Canadian Association of Palynologists
Association Canadienne des Palynologues

NEWSLETTER

Volume 38 Number 1 May 2015

President's Message

It has been a good and eventful year for CAP – we welcome six new members (see listing on p. 12), four from Canadian Universities and two from American universities – some students, some faculty members – and with diverse interests including geology, botany, paleolimnology, paleoclimatology and archeology. In addition, the call for applicants for the CAP Student Award resulted in a tight competition between five excellent candidates with interesting research projects (see the announcement of the winner – and an honourable mention- on p. 2). This all augurs well for the future of palynology.

There was also strong visibility for palynology and related fields at the Joint Assembly in Montreal, including a session entitled "*Global Change During the Holocene and Anthropocene: New Methods, Questions, and Perspectives"* convened by long-time CAP members Matt Peros and Konrad Gajewski (see the *Notes from Montreal* on p. 10) and in a session entitled "*New Insights and Long term Records from Lacustrine Systems"* at IAGLR 2015 (the 58th Annual Conference on Great Lakes Research) in Burlington VT, and we hope to hear about relevant papers delivered at the INQUA Congress in Japan from colleagues who will be in attendance.

Our Website Editor, Alwynne Beaudoin, will be co-leading a field trip entitled "*East of Edmonton: Late Quaternary landscapes, paleoenvironments, and human history*" at Botany 2015 in Edmonton (July 25 – 29). I will be there in charge of the AASP booth (with some CAP membership forms in hand) together with CAP member Kimberley Bell, so if you are in the neighborhood, do stop by! Our IFPS Councillor, Simon Goring, is co-convening parallel sessions entitled "*Paleoecological Patterns, Ecological Processes, Modeled Scenarios: Crossing Scales to Understand an Uncertain Future*?" at two meetings to be held in Baltimore this year: the Ecological Society of America meeting (August 9 – 14) and the Geological Society of America (November 1 – 4). Six other palynologically-relevant sessions will be held at the GSA meeting, including the dedicated topical session "*T146. Palynology*" (see invitation on p. 9).

I look forward to seeing many of you at the AGM to be held in Baltimore in early November – details to be announced by email and on the website.

Francine McCarthy
CAP President
(fmccarthy@brocku.ca),

ISSN 1188-3596

Editor's Notes

Thank you to all who contributed material for this edition of the *CAP Newsletter*:

A. Beaudoin, S. Goring, T. Lacourse, F. McCarthy, V. Pospelova, and M. Vetter.

Deadline for Next CAP Newsletter

Please submit items for the next issue of the *CAP Newsletter* (Volume 38, Number 2, December 2015) by November 10, 2015. Conference reports, announcements, field trip reports, notices of new books, dissertation abstracts, book reviews, news, and essays on topics relevant to Canadian palynology are all welcome. Please send contributions to:

Florin Pendea
CAP Newsletter Editor
ifpendea@lakeheadu.ca

Table of Contents

CAP STUDENT AWARD

This year, the CAP Awards Subcommittee had a very difficult time choosing between five very high-quality applications for the Student Award – thank you to all the applicants, and good luck with the research!

In the end the award went to Kimberley Bell, a PhD candidate in Geoscience at the University of Calgary specializing in palynology and biostratigraphy. The title of her research proposal was *Biostratigraphy of Cretaceous and Paleogene strata in northern Yukon Territory and District of Mackenzie, Northwest Territories.* We look forward to reading a brief summary of her research and the use to which she put the prize money in the December Newsletter.

The committee decided to award an "honourable mention" to Kristin Michels, a PhD candidate - in Botany with an emphasis in Paleoecology at the University of Wisconsin-Madison, for her proposal entitled: *Historical Vegetation Change in the Sylvania Wilderness: A High-Resolution Pollen Record.*

Francine McCarthy
Chair of Awards Selection Committee

Updating the Canadian Association of Palynologists!

The Canadian Association of Palynologists was proposed in 1974 and first met officially on January 8, 1979. In January 1987, CAP was incorporated as a non-profit organization registered in Nova Scotia through the hard work of then Secretary-Treasurer Rob Fensome. The By-laws set up then and modified in a few minor ways since have guided CAP through the years (see the CAP website

http://icons.iconarchive.com/icons/oxygen-icons.org/oxygen/256/Apps-system-software-update-icon.png Commercial use allowed.

http://www.scirpus.ca/cap/hist.htm for a full accounting of CAP's history).

In early 2013 we learned that CAP was not meeting the conditions to continue incorporation in Nova Scotia, including the requirement that our AGM be held in that province each year. Following research, consultation with other scientific organizations, and discussions among members of the Executive and other CAP members, we decided CAP should apply for incorporation as a not-for-profit organization federally, through Corporations Canada. That process was successfully completed on 23 June 2015. With federal incorporation, our members can reside anywhere in the world and we can hold our AGM anywhere as well.

