



## Soil Health Institute Annual Meeting Videos Now Online



Thank you to everyone who attended “Soil Health: The Foundation for Regenerative Agriculture,” the Soil Health Institute’s 5<sup>th</sup> Annual Meeting. With 2,486 registrants, “Soil Health: The Foundation for Regenerative Agriculture” advanced the opportunity we have to address climate change, water quality, food production, biodiversity, and many other pressing issues by improving soil health. Meeting topics included:

### SESSIONS

- Comprehensive Strategy for Advancing Soil Health
- Determining Effective Measurements of Soil Health
- Dimensions of Adoption
- Filling the Economics Gap for Farmers
- Soil Health Policies and Programs in Action

### REPORT

Participants represented 1,335 organizations from 63 countries.

If you missed the meeting or would like to revisit any presentation, videos of our Keynote and Plenary Sessions are available on the [Soil Health YouTube Channel](#).

### POSTERS

The 5<sup>th</sup> Annual Meeting Report is available [here](#).

Video posters are available [here](#).

Meanwhile, we’d like to issue a special thanks to our 28 keynote and plenary speakers as well as the 26 video poster session presenters.

## Please save the date

Next year’s Annual Meeting will be held August 5-6, 2021, with an opening reception August 4, 2021, in Des Moines, Iowa!

We look forward to seeing you in person in Des Moines!





## **Soil Health Institute Awarded \$3.25 Million from ARPA-E to Develop Soil Carbon Measurement and Monitoring System**

The Soil Health Institute (SHI) has been awarded \$3.25 million from the U.S. Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E). The funds will be used to develop an integrated soil carbon measurement and monitoring system called the DeepC System, which will provide standardized carbon sequestration monitoring needs for carbon markets in agriculture.

The system includes in-field measurement tools, an optimized spatial sampling algorithm, and machine learning that leverage the current infrastructure of national soil spectroscopy libraries. Users will be able to obtain rapid measurements of soil carbon stock. According to SHI Chief Scientific Officer Dr. Cristine Morgan, the technology will benefit farmers and ranchers by reducing the time and cost for measuring soil carbon, thereby supporting their participation in carbon markets.

"Soil probes, equipped with sensors that proximally measure both carbon concentration and bulk density of the soil as the probe is pushed into the ground, are an ideal way to measure carbon stock and change along the soil profile rapidly, nondestructively, and cost-effectively. The integrated DeepC System combines sampling design, proximal sensing, and machine learning to obtain rapid, non-destructive measurements of soil carbon stock," Dr. Morgan explained.

"At the Soil Health Institute, we address a full range of issues to advance adoption of soil health systems, from conducting the science to providing local farmer trainings and setting up farmer-to-farmer mentoring networks. This is an example of how we are developing new technology that will help farmers, too," said Dr. Wayne Honeycutt, CEO of the Soil Health Institute.

Co-principal investigators include Kevin Meissner, Engineer; Yufeng Ge, Associate Professor, University of Nebraska-Lincoln; and Alex McBratney, Professor, University of Sydney.

## CLIMATE WEEK EVENT

# How Soil Health Can Achieve Net Zero Carbon Emissions for U.S. Agriculture

*Science is clear: We can reduce greenhouse gas emissions by improving soil health, says Dr. Wayne Honeycutt, President and CEO of the Soil Health Institute.*



The Soil Health Institute (SHI) hosted “Achieving Net Zero Carbon Emission in U.S. Agriculture through Soil Health,” September 22, 2020, as part of [Climate Week NYC](#).

Presentations, given by [SHI](#), [Cargill](#), and [Walmart.org](#), described the overall strategy and work being conducted that will allow the U.S. agricultural sector to achieve net zero carbon emissions by 2040.

Dr. Wayne Honeycutt, SHI’s President and CEO, noted the adoption potential of U.S. agricultural working lands, which includes 655 million acres that can be devoted to prescribed grazing and 396 million acres of cropland, where cover crops, reduced tillage, and nitrogen management could combine to increase carbon storage and provide substantial environmental benefits. Farmers and ranchers also benefit by reducing the cost of nutrient management and enhancing water holding capacity of the soil (which reduces the need for irrigation and provides drought resilience), Dr. Honeycutt said.

