CLEAN UP RURAL BEACHES

GREY SAUBLE CONSERVATION AUTHORITY

1995 ANNUAL REPORT
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Acknowledgments

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Abstract

The CURB program for the Sauble River watershed came to an untimely end after four successful years of implementation. Local landowners invested $1,219,415 into the watershed to complete 205 of the 233 approved projects. The Ministry of Environment and Energy supported these projects with $694,276 in total grant funding. Of the projects completed, 70 were livestock restriction from watercourses (MOEE provided $252,998 in grants), 79 were septic system repair or replacement (MOEE provided $140,073 in grants), 55 were manure runoff reduction with 17 solid manure roofed storages, 1 liquid manure storage and 37 eavestroughing projects (MOEE provided $301,030 in grants), and 1 milkhouse waste water storage project (MOEE provided $175 in grant). An additional $12,000,000 will be required to complete the CURB plan for the Sauble River Watershed based on the completion of 25 (9%) of the 270 potential project identified by this plan.

Weather patterns over the past four years of this CURB program have not been similar with respect to precipitation and resulting discharge levels. Farming activities change throughout the summer season and their impact on water quality varies depending on timing and intensity of precipitation. Due to these variations, conclusions from water quality data are difficult to express. In general, results from 1995 water quality monitoring appeared to demonstrate an overall improvement in water quality compared to 1993 data.

Special monitoring of remediation projects indicated that restricting livestock access from the watercourse reduced E. coli loading. However, sites demonstrating improved wildlife (muskrat) habitat due to abundant vegetation growth, increased E. coli loading. Studies of limited livestock access not eligible for CURB funding, confirmed that E. coli loading still occurred, however, stream morphology downstream of the access site played a key role as to the ability of the stream environment to mitigate the overall loading from a farm site. In general, higher gradient stretches flowing over a rock/rubble substrate reduced the E. coli load carried by the watercourse. Slower flowing stretches with suitable muskrat habitat were found to elevate E. coli levels even higher than the livestock access areas.

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Introduction

The Grey Sauble Conservation Authority's past participation in the Rural Beaches Program, initiated in 1986, resulted in the development of a Clean Up Rural Beaches Plan for the Sauble River Watershed. The objective of this program was to improve the quality of water discharging to the Sauble Beach area, thus protecting this area from beach closures due to unacceptable levels of fecal bacteria.

In 1992, the G.S.C.A. received approval to initiate a five year program committed to implementing their C.U.R.B. Plan as part of the ten year Provincial C.U.R.B. Program. Through the use of landowner grant incentives for remedial projects, public awareness displays and information, demonstration projects, etc., the Authority anticipated that it would be able to maintain healthy swimming conditions at Sauble Beach and reduce the potential of rural activities to influence these conditions. Regular water sampling stations were reestablished on high priority subwatersheds with new stations established on subwatersheds previously not monitored by the Rural Beaches Program but suspected of having an impact on the Beach area due to their proximity to the mouth of the Sauble River. Water quality data collection was modified to include discharge measurements required to calculate the fecal bacterial loads leaving each subwatershed.

In 1993, the C.U.R.B. boundaries for G.S.C.A. were expanded to include all watersheds discharging to the Lake Huron Shoreline. This expanded area included all areas north of the Saugeen River's watershed to the northern boundary of Albemarle township.

Background

Sauble River Watershed

The Sauble River Watershed (Figure 1) is composed of four main branches. The majority of the agricultural activity in this watershed, as a whole, occurs in the headwater areas of the south branch referred to as the Sauble River. The north branch, known as the Rankin River System, and the east branch, known as the Shallow Lake or Park Head Creek System, discharge near the mouth of the Sauble River. These two systems are similar with respect to their dominant wetland features and their low intensity agriculture. The Spring Creek System, which discharges to the Sauble River between the Rankin System and the Parkhead System, is similar to these other two systems with respect to its dominant wetland features and low intensity agriculture. However, the unique characteristic about this system is the long distance it flows underground before resurfacing and discharging to the Sauble River.

CURB Plan

The 1990 CURB Plan for the Sauble River Watershed used mathematical models to evaluate each subwatershed's potential to impact the water flowing from the mouth of the Sauble River. Detailed field data for each subwatershed was required for these algorithms to create a priority ranking system for remedial funding. Based on the field data collected, the northern section of the Sauble River, the central section of the Sauble River, Maryville Creek, Arkwright Creek, and

Fenton Drain were identified as the top five priority subwatersheds. Total cost for complete remediation of the identified rural water quality impact sources was estimated to be $3,530,660.

Due to the lack of detailed field data for several subwatersheds and their close proximity to the Sauble River mouth, the Local C.U.R.B. Review Committee redefined the priority areas (Figure 1) to address the potential each system has to impact water quality at the Beach Area. Factors such as distance upstream from the Sauble River mouth, presence of lakes, wetlands or sinkholes, and the location of water quality monitoring stations were considered when determining boundary locations.

Methods

Water Quality Analysis

All water samples were collected using standard methods. All samples were submitted to the Ministry of Environment and Energy's laboratory in London and analyzed for the following bacterial and chemical parameters:

- E. coli
- Pseudomonas aeruginosa
- Fecal Streptococci

- Dissolved Reactive Phosphorous
- Total Phosphorous
- Suspended Solids
- Free Ammonia
- Total Kjeldahl Nitrogen
- Nitrite
- Nitrate
- pH
- Chloride
- Conductivity

Due to equipment calibration problems associated with analyzing samples with high ammonia and phosphorous, high range setting were used in 1995. Free ammonia concentrations were recorded with a low range of 0.05 mg/l compared to 0.01 mg/l. Total and reactive phosphorous concentrations were recorded with a low range of 0.01 mg/l in 1995 compared to 0.001mg/l for previous years. For comparison purposes, data collected from 1992 - 1994 was modified to reflect the new low range assigned in 1995.

Discharge

Due to the importance of determining contaminant loading rates produced by each subwatershed, discharge values were recorded for each water quality monitoring site directly after water samples were taken. Where possible, automatic stream flow gauges were utilized for obtaining discharge values. Water level values were recorded directly from these gauges and converted to discharge values using the most recent conversion tables. Under high flow conditions, a digital flow metre (Global Flow Probe) was used to determine water velocity. Unfortunately, this apparatus did not

perform well under low flow conditions. As a result, several innovative techniques were used (Appendix 1) which produced consistent data that was considered to be reasonably accurate when compared to standard surface float methods. By using the flow data collected and the cross sectional area of the station, a discharge value was calculated.

Selection of Regular Water Quality Monitoring Sites

The Sauble Watershed can be divided into primary (1), secondary (2) and low (3) priority areas based on their potential to impact the quality of water discharging from the Sauble River during high beach use periods. In general, the closer the watershed was to the beach area, the higher the priority ranking. Water sampling stations were located at the downstream end of each of these priority areas in order to monitor their water quality impact on the receiving watershed system. Within the primary and secondary priority areas, water sampling stations were set up near the mouth of each subwatershed in order to monitor their impact on that priority area's water quality (Figure 1). Most of the regular sites were sampled bi-weekly from May 30 to August 23, 1995. Table 1 lists the rationale for each station's location as illustrated in Figure 1.

Table 1. Description and purpose of each water quality monitoring station for the 1995 summer sampling period.

Station #	Rationale for Station
1	**Sauble Falls** - station monitoring water quality discharging from the entire Sauble River Watershed
2	**Rankin River** - station monitoring water quality discharging from the Rankin River Watershed
3	**Maryville Creek** - station monitoring water quality discharging from the Maryville Creek Watershed
4	**Spring Creek** - station set up in 1993 to monitor water quality discharging from the Spring Creek Watershed
5	**Parkhead Creek** - station monitoring water quality discharging from the Parkhead Creek Watershed
6	**Sauble River** - station monitoring water quality of Sauble River at midpoint of the Primary Priority Area and upstream of Parkhead Creek Watershed - monitored in 1992 only
7	**Arran Lake Outlet** - station monitoring water quality discharging from the Arran Lake Watershed
8	**Sauble River** - station monitoring water quality discharging from the Secondary Priority Area
9	**Fenton Drain** - station monitoring water quality discharging from the Fenton Drain Watershed - not monitored in 1993
10	**Arkwright Creek** - station monitoring water quality discharging from the Arkwright Creek Watershed
11	**Tyndall Drain** - station monitoring water quality discharging from the Tyndall Drain Watershed - not monitored in 1993
12	**Tara Creek** - station monitoring water quality discharging from the Tara Creek Watershed
13	**Arranvale Creek** - station monitoring water quality discharging from the Arranvale Creek Watershed
14	**Sauble River** - station downstream of the Tara Sinkholes monitoring water quality discharging from the Low Priority Area of the Sauble River Headwaters
15	**Sauble River** - station monitoring water quality discharging from the Sauble River Headwater area upstream of the Tara Sinkholes

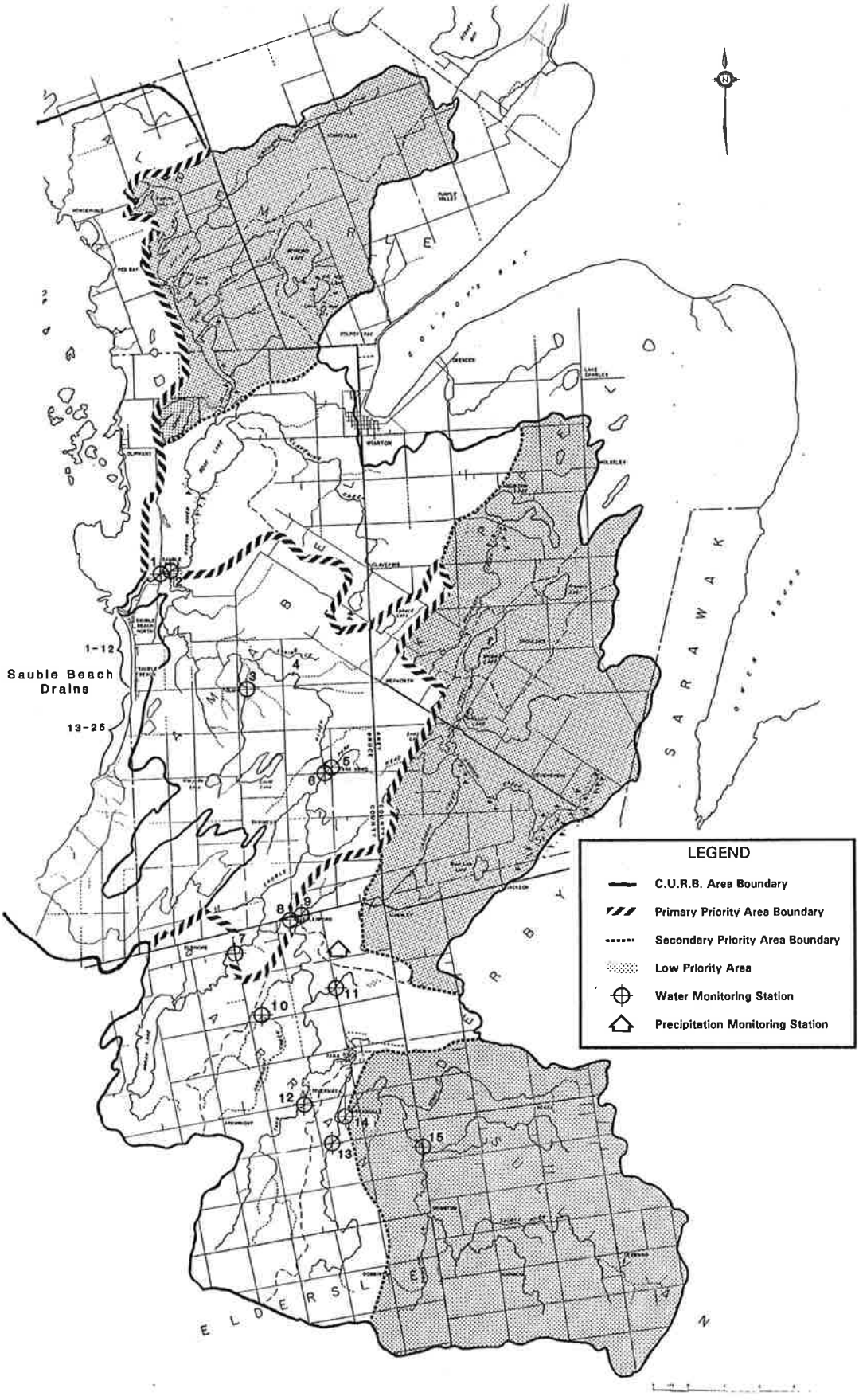

Figure 1. Map of the Sauble River Watershed with the locations of the regular water quality monitoring stations, the C.U.R.B. Priority Area Boundaries, and the precipitation monitoring station.

Data Interpretation

The extensive use of E. coli concentration for comparative purposes can be very misleading if the discharge of the watercourse is not taken into account. For example, a small stream demonstrating a higher E. coli concentration than a larger stream, may not deliver as many E. coli bacteria to the receiving water body. Determining the E. coli load or rate that bacteria are delivered to (or from) a monitoring station, produces a value that can be compared to other stations and situations. The product of the discharge (cm^3/s) and the concentration ($\#/100cm^3$) determines the load (#/s) carried by a system.

Special monitoring stations located upstream and downstream of each of the case study sites permitted the calculation of E. coli loading within each study area. Subtracting the E. coli load entering the case study site from the load leaving each site produced positive or negative loading rates within the study area. A positive loading indicated that the study area was adding E. coli to the watercourse faster than the E. coli were removed. A negative loading indicated that the E. coli were removed from the system at a rate faster than they were added, suggesting a net water quality improvement.

Case Studies

In order to study the impact of the site and the project's improvement to water quality, water sampling and discharge stations were set up to monitor water entering and leaving the site. From this information, the loading or reduction of E. coli was calculated which indicated the effectiveness of the remedial project. In 1995, sampling was concentrated on projects completed in 1993 to determine the impact of the project after two full years of implementation. Other stations were setup to monitor the impact limited livestock access (non-CURB projects) has on water quality and the effect that stream morphology has on reducing this impact.

Precipitation

Precipitation records were obtained from an Environment Canada local volunteer recorder, Grace Rock. Grace's station is located near Tara (Figure 1) which is centrally located for this C.U.R.B. Program.

Results and Discussion

Precipitation

The precipitation recorded for the central Sauble River watershed during the summer of 1992, 1993, 1994 and 1995 is represented in Figures 2, 3, 4 and 5 respectively. Dates on which water quality monitoring occurred, are superimposed on these figures to indicate samples that may contain contamination from pulse sources during wet, field runoff conditions after a rain event. In general, the past three years have not demonstrated similar precipitation patterns. In 1992, the majority of the rainfall occurred in August after a relatively dry summer. After a wet spring, June produced the bulk of the summer rainfall in 1993 with July yielding a large portion of the precipitation for the summer of 1994. Portions of the 1995 rainfall pattern were similar to previous years, however, the total summer pattern did not duplicate conditions that existed for any of the other sampling programs. With four different precipitation patterns, comparison of water

quality data from these years is limited since runoff and flow patterns and their timing with different agricultural activities will impact receiving waterbodies differently.

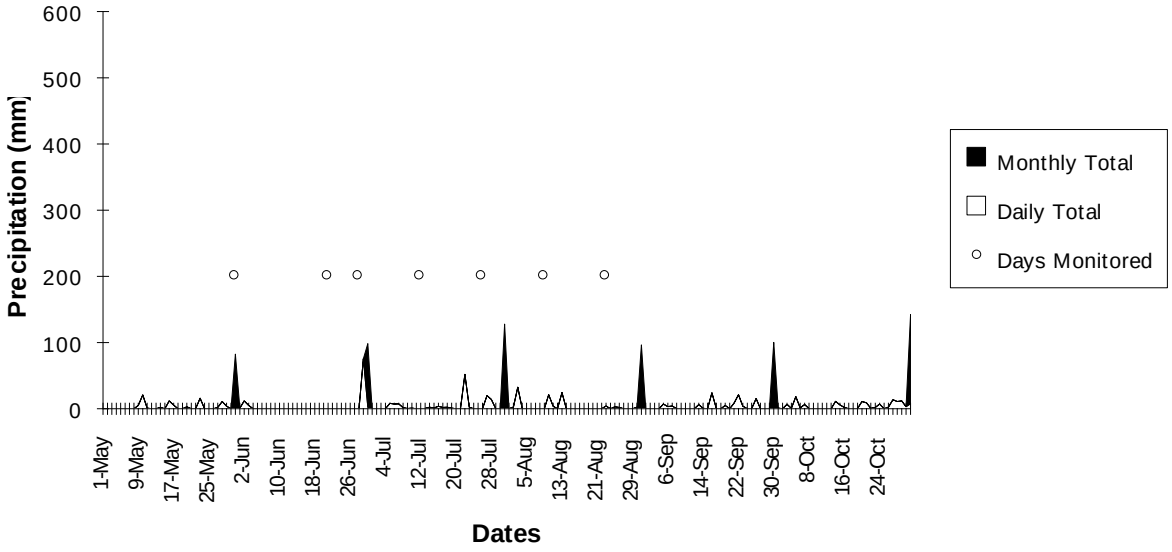

Figure 2. Monthly and daily precipitation totals for the summer of 1995 with water quality monitoring days superimposed.

