



CANQUA

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A brief message from the newsletter editor;

Every newsletter needs a couple of basic things; contributions from the readers and an editor to put the document together and send it out. Even though submissions were requested through the Quaternary listserver, contributions were few in number and slow in coming. Many of the items that appear in this issue have already been distributed through various listservers and websites, and may not contain much new information. This is a result of immediate computer communications...we can send our message to hundreds or thousands of readers effortlessly. With this kind of rapid and efficient information distribution, perhaps we should strive for a newsletter that includes items that may not be fit for instantaneous distribution, items such as these abstracts, conference reports (including photos!), job advertisements, summaries of major research projects, or new funding sources. I am therefore asking that the readership continue to take pride in CANQUA, and to make this newsletter a true forum for new information (in English, French, or both). Submissions are always welcome. In the last issue I started a new item profiling new Quaternary-related appointees at a Canadian university. The response was so overwhelming that no-one volunteered to be profiled for this issue (hard-act-to-follow syndrome?). So I have bitten the bullet and decided to profile myself (and by default extended the scope to include government researchers), partly as an introduction to your newsletter editor, partly shameless self-promotion, and partly to continue the momentum of the idea over to the next newsletter (which is when I will really start to call in favours!)

A warm thanks to those that have contributed, and I hope others will continue to do so in the future.

Sincerely;; Stephen Robinson – Geological Survey of Canada e-mail: srobinso@NRCan.gc.ca

CANQUA 2001 preliminary announcement - Whitehorse, Yukon Technical and poster sessions August 20-24, 2001

Field trips (anticipated) August 16-20 (Klondike Goldfields), 22 (mid-conference field trips), 25-26 (Fort Selkirk sections)

Sponsoring organizations: Heritage Branch, Yukon Tourism, Yukon Geology Program

Conference chair: Jeff Hunston (867) 667-5363 Jeff.Hunston@gov.yk.ca

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Abstracts for platform and poster sessions will be due by May 31, 2001. Talks from the platform will be limited to about 15 minutes. Submissions on any aspect of Quaternary studies are welcome. A limited number of special sessions can be arranged. We anticipate some emphasis on:

- Interglacial/interstadial environments
- Paleobotany
- Fossil ice/permafrost
- Economic Quaternary geology
- Quaternary geohazards

The conference website will go on-line soon. It will include on-line abstract submission and conference registration. Reduced student fees and billeting will be available. Some activities for guests will be available. For preliminary information contact John Storer at jstorer@gov.yk.ca

NOMINATIONS FOR 2001 W.A. JOHNSTON MEDAL

The Canadian Quaternary Association seeks nominations for its highest award, the W.A. Johnston Medal. This award bestowed by CANQUA recognizes professional excellence in Quaternary research. Nominations for the award are now being accepted. Complete nomination packages must be received by the 2001 Committee Chair (see address below) before 30 APRIL 2001.

Qualifications of Nominees

Nominees for the medal must meet at least two of the following criteria:

- a) they are a Canadian citizen or a landed immigrant in Canada;
- b) they currently reside in Canada or resided in Canada for at least 10 years during their professional career;
- c) their research bears directly on Canadian studies, either through work on Canadian field sites or development of methods applied to Canadian sites;
- d) they have trained/supervised students who work or have worked in Canada on Canadian projects for extended periods of time.

A list of past awardees can be found on the CANQUA website: www.mun.ca/canqua/

Preparation of Nominations

The complete nomination package should have a total length not exceeding 20 typewritten pages.

Each nomination package must contain:

- 1) a 2-3 page letter of nomination, submitted by a CANQUA member in good standing (nominator), clearly identifying which two qualifying criteria the candidate successfully meets.
- 2) a curriculum vita for the nominee not exceeding 10 pages in length, stressing the person's contributions to Quaternary science research, teaching and community service; and
- 3) no more than four letters of reference each no longer than 2 pages in length and each containing as many signatures of support as the referee wishes.

The nomination package may also contain 1-2 pages of other supporting documentation, at the nominator's discretion.

Excluding the current President and Past President of CANQUA, all remaining executive officers can be nominators during their terms of office but cannot serve on the selection committee. Complete nomination packages must reach the W.A. Johnston Medal Committee Chair before the deadline date established for that year. Unsuccessful nominations will be held for a second term.

Mail nominations to
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8th International Paleolimnology Symposium Report

The 8th International Paleolimnology Symposium was held at Queen's University, Kingston, Ontario from August 20-24, 2000. The conference was preceded and followed by excursions, as well as a series of workshops. Conference co-chairs Drs. John Smol and Brian Cumming along with their colleagues at PEARL

(Paleoecological Environmental Assessment and Research Lab) organized and hosted this highly successful meeting. Approximately 250 paleolimnologists from all over the world attended, including delegates from every continent (except Antarctica!). It was heartening to see a significant number of researchers from Europe and Australia who were able to travel the distance in order to participate in the meetings as well as African, Asian and South American colleagues.



**Organizers Brain
Cumming and John
Smol.** credit: S. Wilson

Keynote speakers were featured each day, at the beginning of the morning and/or afternoon sessions, bringing to the forefront some of the recent developments and pressing questions of mainstream paleolimnology. In this report we present *some* of the highlights from the talks as space limitations prevent a comprehensive summary. **Dr. M. Brenner** (University of Florida) opened the meeting with a fascinating summary of late Pleistocene/Holocene environments of the Yucatán Peninsula. Based on paleolimnological reconstructions, he and his colleagues tracked agricultural land clearance practices resulting in deforestation and soil erosion and demonstrated how the 9th century decimation of the Mayan civilization could be strongly attributed to drought during that period. **Dr. D. Livingstone** (Duke University) instigated much discussion when he challenged paleolimnologists to strive to achieve a better understanding of coring. He emphasized that intermittent sampling can occur if variations in sediment shear strength are encountered along the sediment sequence during coring, resulting in faulty paleoenvironmental interpretations. In his keynote lecture entitled, "Let's clean up our act" he warned the audience that it was all too easy to become complacent and to accept current practices in paleolimnological coring procedures. A better understanding of core tube length : inner diameter as well as a minimization of the tube thickness helps define the maximum core length retrievable with minimum distortion or coring artifacts. Significant improvements could be attained by using larger diameter core

barrels and ensuring that the length of drive and the length of retrieved core were comparable. **Dr. Patrick De Deckker** (The Australian National University) gave an insightful comparative overview of the state of paleolimnology and paleoceanography. Despite similar scientific objectives towards global paleoenvironmental reconstruction, very little collaboration exists between these two research fields. Each uses different techniques to process and analyse cores and they also rely on very different proxies, yet important lessons can be gained from both. He encouraged the use of proxies that can be compared between oceanic and limnological settings, as well as exchange of technologies and more collaboration. The syntheses provided by the PEP (Pole Equator Pole) studies are timely and he further expanded on the directions that future research should follow. For example, oceanographers have long overcome the challenge of retrieval of long cores from deep waters, however long core retrieval from deep inland lakes has been rare, e.g., Lake Biwa, Japan. **Dr. W. Dean** (USGS) gave a highly informative and entertaining keynote presentation on the recent development of GLAD800 (Global Lake Drilling to 800 meters). Funded by the International Continental Scientific Drilling Program (ICDP) this modular floating platform enables retrieval of long cores in up to 200 m of water. A short "on the scene" video showed the eight, 20 foot long sea/land shipping containers which form the barge supporting the drill rig, as well as some footage of the inaugural core retrieval on Great Salt Lake. Portable laboratory and cold storage facilities on shore allow for the immediate subsampling of core sections as they are retrieved. The modular design of the barge allows for the relatively easy deployment of the system on different continents and indeed future coring assignments are planned for Lake Titicaca and elsewhere. The potential for estuarine and coastal regions is also great.

