Horizon Networks INTSA Project – Rhizome GridADAPT Resilience Planning Trial

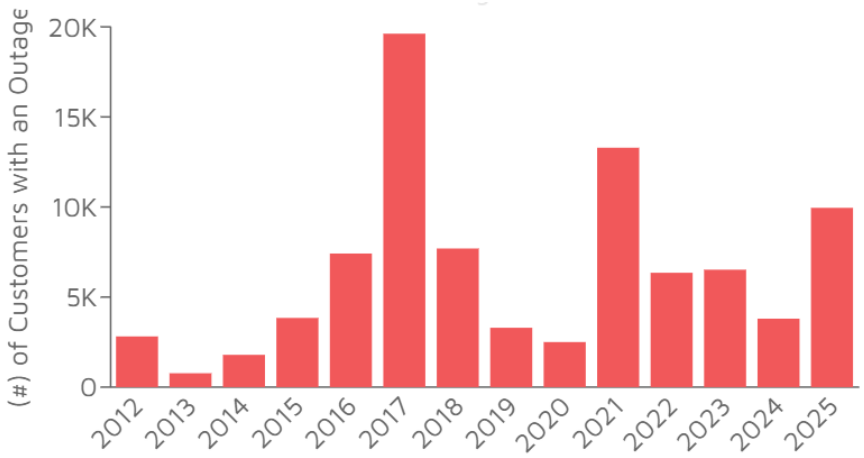
EEA Asset Management Forum – June 2026

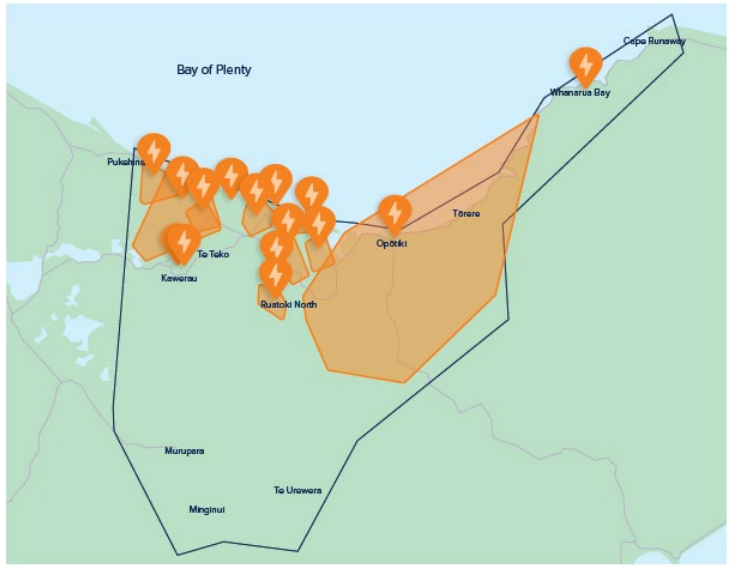
Horizon Networks

We will discuss

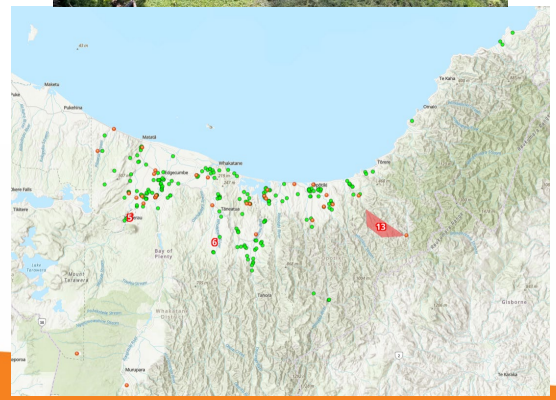
- Scene setting – impact of weather events and current capability
- INTSA project - Rhizome GridADAPT pilot
- Next steps

Business Context

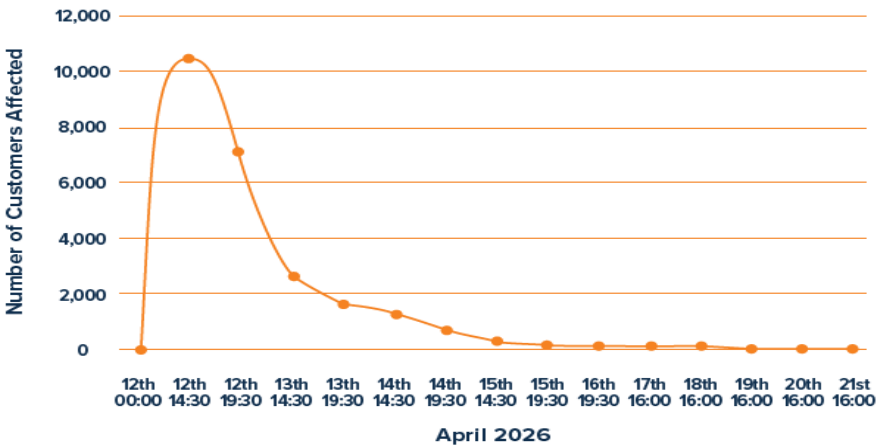




Areas affected by the high voltage network faults as of 12th April.



