Jarvis, S., Wolfe, B.B., Johnston, J.W., Edwards, T.W.D., 2007, **Paleohydrologic Reconstruction of the Peace River from Magnetic Susceptibility Measurements of Oxbow Lake Sediments, Peace-Athabasca Delta**, *Ontario-Québec Paleolimnology Group Graduate Student Conference*, April 18 - 20, Wilfrid Laurier University, Waterloo, Ontario, Abstracts with Program.

Ice-jam flooding of the Peace-Athabasca Delta is an important hydrological process for the replenishment of hundreds of shallow perched basins that provide key foraging and nesting habitat for migratory birds. Previous research on laminated sediments collected from two oxbow lakes periodically connected to major Peace River distributaries has resulted in a 300-year record of flood frequency. In an effort to extend this record and broaden the understanding of the relationship between Peace River hydrology and climate variability, a series of vibracores and gravity cores were collected at sites proximal, intermediate, and distal to the inlet of each oxbow lake. Dark beds in the sediment cores have sharp lower contacts and diffuse upper contacts, consistent with energy conditions associated with flood events. High resolution analysis of magnetic susceptibility has been used to identify flood deposits at all three coring sites in each oxbow. Peaks and troughs in magnetic susceptibility have been used to correlate cores within and between sites. Results show significant shifts in flood frequency and magnitude down-core. A preliminary chronology, spanning the past 800 years, suggests that Peace River flood frequency and magnitude were substantially greater during the Medieval Warm Period (MWP: ~1200-1500 AD) when compared to the Little Ice Age (LIA: ~1500-1900) and post-LIA interval (~1900-present). Although climatic conditions during the MWP were relatively warm and dry in Canada's Northern Great Plains, earlier and/or more rapid snowmelt in the eastern Rocky Mountains may have produced conditions conducive to more frequent and more severe ice-jam events along the Peace River. Ongoing research includes the refinement of the chronology using cesium-137 and lead-210, as well as elemental and stable isotope analyses. Multi-proxy analysis of sediment cores will provide further insight into the response of the Peace River to climate variability over the past 1000 years. A paleoenvironmental perspective covering a timeframe with a wide range of climatic conditions is critical for effective stewardship of this internationally-recognized ecosystem.