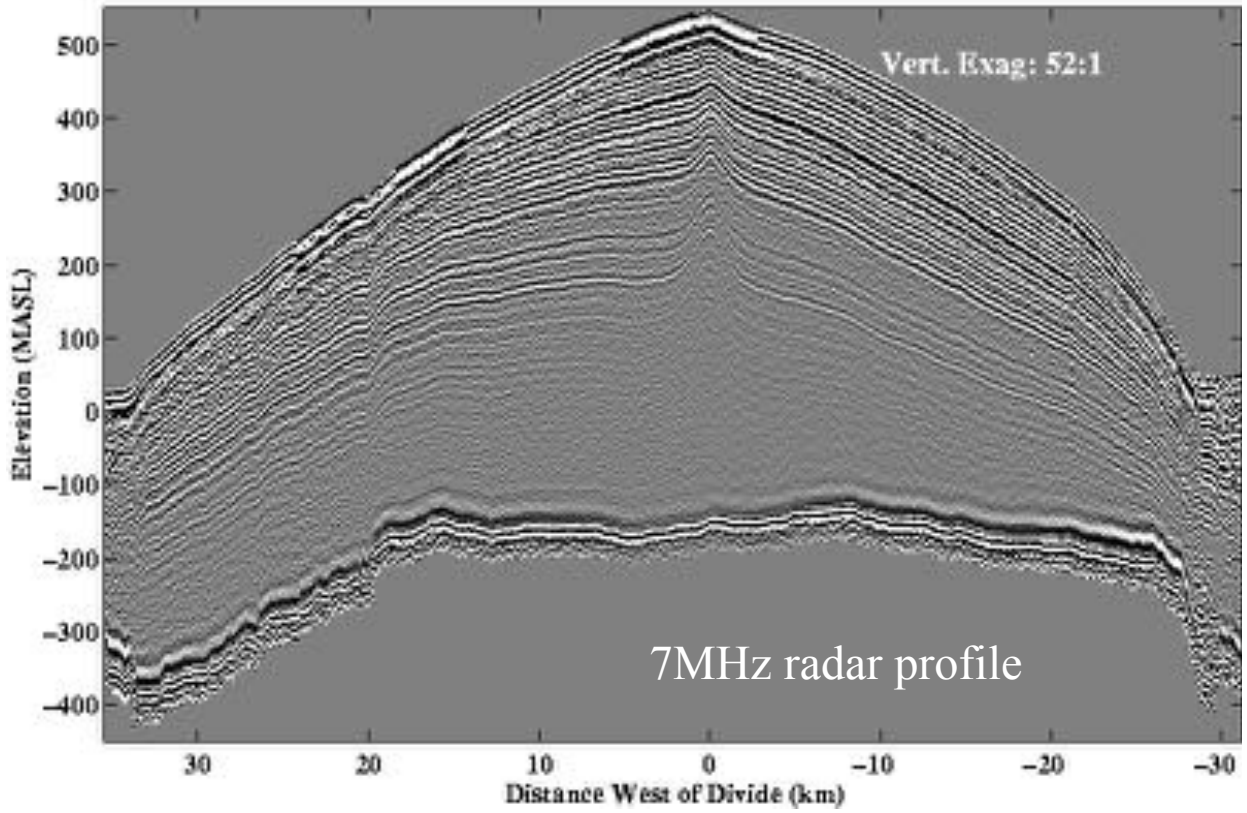
Intermediate Drill at Roosevelt Island, 2011-12

- coastal ice dome in the eastern Ross Sea about 100 km by 60 km, that rises ~500m above the surrounding ice shelf.
- ice thickness at divide ~745 m
- accumulation at divide ~0.20m/yr
- mean annual temperature -23 C
- drilling to the bed at the summit

