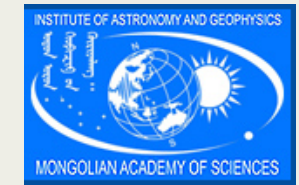


Participation of the Austrian and the Mongolian NDCs to the CTBTO Mentoring Programme

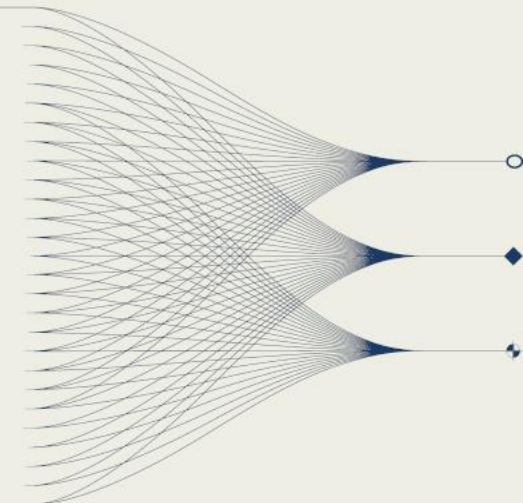
Ulrike Mitterbauer, Khishigdelger Ulziisaikhan

GeoSphere Austria, Institute of Astronomy and Geophysics – Mongolian Institute of Science



INTRODUCTION AND MAIN RESULTS

In the framework of the CTBTO Mentoring Programme for early-career women and STEM experts from National Data Centers served as mentors. The Austrian NDC, which is managed by a female seismologist, decided to take part to this initiative, willing to share her experience and knowledge. The Mentoring Programme was held over six month in a virtual format, focusing on one-on-one teaching. The PTS selected an early-career woman, who is working as a seismologist for the Mongolian NDC, as mentee. We decided to focus on the evaluation of the National Preparedness Exercise 2024 (NPE2024).





Third Cycle of Mentoring Programme

In the third cycle of the mentoring programme, experts from the National Data Centres (NDCs) and national laboratories of States Signatories that contribute to the work of the CTBTO were serving as mentors. Mentors from these institutions possess specialized expert knowledge and technical expertise that will further enrich the experiences of mentees in the programme.

Goals:

- Increased number of early-career women in STEM fields benefitting from the programme
- Enhanced collaboration between CTBTO Staff, National Data Centres, and national laboratories
- Empowerment of women in STEM through skills development and career guidance
- Enriched talent pipeline for CTBTO in terms of PTS verification activities and potentially Secretariat staff

The CTBTO Mentoring Programme is a virtual programme and consists of two types of capacity-building elements. The primary focus of one-on-one mentoring is supported by learning events.

