A photograph of a river flowing through a forested area. The water is brownish and turbulent, suggesting rapids or a narrow channel. The banks are lined with trees, some of which are bare, and patches of snow are visible on the ground. The sky is overcast.

Economic Valuation of Ecosystem Services in West Michigan

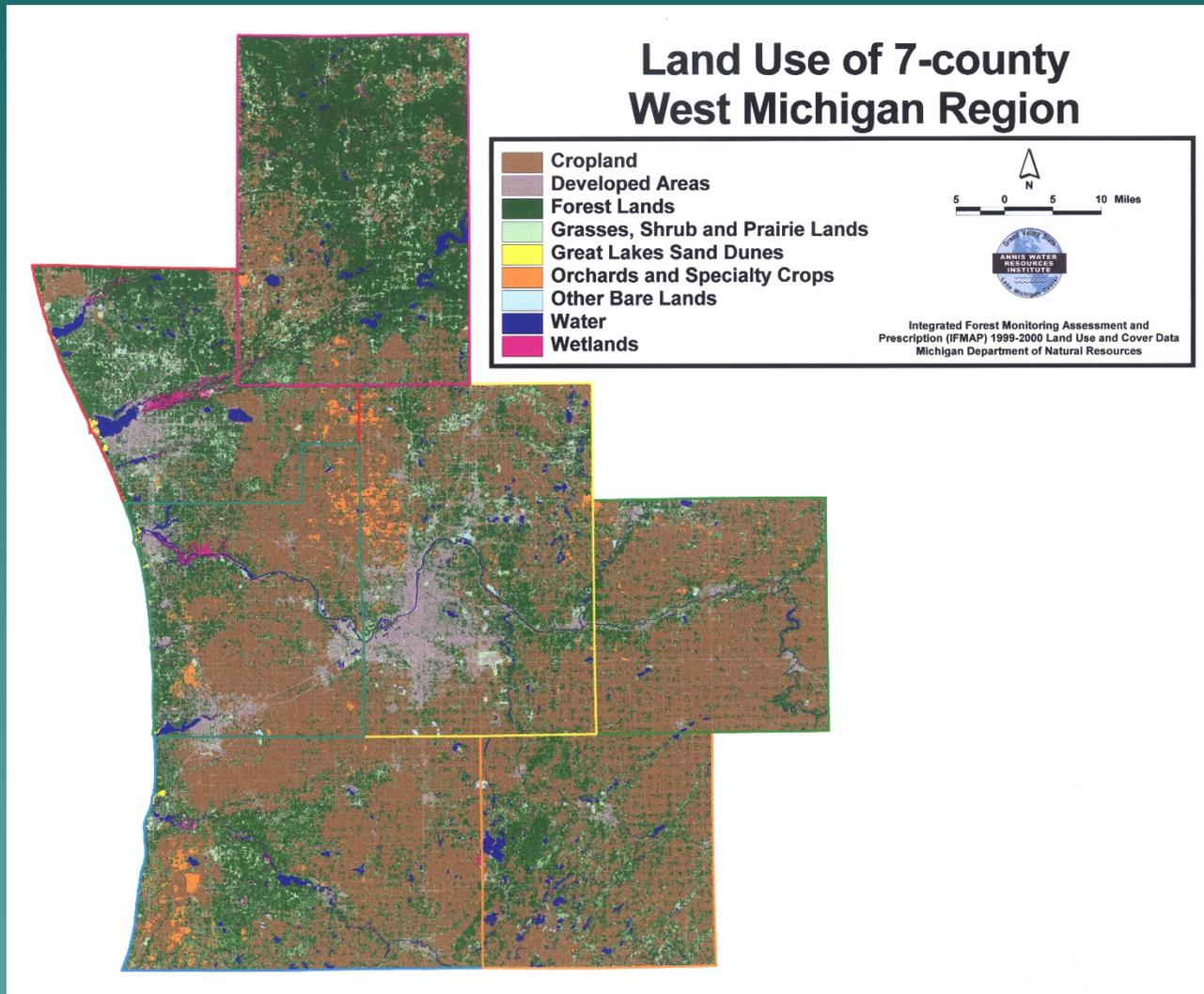
Paul Isely

Green Infrastructure,
Grand Rapids MI
August 8, 2015

Generation 1

INVEST

Mapping



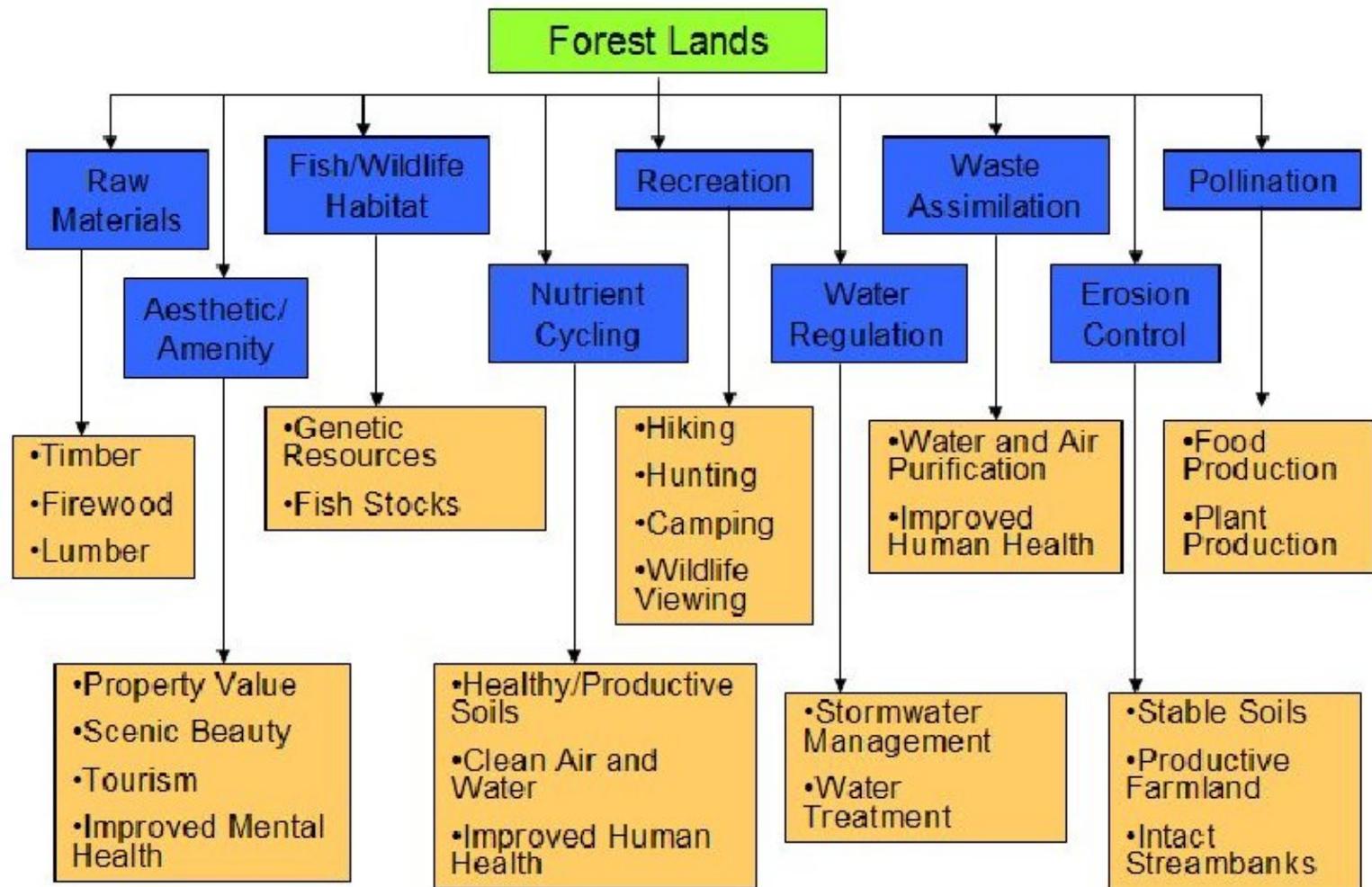
- ❖ 30 IFMAP land use categories combined into 9 project categories

