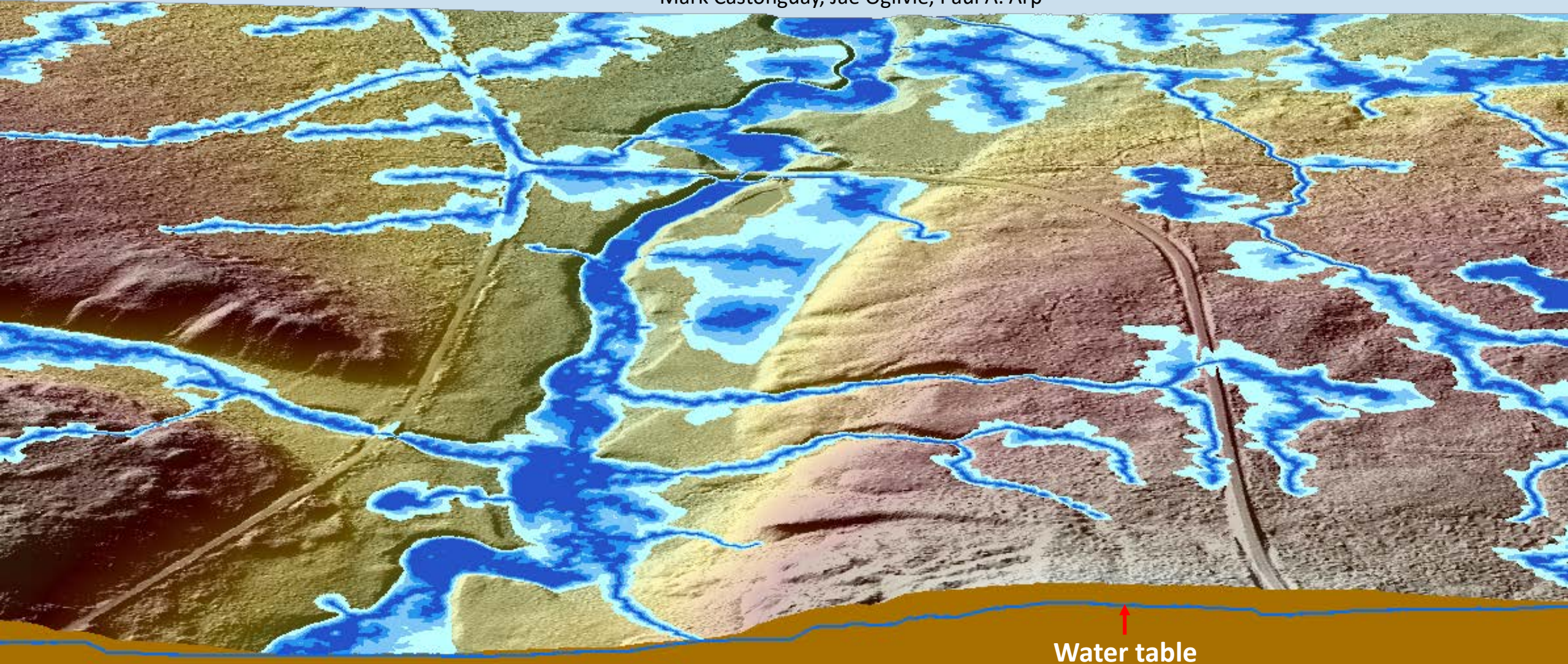Peatlands & Wetlands in Atlantic Canada
June 6-7, 2017, Shippagan, NB

What research is required for wetlands in Atlantic Canada?

**Research Initiatives and Activities at the Forest Watershed Research Centre, UNB, Fredericton, NB**
Mark Castonguay, Jae Ogilvie, Paul A. Arp

**Water table**

# Latest Developments and Research Initiatives at the Forest Watershed Research Centre

Full LiDAR and Coverage for New Brunswick by 2018, 1 m resolution, includes full features, e.g., forest & vegetation metrics at 20 m resolution
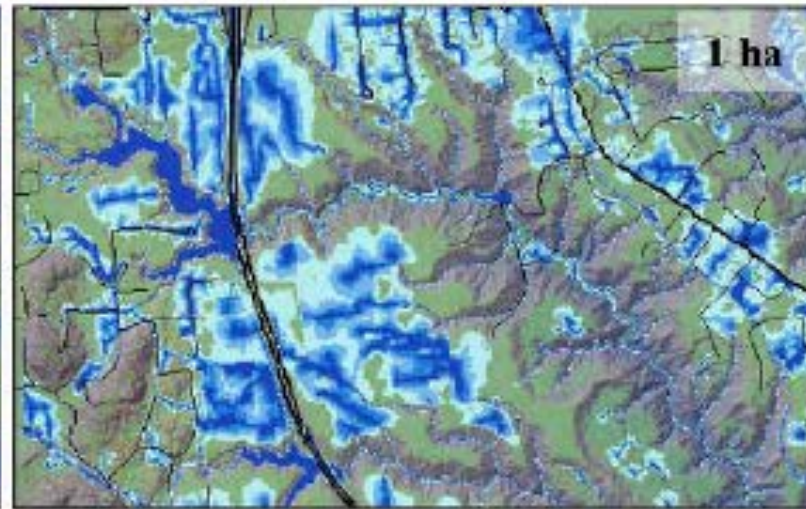
Comprehensive Flow-channel and Wet-areas Mapping across New Brunswick, 1 m resolution, by 2018

