# Indiana Lake Michigan Coastal Program

Coastal Zone Management Section 309
Enhancement Grant Program

Assessment and Multi-Year Strategy
2021 – 2025

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PREPARED BY:

Indiana Department of Natural Resources
Indiana Lake Michigan Coastal Program

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# I. Introduction

Section 309 of the Coastal Zone Management Act (CZMA), as amended in 1990 and again in 1996, establishes a voluntary grants program to encourage states and territories with approved programs to develop program enhancements in one or more of the following areas:

- ✓ Wetlands
- ✓ Public access
- ✓ Coastal hazards
- ✓ Cumulative and secondary impacts
- ✓ Energy and government facility siting
- ✓ Lake debris
- ✓ Lake resources
- ✓ Special Area Management Plans
- ✓ Aquaculture

Under this program the Secretary of Commerce is authorized to make awards to states and territories to develop and submit for federal approval program changes that support attainment of the objectives of one or more of the enhancement areas. The Office for Coastal Management (OCM) provides guidance to states and territories for developing or updating previous Assessment and Strategy documents. The OCM guidance provides a recommended format to address each enhancement area in the document. The most recent guidance was issued in June of 2019.

The current guidance included a process and templates for developing the state plan and introduces the concept of "areas of national importance." In the 2021-2025 guidance, the NOAA identified the Coastal Hazard enhancement area as the "area of national importance."

The Section 309 process consists of three mandatory and one optional step. The LMCP and other Coastal Management Programs (CMP) are to conduct a Phase I (High Level) Assessment for each of the nine enhancement areas. If an enhancement area receives a ranking of "High" priority, the CMP is to conduct a Phase II (In-depth) Assessment for the enhancement area. The CMP may then develop a Strategy for an enhancement area, in order to address the issues identified in the Phase II Assessment.

# II. Summary of Section 309 Achievements

## Coastal Hazards (2012-2013):

**Indiana Lake Michigan Shoreline Coastal Hazards Model Ordinances (2012) -** The Indiana Lake Michigan Coastal Program developed this document to provide guidance for Coastal Communities to understand the ecological value of the natural shoreline and associated coastal resources and the coastal hazards that can negatively impact the shoreline, public safety, and shoreline properties and infrastructure. High Erosion Hazard Areas are identified for the entire Indiana Lake Michigan shoreline. The document further addresses the challenges faced by municipalities and decision makers when planning for shoreline development and permit issuing. Model ordinances are suggested to help assure that coastal redevelopment proceeds in a manner that will most likely assure the future social and financial health of the community. The likely result of these ordinances will be communities avoiding construction in hazard areas as well as the protection of coastal natural resources. The LMCP intends to undertake additional outreach and training to achieve these goals. This work was undertaken as part of the Technical Assistance Planning Program (TAPP) component of the LMCP.

**GIS Mapping of the Indiana Lake Michigan Shoreline (2013)**

The LMCP and partners identified coastal data as a gap in addressing Indiana coastal hazards. The LMCP utilized Section 309 funding to contract with the Polis Center and 39 Degrees North to fill this gap. The professional services contract contained two deliverables completed in 2013:

1. Complete and update requested Indiana Lake Michigan Shoreline GIS Data Layers Maps and attributes on shoreline structures and land use 1000 ft. inland, and
2. Indiana Lake Michigan Shoreline structure, land use, processes, for an electronic inventories catalogue.

A variety of data layers collected/created during the GIS project can be used by local communities to reduce hazard risk. The inventory contained shoreline armoring, structures, and associated analysis. The packaged geodatabase was initially distributed in late 2014. The intended outcome is to direct future public and private development and redevelopment away from hazardous areas, including High Erosion Hazard Areas (HEHAs) and hazard areas delineated as FEMA V-zones and areas vulnerable to inundation from Great Lakes level fluctuations. Prevent or minimize threats to existing populations and property from both episodic and chronic coastal hazards.

## Public Access (2006-2015)

The 2005-2010 assessment identified public access as a high priority. The DNR Division of Outdoor Recreation develops the State Comprehensive Outdoor Recreation Plan every five years. It was noted that some of the information for the coastal area was erroneous and out of date. As such, the LMCP and partners worked to develop strategies to address these issues with the intent of developing a public access plan.

Within the framework of the development of a Coastal Public Access Management Plan, the contractor conducted a comprehensive inventory of existing public access sites and trails within the Indiana coastal area. The new information was incorporated into the Statewide Comprehensive Outdoor Recreation Plan (SCORP) database. The overall goal of this project was to compile an accurate inventory of public recreation access sites and trails in the coastal area of Lake Michigan, within the State of Indiana as a first step in the overall planning and management of recreational resources in the Indiana Coastal area.

**Coastal Area Needs Assessment Summary (2009)**

The second phase of the public access management plan project entailed a needs assessment. This Public Access Needs Assessment compiled existing data and research to establish a clear plan for the improvement of an increase in public access land in the coastal region of Indiana. This region's unique characteristics—history, varied landscape, industry, and shifting trends in commerce—justify a formal needs assessment to determine appropriate measures to be taken toward its long-term overall improvement. In order to determine these measures, several methods were employed in three distinct sections, each educated by the others. The research and analysis phase included a review of local and county parks and recreation master plans, federal, state, and regional planning and policy documents, a benchmarking study, condition assessments, and map development. The public engagement phase included individual stakeholder meetings, focus group meetings, and a public meeting. The service standards and gaps phase included the development of level of service (LOS) standards, a gap analysis, and a priority index.

Level of Service Standards

The information gathered during the benchmarking process was utilized to develop new Level of Service (LOS) standards for the coastal region. The LOS standards set an attainable goal for public access in the region.

| Facility Type | Access Requirement |
|---|---|
| Park Acreage | 50 acres per 1,000 residents |
| Hard Surface Multi-Purpose Trails | 2 miles per 10,000 residents |
| Public Access Launch Points for Personal Watercraft | 0.45 per 10,000 residents |
| Public Fishing Access Points | 1.14 per 10,000 residents |
| Natural Surface Hiking Trails | 3.0 mi. per 10,000 residents |

The Needs Assessment of Public Access Recreation Sites within the Indiana Coastal Area was conducted by the Eppley Institute for the Indiana Department of Natural Resources Lake Michigan Coastal Program in December 2009 utilizing 309 Grant Funding (December 2009).

According to the benchmarking study, the Indiana Coastal Area is:

- Below average in the miles of multi-use walking and biking trails
- Below average in the number of public access launch points for personal watercraft
- Above average in miles of public beaches
- The only region where beach fees are charged for residents
- Far above average in fishing access points
- Above the median in total park acres (Duluth has such a large number of acres for its population size that it skews the average)

While there are many public beaches available, access to them is often limited by a lack of parking and beach access points. Beach access in the benchmark communities is, for the most part, supported by state or municipal protection and easily accessible points near densely populated areas.

Also lacking in the Indiana Coastal region when compared to the benchmarks is public access to boating opportunities. The number of large, well placed public marinas directly on Lake Michigan is substantially lower than that of the benchmarks.

Public Engagement

The results of the stakeholder interviews and the focus groups are similar in many ways and provide many ideas for the improvement of public access in the region. The main ideas are as follows:

- Connectivity between trails and existing natural areas
- Ongoing management of restored natural areas
- Increase public awareness and access through communication and signage
- Implementation of the Marquette Plan
- Regional cooperation
- Increased funding

Gaps Analysis

The Gaps Analysis qualitatively and quantitatively assessed current levels of public access to determine the areas most in need of improvements. The qualitative section provided specific examples of sites and areas within the region where improvements in service should be made. The quantitative section assessed current conditions based on acreage and mileage values compared to the defined LOS standards to illustrate the state of public access land in the region.

The findings from this qualitative gaps analysis included:

- a need for additional public recreation lands and amenities in many communities across the region
- a need for improved signage and wayfinding to direct users to recreation sites
- a need to complete trail connections to complete what is now a fragmented trail system
- a need for connectivity of natural resource lands throughout the region
- a need for the creation of blueways for non-motorized boats in many areas of the region

## Historic Public Access (2013-2015)

The Public Access studies conducted from 2006-2009 focused on access to recreation focused properties. A gap identified in the 2011-2015 assessment was access to properties of a cultural and historic nature.

The LMCP funded Indiana Landmarks (501c3) to assess cultural and historical properties in the coastal region. The project provided updates to the Coastal Historic and Cultural Resources Study of the Lake Michigan Watershed and the Interim Reports for Lake, Porter and LaPorte counties. These updates will be utilized by Indiana Landmarks and DNR Division of Historic Preservation and Archaeology for updating site listings on the State and National Register, which have policies associated with the National Historic Preservation Act and SHPO Review. Communities now have access to the most current information regarding location and condition of historic resources, which will be used in updates of their Parks Master Plans, Comprehensive Plans, and ordinance development.

In addition, within the Indiana Lake Michigan Coastal Program Area, Indiana Landmarks conducted an analysis and prepared a revised condition assessment of public access potential for these historic sites. The belief was that if communities understand where these properties exist, they may be more apt to apply to LMCP Grants Program for public access improvements. The condition assessment was the first of its kind and allowed communities the ability to better articulate their needs and create consistency

with the latest public access efforts of the LMCP: Public Access Inventory, Needs Assessment and Condition Assessment.

## Cumulative and Secondary Impacts (2008-2010)

The 2005-2010 assessment identified Cumulative and Secondary Impacts as a high priority area. More specifically the assessment identified Septic Systems as an issue requiring attention. The Indiana State Department of Health (ISDH) delegates the issuance of septic permits to the county health departments. The ISDH did not have a centralized septic permit database. The lack of a centralized database was identified as a weakness within the Cumulative and Secondary Impacts enhancement area. The LMCP and ISDH developed a strategy to address the weakness. The strategy used a mix of Section 309 and Section 306 funds. Tasks outlined in the strategy include: modification/enhancement of EPA funded TWIST database to meet ISDH needs, training program development, hands on training and support for county health departments, and provision of funds for county health departments to input data from paper records to the new database. The revised database was renamed Indiana Tracking Onsite Sewage Systems (iTOSS.)

## Ocean and Great Lakes Resources (2010 – 2014)

### Shipwreck Management Plan

The LMCP used Section 309 funds to assess existing known underwater archaeological resources (shipwrecks). In addition, a management plan for these known shipwrecks was developed. Management recommendations included: increased outreach and education, establishment of a shipwreck preserve, installation of mooring/marker buoys, additional monitoring/exploration work, and nomination of sites to the National Register of Historic Places. Work was conducted by Dr. Kira Kaufmann and staff from Commonwealth Cultural Resources Group (CCRG.)

The *JD Marshall* Preserve was established in September 2013. This one hundred acre preserve protects the *JD Marshall* shipwreck just offshore from Indiana Dunes State Park in Porter County, Indiana. The LMCP used Section 309 funds from 2009 and 2010 for the site assessment and management plan development. The LMCP staff coordinated partners from the Indiana Department of Natural Resources Division of: Nature Preserves, State Parks and Reservoirs, Law Enforcement, Historic Preservation and Archaeology, and Fish and Wildlife. The mooring buoys and plaques for this site are being procured and should be installed in 2015.

The *Material Service* barge was nominated to the National Register of Historic Places in 2013. The nomination materials were developed by the same consulting firm that developed the shipwreck management plan. The *Material Service* is located in the Lake County portion of Lake Michigan.

The project resulted in multiple outcomes. The state now has a Management Plan for Underwater Archaeological Resources, Site Management Plant for *JD Marshall* preserve, an inter-division MOA for the management of the *JD Marshall* preserve, one additional shipwreck on the National Register of Historic Places, development of an avocational training program for recreational divers that want to assist in wreck monitoring, enhanced educational materials – www.indianashipwrecks.org and increased public access to the *JD Marshall* preserve with the addition of mooring buoys.

# III. Assessments

# **Wetlands** – Phase I Assessment

**Section 309 Enhancement Objective:** Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands. §309(a)(1).

*Note: For the purposes of the Wetlands Assessment, wetlands are "those areas that are inundated or saturated at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." [33 CFR 328. 3(b)]. See also pg. 17 of the CZMA Performance Measurement Guidance[1] for a more in-depth discussion of what should be considered a wetland.*

## PHASE I (HIGH-LEVEL) ASSESSMENT:

*Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.*

**Resource Characterization:**

1. Using provided reports from NOAA's Land Cover Atlas[2], please indicate the extent, status, and trends of wetlands in the state's coastal counties. You can provide additional or alternative information or use graphs or other visuals to help illustrate or replace the table entirely if better data are available. Note that the data available for the islands may be for a different time frame than the time periods reflected below. In that case, please specify the time period the data represents. Also note that Puerto Rico and the Commonwealth of the Northern Mariana Islands (CNMI) currently only have data for one time point so will not be able to report trend data. Instead, Puerto Rico and CNMI should just report current land use cover for all wetlands and each wetlands type.

Current State of Wetlands in 2014 LMCP Area only (excluding Lake Michigan proper) (acres) – (Source National Wetlands Inventory 2010 and 2014): ____approximately 53,943.51 acres____

Table 1. Acres of wetlands within Lake, Porter, and LaPorte counties and within the LMCP boundary, excluding Lake Michigan proper, in 2010/2014. The latest National Wetland Inventory data was downloaded and opened in ArcGIS 10.5.1, clipped to the LMCP and county boundaries, and summary statistics analyzed from the attribute tables. Some wetland acreage was over estimated in the individual county analyses. Wetland shapefiles that cross county lines were not split up; therefore, some acreage was included in summation for each county that was not actually in that respective county boundary. A correction for this was attempted by clipping the wetlands layer to combined boundary shapefiles (all LMCP and all three counties combined) and running the summary statistics, excluding Lake Michigan.

[2] https://coast.noaa.gov/digitalcoast/tools/lca.html Note that the 2016 data will not be available for all states until later Summer 2019. NOAA OCM will be providing summary reports compiling each state's coastal county data. The reports will be available after all the 2016 data is available.

| County | | Wetland Acres |
|---|---|---|
| Lake | LMCP Boundary | 19,826.63 |
| | Total County | 33,255.20 |
| Porter | LMCP Boundary | 20,114.69 |
| | Total County | 28,937.57 |
| LaPorte | LMCP Boundary | 14,130.54 |
| | Total County | 38,584.39 |
| Total | LMCP Boundary | 116,264.64 |
| | Total Counties | 100,777.17 |
| Total corrected for county line overlap | LMCP Boundary | 53,943.51 |
| | Total Counties | 93,708.03 |

Table 2. Indiana LMCP coastal wetlands status and trends using data available from 1996-2011 for Lake, Porter, and LaPorte Counties combined from NOAA CCAP Land Cover Atlas

| Change in Wetlands | From 1996-2011 | From 2006-2011 |
|---|---|---|
| Percent net change in total wetlands (% gained or lost) | -2.52% | -1.84% |
| Percent net change in freshwater (palustrine wetlands) (% gained or lost) | -2.52% | -1.84% |
| Percent net change in saltwater (estuarine) wetlands (% gained or lost) | 0% | 0% |

Table 3. How Indiana LMCP coastal are changing using data available from 1996-2011 for Lake, Porter, and LaPorte Counties combined from NOAA CCAP Land Cover Atlas

| Land Cover Type | Area of wetlands transformed to another type of land cover between 1996-2010 ($mi^2$) | Area of wetlands transformed to another type of land cover between 2006-2010 ($mi^2$) |
|---|---|---|
| Development | 2.90 | 2.64 |
| Agriculture | 0.39 | 0.28 |
| Barren Land | 0.13 | 0.01 |
| Water | 0.20 | 0.14 |
| Total | 3.62 | 3.07 |

Table 4. Wetland coverage and change from 1996, 2006, and 2011 in Lake, Porter, and LaPorte Counties, Indiana. Wetland coverage ($mi^2$) was calculated using the County area and "Percent Area that is Wetland" from NOAA's Digital Coast CCAP Land Cover Atlas. Wetland coverage (acres) was calculated using the conversion formula in Microsoft Excel 2013 to convert the calculated wetland coverage in $mi^2$ to acres. Percent change was calculated between the years using the following equation:

$$\text{Percent change} = \left( \frac{\text{A County wetland coverage 2010 mi}^2 \text{ - A County wetland coverage 1996 mi}^2}{\text{A County wetland coverage 1996 mi}^2} \right) \text{x } 100$$

$$\text{Percent Change} = \left( \frac{\text{A County wetland coverage 2010 mi}^2 \text{ - A County wetland coverage 2006 mi}^2}{\text{A County wetland coverage 2006 mi}^2} \right) \text{x } 100$$

| | Lake County | Porter County | LaPorte County | TOTAL |
|---|---|---|---|---|
| County Area* | 626 $mi^2$ | 522 $mi^2$ | 613 $mi^2$ | 1761 $mi^2$ |
| 1996 County wetland coverage** | 6.31 % | 7.78 % | 9.05 % | 7.70 % |
| 2006 County wetland coverage** | 6.25 % | 7.75 % | 9.02 % | 7.66 % |
| 2010 County wetland coverage** | 5.9 % | 7.63 % | 9.03 % | 7.50 % |
| 1996 County wetland coverage | 39.50 $mi^2$ | 40.61 $mi^2$ | 55.48 $mi^2$ | 135.59 $mi^2$ |
| 2006 County wetland coverage | 39.13 $mi^2$ | 40.46 $mi^2$ | 55.29 $mi^2$ | 134.87 $mi^2$ |
| 2010 County wetland coverage | 36.93 $mi^2$ | 39.83 $mi^2$ | 55.35 $mi^2$ | 132.12 $mi^2$ |
| 1996 County wetland coverage | 25,280.28 acres | 25,991.32 acres | 35,504.82 acres | 86,776.42 acres |
| 2006 County wetland coverage | 25,039.90 acres | 25,891.10 acres | 35,387.12 acres | 86,318.12 acres |
| 2010 County wetland coverage | 23,637.67 acres | 25,490.20 acres | 35,426.35 acres | 84,554.22 acres |
| Change in wetland coverage 1996-2010 | -2.57 $mi^2$ | -0.78 $mi^2$ | -0.12 $mi^2$ | -3.47 $mi^2$ |
| Change in wetland coverage 1996-2010 | -1,642.62 acres | -501.12 acres | -78.46 acres | -2222.20 acres |
| Percent change in wetlands coverage 1996-2010 | -6.50 % | -1.93 % | -0.22 % | -2.56 % |
| Change in wetland coverage 2006-2010 | -2.19 $mi^2$ | -0.63 $mi^2$ | 0.06 $mi^2$ | -2.76 mi2 |
| Change in wetland coverage 2006-2010 | -1,402.23 acres | -400.89 acres | 39.23 acres | -1763.90 acres |
| Percent change in wetlands coverage 2006-2010 | -5.60 % | -1.55 % | 0.11 % | -2.04 % |

* 2010 U.S. Cencus data

** NOAA Digital Coast CCAP Land Atlas

2. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and tends of coastal wetlands since the last assessment to augment the national datasets.

   The collection of information regarding wetland acreage losses highlights the gaps in data at the state and national level. Figures in the tables above were calculated using different methodology and all report different estimates of wetland coverage in Northwest Indiana. Table 1 estimates wetland coverage for both the LMCP area and individual counties using the latest available National Wetlands Inventory (NWI) data from. The NWI for most of the Lake Michigan Coastal Program region was last completed in 2010 (Ducks Unlimited, 2010) while the NWI for most of the Kankakee region, which covers the southern portions of Lake, Porter, an LaPorte counties, was last completed in 2014 (Ducks Unlimited, 2014). Data from NOAA Digital Coast CCAP Land Atlas for all of Lake, Porter, and LaPorte counties is summarized as percent changes of wetland coverage and land use change (Tables 2 and 3). Approximately 3.07 $mi^2$ or 1,964.79 acres of wetlands have been lost in the tri-county region between 2006 and 2010 (Table 3). Using CCAP Land Atlas data and total county size from the 2010 U.S. Census, wetland coverage and change in terms of $mi^2$ and acreage was back calculated (Table 4) highlighting discrepancies in area estimates between data sources. It should also be noted that some of the above changes may not reflect permanent wetland losses and that changes to water may reflect a loss of vegetative wetlands but could also be associated with gains in un-vegetated wetland types (such as unconsolidated bottom), which C-CAP does

not map. Because no wetland data has been calculated since 2011 in our region, it is difficult to estimate the true current state of wetlands. Additionally, technology for wetland mapping improves nearly every year so document losses or additions of wetlands may not actually reflect true losses or gains, rather a more accurate depiction of them.

The 2016-2020 309 Plan identified a strategy to update the NWI for our coastal region and to create functional assessments for the mapped wetlands. This project is in progress with an updated NWI expected to be completed by December 31, 2020 and functional assessments completed by June 30, 2021. The mapping will use the latest technology and lake levels at the time of last aerial and LiDAR imagery collection. This information will be thoroughly documented in order to ensure easier comparability into the future. The functional assessments will be completed using Landscape, Landform, Waterflow path, and Waterbody (LLWW) Landscape Level Wetland Functional Assessment (LLWFA) methodology (Tiner 2014) tailored to the Southern Lake Michigan region. This will provide LMCP and many stakeholders with detailed, updated information on coastal wetland status and functionality for protection, planning, and prioritization.

The State currently lacks methods to track wetland gains/losses outside of CCAP and 309 planning. Reliable historical data is also lacking for the State.

**Management Characterization:**

1. Indicate if there have been any significant changes at the state or territory level (positive or negative) that could impact the future protection, restoration, enhancement, or creation of coastal wetlands since the last assessment.

