Forest fuel characteristics and logistics

- for effective handling and development

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Increased utilization of primary forest fuel

- Utilize a larger proportion of the forest fuel potential
- More efficient and reliable precurement systems
- Cost reductions
- Increased value of the fuel

Planning tool
- to minimize soil damages

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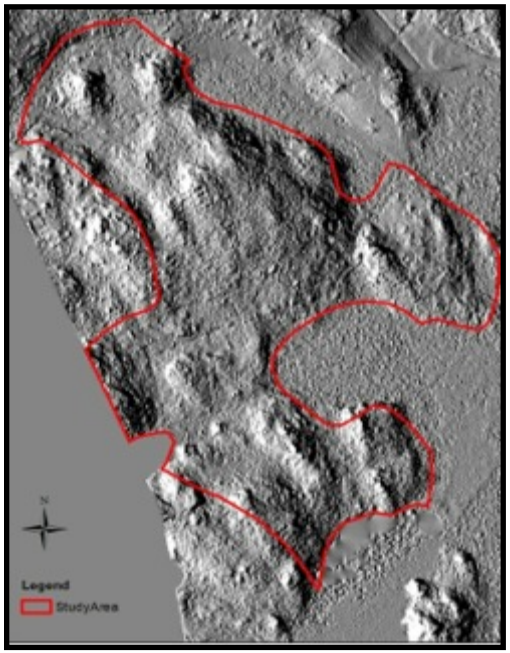
Digital terrain models

Considerations

Planning tool - Water Model

70-80% of all vehicle damage
- within areas classified as wet



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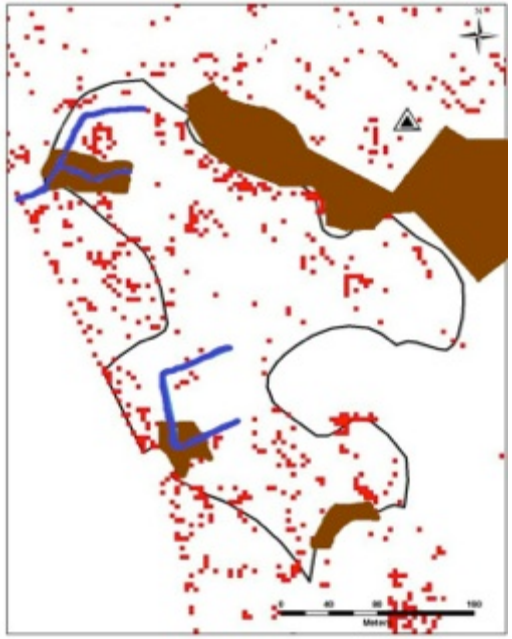