Dr. Honeycutt addressed the overall strategy while Dr. Cristine Morgan, Chief Scientific Officer of SHI, evaluated gaps in effective measurements and indicated many answers will be coming from SHI’s North American Project to Evaluate Soil Health Measurements. Mr. Ryan Sirolli, Global Row Crop Sustainability Director for Cargill, described work being conducted to understand the business case experienced by farmers. Dr. Dianna Bagnall, Research Soil Scientist for SHI, introduced new information to assist farmers with building drought resistance through soil health management. Mr. Leo Pradela, Senior Manager, Sustainable Supply Chains at Walmart.org, summarized current farmer education programs that drive the adoption of soil health practices, such as *Healthy Soils for Sustainable Cotton*.

**U.S. Adoption of Four Soil Health Practices**  
 (29 recognized & funded by USDA-NRCS for reducing C emissions)

Practice	Capacity (Million acres)	Current Adoption (Million acres)	Current Adoption (%)
Prescribed Grazing	655	7	1
Cover Crops	396	15	4
No Till	396	104	26
Nitrogen Management	396	138	35

US Ag. Census (NASS, 2019); ERS (2017)



After initial presentations, the audience engaged in a discussion period.

Climate Week NYC 2020 was the biggest, most global Climate Week yet. More than 500 events were hosted from over 30 countries around the world. Thank you to the more than 900 attendees from 49 countries who registered for our event.



Dr. Wayne Honeycutt  
Soil Health Institute



Dr. Cristine Morgan  
Soil Health Institute



Mr. Ryan Sirolli  
Cargill



Dr. Dianna Bagnall  
Soil Health Institute



Mr. Leo Pradela  
Walmart.org

# “Assessing Soil Health” Webinar Series Delivers Information on Measuring and Assessing Soil Health

Approximately 13,000 Certified Crop Advisers (CCA) annually enroll in continuing education credits to maintain their certification with the CCA program run by the American Society of Agronomy (ASA). Recently, ASA and the Soil Health Institute conducted a 10-question survey to better understand the needs of this community of farmer advisers and CCAs regarding current and desired soil health knowledge. The top two priorities included need for 1) economic analyses that quantify the business case of soil health practice adoption and 2) standardized soil health measurements.

SHI values the development of a well-rounded community of practitioners who are informed on the technical aspects of soil sampling for soil health, interpreting soil test results, and managing for improved soil health. With this goal and the needs of CCAs in mind, SHI and the Soil Science Society of America (SSSA) partnered to develop the “Assessing Soil Health” series of webinars. These webinars offer continuing education units (CEUs) for CCAs and other certified professionals in the ASA program and also information to other agriculture consultants who advise producers interested in including soil health as a part of their agricultural retail

business. The webinar series on measuring and assessing soil health is generously supported by The Walton Family Foundation, with CEUs provided to practitioners free of charge. The series is open to the public.

Each webinar focuses on a particular aspect of measuring soil health including soil water, carbon, and nitrogen, as well as microbial measurements and quantitative evaluation of economics of soil health management systems. Data analyses provided in the webinars include findings from the literature, research performed at SHI, and from the North American Project to Evaluate Soil Health Measurements. Three of the six planned webinars have been delivered and attendance has averaged 780 participants and 1,870 registrants. Those who registered but were unable to attend the live event have access to the recordings. Additionally, SHI and SSSA are providing written content that summarizes the webinars in the *Crops and Soils Magazine*. These articles include a set of questions that CCAs can answer to earn CEUs as well.

For more information about the webinar series and to register for the upcoming November webinar, visit <https://www.soils.org/education/online-courses/webinar-series-soil-health>.

Webinar Title	Date
Measures of Soil Water Cycling	July 21, 2020
Measures of Soil Carbon Cycling and Storage	August 13, 2020
Measures of Soil Nitrogen Cycling	September 17, 2020
Practical Measures of the Soil Microbiome: How do Crop Advisers Use the Data?	November 17, 2020
Recommended Standard Measurements for Soil Health	December 8, 2020
Soil Health Economics	January 19, 2021

# The Business Case for Adopting Soil Health Management Systems – A Project Update

In August of 2019, the Soil Health Institute and Cargill announced a new partnership to assess, demonstrate, and communicate the economics of soil health management systems (SHMS) across North America. The project goal was to conduct 100 interviews



with corn and soybean growers in nine states to obtain information for conducting partial budget analyses that quantify the dollar value of SHMS compared to conventional management systems. SHI began conducting in-depth interviews with farmers in December of 2019 and just recently completed the 100<sup>th</sup> interview. We are now digging into the data using partial budget analysis methodology to determine the impact of soil health promoting practices on farmers' profitability.

