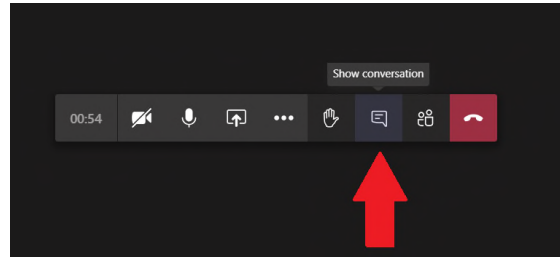


Welcome!

- If you are attending the webinar on your computer, please add your name, title, and organization(s) to the chat box.
 - Bring your mouse to the lower part of the screen until a set of buttons appears. They may also be at the top of your screen.
 - Click "Show Conversation."



Gloucester County, New Jersey Hazard Mitigation Plan – 2022 Update

Steering Committee Risk Assessment Meeting | June 23, 2021

Gloucester County received FEMA funding to update the Hazard Mitigation Plan (HMP). To help meet the required 25% match, the County will use in-kind services.

Please use this form to document your time spent working on the HMP. This includes attending meeting, conference calls, working on your municipal annex, revising sections of the plan, etc.

If you have any questions, please reach out to Heather Appar (heather.appar@netratech.com | 973.630.8046) or Chris Much (chris.much@netratech.com | 973.630.8357).

[illegible]

2

Project Schedule Review



- | | |
|-----------------------|--|
| ✓ April/May 2021 | Kick-Off Meetings |
| ✓ April-June 2021 | Data Collection |
| ✓ June 23, 2021 | Risk Assessment Presentation to Steering Committee – TODAY! |
| ❑ June 30, 2021 | Risk Assessment Presentation to Planning Partnership |
| ❑ April-June 2021 | Update Hazard Profiles – <i>in progress</i> |
| ❑ June-July 2021 | Develop Problem Statements with Municipalities and County |
| ❑ July/August 2021 | Mitigation Strategy Workshop (date TBD) |
| ❑ July-September 2021 | Plan Development |
| ❑ September 2021 | Review Draft Plan |
| ❑ October 2021 | Plan Submitted to FEMA and NJOEM |

5

Municipal Participation Status

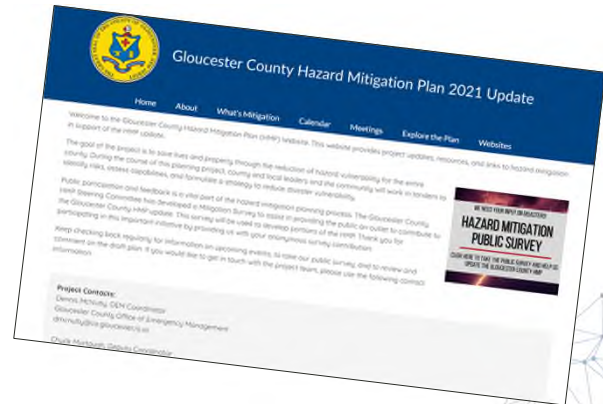
- To date, we have received Letters of Intent to Participate (LOIP) from 14 out of 25 (see list to the right)
- Next Step for Annex Completion includes confirmation of Risk Ranking Assessment, status updates on previous mitigation projects from the 2016 HMP, identifying new projects for the 2021 Update and filling in the annexes.
- Upcoming steps include problem statement brainstorming and mitigation project identification.

Status (6/18/2021)	
Gloucester County	Following up with individual departments as needed
Clayton (B)	Received all worksheets; annex in progress
Deptford (Twp)	Received nearly all worksheets; annex in progress
East Greenwich (Twp)	Received all worksheets; annex in progress
Elk (Twp)	Received all worksheets; annex in progress
Franklin (Twp)	No LOIP; no worksheets
Glassboro (B)	No worksheets to date but Tetra Tech spoke to the Borough on 6/9
Greenwich (Twp)	No LOIP; no worksheets
Harrison (Twp)	Only received one worksheet to date
Logan (Twp)	No worksheets to date
Mantua (Twp)	No LOIP; no worksheets
Monroe (Twp)	Received all worksheets; annex in progress
National Park (B)	No LOIP; no worksheets
Newfield (B)	No LOIP; no worksheets
Paulsboro (B)	No LOIP; no worksheets
Pitman (B)	Received all worksheets; annex in progress
South Harrison (Twp)	No LOIP; no worksheets
Swedesboro (B)	No worksheets to date
Washington (Twp)	No LOIP; no worksheets
Wenonah (B)	Received all worksheets; annex in progress
West Deptford (Twp)	Received all worksheets; annex in progress
Westville (B)	Received all worksheets; annex in progress
Woodbury (C)	No LOIP; no worksheets
Woodbury Heights (B)	No LOIP; no worksheets
Woolwich (Twp)	No worksheets to date
Rowan University	No LOIP; no worksheets

