The Supporting Role of Laboratory Mesocosms in Scotty Creek Studies

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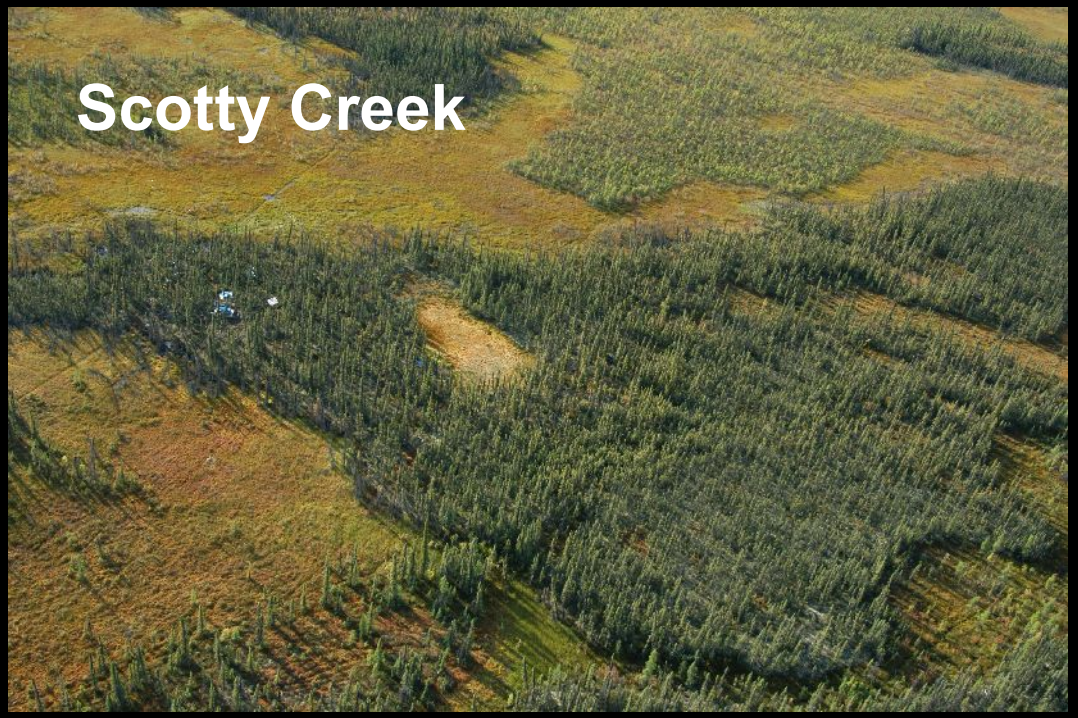
Cold Regions Collaborations & IP3

- UWO CFI proposal for Experimental Climate Change Research Facility awarded 2004
- Quantify effects of climate change ground & surface water of Canada's subarctic regions (climate forcing experiments)
- Collaborations Bill Quinton & Masaki Hayashi
  - Aug. 2006 field visit Scotty Creek & join IP3
  - Aug. 2007 sampling soil monoliths
  - April 2008 BioChamber delivered to UWO

Research Objectives

- Couple experiments on peat from Scotty with on-going field studies to better elucidate:
  - Moisture dynamics at active-layer / permafrost transition zone;
  - Develop numerical model to estimate interface and water table during seasonal ground thaw;
  - Estimate volume and timing of runoff events;
  - Validate hydrologic sensors currently in use