Total Value Calculation

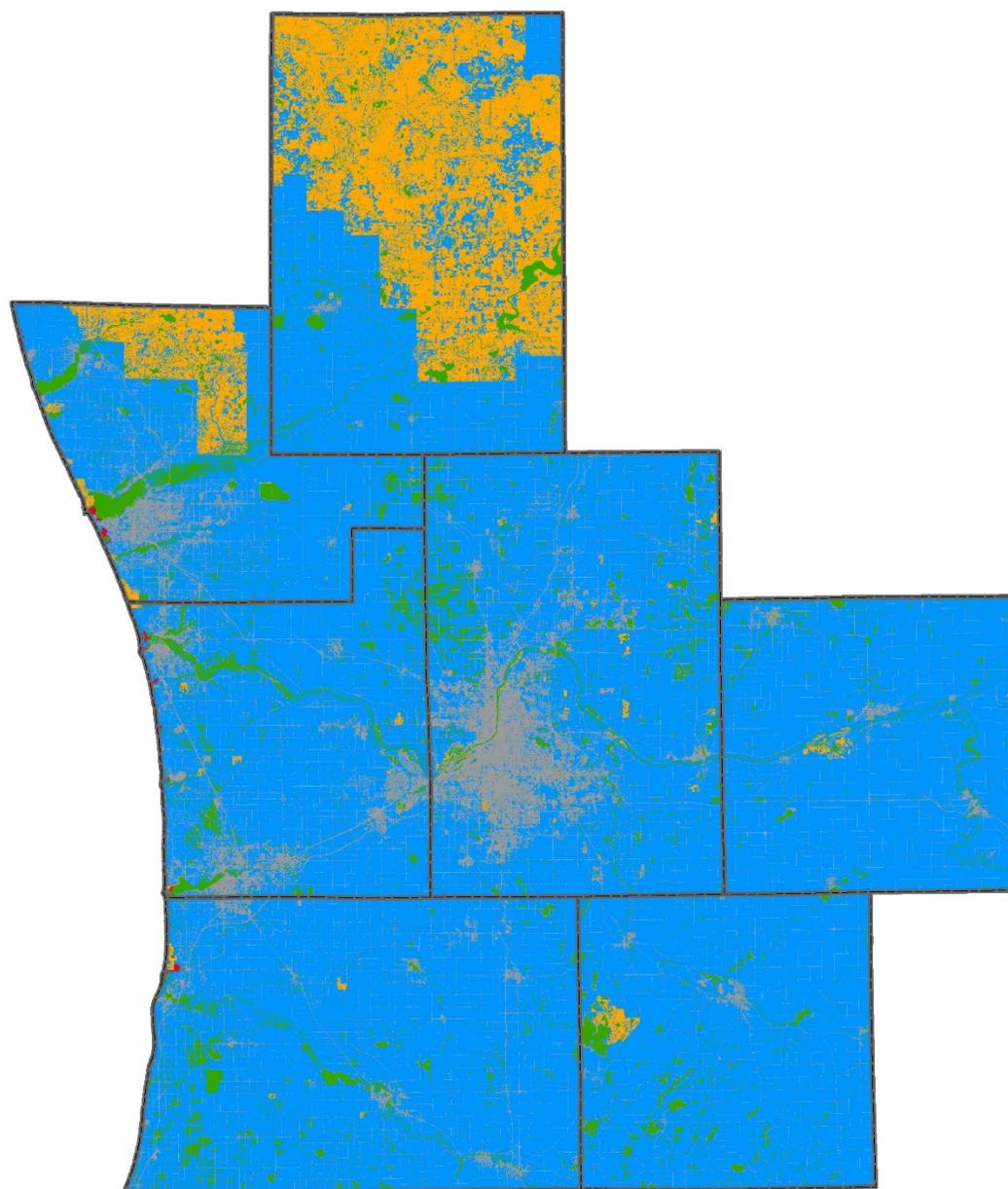
Green
Infrastructure

Ecosystem
Services

Economic
Value
(Benefits to
Humans)



Geographic Summaries



Generation 2

Rein in The Runoff

A stylized silhouette of a mountain range in shades of teal, located at the bottom right of the slide.

