

Supplementary Figures and Tables

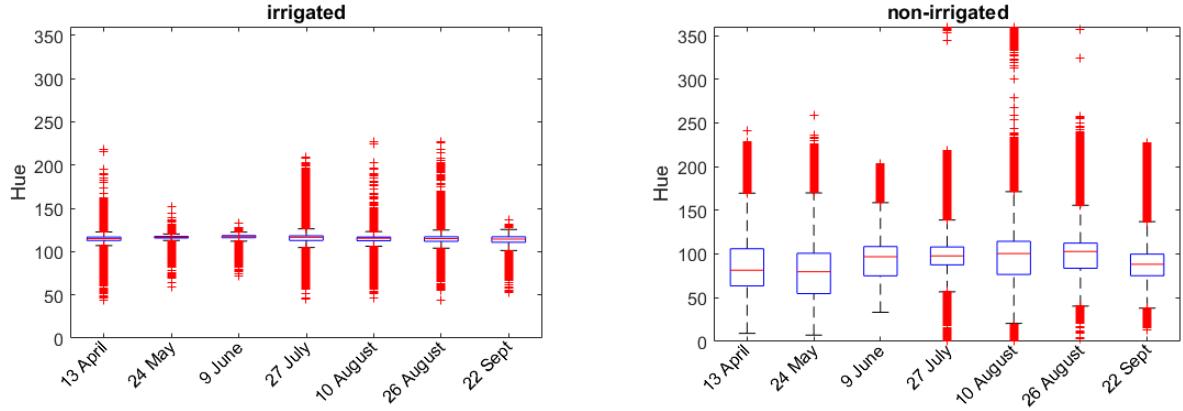


Figure S1: Distribution of Landsat 8 hue values in irrigated and non-irrigated objects of the validation data set. Each date on the x-axis corresponds to a Landsat 8 scene used to derive the validation data (see Figure 3). The central mark in each box correspond to the median, and the edges are the 25th and 75th percentiles. The whiskers extend to the most extreme data points not considered as outliers.

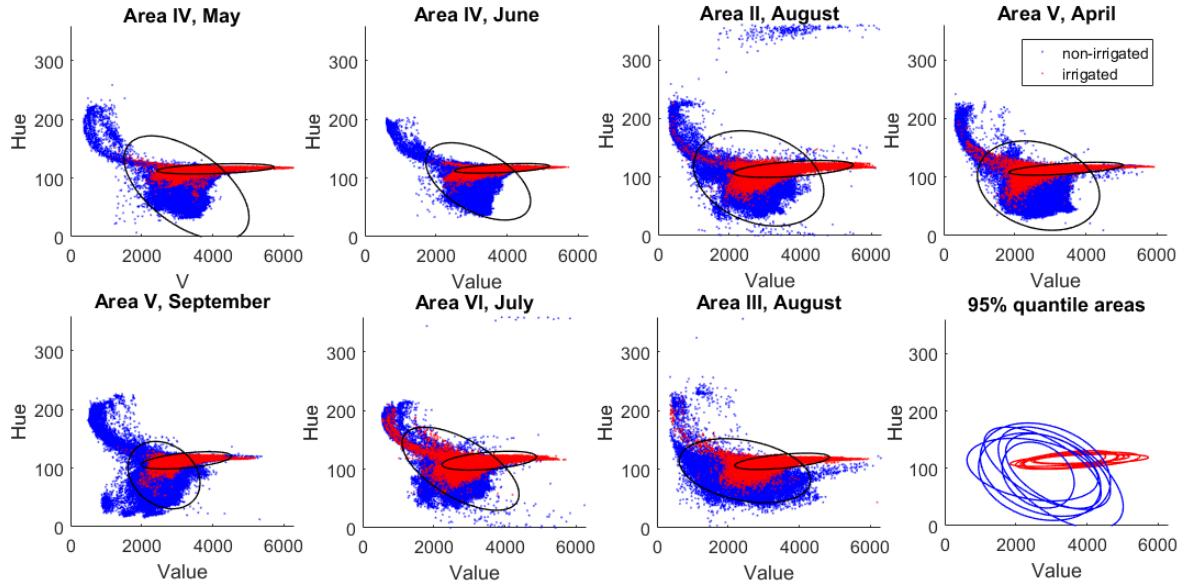


Figure S2: Relationship between Landsat 8 Hue and Value (also 'brightness' or 'intensity') in irrigated and non-irrigated objects of the validation data set. Each subplot corresponds to a validation data set obtained from different Landsat 8 scenes (see Figure 3). Circles around the data cover around 95% of the data points of a given class and are derived by eigen decomposition. The last subplot shows all circles plotted on top of each other.

