

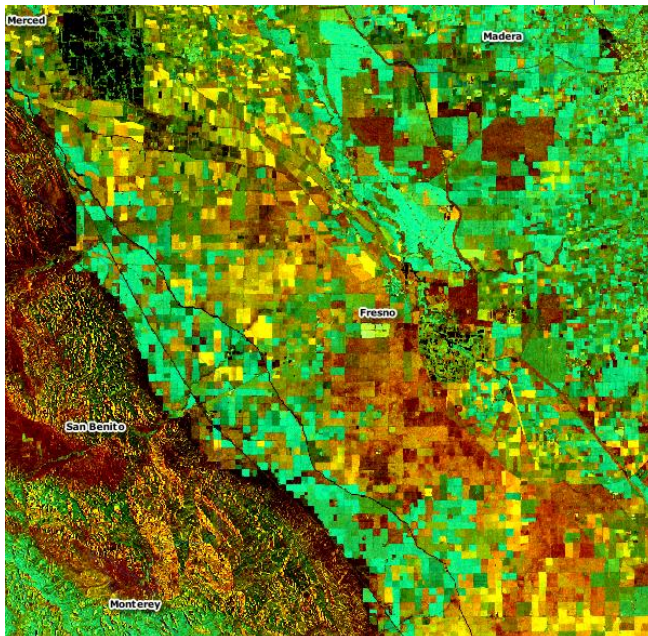
New showcase for California in iMap.

For a region in California in the San Joaquin Valley, we started processing Sentinel-1 data on regular basis. This is radar data that is free of atmospheric interferences and hence ideal for time-series analysis and crop monitoring. The repetition rate is currently at 12 days in ascending recording mode.

The following image shows a pseudo-true color map product from January 18, 2022.

The picture shows the landscape in high color contrast. In the valley you can see cultivated areas with fruits, vegetables and agricultural crops. In the west the valley is bordered by hills.

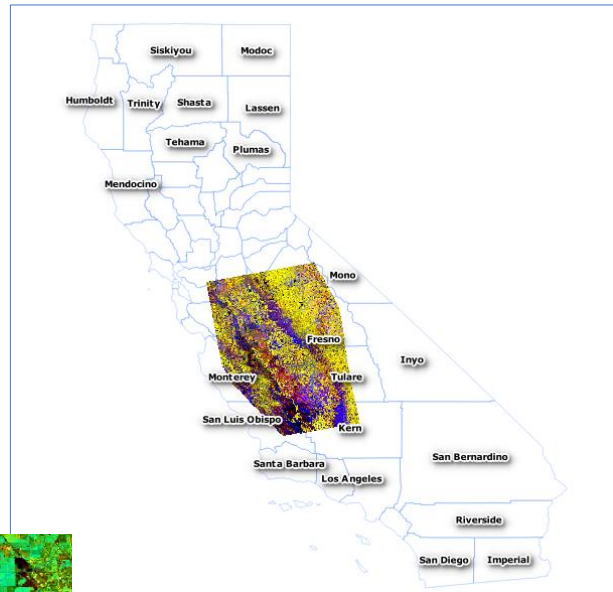
Turquoise blue indicates that there is a lot of



map and the ESVI (enhanced SAR Vegetation Index), which depicts the spatial variability of the biomass. An example is introduced on the next page. If you like to see other products you have to log in at iMap. To do this, you must first register for free on our web-site.

The image on the right shows the SAR Water Index (SWI) calibrated based on the NDWI (Gao). It indicates the moisture in the vegetation and the topsoil. The acquisitions dates from Jan 30, 2022.

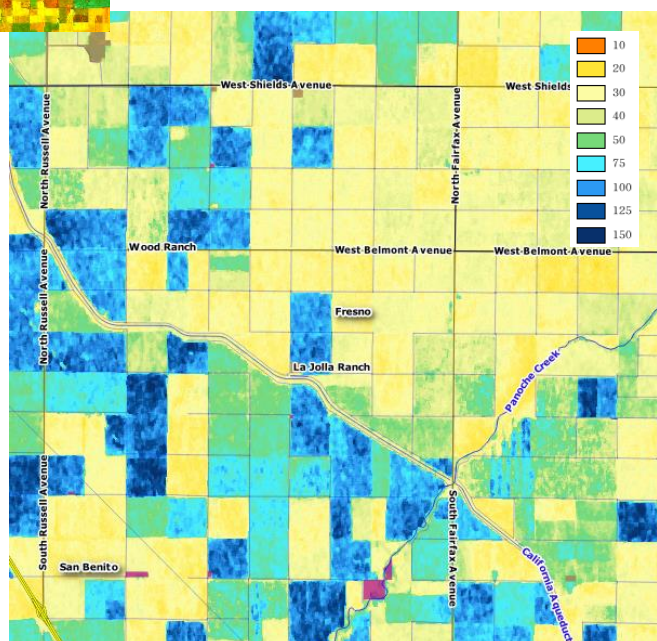
The values range between 0 and 150. The map product is suitable for irrigation control and drought monitoring. Surface waters appear with a low value.



