



# Predicting Fire Effects on Future Forest Landscapes

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*JFSP Project, "Fighting Fire with Fire in Alaskan Black Spruce Forests"*

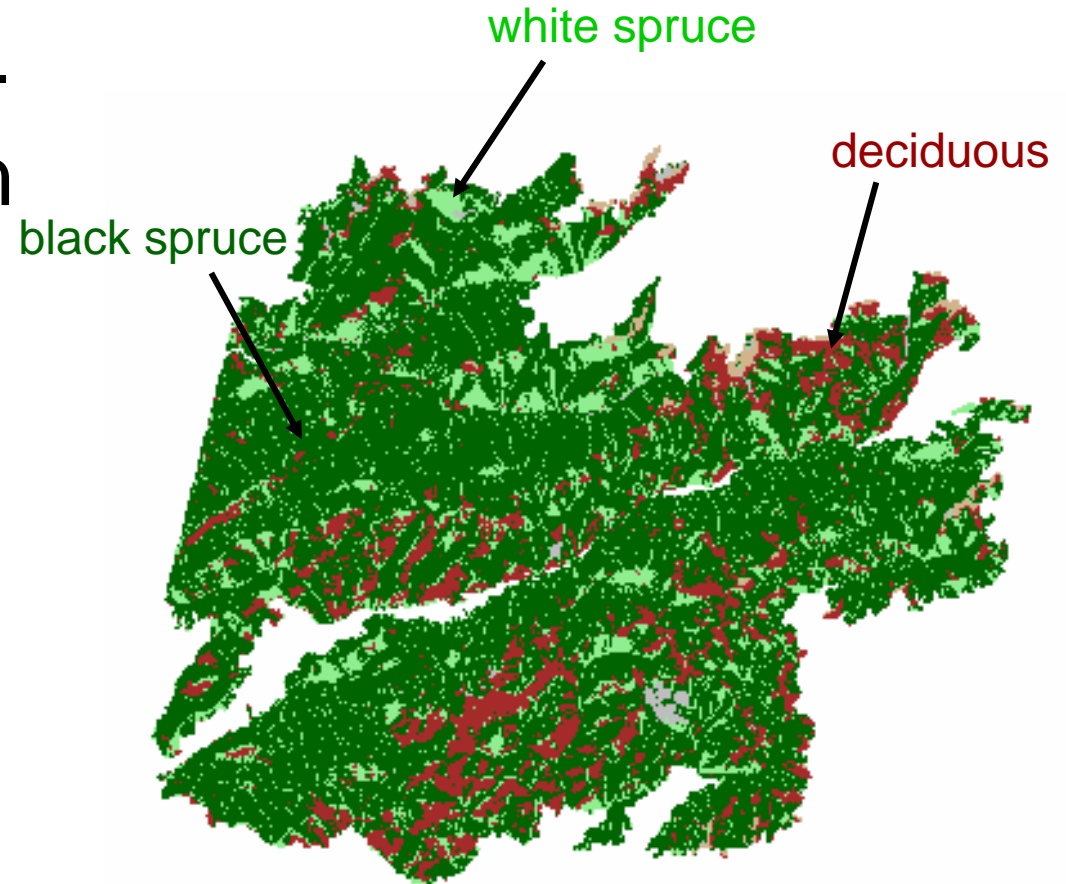
# Successional trajectories modelling

- How might changes in fire severity affect landscape forest composition?
- Simulation experiments:
  - ALFRESCO (Alaska frame-based ecosystem model)
  - 2004 Boundary Fire
  - Estimate future patterns of forest recovery
  - Explore implications for landscape flammability

