Watershed Report Cards:

Providing watershed data to promote local environmental action

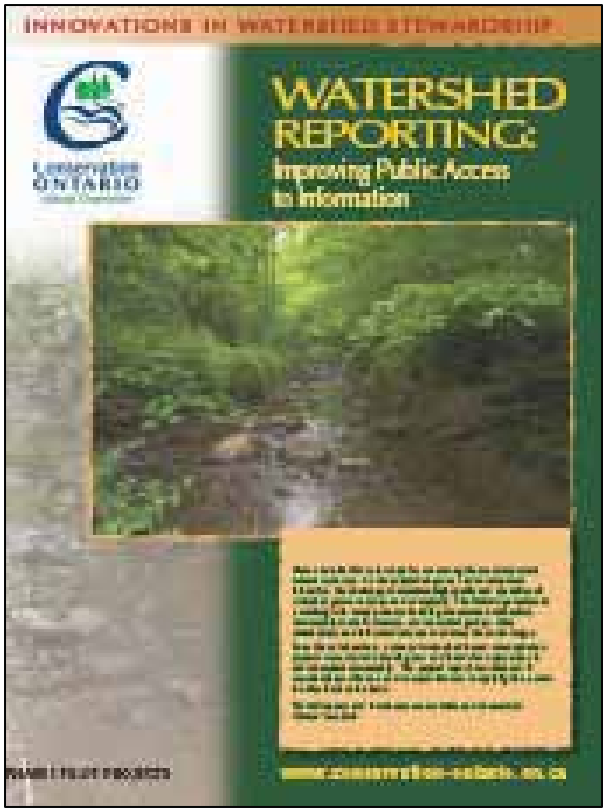
January 13, 2011

Mari Veliz, Healthy Watersheds Coordinator

Does the watershed provide water that is…

Is it healthy?

- Currently 155 physical and chemical attributes of water may be evaluated for the protection of aquatic life
- Identify appropriate and consistent indicators
- What about terrestrial conditions?



