

# Light UAS for forestry applications

an Operational experience

European High Level Unmanned Aircraft Systems (UAS)  
Conferencen

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Swedish Forest Agency

# Swedish Forest Agency

- Swedish Forest Agency is the Government's expert authority on forests and forest policy.
- Our mission is to work for a sustainable utilisation of the Swedish forests according to the guidelines given by the Parliament and the Government.

# Swedish Forest Agency



**We can be found over the whole country**

- 40 forestry districts
- Head office in Jönköping
- Total staff: 950

# Swedish Forest Agency

## Our assignment includes

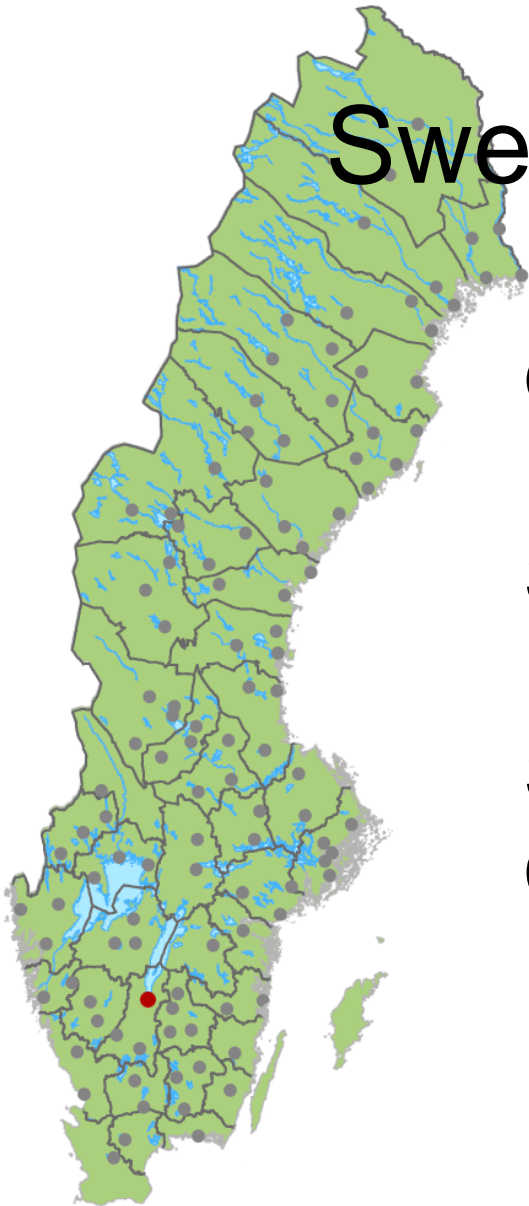
Supervision of the Forestry Act  
Extension

State subsidies

Contractual services

Forest surveys

Information



# Why do we use UAS

- Organic mapping capability
- Quick response time
- Flexibility
- Results instantly available
- High resolution and accuracy
- Cost effective for small areas
- 3D mapping

# Current UAS operations

- SmartPlanes SmartOne-B Light-UAS
  - 1,0 kg MTOW, Minimal risk UAS
  - High resolution 3D-mapping
  - 300m AGL, 800m VLOS





# Equipment







Brussels (Belgium), 1st July 2010





Brussels (Belgium), 1st July 2010





Brussels (Belgium), 1st July 2010





Brussels (Belgium), 1st July 2010



Brussels (Belgium), 1st July 2010





Brussels (Belgium), 1st July 2010

# Current UAS operations

- Damage assessment
- Planning
- Image backdrop
- Digital elevation model

# Current UAS operations

- Damage assessment
  - Storm damage
  - Insect and fungus infestation
  - Documentation and planning of prescribed burning





Storm damage

Brussels (Belgium), 1st July 2010





Brussels (Belgium), 1st July 2010





Brussels (Belgium), 1st July 2010











# Current UAS operations

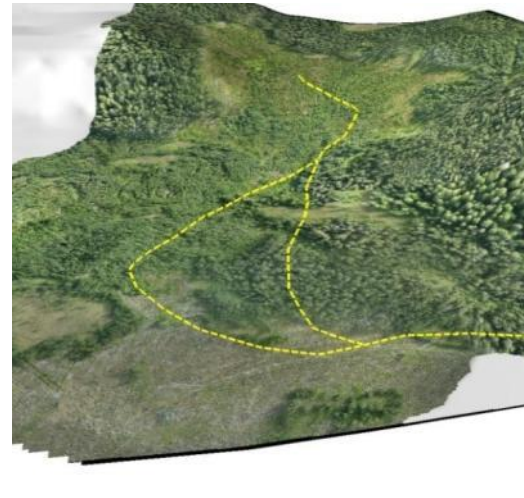
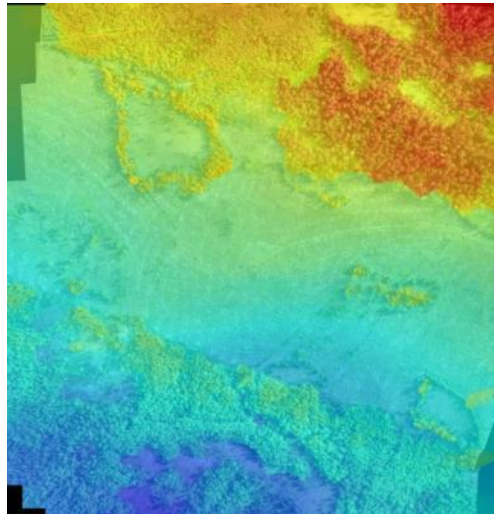
- Planning
  - Forest management plans
  - Road planning
  - Landscape planning







