CERAMAH TEKNIK TECHNICAL TALK

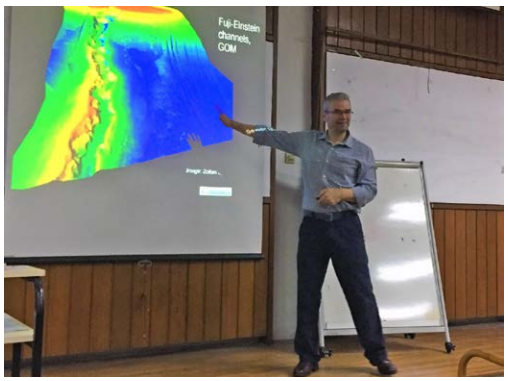
Modelling the evolution of submarine channels and their deposits

Bill McCaffrey (University of Leeds, UK)
Date: 2 November 2017
Venue: Department of Geology, University Malaya

Prof. Dr. Bill McCaffrey presented a talk on "Modelling the evolution of submarine channels and their deposits" at 3 pm, 2nd November 2017 at the Department of Geology, University of Malaya. The talk was attended by about 30 geologists from the industry, academics and graduate students. The talk started with a brief introduction on University of Leeds, particularly the Turbidites Research Group. Bill graduated with a degree in Geology from Oxford in 1987 and a PhD from Leeds in 1991 and is now Chair of Clastic Sedimentology at Leeds University and Research Director of Petroleum Leeds. His principal research interest is in deep marine clastics; he is Principal Investigator of the long-running Turbidites Research Group (TRG) joint industry project. The TRG follows field, theoretical, experimental and computation research approaches to better understand deep marine sedimentation. In addition he has interests in fluvial and shallow marine sedimentology.

Abstract: Deep marine clastic systems are volumetrically the most important sedimentary environment on the surface of the earth. Built by particulate gravity currents (turbidity currents, debris flows, hybrid flows), they can develop a bewilderingly complex array of depositional landforms, such as canyons, channels, levees and semi- or unconfined depositional lobes, and the transitions between them. On the modern sea floor and in the ancient rock record, submarine channels are seen to form in complex patterns, sometimes progressively shifting their position with time, sometimes abruptly shifting to new locations through channel avulsions. A key challenge in deep marine studies is to assess the relative roles of autogenic (internal) *vs.* allogenic (external) forcing in the development of individual submarine channels and of submarine channel networks. Here, three complementary strands of research are described that attempt, at least in part, to address some of these challenges. 1) Simple numerical models can be deployed which show that individual channel-levees are inherently unstable, and must progress to the point of avulsion without external forcing; however they are likely to become increasing sensitive to allogenic forcing as they approach their autogenic limit. 2) Combined numerical and experimental approaches show the important role that aggradational channels play in tuning the flows that traverse them, giving insights into the two-way coupling between landform and flow field. 3) Meta data studies, though in their infancy, show promise in unravelling multi-factorial influence on channel development.

Aerial photo of the submarine channels of the Gorgoglione Flysch and the village of Pietrapertosa, Southern Italy.



Warta Geologi (Newsletter of the Geological Society of Malaysia), Vol. 43, No. 4, October-December 2017