The Connection Between Fog and Fire

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Fire in Santa Barbara

- 2009 Jesusita Fire
- 95 homes damaged
- 9,000 acres burned
- Cost $120 million
Improving Understanding and Response to Fire

- Predict when and the size of the fires
- Methodology applied state-wide
- Economic and environmental benefit by conserving resources
Fog Could Fulfill the Need for Water in the Summer

![Graph showing rainfall and fog observations over a year. The graph reveals peaks in rainfall and fog in different months. Rainfall peaks in February, while fog peaks in July and August. The graph also shows a decrease in rainfall and fog from October to November.]
Driving Research Questions

Do plants use fog water?

Is there a relationship between fog presence and plant flammability?
Isotope Scale

- Light Isotopes (Rain)
- Heavy Isotopes (Fog)
Determining Whether Plants Use Fog

- Cryogenic vacuum extracts water from plants
- Isotope Ratio Mass Spectrometer (IRMS) determines ratio
Quantifying Fog

- Measure quantity of fog deposition
- Fog condenses on fishing line and flows into container
- Measured at Coal Oil Point Reserve here on campus
UCSB Campus

Coal Oil Point Reserve

We are here
Plant Flammability Index

Live Fuel Moisture (LFM) is the ratio of water to dry material

$$LFM = \frac{\text{wet weight} - \text{dry weight}}{\text{dry weight}}$$

Widely used by fire prevention community and public

Below 60% is high fire hazard
San Marcos Fire Station 2008

Percent Live Fuel Moisture

Date

Tea Fire 13-Nov
California Sage Brush

- Shallow roots
- Drought deciduous

Coyote Bush

- Deep roots
- Evergreen
Final Thoughts

- Plants potentially fulfill their need for water using fog which would affect their flammability

- Next step to look at dates of high fluctuation and test for water isotope ratios