

PESA ACT Branch Shallow Gas, Gas Hydrate And Seabed Fluid Flow Workshop

The PESA ACT Branch hosted a two-day workshop by Dr Alan Judd at the Garden City Motel in Canberra during October. Dr Judd is an internationally recognised authority on seabed fluid flow and co-author with Martin Hovland of *Seabed Pockmarks and Seepage*. He is currently preparing a book titled *Seabed Fluid Flow*, for publication in 2005. Geoscience Australia sponsored Dr Judd's trip from the UK as part of its program to identify new oil provinces in frontier basins through seepage detection. The workshop was well attended, with 20 participants including staff from Geoscience Australia, CSIRO and the Australian Institute of Marine Sciences.

During the first morning, the workshop covered the origins of seabed fluids, the formation of methane-derived authigenic carbonates, seismic indications of shallow gas accumulations, and the hazard shallow gas presents to petroleum explorers. An exercise in mapping a gas-water contact around a small seismic grid provided participants with some hands-on experience in identifying shallow gas accumulations in seismic data, and calculating gas overpressure. The first day ended with a session on seabed features associated with seabed fluid flow, and included some spectacular images and video footage of pockmarks and active mud volcanoes.

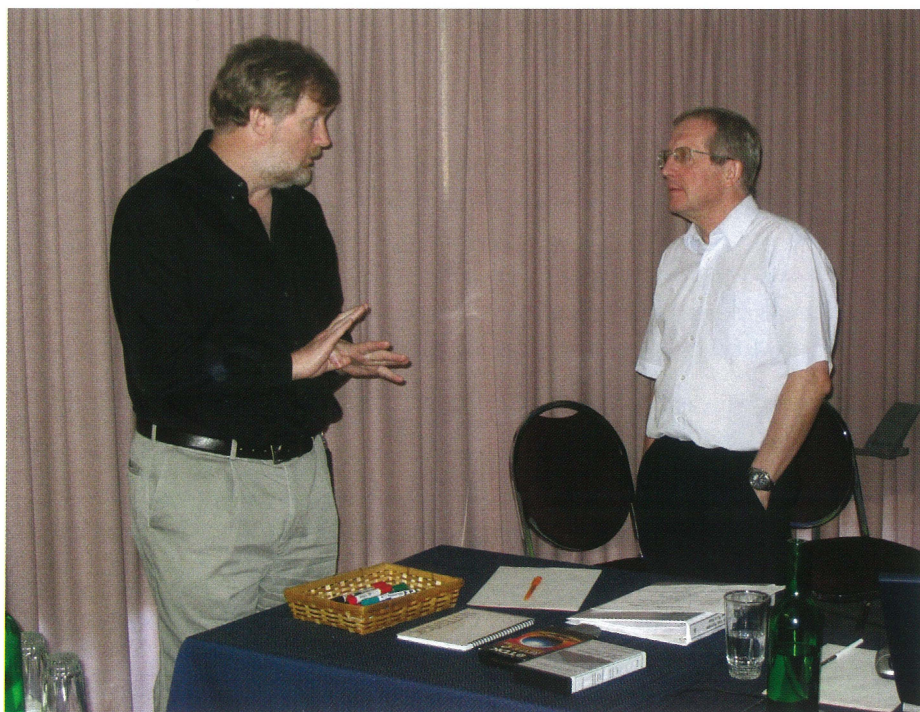
The second day of the workshop began with a session on the biological communities associated with hydrocarbon seeps, and the biological processes that produce methane-

derived authigenic carbonates. Participants were provided with a practical exercise in detecting features associated with seabed

seeps using side-scan sonar, echo sounder, sub-bottom profiler and multi-beam echo sounder data. The exercise highlighted not



Dr Alan Judd presenting his workshop



Fred Kroh (Geoscience Australia) quizzing Dr Alan Judd about acoustic detection of hydrocarbon seeps

only how these features are manifested on acoustic data, but also results that can be confused with seepage features (fish shoals, oyster mounds, spud can depressions). The workshop ended with a session on the origins, benefits and hazards associated with gas hydrates.

Key take-home messages from the workshop included: seabed fluid flow is a common phenomenon, but associated seabed features are not always obvious and easy to identify; there are numerous indicators of hydrocarbon seeps on acoustic data, however, there are also numerous ambiguities (important to use your geo logic); hydrocarbon seeps may be more influential for marine biological communities than is currently appreciated, with anaerobic oxidation of methane a fundamental biological process; and ground-truthing seabed seeps can't be undertaken through random sampling but needs to be geologically focused, with the most important tool in any survey being a set of eyes (ROV etc.) at the sample site so that it is possible to target the sampling. ■