5.1 METHODOLOGY AND TOOLS

2021 HMP Update Changes

- The risk assessment was updated using best available information.
  - Hazard events and associated impacts were researched and summarized from 2013 to 2020
  - 2014-2018 American Community Survey 5-year estimates were utilized.
  - For this update, a customized general building stock was created using building footprints and parcel data from the County, which was supplemented with 2013 MOD-IV tax assessor data and 2019 RS Means replacement cost value for building and content replacement costs. This data was used to develop a structure-level building inventory and estimate replacement cost value for each building to value exposure and losses to the hazards of concern.
  - A critical facility inventory was created using data from Cape May County and County jurisdictions. Attribute information (e.g., back-up power, ownership, structure type, etc.) for each critical facility provided by the County was referenced and supplemented with default attributes defined by regional assumptions provided by Hazus.
  - Lifelines were identified in the critical facility inventory to align with FEMA's lifeline definition.
  - Hazus-MH v4.2 was used to estimate potential impacts to the flood, wind and seismic hazards.
  - Best available hazard data was used as described in this section.

The following summarizes the asset inventories, methodology and tools used to support the risk assessment process.

5.1.1 Asset Inventories

Cape May County assets were identified to assess potential exposure and loss associated with the hazards of concern. For the HMP update, Cape May County assessed exposure vulnerability of the following types of assets: population, buildings and critical facilities/infrastructure, new development, and the environment. Some assets may be more vulnerable because of their physical characteristics or socioeconomic uses. To protect individual privacy and the security of critical facilities, information on properties assessed is presented in aggregate, without details about specific individual personal or public properties.

The risk assessment included the collection and use of an expanded and enhanced asset inventory to estimate hazard exposure and vulnerability.

Population

Total population statistics from the 2014-2018 American Community Survey 5-year estimate were used to estimate the exposure and potential impacts to the County's population in place of the 2010 U.S. Census block estimates. Population counts at the jurisdictional level were averaged among the residential structures in each jurisdiction of the County to estimate the population at the structure level. This estimate is a more precise distribution of population across the County compared to only using the Census block or Census tract boundaries. Limitations of these analyses are recognized, and thus the results are used only to provide a general estimate for planning purposes.

As discussed in Section 4 (County Profile), research has shown that some populations are at greater risk from hazard events because of decreased resources or physical abilities. Vulnerable populations in Cape May County included in the risk assessment are children, elderly, population below the poverty level, non-English speaking individuals, and persons institutionalized with a disability.

Buildings

The updated building stock inventory was created using building footprints and parcel data from the County, which was supplemented with 2013 MOD-IV tax assessor data and 2019 RS Means replacement cost value for building and content replacement costs. Attributes provided in the spatial files were used to further define each structure in terms of occupancy class, construction type, year built, foundation type, etc. Default information was used to fill in the gaps for buildings that could not be assigned attributes from the assessor's data or from the data provided by the County and jurisdictions. The centroid of each building footprint was used to estimate the building location. If a building footprint was not located due to limited spatial data, parcels that had assessor's information supporting the presence of a building were given a centroid to represent the location of a structure. Structural and content replacement cost values (RCV) were calculated for each building utilizing available assessor data and RS Means 2019 values; a regional location factor for Cape May County was applied (1.12 for non-residential structures and 1.2 for residential structures). Replacement cost value is the current cost of returning an asset to its pre-damaged condition, using present-day cost of labor and materials. Total replacement cost value consists of both the structural cost to replace a building and the estimate value of contents of a building. The occupancy classes available in Hazus were condensed into the following categories (residential, commercial, industrial, agricultural, religious, governmental, and educational) to facilitate the analysis and the presentation of results. Residential loss estimates address both multi-family and single-family dwellings.

Critical Facilities and Lifelines

A **lifeline** provides indispensable service that enables the continuous operation of critical business and government functions, and is critical to human health and safety, or economic security (FEMA).

An updated critical facility inventory was created for this hazard mitigation plan, which includes essential facilities, utilities, transportation features and user-defined facilities. The critical facility dataset was reviewed by the County and jurisdictions for accuracy, additions or deletions of new/moved critical assets, identification of backup power for each asset (if known) and whether the critical facility is considered a lifeline in accordance with FEMA's definition; refer to Appendix J (Critical Facilities). To protect individual privacy and the security of assets, information is presented in aggregate, without details about specific individual properties or facilities.

