

Soil Carbon Intelligence Market Forecasts to 2034 – Global Analysis By Carbon Measure (Organic Carbon, Inorganic Carbon, Carbon Stock, Carbon Change, Carbon Sequestration and Other Carbon Measures), Technology, Depth, Frequency, End User, and Geography

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Abstracts

According to Statistics MRC, the Global Soil Carbon Intelligence Market is accounted for \$0.7 billion in 2026 and is expected to reach \$2.8 billion by 2034 growing at a CAGR of 18.9% during the forecast period. Soil Carbon Intelligence comprises technologies and analytical platforms that measure, estimate, monitor, and manage carbon stored in agricultural soils. These solutions combine soil sampling, remote sensing, satellite imagery, field sensors, geospatial data, farm-management records, and modeling techniques to generate estimates of soil organic carbon. Farmers and agricultural organizations use soil carbon intelligence to evaluate changes resulting from conservation practices, cover crops, reduced tillage, organic amendments, and other soil-management activities. The information can support carbon accounting, sustainability reporting, regenerative agriculture programs, and carbon-credit verification. Increasing demand for measurable soil-health and carbon outcomes is driving technology adoption. Advances in digital soil mapping and machine-learning models are improving measurement efficiency. Better monitoring also enables agricultural stakeholders to track carbon changes across individual fields and larger farming operations.

Market Dynamics

Driver:

Growing carbon market demand for soil carbon credits

Growing carbon market demand for soil carbon credits is driving significant investment in Soil Carbon Intelligence solutions that enable accurate measurement and verification of carbon sequestration outcomes. Corporate net-zero commitments and increasing voluntary carbon market participation are creating sustained demand for verifiable soil carbon data that meets rigorous verification standards. Regulatory requirements for soil carbon reporting are accelerating adoption of comprehensive monitoring solutions as governments implement climate policies. Soil carbon represents the largest terrestrial carbon sink with significant sequestration potential through improved agricultural management practices. Carbon credit prices for soil carbon are increasing as demand outpaces supply in voluntary markets.

Restraint:

High measurement costs and sampling requirements

High measurement costs and extensive sampling requirements present significant barriers to widespread Soil Carbon Intelligence adoption across large agricultural areas with diverse soil types and management histories. Limited standardization of monitoring protocols creates challenges for data comparability and verification across different carbon programs and registries. Laboratory analysis costs and turnaround times affect monitoring economics and project feasibility for smaller operations. Spatial variability in soil carbon requires intensive sampling for accurate assessment across heterogeneous landscapes. Many farmers cannot afford comprehensive monitoring without financial support.

Opportunity:

Advancements in spectroscopic and remote sensing technologies

Advancements in spectroscopic and remote sensing technologies are enabling lower-cost, higher-frequency Soil Carbon Intelligence with reduced sampling requirements that expand accessibility. AI and machine learning applications are improving measurement accuracy and predictive capabilities through advanced data processing and pattern recognition. Development of in-situ soil sensors enables continuous monitoring and real-time data availability for adaptive management decisions. Integration with farm management platforms is expanding monitoring application and value through combined data analysis. Technology costs continue decreasing, making monitoring more affordable.

Threat:

Methodological uncertainty and verification challenges

Methodological uncertainty regarding soil carbon measurement and verification poses risks to carbon market confidence and investment in Soil Carbon Intelligence projects. Competition from alternative monitoring approaches may limit market growth as new technologies emerge and compete for market share. Regulatory changes affecting carbon credit methodologies could impact monitoring demand and required measurement protocols. Limited availability of trained personnel and laboratory capacity constrains monitoring scalability and increases costs. Data quality concerns may affect market credibility and investor confidence.

Covid-19 Impact:

The COVID-19 pandemic temporarily slowed Soil Carbon Intelligence adoption as field sampling and laboratory operations faced disruptions across global markets during lockdown periods. However, growing carbon market interest and corporate sustainability commitments accelerated demand for soil carbon measurement during the recovery period. The post-pandemic period has witnessed significant investment in monitoring technologies and capacity expansion to meet growing demand. Remote sensing and modeling approaches gained importance during access restrictions and continue to be valued for their scalability. Investment in Soil Carbon Intelligence continues to grow as carbon markets mature.

The organic carbon segment is expected to be the largest during the forecast period

The organic carbon segment is expected to account for the largest market share during the forecast period as soil organic carbon represents the most significant and actively managed carbon pool in agricultural soils with direct relevance to carbon sequestration and soil health improvement. Organic carbon measurement is essential for carbon credit generation and agricultural sustainability programs across all farming systems and land uses. Growing recognition of soil organic carbon benefits is driving sustained demand for monitoring solutions that quantify organic carbon stocks and changes. Established scientific consensus supports organic carbon as the primary focus of Soil Carbon Intelligence efforts. Organic carbon directly influences agricultural productivity and soil function.