# Current UAS operations



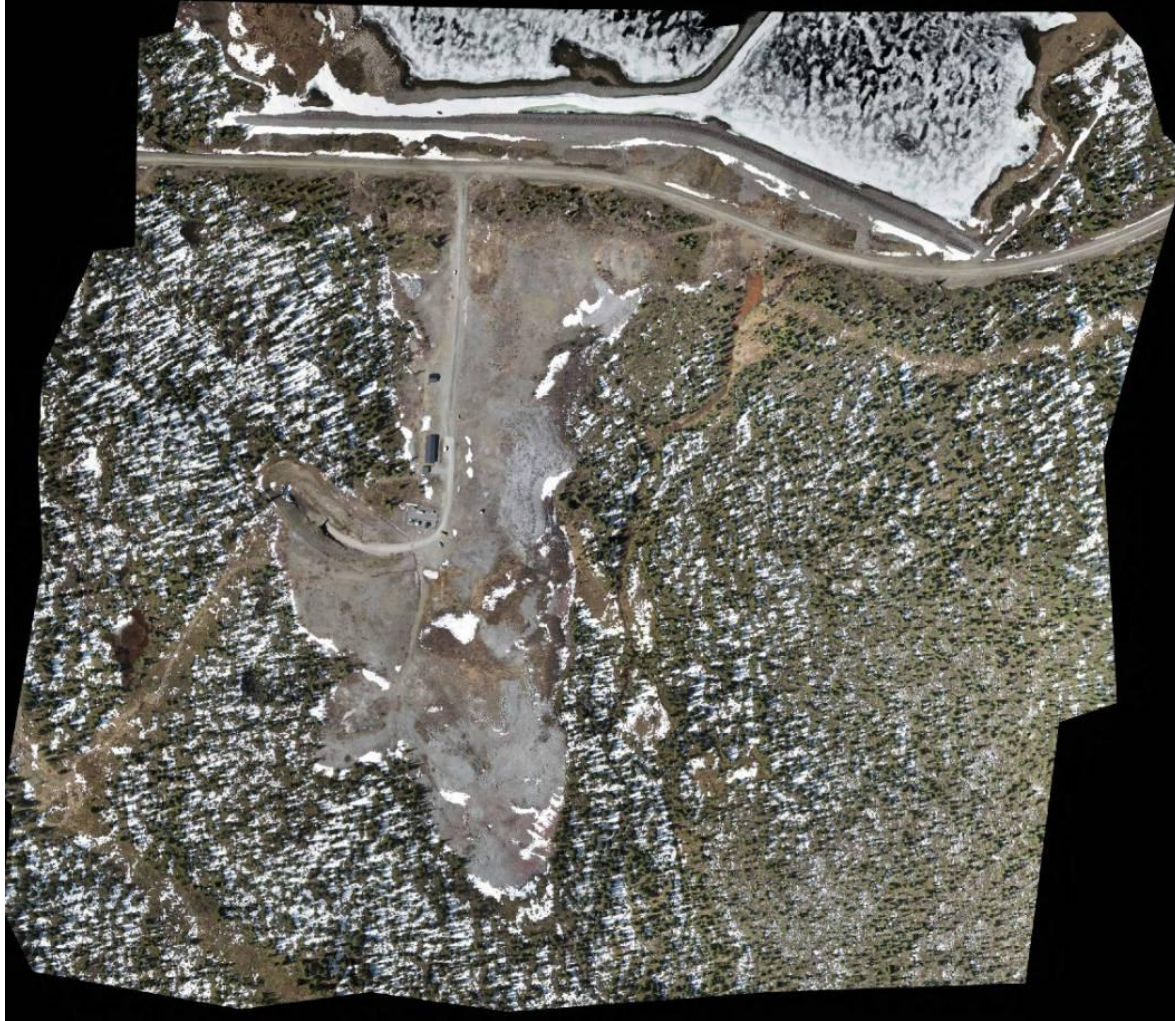
Skule National park

# Current UAS operations

- Image backdrop
  - Visualisation
  - High resolution



# Current UAS operations



Brussels (Belgium), 1st July 2010



# Current UAS operations

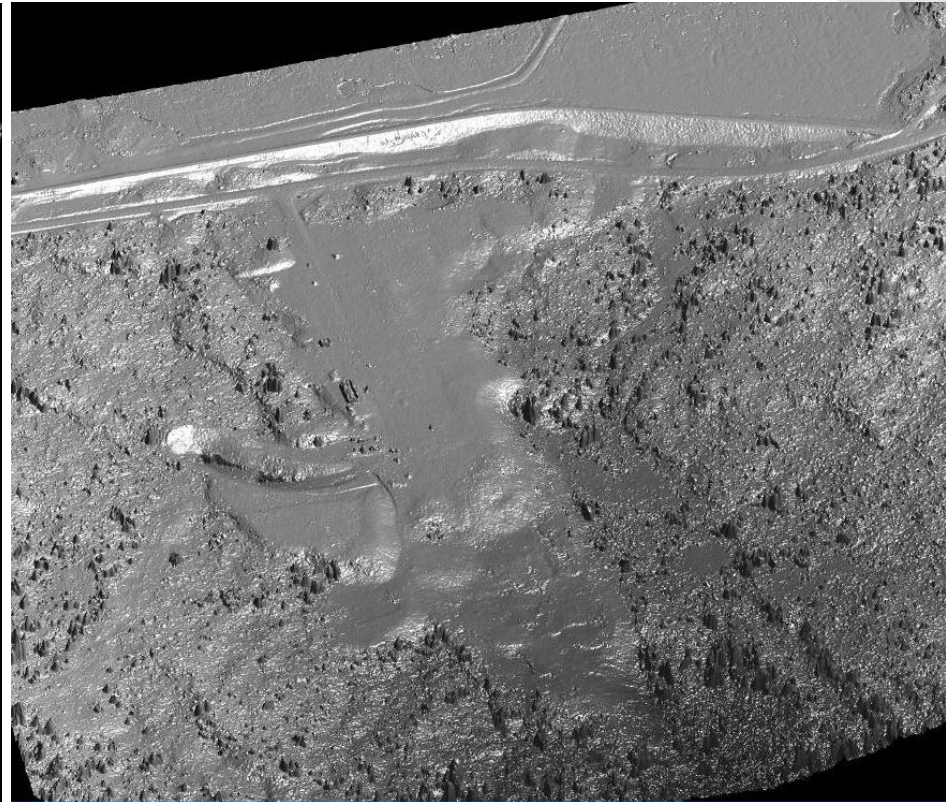
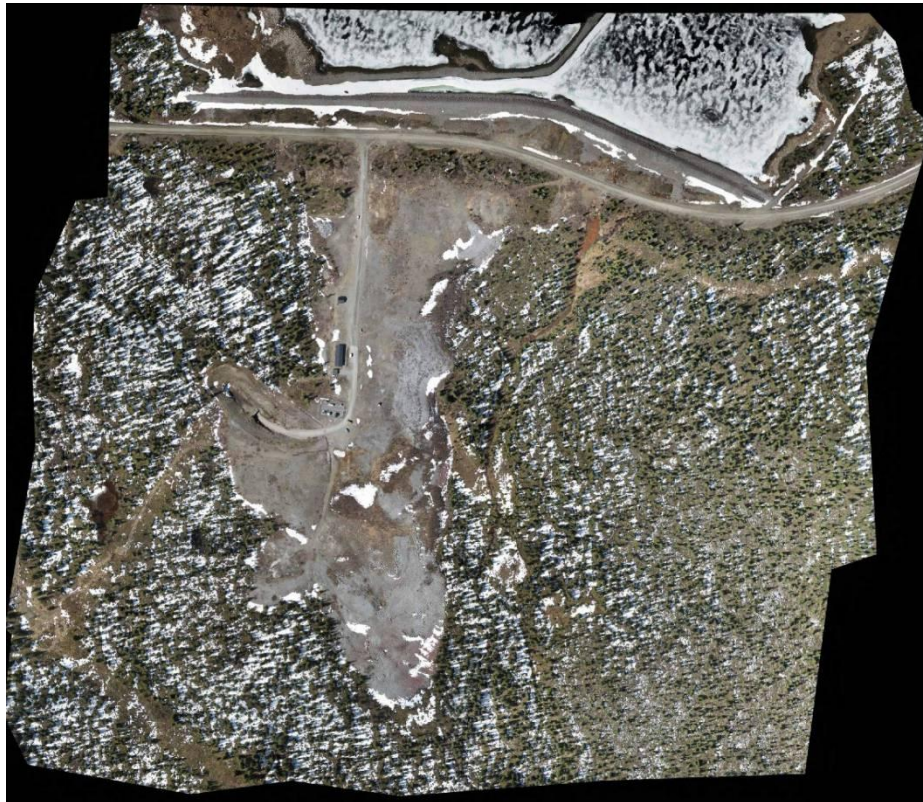


