

Integrating Natural & Nature-Based Solutions

What are Natural and Nature-Based Solutions (NNBS)?

Natural and Nature-Based Solutions leverage natural systems to reduce coastal hazard risks while delivering environmental, social, and economic benefits. NNBS generally fall into three categories:

- **Natural:** Protecting or restoring existing ecosystems such as wetlands, dunes, and floodplains.
- **Nature-Based:** Designed solutions that use or mimic natural processes, including living shorelines, rain gardens, and green open spaces.
- **Hybrid:** Integrating natural features with traditional infrastructure, including marsh sills, permeable pavement, and bioswales for stormwater management.

Why NNBS matter for success in coastal resilience

Coastal hazards are becoming more frequent and interconnected. Many natural systems already reduce flooding, erosion, and storm impacts by slowing, absorbing, and storing water, while dissipating wave, tidal, and current energy.

NNBS:

- Leverage natural processes that already manage water and energy
- Restore or enhance systems that have been degraded
- Adapt over time as conditions change
- Natural and nature-based approaches support systems that function, adapt, and recover over time.

NNBS in the context of the RCCP

The N.C. Resilient Coastal Communities Program (RCCP) supports locally driven resilience planning across four phases.

Within the RCCP, NNBS are:

- A planning lens, not a single project type
- A way to connect flooding, water quality, habitat, and community goals
- An opportunity to expand the range of viable Phase 4 projects



How to embed NNBS throughout RCCP phases

Phases 1–2

Identify natural features that already help manage flooding and erosion, such as wetlands, floodplains, and open space. Map how water moves through the community and where it naturally spreads out or collects.

Phase 3

Select NNBS-forward or hybrid projects that fit local conditions and are well-positioned to compete for future funding and implementation.

Phase 4

Implement NNBS or hybrid projects that are built to perform over time, adapt to changing conditions, and require less long-term maintenance.

Rethinking “traditional” resilience projects

Traditional “gray” infrastructure approaches are often designed to address a specific problem but may not capture the full range of risks and benefits across a community. Instead of asking:

“How do we solve this problem with a single structure?”

Ask: How can we reduce risk while improving how the landscape functions over time?

Single-Purpose Approach	Connected, NNBS-Informed System
Pipe upsizing	Floodable corridors and green conveyance networks
Integrated Living Shorelines	Living shorelines integrated with adjacent habitats
Detention basins	Multi-use green space connected to living drainage systems
Hardened outfalls	Naturalized channels that drain across the landscape

Thinking beyond the obvious traditional

NNBS-forward RCCP projects are most effective when they:

- Connect across the landscape, linking upstream, shoreline, and open space
- Layer multiple functions, reducing risk while supporting habitat, water quality, and community use
- Work over time, adapting as conditions and needs change