EFH Project - Processed input datasets

Dataset name (CSV format):

Cod\_S\_running

Content description:

Dataset of fish catch and environmental variables for fish survey hauls undertaken in UK waters between 2010-2020, used as input data for EFH modelling of Spawning habitat for Cod, Gadus morhua.

Fish data only refer to Cod spawning ('running') individuals (identified based on spawning maturity- age-length keys (SMALK) available for the selected catch data from Datras database) occurring in the catches (quarter Q1 only) from International Bottom Trawl Surveys (IBTS, incl. NS-IBTS, SCOWCGFS) undertaken by different countries in waters around the UK, under ICES coordination.

The environmental variables associated with each survey event have been extracted from relevant environmental data layers.

Dataset structure:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Heading | Description | Variable type | Unit/categories (incl. NA where no data) | Source |
| Species\_EFH\_stage | Species, EFH function, and life stage the fish survey data refer to (= file name) | Categorical (nominal) | Category defined by combination of species (common name, e.g. Anglerfish), EFH function (R for refugia, N for nursery, s for spawning), and indicator life stage (including max body size cut-off for juveniles in nursery, life stage as early stage egg (EG1) or 'running' adult for spawning, all life stage/sizes for refugia) | - |
| Haul-ID | Index identifying survey haul, as a combination of survey name, date, latitude and longitude | Categorical (nominal) | Category defined by combination of survey name (e.g. SIAMISS, NS-IBTS), haul event (date, as number), haul locatiopn (latitude and longitude, as deg N and deg E WGS 1984, respectively) | - |
| Survey | Survey code | Categorical (nominal) | BTS; EVHOE, IE-IGFS, NS-IBTS, SCOROC, SCOWCGFS; MEGS (codes and explanations from ICES vocabularies - https://vocab.ices.dk/); East\_Coast (from sandeel dredge dataset) | Original survey dataset |
| Country | Country code (for ICES surveys only) | Categorical (nominal) | BE, DE, DK, FR, FO, GB, GB-SCT, IS, IE, NL, NO (codes and explanations from ICES vocabularies - https://vocab.ices.dk/) | Original survey dataset |
| Ship | Ship code (for ICES surveys only) | Categorical (nominal) | (codes and explanations from ICES vocabularies - https://vocab.ices.dk/) | Original survey dataset |
| Quarter\_AF | Haul event, Quarter; derived from Date | Categorical (nominal) | 1, 2, 3, 4 | Derived from original survey dataset |
| Date | Haul event, Date | Numeric (discrete) | [date in numerical format] | Original survey dataset |
| Day | Haul event, Day; derived from Date | Numeric (discrete) | Day number (1-31) | Derived from original survey dataset |
| Month | Haul event, Month; derived from Date | Numeric (discrete) | Month number (1-12) | Derived from original survey dataset |
| Year | Haul event, Year; derived from Date | Numeric (discrete) | Year | Derived from original survey dataset |
| HaulNo (or HaulID) | Haul identification number/code (as allocated in original survey dataset) | Categorical (nominal) | - | Original survey dataset |
| Gear | Sampling gear | Categorical (nominal) | BT4A, BT4AI, BT4S, BT7, BT8; GOV; BGN60, Gulf7, NACKTHAI (codes and explanations from ICES vocabularies - https://vocab.ices.dk/) | Original survey dataset |
| DayNight | Haul event, timing | Categorical (nominal) | Day (D), Night (N) | Original survey dataset |
| ShootLong (or StartLongi) | Haul location (shooting point), latitude (WGS 1984) | Numeric (continuous) | deg N | Original survey dataset |
| ShootLat (or StartLatit) | Haul location (shooting point), longitude (WGS 1984) | Numeric (continuous) | deg E | Original survey dataset |
| LAT | Haul location (central point), latitude (WGS 1984); calculated as mean between shooting and hauling locations from original dataset | Numeric (continuous) | deg N | Calculated from original survey dataset |
| LONG | Haul location (central point), longitude (WGS 1984); calculated as mean between shooting and hauling locations from original dataset | Numeric (continuous) | deg E | Calculated from original survey dataset |
| CPUE | Catch per Unit Effort, individuals of the species and life stage of interest only | Numeric (continuous) | individuals per hour per haul | Calculated from original survey dataset |
| PA | Presence/absence of individuals of the species and life stage of interest in the haul | Categorical (ordinal) | 1 (presence), 0 (absence) | Derived from original survey dataset |
| PAaggr | Presence/absence of aggregations of individuals of the species and life stage of interest (i.e. at top quartile CPUE) of the species in the haul | Categorical (ordinal) | 1 (presence), 0 (absence) | Derived from original survey dataset |
| Depth | Water depth (bathymetry), at haul location | Numeric (continuous) | meters (m) | Derived from EMODnet Bathymetry 2020 |
| Bathy\_Conf | Quality index (CQI)of the bathymetric data product (from Emodnet quality assessment) based on accuracy of the bathymetric survey, temporal representativity/consistency, completeness, age of the survey (four separate QIs (scores) then combined (summed) in a single one (CQI)) (see more details in 'data Emodnet\_bathymetry\_quality-index\_application\_version05022021.pdf', from emodnet-bathymetry.eu) | Numeric (continuous) | - | Derived from EMODnet Bathymetry 2020 |