6

Public Outreach and Engagement

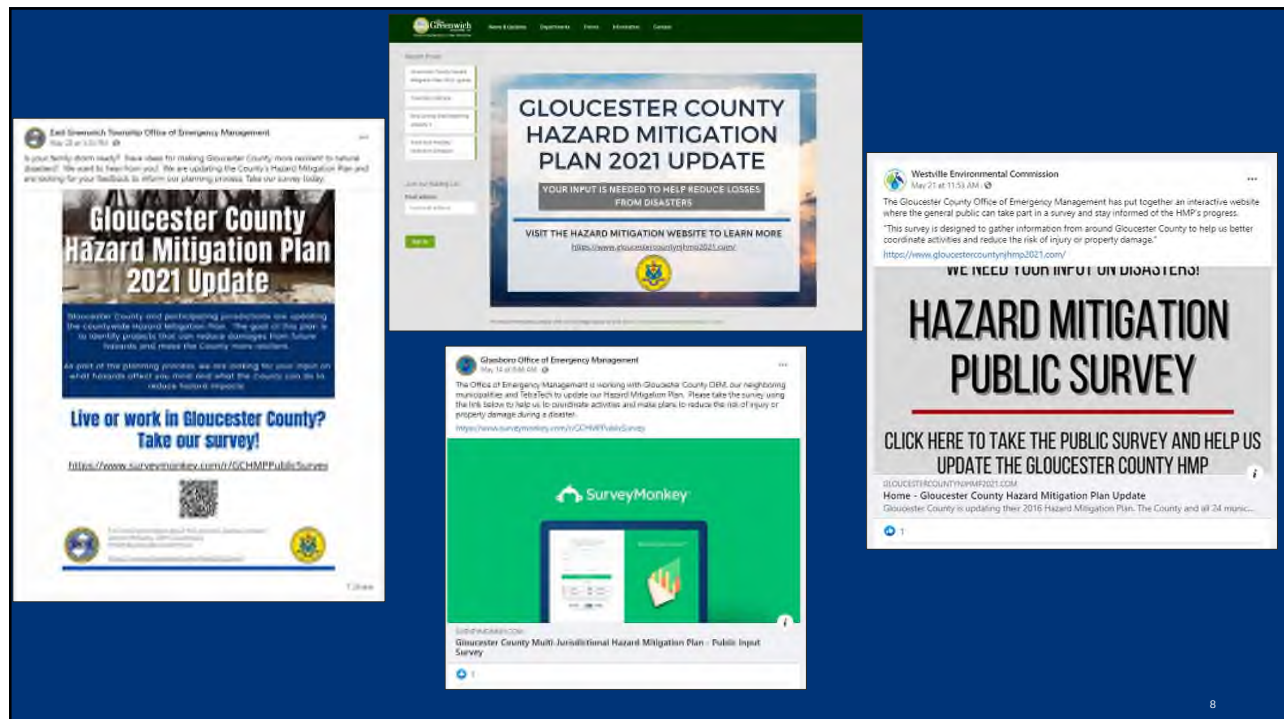
- Stakeholder and neighboring county surveys were distributed
- To date, we have received 46 responses to the public survey
- We are currently developing a Story Map – stay tuned!
- Public Engagement – County and municipalities were sent different tools they can use to help
 - HMP website
<https://www.gloucestercountynjhmp2021.com>
 - Social Media announcements – Facebook and Twitter



TETRA TECH

7

7



8

8



Risk Assessment Overview



9

What is Risk?

Risk is defined as a function of :

- ✓ Hazard
 - Source of potential danger or adverse condition
- ✓ Exposure
 - Manmade or natural features that are exposed to the hazard
- ✓ Vulnerability
 - Damage susceptibility of the exposed features
- ✓ Adaptive Capacity (or capability)
 - Plans/policies
 - Response/recovery
 - Financial resources

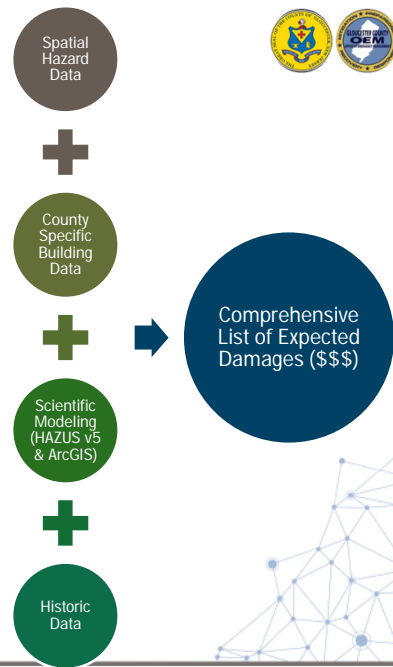


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10

Purpose of the Risk Assessment

- To get a better understanding of the risks you face
- Initial results based on available data
- Quantitative data (population/structures exposed, structural damages within hazard zones) used when available
- Qualitative community input (such as unmapped flood areas) integrated to adjust results
- Local community input to adjust relative rankings



11



Preliminary Hazard Ranking

How are the rankings calculated?

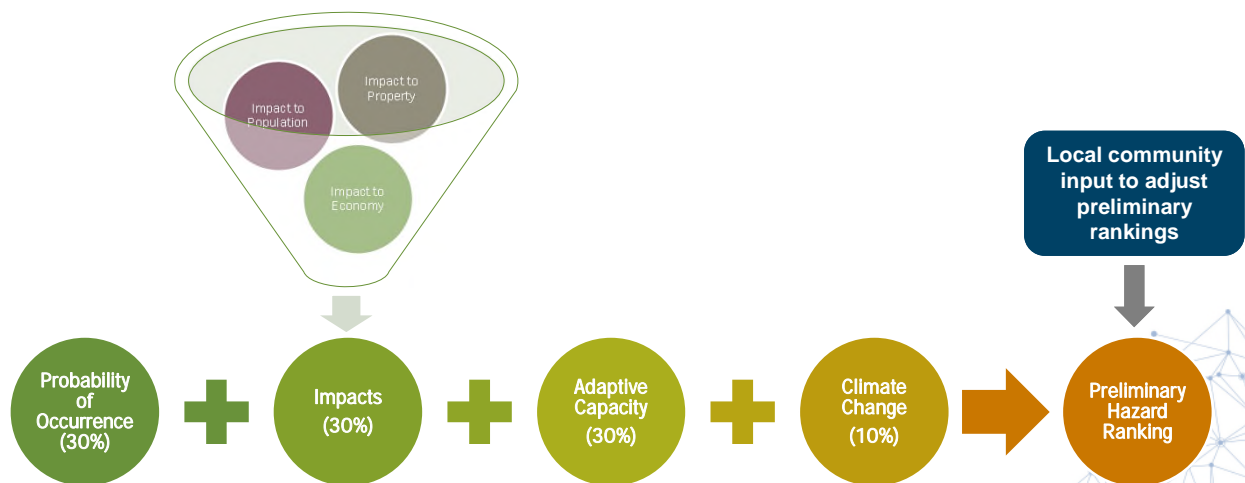
12

Preliminary Hazard Ranking Methodology


- The calculated probability of a hazard occurring based on historical data
- *Impacts to people, property, and the economy* based on GIS data and analysis of exposure.
- The degree to which *climate change* will affect future occurrences based on best available data.
- Capability- the ability of your community to respond to the hazard based on ordinances, mitigation strategies and procedures, and readiness.

