

There are additional references for the following Science Highlight articles:

- F.M. Chambers, J.R.G. Daniell and ACCROTELM Members
- R.K. Booth, S.T. Jackson and M. Notaro
- M. Blaauw, J. Andrés Christen and D. Mauquoy
- B. van Geel and D. Mauquoy
- M. Lamentowicz, W.O. van der Knaap, J.F.N. van Leeuwen, S. Hangartner, E.A.D. Mitchell, T. Goslar, W. Tinner and C. Kamenik
- E.L. McClymont, E. Pendall and J. Nichols
- B. Hong, M. Uchida, X.T. Leng and Y.T. Hong
- F. De Vleeschouwer, G. Le Roux and W. Shotyk
- D.W. Beilman, G.M. MacDonald and Z. Yu
- S. Page, R. Wüst and C. Banks
- O. Lähteenoja and K.H. Roucoux
- T.R. Christensen, M. Mastepanov, M. Johansson and D. Charman
- J.L. Conroy, J.T. Overpeck and J.E. Cole
- G. Leduc, L. Vidal, O. Cartapanis and E. Bard
- S.J.A. Jung, D. Kroon, G. Ganssen, F. Peeters and R. Ganeshram

F.M. Chambers, J.R.G. Daniell and ACCROTELM Members

ACCROTELM Members: Jukka Alm, Sue Bartlett, Carole Begeot, Liz Bingham, Maarten Blaauw, Antony Blundell, Frank Chambers, Dan Charman, John Daniell, Richard Evershed, Edgar Karofeld, Atte Korhola, Hansjörg Kuester, Jukka Laine, Michel Magny, Dmitri Mauquoy, Erin McClymont, Fraser Mitchell, Pirita Oksanen, Richard Pancost, Kaarina Sarmaja-Korjonen, Heiki Seppä, Ülle Sillasoo, Bettina Steffanini, Mareike Steffens, Eeva-Stiina Tuittila, Minna Väliranta, Johannes van der Plicht, Bas van Geel, Dan Yeloff.

- Aaby, B., 1976: Cyclic variations in climate over the past 5500 years reflected in raised bogs, *Nature*, **263**: 281–284.
- Aaby, B. and Tauber, H., 1975: Rates of peat formation in relation to degree of humification and local environment, as shown by studies of a raised bog in Denmark, *Boreas*, **4**: 1–14.
- Andersson, S., Bergman, J., Wastegård, S. and Schoning, K., in press: Synthesis of proxy response to climate change in central Sweden during the late Holocene. In: Andersson, S. Late Holocene humidity variability in central Sweden, PhD thesis, Stockholm University, paper V.
- Backéus, I., 1990: The cyclic regeneration in bogs—a hypothesis that became an established truth, *Striae*, **31**: 33–5.
- Barber, K.E., 1981: *Peat Stratigraphy and Climatic Change—a Palaeoecological Test of the Theory of Cyclic Peat Bog Regeneration*, A A Balkema, Rotterdam.
- Barber, K.E., Chambers, F.M., Maddy, D., Stoneman, R. and Brew, J., 1994: A sensitive high-resolution record of late-Holocene climatic change from a raised bog in northern England, *The Holocene*, **4**: 200–207.
- Beer, J. and van Geel, B., 2008: Holocene climate change and the evidence for solar and other forcings. In: R.W. Battarbee and H.A. Binney (Eds), *Natural Climate Variability and Global Warming: a Holocene Perspective*, Wiley-Blackwell, 138–162.
- Bingham, E.M., McClymont, E.L., Väliranta, M., Mauquoy, D, Roberts, Z., Chambers, F.M. and Evershed, R.P., 2009: Conservative composition of n-alkane biomarkers in Sphagnum species: implications for palaeoclimate reconstruction in ombrotrophic peat bogs, *Organic Geochemistry*, doi: 10.1016/j.orggeochem.2009.06.010
- Blaauw, M., 2003: *An investigation of Holocene sun-climate relationships using numerical C-14 wiggle-match dating of peat deposits*. Published PhD thesis, University of Amsterdam, The Netherlands.
- Blaauw, M., van Geel, B. and van der Plicht, J., 2004: Solar forcing of climate change during the mid-Holocene: indications from raised bogs in The Netherlands, *The Holocene*, **14**: 35–44.
- Blackford, J.J. and Chambers, F.M., 1993: Determining the degree of peat decomposition for peat-based palaeoclimatic studies, *International Peat Journal*, **5**: 7–24.

- Blytt, A., 1876: *Essay on the Immigration of the Norwegian Flora During the Alternating Rainy and Dry Period*, Alb. Cammermayer, Christiania (Oslo).
- Booth, R.K., 2010: Testing the climate sensitivity of peat-based paleoclimate reconstructions in mid-continental North America, *Quaternary Science Reviews*, doi: 10.1016/j.quascirev.2009.11.018
- Booth, R.K., Jackson, S.T. and Notaro, M., 2010: Using peatland archives to test paleoclimate hypotheses, *PAGES news*, 18(1).
- Borgmark, A., 2005: Holocene climate variability and periodicities in south-central Sweden, as interpreted from peat humification analysis, *The Holocene*, **15**: 387–395.
- Bradley, R.S., 1999: *Paleoclimatology, Reconstructing Climates of the Quaternary* 2nd edn, Harcourt Academic Press, San Diego.
- Chambers, F.M. and Blackford, J.J., 2001: Mid- and Late-Holocene climatic changes: a test of periodicity and solar forcing in proxy-climate data from blanket peat bogs, *Journal of Quaternary Science*, **16**: 329–338.
- Chambers, F.M. and Charman, D.J., 2004: Holocene environmental change: contributions from the peatland archive, *The Holocene*, **14**: 1–6.
- Chambers, F.M., Daniell, J.R.G. and Brain, S.A., 2007a: Climate Change featuring the ACCROTELM project: dissemination of a European RTD project by film and DVD. In: Filho, W.L., Mannke, F. and Schmidt-Thome, P. (Eds) *Information, Communication and Education on Climate Change—European Perspectives*, Peter Lang, Frankfurt am Mein, 165–173.
- Chambers, F.M., Mauquoy, D., Brain, S.A., Blaauw, M. and Daniell, J.R.G., 2007b: Globally synchronous climate change 2800 years ago: proxy data from peat in South America, *Earth and Planetary Science Letters*, **253**: 439–444.
- Charman, D.J., 2007: Summer water deficit controls on peatland water table changes: implications for Holocene palaeoclimate reconstructions, *The Holocene*, **17**: 217–227.
- Charman, D.J., Blundell, A. and ACCROTELM members, 2007: A new European testate amoebae transfer function for palaeohydrological reconstruction on ombrotrophic peatlands, *Journal of Quaternary Science*, **22**: 209–221.
- Charman, D.J., Barber, K.E., Blaauw, M., Langdon, P.G., Mauquoy, D., Daley, T.J., Hughes, P.D.M. and Karofeld, E., 2009: Climate drivers for peatland palaeoclimate records, *Quaternary Science Reviews*, **28**: 1811–1819.
- De Jong, R., Björck, S., Björkman, L. and Clemmensen, L.B., 2006: Storminess variation during the last 6500 years as reconstructed from an ombrotrophic peat bog in Halland, SW Sweden, *Journal of Quaternary Science*, **21**: 905–919.
- De Jong, R., Hammarlund, D. and Nesje, A., 2009: Late Holocene effective precipitation variations in the maritime regions of south-west Scandinavia, *Quaternary Science Reviews*, **28**: 54–64.
- De Jong, R., et al., in press: Peatlands and climate. In: Dodson, J. (Ed.) *Changing Climates, Earth Systems, and Society*, Elsevier.
- De Vleeschouwer, F., Piotrowska, N., Sikorski, J., Pawlyta, J., Cheburkin, A., Le Roux, G., Lamentowicz, M., Fagel, N. and Mauquoy, D., 2009: Multiproxy evidence of ‘Little Ice Age’ palaeoenvironmental changes in a peat bog from northern Poland, *The Holocene*, **19**: 625–637.
- Hughes, P.D.M., Blundell, A., Charman, D.J., Bartlett, S., Daniell, J.R.G., Wojatschke, A. and Chambers, F.M., 2006: An 8,500 cal. year multi-proxy climate record from a bog in eastern Newfoundland: contributions of meltwater discharge and solar forcing, *Quaternary Science Reviews*, **25**: 1208–1227.
- Magny, M., 2006: Holocene fluctuations of lake levels in West-Central Europe: methods of reconstruction, regional pattern, palaeo-climatic significance and forcing factors. In: Elias, S. (Ed.) *Encyclopedia of Quaternary Geology*, Elsevier, 1389–1399.
- Magny, M., Peyron, O., Gauthier, E., Rouèche, Y., Bordon, A., Billaud, Y., Chapron, E., Marguet, A., Pétrequin, P. and Vannièrè, B., 2009: Quantitative reconstruction of climatic variations during the Bronze and early Iron ages based on pollen and lake-level data in the NW Alps, France, *Quaternary International*, **200**: 112–110.
- Mauquoy, D. and Barber, K.E., 1999: Evidence for climatic deteriorations associated with the decline of *Sphagnum imbricatum* Hornsch. ex Russ. in six ombrotrophic mires from northern England and the Scottish Borders, *The Holocene*, **9**: 423–37.

- Mauquoy, D., van Geel, B., Blaauw, M. and van der Plicht, J., 2002: Evidence from northwest European bogs shows 'Little Ice Age' climatic changes driven by variations in solar activity, *The Holocene*, **12**: 1–6.
- Mauquoy, D., van Geel, B., Blaauw, M., Speranza, A. and van der Plicht, J., 2004: Changes in solar activity and Holocene climate shifts derived from ^{14}C wiggle-match dated peat deposits, *The Holocene*, **14**: 45–52.
- Mauquoy, D., Yeloff, D., van Geel, B., Charman, D.J. and Blundell, A., 2008: Two decadal resolved records from north-west European peat bogs show rapid climate changes associated with solar variability during the mid-late Holocene, *Journal of Quaternary Science*, **23**: 745–763.
- McClymont, E.L., Mauquoy, D., Yeloff, D., Broekens, P., van Geel, B., Charman, D.J., Pancost, R.D., Chambers, F.M. and Evershed, R.P., 2008: The disappearance of *Sphagnum imbricatum* from Butterburn Flow, UK, *The Holocene*, **18**: 991–1002.
- McClymont, E.L., Mauquoy, D., Yeloff, D., Broekens, P., van Geel, B., Charman, D.J., Pancost, R.D., Chambers, F.M. and Evershed, R.P. 2009: The disappearance of *Sphagnum imbricatum* from Butterburn Flow, UK: a reply to comments by Bjorn Robroek et al., *The Holocene*, **19**: 1094–1097.
- Plunkett, G. and Swindles, G.T., 2008: Determining the Sun's influence on Late Glacial and Holocene climates: a focus on climate response to centennial-scale solar forcing at 2800 cal. BP, *Quaternary Science Reviews*, **27**: 175–184.
- Sernander, R., 1908: On the evidence of post-glacial changes of climate furnished by the peat mosses of northern Europe, *Geologiska Föreningens i Stockholm Förhandlingar*, **31**: 423–448.
- Sillasoo, Ü., Poska, A., Seppä, H., Blaauw, M. and Chambers, F.M., 2009: Linking past cultural developments to palaeoenvironmental changes in Estonia, *Vegetation History and Archaeobotany*, **18**: 315–327.
- Speranza, A., van der Plicht, J. and van Geel, B., 2000: Improving the time control of the Subboreal/Subatlantic transition in a Czech peat sequence by ^{14}C wiggle-matching, *Quaternary Science Reviews*, **19**: 1589–1604.
- Speranza, A., van Geel, B. and van der Plicht, J., 2002: Evidence for solar forcing of climate change at ca. 850 cal BC from a Czech peat sequence, *Global and Planetary Change*, **35**: 51–65.
- Swindles, G.T., Plunkett, G. and Roe, H., 2007: A delayed climatic response to solar forcing at 2800 cal. BP: multi-proxy evidence from three Irish peatlands, *The Holocene*, **17**: 177–182.
- Väliiranta, M., Korhola, A., Seppä, K., Tuittila, E.-S., Sarmaja-Korjonen, K., Laine, J. and Alm, J., 2007: High-resolution reconstruction of wetness dynamics in a southern boreal raised bog, Finland, during the late Holocene: a quantitative approach, *The Holocene*, **17**: 1093–1107.
- van Geel, B., 2006: 'Quaternary non-pollen palynomorphs' deserve our attention! *Review of Palaeobotany and Palynology*, 141: vii–viii. (Preface to Special Issue: *Quaternary Non-pollen Palynomorphs* edited by B. van Geel).
- van Geel, B. and Renssen, H., 1998: Abrupt climate change around 2,650 BP in North-West Europe: evidence for climatic teleconnections and a tentative explanation. In: Issar, A.S. and Brown, N. (Eds) *Water, Environment and Society in Times of Climatic Change*, Kluwer, Dordrecht, 21–41.
- van Geel, B. and Mauquoy, D., 2010: Peatland records of solar activity, *PAGES news*, 18(1).
- van Geel, B., Buurmann, J. and Waterbolk, H.T., 1996: Archaeological and palaeoecological indications of an abrupt climate change in The Netherlands, and evidence for climatological teleconnections around 2650 BP, *Journal of Quaternary Science*, **11**: 451–460.
- Yeloff, D., Bennett, K.D., Blaauw, M., Mauquoy, D., Sillasoo, U., van der Plicht, J. and van Geel, B., 2006: High precision ^{14}C dating of Holocene peat deposits: a comparison of Bayesian calibration and wiggle-matching approaches, *Quaternary Geochronology*, **1**: 222–235.
- Yeloff, D., van Geel, B., Broekens, P., Bakker, J. and Mauquoy, D., 2007a: Mid- to late-Holocene vegetation and land-use history in the Hadrian's Wall region of northern England: the record from Butterburn Flow, *The Holocene*, **17**, 527–538.
- Yeloff, D., Charman, D., van Geel, B. and Mauquoy, D., 2007b: Reconstruction of hydrology, vegetation and past climate change in bogs using fungal microfossils, *Review of Palaeobotany and Palynology*, **146**: 102–145.