High Voltage Network Restoration



Power restored to 100% of affected customers by 4pm Tuesday 21st April.

10,000+
Out of 25,464 Customers Affected

100%
Of Affected Customers Restored

150+
Crew and Support Involved

77
Number of Faults on High Voltage Network

6,000+
Total Man Hours Worked

90,000+
Total Mileage Travelled (Km)

Business Context

- Horizon Networks 2024 customer survey found 62% of respondents are concerned about the impact of extreme weather on the network
- The survey also showed that the community places strong importance on improving the network's ability to cope with disruptions and unexpected events and planning ahead

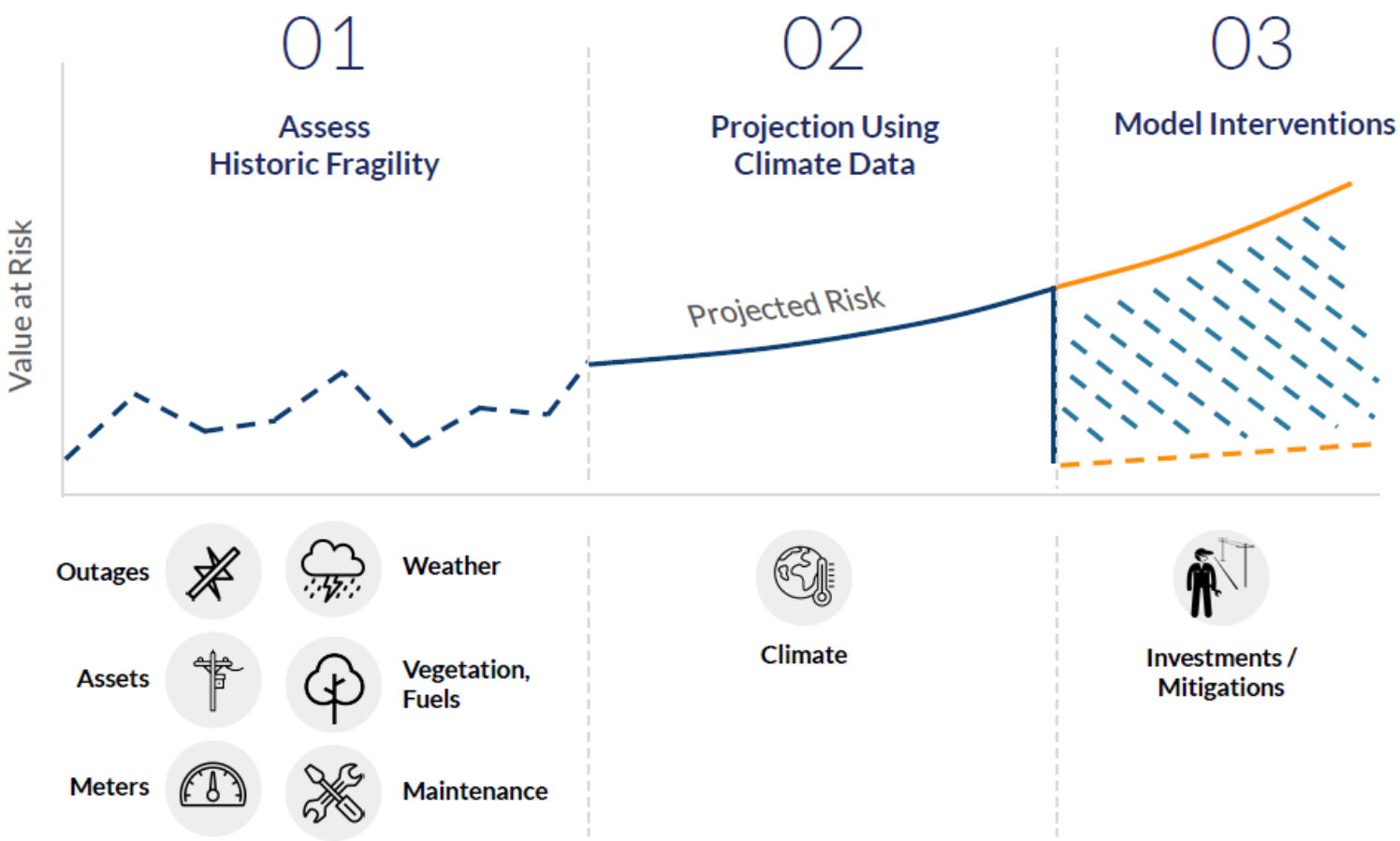
Business Context

- Current capability
  - Climate projection and hazard visualisation
  - Qualitative risk framework
  - Vulnerable point assets identified
  - Some mitigation options developed
- Limitations of existing toolset
  - Hazard assessment mostly at individual asset level
  - Risk assessments are based on theoretical calculations
  - No integration of current and forecast asset condition
  - No consideration on historical outages and asset failures
  - Unable to conduct scenario analysis easily
  - Manual and labor-intensive calculations

Combined likelihood			Hazard likelihood			
			Very Unlikely	Unlikely	Likely	Very Likely
			VU	U	L	VL
Vulnerability Score	Very low	1	1VU	1U	1L	1VL
	Low	2	2VU	2U	2L	2VL
	Moderate	3	3VU	3U	3L	3VL
	High	4	4VU	4U	4L	4VL

Risk			Criticality				
			Very low	Low	Moderate	High	Very high
			1	2	3	4	5
Combined likelihood	Very unlikely	VL	1VU	2VU	3VU	4VU	5VU
	Unlikely	UL	1UL	2UL	3UL	4UL	5UL
	Likely	L	1L	2L	3L	4L	5L
	Very likely	VL	1VL	2VL	3VL	4VL	5VL

Rhizome GridADAPT



Investment Benefits Represented Directly in Investment Planning Tool

- Pole Upgrades
- Veg Management