Developments can expanded across Atlantic Canada, Quebec, Maine, etc.
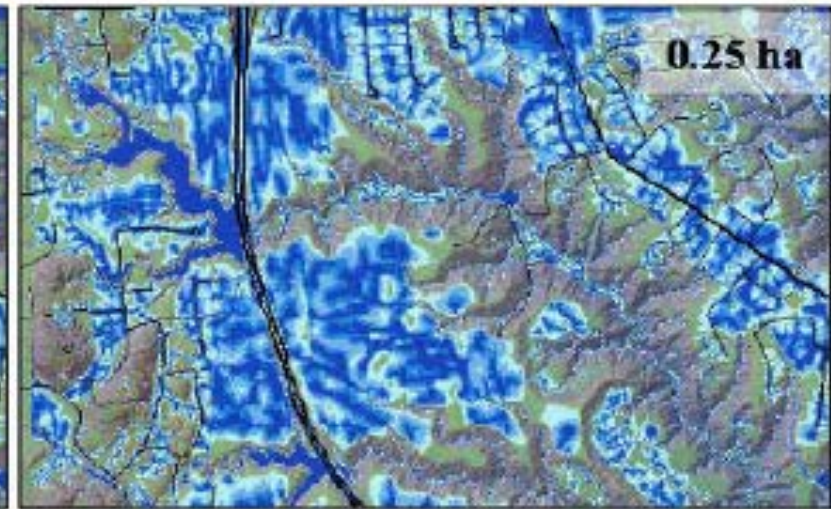
**Multi-temporal UAV Survey** with hydrological interpretations, at 5 cm resolution
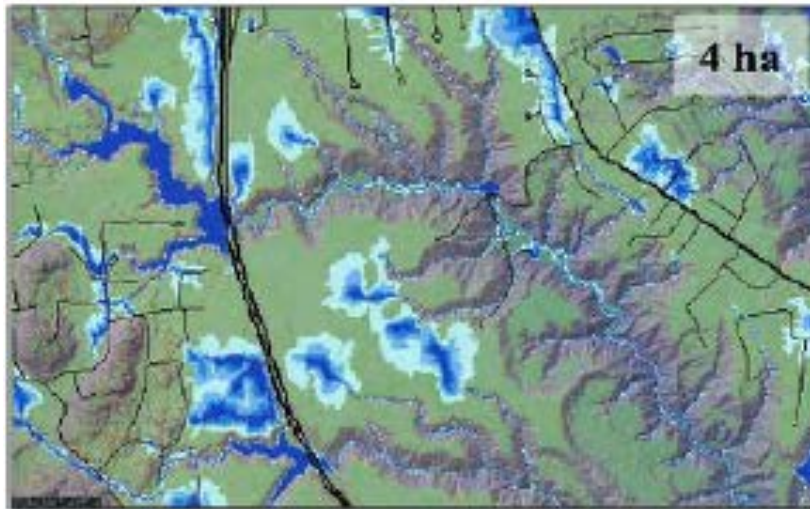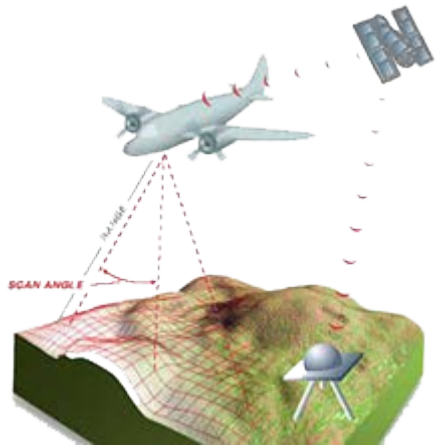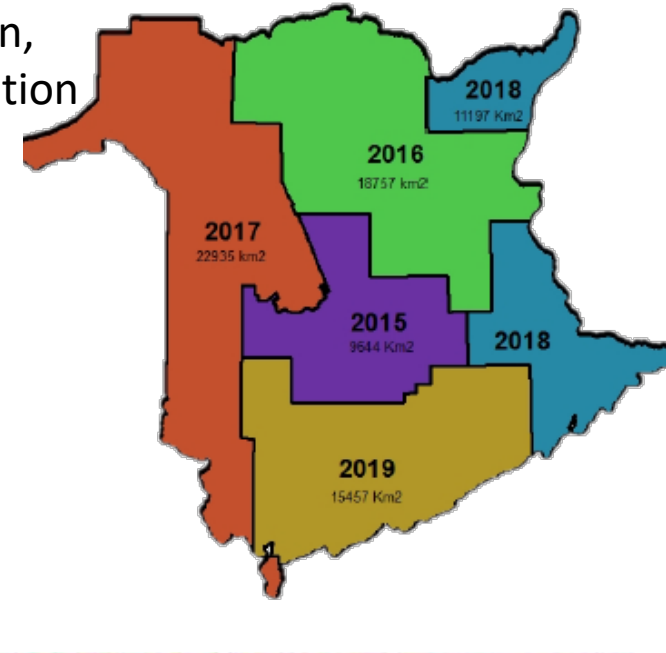


