Carbon Guardian

Integrated Monitoring for Secure Carbon Storage

C44 Monitoring Platform

June 2026

Carbon Guardian

Carbon Sequestration and Underground Storage

Project Planning

Plan

- Site Selection
- Reservoir Modeling
- Permitting
- Budgeting

MMV Platform

Monitor

- Measurements
- Data Aggregation & Analytics
- Surveillance & Detection
- Reporting and Compliance

Carbon Ledger

Account

- Carbon Credit Yield
- Monitoring & Verification
- Carbon Credit Certification
- Registry Reporting

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3C's of Operational Assurance

Confidence

Continuous monitoring and verification is essential to maintain **public trust and regulatory confidence** in CO_2 storage operations.

C44 provides independent monitoring, verification, and operational assurance across the project lifecycle.

Independent Monitoring & Verification

Conformance

Surveillance and reporting requirements evolve throughout the lifecycle of CO_2 storage projects.

C44 enables **operational conformance** through integrated workflows, automated reporting, and real-time performance insights.

Operational Compliance & Reporting

Containment

Long-term CO_2 storage requires continuous monitoring of **subsurface integrity** and operational risk.

C44 supports early detection, risk mitigation, and intelligent alerting for containment assurance.

Risk Detection & Alerting

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CCS Monitoring Goals and Methods

Method	Plume Position	Top Seal Integrity	Induced Seismicity	Injection	Well Integrity	Leakage Detection
4D Seismic / VSP	✓	✓				
Microseismic	✓	✓	✓			
Reservoir Simulation	✓					
Geomechanics		✓	✓			
P, T and Volume				✓	✓	
Fiber-optical			✓	✓	✓	✓
(Geo)-Chemical Sampling					✓	✓

Beachhead: Microseismic

- Event detection
- Real-time insights
- Fast deployment
- Expansion into CCUS / geothermal / frac

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Integrated Microseismic Service

One team from network design to decision-ready insights

Network Design

Plan

- Optimize station location and number
- Meet resolution targets
- Investigate noise levels

Monitoring Platform

Monitor

- Scalable enterprise cloud platform
- Detection and localization of events
- Automated reporting

Technical Advisory

Advise

- Detailed event analysis
- Geologic and geomechanical context
- Actionable operational recommendations

Instrumentation

Deploy

- Sensors and telemetry
- Commissioning and field tech services
- Collaboration with Güralp as OEM

Data Engineering

Integrate

- Data aggregation and secure storage
- Data integration
- Storage cost optimization

Geomechanics

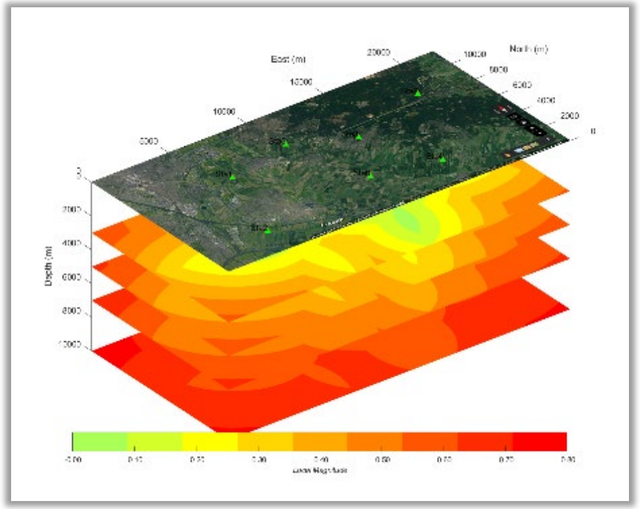
Mitigate

- Establish geomechanical models
- Describe slip potential of natural faults
- Provide safe operational parameters

Integrated Microseismic Services

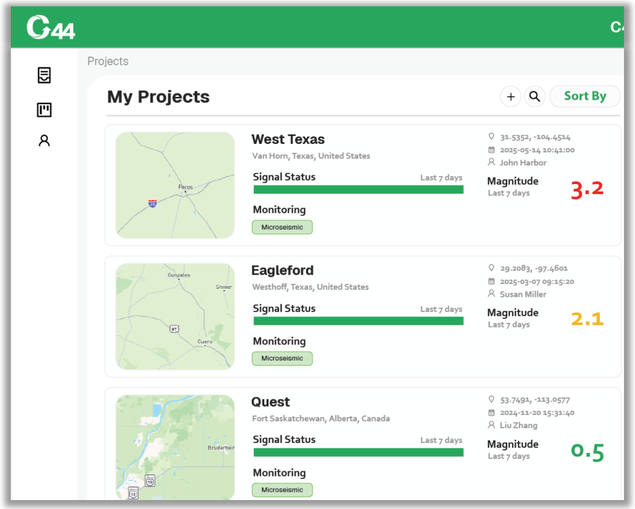
Network Planning

- Optimize number and position of stations
- Satisfy magnitude of completeness requirements



