ILLINOIS ACTIVITIES TO ADDRESS NUTRIENTS

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April 3, 2012

Scope of Water Quality Impacts

- Public Water Supplies (nitrate)
  - 83 miles not supporting
  - 3 lakes not supporting
  - 8% of community water supplies have elevated nitrate
- Aquatic Life
  - Phosphorus a contributing cause in 35% of impaired stream miles

Scope of Water Quality Impacts, Cont'd

- Of lake acres impaired for aesthetic use
  - 82% impaired in part by total P
  - 81% impaired in part by aquatic algae
- 30 River/Stream segments impaired in part by aquatic algae
- Illinois is one of the largest contributors of nutrients to the Gulf of Mexico
  - 15 - 19% of total N load
  - 10 – 13% of total P load

Sources Contributing to Gulf

Statewide

	Nitrogen Load	Phosphorus Load
Sewage effluent	16%	47%
Non-point (primarily agriculture)	84%	53%

Urban stormwater important, not well quantified

Numeric Nutrient Criteria

- P standards 0.05 mg/L for lakes greater than 20 acres (aquatic life)
- Nitrate standard 10mg/L for public water supplies
- Continuing to work on identifying NNC for flowing waters (aquatic life)
- Exploring a protective standard for low P streams/rivers

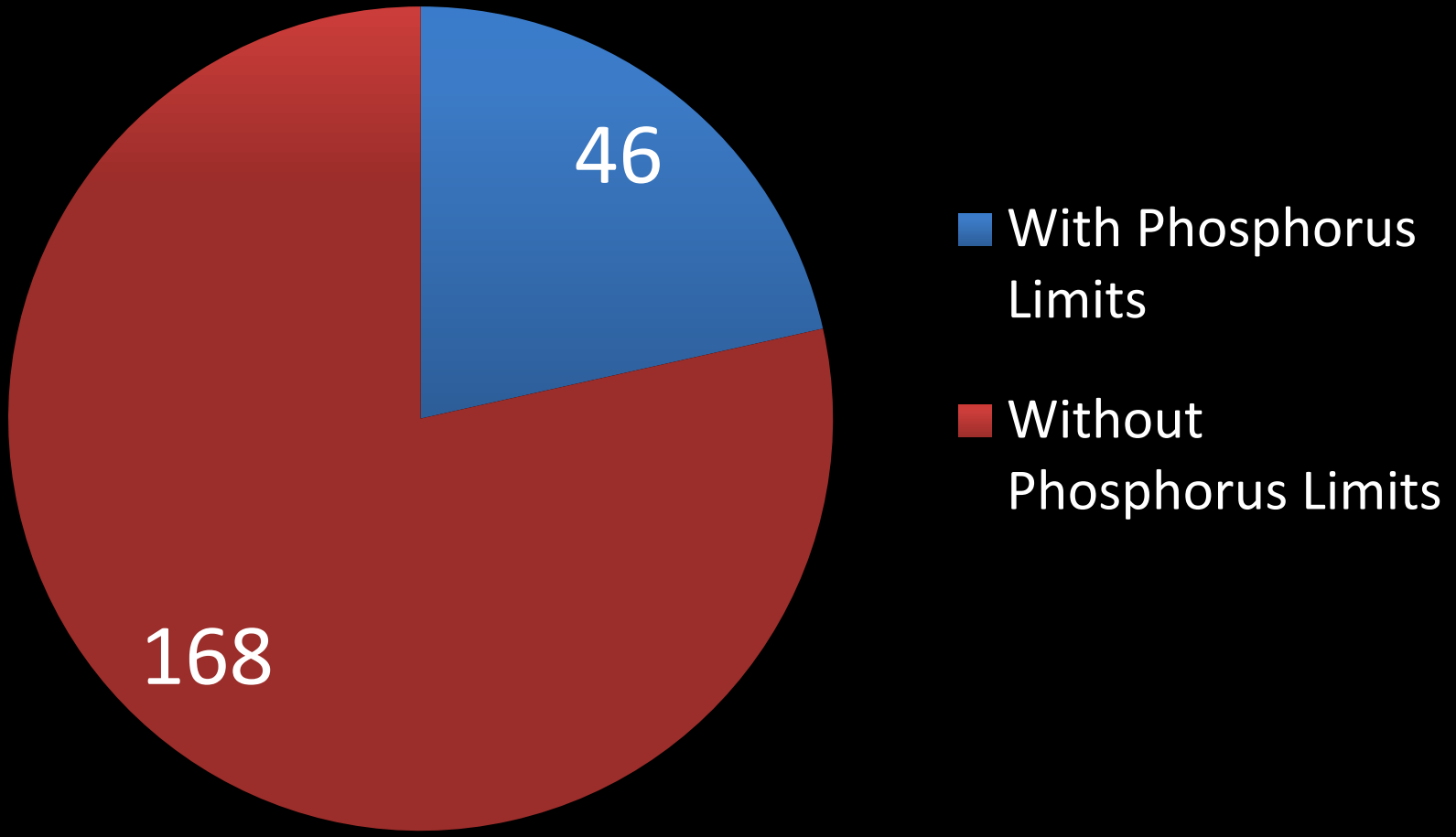
Activities Focused on Point Sources

- Phosphorus Effluent Standard – 1 mg/L P for new/expanded discharges
- Anti-degradation – required evaluation has resulted in P and/or N limits
- TMDLs for nitrate and P – WLA has resulted in permit limits

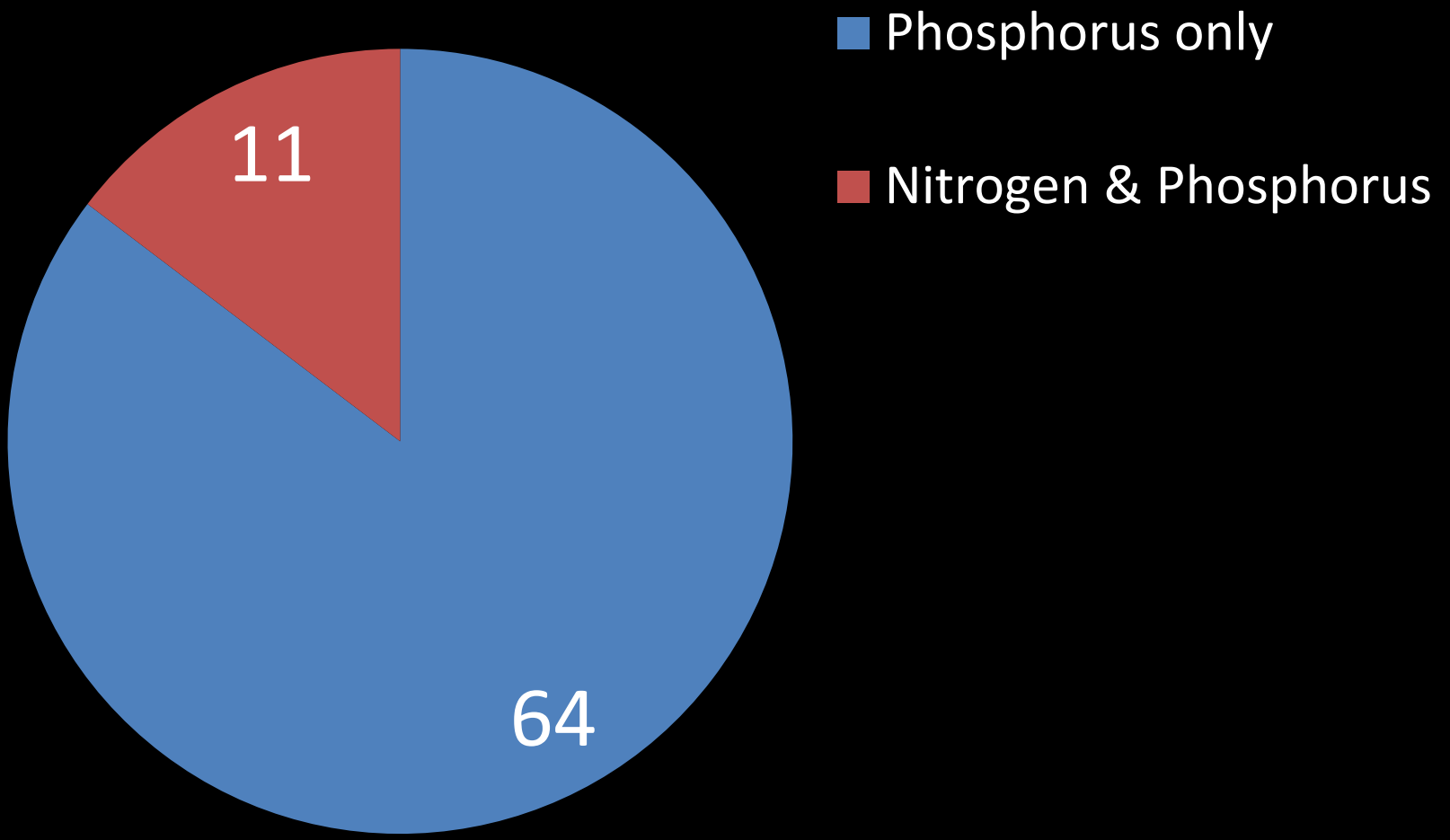
Activities Focused on Point Sources Cont'd

- USEPA letter to limit nutrients to address narrative standard – only approach under existing regulations is TMDLs – considering revised narrative
- Considering technology-based requirement triggered by impairments or facility upgrade.

