

Sustainability Conceptual Site Model (SustCSM) and the Project Cycle: Linking Management, Restoration, Re-Use and Resilience in a Changing World

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Introduction: Remediation and DM management projects, from conception, assessment and remedy design, to implementation and closure, can be quite complex, involving a number of questions, negotiations and decisions; potentially requiring significant time, money, and effort. The project cycle can be broken into a number of inter-dependent steps; starting with scoping, and leading to adaptation (and another cycle) or closure and re-use.

Methods: A framework has been developed which illustrates the sediment remedial project cycle, and the role that sustainable conceptual site model (SustCSM) plays in each phase of project development, assessment and stakeholder outreach. Examples are provided. This frame, as a template for guiding broader sediment and dredged material management, in the context of coastal, river and delta management in a changing environment, is explored.

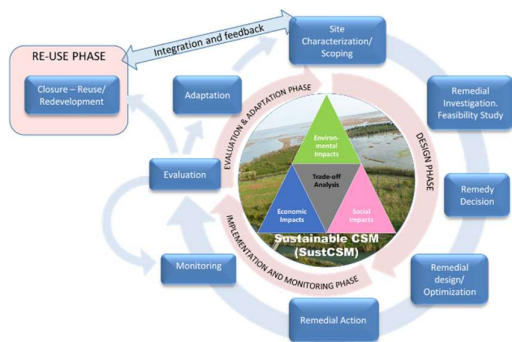


Fig. 1: Example of the remediation project cycle underlain by the Sustainability Conceptual Site Model

Results: Sustainability assessment can play a role in all steps in the remediation project cycle and sustainability thinking can provide a communication tool between stakeholder outreach and decision making. A SustCSM can be used to frame sustainability assessment and decision making, and to link criteria for these issues to stakeholders' visions for site restoration and re-use. A SustCSM considers traditional CSM elements, as well as resource inputs and outputs, land re-use and restoration goals, stakeholder well-being, and resilience; it should include desirable and undesirable pathways of

environmental, economic and social impact of remedial alternatives.

Discussion: Resilience considerations can include potential effects of re-contamination or recovery from point and non-point sources, as well as erosional, depositional or disturbance events from ongoing, changing or extreme natural or anthropogenic processes, including those influenced by or influencing adaptation to climate change. Management and site re-use, including restoration and redevelopment activities, are intrinsically linked, although a disconnect between these two remains. An holistic approach would bring together management and reuse, in terms of the goals and services desired by a range of stakeholders to achieve whole-system sustainability benefits, exploit synergies and minimize the costs and environmental impacts associated with bringing land back into beneficial use. A conceptual framework and approach in which sustainability and services assessment of sediment management is set within the broader context of site restoration and re-use goals, underlain by a SustCSM is described.

Sustainable management seeks to balance environmental, economic and social risks and benefits using a balanced and transparent decision-making process. More sustainable and resilient remedial decisions are made with the end use in mind; more acceptable ones engage and consider the values of stakeholders in a transparent and consistent manner. Assessment tools that are underlain by a sustainable conceptual site model envision these broad impacts, beyond our traditional consideration of risk pathways, in a manner that seeks to deliver desired site end uses, with a minimum of impacts. This seeks to translate technical aspects of management alternatives in terms that are of interest or concern to those who will be affected by the decision making process, ideally delivering more sustainable and acceptable outcomes.