Vancouver Lake Watershed Partnership
2010 Annual Report

A Message from the Partnership's Steering Group

The Vancouver Lake Watershed Partnership has seen much progress in 2010. This annual report highlights major milestones of this past year and points to some of the upcoming projects of 2011. Of note in 2010:

- In April, a new project management contract was signed with PC Trask & Associates.
- The US Geological Survey began the much anticipated water balance-nutrient budget research. This work was identified as critical to understanding Vancouver Lake in the 2008 Technical Foundation and is now being conducted under a Joint Funding Agreement between the Partnership and USGS.
- In February, Washington State University-Vancouver concluded its three year research project studying food web dynamics in Vancouver Lake and how blue-green algae (cyanobacteria) are impacted by other microorganisms.

The Partnership and funding agencies have been able to continue our investment in the work necessary to understand and improve Vancouver Lake despite the continued recession and its impacts to our community and partners. We continue to see steady progress through our prudent investment and management. For 2011, we will be conducting more outreach throughout the community to ensure that stakeholders and local residents understand the issues at hand as we consider the most appropriate means to address the water quality issues of Vancouver Lake.

Brian Carlson
City of Vancouver

Kevin Gray
Clark County

Patty Boyden
Port of Vancouver

Water Balance-Nutrient Budget Research Underway

The US Geological Survey installed sampling equipment around Vancouver Lake in October and November, kicking off the water balance – nutrient budget research project. This study will allow for the identification of the sources, amount, and timing of water and nutrients to the lake.

In this photo, James Foreman is making final adjustments to instrumentation installed at the Vancouver Lake Sailing Club. A solar panel helps power a data collection platform that records relative humidity, water temperature, wind speed, wind direction, and radiant solar energy to calculate evaporation from the lake. This data, combined with precipitation volume collected at the flushing channel will be used to calculate the gains and losses of lake water from the atmosphere.

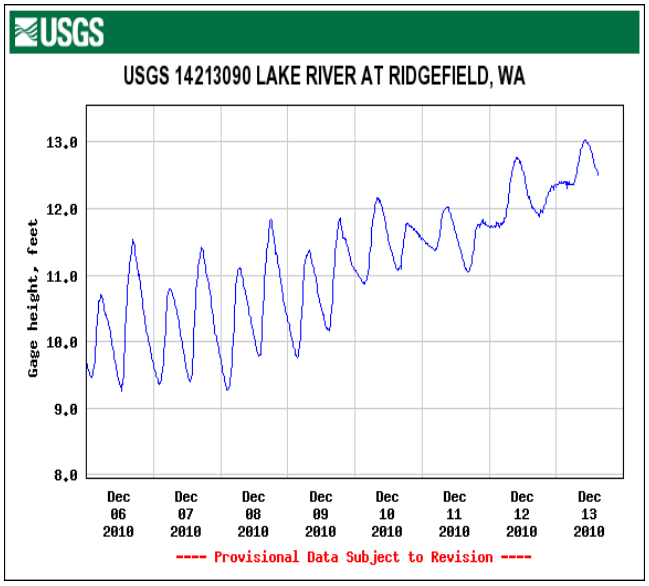
Water Balance-Nutrient Budget Research, continued

Three flow gages are located at the flushing channel, Burnt Bridge Creek, and Lake River to measure water input and output to the lake at these locations. These continuous run gage stations are telemetered to allow for offsite data monitoring.

In addition to these continuous measurements, 'spot' discharge measurements are taken monthly at the Burnt Bridge outfall and Lake River near where water quality samples are collected. This provides information of water flux to compare with the flow measurement upstream at the continuous gages.

Water quality samples are collected on a monthly basis. Samples will be analyzed for nitrate, nitrite, ammonium, total nitrogen, total phosphorus, ortho-phosphate, total suspended solids (TSS), particulate nitrogen and phosphorus, and conventional water quality parameters (specific conductivity, turbidity, temperature, pH, dissolved oxygen).

Project information can be viewed at the USGS website: http://wa.water.usgs.gov/projects/vancouverlake/
A link to the USGS site will also be posted on the Vancouver Lake Watershed Partnership Website.



A snapshot of the data collected from the Lake River gage station. After river cross section measurements are made, this data will be translated into flow volume. The stations will be linked to the USGS project webpage in the near future.

Rich Sheibley tends to the DH-74 integrated depth sampler at flushing channel. This water quality sampler was lowered through the water column at three stations equally distributed along the width of the stilling vault, ensuring that the sample collected was representative of the entire water body.

Outreach

The Vancouver Lake Watershed Partnership Outreach and Involvement Plan is near completion. The goals of the Vancouver Lake Watershed Partnership outreach effort are to increase community understanding of the issues facing Vancouver Lake and build support for future management of Vancouver Lake.