Watershed Indicators
Water Quality

Phosphorus

0.03 mg/L

E. coli

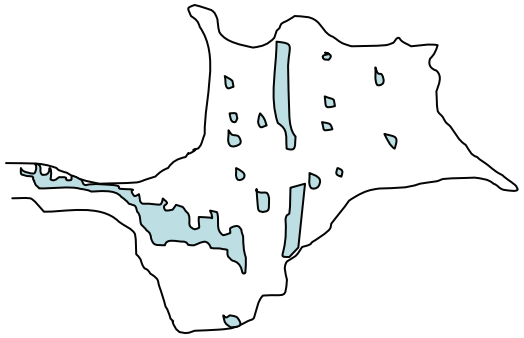
100 cfu/100 mL

Benthic
Invertebrates

Score
1 to 10

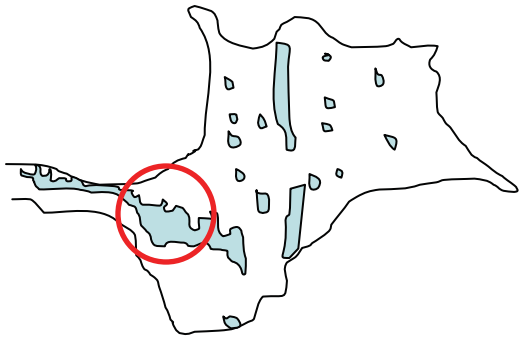
Watershed Indicators
Forest Conditions

Forest Cover



30 % of watershed area

Forest Interior

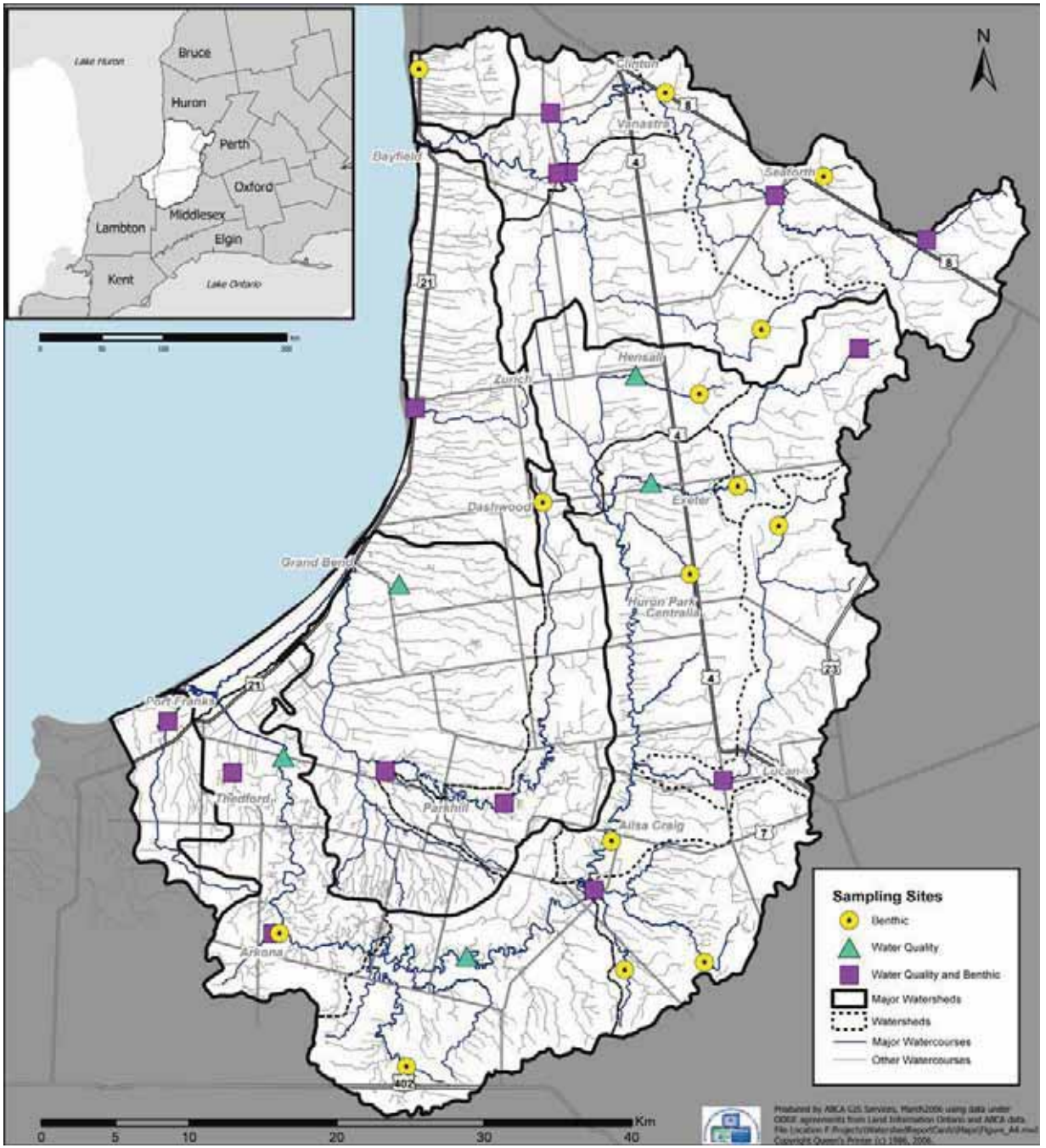


10 % of watershed area

Methods

- 16 watersheds
- Grade watersheds based on forest and surface water conditions (compared to provincial standards)
- Involve stakeholders to review format and content

Water Sampling



Determining forest conditions on a watershed basis

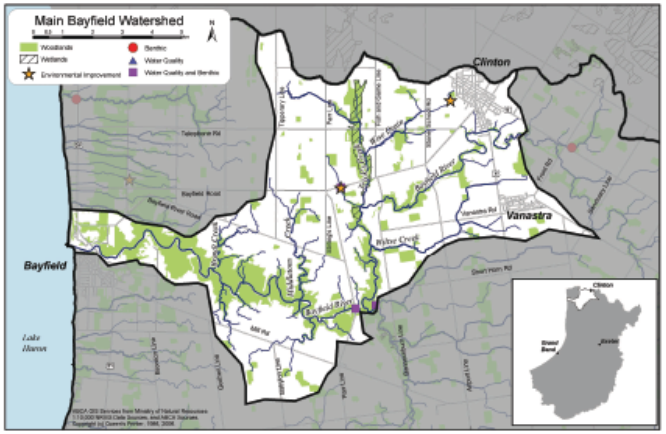
Watershed Report Card

Main Bayfield Watershed Report Card

Grades:

