WMWA Workshop

Nutrient Management

Nutrient Management

- ***Identify Problem Nutrient(s)***
- ***Identify Nutrient Source***
- ***Determine Required Reduction Level***
- ***Identify Management Strategies***
- ***Implement Strategies***

Why Do It?

- ***Clean Water Act***
- ***Improve Water Quality***
- ***Protect Fishery***
- ***Protect Property Values***
- ***Protect State Economy***
  - ***4 Billion Dollar Industry***

Clean Water Act – Federal Law

- Clean Water Act requires waterbodies to meet "fishable and swimmable" standards
- CWA implemented through NPDES Permit Program (EPA)
- NPDES Program requires SWPPP Permits and where appropriate TMDL Studies (MPCA)
- **TMDL Implementation Plans** must be incorporated into SWPPP Plans (Municipal)
- SWPPP Permits (MPCA) require compliance with WLA and LA (Municipal)

STOP

CLOSED

Based on recent monitoring for E. coli bacteria

Serious risk of illness may be present

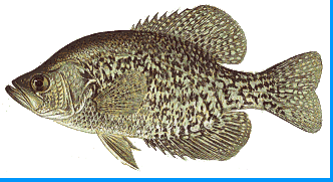
THIS AREA IS CLOSED TO SWIMMING

FOR MORE INFORMATION:

1-800-441-4636 ext. 1460

www.wibeaches.us

Productivity















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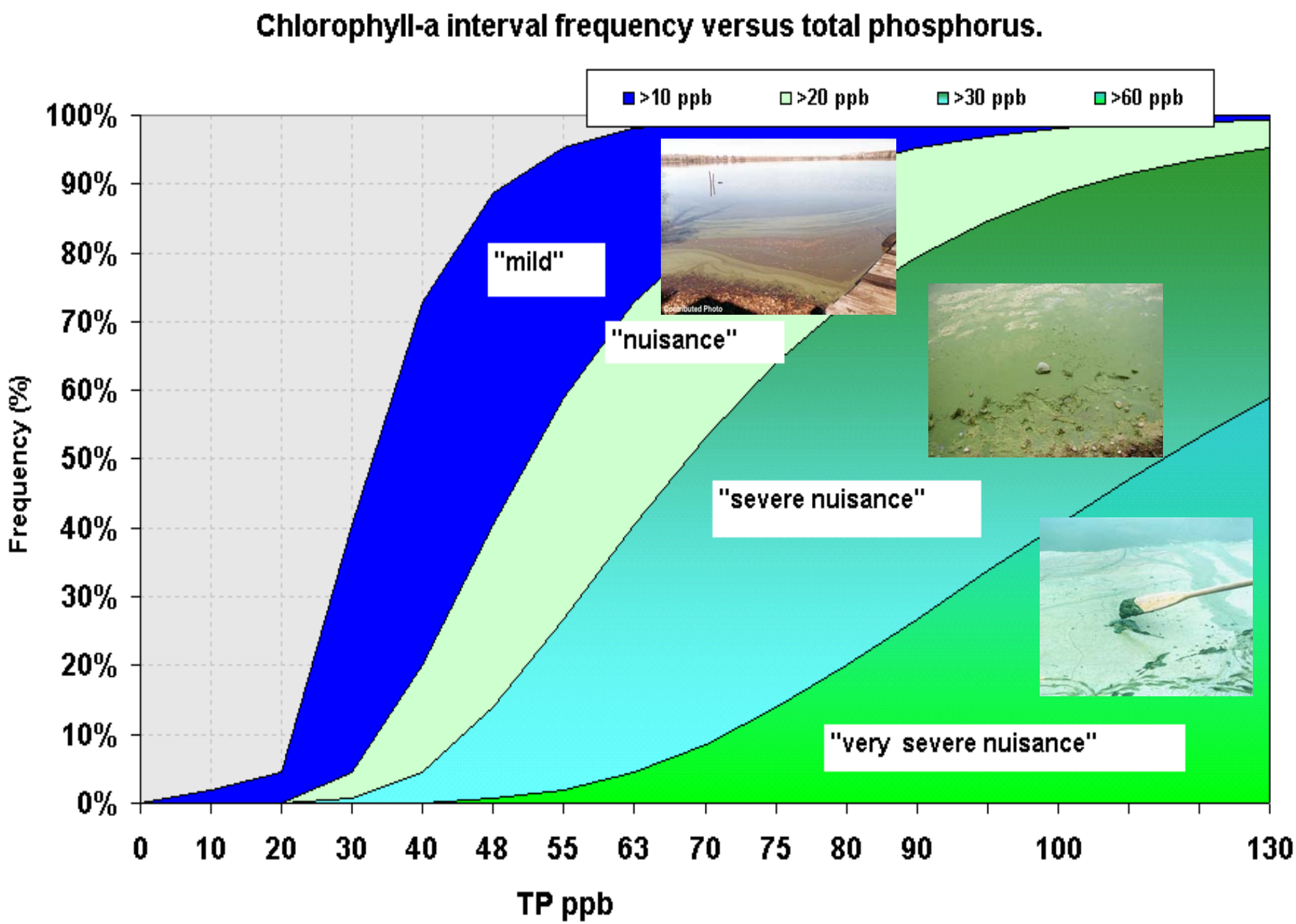
Chlorophyll-a interval frequency versus total phosphorus.
>10 ppb
>20 ppb
>30 ppb
>60 ppb
"mild"
"nuisance"
"severe nuisance"
"very severe nuisance"
Contributed Photo
Frequency (%)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
10
20
30
40
48
55
63
70
75
80
90
100
130
TP ppb

