

Comparison of precipitation frequencies in Padova and Trieste, Italy, during the 18th century.

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In this work we compare the frequency of precipitation in Padova and Trieste, Italy, during the 18th century, using instrumental and non-instrumental observations.

In Padova regular instrumental meteorological observations, i.e. indoor and outdoor air temperature, barometric pressure, precipitation total and frequency, wind direction and other weather observations were started in 1725 by Giovanni Poleni and his son Francesco, and were continued by Giuseppe Toaldo and Vincenzo Chiminello. In the following centuries, this series continued nearly without gaps till today. Giovan Battista Morgagni performed a parallel series of observations (1740-1768) including rain frequency. The sites and the methodology used for the observations are known, and, in the case of Toaldo, also original measurement units are still available in the form of calibrated water containers. In Trieste the occurrence of precipitation was observed by Antonio Scussa and reported in his diary, that covers the 1732-1749 period.

Padova and Trieste are respectively located on the Western and Eastern sides of the North Adriatic sea, at a geographic distance of approximately 160 km. Despite the relative short distance, the different positions relative to the Adriatic basin affect the precipitation regimes at the two sites in the presence of the most frequent winds, namely Bora and Sirocco. The warm, humid Sirocco (from SE) generates precipitation at Padova, while Trieste is partly shielded by the Istrian Peninsula. Also in the case of Dark Bora (from ENE), dynamically generated by Sirocco when it overflows the Alpine chain, the precipitation is different. A comparison of the two sites may help to know how the general climate and extreme events changed over the course of centuries.