

Using Bayesian networks to model insect flight activity

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Insect development and activity are weather-dependent processes. Flight behaviour in particular is strongly mediated by meteorological conditions and the form of this relationship is normally species-specific. To predict the activity of forest insects, their flight patterns, and the subsequent likelihood that a wood commodity may be subjected to the potential presence of a pest during a particular time period requires an understanding of the relationship between key meteorological conditions and flight. We test key parameters (temperature, humidity, wind speed, rainfall) and their influence on the flight activity of key forest insects (*Hylurgus ligniperda*, *Hylastes ater*, and *Arhopalus ferus*) over a twelve week period at a temporal resolution of 1 hour. We will demonstrate a Bayesian network that models the probability of insect flight activity given past weather conditions and can predict the likelihood of flight activity given forecast weather data.

