Second Draft Agenda
U.S. Science Support Program – International Ocean Discovery Program Workshop

Antarctica’s Cenozoic ice and climate history:
New Science and new challenges of drilling in Antarctic waters.

IODP, Texas A&M, College Station, 9-11 May 2016

Monday 9 May, Morning (Room 110/111, Koldus Building, Texas A&M)
8:00 – 8:45 Arrive; pick up badges; coffee.
8:45 Welcome and introductions; housekeeping.
9:00 Introduction to the workshop agenda and objectives (Trevor Williams)

Proposed IODP Antarctic Drilling
9:15 A short history of past Antarctic scientific drilling (Frank Rack)
9:30 Introduction to the IODP proposal system (David Mallinson)
9:45 Coffee break with fruit and pastries
10:15 Presentations on Antarctic and Southern Ocean drilling proposals at JOIDES Resolution Facility Board:
   IODP-751. Ocean-ice sheet interactions and West Antarctic Ice Sheet vulnerability:
   clues from the Neogene and Quaternary record of the outer Ross Sea continental margin (Rob McKay et al.).
   IODP-839. Development and sensitivity of the West Antarctic Ice Sheet tested from drill records of the Amundsen Sea Embayment (Karsten Gohl et al.).
   IODP-732. Sediment drifts off the Antarctic Peninsula and West Antarctica (Jim Channell, Rob Larter, et al.).
   IODP-567. Paleogene South Pacific APC Transect: Heat Transport and Water Column Structure During an Extreme Warm Climate (Debbie Thomas et al.).

11:30 Updates on Antarctic and Southern Ocean drilling proposals:
   IODP-848. Late Neogene to Quaternary ice-sheet and sea-level history of the Weddell Sea, Antarctica (Mike Weber et al.). At IODP Science Evaluation Panel (SEP).
   IODP-847. Plio-Pleistocene reconstruction of ice-sheet, atmosphere, and ocean dynamics in Iceberg Alley (Mike Weber et al.) Resubmitted to SEP, 1 April 2016.

12:00 – 1:00 Lunch (multiple food options available in the nearby Memorial Student Center)
Monday 9 May, Afternoon  (Room 110/111, Koldus Building, Texas A&M)

1:00  Updates on Antarctic and Southern Ocean IODP drilling proposals (continued)

IODP-812-MSP. Southeastern Ross Sea (Doug Wilson et al.);
IODP-868 Scotia Sea (Javier Hernandez Molina et al.);
Drake Passage (Frank Lamy, Gisela Winckler et al.);
Agulhas Plateau (Gabi Uenzelmann-Neben et al.);
IODP-MDP-863 ISOLAT.

Geographic areas and time intervals of interest; toward an integrated overview of Antarctic ice in intervals of past high atmospheric CO\textsubscript{2} levels.

2:00  Presentation: Ice sheet modeling (Rob DeConto)

2:15  Presentation: Sea level and Glacial Isostatic Adjustment (GIA) (Jacky Austermann)

2:30  Coffee Break

2:45  Discussion: Where to drill – do we target the best geographic locations? Are we targeting the geographic sectors where ice sheets are sensitive to climate change? Do we have a balance of drilling locations between deep water (continuous records) and close to the ice edge (a more direct record of ice advance and retreat)?

3:15  Presentation: Carbon dioxide, temperature, and ice volume over the Cenozoic (Amelia Shevenell)

3:30  Discussion: Which ages, events, and high-CO\textsubscript{2} scenarios to target? e.g. Late Eocene climate cooling, and ice extent and climate variability over the course of the Oligocene through to the Holocene. In particular: warm intervals and transitions that can serve as analogues for future warming (e.g. Oligocene, Mid-Miocene, Pliocene). Which intervals are currently not well characterized?

4:15  Discussion: The place of Antarctic drilling in the IODP Science Plan and as policy-relevant science.

- The fundamental links of Antarctic drilling to the IODP Science Plan and the Denver prioritization of the Science Plan challenges.
- Opportunities for linking the new results to current climate change questions. IPCC-level science and policy-relevant science.
- Summary, outlook, plan for workshop report.

5:00  Buses to the hotels and then from the hotels to evening reception.

Monday 9 May, Evening  (Blackwater Draw, a microbrewery in Bryan)

~6:00  Catering by Papa Perez Mexican restaurant.

