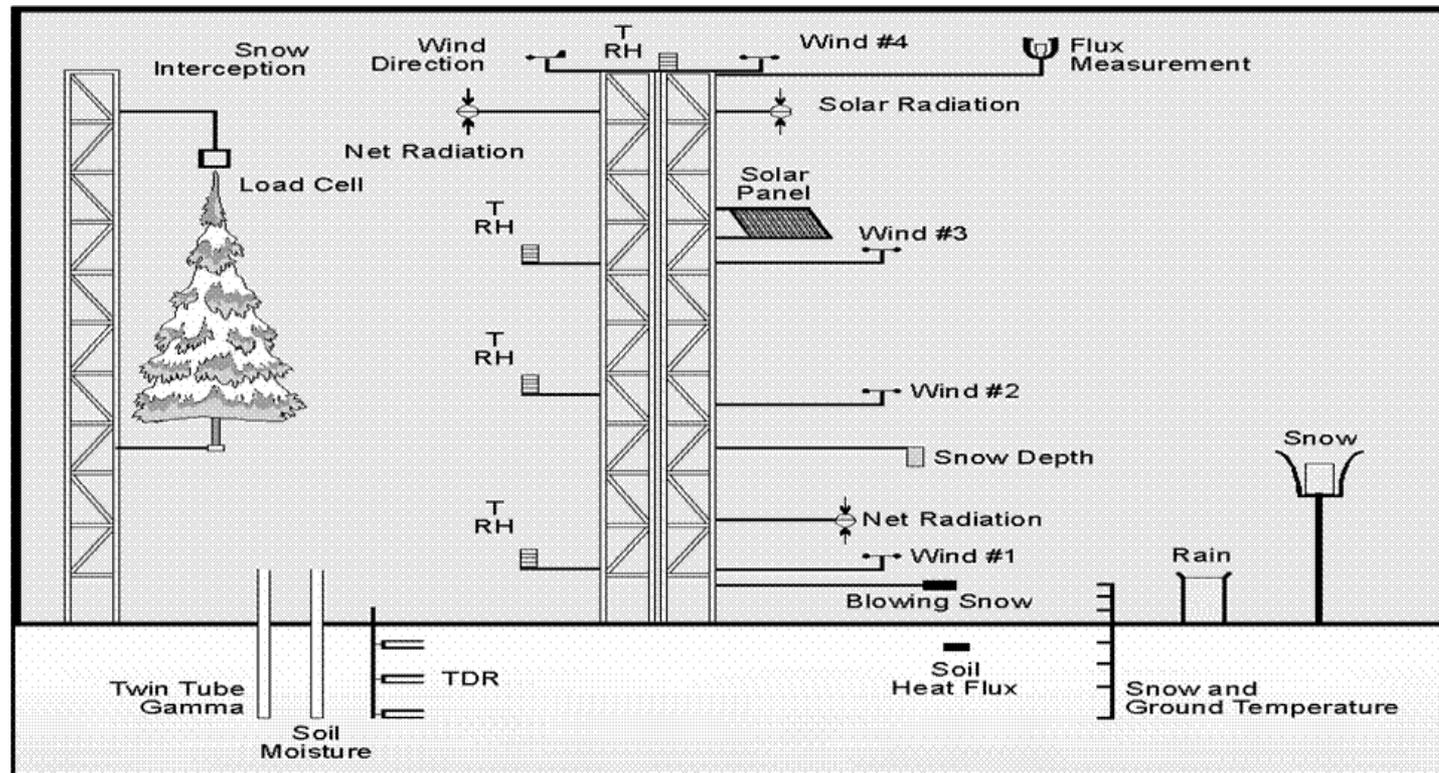


Research and monitoring activities and needs related to ABoVE and POLAR activities

J Richard Janowicz
Water Resources Branch
Yukon Department of
Environment
May 16, 2016

