

平成27年度交換科学者派遣報告 (大韓民国・ジャンボゴ基地)

課題名：韓国（大韓民国）との固体地球-大気-海洋-雪氷圏
相互作用に関する共同研究

期 間：平成27年11月17日～平成27年12月30日

派遣者：金 尾 政 紀
(国立極地研究所 研究教育系地圏グループ)

派遣先：西南極テラノバ湾周辺、
メルボルン火山・デービッド氷河を含む地域
(南緯73° 00' ～ 76° 00'、東経160° 00' ～ 168° 00')



目 的：

西南極テラノバ湾・Jang Bogo基地周辺で、地震計・インフラサウンドセンサーの観測網整備・拡充による共同観測を実施

日 程：平成27年

- 11月 17日 東京（成田空港）発
11月 18日 ブリスベン経由、ホバート着
22日 アラオン（Araon）乗船、ホバート発
12月 4日 アラオン、Jang Bogo 基地（テラノバ湾）着
5日～ Jang Bogo 基地滞在
インフラサウンド・地震計観測点の保守・設置
- 12月 16日 Jang Bogo基地発、Araon乗船
28日 Araonクライストチャーチ着
29日 クライストチャーチ発、
シドニー経由、
30日 東京（成田空港）着



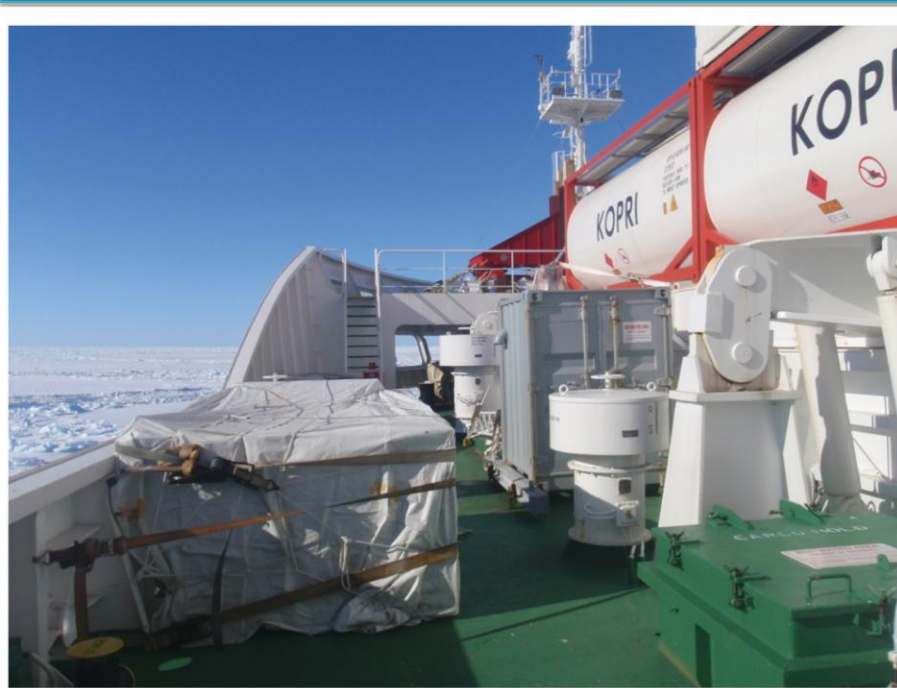


Specification

- Classification: KR PL 10 (Equal to DnV Polar 10)
- Principal dimensions: 110m(L) X 19m(B) x 9.9m(D)
- Gross tonnage: 6,950
- No. of Passengers: 85 (25 crew + 60 researchers)

アラオン: 乗員 25名、乗客50~60名(最大65ベッド数)、@往路

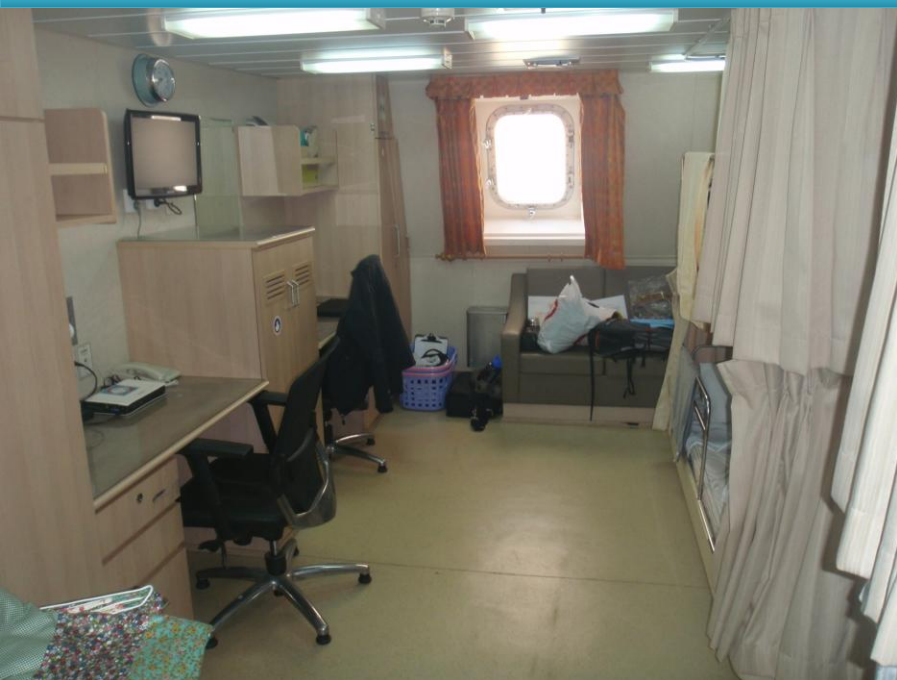
Facilities of ARAON / Heli Deck



Facilities of ARAON / 食堂

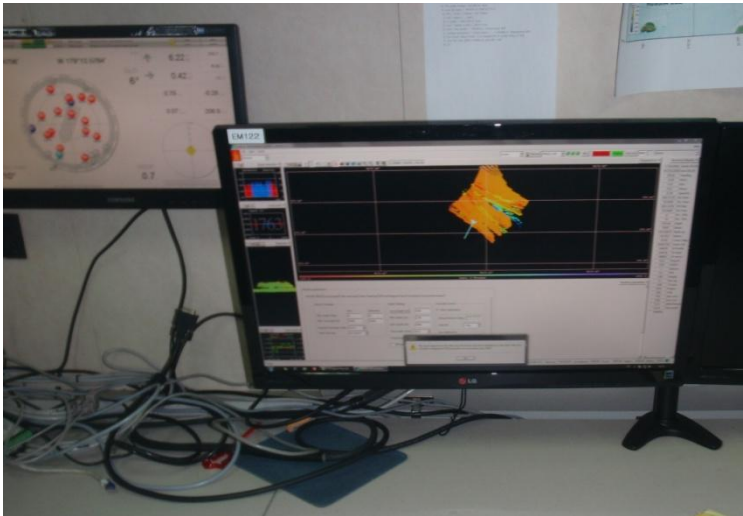


Facilities of ARAON / 個室・ドライラボ

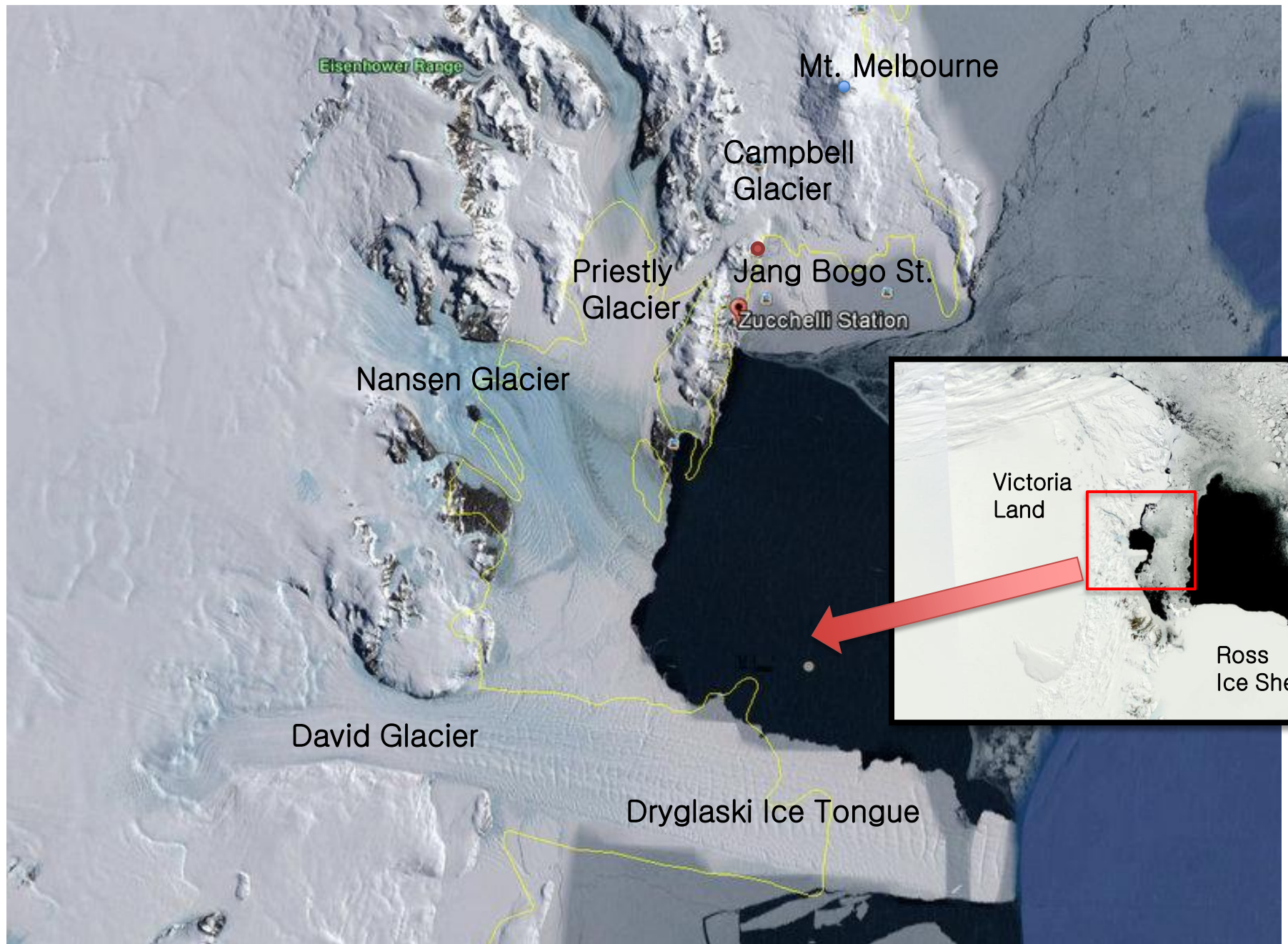


Acoustic Research on R/V ARAON

- Multi/single-beam Echo Sounder, Deep Tow Side Scan Sonar, Acoustic synchronizer etc.