R.K. Booth, S.T. Jackson and M. Notaro

- Booth, R.K., 2008: Testate amoebae as proxies of mean annual water-table depth in *Sphagnum*-dominated peatlands of North America, *Journal of Quaternary Science*, **23**: 43-57.
- Booth, R.K., 2010: Testing the climate sensitivity of peat-based paleoclimate reconstructions in mid-continental North America, *Quaternary Science Reviews*, **29**: 720-731. doi: 10.1016/j.quascirev.2009.11.018
- Booth, R.K. and Jackson, S.T. 2003. A high-resolution record of late Holocene moisture variability from a Michigan raised bog. *The Holocene*, **13**: 865-878.
- Booth, R.K., Notaro, M., Jackson, S.T. and Kutzbach, J.E., 2006: Widespread drought episodes in the western Great Lakes region during the past 2000 years: geographic extent and potential mechanisms, *Earth and Planetary Science Letters*, **242**: 415-427.
- Charman, D.J., 2007: Summer water deficit variability controls on peatland water-table changes: implications for Holocene palaeoclimate reconstructions, *The Holocene*, **17**: 217-227.
- Charman, D.J., Blundell, A., Chiverrell, R.C., Hendon, D.H. and Langdon, P.G., 2006: Compilation of non-annually resolved Holocene proxy climate records: stacked Holocene peatland palaeo-water table reconstructions from northern Britain, *Quaternary Science Reviews*, **25**: 336-350.
- Charman, D.J., Barber, K.E., Blaauw, M., Langdon, P.G., Mauquoy, D., Daley, T.J., Hughes, P.D.M. and Karofeld, E., 2009: Climate drivers for peatland palaeoclimate records, *Quaternary Science Reviews*, **28**: 1811-1819.
- Cobb, K.M., Charles, C.D., Cheng, H., and Edwards, R.L. 2003. El Nino-Southern Oscillation and tropical Pacific climate during the last millennium. *Nature*, **424**: 271-276.
- Cook, E.R., Woodhouse, C., Meko, D.M. and Stahle, D.W., 2004: Long-term aridity changes in the western United States, *Science*, **306**: 1015-1018.
- Cook, E.R., Seager, R., Cane, M.A. and Stahle, D.W., 2007: North American drought: reconstructions, causes, and consequences, *Earth-Science Reviews*, **81**: 93-134.
- Dai, A., Trenberth, K.E. and Qian, T., 2004: A global dataset of Palmer Drought Severity Index for 1870-2002: relationships with soil moisture and effects of surface warming, *Journal of Hydrometeorology*, **5**: 1117-1130.
- Daniels, J.M. and Knox, J.C., 2005: Alluvial stratigraphic evidence for channel incision during the Mediaeval Warm Period on the central Great Plains, USA, *The Holocene*, **15**: 736-747.
- Dise, N.B., 2009: Peatland responses to global change, *Science*, **326**: 810-811.
- Feng, S., Oglesby, R.J., Rowe, C.M., Loope, D.B. and Hu, Q., 2008: Atlantic and Pacific SST influences on Medieval drought in North America simulated by the Community Atmospheric Model, *Journal of Geophysical Research*, **113**, D11101, doi:10.1029/2007JD009347.
- Goble, R.J., Mason, J.A., Loope, D.B., and Swinehart, J.B. 2004. Optical and radiocarbon ages of stacked paleosols and dune sands in the Nebraska Sand Hills, USA, *Quaternary Science Reviews*, **23**: 1173-1182.
- Goodrich, G.B., 2007: Multidecadal climate variability and drought in the United States, *Geography Compass*, **1/4**: 713-738.
- Graham, N.E., et al., 2007: Tropical Pacific – mid-latitude teleconnections in medieval times, *Climatic Change*, **83**: 241-285.
- Helama, S., Merilainen, J. and Tuomenvirta, H., 2009: Multicentennial megadrought in northern Europe coincided with a global El Nino-Southern Oscillation drought pattern during the Medieval Climate Anomaly, *Geology*, **37**: 175-178.
- Herweijer, C., Seager, R., Cook, E.R. and Emile-Gray, J., 2007: North American droughts of the last millennium from a gridded network of tree-ring data, *Journal of Climate*, **20**: 1353-1376.
- Jansen, E., et al., 2007: Palaeoclimate. In: Solomon, S., et al. (Eds.) *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, United Kingdom and New York, USA.
- Keigwin, L.D. 1996. The little ice age and medieval warm period in the Sargasso Sea. *Science*, **274**: 1504-1508.
- MacDonald, G.M. and Case, R.A. 2005. Variations in the Pacific Decadal Oscillation over the past millennium, *Geophysical Research Letters*, **32**, L08703, doi:10.1029/2005GL022478.
- Mason, J.A., Swinehart, J.B., Goble, R.J. and Loope, D.B., 2004: Late Holocene dune activity linked to hydrological drought, Nebraska Sand Hills, USA, *Holocene*, **14**: 209-217.

- McCabe, G.J. and Palecki, M.A., 2006: Multidecadal climate variability of global lands and oceans, *International Journal of Climatology*, 849-865.
- McCabe, G.J., Palecki, M. and Betancourt, J.L., 2004: Pacific and Atlantic Ocean influences on multidecadal drought frequency in the United States, *Proceedings of the National Academy of Science*, **101**: 4136-4141.
- McCabe, G.J., Betancourt, J.L., Gray, S.T., Palecki, M.A. and Hidalgo, H.G., 2008: Associations of multi-decadal sea-surface temperature variability with US drought, *Quaternary International*, **188**: 31-40.
- Meko, D.M., Woodhouse, C.A., Baisan, C.A., Knight, T., Lukas, J.J., Hughes, M.K. and Saltzer M.W., 2007: Medieval drought in the upper Colorado River Basin, *Geophysical Research Letters*, **34**: L10705, doi:10.1029/2007GRL029988.
- Miao, X., Mason, J.A., Swinehart, J.B., Loope, D.B., Hansen, P.R., Goble, R.J. and Liu, X., 2007: A 10,00 year record of dune activity, dust storms, and severe drought in the central Great Plains, *Geology*, **35**: 119-122.
- Seager, R., Graham, N., Herweijer, C., Gordon, A.L., Kushnir, Y. and Cook, E., 2007: Blueprints for Medieval hydroclimate, *Quaternary Science Reviews*, **26**: 2322-2336.
- Seager, R., Kushnir, Y., Ting, M., Case, M., Naik, N. and Miller, J., 2008: Would advance knowledge of 1930s SSTs have allowed prediction of the dust bowl drought? *Journal of Climate*, **21**: 3261-3281.
- Shuman, B., Henderson, A.K., Plank, C., Stefanova, I. and Ziegler, S.S., 2009: Woodland-to-forest transition during prolonged drought in Minnesota after ca. AD 1300, *Ecology*, **90**: 2792-2807.
- Sridhar, V., Loope, D.B., Swinehart, J.B., Mason, J.A., Oglesby, R.J. and Rowe, C.M., 2006: Large wind shift on the great plains during the Medieval Warm Period, *Science*, **313**: 345-347.
- Sutton, R.T. and Hodson, D.L.R., 2005: Atlantic Ocean forcing of multidecadal variations in North American and European summer climate, *Science*, **309**:115-118.
- Sutton, R.T. and Hodson, D.L.R., 2007: Climate response to basin-scale warming and cooling of the North Atlantic Ocean, *Journal of Climate*, **20**: 891-907.
- Trouet, V., Esper, J., Graham, N.E., Baker, A., Scourse, J.D. and Frank, D.C., 2009: Persistent positive North Atlantic oscillation mode dominated the Medieval Climate Anomaly, *Science*, **324**: 78-80.
- Woodhouse, C.A., Russell, J.L. and Cook, E.R., 2009: Two modes of North American drought from instrumental and paleoclimatic data, *Journal of Climate*, **22**: 4336-4347.

M. Blaauw, J. Andrés Christen and D. Mauquoy

- Barber, K.E. and Langdon, P.G., 2007: What drives the peat-based palaeoclimate record? A critical test using multi-proxy climate records from northern Britain, *Quaternary Science Reviews*, **26**: 3318-3327.
- Belyea, L.R. and Clymo, R.S., 2001: Feedback control of the rate of peat formation, *Proceedings of the Royal Society of London: Biological Sciences*, **268**: 1315-1321.
- Belyea, L.R. and Baird, A.J., 2006: Beyond the "limits to peat bog growth": cross-scale feedback in peatland development, *Ecological Monographs*, **76**: 299-322.
- Bennett, K.D., 1994: Confidence intervals for age estimates and deposition times in late-Quaternary sediment sequences, *The Holocene*, **4**: 337-348.
- Bennett, K.D. and Fuller, J.L., 2002: Determining the age of the mid-Holocene *Tsuga canadensis* (hemlock) decline, eastern North America, *The Holocene*, **12**: 421-429.
- Blaauw, M. and Christen, J.A., 2005: Radiocarbon peat chronologies and environmental change, *Applied Statistics*, **54**: 805-816.
- Blaauw, M., Heuvelink, G.B.M., Mauquoy, D., van der Plicht, J. and van Geel, B., 2003: A numerical approach to ¹⁴C wiggle-match dating of organic deposits: best fits and confidence intervals, *Quaternary Science Reviews*, **22**: 1485-1500.
- Blaauw, M., Christen, J.A., Mauquoy, D., van der Plicht, J. and Bennett, K.D., 2007: Testing the timing of radiocarbon-dated events between proxy archives, *The Holocene*, **17**: 283-288.
- Blaauw, M., Wohlfarth, B., Christen, J.A., Ampel, L., Veres, D., Hughen, K.A., Preusser, F. and Svensson, A., 2010a: Were last glacial climate events simultaneous between Greenland and

- France? A quantitative comparison using non-tuned chronologies, *Journal of Quaternary Science*, **25**: 387-394.
- Blaauw, M., Bennett, K.D., Christen, J.A., 2010b: Random walk simulations of fossil proxy data, *The Holocene*, doi:10.1177/0959683609355180.
- Blaauw, M., Christen, J.A., Pérez, S.E., in preparation: Flexible palaeoclimate age-depth models using an autoregressive gamma process.
- Bronk Ramsey, C., 2008: Deposition models for chronological records, *Quaternary Science Reviews*, **27**: 42-60.
- Chambers, F.M., Mauquoy, D., Brain, S.A., Blaauw, M. and Daniell, J.R.G., 2007: Globally synchronous climate change 2800 years ago: Proxy data from peat in South America, *Earth and Planetary Science Letters*, **253**: 439-444.
- Charman, D., Barber, K., Blaauw, M., Langdon, P., Mauquoy, D., Daley, T., Hughes, P. and Karofeld, E., 2009: Climate drivers for peatland palaeoclimate records, *Quaternary Science Reviews*, **28**: 1811-1819.
- Christen, J.A., Clymo, D. and Litton, C.D., 1995: A Bayesian approach to the use of ^{14}C dates in the estimation of the age of peat, *Radiocarbon*, **37**: 431-442.
- Kilian, M.R., van der Plicht, J. and van Geel, B., 1995: Dating raised bogs: new aspects of AMS ^{14}C wiggle matching, a reservoir effect and climatic change, *Quaternary Science Reviews*, **14**: 959-966.
- Kilian, M.R., van Geel, B. and van der Plicht, J., 2000: ^{14}C AMS wiggle matching of raised bog deposits and models of peat accumulation, *Quaternary Science Reviews*, **19**: 1011-1033.
- Mauquoy, D., van Geel, B., Blaauw, M. and van der Plicht, J., 2002: Evidence from North-west European bogs shows 'Little Ice Age' climatic changes driven by changes in solar activity, *The Holocene*, **12**: 1-6.
- Parnell, A.C., Haslett, J., Allen, J.R.M., Buck, C.E. and Huntley, B., 2008: A flexible approach to assessing synchronicity of past events using Bayesian reconstructions of sedimentation history, *Quaternary Science Reviews*, **27**: 1872-1885.
- Pilcher, J.R., Hall, V.A. and McCormac, F.G., 1995: Dates of Holocene Icelandic volcanic eruptions from tephra layers in Irish peats, *The Holocene*, **5**: 103-110.
- Reimer, P.J. et al., 2009: IntCal09 and Marine09 radiocarbon age calibration curves, 0-50,000 years cal BP, *Radiocarbon*, **51**: 1111-1150.
- Scott, E.M., 2007: Radiocarbon dating: sources of error. In: Elias, S.A. (Ed), *Encyclopedia of Quaternary Science*, Elsevier, Amsterdam: 2918-23.
- Telford, R.J., Heegaard, E. and Birks, H.J.B., 2004: All age-depth models are wrong: but how badly? *Quaternary Science Reviews*, **23**: 1-5.
- Turetsky, M.R., Manning, S. and Wieder, R.K., 2004: Dating recent peat deposits, *Wetlands*, **24**: 324-356.
- van der Linden, M., Vickery, E., Charman, D.J. and van Geel, B., 2008: Effects of human impact and climate change during the last 350 years recorded in a Swedish raised bog deposit, *Palaeogeography, Palaeoclimatology, Palaeoecology*, **262**: 1-31.
- van Geel, B. and Mook, W.G., 1989: High-resolution ^{14}C dating of organic deposits using natural atmospheric ^{14}C variations, *Radiocarbon*, **31**, 151-155.
- Van Geel, B. and Mauquoy, 2010: Peatland records of solar activity, *PAGES news*, 18(1).
- von Post, L., 1946: The prospect for pollen analysis in the study of the Earth's climatic history, *New Phytologist*, **45**: 193-217.
- Yu, Z., Campbell, I.D., Vitt, D.H. and Apps, M.J., 2001: Modelling long-term peatland dynamics. I. Concepts, review, and proposed design, *Ecological modelling*, **145**: 197-210.

