



Solar Solution to Nutrient Pollution

by Barb Maynard

Residents of Silver Lake in Loveland are taking action against the effects of excess nutrients. On June 12, they installed a solar-powered water circulator, known as a Solar Bee, in the lake. By pumping water – up to 10,000 gallons per minute – from the bottom of the lake to the surface, the Solar Bee should alleviate problems with algal blooms and fish kills.

Silver Lake is a classic case of nutrient pollution. Over the years, residents have experienced the algal blooms, fish kills, and foul odors that often accompany excess nutrient loads and the resultant hypoxia. Stormwater inputs, lawn runoff and geese probably all contribute to the problem. In the absence of a practical strategy to reduce nutrient inputs, the Solar Bee should help to alleviate the symptoms by moving oxygen-poor water to the surface to become oxygenated. Keeping the lower depths of the lake oxygenated will not only be good for fish, but it will also prevent the release of smelly hydrogen sulfide, said limnologist Chris Knud-Hansen.

In addition to alleviating algal blooms and fish kills, the Solar Bee should prevent high concentrations of E. coli from forming, by both diluting the bacteria to safe concentrations throughout the lake and bringing the bacteria to the water surface where UV light from the sun can kill them.

Continued water quality monitoring will provide a comparison of conditions before and after installation of the Solar Bee.

The design of the Solar Bee is unique because it uses solar power for the pump and efficient laminar flow, instead of turbulent flow used by water aerators, said company representative Harvey Hibel. The Solar Bee cost approximately \$25,000, with annual operating and maintenance costs of about \$5. Locally, Solar Bees are also in use at Platte River Power Authority's Rawhide Energy Station, north of Fort Collins.

For more information about the Solar Bee, see www.solarbee.com.



Mike Borsma of Pump Systems, Inc. installs the Solar Bee in Silver Lake.

Thompson School District is Conserving Water

The Thompson School District is doing its part for water conservation, by implementing plans designed to save approximately 16 million gallons annually.

Scott Weber, Resource Conservation Manager for the district, stressed that the district recognizes the need to protect Colorado's valuable water resources. "We need to do what we can to conserve water and to be good neighbors in our community," he noted. "Protecting valuable water resources is very important to the district."

Updating indoor facilities will save the school district about 7 million gallons of water this year. Between August 2002 and January 2003, the district:

- Replaced 450 toilets with low-volume models.
- Retrofitted about 450 urinals.
- Added aerators to faucets in bathrooms and classrooms.
- Installed equipment to re-circulate water used to cool compressors.
- Replaced dishwashers with more efficient models.

In addition, the school district will save another 9.8 million gallons, or approximately 20%, of irrigation water in 2003, as promised through an agreement with the City of Loveland. A 20% reduction fits with Phase I of the City's plan to meet water supply needs. If the City decides that drought conditions require it to go to Phase II, then the school district will step up to a 40% reduction in water use for irrigation. The district will meet these goals by:

- Upgrading irrigation equipment.
- Installing additional meters to reduce over-irrigation errors.
- Implementing time restrictions on irrigation zones.

Conserving water not only helps the City to meet their water supply needs, but also helps the school district financially. "Saving water reduces the money spent on water as well as on sewer charges," Weber said.

What Can You Do to Prevent Nutrient Pollution?

The choices we make as consumers and citizens have a profound effect on water quality. To minimize your contribution to nutrient pollution, you can:

- Minimize use of fertilizers and manage them properly. Excess fertilizer washes off lawns and farms into nearby waters. Consider using organic fertilizers, which are less prone to runoff.
- Wash your car at car washes where the waste enters the public water treatment system, rather than in your driveway.
- Reduce electricity use and drive less. Power generation, either in an electrical power plant or in a car, generates nitrogen oxides (NOx), which are transformed into nitrates in the air and deposited throughout the country.
- Preserve land adjoining rivers and streams. This land, often called a riparian buffer, can play a vital role in preventing nutrients that wash off fields and streets from reaching the rivers and coasts. Preserving wetlands also helps keep nutrients out of rivers, estuaries and coastal waters.
- Maintain septic systems properly.