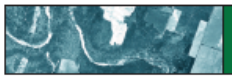
Forest Conditions	B
Surface Water Quality	C

This report card summarizes water quality and forestry information for the Main Bayfield watershed (*the highlighted area on the map below*). This map also shows water quality stations and example environmental improvement locations. For consistency across watersheds, Conservation Ontario has recommended the use of specific water quality and forestry indicators that are described in the following tables. The summary is intended to provide landowners, groups, municipalities and agencies with information to protect, enhance and improve natural features of the watershed. The ongoing monitoring will be reported on a five-year cycle which will help local people manage their natural features. This report card is part of a larger report entitled The Ausable Bayfield Conservation Authority Watershed Report Card available at: www.abca.on.ca. Further information, including methodology, comparisons to the other 15 Ausable Bayfield watersheds and references are also found in the report.



Priority Strategy for Main Bayfield Watershed

Protect: The main channel between Parr Line and Bayfield is an ecosystem that needs to be protected.



Main Bayfield Watershed Features

Area: 89 km²	Municipalities: Bluewater, Central Huron, Huron East
Geology	53% Till Moraines; 20% Till Plains (Undrumlinized); 16% Spillways; 3% Kame Moraines; 3% Sand Plains; 3% Bevelled Till Plains; 1% Water; 1% Beaches and Shorecliffs (GIS derived with physiographic maps) (Chapman and Putnam 1984)
Soils	44% Clay Loam; 27% Silty Loam; 18% Loam; 11% Bottomland (County Soils Maps 1951-1991)
Land Use	70% agriculture; 20% woodlot; 5% urban; 5% other (OMAFRA 1983)
Streamside Cover	43% of 15 metre area on both sides of open streams is vegetated (OMNR 1986, ABCA 1999)
Wetlands	Existing: 6% (OMNR 2003, ABCA 2004); Potential: 8% (ABCA 2005)
Natural Areas	Bayfield River (Area of Natural and Scientific Interest); Trick's Creek (Provincially Significant Wetland); Goderich Environmentally Significant Areas 1 to 4; Tuckersmith Environmentally Significant Areas 1 and 2; Clinton Conservation Area
Groundwater	Both shallow (Holmesville Aquifer) and bedrock aquifers are found here. The bedrock aquifer is the most common source of drinking water and is part of a large aquifer system in southwestern Ontario. The Holmesville Aquifer is possibly the source of drinking water for dug or bored wells in the area and is also the main source of the flow in Trick's Creek. Both aquifers have been sampled and nitrate, chloride and fluoride concentrations are well below provincial drinking water standard maximums. Due to the local geology there is cold, constant water flow in some tributaries, contributing to the base-flow, improved water quality and fisheries in the Bayfield River.
Fishes	Migratory trout fishery in the main channel; cold water fishery in the tributaries

Species at Risk

(As determined by the Committee on the Status of Endangered Wildlife in Canada)

(SOURCE: Natural Heritage Information Centre, 2006)

Vegetation:	None identified at this time.
Reptiles:	None identified at this time.
Birds:	None identified at this time.
Fishes:	None identified at this time.
Mussels:	Rainbow
Mammals:	None identified at this time.

