



# QUEEN'S INSTITUTE FOR ENERGY & ENVIRONMENTAL POLICY

# The challenges of improving biomass inventory for southeastern Ontario

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# Outline

- Inventory tools
- The Renewable Energy Region
- Workshop on biomass inventory
- Next steps
- Current & future data tools
- Some early results



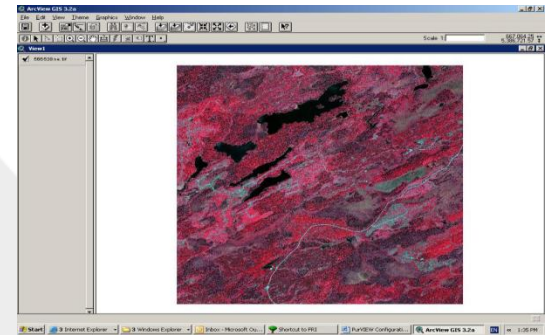
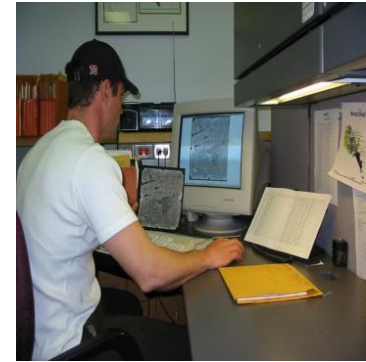
# Traditional inventory

- Carried out by forest industry
- Extensive survey of forest resources
- Designed to locate merchantable timber species for mills
- General characterization
  - ▶ Species
  - ▶ Forest conditions
  - ▶ Regeneration
- Based on:
  - ▶ Aerial photo interpretation
  - ▶ Field survey



# Forest resource inventory (FRI)

- Enhanced Inventory:
  - ▶ Carried out by Ontario Ministry of Natural Resources
  - ▶ Move from 20-yr to 10-yr inventory cycle
  - ▶ Moving from periodic inventory to continuous inventory
  - ▶ Improved field sampling to connect with growth and yield program
  - ▶ Ecologically based
  - ▶ Higher quality of information through implementation of new technologies
- Objective: ensure FRI is current and effective to support better forest management decisions



# Renewable Energy Region (RER)



# Forest sector opportunities

- Why do we need an updated inventory in the RER?
  - ▶ Credit crisis impacts across the Canadian forestry sector
  - ▶ Closure of sawmills and pulp and paper facilities
  - ▶ Ontario Power Generation: phase out coal by 2014
  - ▶ Interest in forest-based bioenergy production



# Workshop on biomass inventory

Consultation at Queen's - March 7, 2009

- About 30 experts - Ontario Ministry of Natural Resources, local industry, academics, other government, and the Eastern Ontario Model Forest
- Results of meeting submitted to Forestry Chronicle

Challenges identified:

- Inventory out of date
  - ▶ Complete Forest Inventory (FRI) in 1978
  - ▶ Some counties updated in 1991
- Difficult to gain access to information
  - ▶ Highly fragmented ownership
  - ▶ Some data held by private landowners
  - ▶ No central place for data



# From the workshop

Inventory needs to have 4 attributes:

1. Continually updated
2. Inclusive
  - ▶ Include crown and private land
3. Comprehensive
  - ▶ Include measures of all forest biomass
4. Accessible
  - ▶ Data has to be accessible to forest stakeholder
  - ▶ Users should be able to feed back into the system



# Next steps – in the short term

- Optimize existing knowledge base
  - ▶ SOLRIS, QuickBird and DRAPE
- Use emerging tools (LiDAR, predictive vegetation mapping)
- Establish and maintain long-term sample plots
- Create a peer-reviewed validation system for inventory

*Ongoing work at Queen's Geography*

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- Start committee to steer natural resource inventory
- Consider forest tenure reform
  - ▶ Redefine merchantable/valuable biomass
  - ▶ Possibly assigning multiple tenures on same land

