NASA's Wildland Fire Management Program

Ana I. Prados
University of Maryland Baltimore County, USA
aprados@umbc.edu

Other Team members: David Green, Joanne Hall, Jessica McCarty, Rob Sohlberg, Amber Soja

8TH INTERNATIONAL WILDLAND FIRE CONFERENCE

NASA Wildland Fire Management Program

Focus on proactive fire management

Risk-based/anticipatory approach vs. reactive

Key Objectives:

1) Assemble Communities of Practice
2) Co-develop knowledge and applications with relevant partners
3) Transition of NASA technology and applied science to organizations that support wildfire management (govt., private sector)

NASA Wildland Fire Management: Current Portfolio

Event perimeter mapping using optical and radar data
Wildfire twins for predicting smoke impacts

Risk Vulnerability prediction
GEDI LIDAR
Active Fire tracking
Multi-hazard disaster awareness

Wildfire stakeholder mapping
Insurance sector landscape analysis
Capacity building for indigenous communities

Low latency wildfire detection
Actionable lidar-based data
Fire event situation awareness

Ecosystem resilience and recovery
Hydrologic risk
Post wildfire ash mapping

Integration of Multi-Satellite Active Fire Data into NASA FIRMS

Datasets:

1) Geostationary: multiplatform near-global coverage; *more timely (within an hour) and frequent (every 15 mins)* observations

2) Landsat-8 and -9 over north America, *higher spatial resolution (30 m) compared to MODIS/VIIRs*

Platform: NASA FIRMS (US/Canada) has a very broad user base (researchers, land managers, land & homeowners, legal professionals, etc.)

Landsat active fire map (red dots) of Mosquito Fire, September 9, 2022
Project team: University of Maryland, NASA, USDA Forest Service, USGS

Probability Burn Indices for the Re-insurance Sector

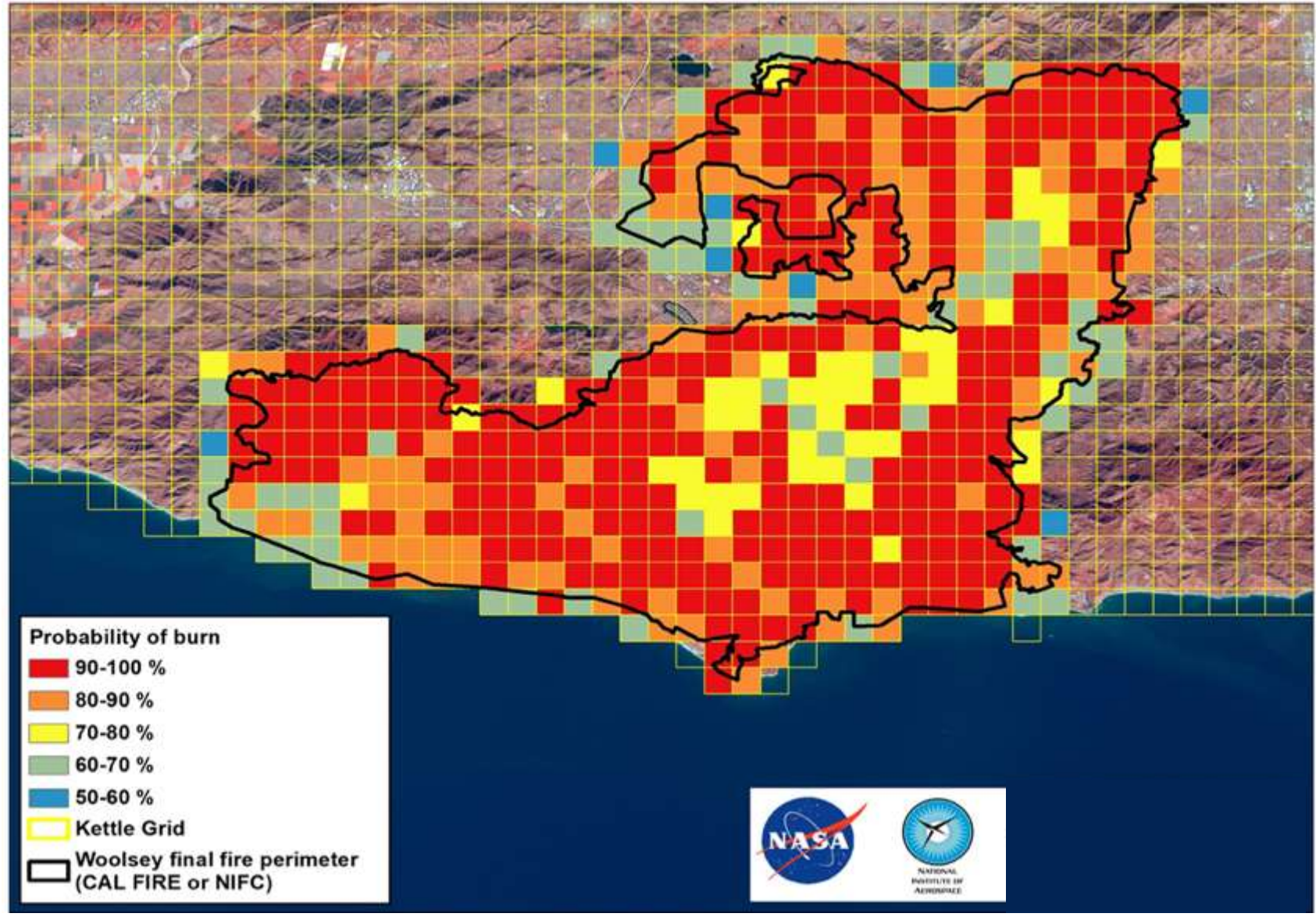
Team: Kettle Limited (reinsurance company), NASA Langley

Use multiple satellite data sources to co-develop a Probability Burn Index

Enables homeowners and businesses to rapidly recuperate losses following fire event; decreases reimbursement time from 1+ years to 2 months.

