Development of a Seabed Geomorphology classification approach; aspiring towards a robust tool to support comprehensive and consistent seabed mapping

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In 2016, through a collaboration between marine mapping programmes in Norway, Ireland, and the UK, we published a new classification scheme to aid the characterisation of seabed geomorphology (Dove et al., 2016). The classification scheme was developed to address shared objectives and challenges in seabed mapping, particularly to enable more consistent classification where required. The novel aspect of this framework was the effort to independently describe seabed features according to their observed physical (1-Morphology), and the more subjective interpretation of their origin and evolution (2-Geomorphology). Initial application of the approach within our own groups and externally proved promising, and through the welcome involvement of colleagues from Geoscience Australia, we continued to progress and improve the approach.

We are now within the second phase of the project, which involves the development of glossaries for both parts of the classification scheme. The glossary for part-1 Morphology was recently completed and published (Dove et al., 2020). This glossary includes a revised list of feature names, with definitions and representative diagrams for each feature. Feature definitions are in-part drawn from the International Hydrographic Organization (IHO) guide for undersea feature names, which were modified and augmented with additional terms to ensure the final feature catalogue and glossary encompasses the diversity of morphologies observed at the seabed.

Part-2 Geomorphology glossary is now in development. We anticipate it to be more complicated than the Morphology glossary due to the (often) variable meaning of different terms between different fields and individual scientists. But as for Part 1, our primary objective is to produce a useful and robust framework (applicable from the coastal zone to the abyss), that minimises duplication and/or ambiguity as much as possible. The Geomorphology glossary will include example bathymetry images to add further value.

Dove, D., Bradwell, T., Carter, G., Cotterill, C., Gafeira Goncalves, J., Green, S., Krabbendam, M.,
Mellett, C., Stevenson, A., Stewart, H. and Westhead, K., Scott, G., Guinan, J., Judge, M., Monteys, X.,
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1: morphology features glossary.