



OBS Park in Warsaw



Institute of Geophysics
Polish Academy of Sciences

2017 European OBS Technical Workshop

Paris, France, 06-07.11.2017

Agenda

- The Team
- Collaboration
- The Legacy
- Our OBS
- BalTec
- KNIPAS
- Future plans
- Lessons learned

The team

- Department of the Lithospheric Research
- Decades of projects in national and international collaboration
- 1 professor, 3 associate professors, 1 assistant professor, 3 research assistants and 1 technician
- Projects in Central Europe, Arctic and Antarctic
- Reflection, WARR, passive data exposure



Collaboration

Domestically, our Department works closely with the:

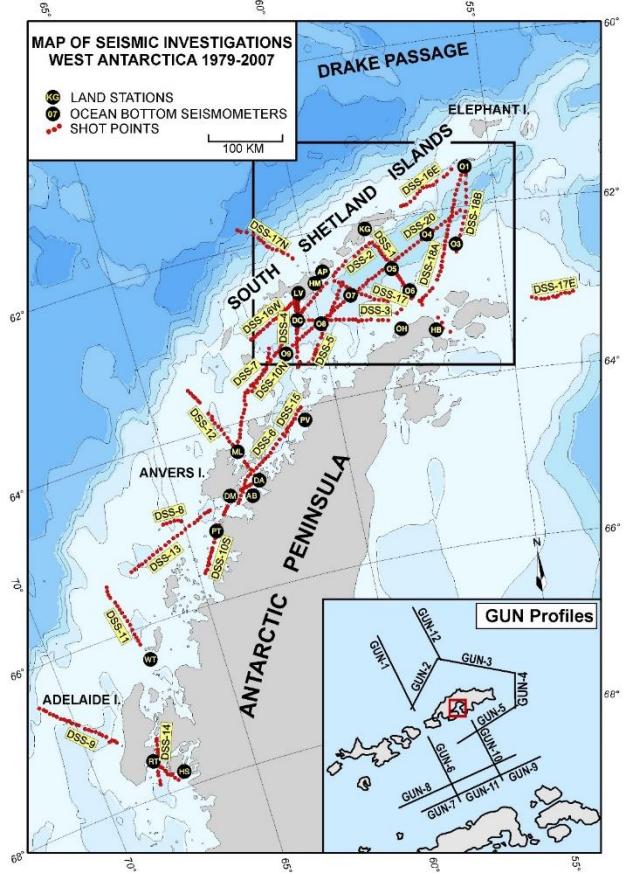
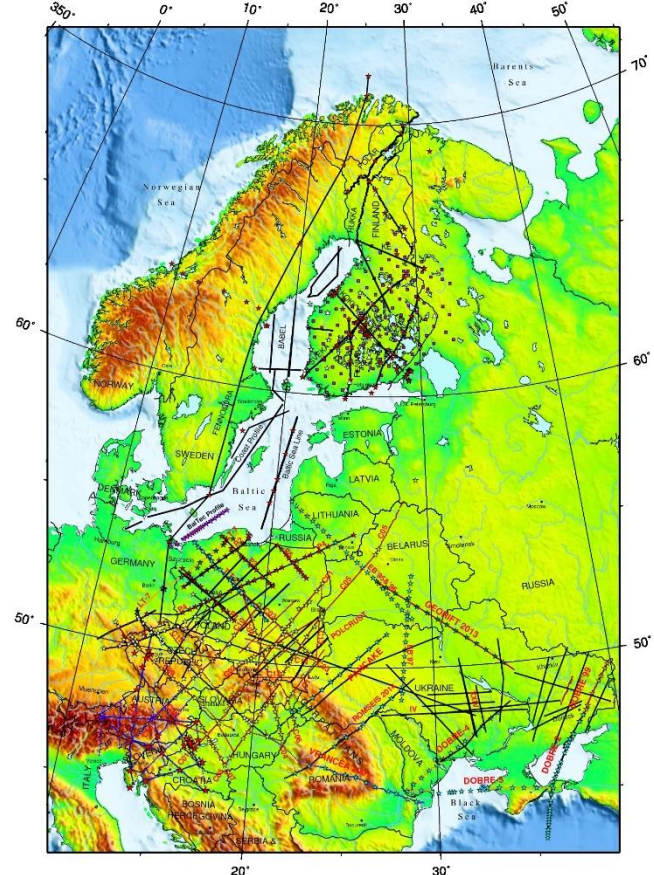
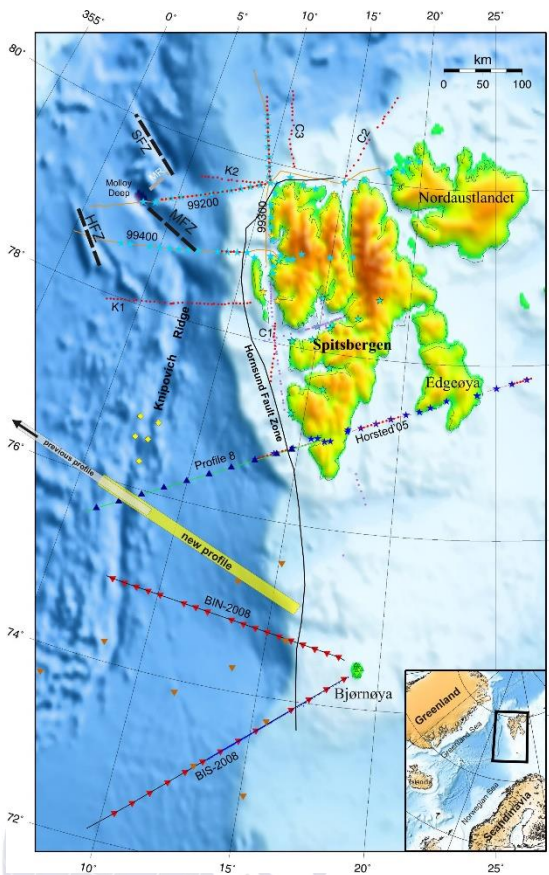
- PGNiG – Polish Oil and Gas Company
- Polish Geological Institute, Warszawa
- Geofizyka Toruń S.A.
- Geofizyka Kraków S.A.
- Institute of Geological Sciences, PAS
- University of Wrocław
- Institute of Geophysics, University of Warsaw