Environment and Land Use Area

National land use land cover data updated by the New Jersey Department of Environmental Protection (NJ DEP) in 2019 was used to assess land use characteristics of the County. This land use land cover data represents land use land cover in 2015, and is updated from the 2012 dataset. This dataset helped to inform spatial areas of residential, non-residential, and natural land use areas.

The residential land use category included the following land use types: mixed residential; residential, high density or multiple dwelling; residential, rural, single unit; residential, single unit, low density; and residential, single unit, medium density. The non-residential land use category included all other land use types.

The natural land use category was created using a sub-group of the non-residential land use category, including the following land use types: artificial lakes; Atlantic ocean; Atlantic white cedar wetlands; bare exposed rock,

rock slides, etc.; beaches; coniferous brush/shrubland; coniferous forest (>50% crown closure); coniferous forest (10-50% crown closure); coniferous scrub/shrub wetlands; coniferous wooded wetlands; deciduous brush/shrubland; deciduous forest (>50% crown closure); deciduous forest (10-50% crown closure); deciduous scrub/shrub wetlands; deciduous wooded wetlands; disturbed tidal wetlands; disturbed wetlands (modified); freshwater tidal marshes; herbaceous wetlands; managed wetland in built-up maintained rec area; managed wetland in maintained lawn greenspace; mixed deciduous/coniferous brush/shrubland; mixed forest (>50% coniferous with >50% crown closure); mixed forest (>50% coniferous with 10-50% crown closure); mixed forest (>50% deciduous with >50% crown closure); mixed forest (>50% deciduous with 10-50% crown closure); mixed scrub/shrub wetlands (coniferous dom.); mixed scrub/shrub wetlands (deciduous dom.); mixed wooded wetlands (coniferous dom.); mixed wooded wetlands (deciduous dom.); natural lakes; old field (< 25% brush covered); open tidal bays; phragmites dominate coastal wetlands; phragmites dominate interior wetlands; phragmites dominate old field; saline marsh (high marsh); saline marsh (low marsh); streams and canals; tidal mud flat; tidal rivers, inland bays, and other tidal waters; undifferentiated barren lands; upland rights-of-way undeveloped; and wetland rights-of-way.

New Development

In addition to assessing the vulnerability of the built environment, Cape May County examined recent development over the last 5 years and anticipated new development in the next 5 years. Each jurisdiction was asked to provide a list by parcel ID or address of major development that has taken place within these timeframes.

New development was separated by anticipated in the next five years and recently developed over the last five years. An exposure analysis was conducted in GIS to determine hazard exposure to these development sites. Projects that are built on multiple parcels were assessed as one unit, so if one parcel identified within the project boundary intersected a spatial hazard layer, the entire project was considered 'exposed' to the hazard area of concern.

Identifying these changes and integrating new development into the risk assessment provides communities information to consider when developing the mitigation strategy to reduce these vulnerabilities in the future. The identified new development is listed in Section 4 (County Profile) and hazard exposure analysis results are presented in Section 9 (Jurisdictional Annexes) as a table in each annex.

5.1.2 Methodology

To address the requirements of the DMA 2000 and better understand potential vulnerability and losses associated with hazards of concern, Cape May County used standardized tools, combined with local, state, and federal data and expertise to conduct the risk assessment. Three different levels of analysis were used depending upon the data available for each hazard as described below. Table 5.1-1 summarizes the type of analysis conducted by hazard of concern.

(1) Historic Occurrences and Qualitative Analysis – This analysis includes an examination of historic impacts to understand potential impacts of future events of similar size. In addition, potential impacts and losses are discussed qualitatively using best available data and professional judgement.
(2) Exposure Assessment – This analysis involves overlaying available spatial hazard layers, or hazards with defined extent and locations, with assets in GIS to determine which assets are located in the impact area of the hazard. The analysis highlights which assets are located in the hazard area and may incur future impacts.
(3) Loss estimation — The FEMA Hazus modeling software was used to estimate potential losses for the following hazards: flood, earthquake, hurricane. In addition, an examination of historic impacts and an exposure assessment was conducted for these spatially-delineated hazards.

