Mentimeter

The session will begin shortly.

Thank you for your participation.

Welcome from Coalitions & Collaboratives, Inc.

- Carol Ekarius

Welcome to 2020 After the Flames Virtual Science Symposium

Mentimeter

Planning and Organizing Committee

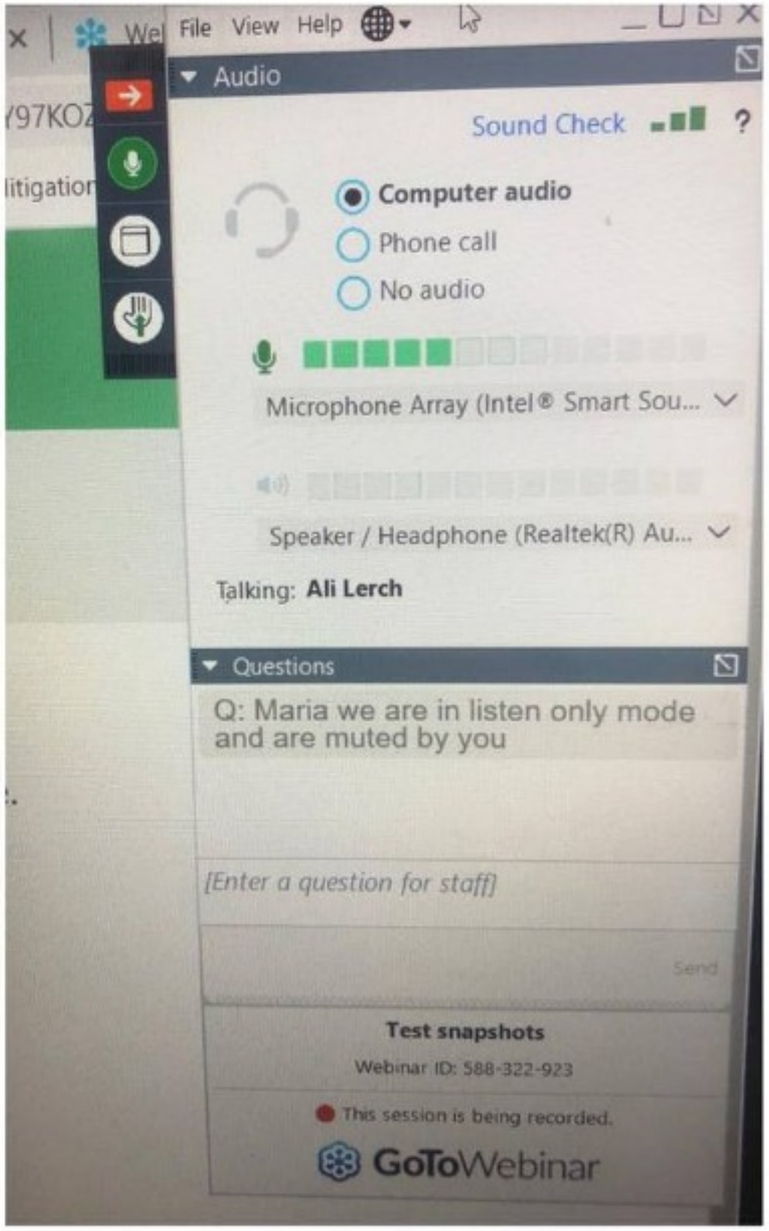
Katherine Rowden, NOAA/NWS
Nina Oakley, UCSD/SIO/CW3E
Jason Kean, USGS
Cara Farr, USFS
Richard Schwab, NPS
Anne Bradley, TNC
Jane Mannon, COCO

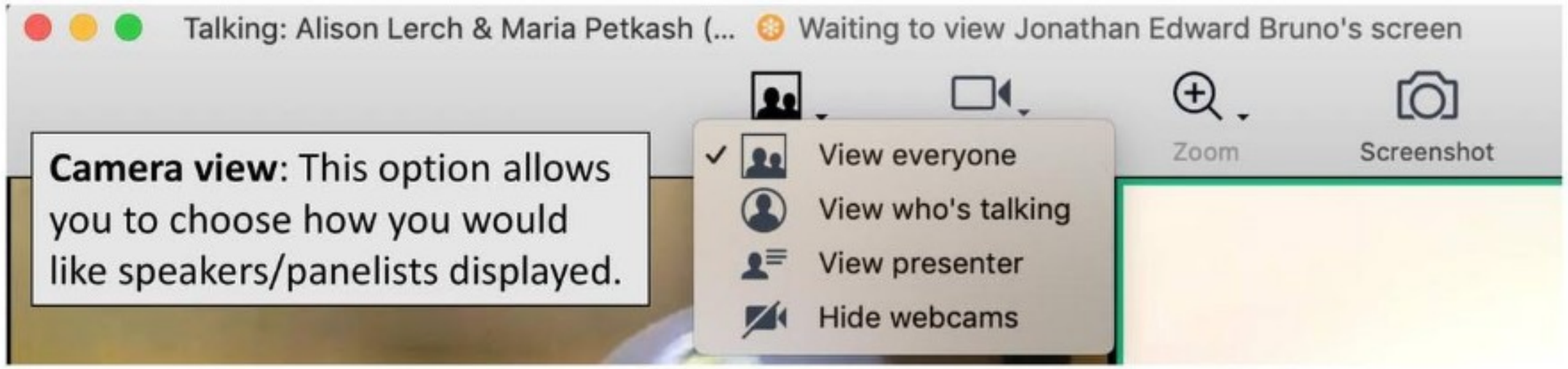
Goals of this symposium:

- Assess science needs and barriers to communication of science
- Determine communication strategies for post-fire science
- Develop pathways forward for working together in post-fire response

GoToWebinar Interface

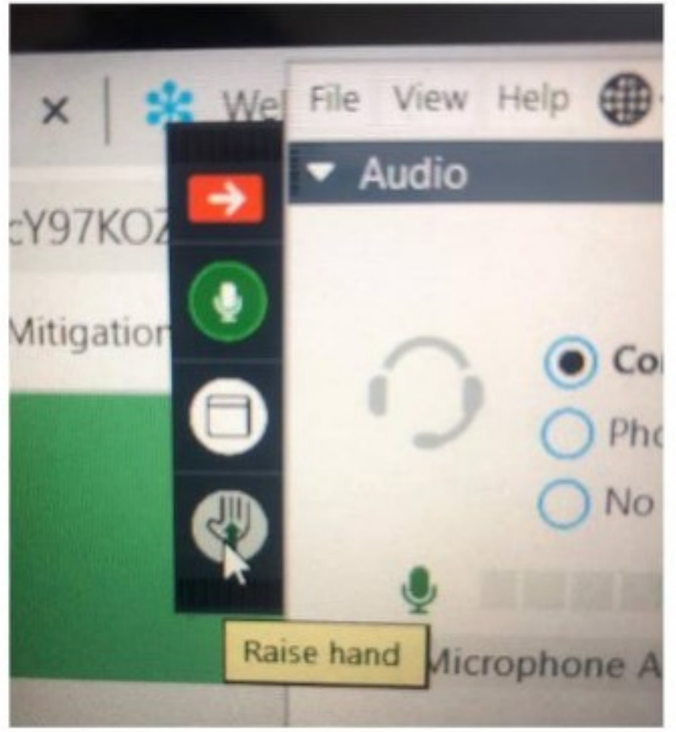
Mentimeter





Camera view: This option allows you to choose how you would like speakers/panelists displayed.

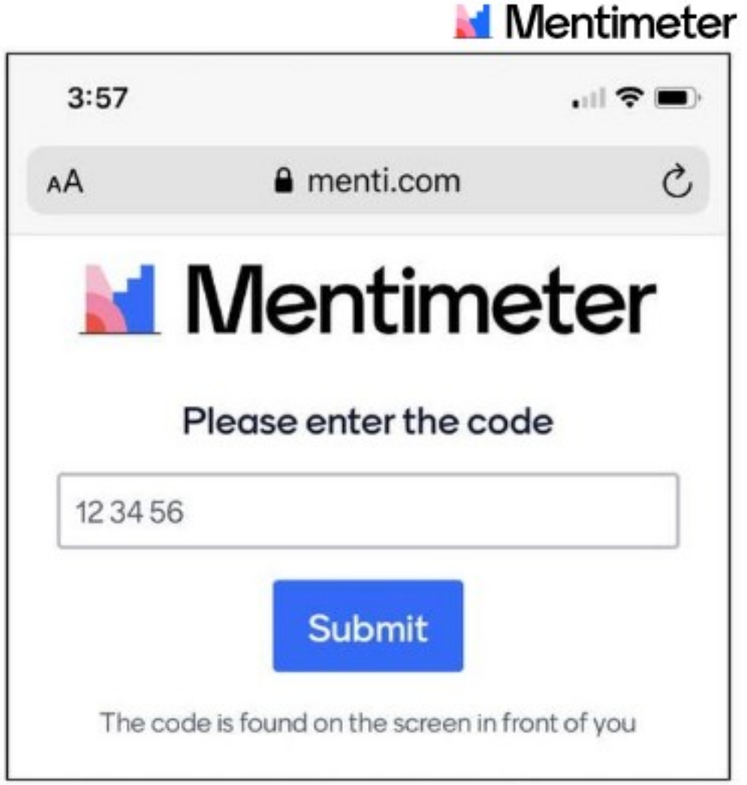
Raise hand: If you need attention from tech support, can raise hand.



Question Area: Questions only goes to hosts/tech support. Use this to ask for tech help or other conference support.

A few things before we begin…

- Your mic will be **muted** and camera **turned off** throughout conference.
- If you have any **technical issues** please **enter them in chat** so our tech team can assist you.
- We will be using Mentimeter for polling and Q&A. We recommend having a **cell phone or browser window handy** for this.



- When prompted by moderator, all you need to do to participate is go to menti.com in browser and enter code! Click **submit** to answer questions.
- **Chat:** GoToWebinar chat only goes to organizers/presenters. If you would like to make a comment in chat please do, we will do our best to incorporate it in the conversation.

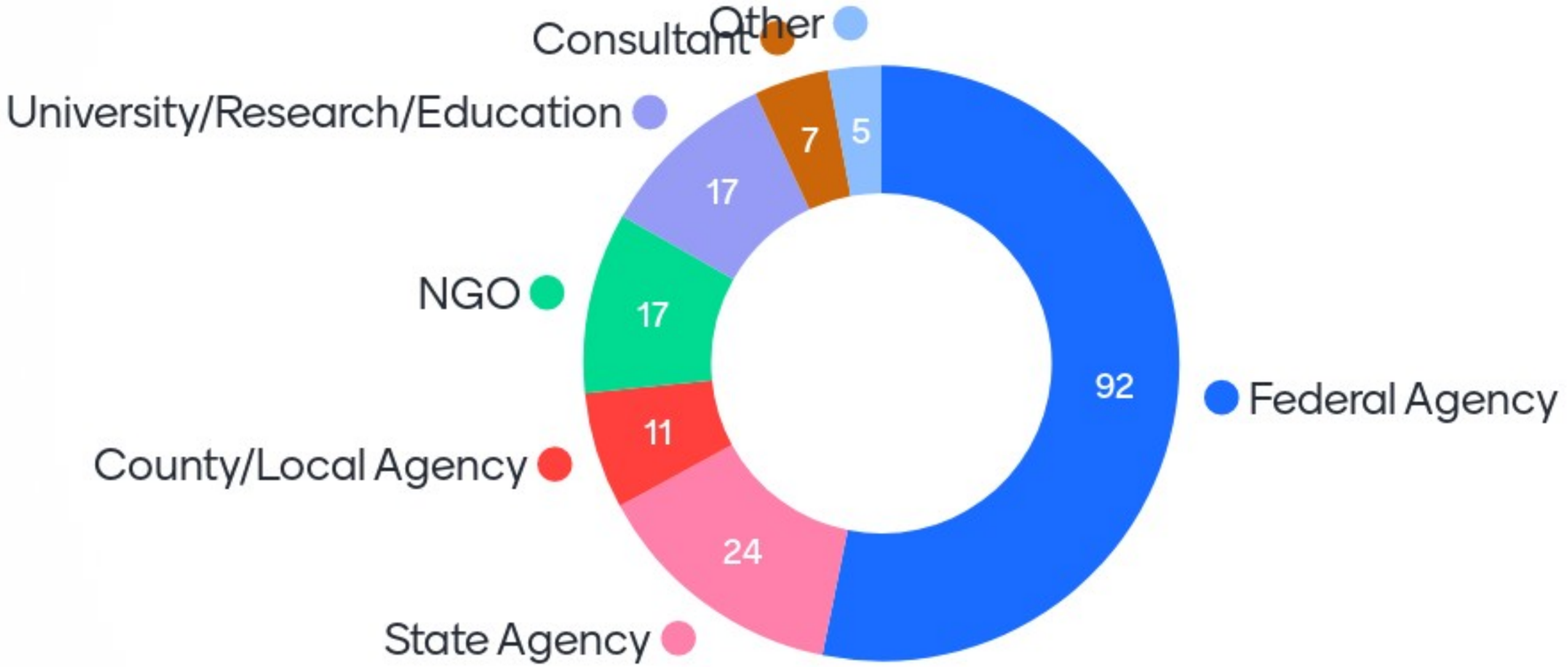
Panel Discussions, Q&A, and Polling

Mentimeter

- All **polling is anonymous**. For open-ended questions, respond freely but be **conscientious and professional**.
- **Panel member bios** are available at: https://aftertheflames.com/science-speakers/, link posted in the chat box.
- Conference summary and attendee list will be sent to all in weeks following conference.
- We have many attendees and fixed time for questions. We will work to have unanswered questions addressed in conference report, or reach out to speaker directly.

Before we start, let's get to know each other a bit through polling!

What sector best represents you?



173

What field best represents your expertise?

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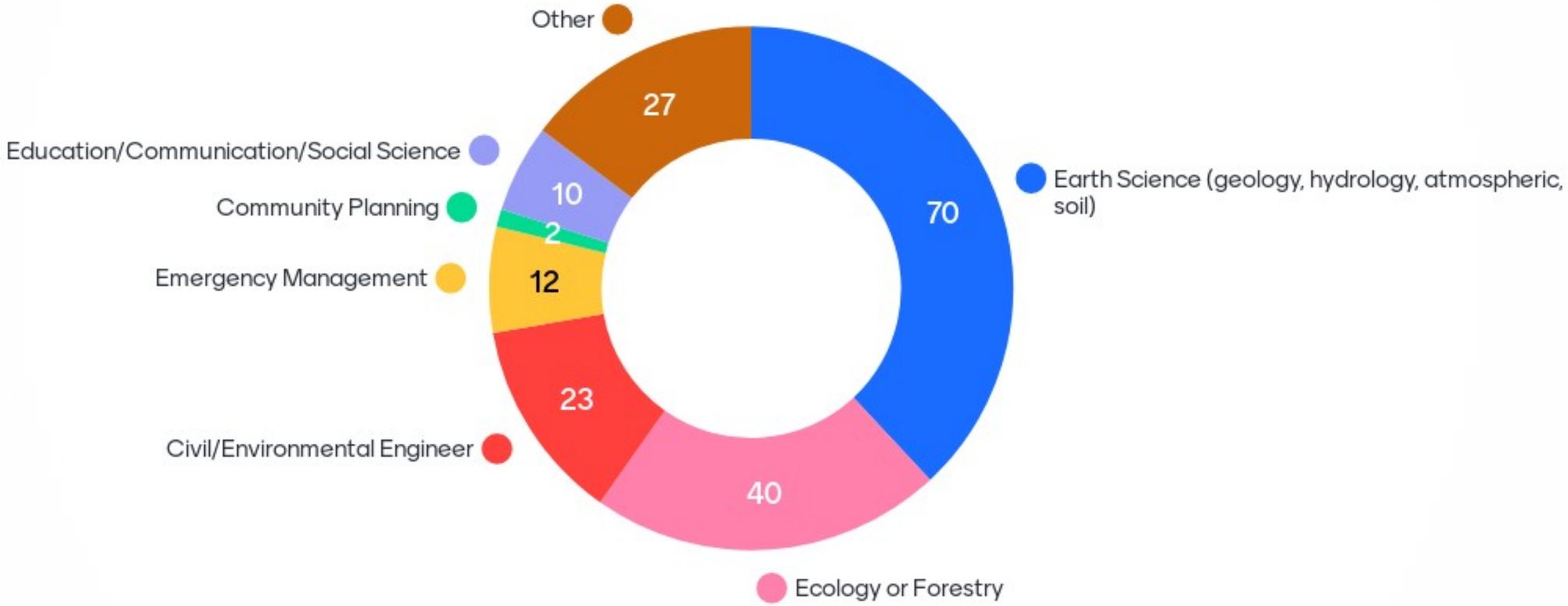
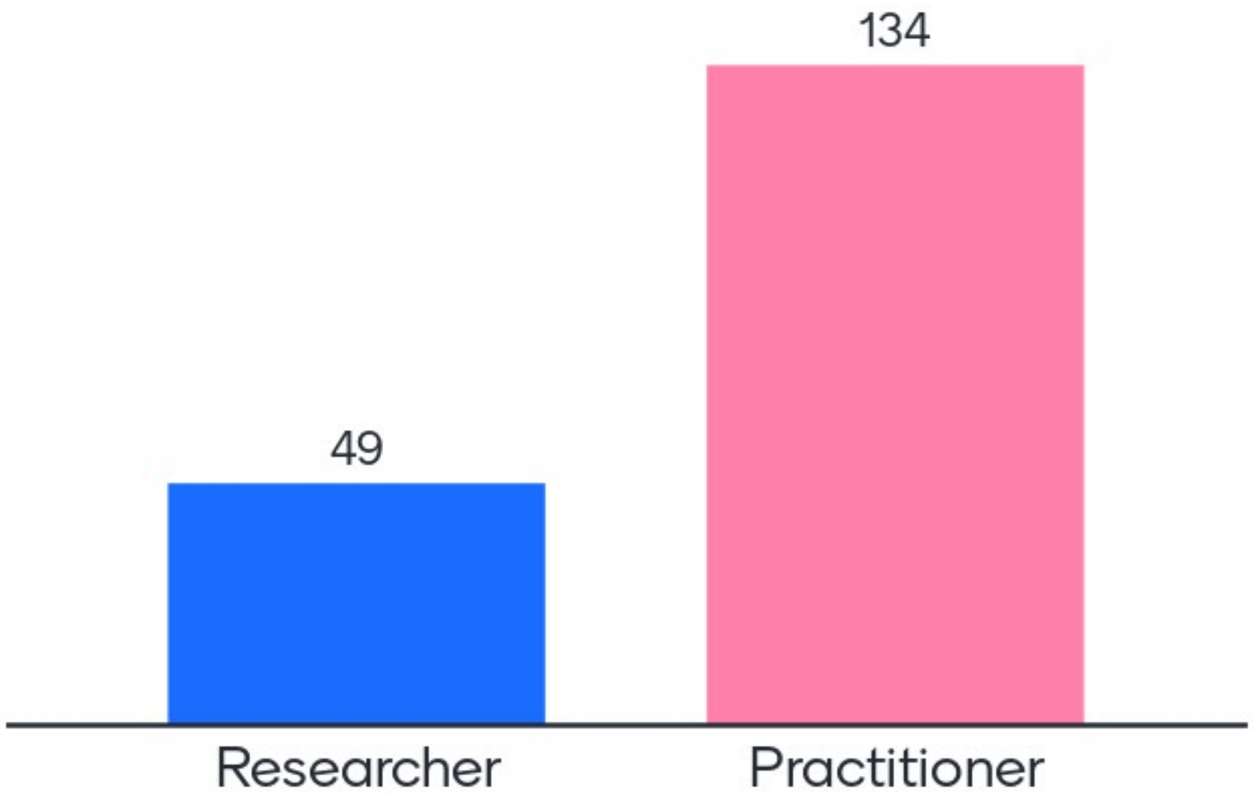


184

Do you consider yourself a researcher (creator) or practitioner (user) of post-fire science?



