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Hydrology and Earth System Sciences Discussions

Interactive comment on "Interannual variability of winter precipitation in the European Alps: relations with the North Atlantic Oscillation" *by* E. Bartolini et al.

Anonymous Referee #1

Received and published: 1 September 2008

GENERAL COMMENTS

The study investigates fluctuations and temporal trends in the interannual variability of precipitation and seeks for a relationship between monthly/seasonal precipitation and large-scale patterns of atmospheric circulation. The Alpine region exhibits the strongest interannual variability of winter precipitation in Europe. Unlike previous studies, conducted on smaller temporal and spatial extent, the relationship between winter precipitation and large-scale patterns of atmospheric circulation is found to be non-significant. Significant temporal trends were observed only in the Eastern sector of the

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Interactive Discussion

Discussion Paper

Alpine region, where winter precipitation is expected to decrease in the future.

The main message of the paper is the rejection of an hypothesis, the correlation between variability of winter precipitation and modes of atmospheric circulation (e.g. NAO). I consider this "negative result" as a positive contribution to the scientific discussion, and therefore worthy of publication. I suggest a minor revision of the manuscript to clarify some points, listed as "specific comments".

SPECIFIC COMMENTS

- line 13, page 2047 - You cite some previous works on the same subject. Please specify which kind of relationship do they find. You only comment on the fact that they identify trends, while you don't (lines 10-20, page 2053). Say, if so, that they find also significant correlation between winter precipitation and NAO.

- lines 18 and following, page 2047; line 19 and following, page 2049 - It is difficult, for a non-expert, to realize what effectively are the "modes of atmospheric circulation", without turning to the references. You could add some more explications or, better, you could add a figure where data you are comparing are shown (e.g. winter rainfall amount or SPI in one grid-cell/station vs NAOI).

- line 4, page 2049 - Specify, if it is the case, that these stations were not used for the creation of the CRU TS 1.2 grids.

- line 19, page 2050 - The definition of SPI, and how it is calculated, is confusing. You say that the SPI "represents the difference between precipitation values and the mean, divided by the standard deviation for a given averaging period t", but apparently it is not calculated as "difference between precipitation values and the mean, divided by the standard deviation for a given averaging period t".

- line 7, page 2054 - I would say that strong year-to-year variability in winter-season precipitation can "definitely not" be explained by the dominant large-scale modes of climate variability in the Northern Hemisphere.

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- line 24, page 2054 - I would not say that the dependence of precipitation regimes on NAO in the Alps region is "particularly" weak. It is weak as in all the band correspondent to their latitude, that is apparently the transition band between positive and negative correlation (Fig 3 and 4).

TECHNICAL CORRECTIONS

- line 4, page 2050 - I would use Dec-Mar instead of DJFM

- line 10, page 2050 - ...in different places...

- line 7, page 2053 - I would separate with a 'newline' the trend analysis from the correlation analysis.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 2045, 2008.