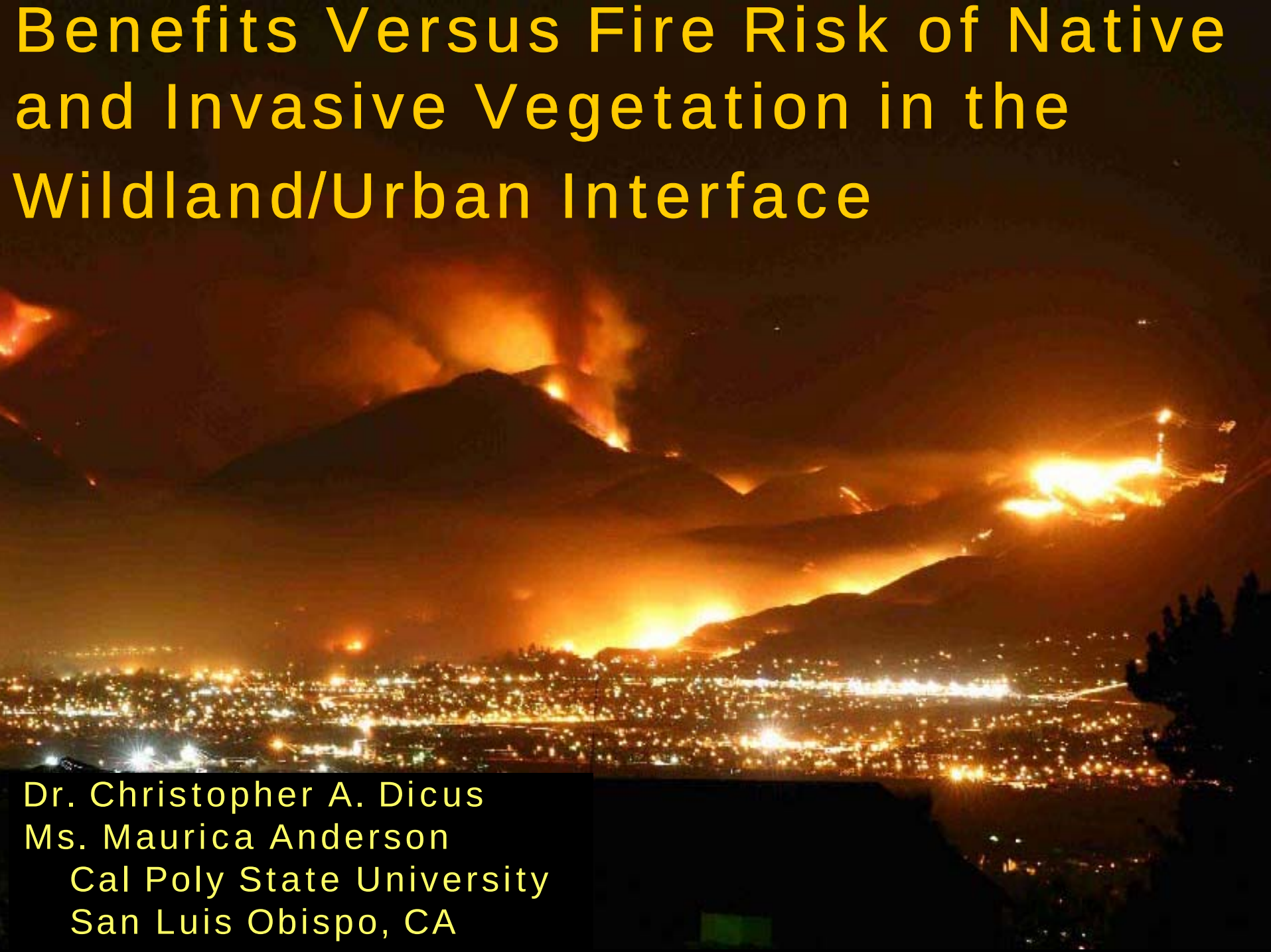
Benefits Versus Fire Risk of Native and Invasive Vegetation in the Wildland/Urban Interface



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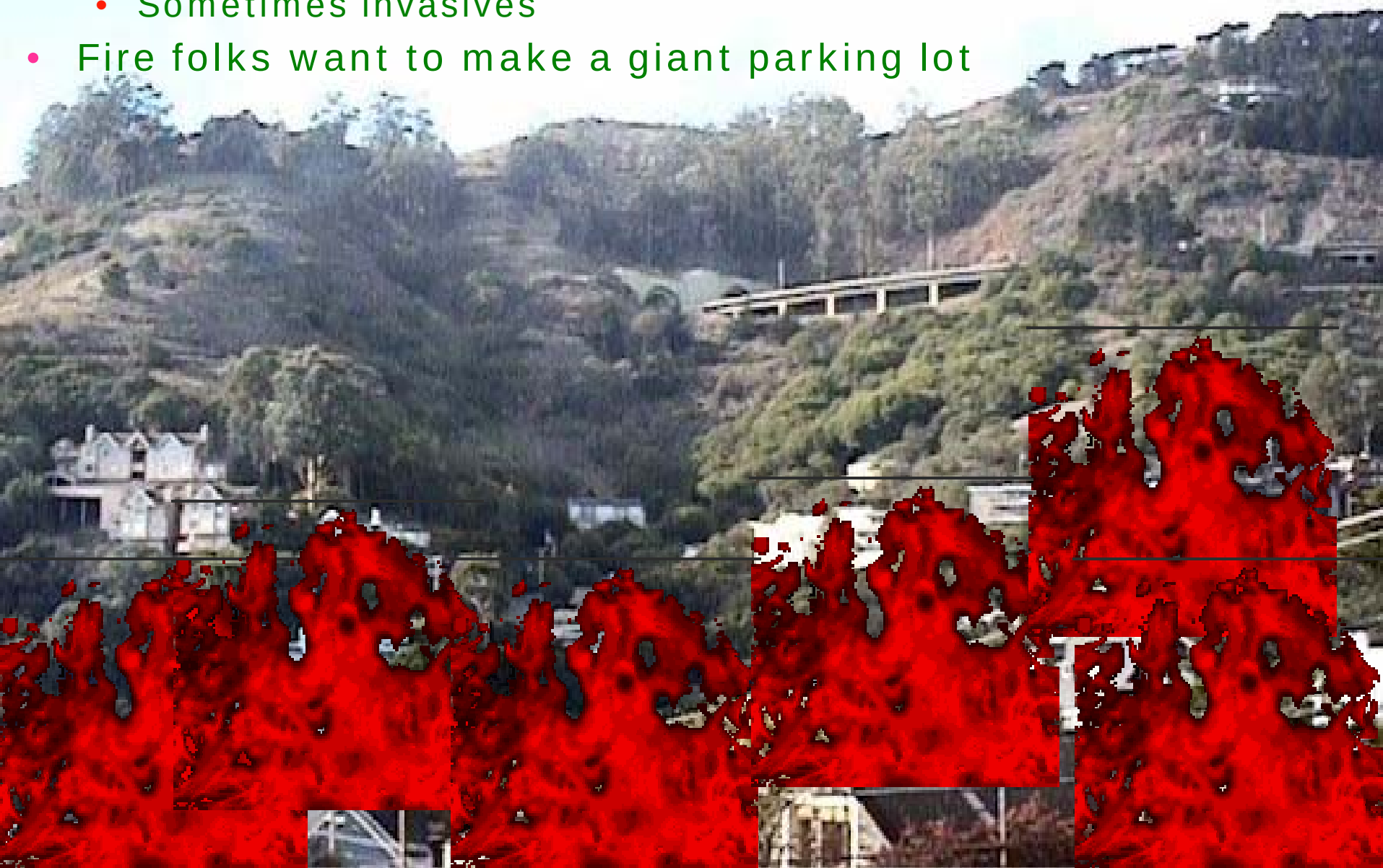
San Luis Obispo, CA