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# In the medium term

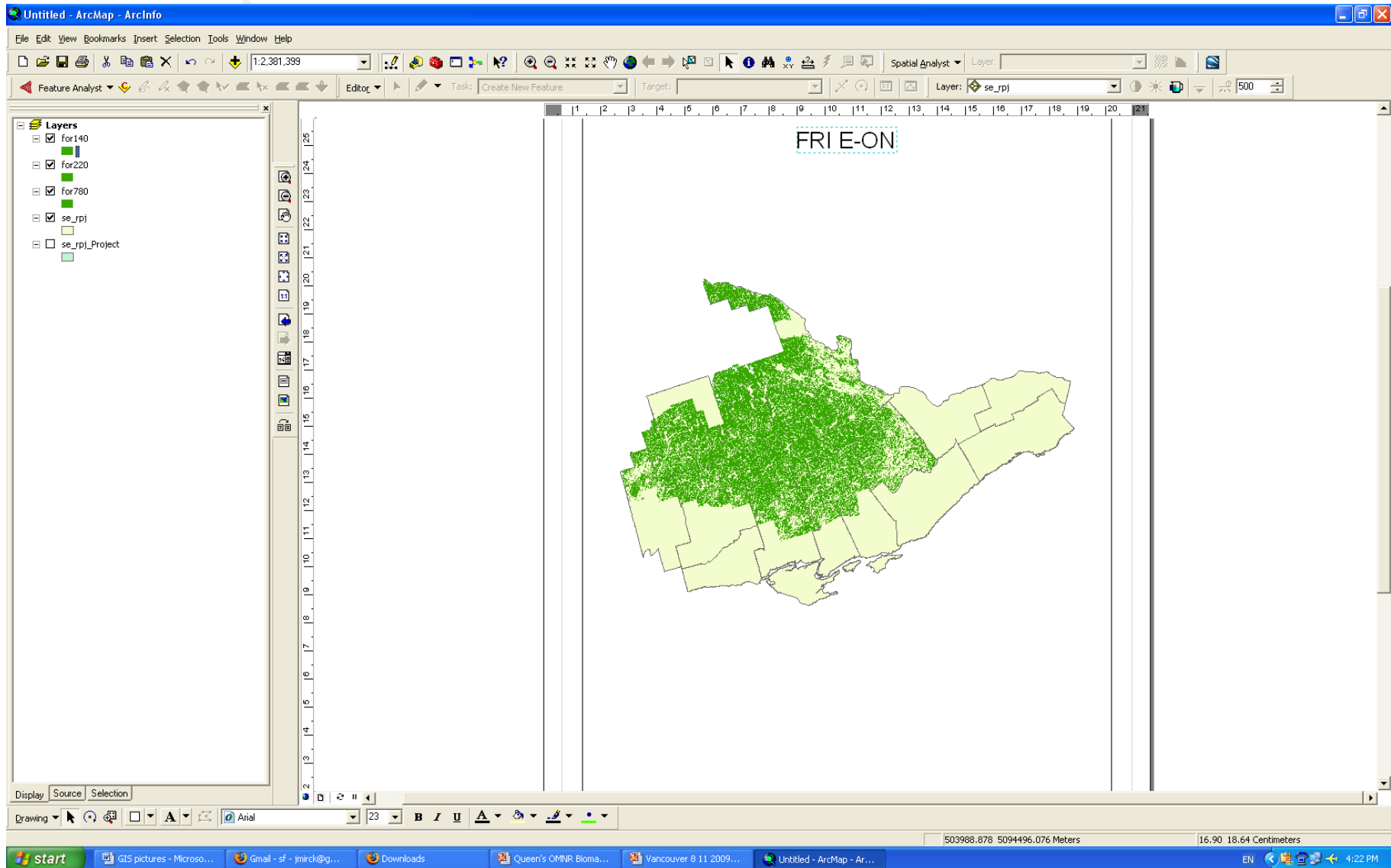
- Move from strategic to operational level data
- Link socio-economic data to technical databases
- Research database management
- Define a champion to lead inventory

