

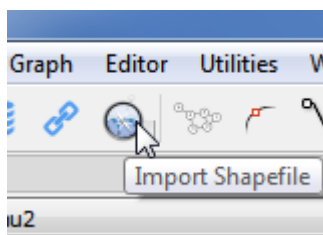
The DISPLACE Object Editor for producing formatted input files –**(Francois Bastardie & Federico Fuga)**

An illustrative dataset called 'testexample' is given at https://github.com/frabas/DISPLACE_input_gis so that any user can scrutinize and run the parameterisation from these raw files using the DISPLACE Objects Editor. If the user wants to start from scratch then the point 1. below (build a graph) will be required, otherwise the user can skip and go directly to point 2.

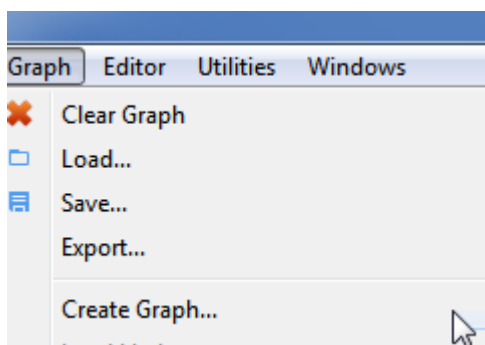
1- First of all, create a graph of nodes for your own fishing region...

(Go to section 2 if you already have it or if you want to start from the one given in the example dataset)

You'll need some GIS shape files defining the marine space delineating the DISPLACE graph building e.g. handmadeAPolyAroundIoneanSea.shp and co, ne50m4GreeceInversedWithEraser.shp and co, greece_eez.shp and co



Then the graph of nodes is built through the DISPLACE graphical interface under Graph>Create Graph, with settings (for example):



Create Graph

Corner 1 Long: 17.000000 Lat: 33.000000
 Corner 2 Long: 30.000000 Lat: 41.000000

Shape
☐ Geodesic Hex ☐ Geodesic Quad
☒ Planar Hex ☐ Planar Quad

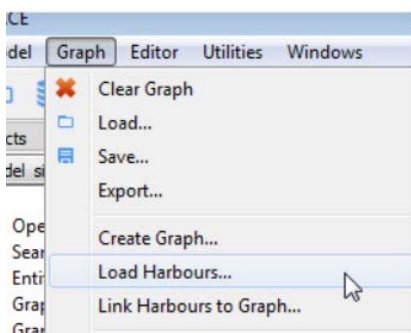
Zones
☐ Include points outside all shapefiles Step: 2.50 km
 1st Inclusion Shapefile: Shapefile handmadeAPolyAroundIoneanSea.shp Step: 2.50 km
 2nd Inclusion Shapefile: Shapefile greece_eez.shp Step: 70.00 km
 Exclusion Shapefile: Shapefile ne50m4GreeceInversedWithEraser.shp ☒ Remove edges traversing this shapefile

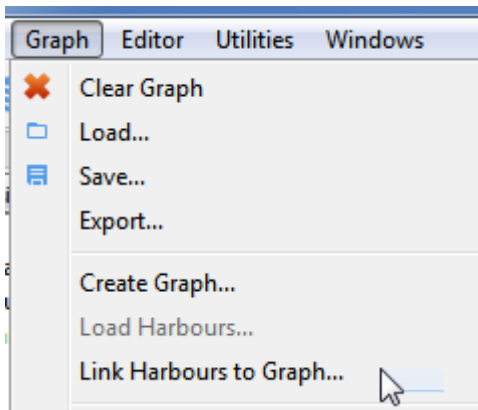
Options
☒ Leave at least n links to any node 1
☐ Limit the number of links per node to 8
☐ Remove edges longer than 80.00 km

Cancel Ok

And a list of all harbours/positions with landings also needed to connect to the graph of nodes:

```
x;y;idx.port
ANCONA;13.499299999999485;43.621600000000434;1
BARI;16.859320728454833;41.135061427521549;2
BARLETTA;16.285200000000223;41.3250000000008763;3
BELLARIA;12.454499999999816;44.160299999999523;4
BISCEGLIE;16.505400000000122;41.247400000000312;5
BRINDISI;17.967699999999233;40.654399999999399;6
CAORLE;12.880199999999634;45.5969000000000488;7
CATTOLICA;12.749599999999232;43.970699999999852;8
CERVIA;12.359099999999716;44.268099999999322;9
CESENATICO;12.402899999999176;44.207200000000753;10
CHIOGGIA;12.298300000000365;45.219399999999951;11
CIVITANOVA MARCHE;13.733700000000718;43.3117000000000194;12
FANO;13.015699999999923;43.853600000000355;13
GIOVINAZZO;16.672500000000625;41.190199999999066;14
GIULIANOVA;13.973900000000897;42.754999999999207;15
GORO;12.294700000000395;44.843300000000497;16
GRADO;13.382400000000464;45.674300000000564;17
ISOLE TREMITI;15.500000000000000;42.116667000000000;18
Izola;13.657499999999516;45.538300000000277;19
Koper;13.729900000000384;45.550199999999734;20
LESINA;15.350000000000000;41.866667000000000;21
LEUCA;18.363400000000183;39.7957000000000608;22
MANFREDONIA;15.914800000000499;41.624999999999972;23
MARANO LAGUNARE;13.169167000000000;45.766388999999997;24
MARTINISCAVA;13.010000000000810;43.80740000000056;25
```





2- ...then, the object editor can be used....