Table 5.1-1. Summary of Risk Assessment Analyses

Hazard	Population	General Building Stock	Critical Facilities	New Development
Climate Change and Sea Level Rise	E	E	E	E
Coastal Erosion	E	E	E	E
Disease Outbreak	Q	Q	Q	E
Drought	Q	Q	Q	E
Flood	E, H	E, H	E, H	E
Hurricane and Tropical Storm	E, H	E, H	E, H	E
Nor'Easter	Q	Q	Q	E
Severe Weather	Q	Q	Q	E
Severe Winter Weather	Q	Q	Q	E
Tsunami	Q	Q	Q	E
Wildfire	E	E	E	E

E – Exposure analysis; H – HAZUS analysis; Q – Qualitative analysis

Hazards U.S. – Multi-Hazard (Hazus-MH)

In 1997, FEMA developed a standardized model for estimating losses caused by earthquakes, known as Hazards U.S. or Hazus. Hazus was developed in response to the need for more effective national-, state-, and community-level planning and the need to identify areas that face the highest risk and potential for loss. Hazus was expanded into a multi-hazard methodology, Hazus-MH with new models for estimating potential losses from wind (hurricanes) and flood (riverine and coastal) hazards. Hazus is a Geographic Information System (GIS)-based software tool that applies engineering and scientific risk calculations, which have been developed by hazard and information technology experts, to provide defensible damage and loss estimates. These methodologies are accepted by FEMA and provide a consistent framework for assessing risk across a variety of hazards. The GIS framework also supports the evaluation of hazards and assessment of inventory and loss estimates for these hazards.

Hazus uses GIS technology to produce detailed maps and analytical reports that estimate a community's direct physical damage to building stock, critical facilities, transportation systems and utility systems. To generate this information, Hazus uses default Hazus provided data for inventory, vulnerability, and hazards; this default data can be supplemented with local data to provide a more refined analysis. Damage reports can include induced damage (inundation, fire, threats posed by hazardous materials and debris) and direct economic and social losses (casualties, shelter requirements, and economic impact) depending on the hazard and available local data. Hazus-MH's open data architecture can be used to manage community GIS data in a central location. The use of this software also promotes consistency of data output now and in the future and standardization of data collection and storage. More information on Hazus-MH is available at http://www.fema.gov/hazus.

In general, modeled losses were estimated in the program using user-defined flood depth grids for the flood analysis (e.g. 1-percent and 0.2-percent annual chance flood events) and probabilistic analyses were performed to develop expected/estimated distribution of losses (mean return period losses) for hurricane wind and seismic hazards. The probabilistic model generates estimated damages and losses for specified return periods (e.g., 100- and 500-year). Table 5.1-2 displays the various levels of analyses that can be conducted using the Hazus-MH software.

Table 5.1-2. Summary of Hazus-MH Analysis Levels

HAZUS-MH Analysis Levels	
Level 1	Hazus-MH provided hazard and inventory data with minimal outside data collection or mapping.
Level 2	Analysis involves augmenting the Hazus-MH provided hazard and inventory data with more recent or detailed data for the study region, referred to as "local data"

HAZUS-MH Analysis Levels	
Level 3	Analysis involves adjusting the built-in loss estimation models used for the hazard loss analyses. This Level is typical done in conjunction with the use of local data.

Climate Change and Sea Level Rise

All of Cape May County is impacted by climate change. A qualitative analysis assessed the impacts of climate change referencing sources from the U.S. Climate Resilience Toolkit, NOAA, New Jersey Climate Adaptation Alliance, and the 2019 New Jersey State Hazard Mitigation Plan.

In addition, projected sea level rise 2017 data (in one-foot increments) available from the NOAA Office of Coastal Management (https://coast.noaa.gov/slrdata/) was used to understand the assets at risk of future sea level rise per each jurisdiction. Please note these sea level rise projections do not include additional storm surge due to a hurricane or Nor'easter. Sea level rise 1-foot through 4-foot hazard area extents were referenced in the exposure analysis. Asset data (population, building stock, critical facilities, and new development) were used to support an evaluation of assets exposed and potential impacts and losses. To determine what assets are exposed to sea level rise, the County's assets were overlaid with the hazard area. Assets with their centroid located in the hazard area were totaled to estimate the number and values exposed to sea level rise.

Coastal Erosion

Best available data was used to assess Cape May County's vulnerability to coastal erosion. To help understand the geographic distribution of coastal risk, the Limit of Moderate Wave Action (LiMWA) boundary was referenced from FEMA's 2014 Preliminary DFIRM and 2017 Effective DFIRM flood data. The LiMWA boundary was selected to assess coastal erosion because it represents land area that is susceptible to wave action. Wave action can be a driver for coastal erosion in Cape May County. Asset data (population, building stock, critical facilities, and new development) were used to support an evaluation of assets exposed and potential impacts and losses. To determine what assets are exposed to coastal erosion, the County's assets were overlaid with the hazard area. Assets with their centroid located in the hazard area were totaled to estimate the number and values exposed to coastal erosion.

