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**Hydrology and Earth System Sciences Discussions**

# *Interactive comment on* "Hydroclimate variability and its statistical links to the large-scale climate indices for the Upper Chao Phraya River Basin, Thailand" *by* N. Singhrattna et al.

**Anonymous Referee #1**

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General comments

The study investigates the statistical correlations between Thailand Monsoon rainfall and tropical (Indian and Pacific) ocean SST. Rainfall is represented by station records from the Ping River basin in Thailand, and oceanic SST is represented by standard indices (ION, NINO-x,...). Between these variables a cross-correlation analysis is conducted, yielding as many as 36000 values (= 50 stations$\times$5 indices$\times$12 months$\times$12 lead periods). The authors select and investigate those which lie above some significance threshold, and conclude that there is some monsoon predictability depending



on the set of chosen indices.

This kind of analysis, however, is insufficient to warrant publication in HESS. There is a long history and a vast literature on empirical Indian monsoon prediction, which the study could have drawn from methodologically. Instead, the authors merely provide little more than a data mining study for the numerous variables involved. Exploiting the correlations for a proper statistical model would have been the step necessary for a valuable HESS contribution. From the authors' own suggestion: "The developed relationships between rainfall and indices or large-scale atmospheric variables would be useful in the development of rainfall forecasting models as presented in Singhrattna et al. (2005b) and Zehe et al. (2006b)."

Specific comments

The abstract is overloaded.

The introduction misses outlaying the main purpose of the study. So it remains unclear whether the topic is seasonal weather forecast (e.g.) or climate change.

Selecting from a set of 36000 calculated correlations those that are "significant" is a rather poor and misleading undertaking, because for any given significance level p, p percent would turn out to be significant by pure chance - which in this case would be as much as 1800. This may explain some of a number of inconclusive results of the study (such as the large September-October difference).

The actual size of the correlations is often not reported (only whether being significantly nonzero). Similarly, negative and positive correlations are treated equally, which is somewhat counter intuitive and needs explanation.

Technical details

6660, 21: Is the first sentence (the study) about seasonal forecasts or climate change?

6661, 16: Consider to move paragraph up.

6665, 12: In this context one would like to know how large the correlation actually is, and not whether it is significantly nonzero.

6666, 5: This procedure is highly problematic. Choosing from so many candidate correlations is bound to render a considerable amount of them as spurious, depending on the chosen significance level.

6667, 19: Please specify exactly what is meant by "$\pm$0.26". - Fig. 5 is stretched horizontally so that the displayed correspondence of variables is misleading.

6667, 23: Why do you show a moving window here instead of total correlations?

6667, 26: You explained how temperatures can drive monsoon precipitation. But what is 'vice versa' here? In Fig. 6, the curves are hardly distinguishable.

6668, 9: The statement "The negative correlations ..." is unclear.

6668, 14: If correlations are better or more consistent with the SST then why isn't SST considered in the first place?

6668, 27: The trend analysis here starts somewhat unmotivated from the context.

6668, 28: The time series obviously exhibit inhomogeneity, as evidenced by the sharp change in lag-1 autocorrelation around the year 1980.

6670, 24: The large difference between September and October is very likely indicative of the low significance of the reported correlations (see comment 6666, 5).

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 6659, 2009.