

How I learned to stop worrying & love ^{vineyard!} remote sensing

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ARS/NGWI, 2007

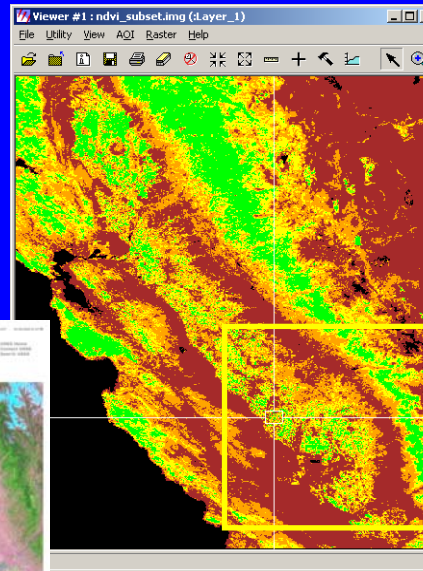
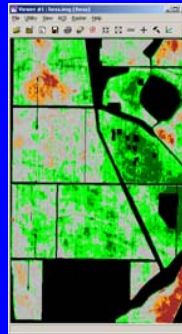
why NASA?

Overview

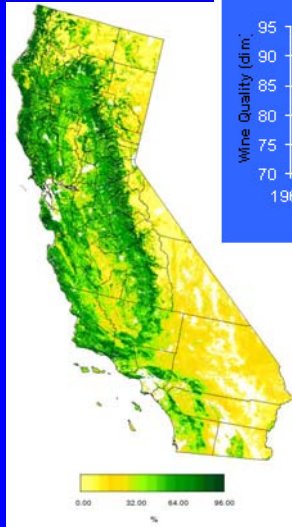
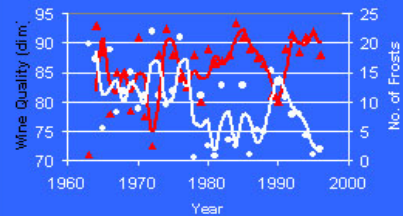
- Applied research examples
- Real-world testimonials
- Comments on state of vineyard remote sensing adoption

