

LAKE HURON

The two main Lake Huron water intakes are at Goderich and Port Blake, London's intake just north of Grand Bend. The Goderich intake, influenced by its location near the shore and the mouth of the Maitland River, has consistently poorer water quality than the Port Blake intake. *E. coli* monitoring at intakes began in 2003, too recently to detect trends. Huron County Health Unit's beach monitoring since 1993 shows that bacteria exceed safe levels for recreation about one third of the time and that near-shore water does not meet drinking water standards. Proper treatment ensures safe drinking water from both facilities.

GROUNDWATER

Most of the region's bedrock groundwater enters the ground east of the region. Shallow overburden aquifers, however, recharge locally. Regular groundwater monitoring began in 2002, too recently to detect trends. In general, groundwater quality is good. Problems occur where:

- Brine wells (used for extracting salt) leak salt
- Polluted surface water, excessive fertilizer and manure application or poor well practices contaminate shallow aquifers
- Naturally-found substances like fluoride, sodium, sulphate and hardness are high

HOW SHOULD WE PROCEED?

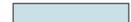
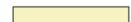
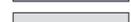
In general, we have good quality drinking water from the region's groundwater and treated water from Lake Huron. Our actions should focus on keeping it that way. Protection of its high quality will be much cheaper than neglecting it now and then paying a lot to fix problems in the future.

Stream quality, however, needs restoration. In some areas, linkage between streams and drinking water means stream clean-up is a necessary step to protect our drinking water.

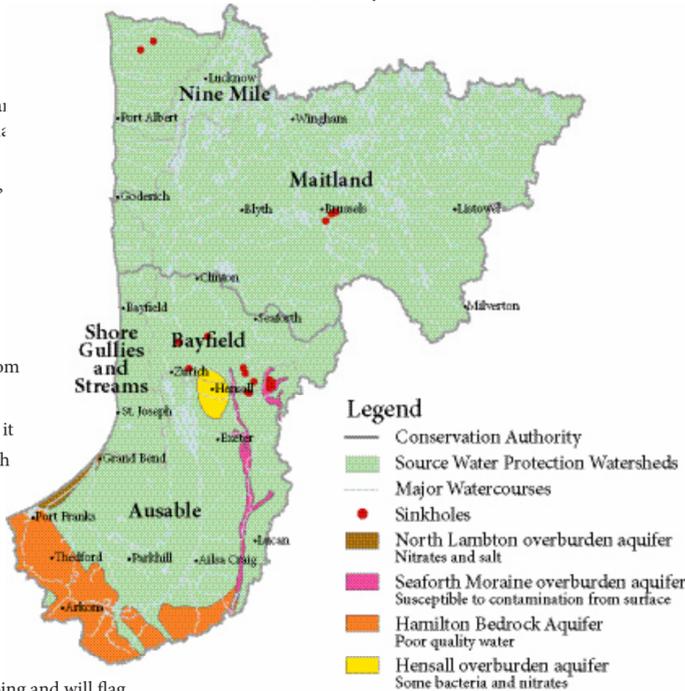
Monitoring water quality will tell us how we are doing and will flag concerns while they are easier to fix. Some groundwater flows very slowly; the impacts of today's practices – good and bad – may not be seen for years. Monitoring groundwater recharge areas will catch problems sooner.

Water Quality Level of Concern: Lake Intakes

Indicator	Analysis	Ratings	
		Goderich	Pt. Blake
Nitrate	Drinking Water		
	Aquatic Health		
	10-year Trend	Deteriorating	Improving
Phosphorus	Drinking Water		
	Aquatic Health		
	10-year Trend	Improving	Improving
Chloride	Drinking Water		
	Aquatic Health		
	10-year Trend	Steady	Steady

	Low Level of Concern Median values over the last 10 years are always better than the guideline
	Moderate Level of Concern Median values over the last 10 years fall on either side of the guideline
	High Level of Concern Median values over the last 10 years are always worse than the guideline
	No standard

Some Groundwater Quality Issues



FURTHER STUDIES

Watershed processes are very complex. Our actions to protect water are most effective when we understand the relationships involved. The Conservation Authorities, municipalities and Ontario Ministry of the Environment have made good progress in watershed knowledge. Some areas for future studies include:

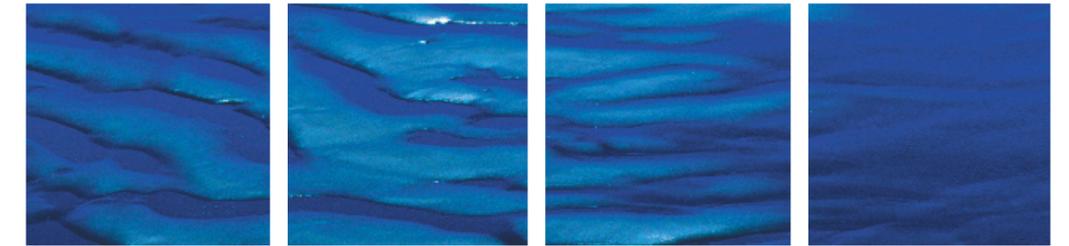
- Monitoring bacteria (*Escherichia coli*), pesticides and heavy metals;
- Determining causes of increased nitrate levels;
- Understanding sinkhole (depression where surface water rapidly enters bedrock) effects on groundwater;
- Assessing how the Maitland River outflow affects the Goderich water intake.

WHAT YOU CAN DO

Our individual actions are adding up and can potentially make a big difference. Some ways you can help are:

- Plant vegetation beside streams and drains
- Have your septic system checked to make sure it's working properly
- Keep contaminants away from wellheads
- Use conservation tillage and fertilizer based on crop requirements
- In industrial processes, ensure that proper procedures are followed and chemicals are used correctly
- Free your lawn from chemicals
- Get expert advice on nutrient management
- Focus action on your watershed's main issues
- **Protect our valuable water**

PROTECTING OUR WATER



DRINKING WATER SOURCE PROTECTION PLANNING AND YOU WATER QUALITY

AUSABLE BAYFIELD MAITLAND VALLEY SOURCE PROTECTION REGION



For more information about SP Planning please contact:
Ausable Bayfield Maitland Valley Source Protection Project
c/o Ausable Bayfield Conservation Authority
RR3, Exeter ON N0M 1S5
519-235-2610 or 1-888-286-2610
info@sourcewaterinfo.on.ca
www.sourcewaterinfo.on.ca



Ausable Bayfield
Maitland Valley
Source Protection
Region

This brochure is part of a series that summarizes the Source Protection Watershed Characterization report, which Conservation Authority staff have produced to develop an understanding of the watersheds' physical, sociological and economic characteristics. This information will assist with the development of Source Protection Plans. The provincial government has introduced the Clean Water Act, which will allow committees of local stakeholders to create Source Protection Plans for their regions. The watersheds of the Ausable Bayfield and Maitland Valley Conservation Authorities will work together as a Source Protection Region for the purposes of developing those plans.

The Ausable Bayfield Maitland Valley Source Protection Region is blessed with water – streams, groundwater and Lake Huron. This brochure summarizes the water quality and basic information for planning its protection.



As water flows from the headwaters to the lake, it collects substances from land it crosses. This is a natural process; substances like nutrients support species that live in water. But depending on human influences, the collection can include excessive amounts of nutrients or contaminants that don't naturally occur. Both pollutant types can harm stream and lake life and sometimes us.

Since agriculture dominates land use in the Ausable Bayfield Maitland Valley region, it plays a major role in the region's water quality. In fact, areas of the region have the highest concentration of manure of any watershed region in Canada. But studies over two decades have shown that municipalities, septic systems, industry and roads are also important influences. Some contaminant sources are obvious, such as a factory pipe discharging into a creek. Other sources are more obscure, such as field runoff carrying excess fertilizer or eroded sediment, and barely noticeable unless you're out in the middle of a thunderstorm. Understanding sources helps target clean-up where it's most cost-effective: this principle is the basis of Drinking Water Source Protection.

Natural characteristics of the watershed affect water quality. Sandy soils soak up rain to supply springs, leaving less surface water to carry contaminants. Clay and silt soils erode easily and make streams murky. Vegetation along streams helps filter out pollutants.

Land management also affects water quality. Fields with row crops are bare for long periods and can be prone to erosion. Drains, tiles and storm sewers can move water to streams before contaminants settle out or break down naturally.

Factors that help water quality – coarser soils, more vegetation and a smaller area of row crops – are more common in the region's northern, inland watersheds.

