Compendium:

Yukon-based Research

Related to Climate and Climate Change

1978-2003

Prepared for the
Northern Climate ExChange
and the North Region of the
Canadian Climate Impacts and Adaptation Research Network
(C-CIARN North)

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Foreword

This Compendium is derived from C-CIARN North's Yukon Research Database, which is available in searchable form on the C-CIARN North website (www.taiga.net/c-ciarn-north) and Northern Climate ExChange's website (www.taiga.net/nce).

Information for the database was gathered through:

- searching the Applications for Licence under the Yukon Scientists and Explorers Act.
- searching the ASTIS database
- searching the Northern Research Institute Fellowship Grants list
- searching the Internet
- personal knowledge of work going on in the Yukon and neighbouring jurisdictions

Not all climate-related research done in the Yukon in the last 25 years is included in this volume. Because academic and private research is generally licensed under the Yukon Scientists and Explorers Act but most government research is not, the database and Compendium are biased toward academic and private research. We hope to correct this bias in future volumes and in intervening updates to the online database.

The Compendium is organized alphabetically under the name of the principal researcher or contact for the project. The index at the back of the volume allows the user to search for research projects by key word, nearby community, or nearby First Nation. More detailed and varied searches are, of course, available through the online database.

Changes are still being made to the database. We would appreciate being informed of any researchers or research that should be included in it.

Finally, we wish to acknowledge the assistance of Pamela Buckway, who compiled the original database and the first draft of this report, and Johannes Menzel, who filled in many blanks in the records.

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Yukon-based Research Related to Climate and Climate Change 1978-2003

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Research Focus: Palaeoecological evidence for Holocene and contemporary environmental change. The response of ecosystems to environmental change.

Date(s): 1981 **Location(s):** Slims River

Notes/Summary: Analysis of a dendrochronological (tree ring) record from the Slims Valley, Yukon, with particular reference to climate patterns.

Related Work: Current work is focused on Mediterranean region.

Publications: Dendrochronological studies in the Slims River Valley, Yukon Territory, MSc thesis, 1982, University of Calgary. Thesis available from National Library of Canada, Canadian Theses on Microfiche Service, National Library, Ottawa, Ont. K1A 0N4 - Canadian theses on microfiche, 0227-3845 ; 60846

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Burwash Landing	White River	climate
Destruction Bay	Kluane	dendrochronology
	Champagne & Aishihik	paleoclimate
		quaternary study

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Research Focus: Late Cenozoic paleoenvironments and climate change

Date(s): 1994 to present **Location(s):** Tintina Trench, Central and Western Yukon

Notes/Summary: Generally, research is on climate conditions in prehistory as revealed in the geological record. Research interests have focused on the collection and comparison of paleomagnetic, biolithostratigraphic, and isotopic data in the reconstruction of late Cenozoic paleoclimates. More specifically, the research has sought to compare terrestrial records which reveal diagnostic floral, faunal, and weathering histories. The bulk of the work has been carried out in North America.

Associated Researchers: J.E. Storer
Duk-Rodkin
C.A. Huscroft

Publications:

E. Irving, J. Baker, R.W. Barendregt, N.D. Opdyke. 2004. Paleomagnetic Data from Late Cenozoic Fort Selkirk Basalts, Yukon and their Tectonic Significance, in Proceeding of the Chapman Conference, American Geophysical Union.

D.G. Froese, J.A. Westgate, R.W. Barendregt, M. Villeneuve, L.E. Jackson, J. Baker, R.J. Enkin, E. Irving, C. Hart, S.J. Preece, and A. Sandhu. 2004. Normal Magnetization at ca. 1.5 Ma at Three Sites in Yukon Territory, Canada: The Gilsa Subchron. Canadian Journal of Earth Sciences

Barendregt, R.W., Enkin, R.J. and A. Duk-Rodkin. 2004. Magnetostratigraphy and late Cenozoic history of the Tintina Trench area, Yukon, Canada. Canadian Journal of Earth Sciences

Duk-Rodkin, A., R.W. Barendregt, S. Smith, and J. White. 2004. An extensive late Cenozoic terrestrial record of multiple glaciations preserved in the Tintina Trench of west central Yukon: stratigraphy, paleomagnetism, paleosols, and pollen. Canadian Journal of Earth Sciences

Huscroft, C.A., B.C. Ward, R.W. Barendregt, and L.E. Jackson, Jr. 2004. Pleistocene Volcanic Damming of Yukon River, and age of the Reid glaciation, west central Yukon. Canadian Journal of Earth Sciences v. 41, no. 2, p. 151-164.

Duk-Rodkin, A., F. Weber, and R.W. Barendregt. 2001. Glacial Limits Map of Upper Yukon River (Scale 1:1,000,000). Geological Survey of Canada Open File # 0174, Natural Resources Canada.

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Dawson	Na-cho Nyak Dun	chronology
Mayo	Tr'ondëk Hwëch'in	paleoclimate
Pelly Crossing	Little Salmon/Carmacks	
	Selkirk	

Last Name: Bartleman **First Names:** Anne-Pascale

Position: Graduate student

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Research Focus: Vegetation succession in a retrogressive thaw slump near Mayo

Date(s): 1997 **Location(s):** Mayo area

Notes/Summary: A study of the regeneration of plant communities in seasonally disturbed areas in the central Yukon, specifically a permafrost-related slump. Work was performed under supervision of Professor Kiyoko Miyanishi, Department of Geography, University of Guelph, and in association with Dr. Christopher Burn of Carleton University.

Associated Researchers: Christopher Burn

Related Work: Researcher has since shifted focus to medicine. Contact for further information on permafrost studies in central Yukon is Dr. Christopher Burn, Carleton University, Ottawa.

Publications: Bartleman, A-P., K. Miyanishi, C.R. Burn and M.M. Côté. 2001. Development of vegetation communities in a retrogressive thaw slump near Mayo, Yukon Territory: a 10-year assessment. Arctic. 54: 149-156

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Mayo	Na-cho Nyak Dun	permafrost vegetation

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Research Focus: Geomorphological responses to climate change in the Canadian northwest during the Holocene

Date(s): 2001 **Location(s):** Northern Yukon

Notes/Summary: Bjornson's research focuses on the geomorphological response to climate change during the Holocene. Photo-interpretation, field observations and Carbon-14 dating allowed the identification of three distinct periods. Recent geomorphological activity suggests a transition to a fourth period. The current warming of the climate leads to the exposure and melting of massive ice bodies as observed in the Richardson Mountains and probably to the melting of cave ice in the Northern Yukon. Bjornson's research indicates that the hot paleoclimate at 11,000 to 8,000 years before present (BP) is perhaps the most relevant analogue of climate warming observed today in the northwestern Arctic.

Associated Researchers: Bernard Lauriol
Jacques Cinq-Mars
Ian D. Clark

Publications: Lacelle, D., Bjornson, J., Lauriol, B., Clark, I.D., Troutet, Y., 2004, Segregated-intrusive ice of subglacial meltwater origin in retrogressive thaw flow headwalls, Richardson mountains, N.W.T., Canada, Quaternary Science Review

Bjornson, J., Lauriol, B. 2001. Météorisation de blocs rocheux sur les pédiments dans le nord Yukon. Permafrost and Periglacial Processes, 12, 289-298

2001 Lauriol, B.; Bjornson, J.; Cinq-Mars, J.; Clark, I.D.; and Lacelle, D. Geomorphological responses to climate change in the Canadian North West during the Holocene: importance of their recognition, Canadian Quaternary Association/ Association canadienne pour l'étude du Quaternaire, Annual Meeting 2001. Whitehorse, Yukon Territory, August 20-24, 2001

Nearby Community(ies):
Old Crow

Nearby First Nation(s):
Inuvialuit
Vuntut Gwitchin

Key Word(s):
chronology
climate
glaciers/ice caps
paleoclimate
paleogeology
quaternary study

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Research Focus: Temperatures in permafrost on Herschel Island, Yukon.

Date(s): 1998 to present **Location(s):** Herschel Island

Notes/Summary: Permafrost active layer temperatures are being monitored using one deep (15 m) thermistor cable and two shallow (1.5 m) thermistor probes. Active layer and near-surface permafrost temperatures are logged at 6 hour intervals at 20, 50, 100 and 150 cm depths. Permafrost temperatures are measured semi-annually at 5, 7.5, 10, 12.5 and 15 m depth. Temperature changes at these depths will signal any long-term changes in the thermal regime of the island's soil environment.

Associated Researchers: Dorothy Cooley
Val Loewen

Related Work: Environmental Monitoring on Herschel Island, Yukon. Partners: Catherine Kennedy (Yukon Department of Environment), Scott Smith (Agriculture and Agri-Food Canada, Summerland, B.C.), Dorothy Cooley (Yukon Department of Environment, Dawson City, Yukon), Steve Kokelj (Carleton University, Ottawa, Ontario), Chris Burn (Carleton University, Ottawa, Ontario).
Changes in vegetation noticed 1998-99. Related projects, established to track changes over long term, include: vegetation monitoring activities, permafrost active layer temperature monitoring, and wildlife observations.

Publications: Kokelj, S.V., S.A.S. Smith and C.R. Burn 2002. Physical and chemical characteristics of the active layer and permafrost, Herschel Island, Western Arctic Coast, Canada. Permafrost and Periglacial Processes 13: 171-185

Nearby Community(ies):

Nearby First Nation(s):
Inuvialuit

Key Word(s):
coastal erosion
historical records
permafrost
vegetation
wildlife

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Research Focus: Investigation of Permafrost in the Yukon

Date(s): 1982 to present **Location(s):** Takhini River valley and Mayo area

Notes/Summary: Research focuses on the impact of climate change on permafrost terrain. Long-term observations at Mayo have provided some of the few data from Canada on how permafrost is responding to present climate variation. The work at Mayo is also concerned with landform evolution as permafrost thaws, and is actively examining the origin of the "drunken" forest, the characteristically tilted trees of boreal regions.

Associated Researchers: Anne-Pascale Bartleman

Related Work: Research in the Mackenzie Delta area (since 1987) involves investigations on ground deformation near ice wedges, and ground movement during permafrost development in drained lakes, including the growth of pingos.

Publications: [Partial list of recent publications]

Burn, C.R. 2003. Lake-bottom thermal regime in thermokarst terrain near Mayo, Yukon Territory. Proceedings, Eighth International Conference on Permafrost, 21-25 July, 2003. Zurich, Switzerland. Balkema, Lisse. Vol. 1: 113-118.

Bartleman, A-P., Miyanishi, K., Burn, C.R., and Côté, M.M. 2001. Development of vegetation communities in a retrogressive thaw slump near Mayo, Yukon Territory: a 10-year assessment. Arctic, 54(2): 149-156.

Kotler, E., and Burn, C.R. 2000. Cryostratigraphy of Klondike "muck" deposits, west-central Yukon Territory. Canadian Journal of Earth Sciences, 37(6): 849-861.

Burn, C.R. 2000. The thermal regime of a retrogressive thaw slump near Mayo, Yukon Territory. Canadian Journal of Earth Sciences, 37(7): 967-981.

Nearby Community(ies):
Mayo
Whitehorse

Nearby First Nation(s):
Na-cho Nyak Dun
Kwanlin Dün
Ta'an Kwäch'än

Key Word(s):
boreal forest disturbance
climate
landslides/erosion
permafrost

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Research Focus: Climate Change in Central Yukon

Date(s): 2001 **Location(s):** Mayo

Notes/Summary: Burn's research summarizes climate change in the Mayo area available from historical records. Mayo began collecting weather records in 1925. Analysis identifies relationships between changes in local environmental systems and climate; how temperature and precipitation have been associated with changes in snow cover, the flow of Stewart River, and forest fires in central Yukon; records of trapping harvest; and a short consideration of the potential variation in plant distribution.

Associated Researchers: V.M. McCoy
Aynslie Ogden

Related Work: This report was part of a process initiated by the Village of Mayo and the Na-cho Nyak Dun First Nation, and assisted by the Northern Climate ExChange, to help determine the potential impacts of climate change on Mayo and to start planning for adaptation.

Publications: V.M. McCoy and C.R. Burn, Carleton University: "Climate Change in Central Yukon", a report prepared for the Village of Mayo, February 2001. Whitehorse: Northern Climate ExChange. Available at yukon.taiga.net/knowledge/resources/Climate_Change_in_the_Central_Yukon.pdf

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Mayo	Na-cho Nyak Dun	adaptation
		climate
		human activity
		human and community health

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Research Focus: Peopling of North America and adaptation to changing conditions, with some attention paid to paleoclimates

Date(s): 1979 to present **Location(s):** North Yukon

Notes/Summary: Jacques Cinq-Mars began working for CMC in 1979 as Chairman of the Rescue Archaeology Programme and Curator of Boreal Forest Archaeology (1979-91). During this period he carried out extensive field research in the Northern Yukon, and initiated the archaeological component of the Northern Oil and Gas Action Plan (NOGAP), which he directed throughout its first phase (1983-90). Among his long-term research interests are the peopling of North America and the origin and development of human modes of adaptation in the circumboreal environments of Eurasia and Beringia (Alaska and Yukon).

Associated Researchers: Jean Bjornson
Marie-Anne Geurts
Bernard Lauriol
Les Cwynar

Related Work: Editor, PALANTH, International Journal of Palaeoanthropology - www.palanth.com

Publications: Lauriol, Bernard; Cabana, Yannick; Cinq-Mars, Jacques; Geurts, Marie-Anne; Grimm, F. Wayne. Canadian Museum of Civilization, Canada; Eastern Ontario Biodiversity Museum, Canada. 2002. Cliff-top eolian deposits and associated molluscan assemblages as indicators of late Pleistocene and Holocene environments in Beringia. INQUA Commission meeting: March 27-30, 2000: Seville, Spain. Quaternary International, 87: pp. 59-79. Pergamon, Oxford, United Kingdom.

Lauriol, B.; Prevost, C.; Deschamps, E.; Cinq-Mars, J.; Labrecque, S. Commission Géologique du Canada, Canada; Musée Canadien des Civilisations, Canada; Université Laval, Canada. 2001. Faunal and archaeological remains as evidence of climate change in freezing caverns, Yukon Territory, Canada. Arctic, v. 54, no. 2, June 2001, p. 135-141.

Ritchie, J.C.; Cinq-Mars, J.; Cwynar, L.C. 1982. L'environnement tardiglaciaire du Yukon septentrional, Canada. [Late-glacial environment in northern Yukon.] Geographie Physique et Quaternaire, v. 36, no 1-2, 1982, p. 241-250.

Nearby Community(ies):
Old Crow

Nearby First Nation(s):
Inuvialuit
Vuntut Gwitchin

Key Word(s):
archaeology
chronology
human activity
paleoclimate
paleoecology

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Research Focus: Hydrology and hydrogeology of aufeis (icings) in the Firth River Basin (1994) and Miner River (2000), Northern Yukon; reconstruction of paleohydrologic conditions for Arctic watersheds during past climatic optimums as an analogue for modern climatic warming (1999)

Date(s): 1994, 1999, 2000 **Location(s):** Northern Yukon

Notes/Summary: Research is focused in the Northern Yukon and in the Richardson Mountains, N.W.T, where distinct periods of geomorphological response to climate change during the Holocene can be distinguished. Photo-interpretation, field observations and Carbon 14 dating enable the identification of three periods. Recent geomorphological activity suggests a transition to a fourth period. The recent warming of the climate leads to the exposure and melting of massive ice bodies as observed in the Richardson Mountains. The hot paleoclimate at 11000 to 8000 years before present is the perhaps the most relevant analogue of climate warming observed today in the northwestern Arctic.

Associated Researchers: Bernard Lauriol
Jean Bjornson

Related Work: * Arctic Paleohydrogeology: Work in the karst regions of the Yukon led to the discovery by Bernard Lauriol and Ian D. Clark of this remarkable material forming in fissures within limestone outcrops. Endostromatolites, so named for their micro-stromatilite structure and hidden growth within bedrock, are ubiquitous in permafrost carbonate regions.
* Permafrost hydrogeology and Canadian Shield mine hydrology: Groundwater recharge and circulation in permafrost, through the analysis of noble gas concentrations and other isotopic tools. The long term disposal of radioactive waste must consider the effects of climate change and renewed glaciation on the repository and nuclide transport.

Publications: Clark, I.D., Lauriol, B., Marschner, M., Sabourin, N., Chauret, Y., 2004. Endostromatolites from permafrost karst, Yukon, Canada: paleoclimatic proxies for the Holocene hypsithermal. In press, Canadian Journal of Earth Sciences.

Clark, I.D. and B. Lauriol, 1997. Aufeis of the Firth River basin, northern Yukon, Canada: insights to permafrost hydrogeology and karst. Arctic and Alpine Research, 29: 240-252.

Lauriol, B., J. Cinq Mars and I.D. Clark, 1991. Les naleds du nord du Yukon: Localisation, genèse et fonte. Permafrost and Periglacial Processes, 2: 225-236.