The dilemma...

- Urban foresters want more vegetative cover
  - Sometimes invasives
- Fire folks want to make a giant parking lot



The objectives....

Determine...

1. Community benefits for various native and invasive plant communities
2. Potential fire behavior for each of the communities above
3. The effect of “treating” these types

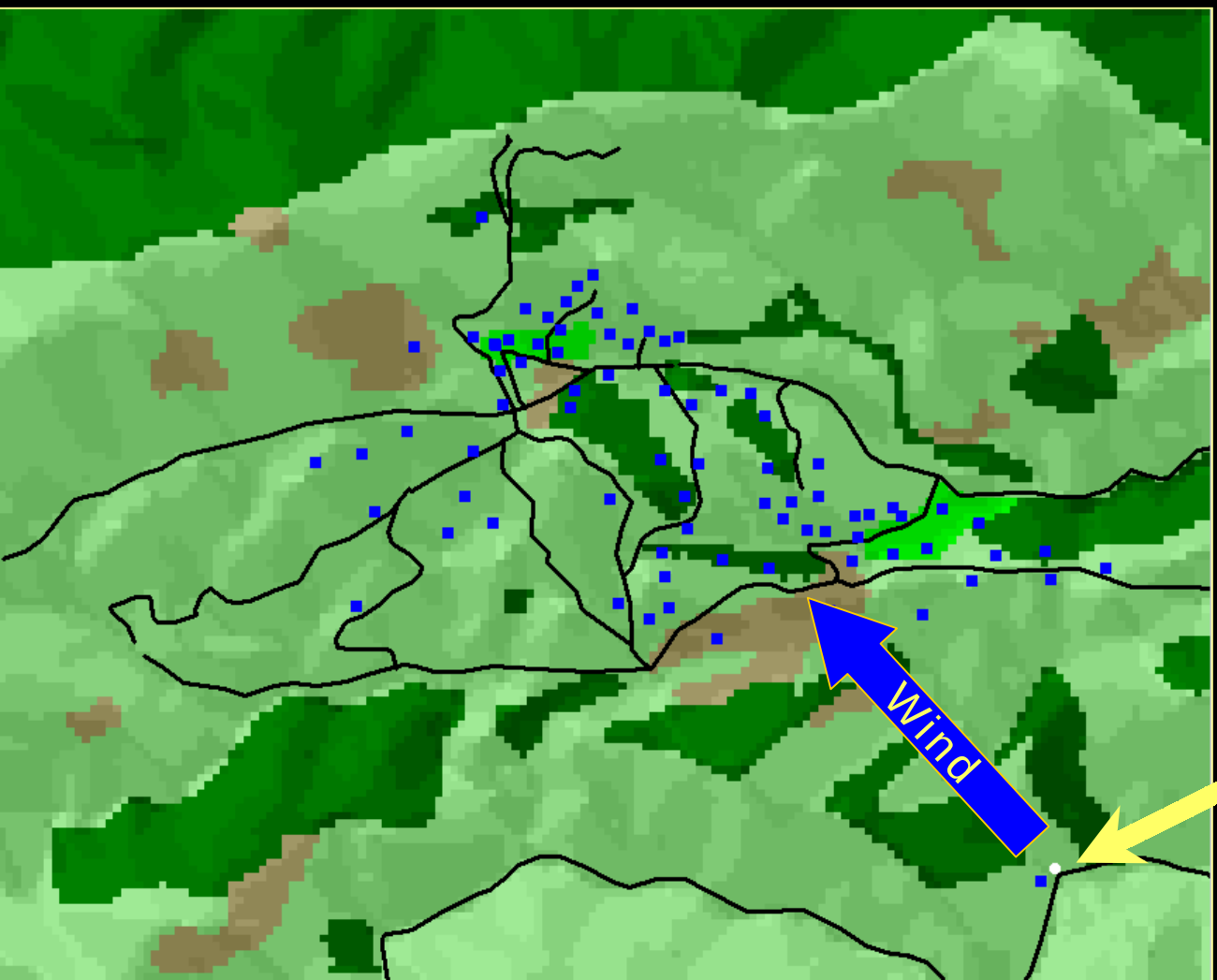
The tools...

- CITYgreen
  - Landscape planning tool for community planners
    - Air pollution removal
    - Carbon sequestration
    - Stormwater runoff

- FARSITE
  - Landscape simulations of fire behavior
    - Intensity
    - Rate of spread

The site...

- Weather
  - Temp: 90ºF
  - RH: 30%
  - Wind: 30 mph (SE)
- Slope: 15-30%
  - Aligned with wind
- Fuel moisture
  - Dead 4%
  - Live 90%
- Community uplsope

