EGU21-7521, updated on 04 Mar 2021
https://doi.org/10.5194/egusphere-egu21-7521
EGU General Assembly 2021

Mapping gravel beds combining multibeam data, underwater video, and grab samples with continuous spatial modeling by random forest

Giacomo Montereale Gavazzi, Vera Van Lancker, and Steven Degraer

Royal Belgian Institute of Natural Sciences, Operational Directorate Nature, Bruxelles, Belgium (gmonterealegavazzi@naturalsciences.be)

In this study, high-resolution (1 m) multibeam echosounder system (MBES) primary data and derivatives, optical images by underwater video drop-frame, and Hamon grab sediment samples, all acquired within 32 km^2 of seafloor in offshore Belgian Waters, were integrated to produce a random forest spatial model targeting the prediction of the continuous surficial distribution of gravel %, i.e., a substrate category whose known detailed distribution is central to the environmental stewardship of natural gravel bed (aka stony reef) habitat. MBES bathymetry and backscatter, reveal explicit details of the seafloor topography and texture, allowing the derivation of secondary variables that are important in the classification process. Underwater video and grab samples provide the means to directly observe the nature and distribution of the response variable. The model output is presented along with a protocol of error and uncertainty estimation, providing detailed information of the gravel spatial distribution that would otherwise remain undetected by categorical-type classifications, focused on predefined habitat classification schemes. Targeting the methodological improvement of this mapping approach, an overview of the limitations identified at the various steps of the acoustic seafloor classification (ASC) pipeline is presented.

How to cite: Montereale Gavazzi, G., Van Lancker, V., and Degraer, S.: Mapping gravel beds combining multibeam data, underwater video, and grab samples with continuous spatial modeling by random forest, EGU General Assembly 2021, online, 19–30 Apr 2021, EGU21-7521, https://doi.org/10.5194/egusphere-egu21-7521, 2021.