Nearby Community(ies):
Old Crow

Nearby First Nation(s):
Vuntut Gwitchin
Inuvialuit

Key Word(s):
chronology
paleoclimate
paleohydrology
permafrost

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Research Focus: Surging glaciers in the St. Elias Mountains

Date(s): 1969 to present **Location(s):** St. Elias Mountains

Notes/Summary: Research is devoted to understanding the physics of glaciers and ice sheets, particularly the nature of ice flow instabilities that cause certain modern glaciers to exhibit extreme oscillations in flow rate and, during the last Ice Age, appear to have triggered rapid changes in global climate. Clarke's group is conducting a long-term study of Trapridge Glacier, a surge-type glacier in the St. Elias Mountains of the Yukon Territory. The object of this field work, started in 1969, is to monitor the glacier as it passes through a complete surge cycle and, from these observations to determine the trigger mechanism for its surges.

Associated Researchers: David W. Leverington

Related Work: Using improved knowledge of ice sheet physics to construct computational models that simulate the dynamics of ancient and modern ice sheets. During the last glacial cycle, Northern Hemisphere ice sheets were an extremely influential component of the global climate system. The Clarke group is collaborating with experts in modelling the dynamics of the ocean and atmosphere to unravel some secrets of the Ice Age and discover what factors account for the rapid changes that characterized the Ice Age climate system.

Publications: Selected recent publications:

Clarke, G. K. C., D. W. Leverington, J. T. Teller, and A. S. Dyke, Superlakes, megafloods, and abrupt climate change, Science, 301, 922-923 (2003).

Flowers, G. E., and G. K. C. Clarke, A multicomponent coupled model of glacier hydrology 2. Application to Trapridge Glacier, Yukon, Canada, Journal of Geophysical Research, 107(B11), 2288, doi:10.1029/2001JB001124 (2002).

Clark, P. U., S. J. Marshall, G. K. C. Clarke, S. W. Hostetler, J. M. Licciardi, and J. T. Teller, Freshwater forcing of abrupt climate change during the last deglaciation, Science, 293, 283-287 (2001).

Clarke, G. K. C., S. J. Marshall, C. Hillaire-Marcel, G. Bilodeau, and C. Veiga-Pires, A glaciological perspective on Heinrich events. In P. U. Clark, R. S. Webb and, L. D. Keigwin (eds.) Mechanisms of global climate change at Millennial time scales, Monograph 112, 243-262 (1999).

Marshall, S. J., and G. K. C. Clarke, Modelling North American freshwater runoff and proglacial lake history through the last glacial cycle, Quaternary Research, 52(3), 300-315 (1999)

Clarke, G. K. C., A short history of scientific investigations on glaciers, Journal of Glaciology, Special Issue, 4-24 (1987).

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Burwash Landing	Kluane	glaciers/ice caps
Destruction Bay	Champagne & Aishihik	paleoclimate
Haines Junction		

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Research Focus: Long-term weather and river variability of the south-central Yukon preserved in annually laminated lake sediments

Date(s): 2002 **Location(s):** White Pass

Notes/Summary: The objective of the project was to study sediments deposited in lakes in the White Pass for evidence of past climatic and hydrological conditions. Sediments from two lakes (Summit and Meadow Lakes) in White Pass, northwest British Columbia, were used to reconstruct hydroclimatic variability over the last seven centuries. These two records are the longest annually-resolved paleoclimate records from this region. These results demonstrate the potential of subannual reconstructions to evaluate seasonal hydroclimatic variability caused by changing influences of climate systems common to this part of North America (e.g. Pacific Decadal Variation. Pacific Decadal Oscillation, El Niño).

Associated Researchers: Andrew Forbes

Related Work: Current research, as PhD student, involves understanding the hydrometeorological signal preserved in subannual sedimentary structures in varves in the Canadian High Arctic.

Publications: Thesis (M.Sc.)--Queen's University at Kingston, 2003. Annually laminated lake sediments as proxies of hydrometeorological behaviour at White Pass, British Columbia/Alaska.

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Carcross	Carcross-Tagish	lakes paleoclimate paleohydrology sediments

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Research Focus: Large northern mammals, such as caribou, including impacts of climate change.
Canadian Taiga and Tundra Experiment (CANTTEX)
International Tundra Experiment (ITEX)

Date(s): 1991 to present **Location(s):** Dawson area, Herschel Island, North Yukon

Notes/Summary: Primary research focus is large northern mammals, including caribou and climate impacts.

Cooley is also involved with the International Tundra Experiment (ITEX), which is concerned with responses of arctic tundra plants and ecosystems to the predicted climate change. The similar CANTTEX, in which Cooley is also involved, expands the ITEX experiments within Canada to encompass the taiga biome as well as the tundra biome.

Cooley is part of a government/academic team monitoring climate change on Herschel Island in the Beaufort Sea off the Yukon's North Coast. For details of the project, go to the CANTTEX project database at www.taiga.net/canttex/index.html and search for "Herschel".

Associated Researchers: Christopher Burn
Catherine Kennedy
Scott Smith
Barney Smith
Don Russell

Related Work: Cooley has been involved in a number of programs to involve communities and hunters in monitoring the condition of caribou and other animals and in tracking changes on the land.

Publications: Kennedy, C.E., Smith, C.A.S. and Cooley, D.A. 2001. Observations of change in the cover of Polargrass, Arctagrostis latifolia, and Arctic Lupine, lupinus arcticus, in upland tundra on Herschel Island, Yukon Territory. Canadian Field-Naturalist 115(2): 323-328.

Kennedy, C, S. Smith, D. Cooley, S. Kokelj and C. Burn 2000. Environmental monitoring on Herschel Island, Yukon. in Program and Abstracts, 51st Arctic Science Conference, September 2000, Whitehorse, YT. p 165.

Smith, C.A.S., C. Kennedy and D. Cooley 2000. Climate change research on the North Slope. Pages 67-68 in 2000 Yukon North Slope Conference Summary Report. Yukon Dept of Renewable Resources, Whitehorse, YT. 171pp.

Arthur, Stephen M., Kenneth R. Whitten, Fran Mauer, and Dorothy Cooley. 2001. Modeling the Decline of the Porcupine Caribou Herd, 1989-1998: the Importance of Survival vs. Recruitment. The Ninth North American Caribou Workshop, Kuujjuaq, Quebec, Canada, 23-27 April, 2001.

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Dawson	Vuntut Gwitchin	studies
Old Crow	Tr'ondëk Hwëch'in	tundra
	Inuvialuit	vegetation
		wildlife

Last Name: Côté **First Names:** Michelle M.

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Research Focus: Evaluation of the thermal regime of lakes in the Mayo area, Central Yukon (1999); investigation of the distribution of permafrost with changes in elevation, slope and aspect near Mayo, Yukon (2000-1)

Date(s): 1999-2001 **Location(s):** Mayo

Notes/Summary: Côté's research investigated the distribution of permafrost in central Yukon. The association of biogeoclimatic zones with permafrost was defined with thermal and physical data from eleven sites. With vegetation interpreted from aerial photographs and topographic information from a digital elevation model these associations were tested in the wider Keno area.

Associated Researchers: Christopher Burn

Publications: Thesis (M.A.)--Carleton University, 2002. The influence of elevation and aspect on permafrost distribution in central Yukon Territory

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Mayo	Na-cho Nyak Dun	lakes permafrost vegetation

Last Name: Coultish **First Names:** Tara Lee

Position: Former graduate student

Affiliation: University of Ottawa

Department:

Address: Not available

City: Ottawa **Prov/state/terr:** ON **Country:** Canada

Research Focus: Palsas and other permafrost mounds, Wolf Creek, Yukon

Date(s): 2001 **Location(s):** Wolf Creek

Notes/Summary: Coultish studied fifty-one frost mounds in Wolf Creek, Yukon Territory. The origin and longevity of the mounds was investigated, and their utility as climatic indicators was assessed. Aerial photographs, spanning the period from 1946 to 2001, showed that palsas at the study site have been aggrading and degrading continually over the past 55 years, and are continuing to do so.

Publications: Thesis (M.Sc.)--University of Ottawa, 2002. Long-term development of palsas and other permafrost-cored mounds in mountainous terrain, Wolf Creek, southern Yukon.

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Whitehorse	Ta'an Kwäch'än	climate
	Kwanlin Dün	permafrost

Last Name: Cruikshank **First Names:** Julie

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Research Focus: Climatic change in Canada: Perspectives from Southwest Yukon First Nations communities

Date(s): 1999-2002 **Location(s):** Southwest Yukon

Notes/Summary: The aim of this project was to document indigenous oral traditions about the impact of the Little Ice Age (from approximately 1550 to the late 1800s) in the Yukon and Alaska, and implications for current debates about climate change. Climate Change and First Nations Communities in Northern Canada: Perspectives from Southwest Yukon (SSHRC funded, 1999-2002).

Publications: 2002. Glaciers and Climate Change: Scientific Research in Sentient Places. In The Power of Traditions: Identities, Politics and the Social Sciences. Topics in Arctic Social Sciences 4:7-16.

2001. Glaciers and Climate Change: Perspectives from Oral Tradition. Arctic 54(4):377-93.

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Beaver Creek	Ta'an Kwäch'än	anthropology
Burwash Landing	Champagne & Aishihik	climate
Carcross	Teslin Tlingit	human activity
Destruction Bay	Kwanlin Dün	human and community health
Haines Junction	Kluane	paleoclimate
Tagish	Carcross-Tagish	
Teslin		
Whitehorse		

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Research Focus: Paleoecology and dynamics of treeline Beringia, postglacial migration of trees into Southern Yukon, climate of Beringia. Spruce - climate dynamics in the Yukon.

Date(s): 1982-2002 **Location(s):** Southern Yukon, White Pass

Notes/Summary: General interests lie in the development of vegetation since the last Ice Age in relation to climate change. How has climate changed? How quickly have plant species and communities been able to respond to changes in climate? In particular, how have arctic boreal plant communities developed in relation to climate forcing? Techniques used: pollen, stomata, plant macrofossil, and midge fly analyses.

Associated Researchers: R.W. Spear
M.F.J. Pisaric
J.C. Ritchie
J. Cinq-Mars

Related Work: Arctic Lupine: population dynamics, resource allocation, seeding patterns, impact of herbivores

Publications: (partial list)

Spear, R.W. and L.C. Cwynar. 1997. Late Quaternary vegetation history of White Pass, northern British Columbia, Canada. Arctic and Alpine Research 29: 45-52.

Cwynar, L.C. and Spear, R.W. Paleovegetation and Paleoclimatic changes in the Yukon at 6KA. Geographie Physique et Quaternaire 49:29-35.

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Carcross	Carcross-Tagish	chronology paleoclimate pollen sampling vegetation

Last Name: D'Arrigo **First Names:** Rosanne D.

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Research Focus: Dendroclimatic field investigations at the North American arctic treeline

Date(s): 1985 to present **Location(s):** Hazel Creek (61 54'N, 140 43'w, Twisted Tree (65 00' N, 138 20'W)

Notes/Summary: Data from northern treeline forests sites (Alaska; the Canadian Interior; Labrador, Canada; Taymir peninsula, Russia and an elevational treeline site in Mongolia) sampled by the Tree-Ring Laboratory over the past two decades have and are being used in modelling and reconstruction of large-scale temperature variability over the past several centuries. Initial reconstruction of annual Arctic and northern hemisphere temperatures were published by Jacoby & D'Arrigo (1989) and D'Arrigo & Jacoby (1993). Since then new sites have been sampled and some existing sites have been updated.

Associated Researchers: Gordon C. Jacoby

Related Work: D'Arrigo is also involved in studies of medium- and long-term climate variability in other parts of the world, including the North Atlantic, Mongolia, and Australasia.

Publications:

D'Arrigo, R., R. Villalba and G. Wiles. 2001. Tree-ring estimates of Pacific decadal climate variability. Climate Dynamics 18: 219-224.

D'Arrigo, R.D., G.C. Jacoby, M. Free, and A. Robock, 1999. Northern hemisphere temperature variability for the past three centuries: tree-ring and model estimates, Climatic Change 42: pp. 663-675.

Jacoby, G.C., R.D. D'Arrigo, and G.P. Juday. 1999. Tree-ring indicators of climatic change at northern latitudes, World Resources Review (11) 1, 21-29.

Jacoby, G., D'Arrigo, R., Luckman, B. 1996. Millennial and near-millennial scale dendroclimatic studies in northern North America. In Jones, P.D., Bradley, R.S., and Jouzel, J., eds., Climatic Variations and Forcing Mechanisms of the Last 2000 Years. NATO ASI Series I41: 67-84.

D'Arrigo, R.D., Jacoby, G.C. 1993. Secular trends in high northern latitude temperature reconstructions based on tree rings. Climatic Change 25: 163-177.

Overpeck, J., K. Hughen, D. Hardy, R. Bradley, R. Case, M. Douglas, B. Finney, K. Gajewski, G. Jacoby, A. Jennings, S. Lamoureux, A. Lasca, G. MacDonald, J. Moore, M. Retelle, S. Smith, A. Wolfe, G. Zielinski. 1997. Arctic environmental change of the last four centuries. Science 278: 1251-1256.

Nearby Community(ies):
Beaver Creek
Burwash Landing
Dawson

Nearby First Nation(s):
Na-cho Nyak Dun
Tr'ondëk Hwëch'in
White River
Kluane

Key Word(s):
chronology
dendrochronology
paleoclimate

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Research Focus: Duerden's research focuses on the impacts of climate change on human activity in the north.

Date(s): 1998 to present **Location(s):** Yukon

Notes/Summary: The aim of Frank Duerden's research is to predict how changes in the physical environment will impact human activity in northern communities. Research efforts incorporate community perceptions of climate change and traditional knowledge of past climatic stresses. The desired result would aid governments and community leaders in identifying and implementing appropriate approaches to ameliorate the impacts of climate change.

In cooperation with Karl Gad, Yukon press reports dating back to 1930 were analyzed to portray past climatic stress on northern communities. In 2004, one of Duerden's students surveyed 28 northern Canadian communities using mainly secondary information to assess the current understanding and impact of climate change.

Associated Researchers: Karl Gad

Related Work: Duerden's other and earlier work in the Yukon involves land use planning, particularly as related to First Nations land claims and governance.

Publications: Translating climate change impacts at the community level: Arctic vol.57, No.2 (June 2004): pp.204-212

Gill, M.J.; Munier, A.; Ogden, A.; Eamer, J.; Duerden, F.; Hik, D.; Fox, S.; Riedlinger, D.; Thorpe, N.; Johnson, I.; Jensen, M. 2001. Climate change impacts in northern Canada: assessing our current knowledge. Northern Review (Whitehorse), no. 24, Winter 2001, p. 144-149

Climate change and human activity in northern Canada: what we know; what we don't know and what we need to know. 2001. The Northern Review 24, pp. 150-159

Gap Analysis Project. 2002. Whitehorse: The Northern Climate ExChange

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
		climate extreme events/natural hazards historical records human activity human and community health

Last Name: Duguay **First Names:** Claude R.

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Website: www.gi.alaska.edu/~duguay/

Research Focus: Remote sensing and monitoring of frozen shallow lakes, Old Crow flats, Northern Yukon (1998-2000).
Remote sensing of permafrost distribution (1994) and boreal forest (1998) near Mayo, Central Yukon.
Radiation balance of sloping surfaces, air temperature, wind regime, Firth River, Northern Yukon (1994)

Date(s): 1994 to present **Location(s):** Crow Flats, Mayo, Northern Yukon

Notes/Summary: Duguay's research is focused on remote sensing and modelling of changes in lake ice, snow, permafrost, and heat transfers from open forest and tundra. He is working on the development of a historical database for analyzing the response of lake ice to climate variability and change in Canada, the development of a numerical model for simulating lake ice growth for lakes of various sizes under present and future climates scenarios, ways of understanding and forecasting the role of lakes in the energy and water-balance of Arctic river basins.

Associated Researchers: Sylvain Labrecque
Antoni G. Lewkowicz

Related Work: Recent field, remote sensing and modelling studies have been in northern Canada (Quebec, Manitoba, Northwest Territories and Yukon Territory) and Alaska.

Publications:
Lenormand, F., C.R. Duguay, and R. Gauthier, 2002. Development of a historical ice database for the study of climate change in Canada. Hydrological Processes, 16(18): 3707-3722.

Lauriol, B., C.R. Duguay, and A. Riel, 2002. Response of the Porcupine and Old Crow rivers in northern Yukon to Holocene climate change. The Holocene, 12(1): 27-34.

Duguay, C.R., W.R. Rouse, P.M. Lafleur, and L.D. Boudreau, 1999. The radiation balance of wetland tundra at northern treeline estimated from remotely sensed data. Climate Research, 13(1): 77-90.

Goodison, B.E., R.D. Brown, G. Flato, M. Brugman, C.R. Duguay, E.F. LeDrew, and A.E. Walker, 1999. CRYSYS - Use of the cryospheric system to monitor global change in Canada: Overview and progress. Canadian Journal of Remote Sensing (Special Issue on CRYSYS/GER'97), 25(1): 3-11.