# In the long term

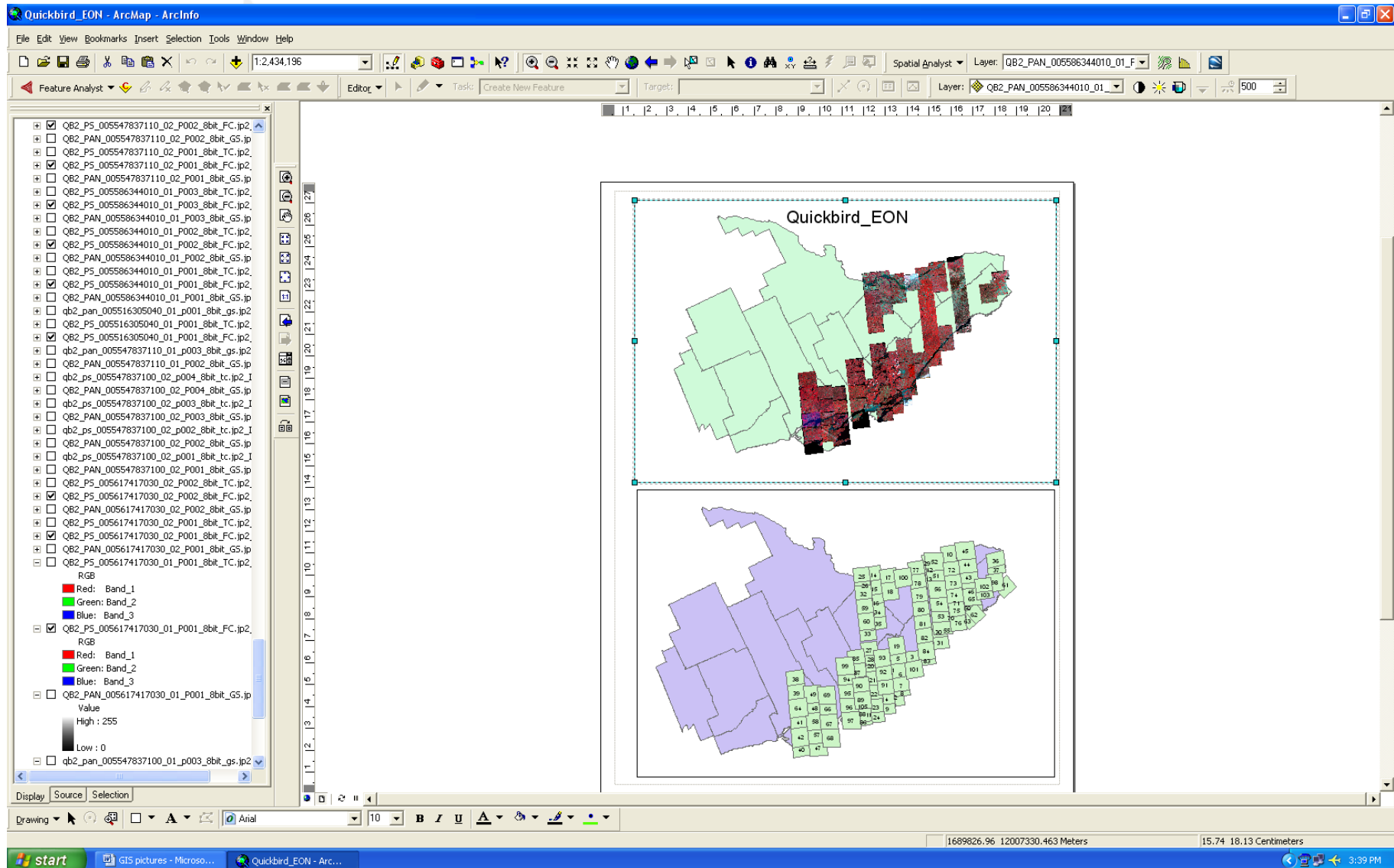
- Improve criteria and indicators for sustainable biomass removal
- Address institutional barriers
- Improving return on investment of inventories
- Implement tenure reform



