Geophysical Research Abstracts
Vol. 19, EGU2017-13153, 2017
EGU General Assembly 2017

Circulation and microplastic dispersion in the Chiemsee (Germany) investigated with numerical modeling.

Francesco Marcello Falcieri (1), Christian Laforsch (2), Sarah Piehl (2), Antonio Ricchi (3), Elizabeth C. Atwood (4,5), Sandro Carniel (1), and Mauro Sclavo (1)

(1) CNR - ISMAR, Venezia, Italy, (2) University of Bayreuth, Bayreuth, Germany, (3) DISVA - UNIVPM, Ancona, Italy , (4) RSS Remote Sensing Solutions GmbH, Baierbrunn, Germany , (5) Ludwig-Maximilians-Universität Munich Biocenter,Planegg-Martinsried, Germany

The Chiemsee (measuring about 80 km2 and a maximum depth of 73 m) is a NATURA 2000 site and one of the major German lakes and plays a significant environmental role for the region. Moreover it is an important touristic destination, making its beaches and water quality highly valuable from a socio-economical viewpoint. As for most inland European aquatic environments, the Chiemsee was recently found to be contaminated by microplastic (i.e. plastic fragments smaller than 0.5 mm). Two main microplastics sources were identified in the Chiemsee: riverine inputs, and degradation of litter from touristic beaches. Hence, it is of interest to study lake circulation and the resulting microplastic dispersion from these sources in order to support activities to achieve a good environmental status.
Here we present the first attempt to characterize the hydrodynamic processes of the Chiemsee with a high resolution 3D implementation of the Regional Ocean Modeling System (ROMS). The simulations were forced with observed riverine inputs and modeled atmospherical fields computed with a local implementation of the Weather Research and Forecasting (WRF) model.
Modeling results provide a first insight into the Chiemsee circulation system and contribute to understanding the dispersion pathways of microplastic particles from different sources. Furthermore, results can be used to highlight coastlines with higher risk of microplastic accumulation, identified using a set of Lagrangian simulations. The work was partially supported by the CNR Short Term Mobility grant.