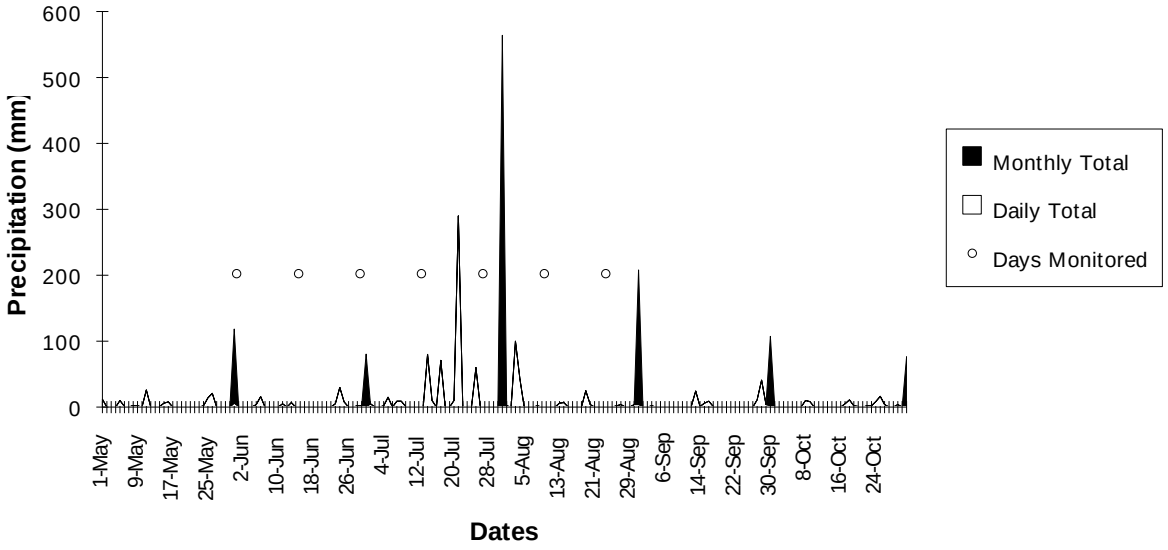

Figure 2. Monthly and daily precipitation totals for the summer of 1994 with water quality monitoring days superimposed.

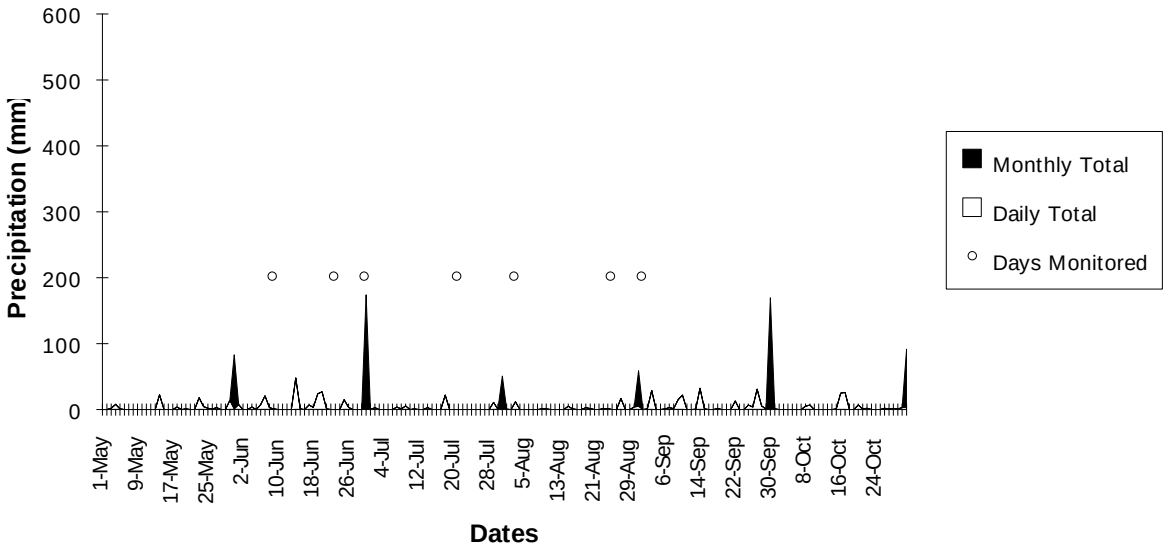

Figure 4. Monthly and daily precipitation totals for the summer of 1993 with water quality monitoring days superimposed.

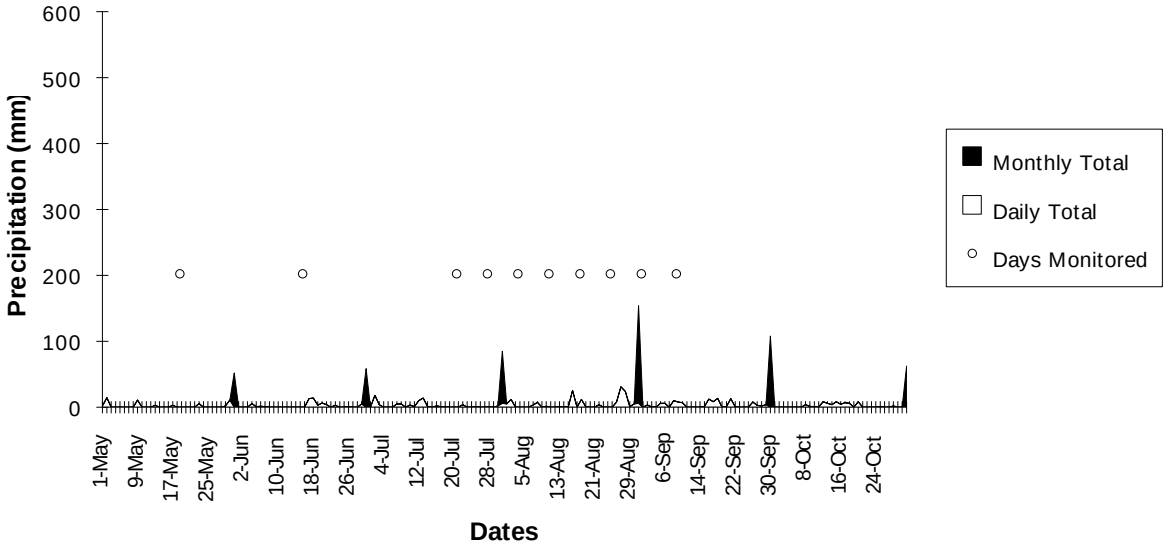

Figure 5. Monthly and daily precipitation totals for the summer of 1992 with water quality monitoring days superimposed.

Discharge

The volume of water leaving each system is an important parameter when determining the actual contaminant loads produced by these systems. Table 2 shows the percentage of the total water flow that contributes to the two Provincial stream flow gauges on the Sauble River. This table demonstrates that, on average, approximately 14% of the total flow discharging to the Sauble River mouth in 1995 was not monitored. This percentage is comparable to the 1993 and 1994 values of 7% and 10%, respectively (GSCA, 1994 & 1995) and represents a significant reduction from the 1992 value of 30% (GSCA, 1993). The addition of a water quality monitoring station on

Spring Creek in 1993 has greatly improved the accuracy of the monitoring program. Of the flows contributing to the stream gauge station in Allenford, approximately 12% were not monitored in 1995. This is consistent with 8% in 1992 and 10% in 1994 (GSCA, 1993 & 1995). This information indicates that the water quality monitoring stations were successful in collecting data from approximately 90% of the total flows within priority areas 1 and 2 during normal flow conditions (excluding 1993 results for priority area 2 upstream of the Allenford station and data lacking from station 3 in 1992). The lack of data from two small stations as well as the unusually wet spring and early summer conditions in 1993, contributed to the extended flow from small surface drains and subsurface tiles reaching the Allenford station, resulting in 38% of the flows not monitored (GSCA, 1994).

Figure 6 demonstrates that the average volume of water discharging from each system in 1995 was significantly lower than flows monitored in 1993 and 1994 but still higher than those monitored in 1992. High discharge values recorded in 1993 were the result of saturated soil conditions from the wet spring causing the increased precipitation in the month of June to runoff directly to the watercourses. Intensive rainfall activity in July of 1994 caused an increase in flows, however, dryer soil conditions prevented the volume of runoff that contributed to the high discharge values of 1993. Dry summer conditions in 1992 would have resisted field runoff until late August when heavy rainfall activity occurred. Average flows for station 1 in 1995 were very similar to the 30 year average for the same sampling period. Assuming flows to be consistent throughout the watershed and other factors have remained constant, average discharge measurements for all of the other stations in 1995 may be similar to their 30 year averages.

Table 2. Average discharge for each regular water quality monitoring station during the summer of 1995 and their percent contribution to the flows recorded at the Sauble Falls and Allenford Provincial Stream Flow Gauges.

Station #	Ave. Discharge in cm^3/s	% Flows to Sauble Falls	% Flows to Allenford	% Flows not Monitored
1	3.80E+06	100.00%		14.11%
2	1.06E+06	27.85%		
3	8.56E+04	2.25%		
4	9.89E+05	26.02%		
5	2.11E+05	5.54%		
6	not monitored			
7	7.98E+04	2.10%		
8	8.41E+05	22.12%	100.00%	12.14%
9	1.44E+04		1.71%	
10	1.54E+04		1.83%	
11	2.07E+04		2.46%	
12	5.97E+04		7.10%	
13	4.15E+04		4.93%	
14	5.87E+05		69.83%	
15	3.78E+05			

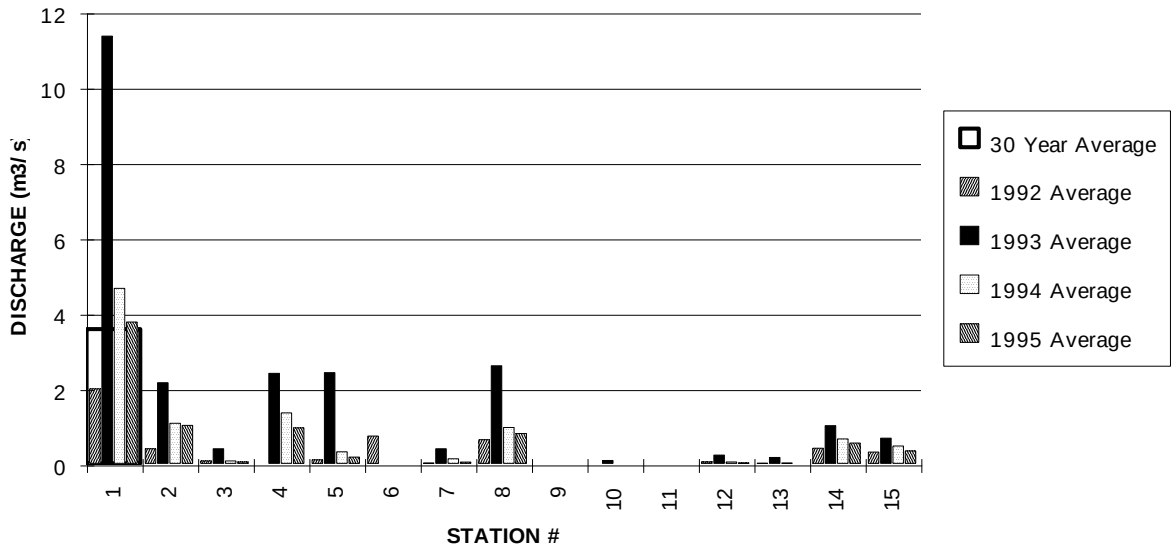

Figure 6. Average discharge (m^3/s) for each regular water quality monitoring station within the Sauble River watershed during the summers of 1992 - 1995.

Fecal Bacteria

The geometric mean E. coli loading rates for each regular water sampling station contributing to priority area 1 and 2 are represented in Figures 9 and 10, respectively. These loading rates are the product of the E. coli concentration (Figures 7 & 8) and the discharge (Figure 6) for each station. In general, 1993 rates were generally higher throughout the watershed. These inflated rates correspond to the significant increase in discharge from each watershed (Figure 6) as a result of the increased field runoff experienced during the wet spring and early summer conditions (Figure 4). Sampling efforts in 1994 were similar to 1993, however, the E. coli loading profile, in general, was less than 1993 mainly due to the decreased field runoff and discharge experienced in 1994. Water sampling efforts in 1992 were concentrated during the later half of the summer (Figure 5) producing data that does not represent the entire summer season evenly as the sampling programs of 1993, 1994 and 1995 attempted to achieve. The differences in weather patterns and timing of the water samples from year to year makes it very difficult to make comparisons and to draw conclusions from these results.

With the exception of station 13 (Arranvale Creek), E. coli loading rates have not demonstrated a significant reduction as a result of three complete years of CURB implementation. Water quality improvements from projects completed in year 4 will not be reflected by this data since the majority of these projects were completed after the summer monitoring period. The significant decrease in the loading rates for station 13 can not be directly attributed to completed CURB projects since very few projects were approved upstream of this station. Past management of the pasture located directly upstream of this station involved the intensive grazing with unrestricted livestock access to the watercourse. This field was not pastured in 1995 during the sampling period, resulting in the decreased bacterial loading observed.

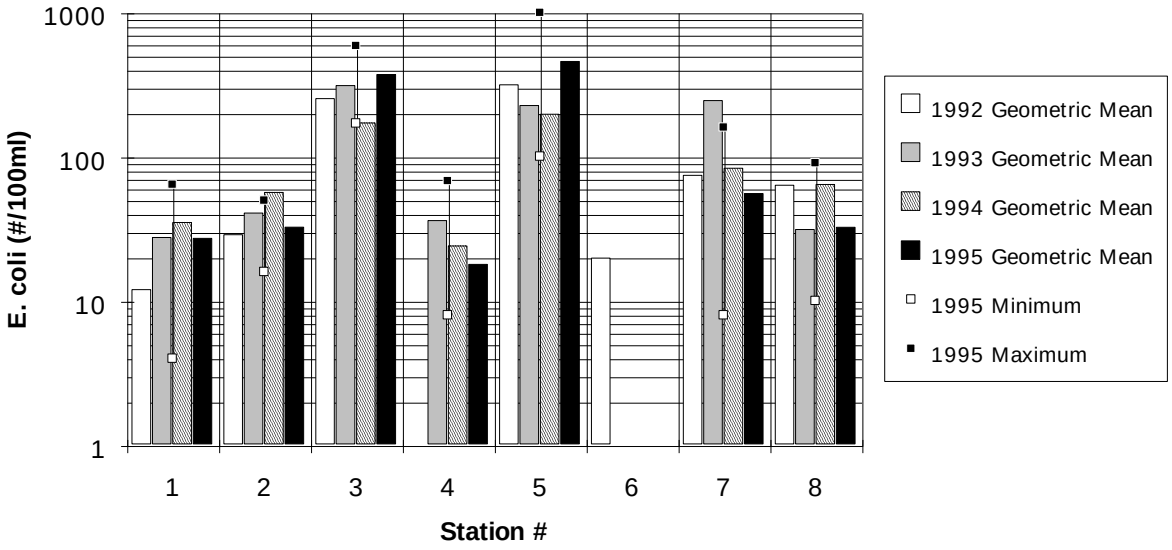

Figure 7. E. coli concentrations (#/100ml) for each regular water quality monitoring station within the Sauble River Priority "One" Watershed during the summers of 1992 - 1995.

