

Biomass Utilization in San Diego County

After the 2003 Wildfire Disaster

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Dimensions of the Disaster

- **392,161 acres burned**, chaparral, oak savannahs and woodlands, and mixed conifer forests
- **2,688 residences**, commercial buildings, and industrial units destroyed
- **2,929 accessory buildings** destroyed
- **3,773 vehicles** destroyed
- **Sixteen fatalities**

300 foot tall flames roaring in at 70 mph



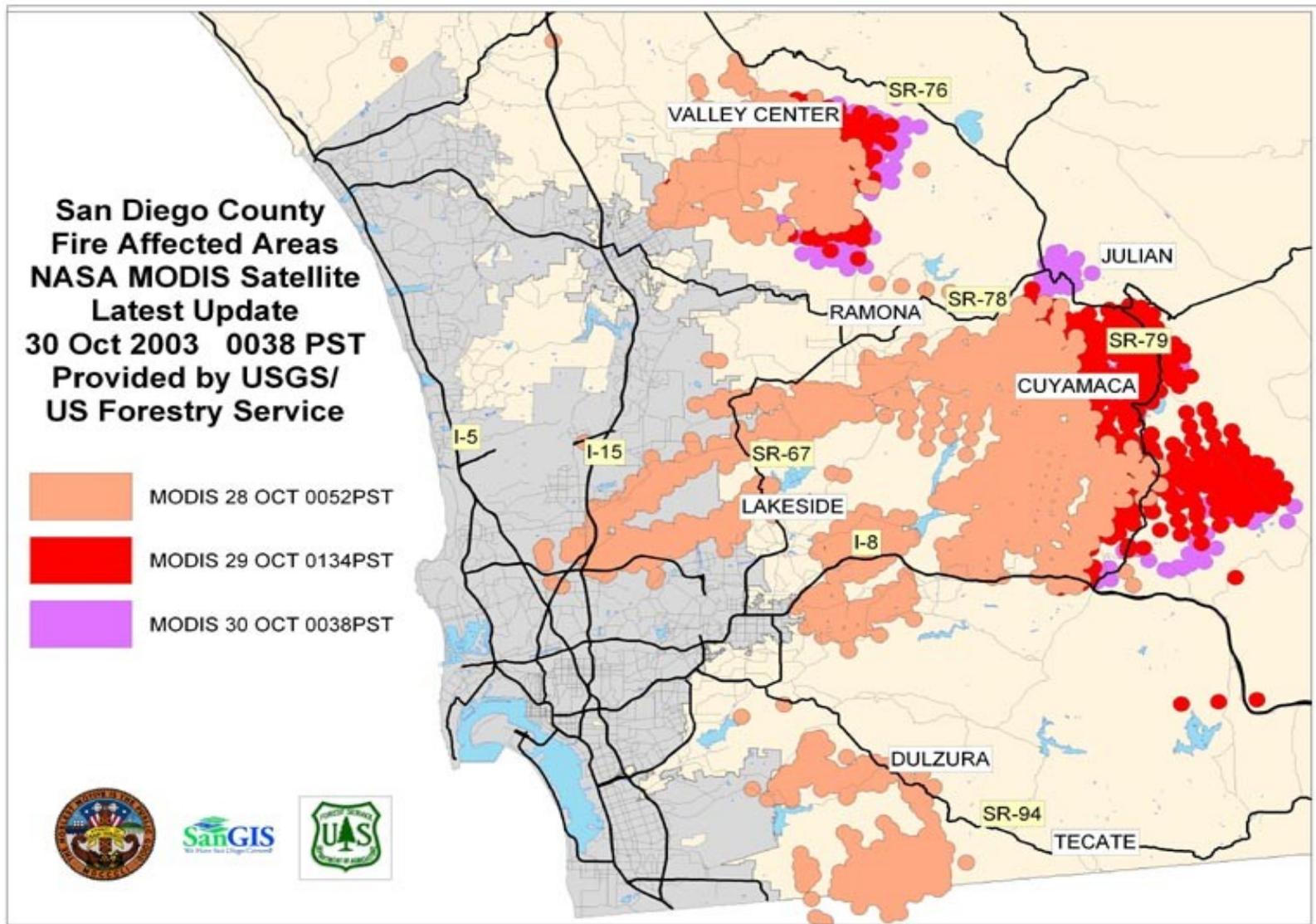
5,617 Buildings Burned



Sixteen people died; firemen and rescue crews protected thousands



Daily chronicle of Cedar Fire







Eucalyptus Plantation

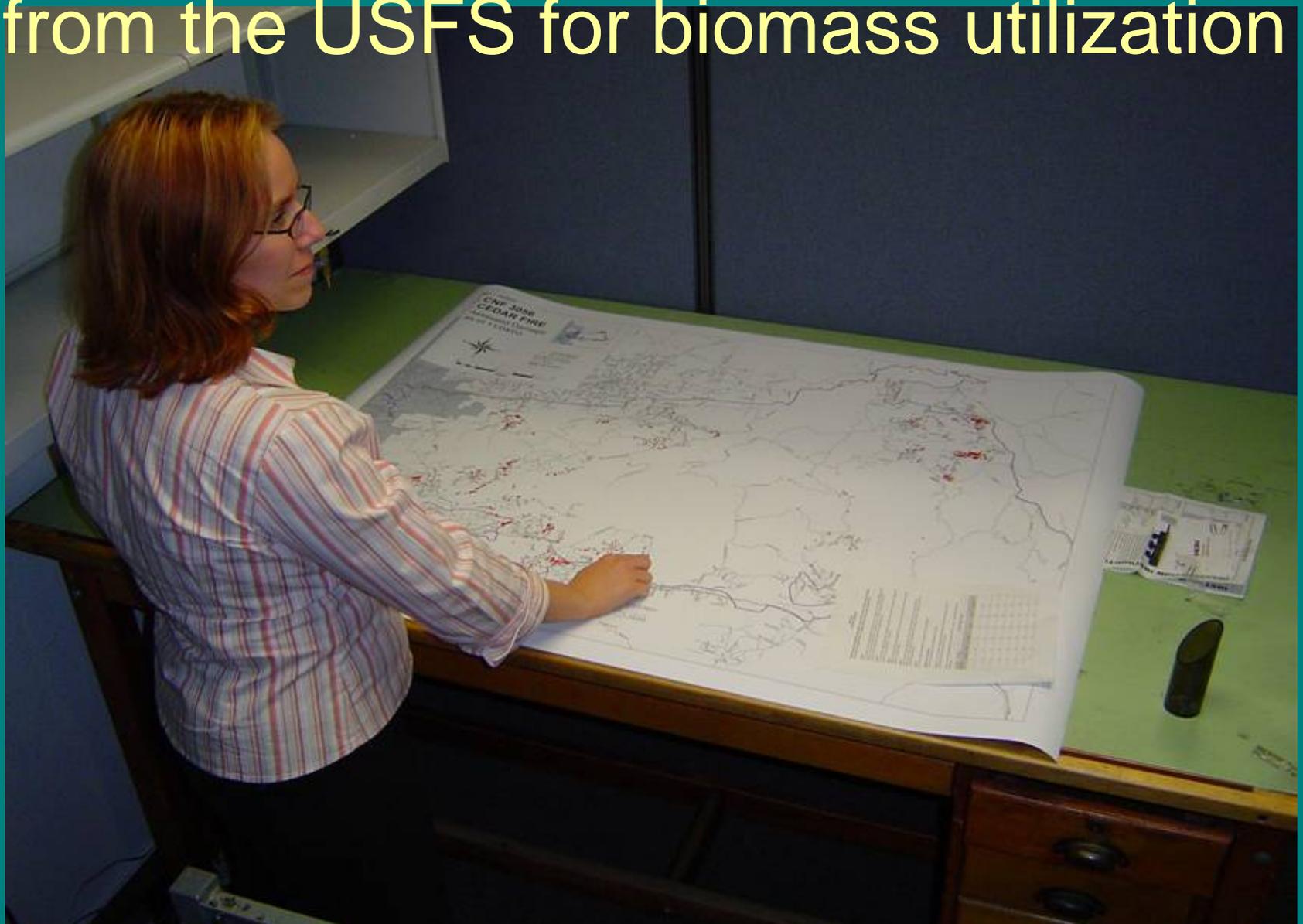




Residential hazards: Dead, dying, diseased trees



Planning began with a grant of \$1.75M from the USFS for biomass utilization



Plan of Operation: Priorities for Biomass Utilization

- **Top Priority** is to protect human health and welfare. Dead, diseased and dying fuel reduction program implemented along critical corridors and human habitations
- **Protect the forest.** ~ mulch applications
- **No burning** in curtain furnaces or open fires
- **No landfilling** of organic material

Priorities for Recovery

- **Protect the Forest**

Spread chips on forest floor, logging and access roads for erosion control. Use best forestry management practices.

No burning of slash in the forests or elsewhere except in biomass plants (Mecca)

- **Protect the greater environment**

No landfilling of any forest organic residues

- **Develop Markets and Strategies**

Don't flood the markets

Landfilling was prohibited



Black Oak forest, Harrison Park



