Phosphorus Impairment in Lake Erie Tributaries in Ohio

Lake Erie Phosphorus Task Force
May 23, 2007

Overview

- What does “impairment” mean?
- What we’ve reported about phosphorus in Lake Erie basin tributaries
- How we’re addressing phosphorus impairments in the Lake Erie basin

Defining an "Impairment"

- Identified during our integrated surveys (chemistry, biology, physical measurements)
- Depends primarily on meeting biological criteria; chemistry mostly used to indicate causes and sources of impairment
- Chemistry sampling is for total phosphorus

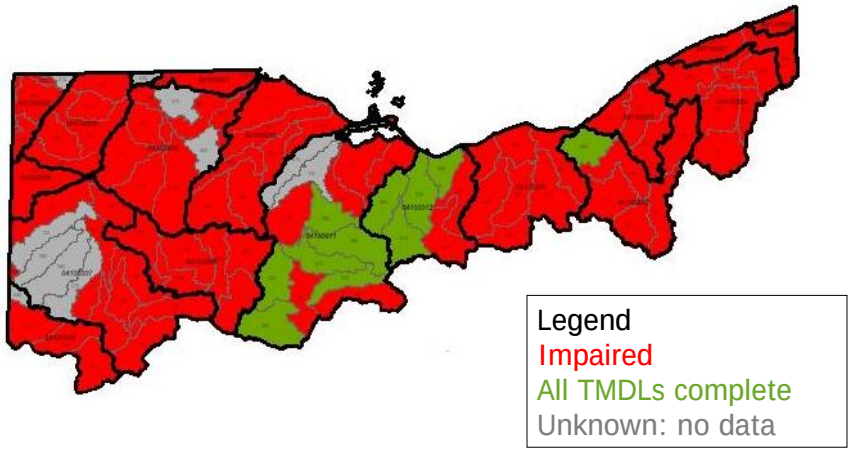
Clean Water Act Reporting: Sections 305(b) and 303(d)

- 305(b): report status of waters statewide
- 303(d) requires States to
  - List and prioritize impaired waters
  - For each impaired water, evaluate what action is needed to fix problems
- 303(d) is safety net for when the technological controls don't work

Summary Stats for Lake Erie Basin

- 331 HUCs in Ohio, 98 are in Lake Erie drainage
- Nearly all are considered to be impaired for some use (aquatic life, recreation, fish tissue), or we don't have data
- Statewide, nutrients cited as impairment cause in 42% of watersheds and 24% of large rivers

