



# CLIMATE CHANGE AND TRANSPORTATION

NJ PACT STAKEHOLDER SESSION

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

18 SEPTEMBER 2020

# NJ PACT: OVERVIEW

Executive Order 89



Executive Order 100



Administrative Order 2020-01



Land Use Rules FHA, CZM, FWW- Stakeholdering and Revision

# OBJECTIVE

**DEVELOPING A REGULATORY FRAMEWORK THAT HELPS TO ENSURE THAT  
THE TRANSPORTATION NETWORK IS PROTECTED AGAINST CLIMATE  
THREATS BOTH TODAY AND TOMORROW**



# GUIDING PRINCIPLES

1. **Develop** regulatory standards that are commensurate with the anticipated level of risk
2. **Provide** tools to help homeowners, developers, and public entities make informed decisions about their investments
  - Property owners and public agencies should inventory their investments to determine vulnerability and risk (a.k.a. “don’t wait for the State”)
  - Local communities can adopt resiliency standards
3. **Evaluate**
  - The intended use of a proposed structure (public, private, recreational, etc.)
  - The criticality of the proposed structure (schools, hospitals, evacuation routes)
  - The likelihood the structure is proposed in an area that will be inundated during its anticipated lifetime – either by daily tides or in flood conditions

# FUTURE INUNDATION & FLOOD DAMAGE

1

Establish a new regulatory area known as the **inundation risk zone** to account for land inundated by SLR

2

Redefine the **tidal** flood hazard area to account for future expansion due to SLR

3

Redefine the **fluvial** flood hazard area to account for future expansion due to increased precipitation and runoff

# INUNDATION AND FLOOD IMPACTS

RUTGERS UNIVERSITY'S SCIENCE AND TECHNICAL ADVISORY PANEL (STAP) REPORT INDICATES A 50% PROBABILITY THAT SEA LEVEL RISE WILL EXCEED 3.3 FEET AND A 17% PROBABILITY THAT SEA LEVEL RISE WILL EXCEED 5.1 FEET BY 2100 ASSUMING MODERATE EMISSIONS.

## *Sea-level rise:*

Table ES-1: New Jersey Sea-Level Rise above the year 2000 (1991-2009 average) baseline (ft)\*

		2030	2050	2070			2100			2150		
				Emissions								
	Chance SLR Exceeds			Low	Mod.	High	Low	Mod.	High	Low	Mod.	High
Low End	> 95% chance	0.3	0.7	0.9	1	1.1	1.0	1.3	1.5	1.3	2.1	2.9
Likely Range	> 83% chance	0.5	0.9	1.3	1.4	1.5	1.7	2.0	2.3	2.4	3.1	3.8
	~50 % chance	0.8	1.4	1.9	2.2	2.4	2.8	3.3	3.9	4.2	5.2	6.2
	<17% chance	1.1	2.1	2.7	3.1	3.5	3.9	5.1	6.3	6.3	8.3	10.3
High End	< 5% chance	1.3	2.6	3.2	3.8	4.4	5.0	6.9	8.8	8.0	13.8	19.6

\*2010 (2001-2019 average) Observed = 0.2 ft

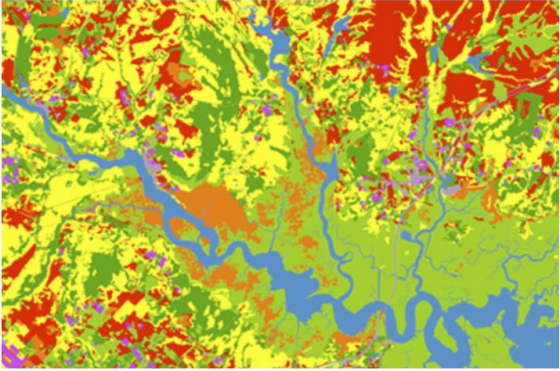


**THE IMPACT OF  
SEA LEVEL RISE ON  
DRY LAND WILL  
CHANGE OVER  
TIME.**





# TOOLS TO UNDERSTAND CLIMATE CHANGE

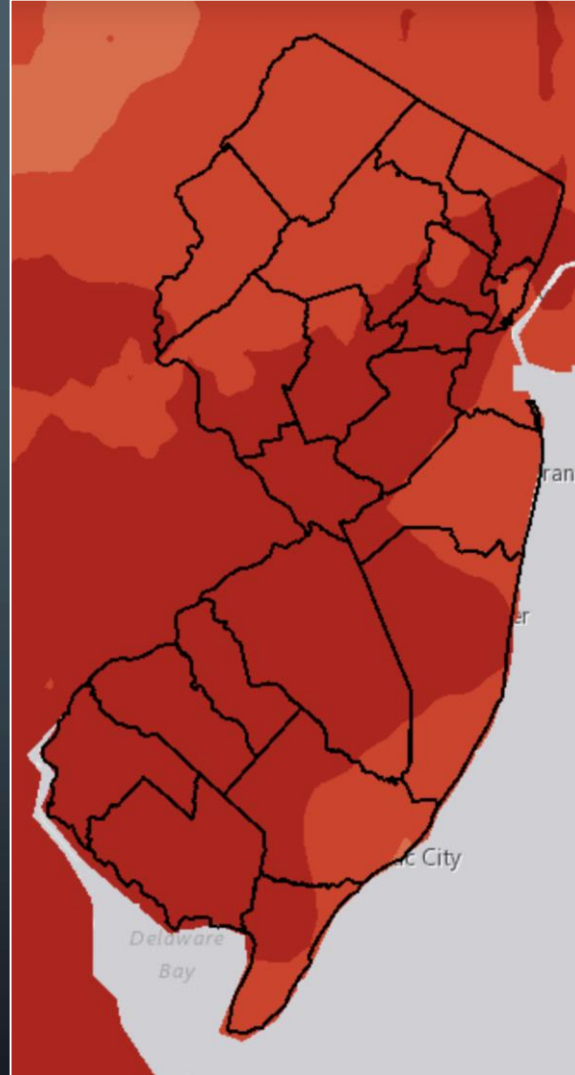


## NJ Forest Adapt

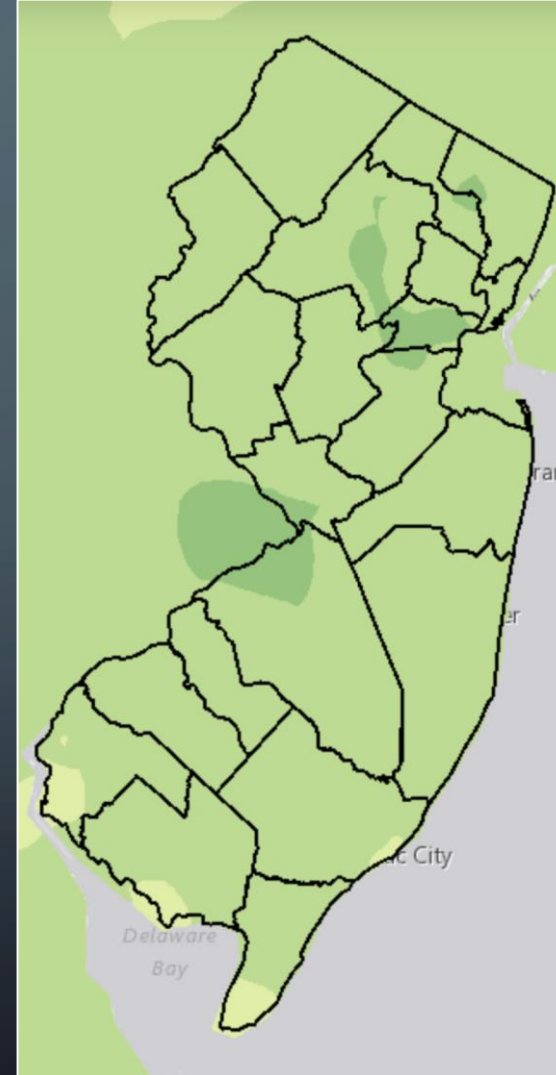
### Forest management tool

This mapping tool enables users to visualize data over multiple timelines and climate change scenarios. Users can explore changes in plant hardiness and heat zones, species distribution, daily minimum and maximum temperatures, heating and cooling degree days, and precipitation. Additional map layers include forest carbon density, canopy cover, impervious surfaces, forest types, pest and disease, wildfire fuel hazard, and more.