PLOAD Results for Total Phosphorus Loadings with and without BMPs - 2006

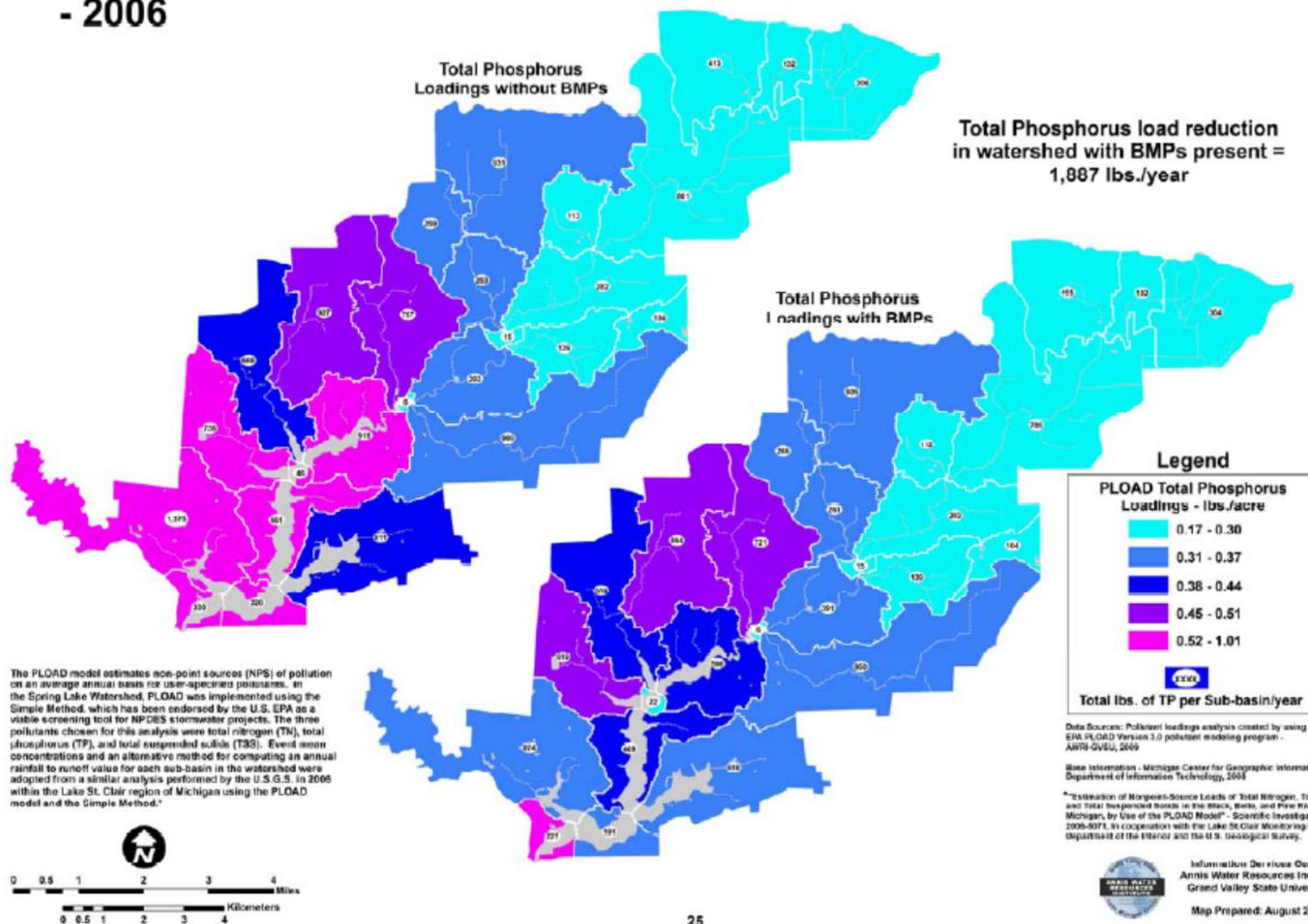


Figure 4-4. PLOAD results with and without BMPs for Total Phosphorus mapped to the ArcSWAT sub-basins for the Spring Lake Watershed's 2006 land use and land cover.

Table 5-6. Cost Effectiveness Associated with Pollutant Load Reductions Per Treated Acre.

