



Analysis of the Connections Between the NAO Jones Index, Precipitation, Temperature, Discharge and Wet Days in the South Mediterranean Region

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The North Atlantic Oscillation (NAO) quantifies the air mass distribution between the north-south Artic-Subtropical Atlantic dipole. It is the most known pattern of atmospheric circulation in the Northern Hemisphere. A way of quantifying the strength of the NAO phases is by using an index, computed by Jones et al. (1997), that measures the difference of the normalized sea level pressure over Gibraltar and over Reykjavik. Swings in the NAO index affect the transport and convergence of atmospheric moisture (Hurrell, 1995). A number of studies over the past decades have investigated the likely link between the change in phases of the NAO index and the response of many ecological, biological, marine and hydrological processes. These studies show the direct impact of the NAO phases on many human activities.

This study investigates both 1) the inter-dependence between the NAO index and precipitation and temperature in the central sector of the Mediterranean region (Southern Italian Peninsula and Islands) and, 2) the impact of the NAO on changes in hydrological regime in that area. The aim of this analysis is to check if there is any direct influence of the NAO phases on agriculture and, thereby, on the economy of this region which is based on harvesting. For each selected record station in the study area, linear correlations between the NAO index and the average winter (December to March) precipitation, temperature, discharge and wet days were calculated, in order to check the spatial correlation between variables, by means of the Pearson coefficient (all significant at 1% level). Then, to describe the variability of the precipitation, temperature, discharge and wet days concisely, a single index for each of these variables was calculated over the study area by first normalizing the data at each station and then averag-

ing all of the records for a selected time period. The linear correlation between these calculated indexes and the NAO index was then generated and showed that: 1) 23% of the winter precipitation variance, 34% of the discharge variance and 35% of the wet days variance are linearly related to the NAO index and, 2) the winter temperature shows a weak correlation with the NAO index, agreeing with previous studies.