The annual reporting requirements are similar to those for incorporation in Nova Scotia. We will need to file an annual return, including our financial statement, each year as before. Filing online will actually be a little cheaper than the Nova Scotia filing fee was.

We will need to make some minor changes to our By-laws and submit those to Corporations Canada before 23 June 2016. Therefore, we will need to consider and approve the new By-laws at CAP's upcoming AGM at the 2015 Geological Society of America Annual Meeting in Baltimore, 1-4 November. The Executive will draft and circulate the proposed new By-laws in advance of the AGM. Please plan to attend!

Mary Vetter
CAP Secretary-Treasurer

Featured article

Exploiting Taphonomy to improve Lake Level Reconstruction

By Francine McCarthy

Paleoenvironmental reconstruction assumes that fossil assemblages primarily reflect the life assemblage, and that it was in equilibrium with ambient conditions, but I have long contended that the importance of taphonomy is often (*typically*?) underestimated. In most lakes the life assemblage is pervasively skewed by factors like differential preservation of the various components of the ecosystem and time-averaging of the record, in addition to transport into and out of the lake (Kidwell and Flessa 1996). Meromixis (permanent stratification leading to anoxia in the unmixed bottom layer, or monolimnion) promotes excellent preservation and effectively eliminates bioturbation, allowing the best opportunity to isolate the biological component of variance between samples from the taphonomic component (Bell et al. 1987; Behrensmeyer et al. 2000).

I attributed the exceptional abundance and diversity of dinoflagellate cysts in Holocene sediments from the deep basins of small, deep lakes in large part to bottom water anoxia in an article entitled: "Dinoflagellates are funky things" in the December 2014 *CAP Newsletter*, Vol. 37 (2). The differences in the middle to late Holocene records of core SP09 from the monolimnion and of core SP07, still in deep water (13.3 m) but within the chemocline (the zone of rapid change in physico-chemical conditions of the water column in Sluice Pond, MA) was attributed to selective oxidation of susceptible dinocysts at the shallower site. Large, ornate cysts attributed to *Peridinium gatunense* Nygaard that comprise as much as 78 % (mean 40.2, n=43) of the Holocene record in core SP09 (Fig. 1) are rare (up to 33%. Mean = 11.3%, n = 15) in the relatively sparse, less diverse dinocyst record in core SP07, illustrating the perils of basing interpretations on analysis of a single core (Drljepan et al., 2014).

Together with my collaborators, I have continued to tease out the ecological and taphonomic signatures of the dinocyst records of Sluice Pond by comparing the palynological assemblage in lakebed sediments both above and below the chemocline. The bathymetry of Sluice Pond provides an ideal natural laboratory to assess the influence of oxidation (Fig. 2). Most of the lake area is less than 5 m in depth and contains well-oxygenated water (see *CAP Newsletter* Vol. 37 (2), p. 12), but there is a deep basin in the southeast part of the lake that inhibits mixing of the water column, and the water above the lakebed is anoxic (see measurements of dissolved oxygen/ DO through the water column at Station 1 near the site of Core SP09 in Figure 1).

