Geophysical Research Abstracts,
Vol. 11, EGU2009-14058, 2009
EGU General Assembly 2009

Glacial hazards: communicating the science and managing the risk

J.M. Reynolds
Reynolds Geo-Sciences Ltd, Mold, United Kingdom (john.reynolds@geologyuk.com, +44-1352 756196)

The recession of glaciers worldwide has received huge media coverage over the last few years in association with the issue of climate change. Young people at schools and colleges are increasingly aware of the environmental pressures due to 'global warming'. Yet simultaneously, there appears to be an increasing move away from studying science both at pre-university and undergraduate levels. One of the oft cited reasons is that students cannot see the application of the subjects being taught them.

Glacial hazards are one of the most obvious adverse effects of climate change, with many, often poor, communities in remote mountain areas being the most affected by frequently devastating Glacial Lake Outburst Floods (GLOFs). When students are exposed to examples of these hazards and the science behind them, many become enthused by the subject and want to study it further. There has been a huge increase in the number of students selecting projects on glacial hazards as well as a large increase in the number of institutions offering to teach modules on this subject.

In an effort to provide a basic visualisation, Peter Kennett has taken the principle of GLOFs and developed a cheap but highly visual demonstration of the potentially devastating effect of melting ice within a moraine leading to subsidence and subsequent dam failure. This is available on www.earthlearningidea.com as 'Dam burst danger – modelling the collapse of a natural dam in the mountains – and the disaster that might follow'. Furthermore, the methods by which glacial hazards are assessed provide excellent applications of geophysics, geology, geography (physical and Human), engineering, mathematics, and glaciology. By exploring the potential vulnerability of communities downstream, the applications can be extended to include sociology, economics, geopolitics and even psychology. Glacial hazards have been the subject of presentations to the Earth Science Teachers Association (ESTA) in the UK to demonstrate these scientific applications.

Communicating the science to students and trying to excite them to the fun of applying these scientific disciplines in the field are important as part of science outreach. It is also important to communicate the science to those in government (local and national) within those countries affected by such hazards and to international funding agencies. There are two issues here: (a) using the media to a positive effect without alarming vulnerable and sensitive communities, and (b) providing the appropriate authorities with the necessary technical information about the hazards, their potential effects if catastrophe strikes, and how to manage the risk in an effective and timely fashion.

For (a) where this is not handled correctly, the media are still ever too keen to headline potential catastrophes and unwittingly cause alarm among local communities. The so-called Palcacocha fiasco in the Cordillera Blanca, Peru, in April 2003 and the Imja Tsho media flurry of May 2008 in Nepal are but two recent examples. For (b) there needs to be a programme of interaction through workshops between the scientific community and key stakeholders in affected countries. Where these have been undertaken, such as in Bhutan, Nepal and Peru, the outcomes have been extremely productive and beneficial. However, much remains to be done in ensuring that authorities and funding agencies, for example, are aware of existing international guidelines on the assessment of glacial hazards that use objective methodologies, such as those funded by the British Government and published in 2003 (see www.geologyuk.com/mountain_ hazards_group/dfid.htm from which the guidelines can be downloaded in PDF format). Similar workshops, for example, are also being developed separately in Austria by the Glacier and Permafrost Hazard (GAPHAZ) Working Group and in Bhutan by the UNDP.