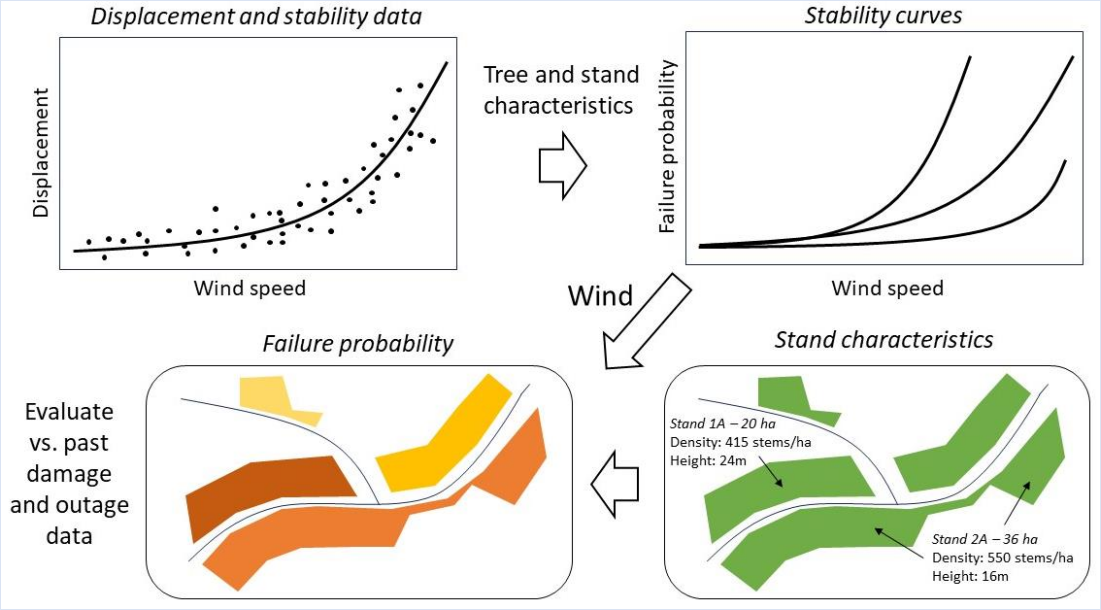
Evaluating effects of climate change and management interventions on vegetation risk to energy grid reliability and resilience



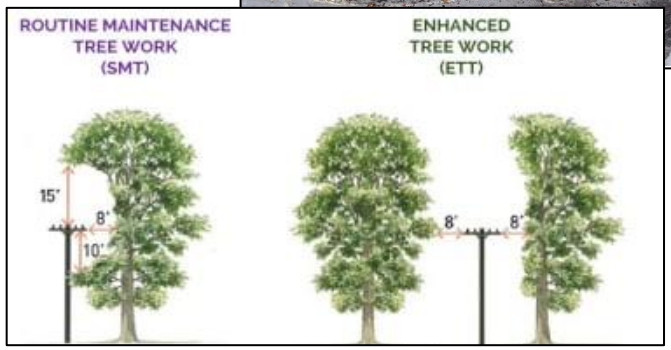
09 February 2024

Robert Fahey, *University of Connecticut*
Thomas Worthley, *University of Connecticut*

Industry Relevance & Need

UCONN TECH PARK

- Managing vegetation risk in a way that minimizes damages, optimizes investment, and limits negative public reactions is critical
- Need better understanding of how to best utilize different vegetation management strategies across the landscape – and where to invest time/effort/funding in cooperative projects
- Require data inputs that are dynamic over time – including vegetation risk characteristics



STORMWISE

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Project Goals and Objectives

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<u>Overall objective:</u> continue the work of the EEC Vegetation Management and Modeling Program and move toward an integrative damage prediction modeling framework for utility-adjacent forests in CT, combining forest and landscape factors and storm characteristics to predict resulting damage

1) ***Development of new experimental research on the effects of climate change-related stressors on tree biomechanics***
2) ***Develop tree failure and damage probability model incorporating information on stand characteristics, disturbance/tree health, and management history to predict tree damage outcomes***
3) ***Conduct scenario modeling focused on evaluating the effect of projected future climate, storm characteristics, and vegetation conditions on damage outcomes***

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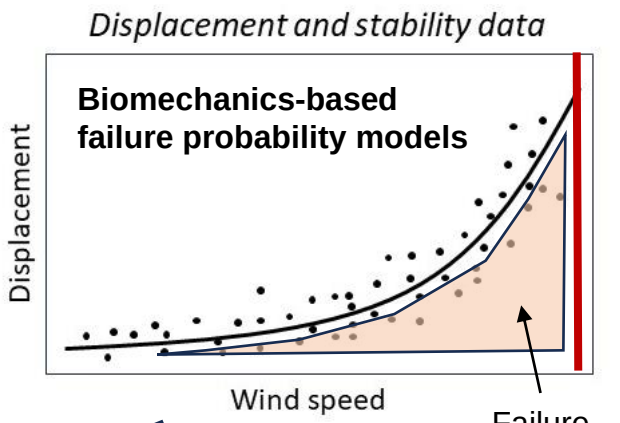
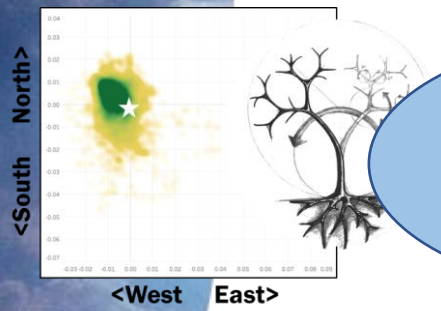
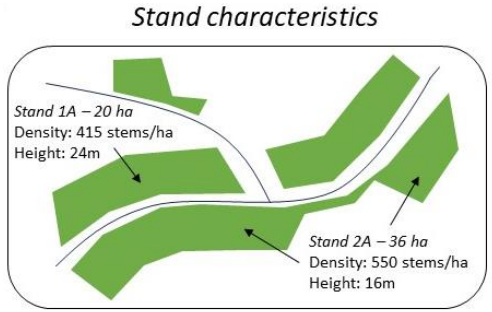
Research Approach

