

Biocomplexity Western Canadian Transect Reconnaissance, July 23 to July 29: Report written by Bill Gould

Objectives: Our goals were to (1) locate suitable sites in bioclimate subzones *A, B, and C* of the CAFF and CAVM subdivisions of the Arctic, (2) establish future grids for the cryoturbation study, to determine the feasibility of logistic support at these sites, and (3) make contacts in Canada to assist with logistics, to facilitate licensing and permits, and to collaborate on research at the sites. Our site selection criteria included location within the appropriate subzone, location relatively near sea level, fine grained mesic, circumneutral soils, twin otter accessibility, and potential for collaboration with additional US and Canadian scientists.

Personnel:

Dr. Skip Walker

Institute of Arctic Biology

University of Alaska Fairbanks

PO Box 757000

Fairbanks, Alaska 99775-7000

Phone: 907-474-2460, Fax: 907-474-7666, Email: ffdaw@uaf.edu

Dr. Bill Gould

International Institute of Tropical Forestry, USDA Forest Service

PO Box 25000, San Juan, Puerto Rico 00928-5000

Phone: 787-766-5335 ext. 114, , Fax: 787-766-6302, Email: wgould@fs.fed.us

Dr. Grizelle Gonzalez

International Institute of Tropical Forestry, USDA Forest Service

PO Box 25000, San Juan, Puerto Rico 00928-5000

Phone: 787-766-5335 ext. 114, , Fax: 787-766-6302, Email: ggonzalez@fs.fed.us

Activities:

July 23-24: We drove from Fairbanks to Inuvik (Fig 1. site 1, See Powerpoint slides), stopping one night in Dawson City. Relatively easy two day drive: (Fairbanks to Tok 206 miles, Tok to Dawson City (187 miles), Dawson City to Inuvik 481 miles).

July 25: Inuvik. We visited the Inuvik Research Center, the Inuvialuit Joint Secretariat headquarters, Boreal Books, Upik Tours, Town Library, and Inuvik Visitors Center. The Inuvik Research Center houses the Aurora Research Institute and the Aurora College. Both are good resources for licensing, logistics, and collaboration in research and teaching.

July 26: Tuktoyaktuk. We traveled with Aklak Air to Tuktoyaktuk (Tuk) Village (Fig. 1 site 2). It is about a 40 minute flight and crosses from boreal forest to subzone *E*, low shrub tundra. The village is accessible in summer by air and boat, there is winter road access from Inuvik. It is an Inuvialuit village of about 1000 people. They have a renewable resources office in town, a grocery store, not a lot of services. There are truck

and boat rentals available. A potential cryoturbation site could be set up near town, with either boat, four wheeler, or float plane access.

June 27: Inuvik. Unable to fly, charter company restricted from flying by federal aviation board. We had to search for an alternative carrier. We settled on North-Wright air out of Norman Wells and chartered a twin otter on wheels.

July 28: Inuvik-Mould Bay-Sachs Harbour. Left Inuvik at 10 am with North-Wright. We flew north along the Tuktoyaktuk Peninsula and on to Sachs Harbour for refueling (320 miles, 2 hrs.). The flight along the Tuk peninsula crosses treeline south of Tuktoyaktuk. Northwest of Tuk we crossed the subzone E-D boundary as the terrain shifts from rolling hills and lakes on glacial deposits to a glaciofluvial plain, numerous thaw lakes, and marine deposits. The north end of the peninsula looks like a good area for a subzone D cryoturbation site (Fig. 1, site 3) and it would be feasible to set up a site with logistics out of Inuvik and Tuktoyaktuk.

We crossed the subzone D-C boundary in the passage between the mainland and Banks Island. Sachs Harbour (Fig 1. site 4) is in subzone C. There is a manned airstrip there, an Inuvialuit village of about 150 people. We stopped only for fuel on this leg.

We continued up the west coast of Banks Island to Mould Bay (315 miles, 2 hrs), flying at an altitude of about 50 feet. We crossed the valleys of the Big River, the Egg River and the Bernard River. Nesting snow geese were very abundant in groups of 10-30 along this stretch. The vegetation looked (judging from the plane) like wet sedge meadows in numerous pond edges and depressions, probably *Dryas*, *Carex rupestris* and *Kobresia* on drier areas, *Cassiope* in snowbeds. The river channels were relatively barren gravel bars. We crossed the subzone C-B boundary in the channel north of Banks Island and landed at Mould Bay to refuel.