Water in the watershed is like the circulatory system in a person. Just as a few blood tests can indicate our health, water tests can indicate watershed health. Regular monitoring of water quality indicators can tell us if the watershed ecosystem is improving or deteriorating.

Water quality indicators include nutrients (nitrate and phosphorus), bacteria, suspended sediment, chloride and copper. Nitrate, phosphorus and bacteria come from fertilizer, manure, faulty septic systems and sewage treatment plants. Sediment comes from field erosion and construction sites. Chloride and copper indicate urban influences: chloride comes from road salt and copper from sewage treatment. Indicators usually have maximum levels for safe drinking water and for healthy ecosystems.

HOW ARE WE DOING? SURFACE WATER

In our region, we don't drink water from streams and rivers but they flow into our drinking water sources – Lake Huron and groundwater. Streams are also important habitat for many species of wildlife. Water-based recreation is also vital to the region's economy.

To the right is a comparison of indicator results from a site near the mouth of each of six watercourses. The level of concern is rated using the standards for safe drinking water and healthy aquatic habitat. The trend over the last ten years is included.

Of the six watercourses, the Nine Mile and Maitland Rivers have the best water quality according to Provincial Water Quality Monitoring Network sampling. Good management practices are helping reduce both phosphorus and sediment levels throughout the region. Nitrate concentrations, however, are rising in the Bayfield River and Parkhill Creek – a concern in terms of both stream life and possible future effects on drinking water sources. Bacteria levels require attention in many watersheds.

The maps below show more detail. They present the distribution of nitrate, phosphorus and *E. coli* bacteria concentrations at 45 stream sample sites. They also illustrate the land area that contributes runoff to each site. While, on average, stream quality in each area will reflect its downstream site's quality, individual streams can differ. Stream-specific sampling is needed to rate stream-specific quality.

If you live in a green area, keep up the good work: protecting good

quality is far easier than cleaning up problems. All other areas have, on average, stream quality worse than guidelines for ecosystem health. In some watersheds, soil types contribute to the vulnerability. However, remedial actions, such as planting stream-side vegetation or repairing septic systems, are important throughout the region. Remedial actions in the peach and yellow areas are most likely to improve indicators to guideline levels. Remedial actions in purple and light pink areas could make a big difference in overall stream quality.

The numerous small streams and gullies that drain directly into Lake Huron have little water quality data. Given stream proximity to each other and to the lake, if any water pollution occurs, it readily reaches the lake.