For detecting the side scan image of the **Dryglaski Ice Tongue** of David Glacier



Extreme Geophysics Group (EGG)

KOPRI - EGG の研究協力者

【Jang Bogo Station】

Dr. Won Sang Lee (プロジェクトリーダー、Seismology/Hydro-acoustic)

Dr. Yongcheol Park (受入研究者、Seismology/Infrasound)

Dr. Hyun Jae Yoo (Seismology)、Dr. Choon Ki Lee (Geodesy)

Dr. Sukyoung Yun (Seismology/Hydro-acoustic)

Mr. Jin Seok Kim (Engineer) , Ms. Ji yeon Lee (Secretary)

Mr. Jin Hoon Jung (越冬モニタリング、Kang Wang 国立大学学生), 他FA1名

その他、KOPRI以外: NOAA 2名 (Hydro-acoustic) ・コロンビア大学2名 (CTD) ・

タスマニア大学2名 (マルチビーム)、メリーランド大学2名 (氷河傾斜計)、POLAR66
(AMIGOS (気象・GPS・ビデオ) 1名; Ronald Ross),

NIPR 1名 (金尾、Seismic/Infrasound)



非常時の連絡先

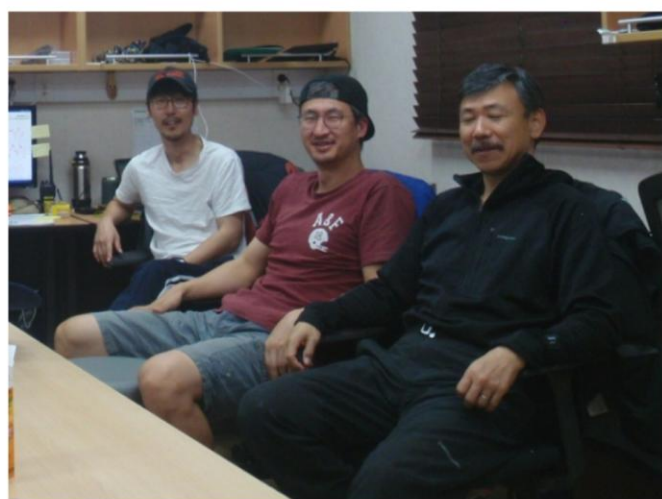
【韓国極地研究所(KOPRI)】

Division of Polar Earth-System Sciences,
(極域地球システム科学部門)

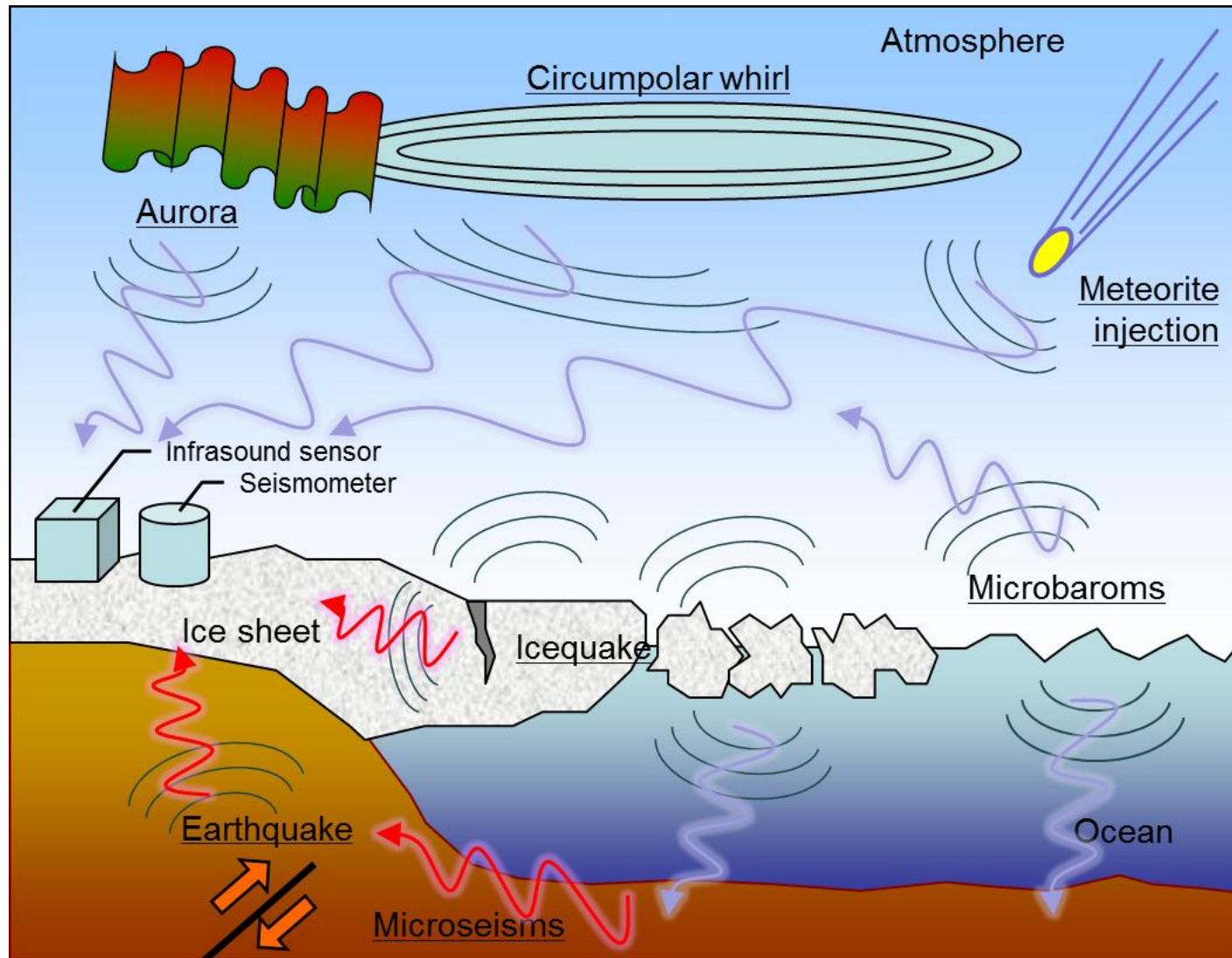
Dr. Jong Kuk Hong (部門ディレクター)



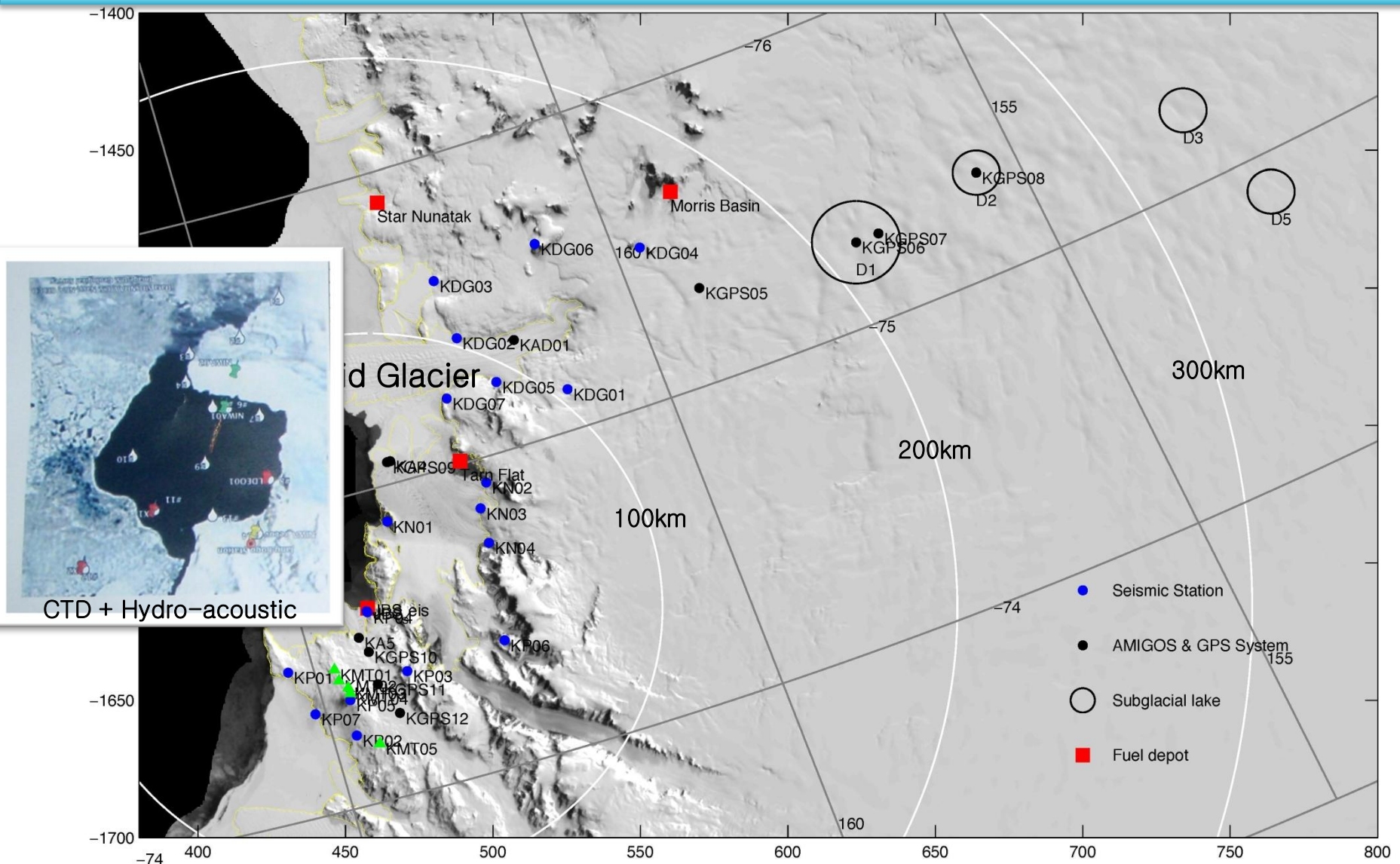
KOPRI
Extreme
Geophysics
Group
= EGG !



EGG Project title; “Interdisciplinary approach to understanding climate changes by observing cryosphere environment”



Station map by EGG project / KOPRI



Intergrated Cryosphere Monitoring Network; EGGNet

KA-3 is a collaborative effort between Polar66 and [KOPRI](#).
The [KA-3](#) was deployed on 12th Nov, 2012, 74 38S, 164 12E.

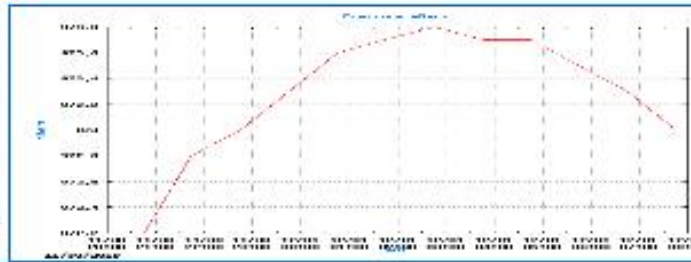
AMIGOS Station, by POLAR66 Co.