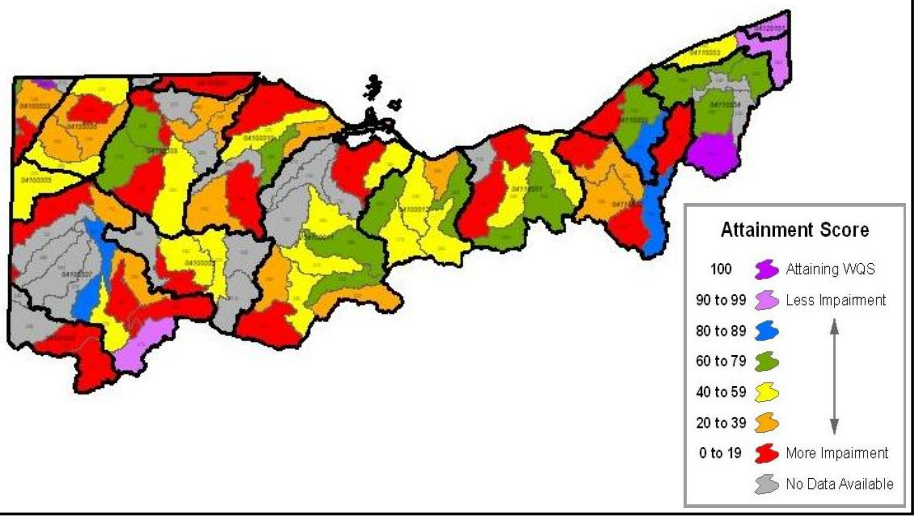
Overall Impairment



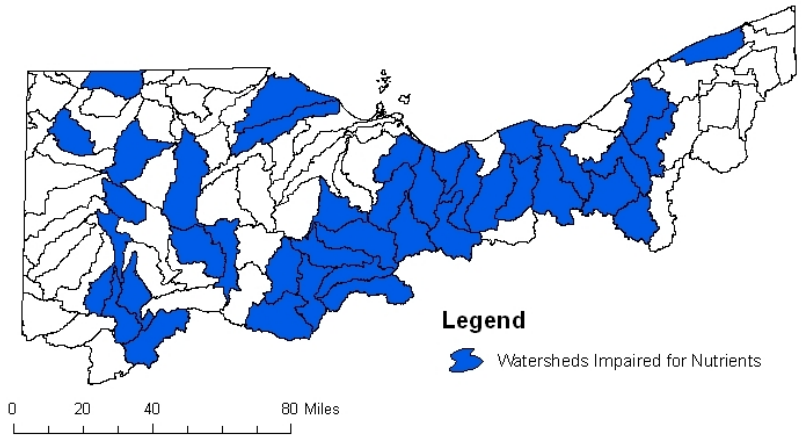
Aquatic Life Use Summary

- Of the 98 Lake Erie basin HUCs
  - 1: attaining WQS
  - 24: status "unknown" due to lack of data
  - 73: at least one area of not attaining WQS
    - 20: TMDLs completed
    - 53: TMDLs underway or planned
- 40 of the 73 are impaired for nutrients (55%)

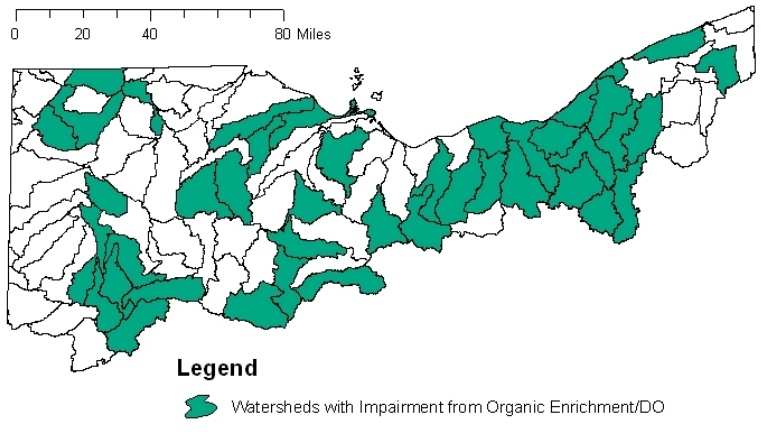
Aquatic Life Use Status



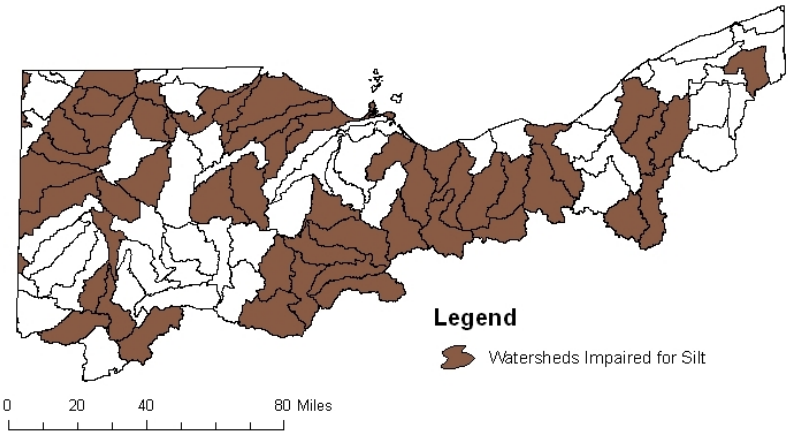
Impaired by Nutrients



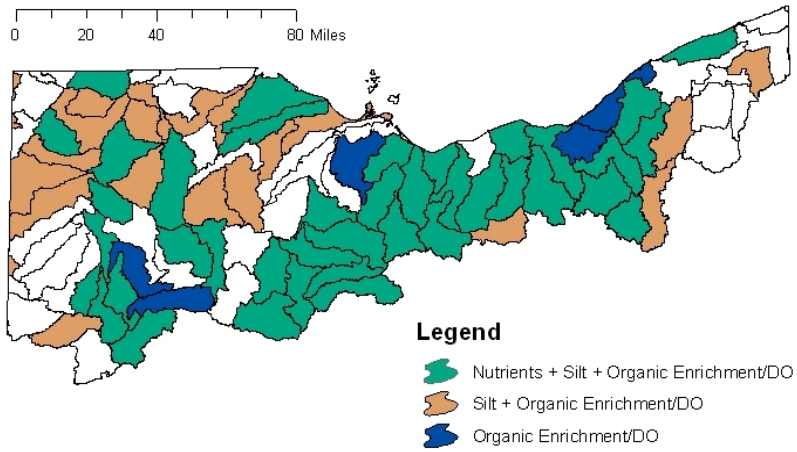
Impaired by Organic Enrichment/D.O.



