WHAT ARE WUI FIRES?

• Wildland Urban Interface (WUI)
  – WUI is where the built environment adjoins the natural environment
  – Can be a distinct interface boundary or an intermix of built and natural

• Socio-economic and natural CONSEQUENCES 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...
Caused by millions of flying embers!
House to house fire spread: usually wind driven
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 *BOTH* at the same time

• California has worst WUI FIRE problem in the world...it is a wicked problem

• CA has the greatest suppression costs

• **CA suffers the greatest consequences**

• **CA does limited WUI fire education and research**
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

- Consequences
- Prevention
- Structure Design
- Disaster Management
- Community Design
- Costs
- Fire/Risk Modeling
- Vegetation Management
- Planning
- Ground Response
- Aerial Response
- Mitigation
- Road Network Design
- Human Behavior
- Aerial Response
- Critical Infrastructure
- Public Education
- Fire/Risk Modeling
- Recovery
- GIS
- Ground Response
- Evacuation Planning
- Public Policy
- Remote Sensing
- Professional Education
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 RE-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 PLANT - 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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Bio Gel solution
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.