| End of summer | Spring, Fall | After snowmelt |

**Research Initiatives for Wetlands and Peatlands (inland, coastal):**

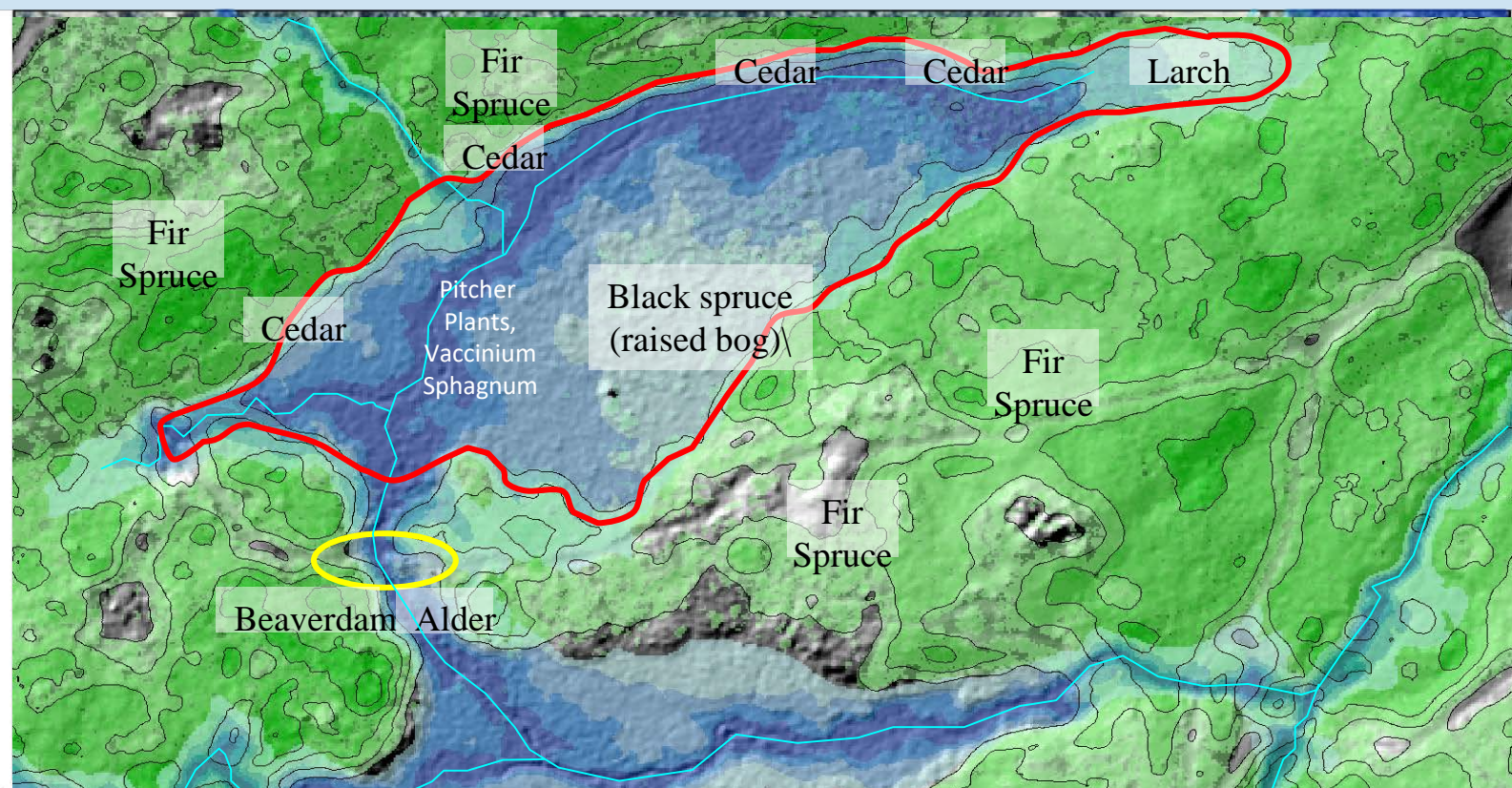Better wetland borders, flow channels, watersheds

