{rokbox title=|Location of the Shallow Field of Fluid Expulsion :: Image: Authors| thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-deep-sea-habitat-characterization-gazul-mud-volcano-cadiz-urra-et-al-2020-thumb.jpg|}images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-deep-sea-habitat-characterization-gazul-mud-volcano-cadiz-urra-et-al-2020.jpg{/rokbox}

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Patricia Puerta
, Jesús Rivera, Lea-Anne Henry, José L. Rueda, 2020.
Deep-sea habitat characterization using acoustic data and underwater imagery in Gazul mud volcano (Gulf of Cádiz, NE Atlantic).
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Abstract: Gazul is the shallowest mud volcano (MV) within the Shallow Field of Fluid Expulsion (SFFE) of the northeastern Gulf of Cádiz (NE Atlantic; 300–1200 m depth). The SFFE represents an important geo- and biodiversity area that was designated as a Site of Community Importance under the European Habitats Directive in 2014. In this study, geological features, habitats and associated biodiversity, as well as anthropogenic impacts, were characterized at Gazul MV from underwater imagery and multibeam bathymetry. Multivariate methods using the Bray-Curtis similarity index identified six main habitats, each of which harbored a characteristic faunal assemblage that included: (1) sandy ripple bottoms typified by the actiniarian *Actinauge richardi*; (2) sandy, muddy, coarse sand and bioclastic bottoms dominated by the solitary coral *Flabellum chunii*; (3) coarse sand and bioclastic bottoms, together with soft sediments covered by scattered methane-derived authigenic carbonates (MDACs) (mixed bottoms), characterized by the echinoid *Cidaris cidaris*; (4) hard bottoms comprising MDACs dominated by a wide variety of sponges and gorgonians; (5) coral-rubble bottoms typified by the presence of colonial scleractinian communities dominated by *Madrepora oculata*; and (6) mixed bottoms characterized by the presence of a styelid ascidian. Slope and water depth were the main factors explaining assemblages' distribution, which was also supported by the presence of MDACs such as slabs, crusts and chimneys on the seafloor, as well as by the geomorphologic diversity of Gazul MV. The results highlight Gazul MV as an eco-biologically

important area harboring different vulnerable marine ecosystem (VME) elements with indicator taxa such as scleractinians, sponges, gorgonians and black corals. ROV images revealed abandoned or lost fishing gears and marine debris on the seafloor, indicating anthropogenic impacts in Gazul MV and adjacent areas. Indeed trawling fisheries activities have also been detected in Vessel Monitoring System datasets. A fishery restricted area is recommended in Gazul MV due to the occurrence of diverse VMEs and species included in different conservation directives and conventions.

Keywords: Benthic communities, Conservation, Deep-sea habitats, Mud volcano, ROV, Vulnerable marine ecosystem