# Current UAS operations

- Digital elevation model

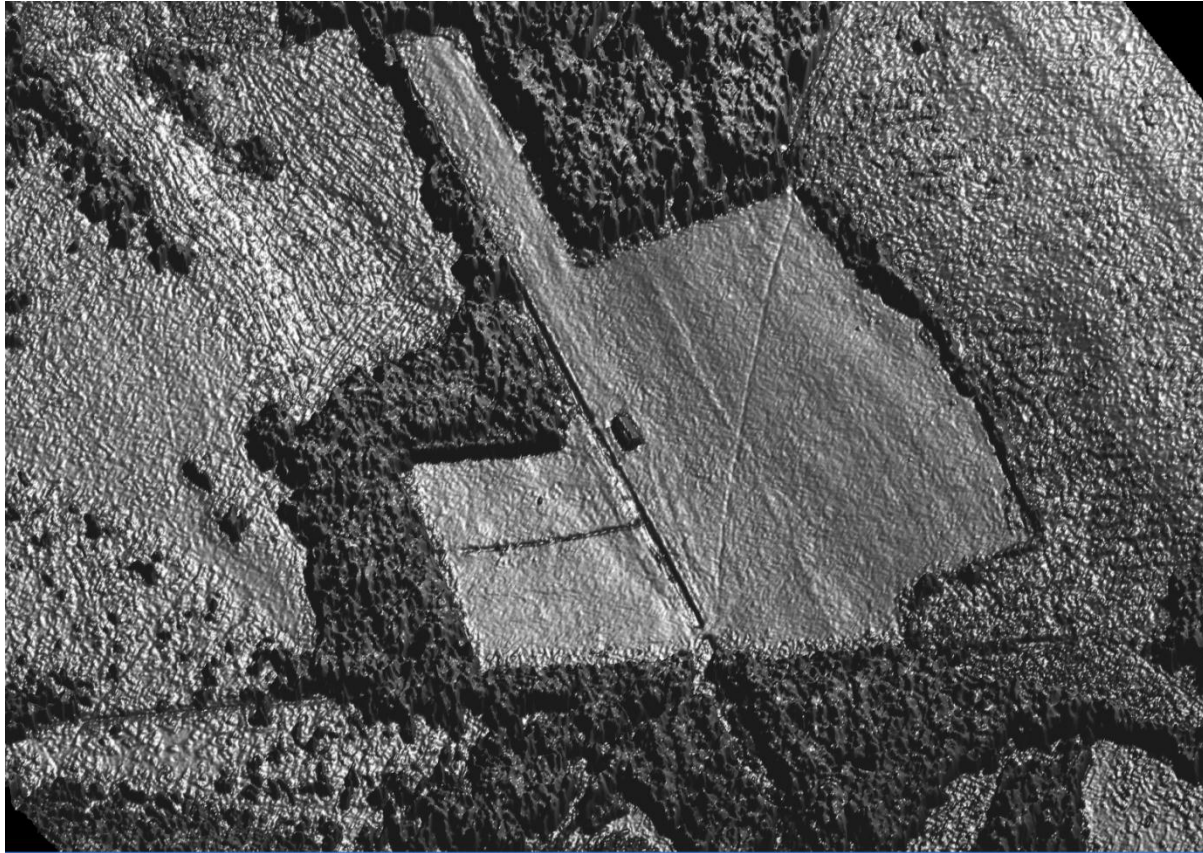


# Current UAS operations





# Current UAS operations





# The Swedish Transport Agency's regulations

- Four categories
  - Category 1A
  - Category 1B
  - Category 2
  - Category 3

# The Swedish Transport Agency's regulations

- Four categories
  - Category 1A Unmanned aircraft with maximum take-off weight of less than or equal to 1.5 kg, which develops a maximum kinetic energy of 150 J and is flown only within the visual line of sight of the pilot.



# The Swedish Transport Agency's regulations

- Four categories
  - Category 1B: Unmanned aircraft with maximum take-off weight of more than 1.5 kg but less than or equal to 7 kg, which develops a maximum kinetic energy of 1000 J and is flown only within the visual line of sight of the pilot. Maximum altitude 120m, (400ft)

# The Swedish Transport Agency's regulations

- Four categories
  - Category 2: Unmanned aircraft with maximum take-off weight of more than 7 kg which is flown only within the visual line of sight of the pilot. Maximum altitude 120m, (400ft).



# The Swedish Transport Agency's regulations

- Four categories
  - Category 3: Unmanned aircraft which is certified to fly and be controlled beyond the visual line of sight of the pilot.