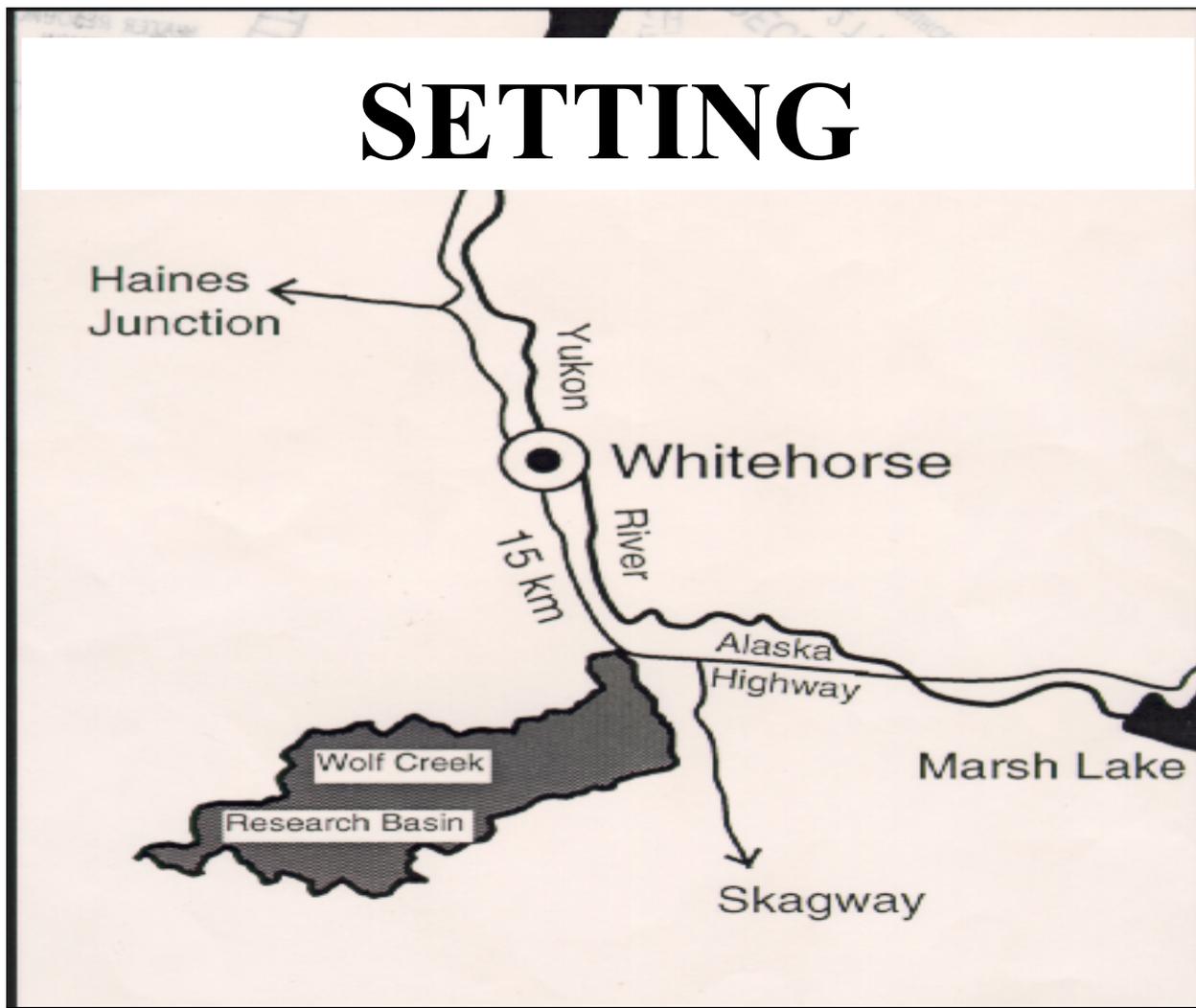
WOLF CREEK RESEARCH BASIN

- Established 1992 for Hydrologic Model Development / Calibration Purposes
- Developed into an Integrated Study of Hydrometeorological Processes and Climate Research