Mountains of limbs and trunks





Market Development

- **Merchantable timber** was taken to sawmills as far away as Washington State; some was even shipped to China. Three local mills were built.
- **Primary species of value** were Incense Cedar, White Fir, and Jeffrey Pine.
- As of November 2006, **464,385** trees had been harvested on **31,026** acres.







Market Development

- **Agricultural Applications**
 - Apple orchards at higher elevations (15,000 tons)
 - Citrus and Avocado orchards in nearby valleys (15,000 tons)
- **New potentials include:**
 - Poultry operations, dairies
 - Horse ranches
 - Composting
 - Landscaping, nurseries

Secondary Markets

- **Chips and slash** were transported to the biomass plant in Mecca, Riverside, CA (About 15,000 tons accounted for as a conservative estimate).
- **Chips and slash** were also transported to various landscaping companies in San Diego, Orange and Riverside counties for mulching and composting. (estimated 15,000 tons).



Tub Grinder in Action



Many kinds of value added mulch and compost have been produced



Apple orchards received more than
15,000 tons of mulch debris





Turning poultry compost





Phytophthora spp.



Innovative use of burnt logs



Preliminary Economic Model

- Assumptions: As of November, 2006
- 176,466 Merchantable trees harvested (38% of stands treated).
- 447,300 Bd Ft Lumber (\$0.21/bd ft)
- 1,427,000 Bd Ft chips and firewood (\$2 /cubic yard).
- ~ \$15 Million total value of biomass
- After grant costs and 2.5 multiplier, there is a net gain to the economy of ~\$10.9 Million

Remnants of sawmill activities remain to be cleaned up