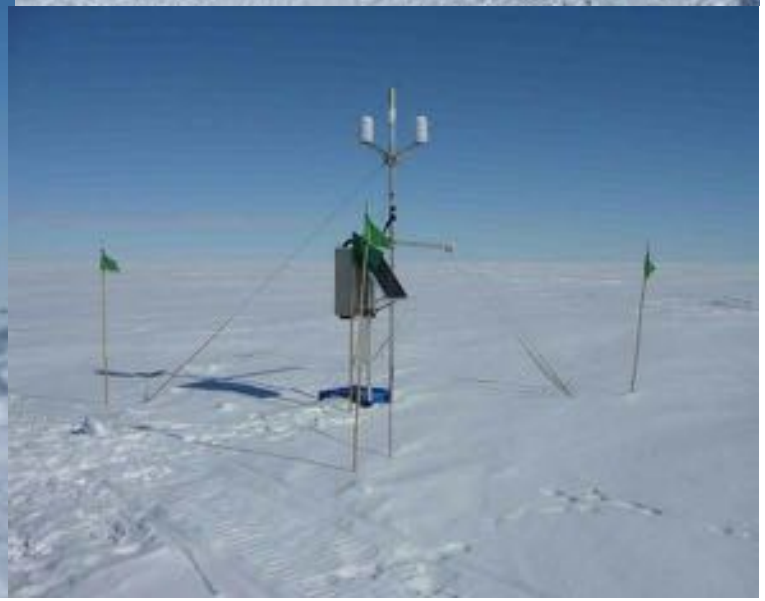


An international partnership with participants from US, NZ, Britain, Denmark, Italy, Australia, Germany, China

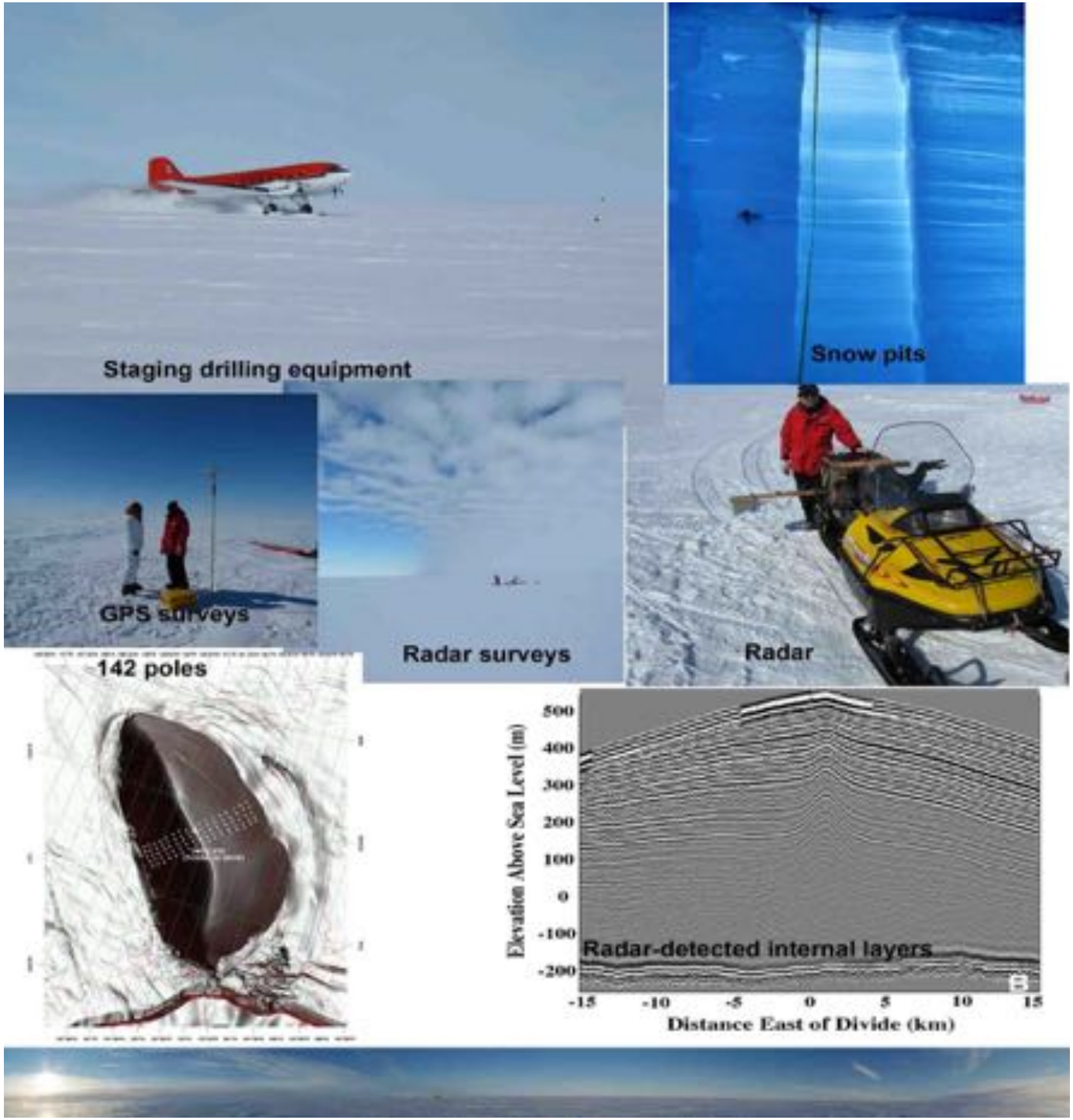
- 650 km from McMurdo;
- NZ partners have designed and built an intermediate-depth drill (based on the Danish Hans Tausen drill);
- camp is run by NZ partners; they have necessary environmental permits;
- core is shipped to their new ice core facility in Lower Hutt. International collaborators will either process the core there or ship it to home institutions for analyses.