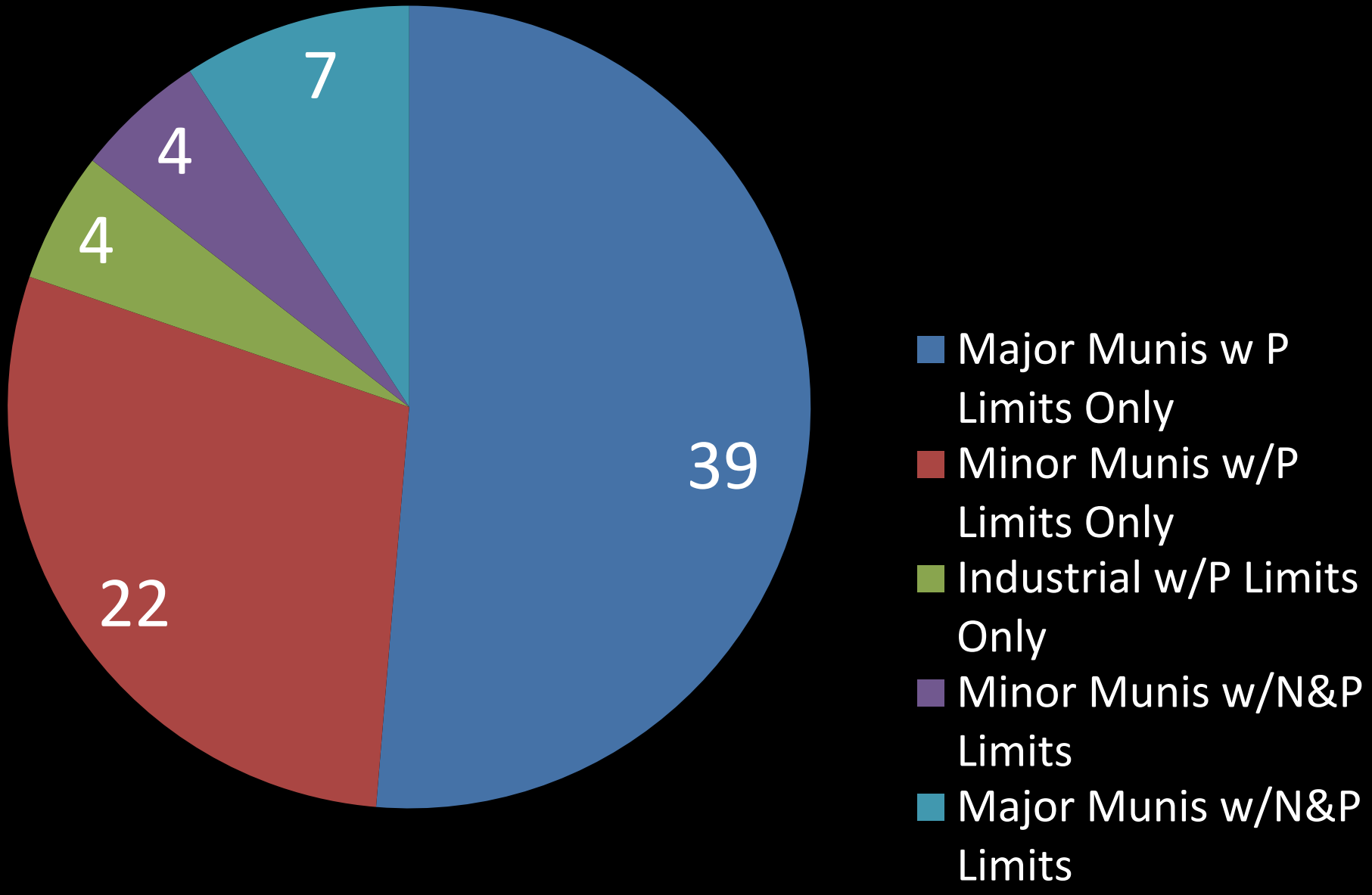
Major Municipal Facilities



All Facilities with Nutrient Limits



Types of Facilities with Limits



POTENTIAL NUTRIENT RULEMAKING

- Establish revised narrative
- Establish technology-based phosphorus standard
- Establish protection for low P streams

