ENVIROMENTAL FACTORS CONTRIBUTING TO THE EMERGENCE OF SOUTHERN GREAT PLAINS WILDFIRE OUTBREAKS

INTRODUCTION

- Traditionally, operational efforts in fire meteorology and predictive services have focused on short-term, or dynamic, fire regime considerations such as vegetative responses to seasonal variability and the daily state of weather.

- Due to the recent disastrous public impacts of southern Great Plains wildfire outbreaks (SGPWOs), meteorologists and fire analysts now strive to better understand long-term trends in climate and vegetative fuels as well as population and socio-economic conditions that have made the region vulnerable to violent “firestorms”.

- This study examines long-term changes to the Great Plains’ fire regime in Texas that have led to an increased environmental risk of wildfire outbreaks. An example of how these factors have amplified the region’s vulnerability to wildland fire and contributed to the emergence of SGPWOs is illustrated by events at Cross Plains, Texas, where 120 homes, churches, and businesses were destroyed and two persons killed during a regional fire outbreak on 27 December 2005.

HISTORICAL FIRE TRENDS

Texas statewide yearly mean KBDI (1900-2010) plotted with population and SGPWOs. The current period of high KBDI indicative of a multi-decadal drought is shaded. SGPWOs have occurred in association with rapid population growth during this modern long-term drought.

CLIMATE, POPULATION, AND LAND USE

CROSS PLAINS, TEXAS - 27 DECEMBER 2005

CONCLUSIONS

- TA&MFS wildland fire records show that despite a general decline in the number of annual wildfires, a dramatic increase in mean fire size has occurred during the past decade. Note: this data is biased by changes in sampling practices since 2000. Portions of the Great Plains have seen an increase in woody species during the last century, which may be symptomatic of a general decrease in fire.

- Long-term trends in KBDI indicate three multi-decadal droughts in the past century. The most recent prolonged drought began in the late 1990s.

- The population of Texas (regionally representative) has increased dramatically since the previous long-term drought of the 1940s-1950s. Along with increased population, socio-economic changes have resulted in a reduction of grazed/plowed agricultural lands in favor of conserved grasslands.

- These environmental trends, illustrated by events at Cross Plains, Texas, have supported the emergence of SGPWOs within the modern southern Great Plains fire regime.

For additional information or questions contact:
Todd Lindley todd.lindley@noaa.gov
NOAA/National Weather Service – Amarillo, Texas
Gregory P. Murdoch
NOAA/National Weather Service – Midland, Texas
Bradley R. Smith
Texas A&M Forest Service – Longview, Texas
Kurt M. Van Speybroeck
NOAA/National Weather Service – Southern Region – Regional Operations Center – Fort Worth, Texas

*For additional information or questions contact:
Todd Lindley todd.lindley@noaa.gov
NOAA/National Weather Service – Amarillo, Texas