Forest Products & Construction Equipment Exposition,
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Woody Biomass Utilization Opportunities

Logic and Technologies

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In partnership with
USDA Forest Service Region 5

Overview of today

Purpose:

Look at some alternatives for woody biomass utilization based on challenges and opportunities that will work today

Aim to deliver benefits now:

- Reducing wildfire risk
- Enhancing forest health
- Delivering value to communities

Plus:

- California trends
- Funding sources

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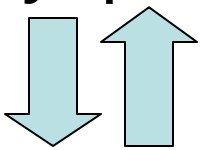
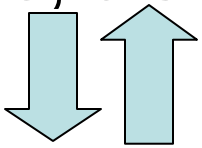
Overview: Value chain considerations

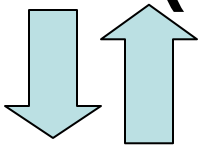
Resource : quality, price, availability



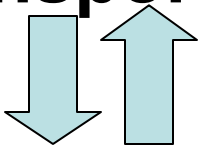
Transport: mode, distance, terrain



Process – Product (technology)



Transport



Market

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Woody biomass in California








Key criteria: Raw material form is important

Every process has a raw material specification

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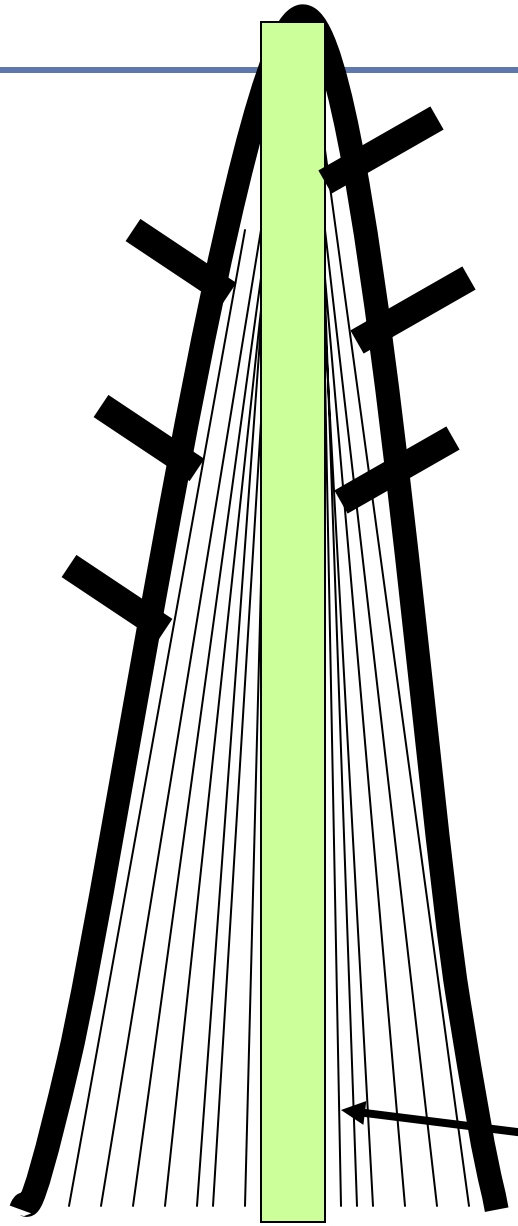
Small Diameter Wood is Different from wood derived from larger trees