- Undergrounding
- Line Hardening
- Distribution Automation
- Covered Conductor
- Microgrids
- EPSS

Benefit Functions

- Climate Risk
- Reliability Risk
- Resilience Risk
- Reduced O&M

INTSA Project Overview

- **Objective:** Enhance Horizon Networks toolset for planning and managing climate-related risks to our electricity distribution network.
- **Key outputs**: Assess the suitability of Rhizome GridADAPT for long-term resilience planning, focusing on
  - the applicability of asset fragility modelling in New Zealand's context;
  - data quality requirements and the effect on modelling accuracy;
  - accuracy of identifying network vulnerability and quantifying climate resilience risks;
  - the application of the scenario analysis for planning purposes.

INTSA Project Overview

Phase I: Methodology and Data Transfer – completed

- Identify and validate all input data and the required data quality for vulnerability modelling.
- Transform data into the platform's internal domain model within the model staging environment.

Phase II: Model Implementation – in progress

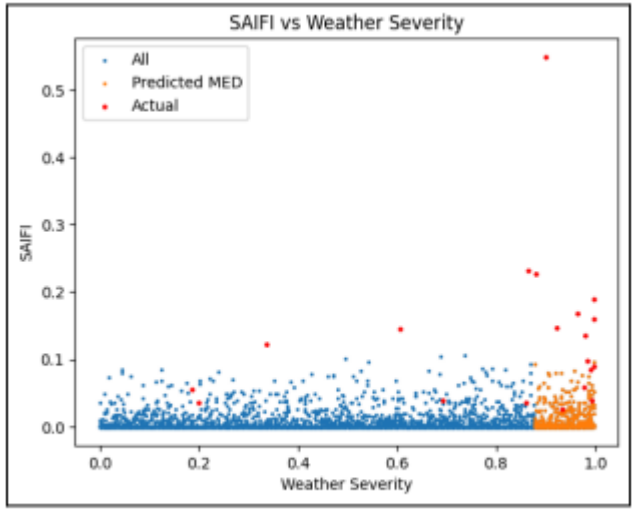
- Ingest relevant climate and weather datasets – completed
- Implement machine learning to understand the likelihood and consequence of failure to feeder segments from various types of extreme weather physical hazards – in progress
- Cost-benefit metric for each investment-segment location – in progress

Phase III: Validation, Closeout, and gridADAPT Evaluation – Late 2026

- Complete validation and develop validation metrics related to extreme weather projection analysis and asset fragility analysis.
- Incorporate the outputs into climate risk and cost-benefit analysis.
- Evaluate Rhizome GridADAPT and complete the project outcomes report.
- Complete and submit the project closeout report