The final two keynote speakers addressed the importance of multiproxy studies. **Dr. A. Lotter** (University of Bern) described the potential and limits of quantitative inference models in multi-proxy climate reconstructions. Several strong climate inference models (primarily for summer temperature) have now been developed using terrestrial and aquatic proxies (e.g. chironomids, diatoms, cladocera and chrysophyte cysts), however very few downcore applications have been presented so far. Furthermore, few studies have undertaken a multiproxy approach, which provides a better assessment of climate reconstructions. Using examples of multi-proxy reconstructions of late-glacial and Holocene summer temperatures from Swiss lakes, he stressed the importance of looking at the ecotonal boundaries of individual biota as well as sample specific errors. **Dr. H.J.B. Birks** (University of Bergen & University College London) began by identifying the difficult challenges that multiproxy paleolimnological studies present. Although the advantages include a more detailed,

holistic view and an increase in the degrees of freedom in interpretations, they are also time-consuming and researchers are often faced with "too much data". Various proxies have different strengths and weaknesses that need to be identified and the storage and interpretation of the data is a major challenge. Project design can bypass disadvantages such as core correlation by using long, wide diameter corers, which allow for multiproxy measurements to be conducted on the same core. The increased advantages are compelling and the value of multiproxy projects was certainly well established by these last two keynote speakers.

The conference was organized to maximize the number of oral presentations while maintaining sufficient time for discussion throughout the day. Given the number of participants and the limited time, two concurrent oral sessions were held. The main session themes included: Alpine, Arctic and Antarctic; Climate; Lake Management; New Developments; Rivers and Reservoirs; and Tropical and Subtropical. For those interested in attending talks in both sessions, quick room changes could be effected as the two lecture halls were closely situated.

Three formal poster sessions were scheduled throughout the meeting, during which the 108 posters could be viewed and discussed with authors. Posters were organized in parallel groups to the oral presentation themes: Arctic (11 presentations), Alpine (14), Climate (24), Lake Management (17), New Developments (27), Rivers and Reservoirs (4) and Tropical and Subtropical (11). Posters were displayed in the central atrium of the Biosciences complex for the duration of the meeting. Given that this was also the venue for coffee breaks, lunches and a late afternoon cash bar, it ensured that posters received a great deal of attention outside the formal sessions. Many fruitful discussions were thus instigated in an informal setting.

Social and informative outings were also organized to complement the symposium. For the most part, the weather held out and provided sunny, cool days on the beautiful limestone campus of Queen's University. Most lunches and dinners were included in the cost of registration and the organizers did their best to ensure that delicious food was served in beautiful settings. An outdoor barbeque held in the courtyard of Ban Righ Hall helped many people relax after the first day of meetings. The banquet meal was eaten in a bright and airy dining hall, to the accompaniment of a gifted classical guitarist. Even the coffee breaks were catered with freshly baked goodies, so that by the end of the meeting many people were loosening their belts. We had cake and icing too!

A pre-conference fieldtrip, led by Dr. Brian Cumming took an interested group of researchers to the Adirondacks to visit the famous New York State lakes of the renowned PIRLA I and II (Paleoecological Assessment of Recent Lake Acidification) projects. Approximately 15 people participated in the opportunity to explore and hike through this high peaks region of Eastern North America. A post-conference excursion throughout Southern Ontario was led by Dr. John Smol and colleagues at PEARL. The busload of participants visited historic sites of the region, e.g., Old Fort Henry and Upper Canada Village before stopping to explore parts of the St. Lawrence River, Cooper Marsh and the Queen's University biological station at Lake Opinicon where several eutrophication related studies have been conducted. Other stops included the meromictic Little Round Lake, as well as an "onsite lecture" by Dr. W. Vreeken (Queen's University) on marl deposition in Southern Ontario Lakes.



Very few paleolimnologists will ever give up a chance to talk about mud and their particular branch of science. Therefore many took this opportunity to organize mini-symposia and workshops while so many of their colleagues were gathered together. The Arctic-Antarctic Diatom Symposium held their 9th informal two-day meeting before the Paleolimnology Symposium began. Organized to ensure taxonomic consistency amongst diatomists, a group of about 20

people gathered to compare and discuss their high latitude diatom assemblages. Presentations by Paul Hamilton (Canadian Museum of Nature) and Hedy Kling (Freshwater Institute, Winnipeg) brought the group up to date on some of the taxonomic advances and characteristics of problem genera such as *Achnanthes*, *Aulacoseira* and *Cyclotella*. Similarly a two-day chironomid (aka dead midges) workshop was held. Other workshops were organized during a free afternoon provided mid-week. During this time the second part of the chironomid workshop was held. Approximately 28 people were in attendance for the first unofficial international dead midges workshop. Suffice it to say that interest in chironomid paleoecology has more than quadrupled in recent years! The workshop was hosted by Dr. Ian Walker of Okanagan University College, Kelowna, and Roberto Quinlan, a Ph.D student at PEARL. The first session (prior to the conference) consisted of a discussion and first-hand viewing of laboratory techniques such as sediment preparation, sieving, sorting and mounting of headcapsules. It was interesting to hear of the diversity of techniques, instruments and mounting media that researchers are using, particularly our European colleagues, and to get some insights on what methods work well. The second session focused on taxonomy, with Steve Brooks (Natural History Museum, London) giving an overview of his new taxonomic guide for the Tanypodinae, soon to be published in Journal of Paleolimnology. Other discussions centered on the difficult Tanytarsini tribe, and attempts were made to identify headcapsule features that might enable us to distinguish the different genera in this group. Anyone interested in learning more about chironomids and their use in paleoecology can visit the chironomid home page at <http://www.ouc.bc.ca/eesc/iwalker/intpanis/>

Dr. W. Last provided the following synopsis on the Lake Baikal workshop. Dr. Mike Sturm (EWAG, Dubendorf, Switzerland) convened a most successful 2 hr Lake Baikal Workshop on Wednesday afternoon. After a brief summary of the status of past limnogeological and paleolimnological research on this important lake by Dr. Sturm, the 20-25 participants heard progress reports from several of the key investigators involved in a new international collaborative coring and analytical program. Dr. Hedi Oberhansli (GeoForschungs Zentrum, Potsdam, Germany) summarized the on-going lithostratigraphic and biostratigraphic research of the new EU coring project, highlighting many of the emerging high-resolution proxy databases. This cooperative project involves researchers from Belgium, Germany, Poland, Switzerland, UK, and United States. Dr. Anson Mackay (ECRC, University College London, UK) provided a glimpse at the diatom stratigraphy and summarized some of the concepts involved in reconstructing the relatively recent climatic signals in the basin. Dr. Kenji Kashiwaya (Kanazawa Univeristy, Japan) provided a detailed overview of the Japanese efforts on the lake in the vicinity of the Academician Ridge and highlighted the cyclical fluctuations that are apparent in the past 250k yr record. All presentations were informal which afforded excellent exchange of ideas and provided the participants the opportunity to pose questions and discuss the material.

Dr. R. Battarbee briefed all interested persons on the relatively new PAGES (Past Global Changes) initiative called LIMPACS (Human Impact on Lake Ecosystems). Instigated 18 months ago, LIMPACS is based on process-based working groups which combine neolimnology, paleolimnology and modeling in order to better understand anthropogenic impacts. The steering committee met in Windermere, UK in January 2000 and a science plan is to be published shortly. Additional information on this effort can be found at www/geog/ucl.ac.uk/ecrc/limpacs/limpacs.htm.

Many people have made important contributions to the field of paleolimnology, and during the meetings we were very fortunate to be able to spend an afternoon with Dr. S. R. Brown. Emeritus Professor at Queen's University, Ted Brown is responsible for having injected the paleolimnological serum into John Smol and Peter Leavitt amongst others. We have all witnessed the result of that inoculation. Many people took the opportunity to chat with Ted and to remember many shared coring and research experiences.

While there was ample opportunity to enjoy each other's company during the meeting and to catch up on the latest news about colleagues who had not been able to attend these meetings, we also took a moment during the opening of the conference, to remember those colleagues of ours who had died since the last meeting and who were with us in memory. These include: Drs. Frode Berge, Thomas Edmondson and Julian Szeicz. They made important contributions to the science of paleolimnology and they are sorely missed by all.

The International Paleolimnology Symposium was originally held every fourth year; however, a decision to move to every three years was made during the previous meetings (7th International Paleolimnology Symposium) in Germany. During the final business meeting, participants of the 8th symposium voted to accept

the invitation made by Drs. V-P. Salonen and A. Korhola to hold the next Paleolimnology Symposium in Helsinki, Finland, in 2003.

In conclusion, the 8th International Paleolimnological Symposium was a huge success. Not only were so many paleolimnologists, aka mud lovers, able to attend, but the quality of all presentations and posters was extremely high. Abstracts of the oral and poster presentations can be viewed online at the Journal of Paleolimnology web page: <http://biology.queensu.ca/~pearl/paleo2000.htm>. On behalf of all participants, we'd like to take this opportunity to thank all members of PEARL for their great efforts in coordinating such a highly organized meeting. Thanks to all those who presented their data and participated in the meetings. We all learned something and we all had a good time doing so. Thanks very much.