[Where is KA3?](#)



[What is KA3?](#)

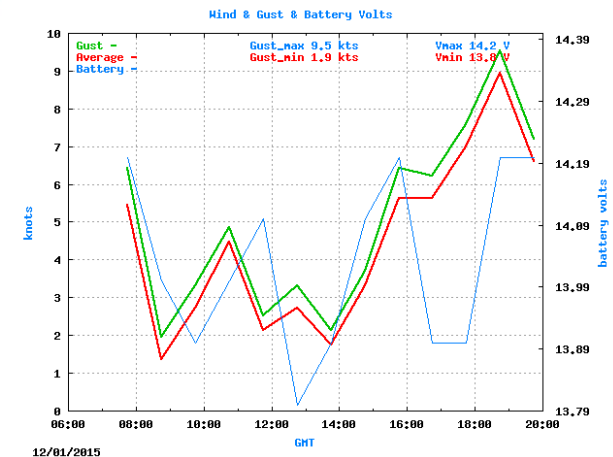


[Realtime KA3?](#)

5 New pictures uploaded @ 0430z, Today is Tuesday, 01-Dec-2015 08:27:21 GMT

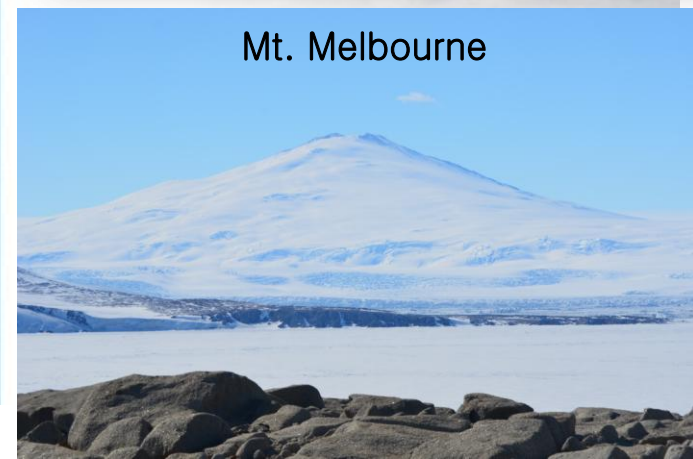
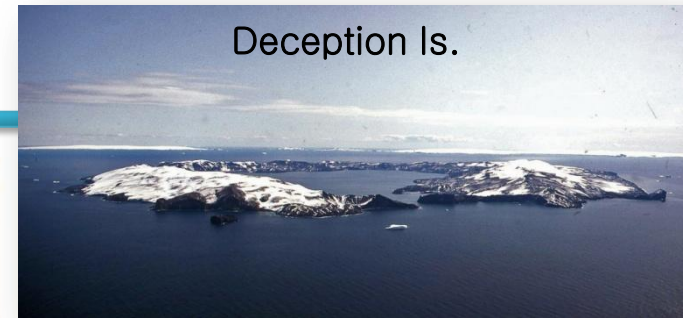
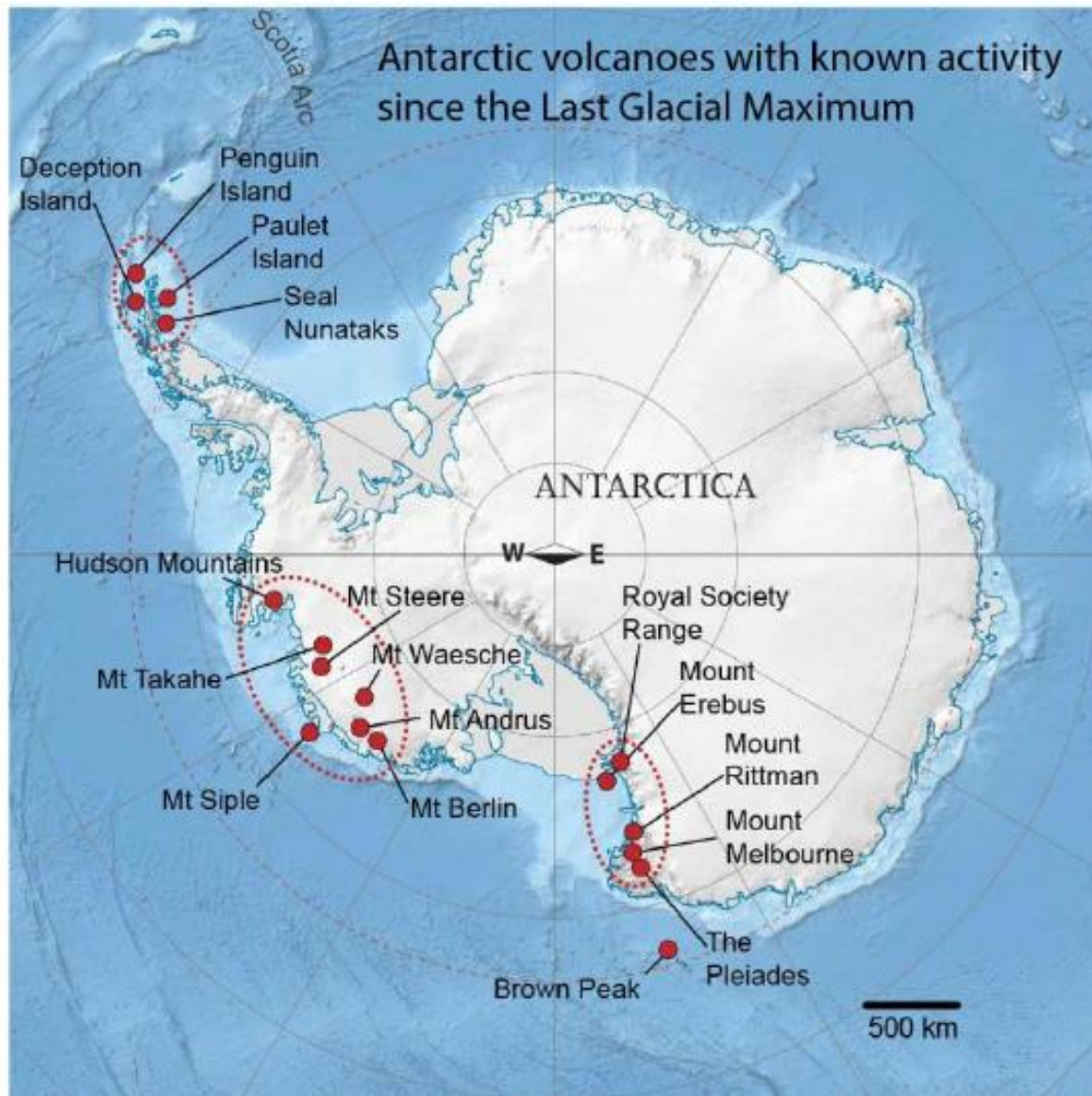


click [here](#) for KA-1 photos and weather
click [here](#) for KA-2 photos and weather
click [here](#) for Wx7 photos and weather
click [here](#) for Wx8 photos and weather
click [here](#) for Pcam photos and weather



