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Acoustic Seabed Characterization of the Porcupine Bank, Irish Margin

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The Porcupine Bank represents a large section of continental shelf situated west of the Irish landmass, located in water depths ranging between 150 and 500m. Under the Irish National Seabed Survey (INSS 1999-2006) this area was comprehensively mapped, generating multiple acoustic datasets including high resolution multibeam echosounder data. The unique nature of the area's datasets in terms of data density, consistency and geographic extent has allowed the development of a large-scale integrated physical characterization of the Porcupine Bank for multidisciplinary applications. Integrated analysis of backscatter and bathymetry data has resulted in a baseline delineation of sediment distribution, seabed geology and geomorphological features on the bank, along with an inclusive set of related database information. The methodology used incorporates a variety of statistical techniques which are necessary in isolating sonar system artefacts and addressing sonar geometry related issues. A number of acoustic backscatter parameters at several angles of incidence have been analysed in order to complement the characterization for both surface and subsurface sediments. Acoustic sub bottom records have also been incorporated in order to investigate the physical characteristics of certain features on the Porcupine Bank. Where available, groundtruthing information in terms of sediment samples, video footage and cores has been applied to add physical descriptors and validation to the characterization. Extensive mapping of different rock outcrops, sediment drifts, seabed features and other geological classes has been achieved using this methodology.