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THE LAST 4000 YEARS AT PINE LAKE, ALBERTA

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Sediments from Pine Lake, Alberta, Canada (52° 04' N 113° 27' W) have been analyzed at 1 cm intervals for grain size, grain shape, crystal:glass ratio, bulk geochemistry, charcoal abundance, and at 5 - 10 cm intervals for pollen content. The sedimentary record extends to a little more than 4000 years ago. Results show (1) that in Pine Lake grain size reflects past runoff with finer silt and clay fractions being more pronounced during more arid/warmer periods and coarser silt fractions during moister/cooler periods, and thus offers a vegetation independent palaeo-climatic proxy record, (2) the occurrence of volcanic glass from the 1980 eruption of Mt. St. Helens, detectable only by microscopic examination, and providing a recent chronostratigraphic marker for the region, (3) a previously unknown volcanic ash bed, dated at approximately 1200 years ago, (4) the effects of historic anthropogenesis have led to an increase in organic sedimentation, phosphorous, sulphur, and lead, (5) a change in charcoal producing processes around the lake basin, and (6) a shift from grassland to aspen parkland, the introduction of non-native species and the development of agriculture.

The development of the aspen parkland in the region slightly precedes major settlement and fire suppression; it is therefore proposed that the development of the aspen parkland resulted from the extirpation of bison in the mid and late 1800's. Prior to this time, the aspen parkland in this area was patchy, without the nearly continuous aspen cover of today. This may have major implications for the future development of the vegetation of this region.

The grain-size record of past runoff suggests that the climate of the recent past has been atypical of the last 4000 years, and that the more arid climate of the 1930s was closer to the long-term mean than was any other period this century.

Celina Campbell

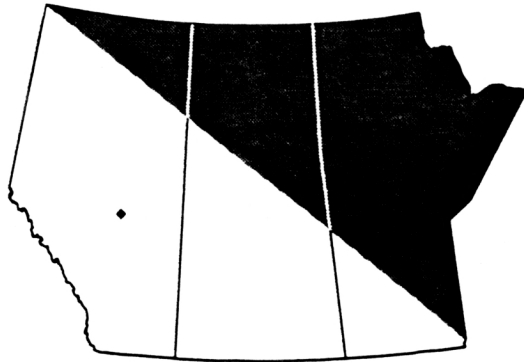
Celina is a PhD student with an interest in climate changes of the past, particularly as they relate to the archaeological record and arid regions.

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Ian is a vegetation ecologist with interests in tree-rings, pollen, the Little Ice Age, the Medieval Warm Period, and forest vegetation modelling.

Climate, Landscape
and
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