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Potential influence of shells on multibeam backscatter imagery
within the Te Matuku Marine Reserve, New Zealand

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Backscatter imagery from a KONGSBERG EM3000 multibeam echosounder (300kHz) has been analyzed to investigate its potential for benthic habitat mapping. A MATLAB code has been developed to process both bathymetry and coregistered echo-strength, which includes a simple correction to remove the typical multibeam echo strength swathe contrast introduced by the backscatter incident-angle dependence. Although the correction algorithm does not completely remove the effect, it is sufficient to generate maps of suitable quality for further analysis. The processing code was applied to a dataset from a survey performed on two sites in the Tamaki Strait, New Zealand, in August 2007, including a section of the Te Matuku marine reserve. Within the marine reserve, a 400m² area displays a strong reflectivity that contrasts with its surroundings while a past ground-truth data collection shows the full area is dominated by mud with only some differences in shell fragments distribution. Hypotheses to explain the origin of this reflectivity contrast are formulated and verified against past sediment and benthic survey results with emphasis on the potential influence of shells on multibeam backscatter. The potential of multibeam surveying for detecting the coverage of shells patches in benthic habitat mapping is discussed.