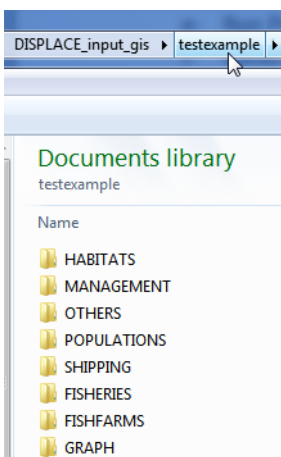
In essence, the steps are:

- a- Generate Populations Features (from specs 1 and 3; producing the stock_names file)
- b- Generate Pop Avail from Surveys (using specs 2 and the graph)
- c- Generate Populations Avail GIS Layers (stored in SpatialLayers folder)
- d- Generate Populations Config Files
- e- Run Populations Config Files
- f- Generate Populations Interaction Matrix File
- g- Generate Populations Various Files

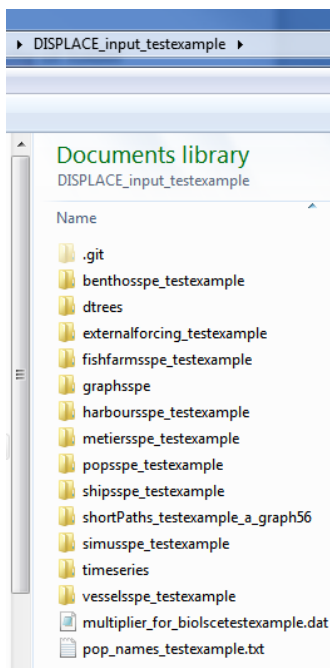
Some steps are actually optional because the user could start from existing files e.g. some GIS layers created elsewhere, etc.

An example dataset is provided together with the Object Editor so that any user can run the parameterisation and produce the required DISPLACE input files.

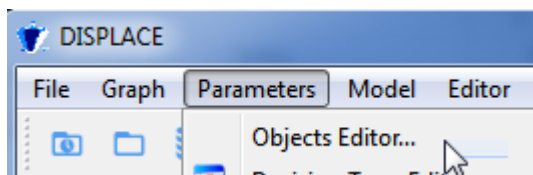
The example dataset (called 'testexample') is structured like this:



....while all the DISPLACE input files produced by the parameterisation should create a hierarchy of folder like this:

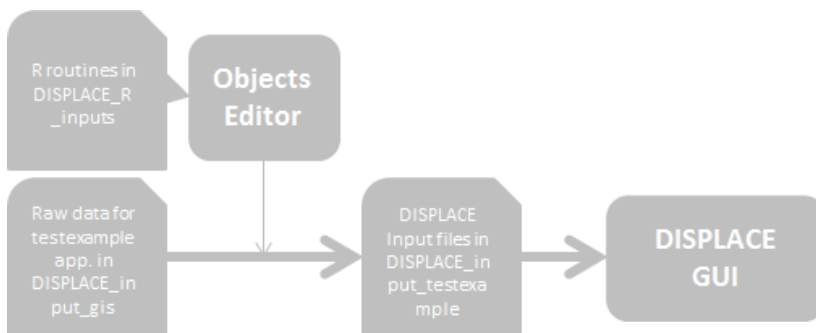


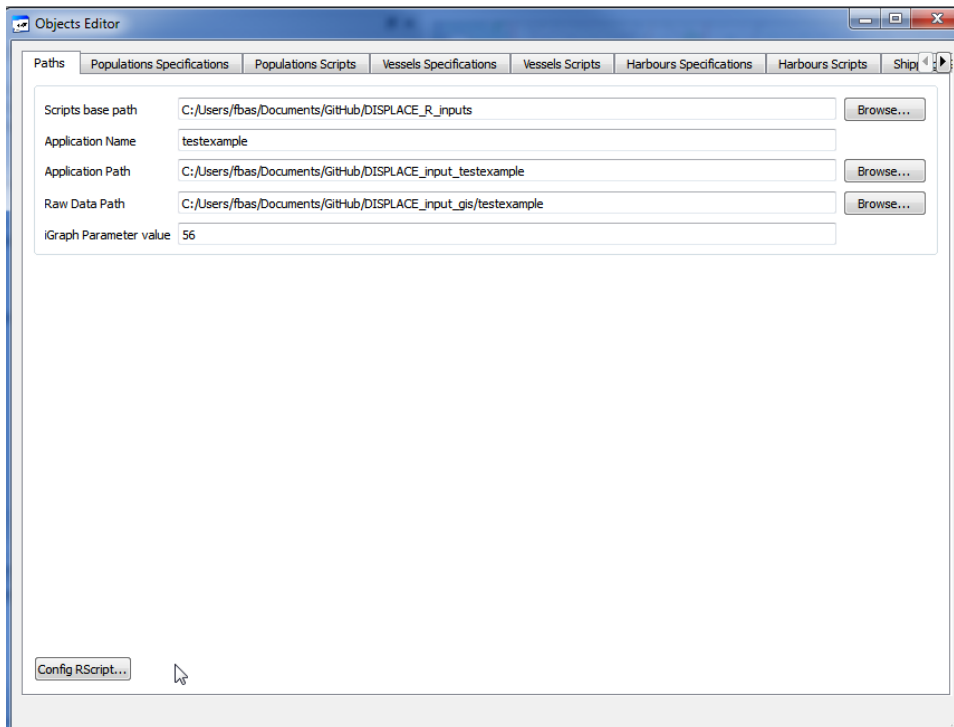
So, to start:



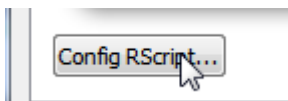
The ui is giving some support for running the R scripts (usually located in DISPLACE_R_inputs) producing the DISPLACE input files.