Table 5. Significant changes that could impact the future protection, restoration or enhancement, or creation of coastal wetlands in Indiana since the last assessment.

| Management Category | Significant Changes Since Last Assessment (Y or N) |
|---|---|
| Statutes, regulations, policies, or case law interpreting these | Y (Proposed 2021 SB389) |
| Wetlands programs (e.g., regulatory, mitigation, restoration, acquisition) | Y |

2. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

a. At the start of the 2021 Legislative session a bill was introduced to remove protections of previously State protected isolated wetlands. At the time of this submission 2021 IN SB389 passed the Senate Environmental Affairs Committee.

b. The changes were not an outcome of 309 nor were they CZM driven.

c. It is unknown at this time the impact of this change. Currently isolated wetlands are protected as described below:

When a project is planned in Indiana that will impact a wetland, stream, river, lake, or other Water of the U.S., the Indiana Department of Environmental Management (IDEM) must issue a Section 401 Water Quality Certification (401 WQC). A Section 401 WQC is a required component of a federal permit and must be issued before a federal permit or license can be granted. The bulk of federal permits requiring Section 401 Water Quality Certification from IDEM are Section 404 Dredge and Fill Permits, which are issued by the U.S. Army Corps of Engineers (USACE). However, applicants for a license to operate a hydroelectric dam from the Federal Energy Regulatory Commission (FERC) must also receive Section 401 Water Quality Certification from IDEM. Section 404 of the Clean Water Act establishes a program to regulate the discharge of dredged and fill material into Waters of the United States. The basic premise of the USACE's Section 404 Regulatory program is that dredged or fill material cannot be discharged into water if the nation's waters would be significantly degraded or if a feasible alternative exists that is less damaging to the aquatic environment. Dredge and fill activities are controlled by a permit process administered by the U.S. Army Corps of Engineers and overseen by the Environmental Protection Agency (EPA).

This means that any person or company planning to discharge fill materials to Indiana wetlands or other water bodies such as streams, rivers, and lakes by filling, excavating, open-trench cutting, or mechanical clearing, must receive Section 401 Water Quality Certification authorization from IDEM and must also apply for, and receive, a federal Section 404 Dredge and Fill Permit from the USACE.

If the USACE determines that wetlands or other water features are present, but determines that they are not Waters of the U.S., then they are considered to be Waters of the State. Isolated wetlands (those wetlands not regulated under the federal Clean Water Act) are Waters of the State and are regulated under Indiana's State Isolated Wetlands law (Indiana Code 13-18-22). Impacts to isolated wetlands require State Isolated Wetland Permits from IDEM. Again, because the federal government's jurisdiction is different than the state's, IDEM must be contacted to determine which, if any, state authorization(s) is/are needed before an applicant may legally discharge pollutants (including fill materials) to wetland, streams, rivers, lakes, and other Waters.

IDEM works closely with the U.S. Army Corps of Engineers and coordinates the permit application processes as much as possible. IDEM recommends that any potential applicant first contact the Corps to begin the application process and determine if the proposed project will impact wetlands or other regulated waters, and to determine whether or not a federal permit is required. If a federal permit is not required, IDEM can determine if a State Isolated Wetland Permit is required.

Although both IDEM and the U.S. Army Corps of Engineers regulate impacts to wetlands and other Waters of the U.S., they have different authority and jurisdictions. Both IDEM and the Corps need to be contacted before any discharge to or activity in a wetland, stream, river, lake, or other Water occurs.

If the USACE determines that a proposed project will require a Corps' Section 404 Dredge and Fill Permit, then the applicant must also apply for, and obtain, a Section 401 Water Quality Certification from IDEM. IDEM will review the proposed activities to determine if they will comply with Indiana law, including state water quality standards.

Applicants must demonstrate to IDEM how they are avoiding impacts to wetlands and Waters of the U.S/Waters of the State. If an applicant is unable to completely avoid impacts, they must demonstrate how their proposed project and unavoidable impacts to wetlands and other regulated waterbodies have been minimized. Applicants must provide compensatory mitigation for any remaining adverse impacts to wetlands and other regulated Waters.

IDEM will deny Section 401 Water Quality Certification and State Isolated Wetland permit applications if an applicant cannot show that their discharge(s) and impact(s) will comply with state law and may cause violations of water quality standards. As an example, IDEM may deny Section 401 WQC or an Isolated Wetland Permit if an application is incomplete, if an impact can be avoided or is deemed unnecessary, or if an applicant's proposed compensatory mitigation will not offset adverse impacts to water quality. An IDEM Non Rule Policy Document, Reasons for Denial (NRPD-Water-011, available on the IDEM Nonrules Policies page), was put into effect on April 13, 2007. A person may not proceed with their project until he or she has received a Section 401 Water Quality Certification and/or Isolated Wetland Permits (or other authorization) from IDEM.

This bill would remove IDEM's role and impact the In-Lieu Fee Program (below).

a. The State of Indiana adopted an "In-Lieu Fee Program" in 2018, sponsored by the IDNR and the Indiana Natural Resources foundation:

In-Lieu Fee Program Overview - The term "in-lieu fee program" (ILF) refers to a program involving the restoration, establishment, enhancement, and/or preservation of aquatic resources through funds paid to a governmental or non-profit natural resources management entity to satisfy compensatory mitigation requirements for permits. The ILF program sells "advance credits" to permittees who purchase these credits in lieu of performing mitigation themselves (i.e., permittee-responsible mitigation). The legal obligation to provide compensatory mitigation is then transferred to the sponsor of the in-lieu fee program (Indiana DNR) upon receipt of funds for sales of wetland and/or stream credits in a service area(s). The DNR's ILF is a fee-based program that is carried out through fees collected from credit sales to applicants who elect to use the ILF program to fulfill their compensatory mitigation requirements. The State of Indiana will not be subsidizing mitigation for permit recipients with taxpayer dollars.

Fees collected for these credit sales will be deposited in the appropriate accounts owned and managed by the Indiana Natural Resources Foundation, a not-for-profit organization that exists to promote, support, assist, sustain and encourage the charitable, educational and scientific programs, projects and policies of the DNR.

In-lieu fee programs are regulated by the U.S. Army Corp of Engineers under the 2008 Federal Rule (33 CFR Part 332), "Compensatory Mitigation for Losses of Aquatic Resources" ("Mitigation Rule") as published in the Federal Register by the Corps of Engineers and the U.S. Environmental Protection Agency on April 10, 2008.

The proposed Indiana Stream and Wetland ILF Mitigation Program would be applicable for aquatic resource impacts within the entire State of Indiana.

b. This new program was not CZM nor 309 driven.

c. The program's potential impact is a no net loss of wetlands.

**Enhancement Area Prioritization:**

1. What level of priority is the enhancement area for the coastal management program?

**High** _X___
**Medium** _____
**Low** _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

The Coastal Advisory Board identified Wetlands as a high priority enhancement area in facilitated discussion of the 309 assessment at a Coastal Advisory Board Meeting in December 2019. A stakeholder survey conducted in December 2019 – January 2020 online to the Wetlands Steering Committee, watershed groups, the regional MS4 organization, the Environmental Management Policy Committee (EMPC), and other select stakeholders also identified **Wetlands** as a high priority enhancement area.

Stakeholder Concerns: Historical wetlands data needs digitized, mapped, and characterized, invasive plants, filling for development and development pressures (urban and agricultural), habitat fragmentation and general loss of habitat, stormwater runoff and nonpoint source pollution, sedimentation, hydrologic alterations from urban and agricultural land use, climate change, loss of wetland/upland complexes, lack of identification and protection, lack of long-term strategic management, water level fluctuations/Great Lakes level change, negative public perception, and beavers.

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## Wetlands – Phase II Assessment

**In-Depth Resource Characterization:**
*Purpose: To determine key problems and opportunities to improve the CMP's ability to protect, restore, and enhance wetlands.*

1. What are the three most significant existing or emerging physical stressors or threats to wetlands within the coastal zone? Indicate the geographic scope of the stressor, i.e., is it prevalent throughout the coastal zone or specific areas that are most threatened? Stressors can be development/fill; hydrological alteration/channelization; erosion; pollution; invasive species; freshwater input; sea level rise/Great Lake level change; or other (please specify). When selecting significant stressors, also consider how climate change may exacerbate each stressor.

| | Stressor/Threat | **Geographic Scope** (throughout coastal zone or specific areas most threatened) |
|---|---|---|
| Stressor 1 | Development, urban sprawl, and other activities that result in the loss and fragmentation of wetlands through the placement of fill | Throughout coastal region |
| Stressor 2 | Run-off to wetlands (isolated and jurisdictional) and jurisdictional waterways from existing infrastructure, new development, redevelopment, agricultural run-off, and other activities that are associated with the discharge of pollutants. These sources of pollutants are associated with point sources which may or may not be regulated under NPDES while others would be non-point sources | Throughout coastal region |
| Stressor 3 | The widespread existence of the invasive species has resulted in an impact to natural wetland systems and the conversion to monoculture. This area of the state also has one of the most significant populations of Common Reed (*Phragmites australis*). Climate change may exacerbate the stressor. | Throughout coastal region |
| Stressor 4 | Lake Michigan Lake Level Fluctuations - The potential for Lake Michigan to fluctuate may have a significant impact on the resource. If water levels recede, existing adjacent coastal wetland diversity could be altered, including the encroachment of invasive species. There is also the potential that the three criteria that classifies an area to be a wetland could be altered, thereby increasing the opportunity for these areas to succumb to the pressures of development. The alteration of water levels could affect pollution mixing zones for permitted NPDES Discharges. Climate change may exacerbate the stressor. | Shoreline and nearshore |

2. Briefly explain why these are currently the most significant **stressors** or threats to wetlands within the coastal zone. Cite stakeholder input and/or existing reports or studies to support this assessment.

   The coastal area is one of the most highly developed regions of the state. New development and its associated impacts pose a threat to established wetland systems. In addition, the area consists of a highly urbanized residential, commercial, and industrial landscape that historically resulted in large expansive areas of impervious surfaces. At the time of development, many of these areas did not take into consideration the utilization of storm water quality measures to address the quality of discharges and management of run-off rates.

   The functional value of wetlands in the coastal area is compromised. The once vast network of wetlands has been reduced to a fragmented mosaic. The functional value of the remaining wetlands

may be compromised further due to the spread of invasive species such as purple loosestrife, reed canary grass, and common reed (*Phragmites australis).* The Phase I assessment shows a loss of roughly two thousand acres of wetlands during the period 1996-2010. The numbers may not accurately reflect the change in wetlands or the functional loss of wetlands during this period; however. As of this time, the State is working on a project from the 2016-2020 309 Plan, to update the National Wetlands Inventory for the coastal region, obtain functional assessment data on all mapped wetlands, and create a model ordinance for wetland protection. In August 2019, the LMCP formed a Wetlands Steering Committee comprised of wetland professionals from: Audubon Great Lakes, citizen from the Coastal Advisory Board, City of Gary, City of Hobart, Ducks Unlimited, Executive Director Merrillville Stormwater utility, IDEM-LAMP, IDEM-Wetlands Program, IDNR-Division of Nature Preserves, IDNR-Lakes and Rivers Enhancement Program, DNR-Lake Michigan Coastal Program, INDOT, DNR-Stream and Wetland Mitigation Program, Lake County SWCD, LaPorte County NRCS, LaPorte County SWCD, Michigan City, NIRPC, NPS Community Planning, Porter County SWCD, Shirley Heinze Land Trust, The Nature Conservancy, The Wetlands Initiative, U.S. Army Corps of Engineers, and USFWS. This Committee further refined needs for wetlands mapping and functional assessment information ultimately deciding on a process to be contracted out for completing by December 31, 2020 (mapping) and June 30, 2021 (functional assessments).

Landscape, Landform, Waterflow path, and Waterbody (LLWW) attributes are being assigned to each wetland allowing for Landscape Level Wetland Functional Assessments (LLWFA) to be completed for all wetlands identified. Tiner (2003a and b) described approximate functional characteristics at significant levels based on LLWW characteristics and recorded functions. The State of Michigan applied this in 2006-2011 and worked with a team of wetland professionals to tailor the functional assessment variables and determinations to southern Michigan, which has very similar habitats to the Indiana Lake Michigan coastal region. The Indiana Wetlands Steering Committee agreed that this process should be sufficient for Indiana as well, given close coordination between them and the contractor to ensure all correlations and functional assignments make sense for the region.

Because this data only provides information on wetlands for a given point in time, it has been recommended that the LMCP determine a more regular schedule for updating this information. What still remains missing from this information is digitization of historical imagery and accurate assessments of historical wetland coverage and functionality. Additionally, to increase the utility of this tool and enable users to access the most up-to-date information for a given wetland, it was recommended that the process for submitting delineation information be updated to a digital process and make information available to external users (not just State officials).

Citation: Tiner, R. 2003a. Dichotomous keys and mapping codes wetland landscape position, landform, water flow path, waterbody type descriptors. U.S. Fish and Wildlife Service, national Wetlands Inventory Northeast Region, Hadley, MA, USA.
Tiner, R. 2003b. Correlating enhanced National Wetlands Inventory data with wetland functions for watershed assessments: a rationale for northeastern U.S. wetlands. U.S. Fish and Wildlife Service, Northeast Region, Hadley, MA, USA.

3. Are there emerging issues of concern but which lack sufficient information to evaluate the level of the potential threat? If so, please list. Include additional lines if needed.

| Emerging Issue | Information Needed |
|---|---|
| | |
| | |

The issues identified above appear to be the most significant and at this time and we have not identified any other emerging issues.

**In-Depth Management Characterization:**
*Purpose: To determine the effectiveness of management efforts to address identified problems related to the wetlands enhancement objective.*

1. For each additional wetland management category below that was not already discussed as part of the Phase I assessment, indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) have occurred since the last assessment.

| Management Category | Employed By State or Territory (Y or N) | CMP Provides Assistance to Locals that Employ (Y or N) | Significant Changes Since Last Assessment (Y or N) |
|---|---|---|---|
| Wetland assessment methodologies | Y | Y | Y |
| Wetland mapping and GIS | Y | Y | Y |
| Watershed or special area management plans addressing wetlands | N | N | N |
| Wetland technical assistance, education, and outreach | Y | Y | Y |
| Other (please specify) | | | |

2. For management categories with significant changes since the last assessment, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information.
    a. Describe significant changes since the last assessment;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

<u>Wetland Assessment Methodologies</u>

a. Landscape Level Wetland Functional Assessment methodology has been decided and project detailing methodology is currently underway
b. Yes 2016-2020 309 Plan
c. Future functional assessments for the Coastal Region will use this same methodology

<u>Wetland mapping and GIS</u>

a. Updated National Wetlands Inventory being completed and will be available in a GIS to all stakeholders and public
b. Yes 2016-2020 309 Plan

c. All future NWI updates will follow this methodology and involve important partners like USFWS National Wetlands Inventory Program and IDEM

Wetland technical assistance, education, and outreach

a. A Wetlands Steering Committee was formed to design a project to better address stakeholder needs for technical assistance. A model ordinance for wetland protection will be published on the LMCP website.
b. Yes 2016-2020 309 Plan
c. Communities can utilize this GIS data, report, and model ordinance for better, long-term planning and wetland protection efforts.

Wetland technical assistance, education, and outreach

a. DNR created the Stream and Wetland Mitigation In-Lieu Fee Program in 2018.
b. Yes 2016-2020 309 Plan
c. The Indiana Stream and Wetland Mitigation Program (IN SWMP), is a statewide in-lieu fee program that allows permittee applicants (developers) the option to purchase stream and/or wetland mitigation credits to fulfill compensatory mitigation requirements for permitted impacts authorized under Sections 404 and 401 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and Indiana's State Isolated Wetlands law (Indiana Code 13-18-22). DNR's program sells "advance credits" to permit applicants who purchase these credits in-lieu of performing mitigation themselves (i.e., permit recipient-responsible mitigation). The legal obligation to provide compensatory mitigation is then transferred to the sponsor of the in-lieu fee program (Indiana DNR) upon receipt of associated credit fees.
   DNR's program is regulated by the Corps under the 2008 Federal Rule (33 CFR Part 332), "Compensatory Mitigation for Losses of Aquatic Resources" ("Mitigation Rule") as published in the Federal Register by the Corps of Engineers and the U.S. Environmental Protection Agency on April 10, 2008.
   Additionally, the Indiana Natural Resources Commission (NRC) adopted new rules allowing for an ILF for permits for construction in a floodway, public freshwater lake or navigable waterway issued by the DNR Division of Water under the Flood Control Act, Lakes Preservation Act or Navigable Waterways Act. While this rule was formally adopted by the NRC, it is not yet in effect. The DNR Division of Fish & Wildlife is working on a non-rule policy document that will assist the DNR and the regulated community on how the ILF option will be carried out. Previously, these permits required an applicant to restore aquatic resources and habitat either (1) at or near the project site, or (2) using an approved mitigation bank. The ILF program adds a mitigation option for permit applicants.

3. Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the state's or territory's management efforts in protecting, restoring, and enhancing coastal wetlands since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the state's or territory's management efforts?

   At the time of this submission there are no specific studies that have been completed to illustrate the effectiveness of Indiana's management efforts in protecting, restoring, and enhancing coastal wetlands.

**Identification of Priorities:**

1. Considering changes in wetlands and wetland management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve its ability to more effectively respond to significant wetlands stressors.

   *Management Priority:* Inventory, digitize and analyze historical wetlands data to provide basis for more accurate comparison of wetland changes over time

   *Description:* It is a fact that wetlands are decreasing due to development pressures or functionally changing due to climate and lake levels, however to what extent is unknown as historical data is not easily accessible. Accurate tracking of wetland data over time is the only way to tell the story and provide communities useful information for preservation or development decision making. Historical data exists but it unknown to what extent, it is a priority to inventory this data and digitize historical data. Share this data on Indiana Coastal Atlas. The Indiana Coastal Atlas will be developed in 2021 with 309 Funding received from the last assessment.

2. Identify and briefly explain priority needs and information gaps the CMP has to help it address the management priorities identified above. The needs and gaps identified here do not need to be limited to those items that will be addressed through a Section 309 strategy but should include any items that will be part of a strategy.

| Priority Needs | Need? (Y or N) | Brief Explanation of Need/Gap |
|---|---|---|
| Research | Y | Model changes to wetlands given scenarios of land use change, Great Lakes level change, and climate change |
| Mapping/GIS | Y | Updated maps of current wetlands, historical imagery processing including updates to historical wetlands layer from USFWS |
| Data and information management | Y | Database to track wetland permits – method for updating delineation and permitting data, updated functional assessments over time |
| Training/capacity building | Y | Train LMCP and partners on data interpretation, wetland delineations, and functional assessments. Train municipal staff on Coastal Atlas tool and role that wetlands play in overall landscape. Wetland functions related to water quality improvements, storm water attenuation, and habitat quality. |
| Decision-support tools | Y | Explore tie in with IL IN SG Tipping Points and explore creating a risk assessment tool for wetlands for communities |
| Communication and outreach | Y | Educate public and decision makers on new tool and value of wetlands for protection and resiliency planning |
| Other (Specify) | | |

**Enhancement Area Strategy Development:**

1. Will the CMP develop one or more strategies for this enhancement area?
   **Yes** __X__
   **No** _____

2. Briefly explain why a strategy will or will not be developed for this enhancement area.
   The LMCP and partners will develop a strategy for the wetlands enhancement area. The LMCP Coastal Advisory Board, Wetlands Steering Committee, stakeholder survey, and meetings with state agency staff all identified this as an issue that should be addressed. However, given costs and funding constraints, the LMCP cannot develop strategies to address all issues identified in this assessment. The LMCP will develop strategies that tie with the program goal of providing technical and financial assistance to local communities regarding coastal resource management. Issues fitting with the goal include incorporating the functional assessment data into the IDEM website.

