



Reference SON: *Strategic Research HQ Initiative*

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Proponent(s)/District

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Funded: *2013-2019*

Keywords: *Ecosystem goods and services, USACE planning tools, SMART Planning, EGS tools, GIS*

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Last updated: 09/23/2024

Ecosystem Goods and Services (EGS) Framework, Tool Development and Methods Refinement¹

Research Need

Many federal agencies are beginning to formally recognize and consider in their decision-making processes services yielded by ecosystems that benefit humans. USACE currently lacks a structured approach to adequately consider appropriate ecosystem services in a manner scalable to its disclosure and decision-making contexts. The general purpose of this project is to improve our understanding and ability to incorporate consideration of ecological goods and services (EGS) in Corps planning, including the development of new tools that would make the implementation of EGS assessment in Corps Planning easier and more consistent.

Project Objectives & Plan

We will use the expertise of Corps Planners and academics working in the EGS field to test, develop example applications, and potentially refine the Proposed Framework developed in Phase I. We will also provide Districts with tools to more consistently address elements of non-use services that address societal preferences—without attempting to monetize the benefits of those services—using the best available science in a systematic and repeatable way. This will include:

- Multiple case studies testing the Proposed Framework in different types of projects and different parts of the country, and a write up of each as a chapter in a technical report.
- Three integrated EGS tools (Blue Carbon, Connectivity, and Scarcity/Restorability) in a GIS-based web platform, plus technical notes on each, and a technical note on the platform as a whole.

Payoff

This project will advance the Corps' capabilities to capture the full range of relevant benefits and losses resulting from Corps projects via EGS assessment. The tests of the

Proposed Framework will provide planners with examples of EGS assessment in a number of settings and project types, in the event that future planning policy enables the use of EGS assessment in Corps planning. The tools being developed will also promote eventual EGS assessment, but may also be used under existing planning procedures in budget justification.

Products

Journal Articles (JAs)

Wainger, L.A., Murray, E.O., Theiling, C.H., McMurray, A.M., Cushing, J.A., Komlos, S.B. and Cofrancesco, A.F. (2023). Broadening benefits and anticipating tradeoffs with a proposed ecosystem service analysis framework for the US Army Corps of Engineers. *Environmental Management* 71, 901–920.

Technical Reports (TRs)

Cushing, J.A., Komlos, S.B., Barnes, T.K., Theiling, C.H. and Murray, E.O. (In editing). Incorporating ecosystem goods and services into USACE project planning: a retrospective analysis (ERDC/EL TR-24-XXX), Technical Report. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Hychka, K., Wainger, L.A., Murray, E.O. and Price, E.W. (In review). Using connectivity to improve non-monetary benefit relevant indicators of non-use ecosystem service values from restoration, Technical Report. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Murray, E.O., Mendoza, G.F., Wainger, L.A., Griscom, H.R. and Cushing, J. (In review). Ecosystem goods and services (EGS) models and tools: a synthesis report of information in the EGS models and tools catalog, Technical Report. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Murray, E.O., Theiling, C.H. and Wainger, L.A. (In editing). Developing an ecosystem goods and services assessment framework: Products and Resources (ERDC/EL TR-25-XXX), Technical Report. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Reed, D., Martin, L. and Murray, E.O. (In review). Using scarcity and reliability data to value ecosystem services: assessment of currently available resources and metric aggregation methods, Technical Report. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Wainger, L.A., Filoso, S., Gazenski, K., Theiling, C.H. and Murray, E.O. (In editing). Applying the ecosystem goods and services (EGS) framework: Meramec case study (ERDC/EL TR-24-XXX), Technical Report. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Wainger, L.A., Filoso, S., Murray, E.O., Weber, M.A., Price, E.W., Flemming, T.H. and Hychka, K. (In editing) Assessing relative wetland flood risk management benefits using COPE: An exploration of Capacity, Opportunity, Payoff and Equity (ERDC/ EL TR-25-XXX), Technical Report. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Wainger, L.A., McMurray, A., Griscom, H.R., Murray, E.O., Cushing, J.A., Theiling, C.H. and Komlos, S.B. (2020). A proposed ecosystem services analysis framework for the U.S. Army Corps of Engineers (ERDC/EL SR-20-2), Special Report. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Wainger, L.A., McMurray, A., Murray, E.O., Komlos, S.B. and Cushing, J.A. (In review). Test of a proposed ecosystem goods and services analysis framework in the Willamette River Basin: potential to inform future planning guidance, Technical Report. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Wainger, L.A., Sifleet, S., Shafer, D. and Bourne, S. (In review). Ecosystem service benefits of three ecological restoration projects in the coastal northeast, Technical Report. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Technical Notes (TNs)

Murray, E.O., Cushing, J.A., Wainger, L.A. and Tazki, D.J. (2013). Incorporating ecosystem goods and services in environmental planning: definitions, classification and operational approaches (ERDC TN-EMRRP-ER-18), Technical Note. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Murray, E.O. and Markin, C. (In review). The potential of a web based geospatial platform for using best available data in smart planning decisions: adding environmental tools to SimSuite, Technical Note. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Murray, E.O., Wainger, L.A. and Markin, C. (In review). Estimating blue carbon sequestration rates in restored coastal saltmarshes, Technical Note. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Other Publications

Reed, D., Martin L. and Cushing J.A. (2013). Using information on ecosystem goods and services in Corps planning: an examination on authorities, policies, guidance, and practices (2013-R-07), Institute for Water Resources Report. U.S. Army Corps of Engineers Institute for Water Resources, Alexandria, Virginia.

Conference Presentations/Webinars/Workshops

Gazenski, K., Wainger, L.A. and Murray, E.O. (2016). Using scarcity data to value ecosystem services: assessment of currently available resources, Poster. A Community for Ecosystem Services (ACES), Jacksonville, Florida.

Murray, E.O. (2016). Framing climate change science and adaptation in the context of ecosystem services: moving the ball forward, Panelist. A Community for Ecosystem Services (ACES), Jacksonville, Florida.

Murray, E.O. (2016). What's next for ecosystem services in decision making? Priorities and pathways, Panelist. A Community for Ecosystem Services (ACES), Jacksonville, Florida.

Project Activities

Coordinate with HQ on integration of multiple planning initiatives, including EGS, into Corps planning.

Attend HQ Meetings on developing policy guidance on EGS application.

¹**Project Alias – Work Unit Documentation Title:** *Ecosystem Goods and Services Tools Development and Methods Refinement (Incorporating EGS into Corps Planning, Phase II)*