**Table 1.** Environmental variables used in the present study, with their names, short description and general category. The layer source is also provided. Further detailed information can also be found in **Table S2**.

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| --- | --- | --- | --- | --- |
| **a/a** | **Variable\_Name** | **Description** | **Categories** | **Source** |
| 1 | bathymetry | Depth of the seafloor (m) | topography | MARSPEC |
| 2 | biogeo01 | East/West Aspect (radians) | topography | MARSPEC |
| 3 | biogeo02 | North/South Aspect (radians) | topography | MARSPEC |
| 4 | biogeo03 | Plan Curvature | topography | MARSPEC |
| 5 | biogeo04 | Profile Curvature | topography | MARSPEC |
| 6 | biogeo05 | Distance to Shore (km) | topography | MARSPEC |
| 7 | biogeo06 | Bathymetric Slope (degrees) | topography | MARSPEC |
| 8 | biogeo07 | Concavity (degrees) | topography | MARSPEC |
| 9 | biogeo08 | Mean Annual SSS (psu) | salinity | MARSPEC |
| 10 | biogeo09 | SSS of the freshest month (psu) | salinity | MARSPEC |
| 11 | biogeo10 | SSS of the saltiest month (psu) | salinity | MARSPEC |
| 12 | biogeo11 | Annual range in SSS (psu) | salinity | MARSPEC |
| 13 | biogeo12 | Annual variance in SSS (psu) | salinity | MARSPEC |
| 14 | biogeo13 | Mean Annual SST (°C) | temperature | MARSPEC |
| 15 | biogeo14 | SST of the coldest month (°C) | temperature | MARSPEC |
| 16 | biogeo15 | SST of the warmest month (°C) | temperature | MARSPEC |
| 17 | biogeo16 | Annual range in SST (°C) | temperature | MARSPEC |
| 18 | biogeo17 | Annual variance in SST (°C) | temperature | MARSPEC |
| 19 | tot\_impact | total impact: a combination of the sst\_tr26 and sst\_tr19 products | temperature | Ramirez et al. 2018; 2021 |
| 20 | sst\_tr26 | sst\_trend\_1982\_2019: number of days with SST >26oC threshold | temperature | Ramirez et al. 2018; 2021 |
| 21 | sst\_tr19 | sst\_trend\_1982\_2019: number of days with SST >19oC threshold | temperature | Ramirez et al. 2018; 2021 |
| 22 | sst\_tr12 | sst\_trend\_1982\_2019: number of days with SST <12oC | temperature | Ramirez et al. 2018; 2021 |
| 23 | sst\_min\_sl | sst\_min1982\_2019\_slopes: minimum annual SST | temperature | Ramirez et al. 2018; 2021 |
| 24 | sst\_m\_slwi | sst\_mean1982\_2019\_slopes\_wint: mean annual SST during winter (January 1st to March 31th) | temperature | Ramirez et al. 2018; 2021 |
| 25 | sst\_m\_sl | sst\_mean1982\_2019\_slopes: mean annual SST | temperature | Ramirez et al. 2018; 2021 |
| 26 | sst\_max\_sl | sst\_max1982\_2019\_slopes: maximum annual SST | temperature | Ramirez et al. 2018; 2021 |
| 27 | fishing\_ef | fishing effort (Global Fishing Watch 2012-2016) | Human pressure | Ramirez et al. 2018; 2021 |
| 28 | PLD\_60 | designation of distinct hydrodynamical provinces and connectivity through larval dispersal | biology | Rossi et al. 2014 |
| 29 | Mesopelag | Biogeochemical mesopelagic regions | biology | Reygondeau et al. 2017 |
| 30 | Bathypelag | Biogeochemical bathypelagic regions | biology | Reygondeau et al. 2017 |
| 31 | EcoReg | ecoregionalisation, considering the biological components of the Mediterranean ecosystems | biology | Reygondeau et al. 2014 |
| 32 | BioReg | Biogeochemical epipelagic regions | biology | Reygondeau t al. 2017 |
| 33 | ClusterCli | phenology and interannual variability of surface chlorophyll concentration | climatology | Mayot et al. 2016 |
| 34 | windspeed | Wind Speed | climatology | GMED |
| 35 | surcurrent | Surface Current | climatology | GMED |
| 36 | sst\_mayoct | Summer temperature | temperature | GMED |
| 37 | salinity | salinity | salinity | GMED |
| 38 | primprod | primary productivity | chemicals | GMED |
| 39 | parmean | PAR mean (Photosynthetically Active Radiation) | climatology | GMED |
| 40 | o2saturate | saturated oxygen | chemicals | GMED |
| 41 | nitrate | nitrate | nutrients | GMED |
| 42 | calcite | calcite | nutrients | GMED |
| 43 | btemp | Water Column temperature | temperature | GMED |
| 44 | bsilicate | bottom silicate | nutrients | GMED |
| 45 | bphosphate | Bottom phosphate | nutrients | GMED |
| 46 | bo2utilize | Bottom Utilized Oxygen | nutrients | GMED |
| 47 | bo2dissolv | Bottom dissolved oxygen | nutrients | GMED |
| 48 | bnitrate | bottom nitrate | nutrients | GMED |
| 49 | bedtemp | Seabed temperature | temperature | GMED |
| 50 | Berline | regionalization solely based on connectivity due to ocean currents | climatology | Berline et al. 2014 |
| 51 | Raw\_CluCli | raw phenology and interannual variability of surface chlorophyll concentration | climatology | Mayot et al. 2016 |
| 52 | FrontiersS | synthesis congruence smoothed | frontiers | Ayata et al. 2018 |
| 53 | Currents | Kinetic energy due to currents at the seabed in the Mediterranean Sea | climatology | EMODNET |
| 54 | bo\_ph | pH | chemicals | GMED |