



3rd Science for the Environment Conference
Aarhus Denmark 1-2 October 2015

POLLUTANTS DIFFUSION NUMERICAL MODELLING IN AUGUSTA HARBOUR SEAWATER SYSTEM (SIRACUSE, ITALY)

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ABSTRACT

In the last twenty years research have tried to describe natural environment by means of various numerical models. Scientists needed to shrink the several natural aspects in equations able to describe and quantify the environmental processes. The pollution mitigation is the scientific challenge of this century and the application of numerical models are very powerful and helpful instruments to achieve this aim especially in a critical economic condition, where are difficult to source the economic assets in order to evaluate and monitoring contaminants in field activity. Hydrodynamics computational models can well describe how the water moves inside basins, harbours or offshore knowing the driving forces (wind and tidal). Furthermore, there are many mono-, bi- or three-dimensional models of and transport of pollutants which consider kinetic and physical aspects. Recently, the integration of those two models has been applied to investigate pollutants propagation and predict potential contaminant sources or impacted areas. The present work aims to develop a complex three-dimensional hydrodynamic model combined with a propagation model of a hypothetical conservative pollutant in space and in time. This approach was adopted in the Augusta Harbour (Siracuse, Italy), a highly industrialized Sicilian marine area in the middle of Mediterranean Sea. It can be considered as a preliminary decision support system to design an economic seawater-monitoring plan.



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