183

How I feel about my or my organization's preparedness for the upcoming fire/post-fire season:

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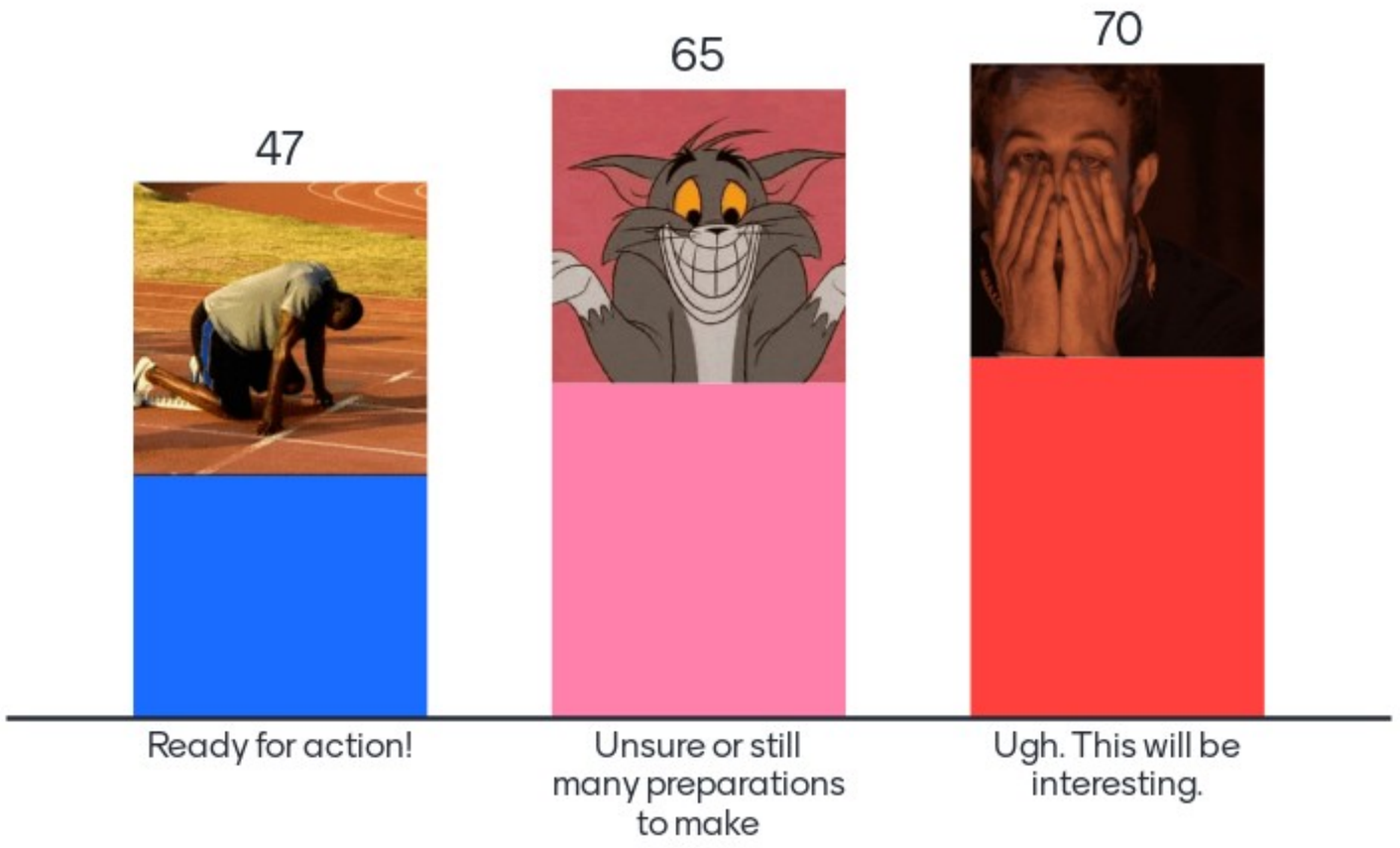
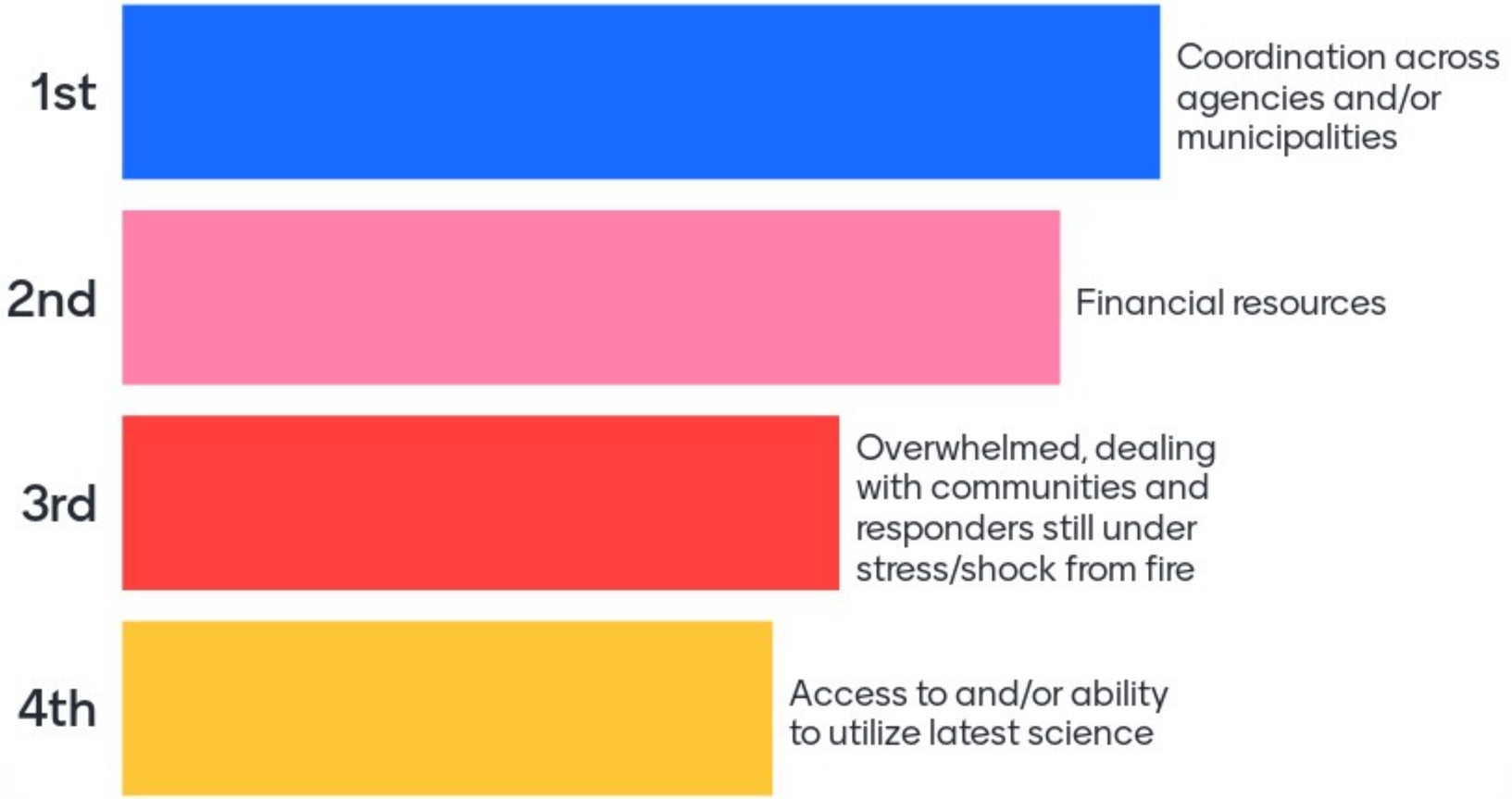


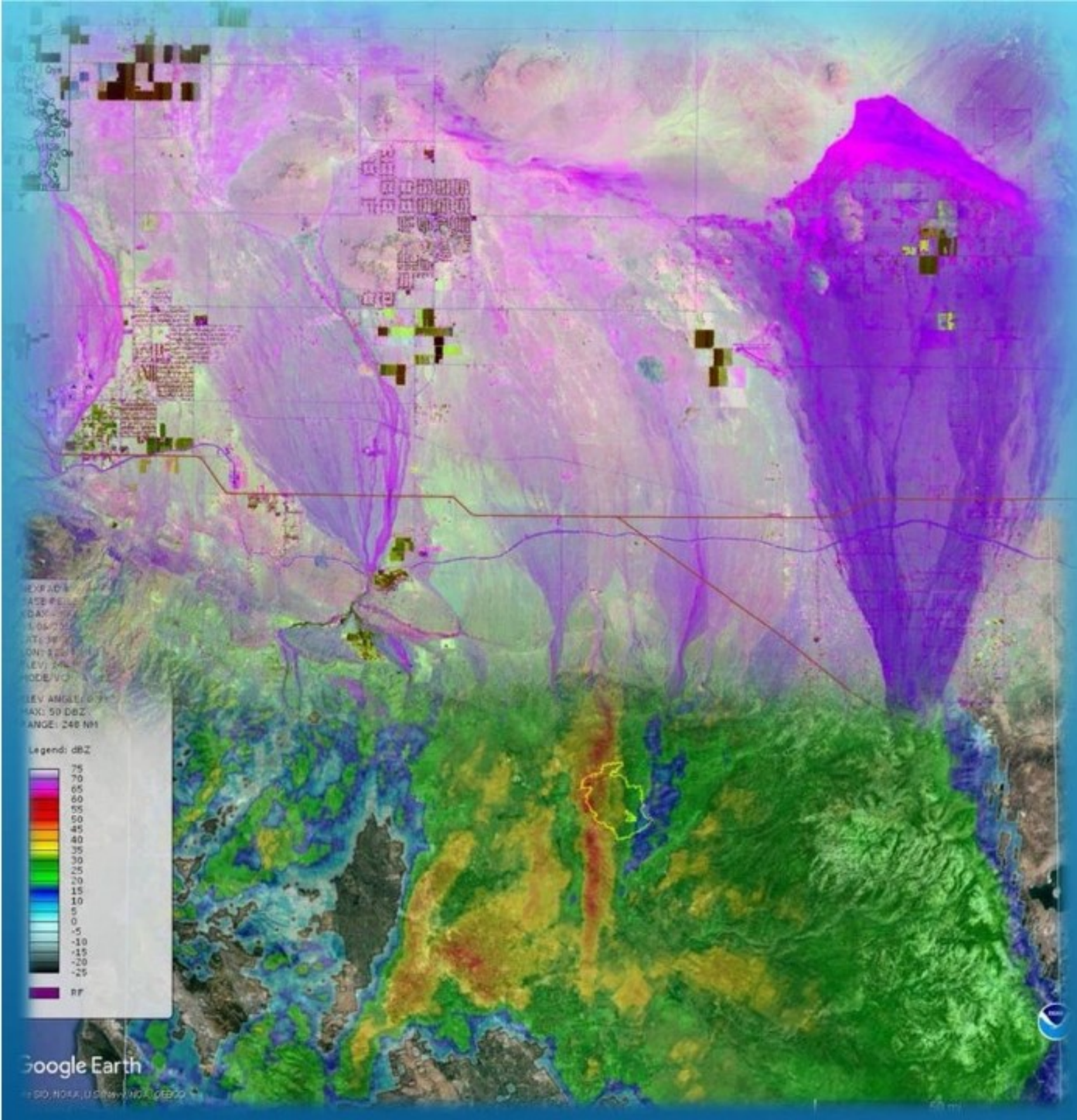
182

Rank these items from greatest to least as barriers to your best post-fire response:



Jeremy Lancaster, California Geological Survey

- How Far We've Come in Post-Fire Science
- REMINDER: Questions after presentation through Mentimeter
- Use chat for technical issues



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POST-WILDFIRE SCIENCE: HOW FAR WE HAVE COME

JEREMY LANCASTER
CALIFORNIA GEOLOGICAL SURVEY
GEOLOGIC AND LANDSLIDE MAPPING PROGRAM MANAGER

AFTER THE FLAMES CONFERENCE - VIRTUAL
19 MAY 2020

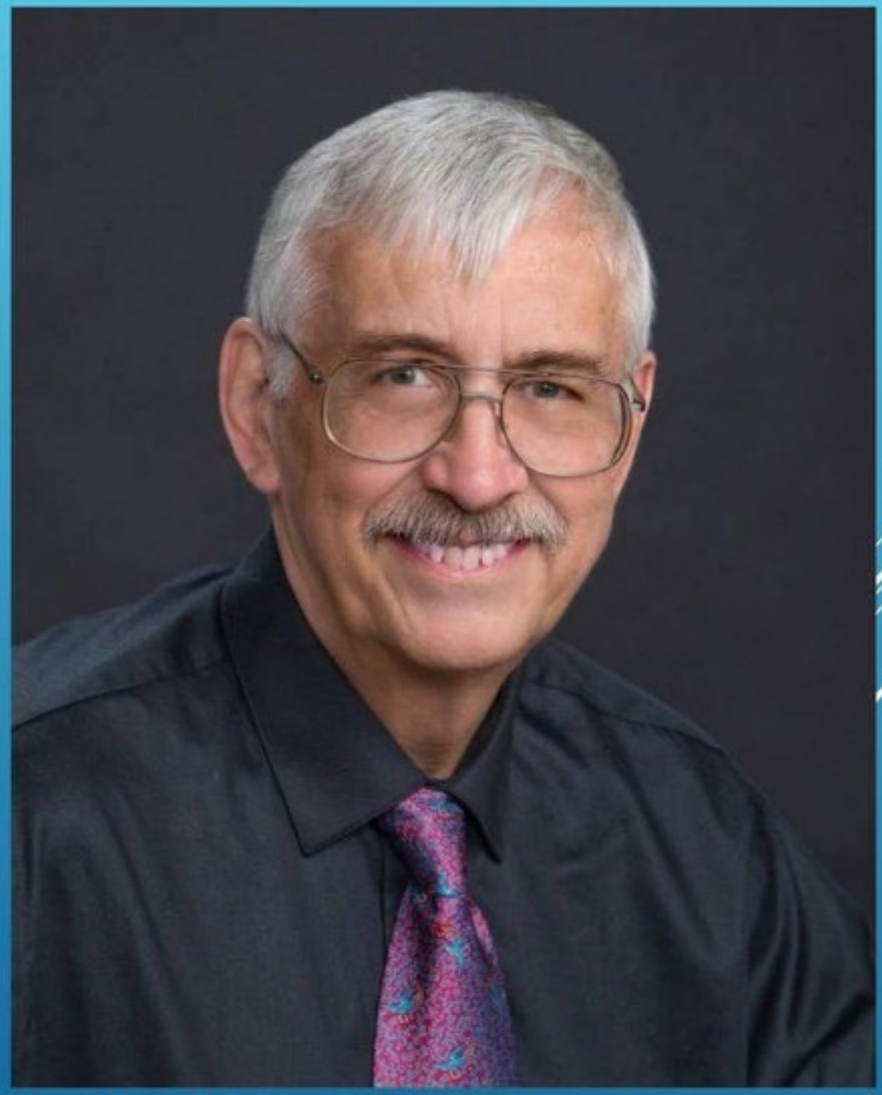
California Department of Conservation
California Geological Survey

Honoring Jerome V. DeGraff (1945-2020) USFS, CSUF

Jerry had a wide impact as an educator and an Engineering Geologist

- Authored or co-authored 100 or more contributions to books, proceedings, and peer reviewed journals.
- Transportation Research Board's Special Report 247 - Landslides: Investigation and Mitigation
- His publications have been cited more than 1,700 times

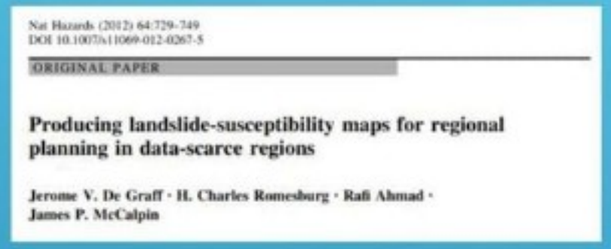
- He co-authored the textbook Principles of Engineering Geology, which earned the GSA Engineering Geology Division's E.B. Burwell Jr. Award and AEG's Claire P. Holdredge Award.
- GSA Engineering Geology Division - Distinguished Practice Award, and AEG and GSA
- 2016-17 Richard H. Jahns Distinguished Lecturer position — he presented 103 lectures in 26 states and 3 Canadian provinces to about 3,250 students and professionals.



Sandy, Mark and Nick, and grandson Liam

Honoring Jerome V. DeGraff (1945-2020)

Mentimeter

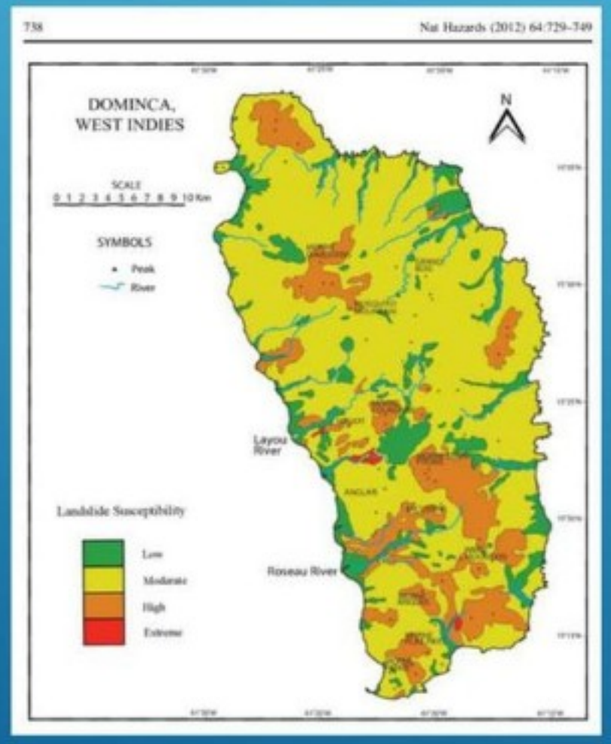


Nat Hazards (2012) 64:729–749
DOI 10.1007/s11069-012-0267-5

ORIGINAL PAPER

Producing landslide-susceptibility maps for regional planning in data-scarce regions

Jerome V. De Graff · H. Charles Romesburg · Rafi Ahmad · James P. McCalpin



738 Nat Hazards (2012) 64:729–749

DOMINCA, WEST INDIES

N

SCALE 0 1 2 3 4 5 6 7 8 9 10 Km

SYMBOLS

Peak

River

Layou River

Roseau River

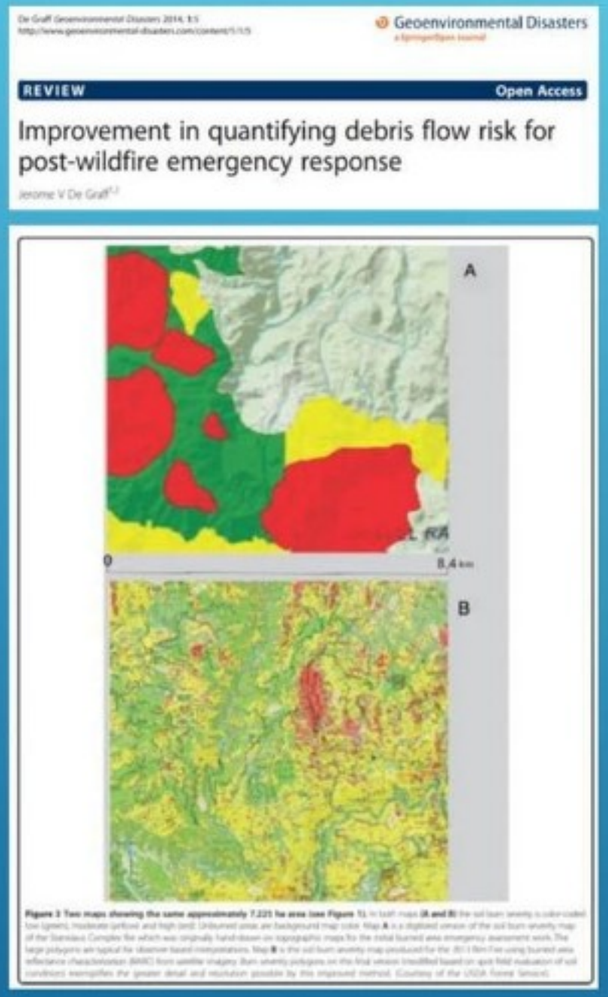
Landslide Susceptibility

Low

Moderate

High

Extreme



De Graff Geoenvironmental Disasters 2014, 1:5
http://www.geoenvironmental-disasters.com/content/1/1/5

Geoenvironmental Disasters
a SpringerOpen Journal

REVIEW Open Access

Improvement in quantifying debris flow risk for post-wildfire emergency response

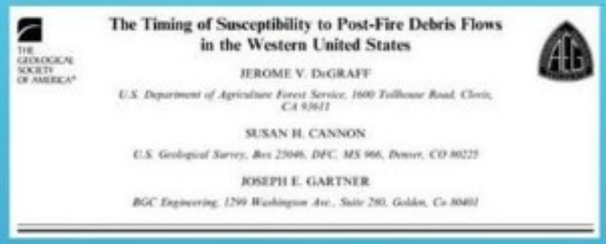
Jerome V De Graff[1,2]

A

0 8.4 km

B

Figure 3 Two maps showing the same approximately 7,221 ha area (see Figure 1). In both maps (A and B) the soil burn severity is color-coded: low (green), moderate (yellow) and high (red). Unburned areas are background map color. Map A is a digitized version of the soil burn severity map of the Staniaus Complex fire which was originally hand-drawn on topographic maps for the initial burned area emergency assessment work. The large polygons are typical fire observer-based interpretations. Map B is the soil burn severity map produced for the 30 × 30 m Fire using burned area reflectance characterization (BARC) from satellite imagery. Burn severity polygons on this final version (modified based on post-fire) evaluation of soil conditions exemplifies the greater detail and resolution possible by this improved method. Courtesy of the USDA Forest Service).



