Using the habitat capacity model

With Ecospace loaded, the habitat capacity model is configured in four steps:

1. Define environmental input layers

The habitat capacity model requires a map layer for each environmental factor that you wish to include. These layers are not provided in an Ecospace scenario, and are up to you to define. This is done via *Menu > Ecospace> Define Environmental input Layers* (Figure 1)

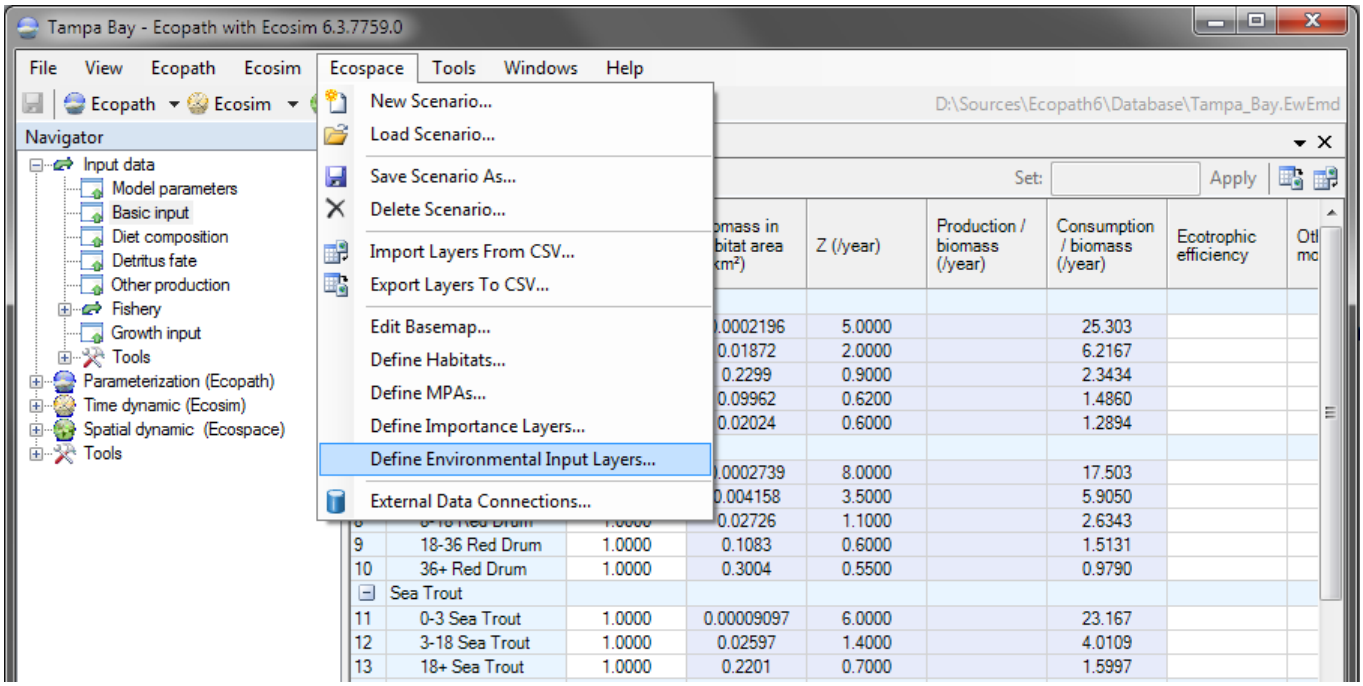

Figure 1 - Start defining environmental input layers

This brings up an Add/Edit/Delete interface that resembles forms to manage fleets, habitats, MPA?s, etc (Figure 2). Here you can add new layers, modify or delete existing layers. Note that the terms ?map? and ?layer? are freely used interchangeably, which perhaps should not be so.

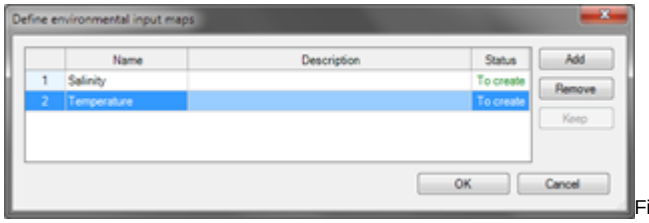

Figure 2 - Define environmental input layers

Anyway, once your layers are defined you can provide the layers with data in the Ecospace maps interface.

