Effective stewardship of floodplain landscapes requires knowledge of the relative roles of natural processes and upstream human activities on environmental flows. In floodplain landscapes, hydroecological conditions that develop from potentially competing drivers, such as climate change and industrial development, tend to be expressed at spatial and temporal scales that are often inadequately captured by existing monitoring datasets. Consequently, perceived cause–effect relations may be misunderstood, conflict can escalate among stakeholders, and effectiveness of surveillance systems, policies, and governance may be impaired. This is the context for the Peace-Athabasca Delta, an internationally-recognized water-rich floodplain landscape located in northern Alberta that has been subject to multiple stressors. Based on over a decade of research, this seminar will relay key findings from lake sediment records that have fostered an unparalleled window into the past to address water quantity and quality concerns of today.

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