Wastewater Treatment Plants	Clinton, Bayfield, Vanastra

Main Bayfield
Forest Cover, Surface Water Quality

	Indicator and Description	Main Bayfield Result	Main Bayfield Grade	Ausable Bayfield Area Result	Ausable Bayfield Area Grade
Forest Conditions	**Forest Cover** is the percentage of the watershed that is forested. Environment Canada recommends **30%** of a watershed should be in forest cover.	19.9%	B	12.6%	C
Forest Conditions	**Forest Interior** is the area inside a woodlot that some bird species need for breeding. Environment Canada recommends **10%** of a watershed should be in forest cover that is at least 100 m from the forest edge.	4.4%	C	2.8%	D
Water Quality	**Total Phosphorus** is an element that enhances plant growth and contributes to excess algae and low oxygen in streams and lakes. The Ministry of the Environment has established an environmental health objective concentration of **0.03 mg/L**.	0.05	B	0.08	B
Water Quality	**E. coli** (*Escherichia coli*) are bacteria found in human and animal waste. Their presence in water indicates the potential for the water to have other disease-causing organisms. The Ministry of Health has established a guideline of **100 cfu** (colony forming units)/**100 mL** in recreational waters.	236	C	233	C
Water Quality	**Benthic Invertebrates** are small animals without backbones that live in stream or lake sediments. The Family Biotic Index **(FBI)** summarizes the information about the numbers and types of these animals in a sediment sample. FBI values provide stream health information and values range from **1 (healthy) to 10 (degraded)**.	5.5	C	5.6	C

Grade	Explanation
A	Indicates excellent ecosystem conditions and protection may be required. Some areas may require enhancement.
B	Indicates good ecosystem conditions. Some areas may require enhancement.
C	Indicates ecosystem conditions that need to be enhanced.
D	Indicates poor ecosystem conditions that need to be improved.
F	Indicates degraded ecosystem conditions that need considerable improvement.

Main Bayfield
Next Steps and Local Successes

To improve forest conditions ...

- Connect small woodlots to the main Bayfield River Valley Forest.
- Forest interior values can be increased by planting native trees and shrubs around existing woodlots or by retiring land near woodlot edges.

To improve water quality ...

- Manure Management:
  - Apply manure at rates and times to optimize crop uptake of nutrients and prevent runoff.
  - Monitor tile outlets for contaminants during and following manure application and implement spill contingency plans if necessary.
  - Ensure manure storage facilities are adequate and properly functioning.
  - Keep records; develop a nutrient management plan (Environmental Farm Plan funding may be available).
- Plant windbreaks, establish grassed waterways on closed drains and practise conservation tillage on erosion-prone soils, particularly along the Bayfield River (Programs available through ABCA).
- Fix faulty septic systems and establish a septic maintenance plan.
- Decommission abandoned wells and upgrade existing wells to prevent groundwater contamination.
- Protect existing cold water tributaries and wetlands.
- Further assessment of the Trick's Creek watershed is required to identify wetland and stream restoration projects.

Other recommendations

- Investigate costs and benefits associated with a Bayfield River Trail from Parr Line to Bayfield.
- Complete Environmental Action Plans (Farmers see Environmental Farm Plan; Lakeshore residents see Lakeshore Stewardship Manual). A stewardship manual for rural non-farm landowners should be completed by 2007. Contact the ABCA for more information.
- A detailed investigation into the rainbow trout distribution, abundance and local spawning requirements might help to promote these attributes throughout the sub-basin.
- Continue to support the province's natural heritage policies through local official plans and zoning by-laws (i.e., storm water management, tree cutting bylaw).

Thumbs up!