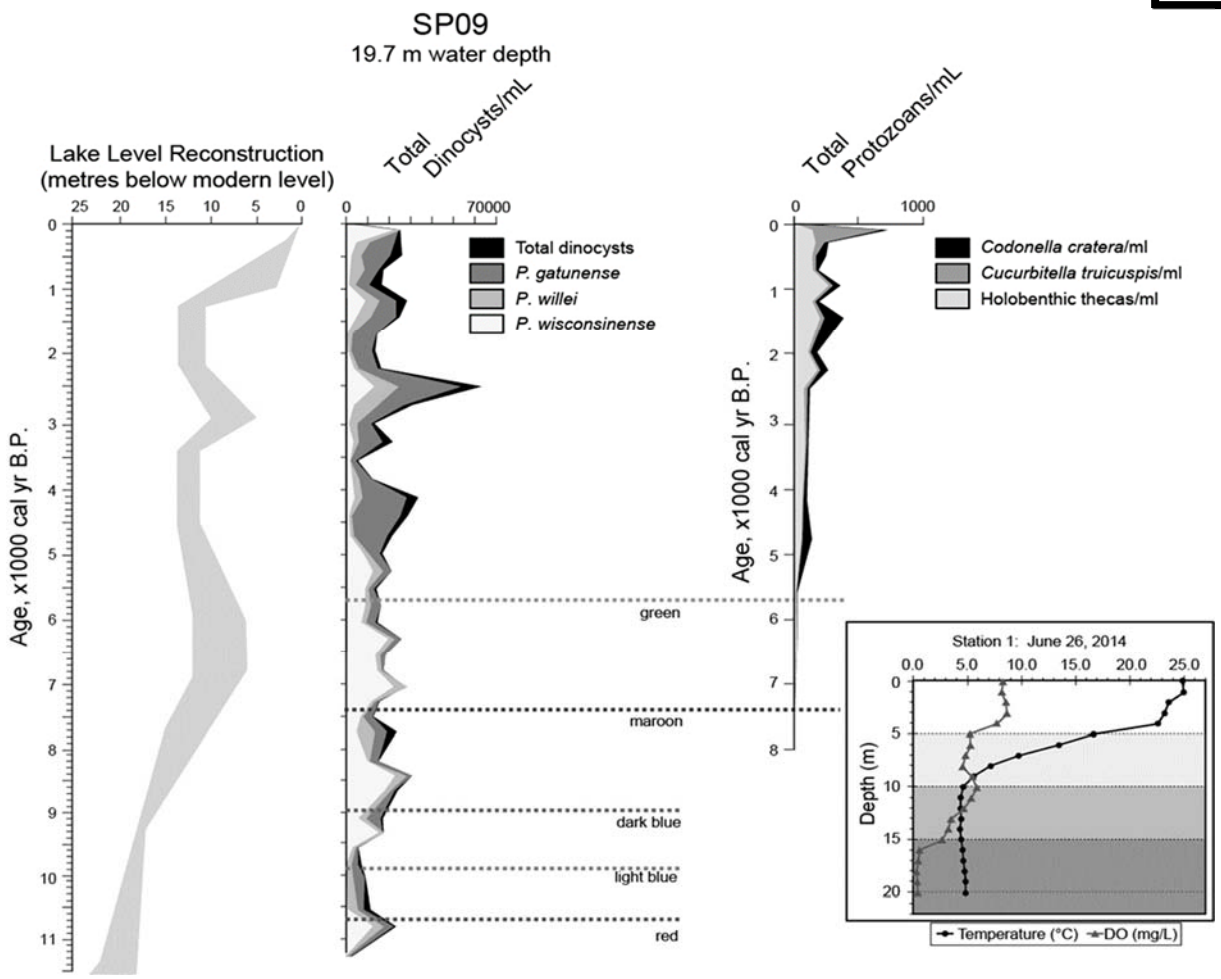


Figure 1. Core SP09, near Station 1 where water quality was measured showing an anoxic monolimnion below 15 m in the water column, contains a diverse and abundant dinocyst record. The transition from a *Peridinium wisconsinense*- dominated assemblage to one rich in taxa like and *Peridinium gatunense*, *P. willei*, and *P. volzii* reflects eutrophication during the mid-Holocene drought (Drljepan et al., 2014). The absence of holobenthic protozoans (testate amoebae/ thecamoebians) below the maroon reflector reflects bottom water anoxia (dissolved oxygen concentration nearly 0 mg/L) until ~7500 years ago when site SP07 was initially transgressed (lake level reconstruction from Hubeny et al., 2015; also see Fig. 2), and the abundance of holoplanktonic protozoans (black) as well as testate amoebae with a planktonic phase (dark grey) records seasonal anoxia in a eutrophic lake.

The high variability in dinocyst assemblages across the modern lakebed (Fig. 3) undoubtedly results from a variety of ecological and taphonomic factors, but the strong inverse relationship between water depth and the relative abundance of cysts of *Peridinium willei* (R^2 = .8072) reported in the last newsletter (see *CAP Newsletter* Vol. 37 (2), p. 14) is evident. Sediments within the mixolimnion are rich in holobenthic testate amoebae that require oxygenated bottom water (McCarthy et al., in prep.), and the inferred preservation bias toward the large, thick-walled cysts of *P. willei* is consistent with