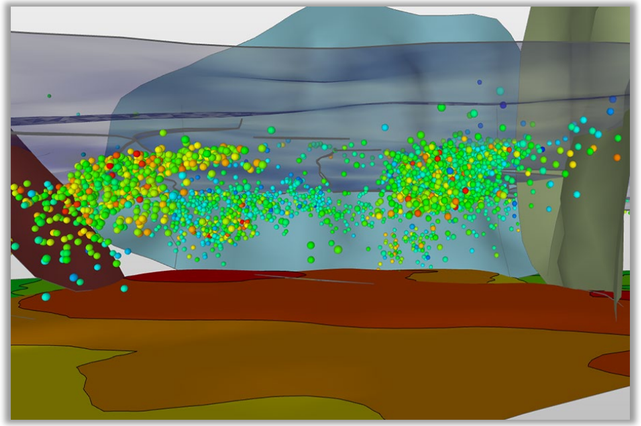
Monitoring Platform

- Enterprise platform for seismic monitoring
- Event detection, localization and reporting



Interpretation

- Interpretation in geological and geomechanical context
- Operational recommendations



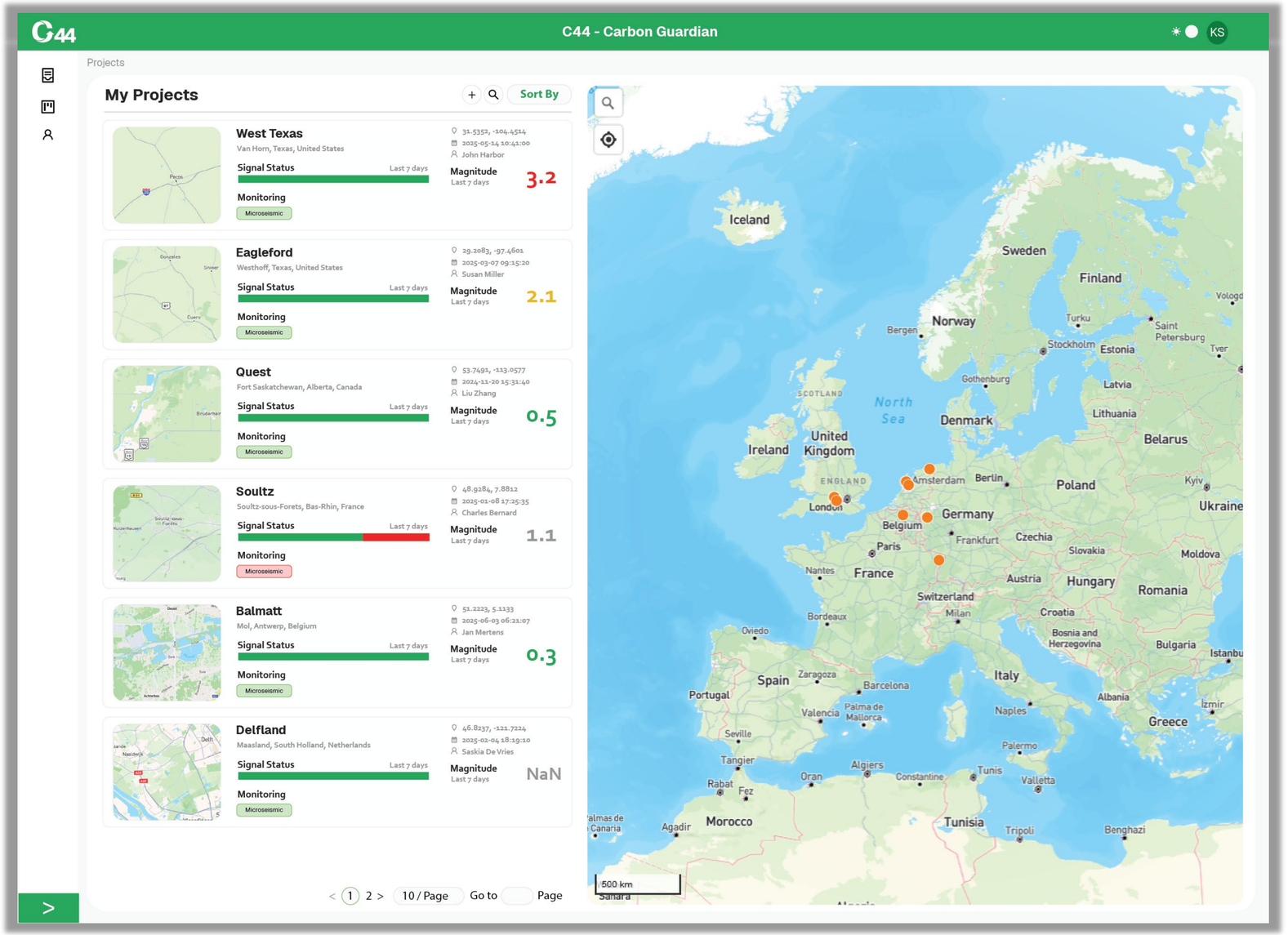
C44 Monitoring Platform

January 2026

Monitoring Platform

Enterprise Platform

- **SaaS offering** with subscription plans tailored to your needs