Leverington, D.W. and C.R. Duguay, 1997. A neural network method to determine the presence or absence of permafrost near Mayo, Yukon Territory, Canada. Permafrost and Periglacial Processes, 8: 205-215.

Leverington, D.W. and C.R. Duguay, 1996. Evaluation of three supervised classifiers in mapping "depth to late-summer frozen ground," Central Yukon Territory. Canadian Journal of Remote Sensing, 22(2): 163-174.

Labrecque, S. and C.R. Duguay, 2001. Étude de la dynamique spatio-temporelle récente des lacs thermokarstiques de la plaine Old Crow Flats, Yukon, par télédétection. Proceedings of the 23rd Canadian Symposium on Remote Sensing – 10e Congrès de l'Association québécoise de télédétection, hard-copy and CD-ROM, pp. 585-590.

Duguay, C.R., Y. Ernou, and J. Hawkings, 1999. SAR and optical satellite observations of ice-covered thermokarst lakes, Old Crow Flats, Yukon Territory. Proceedings of the 56th Eastern Snow Conference, p. 45.

Duguay, C.R., D.W. Leverington, and H. McNairn, 1997. Land cover information content of polarimetric SAR data of a boreal forest, central Yukon Territory. Proceedings of the International Symposium: Geomatics in the era of RADARSAT (GER '97), 9 p., CD-ROM.

Crevier, Y. and C.R. Duguay, 1995. Albedo of snow in the Kluane Range, Yukon Territory : An estimating method using Landsat-5 TM data and terrain modelling. Proceedings of the Second International Workshop on Application of Remote Sensing in Hydrology, pp. 159-170.

Leverington, D.W. and C.R. Duguay, 1994. Prediction of depth to frozen ground using satellite imagery and digitized ground data, Mayo, Y.T. Proceedings of the 1994 Annual Meeting of the International Association of Mathematical Geology (IAMG'94), pp. 133-138.

Crevier, Y. and C.R. Duguay, 1993. Estimating the reflectance and albedo of glaciers in the Kluane Range, Yukon Territory, with Landsat TM and digital terrain data. Proceedings of the 16th Canadian Symposium on Remote Sensing, pp. 239-244.

Nearby Community(ies):
Mayo
Old Crow

Nearby First Nation(s):
Inuvialuit
Na-cho Nyak Dun
Vuntut Gwitchin

Key Word(s):
climate modelling
freeze-up/thaw
historical records
lakes
permafrost
remote sensing

Last Name: Eamer **First Names:** Joan

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Research Focus: The Borderlands Co-op monitors and assesses change in the range of the Porcupine Caribou Herd and extending to the Mackenzie Delta. Community-based monitoring is conducted in a number of northern villages in the Northwest Territories and Alaska, as well as in Old Crow, Yukon.

Date(s): 1994 to present **Location(s):** Old Crow, Aklavik, Inuvik, Fort McPherson, Tuktoyaktuk, Tsiigehtchic and Arctic Village

Notes/Summary: The Arctic Borderlands Co-op was founded in 1994 when representatives from several different community groups, agencies and governments started an ecological monitoring program. The focus of the monitoring is on climate change, contaminants and regional development. Co-op activities include the tracking of ecological indicators and community projects. A Gathering is held each year to report the Coop's findings and exchange information. The Co-op's primary mode of communication and results distribution is its website, www.taiga.net/coop

Publications: Annual reports from Gatherings and annual community monitoring reports, as well as occasional reports, are available on the Co-op's website.

Nearby Community(ies):
Old Crow

Nearby First Nation(s):
Inuvialuit
Vuntut Gwitchin

Key Word(s):
birds
caribou
fish/aquatic
human activity
human and community health
native harvesting/country foods
studies
terrestrial mammals
traditional knowledge
wildlife

Last Name: Farnell **First Names:** Rick

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Research Focus: Caribou, paleoenvironmental studies related to discovery of human artifacts and biological remains in alpine ice patches - ongoing multidisciplinary study.

Date(s): 1997 to present **Location(s):** Southwestern Yukon

Notes/Summary: Since the discovery of dung-rich alpine ice patches in southwest Yukon in 1997, continuing multidisciplinary studies have provided a unique window on the biology, climate, and hunting activity in this region over much of the Holocene. Aerial surveys have identified 72 ice patches of variable size, and 65 patches have been ground-surveyed for organic remains (numbers current to end of 2003). Of these, 35 yielded an abundance of biological specimens, including caribou and other rare large mammal remains, mummified small mammals and birds, and artifacts spanning 8000 years. The dung provides pollen and plant macrofossils for analysis and paleoenvironmental reconstruction, as well as dietary, genetic, and parasitic information. Stratigraphically controlled sampling of dung within ice layers has yielded a geochronology placing their formation as early as 8300 or 8000 years BP. Ice patch formation was nearly continuous except for an interval between 6700 and 4700 years BP and another between 1440 and 1030, when warm or dry conditions (or both) resulted in no net ice accumulation. Resumption of ice accumulation over the following 500 years likely culminated in the Little Ice Age. The size of the ice patches during this period is made evident by a lichen-free zone that haloes each patch. More recently, interpretation of air photos from 1946 to 2001 has found a significant reduction in ice patch dimensions. Daily temperature records for Whitehorse (1942-2001) were used to calculate melting degree-day values that account for a large part of the variation in ice patch size, indicating that while considerable melting has likely occurred since the end of the Little Ice Age, the ice patches are highly sensitive to decadal changes in temperature.

Associated Researchers: Donald E. Russell
Greg Hare
Sheila Greer
Ruth Gotthardt
Erik Blake
Charles Schweger

Related Work: Primary work is caribou biologist for Yukon Environment.

Publications: Multidisciplinary investigations of alpine ice patches in southwest Yukon: Paleoenvironmental and paleobiological investigations. 2004. Farnell, Richard; Hare, Gregory P.; Blake, Erik; Bowyer, Vancy; Schweger, Charles; Greer, Sheila; Gotthardt, Ruth. Arctic Vol. 57, No. 3, Sept. 2004: pp. 247-259.

In pursuit of prehistoric caribou on Thandlät, southern Yukon. 1999. Kuzyk, G.W.; Russell, D.E.; Farnell, R.S.; Gotthardt, R.M.; Hare, P.G.; Blake, E. Arctic, v. 52, no. 2, June 1999, p. 214-219.

Nearby Community(ies):
Carcross
Haines Junction
Tagish
Whitehorse

Nearby First Nation(s):
Ta'an Kwäch'än
Champagne & Aishihik
Kwanlin Dün
Carcross-Tagish

Key Word(s):
anthropology
caribou
chronology
glaciers/ice caps
human activity
paleoclimate
paleoecology
vegetation

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Research Focus: Late Quaternary palaeoclimate of the Yukon River watershed from lake sediment cores

Date(s): 2000 **Location(s):** Yukon River Watershed

Notes/Summary: Research focuses on determining paleoenvironmental changes by studying the sedimentary record of marine and freshwater systems. Modern systems are studied to learn about interactions between physical, geological, biological and chemical processes, and to determine linkages between climate and sediment composition. A major goal is to better understand the causes and mechanisms of climate change. Most research is being conducted in Alaska, but some work is in the Yukon Territory part of the Yukon River basin.

Associated Researchers: Jon Sweetman

Publications: Modern climate analogues of paleoclimatic variations in eastern interior Alaska during the past 14,000 years: Atmospheric-circulation controls of regional temperature and moisture responses. Edwards, M.E., Mock, C., Finney, B., Barber, V. and Bartlein, P. Quaternary Science Reviews 20: 189-202 (2001).

Holocene lake sediment records of Arctic hydrology. MacDonald, G.M., Felzer, B., Finney, B.P., and Forman, S.L. Journal of Paleolimnology 24: 1-14 (2000).

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Carmacks	Ta'an Kwäch'än	chronology
Dawson	Kwanlin Dün	fresh water
Tagish	Carcross-Tagish	marine geology/oceanographic
Whitehorse		paleoclimate
Whitehorse		sediments

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Research Focus: Coastal stability monitoring along Yukon North Coast.
Impacts of climate change on Canada's coasts.

Date(s): 1991 to present **Location(s):**

Notes/Summary: The Yukon portion of this research project involves mapping the western Canadian Arctic coastline in terms of its sensitivity to coastal erosion under climate change and sea-level rise; monitoring coastline changes and the processes responsible; defining rates of relative sea-level change and contributions from vertical motion of the crust; determining coastal sensitivity to other climate changes (increased air, ground, and water temperatures, diminished sea ice, and higher wave energy); and collecting information on coastal geology and geomorphology for ground-truthing of remote sensing data (to calibrate predictive models of coastal change).

Associated Researchers: John Shaw
Steven Solomon

Publications: Potential impacts of global sea-level rise on Canadian coasts. 1998. Shaw, J.; Taylor, R.B.; Solomon, S.; Christian, H.A.; Forbes, D.L.. Canadian Geographer, v. 42, no. 4, 1998, p. 365-379, ill., maps

Sensitivity of the coasts of Canada to sea-level rise. 1998. Shaw, J.; Taylor, R.B.; Forbes, D.L.; Ruz, M.-H.; Solomon, S. Canada. Geological Survey. Bulletin, 1998, 505:1-79

Coastal erosion and nearshore profile variability in the southern Beaufort Sea, Ivvavik National Park, Yukon Territory. 1997. Forbes, D.L. Ottawa: Natural Resources Canada, 1997.

Coastal impacts of climate change: Beaufort Sea erosion study. 1994. Solomon, S.M.; Forbes, D.L.; Kierstead, R.B. Canadian Climate Centre report, no. 94- 2; Downsview, Ont.: Canadian Climate Centre, 1994

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
	Inuvialuit	climate modelling coast/marine coastal erosion marine geology/oceanographic sea level

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Research Focus: Ground-ice and permafrost investigations, geomorphological and cryostratigraphic studies

Date(s): 1967-1988 **Location(s):** Klondike, Mayo, Dawson City, Dempster Highway, Shingle Point

Notes/Summary: Yukon-based work includes investigations of ground-ice and permafrost, geomorphological and cryostratigraphic studies, in the vicinity of Dawson City, the Dempster Highway, Mayo and at Shingle Point Yukon. General focus of research is on nature and variability of predicted climate change due to global warming in northern and polar areas of Canada. Explores sensitivity of these environments to such warming. Focuses especially on identification of uncertainties surrounding attempts to plan for future sustainable economic and social development in these areas.

Associated Researchers: Wayne H. Pollard

Related Work: Periglacial geomorphology and permafrost-related research in many parts of Arctic Canada (e.g. Banks, Victoria, Prince Patrick, Melville, Ellef Ringnes and other islands; the Mackenzie Delta region and northern Yukon coast; the northern interior Yukon) since 1967. Much of French's recent work involves Antarctica.

Publications: Past and present permafrost as an indicator of climate change. 1999. French, Hugh M. In: Proceedings of the International symposium on Polar Aspects of Global change, Tromso, Norway, August 24-28, 1998; [edited by] Weller, G.; (1999), p.269-274

An appraisal of cryostratigraphy in North-west Arctic Canada. 1998. French, H.M. Permafrost and Periglacial Processes, v. 9, no. 4, Oct.-Dec. 1998, p. 297-312.

Climate change and permafrost. Canada's cold environments. 1993. Smith, Michael W.; French, Hugh M. Montreal & Kingston. McGill-Queen's University Press, 1993, 291-311

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Dawson	Vuntut Gwitchin	adaptation
Mayo	Na-cho Nyak Dun	climate modelling
	Inuvialuit	economy
	Tr'ondëk Hwëch'in	human activity
		permafrost

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Research Focus: Late Cenozoic records of environmental change in Eastern Beringia

Date(s): 1998 to present **Location(s):** Klondike goldfields

Notes/Summary: Research interests are in the Quaternary stratigraphy and natural hazards, focusing mainly on the late Cenozoic (Pliocene and Pleistocene) history of the upper Yukon basin. This region of interior Yukon and Alaska, eastern Beringia, remained unglaciated through the Quaternary and preserves a tremendous record of the evolution of climate, vegetation and mammalian fauna over the last few million years. Current research focus is on the climate history of this region through the Brunhes Chron (last 780,000 yrs) as recorded in glacial and interglacial deposits. This work is strongly interdisciplinary, involving paleobotanists, paleontologists, molecular biologists, petrologists and soil scientists in unraveling the impacts of past climates on the Beringian ecosystem.

Associated Researchers: Crystal A. Huscroft
John E. Storer

Publications:

Zazula, G.D., Froese, D.G., Schweger, C.E., Mathewes, R., Telka, A., Harington, C.R., and Westgate, J.A. 2003. Late Pleistocene steppe macrofossils in east Beringia. Nature, 423: 603

Froese, D.G., Westgate, J.A., Preece, S.J. and Storer, J. 2002. Age and significance of the late Pleistocene Dawson tephra in eastern Beringia. Quaternary Science Reviews: 20-21: 2133-2138

Westgate, J.A., Preece, S.J., Froese, D.G., Walter, R.C. and Schweger, C.A. 2001. Tephrochronology dates two extensive glaciations in Yukon Territory. Quaternary Research, 56(3): 288-306

Froese, D.G., Barendregt, R.W., Enkin, R.J., and Baker, J. 2000. Paleomagnetic evidence for multiple late Pliocene-early Pleistocene glaciations in the Klondike area, Yukon

Territory. Canadian Journal of Earth Sciences, 37: 863-877

Sedimentology and paleomagnetism of Plio-Pleistocene lower Klondike valley terraces, Yukon Territory. 1997. MSc thesis, University of Calgary

Eastern Beringian paleoclimate from fluvial and eolian deposits, Plio-Pleistocene middle Yukon River, central Yukon and Alaska. 2002. Ph.D. thesis, University of Calgary

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Dawson	Tr'ondëk Hwëch'in	chronology extreme events/natural hazards fluvial geomorphology paleoclimate paleogeology quaternary study

Last Name: Gad **First Names:** Karl

Position: Student

Affiliation: Ryerson University

Department: School of Applied Geography

Address: c/o Professor Frank Duerden, fduerden@ryerson.ca

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E-mail: kgad@arts.ryerson.ca

Research Focus: Community vulnerability to climate change, specifically related to natural hazards

Date(s): 2001, 2002 **Location(s):**

Notes/Summary: Development work on a natural hazards database for the Yukon, based on a review of historical records. Goal is to assess community vulnerability to climate change. Work is being done under the supervision of Professor Frank Duerden and is related to other assessments of hazards and vulnerability being conducted by Duerden and his students.

Associated Researchers: Frank Duerden

Publications: Natural hazards database for the Yukon : an exploration. 2002. Unpublished manuscript available at Energy, Mines and Resources Library, Whitehorse, and at the Northern Climate ExChange library, Yukon College, Whitehorse.

Gad, Karl. (2002). Community vulnerability to climate change . [Toronto] : The author.

Nearby Community(ies): **Nearby First Nation(s):** **Key Word(s):**
extreme events/natural hazards
historical records
human activity
human and community health

Last Name: Gajewski **First Names:** Dr. Konrad

Position: Professor

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Website: www.uottawa.ca/academic/arts/geography/pro

Research Focus: Postglacial environmental history of the Southwest Yukon.

Date(s): 1990s to present **Location(s):** Southwest Yukon

Notes/Summary: Gajewski has analyzed sediments from different lake environments form the Kluane region for a multi-parameter approach to palaeoenvironment reconstruction. 4-5 m cores dating form deglaciation of the region provided the opportunity for high resolution studies and offer the possibility of studies of climate variability by comparison with lacustrine record in the Whitehorse area. Geochemical and stratigraphic analysis together with initial analysis of molluscs indicate variability of conditions throughout the Holocene.

Associated Researchers: Peter G. Johnson
Joan Bunbury

Related Work: Impacts of climate change on arctic vegetation and arctic lakes, Nunavut

Publications:

Wilson, S and K Gajewski. Accepted (2004). Modern chironomid assemblages and their relationship to physical and chemical variables from southwest Yukon and northern British Columbia Lakes. Arctic, Antarctic and Alpine Research

Sawada, M, A Viau, G Vettoretti, W R Peltier and K Gajewski. 2004. Paleoclimate model-data comparison for 6ka. Quaternary Science Reviews 23(3-4): 225-244. doi: 10.1016/j.quascirev. 2003.08.005

Gajewski, K and D Atkinson. 2003. Climate change in the Canadian Arctic. Environmental Reviews 11: 69-102.

Wilson, S and K Gajewski. 2002. Surface sediment diatom assemblages and water chemistry from 42 subarctic lakes in the southwestern Yukon and northern British Columbia, Canada. Ecoscience 9: 256-270.

Viau, A, K Gajewski, P Fines, D Atkinson and M Sawada. 2002. Terrestrial evidence for a 1500-yr cycle in Holocene climates. Geology 30:455-458.

Bourgeois, J, K Gajewski and R Koerner. 2001. Spatial patterns of pollen deposition in arctic snow. Journal of Geophysical Research / Atmospheres 106(D6): 5255-5266.