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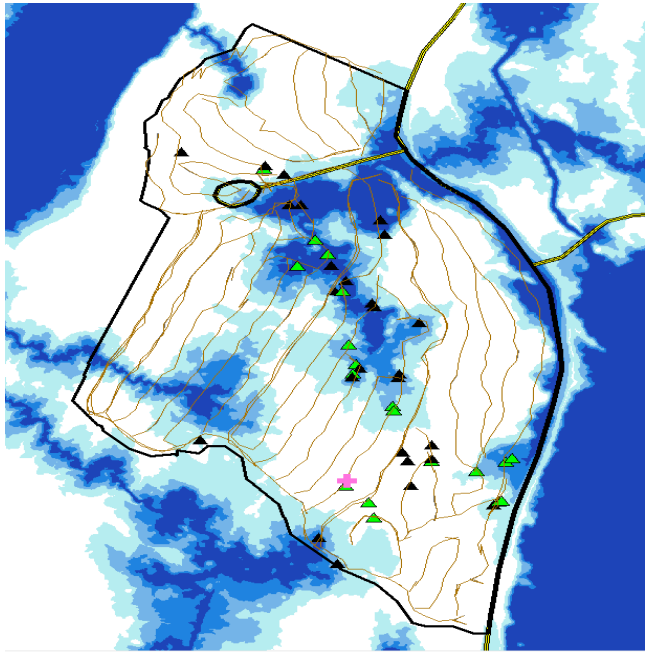
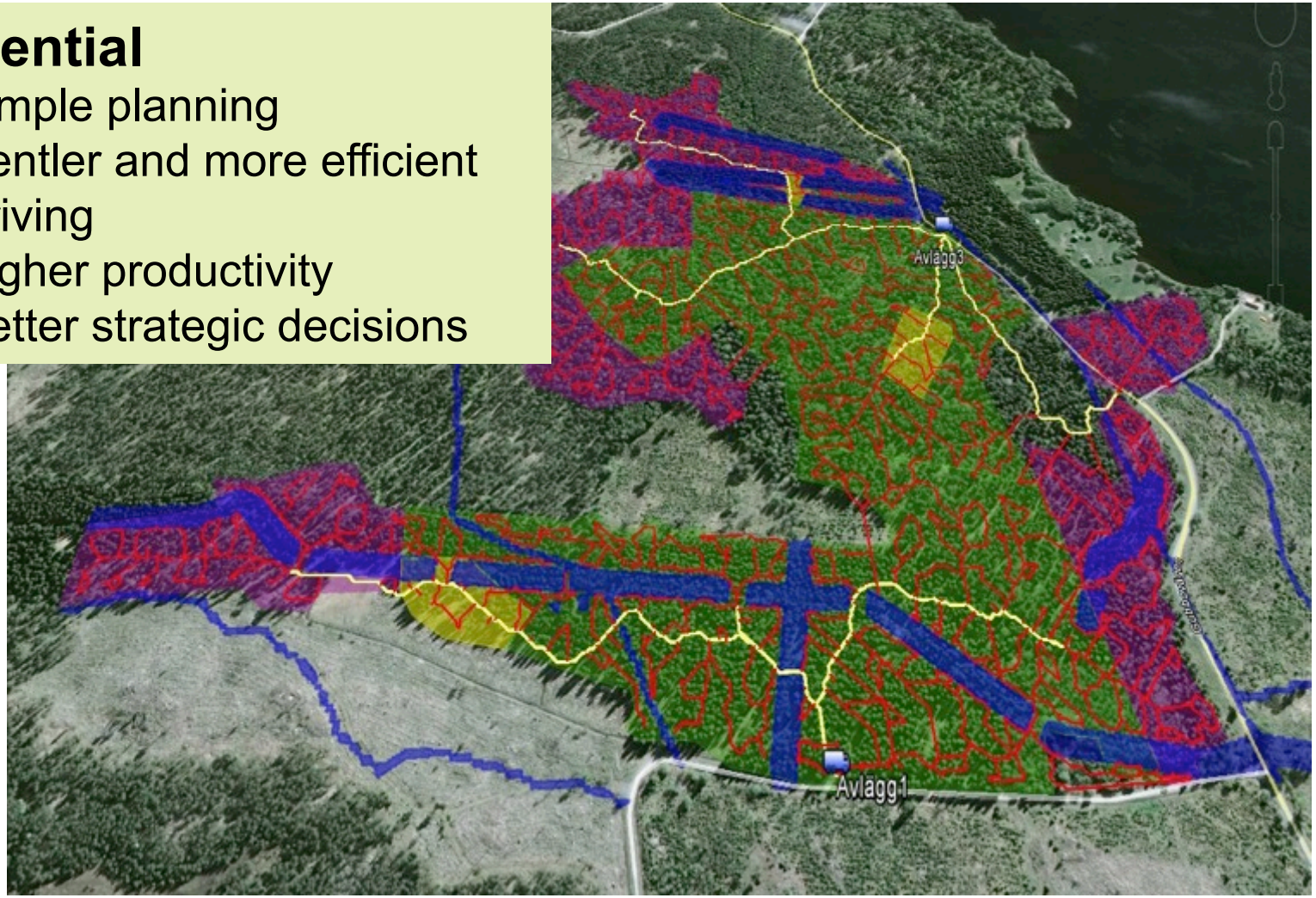