NUTRIENT WORKGROUPS

#1 – Language of narrative

#2 – Tech-based standard

#3 – Determining “significant contribution”

#4 – Low P streams

Potential Updates to the Illinois Narrative WQS

Existing Narrative WQS – "Offensive Conditions"

- Algae and aquatic plant growth of unnatural origin is prohibited
- The regulation was changed in 1990 striking aquatic life use protection language
- Regulation contains no hint as to what is unnatural

Potential Updates to the Narrative

- The presence of algae or aquatic plants in a water body will be considered an offensive condition with regard to aquatic life use, and could be termed cultural eutrophication, when in any 24 hour period, both of the following conditions occur:
  - the dissolved oxygen water quality standard of Section 302.206(b)(1)(A), 302.206(b)(2)(A), 302.206(c)(1)(A) or 302.206(c)(2)(A) is not achieved, and,
  - dissolved oxygen exceeds 100% saturation.

The Dissolved Oxygen Signature of Excess Algae/Aquatic Plants

- Using this pattern of algae impact as the guiding principle of determining when too much phosphorus is present has advantages:
  - Grounded in the DO WQS
  - Easily measured
  - Directly in the cause/effect chain
- Excess Phosphorus ➡ Excess Algae ➡ Low DO = Eutrophication

Workgroup #2 – Technology-Based Standards for Phosphorus

- Triggered when:
  - Cultural eutrophication exists
  - Major upgrade occurs
- Illinois Association of Wastewater Agencies (IAWA) conducted a study to define reasonable, cost-effective performance level for phosphorus nitrogen

Workgroup #2 – Technology-Based Standards for Phosphorus

- Initial recommendation on P effluent standard:
  New construction – 1 mg/L
  Retrofit – 1.5 mg/L

Why Technology-Based Standards?

- No clear cause-effect relationship allowing numeric WQS
  - Other factors drive algae/plant growth in IL streams
- Technology-based limits are proactive
- Technology-based limits get directly to what can be done to reduce phosphorus
  - Regulating ~10% of facilities addresses ~90% of P
- Technology-based limits allow financial planning
- Unmanageable WQBELs are avoided

How much phosphorus will technology-based standards remove?

- 45% of P in IL streams is from point sources
- 55% of P in IL streams is from non-point sources
  - Dr. Mark David, U of IL
- 90% of point source flow will be covered under technology limits
  - If average reduction is from 3.5 mg/L to 1.0 mg/L P

- Then ~ 64% of the point source P is removed
- Therefore, ~29% of total stream P is removed

Phosphorus Modeling

- Nutrient Workgroup #3 met on February 22, 2012
- The purpose of this group was to determine which point sources of phosphorus are significant to downstream algae or aquatic plant impairment

Phosphorus Modeling (Cont'd)

- Phosphorus modeling possibly could show which discharges need a P limit
- This would help Illinois EPA with the current mandate to regulate P based on the existing narrative standard and help with the drafting of the future regulations for dischargers upstream of waters determined to be culturally eutrophic

Phosphorus Modeling (Cont'd)

- Good discussion occurred on this subject
- It was postulated that P modeling would be difficult
- A criterion, probably an arbitrary one, would be needed in conjunction with modeling to "draw a line in the sand" and determine what is a significant P contribution
- Using the current cut-off of facilities 1 MGD or larger to regulate P at all such sources upstream of algae/plant impaired waters was suggested

Phosphorus Modeling (Cont'd)

- The suggestion to simply regulate P at 1 mg/L at facilities 1 MGD or larger gained some (but probably not complete) consensus
- Illinois EPA will prepare a protocol based on this idea that will include a summary of how this approach would affect P point source discharges and overall P loading to an example watershed – the Upper Des Plaines River.

Illinois Priority Watersheds to Reduce Nutrient Loss

Watershed	Target Nutrient
Lake Bloomington	Total Phosphorus Nitrate
Lake Vermilion	Total Phosphorus Nitrate
Lake Decatur	Total Phosphorus Nitrate
Vermilion River (Illinois Basin)	Nitrate
Salt Fork Vermilion River (Wabash Basin)	Nitrate
Lake Mauvaise Terre	Total Phosphorus Nitrate

2011