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Structural Geology in the 21st Century: The role of a modern Geological Survey

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The British Geological Survey (BGS) is the oldest geological survey in the world, established initially as part of the Ordnance Survey and then as a single entity in its own right in 1845. The BGS is now a leading environmental research centre for the British Government providing advice to the UK government on all aspects of geoscience as well as providing impartial geological advice to industry, academia and the public. Since its inception, the role of the geological survey has evolved in line with the needs of society and advancing knowledge in the geological sciences.

While geological mapping and the description of rocks and structures must remain a core skill for any geological survey, there is an increasing demand for surveys including the BGS to apply that knowledge and understanding to practical societal issues, many of which seek to address challenges in infrastructure development and civil engineering. These challenges include reducing the risk of unforeseen ground conditions and seismic and volcanic hazard studies. The most challenging regions to work are those that are currently developed and actively being redeveloped such as in Southeast Asian megacities, where a number of subsurface developments are actively being undertaken. While there may be abundant geological data from site investigations, these are typically restrictive in their extents and resolution, and access to surface geology is limited due to the developments. In many cases there are large quantities of legacy data and multiple interpretation making it essential to draw on knowledge and experience to make predictions of the subsurface with a degree of confidence while remaining flexible enough to adapt your model and understanding to new data.

The paramount need to communicate BGS knowledge effectively across disciplines has resulted in cross-discipline learning in BGS and has changed the way the survey develops staff and students. Significantly, the role of knowledge transfer and training has extended through international collaboration as part of the British Governments Official Development Assistance funding initiative, as well as a wide range of commissioned works. Exploiting integrated geological mapping, statistical, static and dynamic modelling, as well as cross-discipline communication allows for a more robust subsurface understanding that better reflects the end users' needs. It is not sufficient simply to be a structural geologist, we need to be able to apply our structural knowledge to a broad range of issues and challenges. Equally importantly, we must communicate that knowledge and experience effectively across disciplines and cultures.