Logging information

Potential

- simple planning
- gentler and more efficient driving
- higher productivity
- better strategic decisions



Comminution – new systems

- **Increased productivity - but can not be utilized**
- **To increase utilization of chipper**
  - The container system
  - Blow directly in the truck
    or on canvas
  - Planning landings
- **Balanced number of containers and trucks in the system**
- **More efficient chipping**
  - Customize target length of chips
  - Customize bottom sieve
  - Sharp knives

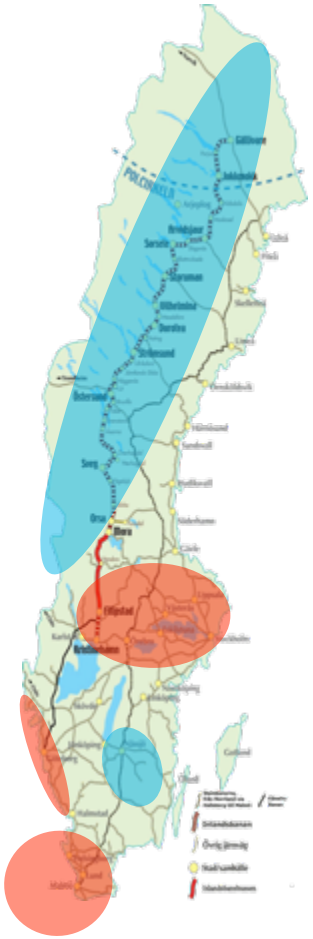
Even fraction distribution – less fine fractions

- **Coarser fractions**
  - Storability
  - Wearing
  - Assortments
- **Customers order controlled chipping**
  - Great potential to be able to clearly communicate the client's requirements before chipping
- **Storage**
  - Large-scale storage of wood chips
  - Quality aspects in storage

Storage and reception at terminal

- **Loss of biomass and hydration**
  - Fines fractions
- **Cover with cloth**
  - Dry materials
  - Even temperature
  - Small loss of substance

Remote transports…



- Train transports
- Boat transports
- HTC trucks

74-tonne chip trucks

- 10-12 % fuel savings
- No increased road wear
- No negative impact on road safety

Productify to communicate

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Effective management of forest fuel by well-specified fuel products

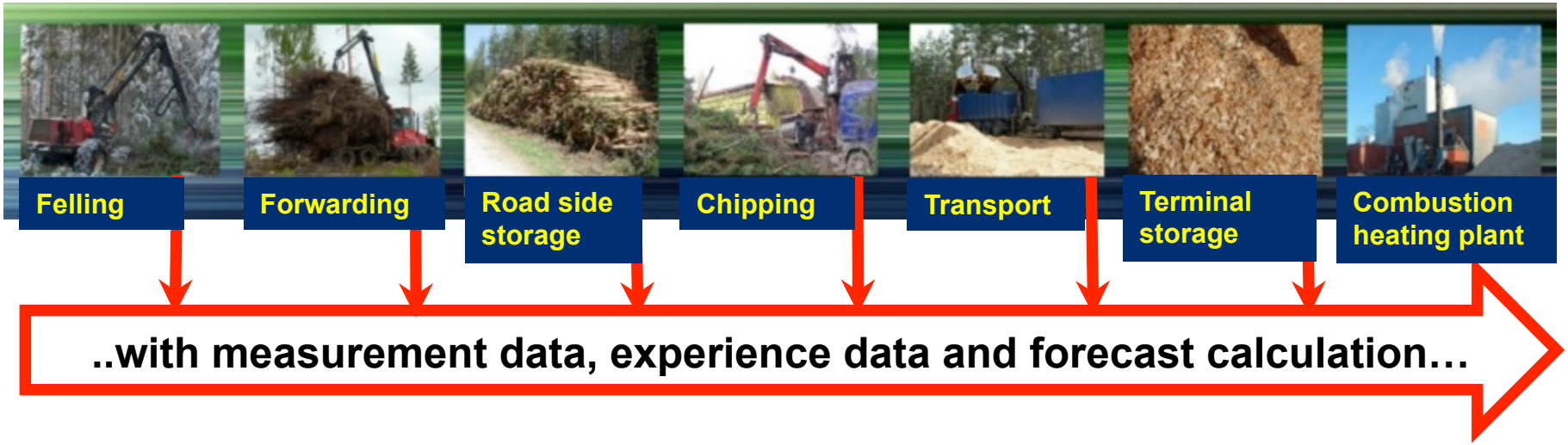
In March we want 1750 MWh of TRB - 8 and 1350 MWh of TRB - 13 ”