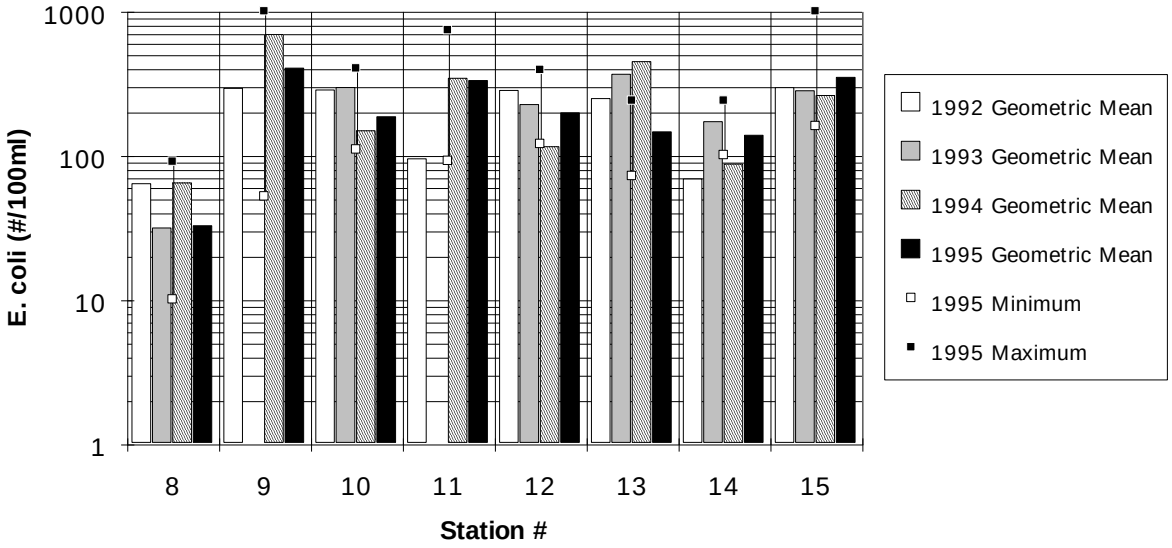

Figure 8. E. coli concentrations (#/100ml) for each regular water quality monitoring station within the Sauble River Priority "Two" Watershed during the summers of 1992 - 1995.

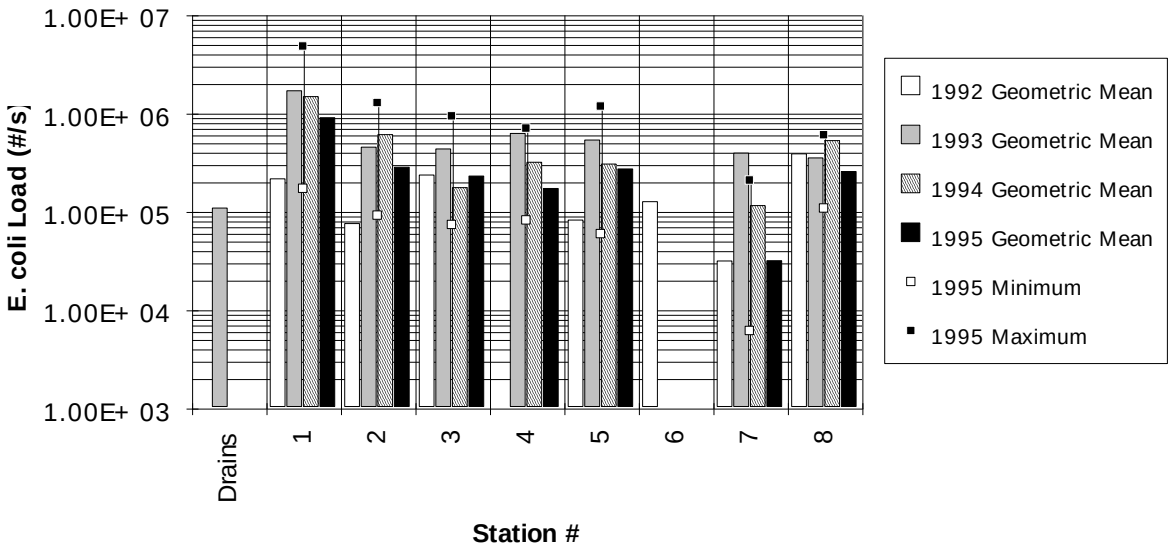

Figure 9. E. coli loading rates (#/s) for each regular water quality monitoring station within the Sauble River Priority "One" Watershed during the summers of 1992 - 1995 (total loading rate of beach drains included for 1993).

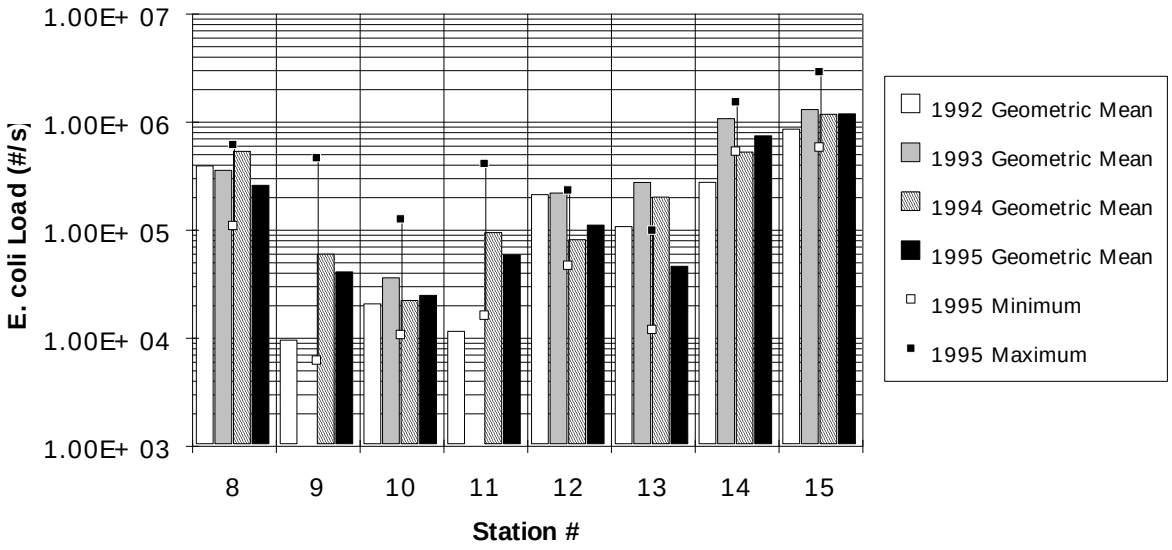

Figure 10. E. coli loading rates (#/s) for each regular water quality monitoring station within the Sauble River Priority "Two" Watershed during the summers of 1992 - 1995.

Chemical

Total Phosphorous

Total phosphorous is closely related to aesthetic conditions along waterways and beaches. Figure 11 demonstrates that total phosphorus levels within the Primary Priority Area (stations 1-5) greatly increased and exceeded the Provincial Guideline of 0.03 mg/l, the level resulting in excessive plant growth and algae blooms (M.O.E.E., 1994). The increased level recorded for

these stations can not be explained since these watersheds are not similar and there has not been any significant influences on these results other than the changed analyzing procedure adopted be the lab to use the high range scale as opposed to the low range scale. Attempts have been made to standardize the data by charting values <0.01 as 0.01. Values recorded for the stations in the agricultural areas of priority area "two" (Figure 12) did not appear to be impacted by the change in lab procedure since previous values were already in the high range.

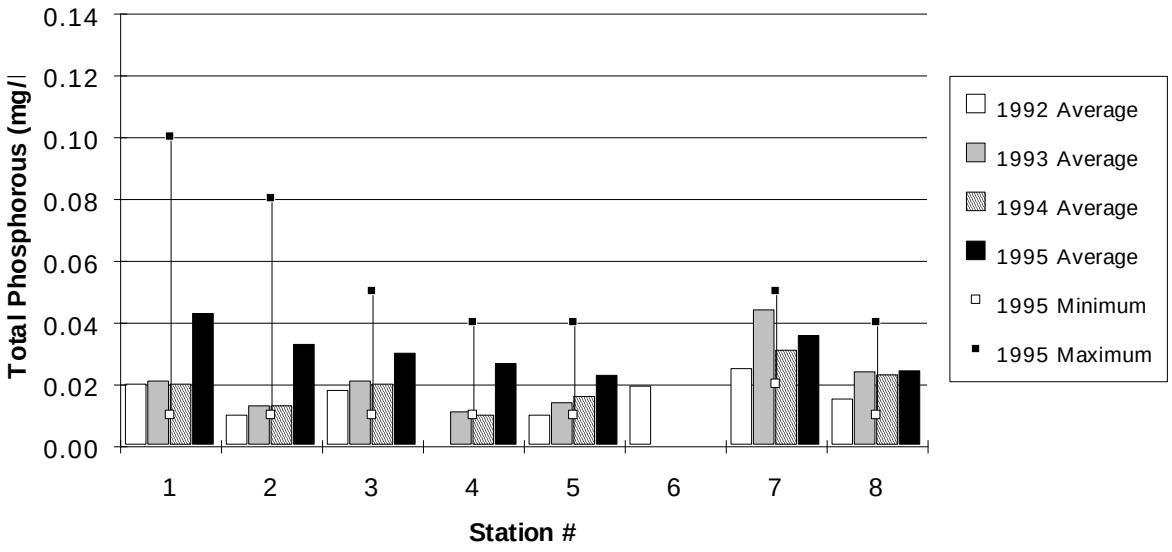

Figure 11. Total Phosphorous concentrations for the regular water quality monitoring stations within the Sauble River Priority "One" Watershed during the summers of 1992 - 1995.

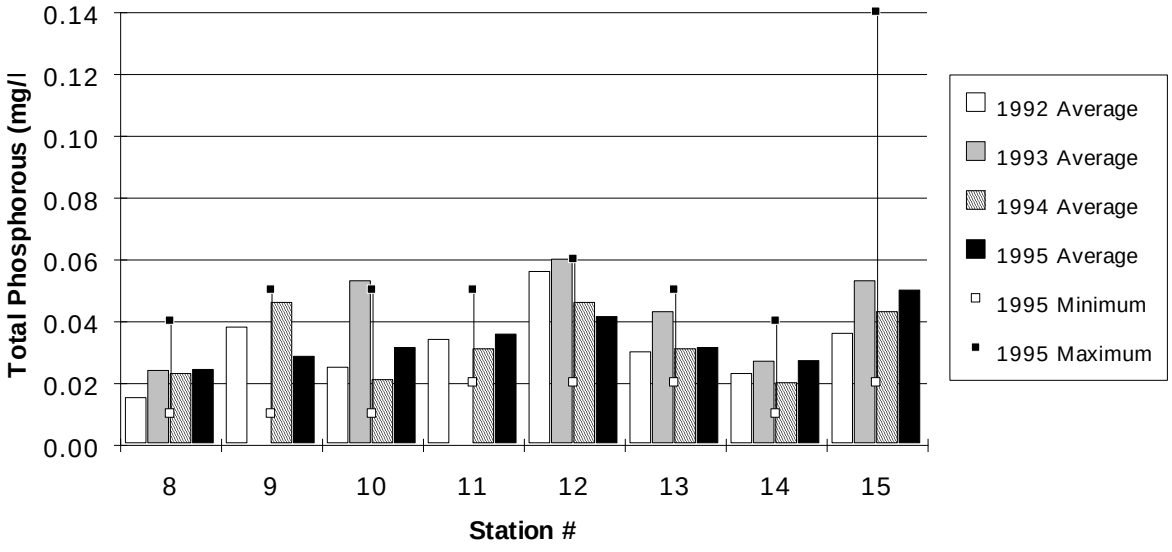

Figure 12. Total Phosphorous concentrations for the regular water quality monitoring stations within the Sauble River Priority "Two" Watershed during the summers of 1992 - 1995.

Organic Nitrogen

Organic nitrogen is represented by the total Kjeldahl nitrogen concentration minus the ammonia nitrogen concentration. The Ontario Ministry of Environment and Energy has an Operational Guideline of 0.15 mg/l for drinking water. Levels exceeding this value usually result in taste and odour problems. All of the regular stations monitored had levels in excess of this guideline (Figures 13 & 14) indicating excessive loading of organic nitrogen throughout the entire Sauble River Watershed. Increased discharge resulting from precipitation patterns and runoff appears to

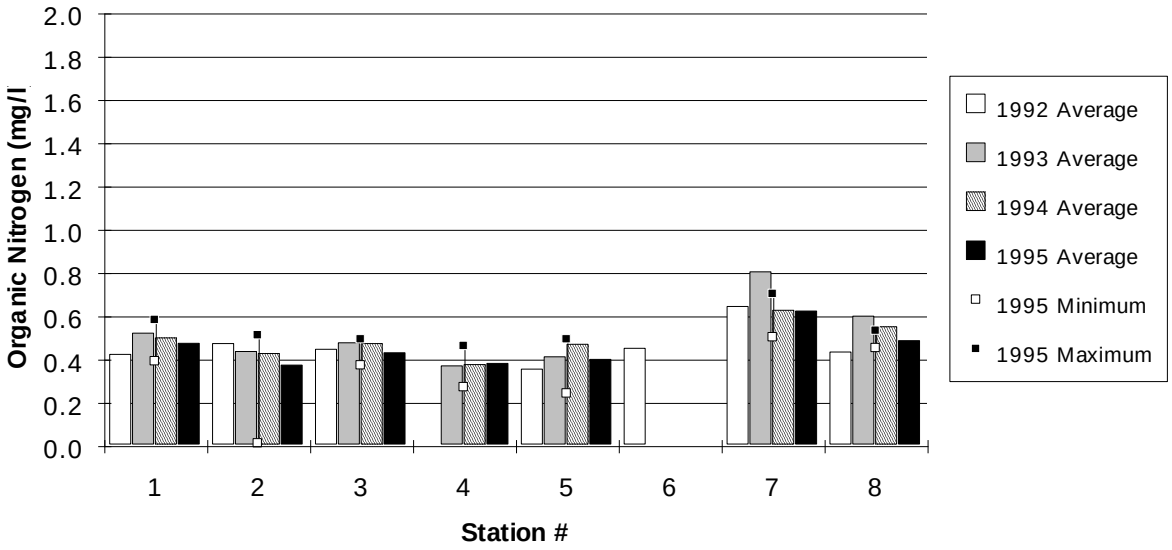

Figure 13. Organic Nitrogen concentrations for the regular water quality monitoring station within the Sauble River Priority "One" Watershed for the summers of 1992 - 1995.

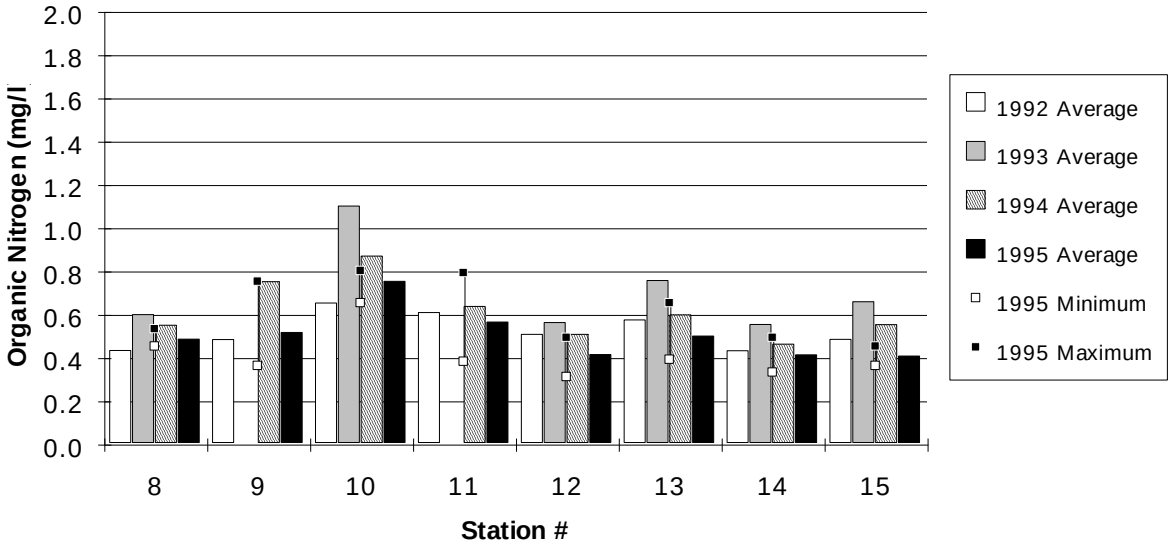

Figure 14. Organic Nitrogen concentrations for the regular water quality monitoring station within the Sauble River Priority "Two" Watershed for the summers of 1992 - 1995.

directly impact the mean organic nitrogen levels within a watercourse. As discharge or runoff increases, organic nitrogen levels increase. The wet spring and early summer conditions of 1993 had the greatest impact on these levels, especially in the high intensity agricultural areas along the southern branch of the Sauble River (stations 7 - 15).

