

## **Can recently observed precipitation trends over the Mediterranean area be explained by climate change projections?**

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We examine the possibility that anthropogenic forcing (Greenhouse gases and sulfate aerosols, GS) is a plausible explanation for the recently observed precipitation trends over the Mediterranean area. For this purpose, we investigate the consistency of annual and seasonal observed trends in precipitation with the response to GS forcing estimated from 15 coupled atmosphere-ocean general circulation models derived from CMIP3 datasets and a set of regional climate models from CIRCE project. In summer we find that the projected changes in mean summer precipitation are consistent with the observed changes in recent decades. Consistency in summer suggests that the observed drying trend over the Mediterranean will continue in the future.

Pattern similarity statistics used in this study indicates that, in winter and spring observed trends and variability are larger than climate change projections. In autumn we find an important difference, observations contradict the projections. Observations suggest that in autumn Mediterranean region has become wetter by about 2 mm/month per decade increase in amount of precipitation during last 30 years. In contrast to observed trends all global and regional scenarios give us a picture of increasingly drier and stable conditions. Inconsistency in annual cycle of precipitation over the Mediterranean can occur for two reasons: Either our expectation of future change is wrong, or the anthropogenic forcing is not dominant in recent years.