24.22 Hazard and Risk Commission – Report 2024

- Membership

The following people are the current steering committee members.

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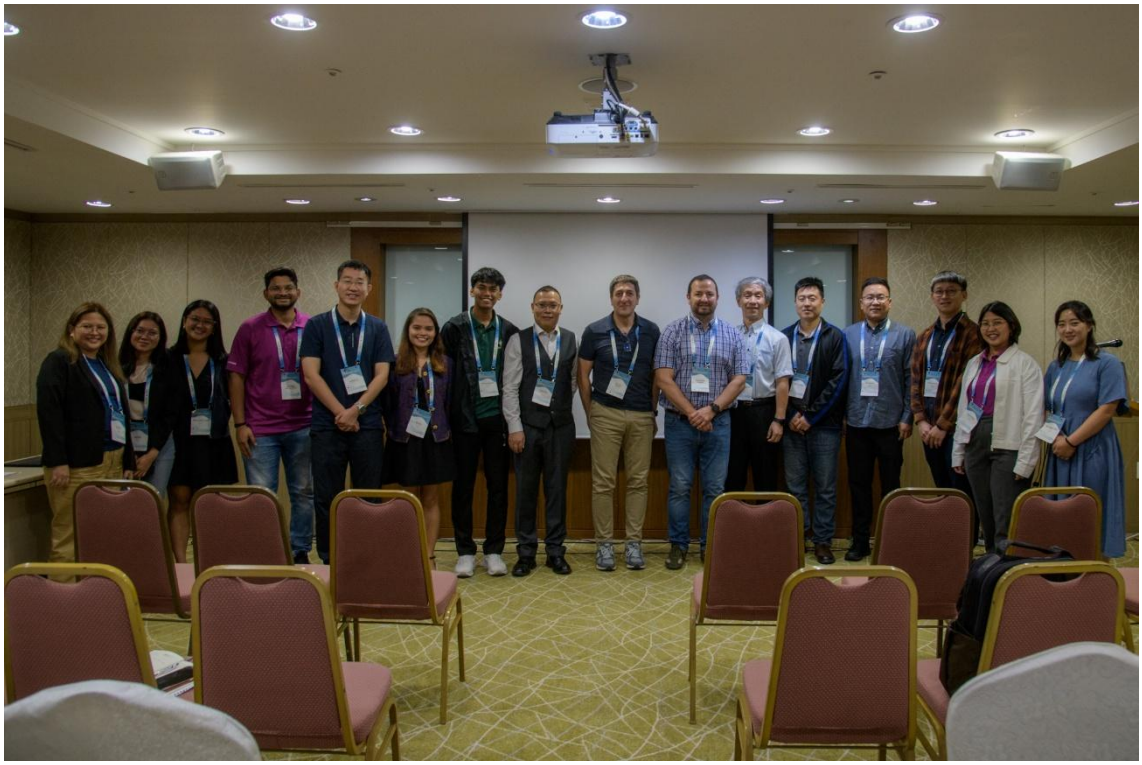
URL of the website of the commission:
http://oguchaylab.csis.u-tokyo.ac.jp/IGU_Hazard/index.html
The website is currently being renovated.

There are 160 corresponding members who regularly receive information via e-mail. The members are from the following countries (number of people in parentheses): Argentina (1), Bangladesh (2), Belize (1), Brazil (1), Cameroon (1), Chile (2), China (41), China (HK) (1), Fiji (1), France (3), Germany (2), Greece (2), India (25), Indonesia (2), Iran (3), Iraq (1), Israel (1), Italy (4), Japan (25), Kuwait (1), Mexico (1), Myanmar (1), Nepal (1), Oman (1), Philippines (1), Poland (2), Portugal (1), Romania (4), Russia (2), Singapore (2), Slovenia (1), Spain (1), Taiwan (5), Turkey (2), UK (2), USA (13), and Vietnam (1).

- Meetings

1) Supporting the AOGS 21st Annual Meeting Conference in Pyeongchang, Korea, on 23-28 June 2024

The Asia Oceania Geosciences Society (AOGS) organizes yearly an international conference to promote geosciences and its applications for the benefit of humanity, specifically in Asia and Oceania and with an overarching approach to global issues (https://www.asiaoceania.org/aogs2024/public.asp?page=home.asp#). Our commission supported the organization of the conference by submitting the session IG-36 "Progress Related to Data and Models for Predicting Rain-induced Landslides", afterward merged with the session IG01 "Natural Hazards and Disaster Risk" co-chaired by Commission member Alessandro Mondini and Yaohui Liu, Shandong Jianzhu University, China.
Commission member Takashi Oguchi presented "A Review of Early Hazard Warning Systems in Japan", and Commission member Alessandro Mondini presented "Deep Learning Forecast of Rainfall-induced Shallow Landslides in Italy" in the aforementioned session.



