

HARRY R. HUGHES CENTER FOR AGRO-ECOLOGY REQUEST FOR PROPOSAL

Soil Health through soil carbon measurement

The mission of the Hughes Center is to *provide leadership to promote environmentally sound and economically viable agriculture and forestry as Maryland's preferred land use through research, outreach and collaboration.*

OVERVIEW

Harry R. Hughes Center for Agro-Ecology seeks to *lead an effort to expand the use of soil health practices by farmers to improve farm profitability and resiliency with the secondary benefit of sequestering carbon.* This priority is part of the strategic priorities developed by the Board of Directors. The project will leverage a Regional Conservation Partnership Program (RCPP) grant to Maryland Department of Agriculture (MDA) that seeks to enhance soil health and improve both air quality through increased carbon sequestration and water quality through increased efficiency of nutrient use and water management.

The Objective

Measure the carbon profile in Maryland's agricultural soils for the purpose of: 1) Ground truthing the COMET Farm tool to provide feedback to farmers about outcomes of practices that may enhance soil health; 2) provide data to develop mapping tool for soil carbon at the field scale; and 3) provide objective input to agencies seeking to measure/track/incentivize carbon sequestering by agricultural and forestry practices.

The Opportunity

The Hughes Center will fund a project up to **\$200,000** over a 3 year period to achieve the desired results. The Hughes Center does not fund overhead costs. All qualified proposals will be considered, however proposals that identify opportunities to provide matching or in-kind funds will receive preference. The Center encourages multi-disciplinary proposals that engage in collaboration across academic areas or industrial sectors. However, implementation must take place within the state of Maryland and will minimally accomplish the goals described in the NRCS RCPP grant (attached) which focus in the Soil Conservation Districts in the four counties on the Eastern Shore of Maryland: Kent, Queen Anne, Caroline and Talbot counties. These counties have the highest acreage of enrollment rate for the cover crop program in Maryland and no-till management systems predominate.

The Maryland agricultural community has the highest adoption rates of cover crop and no-till practices in the nation. It might be expected that these practices, where optimized, may have produced increased concentrations of carbon in the state's cropland soils. Soil health is a key agro-ecology characteristic that may help farms become both more profitable and more environmentally sustainable. To achieve the best long term results, innovation will likely occur at the farmer level. Supporting a combination of practices and using an adaptable tool to provide feedback to the farmer will support increased adoption of optimized practices.

Several different statewide policies intersect around soil health. Maryland's Greenhouse Gas Reduction Act seeks to reduce greenhouse gas emissions 25% by 2020 and 40% by 2030. These ambitious goals must complement the Chesapeake Bay Program, which brings millions of dollars of resources to reduce agricultural nutrient runoff in the watershed. Measurable water quality improvements in the Chesapeake Bay have resulted in habitat improvement including increased fisheries production and improved submerged aquatic vegetation. The use of cover crops is likely the single most important practice that controls agricultural nutrient loss into the Bay. Beyond 2025, the State will require more from our farmers and thus development of optimized conservation practices including, soil health practices to support both farm profitability and a healthy ecosystem, need to be rigorously tested.

Researchers applying for this funding will be at the forefront of supporting implementation of innovative agricultural practices. The project will help farmers optimize their practices to both reduce nutrient run off while protecting soil and reducing net greenhouse gas emissions.

Analyzing how NRCS supported practices like:

- Cover crops
- Crop rotations
- Enhanced Nutrient Management
- Variable rate technology
- Residual and tillage management crop rotations
- Precision farming
- Edge of field tools
- Composting
- Forest and biomass planting

The proposal will assess the use of these practices on farms and will support farm scale decision making up to state level policies. The proposal will achieve the following results. 1) Providing useful field-based feedback to farmers and supporting farmer-to-farmer communication. The proposal should incorporate use of the NRCS's "Maryland soil health card." Assessment of this tool in comparison to the COMET model is desired. 2) Developing information to support statewide maps of soil health will be used by agencies to concentrate resources efficiently while promoting Maryland farmers as national leaders in soil health. 3) Finally, analyzing a variety of practices that both foster farm-based innovation and could ultimately encourage a policy transition from pay for performance rather than pay for practice.

According to the Soil Health Institute the [COMET farm tool](#) is the industry standard for estimating the carbon footprint for cropland. This tool was designed to provide guidance for reducing greenhouse gas reduction and carbon sequestration through farm management practices. The tool uses detailed spatially-explicit data on climate and soil conditions and produces accurate estimates for a farm. Assessment of the value of this tool to Maryland's greenhouse gas reduction act and the state's goal to sequester carbon in cropland would be a key outcome.

The Criteria

Preproposal Due Date and rubric

- Preproposal Due: May 15, 2018
- Full Proposal July 15, 2018
- Presentation to Board of Directors September 2018
- Who can Apply: Professionals and academics with credentials supporting their proposal subject matter.
Researchers with outstanding reports due to the Hughes Center are ineligible.
- The project presents novel research that enhances knowledge and science and economics in agriculture forestry and/or natural resources to benefit working lands and the Chesapeake Bay.
- This proposal is grounded in objective science?
- The design appears to be well thought out with testable hypothesis, appropriate methods.
- Do the investigators have the experience and skills to perform the work?
- Does the budget seem plausible and likely to achieve the desired outcomes?
- Is the time frame adequate?
- How relevant is this project to the priority of soil health as outlined in the proposal?
- Evaluate the collaborations found in this project especially value those non-traditional collaborations.
- Is matching funding identified and likely?

PRE-PROPOSAL FORMAT

Pre-Proposal Format 12 font size or larger

1. Cover Sheet: 1-page
 - a. Proposal Title
 - b. Names and contact information of participants with Principal Investigator identified
 - c. Date of submittal
2. Proposal: 2-pages
 - a. Clear statement of the hypothesis and objectives with literature review
 - b. Discussion of the methods needed to address the question
 - c. Discussion of the tools and facilities that will enhance the success of the project
 - d. Potential limitations or barriers to completion
3. Qualifications of the participants (no more than 2 pages)
 - a. Brief bio of the project participants with highlights of the skills that will enhance the project outcomes
4. Timeline 1/2 page
 - a. Provide specific dates when deliverables will be complete and available to the Center
 - b. Include any contingencies for deliverables
5. Budget 1/2 page
 - a. Provide a chart that includes a minimum of the following budget items:
 - i. Salaries
 - ii. Fringe Benefits
 - iii. Equipment/materials/supplies
 - iv. Travel
 - v. Identify potential match and established matches (in-kind) and the sources and timelines
 - vi. Total proposal requested from the Hughes Center

Next Steps

Proposal Approval Process:

- Pre-proposal Review and selection May-June 2018
- Includes independent review
- Announcement of Short listed proposals June 2018
- Full Proposal due July 15, 2018
- Proposal Review Complete September 10 2018
 - Includes scientific review
 - Hughes Center Board review and selects grantees
 - Board meeting with proposal finalist presentations: September 10, 2018
- Announcement of final project selection no later than September 12, 2018

The Center will establish a payment schedule that aligns with the timeline of deliverables. Failure to meet deadlines will result in delayed or denied payment.

Contact Point

All inquiries should be directed to Suzanne E. Dorsey, Ph.D., Executive Director of the Harry R. Hughes Center for Agro-Ecology. Sdorsey1@umd.edu 410-827-8056.