B. van Geel and D. Mauquoy

- Beer, J. and van Geel, B., 2008: Holocene climate change and the evidence for solar and other forcings. In: R.W. Battarbee and H.A. Binney (Eds), *Natural Climate Variability and Global Warming: a Holocene Perspective*, Wiley-Blackwell, 138-162.
- Blaauw, M., Heuvelink, G.B.M., Mauquoy, D., van der Plicht, J. and van Geel, B., 2003: A numerical approach to ^{14}C wiggle-match dating of organic deposits: best fits and confidence intervals, *Quaternary Science Reviews*, **22**: 1485-1500.

- Bond, G., Kromer, B., Beer, J., Muscheler, R., Evans, M.N., Showers, W., Hoffmann, S., Lotti-Bond, R., Hajdas, I. and Bonani, G., 2001: Persistent solar influence on North Atlantic climate during the Holocene, *Science*, **294**: 2130-2136.
- Chambers, F., Daniell, J.R.G. and ACCROTELM Members, 2010: Peatland archives of late-Holocene climate change in northern Europe, *PAGES news*, 18(1).
- Kilian, M.R., van der Plicht, J. and van Geel, B., 1995: Dating raised bogs: new aspects of AMS ^{14}C wiggle matching, a reservoir effect and climatic change, *Quaternary Science Reviews*, **14**: 959-966.
- Magny, M., 2004: Holocene climate variability as reflected by mid-European lake level fluctuations, and its probable impact on prehistoric human settlements, *Quaternary International*, **113**: 65-79.
- Magny, M., 2007: Lake level studies - West-Central Europe. In: *Encyclopedia of Quaternary Studies*, Vol. 2, pp. 1389-1399. Elsevier, Amsterdam.
- Mauquoy, D., van Geel, B., Blaauw, M. and van der Plicht, J., 2002a: Evidence from northwest European bogs shows 'Little Ice Age' climatic changes driven by variations in solar activity, *The Holocene*, **12**: 1-6.
- Mauquoy, D., Engelkes, T., Groot, M.H.M., Markesteijn, F., Oudejans, M.G., van der Plicht, J. and van Geel, B., 2002b: High-resolution records of late-Holocene climate change and carbon accumulation in two north-west European ombrotrophic peat bogs, *Palaeogeography, Palaeoclimatology, Palaeoecology*, **186**: 275-310.
- Mauquoy, D., Yeloff, D., van Geel, B., Charman, D. and Blundell, A., 2008: Two decadal resolved records from north-west European peat bogs show rapid climate changes associated with solar variability during the mid-late Holocene, *Journal of Quaternary Science*, **23**: 745-763.
- Neff, U., Burns, S., Mangini, A., Mudelsee, M., Fleitmann, D. and Matter, A., 2001: Strong coherence between solar variability and the monsoon in Oman between 9 and 6 kyr ago, *Nature*, **411**: 290-293.
- Reimer, P.J., et al., 2004: INTCAL04 terrestrial radiocarbon age calibration, 0-26 cal kyr BP, *Radiocarbon*, **46**: 1029-1058.
- Speranza, A., van Geel, B. and van der Plicht, J., 2002: Evidence for solar forcing of climate change at ca. 850 cal BC from a Czech peat sequence, *Global and Planetary Change*, **35**: 51-65.
- Stuiver, M. and Pollach, H.A., 1977: Discussions of reporting ^{14}C data. *Radiocarbon*, **19**: 355-363.
- van der Plicht, J., van Geel, B., Bohncke, S.J.P., Bos, J.A.A., Blaauw, M., Speranza, A.O.M., Muscheler, R. and Björck, S., 2004: Early Holocene solar forcing of climate change in Europe, *Journal of Quaternary Science*, **19**: 263-269.
- van Geel, B. and Mook, W.G., 1989: High-resolution ^{14}C dating of organic deposits using natural atmospheric ^{14}C variations, *Radiocarbon*, **31**: 151-156.
- van Geel, B., Buurman, J. and Waterbolk, H.T., 1996: Archeological and paleoecological indications for an abrupt climate change in The Netherlands and evidence for climatological teleconnections around 2650 BP, *Journal of Quaternary Science*, **11**: 451-460.
- van Geel, B., van der Plicht, J., Kilian, M.R., Klaver, E.R., Kouwenberg, J.H.M., Renssen, H., Reynaud-Farrera I. and Waterbolk, H.T., 1998: The sharp rise of $\Delta^{14}\text{C}$ ca. 800 cal BC: possible causes, related climatic teleconnections and the impact on human environments, *Radiocarbon*, **40**: 535-550.
- van Geel, B., et al., 2004: Climate change and the expansion of the Scythian culture after 850 BC, a hypothesis, *Journal of Archaeological Science*, **31**: 1735-1742.
- M. Lamentowicz, W.O. van der Knaap, J.F.N. van Leeuwen, S. Hangartner, E.A.D. Mitchell, T. Goslar, W. Tinner and C. Kamenik**
- Ammann, B., 1986: Litho- and palynostratigraphy at Lobsigensee: Evidences for trophic changes during the Holocene - Studies in the Late-Quaternary of Lobsigensee No 13, *Hydrobiologia*, **143**: 301-307.
- Ammann, B., Birks, H.J.B., Brooks, S.J., Eicher, U., von Grafenstein, U., Hofmann, W., Lemdahl, G., Schwander, J., Tobolski, K. and Wick, L., 2000: Quantification of biotic responses to rapid climatic changes around the Younger Dryas – a synthesis, *Palaeogeography Palaeoclimatology Palaeoecology*, **159**: 313-347.
- Charman, D.J., 2002: *Peatlands and environmental change*, Chichester, John Wiley & Sons.

- Dahlgren, R. and Turner, M.: Nutrient cycling in forest systems, <http://lawr.ucdavis.edu/classes/Ssc219/biogeo/start.htm>
- Genries, A., Mercier, L., Lavoie, M., Muller, S.D., Radakovitch, O. and Carcaillet, C. 2009: The effect of fire frequency on local cembra pine populations, *Ecology*, **90**: 476-486.
- Goslar, T., Van der Knaap, W.O., Kamenik, C. and Van Leeuwen, J.F.N., 2009: Free-shape 14C age-depth modelling of an intensively dated modern peat profile, *Journal of Quaternary Science*, **24**: 481-499.
- Hofstetter, S., Tinner, W., Valsecchi, V., Carraro, G. and Conedera, M., 2006: Lateglacial and Holocene vegetation history in the Insubrian Southern Alps - New indications from a small-scale site, *Vegetation History and Archaeobotany*, **15**: 87-98.
- Joosten, H. and De Klerk, P., 2007: DAMOCLES: a DASHing MONolith Cutter for fine sectioning of peats and sediments into Large Slices, *Boreas*, **36**: 76-81.
- Kamenik, C., Van der Knaap, W.O., Van Leeuwen, J.F.N. and Goslar, T., 2009: Pollen/climate calibration based on a near-annual peat sequence from the Swiss Alps, *Journal of Quaternary Science*, **24**: 529-546.
- Lamentowicz, M., Van der Knaap, P., Lamentowicz, L., Van Leeuwen, J.F.N., Mitchell, E. A.D., Goslar, T. and Kamenik, C., 2010: A near-annual palaeohydrological study based on testate amoebae from an Alpine mire: surface wetness and the role of climate during the instrumental period, *Journal of Quaternary Science*, in press DOI 10.1002/jqs.1295.
- Lamentowicz, M., Van der Knaap, W.O., van Leeuwen, J.F.N., Goslar, E.D.M., Mitchell, E.A.D., Hangartner, S. and Kamenik, C.: Last millennium multiproxy high-resolution palaeoenvironmental study from an Alpine mire. in prep.
- Laternser, M. and Schneebeli, M., 2003: Long-term snow climate trends of the Swiss Alps (1931-99), *International Journal of Climatology*, **23**: 733-750.
- Stahli, M., Finsinger, W., Tinner, W. and Allgower, B., 2006: Wildfire history and fire ecology of the Swiss National Park (Central Alps): new evidence from charcoal, pollen and plant macrofossils, *The Holocene*, **16**: 805-817.
- Valsecchi, V., Carraro, G., Conedera, M. and Tinner, W., 2010: Late Holocene vegetation and land-use dynamics in the Southern Alps (Switzerland) as a basis for nature protection and forest management, *The Holocene*, in press DOI: 10.1177/0959683609355178..
- van der Knaap, W.O., van Leeuwen, J.F.N., Fankhauser, A. and Ammann, B., 2000: Palynostratigraphy of the last centuries in Switzerland based on 23 lake and mire deposits: Chronostratigraphic pollen markers, regional patterns, and local histories, *Review of Palaeobotany and Palynology*, **108**: 85-142.
- van der Knaap, W.O. and van Leeuwen, J.F.N., 2003: Climate-pollen relationships AD 1901-1996 in two small mires near the forest limit in the northern and central Swiss Alps, *Holocene*, **13**: 809-828.
- Wehrli, M., Mitchell, E.A.D., van der Knaap, W.O., Ammann, B. and Tinner, W., 2010: Effects of climatic change and bog development on Holocene tufa formation in the Lorze Valley (central Switzerland), *The Holocene*, in press.
- Wipf, S., Stoeckli, V. and Bebi, P., 2009: Winter climate change in alpine tundra: plant responses to changes in snow depth and snowmelt timing, *Climatic Change*, **94**: 105-121.

E.L. McClymont, E. Pendall and J. Nichols

- Avsejs, L.A., Nott, C.J., Xie, S., Maddy, D., Chambers, F.M. and Evershed, R.P., 2002: 5-n-alkylresorcinols as biomarkers of sedges in an ombrotrophic peat section, *Organic Geochemistry*, **33**: 861-867.
- Baas, M., Pancost, R.D., van Geel, B. and Sinninghe Damsté, J., 2000: A comparative study of lipids in *Sphagnum* species, *Organic Geochemistry*, **31**: 535-541.
- Bingham, E.M., McClymont, E.L., Väiliranta, M., Mauquoy, D., Roberts, Z., Chambers, F.M., Pancost, R.D. and Evershed, R.P., 2010: Conservative compositions of n-alkane biomarkers in *Sphagnum* species: Implications for palaeovegetation reconstruction in ombrotrophic peat bogs, *Organic Geochemistry*, **41**(2): 214-220.
- Boon, J.J., Dupont, L. and De Leeuw, J.W., 1986: Characterization of a Peat Bog Profile by Curie Point Pyrolysis-Mass Spectrometry Combined with Multivariate Analysis and by Pyrolysis Gas