Inorganic Nitrogen (Nitrates and Nitrites)

Nitrates are usually present in water due to the presence of decaying plant or animal material, agricultural fertilizers, domestic sewage, or geological formations containing soluble nitrogen compounds. A causal relationship between the presence of nitrate in drinking water and infantile methaemoglobinaemia exists due to the reduction of the nitrate ion by intestinal bacteria into the nitrite ion. Under natural conditions, the nitrite ions are quickly oxidized to nitrate ions and are rarely found in surface waters in any significant concentration. Once in the blood stream, this nitrite ion reacts with the iron of haemoglobin to produce methaemoglobin, an altered haemoglobin, which is unable to transfer oxygen. The affected tissues then become oxygen-starved. This condition is rare and only occurs in susceptible infants. Older children and adults drinking the same water are not affected. For this reason, Nitrite levels in drinking water must not exceed 1.0 mg/l and Nitrate plus Nitrite (inorganic nitrogen) levels must not exceed 10.0 mg/l (M.O.E.E., 1992).

Results from the regular monitoring stations indicate that none of the stations reached inorganic nitrogen levels beyond this guideline (Figures 15 & 16). The impact of the 1993 weather pattern with its increased runoff and resulting discharge levels did affect watersheds in a similar manner as demonstrated with the organic nitrogen results. However, not all of the stations demonstrated the same correlation.

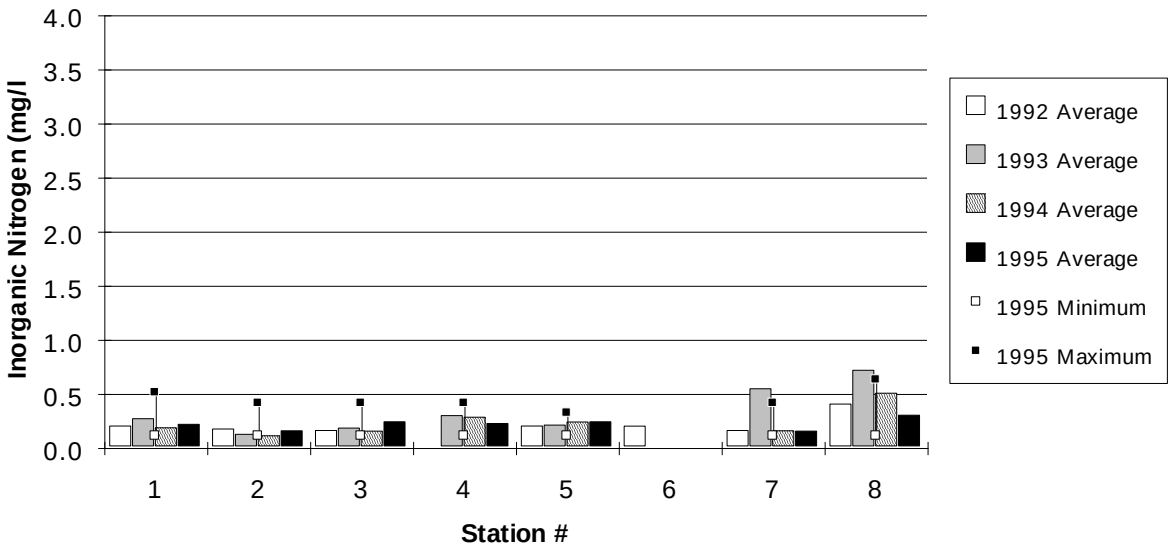

Figure 15. Inorganic Nitrogen concentrations for the regular water quality monitoring stations of the Sauble River Priority "One" Watershed during the summers of 1992 - 1995.

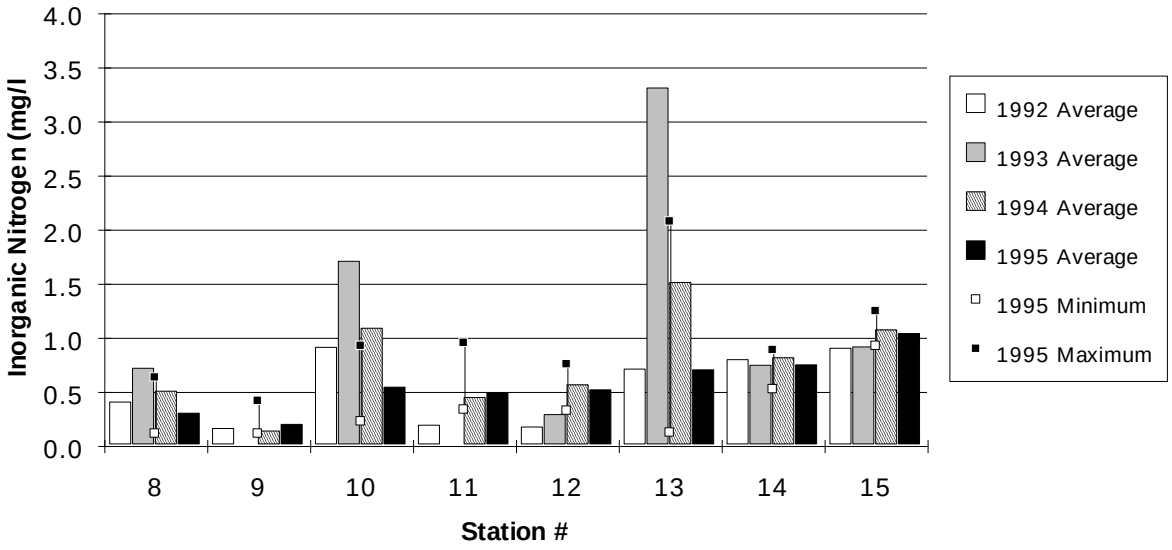

Figure 16. Inorganic Nitrogen concentrations for the regular water quality monitoring stations of the Sauble River Priority "Two" Watershed during the summers of 1992 - 1995.

Other Chemical Parameters

The remaining chemical parameters monitored are represented in Appendix 2. Changes in lab reporting (use of high range instead of low range) may have been the resulted the unusually high levels demonstrated in some of these charts. However, maximum concentrations and other values monitored were not found to be in excess of provincial guidelines and were considered to be normal for surface waters within this area.

1995 CURB Participation

Program participation in 1995 remained very active with 93 projects receiving approval for funding compared to the 103 projects approved in 1994. Total program participation to the end of Year 4 includes 233 approved projects of which 205 have been completed (figure 17). Seventy completed fencing and alternate watering projects resulted in 36.5 km of watercourse being fenced out, requiring 55 km of fencing. Manure runoff reduction project accounted for 55 of the completed projects including 17 covered solid manure storages, 1 liquid manure storage and 37 eavestroughing or clean water diversion projects. Septic system repair or replacement resulted in 79 completed projects. Milkhouse waste water treatment or storage was not very active in this area resulting in only one small project being completed.

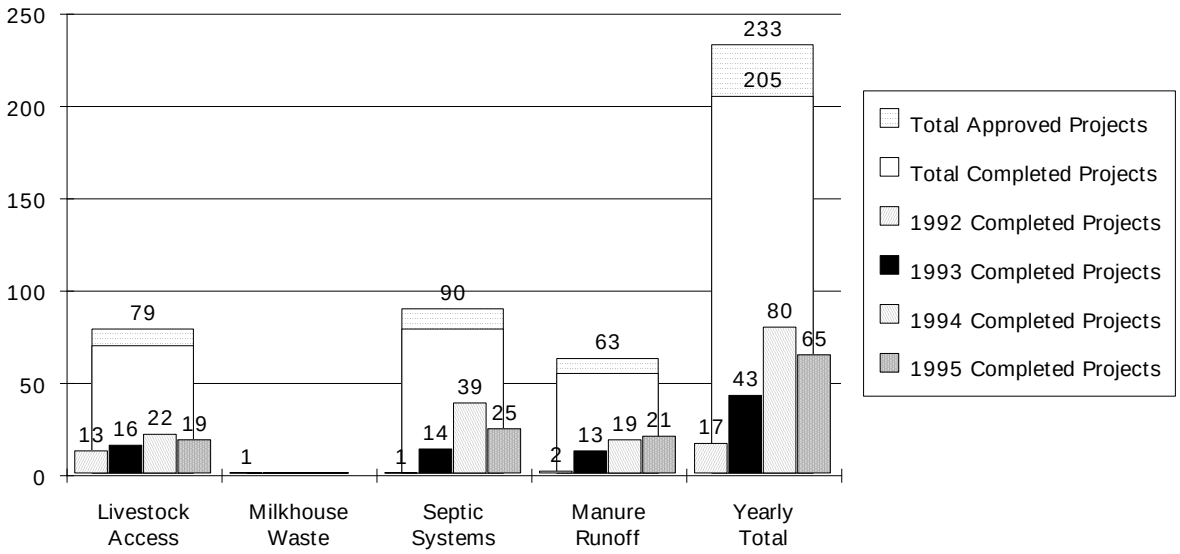

Figure 17. Detailed yearly comparison of projects approved for funding after the fourth and final year of the GSCA CURB program.

Total capital costs and corresponding approved grants are represented in Figure 18. Figure 19 represents a detailed breakdown of the capital costs and grants issued for 1995. The majority of grant funding has been evenly distributed between livestock access restriction and manure runoff reduction. Demonstration funds were committed in 1993 to the manure runoff reduction component of the program. Average regular grants (excluding demonstration funds) issued for each component of the CURB program remain very cost effective even with the manure runoff grants increasing with the increased interest in covered solid manure storages.

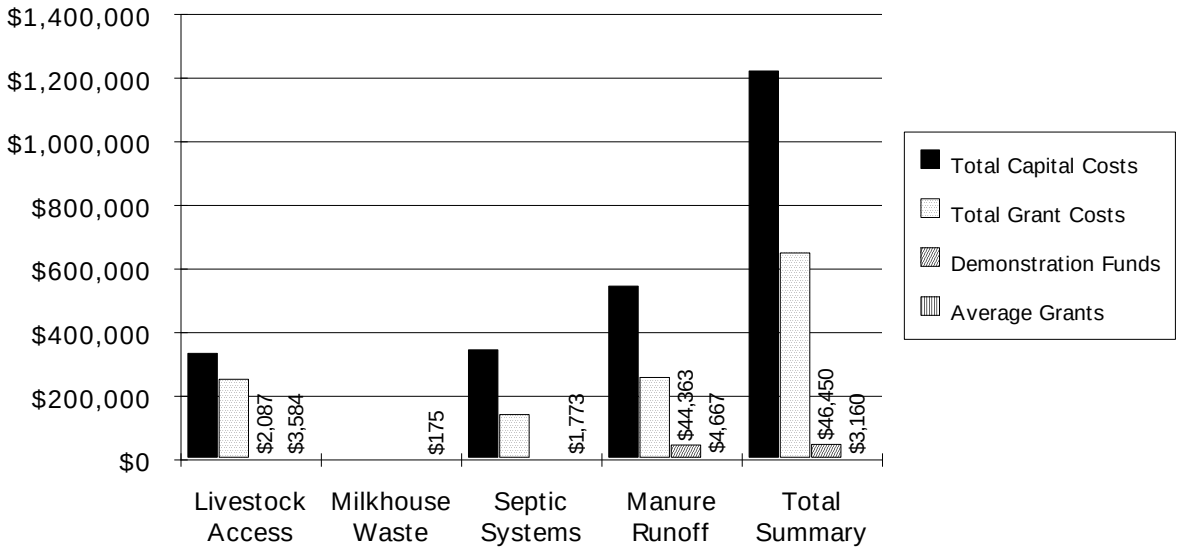

Figure 17. Detailed comparison of total capital and grant costs for completed remediation projects after the fourth and final year of the GSCA CURB program.

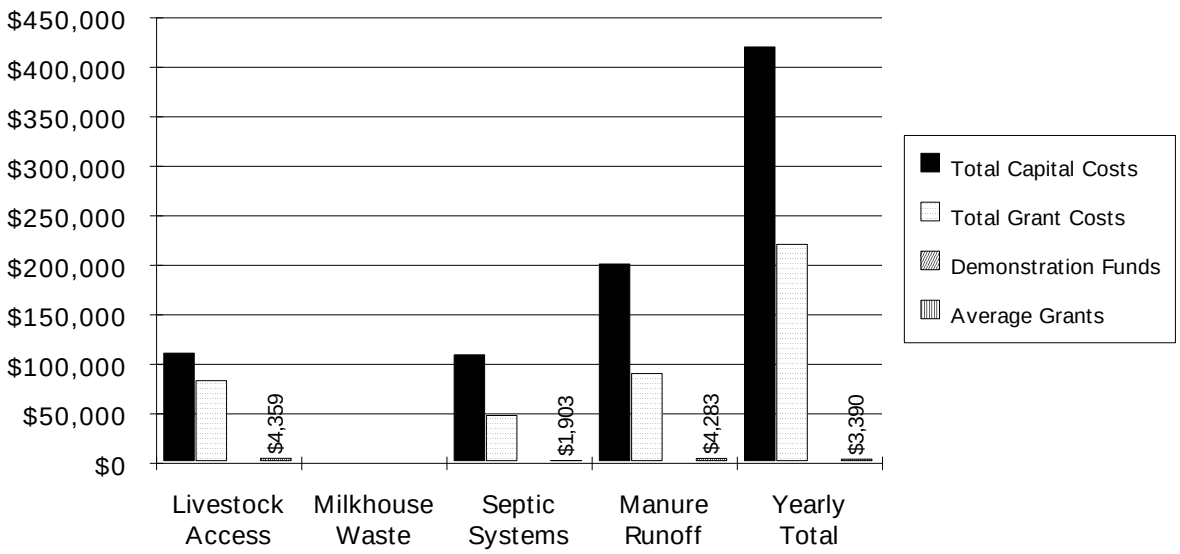

Figure 18. Detailed comparison of capital and grant costs for each project type completed in 1995.

CURB Plan success is represented in Figure 19. After the fourth and final year of the CURB program, a total of 25 or 9% of the potential projects identified in the GSCA CURB Plan have been completed. An additional 122 water quality improvement projects not identified by the CURB Plan, have been completed within the original CURB boundaries. This indicates that the remediation and associated costs for the Sauble River watershed was underestimated by the original CURB Plan (GSCA, 1990). A total of 58 water quality improvement projects located within the expanded CURB area have been completed. Assuming the percentage of CURB Plan completed projects and the cost of remediation (i.e. $1,200,000 invested for 9% completion) to be consistence throughout the watershed, an additional $12,000,000 will be required to complete the CURB Plan.

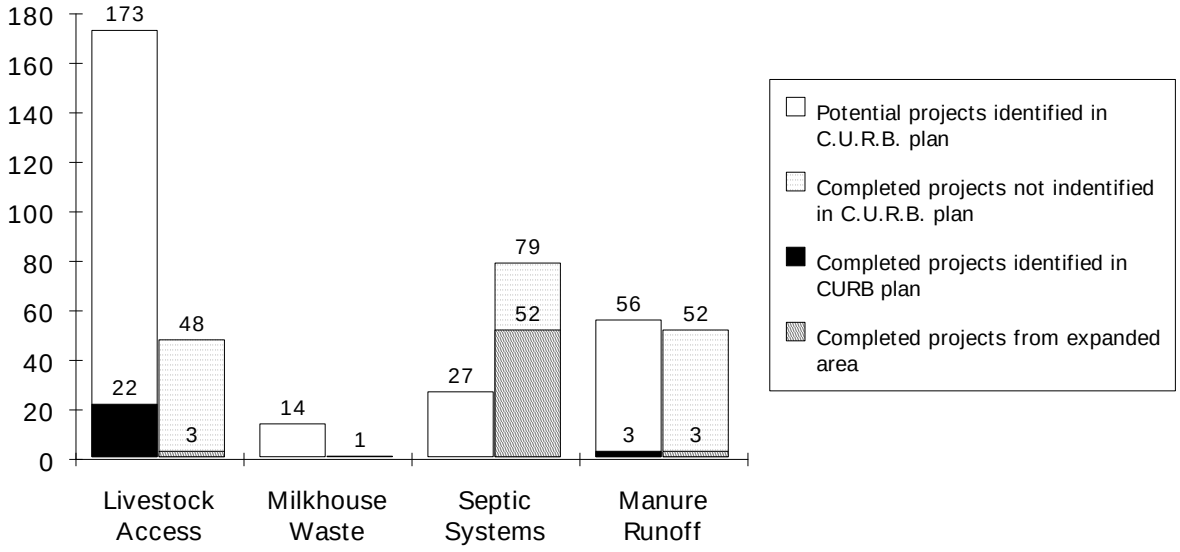

Figure 19. Total remediated projects identified by the CURB plan for the Sauble River Watershed after the fourth and final year of the GSCA CURB program.