Activities 2010-11

- Five colleagues from New Zealand deployed with camp infrastructure, equipment, fuel, and science cargo;
- one person from AntNZ (cook and medic). No carpenters etc required for camp setup.
- the camp also supported our group (I-209) of three;
- all put-in and pull-out flights by Basler.

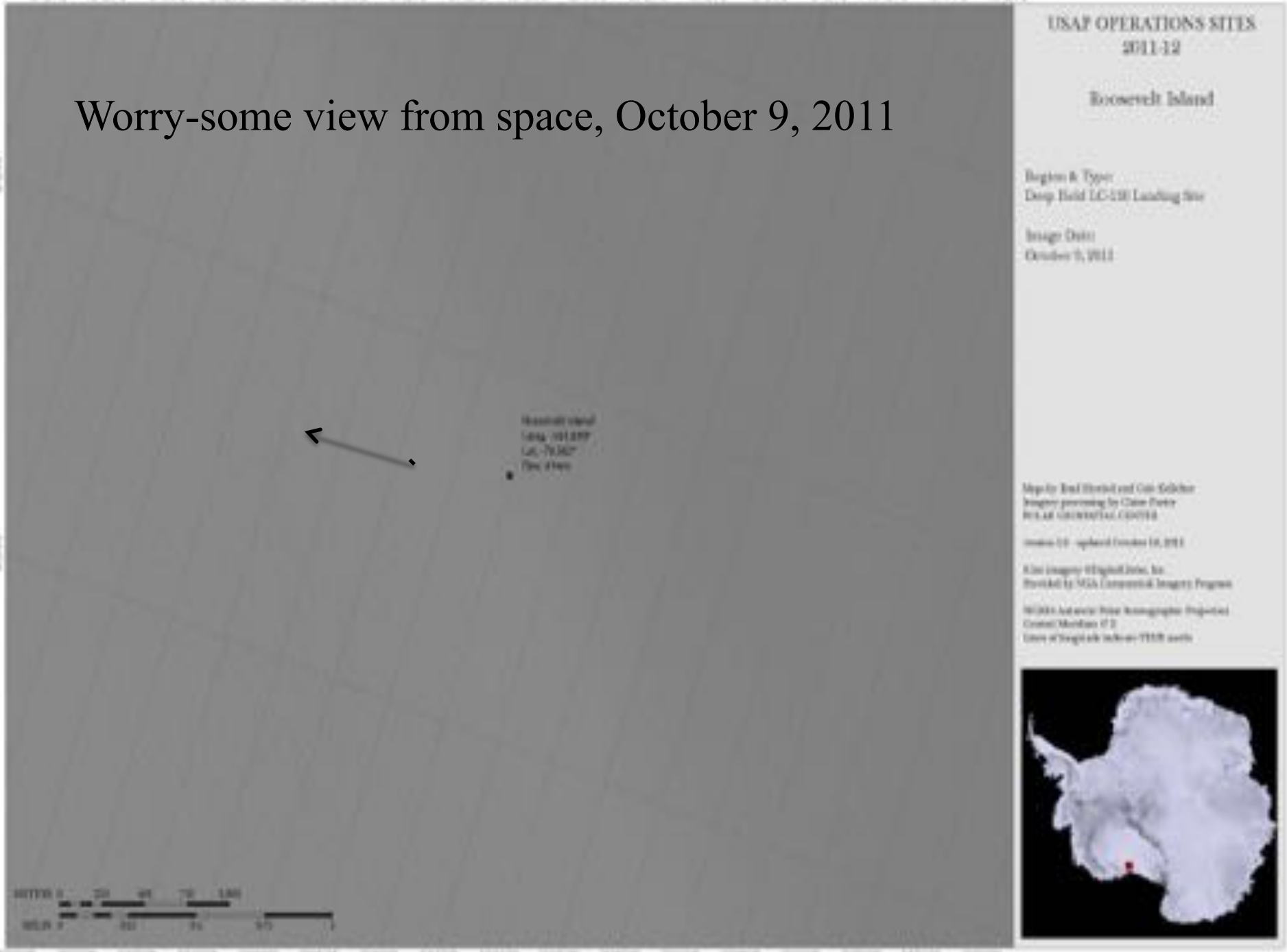


Activities 2010-11



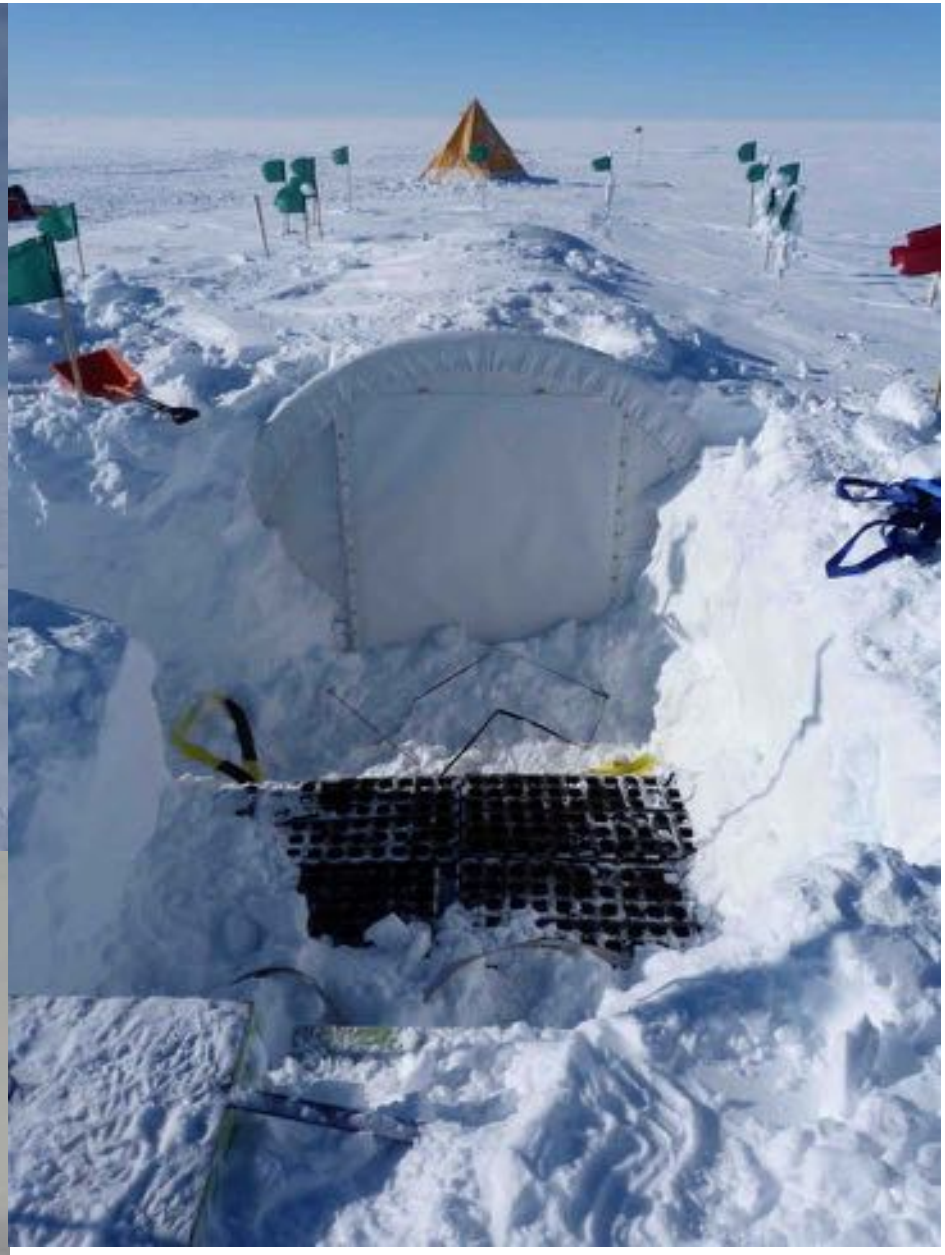

Activities 2010-11
- equipment staged for the winter

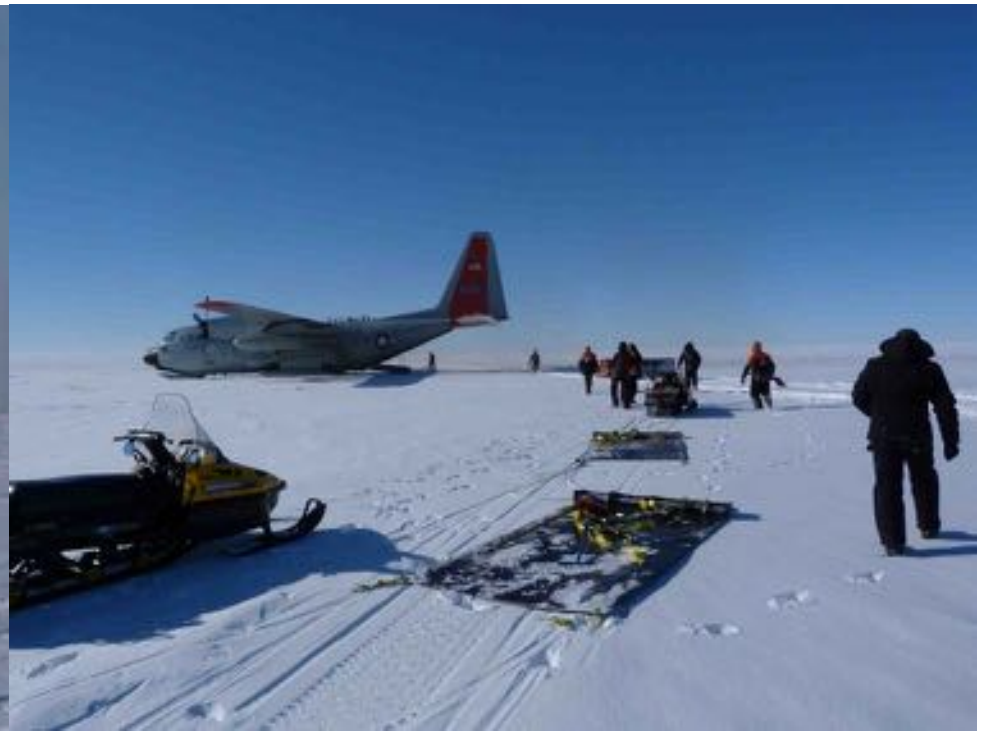
Worry-some view from space, October 9, 2011



Activities 2011-12

- Digging
- no heavy equipment on site





Basler: 2011-12

Early season

- 9 missions approx 4000lbs each flight in;
- total in 35,000lbs;
- little retro; this will be higher next season.

Mid season

- 1 USAP (Conway) 2,000lbs;
- retro approx 4,000lbs including ice core.

Late season pullout

- 2 missions approx 4,000lbs each flight in;
- out 5,700lbs each flight – total 11,500lbs

C-130: 2011-12

Early season

- 1 mission approx 8000lbs in.

- no problems with open field landing this season;
- warmer temperatures may be problematic mid season;
- no equipment on site for grooming runway.

Twin Otters: 2011-12

No successful missions. Use of Twin Otter is not viable because:

- Otter can take ~2,000lb payload to Roosevelt Island.
- distance from McMurdo (650km, 390Nm) requires refueling (5 drums ~ 2,000lbs);
- weather conditions often change rapidly (rolling fog); the timing for landing is critical, but hard to forecast.