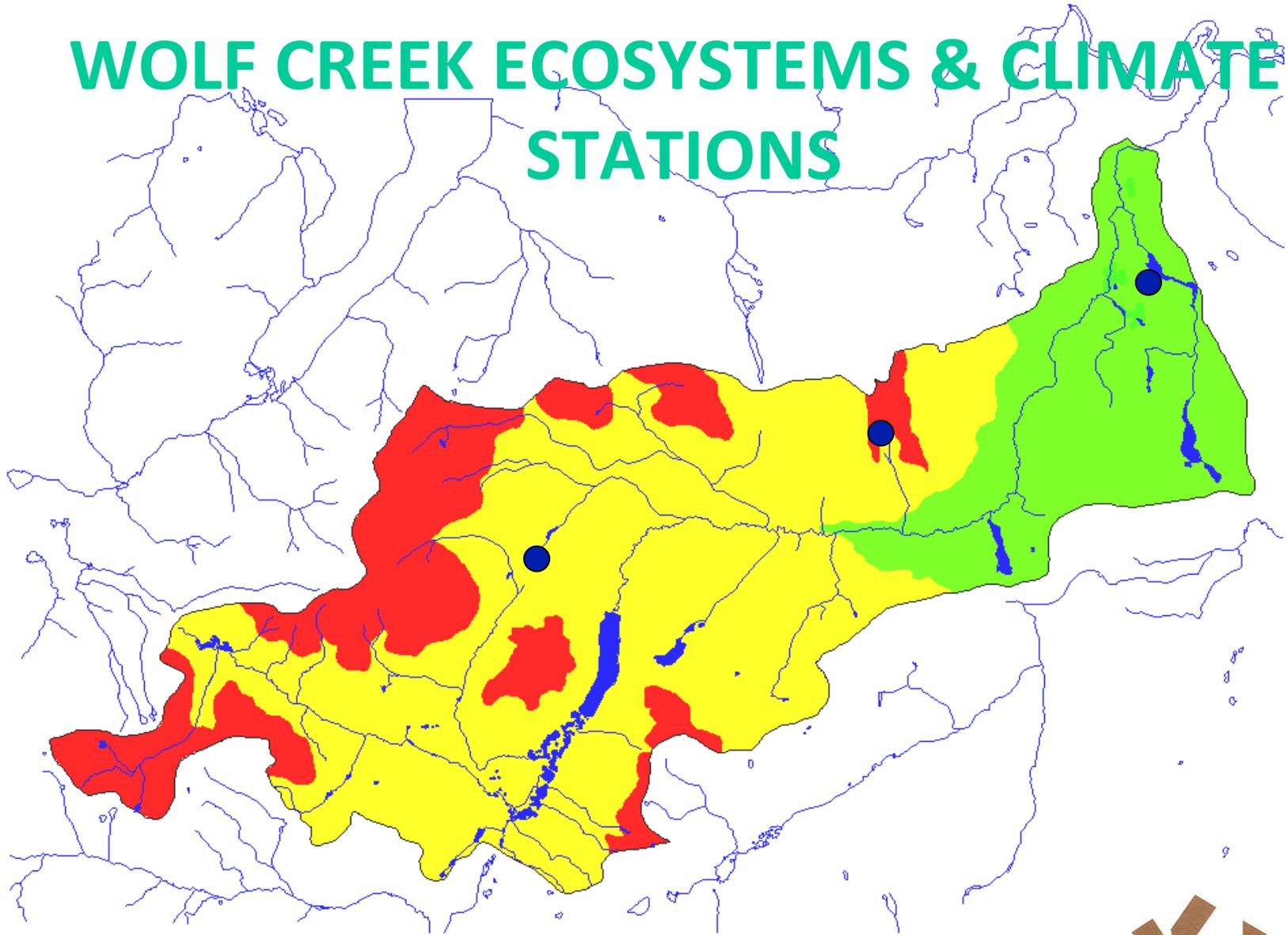


Wolf Creek Tower Schematic

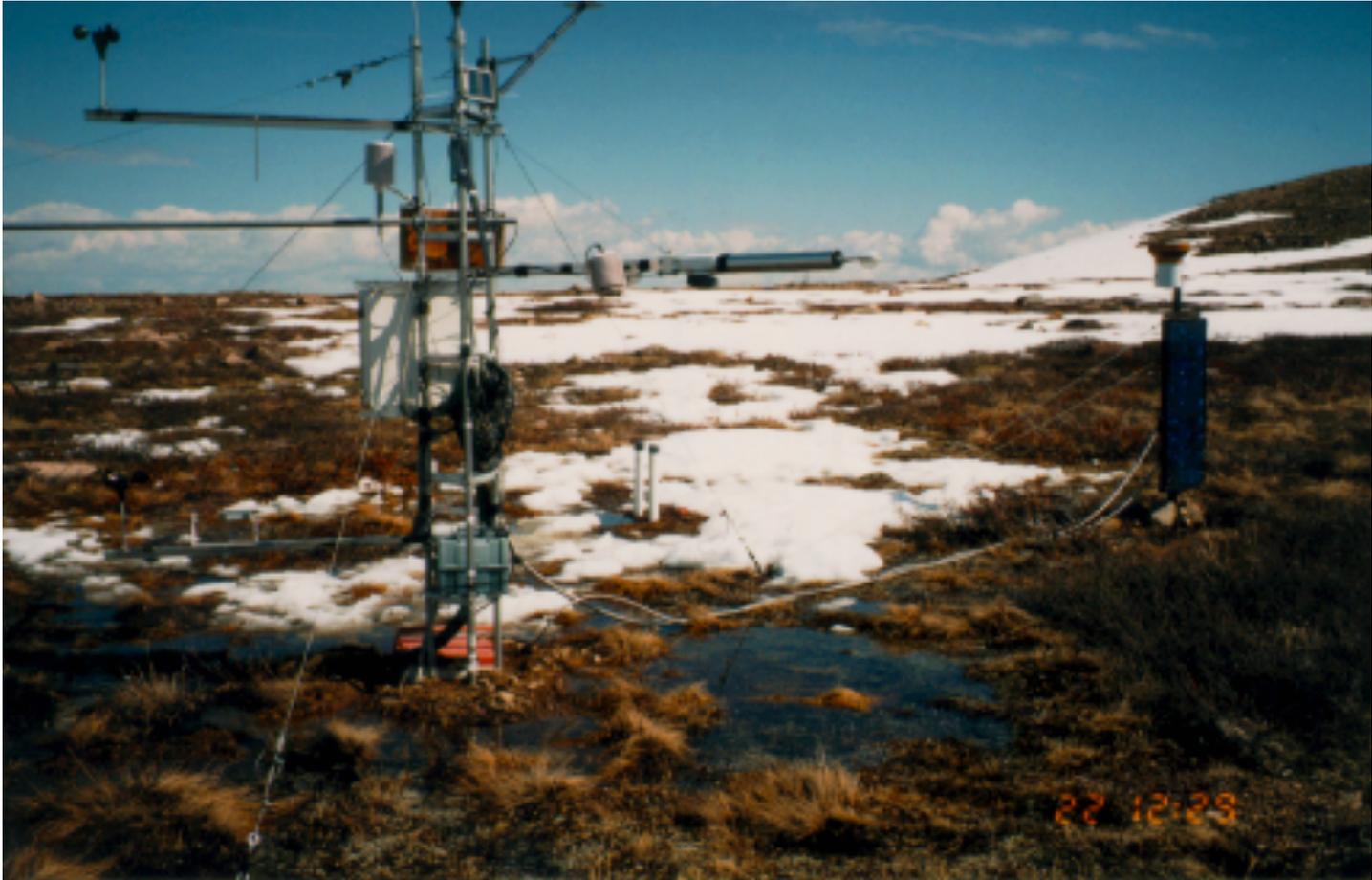
SETTING



WOLF CREEK ECOSYSTEMS & CLIMATE STATIONS

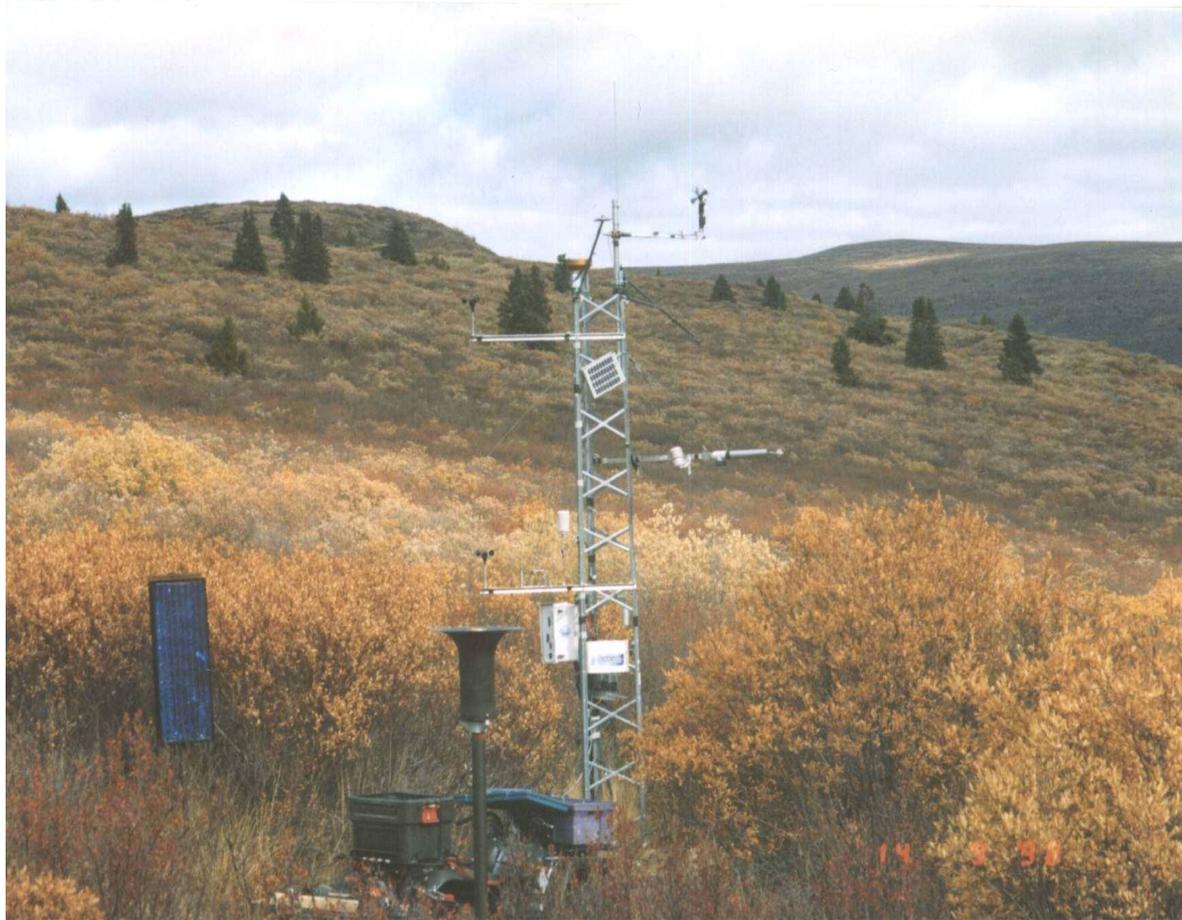


ALPINE TUNDRA