2. Provide map values

Once the layers have been defined you can enter values in the environmental input layers (Figure 3)

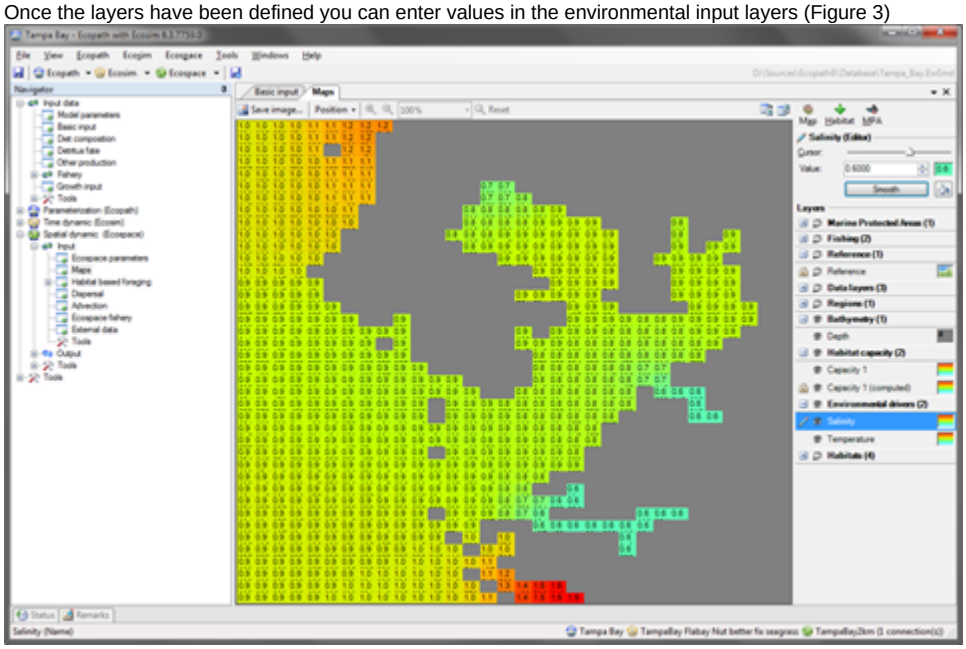

Figure 3 - Populate environmental input layers

3. Define environmental responses

Functional groups respond to the environmental drivers via a mediation-like structure. You will need to define these curves via *Navigation Tree > Ecospace > Input > Habitat based foraging*.