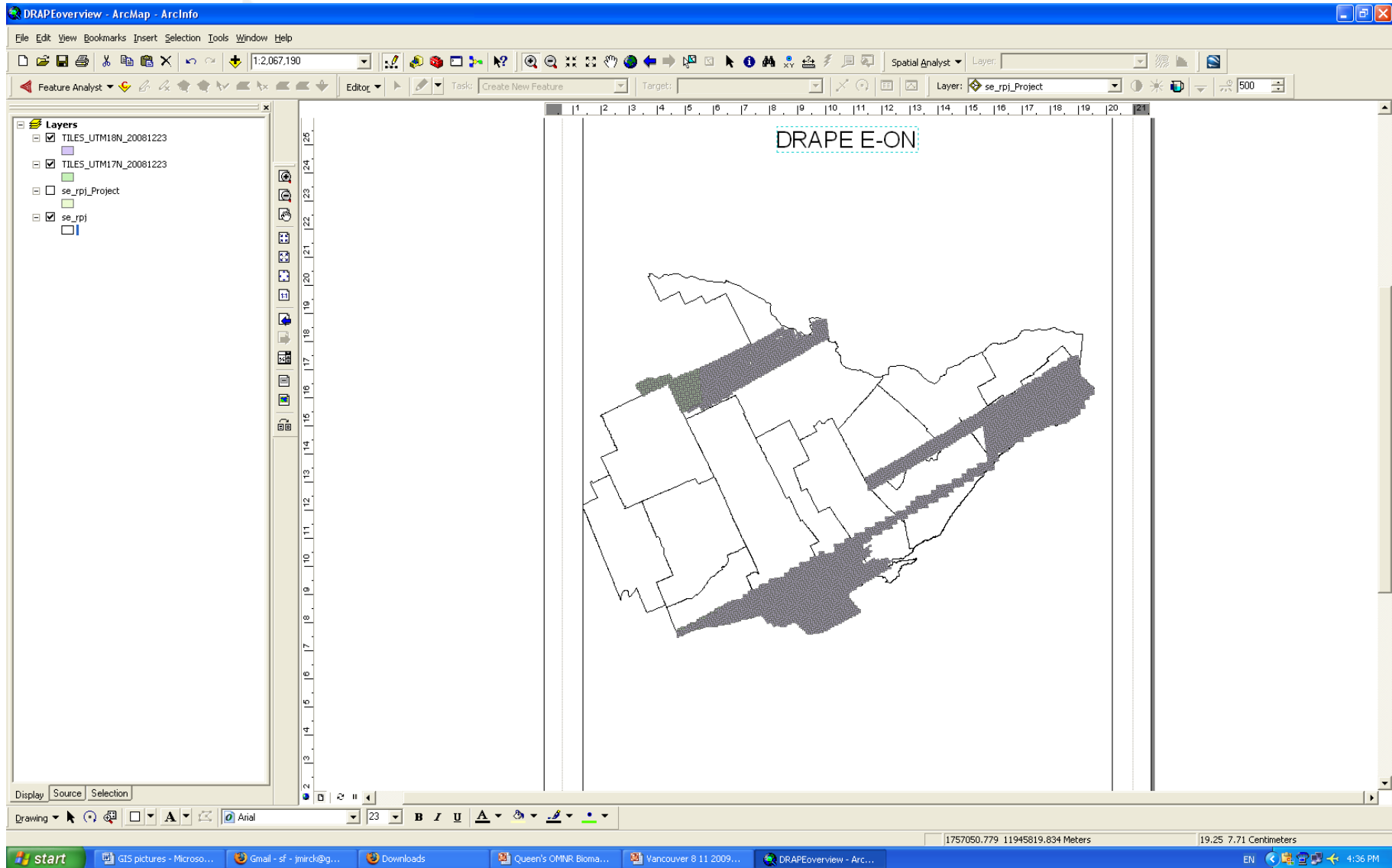
# Existing data tools



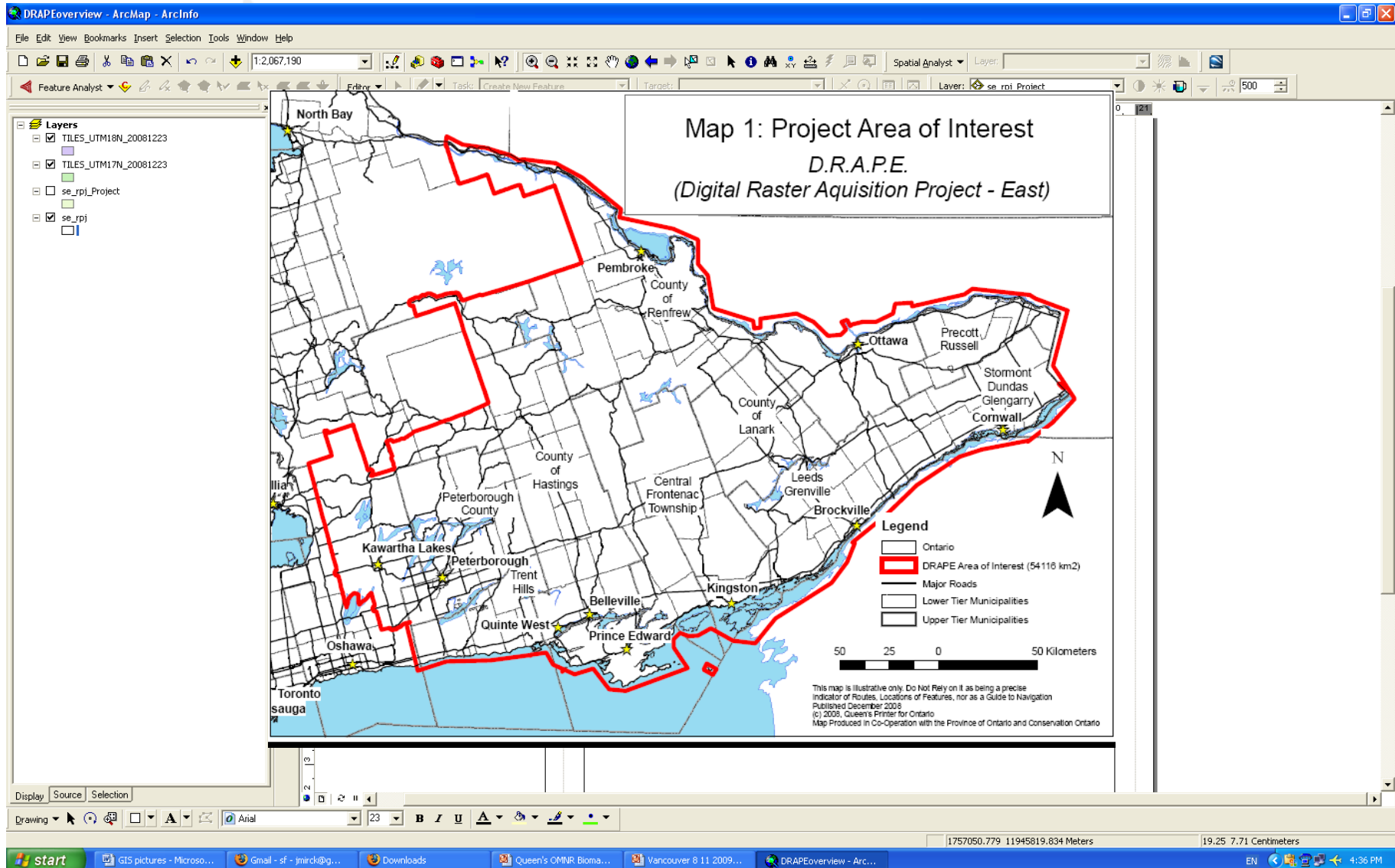
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