Juvenile Wood Core – first 5 to 20 growth rings

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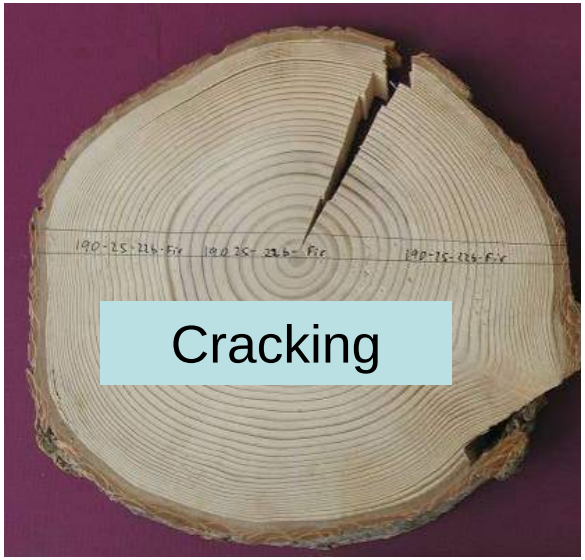
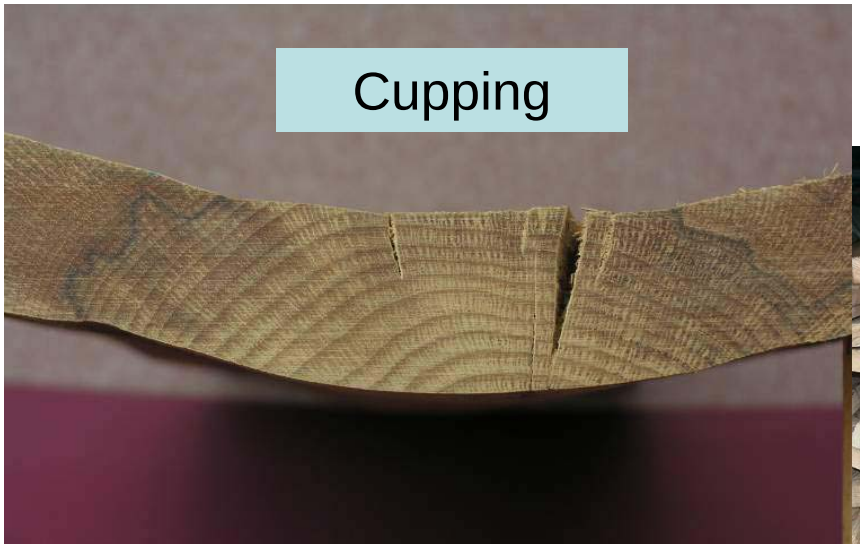
Problems with smallwood?

- Raw material properties
  - Juvenile wood
  - Differential shrinkage
  - Knots

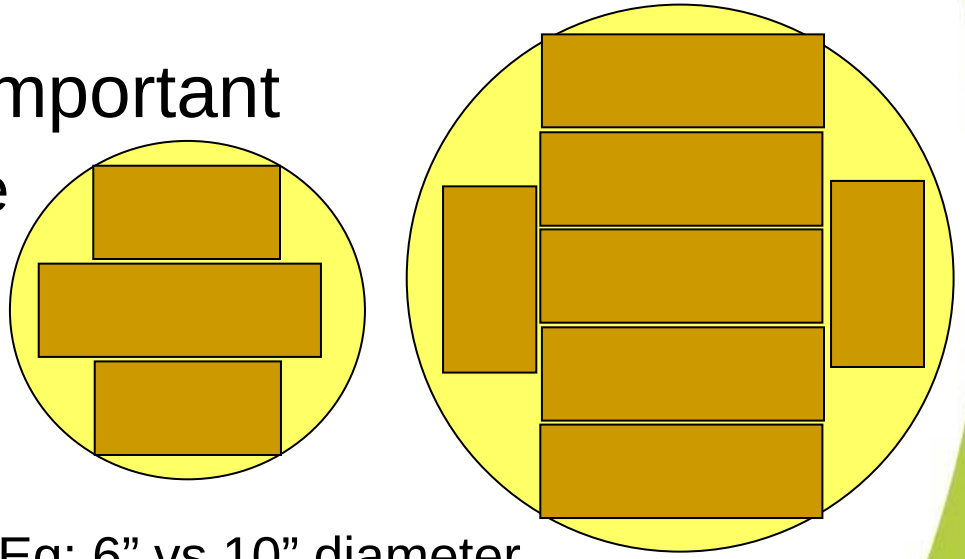




It behaves badly…

Processing small logs

- More logs to process for same output
- Higher transportation costs
- More handling in mill
- Less valuable products
- Defects have a greater impact (knots, juvenile wood etc)
- Efficiency is very important
  - Speed and volume



Eg: 6” vs 10” diameter

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Breaking wood down into particles minimizes the impact of defects (knots, juvenile wood, insect galleries etc.)

