

Session #6 - Integrated Remediation Practices

Time	1115am-1135am
Topic	Using ecosystem water and carbon fluxes as integrated indicators of reclamation success on northern-latitude mine sites.
Abstract	<p>The cycling of water, energy, and carbon are ecosystem functions that support the overall health and success of vegetated ecosystems. Plant growth is controlled by climate and mediated by available water and sufficient nutrients in the rooting zone. Ecosystems are adapted to their range of climatic conditions, and within this range, with insufficient water and/or nutrients, carbon uptake is reduced and ecosystems experience stress. In most of western and northern Canada, vegetated ecosystems experience growing-season water stresses that limit growth. Understanding the linkages between climate, water availability and use, and carbon assimilation is central to understanding of the magnitude of this limitation, and of key ecosystem functions.</p> <p>We assembled and synthesized over 15 years of research (and 60 site-years of data) on water and carbon fluxes and associated ecosystem function and development on reclaimed oil-sands-mine sites and on non-mine reference sites initiated through other disturbances (i.e., forest harvest and fire) in the Athabasca Oil Sands Region of Northern Alberta. This research represents a continuation and expansion of an existing long-term ecohydrological research network. A central premise of this work is that if reclaimed and reference sites with similar moisture and nutrient availability are using water and assimilating carbon at similar rates under the same climate, this suggests that the reclaimed sites are experiencing no greater levels of environmental stress than the reference sites, and no greater limitations to accessing/utilizing available site resources. Results of our work to date indicate similar functional process in terms of water storage and use, and carbon assimilation, between mine sites reclaimed to boreal-forest communities and comparable non-mine reference sites.</p> <p>Following on this work, we are beginning research centred on the Faro mine site in the south-central Yukon, using a similar approach and techniques. The objective of this program is to evaluate how fluxes of water, energy and carbon dioxide from sites across a disturbance gradient can be used to demonstrate equivalent capability for post-mining landscapes in cold, montane environments of the Yukon. This will complement existing research located in the Wolf Creek study catchment (near Whitehorse) that characterizes reference conditions and has been ongoing for several years.</p>
Presenter(s)	J. Straker, Integral Ecology Group Ltd.
Bio(s)	Justin Straker is a soil scientist and forest ecologist with the Integral Ecology Group. His work has focussed on ecological aspects of mine reclamation for twenty years, including work in Yukon, NWT, Nunavut, and Alaska.