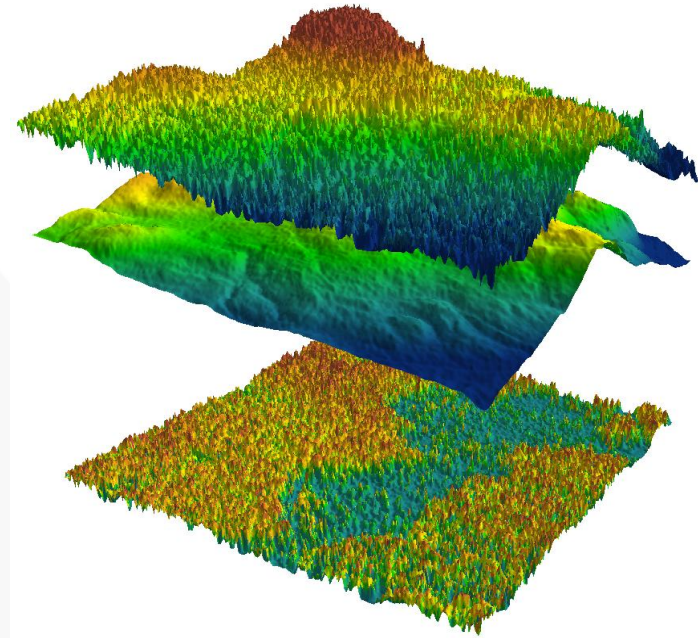
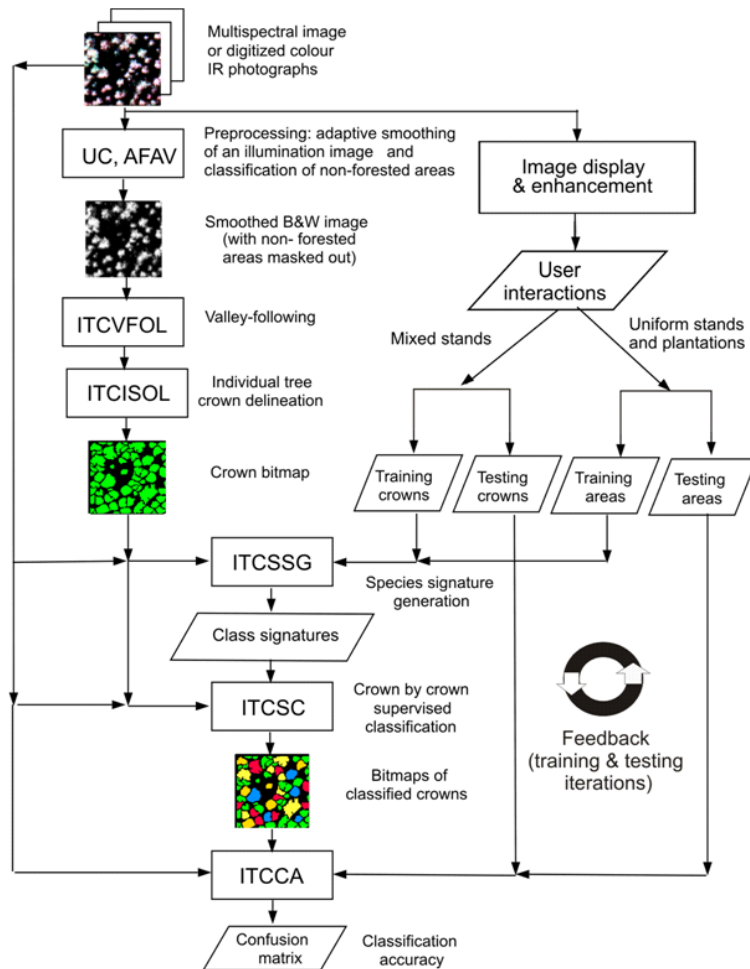
# Existing data tools