Camp infrastructure: 2011-12

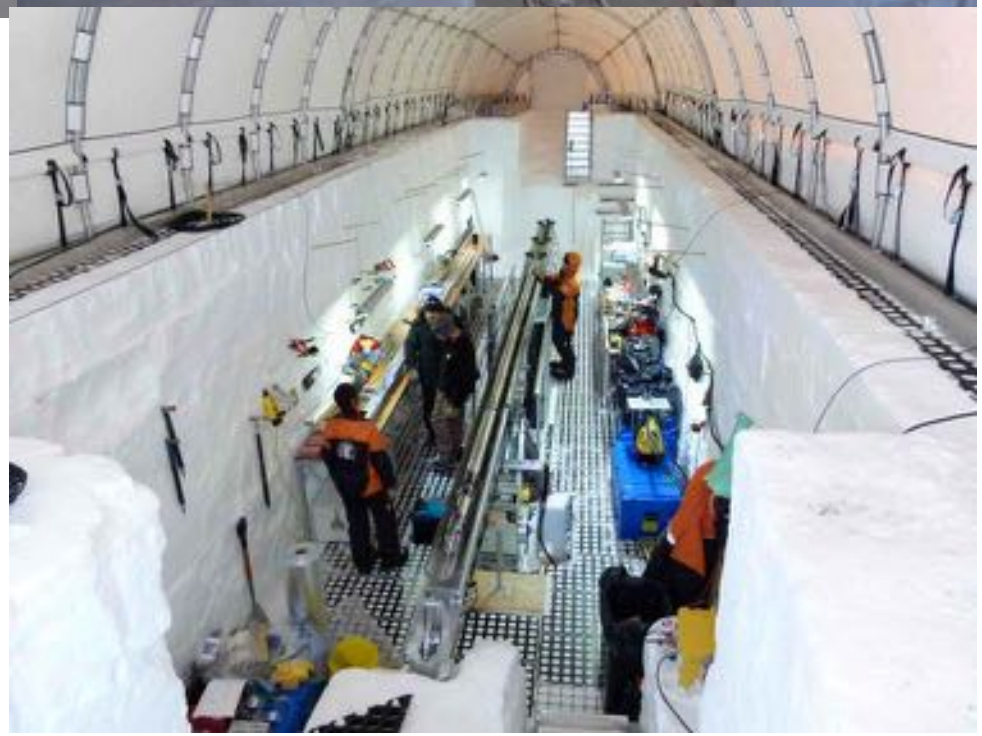
11 people on station: two support people from Ant. NZ; four engineers/drillers (including Lou Albershardt who deployed as I-209); five science, including three students (one from U. Maine)

- No extra support people required for camp putin
- One Rac tent for galley/mess/showers/wash;
- toilet tent;
- pyramid tents and mountain tents for sleeping;
- utility tent for generators;
- drill tent.

Camp infrastructure: 2011-12

8-section Rac tent.

- 6 sections for galley/mess; 2 for water heating/shower/washing;
- excess heat from drill generators used to melt/heat water;
- propane used for cooking;
- 2 oil burning heaters/dryers;
- solar panels and wind generator;
- iridium phones and HF radio for comms.



