

Weather Clim. Dynam. Discuss., author comment AC2  
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## Reply on RC2

Joel Lisonbee and Joachim Ribbe

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Author comment on "Seasonal climate influences on the timing of the Australian monsoon onset" by Joel Lisonbee and Joachim Ribbe, Weather Clim. Dynam. Discuss.,  
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Thank you for these thoughtful comments. You provided three points for us to address and we will provide a response to all three points in order.

In response the first point:

Thank you very much for this suggestion. We've added a small statement to our paper.

Nicholls et al (1982) showed that 30% of the wet season rainfall occurs before the monsoon onset and 70% occurs afterward. At Darwin Airport the average rainfall total on days with > 0.2 mm of rain for non-monsoon days is 14.7 mm while the average daily rainfall amount for monsoon days is 21.3 mm. Pre-monsoonal rainfall is characterized by meso-scale thunderstorms, which may produce large rainfall totals locally on individual days, while monsoonal rainfall can produce large rainfall totals for multiple days and over a very broad areas (Pope et al. 2009). The impacts of wet season rainfall may appear in the early wet season, but the likelihood increases under a persistent monsoon pattern.

It is known that early wet season (Oct-Dec) rainfall correlates well with ENSO (McBride and Nicholls, 1983), thus this paper focuses on the dynamical monsoon.

In response to the second point:

Thank you, this is a really good point. Why should seasonal scale variability influence sub-seasonal scale weather patterns (i.e. the monsoon)? We are investigating this possibility because it has been proposed in previous research (Hendon et al. 1989; Drosowsky and Wheeler, 2014; Kim et al., 2006; Kullgren and Kim, 2006; Nicholls, 1984; Nicholls et al., 1982; Smith et al., 2008; Webster et al., 1998) and we would like to test these possible connections in the most complete way possible.

The reviewer is correct that the value comes in allowing for planning at longer time scales. At the moment, our best technology for predicting monsoon bursts is the MJO which provides predictability at multi-week timescales. If there was a connection between monsoon onset and seasonal climate drivers it would provide a valuable planning mechanism for agriculture producers and so many others in tropical Australia.

We have re-written the paragraph in question. It now reads:

"The MJO provides predictability of the monsoon onset at multi-week timescales. If there was a connection between monsoon onset and climate drivers on a seasonal (multi-month) time scale it could provide a valuable planning mechanism for agriculture producers and so many others in tropical Australia. This paper presents a statistical analysis of seasonal-scale(1–6 month) climate influences on the timing of the dynamical onset of the Australian monsoon for the period 1950-51 to 2020-21. With the acknowledgement that monsoon onset occurs on a sub-seasonal time scale, we are investigating this possibility because it has been proposed in previous research (Drosowsky, 1996; Hendon et al., 1989; Kim et al., 2006; Kullgren and Kim, 2006; Nicholls, 1984; Smith et al., 2008; Webster et al., 1998) and we would like to test these possible connections."

In response to the third point:

Many thanks for this information. We followed up on this and included Berry & Reeder (2016) in our paper.