Buses back to hotels at ~9:00 and ~10:00.
Tuesday 10 May, Morning (Room 110/111, Koldus Building, Texas A&M)

Drilling in a harsh polar environment: sea ice, icebergs and weather assessment; planning for the unexpected.

8:00 – 8:45 Arrive; coffee.
8:45 Introduction to the ice and weather session (Trevor Williams)
9:00 Satellite imagery of ice conditions (Michael Cloutier, PGC)
9:15 Weather: forecasts of temperature, wind, and sea state; typical seasonal changes; available weather forecast and re-analysis products.
9:45 Coffee break with fruit and pastries.
10:15 Discussion: How best to plan for ice and weather conditions?
   Including, for example:
   - Direct experiences of attendees from high-latitude research cruises.
   - The utility of icebreaker support.
   - Sea bed drilling technology (MeBo, RD2).
   - Characteristics of sea ice and storm (ship heave) conditions, monitoring, decision-making at sea;
   - Role of Alternate sites and prioritization.

Information about the examination of Antarctic sediment cores part of the workshop
11:30 Introduction and organization (Denise Kulhanek and David Harwood)
12:00 – 1:00 Lunch (multiple food options available in nearby Memorial Student Center)

Tuesday 10 May, Afternoon (Koldus 110/111 and IODP / Gulf Core Repository)

1:00 – 2:00 Five-minute presentations about each of the sets of sediment cores to be shown:

Sediment cores similar to those anticipated from proposed expeditions:

- Ross Sea, IODP-751. Site 270 (Oligocene-Miocene Ross Sea shelf; examples of marine transgression, diamictite, shallow marine mudstone, glacial rythmites).
- Amundsen Sea, 839. Sites 1097 and 1103 (late Miocene-Pliocene Peninsula shelf; examples of diamictites, proglacial debris flows, and ice-distal muds).
- Peninsula-Belingshausen, IODP-732. Site 1096 and 1101 (Pleistocene Peninsula sediment drifts; including MIS interglacials 5, 9, and 31).
- George V Land, IODP-813. Site 1166 (Cretaceous-Eocene Prydz Bay shelf; examples of organic and mica-rich siltstone, and pre-glacial to glacial unconformity)

Sediment cores related to time intervals and environments of interest:

- Antarctic ice sheet evolution through time, Site 689 (Eocene to Pliocene at Maud Rise).
- Pliocene sedimentary cycles, Site U1361, Wilkes Land (diatom-rich and silty clay alternations, iceberg-rafted debris).
Late-Pleistocene and Holocene Antarctic sediments, Sites 1098 and 1099, Palmer Deep (ice retreat, calving bay facies, laminations).

Pliocene ice retreat in shelf sediments, Site 742, Prydz Bay (diatomite and diamicrite).

Mid-Miocene climate transition, Site U1356, Wilkes Land, and 1165, Prydz Bay (dropstones in silty clay).

Micropaleontological examples from the IODP collection in the microscope room.

2:00 – 3:00 Travel one mile from Koldus to IODP / Gulf Coast Core Repository by university bus (free) or on foot.

Examination of Antarctic sediment cores in the Gulf Coast Core Repository.

3:00 Meet in IODP lobby: Welcome and orientation to the IODP and GCR.

The sediment cores will be organized into about twelve stations (core tables), each focusing on a different Antarctic location or time interval, each table holding up to eight 1.5 m core sections and a small microscope at some of them. There will be an additional station for micropaleontology. Groups of about seven people will move from station to station, spending 30 minutes at each one. Groups will contain a mix of experienced and junior scientists.

At each sediment core station, a map and seismic profile will provide the setting, and published data from the cores will be displayed on screen or on paper on the tables, to give examples of data such as ice-rafted debris (IRD) content, micropaleontology, opal content, physical properties, and other measurements.

In parallel: possible breakout groups to discuss matters arising from the first day and a half of the workshop; report writing.

3:00 Station 1
3:30 Station 2
4:00 Station 3
4:30 Station 4
5:15 First bus to hotels.
5:45 Second bus to hotels.

Tuesday 10 May, Evening

Free time - see logistics document for restaurant options!
Wednesday 11 May  (IODP / Gulf Coast Repository)

Examination of Antarctic sediment cores in the Gulf Core Repository (continued)

In parallel: possible breakout groups to discuss matters arising from the first two days of the workshop; report writing.