Applied research examples

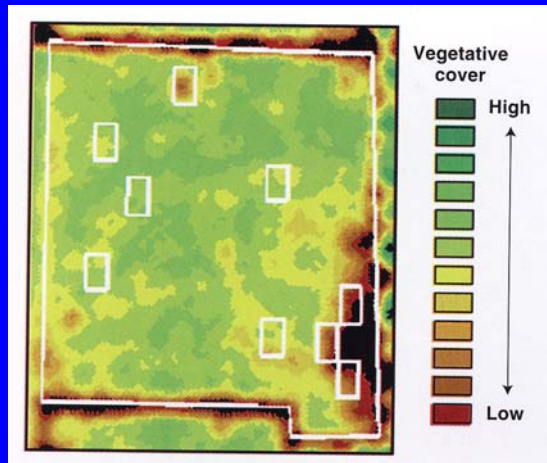
OCEAN-ATMOSPHERE-LAND COUPLING ALONG COASTAL CALIFORNIA



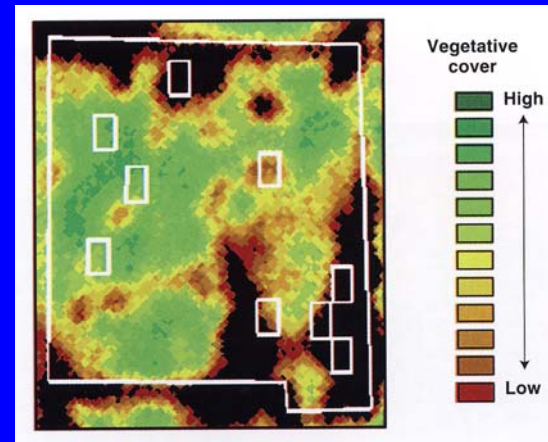
Frost(JFM) & Wine Quality



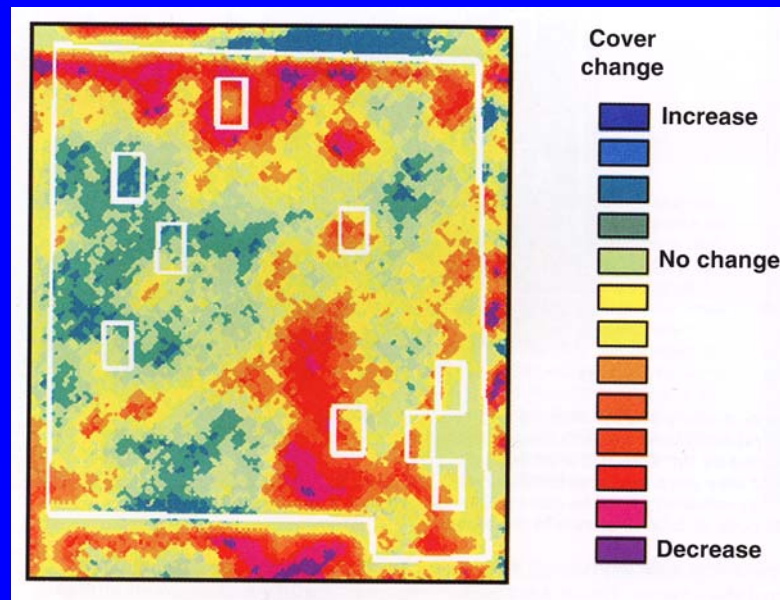
