Guide to adapting the MPA\_tsFile\_Generator Excel tool for your Atlantis model.

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I developed this tool back in 2012, so I am a little fuzzy on all of the aspects, but I re-ran it in 2021 and it still works. There are some comments in the cells to provide some guidance on what is needed, but I do not think anyone has tried to adapt this tool for their model yet, so I am taking a stab at providing a general guideline. I hope it helps. If you are having issues, please feel free to contact me.

Sheets:

| Notes\_How\_To\_Use\_Workbook | I added the text from this doc to this sheet. |
| --- | --- |
| **START HERE\_ONOFF\_Timesteps** | **This is organizing all of the information for defining the marine closures. This will require most of your attention.** |
| VBAOUT | I think this is a dummy sheet for the Macro. Do not touch it. |
| VBAOUT2 | I think this is a dummy sheet for the Macro. Do not touch it. |
| **Headers** | **This contains the text for the header of the TS files. You will need to edit this to match your model.** |
| Fleets | I think this is a dummy sheet that is no longer being used, but to be honest I am not totally sure… |
| Timesteps | TS files need to be told the time step when to activate. This sheet goes through the dates indicated for the simulation and determines the corresponding time steps. I think this was automatic and that you need to edit this… |

Preliminary work:

Before working in the sheet *START HERE\_ONOFF\_Timesteps* to organize all your MPA information, update the information in the *Headers* sheet to your model. I think this is the only preliminary work you will need to do before diving into *START HERE\_ONOFF\_Timesteps*

Filling in *START HERE\_ONOFF\_Timesteps*:

1. When opening this, if you are asked to allow macros to run, click yes
2. In col 11, row 1, write the directory where you would like all your MPA.ts files to be saved. The tool does NOT create this directory, so make sure you make it before your run or else I am sure it will error out.
3. In col 11, row 2, write the first day of the model run MM/DD/YYYY
4. In col 11, row 3, write how many years are in the simulation. You should not underestimate this, but overestimation is okay.
5. Columns 1-11 contain information regarding the MPA, its locations, and its activation/deactivation (if applicable). While Columns 13-XXX contain information regarding the fleets impacted and the proportion of closure. Remember, 0 = no take, no fishing; 1 = fully exploited, no restriction
6. Columns 1 - 11: defining closures is two-dimensional in a way as you need to define the fleet restrictions and associated polygons. Thus while columns 13-XXX contain the information with respect to fleet specific impacts, the number of rows reflect the polygons contained in the closure. Thus, if there closure impacts 5 of your Atlantis polygons, then you will need 5 rows in the sheet associated to that closure.
   1. Name of closure - must be identical across all rows associated to the closure
   2. Polygon box ID - for each row, indicate the corresponding polygon ID
   3. PropArea - if representing a closure that does not perfectly align with the polygon map, this is where you describe the proportion of the polygon that overlaps with the closure. Back in the day, I figured these out for the GOM model using ArcGIS. But, if you are dealing with hypothetical closures, then it makes sense to make this a 1 and just move on.
   4. Restriction - just a summary of the restriction of this closure for bookkeeping purposes
   5. Start date - MM/DD/YYYY - the date the closure is active. NOTE: MPA.ts files can not start on ts 0 (I can not remember if the tool accounts for this)! If the closure is active from the start, then you must use the time step 1 regardless. Keep this in mind when looking at spatial outputs. Make sure to drop data from day 0 as your closure is not yet active. If you include output data from day 0 into your spatial analysis, it may throw you off as you will see landings in areas that you turned off - so just drop that data.
   6. End data - if the mpa is to be active the entire simulation, then type “Active”. If it eventually closes (like the emergency closure in the Gulf of Mexico did) then put the date of closure (MM/DD/YYYY).
   7. On/Off Switch - is your closure seasonal? Type Yes or No.
   8. DateOn - DO NOT TOUCH - automatically set equal to Start date.
   9. DateOFF - There are several specifications on what to do here based on what you set in the previous columns. Please read the comment attached to the cell.
   10. TimestepON - DO NOT TOUCH - automatically set with a macro in the tool
   11. TimestepOFF - DO NOT TOUCH - automatically set with a macro in the tool
7. Columns 13 - XXX:
   1. For each column, row 3 and 4, write the code for your fleets in each column. The order should match the fleet order in your fleets.csv input file.
   2. I think you also need to put the fleet id number in row 2…
   3. For each column (fleet) and each row (polygon within a closure), specify the proportion of impact on the fleet. 0 - no fishing of the fleet at all, 1 - fishing allowed. There needs to be a value for all fleets! Thus, if a fleet is not impacted by a closure, make sure to put a 1 there. If empty, the macro might assume 0. Do not worry about the box proportion here, the macro automatically considers that when developing the mpa.ts files.
8. View -> Macros -> View Macros
9. Make sure “MPA\_ts” is selected
10. Hit Run
11. After about a minute, you should have your ts files in your specified directory.
12. As a side note, I have made these ts files on the windows side then transferred them to a linux machine to run with Atlantis. I am not totally sure, but it is possible that I had to “flip” these files once on the linux machine in order to make them run.