

**O42.2****Model derived threshold values for the OSPAR assessment of eutrophication in European marine waters**

Sonja van Leeuwen<sup>1</sup>, Hermann Lenhart<sup>2</sup>, Anouk Blauw<sup>3</sup>, Xavier Desmit<sup>4</sup>, Liam Fernand<sup>5</sup>, Rene Friedland<sup>6</sup>, Onur Kerimoglu<sup>7</sup>, Martin Plus<sup>8</sup>, Theo Prins<sup>3</sup>, Christoph Stegert<sup>9</sup>

<sup>1</sup>NIOZ, The Netherlands. <sup>2</sup>Hamburg University, Germany. <sup>3</sup>Deltares, The Netherlands. <sup>4</sup>RBINS-MUMM, Belgium. <sup>5</sup>Cefas, UK. <sup>6</sup>IOW, Germany. <sup>7</sup>University of Oldenburg, Germany. <sup>8</sup>Ifremer, France. <sup>9</sup>Helmholtz-Zentrum Geesthacht, Germany

**Abstract**

Here we present the results of the 2020 online workshop of the OSPAR Intersessional Correspondence Group on Eutrophication Modelling (ICG-EMO). The aim of the workshop was to simulate pre-eutrophic conditions on the western European Shelf, with the specific aim of using the ensemble results to set thresholds for eutrophication indicators for the next OSPAR Common Procedure (COMP4, 2022). To this end, 8 modelling centres from around Europe participated with their most relevant marine ecosystem model. Inputs and boundary conditions were prescribed in order to generate comparable model simulations. Riverine loads, Baltic inflow and atmospheric deposition were applied at estimated pre-eutrophic levels for nitrogen and phosphorous compounds, while other inputs were kept at current levels. The period 2006-2014 was simulated for the current state and two historic input scenarios by most participants, and mean values for 2009-2014 were reported for the new assessment areas used by OSPAR for a range of ecosystem variables.

COMP4 threshold levels were calculated for standard indicators and compared to the previous thresholds based on sparse observations. In general lower thresholds were found compared to the previous observation-based thresholds, particularly offshore. The modelled results also allow for a quantification of the new COMP4 target area variability in time and space, showing higher variability in the German Bight target areas. Furthermore we consider changes in additional characteristics like pelagic and benthic biomass and biomass ratios (e.g. phytoplankton:zooplankton, phytoplankton:bacteria) with respect to the simulated pre-eutrophic conditions and the current state.

**Keywords**

Eutrophication, Modelling, Thresholds, Ensembles