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Uncertainty in predictions of seabed sediment classes based on grab samples and acoustic data

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Mapping seabed habitats is an essential prerequisite to policy and management decisions. The texture of the seabed sediments, defined with respect to the proportions of gravel, sand and mud size fractions, is a basic property that distinguishes sedimentary seabed habitats under the EUNIS habitat classification scheme. EUNIS sediment habitats are defined on this 2-D texture triangle. The composition of the seabed sediments at an unsampled site can be predicted by additive log-ratio cokriging from grab samples, and it is possible to include acoustic backscatter and bathymetry data to improve the precision of these predictions. In this presentation we shall show how this is achieved. The prediction distribution on the texture triangle can be summarized to express the uncertainty of these kriging predictions. Probabilities can be computed for each EUNIS texture class, and the uncertainty expressed with respect either to the probability of the most probable class, or the information content of the set of class probabilities summarized by their entropy.