BMP	Total Installation Cost	Total Opportunity Cost ¹	25 Year Maintenance Costs ²	Total Cost	Net Costs Associated with Pollutant Load Reductions ³		
					TP	TN	TSS
Bioretention/ Rain Gardens	\$21,500	(\$17,100)	\$3,773	\$8,173	\$13,622	\$24,038	\$8,603
Vegetated/ Bio-Swales	\$16,620	(\$20,500)	\$483	(\$3,396)	(\$7,718)	(\$8,490)	(\$5,660)
Green Roofs	\$686,070	(\$442,765)	\$9,056	\$252,361	\$315,451	\$315,451	\$315,451
Pervious Pavement	\$371,100	(\$340,400)	\$0 ⁴	\$30,700	\$56,330	Not Calculated	\$33,736
Constructed Wetlands	\$22,500	(\$25,900)	\$483	(\$2,917)	(\$6,077)	(\$3,740)	(\$3,241)

¹ These represent added costs associated with traditional stormwater management practices and/or replacement costs.

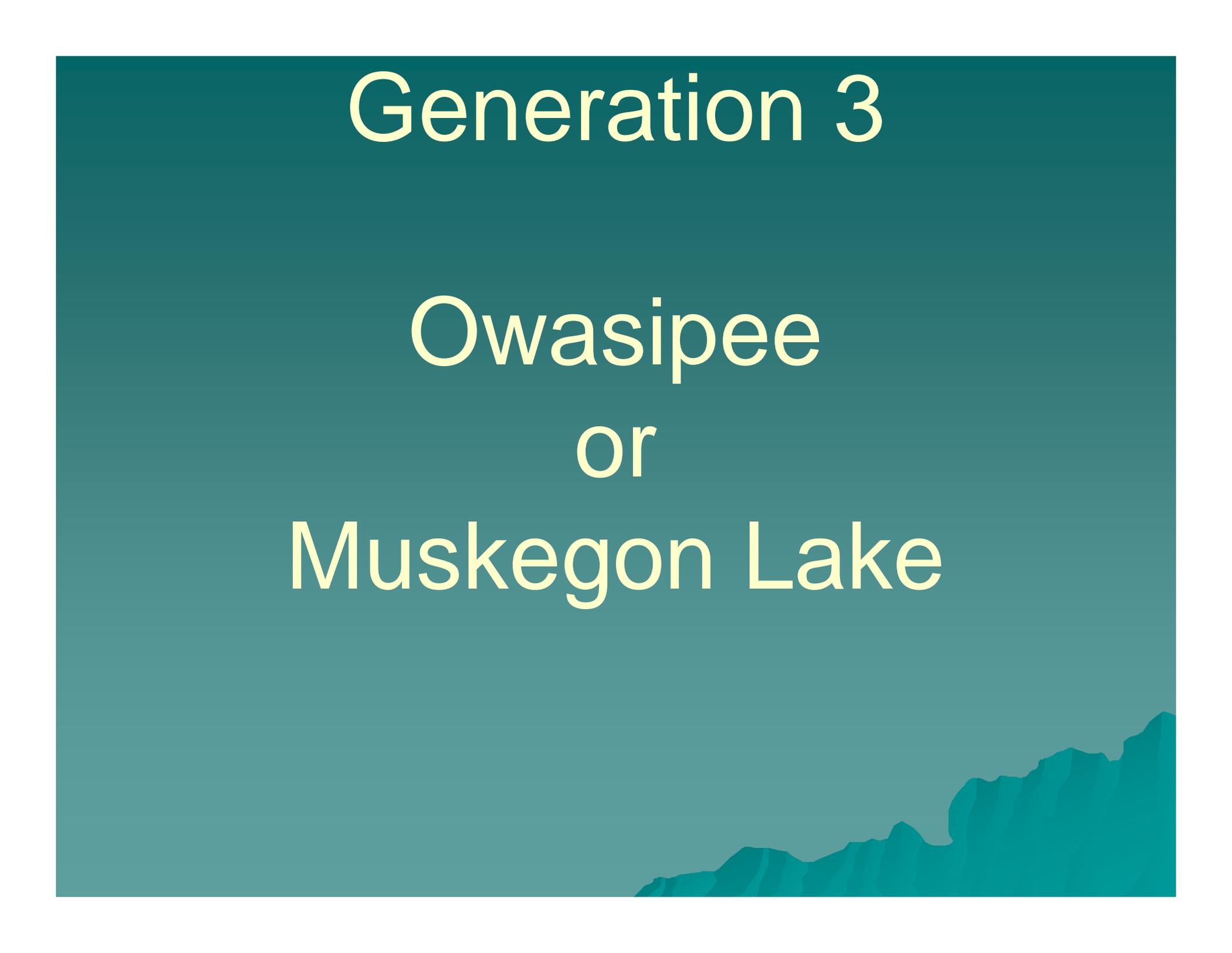
² Maintenance costs were the net present value of annual maintenance costs from Table 5-5 over 25 years, given a 5% discount rate.