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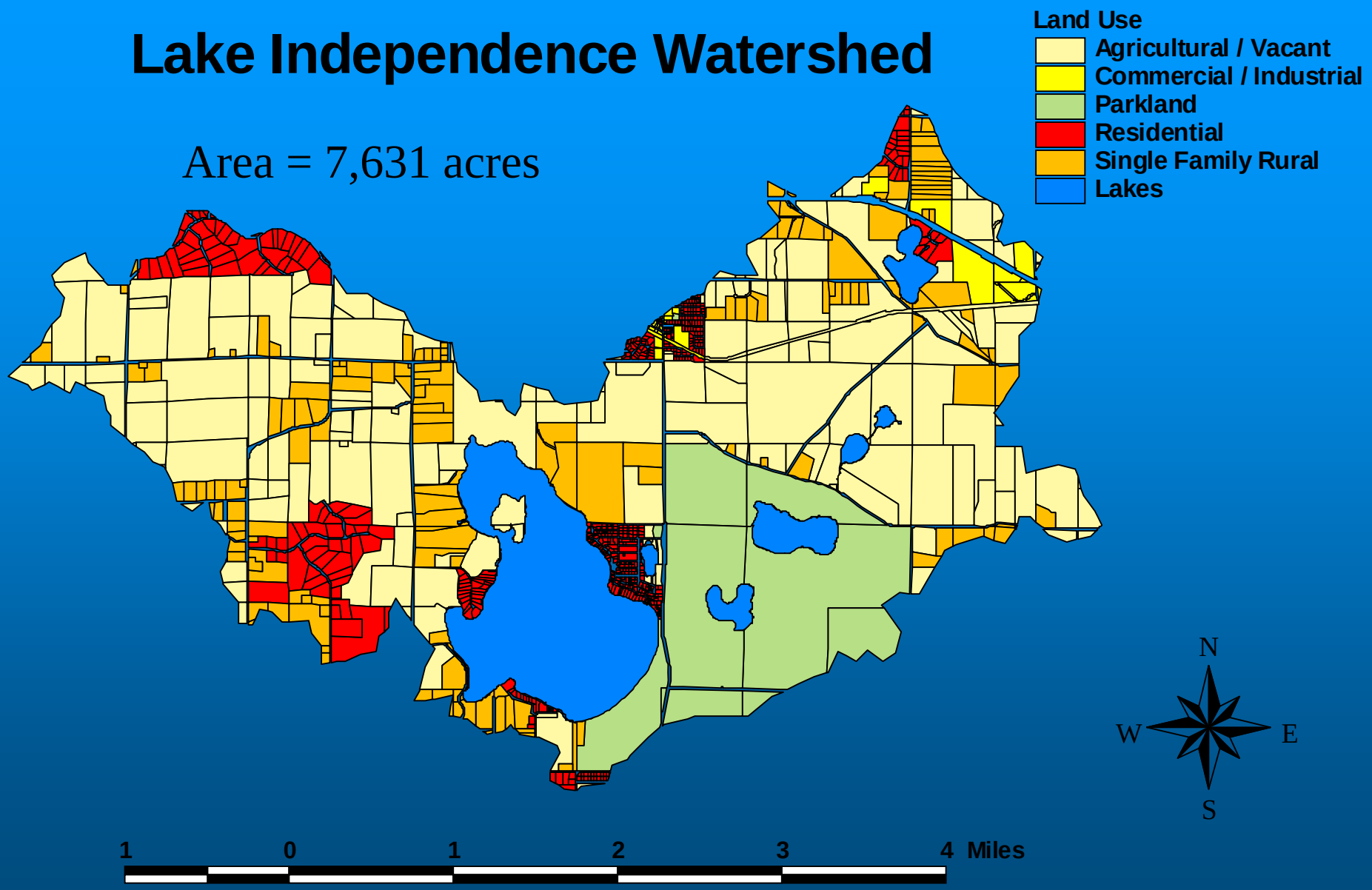