THE GEOLOGICAL SOCIETY OF AMERICA

The Timing of Susceptibility to Post-Fire Debris Flows in the Western United States

JEROME V. DeGRAFF

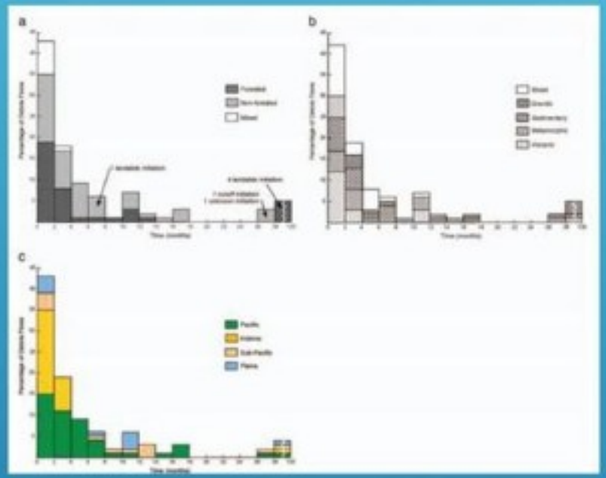
U.S. Department of Agriculture Forest Service, 1600 Tollhouse Road, Clovis, CA 93611

SUSAN H. CANNON

U.S. Geological Survey, Box 25046, DFC, MS 966, Denver, CO 80225

JOSEPH E. GARTNER

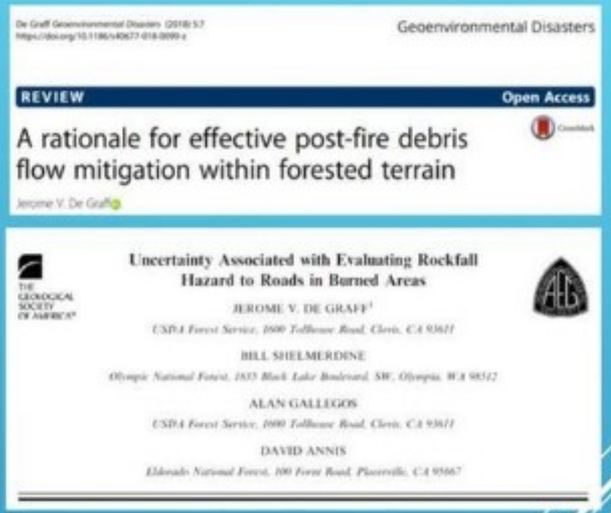
BGC Engineering, 1299 Washington Ave., Suite 210, Golden, Co 80401



a

b

c



De Graff Geoenvironmental Disasters (2018) 5:7
https://doi.org/10.1186/s40677-018-0099-z

Geoenvironmental Disasters

REVIEW Open Access

A rationale for effective post-fire debris flow mitigation within forested terrain

Jerome V. De Graff

THE GEOLOGICAL SOCIETY OF AMERICA

Uncertainty Associated with Evaluating Rockfall Hazard to Roads in Burned Areas

JEROME V. DE GRAFF[1]

USDA Forest Service, 1600 Tollhouse Road, Clovis, CA 93611

BILL SHELMERDINE

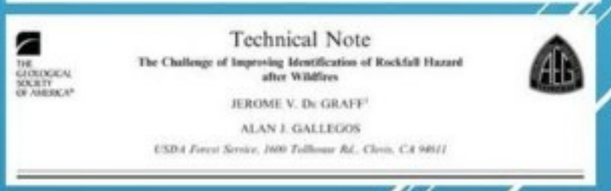
Olympic National Forest, 1835 Black Lake Boulevard, SW, Olympia, WA 98512

ALAN GALLEGOS

USDA Forest Service, 1600 Tollhouse Road, Clovis, CA 93611

DAVID ANNIS

Eldorado National Forest, 100 Forni Road, Placerville, CA 95667



THE GEOLOGICAL SOCIETY OF AMERICA

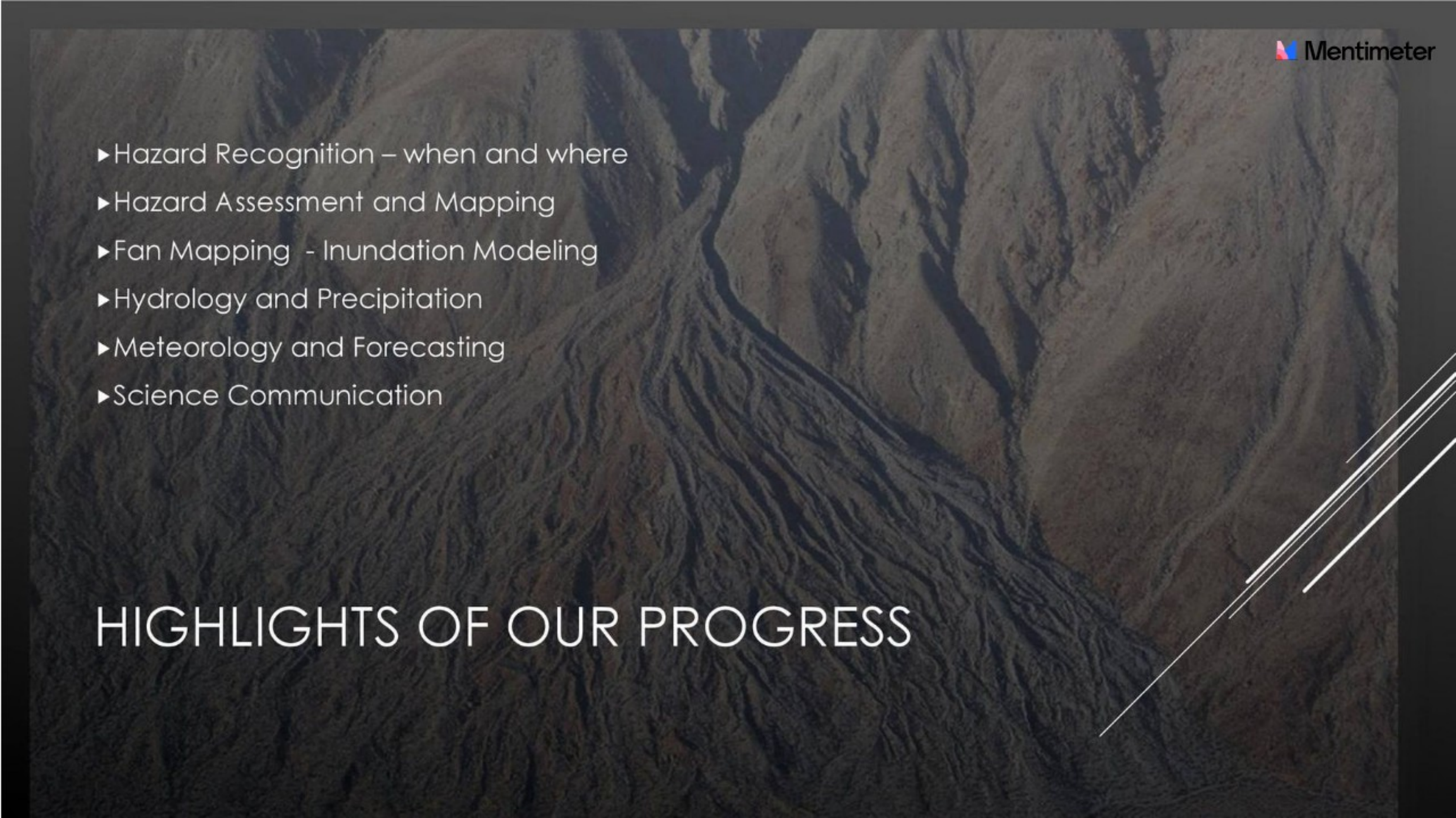
Technical Note

The Challenge of Improving Identification of Rockfall Hazard after Wildfires

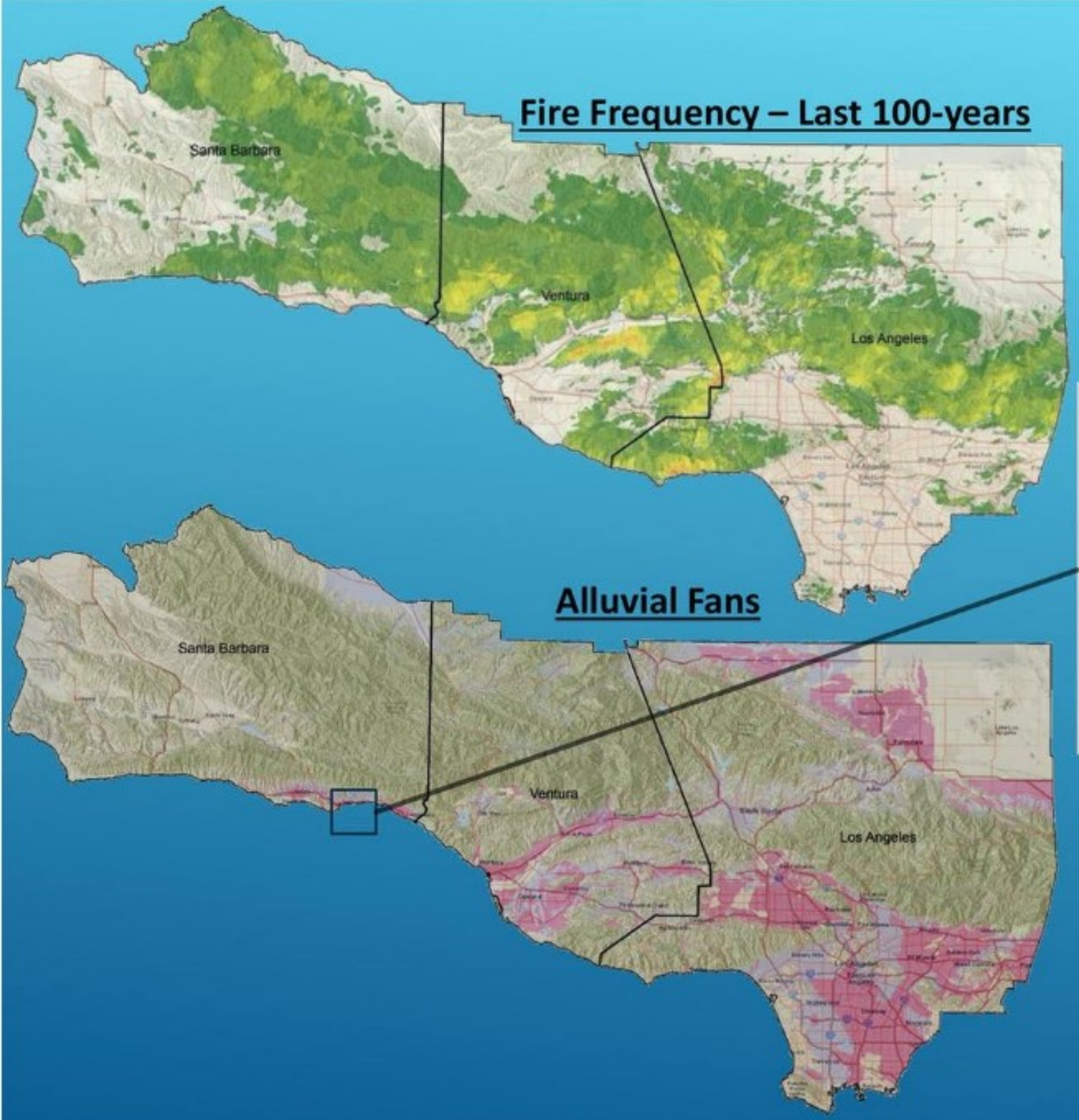
JEROME V. De GRAFF[1]

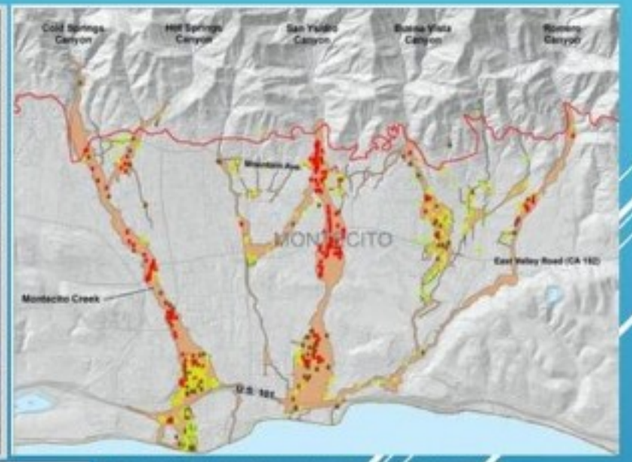
ALAN J. GALLEGOS

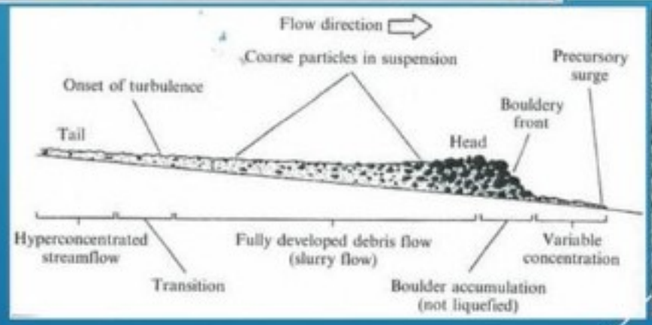
USDA Forest Service, 1600 Tollhouse Rd., Clovis, CA 94611


Mentimeter
Hazard Recognition – when and where
Hazard Assessment and Mapping
Fan Mapping - Inundation Modeling
Hydrology and Precipitation
Meteorology and Forecasting
Science Communication
HIGHLIGHTS OF OUR PROGRESS