- Based on **Microsoft Azure** the leading cloud platform in the energy industry
- State-of-the-art **data security through 2-factor authentication and role-based access control**
- Scalable to **multiple projects**
- One **single application** for all your microseismic monitoring and reporting needs



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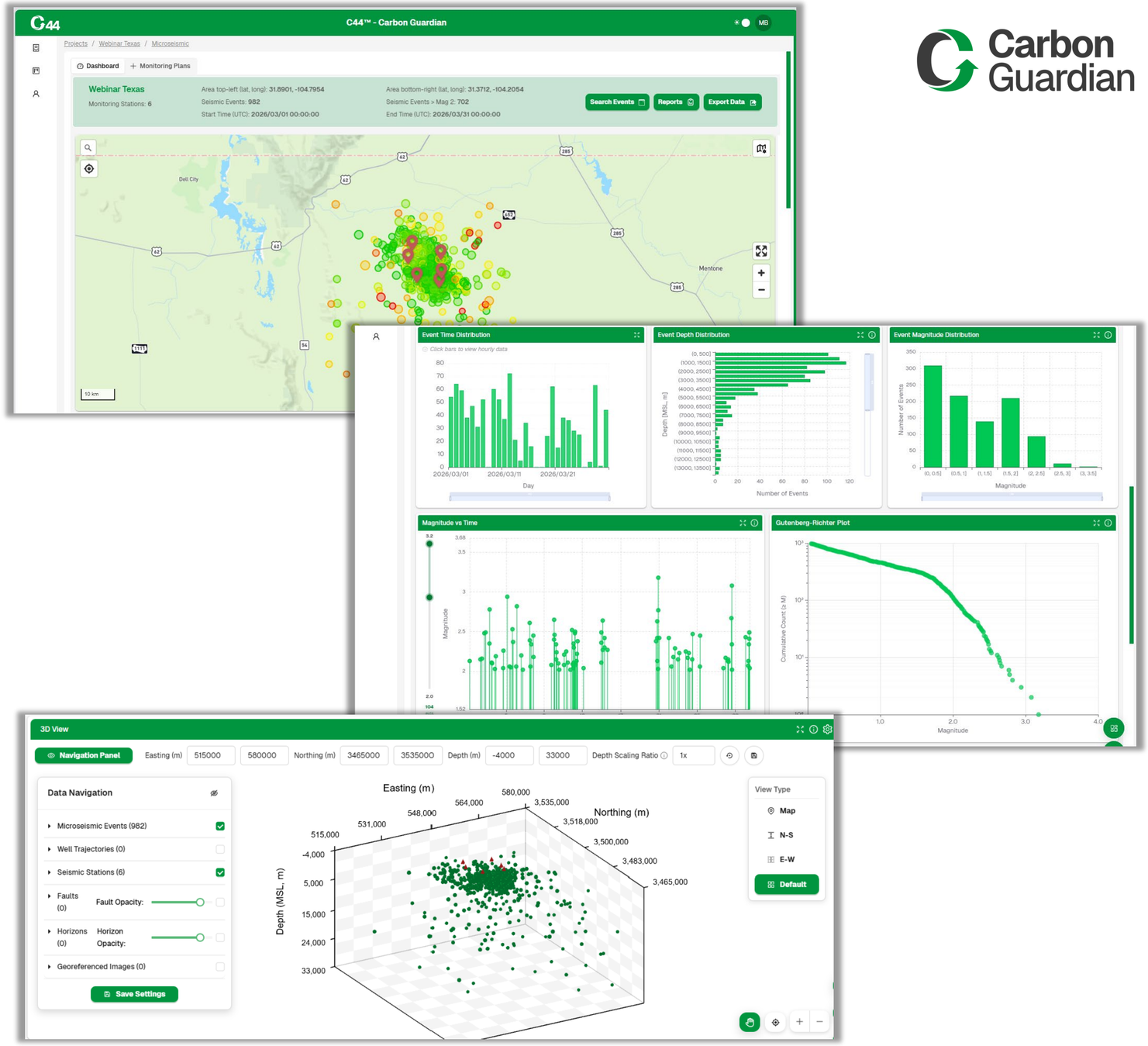
Monitoring Platform