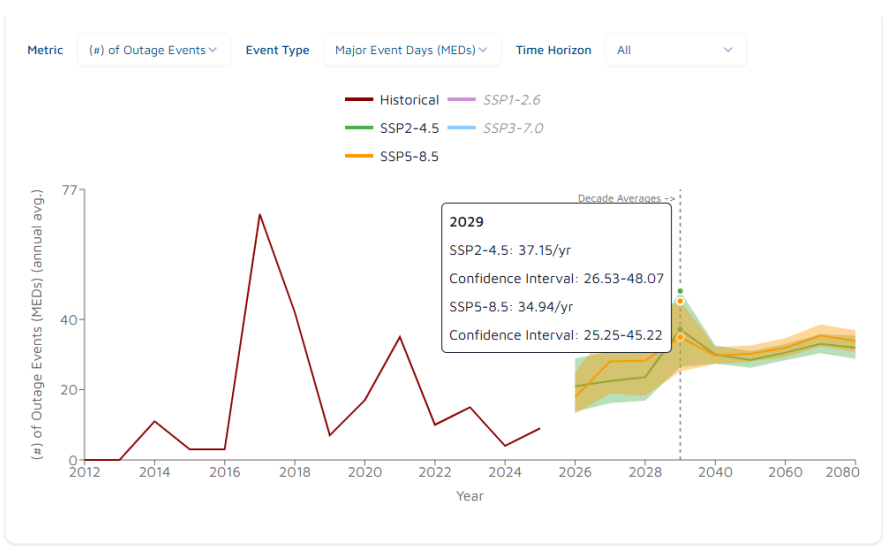
Data Science Behind the Scenes

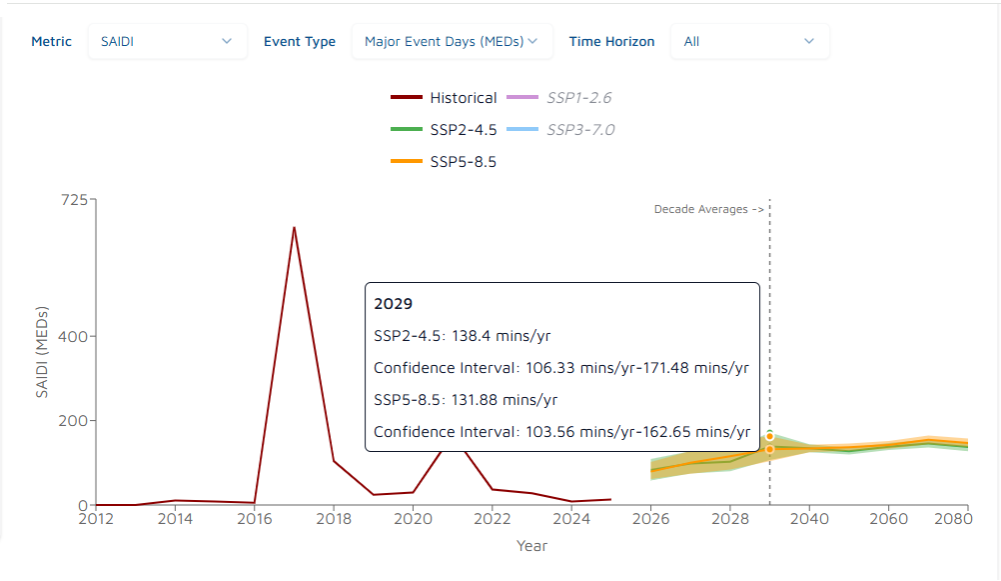
- Weather severity modelling: detect weather patterns that might lead to a significant outage
- Two stage modelling: 1. identifies severe weather days 2. identify those days that might trigger outages
- Model calibration
  - Different ML models: logistic regression, random forests, and XGBoost
  - Use different windows around MEDs to detect real weather patterns
  - Inclusion of quantile metrics in the prediction to reflect relative impact of weather factors in Horizon's context
  - Further refinement for MEDs not associated with weather
- 4338 experiments combining different features and protocols were completed to obtain the best weather severity model
- The model with the highest accuracy detected over 74% of events, compared to 21% of the benchmark model which uses simple weather thresholds such as wind speed or precipitation