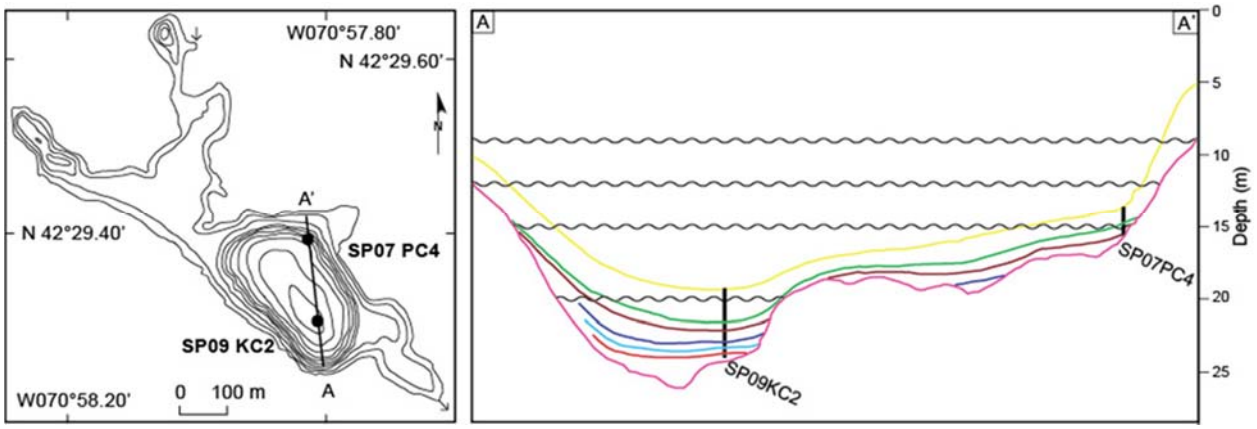


Figure 2. Sub-bottom profile line from Sluice Pond along transect A – A' showing seismic reflectors illustrated with colored lines and core locations with black lines. The yellow reflector is the modern lakebed, the pink reflector is the glacially-scoured basin, and the maroon reflector, dated 7456 + 50 in core SP09 and 7816 + 163 in core SP07, records the initial transgression of the marginal site (modified from Hubeny et al., 2015). The affinity for meromixis varied dramatically with fluctuations in lake level through the Holocene, as calculated for in Table 1 for the water depths illustrated; today, the relatively large surface area with well-mixed waters over most of the lake produces seasonal anoxia in the deep basin, intensified by BOD due to decay of organics on the lakebed.

the relatively frequent report of these cysts in palynological studies (e.g., Norris and McAndrews, 1970; Burden et al., 1986; Zippi et al., 1990; McCarthy et al., 2011; Danesh et al., 2013; McCarthy and Krueger, 2013). Conversely, sediments rich in loricae of planktonic protozoa and tests of *Cucurbitella tricuspis* (a testate amoeba species known to tolerate seasonal anoxia due to its relationship with *Spirogyra* in the water column) contain abundant cysts rarely reported in palynological studies (Fig. 2), including *Peridinium gatunense* that was abundant (> 1000 cells/mL/ ~300 mg chlorophyll/m^3) in Lake Kinneret (Sea of Galilee) during spring blooms until the mid-1990s when hydrological modifications prevented inflows of nutrient-enriched water from the Jordan River (Viner-Mozzini et al. 2003; Zohary et al., 2012).

We are using the taphonomic bias to refine the water level curve – and thus the paleohydrologic/ paleoclimatic history of Sluice Pond. Assuming that oxidation is represented by low-diversity assemblages strongly dominated by resistant cysts (*Peridinium wisconsinense* during the early oligotrophic, small, deep phase and *Peridinium willei* since the lake became eutrophic; see Drljepan et al., 2014), we can assess bottom water oxygenation through the Holocene.

There was a high affinity for meromixis (calculated using the equation of Hutchinson, 1957) through most of the Holocene (Table 1), particularly between the red and maroon reflectors (~11,000 – 7400 cal BP) when a very small, steep-walled lake occupied the basin, inhibiting turnover (Fig. 2). The transgression to the site of Core SP07 between ~7400 and 5700 cal BP – from the maroon and green reflectors – covered a relatively large area with shallow water; the establishment of an aerobic benthic fauna dominated by holobenthic thecamoebians is ecological evidence of oxygenated bottom waters between ~7400 and 5200 cal

Table 1: Approximate affinity for meromixis (Zr) depends on basin geometry, specifically the ratio of the maximum depth to surface area, and thus varied in response to lake level fluctuations though the Holocene; Zr > 2 generally describes a meromictic lake.

Age cal BP (between reflectors:)	Meters below lake level (m bmll)	Relative depth (Zr)
~4200 (green - yellow)	~12	2.25
~6700 (maroon - green)	~9	1.85
~7800 (dark blue - maroon)	~15	2.7
~11400 (pink - red)	~20	2.12

BP – an interval strongly dominated by the large, thick-walled cysts of *P. wisconsinense* and *P. willei.* This dinocyst assemblage leads us to postulate brief periods of oxygenation around 8500 and 9300 cal BP during the dominantly meromictic early Holocene, possibly due to higher wind stress.

