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.
8:50     Introduction to the workshop agenda and objectives.

Proposed IODP Antarctic Drilling

9:00     Short summary of past Antarctic scientific drilling, including recent expeditions.
9:15     Introduction to the IODP proposal system.
9:30     Presentations on Antarctic 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 (McKay et al.).

IODP-839.  Development and sensitivity of the West Antarctic Ice Sheet tested from drill records of the Amundsen Sea Embayment (Gohl et al.).

10:00  Coffee break with light snacks (15 minutes)

IODP-732.  Sediment drifts off the Antarctic Peninsula and West Antarctica (Channell, Larter, et al.).

IODP-567.  Paleogene South Pacific APC Transect: Heat Transport and Water Column Structure During an Extreme Warm Climate (Thomas et al.).

Questions and discussion (15 minutes).

11:00  Presentations on Antarctic drilling proposals that are scheduled or in IODP review:


IODP-847.  Plio-Pleistocene reconstruction of ice-sheet, atmosphere, and ocean dynamics in Iceberg Alley (Weber et al.) Resubmitted to the IODP Science Evaluation Panel (SEP), 1 April 2016.

IODP-848.  Late Neogene to Quaternary ice-sheet and sea-level history of the Weddell Sea, Antarctica (Weber et al.). At SEP.

Other presentations, possibly including:
IODP-812-MSP. Shallow drilling in the far southeastern Ross Sea Antarctica for records of the early West Antarctic Ice Sheet (Wilson et al.), at IODP SEP.

IODP-868 Scotia Sea – tectonics and sedimentation (Hernandez Molina et al.),

Questions and discussion (15 minutes).

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)

Geographic areas and time intervals of interest; toward an integrated overview of Antarctic ice in intervals of past high atmospheric CO₂ levels.

1:00  Presentation: Ice sheet modeling (will also serve as an introduction to the geographic areas of the ice sheet).

1:15  Presentation: Sea level and Glacial Isostatic Adjustment (GIA) (Austermann)

1:30  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)?

2:15  Presentation: Carbon dioxide, temperature, and ice volume over the Cenozoic.

2:30  Break

3:00  Discussion: Which ages, events, and high-CO₂ 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?

4:00  Discussion: Synthesis of the discussions so far, and the place of new IODP Antarctic drilling 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.
- Possible new drilling proposals.
- Summary, outlook, plan for workshop report.

Monday 9 May, Evening – group reception

At Blackwater Draw, a microbrewery in Bryan. Catering by Papa Perez Mexican restaurant.
Tuesday 10 May, Morning (Room 110/111, Koldus Building, Texas A&M)

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

8:15 – 8:45 Arrive; coffee.
8:45 Introduction to the topic of ice and weather conditions in Antarctic waters.
9:00 Satellite imagery of ice and weather conditions (Morin, or another rep. from PGC)
9:15 Sea ice – seasonal changes, trends, etc.
9:30 Sea ice images over the season over the site locations of the proposed expeditions.
9:45 Coffee break with light snacks (15 minutes)
10:00 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.

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 Introduction and organization for the core description part of the workshop (Harwood and Kulhanek)

2:00 – 2:45 Travel one mile from Koldus to IODP / Gulf Coast Repository by university bus (free) or on foot.

Examination of Antarctic sediment cores in the Gulf Core Repository.

2:45 Meet in IODP lobby: Welcome and orientation to the IODP and GCR.
3:00 The sediment cores will be organized into about six stations (benches), each focusing on a different area or time interval, each bench holding up to eight 1.5 m core sections and a small microscope at some of them. There will be three or four additional stations for micropaleontology, possible student posters, etc. Groups of about six people will cycle around the stations, spending about 50 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 above the benches, to give examples of 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.

Stations with sediment cores similar to those anticipated from proposed expeditions:

1. Ross Sea / Amundsen Sea, IODP-751, 839. Site 270 + (Oligocene-Miocene)
2. Peninsula-Belingshausen, IODP-732. Site 1096 + (Pliocene-Pleistocene)
3. George V Land, IODP-813. Sites U1356, 1166 + (Eocene-Oligocene)

Stations with sediment cores related to time intervals of interest:

4. Antarctic ice sheet evolution through time, e.g. Site 689, Maud Rise.
5. Pliocene cycles. Site U1361
6. Holocene Antarctic sediments.
[ Note: we are still working on the exact sites and cores to lay out for the workshop. ]

Activities at other stations in adjoining rooms

7. Microscope work – micropaleontology, IRD.
8. Student posters
9. Timeline for a drilling proposal / how to apply to an expedition.

