

## ECOSYSTEM SERVICES MARKET RESEARCH CONSORIUM (ESMRC) REQUEST FOR PROPOSALS

Ecosystem Services Market Consortium LLC (ESMC) is working with partners and collaborators across the agricultural supply chain to invest in critical research to build a technologically advanced ecosystem services market to reward and incentivize beneficial impacts of sustainable agricultural practices and systems. The member-driven research consortium – known as the ESMRC - will support development of a cost-effective and scalable approach to farmer and rancher engagement in ecosystem service markets, an approach needed to scale the beneficial impacts of sustainable practice adoption on working agricultural lands. The ESMRC will also meet corporate and societal needs by quantifying, monitoring and verifying the environmental benefits achieved on an annual and ongoing basis. To achieve these goals, four ESMRC Working Groups have been established and tasked with developing and implementing specific research and development initiatives. The Working Groups, co-led by ESMC members and informed by Science Advisors chosen from a slate of national experts, will focus on the research, development, demonstration and deployment of cost-effective, scalable technologies and approaches to launch the market.

### BACKGROUND INFORMATION:

ESMRC Working Group 2 was established to support development of accurate, cost-effective and scalable quantification of agricultural management system impacts on water quality and water quantity. This includes supporting the development of innovative and advanced analytical tools and technologies to cost-effectively quantify, assess, monitor, and verify systems-based water impacts of the operations of farmers and ranchers at scale while providing robust and transparent documentation of outcomes. This includes the utilization, testing and refinement of direct, modeled, and remote quantification tools and technologies with a goal to reduce burden on program participants, including agricultural sector participants, program operators, and verifiers. These quantification approaches and tools will be evaluated and refined for use in market-based protocols, including through field testing in pilot projects. Based on prior technical work for developing [ESMC's first generation Protocol](#) and subsequent work to further adjust quantification approaches, the APEX model was chosen for water quality quantification for both Scope 1 credits and Scope 3 asset generation. In the context of ESMC's Protocol, Scope 1 credits and Scope 3 assets represent varying levels of producer data inputs, monitoring, and verification requirements to best approximate the buyer demand for environmental assets. Scope 1 credits refers to those assets that are a result of conservation practice implementation for use in GHG and water quality markets. Scope 3 refers to GHG, water quality, and water efficiency assets that can be used in supply chain reporting. As ESMC expands the Integrated Protocol to additional regions and covers different production and cropping systems, the APEX modeling approaches will need to be further tested to evaluate accuracy, adequacy and feasibility for use at scale in quantifying water quality outcomes and in

generating Scope 1 credits and Scope 3 assets. The models will need to incorporate additional conservation practices that are regionally relevant to water quality and will need to be further calibrated and validated in some regions to ensure the accurate quantification of water quality improvements for meaningful credit generation. Research is needed to understand the water quality benefits across varying geographies in response to soil health and other conservation practices. Accurately capturing these differences within ESMC's modeling approach will be critical for generating viable water quality assets. As ESMC Pilot Projects are launched, they will be a testing ground for the Integrated Protocol and tiered asset generation. A standardized design for evaluating the modeling outputs and associated credits from each of the pilot project sites will be needed across all ESMC pilot projects in the first year to identify strengths and weaknesses in the approach. Well-designed research studies on select pilot sites that are incorporating water quality monitoring will also provide opportunities to gather water quality data, build out and parameterize the models and run analyses to determine expected outcomes from practice adoption. With ESMC's eventual expansion to all regions in the US, enabling broader efforts to expand the capabilities of the model to account for additional practices, achieve adequate regional calibration and validation, and build automated processes will proactively address ESMC's future needs.

**PROJECT TITLE: WG#2 PROJECT 1 – Evaluation, improvement and scaling of water quality quantification approaches for water asset generation in ESMC's Integrated Protocol**

**PROJECT SUMMARY:** This RFP seeks to engage one or multiple partners to design and implement testing and evaluation of the APEX water quality modeling approach as part of ESMC's Integrated Protocol for Scope 1 credit and Scope 3 asset generation on pilot project sites. The work will cover ESMC's 2020 pilot regions to demonstrate viable water asset generation, discover needed modeling improvements or adaptations, recommend Protocol refinements, while identifying opportunities to support model calibration, validation, expansion and automation.