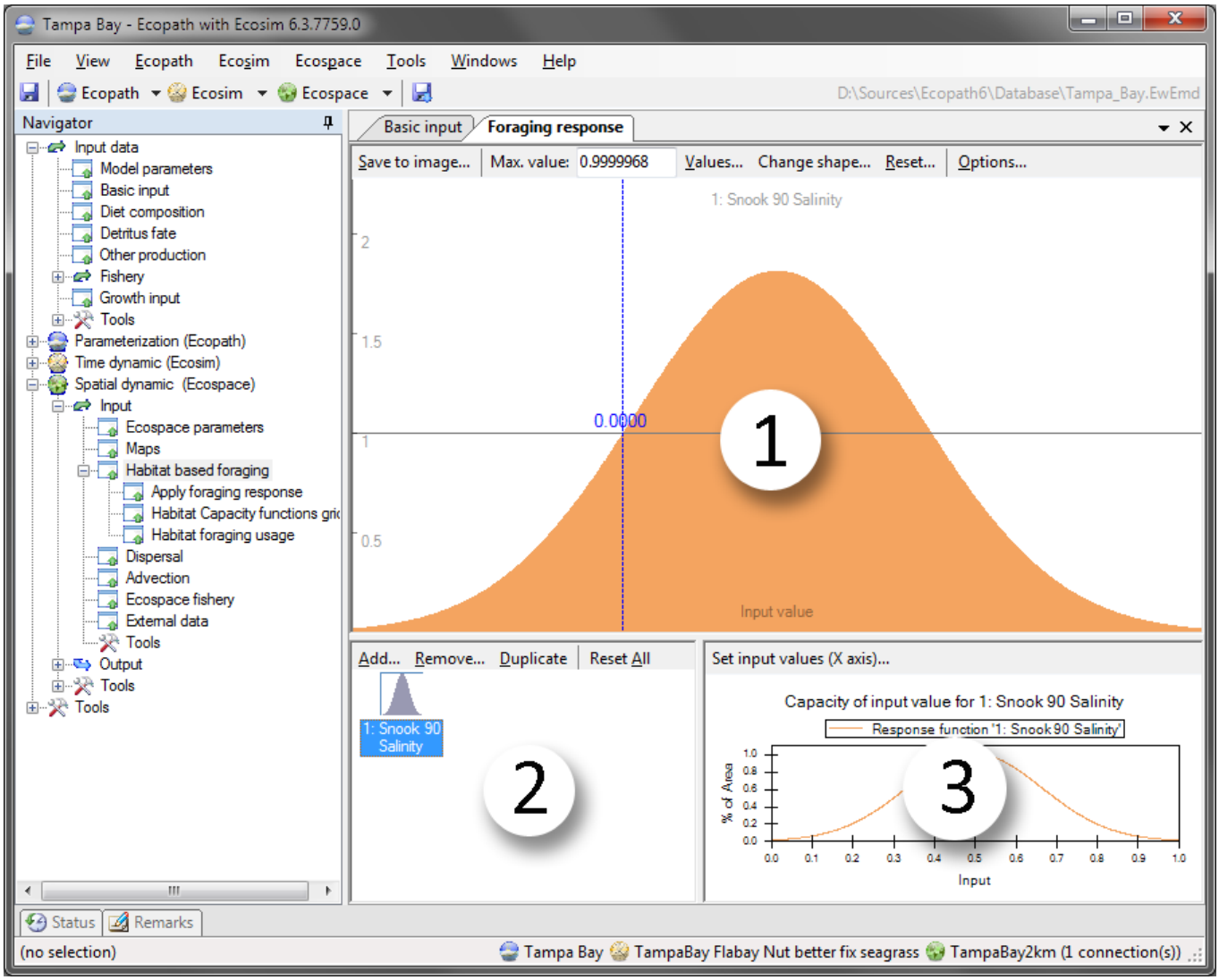

Figure 4 - Foraging response configuration form

The foraging response configuration interface has three components:

i. A sketchpad where the response function is drawn.
   The blue line identifies the ?1? value connection point: the point where there is no positive or negative effect. The 0.000 label does not respond yet;
i. Thumbnails for all available response functions.
   Here you manage which response functions are available;
i. The capacity panel, where you define how response functions apply to groups.

As in mediation, a single response function can be used by any number of groups. You can reshape and rename functions with the ?Values? and ?Change shape? options on the sketchpad toolbar. Next, we?ll apply the foraging response to the environmental drivers.

4. Define foraging response

Next, define which functional groups use the response curves that you defined, and to what environmental driver the response applies. This interface is accessed through the ?Set input values? on the capacity panel (Figure 4).

This brings up the ?foraging area response to input maps? interface (Figure 5) for a single response function.

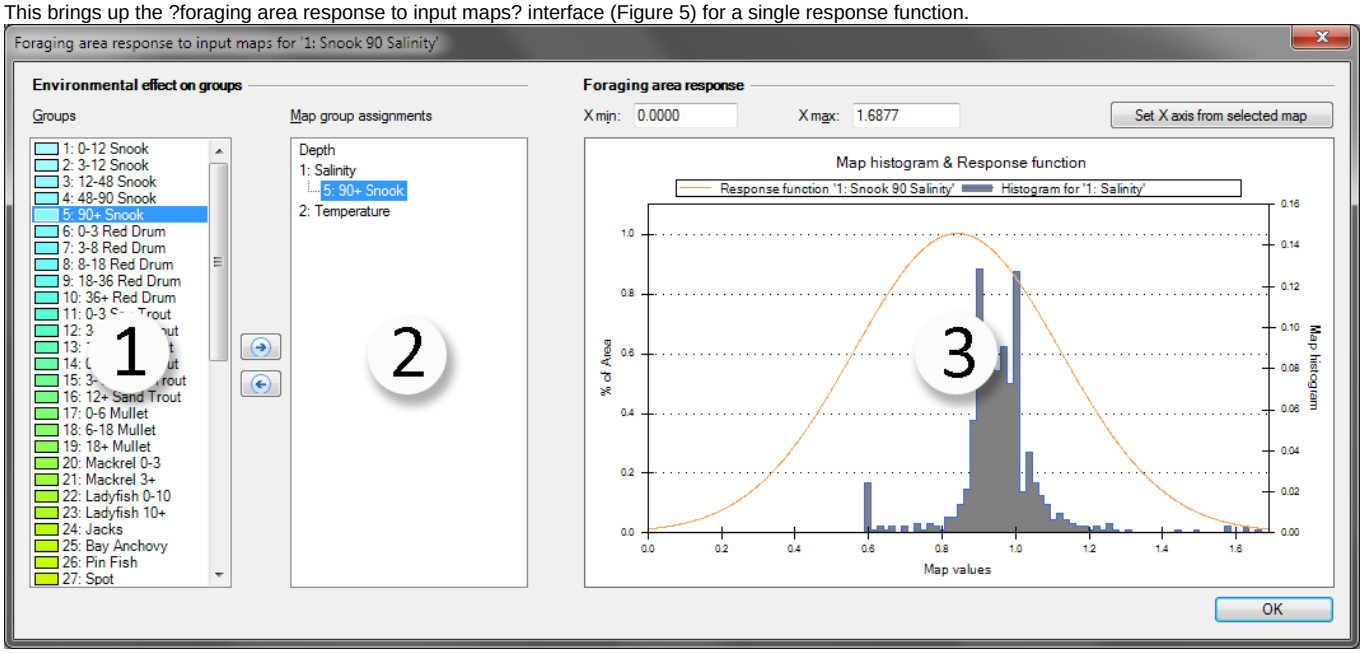

Figure 5 - Foraging area response interface

In this interface, the configured components are put together. Here, users define how groups respond to environmental drivers for the selected environmental response function.

