Lake Michigan Coastal Resilience Initiative Project Worksheet FAQs

The terms, concepts and anticipated questions are explained herein, and provided as an aid to workshop participants to support responses to questions pertaining to their proposed projects. The individual terms and concepts are identified as Frequently Asked Questions (FAQs) and linked within the worksheets, where applicable.

FAQ #1 Example Projects

The following project examples were developed during the 2019-2020, NOAA lead state-level workshops (https://coast.noaa.gov/digitalcoast/stories/habitatdata.html). These workshops gathered similar types of priority information for statewide projects. These spatially broader projects may be helpful in articulating your site-specific projects for municipal areas.

Project Name	Project Goals	Project Description
Living shoreline pilot projects along the northern Illinois shoreline	Stabilize and enhance a to-be- determined percentage of coastal and riparian habitat for long-term resiliency by 2030.	This project would study which living shoreline practices are most sustainable along the northern Illinois shoreline and identify key locations for pilot projects between Lake Forest and Highland Park. This stretch of shoreline spans approximately 3 miles and includes a mix of high-quality natural area that is highly impacted by erosion; land use includes public space, NGO- and county-owned preserves, and private property. This project would aim to be a comprehensive, collaborative effort to protect, enhance, and rehabilitate the coastal zone into a resilient regional asset by sustainably facilitating coastal processes, such as wave energy.
Burns Ditch restoration in Lake and Porter Counties	Surface water will be restored to increase storm water storage by 5% so that diverse, self-sufficient biological communities are supported.	Burns Ditch is highly modified and the area is prone to flooding. We want to create a two stage ditch, reconnect oxbows, and use them for flow storage. This restoration will require land acquisition on farm fields and other agricultural lands. This would improve habitat, restore connectivity to the floodplain, and reduce flooding. The target species include waterfowl, trout/salmon, spotted turtle, and maybe yellow perch. This would restore ~150 acres.

Project Name	Project Goals	Project Description
Drowned river mouth wetland complex restoration	Protect, conserve, and restore critical habitat including islands (migratory birds), reefs (fish spawning/nursery habitat), and nearshore, shallow water habitat for all GLRI Action Plan III species by 2030 (identify, protect, restore, understand)	The drowned river mouths are unique systems that provide unique wetland habitat. There has been a lot of industrial and residential development here. There is also a lot of potential for river bank and shoreline restoration projects. These projects would restore habitat for water fowl, walleye, northern pike, yellow perch, sturgeon, and ducks, and they would also be highly visible to the public. Grand Valley State University and several other partners are already on board.

FAQ #2 Lake Michigan Project Goals

Below is a list of primary, coastal and nearshore zone restoration and protection goals for Lake Michigan, that were expressed during the 2019-2020, NOAA lead state-level workshops (https://coast.noaa.gov/digitalcoast/stories/habitatdata.html). These workshops gathered similar types of priority information for statewide projects. These spatially broader goals may be helpful in articulating your site-specific project goals for municipal areas.

- Modify or increase the hydrologic connectivity of inland marshes with Lake Michigan to benefit native species.
- Stabilize and enhance coastal habitat areas.
- Increase in-water and coastal habitats through sustainable practices.
- Protect, enhance, or restore natural features of coastal wetlands, estuaries, as well as hydrologically connected streams and river mouths.
- Restore surface water to increase storm water storage so diverse and self-sufficient biological communities are supported.
- Enhance, diversify, or increase fish habitat for various life stages of native, threatened and endangered species.
- Protect, conserve, and restore critical habitat, including islands, reefs, and nearshore shallow water habitat for native, threatened and endangered species.
- Stabilize shorelines to reduce erosion and improve habitat connectivity using nature-based solutions.
- Reduce hardened shorelines and reconnect transition zone to restore shoreline.

FAQ #3 EPA Wetlands Restoration Definitions

The Federal Geographic Data Committee, Wetlands Subcommittee developed definitions for restoration and related activities designed to aid agencies in accurately reporting wetland increases due to their program activities. Many different definitions of these terms have been used by various agencies. The definitions, below, provide standard terminology for the more than 15 agencies involved in wetland restoration, related activities, and/or mitigation.

Protection/Maintenance: the removal of a threat to, or preventing decline of, wetland conditions by an action in or near a wetland. Includes purchase of land or easement, repairing water control structures or fences, or structural protection such as repairing a barrier island. This term also includes activities commonly associated with the term preservation. Protection/Maintenance does not result in a gain of wetland acres or function.

Enhancement: the manipulation of the physical, chemical, or biological characteristics of a wetland (undisturbed or degraded) site heighten, intensify, or improve specific function(s) or for a purpose such as water quality improvement, flood water retention or wildlife habitat. Enhancement results in a change in wetland function(s) and can lead to a decline in other wetland function, but does not result in a gain in wetland acres. This term includes activities commonly associated with the terms enhancement, management, manipulation, directed alteration.

Re-establishment: the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former wetland. Re-establishment results in rebuilding a former wetland and results in a gain in wetland acres.