The increased productivity associated with the rapid decline in lake level around ~5100 cal BP (the mid-Holocene drought evident throughout New England, recorded by the hemlock "crash"; Webb et al., 1993; Hubeny et al., 2015) appears to have promoted seasonal anoxia resulting from BOD (biochemical oxygen demand; Hargrave, 1972) through most of the late Holocene, allowing holobenthic testate amoeba to thrive for part of the year, but allowing the preservation of high concentrations of oxidation-susceptible cysts of dinoflagellates that thrive in nutrient-rich waters in addition to the eutrophic *Peridinium willei* (McCarthy et al., in prep.). The dinocyst data record brief periods of increased oxidation occurred around 3600 and 2500 cal BP, suggesting that the highstands in the lake level reconstruction of Hubeny et al. (2015) should be adjusted.

To those still wondering it there any paleolimnological value to studying the cysts of freshwater dinoflagellates, hopefully this multiproxy study combining lakebed sediments across a partly meromictic lake with core studies has illustrate their potential as long as their record is recognized to be the product of both the environmental conditions impacting the motile plankton in the water column and the taphonomic conditions impacting the cysts on the lakebed. Teasing apart the taphonomic and ecological signatures is allowing us to refine our paleohydrologic and paleoclimatic reconstructions.

References cited

Behrensmeyer, A. K., S. A. Kidwell, and R. A. Gastaldo. 2000. Taphonomy and paleobiology, p. 103-147. In D. H. Erwin and S. L. Wing [eds.], Deep time: paleobiology's perspective. The Paleontological Society: Allen Press, Lawrence Kansas.

Bell, M.A., M. S. Sadagursky, and J. V. Baumgartner, 1987. Utility of lacustrine deposits for the study of variation within fossil samples. Palaois 2: 455 – 466.

Burden, E. T., J. H. McAndrews, and G. Norris, 1986 Palynology of Indian and European forest clearance and farming in lake sediment cores from Awenda Provincial Park, Ontario, Canada. Can. J. Earth Sci. 23: 43-54.

Danesh, D. C., F. M.G. McCarthy, O. Volik, and M. Drljepan, 2013. Non-pollen palynomorphs as indicators of water quality in Lake Simcoe, Ontario, Canada. Palynology 37: 231-245.

Drljepan, M., 2014, Algal and protozoan response to natural and environmental change in Sluice Pond, MA through the Holocene: MSc thesis, Brock University, Canada http://dr.libra ry.brocku.ca/ handle/10464/5508

Drljepan, M., F. M. G McCarthy, and J. B. Hubeny. 2014, Natural and cultural eutrophication of Sluice Pond, MA recorded by algal and protozoan microfossils. Holocene 24: 1731 – 1742

Hargrave, B. T. 1972. Oxidation-reduction potentials, oxygen concentration, and oxygen uptake of profundal sediments in a eutrophic lake: Oikos: 23:167-177.

Hubeny, J. B., F. M. G. McCarthy, J. Lewis, M. Cantwell, M. Drljepan, C. Morissette, J. W. King, & M. L. Crispo. 2015. Holocene stratigraphy, environmental history and regional hydroclimate significance of Sluice Pond, northeastern MA. J.Paleolimnol. 53: 251 – 287.

Kidwell, S. M and K. W. Flessa. 1996. The quality of the fossil record: populations, species and communities. Annual Review of Earth and Planetary Sciences 24: 443 – 464.

McCarthy, F. M. G., 2014. Dinoflagellates are funky things. Canadian Association of Palynologists Newsletter 37(2), p. 8-16.

McCarthy, F. M. G., K. N. Mertens, M. Ellegaard, K. Sherman,V. Pospelova, S. Ribeiro, S. Blasco, and D. Vercauteren. 2011, Resting cysts of freshwater dinoflagellates in southeastern Georgian Bay (Lake Huron) as proxies of cultural eutrophication. Rev. Palaeobot. Palynol.166: 46-62.

McCarthy F. M. G. and Krueger A.M. 2013. Freshwater dinoflagellates in paleolimnological studies: *Peridinium* cysts as proxies of cultural eutrophication in the southeastern Great Lakes region of Ontario, Canada, p. 133-139. In J. M. Lewis, F. Marret, L. Bradley [eds.] Biological and geological perspectives of dinoflagellates. London: The Micropalaeontological Society, Special Publications. Geological Society.

Norris G. and J. H. McAndrews, 1970. Dinoflagellate cysts from post-glacial lake muds, Minnesota (U.S.A.). Rev. Palaeobot. Palynol.10: 131–156.

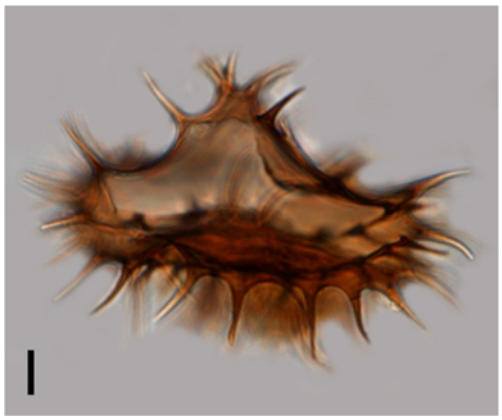
Viner-Mozzini, Y., T. Zohary, and A. Gasith. 2003. Dinoflagellate bloom development and collapse in Lake Kinneret: a sediment trap study. J.Plankton Res. 25: 591 – 602.