Pairing



Mentee – Ms Khishigdelger Ulziisaikhan



NAME: Khishigdelger Ulziisaikhan

OCCUPATION: seismic analyst and researcher

GENDER: female

NATIONALITY: Mongolia

Mentor – Ms Ulrike Mitterbauer

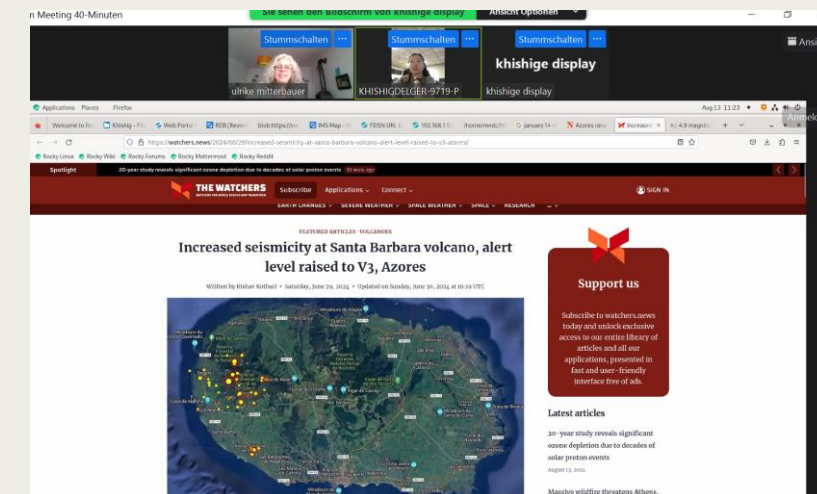


NAME: Ulrike Mitterbauer

JOB TITLE: NDC-Manager

NATIONALITY: Austrian

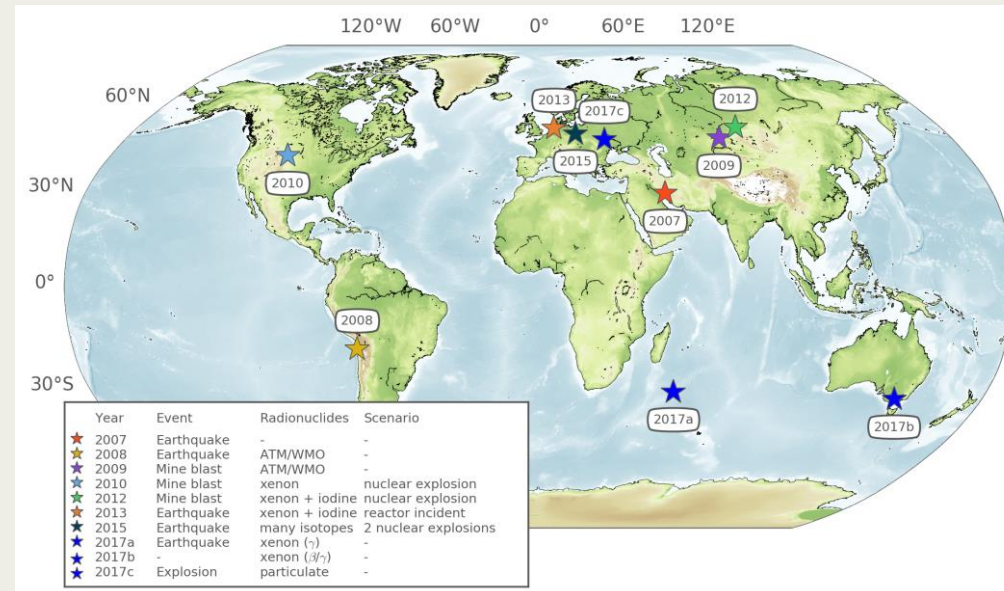
One-on-one mentoring via Zoom



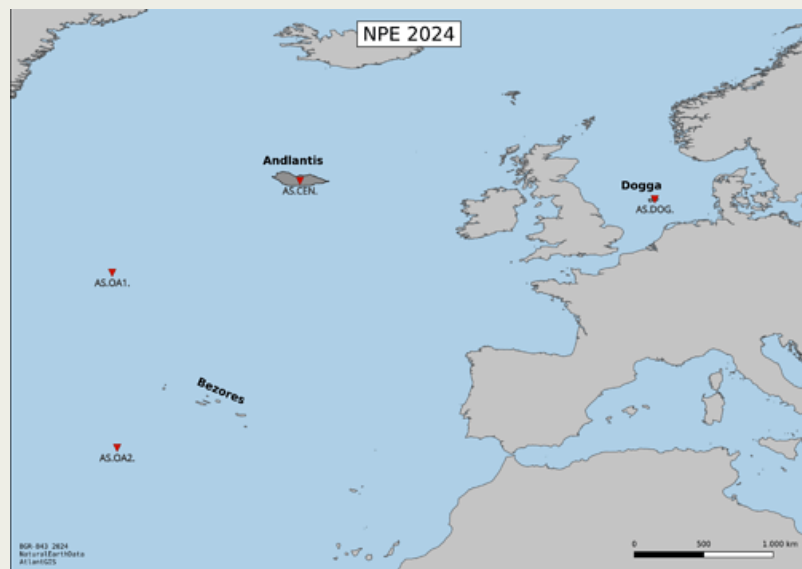
The NDC Preparedness Exercise (NPE) was first proposed in a national document (CTBT/WGB-28/DE-IT/1) during the 28th meeting of WG-B. The purpose of this exercise is to test the effectiveness and performance of the NDCs as well as the data availability and quality of the PTS. Accordingly, the following are to be carried out:

- Readiness test at the NDC-AT,
- Tests regarding the data flow between NDCs and IDC
- Investigations of the quality and suitability of IDC products
- Investigations of the effectiveness of NDC analysis procedures,
- Evaluations of additional data and further analyses

The NPE has been conducted since 2007. Since then, nine exercises have been held and discussed in workshops. The scenarios of the exercises have become increasingly complex over time. Data fusion of simulated radionuclide data with atmospheric transport modeling and the analysis of seismic data is necessary to identify the underlying event as accurately as possible.



