Update on Preliminary Reconnaissance of Northern California Wildfires (Tubbs Fire)

February 20, 2018
NCST Advisory
Committee Meeting

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Tubbs Fire Preliminary Reconnaissance

Reconnaissance Team:

NIST: Alexander Maranghides, Andrew Mundy, Nicolas Bouvet, Eric Link, Michael Selepak

US Forest Service (USFS): Ruddy (William) Mell

FEMA: Erin Ashley

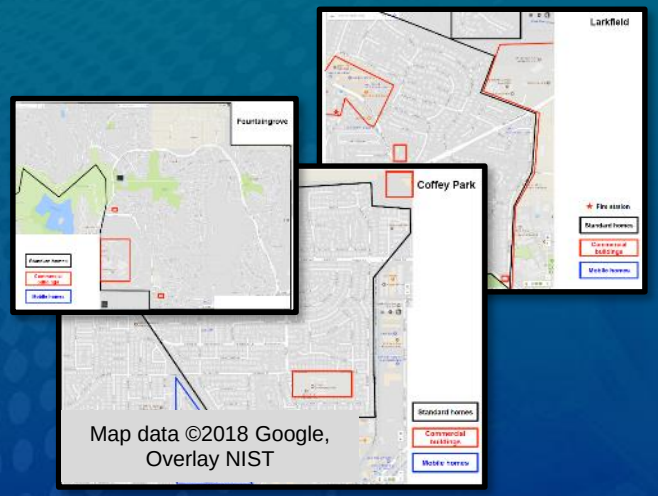
Shadow Team:

NIST: Stacy Bruss, Keith Martin, Christopher Brown, Lydia Shi, Michael Newman, Melissa Lieberman, Becky Turnbull, Nicole Cooper, Konstantina Di Menza, Cartier Murrill, Carmen Martinez, Ed Hnetkovsky, and Carolyn Rowland:

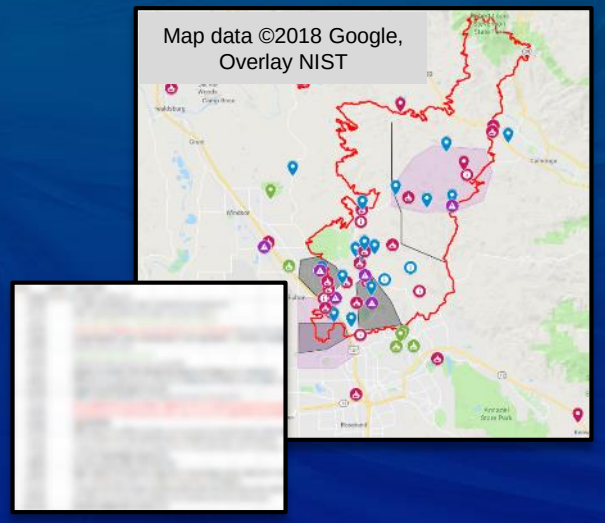
Preliminary Reconnaissance Preparations

- Disaster & Failure Studies (DFS) Criteria Rating
- Updating DFS rating and developing deployment memo
- Getting deployment approval
- Identifying fire, preliminary reconnaissance team and deployment schedule
- Contacting on-scene authorities and gaining access
- Identifying Shadow Team and generating assignments

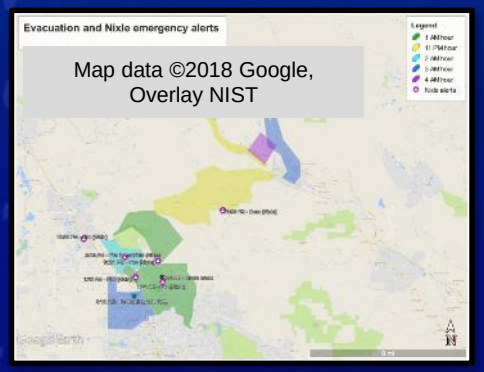
Tubbs Fire Situational Awareness - Shadow and Deployment Teams



Construction Type Identification



Timeline Estimation/
Dispatch Radio Recordings



Emergency Alerts and Evacuation Monitoring

Logistics and Hardware/Software

- IT infrastructure:
  - Cell phones, satellite phone
  - Computers, Slack and Google Drive
- Preparing for travel (field kits/map tubes)

NIST WUI Field Kits

Field Day 1 – Travel to Incident

- Flew to San Francisco, connected with USFS, drove to Incident Command Post (ICP)
  - At the peak ~6,000 people*
  - Over 325 fire agencies assisted*
  - Down to ~3,000 at time of our arrival*
- Assimilated into incident
- Met with CA State Fire Marshal, CALFIRE Unit Chief, Damage Inspectors (DINS)
  - Received Operations (OPS) brief
- Placed request for damage map and discussed damage and destruction with DINS
- Outlined plan for deployment

NIST Team with DINS at ICP

Incident Command Post

* Source: ICP Briefing

Field Day 2

- ICP – checked in and picked up map
- Community surveyed was Larkfield with CALFIRE escort
- FEMA joined team
- Objectives: examine overall fire behavior
  - Teams worked on same street, each taking one side
  - Technical points of interest:
    - heavy timber
    - fences
    - retaining walls
    - general fire behavior (crowning vs. surface fire)
    - damaged structures

