



PALSEA

PALSEA2 **2014 Workshop**

Methodologies used to document palaeo sea level and ice-sheet extent and build sea level/ice sheet databases



Glencanisp Lodge, Lochinver, Scotland, UK
17th – 22nd September

Meeting organisers:
Antony Long and Natasha Barlow
Department of Geography, Durham University

#PALSEA2014



INQUA
International Union for Quaternary Research

With contributions from

Tom Bradwell
British Geological Survey

Hannah Mathers
University of Glasgow

Ian Shennan
Durham University

PALSEA2 organising committee

Anders Carlson
Oregon State University

Andrea Dutton
University of Florida

Antony Long
Durham University

Glenn Milne
University of Ottawa

Introduction

PALSEA2 is a PAGES IGBP, INQUA, WUN working group focused on using past changes in sea level and Earth's cryosphere to constrain future sea-level rise in response to climate change. It is a continuation of PALSEA that operated from 2008 to 2012.

The greatest uncertainty in projecting future sea-level rise lies in the responses of Earth's remaining ice sheets. The observational period of sea level and ice sheet mass balance spans at best only the last century, at least partly exacerbating present uncertainty in future sea-level rise. In contrast, the geologic record provides valuable archives of how ice sheets and sea level have responded to past climate variability, particularly during periods of climate warming. The information contained in the geological record can therefore help assess the relationship between ice sheets, sea level and climate change, and provide a firm basis for projecting the future. This working group continues to bring together observational scientists and ice-sheet, climate and sea-level modelers in order to better define observational constraints on past sea-level rise and improve our understanding of ice-sheet responses to rapid climate change.

The overarching goal of PALSEA2 is to better understand ice-sheet and sea-level processes that led to sea-level change during past periods when ice volume was similar to that at present, and hence societally relevant, by addressing the following objectives:

1. Document and synthesize data on rates, patterns, and budgets of sea-level variability during Quaternary/Pliocene warm periods and assess the ability of numerical and semi-empirical models to simulate these observations.
2. Estimate the sea-level/ice-sheet response time (and governing processes) to past "warm" climates and use this data-driven information to improve future sea-level rise projections; thus bridging the gap between paleo and historical observations and future predictions.

The aim of the 2014 workshop in north west Scotland is to explore, discuss and debate the methods by which precise and accurate reconstructions of past sea level and ice sheet extent can be developed over a range of spatial and temporal scales, from the Pliocene optimum to the current interglacial.

