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A high resolution hydrodynamical-ecological model for the North Adriatic Sea

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In order to study the response of an ecological system representing a suspended mussel aquaculture farm in North Adriatic Sea to different physical and ecological forcing, a coupled hydrodynamical-ecological model has been developed. A very high resolution, general coordinate, boundary fitted hydrodynamic model has been used to simulate the circulation of the Adriatic Sea, with a special focus along the Italian coasts. The ecological model is constituted by a modified Nutrient-Phytoplankton-Zooplankton (NPZ) model, including a set of parameterized reactions for the description of mussels activity (e.g. mussel filtration, biodeposit production rates, etc.). Different climatically relevant scenarios were considered, including extreme events such as strong wind fields, large temperature and salinity anomalies and large algal blooms.