

Accessing the BP Petroleum Prediction Toolkit via Petrel – An Efficient Deployment of In-House Subsurface Tools

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ABSTRACT

Many oil and gas companies have built proprietary in-house predictors for rock and fluid attributes. These tools were often built by exploring large data sets for correlations that can be used in a predictive sense, or by applying insights based on first principles or experimental data. The proprietary insights are often captured in spreadsheets, and sometimes in stand-alone software tools. Within BP, both spreadsheets and stand-alone software were used to disseminate a set of predictors collectively termed the “BP Petroleum Prediction Toolkit” (BP PPT). The toolkit modules were designed to provide a consistent, yet flexible work flow for the following tasks: 1. Estimate the properties of fluids generated from source rocks depending on source rock properties and pressure – temperature paths through geologic time in 1D or 3D (Source and fluids module) 2. Estimate phases expected for these fluids depending on PVT conditions (Phase calculator) 3. Perform simple and more sophisticated estimation of seal capacity, dependent on e.g. fluid types, temperature and cap rock properties (Seal Risk Basic and Seal Risk Advanced) 4. Correct bore hole and produced fluid temperatures (Temperature estimation) 5. Unravel proportions of gases from different sources using molecular and isotopic information (Gas Unmixer) 6. Evaluate whether differences in reservoir fluid composition and pressure are due to compartmentalisation or poor fluid mixing over geologic time scales (Compartmentalization Tool). While the stand-alone toolkit was useful for carrying out these tasks, the reach of the tools required users to download and install the software, and carry out manual updates to stay up to date. A more efficient deployment of BP PPT to a large and diverse subsurface community can now be achieved by coding the tool into a Petrel plug-in, which also leverages on native capabilities in Petrel. Petrel is widely applied across different functions of the company, and global updates to the tools are managed centrally. This avoids inconsistent versions of the tools being used within the company, and no action on behalf of the user is required to get access to the tools. Map-based operations also benefit from the shared software platform. Examples of how the tool works will be presented.