

Water Quality Restoration Program

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Lac La Biche Watershed Steering Committee Update

Summer 2005 is turning out to be a very exciting and busy season. The 5 year Strategic Plan for Lakeland County's Environmental Services has been approved. The plan deals with critical issues identified through the Lac la Biche Watershed Project. The highlight of the plan is the approval of a Watershed Management Plan by 2009. Other goals include education and public involvement as well as a focus on lakeshore development and riparian areas. Lakeland County is also committed to continuing our watershed programs such as:

- ◆ Inflow sampling on Lac la Biche
- ◆ Caffeine and pesticide testing
- ◆ Lake water quality profiles for 2005 on Fork, Elinor, Lac la Biche, Touchwood and Beaver Lakes
- ◆ Water Quality Restoration Program quarterly newsletter
- ◆ Mad About Science children's program
- ◆ Farm Water Watch
- ◆ Lake Watch in partnership with the Alberta Lake Management Society
- ◆ public beach monitoring of fecal coliforms and *E.coli* in partnership with the Aspen Regional Health Authority.

For a copy of the strategic plan contact Megan Rawles at 623-1747.

The Smart Development Healthy Communities workshop was held on April 28, 2005, and attracted 40 participants. There were 9 guest speakers including world-renowned experts Tom Holz and Dr. Hans Schreier. The focus of the workshop was low impact development alternatives for cottage owners, residents, buyers, developers and real estate agents. Overall the workshop was successful and rated at 4.5 out of 5 (excellent).



Congratulations to our joke contest winner, Stephan Menard who won a Mad About Science T-shirt.

A man takes his dog to the vet and says "My dog's cross-eyed. Is there anything you can do for him?" "Well", says the vet, "let's have a look".

He picks the dog up and examines his eyes. Finally he says, "I'm going to have to put him down". "What! Just because he is cross-eyed?"

"No, because he is really heavy".



L. Behnke





Beneath the Surface Part III: Nutrients

By: Lauren Behnke, Lakeland County

Water Saving Tips...

◆ Shut the tap off when brushing your teeth

◆ Avoid watering your lawn during hot days; most of it is lost to evaporation

◆ Collect rainwater in a screened barrel to water house and garden plants

◆ Take short showers instead of baths

◆ Wash your vehicle with a bucket of water; use the hose only to rinse

◆ Wash only full loads of laundry and make sure to choose the appropriate water level.

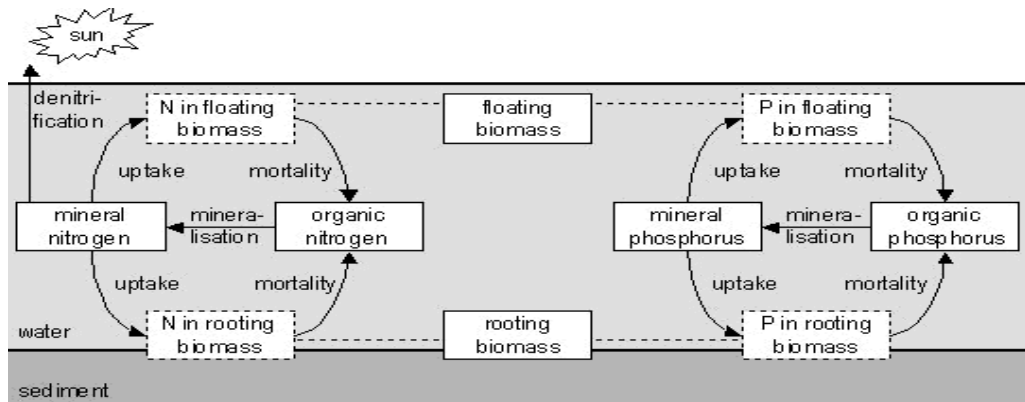


As we continue our underwater adventure of Beneath the Surface we see that nutrients, in addition to temperature and productivity also play a key role in the underwater environment. **Macronutrients** are those chemical elements needed in large quantities for the normal growth and development of living organisms.

