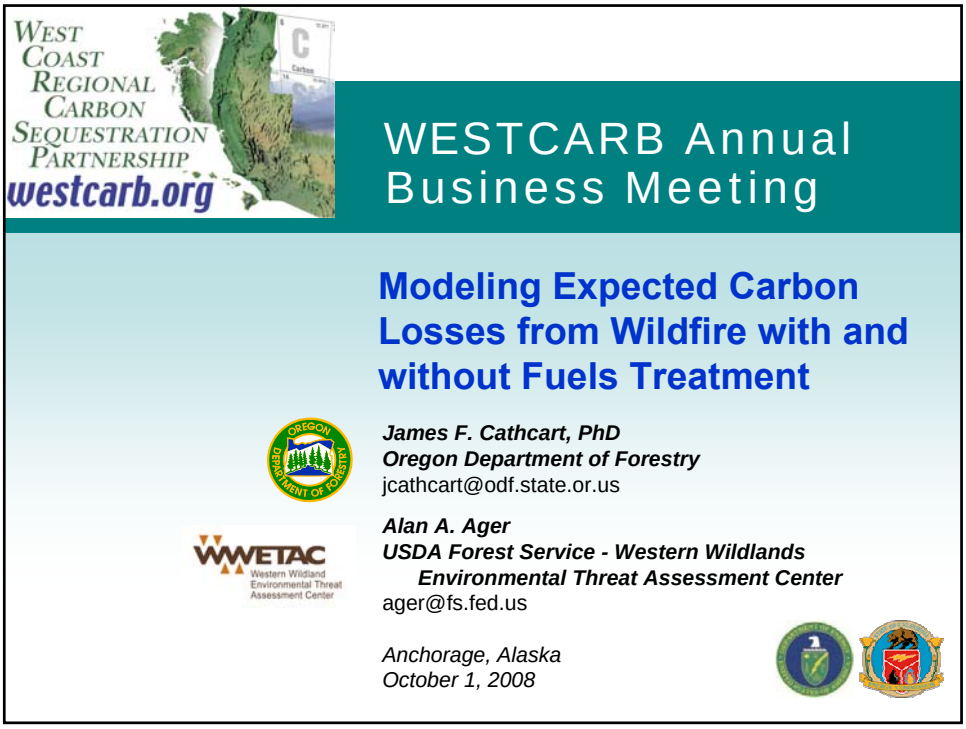
WEST COAST REGIONAL CARBON SEQUESTRATION PARTNERSHIP
westcarb.org
WESTCARB Annual Business Meeting
Modeling Expected Carbon Losses from Wildfire with and without Fuels Treatment
James F. Cathcart, PhD
Oregon Department of Forestry
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Alan A. Ager
USDA Forest Service - Western Wildlands
Environmental Threat Assessment Center
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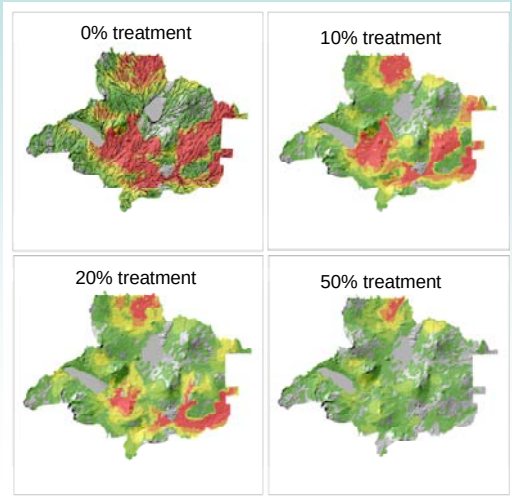
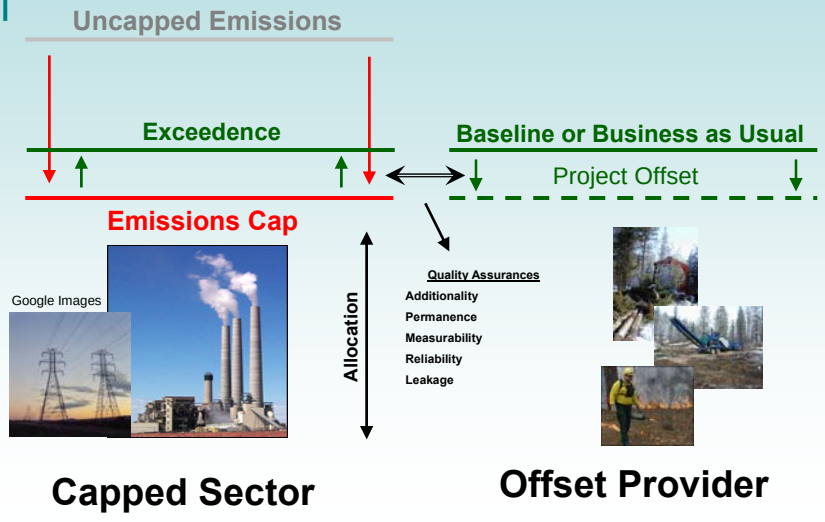
Anchorage, Alaska
October 1, 2008