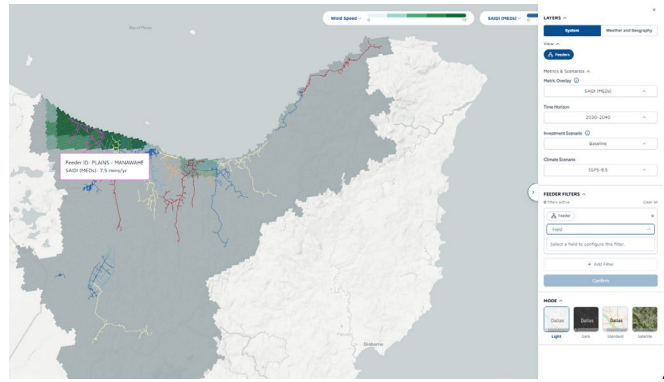


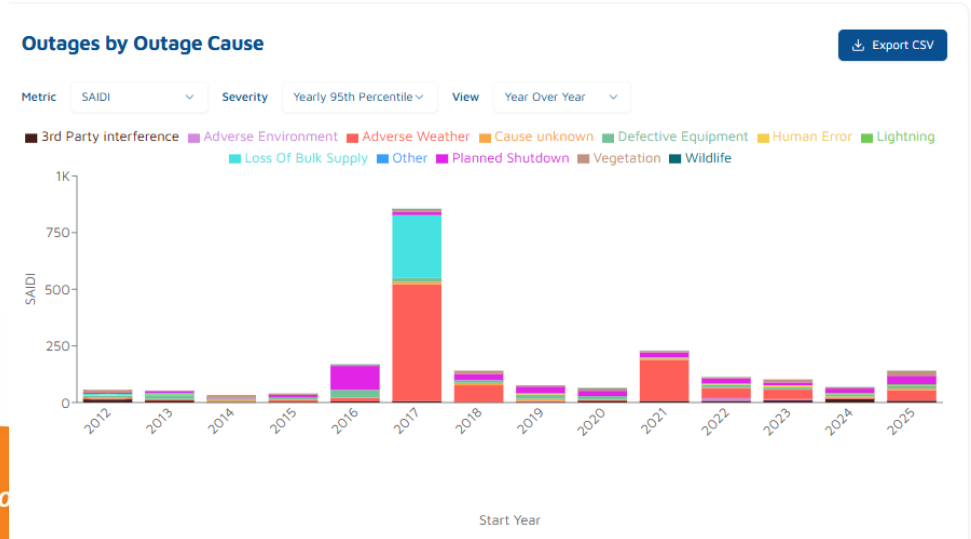
Logistic regression model

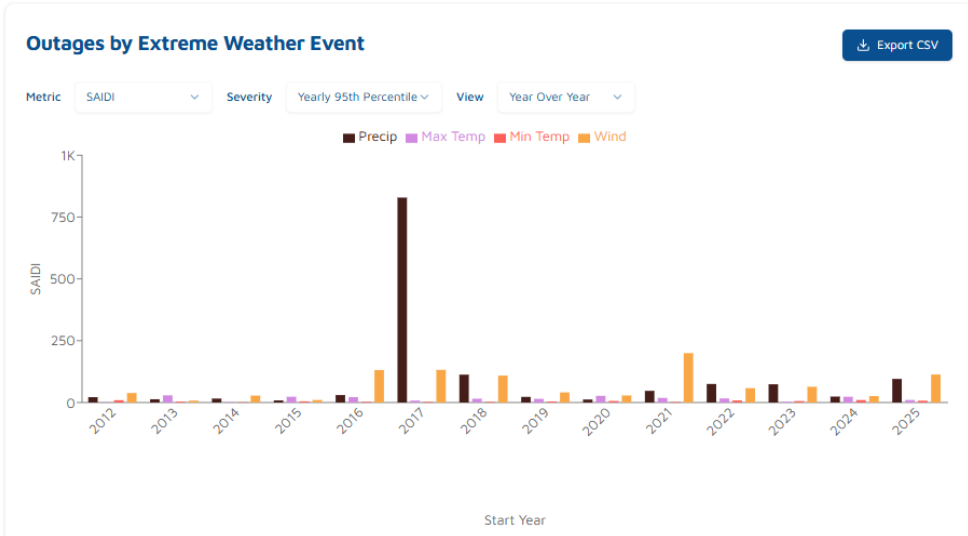
Preliminary dashboards











Next Steps

- Inclusion of PoF prediction at the asset level
- Provide more granular risk assessment at sub-feeder level (i.e isolation areas)
- Cost benefit analysis for intervention options
- Integrate GridADAPT to climate

resilience planning

- INTSA close out report