New Jersey's Coastal Ecological Restoration and Adaptation Plan (CERAP)

March 2024 by Rick Lathrop, Rachael Sacatelli and Michelle Stuart (Rutgers CRSSA and ORA)

What is the CERAP? The New Jersey Department of Environmental Protection (DEP) is developing a Coastal Ecological Restoration and Adaptation Plan (CERAP) for New Jersey's (NJ)'s coastal marshes, estuaries and back-bays. To find out more about CERAP, go to https://dep.nj.gov/climatechange/resources/njcerap/.



Efforts to protect, enhance, or restore coastal habitats require accurate identification of at-risk areas that may be experiencing a variety of stressors on multiple spatial scales. To evaluate the need for and location of appropriate intervention strategies and tactics, it was deemed necessary to determine the magnitude of place-based stressors or as we refer to them here as **Issues of Concern (IOC).** Eight IOC's have been identified, including:

- Coastal Ecosystem Degradation and Habitat Loss
- Shoreline Erosion
- Coastal Flood Damage
- Nuisance Flooding
- Coastal Storm Damage
- Water Quality Degradation
- Loss of CO₂ Sequestration
- Overburdened Communities

The IOCs are stated not as goals to be met but more as a potential vulnerability. Take for example, water quality. From an IOC perspective, we are concerned about identifying areas

where water quality is degraded, i.e., where water quality is an issue of present or future concern. Though one might be equally interested in identifying areas of high water quality and want to protect that present status (i.e., how then NJDEP treats C1 streams) that is not the approach we have adopted. To aid in area and project site evaluation and planning, we have developed a quantifiable, mappable metric for each IOC. The IOC's can be visualized as either individual IOCs layers and in composite. For more background on the IOC's please consult https://crssa.rutgers.edu/projects/cerap/doc/CERAP_Issues_of_Concern_Mapping_Methodolo

To help identify locations across NJ's coastal zone that are potential candidates for future restoration, enhancement, or preservation projects with the largest value for net carbon sequestration, ecosystem health and built community resilience, we asked partners from the state's major coastal regions to identify **Areas** and/or potential Project sites based on their perceived vulnerability to one or more of eight IOCs as mapped for CERAP, as well as their local knowledge. An **Area** represents defined geographic location on the order of 10 to 100+ hectares in size (e.g., area around a river mouth) and a **Projects** represents a specific geographic site for a proposed project (e.g., living shoreline, thin-layer placement, etc.). As part of this stakeholder-driven nomination process, end-users completed an online survey about the area in question as well as locational information through an interactive digitizing process (i.e., the end-users digitized a polygon outlining the Area that they were nominating for future consideration for resiliency/adaptation projects).

The **Coastal Ecological Restoration and Planning (CERAP) Explorer** is an online decision support tool that includes a statewide map for each of the IOCs, a combined vulnerability estimate that represents how many IOCs in a given location are highly vulnerable, and supplemental data for some IOCs to allow the end-user to explore the data sets used to create the vulnerability estimates. The nominated Areas and Projects along with the associated attribute information is also accessible for query and download. This document provides guidance on how to navigate the CERAP Explorer. To access the CERAP online data explorer, use the following link: https://nirestors.rutgers.edu/nj-cerap/.



When you start the CERAP Explorer application, the initial display window includes a map of New Jersey and the catalog of nominated Areas (polygons in green) and Projects (points in red). To display the various IOC maps, select Layer Selection. The data are grouped into 5 major themes:

- Projects
- Areas
- Issues of Concern
- Additional IOC Data
- General Administrative Data for Context



Click on the (i) information icon to get further information about the data layer in a pop-up that will appear above the Map display window. Click the **X** to close any pop-up window.



Click on the Map Service option to access the ArcGIS Online page for that Layer. Note that one can open that layer in a separate Map Viewer or on ArcGIS Desktop. Select either Open in ArcMap or ArcGIS Pro.

More guidance is provided on page 10 of this document.

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Back in the CERAP Explorer, in the Layer Selection box, click on the >> to access the map layers.

Click on the \Box_+ Layer icon to display the layer in the map display window. One can open multiple layers at the same time

Issues of Concern

| Layer Selection Add layers to map | | | | | |
|---|-----|-----|--|--|--|
| Go to Top Level Menu | | | | | |
| < Issues of Concern | | | | | |
| IOC Vulnerability Number of IOCs | í | [7] | | | |
| IOC Vulnerability Composite Sum | (j) | [7] | | | |
| Carbon Sequestration Potential | (j) | [7] | | | |
| Coastal Habitat Degradation Vulnerability | í | [-] | | | |
| Likelihood of Erosion by 2050 | (j) | [7] | | | |
| Nuisance Flooding | (j) | [7] | | | |
| Monetary Loss after Coastal Storms | (i) | [7] | | | |
| Overburdened Communities under the New Jersey Environmental Justice Law | (j) | 4 | | | |
| Coastal Storm Surge Vulnerability | (i) | [+] | | | |
| Water Quality Support of General Aquatic Life | (j) | [-] | | | |