In brief, the parameterization is producing the DISPLACE input files that fits DISPLACE:

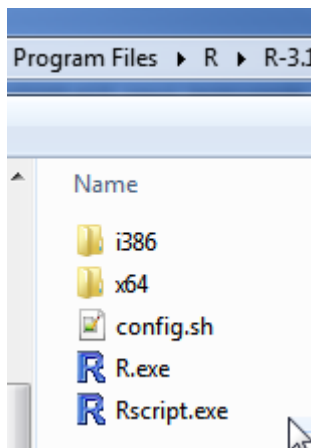




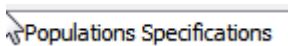
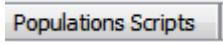
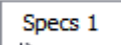


You also need to have R pre-installed (<https://cran.r-project.org/>) and the path set for it:



For example:



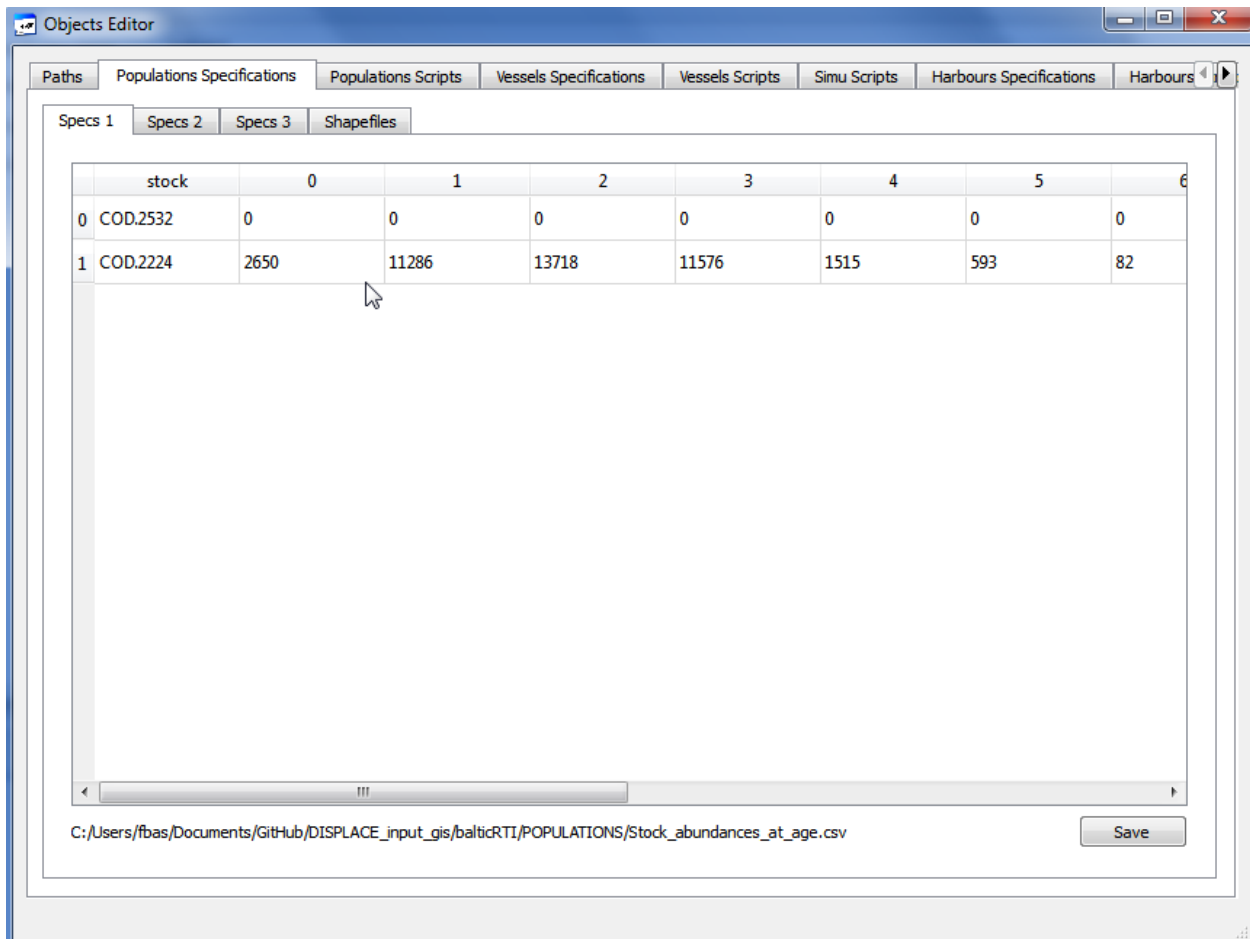
On the Objects Editor main menu, we have:

Specifications pages  separated from the R scripts  for each type of objects. Specifications can related to several files:   

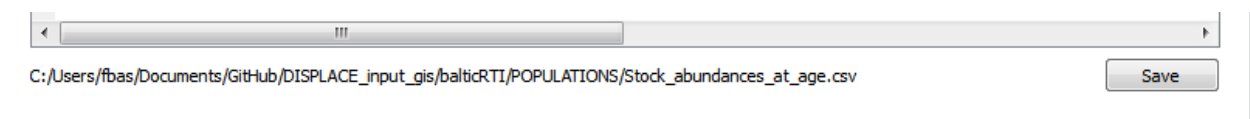
Using R scripts should provide enough flexibility for the user to adapt them when required, which should work as long as the input file format to DISPLACE is not changed.

Note that some R scripts are likely to fail if some of the required R packages are not installed. This is not a big problem; just install them in your R console by typing: `install.packages("a_package_name")`.