- Moss, Grass, Lichen
- 50 % Level; 50% Shallow Slope (10^0)

SUBALPINE TAIGA



- Moderate (15°) Undulating Hillslope
- Shrub Alder & Willow (2 m)

BOREAL FOREST



- Thick Spruce Canopy (20 m)

BOREAL FOREST – PLANNED UPGRADING

Funding: Public Safety Canada

Boreal Ecosystem Research and Monitoring (BERMS) Site
– Waskesiu, SK



Yukon

POLAR KNOWLEDGE CANADA

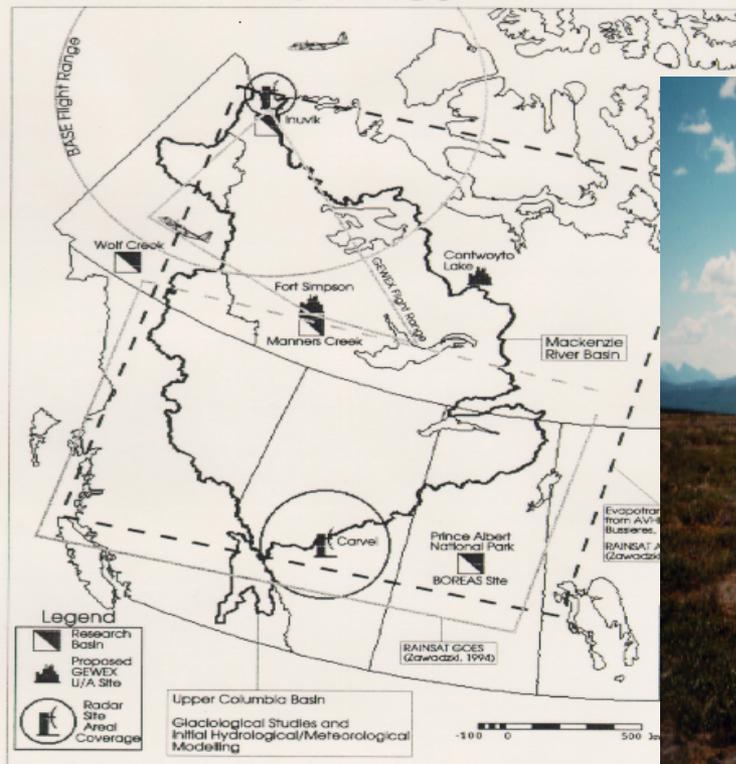
POLAR FUNDING: Provided 2015 to Upgrade Met Stations with Telemetry