Attendees at the "Natural Hazards and Disaster Risk" session at the AOGS Conference held in Pyeongchang, Korea, on June 23 – 28 June.

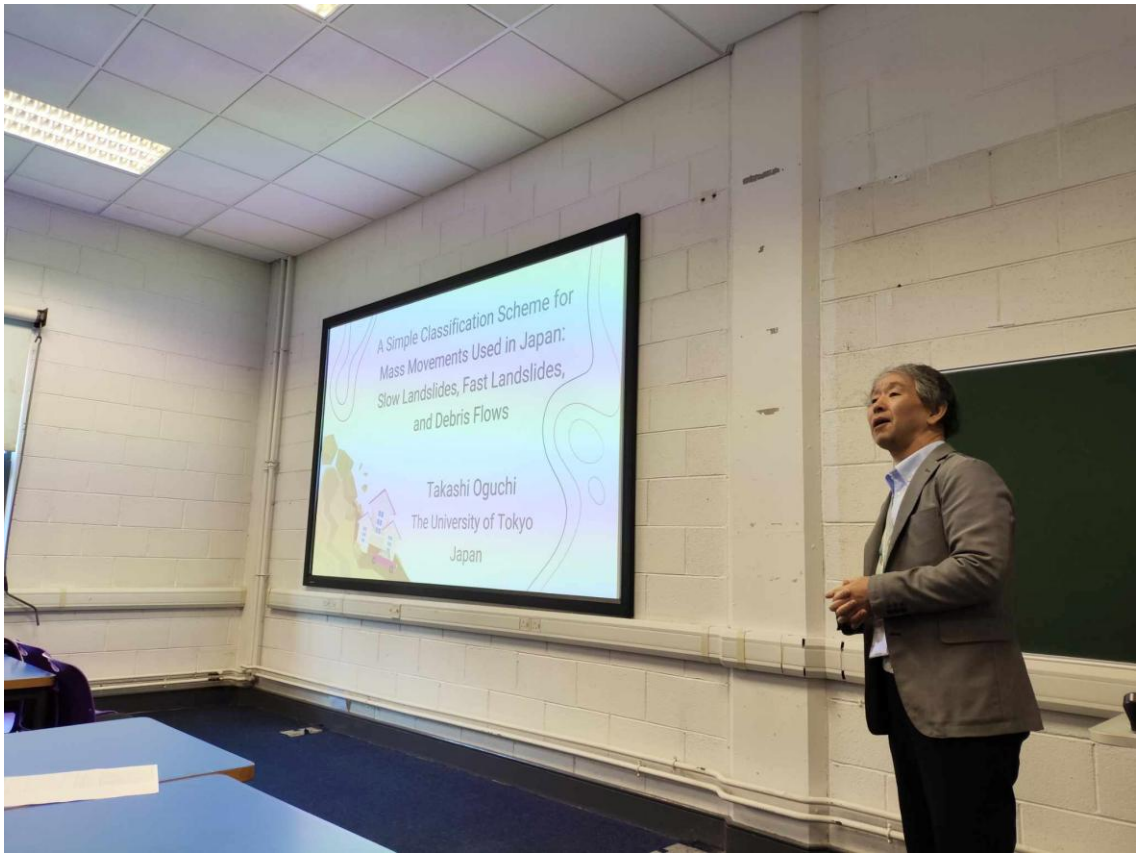
2) Supporting the 35th International Geographical Congress in Dublin, Ireland, 24-30 August 2024

A Hazard and Risk Commission Meeting was held on the 29th of August with the participation of members Takashi Oguchi and Alessandro Mondini, as well as some externally interested persons. During the meeting, the structure of the new commission was presented together with the activities carried out in 2023 and early 2024.

Our commission organized Session C22 "Exploring the differences in understanding and addressing natural hazard". Commission member Alessandro Mondini was the convener and chairperson of the session. More than 35 abstracts were originally submitted to the session. We had 20 oral presentations spread in four sessions on the 29 of August, and a few poster presentations. The papers presented at our session covered various aspects of hazard and risk issues, especially the impact and mitigation of natural hazards including earthquakes, fluvial erosion, floods, and landslides. A few talks included aspects related to social science.

