

SEA POLLUTION AND WASTEWATER OUTFALLS

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The research activity about WASTEWATER DISCHARGE IN COASTAL WATERS AND EFFECTS ON AQUATIC ECOSYSTEMS is carried out by:

- coastal dispersion modelling of freshwater coming from mouth of harbour channels and carrying out monitoring campaigns of sea water quality data. Research field are the Marano estuary mouth receiving the outfall of Riccione WWTP and Rimini Nord along-shore area, characterized by presence of coastal breakwaters near sea outlet of Marecchia river,
- monitoring campaigns of hydraulic parameters and water quality analysis executed in different tract of internal channels connected to Cesenatico port canal.

Results concern

- pointing out and calibration of a quality model describing aquatic ecosystem of transition waters in summer dry weather conditions,
- evaluation of thermoaline profile role in maintaining nutrients and pollutants in surface layers of coastal sea,
- model calibrations and prediction of freshwater dispersion plume area in summer dry weather conditions.

The research activity about OIL SPILL OFF SHORE OUTFALLS AND COASTAL ZONE POLLUTANTS DISPERSION is developed by

- testing drifter performances in tracing such off-shore as coastal trajectory of floating discharged substances in different conditions of sea currents and winds,
- monitoring of freshwater discharged from Cesenatico harbour channel mouth during tidal phases and varying thermoaline conditions,
- measurements campaigns in coastal sea of vertical profiles of oxygen, temperature, salinity, pH, redox describing effects of breakwaters in conditioning freshwater alongshore distribution.

Results consist in:

- design of a proper oil spill drifter and tools to predict oil spill and validate numerical codes (GNOME, Medslik),
- validation and calibration of a 3D dispersion model, applied to a plume dispersion in low depth sea areas characterized by along-shore submerged and emerged breakwaters.



Fig. 1. Sea trajectory monitoring described by oil spill drifters. Measurement campaigns carried out in the coastal area facing Cesenatico between June and September 2009.

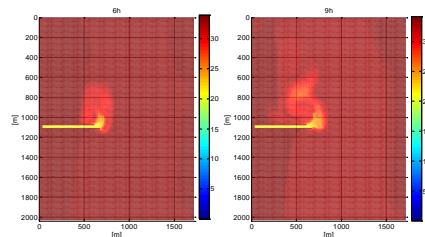
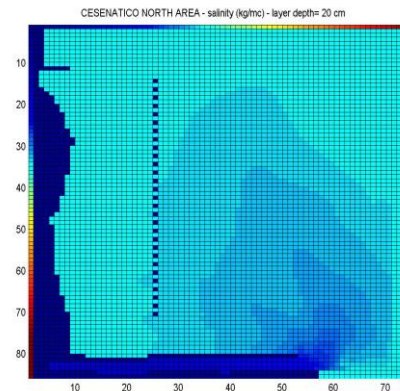


Fig.2. Dispersion modelling of freshwater coming from Cesenatico Port Canal basin. Simulation of the plume dispersion during different wind and current conditions.

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RESEARCH PROJECTS

- **PRIMI:** Pilot project: marine hydrocarbon pollution. Financed by Agenzia Spaziale ItalianaCIRI

- **TECNOPOLI** Project: Fluidodinamica per le applicazioni ambientali

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