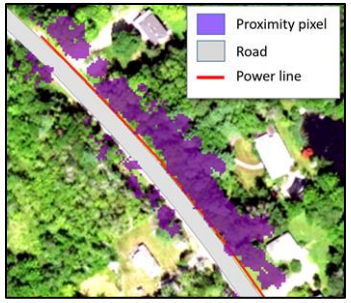


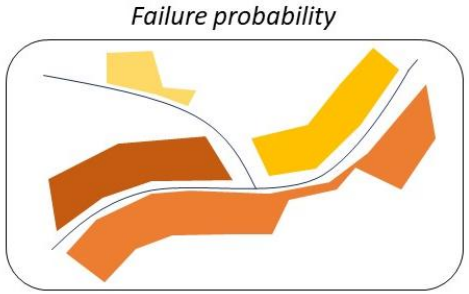


1. Effect of climate and novel stressors on tree biomechanics

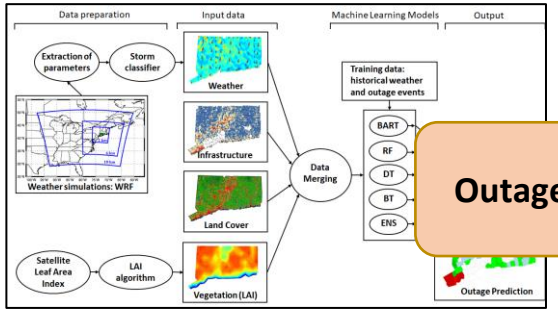
2. Vegetation failure probability models and maps

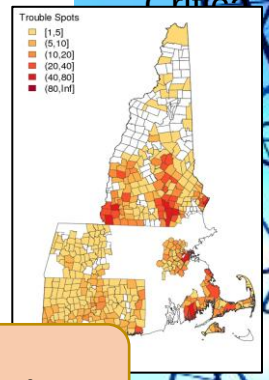






3. Modeling of damage under future storm, climate and management scenarios





Outage Predictions

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Outcomes and Deliverables

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- Improved prediction of vegetation failure and damage in utility-adjacent forest stands based on biomechanical data and effects of climate change and novel forest stressors (with dynamic inputs from remote sensing data)
- Potential to improve outage prediction with dynamic vegetation failure risk as an input to models
- Spatially explicit targeting of optimal locations for application of vegetation management effort and approaches – dynamic based on vegetation characteristics inputs
  - e.g., ETT vs. SMT and optimal cycles based on vegetation growth and health issues
  - locations to pursue cross-ownership strategies (e.g., “Stormwise” forest management)

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Research Impact

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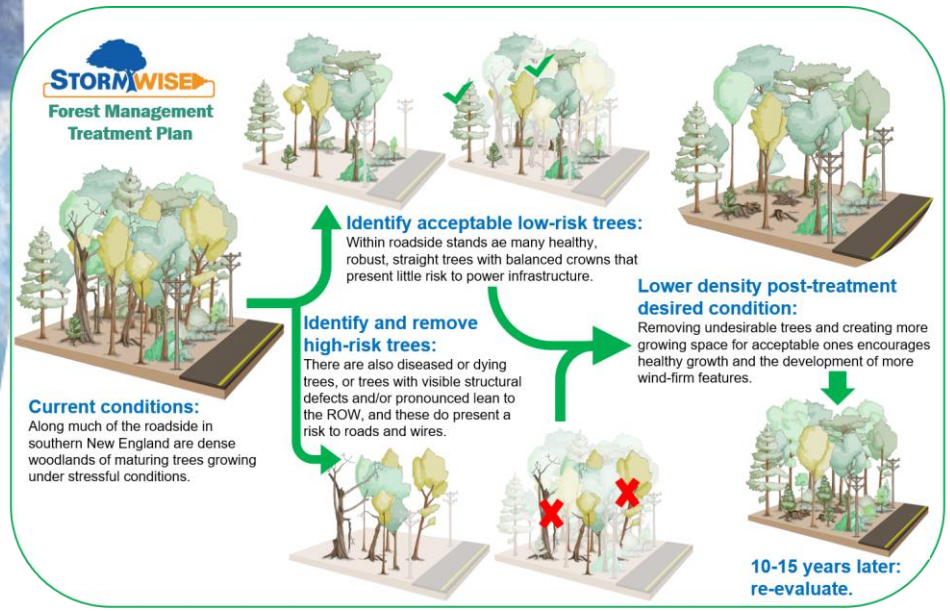
- Better predict vegetation failure and associated damage
- Reduce conflicts between vegetation and infrastructure through targeted management intervention
- Optimize investment of time and resources into vegetation risk mitigation
- Limit potential public relations issues associated with vegetation management



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