<http://thistle.org/k-amigos3/>

南極大陸の火山の分布

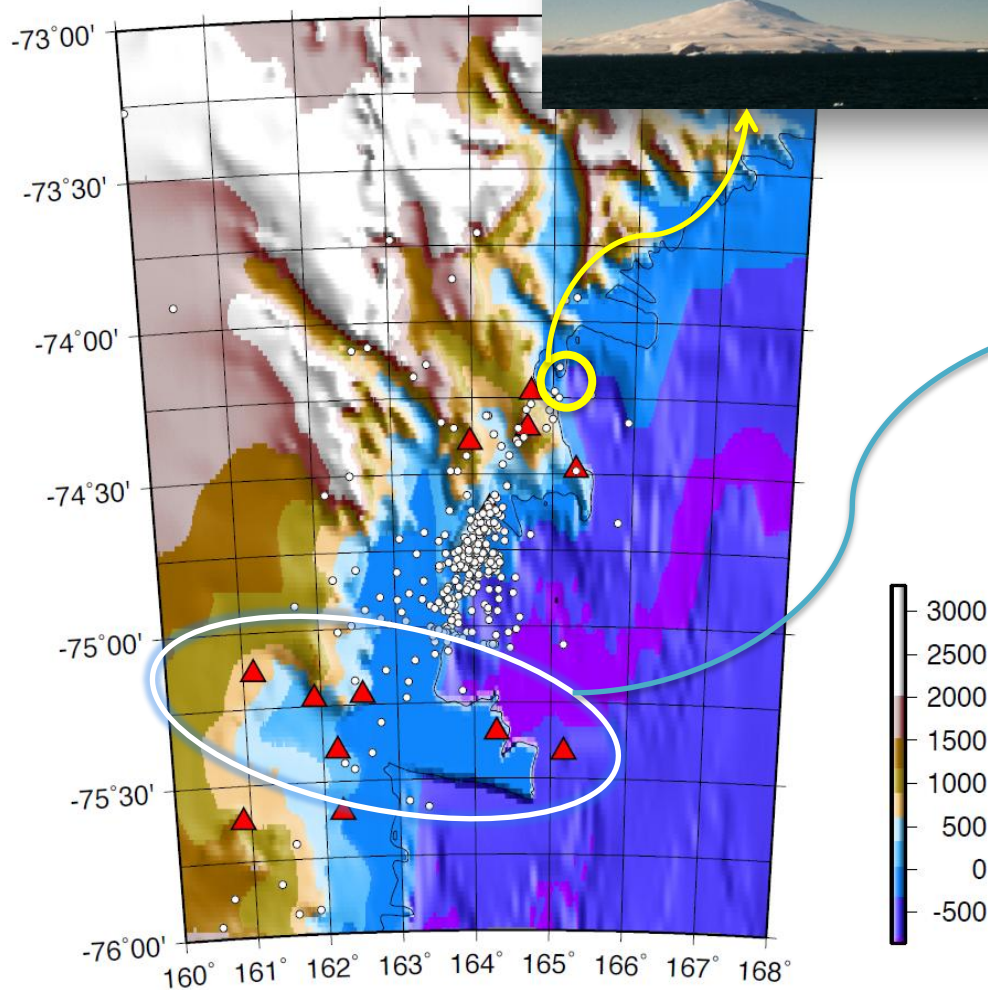


テラノバ湾・メルボルン火山

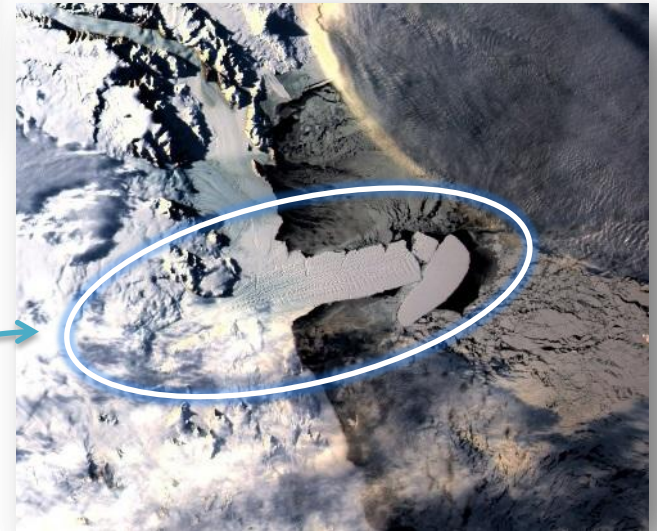


Seismic + Infrasound station: Seismicity in 2011

- Mt. Melbourne

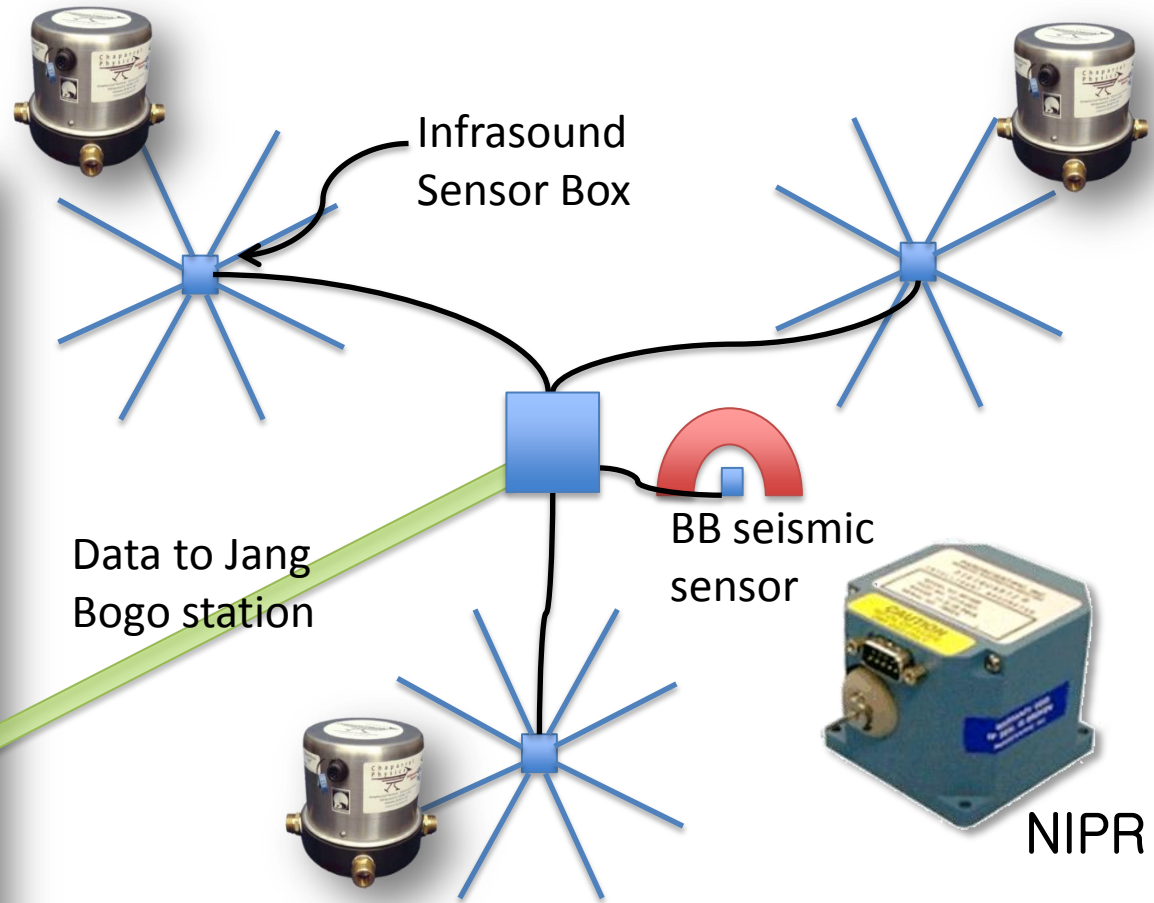


- David Glacier



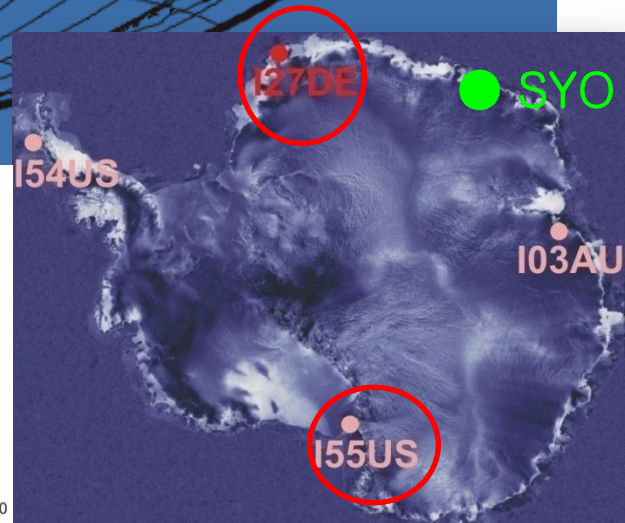
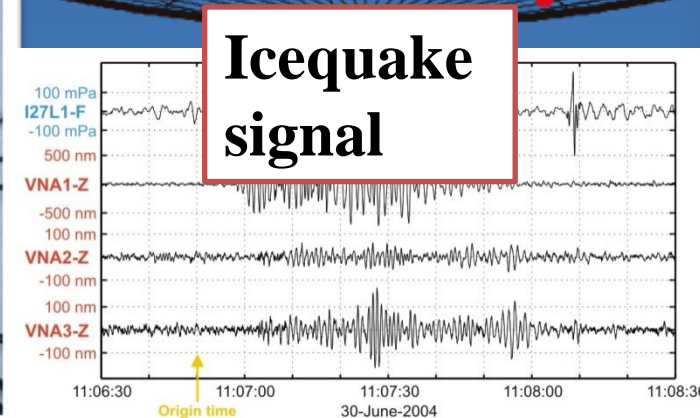
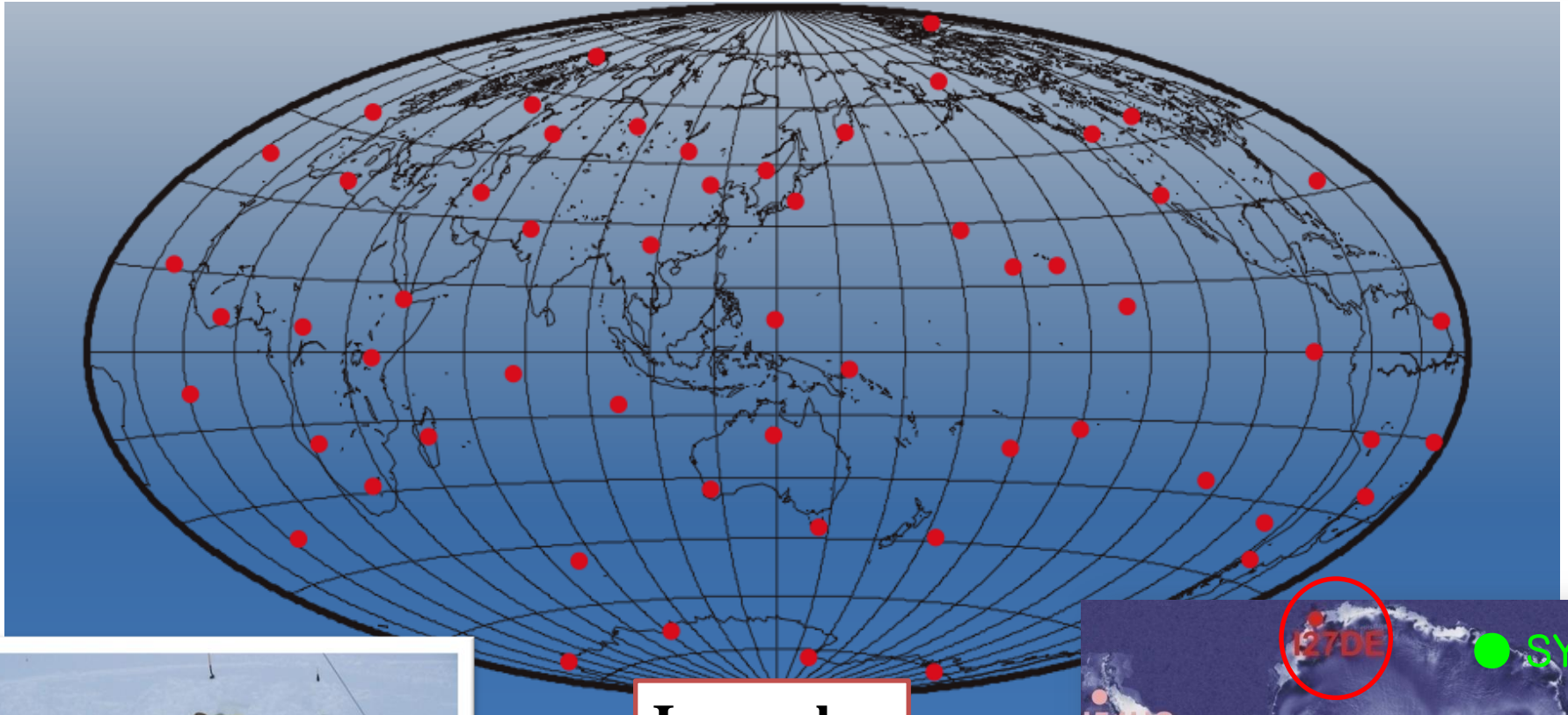
- To monitor sound from ice and volcanic activities at Mt. Melbourne.

Infrasound station: plan in 2015

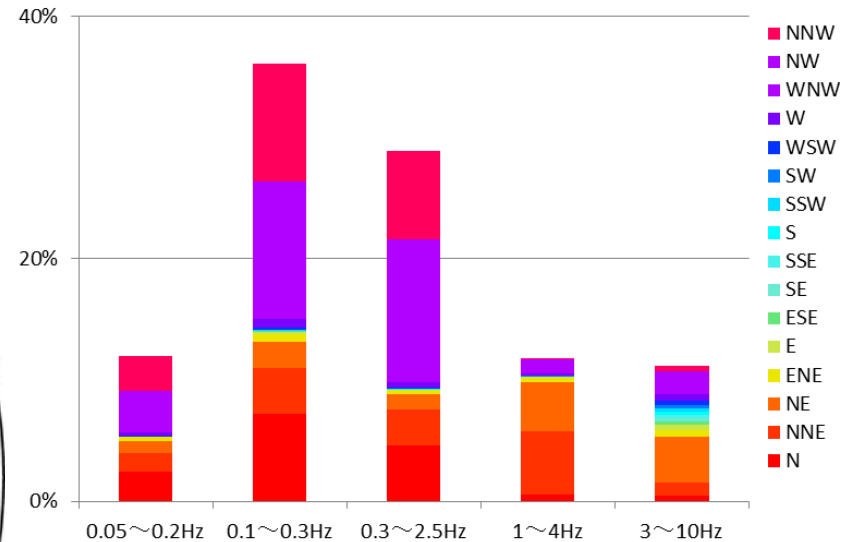
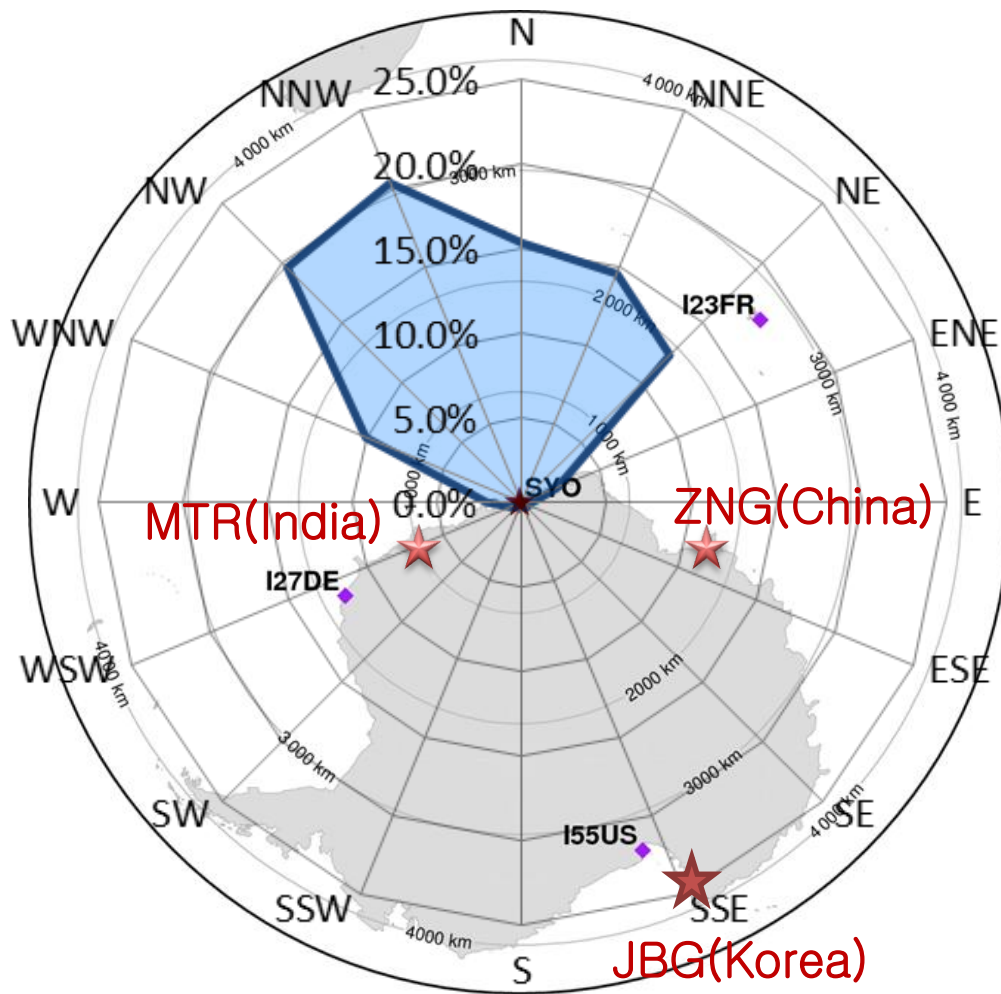


- A array consist of three nano-barometers in Jang Bogo station + top of Mt. Melbourne
- Collaborating with NIPR (Dr. Kanao)

Comprehensive Nuclear Test-Ban Treaty Organization (CTBTO)



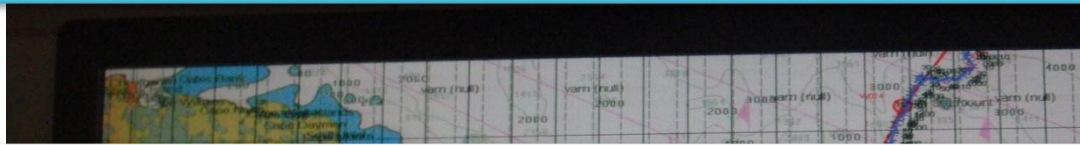
Occurrence rate (%) of detected predominant signals at SYO from 10 February to 31 March, 2013



**AFoPSの連携による国際共同観測、
東南極の広域なインフラサウンド観測
網の構築**
→ 南大洋を起源とするmicrobaroms
の詳細な位置の推定が期待

Occurrence rate (%) of the detected predominant signals at SYO from 10 February to 31 March, 2013; left) the polar plot of all frequency bands. right) the histogram of the five frequency bands, by different colors for each directions.