Mould Bay (Fig 1. site 5) is a currently unmanned weather station monitored by Environment Canada. It was manned until 1995 and there are numerous abandoned buildings and vehicles. After refueling we crossed over the center of the island and up the northwest coast. The north coast had numerous small streams, polygonal features, and bare ground or cryptogamic crusts. We investigated two abandoned airstrips near Satellite Bay (Fig. 1, site 6). The northernmost airstrip was well marked but appeared a little flooded so we landed at the southern strip. It was well-marked with barrels and in good condition. There is an abandoned metal building to the west and adjacent to the strip (15 x 20 foot, with high ceiling). We landed and set up a cryoturbation grid, placed a climate station, conducted one relevé, and collected litter samples for future use.

We returned to Mould Bay along the east coast, flying over some of the better vegetated parts of the island (subzone B - *Salix arctica*, *Luzula nivalis* and *L. confusa*). These appear to be on the north (south facing) side of the big inlets in Prince Patrick's eastern edge. At Mould Bay we examined the facilities and set up a climate station, looked for *Cassiope* in snowbeds but found none. The facilities (buildings, trucks, fuel) are potentially available through collaboration with Environment Canada.

On our return to Sachs Harbour we flew low over the central portion of Banks Island, along the Thomsen River. The Green Cabin area (Fig 1. site 7) has a good landing strip and a cabin that can be used. It might make a suitable Subzone C cryoturbation site. It is within the Aulavik National Park so additional permits would be needed there. We refueled at Sachs Harbour and slept for a few hours in rooms above the town co-op.

July 29: We placed a climate station south of the runway and flew from Sachs Harbour to Inuvik in the morning. We didn't have time to do too much reconnaissance in the Sachs Harbour area, but potentially a Subzone C site could be set up within some reasonable distance to town. This would provide a good logistics base for work at that site.

July 30-31: Return to Fairbanks.

Contacts and Resources

Inuvik

Aurora Research Institute (ARI) and Aurora College. 191 Mackenzie Road, Box 1450, Inuvik, NT X0E 0T0. Telephone: (867) 777-3298 Fax: (867) 777-4264, E-mail Contact: Director (research_ari@gov.nt.ca), <http://www.auresint.nt.ca/>

Headquarters at the Inuvik Research Center and responsible for education, outreach and licensing research in the NWT. Associated with Arctic College which offers classes to the region. Facilities include accommodation for up to 20 people, office space and a conference room; a library with computers and Internet access, four laboratories and workshop space, and; equipment storage and freezer space. Researchers may access field equipment including snowmobiles, toboggans, boats and motors and camp equipment. They have ongoing research projects in the western Canadian Arctic.

Valorie Walker, Ph.D., Director ARI. Valorie will be stepping down within a year.

Responsible for planning and providing overall direction of the Institute's activities Science Advisor for the Government of the Northwest Territories. Supervise technology development division of research. (tel) 867-777-3298, (fax) 867-777-4264.

Mike Salomons, Manager, research programs.; Mike is planning ethnobotany study to include Sachs Harbour, Tuk, Palatuk, and Holman. Interested in collaboration with TEK studies and field class. (tel) 867-777-4628, (fax) 867-777-4264, www.nwt.research.com, Mike_Salomons@gov.nt.ca.

Michelle Crossfield, License Manager. Michelle will be our first contact for licensing and permits in NWT. (tel) 867-777-3298, (fax) 867-777-4264.

Les Kutney, Senior technician. Lee handles logistics and scheduling and seems to be most aware of the logistic resources and day to day activities of the Center. (tel) 867-777-3298, (fax) 867-777-4264.

Andrew Applejohn, Manager, Inuvik Research Center. Works with educational, outreach programs. (tel) 867-777-3298, (fax) 867-777-4264.

Aurora College:

Erica Kolter, Instructor. Teaches Natural Resource Technology - wildlife, GIS courses. (tel) 867-777-7800.

Inuvialuit Corporation. Handles all kinds of business, research, resource management on Inuvialuit lands.

Norm Snow, Director, Joint Secretariat. Involved in fisheries and wildlife - overseas Environmental Impact Review Board (EIRB). (tel) 867-777-2828.

Linda Graf, Environmental Impact Review Board (EIRB), Reviews research permits for Inuvialuit owned lands. (tel) 867-777-2828.

Parks Canada (Inuvik, NWT), PO Box 1840 Inuvik NT X0E 0Y0. (tel) 867-777-3248 (fax:) 867-777-4491 Inuvik_Info@pch.gc.ca

Ron Larson, Parks employee (permits) 867-777-8817

Andrew Lawrence, Chief Park Warden, Aulavik National Park, Sachs Harbour, NT, Canada X0E 0Z0

(tel) 867-690-3904 (fax:) 867-690-4808 email: Andrew.Lawrence@pch.gc.ca

Lodging

Finto Inn, 867-777-2647. Good.

Arctic Chalet bed and breakfast, Julie and Olaf Falsnes, Box 2404 25 Carn Street, Inuvik, NT X0E 0T0. (tel) 867-777-3535, (fax) 867-777-4443.