Nutrient cycling is quite efficient at keeping the macronutrients in check by balancing supply and demand. However problems can arise when there is addition of excess nutrients, often as a result of anthropogenic (human) activities. In freshwater systems, the main macronutrients are **Phosphorus** and **Nitrogen**. The natural sources of phosphorus are erosion of sedimentary rocks, natural deposits and atmospheric deposition. The anthropogenic sources include fertilizers and detergents in runoff and urban/rural wastewater. In most healthy lakes, phosphorus is the limiting nutrient for growth of plants, algae and cyanobacteria, meaning that it is usually the macronutrient in shortest supply. This means that if all of the phosphorus is used up, plant growth will stop regardless of the amount of nitrogen present. Phosphorus is therefore very important to primary production. However, too much phosphorus can contribute to the eutrophication of lakes, which can lead to the rapid growth of algae and weeds. There are several types of phosphate that can be measured. **Total phosphorus** is composed of all phosphorus forms, both particulate and dissolved. The dissolved form of phosphorus is readily taken up and used by photosynthesizing organisms. It is an essential part of their DNA (genetic code) and ATP (energy store).

Nitrogen itself is extremely abundant in our atmosphere, however most plants and organisms can only use fixed nitrogen in the form of nitrate and ammonium. Luckily most photosynthesizers, as well as some bacteria and cyanobacteria are capable of fixing atmospheric nitrogen into useable forms. There are several sources of nitrogen and nitrates including; agriculture, fertilizers, animal excreta, fossil fuel combustion, and industries that use nitrates. The nitrogen cycle is made up of four processes; fixation, ammonification, nitrification and denitrification. **Nitrogen fixation** is the process that converts nitrogen (gas) to ammonia or nitrate. **Ammonification** is the reaction in which organisms break down amino acids to produce ammonia. **Nitrification** is the process of converting ammonia to nitrite and nitrate providing energy for decomposing organisms. Finally, **denitrification** occurs when nitrate is used by photosynthesizing organisms or when nitrate is reduced to gaseous nitrogen by bacteria and released.

Nutrients are an extremely important aspect of an aquatic environment, without them organisms would have a tough time surviving. Stay tuned for Part IV of Beneath the Surface when we deal with gases in the water.





Contest!!!

We invite your children to submit a photograph to be used in future newsletters.

Photo ideas:

Lake, sky, nature, river, plants (but No people in the photos)

- *Send your photo (4x6 regular photo size) with your name, age and phone number, by August 15, 2005 to:*

*Megan Rawles
Lakeland
County
Box 1679 Lac
La Biche, AB
T0A 2C0*

Winners will be chosen by draw and will receive their photograph framed.

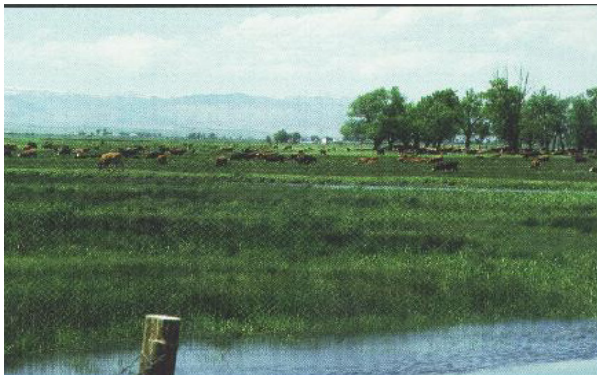


Water: A Benefit or a Liability

By Andrew Schoepf, Alberta Fish and Game Association

The Alberta Fish and Game Association and Lakeland County have partnered to offer area producers a new surface-water testing program over the next few years. Farm WaterWatch provides agricultural producers an opportunity to learn about water issues specific to their own farm and take a proactive role in the stewardship of the streams and wetlands in their community.

Over the past decade, Alberta's agricultural industry has made significant investments to identifying the relative impact of agricultural practices on surface water quality. There have also been considerable advancements made to develop new land and crop management techniques that protect surface waters from the sediment, bacterial, and nutrient loads that typically come from agricultural landscapes. Within Lakeland County a lot of attention has focused on identifying some of these surface water quality issues within the Lac la Biche watershed. Clearly, agricultural producers are not the only party contributing to the decline in surface water quality in Lac la Biche. They may not even be the single largest source of pollutant loading within this watershed, but they do manage a considerable proportion of the watershed area and therefore have the capacity to make a huge positive contribution to the health of our aquatic ecosystems.