**PROJECT GOALS:**

1. Support the incorporation of additional regionally relevant conservation practices into the APEX model to prepare for implementation of the ESMC Protocol in expanded regions to improve the accuracy of water quality quantification.
2. Evaluate the outcomes of ESMC's two-tiered APEX approach for water quality quantification as part of ESMC's Integrated Protocol for water quality credit generation on pilot project sites in ESMC's pilot regions to assess effectiveness, accuracy, feasibility and efficiency relative to expected outcomes.
3. Evaluate the pilot site outcomes of the Protocol's water quality asset generation process relative to expected outcomes and requirements for asset generation.
4. Use the results to inform ESMC Protocol refinement, improve implementation and identify needed modifications to water quality modeling approaches.

5. Support the continued calibration and validation of the two-tiered APEX model in ESMC Protocol adaptation regions in the US to improve quantification of water quality assets to support ESMC credit generation.
6. Explore opportunities to streamline and automate the modeling process to increase efficiency and speed of water quality quantification.

Potential pilot project sites are under consideration throughout the Midwest, including but not limited to Kansas, Nebraska, Minnesota, Ohio, Illinois.

### **PROJECT OBJECTIVES: (SOW)**

The following modules of this project are seen as necessary to achieve the overall project goals. A single proposal to this RFP can address one or more of the modules. Applicants can also develop collaborative proposals with other groups to bring together the needed expertise to develop a single coordinated proposal. In all cases, it will be expected that Phase leads will work closely with the ESMRC Project Manager, ESMRC Research Director, ESMRC Working Group Project Advisory Committee and other key project partners during project implementation, including monthly project meetings. Project design and results should be focused on developing recommendations for practical application in the context of ESMC's ecosystem services market program.

ESMRC Project Advisory Committee – Caroline Wade, ESMRC Project Manager; ESMRC Research Director (to be identified); Working Group Members: Heidi Peterson, Michelle Perez, Allison Thomson; Working Group Science Advisors: Kathy Boomer, Peter Kyveryga, Sally Flis.

#### Module 1

1. Work with Quantification Model Calibration Strike Team, ESMC's modeling team, and model developers to modify, refine and prepare the APEX model to adequately account for regionally relevant conservation practices in pilot regions, including gathering science documentation of practice efficiencies if needed.
2. Build on Step 1 work to support external development of a Roadmap for a national buildout which could include: a broader plan for adding relevant conservation practices in additional regions; prioritization and planning for identifying or establishing water quality testing sites for parameterization, calibration and validation; developing a research agenda; and designing a wide call for data to improve the calibration and validation database.
3. Based on the needs of model developers, identify water quality monitoring sites in pilot project regions and facilitate alignment with the standard research design required to generate the missing data needed to support calibration of the APEX model (this could/should be done in conjunction with data collection efforts for the calibration and validation of the DNDC model and OptIS)

Module 2 - focused on 2020 pilot regions (Midwest, GL, CA, SGP, NGP) to include rangeland and rowcrop production systems for up to 50,000 acres.

1. Work with the ESMC Research Director to develop a standardized framework for evaluation of water quality quantification and water asset generation approaches and outcomes using ESMC's Integrated Protocol on pilot project sites. Work collaboratively with researchers doing similar work for soil C and GHG asset quantification and asset generation to harmonize design and analysis. See additional details and requirements noted in ESMRC Working Group Pilot Project In-field Research Module below.
2. This work can be divided into two separately led projects (2a and 2b) focused on the two levels of assets depending on capacity and expertise of contractors with close coordination across the two projects.

Module 2a – relevant to ESMC **Scope 3** asset generation

1. Conduct evaluations on all pilot project sites enrolled in 2020 and on select sets of previously collected data to determine outcomes of quantification and asset generation. This will focus on developing and testing of scaled back data collection or use of remote sensed data or other data collection sources for a Scope 3 “APEX lite” process.

Module 2b – relevant to ESMC **Scope 1** asset generation

1. Conduct evaluations on all pilot project sites enrolled in 2020 and on select sets of previously collected data to determine outcomes of quantification and asset generation. This will focus on testing of full data collection for Scope 1 asset generation.

Module 3

1. Explore the potential of current batch automation efforts to streamline the modeling process and reduce processing time, including pilot trials.