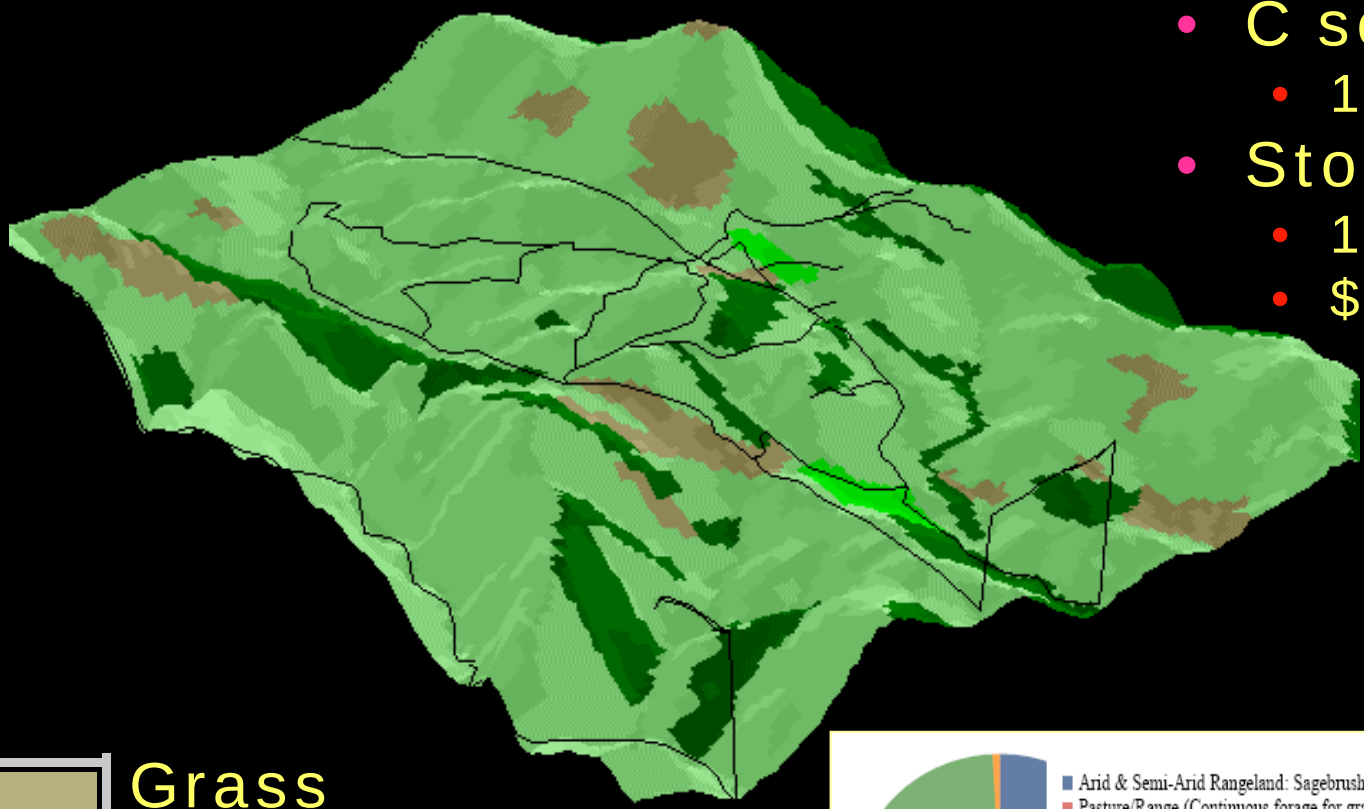


Fire ignites here

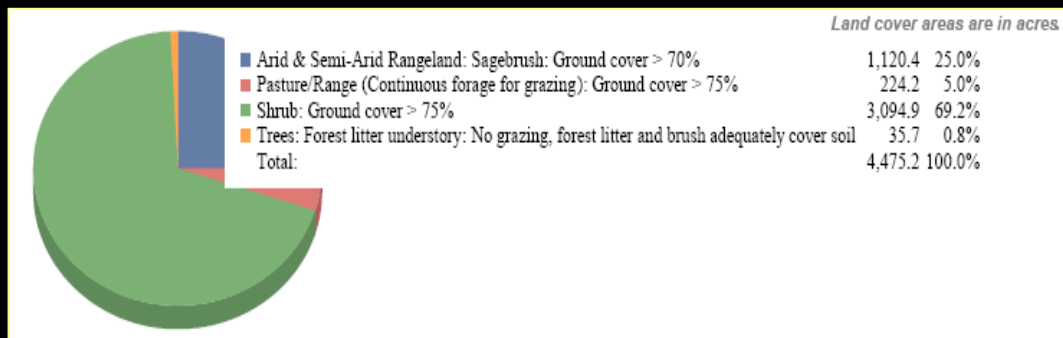
Burns 4 hours

Mature chaparral (FM 4)

- Air pollution
  - 3440 lbs
  - $8774
- C sequestration
  - 1197 tons
- Stormwater
  - 1.4 million ft^3
  - $250,000