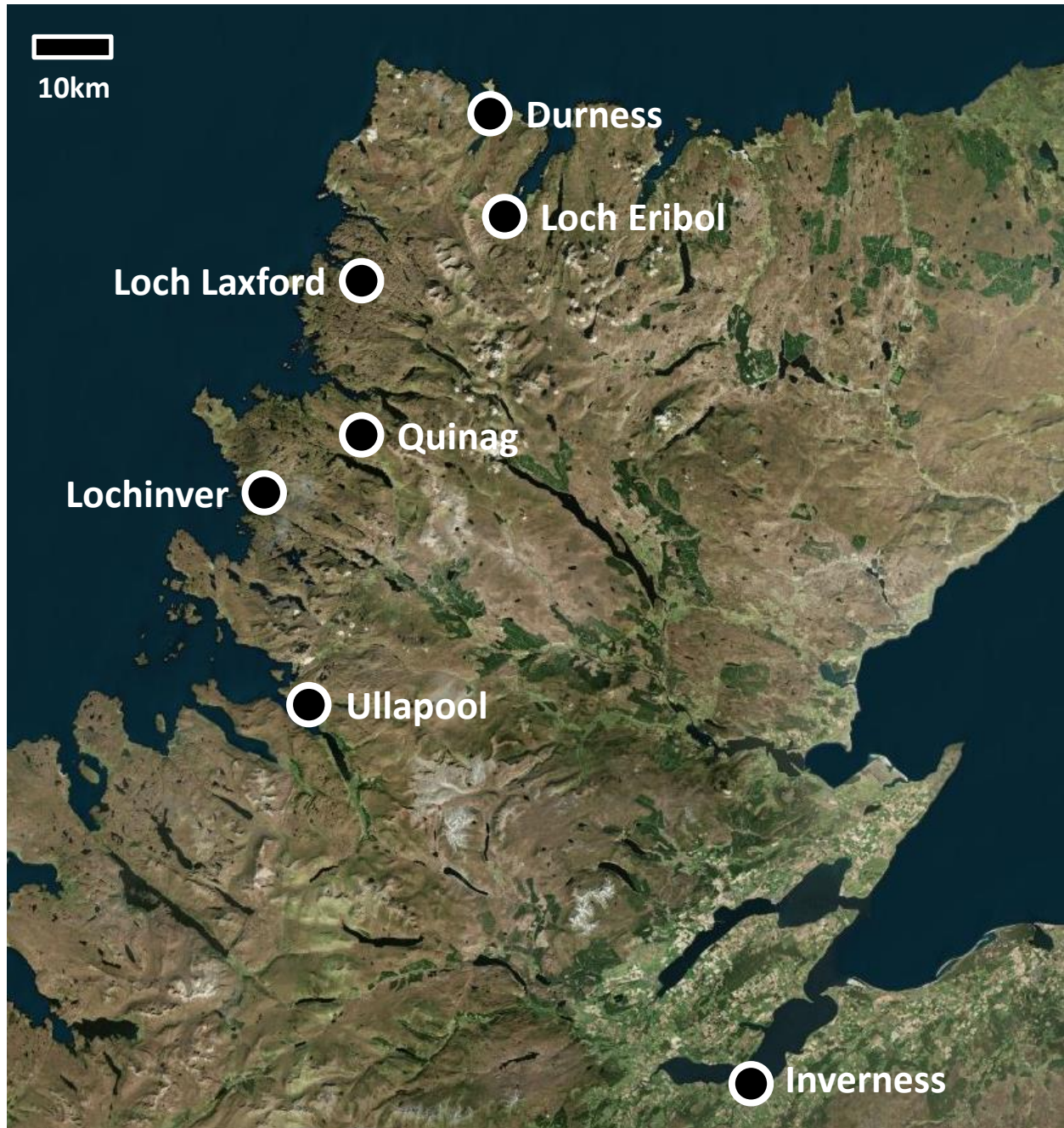
North west of Scotland is chosen because it is an ideal venue for an intense combined field and presentation workshop. The British and Irish Ice Sheet is located on the climatically sensitive margins of the North Atlantic and is a well-constrained analogue for many other ice sheets. The challenges in reconstructing its history - including its vertical and lateral extent, onshore and offshore correlations, the influence of local and regional climate forcing, as well as impacts on local and global sea level - are common themes that challenge the international PALSEA2 community.

The field sites visited during the week, along with the excellent list of posters and presentations, will provide a stimuli for debates regarding how existing and new databases of observations should be constructed and how the PALSEA2 community can use these to address the programmes' broader paleo sea-level questions.

We welcome you to north west Scotland and hope you have an enjoyable and productive conference and field meeting.

The conference organisers and PALSEA2 committee

Overview map of north west Scotland



Meeting timetable

Tuesday 16th September

	Arrive in Inverness Delegates to make own accommodation arrangements
2000	Optional meet up in Inverness pub: Castle Tavern, 1 View Place, Inverness, IV2 4SA

Wednesday 17th September

0900	Collection of delegates Location 1: Inverness railway station car park (0900) Location 2: Tesco car park, behind the Premier Inn (0920)
0930	Drive to Ullapool: Introduction overview of area Drive to Glencansip Lodge: walk out from Lodge, with packed lunch
1500	Lodge check-in
1600	Poster session
	Bittermann Klaus Human induced sea level now and by 2100 CE
	Bradley Sarah Low post-glacial rebound rates in the Weddell Sea due to Late Holocene ice-sheet readvance
	Bradwell Tom Taking the rough with the smooth: pre-glacial weathering, glacial erosion zones and implications for ice sheet history in bedrock landscapes
	Clark Jorie Constraints on the thickness of the Irish Ice Sheet and implications for paleoclimate from 10Be dating of Irish cirque glacier moraines
	Gasson Ed Antarctic bedrock topography and ice sheet stability during the Oligocene and Miocene
	Goslin Jérôme A new Holocene relative sea-level history in western Brittany: implications for the understanding of isostatic dynamics of north-western Europe
	Hallmann Nadine Reconstructing Late Holocene sea-level change from coral microatolls, French Polynesia
	Hibbert Fiona A preliminary assessment of the timing of the decay of the MIS 6 ice sheets
	Vacchi Matteo Applications of Relative Sea Level databases in tectonically-active coastal areas
1900	Dinner
2030	After dinner talk: Introduction to North West Scotland