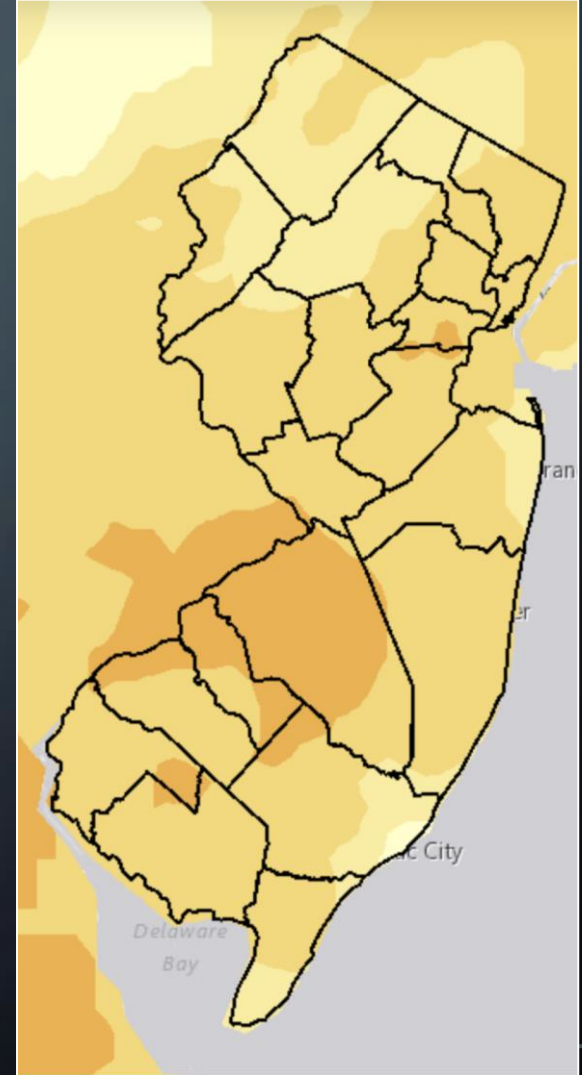
Mean Max Daily Temp, 2050-70



Mean Monthly Precipitation, 2050-70

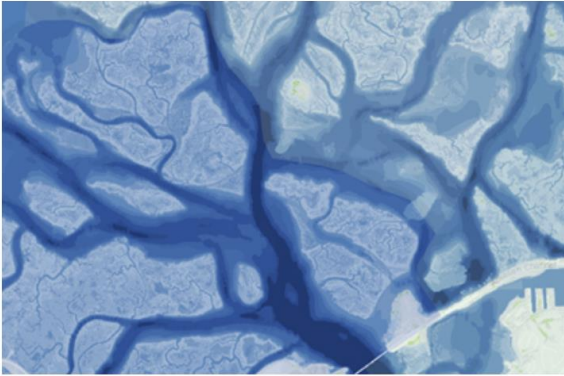


Days Above 95-deg, 2050-70





# TOOLS TO UNDERSTAND CLIMATE CHANGE

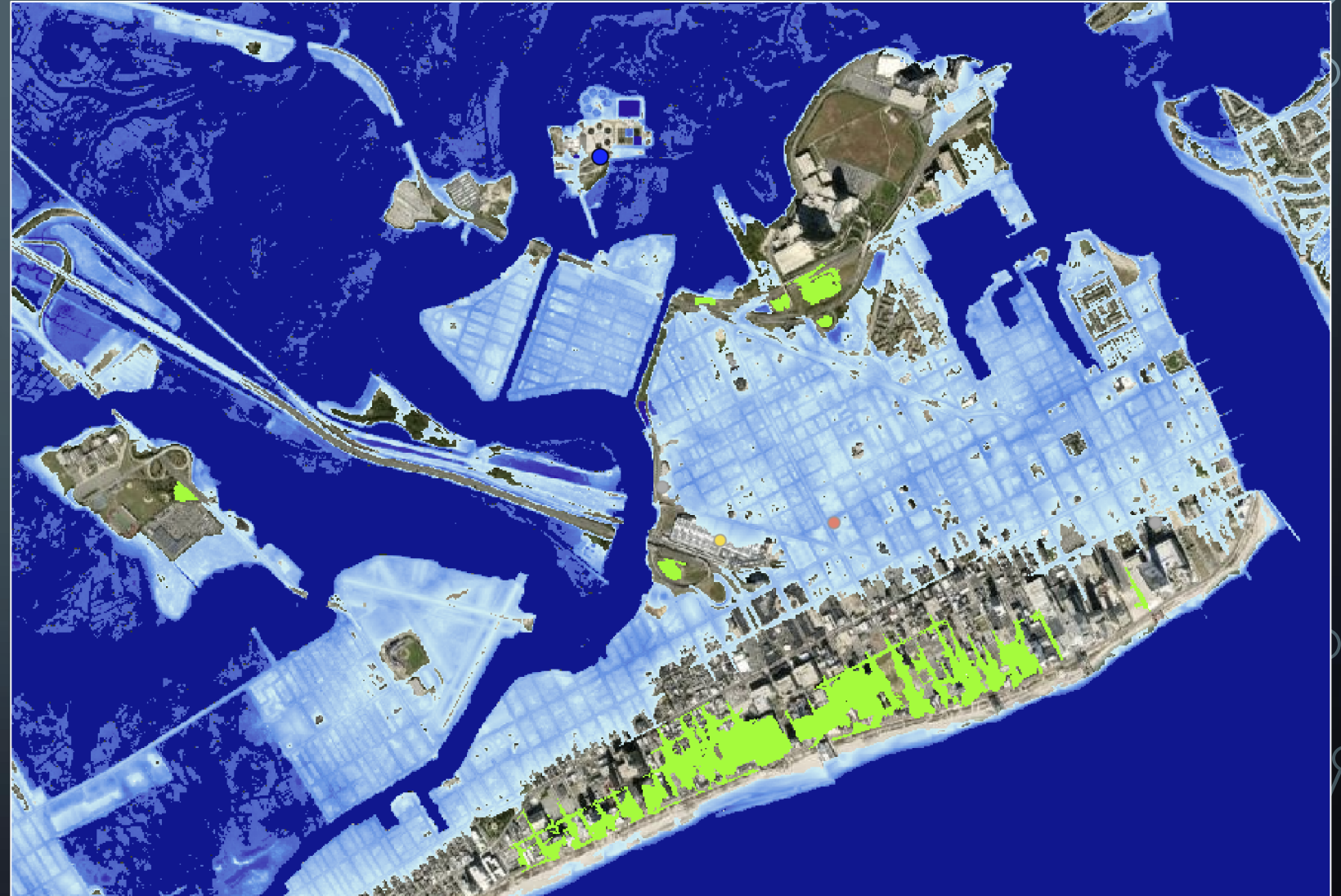


## NJ FloodMapper

### Flood exposure mapping tool

NJ FloodMapper is an interactive mapping tool that allows users to conduct flood exposure analysis based on the best available science for sea-level rise and numerous other parameters, including total water levels, hurricane surge, FEMA flood zones, and Hurricane Sandy surge. Additional map layers depict infrastructure, environmental hazards, marsh and open space, social vulnerability, flood insurance payments for property loss, and land use.