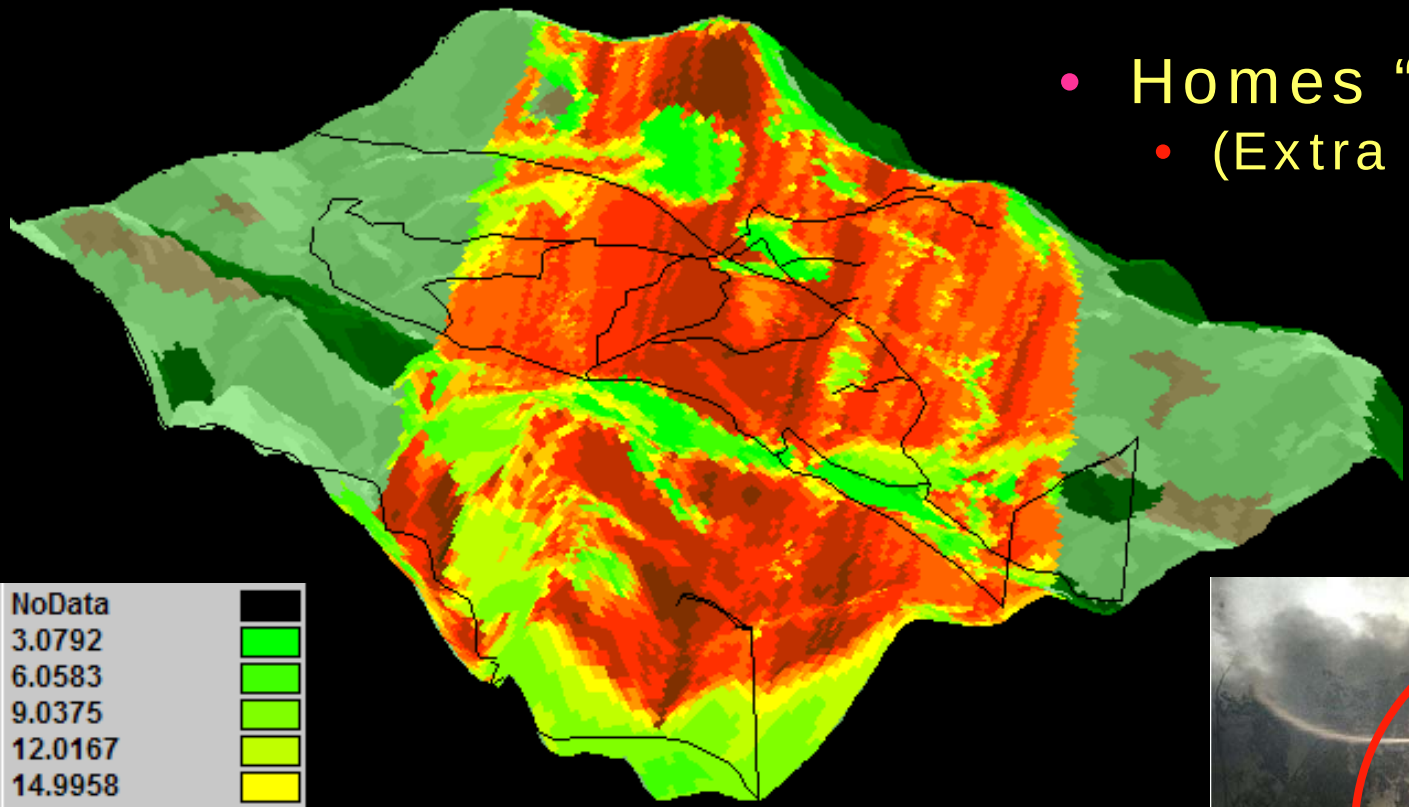
Grass
Brush
Oak
Brush



Mature chaparral (FM 4)

- 1943 acres
- High intensity

- Homes “threatened”
  - (Extra crispy)



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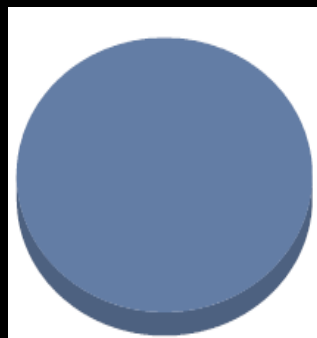
32.8708	
35.8500	

Iceplant (custom FM)

- Air pollution
  - 0 lbs
  - $0
- C sequestration
  - 0 tons
- Stormwater
  - 3.71 million ft^3
  - $7.4 million

Grass
Iceplant
Oak
Iceplant



Land cover areas are in acres

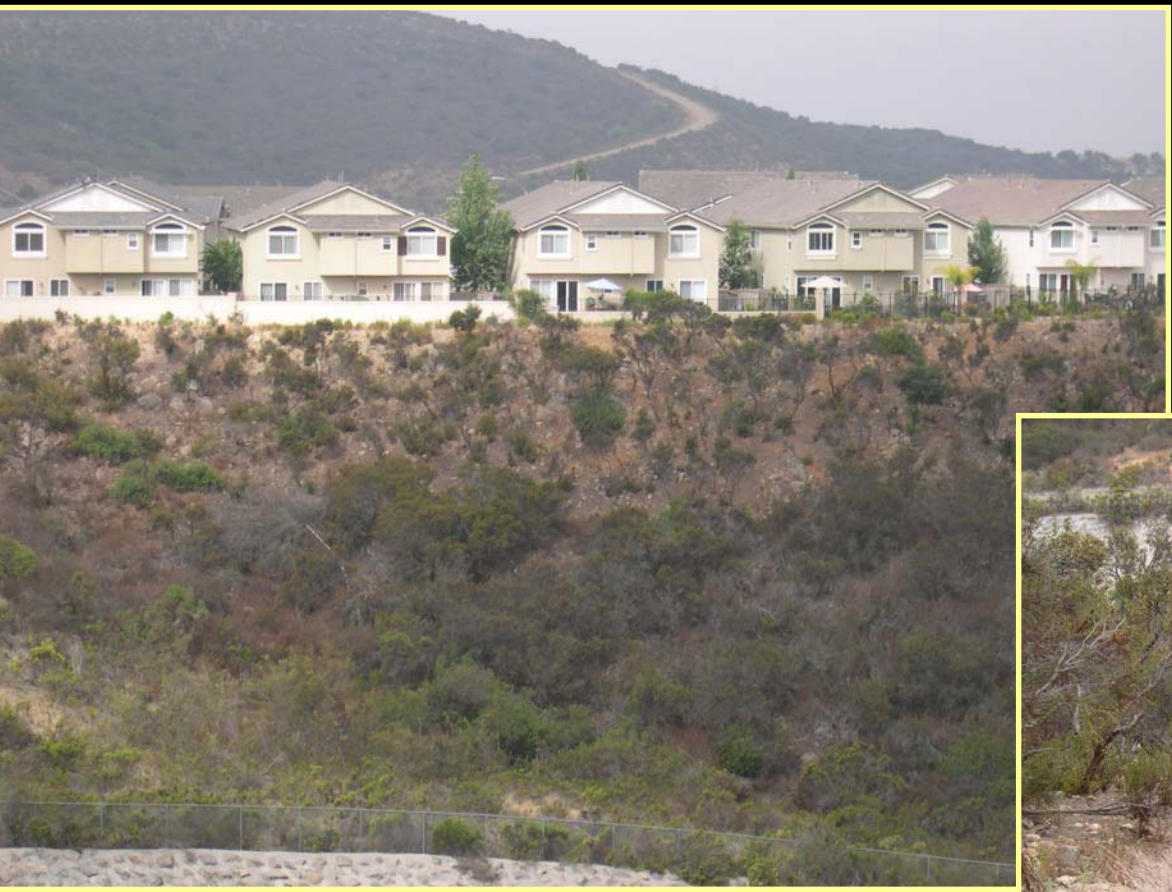
Arid & Semi-Arid Rangeland: Herbaceous: Ground cover > 70%	4,475.2	100.0%
Total:	4,475.2	100.0%

Iceplant (custom FM)

