SIMULATION OF ANNUAL CYCLES OF PHYTOPLANKTON, ZOOPLANKTON AND NUTRIENTS TO THE SOUTH OF THE GRAN CANARIA ISLAND USING A MIXED LAYER MODEL COUPLED WITH A BIOLOGICAL MODEL

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In oceanography, the *mixed layer* refers to the near surface part of the water column where physical and biological variables are distributed quasi homogeneously. Its depth depends on the conditions at the air-sea interface and on the characteristics of the flow, and has a strong influence on biological dynamics.

The aim of this work is to model the behaviour of the mixed layer in waters situated to the south of Gran Canaria Island, as well as the annual biological cycles (nutrients, planktons, detritus) which depend on it. To this end the one dimensional version of the ROMS (**Shchepetkin and McWilliams, 2005)** model is applied. The model consists of a physical model coupled with a biological one, with a mixed layer sub-model *K-Profile Parameterization* (**Large et al., 1994**).

Initialization is done using mean profiles established from *in situ* data (**Barton et al., 2004**), forcing is from monthly means of heat fluxes, surface temperature, wind stress and heat flux sensitivity to sea surface temperature. These physical parameters are extracted from climatic databases and averaged over a 10-year period.

Simulations underlines a strong stratification and a shallow mixed layer under the effect of the important heat fluxes in summer and a deep mixed layer due to convective mixing in late winter, causing an injection of nutrients into the *euphotic layer* and a phytoplankton bloom in February. *Sverdrup critical depth theory* (**Sverdrup, 1953**) is applied in the interpretation of these observations.

Finally the model validation is achieved either through *in situ* or climatic data, bringing to light a qualitative and quantitative agreement between model results and reality.

References

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