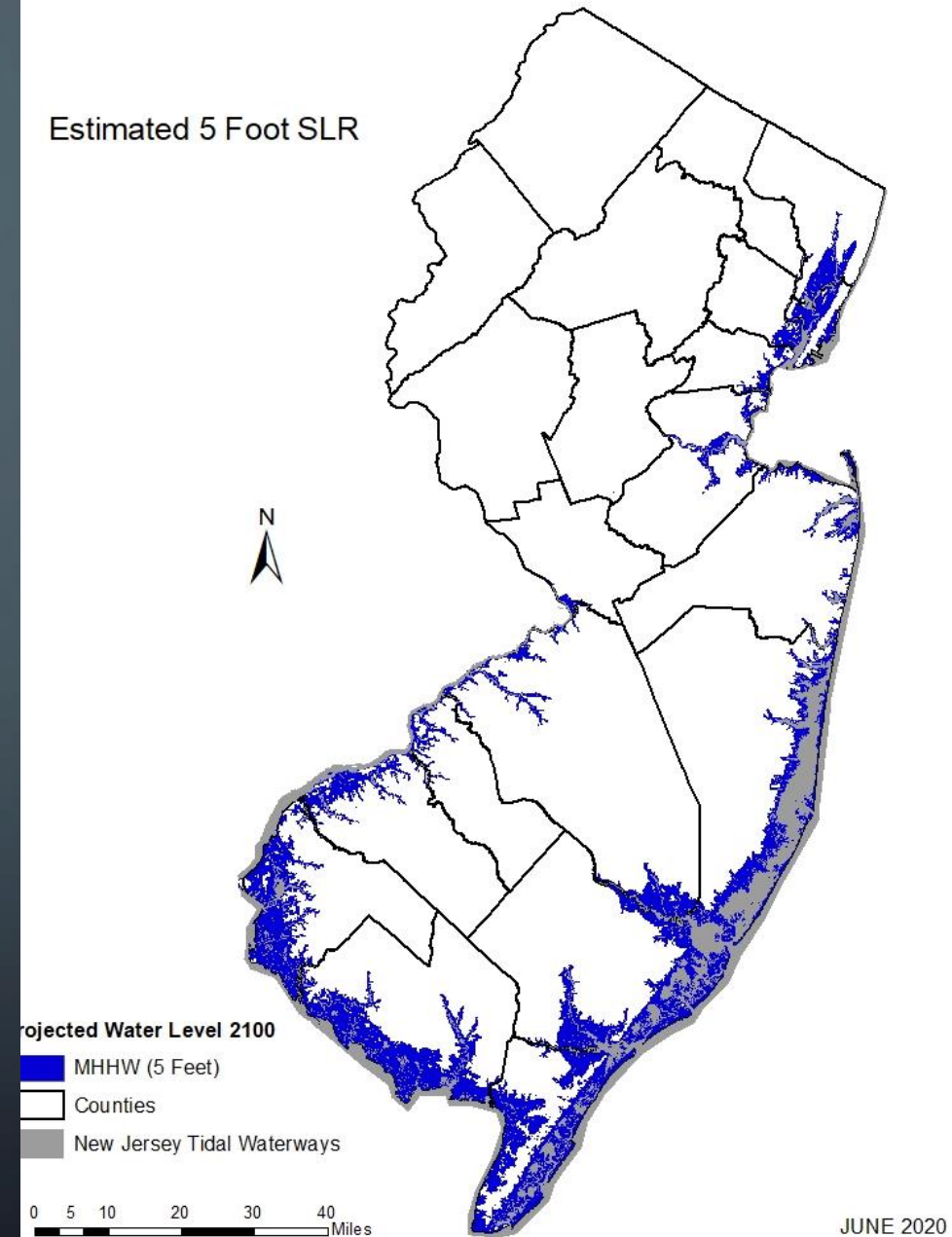
Utilities, Atlantic City, 5-feet SLR



# INUNDATION RISK ZONE

- CONSISTS OF LAND THAT IS NOW MOSTLY DRY BUT IS EXPECTED TO BE INUNDATED BY TIDAL WATERS AT LEAST TWICE PER DAY, OR PERMANENTLY, BY THE YEAR 2100.
- ENCOMPASSES ALL LAND THAT LIES BELOW THE IRZ ELEVATION, WHICH IS CALCULATED BY ADDING FIVE FEET TO THE ELEVATION OF THE MEAN HIGHER HIGH WATER (MHHW).
- DEVELOPMENT WITHIN THE IRZ WILL HAVE MORE PROTECTIVE STANDARDS THAN THE REMAINDER OF THE FLOODPLAIN BEYOND IT.

Estimated 5 Foot SLR



JUNE 2020

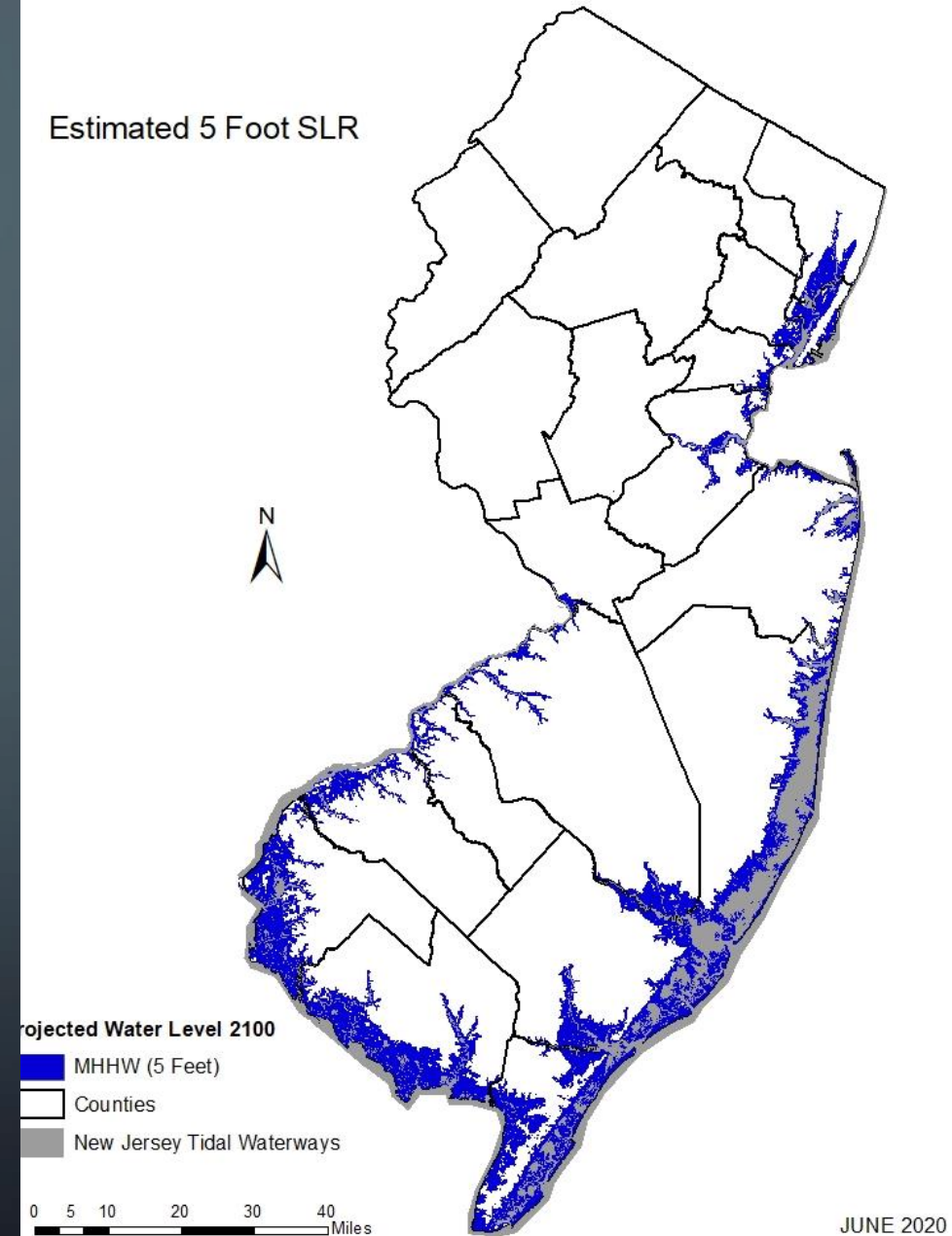
This map is for information only, not for regulatory purposes.  
FEMA Flood Zones not included in this review.



