2022 Campbell Lecture

Dr. Cristine Morgan
Chief Scientific Officer, Soil Health Institute

Soil Structure and the Physics of Soil Health

Thursday – April 7, 2022
2.10 – 3.00 pm in VBRB 305
(Veterinary and Biomedical Research Building)
Zoom Meeting ID: 979 3050 3945, Passcode: 866115
(Reception to follow)

Dr. Cristine Morgan is the Chief Scientific Officer of the Soil Health Institute. In this role she is responsible for developing and establishing the scientific direction, strategy and implementation plan for the Institute’s research programs and establishing research priorities. Prior to joining the Institute, Dr. Morgan was Professor of Soil Science at Texas A&M University in College Station, TX, with a research emphasis in soil hydrology, pedometrics, and global soil security. Dr. Morgan earned her M.S. and Ph.D. in Soil Science from the University of Wisconsin-Madison, Soil Science Department. Her B.S. degree is in Plant and Environmental Soil Sciences from Texas A&M University).

About the lecture
Whether speaking of Climate Smart Agriculture, Regenerative Agriculture, or any type of farming that improves ecosystem services, improving soil health is the foundation for success. When we speak of soil health we often get colorful descriptions of counting earthworms, emotive stories of the microbiome, and hear that the soil health concept is an awakening to a better appreciation of the biology of soil. Soil biology plays an important role in improving soil structure, and soil structure is a key component to understanding how improved soil health leads to soil carbon storage, drought resilience, cleaner water, reduced flooding, and better nutrient cycling. However, soil physicists don’t speak much of structure nor soil health. I think it is because we don’t measure soil structure easily and because soil structure is complicated. In this seminar, I will explore examples of acknowledging soil structure in the evaluation of soil health and soil functioning, especially as it relates to soil-water relationships. I will discuss novel measurement of soil structure, novel methodology in acknowledging the role of soil structure in soil health and show an example (or two) of how biophysical modeling and smartphones can be used to communicate the importance of soil structure to soil managers.

The Campbell Lecture was created to help further understanding of environmental soil science. It is named for Dr. Gaylon Campbell, who spent nearly 30 years as a professor of environmental biophysics and soil physics in the WSU’s Crop & Soil Sciences department. He retired from WSU in 1998 to become vice president of engineering at Decagon Devices, a manufacturer of biophysical research instrumentation. The lecture was created through gifts from Campbell Scientific, Inc., and Decagon Devices, Inc (now Meter Group).