Scotty Creek


Scotty Creek

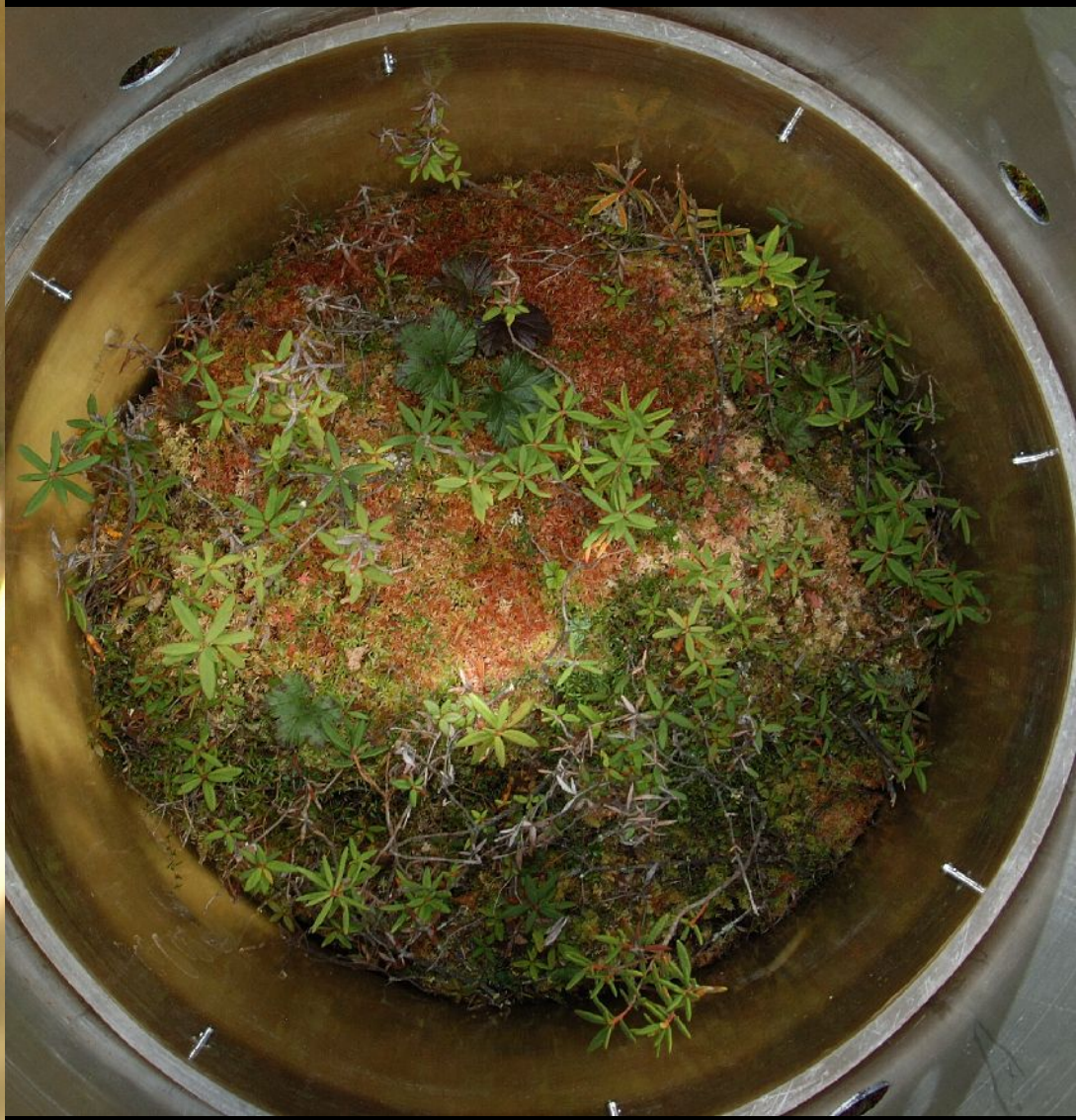

Enbridge pipeline right of way-
52 km SE Fort Simpson


GSC Field Site
90 km NW Fort Simpson


SNA
SOUTH NAHANNI
C-GSOL

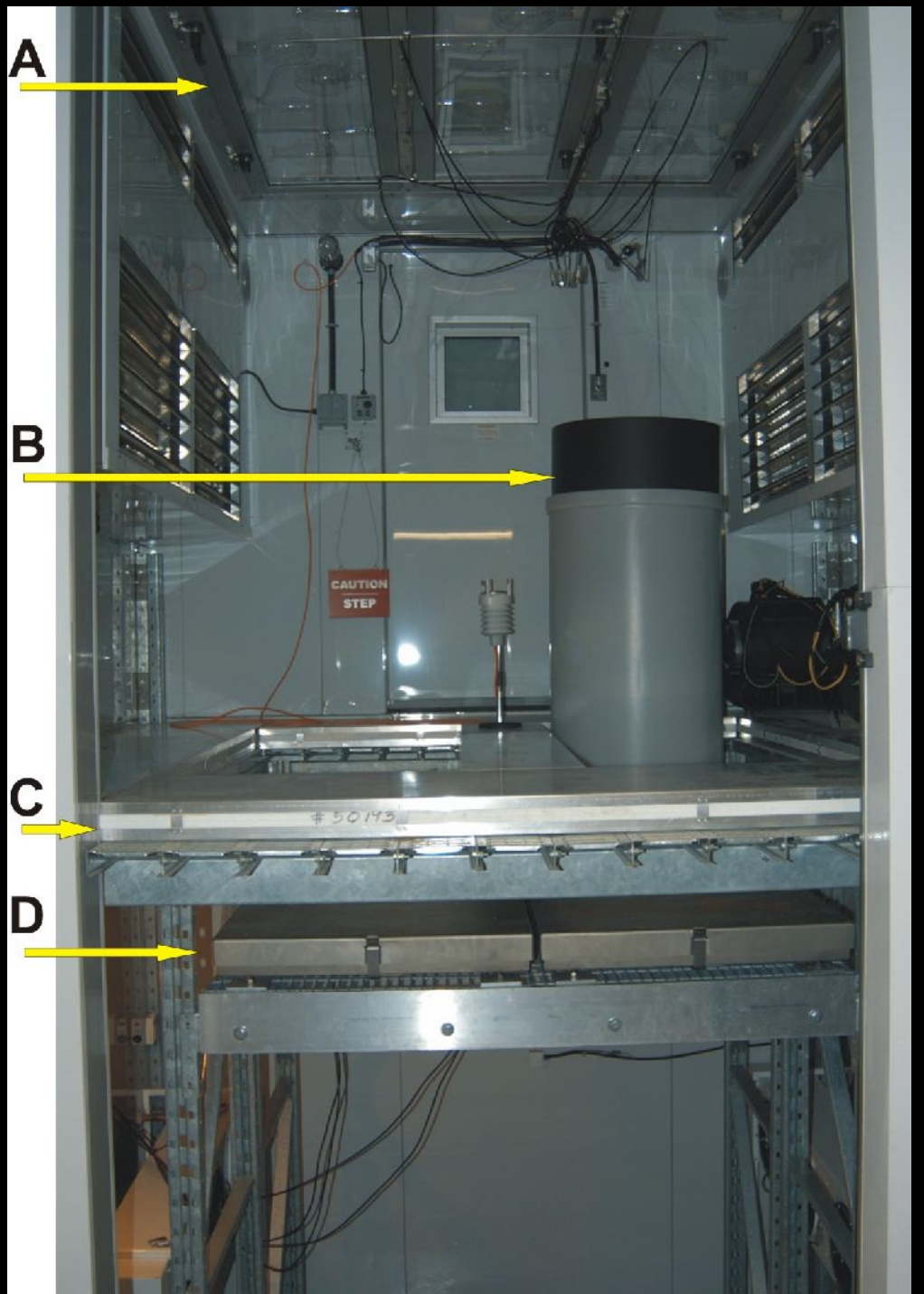

SNA
SOUTH NAHANNI
C-GSOL

Lichens & labrador tea



mosses & labrador tea

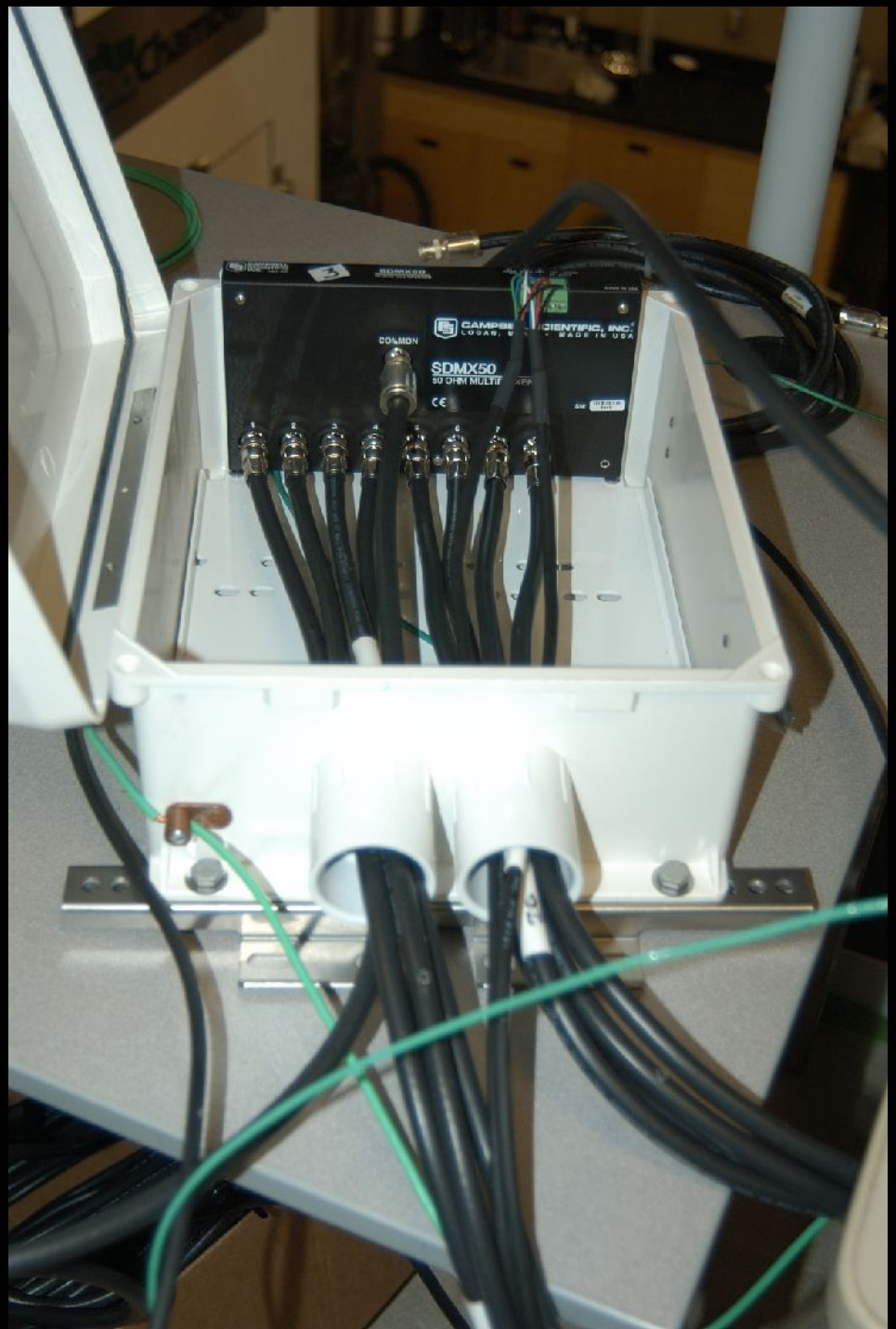

BioChambers


A
B
C
D
CAUTION
STEP

IC
GC-MS
ICP-ES
AA

X-ray flour.
e. Microprobe
LSIS


LakeShore
1 107.42Ω 5S. Under
2 107.40Ω 6S. Under
3 107.53Ω 7S. Under
4 107.54Ω 8S. Under
218 Temperature Monitor



TDR-100

-Tested both R8 & R58 cables

-Using low loss cables throughout

-May allow us to separate frozen and unfrozen moisture & monitor freezing process.

Work Underway

- Permeability vs. density measurements on Thunder Bay peat
- Still working on instrumentation – machining
- Scotty monoliths moved over by ~ Dec. and start experiments
- Pursuing grants for larger scale research

Acknowledgments

- CFI
- UWO Academic Development Fund
- UWO Faculty of Science (Dean)
- IP3