The panels perform as follows:

i. Functional group selection panel. Selected groups can be added selected driver maps in (2)

i. Group/driver assignment panel, showing which groups are assigned to which environmental drivers. Notice that ?Depth? is always listed beside the user-defined environmental drivers.

i. This panel shows the function panel imposed upon a histogram of values from the currently selected input map. The ?set X axis from selected map? option will populate the histogram, and the X min and X max defines min and max values for the response curve.

5. Run

Check that capacity calculations do use the capacity model in the Ecospace parameters form (Figure 6)

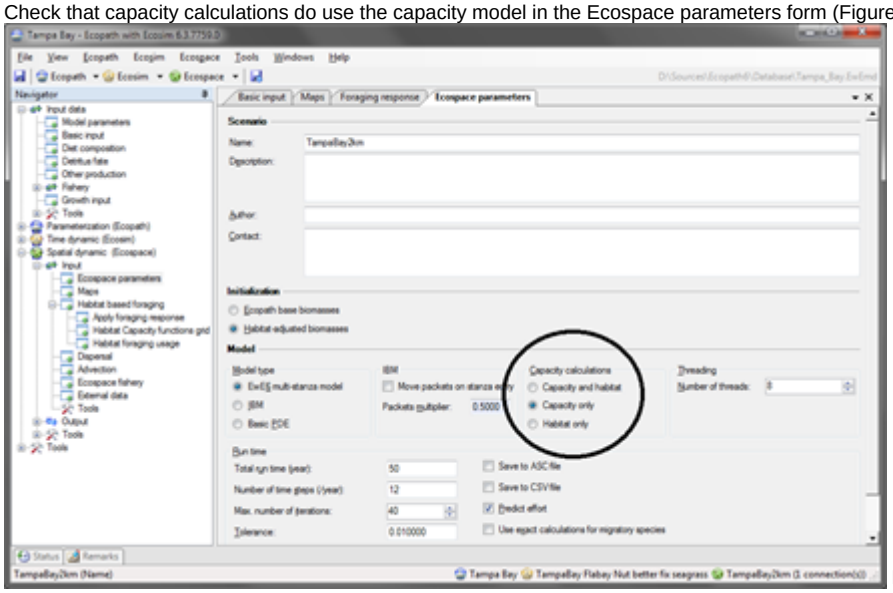

Figure 6 - Ecospace parameters to check for capacity

The resulting capacity map can be viewed in the Ecospace map

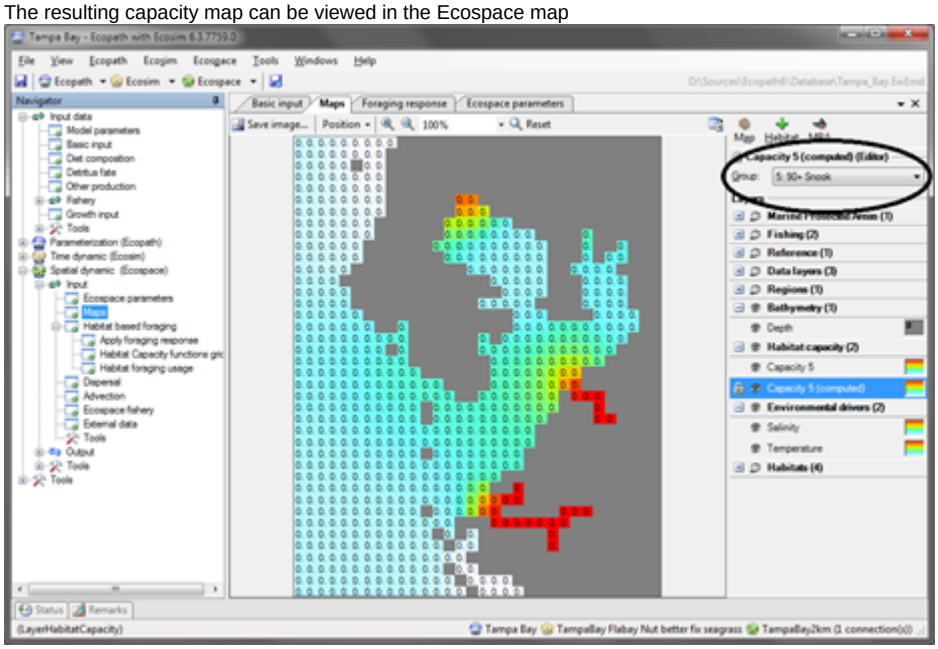

Figure 7 - Computed capacity