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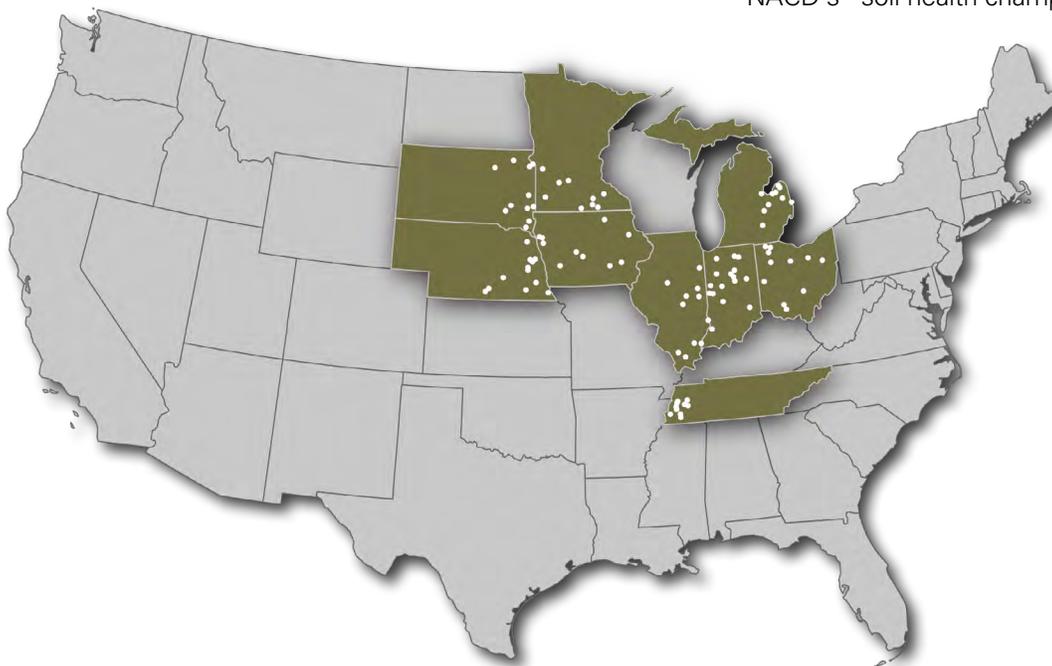
Region	States	Completed Interviews
A	Iowa, Nebraska	22
B	Tennessee	10
C	Illinois, Indiana	27
D	Minnesota, South Dakota	20
E	Michigan, Ohio	21

In July, project manager Dr. John Shanahan and agricultural economist Dr. Archie Flanders presented project updates at the Soil and Water Conservation Society's 75<sup>th</sup> International Annual Conference. Dr. Flanders also offered insight on partial budget analysis in his [presentation](#) during SHI's 5<sup>th</sup> Annual Meeting "Soil Health: The Foundation for Regenerative Agriculture." During the same event, Dr. Shanahan moderated a [panel](#) of farmers who shared their stories on the benefits and challenges of adopting SHMS on their operations.

The team is now analyzing the interview findings, which will be aggregated by region in partial budget format alongside analysis from more than 120 experimental research sites across North America.

Project results will be distributed in five fact sheets, one for each region, that describe the regional cropping practices and partial budgets on the economic costs and benefits for adopting SHMS. Additionally, a final summary report that includes the data from 100 farmer interviews will be produced to highlight significant findings from the project.

SHI is closely coordinating this project with the National Association of Conservation Districts (NACD) and U.S. Department of Agriculture, Natural Resources Conservation Service, having completed additional interviews with 25 of NACD's "soil health champion" farmers.



