

Climate Change Resiliency: Using Ecosystem Services Concepts to Guide Risk Assessments and Site Remediation

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Background/Objectives. Approaching environmental assessment and remediation within a socio-ecological systems framework and using ecosystem services concepts has the potential to result in better human health and environmental outcomes that span local to global scales. This is especially the case during the scoping of potential remedial alternatives and site re-use planning efforts that explicitly incorporate climate change resilience. Socio-ecological systems frameworks are grounded in the perspective that human social systems are contained within and completely dependent upon the broader ecological system (Higgins et al. 2020). This framework has been applied more widely in natural resource management and to environmental restoration planning. The concepts, however, may be successfully applied throughout the remedial project life cycle with the goal of 1) connecting human health and ecological risk assessments to provide a more holistic characterization of risk and 2) subsequently promoting sustainable resilient remediation (SRR) planning processes that incorporate diverse stakeholder perspectives and identify opportunities to enhance ecosystem services through nature-based solutions.

Approach/Activities. During the past two decades, an abundance of resources have become available from the U.S. Environmental Protection Agency (EPA), the U.S. Army Corps of Engineers (USACE), and other federal and state entities to support education and wider adoption of nature-based solutions to address environmental challenges. In November 2022, the White House Council on Environmental Quality, the White House Office of Science and Technology Policy, and the White House Office of Domestic Climate Policy issued a roadmap outlining federal strategies and a resource guide to accelerate the implementation of nature-based solutions to fight climate change, nature loss, and inequities. This presentation will highlight the integration of nature-based solutions into site-specific remediation planning using the “language” of ecosystem services and a socio-ecological systems framework. The intent is to provide a summary of key terms, highlight relationships between human health and ecosystem services, identify key tools and resources, and illustrate an example of the benefits to using a socio-ecological systems approach to risk assessment and remediation.

Results/Lessons Learned. Multi-disciplinary processes that combine ecological, social, institutional, and policy considerations are complex but essential in identifying and implementing solutions to present day environmental challenges like the remediation of contaminated sites. At present, there are numerous initiatives following parallel paths with a common end goal of identifying equitable solutions that benefit people and the environment, particularly in the context of adaptation to and mitigation of climate change. While much work remains, this presentation will summarize the significant strides that have been made to illustrate the connection between ecosystem processes and human well-being, which can be used to guide site remediation efforts.