The project management team developed a draft plan with input from the Steering Group this past fall. The draft plan was presented at the December 15, 2010 full Partnership meeting for input and direction from Partnership members. After partner input is incorporated, the final plan will be released in early 2011.

The "inreach" component of the plan also began this fall, in which the project management team met with partnership members on an individual basis. These meetings were instrumental in gathering valuable information and suggestions from each partner. The findings will be summarized for the March 16, 2011 Partnership meeting.

Presentations identified in the outreach plan will begin in the first quarter of 2011.

Plankton Monitoring and Zooplankton Grazing Assessment by WSU-Vancouver

The Aquatic Ecology Laboratory at Washington State University Vancouver (WSU-V) released the final report on its three year research project to assess plankton populations and trophic (food web) interactions in Vancouver Lake. This research will allow the Partnership to better understand and quantify factors that influence blue-green algae (cyanobacteria) blooms in Vancouver Lake. This work, spanning from March 2007 to February 2010, was supported by funding from the Vancouver Lake Watershed Partnership and a grant by the Washington Department of Ecology's Freshwater Algae Program. Ecology staff expressed high regard for this trophic research, conducted by WSU's Dr. Stephen Bollens and Dr. Gretchen Rollwagen-Bollens.

A key question in this research was: "what is the impact of various species of planktonic grazers on cyanobacteria blooms?" By measuring growth rates of cyanobacteria and algae along with zooplankton grazing rates, the researchers determined that both protozoan and metazoan zooplankton (see definitions at right) have the capacity to significantly consume algae and cyanobacteria, and other zooplankton. At certain times during the cyanobacteria bloom, these grazers are likely having a strong enough impact on particular algae or cyanobacteria species to counter population growth rates and thereby impact the timing and magnitude of cyanobacteria blooms.

The findings of this study are important for scientists and managers to better understand the dynamics of cyanobacteria blooms in Vancouver Lake. Considering potential impact on the diverse species and their trophic interactions will be critical in identifying appropriate management strategies to improve Vancouver Lake.

Definitions:

Plankton: Small or microscopic organisms, including phytoplankton and zooplankton, that float or drift in water, especially near the surface, and serve as food for fish and other larger organisms.

Phytoplankton: Microscopic plant-like organisms (algae and cyanobacteria).

Zooplankton: Tiny animals (metazoans) and animal-like microorganisms (protozoans). The larger metazoans often feed on protozoans as well as phytoplankton.

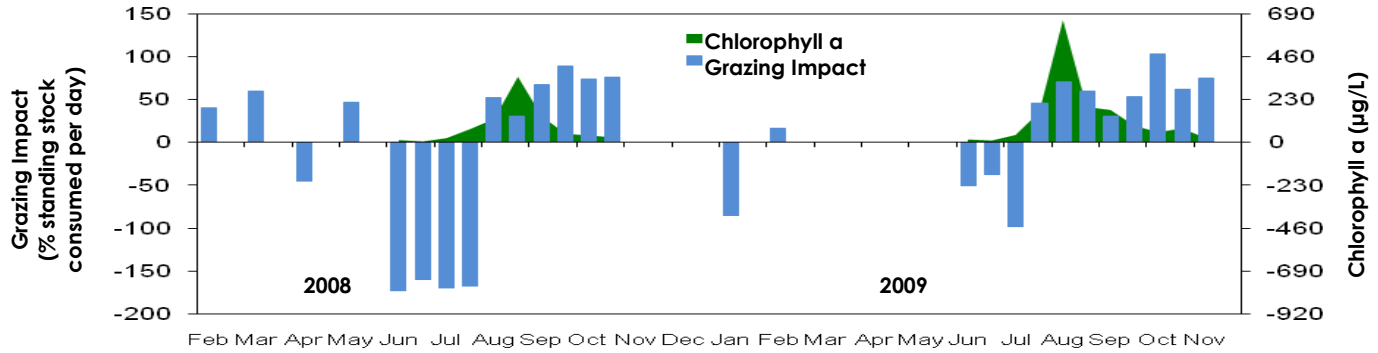


Figure 1. Impact of grazing by protozoans. Protozoans consumed ~50% of the algal/cyanobacteria community per day during spring 2008, but during June-July of both 2008 and 2009 protozoans were selectively consuming only one group of algae (diatoms) which apparently allowed other algae/cyanobacteria to grow more quickly (as evidenced by "negative" grazing impact). However, once the cyanobacteria bloom began in August, protozoan grazers consumed 65-100% of the algal/cyanobacteria community on a daily basis through the autumn of both years.

