

## Inputs (from farmer)

## Data Acquisition

## Processing

## Outputs

Farm coordinates

Crop type

Planting date

Total growing days

4 stages of crop growth dates

Filtered data (SM, RZSM, ET, PET, and P) from global data for the farm with a reasonable radius (radius is calculated based on farm's size and data resolution)

Farm record ( $\Delta$ SM,  $\Delta$ RZSM, 8 d ET, 8 d PET, and 8 d P) [2010-2020]

8 d P,  $\Delta$ SM, and  $\Delta$ RZSM

$\Delta$ SM and  $\Delta$ RZSM conversion to depth based on the date. For past years all depth is 500 mm. Observed NI with and without  $\Delta$ SM

RF to predict future  $\Delta$ SM,  $\Delta$ RZSM, ET, and PET

Locate farm

Show 4 stages of crop growth dates

Calculate NI

Theoretical daily breakdown of NI

3-week timeseries of P, ET, and PET