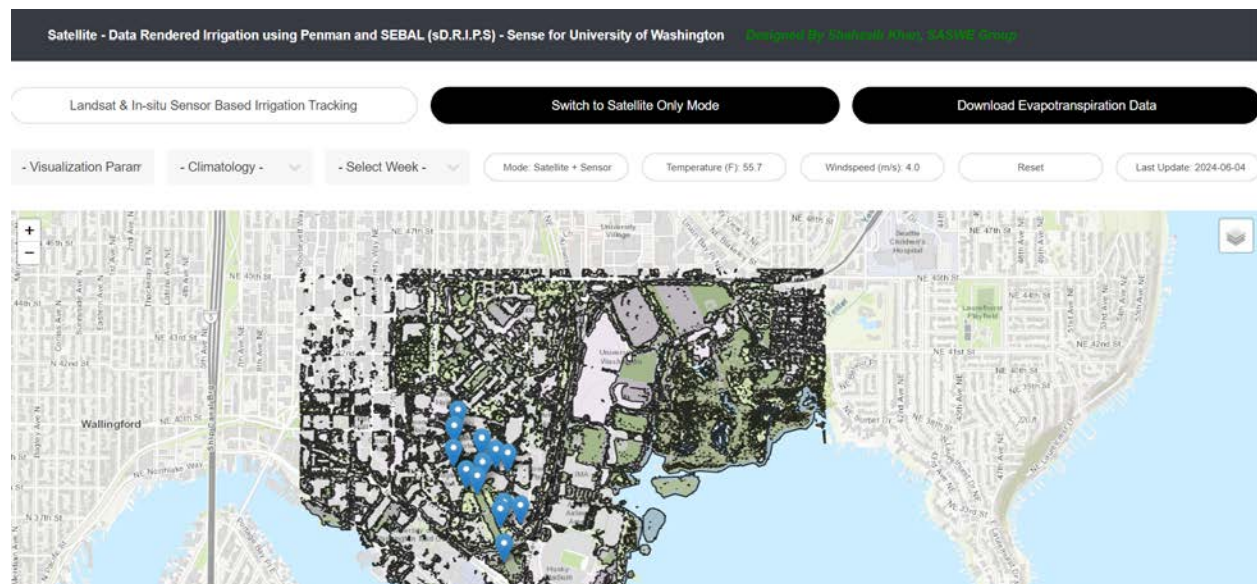


HOW TO USE THE UNIVERSITY OF WASHINGTON'S SENSOR AND SATELLITE BASED IRRIGATION TRACKING DASHBOARD (sDRIPS-sense)

At this site: <https://depts.washington.edu/saswe/sdrips-sense/>, irrigation and ET (evapotranspiration) data for the UW campus are tracked using satellite and ground sensors. This information is available through an online dashboard. The system will be operational starting June 10, 2024.

PURPOSE OF THIS MANUAL:

This manual aims to familiarize users with the key features of the dashboard, enabling them to query the desired information and provide feedback for improving the user experience in decision-making processes.



KNOWING THE DASHBOARD:

Mode: The platform operates in 'Satellite + Sensor' mode by default. If the sensors fail due to unforeseen circumstances, the system automatically switches to "Satellite Only" mode. The current operational mode, which indicates how the ET was estimated, is displayed in the 'Mode' tab.

Temperature: The mean temperature is provided in Fahrenheit. If the system is in 'Satellite + Sensor' mode, this data comes from the sensors (averaged over the in-situ temperature sensors). If the system is in 'Satellite Only' mode, the data is derived from only a global modeling system (Global Forecasting System) that has coarser spatial resolution.

Windspeed: The mean windspeed, measured in meters per second, is estimated through global modelling called GFS (Global Forecasting System).

Last Update: This shows the most recent date when the system was last run.

Markers on the map: The markers represent the sensor locations; Hovering over a marker reveals the sensor ID and the type of sensor installed at that location.