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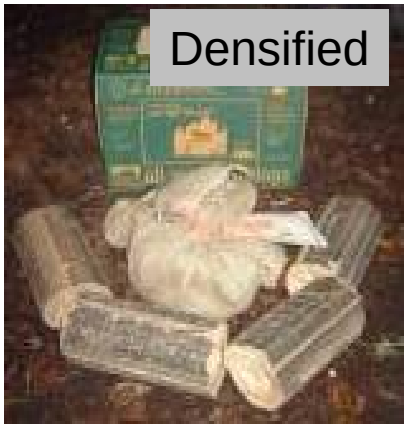
Creating uniformity



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Key criteria

- Learn from previous experience
- Woody biomass may not pay its way out of the forest but it can add value and offset costs
- Community support and involvement is important – without it many projects fail

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Key criteria – build on existing industry

- Existing infrastructure is an important opportunity:
  - Contractors
  - Primary processing (sawmills, veneer etc)
  - Powerplants
  - Panelboard
  - Pulp

  - What do they pay?
  - Feedstock specification?
  - Opportunity to adapt to changing feedstock?

Infrastructure is difficult to bring back

…when it is gone it is gone

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Key criteria: technology

- Wood technology can do almost anything
- There are many existing proven technologies
- Even more “emerging technologies”
  - Carry out due diligence
  - Silver bullets do not exist

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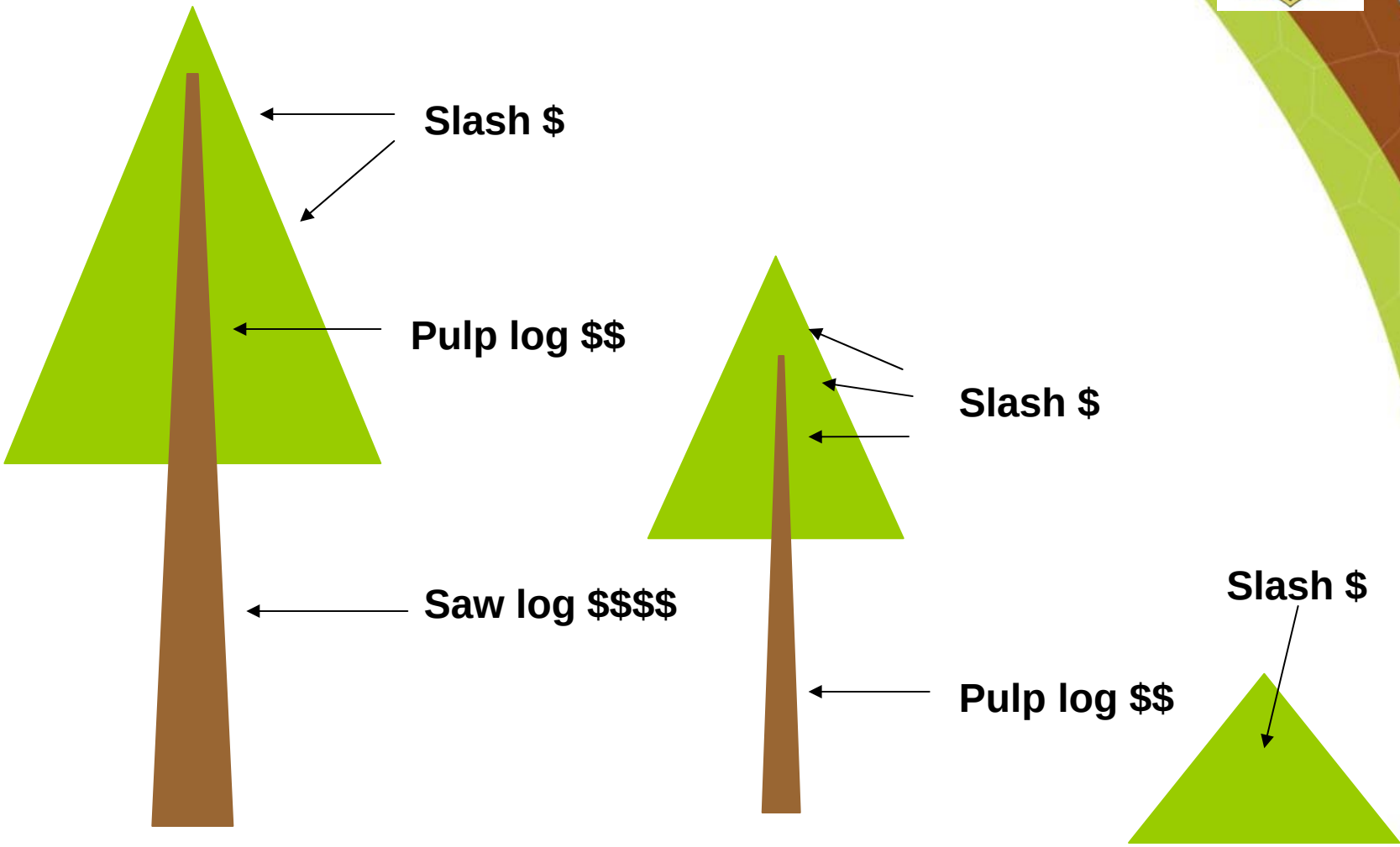
Key criteria - scale

