Technical Session 6: Utility Company Research

A Dose Response Model Approach to Subterranean Decay Hazard Mapping for Utility Poles

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Background

Decay hazard mapping was created in 1973 to provide a means to qualitatively differentiate environmental exposure across the United States. The development of a national map with zones ranging from low to high/severe has evolved from four zones to five as regional adjustments to the boundaries were made three times with the last adjustment in 1993. Given the increase in capabilities in geostatistical modeling and the need to optimize life cycle extension processes for wood utility poles, a new approach was explored to assess the relative subterranean decay hazard that wood poles are exposed to.

Abstract

Exposure-response relationship models are widely used in scientific and medical research to describe the behavior of a system or subject in terms of changes in the condition of the system or subject as a result of exposure to different quantifiable exposures. Utilizing this approach an exposure model has been developed for wood utility pole groundline decay using a calculated daily dose comprised of soil moisture, soil temperature, relative humidity, and precipitation frequency. Soil Climate Analysis Network (SCAN), and Snow Telemetry (SNOTEL) station data were used to develop a daily dose value.

The calculation evaluates whether suitable daily moisture conditions exist, and if so the soil temperature is used to quantify the energy available for wood decay fungi growth. Daily dose calculations were then used to develop an estimated annual dosing rate for each of the SCAN and SNOTEL observation stations.

An ensemble estimated annual dose rate model was created for the continental United States with these station values using multiple geostatistical modeling techniques. Estimated annual dose rate values were classified into five zones which were evaluated and validated using over three million utility pole inspection records. A five zone map of the continental United States was produced based on the estimated annual dose rate and the inspection data.

Pole Removal in Sensitive Environments: An Update on Removal of Pentachlorophenol in Treated Poles in Alaska

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Excel Inspection Program

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Line and Pole Management Strategies: Wildfire Prevention & Protection

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Fire Resistance and Gaff Penetration into DCOI Treated Wood

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