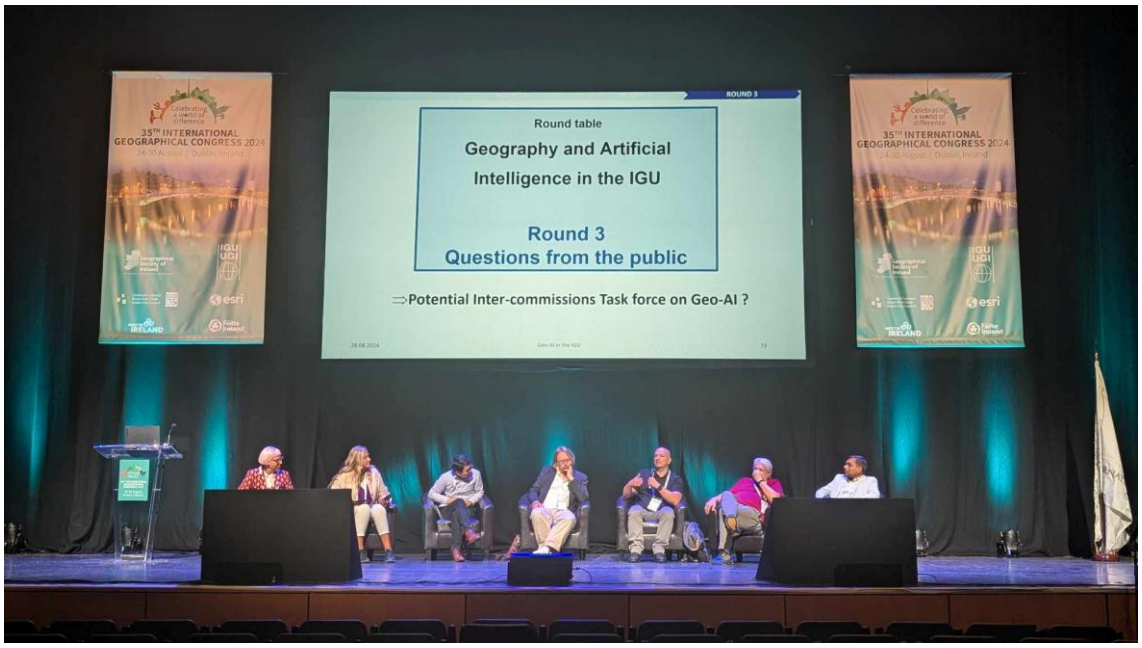
There was also active discussion after each presentation.

Commission member Takashi Oguchi presented O5.067:
A simple classification scheme for mass movements used in Japan: slow landslides, fast landslides, and debris flows.



Commission member Takashi Oguchi presenting at the 35th International Geographical Congress in Dublin, August 2024.

Commission member Alessandro Mondini attended as a panelist in the round table: Geography and Artificial Intelligence in the IGU held in IGC on the 28th of August, aimed to inform the public on what is GeoAI, but also on what it is relevant for Geography to carry out an informed scientific position on the emergent use of AI, and specifically GeoAI.



Commission member Alessandro Mondini attending the round table: “Geography and Artificial Intelligence in the IGU” at the IGC in Dublin, on the 28 August 2024.

3) Participating at the International Academy of Astronautics (IAA) on small Satellite Technologies and Applications, Salta, Argentina, 4 – 9 November 2024

The Conference follows a history of IAA events in Latin America, which started with the 1st Cubesat Workshop in Brasilia in 2014, and the 1st Small Satellites Symposium in Buenos Aires in 2017.
The objectives of the event were: 1) to allow experts and students from the Region to learn the latest worldwide developments in small satellite technologies and applications, 2) to have an opportunity to present the regional developments to colleagues from Latin America and the rest of the World, and, 3) to create and strengthen networks of cooperation that enable and increase regional participation in small satellite activities (https://cienciaytecnologia.salta.gob.ar/).

The conference also allowed the presentation of space-related topics, not specifically 'small satellites'. The Commission member Paola Cardozo presented "SAR Remote Sensing for rapid landslide detection in Latin America and the Caribbean", fostering the activities of the commission as drivers for a more intensive use of SAR technologies in natural hazards studies.