Status of Beach Closures

Sauble Beach continues to remain one of the cleanest beaches in Ontario. Historically, a portion of this beach was closed to swimming due to a washed out tile bed from one of the three public washrooms located along the lakeshore on the Saugeen Reserve. This spring, the tile bed of one of these washrooms was found to be surfacing, threatening the closure of the beach again. Fortunately, the swimming season had not started yet and the CURB program was there to provide incentive grants to correct the problem, preventing the beach closure.

Case Studies

Case Study #1

This 50m stretch of Arranvale Creek was accessed by 70 feeder cattle. Water sampling before the cattle were restricted from the watercourse indicated a positive E. coli loading (Figure 20). After the completion of the project, E. coli loading rates fluctuated from positive (loading still occurring) to negative (removal of E. coli). Samples taken in 1994 indicate periods when loading still occurred, however the magnitude of loading is significantly less than pre-project samples. Samples taken three years after the project has been completed, indicate that the loading rates remain below those demonstrated before complete restriction.

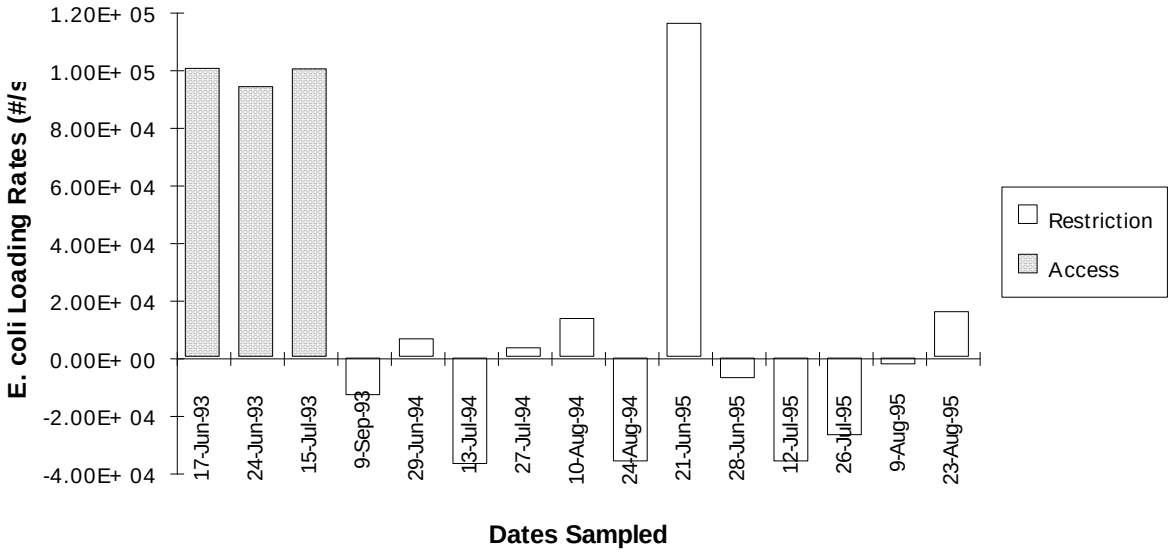

Figure 20. Surface water E. coli loading rates from a 70 head feeder cattle farm operation along a 50m stretch of Arranvale Creek within the Sauble River Watershed during the summers of 1993, 1994 and 1995.

Case Study #2

This 250m stretch of Arkwright Creek is accessed by 40 feeder cattle. Before the project was completed, only two sampling dates were available (Figure 21). Resulting E. coli loading rates from these two samples were not consistent preventing any conclusions as to the impact this site had on water quality. Samples taken in 1994 indicate that loading has increased. Visually, water quality at this station appeared to improve, however, the excessive weed growth, slow flow and deep sections within the channel has produced ideal muskrat habitat. Numerous muskrat feeding areas were common throughout this stretch of drain. Unfortunately, pre-project information on muskrat activity in this area was not available. Other sources of E. coli loading within the area, apart from the increased wildlife activity, were not suspected. Samples taken in 1995 indicate that the loading has decreased and this stretch of watercourse has shown it's greatest reduction in E. coli levels. Muskrat activity was not as prevalent as in 1994, reducing the wildlife impact on this section.

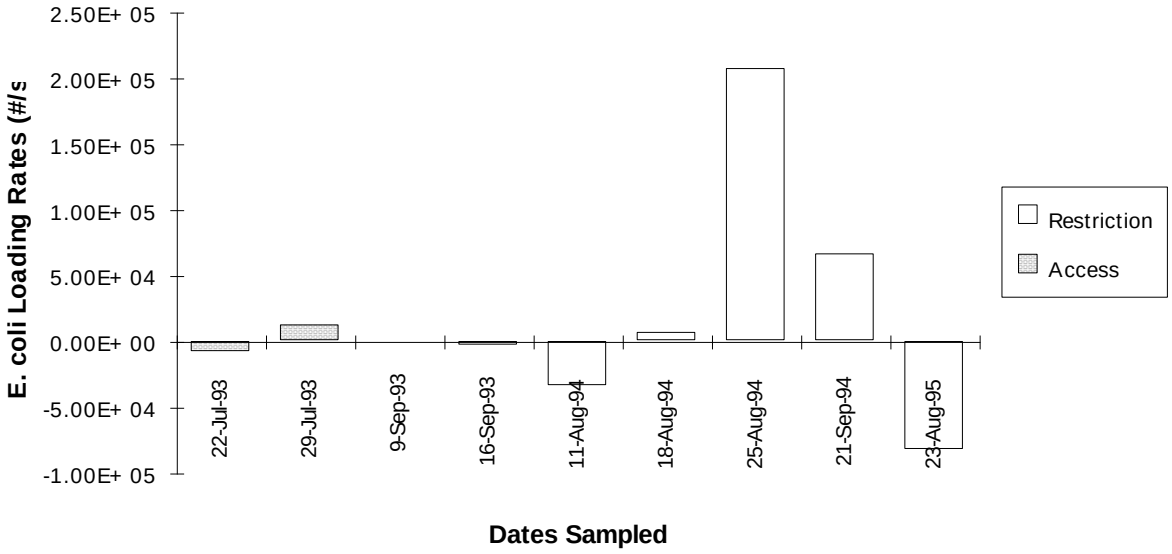

Figure 21. Surface water E. coli loading rates from a 40 head feeder cattle farm operation along Arkwright Creek within the Sauble River Watershed during the summers of 1993, 1994 and 1995.

Case Study #3

Surface water E. coli loading rates for three similar sites within the Sauble River watershed are compared in Figure 22. Site 1 represents a portion of Fenton Drain accessed by 70 feeder cattle. Sites 2 and 3 represent sections of Tyndal drain and Arkwright Creek which were fenced to completely restrict access to the watercourse by 70 head of feeder cattle. In general, the unrestricted access site (site 1) demonstrated E. coli loading rates higher than the complete restriction sites. These rates were not consistent from day to day suggesting that cattle access does not produce consistent loading rates and that these rates may fluctuate throughout the day. The timing and number of water samples required to accurately document the impact that unrestricted cattle access has on water quality needs to be studied in greater detail to produce a consistent monitoring protocol. Background wildlife impact on water quality, as demonstrated on July 26 for sites 2 and 3, should be considered when assessing these types of projects.

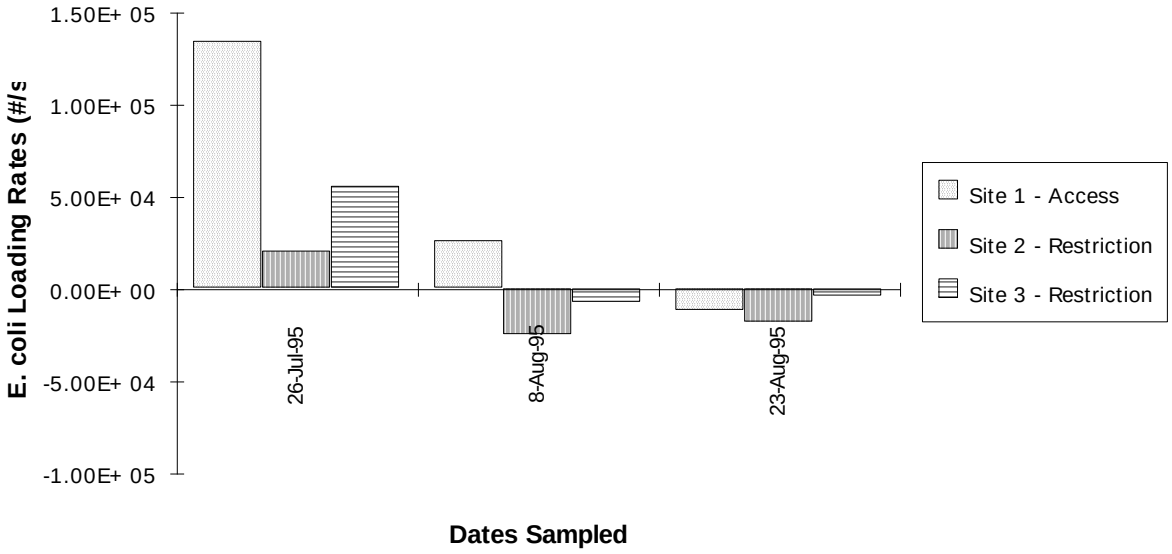

Figure 22. Comparison of completely restricted and unrestricted livestock access to surface water E. coli loading rates from three similar 70 head feeder cattle farm operation along small drains within the Sauble River Watershed.

Case Study # 4

The completion of two adjacent Community Fisheries Involvement Projects (CFIP) on Maxwell Creek which involved the restriction of cattle access to bed level (ford) crossings provided an excellent opportunity to monitor the E. coli loading rates associated with this style of access as well as the impact stream morphology has on reducing the E. coli load within the system. These two access sites were separated by 250m of watercourse flowing over a rock/rubble/gravel substrate. Downstream of the second site, the watercourse was slow flowing with a mud/silt substrate. Water samples were taken directly upstream and downstream of each access site and 500m downstream of the second access site. The actual E. coli loading rates are displayed in

Figure 23. The two access sites consistently increased the E. coli load within the watercourse. However, the 250m stretch of the fast flowing section demonstrated purifying properties that counteracted the loading caused by the upstream access site. The slow flowing section immediately downstream of the second access site did not demonstrate these same properties. This section was found to consistently increase the E. coli loads even higher than the upstream cattle access site. Muskrat activity was very obvious throughout this section.

This study demonstrates that properties such as higher densities of predators that feed on bacteria and greater exposure to solar radiation associated with fast flowing, higher gradient watercourses, have a greater potential to reduce the bacterial load than slow flowing sections with abundant wildlife habitat and a greater potential for wildlife impact. In the future, restricted livestock access may be considered an option for some livestock operations depending on livestock densities, downstream morphology and length of the watercourse flowing through the operation and water quality objectives resulting in a "no net gain" caused by the farming operation.

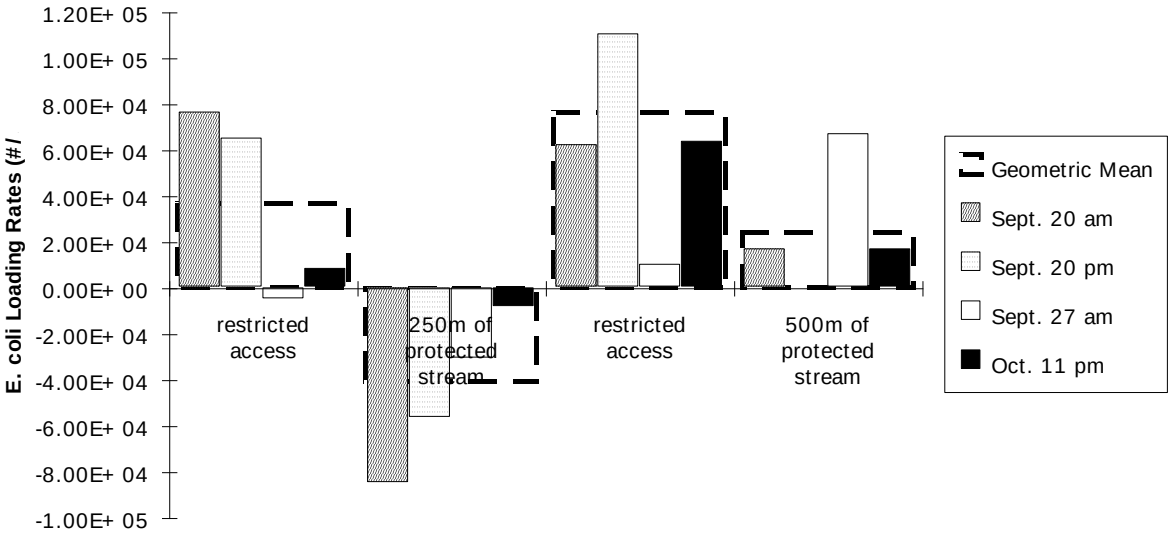

Figure 23. Comparison of the impact stream morphology has on surface water E. coli loading rates from two similar 40 head cow/calf cattle farm operations with restricted stream access along Maxwell Creek within the Pottawatomi River Watershed.

Information and Education Activities

During the summer of 1995, the C.U.R.B. Program was promoted to targeted landowners through the use of small inserts with municipal tax notices (Appendix 3). This form of promotion ensured that all landowners within the targeted areas were notified of the program. Fall Fair displays in the Desboro, Arran-Tara, and Wiarton areas provided an excellent opportunity for landowners to approach staff and make general inquiries about the CURB Program. A solar power company invited CURB staff to their open houses to promote the CURB program and the application of solar watering systems. Signs promoting the beach and watersheds protected by CURB, were posted at beach access points, public boat launches and county road bridges within the CURB watershed. Additional signs (11"x17") were placed at each of the completed project location sites to provide ongoing promotion of the C.U.R.B. Program.

References

Gessner, F.,1950. "Die okologische Bedeutung der Stromungsgeschwindigkeit fliessender Gewasser und ihre Messung auf kleinstem Raum". Arch. Hydrobiol. 43, 159- 65. 5, 89.

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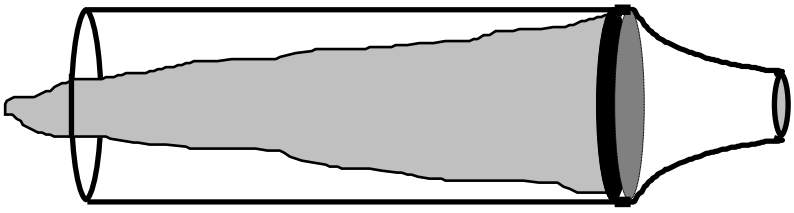
Appendix 1

Innovative Homemade Flow Meters

Flow Meter #1

This flow meter, designed by Gessner (1950), consists of a truncated cone with an opening 5-10 mm in diameter at the apex. To the base of the cone is attached a thin rubber bag (a rubber glove works well), which is protected by an open-ended cylinder as illustrated in the diagram below. Baby bottles that use disposable bags are ideal for this purpose after the closed end of the nipple has been cut off and its area determined.



With the bag in the collapsed condition, the opening of the cone is closed with a finger, and the apparatus is placed facing the current, the volume of water passing through the area of the apex during a measured time period will produce a water velocity value.

For example:

Area of apex = 1 cm^2
Time = 2 seconds
Volume of water trapped in the bag = 50 cm^3 or 50 ml

Velocity = Volume /(Time X Area) = 50 cm^3/(2 sec X 1 cm^2) = 25 cm/sec

Flow Meter #2

This flow meter has a very simple design which uses a float and a tube which permits the measurement of water velocity at any depth within the water column. A hollow transparent tube, with a known length marked on it, is placed in the water at the desired depth with an open end facing the current. Ideally, a neutrally buoyant float (perforated golf ball) is introduced into the tube at the upstream end. The water velocity can be determined by recording the time it takes for the float to travel the designated distance inside the tube.

For example:

Distance within tube = 50 cm
Time for float to travel 50 cm = 2 sec.