Gajewski, K, R Vance, M Sawada, I Fung, LD Gignac, L. Halsey, J John, P Maisongrande, P Mandell, P Mudie, P Richard, A. Sherrin, J Soroko and D Vitt. 2000. The climate of North America and adjacent ocean waters ca. 6ka. Canadian Journal of Earth Sciences. 37: 661-681.

Lacourse, T and K Gajewski. 2000. Late Quaternary vegetation history of Sulphur Lake, southwest Yukon Territory, Canada. Arctic 53:27-35

Nearby Community(ies):
Burwash Landing
Destruction Bay
Haines Junction

Nearby First Nation(s):
Kluane
Champagne & Aishihik

Key Word(s):
chronology
lakes
paleoclimate
paleoecology
quaternary study

Last Name: Geurts **First Names:** Marie-Anne

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Research Focus: Holocene palynology and paleogeography of the Ruby Range in Southwest Yukon

Date(s): 1985-1988 **Location(s):** Ruby Range, St. Elias Mountains

Notes/Summary: Broad areas of interest are Quaternary geomorphology, palynology, and paleogeography. Work in western Yukon has involved reconstruction of Beringian environments from sediment records.

Associated Researchers: Jacques Cinq-Mars
Bernard Lauriol
Daniel Lagarec

Related Work: Has done specific work Nisling River area and Coal River Springs in southeast Yukon.

Publications:

Lauriol, Bernard; Cabana, Yannick; Cinq-Mars, Jacques; Geurts, Marie-Anne; Grimm, F. Wayne. 2002. Cliff-top eolian deposits and associated molluscan assemblages as indicators of Late Pleistocene and Holocene environments in Beringia. Quaternary International Vol. 87, pp. 59-79

Geurts, M.-A., 1997. Ontogenèse des encorbellements inverses (Yukon, Canada), Études de Géographie physique, Travaux 1997 Supplément au N°XXVI, Colloque Hispano-Français 20-22 Mars 1997 sur les milieux carbonatées continentaux, 51-54.

Dewez, V. et M.-A. Geurts, 1996, Analyses minéralogiques multivariées de sédiments du Wisconsinien supérieur au sud-ouest du Yukon, Canadian Journal of Earth Sciences, 33: 42-51.

Geurts, M.-A. et Véronique Dewez, 1993, Le Lac Glaciaire Nisling et le Pléistocène dans le bassin supérieur de la Nisling River, au Yukon, Géographie physique et Quaternaire, 1993, 47 (1): 81-92.

Geurts, M.-A., Frappier, M. et Tsien, H.H., 1992, Morphologie des barrages de travertin de Coal River Springs, sud-est du Territoire du Yukon, Géographie physique et Quaternaire, 46 (2): 221-232.

Wang, X.C. et M.-A. Geurts, 1991.Late Quaternary Pollen Records and Vegetation History of the Southwest Yukon Territory: A review, Géographie physique et Quaternaire, 45 (2): 175-193.

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Burwash Landing	White River	paleoecology
Destruction Bay	Kluane	paleogeology
Haines Junction	Champagne & Aishihik	quaternary study
		sediments

Last Name: Gordon **First Names:** Richard

Position: Park Ranger; contact

Affiliation: Yukon Environment

Department: Parks Branch, Herschel Island Territorial Park

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Website: www.environmentyukon.gov.yk.ca/parks/herschel.shtml

Research Focus: Herschel Island park staff provide assistance for various projects, many related to monitoring indicators of climate change on Herschel Island.

Date(s): Ongoing **Location(s):** Herschel Island Territorial Park

Notes/Summary: Data collection and project assistance related to: cataloguing distribution and seasonal sprouting times of various plants; International Tundra Experiment (ITEX) plots; geomorphological changes related to permafrost, erosion, coastal influences; wildlife observations.

Associated Researchers: Dorothy Cooley
Christopher Burn
Catherine Kennedy

Nearby Community(ies):

Nearby First Nation(s):
Inuvialuit

Key Word(s):
birds
climate
coastal erosion
permafrost
vegetation

Last Name: Gotthardt **First Names:** Ruth M.

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Research Focus: Primary research focus is Yukon archaeology. Research linked with climate change is associated with assessment of biological remains and artifacts discovered in melting alpine ice patches in the southern Yukon.

Date(s): 1997 to present **Location(s):** Southwestern Yukon

Notes/Summary: See entry under Richard Farnell for more detail.

Associated Researchers: Richard Farnell
Greg Hare
Don Russell
Erik Blake

Publications: Kuzyk, G.W.; Russell, D.E.; Farnell, R.S.; Gotthardt, R.M.; Hare, G.; Blake, E. 1998. Postglacial caribou remains preserved in snow patch in southern Yukon. Proceedings of the Eight North American Caribou Workshop, Whitehorse, Yukon, Canada, 20-24 April 1998 / Edited by Rick Farnell, Don Russell and Debbie van de Wetering. Rangifer, special issue no. 12, 2000, p. 194

Kuzyk, G.W.; Russell, D.E.; Farnell, R.S.; Gotthardt, R.M.; Hare, P.G.; Blake, E. In pursuit of prehistoric caribou on Thandlät, southern Yukon. Arctic, v. 52, no. 2, June 1999, p. 214-219.

Study of culture and land use for the Little Salmon Carmacks Band : final report / [YWRR]

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Burwash Landing	Ta'an Kwäch'än	archaeology
Carcross	Champagne & Aishihik	caribou
Haines Junction	Kwanlin Dün	climate
Tagish	Kluane	native harvesting/country foods
Whitehorse	Carcross-Tagish	paleoclimate
		paleoecology

Last Name: Greer **First Names:** Sheila C.

Position: Consulting Anthropologist and Research Associate

Affiliation: University of Alberta

Department: Canadian Circumpolar Institute

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E-mail: sgreer@ualberta.ca

Research Focus: Archaeology associated with evidence revealed by glacial melt associated with climate change.

Date(s): 2000 to present **Location(s):** Southwestern Yukon

Notes/Summary: Greer, in collaboration with and on behalf of the Champagne and Aishihik First Nations, has been involved in the investigation of two sets of archaeological sites revealed by recent glacial retreat. These include biological remains and artifacts retrieved at numerous melting alpine ice patches in the southwestern Yukon - locales which were ancient aboriginal hunting sites; and the Kwaday Dan Ts'inchi discovery, the human remains and associated artifacts found in a retreating glacier in Tatshenshini-Alsek Park near the British Columbia-Yukon border.

Associated Researchers: Greg Hare
Ruth Gotthardt
Diane Strand

Related Work: Archaeological research through much of the Yukon and as far east as the Mackenzie Valley; southern Yukon ethnohistory and traditional aboriginal land use; land use research for the Teslin Tlingit Council (Yukon); heritage resource management in a First Nations self-government context.

Publications: Yukon Ice Patch Archaeological Sites: New Insights into Precontact Land Use Patterns. 2004. Greer, Sheila (Canadian Circumpolar Institute, University of Alberta), Greg Hare (Heritage Resources, Government of Yukon), and Diane Strand (Champagne and Aishihik First Nation). Paper presented at Alaska Anthropological Association 31st Annual Conference, April 7-10, 2004, Whitehorse, Yukon

Beattie, O.; Apland, B.; Blake, E.W.; Cosgrove, J.A.; Gaunt, S.; Greer, S.; Mackie, A.P.; Mackie, K.E.; Straathof, D.; Thorp, V.; Troffe, P.M. 2000. The Kwäday Dän Ts'ønchi discovery from a glacier in British Columbia. Canadian Journal of Archaeology, v. 24, 2000, p. 129-147.

Farnell, Richard, P. Gregory Hare, Erik Blake, Vandy Bowyer, Charles Schweger, Sheila Greer and Ruth Gotthardt, 2004. Multidisciplinary Investigations of Alpine Ice Patches in

Southwest Yukon, Canada: Paleoenvironmental and Paleobiological Investigations. Arctic 57-3:247-259.

Hare, P. Gregory, Sheila Greer, Ruth Gotthardt, Richard Farnell, Vandy Bowyer, Charles Schweger and Diane Strand, 2004. Ethnographic and Archaeological Investigations of Alpine Ice Patches in Southwest Yukon, Canada. Arctic 57-3: 260-272.

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Haines Junction	Champagne & Aishihik	archaeology paleoclimate

Last Name: Hare **First Names:** Greg

Position: Site Assessment Archaeologist

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Department: Heritage Resources Unit

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E-mail: greg.hare@gov.yk.ca

Research Focus: Archaeological and paleoenvironmental research related to degrading ice patches in southwestern Yukon.

Date(s): 1997 to present **Location(s):** Region between Kusawa Lake and Jo Jo Lake

Notes/Summary: Research into ice patches between Kusawa Lake and Jo Jo Lake. These patches reveal caribou droppings, pollen, darts, arrows, and other artifacts from thousands of years ago. Radiocarbon dates on caribou fecal material indicate that caribou were present on ice patches at least 8,000 years ago and used these locales intermittently throughout the Holocene. Pollen and macrobotanical remains from the caribou fecal pellets are used to shed light on the ecological history of alpine regions and characterize the local paleoecology of Holocene-age caribou habitats. There is good potential for getting phenomenal information about Holocene environments (in the last 10,000 years since deglaciation) and about human land use and technology.

Associated Researchers: Ruth Gotthardt
Sheila Greer
Richard Farnell

Related Work: A broad range of Yukon-based archaeology.

Publications:

Yukon Ice Patch Archaeological Sites: New Insights into Precontact Land Use Patterns. 2004. Greer, Sheila (Canadian Circumpolar Institute, University of Alberta), Greg Hare (Heritage Resources, Government of Yukon), and Diane Strand (Champagne and Aishihik First Nation). Paper presented at Alaska Anthropological Association 31st Annual Conference, April 7-10, 2004, Whitehorse, Yukon

Kuzyk, G.W.; Russell, D.E.; Farnell, R.S.; Gotthardt, R.M.; Hare, G.; Blake, E. 2000. Postglacial caribou remains preserved in snow patch in southern Yukon. Proceedings of the Eight North American Caribou Workshop, Whitehorse, Yukon, Canada, 20-24 April 1998 / Edited by Rick Farnell, Don Russell and Debbie van de Wetering. Rangifer, special issue no. 12, 2000, p. 194

In pursuit of prehistoric caribou: Alpine ice patch research in southwest Yukon. 1999. Hare, G. Yukon Historical and Museums Association newsletter, (Spring/Summer, 1999), p.1-2

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Carcross	Carcross-Tagish	archaeology
Haines Junction	Ta'an Kwäch'än	caribou
Tagish	Kwanlin Dün	human activity
Whitehorse	Champagne & Aishihik	native harvesting/country foods
		paleoecology

Last Name: Harris **First Names:** Stuart A.

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Research Focus: Study of Southern Yukon palsas and peat plateaus, particularly in the Fox Lake area (1985-89)
Monitoring ground/air temperature of permafrost landforms to assess climatic change (1996-2001)

Date(s): 1985-2001 **Location(s):** Southern Yukon

Notes/Summary: Harris studies characteristics and differences between lithalsas, palsas and peat plateaus; heat flow regimes beneath block slopes; heat flow studies under different vegetation covers; monitoring of air and ground temperatures in the permafrost from Claresholm to central Yukon; rates of movement and the nature of block streams.

Publications:

Conditions of formation of stratified screes, Slims River valley, Yukon Territory: a possible analogue with some deposits from Belgium. 2000. Harris, Stuart A.; Prick, Angélique. Earth Surface Processes and Landforms, 2000, 25(5):463-481.

Effects of vegetation cover on soil heat flux in the southern Yukon Territory. 1998. Harris, Stuart A. Erdkunde, 1998,52(4):265-285.

Palsa-like mounds developed in a mineral substrate, Fox Lake, Yukon Territory. 1993. Harris, Stuart A.; Cheng Guodong; Zhu Yuanlin. International Conference on Permafrost, 6th, Beijing, China, 5-9 July 1993. Proceedings, Vol.1; Guangzhou. South China University of Technology Press, 1993, 238-243

Debris flow characteristics in an area of continuous permafrost, St. Elias Range, Yukon Territory. 1993. Harris, Stuart A.; Gustafson, Catherine A. Zeitschrift für Geomorphologie, 1993, 37(1):41-56

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Carmacks	Little Salmon/Carmacks	hydrology
Whitehorse	Kwanlin Dün	peat
	Ta'an Kwäch'än	permafrost

Last Name: Harry **First Names:** David G.

Affiliation: Natural Resources Canada, Terrain Sciences Division (formerly)

Department: Geological Survey of Canada

City: **Prov/state/terr:** **Country:** Canada

Research Focus: Permafrost and Quaternary studies - Ice wedges and permafrost conditions near King Point, Beaufort Sea coast, Yukon Territory

Date(s): 1985 **Location(s):** King Point, Yukon north coast

Notes/Summary: Measured depth to the top of ice wedges. Work in conjunction with Wayne Pollard and Hugh French.
A palaeotemperature reconstruction based on periglacial phenomena in Europe north of approximately 51 °N, is compared with high-resolution regional climate model simulations of the marine oxygen isotope Stage 3 palaeoclimate.

Associated Researchers: Wayne Pollard
Hugh French

Publications: With Dr. Hugh M. French, Dr. Wayne H. Pollard. 1985. Current research - Geological Survey of Canada, paper 85- 1A, p. 111-116, ill., map

Nearby Community(ies):

Nearby First Nation(s):
Inuvialuit

Key Word(s):
climate modelling
glaciers/ice caps
permafrost

Last Name: Hik **First Names:** David S.

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Research Focus: 1995-2000: Factors regulating the structure and dynamics of alpine plant communities in the Southwest Yukon;
2001ff: Effects of climate change on alpine plants and animals in the Southwest Yukon.

Date(s): 1995 to present **Location(s):** Ruby Range, southwest Yukon

Notes/Summary: David Hik's research program is focused on studies of plant-herbivore-climate interactions in northern alpine ecosystems. In collaboration with a diverse group of students, university and government scientists, and northern communities, the work addresses the causes and consequences of short and long-term climate variability and change in the southwest Yukon. Current projects are focused on the population dynamics and foraging ecology of collared pikas, hoary marmots, Arctic ground squirrels and Dall sheep; responses of alpine vegetation to herbivory, warming, nutrient addition and changes in phenology of snow cover; and landscape level changes linked to treeline dynamics and various abiotic physical processes in northern mountain environments. Current research Programs are the Kluane Alpine Ecosystem Project and the St. Elias Climate Change Project.

Associated Researchers: D.S. Slocombe
Ryan Danby
Carey, Jean

Publications: Hik, David S.; Sloan, Karen Kraft. 2004. Putting the Canadian polar house in order. Arctic Volume 57 No. 2 (June 2004) pp iii-v.

Hik, David S.; Boonstra, Rudy. 2003. Introduction: Biology of the Canadian Arctic: A Crucible for Change in the 21st Century. a symposium at the Annual Meeting of the Society for Integrative and Comparative Biology, 4-8 January 2003, Toronto. McLean, VA: Society for Integrative and Comparative Biology.

Danby, RK; Hik, DS; Slocombe, DS; and Williams, A. 2003. Science and the St. Elias: sustainable development in North America's highest mountain range. The Geographical Journal 169 (2003): 191-204.

Hik, DS; McColl, C; and Boonstra, R. 2001. Why are Arctic ground squirrels more stressed in the boreal forest than in alpine meadows? EcoScience 8(2001): 275-288.

Cornelissen, JHC; Callaghan, TV; Alatalo, JM; Michelsen, A; Graglia, E; Hartley, AE; Hik, DS; Hobbie, SE; Press, MC; Robinson, CH; Henry, GHR; Shaver, GR; Phoenix, GR; Gwynn Jones, G; Jonasson, S; Chapin III, FS; Molau, U; Neill, C; Lee, JA; Melillo, JM; Sveinbjörnsson, B; & Aerts, R. 2001. Global change and arctic ecosystems: is lichen decline a function of increases in vascular plant biomass? Journal of Ecology, December 2001, vol. 89, no. 6, pp. 984-994(11)

Nearby Community(ies):
Burwash Landing
Destruction Bay
Haines Junction

Nearby First Nation(s):
Kluane
Champagne & Aishihik

Key Word(s):
adaptation
boreal forest ecosystem
climate
human activity
terrestrial mammals
vegetation
wildlife

Last Name: Huisman **First Names:** Lisa M.

Position: Former graduate student

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Department: Department of Geography and Environmental Studies

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Research Focus: Development of ice in permafrost peatlands, central Yukon
The relation between hummock cryoturbation and tilting trees, central Yukon.

