"THE EFFECTS OF USING DIFFERENT ALGORITHMS FOR CALCULATING THE FOOT OF SLOPE BASED ON THE MAXIMUM CHANGE OF GRADIENT"

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Abstract

The extent of the outer limit of the continental shelf of a coastal state is greatly dependent on the placement of the foot of the continental slope. Both the Gardiner line (based on sediment thickness) and the distance formulae line (foot of slope + 60M), which are possible extensions to the continental shelf, are based on an interpretation of the foot of slope points.

UNCLOS Article 76 defines the foot of slope as: "4. (b) In the absence of evidence to the contrary, the foot of the continental slope shall be determined as the point of maximum change in the gradient at its base."

This article discusses the maximum change of gradient of bathymetric profiles and why this point may not be as unique in a real case, as it may seem from a theoretical point of view. Different algorithms for determining the maximum change of gradient will be presented. Also we will see how the choice of algorithm and the algorithm's parameter settings affects the placement of the foot of slope point.

The article describes some common pitfalls one should avoid when computing the change of gradient in a real case, along with a new approach for calculating the maximum change of gradient. This algorithm gives good and stable results in most cases.

The Geocap software package with its bathymetric profile analysis tool is used to examine the different algorithms.