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Abstracts from recently completed theses

Mazzucchi, D., 2000. Holocene environmental reconstruction of the Cassiar Region, northwestern British Columbia. M.Sc. Thesis, Department of Geography, Queen's University, Kingston. Supervisor: R. Gilbert.

Pollen, macrofossils, charcoal and lake sediments reveal environmental and vegetation changes throughout the Holocene in northwestern British Columbia. Pyroclastic ejecta of uncertain origin and radiometric dating from three sediment cores are used to develop a chronology of high magnitude rainstorm events and paleovegetation for the Pyramid Lake basin in the Cassiar Mountain region since deglaciation at 9700 BP ± 200. Physical analysis allows the identification of 15 distinct, predominantly minerogenic laminae that represent terrestrially derived material delivered to the lake by runoff events. The frequency of minerogenic lamina deposition, and by analogy of storms, has changed throughout the Holocene. The recurrence interval of layers averages 630 years with the most frequent rainstorm events occurring between 4400 and 5100 BP. During this period, the pollen record suggests that white spruce (*Picea glauca*) may have colonized near the lake, although mature forest did not develop at the lake at any point during the Holocene. The macrofossil record indicates that subalpine fir (*Abies lasiocarpa*) has been present, likely as krummholz, above the elevation of the lake since at least 9400 BP. Pollen of exotic western hemlock (*Tsuga heterophylla*) is represented from ca. 1500 BP to present and may be a consequence of changes in regional air mass circulation patterns. The Pyramid Lake record illustrates the utility of alpine lake sediments as a proxy for estimating past rainstorm frequency and climate change.

Silis, A.B., 1999. A paleoenvironmental interpretation of glacial Lake Algonquin lagoonal sediments, southwestern Ontario, using ostracodes. M.Sc. Thesis, Department of Earth Sciences, University of Waterloo, 215 p., Supervisor: P. F. Karrow.

Glacial Lake Algonquin existed (11300 to 10500 y BP) in the present Lake Superior, Lake Michigan and Georgian Bay basins. Ostracodes in lagoonal sediments that formed in embayments of Lake Algonquin were studied at Eighteen Mile River, Kincardine, Underwood Creek, and Mill Creek near Lake Huron and Bighead River and Clarksburg sites near Georgian Bay. Paleoenvironmental reconstructions of these lagoons were made using ostracode identification and the Delorme autoecological based paleointerpretive model.

Four paleoenvironmental zones were identified at the study sites. The first phase, seen at all sites, represents a deltaic type environment. At the Underwood Creek, Mill Creek, Bighead River and Clarksburg sites a second phase indicates the water body became shallower after the previous deltaic phase. This is followed by a zone indicating deepening water conditions. The deepest water and final phase is found in all of the sites studied.

Johnston, J.W., 1999. Sedimentology and depositional history of the Wasaga Beach and Ipperwash areas. M.Sc. Thesis, Department of Earth Sciences, University of Waterloo, 202 p., Supervisor: P. F. Karrow.

The geological history and sedimentology of the best preserved and developed beach-barrier complexes in the Lake Huron basin at Ipperwash (southeast Lake Huron) and Wasaga Beach (southeast Georgian Bay) in Ontario were studied. Riverbank exposures, profile surveys, hand and piston coring, ground penetrating radar, grain size, carbonate, and pebble lithology analyses were used to interpret glacial and coastal environments.

Sediments were environmentally classified as glacial (Newmarket and Kettleby tills at Wasaga), beach barrier (gravelly to silty sands), bar-enclosed lagoonal (sand, peat, marl), beach ridge-swale (sand and gravel), and aeolian parabolic dunes (sand). Former late Holocene lake levels of ancestral Lake Huron were distinguished by the subsurface contact of foreshore sands over upper shoreface sands. Isostatic rebound was more strongly recorded at Wasaga Beach, with more marked stream incision and a +7m difference in Nipissing elevations, but both complexes include 40 to 44 individual beach ridges formed from short-term fluctuations in water levels.

Clegg, Y., 1999. Historical inventory of sedimentary carbon and metals in a Bay of Fundy salt marsh. M.Sc. Thesis, Department of Geography, McGill University. Supervisor: G. Chmura.

In 1996, four cores (~30 cm depth) were extracted from the high marsh zone of Dipper Harbour salt marsh in the Bay of Fundy. Soil bulk densities are shown to be controlled by mineral density and are higher than those reported for salt marshes in the northeastern United States. Examination of variations in mineral content suggests that regular tidal action and ice rafting deposits the majority of the mineral sediment to the high marsh zone. Dating techniques (based upon pollen, ^{137}Cs , ^{210}Pb and total Pb) were applied to selected cores, suggesting accretion rates from 0.25 to 0.31 cm yr⁻¹ which are higher than the rates of local relative sea level rise. Correlation of trace metal densities (Cu, Fe, Pb and Zn) to Al densities were used to justify Al normalization. After consideration of natural sources and adsorption factors, the normalized Pb profiles are shown to reflect historical pollution levels of leaded gasoline consumption. Carbon storage values in the upper 25 cm of sediment range from 7.3 - 10.5 kg C m⁻² and carbon accumulation rates vary from 95 to 124 g C m⁻² yr⁻¹, representing 15 - 29% of the salt marsh macrophyte productivity.

En 1996, quatre carottes (~30 cm de profondeur) ont été extraites de la zone du haut-marais du marais salant de Dipper Harbour, dans la Baie de Fundy. La densité de masse des sédiments est contrôlée par la densité du contenu minéral et s'avère plus élevée que les valeurs des marais salants du nord-est des États-Unis. L'étude des variations du contenu minéral suggère que l'action normale de la marée et les radeaux de glace déposent la plupart de la matière minérale dans la zone du haut-marais. Différentes techniques de datation (i.e., pollen, ^{137}Cs , ^{210}Pb et Pb total) ont été appliquées à certaines carottes, donnant des taux d'accrétion de 0,25 à 0,31 cm an⁻¹ qui sont plus élevées que l'élévation locale du niveau marin relatif. Les corrélations entre les densités des métaux (Cu, Fe, Pb et Zn) avec les densités de Al justifient l'utilisation de la normalisation avec Al. Après avoir considéré les sources naturelles et les facteurs d'adsorption, les contours du Pb normalisés reflètent l'évolution du niveau de consommation de l'essence au plomb. Les valeurs de carbone retenues dans les premiers 25 cm de sédiment varient de 7,3 - 10,5 kg C m⁻² et les taux d'accumulation du carbone varient de 95 à 124 g C m⁻² an⁻¹, cela représente 15 - 29% de la production des plantes du marais salant.

Sheppard, K., 2000. Stratigraphy and chronology of deglacial events at highlands, southern St. George's Bay, southwest Newfoundland. M.Sc. thesis, Department of Geography, Memorial University of Newfoundland. Supervisor: T. Bell.

This thesis describes and interprets the sedimentology, geomorphology, and chronology of Quaternary deposits at Highlands, southern St. George's Bay, southwest Newfoundland. These deposits are critical in

understanding the glacial and deglacial history of the region, and whether retreat was interrupted by a climatic reversal causing a readvance at ~12.6 ka BP across the lowlands around St. George's Bay.

The physiography of the Highlands area consists of a low-relief coastal plain backed to the east and south by the Long Range and Anguille mountains, respectively. The coastal plain is dominated by gravel near the coast, with till outcropping farther inland. The uplands are dominated by bedrock interspersed with till veneer. Late Wisconsinan ice, originating on the southern Long Range Mountains, covered the entire area and extended to a terminal position offshore in St. George's Bay. Striations and clast fabrics indicate that ice flow was generally west-northwestward and unconfined by topography. Deglacial ice flow was affected by topographic highs becoming diverted southwestward down Codroy Valley and south of Bald Mountain.

Retreat of ice across the lowlands occurred in a tidewater environment. Sediments exposed in the coastal sections relate to this retreat and were mostly deposited near the grounding-line on a subaqueous fan, as sediment and meltwater entered the sea via a subglacial jet. Two distinct sedimentary sequences relating to the surface topography occur along the coast. The coast is dominated by planar surfaces at 18 to 20 m asl and 24 to 26 m asl, interrupted by the Highlands ridge ranging from 34 m asl at the coast, to >60 m asl inland. Exposures through the planar surfaces consist generally of bedrock, overlain successively by diamicton, mud, sand, gravel, and sand and silt. These represent a deglacial sequence from subglacial and proglacial deposition of the diamicton; to glaciomarine sedimentation of the mud and sand; and glaciofluvial/fluvial deposition of the gravel on outwash terraces. Sand and silt capping the coastal sections are interpreted as aeolian deposits.