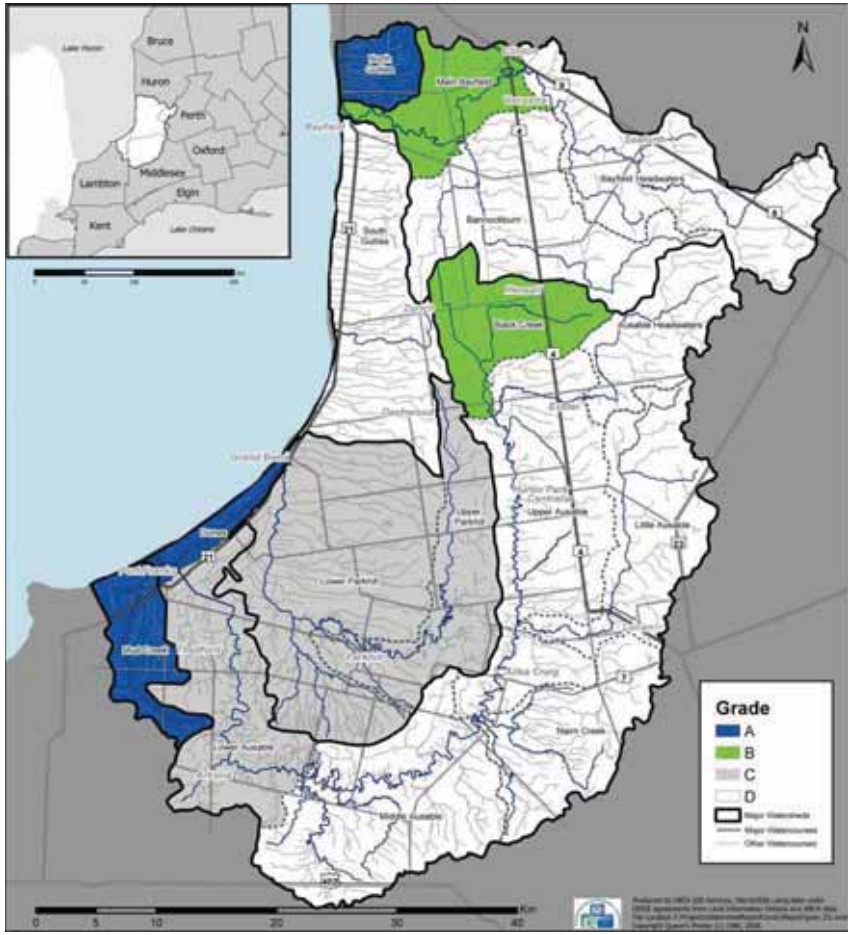
Landowners in the Bayfield River Valley from Trick's Creek to Bayfield are frequently engaged in conservation projects that enhance the river, such as the project recently undertaken on the Steenstra Drain.

This is just one example in the watershed – give us a call and tell us about your project.

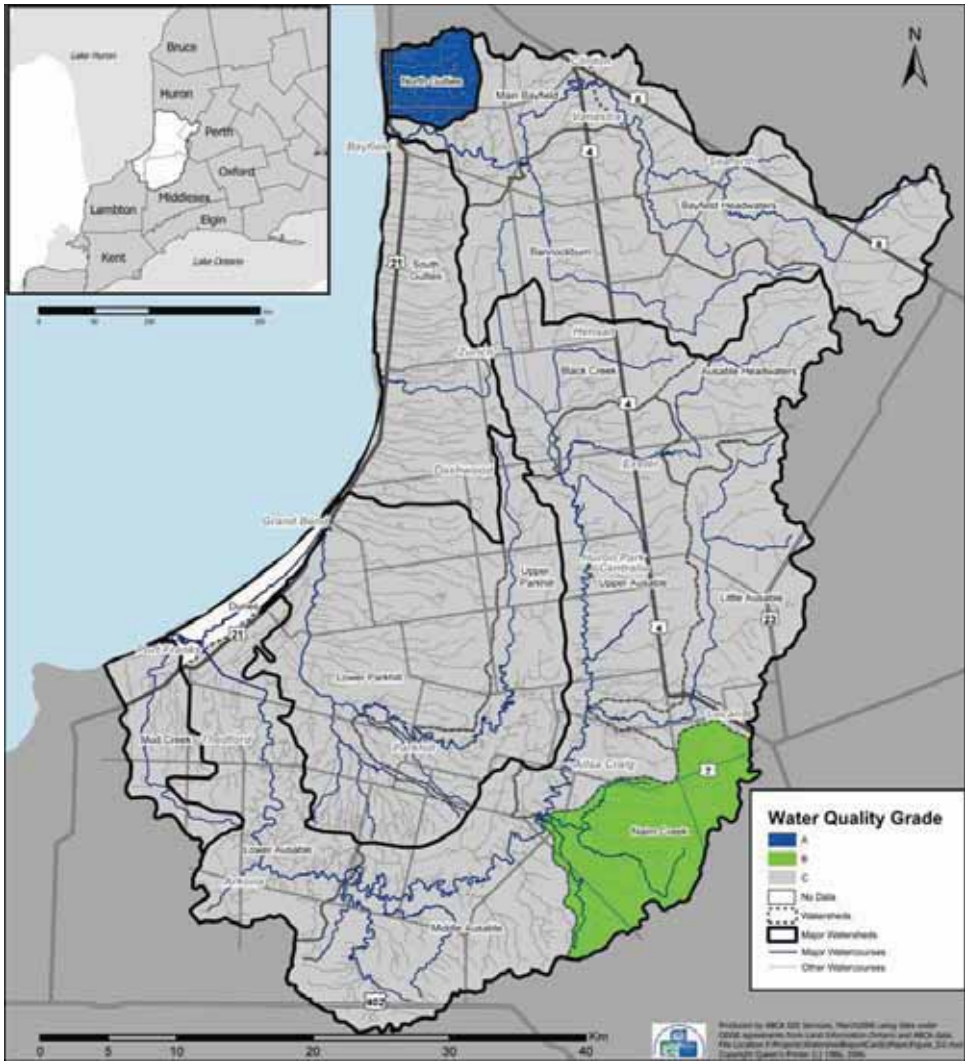
Ausable Bayfield Conservation Authority
71108 Morrison Line, RR 3 Exeter, ON N0M 1S5
E-mail: info@abca.on.ca
Web site: www.abca.on.ca
Phone (519) 235-2610, 1-888-286-2610

