

Abstract – plenary talk.

Innovative Exploration in Papua New Guinea; past, present and future

Kevin C Hill,

Basin Genesis Hub, Earth Sciences, University of Melbourne and HillGeostructure Pty Ltd,

geokch@optusnet.com.au

Two of the recent, global gas discoveries and field extensions, Pnyang and Muruk, were in the mountainous jungle of PNG requiring innovative exploration techniques. Prior to the 1970's, PNG prospects were defined by field mapping and drilled where there was river access. Regional gravity data, refraction data and heli-supported rigs lead to drilling of wells in the Highlands in the 70's, including using slim-hole rigs, leading to major oil and gas discoveries in the 80's. These targets were almost all defined by detailed structural modelling of outcrop data as the few seismic reflection lines were of limited value. During the 90's many new techniques were tried, including passive seismic, magneto-tellurics, aeromagnetics, fission track analysis and Sr isotope dating of the Miocene limestones, as well as improved, but expensive, seismic acquisition. The modern era of enhanced exploration has been facilitated by access to high-resolution 3D digital data, particularly topographic data that has allowed meaningful static corrections to gravity, magnetics, EM and 2D seismic data as well as the construction of detailed 3D structural models. In the future, it is unlikely that reflection seismic data will significantly improve, but the order of magnitude improvements in gravity gradiometry combined with topography defined by LIDAR will make it a significant 3D exploration tool. 3D Finite element mechanical modelling of structures will become routine, constrained by new dating techniques such as limestone thermochronometry. This will facilitate 3D basin modelling and much improved exploration efficiency, likely to lead to a new wave of discoveries. The easy plays have been found. The hard plays are now increasingly detectable.

Kevin Hill biography

Kevin is a structural geologist who has over 30 years' experience in industry and academia. He worked for BP in Canada and London in their structural specialists group and completed a PhD on the PNG fold belt. He has taught at La Trobe and Melbourne Universities and consulted with many companies in Australia and SE Asia. Kevin has worked for the last 10 years with Oil Search Ltd and now teaches courses and consults throughout SE Asia, and carries out research with the Basin Genesis Hub at the University of Melbourne.