Exposures through where Highlands ridge intersects the coast (Highlands section) consist of mud, overlain sequentially by sand and gravel; diamicton; gravel and gravelly sand; and sand and silt. This section represents the more proximal part of the grounding-line fan. Diamicton forms a continuous unit along the top of the Highlands section, grading laterally from structureless to stratified, and has characteristics of subglacial, proglacial, sediment gravity flow, and rainout depositional processes. At one site, a fossiliferous diamicton is interpreted to be deposited by a combination of sediment gravity flows, suspension settling from meltwater plumes and ice rafting, and traction currents. A radiocarbon date of $13\,680 \pm 90$ BP (Beta-120124) on paired shells from this diamicton is interpreted to represent the date of its emplacement. This date lies within the range of all other dates (~13.1 to 14 ka BP) on marine organisms from sediments along the coast of southern St. George's Bay, and suggests that deposition of the diamicton was contemporaneous with sedimentation in all areas along the coast. Evidence to support a climatically induced readvance at ~12.6 ka BP was not found.

Robinson, S.D., 2000. Carbon accumulation in discontinuously frozen peatlands, southwestern Northwest Territories, Canada. PhD Thesis, Department of Geography, McGill University, 148 pages. Supervisor: T. R. Moore.

Rates of carbon and peat accumulation were studied in a series of peat landforms within discontinuously frozen peatlands near Fort Simpson, Northwest Territories. An extended distribution of the White River volcanic ash layer was used as a chronostratigraphic horizon to ensure a consistent time span of peat deposition among peat cores and to allow a large core sample size without the expense of radiocarbon dating. *Apparent recent* carbon accumulation rates measured over the past 1200 years were not significantly different among rich fen, peat plateau, and collapse fen (means 13 - 14 g C m⁻² yr⁻¹). Poor fen and bog mean accumulation rates were 20 - 22 g C m⁻² yr⁻¹ and were not significantly different from each other. Microtopography and water table position appear to be important controls on both carbon and vertical peat accumulation rates. A regional survey incorporating measurements from other parts of the southwestern Northwest Territories and the southeastern Yukon shows rates similar to those near Fort Simpson.

The aggradation of permafrost results in 50 and 65% decreases in carbon and vertical peat accumulation rates, respectively. Carbon and peat accumulation continue to decrease significantly with both increasing permafrost maturity and the number of ground fires. The internal degradation of permafrost results in nearly a doubling in carbon accumulation rates, yet permafrost degradation at the margins of a peat plateau results in carbon accumulation rates similar to the peat plateau.

Clymo's (1984) carbon accumulation model was applied to cores from each landform in addition to a core spanning the entire developmental history of the peatland. Results indicate that *true* carbon accumulation and sequestration efficiency rates in ombrotrophic peatlands are lower in the upper Mackenzie Valley than for other boreal regions, primarily owing to high decomposition rates. The cessation of carbon accumulation is being approached. The model also serves to highlight the dangers of using *apparent* and *true* carbon accumulation rates interchangeably.

Apparent and true carbon accumulation rates are significantly lower than published rates from other parts of northern Canada, Finland, and the Former Soviet Union. Low and variable summer precipitation in the region may be a significant factor through increased aerobic decomposition and/or decreased plant production caused by moisture stress.

Des taux de carbone et d'accumulation de tourbes ont été étudiés pour une série de formes de tourbières au sein de tourbières gelées discontinues près de Fort Simpson, dans les Territoires du Nord-Ouest. La couche de cendres volcaniques White River a été utilisée comme marqueur chronostratigraphique afin d'assurer une durée consistante de la déposition de la tourbe à travers les carottes de tourbe, et de permettre le carottage à grand diamètre sans les coûts associés à la datation au carbone radioactif. Des récents taux d'accumulation de carbone apparents mesurés au cours des 1200 dernières années n'ont pas montré de différences significatives entre les riches tourbières minérotrophes, les plateaux de tourbières, et les tourbières minérotrophes effondrées (moyenne : 13 - 14 g.C m⁻².année⁻¹). Des taux d'accumulation moyens pour des tourbières minérotrophes faibles en éléments nutritifs et pour des tourbières ombrotrophes étaient de 20 - 22 g.C.m⁻².année⁻¹, et ne montraient pas de différences significatives entre eux. La microtopographie et la position de nappe phréatique semblent être des facteurs importants sur le contrôle du taux d'accumulation de carbone et du taux d'accumulation vertical de la tourbe. Un levé régional incorporant des mesures venant d'autres secteurs du sud-ouest des Territoires du Nord-Ouest et du sud-est du Yukon montre des taux similaires à ceux mesurés près de Fort Simpson.

Le développement du pergélisol résulte en une perte de respectivement de 50% du taux d'accumulation du carbone et de 65% du taux vertical d'accumulation de la tourbe. L'accumulation du carbone et de la tourbe continue à décroître de façon significative avec à la fois une augmentation de la maturité du pergélisol et une augmentation du nombre de feux de sol. La dégradation interne du pergélisol résulte pratiquement au doublement des taux d'accumulation du carbone. De plus, la dégradation du pergélisol en bordure des plateaux de tourbières conduit à l'obtention de taux d'accumulation de carbone similaires à ceux trouvés sur les plateaux de tourbières.

Le modèle d'accumulation du carbone de Clymo (1984) a été appliqué aux carottes provenant de chacune des formes de tourbières. Les résultats indiquent que l'accumulation *vraie* de carbone et les taux d'efficacité d'emprisonnement dans des tourbières ombrotrophes mesurés dans la haute vallée du Mackenzie sont inférieurs à ceux des autres régions boréales. Ceci est essentiellement dû aux taux élevés de décomposition, puisque l'accumulation du taux de carbone arrive à sa fin. Le modèle sert également à mettre en lumière les dangers de l'utilisation de l'un ou l'autre des taux d'accumulation *apparent* et *vrai*.

Les taux d'accumulation du carbone *apparent* et *vrai* sont inférieurs aux taux publiés provenant d'autres régions du Canada nordique, de Finlande, et de l'ancienne Union des Républiques Soviétiques. Des précipitations estivales variables et faibles dans la région de la haute vallée du Mackenzie peuvent être un facteur significatif à l'augmentation de la décomposition aérobique et/ou à la baisse de la production de plantes causée par des contraintes d'humidité.

Stuart, A.J., 1999. The Quaternary geology and paleoindian history of the Sibley Peninsula, Thunder Bay, Ontario. M.Sc. Thesis, Department of Earth Sciences, University of Waterloo, 256 p., Supervisor: P. F. Karrow.

The Sibley Peninsula near Thunder Bay, Ontario, is a rugged cuesta of metasedimentary rock facies capped by diabase sills and glacial drift. The topography consists of mesas, scarp-bounded fault valleys rich in raised shorelines, and thin discontinuous till plains. The peninsula was glaciated at least twice by Superior Lobe ice moving southwest from the Patrician sector of the Laurentide ice sheet. Evidence of the first advance, which culminated around 11,000 B.P. is limited to lake basin scours, stoss and lee topography, and striae which show the ice advanced between 246°N and 265°N. Marquette ice readvanced across the peninsula between 223°N and 243°N at 9,900 B.P. Deltaic features and a recessional moraine (Sibley Moraine) indicate that by 9,700 B.P. the melting of Marquette ice slowed as it withdrew eastwards from the Peninsula. Coeval to the ice retreat, raised shorelines belonging to proglacial Lake Beaver Bay indicate that all but the highest areas on the peninsula would have been flooded. Despite favourable conditions, palaeoindians probably did not settle on the Sibley Peninsula until ice had retreated completely from it, sometime prior to 9,500 B.P. during the Lake Minong phase of Lake Superior.

Mate, D.J., 2000. Quaternary Geology, Stratigraphy and Applied Geomorphology in the Southern Nechako Plateau, Central British Columbia. M.Sc. thesis, School of Earth and Ocean Science, University of Victoria. Supervisor: V. Levson.

