

Through the analysis of the time series provided by SORade-SOMLIT in the period 1995-2011, we examined annual and inter-annual cycles of hydro-biochemical variables at Point B in the Bay of Villefranche sur Mer. A cumsum analysis enabled us to detect trends across the studied period. A  $D^2$  to the centroid analysis enabled us to detect temporal discontinuities in seasonality across the years. Important changes in the hydrology of the Bay of Villefranche sur Mer have occurred from 1995 to 2011. Since 1995, we observed a gradual increase in salinity and temperature at Point B. This was also observed at DYFAMED in Western Mediterranean Deep Water, as was the observed abrupt increase of temperature (+ 1°C) and salinity (+ 0.1 psu) in 2006. This abrupt event seems to have been preconditioned by the decrease of freshwater inputs during the three preceding years. In the Ligurian waters, this increase was much larger and more abrupt than previously measured elsewhere and reveals the high sensitivity of the Mediterranean Sea to decreases in freshwater inputs. Chlorophyll-a concentration presents an overall downtrend throughout the studied period and shows mostly negative correlation with nitrate concentration which stands at odds with the common conceptual model that favorable nutrient conditions result in high phytoplankton concentration. This could be due to grazers controlling primary production or coastal anthropogenic impact. Four distinct hydrological and biochemical periods were detected throughout the studied period, each characterised by varying stratification timing and duration and more or less strong mixing events. It seems that the oscillation between very saline and fresher periods, caused by inter-annual climatic changes in the freshwater input, is at the origin of such variations causing varying mixing events and impacting on the seasonality and therefore chlorophyll-a concentrations of the bay of Villefranche sur Mer. The maintaining and development of the monitoring of long term changes is more than ever essential if we are to understand this decrease in productivity in the bay of Villefranche sur Mer. Further studies should include a thorough shore/offshore biochemical comparison.