

10-hour timelag dead fuel moisture model

Description

The 10-hour timelag fuel moisture MC_{10} is the moisture content of the 10-hour timelag fuels, which consist of dead roundwood 0.25 to 1 inch in diameter and the layer of litter extending from just below the surface to 0.75 inch below the surface (Deeming et al. 1977).

The calculation of the 10-hour timelag fuel moisture model requires the use of fuel sticks. However, an estimation of the 10-hour fuel moisture at midafternoon without the use of fuel sticks is possible according to the formula described here (Bradshaw et al. 1983).

As for the calculation of the [1-hour timelag fuel moisture model](#), the calculation of the 1-hour timelag fuel moisture model requires daily temperature [$^{\circ}\text{F}$], relative humidity [%] and fraction of sky cover at early to midafternoon time (Bradshaw et al. 1983).

Formula

When fuel sticks are not used, the 10-hour fuel moisture MC_{10} [%] for midafternoon observation time is estimated in a manner similar to that for the [1-hour fuel moisture model](#) (Cohen & Deeming 1985):

$$MC_{10} = 1.28 \cdot EMC_{f/a}$$

where $EMC_{f/a}$ is the same EMC used to calculate the [1-hour timelag dead fuel moisture model](#).

NB: According to Bradshaw et al. (1983), this model works well for early afternoons in strong continental areas at the approximate latitude of Nebraska ($\sim 41^{\circ}\text{N}$) in the late summer, but tends to underpredict fuel stick moisture under other conditions.

The 10-hour timelag fuel moisture model is supposed to be calculated on a daily basis. The meteorological data used for its calculation have to be recorded at early to mid-afternoon time (1 to 3 pm).

References

Deeming et al. (1977)
Bradshaw et al. (1983)