Interactive comment on "Managing fire risk during drought: the influence of certification and El Niño on fire-driven forest conversion for oil palm in Southeast Asia" *by* Praveen Noojipady et al.

Praveen Noojipady et al.

praveen.noojipady@nasa.gov

Received and published: 29 March 2017

The authors compare fire activity and deforestation between RSPO-certified and non-certified oil palm plantations in Southeast Asia, arguing that RSPO certification has led to reduced fire activity during dry years. This is a well-written paper and the overall result is important. My only significant concern is the assumption that dry conditions during the big fire years were the same with respect to the locations of certified and non-certified plantations.

We appreciate the Reviewer's recognition of the importance of this study. As the Reviewer suggests, the spatial distribution and duration of precipitation anomalies during El Niño events is somewhat variable. In our study, certified and non-certified plan-

tations can only be compared for Indonesia. As indicated in Figure 1, certified and non-certified plantations in Indonesia are clustered in similar locations: 73% of certified plantations were directly adjacent to one or more non-certified plantations, and 89% of certified plantations were within 10 km of a non-certified plantation. Given this clustering, and the spatial resolution of precipitation estimates from the TRMM satellite (0.25 degree resolution), we assume that El Niño events are likely to influence certified and non-certified plantations in a similar fashion. Precipitation distributions vary for recent El Niño events (see Figure R2, below). However, the main emphasis of this study was to compare among certified, non-certified, and buffer areas during the same year. In a revised manuscript, we would further emphasize the relative comparison among certified plantations, non-certified plantations, and buffer areas in a given year.

****

Comments P1L21: should this be 'did not stop altogether'?

Yes, we have changed to "did not stop altogether"

****

P3L30: I didn't understand the '(ever)' and '(never)' wrt certified and non-certified

In our study, "ever" refers to oil palm plantations that ever got certified after the cutoff year (i.e., year 2009). Whereas, the "never" refers to non-certified plantationsâĂŤthose plantations that were not certified between 2009 and 2015. However, many of the non-certified plantations are in the process of certification and may get certified in future years.

****

P4L20: The end of this sentence implies that Southeast Asia has little rainfall seasonality, which I don't think you mean to say.

This sentence refers to the persistent cloud cover in tropical regions without regular dry

seasons, typically considered months with <100 mm rainfall. In a revised manuscript, we would clarify this statement as "regions with persistent cloud cover" to avoid confusion between rainfall seasonality and drier conditions when lower cloud cover facilitates satellite remote sensing.

****

P6L28: How are you excluding the possibility that the certified plantations just weren't as dry in 2015 compared to, say, 2006? Figures A3 and Figure 5 clearly show a drop in fire activity over the analysis period over the certified plantations, but from Figure 1, these plantations are not evenly distributed across Sumatra and Kalimantan. It's possible that these regions, for example south-central Kalimantan, were just wetter in 2015 than previous years, given that regional rainfall can vary across El Niño years. Or perhaps they were drier, in which case your argument about RSPO effects is strengthened. Either way, regional rainfall needs to be looked at or mentioned as a possible factor.

We agree with the reviewer that the spatial distribution of plantations is a potential source of variability that was not directly addressed in our original manuscript. In addition to the analysis of proximity, as described above, it is possible to characterize the time series of fire activity for the closest certified and non-certified plantations. In Figure R4, below, we show the time series of MODIS fire detections (similar to Figure 5), restricting the analysis to non-certified plantations within 50 km of one or more certified plantations in Indonesia (N=1076 of 1536 non-certified plantations). By limiting the comparison to nearby plantations, we can more confidently assume that these regions experienced similar precipitation patterns (as shown in Figure R2 using 0.25 degree TRMM data). Figure R4 shows a similar pattern of interannual variability as Figure 5, and the relative comparison among certified and non-certified plantations is consistent with Figure 5 for El Niño years, including 2006, 2009, and 2015. We therefore conclude that the relative difference between certified and non-certified plantations in these years is not driven by differences in the spatial distribution of oil palm plantations.

