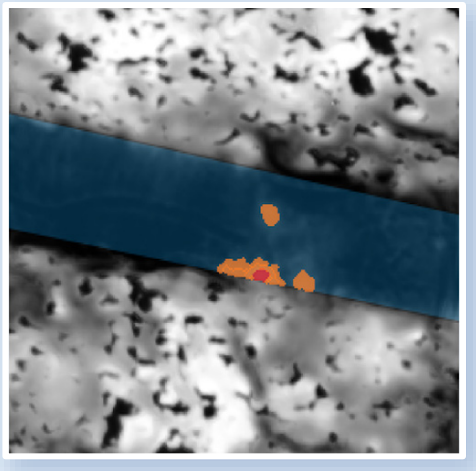
Supplemental Project Notice

MULTI-VENDOR SATELLITE TECHNOLOGY EVALUATION FOR VEGETATION MANAGEMENT APPLICATIONS



PROJECT HIGHLIGHTS

- Document processes and workflows for different satellite-based vegetation management (VM) solution providers
- Increases understanding of technical approaches from solution providers
- Measures satellite-based VM solutions against other technologies (drone LiDAR and imagery)
- Provides ground truth verification and determine the accuracy and usefulness of the predictions provided by the satellite-based VM solutions
- Combine field observations and targeted data collection to objectively quantify the performance of satellite-based approaches
- Provides utilities knowledge to confidently choose their preferred inspection method

Background, Objectives, and New Learnings

Managing vegetation is the most common, recurring, and challenging task for electric utilities. It is expensive, service territory wide, and never stops. Even after the work is complete, trimming crews will eventually be sent back to the same areas to re-trim in the future. Utilities trim rights-of-way for several reasons, but the main motivation is system reliability and regulatory compliance. Due to the scale of the task, utilities deploy several methods to assess growth and prioritize trimming decisions. These 'traditional methods' combine foot patrols, aircraft, human observations, and 3D point cloud data (LiDAR). The inspection methods are time consuming, expensive, and sometimes subjective.

Satellite imagery may be a new inspection tool for utilities to deploy. Satellites allow for wide-area assessments without the need to put boots on the ground or aircraft in the sky. While not as accurate as LiDAR or as high definition as a drone imagery, satellite-based image analytics can provide insights to help T&D vegetation managers prioritize investments. Several private sector companies claim utilities can use satellite imagery to estimate vegetation proximity, canopy volume, and even species identification. There is no doubt that these statements hold some truth. EPRI proposes to investigate the performance and associated use cases for satellite-based vegetation management solutions.

Benefits

After this project, utilities should have the knowledge to confidently deploy their preferred inspection method. This in turn could benefit the public by realizing increases in reliability and overall system resiliency.

Project Approach and Summary

To support this research, EPRI proposes to participate in collaborative pilots. EPRI and project participants will identify potential satellite-based vegetation management solution providers to participate in the pilot.

All providers will analyze the same area and provide their estimates for tree canopy (tree heights and proximity to lines), tree

characteristics (tree species, tree health/stress, and growth rate), and other assessments (soil conditions, work equipment requirements, etc.). Providers will also provide their recommendations for optimizing vegetation management resources based on areas of encroachment and deceased or stressed trees.

EPRI and the host utility will identify, scope, and deploy satellite-based Vegetation Management (VM) solutions for the test area. EPRI will document non-proprietary vegetation management practices by the host utility (T&D VM Inspection methods and trimming cycles) and analyze available data such as historical feeder/outage data, and GIS data.

Drone LiDAR and high-resolution images will be captured in the same test area to provide additional data sources to assess the performance of the satellite technology.

After the pilot and the analysis of pertinent data, EPRI will conduct and a ground truth, field verification to determine the accuracy and usefulness of the predictions by the satellite-based VM solution providers.

Deliverables

The deliverables that are part of this work include:

- Periodic webcasts to update participants on progress and results
- A comprehensive technical report reviewing solution approaches, field results, and prediction verification

The non-proprietary results of this work will be incorporated into EPRI R&D Program 51, and made available to the public, for purchase or otherwise.

Price of Project

The cost to participate is $90,000 for the host utility and $45,000 for non-host utilities, which can be split over the duration of the project (2022–2024). This project qualifies for Self-Directed Funding (SDF).

The project requires one host utility and six non-host participants to evaluate three satellite-based VM solution providers.

Project Status and Schedule

The project has a host utility and is looking for additional non-host members to join the project. The funding from non-hosts participants will enable more data collection, analysis, and scope for pilots conducted at the hosted test area.

Data collection will start in August 2023 and project is expected to conclude by Q4, 2024.

Who Should Join

The project is open to all EPRI members.
Utilities interested in new offerings by satellite-based vegetation management solution providers are encouraged to participate.

Contact Information

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Product ID: 3002025732 **Project ID: 1-117332** **July 2023**

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