

Model Applications: Management and Climate affect Fire Spread

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Introduction

- Chequamegon National Forest, WI
- With FARSITE model (Finney 1998)
- With HARVEST model (Gustafson and Crow 1996)
- Look at fire spread across the landscape using standard fuels (Anderson 1982)
- Include 2 web presentations based on this research



Objectives

- Between non harvest and harvest landscapes with 2 amounts of harvesting at 2% and 4%; and between 2 types of harvest patterns, clustered and dispersed.
- Between 3 levels of wind and rain applied to every landscape.
- Between separate locations on the landscape.



Methods

- Gather data from FARSITE simulation at CNF, using 2001 landscape and 2002 weather
- Place fires on the landscape in 12 different locations
 - 15 days long, 24 hour burning period
 - same starting moistures in fuels in all cases



Methods: Fuel Variables

- Reclassified 6 habitat categories of CNF
 - from Bresee et al. (2004) to 4 of Anderson's fuels which FARSITE was designed to use
 - to create the control, non harvested landscape
- Use HARVEST model
 - to create harvested landscapes
 - replace the fuel layer in FARSITE
- To all landscapes apply 3 levels of rain and wind



Methods: Weather Variables

- Use historic data from Ashland, WI to find ranges that are logical for high and low rain and wind from the past 100 years
http://mcc.sws.uiuc.edu/Precip/WI/470349_psum.html
- Control weather is actual CNF, NHW tower data, scenarios are 100% higher and 50% lower for both rain and wind
- Change the ASCII file inputs in FARSITE, run simulations

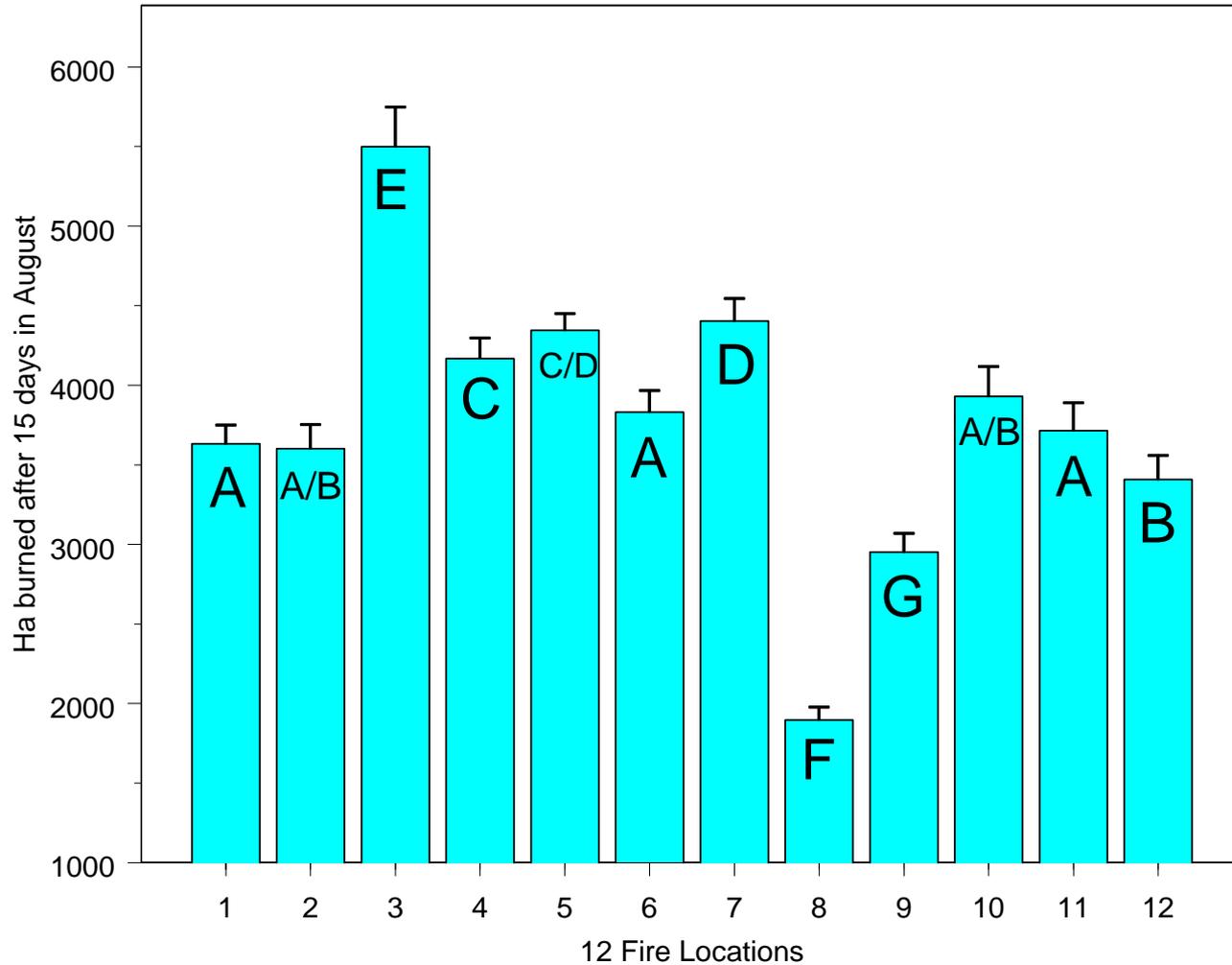


Preliminary Results

- Location, rain, landscape are significantly different but not wind
 - Wind was scaled up
- 12 fire locations have the most variability
- Rain has a strong effect on fire spread
- All harvest scenarios reduce fire spread
 - First by amount, 2% and 4% and then by pattern of harvest, dispersed and clumped
 - Control, D2, C2, D4, C4.



Fire Ignition Point



Web Presentations

- [FARSITE Surface Fire Interactive](#)
 - Choose number of days and rain fall
- [FARSITE and HARVEST model Interactive](#)
 - Choose harvest scenario and rain fall



Conclusions

- Fire locations can be prioritized for fire spread by habitat
- Rain is a strong indicator of fire spread
- Harvesting decreased fire spread in our simulations



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