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| Overview of the files used in model simulations (located in the ‘src’ folder) | |
| **.csv files** |  |
| paras | This is the dataset containing all the adjustable parameters required by the model. **Fill with the desired parameters values before running a simulation.** Each row will be used for one iteration. See *Guide paras* document for full description. |
| farms.week1 | List of farms used in simulation. Includes ID numbers, latitudes and longitudes, number of salmon per farm, and average lice levels.  **Must ensure that the order of the farms is the same for all files (*farms.week1, D, H, temp, prod.cycle*) – farm IDs in ascending order.** |
| Dw | Connectivity matrix calculated from winter dispersal simulations. Each cell contains the probability of larvae dispersing from a farm (column) to a farm (row). |
| Ds | Connectivity matrix calculated from spring/summer dispersal simulations. |
| H | Distribution of strategies across farms. Each column represents one distribution scenario (the name of which is assigned in *paras.csv* under ‘Hcol’). Each farm (row) is assigned a strategy: either ‘x’, ‘y’, ‘z’ or any combination of the three. What these strategies represent is assigned described in *paras.csv*. |
| temp.sw | The weekly temperature-dependent growth rate of lice (*δ*) on each farm (row) at each 5-week period of the year: s1–5 (‘summer’), sp (‘spring’), w1–4 (‘winter’). |
| temp.fw | The weekly temperature-dependent reproduction output of lice (*f*) on each farm at each 5-week period of the year. |
| prod.cycle | Each farm can be given a unique production cycle – alternating periods of activity and fallow. This matrix assigns each farm (row) either active (1) or inactive/fallow (0) for every week (columns).  **So far, I have not been including production cycles in my simulations (i.e., matrix is all 1s).** |
| **R scripts** |  |
| parameters\_2loci | **This is the script called by the job submission – contains the elements required to run multiple iterations of the model.** Takes the parameter values given in *paras.csv* and converts these into the format needed by the population model. Then calls the next scripts. |
| popSims\_2loci | Creates the full metapopulation matrix **N** (*called* ***P*** *in Coates et al.*) to be filled out by the population model. Then calls the model function *popFun\_2loci*. Afterwards, converts and saves the output **N** into a usable data frame. |
| popFun\_2loci | The function (a ‘for loop’) for the metapopulation model. In each loop, the function ultimately multiplies the metapopulation matrix at *t* (**Nt**) by a transition matrix for *t* (**Mt**), to predict the metapopulation at *t+1*. |
| MFun\_2loci | Called by the *popFun* and *treatFun* functions. Creates the specific transition matrix **M** for the current time-step *t*. |
| treatFun\_2loci | The same as *popFun\_2loci*, but returns a record of which delousing treatments were applied at each farm, at each time-step. |
| treatments\_2loci | Creates the matrix to be filled by *treatFun\_2loci* function, and then calls the function. Converts and saves the output into a usable data frame. |
| mapPlot\_2loci | Creates maps and plots from the model outputs. |
| **In ‘create\_files’ folder These files are used to create the above .csv files (but are not directly used by the model)** | |
| dispersal\_sims (folder) | Contains data of dispersal simulation outputs (provided by Samsing et al. 2017) |
| calculate\_D | Create dispersal matrices (*Dw*.*csv*and *Ds.csv*) from the datasets in **dispersal\_sims** |
| create\_paras\_2loci | Template to create empty *paras.csv* |
| H.dist | Creates *H.csv* (i.e. new treatment distributions). **Use this to add new strategy distributions (columns of H) as required.** |
| lice\_2012\_2022 | Real-life data of lice infestations, temperature and farm activity for all Norwegian farms, 2012 – 2022 (from barentswatch.com). |
| prod\_cycle | Creates *prod.cycle.csv* (average production cycles for each farm) using farm activity data in *lice\_2012\_2022.csv* |
| seasons | Matches the 5-week seasonal periods used in the model (s1–5, sp, w1–4) to each week of the year. Used by *temptime* script. |
| temp.t | Average temperature per farms per 5-week period (calculated in *temptime*). |
| temptime | Uses farm temperature data (in *lice\_2012\_2022*) to calculate average 5-week temperatures (*temp.t*). Then uses *temp.t* to calculate the weekly growth rate (*temp.sw*) and reproductive rate (*temp.fw*) per farm per season. |
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