Disease Outbreak

Disease outbreak is a new hazard of concern for Cape May County. All of Cape May County is exposed to disease outbreak events. A qualitative assessment was conducted for the disease outbreak hazard. Research from the Centers for Disease Control and Prevention and the State of New Jersey was utilized to qualitatively assess the most recent COVID-19 outbreak.

Drought

Drought is a new hazard of concern for Cape May County. To assess the vulnerability of Cape May County to drought and its associated impacts, a qualitative assessment was conducted. The United States Department of Agriculture (USDA) Census of Agriculture 2017 was used to estimate economic impacts. Information regarding the number of farms, land area in farms, etc. was extracted from the report and summarized in the vulnerability assessment. Additional resources from several scientific studies, the Office of the New Jersey State Climatologist, and the Intergovernmental Panel on Climate Change (IPCC) were used to assess the potential impacts to the population from a drought event.

Flood

The 1-percent and 0.2-percent chance flood events were examined to evaluate Cape May County's risk and vulnerability to the coastal and riverine flood hazard. These flood events are generally those considered by planners and evaluated under federal programs such as the NFIP.

The effective Cape May County FEMA Digital Flood Insurance Rate Map (DFIRM) published in 2017 and the preliminary DFIRM published in 2014 was used to evaluate exposure and determine potential future losses. A depth grid for the 1-percent annual chance flood event was generated using the effective and preliminary DFIRMs and the 2014 post Sandy 1-meter resolution Digital Elevation Model (DEM). The DEM tiles were mosaiced and the holes where existing water surfaces occur (i.e., water bodies and streams/rivers) were filled in using a value of zero. The depth grid was separated by the coastal hazard area and the riverine hazard area, which were defined by the 1986 New Jersey Department of Environmental Protection, Office of Environmental Analysis, and the Coast Survey Limited head of tide points. The head of tide points split AE zones into coastal and riverine zones where the AE zone on the inland side of the head of tide is characterized as the riverine hazard area and the AE zone on the seaward side of the head of tide is characterized as the coastal hazard area. All A zones depicted in the preliminary and effective DFIRMs are characterized as riverine hazard areas. Additionally, VE and AO zones are characterized as coastal hazard areas. The final depth grid was integrated into the Hazus-MH v4.2 coastal flood model used to estimate potential losses for the 1-percent annual chance flood event.

To estimate exposure to the 1-percent and 0.2-percent annual chance flood events, the DFIRM flood boundaries were overlaid on centroids of updated assets (population, building stock, critical facilities, and new development). Centroids that intersected the flood boundaries were totaled to estimate the building replacement cost value and population vulnerable to the flood inundation areas. A Level 2 Hazus coastal and riverine flood analysis was performed. Both the critical facility and building inventories were formatted to be compatible with Hazus and its Comprehensive Data Management System (CDMS). Once updated with the inventories, the Hazus coastal and riverine flood models were run to estimate potential losses in Cape May County for the 1-percent annual chance flood event. A user-defined analysis was also performed for the building stock. Buildings located within the floodplain were imported as user-defined facilities to estimate potential losses to the building stock at the structural level. Hazus calculated the estimated potential losses to the population (default 2010 U.S. Census data), potential damages to the general building stock, and potential damages to critical facility inventories based on the coastal and riverine depth grids generated and the default Hazus damage functions in the flood model.

Furthermore, locations identified as repetitive loss properties were provided by FEMA Region 2 and summarized to obtain an understanding of repetitive flood loss areas. These repetitive loss properties were geocoded using Geocodio and displayed on maps in the flood section and Jurisdictional Annexes (Volume II Section 9). FEMA Region 2 also provided a summary of the number of NFIP policies and claims for each jurisdiction.

Hurricane and Tropical Storm

A Hazus probabilistic analysis was performed to analyze the wind hazard losses for Cape May County for the 100- and 500-year mean return period events. The probabilistic Hazus hurricane model activates a database of thousands of potential storms that have tracks and intensities reflecting the full spectrum of Atlantic hurricanes observed since 1886 and identifies those with tracks associated with Cape May County. Hazus contains data on historic hurricane events and wind speeds. It also includes surface roughness and vegetation (tree coverage) maps for the area. Surface roughness and vegetation data support the modeling of wind force across various types of land surfaces. Default demographic and updated building and critical facility inventories in Hazus were used for the analysis. Although damages are estimated at the census tract level, results were presented at the municipal level. Since there are multiple census tracts that contain more than one jurisdiction, a density analysis was used to extract the percent of building structures that fall within each tract and jurisdiction. The percentage was multiplied against the results calculated for each tract and summed for each jurisdiction.

