Geophysical Research Abstracts,
Vol. 11, EGU2009-8549, 2009
EGU General Assembly 2009

Lagrangian evaluation of air and moisture transports from and to the Mediterranean basin

I. Schicker, P. Seibert, and S. Radanovics

University of Natural Resources and Applied Life Sciences, Water-Atmopshere-Environment, Institute of Meteorology, Vienna, Austria (irene.schicker@boku.ac.at)

Within the Sixth Framework Programme project CIRCE (Climate Change and Impact Research: the Mediterranean Environment), we have carried out analyses of the transport of air and moisture from and to the Mediterranean basin. These evaluations are based on the global data set generated by Andreas Stohl (Stohl, 2006) through a global, domain-filling simulation with the Lagrangian particle model FLEXPART. The data set covers the period from 27 October 1999 to 30 April 2005.

Residence times, stagnation and recirculation have been calculated for different time intervals between 1 and 90 days on a seasonal and annual base. Residence times, precipitation and moisture budgets have also been evaluated for a number of sub-basins.

The origin of the precipitating moisture was diagnosed globally as the fraction of the total precipitation on a grid cell that stems from moisture which evaporated inside the Mediterranean or, respectively, its sub-basins.

Residence times of the 90-days time interval show very clearly that the Mediterranean is a crossroad of air streams, where air enters mainly from the Northwest while the outflow splits into two big parts, one through Central Asia to the Pacific coast and the other one over North Africa into the tropical Atlantic. In general, longer residence times are found over the Western and Central Mediterranean than over the Eastern Mediterranean which is strongly influenced by the Etesian winds crossing the basin.

Over most of the Mediterranean basin, the fraction of authochtonic precipitation is at least 40% throughout the year. It is highest in summer with values between 50% and 70%. Results for autumn also show the influence which the SST has in autumn compared to spring time with its lower SST. Autumn and spring also show the pathways for the export of moisture in precipitation most clearly. Dominant pathways are to the Northeast and towards Central Africa, which is comparable weak. In addition, a maximum over eastern Central Europe is visible which can be connected with Vb-like cyclone tracks.

Stohl, A. (2006) Characteristics of atmospheric transport into the Arctic troposphere. J. Geophys. Res. 111, D11306, doi:10.1029/2005JD006888.

Acknowledgement: We want to thank Andreas Stohl for providing the data. This work was carried out in the CIRCE Integrated Project - Climate Change and Impact Research: the Mediterranean Environment, project No. 036961, part of the European Commissionś Sixth Framework Programme, Sustainable Development, Global Change and Ecosystems.