- Chromatography-Mass Spectrometry. In: Fuchsman, C.H. (Ed.), *Peat and Water*, Elsevier Applied Science Publishers Ltd, 215-239.
- Calvo, E., Grimalt, J. and Jansen, E., 2002: High resolution U^{K}_{37} sea surface temperature reconstruction in the Norwegian Sea during the Holocene, *Quaternary Science Reviews*, **21**(12-13): 1385-1394.
- Daley, T.J., Street-Perrott, F.A., Loader, N.J., Barber, K.E., Hughes, P.D.M., Fisher, E.H. and Marshall, J.D., 2009: Terrestrial climate signal of the "8200 yr B.P. cold event" in the Labrador Sea region, *Geology*, **37**(9): 831-834.
- Daley, T.J., Barber, K.E., Street-Perrott, F.A., Loader, N.J., Marshall, J.D., Crowley, S.F. and Fisher, E.H., in press: Holocene climate variability revealed by oxygen isotope analysis of Sphagnum cellulose from Walton Moss, northern England, *Quaternary Science Reviews*, doi:10.1016/j.quascirev.2009.09.017.
- Freudenberg, K., 1965: Lignin: Its Constitution and Formation from p-Hydroxycinnamyl Alcohols: Lignin is duplicated by dehydrogenation of these alcohols; intermediates explain formation and structure, *Science*, **148**(3670): 595-600.
- Kuhry, P. and Vitt, D.H., 1996: Fossil Carbon/Nitrogen Ratios as a Measure of Peat Decomposition, *Ecology*, **77**(1): 271-275.
- Loader, N.J., McCarroll, D., van der Knaap, W.O., Robertson, I., and Gagen, M., 2007: Characterizing carbon isotopic variability in *Sphagnum*, *The Holocene*, **17**(3): 403-410.
- McClymont, E.L., Mauquoy, D., Yeloff, D., Broekens, P., van Geel, B., Charman, D.J., Pancost, R.D., Chambers, F.M. and Evershed, R.P., 2008: The disappearance of *Sphagnum imbricatum* from Butterburn Flow, UK, *The Holocene*, **18**(6): 991-1002.
- Menot-Combes, G., Burns, S.J. and Leuenberger, M., 2002: Variations of $^{18}O/^{16}O$ in plants from temperate peat bogs (Switzerland): implications for paleoclimatic studies, *Earth and Planetary Science Letters*, **202**(2): 419-434.
- Nichols, J.E., Booth, R.K., Jackson, S.T., Pendall, E.G. and Huang, Y., 2006: Paleohydrologic reconstruction based on *n*-alkane distributions in ombrotrophic peat, *Organic Geochemistry*, **37**(11): 1505-1513.
- Nichols, J.E., Walcott, M., Bradley, R., Pilcher, J. and Huang, Y., 2009: Quantitative assessment of precipitation seasonality and summer surface wetness using ombrotrophic sediments from an Arctic Norwegian peatland, *Quaternary Research*, **72**(3): 443-451.
- Nichols, J., Booth, R.K., Jackson, S.T., Pendall, E.G. and Huang, Y., 2010: Differential hydrogen isotopic ratios of *Sphagnum* and vascular plant biomarkers in ombrotrophic peatlands as a quantitative proxy for precipitation-evaporation balance, *Geochimica et Cosmochimica Acta*, **74**(4): 1407-1416.
- Nott, C.J., Xie, S., Avsejs, L.A., Maddy, D., Chambers, F.M. and Evershed, R.P., 2000: *n*-Alkane distributions in ombrotrophic mires as indicators of vegetation change related to climatic variation, *Organic Geochemistry*, **31**: 231-235.
- Pancost, R.D., van Geel, B., Baas, M. and Sinninghe Damsté, J., 2000: $\delta^{13}C$ values and radiocarbon dates of microbial biomarkers as tracers for carbon recycling in peat deposits, *Geology*, **28**(7): 663-666.
- Pancost, R.D., Baas, M., van Geel, B. and Sinninghe Damsté, J.S., 2002: Biomarkers as proxies for plant inputs to peats: an example from a sub-boreal ombrotrophic bog, *Organic Geochemistry*, **33**(7): 675-690.
- Pancost, R.D., Baas, M., van Geel, B. and Sinninghe Damsté, J., 2003: Response of an ombrotrophic bog to a regional climate event revealed by macrofossil, molecular and carbon isotopic data, *The Holocene*, **13**(6): 921-932.
- Pendall, E., Markgraf, V., White, J.W.C., Dreier, M., and Kenny, R., 2001: Multiproxy record of late Pleistocene-Holocene climate and vegetation changes from a peat bog in Patagonia, *Quaternary Research*, **55**: 168-178.
- Raghoebarsing, A.A., et al., 2005: Methanotrophic symbionts provide carbon for photosynthesis in peat bogs, *Nature*, **436**(7054): 1153-1156.
- Schellekens, J., Buurman, P. and Pontevedra-Pombal, X., 2009: Selecting parameters for the environmental interpretation of peat molecular chemistry - A pyrolysis-GC/MS study, *Organic Geochemistry*, **40**(6): 678-691.

- Skrzypek, G., Kaluzny, A., Wojtun, B. and Jedrysek, M.-O., 2007: The carbon stable isotopic composition of mosses: A record of temperature variation, *Organic Geochemistry*, **38**(10): 1770-1781.
- van der Heijden, E., Boon, J.J., Rasmussen, S. and Rudolph, H., 1997: Sphagnum Acid and its Decarboxylation Product Isopropenylphenol as Biomarkers for Fossilised Sphagnum in Peats, *Ancient Biomolecules*, **1**(2): 93-107.
- Weijers, J.W.H., Schouten, S., van der Linden, M., van Geel, B. and Sinninghe Damsté, J.S., 2004: Water table related variations in the abundance of intact archaeal membrane lipids in a Swedish peat bog, *FEMS Microbiology Letters*, **239**: 51-56.
- White, J.W.C., Ciais, P., Figge, R.A., Kenny, R. and Markgraf, V., 1994: A high-resolution record of atmospheric CO₂ content from carbon isotopes in peat, *Nature*, **367**: 153-156.
- Williams, T.G. and Flanagan, L.B., 1996: Effect of Changes in Water Content on Photosynthesis, Transpiration and Discrimination against ¹³CO₂ and C¹⁸O¹⁶O in *Pleurozium* and *Sphagnum*, *Oecologia*, **108**(1): 38-46.
- Yeloff, D. and Mauquoy, D., 2006: The influence of vegetation composition on peat humification: implications for palaeoclimatic studies, *Boreas*, **35**(4): 662-673.

B. Hong, M. Uchida, X.T. Leng and Y.T. Hong

- Bond, G., Showers, W., Cheseby, M., Lotti, R., Almasi, P., deMenocal, P., Priore, P., Cullen, H., Hajdas, I. and Bonani, G., 1997: A Pervasive millennial-scale cycle in North Atlantic Holocene and glacial climates, *Science*, **278**: 1257-1266.
- Booth, R.K., Jackson, S.T. and Notaro, M., 2010: Using peatland archives to test paleoclimate hypotheses, *PAGES news*, 18(1).
- Brenninkmeijer, C.A.M., Van Geel, B. and Mook, W.G., 1982: Variations in the D/H and ¹⁸O/¹⁶O ratios in cellulose extracted from a peat bog cove, *Earth and Planetary Science Letters*, **61**: 283-290.
- Briggs, D.E.G., Evershed, R.P. and Lockheart, M.J., 2000: The biomolecular paleontology of continental fossils, *Paleobiology*, **26**: 169-193.
- Dansgaard, W., 1964: Stable isotopes in precipitation, *Tellus*, **16**: 436-468.
- Francey, R.J. and Farquhar, G.D., 1982: An explanation of ¹³C/¹²C variations in tree rings, *Nature*, **297**: 28-31.
- Gao, Y.X. and Xu, S.Y., 1962: *Some problems of East Asian Monsoon*, pp. 1-49, Science Press, Beijing.
- Hong, B., Lin, Q.H. and Hong, Y.T., 2006: Interconnections between the Asian monsoon, ENSO, and high northern latitude climate during the Holocene, *Chinese Science Bulletin*, **51**: 11-19.
- Hong, Y.T., Jiang, H.B., Liu, T.S., Zhou, L.P., Beer, J., Li, H.D., Leng, X.T., Hong, B. and Qin, X.G., 2000: Response of climate to solar forcing recorded in a 6000-year δ¹⁸O time-series of Chinese peat cellulose, *The Holocene*, **10**: 1-7.
- Hong, Y.T., Wang, Z.G., Jiang, H.B., Lin, Q.H., Hong, B., Zhu, Y.X., Wang, Y., Xu, L.S., Leng, X.T. and Li, H.D., 2001: A 6000-year record of changes in drought and precipitation in northeastern China based on a δ¹³C time series from peat cellulose, *Earth and Planetary Science Letters*, **185**: 111-119.
- Hong, Y.T., et al., 2003: Correlation between Indian Ocean summer monsoon and North Atlantic climate during the Holocene, *Earth and Planetary Science Letters*, **211**: 371-380.
- Hong, Y.T., Hong, B., Lin, Q.H., Shibata, Y., Hirota, M., Zhu, Y.X., Leng, X.T., Wang, Y., Wang, H. and Yi, L., 2005: Inverse phase oscillations between the East Asian and Indian Ocean summer monsoons during the last 12000 years and paleo- El Niño, *Earth and Planetary Science and Letters*, **231**: 337-346.
- Hong, Y.T., Hong, B., Lin, Q.H., Shibata, Y., Zhu, Y.X., Leng, X.T. and Wang, Y., 2009: Synchronous climate anomalies in the western North Pacific and North Atlantic regions during the last 14,000 years, *Quaternary Science Reviews*, **28**: 840-849.
- Lee, X.Q., et al., 2005: Carbon isotope of bulk organic matter: A proxy for precipitation in the arid and semiarid central East Asian, *Global biogeochemical cycles*, **19**, GB4010, doi:10.1029/2004GB002303.
- Ménot-Combes, G., Burns, S.J. and Leuenberger, M., 2002: Variations of ¹⁸O/¹⁶O in plants from

- temperate peat bogs (Switzerland): implications for paleoclimatic studies, *Earth and Planetary Science Letters*, **202**: 419-434.
- McClymont, E., Pendall, E. and Nichols, J., 2010: Stable isotopes and organic geochemistry in peats: tools to investigate paleohydrology, paleotemperature and biogeochemistry, *PAGES news*, 18(1).
- Reimer, P.J., et al., 2004: Residual delta ¹⁴C around 2000 year moving average of IntCal04, *Radiocarbon*, **46**: 1029-1058.
- Schleser, G.H., 1995: Parameters determining carbon isotope ratios in plants, In: Frenzel, B., Stauffer, B. and Weiss, M.M. (Ed.), *Paläoklimaforschung* **15**: 71-96, Strasbourg, France.
- Sun, H.I., 1996: *Formation and Evolution of Qinghai-Xizang Plateau*, Shanghai Press, Shanghai: pp. 101-146.
- Sun, S. and Yin, M., 1999: Subtropical high anomalies over the Western Pacific and its relations to the Asian monsoon and SST anomaly, *Advances in Atmospheric Sciences*, **16**: 559-568.
- Tao, S. and Chen, L., 1987: A review of recent research on the East Asian summer monsoon in China, In: Chang, C.P. and Krishnamurti, T.N. (Ed.), *Monsoon Meteorology*, Oxford, Oxford University Press: pp. 60-92.
- Teller, J.T., Leverington, D.W. and Mann, J.D., 2002: Freshwater outbursts to the oceans from glacial Lake Agassiz and their role in climate change during the last deglaciation, *Quaternary Science Reviews*, **21**: 879-887.
- Wang S. and Zhu J., 2006: Studies of chronology of millennial time scale climate oscillation in the Holocene, *Advances in Climate Change Research*, **2** (Suppl. 1): 73-76.
- Wang, G., Feng, X., Han, J., Zhou, L., Tan, W. and Su, F., 2008: Paleovegetation reconstruction using δ¹³C of soil organic matter, *Biogeosciences*, **5**: 1325-1337.
- Wu, G.X., Chou, J.F., Liu, Y.M., Zhang, Q.Y. and Sun, S.Q., 2003: Review and prospect of the study on the subtropical anticyclone, *Chinese Journal of Atmospheric Sciences*, **27**(4): 503-517.
- Yin, M. and Sun, S., 2000: A study on the response of subtropical high over the Western Pacific on the SST anomaly, *Chinese Journal of Atmospheric Sciences*, **24**(2): 193-206.

F. De Vleeschouwer, G. Le Roux and W. Shotyk

Data used in the production of figure 1 are indicated with an asterix.

- *Aaby, B. and Jacobsen, J., 1979: Changes in biotic conditions and metal deposition in the last millennium as reflected in ombrotrophic peat in Draved Mose, *Aarbog - Danmarks Geologiske Undersoegelse*, **1978**: 5-43
- *Aaby, B., Jacobsen, J., and Jacobsen, O.S., 1979: Lead-210 dating and lead deposition in the ombrotrophic peat bog, Draved Mose, Denmark, *Aarbog - Danmarks Geologiske Undersoegelse*, **1978**: 45-68.
- *Baron, S., Lavoie, M., Ploquin, A., Carignan, J., Pulido, M. and de Beaulieu, J.-L., 2005 : Record of metal workshops in peat deposits: history and environmental impact on the Mont Lozère Massif, France, *Environmental Science and Technology*, **39**: 5131-5140.
- *Bindler, R., Brännvall, M.-L., Renberg, I., Emteryd, O. and Gripe, H., 1999: Natural Lead Concentrations in Pristine Boreal Forest Soils and Past Pollution Trends: A Reference for Critical Load Models, *Environmental Science and Technology*, **33**: 3362-3367.
- *Bindler, R., Klarqvist, M., Klaminder, J. and Förster, J., 2004: Does within-bog spatial variability of mercury and lead constrain reconstructions of absolute deposition rates from single peat records? The example of Store Mosse, Sweden, *Global Biogeochemical Cycles*, **18**: GB 3020, doi:10.1029/2004GB002270
- *Bindler, R., Renberg, I., and Klaminder, J., 2008: Bridging the gap between ancient metal pollution and contemporary biogeochemistry, *Journal of Paleolimnology*, **40**: 755-770.
- Birks H.J.B., 1965: Pollen Analytical Investigations at Holcroft Moss, Lancashire, and Lindow Moss, Cheshire, *Journal of Ecology*, Vol. 53, No. 2 (Jul., 1965), pp. 299-314.
- *Brännvall, M.-L., Bindler, R., Emteryd, O., Nilsson, M. and Renberg, I., 1997: Stable isotope and concentration records of atmospheric lead pollution in peat and lake sediments in Sweden, *Water, Air and Soil Pollution*, **100**: 243-252.
- *Cloy, J.M., Farmer, J.G., Graham, M.C., MacKenzie, A.B. and Cook, G.T., 2005: A comparison of antimony and lead profiles over the past 2500 years in Flanders Moss ombrotrophic peat bog, Scotland, *Journal of Environmental Monitoring*, **7**: 1137-1147.