³ These costs were adjusted based upon the BMPs' ability to reduce pollutant loads (Table 5-4).

⁴ Zero maintenance costs for pervious pavement are based on the assumption that current pervious pavement technologies were used and that high efficiency street sweeping is already in place.

Generation 3

Owasipee
or
Muskegon Lake

The background is a solid teal color. At the bottom right corner, there is a silhouette of a mountain range in a darker shade of teal.

Owasippe

Land Cover and Use with Surrounding Ownership Owasippe Scout Reservation

Legend

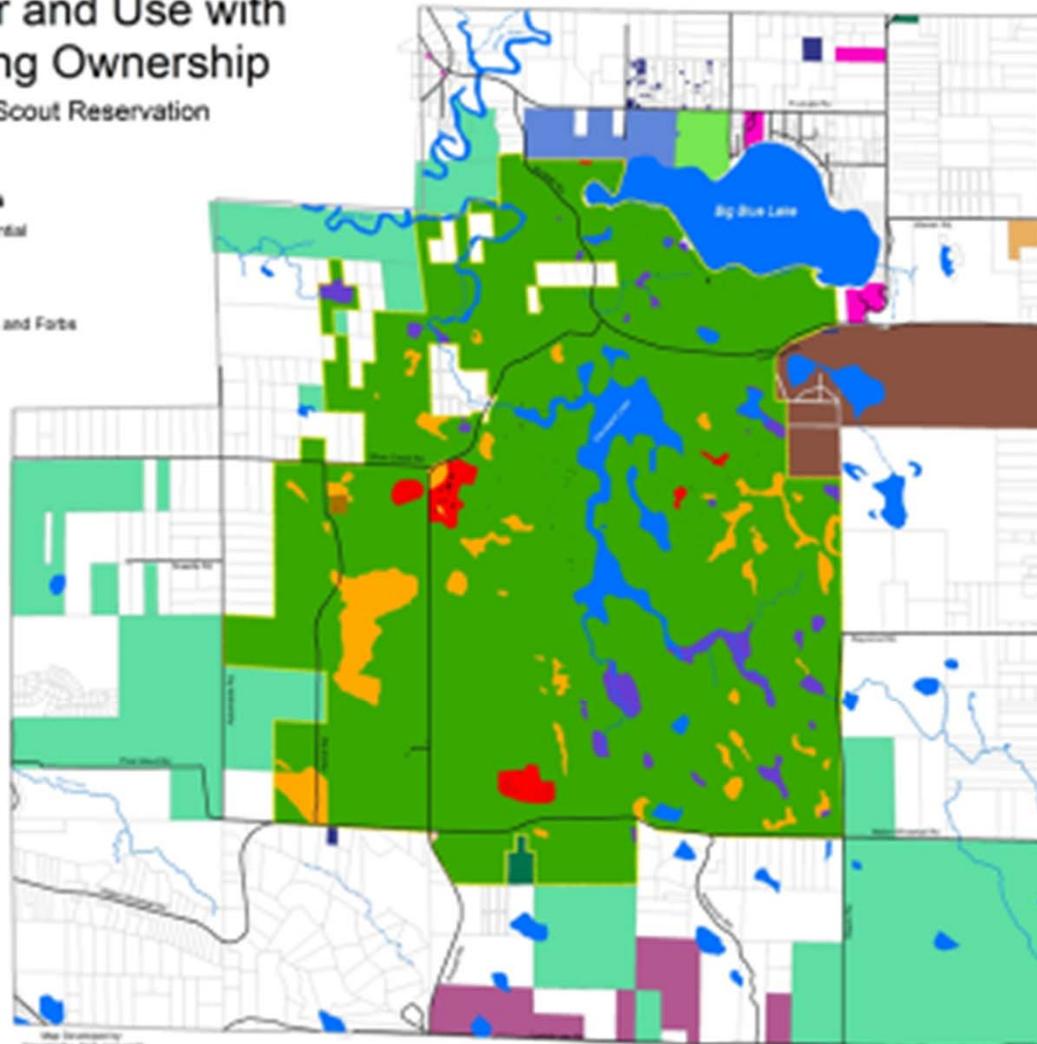
Land Cover/Use Types

- Single Family Residential
- Institutional
- Permanent Pasture
- Open Field - Grasses and Forbs
- Forest
- Lake/Pond
- Wetland