| SST | Sea surface temperature, at haul location and mean for relevant month and year of survey | Numeric (continuous) | Celsius degrees | Calculated from E.U. Copernicus Marine Service layer (sea\_water\_potential\_temperature (SST) - Data) |
| SBT | Sea bottom temperature, at haul location and mean for relevant month and year of survey | Numeric (continuous) | Celsius degrees | Calculated from E.U. Copernicus Marine Service (sea\_water\_potential\_temperature\_at\_sea\_floor (BT) Data) |
| NPPV | Net Primary Production (Carbon per unit volume of seawater), at haul location and mean for relevant month and year of survey | Numeric (continuous) | mg C m-3 day-1 | Calculated from E.U. Copernicus Marine Service (net\_primary\_production\_of\_biomass\_expressed\_as\_carbon\_per\_unit\_volume\_in\_sea\_water (PP)/(NPPV) - Data) |
| SSS | Sea surface salinity, at haul location and mean for relevant month and year of survey | Numeric (continuous) | PSU | Calculated from E.U. Copernicus Marine Service (sea\_water\_salinity (SSS) Data) |
| MLT | Mixed layer thickness, at haul location and mean for relevant month and year of survey; corresponding to Mixed Layer Depth (MLD) in source layer, calculated from profiles with the density criteria (MLD defined as the depth at which density difference from the surface reaches 0.02 kg/m3) and temperature criteria (MLD defined as the depth at which temperature difference from the surface reaches 0.2°C) | Numeric (continuous) | meters (m) | Calculated from E.U. Copernicus Marine Service (ocean\_mixed\_layer\_thickness\_defined\_by\_sigma\_theta - Data) |
| Dist | Distance from coast, linear distance from high water level | Numeric (continuous) | meters (m) | Measured from EMODnet (satellite derived, high resolution product) |
| ICESarea | ICES Area code | Categorical (nominal) | [ICES Area code] | From ICES Metadata Catalogue |
| CUR | Currents, kinetic energy at seabed at haul location; from source dataset, as 90th percentile Kinetic Energy due to currents at the seabed in the Atlantic Sea (see https://gis.ices.dk/geonetwork/geonetwork/api/records/d72bfeca-ceb5-4faa-b7b0-e95db8c6310b) | Numeric (continuous) | N m2/s | Derived from EMODnet 2017 |
| CUR\_Conf | Confidence associated to CUR at haul location; from sourse dataset | Categorical (ordinal) | 1 to 3 | Derived from EMODnet 2017 |
| WAV | Waves, kinetic energy at seabed at haul location; from source dataset, as Kinetic energy at the seabed due to waves - Celtic, North Sea (mean of annual 90th percentile) (see http://gis.ices.dk/geonetwork/srv/eng/catalog.search#/metadata/2a2659c4-ce1b-4feb-81cf-a2bcbc362a3f) | Numeric (continuous) | N m2/s | Derived from EMODnet 2019 |
| WAV\_Conf | Confidence associated to WAV value at haul location; from sourse dataset | Categorical (ordinal) | 1 to 3 | Derived from EMODnet 2019 |
| SandbH01 | Presence of Sandbank Habitat within 5 km of haul location | Categorical (ordinal) | 1 (presence), 0 (absence) | Derived from a combination of source layers, incl. OSPAR 2020, EMODnet Seabed Habitats 2019, GEMS 2019 |
| StructH01 | Presence of Structured Habitats within 5 km of haul location; structured habitats include reefs (various types), mussel/oyster beds, Sabellaria8, Lophelia, corals, rocky walls, coral gardens etc | Categorical (ordinal) | 1 (presence), 0 (absence) | Derived from a combination of source layers, incl. OSPAR 2020, EMODnet Seabed Habitats 2019, GEMS 2019 |
| VegH01 | Presence of Vegetated Habitats within 5 km of haul location; vegetated habitats include including kelp and seaweed, maerl beds, and seagrass beds | Categorical (ordinal) | 1 (presence), 0 (absence) | Derived from a combination of source layers, incl. OSPAR 2020, EMODnet Seabed Habitats 2019, GEMS 2019 |
| Slope | Mean slope across 5 km buffer around haul location | Numeric (continuous) | degrees | Calculated from EMODnet Bathymetry 2020 |
| Substr\_OLD | Substratum type, predominant type within 5 km of haul location (from EMODnet Seabed Habitats 2017) | Categorical (nominal) | Coarse substrate/sediment (Coarse), Sand (Sand), Sandy mud (sMud), Sandy mud or Muddy sand (sMud\_mSand), Muddy sand (mSand), Fine mud or Sandy mud or Muddy sand (f-sMud\_mSand), Fine mud (fMud), Mixed sediment (Mixed), Sediment (unclassified; Sed), Rock or other hard substrata (RockHard), Sabellaria spinulosa reefs (ssReef), Worm reefs (wReef) | Calculated from EMODnet Seabed Habitats 2017 |
| Substr\_Conf\_OLD | Confidence associated to Substr at haul location (from EMODnet Seabed Habitats 2017) | Categorical (ordinal) | 1 to 3 | Derived from EMODnet Seabed Habitats 2017 |
| Substr | with INFOMAR to fill gaps) | Categorical (nominal) | Coarse substrate/sediment (Coarse), Sand (Sand), Sandy mud (sMud), Sandy mud or Muddy sand (sMud\_mSand), Muddy sand (mSand), Fine mud or Sandy mud or Muddy sand (f-sMud\_mSand), Fine mud (fMud), Mixed sediment (Mixed), Sediment (unclassified; Sed), Rock or other hard substrata (RockHard), Sabellaria spinulosa reefs (ssReef), Worm reefs (wReef) | Calculated from EMODnet Seabed Habitats 2017 and INFOMAR |