Erosion along the Nechako Reservoir and Cheslatta River Spillway has resulted in unusually well exposed Quaternary and Holocene stratigraphy. Surficial sediments in the study area are mostly products of Late Wisconsinan Glaciation. New evidence for pre-late Wisconsinan sedimentation has been found in a section along the shores of the Nechako Reservoir. Till of an older glaciation and organic bearing, blue-grey, lacustrine sediments of probable Middle Wisconsinan age underlies younger sediments deposited during the Fraser Glaciation. Pleistocene sediments deposited in front of the ice margin were overridden during ice advance and are locally preserved in the largest valleys.

Till is the most common Pleistocene sediment covering approximately 80% of the area mainly as blankets greater than 1 metre thick. Large areas of exposed bedrock are rare. Holocene bogs and swamps are common in low-lying areas between streamlined ridges. Fluvial and glaciofluvial deposits occur mainly along the Cheslatta River valley. The distribution of advance-phase glaciolacustrine sediments and associated deltaic deposits has shown that advance-phase lakes occurred at least up to several metres above the modern reservoir level (approximately 855 m).

Stratigraphic and geomorphic studies were conducted at several slope failures within the study area. Translational landslides are common along the shoreline of the Nechako Reservoir, in particular, Chelasie Arm. They are approximately 15-50 m wide and usually extend 15-30 m up slope. Typically, these slides occur on southwest facing shorelines, consist of numerous small slump blocks and have main scarps less than a metre high. Slope movements in this area are smaller and have shallower rupture surfaces than those along the Cheslatta River.

Two active complex rotational-earthflow landslides were discovered along a portion of the Cheslatta River that extends from a spillway at Ootsa Lake to Cheslatta Lake. Longitudinal profiles and detailed field observations were recorded at both slope movements. Slump 1 was approximately 34 m wide, 14 m high, has a 6 m high main scarp and one slump block. Slump 2 was approximately 230 m wide, 24 m high, had a 3 m high main scarp and three separate slump blocks. Both have amphitheatre shaped main scarps, some backward-tilted slump blocks, and earthflows and slickenside surfaces at their base. A small sag pond was also found at slump 2.

Several factors are responsible for translational slope movements. They include removal of lateral support by wave erosion at the base of shoreline slopes and shoreline aspect; slides commonly occur in areas exposed to the dominant wind direction and water level fluctuations. It is interpreted that the dominant controlling factors for complex rotational-earthflow landslides are fluvial erosion and the presence of clay-rich glaciolacustrine sediments within the stratigraphic sequence. Wherever the dominant sediment type is till, competent shoreline bluffs and river banks occur. Conversely, unstable areas seem to be associated, at least partly, with clay-rich glaciolacustrine material.

Crag-and-tails, flutings, and drumlinoid ridges with a generally consistent northeast trend are the dominant landforms in the study area. Most stoss-ends of these forms consist of bedrock knobs, while ridges of till occur down-ice. Crescent and comma shaped erosional depressions wrap around these forms and are often filled with bogs or standing water. They often combine to form large troughs oriented transverse to subglacial flow. It is concluded that these depressions are formed by subglacial meltwater floods. These floods have enhanced the preexisting subglacial topography and their progressive channelization is believed to have formed tunnel valleys within the region. These valleys are 1-2 km wide, flat-floored, steep sided and contain misfit streams and eskers in their bottoms.

Robinson, C.A., 1998. An Evaluation of Factors Affecting Sea Level Variation in Hudson Bay. M.Sc. thesis, Department of Geography, University of Toronto – Erindale. Supervisor: W.A. Gough.

Hudson and James Bay form the world's largest inland sea. The tide gauge record of Churchill, MB has been used in studies of sea level variability, isostatic readjustment, and global climate change. Factors such as precipitation, runoff, and thermal expansion which contribute to sea level variation in Hudson and James Bay are evaluated using methods of statistical correlation, correlation matrices, and other quantitative methods. Local discharge from the Churchill River is found to be correlated with the Churchill tide gauge record with an

explained variation of 43%. A two level one-dimensional model is used to calculate values for thermal expansion. The results are combined to create a water balance for the Bays. Seasonal sea level variation in Hudson Bay seems primarily due to the actions of annual spring discharge and late summer thermal expansion.

Couture, N., 2000. Sensitivity of permafrost terrain in a high Arctic polar desert: an evaluation of ground ice conditions near Eureka, Ellesmere Island, Nunavut. M.Sc. thesis, Department of Geography, McGill University. Supervisor: W. Pollard.

A first approximation of ground ice volume for the area surrounding Eureka, Nunavut, indicates that it comprises 30.8% of the upper 5.9 m of permafrost. Volume depends on the type of ice examined, ranging from 1.8 to 69.0% in different regions of the study area. Excess ice makes up 17.7% of the total volume of frozen materials in the study area. Melt of ground ice in the past has produced thermokarst features which include ground subsidence of up to 3.2 m, formation of tundra ponds, degradation of ice wedges, thaw slumps greater than 50 m across, gullying, and numerous active layer detachment slides. With a doubling of atmospheric carbon dioxide, the rise in mean annual temperatures for the area is projected to be 4.9 to 6.6°C, which would lengthen the thaw season and increase thaw depths by up to 70 cm. The expected geomorphic changes to the landscape are discussed.

Pour la région avoisinante Eureka au Nunavut, une première approximation du volume de glace au sol révèle une proportion de 30.8% dans les 5.9 premiers mètres du pergélisol. Le volume de glace dépend du type de glace examiné et varie de 1.8 à 69.0%. La glace en excès constitue 17.7% du volume total de matériel glacé. La fonte de la glace au sol dans le passé a permis l'affaissement du sol jusqu'à 3.2 mètres, la formation de lacs thermokarstiques, la dégradation des fentes de gel, des glissements régressifs dûs au gel de plus de 50 mètres, des ravinements, et plusieurs décollements de la couche active. Avec l'accroissement du dioxyde de carbone dans l'atmosphère, les prévisions indiquent une augmentation potentielle de la température moyenne annuelle de 4.9 à 6.6°C pour la région étudiée. Cette hausse de la température allongerait la saison de dégel et augmenterait les profondeurs de dégel à près de 70 cm. Les changements géomorphologiques attendus au paysage sont discutés.

Snippets submitted by our members or readers.....or compiled from the internet

A new publications of Quaternary interest....

Geological Society Special Publication no. 176
Deformation of Glacial Materials. Edited by A. J. Maltman, B. Hubbard and M. J.

ISBN 1-86239-72-X, November 2000, Hardback, 352 pages, List price: £79.00 / US\$132.00

Readership:

Quaternary Geologists, glaciologists, glacial geomorphologists, structural geologists, sedimentologists, engineering geologists, final year undergraduates and Masters levels.

The flow of glacier ice can produce structures that are striking and beautiful. Associated sediments, too, can develop spectacular deformation structures, and examples are remarkably well preserved in Quaternary deposits. Although such features have long been recognized, they are now the subject of new attention from glaciologists and glacial geologists.

This collection of papers addresses how the methods for unravelling deformation structures evolved in recent years by structural geologists can be used for glacial materials, and the opportunities offered to structural geologists by glacial materials for studying deformation in rocks. There are authoritative reviews by leading scientists with a global coverage.

Order direct from the Geological Society Publishing House or through our internet bookshop: <http://bookshop.geolsoc.org.uk> Unit 7, Brassmill Enterprise Centre, Brassmill Lane, Bath, BA1 3JN. Tel: 0044 1225 445046. Fax: 0044 1225 442836. Sales Queries to Dawn Angel (dawn.angel@geolsoc.org.uk)

AUSTRALIAN QUATERNARY ASSOCIATION

Biennial Conference

5 February – 9 February 2001

Southcombe Lodge, Port Fairy, Victoria

<http://www.arts.monash.edu.au/ges/research/conference.html>

Information and Registration Form can be found on the conference web site. Registration forms must be returned by 1st DECEMBER 2000. Contributions from all areas of Quaternary studies are sought for oral or poster presentations. In view of the location of the conference, papers on Quaternary history of the Western Plains are particularly welcome. The theme of the QRA Annual Discussion Meeting in January 2001 is the use of modern analogues for reconstructing past environments.

If you or some of your colleagues are currently doing any research which may come under this topic I would be interested in hearing about it, and possibly including a presentation at this meeting. The areas we are interested in are for example use of studies of modern processes or distributions for reconstruction of past events at sites, including the problems and practicalities, possibly with an overview on how the use of this data has changed since the turn of the century. If you feel able to contribute to this meeting I would be grateful for a provisional title.

