

# The Science of Scenery

HOW GEOMORPHOLOGY CAN HELP ASIA COPE WITH ITS ENVIRONMENTAL CHALLENGES.

Text and Photos: DAVID HIGGITT

Geomorphology can be regarded as the ‘science of scenery.’ It seeks to explain how landscapes develop over time, the operation of earth surface processes such as erosion, landsliding and river flows, and the interactions between these processes and the landscape.

Two challenges facing geomorphology are trying to understand and predict the impact of global warming on earth surface systems, and identifying how humans destabilise the environment. Both of these challenges are acute in tropical Asia, where floods, storm surges and landslides not only alter the landscape, they also pose a great risk to people.

To some extent, the discipline of geomorphology is not as well-developed or -appreciated in tropical Asia as elsewhere. For this reason, in June 2007, the International Association of Geomorphologists (IAG) held a conference in Kota Kinabalu, Sabah, Malaysia, which was attended by 100 earth scientists from Asia and beyond. The conference was jointly organised by the National University of Singapore, Yayasan Sabah and Universiti Sabah Malaysia. Its programme was designed to showcase some of the research conducted in Asia to an international audience, and to allow for the exchange of ideas and approaches.

Established in 1966, Yayasan Sabah has a remit to redistribute the state’s timber wealth to the populace through social and educational programmes. It has established conservation areas at Danum Valley, Maliau Basin and Imbak Canyon, deep in the heart of Borneo.

Geomorphology seeks to understand landform dynamics and to predict changes through careful field observation, computer modelling and experimentation.

At Danum, there has been a long-established programme of hydrology and geomorphology research, supported through a joint programme with the United Kingdom’s Royal Society. This research has quantified the impact of selective logging on water and sediment discharge in rivers, enabling recommendations for sustainable forestry to be devised. Professor Ian Douglas (Manchester University) has worked at Danum for three decades, and he presented a keynote address explaining how fieldwork has been translated into policy recommendations.

The link between scientific research and environmental policy, however, is far from automatic. One of the key themes of the conference was ‘Communicating Geomorphology,’ which explored how field scientists can integrate their research with a wider body of knowledge about the environment, discuss ideas with stakeholders and explain the significance of their research findings to a wider audience.

In tropical Asia, there is still a need for research about the sensitivity of earth surface systems to environmental change, but the challenges posed by human-induced and climate-induced change will require more than good science – they need interdisciplinary approaches and a willingness to share



As geomorphology is essentially a field science, IAG conference delegates are not immune from the pleasures of seeing the spectacular landscapes of Borneo.

ideas beyond the normal circle of fellow earth scientists. These themes were developed in a keynote address by Professor Gary Brierley (University of Auckland), sponsored by the *Journal of Geography in Higher Education*. The role of universities in promoting environmental understanding among students should not be underestimated here.

Many of the research projects described during the conference focused on environmental hazards such as risk assessment for tsunami impacts, determining slope stability criteria in urban development and the flooding and channel change associated with deforestation. Landslides in Asia were well-represented. New techniques such as terrestrial laser scanning provide remarkable insights into the changes in the three-dimensional structure of unstable slopes.

Progress is also being made in documenting landslides in mountainous regions and identifying the precursors for landslide activity (providing the prospect of improving risk assessment and emergency response). Simply put, we are only at the beginning of what geomorphology can do for the region. ■



## Geomorphology and Conservation

Though there is much for geomorphology to do in understanding the impact of environmental hazards around the world, it is also possible to use it to promote and protect the amazing diversity and splendour of landscape around the earth. The IAG is now involved with the World Conservation Union (IUCN) in providing criteria for assessing spectacular landscapes for World Heritage Site status. The vast majority of World Heritage Sites have been designated on the basis of cultural or biological significance, and in general, the role of geomorphology has been overlooked. This means that many spectacular landscapes worldwide are relatively unprotected, or that the significance of landscape in existing sites has been underplayed. There is much potential for geo-tourism at World Heritage Sites in Asia, though this trend also introduces the need to manage visitor numbers sustainably.

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### Resources

International Association of Geomorphologists  
[www.geomorph.org](http://www.geomorph.org)

World Conservation Union  
[www.iucn.org](http://www.iucn.org)

Yayasan Sabah  
[www.ysnet.org.my](http://www.ysnet.org.my)