Scale of markets vs biomass availability

- **Bulk (100,000+ ton/yr)**
  - A monster to feed?
  - Long term (~10+ years) supply commitments required
- **Small-medium markets (<60,000 ton/yr)**
  - Less risk
  - Less controversial
  - Community scaled

Key criteria: Value helps to move residuals



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Products/technologies of interest:

1. Sawing
2. Roundwood
3. Densified wood products
4. Chip and shavings
5. Firewood
6. Institutional heat

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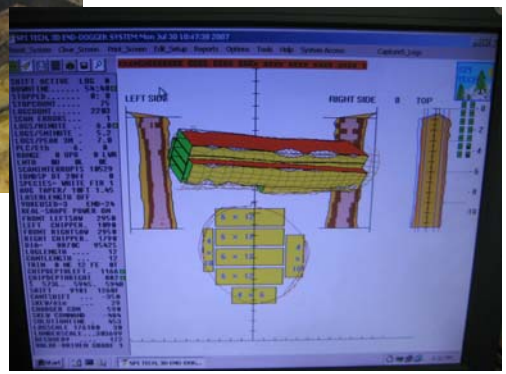
1. Small log sawmilling



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2. Round Wood-Is Stronger and More Stable

Slide provided by USDA Forest Service, Forest Products Lab

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Connections are Difficult-Costly

Slide provided by USDA Forest Service, Forest Products Lab

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Post and Pole – more realistic for now

- Low tech
- Low investment ($750k)
- Big market in California

Post and Pole key figures

- Site size - 3-5 acres
- Investment - $750,000+ (ex land and permits)
- Equipment - typically 1 peeler and 1 doweler (production ~1,200 - 2,000 pieces per day)
- Raw material – lodgepole pine, ponderosa pine (treatability, availability, lower taper and smaller knots), White fir and douglas fir less desirable (treating and shipping weight issues)
- Typical plant needs 10,000-20,000 tons/yr (depending on plant efficiency)
- Employees – 10-15
- Market Trends - lower Canadian dollar and lower fuel prices mean that there are more Canadian imports and competition
- Other considerations:
  - Residuals market (eg animal bedding, hog fuel and firewood)
  - Sorting/merchandizing system (small processors in yard vs automated sort systems with multiple bins)
  - Treatment plant – onsite or send elsewhere?