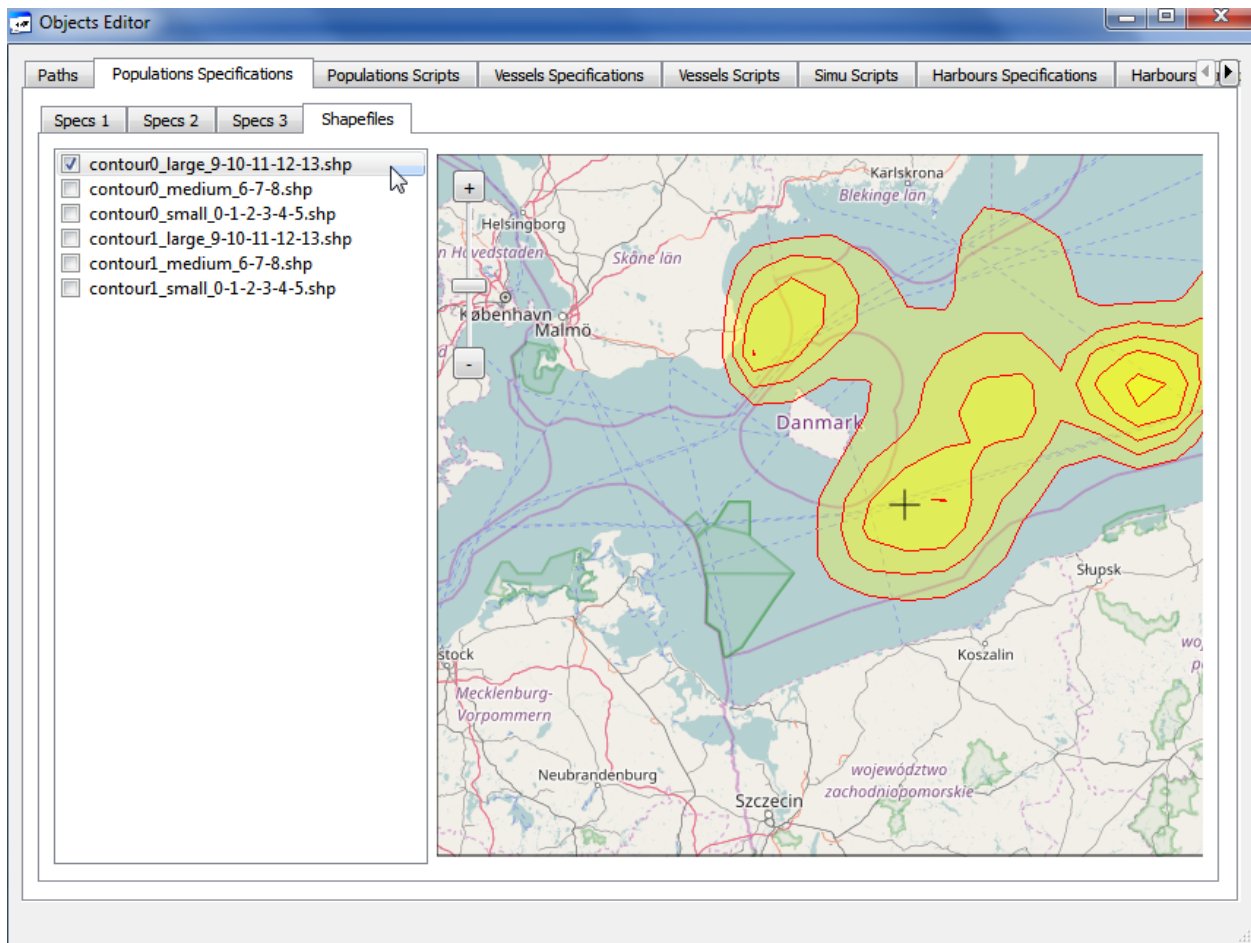
For Population-related files



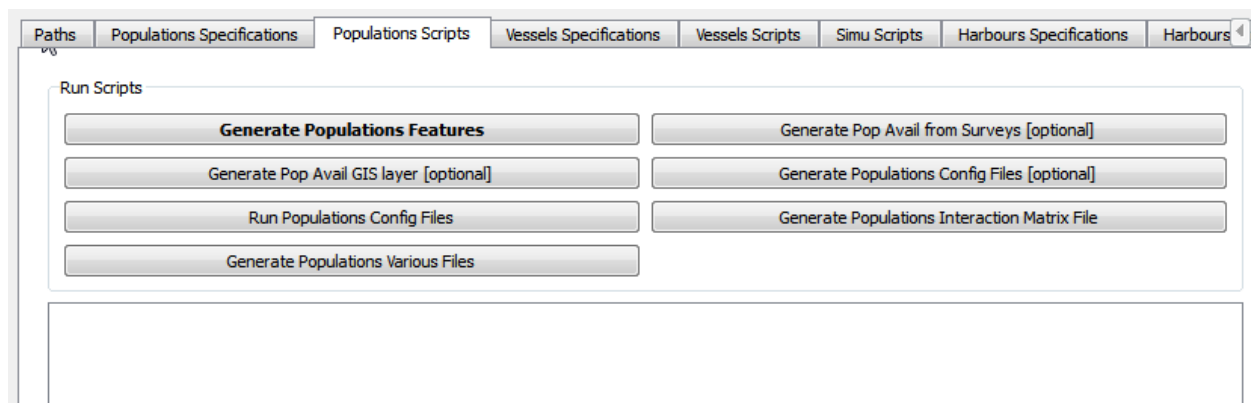
Giving the file location to help the user figuring it out:



There is a map viewer for the GIS layer specifications related to the spatial distribution of fish per size category:



Then the R scripts are all behind the buttons of the ui:



For Vessels & Metiers related files

In essence, the steps are:

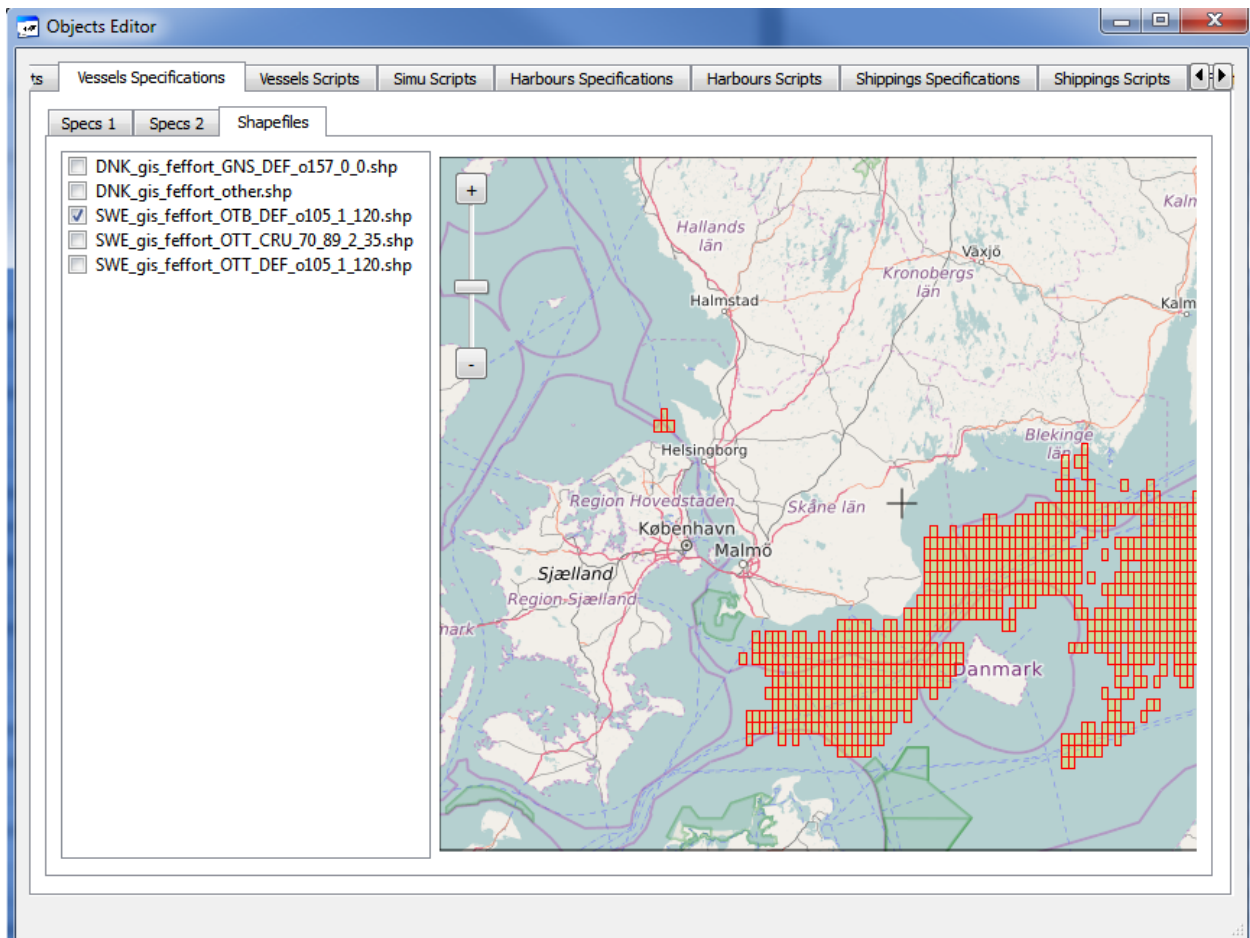
- a- Generate Vessels Config Files
- b- Generate Vessels Fishing Effort GIS Layers
- c- Run Vessels Config Files
- d- Generate Metiers Selectivity per Stock Files
- e- Generate Metiers Various Files
- f- Generate Other Catches On Nodes
- g- Overwrite Catch Equation Parameters (optional – overwrite some "Run Pop Config Files" parameters)

Generate Vessels config files will be done from the vessels specifications:

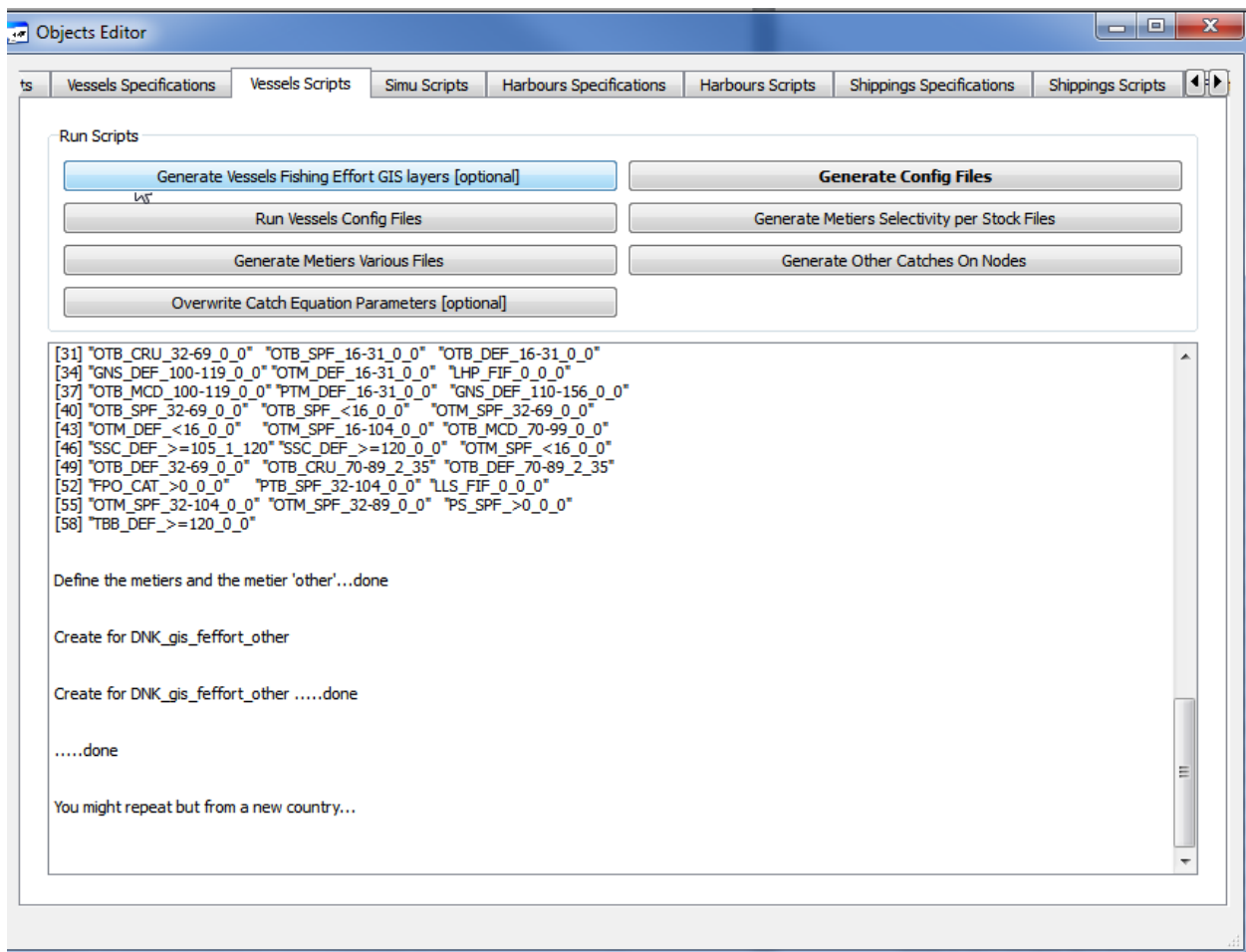
	VE_REF	SL_HARB	LE_MET	LE_MET_rough	COD_kg_h	DAB_kg_h	FLE_kg_h	HAD
0	DNK000001403	NA52	other	Trawl	0	0	0	0
1	DNK000001391	NA55	GNS_DEF_o157_...	Passive	84.7128234226055	2.07848388561053	2.29813890149796	0
2	DNK000001391	Travemünde	GNS_DEF_o157_...	Passive	47.0925	0	0	0
3	SWE_1	Varberg	OTT_CRU_70_8...	Trawl	0.259713805571...	0	0	0
4	SWE_1	Träslövsläge	OTT_CRU_70_8...	Trawl	0.625	0	0	0
5	SWE_1	Träslövsläge	OTT_DEF_o105_...	Trawl	244.688737686605	0	0	0
6	SWE_1	Simrishamn	OTT_DEF_o105_...	Trawl	116.343490304709	0	0	0
7	SWE_1	Skillinge	OTT_DEF_o105_...	Trawl	117.255717255717	0	0	0
8	SWE_1	Sandvig	OTT_DEF_o105_...	Trawl	163.076923076923	0	0	0
9	SWE_2	Träslövsläge	OTT_DEF_o105_...	Trawl	84.5299461641992	0	0	0
10	SWE_2	Simrishamn	OTT_DEF_o105_...	Trawl	122.956975652048	0.012029477638...	0	0.016583

C:/Users/fbas/Documents/GitHub/DISPLACE_input_gis/balticRTI/FISHERIES/vessels_specifications_per_harbour_metiers.csv

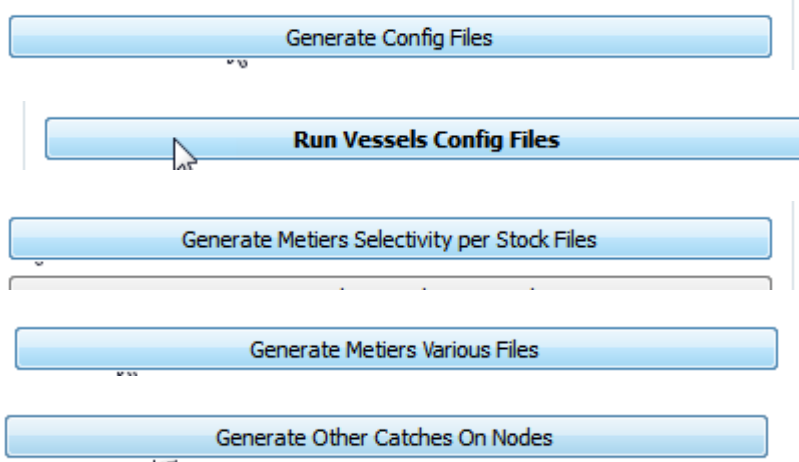
....including some spatial layers concerning the fishing effort spatial distribution per type of activity:



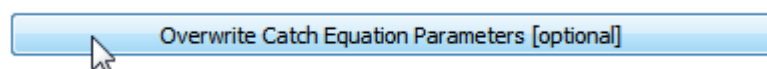
If you don't have them from the start, these layers will be produced by the 'Generate Vessels Fishing Effort GIS layers' R routine:



Then go step by step, running each routine sequentially:



The last one is trickier:



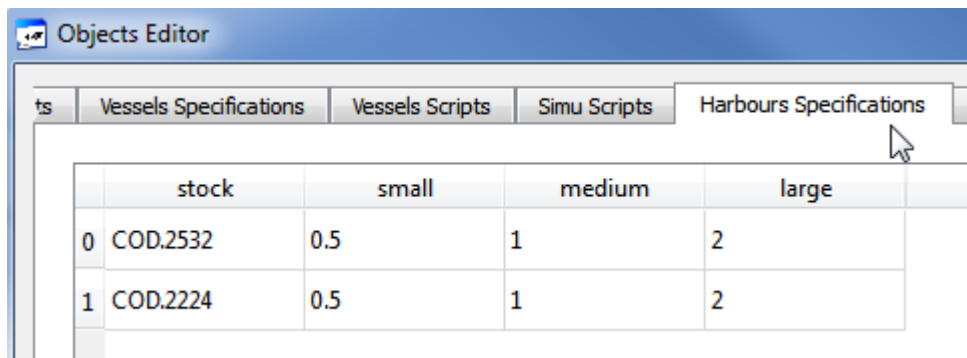
Would probably need you to think about how to adapt it to your own case....but for now it should work with the set given as example.