Fans, Fire History, Debris Flows



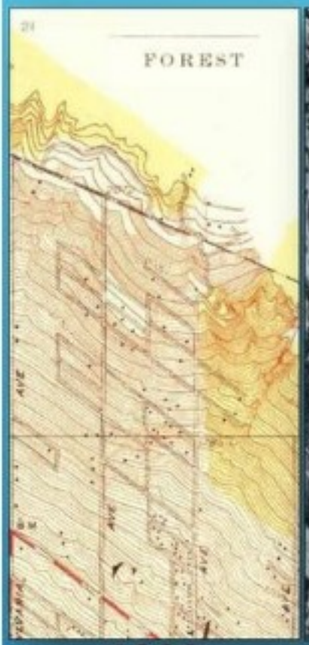




Urbanization of Alluvial Fans

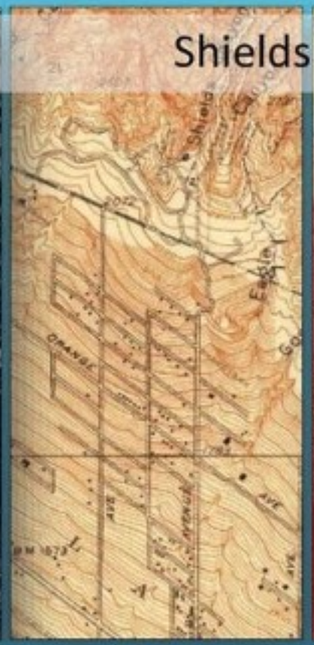
Mentimeter

Shields Canyon Fan, La Cresenta Valley, CA

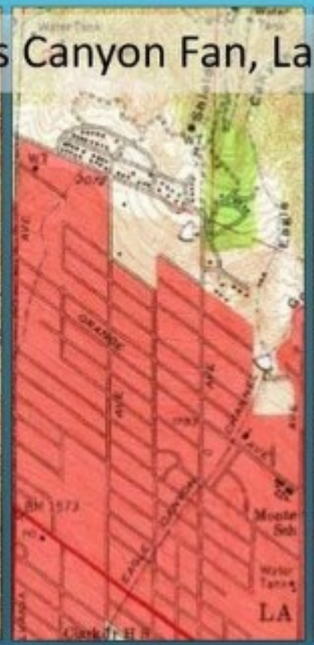


1928

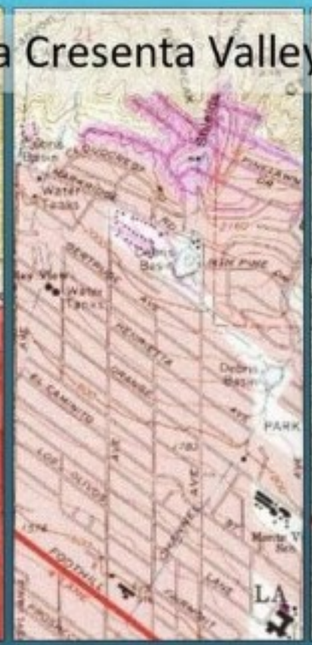
1934



1939



1953



1966

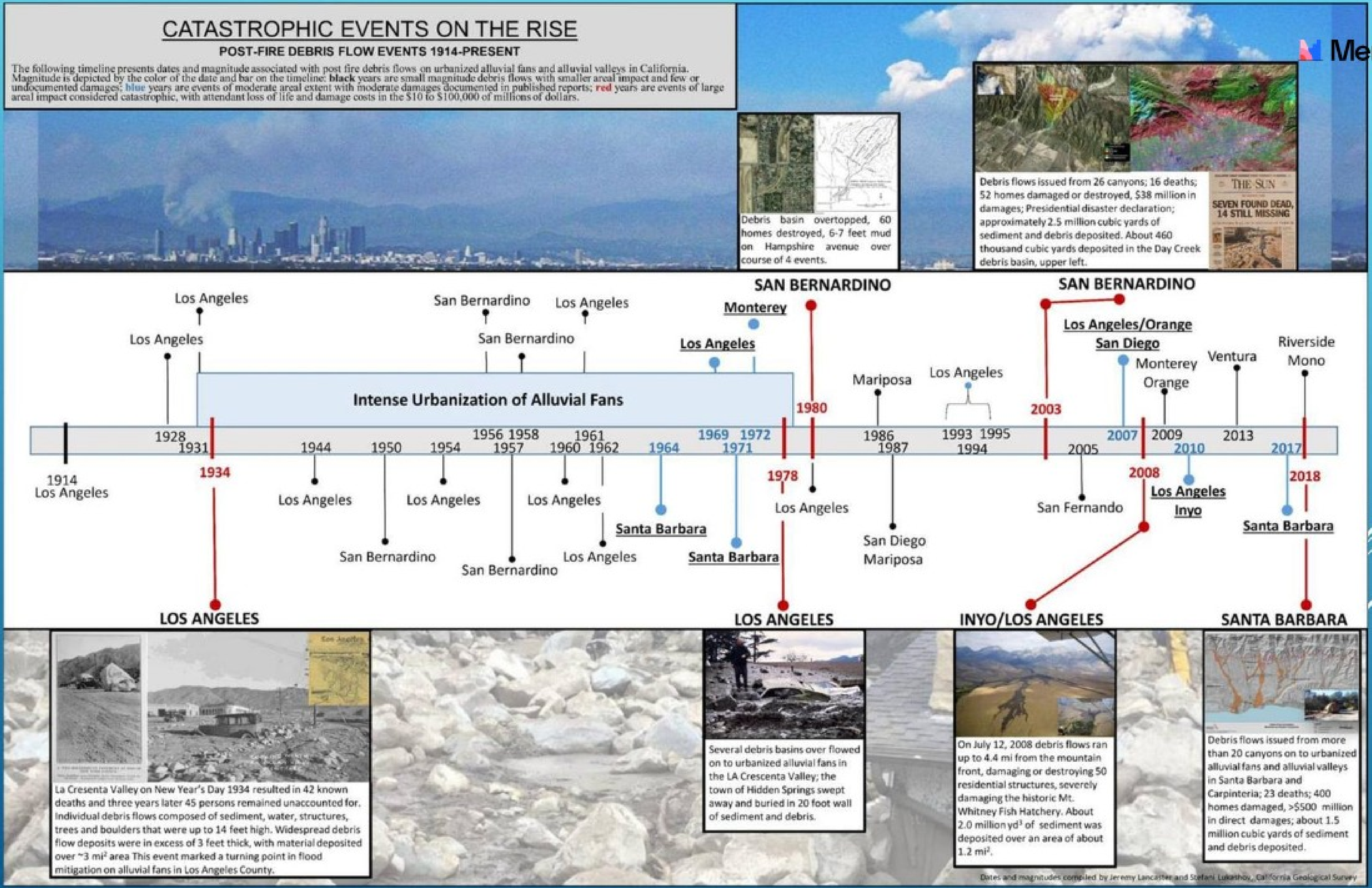
1995

Google Earth 2009

162 Debris Basins

Haines DB

Mulally DB Overtopped

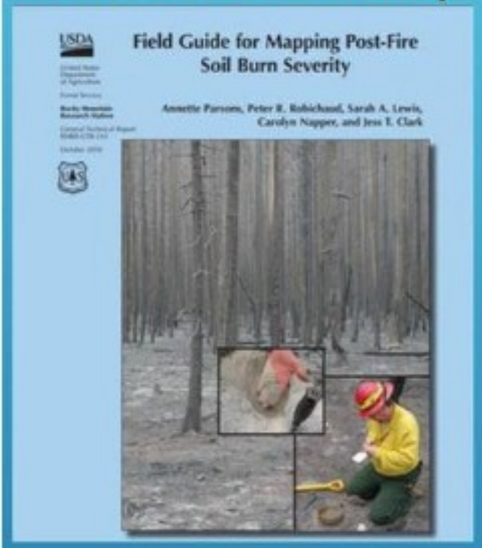


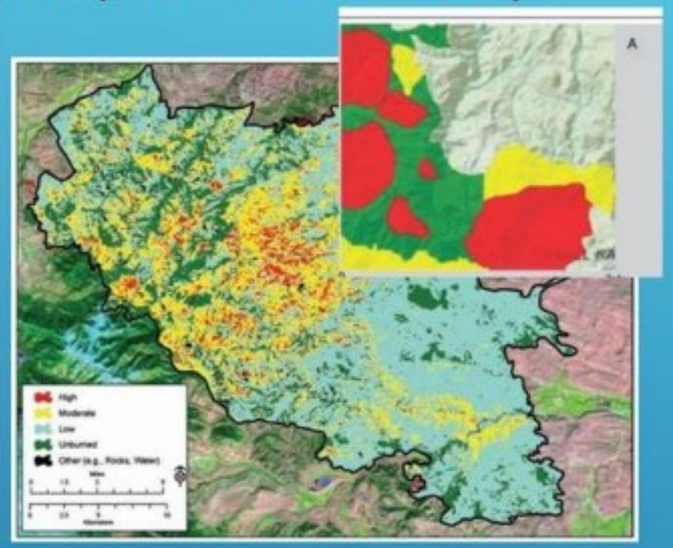
CATASTROPHIC EVENTS ON THE RISE
POST-FIRE DEBRIS FLOW EVENTS 1914-PRESENT
The following timeline presents dates and magnitude associated with post fire debris flows on urbanized alluvial fans and alluvial valleys in California. Magnitude is depicted by the color of the date and bar on the timeline: black years are small magnitude debris flows with smaller areal impact and few or undocumented damages; blue years are events of moderate areal extent with moderate damages documented in published reports; red years are events of large areal impact considered catastrophic, with attendant loss of life and damage costs in the $10 to $100,000 of millions of dollars.
Debris basin overtopped, 60 homes destroyed, 6-7 feet mud on Hampshire avenue over course of 4 events.
Debris flows issued from 26 canyons; 16 deaths; 52 homes damaged or destroyed, $38 million in damages; Presidential disaster declaration; approximately 2.5 million cubic yards of sediment and debris deposited. About 460 thousand cubic yards deposited in the Day Creek debris basin, upper left.
THE SUN
SEVEN FOUND DEAD, 14 STILL MISSING
Intense Urbanization of Alluvial Fans
1914 Los Angeles
1928 Los Angeles
1931 Los Angeles
1934 LOS ANGELES
1944 Los Angeles
1950 San Bernardino
1954 Los Angeles
1956 San Bernardino
1957 San Bernardino
1958 San Bernardino
1960 Los Angeles
1961 Los Angeles
1962 Los Angeles
1964 Santa Barbara
1969 Los Angeles
1971 Santa Barbara
1972 Monterey
1978 LOS ANGELES
1980 SAN BERNARDINO
1980 Los Angeles
1986 Mariposa
1987 San Diego Mariposa
1993 1995 Los Angeles
1994
2003 SAN BERNARDINO
2005 San Fernando
2007 Los Angeles/Orange San Diego
2008 INYO/LOS ANGELES
2009 Monterey Orange
2010 Los Angeles Inyo
2013 Ventura
2017 Santa Barbara
2018 Riverside Mono
2018 SANTA BARBARA
La Cresenta Valley on New Year's Day 1934 resulted in 42 known deaths and three years later 45 persons remained unaccounted for. Individual debris flows composed of sediment, water, structures, trees and boulders that were up to 14 feet high. Widespread debris flow deposits were in excess of 3 feet thick, with material deposited over ~3 mi² area This event marked a turning point in flood mitigation on alluvial fans in Los Angeles County.
Several debris basins over flowed on to urbanized alluvial fans in the LA Crescenta Valley; the town of Hidden Springs swept away and buried in 20 foot wall of sediment and debris.
On July 12, 2008 debris flows ran up to 4.4 mi from the mountain front, damaging or destroying 50 residential structures, severely damaging the historic Mt. Whitney Fish Hatchery. About 2.0 million yd³ of sediment was deposited over an area of about 1.2 mi².
Debris flows issued from more than 20 canyons on to urbanized alluvial fans and alluvial valleys in Santa Barbara and Carpinteria; 23 deaths; 400 homes damaged, >$500 million in direct damages; about 1.5 million cubic yards of sediment and debris deposited.
Dates and magnitudes compiled by Jeremy Lancaster and Stefani Lukashov, California Geological Survey

DF Hazard Assessment and Mapping

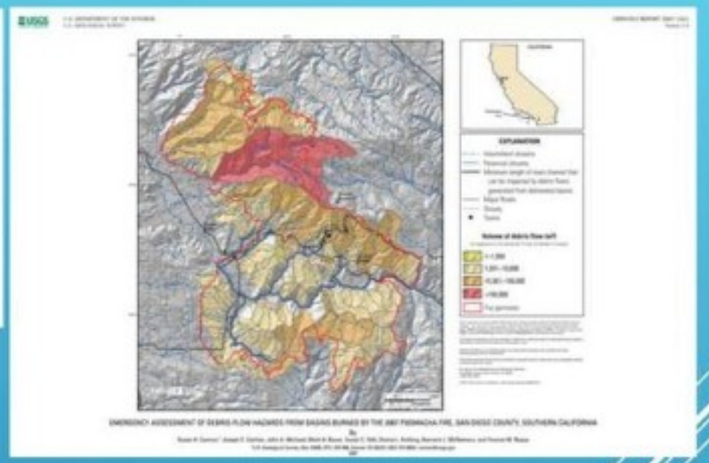
Mentimeter

Soil Burn Severity Early Years and Today

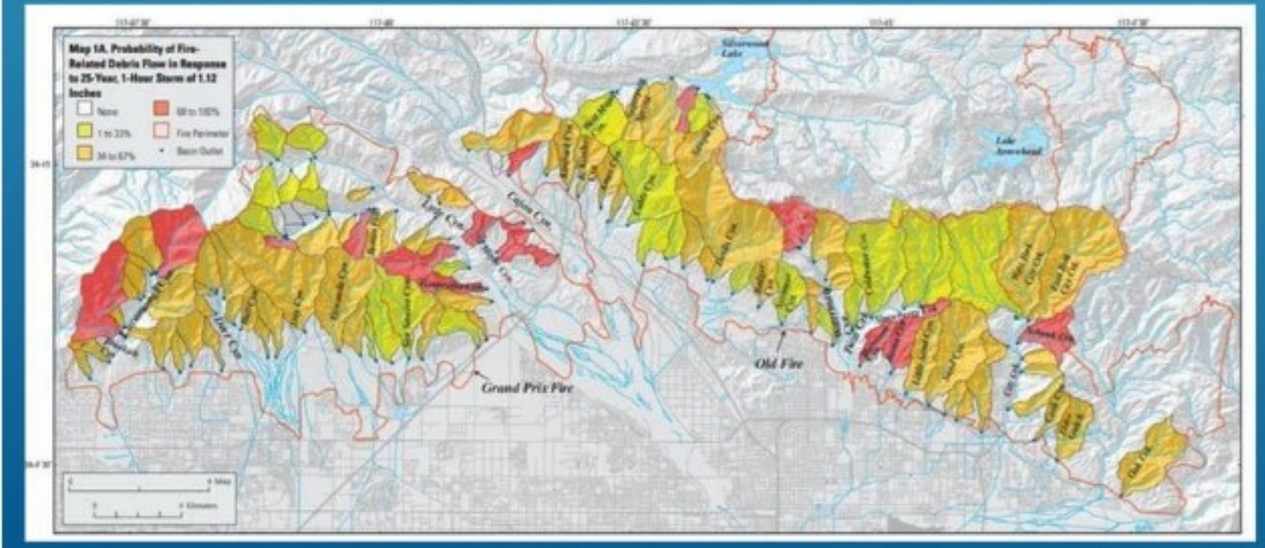




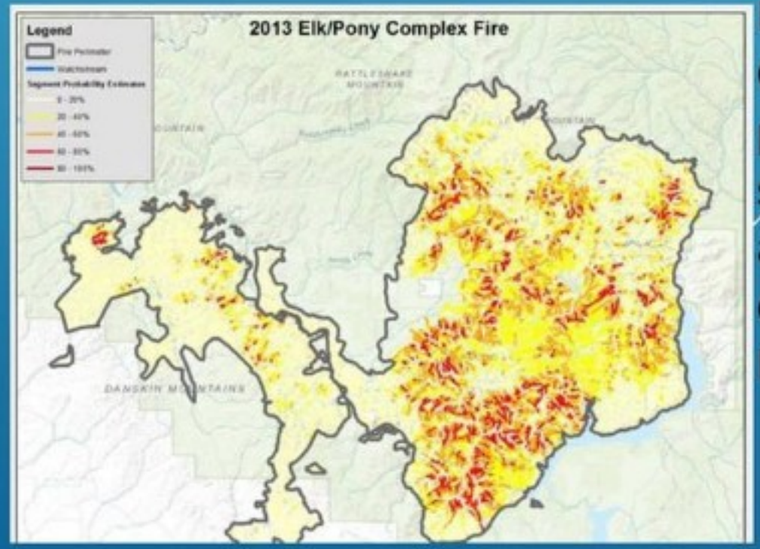
2007: Gartner's Volume Model used in Poomacha Fire



2003: Cannon - Grand Prix Old Fires



2013: USGS Post-Wildfire DF Hazard Mapping Goes Online



Refinements Include: Continuous parameterization, segment probability and volume, different design storms, Database download

DF Hazard Assessment and Mapping

2017: Staley – Inversion Model

Geomorphology 278 (2017) 149–162

Contents lists available at ScienceDirect

Geomorphology

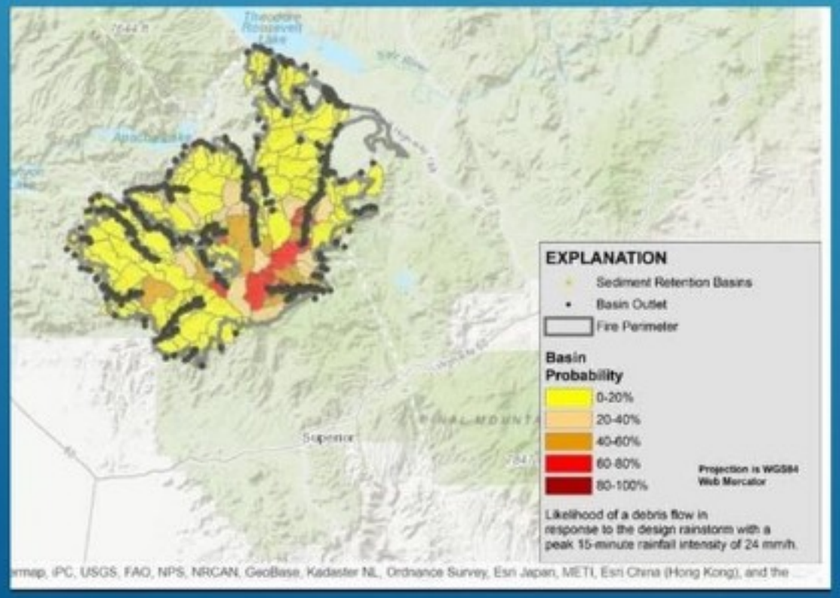
journal homepage: www.elsevier.com/locate/geomorph

Prediction of spatially explicit rainfall intensity–duration thresholds for post-fire debris-flow generation in the western United States

Dennis M. Staley [a,*], Jacquelyn A. Negri [a], Jason W. Kean [a], Jayme L. Laber [b], Anne C. Tillery [c], Ann M. Youberg [d]

[a] U.S. Geological Survey, Golden, CO, USA
[b] National Weather Service, Los Angeles – Oxnard, CA, USA
[c] U.S. Geological Survey, Albuquerque, NM, USA
[d] Arizona Geological Survey, Tucson, AZ, USA

2019: USGS – Woodbury Fire, AZ



2008: Youberg - Pre-Fire Hazard Mapping

OPEN-FILE REPORT OFR-08-08

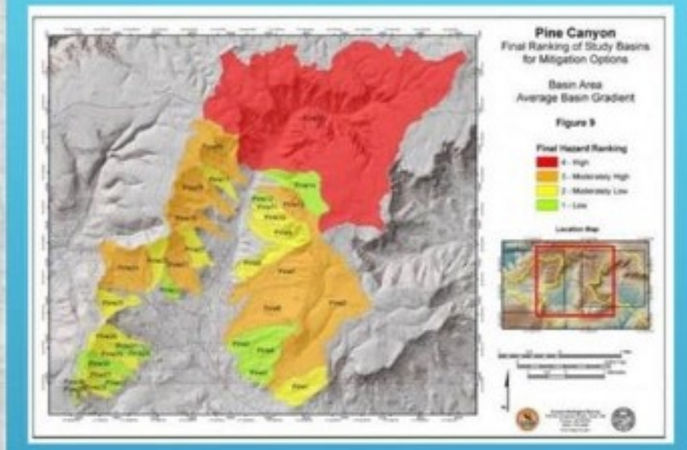
Arizona Geological Survey

www.azgs.az.gov

DELINEATING POST-WILDFIRE DEBRIS FLOW HAZARDS FOR PRE-FIRE MITIGATION, PINE AND STRAWBERRY, ARIZONA A FEMA 5% INITIATIVE STUDY

Ann Youberg

June 30, 2008



2019: Staley Pre-Fire Hazard Mapping

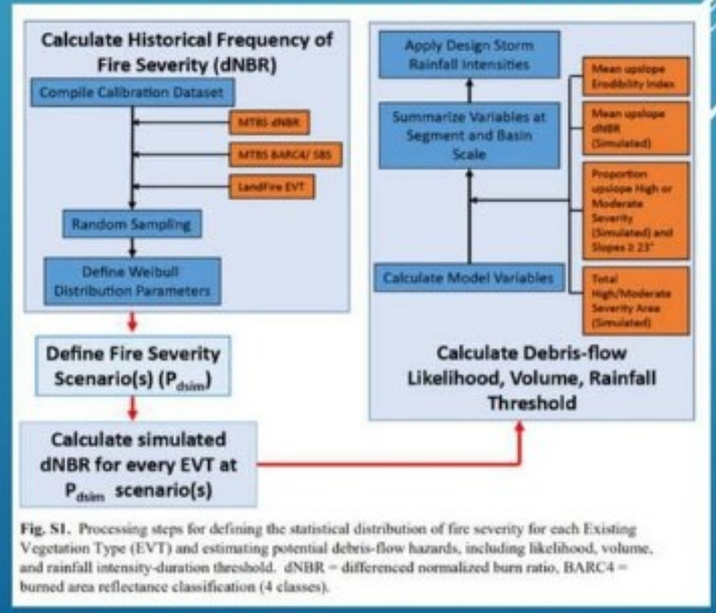


Fig. S1. Processing steps for defining the statistical distribution of fire severity for each Existing Vegetation Type (EVT) and estimating potential debris-flow hazards, including likelihood, volume, and rainfall intensity-duration threshold. dNBR = differenced normalized burn ratio, BARC4 = burned area reflectance classification (4 classes).