In addition to estimating potential losses due to wind, an exposure analysis was conducted using the 2014/2016 Sea – Lake Overland Surge from Hurricanes – SLOSH Model, which represents potential flooding from worst-case combinations of hurricane direction, forward speed, landfall point, and high astronomical tide. Please note

these inundation zones do not include riverine flooding caused by hurricane surge or inland freshwater flooding. The model, developed by the NOAA Office for Coastal Management forecast surges that occur from wind and pressure forces of hurricanes, considers only storm surge height, and does not consider the effects of waves. The SLOSH spatial data includes boundaries for Category 1 through Category 4 hurricane events.

Asset data (population, building stock, critical facilities, and new development) were used to support an evaluation of assets exposed and potential impacts and losses associated with this hazard. To determine what assets are exposed to storm surge, the County's assets were overlaid with the SLOSH hazard area. Assets with their centroid located in the hazard area were totaled to estimate the replacement cost value (structure and content) and population exposed to the hazard.

Nor'Easter

All of Cape May County is exposed to Nor'Easters. A qualitative assessment was conducted for the Nor'Easter hazard with supporting information discussed in other hazard sections (e.g., Hurricane, Severe Weather). Information from the NOAA, the EPA, and Cape May County were used to assess the potential impacts to the County's assets.

Severe Weather

All of Cape May County is exposed to severe weather events. A qualitative assessment was conducted for the severe storm hazard with supporting information discussed in other hazard sections (e.g., Flood, Hurricane). Information from several research articles, the National Weather Service, and Cape May County were used to assess the potential impacts to the County's assets.

Severe Winter Weather

All of Cape May County is exposed and vulnerable to the severe winter weather hazard. In general, structural impacts include damage to roofs and building frames, rather than building content. Current modeling tools are not available to estimate specific losses for this hazard. A percentage of the custom-building stock structural replacement cost value was utilized to estimate damages that could result from winter storm conditions (i.e., 1-percent, 5-percent, and 10-percent of total replacement cost value). Given professional knowledge and currently available information, the potential losses for this hazard are considered to be overestimated; hence, providing a conservative estimate for losses associated with winter storm events.

Tsunami

All of Cape May County is exposed and vulnerable to the tsunami hazard. A qualitative assessment was conducted for the tsunami hazard with supporting information discussed in other hazard sections (e.g., Flood, Hurricane). Information from the Caribbean Disaster Emergency Agency, International Tsunami Information Center, NOAA, and several research articles were used to assess the potential impacts to the County's assets.

Wildfire

The New Jersey Department of Environmental Protection (NJ DEP) and the New Jersey Forest Fire Service (NJFFS) 2009 high, very high, and extreme wildfire fuel hazard area boundaries and the 2010 Wildland-Urban Interface/Intermix obtained through the SILVIS Laboratory, Department of Forest Ecology and Management, University of Wisconsin – Madison, was referenced to delineate wildfire hazard areas. The NJ DEP and NJFFS wildfire high, very high, and extreme fuel hazard areas were aggregated into one location. The University of Wisconsin – Madison wildland fire hazard areas are based on the 2010 Census and 2006 National Land Cover Dataset and the Protected Areas Database. For this risk assessment, the high-, medium-, and low-density

interface areas were combined and used as the "Interface" hazard area, and the high-, medium-, and low-density intermix areas were combined and used as the "Intermix" hazard areas.

Asset data (population, building stock, critical facilities, and new development) were used to support an evaluation of assets exposed and potential impacts and losses associated with this hazard. To determine what assets are exposed to wildfire, available and appropriate GIS data were overlaid with the hazard area; Assets with their centroid located in the hazard area were totaled to estimate the totals and values exposed to a wildfire event.

