

DELAWARE'S

Climate Action Plan

Public Workshop Summary

Round 2: Fall 2020

Workshop Nos. 2, 3 and 4



This report was prepared by the Delaware Department of Natural Resources and Environmental Control

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OVERVIEW

As part of the Climate Action Plan development process in 2020, the state engaged Delaware residents to share their ideas about climate change and the opportunities and barriers to climate action. The Department of Natural Resources and Environmental Control's (DNREC) Division of Climate, Coastal and Energy has led on-going public engagement to develop a Climate Action Plan for Delaware. An initial [series of public workshops were held in March 2020](#) to educate the community about climate change, inform them of the state's planning process and introduce them to example strategies to minimize greenhouse gas emissions and maximize resilience to climate change impacts. The overall goal was to understand barriers, resource needs and interest in the public's support for various climate action strategies.

The second round of public workshops was held in fall 2020 to build on the initial engagement effort. This second round consisted of four workshops held entirely online via the videoconference software Zoom. The series focused on soliciting feedback on potential actions the state could take to minimize greenhouse gas emissions (Workshop No. 1) and maximize resilience to climate change impacts (Workshop Nos. 2, 3 and 4). This summary captures the results of Workshop Nos. 2, 3 and 4. Each workshop focused on a different climate change impact and possible actions to maximize resilience to the impact. Workshop times, topics and dates are noted below:

THURSDAY, SEPTEMBER 24

Sea Level Rise

5:30 p.m. – 7 p.m.

Online (Zoom)

TUESDAY, SEPTEMBER 29

Increased Temperatures

5:30 p.m. – 7 p.m.

Online (Zoom)

THURSDAY, OCTOBER 1

Heavy Precipitation and Flooding

5:30 p.m. – 7 p.m.

Online (Zoom)

The goals of Workshop Nos. 2, 3 and 4 were to:

- Provide an overview of the Climate Action Plan and its development process;
- Communicate how public input has shaped the planning process for the Climate Action Plan;
- Provide an overview of how actions identified for maximizing resilience were created; and
- Gather feedback on which actions to maximize resilience participants would like to see the state implement.

BY THE NUMBERS

	September 24, 2020	September 29, 2020	October 1, 2020
Number of Workshop Participants	71	56	74

THE APPROACH

Workshop Nos. 2, 3 and 4 were designed to share actions state agencies can take to maximize resilience and solicit feedback from the public on each of the recommended actions. The actions presented at the workshops were created by reviewing past efforts, interviewing experts and engaging stakeholders. To fully cover the information, the Climate Action Plan team decided to host three workshops that each focused on a separate climate change impact and related actions that could build resilience. The three impact topics were chosen based on the *2014 Climate Vulnerability Assessment* and the *2017 Sea Level Rise Vulnerability Assessment*. According to these documents, the greatest projected climate change impacts include increased temperatures, changes in precipitation and sea level rise. The team decided to focus on a major aspect of precipitation changes and designed the workshop around heavy precipitation and flooding.

All three workshops presented different topic materials but followed a similar format. The agenda was the same for all three workshops.

Agenda	
5:30 p.m. – 5:40 p.m.	Workshop Introduction
5:40 p.m. – 6 p.m.	Climate Change Impacts
6 p.m. – 6:45 p.m.	Actions to Maximize Resilience
6:45 – 7 p.m.	Questions and Wrap-up
7 p.m.	Workshop Ends

The core components of the workshops consisted of a presentation on Delaware's Climate Action Plan and resiliency actions that agencies could undertake (see Appendix 1), a series of interactive polls (see Appendix 3) and a brainstorming session to capture ideas from the public for the team to consider (see Appendix 5). To wrap up each workshop a live question and answer session with the main workshop presenters, Dr. Robert Scarborough the Delaware Coastal Management Program (DCMP) Manager and Ms. Maggie Pletta a Coastal Resiliency Planner with DCMP, was held. It provided an opportunity for participants to get clarification on the information presented and the ideas suggested by participants during the brainstorming session. Dr. Scarborough and Ms. Pletta answered as many questions as possible live and provided answers to all unanswered questions via a document posted on November 6, 2020 to declimateplan.org (see Appendix 4).

The workshop started with basic information that outlined the Climate Action Plan process; this information was repeated at each of the three workshops. This layout was deemed necessary to ensure that participants had a basic understanding of the purpose of the Plan and the workshop series without being present at all workshops. To help prepare participants, handouts on the projected impacts and the sectors at risk to the impacts were sent to participants in advance of the workshop sessions (see Appendix 2).

Originally the workshops were planned to be in-person; due to the COVID-19 pandemic they were held virtually, and a third-party closed captioning provided live captioning during the workshops to increase accessibility.

Presentation

The presentations provided an overview of Delaware's climate action planning process, emphasized why it is essential to act now and possible actions to build resilience.

Each presentation started with the same introductory slides that outlined background information about the goals of the Plan, the planning timeline and how the actions presented during the workshops were identified.

After the initial opening slides, each presentation covered information about a specific climate change impact topic. A short video was created for each workshop to provide a high level review of how sea level rise, increased temperatures and heavy precipitation and flooding will impact Delaware. All three videos are available on declimateplan.org. After the videos, a more in-depth look at how climate change would affect agriculture, human health and safety, water resources, natural resources and infrastructure was provided.