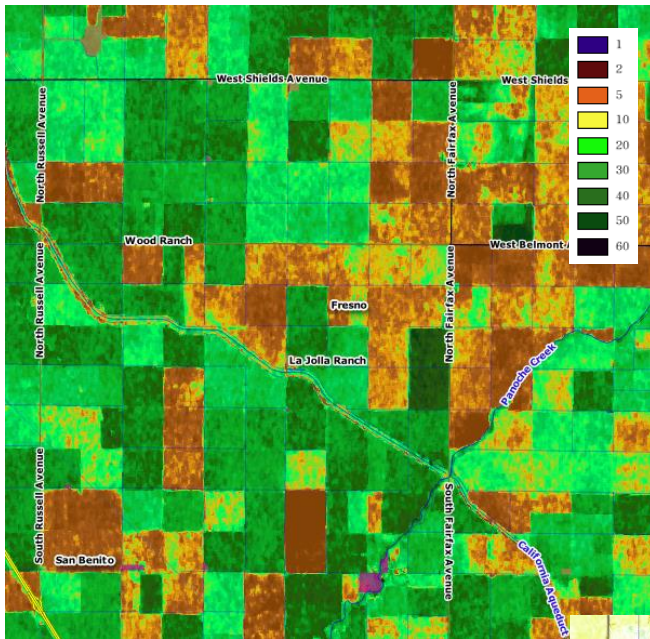
biomass. Usually around trees or orchards. Brown shows bare topsoil. Yellow tilled soil. In green you can see different intensities of biomass in field crops.

In iMap, the satellite data is overlaid with open-street-map data for better orientation. Various map products are available. The base map includes a product that differentiates the different types of crops from each other by color. For this purpose, all data was statistically analyzed over a period of 60 days and combined into a color image.

Two map products are directly accessible for each region. For this project, these are the base



The top left product shows the SAR Vegetation Index (ESVI), which can be used as a proxy for fresh biomass. Values range from 0 to 100. Water is shown in blue. Bare ground in brown. Vegetation appears from yellow to green. Site-specific differences in vegetation development can be identified. The map on the left is as well from May 11, 2021.



The other two products are derivatives from the ESVI. Those are the two products: GCB (Gradual Change of Biomass) and EVO (Evolution of Biomass)

The image below shows the GCB of May 11, 2021. The map shows the biomass development of the last 12 days. The products represent the deviation of the pixel values from 2 succeeding acquisitions based on 100. Accordingly, a value of 75 is a reduction of 25 ESVI units from the previous recording.

The image below shows the GCB of May 11, 2021. The map shows the biomass development of the last 12 days.

The products represent the deviation of the pixel values from 2 succeeding acquisitions based on 100. Accordingly, a value of 75 is a reduction of 25 ESVI units from the previous recording.

The map product allows a value-based change detection.

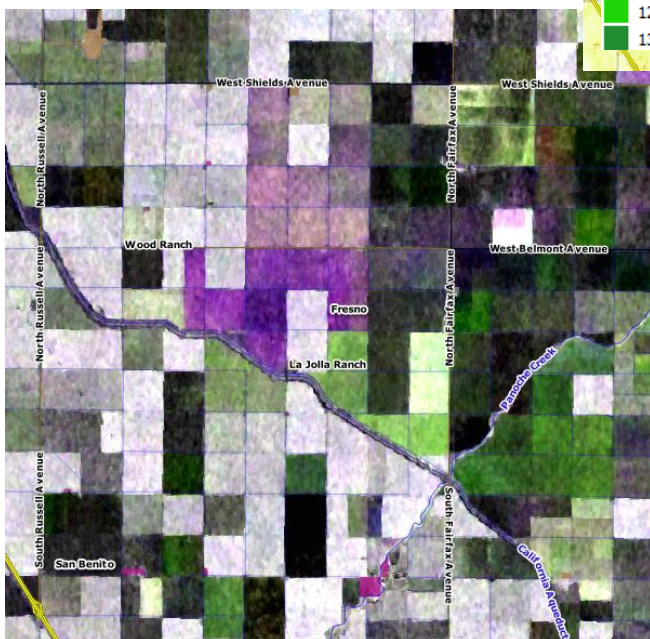
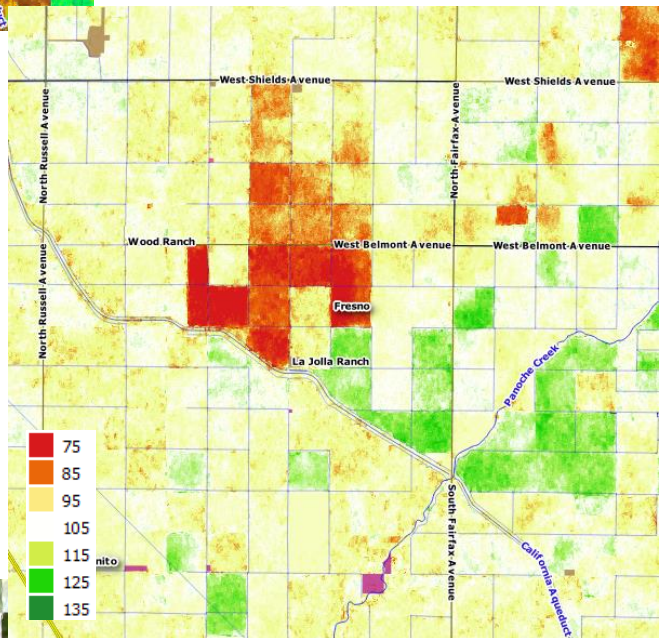
The last map product is as well from May 11, 2021. Here 3 consecutive ESVI images were combined into one color image.

The respective color signature results from 3 different pixel values.

We see, that water or bare ground appears in black if it was bare for the entire period of 3 combined exposures.

We see constantly high values in light gray.

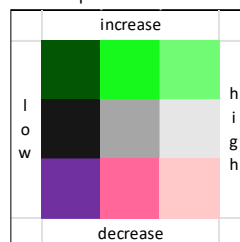
Often these consistently high values represent forests or orchards. In green color we see growth.



In dark green the growth is at a low level. In light green the growth is at a high level.

In pink we see a value reduction or maturity development

The map product covers a period of 24 days and gives a quick overview of the latest biomass development.



SAR measures the changes on the surface with constant low noise and is hence ideal for crop monitoring.

[Direct link to the project.](#)