- *Coggins, A.M., Jennings, S.G. and Ebinghaus, R., 2006: Accumulation rates of the heavy metals lead, mercury and cadmium in ombrotrophic peatlands in the west of Ireland, *Atmospheric Environment*, **40**: 260-278.
- *De Vleeschouwer, F., Gerard, F., Goormaghtigh, C., Mattielli, N., Le Roux, G. and Fagel, N., 2007: Last two millennia atmospheric lead and heavy metals inputs in a Belgian peat bog: regional to global human impacts, *The Science of the Total Environment*, **377**: 297-310.
- *De Vleeschouwer, F., Fagel, N., Cheburkin, A., Pazdur, A., Sikorski, J., Mattielli, N., Renson, V., Fialkiewicz, B. and Piotrowska, N., 2009: Anthropogenic impacts in North Poland over the last 1300 years, *The Science of the Total Environment*, **407**: 5674-5684.
- *Farmer, J.G., MacKenzie, A.B., Sugden, C.L., Edgar, P.J. and Eades, L.J., 1997: A comparison of the historical lead pollution records in peat and freshwater lake sediments from central Scotland, *Water, Air and Soil Pollution*, **100**: 253-270.
- *El-Daoushy, F. and Tolonen, K., 1984: Lead-210 and heavy metal records in dated ombrotrophic peat-hummocks from Finland, *Nuclear Instruments and Methods in Physics Research B*, **223**: 392-399.
- *Ettler, V., Navratil, T., Mihaljevic, M., Rohovec, M., Zuna, M., Sebek, O., Strnad, L. and Hojdova, M., 2008: Mercury deposition/accumulation rates in the vicinity of a lead smelter as recorded by a peat deposit, *Atmospheric Environment*, **42**: 5968-5977.
- *Ettler, V. and Mihaljevic, M., 1999: Distribution of trace elements in several ombrotrophic peat bogs in the Bohemian Massif, *Rostlinna Vyroba*, **45**: 331-334.
- *Görres, M. and Frenzel, B., 1993: The Pb, Br and Ti content in peat bogs as indicators for recent and past depositions, *Naturwissenschaft*, **80**: 333-335.
- *Görres, M. and Frenzel, B., 1997: Ash and metal concentrations in peat bogs as an indicator of anthropogenic activity. *Water, Air and Soil Pollution*, **100**: 355-365.
- *Gilbertson, D. D., Gratten, J. P., Cressey, M., and Pyatt, F. B., 1997 : An air-pollution history of metallurgical innovation in iron- and steel-making: A geochemical archive of Sheffield, *Water, Air and Soil Pollution*, **100**: 327-341.
- *Holynska, B., Ostachowicz, B., Ostachowicz, J., Samek, L., Wachniew, P., Obidowicz, A., Wobrauschek, P., Strel, C. and Halmetschlager, G., 1998: Characterisation of ²¹⁰Pb dated peat core by various X-ray fluorescence techniques, *The Science of The Total Environment*, **218**: 239-248.
- *Hutchinson, S.M. and Armitage, R.P., 2009: A Peat Profile Record of Recent Environmental Events in the South Pennines (UK), *Water, Air and Soil Pollution*, **199**: 247-259.
- *Jensen, A., 1997: Historical deposition rates of Cd, Cu, Pb, and Zn in Norway and Sweden estimated by Pb-210 dating and measurement of trace elements in cores of peat bogs, *Water, Air and Soil Pollution*, **95**: 205-220.
- Jouffroy-Bapicot, I., Pulido, M., Baron, S., Galop, D., Monna, F., Lavoie, M., Petit, C., de Beaulieu, J.-L. and Richard, H. 2007: Environmental impact of early palaeometallurgy: pollen and geochemical analysis, *Vegetation History and Archaeobotany*, **16**: 251-258.
- *Kempter, H., Görres, M. and Frenzel, B., 1997: Ti and Pb concentrations in rainwater-fed bogs in Europe as indicators of past anthropogenic activities, *Water, Air and Soil Pollution*, **100**: 367-377.
- *Kempter, H. and Frenzel, B., 1999: The local nature of anthropogenic emission sources on the elemental content of nearby ombrotrophic peat bogs, Vulkaneifel, Germany, *The Science of the Total Environment*, **241**: 117-128.
- *Kempter, H. and Frenzel, B., 2000: The impact of early mining and smelting on the local tropospheric aerosol detected in ombrotrophic peat bogs in the Harz, Germany, *Water Air and Soil Pollution*, **121**: 93-108.
- *Klaminder, J., Renberg, J., Bindler, R. and Emteryd, O., 2003: Isotopic trends and background fluxes of atmospheric lead in northern Europe: Analyses of three ombrotrophic bogs from south Sweden, *Global Biogeochemical Cycles*, **17**: 1090, doi:10.1029/2002GB001921
- *Küster, H. and Rehfuess, K.-E., 1997: Pb and Cd Concentrations in a Southern Bavarian bog profile and the history of vegetation as recorded by pollen analysis, *Water, Air and Soil Pollution*, **100**: 379-386.

- *Kylander, M.E., Weiss, D.J. and Kober, B., 2009: Two high-resolution terrestrial records of atmospheric Pb deposition from New Brunswick, Canada, and Loch Laxford, Scotland, *The Science of the Total Environment*, **407**: 1644-1657.
- *Kylander, M.E., Weiss, D.J., Martinez-Cortizas, A., Spiro, B., Garcia-Sanchez, R. and Coles, B.J., 2005: Refining the pre-industrial atmospheric Pb isotope evolution curve in Europe using an 8000 year old peat core from NW Spain, *Earth and Planetary Science Letters*, **240**: 467-485.
- *Lee, J. and Tallis, J., 1973: Regional and historical aspects of lead pollution in Britain, *Nature*, **245**: 216-220.
- *Le Roux, G., et al., submitted: Dust input - Climate interactions through the Holocene in Central Europe, *Submitted to Nature*.
- *Le Roux, G., Weiss, D., Grattan, J., Givelet, N., Krachler, M., Cheburkin, A., Rausch, N., Kober, B. and Shotyck, W., 2004: Identifying the sources and timing of ancient and medieval atmospheric lead pollution in England using a peat profile from Lindow bog, Manchester, *Journal of Environmental Monitoring*, **6**: 502-510.
- *Le Roux, G., Aubert, D., Stille, P., Krachler, M., Kober, B., Cheburkin, A.K., Bonani, G. and Shotyck, W., 2005: Recent atmospheric Pb deposition at a rural site in southern Germany assessed using a peat profile and snowpack, and comparison with other archives, *Atmospheric Environment*, **39**: 6790-6801.
- *Livett, E.A., Lee, J.A. and Tallis, J.H., 1979: Lead, zinc and copper analyses of British blanket peats, *Journal of Ecology*, **67**: 865-891.
- *MacKenzie, A.B., Logan, E.M., Cook, G.T. and Pulford, I.D., 1998: Distributions, inventories and isotopic composition of lead in ²¹⁰Pb-dated peat cores from contrasting biogeochemical environments: Implications for lead mobility, *The Science of the Total Environment*, **223**: 25-35.
- *Martin, M.N., Coughtrey, P.J., Ward, P., 1979: Historical aspects of heavy metal pollution in the Gordano Valley, *Proceedings of the Bristol Naturalist's Society*, **37**:91-97.
- *Martinez-Cortizas, A., Pontevedra-Pomba, X., Nóvoa Muñoz, J.C. and García-Rodeja, E., 1997: Four thousand years of atmospheric Pb, Cd, and Zn deposition recorded by the ombrotrophic peat bog of Penido Vello (northwestern Spain), *Water, Air and Soil Pollution*, **100**: 387-403.
- *Martinez-Cortizas, A., García-Rodeja, E., Pontevedra-Pombal, X., Nóvoa Muñoz, J., Weiss, D. and Cheburkin, A.K., 2002: Atmospheric Pb deposition in Spain during the last 4600 years recorded by two ombrotrophic peat bogs and implications for the use of peat as archives, *The Science of the Total Environment*, **292**: 33-44.
- *Mighall, T.M., Abrahams, P.W., Grattan, J.P., Hayes, D., Timberlake, S. and Forsyth, S., 2002: Geochemical evidence for atmospheric pollution derived from prehistoric copper mining at Copa Hill, Cwmystwyth, mid-Wales, UK, *The Science of the Total Environment*, **292**: 69-80.
- *Mighall, T.M., Timberlake, S., Foster, I.D.L., Krupp, E. and Singh, S., 2009: Ancient copper and lead pollution records from a raised bog complex in Central Wales, UK, *Journal of Archaeological Science*, **36**: 1504-1515.
- *Mihaljevic, M., Zuna, M., Ettlér, V., Chrástny, V., Sebek, O., Strnad, L. and Kyncl, T., 2008: A comparison of tree rings and peat deposit geochemical archives in the vicinity of a lead smelter, *Water, Air and Soil Pollution*, **188**: 311-321.
- *Mihaljevic, M., Zuna, M., Ettlér, V., Sebek, O., Strnad, L. and Golias, V., 2006: Lead fluxes, isotopic and concentration profiles in a peat deposit near a lead smelter (Příbram, Czech Republic), *The Science of the Total Environment*, **372**: 334-344.
- *Monna, F., Galop, D., Carozza, L., Tual, M., Beyrie, A., Marembert, F., Chateau, C., Dominik, J. and Grousset, F.E., 2004: Environmental impact of early Basque mining and smelting recorded in a high ash minerogenic peat deposit, *The Science of the Total Environment*, **327**: 197-214.
- *Nieminén, T., Ukonmaanaho, L. and Shotyck, W., 2002: Enrichment of Cu, Ni, Zn, Pb and As in an ombrotrophic peat bog near a Cu-Ni smelter in SW Finland, *The Science of the Total Environment*, **292**: 81-89.
- *Novak, M., Emmanuel, S., Vile, M.A., Erel, Y., Véron, A., Paces, T., Wieder, R.K., Vanecek, M., Stepanova, M., Brizova, E. and Hovorka, J., 2003: Origin of lead in eight Central European peat bogs determined from isotope ratios, strengths, and operation times of regional pollution sources, *Environmental Science and Technology*, **37**: 437-445.

- *Novak M., Erel Y., Zemanova L., Bottrell S.H. and Adamova M., 2008: A comparison of lead pollution record in Sphagnum peat with known historical Pb emission rates in the British Isles and the Czech Republic, *Atmospheric Environment*, **42**: 8997-9006.
- Nriagu, J.O., 1983: Lead and lead poisoning in the Antiquity. John Wiley, New York.
- Pacyna, E.G., Pacyna, J.M., Fudala, J., Strzelecka-Jastrzab, E., Hlawiczka, S., Panasiuk, D., Nitter, S., Pregger, T., Pfeiffer, H. and Friedrich, R., 2007: Current and future emissions of selected heavy metals to the atmosphere from anthropogenic sources in Europe, *Atmospheric Environment*, **41**: 8557-8566.
- Pacyna, J.M., Pacyna, E.G. and Aas, W., 2009: Changes of emissions and atmospheric deposition of mercury, lead, and cadmium, *Atmospheric Environment*, **43**: 117-127.
- *Rauch, S., Hemond, H.F., Barbante, C., Owari, M., Morrison, G.M., Peucker-Ehrenbrink, B. and Wass, U., in press: Importance of automobile emissions for platinum, palladium and rhodium deposition in the northern hemisphere, *Environmental Science & Technology*.
- *Rausch, N., Nieminen, T.M., Ukonmaanaho, L., Le Roux, G., Krachler, M., Cheburkin, A., Bonani, G. and Shotyk, W., 2005: Comparison of Atmospheric Deposition of Copper, Nickel, Cobalt, Zinc, and Cadmium Recorded by Finnish Peat Cores with Monitoring Data and Emission Records, *Environmental Science and Technology*, **39**: 5989-5998.
- Renson, V., De Vleeschouwer, F., Mattielli, N., Nekrassoff, S., Streel, M. and Fagel, N., 2008: Roman road pollution assessed by elemental and lead isotopes geochemistry in East Belgium, *Applied Geochemistry*, **23**: 3253-3266.
- *Schell, W.R., Tobin, M.J., Novak, M.J.V., Wieder, R.K. and Mitchell, P.I., 1997: Deposition history of trace metals and fallout radionuclides in wetland ecosystems using ^{210}Pb chronology, *Water, Air and Soil Pollution*, **100**: 233-239.
- *Shotyk, W., 1996: Natural and anthropogenic enrichments of As, Cu, Pb, Sb, and Zn in rainwater-dominated versus groundwater-dominated peat bog profiles, Jura Mountains, Switzerland, *Water, Air and Soil Pollution*, **90**:375-405.
- *Shotyk, W., 2002: The chronology of anthropogenic, atmospheric Pb deposition recorded by peat cores in three minerotrophic peat deposits from Switzerland, *Science of the Total Environment*, **292**:19-31.
- *Shotyk, W., Nesbitt, H.W. and Fyfe, W.S., 1990: The behaviour of major and trace elements in complete vertical peat profiles from three *Sphagnum* bogs, *International Journal of Coal Geology*, **15**:163-190.
- *Shotyk, W., Nesbitt, H.W. and Fyfe, W.S., 1992: Natural and anthropogenic enrichments of trace metals in peat profiles, *International Journal of Coal Geology*, **20**:49-84.
- *Shotyk, W., Cheburkin, A.K., Appleby, P.G., Fankhauser, A. and Kramers, J.D., 1997: Lead in three peat bog profiles, Jura Mountains, Switzerland: enrichment factors, isotopic composition, and chronology of atmospheric deposition, *Water, Air and Soil Pollution*, **100**: 297-310.
- *Shotyk, W., Weiss, D., Appleby, P.G., Cheburkin, A.K., Frei, R., Gloor, M., Kramers, J.D., Reese, S. and van der Knaap, W.O., 1998: History of atmospheric lead deposition since 12,370 ^{14}C yr BP recorded in a peat bog profile, Jura Mountains, Switzerland, *Science*, **281**: 1635-1640.
- *Shotyk, W., Blaser, P., Grünig, A. and Cheburkin, A.K., 2000: A new approach for quantifying cumulative, anthropogenic, atmospheric lead deposition using peat cores from bogs: Pb in eight Swiss peat bog profiles, *Science of the Total Environment*, **249**: 281-295.
- Shotyk, W., Weiss, D., Kramers, J.D., Frei, R., Cheburkin, A.K., Gloor, M. and Reese, S., 2001: Geochemistry of the peat bog at Etang de la Gruère, Jura Mountains, Switzerland, and its record of atmospheric Pb and lithogenic trace elements (Sc, Ti, Y, Zr, Hf and REE) since 12,370 ^{14}C yr BP, *Geochimica et Cosmochimica Acta*, **65**: 2337-2360.
- *Shotyk, W., Weiss, D., Heisterkamp, M., Cheburkin, A.K. and Adams, F.C., 2002: A new peat bog record of atmospheric lead pollution in Switzerland: Pb concentrations, enrichment factors, isotopic composition, and organolead species, *Environmental Science and Technology*, **36**: 3893-3900.
- *Shotyk, W., Goodsite, M.E., Roos-Barraclough, F., Heinemeier, J., Frei, R., Asmund, G., Lohse, C. and Stroyer, T.H., 2003: Anthropogenic contributions to atmospheric Hg, Pb, and As deposition recorded by peat cores from Greenland and Denmark dated using the ^{14}C AMS "bomb pulse curve", *Geochimica et Cosmochimica Acta*, **67**: 3991-4011.