http://www.abca.on.ca/reportcard.php

Forest Conditions - Summary



Water Quality - Summary



General Actions for Improved Local Watersheds

- Forest interior – Increase plantings around local woodlots
- Forest cover – Increase plantings in non-productive land
- Total Phosphorus – Reduce soil erosion
- E. coli - Manure management, upgrade septics and wastewater treatment plants where necessary
- Invertebrates – Drain maintenance

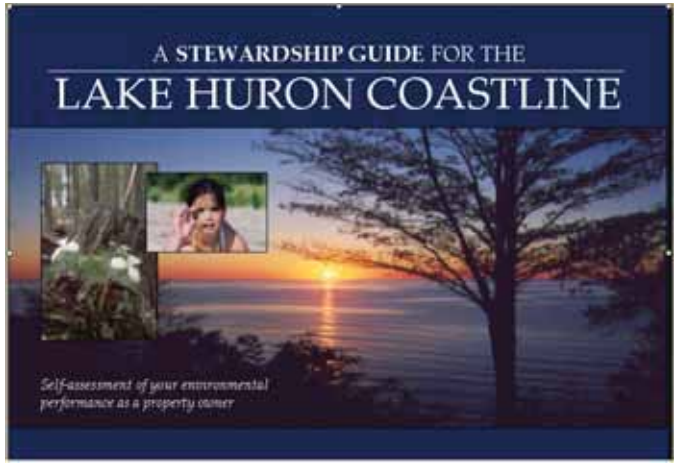
Specific Actions

Look at the maps –

Where do you live?

- Evaluate your property and follow recommended actions
  - Lakeshore Residents – A Stewardship Guide for the Lake Huron Coastline
  - Farmers – Environmental Farm Plan
  - Rural Non Farm Residents – Rural Landowner Stewardship Guide for the Huron Watershed