The spectroscopy segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the spectroscopy segment is predicted to witness the highest growth rate driven by increasing adoption of rapid, cost-effective spectroscopic analysis for soil carbon measurement across research and commercial applications.

Spectroscopy enables high-throughput analysis with minimal sample preparation and reduced laboratory costs compared to traditional combustion methods. Advances in portable and handheld spectrometers are expanding field-based measurement capabilities that reduce transportation costs and provide immediate results.

Spectroscopy is increasingly replacing traditional laboratory analysis for routine soil carbon measurement. Growing availability of spectral libraries improves measurement accuracy and reliability.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share owing to established carbon markets, advanced soil monitoring capabilities, and strong research infrastructure supporting technology development. The United States hosts major Soil Carbon Intelligence companies and research institutions with extensive measurement capabilities and established verification protocols.

Favorable policy environment and carbon market development reinforce regional market leadership through government programs and private sector initiatives.

Significant investment in soil health research supports continued monitoring innovation. Strong corporate demand for soil carbon credits drives monitoring adoption.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR driven by growing agricultural sector, increasing carbon market participation, and rising investment in soil monitoring capabilities across major economies. China, India, and Australia are expanding Soil Carbon Intelligence programs to support climate commitments and participate in growing carbon markets. Growing awareness of soil carbon benefits is accelerating market expansion across the region as farmers seek new revenue sources. Government programs supporting sustainable agriculture are creating favorable policy environments for monitoring adoption. Significant agricultural land area creates substantial market opportunities.

Key players in the market

Some of the key players in the Soil Carbon Intelligence Market include Yard Stick PBC, EarthOptics, Inc., Perennial Climate Inc., Downforce Technologies Ltd., Regrow Agriculture, Inc., Boomitra, Inc., Agreena ApS, Soil Capital SAS, Trace Genomics, Inc., Ceres Imaging, Inc., Arva Intelligence, CIBO Technologies, Inc., Indigo Ag, Inc., Loam Bio Pty Ltd., and CarbonSpace.

Key Developments:

In May 2025, Yard Stick PBC launched an enhanced Soil Carbon Intelligence platform integrating spectroscopy, in-situ sensors, and modeling capabilities. The platform provides rapid, cost-effective soil carbon measurement across diverse agricultural systems. The development responds to growing demand for scalable Soil Carbon Intelligence solutions.

In March 2025, EarthOptics, Inc. announced significant enhancements to its Soil Carbon Intelligence capabilities with new sensor technologies and analytics for improved measurement accuracy. The enhancements enable more precise carbon measurement and verification for carbon market participation.

Carbon Measures Covered:

Organic Carbon

Inorganic Carbon

Carbon Stock

Carbon Change

Carbon Sequestration

Other Carbon Measures

Technologies Covered:

Laboratory Analysis

Spectroscopy

Remote Sensing

Soil Sensors

Modeling

Other Technologies

Depths Covered:

Surface Soil

Topsoil

Subsoil

Deep Soil

Multi-Depth

Other Depths

Frequencies Covered:

Single-Time

Seasonal

Annual

Multi-Year

Continuous

Other Frequencies

End Users Covered:

Farmers

Research Institutions

Carbon Developers

Agribusinesses

Government Agencies

Other End Users

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:

Company Profiling

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

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

Contents

1 EXECUTIVE SUMMARY

- 1.1 Market Snapshot and Key Highlights
- 1.2 Growth Drivers, Challenges, and Opportunities
- 1.3 Competitive Landscape Overview
- 1.4 Strategic Insights and Recommendations

2 RESEARCH FRAMEWORK

- 2.1 Study Objectives and Scope
- 2.2 Stakeholder Analysis
- 2.3 Research Assumptions and Limitations
- 2.4 Research Methodology
 - 2.4.1 Data Collection (Primary and Secondary)
 - 2.4.2 Data Modeling and Estimation Techniques
 - 2.4.3 Data Validation and Triangulation
 - 2.4.4 Analytical and Forecasting Approach

3 MARKET DYNAMICS AND TREND ANALYSIS

- 3.1 Market Definition and Structure
- 3.2 Key Market Drivers
- 3.3 Market Restraints and Challenges
- 3.4 Growth Opportunities and Investment Hotspots
- 3.5 Industry Threats and Risk Assessment
- 3.6 Technology and Innovation Landscape
- 3.7 Emerging and High-Growth Markets
- 3.8 Regulatory and Policy Environment
- 3.9 Impact of COVID-19 and Recovery Outlook

