

WILDFIRE

News & Notes

NWCG's NEW QUALIFICATIONS AND TRAINING SYSTEM UMBRELLA

The Canadian Fire Danger Ratings Associated with the 1991 Oakland-Berkeley Hills Fire

In two previous issues of *Wildfire News & Notes* the values for the six standard components of the Canadian Forest Fire Weather Index System (FWI) System associated with the 1990 Stephan Bridge Road Fire (Vol. 6, No. 1, p. 6) and the 1991 Spokane area fires (Vol. 6, No. 4, p. 6-7) were presented. We recently undertook to do the same for the Oakland-Berkeley Hills Fire of October 20, 1991, in connection with advanced behavior training courses held in New Zealand during March and April 1993.

Both the case study report and the videotape produced by the National Fire Protection Association on this very significant wildfire incident were utilized in the wildland-urban interface segment of the courses.

Examination of the climatological observations made at the Oakland Museum (9 m MSL and 8 km southwest of the fire area) revealed that 179 mm of rainfall fell in March 1991. This data is summarized in various issues of *Climatological Data-California* published by the National Climatic Data Center (NCDC) in Asheville, North Carolina. However, a total of only 34.3 mm of rain was recorded between April 1 and October 20. The last period of rain (4.8 mm) occurred on Aug. 13-14,

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67 days prior to the major run of the 1991 Oakland-Berkeley Hills Fire. Mean monthly maximum temperatures in the six months preceding the fire varied from around 18 to 23°C.

The weather readings taken at the Chabot Observatory (elevation: 111 m MSL) located approximately eight kilometers southwest of the fire area (elevation: nominally, 365 m MSL) are considered to be the most representative of the conditions which existed at the time because of the station's position west and downwind of the Oakland-Berkeley Hills ridge line (Robert A. Schroeder, University of California, Berkeley, personal communication). At the time of the fire's outbreak between 10:45 and 11:15 on October 20, ambient air temperature was 27.8°C and winds were NNE (26°) at 31 km/h. Unfortunately, the computed relative humidity ($\approx 2\%$) based on the dewpoint temperature appears to be suspect in view of the observations from other nearby stations. For example, at the Oakland International Airport (elevation: 27 m MSL) adjacent to San Francisco Bay, 15 km south of the fire area, the temperature was 28.3°C, winds were NNE (20°) at 20 km/h and relative humidity was 30%.

—continued on page 5

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Fire Danger Ratings

Continued from page 1

In order to calculate the FWI System components for the Oakland-Berkeley Hills Fire, the daily 1:00 P.M. PDT fire weather observations at the Oakland airport for April to October 1991 were obtained from the NCDC. On October 20, the following conditions prevailed:

Dry-bulb temperature: 32.2° C

Relative humidity: 17%

10-m open wind: NE (40°) @ 37 km/h

The numerical values for the three fuel moisture codes and three fire behavior indexes of the FWI System as calculated from the daily 1:00 P.M. PDT weather observations at the Oakland airport and the 24-hour accumulated rainfall at the Oakland Museum were in turn:

Fine Fuel Moisture (FFMC): 95.7

Duff Moisture (DMC): 164

Drought Code (DC): 1082

Initial Spread Index (ISI): 61.5

Buildup Index (BUI): 238

Fire Weather Index (FWI): 118

These ratings are indicative of extreme fire potential regardless of what aspect of fire danger or fire behavior one wishes to consider (i.e., ignition ease, spread rate, spotting, control difficulty or impact). For example, in most fuel types when the DC reaches values of 300-500 or greater, deep duff fuels are sufficiently dry to support smoldering combustion, and fire managers need to be especially cognizant of this fact during mop-up operations.

The findings reported here coupled with previous studies illustrate the value that fire danger rating systems can have as planning and operational decision-making aids in wildland/urban interface fire management.

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