Szenario NPE 2024



Suspicious event in BEZORES,
14.1.2024

Disclosure of data in five steps:

- 5.2.24: Local seismic data
- 13.3.24: Local Infrasound data
- 3.5.24: Xenon detections within IMS (RN33, RN63)
- 14.5.24: Hydroacoustic detection HA10
- 14.5.24: Local RN-detections at Madeira

All local data published
by ANDLANTIS

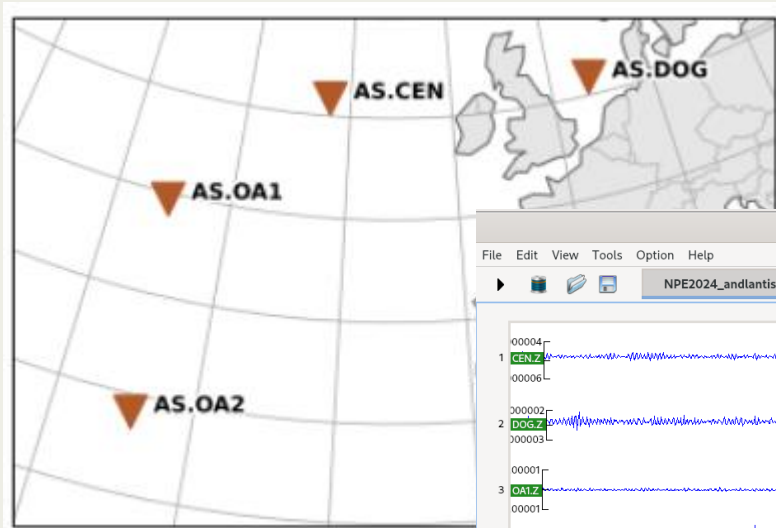
Mentoring Topics:

- General Introduction into NPEs
- Analysis of waveform data -> Location & Time using NDC-in-a-Box Software (Geotool, DTK-GPMCC)
- Introduction to Infrasound and Hydroacoustic data
- Introduction to nms_client and data download
- Introduction Secure Webpage and Bulletins offered by CTBTO
- Introduction Webgrape
- Basic Research in www for local seismic networks and data > real world application
- Interpretation of a hybrid dataset