People can rebuild their communities faster

Product available to the larger reinsurance industry.



Disasters Avoided

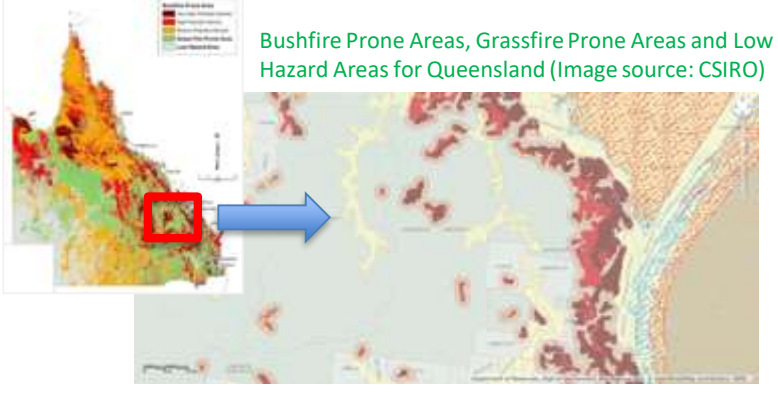
- Case studies of different disaster types (fire, flooding, heat, seismic, etc.) that have been avoided, including through use of Earth observations, supported by open access research background papers. Emphasis on local successes as well as larger (state/national) successes.
- A collation of information about the ethos and approach to avoiding disasters, including links to learning resources.
- Communications about disasters avoided, through various channels (events, media, journals et al).

Example: Avoiding Wildfire Disasters in Australia

- Indigenous knowledge is helping people find appropriate ways to exercise stewardship over fire-prone land.
- Partnerships with indigenous groups maintain protocols, with elders determining where and when controlled burns are put in place.
- Prescribed burns are not the sole solution to reducing fire risk. They are part of a greater whole of living with fire, which includes taking a considered approach to land management.

Technology is also being leveraged as part of the greater whole to avoid fire disasters. CSIRO has developed, and made available online for free, mapping technology for bushfire prone areas in Queensland (to a 25-metre square level of detail) to help people be aware of fire risk and avoid fire disasters.

Right-way fire and using Earth images (Image source: Bush Heritage Australia)



Bushfire Prone Areas, Grassfire Prone Areas and Low Hazard Areas for Queensland (Image source: CSIRO)

Actionable Fire Science Information (AFSI) Hub Version 2.0

For fire practitioners, decision-makers and researchers

- Calendar of Community Events
- Case Studies and Story Maps
- Information and links to data products and platforms: (NIFC, NOAA, CAL FIRE, FIRMS, etc.)
- Articles on accomplishments
- Dedicated program area with info on currently funded projects

International Collaborations

Focus: Latin America, Spain, Portugal

Identify governance practices that facilitate the use of remote sensing for proactive fire management

Exchange knowledge on innovative uses of applied fire science

Co- develop science-driven fire management best practices

Conduct Stakeholder mapping

International Association of WILDLAND FIRE

fireEUrisk

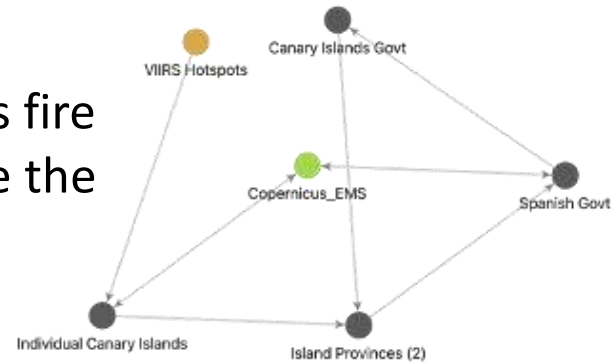
GOFC-GOLD
Global Observations of Forest Cover and Land Use Dynamics

Wildfire Stakeholder Mapping and Analysis

Stakeholder: individuals or organizations who can affect or are affected by a phenomenon (such as a particularly technology)

Why?

- To understand stakeholder network weaknesses and identify areas than need to be prioritized in order to maximize the benefit of a technology
- Foundation for knowledge mapping: who knows what and how does fire related knowledge flow between stakeholder categories? Where are the knowledge gaps?



Spain/Portugal (preliminary analysis in progress, satellite data usage context) - poster presentation tomorrow, Stakeholder Session, 11:30am)

In the U.S – Fire *relational stakeholder database* in progress (USGS Civil Applications Committee, led by Conversa Corps of behalf of the Gordon and Betty Moore Foundation; NASA is a partner)

Contact

Ana Prados

aprados@umbc.edu

linkedin.com/in/anaprados