1.- Motivation

One of the objectives of the IDEA project was to better understand how the interannual variability of abiotic factors could impact on the population dynamics of two demersal ecosystems in the Balearic Islands. This interannual variability has been shown to be related to the presence/absence of Western Mediterranean Intermediate Water (WIW) in the Balearic channels.

**IDEA project:** Influence of oceanographic structure and dynamics on demersal populations in waters of the Balearic Islands

2.- Interannual variability

The regional circulation in the northwestern Mediterranean in late spring is generally dominated by the Northern Current, which carries down Atlantic waters from the Gulf of Lions along the continental slope of the Iberian Peninsula into the Balearic subbasin. This current bifurcates when reaching the Ibiza Channel; one significant part crosses the channel transporting waters from the Mediterranean into the Algerian subbasin, while other part cyclonically returns to the northeast forming the Balearic Current along the northern coasts of the Balearic Islands (a).

However, if previous winter has been colder than usual (b), the circulation changes dramatically: the Northern Current may be blocked when reaching the Ibiza Channel and then recirculates cyclonically joining the Balearic Current without significant transport of waters through the Ibiza Channel.

3.- Presence of WIW from hydrographic data

The clearest way to track the presence of WIW in the channels is by means of a 6S diagram where water properties for given water masses are limited by their thermohaline properties.

Available oceanographic cruises in the channels since 1985 allow tracking the WIW presence/absence in the Balearic Channels. This qualitative information may be complemented with quantitative data available from MEDATLAS data base in the region defined by the coordinates 0º E-2º E and 38ºN – 40ºN (Ibiza Channel) and from other hydrographic campaigns around the Balearic Islands.

**Late spring circulation in the NW Mediterranean after a mild winter (a) and cold winter (b)**

It is generally accepted that this interannual variability is strongly related to the properties and the amount of WIW reaching the channels in late spring.

4.- The IDEA index

Both methods shown in 3 are short in time and have gaps in the series. In order to obtain a longer and continuous index for WIW presence and then for regional circulation, the meteorological NCEP/NCAR reanalysis dataset was investigated.

Despite WIW formation should in principle be more related to sea–air heat flux losses, the comparison with in situ oceanographic data seem to suggest that correlation is much better when air surface temperature anomalies are used instead.

Time series of air-sea heat flux losses from the NCEP/NCAR reanalysis data set averaged for the period December-March at the grid point closest to the Gulf of Lions (red line) and standardized winter (December-March) air surface temperature anomalies (purple line). Data from hydrographic surveys are also included (in grey) for a better comparison.