Internal topography,

Internal drainage and water quality variations,

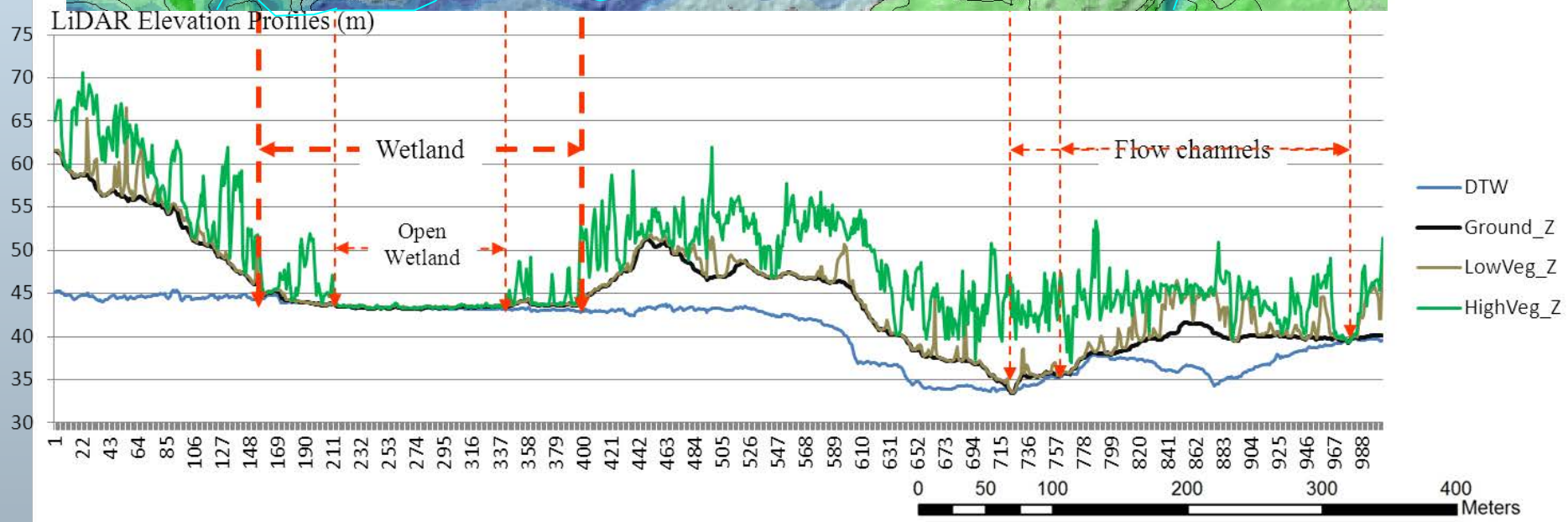Internal plant community distributions,

Wetland to-wetland connectivities

Daily moisture content, stream discharge, temperature, frost depth through hydrological modelling

LiDAR derived depth-to-water feature (m)

0  dark blue
1  light blue

Fir Spruce
Cedar
Cedar
Larch
Fir Spruce
Cedar
Fir Spruce
Cedar
Pitcher Plants, Vaccinium Sphagnum
Black spruce (raised bog)
Fir Spruce
Fir Spruce
Beaverdam  Alder

LiDAR Elevation Profiles (m)

Wetland
Open Wetland
Flow channels

DTW
Ground_Z
LowVeg_Z
HighVeg_Z

# Wetland Better Border Conformance Testing

**Probability of wetland border 'x' meters away from DTW=0.5m contour**

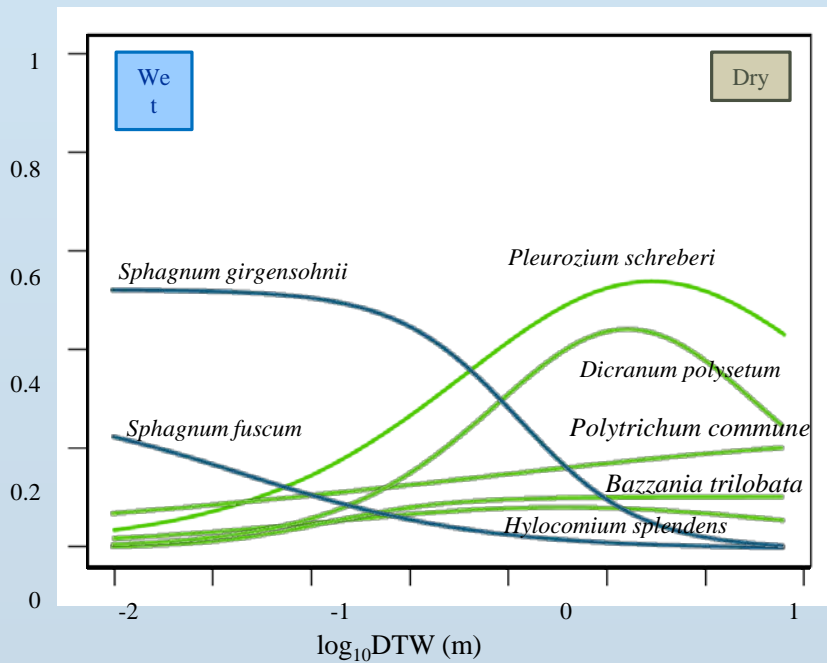Using provincial DEMs:

generally ± 40 m,
8 times out of 10

Using bare-ground LiDAR DEMs:

generally ± 4 m,
8 times out of 10

Conformance (%)

