Natural Hazards Awareness in Antarctica: An update on the COMNAP project

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Summary

The Antarctic season 2020/21 marked unusual, increased, seismic activities around the Antarctic Peninsula region as discussed in ATCM XLIII (2021) WP65 *Earthquake Emergency Management System* submitted by Chile. After ATCM XLIII discussion, Resolution 7 (2021) Earthquake Emergency Management System was agreed. That Resolution invited COMNAP to “present a report to assess the general situation of emergency plans at Antarctic bases and its support operations, and the degree of implementation of natural disaster risk assessment programmes”. COMNAP responded to this request and presented the results in ATCM XLIV (2022) WP018 *Report on Emergency Plans and Implementation of Natural Disaster Risk Assessment at Antarctic Stations*. WP018 signaled that further work would be undertaken by COMNAP on this topic. This Information Paper reports on the progress against that additional work.

***Background***

In response to national Antarctic programmes’ concern about unusual, increased, seismic activity around the Antarctic Peninsula, COMNAP launched the project “Earthquake, Tsunami, Volcanic Events Awareness”.

The project began with a desktop exercise to assess the locations of all sixty-seven (67) Antarctic stations especially in regards to their distance from the coast and height above mean sea level (see ATCM XLIV (2022) WP 18 *Report on emergency plans and implementation of natural disaster risk assessment at Antarctic stations).*

During the intersessional period between ATCM XLIV (2022) and ATCM XLV (2023), COMNAP invited national Antarctic programmes to include experts in a “Technical Collaboration Group.” The group’s initial aims were to review the current Antarctic seismic/volcanic monitoring stations emplaced in Antarctica, identify knowledge gaps and collaboratively strengthen our ability to prepare for offering information to operators in the area about the risk presented by seismic-related (earthquake, volcano and tsunami) hazards. The project group has met (virtually) on three occasions and discussion continues.

There has also been an exchange of information with SCAR experts undertaking related work on seismicity and associated risk in Antarctica. Various COMNAP Member programmes have suggested that the project’s focus should be widened from seismic-related hazards to all natural hazards in Antarctica. This will be further discussed at the COMNAP AGM 35 (June 2023) through the COMNAP Safety Expert Group. That group has done significant work on safety in relation to natural hazards in Antarctica to date.

***COMNAP Technical Collaboration Group***

COMNAP convened the first meeting (virtual) of the Technical Collaboration Group on earthquakes and volcanic riskon UTC Wednesday 13 April 2022 with sixty-two participants in attendance. The group is a practical and technical group that focused on understanding the distribution of the current seismic monitoring equipment in the Peninsula region of Antarctica. Five presentations were introduced to provide examples of systems already in place and update on progress and studies:

1. “Seismic-volcanic surveillance at Deception Island and the Scotia plate”   
   Manuel Berrocoso and Antonio Quesada (Comité Polar Español (CPE), Spain).
2. “Status of the KOPRI seismic network in Antarctica”   
   Yongcheol Park (Korea Polar Research Institute (KOPRI), Republic of Korea).
3. "Turkish Antarctic seismic station on Horseshoe Island and a low-cost approach to seismic network"   
   Hasan Hakan Yavasoglu and Yusuf Engin Tetik (TÜBITAK, Türkiye).
4. “Progress on Volcanic & Tsunami Risk Assessments for the new Scott Base”   
   John Cottle (Antarctica New Zealand, New Zealand).
5. “Identification of natural hazards in the area of influence of the Pedro Maldonado scientific station and integrated network for monitoring tsunami warning”   
   Ashley Casierra Tomalá (Instituto Oceanográfico y Antartico de la Armada (INOCAR), Ecuador).

This first meeting agreed that while there has not been a history of big earthquakes (> 6.5 magnitude) in Antarctica, a seismic monitoring network, recording large and small magnitude earthquakes and volcanic activities, can give a better understanding of the level of activity, hazards and risks in the area. The terms of reference for the group and ideas for the conceptual framework were discussed.

A second meeting, “Towards a regional network for seismic surveillance in the Peninsula region” was held virtually on UTC 18 October 2022 and attended by members from ten countries operating in the Antarctic Peninsula. The aim of this meeting was to discuss the intention to create a network connecting the established seismic systems in the Antarctic Peninsula. During the meeting the distinction between data collection for scientific purposes rather than for safety purposes was highlighted and there were discussions on the technical nature of the network.

Further meetings are scheduled for UTC 4 May 2023 at 1200hrs (virtual) and June 2023 (in-person discussion during the COMNAP AGM 35).

***Update to the Tsunami Awareness in Antarctica brochure***

An additional aspect of the project is to review and update the COMNAP brochure *Tsunami Awareness in Antarctica* (July 2014) (<https://www.comnap.aq/handbooks-manuals-operational-guidelines>). With many national Antarctic programmes undergoing refurbishments at their station, it seemed timely to revisit the topic and provide updated COMNAP information and guidance. The brochure has been through a review in contact with the Joint Australian Tsunami Warning Centre and the updated version will be shared during the COMNAP AGM 35 (2023). After which, it will be made publicly available. COMNAP is also currently consulting on guidance for national Antarctic programmes on what to do in the event of an earthquake that is felt or affects Antarctic facilities and personnel.