Additional IOC Data

| La Ad | Layer Selection Add layers to map | | | | | |
|----------|--|-----|------------------|--|--|--|
| | Go to Top Level Menu | | | | | |
| < | Additional IOC Data | | | | | |
| | FEMA Reported Total Insurance Payments for Coastal Storm Damage | 1 | 4 | | | |
| | FEMA total Reported Losses from Coastal Storm Damage | (j) | []] | | | |
| | Salinity | í | 4 | | | |
| | Water Quality for Support of Shellfish | í | (J | | | |
| | Social Vulnerability All Data | í | 4 | | | |
| | Tidal Restriction | (j) | []] | | | |

General Administrative Data

| Layer Selection Add layers to map | | | | | |
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| | Go to Top Level Menu | | | | |
| < | General Administrative Data for C | ontext | | | |
| | Ecological Solutions Projects of New Jersey | (j) | [7] | | |
| | Hurricane Evacuation Routes | (j) | [7] | | |
| | Flood Hazard Areas | (j) | [7] | | |
| | Natural Heritage Priority Sites | (j) | [7] | | |
| | Municipality Boundaries | (j) | 4 | | |
| | Open Space Areas Loads slowly | 1 | [7] | | |
| | Parcels Continue to zoom in until block and lot numbers are visible | (j) | [7] | | |
| | Roads Zoom in to view | 1 | [| | |
| | Landscape Project Species Based Habitat (Marine, Delaware Bay, and Atlantic Coastal) | 1 | 4 | | |

To control how you display these various data sets, click on Layer Control. In the example window below, we have selected 2 IOCs layers along the Projects and Areas layers. To move layers up or down the stack, grab the \therefore Drag icon (see red circle below) and drag up or down. Layers at the top of the stack take precedence in display (i.e., sit overtop the other layers).



Select the **v** down arrow (yellow circle in graphic above) to adjust individual layers. One can Hide a layer using the Visible-Hidden toggle or change the Opacity with the Opacity scale. One might want to change the Opacity (the inverse of Transparency) to allow underlying layers previously displayed to be more readily visible.

To view the map Legend, click on Legend and a pop-up with the color scheme and class names for the selected layers will appear. To make the legend disappear, click on the Legend icon.



CERAP Issues of Concern Explorer





One can alter the underlying base map through the Select Basemap option.

To zoom to a specific location, use the Find Location \bigcirc icon. Type in a place name, address or Lat/Long coordinate location in the pop-up box.



One can query the map by clicking on a grid cell or polygon. For example, below we clicked on a polygon. One can scroll down to see the full table of information submitted for that Area or Project. If more than one record exists at that location (i.e. both an Area and Project record) one can toggle over Using the <> arrows in the upper right of the pop-up box

| Q Zoom to | | | 4 | 1 of 2 | 1 |
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| Projects | | | ^ | | |
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| Project Nar | ne | 6083 Section 1122 Drec Islands_1 | ige | | |
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| Project Lea | d | Rob VonBriel | | | |
| Project Cor | ntact | robert.vonbriel@dep.nj. | gov | | |
| Lead Organ | nization Type | State | | | |
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An A key feature of the CERAP Explorer is the ability to Filter Areas 🕞 or Filter Projects 🚍 .

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|-------------------|--|-------|--------------------------------|--|------|
| Selection | Filter Areas | | Selection | Filter Projects | |
| ₫ Layer Control | If you choose an option and then choose another option from the same dropdown, the filter statement at the bottom includes both items. Choose as many as you | Flyat | ₫ <mark>0</mark> Layer Control | If you choose an option and then choose another option from the same dropdown, the filter statement at the bottom includes both items. Choose as many as you | FI |
| i≣ Legend | would like. | | j≣ Legend | would like. | |
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CERAP Issues of Concern Explorer

CERAP Issues of Concern Explorer



One can also export the filtered table using the Export CSV option. CSV = Comma Separated Variable.

To clear the selections, use the **Reset Filters** option (at top of Filter pop-up window). The Attribute table can be removed by refreshing \int_{a}^{b} the application.

The **CERAP Explorer** provides links to other tools that are part of the NJResTOrS tool kit.



The ResTOrS Work flow landing page (<u>https://njrestors.rutgers.edu/</u>).



Further Guidance on Accessing/Downloading individual CERAP GIS data layers

Most of the CERAP and other related environmental data sets are published to ArcOnline or available through a Map Service. Click on the (i) information icon to get further information about the data layer in a pop-up that will appear above the Map display window. Click on Map Service (note some layers may not have a Map Service available).



You should then see several possible windows. In the one below, select the **Open In ARCGIS Desktop** box in upper right. Note you will need an active ESRI ArcMap license to do so.

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Alternatively you might get sent to a ARCGIS REST Services Directory. Select the CERAP_IOC_DATA (Map Server) option (see below).



The MapServer is accessible at the following URL https://njmaps1.rad.rutgers.edu/arcgis/rest/services/CERAP/CERAP_IOC_Data/MapServer

If you highlight a desired layer, then select ArcMap that GIS layer will download as a .lyr file that is accessible in ArcMap.



One can load the entire WMS in Arc Catalog to access all the files served up at CRSSA. Note that some GIS files are being pulled in from other WMS (e.g., FEMA), so one would have to go to their home site.

| General | | × |
|----------------------------------|--|--------|
| Server URL: | arcgis/rest/services/CERAP/CERAP_IOC_Data/MapServer ArcGIS Server: http://gisserver.domain.com:6080/arcgis | |
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