Impacts and occurrence of Emerald Ash Borer (EAB) in New Jersey

Nazia N. Arbab & Jason Grabosky

Emerald Ash Borer (*Agrilus planipennis*) is an exotic invasive beetle that affects all species of true ash trees (*Fraxinus* species) in New Jersey. The full extent of EAB infestation in New Jersey is not yet known. EAB was first detected in NJ in the summer of 2014. The present research utilized a machine learning approach and implemented the Maxent (maximum entropy approach) to project and map predicted conditions for EAB infestation risk. This Maxent model is based on the associations of thirteen independent variables with EAB presence data from 2014 to 2015. Detection likelihood values were generated using the bootstrap option of the Maxent statistical technique due to small sample size of detected EAB locations. The analysis was limited to the range of ash in NJ and included urban areas. Preliminary results show that the most suitable environmental predictor for EAB spread is the distance from urban areas in New Jersey. In other words, street trees are at higher risk of infestation than those in non-urban areas. The jackknife results of other environmental predictors such as south-facing slopes, distance to high value ash utilizers industries and mean precipitation suggest that there are other factors that influence EAB spread, though their importance is comparatively weak when tested in isolation. The proximity to urban areas is by far the most suitable environmental predictor of EAB spread. Maxent model results show that more than 500 municipalities are at some (1% or more) risk of EAB spread.