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# 2004 Boundary Fire

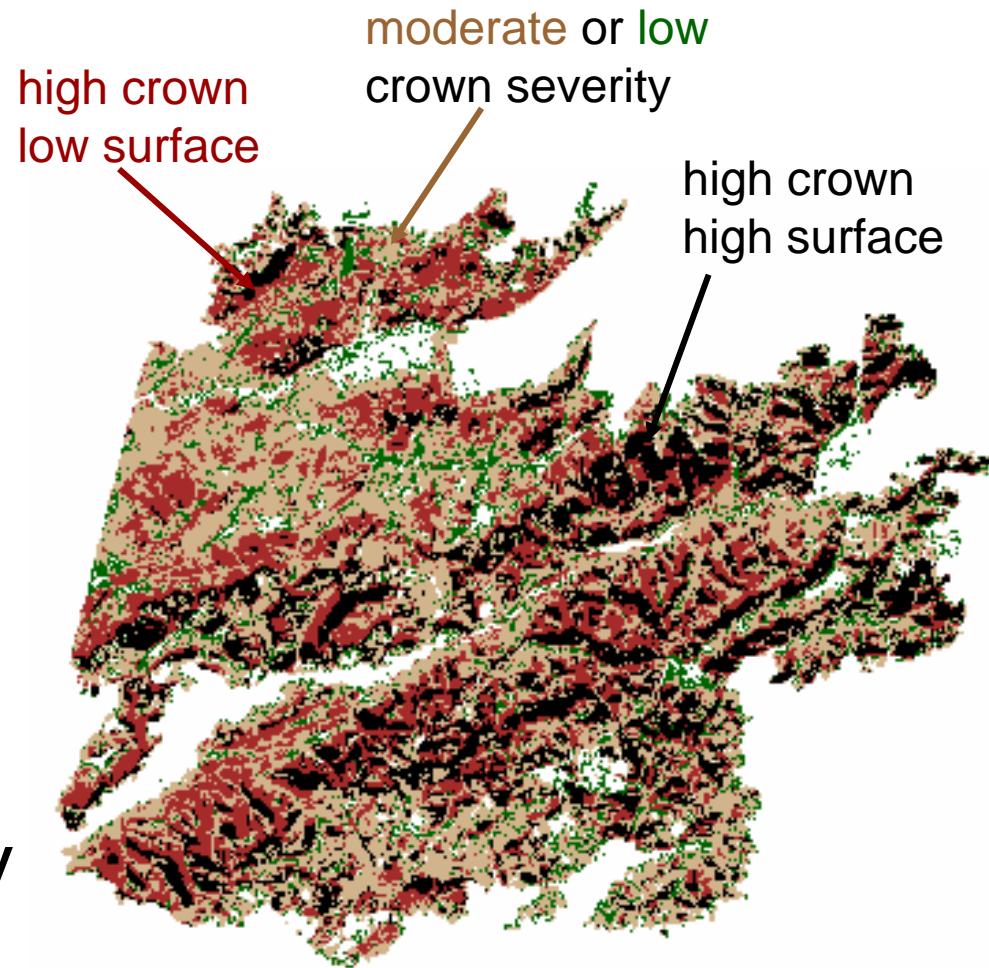
1. Start with pre-fire vegetation



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# 2004 Boundary Fire

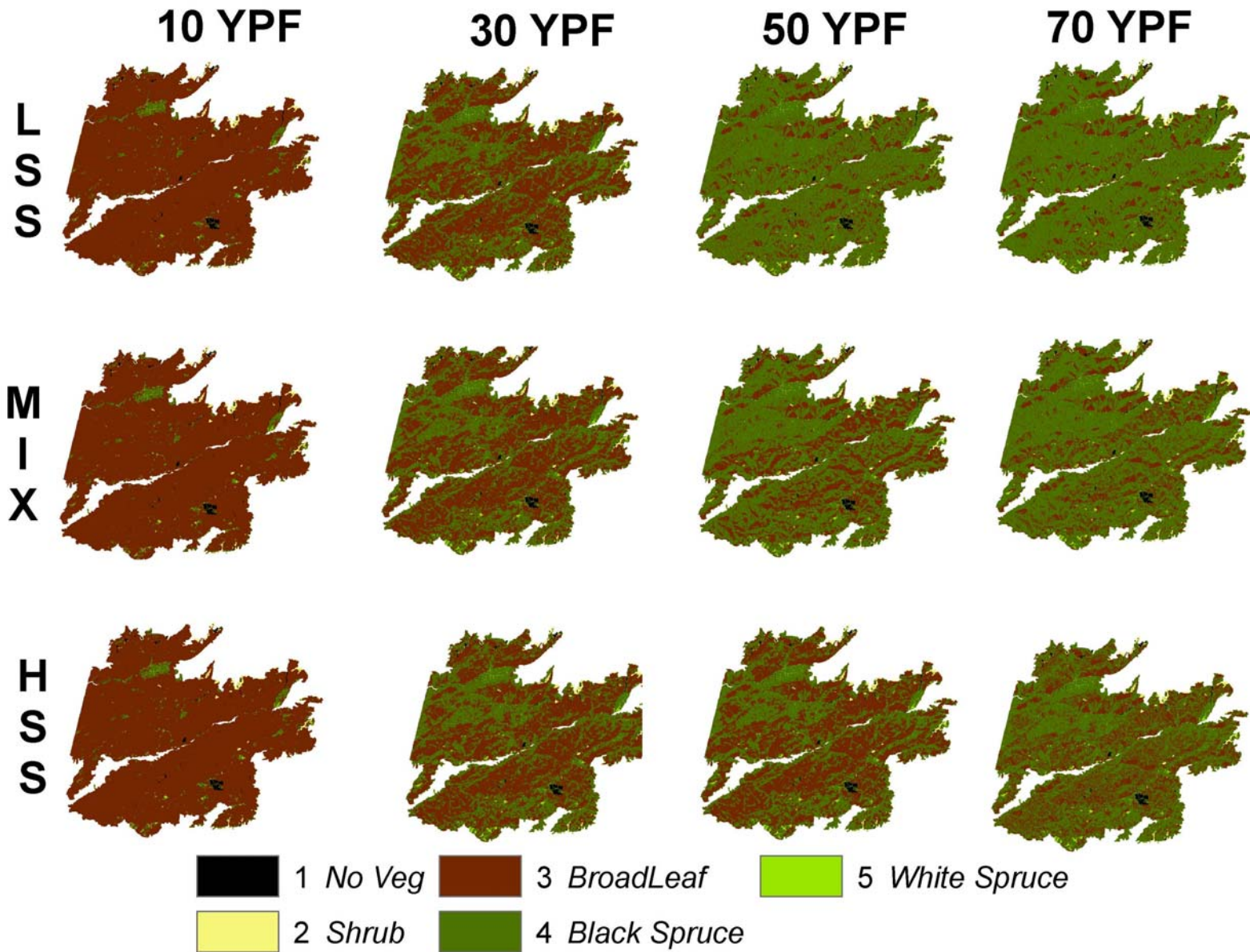
1. Start with pre-fire vegetation
2. Add on fire severity (NBR)
3. Include scenarios for low or high surface severity