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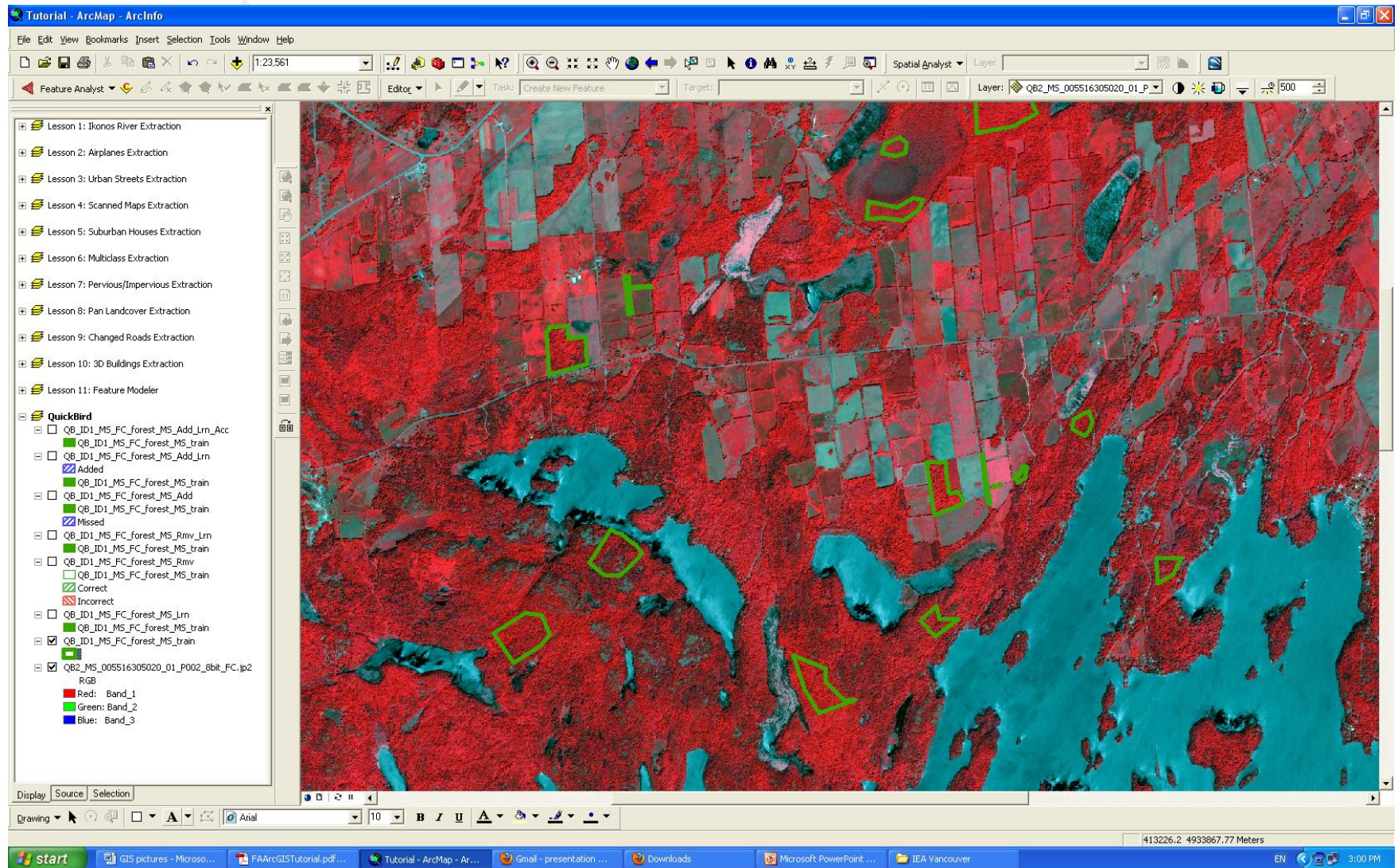
# Future data tools