8:15 – 9:00  Arrive; coffee.

9:00  Station 5
9:30  Station 6
10:00  Coffee break (and access to other core tables)
10:30  Station 7
11:00  Station 8

11:30 – 1:00  Lunch (Blue Baker pizza and salad, setup in lobby, eat in lobby or outside).

1:00  Station 9
1:30  Station 10
2:00  Coffee break (and access to other core tables)
2:30  Station 11
3:00  Station 12

3:30  Workshop plenary session and wrap-up, IODP Room C126
  Reports and recap from the discussion sessions.
  Plan for moving forward; plan for the workshop report for the JOIDES Resolution Facility Board.

5:00  Meeting close; first bus to hotels.
5:30  Second bus to hotels.
Workshop participants:

Gary Acton  Sam Houston University
John Anderson  Rice University
Jeanine Ash  UCLA
Jacqueline Austerman  Harvard University
Phil Bart  Louisiana State University
Sjoerd Berends  Siem Offshore
Rachel Bertram  Imperial College London, UK
Steve Bohaty  NOC, Southampton, UK
Imogen Browne  University South Florida
Jim Channell  University Florida
Brad Clement  Texas A&M University
Michael Cloutier  Polar Geospatial Center, Minneapolis
Jason Coenen  Northern Illinois University
Ellen Cowan  Appalachian State University
Rob DeConto  University of Massachusetts
Laura De Santis  OGS Trieste, Italy
Justin Dodd  Northern Illinois University
Eugene Domack  South Florida University
Carlota Escutia  Instituto Andaluz de Ciencias de la Tierra, Spain
Sarah Feakins  University of Southern California
Andrew Fraass  Smithsonian Institution
Karsten Gohl  AWI, Bremerhaven, Germany
Michelle Guitard  University of South Florida
Anna Ruth Halberstadt  Rice University
David Harwood  University of Nebraska, Lincoln
Daniel Hauptvogel  University of Houston
CD Hillenbrand  British Antarctic Survey, UK
Katharina Hochmuth  AWI, Bremerhaven, Germany
Minoru Ikehara  Kochi University, Japan
John Jaeger  University of Florida
Tom Janecek  NSF, Washington DC
Denise Kulhanek  Texas A&M University
Rob Larter  British Antarctic Survey, UK
Bridget Lee  University of California Riverside
Chris Lowery  University of Texas Institute for Geophysics
Melissa Luna  Wesleyan University
David Mallinson  East Carolina University
Mitch Malone  Texas A&M University
Ellen Martin  University of Florida
Yasmina Martos  British Antarctic Survey
Rob McKay  Victoria University of Wellington, New Zealand
David McInroy  ESO, Edinburgh, UK
Jennifer Middleton  Harvard University
Yuribia Munoz  University of Houston
Frank Nitsche  Lamont Doherty Earth Observatory
Suzanne O’Connell  Wesleyan University
Elisabetta Olivo  OGS Trieste, Italy
Sandra Passchier  Montclair State University
Molly Patterson  University of Massachusetts
Stephen Pekar          Queens College CUNY  
Michelle Penkrot       University of Florida  
Frank Rack             University of Nebraska, Lincoln  
Brendan Reilly         Oregon State University  
Delaney Robinson       University of Houston  
Alan Rooney            Harvard University  
Yair Rosenthal         Rutgers University  
Ari Salabarmada        Instituto Andaluz de Ciencias de la Tierra, Spain  
Howie Scher            University of South Carolina  
Reed Scherer           Northern Illinois University  
Amelia Shevenell       South Florida University  
Lauren Simkins         Rice University  
Catherine Smith        University of South Florida  
Joe Stoner             Oregon State University  
Debbie Thomas          Texas A&M University  
Ellen Thomas           Yale University  
Gabi Uenzelmann-Neben  AWI, Bremerhaven, Germany  
Kara Vadman            University of South Florida  
Tina van de Flierdt    Imperial College London, UK  
Jonathan Warnock       Indiana University of Pennsylvania  
Sophie Warny           Louisiana State University  
Mike Weber              University of Köln, Germany  
Jo Whittaker           University of Tasmania, Australia  
Trevor Williams        Texas A&M University  
Gisela Winckler        Lamont Doherty Earth Observatory  
Wenshen Xiao           Tongji University, China  
Mingyu Yang            University of Nebraska, Lincoln