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Title: Prescribed Fire Modeling at Los Alamos National Laboratory

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Prescribed Fire Modeling at Los Alamos National Laboratory

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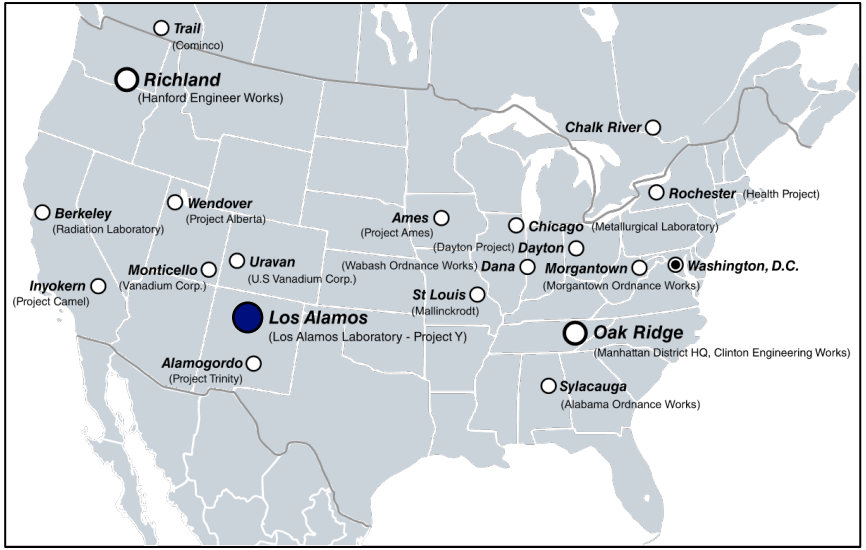
Outline

- Introduction
- Project Background
  - Fire Modeling
  - Prescribed Fires
- Project Objective
- QUIC-Fire
  - Simulations
  - Ensembles
- Conclusion

Introduction

- Los Alamos National Laboratory – Los Alamos, NM
  - Manhattan Project (1943)

- DOE Mission Areas:
  - National Security
  - Science
  - Energy
  - Environmental Management*



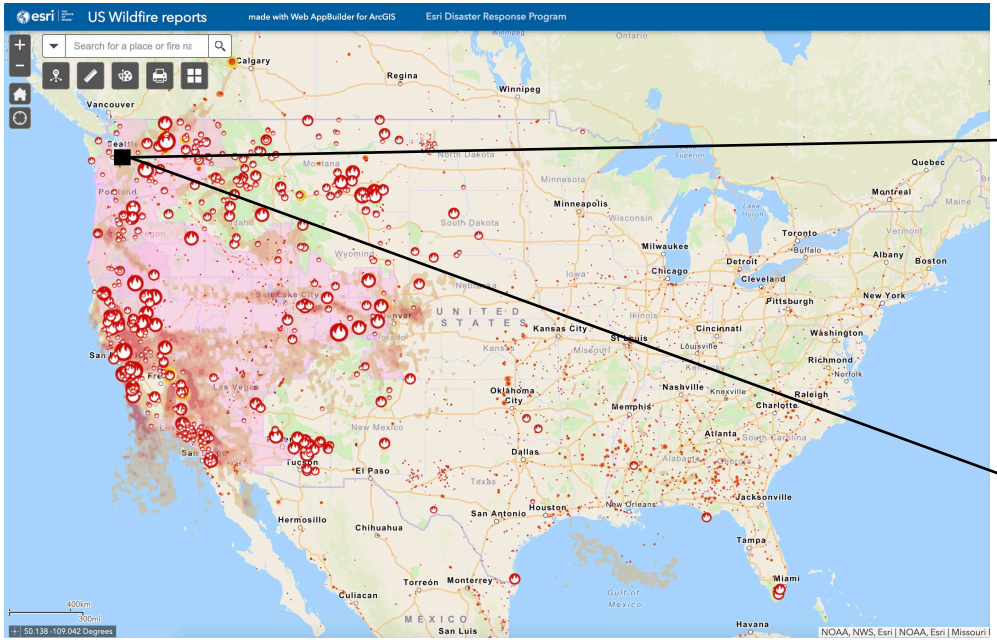
Project Background

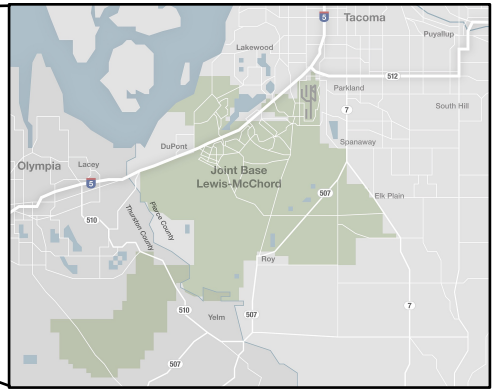
- Fire Modeling:
  - Investigate wildfires
  - Plan prescribed fires

