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Geohazards Assessment, Data Integration and Visualization via ArcGIS

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Geohazards are geological features on the seafloor or in the subsurface that may pose drilling and/or development-related issues (e.g. infrastructure placement). Geohazards are conventionally assessed qualitatively via seismic interpretation and the evaluation of site survey geophysical data such as high resolution 2D seismic, multibeam bathymetry and side scan sonar. ArcGIS technology enables improved analysis of geohazards through spatial analyst tools and data integration. The Shell UIA Geohazards Team has developed several improved methods of assessing geohazards via ArcGIS that simplify standard procedures and accelerate project delivery.

ArcGIS integrated methodologies include: 1) geohazards screening tool for the Northwest Borneo region, 2) geohazards risk assessment workflow, and 3) techniques for predictive mapping of seafloor habitats. The screening tool leverages on advanced ArcGIS data management practices and improves accessibility of historical geohazards information. As a result, the geohazards screening tool enables rapid preliminary screening of geohazards for exploration and development planning. The geohazards risk assessment workflow provides risk quantification at any given location within an evaluated area through a weighted risk map deliverable. The weighted risk map improves geohazards visualization and understanding of areas by combining multiple risks into a single ranked risk layer. ArcGIS has also enabled extrapolated mapping of seafloor biological habitats by integrating environmental data with seafloor geophysical data. The outcome is the extension of seafloor habitat information beyond existing environmental data points to minimize environmental impact of infrastructure and wells.

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