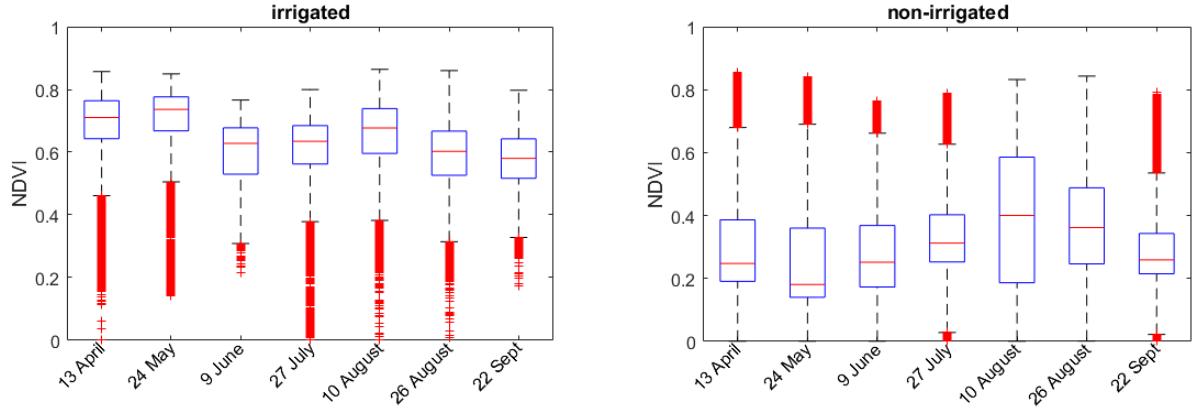


Figure S3: Distribution of Landsat 8 NDVI values in irrigated and non-irrigated objects of the validation data set. Each date on the x-axis corresponds to a Landsat 8 scene that was used to derive the validation data (see Figure 3). The central mark in each box correspond to the median, and the edges are the 25th and 75th percentiles. The whiskers extend to the most extreme data points not considered as outliers.

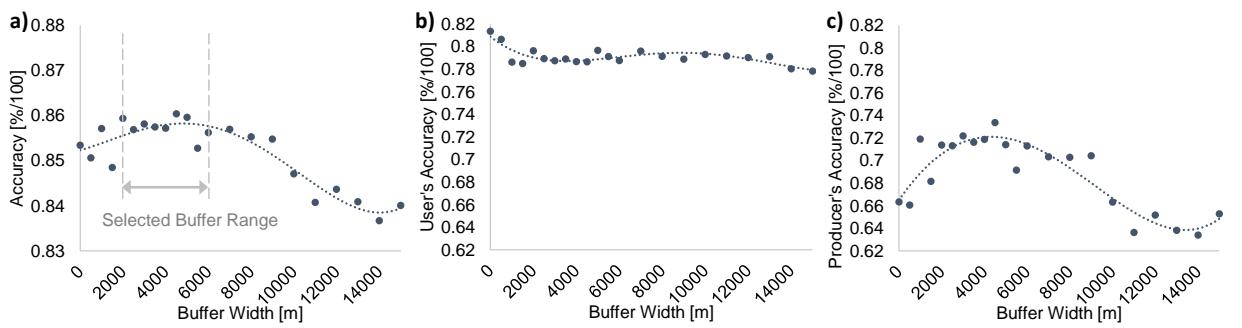


Figure S4: Overall Accuracy (a), user's accuracy (b) and Producer's Accuracy (c) of the L7/MOD irrigation map in function of buffer width around training regions (Figure 3). For this figure, the algorithm is applied always outside the basin where it was trained (if the validation data are located in the Chu Basin, the training regions from the Talas Basin are used and vice versa). The dotted lines represent third degree polynomials fitted to the results. The buffer width range considered in the following for irrigation area calculations is indicated by the dashed grey lines.

