

Environmental Restoration and Climate Change: Impacts to Remedies and Monitoring Approaches

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Background/Objectives. Designs for remedies constructed since the 1980s at environmental restoration sites across the globe have relied on implicit assumptions regarding the stability of the climate. These assumptions include factors such as groundwater level and salinity, mean precipitation, mean sea level and probable storm surge height. As climate change begins to call into question these fundamental assumptions, site managers must adjust their approach to monitoring remedies in place, incorporate climate change into assessment of remedy performance and protectiveness, and consider potential impacts to remedies well beyond the standard 30-year life cycle assessment to match the timescales of climate change effects.

Approach/Activities. U.S. EPA, U.S. state regulatory agencies, and other regulatory bodies have incorporated assessment of climate change impacts into their remedy review processes. Site managers and environmental restoration consultants have developed novel approaches to assessing remedy protectiveness and resilience and have considered the feasibility of entirely new remedies at sites such as shoreline landfills that are particularly vulnerable to climate change impacts. The issue of shoreline landfills alone is of enormous magnitude, with hundreds of thousands of such landfills around the world, often unlined and without leachate management (Brand et al., 2017).

Results/Lessons Learned. This presentation will provide examples of regulatory approaches to integrating climate resilience into periodic remedy reviews and will provide case studies of remedy reviews. Tools used for assessing remedy resilience will be illustrated, including predictions of sea level change and storm surge erosion on shoreline landfills and use of unmanned aerial aircraft to produce high resolution digital elevation models of shorelines used to model the slow inundation of land areas with remedies in place.