Air-photo
LiDAR-WAM
Prov. DEM WAM
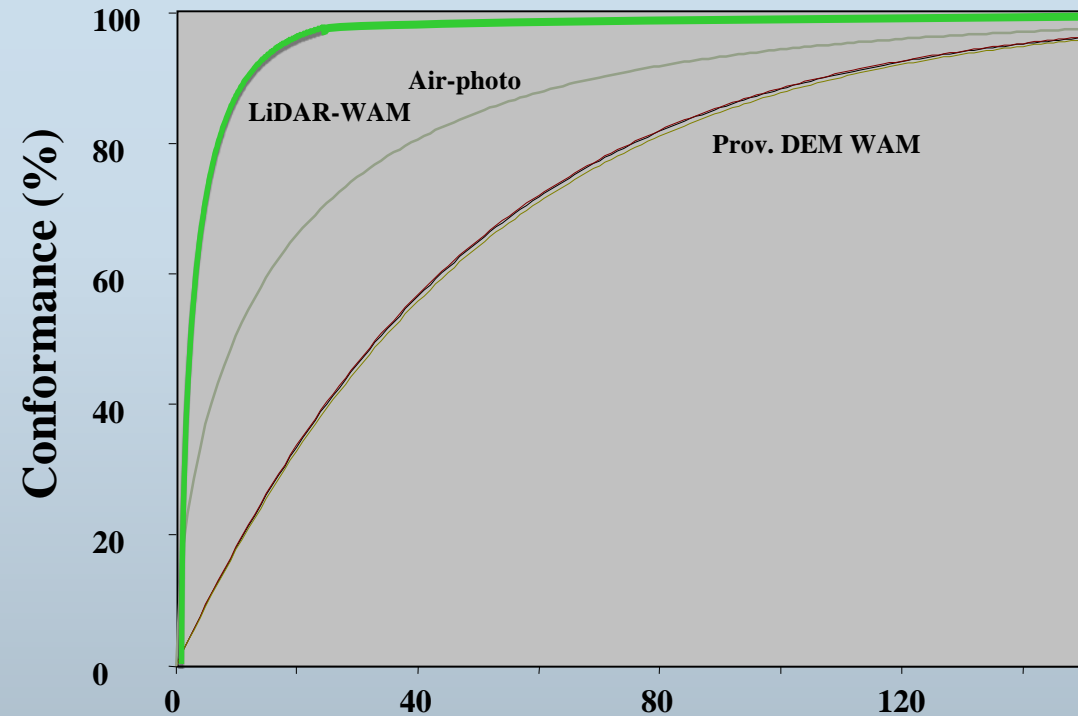
**Nearest distance between GPS and mapped culvert locations, in m**

