Protocol:

**The forcing data and S&T profiles are taken from**

* *The salinity and temperature profiles were gernated via data from The Western Channel Observatory. The Western Channel Observatory is currently funded by the UK Natural Environment Research Council through its National Capability Long-term Single Centre Science Programme, Climate Linked Atlantic Sector Science, grant number NE/R015953/1.*
* *The meteorological forcing data is derived from hourly ERA5 data from the Copernicus Climate Change Service (C3S) Climate Data Store (CDS).*
  + *Hersbach, H., Bell, B., Berrisford, P., Biavati, G., Horányi, A., Muñoz Sabater, J., Nicolas, J., Peubey, C., Radu, R., Rozum, I., Schepers, D., Simmons, A., Soci, C., Dee, D., Thépaut, J-N. (2018): ERA5 hourly data on single levels from 1979 to present. Copernicus Climate Change Service (C3S) Climate Data Store (CDS). (Accessed on <09-02-2021>), 10.24381/cds.adbb2d47*
* *The tidal forcing data was generated using*[*FVCOM*](http://fvcom.smast.umassd.edu/fvcom/)*, as part of the Risks and Opportunities for Sustainable Aquaculture (ROSA) project, grant number BB/M026221/1.*

**Initial value conditions**

The GOTM initial values are taken from the T&S profiles above. The initial values for ERSEM (set for 01/01/2007 – but their origin is not entirely certain) can be found in fabm.yaml: under each ERSEM variable is “initialization” which sets a vertically constant single initial value for the whole water column. The single initial value conditions have been modified for nitrate, silicate, phosphate and ammonium based on the 2000-2020 L4 January climatological data and 1992-2019 total chlorophyll-a climatology. The climatological data were agregated from all depths (assuming the water column was fully mixed). The total phytoplankton chlorophyll was distributed into 4 ERSEM PFTs chlorophyll based on January 2010 L4 data for phytoplankton community structure (2010 was the only year for which I had such data available) and then chlorophyll was redistributed into other PFT components by preserving the same ratios that were in the original L4 initial value data. The model was started on 01/01/2007 and the run produced initial values for 01/06/2007 (the stratified period), which can be found aggregated for different ERSEM variables (P1.dat, P2.dat … Nut.dat …. R1.dat …). The idea is to produce similar initial values for the mixed period: 01/11/2007. However later years can be considered if longer spin-up time is needed for other bgc models (ERSEM at L4 seems to be fine with 2-3 month spin-up time).

**Open questions**

1. Do we need longer spin-up times / starting date much later to make it more consistent with BATS?

2. Is profile T&S OK for the initial restarts, or do we want climatological T&S?