Zippi P., Y. T. Yung,J. H. McAndrews, P. Stokes, and G. Norris, 1990. An investigation of the potential of zygnematacean zygospores, *Peridinium*, and *Pediastrum* as paleoindicators of recent lake acidification. In: Environmental Research & Technology Transfer Conference, Toronto, Proceedings, vol. 1. Ontario Ministry of the Environment, pp 393–396.

Zohary T, A. Nishri, and A. Sukenik, 2012. Present–absent: a chronicle of the dinoflagellate *Peridinium gatunense* from Lake Kinneret. Hydrobiologia 698: 161-174.

PALYNFO

The first online modern organic-walled dinoflagellate cyst determination key



Cyst of *Selenopemphix quanta* (scale bar is 10 µm)

The first online modern organic-walled dinoflagellate cyst determination key has been launched at https://www.marum.de/dinocystkey.html.

The website offers information on cyst morphological characteristics and the cyst-motile stage relationship. It gives a comparison with other morphologically similar taxa and provides cyst descriptions that are illustrated by line drawings and high-quality bright-field photomicrographs. The key is compatible with all major computing platforms and it is free of charge to users if cited accordingly:

Zonneveld, K.F. and Pospelova, V. 2015. A determination key for modern dinoflagellate cysts. *Palynology*, 23 pp. http://dx.doi.org/10.1080/01916122.2014.990115.

Vera Pospelova, CAP President-elect

CAP AGM NOVEMBER 2015

The next Annual General Meeting of CAP will be held in conjunction with the Annual Meeting of the Geological Society of America in Baltimore MD, Nov. 1 – 4, 2015. Details about time and place will follow by email to the membership and will be posted on our website (I will try to find a location that is relaxed and social but less noisy than the pub in which we met in Vancouver!). I will be in charge of the AASP booth at the GSA meeting and will carve out a little corner for CAP. Below I have listed several sessions of potential interest to our membership, including session T190 (recommended by Simon Goring), so I hope to see many of you there.

T146. Palynology

T205. Integration of Microfossils and Sedimentology in Stratigraphic Analysis

T144. 200 Years and Going Strong: The Role of Paleontology in Geologic Mapping (Posters)

T155. Timing of the Origins and Evolution of Unicellular Eukaryotes

T12. From Peat to Coke: Honoring the Legacy of William Spackman

T143. What Makes a Juicy Rock? Global Climate Events and Deposition of Organic Rich Shales through Time

T190. Paleoecological Patterns, Ecological Processes, Modeled Scenarios: Crossing Temporal Scales to Understand an Uncertain Future [GSA Quaternary Geology and Geomorphology Division; AASP - The Palynological Society; Canadian Association of Palynology; GSA Limnogeology Division; Paleoceanography/Paleoclimatology Discipline; SEPM (Society for Sedimentary Geology); Paleontological Society]

AGU- GAC- MAC-CGU JOINT ASSEMBLY/ RÉUNION CONJOINTE

Notes from Montréal

There were a number of presentations of potential interest to palynologists at the AGU-GAC- MAC-CGU- JOINT ASSEMBLY/ RÉUNION CONJOINTE that was held at the Palais des congrès de Montréal May 3-7 2015. A great many were in the session convened by long-time CAP members Matt Peros and Konrad Gajewski, but others could be found in other paleoecological and stratigraphic sessions, including posters. A selection of relevant titles is listed below (* denotes a CAP member):

R Hébert et al. *Regional Climate Projections using Effective Climate Sensitivities*

P D Roy et al. *Hydro-climate of Subtropical North America since Last Glacial Maximum and Variations in the Dynamics of Atlantic and Pacific Moistures*

J P Jenny et al. *Paleolimnological evidence of global spread of hypoxia in freshwaters caused by local anthropogenic pressures*

*F M G McCarthy et al. *Non-Pollen Palynomorph Records of Natural (Climate-Driven) and Cultural Eutrophication*

A Winegardner et al. *Identifying Regional Hotspots of Biodiversity Change Over the Past ~150 Years: Beta-diversity of Diatom Assemblages from ~400 US Lakes*

*J M St-Jacques et al. *Low-frequency Variability in the North and South Saskatchewan Rivers over the Past Millennium*

