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Discussions

Interactive comment on "Predicting East African spring droughts using Pacific and Indian Ocean sea surface temperature indices" *by* C. Funk et al.

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Interactive comment on "Predicting East African spring droughts using PaciïňĄc and Indian Ocean sea surface temperature indices" by C. Funk et al. Anonymous Referee #1 Received and published: 23 April 2014 The paper is well written and researched, however I don't get the connection between the results and the interpretation. There is a double negative in the loading pattern and correlation maps that obscures the meaning. Attached are reviewer's analysis for author's consideration. Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 3111, 2014.

Response: We appreciate reviewer 1's kind assessment regarding the clarity and quality of our research. Based on the reviewer's comments, however, it seems that we have

not done an adequate job of explaining the relationship between the rainfall principal components, the SST correlation fields, and the choice of time periods used. We have added the following paragraph to our discussion of the PC1 – SST correlation pattern. We have also examined the reviewers EOF, time score and correlation maps with Ts, SST, 200U, and SLP. The GPCC EOF pattern and score time series seems broadly similar to our analysis, which is based on a different time period and region. The low pc scores appear to align with our PC1 (1984, 1992, 1993, 2000, 2004, 2009). The 1950-2010 correlation patterns are weak; and we acknowledge that this is accurate. However, an important teleconnection has emerged since the mid-1990s, and this teleconnection is the core of our paper. The focus is on applications to humanitarian early warning, and within this context it is the current behavior that is of considerable importance. We concede, however, to not explaining this adequately, and have strengthened the manuscript in this aspect.

It should be noted that the strength of these SST correlations depend on the time period analyzed. As discussed in Funk et al. (2013) or Liebmann et al. (2014), the strong negative correlation structure shown in Fig. 2a has only manifested since the mid-1990s. Running correlations with Niño 3.4 SSTs indicate weak relationships before that period (Funk et al. 2013). Analysis of 1948-1987 climate data (Hastenrath et al., 2011), furthermore, indicate weak teleconnections between Kenyan boreal spring rainfall and the atmospheric circulation over the Indian Ocean. As the mean Walker Circulation has intensified (L'Heureux et al., 2013), however, the East African drought impacts of La Niña-like SST patterns has intensified (Williams and Funk, 2011) due to the influence of a stronger WPG (Hoell and Funk, 2013), resulting in the type of correlation structure shown in Fig. 2a. Atmospheric Global Circulation Models (AGCMs) have also been used to confirm the plausibility of this correlation pattern (Hoell and Funk, 2013a;Liebmann et al., 2012;Lyon and DeWitt, 2012).

Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/11/C2365/2014/hessd-11-C2365-2014-C2366

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supplement.pdf

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