Ownership

- Blue Lake Church
- Blue Lake Fire-Arts Camp
- County
- Genard P. Ford Council
- Wanabe National Forest
- State of Michigan
- Township
- VI Sikh Center Highway
- VFCA & VNCA

- Residential with a few Commercial parcels
- Building Structure



Water features (lake use and stream history) based on their incorporation of 2001 and on 2001 orthophotography by 2010 Aerial, 2011. Ownership from Michigan County Landowners Department, 2010. Roads and building based on Michigan Geographic Data Framework, 2010.



0 0.25 0.5 1 Mile

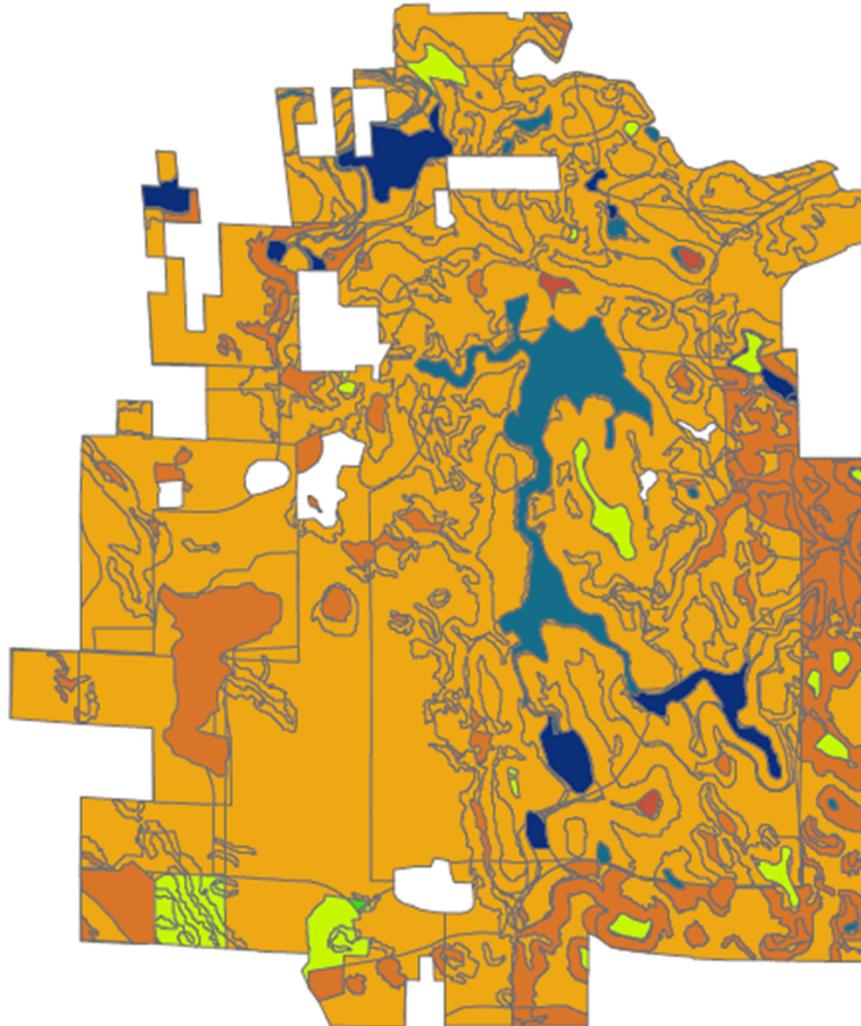
Map developed by
Michigan State University
North Water Resources Institute
November 2010