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# 2004 Boundary Fire

1. Start with pre-fire vegetation
2. Add on fire severity (NBR)
3. Include scenarios for low or high surface severity
4. Model black spruce recovery trajectories
  - extended deciduous phase under high surface severity

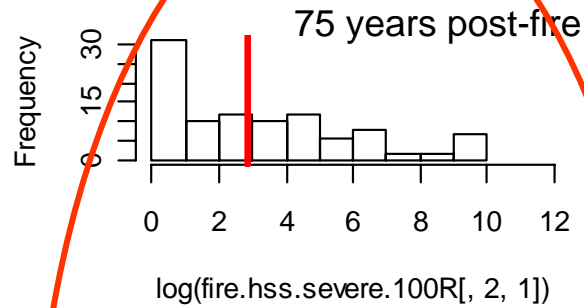
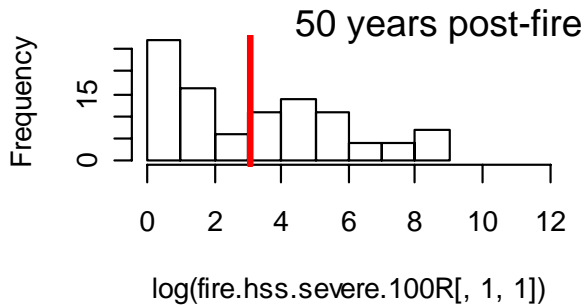