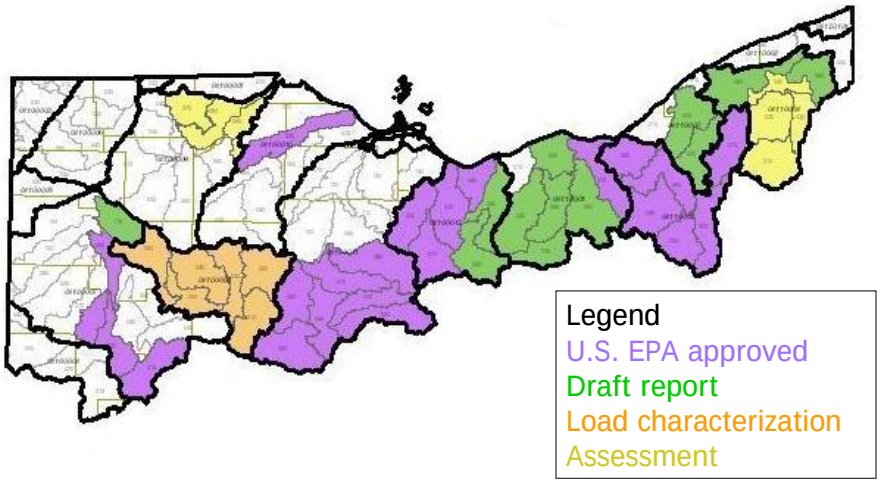
Impaired by Siltation



Impaired by Nutrients/Silt/Enrichment



Status of TMDLs



Deciding What to Target

- No numerical phosphorus criterion in Ohio WQS
- Narrative criterion: phosphorus should be limited to prevent nuisance growths of algae and weeds (OAC 3745-1-04, E)
- TMDL targets based on Ohio EPA data on associations of healthy aquatic communities to phosphorus levels

Deciding What to Target

- Best communities where phosphorus lowest
- Scaled by drainage area size and ecoregion
- Typical targets (mg/l):

Headwaters	Wadable	Small River	Large River
< 20 sq mi	20 - 200 sq mi	200 – 1000 sq mi	➢1000 ➢sq mi
0.08	0.10	0.17	0.30

Completed TMDLs in Lake Erie Basin

	D.O.	Phosphorus	Sediment
Cuyahoga	x	x	x
Rocky		x	
upper Auglaize		x	x
upper Sandusky		x	x
Old Woman			x
Euclid	x	x	x
Huron	x	x	x
Toussaint		x	x
Vermilion (draft)		*x*	*x*
Chagrin (draft)		*x*	*x*

TMDL Results for Phosphorus

Project	Year	Phosphorus Reduction (%)
Cuyahoga	2000-03	28 - 76
Rocky (Plum)	2001	14
upper Auglaize	2004	15 - 96
upper Sandusky	2004	25 - 65
Euclid	2005	41
Huron	2005	5 - 43
Toussaint	2006	18 – 32
Vermilion (draft)	--	*15 - 23*
Chagrin (draft)	--	*22*

Typical Point Source Recommendations

- Limit point source effluent phosphorus to 1 mg/l
  - Not new to major dischargers in Lake Erie basin
  - Sometimes down to 0.5 mg/l
  - Include compliance schedule
- New monitoring for facilities that don't monitor.
- Eliminate sanitary sewer overflows
- Limit combined sewer overflows (CSOs), especially in Cuyahoga, also in upper Auglaize

Typical Nonpoint Source Recommendations

- Habitat restoration and protection
- Agricultural conservation practices
- Manure management plans
- Home septic system improvements (including elimination in favor of central sewers)
- Watershed awareness education
- Try to work in sync with local watershed action plans

Recommendation Follow-Through

- Point sources: enforced through NPDES permits, long-term control plans, Director's orders
- Non point sources: have directed 319 and other incentive funding to TMDL recommendations, and worked with NRCS to align with their funding
- New monitoring to assess effectiveness