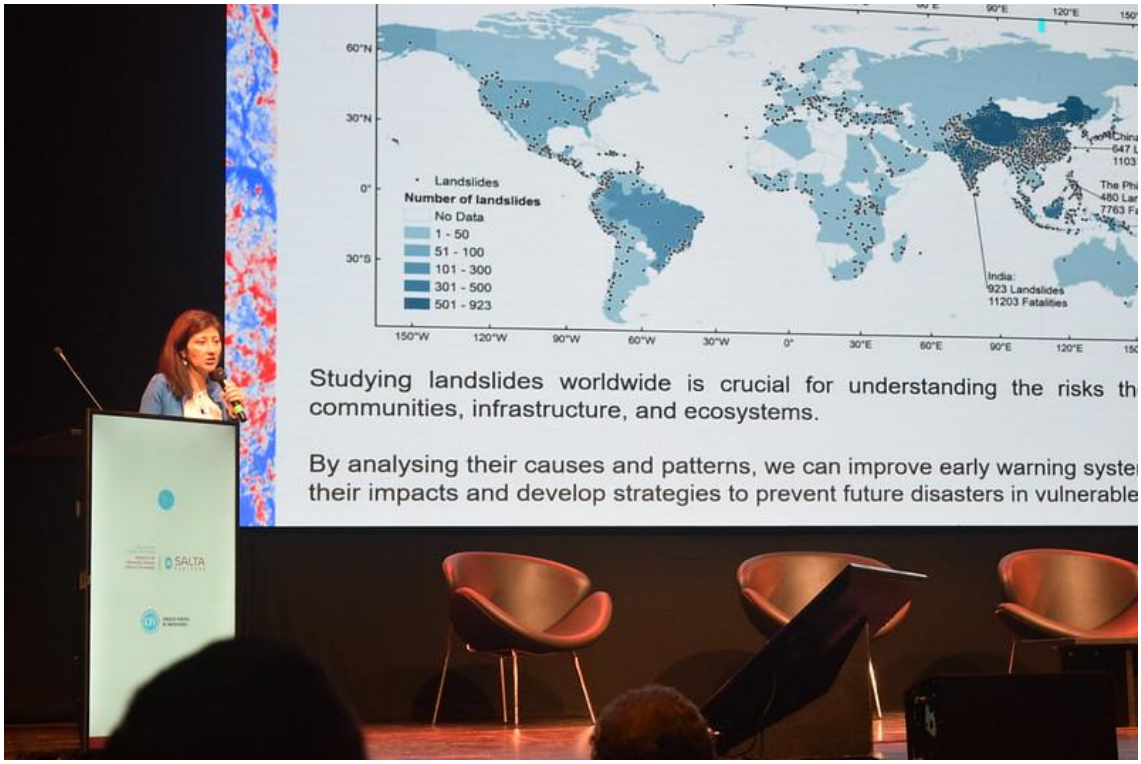


Photo taken during the Paola Cardozo keynote speech at the IAA conference on small Satellite Technologies and Applications, Salta, Argentina, 4 – 9 November 2024.

- Conference papers

The Commission members Paola Cardozo and Alessandro Mondini published the conference paper “SAR Remote Sensing for Rapid Landslide Detection in Latin America and the Caribbean” at the IAA conference on small Satellite Technologies and Applications, Salta, Argentina, 4 – 9 November 2024, presenting the activities of the commission as a potential bridge between new and advanced SAR techniques for landslide mapping and Latin America and Caribbean scientists. The paper is available at the link: https://drive.google.com/file/d/1K8l7392zF8C8646uNMXMHjJ_2Q-J2NWB/view, proceedings are not yet available.

SAR Remote Sensing for rapid landslide detection in Latin America and the Caribbean

C. Paola Cardozo (1), Alessandro C. Mondini (2)

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Abstract: For rapid assessment during and after a disaster, we need a system that can penetrate clouds, such as synthetic aperture radar (SAR), which operates in the microwave spectral range where clouds are almost transparent. SAR measures both amplitude and phase. SAR amplitude depends on the type of backscatter, and landslides may backscatter differently from other land cover types, or changes in backscatter caused by the occurrence of a landslide may aid in their identification. This paper examines the current state of the art in exploiting SAR amplitude for new rapid landslide detection and its use in Latin America and the Caribbean (LAC). In this regard, the paper highlights the lack of LAC authors, and a limited investigation in the LAC areas compared to other areas of the world. In conclusion, radar imagery is suitable for mapping different types and sizes of rapid landslides in different physiographic settings, helping to reduce landslide risk, but is not fully exploited in certain areas of the world

Part of the conference paper “SAR Remote Sensing for Rapid Landslide Detection in Latin America and the Caribbean”.

- Future plans

The following future events and collaborations are in progress:

1) Organizing a session at the International Association of Geomorphologists (IAG) Regional Conference on Geomorphology with the theme: “Geomorphology for society: challenges and opportunities

The meeting will be held in Timisoara, Romania, on September 16 – 18, 2025. Alessandro Mondini will co-chair the scientific session TS14 “Landslides in Climate Changes Circumstances” co-organized with the IAG International Consortium on Landslides.

2) Organizing a session at the 11th International Conference on Geomorphology

The meeting will be held in Christchurch, New Zeeland, 2 - 6 February 2026. Two members of the commission, Oded Katz and Alessandro Mondini, proposed the scientific session “Addressing Uncertainties in Landslide Prediction Across Spatial and Temporal Scales”. The final program of the conference is not yet available