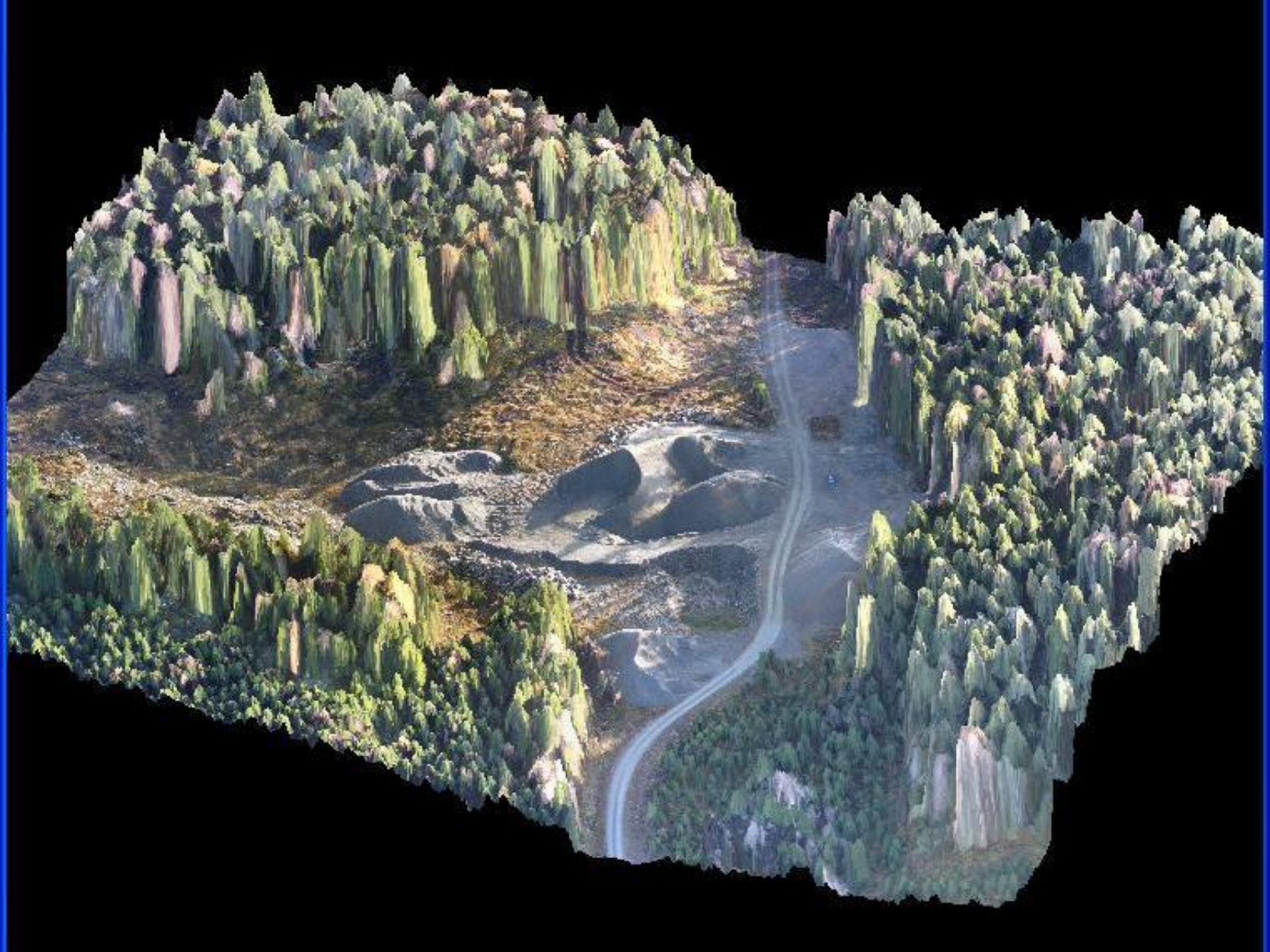
# the Future use of Light UAS for forestry applications

- Many Light-UAS operated in parallel on a daily basis at local level
- UAS provides detailed and current mapping as a complement to satellite imagery and conventional aerial photography



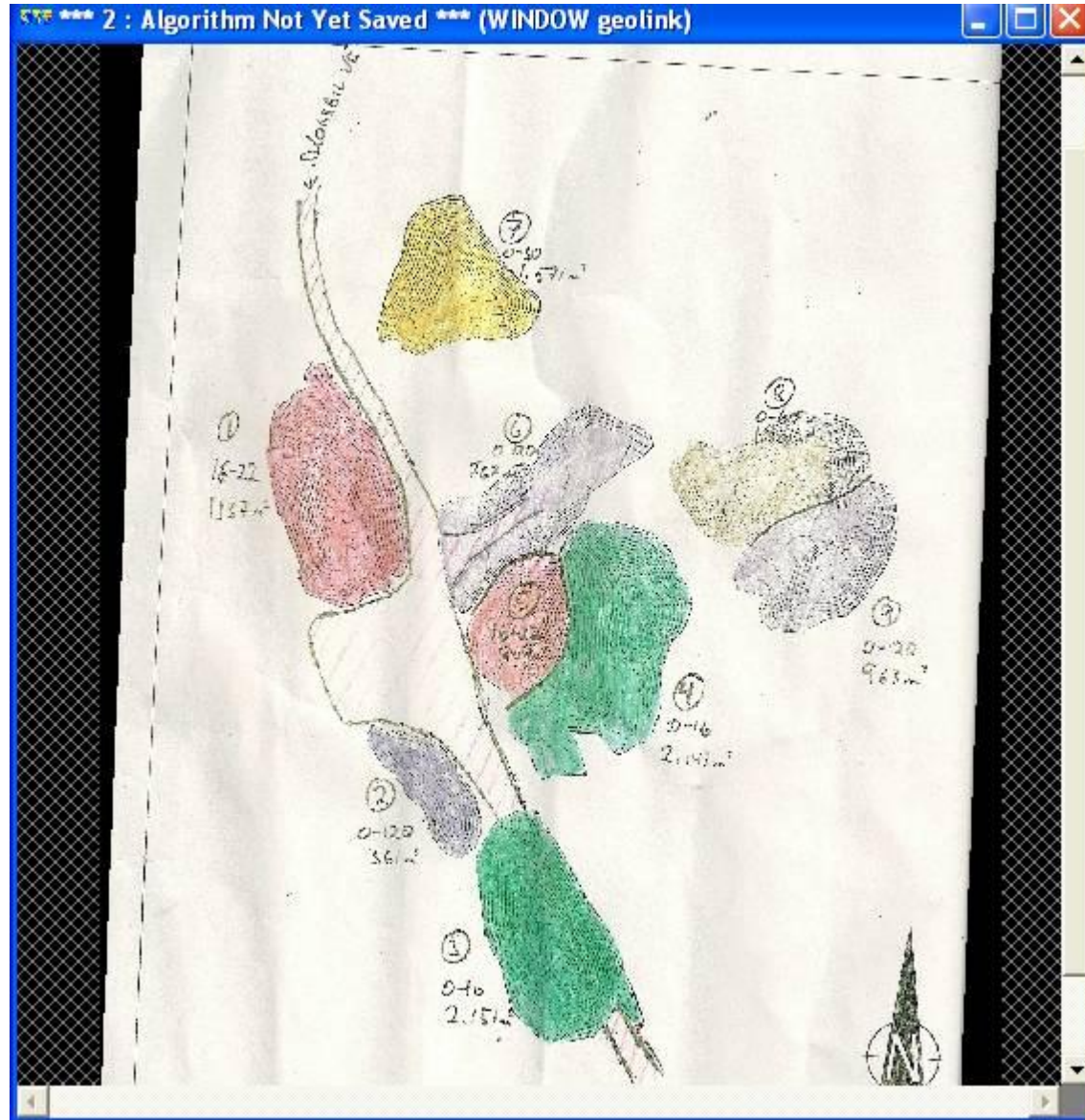
# the Future use of Light UAS for forestry applications

- Forest Inventory
- Environmental monitoring
- Cultural heritage
- Wild life management
- Services
- Environmental impact assessment
- .....