The programme to date includes cave sediments, glacial landscapes, pollen studies, sea levels, the use of transfer functions, cold climate experiments, dating techniques, but we are keen to encourage wide participation and would welcome proposals for papers on fluvial processes as analogues, archaeology, taphonomic studies, other palaeoecological work such as plant macrofossils, diatoms, ostracods etc.

The Australasian Quaternary Association (AQUA) has a new website at:

<http://rses.anu.edu.au/enproc/AQUADATA/AQUA.html>

The site contains information on the organisation, forthcoming meetings, awards, jobs, conferences and publications. There are back issues of the organisation's journal 'Quaternary Australasia' which acts as a newsletter and publishes short articles.

AQUA also maintains the mailing list 'AQUAlist'. AQUAlist is used to notify members of the Quaternary community of job vacancies, upcoming conferences, funding opportunities and new research, especially where pertinent to Australia. More information is available on the webpage.

ECRC SHORT COURSES IN ENVIRONMENTAL PALAEOECOLOGY FOR MSc AND PhD STUDENTS 2000/2001

INTRODUCTION TO POLLEN ANALYSIS

(Dr. S.M. Peglar & Dr. H. Seppa)

27th November - 1st December 2000 Course Tuition Fee: GBP300

OSTRACOD ANALYSIS

(Dr. J.A. Holmes & D. Horne, University of Greenwich)
15th-19th January 2001 Course Tuition Fee: GBP300

INTRODUCTION TO DIATOM ANALYSIS

(Dr. V.J. Jones & Prof. R.W. Battarbee)
22nd January - 2nd February 2001 Course Tuition Fee: GBP600

DIATOM MICROPALAEONTOLOGY

(Dr. V.J. Jones, Prof. R.W. Battarbee, Dr. C.E. Stickley)
5th - 9th February 2001 Course Tuition Fee: GBP300

INTRODUCTION TO BENTHIC FORAMINIFERA ANALYSIS

(Dr. M. Kaminski, Geological Sciences, UCL)
February 2002 Course Tuition Fee: GBP300

INTRODUCTION TO PLANT MACROFOSSIL ANALYSIS

(Dr. H.H. Birks)
12th - 16th February 2001 Course Tuition Fee: GBP300

INTRODUCTION TO DENDROCHRONOLOGY & DENDROCLIMATOLOGY

(Dr. M. Bridge, Institute of Archaeology)
15th - 16th February 2001 Course Tuition Fee: GBP120

INTRODUCTION TO PALAEOCEANOGRAPHY

(Dr. M. Maslin)
19th - 23rd February 2001 Course Tuition Fee: GBP300

CHIRONOMIDS: WATER QUALITY AND CLIMATE CHANGE

(S.J. Brooks, Natural History Museum & Dr. L. Ruse, Environment Agency)
19th - 22nd February 2001 Course Tuition Fee: GBP240

NUMERICAL ANALYSIS OF BIOLOGICAL & ENVIRONMENTAL DATA

(Prof. H.J.B. Birks & Dr. M. Kernan)
5th - 16th March 2001 Course Tuition Fee: GBP650

STABLE ISOTOPES IN THE LACUSTRINE & MARINE ENVIRONMENT

(Dr. M. Leng, NERC Keyworth & Dr. M. Maslin)
19th-22nd March 2001 Course Tuition Fee: GBP180 + Keyworth Visit Costs

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PRAIRIE ADAPTATION RESEARCH COOPERATIVE: Linking climate change science and policy

In 1998, the Climate Change Action Fund (CCAF) funded an Option Paper for Science, Impacts and Adaptation (Canadian Climate Program Board, 1998.). This report proposed a nation-wide Canadian Climate Impacts and Adaptation Research Network (C-CIARN) and that a physical node be established in an area where the effects of climate are significant and where some adaptation research capacity and coordination exists. In the Prairies, the agricultural community has a history of adapting to climatic variability. The Canadian Climate Centre's general circulation model predicts that the largest CO₂-induced rise in mean surface temperature in southern Canada will occur in the Interior Plains (Boer *et al.* 1992). Most GCMs also forecast reduced net soil moisture and water resources in summer (Herrington *et al.*, 1997: 16-17). A statistically significant increase in temperature over the past century has been documented for the prairie provinces (Gullett and Skinner, 1992).

The level of agricultural adaptation effort already resident in the Prairie Farm Rehabilitation Administration (PFRA) in Regina, and the supporting research activities of the Research Branch of Agriculture and Agri-food Canada at its research stations across the Prairies, made Regina the logical base for pursuing climate impacts and adaptation research. The federal government therefore committed in mid 1999 to building upon this base through additional investment in adaptation research to establish a prairie adaptation research network that would eventually be part of the proposed national network. The University of Regina made the generous offer to host the physical base of a prairie network on the site of the Petroleum Technology Research Centre (PTRC) with the financial support of the federal department of Western Economic Diversification. On March 24, 2000, in Regina, Minister Ralph Goodale (Natural Resources Canada) announced the establishment of the Prairie Adaptation Research Cooperative (PARC).

PARC supports interdisciplinary research on adaptation to the impacts of climate change on the Prairies. It coordinates and encourages collaborative research among sectors and disciplines, and, through the training of new graduates, acts as a focal point for the professional development of researchers in this emerging field of study. The objective of the research activities is to minimize the possible negative impacts of climate change and to take advantage of new economic or environmental opportunities that may arise. Research supported by PARC examines the climatic sensitivity of agriculture, forestry, water resources and other sectors. It assists in developing adaptation strategies that have practical applications to decision making. In addition to focussing on the particular needs of the Prairies, PARC will help bring stakeholders together to address national and sectoral issues.

The operation of PARC will be guided by a Board consisting of senior representatives of the federal government, the three Prairie provincial governments and other organizations. The PARC director and research coordinators identify opportunities to broaden the scope of research activities through integration or extension of work being carried out elsewhere. Currently a steering committee, representing three federal government departments, Alberta, Saskatchewan and Manitoba and the University of Regina, is overseeing the PARC activities until the Board of directors is in place. This committee has been responsible for soliciting activities that could be undertaken quickly, generally by widening the scope of activities already underway to address the impacts of, and adaptation to, climate change.

Initial funding of \$3 million has been allocated from the Climate Change Action Fund. Additional support for PARC of \$400,000 is provided by Western Economic Diversification to cover rent for the PARC office in the Petroleum Technology Research Centre at the University of Regina. Project funding of about \$2 million is available in 2000-2001. The steering committee and Research Coordinators identified twelve projects that provided a quick start to the research program. These projects expand on existing initiatives, are generally prairie-wide and will produce significant outputs by March 31, 2001. An additional twenty research projects were funded in June through an open call for proposals .

References

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Canadian Climate Program Board, 1998. Understanding and Adapting to Climate Change: A Canadian Perspective. Foundation Paper, Climate Science, Impacts, and Adaptation, Canada's National Implementation Strategy. Submitted to the Climate Change Action Fund.

Gullet, D.W. and Skinner, W.R. 1992. The State of Canada's Climate: Temperature Change in Canada 1895-1991. State of the Environment Report No. 92-2, Environment Canada, 36 p.

Herrington, R., Johnson, B.N. and Hunter, F.G. 1997. Responding to Global Climate Change in the Prairies: Volume III of the Canada Country Study: Climate Impacts and Adaptations. Prairie and Northern Region, Environment Canada, Regina, 44 p.

More information on PARC objectives and programs is available at www.parc.ca

Dave Sauchyn
CANQUA VP and
Earth Science Research Coordinator
Prairie Adaptation Research Cooperative

GLACIER-INFLUENCED SEDIMENTATION ON HIGH-LATITUDE CONTINENTAL MARGINS: MODERN AND ANCIENT

A meeting of the Marine Studies Group of the Geological Society to be held at: School of Geographical Sciences, University of Bristol, Bristol, England

29-30 March 2001 First announcement and call for papers

The last decade has seen important advances in the understanding of glacier-influenced sedimentation on high-latitude continental margins. Sedimentary packages in fjord-shelf-slope settings preserve a record of interactions between glaciers, oceans and climate. The objective of this meeting is to provide researchers working on these topics in both modern and ancient environments with a forum for presentation and discussion of their research. The scope of the meeting is intended to be broad, reflecting the frequently inter-disciplinary nature of the topic.