Navigation Image on R/V ARAON, @ Dec. 02, 73S



Own Ship INFO [CCRP1]

HOG (GYRO) **180.4°**
STW (LOG) **10.7 kn**
COG (GPS) **182.0°**
SOG (GPS) **12.0 kn**

LMT 2015-12-02 08:27:27+13:00
POSN1 **73°15.4002'S**
GPS2 **179°15.6979'E**
WGS-84
CTS
Vector T 6 min
Depth (***)

Filter	Association	Ring	Sector
READY			AUTO
Route	V023-03		
To WPT	016:		
DIST	32.0 NM		BRG 185.5°
CALC	Drift	Route	WPT Pair
DEST	20		303.9 NM
SPD	CALC		10.0 kn
TTG			30:23:18
ETA			12-03 14:50 LMT

Chart INFO

☒ MOB Other - !

Port List 1:2,000,000 -

Home 198.265 NM -

Zoom Out True -

Zoom In North Up -

Zoom Area 000.0°

Tools

EBL1 T OFF ° D

VRM1 OFF NM

EBL2 T OFF ° D

VRM2 OFF km

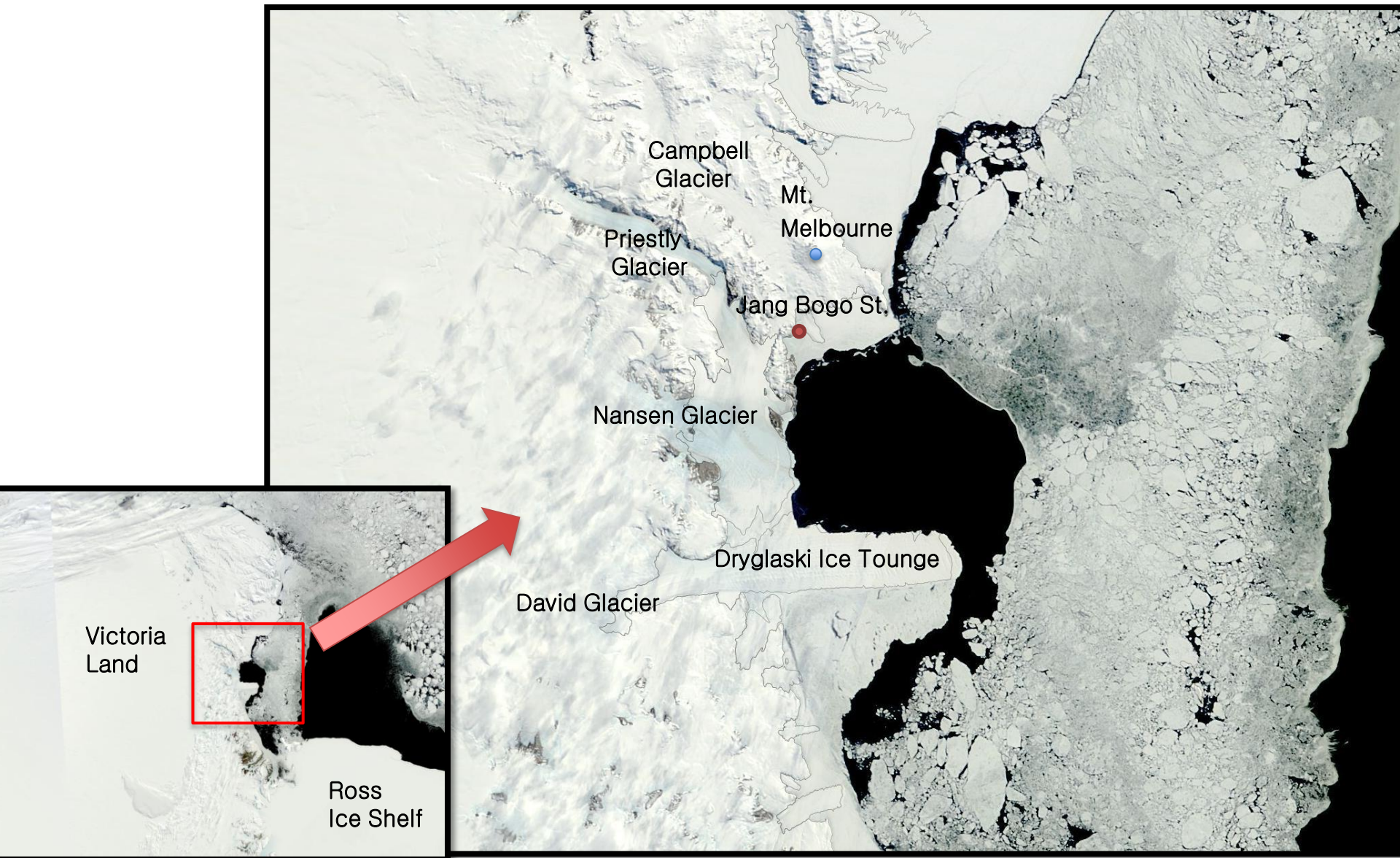
Actual course change Alarm

Actual course change List

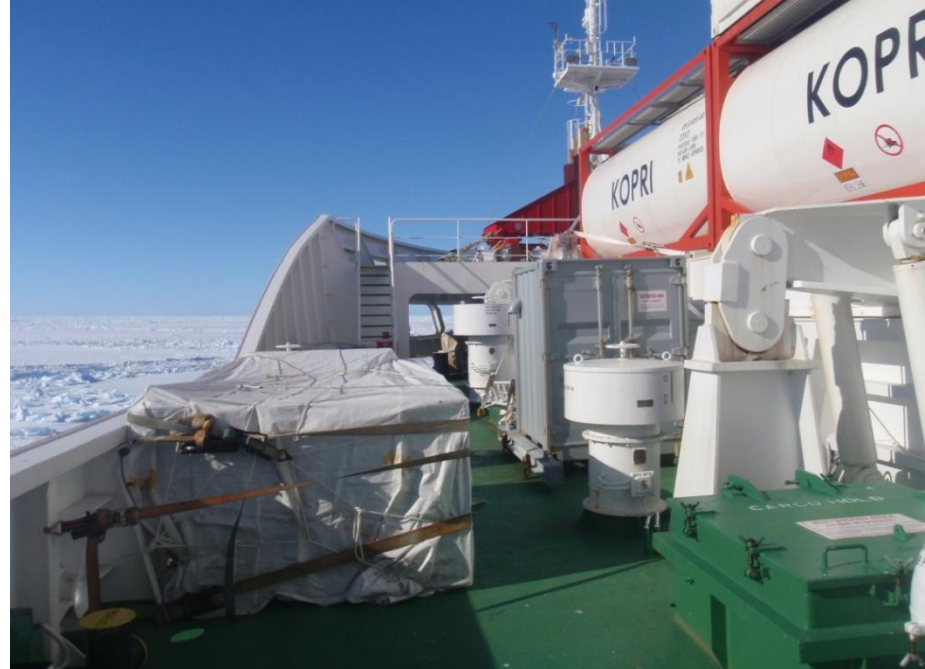
E T 269.1° 73°18.760'S

209.6 NM 167°08.227'E

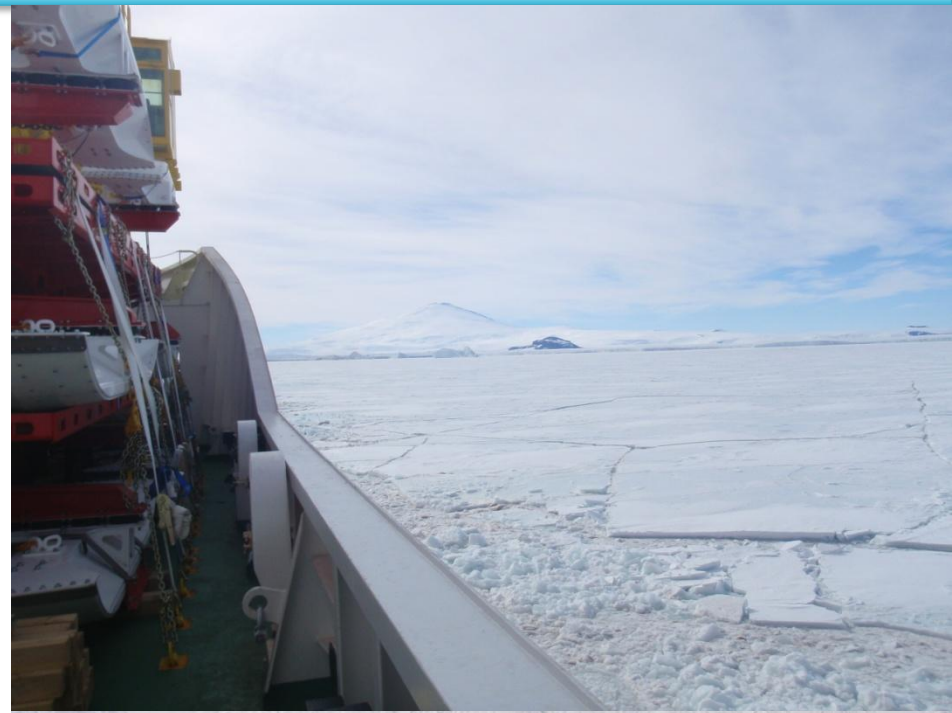
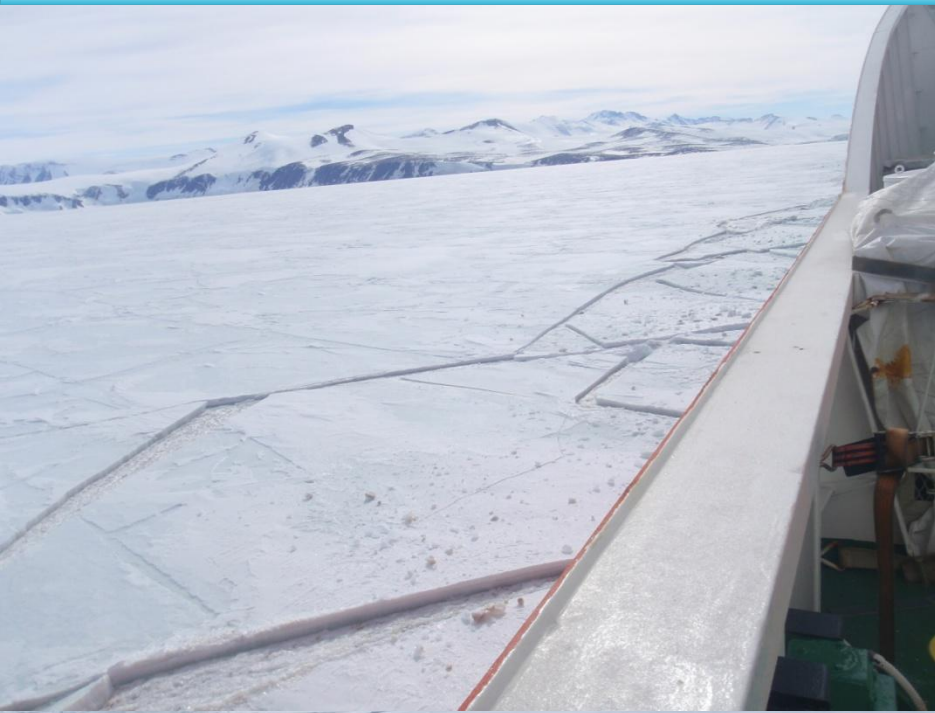
MODIS image around Tera Nova Bay @ Dec. 02



Sea Ice viewed from R/V ARAON, @ Dec. 02, 73S



Sea Ice viewed from R/V ARAON, @ Dec. 03, Tera Nova Bay



Sea Ice viewed from R/V ARAON, @ Dec. 04, near JB St.