Date(s): 2000-2001 **Location(s):**

Notes/Summary: Ninety-two cross-sectional discs were extracted from tilted trees growing in hummocky and non-hummocky permafrost terrain near Mayo, Yukon Territory, in order to investigate the development of compression wood between 1900 and 2000. Chronologies were constructed by calculating the percentage of trees showing compression wood in each year of the record. Trees growing at the hummocky site showed increased compression wood for 1908-11 and 1964-70. Climate conditions during these periods may have increased soil moisture, leading to greater frost action and increased tilting. Trees at the non-hummocky site showed increased compression wood for 1924-31, 1936-46, and 1956-63. There is no consistent climate signal associated with these periods. Periodic flooding of Stewart River may have increased soil moisture at this site resulting in greater cryoturbation, and increased compression-wood formation.

Associated Researchers: Chris Burn

Publications: Unpublished MA thesis. Carleton University, Ottawa. Development of compression wood in trees of the 'Drunken Forest', central Yukon Territory. 2002.

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Mayo	Na-cho Nyak Dun	chronology dendrochronology permafrost vegetation

Last Name: Huscroft **First Names:** Crystal

Position: Instructor

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Research Focus: Landslides and relationship with climate change

Date(s): 2003 to present **Location(s):** Alaska Highway corridor, Yukon Territory

Notes/Summary: Work focuses on landslide hazards presently occurring along the Alaska Highway, and included some assessment of the potential effects of climate change on climatically controlled landslide triggers.
Formerly with Yukon Geological Survey.

Associated Researchers: John E. Storer
Duane G. Froese
Panya Lipovsky

Related Work: Detailed investigations of permafrost controlled landslides in other parts of the Yukon Territory are ongoing this season.

Publications:

Huscroft, C.A., Lipovsky, P.S. and Bond, J.D., 2004. A regional characterization of landslides in the Alaska Highway corridor, Yukon. Yukon Geological Survey, Open File 2004-18, 65 p., report and CD-ROM.

Huscroft, C. A. Lipovsky, P. S. Lewkowicz, A. (submitted): The Nines Creek Rock and Ice Avalanche: an Example of the Impact of Climate Change on Catastrophic Geomorphic Processes in the Kluane Ranges, Yukon Territory, Canada Eos Trans. AGU, Fall Meet. 2004 Suppl., Abstract

Huscroft, C. A., Lipovsky, P. S., Bond, J. B. 2003: Permafrost and landslide activity: Case studies from south-western Yukon Territory in Yukon Exploration and Geology 2003, Yukon Geological Survey. p.107-119

Huscroft, C. A. Lipovsky, P. S. 2003: Climate Change and Periglacial Landslide Activity in South-Western Yukon Territory. Eos Trans. AGU, 84(46), Fall Meet. Suppl., Abstract C21B-0811, 2003 American Geophysical Union Annual General Meeting. San Francisco, California

Jackson L. E., Huscroft, C., Barendregt, R. W., Froese D. A., Villeneuve, M.2003: 2.5 ma chronology of regional glaciation in west-central Yukon, Canada based on radiometric and paleomagnetic dating of volcanic rocks. XVI INQUA Congress Reno, Nevada July 23 - 30, 2003

Nearby Community(ies):
Beaver Creek
Burwash Landing
Destruction Bay
Haines Junction
Whitehorse

Nearby First Nation(s):
Champagne & Aishihik
White River
Kluane
Kwanlin Dün

Key Word(s):
chronology
extreme events/natural hazards
fluvial geomorphology
landslides/erosion
permafrost

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Website: www.ldeo.columbia.edu/res/fac/trl/druid/

Research Focus: Dendroclimatic (tree rings related to climate) field investigations at the North American arctic treeline, central and southwest Yukon

Date(s): 2000 **Location(s):** North Fork Pass, and Hazel Creek

Notes/Summary: Project involved dendroclimatic field investigations along the North American Arctic treeline in the Yukon and Alaska. The goal of this study was to collect, process and analyze wood samples from living, relict and subfossil trees and logs in order to develop longer, millennial or near millennial tree-ring chronologies from the northern treeline for reconstruction of past temperatures. The oldest record generated from this effort was a latitudinal treeline site in the Yukon Territory, which dates back to AD 1099. Other records date back to at least the late 1600s. The chronologies have been used in reconstructions of regional to larger-scale temperatures and other dendroclimatic studies.

Associated Researchers: R.D. D'Arrigo

Related Work: Rosanne D'Arrigo, Gordon Jacoby and Brendan Buckley of the Tree-Ring Laboratory at the Lamont-Doherty Earth Observatory, NY

Publications: Publications from Yukon work in preparation.

Jacoby, G.C., R.D. D'Arrigo, and G. Juday, 1999. Tree-ring indicators of climatic change at northern latitudes, World Resources Review 11 (1) 21-29.

Jacoby, G. C. and D'Arrigo, R. D., Tree rings, carbon dioxide, and climatic change, Proc. Nat'l. Acad. Sci., v. 94, 8350-8353, 1997.

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Beaver Creek	White River	chronology
Burwash Landing	Kluane	dendrochronology
Dawson	Na-cho Nyak Dun	paleoclimate
	Tr'ondëk Hwëch'in	temperature

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Research Focus: Paleoecology of wetlands

Date(s): 1978 **Location(s):**

Notes/Summary: Research on paleobryographic, paleoecological and floristic in the vicinity of Kluane Lake, Mayo, Dempster, Old Crow & Porcupine River. Yukon work dates from late 1970s and early 1980s.

Publications: Matthews, John V. [Jr]; Schweger, Charles E.; Janssens, Jan A. 1990. The last (Koy-Yukon) interglaciation in the northern Yukon: evidence from Unit 4 at Ch'ijee's Bluff, Bluefish Basin. Geographie Physique et Quaternaire, 1990, 44(3):341-36

Hughes, O.L.; Harington, C.R.; Janssens, J.A.P.; Matthews, J.V.; Morlan, R.E.; Rutter, N.W.; Schweger, C.E. 1981. Upper Pleistocene stratigraphy, paleoecology, and archaeology of the northern Yukon interior, eastern Beringia. I. Bonnet Plume Basin. Arctic, v. 34, no. 4, Dec. 1981, p. 329-365.

Schweger, C.E.; Janssens, J.A.P. 1980. Paleoecology of the Boutellier nonglacial interval, St. Elias Mountains, Yukon Territory, Canada. Arctic and Alpine Research, v. 12, no. 3, Aug. 1980, p. 309-317.

Janssens, Jan A. P.; Zander, Richard H. Leptodontium flexifolium and Pseudocrossidium revolutum as 60,000-year-old subfossils from the Yukon Territory, Canada. Bryologist, vol.83,no.4, 1980; p.486-96.

Nearby Community(ies):
Burwash Landing
Mayo
Old Crow

Nearby First Nation(s):
Vuntut Gwitchin
Na-cho Nyak Dun
Kluane

Key Word(s):
chronology
fresh water
lakes
paleoecology
quaternary study
vegetation

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Research Focus: The hydrology and paleohydrology of the Kluane region; Holocene history of southwest Yukon; palaeoenvironment reconstruction and impacts of climate variability and change in Southern Yukon

Date(s): 1981 to present **Location(s):** Gladstone Creek, eastern shore of Kluane Lake; Ruby Range; Kluane Park

Notes/Summary: Geomorphology and Paleoenvironments of High Mountain Regions: Research is focused on the hydrology and paleohydrology of the Kluane Region with specific interest in the history of Kluane Lake and the open and closed system lakes in the Shakwak Trench.

Associated Researchers: Konrad Gajewski

Related Work: Science Policy: As a result of external administrative roles the development of science policy, both for the North and nationally, has become a research focus. The relationship between science and decision making is central to the development of strategies on current circumarctic and bipolar research issues.

Publications:

Johnson, P.G. 2000. Setting priorities for research in the North of Canada. The northern review: a multidisciplinary journal of the arts and social sciences of the North, Northern review (Whitehorse), no. 22, Winter 2000, p. 156-165

Sawada, M.; Johnson, P.G. 2000. Hydrometeorology, suspended sediment and conductivity in a large glacierized basin, Slims River, Yukon Territory, Canada (1993-94) Arctic, v. 53, no. 2, June 2000, p. 101-117

Johnson, P.G., Gajewski, K. & Lacourse, T., 1999, Palaeoenvironment reconstruction in the southwest Yukon, potential for fine resolution studies over the last 1000 years. In Wolf Creek Research Basin: Hydrology. Ecology. Environment. J.W. Pomeroy & R.J. Granger eds. National Water Research Institute. 109 - 120.

Johnson, P.G. 1998. Morphology and surface structures of Maxwell Creek rock glaciers, St. Elias Mountains, Yukon. Rheological Implications. Permafrost and Periglacial Process 9, 57-70.

Johnson, P.G. 1997. Spatial and temporal variability of ice-dammed lake sediments in alpine environments. Quaternary Science Reviews. 16 (7) 635-647.

Nearby Community(ies):
Burwash Landing
Destruction Bay
Haines Junction

Nearby First Nation(s):
Champagne & Aishihik
Kluane
White River

Key Word(s):
chronology
discharge
glaciology
lakes
paleoclimate
quaternary study
sediments

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Research Focus: Interactions between fire, climate and succession in the boreal forest (2001 to present)
Vegetation monitoring in Wolf Creek Research Basin.
Community-based vegetation and soil-temperature monitoring at Old Crow, Yukon (1997)

Date(s): 1997, 2001 to present **Location(s):** Old Crow

Notes/Summary: Research focuses on the impacts of changes in fire regime on vegetation and soil processes in boreal forests (mostly Yukon and Alaska). Because fire regimes are sensitive to climate, ecosystem responses to altered fire regimes are likely to represent an important indirect effect of climate change. Much of her research has focused on how variations in burn severity and fire frequency impact post-fire vegetation regeneration. Some of her earlier work has focused on how arctic tundra species are likely to directly respond to variations in climate. She is also currently involved with long-term projects at Herschel Island and Old Crow (Yukon), which are designed to monitor changes in tundra vegetation communities in response to climate change.

Associated Researchers: Chris Burn
Joan Eamer
Don Russell

Related Work: How climate interacts with disturbance in governing long-term species distribution patterns, particularly in the case of lodgepole pine.

Publications:
Johnstone, J. F. 2003. Fire and successional trajectories in boreal forest: Implications for response to a changing climate. Biology. University of Alaska Fairbanks, Fairbanks, Alaska, 201 p.

Johnstone, J. F. and F. S. I. Chapin. 2003. Non-equilibrium succession dynamics indicate continued northern migration of lodgepole pine. Global Change Biology 9:1401-1409.

Johnstone, J. F., F. S. I. Chapin, J. Foote, S. Kemmett, K. Price and L. Viereck. 2004. Decadal observations of tree regeneration following fire in boreal forests. Canadian Journal of Forest Research 34:267-273.

Johnstone, J. F. and G. H. R. Henry. 1997. Retrospective analysis of growth and reproduction of Cassiope tetragona and relations to climate in the Canadian High Arctic. Arctic and Alpine Research 29:459-469.

Nearby Community(ies):
Old Crow

Nearby First Nation(s):
Inuvialuit
Vuntut Gwitchin

Key Word(s):
boreal forest disturbance
climate
extreme events/natural hazards
forest use
tundra
vegetation

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Research Focus: Investigation of permafrost in the Yukon's discontinuous zone

Date(s): 2000-2001 **Location(s):** Takhini River valley

Notes/Summary: Research on the relation between air and ground surface temperature in discontinuous permafrost in Yukon.
Air and surface temperatures were measured for one year at five sites with different permafrost conditions to examine the behaviour of freezing and thawing n-factors and the relations between air and surface temperatures. During the freezing season, surface temperatures were lower where the snow cover was thin. Where snow covers were similar, surface temperatures were lower where permafrost was present. The freezing n-factor is controlled primarily by snow, but also by subsurface thermal conditions. During the thawing season, surface temperatures were higher where the near-surface thermal diffusivity allowed for rapid descent of the frost table. The thawing n-factor is primarily controlled by near-surface thermal diffusivity. The freezing n-factor is representative of the relation between air and surface temperature only during the mid season, while the thawing n-factor is representative of mid-season conditions when the mid season is longer than the early season.

Associated Researchers: Chris Burn

Publications: Karunaratne, K.C., and Burn, C.R. 2003. Freezing n-factors in discontinuous permafrost terrain, Takhini River valley, Yukon Territory, Canada. Proceedings, Eighth International Conference on Permafrost, , 21-25 July, 2003. Zurich, Switzerland. Balkema, Lisse. Vol. 1: 519-524.

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Whitehorse	Champagne & Aishihik	permafrost
	Ta'an Kwäch'än	temperature

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Research Focus: Arctic alpine biogeography, northern development, periglacial geomorphology, palsa evolution in alpine tundra in the Macmillan Pass area, Yukon.

Date(s): 1990 to present **Location(s):** Macmillan Pass

Notes/Summary: Disturbance ecology and environmental changes affecting permafrost landforms are the two main areas of the research. Since 1973 these field-based investigations have been conducted in northern and alpine areas of Canada, including winter as well as growing-season research. Efforts are made to build on existing long-term data bases that extend from the mid-1940s to incorporate the extremes that these areas experience. Year-round data collection is possible with automated installations that log atmospheric and soil climate values. Natural and assisted revegetation of anthropogenic disturbances and the abiotic effects of industrial activities are under investigation. The results have application to northern development.

Related Work: Similar studies in areas of the Northwest Territories.

Publications:

Nolte, S., Kershaw, G.P. and Gallinger, B.J. 1998. Thaw depth characteristics over 5 thaw seasons following installation of a simulated transport corridor, near Tulita (Fort Norman), N.W.T. Canada. Permafrost and Periglacial Processes. 9:71-85

Harper, K.A. and Kershaw, G.P. 1997. Soil characteristics of 48-year-old borrow pits and vehicle tracks in shrub tundra along the CANOL No. 1 Pipeline corridor, Northwest Territories, Canada. Arctic and Alpine Research. 29(1):105-111

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Ross River	Na-cho Nyak Dun	human activity
	Kaska Tribal Council	land use planning
		permafrost
		vegetation

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Research Focus: 2002: Climatic and microclimatic control on the morphology and rates of movement of solifluction lobes, Kluane region, Yukon

Date(s): 2001 to present **Location(s):** Outpost Mountain, Kluane Range

Notes/Summary: Current work related to PhD research on climatic controls on solifluction lobes at Outpost Mountain, Kluane. Supervisor is Antoni Lewkowicz, University of Ottawa. Lewkowicz's focus of research is geomorphic and hydrologic processes active in permafrost terrain, and on mountain permafrost distribution, with particular interest in the impacts of potential climate change and climatic variation on processes such as detachment sliding, solifluction, ground ice melt and river sediment transport.

Publications: 2003 (M.Sc. Thesis, University of Ottawa, Department of Geography) Kinnard, Christophe, Development of Solifluction Lobes, Kluane Range, Yukon Territory (Supervisor: A. Lewkowicz)

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Destruction Bay	Champagne & Aishihik	climate
Haines Junction	Kluane	glaciology
		landslides/erosion
		permafrost

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Research Focus: Population ecology of small mammals in the Kluane Lake region

Date(s): 1986 to present **Location(s):** Kluane Lake

Notes/Summary: Research was a core part of the Kluane Boreal Forest Ecosystem Project, which closed in 1996. The findings were synthesized into a model of the boreal forest vertebrate community. Krebs and his associates have continued to monitor a variety of plant and animal indicator species in the Kluane region.

Associated Researchers: Stan Boutin
Rudy Boonstra

Publications: Carrier, P.; Krebs, C.J. 2002. Trophic effects of rainfall on Clethrionomys rutilus voles: an experimental test in a xeric boreal forest in the Yukon Territory. Canadian Journal of Zoology, v. 80, no. 5, May 2002, p. 821-829.

Krebs, C.J.; Kenney, A.J.; Gilbert, S.; Danell, K.; Angerbjörn, A.; Erlinge, S.; Bromley, R.G.; Shank, C.; Carriere, S. 2002. Synchrony in lemming and vole populations in the Canadian Arctic. Canadian Journal of Zoology, v. 80, no. 8, Aug. 2002, p.1323-1333.

Krebs, C.J.; Zimmerling, T.N.; Jardine, C.; Trostel, K.A.; Kenney, A.J.; Gilbert, S.; Hofer, E.J. 2002. Cyclic dynamics of snowshoe hares on a small island in the Yukon. Canadian Journal of Zoology, v. 80, no. 8, Aug. 2002, p.1442-1450

Ecosystem dynamics of the boreal forest: the Kluane Project. New York : Oxford University Press, 2001.

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Burwash Landing	Kluane	boreal forest ecosystem
Destruction Bay	Champagne & Aishihik	studies
Haines Junction		terrestrial mammals

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Research Focus: Development of a Multi-Parameter Ice Core Record from Eclipse Icefield, St. Elias Mountains, Yukon Territory.

Date(s): 1996, 2001-2 **Location(s):** Eclipse Icefield, between the Kaskawulsh and Donjek Glaciers, Kluane National Park

Notes/Summary: In the summer of 1996, a 160 m ice core was recovered from the Eclipse Dome (3107 m) in the St. Elias mountains of the Yukon Territory during a test of a new, lightweight intermediate-depth ice drill. The core was then shipped frozen to the University of New Hampshire. The Eclipse Dome record will provide a valuable contribution for a data poor region to the growing network of multi-parameter, annually resolved ice core and tree-ring records from the Arctic that can be used to document the regional characteristics of global climate change events.

