

UBC at PLRP

Bernard Laval, Alexander Forrest, Weston Pike, Yehya Imam, Roger Pieters

Note: the names associated with each theme below are the UBC people, there are outside collaborators for each of these.

Bernard Laval's research group in the Dept of Civil Eng at UBC is jointly leading research activities at Pavilion Lake. Apart from providing all logistical support, the research team is contributing in the following areas:

Deepworker pilot team (B Laval, A Forrest): see NASA press release for details

Autonomous Underwater Vehicles (A Forrest, B Laval, W Pike): Dr. Bernard Laval has been developing the use of an Autonomous Underwater Vehicle (AUV) to map the unknown areas of Pavilion Lake. The AUV, called *UBC-Gavia*, conducts underwater surveys untethered and unmanned for up to 6 hours at a time. This has complemented SCUBA work in Pavilion Lake in the past by identifying targets of interest by camera and SONAR surveys of large regions of the lake. *UBC-Gavia* also complements the Deepworker submersible missions to be conducted this summer. In space exploration, unmanned robots are almost exclusively used to survey unknown regions before human missions are planned. Autonomous robots are also used hostile environments where the objective hazard is higher. Planned missions for *UBC-Gavia* in the upcoming field season are focused on the deepest part of the lake. In an analogy to exploration science, an unmanned vehicle will survey the most hostile regions to open the way for manned survey missions in the years to come.

Physical Limnology (B Laval, A Forrest, Y Imam): Aquatic ecology is highly dependant on physical process for growth and function. The microbialite ecology of Pavilion Lake. A detailed examination of the physical environment in Pavilion Lake is being carried using *UBC-Gavia* (see above) as well as traditional limnological techniques such as profiling and moored in situ water property sensors and 3D numerical models.

Kelly Lake (W Pike, B Laval): Kelly Lake is a sister site to Pavilion Lake and contains morphologically similar microbialite structures. Since 2004 this site has been visited in conjunction with field visits to Pavilion Lake. Samples of microbialites, water and sediment have been collected from Kelly Lake and the chemistry of each is in ongoing analysis. Physical limnology has been examined through the use of CTD and light profiles. Rudimentary exploration has been accomplished with SCUBA divers, robotic submersibles, and sonar.

Curtis Suttle

Curtis Suttle of UBC EOS is contributing to the overall PLRP science goals starting this year. His research group is studying the virus ecology of Pavilion Lake.