Rehabilitation: the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions of degraded wetland. Rehabilitation results in a gain in wetland function, but does not result in a gain in wetland acres.

Detailed definitions for the above habitat restoration types can be found here:
Wetlands Restoration Definitions and Distinctions | US EPA

FAQ #4 Spatial Extent of Projects

For the purposes of the Lake Michigan Coastal Resilience Initiative (LMCRI), we are interested in identifying projects that fall within the offshore, 80-meter depth contour and 1,000 feet inland from the coastline. These boundaries are defined by NOAA as a preference towards lakeshore projects. Projects that fall outside these spatial extents will only be considered if they can be demonstrated to provide significant benefits to habitat and species that do fall within these extents.

These extents are shown in the map below or can be dynamically viewed using the map viewer here: https://dewberry.maps.arcgis.com/apps/webappviewer/index.html?id=a8c949bf057d4c41931648bd6d3a03de.

FAQ #5 Coastal Hazards

This NOAA self-guided training resource describes coastal hazards that can be reduced with green infrastructure solutions: Nature-Based Solutions for Coastal Hazards: Nature-Based Solutions for Coastal Hazards: The Basics. Coastal hazards are defined and described in Step 1 of this training. *https://coast.noaa.gov/elearning/greeninfra/nbspart1/*

Coastal flooding occurs in areas directly adjacent to coastal waters. Many factors can contribute to coastal flooding, such as tropical storms, Nor'easters, or hurricanes. These storms cause flooding, storm surge, wind, rain, and erosion–all of which can damage property and infrastructure.

Stormwater runoff occurs in area with many paved surfaces that receive too much rain, too fast. The stormwater system can become overwhelmed, causing streets, yards, and basements to flood. Stormwater runoff also carries pollutants into rivers and lakes, causing water quality issues.

Riverine flooding occurs when there is excessive rainfall over an extended period, causing a river to exceed its banks and flow into the surrounding floodplain. The floodwater erodes land and damages and destroys homes, roads, bridges, and parks.

Storm surge is an abnormal rise of water pushed onshore by a storm, such as a hurricane, which can flood communities and damage homes, infrastructure, and roads.

Wave action - Waves and wind erode dunes, overtop coastal barriers such as seawalls, and elevate water levels on top of surge. In addition to the damage waves can inflict directly on buildings and infrastructure, wave action can erode the shoreline and adjacent uplands.

Coastal erosion comes from many sources, including stream channelization, wind, waves, seawalls (causing erosion on adjacent properties), lack of sediment, sea level rise, and reduced ice cover during winter storms. Erosion causes damage or loss of land and nearby infrastructure.

A **seiche** is a surge-related coastal flooding phenomenon experienced on lager lakes, such as the Great Lakes, that results in both abnormally high and low water levels on opposite sides of the lake in a short period of time. Seiche waves cause flooding and erosion that damages property.

Fluctuations in water levels in the Great Lakes correspond to longer-term temperature and precipitation trends. These fluctuations can cause erosion, flooding, and issues with stormwater pipe outfalls and coastal infrastructure.

Climate change or other future conditions may cause changes to communities, such as population growth or decline; changes to land use, such as suburban sprawl and urbanization; changes to weather, such as increased drought and flood risk; and even changes to the land and water resources themselves, such as erosion, sea level rise, and salt water intrusion.

Hydrologic disconnections between the nearshore region and upper parts of the watershed occur when direct routes of drainage or overland flow of water to a watercourse or lake are removed. This can cause negative environmental effects including blocking fish passage and movement of other species.

An **invasive species** is an organism that causes ecological or economic harm, or harm to human health, in a new environment where it is not native.

Degraded water quality can occur due to the presence of chemical contaminants (pesticides, hydrocarbons or oil, heavy metals), pathogens, excessive sedimentation, and elevated nutrient loads.

FAQ #6 Ecosystem Services

This NOAA self-guided training resource describes coastal hazard reductions that can be achieved with green infrastructure solutions: Nature-Based Solutions for Coastal Hazards: Nature-Based Solutions for Coastal Hazards: The Basics. Ecosystem services are defined and described in Step 3 of this training. *https://coast.noaa.gov/elearning/greeninfra/nbspart1/*

Coastal flood control stores and absorbs floodwaters from coastal storm events.

Coastal buffering provides a protective barrier from storm surge and large coastal storms.

Slope stabilization holds sediment in place to maintain natural slopes along streams, rivers, and coastlines.

Erosion control encourages natural coastal processes that stabilize shorelines.

Wave attenuation slows and absorbs the energy of waves coming to shore.

Sediment transport allows for the natural movement of sediments that build up the coastline.

Water filtration cleans pollutants from stormwater runoff.

Water infiltration allows water to naturally soak into the ground.

Stormwater retention stores and absorbs stormwater runoff due to inland storm events.

Groundwater recharge raises the water table and reduces saltwater intrusion.

Riverine flood control stores and absorbs floodwaters during storm events that cause riverine flooding.