Microseismic Module

- Interactive and user-friendly **dashboard** for seamless real-time monitoring, event detection, and actionable insights
- Always informed through **customizable alerts** for data completeness and event detection
- Understand your data through **interactive map** and **3D displays**
- Efficiently comply with reporting requirements through **automated and manual reporting**



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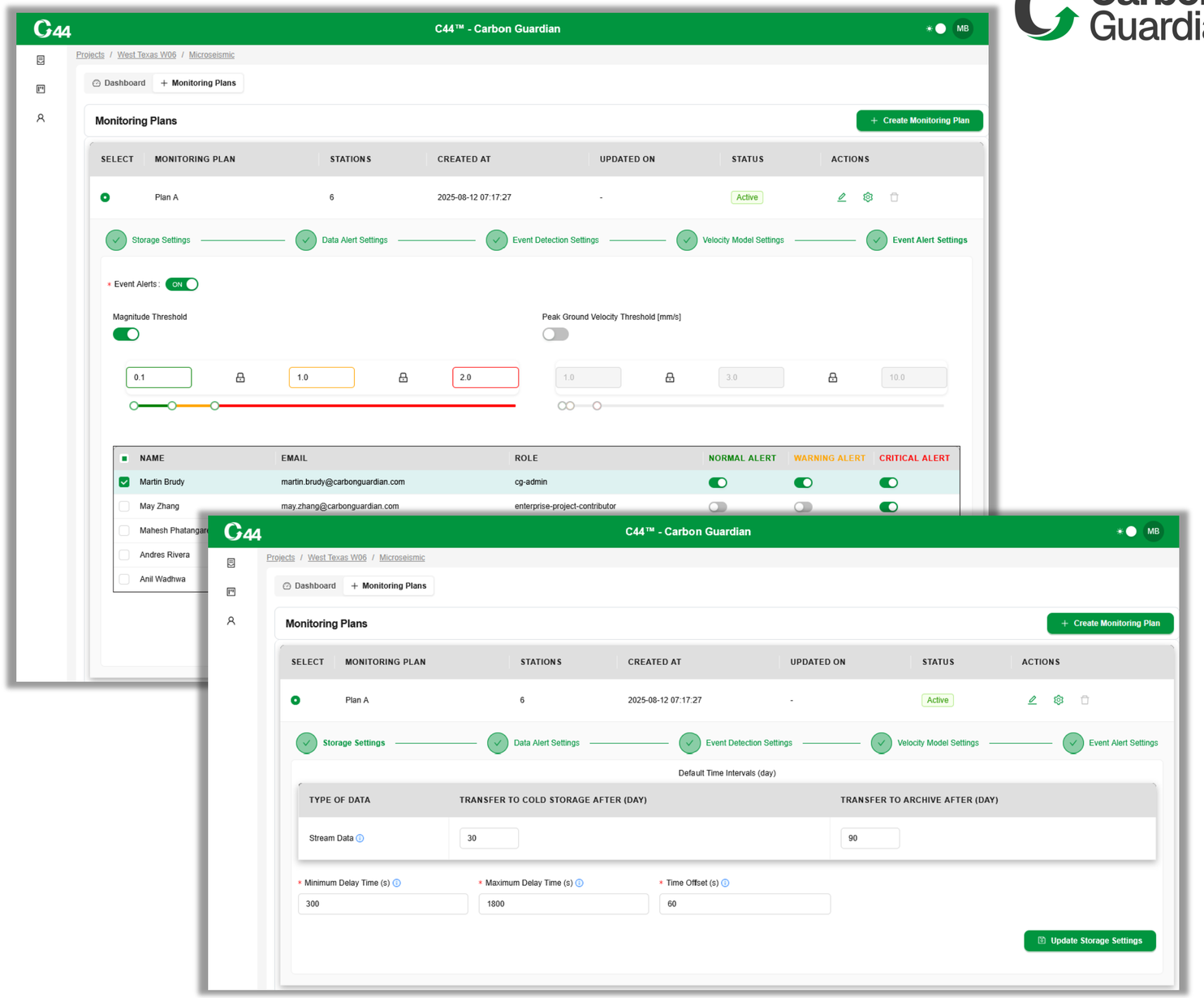
Monitoring Platform