Department cooperates with nearly 30 institutions and scientific organizations in Europe and North America:

- Institute of Geophysics, National Academy of Sciences of the Ukraine, Kiev
- University of Helsinki, Finland
- Uppsala University, Sweden
- University of Bergen, Norway
- Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany
- Oklahoma University, USA
- Incorporated Research Institutions for Seismology (IRIS), Washington, USA
- National Science Foundation, Washington, USA
- ION Geophysical, USA

- Scientific Committee on Antarctic Research (SCAR), Cambridge, UK
- European Polar Board, Strasbourg, France
- Sodankylä Geophysical Observatory, Oulu, Finland
- NORSAR, Norway
- University of Oslo, Norway
- Vienna University of Technology, Austria
- GeoForschungsZentrum, Potsdam, Germany
- University of Potsdam, Germany
- University of Copenhagen, Denmark
- Eötvös Loránd Geophysical Institute, Budapest, Hungary
- Geophysical Institute, Academy of Sciences of the Czech Republic, Praha
- Geological Survey of Slovak Republic, Bratislava
- Geological Institute of Slovak Academy of Sciences, Bratislava
- GeoAzur, France
- University J. Fourier, Grenoble, France
- University Bucharest, Romania
- University of Aberdeen, Scotland
- Institute for Nature Management of the National Academy of Sciences of Belarus, Minsk
- State Enterprise "NPC in geology", Minsk, Belarus

Past experiments



OBS GURALP 6T

Key facts:

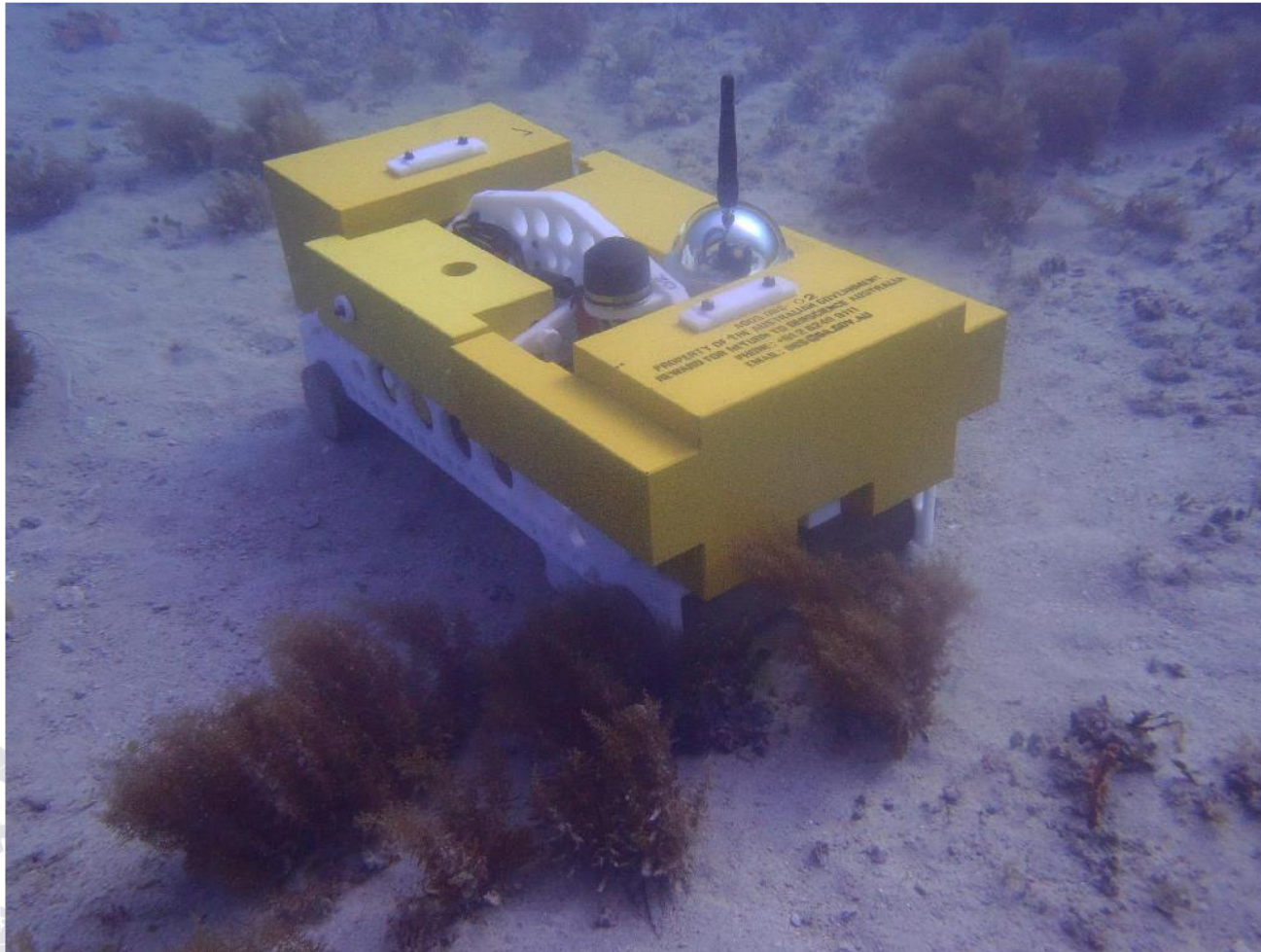
- Suitable for depths of up to 6000 m (19,685ft)
- Freefall, fully autonomous system for quick and simple deployment
- Easy recovery via acoustic mechanical release, allowing the instrument to float back to the surface
- Additional back-up burn-wire release system via acoustic signal or pre-programmed before deployment
- Incorporates a magnetometer to confirm instrument orientation
- Non specialist deployment vessels can be used
- Minimal Linear clock drift: < 1ms per day
- Can remain on the seafloor for up to 12 months
- Robust housing material to protect instrument from water and corrosion
- Self levelling gimbal
- Each titanium OBS incorporated a Guralp 6T-OBS 3-component broadband (60s-100Hz) seismometer with a hydrophone (1Hz–30kHz) attached to the fourth channel.

OBS GURALP 6T

- 4 OBS
- Tested in Baltic Sea, Svalbard area and Australia – PNG areas
- Ready to be shipped early 2018, available until April/May 2019