Thursday 18th September

(the next three days are flexible to allow for the weather).

0800	Breakfast
	Field day: glacial and sea level history of North West Scotland
	Stops:
	Straith Dionard
0900	Durness
	Rispond, Loch Eribol
	Head of Loch Eribol
	Loch Laxford
	Dinner
1900	Seating for dinner will be by place names at the table. This is to ensure that early career scientists and senior scientists will be mixed up to allow ECRs to ask questions re career paths etc.
	Free evening

Friday 19th September

0800	Breakfast
	Field day: glacial landscapes
	Stops:
0900	Walk up the Quinag dip slope (approx. 500m of ascent)
	Megagroves at Elgin
1900	Dinner
2030	After dinner discussion Glenn Milne: IPCC and PALSEA2

Saturday 20th September			
0800	Breakfast		
0900	Paper session		
	Sea-level change and ice sheets (i) Chair: Antony Long		
0900-0930	Clark	Peter	Progress and Uncertainties in Closing the Sea-Level Budget During the Last Glacial Maximum
0930-0950	Williams	Felicity	Investigation of sea-level through the last interglacial period using new ice loading histories based on continuous records
0950-1010	Sivan	Dorit	High-resolution last interglacial sea levels exposed in the Galilee coast, Israel
1010-1030	Discussion		
1030-1100	Coffee		
	Sea-level change and ice sheets (ii) Chair: Natasha Barlow		
1100-1130	Bradley	Sarah	Glacial Isostatic Adjustment model of the British Isles: Past, Present and Future
1130-1150	Carlson	Anders	Minimal retreat of the Greenland ice sheet during the Holocene
1150-1210	Barnett	Robert	Late Holocene sea-level changes in the ice sheet proximal Gulf of St Lawrence from a 'suite' of proxy data
1210-1230	Discussion		
1230-1330	Lunch		
	Late Holocene (i) Chair: Anders Carlson		
1330-1415	Horton	Ben	Reconstructing Common Era sea level: lessons from the U.S. Atlantic Coast
	Kopp	Robert	Reconstructing Common Era sea level II: An integrated analysis
1415-1435	Milne	Glenn	Sea-Level Projections for the US Gulf Coast
1435-1500	Discussion		
1500-1530	Coffee		
	Late Holocene (ii) Chair: Torbjorn Tornqvist		
1530-1550	Gehrels	Roland	Sea-level rise 'hot spots' in the North Atlantic: a late Holocene perspective
1550-1610	Rahmstorf	Stefan	Using paleo sea-level records together with semi-empirical sea-level models
1610-1640	Discussion		
1900	Conference dinner		

