CALIFORNIAVIEW 2022-2023 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 2022, CaliforniaView's applied research focused on the state's 34 million acres of rangelands. Key deliverables include rangeland productivity monitoring tools using multi-spectral satellite observations from Landsat and Sentinel 2, improved understanding of rangeland vulnerability to climate change and extreme weather, and projected forage production under future climate change projections. A pilot study has also been initiated to use the PRISMA hyperspectral data to track residual forage dry matter (RDM), a critical rangeland health indicator for annual grasslands. Our outreach activities have also advanced remote sensing education across the state.

(a) Exclosures for on the ground measurements.
(b) Coverage of PRISMA hyperspectral imagery acquired during 2022 -2023.
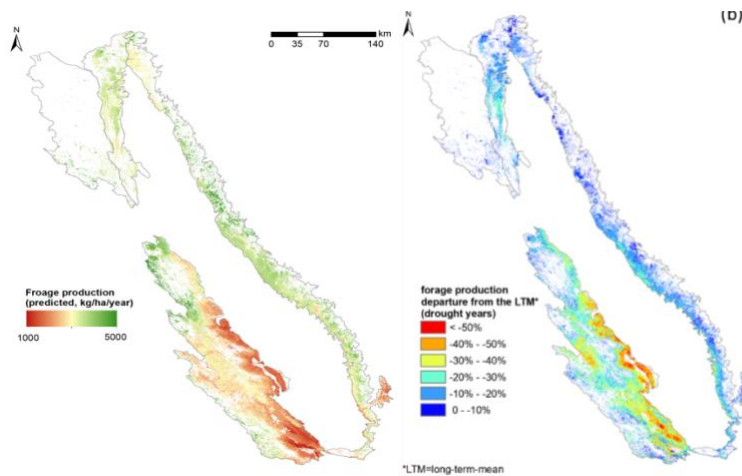
(a) Spatial distribution of long term mean forage production derived from MODIS and Landsat fusion and (b) Mean forage production during dry years between 2004-2019.

CaliforniaView partnered with USDA FSA and 17 county-based UCCE farm advisors, working with ranchers and land managers to collect field data for model calibration and validation. Daily and annual forage production was estimated at 30m. Large spatial variability (2940±934 kg/ha/yr; CV=35%) was found across the state's grasslands. Drought reduced forage production by 33±19%. Our machine learning analysis highlights key regional differences in forage vulnerability to climate and provides insights into the intertwining and potentially counteracting effects of seasonal temperature and precipitation regimes. Remote sensing technology provides scalable monitoring tool and guidance for adaptive ranching.

Public engagement with remote sensing technology. CaliforniaView hosted exhibitions at the annual University Open House with more than 35,000 visitors. Various drone platforms and imaging cameras were showcased, along with poster presentations on UAV applications. Thermal photo booth attracted many visitors, demonstrating the concept of thermal remote sensing.

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BENEFITS TO CALIFORNIA

California's landscape is ecologically and climatological diverse, vulnerable to warming, drought, and wildfires. As a most productive agricultural state, it also faces the challenge of minimizing water and N use while maximizing the yield. CaliforniaView has been contributing to cost-effective monitoring across scales with remote sensing technology and facilitate data-driven adaptive management for sustainable natural resource and agriculture. Our research, education and outreach activities have benefited a broad range of stakeholders by

- Demonstrating and providing support to state agencies and the specialty crop industry on satellite and UAV remote sensing technology and AI.
- Training students from multiple disciplines via targeted curriculum development, mini project mentoring, and workshops to equip next generation workforce with remote sensing foundation and tools.
- Educating broader audience about the benefits and recent advancements of remote sensing and AI applications.
- Showcasing and sharing 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.
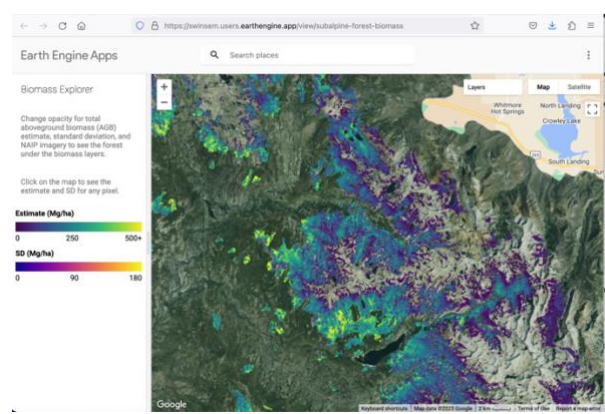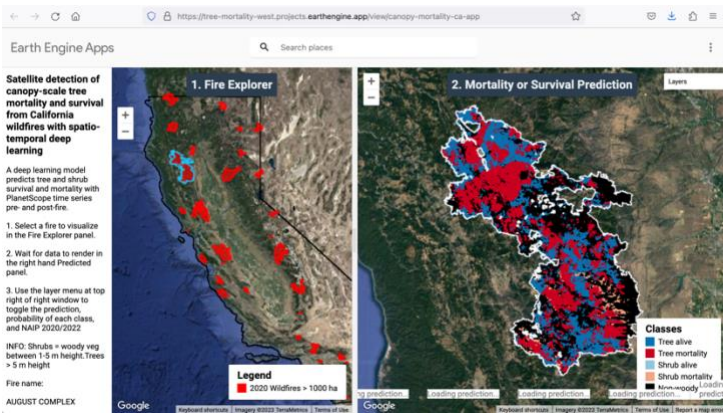
CALIFORNIAVIEW CONSORTIUM MEMBERSHIP

Federal consortium members identified above do not receive funding from AmericaView.

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