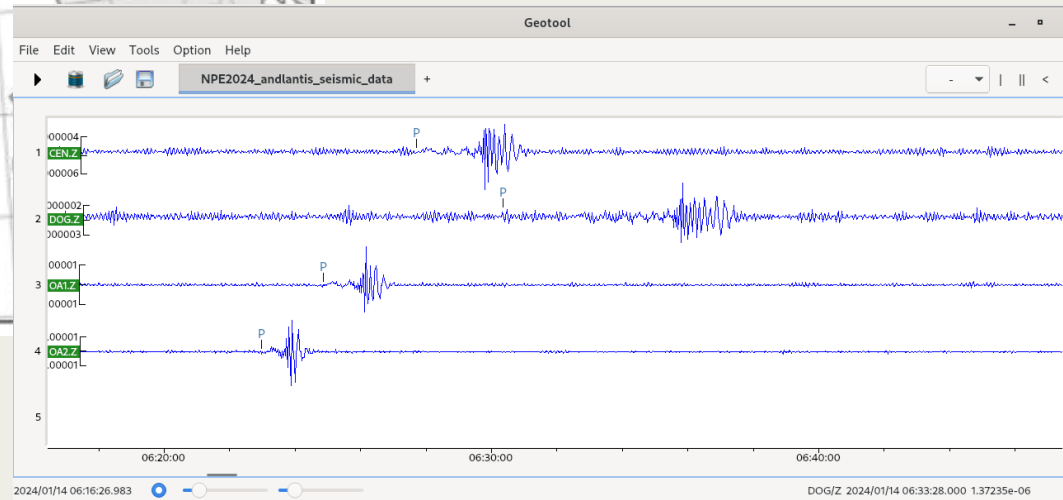


Analysis of waveform data -> Location, Time

Ulrike Mitterbauer, Khishigdelger Ulziisaikhan

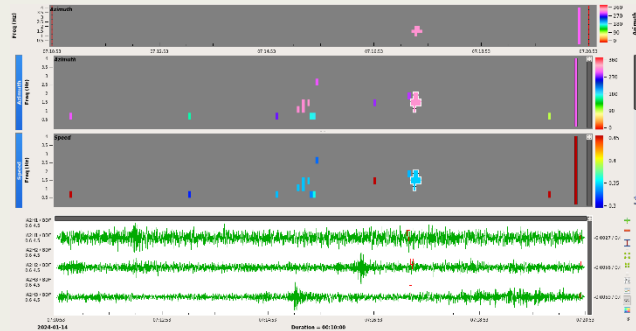


Local seismic stations

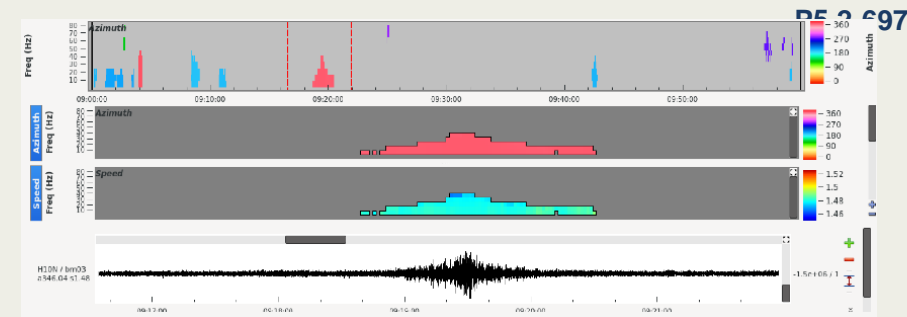
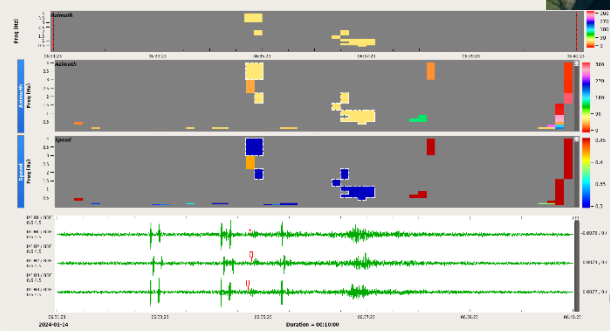


Unfiltered waveforms

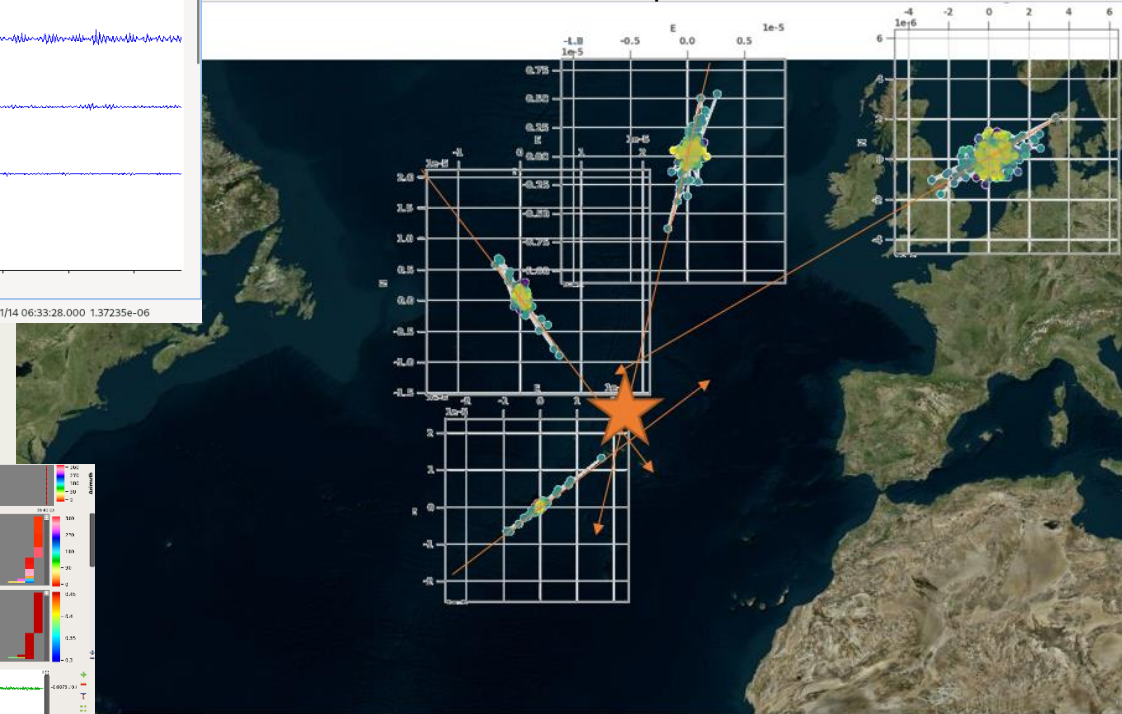
Infrasound station FU,
distance 1300 km



Infrasound station SC,
distance 275 km



Hydroacoustic analysis HA10N,
T-Phase, no underwater explosion



Polarization analysis

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News

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HOME CRYPTO GOLDEN VISA EXCLUS