# INUNDATION RISK ZONE

- EXAMPLES OF USES APPROPRIATE FOR THE IRZ INCLUDE RECREATIONAL USES SUCH AS PARKS, TRAILS, AND BOARDWALKS, SHORELINE PROTECTION AND ENVIRONMENTALLY BENEFICIAL PROJECTS, WATER-DEPENDENT ACTIVITIES, AND ACTIVITIES WITH SHORT LIFESPANS, SUCH AS SOLAR PANELS.
- NEW BUILDINGS AND NEW CRITICAL INFRASTRUCTURE WOULD GENERALLY BE PROHIBITED.

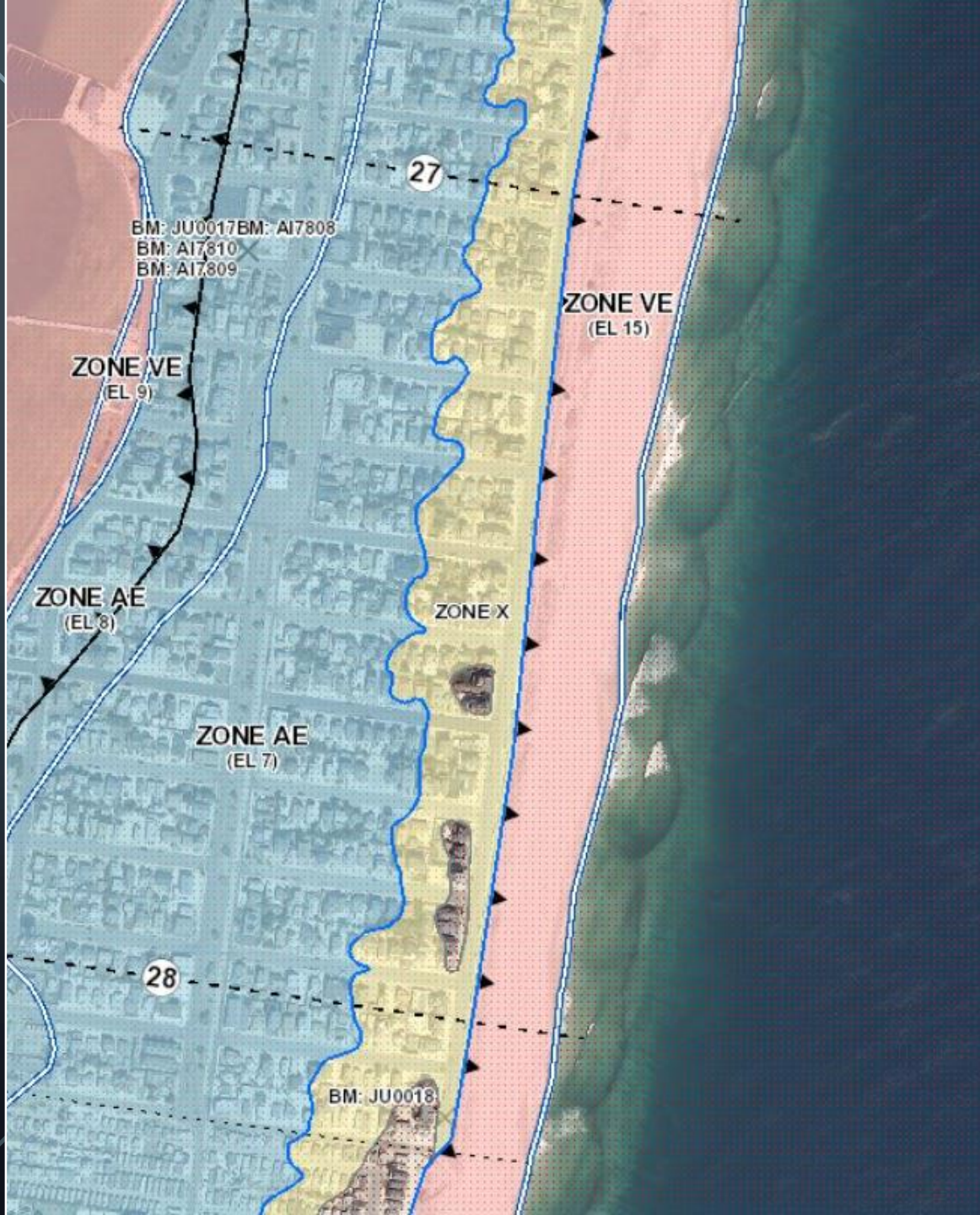
Estimated 5 Foot SLR



JUNE 2020

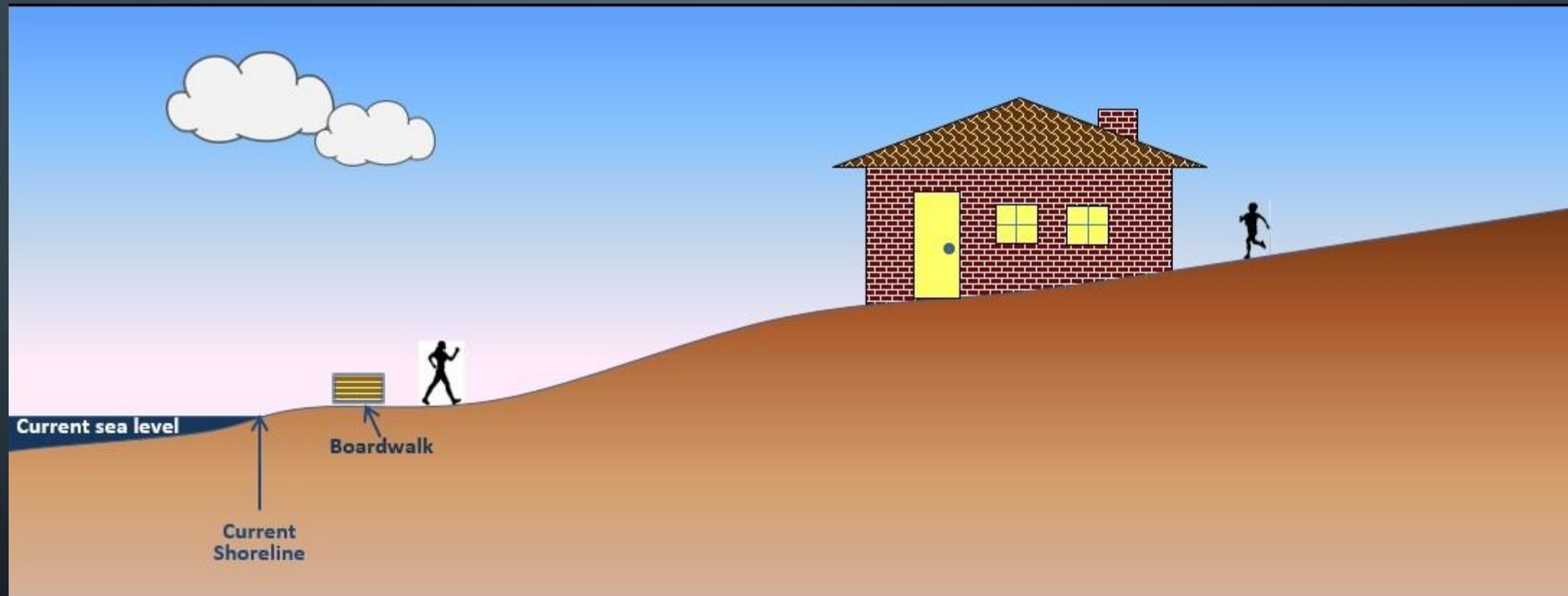
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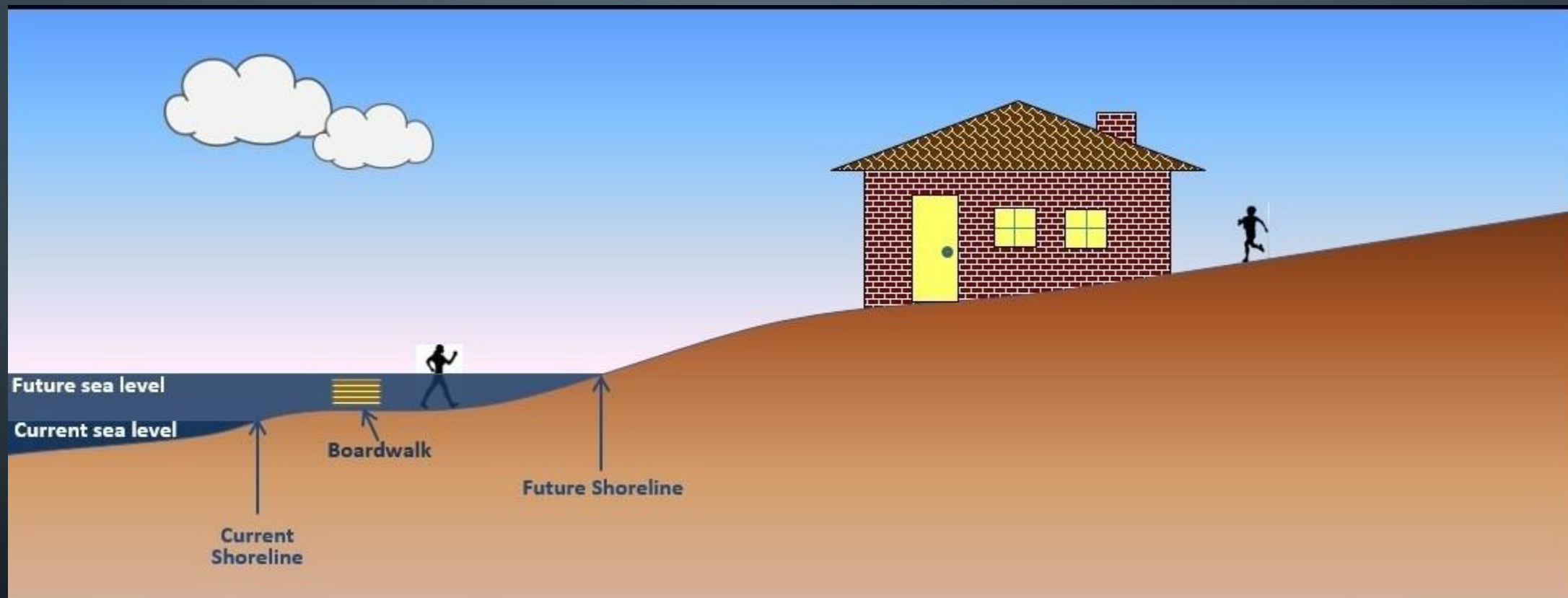




