

# **AI-Based Soil Carbon Sequestration Market Forecasts to 2034 – Global Analysis By Solution Type (Carbon Monitoring Platforms, AI-Based Soil Analytics, Carbon Credit Platforms, MRV (Measurement Reporting Verification) Tools, Predictive Carbon Modeling Systems and Soil Data Intelligence Platforms), Farm Type, Technology, Application, End User and By Geography**

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## **Abstracts**

According to Statistics MRC, the Global AI-Based Soil Carbon Sequestration Market is accounted for \$10.5 billion in 2026 and is expected to reach \$22.3 billion by 2034 growing at a CAGR of 9.8% during the forecast period. AI-based soil carbon sequestration refers to the integrated application of artificial intelligence, machine learning algorithms, satellite and drone remote sensing, IoT soil sensor networks, and cloud-based data analytics platforms to monitor, quantify, predict, and verify the accumulation of organic carbon within agricultural soils resulting from regenerative land management practices, including cover cropping, reduced tillage, composting, and agroforestry. These platforms combine AI-powered soil carbon stock prediction models trained on large geospatial and soil science datasets with measurement, reporting, and verification tools that generate auditable carbon sequestration documentation for voluntary carbon market credit issuance, regulatory carbon accounting compliance, and corporate supply chain scope 3 emission reduction verification programs across diverse agricultural landscapes and farm operation scales.

Market Dynamics:

Driver:

Voluntary carbon market expansion and corporate net-zero demand

The rapid scaling of voluntary carbon markets driven by corporate net-zero greenhouse gas emission commitments, creating mandatory agricultural supply chain scope 3 reduction requirements, is generating substantial institutional demand for credible, AI-powered soil carbon measurement and verification platforms. Major food and consumer goods companies, including General Mills, Unilever, Nestlé, and PepsiCo, have announced regenerative agriculture sourcing commitments requiring landscape-scale soil carbon sequestration documentation that manual soil sampling cannot efficiently provide. AI-based platforms enabling continuous, satellite-integrated carbon monitoring at per-farm resolution are becoming essential infrastructure for the agricultural carbon credit market at commercial scale, driving systematic investment in monitoring technology deployment across enrolled farming operations globally.

#### Restraint:

##### Soil carbon measurement accuracy and uncertainty quantification

Scientific uncertainty around AI soil carbon prediction model accuracy, particularly across diverse soil types, cropping systems, and climate zones underrepresented in model training datasets, creates credibility challenges for carbon credit programs relying on AI-estimated rather than laboratory-measured soil organic carbon values. Carbon market buyer scrutiny of measurement uncertainty and additionality verification is driving stringent quality standards that some AI monitoring platforms currently struggle to meet consistently across all deployment geographies. The cost and logistical complexity of maintaining adequate laboratory soil sample validation programs to calibrate and validate AI prediction models across large enrolled farm networks create ongoing investment requirements that affect platform economics.

#### Opportunity:

##### Regulatory carbon farming payment scheme compliance infrastructure

Government-mandated carbon farming payment programs in the European Union, Australia, United Kingdom, and several US state jurisdictions requiring certified measurement, reporting, and verification of agricultural carbon sequestration for subsidy payment qualification represent a large and predictable institutional procurement market for AI soil carbon monitoring platforms. The EU Carbon Farming Initiative, creating direct payment incentives for farmers demonstrating verified carbon sequestration through approved digital monitoring methodologies, is establishing regulatory demand for AI carbon monitoring adoption at the European agricultural landscape scale that represents the largest government-mandated agricultural carbon analytics procurement program globally.

#### Threat:

##### Carbon credit market price volatility and buyer confidence erosion

Significant voluntary carbon market price volatility and credibility challenges affecting high-profile agricultural carbon offset programs, including investigative journalism

questioning additionality and permanence of specific offset methodologies, have created corporate buyer confidence concerns that threaten sustained demand for the agricultural carbon credits whose revenue streams underpin farmer adoption incentives for AI monitoring platform enrollment. If voluntary carbon market buyer demand contracts in response to reputational challenges, the premium carbon credit pricing that compensates farmers for monitoring program participation costs and land management changes may decline below economically attractive thresholds, reducing the commercial incentive for AI soil carbon sequestration platform adoption.

#### Covid-19 Impact:

The pandemic accelerated corporate sustainability commitment timelines and elevated investor ESG pressure on food companies, indirectly creating accelerated agricultural carbon market development and AI monitoring demand. Digital transformation investments enabling remote farm data collection during pandemic movement restrictions built infrastructure applicable to carbon monitoring programs at scale. Post-pandemic, mandatory regulatory carbon accounting requirements in multiple major markets and growing voluntary carbon market maturation are sustaining strong AI-based soil carbon sequestration platform investment and deployment growth.