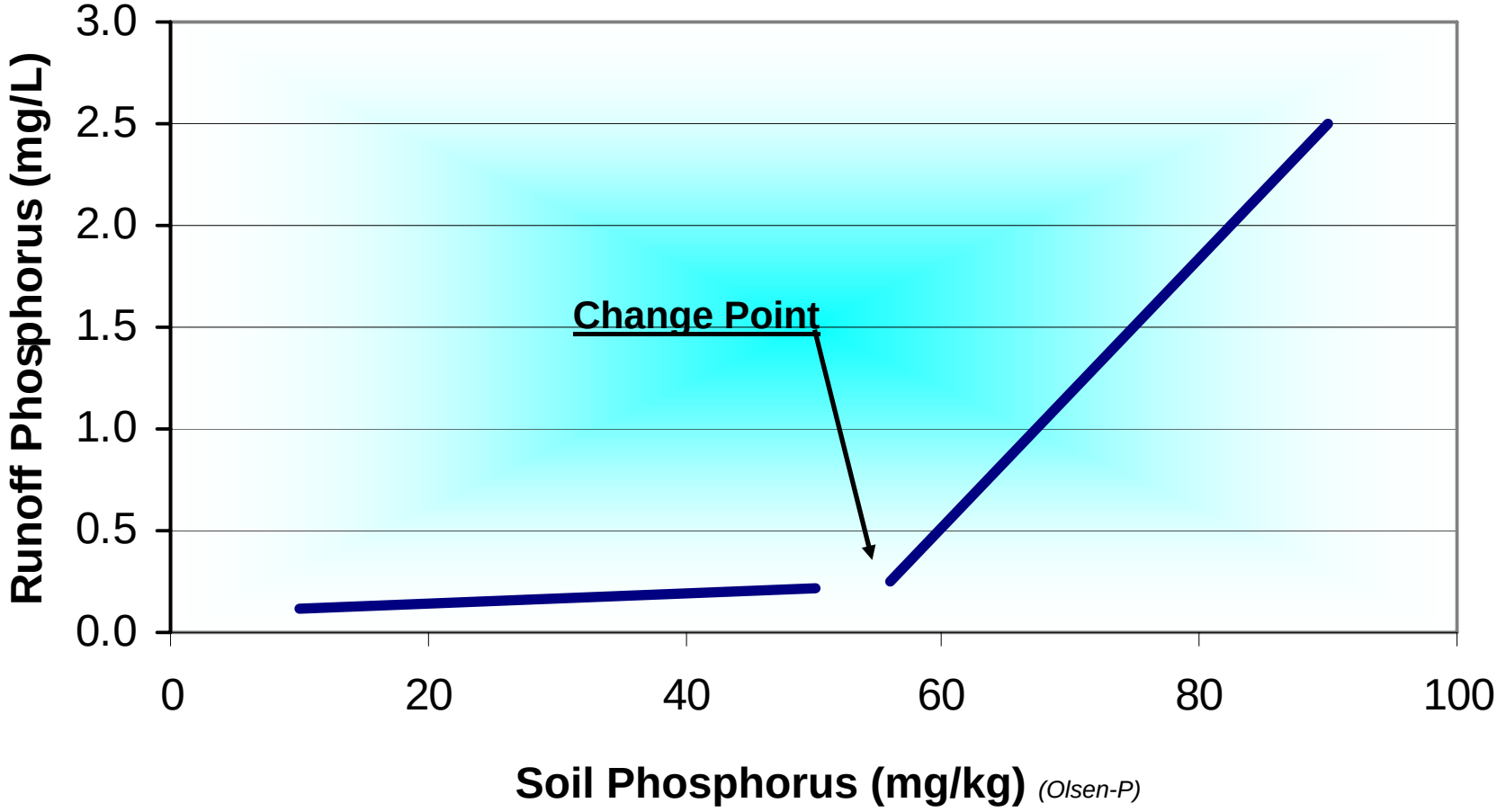
Lake Independence Watershed

