Response to Editor:

Due diligence was given to address the review comments provided by the reviewers. However, some basic facts need to be corrected before taking a decision.
First of all the authors need to reconsider reworking on the whole study by incorporating the actual resolution of the SMAP L3 soil moisture product, that is ~33 km. Considering this aspect, the actual resolution of~33 km may impact the overall results/outcome of the study.

Response: We thank the editor for this comment and we agree that the sampling resolution of the SMAP data (~33km) may not be sufficient to capture the irrigation features in many places. Prior studies such as Lawston et al. [2017] have documented that the SMAP L3 enhanced product is able to represent large scale irrigation features, which is the primary reason for its use in this study. In our own study domain, the SMAP L3 enhanced product shows increased utility compared to the use of the standard SMAP L3 product. We did not include these results in the manuscript as the structure of the experiments using the standard and enhanced product is not exactly equivalent (the forcing datasets, model spinup strategies, etc.).

The authors have admitted that having high-resolution information will improve effective monitoring of drought over the North Africa region. The SMAP mission also provides the SMAP-Sentinel based soil moisture product at 3 km and 1 km with a revisit interval between 6-12 days. Evaluation of irrigation signals from this high-resolution SMAP product is also crucial because the spatial resolution is important when it comes to the detection of irrigation signals and their influence on drought detection over croplands.

Response: We thank the editor for providing this valuable information and we agree that assimilating high-resolution SMAP-Sentinel product has the potential to improve the soil moisture condition impacted by irrigation, thus providing better surface condition for Morocco, and benefiting the drought monitoring. However, the assimilation of SMAP-Sentinel products is not supported in the NASA LIS framework, which is a non-trivial effort. However, we acknowledge that this is an important topic for soil moisture data assimilation, and we are interested in applying the product to our other on-going projects as we work towards implementing the feature of assimilating SMAP-Sentinel products in our modeling framework. To highlight this potential, we elaborated our discussion by adding the following sentences in section 4 para 3:

"Although SMAP products are reported to show capability in detecting irrigation signal for places such as California Central Valley and High Plains [Lawston et al., 2017;

Felfelani et al., 2018; Kumar et al., 2018], this capability is likely to be limited within the intensively irrigated hot spots that have limited spatial extents. To capture the irrigation signal for smaller or sparsely distributed irrigation areas, soil moisture products at higher resolution has greater potential to provide benefits such as the SMAP-Sentinel1 datasets [Lievens et al., 2017; Das et al., 2019; Jalilvand et al., 2021].

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