Habitat restoration provides site-specific actions designed to improve the biological productivity or functioning of a particular ecosystem or area.

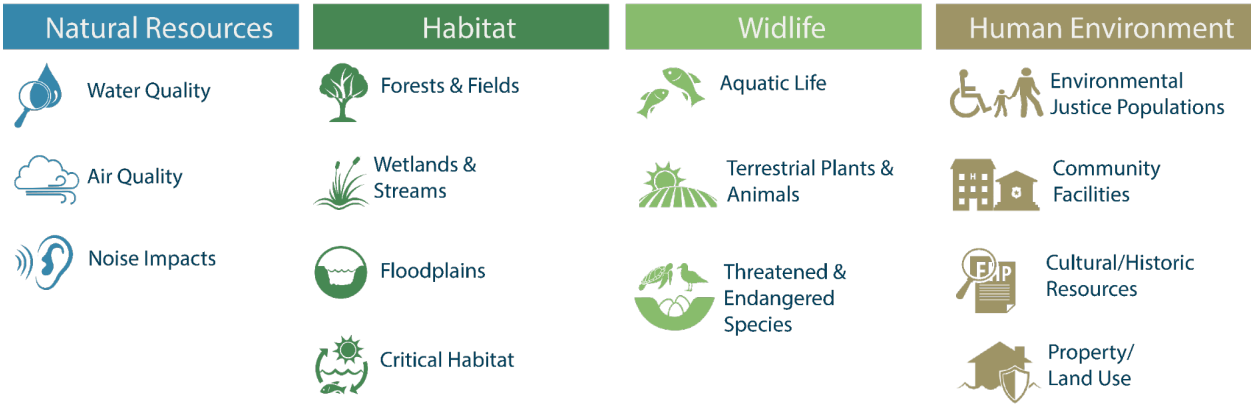
Species conservation protects and recovers endangered and threatened species and their habitats.

FAQ #7 Target Species

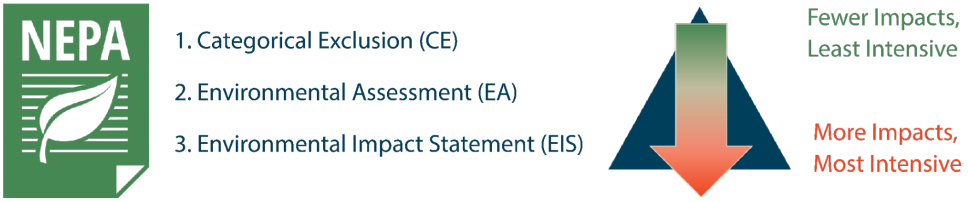
Federally threatened, endangered, and candidate species that demonstrate how GLRI investments can have the greatest impact (EPA, 2019; pp 24): GLRI Action Plan III.
https://www.epa.gov/sites/default/files/2019-10/documents/glri-action-plan-3-201910-30pp.pdf

FAQ #8 Evaluating Impacts to Environmental or Social, Historical, or Cultural Assets

Early on in the project planning and design process, it is important to evaluate if the project is anticipated to result in any adverse impacts on the built and natural environment. The list below provides an example of resource impacts that should be evaluated. Project design should aim to minimize impacts on these resources and maximize benefits.



Projects with federal involvement (federal funding, federal action, or federal property) will likely require an environmental review in compliance with the National Environmental Policy Act (NEPA). The type of NEPA document required is dependent upon the anticipated environmental impacts identified. There are three main types of NEPA assessment. Early project planning can help identify which type of documentation will be needed. For more information visit the EPA's website: https://www.epa.gov/nepa/national-environmental-policy-act-review-process.



FAQ #9 Data Resources

NOAA's Digital Coast provides resources and links to data, tools and training: *https://coast.noaa.gov/digitalcoast/*

FAQ #10 Lake Michigan Coastal Resilience Initiative Project Selection Criteria

Projects will be evaluated as to whether they meet the following GLRI Habitat and Species criteria (EPA, 2019; pp 22):

- Increase coastal communities' understanding of lake processes important to habitats and species.
- Represent innovation related to the use of natural and nature-based features that will enhance coastal ecosystem function.
- Consider the beneficial use of dredged material to create new habitats for species important to Great Lakes stakeholders.
- Use lessons learned from past efforts and address fragmented habitats by connecting habitats important to key species and communities to increase their resilience.
- Support population-level enhancements, reintroductions, and tracking of state, tribal, and other Great Lakes native species of importance.
- Support protection of native species that have cultural, subsistence, and economic value.

Note that projects that involve contaminants or contaminant cleanup will not be considered.

FAQ #10 Links to Other Helpful Resources

- Great Lakes St. Lawrence Cities Initiative *https://glslcities.org/initiatives/*
- What is coastal resilience? *https://oceanservice.noaa.gov/ecosystems/resilience/*
- Nature-based coastal resilience *https://coastalresilience.org/*
- NOAA Great Lakes resources *https://coast.noaa.gov/regions/greatlakes/glri/*