



“...Sharing the geological interpretation of seismic data”.

The Virtual Seismic Atlas – revealing the structure of the Earth .

Geologists spend much time and effort predicting Earth structure – the better to understand how our planet works and to develop its natural resources efficiently. Yet the key seismic geophysical methods, the geology they reveal and the techniques used to interpret them remain the preserve of a few scientists. This exclusivity inhibits creative research, limits training opportunities for students and professionals and restricts public understanding of earth science. With the launch of the Virtual Seismic Atlas (VSA) - this is about to change. The VSA is an independent, community based resource delivered freely over the internet that captures and shares the geological interpretation of seismic data globally. It provides exciting images of the inaccessible Earth and acts as a technology showcase via a purpose-built database and bespoke search engine. The VSA offers new opportunities for earth science research and will make training at all levels more relevant to modern industry. From 20th April 2008, all will be revealed from the free internet site:

www.seismicatlas.org

Why are seismic data important?

Each year oil and gas companies spend billions of dollars making images of the geology below the Earth's surface – using controlled explosions to reflect energy back from the rocks below rather in the way that echo-sounders map the sea bed. These seismic data help the companies detect the structures that contain the hydrocarbons, allowing them to drill wells and produce these increasingly valuable resources more efficiently. The same data have revolutionized understanding of how the world's basins have formed and been filled with sediment, fundamental repositories of information on Earth History. And they are increasingly important for evaluating natural hazards, such as the instability of submarine slopes. The seismic collected by the oil and gas business represents, by a substantial margin, humanity's greatest resource of geophysical data, both in terms of volume and in financial investment.

Why have the VSA?

Seismic data are continually released for research and training, either directly to university-based geoscientists or through intermediary data “libraries”. Imagery is commonly reproduced in scientific journals and other hard-copy publications. But all these resources are dispersed. Imagine a set of postcards of, say satellite images of our planet’s surface. And these might have individual information, such as place names or geographic features labelled on them. Think how difficult it is to find information if these “postcards” are in hard copy, or even if they are digital and held on different websites. And realise just how easy it now is to find all of these images and information via GoogleEarth. This ease of access to information is what the VSA aspires to, and more – because understanding seismic images demands scientific interpretation. Our challenge has been to allow VSA users to find images not just by places but on the geology the seismic data displays. So now you can find pictures of subsurface tectonic faults, submarine canyons, mud volcanoes and even possible meteorite impact craters. It’s early days for the VSA. A preliminary collection of images and geological interpretations are online. But the design allows rapid addition of further images so that, like most on-line community internet resources, its content can grow organically.

How does the VSA work?

The VSA project is jointly run by the Universities of Aberdeen and Leeds. The VSA is effectively an on-line publishing environment. It allows everyone to browse, find and download images. Future developments will allow public authoring of content. The content of the VSA resides in an industry-standard database provided by EMC’s Documentum and is retrieved using Endeca’s information access engine (used by leading retail sites such as Tesco, Home depot, Wallmart, IBM and others). Searches generate image galleries that act as dramatic showcases for seismic data and the geological structures they reveal. The whole application package was developed from “getknowledge” an internal information management resource developed by BHPBilliton and their partners, Blue Fish Development. Blue Fish built the VSA application that exists today. The website is currently housed at the University of Leeds.

Who’s who?

The VSA is a partnership between university-based geoscientists, research institutions and broad swathes of the oil and gas industry together with information technologists. The project director is Rob Butler, Professor of Tectonics at the University of Aberdeen (previously Professor of Tectonic Geology at the University of Leeds), in conjunction with Professors Bill McCaffrey and Graham Stuart (University of Leeds). The patrons of the project are Richard Hardman (former President of the Geological Society) and David Roberts (Visiting Professor at Royal Holloway, University of London and ‘Distinguished

Advisor' of International Exploration at BP). The project is guided by an Advisory Group drawn from universities and industry.

The project has been possible due to the financial support of the UK's Natural Environment Research Council (as part of their Knowledge Transfer programme), the Petroleum Exploration Society of Great Britain and a consortium of energy companies (BG, Hess, Shell and StatoilHydro). VSA partners include Blue Fish, Endecca, BHPBilliton and EMC Documentum together with the British Geological Survey, the Geological Society and companies Badley Geoscience, CGGVeritas, Fugro and Midland Valley.

Examples

The VSA aspires to global coverage and the full range of imaged crustal geology. The current content – designed to show off the site's functionality – provides a taster of things to come. Even now it includes:

- Images of the subduction zone offshore Indonesia;
- Oil field structures from the North Sea;
- Submarine canyons in the Niger delta;
- Crustal-scale images of the Chixulub impact crater (Mexico);
- Images of now-extinct submarine volcanoes off-shore NW Britain;
- Mud volcanoes from the Caspian Sea;
- Vast gravity-collapse structures from offshore Namibia;
- and much more....

The VSA Launch

The VSA launch coincides with the Annual Meeting of the American Association of Petroleum Geologists (in San Antonio, Texas). The VSA is part of the exhibition at this conference and launches on the opening day: 20th April 2008.

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