O'Conner et al present an interesting and novel study on the effect of ground water depth (GWT) on evapotranspiration (ET), land surface temperature (LST) and the enhanced vegetation index (EVI). More precisely they study if the effect of GWT on ET, LST and EVI differs between vegetation types and season (with respect to rainfall). The authors find a strong difference in ET, LST and EVI between crop- and forest areas. Furthermore for crops they find a higher ET and lower LST in areas with shallower water table depth during the dry season transition.

The topic of the study is interesting and, as far as I know, they are the first to include the effect of GWT on ET at this scale. The set-up of the study (three land cover types, combined with two WTD classes) is easy to understand and effective. Figure 2 provides a good overview this set-up.

I have a few questions for the authors regarding the methodology (the used data sets and different choices made). Afterwards I wrote some general remarks on the content of the paper, followed by some suggestions with respect to the structure of the paper.

Methodology

- Three land cover types are studied: forest, savanna and cropland. The motivation for the inclusion of forest and cropland is clear: both are very different in structure and effect on the moisture recycling system. Also with respect to deforestation, these two land cover classes are a logical choice to study. The motivation for the inclusion of savanna is however not clear to me. What are the characteristics of the Cerrado savanna with respect to the water balance and what can be expected for this ecosystem? To make this more clear, I suggest to add root characteristics of savanna to figure 2.
- Three different time frames are studied: mean annual values, the dry season transition (DST) period and wet season transition (WST) period. The DST and WST are discussed in paragraph 2.3.2. Nevertheless it remains unclear to me why the WST and DST periods are selected, instead of the more extreme dry (and wet) season. Is it related to the planting and harvesting season of the crops?
- The authors selected the MOD16A2 data product to derive ET and briefly present the product as well as why this product is selected (one of the best available datasets, high spatial and temporal resolution, it is widely used). Also the authors describe that the remote sensing data has "obvious limitations" (L475). I have some concerns regarding this dataset and would like the authors to elaborate a bit on the characteristics and main limitations of using this MODIS data product in their study. Several studies validated the product (E.g. Velpuri et al., 2013) or wrote that especially for tropical sites across the amazon basin, the MODIS ET remains challenging (e.g. the recently published paper Xu et al., 2019).
- At the studied scale, the modelled water table depth classes are mainly based on the topography of the landscape. Are the MODIS products unbiased for this topography? E.g. is the LST corrected for topography and are the meteorological data required for MODIS ET calculation independent of topography?
- A few smaller points that unclear to me are:
    - Are the start and end of the DST and WST calculated for each TRMM pixel?
    - How many (cloudless) remote sensing data points are available? And is this enough to present the results (LST or ET values) with three decimal digits (e.g. L317, 329)?

General remarks and questions

- The results show that for cropland, EVI is higher for areas with a shallow WTD (paragraph 3.3 / L391). From the supplementary figures, it seems that deep WTD areas lag behind shallow

WTD croplands. Is this due to water conditions only, or could this be an effect of a different cropping regime? Do farmers adapt the species and timing of agricultural practices to the local conditions, e.g. length of the dry season?

- L184 "This MODIS product … is correlated to photosynthesis/evapotranspiration" (Sims et al., 2006). Please adjust this sentence, or add a reference (Sims et al., 2006 did not study evaporative fluxes).
- Caption figure 2: "while other vegetation has a lower maximum rooting depth". By other, do you mean crops and/or savanna? What is the rooting depth of savanna trees?
- A few lines are unclear to me:
    - L196 "Further, this choice avoids potential circularity in using land cover classification to detect an effect on a parameter that uses land cover classification to produce its modelled value"
    - L395 "if this extra warming above the canopy is caused by a change in ET, then better estimates of ET should be possible, however, this is not trivial"
    - L400 "therefore, the modelled data was expected to underperform, making the differences we found for the dry season even more important"

Structure and writing

I recommend to check the manuscript for spelling, punctuation and sentence structure. Below I give some suggestions that the authors could consider.

I recommend to more clearly differentiate between introduction, methods, results, discussion and conclusion. For example avoid hypothesis-like sentences in the methods section ("We expected that", L178), avoid discussion-like sentences in the results section (e.g. "as hypothesised", L316) and do not add new information to the conclusion. Personally I read the lines 490-502 like a discussion, instead of as the conclusion. Furthermore, I recommend to group the hypotheses in one paragraph and align these hypotheses with the discussion and / or conclusion, to guide the readers through the presented story. From the introduction I deducted four hypotheses and some of them are explicitly discussed, while one is not mentioned in the discussion. Also, some new (parts of) hypothesis are introduced in the discussion, which were not introduced earlier. E.g.

1. L102: "We hypothesise that areas of shallow WTD allow vegetation to access soil moisture, with both shallow and deep rooted vegetation potentially facilitating vegetation productivity and higher ET when compared to areas of deep WTD."
    - L369: "In this study, we tested the hypothesis that areas of shallow WTD would have higher ET when compared to areas of deep WTD, primarily in shallow rooted crop vegetation → Last part of this hypothesis is not mentioned in the introduction.
2. L116: "In areas of shallow WTD, the saturated zone is closer to the root zone of the vegetation. In these locations we, therefore, expect vegetation to be buffered against the reduction in rainfall during the dry season transition and experience drought conditions later, thus delaying the effect of the dry season". → This one is not (directly) referred to in the discussion
3. L428: "As forests has been shown to maintain ET throughout the seasons as its deep roots access deeper groundwater, we hypothesised that no change should be observed in ET, LST and EVI." → I didn't find this hypothesis in the introduction.

Some spelling related suggestions:

- L51 “changes (**reduction / decline**) in evapotranspiration reduce the available atmospheric moisture”.
- L57 “forests can maintain a high rate of evapotranspiration during the dry season, **they are not** affected by low rainfall”.
- L92 “agricultural vegetation … experiences high seasonality during the dry season unseen in forest vegetation”. Seasonality in what?
- L130 “annual average temperatures ranging between 22 – 26 ^{o}C”. Are 22 and 26 monthly mean temperatures?
- L167 “the MODIS ET products were previously tested … more accurate over longer temporal scales and larger areas”. By this do you mean more accurate than shorter time/spatial scales?
- L180 “a 16 day repeat**ed** observation”.
- L210 “and found good agreement **at/for** shallower WTD however,”.
- L229 “these roots may **penetrate into the** soil until the saturated zone in shallow WTD; however, **do** not penetrate further in deep WTD”.
- L240 “**three** primary time periods”.
- L265 “we used an average value over these transition periods” (value of what?).
- L287 “a year was considered statistically significant”. E.g. “for one year, the difference in .. was considered statistically significant”.
- L302 “3.967 ± 0.0.09”.
- E.g. L371/L379 “since crop experiences”. I recommend to use for example “crop species” or “a crop” or “cropland”.
- L377 “indicate that local conditions can be ~~much~~ warmer in deep WTD areas”.
- L380 “the **roots** of crop vegetation only penetrates to a maximum of 2 m, in shallow..”.
- L408 “this could mean that in deep WTD **areas** temperature could even be ..”
- L409 “WTD **was** not”.
- L444 “the difference in ET was very small**,** < 1% difference between deep and shallow **rooted areas**”.