Inuvik Research Center, has four 4-bedroom units available.

(tel) 867-777-3298, (fax) 867-777-4264.

Air charter

Aklak Air, 867-777-3555, 867-777-3388, Two twin otters (at least)

North-Wright Airways Ltd. Bag Service 2200, Norman Wells, NT X0E 0V0. Scheduled and charter services on a wide variety of single and twin engine aircraft. Canadian Connector scheduled service to Colville Lake, Fort Good Hope, Tulita, Deline, Inuvik and Yellowknife. Charter services across the north, including Nunavut, Yukon and Alaska. Mountain and off strip operations on floats, skis and tundra tires.

Administration and Aircraft Charters: (867) 587-2288.

Scheduled Flight Reservations: (867) 587-2333. Fax: (867) 587-2962. Website: www.north-wrightairways.com . Email: north-wright@nt.sympatico.ca.

Air North, 1-800-764-0407. Commercial flights - Fairbanks to Inuvik.

Tuktuyuktuk

Logistics

David Anderson, Boat and car rentals. (tel) 867-977-2626 (w), 867-977-2459 (h)

Upik tours, (tel) 867-977-2170, or 867-977-2399.

Hamlet of Tuktoyaktuk, Box 120 Tuk, NT, X0E 1C0

(tel) 867-977-2286, (fax) 867-977-2110

Sachs Harbour

Logistics

Roger and Jackie Kuptana, Bed and breakfast.

Roger Kuptana, President, Hunters and Trappers Association (HTA) for Banks Island

Other

Polar Continental Shelf Project, 867-252-3872

Sachs Harbour Weather, Brad Carpenter, 867-690-4261

Mould Bay

For access to camp contact Canadian Atmospheric and Environment Service, Jerry

McEachern, Polar Shelf Program in Resolute is the place to get started 867-252-3872.

Mr. Luke Aweski, Canadian Meteorological Service: He was the person who gave us permission to visit the camp and appears to be most knowledgeable about Mould Bay.

780-495-547

Site descriptions (See powerpoint slides for number references):

1. Inuvik: Town of 3000 Dene, Inuvialuit and nonnatives. Within the Northern Boreal forest. Mackenzie Delta to the west, rolling hills and lakes on glacial deposits to the east. Primarily black spruce with willow and alder on waterways. Extensive open lichen woodland on well drained glacial deposits. Location of Aurora Research Institute, Inuvik Research Center, Aurora College, and Inuvialuit Corporation. Staging point for reaching Tuktoyuktuk, Banks Island, and Prince Patrick Island. Air charter, lodging, banks, groceries, fuel all available.

Location: 68° 18' N Lat. 133°29' W Long.

Elevation 5 m.

MJT: 13.8 °C

MAT: -28.6 °C

2. Tuktoyuktuk village: Situated on the southern end of the Tuktoyuktuk Peninsula, within subzone E. West of Tuktoyuktuk are similar rolling hills and lakes on glacial deposits. Thaw lakes and several pingos near Tuk. Wet sedge meadows in low areas, tall and low shrub willow on mesic sites, lichen-heath vegetation on well-drained knolls.

Boat and car rentals available, Daily flights from Inuvik.

Location: 69° 27' N. Lat. 133° 02' W. Long.

El. 5 m

MJT 11.1 °C

MAT -10.5 °C

3. Northern Tuktoyuktuk Peninsula (from climate station at Nicholson Peninsula just east of Tuk Peninsula)

Location

Elevation

Bioclimatic subzone D

MJT 8.2 °C Dominant vegetation

Surficial geology Glaciofluvial plain (Wheeler et al)

Facilities (none that we know of)

4. Sachs Harbour (Ikaahuk - where you get across), Banks Island. As small Inuvialuit village of 135 people. Trying to run commercial harvest of muskox on the island. There

is an airport, commercial flights, a coop grocery store, a bed and breakfast, and rental apartment available.

Location: 71° 59' N. Lat.,

125° 14' W. Long.

Elevation

Bioclimatic subzone C

MJT 6.2 ° C

Dominant vegetation: Prostrate dwarf shrub - graminoid

Sachs Harbour climate station # 561024

5, Green Cabin Banks Island,

Location: 73° 13' 30" N. Lat., 119° 34' W. Long.

El: 50 m

Elevation

Bioclimatic subzone C

Dominant vegetation: Prostrate dwarf shrub - graminoid

Facilities - Landing strip for twin otter, small cabin, possibly climate data

6. Mould Bay, Prince Patrick Island

Location: 76° 14' N. Lat., 119° 18' W. Long.