National Association of Conservation Districts



United States Department of Agriculture

Natural Resources Conservation Service

## NAPESHM UPDATE

# Progress on Identifying Most Effective Measurements

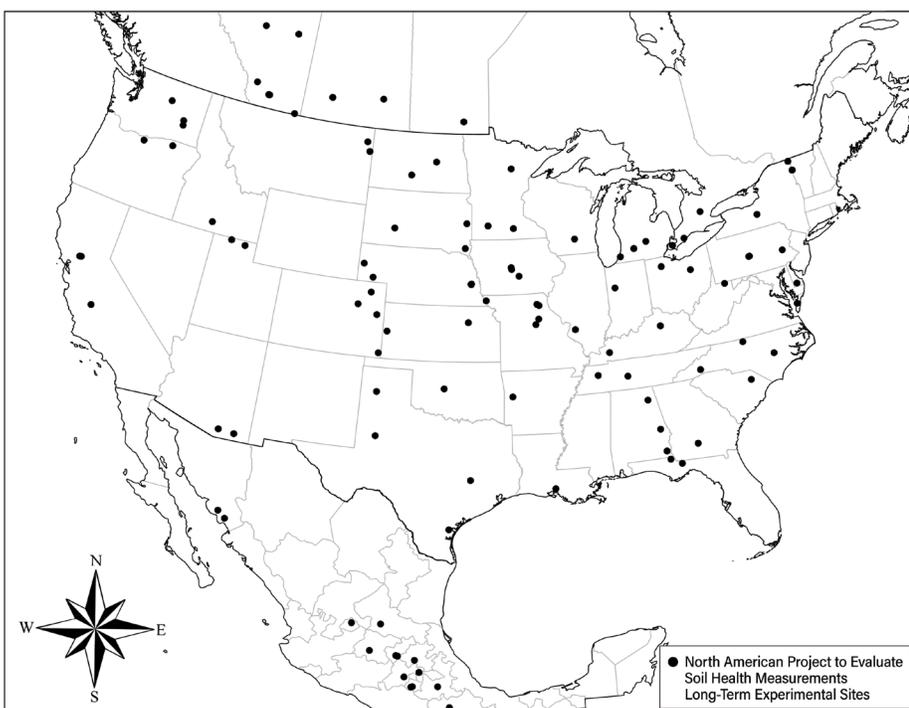
The North American Project to Evaluate Soil Health Measurements (NAPESHM) is at full steam. Recently, we have worked with our Partnering Scientists to finalize detailed documentation of management practices for each of the 124 sites, 689 treatments, and 2,025 samples. This trove of management data allows us to analyze the measurements, develop continuous management ratings, create partial budget analyses, and run greenhouse gas emission models.

In addition to the overall description of each measurement and the relationships among variables, the team has focused on how management and inherent features affect each soil health indicator. The first round of papers will provide the evaluation for carbon, nitrogen, and water storage and cycling indicators, aggregate stability methods, and the very tip of the iceberg on microbial community structure. Through this process, we aim to push science and agriculture forward by determining the best suite of methods to measure specific agroecosystem functions. From this, we are building a framework for interpretation with the intention of helping farmers/land managers make economically and environmentally sound land-use decisions.

We are excited to synthesize our results and share them with our soil health community. We presented preliminary results at the Soil Health Institute's 5<sup>th</sup> annual meeting. You can [click here](#) to go directly to that playlist on the Soil Health Institute (SHI) YouTube channel. A major step toward getting this information in the hands of practitioners has been a series of sponsored certified crop adviser trainings, produced in partnership with the Soil Science Society of America (SSSA). (See page 4 for more information on the training webinars.) Many additional presentations were given at the Tri Societies Annual Meeting session on "[Measuring and Assessing Soil Health](#)" that also included talks by U.S. Department of Agriculture, Natural Resources Conservation Service, American Farmland Trust, and U.S. Department of Agriculture, Agricultural Research Service.

We thank all Partnering Scientists and their institutions, participating laboratories, engaged colleagues, project partners (The Nature Conservancy, The Soil Health Partnership), and primary funders, including the Foundation for Food and Agricultural Research, General Mills, and The Samuel Roberts Noble Foundation, for their support.

For more information, contact Lead Scientist Dr. Shannon Cappellazzi at [scappellazzi@soilhealthinstitute.org](mailto:scappellazzi@soilhealthinstitute.org), scientists on the NAPESHM project team, or other SHI representatives.



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# Virtual Field Days Focus on Soil Health Promoting Practices in Cotton

The Soil Health Institute (SHI) worked with the University of Arkansas Division of Agriculture & Extension specialists and the Soil Health Labs at the School of Public Health at the University of South Carolina to produce a series of virtual soil health field days. The videos include conversations with cotton growers and soil health specialists in Arkansas and South Carolina. According to David Lamm, Project Manager of *Healthy Soils for Sustainable Cotton*, the series of 13 videos is publicly available on [SHI's YouTube Channel](#).