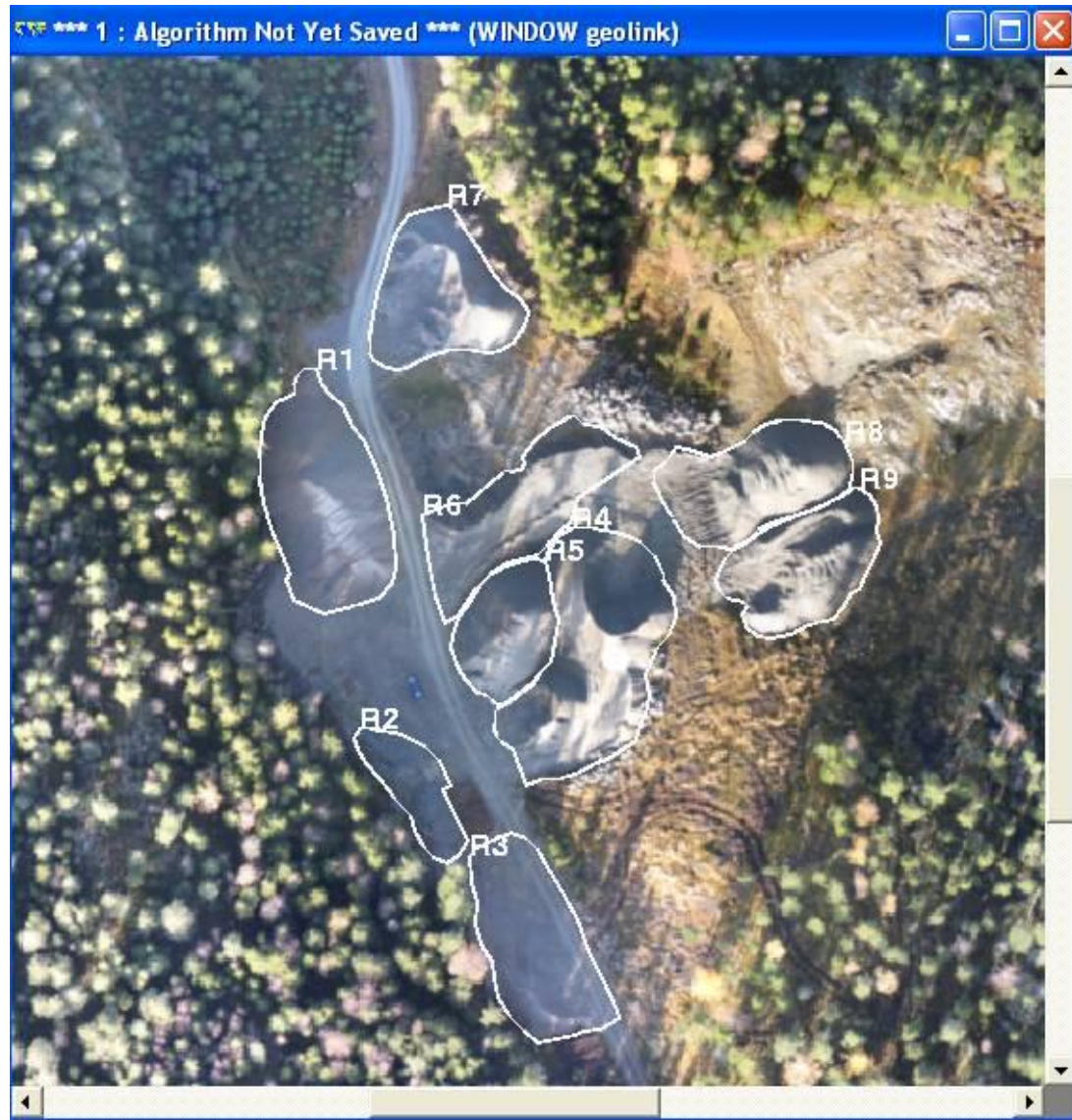




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