Phylloxera monitoring



Yr 1



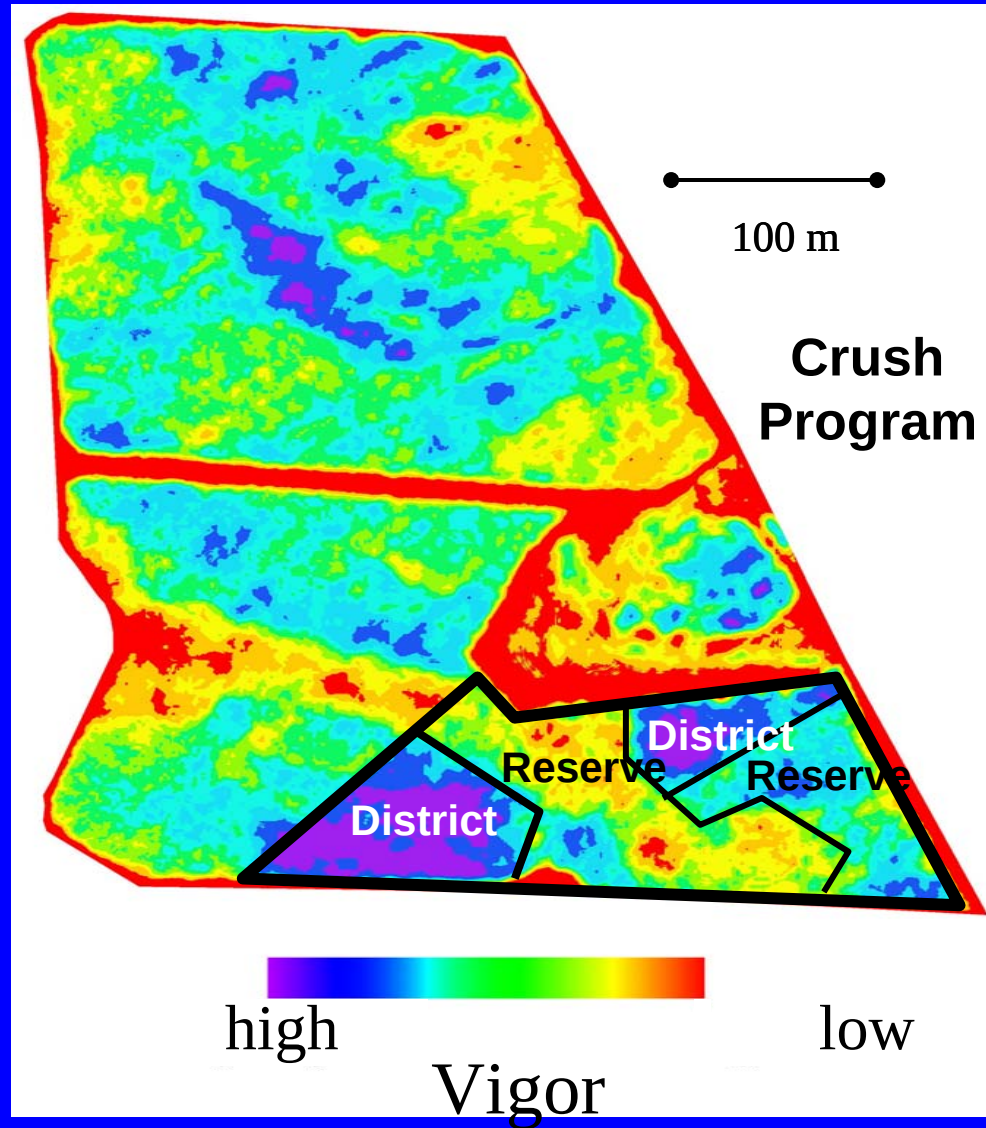
Yr 2



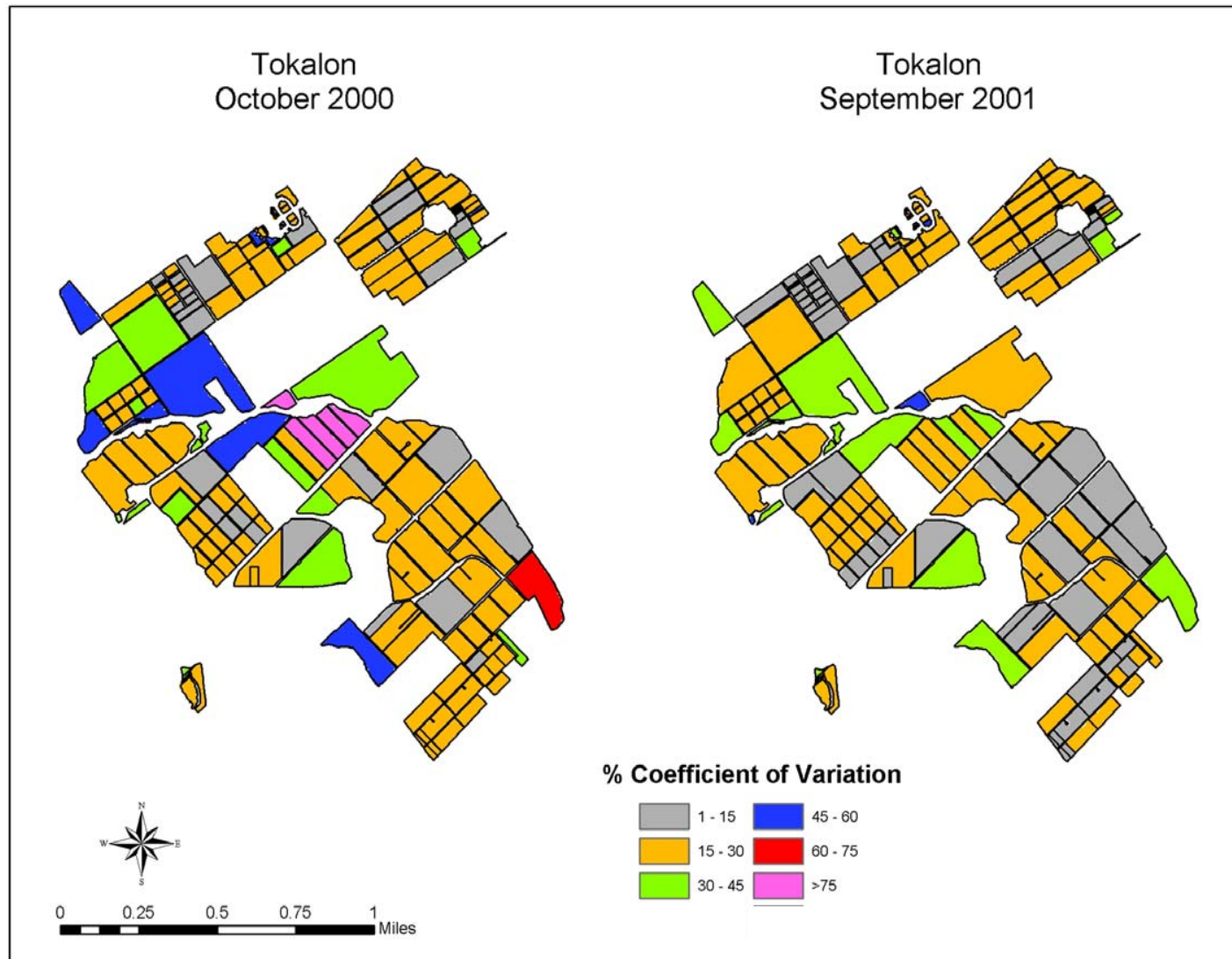
yr-yr progression

Calif. Agric. 1996

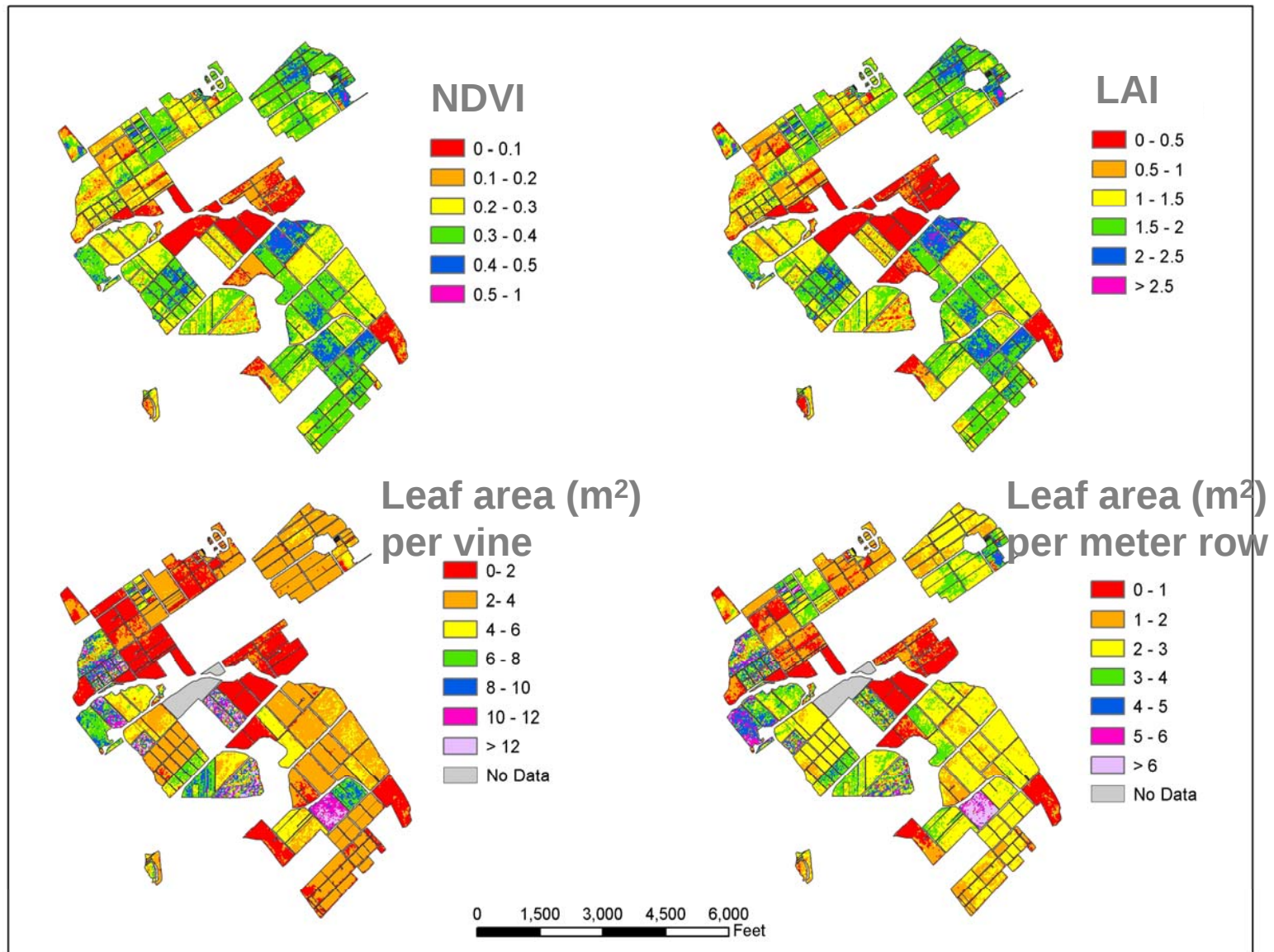
Harvest management



