The Geo-Engineers without Borders Committee (GeoWB)

Prof. Pierre Delage - Leader of GeoWB Project
Daniela Pollak - Board Member ISSMGE

The GeoWB committee (https://www.issmge.org/committees/geo-engineers-without-borders) has been presented in the 1st issue of the new format of the ISSMGE Bulletin of March 2024, together with its aims, strategy and functioning. This paper provides an update of the GeoWB activities. A recent achievement has been the registration of a Voluntary Statement made at the United Nations Office for Disaster Risk Reduction (UNDRR), aimed at "Providing international geotechnical engineers all over the world to help with geo-disasters". Also, various disasters recently occurred and an update of the GeoWB activities with respect to those is given.

Membership

With 16 members, the membership is now as follows:

Prof. Pierre Delage, Chair (France - Europe)
Eng. Daniela Pollak, Board member (Chile - South America)
Dr. Léo Alibert (Lebanon - Asia)
Prof. T. Baser (USA – North America)
Prof. Qun Chen (China - Asia)
Eng. Ahmed Chraibi (Morocco - Africa)
Dr. Lawrence de Leeuw (UK - Europe)
Prof. George Gazetas (Greece - Europe)
Prof. Antonio Gens (Spain - Europe)
Eng. Will Ibim (Nigeria - Africa)
Dr. Jan Kupec (New Zealand - Australasia)
Prof. Enlong Liu (China, Asia)
Prof. Fernando Marinho (Brasil - South America)
Prof. Luciano Picarelli (Italia - Europe)
Dr. Ezra Y. S. Tjung (USA – North America)
Prof. Shu Yu (China - Asia)

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Members come from all ISSMGE regions and include some internationally well-known specialists in dams (A. Chraïbi), earthquakes (G. Gazetas), failure of geotechnical structures (A. Gens) and slope instabilities (L. Picarelli).

Geo-disasters

Unfortunately, a lot of geo-disasters occurred since GeoWB was created, in particular in 2023. They have been already mentioned in the previous Bulletin and some reports are available in the GeoWB website. Quite recently, a catastrophic landslide due to toe buckling resulting in a rock topple inundation with casualties suspected to be around 700 people buried occurred on Friday 24 May 2024 during the night at 3 AM near the Yambali Village in the Enga province, close to the centre of Papua New Guinea Highlands.

At the same time, GeoWB members were involved in the geo-disaster resulting from heavy rains and floods along river Guaiba that occurred on the beginning of May 2024 in Rio Grande do Sul (Brazil).

GeoWB is presently strongly involved in the following actions:

-**The Al Haouz earthquake of 8 September 2023 in the High Atlas in Morocco**, at 70 km from the city of Marrakech. A contact has been made with Dr. L. El Moudnib, seismologist in the Laboratory of Geophysics and Natural Risks of the Scientific Institute of the Mohammed V University in Rabat, and a joint report is being prepared with Prof. G. Gazetas, GeoWB member. The epicentre of this earthquake was 8 km deep in the High Atlas and it affected a series of small villages from this poor and remote area, with around 3000 casualties and 6000 injuries (see https://en.wikipedia.org/wiki/2023_Al_Haouz_earthquake).

The village of Amerzgan, one of the most destroyed ones (Wikipedia, photo Lucien Mahin)

From the Board

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-The heavy rains, floods and slope instabilities in Rio Grande do Sul, Brazil. Thanks to an initiative of Prof. Gabriela Medero, who works in Heriot Watt University in Scotland but comes from Porto Alegre in Rio Grande do Sul, we could have good contacts allowing to set up a GeoWB mission. Prof. André Assis, VP for the South American region, also provided useful information about this disaster during the Board meeting of 25 May in Shanghai. A mission is presently being undertaken there by Prof. Fernando Marinho, from the University of São Paulo. The significant destruction of infrastructures resulting from the huge floods (the levels of the river Guaiba have been more than 5 meters above normal, a little bit more than the last catastrophic flood of 1941) make transport and access to the sites quite problematic (see https://en.wikipedia.org/wiki/2024_Rio_Grande_do_Sul_floods).

The Guaiba bridge on 5 May 2024
(Wikipedia, Photo Ricardo Stuckert)

Prof. Fernando Marinho

--The recent landslide of 24 May 2024 resulting from heavy rains that destroyed the village of Yambali in the Enga province, Papua New Guinea.

Dr. Jan Kupec, GeoWB member, is presently involved as lead geotechnical engineer in the relief mission there, as part of an Australian and New Zealand combined response to support UN and PNG Government efforts on the ground. We look forward to receiving from him some geotechnical feedback. Note that security in PNG is concern and official protection is needed to ensure the security of the mission team, which is the case thanks to the official support of national and international entities. Besides a better understanding of the landslide mechanisms, an important geotechnical challenge is to ensure the people safety with respect to other instabilities developing close to the first one. The field team is collaborating closely with geospecialists in NZ to provide numerical modelling and hazard maps.

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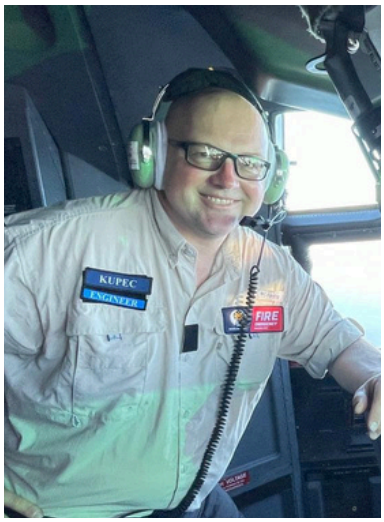
The Yambali landslide in Papua New Guinea (24/5/2024). The landslide is 650 m long. (Photo Dr Jan Kupec)



Dr Jan Kupec

These actions have been made possible thanks to the contacts we have through our geotechnical network. We hope that they will popularise the activities of GeoWB and make it better known among national and international organisations and stakeholders. Also, the feedback of the survey sent to ISSMGE Member Societies all over the world (around 90 countries) will further popularise GeoWB, reinforce our operational network and strengthen the data base of volunteer engineers ready to help. Up to now, 27 out of the 90 Member Societies have responded, with a majority ready to propose volunteer geotechnical engineers for GeoWB missions. We also learned that, unsurprisingly, 17 countries among those 27 have national organisations aimed at preventing/managing geo-disasters. This better knowledge of national contexts will help optimising the efficiency of GeoWB actions. We also have more information about the geo-disasters that may affect those countries. To get answers from more countries, the deadline to respond has been extended to the end of June 2024.

Conclusion

The good news is that the activity of GeoWB is growing with two missions being presently carried out (beginning of June 2024). The bad news is that this increased activity is due to a growing and unfortunate occurrence of geo-disasters, in particular due to storms and heavy rains that were never met before, often in conjunction with the climatic change. Examples are the Daniel storm (September 2023) that ravaged Greece (Thessaly) and Libya (failure of the Derna dams), the storm that devastated the state of Rio Grande do Sul in Brazil (April-May 2024) and the rock topple that triggered the Yambali landslide in Papua-New Guinea (end of May 2024).

Given that it is not so easy to get involved in an efficient manner with respect to geo-disasters, we hope that the two missions that recently started will further popularise the actions of GeoWB and make easier its actions in forthcoming geo-disasters.