## **Coastal Hazards** – Phase I Assessment

**Section 309 Enhancement Objective:** Prevent or significantly reduce threats to life and property by eliminating development and redevelopment in high-hazard areas, managing development in other hazard areas, and anticipating and managing the effects of potential sea level rise and Great Lakes level change. §309(a)(2)

*Note: For purposes of the Hazards Assessment, coastal hazards include the following traditional hazards and those identified in the CZMA: flooding; coastal storms (including associated storm surge); geological hazards (e. g. , tsunamis, earthquakes); shoreline erosion (including bluff and dune erosion); sea level rise; Great Lake level change; land subsidence; and saltwater intrusion.*

### PHASE I (HIGH-LEVEL) ASSESSMENT:

*Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.*

**Resource Characterization:**

2. In the table below, indicate the general level of risk in the coastal zone for each of the coastal hazards. The following resources may help assess the level of risk for each hazards. Your state may also have other state-specific resources and tools to consult. Additional information and links to these resources can be found in the "Resources" section at the end of the Coastal hazards Phase I assessment Template:

    - The state's multi-hazard mitigation plan
    - Coastal county snapshots: Flood Exposure
    - Coastal Flood Exposure Mapper
    - Sea Level Rise/Great Lakes Level Change Viewer
    - National Climate Assessment

Table 6. General level of risk associated with hazards in Indiana's coastal region.

| Type of Hazard | General Level of Risk[4] (H,M,L) |
|---|---|
| Flooding (riverine, stormwater) | H |
| Coastal storms (including storm surge) | H |
| Geological Hazards (e.g., tsunamis, earthquakes) | L |
| Shoreline erosion | H |
| Sea level rise | Not applicable |
| Great Lakes level change | H |
| Land subsidence | L |
| Saltwater intrusion | L |
| Other (please specify) | Not applicable |

*4Risk is defined as "the estimated impact that a hazard would have on people, services, facilities and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage." Understanding Your Risks: Identifying Hazards and Estimating Losses. FEMA 386-2. August 2001"*

2. If available, briefly list and summarize the results of any additional data or reports on the level of risk and vulnerability to coastal hazards within your state since the last assessment. The state's multi-hazard mitigation plan or climate change risk assessment or plan may be a good resource to help respond to this question.
   - 2050 Comprehensive Plan
     With the average annual temperature estimated to rise 5-6°F by 2050, and the average number of days exceeding temperatures over 95°F doubling or tripling, Northwestern Indiana expects to experience several hazards related to, or exacerbated by, climate change. Such hazards include: increased erosion from intense precipitation; seasonal precipitation changes, both in amount and type of precipitation; bridge scour from flooding and hydrologic changes; changes in the timing of freeze/thaw cycles; lack of ice cover in the Great Lakes, fluctuating lake levels; and road buckling. Increasing temperatures may also result in health impacts to regional communities – particularly in vulnerable populations – and cause increased energy demand. Annual precipitation will increase by 6-8%, with more extreme storm events occurring during winter and spring. These extreme weather events will contribute to flooding and erosion, and will impact water quality from combined sewer overflows and increased stormwater runoff. Threats to bridges, supporting structures, and other infrastructure will occur when rivers and streams overflow their banks. In addition, by 2040, it is estimated that there will not be enough water to sustain the global population if current consumption needs continue. While it is unlikely that Northwestern Indiana will directly experience these shortages due to access to Lake Michigan, the region could potentially see massive population growth from the migration and displacement of people from water-stressed areas. This population spike would cause additional strain and pressure on the resources and weakened infrastructure network of Northwestern Indiana.
   - Deep River-Portage Burns Waterway Watershed Plan
     Degradation and loss of upland and riparian habitats is negatively affecting the Deep River watershed's ability to store and filter stormwater runoff and increases risk of erosion and flooding. Some streams in the Deep River watershed are frequently turbid and have nuisance levels of aquatic plant growth and harmful algal blooms. Elevated pathogen levels in streams pose a risk to human health. Biotic health and recreational value is degraded by pollution, hydro modification, erosion, sedimentation, and nutrification.
   - Indiana Coastal and Estuarine Land Conservation Program (CELCP) Plan
     The goal of the CELCP is to identify and protect the most biodiverse properties that are at risk of conversion. The population in the coastal region is described in this plan as being 10 times more densely populated than inland areas with expectations of continued growth. This population growth is identified as a threat to coastal ecosystems due to habitat loss and increased pollution. Urban sprawl and resulting development is and will be competing with natural areas. Changes in land management and invasive species were also identified as threats to regional biodiversity and ecosystem function.
   - Indiana Dunes Climate Change Adaptation Plan 2018
     Generally, Dunes ecosystems are at risk for phenological mismatches due to no expected change in day length, big change in air temperatures, and slower, less change in soil temperatures. Increases in mean temperatures, growing season, precipitation and decrease in snow cover days along with increased variability of these things will increase the vulnerability of species' life cycle success and complicate ecological impacts. Indiana shorelines and nearshore areas are at risk with changes in water temperatures, storm activity, lake level change and resulting current and wave action. Vegetation establishment may be negatively impacted by human disturbance and increased erosion during high lake levels. Invasive species are likely to become more problematic and difficult to control

as they are able to more quickly adapt to the earlier, more variable spring timing than native plants. Issues stemming from the fragmented landscape of the Region are expected to be exasperated. Humans are vulnerable to increased chances of heat stresses, susceptibility of disease vectors (due to increased production of mosquitos and ticks), impacts to recreational opportunities due to decreased water quality and flooding, and all of the resulting effects of these on health, workload, and work activities. Recreational amenities and infrastructure in general are at higher risk for damage with increase in precipitation and intensity of storms that may cause wash-outs and other infrastructure damage. Water resources are vulnerable to sedimentation and decreased water quality due to increased nonpoint source pollution and erosion.

- Indiana State Hazard Mitigation Plan
  The *Indiana State Hazard Mitigation Plan* cites that temperatures in Indiana are projected to rise about 5-6°F by 2050, that the number of extremely hot days will increase while extreme cold events will decline, and that the frost-free season will lengthen. These shifts will impact air quality, extend the growing and allergy season, and create more favorable conditions for some pests and invasive species. Increasing temperature trends will create wetter winters and springs, which will increase the risk of flooding and combined sewer overflows, putting a greater strain on flood control systems and infrastructure. In addition, occurrences of extreme rain events and increasing rainfall totals are expected to continue, with Northwestern Indiana (the Coastal Program Area) experiencing the largest increase in these rain events. Indeed, Hammond, IN (Lake County) was found to be among the top five repetitive loss communities in the State of Indiana. These events contributed, and will continue to contribute, to soil erosion and nutrient runoff, affecting water quality. While the NFIP has not mapped flood areas along coastlines, it has been estimated that 25% of homes and other structures within 500ft of the U.S. coastline and shorelines of the Great Lakes will fall victim to the effects of erosion within the next 60 years.
- Purdue University Climate Change Report
  Average temperatures in Indiana have warmed 1.2°F since 1895, and are projected to rise about 5-6°F by mid-century, with significantly more warming by the century's end. Near-surface summer water temperatures in Lake Michigan have been warming about 1°F per decade; by mid-century, summer water temperatures are projected to rise about 5-6°F above the historical average. However, information is lacking with regard to how changes in Lake Michigan's temperature will affect northern Indiana's climate, as lake temperatures are not well-represented in most models. Extreme cold events are declining; by mid-century, the northern third of Indiana, include the Coastal Region, will experience on average six days per year below 5°F (current average 1915-2013 is 13 days).The Coastal Region of Indiana is expected to experience warmer, wetter springs and winters, and drier, hotter summers. Annual precipitation has increased 5.6 inches since 1895, with more rain falling in heavier downpours. More extreme and intense rain events will increase flooding risks and associated impacts to human health and safety, and will affect water quality through combined sewer system overflow and nutrient runoff. These events will also impact aquatic ecosystems through altered hydrologic patterns, and could threaten habitat, breeding, and survival of sensitive species. Increased precipitation, in conjunction with warmer trending temperatures, will provide favorable conditions for the spread of vector-borne diseases (e.g. malaria, dengue fever, Zika, Lyme disease), as well pests and invasive species. Disease, health and safety issues, extreme temperature and weather events, changes in biodiversity, and the shifts in the timing of biological events are expected to have an impact on area tourism and recreation. Heat stress events are projected to increase in frequency, duration, and magnitude. These elevated temperatures in urbanized areas create heat islands, which may further exacerbate the aforementioned impacts of climate change in these communities.

- The Sheridan Beach and Esplanade Public Access Plan
  Plans public access to Sheridan Beach and the Esplanade in Michigan City to minimize erosion and risk to dune ecosystems.

**Management Characterization:**

1. In the tables below, indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) have occurred that could impact the CMP's ability to prevent or significantly reduce coastal hazards risk since the last assessment.

Table 7. Significant changes in **Hazards** statutes, regulations, policies, or case law in Indiana since the last assessment

| Topic Addressed | Employed by State or Territory (Y or N) | CMP Provides Assistance to Locals that Employ (Y or N) | Significant Changes Since Last Assessment (Y or N) |
|---|---|---|---|
| Elimination of development/redevelopment in high-hazard areas[6] | N | Y | Y |
| Management of development/redevelopment in other hazard areas | Y | Y | N |
| Climate change impacts, including sea level rise or Great Lakes level change | N | Y | N |

6 State's definition of high-hazard areas

Table 8. Significant changes in **Hazards** planning programs or initiatives in Indiana since the last assessment

| Topic Addressed | Employed by State or Territory (Y or N) | CMP Provides Assistance to Locals that Employ (Y or N) | Significant Changes Since Last Assessment (Y or N) |
|---|---|---|---|
| Hazard mitigation | Y | Y | Y |
| Climate change impacts, including sea level rise or Great Lakes level change | Y | Y | Y |

Table 9. Significant changes in Hazards mapping or modeling programs and initiatives in Indiana since the last assessment

| Topic Addressed | Employed by State or Territory (Y or N) | CMP Provides Assistance to Locals that Employ (Y or N) | Significant Changes Since Last assessment (Y or N) |
|---|---|---|---|
| Sea level rise or Great Lakes level change | Y | Y | N |
| Other hazards | - | - | - |

2. Briefly state how "high-hazard areas" are defined in your coastal zone.

**Coastal Program**
The Indiana Lake Michigan Coastal Program Final Environmental Impact Statement identifies a

High Erosion Hazard Area (HEHA) as a portion of the shoreline with a long-term erosion rate greater than one foot per year. The Indiana shoreline of Lake Michigan includes several HEHAs; although, many of the areas are currently protected from erosion by man-made structures or are included in the National Park or State Park where the natural shoreline is preserved.

**State of Indiana**

For the purpose of identifying high hazard areas in the coastal region, the state utilizes FEMA Flood Plain Maps and Multi-Hazard Mitigation Plans. In reference to coastal hazard areas, the State Multi Hazard mitigation plan states with regards to coastal erosion: "The NFIP has not mapped flood areas along coastlines, but it has been estimated that 25 percent of homes and other structures within 500 feet of the U. S. coastline and the shorelines of the Great Lakes will fall victim to the effects of erosion within the next 60 years. [6]

3. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes;
    c. Characterize the outcomes or likely future outcomes of the changes.

**State Hazard Regulations:**

a. New FEMA Floodplain Maps – Flood Plain Maps identify areas appropriate for development and reduce areas of repetitive loss.
b. Not 309 or CZM driven changes.
c. Removing homes or restricting property development in the floodway or floodway fringe, thereby creating in perpetuity, green spaces, parks, golf courses and other unobstructed land are prime examples of the state's current mitigation efforts.

**Hazard Planning:**

a. Updated Hazard Mitigation Plans – Updated Plans (2019 State Hazard Mitigation Plan, 2018 Lake County Multi-Hazard Mitigation Plan, 2019 Porter County Multi-Hazard Mitigation Plan, and 2016 LaPorte County Multi-Hazard Mitigation Plan) provide guidance for local community hazard mitigation planning. Hazard Mitigation Plans identified new critical infrastructure and local hazards; reviewed the state's mitigation goals and updated the local mitigation goals; reviewed the most recent local hazard data, vulnerability assessment, and maps; evaluated the effectiveness of existing mitigation measures and identified new mitigation projects; and reviewed materials for public participation.

**The State Plan** included the following major updates: Climate projections are indicating that the State could see an increase in precipitation (6-8%) by mid-century. This will increase the flooding risk in communities throughout the State. There is also projected to be an increase in extreme temperature events (hot and cold). New research is indicating that the most frequent area of tornado activity nationwide (Tornado Alley) is starting to shift eastward due to these precipitation and temperature changes. This shift would bring more frequent severe storms and/or tornadoes to the State. The earthquake hazard section emphasizes that the threat of earthquakes is not confined to southwestern Indiana. The entire State needs to be prepared for an earthquake, and five new scenarios in this plan update show the projected effects of an earthquake in various parts of the state. In collaboration with 63 subject matter experts, seven State agencies, State universities, and other national partners, 91 strategies

to help mitigate the risk from natural hazards and build the resiliency of the State have been identified in this plan update. These strategies are described in Section 9 of the plan. General goals and objectives include: integrating Indiana's mitigation policies and programs to maximize efficiency and leverage funding; lessening the impacts of disaster to new and existing infrastructure, residents, and responders; minimizing the loss of life and injuries cause by disasters; and promoting research education and outreach to expand Indiana's knowledge about disasters and their impacts.

**The Lake County Plan** prioritized hazards as following: Low Risk: dam/levee failure, drought, landslide and land subsidence; Elevated Risk: earthquake, extreme temperature, tornado, wind storm and ice, fire; Severe: flood, hail, thunder and windstorms, hazardous materials incident. Proposed updated mitigation practices include: review regular inspection reports and maintenance records of high hazard dams; encourage Doubletree and Lake Hills Dam owners to develop an IEAP; Increase awareness and participation in the various mass notification system and various social media outlets; coordinate with private business owners utilizing large dynamic message boards for business to provide messages during hazardous events and recovery efforts; encourage weather radios in all critical infrastructure and encourage use by residents and businesses; evaluate and utilize flood forecasting capabilities including stream gages, flood forecast maps, and flood alerts; propose an ordinance to require developers to install additional outdoor warning sirens for new developments or pay into a siren fund as part of new development; review and install a centralized system for testing, maintenance, and operation of outdoor warning sirens; improve disaster preparedness and emergency response at the local level through the COAD, CERT, or similar program; purchase additional mobile electronic messaging boards and develop protocol for local interactions to provide current hazard information; improve planning and coordination among event coordinators, facility owners, and emergency response teams; prepare a detailed Flood Response Plan to improve response and reduce losses from a flood event; Inventory needs for mobile data terminals in response vehicles and purchase and install as feasible; coordinate communications, documentation, and record keeping between NFIP communities and agencies including a database of accurate and community specific information following each hazard events; create a plan to establish an Emergency Operations Center in each community and coordinate with the county; develop listing of at-risk populations and develop appropriate evacuation protocols for various hazards; Inventory areas with repetitive flooding and prioritize for detailed hydraulic analyses; support FEMA approved flood depth mapping (RiskMAP) to better show the flood risk potential; implement activities and recommendations outlined within the studies and plans developed by the Little Calumet River Basin Commission and Kankakee River Basin Commission; investigate reciprocal agreements between neighboring communities and/or counties for structural inspections following hazardous events; develop and complete a Fire Hazard inventory of at-risk structures (large apartment complexes, abandoned buildings in concentration and blighted areas); assess and upgrade fire hydrant, including dry hydrants, throughout the county; protect existing critical facilities in floodplains noted in Table 3-12; discourage development of new critical facilities in known hazard areas; update and coordinate GIS layers with location and attributes of critical infrastructure and continue to use the most recent GIS data in land use planning efforts; train GIS staff in HAZUS-MH to quantitatively estimate losses in "what-if scenarios"; incorporate hazard information, risk assessment, and hazard mitigation practices into the Comprehensive Land Use Plan and Development Review to better guide future growth and development; establish overlay zones in the Zoning Ordinance to discourage construction of new critical facilities in known hazard areas; utilize zoning to manage development of non-critical facilities in known hazard areas; improve Dike Ditch and levee west of US 41 in West Creek Township; complete commodity flow study to determine typical types and quantities of chemicals being transported throughout Lake County; clearly advertise location of safe rooms and community shelters for large gatherings of people (live, work, shop, recreate, etc.); investigate and provide possible incentives for (private) buildings with approved safe rooms; secure a fuel reserve, or

ensure contractual emergency provisions so critical infrastructure may run on power backup for extended periods of time; designate a fuel reserve transportation route through each community; investigate the potential to utilize wind or solar generators; maintain and expand Tree City USA participation; propose and adopt a water conservation ordinance and contingency plans to implement during water shortages; and to establish standard procedures for issuing an open burn ban during periods of dry weather.

**The Porter County Plan** prioritized hazards as following: Low Risk: drought, earthquake, landslide and subsidence; Elevated Risk: dam failure, flood, hail, thunder, windstorm, winter storm and ice, tornado; Severe: extreme temperatures, fire, hazardous material incidents. Proposed updated mitigation practices include: clearly advertise location of safer areas and community shelters for large gatherings of people (sporting events, 4H fair, etc.); develop a domestic animal friendly evacuation plan and domestic animal friendly shelter; investigate incentives for buildings with approved safe rooms and encourage construction of safe rooms in all new municipal facilities; reduce flood insurance premiums through participation in the NFIP's CRS Program; continue to conduct detailed flood studies for problem areas and/or areas with repetitive flooding problems; prioritize areas and complete flood depth mapping (RiskMAP) to better understand flood risk potential; conduct watershed studies, stormwater master plans, or coastal erosion studies to develop action strategies for mitigation and protection; inventory needs and procure additional equipment as funding is available; develop or update evacuation places for hazardous materials facilities; review regular inspection and maintenance records of high hazard dams regardless of ownership; develop a countywide GIS consortium with standards for file development and review procedures; train first responders on GIS; protect existing critical facilities in floodplain; institute a voluntary retrofit and/or buyout plan for prioritized structures subject to repetitive flooding; develop floodplain overlay district to further protect area from development while allowing passive uses; inventory needs for mobile data terminal hardware or software in response vehicles and purchase and install as prioritized; investigate an immunization program for all emergency responders, inspection staff, and families; improve recordkeeping to achieve accurate and community specific information following each hazard event including extent, magnitude, cost, response, and recovery efforts; develop a debris management; develop municipal and county continuity of government (COG) and individual departmental continuity of operations (COOP) plans; investigate reciprocal agreements between neighboring communities/counties for structural inspections following hazardous events; improve disaster preparedness and emergency response at the local level through the Community Emergency Response Team (CERT) or Community Organizations Active in Disasters (COAD) program (or similar program); create bilingual notifications and hazard preparedness materials; increase interdepartmental communications related to hazard awareness and planning efforts; investigate and propose an ordinance to require developers to pay to install additional sirens for new developments or pay into siren fund as part of new development; develop MOUs between the EMA and municipalities regarding the provisions of power and maintenance of outdoor warning sirens; purchase additional mobile electronic messaging boards and develop protocol for local interactions to provide current hazard information; install additional dry-hydrants throughout the county; harden critical or public facilities to withstand severe wind damages; secure a fuel reserve, or ensure emergency provisions are outlined in contracts, and designate a fuel route, to ensure critical infrastructure may run on power back-up for extended periods of time; investigate the potential to utilize alternative (solar) generators where appropriate; and to investigate and propose local water conservation ordinance and contingency plans to impose at time of water shortages.

**The LaPorte County Plan** prioritized hazards as following: Low Risk: dam failure, earthquake, hazardous materials incident; Elevated Risk: flooding, tornado and windstorm, winter storms and ice storms. Additional hazards included but not prioritized include: coastal storms and seiche, extreme temperatures, and hailstorms. Proposed updated mitigation practices include: update and coordinate GIS layers with

location and attributes of critical infrastructure; train GIS staff in HAZUS-MH to quantitatively estimate losses in “what if scenarios” and continue to use the most recent GIS data in land use planning efforts; post information/warning signs in local parks and other public gathering places explaining what to do in case of a hazard event; maintain LEPC reporting and training efforts as required through SARA Title III and ensure current facility maps and response plans are on file for Tier II facilities; establish/maintain a local HMRT; increase number of personnel certified to OSHA III Technician level; incorporate hazard information, risk assessment, and hazard mitigation practices into the Comprehensive Land Use Plan and Development Review to better guide future growth and development; develop temporary and/or long-term shelter agreements within the County. Potential for tiered levels of shelters, domestic animal shelters, etc.; educate the public regarding the importance of safe areas and/or community shelters in vulnerable locations; advertise or announce locations of safe rooms and community shelters for large gatherings of people. (Football games, 4H Fair, etc.); coordinate with private business owners utilizing large dynamic message boards for business to provide messages during hazardous events and recovery efforts; require weather radios in all critical infrastructure and encourage use by residents and businesses; coordinate communications and notifications within County and DHS District utilizing redundant systems; increase awareness and participation in a mass notification system; improve disaster preparedness and emergency response at the local level through the CERT program; continue to utilize social media outlets for preparedness and recovery efforts; and increase participation; prepare a detailed flood response and evacuation plan (utilizing gages, maps, and alerts) to improve response and reduce losses from a flood event; propose and adopt an ordinance to require developers to pay to install additional sirens for new developments or pay into a County-wide fund to install additional sirens as needed; purchase additional mobile message boards, warning signs, or barricades to place in areas affected by hazards; encourage new or retrofitted critical infrastructure to incorporate structural bracing, shutters, laminated/impact resistant glass and interlocking roof coverings to minimize damage; encourage property owners and renters in known hazard areas to have proper insurance coverage to protect their property and assets from potential damage; prohibit the development of new critical infrastructure in 1% & 0.2% annual chance flood hazard area; relocate, buyout, or floodproof (nonresidential) existing non-critical structures that are subject to repetitive flooding; develop an inventory and complete an inspection of public and commercial buildings that may be particularly vulnerable to earthquake damages; allow Floodplain Administrators and other related staff to prepare for and obtain the Certified Floodplain Manager (CFM) certification and/or participate in INAFSM activities; support FEMA approved flood depth mapping (RiskMAP) to better understand the flood risk potential; participate in the update of the Lake Michigan coastal flood hazard zone studies; obtain or dedicate funding to implement recommendations from completed flood protection studies and/or install regional detention or diversion projects; require wiring for large generator power back up be installed in all new critical infrastructure; develop and adopt an ordinance requiring the burial of power lines in new development or require designed-failure mode that allows lines to fall or fail in small sections only; utilize realistic training and exercises that stimulate response conditions and scenarios for emergency responders, decision-makers, and general public; coordinate communications, documentation, and record keeping between NFIP communities and agencies including a database of accurate and community specific information following each hazard event; prepare evacuation plans for neighborhoods and/or mobile home parks in hazard areas; designate and enforce snow routes with no street parking to allow for snow removal activities; develop tiered levels of snow emergencies/advisories, etc. within municipalities, County, and DHS District; develop and implement a voluntary immunization program for all emergency responders, inspection staff, and families; implement the erosion and sediment control BMPs identified in the Storm Water Quality Management Plan; and to maintain trees on public property and right-of-ways and encourage maintenance on private property to reduce the risk of downed utility lines and falling limbs.

b. Not 309 or CZM driven

c. The State of Indiana Multi-Hazard mitigation strategy is designed to reduce or eliminate the risk from natural and man-made hazards without diminishing the quality of life of its citizens or their communities. Severe Storms affecting the Lake Michigan shoreline in 2018, 2019, and 2020 caused extensive property and natural resource damages in the Lake Michigan Coastal Region. Coastal Region Hazard planning will need to address protective and proactive measures including the development of local ordinances, mitigation and/or adaptation strategies, and coastal community education.