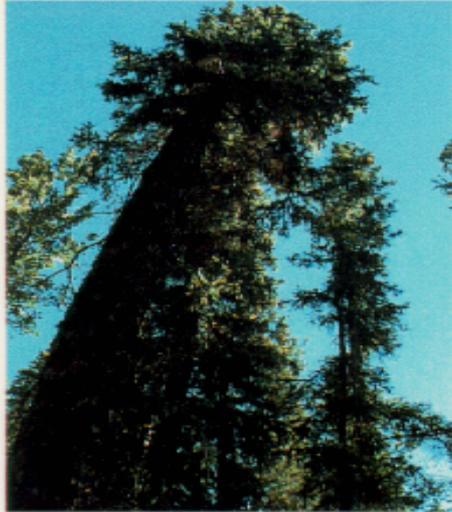
MILESTONES

Global Energy and Water Cycle Experiment (GEWEX) -1994

Research Basins and Observational Systems for MAGS

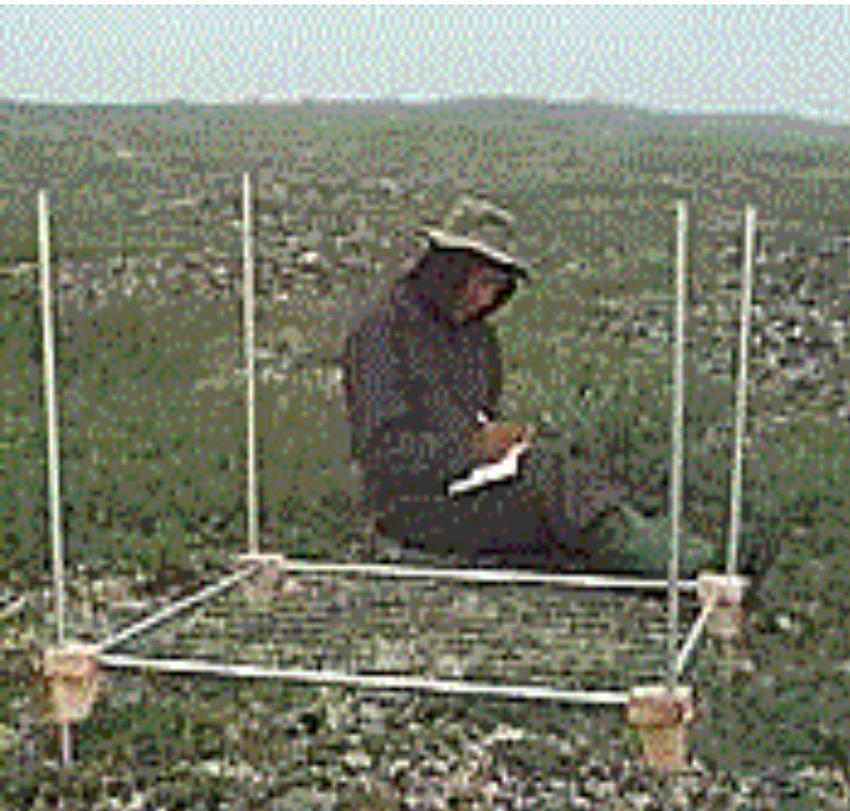


ENVIRONMENT CANADA ECOLOGICAL MONITORING AND ASSESSMENT NETWORK - 1997



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INTERNATIONAL TUNDRA EXPERIMENT - 1998