13

Preliminary Hazard Ranking Formula




14

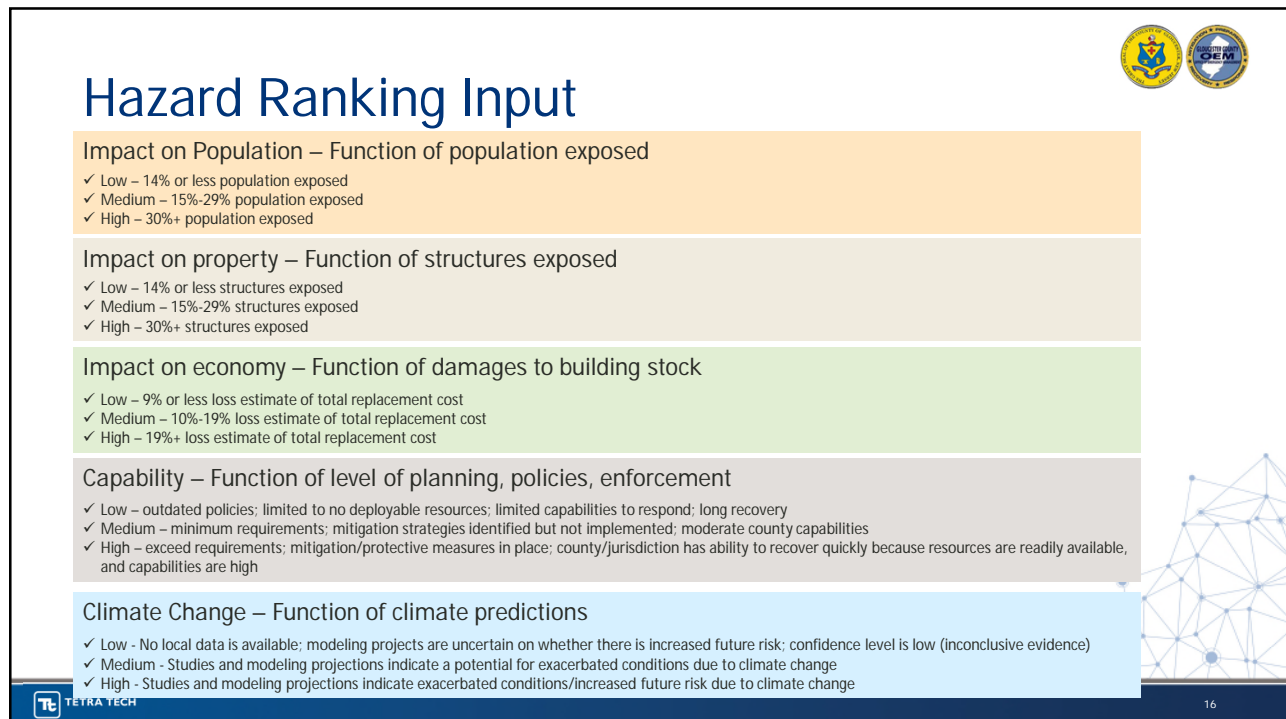


Ranking the Hazards of Concern



What information plays a role in determining the hazard rankings?



15



Hazard Ranking Input

Impact on Population – Function of population exposed

- ✓ Low – 14% or less population exposed
- ✓ Medium – 15%-29% population exposed
- ✓ High – 30%+ population exposed

Impact on property – Function of structures exposed

- ✓ Low – 14% or less structures exposed
- ✓ Medium – 15%-29% structures exposed
- ✓ High – 30%+ structures exposed

Impact on economy – Function of damages to building stock


- ✓ Low – 9% or less loss estimate of total replacement cost
- ✓ Medium – 10%-19% loss estimate of total replacement cost
- ✓ High – 19%+ loss estimate of total replacement cost

Capability – Function of level of planning, policies, enforcement

- ✓ Low – outdated policies; limited to no deployable resources; limited capabilities to respond; long recovery
- ✓ Medium – minimum requirements; mitigation strategies identified but not implemented; moderate county capabilities
- ✓ High – exceed requirements; mitigation/protective measures in place; county/jurisdiction has ability to recover quickly because resources are readily available, and capabilities are high

Climate Change – Function of climate predictions

- ✓ Low - No local data is available; modeling projects are uncertain on whether there is increased future risk; confidence level is low (inconclusive evidence)
- ✓ Medium - Studies and modeling projections indicate a potential for exacerbated conditions due to climate change
- ✓ High - Studies and modeling projections indicate exacerbated conditions/increased future risk due to climate change



16

16

County Preliminary Hazard Ranking

Hazard of Concern	2021 Draft	Agree with draft hazard ranking?
Coastal Erosion and Sea Level Rise	Low	
Dam and Levee Failure	Low	
Disease Outbreak	Low	
Drought	Medium	
Earthquake	Medium	
Extreme Temperature	Medium	
Flood (riverine, storm surge, urban/stormwater)	Low	
Geological Hazards	Low	
Hazardous Materials	High	
Hurricane	Low	
Infestation and Invasive Species	Low	
Nor'Easter	Low	
Severe Weather	High	
Severe Winter Weather	Medium	
Wildfire	Low	
Utility Interruption	Low	

17

Preliminary Ranking Overview

Preliminary Ranking	Low, Medium, High
Inputs	<ul style="list-style-type: none"> • Frequency – unlikely to frequent • Population – % population exposed to hazard area • Property – % building stock exposed to hazard area • Economy – % damage (Replacement Cost Value) for buildings exposed to hazard area • Adaptative Capacity – low to high • Climate Change – low to high
Adjustments	<ul style="list-style-type: none"> • Considered frequency of hazard event • Considered overall impact to population, property, and/or economy
Comments	<ul style="list-style-type: none"> • Each municipality will review the ranking and adjust accordingly • Every high ranked hazard will need a mitigation action