# DTW-based moss probability distribution mapping across landscape, at 1 m resolution
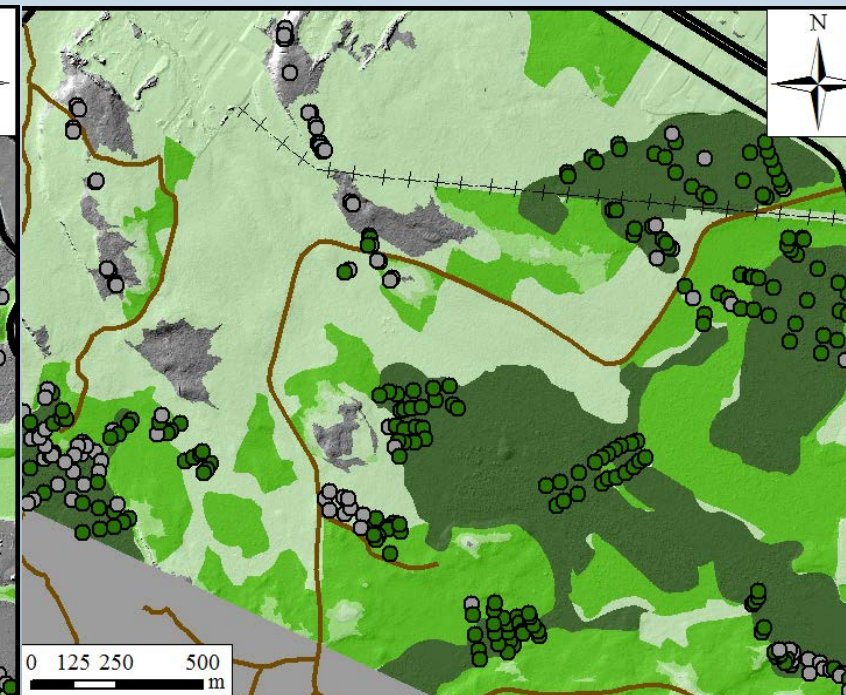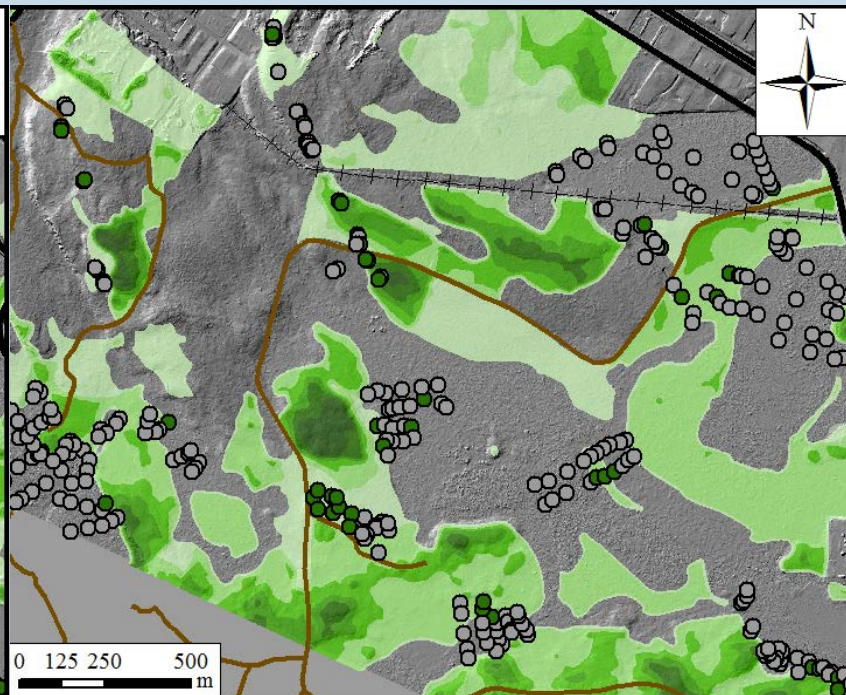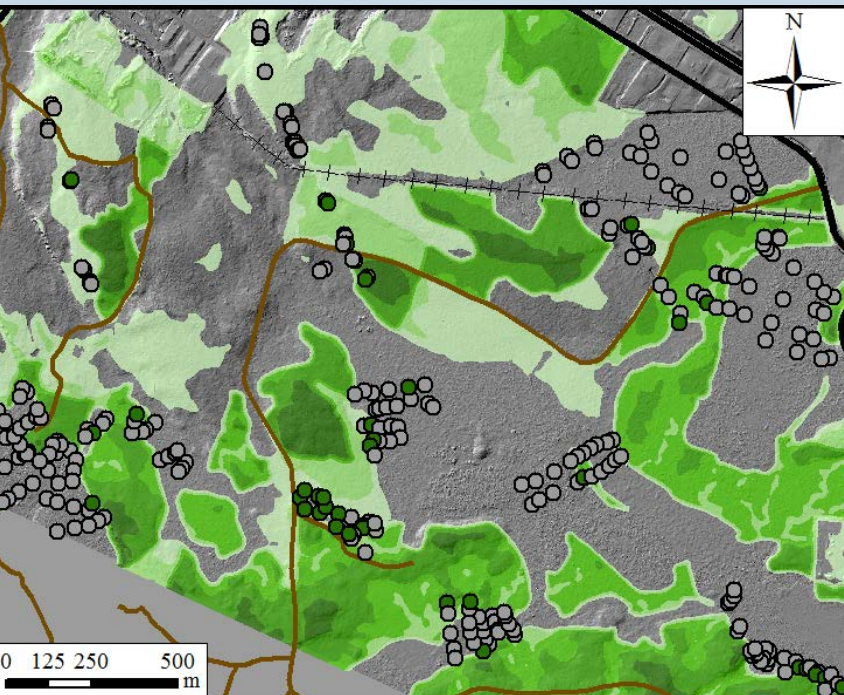