In 2002, another expedition involving Kreutz collected an 1,100-foot deep core last summer in the St. Elias Mountains in the Yukon Territory. The core was the deepest ever retrieved from the St. Elias range. Researchers hope to shed light on an El Nino-like weather cycle known as the Pacific Ocean Decadal Oscillation, or PDO. Better knowledge of the PDO may help answer questions about an apparent climate change in northwest North America.

Publications: Kreutz, K.J., Mayewski, P.A., Meeker, L.D., Twickler, M.S., Whitlow, S.I., and Pittalwala, I.I. 1997. Bipolar changes in atmospheric circulation during the Little Ice Age. Science, 277, 1294-1296.

Nearby Community(ies):
Burwash Landing
Destruction Bay

Nearby First Nation(s):
Kluane

Key Word(s):
chronology
climate
dendrochronology
glaciers/ice caps
ice-cores
paleoclimate

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Research Focus: Detecting recent changes in the areal extent of thawed lakes in the Old Crow Flats, Y.T., using remotely sensed date.

Date(s): 2000 to present **Location(s):** Old Crow Flats

Notes/Summary: Sylvain Labrecque is involved in monitoring the spacial and temporal dynamics of thaw lakes in the Old Crow Flats area with Landsat data from 1970. Results show no clear trends over the 30-year period, with some thaw lakes expanding and some drying. There are plans to extend the period of analysis back to the 1950s using aerial photography.

Associated Researchers: Claude R. Duguay
Jim Hawkings

Related Work: With Claude Duguay and Jim Hawkings.

Publications: Labrecque, S. and C.R. Duguay, 2001. Étude de la dynamique spatio-temporelle récente des lacs thermokarstiques de la plaine Old Crow Flats, Yukon, par télédétection. Proceedings of the 23rd Canadian Symposium on Remote Sensing,– 10e Congrès de l'Association québécoise de télédétection, hard-copy and CD-ROM, pp. 585-590.

Nearby Community(ies):
Old Crow

Nearby First Nation(s):
Vuntut Gwitchin

Key Word(s):
historical records
lakes
permafrost

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Research Focus: Research with respect to the geomorphology and palaeoclimatology of the Gladstone Valley, Ruby Range

Date(s): 1981-1982 **Location(s):** Ruby Range

Notes/Summary: Paleoclimatic reconstruction, using evidence of land forms, sediments, and pollen deposition.

Associated Researchers: Marie-Anne Geurts

Related Work: Recent work has been focused on northern Quebec and other areas of eastern Canada.

Publications:

Lagarec, Daniel. 1988. The interdependence of latitude and longitude in southern Yukon temperatures. [La dependance latitudinale et altitudinale des temperatures dans le sud du Yukon.] The Canadian Geographer, 1988, 32(1):50-56

Lagarec, D. 1986. The climatic characteristics of pollen transport in the valley of Gladstone Creek, Ruby Range, Yukon (in French). Microlog fiche service from Micromedia, fiche 86-0359.

Geurts, M.-A (Marie-Anne); Lagarec, Daniel. 1984. Les caracteristiques climatiques de la pluie pollinique dans la vallée du Gladstone Creek, Chaine Ruby, Territoire du Yukon. Ottawa: Departement de Geographie, Université d'Ottawa, [1984].

Lagarec, D. 1983. Thermal regimes in Southern Yukon. Proceedings of the 34th Alaska Science Conference, 28 September-1 October 1983; Alaska/Canada north: neighbors in science, Whitehorse, Yukon, held in conjunction with the Yukon Historical and Museums Association. Fairbanks: American Association for the Advancement of Science, Arctic Division and Ottawa: Dept. of Indian and Northern Affairs, Northern Program, 1983.

Nearby Community(ies):
Beaver Creek
Burwash Landing
Destruction Bay
Haines Junction

Nearby First Nation(s):
White River
Kluane
Champagne & Aishihik

Key Word(s):
chronology
fluvial geomorphology
paleoclimate
pollen sampling
sediments
temperature

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Research Focus: Hyperspectral signature of ground ice and permafrost features in the southern Canadian Beaufort Sea.

Date(s): 2002 to present **Location(s):** Herschel Island

Notes/Summary: Project is part of a circumpolar study named Arctic Coastal Dynamics (ACD), which aims at identifying causes of enhanced coastal erosion in Arctic coastal ecosystems. His recent work deals with the exploration of new exploratory applications of IKONOS and LANDSAT imagery for permafrost mapping. His Master's thesis involved the remote sensing investigation of 20th century coastal retreat rates on Herschel Island, Yukon Territory.

Associated Researchers: Wayne Pollard

Publications: Lantuit, Hugues; Pollard, W. 2002. International Permafrost Association, United States; Geological Survey of Canada, Canada; University of Oslo, Norway. Remotely sensed evidence of enhanced erosion during the twentieth century on Herschel Island, Yukon Territory. 3rd international workshop; Arctic coastal dynamics: Dec. 2-5, 2002: Oslo, Norway; Arctic Coastal Dynamics - Report of the International Workshop, 3: pp. 54-59

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
	Inuvialuit	coastal erosion
		permafrost

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Research Focus: A study of ground and cave ice in the Northern Yukon
Sedimentological processes and palaeoenvironmental history of glacial lakes in the northern Yukon
Palaeoenvironmental research on the Porcupine River, Old Crow River and at Tsi tse Han Cave in Northern Yukon

Date(s): 1992-2001 **Location(s):** Northern Yukon

Notes/Summary: The objective of the North Yukon/Richardson Mountains project is to establish the major geomorphological changes that have taken place in the northern Yukon and Richardson Mountains in the past thousands of years. Attention is focused particularly on formations related to permafrost and ground ice. Currently, the main focus is landslides and thermokarst lakes.

Associated Researchers: Marie-Anne Geurts
Claude Duguay

Publications:

Lauriol, B., Duguay, C, Riel, A. 2002. Responses of the Porcupine and Old Crow Rivers in Northern Yukon to Holocene climate changes. The Holocene, 12,1, 27-34;

Lauriol, B., Cinq-Mars, J., Deschamps, E., Prévost, C., Labrecque, S. 2001. Faunal and archaeological remains as evidence of climate change in freezing caverns, Yukon Territory, Canada. Arctic, 54, 135-141.

Clark, I.D., Lauriol, B., Harwood, L, Marshner, M. 2001. Groundwater Contributions to Discharge in a Permafrost Setting, Big Fish River, N.W.T., Canada. Arctic, Antarctic and Research, 33:62- 69

Lauriol, B, Cabana, Y., Cinq-Mars, J, Geurts, M.-A., Grimm, F.W. 2001. Cliff-top eolian deposits and associated molluscan assemblages as indicators of Late Pleistocene and Holocene environments in Beringia. Quaternary International 87, 59-79.

Lauriol, B, Clark, I.D. 1999. Fissure calcretes in the arctic: a paleohydrologic indicator. Applied geochemistry 14: 775-785

Clark, I.D., Lauriol, B. 1997. Aufeis of the Firth River Basin, Northern Yukon, Canada: Insights into Permafrost Hydrogeology and Karst. Alpine Arctic and Research. 29: 240- 252

Lauriol, B. , Ford, D.C., Cinq-Mars, J, Morris, W.A. 1997. The chronology of speleothem deposition in Northern Yukon and its relationship to permafrost. Canadian Journal of Earth Science; 23:902-911.

Nearby Community(ies):
Old Crow

Nearby First Nation(s):
Inuvialuit
Vuntut Gwitchin

Key Word(s):
fluvial geomorphology
lakes
paleoclimate
permafrost
rivers

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Research Focus: Use of remote sensing and other technology to assess permafrost depth and ground cover in the central Yukon

Date(s): 1994-1998 **Location(s):** Mayo

Notes/Summary: Current research emphasis is on 1) the study of surface processes and features on Mars, the Moon, and Venus, 2) the study of glacial Lake Agassiz and its impact on late-glacial North America, and 3) the development and evaluation of algorithms and techniques for generating geological information from satellite imagery.

Associated Researchers: Claude Duguay

Publications:

Leverington, D.W., Duguay, C.R., 1997. "A neural network method to determine the presence or absence of permafrost near Mayo, Yukon Territory, Canada", Permafrost and Periglacial Processes, 8: 205-215.

Clarke, G.K.C., Leverington, D.W., Teller, J.T., Dyke, A.S., 2003. "Superlakes, megafloods, and abrupt climate change", invited 'Perspectives' article, Science, 301: 922-923.

Leverington, D.W., Duguay, C.R., 1996. "Evaluation of three supervised classifiers in mapping 'depth to late-summer frozen ground', central Yukon Territory", Canadian Journal of Remote Sensing, 22: 163-174.

Leverington, D.W., 1995. "A field survey of 'late-summer depths to frozen ground' at two study areas near Mayo, Y.T., Canada", Permafrost and Periglacial Processes, 6: 373-379.

Duguay, C.R., Leverington, D.W., McNairn, H., 1997. "Land cover discrimination in the boreal forest using polarimetric SAR imagery, central Yukon Territory", Proceedings - 19th Symposium of the Canadian Remote Sensing Society.

Leverington, D.W., Duguay, C.R., 1995. "Evaluation of neural network performance in land cover classification", Proceedings: 26th International Symposium on Remote Sensing of Environment / 18th Annual Symposium of the Canadian Remote Sensing Society, pp.83-86.

Leverington, D.W., 1995. "A central Yukon field survey of depths to near-surface frozen ground", Proceedings: 25th Arctic Workshop, pp.108-110.

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Mayo	Na-cho Nyak Dun	permafrost remote sensing

Last Name: Lewkowicz **First Names:** Antoni G.

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Research Focus: Permafrost distribution and effect on geomorphology, Wolf Creek, Yukon
Radiocarbon dating of ten solifluction lobes, Outpost Mountain, Kluane

Date(s): 2000 to present **Location(s):** Wolf Creek, Kluane

Notes/Summary: Research focuses on geomorphic and hydrologic processes active in permafrost terrain, and on mountain permafrost distribution. A particular interest is the impacts of potential climate change and climatic variation on processes such as detachment sliding, solifluction, ground ice melt and river sediment transport. After focusing on the Arctic Islands for more than 25 years, Lewkowicz recently switched to areas above tree-line in the mountains of the Yukon where climate change impacts are likely to be felt in the foreseeable future.

Associated Researchers: Claude Duguay

Related Work: A number of Dr. Lewkowicz's graduate students are involved in Yukon research projects - Christophe Kinnard and Reid van Brabant at Outpost Mountain, Kluane; Tara Coultish and Mark Ednie at Wolf Creek.

Publications: Hugenholtz, C.H. and Lewkowicz, A.G. 2002. Morphometry and environmental characteristics of turf-banked solifluction lobes, Kluane Range, Yukon Territory, Canada. Permafrost and Periglacial Processes, 13(4), in press, 2002.

Nearby Community(ies):
Burwash Landing
Destruction Bay
Haines Junction
Whitehorse

Nearby First Nation(s):
Champagne & Aishihik
Kluane
Ta'an Kwäch'än
Carcross-Tagish
Kwanlin Dün

Key Word(s):
hydrology
permafrost

Last Name: Lipovsky **First Names:** Panya

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Research Focus: Landslides, geomorphology and GIS

Date(s): 2003 to present **Location(s):** Alaska Highway corridor, Yukon Territory

Notes/Summary: Work focuses on landslide hazards in the Alaska Highway corridor, and includes some assessment of the potential effects of climate change on climatically controlled landslide triggers. Detailed investigations of permafrost controlled landslides in other parts of the Yukon Territory are ongoing.

Associated Researchers: Crystal Huscroft

Publications: Huscroft, C.A., Lipovsky, P.S. and Bond, J.D., 2004. A regional characterization of landslides in the Alaska Highway corridor, Yukon. Yukon Geological Survey, Open File 2004-18, 65 p., report and CD-ROM.

Nearby Community(ies):
Whitehorse

Nearby First Nation(s):
Kwanlin Dün

Key Word(s):
human activity
landslides/erosion
transportation

Last Name: Loewen **First Names:** Val

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Research Focus: Monitoring of key circumpolar plant species.

Date(s): 1990s to present **Location(s):** Wolf Creek Basin

Notes/Summary: Val Loewen is involved with the International Tundra Experiment (ITEX), formed in 1990 to conduct research on responses of arctic tundra plants and ecosystems to the predicted climate change throughout the tundra biome. Loewen's primary association is with the ITEX site in the alpine tundra section of the Wolf Creek Research Basin, Whitehorse, Yukon. There also are or have been ITEX sites in the Kluane region, Old Crow, and Herschel Island.

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Whitehorse	Kwanlin Dün	studies
	Ta'an Kwäch'än	tundra
		vegetation

Last Name: Luckman **First Names:** Brian H.

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Research Focus: Dendroclimatic Reconstruction of Precipitation and Temperatures in the Yukon

Date(s): 1999, 2002 **Location(s):** Southwest Yukon

Notes/Summary: Broader work involves developing dendrochronology (tree-ring) networks as indicators of past climates, mainly in the Rockies. More recently Luckman's group has begun developing sampling networks in the southwest Yukon and Northern Canadian cordillera to develop a similar database for dendroclimatological studies. In this region Picea glauca and Abies lasiocarpa are the target species.

Publications:

Luckman, B. H (Brian Henry); Watson, E; Youngblut, Donald K. 2001. Dendrochronological and dendroclimatic investigations in the Cordillera: southern Yukon and British Columbia. London, ON: University of Western Ontario.

Baumgartner, T. R.; Bradbury, J. P.; Diaz, H. F.; Dunbar, Robert B.; Luckman, B. H.; Markgraf, Vera; Seltzer, G. O.; Swetnam, T. W.; Villalba, R. 2000. Paleoclimate reconstruction along the pole-equator-pole transect of the Americas (PEP 1). Quaternary Science Reviews, 19. 1-5; p. 125-140; Pergamon, Oxford, United Kingdom.

Luckman, B. H (Brian Henry); Youngblut, Donald K. 2000. Dendroclimatic investigations in the southwest Yukon: a preliminary assessment. London, ON: University of Western Ontario.

Luckman , B.H. and Youngblut, D. 2000 Dendroclimatic Investigations in the Southwest Yukon: A Preliminary Assessment. Report to Meteorological Service of Canada, Parks Canada and the Yukon Government, May 2000, iii + 52p.

Luckman, B. H., Watson , E. and Youngblut, D.K. 2001 Dendrochronological and Dendroclimatic Investigations in the Cordillera: Southern Yukon and British Columbia. Final Report; Collaborative Research Agreement, 2000-2001.Submitted to the Meteorological Service of Canada. February 2001

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Burwash Landing	Champagne & Aishihik	chronology
Destruction Bay	Kluane	dendrochronology
Haines Junction		paleoclimate

Last Name: MacDonald **First Names:** Glen M.

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Research Focus: Dendroclimatic reconstruction from white spruce at the subarctic alpine treeline in northwestern Canada.

Date(s): 1993 **Location(s):**

Notes/Summary: Glen M. MacDonald is interested in the relationship between climatic variations and vegetation response at different spatial and temporal scales. He uses fossil pollen, fossil stomates, plant macrofossils, tree-rings, geochemistry and historical records to reconstruct past climate variation and then examine vegetation changes caused by these variations. Areas of active field research include the northern Great Plains and adjacent Rocky Mountains, the North American subarctic, Russia and Siberia.

Associated Researchers: J.M. Szeicz
M.F.J. Pisaric
Les Cwynar

Publications:

Szeicz, J.M. and MacDonald, G.M. 2001. Montane climate and vegetation dynamics in easternmost Beringia during the Late Quaternary. Quaternary Science Reviews 20: 247-257.

Edwards, M.E., Anderson, P.M., Brubaker, L.B., Ager, T.A., Andreev, A.A., Bigelos, N.HZ., Cwynar, L.C., Eisner, W.R., Harrison, S.P., Hu, F-S., Jolly, D., Lozhkin, A.V., MacDonald, G.M., Mock., C.J., Ritchie, J.C., Sher, A.V., Spear, R.W., Williams, J.W., and Yu, G. 2000. Pollen-based biomes for Beringia 18,000, 6000 and 0 14C yr BP. Journal of Biogeography 25: 521-554.

Larsen, C.P.S. and MacDonald, G.M. 1998. An 840-year record of fire and vegetation in a boreal white spruce forest. Ecology 79: 106-118.

Overpeck, J., Hughen, K., hardy, D., Bradley, R., Case, R., Douglas, M., Finney, B., Gajewski, K., Jacoby, G., Jennings, A., Lamoureux, S., Lasca, A., MacDonald, G., Moore, J., Retelle, M., Smith, S., Wolfe, A. and Zielinski, G. 1997. Arctic environmental change of the last four centuries. Science 278: 1251-1256

MacDonald, G.M. and McLeod, T.K. 1996. The Holocene closing of the 'Ice-Free Corridor': A biogeographical perspective. Quaternary International 32: 87-95.