4 COMPETITIVE AND STRATEGIC ASSESSMENT

- 4.1 Porter's Five Forces Analysis
 - 4.1.1 Supplier Bargaining Power
 - 4.1.2 Buyer Bargaining Power
 - 4.1.3 Threat of Substitutes
 - 4.1.4 Threat of New Entrants

- 4.1.5 Competitive Rivalry
- 4.2 Market Share Analysis of Key Players
- 4.3 Product Benchmarking and Performance Comparison

5 GLOBAL SOIL CARBON INTELLIGENCE MARKET, BY CARBON MEASURE

- 5.1 Organic Carbon
- 5.2 Inorganic Carbon
- 5.3 Carbon Stock
- 5.4 Carbon Change
- 5.5 Carbon Sequestration
- 5.6 Other Carbon Measures

6 GLOBAL SOIL CARBON INTELLIGENCE MARKET, BY TECHNOLOGY

- 6.1 Laboratory Analysis
- 6.2 Spectroscopy
- 6.3 Remote Sensing
- 6.4 Soil Sensors
- 6.5 Modeling
- 6.6 Other Technologies

7 GLOBAL SOIL CARBON INTELLIGENCE MARKET, BY DEPTH

- 7.1 Surface Soil
- 7.2 Topsoil
- 7.3 Subsoil
- 7.4 Deep Soil
- 7.5 Multi-Depth
- 7.6 Other Depths

8 GLOBAL SOIL CARBON INTELLIGENCE MARKET, BY FREQUENCY

- 8.1 Single-Time
- 8.2 Seasonal
- 8.3 Annual
- 8.4 Multi-Year
- 8.5 Continuous
- 8.6 Other Frequencies

9 GLOBAL SOIL CARBON INTELLIGENCE MARKET, BY END USER

- 9.1 Farmers
- 9.2 Research Institutions
- 9.3 Carbon Developers
- 9.4 Agribusinesses
- 9.5 Government Agencies
- 9.6 Other End Users

10 GLOBAL SOIL CARBON INTELLIGENCE MARKET, BY GEOGRAPHY

- 10.1 North America
 - 10.1.1 United States
 - 10.1.2 Canada
 - 10.1.3 Mexico
- 10.2 Europe
 - 10.2.1 United Kingdom
 - 10.2.2 Germany
 - 10.2.3 France
 - 10.2.4 Italy
 - 10.2.5 Spain
 - 10.2.6 Netherlands
 - 10.2.7 Belgium
 - 10.2.8 Sweden
 - 10.2.9 Switzerland
 - 10.2.10 Poland
 - 10.2.11 Rest of Europe
- 10.3 Asia Pacific
 - 10.3.1 China
 - 10.3.2 Japan
 - 10.3.3 India
 - 10.3.4 South Korea
 - 10.3.5 Australia
 - 10.3.6 Indonesia
 - 10.3.7 Thailand
 - 10.3.8 Malaysia
 - 10.3.9 Singapore
 - 10.3.10 Vietnam

10.3.11 Rest of Asia Pacific

10.4 South America

10.4.1 Brazil

10.4.2 Argentina

10.4.3 Colombia

10.4.4 Chile

10.4.5 Peru

10.4.6 Rest of South America

10.5 Rest of the World (RoW)

10.5.1 Middle East

10.5.1.1 Saudi Arabia

10.5.1.2 United Arab Emirates

10.5.1.3 Qatar

10.5.1.4 Israel

10.5.1.5 Rest of Middle East

10.5.2 Africa

10.5.2.1 South Africa

10.5.2.2 Egypt

10.5.2.3 Morocco

10.5.2.4 Rest of Africa

11 STRATEGIC MARKET INTELLIGENCE

11.1 Industry Value Network and Supply Chain Assessment

11.2 White-Space and Opportunity Mapping

11.3 Product Evolution and Market Life Cycle Analysis

11.4 Channel, Distributor, and Go-to-Market Assessment

12 INDUSTRY DEVELOPMENTS AND STRATEGIC INITIATIVES

12.1 Mergers and Acquisitions

12.2 Partnerships, Alliances, and Joint Ventures

12.3 New Product Launches and Certifications

12.4 Capacity Expansion and Investments

12.5 Other Strategic Initiatives

13 COMPANY PROFILES

13.1 Yard Stick PBC

- 13.2 EarthOptics, Inc.
- 13.3 Perennial Climate Inc.
- 13.4 Downforce Technologies Ltd.
- 13.5 Regrow Agriculture, Inc.
- 13.6 Boomitra, Inc.
- 13.7 Agreeena ApS
- 13.8 Soil Capital SAS
- 13.9 Trace Genomics, Inc.
- 13.10 Ceres Imaging, Inc.
- 13.11 Arva Intelligence
- 13.12 CIBO Technologies, Inc.
- 13.13 Indigo Ag, Inc.
- 13.14 Loam Bio Pty Ltd.
- 13.15 CarbonSpace