18

Hazard Ranking Input Categories

Category		Level / Category	Degree of Risk / Benchmark Values
Probability of Occurrence		Unlikely	A hazard event is not likely to occur or is unlikely to occur with less than a 1% annual chance probability.
		Rare	Between 1 and 10% annual probability of a hazard event occurring.
		Occasional	Between 10 and 100% annual probability of a hazard event occurring.
		Frequent	100% annual probability; a hazard event may occur multiple times per year.
Impact	Population	Low	14% or less of your population is exposed to a hazard with potential for measurable life safety impact, due to its extent and location.
		Medium	15% to 29% of your population is exposed to a hazard with potential for measurable life safety impact, due to its extent and location.
		High	30% or more of your population is exposed to a hazard with potential for measurable life safety impact, due to its extent and location.
	Property	Low	Property exposure is 14% or less of the total number of structures for your community.
		Medium	Property exposure is 15% to 29% of the total number of structures for your community.
		High	Property exposure is 30% or more of the total number of structures for your community.
	Economy	Low	Loss estimate is 9% or less of the total replacement cost for your community.
		Medium	Loss estimate is 10% to 19% of the total replacement cost for your community.
		High	Loss estimate is 20% or more of the total replacement cost for your community.
Capabilities		Weak	Weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
		Moderate	Plans, policies, codes/ordinances in place and meet minimum requirements; mitigation strategies identified but not implemented on a widespread scale; county/jurisdiction can recover but needs outside resources; moderate county/jurisdiction capabilities.
		Strong	Plans, policies, codes/ordinances in place and exceed minimum requirements; mitigation/protective measures in place; county/jurisdiction has ability to recover quickly because resources are readily available, and capabilities are high.
Climate Change		Low	No local data is available; modeling projections are uncertain on whether there is increased future risk; confidence level is low (inconclusive evidence).
		Medium	Studies and modeling projections indicate a potential for exacerbated conditions due to climate change; confidence level is medium to high (suggestive to moderate evidence).
		High	Studies and modeling projections indicate exacerbated conditions/increased future risk due to climate change; very high confidence level (strong evidence, well documented and acceptable methods).

19

Coastal Erosion and Sea Level Rise

13
Buildings
Exposed to the
Coastal Erosion
Hazard Area

3.5°F
Overall
increase in
temperature
across NJ

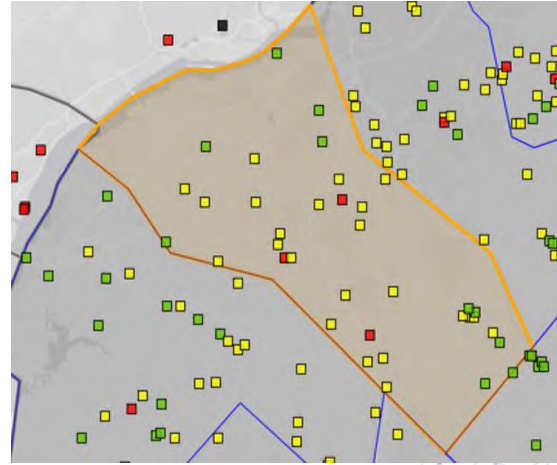
21
People
Exposed to 3-
foot SLR

- Limited to coastal influenced waters along or flowing into the Delaware
- 3-foot of sea level rise likely before end of the century
- Increased sea levels lead to greater rates of coastal erosion

20

Dam Failure and Levee Failure

- Gloucester County is home to:
 - 3 high hazard dams
 - 27 significant hazard dams
 - 9 low hazard dams
 - 4 levee systems consisting of 28 structures
- No major dam or levee failure events have occurred in the County since 2015
- Qualitative assessment – no spatial inundation areas available for analysis



21

Disease Outbreak and Pandemic

**new*

- West Nile Virus
- Eastern Equine Encephalitis
- St. Louis Encephalitis
- Lyme Disease
- Influenza
- Ebola
- COVID-19

1,435
Confirmed Cases of Influenza
(2010 – 2019)

1,229
Cases of Lyme Disease
(2010 – 2019)

26,599
Confirmed cases of COVID-19
(as of 6/18/2021)

613 Total Deaths

Disease Outbreak Declarations

- West Nile Virus – EM-3156 – May-November 2000
- COVID-19 – DR-4488 – January 2020 to present

22

Drought



Since 2012, the County has experienced 6 droughts as a combination of excessive heat and drought conditions

Potential impacts:

1. Increased wildfire risk
2. Impacts to agriculture/farms
3. Drinking water supply (groundwater and surface water)



Number of farms



Acres of farmland



Total market value of products sold (2017)

