

Mitchell Lake Association 2011

Mark Enochs
September 22, 2011

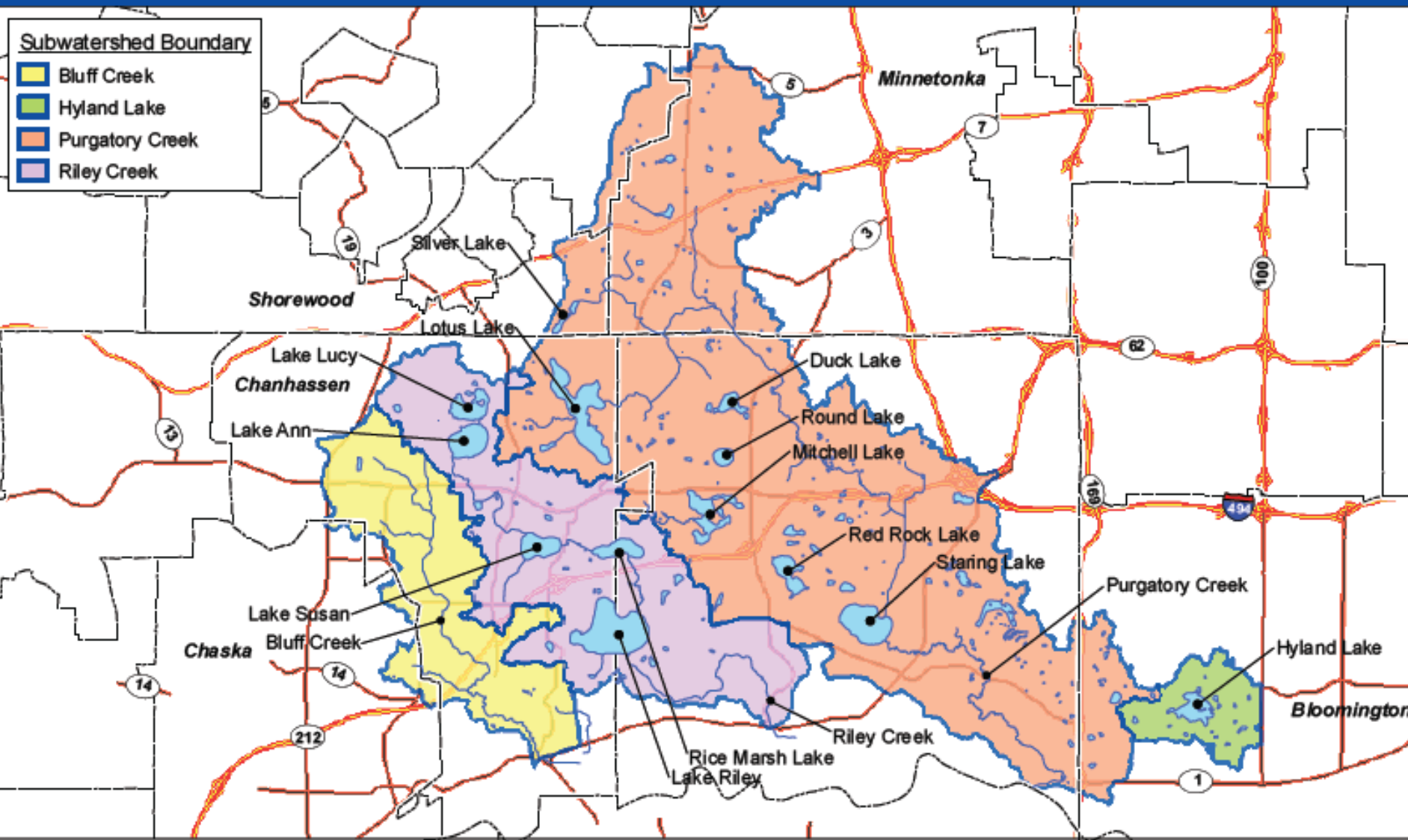


**Riley
Purgatory
Bluff Creek
Watershed District**

CH2MHILL.