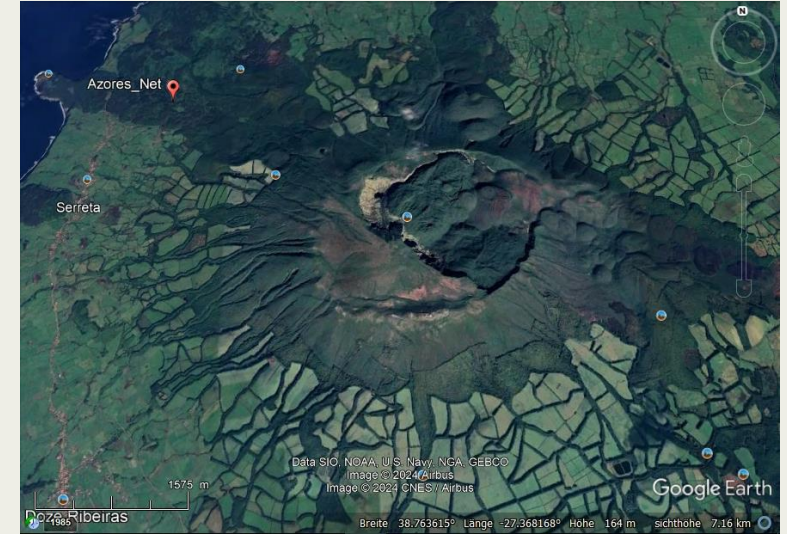
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Share



Azores raise alert level for Santa Bárbara volcano

The alert level for the Santa Bárbara volcano, in Terceira, has risen to V3 and that of the island's fissure volcanic system to V1, due to seismic activity, according to the center of seismovolcanic surveillance of the



Volcano Santa Barbara / Terceira

<https://www.volcanodiscovery.com/de/terceira/news/245487/Santa-Barbara-volcano-Terceira-Island-Azores-increased-earthquake-activity-triggers-volcanic-alert.html>

Santa Bárbara volcano (Terceira Island, Azores): increased earthquake activity triggers volcanic alert



14.1.2024

Sismo sentido nas ilhas Terceira e S. Jorge



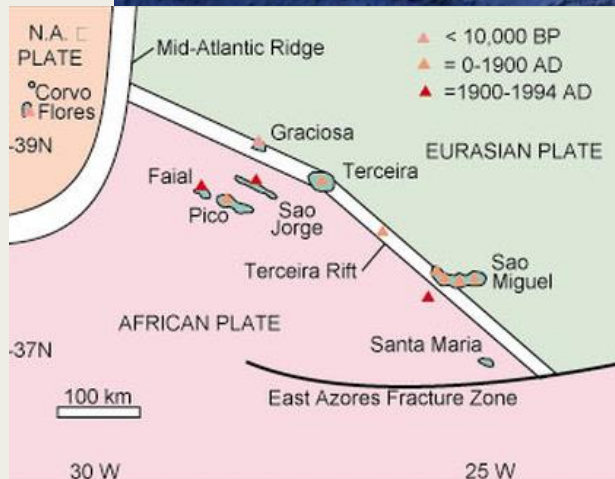
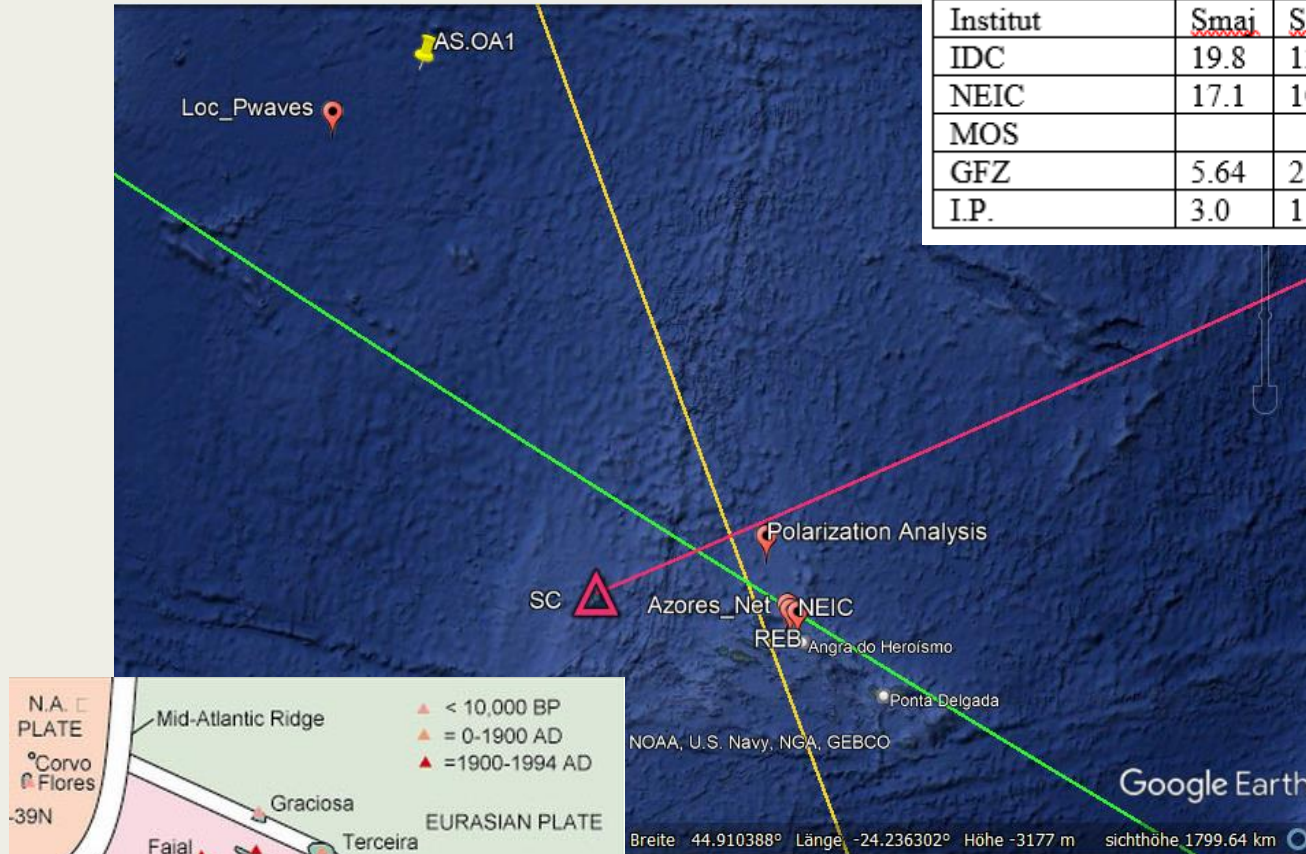
O Centro de Informação e Vigilância Sismovulcânica dos Açores (CIVISA) informa que às 07:19 (hora local = hora UTC-1), do dia 14 de janeiro foi registado um evento com magnitude 4,5 (Richter) e epicentro a cerca de 1 km a NNW da Serreta, ilha Terceira.