Source: Larry Swan, USFS

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3. Densified Wood Products

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Example: 40,000 ton/yr pellet facility

- 100 BDT/day
- $5.5-$7m build cost
- 24/7 operation
- 3-5 acre site
- 30-35 jobs

4. Niche woodchip and shavings

- Animal bedding (shavings) ($1m)
- Bio-filtration (chip)
- Cattle corrals (chip)

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5. Firewood

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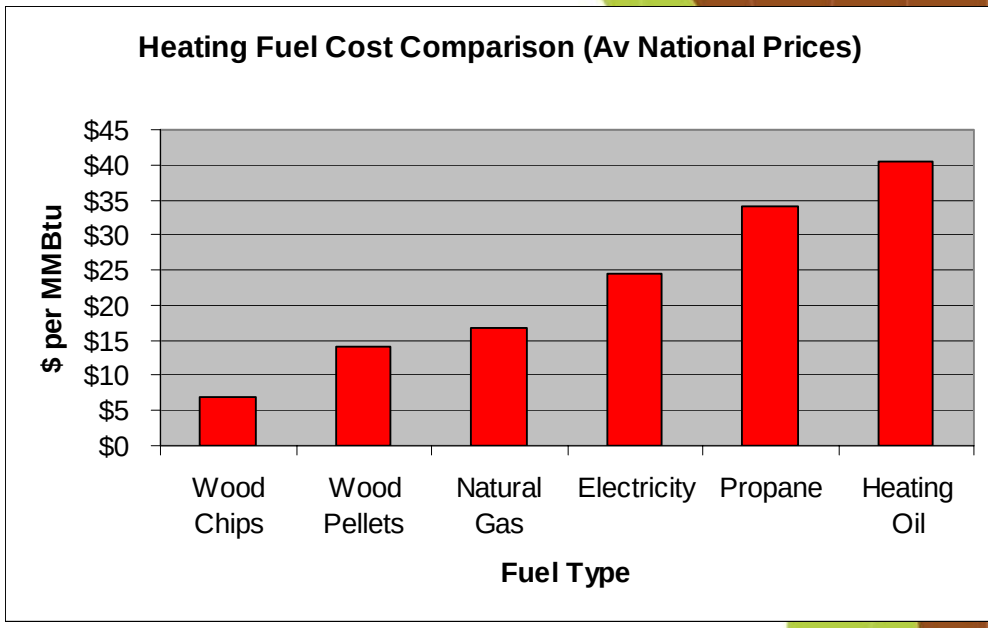
6. Small scale heat (institutional)

- Can be cheaper than alternatives – it is easy to calculate simple payback
- Carbon neutral
- Local market
- Opportunities for public buildings (10,000 sq ft to 1m+ sq ft)
- Permitting can be an issue
- Long payback period may be a problem (5-15+ yrs)