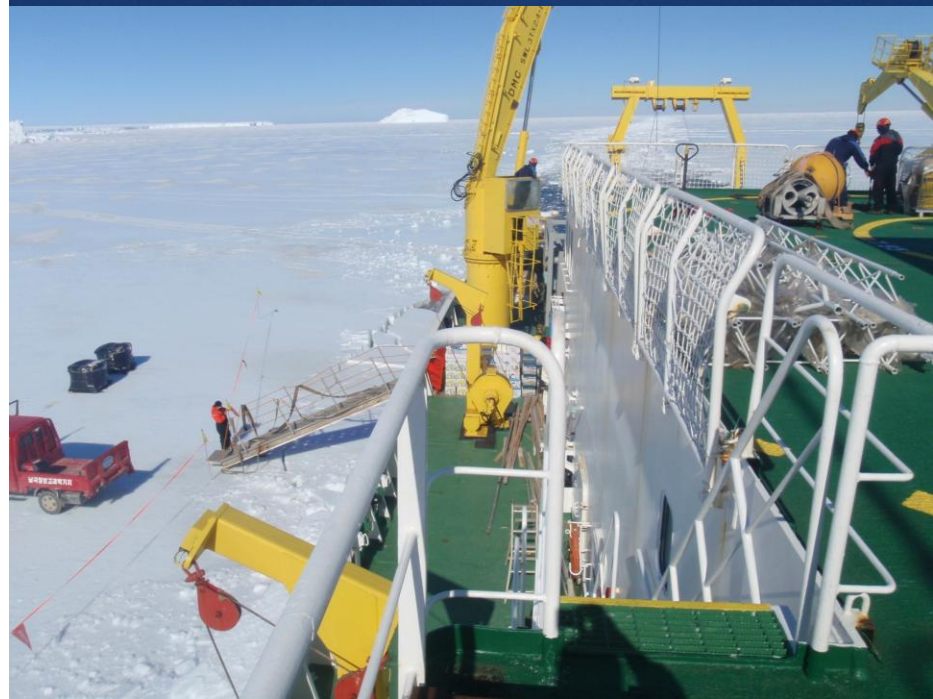
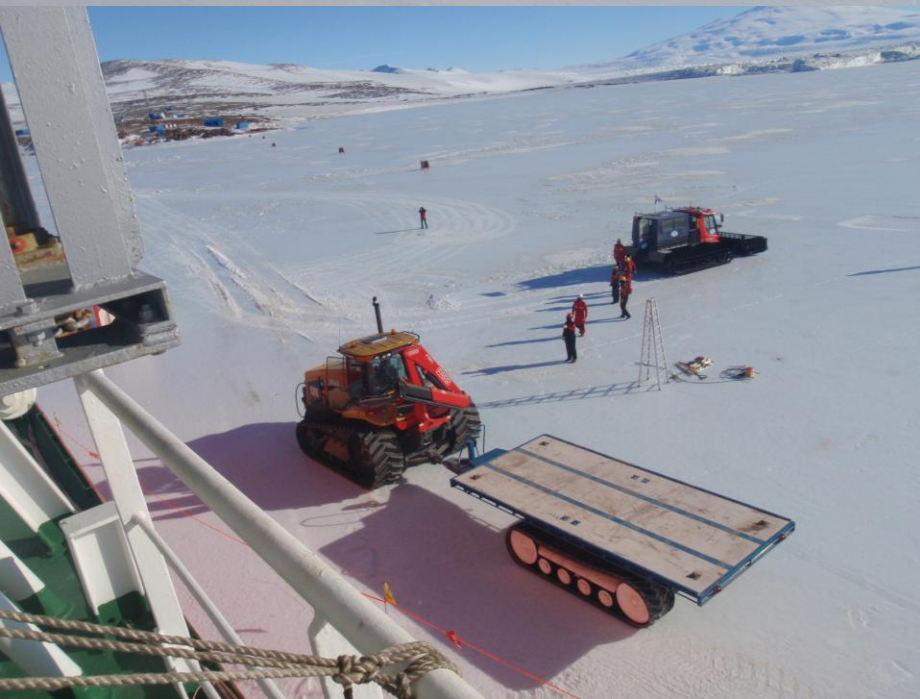
R/V ARAON arrives at Jang Bogo St., Dec. 04



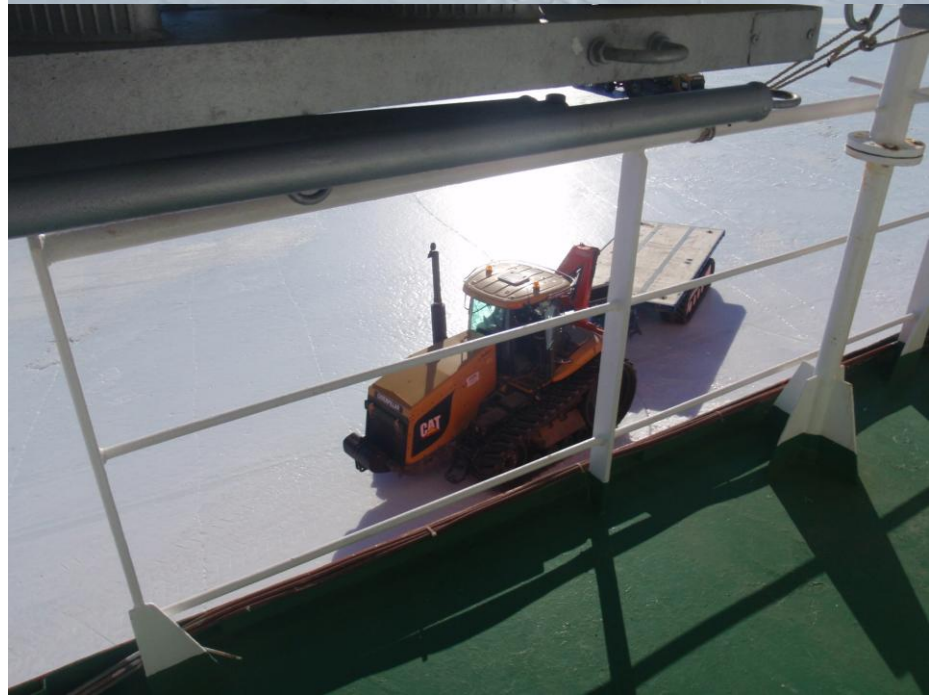
Transportation of Helikopter to Jang Bogo St., Dec. 04



Transportation from ARAON to Jang Bogo St., Dec. 05



Transportation from ARAON to Jang Bogo St., Dec. 05



Jang Bogo St., Dec. 16



Memorial Monuments of Jang Bogo Station

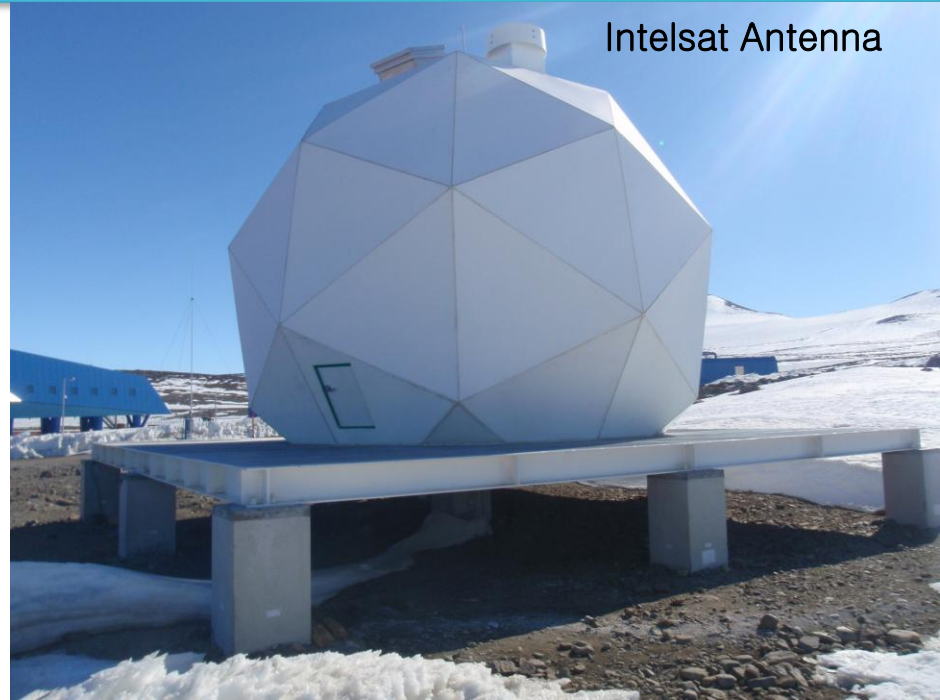


Major constructions of Jang Bogo Station

Power Station



Intelsat Antenna



Mechanics



Emergency Building



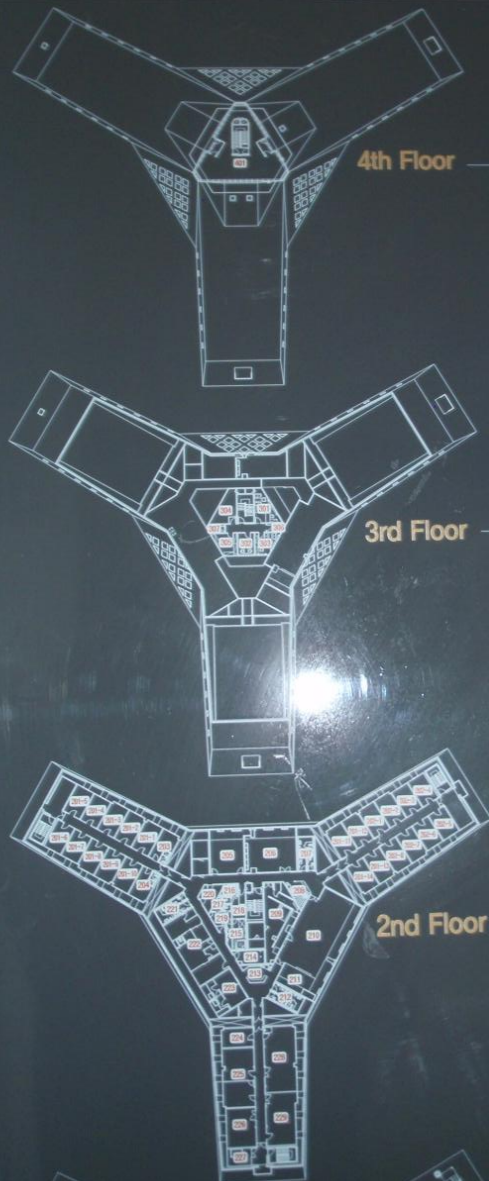
Vehicles, containers, etc. of Jang Bogo Station