Once it is all done then you have all the input files informed in the /vesselsspe and /metiersspe folders for the creation of the set of vessels in DISPLACE.

But DISPLACE will not work until all the input files are created for all types of objects. So:

For Harbours related files

Giving the price in euro per kilo per stock per commercial category – In this case it will be the same for all harbours.



	stock	small	medium	large
0	COD.2532	0.5	1	2
1	COD.2224	0.5	1	2

Generate Harbours Files

Then run the R script:

If alternative price settings is wished then the R script would need to be adapted by the user on that purpose.

For Shipping related files

Objects Editor

ts

Vessels Specifications

Vessels Scripts

Simu Scripts

Harbours Specifications

Harbours Scripts

Shippings Specifications

Shippings Scripts

Specs 1

Specs 2

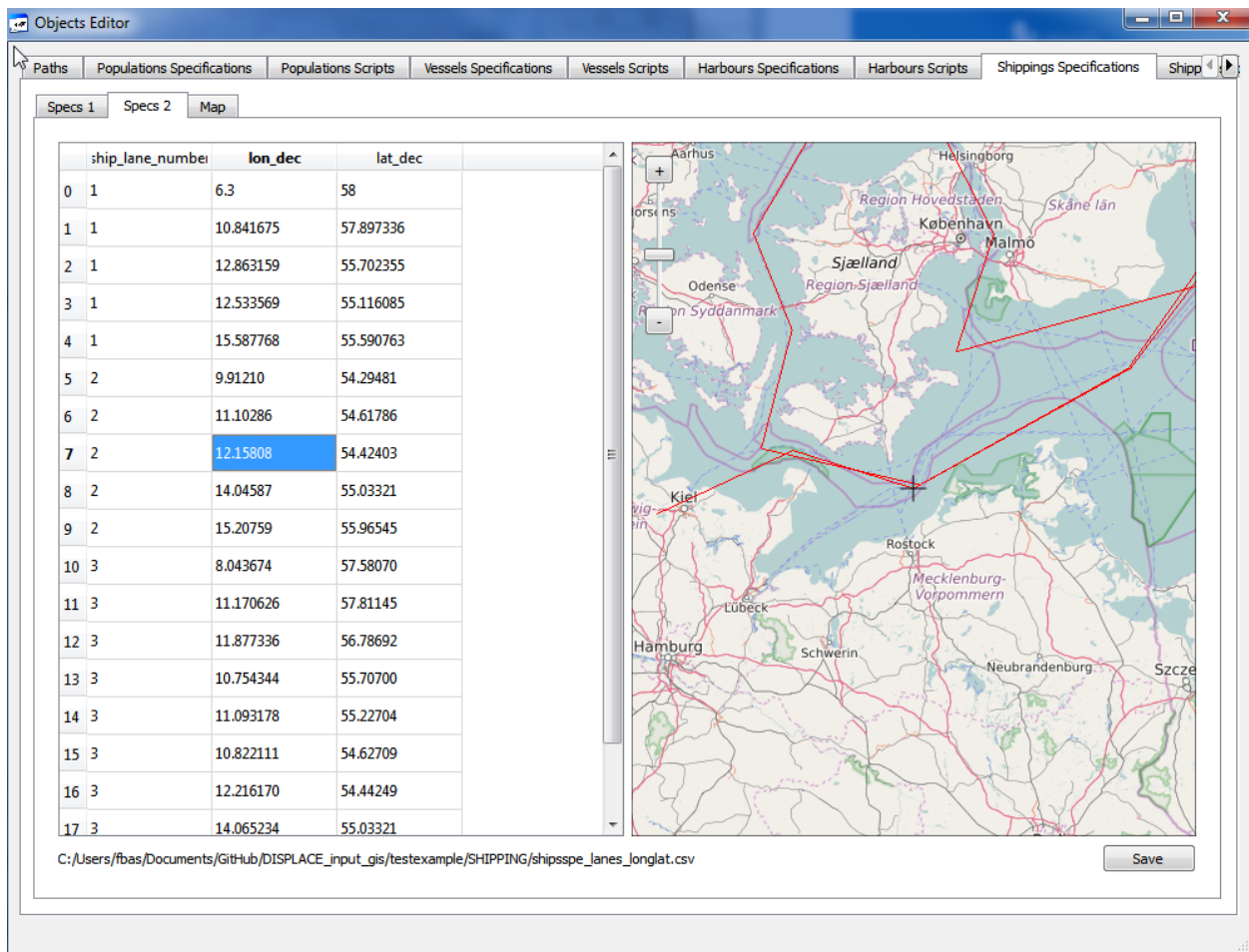
Specs 3

Map

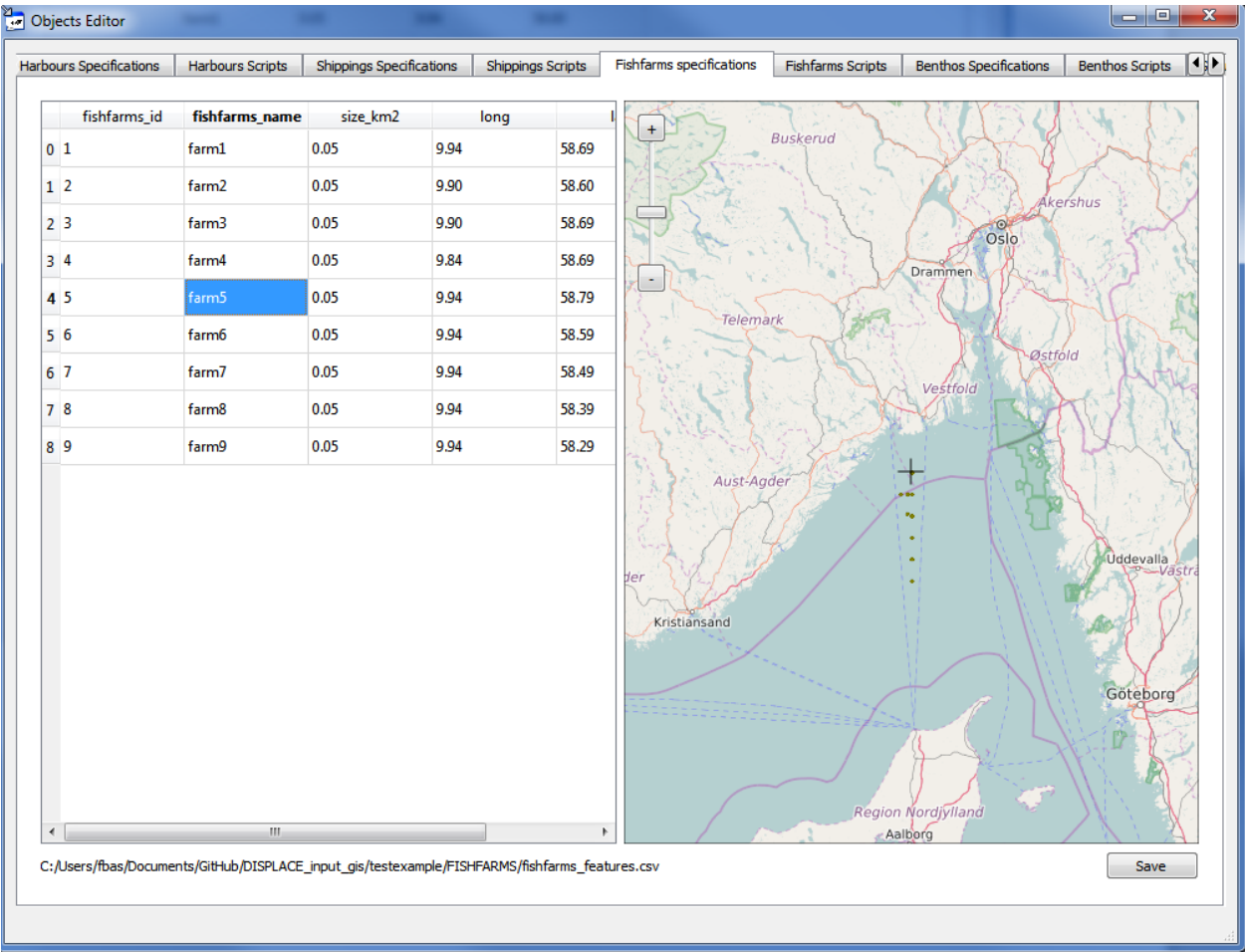
	ship_name	imo	year_build	flag	type	type_code	kW	
0	SHIP1	1000000	2006	Greece	Tanker	1	250	3000
1	SHIP2	2000000	2006	Greece	Tanker	1	250	3000
2	SHIP3	3000000	2006	Greece	Tanker	1	250	3000
3	SHIP4	4000000	2006	Greece	Tanker	1	250	3000