Ontario's Environmental Farm Plan Program



Potential Limitations

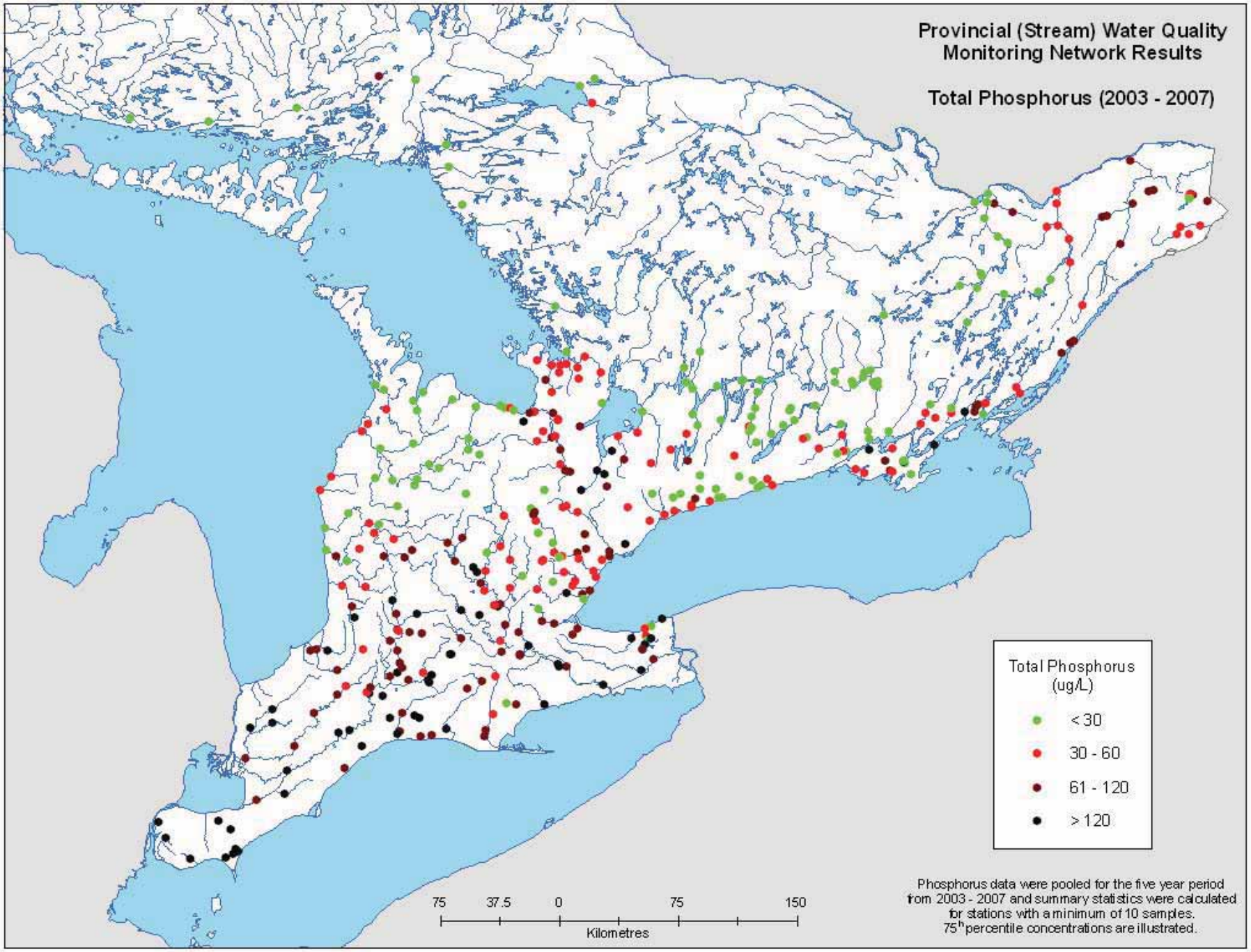
- Water quality is the result of both land use activities and existing natural conditions (e.g., soils, geology etc.)
- Water quality grades may not reflect improved land use activities immediately