Sunday 21st September			
0800	Breakfast		
0900	Paper session		
	Databases (i) Chair: Andrea Dutton		
0900-0930	Tarasov	Lev	Using paleo data to constrain glaciological ice sheet reconstructions
0930-0950	Dusterhus	Andre	Using enhanced databases for statistical sea-level evaluation
0950-1010	Whipple	Matt	Sensitivity testing regions of Antarctic retreat from far field sea level data during the Last Interglaciation
1010-1030	Discussion		
1030-1100	Coffee		
	Databases (ii) Chair: Glenn Milne		
1100-1130	Dutton	Andrea	How databases, data transparency, and standards for data collection and reporting can transform our understanding of sea-level change: A case study from the Bahamas
1130-1150	Hibbert	Fiona	A new compilation of coral benchmarks: towards a consistent global repository of U-Th dated indicators of past sea levels
1150-1210	Khan	Nicole	Holocene Sea-Level Database for the Caribbean Region
1210-1230	Discussion		
1230-1330	Lunch		
	Databases (iii) Chair: Fiona Hibbert		
1330-1415	Tornqvist	Torbjorn	Synthesizing post-LGM sea-level data from the United States, Canada, and the Caribbean: Historical context, challenges, and prospects
	Hijma	Marc	A new protocol for a geological sea-level database
1415-1435	Rovere	Alessio	Databases of paleo shorelines: state of the art and future directions
1435-1500	Discussion		
1500-1530	Coffee		
	Database discussion		
1530-1700	Database discussion led by PALSEA2 committee		
1900	Dinner		
2030	After dinner PALSEA2 business meeting: PALSEA2 committee		

Monday 22nd September

0800 Breakfast

0900 Depart for Inverness.
Intended arrival at airport and railway station by 1400

Delegate list and email addresses

Name	Email
Alessio Rovere	University of Bremen
Anders Carlson	Oregon State Univeristy
Andre Düsterhus	National Oceanography Centre, Liverpool
Andrea Dutton	University of Florida
Antony Long	Durham University
Ben Horton	Rutgers State University
Dorit Sivan	University of Haifa
Edward Gasson	University of Massachusetts
Felicity Williams	Southampton University
Fiona Hibbert	Southampton University
Glenn Milne	University of Ottawa
Hannah Mathers	Glasgow University
Ian Shennan	Durham University
Jerome Goslin	CNRS France
Jorie Clark	Oregon State Univeristy
Klaus Bitterman	Postdam Institute of Climate Research
Lev Tarasov	Memorial University
Marc Hijma	Deltares, Netherlands
Matteo Vacchi	CNRS France
Matthew Whipple	Bristol University
Nadine Hallmann	CNRS France
Natasha Barlow	Durham University
Nicole Khan	Rutgers State University
Peter Clark	Oregon State Univeristy
Robert Barnett	University of Quebec
Robert Kopp	Rutgers State University
Roland Gehrels	University of York
Sarah Bradley	Utrecht University
Stefan Rahmstorf	Postdam Institute of Climate Research
Tom Bradwell	British Geological Survey
Torbjorn Tornqvist	Tulane University

POSTERS

Human induced sea level now and by 2100 CE

Klaus Bittermann, Stefan Rahmstorf, Robert E. Kopp, Andrew C. Kemp, Jeffrey P. Donnelly, Carling C. Hay, Jerry X. Mitrovica, Eric D. Morrow, Benjamin P. Horton

Low post-glacial rebound rates in the Weddell Sea due to Late Holocene ice-sheet readvance

Sarah L. Bradley, Richard C.A. Hindmarsh, Pippa L. Whitehouse, Michael J. Bentley, Matt A. King

Taking the rough with the smooth: pre-glacial weathering, glacial erosion zones and implications for ice sheet history in bedrock landscapes

Tom Bradwell & Maarten Krabbendam

Constraints on the Thickness of the Irish Ice Sheet and Implications for Paleoclimate from ¹⁰Be Dating of Irish Cirque Glacier Moraines

Aaron M. Barth and Jorie Clark

Antarctic bedrock topography and ice sheet stability during the Oligocene and Miocene

Edward Gasson, Rob DeConto, David Pollard

A new Holocene relative sea-level history in western Brittany: implications for the understanding of isostatic dynamics of north-western Europe.

Jérôme Goslin, Brigitte Van Vliet-Lanoë, Serge Suanez

Reconstructing Late Holocene sea-level change from coral microatolls, French Polynesia

Hallmann, N., Camoin, G., Vella, C., Eisenhauer, A., Samankassou, E., Botella, A., Milne, G.A., Fietzke, J., Dussouillez, P., Plaine, J.

A preliminary assessment of the timing of the decay of the MIS 6 ice sheets

Hibbert, F.D.

Applications of Relative Sea Level databases in tectonically-active coastal areas

Matteo Vacchi, Simon E Engelhart, Ben P Horton