NEW MEXICO
Climate

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Office of the State Climatologist | Department of Agronomy and Horticulture
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Extinguished for Now: New Mexico Fire Season 2000

by Tom Bird
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During spring 2000, New Mexico was in the national spotlight with numerous high profile wildfires. The Cerro Grande fire near Los Alamos, the Cree fire near Ruidoso, and the Scott Able fire east of Cloudcroft each burned thousands of acres of New Mexico forests.

The Cerro Grande fire in May was the biggest, burning 47,650 acres and 235 structures. The fire also caused damage to Los Alamos National Laboratory and made the list of the most serious wildland fires in United States history.

Peak wildland fire activity tends to migrate around the country throughout the year, based on normal climatalogical patterns for each region. During the summer, the Great Basin has extreme fire activity. New Mexico normally experiences two peak wildland fire seasons each year. These fire seasons fittingly correspond to the two driest times of the year. The worst of the two seasons is usually the windy, spring season when the state receives almost no rain and experiences strong, dry winds. The threat of fire is heightened during this season, because live vegetation is starved for moisture. Fires during this first season are most often caused by human activity or lightning from dry thunderstorms (thunderstorms with little or no rain). With no rain, fires caused by lightning strikes cannot be extinguished naturally.

As the summer approaches, the general pressure pattern changes and causes southerly winds to converge over New Mexico and Arizona from the Pacific Ocean and Gulf of Mexico. Commonly referred to as the Southwest Monsoon, this phenomena increases atmospheric moisture levels dramatically and allows for almost daily wetting thunderstorm activity. During this season, vegetation greens up, and increased moisture content makes it harder for fires to start. Also, most lightning strikes are accompanied by rainfall, which tends to quickly douse any fires that do start.

The second fire season usually begins during the fall, which brings another dry period for southern New Mexico. During this time, many grasses and other small plants begin to die and dry out, providing ready fuel for wildland fire activity. Moisture levels in the atmosphere are reduced, and once again dry thunderstorms become a threat to ignite fires.

Making your home safe from wildland fire

By Ted Sammis, John Mexal, Walter Zachritz II, and Robert Cain

The western United States is subject to forest and rangeland fires that can destroy homes and damage watershed vegetation cover, which can degrade drinking water quality and quantity. Fires are more prevalent during droughts, which occur every 10 years on average in New Mexico. The U.S. Forest Service produces a monthly fire forecast index, which characterizes the weather-induced wildland fire potential for the continental United States. The index, a modified version of the Chandler Burning Index (CBI), provides a measure of the effects of temperature and humidity on fire intensity and rate of spread (Fig. 1).

Both the intensity and spread components of the index value are linearly related to temperature—an increase in temperature results in a higher but insignificant index value. But that are exponentially related to humidity—a small decrease in humidity results in a large increase in the index value (Fig 2.).

National Weather Service balloon

Another index calculated by the Forest Service is the Haines Index, or Lower Atmosphere Stability Index, which is computed each morning from the atmospheric temperature, dew point and barometric pressure data collected from National Weather Service balloons.

The Haines Index is composed of a stability value and a moisture term. The stability value is derived from the temperature difference at two atmospheric levels. The moisture term is derived from the dew point depression at a single atmospheric level. This index is correlated with speed of fire growth on fires that are not dominated by surface winds. Even when surface moisture is low, a high Haines Index can result in uncontrollable wildfires.

The Haines Index ranges from 2 to 6 to indicate the potential for large fire growth.

2 : Very Low Potential
(Moist Stable Lower Atmosphere)
3 : Very Low Potential
4 : Low Potential
5 : Moderate Potential
6 : High Potential
(Dry Unstable Lower Atmosphere)

At the time of the Cerro Grande fire near Los Alamos, N.M., the Haines Index was high. Wild fires that start under a high temperature, windy conditions and low humidity tend to burn fast and may be uncontrollable.

Homes located near the wildland-urban interface are at greater risk for wildfire damage than those located in urban areas. Homeowners can help protect their property from wildfires. The Internet is an excellent source of information about what precautions are appropriate. Four fire prevention zones have been defined by the City of Santa Barbara, Calif. and Colorado State University. The first zone, located closest to the residential structure, should be at least 15 feet wide and designed to protect the home from intense flames and sparks carried by strong winds, which are common during a wildfire.

The second zone is open ground surrounding the home known as defensible space. Generally, homeowners should clear flammable vegetation from at least a 70-foot perimeter (Fig. 2). Wildfires run up slopes and gullies so the size of the defensible space should increase as the steepness of the slope

increases. For example, a home on a 25 percent slope should have at least 95 feet of defensible space on the side uphill from the house. The defensible space should be at least 115 feet downhill from the house.