Subwatershed Boundary

- Bluff Creek
- Hyland Lake
- Purgatory Creek
- Riley Creek



- Legend**
- Municipal Boundary
 - Lakes
 - Streams
 - Highway
 - State Highway



Watershed Location and Boundaries
Riley Purgatory Bluff Creek Watershed District

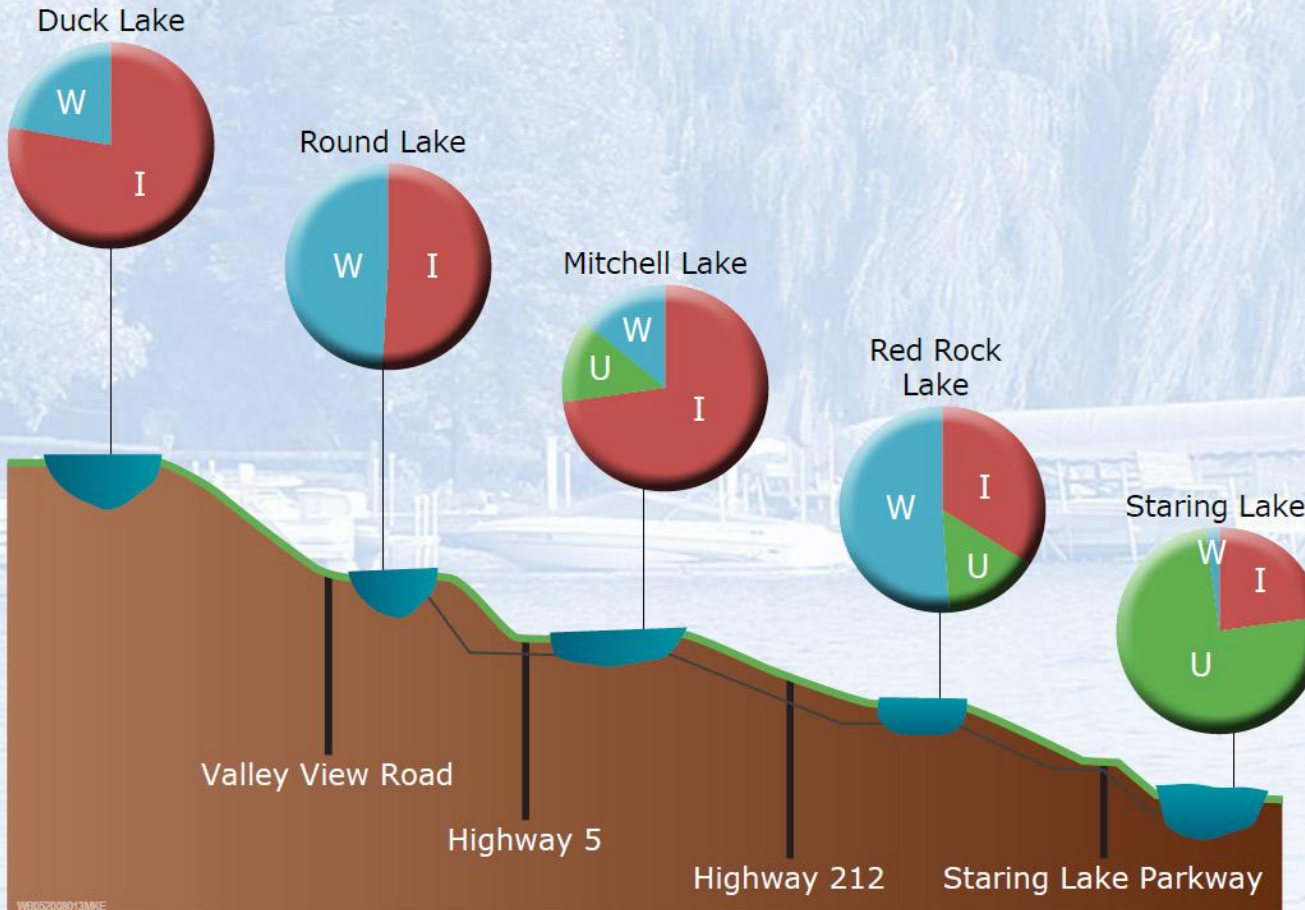




- “One Water” Resource Management
- Citizen Leadership and Priority
- Resource Specific
- Restore and Protect
- Measureable Benefits

PURGATORY CREEK "One Water"

LAKE PHOSPHORUS LOADING CONTRIBUTIONS BY SOURCE*



LEGEND

The charts on this page reflect the relative proportion of phosphorus loading into each lake of the Riley Creek One Water.