Guided Workflow

- Create multiple monitoring plans efficiently using the guided workflow
- **Cost-optimized, automated data storage**
- Optimized event detection through control of all monitoring and event detection parameters
- Specify site-specific **velocity model** for optimal event localization
- Define **traffic light system** to trigger event notifications based on event magnitude or peak ground velocity



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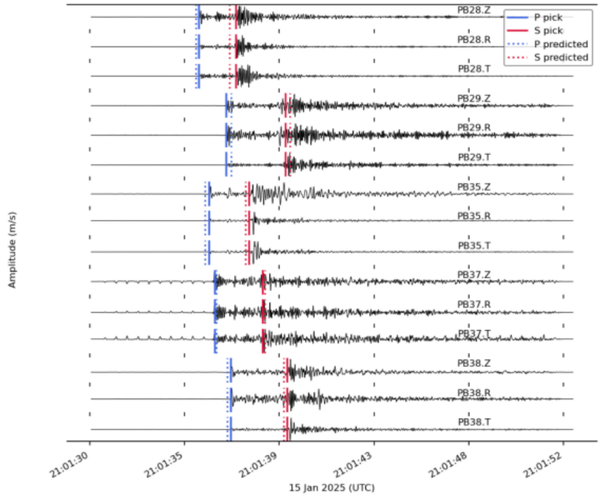
Monitoring Platform

Event Detection & Localization

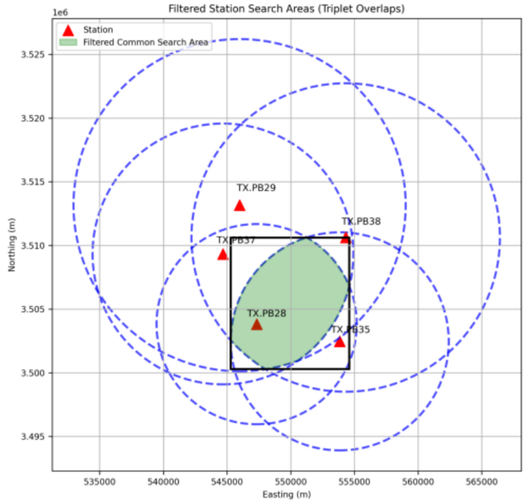
- State of the art algorithms for **reliable event detection, localization and magnitude determination**
- **Uncertainty determination** for event localization
- Processing **details readily available** for all events for display and download

Event ID: 2025-01-15T21_01_35.780000
Origin Time (UTC): 2025-01-15T21:01:33.517500Z
Latitude: 31.6440, Longitude: -104.4937, Depth: 6.224 km
Magnitude: 1.27 (ML)