1. What level of priority is the enhancement area for the coastal management program?

**High** __X__
**Medium** _____
**Low** _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Stakeholder Concerns: the lake itself, wind, Great Lakes level change, overdevelopment of shore protection structures, the effects of break walls on natural processes and flow of sediment, lack of knowledge and information of/about coastal dynamics during storm events and effects of storms on coastal shorelines, communities, and throughout the coastal region, flooding - especially with coastal storms, precipitation, and along Deep River, lack of cohesive, regionally accepted action and adaption plans or knowledge of their contents and reach, lack of knowledge/information of coordination of post hazard funding resources, community hazard communication and coordination is lacking, shoreline erosion, invasive species, lack of comprehensive and collaborative land use planning, non-point source pollution, beach loss, drownings, lack of living shoreline implementation, communication (inter-, intra-agency, with industry, and with the public) regarding hazards, incidents, and storms, overdevelopment of shoreline, increasing population and increased risks, loss of wetland storage, inappropriate long-term planning and maintenance projects, climate change.

## Coastal Hazards – Phase II Assessment

**In-Depth Resource Characterization:**
*Purpose: To determine key problems and opportunities to improve the CMP's ability to prevent or significantly reduce coastal hazard risks by eliminating development and redevelopment in high-hazard areas and managing the effects of potential sea level rise and Great Lakes level change.*

1. Based on the characterization of coastal hazard risk, what are the three most significant coastal hazards within your coastal zone? Also indicate the geographic scope of the hazards, i.e., is it prevalent throughout the coastal zone, or are there specific areas most at risk?

Table 10. The top three Coastal Hazards identified by Indiana coastal region stakeholders, Department of Natural Resources staff, and the LMCP staff through management activities, partner interaction, and review of regional plans and documents.

| | Type of Hazard | Geographic Scope (throughout coastal zone or specific areas most threatened) |
|---|---|---|
| Hazard 1 | Flooding | The East Chicago area to Gary, Lake Station to Portage, all around Little and Grand Calumet Rivers, Michigan City and all shoreline communities, Deep River watershed |
| Hazard 2 | Erosion | Shoreline communities, river/stream corridors, throughout the coastal area |
| Hazard 3 | Great Lakes level fluctuations | Nearshore and shoreline |

2. Briefly explain why these are currently the most significant coastal hazards within the coastal zone. Cite stakeholder input and/or existing reports or studies to support this assessment.

Hazard 1 – Flooding

The greater East Chicago area through Gary, Lake Station through Portage, Michigan City, and shoreline communities. Areas at highest risk are those near and along the Little and Grand Calumet Rivers, Trail Creek, Deep River and communities along the shoreline that are most readily affected by Great Lakes level change, although much of the coastal region is at some risk of flooding. Flooding was identified as a primary threat to the region, especially in conjunction with climate change, in the Purdue Climate Change Report, Deep River-Portage Burns Waterway Watershed Plan, CELCP Plan, Indiana Dunes Climate Change Adaptation Plan, 2050 Comprehensive Plan, and 2019 State of Indiana Hazard Mitigation Plan. The areas at greatest risk were identified by analyzing the Great Lakes Level Change Viewer, FEMA Flood Hazard Data, the above stated plans, and staff and stakeholder input.

The relatively flat topography and high ground water table prevalent in many coastal areas contributes to severe flooding episodes resulting from storm events and fluctuating water levels. Damages occur at every level from flooded basements and failing septic systems, to rivers overtopping their banks and serious damage to properties and natural resources. The risks of flooding and changing lake levels present challenges for coastal community development and resilience. With populations expected to increase in Lake and Porter Counties and tourism increasing region-wide, flooding will continue to be a concern and requires attention during development planning. Many coastal wetlands have been filled for developmental purposes without understanding the functional value loss and resulting hydrologic changes. This suspected loss of wetlands throughout the region is thought to contribute to loss of flood water storage and increased flooding issues. Although structures such as seawalls or breakwaters have been constructed in the Lake or along the coast to afford protection for industrial, residential, and commercial developments, these structures contribute to the alteration of the shoreline. What provides protection for one area of the coast can negatively affect another. Dams and levees have also been constructed to manage tributary waters in the coastal region, the largest being the Little Calumet River, Indiana Flood Control and Recreation Project designed to provide structural flood protection along the main channel of the Little Calumet River from the Illinois State Line to Gary, IN. (http://littlecalriverbasin.org/about.html)

Many of these flooding issues can be addressed locally in the coastal region through integrated planning, ordinance development and implementation, improved research, modeling, and monitoring of coastal processes in different weather, climate, and lake level scenarios to inform decision makers and the public, and coordinated planning and communication within and between agencies, developers, communities, and NGOs. Green infrastructure practices provide feasible and cost-effective measures to manage precipitation on-site and reduce localized flooding. However, further research is needed on specific site

and watershed benefits of different types of green infrastructure in our Indiana coastal communities. Many municipalities throughout the region are interested in working closer with regional entities to implement and maintain green infrastructure for stormwater management; however, long term maintenance plans, regional inventories, and coordinated, strategic planning is needed to help facilitate successful green infrastructure incorporation into our coastal communities. Wetlands and greenspace protection can further reduce damages from high water and tributary flooding. Expansion on the current 309 project (updating the coastal region NWI and conducting functional assessments) to include future updates and incorporation of historical imagery and data is needed. Further, integrating Lake Michigan tributary watershed plans into comprehensive plans, ordinances and codes is another way of integrating green infrastructure into land use strategies.

Hazard 2 – Erosion

Shoreline communities, river and stream banks and corridors, and many localities throughout the coastal region are at risk of erosion. The highly erodible soils, changes in land use, channelization and hydromodification, public use of dune landscapes outside of designated areas, increased precipitation and storm intensities, and loss of biodiversity and therefore destabilization of the ecosystems all lead to increased risk of erosion around the coastal area. These risks were detailed in the Purdue Climate Change report, Michigan City Tree Planting ordinance, Deep River-Portage Burns Waterway Watershed Plan, The Sheridan Beach and the Esplanade Plan, CELCP Plan, 2050 Comprehensive Plan, Indiana Dunes Climate Change Adaptation Plan, and 2019 State of Indiana Hazard Mitigation Plan. This hazard and areas were also identified by staff and stakeholders.

Beaches and dunes are important elements of the Lake Michigan shoreline environment; they are critical to the health of the coastal systems and are the first line of defense during a hazard event. In July 2019, Lake Michigan reached a near record high water level of 581.92 feet. As recently as December 2019/January 2020, a storm event resulted in the loss of 10 – 15ft. of foredune along the natural coastline. In some cases, homes built on the foredune lost their "front yard", sea walls, and in some cases, home supports and land beneath their foundations. Several septic system drain fields were exposed as well causing major public health concerns. Although storms and lake levels cannot be controlled, property and natural resource damage caused by storms, erosion and fluctuating lake levels can be mitigated through early planning designed to protect shoreline and community resources. The LMCP has developed model ordinances to address protection, management, and restoration of beaches and dunes in coastal communities. Further research, monitoring, and modeling into coastal dynamics during a range of storm events and lake level scenarios is needed to provide better technical assistance to communities. Improved communication within and between agencies, decision makers, and the public is needed to improve our communities' preparedness, facilitate adoption of ordinances appropriate to each community's needs, and to increase our region's resiliency. Further research into high erosion hazard areas and coastal condition and vulnerabilities would be beneficial to our agencies and communities as well.

**Coastal Atlas**

The Coastal Atlas will consolidate GIS data (e.g. land cover data, flood mapping, hazard areas, etc.) for the Coastal Region onto one online GIS based platform. This 309 project is in progress and will include partners such as the State Geographic Information Office.

**Shoreline Aerial Photos**

The LMCP procures aerial photos of the Lake Michigan shoreline each year. This partnership project with the Indiana Geographic Information Office and the DNR Division of Water is conducted annually. The aerial photos are used as a decision support tool for Division of Water regulatory staff. Aerial photos from

past years used as the base map for shoreline assessment. The aerial photos from this year will to be used in assessing damage from the December 2019 - January 2020 storms and identifying areas at risk from erosion. Starting in 2020 images will be collected using Orthophotography and delivered to the State Geographic Information Office.

**Orthoimagery Specifications**

4-band (R,G,B,NIR) 3-inch or 6-inch digital orthoimagery for the project referenced to the Indiana State Plane West Coordinate System in US survey Feet or Client approved coordinate system. Use the new American Society of Photogrammetry and Remote Sensing (ASPRS) Standards for Digital Geospatial Data (edition 1, version 1.0-November 2014) guidelines.

- The 7.5 cm (3-inch) Ground Sample Distance (GSD) orthoimagery data set will be produced to meet ASPRS Positional Accuracy Standards for Digital Geospatial Data (2014) for a 15 (cm) RMSEx / RMSEy Horizontal Accuracy Class which equates to Positional Horizontal Accuracy = +/- 36.72 cm (1.20 feet) at a 95% confidence level, with a mosaic seamline mismatch of no greater than 30 cm (0.98 foot) equivalent to 4 pixels.
- The 15 cm (6-inch) Ground Sample Distance (GSD) ortho imagery data set will be produced to meet ASPRS Positional Accuracy Standards for Digital Geospatial Data (2014) for a 30 (cm) RMSEx / RMSEy Horizontal Accuracy Class which equates to Positional Horizontal Accuracy = +/- 73.43 cm (2.41 feet) at a 95% confidence level, with a mosaic seamline mismatch of no greater than 60 cm (1.97 feet) equivalent to 4 pixels.
- Use the existing Cook, Lake, Porter, and Berrien County Lidar data to produce a LIDAR derived DEM data.
- Use the new 4-band aerial imagery.
- Use a modular tile grid (6-inch 2,500’ X2,500’ or 3-inch 1,250’ X 1,250’), the corridor may not fill out a complete tile, partial tiles will be delivered.
- Using the imagery and LIDAR derived DEM data, perform rectification using bi-cubic convolution algorithms.
- Imagery contrast, brightness, and tone will be matched before any mosaicking can be initiated. Use an automated/ interactive methodology to perform image mosaicking. Note: mosaick lines may appear in water.
- Deliver each orthoimagery tile in GEOTIFF format, along with a 20:1 compressed MrSid file.

DNR with assistance from the Lake Michigan Coastal Program and Indiana Department of Transportation has been collecting imagery of the lake shore, off and on since the 1930’s as a baseline to determine the changes along the lake shore due to weather/water conditions. This data is instrumental in scientific research for foresight of patterns of topologic changes leading to better understanding of how to mitigate risk for the area. This data is required for the on-going emergency application process to mitigate current damage. It will also be used should the Governor need to declare a disaster emergency.

In the past, the collection of this data has been done in cooperation with INDOT, who had the equipment to collect the data, as well as having the technical experts to process the data. At this time the equipment is no longer available as it was antiquated. Due to manpower restrictions the technical assistance is undermanned, but INDOT is willing to assist with QA/QC.

At present (2020) Lake Michigan has risen almost 6 feet from a new record low level of 576.02’ IGLD’85 set in January 2013, to a near record high level of 581.92 feet in July 2019. To not fly the shoreline in 2020 threatens to miss this present high lake level period, and its impact on the Indiana shoreline erosion and shoreline damage.

The "record high" monthly average lake level of 582.35 feet IGLD'85 occurred in October 1986. Unfortunately, no aerial photo flight was flown that year (1986) resulting in the loss of valuable historical shoreline information (beach widths, coastal dune-bluff positions, etc.). Thankfully, an aerial photo flight was done in 1987, showing the loss of beaches and coastal erosion resulting from the high lake levels and storm activity during the fall and winter storms of 1986, but without the conditions of 1986 the shoreline rate of erosion during this past high lake level period was lost. That information is lost forever. According to the most recent (February) Corps of Engineers "Monthly Bulletin of Lake Levels for the Great Lakes", starting in January 2020 a new monthly record high was set, and for the next six months it is predicted that possible new monthly record high levels could be broken. ACTUAL CHART: http://lre-wm.usace.army.mil/ForecastData/BulletinGraphics/MBOGLWL-mich_hrn.pdf

The October 1986 record high lake level was broken this year. The DNR needs to be ready to document not only this historic event and its impact on the Indiana shoreline, but also the impact of storms eroding and damaging the Indiana shoreline in the future.

Hazard 3 – Great Lakes Water Level Fluctuation
In the mid-1970s and 1980s, high lake levels led to severe erosion and flood conditions along Indiana's shoreline. Today, lake levels are at a near record high reaching 581.92 feet in July 2019, 2.62 feet above the average for that month, and are projected to increase into 2020. Damage has been reported by most shoreline communities, with some requesting a state-issued emergency declaration. High lake levels paired with intense storms creates significant opportunities for erosion and flooding along the shoreline and even inland as lake level fluctuations affect both shoreline and hydrologically connected areas. Coastal area water tables rise and fall with Lake Michigan, sometimes causing significant flooding of basements and normally dry areas. Native dune grasses stabilizing foredunes may become undercut, uprooted and washed away. Many seawalls and other hardened structures may not have been designed or properly installed to withstand the high water level and pressure of waves (crashing onto and pushing behind them) causing them to fail and expose land behind them to high energy waves.

https://www.lre.usace.army.mil/Media/News-Releases/Article/2076677/record-high-water-levels-to-continue-in-2020/

Hardened structures also increase the wave energy around them contributing to significant erosion on adjacent, unarmored shores. Most shoreline communities were not prepared to implement dune restoration measures following past high lake level storms and some had allowed developments that contributed to dune erosion and property damage. Climate change was also identified as a compounding factor to the effects of Great Lakes level change, flooding, and erosion in the Purdue Climate Change report, Michigan City Tree Planting ordinance, Deep River-Portage Burns Waterway Watershed Plan, The Sheridan Beach and the Esplanade Plan, CELCP Plan, 2050 Comprehensive Plan, Indiana Dunes Climate Change Adaptation Plan, and 2019 State of Indiana Hazard Mitigation Plan and by staff and stakeholders.

Further research, monitoring, and modeling into coastal dynamics during a range of storm events and lake level scenarios is needed to provide better technical assistance to communities. Improved communication within and between agencies, decision makers, and the public is needed to improve coastal communities' preparedness, facilitate adoption of ordinances appropriate to each community's needs, and to increase our region's resiliency. Further research into high erosion hazard areas, structures located within and coastal conditions and vulnerabilities would be beneficial to our agencies and communities as well.

**Coastal Hazard Stakeholder Input**

The Coastal Program 309 Assessment stakeholder survey conducted in December of 2019 – January 2020 identified Coastal Hazards as a high enhancement priority for the coastal region. The primary concern was that coastal communities do not have adequate information and processes in place for planning and development efforts that create a balance between conservation, protection, adaptation, and new development along the Lake Michigan shoreline and within coastal communities. Improving our data and ability to model shoreline and regional impacts under specific lake level, weather, and climate scenarios was suggested. Continued and improved shoreline monitoring and modeling, including use of aerial imagery, LiDAR, bathymetry, vegetation and soils data, etc. was recommended to improve internal agency understanding and ability to provide technical assistance to communities. A review of current permitting processes was also suggested in order to identify opportunities for improved State coordination and input regarding shoreline projects. Facilitation of discussion within and between agencies, developers, municipalities, and NGOs on sustainable development, coastal hazard planning, post-hazard recovery planning, green infrastructure, and hazard mitigation was also suggested. Education on the importance of limited and resilient shoreline development, dune protection, erosion, and flooding prevention, living shorelines, wetland and greenspace protection, and recreational hazards such as drowning was suggested for local governments and coastal region residents. Focusing on water quality ordinances related to nonpoint source pollution, intensified by coastal hazards such as flooding, erosion, and fluctuating lake levels, was also recommended.

3. Are there emerging issues of concern, but which lack sufficient information to evaluate the level of the potential threat? If so, please list. Include additional lines if needed.

Table 11. Emerging issues of concern in the Indiana coastal region related to **Coastal Hazards** identified by coastal region stakeholders.

| Emerging Issue | Information Needed |
|---|---|
| Institutional knowledge loss/agency capacity | Potential for institutional knowledge loss upon eventual retirement of key coastal dynamics technical support staff |

**In-Depth Management Characterization:**
*Purpose: To determine the effectiveness of management efforts to address identified problems related to the coastal hazards enhancement objective.*

1. For each coastal hazard management category below, indicate if the approach is employed by the state or territory and if there has been a significant change since the last assessment.

| Management Category | Employed by State/Territory (Y or N) | CMP Provides Assistance to Locals that Employ (Y or N) | Significant Change Since the Last Assessment (Y or N) |
|---|---|---|---|
| **Statutes, Regulations, and Policies:** | | | |
| *Shorefront setbacks/no build areas* | N | N | Y |
| *Rolling easements* | N | N | N |
| *Repair/rebuilding restrictions* | N | N | Y |
| *Hard shoreline protection structure restrictions* | Y | Y | Y |

| | | | |
|---|---|---|---|
| *Promotion of alternative shoreline stabilization methodologies (i.e., living shorelines/green infrastructure)* | Y | Y | N |
| *Repair/replacement of shore protection structure restrictions* | N | Y | Y |
| *Inlet management* | N | N | N |
| *Protection of important natural resources for hazard mitigation benefits (e. g. , dunes, wetlands, barrier islands, coral reefs) (other than setbacks/no build areas)* | N | N | N |
| *Repetitive flood loss policies (e. g. , relocation, buyouts)* | Y | Y | Y |
| *Freeboard requirements* | Y | Y | Y |
| *Real estate sales disclosure requirements* | Y | Y | N |
| *Restrictions on publicly funded infrastructure* | Y | Y | N |
| *Infrastructure protection (e. g. , considering hazards in siting and design)* | Y | Y | N |
| *Other (please specify)* | | | |
| **Management Planning Programs or Initiatives:** | | | |
| *Hazard mitigation plans* | Y | Y | Y |
| *Sea level rise/Great Lake level change or climate change adaptation plans* | Y | Y | Y |
| *Statewide requirement for local post-disaster recovery planning* | N | N | N |
| *Sediment management plans* | N | N | N |
| *Beach nourishment plans* | Y | Y | N |
| *Special Area Management Plans (that address hazards issues)* | Y | Y | N |
| *Managed retreat plans* | N | N | N |
| *Other (please specify)* | | | |
| **Research, Mapping, and Education Programs or Initiatives:** | | | |
| *General hazards mapping or modeling* | Y | Y | Y |
| *Sea level rise mapping or modeling* | Y | Y | Y |
| *Hazards monitoring (e. g. , erosion rate, shoreline change, high-water marks)* | Y | Y | Y |
| *Hazards education and outreach* | Y | Y | Y |
| *Other (please specify)* | | | |

Significant changes:

- New Flood Insurance Rate Maps (FIRM) for communities along Lake Michigan. The affected cities/towns/counties (all participating in the National Flood Insurance Program) will be required to adopt the minimum federal requirements for coastal zone development for areas designated as a Zone V or VE on the preliminary maps. This includes a requirement that all buildings or structures be located landward of the reach of mean high tide, no alteration of sand dunes that would increase potential flood damage, and no fill used as structural support. Additionally, there will be new AO and AH zone designations in some of these communities along Lake Michigan.
- New Multi-Hazard Mitigation Plans – 2019 Indiana State Multi-Hazard Mitigation Plan, 2018 Lake County Multi-Hazard Mitigation Plan, 2019 DRAFT Porter County Multi-Hazard Mitigation Plan, and 2016 LaPorte County Multi-Hazard Mitigation Plan.
- Purdue Climate Change Report and Indiana Dunes Climate Change Adaptation Plan
- Great Lakes Level Viewer created and utilized

- Best Available Floodplain Layer created for new FEMA FIRMs
- Gunderson vs State of Indiana case 90 N.E. 3d 1171 (2018): The Supreme Court, Masa, J., held that: boundary separating public trust land from privately-owned riparian land along the shores of Lake Michigan is the common-law ordinary high water mark and, absent an authorized legislative conveyance, the State retains exclusive title up to that boundary, and walking below the natural ordinary high water mark along the shores of Lake Michigan is protected public use.
- Regional climate change modeling has been created for the Midwest and Indiana
- New LiDAR data and aerial imagery collected
- LMCP Coastal Training Program created.
- New IC 14-29-3-8:
  (8) Except as provided in subsections (c) and (d), if the permittee takes sand from the bed or from under the bed of Lake Michigan, the sand may only be deposited on the beach of Lake Michigan and may not be removed to any other place or used for any other purpose. (b) The department may also prescribe other reasonable conditions in the permit that are in the best interests of the state. (c) A permittee that, in accordance with permit conditions, dredges not more than ten (10) cubic yards of sand from the bed or from under the bed of Lake Michigan within a period of thirty (30) days is exempt from subsection (a)(8) with respect to that quantity of sand. (d) Notwithstanding subsection (a)(8), if the director determines that sand taken from the bed or from under the bed of Lake Michigan contains a toxic material (as defined in IC 13-11-2-233) or a substance that is potentially harmful to human health or to the environment, the sand shall be disposed of in a manner consistent with IC 13-22.

2. Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the state's management efforts in addressing coastal hazards since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the state's management efforts?

   The DNR Lake Michigan Coastal Program publication, "Lake Michigan Shoreline Coastal Hazard Model Ordinances" (2010) provided an overview of Coastal Hazards including natural processes like waves, wind, lake levels and storms as well as human influences such as beach nourishment, breakwalls, and other man-made structures. Following detailed description of shoreline reaches and shoreline community conditions the document provides suggested model hazard ordinances that could be adapted to the characteristics of each community.

   Subsequent to the Lake Michigan Coastal Hazard Model Ordinance publication, there has not been an evaluation of the effectiveness of the state's management efforts. Based on stakeholder input and partner consultation, the LMCP has determined that additional outreach, education, and technical assistance should be provided to Coastal Communities to promote and facilitate adoption of model ordinances that reflect each community's local interests and issues.

**Identification of Priorities:**

1. Considering changes in coastal hazard risk and coastal hazard management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve its ability to more effectively address the most significant hazard risks.

*Management Priority 1:* Data collection and modeling to better understand coastal processes, erosion rates and coastal vulnerabilities under specific lake level, weather, and climate conditions

Description: *With Lake Michigan water levels approaching historic highs, the Lake Michigan shoreline is seeing high amounts of beach erosion and shoreline damage. At present, however, the damage has not been assessed in a quantitative manner and reports remain anecdotal. This shoreline change needs to be quantified and analyzed, in order to guide coastal engineering actions that can be taken to create a more resilient coastline for future high water periods, and to help in the development of shoreline change models than can guide engineering measures leading to a more resilient shoreline. Additionally, this information needs to be placed in historical context and communicated with stakeholders.* (Dr. Cary Troy, Purdue University)

*Management Priority 2:* Review internal Department regulatory processes

*Description:* The State of Indiana DNR implements a couple of different regulatory Lake Michigan permits, including an emergency repair permit. Multiple agencies coordinate Lake Michigan permitting through the LMCP Federal Consistency program. During the past three years of high lake levels and increase in shoreline erosion damage coastal communities request increased participation from State Agencies' for seawall repairs and emergency declarations. A review of the current state processes will lead to a more robust response to coastal communities seeking technical assistance and coordination from State and Federal permitting agencies.

2. Identify and briefly explain priority needs and information gaps the CMP has for addressing the management priorities identified above. The needs and gaps identified here should not be limited to those items that will be addressed through a Section 309 strategy but should include any items that will be part of a strategy.

| **Priority Needs** | **Need?** (Y or N) | **Brief Explanation of Need/Gap** |
|---|---|---|
| Research | Y | Monitoring and research of storm impacts and coastal dynamics, ordinary high water mark, coastal erosion hazard mapping |
| Mapping/GIS/modeling | Y | Erosion, flooding, vulnerable areas, condition assessments, coastal dynamics given specific conditions, regional expansion and development planning |
| Data and information management | Y | Shoreline structures inventory, bathymetry data, hydrographic LiDAR data, aerial imagery, historical data and imagery |
| Training/Capacity building | Y | Training for staff and communities on community needs, adoption of model ordinances, green infrastructure, FEMA, coastal dynamics |
| Decision-support tools | Y | Coastal Atlas website with hazard maps, Toolbox of adaptation strategies |
| Communication and outreach | Y | Better communication with local communities, agencies, and municipalities |
| Other (Specify) | | |

**Enhancement Area Strategy Development:**

1. Will the CMP develop one or more strategies for this enhancement area?

   **Yes** ___X__
   **No** _____

2. Briefly explain why a strategy will or will not be developed for this enhancement area.

   Coastal Program staff, partners, and stakeholders have identified Coastal Hazards as a priority enhancement area to be addressed by first conducting a coastal resiliency needs assessment that will bring together all stakeholders in Indiana's coastal area. At this time there does not exist a consistent definition of resiliency and vulnerability among the coastal communities and the partner government agencies. The LMCP proposes to bring technical experts and policy practitioners together and convene a series of stakeholder meetings to guide future coordinated responses to coastal hazards. Although the LMCP has developed the TAPP Toolkit and Model Hazard Ordinance, these are outdated and do not address current coastal conditions. The creation of a framework for coastal communities to reference for policy development, funding requests and emergency response efforts will lead to improved resiliency decision making. There are some specific strategies that will assist this framework development and that includes: a) a shoreline structural assessment scope (structures have been identified however the individual assessments appear to be costly, therefore prioritizing the structures and identify a cost estimate on completing assessments will assist in budgeting b) 2020 was the first year that Indiana started collected shoreline orthophotography which needs to be incorporated into a Coastal Atlas along with historical shoreline imagery (once inventoried).

## **Public Access** – Phase I Assessment

**Section 309 Enhancement Objective:** Attain increased opportunities for public access, taking into account current and future public access needs, to coastal areas of recreational, historical, aesthetic, ecological, or cultural value. §309(a)(3)

### PHASE I (HIGH-LEVEL) ASSESSMENT:

*Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.*

**Resource Characterization:**

1. Use the table below to provide data on public access availability within the coastal zone.

| Public Access Status and Trends | | | |
|---|---|---|---|
| **Type of Access** | **Current number** | **Changes or Trends Since Last Assessment** (↑, ↓, –, unkwn) | **Cite data source** |
| Beach access sites | 111 | ↑111 from 90 beach/other shoreline access points | Email from IDEM |
| Shoreline (other than beach) access sites | 12 | ↑ And Unknown: Last report was 12 shoreline access points, but previous data was questionable. | GIO.FishAccess Sites_DNR_FW shapefile. Number of shoreline access points on Lake Michigan alone. |
| Recreational boat (power or non-motorized) access sites | 17 | ↓ Last report = 30 but previous data is questionable | GIO.FishAccess Sites_DNR_FW shapefile. |
| Number of designated scenic vistas or overlook points | Not Inventoried | Unknown | Not Inventoried |
| Number of fishing access points (i.e. piers, jetties) | 65 (46 access sites, 19 piers) | ↓ Last report was 19 piers and 60 fishing access sites, but data previous questionable | GIO.FishAccess Sites_DNR_FW shapefile, and PiersLMCP shapefile |
| Coastal trails/ boardwalks | No. of Trails/ 115 Trails, 357 trail segments<br>Miles of Trails/boardwalk 636.43 | ↓ Last Report was 125 Trails (350 trail segments) totaling738.96 miles of trails, but previous data questionable | GIO database. GIO.Trails_DNR_OutRec_IN shapefile, Blueways and Greenways |

| Public Access Status and Trends | | | |
|---|---|---|---|
| **Type of Access** | **Current number** | **Changes or Trends Since Last Assessment** (↑, ↓, –, unkwn) | **Cite data source** |
| Number of acres parkland/open space | Lake Co = 10,568.82, Porter Co = 2,241.51, LaPorte Co = 2,680.87, TOTAL = 15,491.2 ac | ↓ Last Report identified 16,123.4 acres of parkland | Indiana Statewide Outdoor Recreation Plan 2021 - 2025 |
| Access sites that are Americans with Disabilities Act (ADA) compliant[#] | 16 Fish access sites<br>375 recreation facilities<br>TOTAL = 391 (some overlap) | Lake Michigan Coastal Area Public Recreation Access Inventory" (2008) states that, of the 712 Coastal Area Facilities analyzed as part of the study, "approximately 55% of all sites are at least partially compliant with the Americans with Disabilities Act (ADA) | Eppley Institute |
| Other (please specify) | | | |

| Beach | # of Entry Points | # of Beach Access Points |
|---|---|---|
| Hammond East | 1 shared | 2 |
| Hammond West | | 2 |
| Whihala East | 2 | 11 |
| Whihala West | 1 | 2 |
| JP1 | 1 shared | 1 |
| JP2 | | 1 |
| Buffington Harbor | | 1 |
| Lake Street | 1 | 7 |
| Marquette Park | 1 | 18 |
| Wells Street | 1 | 1 |
| Ogden Dunes East | 1 shared | 8 |
| Ogden Dunes West | | 8 |
| IDSP East | 1 shared | 20 |
| IDSP West | | 5 |
| Broadway | 1 | 1 |
| Shore Avenue | 1 | 1 |
| Drexwood | 1 | 1 |
| Washington Park | 1 | 10 |
| Sheridan Stop 2 | 2 | 4 |
| Sheridan Stop 7 | 1 | 1 |
| Long Beach Stop 14 | 1 | 1 |
| Long Beach Stop 20 | 1 | 1 |
| Long Beach Stop 24 | 1 | 1 |
| Shoreland Hills Stop 31 | 1 | 1 |
| Duneland Stop 34 | 1 | 1 |
| Michiana Shores Stop 37 | 1 | 1 |

2. Briefly characterize the demand for coastal public access and the process for periodically assessing demand. Include a statement on the projected population increase for your coastal counties. There are several additional sources of statewide information that may help inform this response, such as the Statewide Comprehensive Outdoor Recreation Plan,[7] the National Survey on Fishing, Hunting, and Wildlife Associated Recreation,[8] and your state's tourism office.

   There are several documents that address public access planning. These include State Agency and regional plans. The documents address current service levels, standards, and opportunities for future development. It is assumed that as the population of the Coastal Area increases that the demand for public access increases as well. The National Recreation and Parks Association has well established guidelines for public park acreage that helps guide open space planning throughout the state. The population within the state's coastal shoreline counties decreased by 27% between 2015-2018 (NOAA National Ocean Economics Program). The population in Lake County is expected to decrease between 0-8.8% between 2021-2025, increase in Porter County 5.1-10%, and decrease in LaPorte County 0-8.8% (STATS Indiana). Counties and local communities submit their recreation plans to DNR Division of Outdoor

Recreation annually to remain compliant for funding opportunities. The LMCP Grants program also conducts an annual survey for priorities regard public access among other topics.

There are no specific processes for periodically assessing demand for public access in the Coastal area, apart from the Indiana Statewide Outdoor Recreation Plan, which is updated 5 years and assesses need based on population estimates. The NIRPC 2050 Plan, the Marquette Plan, and the NIRPC Blueways and Greenways Plan provide opportunities for periodic updates of demand and access improvements.

**Indiana Statewide Outdoor Recreation Plan 2021-2025 –** Updated every 5 years.
http://www.in.gov/dnr/outdoor/4201.htm

A needs assessment of Public Access Recreation Sites within the Indiana Coastal Area was conducted by the Eppley Institute for the Indiana Department of Natural Resources Lake Michigan Coastal Program in December 2009 utilizing 309 Grant Funding (December 2009); however, much of this data needs to be revisited.
http://in.gov/dnr/lakemich/files/lm-Public_Access_Needs_Assessment.pdf

While there are many public beaches available, access to them is often limited by a lack of parking and beach access points. Beach access in the benchmark communities is, for the most part, supported by state or municipal protection and easily accessible points near densely populated areas. Although beach access is lacking for people with disabilities, efforts are being made to provide ADA access (e.g. coastal grants for beach mats in Michigan City and Indiana Dunes State Park; motorized chair in State Park).

Also lacking in the Indiana Coastal region when compared to the benchmarks is public access to boating opportunities. The number of large, well placed public marinas directly on Lake Michigan is substantially lower than that of the benchmarks.

3. If available, briefly list and summarize the results of any additional data or reports on the status or trends for coastal public access since the last assessment.

**Coastal Region:**
Beyond the Beach Discovery Trail funded in part by the Lake Michigan Coastal Program identifies public access natural resource and recreation areas in the Coastal Region and is updated on a continuous basis by the Porter County Tourism Bureau.
http://www.indianadunes.com/beyond-the-beach/

Greenways & Blueways Map (2018) – Northwestern Indiana Regional Planning Commission.
https://www.nirpc.org/greenways-blueways-map/

**Management Characterization:**

Indicate if the approach is employed by the state or territory and if there have been any significant state- or territory-level management changes (positive or negative) that could impact the future provision of public access to coastal areas of recreational, historical, aesthetic, ecological, or cultural value.

Table 12. Significant changes in public access management in Indiana's coastal region.

| Management Category | Employed by State or Territory (Y or N) | CMP Provides Assistance to Locals that Employ (Y or N) | Significant Changes Since Last Assessment (Y or N) |
|---|---|---|---|
| Statutes, regulations, policies, or case law interpreting these | Y | N | Y |
| Operation/maintenance of existing facilities | N | N | N |
| Acquisition/enhancement programs | Y | Y | Y |

1. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
   a. Describe the significance of the changes;
   Indiana Bicentennial Nature Trust (BNT) - Former Governor Mitch Daniels announced the Bicentennial Nature Trust (BNT) in his 2012 State of the State Address as a new statewide effort to honor Indiana's 200th anniversary in 2016. The BNT was created to preserve and protect important conservation and recreation areas throughout Indiana by matching donations of land or dollars. Property acquired with this fund will become part of the public trust to ensure that the land is protected for future generations of Hoosiers to use and enjoy. The state has obligated $20 million in state funding to support the BNT and the Lilly Endowment contributed an additional $10 million grant. Several properties in the Coastal Region will be preserved through the BNT, some in partnership with Coastal Program grants and Coastal and Estuarine Land Conservation Program (CELCP) funding.

   NextLevel Trails Initiative Next Level Trails will invest $90 million – the largest infusion of State trail funding in Indiana history – toward the development of regionally and locally significant trails throughout Indiana. As part of Governor Holcomb's broader Next Level Connections infrastructure program, Next Level Trails (NLT) is designed to incentivize collaborative efforts to accelerate trail connections. The DNR Division of Outdoor Recreation will administer the program in conjunction with the Indiana Department of Transportation.

   b. Specify if they were 309 or other CZM-driven changes; and CZM driven change.
   Coastal Program and partners were able to identify properties eligible for BNT funds and develop partnerships to match BNT and Coastal funds for land acquisition and preservation in the Coastal region. The 2015 Lake Michigan Coastal Grants Program awarded bonus points for utilization of BNT funds. Program received CELCP funding resulting in the potential future preservation of approximately 140 acres of land.

   c. Characterize the outcomes or likely future outcomes of the changes.
   Coordination between the BNT and Lake Michigan Coastal Program grant programs allowed for acquisition of additional lands for public access to coastal areas of recreational, historical, aesthetic, ecological, or cultural value. New opportunities for public access will be set forth in local plans include the Marquette Vision Plan, and the regional Ped, Pedal, Paddle and Greenways and Blueways Plans.

High Efficiency Trail Assessment Process (HETAP)/Wheeled Instrumentation Sensor Package (WISP) methodology and equipment will allow LMCP and DNR staff and coastal land managers (e.g. Parks Department staff) to conduct assessments on their public trails or properties. The data collected by the HETAP/WISP equipment will inform trail/property improvements, plans, and more. The data collected through these assessments will also be shared with the DNR Division of Outdoor Recreation.

2. Indicate if your state or territory has a publicly available public access guide. How current is the publication and how frequently it is updated?

Table 13. Publicly available access guides for Indiana

| Public Access Guide | Printed | Online | Mobile App |
|---|---|---|---|
| State or territory has? (Y ) | Y | Y | Y |
| Web address (if applicable) | • 2019 DNR Indiana Recreation Access Guide<br>• Hunting & Fishing Guides DNR<br>• DNR Where to Fish Finder | http://www.in.gov/dnr/5280.htm<br>http://www.eregulations.com/indiana/fishing/<br>http://www.eregulations.com/indiana/hunting/<br>https://www.in.gov/dnr/fishwild/3591.htm | IDNR Mobile Application for Recreation Access, Fishing and Hunting |
| Date of last update | 2020 | | |
| Frequency of update | Annual | | |

**State:**
**Indiana Lake Michigan Recreation Access Guide** created in 1998 has not been updated. (IDNR) http://in.gov/dnr/lakemich/files/access.pdf

**Indiana Lake Michigan Division of Fish and Wildlife Website** is updated as needed, last update in 2019 with more public access and fishing information https://www.in.gov/dnr/fishwild/3625.htm

**Enhancement Area Prioritization:**

1. What level of priority is the enhancement area for the coastal management program?

**High** _____
**Medium** ___X__
**Low** _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

The Coastal Advisory Board identified **Public Access** as a medium priority enhancement area in facilitated discussion of the 309 assessment at a Coastal Advisory Board Meeting in December 2019. A stakeholder survey conducted in December 2019 – January 2020 online to the Wetlands Steering Committee, watershed groups, the regional MS4 organization, the Environmental Management Policy Committee (EMPC), and other select stakeholders also identified **Public Access** as a medium priority enhancement area.

Stakeholder Concerns: Stakeholders agreed with LMCP classification of medium priority as there are many needs but some of the other enhancement areas may rank higher. The DNR Division of Outdoor Recreation has been of significant help and guidance for this portion of our program. They maintain a database of all public outdoor recreation facilities in the state and together we identified a need to further catalog and describe access sites, especially for amenities, types of access, and universal access. Although this enhancement area did not rise to a high level priority, we will be combining this with Cumulative and Secondary Impacts and write a strategy for this.

## **Marine Debris** – Phase I Assessment

**Section 309 Enhancement Objective:** Reducing marine debris entering the nation's coastal and ocean environment by managing uses and activities that contribute to the entry of such debris. §309(a)(4)

### PHASE I (HIGH-LEVEL) ASSESSMENT:

*Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.*

**Resource Characterization:**

1. In the table below, characterize the existing status and trends of marine debris in the state's coastal zone based on the best available data.

Table 14. Existing status and trends of marine debris in the Indiana coastal region

| **Source of Marine Debris** | **Significance of Source** (H, M, L, unknwn) | **Type of Impact** (aesthetic, resource damage, user conflicts, other) | **Change Since Last Assessment** (↑, ↓, –, unkwn) |
|---|---|---|---|
| *Land-based* | | | |
| Beach/shore litter | H | Aesthetic, user conflict, danger to wildlife (dangerous debris items such as syringes, glass, etc. ) (potential entanglement from balloon strings, etc. to wildlife) | - |
| Land based dumping | M | Aesthetic, resource damage user conflict, danger to wildlife | - |
| Storm drains and runoff | H | Aesthetic, user conflict, danger to wildlife | - |
| Land based fishing (e. g. , fishing line, gear) | L | Aesthetic, danger to wildlife (potential entanglement in fishing lines, nets, etc. ) | - |
| Ocean/Great Lakes based fishing (e. g. , derelict fishing gear) | L | Aesthetic, danger to wildlife (potential entanglement in fishing lines, nets, etc. ) | - |
| Derelict vessels | L | | - |
| Vessel-based (e. g. , cruise ship, cargo ship, general vessel) | L | Resource damage, user conflict | - |
| Hurricane/Storm | H | Resource damage, danger to wildlife (damage to staircases and related infrastructure along the | ↑/- |

| | | | |
|---|---|---|---|
| | | shoreline due to high lake level erosion) | |
| Tsunami | NA | NA | |
| Other (please specify) | M (derelict dredge equipment) | Resource Damage (Historic shipwrecks) | |

If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends or potential impacts from marine debris in the coastal zone since the last assessment.

**2020-2025 Great Lakes Marine Debris Strategic Plan**

Shipwreck study direct and indirect assessments found *Muskegon* wreck impacted by pipe of unknown origin. Additional assessment work shows that the pipe may be a lost hydraulic dredge pipe. Removal plan and site stabilization plan developed for the wreck site but has not yet been executed.

Trash:
Alliance for the Great Lakes records data annually from volunteer clean up events around the Great Lakes. The latest data available for 2018 describe: 19 clean up events, 1,043 volunteer experiences, 3,180 hours of service, and 1,359 pounds of trash collected. 91% of the trash collected was plastic. 54% of the trash was "tiny trash", 23% "food related trash", and 17% "smoking related trash" (http://www.greatlakes.org/adoptabeach - data was obtained via email correspondence). This effort appears to be less than in years prior; however, the Alliance for the Great Lakes collects volunteer data so not all effort is collected consistently from year to year. This also does not include clean up data not organized by Alliance for the Great Lakes.

A need identified from this is a regular, quantitative approach to estimating Indiana Lake Michigan coastal debris and clean up effort.

**Management Characterization:**

1. Indicate if the approach is employed by the state or territory and if there have been any significant state- or territory-level management changes (positive or negative) for how marine debris is managed in the coastal zone.

Table 15 Significant changes in Marine Debris management in Indiana's coastal region.

| Management Category | Employed by State/Territory (Y or N) | CMP Provides Assistance to Locals that Employ (Y or N) | Significant Changes Since Last Assessment (Y or N) |
|---|---|---|---|
| Marine debris statutes, regulations, policies, or case law interpreting these | N | N | N |
| Marine debris removal programs | N | N | N |

2. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes and likely future outcomes of the changes.
        a. 2020-2025 Great Lakes Marine Debris Action Plan - The 2020 Great Lakes Marine Debris Action Plan was created by a voluntary, collaborative effort of 39 organizations from the United States and Canada to address marine debris through coordinated actions. This Action Plan encompasses work that will be undertaken in the next five years (2020-2025). The plan will be re-evaluated and updated in a mid-year review.
        b. CZM supported

Work with IL/IN SeaGrant to help establish both a coordinated marine debris messaging for use in outreach, marketing, and Action Plan retention/recruitment and conduct a needs assessment on prevention strategies on marine debris.