C3

****

P7L9: change 'direct' to 'directly'

We have changed to 'directly'

Please also note the supplement to this comment:
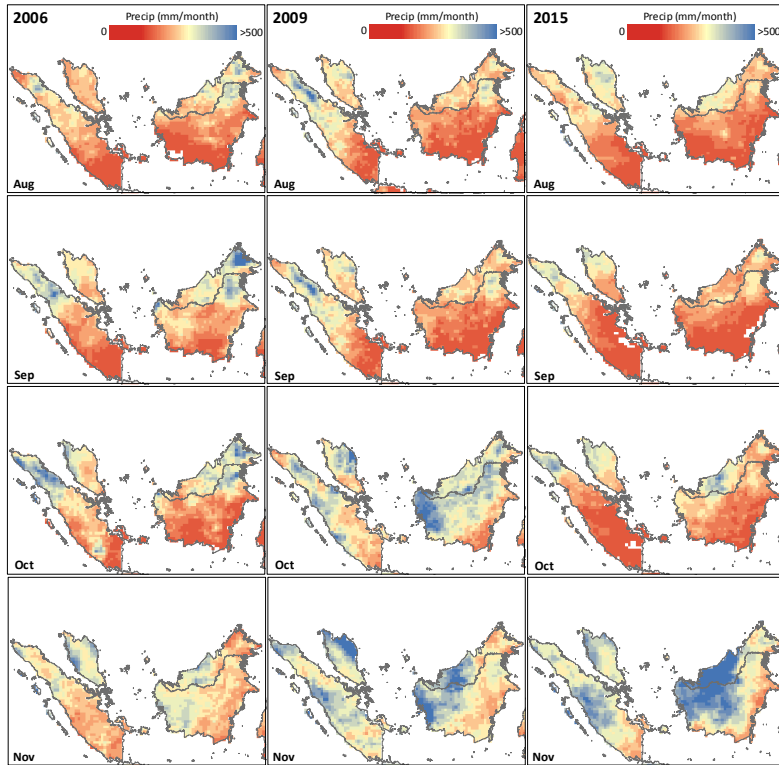http://www.earth-syst-dynam-discuss.net/esd-2017-2/esd-2017-2-AC3-supplement.pdf

Fig. 1. Figure R2: Maps show monthly totals of the precipitation patterns for Indonesia and Malaysia from Tropical Rainfall Measuring Mission (TRMM, 3B43v7) at 0.25° resolution during the dry season in El Niñ
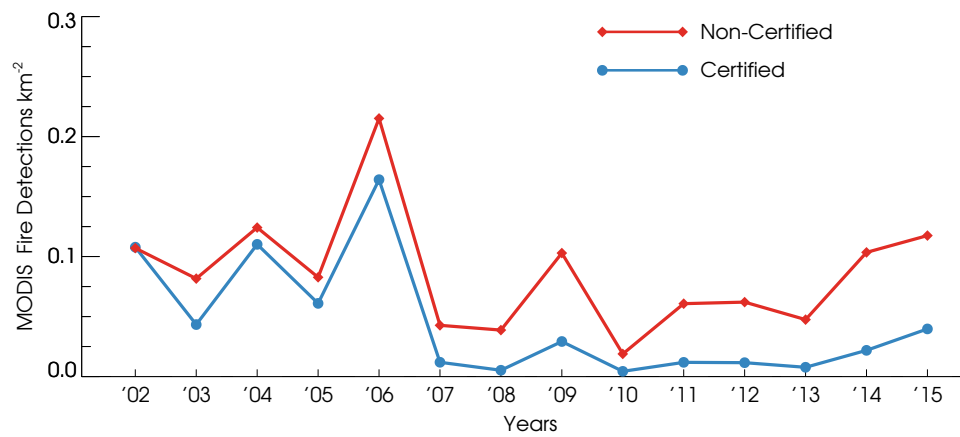
Figure R4. Time series of MODIS active fire detections, as in Figure 5, for certified plantations and the subset of non-certified plantations within 50 km of a certified plantation in Indonesia.