

Summary of the mini-symposium “The Future of Earth Sciences” in honour of Ed de Mulder’s farewell. *Based on the contributions of S. Muhongo, F. Eder, P. Mc Ardle, J. Ebbing, M. van Bracht and E. de Mulder.* Transcribed by J. Peeters.

The Future of Earth Sciences

Earth Sciences are at a crossroads. After the early 1960s and the International Geophysical Year, Earth Sciences became a booming study and Earth scientists were highly valued. However, this view changed rather dramatically in the mid 1980s and has not really recovered since, nor have the dwindling numbers of Earth scientists. With more recent major scientific discoveries, demand for well-trained Earth scientists has been increasing again since 2002, a trend that will continue in the near future. Nevertheless, there is still some ground to be made up in terms of public appreciation.

Nowadays, Earth scientists have access to the highest resolution of scientific information about the Earth in terms of both time and space together with the best understanding we have ever had of Earth processes. The time is now ripe to ask ourselves how we can give Earth Sciences more credit and get it firmly back on the map.

Dutch perspective

Since the 1960s the Geological Survey of the Netherlands has produced many paper-based maps of the Dutch subsurface. The whole process from data collection and field survey, interpretation of the data into complex litho- and chrono-stratigraphical systems, finally resulting in geological maps, was all done manually. Needless to say, this was a very time-consuming process. Moreover, the results could only be used by geologically trained readers.

Digital Geological Models

What has changed since is the sharp increase in use of the subsurface and, consequently, the demands of the different users. As Ebbing says, one of the new requirements is the immediate availability of and insight into the composition and properties of subsurface deposits. Therefore, generic and up-to-date digital geological models are a prerequisite to public provision, especially when these models are multipurpose and form an integral part of complex decision-making and engineering solution strategies. The digital subsurface models of the future will be multifunctional and predictive. The new quantitative GeoTOP NL 3D voxel model contains all the necessary parameters for lithology, hydrology, chemistry and geotechnics, all on a scale of 100x100x0.5 metres and with a reliability index. Of course, the scale detail of the GeoTOP model can only be achieved with an enormous quantity of core information. Indeed, having more than 400,000 digitally available core descriptions, we can count ourselves extremely fortunate in the Netherlands. The use of remote sensing techniques is one way to reduce the problem of a lower density coring network in study areas abroad.

Global perspective

In Africa, by contrast, geology is at the other end of the scale range. Here, there is no actual need for “stamp-size” subsurface models. Muhongo believes that Earth Sciences will contribute to sustainable global economic prosperity and is a global service. With the world’s population continuing to increase, claims on natural resources will further intensify over the next few decades. Therefore, Earth scientists should look for future alternative energy and renewable resources as well as making a contribution to global accessibility to fresh drinking water, sanitation and food. Disaster risk management also calls on assistance from Earth scientists to provide the necessary knowledge to predict and prevent geohazards.

The Future

The future of Earth Sciences demands a multidisciplinary approach in which the cooperation with the public and private sector, both national and international, is vital. It is only then that the public can be made aware of the necessity of Earth Sciences.

Planet Earth

Eder and De Mulder both agreed that global events like the UN International Year of Planet Earth and assigning UNESCO World Heritage predicates to areas of geological interest contribute to the revival of public interest. Together with the ongoing “Planet Earth – Earth Sciences for Society” projects, we as Earth scientists can show how essential our discipline is, both now and in the future!