- Prescribed Fires:
  - Prevent Wildfires
  - Remove invasive species
  - Maintain habitats

Project Objective

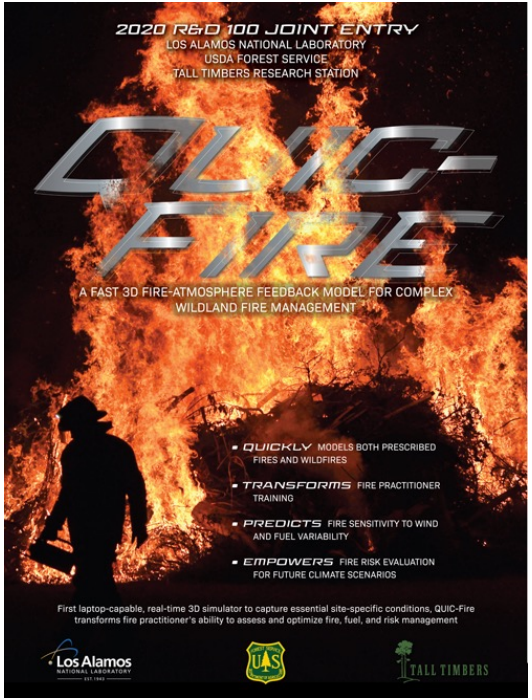
Joint Base Lewis-McChord – Fort Lewis, WA