Topics to be addressed include, but are not limited to:

- Geophysical and geological investigations of glacier-influenced sedimentation on continental shelves and slopes
- Glacimarine sedimentary processes and facies in high-latitude fjords
- Controls on glacier-influenced sedimentation on continental margins
- Reconstruction of former glacier-dynamics from geological and geophysical investigations along continental margins
- Sedimentological investigations of ancient glacier-influenced margins
- Genetic discrimination of glacier-influenced lithofacies on continental slopes

Invited speakers include: J.B. Anderson, J.T. Andrews, E.A. Cowan, M.J. Hambrey, R.D. Powell & J.P.M. Syvitski.

It is intended to publish refereed papers from this meeting as a Geological Society Special Publication. If you would like to contribute to the meeting, please fill in the registration and abstract forms provided on the conference web page.

For further details and updated information:
<http://www.ggy.bris.ac.uk/glac/glacimarine.html>

Registration fee: £45 professionals, £30 members of the Geological Society and students. Includes abstracts booklet, tea/coffee and lunches. There will also be a conference dinner (£30).

Convenors

Professor Julian A. Dowdeswell
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The theme of the QRA Annual Discussion Meeting in January 2001 is the use of modern analogues for reconstructing past environments.

If you or some of your colleagues are currently doing any research which may come under this topic I would be interested in hearing about it, and possibly including a presentation at this meeting. The areas we are interested in are for example use of studies of modern processes or distributions for reconstruction of past events at sites, including the problems and practicalities, possibly with an overview on how the use of this data has changed since the turn of the century. If you feel able to contribute to this meeting I would be grateful for a provisional title.

The programme to date includes cave sediments, glacial landscapes, pollen studies, sea levels, the use of transfer functions, cold climate experiments, dating techniques, but we are keen to encourage wide participation and would welcome proposals for papers on fluvial processes as analogues, archaeology, taphonomic studies, other palaeoecological work such as plant macrofossils, diatoms, ostracods etc.

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Colleagues: I feel sure you will want to join with me in congratulating Peter Bobrowsky, International Director of CGC, on his election, at the 31st International Geological Congress held in August in Rio de Janeiro, to the position of Vice President of the International Union of Geological Sciences. This recognizes Peter's lengthy and energetic involvement in international geoscience, exemplified by his recent office in the Commission on Geological Sciences for Environmental Planning.

Peter continues what has become a tradition of Canadian leadership in the global geoscience community. Bill Fyfe has just completed his term as Past President, and Glen Caldwell continues as Chair of the IUGS Publications Committee, and has just been elected to serve on the Nominating Committee for the Executive of IUGS. More information on IUGS can be obtained through its web site: www.iugs.org

Well done, Peter! Good luck in your new role during it four year term.

Best wishes. Jeremy Hall

"Understanding Global Change in the Arctic" is a full-color brochure outlining the accomplishments and future objectives of the NSF Arctic System Science (ARCSS) Program for a broad general audience. This brochure provides the arctic research community with an informative and useful aid in outreach and education efforts. It was published by the Arctic Research Consortium of the United States (ARCUS) for the NSF ARCSS Program.

Copies are available on request from ARCUS (phone: 907/474-1600; fax: 907/474-1604; arcus@arcus.org) or you may download an electronic copy from the ARCUS web site at: <http://www.arcus.org/ARCSS/brochure/index.html>.

CHANGING OPPORTUNITIES AND CHALLENGES: Human-Environmental Interaction Within the Canadian Prairies Ecozone

A SSHRC Major Collaborative Research Initiatives (MCRI) grant of \$2.5 million has been awarded to a research team led by Principal Investigator Bev Nicholson at Brandon University. Other members of the team are Scott Hamilton (Lakehead University), Dion Wiseman (Brandon University), David Meyer (University of Saskatchewan), Alwynne Beaudoin (Provincial Museum of Alberta), Andrea Freeman and Gerry Oetelaar (University of Calgary) and Collaborator Garry Running (University of Wisconsin - Eau Claire). This interdisciplinary team represents a wide range of research expertise including archaeology, ethnology, geoarchaeology, geomatics, paleobotany, and soils science, and draws on the resources of several major research institutions.

Over the five years of the project, the goals of the research include:

- 1) the reconstruction of the "natural" and "cultural" landscapes in selected locales at five time slices between 500 and 9,000 yr BP.
- 2) the collection of data on landscape use in areas of high biodiversity within the Canadian Prairies Ecozone at selected intervals in the Precontact Period
- 3) developing an understanding of the perceptions and responses of Aboriginal groups to the environmental changes and opportunities provided by these landscapes through time
- 4) the identification of the ways in which Aboriginal groups intentionally modified their environment to maintain or enhance resource potential
- 5) the use of GIS technology to model the data which we collect.

In addition to a program of archaeological excavation at suitable locales in each of the three Prairie Provinces, we will employ a suite of investigative techniques to construct paleoenvironmental and ethnohistoric models, which we will use to test our archaeological models. These investigative techniques include an exhaustive literature search and review, including archival sources, together with consultations with Elders to glean information on oral traditions of land use. Soil and sediment samples will be examined for a variety of biotic and abiotic environmental indicators. Sample collection will be extended beyond exposures in archaeological excavation through the use of a Geoprobe coring unit. We anticipate that this multi-disciplinary approach will provide an unprecedented opportunity to create a holistic view of the past lifeways and the processes which gave rise to vigorous and flourishing Aboriginal societies within the Canadian Prairies Ecozone over the millennia.

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For a media release with additional information, please see:

<http://www.pma.edmonton.ab.ca/events/releases/000313.htm> Please also visit the official SCAPE (Study of Cultural Adaptations in the Canadian Prairie Ecozone) web site at <http://scape.brandonu.ca/> and for more information see <http://www.ualberta.ca/~abeaudoi/stuff/scape.htm>

Special symposium “**Response of near-coastal fluvial systems to sea-level change**: Theoretical and experimental models vs. the Quaternary record”, to be held during the 7th International Conference on Fluvial Sedimentology, Lincoln, Nebraska, August 2001

The last decade or so has seen a strongly increased interest into how fluvial systems in basin-margin settings behave in response to sea-level changes. This trend can be expected to continue in the near future, in view of the ongoing desire to improve sequence-stratigraphic models and the concerns about how coastal regions will respond to future sea-level change under greenhouse conditions. This symposium will focus on the large-scale processes of fluvial aggradation and incision, and resulting changes in the longitudinal profile, when sea level rises and drops. Key questions that need to be addressed include, but are certainly not limited to: (1) to what degree do sea-level changes actually lead to fluvial incision or aggradation, and to what degree can sea-level changes be accommodated by morphological adjustments (e.g., changes in channel pattern)? (2) how quickly do fluvial systems respond to sea-level changes and what, if any, are the time lags involved (e.g., rapidity of headward erosion)? (3) how far inland does sea level exert a control on fluvial incision and aggradation? (4) are there any fundamental differences between fluvial incision due to sea-level fall vs. aggradation due to sea-level rise, in terms of response times and areal extent of the response?

Exciting new developments are currently taking place in the field of experimental modeling, especially because several sophisticated flume tanks specifically designed to simulate sedimentary basins have recently become operational. Numerical stratigraphic models are also quickly evolving, with a shift in emphasis from 2D to 3D models. The Quaternary offers a particularly good testing ground for physical and numerical models, due to the availability of independent sea-level data and exceptionally good dating control. In addition, the last million years or so have been dominated by large-amplitude (~100 m) and high-frequency (~20-100 kyr) glacio-eustatically controlled sea-level cycles with a major imprint on near-coastal fluvial systems. Fluvial responses to sea-level change are therefore currently studied from a wide range of perspectives, and the goal of this symposium is to bring together investigators with different backgrounds. The intention is to gather an interdisciplinary group of geomorphologists, sedimentologists, Quaternary geologists, experimental (physical) modelers, and numerical modelers, to obtain an overview of state-of-the-art research focusing on these issues. The symposium will provide room for both oral and poster presentations, as well as a multimedia section with opportunities for display of computer models and videotaped physical model experiments. In this way, it is hoped to create a fertile environment for the development of new ideas for integrated theoretical and empirical studies in the future. This symposium is closely related and complementary to a broader nonmarine sequence stratigraphy symposium that will be held during the 7th ICFS conference as well, and will focus primarily on the pre-Quaternary rock record.