What Are We Talking About?
Overstocked "At Risk" Stand
Fuels Treatment Actions
-- Timber Harvest
-- Slash Treatment
-- Prescribed Fire
Treated "Resilient" Stand
Google Images
WEST COAST REGIONAL CARBON SEQUESTRATION PARTNERSHIP
2

Landscape



Carbon Offset



Research Questions

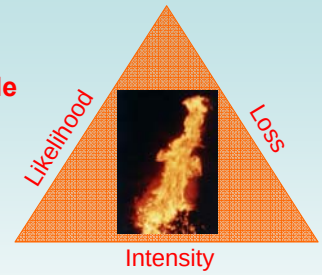
Question #1: Do fuel treatments result in an overall carbon dioxide emission benefit?

- Avoided Emissions by Changing Fire Severity and Extent
- Increased Carbon Sequestration in the Residual Forest
- Carbon Storage in Wood Products/Biomass Utilization

Question #2: If so, can they be observed, measured, and reported to meet a mitigation standard as a carbon offset?

Wildfire Is Stochastic

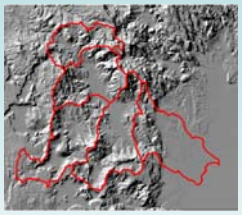
Fire Risk Triangle



Risk – Likelihood that a wildfire will occur
Loss – The consequence from a wildfire given the level of intensity

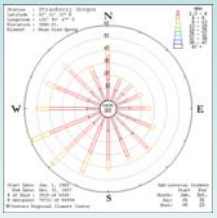
Expected Loss = Σ $Prob_{(likelihood)}$ Σ $Prob_{(intensity)}$ x $Loss_{(intensity)}$