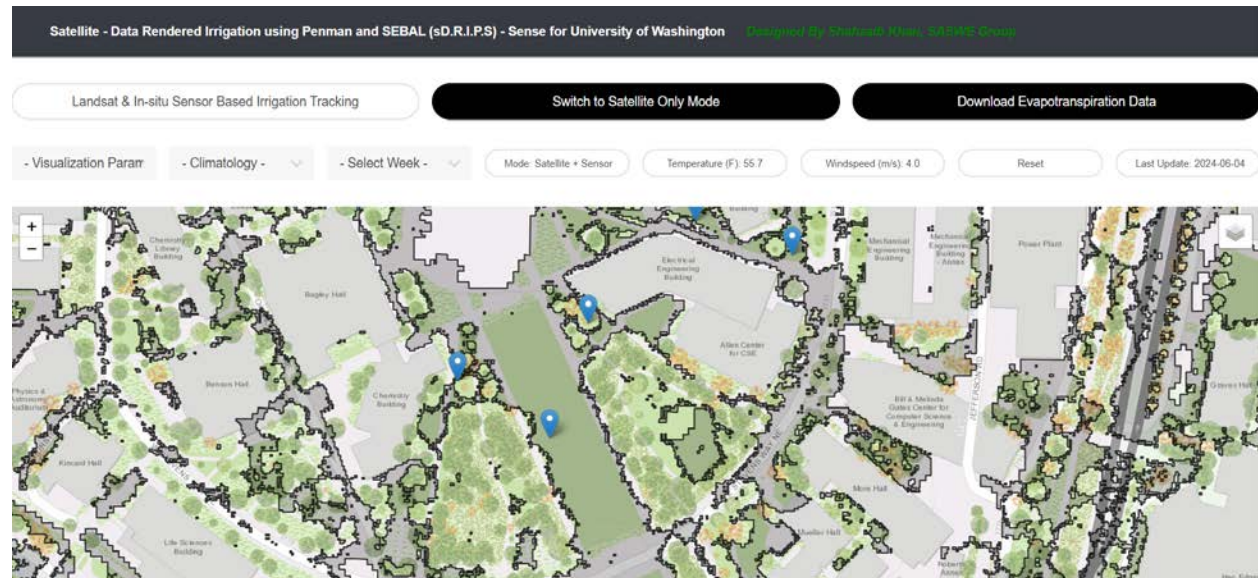
Switch to Satellite Only Mode: This option takes you to dashboard which uses only satellite data to estimate the ET.

Other Tabs: Explained with the example below.

EXAMPLE USAGE:

STEP ONE:

Zoom on to your location of interest. Let's say Rainier Vista and then click on 'Visualization Parameter'



STEP TWO:

Choose your parameter of interest for ET or Irrigation needs. The dashboard provides four types of irrigation-relevant information for each 30X30m pixel of green landscape as follows:

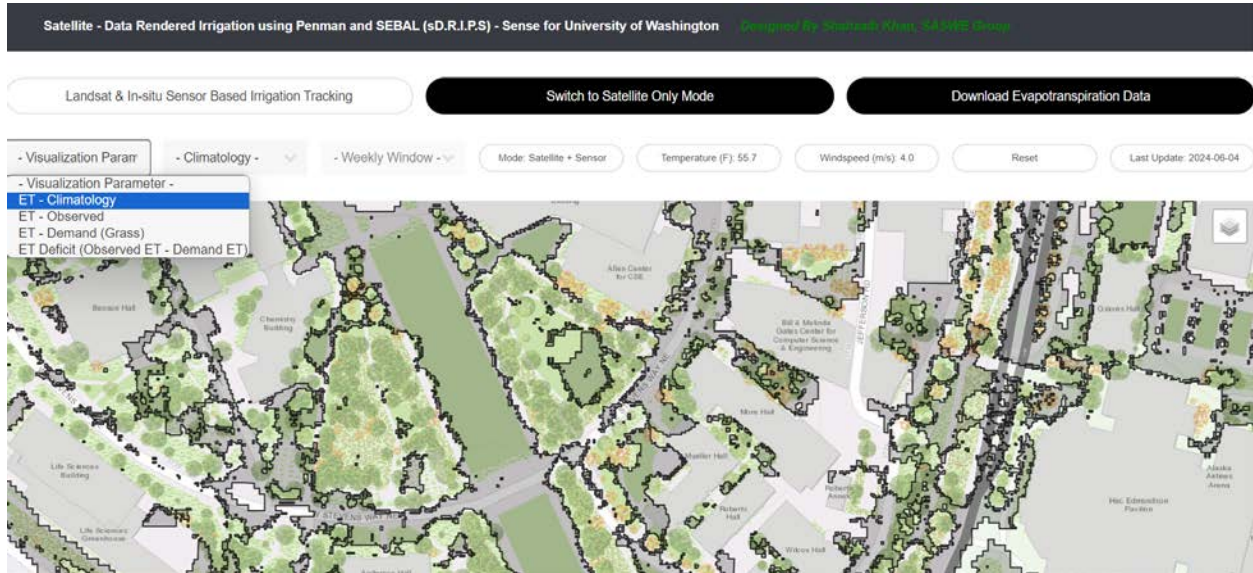
ET-Climatology – This is the total evapo-transpiration (ET) in mm for a specific bi-weekly (two-week) period of summer based on a 20-year average. Here summer ranges from June 1 – September 30. This data is derived from a satellite called Landsat that tracks land temperature and greenery of vegetation and is based on an algorithm called SEBAL (Surface Energy Balance).

ET-Observed – This is the ET observed in inches for the current/latest bi-weekly (two week) or weekly period. In essence, this provides the last two weeks or the last week of ET that was tracked by satellites.