Szeicz, J.M. and MacDonald, G.M. 1996. A 930-year ring-width chronology from moisture-sensitive white spruce (Picea glauca Moench) in northwestern Canada. Holocene 6: 345-351.

Szeicz, J.M. and MacDonald, G.M. 1995. Recent white spruce dynamics at the subarctic alpine treeline of northwestern Canada. Journal of Ecology 83: 873-885. 5.

MacDonald, G.M. and others. 1993. Rapid response of treeline vegetation and lakes to past climate warming. Nature 361: 243-246.

Nearby Community(ies):

Nearby First Nation(s):

Key Word(s):
chronology
dendrochronology
paleoclimate
pollen sampling
vegetation

Last Name: MacIntosh **First Names:** Gordon D.

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Research Focus: Late Quaternary climate change along glacial margins in Eastern Beringia.

Date(s): 1999 **Location(s):** Scottie Creek, Daylight Coming Out Lake, Island Lake

Notes/Summary: The purpose of Gordon D. MacIntosh's research was to discover the effect of the glacial and postglacial environment on the local climate and vegetation as the ice receded, as well as its implications for early man. The paleoenvironmental reconstruction is primarily based on the pollen and macrofossil analysis of a core taken from Daylight Coming Out Lake and Island Lake.

Publications: Palaeoecology of the Scottie Creek District, Beaver Creek, Yukon Territory : life on the edge. Thesis (M.S.)--University of Alaska Fairbanks, 1997.

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Beaver Creek	Vuntut Gwitchin	climate
Old Crow	White River	glaciology
		paleoecology
		vegetation

Last Name: Mackenzie-Grieve **First Names:** Jody

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Research Focus: Thermal habitat use by northern lake trout: energetics, production and conservation under climate warming

Date(s): 2001-2002 **Location(s):** Dezadeash Lake, Kathleen Lake

Notes/Summary: Study of where lake trout living in Dezadeash Lake spend their time. Lake trout are generally thought to prefer a temperature range between 8 and 12 degrees C, and cannot survive in water warmer than 23.5°C. This makes them very vulnerable to climate change. In order to track the fish, Mackenzie-Grieve put radio tags on 20 lake trout in Dezadeash Lake, and another 19 sonar tags on lake trout in Kathleen Lake, which served as her control lake. The tags have temperature probes, so when the fish are located, the temperature of the water in which they are swimming can also be determined.

Publications: Research for Master's thesis - in preparation 2004

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Haines Junction	Champagne & Aishihik	climate fish/aquatic lakes temperature

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Research Focus: Nature and history of ground ice in Central Yukon (1983), Northern Yukon (1984), Yukon Coastal Plain (1987)

Date(s): 1983, 1984, 1987 **Location(s):** Central and Northern Yukon

Notes/Summary: Studies are aimed at clarifying the relationship between permafrost and climate, with a view to predicting impacts of climate change on permafrost and to assessing utility of permafrost as an indicator of climate change.

Related Work: Isotope variations in permafrost waters along the Dempster Highway pipeline corridor

Publications: Vaikmae R.; Bose M.; Michel F.A.; Moormann B.J. 1995. Changes in permafrost conditions. Quaternary international, v. 28, 1995, p. 113-118.

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Mayo	Vuntut Gwitchin	climate
Old Crow	Na-cho Nyak Dun	permafrost
	Inuvialuit	

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Research Focus: Remote sensing study of permafrost near Aishihik Lake (Ruby Range), Yukon.

Date(s): 1990 **Location(s):** Near Aishihik Lake

Notes/Summary: Primary research interests are in the fields of remote sensing, GIS, and Earth System Science modelling in studies of global environmental change. Using an integrated research approach, key environmental indicators of potential global change are being investigated in different parts of the world at dynamic spatial and temporal scales. Current attention is focused on forested ecosystems, agriculture, water, and mountainous terrain, with additional research interests in tropical ocean coral reefs and Arctic sea ice. Airborne and satellite image processing linked with spatial and multi-temporal GIS data analysis are used to extract environmental information at spatial scales ranging from centimetres to regional, continental and global areas. Early Yukon work involved study of remote sensing of permafrost. More recent Yukon work is incorporated into broader study of remote sensing applications in mountainous terrain.

Associated Researchers: Claude Duguay

Publications:

Cihlar, J., B. Guindon, J. Beaubien, R. Latifovic, D. Peddle, M. Wulder, R. Fernandes, J. Kerr, 2003. From Need to Product: A Methodology for Completing a Land Cover Map of Canada using Landsat Imagery. Canadian Journal of Remote Sensing. Special Issue on Landsat-7. Vol. 29(2): 171-186.

Peddle, D.R. and C.R. Duguay, 1998. Mountain Terrain Analysis using a Knowledge Based Interface to a GIS. Geomatica. (Canadian Institute of Geomatics). 52(3), p. 145-163.

Peddle, D.R. and S.E. Franklin, 1993. Classification of Permafrost Active Layer Depth from Remotely Sensed and Topographic Evidence. Remote Sensing of Environment (Elsevier International, USA). 44(1), p.67-80.

Peddle, D.R. and S.E. Franklin, 1992. Multisource Evidential Classification of Surface Cover and Frozen Ground. International Journal of Remote Sensing (Taylor and Francis, U.K.) 13(17): 3375-3380.

Nearby Community(ies):
Haines Junction

Nearby First Nation(s):
Champagne & Aishihik

Key Word(s):
boreal forest ecosystem
climate
land
remote sensing
sea ice

Last Name: Pinard **First Names:** Jean-Paul

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Research Focus: Solar-wind hybrid monitoring, analysis and interpretation.
Wind energy potential in North

Date(s): 1996 to present **Location(s):** Yukon

Notes/Summary: Wind energy research has been active in the Yukon since 1990. Today the wind-monitoring program consists of half-dozen stations that measure winds for a period of at least a year per location. Weather balloon data in and around the territory is also collected. The data from the sites is analyzed and will become part of a wind atlas for the Yukon. Computer wind flow models has become an important tool for exploring wind energy in the mountainous regions of the Yukon.

Related Work: Wind flow through several different plant canopies (a coniferous forest, a maize crop, and two artificial wind tunnel "crops") is computer-simulated using a simple first-order closure. Results show that the mean wind speed, shear stress and turbulent kinetic energy given by the first-order closure compare well with the measured flow and with the second-order models.

Publications: Pinard, J.-P. & Wilson, J.D. 2001. First- and second-order closure models for wind in a plant canopy. J. Applied Meteorol., 40: 1762-1768.

Pinard, J.D.J. 2001. Yukon Wind Energy Study: Wind Energy Assessment in Burwash Landing and Destruction Bay. Report submitted to Yukon Energy. p. 16.

Pinard, J.D.J. 2001. Yukon Wind Energy Study: Bear Creek Wind Monitoring Study. Report submitted to Yukon Community Development Fund. p. 16.

Pinard, J.D.J. 2001. Yukon Wind Energy Study: Wind Energy Assessment in Old Crow. Report submitted to Yukon Energy. p. 25.

Pinard, J.D.J. 2000. Numerical Simulation of Wind in Plant Canopies. Master's Thesis submitted to the University of Alberta.

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Burwash Landing	Vuntut Gwitchin	human activity
Destruction Bay	Kluane	renewable energy
Old Crow	Ta'an Kwäch'än	wind
Whitehorse	Kwanlin Dün	

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Research Focus: Quaternary climate and vegetation change

Date(s): 1970, 1998 to present **Location(s):**

Notes/Summary: Research interests centre on how climate change affects vegetation development at the subarctic and subalpine treelines. To study climate and its impact on vegetation and water resources he uses several paleoecological tools, including, tree ring analysis and fossil pollen and stomata preserved in lake sediments.

Associated Researchers: J.M. Szeicz
G.M. MacDonald
L.C. Cwynar

Publications:

Holocene environmental change at the subarctic alpine treeline in northern British Columbia and the southern Yukon Territory, Canada. 1970, National Library of Canada

Pisaric, M.F.J., Szeicz, J.M., Karst, T. and Smol, J.P. 2000. Comparison of pollen and stomate spectra as indicators of treeline in montane and alpine lake sediments from northwestern Canada. Canadian Journal of Botany. 78:1180-1186.

Pisaric, M.F.J., MacDonald, G.M., Velichko, A.A. and Cwynar, L.C. 2001. The late-glacial and post-glacial vegetation history of the northwestern limits of Beringia based on pollen, stomate and megafossil evidence. Quaternary Science Reviews. 20:235-245.

Pisaric, M.F.J. 2002. Long-distance transport of terrestrial plant material by convection resulting from forest fires. Journal of Paleolimnology 28, 349-354

Pisaric, M.F.J., Holt, C., Szeicz, J.M., Karst, T and Smol, J.P. 2003. Holocene treeline dynamics in the mountains of northeastern British Columbia, Canada, inferred from fossil pollen and stomates. Holocene 13 (2), 161-173

Nearby Community(ies):
Ross River
Watson Lake

Nearby First Nation(s):
Kaska Tribal Council

Key Word(s):
chronology
dendrochronology
paleoclimate
pollen sampling
vegetation
water levels

Last Name: Pollard **First Names:** Wayne H.

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Research Focus: Permafrost & geomorphic studies in Dempster Highway area
Permafrost, ground ice and climate change on the Yukon Beaufort Coast and Herschel Island

Date(s): 1980 to present **Location(s):** Dempster Highway, Coastal Plain, Herschel Island

Notes/Summary: Pollard's primary research activities are concerned with the investigation of the nature and origin of massive ground ice in the Canadian High Arctic and in the McMurdo Dry Valleys region of Antarctica, its role in landscape evolution, and an assessment of its response to global warming. Another focus is the investigation of polar hydrologic systems with respect to groundwater processes like the formation of travertines, frost mounds and icings. One aspect of this research is the investigation of perennial springs on Axel Heiberg Island and there possible application as an analogue for past microbial life on Mars.

Associated Researchers: Dr. Hugh M. French
Hugues Lantuit

Publications: Lantuit, Hugues; Pollard, W. 2002. International Permafrost Association, United States; Geological Survey of Canada, Canada; University of Oslo, Norway. Remotely sensed evidence of enhanced erosion during the twentieth century on Herschel Island, Yukon Territory. 3rd international workshop; Arctic coastal dynamics: Dec. 2-5, 2002: Oslo, Norway; Arctic Coastal Dynamics - Report of the International Workshop, 3: pp. 54-59.

Pollard, W.; Omelon, C.; Couture, N.; Solomon, Steven; Budkewitsch, P. 2001. International Permafrost Association, United States; Geological Survey of Canada, Canada; Geological Survey of Canada, Canada; Natural Resources Canada, Canada. Ice content and sensitivity analysis based on landscape interpretation for several sites along the Beaufort Sea coast. Arctic coastal dynamics: Nov. 26-30, 2001: Potsdam, Federal Republic of Germany; Berichte zur polar- und meeresforschung / Reports on polar and marine research, 413: pp. 48-51; Kamloth, Bremerhaven, Federal Republic of Germany.

Pollard, W.H. 1991. The investigation of buried snowbank ice in ice-rich permafrost in central and northern Yukon, Canada. Bulletin of Glaciologic Research. 9 : 1-7.

Pollard, W.H. 1990. Preliminary results of ground ice studies in the Herschel Island area, Northern Yukon. International Symposium on Geocryological Studies in Arctic Regions, August 1989, 121-133

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Dawson	Inuvialuit	coastal erosion
Old Crow	Vuntut Gwitchin	permafrost
	Tr'ondëk Hwëch'in	remote sensing

Last Name: Ritchie **First Names:** James C.

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Research Focus: Botany and paleobotany studies in the Old Crow basin, Upper Bell River and Keele Range.

Date(s): 1981 **Location(s):** Old Crow basin, Upper Bell River and Keele Range

Notes/Summary: Yukon studies were part of a larger, career-long focus on the reconstruction of paleoclimates and paleoecology from pollen and vegetation evidence.

Associated Researchers: L.C. Cwynar
C.E. Schweger

Publications:

Ritchie, J.C. 1980. Towards a late-Quaternary palaeoecology of the ice-free corridor. Can. J. Anthropol. 1: 15-28.

Cwynar, J.C., and Ritchie, J.C. 1980. Arctic steppe-tundra: a Yukon perspective. Science 208: 1375-1377.

Ritchie, J.C. 1981. Problems of interpretation of the pollen stratigraphy of northwest North America. Pages 377-391. In Quaternary paleoclimate. Edited by W.C. Mahanay. GeoAbstracts, Norwich. 483 pp.

Ritchie, J.C. 1982. The modern and late-Quaternary vegetation of the Doll Creek area, north Yukon, Canada. New Phytol. 90: 563-603.

Ritchie, J.C., and Cwynar, L.C. 1982. The late Quaternary vegetation of the northern Yukon. Pages 113-126. In Paleocology of Beringia. Edited by D.M. Hopkins, J.V. Matthews Jr, C.E. Schweger and S.B. Young. Academic, New York, NY. 489 pp.

Ritchie, J.C., Cinq-Mars, J., et Cwynar, L.C. 1982. L'environnement tardiglaciaire du Yukon septentrional, Canada. Géogr. phys. Quatern. 36: 241-250.

Nearby Community(ies):
Old Crow

Nearby First Nation(s):
Vuntut Gwitchin

Key Word(s):
paleoclimate
paleoecology
pollen sampling

Last Name: Russell **First Names:** Donald E.

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Research Focus: Studies focus on the impacts of global change on arctic ecosystems with reindeer and caribou as the primary focus.

Date(s): ongoing **Location(s):** Northern Yukon

Notes/Summary: Russell has studied caribou for almost three decades. His research includes the impacts of climate and climate change on caribou. Techniques include modelling the body condition of an individual animal facing an array of habitat conditions throughout their annual cycle and modelling herd productivity and community harvest into the future. These models have been utilized to assess the energetic and population impacts of community harvesting, climate change and oil development within the range of the Porcupine Caribou Herd. In addition, a community ecosystem monitoring program uses hunting people's observations and knowledge to reflect current conditions and change, particularly with respect to weather and climate.

Associated Researchers: Richard Farnell
Gary Kofinas

Related Work: All aspects of rangifer ecology. Russell is one of the leads for a new international network concerned with caribou and reindeer ecology - the Circum-Arctic Rangifer Monitoring and Assessment network (CARMA).

Publications:
Russell, D., G. Kofinas, and B. Griffith. 2000. Need and opportunity for a North American caribou knowledge cooperative. Polar Research 19(1): 117-130.

Russell, D. E., A. M. Martell, and W.A.C. Nixon. 1993. The range ecology of the Porcupine Caribou Herd in Canada. Rangifer Special Issue No. 8, 168 pp

Russell, Donald E., Debbie van de Wetering, Robert G. White, and Karen L. Gerhart. 1996. Oil and the Porcupine Caribou Herd--Can we quantify the impacts? Rangifer Special Issue 9:255-257

Russell, D. E. and A.M. Martell 1984. Winter Ecology of caribou (Rangifer tarandus) In: R. Olson et al., Northern Ecology and Resource Management. Univ. of Alberta Press. 438 pp.

Nearby Community(ies):
Old Crow

Nearby First Nation(s):
Na-cho Nyak Dun
Vuntut Gwitchin

Key Word(s):
caribou
climate
human activity
native harvesting/country foods
tundra

Last Name: Strand **First Names:** Diane

Position: Heritage Resource Officer

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Research Focus: Heritage resources related to the Champagne and Aishihik First Nation

Date(s): 1998 to present **Location(s):** Southwestern Yukon

Notes/Summary: Since 1998, there has been ongoing research into biological and cultural evidence revealed by the melting of alpine ice patches in the southwest Yukon. These patches reveal caribou droppings, pollen, darts, arrows, and other artifacts from thousands of years ago. Radiocarbon dates on caribou fecal material indicate that caribou were present on ice patches at least 8,000 years ago and used these locales intermittently throughout the Holocene. Pollen and macrobotanical remains from the caribou fecal pellets are used to shed light on the ecological history of alpine regions and characterize the local paleoecology of Holocene-age caribou habitats. The artifacts recovered are giving a new and clearer picture of human land use, culture, and technology in the southern Yukon over the past 10,000 years.

Associated Researchers: Sheila Greer
Rick Farnell
Don Russell
Greg Hare

Publications: Yukon Ice Patch Archaeological Sites: New Insights into Precontact Land Use Patterns. 2004. Greer, Sheila (Canadian Circumpolar Institute, University of Alberta), Greg Hare (Heritage Resources, Government of Yukon), and Diane Strand (Champagne and Aishihik First Nation). Paper presented at Alaska Anthropological Association 31st Annual Conference, April 7-10, 2004, Whitehorse, Yukon

Beattie, O.; Apland, B.; Blake, E.W.; Cosgrove, J.A.; Gaunt, S.; Greer, S.; Mackie, A.P.; Mackie, K.E.; Straathof, D.; Thorp, V.; Troffe, P.M. 2000. The Kwäday Dän Ts'ønchi discovery from a glacier in British Columbia. Canadian Journal of Archaeology, v. 24, 2000, p. 129-147.