- No fire
  - Great chance of slope failure
  - Forces native plants out

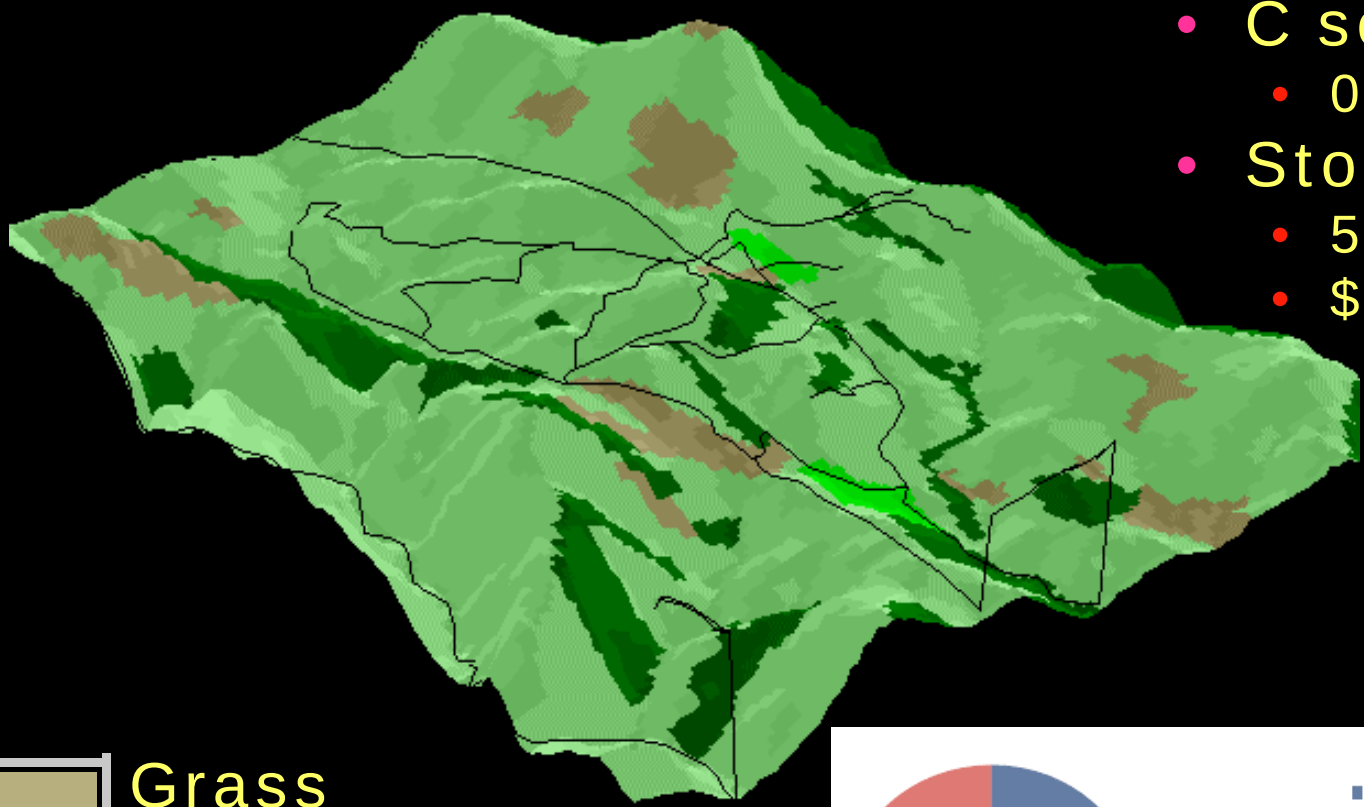
An alternative...

- 100’ zone in San Diego
  - Chaparral thinned
    - Keep high-moisture species
      - Toyon, coyote bush
    - Pruned up



Modified chaparral (custom FM)

- Air pollution
  - 0 lbs
  - $0
- C sequestration
  - 0 tons
- Stormwater
  - 5.7 million ft^3
  - $11 million



Grass
Brush (treated)
Oak
Brush (treated)

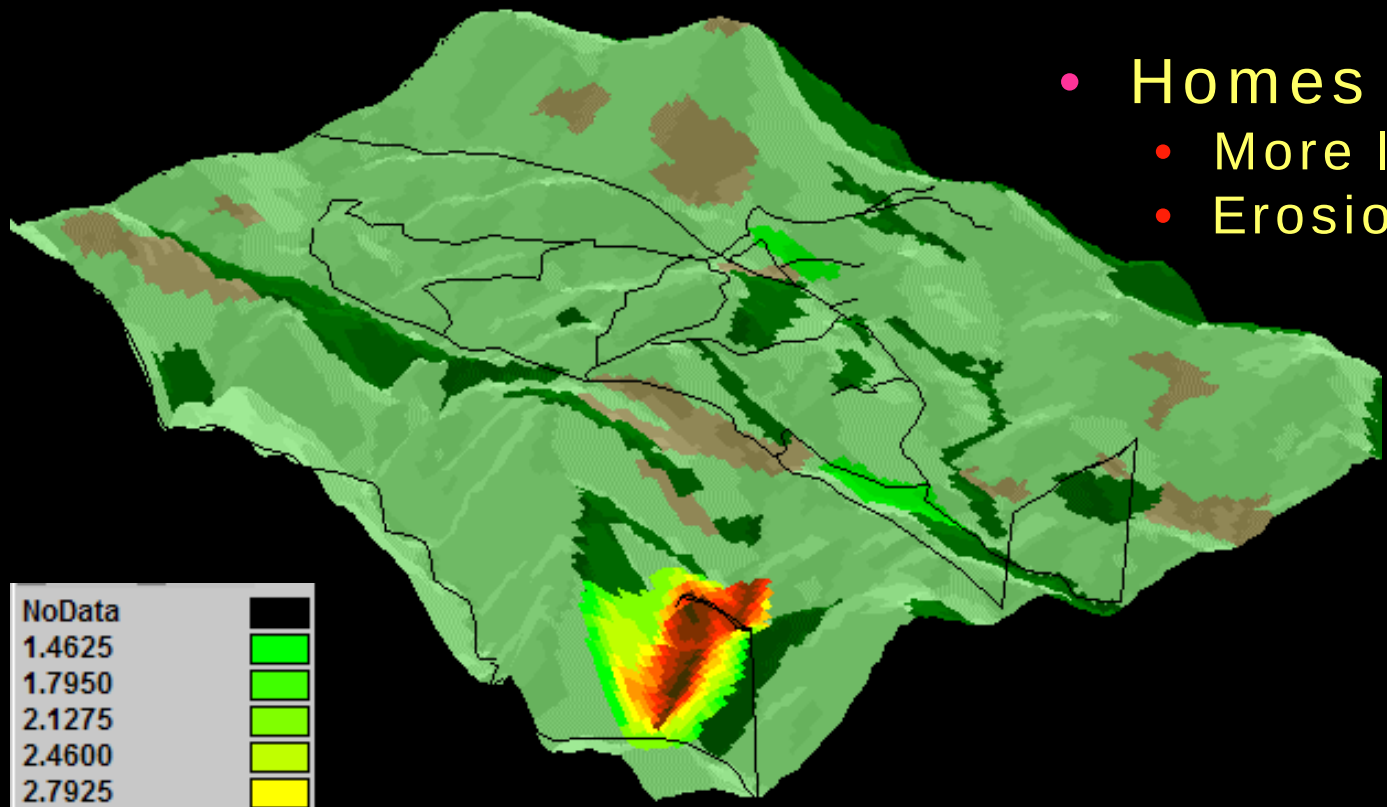
Land cover areas are in acres.