Block uniformity

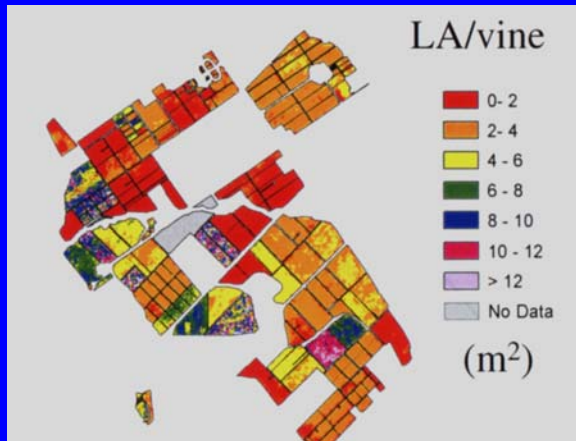


Leaf area

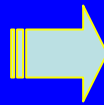
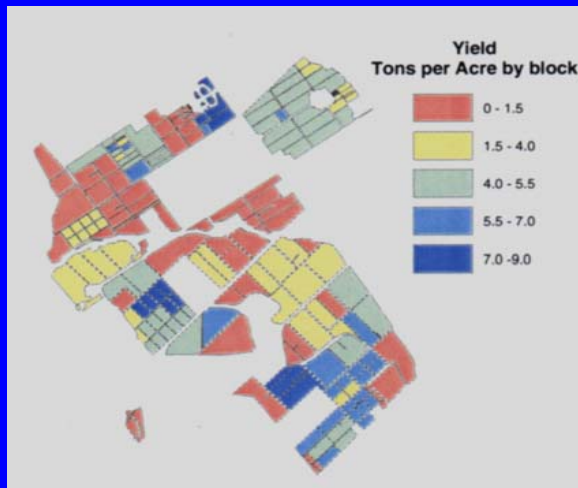


Vine balance

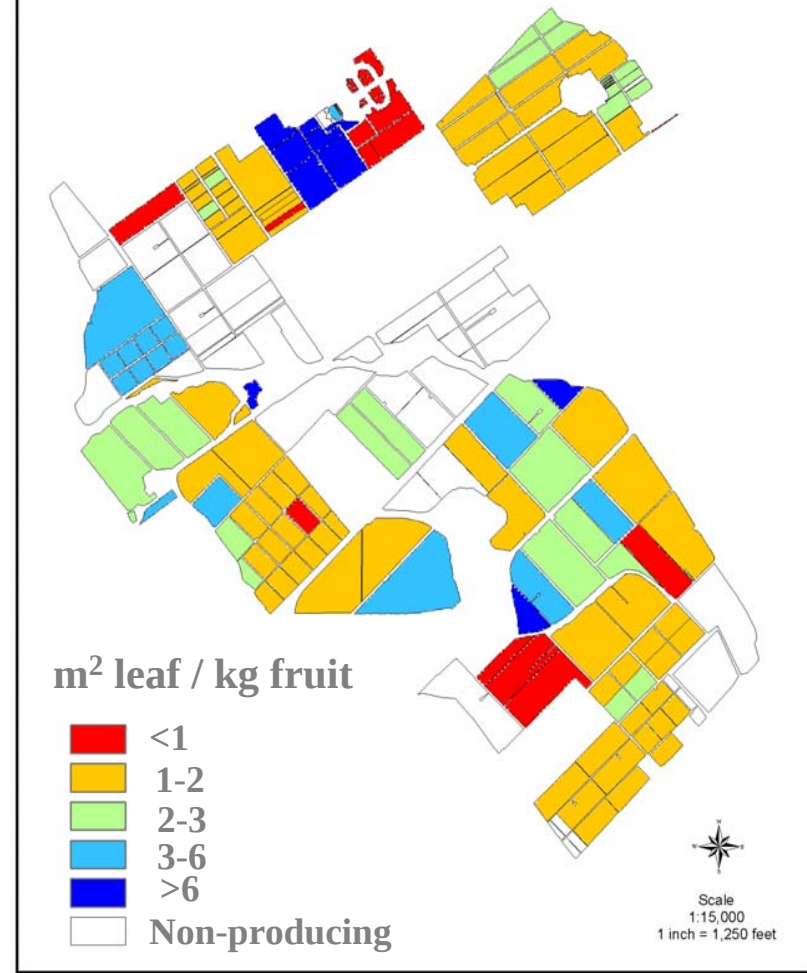
Leaf area per vine (m²)



