

INQUA Commission on Coastal and Marine Processes: President's Report for 2012

1. CMP Membership

President: Roland Gehrels (Plymouth University, UK)

Vice-President: Yusuke Yokoyama (University of Tokyo, Japan)

Secretary: Craig Sloss (Queensland University of Technology, Australia)

Advisory board members: Yongqiang Zong (Hong Kong), Mark Bateman (UK), Cari Zazo (Spain), Gösta Hoffmann (Oman), Ediang Okuku Archibong (Nigeria), Barbara Mauz (UK), Fatima Abrantes (Portugal), Cecile Baeteman (Belgium), Ben Horton (USA).

The CMP general membership list contains 433 email addresses.

2. Selection of conferences held in 2012

- Sea-Level and Adjustment of the Land Observations and Models (SLALOM), Athens, Greece, 19-22 March.
- Sea Level Changes into MIS 5: from Observations to Predictions, Mallorca, Spain, 10-14 April.
- 12th International Coral Reef Symposium, Cairns, Australia, 9-13 July.
- 34th International Geological Congress, Brisbane, Australia, 5-10 August.
- MEDFLOOD project: MEDiterranean sea-level change and projection for future FLOODing, first annual meeting, Rome, Italy, 25 September.
- 3rd IGCP588 conference, Kiel, Germany, 4-10 September
- Session on "Ocean Warming and Freshwater Contributions to Regional and Global Sea Level" at AGU Fall meeting, San Francisco, USA, 2-7 December.

3. Publications

3.1 Selected books and special journal issues in 2011

- Special PALSEA issue in Earth and Planetary Science Letters (v. 315-316), including eleven papers.
- Special IGCP588 issue in Quaternary Science Reviews (v. 54), including eleven papers.

3.2 Journal papers (selected highlights only, presidential bias!)

Carlson, A.E., Clark, P.U., 2012, Ice-sheet sources of sea-level rise and freshwater discharge during the last deglaciation: Reviews of Geophysics 50, doi: 10.1029/2011RG000371.

Carlson, A.E., Winsor, K., 2012. Northern Hemisphere ice-sheet responses to past climate warming. Nature Geoscience 5, 607-613.

Dutton, A., Lambeck, K., 2012. Ice volume and sea level during the Last Interglacial. Science 337, 216-219.

Goto, K., Chagué-Goff, C., Fujino, S., Goff, J., Jaffe, B., Nishimura, Y., Richmond, B., Sugawara, D., Szczuciński, W., Tappin, D.R., Witter, R., Yulianto, E., 2011. New insights into tsunami risk from the 2011 Tohoku-oki event. Marine Geology 290, 46-50.

- Falcini, F., Khan, N.S., Macelloni, L., Horton, B.P., Lutken, C.B., McKee, L., Santoleri, R., Colella, S., Li, C., Volpe, G., D'Emidio, M., Salusti, A., Jerolmack, D.J., 2012. Linking the historic 2011 Mississippi River flood to coastal wetland sedimentation. *Nature Geoscience* 5, 803-807.
- Gasson, E., Siddall, M., Lunt, D.J., Rackham, O.J.L., Lear, C.H., Pollard, D., 2012, Exploring uncertainties in the relationship between temperature, ice volume, and sea level over the past 50 million years, *Reviews of Geophysics* 50, doi 10.1029/2011RG000358.
- Gehrels, W.R., Woodworth, P.L., 2013. When did modern rates of sea-level rise start? *Global and Planetary Change* 100, 263-277.
- Gregoire, L.J., Payne, A.J., Valdes, P.J., 2012. Deglacial rapid sea level rises caused by ice-sheet saddle collapses. *Nature* 487, 219–222.
- Hanebuth, T.J.J., Voris, H.K., Yokoyama, Y., Saito, Y., Okuno, J.i., 2011. Formation and fate of sedimentary depocentres on Southeast Asia's Sunda Shelf over the past sea-level cycle and biogeographic implications. *Earth-Science Reviews* 104, 92-110.
- Rovere, A., Raymo, M.E., O'Leary, M.J., Hearty, P.J., 2012. Crowdsourcing in the Quaternary sea level community: insights from the Pliocene. *Quaternary Science Reviews* 56, 164-166.
- Siddall, M., Milne, G.A., 2012, Understanding sea-level change is impossible without both insights from paleo studies and working across disciplines. *Earth and Planetary Science Letters* 315-316, 2-3.
- Törnqvist, T.E., Hijma, M.P., 2012. Links between early Holocene ice-sheet decay, sea-level rise and abrupt climate change. *Nature Geoscience* 5, 601-606.
- Woodroffe, C.D., Murray-Wallace, C.M., 2012. Sea-level rise and coastal change: the past as a guide to the future. *Quaternary Science Reviews* 54, 4-11.

