

Hello everyone,

I hope that you all enjoyed your summer. For the Petitcodiac Watershed Monitoring Group the summer was a busy one. The group continued its work with the New Brunswick Water Classification Program. This year was a bit different, we started sampling in the Memramcook River Watershed. Preliminary results for this region indicate relatively good water quality. With these kinds of results the group is looking forward to another year of sampling in this beautiful part of southern N.B.

The Halls Creek Rehabilitation Projects has been underway since August. Mathieu D'Astous, project coordinator, has been hard at work cleaning up local brooks and also raising public awareness on environmental issues related to this watershed.

I would like to thank the students that worked for us this summer. PWMG wishes them good luck with their studies. See you next year!

If you have any comments / suggestions or you would like to donate your time to the group's activities, contact us at 384-3369 or by e-mail at: [pwmg@nbnet.nb.ca](mailto:pwmg@nbnet.nb.ca).

Eric R Arseneau, PWMG Coordinator

## **It's a sturgeon! It's a dolphin! No, it's a moose!**

You must of heard or seen all the strange events that have been happening in and around the Petitcodiac River lately? To recap these events, in June two Department of Fisheries and Oceans technicians found a dead Atlantic sturgeon floating above the causeway gates. Three months later, five White sided dolphins were found stuck in the Petitcodiac mud near Riverview. A week later a moose had to be shot because it too was stuck in the mud of the Petitcodiac. What's going on? Are there any scientific explanations to all of this?

Well, as for the dolphins it is not uncommon to see whales beach themselves on purpose. Scientists are not sure why they do this "ritual" (if we can call it that!) but it might be an explanation for the recent event. Another explanation is that the dolphins were chasing fish up the river. In literature, it states that salmon is an important part of their diet.

As for the sturgeon, it probably went up the river early this summer when the gates were opened. It is noted that sturgeon travel long distances (ex. Cape Code to Bay of Fundy) to find food.

Finally the moose was probably sick (brain disease) and disoriented when it wandered onto the Petitcodiac mud flats.

Even with all its difficulties, the Petitcodiac River still demonstrates substantial biological diversity. After all these events, it's easy to believe that the Petitcodiac River still attracts numerous fish and mammals with its numerous resources.

### **Questions, comments, suggestions?**

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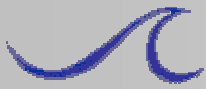
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## **The use of GIS in water quality management**

We all know that water quality issues are fast becoming a concern in our society. A Geographic Information System (GIS) is a powerful tool that can be used to analyze and to solve environmental problems. GIS allows you to store, organize and analyze the data collected on the field. It also allows us to integrate sampling sites from year to year, and to include information like the quality of water, land use and potential sources of pollution. That way, it becomes easier to follow-up on the quality of water, when we know where the sampling sites are located and where the potential sources of pollution are.

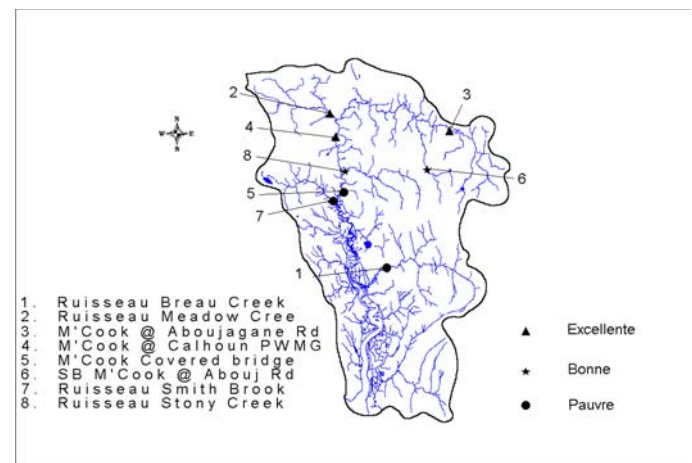


## Summary water quality report of the Memramcook river watershed

After a season of sampling in the Memramcook river watershed, here is a preliminary look at water quality for this area. For the purpose of this newsletter, PWMG will only publish the results for the following parameters; phosphorus, total organic carbon, dissolved oxygen and E-coli (see table). To evaluate the water quality, the sampling results were compared to medians values used to categorize existing water quality.