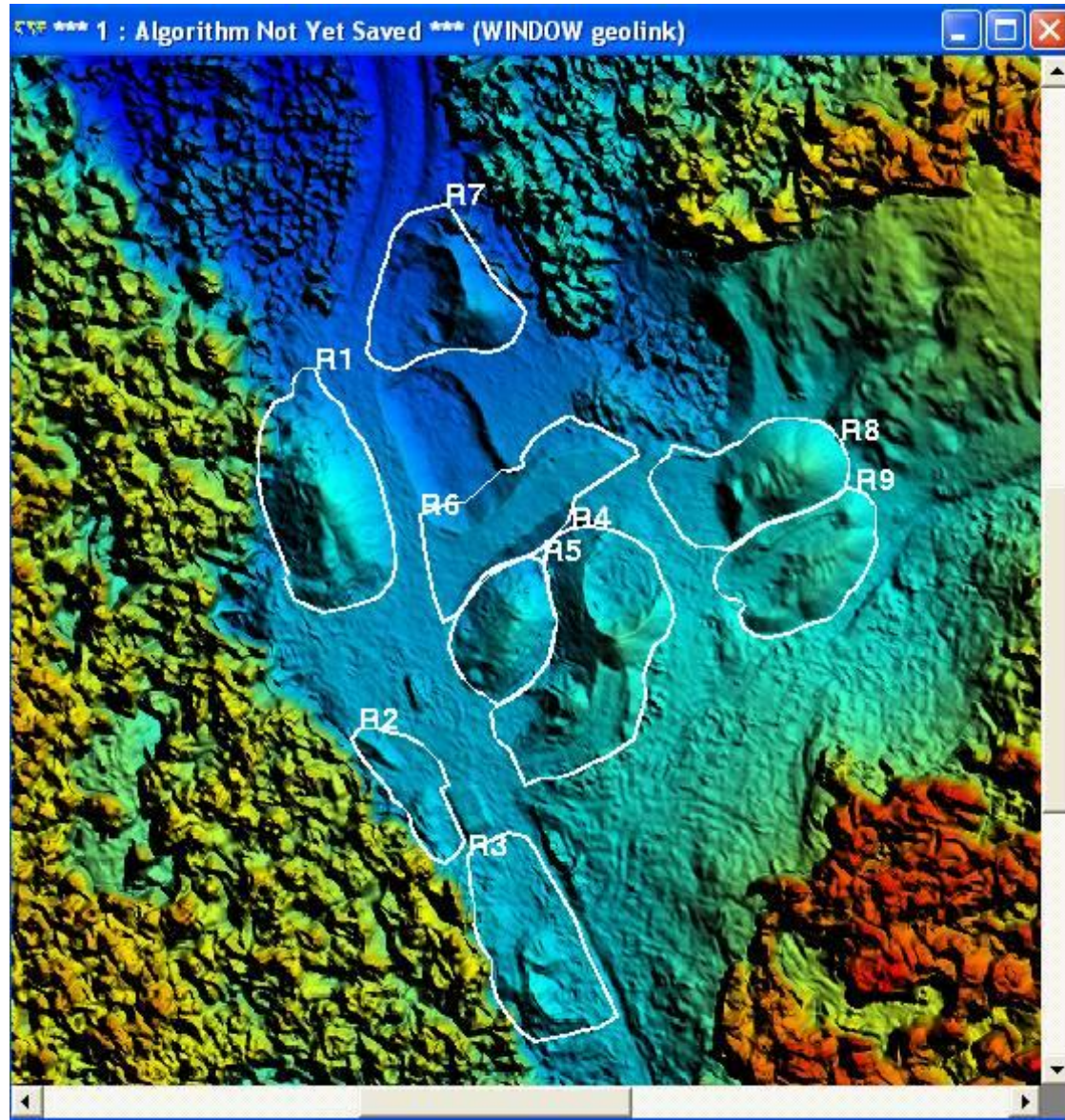


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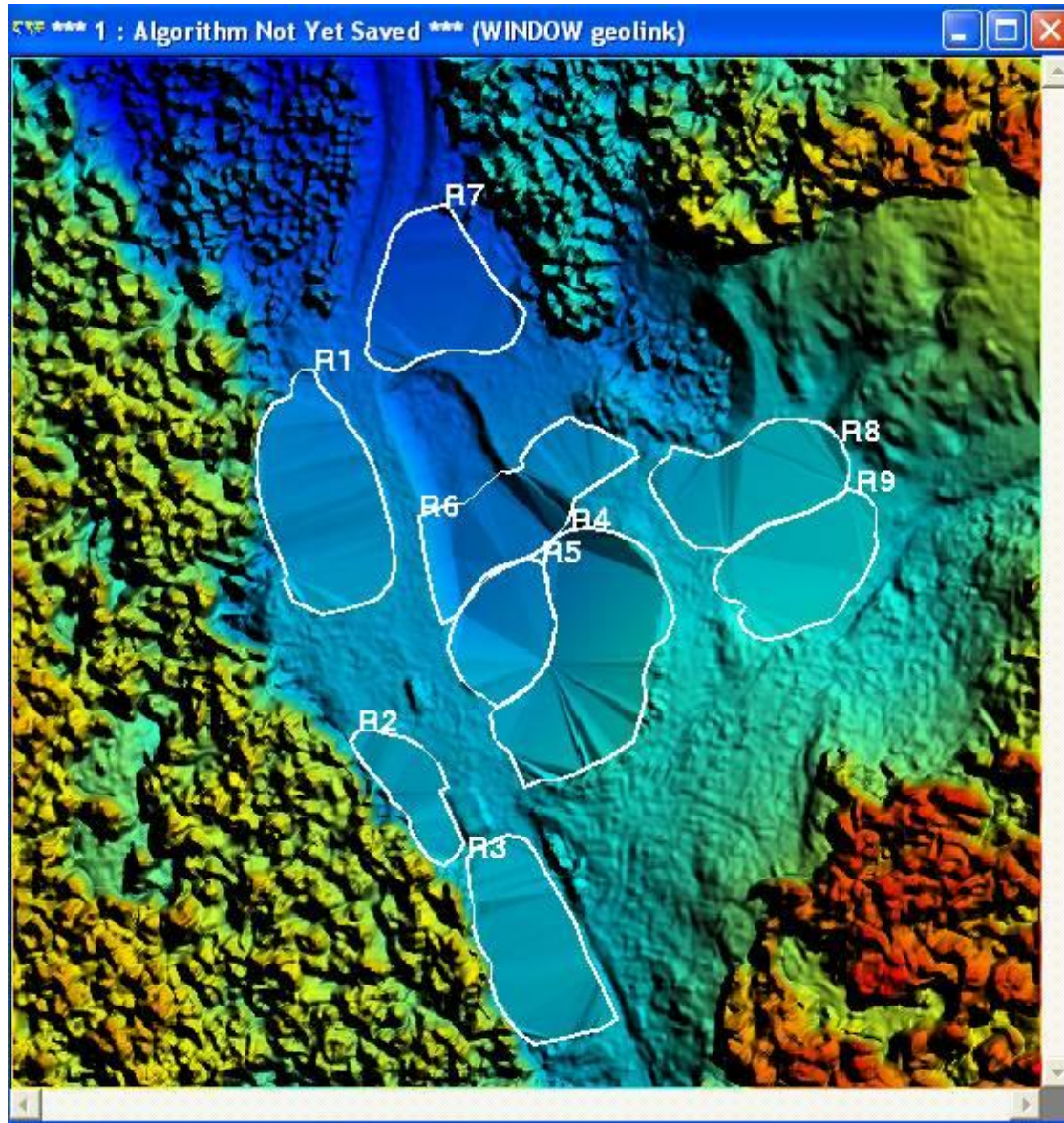