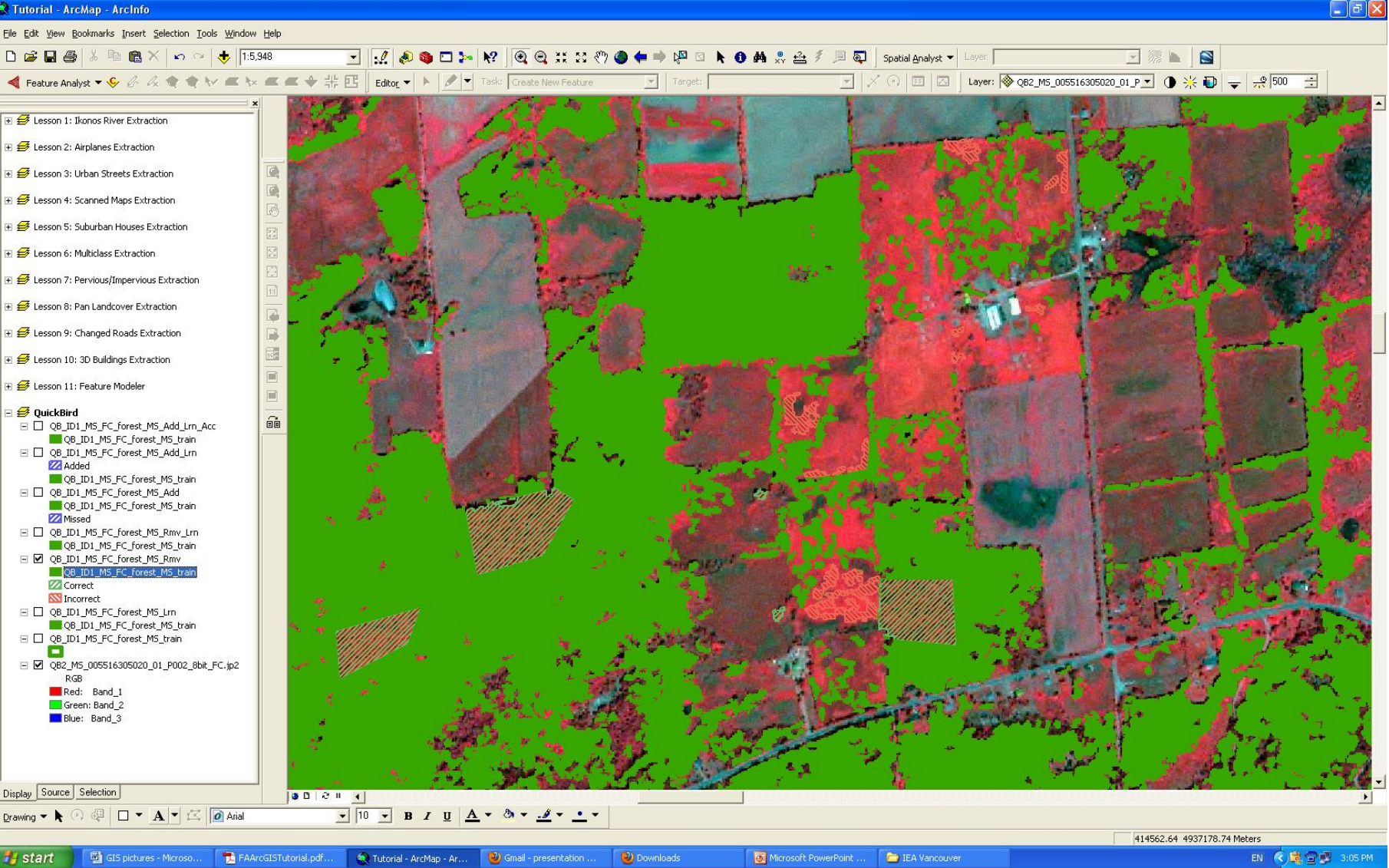


LiDAR canopy height model

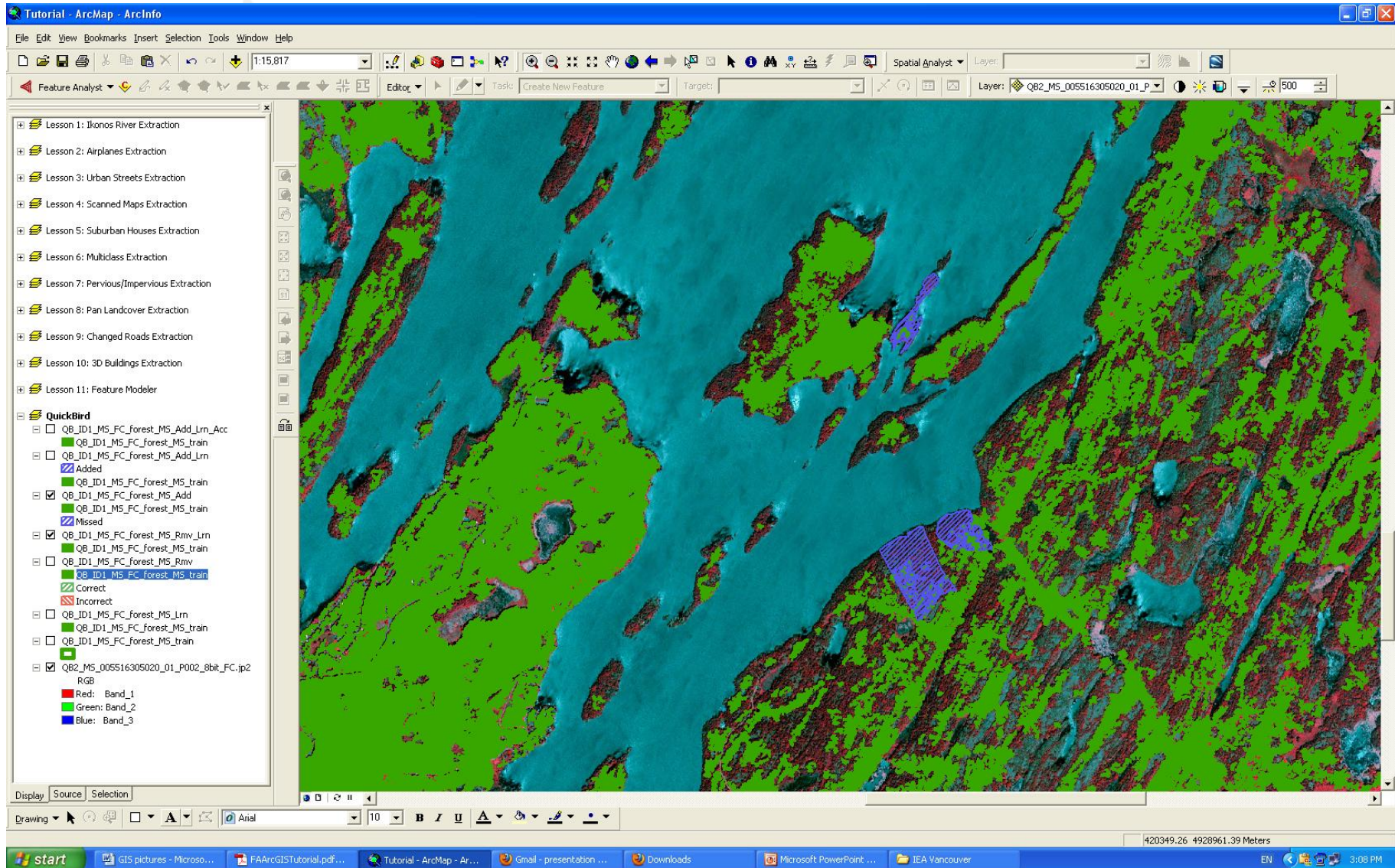
Semi-automated Individual species classification

