



## **A quantitative assessment of repeatability in the petrographic description of carbonate sediments**

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The Dunham classification, as modified by Embry and Klovan, is the most widely-applied classification scheme for the systematic description of carbonate sedimentary rocks. Yet, despite the fact that the divisions of this scheme are so clearly defined and well-established, ambiguities in the petrographic description of thin sections still occur. Many petroleum reservoir modelling systems employ rock-typing schemes heavily biased to the allocation of a rock unit to a specific category within the Dunham classification scheme. Consistency in application of the scheme is therefore imperative. This study investigates the consistency of use of the Dunham classification across academia and industry to assess reproducibility in the petrographic description of carbonate sediments.

In order to control the petrographic parameters of the lithologies used in this study, we created a range of synthetic carbonate thin sections with known component ratios and a range of sedimentary textures spanning the Dunham classification scheme. Some of these textures were deliberately designed to be ambiguous in nature. All samples were subjected to modal analysis in order to accurately constrain component ratios and sedimentary textures.

Identical sets of blind-labelled samples were dispatched to volunteers in academia and industry. Volunteers were asked to describe the samples within the terms of the Dunham classification scheme and complete a questionnaire detailing their current employment position and academic background. The results of the completed surveys were tabulated and analysed in order to assess consistency and reproducibility in the petrographic description of carbonate rocks. Ambiguities were documented and analysed in order to constrain areas of uncertainty in the application of the Dunham classification. Based upon the findings of these data, clarifications to the Dunham classification scheme are proposed.