Fan Mapping

Mentimeter

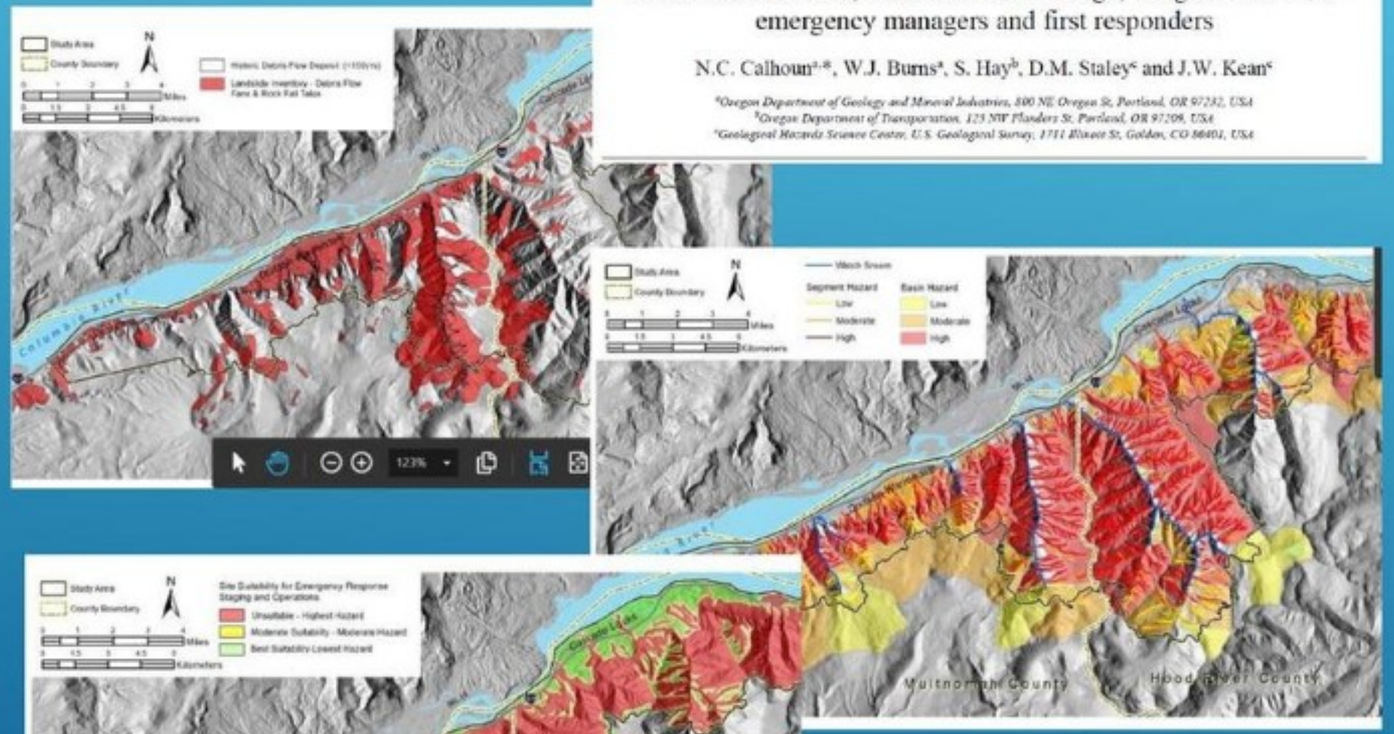
2019: Calhoun et al. – Debris Fan Mapping After Fire, OR

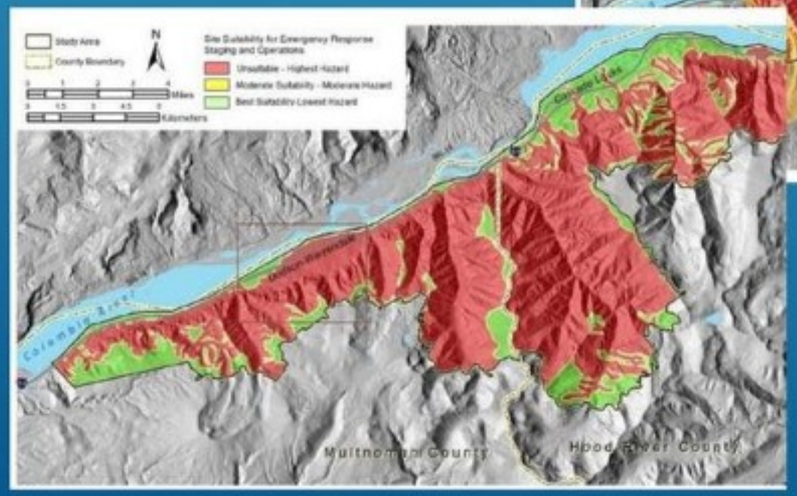
7th International Conference on Debris-Flow Hazards Mitigation

Post-fire rockfall and debris-flow hazard zonation in the Eagle Creek fire burn area, Columbia River Gorge, Oregon: A tool for emergency managers and first responders

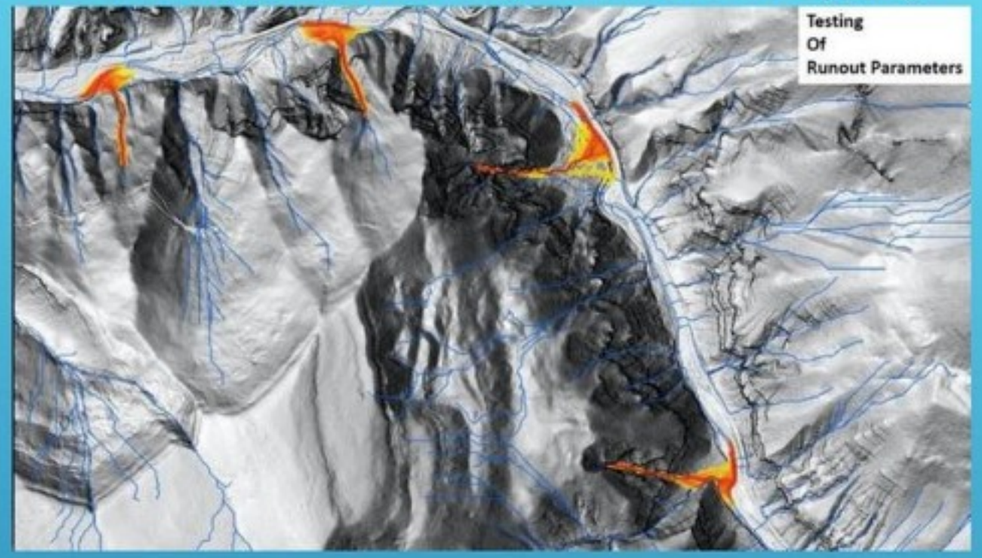
N.C. Calhoun[a,*], W.J. Burns[a], S. Hay[b], D.M. Staley[c] and J.W. Kean[c]

[a]Oregon Department of Geology and Mineral Industries, 800 NE Oregon St, Portland, OR 97232, USA
[b]Oregon Department of Transportation, 123 NW Flanders St, Portland, OR 97209, USA
[c]Geological Hazards Science Center, U.S. Geological Survey, 1711 Illinois St, Golden, CO 80401, USA

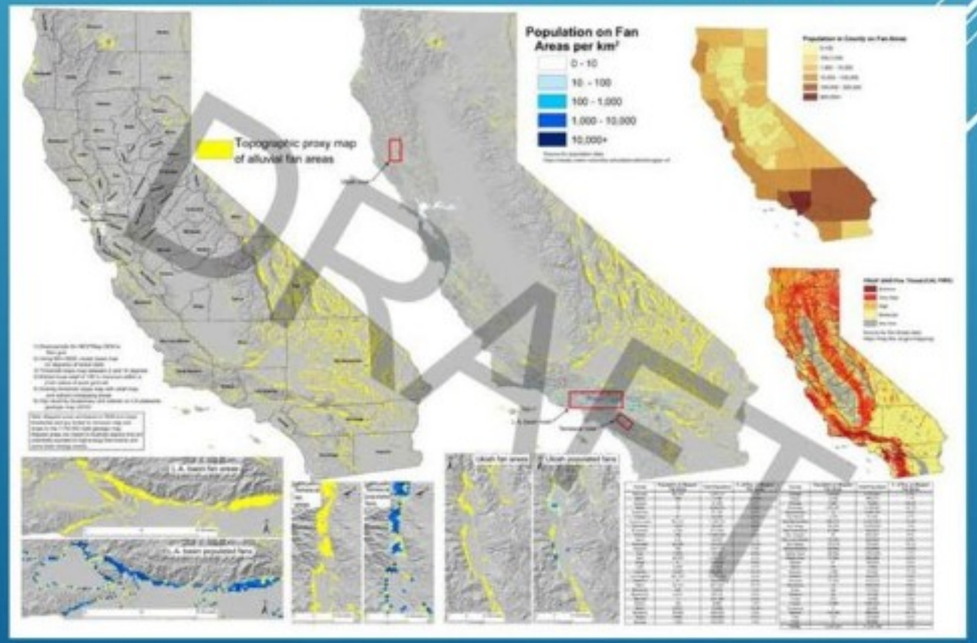




2018: McCoy (CGS, Colorado) – Fan Hazard Mapping



2020: Morelan (CGS) – In Progress Fan Mapping



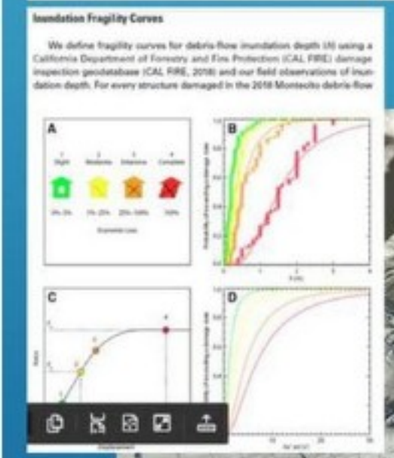
Inundation Modeling – DF Risk

Mentimeter

2019: Kean et al. – Inundation Dynamics (Fragility)

Inundation, flow dynamics, and damage in the 9 January 2018 Montecito debris-flow event, California, USA: Opportunities and challenges for post-wildfire risk assessment

J.W. Kean[1], D.M. Staley[1], J.T. Lancaster[2], F.K. Rengers[1], B.J. Swanson[3], J.A. Coe[1], J.L. Hernandez[3], A.J. Sigman[3], K.E. Allstadt[3], and D.N. Lindsay[4]
[1]U.S. Geological Survey, P.O. Box 25046, MS 966, Denver, Colorado 80225, USA
[2]California Geological Survey, 801 K Street, MS 12-32, Sacramento, California 95638, USA
[3]California Geological Survey, 320 West 4th Street, Suite 850, Los Angeles, California 90013, USA
[4]California Geological Survey, 4108 Airport Road, Redding, California 96002, USA



2019: Bessette-Kirton et al. – Inundation Model Testing

7th International Conference on Debris-Flow Hazards Mitigation

An evaluation of debris-flow runout model accuracy and complexity in Montecito, California: Towards a framework for regional inundation-hazard forecasting

Erin K. Bessette-Kirton[a,*], Jason W. Kean[a], Jeffrey A. Coe[a], Francis K. Rengers[a], and Dennis M. Staley[a]
[a]U.S. Geological Survey, Box 25046, MS 966, Denver, CO 80225, USA

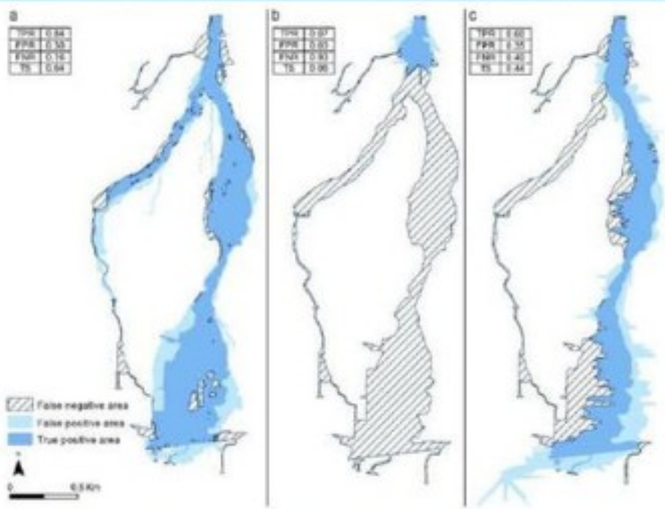
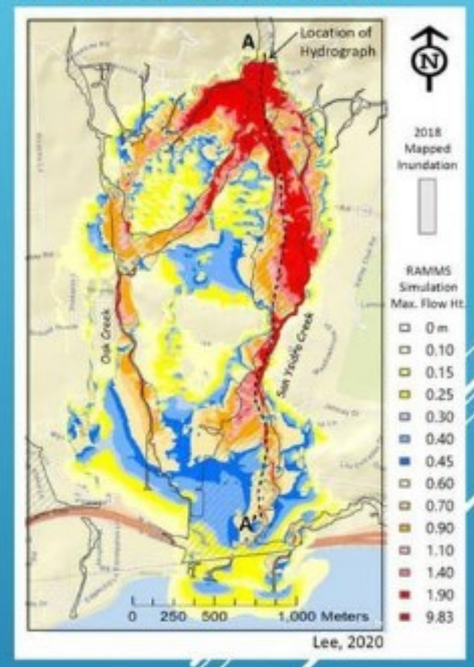


Fig. 2. Modeled inundation area from a) FLO-2D, b) LAHARZ debris flow, and c) LAHARZ lahar, showing the true positive area (dark blue), false positive area (light blue), and false negative area (striped) resulting from each model run, in comparison to the mapped inundation area of debris flows on San Ysidro Creek (Kean et al., 2019; Fig. 1). True positive rate (TPR), false positive rate (FPR), and false negative rate (FNR) are defined as the true positive, false positive, and false negative areas divided by the observed inundation area, respectively. Threat score (TS) is defined as TPR divided by the sum of TPR, FPR, and FNR.

2020: CGS - In Progress RAMMS Calibration



Lee, 2020

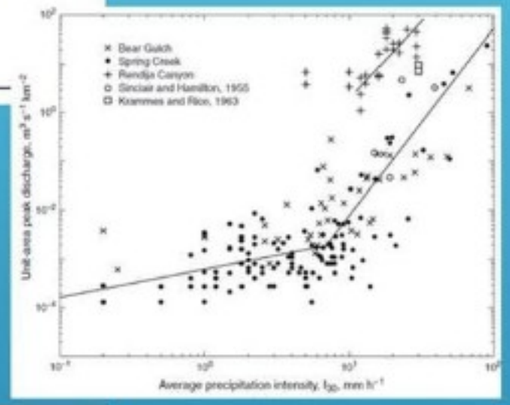
Precipitation

2001: Moody and Martin

HYDROLOGICAL PROCESSES
Hydrol. Process. 15, 2981–2993 (2001)
DOI: 10.1002/hyp.386

Post-fire, rainfall intensity–peak discharge relations for three mountainous watersheds in the western USA

John A. Moody[1]* and Deborah A. Martin[2]
[1]*US Geological Survey, Mail Stop 413, Denver Federal Center, Lakewood, CO 80225, USA*
[2]*US Geological Survey, 3215 Marine Street, Boulder, CO 80303, USA*

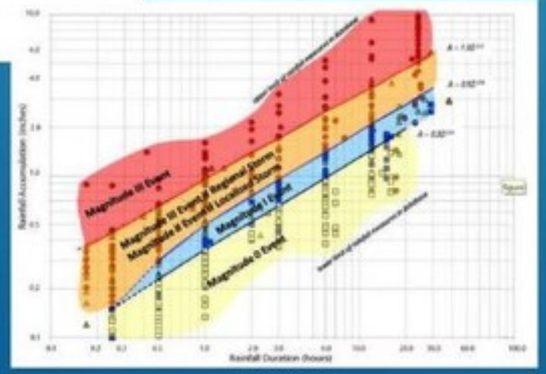


2010: Cannon et al.

USGS
science for a changing world

Relations Between Rainfall and Postfire Debris-Flow and Flood Magnitudes for Emergency-Response Planning, San Gabriel Mountains, Southern California

By Susan H. Cannon,[1] Eric M. Boldt,[2] Jason W. Kean,[1] Jayme L. Laber,[2] and Dennis M. Staley[1]
[1]U.S. Geological Survey
[2]National Oceanic and Atmospheric Administration, National Weather Service

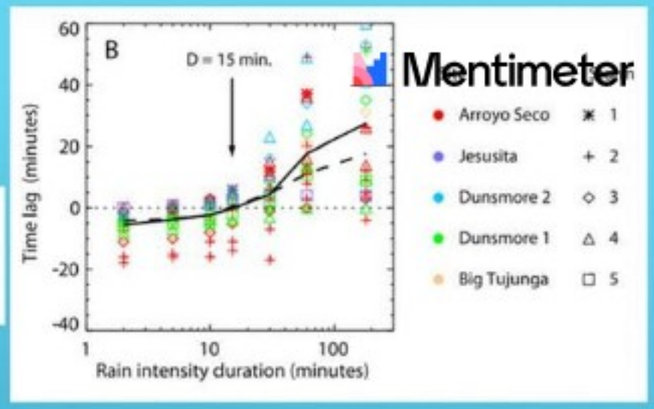


2011: Kean et al.

In situ measurements of post-fire debris flows in southern California: Comparisons of the timing and magnitude of 24 debris-flow events with rainfall and soil moisture conditions

Jason W. Kean,[1] Dennis M. Staley,[1] and Susan H. Cannon[1]

Received 25 February 2011; revised 12 August 2011; accepted 17 August 2011; published 5 November 2011.



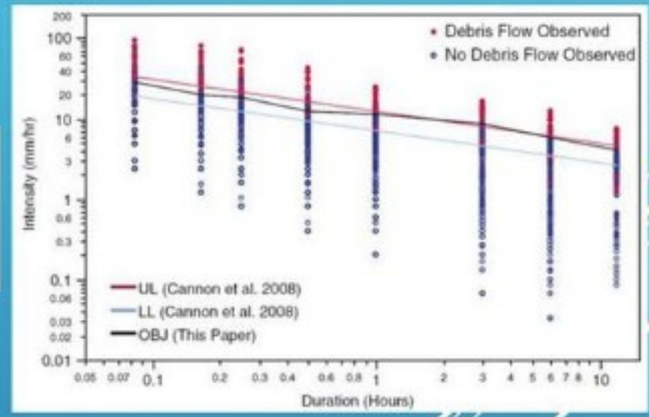
2012: Staley et al.

Original Paper

Landslides
DOI 10.1007/s10346-012-0341-9
Received: 29 September 2011
Accepted: 7 June 2012
© Springer-Verlag (outside the USA) 2012

Dennis M. Staley · Jason W. Kean · Susan H. Cannon · Kevin M. Schmidt · Jayme L. Laber

Objective definition of rainfall intensity–duration thresholds for the initiation of post-fire debris flows in southern California



2017: Staley et al.

Geomorphology 278 (2017) 149–162
Contents lists available at ScienceDirect
Geomorphology
journal homepage: www.elsevier.com/locate/geomorph

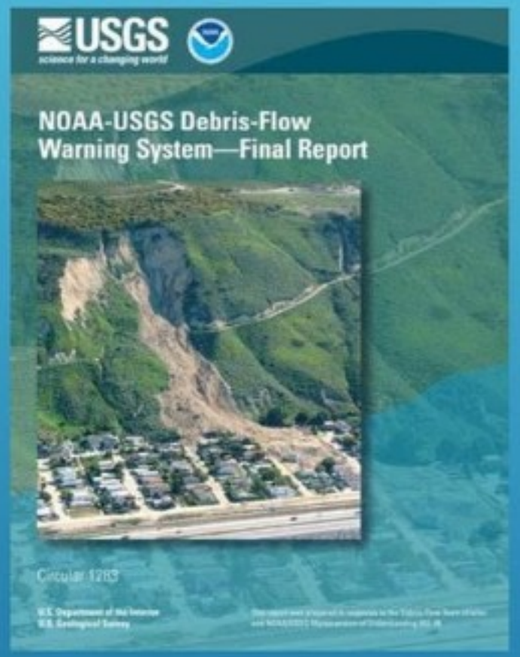
Prediction of spatially explicit rainfall intensity–duration thresholds for post-fire debris-flow generation in the western United States

Dennis M. Staley [a,*], Jacquelyn A. Negri [a], Jason W. Kean [a], Jayme L. Laber [b], Anne C. Tillery [c], Ann M. Youberg [d]

Meteorology and Atmospheric Sciences

Mentimeter

2004: NOAA/USGS



2011: Jorgensen et al.