”1750 MWh TRB - 8 is OK! But we have only 900 MWh of TRB - 13. Can we deliver 450 MWh of TRB - 11 instead ? ”

(F)	Orgin	
		2
	Wo biomass	Stem wood
	Woody biom	residues
	Wo ly biomass	Logging residues

Location Barter

The Product characteristics can be surveyed and monitored throughout the hole supply chain...



… and communicated via national wood procurement systems to obtain:

- Distinctive order of fuel
- Clear goal for production
- Production follow-up
- Quick & distinct prognosis
- Transport optimization

What if...

... we could have a tool to calculate moisture content from

- the piles in the forest stand

- the stacks at the road-side landing

Measurement for production management

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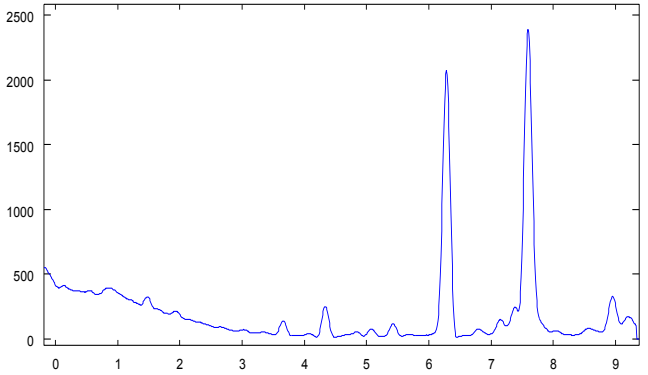
- **Using historical weather data to predict moisture content in road side piles**

- **Using integrated radar to determine moisture content directly when chipping**

Measurement for payment

Using radar to determine moisture content for the hole truckload.

- No sampling
- Fast < 2 minutes to measure all the chips in the truck

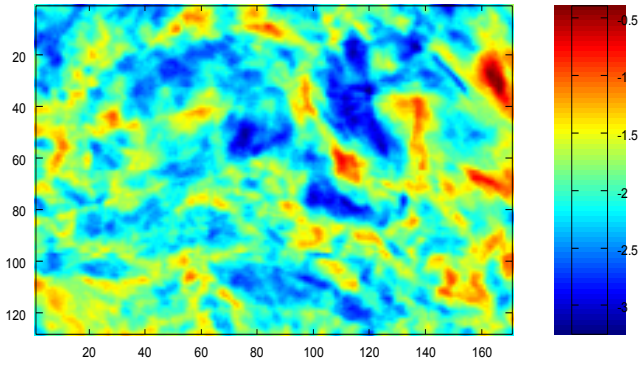


Using X-ray to simultaneously determine:

- Moisture content (M)
- Ash content (A)
- Net calorific value (Q)

Developing possibility to also determine:

- Main fraction (P-class)
- Fine fraction (F)



