Cal Poly WUI F.I.R.E. Institute Dan Turner



WHAT ARE WUI FIRES?

- Wildland Urban Interface (WUI)
 - WUI is where the <u>built environment</u> adjoins the <u>natural environment</u>
 - Can be a <u>distinct interface boundary</u> or an <u>intermix</u> of built and natural

<u>Socio-economic</u> and <u>natural</u>
 <u>CONSEQUENCES</u> of WUI fires are what matter

Confusion: It's a forest fire...right?



Maybe forest fuels aren't always involved



Plenty of defensible space here...





Critical Infrastructure

Consequence of loss?

Communication sites





Power Grid



Highway 101 Cuesta Grade San Luis Obispo

- 217 fires in 15 years
- Costing \$\$\$\$ to suppress
- Closing major state highway
- Threatening transmission powerlines
- Union Pacific Railroad
- Communications sites
- USFS wilderness area and Lopez Lake watershed

Most caused by vehicles (exhaust or fires) from US 101



WHAT ARE THE INDIRECT IMPACTS OF WUI FIRES?

Union Pacific Railroad Trestle

\$ 2 million to repair ... \$ Billions in downstream impact losses



More than an economic toll...







WHAT ARE WUI FIRES?

- WUI fires are neither forest fires nor urban fires

 WUI fires are <u>BOTH</u> at the same time
- California has worst WUI FIRE problem in the world...it is a wicked problem
- CA has the greatest suppression costs
- <u>CA suffers the greatest consequences</u>
- <u>CA does limited WUI fire education and research</u>

Cal Poly WUI F. I. R. E. Institute concept: *"Center of Excellence" in Wildland Urban Interface Fires*

- **Fire**: Improve fire and fuel management through exploration of technology and applied science
- Information: Repository and analysis of WUI fire information and data for policy makers, professionals and public
- Research: Emerging topics and applied problem solutions in prevention, causes, mitigation, response and recovery
- **Educate**: Policy makers, fire professionals, community planners, architects, students, public

"Center of Excellence" Holistic Approach

Consequen	ces	Prevention	Structure Design	Disaster Management
Community I	Design	Costs	Fire/Risk Modeling	Vegetation Management
Plannin	g	1		Mitigation
Road Network I	Design			Critical Infrastructure
Human Behavior				Recovery
Public Educ	ation	ound Response	Aerial Response	Evacuation Planning
GIS				
	Public Policy	Remote Sens	ing Professional E	ducation

Cal Poly WUI F. I. R. E. Institute Colleges

- College of Agri., Food, Enviro. Science
 - Forestry and Natural Resources
 - Forest fire and fuels management
 - WUI Fire Protection Planning



- Environmental Management & Protection
 - CEQA & NEPA
- Environmental Earth & Soil Science
 - Rehabilitation
- Animal Science
 - Range Management

- Bio-Resource & Agri. Engineering

- Mechanized equipment design
- GIS
- Co-generation and biomass

The future forester needs: NEW SOLUTIONS

 Expanded forestry program course work in hazard fuel reduction; prescribed fire use; city and regional planning; WUI fire planning; hazard mitigation; fire protection engineering, environmental planning

 Expand educational outreach on and off campus

Students and "mid career" professionals

College of ENGINEERING

- Fire Protection Engineering

- Structural ignition design
- Human behavior

– Aerospace

- Aircraft: fixed, rotary and UAV
- Satellite imagery/remote sensing

Electrical Engineering

Power grid & distribution systems





– Computer Science & Software Engineering

Computer Modeling

Mechanical Engineering

College of ARCHITECTURE AND ENVIRONMENTAL DESIGN

– City and Regional Planning

- Community design and <u>RE</u>-design
- Resilient Community Research Institute
- CA State Hazard Mitigation Plan for CA OES

– Transportation Planning

Evacuation planning

Architecture

Ignition resistant building design

Landscape Architecture

- Ignition resistant landscape designs
- Right <u>PLANT</u> Right Place





College of Business
 – Economic consequences



- College of LIBERAL ARTS
 - Graphic Communications
 - Journalism
 - Political Science & Public Policy



- College of SCIENCE AND MATH
 - Physics
 - Chemistry
 - Biological Science





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What is ultimately needed?

- Institute Director
- Post Doc researcher(s)
- Faculty & researchers from Cal Poly
- Faculty & researchers from partner universities
- Grad and Undergrad student researchers
- Admin and support staff
- Operational funds for space, equipment, supplies, etc.
- Stakeholder Panel
- Support

Questions and Discussion.



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If structures don't ignite, they don't burn!

If structures don't burn, there is no WUI fire problem.