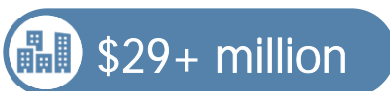
From 2017 Census of Agriculture

23

Earthquake



- Conducted assessment of 100-year and 500-year probabilistic events



Replacement Cost Value (RCV) of building damages from a 500-year MRP event



Estimated displaced households for 500-year MRP event



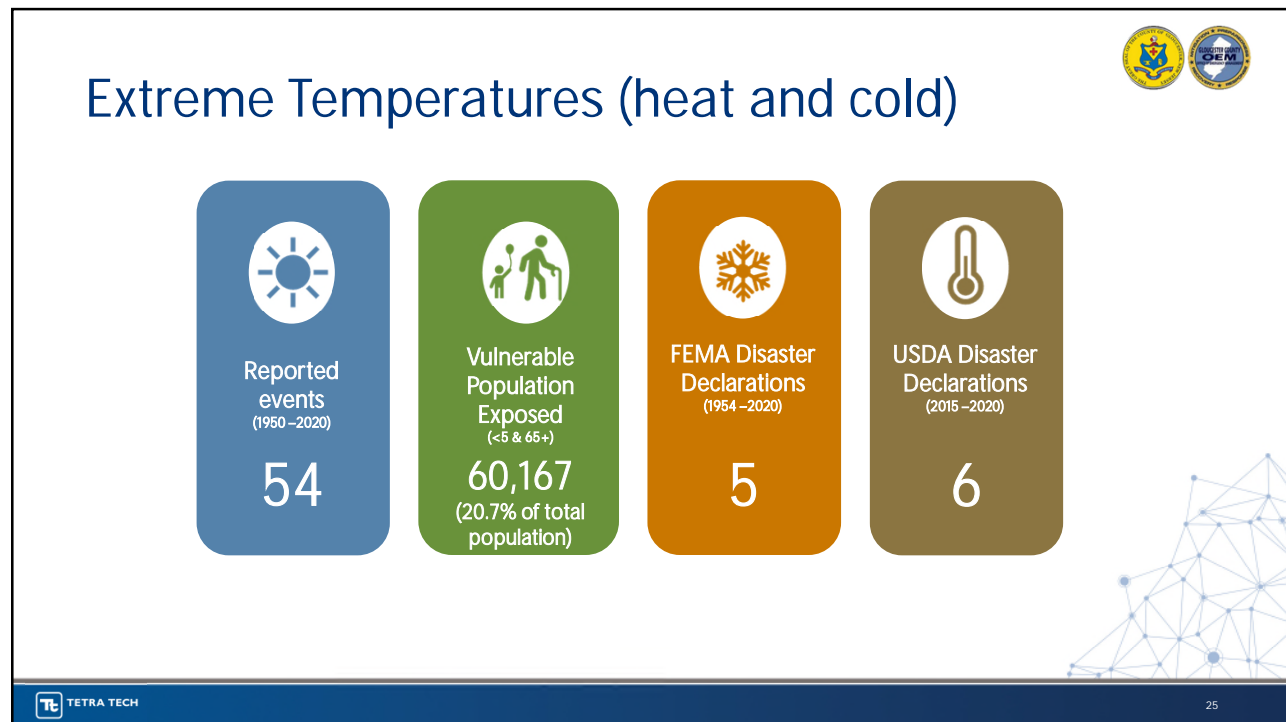
Tons of structural debris from a 500-year MRP event



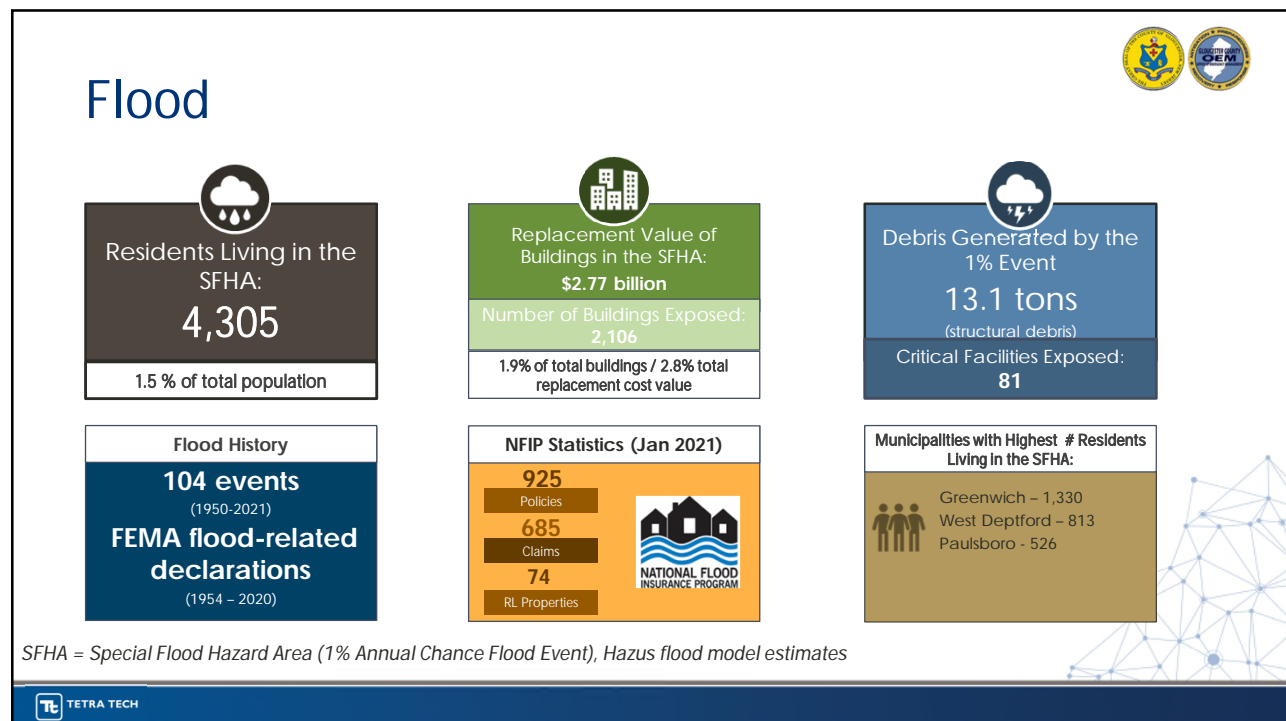
Individuals injured as a result of a 500-year MRP event (no casualties expected)

- Low frequency event but could have large impacts
- Low impact to life, high impact to property

24

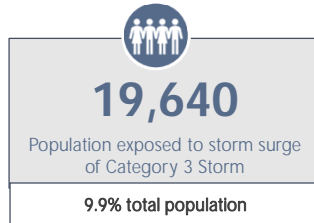


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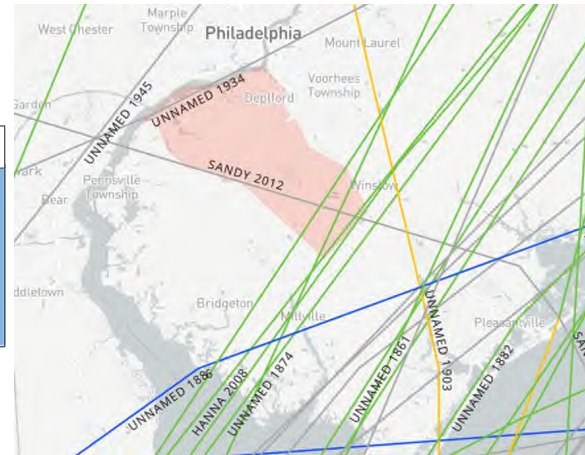


26

Hurricane and Tropical Storm



Hurricane History	
6	3
Federally Declared Hurricane Disaster Events FEMA, since 1953	Reported Tropical Storm Events NOAA, since 1996