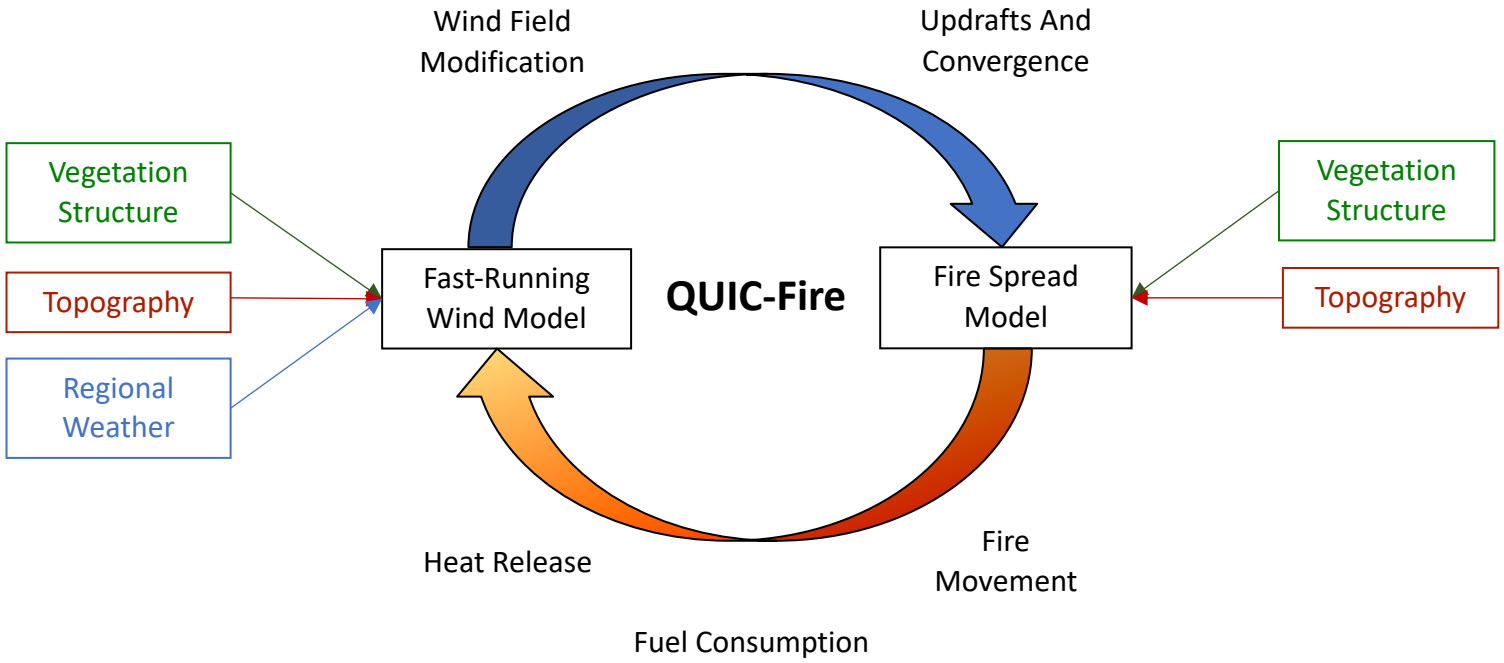


QUIC-Fire

- Developer:
  - Los Alamos National Laboratory
- Co-Developers:
  - U.S. Department of Agriculture Forest Service
  - Tall Timbers Research Station
- 2020 R&D 100 Award
  - Special Recognition: Corporate Social Responsibility

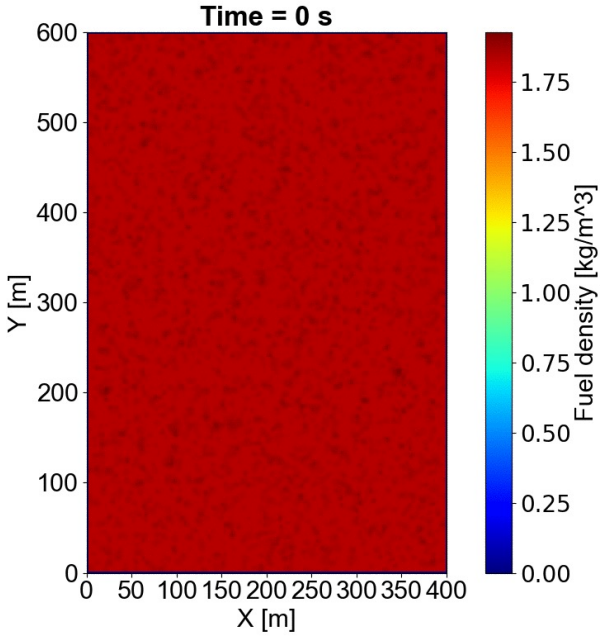


QUIC-Fire

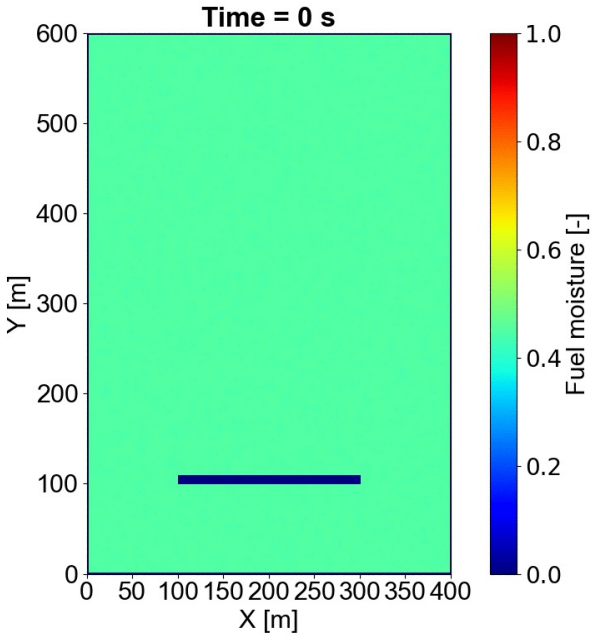

Wind Field Modification
Updrafts And Convergence
Vegetation Structure
Topography
Regional Weather
Fast-Running Wind Model
QUIC-Fire
Fire Spread Model
Vegetation Structure
Topography
Heat Release
Fire Movement
Fuel Consumption