D A Fisher et al. *A Warmer and Earlier High Arctic Holocene Thermal Maximum from Agassiz Ice Cap Core, Ellesmere Island*

J Gauthier et al. *Environmental DNA preserved in lake sediments: Calibrating a new tool for biodiversity science*

S van Bellen et al., *Testate amoeba assemblages of southern Patagonian peat bogs record drastic 20th_century shifts: unprecedented climate change or increased UV-B radiation?*

*M C Peros, J Vachon *Recent aforestation of the Johnville Peat Bog, southern Québec, Canada, investigated using dendroecological and paleoecological techniques*

S Pratte et al., *Peat bog as geochemical archives of atmospheric dust deposition in eastern Canada*: *a multi-proxy approach*

S Timsic et al., *Late Holocene climate of coastal Labrador subseasonal evidence from stable isotope values of tree-rings:*

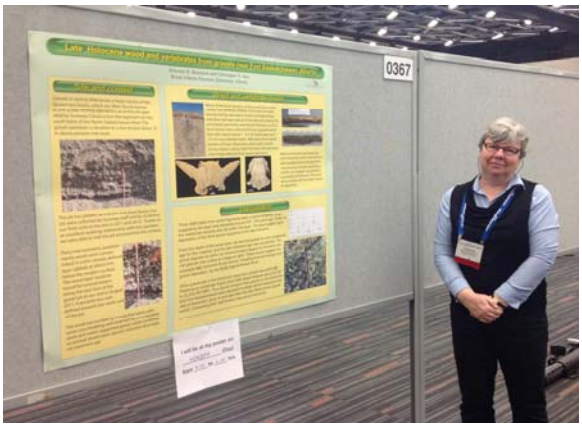
*B F Cumming et al., *Time-transgressive Two-phased Hypsithermal Warm Period Across the Boreal Region of Northwest Ontario: A Multiproxy Study From Deep-water and Near-shore Cores*

*K J Gajewski *Impact of Holocene Climate Variability on Arctic Vegetation*

N Riddick et al. *Using Microfossils to Observe the Occupancy of Pre-Historic Peoples: the Value of Non-Pollen Palynomorphs:*

*E Levac *Long Distance Pollen Transport to the Canadian High Arctic as a Tracer for Atmospheric Circulation*

B Tremblay et al. *Using the Paleo-Record to Constrain Future Arctic Climate Change from Global Climate Models*



Early morning, Alwynne setting up her poster at the Joint Assembly in Montreal and hoping that a few people might drop by to see it.

C Hillaire-Marcel et al. *A few highlights of the late glacial and deglacial history of Baffin Bay and the Labrador Sea*

S Prader et al. *Mid-Miocene Vegetation and Climate Development on the Atlantic Coastal Plain (IODP Expedition 313)*

L Lapointe Elmrabti et al. *Paleoenvironmental records from Alaskan Late Pleistocene yedoma permafrost : A case study from the Itkillik river*

*A B Beaudoin, C N Jass *Late Holocene Wood and Vertebrates from Gravels Near Fort Saskatchewan, Alberta*

O T Gibb et al. *Diachronous Evolution of Sea Surface Conditions from the Labrador Sea to Baffin Bay since the Last Glaciation*

*E Levac, M C F Lewis *Evidence for Meltwater Drainage via the St. Lawrence River in Marine Cores from the Gulf of St. Lawrence, Laurentian Channel and Labrador Sea at the Time of the Younger Dryas*

*A Price et al. *Coastal eutrophication in Northeast US estuaries: dinoflagellate cysts as bioindicators. Coastal eutrophication and biogeography in northeast United States (Maine to Delaware) estuaries as recorded by dinoflagellate cysts.*

Graduate Student Opportunities — Opportunités pour les étudiants de cycles supérieurs

Dr. Terri Lacourse is seeking graduate students (MSc or PhD) to join her paleoecology lab in the Department of Biology at the University of Victoria.

Research in her lab typically focuses on the development and dynamics of forest communities since the last glaciation and the climatic and non-climatic factors that drive vegetation dynamics on long timescales. Potential graduate student research topics also include the past effects of tephra deposition on plant communities, and the links between climate, vegetation and carbon accumulation in peatlands. Students are also encouraged to develop their own research projects in any aspect of palynology or paleoecology. Guaranteed funding for research and student stipend is available.

Ideal candidates will have a solid background in palynology, plant ecology and/or Quaternary science, and excellent academic standing. Interested students are encouraged to send a CV, unofficial university transcripts, and a brief statement of research interests to tlacours@uvic.ca.

Recent Publications

Bringué, M., *Pospelova, V., Field, D.B. 2014. High resolution dinoflagellate cyst record of decadal variability and 20th century warming in the Santa Barbara Basin, California. *Quaternary Science Reviews* 105:86-101.