Hurricane Tracks through August 2020

27

Geological Hazards



• Landslides

- Historic landslides have occurred in the State with one FEMA disaster declarations involving a mudslide (2011), but Gloucester was not affected
- 6,620 residents, or 2.3% of the County population live within the Steep Slope Hazard Area

• Subsidence/sinkholes

- Typically occur in areas within bands of carbonate bedrock
- 32,985 residents, or 11.3% of the County population live in Carbonate Rock Hazard Area

28

Invasive and Nuisance Species



- Emerald Ash Borer

- Infests and kills North American ash trees
- Trees die within 2-4 years of becoming infested



- Spotted Lanternfly

- The insect is rapidly spreading throughout the northeast after first identified in 2014.
- Could devastate agricultural areas



Invasive and Nuisance Species



- Harmful Algal Blooms

- Impacts natural systems, recreation, drinking water supply
- Impacted local waterbodies



- White-Tailed Deer

- Deer populations have reached problematic numbers in numerous areas of the state.
- Impacts on human health and safety include the spread of tick-borne diseases (Lyme Disease) and deer-vehicle collisions
- From 2011-2012, more than 31,192 deer-vehicle collisions occurred in New Jersey



Nor'Easter



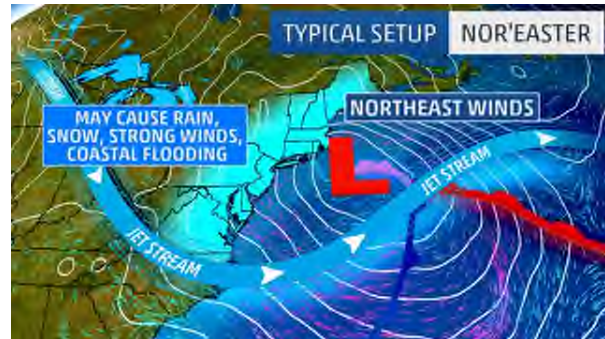
Entire population is vulnerable



Entire building stock is vulnerable

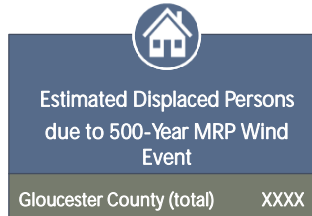
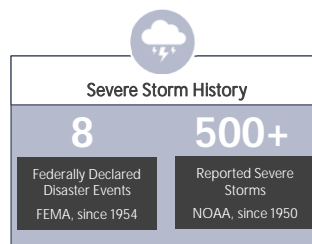


Climate change can increase the frequency of events



31

Severe Weather



Posted 1 hour ago
TORNADO WATCH 515 IS IN EFFECT UNTIL 700 PM EST FOR THE FOLLOWING LOCATIONS:
NJ

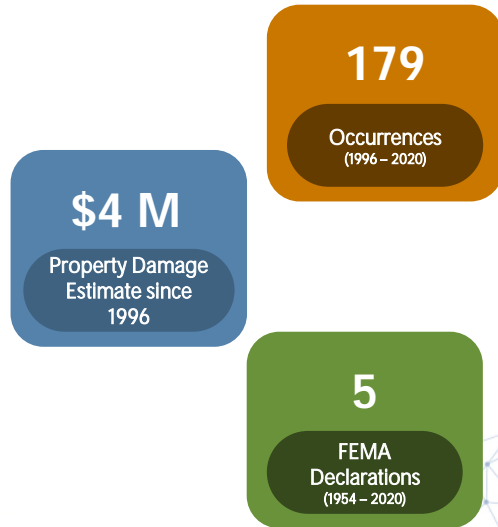
NEW JERSEY COUNTIES INCLUDED ARE:
ATLANTIC BURLINGTON CAMDEN
CAPE MAY CUMBERLAND GLOUCESTER
HUNTERDON MERCER MIDDLESEX
MONMOUTH OCEAN SALEM
SOMERSET



32

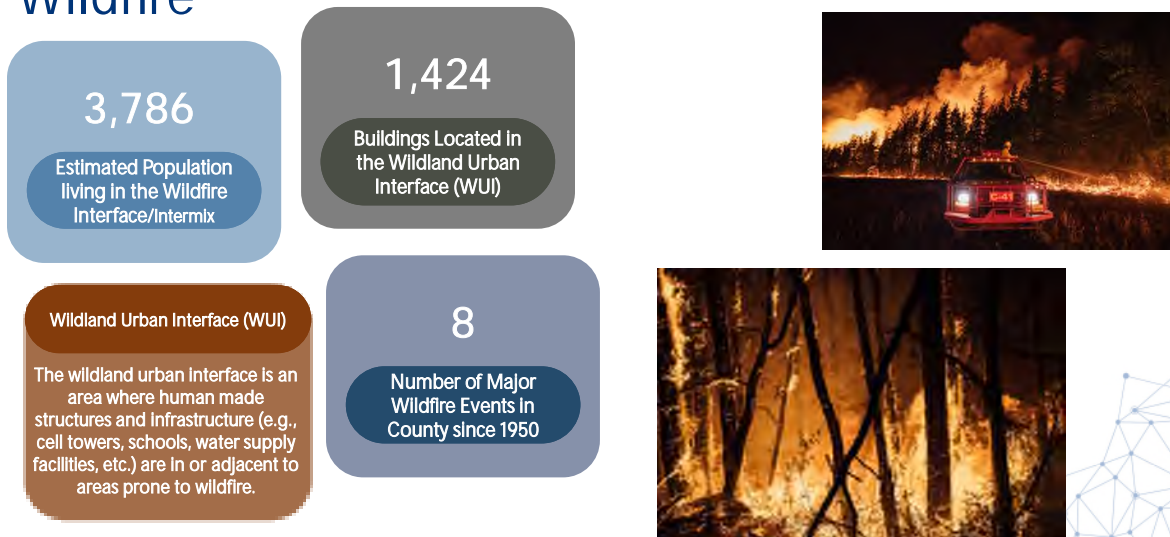
Severe Winter Weather

- The Severe Winter Weather Hazards includes ice, snowstorms, and blizzards
- Occurs annually
- Impacts:
 - Property damage
 - Loss of power
 - Fallen trees/limbs
- Qualitative assessment with 1% and 5% impacts to buildings estimated