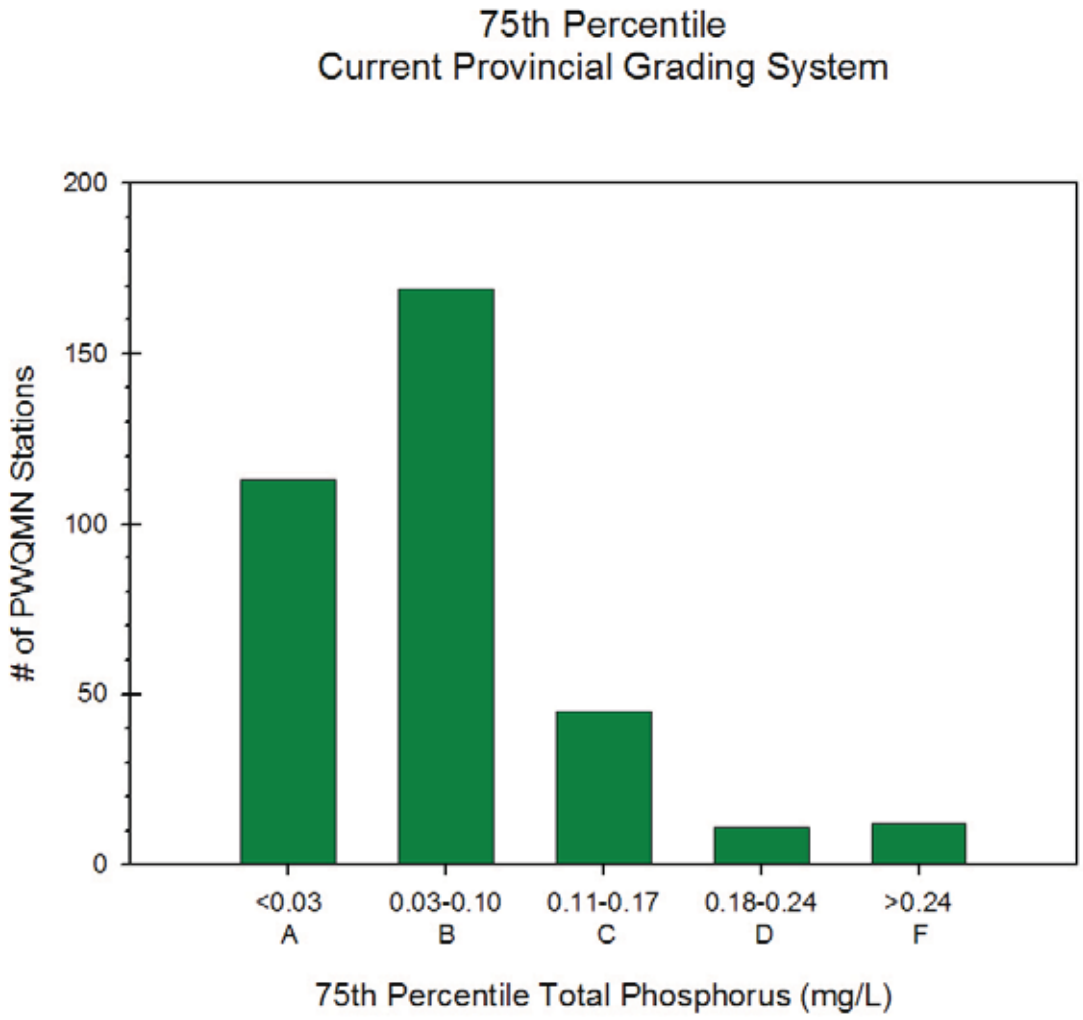
Changes to the Watershed Report Card

Example: Total Phosphorus

Data parameter	Result
Number of stations	386
Number of samples	12,606
Data range (mg/L)	0.002 to 16.3
Data median (mg/L)	0.030
75 percentile (mg/L)	0.064

Total phosphorus (TP) concentrations (mg/L) from the Provincial Water Quality Monitoring Network (2003 to 2007). Summary courtesy Aaron Todd, Ontario Ministry of the Environment.


Provincial (Stream) Water Quality
Monitoring Network Results
Total Phosphorus (2003 - 2007)
Total Phosphorus
(ug/L)
< 30
30 - 60
61 - 120
> 120
75
37.5
0
75
150
Kilometres
Phosphorus data were pooled for the five year period
from 2003 - 2007 and summary statistics were calculated
for stations with a minimum of 10 samples.
75th percentile concentrations are illustrated.


75th Percentile
Current Provincial Grading System
200
150
100
50
0
# of PWQMN Stations
<0.03
A
0.03-0.10
B
0.11-0.17
C
0.18-0.24
D
>0.24
F
75th Percentile Total Phosphorus (mg/L)

Watershed Report Cards

- Summarize existing information
- Grade current health of local environment based on standardized indicators
- Promote local stewardship action
- Evaluation Tool