The predictive carbon modeling systems segment is expected to be the largest during the forecast period

The predictive carbon modeling systems segment is expected to account for the largest market share during the forecast period, due to the premium subscription value generated by AI models that forecast future soil carbon accumulation trajectories under different land management scenarios, enabling farmers and carbon program operators to optimize practice selection for maximum verifiable sequestration credit generation. Predictive modeling capabilities that quantify the carbon credit revenue impact of specific regenerative practice interventions before implementation investment create high-value decision support that corporate supply chain sustainability programs require for credible carbon strategy planning.

The row crop farms segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the row crop farms segment is predicted to witness the highest growth rate, driven by the enormous global cultivation area of wheat, maize, soybean, and rice, providing the largest addressable land area for AI soil carbon monitoring deployment, combined with the most active carbon credit program enrollment across major grain producing regions. Corporate sustainability programs focused on Scope 3 agricultural emission reduction in row crop commodity supply chains are generating systematic enrollment of grain farm portfolios in AI monitoring programs, creating high-volume platform adoption across North American, European, and South American grain production regions.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share, due to the world's most developed voluntary agricultural carbon market infrastructure, concentration of leading AI soil carbon platform startups receiving significant venture capital investment, and large commercial grain farming operations with capital resources for technology program enrollment. The United States leads with established voluntary carbon registry infrastructure through the American Carbon Registry, Climate Action Reserve, and Verra, supporting agricultural soil carbon credit issuance that creates commercial demand for certified AI monitoring platform deployment.

Region with highest CAGR:

Over the forecast period, the Europe region is anticipated to exhibit the highest CAGR, due to the EU Carbon Farming Initiative and Common Agricultural Policy carbon sequestration payment programs creating the world's largest regulatory compliance-driven demand for certified AI soil carbon measurement and verification platforms across European arable farmland. EU Farm-to-Fork targets mandating soil health improvement across member states and direct payment schemes incentivizing regenerative practice adoption are driving systematic AI carbon monitoring infrastructure investment with government co-funding support.

Key players in the market

Some of the key players in AI-Based Soil Carbon Sequestration Market include Indigo Ag Inc., Bayer AG, Yara International, Trimble Inc., IBM Corporation, Microsoft Corporation, SAP SE, Granular Inc. (Corteva), Regrow Ag, Nori Inc., Pachama Inc., ClimateAI, Descartes Labs, CropX Technologies, Agreena, Soil Capital, and Ecorobotix.

Key Developments:

In March 2026, Regrow Ag launched a next-generation AI soil carbon prediction platform, achieving third-party validated accuracy standards across diverse soil types for simultaneous compliance with multiple voluntary carbon market registry methodologies.

In February 2026, Indigo Ag Inc. expanded its carbon program enrollment to European grain producers with an updated AI-based MRV methodology receiving EU Carbon Farming Initiative certification for direct payment scheme participation.

In February 2026, Agreena secured a major contract deploying AI soil carbon monitoring across 500,000 hectares of Danish and German arable farmland for compliance with EU Common Agricultural Policy carbon sequestration payment requirements.

Solution Types Covered:

## Carbon Monitoring Platforms

AI-Based Soil Analytics

Carbon Credit Platforms

MRV (Measurement Reporting Verification) Tools

Predictive Carbon Modeling Systems

Soil Data Intelligence Platforms

#### Farm Types Covered:

Row Crop Farms

Permanent Crop Farms

Mixed Farms

Agroforestry Systems

#### Technologies Covered:

Machine Learning Models

Remote Sensing & Satellite Analytics

IoT Soil Sensors

Big Data Platforms

Blockchain for Carbon Credits

#### Applications Covered:

Carbon Credit Generation

Soil Health Monitoring

Sustainable Farming Planning

Climate Reporting

Regenerative Agriculture

End Users Covered:

Farmers

Agribusiness Companies

Carbon Credit Developers

Government Organizations

Regions Covered:

North America

United States

Canada

Mexico

Europe

United Kingdom

Germany

France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

#### Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Thailand

Malaysia

Singapore

Vietnam

Rest of Asia Pacific

## South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

## Rest of the World (RoW)

### Middle East

Saudi Arabia

United Arab Emirates

Qatar

Israel

Rest of Middle East

### Africa

South Africa

Egypt

Morocco

Rest of Africa

## What our report offers:

Market share assessments for the regional and country-level segments

Strategic recommendations for the new entrants

Covers Market data for the years 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034

Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)

Strategic recommendations in key business segments based on the market estimations

Competitive landscaping mapping the key common trends

Company profiling with detailed strategies, financials, and recent developments

Supply chain trends mapping the latest technological advancements

## Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

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Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

### Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

### Competitive Benchmarking

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