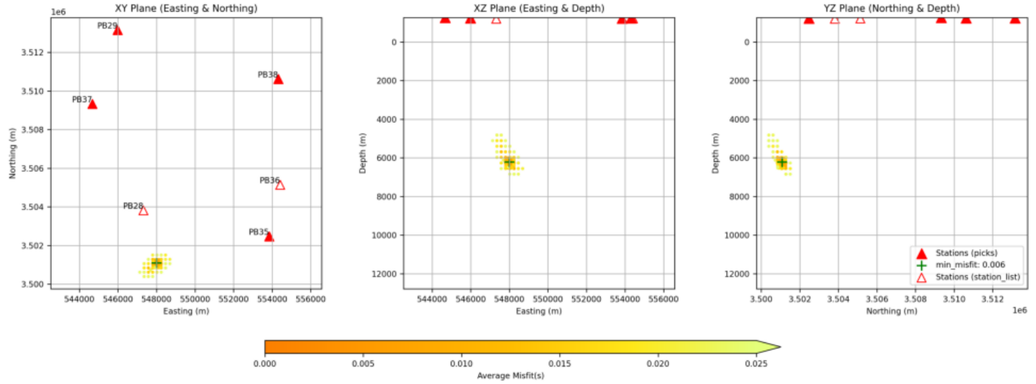
Picks & Waveforms



Triangulation



Location Uncertainty



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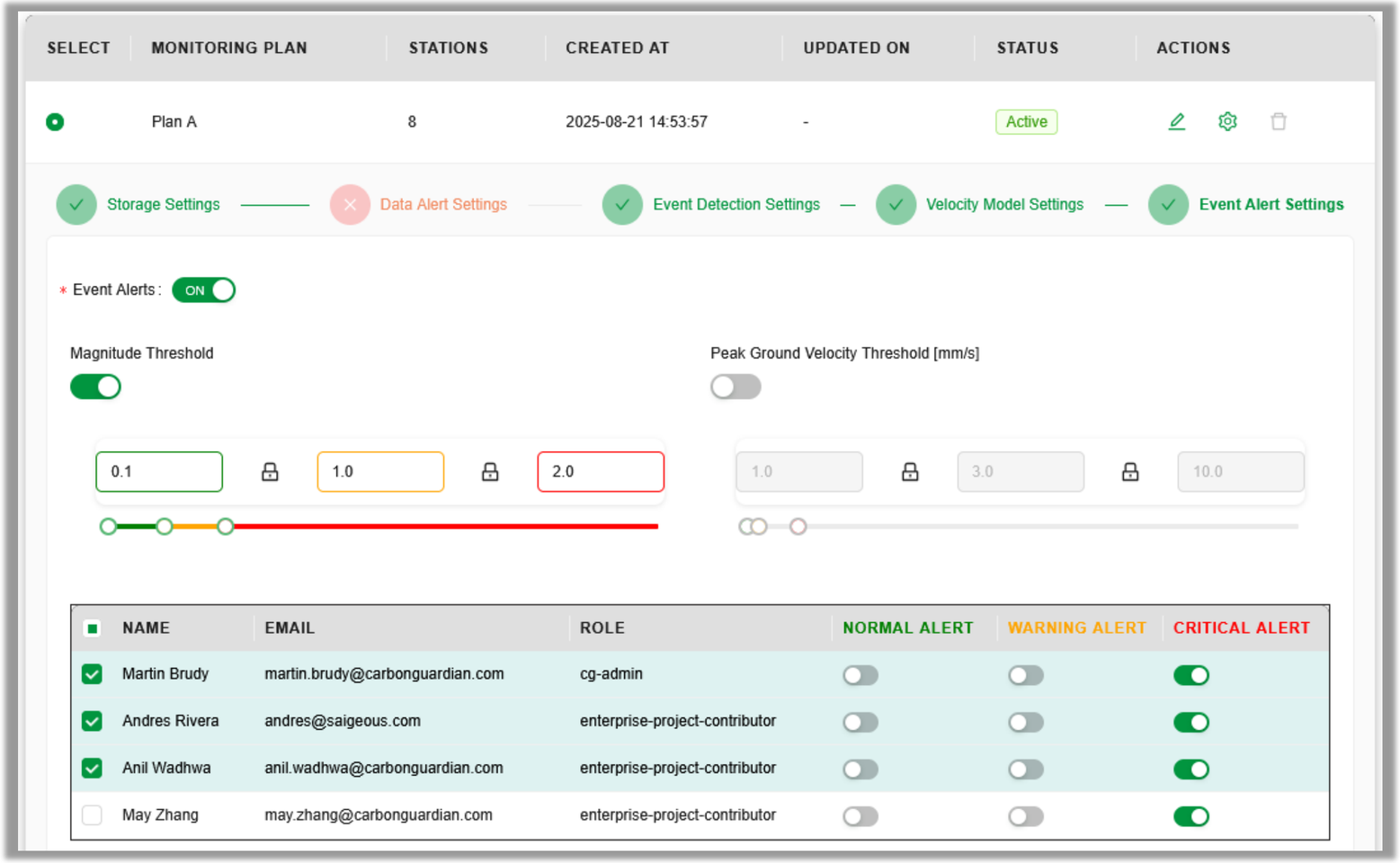
Traffic Light System