- *Shotyk, W., Goodsite, M.E., Roos-Barraclough, F., Givelet, N., Le Roux, G., Weiss, D., Cheburkin, A.K., Knudsen, K., Heinemeier, J. and van Der Knaap, W.O., 2005: Accumulation rates and predominant atmospheric sources of natural and anthropogenic Hg and Pb on the Faroe Islands, *Geochimica et Cosmochimica Acta*, **69**: 1-17.
- Shotyk, W. and Le Roux, G., 2005: Biogeochemistry and Cycling of Lead. In: Sigel, A., et al. (Eds), *Biogeochemical Cycles of the Elements. Metal Ions in Biological Systems*, M. Dekker, New York, **43**: 240-275.
- *Steinnes, E., 1997: Trace element profiles in ombrogenous peat cores from Norway: evidence of long range atmospheric transport, *Water, Air Soil Pollution*, **100**: 405-413.
- *Strnad, L., Mihaljevic, M., Ettlér, V., Barsova, L., Zuna, M., Sebek, O., 2008: Distribution of platinum group elements in peat deposit near a historic lead and silver mining district, *Bulletin of Environmental Contamination and Toxicology*, **81**, 159-163.
- *Ukonmaanaho, L., Nieminen, T.M., Rausch, N. and Shotyk, W., 2004: Heavy metal and arsenic profiles in ombrogenous peat cores from four differently loaded areas in Finland, *Water, Air and Soil Pollution*, **158**: 277-294.
- *van Geel, B., Bregman, R., van der Molen, P.C., Dupont, L.M. and van Driel-Murray, C., 1989: Holocene raised bog deposits in the Netherlands as geochemical archives of prehistoric aerosols, *Acta Botanica Neerlandica*, **38**:476-476.
- *Vile, M.A., Novak, M.J., Brizova, E., Wieder, R.K. and Schell, W.R., 1995: Historical rates of atmospheric Pb deposition using ²¹⁰Pb dated peat cores: corroboration, computation, and interpretation, *Water, Air and Soil Pollution*, **79**: 89-106.
- *Vile, M.A., Wieder, R.K. and Novak, M., 2000: 200 years of Pb deposition throughout the Czech Republic: patterns and sources, *Environmental Science and Technology*, **34**: 12-20.
- *Weiss, D., Shotyk, W., Cheburkin, A.K., Gloor, M. and Reese, S., 1997: Atmospheric Pb deposition from 12,400 to ca. 2,000 BP recorded in a peat bog profile, Jura Mountains, Switzerland, *Water, Air and Soil Pollution*, **100**: 311-324.
- *Weiss, D., Shotyk, W., Appleby, P.G., Cheburkin, A.K. and Kramers, J.D., 1999: Atmospheric Pb deposition since the Industrial Revolution recorded by five Swiss peat profiles: enrichment factors, fluxes, isotopic composition, and sources, *Environmental Science and Technology*, **33**: 1340-1352.
- *Weiss, D., Shotyk, W., Boyle, E.A., Kramers, J.D., Appleby, P.G. and Cheburkin, A.K., 2002: Constraining lead sources to the North Atlantic Ocean: Recent atmospheric lead deposition recorded by two ombrotrophic peat bogs in Scotland and Eastern Canada, *The Science of the Total Environment*, **292**: 7-18.
- Wertimé, T.A., 1973: The Beginnings of Metallurgy: A New Look, *Science*, **182**: 875-887.

D.W. Beilman, G.M. MacDonald and Z. Yu

- Beilman, D.W., MacDonald, G.M., Smith, L.C. and Reimer P.J., 2009: Carbon accumulation in peatlands of West Siberia over the last 2000 years, *Global Biogeochemical Cycles*, **23**: GB1012, doi:10.1029/2007GB003112.
- Berger, A. and Loutre M.F. 1991: Insolation values for the climate of the last 10 million years, *Quaternary Science Reviews*, **10**: 297-317, doi:10.1016/0277-3791(91)90033-Q.
- Brook, E.J., Harder, S., Severinghaus J., Steig E.J. and Sucher, C.M., 2000: On the origin and timing of rapid changes in atmospheric methane during the last glacial period, *Global Biogeochemical Cycles*, **14**: 559-572.
- Cox, P. and Jones C., 2008: Illuminating the modern dance of climate and CO₂, *Science*, **321**: 1642-1644, doi:10.1126/science.1158907.
- Flückiger, J., Monnin, E., Stauffer, B., Schwander, J., Stocker, T.F., Chappellaz, J., Raynaud, D. and Barnola, J-M., 2002: High-resolution Holocene N₂O ice core record and its relationship with CH₄ and CO₂, *Global Biogeochemical Cycles*, **16**: GB1010, doi:10.29/2001GB001417.
- Gorham, E., Lehman, C., Dyke, A., Janssens, J. and Dyke, L., 2007: Temporal and spatial aspects of peatland initiation following deglaciation in North America, *Quaternary Science Reviews*, **26**: 300-311, doi:10.1016/j.quatscirev.2006.08.008.

- Korhola, A., Ruppel, M., Seppä, H., Valiranta, M., Virtanen, T. and Weckström J. 2010: The importance of northern peatland expansion to the late-Holocene rise of atmospheric methane, *Quaternary Science Reviews*, **29**: 611-617, doi:10.1016/j.quascirev.2009.12.010.
- MacDonald, G.M., Beilman, D.W., Kremenetski, K.V., Sheng, Y., Smith, L.C. and Velichko, A.A., 2006: Rapid development of the circumarctic peatland complex and atmospheric CH₄ and CO₂ variations, *Science*, **314**: 285– 288, doi:10.1126/science.1131722.
- Monnin, E., Indermühle, A., Dällenbach, A., Flückiger, J., Stauffer, B., Stocker, T.F., Raynaud, D. and Barnola, J-M., 2001: Atmospheric CO₂ concentrations over the last glacial termination, *Science*, **291**: 112-114.
- Yu, Z.C., Beilman, D.W. and Jones, M.C., 2009: Sensitivity of Northern Peatland Carbon Dynamics to Holocene Climate Change. In: Baird, A., et al., (Eds), *Carbon Cycling in Northern Peatlands*, AGU Geophysical Monograph, American Geophysical Union, **184**: 55-69. doi:10.1029/2008GM000822. A PDF reprint is available by contacting the authors.

S. Page, R. Wüst and C. Banks

- Anderson, J.A.R., 1983: The tropical peat swamps of western Malesia. In: Gore, A.J.P. (Ed.) *Ecosystems of the World: Mires: Swamp, Bog, Fen and Moor, 4B, Regional Studies*, Elsevier, New York: 181-199 pp.
- Anderson, J.A.R. and Muller, J., 1975: Palynological study of a Holocene peat and a Miocene coal deposit from NW Borneo, *Review of Paleobotany and Palynology*, **19**: 291-351.
- Anshari, G., Kershaw, A.P. and van der Kaars, S., 2001: A Late Pleistocene and Holocene pollen and charcoal record from peat swamp forest, Lake Sentarum Wildlife Reserve, West Kalimantan, Indonesia, *Palaeogeography, Palaeoclimatology, Palaeoecology*, **171**: 213-228.
- Anshari, G., Kershaw, A.P., Kaars, S.V.D. and Jacobsen, G., 2004: Environmental change and peatland forest dynamics in the Lake Sentarum area, West Kalimantan, Indonesia, *Journal of Quaternary Science*, **19**: 637-655.
- Brady, M.A., 1997: *Organic matter dynamics of coastal peat deposits in Sumatra*, Ph.D. Thesis, University of British Columbia, Vancouver, Canada.
- Dam, R.A.C., Fluin, J., Suparan, P. and van der Kaars, S., 2001: Paleoenvironmental developments in the Lake Tondano area (N-Sulawesi, Indonesia) since 33,000 yr B.P., *Palaeogeography, Palaeoclimatology, Palaeoecology*, **171**: 147-183.
- Geyh, M.A., Kudrass, H.R. and Streif, H., 1979: Sea-level change during the late Pleistocene and Holocene in the Strait of Malacca, *Nature*, **278**: 441-443.
- Gorham, E., 1991: Northern peatlands: Role in the carbon cycle and probable responses to climatic warming, *Ecological Applications*, **1**: 182-195.
- Hesp, P.A., Cheng, C.H., Hilton, M., Chou, L.M. and Turner, I., 1998: A first tentative Holocene sea level curve for Singapore, *Journal of Coastal Research*, **14**: 308-314.
- Hooijer, A., Silvius, M., Wösten, H. and Page, S.E., 2006: *PEAT-CO₂, Assessment of CO₂ emissions from drained peatlands in SE Asia*, Delft Hydraulics report Q3943: 41.
- Hu, J., Peng, P., Fang, D., Jia, G., Jian, Z. and Wang, P., 2003: No aridity in Sunda Land during the Last Glaciation: Evidence from molecular-isotopic stratigraphy of long-chain *n*-alkanes, *Palaeogeography, Palaeoclimatology, Palaeoecology*, **201**: 269-281.
- Immirzi, C.P. and Maltby, E. with Clymo, R.S., 1992: *The Global Status of Peatlands and their Role in Carbon Cycling*, A report for Friends of the Earth by the Wetland Ecosystems Research Group, Report 11, Department of Geography, University of Exeter, Exeter, UK, Friends of the Earth, London.
- Kienast, M., Steinke, S., Statterger, K. and Calvert, S.E. 2001: Synchronous tropical South China Sea SST change and Greenland warming during deglaciation, *Science*, **291**: 2132-2134.
- Kienast, M., Kienast, S.S., Calvert, S.E., Eglinton, T.I., Mollenhauer, G., Francois, R. and Mix, A.C. 2006: Eastern Pacific cooling and Atlantic overturning circulation during the last deglaciation, *Nature*, **443**: 846-849.
- Maloney, B.K. and McCormac, F.G., 1995: A 30,000-year pollen and radiocarbon record from Highland Sumatra as evidence for climatic change. *Radiocarbon*, **37**: 181-190.
- Maxwell, A.L., 2001: Holocene monsoon changes inferred from lake sediment pollen and carbonate records, northeastern Cambodia, *Quaternary Research*, **56**: 390-400.