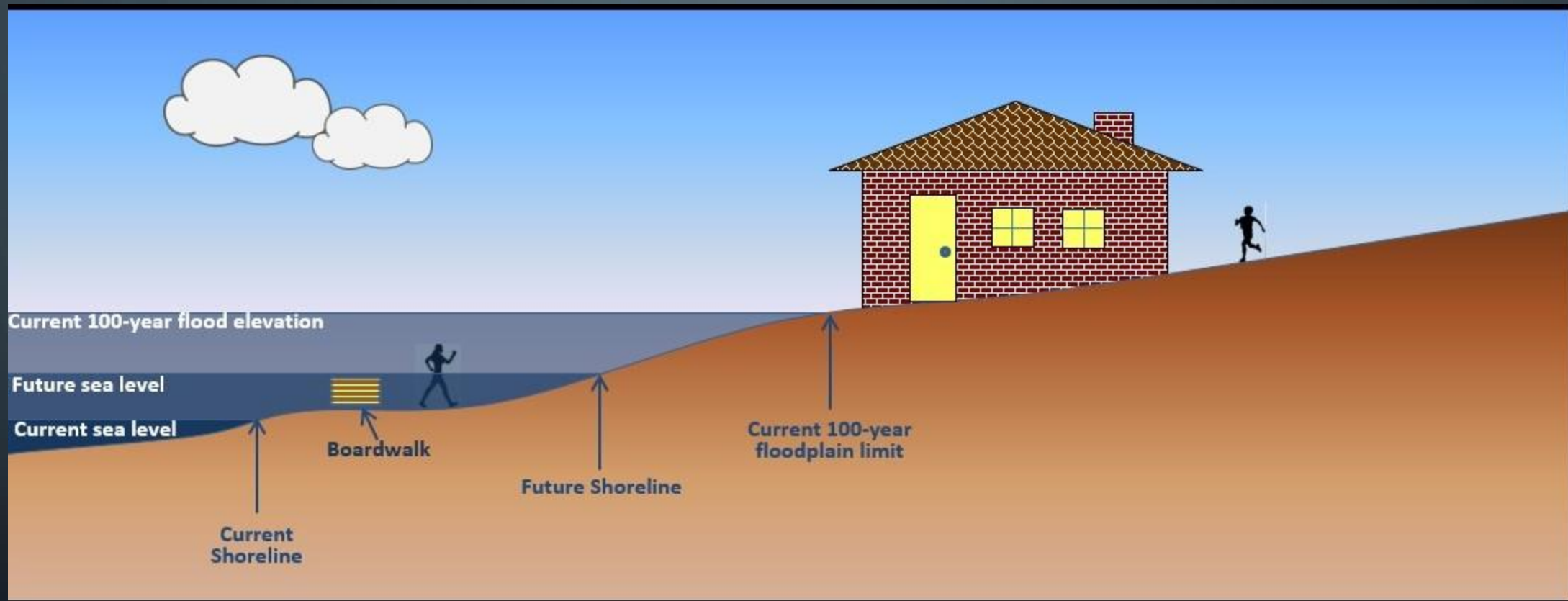
## TIDAL FLOOD HAZARD AREAS

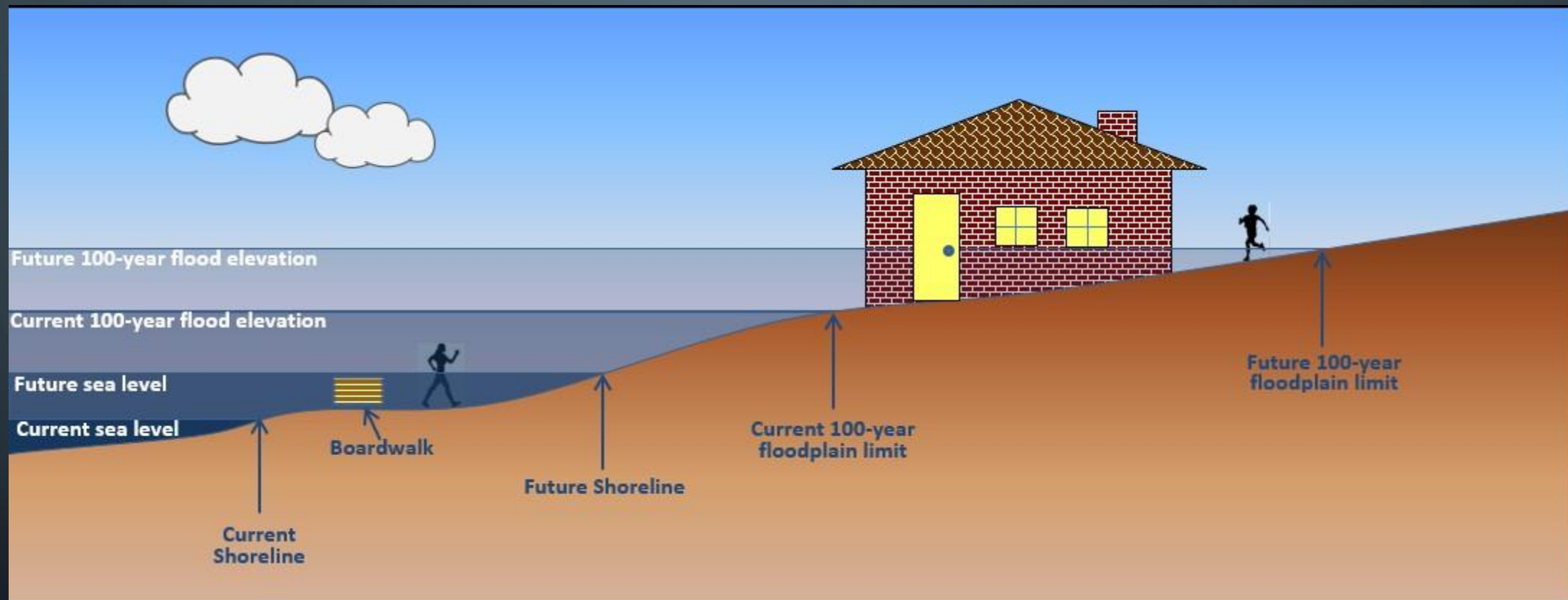
- EXISTING TIDAL FLOODPLAIN IS BASED ON THE HIGHER OF FEMA'S EFFECTIVE OR PRELIMINARY 100-YEAR FLOOD ELEVATION WITH NO FREEBOARD OR FACTOR OF SAFETY.
- PROPOSAL WOULD ADD A 5-FOOT FACTOR OF SAFETY TO EXISTING TIDAL FLOOD ELEVATIONS