# First results Feature Analyst

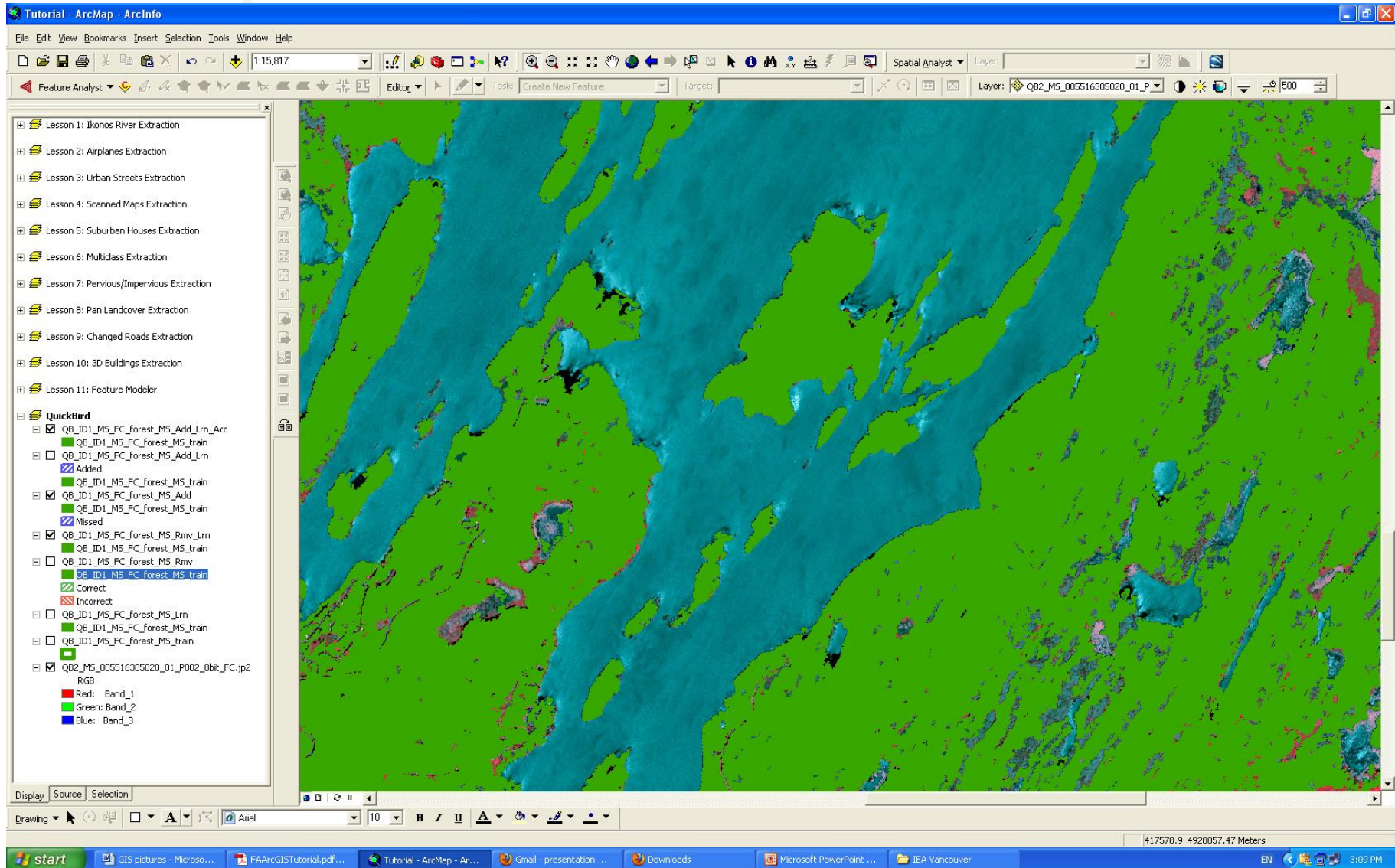




# First results Feature Analyst



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# Thank you!



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