- Maxwell, A.L. and Liu, K-B., 2002: Late Quaternary pollen and associated records from the monsoonal areas of continental South and SE Asia. In: Kershaw, A.P., Tapper, N.J., David, B., Bishop, P.M. and Penny, D. (Eds), *Bridging Wallace's Line*, Advances in GeoEcology 34, Catena Verlag, Reiskirchen: 189-228.
- Morley R.J., 2000: *Origin and Evolution of Tropical Rain Forests*, Wiley, Chichester, Sussex.
- Neuzil, S.G., 1997: Onset and rate of peat and carbon accumulation in four domed ombrogenous peat deposits, Indonesia. In: J.O. Rieley and S.E. Page (Eds), *Biodiversity and Sustainable Management of Tropical Peatlands*, Samara, Cardigan, UK: 55-72.
- Page, S.E., Rieley, J.O., Shotyk, W. and Weiss, D., 1999: Interdependence of peat and vegetation in a tropical swamp forest, *Philosophical Transactions of the Royal Society*, B, **354**: 1885-1897.
- Page, S.E., Siegert, F., Rieley, J.O., Boehm, H-D.V., Jaya, A. and Limin, S.H., 2002: The amount of carbon released from peat and forest fires in Indonesia during 1997, *Nature*, **420**: 61-65.
- Page, S.E., Wüst, R.A., Weiss, D., Rieley, J.O., Shotyk, W. and Limin, S.H., 2004: A record of Late Pleistocene and Holocene carbon accumulation and climate change from an equatorial peat bog (Kalimantan, Indonesia): implications for past, present and future carbon dynamics, *Journal of Quaternary Science*, **19**: 625-635.
- Page, S.E., Rieley, J.O. and Wüst, R., 2006: Lowland tropical peatlands of Southeast Asia. In: Martini, P., Martinez-Cortizas, A. and Chesworth, W. (Eds) *Peatlands: basin evolution and depository of records on global environmental and climatic changes*, Elsevier, Amsterdam (Developments in Earth Surface Processes series): 145-172.
- Page, S.E., Rieley, J.O. and Banks, C.J., in review: Extent and global significance of tropical peat carbon pools, *Global Change Biology*.
- Penny, D., 2001: A 40,000 year palynological record from north-east Thailand; implications for biogeography and paleo-environmental reconstruction, *Palaeogeography, Palaeoclimatology, Palaeoecology*, **171**: 97-128.
- Rieley, J.O., Ahmad-Shah, A-A. and Brady, M.A., 1996: The extent and nature of tropical peat swamps. In: E. Maltby, C.P. Immirzi and Safford, R.J. (Eds.), *Tropical Lowland Peatlands of Southeast Asia*, IUCN, Gland, Switzerland: 17-53.
- Sieffermann, G., Triutomo, S., Sadelman, M.T., Kristijono, A. and Parhadimulyo, S.A., 1987: The peat genesis in the lowlands of Central Kalimantan province, The respective influence of podzolisation and bad drainage, the two main processes of peat genesis in Kalimantan, *International Peat Congress, Yogyakarta*, ORSTOM, Yogyakarta: 17 pp.
- Sieffermann, R.G., Fournier, M., Triutomo, S., Sadelman, M.T. and Semah, A.M., 1988: Velocity of tropical forest peat accumulation in Central Kalimantan province, Indonesia (Borneo). In: *Proceedings of the 8th International Peat Congress, Leningrad, USSR*, International Peat Society, Jyväskylä, Finland, 1: 90-98.
- Sieffermann, R.G., Rieley, J.O. and Fournier, M., 1992: The lowland peat swamps of Central Kalimantan (Borneo): a complex and vulnerable ecosystem. In: *Proceedings of the International Conference on Geography in the Asean Region*, Yogyakarta, Indonesia: 22 pp.
- Staub, J.R. and Esterle, J.S., 1994: Peat-accumulating depositional systems of Sarawak, East Malaysia, *Sedimentary Geology*, **89**: 91-106.
- Tjia, H.D., 1992: Holocene sea-level changes in the Malay-Thai Peninsula, a tectonically stable environment, *Bulletin of the Geological Society of Malaysia*, **31**: 157-176.
- Tjia, H.D., Sujitno, S., Suklija, Y., Harsono, R.A.F., Rachmat, A., Hainim, J. and Djunaedi, 1984: Holocene shorelines in the Indonesian Tin Islands, *Modern Quaternary Research in SE Asia*, **8**: 103-117.
- van der Kaars, W.A., Penny, D., Tibby, J., Fluin J., Dam R.A.C. and Suparan, P., 2001: Late Quaternary palaeoecology, palynology and palaeolimnology of a tropical lowland swamp: Rawa Danau, West Java, Indonesia, *Palaeogeography, Palaeoclimatology, Palaeoecology*, **171**: 129-145.
- van der Werf, G.R., et al., 2008: Climate regulation of fire emissions and deforestation in equatorial Asia, *Proceedings of the National Academy of Sciences of the United States of America*, **105**: 20350-20355.
- Wilford, G.E., 1959: Radiocarbon age determination of Quaternary sediments in Brunei and northeast Sarawak, *British Borneo Geological Survey Annual Report 1959*: 16-20.

- Wüst, R.A.J. and Bustin, R.M., 2004: Late Pleistocene and Holocene development of the interior peat-accumulating basin of tropical Tasek Bera, Peninsular Malaysia, *Palaeogeography, Palaeoclimatology, Palaeoecology*, **211**: 241-270.
- Wüst R.A.J., Rieley J., Page S., Kaars S.v.d., Wei-Ming W., Jacobsen G. and Smith A., 2007: Peatland evolution in Southeast Asia during the last 35,000 cal years: Implications for evaluating their carbon storage potential. In: J.O. Rieley, C.J. Banks and B. Radjagukguk (Eds), *Carbon-climate-human Interaction on Tropical Peatland*. Proceedings of The International Symposium and Workshop on Tropical Peatland, Yogyakarta, 27-29 August 2007, EU CARBOPEAT and RESTORPEAT Partnership, Gadjah Mada University, Indonesia and University of Leicester, United Kingdom: 19.

O. Läfteenoja and K.H. Roucoux

- Baker, T.R., et al., 2004: Variation in wood density determines spatial patterns in Amazonian forest biomass, *Global Change Biology*, **10**: 545-562.
- Bush, M.B., Silman, M.R. and Listopad, M.C.S., 2007: A regional study of Holocene climate change and human occupation in Peruvian Amazonia, *Journal of Biogeography*, **34**(8): 1342-1356.
- Cox, P.M., Harris, P.P., Huntingford, C., Betts, R.A., Collins, M., Jones, C.D., Jupp, T.E., Marengo, J.A. and Nobre, C.A., 2008: Increasing risk of Amazonian drought due to decreasing aerosol pollution, *Nature*, **453**: 212-215.
- Frost, I.G. and Miller, M.C., 1987: Late Holocene flooding in the Ecuadorian rainforest, *Freshwater Biology* **18**(3): 443-453.
- Guzmán Castillo, W., 2007: Valor económico del manejo sostenible de los ecosistemas de aguaje (*Mauritia flexuosa*). In: Feyen, J., et al. (Eds), *International Congress on Development, Environment and Natural Resources: Multi-level and Multi-scale Sustainability, Volume III*, Publication of the Universidad Mayor San Simón, Cochabamba, Bolivia, 1513-1521.
- Hoorn, C., 2006: Mangrove Forests and Marine Incursions in Neogene Amazonia (Lower Apaporis River, Colombia), *Palaios*, **21**: 197-209.
- Irmeler, U., 1977: Inundation – forest types in the vicinity of Manaus, *Biogeographica* **8**: 17-29.
- Junk, W.J., 1983: Ecology of swamps on the middle Amazon. In: Gore, A.J.P. (Ed), *Mires: swamp, bog, fen and moor, regional studies; ecosystems of the World 4B*, Elsevier, Amsterdam, The Netherlands, 269-294.
- Junk, W.J. and Piedade, M.T.F., 2005: The Amazon River basin. In: Fraser, L.H., et al. (Eds), *The World's Largest Wetlands: Ecology and Conservation*, Cambridge University Press, 63-117.
- Kalliola, R., Salo, J., Puhakka, M., Rajasilta, M., Häme, T., Neller, R.J., Räsänen, M.E. and Danjoy, Arias W.A., 1992: Upper Amazon channel migration: Implications for vegetation perturbation and succession using bitemporal Landsat MSS images, *Naturwissenschaften*, **79**: 75-79.
- Keddy, P.A., Fraser, L.H., Solomeshch, A.I., Junk, W.J., Campbell, D.R., Arroyo, M.T.K. and Alho, C.J.R., 2009: Wet and Wonderful: The World's Largest Wetlands Are Conservation Priorities, *BioScience*, **59**(1): 39-51.
- Korhola, A., Ruppel, M., Seppä, H., Väliranta, M., Virtanen, T. and Weckström, J., in press: The importance of northern peatland expansion to the late-Holocene rise of atmospheric methane, *Quaternary Science Reviews*, **29**(5-6): 611-617.
- Läfteenoja, O., Ruokolainen, K., Schulman, L. and Alvarez, J., 2009a: Amazonian floodplains harbour minerotrophic and ombrotrophic peatlands, *Catena*, **79**: 140-145.
- Läfteenoja, O., Ruokolainen, K., Schulman, L. and Oinonen, M., 2009b: Amazonian peatlands: an ignored C sink and potential source, *Global Change Biology*, **15**: 2311-2320.
- Ledru, M.P., 2001: Late Holocene rainforest disturbance in French Guiana, *Review of Palaeobotany and Palynology*, **115**: 161-170.
- Lewis, S.L., et al., 2004: Are global change agents causing widespread changes in tropical forest dynamics? Evidence from 50 South American long-term monitoring plots, *Philosophical Transactions of the Royal Society of London, Series B*, **359**: 421-436.
- Malhi, Y., et al., 2002: An international network to understand the biomass and dynamics of Amazonian forests (RAINFOR), *Journal of Vegetation Science*, **13**: 439-450.
- Malhi, Y., Roberts, J.T., Betts, R.A., Killeen, T.J., Li, W. and Noble, C.A., 2008: Climate Change, Deforestation and the Fate of the Amazon, *Science*, **319**: 169-172.

- Neller, R.J., Salo, J.S. and Räsänen, M.E., 1992: On the formation of blocked valley lakes by channel avulsion in Upper Amazon foreland basins, *Zeitschrift für Geomorphologie*, **36**(4): 401-411.
- Page, S.E., Wüst, R.A.J., Weiss, D., Rieley, J.O., Shotyk, W. and Limin, S.H., 2004: A record of Late Pleistocene and Holocene carbon accumulation and climate change from an equatorial peat bog (Kalimantan, Indonesia): implications for past, present and future carbon dynamics, *Journal of Quaternary Science*, **19**: 625-635.
- Page, S.E., Wüst R.A.J. and Banks, C., 2010: Past and present carbon accumulation and loss in Southeast Asian peatlands, *PAGES news*, 18(1).
- Pärssinen, M.H., Salo, J.S. and Räsänen, M.E., 1996: River floodplain relocations and the abandonment of aborigine settlements in the Upper Amazon Basin: a historical case study of San Miguel de Cunibos at the Middle Ucayali River, *Geoarchaeology: An International Journal*, **11**(4): 345-359.
- Phillips, O., Baker, T.R., Arroyo, L., Higuchi, N., Killeen, T., Laurance, W.F., Lewis, S.L., Lloyd, J., Malhi, Y. and Monteagudo, A., 2004: Pattern and process in Amazon tree turnover, 1976-2001, *Philosophical Transactions of the Royal Society of London, Series B*, **359**: 381-407.
- Rieley, J.O. and Page, S.E., 2005: *Wise use of tropical peatlands: Focus on Southeast Asia*. Alterra - Wageningen University and Research Center and the EU INCO-STRAPEAT and RESTORPEAT Partnerships: 168.
- Ruokolainen, K., Schulman, L. and Tuomisto, H., 2001: On Amazonian peatlands, *International Mire Conservation Group Newsletter*, **2001**(4): 8-10.
- Schulman, L., Ruokolainen, K. and Tuomisto, H., 1999: Parameters for global ecosystem models, *Nature*, **399**: 535-536.
- Suszczyński, E., 1984: The peat resources of Brazil. *Proceedings of the 7th International Peat Congress*, Dublin 1: 468-492.
- Tolonen, K. and Turunen, J., 1996: Accumulation rates of carbon in mires in Finland and implications for climate change, *The Holocene*, **6**(2): 171-178.
- Wright, S.J., 2005: Tropical forests in a changing environment, *Trends in Ecology & Evolution*, **20**(10): 553-560.

T.R. Christensen, M. Mastepanov, M. Johansson and D. Charman

- Åkerman, H.J. and Johansson, M., 2008: Thawing permafrost and thicker active layers in sub-arctic Sweden, *Permafrost and Periglacial Processes*, **19**: 279-292.
- Aurela, M., Laurila, T. and Tuovinen, J.P., 2004: The timing of snow melt controls the annual CO₂ balance in a subarctic fen, *Geophysical Research Letters*, **31**: L16119.
- Beilman, D.W., MacDonald, G.M. and Yu, Z., 2010: The northern peatland carbon pool and the Holocene carbon cycle, *PAGES news*, 18(1).
- Christensen, T.R., Johansson, T., Åkerman, H.J., Mastepanov, M., Malmer, N., Friborg, T., Crill, P. and Svensson, B.H., 2004: Thawing sub-arctic permafrost: Effects on vegetation and methane emissions, *Geophysical Research Letters*, **31**: L04501.
- Christensen, T.R., Mastepanov, M. and Johansson, M., 2009: Presence and absence of permafrost – implications for atmospheric exchange of CO₂ and CH₄, *iLEAPS newsletter*, 8: 28-30.
- Christensen, T.R., Johansson, T., Olsrud, M., Ström, L., Lindroth, A., Mastepanov, M., Malmer, M., Friborg, T., Crill, P. and Callaghan, T.V., 2007: A catchment-scale carbon and greenhouse gas budget of a subarctic landscape, *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, **365**: 1643-1656.
- Fronzek, S., Luoto, M. and Carter, T.R., 2006: Potential effect of climate change on the distribution of palsa mires in subarctic Fennoscandia, *Climate Research*, **32**(1): 1-12.
- Groendahl, L., Friborg, T. and Soegaard, H., 2006: Temperature and snow-melt controls on interannual variability in carbon exchange in the high Arctic, *Theoretical and Applied Climatology*, **88**: 111-125.
- Jackowicz-Korczyński, M., Christensen, T.R., Bäckstrand, K., Crill, P.M., Friborg, T., Mastepanov, M. and Ström, L., in press: Annual cycles of methane emission from a subarctic peatland, *Journal of Geophysical Research - Biogeosciences*.