Drilling

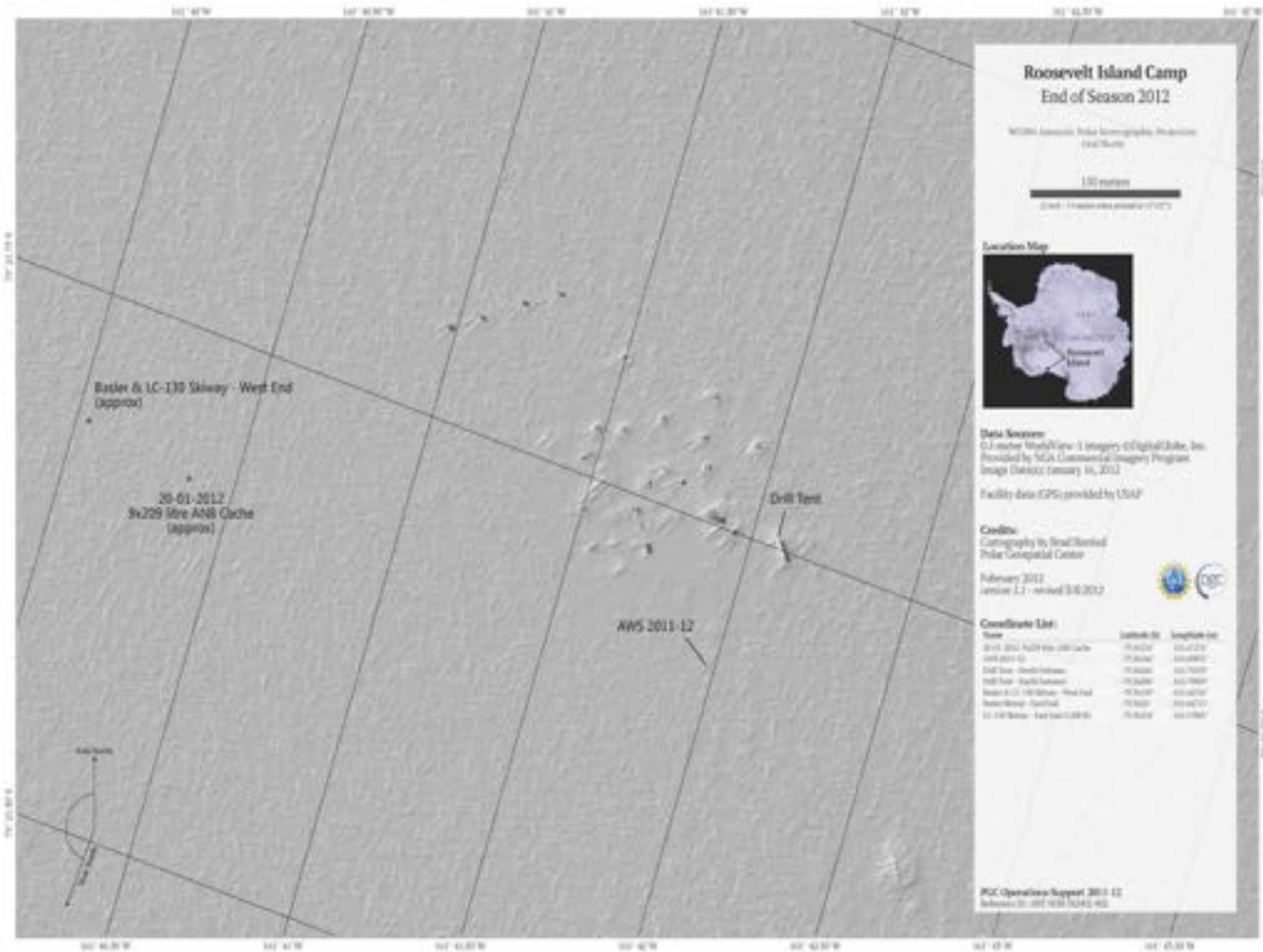
- custom made arch;
- excavations done with chainsaws and shovels and sleds to remove blocks;
- anti-slip flooring worked well.

Plans for 2012-13

- NZ partners plan put in during early October.
- Borehole is now 130m deep; upper 60m is cased and filled with fluid (Estisol 240 with Coasol densifier). Expect to reach the bed in early January.
- we (I-209) will put in early January put in.
- Borehole logging (Hawley), resurvey poles, and repeat radar surveys (Conway & Hindmarsh).

Lessons learned

- Twin Otters are not an efficient use of resources. Although the drill is easily transported by an Otter, Otters need 5 drums (2,000lbs) of fuel to return to McMurdo.
- LC-130 open field landing worked well this season. There is no grooming equipment on site, so this may be a problem if snow conditions are different,
- Baslers worked well. Regular flights through the season will be needed to return core to Scott Base; there is limited storage capacity on site, especially as temperatures warm during the summer;
- fog can be problematic.


Roosevelt Island Camp
End of Season 2012
130 meters
Location Map
Data Sources:
Image Date(s): January 16, 2012
Facility data (GPS) provided by USAP
Credits:
Polar Geospatial Center
February 2012
Coordinate List:
PGC Operations Support 2011-12
Butler & LC-130 Skiway - West End
(approx)
20-01-2012
9x209 litre ANB Cache
(approx)
Drill Tent
AWS 2011-12