PI's: M. Frank, J. Schönfeld, Brian A. Haley, and Roland Stumpf (Ph.D thesis) Funding: Deutsche Forschungsgemeinschaft Duration of project: February 2008 – August 2011

The History of Mediterranean Outflow Water (MOW) in the Late Quaternary

The **Mediterranean Outflow Water (MOW)** has been an important parameter for the salinity budget and thus for the thermohaline circulation of the Atlantic Ocean. Variations of the intensity of MOW in the past, for example due to sea level changes have therefore possibly contributed to changes in Atlantic circulation and deep water formation. So far there are only a few reconstructions of MOW, mainly due to a lack of suitable archives and imitations of suitable tracers.

Goals:

• Use of the seawater radiogenic isotope (neodymium and lead) signatures extracted from marine sediments and from the clay size fraction of the same sediments to reconstruct the intensity and advection of MOW in the past 25,000 years

at locations proximal to the Strait of Gibraltar in the Gulf of Cadiz and the Portuguese continental margin

at more distal locations, such as the the western North Atlantic and the Porcupine Basin near Ireland, where MOW is linked to the occurrence of coldwater carbonate reefs.



(Levitus et al. 1994)

Distribution of elevated salinity typical for MOW in the present day Atlantic Ocean at 1100 m water depth

Publications:

Stumpf, R., Frank, M., Schönfeld, J., and Haley, B.A., 2010. Late Quaternary variability of Mediterranean Outflow Water from radiogenic Nd and Pb isotopes. *Quaternary Science Reviews* 29, 2462-2472.

Stumpf, R., Frank, M., Schönfeld, J., and Haley, B.A., 2011. Climatically driven changes in sediment supply on the SW Iberian shelf since the Last Glacial Maximum. *Earth and Planetary Science Letters* 312, 80-90.

Directly related: Khélifi, N., Sarnthein, M., Andersen, N., Blanz, T., Frank, M., Garbe-Schönberg, D., Haley, B.A., Stumpf, R., and Weinelt, M. 2009. A major and long-term Pliocene intensification of the Mediterranean Outflow, 3.5-3.3 Ma ago. *Geology* **37**, 811-814.