



Deep Mediterranean Water footprint measured in the Strait of Gibraltar during the last decade.

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Deep Mediterranean Water is formed during winter in the Mediterranean Sea due to atmospheric cooling of salty Mediterranean waters. When it reaches the Strait of Gibraltar it finally flows westward into the Atlantic, from where it begins to descend the continental slope by gravity while it mixes with the overlying waters and becomes lighter. Far beyond the strait itself it maintains a recognizable signal and so affects the thermohaline circulation of the Atlantic Ocean.

Thus, the Strait of Gibraltar is the perfect site to monitor the interannual changes occurring over the whole Mediterranean Sea just before Mediterranean Waters incorporate to the Atlantic circulation.

From October 2004 until today the Temperature and Salinity of the Mediterranean outflow through the Strait of Gibraltar have been monitored, resulting in a long-term temporal series with more than 11 years of measurements. A Conductivity-Temperature sensor is placed around 12 meters above the seafloor in the Espartel Sill (35°56'N 5°45'W), the last constriction the Mediterranean deep water finds before leaving the Mediterranean, and is configured to take measurements every 30 minutes. The instrument has been collecting data almost continuously from 2004, except for a 2.5 month gap in 2009 and a 5 months gap during 2011.

This record allows the study of the long-term trend and the interannual changes occurring over the whole Mediterranean during the last 11 years. First results show a mean temperature of the deep Mediterranean waters of 13.20 ± 0.06 °C and a mean salinity of 38.39 ± 0.02 . It is noteworthy the cold signals registered in 2006 and 2013, which could be the result of the severe winters of 2005 and 2012 in Europe, and the positive trend in 2015 toward warmer values. No significant trends have been found for the whole period. On the other hand, the time series exhibits a noticeable interannual variability that merits a deeper analysis.