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# High resolution neodymium characterization along the Mediterranean Sea margins: implications for $\varepsilon$Nd modeling.

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An extensive compilation of published neodymium (Nd) concentrations and isotopic compositions ($\varepsilon$Nd) was realized in order to establish a new database and a map (using a high resolution geological map of the area) of the distribution of these parameters for all the Mediterranean margins. Data were extracted from different kinds of samples: river solid discharge deposited on the shelf, sedimentary material collected on the margin or geological material outcropping above or close to a margin. Additional analyses of surface sediments were done, in order to improve this dataset in key areas (e.g Sicilian strait). The Mediterranean margin Nd isotopic signatures vary from non-radiogenic values around the Gulf of Lions, ($\varepsilon$Nd values  -11) to radiogenic values around the Aegean and the Levantine sub-basins up to +6. Using a high resolution regional oceanic model (1/12° of horizontal resolution), $\varepsilon$Nd distribution was simulated for the first time in the Mediterranean Sea. The high resolution of the model provides the opportunity to study in more details the processes governing the Nd isotope distribution in the marine environment.

This work highlights that a significant interannual variability of $\varepsilon$Nd distribution in seawater could occur. In particular, important hydrological events such as the Eastern Mediterranean Transient (EMT), associated with deep water formed in the Aegean sub-basin, could induce a shift in Nd IC at intermediate depths that could be noticeable in the Western part of the basin. This highlights that the temporal and geographical variations of $\varepsilon$Nd could represent an interesting insight of Nd as a quasi-conservative tracer of water masses in the Mediterranean Sea, in particular in the context of paleo-oceanographic applications, i.e. to explore if EMT-type signatures occurred in the past (Roether et al., 2014, Gacic et al., 2011).