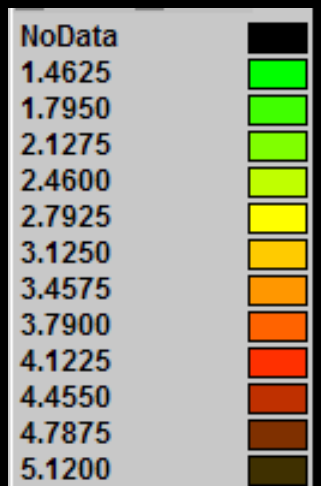
Impervious Surfaces: Unpaved: Dirt	3,319.1	74.2%
Shrub: Ground cover > 75%	1,156.1	25.8%
Total:	4,475.2	100.0%

Modified chaparral (custom FM)

- 66.4 acres
- Low intensity

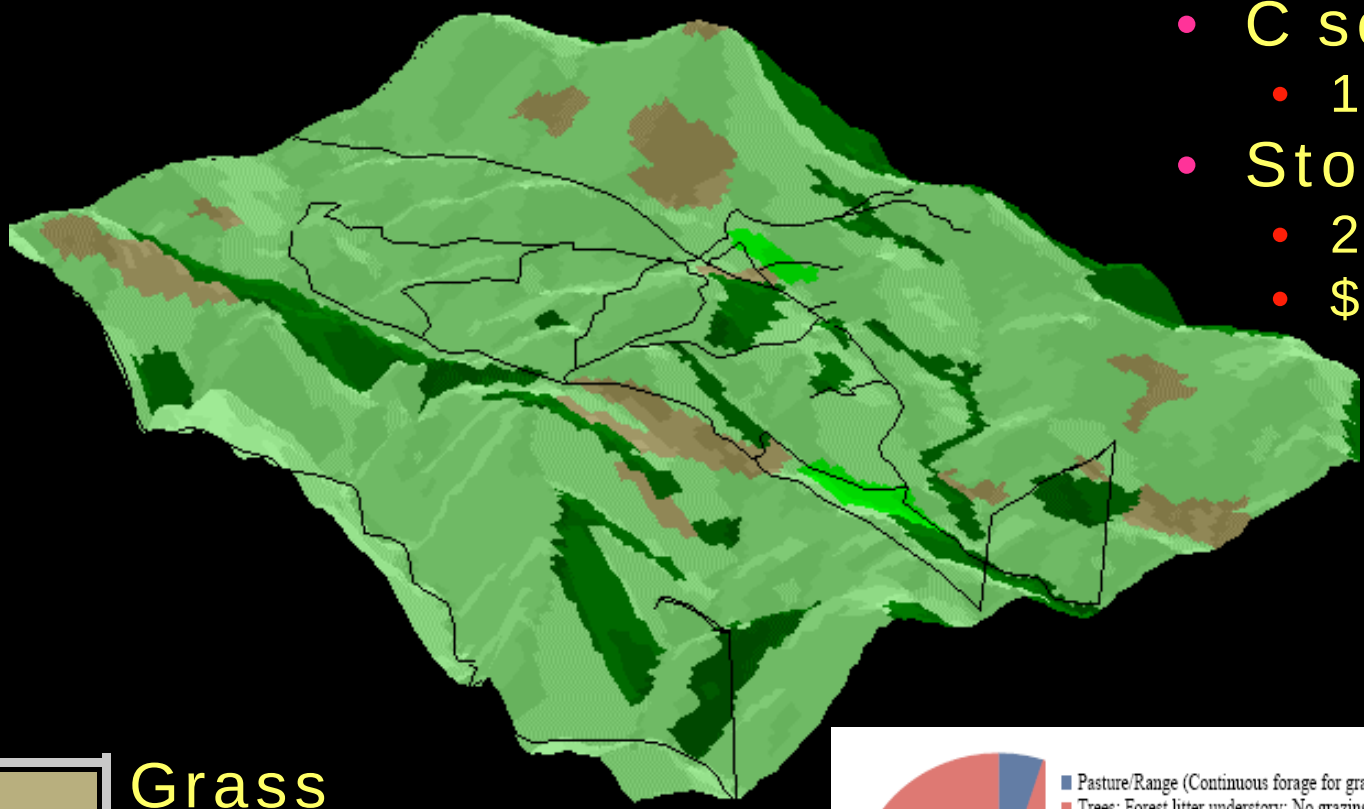
- Homes “safe”
  - More later
  - Erosion?



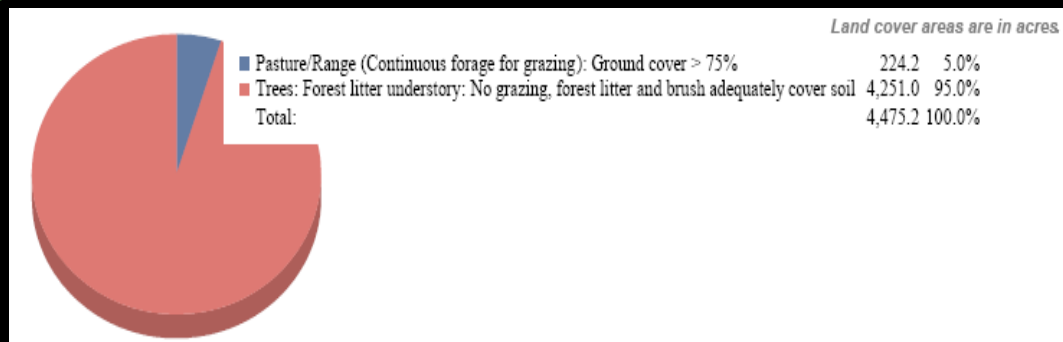


Eucalyptus (FM 9)

- Air pollution
  - 409,000 tons
  - $1 million
- C sequestration
  - 1420 tons
- Stormwater
  - 27.3 million ft^3
  - $54.6 million