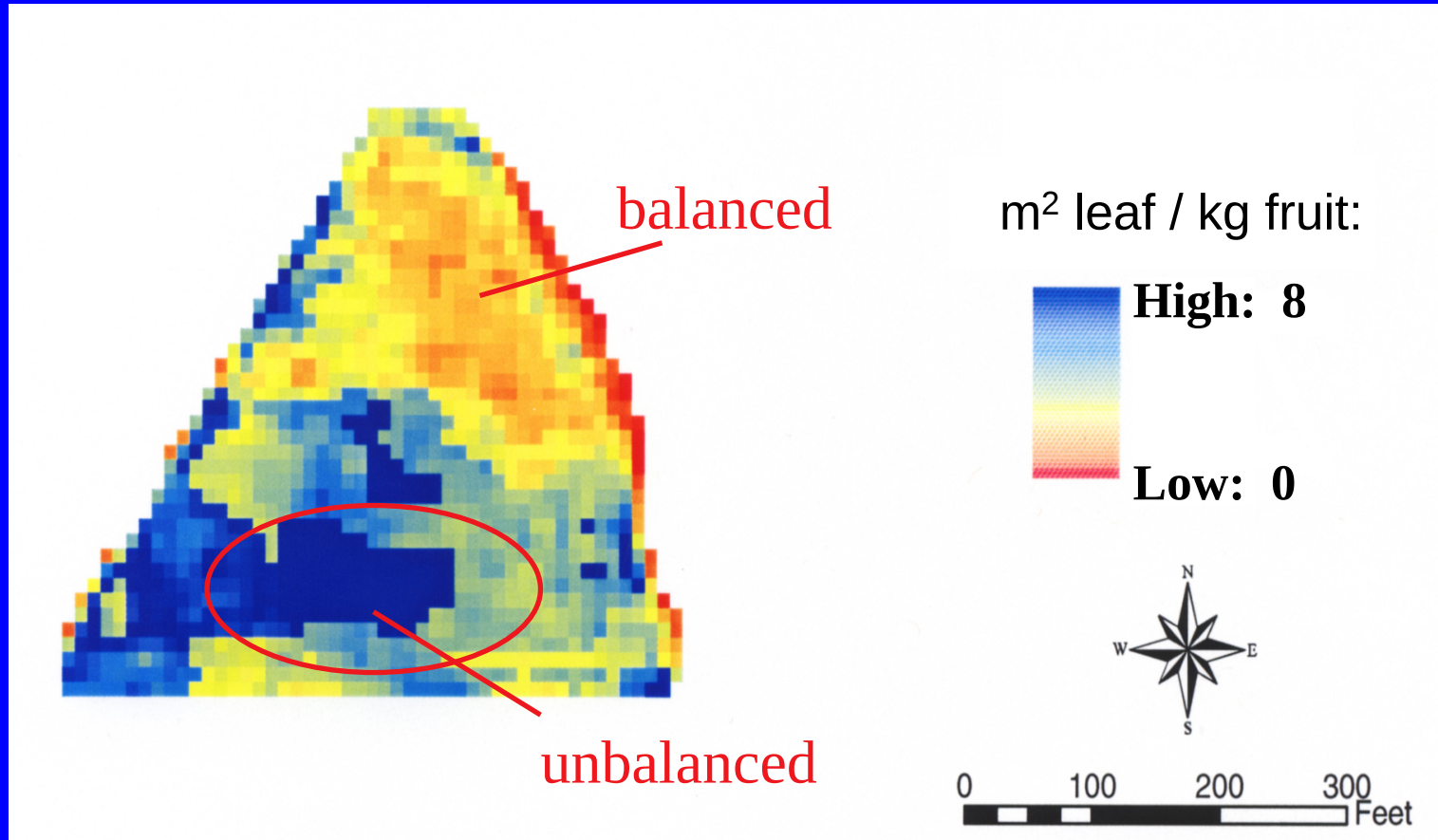
Yield per block (t/ac)



Vine "Balance"