Velocity = Distance/Time = 50 cm/2 sec. = 25 cm/s

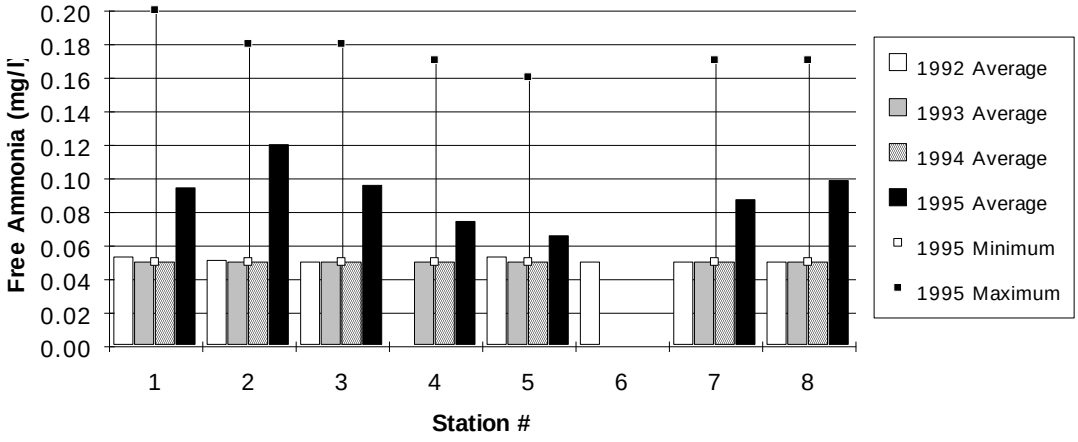
Summary

Each of these methods work very well under different conditions. Flow meter #1 works best in larger waterways with flows around 10 cm/s or greater. Flow meter #2 is excellent for most conditions but is limited to flows less than 50 cm/s depending on the length of the tube. The buoyancy of the float increases resistance to flow as velocities become smaller. However, this apparatus may be satisfactory for measuring flows as slow as 2 cm/s.

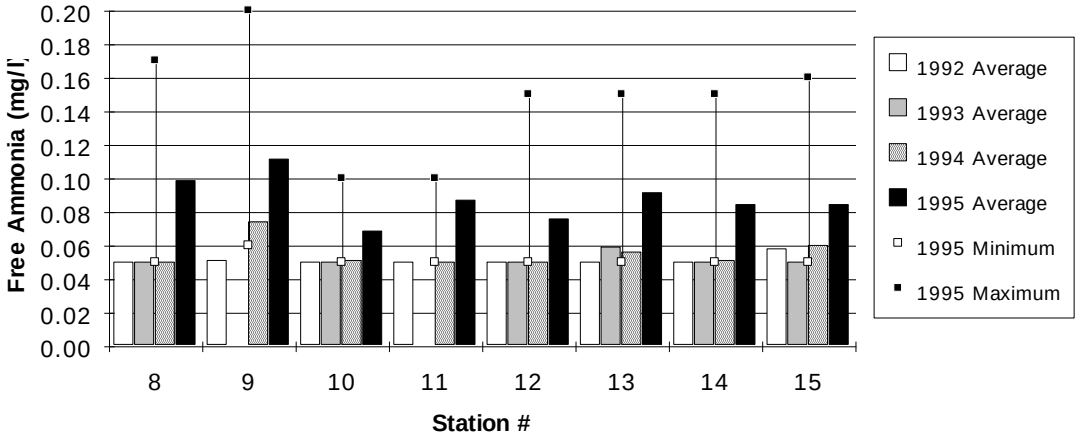
Appendix #2

Other Water Quality Results

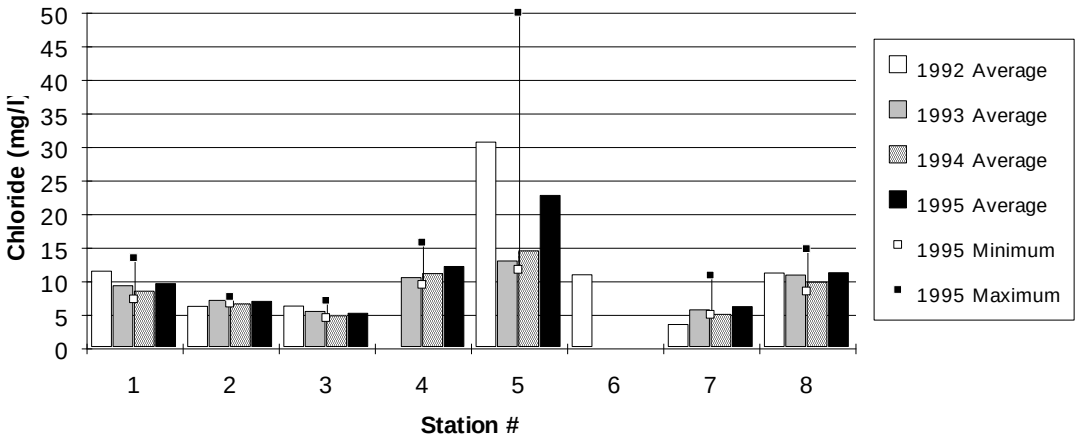
Free Ammonia Concentrations for Stations 1 - 8



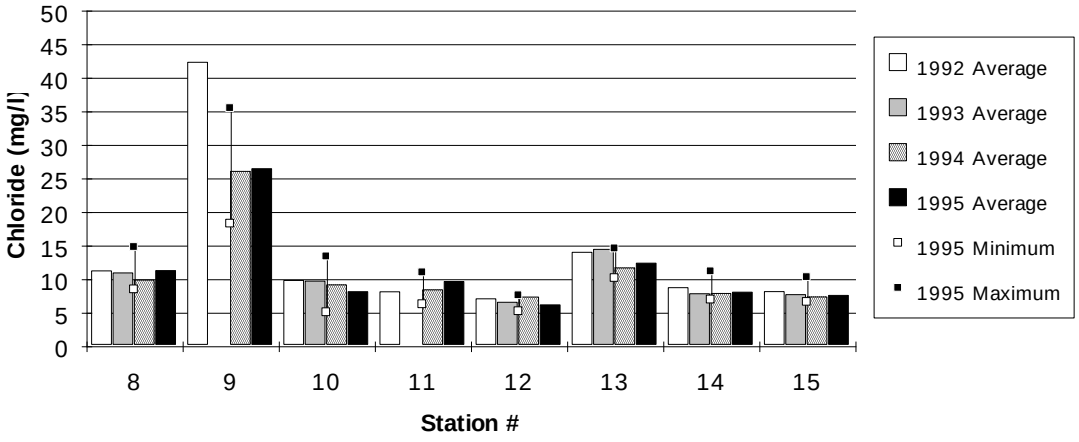
Free Ammonia Concentrations for Stations 8 - 15



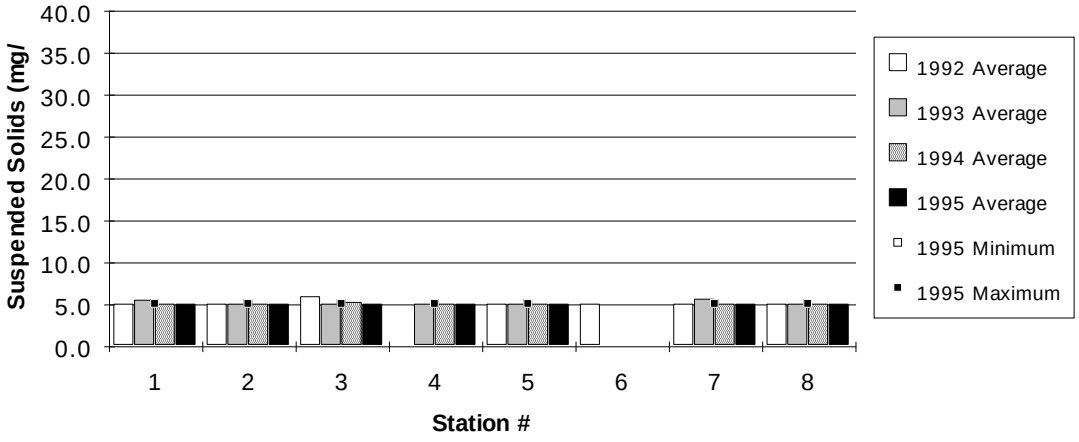
Chloride Concentrations for Stations 1 - 8



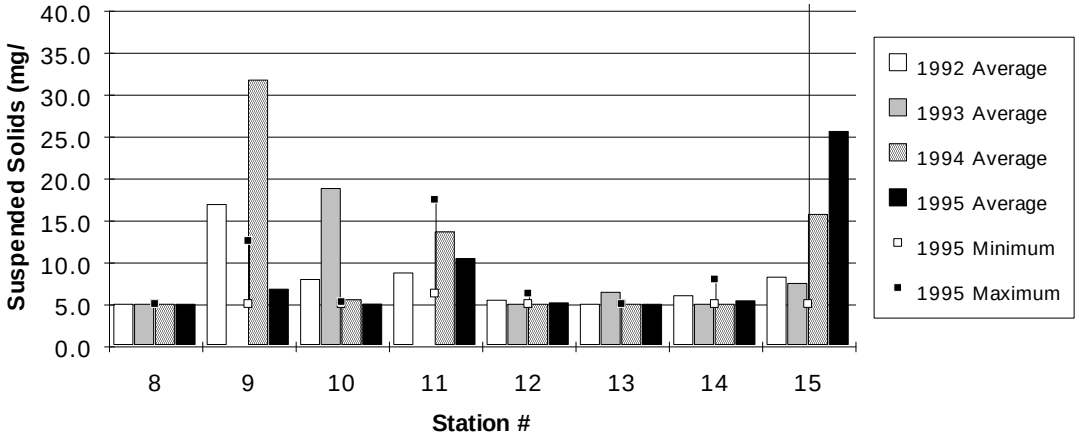
Chloride Concentrations for Stations 8 - 15



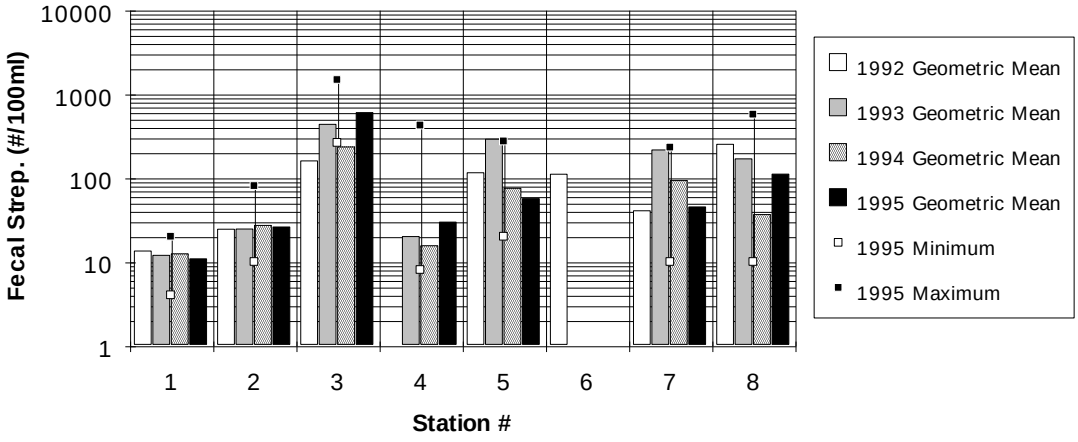
Suspended Solids Concentrations for Stations 1 - 8



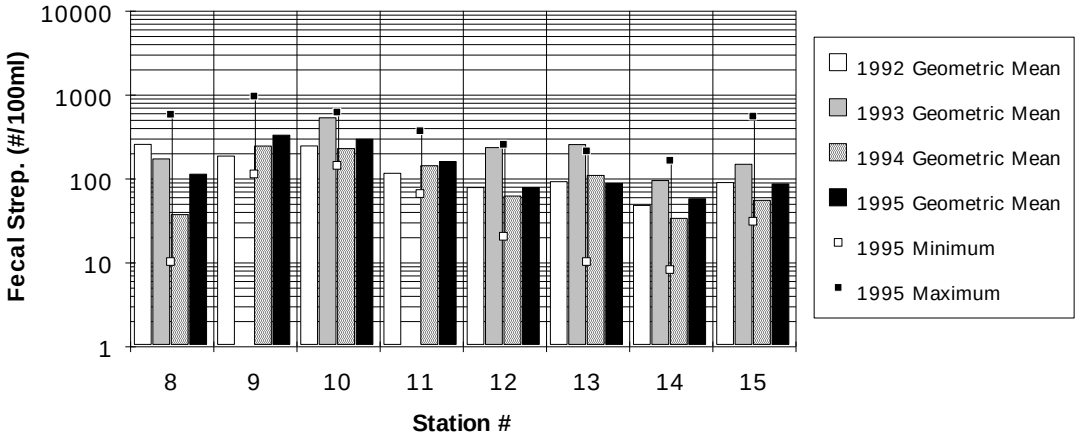
Suspended Solids Concentrations for Stations 8 - 15



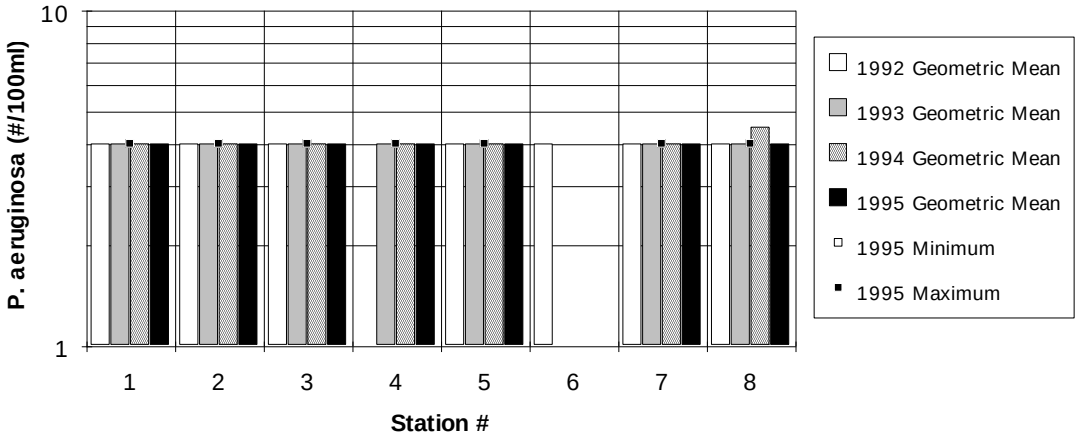
Fecal Strep. Concentrations for Stations 1 - 8



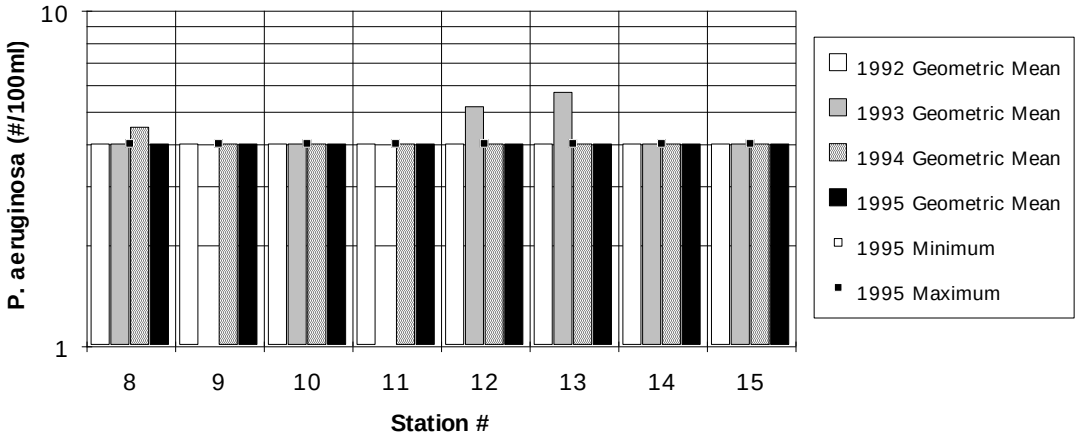
Fecal Strep. Concentrations for Stations 8 - 15



P. aeruginosa Concentrations for Stations 1 - 8



P. aeruginosa Concentrations for Stations 8 - 15



Appendix #3

C.U.R.B. Program Promotion

LANDOWNERS:

You May Qualify for Water Quality Improvement Grants:

Program Objective:

- To reduce the impact that rural activities have on surface water quality

Grant Assistance:

Eligible Items:	*Grant Rate:*	*Grant Maximum:*
Livestock Fencing, Alternate Water Sources, and Crossings:	75%	$10,000.00
Manure Runoff Reduction, i.e. eavestroughing, storages:	50%	$12,000.00
Milkhouse Washwater Disposal Systems:	50%	$5,000.00
Private Septic System Repair or Replacement:	50%	$2,000.00

A COOPERATIVE EFFORT BETWEEN THE LANDOWNER and

Grey Sauble Conservation Authority

CURB
CLEAN UP RURAL BEACHES

For information, contact: Grey Sauble Conservation Authority (519) 376-3076

ATTENTION COTTAGE OWNERS:

You may qualify for the CURB - Clean Up Rural Beaches Grant Program

Grants, up to 50%, are available to replace faulty septic systems impacting water quality at our beaches

For more information, contact:
Grey Sauble Conservation Authority
R.R. #4, Owen Sound, Ont. N4K 5N6
(519) 376-3076 Ask for John

CURB
CLEAN UP RURAL BEACHES

Program Objective:

- To reduce the impact that rural activities have on surface water quality at targeted beaches

What Is Eligible:

- Structures and related equipment designed to reduce surface water quality impairment within targeted watersheds and along Lake Huron

Grant Assistance:

Eligible Items:	*Grant Rate:*	*Grant Maximum:*
Livestock Access Restriction, Alternate Water Sources, and Crossings:	75%	$10,000.00
Manure Runoff Reduction, i.e. eavestroughing, storages:	50%	$12,000.00
Milkhouse Washwater Disposal Systems:	50%	$5,000.00
Private Sewage System Repair and Replacement:	50%	$2,000.00

SOLAR POWER SYSTEMS

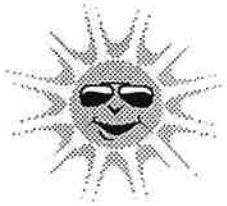
cordially invites you to an

OPEN HOUSE

Saturday, May 6, 1995. 9:00 am - 5:00 pm
Sunday, May 7, 1995. 1:00 pm - 3:00 pm

See SOLAR ENERGY in action!
Learn the benefits of SOLAR ENERGY!