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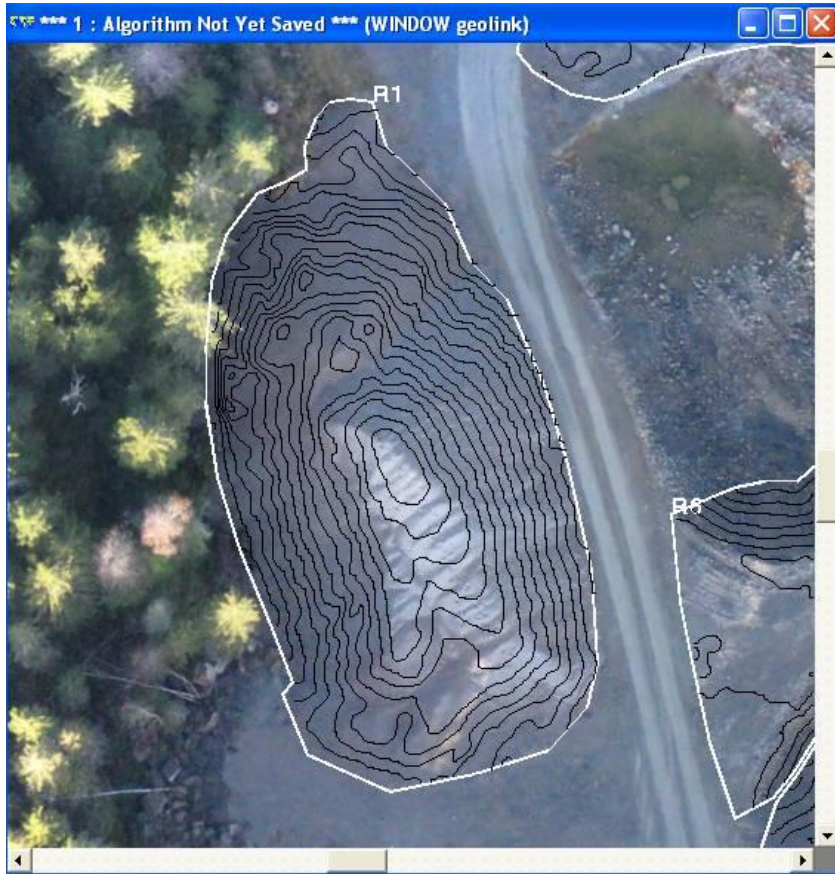


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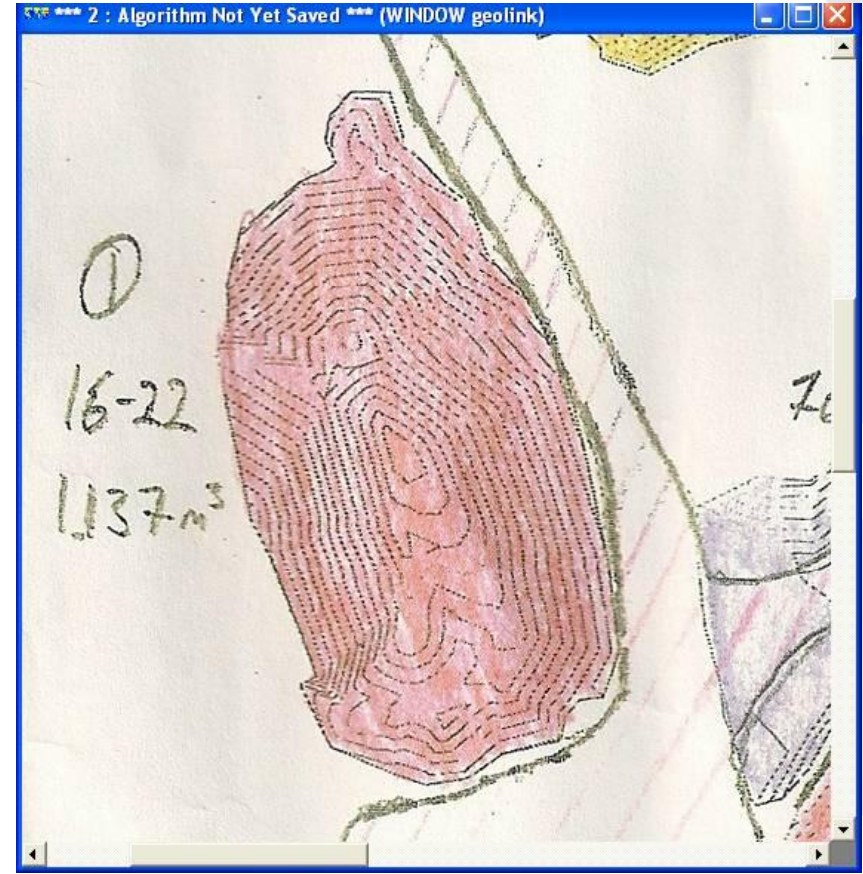




