MODIS
Estimate of
Canopy Water Content

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Santa Monica Mtns: Canopy Water Content

AVIRIS Composite 980 nm Water Absorption

(Ustin et al., 1999)
Cw/LAI Estimation from MODIS

MODIS Water Index (SRWI):

\[
SRWI = \frac{R_{858}}{R_{1240}}
\]

(Pablo Zarco-Tejada et al., 2001 IEEE; Rem. Sens. Env. 2003)
Comparison between Field Measured Water Content VS. MODIS Prediction

1. $y = 0.04x - 0.0208$
   - $R^2 = 0.7238$

2. $y = 0.0173x - 0.0095$
   - $R^2 = 0.7772$

3. $y = 1.3355x - 0.0124$
   - $R^2 = 0.7183$

4. $y = 1.1134x - 0.0088$
   - $R^2 = 0.8644$
Water Content estimation from MOD09A1: seasonal variation

(Zarco-Tejada et al., 2003 Rem. Sens. Env.)
Seasonal Drought and Wildfire Potential

Canopy water content in Southern California Vegetation Measured by MODIS Satellite
Canopy Water Content

• Estimates of LAI
• Estimates of Plant Water Stress
• Estimates of Wildfire Fuel Moisture Content
LAI
Estimated by
NDVI VS EWT

Wind River
Ameriflux Site

Roberts et al., Ecosystems 2004
Wisconsin Tall Tower Flux Site

S.N. Burrows et al.
Ecosystems 2002

MODIS Data 2000-2001
Estimate of LAI from MODIS Water Content vs. MOD09A1
Estimating Water Stress From Water Content
Changes in Canopy Water Content after Irrigation Cutoff

1-CR Ratio (899-1060 nm) vs. Time

Date of Year 1999

+ Water

- Water
Within Field Water Content vs. Days Since Last Irrigation

Pima Fields Only

Acala Fields Only
Estimating Fuel Moisture Content

### Dry Matter in Fresh Samples

![Graph showing the relationship between Inv-PROSPECT Dry matter and Measured Dry matter from fresh samples.]

- The equation is $y = 0.8308x + 0.0009$.
- $R^2 = 0.342$.
- P-value < 0.0001.

Stephane Jacquemoud et al, 1996
Estimates of Fuel Moisture Content

- dry matter estimated seasonally
- water content from Water Index

Emilio Chuvieco et al., in press