

Airborne synthetic aperture radar for nearreal-time wildfire monitoring using NASA's UAVSAR instrument



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Previous Results from Spring Term

dCA





Summer Term Project Objectives

Process all fire case studies from 2009-present and provide a comprehensive list of these fires with associated R² values between our UAVSAR derived differenced cross-polarized (dCA) product versus the Landsat derived dNBR products

Analyze field data and correlate it with the UAVSAR output (dCA)

Study Area

Project Partners



California Department of Forestry and Fire Protection (CAL FIRE)

U.S. Forest Service



UAVSAR



Ability to fly day or night for data acquisition



High spatial resolution (5m)

Penetrate cloud and smoke

UAVSAR Data



Urban

Methodology



Before

After

Difference

Results: Briggs Fire



dCA

dNBR

Vegetation Cover



Results: Mint Fire



dCA



Vegetation Cover



Results: Ken Fire

dCA

dNBR

urban



Results: Kirker Fire

dCA

dNBR



Case Study: Canyon Fire GeoCBI



Case Study: Canyon Fire Correlation



Correlation & Pixel Estimate Tool (PET)



PET = Inner Buffer / Outer Buffer

Fire Name	PET Value	Pearson Value	Primary Vegetation Type
Briggs	5.60	0.74	Shrub
Mint	3.75	0.69	Shrub
Morgan	4.97	0.70	Mixed: shrub, grass, tree
Kirker	1.06	0.10	Grass

Briggs Fire Google Earth Images



Briggs Fire PET: 5.6









Monte Fire Google Earth images





Lake Fire dCA



Fire perimeter

UAVSAR - dCA



Conclusions

Radar response to fire scars seems to be dependent on vegetation density

Good correlation observed with field-collected data from the 2011 Canyon Fire in Tehachapi

Detection level for burned areas during Lake Fire in June lower than expected

Method shows promise for active fire monitoring, but requires more analysis for full assessment of its capacity



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