CYCLES OF SEA ICE DYNAMICS IN THE EARTH SYSTEM WORKSHOP

October 24 – 26, 2018

VANCOUVER, BC, CANADA

C-SIDE

SFU FACULTY OF ENVIRONMENT

INTRODUCTION

Southern Ocean sea ice plays important roles within the Earth system, affecting nutrient cycling, ocean productivity, air-sea gas exchange, deep-water formation, and ocean heat transport. As Southern Ocean sea ice cover is changing, it is important for our climate models to accurately simulate sea ice and its effects on the climate system.

However, climate models currently produce large differences in their scenarios and these differences have profound implications regarding the ability to project future responses to sea ice change. Understanding past sea ice conditions could help refine the models and alleviate some of these challenges, however; our current understanding of past sea ice conditions is limited to just a few locations.

STEERING COMMITTEE

Thank you to the steering committee which made this event possible!

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Helen Bostock
Marine Geologist, National Institute of Water and Atmospheric Research

FRANCE
Xavier Crosta
Senior Research Scientist, University of Bordeaux

CANADA
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Amy Leventer
Professor, Colgate University

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Director and Professor, Climate Change Research Centre, University of New South Wales

INTERNET CONNECTION

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WORKSHOP GOALS

Our goal is to increase our knowledge of Southern Ocean sea ice in the past and to extend the number of locations studied to help us better plan for future sea ice change and its effects on the climate system. By bringing together an international team of interdisciplinary scientists with expertise in sea ice reconstruction from 11 countries, at early, mid and senior career levels, participants will assemble a hemispheric reconstruction of transient changes in sea-ice for the last full glacial cycle (130,000 years). Specifically, participants will...

- assemble existing records of sea ice proxies in the Southern Ocean;
- coordinate taxonomic and statistical approaches between regions;
- develop regional reconstructions of sea-ice dynamics;
- compare these reconstructions with other regional reconstructions of environmental conditions (e.g., temperature, circulation, marine productivity, and ice core proxies of sea ice change); and
- compare these sea ice reconstructions with model simulations of sea ice cover the full glacial-interglacial cycle.

EXPECTED OUTCOMES

A written workshop report will be published as part of the PAGES project and an introductory publication targeted at EOS and led by early career scientists is also planned to document findings and build awareness. Having created this network of expertise, additional work is planned to develop a list of modelling and data-model comparison goals; establish a common data compilation protocol, identify regional subgroups for data assemblage, build a website and provide the groundwork for the publication of a special issue presenting these results.

OUR SPONSORS

We gratefully acknowledge our sponsors for making this project possible. They include:

PAGES
PAST GLOBAL CHANGES

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PRELIMINARY AGENDA

— WEDNESDAY OCT 24

Simon Fraser University, Segal Building, 500 Granville Street, Room 1300

Part I: Overview

8:30 - 9:00 Check-in

9:00 - 9:10 Welcome / Orientation
Karen Kohfeld

9:10 - 9:30 Goals of PAGES Working Groups
Katrin Meissner

9:30 - 9:50 Goals of the C-SIDE Working Group
Karen Kohfeld

9:50 - 10:10 Introduction (names, affiliations, backgrounds)

10:10 - 10:30 Link Between Sea Ice and Deep Ocean Circulation
Alice Marzocchi

10:30 - 10:50 Overview of Southern Ocean Controversies Paper for AGU 100
Helen Bostock

10:50 - 11:10 Break

Part II: Reconstruction of Sea Ice

11:10 - 11:30 Diatoms as a Proxy for Sea Ice: Advances and Challenges
Xavier Crosta
1. What data are available?
2. What do they show?
3. What are the controversies?
4. What do we still need to know?
5. How reliable are the proxies?
6. Calibrations?

11:30 - 11:50 Sea Ice as Seen from the Ice Cores
Rachael Rhodes

11:50 - 12:10 Development of New Sea Ice Proxies
Juliane Mueller

12:10 - 12:30 Discussion: How do we incorporate data that are providing different or inconsistent information?

12:30 - 13:30 Lunch

Part III: Speed Talks

13:30 - 15:00 Participants have 5 minutes to present 1-3 slides regarding their work

15:00 - 15:20 Break

Part IV: Identifying Research Questions and Key Open Controversies

15:20 - 16:30 Parallel Small-Group Discussion: Identify Research Questions and Key Open Controversies
1. Are there specific topics relevant for specific regions? Identify topics/regions for data assemblage
2. What data should be included in the database to address these controversies?

16:30 - 16:50 Report Back and Identify Roles for Paper

16:50 - 17:00 Wrap-Up, Identify Social Media Guru, Plans for Tomorrow

17:30 Dinner at the Irish Heather Pub, 210 Carrall Street (see map page 5)

— THURSDAY OCT 25

SFU Harbour Centre,
515 West Hastings Room 1600

Part V: Database and Model-Data Development

8:30 - 9:00 Check-in

9:00 - 9:20 Summary of Day 1; Goals for Day 2
Amy Leventer

9:20 - 9:50 How Can Earth System Modeling Be Integrated Into This Working Group?
Laurie Menviel

9:50 - 10:20 How Can LinkedEarth Facilitate Data Synthesis Efforts?
Nick McKay (remote)

10:20 - 10:40 Establishment of Data Compilation Protocols
Karen Kohfeld

10:40 - 11:00 Break

11:00 - 12:30 Working Group Discussion
1. Working Group 1: Modeling - Existing Modeling Simulations; Data Needs for Model Evaluation, Room 1500
2. Working Group 2: Sea Ice Proxies - What Needs To Be Included So a Database Can Be Interpreted Correctly, Room 1520
3. Working Group 3: Complementary Data Sets, Room 2200

12:30 - 14:00 Lunch in Room 1600 (additional time to type up summaries from Working Groups)

14:00 - 14:30 Working Groups Report Back (Room 1600)

Part VI: Future Planning

14:30 - 15:45 Discussion Led By **Helen Bostock**
Establishment of 3-Year Working Plan; Development of Topical/Regional Working Groups; Special Issue?; Planning of Model Simulations; Final Database Development Plans

15:45 - 16:10 Q&A
Nick McKay & Julien Emil-Geay (remote)

16:10 - 16:20 Meeting Wrap-Up
Karen Kohfeld

19:00 - 21:00 Evening Public Presentation at SFU Harbour Centre (Room 1900)
Xavier Crosta with Amy Leventer as Moderator

— FRIDAY OCT 26

SFU Wosk Centre for Dialogue, 580 West Hastings Room 370

9:00 - 12:00 Small Group Outline of Controversies Paper, Assigning of Specific Writing Tasks, Preparation of Workshop Report

DIRECTIONS TO IRISH HEATHER PUB

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REPORT DESIGNED BY JAI CHIANG