# the Future use of Light UAS for forestry applications



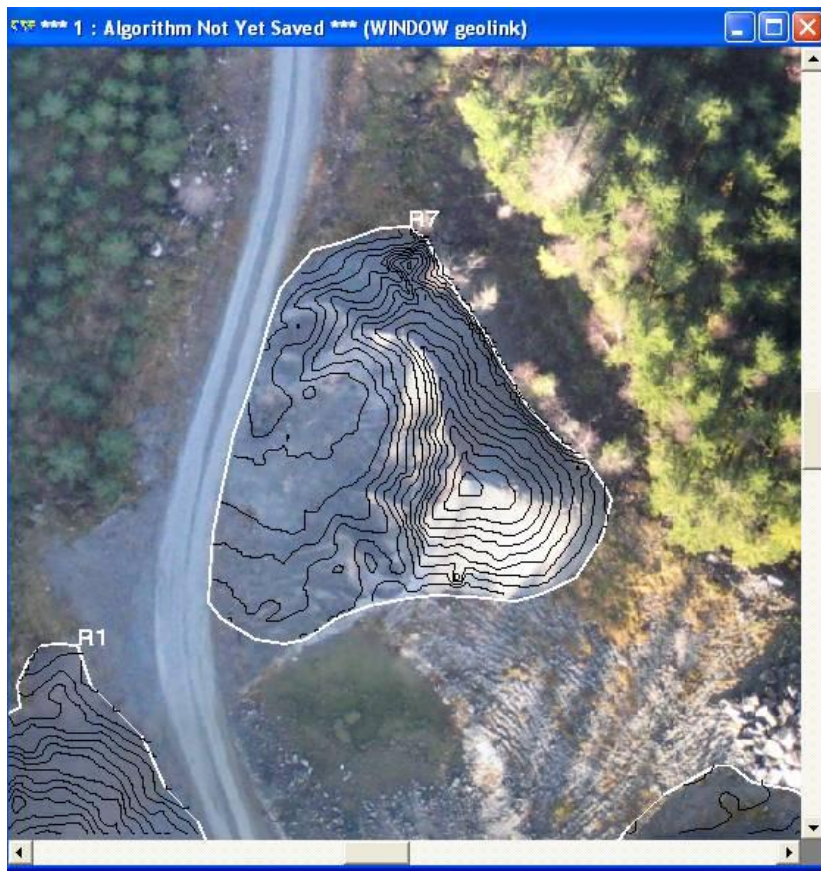
2359 m<sup>3</sup>



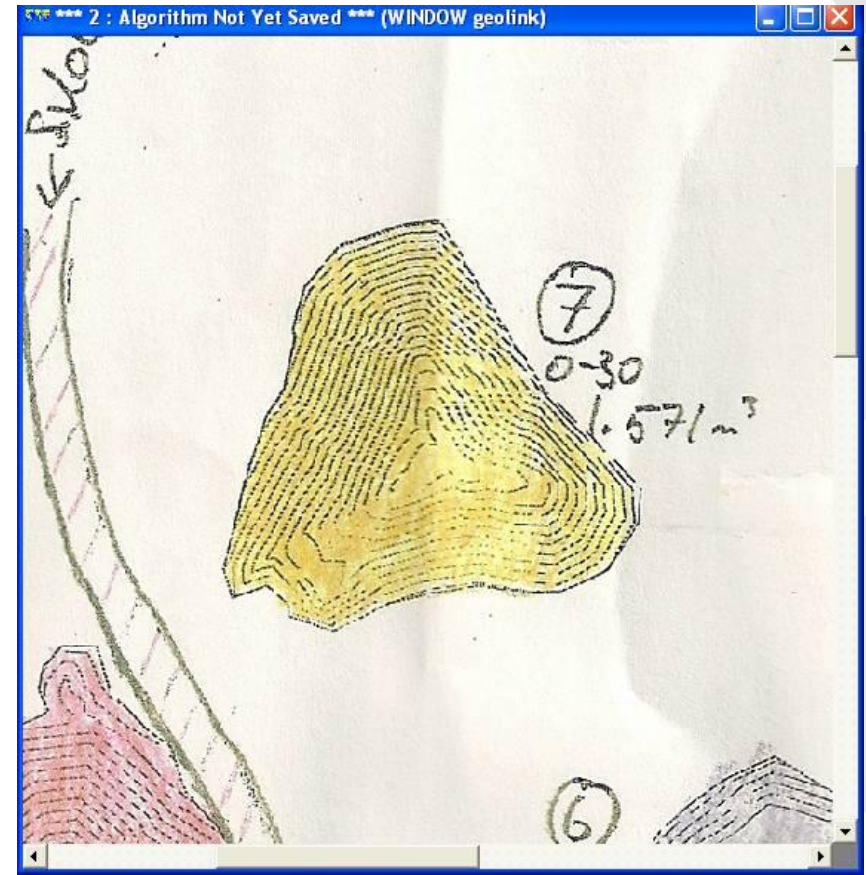
1137 m<sup>3</sup>



# the Future use of Light UAS for forestry applications



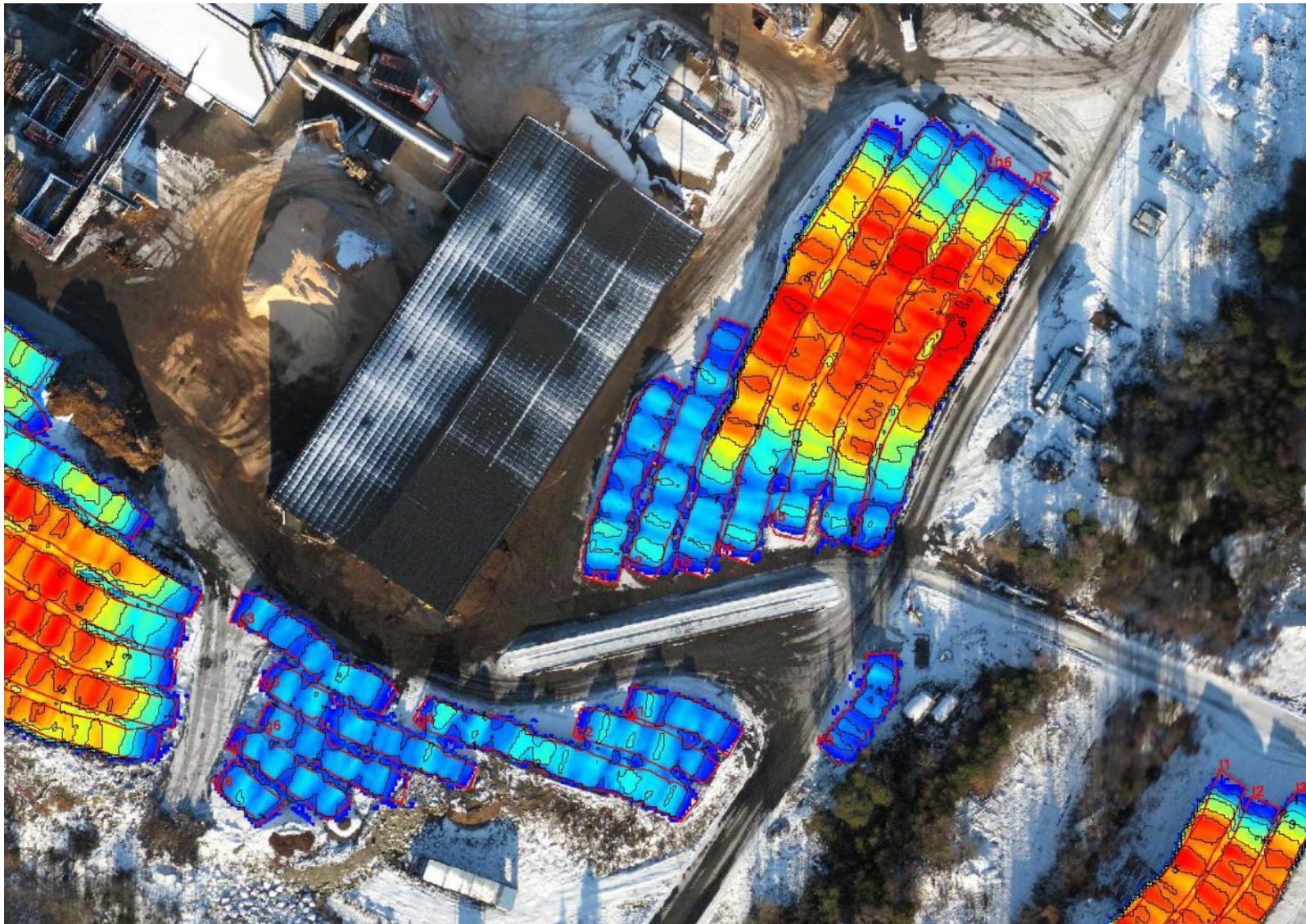
866 m<sup>3</sup>



1571 m<sup>3</sup>



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Brussels (Belgium), 1st July 2010

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