Nearby Community(ies):
Haines Junction

Nearby First Nation(s):
Champagne & Aishihik

Key Word(s):
archaeology
caribou
human activity
native harvesting/country foods
paleoclimate
traditional knowledge

Last Name: Sweetman **First Names:** Jon

Position: Graduate student

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Research Focus: Reconstructing past sockeye salmon productivity and climate variability in the Alsek and Tatshenshini watersheds, Southwest Yukon, from lake sediment records.

Date(s): 2002 **Location(s):** Haines Junction

Notes/Summary: Jon Sweetman's research is focused on examining ecosystem variability and food-web dynamics in Alaskan sockeye salmon nursery lakes. Salmon transport large amounts of nutrients from marine environments into freshwater ecosystems, Salmon obtain most of their adult biomass in the ocean, and then die in freshwater. These nutrient subsidies can have important implications for other organisms living in freshwater habitats.

Salmon are, however, extremely variable in their annual abundance, and the number of salmon returning to spawn to a given system can vary dramatically from year to year. Jon Sweetman's research is focused on how these annual pulses of nutrients effect aquatic community structure. One of the approaches to answering these types of questions is to look at how aquatic organisms have varied over time, by looking at the remains of organisms preserved in the sediments at the bottom of lakes.

Associated Researchers: J. P. Smol
B.P. Finney

Publications: Sweetman, J.N., Honnold, S.G., Sagalkin, N., and Finney, B.P. (In preparation 2004) Complex trophic interactions within zooplankton communities in Alaskan salmon nursery lakes and their implications for sockeye salmon production. Canadian Journal of Fisheries and Ocean Sciences.

Finney B.P., Gregory-Eaves I., Sweetman J., Douglas M.S.V., and Smol, J.P. 2000. Impacts of Climate Change and Fishing on Pacific Salmon Abundance Over the Past 300 Years. Science 290:795-799. (pdf)

Sweetman, J., Finney, B., and Smol, J.P. A paleolimnological assessment of the impacts of climate on freshwater ecosystems in the North Pacific with implications for salmon nursery lakes (Presented at the American Society of Limnology and Oceanography Summer Meeting; Victoria; June 2002)

Sweetman, J., Finney, B., Gregory-Eaves, I., Douglas, M., Smol, J. 2001. Reconstructing the Impacts of Climate Change and Fishing on Pacific Salmon Abundance. (Presented at the American Society for Limnology and Oceanography (ASLO) Aquatic Sciences Meeting; Albuquerque, NM, USA; February 2001)

Nearby Community(ies):
Haines Junction

Nearby First Nation(s):
Champagne & Aishihik

Key Word(s):
boreal forest ecosystem
fish/aquatic
fresh water
lakes
paleoclimate
paleoecology

Last Name: Szeicz **First Names:** Julian Michael

Position: Assistant Professor (deceased)

Affiliation: Queen's University

Department: Department of Geography

City: Kingston **Prov/state/terr:** ON **Country:** Canada

Research Focus: Postglacial vegetation dynamics and climate history at alpine treeline, southeastern Yukon.

Date(s): 1998 **Location(s):** Southeast Yukon

Notes/Summary: Dr J.M. Szeicz 1965-1998: Julian Szeicz lost his life in a snow avalanche on 16th April 1998, near Watson Lake, Yukon. Dr. Szeicz completed his PhD in 1994 with Dr Glen MacDonald at McMaster University, Hamilton, Ontario, on climate change and vegetation dynamics at the subarctic tree line in NW Canada. In 1995, he joined the Department of Geography, Queen's University, Kingston, Ontario, where he developed an international reputation in the field of palaeoenvironmental reconstruction and analysis.

Associated Researchers: Glen M. MacDonald
M.F.J. Pisaric

Publications:

MacDonald, G.M.; Larsen, C.P.S.; Szeicz, J.M.; and Moser, K.A. 1991. The reconstruction of boreal forest fire history from lake sediments: a comparison of charcoal, pollen, sedimentological, and geochemical indices. Quaternary Science Reviews, 10:53-71.

Szeicz, J.M., and MacDonald, G.M. 1994. Age-dependent tree-ring growth responses of subarctic white spruce to climate. Canadian Journal of Forest Research, 24:120-132.

Szeicz, Julian M.; and MacDonald, Glen M. 1995. Dendroclimatic reconstruction of summer temperatures in northwestern Canada since A.D. 1638 based on age-dependent modelling. Quaternary Research, 44:257-266.

Szeicz, Julian M.; and MacDonald, Glen M. 1995. Recent white spruce dynamics at the subarctic alpine treeline of north-western Canada. Journal of Ecology, 83:873-885.

Szeicz, Julian M.; and MacDonald, Glen M. 1996. A 930-year ring-width chronology from moisture-sensitive white spruce (Picea glauca Moench) in northwestern Canada. The Holocene, 6:345-351.

Szeicz, Julian M. 1996. White spruce light rings in northwestern Canada. Arctic and Alpine Research, 28:184-189.

Nearby Community(ies):
Watson Lake

Nearby First Nation(s):
Kaska Tribal Council

Key Word(s):
chronology
dendrochronology
paleoclimate
paleoecology
vegetation

Last Name: Tait **First Names:** Michelle

Position: Graduate student

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Research Focus: Influence of climate change and herbivory on alpine meadow vegetation

Date(s): 2002 **Location(s):** Southwest Yukon

Notes/Summary: This research was conducted as part of the work of the Kluane Alpine Ecosystem Project, headed by Dr. David Hik of the University of Alberta. For information about the project, go to www.biology.ualberta.ca/faculty/david_hik/

Associated Researchers: David Hik

Publications: Effects of climate change and herbivory on alpine plants in the southwest Yukon Territory, Canada - Ottawa: National Library of Canada. Master's thesis, University of Alberta, Department of Biological Sciences, 2002.

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Burwash Landing	Champagne & Aishihik	climate
Destruction Bay	Kluane	terrestrial mammals
Haines Junction		vegetation

Last Name: Tompkins **First Names:** Heather

Position: Graduate student (Master's)

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Research Focus: Historical climatology of south-central Yukon (post 1840)

Date(s): 2003-2005 **Location(s):** 60o N - 64o N, 128o W - 140o W

Notes/Summary: This project will attempt to reconstruct the climate of the central Yukon using two proxy records: historical documentary sources and tree-rings. In northern Canada the instrumental record is relatively short. By examining historical sources from outposts run by the RCMP and HBC, as well as other written accounts, climate information will be identified, gathered and quantified. The documentary sources will be the primary data used in the reconstruction while the dendroclimatic data will be used to evaluate and supplement the historical sources. It is the aim of the project to develop a framework and methodology for historical climatology in Yukon, and by extension, Canada. This information can also help create a better context in which to understand the twentieth century warming that the earth has been experiencing.

Nearby Community(ies):
Beaver Creek
Burwash Landing
Carcross
Carmacks
Dawson
Destruction Bay
Elsa
Faro
Haines Junction
Mayo
Pelly Crossing
Ross River
Tagish
Teslin
Watson Lake
Whitehorse

Nearby First Nation(s):
Ta'an Kwäch'än
Champagne & Aishihik
Na-cho Nyak Dun
Little Salmon/Carmacks
White River
Kwanlin Dün
Tr'ondëk Hwëch'in
Selkirk
Kluane
Kaska Tribal Council
Carcross-Tagish

Key Word(s):
climate
dendrochronology
historical records

Last Name: Vetter **First Names:** Mary A.

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Research Focus: Palaeobotanical research of grasslands, southeast side of Kluane Lake, southwest Yukon

Date(s): 1997 to present **Location(s):** Southwest Yukon, Kluane Lake

Notes/Summary: Mary Vetter and her students research focuses on pollen, charcoal, and stomata analysis of lake sediment in the Kluane Lake area. The research is aimed at reconstructing past grassland environments and associated climatic conditions.

Publications: Vetter, M.A. 1998. Impacts of global climate change on fescue-sage grasslands in southwestern Yukon. Special session on Impacts of Global Climate Change in the Southwest Yukon. Annual Meeting of the Canadian Association of Geographers, 2-6 June 1998. Ottawa, ON

Vetter, M.A. 2000. Grasslands of the Aishihik-Sekulmun Lakes Area, Yukon Territory, Canada. Arctic 53 (2): 165-173.

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Burwash Landing	Kluane	paleoecology
Destruction Bay	Champagne & Aishihik	paleoecology
Haines Junction		sediments
		vegetation

Last Name: Von Finster **First Names:** Al

Position: Resource restoration biologist

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Website: taiga.net/reports/dfo1.html

Research Focus: Northern aquatic habitats

Date(s): 1990s to present **Location(s):** Upper Yukon River Basin

Notes/Summary: Al von Finster's work includes the possible effects of climate change on aquatic habitats in the Upper Yukon River Basin and the impact on fish populations..

Publications: Possible effects of climate change on the physical characteristics of fish habitats in the Yukon River Basin in Canada, 2001. Available as a web report at taiga.net/reports/dfo1.html

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Carmacks	Ta'an Kwäch'än	fish/aquatic
Tagish	Teslin Tlingit	fresh water
Teslin	Kwanlin Dün	
Whitehorse	Carcross-Tagish	

Last Name: Wake **First Names:** Cameron P.

Position: Research Assistant Professor

Affiliation: University of New Hampshire

Department: Climate Change Research Centre

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Research Focus: Development of a multi-parameter ice core record from Eclipse Icefield, St. Elias Mountains, Yukon Territory

Date(s): 1996 **Location(s):** Eclipse Icefield, between the Kaskawulsh and Donjek Glaciers, Kluane National Park

Notes/Summary: Cameron Wake's research focuses on the development of climate records through the recovery and analysis of ice cores. He is currently leading research programs to develop high resolution, multi-parameter ice core paleoclimate records from glaciers on the Tibetan Plateau and in the Canadian Arctic. In the summer of 1996, a 160 m ice core was recovered from the Eclipse Dome (3107 m) in the St. Elias mountains of the Yukon Territory. The core was then shipped frozen to the University of New Hampshire for analysis in the hope of reconstructing a seasonal paleoclimate record for the past 200 years.

Associated Researchers: Kaplan Yalcin
Niels Gundestrup

Publications: With Kaplan Yalcin and Niels Gundestrup: The climate signal recorded in the oxygen isotope, accumulation, and major ion time-series from the Eclipse Ice Core, Yukon Territory. Annals of Glaciology 35, 416-422, 2003, in review.

With Kaplan Yalcin: A century of North Pacific volcanism in an ice core from Eclipse icefield, Yukon Territory, Canada. J. Geophys. Res. 108, 2003, in review.

With Kaplan Yalcin: Anthropogenic signals recorded in an ice core from Eclipse icefield, Yukon Territory, Canada. Geophysical Research Letters 28, 4487-4490, in review.

Nearby Community(ies):
Burwash Landing
Destruction Bay

Nearby First Nation(s):
Kluane

Key Word(s):
chronology
ice-cores
paleoclimate

Last Name: Wein **First Names:** Ross Wallace

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Research Focus: Northern invasion of weeds under climatic change (1993)
Climate change effects on regenerating aspen and white spruce following fires (2001-2002)

Date(s): 1993, 2001-2002 **Location(s):** Southern Yukon

Notes/Summary: Research includes: environmental effects of fire, ecology of northern forests and the impact of industry. The book co-edited with D.A. MacLean entitled "The Role of Fire in Northern Circumpolar Ecosystems" included his early work. He maintains a strong interest in the circumpolar boreal forest. Current research investigates hypotheses related to the influence of severe fires on plant succession and nutrient cycling in light of changing climates in peatlands, forests and tundra. Field research sites are located in Wood Buffalo National Park and near Inuvik, Northwest Territories.

Publications:

Trofymow, J.A. and many others including R.W. Wein. 2001. Rates of litter decomposition after six years in Canadian forests: influences of litter quality and climate. Can. J. For. Res. 30:

Nalder, I.A., R.W. Wein, M.E. Alexander and W.J. de Groot. 2000. Physical properties of dead and downed round-wood fuels in the boreal forests of western and northern Canada. International Journal of Wildland Fire 9: 85-99.

Wein, Eleanor E.; Wein, Ross W. Predictions of global warming influences on aboriginal food use patterns in northwestern Canada. Northern Review, 1995, 14:86-94.

Nearby Community(ies): **Nearby First Nation(s):** **Key Word(s):**
boreal forest disturbance
boreal forest ecosystem
forest use

Last Name: Wolfe **First Names:** Stephen A.

Position: Research Scientist

Affiliation: Natural Resources Canada, Terrain Sciences Division

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Website: www.snowchange.org/views/indigenous/csticr.pdf

Research Focus: Permafrost response to climatic warming along the Yukon Arctic Coast.

Date(s): 1999 **Location(s):** Yukon Coastal Plain

Notes/Summary: Conducted surveys of active-layer detachments, thawslides and ice-wedge depths on the Yukon Coastal Plain in summer of 1999, to investigate evidence of impacts of warming (in particular effects of 1998 warm year) on permafrost.

Publications: S.A. Wolfe, E. Kotler and F.M. Nixon. 2000. Recent warming impacts in the Mackenzie Delta, Northwest Territories, and northern Yukon Territory coastal areas GSC Current Research, 2000-B1, 9 p.

S.A. Wolfe, E. Kotler and S.R. Dallimore. 2001. Surficial Characteristics and the Distribution of Thaw Landforms (1970-1999), Shingle Point to Kay Point, Yukon Territory GSC Open File 4115. CD-ROM.

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
	Inuvialuit	climate
		coast/marine
		permafrost

Last Name: Woo **First Names:** Ming-ko (Hok)

Position: Professor

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Research Focus: Effects of seasonal frost and permafrost on the hydrology of subarctic slopes.

Date(s): 1998 to present **Location(s):** Wolf Creek Research Basin

Notes/Summary: Ming-ko (Hok) Woo studied two slopes in the central Wolf Creek Basin to determine the effects of permafrost and seasonal frost on the hydrological process in a subarctic subalpine environment. Results show that vertical hydrological process of infiltration and evaporation prevail at the south slope, whereas the permafrost underlying the north slope prevents deep seepage so that lateral processes are also important in generating horizontal flow. This finding has applications to catchment hydrology because of the implications that the permafrost slopes are major contributors to stream flow.

Associated Researchers: Sean Carey

Related Work: Much of Dr. Woo's work is associated with the hydrology and permafrost regimes of the high Arctic.

Publications: Carey, S.K. and Woo, M.K. 2000. Within slope variability of ground heat flux, subarctic Yukon. Physical Geography 21,407-417.

Carey, S.K. and Woo, M.K. 2000. The role of soil pipes as a slope runoff mechanism, subarctic Yukon, Canada. Journal of Hydrology 233, 206-222.

Nearby Community(ies):	Nearby First Nation(s):	Key Word(s):
Whitehorse	Ta'an Kwäch'än	discharge
	Carcross-Tagish	hydrology
	Kwanlin Dün	permafrost

Last Name: Yalcin **First Names:** Kaplan B.

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E-mail: heykaplan@hotmail.com

Website: www.ccrc.sr.unh.edu/perspgs/yalcin.html

Research Focus: Development of a multi-parameter ice core record from Eclipse Icefield, St. Elias Mountains, Yukon Territory

Date(s): 1996 **Location(s):** Eclipse Icefield, Kluane National Park

Notes/Summary: Yalcin's research has focused on the development of paleoclimate records through the chemical analysis of ice cores collected from the St. Elias Mountains. His master thesis was based on the development of an ice core paleoclimate record from Eclipse Icefield in the St. Elias Mountains. In 2001, he joined an international team of researchers led by the Geological Survey of Canada on an expedition to Mt. Logan. The primary goal of the expedition was the recovery of a surface to bedrock ice core from the summit plateau of Mt. Logan. His contribution to the project involved the collection of aerosol, surface snow, and snowpit samples from King Col, an intermediate elevation site on the Logan massif. The goal of this research is to investigate the relationships between aerosol and snow chemistry at King Col and evaluate the potential of the King Col site as a future ice-coring site.

Associated Researchers: Cameron P. Wake

Publications: With Cameron P. Wake and Niels Gundestrup: The climate signal recorded in the oxygen isotope, accumulation, and major ion time-series from the Eclipse Ice Core, Yukon Territory. Annals of Glaciology 35, 416-422, 2003, in review.

With Cameron P. Wake: A century of North Pacific volcanism in an ice core from Eclipse icefield, Yukon Territory, Canada. J. Geophys. Res. 108, 2003, in review.

With Cameron P. Wake: Anthropogenic signals recorded in an ice core from Eclipse icefield, Yukon Territory, Canada. Geophysical Research Letters 28, 4487-4490, in review.

Nearby Community(ies):	**Nearby First Nation(s):**	**Key Word(s):**
Burwash Landing	Kluane	chronology
Destruction Bay		ice-cores
		Paleoclimate

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