Helicopter port of Jang Bogo Station



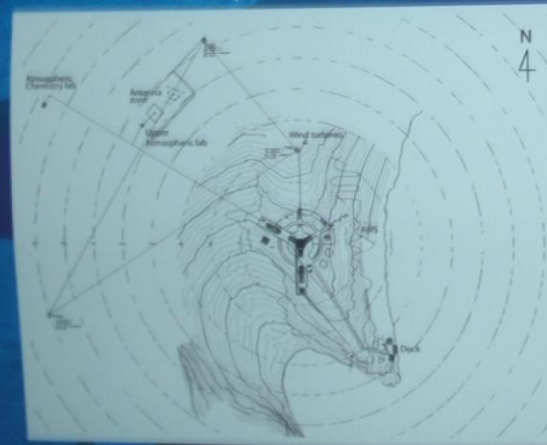
Main Building of Jang Bogo Station



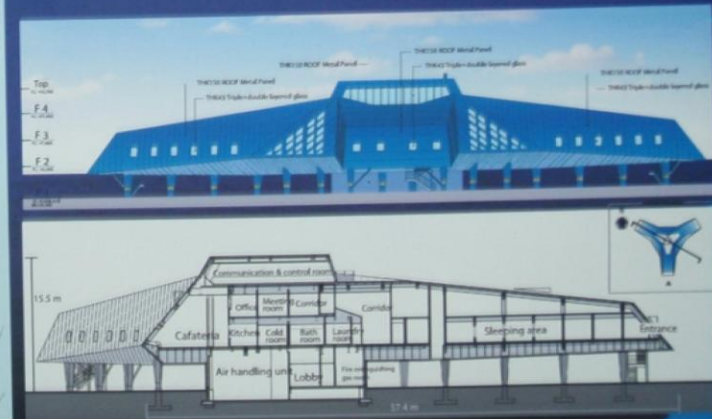
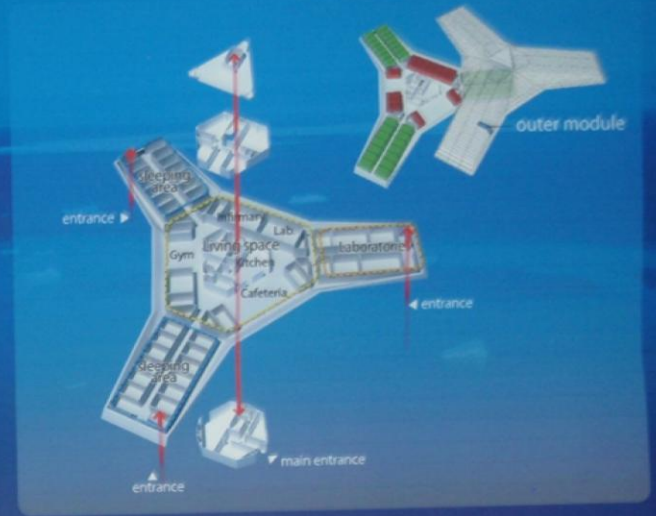
- reduce waste and construction time



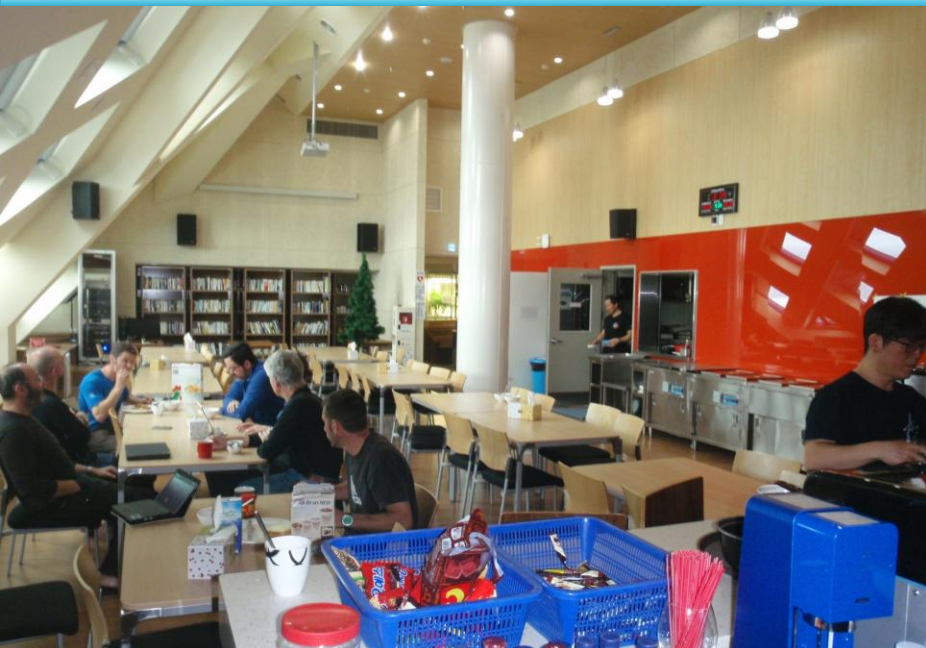
developed concept design



Station layout

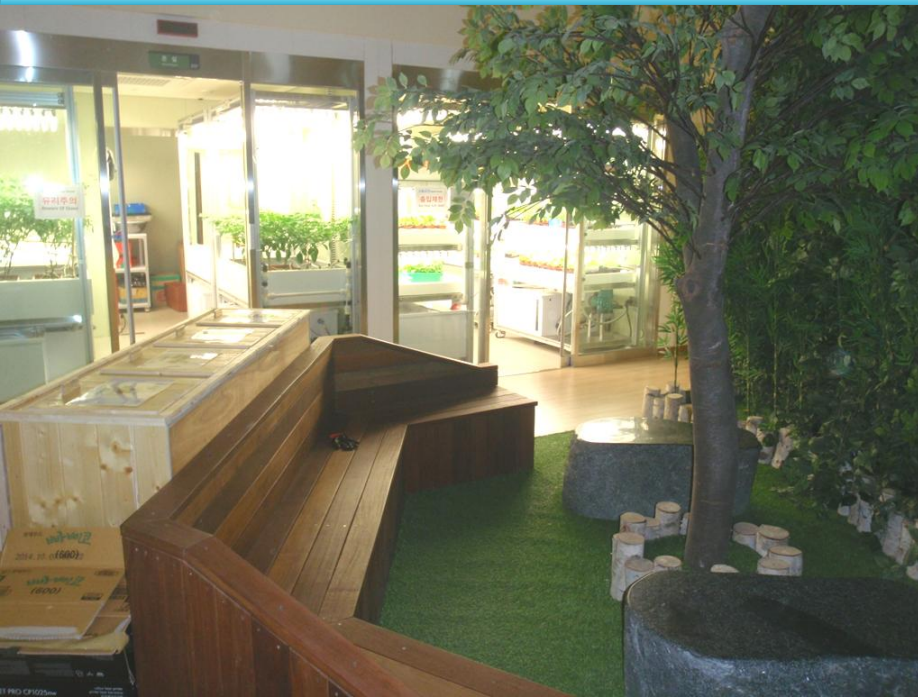


Inside the Main Building of Jang Bogo -1



夏期間滞在数、最大60名程度(含む野外パーティ(雪氷・地質)、越冬隊15名)

Inside the Main Building of Jang Bogo -2



Inside the Main Building of Jang Bogo -3



ジム



各グループのラボ



多目的会議室

Inside the Main Building of Jang Bogo -6



EGG-2015 onshore-activities @JB



➤ Inside JB Station [monitoring]

- Replace **seismic station** to new location
- Establish **infrasound array** (by 3 stations)
- Deploy a long-period **infrasound** station (by NIPR)
- Start **Superconducting Gravimeter** observation

➤ Outside JB Station [by helicopter operation]

- Maintain **seismic stations**
(Melbourne Mt. area 7, David Glacier 7)
- Establish **new seismic stations** (Nansen Glacier 4)
- Maintain & establish **GPS stations** (total 15)
- Maintain & establish **AMIGOS stations** (total 5)
- Deploy **tilt-meters** (Nansen Glacier 2)
- Deploy **seismic array** (inland of David Glacier 15)
(to detect sub-glacial lakes + crustal structure)

EGG members @ Geophysical Observatory



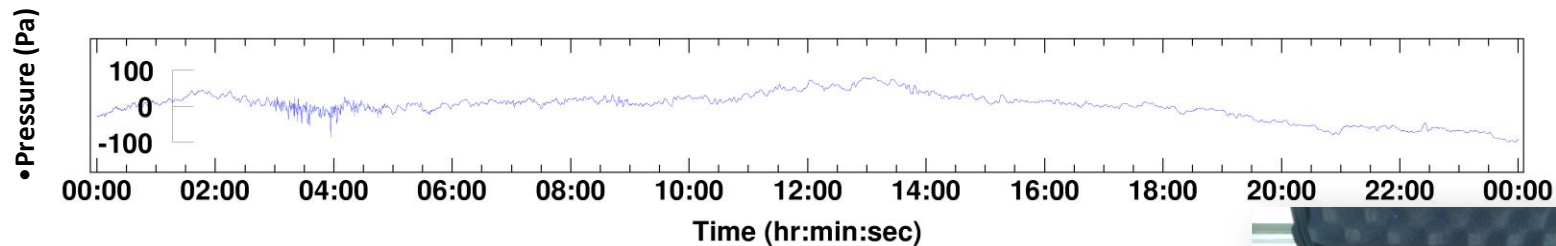
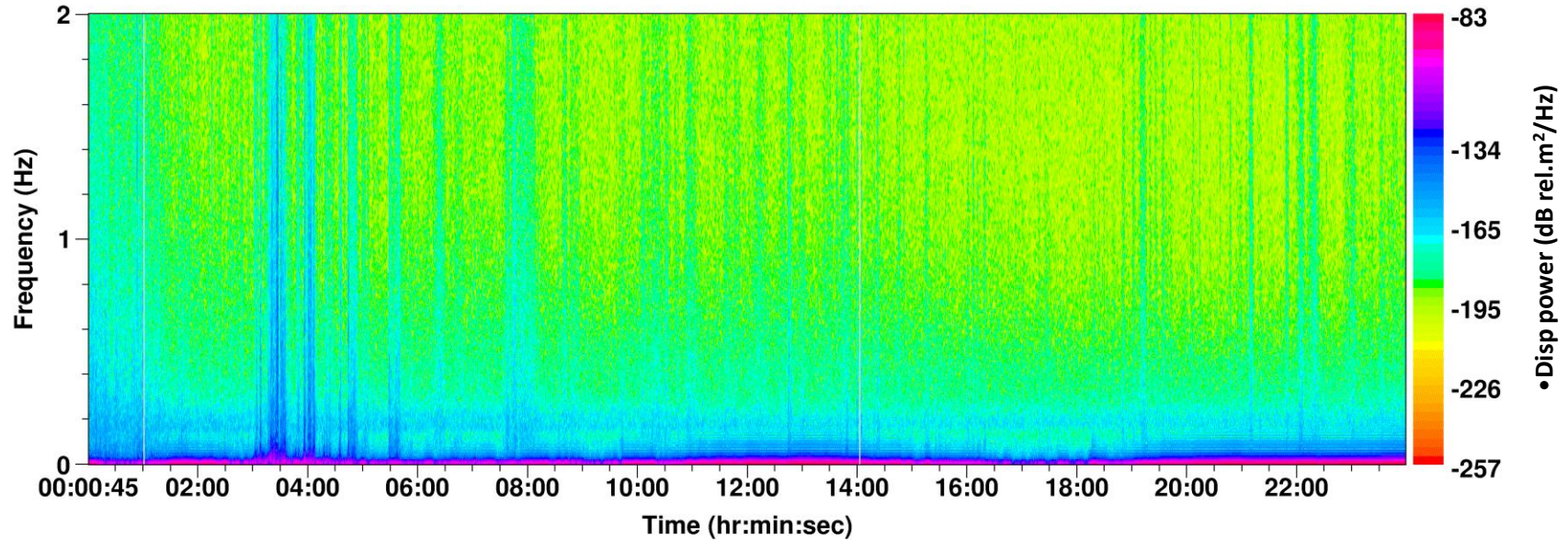
Infrasound station by Paro-sensor @ Jang Bogo