33

Wildfire



34

Utility Failure

- History
 - Primarily caused by other hazards
 - Power failure events common
- Impacts
 - HVAC failure
 - Communications failure
 - Food spoilage
 - Basement flooding
 - Carbon monoxide exposure from generators
 - Individuals' dependent on medical equipment
 - Access to potable water
 - High cost to government and community services



Strengths, Weaknesses, Opportunities + Obstacles (SWOO) Exercise

Strengths, Weaknesses, Obstacles, and Opportunities (SWOO)



Hazard	
Strengths	Weaknesses
<p>What does the county and its communities do well in terms of:</p> <ul style="list-style-type: none"> ➤ Plans and Regulations <ul style="list-style-type: none"> ➤ Codes, Ordinances, Planning Studies, Comprehensive Plans, Adaptation and Resiliency Plans ➤ Structure and Infrastructure Projects ➤ Natural Systems Protection ➤ Education and Awareness Programs ➤ Preparedness ➤ Others? 	<p>What can the county and its communities do better or what are the gaps in terms of:</p> <ul style="list-style-type: none"> ➤ Plans and Regulations <ul style="list-style-type: none"> ➤ Codes, Ordinances, Planning Studies, Comprehensive Plans, Adaptation and Resiliency Plans ➤ Structure and Infrastructure Projects ➤ Natural Systems Protection ➤ Education and Awareness Programs ➤ Preparedness ➤ Others?



37

Strengths, Weaknesses, Obstacles, and Opportunities (SWOO)



Hazard	
Obstacles	Opportunities
<p>What is preventing the county and its communities to implement in terms of:</p> <ul style="list-style-type: none"> ➤ Plans and Regulations <ul style="list-style-type: none"> ➤ Codes, Ordinances, Planning Studies, Comprehensive Plans, Adaptation and Resiliency Plans ➤ Structure and Infrastructure Projects ➤ Natural Systems Protection ➤ Education and Awareness Programs ➤ Preparedness ➤ Others? 	<p>What can the county and its communities implement terms of:</p> <ul style="list-style-type: none"> ➤ Plans and Regulations <ul style="list-style-type: none"> ➤ Codes, Ordinances, Planning Studies, Comprehensive Plans, Adaptation and Resiliency Plans ➤ Structure and Infrastructure Projects ➤ Natural Systems Protection ➤ Education and Awareness Programs ➤ Preparedness ➤ Others?



38

Strengths, Weaknesses, Obstacles, and Opportunities (SWOO)

Gloucester County HMP - SWOO Exercise

Gloucester County Strengths, Weaknesses, Obstacles, and Opportunities (SWOO)

The purpose of the Strengths, Weaknesses, Obstacles, and Opportunities (SWOO) is to identify mitigation strategies and capabilities that will meet the goals and objectives of the plan update. It is also used to develop potential mitigation actions for the participating jurisdictions.

Strengths – what we do well, what we can capitalize on
Weaknesses – what could we do better, what we need to strengthen
Obstacles – things that stand in the way, and either prevents you from doing something or something that needs to be overcome (e.g. regulatory, geographical, environmental, financial)
Opportunities – used to develop mitigation strategies

Coastal Erosion/Sea Level Rise

Please identify any Strengths, Weaknesses, Obstacles, or Opportunities regarding County and/or municipal capabilities to mitigating hazard impacts.

Strengths

Your answer

Gloucester County HMP - SWOO Exercise

Gloucester County Strengths, Weaknesses, Obstacles, and Opportunities (SWOO)

The purpose of the Strengths, Weaknesses, Obstacles, and Opportunities (SWOO) is to identify mitigation strategies and capabilities that will meet the goals and objectives of the plan update. It is also used to develop potential mitigation actions for the participating jurisdictions.

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Obstacles – things that stand in the way, and either prevents you from doing something or something that needs to be overcome (e.g. regulatory, geographical, environmental, financial)
Opportunities – used to develop mitigation strategies

For the current plan, a total of 16 hazards of concern were identified as significant hazards affecting the entire planning area, to be addressed at the county level in this plan:

1. Coastal Erosion/Sea Level Rise
2. Dam/Levee Failure
3. Disease Outbreak
4. Drought
5. Earthquake
6. Extreme Temperature
7. Flood
8. Geomorphological Hazards
9. Hazardous Materials
10. Hurricane/Tropical Storm
11. Invasive Species
12. Ion Radiation
13. Severe Weather
14. Severe Winter Weather
15. Wildfire
16. Utility Failure

Please use this survey to identify Strengths, Weaknesses, Obstacles, and Opportunities for each hazard.

39

Complete the On-line SWOO by July 7th

- <https://forms.gle/2F1ecFNKhJrZ3ygh6>
- Individual jurisdictions will be asked to complete the SWOO as well
- Important – this informs the Mitigation Strategy development

40



2021 HMP Mission Statement and Goals and Objectives



41

Mission Statement



- Per FEMA guidance (386-1), a mission statement or guiding principle describes the overall duty and purpose of the planning process and serves to identify the principal message of the plan. It focuses or constrains the range of goals and objectives identified. This is not a goal because it does not describe outcomes.
- Should a mission statement be included in this update?



42

42



Goals and Objectives

- Based on the input we received, the goals for the 2021 HMP are:
 - Goal 1 – Protect Life
 - Goal 2 – Protect Property
 - Goal 3 - Improve education and outreach efforts regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk
 - Goal 4 - Improve data collection, use, and sharing to reduce the risk of natural hazards
 - Goal 5 - Improve capabilities and coordination at municipal, county, and state levels to plan and implement hazard mitigation measures
 - Goal 6 - Support Continuity of Operations Pre-, During, and Post-Hazard Events
 - Goal 7 - Address Long-Term Vulnerabilities from High Hazard Dams