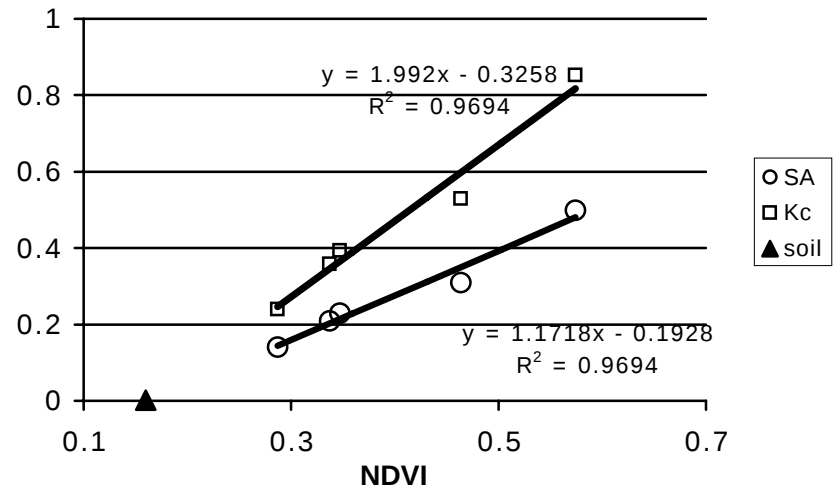


More vine balance

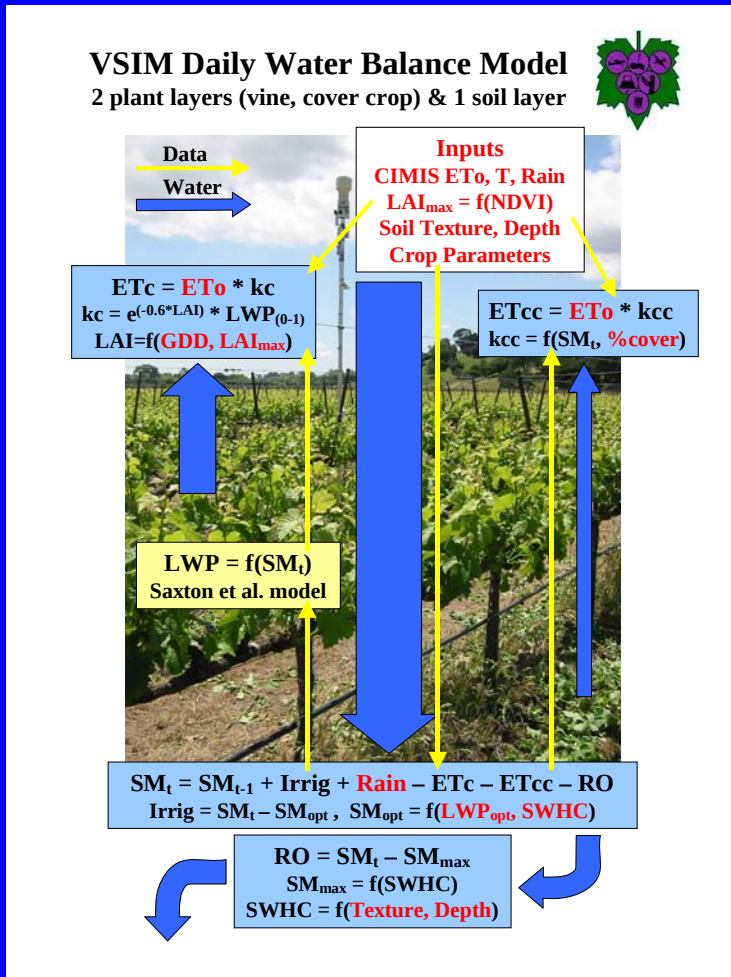


ASAE. 2003

Shaded area

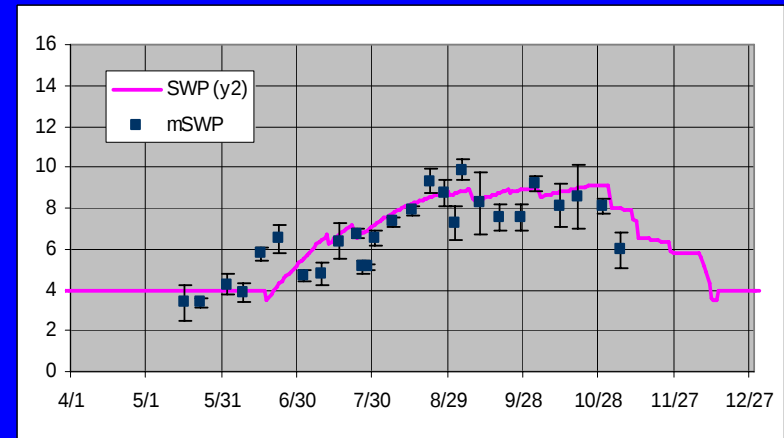
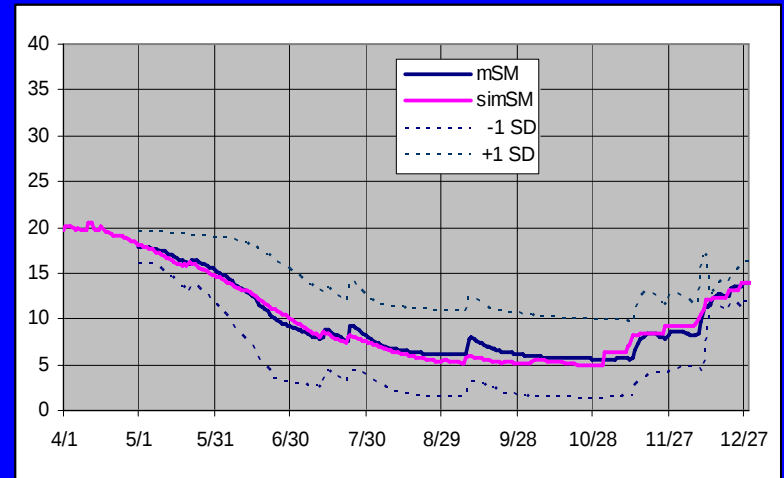


