

Memorandum

From: Center for Soil Technologies (SoilTech) Industry Advisory Board
To: Faculty of Iowa State University, University of Connecticut, University of Southern California, and University of Washington
Subject: SoilTech 2024 Research Solicitation
Date: 20 September 2024

Description of Opportunity

The Center for Soil Technologies (SoilTech), a National Science Foundation Industry-University Cooperative Research Center (IUCRC), seeks to invest in pre-competitive research and development of new technologies at partner universities that address the research priorities of SoilTech's Industry Advisory Board. SoilTech invites researchers across its four participating university sites at the University of Southern California, Iowa State University, the University of Connecticut, and the University of Washington, to submit proposals for new projects or continuations of existing projects relevant to SoilTech's core research areas.

The SoilTech Mission

Healthy soils are needed to sustain life, to grow food, to provide shelter, to provide resilient infrastructure, and to enable mobility, but there is presently a lack of knowledge about many key aspects of soil and its dynamics such as variations in moisture and organic matter content, and how these variations affect soil and ecosystem health, terrain stability, and emergent phenomena such as wildfire hazards and earthquakes. SoilTech aims to fill this knowledge gap by addressing industry-driven research needs of our Industry Advisory Board members in fields like agriculture, defense, energy, sustainability, and environment. SoilTech serves as a first-of-its-kind hub for technical exchange and collaborative research among the four participating university sites and among the organizations represented within the SoilTech Industry Advisory Board, providing inter-disciplinary knowledge synthesis and broad applications of its research. SoilTech's participating sites will train the next generation of workforce in sensing, measurement and monitoring practices that will broadly benefit society.

Key Dates

Activity	Description	Date
RFP Issued	Solicitation distributed to researchers at partner universities	20 September 2024
White Paper Submissions Due	1-page whitepaper submission deadline	18 October 2024
White Papers Reviewed	SoilTech Industry Advisory Board to review whitepapers and invite proposals for further development	TBD (October 2024)

White Paper Submitters Notified	All whitepaper authors will be notified of the outcomes of their submissions; select proposers may be invited for full proposal submissions	TBD (October 2024)
Full Proposal Submissions Due	Full proposal submission Deadline	TBD (November 2024)
Full Proposals Reviewed	SoilTech Industry Advisory Board meets to review full proposals	TBD (December 2024)
Project Start Date	New projects begin	1 January 2025

SoilTech 2024 Priority Topics for Research Proposals

Topic 1	Sensors & Sensor Networks for Soil Characteristics
Satellite-based systems and algorithms for subsurface soil profiles; near-surface/proximal sensing; <i>in situ</i> sensors and networks; UAV-based sensors and swarms; high-altitude airborne and spaceborne remote sensors; energy-aware wireless networks	
Topic 2	New Modalities in Soil Modeling & Data Analytics
Integrated modeling; uncertainty analyses to inform field initiatives; validating soil carbon models	
Topic 3	Soil Health & Sustainability
Large-scale soil health; sustainable land use; soil remediation strategies; PFAS sensing; impact on wildfire/earthquake danger and ecosystem recovery assessment; soil organic carbon dynamics	
Topic 4	Data Integration
Sensor and Data fusion, multi-scale and integrative data analytic frameworks for future data collection and validation, data-driven physics, physics-based models	

SoilTech 2024 Industry Advisory Board Members

- Bayer Crop Science/The Climate Corporation
- Foundation for Food & Agriculture Research
- John Deere
- Mitsubishi Electric Research Laboratories
- NASA Earth Sciences Technology Office Advanced Information Systems Technology (AIST) program
- Onset Environmental
- Raytheon
- Syngenta

White Paper Submission Instructions

Please note that SoilTech will use a two-stage process to evaluate proposals. The submission instructions for the first stage of the process are described here. Further instructions for full submissions will be provided to those proposals invited to move to the second stage of the evaluation process.

White Papers should be a maximum of 1 page (including figures), single-spaced, minimum of 11-point font, and minimum 0.5-inch page margins. Proposals must include the following information:

- Concise statement of objectives *relevant to industry needs* in one of the priority topics listed above
- Concise description of current state of the art/prior art; noting current technology or research gaps that are being addressed by this project
- Concise description of research plans and approximate research timeline
- Background/expertise of team members and description of planned collaboration between partner institutions, if applicable
- Expected outcomes/deliverables
- Funding request [maximum \$50,000 per project for single-university proposals or \$100,000 per project for collaborative projects at two or more universities]

Additional Submission details

- Projects must be led by at least one faculty member from a participating university site (USC, UConn, UW or ISU); collaborations across two or more university sites are encouraged
- The project performance period may be up to one year
- Projects may be invited for renewal/continuation at the discretion of the Industry Advisory Board
- Proposals should be *pre-competitive* in nature and are not expected to generate intellectual property (IP). Use of background IP and overlap with existing IP should be avoided.

Proposal should be submitted in PDF format to Samantha Danner

(samantha.danner@usc.edu) by 17:00 Pacific Time (UTC-08:00) on 18 October 2024.

Proposal Evaluation Criteria

- White Paper proposals will be reviewed by the SoilTech Industry Advisory Board (IAB), whose current membership is listed above
- Reviewers will select 10-14 whitepapers for development into full proposals

- Reviewers will be asked to comment on proposals' major and minor strengths and weaknesses in the following areas:
 - technical merit (40%)
 - project feasibility based on budget and team expertise (40%)
 - value to IAB member organizations (20%)
- Proposals will be selected based on their level of interest to the organizations that make up the IAB
- Proposals will be evaluated for their potential for infusion/commercialization
- Proposals should adhere to one or more of the priority research topics, which were vetted by the IAB
- Proposals that are not primarily pre-competitive will not be considered