Water type	Total phosphorus (mg/l)	Total Organic Carbon (mg/l)	Dissolved oxygen (mg/l)	Fecal Coliforms (no./100 ml)
Excellent	<0.017	<10	>6	<100
Good	0.017-0.033	10-15	5-6	100-200
Poor	>0.033	>15	<5	>200

Site	Category	Reason
1	Poor	E-coli(>200)
2	Excellent	---
3	Excellent	---
4	Excellent	---
5	Poor	E-coli (100-200), Phosphorus (0.073)
6	Good	Phosphorus (0.027)
7	Poor	E-coli (>200), Phosphorus (0.032)
8	Excellent	---



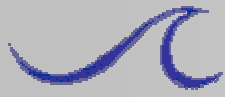
### Glossary

**Dissolved oxygen:** Dissolved oxygen is one of the most important indicators of the quality of water for aquatic life. It is essential for the basic metabolic processes of animals and plants inhabiting our inland and coastal waters. D.O. levels will determine the number and types of organisms living in that body of water.

**E-coli:** Indicator of fecal contamination from warm-blooded animals.

**Total organic carbon:** Total organic carbon is generally humic substances and partly degraded plant and animal materials. Sources include plant and animal materials, runoff from agricultural lands, and municipal and industrial waste. Excessive levels can deplete the water of dissolved oxygen in the decomposition process.

**Total phosphorus:** Phosphorus is generally not present in significant quantities in surface waters because it is an essential nutrient and taken up by plants. Phosphorus originates from weathering of bedrock, decomposing of organic matter, domestic sewage phosphates from detergents, and drainage from farming operations. While not commonly toxic to humans, animals or fish, an excess of phosphorus in surface waters can lead to an overabundance of plant growth.



## How important are wetlands to water quality?

For a long time we have thought of wetlands as being wastelands. Since the arrival of Europeans these ecosystems have been drained for agriculture, shopping malls, industrial development, waste disposal sites etc. For example, in the Great Lakes region 83% of wetlands have been destroyed. The situation is even worse around Lake Ontario, which has lost 99% of its wetlands. Urbanization, road construction, hydroelectric projects and agriculture are to blame for the destruction of wetlands in these two areas. Destruction of these ecosystems (wetlands) can and will lead to inundations, drought and water quality problems. Wetlands are the kidneys of our environment, they filter out pollutants from its surrounding environment. At a water quality level, wetlands act as nutrient sinks extracting excess nutrients from surface water. It goes without saying that wetlands are very important when it comes to water quality. Now more than ever, it is important to keep these ecosystems intact. With higher instances of pollution in and around our watercourses, wetlands are a natural line of defense against these problems.

## Macroinvertebrates and the Health of Watercourses

The evaluation of the ecological integrity of a given watercourse is not an easy task. However, the identification of organisms who live in these can tell us a lot about their health.

The use of macroinvertebrates, which includes insects and larvae, as indicators is based on the principle that some organisms will survive and proliferate in polluted environments while others are more sensitive to human disturbances.

Macroinvertebrates are not only food for fish, they are also reliable indicators of water quality, biodiversity and habitat integrity.

### Upcoming activities:

- N.B. Water Classification Meetings (to be announced)
- PWMG steering committee meeting (November, 2001)

## The Beautiful Poison

In July of 2001, the Supreme Court of Canada upheld the decision of the municipality of Hudson Québec to ban the cosmetic use of pesticides. In Atlantic Canada, several municipalities, such as Halifax and Shediac, have taken the same stance as the negative impact of these chemicals on the environment and human health is increasingly recognized.

Only a very small percentage of the 7000 pesticide products on the Canadian market have been tested for carcinogenic or mutagenic properties. Some of the active and non-active ingredients contained in these products, or the combination of these have been linked with the development of cancer and other illnesses such as Parkinson's disease. However, due to the diversity of interacting factors, such as age, heredity and so on, making the link between pesticide use and human health is not an easy task.

Pesticides can also be extremely harmful for other animals, including those that are not targeted. The non-lethal or indirect effects of pesticide exposure can be just as devastating to a given population as those that kill immediately. These include, the deterioration of reproductive function, behavioral change, loss of weight, and habitat loss. For example, a particular fish population can lose a vital food source if a particular insect species is eliminated from the local food chain. Similarly, this same fish species can decline from the loss of habitat as a result of the destruction of vegetation related to pesticide use.

Pesticides build-up upwards in the food chain through a process called bioaccumulation. Their impact on animal and plant species increases with time as these products build-up in living tissues. The problem is even more worrisome when we consider the widespread distribution of pesticides in our environment. According to a leading U.S. study, 96% of all fish, 100% of all surface waters and 33% of all aquifers tested had traces of one or more pesticides. The extensive dispersion of pesticides is not solely due to their cosmetic use. However, people should consider alternatives to cosmetic pesticide use when dealing with common household "pests". Moreover, regional and municipal representatives have the responsibility to impose stringent restrictions on their use.