Response to comments by Referee #1.

Ref 1: My main comment concerns the analysis of the diurnal temperature range (DTR). I agree with the authors that analysis of DTR response can provide valuable information on drought sensitivity of vegetation – but this requires comparison with DTR conditions during non-drought conditions (or some kind of DTR-climatology). It can be expected that also under normal conditions, the DTR differs between short and tall vegetation due to effects of different roughness, thermal inertia etc. It is thus unclear whether the signal in Fig. 9 reflects drought conditions. I believe the DTR analysis is interesting enough to justify some additional analysis and discussion. As a minimum effort, I believe the authors should produce a similar plot to Fig. 9 showing the correlation between vegetation height and DTR for a non-drought period in August of a different year, to show that during normal conditions the DTR is not so strongly related to vegetation height.

Reply: We expanded our analysis of the DTR, additional figures showing the DTR for non-drought years are included in the appendix and are discussed in the text (see plots of the correlation between DTR and vegetation height for 5 August 2002, 2003 and 2004). For these three periods we also included the corresponding GPCP precipitation of the preceding 32 days, and the MODIS LST. The figures of non-drought years show no difference in DTR between short and tall vegetation. Over France and Germany, in particular, the spatial extent of the DTR correlation with vegetation height appears to depend on the presence of above average temperatures more than a precipitation deficit, although it should be noted that precipitation is generally more variable in space and time.

Ref 1: A second comment relates to the mechanism that the authors propose explains the observed signals. Whereas deeper roots under tall vegetation can possibly explain the observed signals in NDVI and DTR, this is definitely not the only possible explanation. There is, for instance, no reason why DTR should stay the same with increasing mean temperature given the strong nonlinearities in radiative and aerodynamic processes. Also, it is likely that tall vegetation has developed better strategies to cope with drought, for instance by reducing stomatal opening in response to high temperatures and VPD leading to higher water availability later during the drought (this process can occur independent of differences rooting depth). The authors should indicate that alternative explanations are possible that can explain the observed differences between short and tall vegetation.

Reply: We expanded the discussion of potential factors leading to a reduced DTR for tall vegetation. These now include greater rooting depth (this includes a discussion of the relationship betwenn vegetation height and rooting depth in different data sets), stomatal closure during early stages of the drought, increased shading and increased canopy aerodynamic resistance with increased vegetation height and canopy closure. Albedo is likely of lesser importance as found by studies referenced in the text.

Editorial comments:
Line 5, Abstract: What do the authors mean by compensating effects?
Compensating effects refers to albedo and evapotranspiration. Added to the abstract.

Page 16076, Line 10: vegetation index or indices?

Vegetation index or indices – will leave as index. We are happy to change it if the editor requests.

Page 16079, Lines 11–15: At this point no results should be discussed.
Accepted, this is deleted from the introduction and moved to the discussion.

Page 16082, Line 25: a 50 km square?
Yes, 50 km square. Changed to 50 km x 50 km square.

Page 16083, Lines 11–15: The authors mix anomalies and absolute values during drought conditions (see also my main comment). Please discuss DTR in relation to normal summer conditions.

We added figures and analysis of the DTR for other periods; see response to first main comment.

Fig 9, caption: In the Data section, it is mentioned that the DTR product is an 8-day mean. How does this relate to the single date mentioned in the caption (25 Aug)?

The DTR is the difference between the MODIS LST products; the 8-day mid-day and 8-day mid-night temperatures. This is added to the discussion of the data, as also requested by reviewer #2. Note we need to correct the caption to Figure 9 (now Figure 8), the date should have been August 5th.