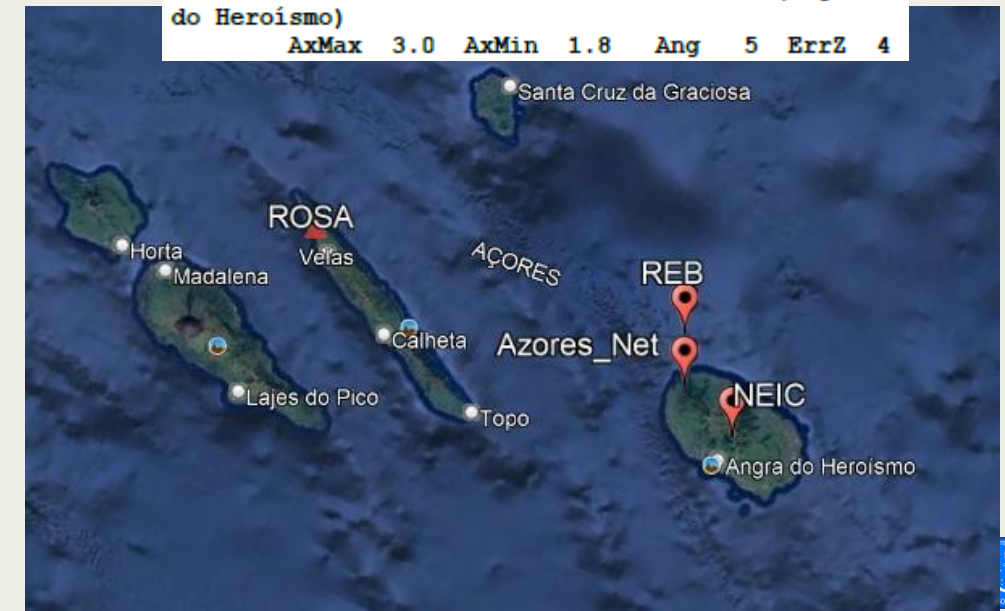
Institut	<u>S_{mai}</u>	<u>S_{min}</u>	Tiefe	<u>M_b</u> (ml)
IDC	19.8	13.80	0	4.2
NEIC	17.1	10.87	10	4.9
MOS			10	5.1
GFZ	5.64	2.93	10	4.9
I.P.	3.0	1.8	0	4.5 ml