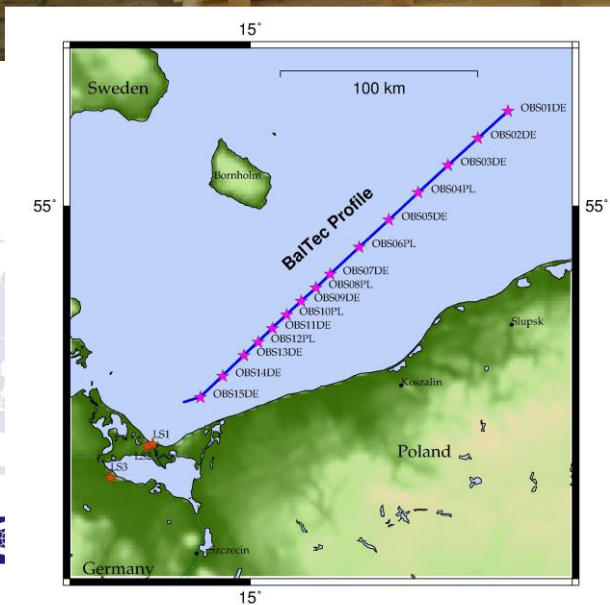
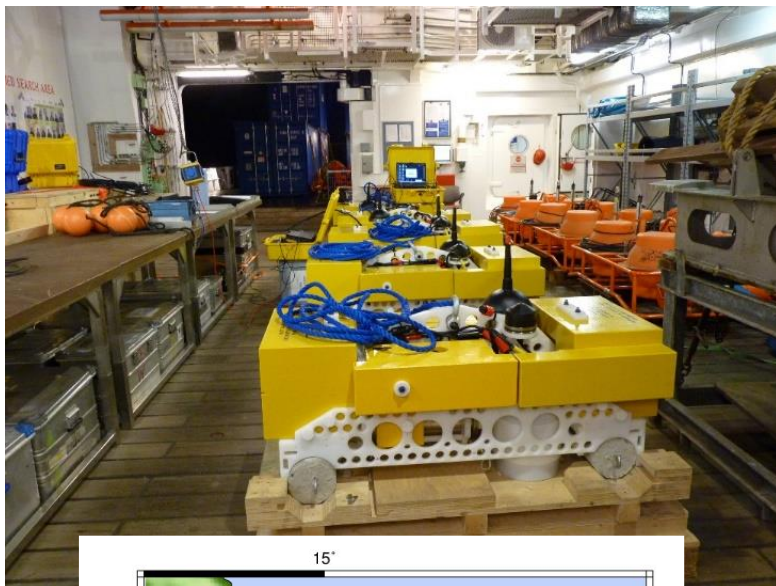
OBS GURALP 6T



BALTEC

- RV Maria S. Merian expedition MSM52 (BalTec) in March 2016
- Imaged the Paleozoic to recent tectonic and sedimentary evolution of the southern Baltic Sea between the North German Basin across the Tornquist Fan and up to the Baltic Shield east of Gotland with unique vertical resolution
- 8 GI-Guns as a source array and a digital seismic streamer of 2700 m active length.
- 62 profiles having a total length of 3500 km.
- One OBS profile (15 + 3 land stations)
- Depths 20-70m

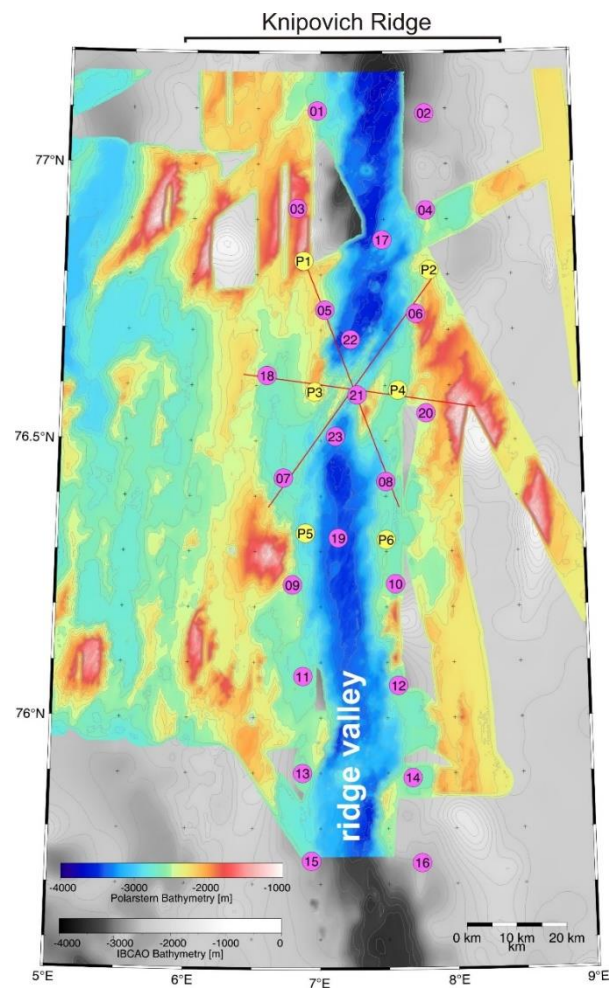
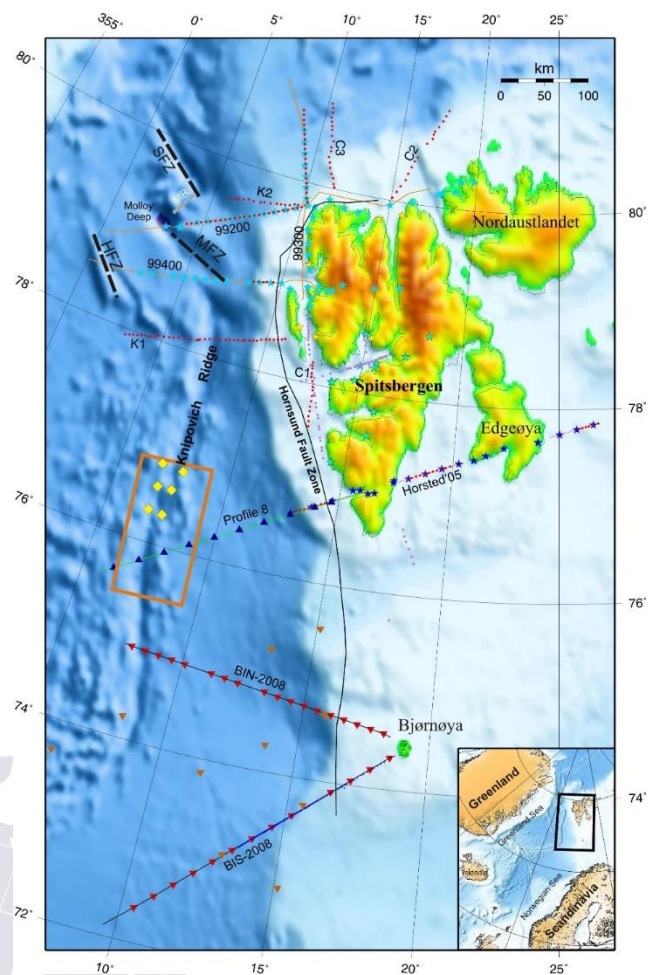
BALTEC