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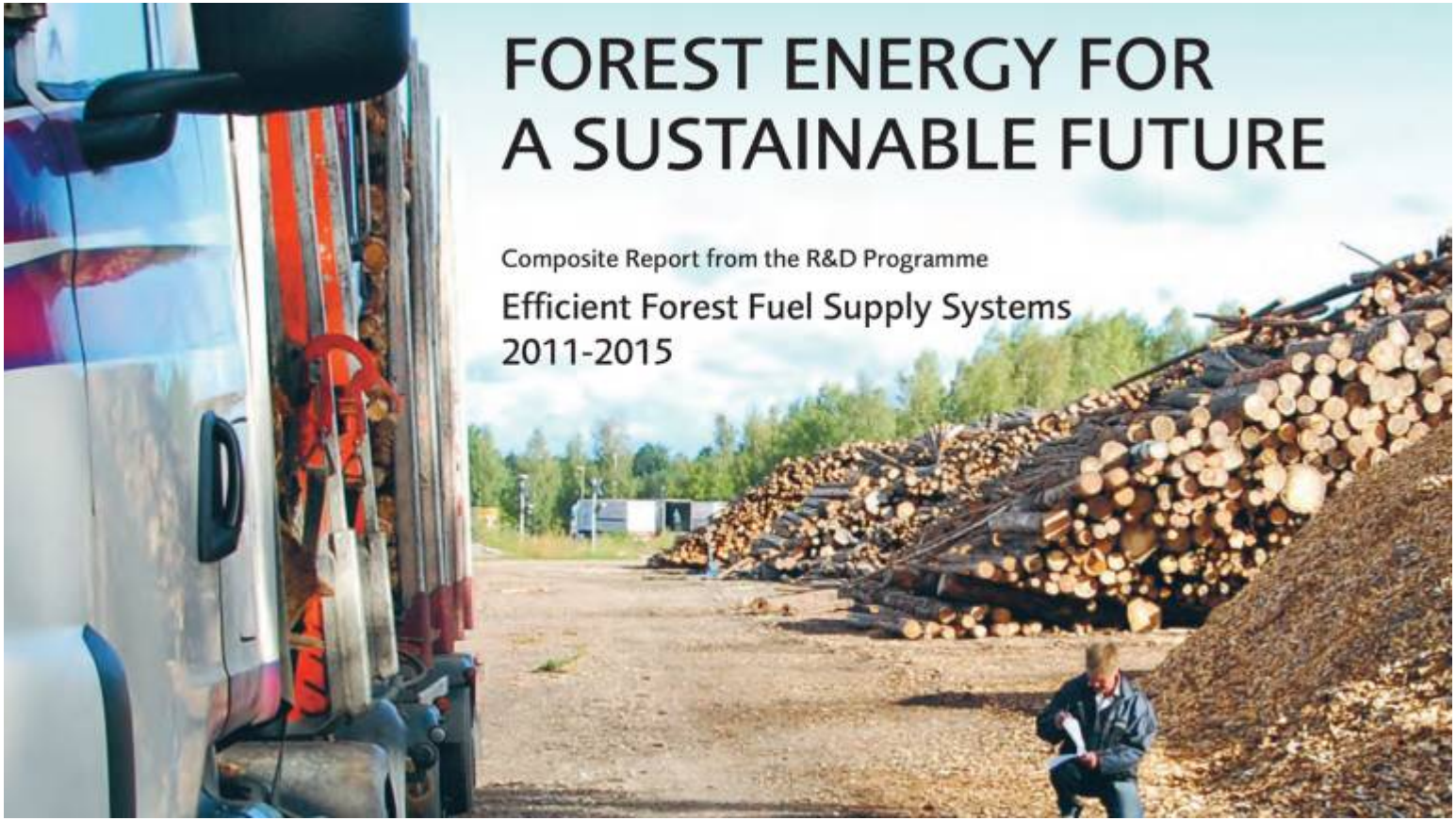

A composite report is available for free download at
www.skogforsk.se

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