**Enhancement Area Prioritization**

1. What level of priority is the enhancement area for the coastal management program?

**High** _____
**Medium** __X__
**Low** _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

The Coastal Advisory Board identified **Marine Debris** as a medium priority enhancement area in facilitated discussion of the 309 assessment at a Coastal Advisory Board Meeting in December 2019. A stakeholder survey conducted in December 2019 – January 2020 online to the Wetlands Steering Committee, watershed groups, the regional MS4 organization, the Environmental Management Policy Committee (EMPC), and other select stakeholders also identified **Marine Debris** as a medium priority enhancement area.

Stakeholder Concerns: The main concerns for marine debris in the Indiana coastal region are a lack of quantitative data, understanding of its source, and understanding of its impact on the region both short and long term. The Coastal Advisory Board identified a concern about plastics entering the waterways, including Mylar and latex balloons. Per- and polyfluoroalkyl substances (PFAS) were also identified as a marine debris emerging issue. It is unknown the current status of research in Indiana. With recent high lake levels, Indiana has seen a significant amount of erosion leading to damaged seawalls and stairwells contributing to infrastructure debris in the shoreline area of the lake. It was also suggested for LMCP to support or pursue education outreach initiatives for marine debris. There is a regional need for research and education regarding marine debris. Rather than elevate this enhancement area to High priority and develop a programmatic changing strategy, the LMCP should strongly consider supporting partner research and education/outreach efforts for Great Lakes marine debris.

## **Cumulative and Secondary Impacts** – Phase I Assessment

**Section 309 Enhancement Objective:** Development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources. §309(a)(5)

### PHASE I (HIGH-LEVEL) ASSESSMENT:

*Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.*

**Resource Characterization:**

1. Using National Ocean Economics Program Data on population and housing,[9] please indicate the change in population and housing units in the state's coastal counties between 2012 and 2017. You may wish to add additional trend comparisons to look at longer time horizons as well (data available back to 1970), but at a minimum, please show change over the most recent five year period (2012-2017) to approximate current assessment period.

   Table 16. Trends in coastal population and housing units for Indiana's Lake, Porter, and LaPorte counties.

| | 2012 | 2017 | Percent Change (2012-2017) |
|---|---|---|---|
| Number of people | 770,396 | 763,221 | -0.93% |
| Number of housing units | 324,875 | 330,612 | 1.77% |

2. Using provided reports from NOAA's Landcover Atlas indicate the status and trends for various land uses in the state's coastal counties between 1996 and 2016. You may use other information and include graphs and figures, as appropriate, to help illustrate the information. Note that the data available for the islands may be for a different time frame than the time periods reflected below. In that case, please specify the time period the data represents. Also note that Puerto Rico currently only has data for one time point so will not be able to report trend data. Instead, Puerto Rico should just report current land use cover for developed areas and impervious surfaces.

Table 17. Distribution of land cover types in Indiana coastal counties between 1996 and 2011 using data from NOAA's Land Cover Atlas. Data beyond 2011 was not available from Indiana at the time of this assessment.

| Land Cover Type | Land Area Coverage 2011 (Acres) | Gain/Loss Since 1996 (Acres) |
|---|---|---|
| Developed, High Intensity | 72,498.91 | + 8,057.57 / -288.00 |
| Developed, Low intensity | 104,991.58 | + 12,211.15 / -844.80 |
| Developed, Open Space | 28,204.69 | + 9,004.76 / -467.20 |
| grassland | 44,511.82 | + 1,529.59 / -6,617.57 |
| Scrub/Shrub | 22,764.71 | + 230.40 / -3,487.99 |
| Barren Land | 2,579.19 | + 1,132.80 / -281.60 |
| Open Water | 80,754.88 | + 537.60 / -595.20 |
| Agriculture | 516,465.13 | + 2,431.99 / -18,054.33 |
| Forested | 97,734.01 | + 1,593.59 / -4,191.98 |
| Woody Wetland | 68,434.93 | + 793.60 / -2,054.39 |
| Emergent Wetland | 10,777.56 | + 2,783.99 / -1216.00 |

3. Using provided reports from NOAA's Landcover Atlas please indicate the status and trends for developed areas in the state's coastal counties between 1996 and 2011 in the two tables below. You may use other information and include graphs and figures, as appropriate, to help illustrate the information. Note that the data available for the islands may be for a different time frame than the time periods reflected below. In that case, please specify the time period the data represents. Also note that Puerto Rico currently only has data for one time point so will not be able to report trend data. Unless Puerto Rico has similar trend data to report on changes in land use type, it should just report current land use cover for developed areas and impervious surfaces.

Table 18. Development status and trends for Lake County, Indiana between 1996 and 2011. Data beyond 2011 was not available for Indiana at the time of this assessment.

| | 1996 | 2011 | Percent Net Change |
|---|---|---|---|
| Percent land area developed | 30.68% | 35.49% | 15.67% |
| Percent impervious surface area | 12.97% | 14.64% | 12.91% |

Table 18. How land use is changing for Lake County, Indiana between 1996 and 2011. Data beyond 2011 was not available for Indiana at the time of this assessment.

| How Land Use is Changing in Coastal Counties | |
|---|---|
| **Land Cover Type** | **Areas Lost to Development Between 2006-2011** (Acres) |
| Barren Land | 140.80 |
| Wetland | 1,395.19 |
| Open Water | 294.40 |
| Agriculture | 10,335.96 |
| Scrub/Shrub | 947.20 |
| Grassland | 3,270.39 |
| Forested | 1,100.80 |

Table 19. Development status and trends for Porter County, Indiana between 1996 and 2011. Data beyond 2011 was not available for Indiana at the time of this assessment.

| | 1996 | 2011 | Percent Net Change |
|---|---|---|---|
| Percent land area developed | 12.91% | 15.85% | 22.77% |
| Percent impervious surface area | 4.94% | 5.82% | 17.86% |

Table 20. How land use is changing for Porter County, Indiana between 1996 and 2011. Data beyond 2011 was not available for Indiana at the time of this assessment.

| How Land Use is Changing in Coastal Counties | |
|---|---|
| **Land Cover Type** | **Areas Lost to Development Between 2006-2011** (Acres) |
| Barren Land | 19.20 |
| Wetland | 371.20 |
| Open Water | 44.80 |
| Agriculture | 5,062.38 |
| Scrub/Shrub | 416.00 |
| Grassland | 2,227.20 |
| Forested | 800.00 |

Table 21. Development status and trends for LaPorte County, Indiana between 1996 and 2011. Data beyond 2011 was not available for Indiana at the time of this assessment.

| | 1996 | 2011 | Percent Net Change |
|---|---|---|---|
| Percent land area developed | 7.51% | 7.93% | 5.63% |
| Percent impervious surface area | 2.83% | 2.98% | 5.13% |

Table 22. How land use is changing for LaPorte County, Indiana between 1996 and 2011. Data beyond 2011 was not available for Indiana at the time of this assessment.

| How Land Use is Changing in Coastal Counties | |
|---|---|
| **Land Cover Type** | **Areas Lost to Development Between 2006-2011** (Acres) |
| Barren Land | 38.40 |
| Wetland | 83.20 |
| Open Water | 19.20 |
| Agriculture | 864.00 |
| Scrub/Shrub | 102.40 |
| Grassland | 422.40 |
| Forested | 153.60 |

4. Briefly characterize how the coastal shoreline has changed in the past five years due to development, including potential changes to shoreline structures, such as groins, bulkheads and other shoreline stabilization structures, and docks and piers. If available, include quantitative data that may be available from permitting databases or other resources about changes in shoreline structures.

Table 23. Indiana coastal shoreline development as of 2013; no new data has been reviewed in Indiana since 2013.

| Shoreline Types | |
|---|---|
| **Surveyed Shoreline Type** | **Percent of Shoreline** |
| Armored | 63.53% |
| Beaches | 36.47% |
| Flats | NA |
| Rocky | NA |
| Vegetated | NA |

No new data on Indiana's shoreline structures or development has been synthesized since a 2013 study described in the 2016-2020 309 plan. This was identified as a need.

5. Briefly list and summarize the results of any additional state- or territory-specific data or reports on the cumulative and secondary impacts of coastal growth and development, such as water quality and habitat fragmentation, since the last assessment to augment the national data sets.

   More research is needed for Indiana in this area.

   2050 Comprehensive Plan – With the average annual temperature estimated to rise 5-6°F by 2050, and the average number of days exceeding temperatures over 95°F doubling or tripling, Northwestern Indiana expects to experience several hazards related to, or exacerbated by, climate change. Such hazards include: increased erosion from intense precipitation; seasonal precipitation changes, both in amount and type of precipitation; bridge scour from flooding and hydrologic changes; changes in the timing of freeze/thaw cycles; lack of ice cover in the Great Lakes, fluctuating lake levels; and road buckling. Increasing temperatures may also result in health impacts to regional communities – particularly in vulnerable populations – and cause increased energy demand. Annual precipitation will increase by 6-8%, with more extreme storm events occurring during winter and spring. These extreme weather events will contribute to flooding and erosion and will impact water quality from combined sewer overflows and increased stormwater runoff. Threats to bridges, supporting structures, and other infrastructure will occur when rivers and streams overflow their banks. In addition, by 2040, it is estimated that there will not be enough water to sustain the global population if current consumption needs continue. While it is unlikely that Northwestern Indiana will directly experience these shortages due to access to Lake Michigan, the region could potentially see massive population growth from the migration and displacement of people from water-stressed areas. This population spike would cause additional strain and pressure on the resources and weakened infrastructure network of Northwestern Indiana.

   The State Wildlife Action Plan details habitat and species threats and concerns for the Great Lakes Planning region: Although the aquatic systems have increased marginally, the Great Lakes Region has experienced loss in most habitat types over the past ten years. Most habitats were lost to urban development, and agriculture lost the most cover in terms of total acreage (Fig. 6-5). Percentage-wise, the greatest net losses were seen in grasslands (3.2%), forests (1.7%), and wetlands (1.4%). The greatest net increases percentagewise were seen in barren lands (8.3%) and developed lands (6.2%).

***Table 6-2.*** Threat category ranking to habitats in the Great Lakes Region. First-level threats categories are based on the hierarchical method of identifying threats outlined in Salafsky et al. (2008). Ranked threat categories for the entire region are arranged by each major habitat type (1 - highest threat).

| Category | Regional Ranking | Aquatic Systems | Agricultural Lands | Barren Lands | Developed Lands | Forests | Grasslands | Wetlands |
|---|---|---|---|---|---|---|---|---|
| Invasive and Other Problematic Species and Genes | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 1 |
| Residential and Commercial Development | 2 | 4 | 3 | 1 | 1 | 2 | 3 | 4 |
| Agriculture and Aquaculture | 3 | 3 | 4 | 7 | 10 | 4 | 2 | 3 |
| Natural Systems Modification | 4 | 6 | 2 | 6 | 5 | 3 | 4 | 2 |
| Pollution | 5 | 2 | 5 | 3 | 2 | 6 | 8 | 6 |
| Human Intrusion and Disturbance | 6 | 5 | 7 | 4 | 4 | 5 | 5 | 5 |
| Climate Change and Severe Weather | 7 | 7 | 6 | 8 | 7 | 7 | 6 | 7 |
| Transportation and Service Corridors | 8 | 8 | 8 | 5 | 6 | 9 | 7 | 8 |
| Other Stressors | 9 | 9 | 9 | 9 | 8 | 8 | 9 | 9 |
| Biological Resource Use | 10 | 11 | 10 | 11 | 9 | 10 | 11 | 10 |
| Energy Production and Mining | 11 | 10 | 11 | 10 | 11 | 11 | 10 | 11 |

**Management Characterization:**

1. Indicate if the approach is employed by the state or territory and if there have been any significant state-level changes (positive or negative) in the development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources, since the last assessment.

Table 24. Significant changes in management of Cumulative and Secondary Impacts of development in Indiana's coastal region.

| Management Category | Employed by State or Territory (Y or N) | CMP Provides Assistance to Locals that Employ (Y or N) | Significant Changes Since Last Assessment (Y or N) |
|---|---|---|---|
| Statutes, regulations, policies, or case law interpreting these | Y | Y | Y |
| Guidance documents | Y | Y | Y |
| Management plans (including SAMPs) | Y* | Y | N |

2. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:

**AOC Remedial Action Plan (RAP) -** *SAMP like plan

a. Describe the significance of the changes;

AOC Remedial Action Plan (RAP) implementation resulted in 2.3 million pounds of contaminated sediment removal and habitat restoration on approximately 6 miles of the river. Lake Michigan Coastal Program staff provides support for habitat restoration/preservation and management. Federal, state, and local partners continue to restore ecosystems and address the 12 remaining beneficial use impairments (BUIs) applicable to the Grand Calumet River AOC. Indiana Department of Environmental Management (IDEM) and the Citizens Advisory for the Remediation of the Environment (CARE) convened three CARE Workgroup meetings, all of which were open to the public.

IDEM and other partners continued implementing the list of sediment management projects anticipated to result in removal of six BUIs impacting the AOC. The US Army Corps of Engineers (USACE) dredged 167,845 cubic yards of sediment from the Indiana Harbor Ship Canal, including several areas with concentrations of polychlorinated biphenyls (PCBs) over 50 parts per million. Sediment was disposed of in the Confined Disposal Facility in East Chicago. Project partners began source control and design work as part of the Great Lakes Legacy Act project to dredge and cap portions of the Lake George Branch of the Indiana Harbor Ship Canal between Indianapolis Boulevard and the British Petroleum land bridge. In addition, the initial 30 percent design work for the East Branch, Phase II Sediment Management Project was completed. The East Branch, Phase II project will involve the dredging and capping of the area between Cline Avenue and the Gary Sanitary District.

Project partners also continued to implement the habitat management actions anticipated to lead to removal of two BUIs impacting the AOC during 2019. The Lake George Branch Wetlands; prescribed fire; and a substantial portion of the Dune, Swale, and GLLA Wetland Restoration projects are expected to be completed by the end of 2021. IDEM continued efforts to secure the access agreements with property owners required to implement the River Corridor Project.

Partners continued work in 2019 to address high bacteria levels at Jeorse Park Beach in East Chicago. USACE contractors are currently in the warranty period for a restoration that is improving habitat and reducing nonpoint source pollution in the area. IDEM was able to continue a limited-scope gull exclusion

project at the East Chicago-managed beaches and worked with municipal staff to implement additional best management practices designed to further reduce levels of *E. coli* at beaches in Hammond, Whiting, East Chicago, and Gary.

b. Specify if they were 309 or other CZM-driven changes;
   Support work CZM driven.

c. Characterize the outcomes or likely future outcomes of the changes.
   The cleanup of the Grand Calumet River/Indiana Harbor Ship Canal will dramatically reduce exposure to contamination from the river, help reduce the stigma of pollution, and make the river more beautiful. There are currently ideas to improve activities like bird watching, walking, and biking along the river, but these are dependent on local funding. In addition the restoration will further restore wetland habitat including native trees, grasses, and other plants, providing food and shelter to local fish and wildlife. The vast majority of the improvements in the AOC are EPA funded. LMCP support is minor and includes funding for seasonal staff restoration activities.

**LaPorte County Onsite Sewage Disposal Systems (OSDS) Property Transfer Ordinance**

a. Describe the significance of the changes;
   If the property has an on-site septic system or potable water well, the seller/buyer or their authorized agent shall have the septic system inspected by an IOWPA certified inspector and potable water tested prior to closing the property transfer and shall provide the results of the inspection and tests to the buyer and the Health Department.
b. Specify if they were 309 or other CZM-driven changes;
   Support work CZM driven.
c. Characterize the outcomes or likely future outcomes of the changes.
   The LMCP has been working with State and Local Health Departments to educate decision makers and septic system owners on the health, environmental, and economic benefits of inspecting and maintaining residential septic systems. LaPorte County Indiana adopted an OSDS operating permit ordinance based on the ISDH Draft Model Ordinance (Local Ordinance 2012-01) and now this property transfer ordinance (Local Ordinance 2016-02). Other local Health Departments may follow suit and require operating permits for residential septic systems. The LMCP is working closely with Lake and Porter Counties to enhance their capacity to handle the work load of implementing a similar ordinance. Septics with operating permits have a higher functional rate and are less likely to cause nonpoint pollution impairments. There are four health departments in the Indiana Coastal Region that issue septic permits currently.

**NIRPC 2050 Comprehensive Plan**

c. The 2050 Plan outlines existing conditions, future scenarios, and critical paths to a connected, renewed, united, and vibrant Northwest Indiana. It outlines drivers of the region's future including e-commerce, a need to remain globally competitive, containerization for shipping, tourism, high demand housing market, tariffs, maintaining entrepreneurial capacity, investing in renewable and clean energy sources, etc.

   The NWI 2050 Plan builds on the foundation of the 2040 Comprehensive Plan and takes a planning approach that focuses on the intersections and linkages between transportation, the environment, land use, and economic development. By using updated scenario planning methods,

the plan provides a framework that includes different possible futures that Northwestern Indiana may encounter over the next 30 years, and a suite of appropriate strategies by which to address them. The 2050 Plan includes four focus areas: economy and quality of place; environmental quality; mobility and transportation choices; and the people and community leaders of Northwestern Indiana. These focus areas contribution to the overall vision of a region that is connected, renewed, united, and vibrant.

The plan identifies and categorizes "drivers of the future," including: E-commerce, global competiveness, tourism, new energy sources, increased water demand and extreme weather/climate events. Population projections also show that 2 of the 3 Indiana coastal counties are expected to experience increases in populations size over the next 30 years: Lake County by 3%, and Porter County by 36%.

d. Not CZM driven
e. This plan contains strategies, partners, and financial resources by which to achieve the goals outlined in this document. It is expected that this regional document will inform and serve as the basis for future projects, as well as influence decision-making in the coastal area, for the life of the plan.

Updating Regulations on Water Quality Certification

a. Rule change would apply to 401 Water Quality Certifications. Any 401 issued by IDEM will require an expedited timeframe if the Corps requests and any condition must be related to water quality criteria only.
b. Not CZM driven
c. This rule change will apply to 401 Water Quality Certifications only. Only projects which require a federal permit for the discharge of fill requires a 401 and in Indiana, only the 404 and FERC permits trigger this. If this passes, any 401 issued by IDEM will require an expedited timeframe if the Corps requests and any condition must be related to water quality criteria only. I am attaching a copy of our comment letter. IDEM is working with the Corps. on an MOA regarding timeframes associated with the Regulatory Guidance Letter issued August 7, 2019 which also ties into this rule change. In regards to coastal development, we could see an increase in projects which we might have not permitted or would have conditioned differently if this passes which could have a secondary effect on overall management plans.

Grasslands for Gamebirds and Songbirds

a. GGS is a partnership with other conservation agencies including DNR, USDA Natural Resources Conservation Service, Natural Resources Foundation, non-profit conservation groups, private industries and other sponsors to:
    a. Develop and improve grasslands and pollinator habitats in targeted areas in Indiana.
    b. Improve soil health and water quality.
    c. Improve species diversity.
    d. Increase hunting, birding and outdoor recreation opportunities.
    e. Improve overall human health.
    f. Increase funding to local economies.
    g. Preserve cultural heritage.
b. Not CZM driven
c. More focus around the State of IN on improving quality of, funding for, and technical assistance for grassland habitat.

**Enhancement Area Prioritization:**

1. What level of priority is the enhancement area for the coastal management program?

| | |
|---|---|
| **High** | _____ |
| **Medium** | __X__ |
| **Low** | _____ |

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

   The Coastal Advisory Board identified Cumulative and Secondary Impacts as a high priority enhancement area in facilitated discussion of the 309 assessment at a Coastal Advisory Board Meeting in December 2019. A stakeholder survey conducted in December 2019 – January 2020 online to the Wetlands Steering Committee, watershed groups, the regional MS4 organization, the Environmental Management Policy Committee (EMPC), and other select stakeholders also identified Cumulative and Secondary Impacts as a high priority enhancement area.

   Stakeholder Concerns: Future plans to incorporate and manage green space, especially given growing populations in Porter County and assumed looming development pressure, future of deforestation ordinances/policies, needed guidance for developers retaining or creating green space, increasing importance of tourism as well as increasing populations' impacts, access to, and use of natural areas, need identified for communication channels with development/developers, permitting requirements and associated challenges, need a way to better track and understand land use change in real-time, effects and future plans for dealing with coastal erosion and flooding, effects of coastal region high-impact development and habitat conversion on ground water quality, native species, habitats, and nutrient systems, impacts of invasive species, impacts Lake Michigan shoreline hardening and modification, runoff and nutrient and *E. coli* impacts from septic system failures, agriculture, and impervious surfaces, limited lake front public access, loss of agriculture to development, deforestation and wetland loss from development, general growth of the region, coastal protection structures, erosion and public access impairments, understanding of aquatic coastal habitats, sedimentation issues, wetland filling for development, septic systems, loss of forest habitats in face of expanding development, and industrial containment/releases/failures and resulting responses.

## **Special Area Management Planning** – Phase I Assessment

**Section 309 Enhancement Objective:** Preparing and implementing special area management plans for important coastal areas. §309(a)(6)

The Coastal Zone Management Act defines a Special Area Management Plan (SAMP) as "a comprehensive plan providing for natural resource protection and reasonable coastal-dependent economic growth containing a detailed and comprehensive statement of policies; standards and criteria to guide public and private uses of lands and waters; and mechanisms for timely implementation in specific geographic areas within the coastal zone. In addition, SAMPs provide for increased specificity in protecting natural resources, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas, including those areas likely to be affected by land subsidence, sea level rise, or fluctuating water levels of the Great Lakes, and improved predictability in governmental decision making."