QUIC-Fire Simulation Results

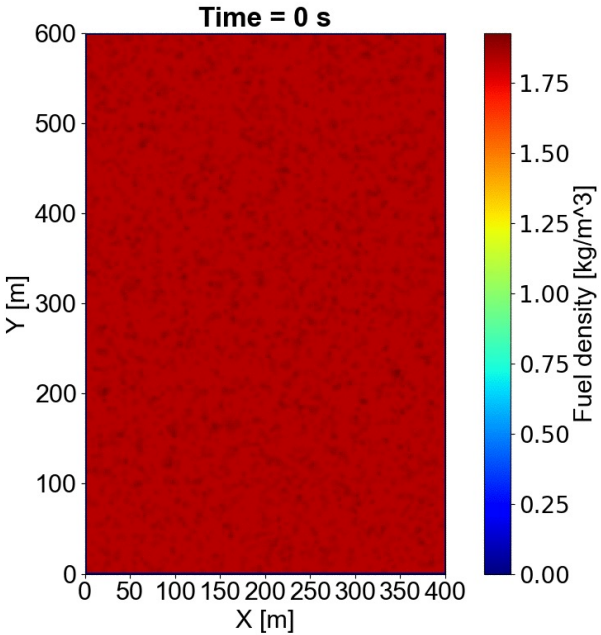
Fuel Density

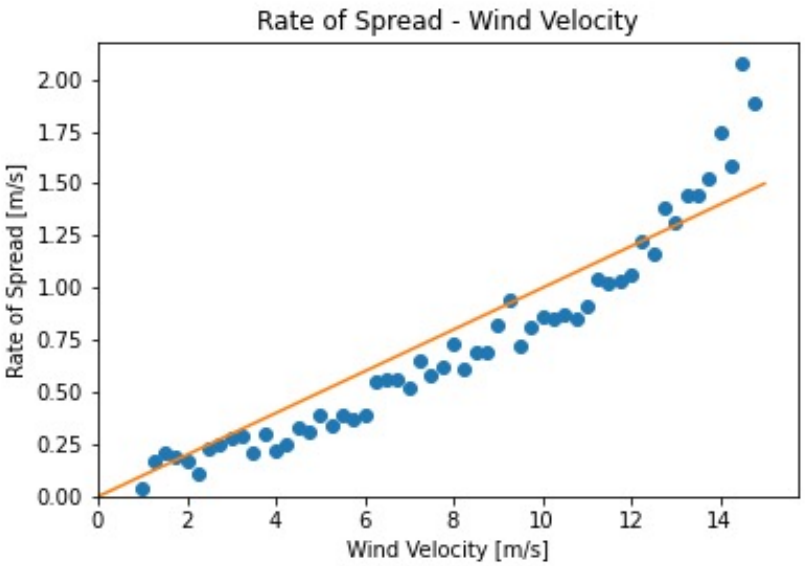


Moisture Content



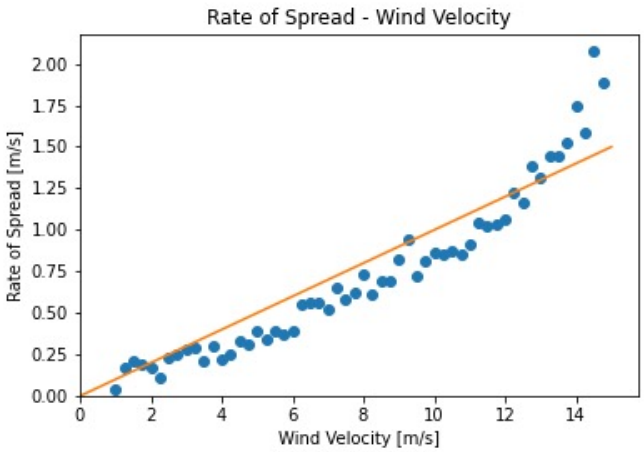
QUIC-Fire Ensembles



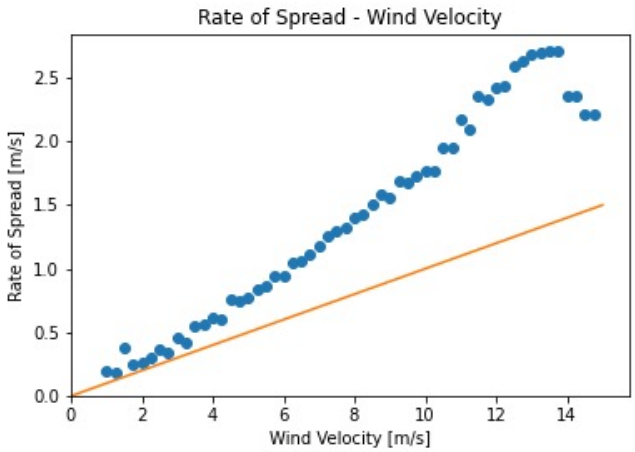


Comparing Ensemble Results

Previous Grass Height: 0.75m



Current Grass Height: 0.50m



Conclusion

- Things I Learned:
  - Commitment Requirements
  - CS & StackOverflow

- Future Work:
  - Updates to Ensemble Program
  - Operational Capability Assessments

Sources

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