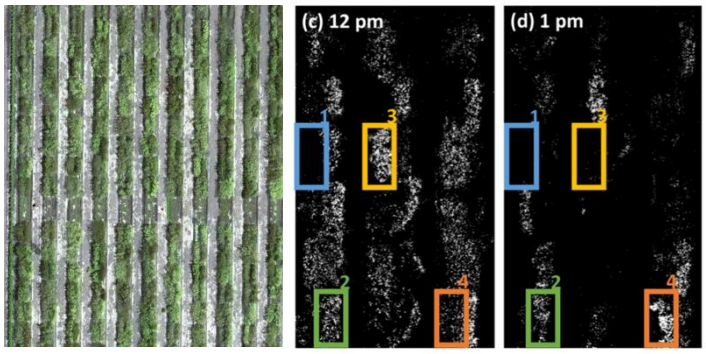
CALIFORNIAVIEW 2019 - 2020

CALIFORNIAVIEW 2019-2020 ACTIVITIES

CaliforniaView's vision is to promote and advance remote sensing education within the state of California utilizing predominantly USGS Landsat data sets to solve societal problems. It has become the state's go-to remote sensing educational resource since 2012. In GY 2019, CaliforniaView has made great efforts to train and promote the applications of UAV technology in precision agriculture, in addition to the continuation of advancing remote sensing education across multiple disciplines.

Graduate student research project on high throughput phenotyping with multispectral drone imaging. CaliforniaView supported a Geography PhD student to work with a Plant Biology student on using drone to capture the lettuce flowering dynamics. Together they designed and implemented the aerial imaging mission with a DJI-MicaSense drone system. An automatic workflow was developed to map flowers. This study demonstrated the efficacy of using drones to detect temporal differences in daily floral opening events.

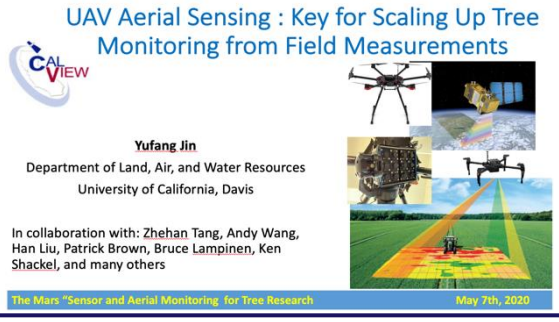


UAV imagery (RGB) and identified floral pixels at different time of the day (e.g., 12pm and 1pm) showing the variation in flower opening time for various lettuce varieties.

Interns learning how to operate the drone for aerial imaging.

Student training on UAV/drone remote sensing technology. CaliforniaView has paired five interns with graduate students in UAV-based research projects. Two Engineering student interns worked on the integration of a high precision RTK GPS unit with a thermal sensor. Three senior students gained hands-on experience on Pix4D drone image processing and visual interpretation for building training dataset. A drone lab was added to the curriculum of a remote sensing course for flight planning and image processing, and a summary lecture on UAV applications in precision agriculture was given to a graduate level course.

UAV/drone technology demonstration. CaliforniaView demonstrated drone technology for agricultural applications via the DroneCamp by partnering with UC Division of Agriculture & Natural Resources, and presented the UAV related research to the Mars Sensor and Aerial Monitoring Team and much broader audience in the NRCS Technology Showcase in Sacramento. We also supported campus-wide drone user groups, UCD Drone Club, and MapTime.



PI Jin gave a talk on UAV applications for tree crop monitoring to the international team of the MARS Corporation in May 2020 (right).

CaliforniaView is a member of the AmericaView Consortium, a nationally coordinated network of academic, agency, non-profit, and industry partners and cooperators that share the vision of promoting and supporting the use of remote sensing data and technology within each state. AmericaView is funded by USGS grant agreement G18AP00077.

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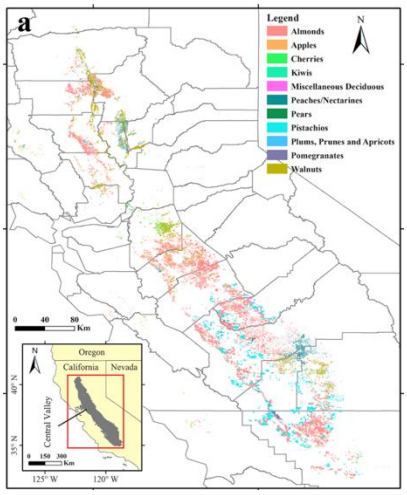
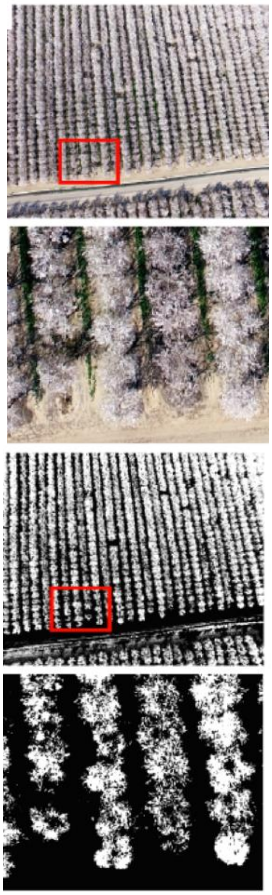
Benefits to California

California is the most diverse and productive agricultural state. There is an urgent need to minimize the inputs of water and fertilizer while maximizing the yield. CaliforniaView's activities contributed to facilitate on-farm adaptive irrigation and fertilization management strategies and inform regional scale water planning by

- Providing guidance to the specialty crop industry, such as the almond board, and large growers in California on the UAV technology for precision agriculture.
- Training students to make sure the next generation workforce is well equipped with remote sensing foundations and tools for sustainable agriculture resource management.
- Relaying the power of multi-scale remote sensing framework and workflow for upscaling drone-based sensing with high resolution satellite imagery, to support better-informed decision making across scales.
- Educating a broader audience, including the general public and state agencies, about the benefits and directions of remote sensing applications.
- Building the bridge between private companies in agriculture technology, agronomists, and growers, to help service providers meet the needs of end users.





Demonstration of bloom monitoring for early season almond yield prediction to improve N management.

CaliforniaView Consortium Membership

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