4. Reporting and proposals

Annual reports were received for INQUA projects 1201 (“PALSEA (PALeo-constraints on SEA-level rise”), 1202 (“Rapid environmental changes and human impact on continental shelves”), 1203 (“MEDFLOOD project: MEDiterranean sea-level change and projection for future FLOODing”), and 1204 (“The Quaternary Contourite Log-book: a deep-water record(er) of variability in palaeoclimate, palaeoceanography and deep-water ecosystems”). Proposals were received for 2 projects and 2 IFGs.

5. News from the working groups

5.1 North & West Europe (Kim Cohen – Netherlands)

This working group has strong linkages with IGCP Project 588 “Preparing for Coastal Change”. The mailing list contains over 180 email addresses.

A special issue in *Geomorphology* is in advanced stage of completion, launched from the INQUA-session in Bern. Organisation of a regional NW Europe meeting failed this year. Members of PALSEA and SPLASHCOS communities are very active, as is the Shelves Project (see 5.2).

Planned: September 2013, Meeting and Fieldtrip Dovey Estuary, Wales, jointly with IGCP-588-UK. (Aberystwyth and Bangor Universities).

5.2 Continental Shelves (Till Hanebuth – Germany)

This working group is now also active as Project 1202 and has proposed an International Focus Group for 2012-2015. The shelves project now has a homepage: https://www.marum.de/en/inqua_project_1202.html.

Three meetings are planned for 2013: In collaboration with GEOHAB 2013 (Marine Geological and Habitat Mapping), May 6-10 in Rome, Italy, IGF Shelf Project 1202 will host a project development meeting for all interested participants. A session and the annual meeting of IGF Shelf Project 1202 will be held on the ABEQUA 2013 (Brazilian Association of Quaternary Sciences), August 4-8 in Natal, Brazil. A session and a project meeting are planned for the IAS 2013 (International Association of Sedimentologists) conference, September 2-5 in Manchester, UK.

Two special journal issues are in preparation. A special issue of *Continental Shelf Research* will be published in 2013 entitled "Geoscience and Habitat Mapping for Marine Renewable Energy". Guest editor is J. V. Barrie. A special issue of *Geomorphology* will be published in 2013 entitled "Continental Shelf Drowned Landscapes". Guest editors are K. M. Cohen and F. J. Lobo.

5.3 Long-term sea-level changes (Teresa Bardaji – Spain)

Bogdan Onac (USA), Joan Fornos (Spain), Jeffrey Dorale (USA) and Giorgio Spada (Italy) organised in April in Mallorca a meeting on "Sea Level Changes into MIS 5: from observations to predictions": http://scholarcommons.usf.edu/tles_sealevel. The meeting was co-sponsored by CMP, PAGES the National Science Foundation, USA; University of South Florida (USA) and Universitat de les Illes Balears (Spain).

The workshop gathered many of the most leading scientists in the world devoted to sea level changes during MIS5, and had 45 attendants from Europe, USA and Australia.

The working group's membership has expanded in 2012, and now include many scientists who have not been involved with INQUA in the past.