## **HEALTHY SOILS FOR SUSTAINABLE COTTON** 2-State Tour - 13 Virtual Field Day Events

### **BUILDING SOIL HEALTH – The View From Arkansas**

- Building Soil Health in Arkansas
- Cotton Soil – Conventional and No-Till
- Introducing the Furrow Runner Plow
- Cover Crop Seed Selection
- Cover Crop Seed Mixes
- Wide Row Cotton

### **BUILDING SOIL HEALTH – The View From South Carolina**

- Soil Health in Richland County (South Carolina)
- Measuring Bulk Density
- Measuring Soil Temperature
- Principles of Regenerative Agriculture
- Warm Season Cover Crop Mixes
- Warm Season Cover Crop Growth
- Wrapping Up in Richland County (South Carolina)

The virtual field day videos are part of the *Healthy Soils for Sustainable Cotton* project, which provides farmer-focused education and training events delivered by SHI scientists, partnering with local soil health technical specialists and farmer mentors who have implemented successful soil health management systems (SHMS). The project aims to increase the adoption of SHMS among cotton producers while documenting environmental and economic benefits.



  
**Healthy Soils**  
*for* **Sustainable Cotton**

*Healthy Soils for Sustainable Cotton is supported through the generosity of the [Wrangler®](#) brand, the [VF Corporation Foundation](#) and the [Walmart Foundation](#).*

*For more information about the project and access to the virtual tour videos, visit <https://soilhealthinstitute.org/soil-health-training/>.*

## Healthy Soils for Sustainable Cotton Named Field to Market Spotlight Honoree

The Soil Health Institute (SHI) is proud to announce it has been recognized as part of [Field to Market's 2020 Project Spotlight Series](#).

[Field to Market](#) acknowledged the [Healthy Soils for Sustainable Cotton](#) project on June 24 during its annual Plenary and General Assembly Meeting. The recognition noted the project's outstanding cross-sector partnership for advancing continuous improvements in sustainable outcomes for U.S. commodity agriculture. In its *Healthy Soils for Sustainable Cotton* project, SHI works with other members across the food and ag value chain to support farmers in improving outcomes in soil health and regenerative agriculture.



SHI would like to thank Field to Market for this recognition,

and gratefully share it with our farmer mentors, Mr. Burton Heatwole (Millen, Georgia), Mr. Sonny Price (Dillon, South Carolina), Mr. Zeb Winslow (Scotland Neck, North Carolina), and Mr. Adam Chappell (Cotton Plant, Arkansas), and our Soil Health Specialists Mr. Peyton Sapp (Georgia), Dr. Buz Kloot (South Carolina), Mr. Will Mann (North Carolina), and Dr. Bill Robertson and Mr. Matt Fryer (Arkansas). SHI also recognizes our partners and sponsors and our *Healthy Soils for Sustainable Cotton* project manager Mr. David Lamm.



Photo by Barrett Self, University of South Carolina

Wrangler

Walmart  org



SHI SOIL HEALTH INSTITUTE

UVA DIVISION OF AGRICULTURE RESEARCH & EXTENSION

TEXAS A&M AGRILIFE EXTENSION



## Cotton & Covers: Farmers Share Their Soil Health Journey

The Soil Health Institute (SHI) released *Cotton & Covers*, a *Healthy Soils for Sustainable Cotton* video series, in late August. The series follows three Southeastern cotton producers as they discuss their individual journeys to build profitable soil health management systems on their farms. Each producer is a mentor to other farmers in SHI's soil health training program, working with other farmers to expand their knowledge of soil health systems and to overcome barriers to adoption.

All six videos in the series are available to watch on the SHI YouTube Channel, at [https://www.youtube.com/playlist?list=PLdFVkeklZuqwGycvECjckjeXH3Amil\\_VF](https://www.youtube.com/playlist?list=PLdFVkeklZuqwGycvECjckjeXH3Amil_VF).

The series features Mr. Sonny Price from Dillon, South Carolina; Mr. Zeb Winslow from Scotland Neck, North Carolina; and Mr. Burton Heatwole from Millen, Georgia. The cotton producers discuss why they decided to explore soil health promoting practices and the benefits they've discovered as they experimented with reduced tillage, increased cover crop species diversity, and livestock grazing.

The video series is part of the *Healthy Soils for Sustainable Cotton* project, which provides farmer-focused education and training events delivered by SHI scientists, partnering with local soil health technical specialists and farmer mentors who have implemented successful soil health management systems. The project aims to increase the adoption of soil health management systems among cotton producers while documenting environmental and economic benefits.

*Healthy Soils for Sustainable Cotton* is supported through the generosity of the [Wrangler®](#) brand, the [VF Corporation Foundation](#) and the [Walmart Foundation](#).

