

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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Reply to Short Comment It is not correct to say it is not mentioned. We state: “The Palmer Drought Severity Index (PDSI) from the TerraClimate site (<http://www.climatologylab.org/>) was used...”. To further clarify, we added the citation for the climate data developed on the TerraClimate site. If readers are concerned about how the climate data are created, they should investigate this publication. The reader can examine all the details of the formulations in the reference. The reference is: Abatzoglou, J.T., S.Z. Dobrowski, S.A. Parks, K.C. Hegewisch, 2018, Terraclimate, a high-resolution global dataset of monthly climate and climatic water balance from

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1958-2015, Scientific Data. Regarding the biomass: We rewrote this section to be clearer and added a more detailed formulation and a citation. We estimated the annual biomass production within the grassland domain of the study area (Fig. 2) using the production subroutine of the Rangeland Vegetation Simulator model (RVS) (Reeves 2016) using the methods of Reeves et al. (2020). The RVS, which was originally developed for simulating rangeland vegetation dynamics in the continental United States, models annual production based on MODIS normalized difference vegetation index (NDVI) at a 250 m spatial resolution (MOD13Q1). The MOD13Q1 NDVI data are composited on a bi-weekly basis and are available at a spatial resolution of 250 m. The QA/QC flags were used to isolate only the best quality NDVI pixels. At each pixel, the highest quality maximum value composite on an annual basis was retained for further analysis. The relationships between ANPP estimates and maximum NDVI were divided into two groups to enable different models to be fit to the lower and upper end of production given as EQ. 1 $y = 240.31 * e^{3.6684(x)}$ where y is the estimated ANPP in kg ha^{-1} and X is the NDVI for the upper range ($X \geq 0.46$) and EQ. 2 $y = 971.1 * \ln(x) + 1976$ where y is the estimated ANPP in kg ha^{-1} and X is the NDVI for the lower range ($X < 0.46$). The division into 2 sections was done, in part, because of the asymptotic nature or “saturation” feature (Santin-Janin et al. 2009) of NDVI with respect to ANPP. We will discuss the discrepancy between the study period (2002-2016) and the economic collapse of the Soviet Union (1990/1991). The conclusion is outlined in bullet points to highlight clearly the major points. They have been described in the text throughout the manuscript.

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