



## **Rural surface ozone levels in the Eastern Mediterranean (Malta, Greece, Cyprus)**

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In this work the surface ozone climatology based on several-year measurements of two rural stations in Greece, Aliartos (1996-1999) and Finokalia (1998-2001) is examined and compared with the corresponding values in Malta/Jordan Lighthouse, Gozo (1997-2001) and Cyprus/Ag. Marina (1997-2001). The above stations experience similar weather conditions during summer regarding the high temperatures and the strong solar irradiation.

The rural surface ozone climatology in Central (Aliartos) and Southern (Finokalia) Greece shows that the summer afternoon ozone, representing well-mixed boundary layer air, is quite uniform over a distance of about 500 km, from May to September, especially during July-August when the average values exceed slightly the 60 ppb level. From the comparison it comes out that the July-August ozone values all over Greece are higher by about 10 ppb than the corresponding values in Malta and in Cyprus which on the average show similar values slightly higher than 50 ppb. In 1998, the first year of common operation of all stations, the differences in the summer rural ozone levels were much more significant (15-20 ppb). In addition, the July-August ozone values in Greece are higher than the April-May values, while in Malta and in Cyprus the April-May values are higher.

After examining the April-May/July-August differences for each station and the July-August differences between the different stations (mean monthly values and also diurnal profiles), the hypothesis of long-range transport of ozone and/or precursors is

tested in order to interpret the measurements. This suggestion is strengthened if the average weather maps are examined, where a northern horizontal flow in the boundary layer towards Greece in summer is clearly shown during July-August, especially in the 850mb level. This is mainly the result of the combined influence of the N. African high and the Middle East low-pressure systems but also enhanced by the local topography namely the Aegean channel. This situation is very clearly observed in the surface meteorological measurements all over the Aegean. During July-August the north winds, named "Etesians" (annual), blow for about 55% of the time in Athens while in the Aegean islands the north flow associated frequently with particularly strong winds, is present for 80-90% of the time. The 60 ppb rural ozone levels are very often exceeded in Greece in July-August during periods of north horizontal flow in the boundary layer.