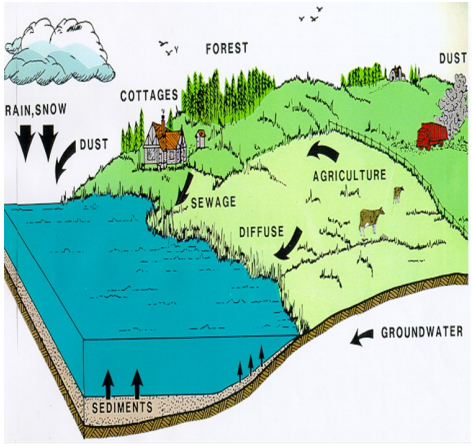
NUTRIENT BUDGET RESEARCH RESULTS: WHAT THEY MEAN FOR LAKE MANAGEMENT

ABOUT THE STUDY

Like many Alberta lakes, Pigeon Lake experiences relatively frequent nuisance blue-green algae (cyanobacterial) blooms. These blooms are known to be caused by the presence of excess nutrients (including phosphorus and nitrogen) in a lake.

There is typically a strong relationship between the intensity of algal blooms and total nutrients in lakes. To shed light on options to address water quality issues, limnologist Chris Teichreb studied the relative contributions of external and internal source of phosphorus entering or "loading" into Pigeon Lake.



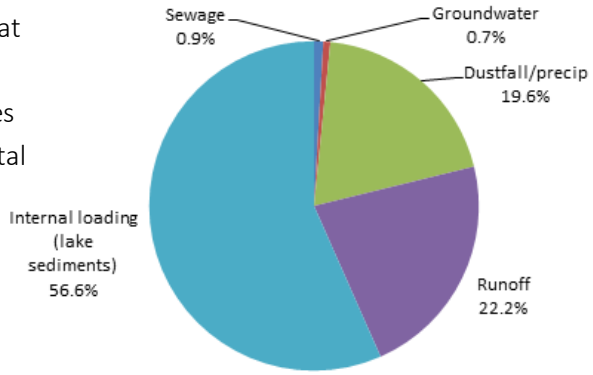
Nutrients promote the growth of cyanobacteria. Nutrient "loading" happens through multiple pathways (See figure above).

STUDY FINDINGS

FIND OUT MORE:

- See the Report **Executive Summary**
- Read the Full Report

About 57% of phosphorus during the open water season is released internally (from sediments at the lake bottom). 43% comes from external sources. The majority of these external sources are from diffuse (non-point) runoff (48% of total external) and dustfall/precipitation (43% of total external). Groundwater, stream inflows and sewage comprise 9% of total external phosphorus inputs to the lake.



WHAT THE FINDINGS MEAN

TOP MANAGEMENT PRIORITIES :

- Promote best management practices to curb runoff
- New watershed bylaws
- Promote riparian restoration and other watershed activities
- Continue exploring in-lake treatment options
- Wastewater treatment system improvements

The relatively even split between external and internal sources of phosphorus in Pigeon Lake calls for a ***balanced approach*** to management. The results emphasize that ***there is no single solution*** that will address the problem of blue-green algae. External sources of phosphorus are a significant fraction of total input, and the diffuse runoff sources represent the largest fraction of the inputs that are controllable. Managing watershed activities that contribute to this type of runoff (for example, the use of cosmetic fertilizers through the implementation of new bylaws or promotion of best management practices) are seen as viable options. Riparian restoration work, and other watershed stewardship activities would likely help address point-source phosphorus inflows. Sewage represents 2% of the external loading source to the lake, however this number could conceivably be reduced to zero through wastewater system improvements. Exploration of in-lake treatments should also be pursued as a way to reduce internal loading rates.

NITROGEN MATTERS TOO! Recent studies suggest that nitrogen promotes the growth of cyanobacteria. Bottom Line: Nutrient reduction strategies should consider nitrogen and phosphorus together.