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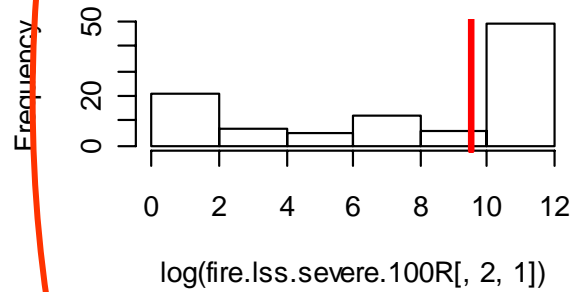
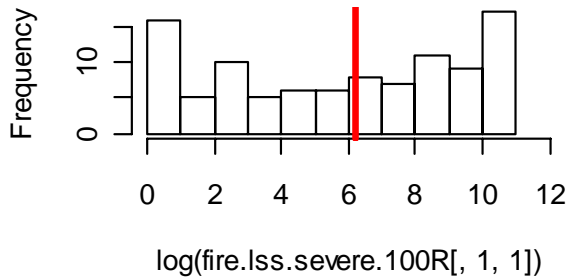
# 2004 Boundary Fire

1. Start with pre-fire vegetation
2. Add on fire severity (NBR)
3. Include scenarios for low or high surface severity
4. Model black spruce recovery trajectories
  - Impacts on future landscape flammability

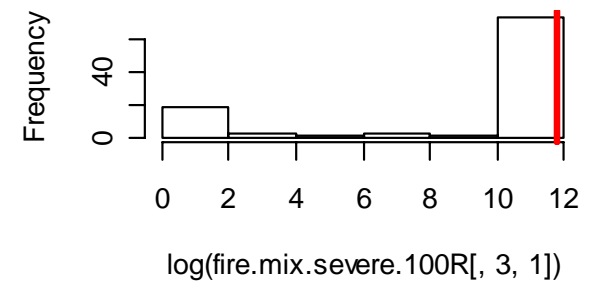
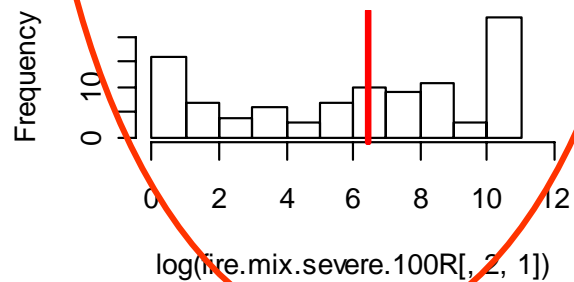
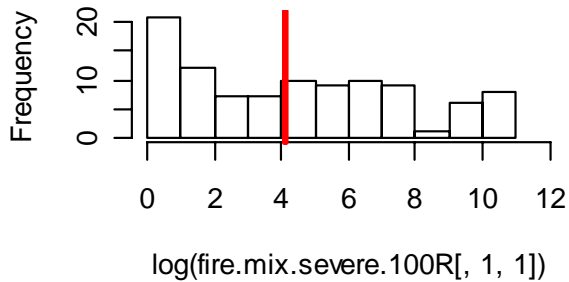
### Scenario 1: High surface fire severity



### Scenario 2: Low surface fire severity



### Scenario 3: 50% High-low surface fire severity



# Summary

- Possible to use real landscape and fire data to project future forest composition
- Including variations in surface fire severity
  - Alters projections of future forest cover
  - Leads to vegetation effects on fire propagation – even in conservative scenarios
- Bottom Line: Fire-initiated changes in successional trajectory can have important, long-term effects on landscape flammability