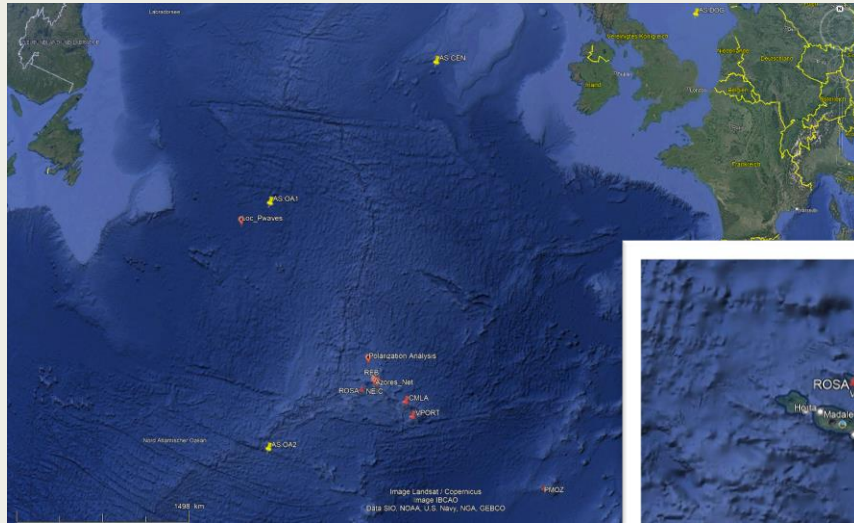
IP ... INSTITUTO PORTUGUÊS DO MAR E DA ATMOSFERA:

14-Jan Ho 08:19:55.3 ML 4.5
 Lat 38.760°N Lon 27.354°W Prof 0
 Região: Serra Sta. Bárbara Rms 0.3
 Sentido: V/VI Terceira: Raminho (Angra do Heroísmo)
 AxMax 3.0 AxMin 1.8 Ang 5 ErrZ 4

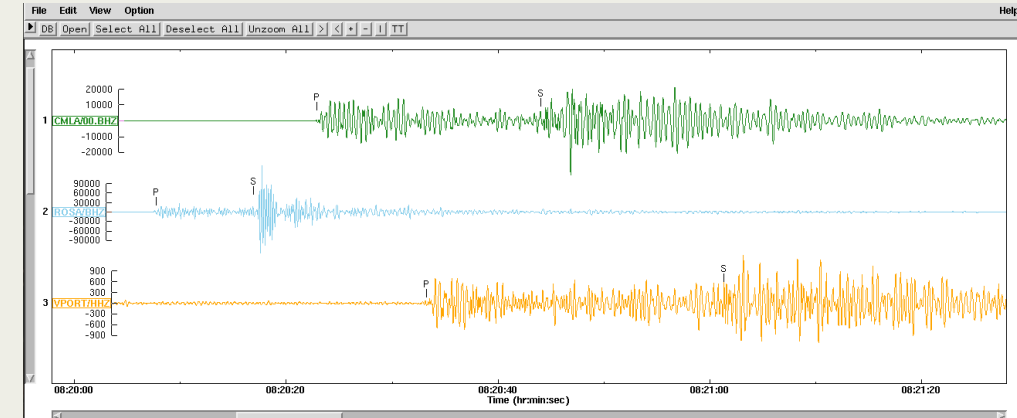
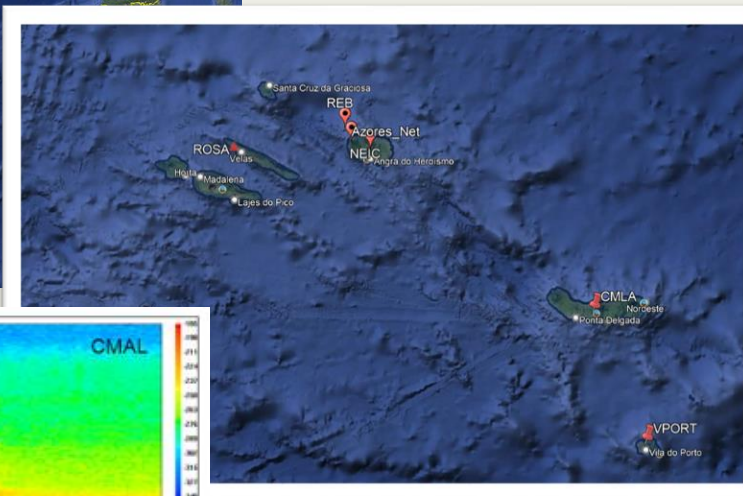


The Azores archipelago is located at the junction of three tectonic plates, the North American, Eurasian and Nubian plates.