- Optional part of each monitoring plan
- Based on magnitude and/or PGS threshold
- Adjustable to specific regulatory requirements
- Automated event notifications based on TLS categories



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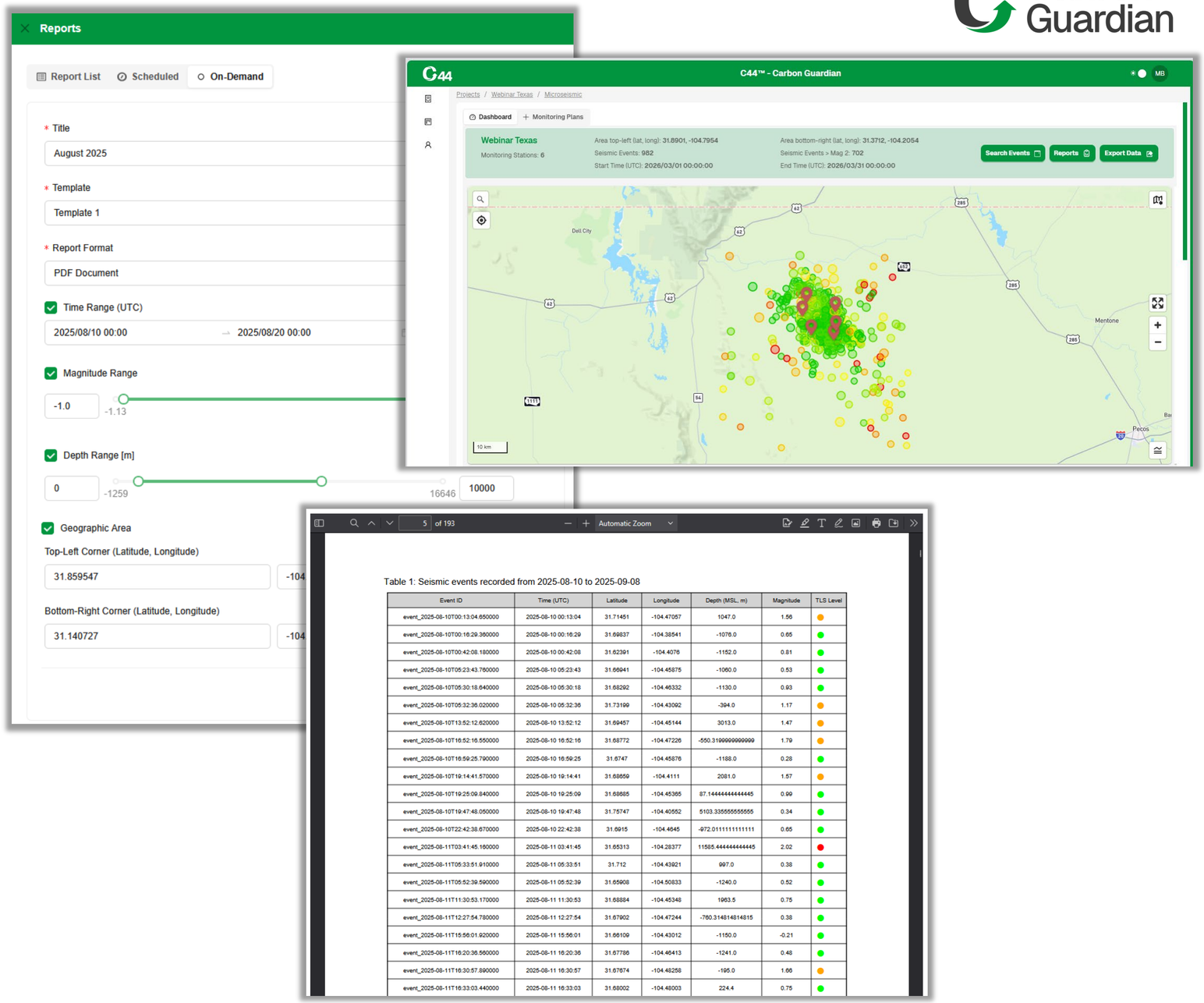
Reporting & Publishing