5.4 Australasia (David Kennedy – Australia)

The Australasian working group has had a very successful year with extensive research conducted on the shorelines of the region with numerous papers and special journal issues being produced. This included some significant publications in a IGCP588 (*Preparing for Coastal Change*) Special Issue in Quaternary Science Reviews. For example Woodroffe and Murray-Wallace (2012) summarized the history of IGCP coastal projects and INQUA involvement in these with an emphasis on the notion that the past, seen from the context of the present, can be a guide to the future. In the same issue Courtney et al. (2012) review and synthesize the debate concerning multiple Holocene megatsunami events in southeast Australia. This has been a controversial issue in the Australian coastal community for several decades. This special issue also included an innovative paper on the reconstruction Holocene climate change from Western Australia using an ostracod transfer function, pollen, and ostracod valve chemistry (Gouramanis et al., 2012)

Another notable publication came from an INTIMATE Quaternary Science Reviews Special issue. Lewis et al. (2012) who provided the most comprehensive review of Holocene sea level change in an Australian context. This review collated all published sea level studies into regional specific Holocene sea level curves.

The highlights for members of the working group have been the hosting of several major conferences in Australia in 2012, including the 34th International Geological Congress in Brisbane and the 12th International Coral Reef Symposium in Cairns. Several important and regular regional conferences were also held including the Australasian Quaternary Society (in Tekapo, New Zealand) and Australian and 15th New Zealand Geomorphology Group Biennial meeting (in Bundanoon, Australia). Both of these latter meetings saw a significant growth in the number of papers presented with a coastal theme reflecting the growth in the coastal community.

The 34th IGC represented the major Quaternary-Coasts event with 8 of the 37 themes having presentations with a coastal topic. These included:

Theme 3. Climate Change: Lessons from the Past; Implications for the Future

Theme 13. Sedimentation and Sedimentary Processes (3 sessions)

Theme 19. Geochronology and Isotope Geology (3 sessions)

Theme 24. Reefs and Carbonates (3 sessions)

Theme 25. Marine Geoscience and Oceanography (6 sessions)

Theme 26. Antarctic and Arctic Geoscience

Theme 29. Surficial Processes and Landscape Evolution

Theme 30. Geohazards (7 sessions, incl. one on tsunamis)

Another major conference in the region was the **4-year International Society for Reef Studies** held in the tropical northern city of Cairns. Two specialist Quaternary sessions were held on:

Theme 1a: Reef and reef island geomorphology

Theme 1b: Reef response to sea-level and environmental changes

All these conference events stimulated many fruitful discussions and debates on the Australasian coast and the working group looks forward to a successful year of coastal research in 2013.

Australian researchers associated with the CMP have also been active within the international coastal community. Six Australian coastal researchers presented at the 3rd IGCP588 conference in Kiel, Germany. Talks presented ranged from Maori legends of a 15th century tsunami in New Zealand and tsunamis in the South Pacific to Holocene sea level change in the Gulf of Carpentaria. This meeting also included two PhD Candidates, Sarah McGowan speaking about sea level variability using tide gauge data reconstructs past rates of change, and Naomi Riggs presented about her use of quartz as a proxy for identifying extreme marine inundation events along the east coast of Australia. Dr. Lynda Petherick also presented on her recent PhD with an innovative project that combined Quaternary terrestrial records of dust deposition in coastal landscape in North Stradbroke Island.

Dr. Craig Sloss also presented a public lecture on his recent involvement as a ship-board scientist on the IODP339 cruise in the Gulf of Cadiz.

References:

Courtney, C., Dominey-Howes, D., Goff, J., Chagué-Goff, C., Switzer, A.D., McFadgen, B., 2012. A synthesis and review of the geological evidence for palaeotsunamis along the coast of southeast Australia: the evidence, issues and potential ways forward. *Quaternary Science Reviews* 54, 99-125.

Gouramanis, C., Dodson, J., Wilkins, D., De Deckker, P., Chase, B.M., 2012. Holocene palaeoclimate and sea level fluctuation recorded from the coastal Barker Swamp, Rottnest Island, south-western Western Australia. *Quaternary Science Reviews* 54, 40-57.

Lewis, S., E., Sloss, C. R., Murray-Wallace, C. V., Woodroffe, C. D., Smithers, S. G., (in press). Post-glacial sea-level changes around the Australian margin: A review. *Quaternary Science Reviews*. Available online 6 October 2012.

Woodroffe, C.D., Murray-Wallace, C.M., 2012. Sea-level rise and coastal change: the past as a guide to the future. *Quaternary Science Reviews* 54, 4-11.

5.5 Chronology and dating (Henk Heijnis – Australia)

No news was received from this group.