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 two days of the workshop.

8:15 – 8:45 Arrive; coffee.
8:45 Examination of Antarctic sediment cores, continued.
10:00 Coffee break
12:00 Lunch (Blue Baker pizza and salad, setup in lobby)
1:00 Examination of Antarctic sediment cores, continued.
4:00 – 4:30 Workshop wrap-up in IODP Room C126
(time can be adjusted depending on when people need to leave for flights or to get on the road).
Workshop student attendees:

Jeanine Ash  
Imogen Browne  
Jason Coenen  
Michelle Guitard  
Anna Ruth Halberstadt  
Katharina Hochmuth  
Bridget Lee  
Jennifer Middleton  
Yuribia Munoz  
Elisabetta Olivo  
Michelle L Penkrot  
Brendan Reilly  
Delaney Robinson  
Ari Salabarnada  
Catherine Smith  
Kara Vadman  
Mingyu Yang

Jeanine Ash  UCLA  
Imogen Browne  U South Florida  
Jason Coenen  Northern Illinois U  
Michelle Guitard  U South Florida  
Anna Ruth Halberstadt  Rice U --> U Mass  
Katharina Hochmuth  AWI, Bremerhaven, Germany  
Bridget Lee  U California Riverside  
Jennifer Middleton  Harvard U  
Yuribia Munoz  U Houston  
Elisabetta Olivo  OGS Trieste, Italy  
Michelle L Penkrot  U Florida  
Brendan Reilly  Oregon State U  
Delaney Robinson  U Houston  
Ari Salabarnada  U Granada, Spain  
Catherine Smith  U South Florida  
Kara Vadman  U South Florida  
Mingyu Yang  U Nebraska Lincoln

Workshop attendees:

Gary Acton  Sam Houston U  
John Anderson  Rice U  
Jacqueline Austerman  Harvard U  
Phil Bart  Louisiana State U  
Steve Bohaty  NOC, Southampton, UK  
Anders Carlson  Oregon State U  
Jim Channell  U Florida  
Ellen Cowan  Appalachian State U  
Laura De Santis  OGS Trieste, Italy  
Justin Dodd  Northern Illinois U  
Eugene Domack  South Florida U  
Carlota Escutia  U Granada, Spain  
Sarah Feakins  U Southern California  
Andrew Fraass  Smithsonian, Washington DC  
Karsten Gohl  AWI, Bremerhaven, Germany  
David Harwood  U Nebraska, Lincoln  
Daniel Hauptvogel  U Houston  
CD Hillenbrand  BAS, UK  
Minoru Ikehara  Kochi U, Japan  
John Jaeger  U Florida  
Tom Janecek  NSF  
Denise Kulhanek  Texas A&M U  
Rob Larter  BAS, UK  
Chris Lowery  U Texas IG  
David Mallinson  East Carolina U  
Mitch Malone  Texas A&M U  
Ellen Martin  U Florida  
Rob McKay  Victoria U Wellington, New Zealand
Paul Morin  
Polar Geospatial Center, Minneapolis

Frank Nitsche  
Lamont / Columbia U

Suzanne O'Connell  
Wesleyan

Sandra Passchier  
Montclair State U, NJ

Molly Patterson  
U Mass

Stephen Pekar  
Queens College CUNY

Frank Rack  
U Nebraska Lincoln

Alan Rooney  
Harvard U

Howie Scher  
U South Carolina

Reed Scherer  
Northern Illinois U

Amelia Shevenell  
South Florida U

Lauren Simkins  
Rice U

Joe Stoner  
Oregon State U

Debbie Thomas  
Texas A&M U

Ellen Thomas  
Yale U

Tina van de Flierdt  
Imperial College London, UK

Jonathan Warnock  
Indiana U Pennsylvania

Sophie Warny  
Louisiana State U

Mike Weber  
U Köln, Germany

Jo Whittaker  
U Tasmania, Australia

Trevor Williams  
Texas A&M U

Wenshen Xiao  
Tongji U, China