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Reply on RC1

Melanie Kammerer et al.

Author comment on "Not just crop or forest: building an integrated land cover map for agricultural and natural areas" by Melanie Kammerer et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2022-331-AC1, 2023

These improved land cover data will be useful for many ecological and agricultural management, conservation, and research applications. To our knowledge, there are no public datasets that are equivalent, in terms of thematic, temporal, and spatial resolution, to the one we produced, establishing the novelty of our work. To illustrate a specific application of our data for modelling ecosystem services, we added the following paragraph to the manuscript introduction:

"An integrated dataset of land cover documenting specific agricultural and natural habitats is a critical input to predict biodiversity, ecosystem services, and climate adaption and mitigation strategies. For example, the Integrated Valuation of Ecosystem Services and Tradeoffs (InVEST) is a set of widely used, spatial models that predict ecosystem services based on land cover data. InVEST predictions of crop pollination services depend on accurate characterization of agricultural and natural habitats available in one spatial product. Within broad classes of agricultural, forest, and wetland habitats, floral resources for pollinators can vary more than 250, 750, and 40-fold, respectively (Iverson et al in prep), necessitating a land cover map that specifies specific types of crop and natural vegetation. We developed this dataset of integrated land cover as an input for our models of pollination services, but expect models of carbon storage, crop disease, pest dynamics, and biocontrol, among other ecosystem services, would be improved with more detailed land cover data."

We also strengthened our discussion of the importance of retaining crop identity in land cover datasets by adding the following examples to paragraph two:

"…annual and perennial crops differ in frequency and intensity of tillage, which has significant implications for climate and soil health as intensive tillage adversely affects soil structure, chemical and biological processes, and increases emission of greenhouse gases (Mangalassery et al., 2015; Busari et al., 2015). Quantifying changes in agricultural land use and crop diversity also depends on land cover data that document specific crop types."

Though we would be willing to include a detailed description of the NVC ground truth data if the reviewers/editor feel we should, we believe it does not fit within the scope of our paper, as our goal was to illustrate how the classification accuracy of our combined product compares to accuracy of CDL and NVC, rather than validating the source datasets

themselves. For more information on CDL and NVC validation procedures, we refer readers to CDL and LANDFIRE websites (https://www.nass.usda.gov/Research_and_Science/Cropland/sarsfaqs2.php#Section1_11.0 and https://landfire.gov/remapevt_assessment.php, respectively) and Lark et al. 2021 (https://doi.org/10.3390/rs13050968). We have added this information to the technical validation text, as well, to guide the reader who may be interested in these validation data.