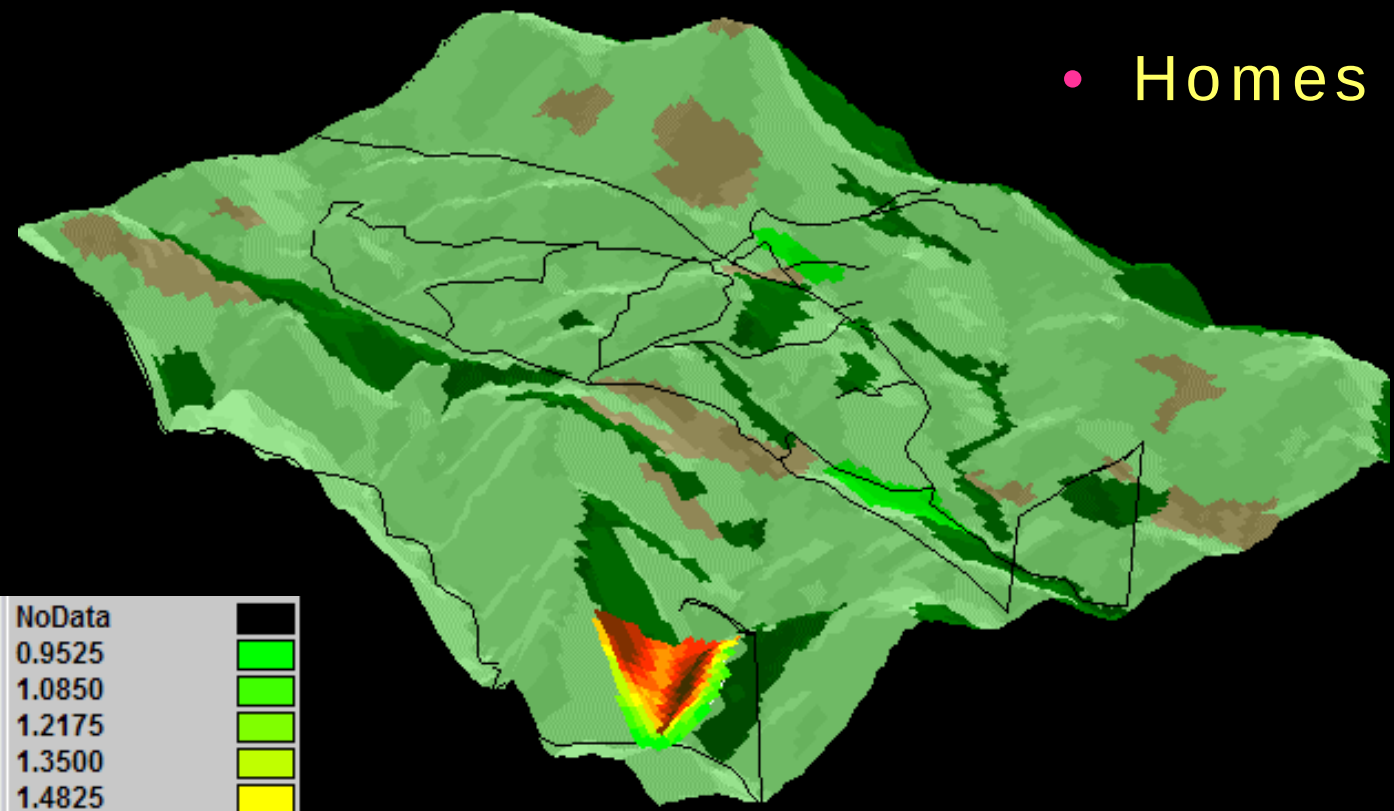
Grass
Eucalyptus
Oak
Eucalyptus

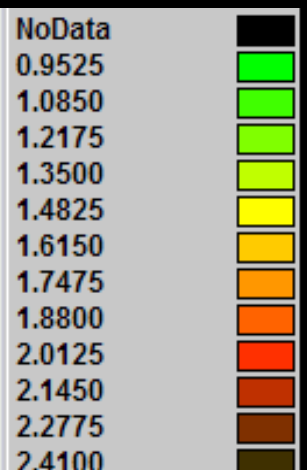


Eucalyptus (FM 9)

- 28.5 acres
- Low intensity

- Homes “safe”

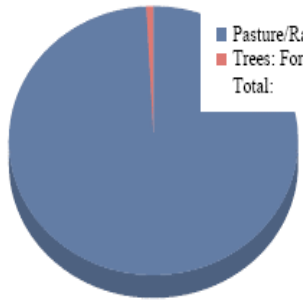




Thinned Eucalyptus (Custom FM)

- Air pollution
  - 3400 tons
  - $8800
- C sequestration
  - 12 tons
- Stormwater
  - 3.5 million ft^3
  - $7 million

Grass
Eucalyptus (treated)
Oak
Eucalyptus (treated)

