MAPPING WITH MULTIBEAM DATA : HOW MUCH DATA DO WE REALLY NEED ?

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As more and more multibeam data becomes available, researchers / cartographers are interested in how to use this data for mapping. As in most software products gridding techniques are applied for mapping the multibeam sampling data. A common known gridding technique is a local interpolator called the inverse distance weighing model. This model predicts values based on local surrounding data points, giving each data point a weighing factor based on a simple function of the distance between the data point and the predicted point. The settings of the model are thus the number of data points used for the prediction, the way these points are gathered (in a simple, quadrant or octant search), the weighing function and the anisotropy ratio of the area under study. Looking for the ideal model settings is part of our research.

A second research item concerns the data density. In shallow waters, like the Belgian continental shelf, multibeam registrations are characterized by a high density of data points. The processing of this huge amount of data is a time consuming task. We pose ourselves the question how much of this data we really need for mapping ?

In this case study several data files differing in data point density are put together. The central part of the Kwintebank, a sandbank in front of the Belgian coast, has been selected for the necessary data acquisition. The relief of this typical sandbank is characterized by the presence of sand waves on top of the general elongated bank structure.

Our research hypotheses states that there is an interaction between the model settings, the available data (or data density) and the relief. In search of the ideal settings of the gridding model, in function of the data density, we are looking for an explanation or theory applicable to the mapping of submarine reliefs.