Considerations for Mitigation and Next Steps

The following items are to be discussed for considerations for the next plan update to enhance the vulnerability assessment:

- All Hazards
  - Utilize updated and current demographic data. If 2020 U.S. Census demographic data is available at the U.S. Census block level during the next plan update, use the census block estimates and residential structures for a more precise distribution of population, or the current American Community Survey 5-Year Estimate populations counts at the Census tract level.
- Climate Change and Sea Level Rise
  - Implement climate risk models into the next plan update to project changes such as plant density, water quality/quantity, or carbon emissions.
  - Implement updated sea level rise data to assess the future flood hazard risk for structures along the coast.
- Coastal Erosion
  - If available during the next plan update, update the risk assessment using a comprehensive coastal erosion hazard area map.
  - Collect data on historic costs incurred to reconstruct buildings, cultural resources and/or infrastructure due to coastal erosion impacts.
- Disease Outbreak
  - Assess trends in outbreaks and review the monetary impacts COVID-19 had on Cape May County.
- Drought
  - If available during the next plan update, update agricultural USDA data using more recent information.
- Flood
  - The general building stock inventory can be updated to include attributes regarding first floor elevation and foundation type (basement, slab on grade, etc.) to enhance loss estimates.
  - Conduct a Hazus-MH loss analysis for more frequent flood events (e.g., 10 and 50-year flood events).
  - Use FEMA's Flood Assessment Structure Tool (FAST) tool for a quicker, simpler flood analysis at the structure level.
  - Further refine the repetitive loss area analysis.
  - Continue to expand and update urban flood areas to further inform mitigation.
- Hurricanes and Tropical Storms
  - The general building stock inventory can be updated to include attributes regarding protection against strong winds, such as hurricane straps, to enhance loss estimates.
  - Estimate storm surge related losses using the Hazus flood model if the data is available.
  - If available during the next plan update, update the risk assessment using a comprehensive coastal erosion hazard area map and updated sea level rise inundation areas.

- Collect data on historic costs incurred to reconstruct buildings, cultural resources and/or infrastructure due to coastal erosion impacts.
- Integrate evacuation route data that is currently being developed.

- Tsunami
  - If the tsunami model in Hazus-MH is updated for the East Coast, use Hazus-MH to assess the tsunami hazard of concern for the County.
- Wildfire
  - General building stock inventory can be updated to include attributes such as roofing material or fire detection equipment or integrate distance to fuels as another measure of vulnerability.

5.1.3 Data Source Summary

Table 5.1-3 summarizes the data sources used for the risk assessment for this plan.

Table 5.1-3. Risk Assessment Data Documentation

Data	Source	Date	Format
Population data	U.S. Census Bureau; American Community Survey 5-Year Estimates	2010; 2018	Digital (GIS) format
Building footprints	Cape May County	2020	Digital (GIS) format
Tax Assessor data	Cape May County; MOD-IV	2020/2013	Digital (GIS/Tabular) format
Critical facilities	Cape May County Steering Committee and Planning Committee	2020	Digital (GIS) format
Post Sandy 1-meter resolution Digital Elevation Model (DEM)	NOAA	2014	Digital (GIS) format
1-Percent and 0.2-Percent Annual Chance Flood Event	FEMA Preliminary/Effective DFIRMs	2014/2017	Digital (GIS) format
Coastal Hazard Area	FEMA Preliminary/Effective DFIRM LiMWA Lines	2014/2017	Digital (GIS) format
Wildfire Fuel Hazard; Wildland-Urban Interface/Intermix	NJDEP NFFS; University of Wisconsin - Madison	2009/2010	Digital (GIS) format
Census of Agriculture	USDA	2017	Digital (PDF Report) format
Sea Level Rise Hazard Area	NOAA	2017	Digital (GIS) Format
Sea-Lake Overland Surge from Hurricanes (SLOSH) Model	NOAA	2014/2016	Digital (GIS) Format
New Development Data	Cape May County Coastal Resilience Initiative/Cape May County Planning Department	2020	Digital (GIS) Format

Limitations

Loss estimates, exposure assessments, and hazard-specific vulnerability evaluations rely on the best available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from the following:

1) Approximations and simplifications necessary to conduct such a study
2) Incomplete or dated inventory, demographic, or economic parameter data
3) The unique nature, geographic extent, and severity of each hazard
4) Mitigation measures already employed by the participating municipalities
5) The amount of advance notice residents have to prepare for a specific hazard event

6) Uncertainty of climate change projections

These factors can result in a range of uncertainty in loss estimates, possibly by a factor of two or more. Therefore, potential exposure and loss estimates are approximate. These results do not predict precise results and should be used to understand relative risk. Over the long term, Cape May County will collect additional data to collect additional data, update and refine existing inventories, to assist in estimating potential losses.

Potential economic loss is based on the present value of the general building stock utilizing best available data. The County acknowledges significant impacts may occur to critical facilities and infrastructure as a result of these hazard events causing great economic loss. However, monetized damage estimates to critical facilities and infrastructure, and economic impacts were not quantified and require more detailed loss analyses. In addition, economic impacts to industry such as tourism and the real-estate market were not analyzed.