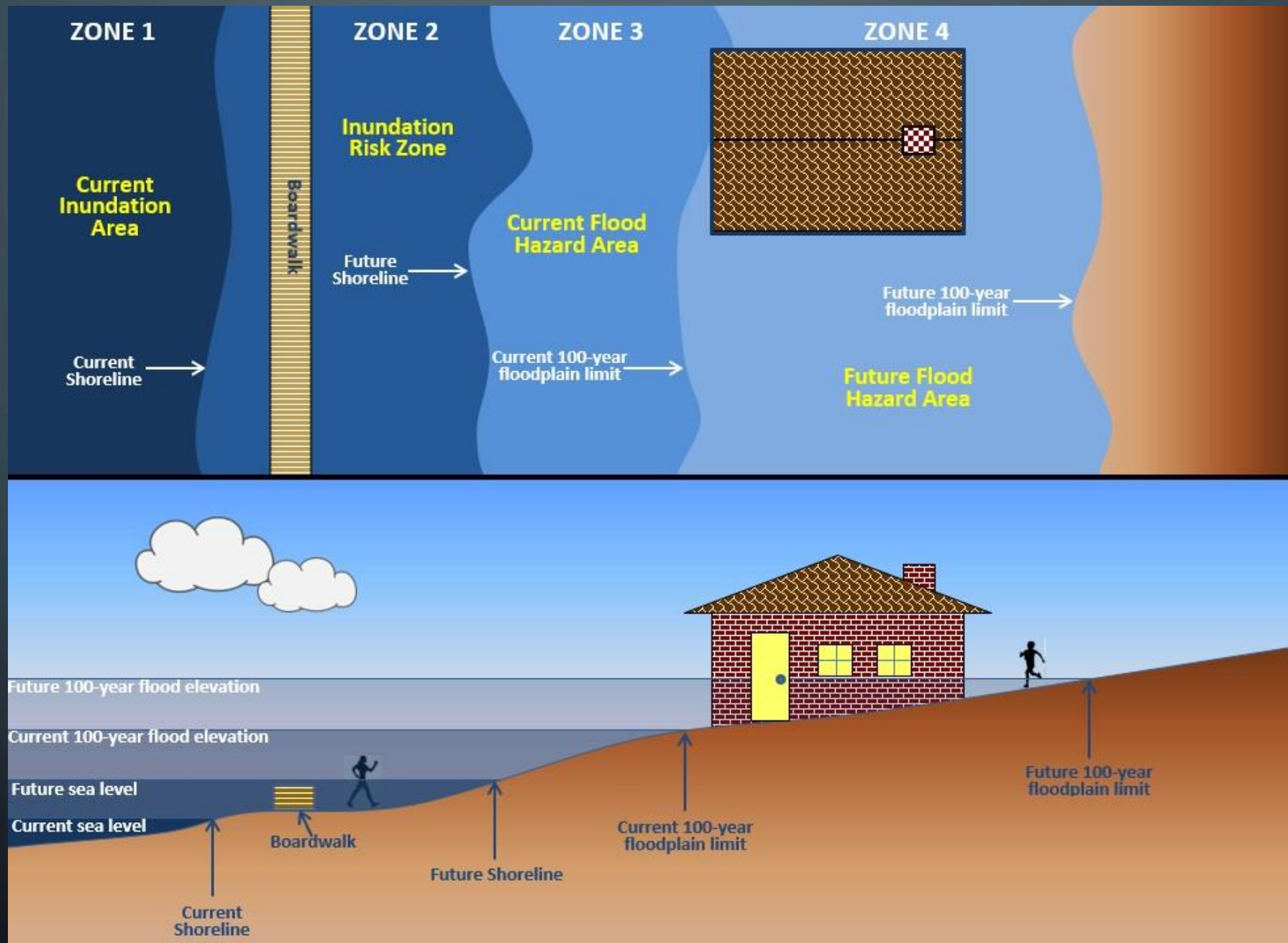








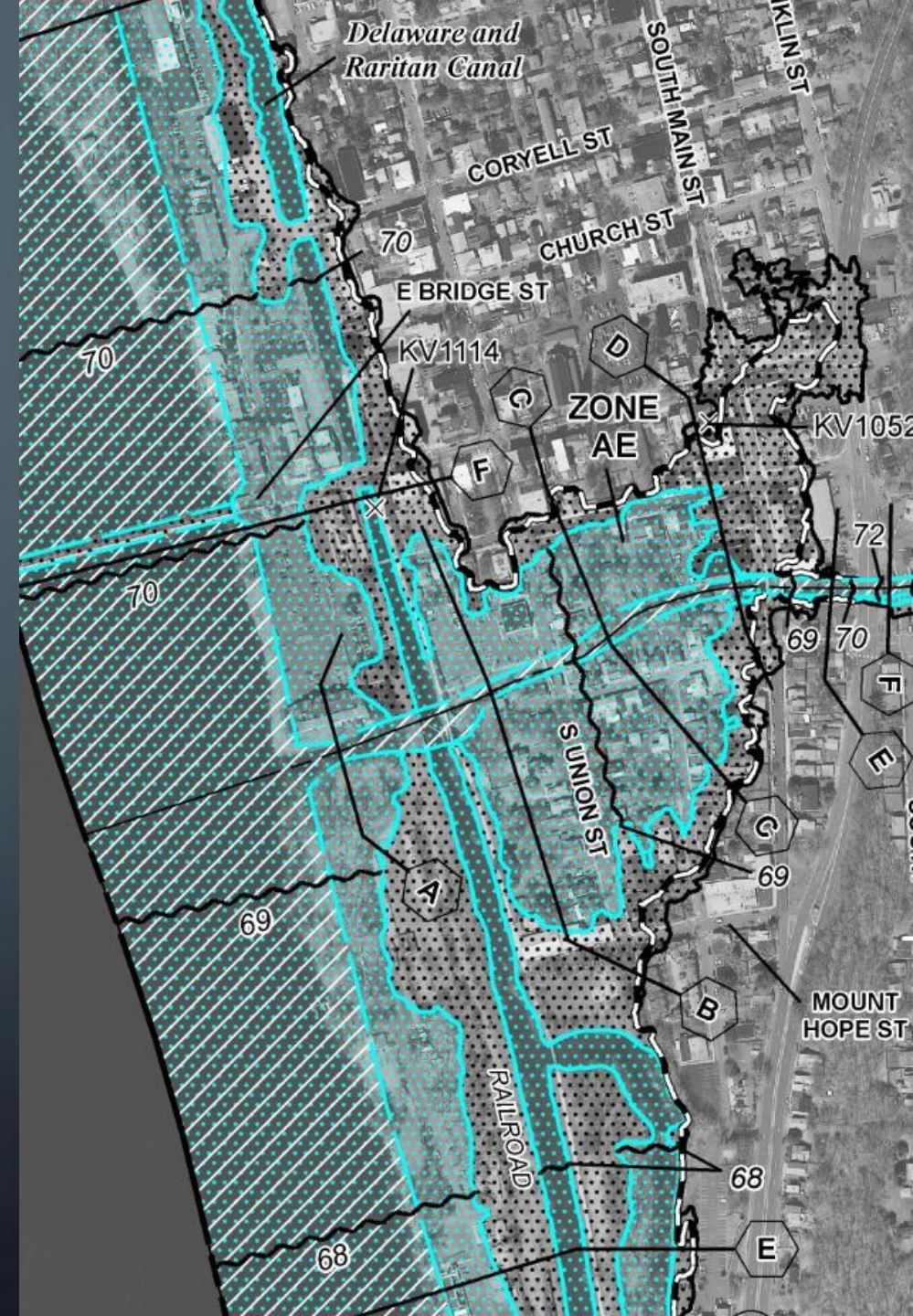






# FLUVIAL FLOOD HAZARD AREAS

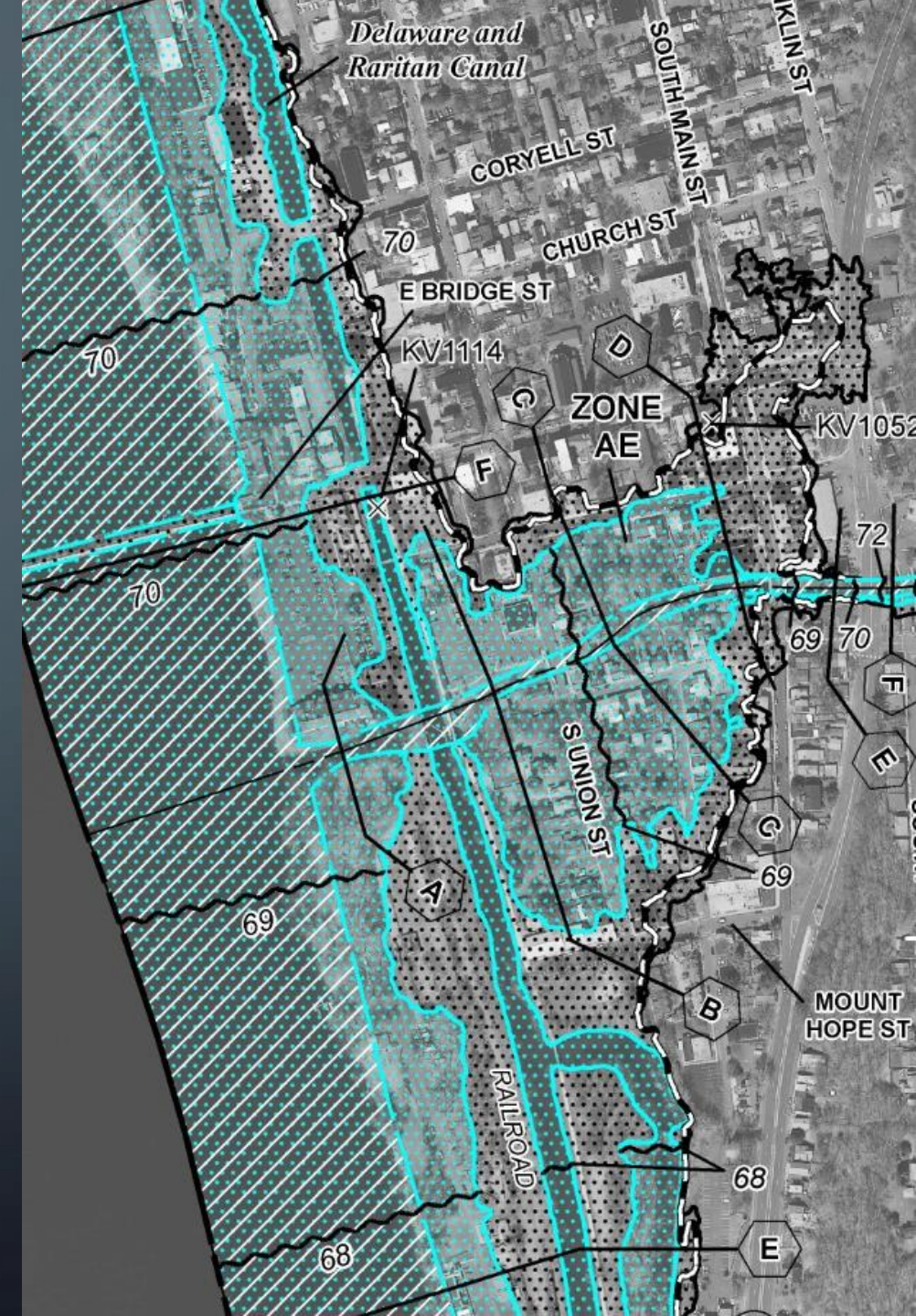
- EXISTING FLUVIAL FLOODPLAIN IS BASED ON THE HIGHER OF FEMA'S EFFECTIVE OR PRELIMINARY 100-YEAR FLOOD ELEVATION WITH A 1-FOOT FACTOR OF SAFETY (UNLESS NJDEP FLOOD STUDY INDICATES AN EVEN HIGHER DESIGN FLOOD ELEVATION).
- A RECENT NEW YORK STUDY CONCLUDES THAT PRECIPITATION INTENSITIES IN NORTHERN NEW JERSEY ARE LIKELY TO INCREASE BETWEEN 30% AND 35% BY 2100.





