Comment on essd-2021-251
Arthur Endsley (Referee)

Referee comment on "High-resolution land-use land-cover dataset for regional climate modelling: A plant functional type map for Europe 2015" by Vanessa Reinhart et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2021-251-RC2, 2021

Overall, the paper seems to represent an advance in land-cover/plant functional type (PFT) modeling that informs regional climate models (RCM). I think the paper could be improved by adding more detail about the crosswalk procedure and, in particular, providing a rich example of how the linkage to the Holdridge Life Zones (HLZ) allows for future updates to the land-cover classification in response to environmental change. I gather that, in an RCM, climate changes that push a location out of one HLZ and into another would prompt an update to the corresponding PFT at that location; i.e., the vegetation canopy would be allowed to change and therefore the RCM model state would change in advance of the next time step. This is very interesting and potentially powerful, given that it allows some of the complexity of a dynamic vegetation model to be represented more simply, but it should be made more explicit.

There are also a couple of key technical issues with the paper. The crosswalk procedure should be explained in much more detail; the tables in Appendix A are deceptively rich in detail but they really don't make sense without more explication in Section 3. I also think Figure 2 may have the colors for each HLZ mislabeled, as some of the map regions' displayed HLZ classes do not make sense (e.g., desert in Scotland). There are also additional analyses referred to by the authors (ca. Line 487, "The additional comparison with a high resolution dataset (WSF2015) showed that not only large but also small agglomerations of urban areas are represented well in LANDMATE PFT.") that are completely undescribed in the paper.

Specific comments:

Lines 12-13: The authors write: "A suitable evaluation method has been developed and applied to assess the quality of the new PFT dataset." This is a little vague. Perhaps the authors could be more specific about the type of evaluation method, or remove this sentence from the Abstract?

Lines 88-95 and Appendix A: I find the crosswalk tables in Appendix A, and the crosswalk procedure as described, to be confusing. The row sums for every crosswalk table in Appendix A are 100, which seems to imply they are percentages. However, using Table A4 as an example, it's not clear to me how the ESA-CCI LC class (number 30 in this example)
Line 20: "was declared an" should be "were declared"
Line 30: "as realistic" should be "as realistically"
Line 44: "origin" should probably be "originate"
Line 127: "are merged" should be "are merged"
Line 185: "lass 61" should probably be "Class 61"
Line 216: A space is missing between the end of one sentence ("2005.") and the start of the next: "Although the ESA-CCI LC..."
Line 428: I think Figure 7g needs to be reference along with Figure 7i.
Line 489: "and despite of the" should probably be "and despite"