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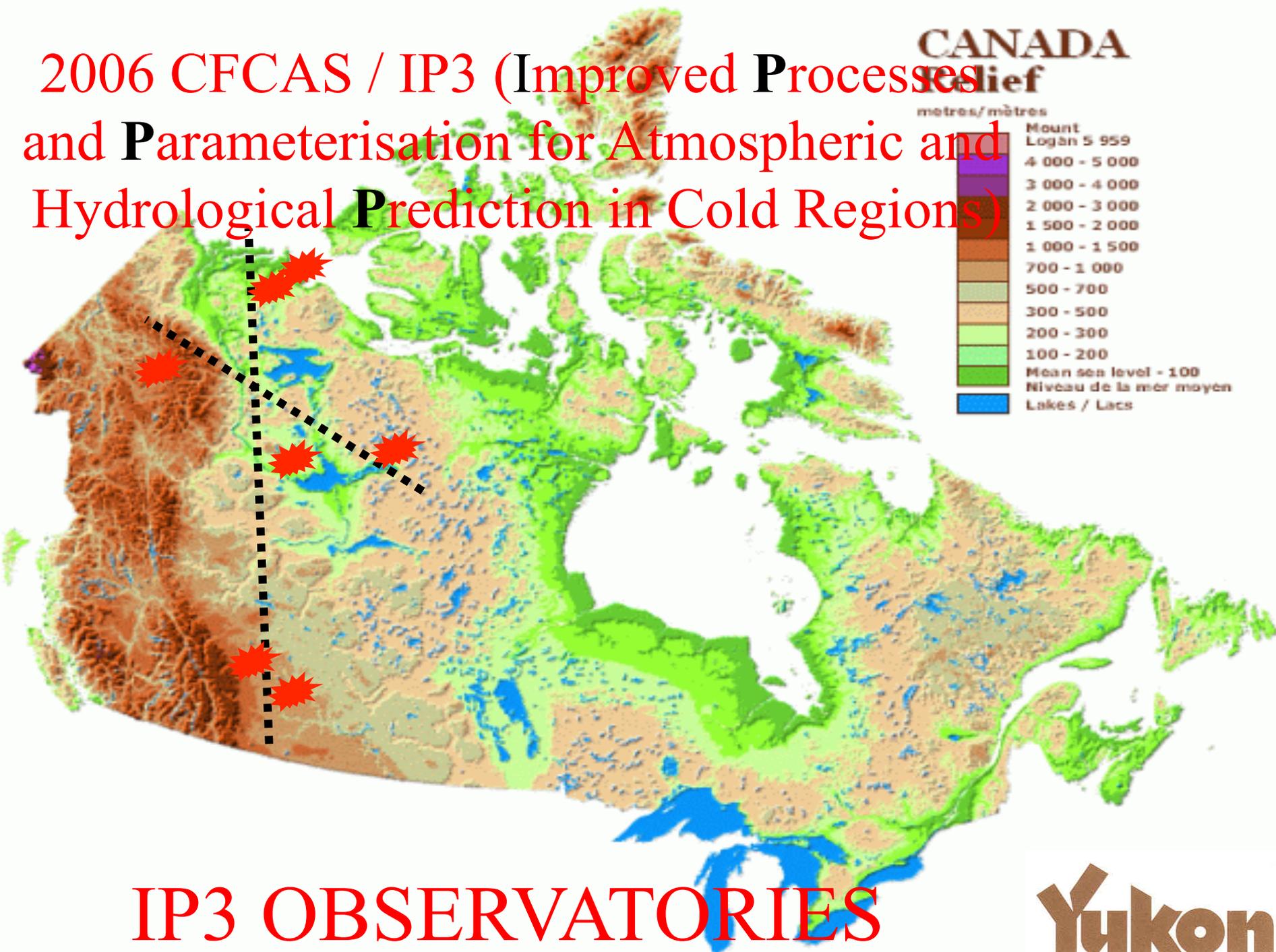
2002 NERC (UK National Environment Research Council) / CFCAS (Canadian Foundation Climate Atmospheric Studies)



7.4.



