

Earth Syst. Sci. Data Discuss., referee comment RC2
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Comment on essd-2021-207

Anonymous Referee #2

Referee comment on "Landsat-based Irrigation Dataset (LANID): 30□m resolution maps of irrigation distribution, frequency, and change for the US, 1997–2017" by Yanhua Xie et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-207-RC2>, 2021

This is a well-written paper describing the methodology used to produced CONUS-wide, 30 m resolution maps of annual irrigation status. This paper effectively presents results from analysis showing the time series of irrigated area state-by-state, irrigated change at the county and state level, and maps change spatially over the CONUS. Figures are clear and easy to read.

Abstract is appropriately specific and clearly states the need for this product, general methodological approach, and utility of the produced data.

-- The link to data seems to be the data published with the RSE manuscript, and appears not to contain maps showing the new LANID_V2 data mapping irrigated hay and pasture. Should this be updated, or another repository offered for the examination of the new data described in this manuscript?

Introduction is well-written and provides a good summary of why irrigation is important, and the impacts and benefits of irrigation. Literature review is appropriately specific and comprehensive. Table 1 is comprehensive and appropriate.

Methods section is clear and concise, and describes a sound approach given the challenge of detecting irrigation from Landsat images. The doption of two different approaches for detectionin the humid East and semi-arid West US, while adding complexity, is justified given the low contrast between irrigated and non-irrigated lands in the East.

Map evaluation and comparison designs seems to choose appropriate, previously produced maps for comparison to LANID.

Figure 4 is especially attractive. Should Figure 4 take into account uncertainty estimates?

Figures 5, 6, and 7 are informative and well done.

Irrigated pasture and hay: where is this data in the repo referred to in the abstract?

Maximum extent, frequency, and formerly irrigated and intermittent irrigated land: interesting findings. Line 259: what is meant by 'energy sorghum'? Table 3 is interesting and informative.

Figures 11 - 13 clearly display the improvement in mapping resolution and accuracy over previous maps.

The comparison of irrigated area maps is clear and offers cogent explanations of why differences in the maps exist, in terms of differences in irrigated lands' definition and classification methodology.

The discussion of uncertainty, limitations, improvements and potential applications is appropriate.