Owasippe

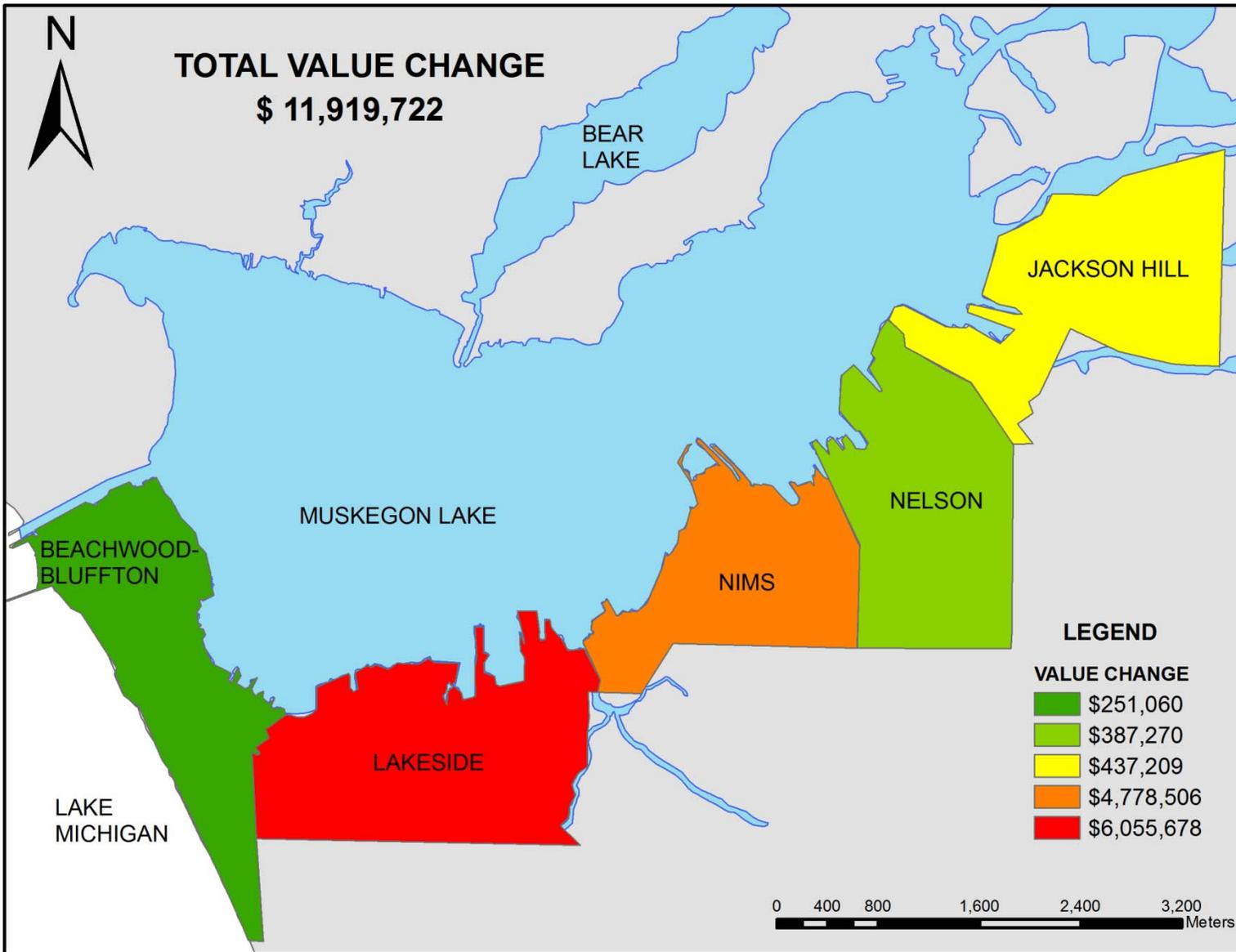
Legend

Final_Valuations_all
VAL_per_year_acre

	64.00 - 86.04
	86.05 - 108.07
	108.08 - 130.11
	130.12 - 152.14
	152.15 - 174.18
	174.19 - 196.21
	196.22 - 218.25
	240.29 - 262.32
	262.33 - 284.35



Muskegon



Generation 4

Storm Water Calculator



Generation 4

- ◆ Parcel or Block level data
- ◆ Customizable to location
- ◆ Designed to answer questions at individual level

Conclusion

- ◆ Valuation has moved from a preliminary effort to educate local policy-makers and the public to specific tools to inform decisionmakers



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