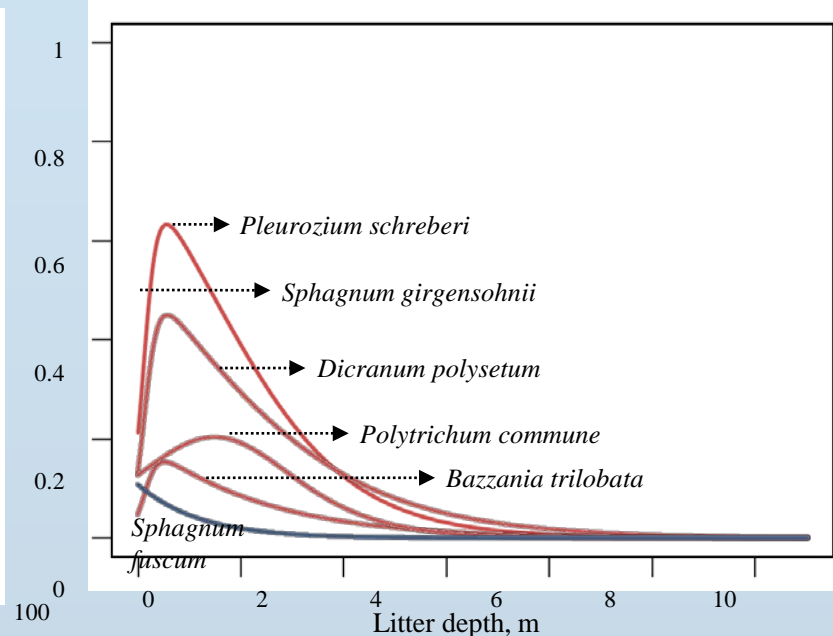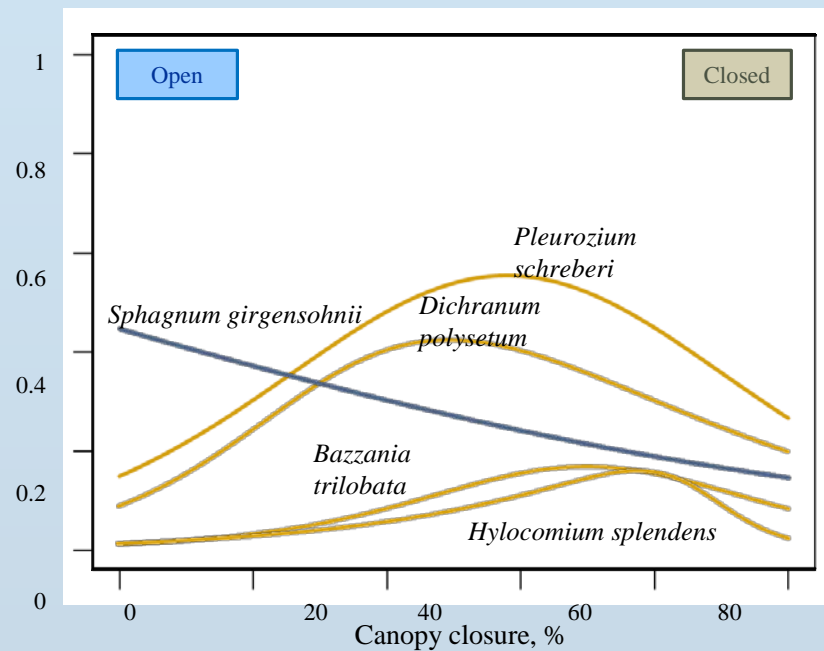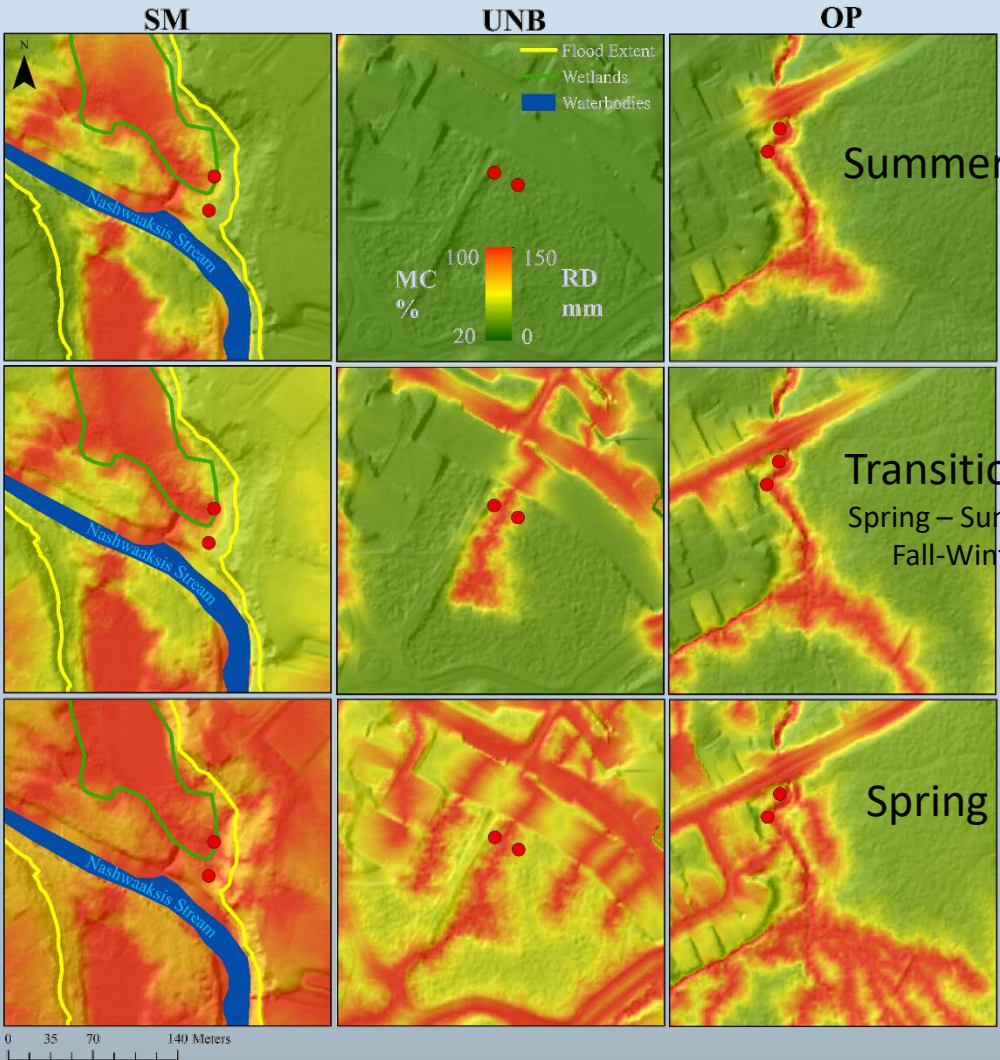
# Soil Trafficability Forecasting
## Spatial & temporal