Source: US DOE Energy Information Administration, Sept 08

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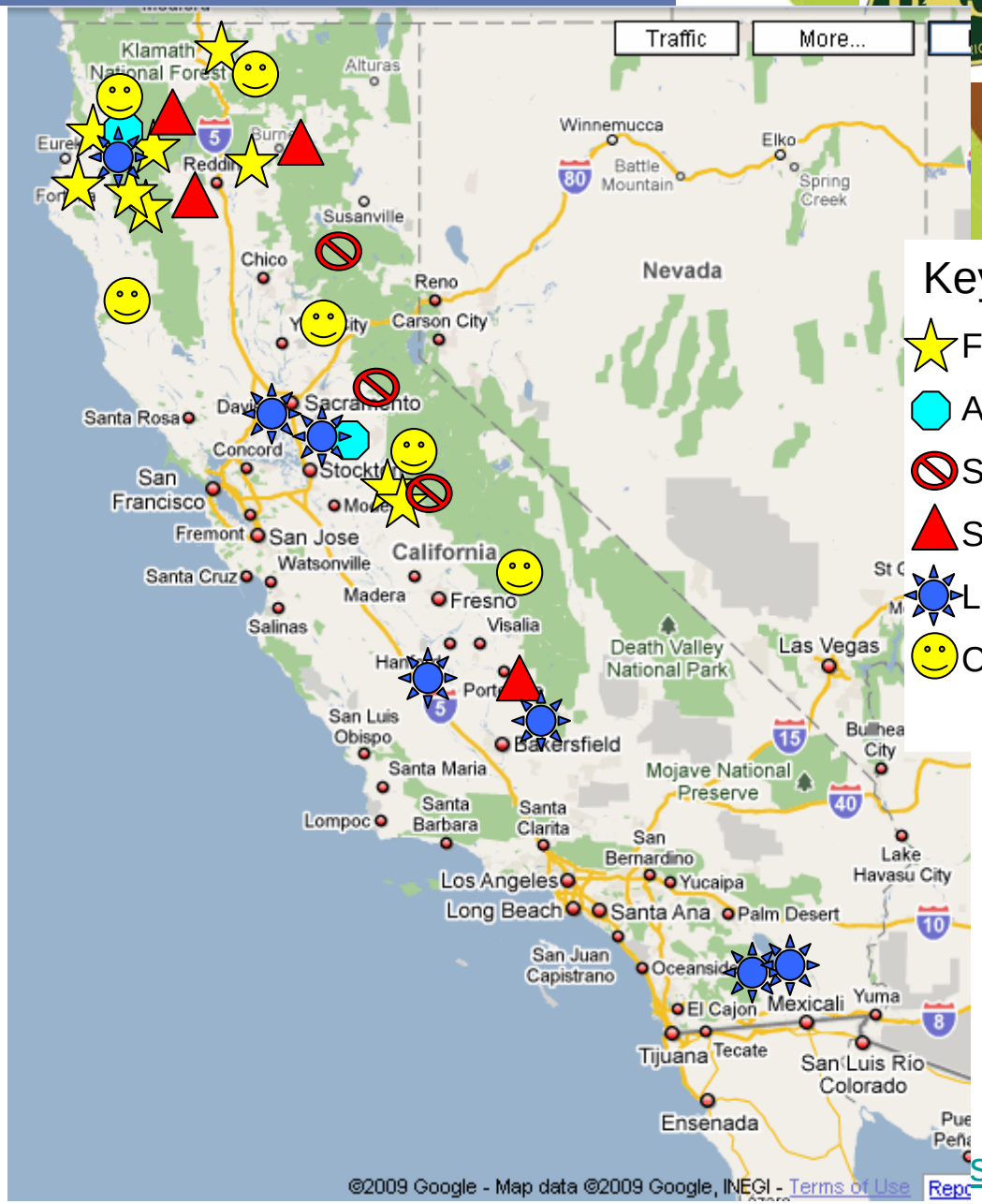
Overview of CA trends



Key:

- FPL WBU grants
- ARRA grants
- Sawmill closure
- SBA mill grants
- Large projects
- Community groups

California trends – the bad

- Recession is hurting the industry:
  - Mills reducing shifts
  - 3 sawmills closed (+1 cogen)
    - Quincy
    - Camino
    - Standard (Sonora)
  - Reduced availability of residuals (price increases)
  - Evergreen pulp mill closed (Samoa)
  - Forest Service sales receiving no bids
  - Stranded sales
  - Ongoing litigation adding to complexity

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California trends – the bright side

- New projects are moving forward:
  - New shavings mill (Sonora), new dowel mill (Blue Lake), Evergreen Pulp may restart (Freshwater Pulp, Samoa)
  - 2 new pellet mills (Sacramento, Carlotta), 1 fuel brick mill (Sonora)
  - 4 powerplant restarts (Blue Lake, Ione, Imperial Valley)
  - 2 powerplant conversions from coal to biomass (Bakersfield, Stockton)
  - 3 new powerplants (Mendocino Co, Placer Co, Fresno Co)
  - Cement kilns starting to co-fire biomass
- New community led biomass groups (Siskiyou Co, Nevada Co, Mendocino Co…)

