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Current induced seabed features along the eastern Rockall Trough, NE Atlantic – an interpretation of TOBI side-scan sonar imagery

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The Rockall Trough, located west of Ireland, bordered by the Rockall Bank in the west and the Porcupine Bank in the east, has been intensively studied during the last decade. Numerous seabed structures were discovered along its eastern and western margin including cold-water coral covered carbonate mounds. The investigations in the Rockall Trough also included TOBI 30 kHz sidescan sonar surveys along its eastern margin. The TOBI data (TOBI stands for 'Towed Ocean Bottom Instrument') revealed that this margin is characterised by an inhomogeneous and complex topography. Mound, scarp and hedge structures can be found, often associated with cold-water corals. Furthermore, hardgrounds, outcrops of banked carbonates observed with ROVs and sediment waves occur, indicating erosion and sediment movement. All of the previously mentioned features are the result of, or affected by, strong bottom currents. Maps based on TOBI data display that most of the pronounced features (e.g. scarps and mound chains) strike parallel to the contours thus parallel to the northward oriented shelf edge current. Sediment waves manly strike slope-parallel indicating across-slope currents. In addition, oblique structures can be found which are neither parallel nor perpendicular to the slope. These complex patterns are probably the expression of the interplay of different bottom currents (main flow, tidal currents). As the spatial effects of these currents remain largely unknown, this study interprets the observed seabed features to reconstruct the prevailing relative bottom current velocities (direction and intensity) along the eastern Rockall Trough margin.

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