Area = 7,631 acres



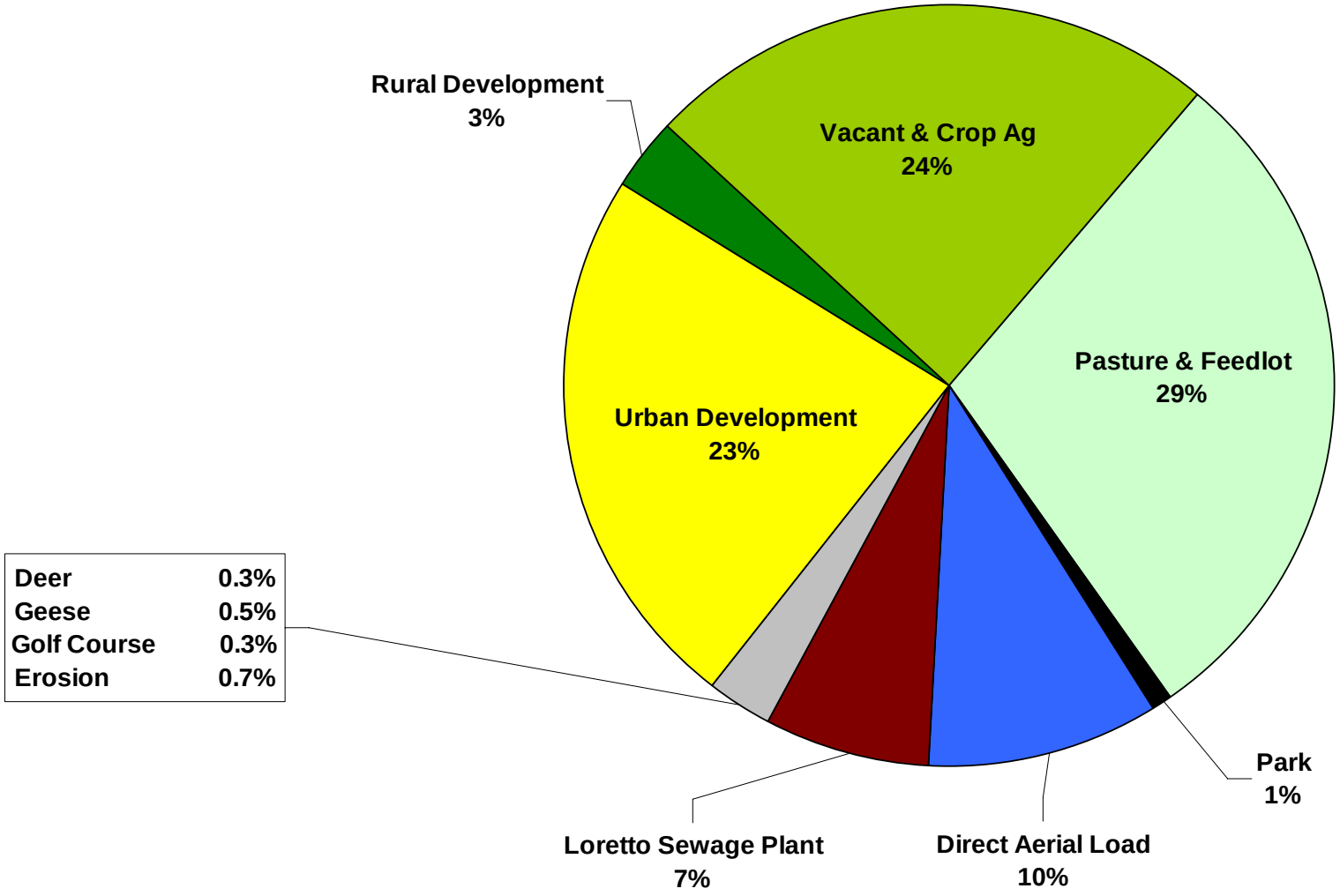
Relationship of Soil-P Level to Runoff-P Concentration



