

## ***Interactive comment on “Trends and regime shifts in climatic conditions and river runoff in Estonia during 1951–2015” by Jaak Jaagus et al.***

### **Anonymous Referee #1**

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#### General comments

The authors have published several papers on the same topic:

Jaagus, J. 2006. Climatic changes in Estonia during the second half of the 20th century in relationship with changes in large-scale atmospheric circulation. *TAC*, 83, 77–88

Sepp, Mait, 2010. On regime shift in the general atmospheric circulation over the Baltic Sea region in winter. *International BALTEX Secretariat Publication*, 46, 46-47

Sepp, Mait, 2016. On Regime Shift in the General Atmospheric Circulation over the Baltic Sea Region. *COST Action 733: Harmonization and Application of Weather Type Classifications for European Regions ; Final Scientific Report*, 221–228.

Jaagus, J., Briede, A., Rimkus, E., Sepp, M. 2016. Changes in precipitation regime in the Baltic countries in 1966–2015. *TAC*, DOI: 10.1007/s00704-016-1990-8

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What is new in the present paper? 1. 15 years and 2 meteorological stations were added, but this did not change the conclusions drawn on temperature, precipitation and snow cover trends in (Jaagus 2006) 2. Trend analysis was complemented with regime shift analysis, but the conclusion that an abrupt change in the circulation over the Baltic Sea has taken place at the end of the 1980s only repeats the existing knowledge (Sepp 2010, Sepp 2016, Lehmann 2011, Soomere and Räämet 2014, Soomere et al 2015, etc) 3. The analysis of river runoff was added and this is new.

Therefore, the authors should make clear difference between the well-known facts, their own earlier conclusions and new information.

References: Lehmann A., Getzlaff K., and Harlaß J. 2011. Detailed assessment of climate variability in the Baltic Sea area for the period 1958 to 2009. *Clim. Res.*, 46, 185–196. Soomere, T. and Räämet, A. 2014. Decadal changes in the Baltic Sea wave heights. *J. Mar. Syst.*, 129, 86–95. Soomere, T., Bishop, S.R., Viška, M., Räämet, A. 2015. An abrupt change in winds that may radically affect the coasts and deep sections of the Baltic Sea. *Clim. Res.*, 62, 163–171

### Specific comments

An interesting part of the paper is regime shift analysis of large-scale circulation indices. Table 2 presents only trends and regime shifts are described very shortly in chapter 3.1. Figure 2 presents the time series of only one index. What about the others? What about return shifts?

Table 3 shows trend and shift values for the whole Estonia, but text in chapters 3.2, 3.3 and 3.4 describes regional differences. This is not acceptable. The spatial distribution of these values should be presented in a more convincing way. E.g., there is a sentence “Generally, the trends and regime shifts at the coastal stations in western Estonia are weaker than at the inland stations of eastern Estonia“. There are no numbers to prove this. Therefore, this sounds like belief, not knowledge.

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Trend values and regime shifts for precipitation shown in Table 3 do not coincide with the data in Tables 1 and 2 shown in (Jaagus et al 2016). This discrepancy should be clarified.

Figures 3, 5, 6, 7 and 8 contain nearly no information, because they are drawn for some selected sites and simply illustrate how trends can be replaced by regime shifts. There is nothing new in comparison of these two methods.

Figure 4 is drawn for only one station and only one index, therefore, its informative value is low. Besides, positive correlation between NAO indices and temperature in winter is a trivial fact.

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[Interactive comment on Earth Syst. Dynam. Discuss., doi:10.5194/esd-2017-24, 2017.](#)

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