Value of a Dual-Polarized Gap-Filling Radar in Support of Southern California Post-Fire Debris-Flow Warnings

DAVID P. JORGENSEN
NOAA/National Severe Storms Laboratory, Norman, Oklahoma

MAIANA N. HANSHAW AND KEVIN M. SCHMIDT
U.S. Geological Survey, Menlo Park, California

JAYME L. LABER
NOAA/National Weather Service, Oxnard, California

DENNIS M. STALEY AND JASON W. KEAN
Central Region Geologic Hazards Team, U.S. Geological Survey, Denver, Colorado

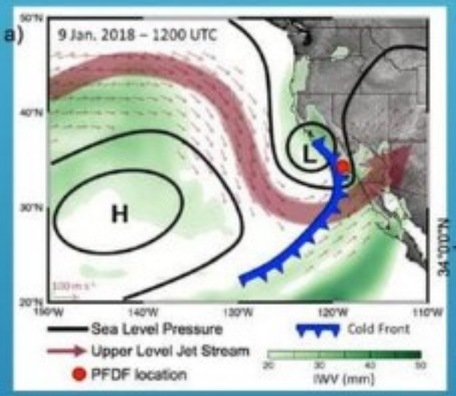
PEDRO J. RESTREPO
NOAA/National Weather Service/Office of Hydrologic Development, Silver Spring, Maryland

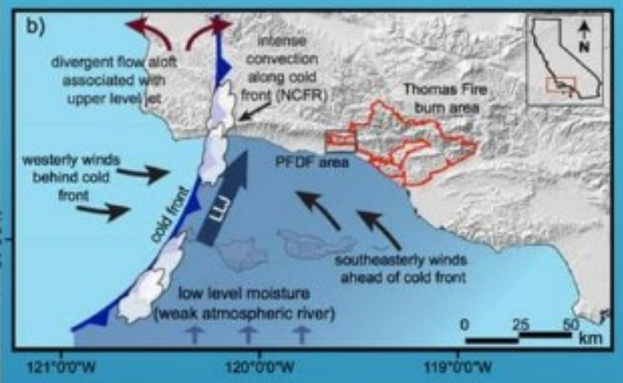
(Manuscript received 9 January 2011, in final form 10 May 2011)

2018: Oakley et al. 1/9 Debris Flow

Brief communication: Meteorological and climatological conditions associated with the 9 January 2018 post-fire debris flows in Montecito and Carpinteria, California, USA

Nina S. Oakley[1,2], Forest Cannon[2], Robert Munroe[3], Jeremy T. Lancaster[4], David Gomberg[3], and F. Martin Ralph[2]





2019: Duarte et al.

Development and implementation of tools to monitor and forecast post-wildfire debris flows

Jorge Duarte*,
Jonathan J. Gourley, Paul Gauthier,
Dennis Staley, Humberto Vergara

*Cooperative Institute for Mesoscale Meteorological Studies
The University of Oklahoma
Norman, OK, USA

EGU General Assembly 2019

Science and Hazard Communication

Mentimeter

USGS
science for a changing world

Prepared in Cooperation with the California Geological Survey

Southern California—Wildfires and Debris Flows

Introduction

Wildland fires are inevitable in the western United States. Expansion of man-made developments into fire-prone wildlands has created situations where wildfires can destroy lives and property, as can the flooding and debris flows that are common in the aftermath of the fires. Fast-moving, highly destructive debris flows triggered by intense rainfall are one of the most dangerous post-fire hazards. Such debris flows are particularly dangerous because they tend to occur with little warning. Their mass and speed make them particularly destructive: debris flows can strip vegetation, block drainages, damage structures, and endanger human life.

Photograph of a typical burned hillslope in southern California. Photograph by Sue Cannon.

The U.S. Geological Survey's Landslide Hazards Program is participating in a multi-agency cooperative effort to investigate debris flows in burned areas of southern California and other parts of the western United States. Participating agencies are the U.S. Department of Agriculture (USDA) Forest Service, the Natural Resources Conservation Service, and the California, Colorado, and Montana Geological Surveys. The objective of this project is to develop methods needed to estimate the locations, probability of occurrence, and size of potentially destructive debris flows. Public officials can use this information to plan and execute emergency response and post-fire rehabilitation.

Analysis of data collected from studies of debris flows following wildfires can answer many of the questions fundamental to post-fire hazard assessments—what and why, where, when, how big, and how often?

What We Know About Post-Fire Debris Flows

What and Why? Post-fire debris flows generally are triggered by one of two processes: surface erosion caused by rainfall runoff, and landsliding caused by infiltration of rainfall into the ground. Runoff-dominated processes are by far the most prevalent because fires commonly reduce the infiltration capacity of soils, which increases runoff and erosion. Infiltration processes are much less common, but prolonged heavy rains may increase soil moisture even after a wildfire. The wetted soil then may fail, producing infiltration-triggered landslides.

Where? Although debris flows can occur in areas underlain by nearly any rock type, the areas most likely to produce debris flows are those underlain by sedimentary or metamorphic rocks that have more than about 65 percent of the area burned at moderate to high severities. In addition, debris flows are most frequently produced from steep (> 20°),

U.S. Department of the Interior
U.S. Geological Survey

Printed on recycled paper

Fact Sheet 2005-3146
September 2005

National Weather Service

Post Wildfire Flash Flood and Debris Flow Guide

Created by National Weather Service Los Angeles/Oxnard
August 2015

www.weather.gov/losangeles

NOAA

WRN
Weather-Ready Nation

AFTER WILDFIRE
A GUIDE FOR NEW MEXICO COMMUNITIES

Search Site | Search | Log in

only in current section

Immediate Safety | Mobilizing Your Community | Who Can Help? | Post-Fire Treatments | Financial Tips | Flood Information | Additional Resources

Home

PRINT PAGE

Who Can Help?

This section describes many of the programs and services provided by agencies and non-profits for communities and individuals who have been affected by wildfire. Please be aware that programs and funding levels can change from year to year, and assistance may not always be

WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES
HILARY S. FRANZ | COMMISSIONER OF PUBLIC LANDS

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Home | Geology | Geologic Hazards | Landslides

Shallow Landslide Hazard Forecast Map

Wildfire-Associated Debris Flows

Wildfire-associated Debris Flows

CONTACT US

WALERT Team Lead
Trevor Contreras
Landslide Hazards Geologist
360-902-1553
trevor.contreras@dnr.wa.gov

If you are impacted by or suspect an active landslide, contact your county emergency manager or your local fire, police, or public works department.

LINKS

For more information visit the following sites:

After Wildfire

A GUIDE FOR CALIFORNIA COMMUNITIES

SILVER JACKETS

June 2019

Mentimeter

California
Department of
Conservation
California Geological Survey

Questions for Jeremy?

Mentimeter

The last slide went by fast, so maybe I missed it, but how do you ensure the latest science is being used by the various agencies that need it/want it, how do you know they are receiving your products and using the science?

I get a lot of small landowners asking questions about post-fire erosion control specific to their area. Issues with invasive species, which method, costs expected etc. Is there a good resource for non-agency folks or is there not enough information?

Would good forest management reduce the amount of debris flow after a fire.

Seems like the Forest Service and National Park Service managers are well aware of the BAER program, post fire risks. BLM seems to be behind the curve as far as manager's knowledge. How do we educate BLM management?

!#*&!$

Having more radar data and gauge data is great. Can you talk about how we solve the issue of getting this data into the warning software.

6

Science Needs Panel Discussion

- Q&A Session to follow; questions asked through Mentimeter
- Speaker bios available at: [https://aftertheflames.com/science-speakers/]

Science Needs Panel

Mentimeter

Panelists

Nina Oakley, Moderator

- **Jeremy Lancaster**, *Supervising Engineering Geologist*, CA Geological Survey
- **Dave Callery**, *Hydrologist/BAER Lead*, USFS
- **Cara Farr**, *National BAER Coordinator*, USFS
- **Rich Schwab**, *National BAER Coordinator*, NPS
- **Katherine Rowden**, *Hydrology Program Manager*, National Weather Service/NOAA
- **Don Lindsay**, *Senior Engineering Geologist*, CA Geological Survey
- **Stephen Brown**, *Hydrologic Engineer*, USACE Albuquerque District

Prompting Questions

1. Thinking about post-fire hazards: Where do you feel "blind" and it scares you?
2. How can research community share information with practitioners?
3. Do you struggle with looking at research and finding too many answers?
4. Of all your post fire science needs, where do you feel the most comfortable?

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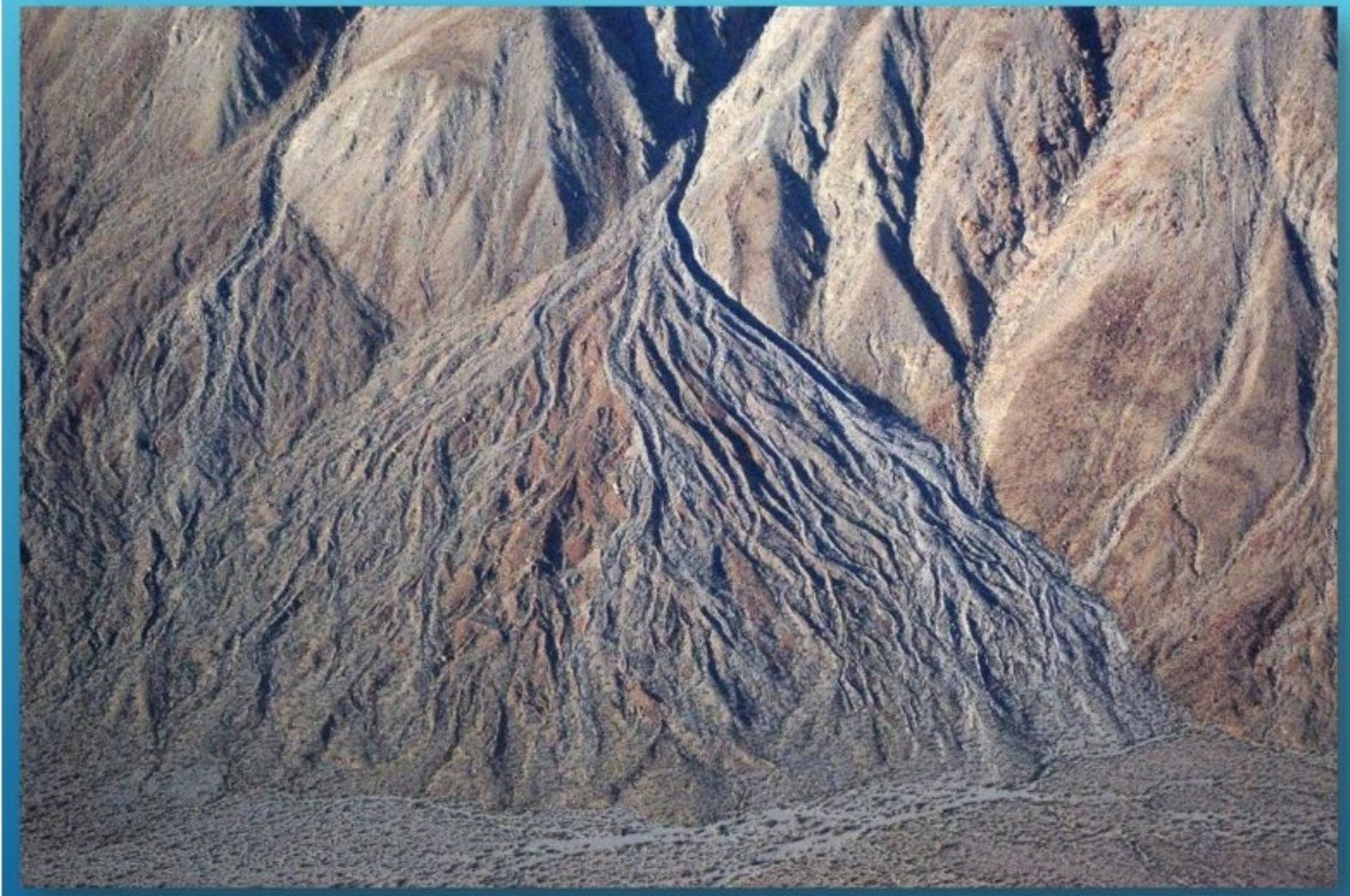


POST-WILDFIRE SCIENCE NEEDS PANEL

JEREMY LANCASTER
CALIFORNIA GEOLOGICAL SURVEY
GEOLOGIC AND LANDSLIDE MAPPING PROGRAM MANAGER

AFTER THE FLAMES CONFERENCE - VIRTUAL
19 MAY 2020

California
Department of Conservation
California Geological Survey

CALIFORNIA'S CHALLENGES

Mentimeter

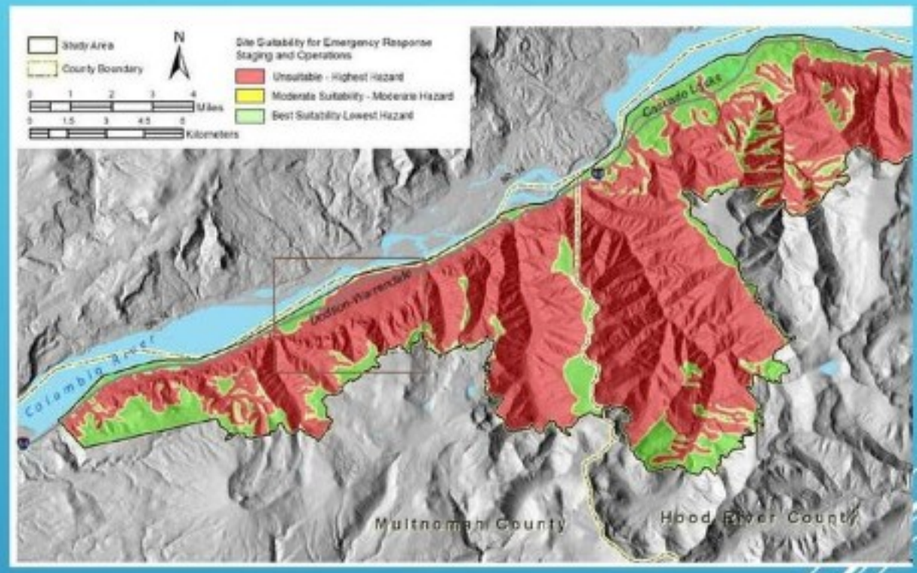
Urbanized alluvial fan floodplains

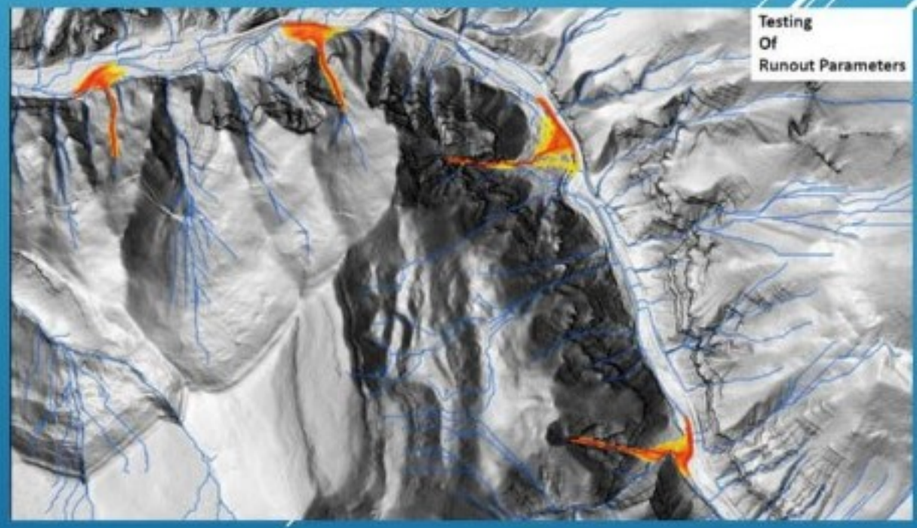
California's Statewide Hazard Mitigation Plan (SHMP):

> *As climate change affects the length of the wildfire season, it is possible that a higher frequency of large fires may occur into late fall, when conditions remain dry, and then be followed immediately by intense rains early in the winter, as occurred with the Thomas Fire in December 2017 and subsequent Montecito and Carpinteria debris flows in January 2018.*

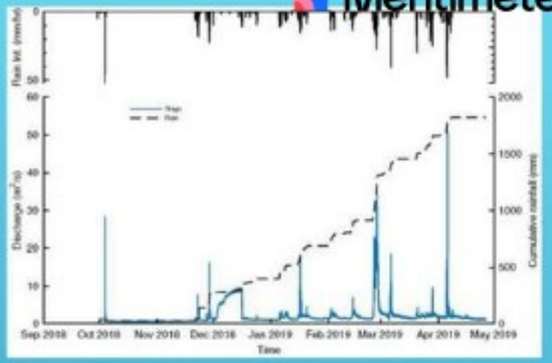
The SHMP also identifies critical life-safety information gaps in the State's hazard mitigation efforts, concluding that:

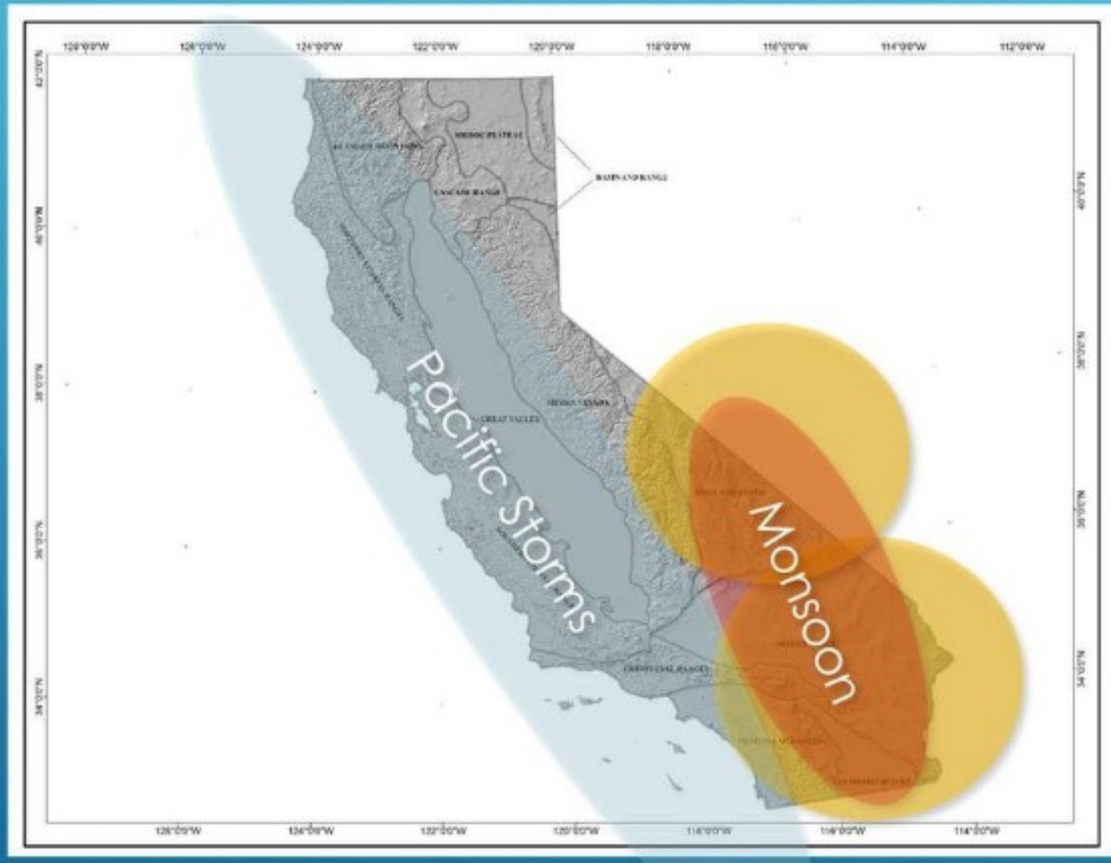
> *There has been no state program to evaluate or map the types of landslides that cause the most casualties. Although the Alluvial Fan Task Force provided some guidance on where runout could affect developing areas in southern California, the need for a statewide assessment of debris flow potential [including flash floods] on hillsides and alluvial fans is not being met.*





CALIFORNIA'S NEEDS





We lack basic data

Hydrology data

- Stream gages
- Precipitation gages
- Radar coverage

For monitoring runoff response!