4	SHIP5	5000000	2006	Greece	Tanker	1	250	3000
5	SHIP6	6000000	2006	Greece	Tanker	1	250	3000
6	SHIP7	7000000	2006	Greece	Tanker	1	250	3000
7	SHIP8	8000000	2006	Greece	Tanker	1	250	3000
8	SHIP9	9000000	2006	Greece	Tanker	1	250	3000
9	SHIP10	1000000	2008	Panama	Tanker	1	250	3000
10	SHIP11	1100000	2010	Sweden	Containership	2	135	3000
11	SHIP12	1200000	2010	Sweden	Containership	2	135	3000
12	SHIP13	1300000	2010	Sweden	Containership	2	135	3000

C:/Users/fbas/Documents/GitHub/DISPLACE_input_gis/balticRTI/SHIPPING/shipsspe_features.csv

Save



For Fishfarms related files



For Benthos related files

Objects Editor

Harbours SpecificationsHarbours ScriptsShippings SpecificationsShippings ScriptsFishfarms specificationsFishfarms ScriptsBenthos SpecificationsBenthos Scripts

SpecsSpecs 2Shapefiles

	metier	landscape	s_after_one_passa
0	0	0	0.2
1	0	0	0.2
2	0	100	0.2
3	0	100	0.2
4	0	101	0.2
5	0	101	0.2
6	0	111	0.2
7	0	111	0.2
8	1	0	0.2
9	1	0	0.2
10	1	100	0.2
11	1	100	0.2
12	1	101	0.2
13	1	101	0.2
14	1	111	0.2
15	1	111	0.2
16	2	0	0.2
17	2	0	0.2

C:/Users/fbas/Documents/GitHub/DISPLACE_input_gis/testexample/HABITATS/prop_loss_on_habitat_after_one_passage_per_metier_per_sz.csvSave