Risk Is Not Completely Random

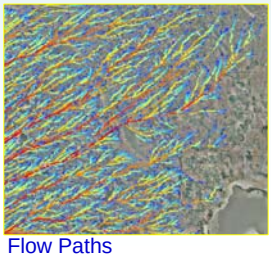


Landscape

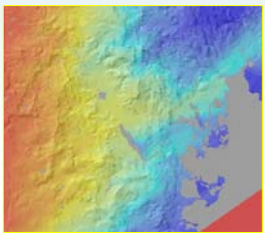
+



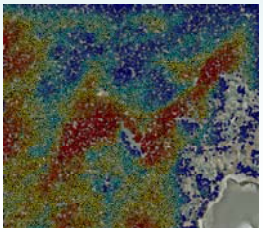
Problem Fire



Flow Paths

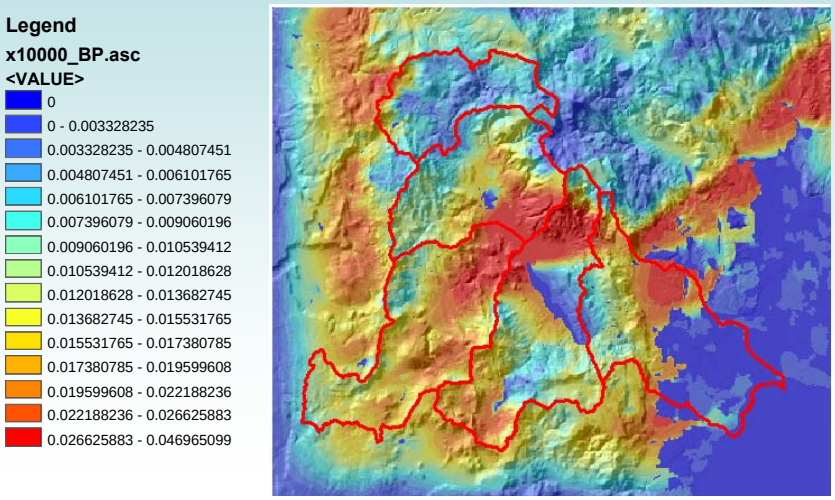


Arrival Time

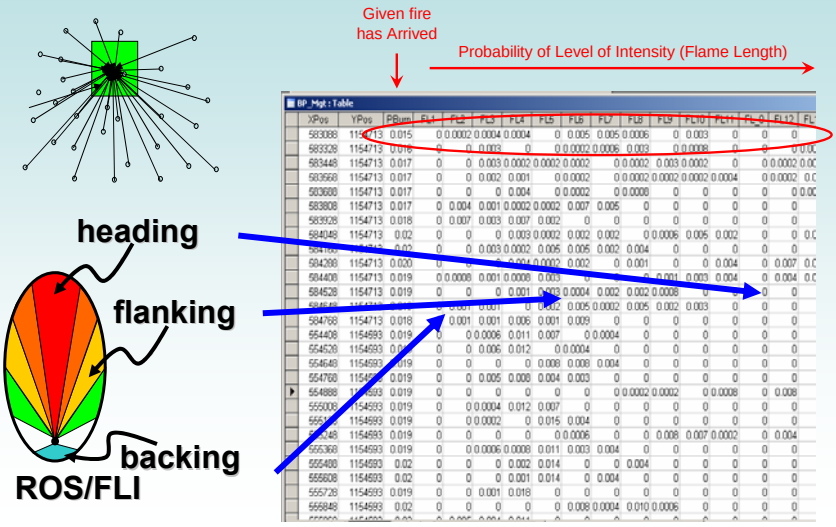


Size of the Fire

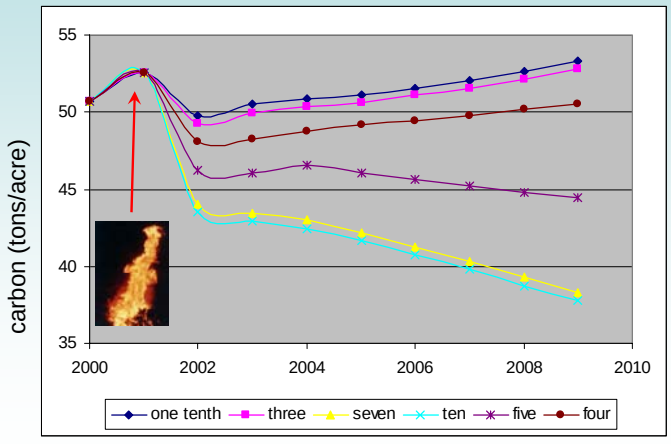
Burn Probabilities (Likelihood)



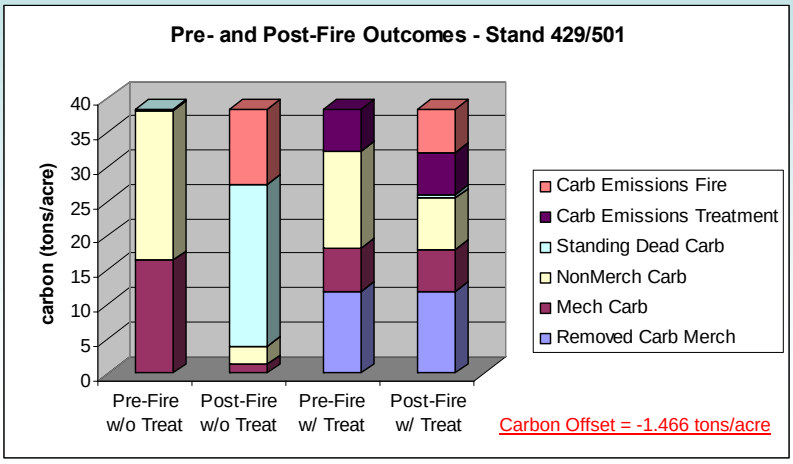
Wildfire Intensity Varies



Loss Is a Function of Intensity



Treated Acres – Source or Sink?



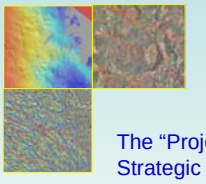
Swing Variable – Slash

This

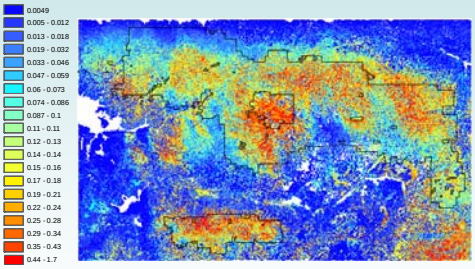
Or This?

Landscape Analysis – Treatment Optimization

Risk Evaluation



The "Project" - Strategic Placement of a Group of Treatments



"Project" Effects
Expected Loss
Across Landscape

What We Have Learned

- **Wildfire Is Stochastic**
- **Risk Is Not Completely Random**
- **Conditional Burn Probabilities Not Uniform Across Landscape**
- **Wildfire Intensity Varies**
- **Loss (Emissions) Is a Function of Fire Intensity**
- **Treated Acres Can Be a Source or a Sink (Depends on Slash)**
- **The "Offset Project" Is a Strategic Collection of Treatments**