We lack maps

- Alluvial fan landform
- Active and inactive areas
- Stratification of lower and higher hazard fans or areas on those fans
- Alluvial fan risk maps in a changing climate
- Fire and flood

We lack understanding of thresholds of response, in:

- Geologic
- Geomorphic
- Hydroclimatic

...domains

We lack topographic data

Questions for Science Needs panel?

Mentimeter

For Katherine Rowden: How often does flash flood guidance change after fires burn?

Dave - Do you find annual recurrence interval rainfall info helpful, or does it matter?

To the best of your knowledge, has anyone adopted machine learning modeling for runoff for post fire environments?

What are some ways you suggest sharing of information can be done efficiently between agencies - between federal agencies, between federal and state and from fed to state to local? is there/should there be a single repository? Who would manage?

My take is that community planners think of alluvial fans as dormant like volcanos. How do we improve our messaging?

Why does BAER hydrology seem to always underestimate flooding?

Both Don and Stephen alluded to sizing structures for post-fire conditions, has consideration been given to temporary structures or crossings to accommodate the changing conditions prior to sizing a permanent structure?

!#*&!$

Has any one looked at using space based rainfall data? I am not sure if it is available fast enough?

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Questions for Science Needs panel?

Mentimeter

How can we get federal agencies BAER teams to look at downstream impacts that are off of federal lands? Change policy to allow them to look at those needs where work on federal lands can make positive impacts off federal land.

What is being done in the Southwest to better predict runoff?

Jeremy - how is the work on the post fire tool kit in CA addressing science needs identified? Is the task force working on the right things?

to the panel: What is the best way to relay your science results to managers dealing with these issues, and helping them to apply it quickly and efficiently?

what is being done in the southwest to better predict runoff?

Has anyone on the panel worked with social scientists before regarding the communication of post-fire hazards issue? How was it implemented and how well did it work?

Wondering if some of the panelists could touch on their thoughts about the use of funds for and benefits of fire suppression compared to post-fire stabilization and rehabilitation.

How do you collaborate with biologists (botany/soil/microbial) on post-fire mitigation? Who do you collaborate with?

How would you like uncertainty be presented in model estimates? color code map, probability, likelihood, the model is right or wrong

43

Questions for Science Needs panel?

Mentimeter

How useful are wildfires prediction for the following season, based on, e.g., satellite soil moisture data.

There has been a lot of work done on probabilities for debris flows and in creating rainfall thresholds. The NWS in a forecast sense is moving more and more toward probabilistic rainfall forecasts. How can we match up those probailities in practice?

Does NWS or others have a detailed database of past post-fire flash floods and debris flows coupled with estimated precipitation rates that generated these? If so, does it include high rainfall intensity non-events?

Much pressure to "capture value" in burned dead/dying (or even minimally at-risk) timber, justified by roadside hazard in local National Forest. Also protect roads with culvert installation. How to deal with this as community member?

thoughts use of funds fo fire suppression compared to post fire stabilization and rehab

All: We heard of many concerns and issues. What issue would Each panelist like to see addressed first? What is their priority#1?

Given the uncertainties in clear water modeling and bulking factors should we consider alternative methods to evaluate risk from post fire flooding/debris flows. Colorado has developed a fluvial hazard zone mapping program that may be a good alternat

Jeremy- do all States is use same method to map alluvial fans?

Do we need to prioritize designing interactive tools/models for post-fire hazards? Or are static products (e.g. maps) more beneficial?

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Questions for Science Needs panel?

Mentimeter

Why don't the BAER teams include a silviculture and fuels specialist that will help in the assessment of risks associated with future fire events and ecological restoration?

At some point I would like to hear a discussion about the use of runoff models verses debris flow models. What are the differences in the two and why use both? Or why not?

How do we make sure that we differentiate modeling threats that can be mitigated with treatments from threats like larger debris flows that cannot be mitigated?

Jeremy and Don - are you seeing communities being more willing to stand-by CGS recommendations on post-fire risk/evacuations/re-occupation of impacted areas in the post-Thomas Fire world?

do you think stream stats needs updating to better support BAER model estimates? how?

Thank you so much for referencing the Joint Fire Science Program - the regionally-based Fire Science Exchanges provide support, online resources and website for exchange of science, briefs, webinars, videos, and links about many wildfire issues -

Inciweb can be an effective way of communicating post-fire information with all cooperating agencies able to post information and contacts. The public has access to it also.

How standardized are BAER reports from various agencies? If not, would that be possible? If standardized , these reports would be easier for machines to parse and analyze.

What is the point in running both hydrologic models and debris flow models? What r the key differences?

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Questions for Science Needs panel?

Mentimeter

The topics supported by the Fire Science Exchange Networks embrace most issues regarding wildland fire, particularly fire ecology, management, post-fire effects, social science and community preparedness, & many other topics. Glad we can be of help!

How can BAER increase collaboration with microbiologists, seeing as how soil microbes can be key to soil aggregation and mitigation efforts?

I'm concerned with apparent lack of follow-through from BAER to longer-term (6 months to 4 years post-fire) rehab and management, particularly discounting of hydrologic concerns that may inhibit timber salvage.

What have been your experiences with funding post fire mitigation projects /actions, and are there improvements to those funding sources being considered to allow a more timely response?

How could the Federal agencies better coordinate the interagency development of post-fire products, services, and science.

Can the risk on alluvial fans ever Be mitigated enough or do people need to be removed from them to stay safe

would pre-disturbance fuels work help to reduce post fire impacts? If so has any work been conducted in an area that has experienced a disturbance?

43

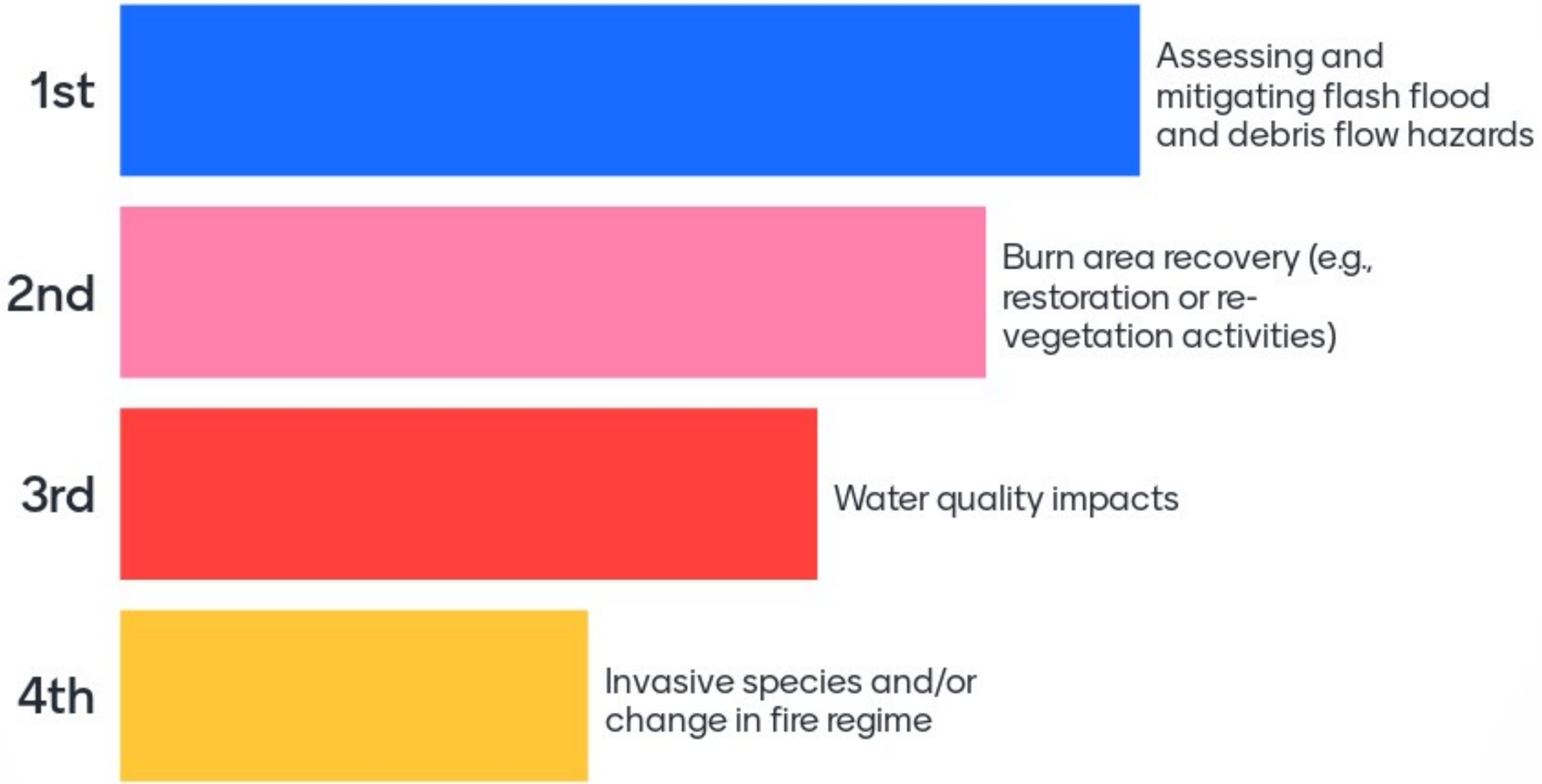
Mentimeter

Enjoy a 5 Minute Break!

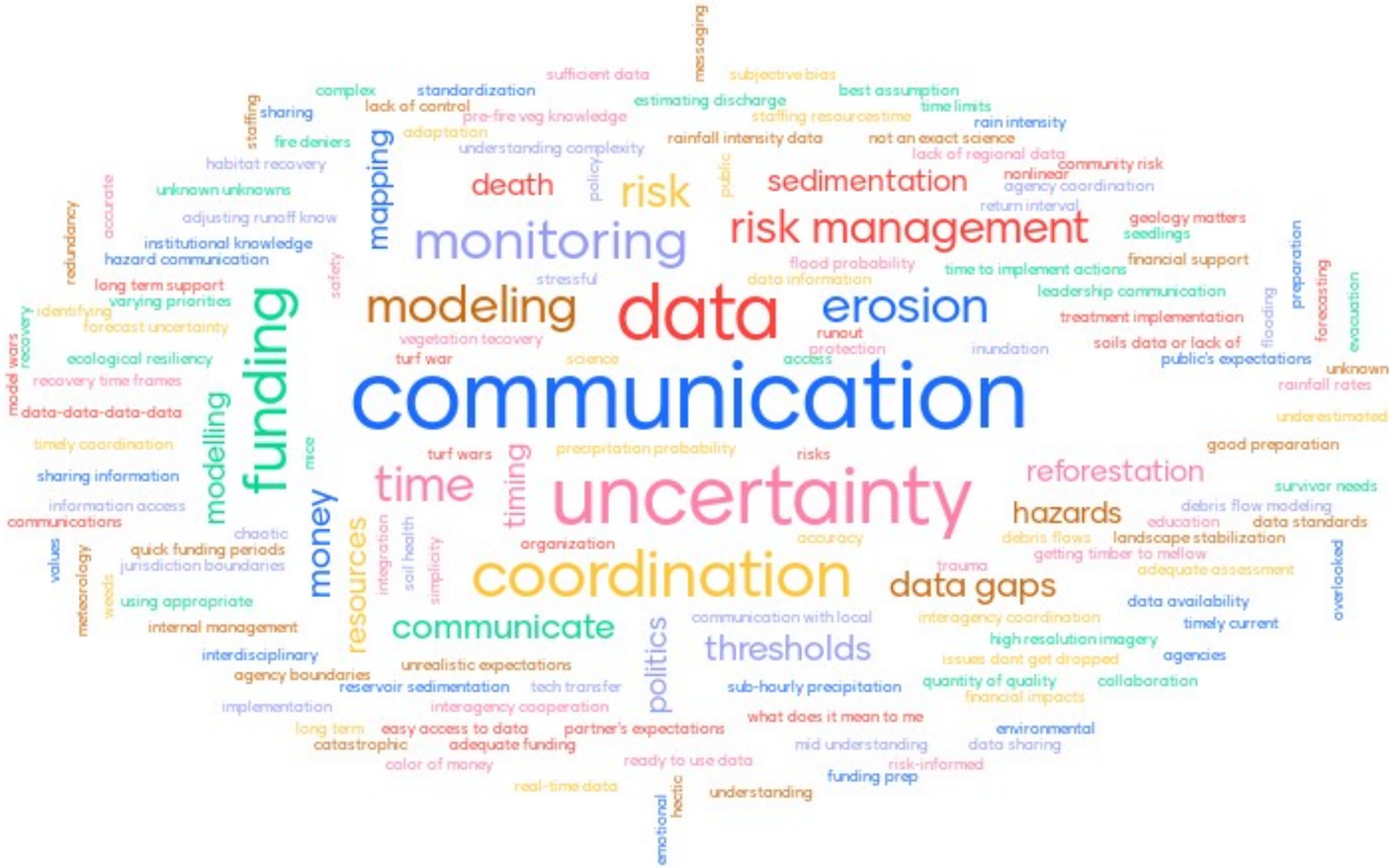
Polling: Science Needs

- Follow along using Mentimeter
- Panelists will discuss as results display in real time

Rank post-fire concerns based on your job responsibilities or research focus:



What three words or phrases describe your post-fire challenges?



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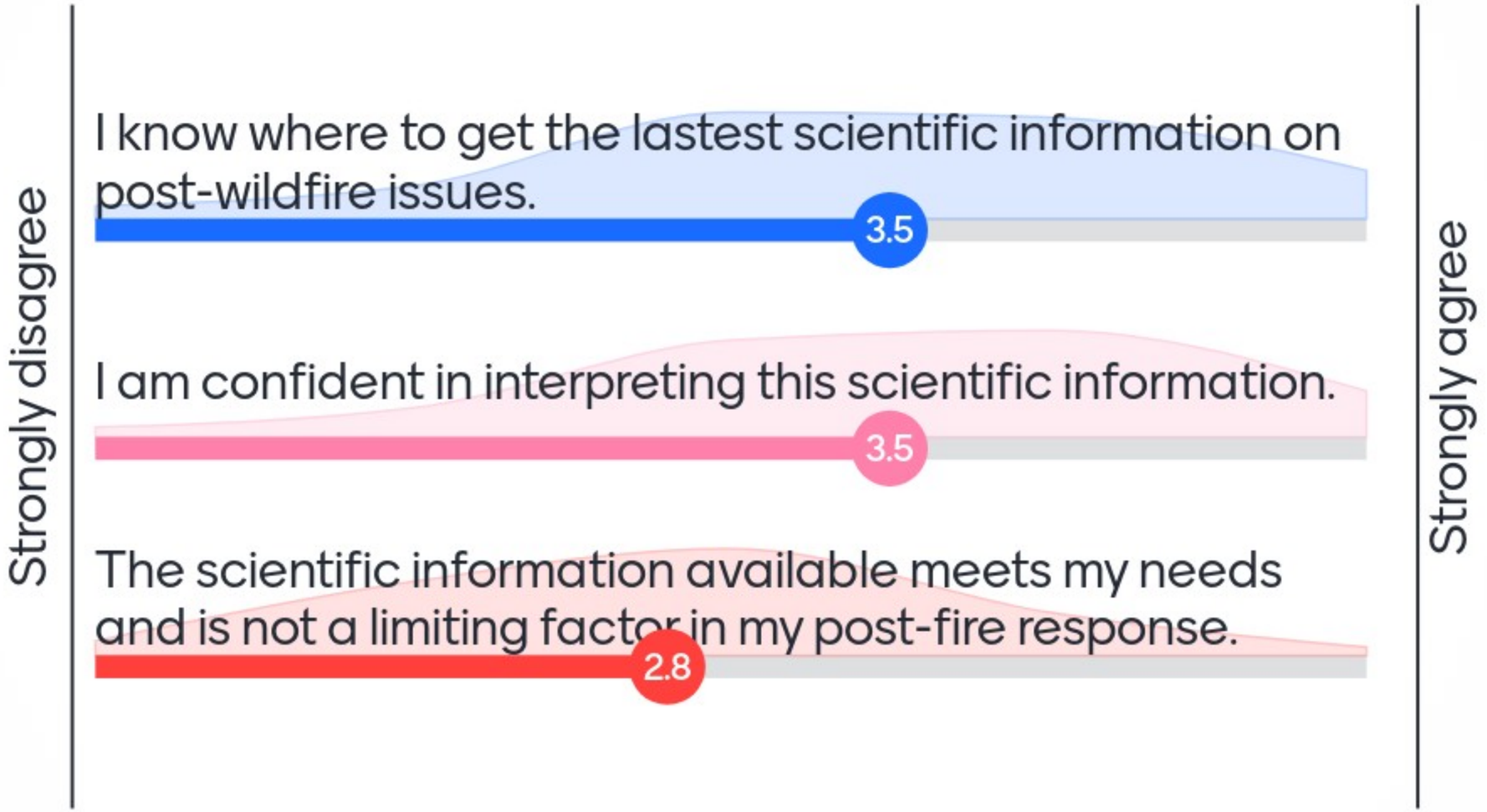
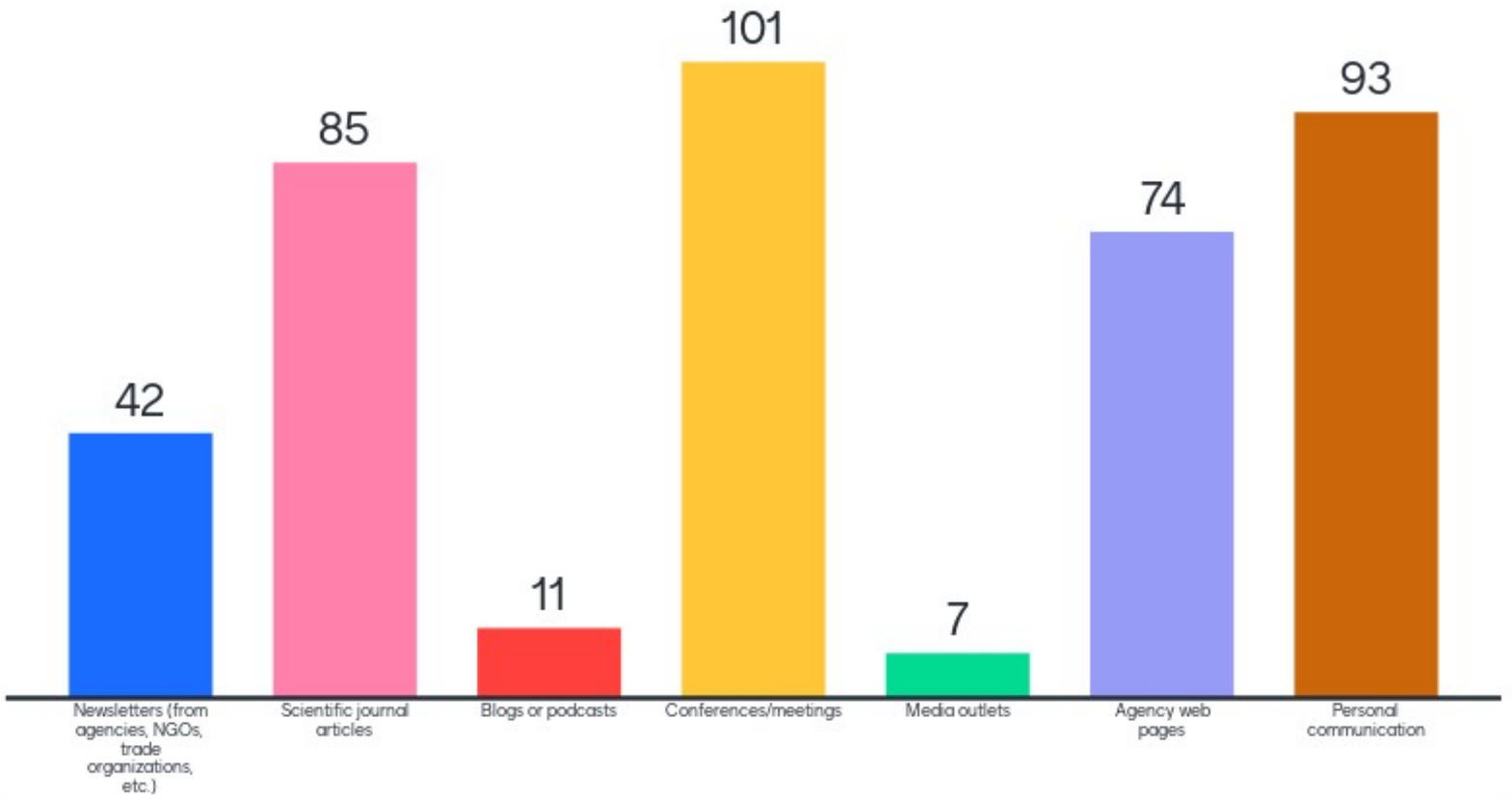
How do you rate these statements?