- On-demand and scheduled reports
- Based on user-specific report templates

- Option to publish (parts) of information for public access
- Technology to enable community engagement and transparency efforts



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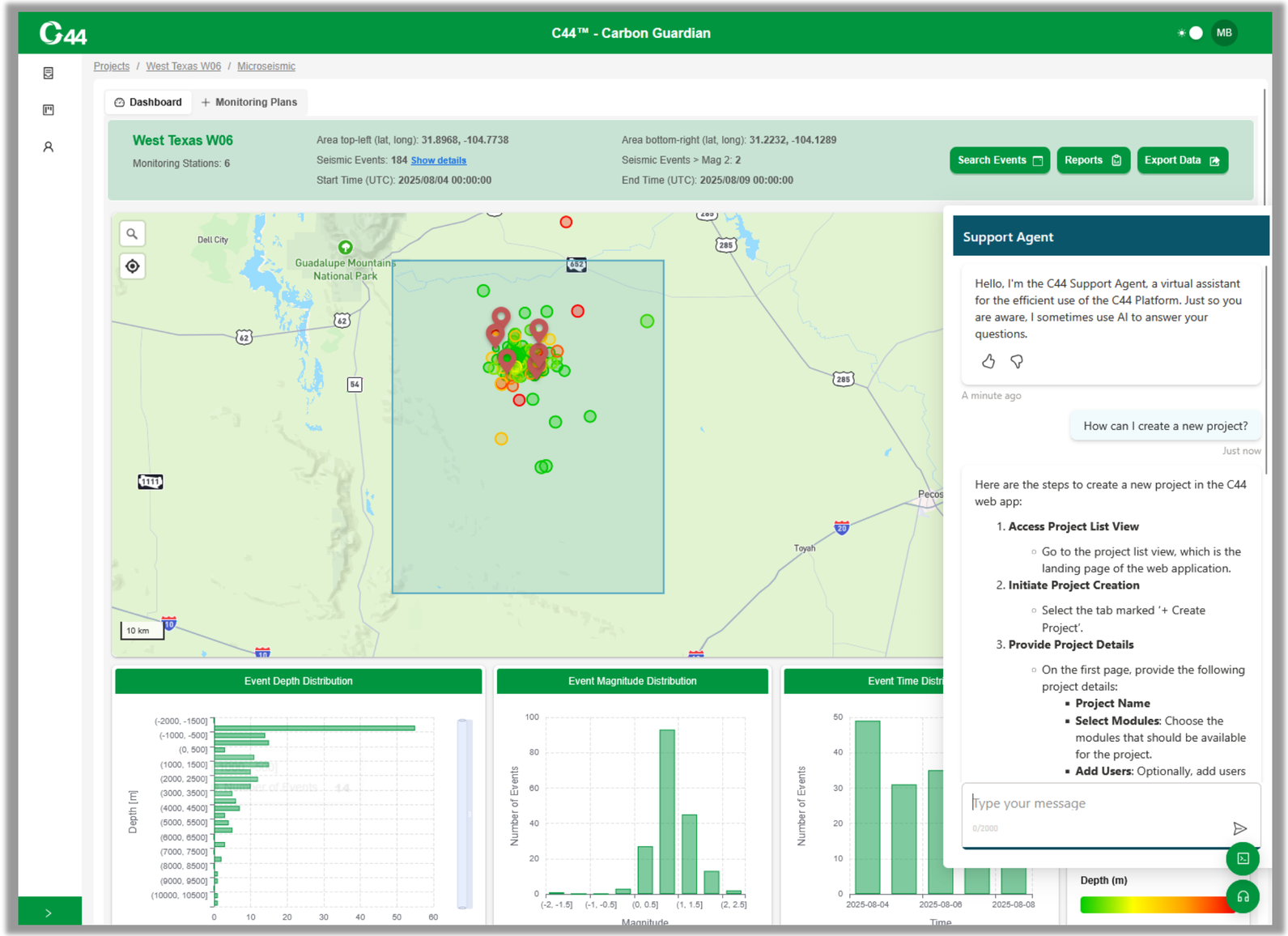
AI Agents

- AI-based **User Support Agent**
- Build on **Copilot Studio** and based on **ChatGPT**
- Trained with proprietary information

- AI-supported selection of location-specific **velocity model**

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