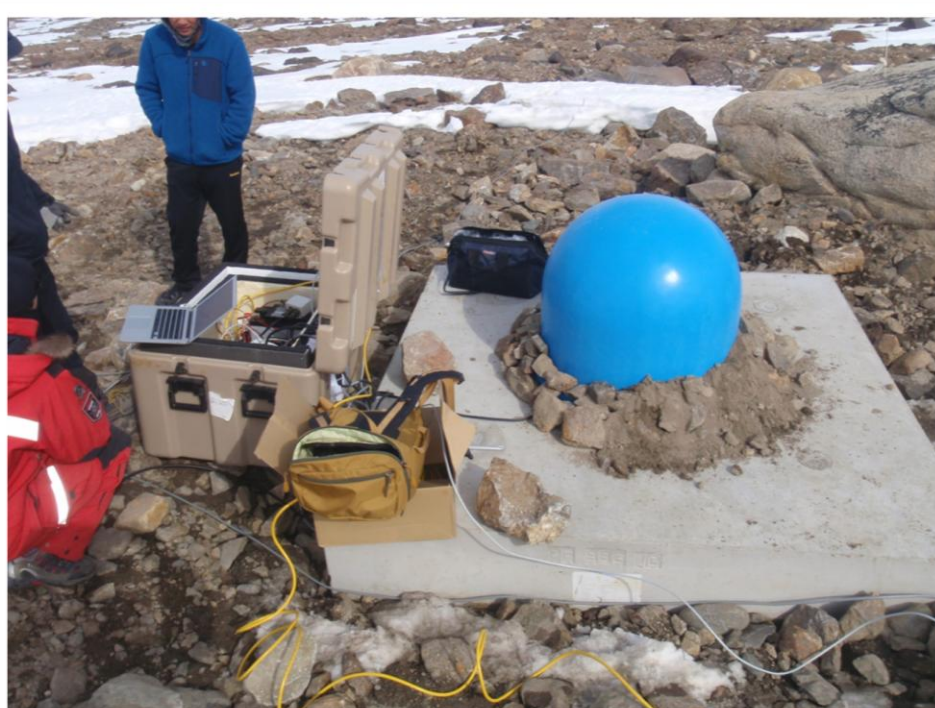
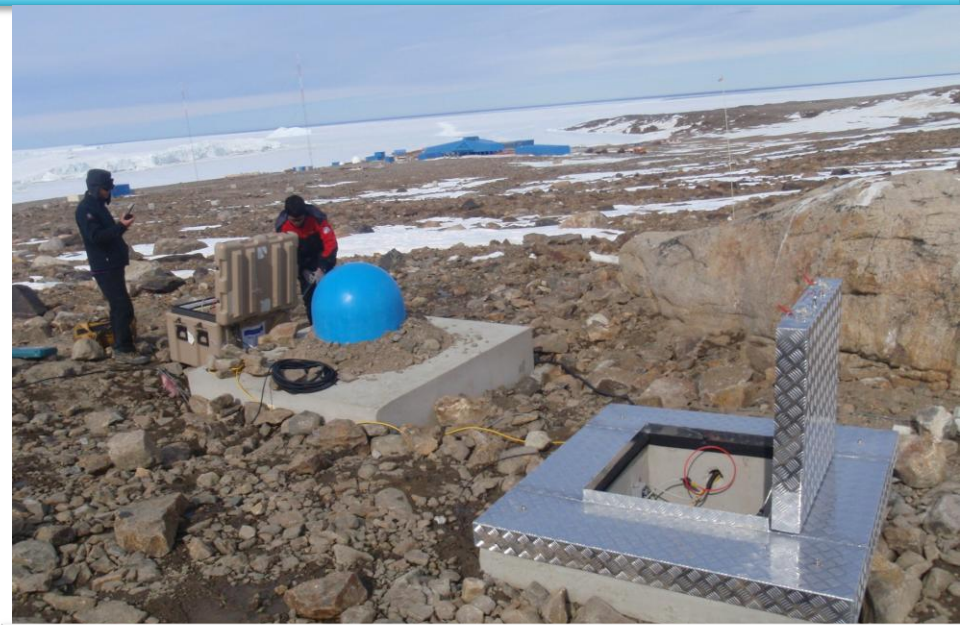
2015/12/13, 2Hzの スペクトル図

Initial infrasound data by Paro-sensor @ Jang Bogo

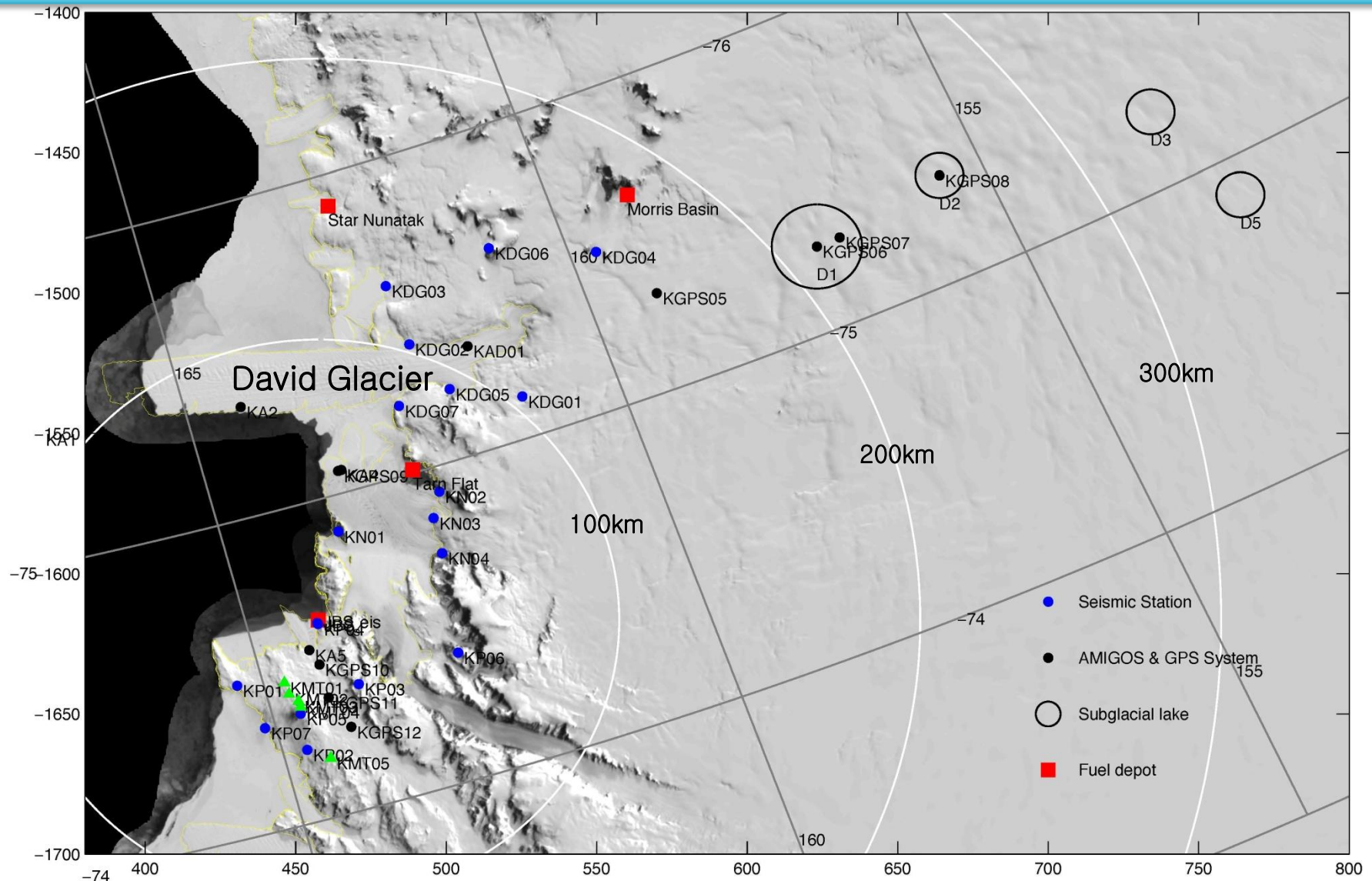
I0105/BDA 2015/12/13 00:00:00.0
window-length 90.0 overlap 81.0



Seismic station @ Jang Bogo



Station map by EGG project / KOPRI

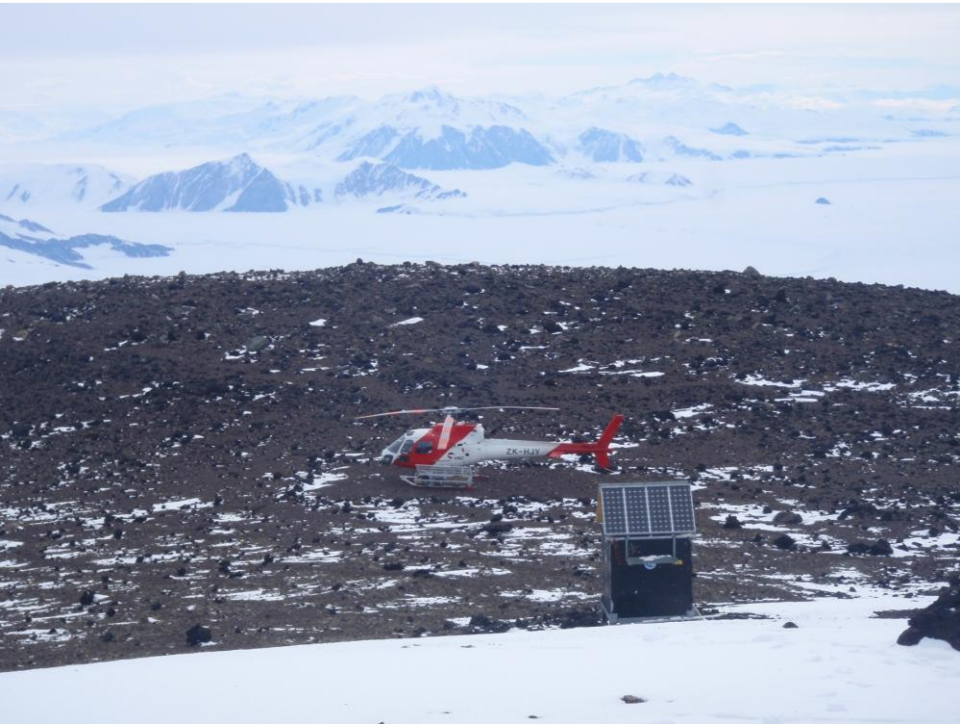


Integrated Cryosphere Monitoring Network; EGGNet

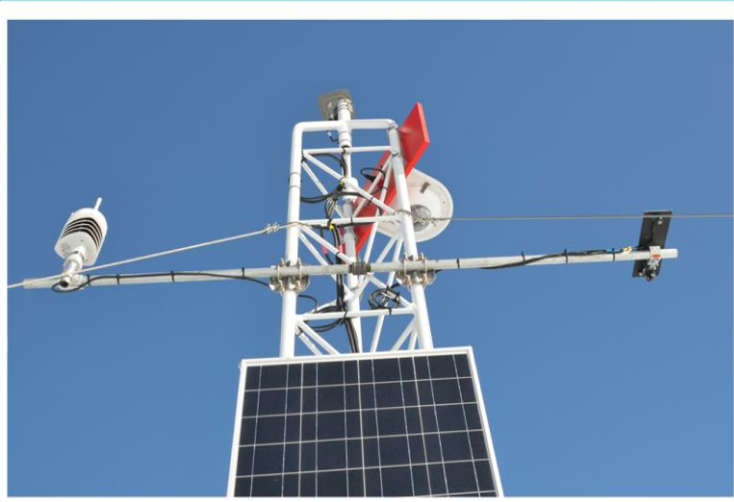
Preparation of field seismic stations @ Jang Bogo



Seismic station at Mt. Melbourne (summit) @ KP05



AMIGOS station at Nansen Glacier @ KN-AMIGOS



On the way back to CHCH @ Araon



Rescue of the fisher ships @ Dec. 19, (71S, 178W)

39名救出



Memories of Jang Bogo Station & Araon

X'mas

2015 Nov.-Dec.

