Geophysical Research Abstracts
Vol. 18, EGU2016-6839, 2016
EGU General Assembly 2016

A new long instrumental serie for the Etesian winds since 1877

F.de Paula Gómez-Delgado (1), Inmaculada Vega (1), David Gallego (1), Cristina Peña-Ortiz (1), Pedro Ribera (1), and Ricardo García-Herrera (2)

(1) Universidad Pablo de Olvide,Sevilla,Spain , (2) Universidad Complutense - IGEO/CSIC, Madrid,Spain

The meteorological observations found in old ships' logbooks have been recognized as a useful source of climatic information in periods and areas not covered by other sources. In the last five years several studies have employed the wind direction observations contained in logbooks to generate climatic indices of instrumental character related to large scale patterns such as the atmospheric westerly circulation in North Atlantic, the strength of the West African Monsoon or the start date of the Indian Summer Monsoon (ISM).

This study is focused on the winds in the eastern Mediterranean (EM) and its relation to the subtropical climate at decadal scale. Previous studies have shown a significant link between the frequency and strength of the prevalent summer northerly winds (Etesian winds) of the EM and the strength of the ISM. This relationship had only been studied in detail for the second half of the 20th century due to the absence of long and continuous series of wind observations in the EM for previous periods. In this work, we use historical wind data contained in ship's logbooks to generate a new climatic index, the "Etesian Wind Index", which can be defined as the percentage of days with prevalent northerly wind (between 315º and 45º) in a fixed region [10ºW-20ºW, 32ºN-36ºN]. We have been able to produce an index of the Etesian winds starting in 1877 suitable to analyze its long term variability and its relation with the ISM in unprecedented detail.

Our first results show that the frequency of the northerly winds in the EM was significantly larger in the first half of the studied period, mainly due to an intensification of the zonal component in the second half of the studied period. Interestingly, the comparison with analogous Etesian wind indices computed from reanalysis products (NCEP/NCAR 20th Century (V2c) and ERA20C), shows strong discrepancies among them and with our instrumental reconstruction, which could indicate a misrepresentation of the Etesian winds in the reanalysis products prior to 1948.

Accordingly to previous works, we have found a strong and significant positive correlation between the Etesian Wind Index and the ISM since 1950 to 2013. This link is also shown for the 1877-1900 period. However the correlation fades out in the period 1900-1950 , even reversing its sign in the central part of the latter period. The origin and causes of this change is still under research.

This research was funded by the Spanish Ministerio de Economia y Competitividad through the project INCITE (CGL2013-44530-P, BES-2014-069733)