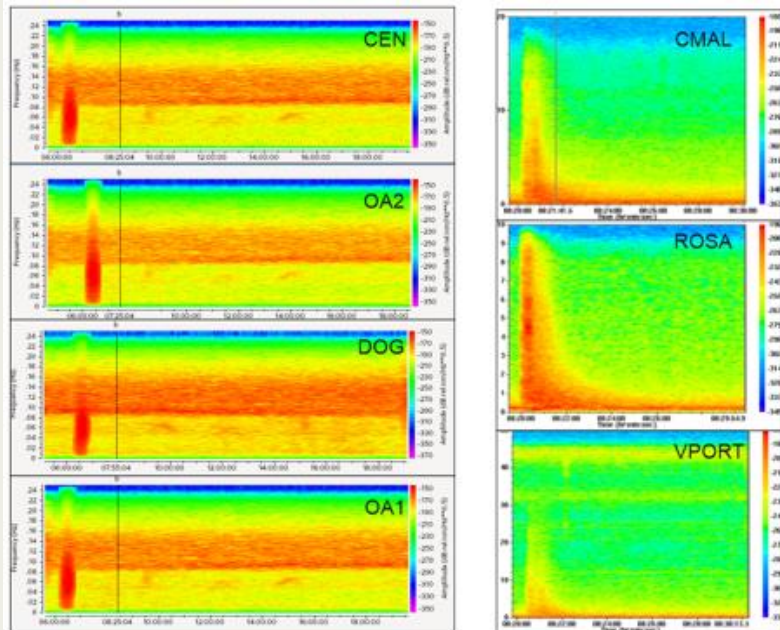




Distance
Andlantis stations:
800-2900km
local stations: 75-280km



z-component of CMLA, ROSA, VPORT
filtered 2-5Hz
clear P- and S-onset, no surface waves
-> tectonic event



1. Andlantis stations: very small spectrum (0.01-0.2), clear signal. It fits neither a spectrogram for an earthquake nor an explosion -> fake data
2. Local station: spectrograms show an earthquake typical signal, with a P signal up 20 Hz and a slow fading over a few minutes.



- **Seismic:** Andlantis stations put an event close to IPMA tectonic event with polarization analysis. Signal does not fit neither an explosion nor an earthquake (sampling rate 0.5 Hz is too low). Public stations show signals from a tectonic earthquake.
- **Infrasound:** Andlantis station IA1 showed the 2013 DPRK nuclear test infrasound data as observed on IS45 (cooperation NDC-NL)
- **Hydroacoustic:** no underwater explosion
- **Radionuclide & ATM:** IMS data at DEX33 and at SEX63 is likely of civil origin taking into account isotopic ratios, zero times and releases from IRE. Source reconstruction with FREAR does not lead back to the waveform event with acceptable reliability.
- **Noble Gas:** Fragmented national radioxenon concentration data is only consistent with a nuclear explosion on 14.1.2024 at the waveform event location followed by a delayed release based on source reconstruction if the fission yields are wrongly compared to activities.

Participation at the 2024 NDC Workshop, Meeting in person

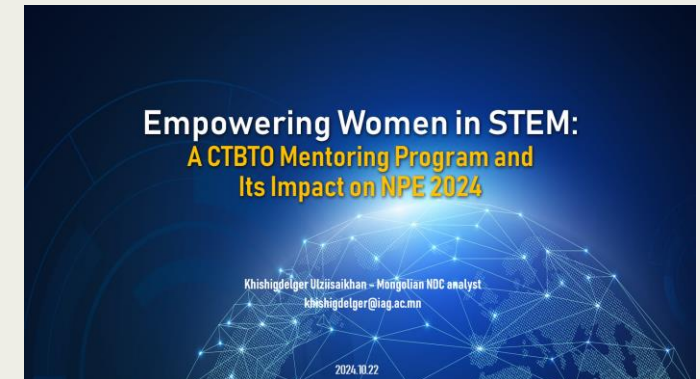


Presentation by Ms. Ulziisaikhan

Through the STEM mentoring program , the Mongolian NDC has engaged in National Preparedness Exercises (NPE) 2024, utilizing all kinds of possible information and data available to simulate and analyze the given test scenario. The hands-on experience gained from NPE 2024 has been invaluable in building technical proficiency and confidence.

The presentation shows an approach to the NPE 2024 exercise , illustrating how applied theoretical knowledge was applied to the given scenario.

Throughout the mentoring sessions, we employed Geotool seismic analysis and the DTK-GPMCC infrasound wave analysis tool. Hydroacoustic data and bulletin information was downloaded via nms client. Mentoring guided through the process of analyzing (interpreting seismic and infrasound) waveform data, fostering critical analytical skills essential for real-world applications in nuclear event detection.





Ulrike Mitterbauer, Khishigdelger Ulziisaikhan

P5.2-697

Mentee:

- Significant improvements in using analytical tools offered within NDC-in-a-Box and understanding information offered by PTS via the secure webpage
- Hands-on experience with actual data not only bolstered technical knowledge but also increased confidence in my ability to contribute to national security initiatives.
- This case study highlights the effectiveness of mentoring in developing specialized skills for emergency preparedness and response.

Mentor:

- Mentoring process much easier if the mentee has already a SSO-account
- Missing exchange between mentors
- Helpful to pair mentors and mentees with a similar technical background