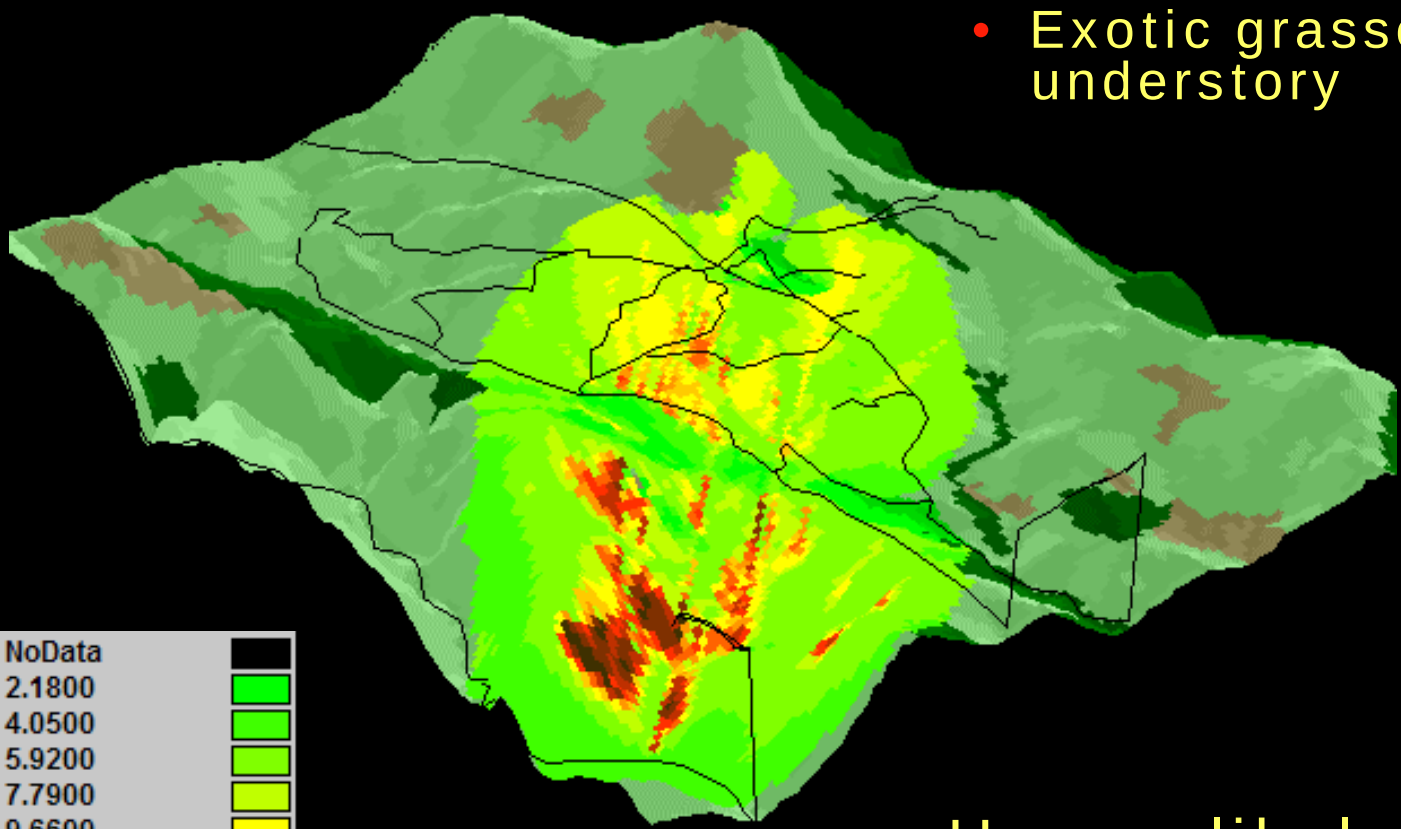


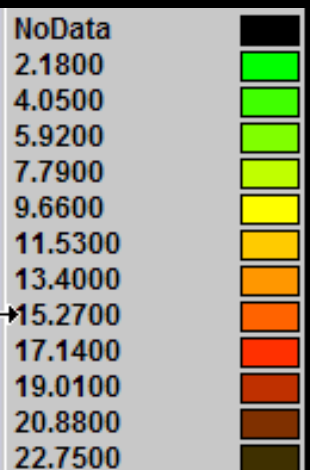
Land cover areas are in acres.

Pasture/Range (Continuous forage for grazing): Ground cover > 75%	4,439.5	99.2%
Trees: Forest litter understory: No grazing, forest litter and brush adequately cover soil	35.7	0.8%
Total:	4,475.2	100.0%

Thinned Eucalyptus (Custom FM)

- 1040 acres
- Moderate to high intensity
  - Exotic grasses & brush in understory





- Homes likely cooked

Fuel not always the problem

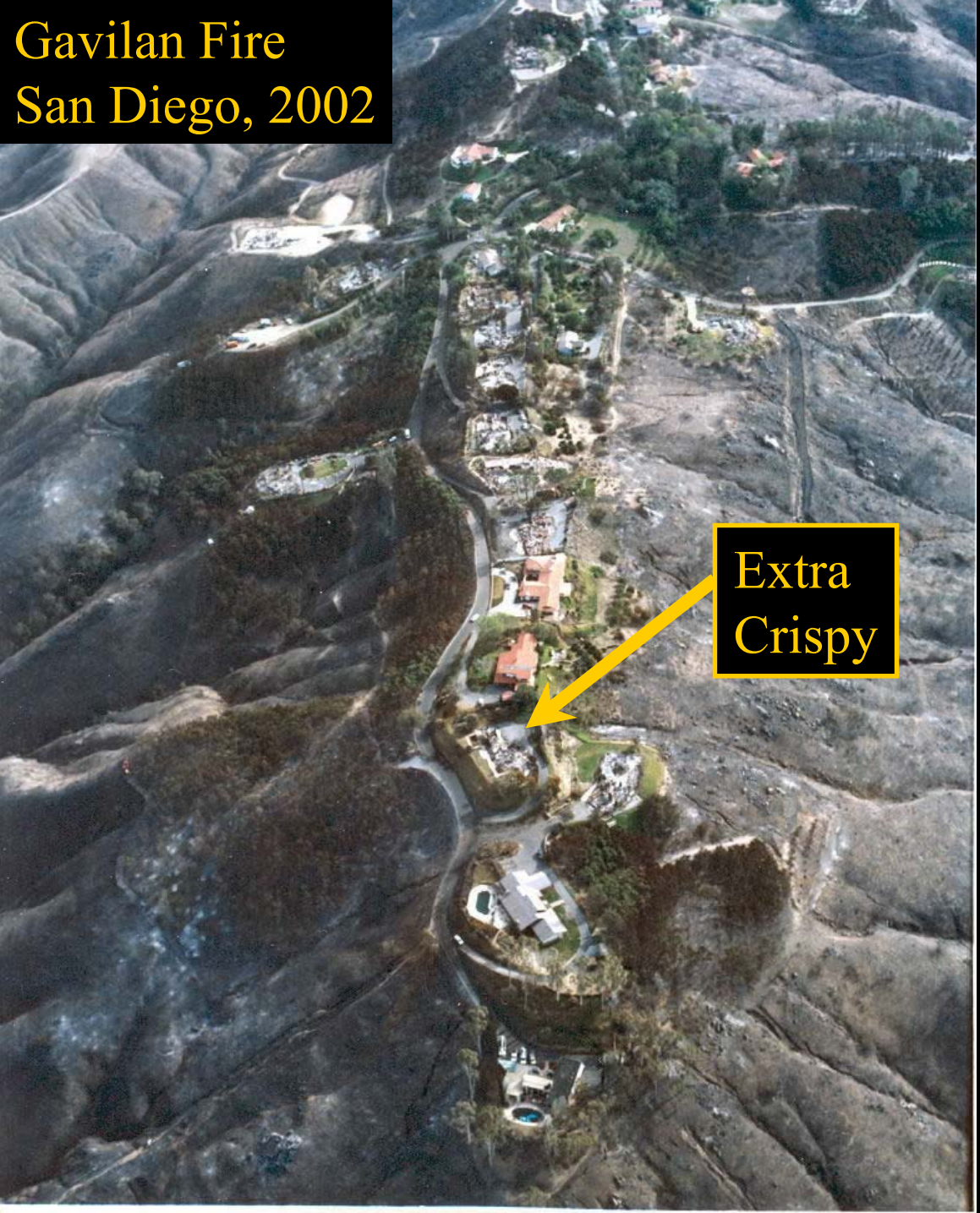
- House burned yet vegetation is untouched
  - Huh???

Cedar Fire 2003

Fire brands

Homes often burn from inside out


A not so
quick
fix...



- >200' clearance
- Class-A roof

- Why did it burn???
  - Built in topographic chimney

The conclusions...

- Both native and invasive species have variable benefits and fire behavior
- Treatments may have unexpected consequences
- Not overly confident with CITYgreen in brush
- “It takes a village” to keep one from burning down

L.A. Times

Thanks!!!

- Funded by the
  CA Agricultural Research Initiative