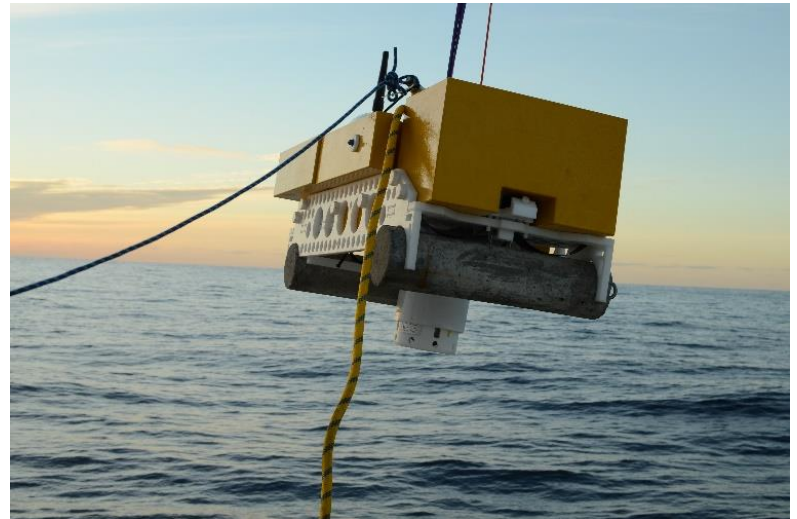
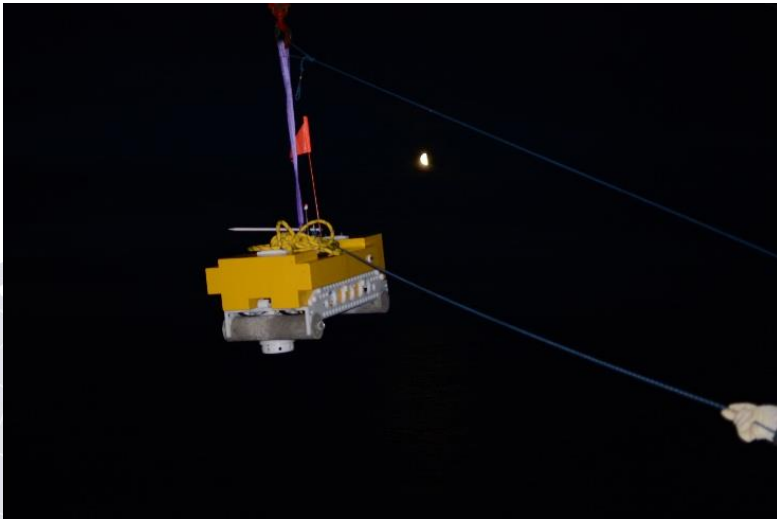
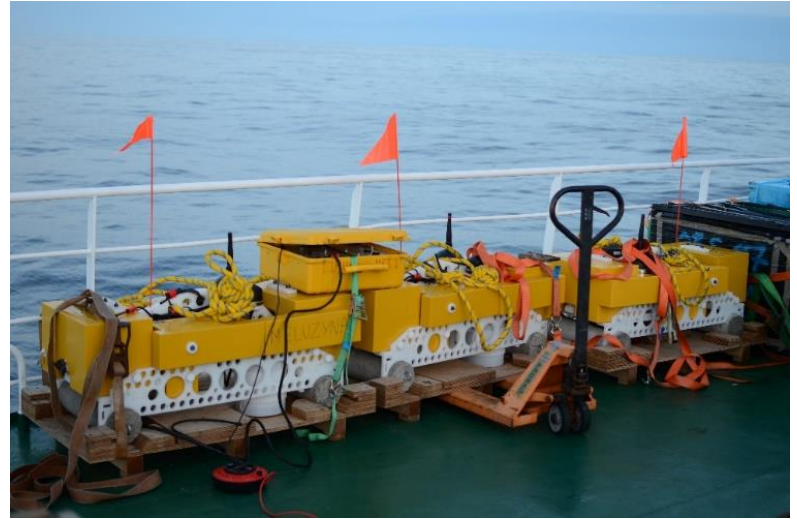
KNIPAS

