We would like to thank Lena Tallaksen for reading the paper and the feedback and remarks regarding the drought terminology.

The comments are in **bold**, our response in *italic.*

The paper addresses an important topic related to the influence of glaciers on the flow regime in a future (warmer) climate, and drought in particular. My remarks relate primarily to the terminology used for defining drought and do not address the full paper as such.

Two different threshold approaches are employed; a threshold based on the historical period and a transient threshold approach, whereby the threshold adapts every year in the future to the changing regimes. In both cases, drought occurs when the discharge falls below the threshold. A daily variable threshold is used (80th percentile), defined based on a 30-day moving average time series. There is no seasonal distinction made and droughts can occur any time of the year as long as the flow is below the daily varying threshold.

The study, which is based on two catchments, projects "extreme increases in drought severity in the future" for the scenario HVT-D, i.e. a historical threshold combined with a dynamical glacier area. More specifically, the simulations show a lower peak flow and a shift towards an earlier melt peak, implying higher than normal flow early in the summer season and lower than normal flow towards the end of the melt period (ref. Figure 7). Accordingly, the projected increase in drought severity (from the time of the peak and onwards) is mainly caused by a change in the timing of the melt peak, or as stated in the paper, "by the regime shift due to a reduction in glacier area". (It is recommended to use the same scale on the y-axis for the different plots in Figure 7 to ease the comparison.)

>> We will use the same scale on the y-axis for Figure 7 in the revised version.

Both catchments have typically glacier flow regimes with low flows in winter and high flows in summer. Projected changes in flow seasonality in catchments with glaciers are strongly linked to changes in the snow regime with more precipitation falling as rain (rather than snow) and less snow accumulating (with the exception of some high altitude regions). Milder winters are projected to lead to earlier spring flood, a tendency that can already be observed for Norway (Wilson et al., 2010). Similar, warmer spring and summers are projected to lead to earlier and more glacier melt (as long as the glacier volume does not reduce too much). However, a shift in the timing or a reduction in the flow during the snow or glacier melt season is not associated with an increase in drought in these cold climate regions; neither by the snow/glacier research communities nor by water management. Rather, if focus is on drought, there is a concern that a longer snow free season combined with an increase in evapotranspiration may lead to increased drought in the following low flow period (e.g. Wilson et al., 2010). Glacierised catchments located in wet climates such as western part of Norway are further expected to be less prone to droughts in the future as compared to catchments located in drier climates.

>> Yes, it is true that research on this issue is more socially relevant in the more vulnerable drier regions of the world, where the dependence on glacier melt water components is higher. Norway and Alaska are used as case studies in this research to analyse the effects of methodological choices because of their good data availability. We hope to apply the outcomes of this research to more vulnerable regions and clarify the role of the reduction of the more reliable meltwater nowadays versus the more variable rainfall-runoff component in different climatic situations. We will clarify this in the revised manuscript.

The terms 'flood' and 'drought', as well as 'high flow' and 'low flow' periods are well defined concepts in hydrology, and I would strongly argue against using the term 'drought' for a period

with relatively low flow during the high flow season or equivalent, 'flood' for a period with relatively high flow during the low flow season, merely based on their percentage deviations from the seasonal flow regime (and not their impacts). Rather, I suggest referring to these deviations as streamflow anomalies (or deficiencies for drought) as originally proposed by Stahl (2001) when introducing the daily varying threshold approach, and later elaborated in Hisdal et al. (2004). As highlighted in these studies, the variable threshold approach is adapted to detect streamflow deviations during both high and low flow seasons, and periods with relatively low flow during the high flow season are commonly not considered droughts. Still, lower than normal flows during high flow seasons may be important for later drought development.

>> We understand that it might be confusing to use the term streamflow drought for anomalies in streamflow during the high flow season, although it does fit within the definition of below normal water availabilities relative to climatology. However, these high flow season streamflow droughts as they are defined with this method have been described as important as well, and have been studied in other studies that used a variable threshold level method (e.g. Van Loon et al., 2015, Fundel et al., 2013) or standardised indices like the Standardized Runoff Index and Standardized flow index (Shukla & Wood, 2008, Vidal et al., 2010). Especially global studies looking at future drought, such as Prudhomme et al. (2014), Van Huijgevoort et al. (2014) and Wanders et al. (2015), define drought compared to climatology everywhere around the world, regardless of definition issues. We also acknowledge that especially streamflow droughts with relative high deficits and long durations within the high flow season will affect downstream water users (e.g. Immerzeel et al., 2010, Messerli et al., 2004). So we do think that the term streamflow drought for severe deficits in the high flow season may have some merit, especially more downstream and for speaking to the global drought community. Moreover, we think that drought is not a so 'well defined concept in hydrology' when looking at the different uses of the term drought in literature and the numerous drought indices that exist. Within the group of authors we have discussed this definition issue extensively and although we have different opinions we settled for using the term streamflow drought in this paper for practical reasons. We suggest to make our definition of streamflow drought in this study more clear and explain how it differs from other studies in the introduction. We will also add some discussion about this drought definition issue in the revised version.

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