- Solar house
- Bring the family
- Free hot dogs and drinks
- Farm pumping system display
- Solar electric fence
- Learn about CURB (Clean Up Rural Beaches)
- Solarex Solar Panels representatives
- Power Battery representatives



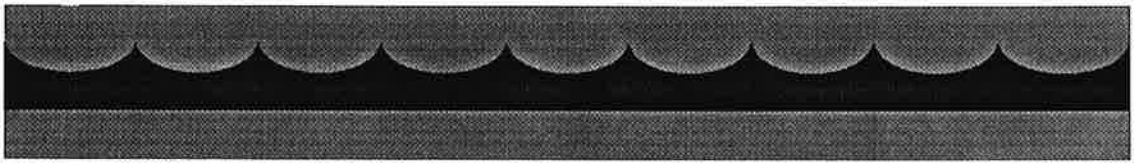
I'm looking forward to seeing you on May 6 or May 7,

Judy Kitto.

CURB signs at beach access areas
(sign design on following page)

CURB

CLEAN UP RURAL BEACHES



WATER QUALITY ALONG THIS BEACH IS BEING IMPROVED THROUGH THE COOPERATIVE EFFORTS OF RURAL LANDOWNERS

and

GREY SAUBLE CONSERVATION AUTHORITY

MINISTRY OF ENVIRONMENT AND ENERGY

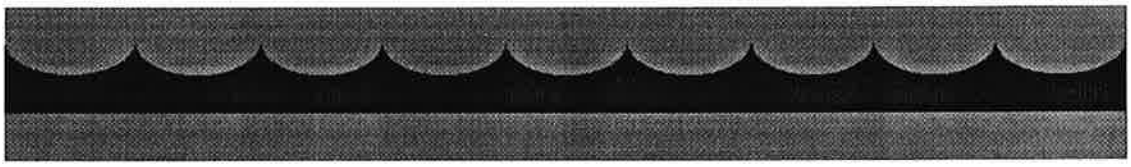
For information about this grant program, contact:

Grey Sauble Conservation Authority (519) 376-3076

CURB signs at river access areas
(sign design on following page)

CURB

CLEAN UP RURAL BEACHES



WATER QUALITY THROUGHOUT THIS WATERSHED IS BEING IMPROVED THROUGH THE COOPERATIVE EFFORTS OF RURAL LANDOWNERS

and

GREY SAUBLE CONSERVATION AUTHORITY

MINISTRY OF ENVIRONMENT AND ENERGY

For information about this grant program, contact:

Grey Sauble Conservation Authority (519) 376-3076

Appendix #4

Related Articles and Letters

More getting sick from water

COLLINGWOOD, Ont. (CP) — A microscopic parasite believed to have infected the water supply has created an outbreak of "epidemic" proportions and sent one woman to hospital with a critical infection.

But Dr. Walter Ewing said a total of 107 cases of intestinal problems have now been officially reported in this town of 15,000. "It's an epidemic for a rural town," he said.

A young woman is in critical condition in a Toronto hospital suffering from the infection, Ewing said.

"I understand her life is threatened by the infection, but this is quite rare," he said. "For the majority of people, it's a nuisance."

The source of the infection is in dispute, but the focus is on a water supply that does not have a filtration system to take out such tiny bugs.

Instead, Collingwood pumps its water directly from Georgian Bay, screens out particles and adds chlorine before sending it into homes. The town's utilities commission has said it has plans to build a treatment plant by 1999.

The Simcoe County medical officer of health ordered residents to boil their water two weeks ago, after several people complained of stomach cramps, vomiting, diarrhea and headaches.

The outbreak occurred over March break, when thousands of people came to the Collingwood area for skiing at nearby hills. Distressed visitors have called public health officials from as far away as Alberta and Missouri.

The infection is caused by a tiny parasite called cryptosporidium, found in human and animal feces..

While most people recover within one or two weeks, the infection can be fatal for the elderly and those with compromised immune systems.

An elderly woman died last week after being transferred to hospital from a local nursing home, suffering from symptoms of the infection. An autopsy was inconclusive and the reason for death was listed as natural causes.

SHALLOW LAKE LEAVES TROUBLES BEHIND

Water issue finally settled

BY PHIL MCNICHOL
Sun Times staff

SHALLOW LAKE

The 500 residents of this village near Owen Sound can expect to have good drinking water by September, 1997.

And it will cost them less than expected.

Shallow Lake needs a water treatment system because of contaminated groundwater in the area.

Several months ago an intense controversy erupted over a proposal to build a $5 million municipal system.

Hundreds of people showed up at public meetings, bullets were sent in the mail to municipal officials, and a bomb was left at the municipal building last month. Police suspect that incident was related to the water issue.

But Tuesday night only a handful of people were on hand to watch Shallow Lake councillors award two key construction contracts for the project. It got the final green light from the Ministry of Environment and Energy earlier this month.

When proposed financing schedules were unveiled late last year home and business owners faced an average cost of $3,400 each for their share of the system's cost, plus their own costs of connecting to the new watermains.

Responding to concerns that this was more than some people could afford, council revised that to $2,500 on average, and increased the amount developers would pay to hook up future lots from $4,000 to $7,000.

The home and business owners' costs could end up being lower still because construction bids came in 10 to 15 per cent lower than expected.

Also Keppel Township has expressed interest in extending the water line to its residents on the eastern outskirts of the village and could share some of the costs, council was told.

Harold Sutherland Construction of Owen Sound — which had the lowest bid at $1.2 million — was awarded the contract to build the distribution system.

Wellington Construction of Palmerston was awarded the contract to build the water treatment plant after submitting a bid just under $2 million. The cost of construction, plus the cost of implementing a water-conservation program, is now expected to be $3.4 million.

See Water on page 2.

OWEN SOUND SUNTIMES MARCH 27, 1996

WATER

Continued from page 1.

Engineering costs of $897,000, plus legal fees and other costs bring the total cost of the project to $4,559,000 — close to $500,000 below estimates late last year when the environmental report for the project was completed.

The new figures include $400,000 built in for unexpected "contingency" expenses, engineers told council. Brad Pryde, of Paragon Engineering, said there is "quite a bit of potential to get most of the $400,000 back."

Council was facing a March 31 deadline to award at least one major contract, or risk losing a provincial commitment for an 85 per cent grant through the Ontario Clean Water Agency, a Crown corporation.

Guy Patourel of Paragon said the system should be operating by September, 1997.

The lower than expected bids mean the village's share of capital costs is now expected to be $683,000 rather than $750,000. Those costs will be shared by property owners and the village, which obtained permission from the Ontario Municipal Board to issue debentures last month.

Homes and businesses in the village currently get their water from private wells, but tests several years ago show many had water quality problems.

The new system will be served by communal wells, but it's already been determined the raw water in those wells is also contaminated and requires treatment.

Members of council alluded to the controversy that has plagued the village in recent months and thanked the officials present for their help and support. "The last six weeks of my life have been a roller-coaster ride comparable to none other," said Dekker.

"I think council has gone through hell unnecessarily," commented Bill Hutchison of the Environment Ministry office in Owen Sound.

Council also approved measures to proceed with the expropriation of the land near the village where the treatment plant will be built. That is not expected to pose any problems, council was told.

OWEN SOUND SUNTIMES MARCH 27, 1996

Sauble nice change for OPP

Beach beat in hot demand

By BILL WALKER
Sun Times staff

SAUBLE BEACH — It's almost noon on a blistering Saturday morning and the cars are streaming onto the beach in a steady procession of blaring radios and clouds of dust.

Right about now, Mike Nemier would normally be cruising his usual stretch of Highway 401 near Cambridge.

In 28 C weather, the asphalt would feel like a hot plate and the OPP motorcycle constable would be desperately hoping drivers would mind their manners and give him an easy 12-hour shift.

"It's a whole different world up here," Nemier, 53, sighed Saturday, taking a break from patrolling Sauble Beach.

"The work is like night and day to what I'm used to. And it's much more relaxing."

The Kitchener resident wasn't always keen on Sauble, admitting he was more of a conscript than a volunteer his first summer tour of duty.

"I really didn't want to come the first year," Nemier reminisced. "They had a motorcycle and needed a rider and they just said I was going.

"I wasn't really too happy about it, but after I spent a summer here, I realized it was a lot better than riding on the 401 with all of those crazy people in their cars."

Nemier's now in his sixth summer at the Sauble Beach detachment, generally one of the most sought-after postings in the OPP's District Six.

Each spring officers from the district's 14 detachments can apply for one of nine constables posts, or the single openings for a sergeant and a detachment commander.

Generally, about 40 officers apply for the postings, which last from early June until just after Labor Day.

"It's just a beautiful area to work in the summer," said Staff Sgt. Terry Nicholls, the detachment commander.

"This posting allows the officers to have a change from their normal duties in the detachment without having to relocate their families and sell their homes. It's a fun place to work because it's so different than the type of work they're normally used to."

It's also a relaxing area to work in, Nemier said, unlike other seasonal postings in such places as Grand Bend and Wasaga Beach.

"We don't have the bars or the action that they do," said Nemier, who has been a police officer for 25 years.

"This is more of a family beach. The only problems we'll have are on long weekends when the kids are in town and they've been drinking and they get a little rowdy. Even then, they're not too bad."

This type of police work is a big change from Nemier's normal duties, which mainly consist of accident investigations and handing out speeding tickets.

"In the winter time, it's nothing to investigate 10 or 15 accidents in a day," Nemier said.

"Then you come up here, it's a whole different atmosphere. You get involved in every aspect of police work. There's also a lot of public relations work here. I drive down the beach and wave at the kids."

That's not to say Sauble Beach is a sleepy, little town.

"You do get the odd topless person or nude bather, but that's about as extreme as it gets," Nemier said, noting the most difficult part of the job is trying to find lost children.

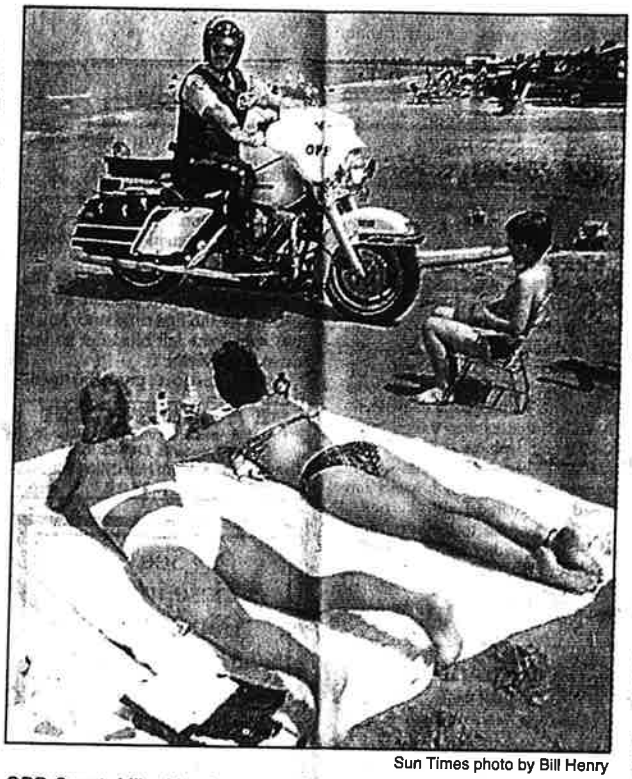
"People get on the beach and if they can't find their kid, automatically they think he's at the bottom of the lake. You can imagine what they feel like, so that can be a little tough until we find them."

The summer postings have also helped Nemier become reacquainted with his relatives in England, who are overwhelmed by Sauble Beach.

"They just think this place is amazing," said Nemier, who has been a motorcycle officer since 1976. "Every year I've been here I've had family from England come over. Before that, I never saw them."

Nicholls explained the OPP provides cottages for the officers and their families each summer. Officers patrol Sauble Beach by car, on foot, and on motorcycle. Four-wheel-drive vehicles and a boat are also available.

"Sauble Beach is unique because 90 per cent of our work is along the beach front and main street area and downtown core," said Nicholls. "For us, life revolves around the beach in summer."



Sun Times photo by Bill Henry

OPP Const. Mike Nemier swaps highway patrols for the beach beat at Sauble each summer. Here he chats with Brenda Bell of Chesley, left, Tina Wilkin of Hanover and Evan Fortune, 7, of Chesley.

ORTS

National tourney set

Volleyball coming to Sauble in a big way

By JONATHON JACKSON
For The Sun Times

Canada's best are headed to the beach.

Sauble Beach will play host to the Canadian beach volleyball championships this weekend, with 96 of the nation's top players and The Sports Network converging on the village.

Spokesman Dave Rudell said he expects a big crowd for the weekend action, which will crown national champions in the men's twos and women's twos.

"I don't think 10 or 15 thousand people are out of the question," he said.

Rudell spearheaded the drive to bring the nationals to Sauble. He made a proposal to Volleyball Canada in March to counter its plan to install the championships in Wasaga Beach despite the absence of a local group to run the tournament there.

The Sauble Beach Volleyball Association has risen to the challenge, however, with approximately 80 volunteers working to have everything ready for the start of the competition Friday at 11 a.m.

Action that day runs until 5 p.m. The games will run Saturday from 9 a.m. to 5 p.m. and from 9 a.m. Sunday. The women's and men's finals are to be played, respectively, Sunday at 2 p.m. and 3:30 p.m. in front of an expected centre-court crowd of 2,000.

Bleachers are being imported from the Seaforth Agricultural Society for the event.

Twenty-four doubles teams in each division are set to take part. Jody Holden and Conrad Linemann of British Columbia and Paul Cox and Frank Blasi of Toronto are among the top men's teams expected to take part.

Janette Solecki and Fiona Moffat of Alberta are a high-profile women's entry. Janice Gerrardi and Sue Weston of Toronto were expected to contend but were forced to withdraw Wednesday. Among the candidates to replace them at press time, Rudell said, were locals Kelly Breutigam of Owen Sound and Stacey McCoy of Wiarton.

If selected to fill in, Breutigam and McCoy will be the only locals in the top level of competition. Other local volleyballers can join up for the men's recreational event Saturday from 9 a.m. to 5 p.m. or the recreational coed tournament Sunday from 9 a.m. to 2 p.m.

All the professional action will be taped by TSN and broadcast at a later date.

Other scheduled weekend activities include concerts, contests and clowns for the kids. For more information contact Rudell at 534-3402.

