

California Rangeland Production Predicted from Satellite Data

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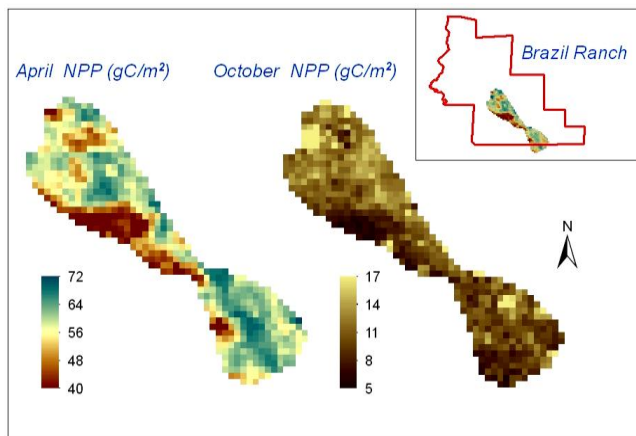
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Background

Western growers face many challenges to the success of their field operations. Uncertainties in weather conditions are constant threats to rangeland forage production. The ability to accurately predict and prepare for changes in forage yields from one year to the next is a pressing need. Adapting growing practices to cope with climate change is now a concern for many land managers.

CASA2100 and the California Rangeland

CASA2100 is an operational system that begins from historical satellite remote sensing data collected at the level of individual agricultural fields. Rangeland forage yields are predicted from a combination of weather station records, soil properties, management data, and observed forage growth stage from satellite imagery.

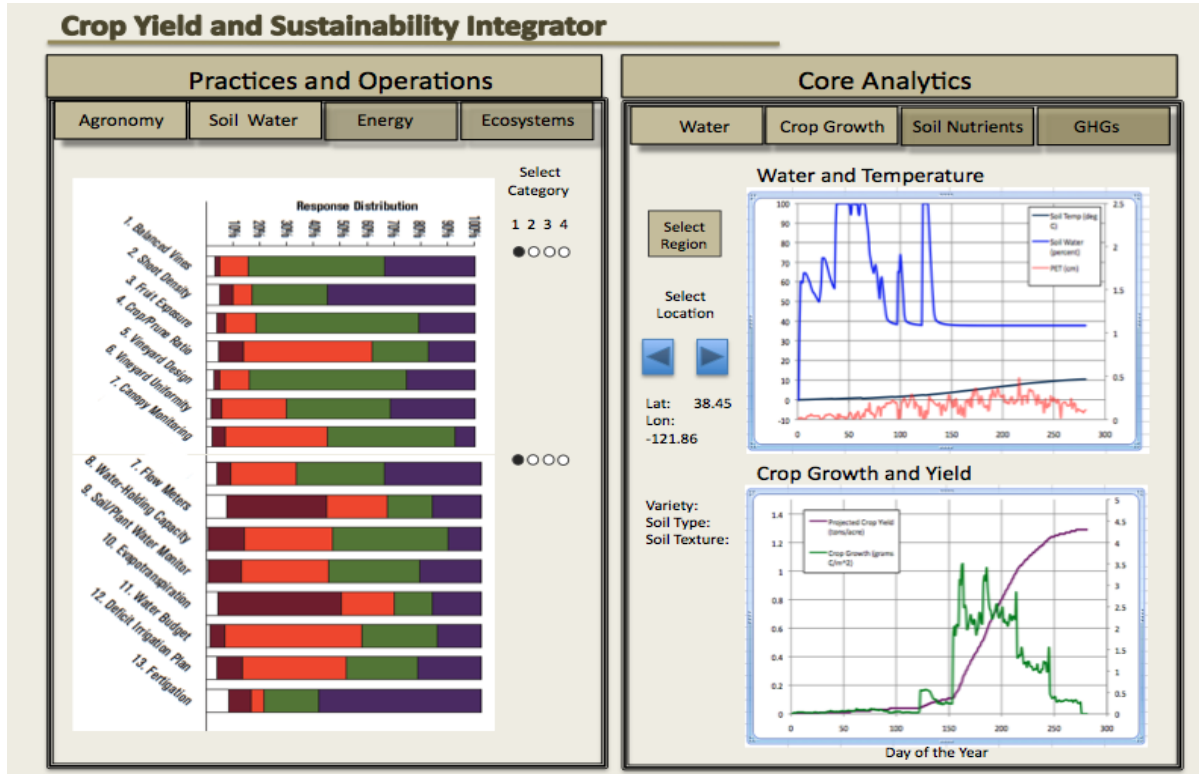


*A new study published in the journal **Natural Resources** accurately estimates net primary production (NPP) and residual dry matter (RDM) in grasslands under different management (ranching versus unmanaged) on the Central Coast of California. CASA Express has been designed to estimate monthly patterns in carbon fixation and plant biomass production using moderate spatial resolution (30-m to 250-m). Results showed annual NPP predictions of between 300-450 grams C per square meter for coastal rangeland sites.*

Operational Services Now Available from CASA2100

Services now available from the CASA2100 system include analysis of past and present satellite remote sensing data sets for estimation of crop yields at the individual field level, plus modeling* analysis of crop water use and soil greenhouse gas emissions (Example in Figure below). Such data provision services include the delivery of digital daily summaries, namely estimates of **annual forage yield, soil water and nutrient use, greenhouse gas (soil carbon dioxide and nitrous oxide) emission fluxes, for selected field locations or scaled-out for entire growing regions of the country.**

Prototype of CASA2100 display window for review and analysis of crop growth and yield predictions, according to reported management practices and field operations provided by growers. Multiple fields may be displayed for comparison of the outcomes of different grower management decisions.



* Based on CASA model as previously developed in 2007 and described in the peer-reviewed journal publication: Potter, C., S. Klooster, A. Huete, and V. Genovese, 2007, Terrestrial carbon sinks for the United States predicted from MODIS satellite data and ecosystem modeling, *Earth Interactions*, 11: 1-21.