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RESEARCH COLLOQUIUM SERIES

Eddy Carmack

Institute of Ocean Sciences
Department of Fisheries and Oceans

Friday
Apr. 16, 2010

3:30 - 4:30

LECTURE THEATRE
7 - 150

LIGHT REFRESHMENTS
SERVED AT 3:20

Quesnel, Queen of Lakes: Climate, Mixing and Fish

Two aspects of lake physics affect fish and their habitat in Quesnel Lake: (1) the underwater temperature climate and (2) circulation and mixing processes that control nutrient budgets. Annual patterns of thermal stratification determine, for example, the length of the growing season, the depth of critical isotherms, habitat 'fronts' and internal thermal 'shocks", vertical (nutrient) exchange and the temperature of out-flowing river water. Nutrient supply to the euphotic zone to support photosynthesis can come externally (e.g. from rivers, migrating fish, anthropogenic inputs) or internally (e.g. from the re-cycling of nutrients within a given lake). For simplicity, internal supply can be further divided into the re-supply during fall and spring 'overturn' (a process through which the surface and bottom waters of a lake are mixed) and additional vertical fluxes associated with diffusion and upwelling during the growing season.

While Quesnel Lake fits the classic definition of a temperate or 'dimictic' lake, in that its surface water cool and warm through 4 °C (the temperature of maximum density at surface pressure) twice yearly, in fall and spring, respectively, data show the lake to be anything but classic; instead, the combined effects of its depth (greater than 500 m) and strong, intermontane wind events point toward a complex partitioning of mixing processes throughout the overturn period.

It is suggested that Quesnel Lake could become the centrepiece study site of a lake climate observation network spanning British Columbia, Yukon and Northwest Territories.

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