W = Watershed Sources (W)

Watershed sources of phosphorus are considered to be inputs coming directly from the watershed. Examples would include runoff from impervious surfaces or stormwater systems.

I = Internal Sources (I)

Internal contribution examples include the release of phosphorus from anaerobic lake sediments or the die-of of aquatic plants.

U = Upstream Sources (U)

Upstream sources of phosphorus are contributions directly from upstream lakes. Outflow from these lakes goes into Riley Creek, which carries the phosphorus load into downstream lakes.

* According to the District's 1996 Mass Balance Study shown in the 2nd Generation Water Management Plan, and supplemented with Use Attainability Analyses as necessary.

Figure 1-5
Phosphorus Loading Contributions by Source in the Purgatory Creek One Water
Riley Purgatory Bluff Creek Watershed District

District Projects in Mitchell Lake...

2008 & 2009:

SolarBee pilot project for hypolimnetic mixing

Result: Ineffective mixing

2008: Sediment Oxygen Demand sampling

2009: Community Sediment Oxygen Demand sampling

2009:

- Hypolimnetic Oxygenation Pilot. Result: *Successful*
- Calcium Peroxide Addition: Result: *Positive, but inconclusive*

District Projects in Mitchell Lake...

2008: Weed Harvesting. 272 tons removed

May: Curly leaf pondweed

2009: Weed Harvesting. 732 tons removed

May: Curly leaf pondweed

July: Eurasian water milfoil

2010: Weed Harvesting. 459 tons removed

May: Curly leaf pondweed



July: Eurasian water milfoil

**1,462 tons
total**

2011 Herbicide Treatment (almost)




Mitchell Lake Herbicide Treatment Area
Eden Prairie, MN

 Resident Responsibility 17.5 Acres
 Weed Herbicide District 17 Acres

0 700 1,400
Feet

Mitchell Lake Water Quality Improvement Project

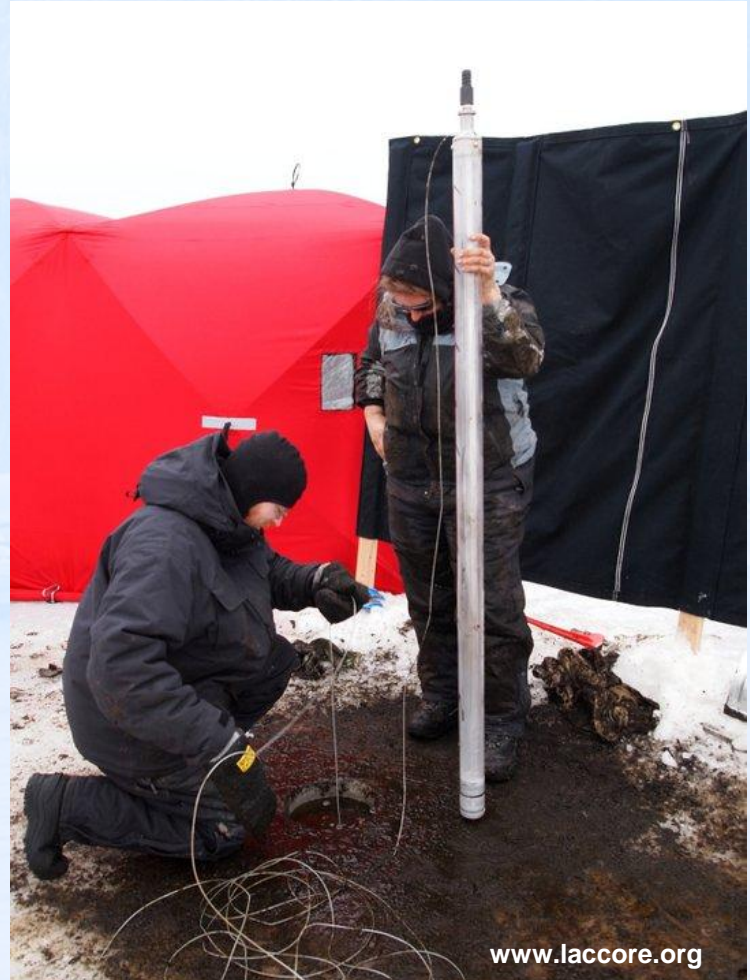
 Riley Purgatory Bluff Creek Watershed District

