



**SEPM RESEARCH CONFERENCE  
"OUTCROPS REVITALIZED: TOOLS, TECHNIQUES AND APPLICATION"**

Kilkee, County Clare, Ireland  
June 22-28, 2008

Conveners: Ole J. Martinsen (StatoilHydro), Morgan Sullivan (Chevron), Andy Pulham (ESACT) and Peter Haughton (University College Dublin)



More than 60 participants assembled in Kilkee, Ireland on June 22nd for the SEPM Research Conference "Outcrops revitalized: Tools, Techniques and Applications". The participants were from both academia and industry (45% industry, 55% academics), and came from Europe, United States and Canada and Australia.



Since both the use of outcrops and tools used for capturing have developed substantially in the last decade, the goal of the conference was to establish a state-of-the-art understanding in terms of the tools and techniques used and also get an overview of new applications of outcrop data.

The presentations covered a wide range of topics. The tools and techniques papers covered aspects from practical and theoretical insight into LiDAR scanning and photorealistic modelling where texture such as a digital photograph is draped onto LiDAR scanned topography, to 3D georadar data collection and interpretation, and seismic modelling. The applications presentations showed a broad range of uses, from improved understanding of clastic and carbonate systems on exploration and production scale, to structural modelling and reservoir modelling. The meeting was a unique chance to meet with professionals covering a wide range of primary disciplines with the common goal of extracting as much useful information as possible out of outcrops for improved understanding of various geological systems.

To provide the participants with a live demonstration of current outcrop data collection techniques, John Thurmond and Trond M. Johnsen of StatoilHydro and Mark Grasmueck of Miami University conducted a combined photorealistic and 3D Ground Penetrating Radar (GPR) survey on an incised valley fill sandstone outcropping near Kilkee. The participants were exposed to challenges with using such techniques, such as strong winds, rain and not least salty sea spray that hampered particularly the georadar collection. A merged dataset was created to show the capabilities of the digital data collection methods. In addition, a photorealistic model was collected over a mud diapir exposed in the cliffs near Kilkee. The mud diapir was also mentioned in the report from a classical Geologist's Association Field Conference in Kilkee in 1957 (Brindley and Gill, 1958, their p. 253) and the quest and risk of capturing its details and geometry by a classic approach are described in a very illustrious way: "In the steep cliff could be seen mounds of brecciated siltstone and shale, at least 100 ft across at the base. They were presumably indicating incipient rafting, but as the top of the sandstone was not broken, the space problem seemed difficult to solution. The President's [of the Geologist's Association (editorial note)] exploits on the cliffs in search of contact evidence revealed his remarkable agility and iron nerve". Clearly, today's digital methods remove the need

for hazardous climbing on cliffs to capture detail and needless to say neither the SEPM representative, the conveners or any participants of the Outcrops Revitalized conference indulged themselves in climbing quests that would put any oil company's or university's HSE rules into jeopardy...

This virtual diapir model was given to each participant as a demonstration and as virtual memory of the conference. While traditional observation from a nearby cliff left the observer with an unanswered question regarding the 3D shape of the mud diapir (Figs. 1-3), the photorealistic model reveals very clearly the ridge shape of the diapir. The data were collected in 1.5 hours, processed and displayed in another 2 hours with full cm-scale quantitative information and viewable from various perspectives. This example illustrated very clearly to participants the usefulness and applicability of new outcrop data collection techniques.





The Kilkee setting allowed for extensive use of the nearby Mississippian and Pennsylvanian (Late Carboniferous) world-class field analogues as catalyst for discussion and illustrations of outcrop challenges. The participants were split into several groups that visited both the deep-water sand-rich stratigraphy of the Ross Formation, the mud-rich slope succession of the Gull Island Formation and the deltaic deposits of the Tullig Cyclothem. The nearby location of the conference to extensive and easily accessible outcrops allowed for a unique flexibility to handle shifting western Irish weather.



In summary, the conference concept of combining detailed presentations of tools and techniques used in outcrop geology data collection with theoretical and practical applications illustrated by hands-on demonstrations seemed to be popular with participants. An SEPM Concepts in Sedimentary Geology book will be produced based on the technical content of the conference.





SEPM and the Convenors gratefully recognize the Conference Sponsors



StatoilHydro

