Dear Editor,

We appreciate the additional suggestions from Reviewer #2 to clarify key aspects of our methods and analysis. Below, reviewer comments appear in black text, and our responses follow in blue text. Revisions to the manuscript are highlighted using track changes.

1. Page 4: Did you verify a sample of the plantations with higher resolution data or field observations? Or could you include methods and/or error estimates from the three studies of planted oil palm that are used here?

In the revised manuscript, we have clarified that both Landsat and higher-resolution data were used to map planted palm and validate the data products:

We have added a statement on plantation map accuracy (Pg.4, line17), "Maps of planted palm were generated from 30 m Landsat imagery, and validated using higher-resolution satellite imagery (Carlson et al., 2013; TW, 2015; Petersen et al., 2016)."

Map products range in accuracy from 77% (Carlson et al., 2013), based on a sample of 400 points using QuickBird Imagery, to an overall accuracy of 87% for Malaysia based using very high resolution from Digital Globe (TW, 2015; Petersen et al., 2016). A complete description of the study methods and validation results can be found in the reference papers. Given the potential for map differences, we used the combined extent of mapped palm plantations from all sources, as noted in the text.

2. Page 4: The selection of 5km for the buffer region still seems somewhat arbitrary. Were any sensitivity analyses performed with this distance?

The selection of the 5km buffer was based on expert opinion. Although forest loss could be evaluated using a narrower buffer width, the resolution of the active fire production from MODIS (1 km, plus positional uncertainty) necessitates a larger buffer width to capture fire activity associated with lands that border existing plantations. The total area in the buffer was approximately double the extent of palm oil plantations in Indonesia (Table 1). Expanding the buffer to consider a broader landscape would dilute the information content of land use dynamics on neighboring lands. The goal was to evaluate forest loss and fire activity adjacent to existing palm oil plantations, rather than a landscape-scale assessment of land use dynamics across Indonesia based on multiple buffer sizes or a wall-to-wall assessment.

3. Figure A6: This is a nice figure to show differences in precipitation, but is there a way to include this in the analysis with some metric showing any differences (or not) between certified and non-certified plantations? And is this figure ever referred to in the main text?

We appreciate the Reviewer's suggestion to bring material from our initial response letter into the manuscript. In the revised paper, we have clarified that certified and non-certified plantations experienced similar conditions during El Niño years, based on 1) the degree of

adjacency among plantations and 2) the 0.25 degree resolution of long-term satellite precipitation records.

The revised caption (now Figure A5, based on the new text reference, Pg. 7, line 31) now reads:

"Figure A5: Monthly precipitation patterns for Indonesia and Malaysia from Tropical Rainfall Measuring Mission (TRMM) at 0.25° resolution for months with peak fire activity during the 2006, 2009, and 2015 El Niño events. Certified and non-certified plantations are clustered in similar locations (see Fig. 1); 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, we assume that precipitation reductions during El Niño events influence certified and non-certified plantations in a similar fashion."

4. Is there any information on whether it's a handful of plantations dominating the fire driven deforestation or if it's more evenly spread across all concessions

In fact, fire-driven deforestation was detected across a large fraction of palm oil plantations in Indonesia. As shown below (Table B7), more than 1/3 of Indonesian plantations that would later be certified had fire-driven deforestation between 2002-2007. From 2008 to 2014, the number of plantations with fire-driven deforestation declined, consistent with lower overall forest loss (Figure 2), but deforestation activity was still distributed across 34-50 plantations. A larger fraction of non-certified plantations in Indonesia had fire-driven deforestation in all years. In Malaysia, fire-driven deforestation detections were less common (Tables B1, B5, B7), as was total fire activity (Table B6).

Table B4: Number of certified and non-certified plantations with fire-driven deforestation between 2002-2014. Plantations with fire-driven deforestation after receiving RSPO certification are shown in parenthesis beginning in 2009.

| Year | Certified | | | Non-Certified |
	Indonesia N=154	Malaysia N=119	Papua New Guinea N=10	Indonesia N=1536
2002	63	20	4	747
2003	64	12	5	733
2004	82	16	4	913
2005	78	18	3	859
2006	67	12	5	927
2007	66	5	5	902
2008	39	8	5	724
2009	50 (0)	7 (0)	3 (0)	886
2010	35 (1)	10 (2)	3 (1)	738
2011	34 (6)	12 (5)	2 (1)	697
2012	36 (12)	9 (5)	2 (1)	783
2013	39 (17)	8 (4)	1 (1)	692
2014	37 (25)	8 (6)	2 (2)	766

We have added a statement to the main text to clarify that fire-driven deforestation was detected on a large proportion of oil palm plantations in Indonesia (Pg 6, Lines 2-4):
"More than 1/3 of Indonesian plantations that would later be certified had fire-driven deforestation between 2002-2007 (Table B4). As total deforestation declined from 2008 to 2014, fire-driven deforestation activity was still distributed across 34-50 plantations (22-32%, Table B4)."

5. Could you more clearly say something in the discussion about not matching the plantations with ancillary factors (accessibility, etc.) when comparing certified and non-certified? Unless I'm missing it, I couldn't find this in the revised text.

We agree with the reviewer that a matched analysis is one potential way to further investigate the influence of certification on land management. We have a separate paper, currently under review, that uses matching to quantify the influence of certification on forest loss for certified plantations in Indonesia. However, it would be premature to reference this additional work at this time.

We have added a statement to the discussion section to more specifically reference this line of analysis (Pg.8, line 30) :

"In a future study, it may be possible to control for differences in remaining forest cover, plantation age, or company management practices using a matched study design."

Carlson, K. M., Curran, L. M., Asner, G. P., Pittman, A. M., Trigg, S. N. & Marion Adeney, J. 2013. Carbon emissions from forest conversion by Kalimantan oil palm plantations. *Nature Clim. Change,* 3**,** 283-287.
Petersen, R., Goldman, E., Harris, N., Sargent, S., Aksenov, D., Manisha, A., Esipova, E., Shevade, V., Loboda, T. & Kuksina, N. 2016. Mapping tree plantations with multispectral imagery: preliminary results for seven tropical countries. *World Resources Institute, Washington, DC*.
TW. 2015. *Transparent World-Tree Plantations* [Online]. World Resources Institute: Global Forest Watch. Available: http://data.globalforestwatch.org/datasets/baae47df61ed4a73a6f54f00cb4207e0_5 [Accessed Dec, 09 2016].