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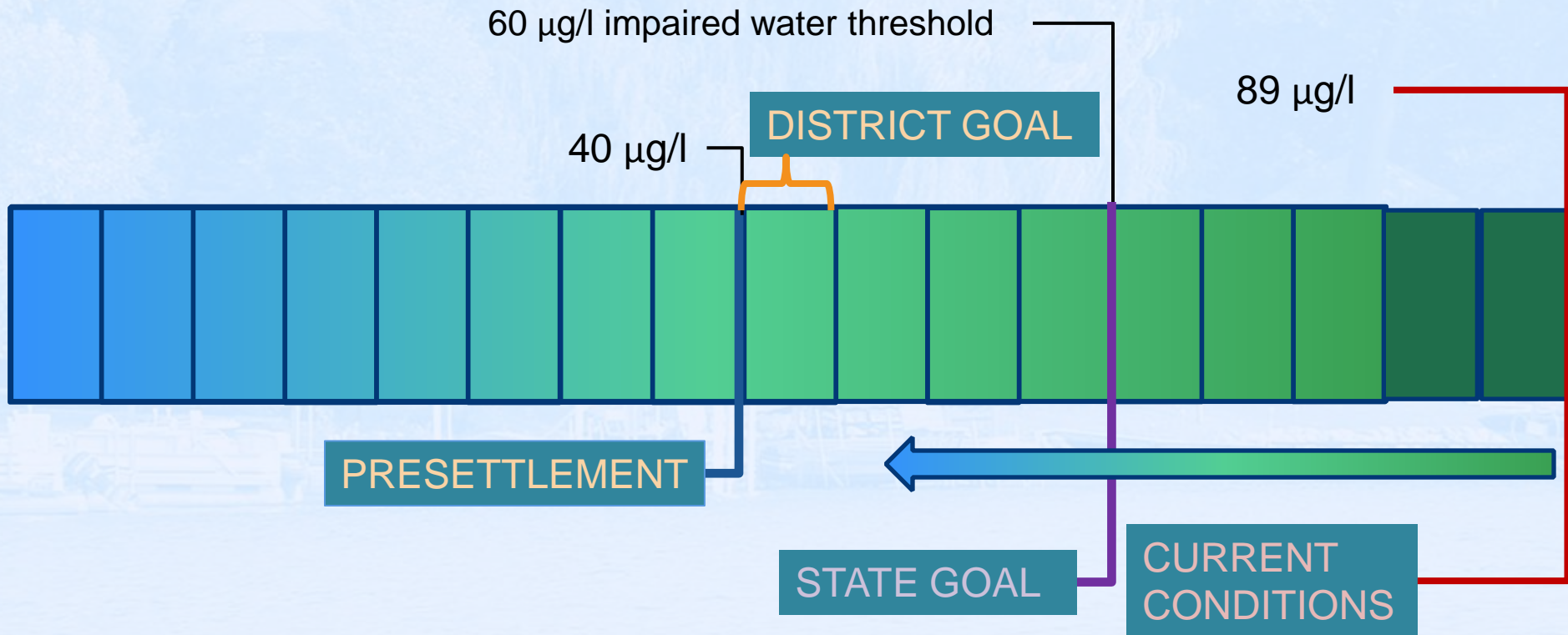
2011 Herbicide Treatment

