Biogeosciences

Discussions

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Interactive comment on "Wetter environment and increased grazing reduced the area burned in northern Eurasia: 2002–2016" *by* Wei Min Hao et al.

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Overview, Introduction Line 23, 33,46-56, 5382, 83 – Agree to change as suggested by the Reviewer 2 Methodology, Mapping burned areas Line 88 and 89 - (Scott, Matt) – A better description of uncertainty will be added. Line 95 – The land cover map for collection 5 were used for this study and my previous studies (4, 5) Data sources, Land Cover First bullet – A comment would be descried on the consistency of MOD12 and section 2.1. Second bullet M-estimation – Our objective was to present consistent grid cell trends in the presence of within-cell variation. We chose to use M-estimation to mitigate the effect large within-cell variation due to a relatively small within-cell sample

such that the map presents a consistent surface. If computed using ordinary least squares (OLS) estimates. Such large within-cell variation could result in some cells with inconsistent or "outlier" trends compared to their neighbors. Line 159 - We applied the correct distribution to the data instead of a normal approximation. A theoretical gamma distribution is defined as having support for y>0 and often skewed (ref. Hogg and Craig, 1974). The gamma distribution is therefore characteristic of the burned area data. Use of the data-appropriate distribution provides for more accurate estimates and confidence bounds. Mood, A.M., Graybill, F.A., Boes, D.C. (1974) Introduction to the Theory of Statistics, McGraw Hill Series in Probability and Statistics, Sec. 3.3. Line 169 Again, we applied the correct distribution to the data instead of a normal approximation. A theoretical beta distribution is defined as having support for $0 < y < 1$ which is characteristic of the proportion burned area data (ref. Hogg and Craig, 1974). Use of the data-appropriate distribution provides for more accurate estimates and confidence bounds Mood, A.M., Graybill, F.A., Boes, D.C. (1974) Introduction to the Theory of Statistics, McGraw Hill Series in Probability and Statistics, Sec. 3.4. Results Figure S1-S4 - We will change the range from 0 to 2 or another scale to improve the visualization of the differences. Lines 332-353 - We argued that the impact of grazing on fire might be a non-negligible contribution based on what was observed in Africa by Holdo et al. In turn, this study provides an additional study case in central Asia to ascertain this hypothesis so that the grazing/fire interactions might be tightly accounted for in fire DGVM interactions. The list of other possible factors associated to the change in political regime might be long but population decrease was around 10% and would technically lead to less fire settings. So we tested the two major fire related hypothesis of grazing (Holdo et al.) and land cover change (Andela et al.) based on our expert knowledge of fire driver. We'll better discuss this point in hypothesis statement and discussion.

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