

1 General

- Changed the length of all simulations from 21 to 22 days. All plot limits were changed to showcase this
- Removed redundant/test scripts. The remaining scripts were renamed to reflect this and reduce confusion.
- Added a module that specifies the biological parameters, water column and simulation properties.
- Changed all scripts to work with the new parameters module. This removed the need to reinitialise the reaction and water column classes whenever we wanted to plot something. This reduces the average time to plot one figure by about 2 seconds.
- Standardised file names in all scripts to correctly reflect physical and biological properties used in the sim and reduce frustration when running different scripts
- Removed the "invalid value encountered in divide" error encountered when running the various get_diagnostics scripts by telling numpy to ignore it. It doesn't fix the problem, but it allows me to get the diagnostics. Error likely due to how the standard deviation is calculated; might not be able to fix but I will try at some point
- Replaced depreciated library functions with the recommended replacements.
- Rewrote the function Get-Cs_eulerian, found in the various plotting libraries, to use a numerical integration method derived specifically for unequal intervals. The calculation should now be faster and more accurate: on average, it is about 0.5s faster when plotting chlorophyll results.
- Moved the plot_eul_aqc_lib module into the main aquacosm library. This module can now be imported along with the other aquacosm modules. This removes the need for an identical plotting module in every aquacosm subfolder. The now redundant modules were removed.
- Changed the function that determines thermocline depth to be more general. This was done by removing the arbitrary temperature definition of the thermocline depth. Instead, thermocline depth is determined by finding the depth where the temperature difference between levels drops below a minimum value. This method is similar to the method in Janecki et al. (2022)

2 Croco1D

2.1 Aquacosm01

- Added the script `plot_eps_EL.py` which produces a scatter plot of the dimensionless variable ϵ defined in Paparella, Vichi(2020) of a simulation at some time versus the maximum difference between the Eulerian and Lagrangian output of the bulk average chlorophyll.
- Added the script `eps_.gif.py`, which produces an animation of the plot produced in `plot_eps_EL.py` across the whole timespan of the simulation. It can be used to see how ϵ changes over time and how that affects the differences between the models.
- Fixed `plot_timeseries.py` and rewrote it to work with the new parameters script and thermocline depth determination.

2.2 Aquacosm02

- Renamed `anim_eul_aqc2` to `anim_eul_aqc-growth` to highlight that this script only animates the aquacosms and their growth rates.
- Changed the axis limits on plots in both animation scripts to the maximum chl value.
- Got the `plot_timeseries` script to plot something. It now plots the ϵ values, not the correct values, but it plots them nonetheless. WIP

2.3 Aquacosm03

- The subplots in `plot_eul_aqc_2.pt` display correctly.