Notes:

PRV NSF meeting workshop

Since 2006 PRV report

Sikukliak vessel, Univ. Alaska

Introductions—capt of Oden, Mattias Peterson, Frank Nitche

KARL ERB
MREFC twice year meetings
Major Research Engin. and Facility Construction---icecube, etc..South Pole
progress on PRV to MREFC

Polar Sea gutted to refit Polar Star operating in 2013

Healy 10 years old overcommitted in Arctic, UNCLOS projects

Gould renewed contract for five years and perhaps another 5 years

Palmer expires summer 2012, RFP for new Palmer lease for 5 years and perhaps beyond

Send to Congress a budget request>>>>>>for new ship, 10 years down the road

Sikuliak in Arctic waters

Antarctic Program
2 phase review NRC Polar Research Council-Board
Preliminary report in June, Nature paper..>>for bi-polar ship

External Blue Ribbon Panel how best to meet the needs
N. Augustine former chair---->Geopolitical
Best way to meet science needs
Meet early in 2012--->

ALEX ISERN

Lease vs purchase,
Mode of operation
Bi-polar ship

LM Gould > 20 years old in 2020 when current lease expires

NB Palmer 2012, 20 years old

PRV Study 2002-2006

Project Advisory Team at NSF??

Jim St. John
NBP ABS A2
Ice class category
Need ABS A3

multi-year ice inclusions

sensitivity histogram

airflow data for atmospheric measurements while underway>>>flow mast resolves problem

Coffee Break

Review PRV Community Response
John Alberts

Marine Geology and Geophysics Breakout Sessions

1) Discussion topics and Science Mission Statements

Integration of science agendas into other programs
IODP, POLENET, Geosciences programs, Biology Programs

Science Questions

1) Ice Mass Transfer to Oceans and from Oceans to Land >>> sea level change
   GRACE (MB) and GIA adjustments land based deployments
   melting flux from marine side>>>close encounters needed
   Time Perspective that Geosciences provide
   Grounding line instability, now and in past :)
   Sediment budget systematics for erosional rates, etc

This drives the capability of the PRV in the following ways:
a. must get close in, regardless of ice conditions, i.e. 50 km
b. must get close to modern grounding lines
c. require long stratigraphic sections (50 m jpc or long core** system and drilling capability to +/- 200m)—how configured
   therefore moon pool)
d. access records preserved in ice covered seas (see Geographic targets)
e. clear wake in heavy ice for seismic gear, 3-5 kt speed in "heavy" ice, limits here need specs!!! OR subsurface gear tow capability, steep and deep
f. best hull mounted system available, 100 m penetration w/ chirp or parasound system
g. helo capability two birds,
h. AUV and ROV capable, not specific unit but deck configuration flexible to accommodate
i. multibeam for swath mapping , resolution dictates hull shape, need details!!!!! 0.5 x 1 degrees array,
j. acoustic noise limitations

2) Nature of Global Lithosphere Ocean Interaction at chemical and physical interfaces at active tectonic settings in the polar regions,
   Fundamental polar region tectonic issues, i.e…
   slow spreading in Arctic>>>

This drives the capability of the PRV in the following ways:
a. access to central Arctic via icebreaking
b.
c.
d.

3) Clathrate methane instability>>>ongoing, where, how initiated, link with geophysics, comparison to deep time events (Paleocene TM), Mesozoic, end Carboniferous icehouse, how?? fresh water flux events, and Ordovician event transition into Silurian

This drives the capability of the PRV in the following ways:

a. Ross Sea focus pockmarks found
b. Vega Drift (NAP) ikaite field
c.
d.

4) Documenting expression of rapid change in sediment record, so this can be used for past events in deeper time,and for predicting direction of additional change

   This drives the capability of the PRV in the following ways:
   a.
   b.
   c.
   d.

5) Geological constraints on benthic habitats in polar regions, what are they?
   This drives the capability of the PRV in the following ways:
   a.
   b.
   c.
   d.

6) Gateways and transitions via oceanic circulation to climate change, crustal block reorganization, and refinement of reconstructions (i.e. Scotia Sea revelations)
   This drives the capability of the PRV in the following ways:
   a.
   b.
   c.
   d.

7) What are the scaling issues required by modelers to help constrain their studies. Key times in the past development of Ant. Ice Sheet which are appropriate to refine models of atmosphere and ice volume relationships.

This drives the capability of the PRV in the following ways:

a.

b.

c.

d.

8) What are the terrestrial to marine correlaries in terms of basin drainage and realms of subsidence, ie. Aurora subglacial basin>>>offshore Wilkes mega basin in Eocene (linkage of subglacial mapping with offshore multibeam and seismic stratigraphy).

This drives the capability of the PRV in the following ways:

a.

b.

c.

d.

9) Can we do seismic work off on pack ice, deployed off ship?

This drives the capability of the PRV in the following ways:

a.

b.

c.

d.

10) Ocean bottom seismometers and long term deployment will need competent platforms.

This drives the capability of the PRV in the following ways:

a.

b.

c.

d.

11) Vent systems and their role in biologic, geochemical, and subice systems. How best to study these systems, survey them, sample them,,, predict location pre survey, evaluate changes post survey

This drives the capability of the PRV in the following ways:

a.
b.
c.
d.

12) How can we integrate education and mission specific cruises,?
More berths, for diversity of participants other than lead PIs

Specific Geographic Targets to meet Science Goals above
(temps. and light limitations accordingly considered)

1. Central Wilkes Land,
2. Amundsen Embayment (PIB)
3. Larsen Embayment
4. Eastern Weddell Sea
5. Alpha Ridge
6. NEast Greenland
7. Nares Strait
8. Balleny Islands region
9. Ross Sea
10. Lomonosov Ridge, Gakkel Ridge
11. Chukchi Sea,

2) Science Question(s)—<u>Time Frame of Earth Systems Evolution</u> by Geoscience Community

Mesozoic early Cenozoic evolution of Antarctic systems, transition into icehouse
Long term evolution of WAIS, APIS, EAIS(??) changes of system within icehouse state

Continental Margin—
site surveys first seismic and seafloor morphology (multibeam w/ ship or AUV)
Separate compressor systems in containers--> not build them into the ship

maintenance costs higher if systems on ship. Durability issues.

cores (JPC system, ultra high resolution Holocene records current directions of climate change) and
drilling followed (moon pool required SIZE of this?)
- geotech single pipe drill
- PROD system (Conoco Phillips, Deep Sea Mineral Exploration)
- Nebo,
- Heave compensation system for sediment systems, need midline hole via hole,

Continental Sequences, pre-Mesozoic—land access via small boat and helo. Support

Sub ice shelf systems, process sedimentation, studies

Longer drill cores
- deep stratigraphic strata along with seismic stratigraphic surveys

INVEST document—white paper IODP targets cannot get into ice covered regions--->
targets

strategic dredging

50 m JPC Adelie Drift, Holocene ooze,

1) ROV-AUV systems

2) Geophysical systems
   Seismic systems and
   what are the future directions of seismic systems
   On same vessel at time of drilling?
   Or separate cruise site surveys two year program issue
   Need for seismic surveys in ice,,East Greenland surveys have
   Demonstrated this is doable in industry

   Seafloor