

Nature Based Solutions: Can we really use gray to build green?

Why? Federal funding increasingly incentivizes Nature Based Solutions



FEMA

NATURE BASED SOLUTIONS: Sustainable planning, design, environmental management, and engineering practices that weave **natural features or processes** into the built environment to build more **resilient** communities.



NATURE BASED SOLUTIONS are approaches to problems ...which mimic characteristics of **natural features**, including **habitats**, but are created by human design, engineering, and construction.



NATURE BASED SOLUTIONS: Project solutions that are motivated and supported by **nature** and that may also offer environmental, economic, and social **benefits**, while increasing **resilience**.



NATURAL INFRASTRUCTURE is an area or system that is either naturally occurring or naturalized and then intentionally managed to provide **multiple benefits** for the environment and human well-being.



ENGINEERING WITH NATURE® is the intentional **alignment of natural and engineering processes** to efficiently and sustainably deliver economic, environmental, and social **benefits** through collaboration.



ECOSYSTEM SERVICE BENEFITS are the contributions the project provides to an ecosystem that **benefits** the environment and human populations such as air quality, water filtration, and recreation space [FEMA Policy FP-108-024-02]



GREEN INFRASTRUCTURE is "the range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspire stormwater and reduce flows to sewer systems or to surface waters." [Water Infrastructure Improvement Act of 2019]

Yes! Concrete drainage products are a critical link to enable Nature Based Solutions!

Project Goals and Benefits

Category	Benefit
Manage	Manage Urban Water - Reduce localized flooding and improve water quality.
Restore	Restore Ecology - Improve existing forest and wetland.
Access	Community Access - Create recreational and educational benefits within the forest and wetland.

Benefits: Urban Water, Ecology, Recreation, Public Health, Urban Heat Mitigation, Community.

Goal 1: Reduce Flooding and Improve Water Quality

1460 lf of 30" RCP
783 lf of 12x6 RCB

Case Study: City of New Orleans Dillard Wetlands

Source: <https://www.nola.gov/resilience-sustainability/gentilly-resilience-district/dillard-wetlands/>

Case Study: Lubberland Creek Culvert Replacement

- Engineering objective: Reduce upstream flooding, eliminate overtopping of road during frequent storm events.
- Environmental Objectives: Restore tidal fluctuation to upstream wetlands, restore critical glass eel migration route.

• Source: <https://www.nature.org/en-us/about-us/where-we-work/united-states/new-hampshire/stories-in-new-hampshire/journey-of-the-glass-eel/>