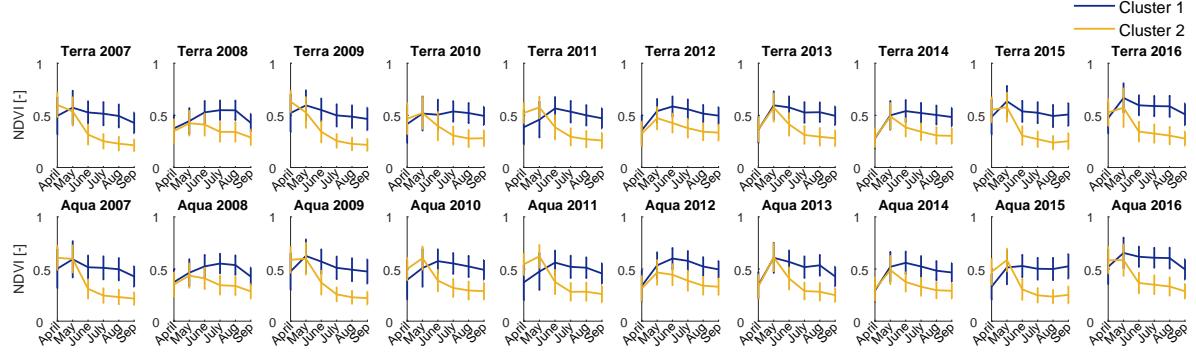


Figure S5: Examples of monthly MODIS Terra and MODIS Aqua NDVI time series associated to two clusters of pixels identified through an unsupervised k-means cluster analysis (Step 2, see Figure 4). Pixels are sampled from the Talas River Basin. Results are shown for the period 2007-2016. Cluster 1 (blue line) can be associated to irrigated surface whereas cluster 2 (yellow line) can be associated to non-irrigated areas. Data points represent the median NDVI per month and cluster and error bars represent the standard deviation.

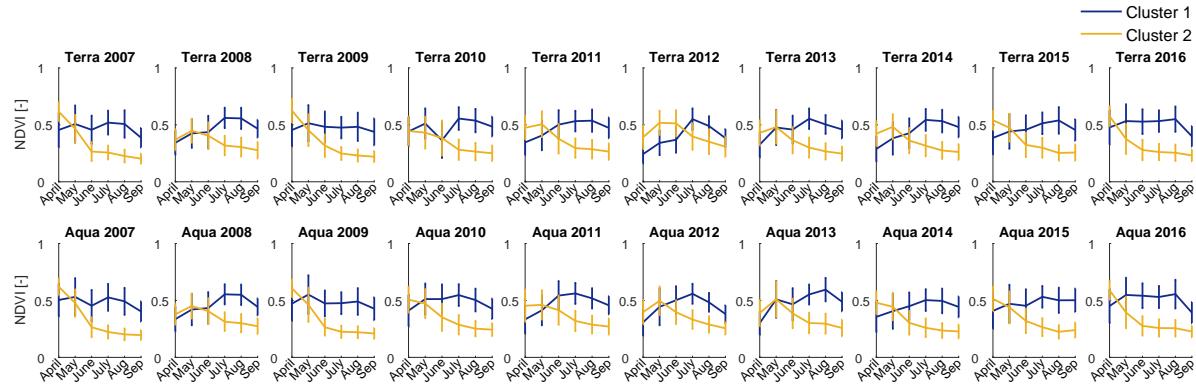


Figure S6: Examples of monthly MODIS Terra and MODIS Aqua NDVI time series associated to two clusters of pixels identified through an unsupervised k-means cluster analysis (Step 2, see Figure 4). Pixels are sampled from the Chu River Basin. Compare also with Figure S5 for more information.