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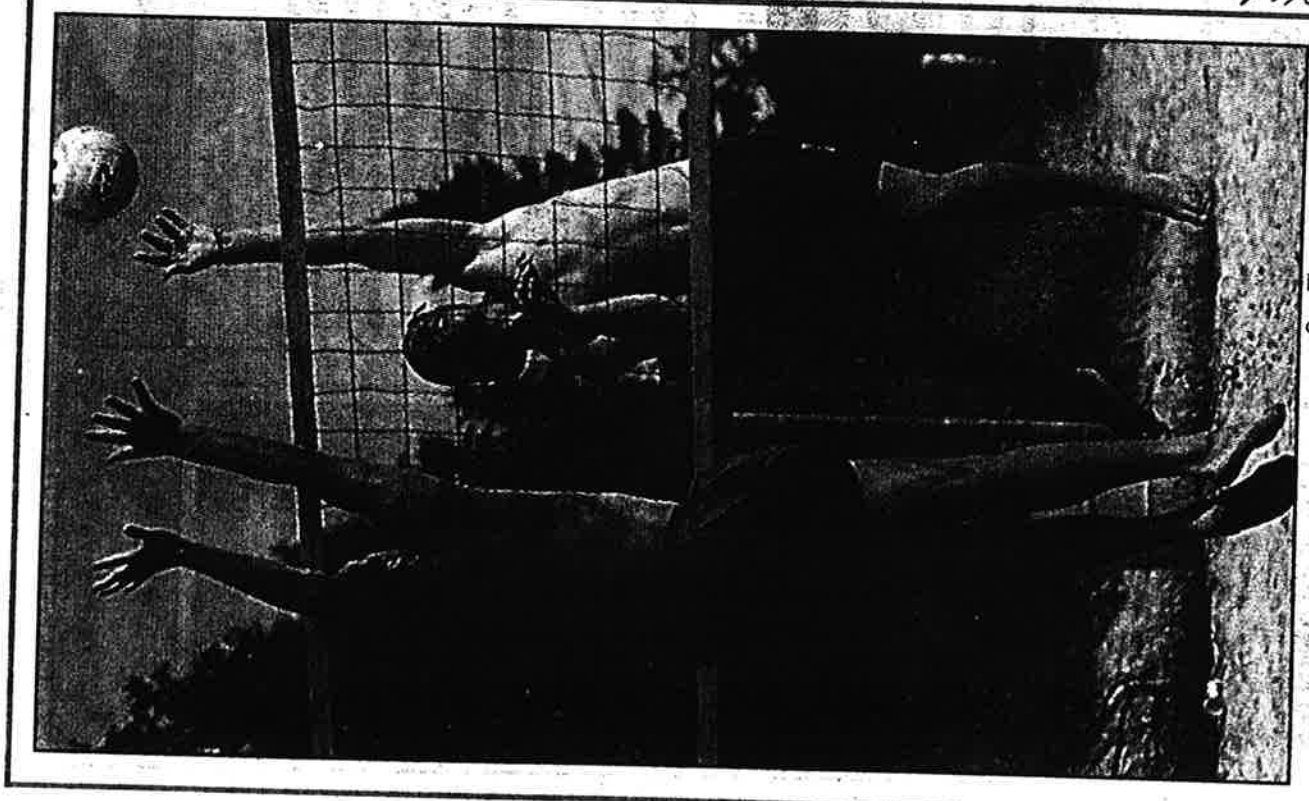
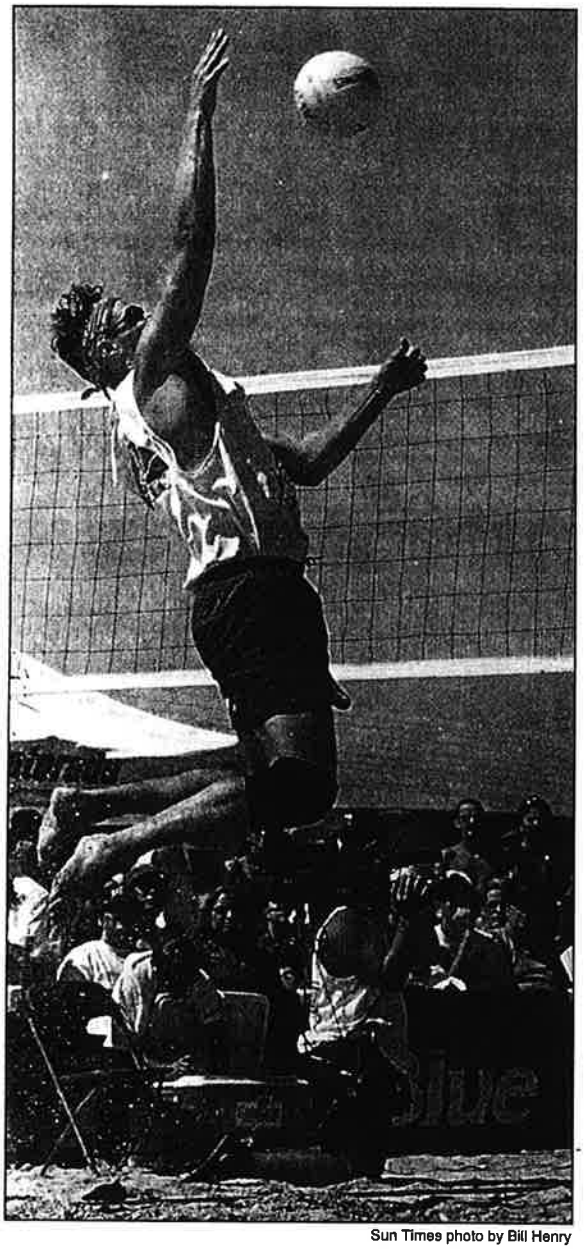


Sun Times photo by Bill Henry

Steve Mathison of the Northwest Territories leaps to return a volley against Stephane Joseph of Montreal Friday as the Canadian beach volleyball championships got underway at Sauble Beach. Finals are Sunday. See page 10 for more



Sun Times photo by Bill Henry

Jodie Holden leaps for a return during the men's final of the Canadian Beach Volleyball Championship Sunday at Sauble Beach. Holden and partner Conrad Linneman won.

Top seeds ice national beach volleyball titles

SAUBLE BEACH — There was no big surprise Sunday as the top-seeded teams walked away with the top prizes at the Canadian beach volleyball championships here before 2,700 fans at centre court.

Janette Solecki and Fiona Moffatt triumphed over Heather Sawyer and Dianne Scott of Manitoba in the women's final. In the men's title match it was Jodie Holden and Conrad Linneman of British Columbia defeating Dave Braun and Mike Hughes of British Columbia.

Scores were unavailable from either match.

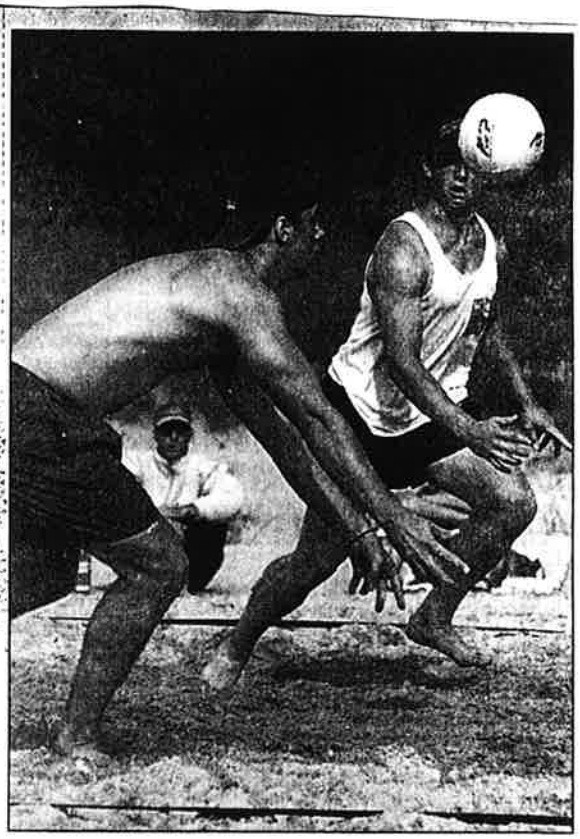
"It was a success," Sauble Beach Volleyball Association representative Dave Rudell said of the tournament Sunday evening, adding the national event may return to Sauble Beach sometime in the near future.

"Volleyball Canada was happy," he said. "The players were happy with the way it was run. They all want to come back."

The three-day event attracted 24 men's teams and 16 women's teams who represent 80 of the best beach volleyballers in the country. Rudell estimated more than 6,000 spectators took in the centre-court play alone.

Two local entries took part in the women's event. Sisters Tanielle and Shailah Myles from the Sauble Beach area wound up ninth while Kelly Breutigan of Owen Sound and Stacey McCoy of Wiarton placed 16th.

The Sports Network was on hand to videotape the championships. They can be seen Sept. 23 at 5:30 p.m.



Sun Times photo by Bill Henry

Steve Mathison, left, and Chris O'Sullivan, both of Yellowknife, NWT, work together during a match Friday as the Canadian beach volleyball championships got underway at Sauble Beach. They lost 15-7 to Sylvain Duplessis and Stepban Joseph of Montreal. Finals are set for Sunday afternoon.

Beach ball north

Volleyball rare sport in NWT

By LISE THORBJORNSEN
Sun Times staff

SAUBLE BEACH – Beach Volleyball in Canada's Northwest Territories comes with some unique complications.

For starters, it's almost unheard of. And for the few people who play, smoke from area forest fires created hazy weather conditions this summer.

But despite less than ideal conditions, four beach volleyball players representing the Northwest Territories are in Sauble Beach this weekend for the Canadian Beach Volleyball Championships. All four are from Yellowknife, the capital city of the Northwest Territories.

Ingarfield

Beach volleyball is played in pairs with the NWT men's amateur team made up of Steve Mathison and Chris O'Sullivan. The women's team is comprised of Paula Ingarfield and Sandra Nielsen. To play in the Canadian championships they had to win back home at the NWT championships. Only four women's teams and 12 men's teams vied for a chance to play in the Canadian championships.

Ingarfield and Nielsen are both skilled players in an indoor court but their experience playing outdoors was limited. They had to make some adjustments, such as taking weather into consideration.

"The wind factor. That's one thing we really notice," said Ingarfield, an employee with the Department of Indian Affairs.

Having a sandy beach under their feet instead of a gymnasium floor was another challenge. "You can't jump as high off the ground," Ingarfield said.

Nielsen, a Queen's University student, added, "It's harder to judge when you're on the court."

Mathison and O'Sullivan along with a few friends play beach volleyball at home in the summer at Long Lake. During the school year both men attend university.

Teams from the Northwest Territories and Maritimes generally aren't as strong as players from Toronto, British Columbia, Manitoba and Quebec, said event organizer Dave Rudell.

Nielsen

An estimated 100 players will compete this weekend. The event is also expected to draw spectators to Sauble though Rudell didn't have an estimate on the numbers.

"We expect it to get really busy," said Bob Cruickshank, ice cream manager and waiter at Dobson's Restaurant across from the beach.

"It should be good for the tourism business," he said. "Lots of tourists come up to see the Canadians. They're the best of the best."

Cruickshank also had high praise for Sauble as the host community. "Ours is the best. The best beach, the best courts, everything."

OWEN SOUND SUN TIMES
MARCH 25, 1996

Vacationland scare

Water safety concerns won't help with tourism

BY LISE THORBJORNSEN
Sun Times staff

Concerns over the safety of Collingwood's water could hurt tourism in this popular vacation town.

The scare over a parasite believed to have infected the town's water supply could cut spring tourism in half, Len Rocque, vice-president of the Georgian Triangle Tourist Association, said Wednesday.

"It could affect us quite severely in the short run," he said. "People who were thinking of visiting Collingwood for two or three days might well pass up coming to this community during the so-called epidemic."

A microscopic parasite found in human and animal feces is being blamed for the outbreak of sickness. The source of the infection is in dispute, but the focus is on the town's water supply which does not have a filtration system to take out such bugs.

"Let's face it," said Rocque, a real estate agent who makes his living selling resort condominiums. "We've got 3,000 resort condominiums in the area. Weekenders might just pass coming up for the next month or two and all the business they bring to town would be lost."

But Rocque expected the scare to blow over in the next few weeks.

Fortunately, spring isn't a busy time of year for tourism, said Steven Booth, manager of the Collingwood Country Kitchen restaurant. Winter and summer are the busy months.

Like Rocque, Booth wonders if concerns surrounding water would scare tourists away. "If you were a tourist would you think twice?" Booth asked.

The Simcoe County medical officer of health ordered residents to boil their water two weeks ago, after several people complained of stomach cramps, vomiting, diarrhea and headaches. The boil-water advisory is still in effect which means a lot of extra work for restaurant workers like Booth.

See Water on page 2.

❑ While tests haven't found the parasite that's believed to be in Collingwood's drinking water, it's still the most likely source of what's made people sick.

See page 5

WATER

Continued from page 1.

"You've got to boil it and then you've got to store it," Booth said, adding, "It takes up refrigeration space and it's very inconvenient."

McDonald's Restaurant stopped serving fountain soft drinks, owner Barry Kelly said. "We've replaced those with canned soft drinks. That's been the biggest inconvenience to us and our customers."

McDonald's is bringing in water from Thornbury and Wasaga Beach for cleaning equipment.

While water is the likely suspect for this bug, extensive water testing turned up no evidence of cryptosporidium, said Ed Houghton, manager of operations for the town's Public Utilities Commission.

Though Houghton supports the boil-water advisory, he also wonders if the town's water supply is to blame.

Other people are also questioning whether the bug came from another source.

"As time goes on and the samples keep coming up negative, one's got to begin to wonder if there's another source other than the water supply," Rocque said.

But he agrees the town water was the most likely source.

"One would have to guess the water supply is probably the culprit," he said. "It is just baffling that we've never found it."

Testing the waters

Agencies scramble to solve mystery of Collingwood sickness

BY SCOTT DUNN
Sun Times staff

While tests have never found a single cryptosporidium parasite in Collingwood's drinking water, it is still the most likely source of what's made people sick, a health unit official said Wednesday.

COLLINGWOOD

Director of environmental health Bill Straughan said he's not troubled that water tests to date haven't turned up the parasite.

There have been indications, but no confirmation because the parasite is difficult to detect, he said.

The manager of Collingwood's Public Utilities Commission isn't so sure it was the water that made people sick.

"To tell you the truth, at this point, I'm not sure anymore," said Ed Houghton.

But a common water supply is the most likely source of contamination, given the random nature of the outbreak, he said.

Straughan hasn't seriously considered leafy lettuce, fruits, vegetables or fruit juices as the cause, though they're also possibilities if they were grown in animal manure, said Houghton.

Severe thunderstorms in January are believed to have washed over farms and through septic beds, carrying with it the parasite to the Pretty River and ending up in Georgian Bay, said Straughan of the Simcoe County Health Unit in Barrie.

Water intake pipes about one mile out and 23-feet deep in the bay likely sucked in the tainted water, which was inadequately processed in the town's rudimentary treatment plant, he said.

Since simple chlorination of drinking water won't kill the bug, and since humans can carry it for up to a month before symptoms may appear, the run-off theory is the most plausible, Straughan said.

Collingwood's boil-water advisory will remain at least until spring run-off has ended said Medical Officer of Health Dr. Walter Ewing in a news release Wednesday.

If new cases of the infection subside, the advisory will be reconsidered.

People first started getting sick two weeks ago. So far 107 cases have been recorded, 20 per cent of which have been confirmed. The actual number of people who have reported having symptoms of the infection is higher because not all have been recorded.

The Pretty River passes through an agricultural area with manure piles and other potential sources of contamination, Straughan said. Plans to test that river for the parasite now and monitor it in future will begin next week, he said.

A 1994 study had already recommended numerous ways to make harbor water cleaner.

"It's not a secret that there are problems out there in the watershed as far as faulty septics . . . it could be agriculture, you know, manure management," said Byron Wesson of the possible source of the parasite.

But funding to implement recommendations of that study over five years run out Friday, one year into the plan.

Provincial government cutbacks are the culprit, said Wesson, who helps implement those recommendations for the Nottawasaga Valley Conservation Authority.

This study of sources of fecal contamination of beaches throughout the NVCA watershed identified $24 million of work needed to bring the harbor water quality up to Ministry of Environment standards.

In 1995, $120,000 was spent on cattle fences to keep them from rivers and streams, on subsidizing rural septic bed replacements and on building manure containment areas.

The study succeeded in gaining the co-operation of the farming community in the area to consider cleaning up their operations where needed, he said.

"Southwestern Ontario it's taken for granted, agricultural pollution is big-time bad news. It's taken a little bit longer in this watershed for the farmers to warm up to that idea."

The PUC is looking at interim types of technology available to eliminate the bug within three to six months. The PUC's long-term goal is a filtration plant.

With files from Lise Thorbjornsen and Canadian Press.