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Climatic changes in Taranto area

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To better understand climatic changes in Taranto area have been analysed daily rainfall data from Grottaglie and Castellaneta rain gouge stations. This two rain gouge station have been chosen because can be considered representative of the situations of the East and West side of Taranto province, and because it is available a long series of daily rainfall data from 1927 to 1996.

Rainfall data analysis show that there is a decrease in rainfall amount of about 2 mm/year for both rain gouge stations. A detail analysis show that rainfall decrease is concentrated during Winter and specially during Autumn months, that are the more relevant for groundwater recharge. On the contrary there is an increase of the rainfall day ($h \geq 1$ mm). To better understand this phenomena rainfall day have been divided considering 3 different threshold of rainfall for a day: 20; 35; 50 mm/day. The analysis have shown that rainfall decrease is concentrated in rainfall of a daily amount between 20 and 35 mm/day the rainfall that gives more contribution to groundwater recharge. At the beginning of the XX century ('20 and '30 years) the total amount of rainfall with a daily amount between 20 and 35 mm/day where more than 50% of the total amount of the year, while at the middle of '90 years it was non more than 30%.

To better analyze the more severe rainfall the study period (1927-1996) has been divided in two sub-period (1927-61; 1962-1996). For Grottaglie rain gouge station an event of 120 mm in a day had a return period of about 120 year on the base of rainfall data of the period 1927-1961, while it has a return period of 50 years n the base of analysis carried out using 1962.96 data. So the probability to have severe daily rainfall event is lower. It is quite contrary to the feeling of people. To better uderstend this problem have been considered rainfall of severe intensity and short duration (1h; 3h;

6h; 12h; 24h) and have been analysed considering the two period 1927-61 1962-96. For both period it has been calculated the climatic curve ($h = a t^n$) for a return period of 20 years. The comparison of the climatic curve of the two considered periods show that for rainfall duration lower than 6 hour the curve of the period 1962-96 gives higher value of rainfall amount respect to that of the period 1927-61. It means that at the end of the century more intense rainfall of duration lower than 6 hour are more probable. For rainfall duration higher than 8 our it the contrary. If we consider that about all hydrographical basin of Taranto area have corrivation time lower than 8 hour it is easy to understand that, also if there is a general trend of rainfall lowering, there is also and increase of hydraulic vulnerability and of erosion processes because is increased the intensity of rainfall duration comparable with the corrivation period of the basins.

The last aspect it has been analyzed is the duration of dry period total. During the XX century the duration of completely dry period has been subject to a shortage. In Grottaglie rain gouge station it has been observed that the maximum duration of a period with complete absence of rainfall was about 50 day at the middle of '30 Years and at the end of 080 years is about 30 days. In Castellaneta was about 40 days at the beginning of '40 years and s became 30 days at the en of '80 years.

It is possible to summarize the obtained results in three main points:

1) The research has shown that rainfall lowering is not uniform all over the year, but it is concentred specially in Autumn mounts giving so severe problems to groundwater recharge;

2) There is an increase of intensity of rainfall with a duration comparable with the corrivation time of hydrographical basins.

3) There is a shortage of the duration of completely dry period.

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