

Engineering With Nature

Project Fact Sheet



Understanding Ecosystem and Engineering Risks and Benefits Associated with Native Vegetation on Riverside Levees

Background

Levee design and management tends to focus on flood risk reduction by maintaining a riverward levee slope that is either rock or mowed grasses. However, much information exists on the benefits of vegetation for soils, slope stability, and human, aquatic, and terrestrial ecosystems. The disconnect highlights a need for information about when and how engineering practices can accommodate locally native vegetation on riverside slopes of levees that contribute not only to flood risk reduction but also a healthy and functional river ecosystem. A planned, vegetated riverside levee can increase overall ecosystem resilience while providing comprehensive economic and health benefits to surrounding communities.

Objectives

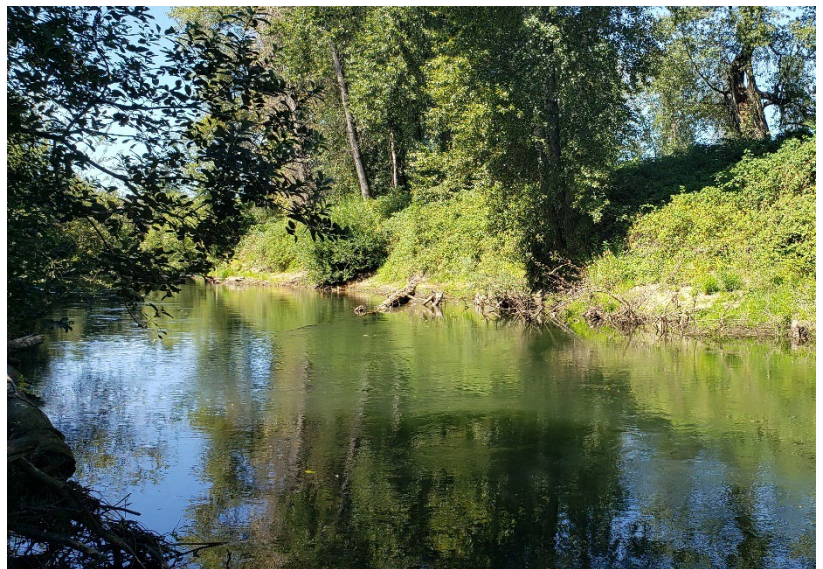
Using the latest science, engineering, and field experiences related to riverside slope vegetation, we will identify where, when, and how local vegetation may be planted and managed to improve resilience and effectiveness of riverside levees. Our objective is to inform levee managers across the US concerning how to evaluate, and potentially employ, the application of their locally native vegetation on riverside slopes for long-term levee resilience and community benefit.

Approach

We are bringing together experts in geomorphic engineering, ecology, levee safety, geotechnical engineering, risk assessment, environmental economics, sponsors, collaborators, and partners involved in levee management within the US. We will analyze and synthesize the existing science and engineering on vegetation as it relates to slope and levee engineering as well as the increasing need for realizing benefits also to ecosystems, human health, and local communities.

Outcomes

Native vegetation growth is expected to become more common on riverward levee slopes, in original design or via rehabilitation, as the benefits in the associated ecosystem and levee benefits/risks are quantified. The context of benefits versus costs can differ by location, and information assimilated in this effort is part of the emerging need to add multiple benefits to new or existing built infrastructure serving society such as through natural and nature-based features.



Points of Contact: Joanna Crowe Curran, Ph.D., P.E., L.G. (Seattle District) Joanna.C.Curran@usace.army.mil (206) 764-3271 ; R. Andrew Goodwin, Ph.D., P.E. (ERDC EL) Andy.Goodwin@usace.army.mil (503) 806-4197