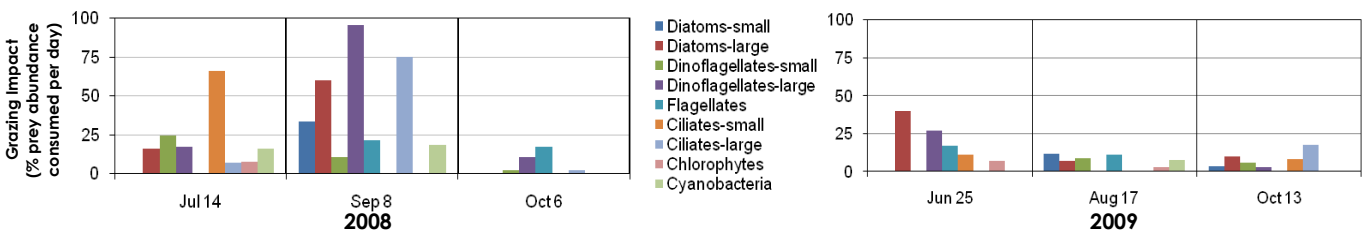


Figure 2. Impact of grazing by copepod zooplankton. In July of 2008 and 2009, just prior to the cyanobacteria blooms, copepods consumed mainly ciliate protozoans and some diatom algae, but not much cyanobacteria. In September 2008 during the cyanobacteria bloom, copepods consumed even more of the diatom and ciliate populations, but never consumed cyanobacteria, even as the bloom progressed through the autumn.

Environmental Protection Agency Findings

JoAnne LaBaw of the Environmental Protection Agency briefed the Partnership on December 15th on EPA's Site Investigation of Vancouver Lake. Thirty three sediment samples were taken from Vancouver Lake, the flushing channel, Columbia River, Burnt Bridge Creek, and Lake River. Six clam samples were taken from the same locations, excluding Lake River. The results were compared to background samples. The results showed that metals, arsenic, beryllium, and cobalt were found in the sediment samples and low levels of metals and PCBs were found in the clam samples. In further examination of these samples, the EPA found:

- Four of the 33 sediment samples contained contaminant concentrations that exceeded NOAA designated Threshold Effects Levels (TEL). Concentrations below the TEL levels pose no potential threat.
- The four samples exceeded TEL levels in the following manner: One sample exceeded TEL for mercury and two samples exceeded TEL for lead. One sample exceeded TEL for three polycyclic aromatic hydrocarbons (chrysene, flouranthene, and pyrene) that are often found together.
- No samples contained contaminant concentrations that exceeded NOAA designated Probable Effect Levels (PEL). Concentrations above PEL levels probably have toxic effects.
- The EPA determined that no further remedial action is warranted by the EPA, as the contaminants found at Vancouver Lake do not reach National Priority List ("Superfund") caliber and the lake does not present a risk to human or environmental health based on toxic components.

Technical Foundation Update

The Technical Group is currently working on an update to the Technical Foundation, originally completed November, 2008. The updated Technical Foundation will include research conducted since the first version, incorporate the 2009 Research Plan, and take account of any changes in projected research needs since the original Technical Foundation was developed in 2008. The updated Technical Foundation will be presented at the March 16, 2011 Partnership meeting.

Upcoming Meetings

The next Steering Group meeting will take place at 3:30 pm on January 19, 2011, at the Port of Vancouver.

The next Full Partnership meeting will take place at 4 pm on March 16, 2011, at the Port of Vancouver.

The Vancouver Lake Watershed Partnership is the result of efforts by the Port of Vancouver, City of Vancouver Department of Public Works, Vancouver-Clark Parks and Recreation, Clark County Department of Public Works and the Fruit Valley Neighborhood Association in 2004 to bring federal, state, and local public agencies with interest and jurisdiction over Vancouver Lake and its watershed, together with citizen stakeholders.

Citizen Members

Jaquelin Edwards
Nancy Ellifrit
Donald Jacobs
Gary Kokstis
Thom McConathy
James Meyer
David Page
Jane Van Dyke
Vernon Veysey

Project Management

PC Trask & Associates, Inc.

Agency Members

Washington Department of Natural Resources
Washington Department of Fish & Wildlife
Washington Department of Ecology
Lower Columbia River Estuary Partnership
U.S. Army Corps of Engineers
Port of Vancouver
City of Vancouver Department of Public Works
Vancouver-Clark Parks & Recreation
Clark County Environmental Services
Fruit Valley Neighborhood Association
Clark County Public Health
Port of Ridgefield
Clark Public Utilities

VANCOUVER LAKE
WATERSHED PARTNERSHIP

For more information please visit the Partnership's website: www.vancouverlakepartnership.org