Modelling Arctic oceanographic connectivity
to further develop PAME's MPA toolbox – description of available data

For the background of data production and data interpretation we refer to the PAME report "Modelling Arctic oceanographic connectivity to further develop PAME's MPA toolbox".

The uploaded data consist of two main types:

1. Connectivity matrices describing the seascape connectivity in the model domain consisting of 40893 model grid cells. The connectivity matrices describe the probability of dispersal between any two selected model grid cells.
2. GIS shape files of dispersal distance (km) from each model grid cell within the model domain.

1. Connectivity matrices

The dataset consists of 112 connectivity matrices produced by the oceanographic model Arctic4, and 14 connectivity matrices produced by the oceanographic model TOPAZ. The connectivity matrices are found in two .zip archives: 'PAME Arctic4 CM.zip' and 'PAME TOPAZ CM.zip'. The Arctic4 matrices are means for the period 2007 to 2016, and the TOPAZ matrices for the period 1991 to 2015. Both sets are divided into one set for the warm season (March to October) and one set for the cold season (November to February). The Arctic4 matrices cover dispersal at the depths: 0, 10, 15, 30, 50, 70, 100, and 150 m, and for the Pelagic Larval Duration (PLD) of: 5, 10, 15, 30, 45, 60 and 90 days. The TOPAZ matrices are only available for the surface (0 m) and for the PLDs: 5, 10, 15, 30, 45, 60 and 90 days. Complete lists of all connectivity matrices are found in the file 'Matrix file list.xlsx'.

The connectivity matrices describe the dispersal probability (0 to 1) between all 40893 model grid cells within the selected Arctic Ocean domain (depth ≤500 m). The elements in the connectivity matrix are read as the probability of dispersal from the grid cell specified by the column number to the grid cell specified by the row number, i.e. "from column to row". The geographic coordinates of row and column number are found in the file 'Matrix file list.xlsx', given as longitude and latitude in decimal degrees (grid cell centers).

All matrices are stored as Matlab binary files (.mat).

2. Shape files of dispersal distance

Shape files showing the geographic distribution of modelled, mean dispersal distance are found in the .zip archive 'PAME GIS layers.zip'. For each grid cell in the model domain a mean dispersal distance (km) has been calculated and these data are found in a set of shape files in two zip-archives. One archive 'Distance with depth shapefiles' gives dispersal distance for larval drift during 30 days at the depths: 0, 10, 15, 30, 50, 100 and 150 m. The second archive 'Distance with PLD shapefiles' gives dispersal distance for larval drift at 10 m depth for the PLDs: 5, 15, 30, 45, 60

and 90 days. The coordinate system used is Coordinate system: WGS 84 / IBCAO Polar Stereographic EPSG:3996.

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