# SHI Announces Scientific Advisory Committee

The Soil Health Institute (SHI) has established a Scientific Advisory Committee to review, provide recommendations, and engage in helpful problem solving with SHI in its on-going mission to safeguard and enhance the vitality and productivity of soils through scientific research and advancement. Areas to be addressed include various aspects of soil health measurements, research and development, quantifying impacts, and driving adoption. SHI's Chief Scientific Officer, Dr. Cristine Morgan, serves as the Committee Chair.

SHI is pleased to welcome the following appointed advisers:



## **Francisco Arriaga, Ph.D.**

Dr. Francisco Arriaga is an Associate Professor and Extension State Specialist with the Department of Soil Science at the University of Wisconsin (UW)-Madison and UW-Extension. His research focuses on

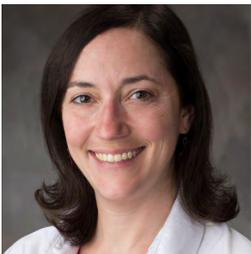
soil management practices for enhanced crop productivity with an emphasis on soil health and water quality.



## **Stephen Machado, Ph.D.**

Dr. Machado is a Professor of Crop Physiology/Agronomy at the Oregon State University Columbia Basin Agricultural Research Center. His research focuses on developing economically and biologically

sustainable agricultural practices, crop rotations, long-term experiments, alternative crops, drought tolerance, site-specific farming, and organic farming.



## **Andrea Basche, Ph.D.**

Dr. Andrea Basche is an Assistant Professor in Cropping Systems at the University of Nebraska-Lincoln's Department of Agronomy and Horticulture Department. Her research focuses on cropping

systems that address profitability, resource use efficiency, climate risks, and improving soil health.



## **Kate Scow, Ph.D.**

Dr. Kate Scow is a Distinguished Professor of Soil Science and Microbial Ecology in the Department of Land, Air and Water Resources at University of California Davis. Her research investigates relationships

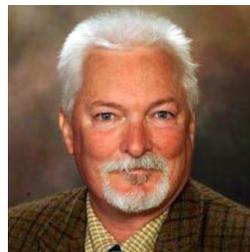
between soil microbial diversity and critical soil functions: biogeochemical cycling, soil structure, organic matter and carbon sequestration, as well as connections between soil biology and soil health.



## **Julie Howe, Ph.D.**

Dr. Julie Howe is Associate Professor of Soil Chemistry and Fertility at Texas A&M University. Her research focuses on nutrient and carbon cycling, including the impact of agricultural management

on nutrients and soil carbon, development and efficacy of fertilizers, and processes that improve soil health.



## **C. Wesley (Wes) Wood, Ph.D.**

Dr. C. Wesley (Wes) Wood is Professor of Soil and Water Science and Center Director of the University of Florida Institute of Food and Agricultural Sciences West Florida

Research and Education Center. His research focuses on carbon and nutrient cycling in managed and natural ecosystems. Dr. Wood is a member of the SHI Board of Directors.

To read their full bios, visit the [About](#) page on the SHI website.



*Dr. Cristine Morgan, who remains an adjunct faculty member at Texas A&M University, moved to her current position at the Soil Health Institute after a successful career as a tenured professor. Here, Dr. Morgan (right) and Ms. Sarah Balke, former Texas A&M Graduate Teaching Assistant, record field data.*

## Dr. Cristine Morgan, Soil Health Institute Chief Scientific Officer, Named Soil Science Society of America Fellow

During its annual meeting, the Soil Science Society of America (SSSA) recognized Dr. Cristine Morgan, Chief Scientific Officer of the Soil Health Institute, as its 2020 SSSA Fellow. The annual award is presented for outstanding contributions to agronomy through education, national and international service, and research.

Dr. Morgan develops scientific strategy and implementation for SHI's research. She holds a B.S. from Texas A&M University in Environmental Soil and Plant Sciences and an M.S. and Ph.D. in Soil Science from the University of Wisconsin-Madison. Dr. Morgan is the Editor-in-Chief of *Geoderma*. Her commitment to solving soil science and agronomy problems motivated her move from academia to SHI where she works with diverse partners to shape agricultural solutions to global existential challenges. She holds adjunct faculty status at Texas A&M University, where she was a tenured professor and recognized for innovative research, translating technology to application, research in Global Soil Security, and elevating soil judging to a global competition. Dr. Morgan is a powerful advocate for soil science, serving the societies with leadership, vision, and passion.

SSSA Fellow is the highest recognition bestowed by the Society.

For more information on the 2020 awards, including award descriptions, visit: <http://www.soils.org/awards/view>.

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