Geolocated Image

Field Day 2 – Larkfield - Carriage Lane

Field Day 3 - Coffey Park

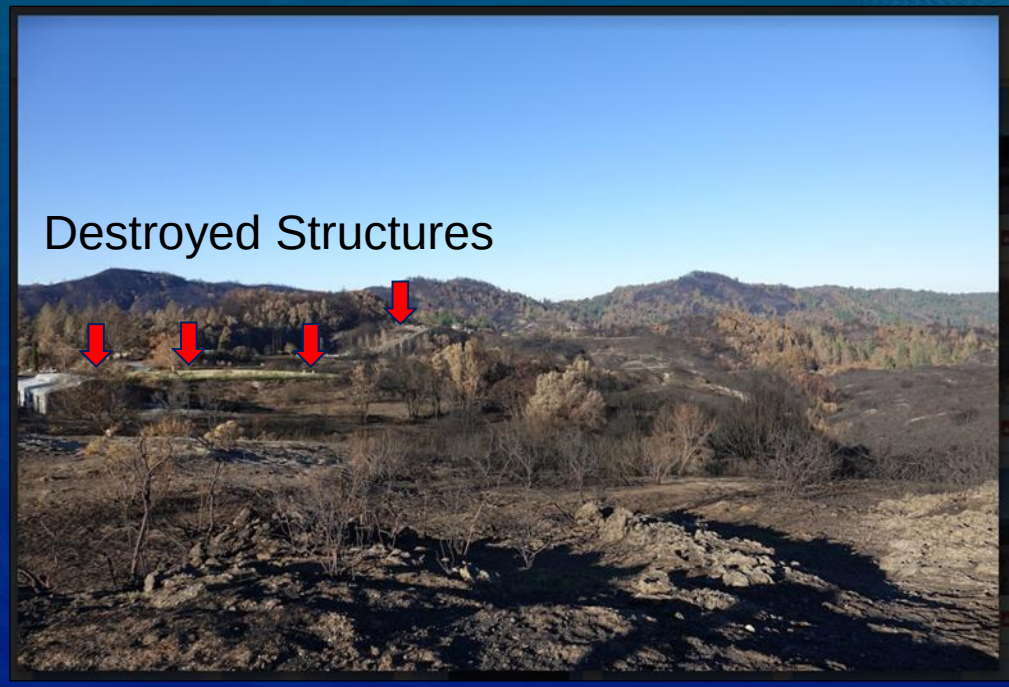
- Started at ICP then proceeded to Coffey Park to meet with Battalion Chief (BC)

- Preliminary observations:
  - Observed aluminum garage door panel ~20 m (60 ft) in a tree
  - There were also several cars located upside down, inside destroyed structures
  - Several reports of vehicles traveling through the air
  - Observations made were very local and did not extend across the entire Coffey Park community

Coffey Park

Field Day 4 – Fire Origins

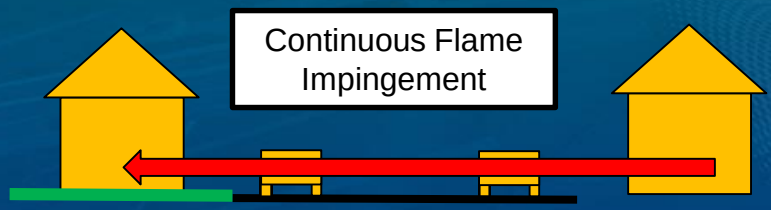
- Drove to Tubbs Lane (one location of fire origin(s))
- Observed non-uniform fuel consumption in the intermix
- Returned to ICP and checked out
- Packed kits, conducted Team debriefing



Tubbs Fire – Northeast of Santa Rosa

Highlights on the NIST Preliminary Reconnaissance of the Tubbs Fire

- Pre-fire conditions
  - Fifty-year fuel buildup
  - Very low fuel moistures (five-year drought; growth spurt; drought)
- The fire hazard
  - Large acreage (36,807 acres)*; Similar footprint to 1964 Hanley Fire
  - Complex terrain
  - Very rapid fire spread
  - Extreme weather event(s)
  - Local very high winds in Coffey Park community
    - Observation by residents of vehicles being blown by the wind
  - Large embers bouncing on pavement (Journey's End Trailer Park)



FD Vehicle Damage from Airborne Debris

* Source: http://www.fire.ca.gov/communications/downloads/fact_sheets/Top20_Destruction.pdf

Highlights, cont.

- The fire hazard, cont.
  - Large number of ignitions (specifics unknown)
  - Multi-day structure ignition event over changing weather conditions
  - Wildland to WUI (first intermix then interface) to city transitions
  - Very rapid fire spread in Coffey Park community (first-hand account info)
    - Including structure to vehicle to vehicle across street to structure
  - Long-range spotting caused inhomogeneous fire spread
  - Patchy wildland fuel consumption

Highlights, cont.