El: 12 m

Bioclimatic subzone B

Dominant vegetation: Luzula- Salix

MJT 3.9

MAT -17.8

TDD 221

Thaw days 59

Mould Bay Climate station # 561023

7. Satellite Bay, Prince Patrick Island

Lat. Long: 77° 17' N. Lat., 116° 47' W. Long.

Elevation: 30 m.

Bioclimatic subzone A

Sandy, gravel substrate.

Vegetation: Cryptogam, cushion-forb barrens, mostly cushion-forming mosses and lichens with a few scattered vascular plants.

Facilities: air strip (twin otters)

Satellite Bay climate station # 561022

General (by Skip Walker):

The Dempster Hiway transect from Dawson City to Inuvik is probably the most beautiful highway in North America. If you ever get a chance to drive it, do it. There are three mountain ranges (two sub ranges of the Ogilvie Mountains, and Richardson

Mountains), big rivers (McKenzie, Peel, Arctic Red, Blackstone, Ogilvie, and Eagle rivers, and no pipeline to spoil the views. The road offers opportunities for studying the treeline across a large region, and forest fires in many stages of succession. Much of the route of the road follows high ridges, so there are excellent views in all directions. The route from Fairbanks to Inuvik can be driven fairly easily in two days. It is 481 miles from Dawson City to Inuvik, and the road is high-speed gravel road much like the Dalton Highway. Eagle Plains is located about half way on the Dempster Hiway and offers a good restaurant, hotel and gas. Inuvik is at the northern end of the Dempster and is a modern Canadian City with good hotels, restaurants and museums and many government offices, and many airplane and helicopter charter services. At Inuvik the logistic support facilities offered by the Aurora Institute and the many government offices make this an excellent center for working the southern part of an Arctic Transect. The aircraft support makes the extreme High Arctic very accessible from here. Conversations with **Dereck Mueller**, of the Polar Shelf Program (email Mueller@NRCan.gc.ca), following the trip, suggest that although PCSP no longer has a permanent base at Inuvik, they still coordinate a great deal of research in the western Canadian Islands, and it is still best to first contact them. They can coordinate activities with other groups and possibly save aircraft costs. He suggested contacting **Dave Maloley**, PCSP manager of logistics, email dmaloley@NRCan.gc.ca, to begin coordinating the project for next summer.

Inuvik is on the east side of the Mackenzie River, and the route from there to Tuktoyaktuk offers a good transect across the forest-tundra transition on a continuous parent material substrate (late Pleistocene glacial till). Tuktoyaktuk is in Bioclimate Subzone E with shrub tundra, and opportunities to study pingos and many periglacial landforms within easy walking or boating distance of the village. The northern portion of the Tuk Peninsula is on marine sediments and is much like the Arctic Coastal Plain with large thaw lakes, ice-wedge polygons and Subzone D vegetation. On Banks Island we saw many muskox herds and snow geese flocks, with highest concentrations around the Bernard River. The entire island except for small part in the south is in Subzone C. There are several landing strips and cabins in the Aulavik National Park offering good access to a wide array of habitats in Subzone C. We still need to find out how willing Parks Canada is accommodate research within the park boundaries and whether or not we will be able to establish grids within the park. Our preferred site would be on the Thompson River at a place called Green Cabin.

Mould Bay is in the southeast portion of Prince Patrick Island. The southeast portion of the island has many bays and has low mountains and relatively lush vegetation compared to the rest of the island. It is a good representative of Subzone B. The meteorological station there is moth-balled, but would be a good base for working the northern end of the an Arctic bioclimate transect. The camp has a big kitchen, dorm rooms, vehicles, recreation facilities, and good landing strip and fuel base. The keys are in the trucks and they would require at least batteries and tires to operate. We got to the far north end of Prince Patrick to a place called Satellite Bay, which is in Subzone A, the coldest bioclimate subzone. The site has a good Twin-Otter landing strip and a large metal building that could be cleaned out and used as a base camp. The only disappointment is that the substrate at Satellite Bay and nearly all of western and northern Prince Patrick I.

is sandy and acidic, and we may have to look to Mackenzie King Island or Isachsen on Ellif Rignes Island to find a nonacidic Subzone A site on fine-grained sediments. Satellite Bay is a very fragile landscape because of the easily disturbed sand, with cushion plant growth forms for all the mosses and lichens, and extensive cryptogamic crusts. We established Hobo air and soil temperature monitoring sites at Satellite Bay (Subzone A), Mould Bay (Subzone B), and Sachs Harbor (Subzone C). The transect is remarkably accessible from Fairbanks. We drove to Inuvik in 2 days, and did the entire transect and site selection from Inuvik to Satellite Bay in Subzones A, B, and C in a single day. We used a Twin Otter and fuel that was cached at Mould Bay.