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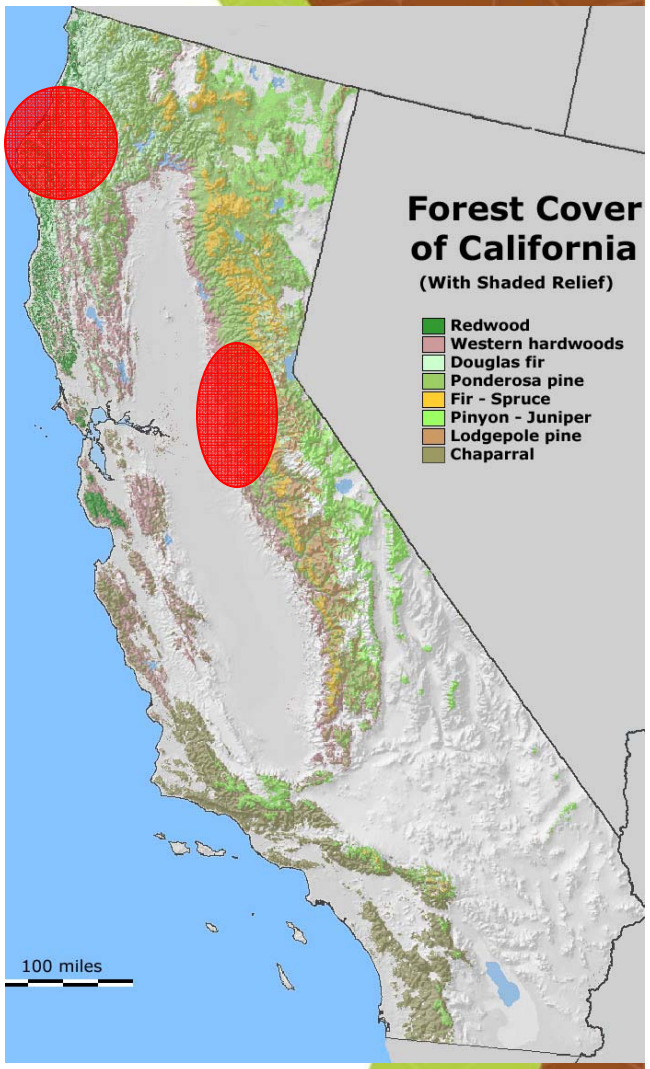
California trends - summary

- Projects are moving forward
  - Primary processing
  - Densified wood products
  - Power
- Small to mid scale reliance on NFS (up to 60,000 BDT/yr)
  - Diversified feedstock or
  - Small scale facilities
- Finance more challenging
- Communities attempting to find common ground and move forward



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Selected funding sources for projects

- USDA FS FPL Woody Biomass Utilization Grant
- USDA FSA Biomass Crop Assistance Program
- CA Association of Resource Conservation and Development Councils Forest Service Grant
- Targeted programs (earmarks)
- American Recovery and Reinvestment Act (ARRA) grants
- CEC energy demonstration programs
- CSREES SBIR Program
- Community Wood Energy Program (not funded yet)

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Selected funding sources for projects

USDA Forest Service National Woody Biomass Grant Program

Objective: creating woody biomass utilization capacity to facilitate fuels reduction

- Annual program
- RFP: September
- Award: July
- $50,000-$350,000 per project
- Generally purchases equipment
- Save money, create markets to treat additional acres

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Projects 2007-2009

~$14.8m

Examples of Funded Projects

- In Woods Equipment
  - Log Forwarder, Feller buncher, Chippers, Grinders, Loaders
- Value added processing equipment:
  - Post and Rail Processor
  - Densified wood fuel manufacturing equipment
  - Log Shavers,
  - Doweling machine,
  - Merchandizing system,
  - Log scanner,
  - Wood fired Dry Kiln

[*Red text = California projects*]

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In-woods equipment

Value-added

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Take home messages

- Increasing amounts of woody biomass will be created through ecosystem management and fuels reduction
- It is a challenge and an economic opportunity for the industry
- Moving woody biomass is expensive – subsidy or other products (eg saw logs) are needed
- Small-medium scale makes sense
- Multiple proven technologies and products available to add value
- Existing industry provides an opportunity to build on
- Community involvement is vital
- Projects are moving forward across California
- Grant assistance is available

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Thank you

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Help with:

- Grants
- Technology
- Markets
- Networks
- Healthy skepticism