- Physical damage to buildings/infrastructure
  - Large number of destroyed structures (5643)*
  - Large number of commercially destroyed structures (94)**
  - Extensive number of downed power lines; cause unknown
- Evacuation and Response
  - Large number of fire fighters responded to the fire (5000+)***
  - Limited initial response due to other concurrent fires (20+)****
  - Multi-jurisdictional, multi-agency response
  - Loss of water pressure due to sprinklers in destroyed residences
  - Nighttime event
  - Complicated evacuation
- Mortality

  Large number of fatalities (22 attributed to the Tubbs fire*, 44 attributed to 2017 Northern CA fires****)

Destroyed Fire Station

* Source: http://www.fire.ca.gov/communications/downloads/fact_sheets/Top20_Destruction.pdf

** Source: https://www.sfgate.com/bayarea/article/Wine-Country-fires-destroyed-8-889-structures-12328007.php

*** Source: ICP Brief

**** Source: https://www.usnews.com/news/best-states/california/articles/2017-11-29/man-dies-of-injuries-raising-wildfires-death-toll-to-44

Summary

- *Great support by CA Office of State Fire Marshall and Santa Rosa Fire Department*
- Losses are greater than on other WUI fires but not unexpected given winds, *limited resources* (associated with other ongoing fire) and possibly *multiple ignitions*
- *A very productive and safely executed preliminary reconnaissance*
- *This preliminary reconnaissance is providing critical insight on possible paths forward for NIST DFS and WUI Group*

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Questions?

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Extra Material

Tubbs, Valley, and Hanley Fires

VALLEY FIRE

Valley Fire Incident Information:		
Last Updated:	October 15, 2015 7:45 pm	FINAL
Date/Time Started:	September 12, 2015 1:24 pm	
Administrative Unit:	CAL FIRE Sonoma-Lake-Napa Unit	
County:		
Location:	southern Lake County	
Acres Burned - Containment:	76,067 acres - 100% contained	
Structures Destroyed:	A total of 1,955 structures have been destroyed including; 1,281 homes, 27 multi-family structures, 66 commercial properties, and 581 other minor structures.	

Source: http://cdfdata.fire.ca.gov/incidents/incidents_details_info?incident_id=1226

In many respects, the Valley Fire was very similar to the September 1964 Hanley Fire, which burned over 52,000 acres and destroyed many homes in a short period of time.

Source: http://calfire.ca.gov/fire_protection/downloads/FireReports/Valley/L_PIAS_AAR_WX_FBAN.pdf

Top 20 Most Destructive California Wildfires

	FIRE NAME *(CAUSE)*	DATE	COUNTY	ACRES	*STRUCTURES*	DEATHS
1	**TUBBS** *(Under Investigation)*	October 2017	Sonoma	36,807	**5,643**	22
2	**TUNNEL - Oakland Hills** *(Rekindle)*	October 1991	Alameda	1,600	**2,900**	25
3	**CEDAR** *(Human Related)*	October 2003	San Diego	273,246	**2,820**	15
4	**VALLEY** *(Electrical)*	September 2015	Lake, Napa & Sonoma	76,067	**1,955**	4
5	**WITCH** *(Powerlines)*	October 2007	San Diego	197,990	**1,650**	2
6	**NUNS** *(Under Investigation)*	October 2017	Sonoma	54,382	**1,355**	2
7	**THOMAS** *(Under Investigation)*	December 2017	Ventura & Santa Barbara	281,893	**1,063**	1
8	**OLD** *(Human Related)*	October 2003	San Bernardino	91,281	**1,003**	6
9	**JONES** *(Undetermined)*	October 1999	Shasta	26,200	**954**	1
10	**BUTTE** *(Powerlines)*	September 2015	Amador & Calaveras	70,868	**921**	2
11	**ATLAS** *(Under Investigation)*	October 2017	Napa & Solano	51,624	**781**	6
12	**PAINT** *(Arson)*	June 1990	Santa Barbara	4,900	**641**	1
13	**FOUNTAIN** *(Arson)*	August 1992	Shasta	63,960	**636**	0
14	**SAYRE** *(Misc.)*	November 2008	Los Angeles	11,262	**604**	0
15	**CITY OF BERKELEY** *(Powerlines)*	September 1923	Alameda	130	**584**	0
16	**HARRIS** *(Under Investigation)*	October 2007	San Diego	90,440	**548**	8
17	**REDWOOD VALLEY** *(Under Investigation)*	October 2017	Mendocino	36,523	**544**	9
18	**BEL AIR** *(Undetermined)*	November 1961	Los Angeles	6,090	**484**	0
19	**LAGUNA** *(Arson)*	October 1993	Orange	14,437	**441**	0
20	**ERSKINE** *(Under Investigation)*	June 2016	Kern	46,684	**386**	2

**"Structures" include homes, outbuildings (barns, garages, sheds, etc) and commercial properties destroyed.
***This list does not include fire jurisdiction. These are the Top 20 regardless of whether they were state, federal, or local responsibility.

CAL FIRE

1/12/2018

Source: http://www.fire.ca.gov/communications/downloads/fact_sheets/Top20_Destruction.pdf