# FLUVIAL FLOOD HAZARD AREAS

- NOAA'S CURRENT 500-YEAR 24-HOUR PRECIPITATION INTENSITY IS ROUGHLY 38% HIGHER THAN TODAY'S 100-YEAR 24-HOUR STORM, THE 500-YEAR FLOOD IS A SUITABLE SURROGATE TO DESCRIBE THE FUTURE FLOOD HAZARD AREA.
- ALONG WATERS FOR WHICH FEMA MAPPING IS NOT AVAILABLE, OR WHERE A PARTY DISPUTES THE ACCURACY OF FEMA MAPPING, THE FUTURE 100-YEAR RAINFALL PLUS 25% WOULD BE USED TO CALCULATE THE FUTURE REGULATORY FLOOD HAZARD LIMIT.





# PROTECTING CRITICAL FACILITIES AND INFRASTRUCTURE



- CREATE A NEW DEFINITION FOR CRITICAL FACILITIES AND CRITICAL INFRASTRUCTURE AS INFORMED BY THE NFIP AND OFFICE OF EMERGENCY MANAGEMENT DEFINITIONS.
- AMEND THE DEFINITION OF CRITICAL BUILDING TO MATCH THE FLOOD DESIGN CLASSES PUBLISHED BY THE AMERICAN SOCIETY OF CIVIL ENGINEERS.
- ADOPT MORE PROTECTIVE DESIGN AND CONSTRUCTION STANDARDS FOR CRITICAL FACILITIES AND INFRASTRUCTURE, WHICH ARE COMMENSURATE WITH THE LEVEL OF ANTICIPATED RISK, SUCH AS REQUIRING A HIGHER ELEVATION AND/OR FLOODPROOFING.



# CURRENT FHA RULE REQUIREMENT

**ELEVATE TRAVEL SURFACE OF RAILROADS & ROADWAYS AT LEAST ONE  
FOOT ABOVE THE FLOOD HAZARD DESIGN FLOOD ELEVATION**

**OR**

**DEMONSTRATE SUCH ELEVATION IS NOT POSSIBLE AND INSTEAD ELEVATE  
TRAVEL SURFACE AS MUCH AS POSSIBLE**



# DISCUSSION

## Question 1

**What does resiliency mean to you?**

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- **No overtopping of roads/rails/maintenance facilities/airports (assets)**
- **Minimization of damage and time asset is out of service**
- **Designing for the future**
- **Other**





# DISCUSSION

## Question 2

**What steps have you taken to increase resiliency of your infrastructure considering the threats of climate change?**

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- Redundancy in transportation network/detour routes
- Reinforcing assets to resist damage from floods/sea level rise
- Other





# DISCUSSION

## Question 3

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**When expanding existing operations or siting new facilities, how do you assess the potential vulnerability of the site to climate threats?**



# DISCUSSION

## Question 4

**What challenges do you face when making  
necessary resiliency improvements?**

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- Drainage issues
- Cost issues
- Regulatory challenges
- Other





# DISCUSSION

## Question 5

**What tools do you currently use  
to assess the vulnerability of your investments?**

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- Cost benefit analysis
- Repair cost
- Length of time asset is out of service
- Other





# DISCUSSION

## Question 6

**How do environmental issues figure into your resiliency strategies?**

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- Flood events to analyze, drainage, and tailwater
- Threatened and endangered species habitat
- Riparian zones and/or wetlands
- Environmental justice
- Other



# DISCUSSION

## Question 7

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**Are there specific regulatory changes that NJDEP can make to facilitate resiliency improvements while ensuring protection of the environment, public health, safety and welfare?**





## EXECUTIVE ORDER 215

- AO 2020-01 directs that the DEP's EO 215 guidelines be updated to incorporate climate change considerations.
- EO 215 requires state agencies to prepare, for DEP review, either an environmental assessment or an environmental impact statement for construction projects over a certain threshold.
  - Applies to projects directly initiated by a state agency or where 20% financial assistance is provided
  - Over \$1m – environmental assessment – less rigorous/no alternatives analysis
  - Over \$5m and over 5 acres of disturbance – environmental impact statement
  - DEP reviews and provides information on probable adverse impacts, applicable regulations and permits and a recommendation to approve, require additional analysis or measures to avoid environmental impacts



# EXECUTIVE ORDER 215

- EO 215 requirements continued....
  - Includes exemptions for things such as maintenance, repair and renovation projects , in kind replacements, building expansions of less than 25%, projects covered by NEPA, loans, and projects reviewed under CAFRA.
  - Looks at impacts to natural resources – land, water, air, wildlife – and socio-economic effects and how those effects will be avoided or minimized
    - Considers threaten and endangered species impacts





# DISCUSSION

## Question 1

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**What are you already doing to address resilience planning/climate change for your projects? What policies and procedures do you have in place? Are these in response to federal requirements?**



# DISCUSSION

## Question 2

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**What types of projects are impacted by these policies and procedures?**

**Can they be improved?**





# DISCUSSION

## Question 3

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**With respect to EO 215, how can the process be improved while continuing to ensure protection of natural resources?**



# DISCUSSION

## Question 4

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**With respect to EO 215, what do you see as its value? What protections does it achieve that are not otherwise addressed by existing regulatory standards?**







# OPEN FORUM

**DISCUSSION OF NEW TOPICS  
AND IDEAS**

**THANK YOU**

**PLEASE CONTACT US TO SHARE  
ADDITIONAL COMMENTS OR CONCERNS AT:**

**[JILL.ASPINWALL@DEP.NJ.GOV](mailto:JILL.ASPINWALL@DEP.NJ.GOV) OR**

**SUBMIT COMMENTS TO THE NJPACT WEBPAGE THROUGH THE SURVEY TAB  
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