

Beyond Prediction –

A Vision of the Future of Subsurface Analysis

Dr. Michael C Daly from BP recently gave a talk in Bahrain on the titled subject. He attempted to answer questions like ‘What will geoscience look like and what, if any, will be the role of geoscientists?’ The following are a few extracts from his presentation:

Of course, no one can know or forecast the future with any degree of certainty. 2020, even 2010, is well beyond the predictable. The technologies, policies, and to a large extent even the capital stock of today, have limited value in predicting the world 10-20 years from now.

But more importantly, forecasts 20 years ahead have commonly been wrong in the past. And not just slightly wrong – we were told in the 1970’s that oil would be exhausted as a resource by the turn of the Century. Sometimes, in order to look forward, it is valuable to look back first, say 20 years to 1982 –and to recall what we didn’t foresee and what didn’t turn out as expected.

One or two of you may recall that in 1982 the price of oil averaged \$32/bbl. US oil production was over 10 million b/d and rising. Norway was only producing ½ million b/d – less than one fifth of today’s levels. China was a growing oil exporter.

The USSR – as it was then – produced over 12 million b/d. Oil demand was falling. The world was in recession – and fuel oil was being backed out frantically. OECD fuel oil consumption fell by a massive 1 million b/d alone that year.

But perhaps more importantly in 1982:

- Microsoft and Intel were not known. They did exist but I suspect that few people had heard of them. There was no Enron. New oil companies such as Petrochina and Lukoil didn’t exist.
- The deepest water where oil was being produced was about 300m in the Gulf of Mexico and 150m in the UK North Sea
- 3D seismic technology was just about to move out of research, 4D and multi-component seismic were blue sky projects. These key applications to our business problems, were still to be uncovered.
- There were of course no laptops, CDs, DVDs, or mobile phones

In reservoir terms, expectations for most existing reservoirs was for a life far shorter than has happened.

Equally, there was speculation that few giant fields remained to be found:

- Today fewer fields than anticipated have actually been abandoned,
- Recovery factors, at least in good clastic reservoirs, are commonly approaching 60%
- Many giant fields have been found. The new Deepwater Provinces of Angola, Gulf of Mexico, and the Western UK Continental Shelf have been discovered and oil is flowing.
- Each of these has demanded huge and unprecedented advances in technology that were certainly not foreseen.
- Oil prices were expected to rise in real terms (from \$32 a barrel then – which is equivalent to over \$60 in today’s money)
- Non-OPEC production was expected to rise for a few years and then peak and decline (in practice it has increased by over 10 million b/d or 40% outside the FSU)

I suspect that we could take different starting points in different decades and prove that we are always surprised by what the future brings – or perhaps better said by the Future We Create. And, for me, this is a big point, we create the future, firstly by talking about it and then by making it happen.

So, that’s why I think the theme here is interesting. The first step to the future is to talk about it. I hope that you can also see why I’m a little concerned about this talk – I can’t be right.

I could draw up a set of hard predictions. But I won’t - others may do that.

Instead I would like to talk about what occurs to me as the leading ‘technical edge’ of our science today, imaging. What it can do, and where it’s going in helping us deal with uncertainty.

This will lead us to an analogue that may help formulate our thoughts about subsurface analysis in the future. Finally, I will say a few words about how that future might be Operationalised through the ideas and concepts of e-field. And what that might mean for geoscientists.

