influence how phosphorus moves. All work was done only during the growing season. Runoff from frozen ground would likely be higher. Some work is being done related to shutting off tile systems/discharge during the winter.

Nick Basta then discussed phosphorus chemistry and sequestration in soils and the utility of soil tests. He described the different characteristics of soils and how those characteristics influence the precipitation or transport of phosphorus. Phosphorus adsorbs to Al, Fe, Mn oxide which are components of clays. As soils get older, the concentrations of Al, Fe and Mn increase. The maximum solubility of phosphorus is between pH 5 and 7. Low sorption soils have a high sand content. Phosphorus reacts quickly with soil. The difference between adsorption and desorption is the number of chemical bonds. If there is only one bond, the P will desorb. If there are two it will adsorb.

Typically you will see more adsorption in the B Horizon because there are more clays at that level. P is more soluble in the upper horizons. Using modern equipment, phosphorus is typically applied only to the top 2 inches of soil. It is not making it down to the plant roots and being adsorbed, particularly if there is no rain. Soil test should be done to extract the labile phosphorus, that which is available over the whole growing season. Bray test works on most Ohio soils. If soil test results are too high, sorbents should be applied to prevent phosphorus runoff. These can be applied to whole fields or just to buffer/filter strip areas.

General discussion comments were:

- Last year spring loading of phosphorus was high
- Erosion was unprecedented
- Water clarity in the lake was the best seen in years this spring
- The tributary loading of phosphorus was not connected to impact on the biological community
- There was lower *Microcystis*, but we saw the introduction of *Lyngbya*
- There was high Mn in drinking water last year. Mn is released during anoxia
- Phosphorus would rather be precipitated than sorbed, but we don't typically see that now because phosphorus has been so overapplied.

Robert Mullen then gave an overview of historical phosphorus input on agricultural lands that he had compiled with the assistance of Kevin Elder. Commercial fertilizer preparation began in the 1950s. Phosphorus fertilizer application began in Ohio in the 1970s. 50% is applied in the Lake Erie basin, most as dry rather than in liquid form. Fertilizer sales reached a peak in the early 1980s but then dropped have remained stable. The application of liquid fertilizer has increased, but most is still dry applied.

Cattle numbers have decreased, swine have stayed the same. Corn and soybean acreage has not changed much. Soybean and wheat are typically no till while corn in NW Ohio is pretty much tilled. Fertilizer for both crops is applied at the same time. There is decreasing trend in an excess phosphorus trend in soils from 1975-2006.

General Discussion

- The amount of P in fertilizer is much higher than that in manure. Sometimes 2, 3, or 4 times higher.
- Heidelberg data from sites at Waterville on the Maumee, Fremont on the Sandusky are solely a measure of ag input. Funding from the Joyce Foundation added sites to the Tiffin and Blanchard Rivers.

Topics for the next agenda would be more focus on soil test and the utility of a P Index, and the assessment of the relative magnitude of the contribution of P from agriculture.

Attendance: Julie Weatherington-Rice – OFFWG; Larry Antosch – OFB; Dan Button – USGS; Paul Bertram – USEPA/GLNPO; Gerry Matisoff – CWRU; Todd Hesterman – Henry Co. SWCD; Robert Mullen – OSU Extension; Norm Fausey – ARS; John Kessler – ODNR; Rick Wilson, Gail Hesse, Julie Letterhos – Ohio EPA; Kevin Elder – ODA; Libbey Dayton, Nick Basta – OSU; Seth Hothem – NEORSD; Steve Davis – NRCS; John Crumrine, Jack Kramer – NCWQR; Chris Riddle – OLEO; Jeff Tyson – ODNR/DOW; Jeff Reutter – Ohio Sea Grant