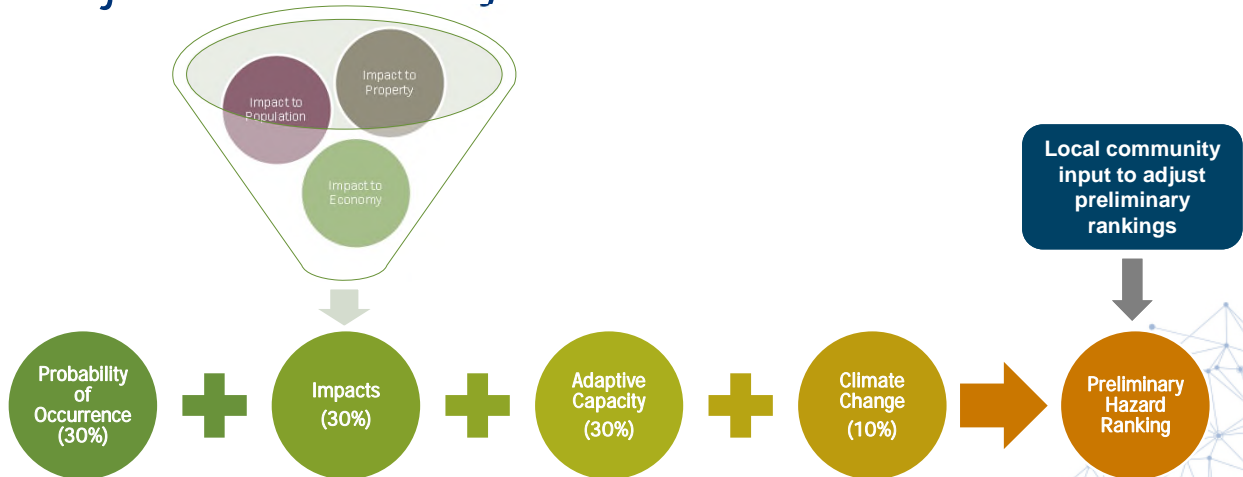
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Looking Ahead

44

Your Task – Review Results and Adjust as Necessary

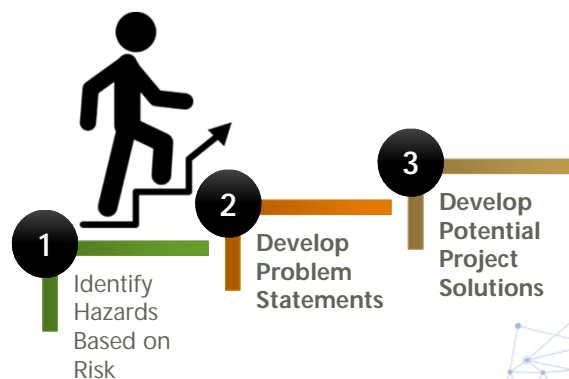


45

Next Steps – Problem Statements



- Municipalities will be presented their hazard rankings on June 30th and will be asked to review and adjust as needed
- Problem statements – start thinking about problems and the best solutions
- Quality not quantity
- We will work with you to prepare problem statements and solutions before the Mitigation Strategy Workshop (July or August)



46

Questions?

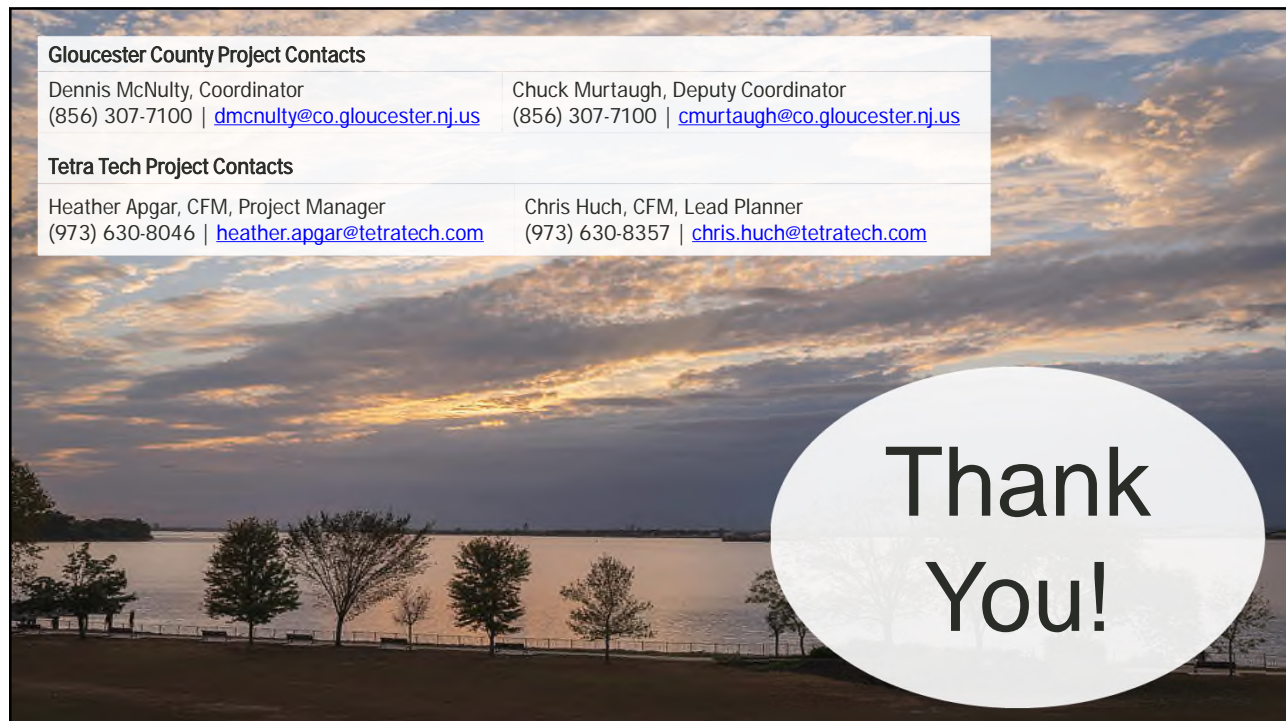




47

Gloucester County Project Contacts	
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Tetra Tech Project Contacts	
Heather Apgar, CFM, Project Manager (973) 630-8046 heather.apgar@tetratech.com	Chris Huch, CFM, Lead Planner (973) 630-8357 chris.huch@tetratech.com



Thank You!

48