

MSc Student - Sub-Bottom Profiler data interpretation of Sumatran lake sediments

Department of Marine Geosciences, University of Haifa (UH)
& Asian School of the Environment (ASE), Nanyang Technological University

Within the framework of a collaboration between ASE and UH, we are searching for one graduate student to work on the interpretation of Sub-Bottom Profiler (SBP) data collected from lakes in Sumatra (Indonesia). The student would enrol in the International M.Sc. Program at the Leon H. Charney School of Marine Sciences (University of Haifa, Israel) for a duration of 2 years, under the supervision of Dr. Nicolas Waldmann and Dr. Yizhaq Makovsky. During selected term breaks the student will visit the ASE in Singapore to work with Dr. Caroline Bouvet de Maisonneuve who will provide geological context and information from sediment cores for the interpretation of the data. Commencement date would be in September 2019, as the semester begins in October 2019.

To apply, please contact Caroline Bouvet de Maisonneuve (carolinebouvet@ntu.edu.sg) or Nicolas Waldmann (nwaldmann@univ.haifa.ac.il).

International M.Sc. Program: <http://marsci.haifa.ac.il/index.php/en/m-sc-heading/intprog-geo>

Dr. Nicolas Waldmann: <http://marsci.haifa.ac.il/petrolab/>

Dr. Caroline Bouvet de Maisonneuve: <https://earthobservatory.sg/research-group/physical-volcanology-and-petrology-caroline-bouvet-de-maisonneuve>

Project description:

As part of a joint ASE-UNP (Indonesia) effort, a geophysical survey of lakes Maninjau, Diatas and Kerinci in West Sumatra and Jambi using a Sub-Bottom Profiler was conducted in April-May 2018. Lake sediments are fantastic archives of geological processes (floods, landslides, volcanic eruptions, earthquakes) and environmental change (climate change and change in land use). Volcanic ash can travel far and forms well-preserved tephra layers in quiet, low-energy sedimentary environments such as lakes. Long term hydrological variations are also recorded with changes in sedimentology, geochemistry and biological proxies. The thickness and distribution of lake sediments can be inferred from acoustic imaging such as with a CHIRP or sub-bottom profiler (SBP). Analysing this data can thus inform about a lake's potential as an environmental archive as well as highlight major events (e.g. landslides, tectonic faulting) that are recorded in the lake sediments. The processing and analysis of SBP data is fundamental to complement the analysis of lake cores.

The goal of this project is to Interpret the SBP data in order to provide (1) a framework for the selection of lake coring sites, (2) a context for the analysis of lake sediments, (3) knowledge about the occurrence of natural hazards such as landslides, earthquakes and faulting in the region, (4) potentially inform about paleoclimatic and paleoenvironmental change.