ET-Demand (Grass) – This is the demand for water (irrigation) assuming the landscape is grass for the latest bi-weekly or weekly period. The ET-Demand (Grass) is calculated on the basis of a Food and Agriculture Organization (FAO) algorithm called Penman equation (or FAO 56 report)

ET-Deficit (Observed ET-Demand ET) – This is basically the amount of water that may be needed to irrigate (if it's negative, should be shown in red) or the amount of overirrigation (if it's positive, should be shown in blue). This is calculated by subtracting Demand ET from Observed ET.

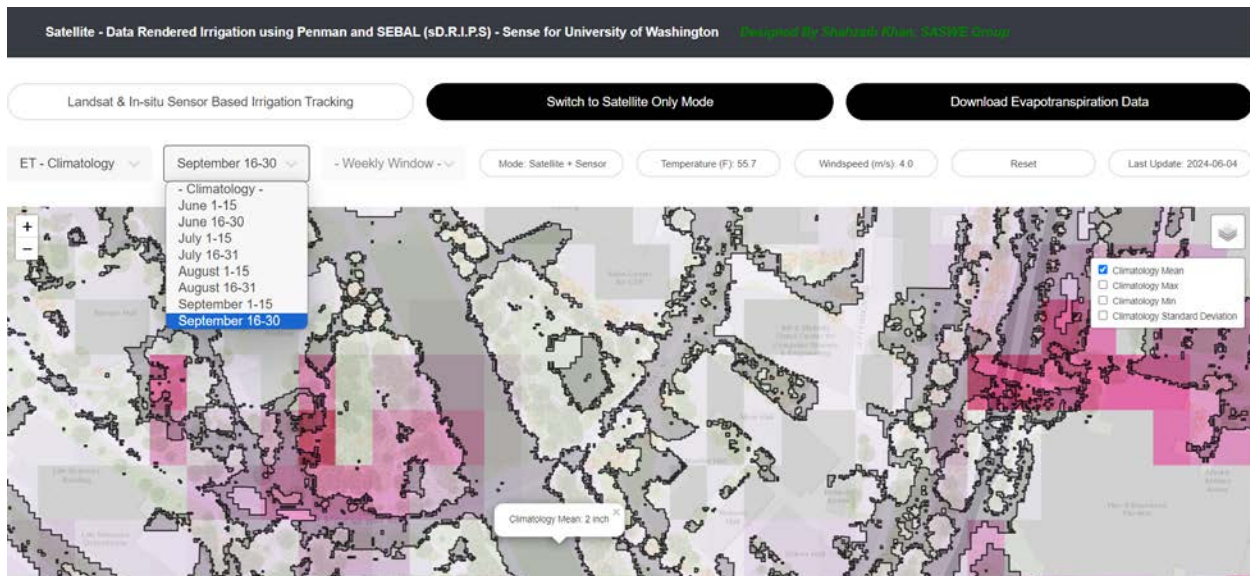
Let's say we want to know the historical average ET for the bi-weekly period of Sept 16-30 at Rainier Vista. We will click on 'ET-Climatology'.



Next, Click on the 'Climatology' tab to select the bi weekly period of Sept 15-30. The map will adapt according to your selection of the period of summer under 'Climatology.'

Now put your mouse exactly on the point of interest and click. The ET (Climatology) for the period of Sept 15-30 (averaged over 20 years) will appear in mm. On the far right, you can check or uncheck boxes to visualize Climatological mean, min, max and standard deviation to get an idea of the range of variation during Sept 15-30 in observed ET.

It is recommended you close the small window for the ET value from your previous query before you start a new one.



STEP THREE:

You can repeat the steps in STEP TWO for other parameters such as ET- Deficit or ET -Observed. However, you MUST hit Reset button to refresh the screen and then click on the parameter of your interest on the far-left tab. Note that the second tab from the left, called ‘Climatology,’ works or is effective in displaying only if you have selected “ET-Climatology” on the leftmost tab.

As an example, the screen below shows the ET-Deficit for the latest (or last) 14 days. The negative values (pixels needing irrigation) are shown in red/pink, while blue is the color for pixels that appear well irrigated. Clicking the mouse on a specific point of interest will yield the deficit irrigation for the last 2 weeks (in this example, it is a 0.18 inch surplus over two weeks and hence there is no need for irrigation).



STEP FOUR – GETTING DATA

If a user is interested in the raw input data used for visualization, then the button on the right ‘Download Evapotranspiration Data’ will provide access to that data. Data will typically be provided as GEOTIFFs, but other formats, such as shapefiles or text raster data, could be hosted as well.

The system is relatively intuitive, though there may be some browser dependency.

AT EVERY NEW QUERY, PLEASE HIT RESET TO REFRESH THE SCREEN