- Johansson, T., Malmer, N., Crill, P.M., Friberg, T., Akerman, J.H., Mastepanov, M. and Christensen, T.R., 2006: Decadal vegetation changes in a northern peatland, greenhouse gas fluxes and net radiative forcing, *Global Change Biology*, **12**: 2352-2369.
- Kokfelt, U., Reuss, N., Struyf, E., Sonesson, M., Rundgren, M., Skog, G., Rosén, P. and Hammarlund, D., submitted: Wetland development, permafrost history and nutrient cycling inferred from Holocene peat and lake sediment records in subarctic Sweden, Submitted to *Journal of Paleolimnology*.
- Korhola, A., Ruppel, M. Seppa, H. Valiranta, M., Virtanen, T. and Weckstrom J., 2010: The importance of northern peatland expansion to the late-Holocene rise of atmospheric methane, *Quaternary Science Reviews*, **29**: 611-617, doi:10.1016/j.quascirev.2009.12.010
- Mastepanov, M., Sigsgaard, C., Dlugokencky, E.J., Houweling, S., Strom, L., Tamstorf, M.P. and Christensen, T.R., 2008: Large tundra methane burst during onset of freezing, *Nature*, **456**: 628-U58.
- McGuire A.D., Anderson L.G., Christensen T.R., Dallimore S., Guo L., Hayes D.J., Heimann M., Lorenson T.D., Macdonald R.W. and Roulet N., 2009: Sensitivity of the carbon cycle in the Arctic to climate change, *Ecological Monographs*, **79**:523-555.
- Oksanen, P.O., 2006: Holocene development of the Vaisjeäggi palsa mire, Finnish Lapland, *Boreas*, **35**: 1, 81-95.
- Schuur, E.A.G., Vogel, J.G., Crummer, K.G., Lee, H., Sickman, J.O. and Osterkamp, T.E., 2009: The effect of permafrost thaw on old carbon release and net carbon exchange from tundra, *Nature*, **459**: 556-559.
- Smith, L.C., MacDonald, G.M., Velichko, A.A., Beilman, D.W., Borisova, O.K., Frey, K.E., Kremenetski, K.V. and Sheng, Y., 2004: Siberian Peatlands a Net Carbon Sink and Global Methane Source Since the Early Holocene, *Science*, **303**: 353-356 DOI: 10.1126/science.1090553
- Tarnocai, C., Canadell, J.G., Schuur, E.A.G., Kuhry, P., Mazhitova, G. and Zimov, S. 2009: Soil organic carbon pools in the northern circumpolar permafrost region, *Global Biogeochemical Cycles* **23**, 2, doi:10.1029/2008GB003327.
- Tokida, T., Miyazaki, T., Mizoguchi, M. and Seki, K., 2005: In situ accumulation of methane bubbles in a natural wetland soil, *European Journal of Soil Science*, **56**: 389-396.
- Turetsky M.R., et al., 2007: The disappearance of relict permafrost in boreal north America: Effects on peatland carbon storage and fluxes, *Global Change Biology*, **13**: 1922-1934.
- Vallee, S. and Payette, S., 2007. Collapse of permafrost mounds along a subarctic river over the last 100 years (northern Quebec), *Geomorphology*, **90**: 162-170.
- Vardy, S., Warner, B. and Asada, T., 2005: Holocene environmental change in two polygonal peatlands, south-central Nunavut, Canada, *Boreas*, **34**: 335-344.
- Walter, K.M., Edwards, M.E., Grosse, G., Zimov, S.A. and Chapin, F.S., 2007: Thermokarst lakes as a source of atmospheric CH₄ during the last deglaciation, *Science*, **318**: 633-636.

J.L. Conroy, J.T. Overpeck and J.E. Cole

- Ashok, K., Behera, S.K., Rao, S.A., Weng, H.Y. and Yamagata, T., 2007: El Niño Modoki and its possible teleconnection, *Journal of Geophysical Research-Oceans*, **112**(C11): doi:10.1029/2006JC003798.
- Braganza, K., Gergis, J.L., Power, S.B., Risbey, J.S. and Fowler, A.M., 2009: A multiproxy index of the El Niño-Southern Oscillation, AD 1525-1982, *Journal of Geophysical Research-Atmospheres*, **114**: doi:10.1029/2008JD01896.
- Cobb, K.M., Charles, C.D., Cheng, H. and Edwards, R.L., 2003: El Niño/Southern Oscillation and tropical Pacific climate during the last millennium, *Nature*, **424**:271-276.
- Conroy, J.L., Overpeck, J.T., Cole, J.E., Shanahan, T.M. and Steinitz-Kannan, M., 2008: Holocene changes in eastern tropical Pacific climate inferred from a Galápagos lake sediment record, *Quaternary Science Reviews*, **27**(11-12): 1166-1180.
- Conroy, J.L. Restrepo, A., Overpeck, J.T., Steinitz-Kannan, M., Cole, J.E., Bush, M. and Colinvaux, P.A., 2009a: Unprecedented recent warming of surface temperatures in the eastern tropical Pacific Ocean, *Nature Geoscience*, **2**(1): 46-50.
- Conroy, J.L., Overpeck, J.T., Cole, J.E. and Steinitz-Kannan, M., 2009b: Variable oceanic influences

- on western North American drought over the last 1200 years, *Geophysical Research Letters*, **36**: doi:10.1029/2009GL039558.
- Cook, E.R., Woodhouse, C.A., Eakin, C.M., Meko, D.M. and Stahle, D.W., 2004: Long-term aridity changes in the western United States, *Science*, **306**, 1015-1018.
- D'Arrigo, R., Cook, E.R., Wilson, R.J., Allan, R. and Mann, M.E., 2005: On the variability of ENSO over the past six centuries, *Geophysical Research Letters*, **32**(3): doi:10.1029/2004GL022055.
- Donders, T.H., Wagner-Cremer, F. and Visscher, H., 2008: Integration of proxy data and model scenarios for the mid-Holocene onset of modern ENSO variability, *Quaternary Science Reviews*, **27**(5-6): 571-579.
- Graham, N.E., et al., 2007: Tropical Pacific-mid-latitude teleconnections in medieval times, *Climatic Change*, **83**: 241-285.
- Guilderson, T.P., Schrag, D.P., Kashgarian, M. and Southon, J., 1998: Radiocarbon variability in the western equatorial Pacific inferred from a high-resolution coral record from Nauru Island, *Journal of Geophysical Research-Oceans* **103**: 24641-24650.
- Guilyardi, E., Wittenberg, A., Fedorov, A., Collins, M., Wang, C.Z., Capotondi, A., van Oldenborgh, G.J. and Stockdale, T., 2009: Understanding El Niño in ocean-atmosphere General Circulation Models Progress and Challenges, *Bulletin of the American Meteorological Society*, **90**(3): 325-340.
- Koutavas, A., DeMenocal, P.B., Olive, G.C. and Lynch-Stieglitz, J., 2006: Mid-Holocene El Niño-Southern Oscillation (ENSO) attenuation revealed by individual foraminifera in eastern tropical Pacific sediments, *Geology*, **34**: 993-996.
- Mann, M.E., Gille, E.P., Bradley, R.S., Hughes, M.K., Overpeck, J.T., Keimig, F.T. and Gross, W.S., 2000: Global Temperature Patterns in Past Centuries: An Interactive Presentation, *Earth Interactions*, **4**: Paper 4.
- Mann, M.E., Cane, M.A., Zebiak, S.E. and Clement, A., 2005: Volcanic and solar forcing of the tropical Pacific over the past 1000 years, *Journal of Climate*, **18**: 447-456.
- Mann, M.E., Zhang, Z.H., Rutherford, S., Bradley, R.S., Hughes, M.K., Shindell, D., Ammann, C., Faluvegi, G. and Ni, F.B., 2009: Global Signatures and Dynamical Origins of the Little Ice Age and Medieval Climate Anomaly, *Science*, **326**: 1256-1260.
- McPhaden, M.J., Zebiak, S.E. and Glantz, M.H., 2006: ENSO as an integrating concept in Earth science, *Science*, **314**(5806): 1740-1745.
- Moy, C.M., Seltzer, G.O., Rodbell, D.T. and Anderson, D.M. 2002: Variability of El Niño/Southern Oscillation activity at millennial timescales during the Holocene epoch, *Nature*, **420**:162-165.
- Oppo, D.W., Rosenthal, Y. and Linsley, B.K., 2009: 2,000-year-long temperature and hydrology reconstructions from the Indo-Pacific warm pool, *Nature*, **460**(7259): 1113-1116.
- Rein, B., Luckge, A., Reinhardt, L., Sirocko, F., Wolf, A. and Dullo, W.C., 2005: El Niño variability off Peru during the last 20,000 years, *Paleoceanography*, **20**(4): PA4003, doi:10.1029/2004PA001099.
- Sachs, J.P., Sachse, D., Smittenberg R.H., Zhang, Z., Battisti, D.S. and Golubic, S., 2009: Southward movement of the Pacific Intertropical Convergence Zone AD 1400-1850, *Nature Geoscience*, **2**(7): 519-525.
- Seager, R., Graham, N., Herweijer, C., Gordon, A.L., Kushnir, Y. and Cook, E., 2007: Blueprints for Medieval hydroclimate, *Quaternary Science Reviews*, **26**: 2322-2336.
- Smith, T.M., Reynolds, R.W., Peterson, T.C., and Lawrimore, J., 2008: Improvements to NOAA's historical merged land-ocean surface temperature analysis (1880-2006), *Journal of Climate*, **21**: 2283-2296.
- Wittenberg, A.T., 2009: Are historical records sufficient to constrain ENSO simulations? *Geophysical Research Letters*, **36**: L12702, doi:10.1029/2009GL038710.

G. Leduc, L. Vidal, O. Cartapanis and E. Bard

- Cobb, K.M., Charles, C.D., Edwards, R.L., Cheng H. and Kastner M., 2003: El Niño-Southern Oscillation and tropical Pacific climate during the last millennium, *Nature*, **424**: 271-276.
- Grelaud, M., Beaufort, L., Cuvén, S. and Buchet, N., 2009: Glacial to interglacial primary production and El Niño-Southern Oscillation dynamics inferred from coccolithophores of the Santa Barbara Basin, *Paleoceanography*, **24**: PA1203, doi:10.1029/2007PA001578.

- Koutavas, A., deMenocal, P.B., Olive, G.C. and Lynch-Stieglitz, J., 2006: Mid-Holocene El Niño-Southern Oscillation (ENSO) attenuation revealed by individual foraminifera in eastern tropical Pacific sediments, *Geology*, **34**: 993-996.
- Laepple, T. and Lohmann, G., 2009: Seasonal cycle as a template for climate variability on astronomical timescales, *Paleoceanography*, **24**: PA4201, doi:10.1029/2008PA001674.
- Leduc, G., Vidal, L., Cartapanis, O. and Bard, E., 2009(a): Modes of eastern equatorial Pacific thermocline variability: Implications for ENSO dynamics over the last glacial period, *Paleoceanography*, **24**: PA3202, doi:10.1029/2008PA001701.
- Leduc, G., Vidal, L., Tachikawa, K. and Bard, E., 2009(b): ITCZ rather than ENSO for abrupt climate changes across the tropical Pacific? *Quaternary Research*, **72**: 123-131.
- Leduc, G., Schneider, R., Kim, J.-H. And Lohmann, G., 2010: Holocene and Eemian Sea surface temperature trends as revealed by alkenone and Mg/Ca paleothermometry, *Quaternary Science Reviews*, doi:10.1016/j.quascirev.2010.01.004, in press.

S.J.A. Jung, D. Kroon, G. Ganssen, F. Peeters and R. Ganeshram

- Altabet, M.A., Higginson, M.J. and Murray, R.W., 2002: The effect of millennial-scale changes in the Arabian Sea denitrification on atmospheric CO₂, *Nature*, **415**: 159-162.
- Barker, S., Diz, P., Vautravers, M., Pike, J., Knorr, G., Hall, I.R. and Broecker, W.S., 2009: Interhemispheric Atlantic seesaw response during the last deglaciation, *Nature*, **457**: doi:10.1038/nature07770.
- Blunier, T., et al., 1998: Asynchrony of Antarctic and Greenland climate change during the last glacial period, *Nature*, **394**: 739-743.
- Blunier, T. and Brook, E.J., 2001: Timing of millennial-scale climate change in Antarctica and Greenland during the last glacial period, *Science*, **291**: 109-112.
- Charles, C.D. and Fairbanks, R.G., 1992: Evidence from Southern Ocean sediments for the effect of North Atlantic deep-water flux on climate, *Nature*, **355**: 416-419.
- EPICA, 2006: One-to-One coupling of glacial climate variability in Greenland and Antarctica, *Nature*, **444**: 195-198.
- Ivanochko, T.S., Ganeshram, R.S., Brummer, G.-J.A., Ganssen, G., Jung, S., Moreton, S.G. and Kroon, D., 2005: Variations in tropical convection as an amplifier of global climate change at the millennial scale, *Earth and Planetary Science Letters*, **235**: 302-314.
- Jung, S.J.A., Kroon, D., Ganssen, G., Peeters, F. and Ganeshram, R., 2009: Enhanced Arabian Sea intermediate water flow during glacial North Atlantic cold phases, *Earth and Planetary Science Letters*, **280**: 220-228.
- Pahnke, K. and Zahn, R., 2005: Southern hemisphere water mass conversion linked to North Atlantic climate variability, *Science*, **307**: 1741-1746.
- Schulz, H., von Rad, U. and Erlenkeuser, H., 1998: Correlation between Arabian Sea and Greenland climate oscillation of the past 110,000 years, *Nature*, **393**: 54-57.
- Shackleton, N.J., Hall M.A. and Vincent, E., 2000: Phase relationships between millennial-scale events 64,000-24,000 years ago, *Paleoceanography*, **15**: 565-569.
- Sloyan, B.M. and Rintoul, S.R., 2001: Circulation, renewal and modification of Antarctic Mode and Intermediate Water, *Journal of Physical Oceanography*, **31**: 1005-1030.
- Stocker, T.F. and Johnsen, S.J., 2003: A minimum thermodynamic model for the bipolar seesaw, *Paleoceanography*, **18**: doi: 10.1029/2003PA000920.
- Stott, L.D., Timmermann, A. and Thunell, R.C., 2007: Southern Hemisphere and Deep-Sea Warming Led Deglacial Atmospheric CO₂ Rise and Tropical Warming, *Science*, **318**: 10.1126/science.1143791.