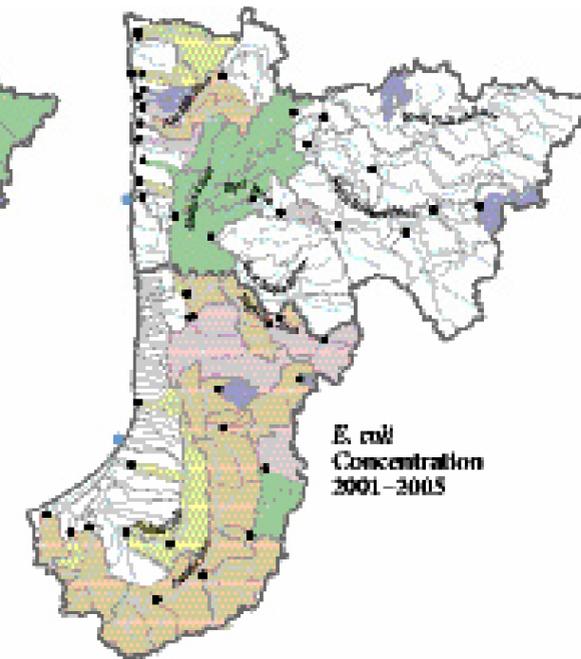
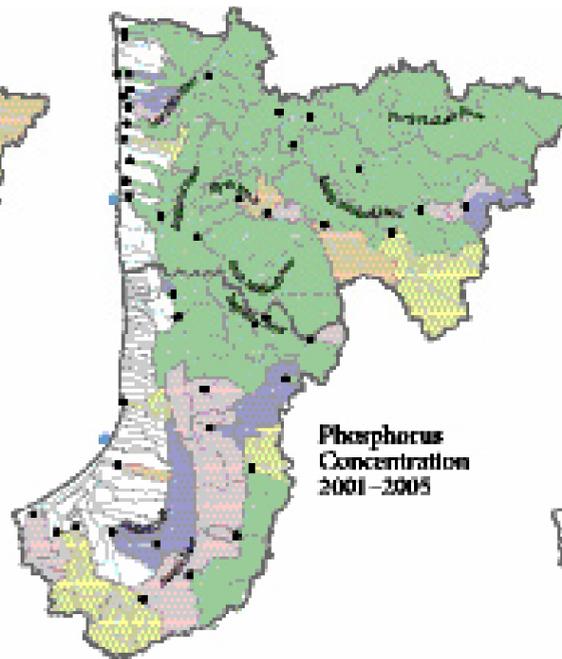
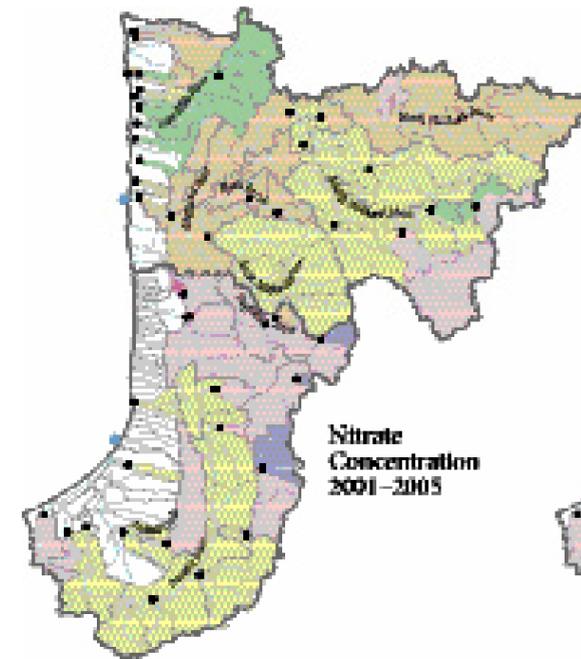
Stream quality tends to improve northward as coarser soils and more natural vegetation filter out more pollutants.

Many landowners and municipalities have already done a great deal to improve water quality. In recent decades, upgraded municipal sewage treatment has made a huge difference. Farmers have built on their traditional land stewardship ethic with new conservation techniques and environmentally-sound practices. Many landowners have repaired their septic systems. The maps would show more red areas without these valuable efforts.

Water Quality Level of Concern: Six Streams

Indicator	Analysis	Nine Mile River	Maitland River	Blyth Brook	Bayfield River	Parkhill Creek	Ausable River
Nitrate	Drinking Water						
	Aquatic Health						
	10-year Trend	Improving	Improving	Improving	Deteriorating	Deteriorating	Improving
Phosphorus	Drinking Water						
	Aquatic Health						
	10-year Trend	Steady	Steady	Steady	Steady	Improving	Steady
Sediment	Drinking Water						
	Aquatic Health						
	10-year Trend	Steady	Steady	Steady	Steady	Steady	Improving
Bacteria	Drinking Water						
	Aquatic Health						
	10-year Trend	Deteriorating	Steady	Steady	Steady	Steady	Steady
Chloride	Drinking Water						
	Aquatic Health						
	10-year Trend	Deteriorating	Improving	Deteriorating	Steady	Deteriorating	Deteriorating
Copper	Drinking Water						
	Aquatic Health						
	10-year Trend	Steady	Steady	Steady	Steady	Steady	Steady

- Low Level of Concern
Median values over the last 10 years are always better than the guideline
- Moderate Level of Concern
Median values over the last 10 years fall on either side of the guideline
- High Level of Concern
Median values over the last 10 years are always worse than the guideline
- No standard



Legend

- Conservation Authority
 - Major Roads
 - Major Watercourses
 - Lake Huron Water Intake
 - Surface Water Monitoring Sites
- Catchment Sample Ratings**
- 0 Not enough data to reliably display water quality at this map scale
 - 1 Low Contribution: Stream Sample Better than Guideline
 - 2
 - 3
 - 4
 - 5
 - 6 Higher Contribution: Stream Sample Increasingly Worse than Guideline

Note: Nitrate and Phosphorus based on annual *E. coli* based on geometric mean