

Earth Sciences in the 21st Century: A Scottish perspective

Wednesday, February 24, 2010
Salisbury Suite, Our Dynamic Earth, Edinburgh

Report Author: Rob Butler (with notes from speakers and recorder, Taija Torvela).
Co-convenors: Rod Brown, Rob Ellam, Colin Graham, Ruth Robinson, Simon Stewart,
John Underhill.
Attendees are listed separately.

Part 1: Briefing and framing issues.

A short outline for the day was given by Rob Butler. The overall mission was to scope out opportunities and challenges for research and training in the years ahead, and to begin to develop collaborations to meet them.

Butler then went on to outline the Science for Scotland document, giving a personal view of how it linked to the day's discussions. The central message is: all sectors of the Earth Science community (academia, institutes, government bodies, business) should develop partnerships thereby increasing capability and developing research and training that has increasing relevance to society.

This was followed by Vicky Hards giving an overview of the C21 Earth Science process. The idea is to prepare a c. 20 page document directed at Earth Science funders (chiefly research councils) and policy-makers. All critical documents are online at:

<http://www.bgs.ac.uk/ukgeoscience/consultation.html>

Deadline for comments on the draft document is 15th March.

Part 2: An audit of Earth Sciences in Scotland

A series of 5-10 minute presentations, interspersed with discussion, were given from various parts of the community. The speakers were: Geoffrey Boulton, Chris Hawkesworth, Colin Sanderson, Paul Dymond, Mike Duncan, Colin Graham, John Gordon, Martin Smith, Andrew Staines, Sarah Gordon, Murray Gardner, Henry Allen, Rod Graham, Roddy Muir.

These wide-ranging presentations set discussion items for the next part of the day.

Part 3. Buzz-groups.

Six mixed-background teams discussed a series of questions designed to scope out ambitions, capabilities and pathways forward. The questions discussed and briefing are outlined in the pre-workshop notes. The following comments are distilled from the reports made back to the meeting at the end of the day.

Areas of pressing research need chiefly focused on those with medium term impact on society. They can be grouped as follows:

Resource security – including the diversity of energy production (enhanced recovered of oil & gas; unconventional hydrocarbons such as coal-bed methane, shale-gas, hydrates; nuclear); economic minerals; water.

Waste management – including containment of rad-waste, other toxins (and securing water quality), carbon capture and storage.

Hazards – understanding risk and uncertainty in the Earth (including those of tectonic origin but also related to the consequence of climate change, including sea-level rise) A large number of more blue-skies research areas were identified, including the development of holistic Earth models for climate change. However, reports tended to focus on topics of the more direct societal benefit (as above).

There is a clear and present demand for capable Earth Scientists with core technical skills (especially in 3D/4D interpretation and visualization) together with reasonable numeracy and the ability to communicate. A series of employers note that the UK is not satisfying the demand for quality. Given the very large student numbers there is still an issue at what stage in a Higher Education degree structure are core skills best delivered, given the significant investments needed in staff time. The role of fieldwork (to enhance understanding and analysis of geological relationships, through techniques such as field mapping), delivered by experts, was seen as critical.

There is widespread ignorance of what Earth Science (or geology) is. what the practitioners do, and of the role of geology in society. Much can and should be done to rectify this. including getting the message out early, at High School to encourage higher-level study and careers. Nevertheless, student numbers are at an all-time high, so something's going well. More can be made of Scotland's heritage in science, "geodiversity" and the role of the extractive industries in wealth creation and technological advance.

Conclusions

There was basic agreement that tackling these issues needs a cocktail of: fundamental research; directly applicable research; sustainable delivery of competent professional Earth Scientists (equipped with core technical skills); and public understanding and appreciation of the role of Earth Science (geology). There are valuable prizes to be won – if the issues are tackled with industry. But industry will do research and acquire the training regardless of Scottish Earth Scientists, it's a global market. To compete in this market the products must be top quality – measured not against other parts of the HE sector but against industry (e.g. service providers) too. The case was made that high quality technical training is achieved only when linked with high quality research. Taking advantage of the current opportunities, this is best achieved through collaboration between different groupings of Earth Scientists, within universities, public bodies and industry. No one location has universal strength, no single university currently has the staffing to provide sufficient quality in the range of basic technical skills in Earth Sciences to satisfy the demands of the diverse range of industry and societal need. There was general agreement that there needs to be a "single voice" that provides clear statements on the above and an array of community structures (shared high-level training, co-operative research resource management, unified web-based information exchange. The next steps are to draw together the main university groups, largely to build a consensus that defines ourselves and possible ways forward, followed by integrating back with the communities represented at this event in Edinburgh (and others), to build partnerships. Individuals should feedback into the C21 with haste.

All docs and info are at: <http://www.abdn.ac.uk/geology/events/C21Scotland/>
1st March 2010.

	affiliation		buzzgroup
Henry Allen	PESGB	Senergy	IV
Ian Alsop	Univ Aberdeen		IV
Richard Bates	Univ St Andrews		AS
Geoffrey Boulton	Univ Edinburgh	CST	IV
Roderick Brown	Univ Glasgow		JH
Rob Butler	Univ Aberdeen		obs
Andrew Curtis	Univ Edinburgh		SG
Maggie Cusack	Univ Glasgow		
Mike Duncan	OPITO		DR
Paul Dymond	Oil & Gas UK		AS
Rob Ellam	SUERC		IV
Russ Evans	BGS		SG
Tony Fallick	SUERC		n/a
Adrian Finch	Univ St Andrews		DR
Murray Gardner	NERC		SS
John Gordon	SNH		JH
Sarah Gordon	Anglo American		SG
Colin Graham	Univ Edinburgh	SESEF	SG
Rod Graham	Hess		JH
Vicky Hards	BGS		obs
Chris Hawkesworth	Univ St Andrews		dep
Andrew Highton	Cen Scot Reg Gp		SS
Trevor Hoey	SAGES	Univ Glasgow	n/a
John Howe	SAMS		JH
Andy Kerr	SAGES	Univ Edinburgh	n/a
Martin Lee	Univ Glasgow		SS
Chris McDermott	Univ Edinburgh		JH
Roddy Muir	Midland Valley		SG
Joyce Neilson	Univ Aberdeen		SS
Derek Richey	BGS		DR
Colin Sanderson	ITF		SG
Zoe Shipton	Univ Glasgow		DR
Martin Smith	BGS		AS
Andrew Staines	SEPA		AS
Simon Stewart	Heriot-Watt Univ		SS
Dorrick Stow	Heriot-Watt Univ		AS
Taija Torvela	Univ Aberdeen		obs
John Underhill	Univ Edinburgh		DR
Ian Vann	Independent		IV
Rachel Wood	Univ Edinburgh		SG
apologies			
Stuart Monroe	Dynamic Earth	SSAC	
Ruth Robinson	Univ St Andrews		
Ruth Wolstenholme	SNIFFER		