- with Alfred Wegener Institute
- Southern Greenland Sea, around Logachev Seamount
- dedicated state-of-the-art passive seismic survey that will explore the still poorly known spreading processes at ultraslow spreading ridges
- year long + active profile
- water depths 2000-2700 m,
- 160 km length
- 5 OBS deployed (24 in total), 3 recovered

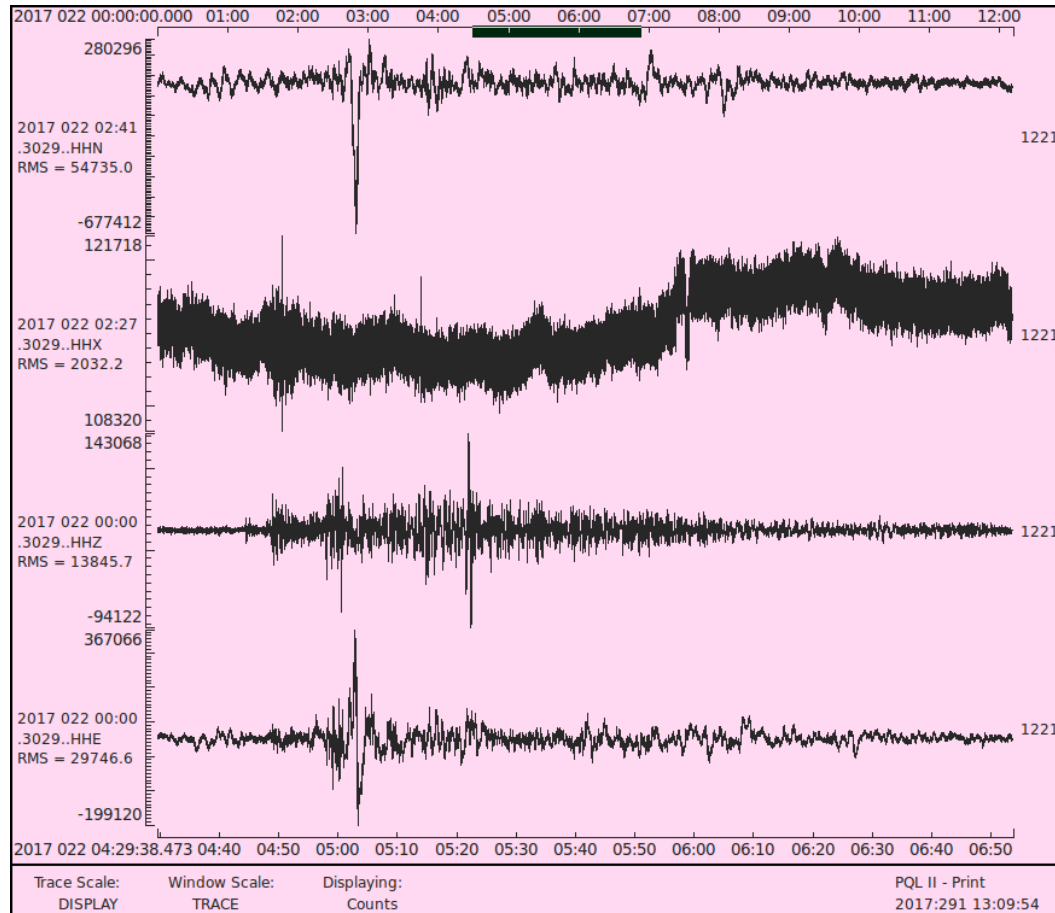