At the center of this issue (both figuratively and literally) lie riparian areas. This diverse vegetation community marks the border between land and water. They serve as significant buffers to filter runoff before it enters our streams and wetlands, and are the living and breathing organs that break down pollutants and revitalize our watershed ecosystems. Agricultural producers collectively manage the vast majority of riparian areas within most developed landscapes, and therefore they also have the potential to provide the greatest environmental benefit by

implementing the best management practices to retain these important ecological features on the landscape.

Equally important to identifying the sources of water quality concerns, is developing a clear understanding of what environmental features and land use activities assist in the improvement of surface water quality. Through Farm WaterWatch, area producers now have the ability to test surface water quality on their own farms. The objective of the program is to provide a confidential way in which producers can identify both environmental concerns and land use activities that positively benefit our water resources. Participants are provided with air photo enlargements of their farm, and a one-on-one environmental consulting service to create a runoff supply model of the farm, and set up a water testing program to relate land uses to water quality. The cost of participation is free. Participation is completely confidential, and all water data remain on the farm.

This program is just one of the options available to interested producers who want to make proactive steps toward protecting the environment and improving the image of agriculture in Alberta. It also can play an important part in developing a risk management strategy, and demonstrates due diligence in addressing potential environmental liabilities.

Whether you live on a creek, or have land that drains into a wetland or lake, this program will provide you with information critical to making informed land use decisions. The business of farming is evolving in Alberta, and both the Alberta Fish and Game Association and Lakeland County want to make sure our local farmers maintain the competitive advantage of operating an environmentally sustainable operation.

For more information on how to participate contact:

Andrew Schoepf, Director Parkland Stewardship Program,
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6924-104 Street, Edm,
T6H 2L7,
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e-mail: andrew@afga.org





Yuck!! What is that Guck???

By: Lauren Behnke, Lakeland County

Letters for the Experts!

Do you have a water quality question or concern you would like to know more about? Ask Us!!!

Upcoming Issues:

- *Aquatic Life in our Watershed*
- *Beneath the Surface Part IV-Gases*
- *Pesticides and Fertilizers-Both sides of the story*
- *Wetland storage ponds*
- *Shoreline Alterations*
- *Riparian Areas*

Algal blooms often occur in Alberta lakes during the warm summer months. They are easily recognized as they cause the lake to appear soupy and thick and can be blue, green, grey or tan in color. These blooms are caused by a dramatic increase in microscopic organisms called algae. The problems associated with algal blooms are mainly appearance, odor, and altered taste of drinking water. Cyanobacteria algal blooms are one type of bloom that can occur naturally in lakes, although they can be rapidly accelerated by human activities; including excess input of nutrients (mainly nitrogen and phosphorus) from various sources such as wastewater and excessive fertilizer use. Cyanobacteria are commonly referred to as blue-green algae and they are some of the most common bloom producing algae.

Two genres of **cyanobacteria**, **Anabaena** and **Microcystis** are known to produce toxins.



Anabaena are a filamentous algae often found in surface scums.



Microcystis have an extremely fast growth rate and form colonies on the water surface.

Toxins produced by these genres are usually released when the cell is ruptured or dies and can be either hepatotoxins which attack the liver or neurotoxins which attack the nervous system. However, not all algal blooms are toxic and it can not be determined by appearance. The rule of thumb should be to refrain from water activities when this scum is present and do not drink water from algal bloom infested areas. Skin rashes, blisters, mouth ulcers, eye, ear and skin irritations may occur after recreational exposure. Once water treatment systems detect cyanobacteria it can be treated and easily filtered out to prevent human consumption. Boiling water is not an effective sterilization method to remove toxins. In addition to protecting ourselves from consuming cyanobacteria during recreational activities, it is also important to protect our family pets and livestock. Serious illness, liver damage, paralysis and even death can occur if an animal drinks a sufficient quantity of the toxins. It is important for us to be aware and provide an alternate water source for animals because they are not as concerned with the odor, and appearance of the water that they drink. For more information contact Lakeland County or the Lac La Biche Community Health Services at 623-4471.



Mad About Science is a fun summertime hands on program designed for children ages 6-12. It is a great way to get outside and have fun all while learning about our lakes, our environment, and our watershed. The program will be running in conjunction with the Lakeland County Fun for Life program. In addition, there will also be Mad About Science workshops held during the summer months. Keep checking the Lac La Biche post or call Lakeland County for more details.

If you have any comments or questions please contact:

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