The third zone is open forest, while the fourth zone, lying farthest away from the residence, consists of native vegetation thinned to reduce foliage (fuel load).

Landscaping in the first two zones should consist of fire-resistant shrubs and vegetation. Trees and shrubs should be at least 10 feet apart. A list of fire retardant vegetation from the University of Utah is available on the Internet at http://www.blm.gov/utah/fire/plant.html. The recommended trees include maple, birch, Eastern redbud, quaking aspen, poplar or cottonwood and willow, because they do not burn as quickly or as hot as pine and Douglas-fir. Safe roofing materials include asphalt, fiberglass, concrete tile, clay tile, or metal. Exterior walls should be constructed of brick, stone, metal, or concrete. For more information about fire prevention zones, visit http://www.smgrowers.com/firesc.htm.

These Internet sites have links to other sites that contain additional information. Also, learn more about how to protect your house from wildfire, use the Internet for easily retrievable information. Organizations that offer updated information about how to protect your home include public and private agencies.

Homes located near the wildland-urban interface are at greater risk for wildfire damage than those located in urban areas.

The National Interagency Fire Center (http://www.nifc.gov/) provides current status of fires in the West, along with educational information about protecting your home.

The Department of Agriculture National Symbols Catalog (http://wahoo.dnr.state.mn.us/catalog/products/fire_welcome.html) has educational materials about fire protection for all age groups.

The private Firewise organization (http://www.firewise.org/) offers materials, along with videos and books about protecting homes from wildfires.

The California Fire Safety Council (http://www.firesafecouncil.org/) presents information that is applicable to New Mexico but gives laws and regulations that apply only to California.

Other government agencies that offer fire protection information include the Federal Emergency Management Agency's United States Fire Administration (USFA) (http://www.usfa.fema.gov/), and the Bureau of Land Management (http://www.blm.gov/utah/fire/safehome.html).

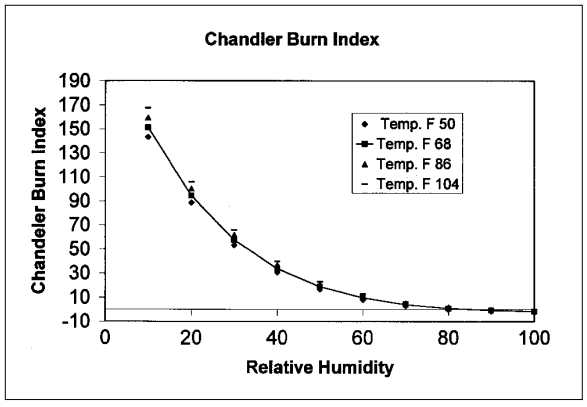

Fig 1.

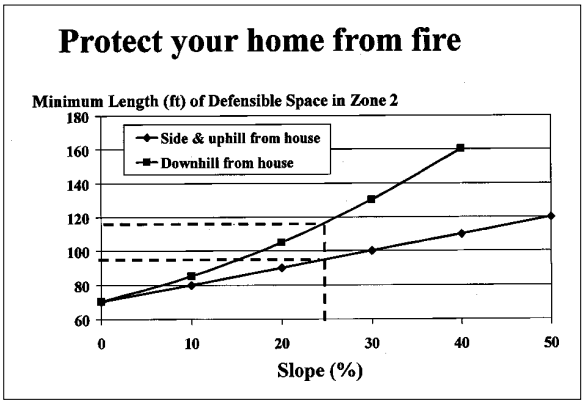

Fig 2.

About NMSU's Climate Center

NMSU's Climate Center is home to the state climatologist who helps New Mexicans understand the impact of climate changes on the environment, human health, and agricultural production.

The state climatologist is responsible for archiving weather data and distributing climate information to the public. Unlike meteorologists, climatologists do not provide weather forecasting or up-to-the-minute bulletins. Instead, they use a computerized data collection system to provide statewide weather reports for previous days, as well as for historical information.

The state climatologist puts climate data into a form people can use to make decisions about their lives. During fire season, people use climate data to assess potential fire hazards and to evaluate fire-fighting conditions. Engineers use information about rainfall and flooding to design bridges, culverts, storm sewers and sanitary sewers. Business owners use climate data to evaluate new business or relocation sites. Farmers use it to anticipate outbreaks of insect pests or crop diseases. People also use climate data when making their recreation and travel plans.

The office of the state climatologist and its head, the state climatologist, are described in New Mexico Statute 75-4-1 through 75-4-4.

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