### PHASE I (HIGH-LEVEL) ASSESSMENT:

*Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.*

**Resource Characterization:**

1. In the table below, identify geographic areas in the coastal zone subject to use conflicts that may be able to be addressed through a special area management plan (SAMP). This can include areas that are already covered by a SAMP but where new issues or conflicts have emerged that are not addressed through the current SAMP.

   Table 25. Opportunities for new of updated Special area Management Plans in Indiana's Coastal Region.

| | Major conflicts/issues |
|---|---|
| Gary/Chicago Airport | Development in ecologically sensitive areas |
| Lake Michigan Industrial Shoreline and Interior | Re-use and Access to abandoned or Underutilized Industrial Properties. Marquette Vision |
| Grand Calumet RAP | GLRI AOC RAP funding will end soon so a contingency/succession plan for the area needs to be considered |
| Michigan City NIPSCO Plant Decommissioning | A plan should be considered for the property following decommission in 10 years |
| Hobart Marsh | Management plan needed following mitigation |

2. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends of SAMPs since the last assessment.

   **Grand Calumet Area of Concern** – The Grand Calumet River has been designated as an Area of Concern pursuant to the Great Lakes Water Quality Agreement. The Grand Calumet River, originating in the east end of Gary, Indiana, flows 13 miles (21 km) through the heavily industrialized cities of

Gary, East Chicago and Hammond. The majority of the river's flow drains into Lake Michigan via the Indiana Harbor and Ship Canal, sending about one billion gallons of water into the lake per day. The Area of Concern (AOC) begins 15 miles (24 km) south of downtown Chicago and includes the east branch of the river, a small segment of the west branch and the Indiana Harbor and Ship Canal. Today, 90% of the river's flow originates as municipal and industrial effluent, cooling and process water and storm water overflows. Although discharges have been reduced, a number of contaminants continue to impair beneficial uses of the River.

Federal, state, and local partners continue to restore ecosystems and address the 12 remaining beneficial use impairments (BUIs) applicable to the Grand Calumet River AOC. Indiana Department of Environmental Management (IDEM) and the Citizens Advisory for the Remediation of the Environment (CARE) convened three CARE Workgroup meetings, all of which were open to the public.

IDEM and other partners continued implementing the list of sediment management projects anticipated to result in removal of six BUIs impacting the AOC. The US Army Corps of Engineers (USACE) dredged 167,845 cubic yards of sediment from the Indiana Harbor Ship Canal, including several areas with concentrations of polychlorinated biphenyls (PCBs) over 50 parts per million. Sediment was disposed of in the Confined Disposal Facility in East Chicago. Project partners began source control and design work as part of the Great Lakes Legacy Act project to dredge and cap portions of the Lake George Branch of the Indiana Harbor Ship Canal between Indianapolis Boulevard and the British Petroleum land bridge. In addition, the initial 30 percent design work for the East Branch, Phase II Sediment Management Project was completed. The East Branch, Phase II project will involve the dredging and capping of the area between Cline Avenue and the Gary Sanitary District.

Project partners also continued to implement the habitat management actions anticipated to lead to removal of two BUIs impacting the AOC during 2019. The Lake George Branch Wetlands; prescribed fire; and a substantial portion of the Dune, Swale, and GLLA Wetland Restoration projects are expected to be completed by the end of 2021. IDEM continued efforts to secure the access agreements with property owners required to implement the River Corridor Project.

Partners continued work in 2019 to address high bacteria levels at Jeorse Park Beach in East Chicago. USACE contractors are currently in the warranty period for a restoration that is improving habitat and reducing nonpoint source pollution in the area. IDEM was able to continue a limited-scope gull exclusion project at the East Chicago-managed beaches and worked with municipal staff to implement additional best management practices designed to further reduce levels of *E. coli* at beaches in Hammond, Whiting, East Chicago, and Gary.

**The Marquette Plan** – The southern shore of Lake Michigan is an unparalleled opportunity and challenge. The Marquette Phase I project set a goal of increasing public access and developing the urbanized area. The Marquette Plan Phase II addressed a new set of challenges with a different set of stakeholders and interest groups. The Marquette Plan Phase II identified the needs of the smaller communities and created a vision that identified and protected greenways identified possible water trails in the region and addressed the needs of smaller communities. The Marquette Plan is a regional plan that creates a comprehensive land use vision for the Lake Michigan drainage basin and a strategy for implementation of that vision.
An update to the Marquette Plan, funded by the LMCP, was completed in 2015. The Marquette Plan 2015 continues to build upon the work completed in Phase I and Phase II of the original Marquette Plan, prioritizing the improvement of the physical, social, and economic connections throughout the

lakefront communities of Northwest Indiana, expanding and improving the region's trail and transportation infrastructure, and protecting the long-term health of coastal natural resources (Marquette Plan 2015, 4). The plan also includes new recommendations regarding the cultural and historical resources within the Marquette Plan study area (5).

**Management Characterization:**

1. Indicate if the approach is employed by the state or territory and if there have been any significant state- or territory-level management changes (positive or negative) that could help prepare and implement SAMPs in the coastal zone.

| Management Category | Employed by State or Territory (Y or N) | CMP Provides Assistance to Locals that Employ (Y or N) | Significant Changes Since Last Assessment (Y or N) |
|---|---|---|---|
| SAMP policies, or case law interpreting these | N | N | Y |
| SAMP plans | Y* | Y | Y |

2. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:

**Casino Law Change –**

a. Describe the significance of the changes
b. Specify if they were 309 or CZM-driven changes
   Not 309 of CZM driven
c. Characterize the likely outcomes or likely future outcomes of the changes

**Grand Calumet River RAP** – *SAMP like plan

a. Describe the significance of the changes
   Ongoing cleanup of Grand Calumet River and restoration of adjacent areas has significantly improved environment.
b. Specify if they were 309 or other CZM-driven changes
   The RAP is not 309 or CZM driven but CZM has provided support through staffing and minor grant support for habitat restoration in the Grand Calumet River AOC.
c. Characterize the outcomes or likely future outcomes of the changes.
   Continued remediation and restoration of sections of the Grand Calumet River will contribute to removing beneficial use impairments and will provide opportunities for recreation such as trails, parks, and boating. River neighborhoods will be improved and property values increased.
   Implementation - Lake Michigan will be protected from pollutants contained in contaminated sediments.

**Marquette Plan –**

a. Describe the significance of the changes

As a result of the original Marquette Planning initiative and subsequent updates over 100 million dollars of state and local match funding has been utilized to restore and revitalize shoreline parks, green space, and recreation amenities along the Indiana Lake Michigan shoreline.

b. Specify if they were 309 or other CZM-driven changes

The Marquette Plan and updates has been in part CZM driven – total **$335,000** Section 306 planning funds.

c. Characterize the outcomes or likely future outcomes of the changes.

Implementation of the Marquette Plan will result in protection and restoration of the Lake Michigan shoreline, improved public access and recreational amenities, cleanup and restoration and reuse of brownfields, and economic revitalization of NW Indiana communities.

**Enhancement Area Prioritization:**

1. What level of priority is the enhancement area for the coastal management program?

| | |
|---|---|
| **High** | _____ |
| **Medium** | __X__ |
| **Low** | _____ |

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

The Coastal Advisory Board identified Special Area Management Plans as a medium priority enhancement area in facilitated discussion of the 309 assessment at a Coastal Advisory Board Meeting in December 2019. A stakeholder survey conducted in December 2019 – January 2020 online to the Wetlands Steering Committee, watershed groups, the regional MS4 organization, the Environmental Management Policy Committee (EMPC), and other select stakeholders also identified Special Area Management Plan as a medium priority enhancement area.

## **Ocean and Great Lakes Resources** – Phase I Assessment

**Section 309 Enhancement Objective:** Planning for the use of ocean [and Great Lakes] resources. §309(a)(7)

### PHASE I (HIGH-LEVEL) ASSESSMENT:

*Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.*

**Resource Characterization:**

1. Understanding the ocean and Great Lakes economy can help improve management of the resources it depends on. Using Economics: National Ocean Watch (ENOW), indicate the status of the ocean and Great Lakes economy as of 2015 (the most recent data) in the tables below. Include graphs and figures, as appropriate, to help illustrate the information. Note ENOW data are not available for the territories. The territories can provide alternative data, if available, or a general narrative, to capture the value of their ocean economy.

Table 26. Status of Great Lakes economy for Indiana coastal counties (Lake, Porter, and LaPorte) all counties combined) (2016) using NOAA ENOW data

| All Counties Combined | All Ocean Sectors | Living Resources | Marine Construction | Ship & Boat Building | Marine Transportation | Offshore Mineral Extraction | Tourism & Recreation |
|---|---|---|---|---|---|---|---|
| Employment (# of Jobs) | 8,708 | 17* | 14* | 0 | 915 | 17* | 6,982 |
| Establishments (# of Establishments) | 460 | 0* | 0* | 0 | 43 | 0* | 391 |
| Wages (Millions of Dollars) | $181.30 | -* | -* | - | $37.70 | -* | $98.10 |
| GDP (Millions of Dollars) | $348.20 | -* | -* | - | $58.9 | -* | $202.00 |

*Uses suppressed data. It was mentioned in passing that the State of Indiana is an impediment for updating this data

Table 27. Status of Great Lakes economy for Lake County, IN (2016) using NOAA ENOW data

| Lake County | All Ocean Sectors | Living Resources | Marine Construction | Ship & Boat Building | Marine Transportation | Offshore Mineral Extraction | Tourism & Recreation |
|---|---|---|---|---|---|---|---|
| Employment (# of Jobs) | 2,298 | 9* | 9* | 0 | 276 | 5* | 1,642 |
| Establishments (# of Establishments) | 163 | 0* | 0* | 0 | 23 | 0* | 122 |
| Wages (Millions of Dollars) | $58.30 | -* | -* | - | $12.9 | -* | $22.1 |
| GDP (Millions of Dollars) | $112.90 | -* | -* | - | $20.2 | -* | $48.3 |

*Uses suppressed data.

Table 28. Status of Great Lakes economy for Porter County, IN (2016) using NOAA ENOW data

| Porter County | All Ocean Sectors | Living Resources | Marine Construction | Ship & Boat Building | Marine Transportation | Offshore Mineral Extraction | Tourism & Recreation |
|---|---|---|---|---|---|---|---|
| Employment (# of Jobs) | 3,893 | 4 | 5* | 0 | 362 | 9* | 3,121 |
| Establishments (# of Establishments) | 168 | 0 | 0* | 0 | 14 | 0* | 149 |
| Wages (Millions of Dollars) | $80.7 | - | -* | - | $16.0 | -* | $42.8 |
| GDP (Millions of Dollars) | $153.6 | - | -* | - | $25.0 | -* | $87.1 |

*Uses suppressed data.

Table 29. Status of Great Lakes economy for LaPorte County, IN (2016) using NOAA ENOW data

| LaPorte County | All Ocean Sectors | Living Resources | Marine Construction | Ship & Boat Building | Marine Transportation | Offshore Mineral Extraction | Tourism & Recreation |
|---|---|---|---|---|---|---|---|
| Employment (# of Jobs) | 2,517 | 4 | 0* | 0 | 277 | 3* | 2,219 |
| Establishments (# of Establishments) | 129 | 0 | 0* | 0 | 6 | 0* | 120 |
| Wages (Millions of Dollars) | $42.3 | - | -* | - | $8.8 | -* | $33.2 |
| GDP (Millions of Dollars) | $81.7 | - | -* | - | $13.7 | -* | $66.6 |

*Uses suppressed data.

Table 30. Change in Great Lakes economy for Indiana's coastal counties (all counties combined) (2005-2016).

| All Counties Combined | All Ocean Sectors | Living Resources | Marine Construction | Ship & Boat Building | Marine Transportation | Offshore Mineral Extraction | Tourism & Recreation |
|---|---|---|---|---|---|---|---|
| Employment (# of Jobs) | 1608 | -16* | -227* | 0* | -390 | -10* | 148.9 |
| Establishments (# of Establishments) | 73 | 0* | -18* | 0* | 1 | 0* | 76 |
| Wages (Millions of Dollars) | $67.70 | -* | $(11.90)* | -* | $(5.8) | -* | $39.9 |
| GDP (Millions of Dollars) | $89.10 | -* | $(22.30)* | -* | $(17.4) | -* | $71.3 |

*Uses suppressed data.

Table 31. Change in Great Lakes economy for Lake County, IN (2005-2016).

| Lake County | All Ocean Sectors | Living Resources | Marine Construction | Ship & Boat Building | Marine Transportation | Offshore Mineral Extraction | Tourism & Recreation |
|---|---|---|---|---|---|---|---|
| Employment (# of Jobs) | 743 | -7* | -218 | 0* | -55 | -3* | 670 |
| Establishments (# of Establishments) | 32 | 0* | -18 | 0* | 4 | 0* | 31 |
| Wages (Millions of Dollars) | $27.8 | -* | $(11.90) | -* | $4.0 | -* | $12.4 |
| GDP (Millions of Dollars) | $39.6 | -* | $(22.30) | -* | $4.5 | -* | $20.8 |

*Uses suppressed data.

Table 32. Change in Great Lakes economy for Porter County, IN (2005-2016).

| Porter County | All Ocean Sectors | Living Resources | Marine Construction | Ship & Boat Building | Marine Transportation | Offshore Mineral Extraction | Tourism & Recreation |
|---|---|---|---|---|---|---|---|
| Employment (# of Jobs) | 930 | -3 | -6* | 0* | -161 | -3* | 711 |
| Establishments (# of Establishments) | 26 | 0 | 0* | 0* | -1 | 0* | 27 |
| Wages (Millions of Dollars) | $38.7 | - | -* | -* | $(1.9) | -* | $18.7 |
| GDP (Millions of Dollars) | $50.4 | - | -* | -* | $(6.2) | -* | $34.1 |

*Uses suppressed data

Table 33. Change in Great Lakes economy for LaPorte County, IN (2005-2016).

| LaPorte County | All Ocean Sectors | Living Resources | Marine Construction | Ship & Boat Building | Marine Transportation | Offshore Mineral Extraction | Tourism & Recreation |
|---|---|---|---|---|---|---|---|
| Employment (# of Jobs) | -65 | -6 | -3 | 0* | -174 | -4* | 108 |
| Establishments (# of Establishments) | 15 | 0 | 0* | 0* | -2 | 0* | 18 |
| Wages (Millions of Dollars) | $1.2 | - | -* | -* | $(7.9) | -* | $8.8 |
| GDP (Millions of Dollars) | $(0.9) | - | -* | -* | $(15.7) | -* | $16.4 |

*Uses suppressed data

2. Understanding existing uses within ocean and Great Lakes waters can help reduce use conflicts and minimize threats when planning for ocean and Great Lakes resources. Using Ocean Reports, indicate the number of uses within the ocean or Great Lakes waters off of your state. For energy uses (including pipelines and cables, see the "Energy and Government Facility Siting" template following). Add additional lines, as needed, to include additional uses that are important to highlight for you state. Note: The Ocean Reports tool does not include data for the Great Lakes states. Great Lakes states should fill in the table as best they can using other data sources.

Table 34. Uses within our Great Lakes waters of Indiana

| **Type of Use** | **Number of Sites** |
|---|---|
| Federal sand and gravel leases *(Completed)* | Unknown |
| Federal sand and gravel leases *(Active)* | Unknown |
| Federal sand and gravel leases *(Expired)* | 25 abandoned |
| Federal sand and gravel leases *(Proposed)* | Unknown |
| Beach Nourishment Projects | 1 – Mount Baldy |
| Ocean Disposal Sites | Unknown |
| Principle Ports *(Number and Total Tonnage)* | 4 |
| Coastal Maintained Channels | Unknown |
| Designated Anchorage Areas | Unknown |
| Danger Zones and Restricted Areas | Unknown |
| Other (please specify) | Unknown |

3. In the table below, characterize how the threats to and use conflicts over ocean and Great Lakes resources in the state's territory's coastal zone have changed since the last assessment.

Table 35. Significant changes to Indiana's Great Lakes resources and uses since the las assessment.

| **Resource/Use** | **Change in the Threat to the Resource or Use Conflict since Las Assessment** (↓, ↑, -, unknown) |
|---|---|
| Benthic Habitat (including coral reefs) | ↓ and ↑ AOC improvements but quagga mussel impacts |
| Living marine resources (fish, shellfish, marine mammals, birds, etc) | ↓ hemi-marsh/marsh birds, ↓ steelhead and yellow perch but also ↑ due to cormorants |
| Sand/gravel | - unknown |
| Cultural/historic | ↓ |
| Other (please specify) | |
| Transportation navigation | - |
| Offshore development[#] | - unknown |
| Energy Production | - unknown |
| Fishing (commercial and recreational) | ↓ and ↑ |
| Recreation/tourism | ↓ |
| Sand/gravel extraction | - unknown |
| Dredge disposal | - unknown |
| Aquaculture | - |
| Other (please specify) – Shipwrecks | ↑ Not being maintained/managed |

4. For the Ocean and Great Lakes resources and uses in the table above that had an increase in threat to the resource or increased use conflict in the state's or territory's coastal zone since the last assessment, characterize the major contributors to that increase. Place an "X" in the column if the use or phenomenon is a major contributor to the increase.

Table 36. Significant changes to Indiana Great Lakes resources and uses since the last assessment.

| | Land-based development | Offshore development | Polluted runoff | Invasive species | Fishing (Comm and Rec.) | Aquaculture | Recreation | Marine transportation | Dredging | Sand/mineral extraction | Ocean acidification | Other (specify) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Example: Living marine resources* | | X | X | X | X | X | | X | X | | | |
| Native plants | X | | X | X | | | X | | | | | |
| Other | | | | | | | | | | | | |

5. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends of ocean and Great Lakes resources or threats to those resources since the last assessment to augment the national data sets.

Data is limited and not clearly organized or available for the State. The LMCP-sponsored shipwreck management plan project identified several threats to the underwater archaeological resources in Lake Michigan waters of Indiana. Observed threats include: anchor scars, anchors embedded in/under wreck, remnant rope tied to wreck structure, and derelict hydraulic dredge piping. All of the threats noted are anthropogenic in origin. The plan recommended increased preserve management and public outreach to increase awareness.

**Management Characterization:**

1. Indicate if the approach is employed by the state or territory and if any significant state- or territory-level changes (positive or negative) in the management of ocean and Great Lakes resources have occurred since the last assessment?

Table 37. Significant changes to management of ocean and Great Lakes resources in Indiana since the last assessment

| Management Category | Employed by State or Territory (Y or N) | CMP Provides Assistance to Locals that Employ (Y or N) | Significant Changes since Last Assessment (Y or N) |
|---|---|---|---|
| Statutes, regulations, policies, or case law interpreting these | Y | Y | Y |
| Regional comprehensive ocean/Great Lakes management plans | Y | Y | Y |
| State comprehensive ocean/Great Lakes management plans | Y | Y | Y |
| Single sector management plans | Y | Y | ? |

2. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    **c.** Characterize the outcomes or likely future outcomes of the changes**.**

a. Indiana Senate Enrolled Act 178: SEA 178 requires that any sand dredged from Lake Michigan under a permit from the Indiana Department of Natural Resources may only be deposited on the beach of Lake Michigan.
b. It was not a 309 driven change.
c. Encourages the use of dredged material from the source of Lake Michigan to be placed on eroded beaches of Lake Michigan.

5. Indicate if your state or territory has a comprehensive ocean or Great Lakes management plan.

| Comprehensive Ocean/Great Lakes Management Plan | State Plan | Regional Plan |
|---|---|---|
| Completed plan (Y/N) (If yes, specify year completed) | N | Y – NIRPC 2050 – June 2011 |
| Under development (Y/N) | N | Y – LAMP 2020 |
| Web address (if available) | NA | https://www.nirpc.org/2040-plan/mobility/2050-plan/ |
| Area covered by plan | NA | Lake, Porter, and LaPorte Counties |

**Enhancement Area Prioritization:**

1. What level of priority is the enhancement area for the coastal management program?

| | |
|---|---|
| **High** | _____ |
| **Medium** | _____ |
| **Low** | __X___ |

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

   The Coastal Advisory Board identified Ocean and Great Lakes Resources as a low priority enhancement area in facilitated discussion of the 309 assessment at a Coastal Advisory Board Meeting in December 2019. A stakeholder survey conducted in December 2019 – January 2020 online to the Wetlands Steering Committee, watershed groups, the regional MS4 organization, the Environmental Management Policy Committee (EMPC), and other select stakeholders also identified Ocean and Great Lakes Resources as a low priority enhancement area.

## **Energy and Government Facility Siting** – Phase I Assessment

**Section 309 Enhancement Objective:** Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities and Government facilities and energy-related activities and Government activities which may be of greater than local significance. §309(a)(8)

### PHASE I (HIGH-LEVEL) ASSESSMENT:

*Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.*

**Resource Characterization:**

1. In the table below, characterize the status and trends of different types of energy facilities and activities in the states or territories coastal zone based on best available data. If available, identify the approximate number of facilities by type. For ocean-facing states and territories (not Great Lakes states), Ocean Reports including existing data for many of these energy facilities and activities.