- MLA-initiated. Thank you
- 2,4-D was to be used
- MnDNR-classifies Mitchell as **Natural Environment Lake**
- Thus, herbicide use by anyone in Mitchell is not permitted, including...
 - Individual homeowners
 - City
 - District
 - Others
- MnDNR does allow the use of copper sulfate for algae or snail control, but not for submerged plant control

2011: Paleolimnology – Record of historic water quality from sediment cores



Mitchell Lake Lake Reclamation Status

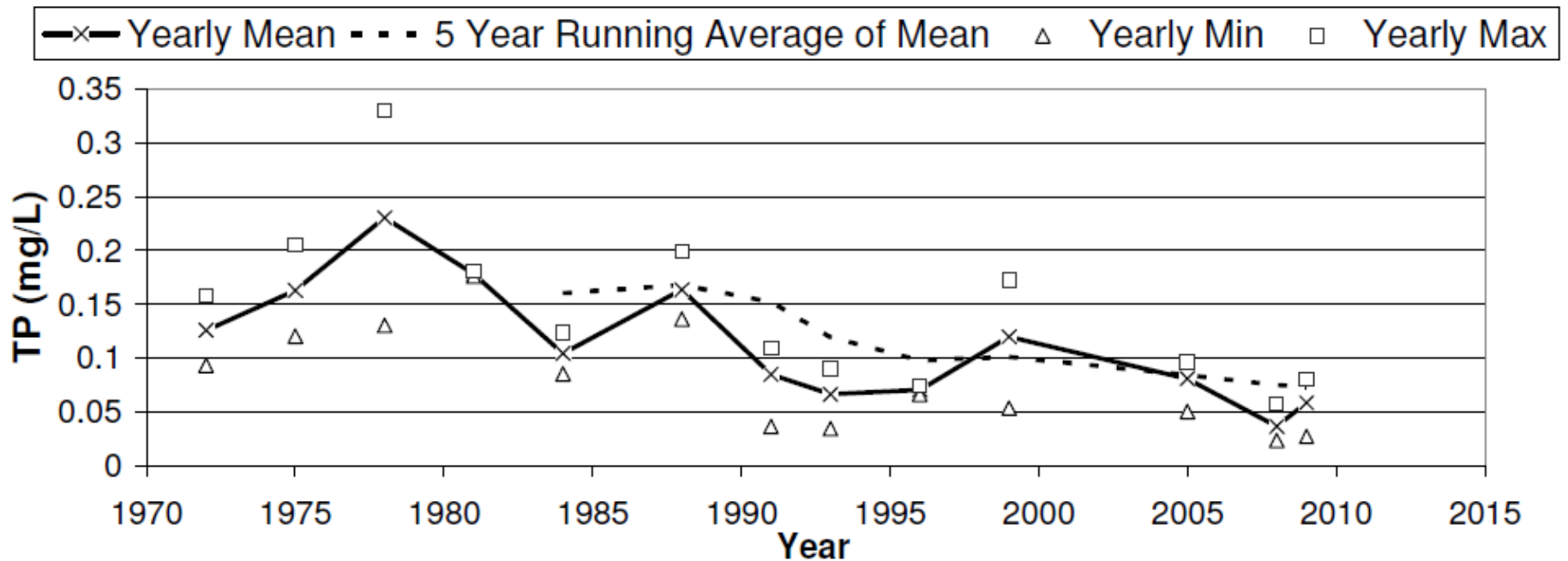


Mitchell Lake Recommendations

- Sedimentation near presettlement value →
Stormwater infrastructure is working
- Sedimentation legacy responsible for current impairment
- **Short term** (2012 to 2022):
Improve water quality with in-lake methods to counter legacy
- **Long term** (2022 - 2072):
Incremental adoption of LID in watershed