2006 CFCAS / IP3 (Improved Processes and Parameterisation for Atmospheric and Hydrological Prediction in Cold Regions)

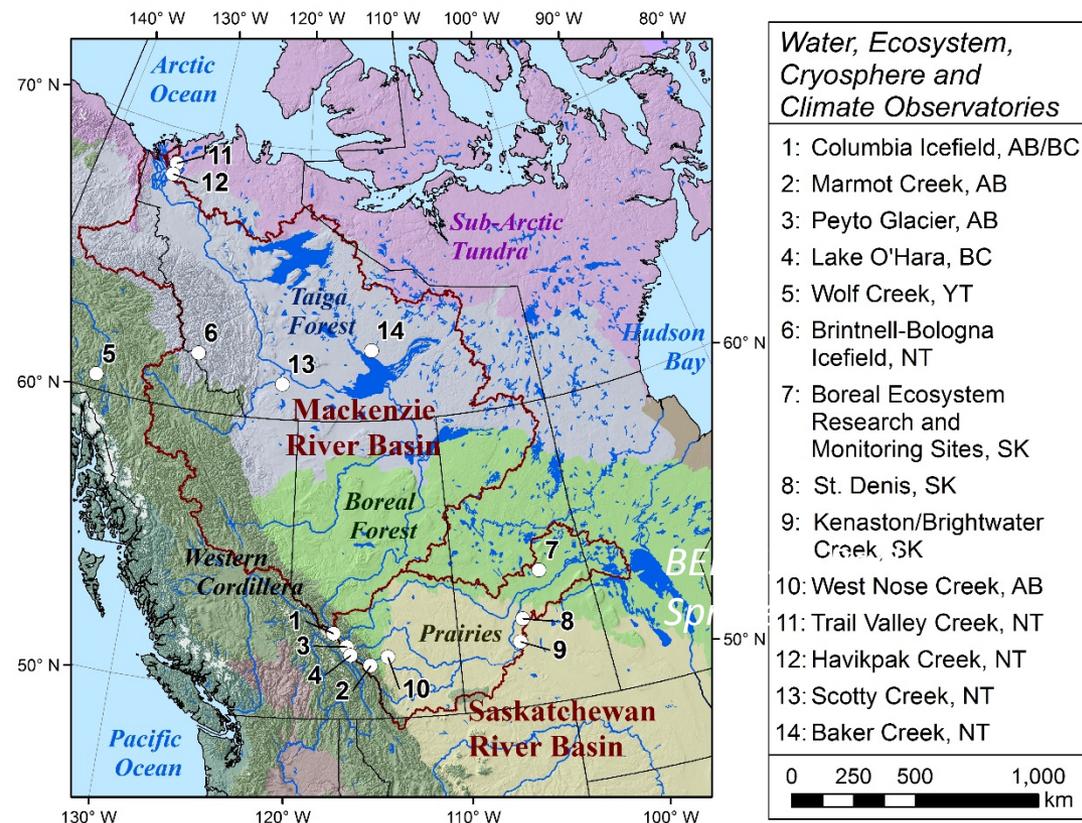


IP3 OBSERVATORIES

Yukon

Changing Cold Regions Network (CCRN) Research Programme: Geographic Focus / Water, Ecosystem, Cryosphere and Climate (WECC) Observatories

- A network of WECC Observatories combine meteorological, hydrological, ecosystem, and cryospheric observations with multi-scale coupled models from the surface to the atmosphere.
- Observatories contain long-term legacy data sets, including hydro-meteorological variables, remote sensing observations, LiDAR topography, and soils, geology, and vegetation characterization



Ongoing research and monitoring *Related to ABoVe and POLAR activities*

Buckbrush Eddy Covariance
Tower



Planned research and monitoring *Related to ABoVE and POLAR activities*

- *Continued hydrometeorological process and climate change research*
- *Transfer Wolf Creek findings to other Yukon and cold region locations*
 - *Public Safety (flood forecasting / flood hazard mapping)*
 - *Transportation (stream crossing design)*
 - *Mining (water supply / tailings pond design)*

Management related research & monitoring needs *Related to ABoVe and POLAR activities*

- *Wolf Creek research history aligns well with ABoVE and POLAR program objectives*
- *Wolf Creek infrastructure and resources would support ABoVE and POLAR program research*

Opportunities for ABoVE/POLAR for engagement, education, outreach

- *23 years of continuous high quality hydrometeorological data (3 met, 4 hydrometric stations including eddy covariance instrumentation)*
- *3 ecosystems (forest, subalpine, alpine)*
- *Easy access to basin*

SUMMARY

- > 25 Student MSc and PhD Theses
- > 100 Peer Reviewed Journal Papers
- >30 University and Research Agencies from North America and Europe
- Wolf Creek Recognised Nationally and Internationally for Cold Regions Hydrometeorological Process and Climate Change Research