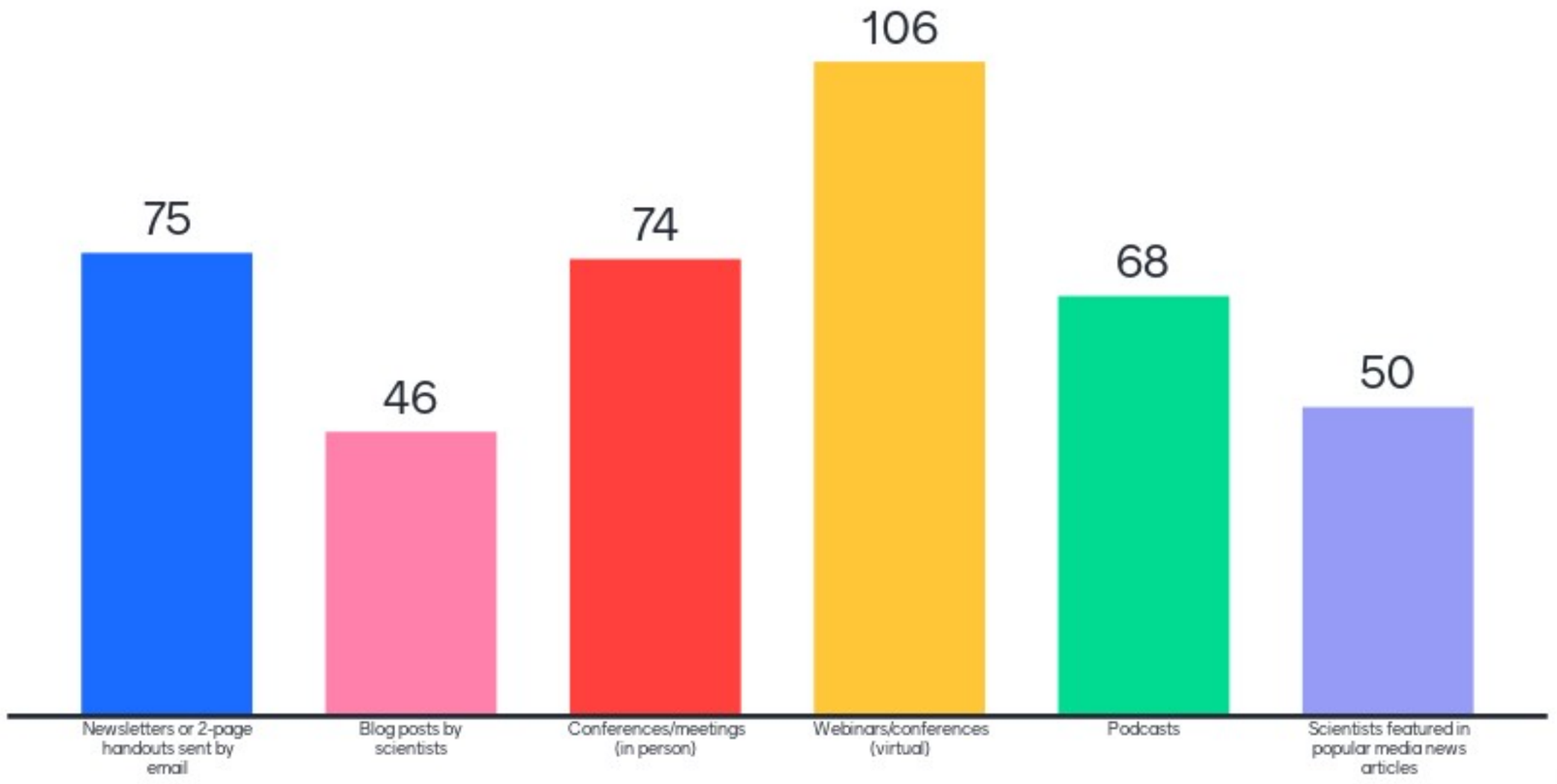


Where do you typically get your post-fire science information? Choose all that apply.



130

What mechanisms would you like to see used more frequently for communicating post-fire science? Choose all that apply.



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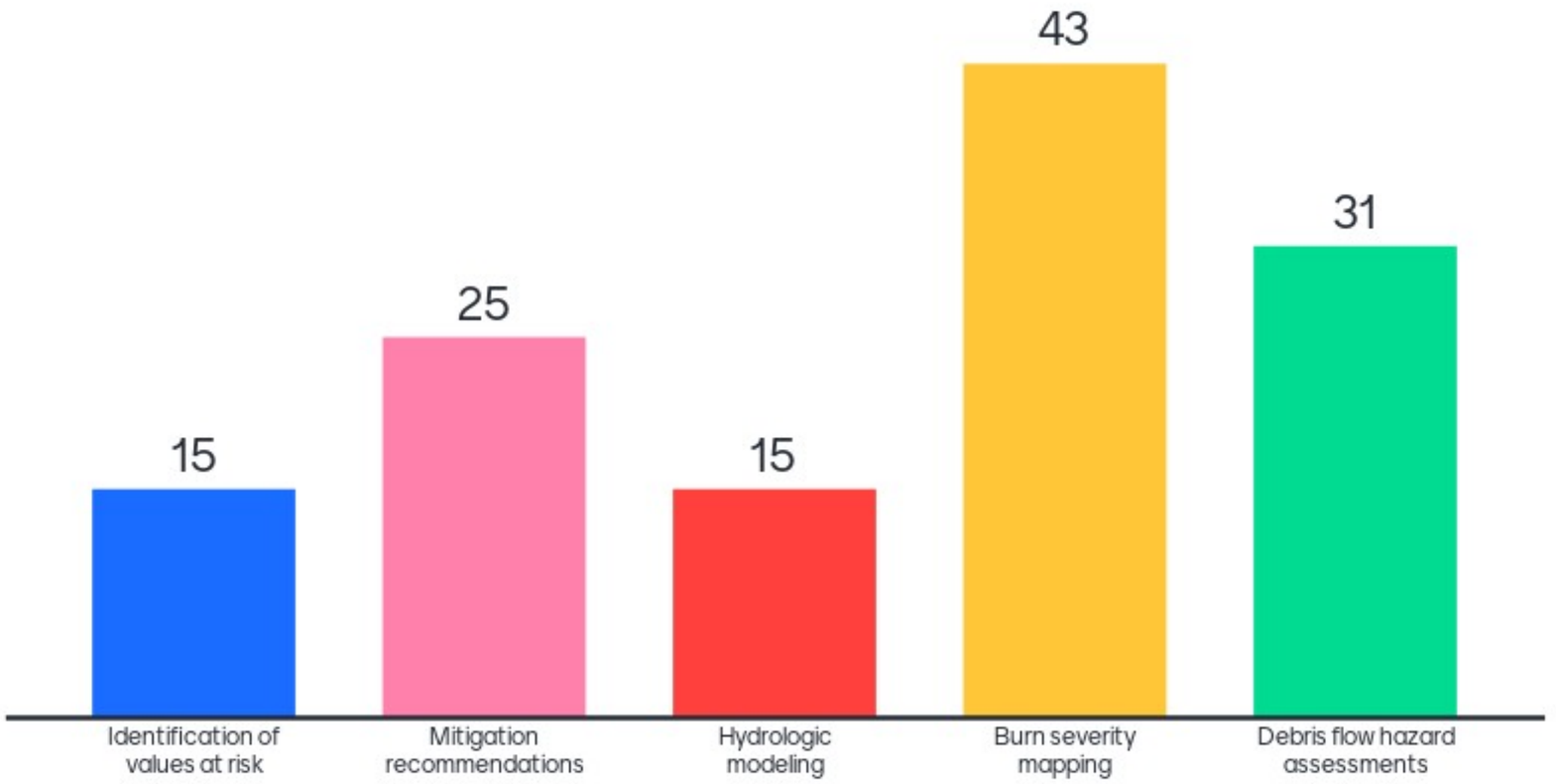
What component of agency post-fire assessments is most useful to you?



Mentimeter

129

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

Downstream recommendations	community outreach	Model and data uncertainty.
Survivor/Resource Connections	Community perspective	uncerntainty
All values at risk.	!#*&!$	resources available to private landowners impacted by fire

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

- Downstream analysis flooding
- Public perception about messaging
- debris flow inundation estimates
- Socioeconomic information, who is impacted or at risk, most vulnerable
- better mentoring
- communication plan
- Fluvial Hazard Zone mapping
- funding to address mitigation recs
- suspended sediment transport downstream

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

- Flash flood rainfall thresholds like USGS does for debris flows
- Thresholds
- Inundation Risk Maps
- Community engagement
- Downstream effects
- Community pitteach
- More on off forest effects/risks
- Implementation plan
- Downstream off-forest hazard assessments

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

Impacts beyond federal boundaries.

Downstream recommendations

Uncertainty!

Downstream values

long term rehab opportunities and needs.

How risk changes over time.

Debris outflow locations

Better assessment of downstream off fed land risks

Tradeoffs

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

- Available programs/funding
- temporal risk estimates
- coordinating risk from debris-flows and flooding
- Confidence intervals
- Inundation mapping
- Downstream values at risk
- Community communication
- Downstream impacts and threats
- Follow-up report

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

Like flood inundation mapping but for potential debris flows. Visualization tools!!!

Coordination contact lists

Reforestation need/potential

!#*&!$

inundation potential

probabilistic interpretation

Downstream treatments

Community outreach plan

Impacts on indigenous communities and their homelands.

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

Zones of erosion/deposion

Data needed but didn't have

DF runout modeling.

Understanding of monitoring so that we can learn whether our assessments are accurate.

Community well being assessment in post fire landscape

Soil hydraulic effects reporting

Follow up and reporting on outcomes

Funding for mitigations

post-fire debris flow and flood history

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

Mitigation resources

Mapping to the pour point

debris flow vs. flash flood thresholds

One location to send impacted people to for additional resources. There is not one site they can get to key information.

Plan for community moving forward - what does community need to do moving forward, in what order, and with what resources

Downstream debris flow, not just those on federal land.

Treating all lands

working with those impacted to identify achievable mitigation actions

Integration with local media and government

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

vegetation burn severity

A publically available post fire database with field measurements, modeling, resources at risk and recommendations

Prediction of potential return interval(s) of mass wasting or debris flow events that might occur in the same place.

Impacts to marine environment

An end user education component

Development of a process flow map, which partners do what task and in what order to get to the multiple end users.

Monitoring for adaptive learning and management

Mentoring

better mentoring

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

public outreach

Identify mitigation resources

Vegetation recovery

The framework for handing off to the forest, complete with responsible parties. Things get dropped all the time, and it is infuriating!

I'd be really interested in some sort of follow up that brings together the "science info doesn't always meet my needs" response and the "I would like more webinars/virtual conferences" responses.

Communicating results

Political and social implications of mitigation techniques

Make assessments easier to find

Extent of debris flow runout

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

We should poll folks to find out what would meet their science needs and do webinars on the listed topics.

Recommendations for immediate burn-out of scorched but not consumed fuels (as future fire hazard issue,) and interface with wildlife habitat.

Downstream effects

Pist-fire monitoring

Uncertainty in the numbers

Post-mitigation effectiveness

Simplification of post-Fire assessments for public consumption

Uncertainty

Model Certainty Assessment

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

Managing expectations

Downstream

Funding to implement mitigation in a timely manner.

Impacts beyond federal boundaries

long-term soil impacts

Risk over time

Introduction of new technologies and mentor ship on thes... like drones, models, model parameters, iterative modeling efforts and coordination between modeling groups.

Better coordination between USFS and states.

Analysis at smaller watershed scale

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

Rainfall Thresholds

Cost effectiveness evaluation of recommendations

Inundation mapping on and below forest

Which channel reaches are erosional/depositional

Local capacity to support agency assessments.

Consideration of non-federal lands

Inundation mapping

Inundation mapping

Monitoring and effectiveness of BAER plan

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

Mapping of areas where salvage would cumulatively impact hydrologic concerns, vs where it would be less impactful.

Vegetation recovery

Monitoring and results.

Flood risk changes with recovery

Assessments of what actually happens compared to what the report was saying.

Better Tools for mapping recovery and how it can inform risk

Cost estimates compared with those for mitigation and prevention.

Tools for real-time debris flow monitoring. Camera or laser systems for very high risk areas.

Long-term effects of fire on water supply and water quality.

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

Agencies requiring mudflow/debris-flow analyses in addition to clear-water modeling for post-fire recovery development

Limitations of modeling and specifically saying how much the numbers should be trusted and presented

In-channel erosion processes

Contact points for private landowners including as many agencies as possible.

funding opportunities

Co-production of science and It's application

Release of report to public, or at least being made available on web site(s).

Pre fire assessments made on treated areas to see if thinning and burning affects the models.

Effectiveness monitoring. There is never a Feedback

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

Science based desired conditions to guide long term landscape restoration

Microbes

"Pocket-guide" for community managers and communities about what post-fire programs belong to which federal and state agencies and how they work.

Some of these areas are "natural" mobile drainages. At what point do we say this is a natural event?

follow up discussion between forests who applied BAER within the region

Use of citizen scientists to help generate obs for post fire effects

Updates as the burn scar ages

Soil Health Assessments

Microbe recovery monitoring

148

What is missing from agency post-fire assessments that you would like to see addressed?

Mentimeter

Wind erosion potential and its effects on air quality, water, and landscapes

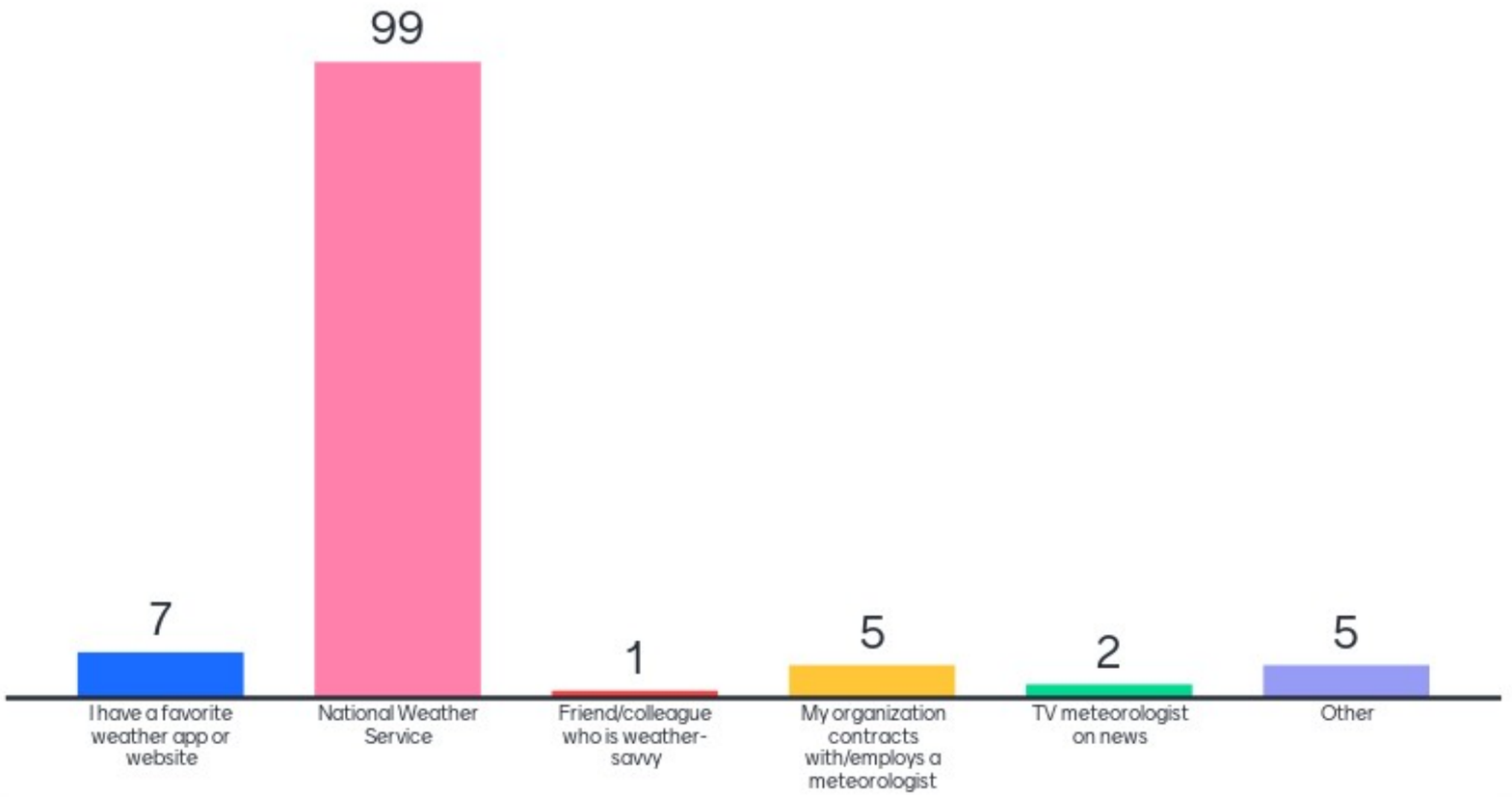
Rainfall atlas for the Pacific Northwest

Mitigation innovations

Closer interaction and coordination with invasive species management efforts.

148

Where do you primarily seek precipitation forecast information for post-fire hazards?



I need more or improved scientific information on (two words or phrases):

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Thank you for participating in Day 1! Please sign up for Day 2 if you have not already.

- Tomorrow's schedule, all times in MDT:
- 10 AM: Introduction and summary of Day 1
- 10:15 AM: Science Research Panel
- 11:30 AM: Interactive discussion on research directions w/ Mentimeter
- 12:15 PM: Update on WFLC and WGA efforts
- 12:50 PM: Other networks and collaborative efforts
- 1:20 PM: Wrap-up, finish by 1:30 PM