

Report Name	Author	Published year	Description
Shoreline Erosion and Flooding (Erie County)	The Great Lakes Research Institute	1975	Study identifies areas of coastline that are considered hazard areas due to being in danger of being destroyed by receding bluff or floodwaters created by combinations of storm and highwater level. Each hazard zone is assessed as to whether the threat to structures is imminent, potentially hazardous by 2000, or relatively secure from threat within in the next 25 years.
Coastal Erosion Inventory (Harborcreek Township)	Northwest Engineering, Inc.	1981	Study inventories nature of the shoreline in Harborcreek Twp and the erosion processes at work, including the identification of particularly hazardous areas, existing attempts at addressing erosion and their level of success, and recommendations to deal with erosion problems found.
Low Cost Shore Protection: Design Criteria, Adverse Impacts, Exp. Results, & Model Municipal Ordinance	Knuth, Coastal Research Associates, Inc.	1981	Report discusses various types of shore protection structures and determines their relative success in application toward reducing losses due to erosion and recession.
Development of a Predictive Model for Lake Erie Shoreland Stabilization Structures	Coastal Dynamics, Inc.	1982	Study to develop a numerical model to predict shoreline response in the vicinity of groins for the purpose of permit and monitoring evaluation. Analytical equations for longshore and on/offshore transport of beach sand are solved to predict changes in the shoreline and nearshore depth contours in response to groin placement.
Geotechnical Investigation of the Coastal Bluffs of Erie County	Coastal Research Associates, Inc.	1983	Baseline information on selected sites and evaluation of shoreline with respect to geology and physiography, including a summary of recession data, volumetric losses over the period, bathymetry information and a process matrix.
Erosion Master Manual	Knuth, Edinboro University	1985	Three part manual: Section 1 contains technical support information useful in understanding the often complex cause and effect relationships of shoreline change. Section 2 contains the means to establish the correlation between observed phenomena, causal factors, and measures to mitigate losses due to erosion and/or recession. Section 3 consists of aerial oblique photography slides, enlargements, reach indices and analyses.
Lake Erie Coastline Vegetation Study	Not listed	1986	Investigates the role of vegetation in stabilizing the bluffs and determines the species best adapted to various bluff conditions.
New Techniques for Measuring, Calculating and Monitoring the Rate of Bluff Recession: Lake Erie Coastline, Erie County, Pennsylvania	Knuth and Lindenberg, Edinboro University & Erie Co Conservation District	1994	Evaluation of current system used by Department to monitor bluff recession and erosion rates along lake Erie, including determination if the current techniques should be updated and determine the techniques most appropriate.
Bluff Face Use Demonstration Project	Urban Engineers, Inc. & Dahlkemper Landscape Architects	1994	Purpose of project: to review current stairway designs, visit bluff sites to evaluate existing stairways, research new and innovative stairway designs, and to make recommendations and provide specification and design drawings for construction of stairways at two sites on the bluff face at Lake Erie Community Park.
PI Breakwater Sediment Transport Study	Mercyhurst College	1996	Clarify role of breakwaters in maintenance of the nearshore zone and adjacent beaches, in particular addressing the modifications necessary for shoreline management in order to encompass breakwater-induced changes in the dynamics of the system.
Life on the Edge: Integrating Management of Pennsylvania's Lake Erie Bluffs and Shoreline	PA CRM	1997	Report details development of Special Area Management Plan (SAMP) for PA's Lake Erie bluffs and shoreline as part of the Section 309 Assessment and Strategy in 1997 for the PA Coastal Program. The SAMP process identifies 4 categories of goals: shoreline and bluff management, technical assistance, public access and open space, habitat and wetlands evaluation and preservation.

Bluff Recession Monitoring Along the PA Open Water Coastline of Lake Erie	Knuth, Edinboro University & Erie County Conservation District	2000	This report, part of a long-term series of reports on recession funded by the Coastal Zone Management Program.
Shades Beach Park Littoral Drift Investigation	W.F. Baird & Associates Coastal Engineers, Ltd.	2000	Summarizes study to support Townships' ongoing planning efforts for the proposed harbor construction and shoreline improvements, including collection of existing beach and nearshore conditions, assessment of existing littoral drift patterns, prediction of shoreline response to the harbor, and identification of potential downdrift impacts.
Determination of Sediment Loading Potential to Pennsylvania's Lake Erie Coastal Waters	Knuth, Edinboro University	2001	Study to determine sediment load dispersed to Lake Erie as a result of bluff erosion and recession. Included analysis of bluff height, long term recession rates, stratigraphy, and sedimentological analysis of fourteen segments resulted in a sediment budget proposed for each major reach.
Pennsylvania-Lake Erie Shoreline Protection Structures Study	Wetland and Coastal Resources, Inc. & Coastal Dynamics Inc.	2001	Develop and provide DEP with tools to complete evaluations on impacts of placing groins, seawalls, revetments or combinations thereof. Including a literature and historical data review, on-site investigation of nearshore, beach, and bluff conditions in areas of existing structures, numerical model analysis of shallow water wave conditions and shoreline change, predictive model incorporating groin parameters, and review of existing construction standards.
A Study to Determine Bluff Recession Hazard Areas in Erie County, Pennsylvania	Wetland and Coastal Resources, Inc.	2003	In 1975, the State of Pennsylvania commissioned a study to identify recession hazard areas along the PA shoreline of Lake Erie. Based on this study, Bluff Recession Hazard Areas (BRHAs) were determined and subsequent building setback requirements established. Even though bluff recession rates have continued to be updated for each municipality, the BRHAs have not been updated since the original study. During that time, various factors may have contributed to changes in the appropriate locations of BRHAs. The objective of this study was to utilize modern methodologies to determine existing and potential BRHAs along the Pennsylvania coastline of Lake Erie.
Study to Tentatively Designate Bluff Recession Hazard Areas	PA DEP	2004	Update of previous 1975 study to recommend bluff recession hazard areas. DEP utilized the following data sources to tentatively designate BRHAs: 2003 Wetland and Coastal Resources Report, high altitude aerial photography, low altitude oblique-angle color prints, and control point measurement data.
Pennsylvania Great Lakes Services Integration Project - Three reports listed below are components of this project funded by a Growing Greener grant:			
The Lake Erie Bluff Coast of Pennsylvania: A State of Knowledge Report on Coastal Change Patterns, Processes, and Management	Foyle, Penn State Erie	2018	Reviews the international literature pertaining to cohesive bluff coasts with a specific focus on the state of bluff science, engineering, and management. The report identifies gaps in scientific/engineering data and knowledge concerning: (i) bluff behavior and change mechanisms in the natural environment; (ii) forcing agents and mechanisms that induce bluff instability; and (iii) methods and practices in bluff monitoring, analysis, prediction, and hazard management.
The Bluff Erosion Potential (BEP) Index: A Geometric Model to Map Bluff Erosion Hazards on the Pennsylvania Coast of Lake Erie. Part I (Methods & Assumptions)	Foyle, Penn State Erie	2017 (draft)	Provides background and methods for deriving the Bluff Erosion Potential Index. This current version only includes Part 1, describing the methods. Part II, with the actual findings is still in development, with an anticipated release of 2020.