Table 38. Status and trends in energy facilities and activities in Indiana's coastal zone

| Type of Energy Facility/Activity | Exists in Coastal Zone | | Proposed in CZ | |
|---|---|---|---|---|
| | (# or Y/N) | Change Since Last Assessment (↑, ↓, –, unkwn) | (# or Y/N) | Change Since Last Assessment (↑, ↓, –, unkwn) |
| *Energy Transport* | | | | |
| Pipelines[3] | Y 248 | unknown | ? | unknown |
| Electrical grid (transmission cables) | Y | unknown | | unknown |
| Ports | Y 4 | - | Y | - |
| Liquid natural gas (LNG)[4] | Y | unknown | | unknown |
| Other (please specify) | | | | |
| *Energy Facilities* | | | | |
| Oil and gas | Y | ↑ | Y | unknown |
| Coal | Y | ↓ | N | - |
| Nuclear[5] | N | - | N | - |
| Wind | N | - | N | - |
| Wave[6] | N | - | N | - |
| Tidal[36] | N | - | N | - |
| Current (ocean, lake, river) | N | - | N | - |
| Hydropower | N | - | N | - |

[11]

v/digitalcoast/tools/lca.html" https://www.coast.noaa.gov/digita
lcoast/tools/lca.html. Note that the 2016 data will not be aafter all of the 2016 data is available.
located as well as a list that reflects there general locations: www.nrc.gov/reactors/operating/map-power-reactors.html
[6] For FERC hydrokinetic projects: www.ferc.gov/industries/hydropower/gen-info/licensing/hydrokinetics.asp

| Type of Energy Facility/Activity | Exists in Coastal Zone | | Proposed in CZ | |
|---|---|---|---|---|
| | (# or Y/N) | Change Since Last Assessment (↑, ↓, –, unkwn) | (# or Y/N) | Change Since Last Assessment (↑, ↓, –, unkwn) |
| Ocean thermal energy conversion | N | - | N | - |
| Solar | Y | ↑ | Unkwn | unknown |
| Biomass | N | - | unkwn | unknown |
| Other (please specify) | | | | |

2. If available, briefly list and summarize the results of any additional state- or territory-specific information, data, or reports on the status and trends for energy facilities and activities of greater than local significance in the coastal zone since the last assessment. -- None known

3. Briefly characterize the existing status and trends for federal government facilities and activities of greater than local significance[7] in the state's coastal zone since the last assessment.

   Indiana Dunes National Lakeshore was re-classified as Indiana Dunes National Park.

   **Military Installations in Coastal Region:**
   - Michigan City Coast Guard Station – operational – provides support to Indiana and Southern Michigan waters of Lake Michigan. No change in status since last assessment.
   - Michigan City Naval Armory – operational – used by Army National Guard. No change in status since last assessment.
   - Gary Naval Marine Reserve Training Center – closed – 1999. No change in status since last assessment.

**Management Characterization:**

1. Indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) that could facilitate or impede energy and government facility siting and activities have occurred since the last assessment.

   Table 39. Significant changes in energy and government facility management in Indiana since the last assessment

| Management Category | Employed by State or Territory (Y or N) | CMP Provides Assistance to Locals that Employ (Y or N) | Significant Changes Since Last Assessment (Y or N) |
|---|---|---|---|
| Statutes, regulations, policies, or case law interpreting these | Y | N | N |
| State comprehensive siting plans or procedures | N | N | N |

[7] The CMP should make its own assessment of what Government facilities may be considered "greater than local significance" in its coastal zone, but these facilities could include military installations or a significant federal government complex. An individual federal building may not rise to a level worthy of discussion here beyond a very cursory (if any at all) mention).

2. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

    No significant changes since last Assessment.

**Enhancement Area Prioritization:**

1. What level of priority is the enhancement area for the coastal management program?

| | |
|---|---|
| **High** | _____ |
| **Medium** | _____ |
| **Low** | __X__ |

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

    The Coastal Advisory Board identified Energy and Government Facility Siting as a low priority enhancement area in facilitated discussion of the 309 assessment at a Coastal Advisory Board Meeting in December 2019. A stakeholder survey conducted in December 2019 – January 2020 online to the Wetlands Steering Committee, watershed groups, the regional MS4 organization, the Environmental Management Policy Committee (EMPC), and other select stakeholders also identified Energy and Government Facility Siting as a low priority enhancement area.

# **Aquaculture** – Phase I Assessment

**Section 309 Enhancement Objective:** Adoption of procedures and policies to evaluate and facilitate the siting of public and private aquaculture facilities in the coastal zone, which will enable states to formulate, administer, and implement strategic plans for marine aquaculture. §309(a)(9)

## PHASE I (HIGH-LEVEL) ASSESSMENT:

*Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.*

**Resource Characterization:**

1. In the table below, characterize the existing status and trends of aquaculture facilities in the state's coastal zone based on the best available data. Your state Sea Grant Program may have information to help with this assessment. [8]

| Type of Facility/Activity | Status and Trends of Aquaculture Facilities and Activities | | |
|---|---|---|---|
| | # of Facilities[9] | Approximate Economic Value | Change Since Last Assessment (↑, ↓, –, unkwn) |
| All | 0 | 0 | - |
| | | | |
| | | | |

**2.** If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends or potential impacts from aquaculture activities in the coastal zone since the last assessment.

The Indiana Department of Natural Resources (DNR) issues two types of "aquaculture" permits. One permit – Fish Haulers and Supplies, is very broad and multi-purpose permit that covers most species to sell, produce, or transport fish in Indiana. It covers 38 species of fish. If someone wants to sell, produce or transport something other than one of those 38 species, they need an Aquaculture Permit. The Aquaculture Permit is more specialized than the general Fish Haulers and Suppliers permit. The Aquaculture Permit was mainly established to handle triploid grass carp for vegetation control in private ponds. It also has additional coverage for "other" species that are not covered by the Fish Haulers and Suppliers Permit. The DNR Division of Fish and Wildlife issues approximately 200 Fish Hauler permits and 20 Aquaculture Permits annually statewide.

[8] While focused on statewide aquaculture data rather than just within the coastal zone, the *Census of Aquaculture* (www.agcensus.usda.gov/Publications/2002/Aquaculture/) may help in developing your aquaculture assessment. The 2002 report, updated in 2005, provides a variety of state-specific aquaculture data for 2005 and 1998 to understand current status and recent trends. The next census is scheduled to come out late 2014 and will provide 2013 data.

[9] Be as specific as possible. For example, if you have specific information of the number of each type of facility or activity, note that. If you only have approximate figures, note "more than" or "approximately" before the number. If information is unknown, note that and use the narrative section below to provide a brief qualitative description based on the best information available.

**Management Characterization:**

1. Indicate if the approach is employed by the state or territory and if there have been any state- or territory-level changes (positive or negative) that could facilitate or impede the siting of public or private aquaculture facilities in the coastal zone.

| Management Category | Employed by State or Territory (Y or N) | CMP Provides Assistance to Locals that Employ (Y or N) | Significant Changes Since Last Assessment (Y or N) |
|---|---|---|---|
| Aquaculture comprehensive siting plans or procedures | Y | N | N |
| Other aquaculture statutes, regulations, policies, or case law interpreting these | N | N | N |

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
   a) Describe the significance of the changes;
   b) Specify if they were 309 or other CZM-driven changes;
   c) Characterize the outcomes or likely future outcomes of the changes.

**Enhancement Area Prioritization:**

1. What level of priority is the enhancement area for the coastal management program?

   **High** _____
   **Medium** _____
   **Low** __X___

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

   There are not any Aquaculture facilities in the three Coastal counties as of this time. The Illinois Indiana Sea Grant Program addresses Aquaculture development and promotion. The DNR Division of Fish and Wildlife manages Aquaculture permitting on a statewide basis.

   The Coastal Advisory Board identified Aquaculture as a low priority enhancement area in facilitated discussion of the 309 assessment at a Coastal Advisory Board Meeting in December 2019. A stakeholder survey conducted in December 2019 – January 2020 online to the Wetlands Steering Committee, watershed groups, the regional MS4 organization, the Environmental Management Policy Committee (EMPC), and other select stakeholders also identified Aquaculture as a low priority enhancement area.

# Strategy 2021 - 2025

# Wetland Functional Assessment Outreach

**I. Issue Area(s)**

The proposed strategy or implementation activities will support the following high-priority enhancement areas *(check all that apply)*:

- ☐ Aquaculture
- ☐ Energy & Government Facility Siting
- ☐ Coastal Hazards
- ☐ Ocean/Great Lakes Resources
- ☐ Special Area Management Planning
- ☐ Cumulative and Secondary Impacts
- **X** - Wetlands
- ☐ Marine Debris
- ☐ Public Access

**II. Strategy Description**

**A.** The proposed strategy will lead to, or implement, the following types of program changes *(check all that apply):*

☐ A change to coastal zone boundaries;

☐ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;

**X -** New or revised local coastal programs and implementing ordinances;

☐ New or revised coastal land acquisition, management, and restoration programs;

☐ New or revised special area management plans (SAMP) or plans for areas of particular concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,

☐ - New or revised guidelines, procedures, and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government, and other agencies that will result in meaningful improvements in coastal resource management.

**B. Strategy Goal*:*** Increase technical assistance to government agencies regarding wetland protection with a fully integrated web-based tool – The Indiana Coastal Atlas. This will further previous 309 wetland projects such as the functional assessment.

**C.** Describe the proposed strategy and how the strategy will lead to and/or implement the program changes selected above. If the strategy will only involve implementation activities, briefly describe the program change that has already been adopted, and how the proposed activities will further that program change. (Note that implementation strategies are not to exceed two years.)

Indiana is faced with the elimination of its isolated wetlands protection law, therefore a robust data site that is accessible to the public and coastal communities will improve the State's ability to educate on the local level the value of protecting all wetlands. A fully integrated Coastal Atlas is a strategy that furthers a program change where local decision-making regarding preservation of wetlands for the value of habitat and/or flood storage.

**III. Needs and Gaps Addressed**

Identify what priority needs and gaps the strategy addresses and explain why the proposed program change or implementation activities are the most appropriate means to address the priority needs and

gaps. This discussion should reference the key findings of the assessment and explain how the strategy addresses those findings.

The State of Indiana has a no net loss of wetlands policy. The functional assessment portion of the strategy can be used to identify wetland areas of high function and those that may require restoration. The long-term outcome of successfully implementing these strategy components are higher quality wetlands, more intact aquatic systems and lower potential flood risk along riparian areas.

## IV. Benefits to Coastal Management

Discuss the anticipated effect of the strategy, including the scope and value of the strategy, in advancing improvements in the CMP and coastal management, in general.

The strategy furthers the LMCP vision that coastal resources are preserved, viable, valued and accessible for present and future generations. The strategy provides additional tools that the LMCP and partners can use in planning for the future of these shared coastal resources.

## V. Likelihood of Success

Discuss the likelihood of attaining the strategy goal and program change (if not part of the strategy goal) during the five-year assessment cycle or at a later date. Address the nature and degree of support for pursuing the strategy and the proposed program change and the specific actions the state or territory will undertake to maintain or build future support for achieving and implementing the program change, including education and outreach activities.

The strategy has support at the state level. The needs addressed are raised from the local level. The cross-cutting strategy outline further in this plan outlines the implementation component of this strategy.

## VI. Strategy Work Plan

**Strategy Goal:** Inventory historical wetland data, digitize data and incorporate the data into the Coastal Atlas
**Total Years:** 2023 - 2025
**Total Budget**: $25,000

Year(s): 2023-2025
Description of activities: Inventory historical data, incorporate data and functional assessments integrated into the Coastal Atlas
Major Milestone(s): Library of data and sources, additional chapters and layers incorporated into the Coastal Atlas
Budget: $25,000

## VII. Fiscal and Technical Needs

**A. Fiscal Needs:** If 309 funding is not sufficient to carry out the proposed strategy, identify additional funding needs. Provide a brief description of what efforts the CMP has made, if any, to secure additional state funds from the legislature and/or from other sources to support this strategy.

309 funding will be sufficient to carry out the proposed strategy.

**B. Technical Needs**: If the state does not possess the technical knowledge, skills, or equipment to carry out all or part of the proposed strategy, identify these needs. Provide a brief description of what efforts the CMP has made, if any, to obtain the trained personnel or equipment needed (for example, through agreements with other state agencies).

The State (DNR, IDEM, GIO) possess the technical knowledge to maintain the Coastal Atlas.

**VIII. Projects of Special Merit (Optional)**

None at this time. As the Wetlands Enhancement Area is not an area of National Importance, the LMCP cannot submit a Project of Special Merit for this area.

# *5-Year Budget Summary*

| Strategy Title | Year 1 Funding | Year 2 Funding | Year 3 Funding | Year 4 Funding | Year 5 Funding | Total Funding |
|---|---|---|---|---|---|---|
| Inventory historical data | | | $0 | | | |
| Incorporate data into Coastal Atlas | | | $10,000 | | | |
| Incorporate functional assessments into Coastal Atlas | | | $15,000 | | | |
| **Total Funding** | | | $25,000 | | | |

# Indiana Lake Michigan Coastal Resiliency

**I. Issue Area(s)**

The proposed strategy or implementation activities will support the following high-priority enhancement areas *(check all that apply)*:

- ☐ Aquaculture
- ☐ Energy & Government Facility Siting
- **X** Coastal Hazards
- ☐ Ocean/Great Lakes Resources
- ☐ Special Area Management Planning
- ☐ Cumulative and Secondary Impacts
- ☐ Wetlands
- ☐ Marine Debris
- ☐ Public Access

**II. Strategy Description**

**A.** The proposed strategy will lead to, or implement, the following types of program changes *(check all that apply):*

☐ A change to coastal zone boundaries;

☐ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;

**X** New or revised local coastal programs and implementing ordinances;

☐ New or revised coastal land acquisition, management, and restoration programs;

☐ New or revised special area management plans (SAMP) or plans for areas of particular concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,

☐ New or revised guidelines, procedures, and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government, and other agencies that will result in meaningful improvements in coastal resource management.

**B. Strategy Goal:** Conduct Indiana Coastal Resiliency Coordination Needs Assessment

The Needs Assessment will kick off the Indiana's strategy to address Coastal Resiliency's efforts. The Needs Assessment will also lead into the other Coastal Hazards strategies outlined in this plan: Shoreline Structural Assessment prioritization and scope development using NOAA US Great Lakes Hardened Shorelines classification system to ensure we are covering appropriate structures, and inventory of historical shoreline imagery, further development of the comprehensive Coastal Atlas to include the shoreline imagery. Data products created with be consistent with regional NOAA Digital Coast products and Great Lakes regional data collection efforts. Lastly a work product will include an Indiana Living on the Shorelines Chapter for the Indiana Coastal Atlas.

**C.** Describe the proposed strategy and how the strategy will lead to and/or implement the program changes selected above. If the strategy will only involve implementation activities, briefly describe the program change that has already been adopted, and how the proposed activities will further that program change. (Note that implementation strategies are not to exceed two years.)

The task is to be conducted using current LMCP staff with the assistance of a contractor for professional services. The Program Manager and Coastal Planner will develop the scope of work for the contract, develop the stakeholder list and oversee the contract.

**III. Needs and Gaps Addressed**

Identify what priority needs and gaps the strategy addresses and explain why the proposed program change or implementation activities are the most appropriate means to address the priority needs and gaps. This discussion should reference the key findings of the assessment and explain how the strategy addresses those findings.

**IV. Benefits to Coastal Management**

Discuss the anticipated effect of the strategy, including the scope and value of the strategy, in advancing improvements in the CMP and coastal management, in general.

The strategy furthers the LMCP vision that coastal resources are preserved, viable, valued and accessible for present and future generations. The strategy provides additional tools that the LMCP and partners can use in planning for the future of these shared coastal resources.

**V. Likelihood of Success**

Discuss the likelihood of attaining the strategy goal and program change (if not part of the strategy goal) during the five-year assessment cycle or at a later date. Address the nature and degree of support for pursuing the strategy and the proposed program change and the specific actions the state or territory will undertake to maintain or build future support for achieving and implementing the program change, including education and outreach activities.

This strategy has support at the state and local level. The needs addressed are raised from the local level by partner agencies and organizations such as the Northwest Indiana Regional Planning Commission. The cross-cutting strategy outlined further in this plan outlines the implementation of this strategy.

**VI. Strategy Work Plan**

Using the template below, provide a general work plan that includes the major steps that will lead toward or achieve a program change or implement a previously achieved program change. If the state intends to fund implementation activities for the proposed program change, describe those in the plan as well. The plan should identify a schedule for completing the strategy and include major projected milestones (key products, deliverables, activities, and decisions) and budget estimates. If an activity will span two or more years, it can be combined into one entry (i.e., Years 2-3 rather than Year 2 and then Year 3). While the annual milestones are a useful guide to ensure the strategy remains on track, OCRM recognizes that they may change somewhat over the course of the five-year strategy unforeseen circumstances. The same holds true for the annual budget estimates. Further detailing and adjustment of annual activities, milestones, and budgets will be determined through the annual cooperative agreement negotiation process.

Strategy Goal: Respond to State and local needs regarding Coastal Resiliency in Indiana by continuing the Indiana Coastal Atlas. Assess structures, study erosion rates, develop Living on the Indiana Shoreline and incorporate historical imagery into the Coastal Atlas.
Total Years: 5 years
Total Budget: $350,000

Year(s): 2021
Description of activities: Complete an Indiana Coastal Resiliency Needs Assessment, identify partners, assess costs, establish timeline and deliverables
Major Milestone(s): Creation of a workgroup to guide process and identify priorities and data needs. Creation of a Needs Assessment final document.
Budget: $75,000

Year(s): 2022 - 2023
Description of activities: Begin a series of next step data projects: develop shoreline structural assessment scope and inventory of historical shoreline imagery
Major Milestone(s): 1. Scope developed with cost estimates. 2. Library of imagery completed.
Budget: $25,000

Year(s): 2023 - 2025
Description of activities: Implement the activities identified in the needs assessment incorporating the data projects.
Major Milestone(s): Work group holds regular meetings, data products collected, outreach tools created
Budget: $100,000

Year(s):2022 - 2025
Description of activities: Complete hardened shoreline structure assessment
Major Milestone(s): A final document for DNR Division of Water and assessment date for Indiana Coastal Atlas
Budget: $75,000

Year(s):2022 - 2025
Description of activities: Incorporate shoreline orthophotography and historical imagery into Indiana Map Coastal Atlas as data is received, develop chapters in the Indiana Coastal Atlas
Major Milestone(s): Chapters completed in Indiana Coastal Atlas.
Budget: $50,000

## VII. Fiscal and Technical Needs

**A. Fiscal Needs:** If 309 funding is not sufficient to carry out the proposed strategy, identify additional funding needs. Provide a brief description of what efforts the CMP has made, if any, to secure additional state funds from the legislature and/or from other sources to support this strategy.

No additional funding is needed outside of 309 funding.

**B. Technical Needs**: If the state does not possess the technical knowledge, skills, or equipment to carry out all or part of the proposed strategy, identify these needs. Provide a brief description of what efforts the CMP has made, if any, to obtain the trained personnel or equipment needed (for example, through agreements with other state agencies).

The State possess the staff with the skills to help carry out this strategy.

## VIII. Projects of Special Merit (Optional)

There will not be a submission at this time.

| 5 YEAR BUDGET BY STRATEGY | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Strategy Title** | **2021** | **2022** | **2023** | **2024** | **2025** | **Total Funding** |
| **Coastal Hazards** | Shoreline Structural Assessment prioritization and scope | | $25,000 | | | | $15,000 |
| | Shoreline Structural Assessment | | | | | $75,000 | $75,000 |
| | Indiana Coastal Resiliency Needs Assessment and Implementation | $75,000 | | $50,000 | $50,000 | | $175,000 |
| | Inventory Historical Shoreline Imagery for Indiana Map Coastal Atlas | | $25,000 | | | | $25,000 |
| | Incorporate shoreline orthophotography and historical imagery into Indiana Map Coastal Atlas | | $25,000 | | $25,000 | | $50,000 |
| **Wetlands** | Incorporate wetland functional assessments into Indiana Map Coastal Atlas | | | $25,000 | | | $25,000 |
| | **Total Funding** | **$75,000** | **$75,000** | **$75,000** | **$75,000** | **$75,000** | **$375,000** |

## Summary of Stakeholder and Public Comment

The Indiana Lake Michigan Coastal Program conducted a 309 Enhancement Area priority stakeholder input meeting at its October 2019 Coastal Advisory Board meeting which is open to the public. In addition, LMCP developed a survey listing the 9 enhancement areas and asking stakeholders for their 3 top priorities, their concern regarding those areas, and possible strategies for addressing their concerns. The 309 survey link was emailed to Agency staff, local watershed groups, municipal MS4 groups, the Coastal Advisory Board notification list, and the regional Environmental Policy Management Group (EMPC) notification list. In addition LMCP staff explained the 309 Assessment process at the Coastal Advisory Board Meetings in October, December 2019 and February 2020. LMCP also consulted with agency and NGO partners regarding strategy development for the top priority areas selected.

Through stakeholder and partner consultation, the three two Enhancement Areas priorities are
#1 – Coastal Hazards
#2 – Wetlands

# VII. Acknowledgements

## Funding

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## Special Thanks

The following individuals provided input to this plan:

*Coastal Advisory Board Members*

*State Agency Staff*

*NOAA Staff*

*Northwest Indiana Wetlands Workgroup*

*Survey Participants*