Heckrath et al., 1995

External Sources of Phosphorus Loading to Lake Independence

Total= 2334 lbs/year



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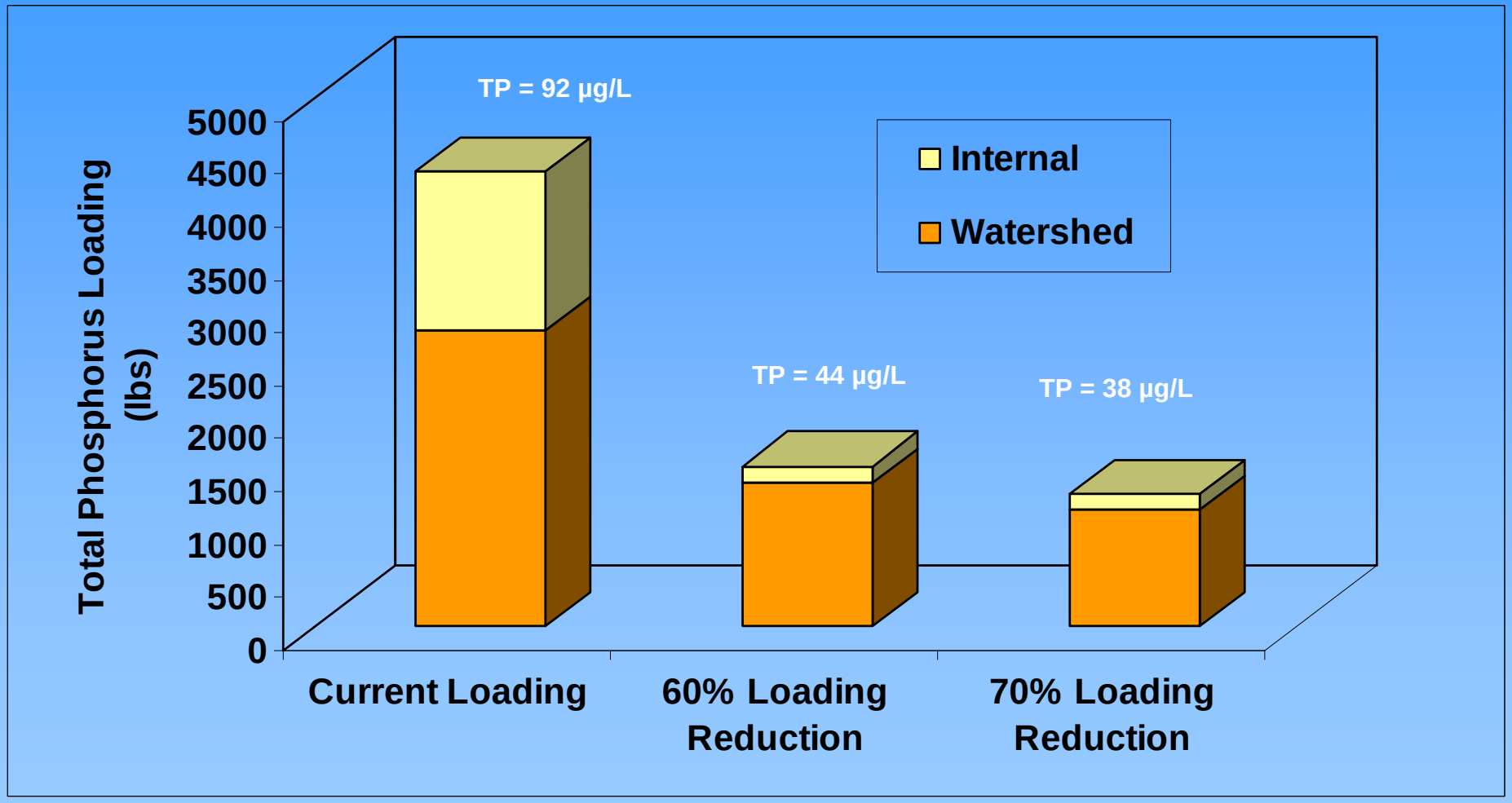
Eutrophication Criteria under consideration for NCHF: TP, Chlorophyll-a and Secchi Depth

Ecoregion	TP (ppb)	Chl-a (ppb)	Secchi (M)
(Class 2a): * Stream trout des. lakes	< 20	< 6	> 2.5
(Class 2b): lakes, aquatic rec. use	< 40	< 13	> 1.5
(Class 2b): * shallow lakes, aquatic rec. use	< 60	< 20	> 1.0

* Draft values under development / review

Lake Sarah

Total Phosphorus Loading



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Source Reduction

Implementation Costs

- Plymouth Creek Pond $1,000,000
- Plymouth Creek Stabilization $1,000,000
- Timber Creek $400,000
- Woods Creek $250,00
- County Road 9/61 $200,000
- East Side Ponds $700,000
- Shoreline Restoration $200,000
- Rain Gardens $172,000
- Annual Street Sweeping $60,000
- Curly-leaf Pondweed Control $400,000
- **Total $4.3 million**