Rainy Lake Water Quality Site - Background Information 7/28/04

Project Organization

The program results from a partnership among the Rainy River Community College (RRCC), the Fort Frances based Rainy Lake Conservancy (RLC), and the Minnesota Pollution Control Agency (MPCA). Voyageurs National Park (VNP) and several private resources are providing additional help and equipment. The overall data package will be used to identify trends and problems, provide baseline data, and to help educate the public on issues and ways to help protect the Rainy Lake environment.

The US Army Corp of Engineers and the International Joint Commission (IJC) are providing the resources to host this site.

Water Quality Data Description

Data collection started in 2002 and is gathered from May through September and includes measurements of water clarity, phosphorus, chlorophyll and bacteria levels as the water quality indicators. Ten sites are being monitored as shown on the accompanying map of Rainy Lake. Water samples are collected by RRCC students and RLC volunteers. Lab work is conducted by RRCC and the Minnesota Department of Health using EPA Lab Methods.

For comparison purposes, the following values for water quality data are typical for Northeastern Minnesota Lakes:

Secchi Depth (SECCHI) 2.4 - 4.6 meters
Chlorophyll a (Chl-a) 4 - 10 µg/L
Total Phosphorus (T. Phos) 14 - 27 µg /L
Fecal Coliform Bacteria (FC Bacteria) 11 - 20 counts/100 ml of water

Definitions of the data follow:

Secchi Depth (SECCHI) - The depth in a lake, measured in meters, to which a Secchi disk can be observed, as a measure of light penetration in water. The Secchi disk is lowered into a section of shaded water until it can no longer be seen and then lifted back up until it can be seen once again. Averaging the two depths gives the clarity of the water.

Chlorophyll a (Chl-a) - Photosynthetic pigment found in all green plants, and the main pigment in algae. The concentration of chlorophyll a is used to estimate the amount of algae (all phytoplankton in a given area) in surface water. Measured in micrograms per liter (µg/L).

While it is normal to find algae in streams and lakes, high levels of algae can lead to low levels of dissolved oxygen in a water body.

Total Phosphorus (T. Phos) - A nutrient essential to the growth of organisms, and is commonly the limiting factor in the primary productivity of surface water bodies. Total phosphorus includes the amount of phosphorus in solution (reactive) and in particle form. Agricultural drainage, wastewater, and certain industrial discharges are typical sources of phosphorus, and can contribute to the eutrophication of surface water bodies. Measured in micrograms per liter (µg/L).

Fecal Coliform Bacteria (FC Bacteria) - A group of bacteria found in the intestinal tract of humans and animals, and also found in soil. While harmless in themselves, coliform bacteria are

commonly used as indicators of the presence of pathogenic organisms and other disease-causing bacteria, such as those that cause typhoid, dysentery, hepatitis A and cholera. Measured in number of bacteria per 100 milliliters of water.

Failing septic systems and runoff from feedlots are common sources of fecal coliform in water samples.

Other existing water quality programs involving Rainy Lake include the Ontario Lake Partner Program, the MPCA Citizens Lake Monitoring Program, and VNP studies. Most of the Minnesota data can be accessed through http://www.pca.state.mn.us/data/eda/ .

Description of Measurement Sites

RAINY LAKE MEASUREMENT SITES

DNR ID 69-0694

SITE #	Name	Sampler	ID	UTM East	UTM North	Long	Lat
110	VNP Long Term Site, E. Dryweed Island	RRCC	69-0694-110	494849.039	5385249.889	-93.070	48.620
111	Grindstone Island Passage	RRCC	69-0694-111	486761.141	5383724.692	-93.180	48.606
112	Grassy Narrows / Bald Rock	RRCC	69-0694-112	482715.345	5384006.878	-93.234	48.609
113	Jackfish Bay Outlet / Mary's Point	RRCC	69-0694-113	481644.400	5384659.645	-93.249	48.615
114	Sand Bay Narrows Channel	RRCC	69-0694-114	474178.377	5385366.809	-93.350	48.621
115	North Arm, Off Reef Point, 100' hole	RLC	69-0694-115	477925.770	5394150.490	-93.300	48.700
116	North Shore Jackfish Bay (dock)	RRCC	69-0694-116	480923.636	5383850.486	-93.259	48.607
117	Camp Kooch (dock)	RRCC	69-0694-117	484051.478	5383918.483	-93.216	48.608
118	Mermaid area (ESE of Pokadot Island)	RLC	69-0694-118	486888.880	5388230.940	-93.178	48.647
119	Seine Bay (N. of midpoint of Scott Islands)	RLC	69-0694-119	502431.000	5387549.230	-92.967	48.641

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