Daily moisture content, stream discharge, temperature, frost depth through hydrological modelling

Soil trafficability forecasting

Using weather records (daily precipitation, air temperature) to project snowpack depth, soil moisture and frost and rut depth

MC: pores pace moisture content %

RD: rut depth, ATV traffic, 10 passes

Fredericton area (forested areas)

SM: Nashwaaksis Floodplain

UNB Campus

OP: Odell Park
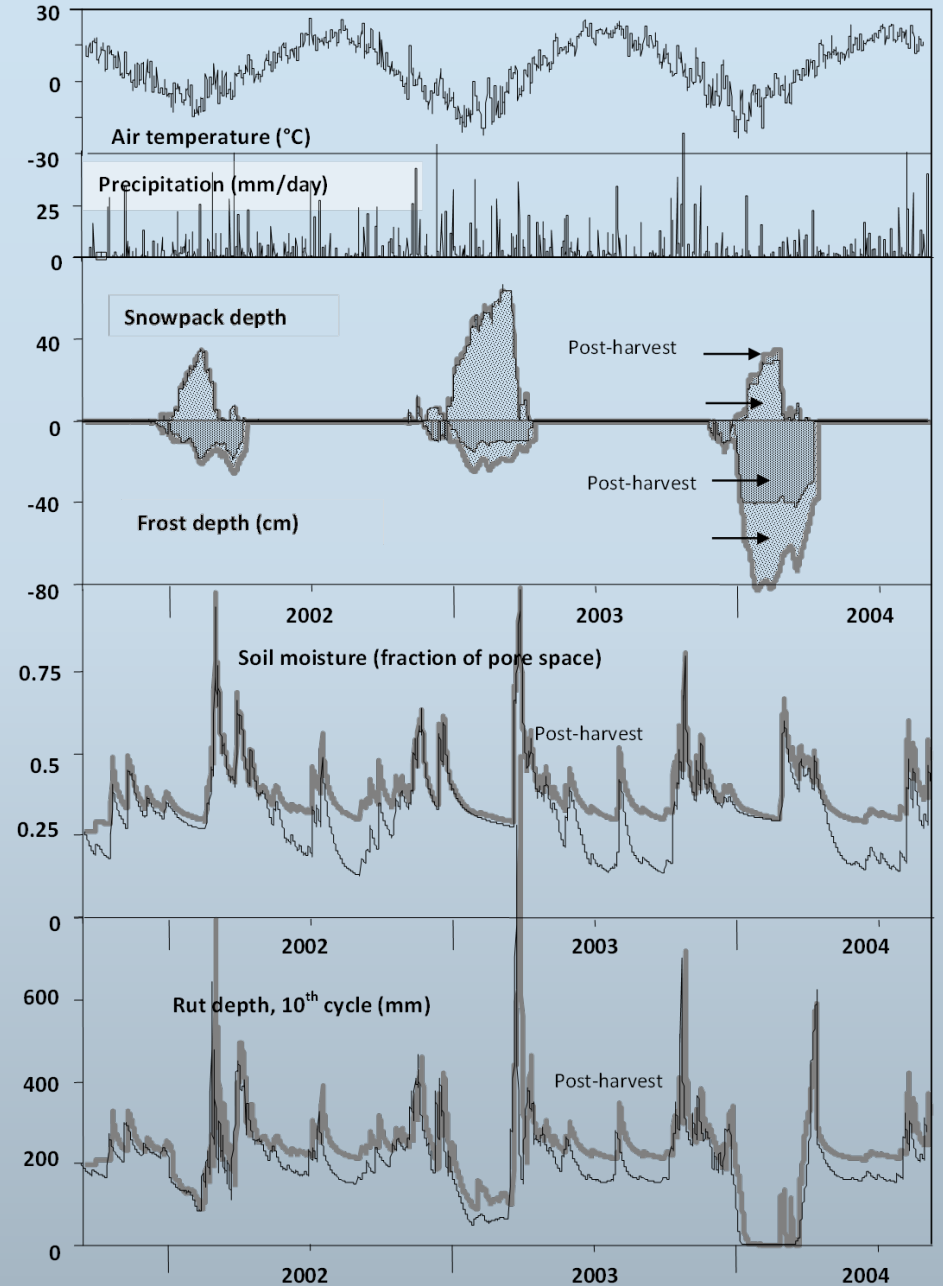
For   more information,

contact  us at UNB



http://watershed.for.unb.ca/

1 -506 -453 4931

arp1@unb.ca



Tilley Hall

H. Irving Library

Kierstead Hall

Toole Hall

UAV-generated
flow-channel  & wet-area map
for UNB's green space on campus;
5 cm resolution,
wet weather conditions