Corimbourieu-Nebout N, Bertini A, Russo-Ermolli E, Peyron O, Klotz S, Montage V, Fauquette S, Allen J, Fusco F, *Goring S, Huntley B, Joannin S, Lebreton V, Magri D, Orain R, Sadori L. 2015. Climate changes in the central Mediterranean and Italian vegetation dynamics since the Pliocene. *Review of Palaeobotany and Palynology* 218:127-147.

Czarnecki, J., Dashtgard, S.E., *Pospelova, V., *Mathewes, R., MacEachern, J.A. 2014. Palynology and geochemistry of channel-margin sediments across the tidal-fluvial transition lower Fraser River, British Columbia, Canada. *Marine and Petroleum Geology* 51:152-166.

*Goring S, Dawson A, Williams JW, Simpson G, Grimm EC, Dawson R. 2015. neotoma: A programmatic interface to the Neotoma Paleoecological database. *Open Quaternary* 1:2.

Heikkilä, M., *Pospelova, V., Hochheim, K.P., Kuzyk, Z.Z.A., Stern, G.A., Macdonald, R.W., Barber, D.G. 2014. Surface sediment dinoflagellate cysts from the Hudson Bay system and their relation to freshwater and nutrient cycling. *Marine Micropaleontology* 106:79-109.

Kristensen, T., and *Beaudoin, A. 2015 Paleo Disasters: Public policy needs to awaken to the threat of an ancient enemy. *Alternatives Journal* 41(2):48-54.

*Lacourse, T., and Davies, M.A. 2015. A multi-proxy peat study of Holocene vegetation history, bog development, and carbon accumulation on northern Vancouver Island, Pacific coast of Canada. *The Holocene*. DOI: 10.1177/0959683615580201

Mertens, K.N., Takano, Y., Gu, H., Yamaguchi, A., *Pospelova, V., Ellegaard, M., Matsuoka, K. 2015. The cyst-theca relationship of a new dinoflagellate with a spiny round brown cyst, *Protoperidinium lewisiae*, and its comparison to the cyst of *Oblea acanthocysta*. *Phycological Research* 63:110–124.

*Price, A. and *Pospelova, V. 2014. *Spiniferites multisphaerus* sp. nov. (Dinophyceae), a new dinoflagellate cyst from the Late Pleistocene in Guaymas Basin, Gulf of California, Mexico. *Palynology* 38(1):101-116.

*Pospelova, V., *Price, A.M., Pedersen, T.F. 2015. Palynological evidence for late Quaternary climate and marine primary productivity changes along the California margin. *Paleoceanography*. palo2022. DOI: 10.1002/2014PA002728

Zonneveld, K.F. and *Pospelova, V. 2015. A determination key for modern dinoflagellate cysts. *Palynology* 1-23. http://dx.doi.org/10.1080/01916122.2014.990115.

* denotes a CAP member

Welcome to new CAP members!

We warmly welcome the following new members to CAP:

- Kristin Michels, University of Wisconsin-Madison
- Jen O'Keefe, Morehead State University
- Clayton Shearer, Carleton University
- Magdalena Sobol, University of Toronto
- Glenn Stuart, University of Saskatchewan
- Maria Velez, University of Regina

CAP MEMBERSHIP FORM

Canadian Association of Palynologists / Association Canadienne des Palynologues (CAP) membership is open to all members of the palynological community in Canada and others with an interest in Canadian palynology. The Association is dedicated to the advancement and encouragement of all aspects of palynology in Canada and the promotion of co-operation between palynologists and those engaged in related fields of study. Membership dues include two issues a year of the *CAP Newsletter*, to which all members are invited to contribute. CAP is affiliated with the International Federation of Palynological Societies (IFPS) and members receive two issues of the IFPS newsletter (*PALYNOS*) each year.

CAP membership dues are $10 per year in Canadian or US funds payable at the beginning of the year. Lapsed members are removed from the mailing list after one year, following a reminder Members may, if they wish, pay for up to three years in advance. To join, please fill out the the membership form, by hand or in Adobe Reader®, and send it with a cheque (drawn on a Canadian or US bank) or money order payable to CAP to:

Dr. Mary Vetter, CAP Secretary-Treasurer, Luther College, University of Regina, Regina, Saskatchewan, S4S 0A2 CANADA

Name:_____

Affiliation:_____

Address:_____

_____

_____

Tel:_____ FAX:_____

E-mail:_____

Web page URL:_____

Research interests:_____

_____

_____

New membership ☐ Renewal ☐ Amount enclosed:_____

May we include your name/address/research interests in the on-line "Directory of Palynologists" in the CAP World Wide Web page? Yes ☐ No ☐