List of Tables

- Table 1 Global Soil Carbon Intelligence Market Outlook, By Region (2023-2034) (\$MN)
- Table 2 Global Soil Carbon Intelligence Market, By Carbon Measure (2023–2034) (\$MN)
- Table 3 Global Soil Carbon Intelligence Market, By Organic Carbon (2023–2034) (\$MN)
- Table 4 Global Soil Carbon Intelligence Market, By Inorganic Carbon (2023–2034) (\$MN)
- Table 5 Global Soil Carbon Intelligence Market, By Carbon Stock (2023–2034) (\$MN)
- Table 6 Global Soil Carbon Intelligence Market, By Carbon Change (2023–2034) (\$MN)
- Table 7 Global Soil Carbon Intelligence Market, By Carbon Sequestration (2023–2034) (\$MN)
- Table 8 Global Soil Carbon Intelligence Market, By Other Carbon Measures (2023–2034) (\$MN)
- Table 9 Global Soil Carbon Intelligence Market, By Technology (2023–2034) (\$MN)
- Table 10 Global Soil Carbon Intelligence Market, By Laboratory Analysis (2023–2034) (\$MN)
- Table 11 Global Soil Carbon Intelligence Market, By Spectroscopy (2023–2034) (\$MN)
- Table 12 Global Soil Carbon Intelligence Market, By Remote Sensing (2023–2034) (\$MN)
- Table 13 Global Soil Carbon Intelligence Market, By Soil Sensors (2023–2034) (\$MN)
- Table 14 Global Soil Carbon Intelligence Market, By Modeling (2023–2034) (\$MN)
- Table 15 Global Soil Carbon Intelligence Market, By Other Technologies (2023–2034) (\$MN)
- Table 16 Global Soil Carbon Intelligence Market, By Depth (2023–2034) (\$MN)
- Table 17 Global Soil Carbon Intelligence Market, By Surface Soil (2023–2034) (\$MN)

Table 18 Global Soil Carbon Intelligence Market, By Topsoil (2023–2034) (\$MN)

Table 19 Global Soil Carbon Intelligence Market, By Subsoil (2023–2034) (\$MN)

Table 20 Global Soil Carbon Intelligence Market, By Deep Soil (2023–2034) (\$MN)

Table 21 Global Soil Carbon Intelligence Market, By Multi-Depth (2023–2034) (\$MN)

Table 22 Global Soil Carbon Intelligence Market, By Other Depths (2023–2034) (\$MN)

Table 23 Global Soil Carbon Intelligence Market, By Frequency (2023–2034) (\$MN)

Table 24 Global Soil Carbon Intelligence Market, By Single-Time (2023–2034) (\$MN)

Table 25 Global Soil Carbon Intelligence Market, By Seasonal (2023–2034) (\$MN)

Table 26 Global Soil Carbon Intelligence Market, By Annual (2023–2034) (\$MN)

Table 27 Global Soil Carbon Intelligence Market, By Multi-Year (2023–2034) (\$MN)

Table 28 Global Soil Carbon Intelligence Market, By Continuous (2023–2034) (\$MN)

Table 29 Global Soil Carbon Intelligence Market, By Other Frequencies (2023–2034) (\$MN)

Table 30 Global Soil Carbon Intelligence Market, By End User (2023–2034) (\$MN)

Table 31 Global Soil Carbon Intelligence Market, By Farmers (2023–2034) (\$MN)

Table 32 Global Soil Carbon Intelligence Market, By Research Institutions (2023–2034) (\$MN)

Table 33 Global Soil Carbon Intelligence Market, By Carbon Developers (2023–2034) (\$MN)

Table 34 Global Soil Carbon Intelligence Market, By Agribusinesses (2023–2034) (\$MN)

Table 35 Global Soil Carbon Intelligence Market, By Government Agencies (2023–2034) (\$MN)

Table 36 Global Soil Carbon Intelligence Market, By Other End Users (2023–2034) (\$MN)

Note: Tables for North America, Europe, APAC, South America, and Rest of the World (RoW) are also represented in the same manner as above.

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