



## **Sediment fluxes and trace metals concentration assessment in the Gaeta Gulf area, central Tyrrhenian Sea, Italy.**

Sergio Scanu, Daniele Piazzolla, Simone Bonamano, Riccardo Martellucci, Lorenzo Costanzo, Davide Bonomo, and Viviana Piermattei

Tuscia University, Department of ecological and biological studies (DEB), Italy

The coastal environment plays a fundamental role in human life as it is characterised by the highest values of ecosystem services and by multiple uses that are often in conflict with each other. The coastal environment is also subject to anthropogenic stressors of various kinds that are correlated with the different uses in place and that increase its vulnerability. In order to acquire more detailed information on the sedimentation processes and on the degree of pollution, this work studied the sedimentary fluxes and the concentrations of Arsenic (As), Nickel (Ni) and Lead (Pb) associated with marine sediments in the Gulf of Gaeta (Latium coast, Italy). In particular, we tried to verify the influence of the anthropic activities in the area on the sediment fluxes, taking into account the natural solid contribution to the sea deriving from the coastal streams and the Garigliano river. Sediment fluxes were measured using a deposimetric station located near the commercial port of Gaeta, through monthly campaigns. This station allowed to deploy sediment traps at 6 different distances from the bottom. The total sedimentary flux in the area, discerning the amount of the primary flux ( $F_p$ ) and the resuspension flux ( $F_r$ ) with respect to the total flux ( $F_t$ ) as well as the concentration of As, Ni and Pb in the sediment traps were measured monthly during the sampling campaigns. The measured sediment fluxes were also compared with the meteo-marine conditions (wind intensity, wave height), pluviometric measurements and maritime traffic. The comparison between the sediment fluxes and the concentration of the considered trace metals allowed to quantify over time the trace metals fluxes in the study area. The results obtained from the sediment analysis showed a moderate degree of contamination of As and Ni. The exceeding of the Effect Range Low (ERL) threshold described in the Sediment Quality Guidelines (SQGs) could be attributed to the influence of anthropogenic activities associated with the use of fossil fuels, maritime traffic and industrial activities in the study area.