Water



Soil Moisture

Stem Water Pot'l



More water

Leaf Area

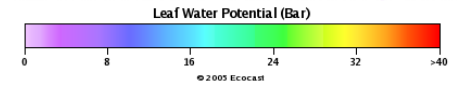
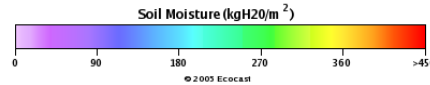
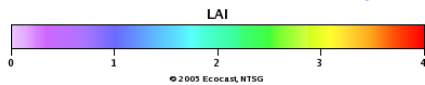
Soil Moisture

Water Stress

LAI July 15, 2005

Soil Moisture June 30, 2005

Leaf Water Potential June 30, 2005



Calif. Irrig. Institute 2006

Irrigation Forecast

week of July 19-26, 2004

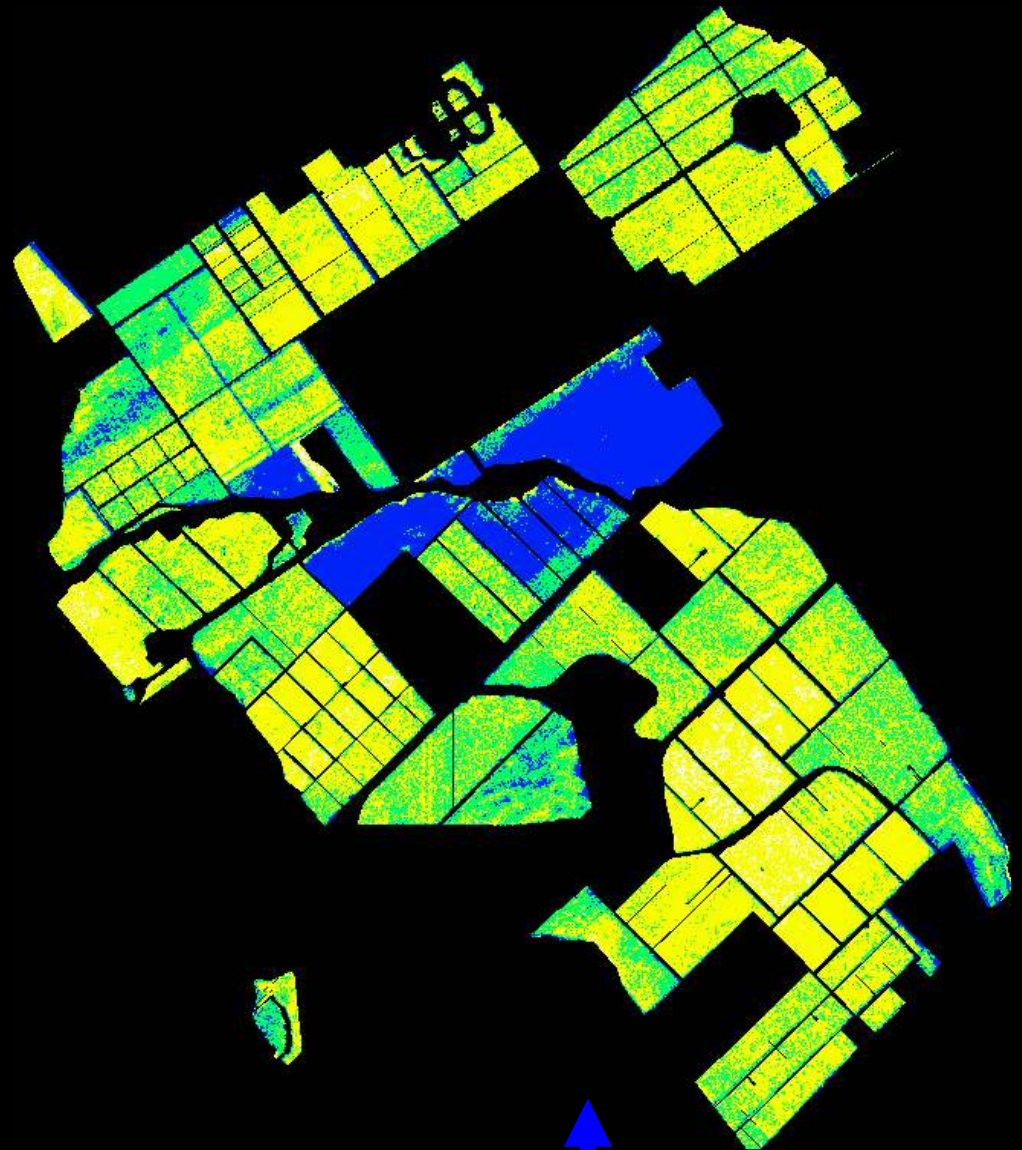
CIMIS Measured Weather Data
through July 18, 2004