KNIPAS



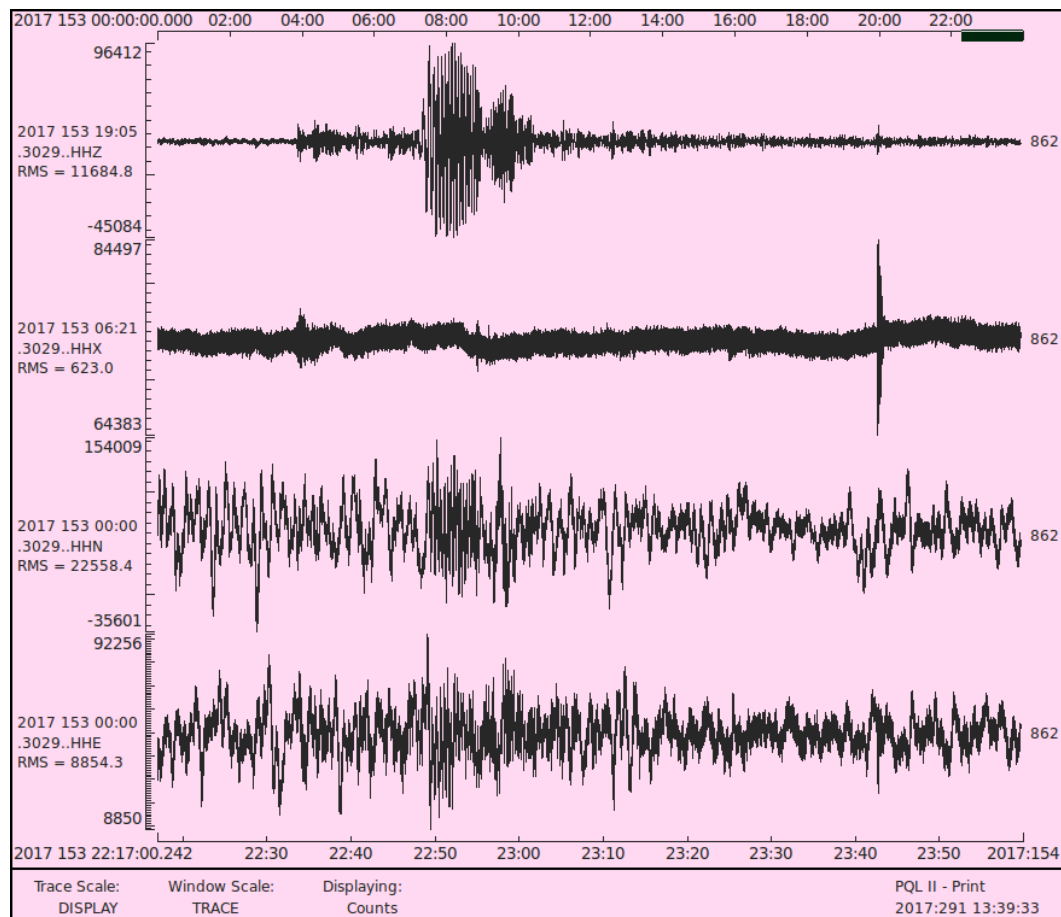
KNIPAS deployment scenery



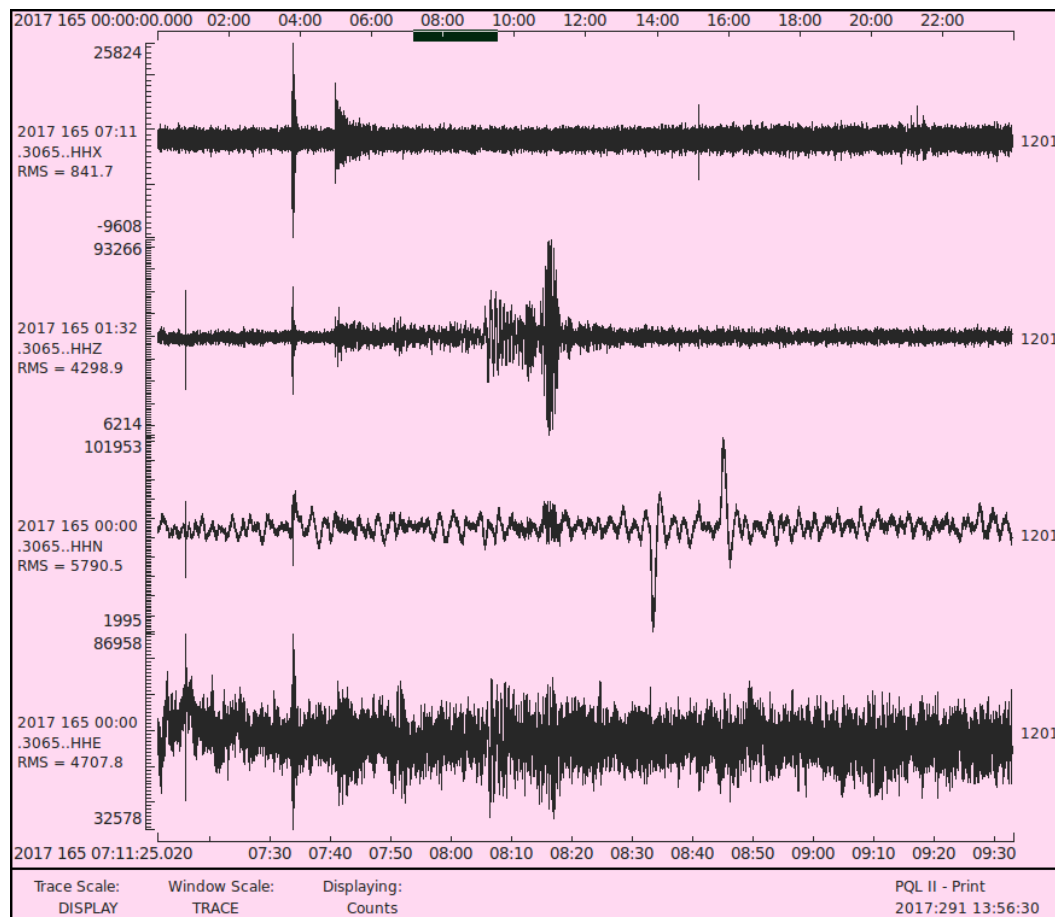
7.9 Papua New Guinea Earthquake



6.8 Alaska Earthquake

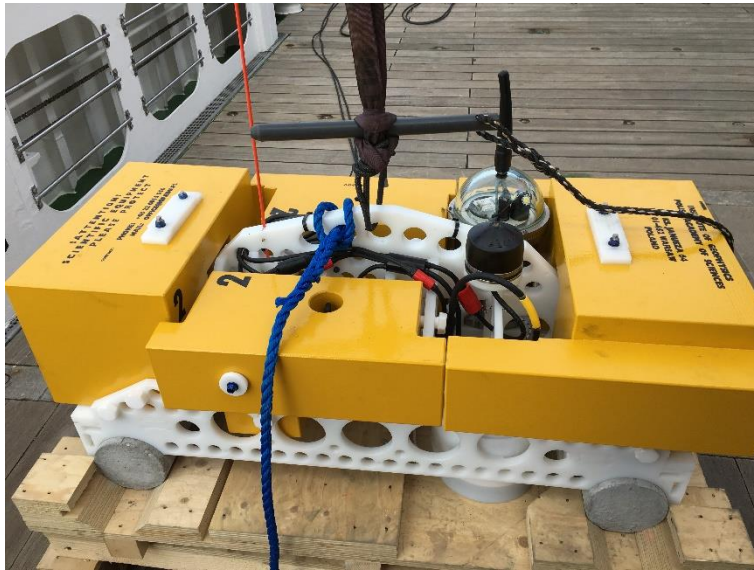


6.9 Guatemala Earthquake



Lessons learned so far

- Worked out simple and reliable releasing
- Muddy/silty/clayish seafloors are no go ones.



The specific construction of ballast releasing mechanism has a tendency to fail. In viscous environments OBS gets stuck and recovery fails.

Future plans

- Upcoming project in Svalbard area in 2019 (June – August) with UiB
- Equipment available from early 2018, until early 2019
- Find missing OBS at Greenland/Iceland coast 😊





Merci!



**Institute of Geophysics
Polish Academy of Sciences**