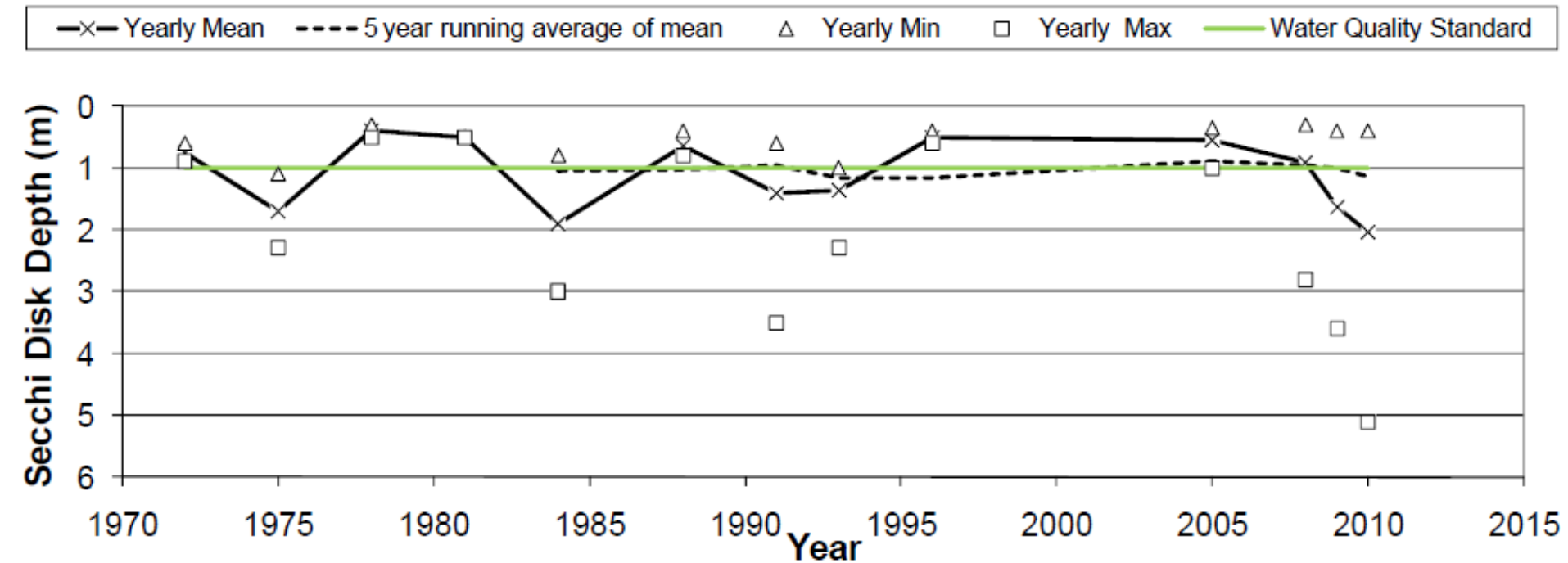
Current Status

Mitchell Lake Total Phosphorus 5 Year Running Average



Current Status


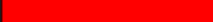

Mitchell Lake Secchi Disk Depth Year Running Average



Lake Reclamation Alternatives

Lake and applicable reclamation methods	Biomanipulation / fisheries management	Winter aeration for carp management	Invasive weed management	Native aquatic plant restoration	Hypolimnetic oxygenation	Calcium nitrate	Destratification	Winter aeration / oxygenation for nutrient control	Alum micro-floc	Conventional alum, deep application
Lucy	X			Unknown						
Ann	X	NA		NA	X			X		
Susan	X			X						
Rice Marsh	X	X	NA	NA	NA		NA		Unknown	
Riley	X	NA		NA						
Round		NA	X	NA		X				
Mitchell		NA	X	NA	X					
Red Rock		NA	X	NA						
Lotus	X			Unknown						
Silver	Unknown	NA		Unknown	NA	Unknown	Unknown		Unknown	
Starling	X				NA	Unknown				
Duck	Unknown	NA		Unknown	NA	Unknown	Unknown		Unknown	
Hyland	Unknown	NA		Unknown	NA	Unknown	Unknown		Unknown	

Key

	Desireable alternative
	Undesireable / contraindicated / ineffective
	Undecided, needs more study.
X	Recent / current project in District
NA	Not applicable

Questions?



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