NWS Forecast Weather Data
July 19-26, 2004

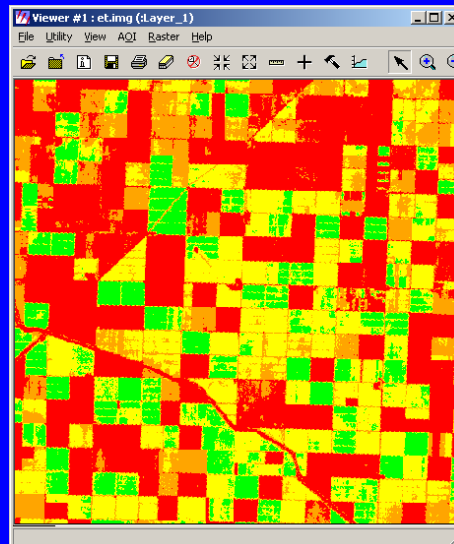
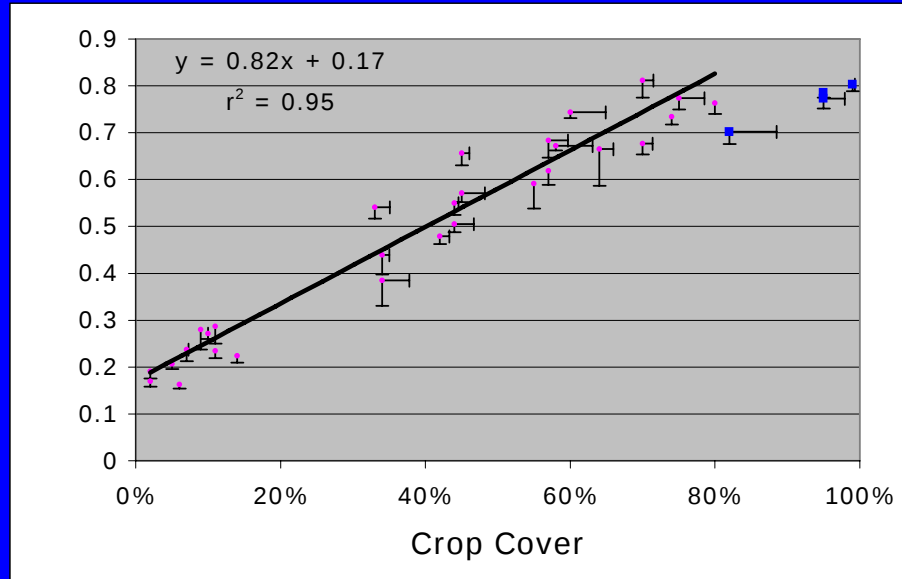
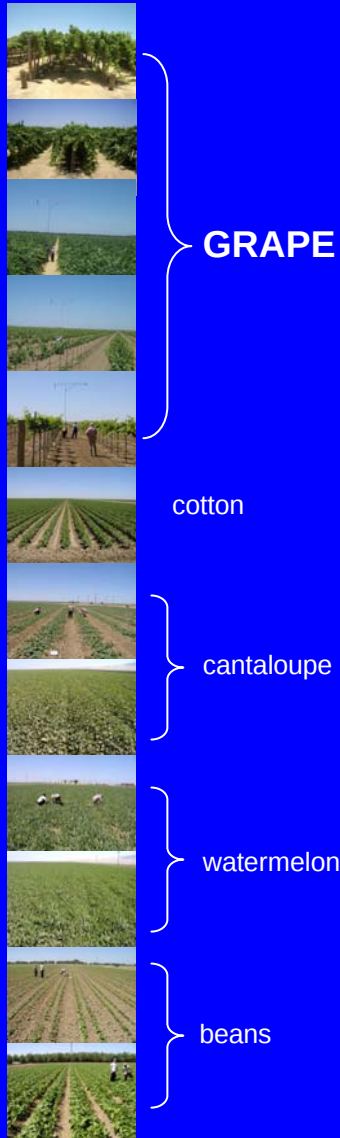


Forecast Irrigation (mm)

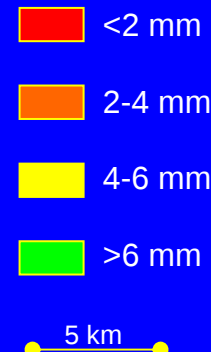
0 meters 1000



ET mapping



ET for 6/19/06:



Grower testimonials...



Remote Sensing Applications - “Top 5” List...

- 1) Harvest planning
- 2) Irrigation problems
- 3) Soils problems
- 4) Pest/disease control
- 5) Pretty picture to hang on wall

“A client is experimenting with early forecasting by using multiple NDVIs. He hopes to predict his likelihood of a quality harvest vs. a standard harvest earlier in the season to decide what quality of barrel he is going to buy. The difference is \$600 barrels vs. \$200 barrels.”

“One client of 8 acres identified a former stream bed that was siphoning off their purchased irrigation water. They redesigned their irrigation blocks and are now using 80% less irrigation water.”

“We have had many clients of all sizes that never knew they had any grapes of reserve quality. When they used the NDVIs as a grape sampling guide they discovered areas that could be harvested separately.”

“NDVIs are also a great tool for companies that are grape buyers from smaller vineyards for grower relations. A number of my clients are in this category and they use the NDVIs to assist their growers in improving quality and uniformity throughout the vineyard.”

“A vineyard consultant uses NDVI on undeveloped property to design their soils sampling program in order to increase accuracy and to lower field costs in developing soils profiles.”

- Remote sensing can support NGWI research priorities in Production/Processing, Quality, and Sustainability...



Can we talk?

Benchmarks for adoption of vineyard remote sensing

Commercial:

satisfactory

- low level products (radiometric)
- qualitative interpretation
- proprietary

Research:

unsatisfactory

- higher level (biophysical, physiological...)
- quantitative
- public domain

Bonus slide



The 5 RapidEye satellites orbit at an altitude of 630 km.