Module 4

1. Results and recommendation from across project modules will be shared by all leads and integrated into a final report. The Integrated Report development will be facilitated by ESMRC's Research Director and the Project Advisory Team to synthesize reports on findings and provide evidence to support recommendations for needed adjustments to the Protocol requirements, implementation, data collection and modeling approaches.

ESMRC Working Group Pilot Project In-field Research Module

In field testing projects will be closely coordinated by an ESMRC Project Advisory Committee made up of an ESMRC Project Manager, ESMRC Research Director, Working Group Science Advisors and Working Group Members who will provide guidance, oversight, and coordination with the project leads of overlapping research projects at the site and of other relevant Working Group projects.

In field testing projects must be done on sites enrolled as ESMC Pilot Projects and in collaboration with ESMC Member lead. Proposals should include acres, cropping system, location, timing, project partners as well as the proposed research and any connection to overlapping research projects in progress.

## Research Module Format

Project Title:

ESMC Pilot Project and Site Description: (Member lead, acres, cropping system, location, timing, project partners)

ESMC Pilot Project proposed research components:

- Coordination with Project Advisory Committee
- Coordination with other ESMRC projects and pilot research (list titles and leads)
- Other ongoing or planned research at sites (list titles and leads)
- Proposed research

ESMC Pilot Project Timeline:

Proposals should include a timeline for immediate work and future plans for replication on additional ESMC pilot project sites as projects are identified and launched. ESMC pilot regions for 2020 include Southern Great Plains, Northern and Western Great Plains, Midwest, Great Lakes and California. Any geographic limitations should be noted.

### **PROJECT DELIVERABLES:** (including necessary documentation)

#### Module 1

1. Report on APEX practice additions and modifications recommended and implemented
2. Report on calibration/validation gaps in Protocol expansion regions and opportunities for ESMC pilots
3. Report on progress toward development of an APEX Buildout Roadmap

#### Module 2

1. Documented Standardized Evaluation Framework for pilot projects
2. Report of findings on water quality quantification evaluation (Scope 1 and Scope 3) and lessons learned; participation in collaborative research session to develop recommendations for improvements to ESMC procedures and Protocol
3. Report of findings on water quality asset generation evaluation (Scope 1 and Scope 3) and lessons learned; participation in collaborative research session to develop recommendations for improvements to ESMC procedures and Protocol

#### Module 3

1. Report on status and feasibility of modeling automation and recommendations for implementation, including results of pilot trials.

#### Module 4

1. Final report synthesizing progress and results from modules 1-3, resulting recommendations for modeling modifications, adaptations and refinements, protocol refinements, and next steps for implementing the approach at scale.

**PROJECT TIMELINE:**

Spring 2020 – Spring 2021

**PROPOSAL FORMAT:**

- Executive summary
- Vendor/Researcher Background information
  - Number of projects and time in business/field of study
  - Experience in similar or related business/research
  - Project management strategy/techniques
- Proposed services or deliverables, including In-Field Research Module if applicable
- Plans for collaboration and coordination with key ESMRC and ESMC Member contacts
- Timeline and budget
- Project Team
- Portfolio of similar or related work/research projects
- Contact information for two references
- Risks and mitigation strategies to executing services, deliverables, timeline, and on budget

Funding notes for contractors: Identification of in-kind or cash match funding (non-federal) is encouraged but not required. Institutional overhead is limited to 10% by FFAR. The unrecovered overhead CANNOT be used as match.

**SELECTION CRITERIA:**

Proposals will be reviewed for technical and scientific soundness by the Working Group Science Advisory Committee led by ESMRC's Research Director and reviewed by ESMRC Working Group 2 for completeness of application, feasibility of approach and timeline, budget requirements, and commitment to collaboration. The reviewers may request additional information as part of the review process.

**SELECTION TIMELINE:**

Proposal must be submitted as a PDF document via email to Caroline Wade, ESMRC Project Manager, at [cwade@ecosystems-services-market.org](mailto:cwade@ecosystems-services-market.org) by April 7th, 8pm Eastern. Final decisions will be made by April 17<sup>th</sup> and all vendors will be notified by April 21<sup>st</sup>.

If you have questions regarding this RFP please contact Caroline Wade directly at [cwade@ecosystems-services-market.org](mailto:cwade@ecosystems-services-market.org) or 309-231-7440.