

November, 2007

Climate Change and Fire

Research has documented strong links between past climate variability and area burned in wildfires, particularly in the western United States. Projections from climate models suggest that burned areas and fire severity will increase in the future over much of the United States. These changes will affect fire suppression costs and resources, alter ecosystem characteristics, and increase potential fire risk to communities.

Key Points:

- The extent and severity of drought, timing of spring snowmelt, and changes in ocean circulation patterns have all historically contributed to the extent and severity of wildfire on forests and rangelands.
- Many areas of the US have warmed significantly over the past 40 years, with the greatest changes occurring in northern latitudes and in the west; these changes are projected to continue.
- Much of the recent increase in fire in the western United States can be correlated with increasing temperatures, changes in precipitation patterns, and longer fire seasons since the mid 1980's. No single event, however, can be specifically linked to climate change.
- There is growing scientific evidence that climate change will increase the number and size of wildfires, both globally and in North America. The effects of climate change on wildfire occurrence, extent, and severity will vary in different regions of the country.
- Climate change and changing wildfire patterns will cause changes in the distribution of individual plant species and of forest and rangeland ecosystems.
- Even where rainfall remains the same or increases, warming temperatures can greatly increase plants' need for water, and increase drought stress and fire hazard.
- As fires burn more frequently, burn larger areas, or burn more severely, the carbon stored in ecosystems will decrease, and carbon gases and particulates in the atmosphere will increase.
- These increases will add to air pollution and have the potential to increase the intensity of greenhouse warming. The net impact of fires on global warming potential, however, is not fully understood.
- Forest management techniques such as prescribed burning or thinning dense forests, can make forests more resilient to wildfire and decrease fire emissions.
- While the Fall 2007 fires in Southern California can not be specifically attributed to climate change, they are an example of the types of fire activity that we can expect to see more frequently in many areas of the western US, and are consistent with projections from climate change models.

For more information contact: Susan G. Conard, National Program Leader, Fire Ecology Research, 703-605-5255; sconard@fs.fed.us