The symposium will be held at the next fluvial sedimentology meeting in Nebraska, and contributions from the Quaternary community are highly welcomed. Further info about this symposium can be obtained from Torbjörn Törnqvist, University of Illinois at Chicago, tor@uic.edu. General info about the conference can be found at <http://www.unl.edu/geology/ICFS.html>.

Next year's EUG conference to be held in Strasbourg, France next Spring (April 8th-12th 2001) offers a number of Quaternary related symposia which may appeal to members of this list. Amongst these is the following interdisciplinary session:

'Late Quaternary floodplains: sedimentary records of environmental change'

Floodplain depositional sequences provide an excellent opportunity to assess local, catchment and regional environmental change and to examine the ways in which a variety of controls influence river processes. This session is aimed at a wide range of researchers working on fluvially influenced sites, including those with particular interests in fluvial sedimentology and geomorphology, palaeoecology, geochemistry and geoarchaeology. The focus is upon the Late Quaternary, essentially the period between the onset of the last (Eemian/Ipswichian) interglacial and the present day (OI Stages 5e-1, 130-0 ka BP). This period is

characterised by a succession of dramatic climatic oscillations and, during the last 10,000 years, increasing human impact. In many places, fluvial records will also be influenced by neotectonic activity.

Information about the EUG can be found at <http://eost.u-strasbg.fr/EUG/>. Further details of the conference should appear on that site in the near future. Further details on the Floodplains session can be obtained from philip.collins@brunel.ac.uk

First Announcement

2nd RUSSIAN CONFERENCE ON GEOCRYOLOGY

6-8 June 2001
Moscow, Russia

In accordance with the decision of the First Russian Conference on Geocryology held 6-8 June 1996 the 2nd RUSSIAN CONFERENCE ON GEOCRYOLOGY will be held at Moscow State University in June 2001.

The conference will be devoted to the most recent projects in various fields of geocryology. We plan to publish the accepted papers that contain original research data before the conference. The conference is organized by the Department of Geocryology, Faculty of Geology, MSU; Institute of Permafrost Studies, Siberian Branch of the Russian Academy of Sciences; Production and Research Institute of Engineering Surveying for Construction (PNIIS); Institute of the Earth Cryosphere, Siberian Branch of the Russian Academy of Sciences; All-Russia Institute of Hydrogeology and Engineering Geology (VSEINGEO); Research Institute of Foundations and Underground Constructions (NIIOSP); State Planning Institute "Fundamentproekt", etc.

SECTIONS:

- Regional and Historical Geocryology
- Lithogenous Geocryology
- Dynamic Geocryology
- Historical Geocryology
- Permafrost Engineering
- Physics, chemistry and mechanics of frozen ground

TIME:

31 December 2000 - the deadline for the submission of application for participation and papers

March 2001 - distribution of the conference schedule

June 2001 - conference held at Moscow State University, Vorob'evy Gory, Moscow

Additional information on this conference is available by e-mail from the Organizing Committee. Please contact: Dr. Evgeny Chuvilin, chuvilin@geol.msu.ru, phone: +7(095) 939-19-27 or Dr. (Mrs.) Nina Trush, cryology@geol.msu.ru, phone: +7(095) 939-49-19 - Fax: +7(095) 939-49-65

The Fifth International Conference on Geomorphology (5th ICG) will take place at Korakuen Campus, Chuo University in Tokyo, Japan, from 23-28 August 2001. For more information on this conference, please go to: http://wwwsoc.nacsis.ac.jp/jgu/icg_hopa/indexicg.html

FOCUS ON A NEWLY APPOINTED QUATERNARIST

I initiated a new section for the newsletter last issue to give some exposure to a new Quaternary-related faculty member at a Canadian university. The last issue profiled Dr. Scott Lamoureux of Queen's University. Although I tried to twist some arms and pull in some favours, I had no takers to be profiled this issue (Scott is obviously a hard act to follow !). So, partly in an effort not to let this section die (and partly shameless self-promotion !) I had no choice but to profile myself. This also then implies that the section is now open to government as well as university scientists. So, here I am, your newsletter editor...



Dr. Stephen Robinson

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Statement of research interest:

I am primarily interested in carbon accumulation studies in permafrost-affected peatlands. Included in this is the Holocene carbon stocks and more contemporary dynamics of carbon within peatlands. Recent research has focused on the influence of permafrost aggradation and degradation, as well as the impact of fire, upon carbon accumulation in the Mackenzie Valley, Northwest Territories. A current research project utilizes 50 years of aerial photographs and Ikonos satellite images to examine the rates of permafrost thaw in peatlands in response to recent warming. The results of these projects will be used to estimate future changes to permafrost and carbon storage under scenarios of further climate warming.

Other research interests include the distribution and characterization of massive ground ice, and thermokarst resulting from the melting of massive ice. I have also extensively used ground penetrating radar (GPR) as a non-destructive mapping tool in permafrost areas. Current research at the GSC also includes an examination of the impacts of climate change upon community infrastructure in Norman Wells and Tuktoyaktuk, as well as traditional lifestyles in Sachs Harbour.

Current Research Projects:

As Principle Investigator:

Impacts of Climate Change on Infrastructure in Northern Communities
Northern Peatlands to Monitor Recent and Future Warming

As a Participant:

Inuit Traditional Knowledge of Climate Change (with Int'l. Inst. for Sustainable Development)
Permafrost and Geotechnical Aspects of Northern Pipelines
Climate Change in Nunavut (contributor to a poster series)

Employment

1998 - present Physical Scientist, Terrain Sciences Division, Geological Survey of Canada, Ottawa.
1997 & 1999 Lecturer, Department of Geography, McGill University, Montréal, Québec
1994 Researcher – Interprovincial Pipelines Ltd., Norman Wells, N.W.T.
1994 to 1998 Consulting
1991 to 1999 Teaching Assistant – Queen's and McGill Universities

Education

- 2000 Ph.D. Department of Geography, McGill University
Thesis: Carbon accumulation in discontinuously frozen peatlands, southwestern Northwest Territories, Canada. Supervisor: Dr. Tim Moore (see abstract this newsletter)
- 1994 M.Sc. Department of Geography, Queen's University
Thesis: Geophysical and geomorphological investigations of massive ground ice, Fosheim Peninsula, Ellesmere Island, Northwest Territories. Supervisor: Dr. Robert Gilbert
- 1991 B.E.S. (Honours) Physical Geography and Earth Sciences, University of Waterloo

Field Research Experience:

- 11 seasons in the Canadian north (Mackenzie valley and delta, Slave Geological Province, Ellesmere, Axel Heiberg, and Banks Islands) with Queen's University, McGill University, and the Geological Survey of Canada.
- northern Ontario and Manitoba

Recent Publications:

- Robinson, S.D.**, in press. Extending the late Holocene White River Ash distribution, northwestern Canada. *Arctic*, accepted July 2000.
- Robinson, S.D.**, and Moore, T.R., 2000. The influence of permafrost and fire upon carbon accumulation in high boreal peatlands, Northwest Territories, Canada. *Arctic, Antarctic and Alpine Research*, 32 (2), p. 155-166.
- Robinson, S.D.**, Burgess, M.M., Kettles, I.M., and Wolfe, S.A., 2000. The use of ground penetrating radar in permafrost environments. Proceedings of the Society of Exploration Geophysics Annual Conference, Calgary, p. 1363-1366.
- Robinson, S.D.**, Couture, R., and Burgess, M.M., 2000. Climate change, permafrost, and community infrastructure: A compilation of background material from Norman Wells, Northwest Territories. *Geological Survey of Canada Open File Report 3913*, 103 pages.
- Robinson, S.D.**, and Moore, T.R., 1999. Carbon and peat accumulation over the past 1200 years in a landscape with discontinuous permafrost, northwestern Canada. *Global Biogeochemical Cycles*, 13 (2), p. 591-602.
- Robinson, S.D.**, and Michaud, Y., 1999. Geomorphologic applications of ground penetrating radar. In: A Handbook of Geophysical Techniques for Geomorphic and Environmental Research, R. Gilbert, compiler, *Geological Survey of Canada Open File Report 3731*, p. 69-102.
- Robinson, S.D.**, and Pollard, W.H., 1998. Massive ground ice within Eureka Sound bedrock, Ellesmere Island, N.W.T. *Proceedings of the Seventh International Conference on Permafrost*, Yellowknife, N.W.T., p. 949-954.

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