Finally, the bulk of the presentation focused on reviewing specific strategies that state agencies can take to help build resilience. The strategies were grouped by seven overarching categories:

- 1) Management Plans
- 2) Regulation and/or Policy
- 3) Research and Monitoring
- 4) Support for Communities and Stakeholders
- 5) Outreach
- 6) Facilities and Infrastructure Design and Management
- 7) Administrative Processes

For each proposed category, a variety of strategies were presented for discussion. For each strategy, a specific action was provided as an example on how the strategy could be implemented and how it built resilience.

Full presentation slides for each workshop are available in Appendix 1.

Developing the Climate Action Plan

- Built on Past Efforts**
 - Statewide Sea Level Rise Planning Initiative
 - Executive Order 41
 - Literature Reviews
- Interviewed Experts**
 - State Agencies
 - Neighboring State Climate Programs
 - Universities and Federal Agencies
- Engaged Stakeholders**
 - Public Workshops in March
 - Online Survey
 - Submission of Comments

15

What's at risk from increased temperatures?

- Agriculture**
 - Crop and livestock health
 - Costs of farming
- Human Health**
 - Vector borne diseases
 - Heat related illnesses
- Infrastructure**
 - Energy generation
 - Roads, bridges, and rail lines
- Natural Resources**
 - Wildlife and plant health
 - Wildlife food sources
- Water Resources**
 - Water use
 - Water quality

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Support of Communities and Stakeholders
Help in the form of trainings, resources, and technical assistance.

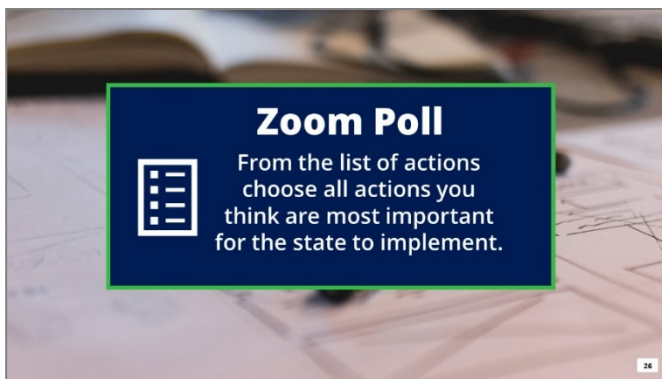
- Increase grant opportunities for communities for adaptation projects.
- Support agricultural community adaptation.
- Support programs and initiatives that help frontline communities adapt.
- Provide outreach, trainings, and tools to the public and government agencies on health impacts.
- Provide outreach, trainings, and tools to the public and government agencies.

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Polling



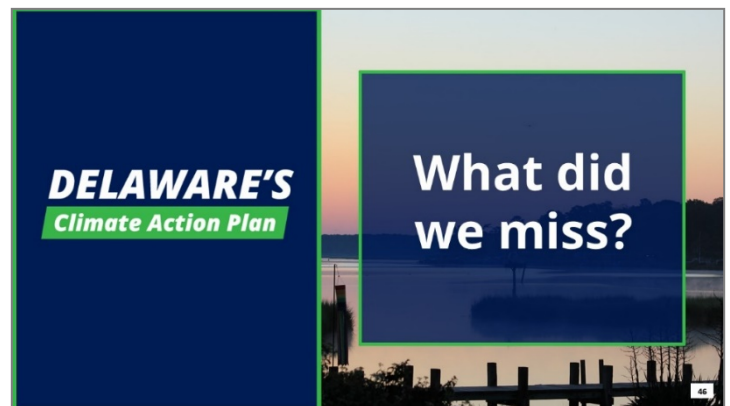
Voluntary, interactive polls were used to gather feedback from workshop participants, there was a total of nine polls during each workshop. The first two polls remained the same across all three workshops; they collected basic information about participants including the state they live in and what type of organization, if any, they were representing on the call. These polls also served to give workshop attendees practice with the zoom polling interface. Overwhelmingly across the three workshops participants were from Delaware and concerned citizens not representing an organization.



The other seven polls were administered after each category and strategies were presented to attendees. The poll question remained the same every night, “From the list of actions choose all actions you think are most important for the state to implement.” However, the strategies, or referred to here as actions, listed in the poll changed based on the workshop impact topic. The goal of these polls was to understand what actions participants supported and which items will need additional review. Overall participants supported all of the strategies presented, greater analysis on the feedback is provided in the following “What We Heard Section”. Full poll results can be found in Appendix 3.

Brainstorming Session

After all categories and strategies were presented, the team provided participants the opportunity to provide additional feedback during a write-in brainstorming session. The session lasted for five minutes and participants were able to input any additional actions that they believed were missing, ask clarifying questions and provide additional feedback on the actions that were presented. This resulted in over 100 separate comments submitted by participants across all three nights. An analysis of the feedback is provided in the “What We Heard Section” and a full catalogue of the comments can be found in Appendix 5.



WHAT WE HEARD

Generally, participants support the proposed resilience actions identified by the state, which indicates to the Climate Action Plan team that they are on the right track. Across all three workshops participants did not overwhelmingly support one action over another in the polls. This could be for two reasons; one they support all of the actions equally or two because it did not ask them to rank the actions so no clear distinctions in level of support can be made. A definitive answer cannot be provided by the planning team at this time.

Based on the few dissenting opinions in the polls and comments submitted during the brainstorming sessions, additional engagement work is needed throughout the plan development and implementation. Among workshop attendees there was a trend that they wanted stronger actions that would require updated or new regulations.

While the Climate Action Plan is meant to guide state agency decisions it was brought up at two of the three workshops that private industry, businesses and individuals need targeted adaptation action as well. This desire to have a comprehensive approach to maximizing resilience should be considered in the development of the plan. Additionally, participants noted that the state should consider creating resiliency guidance documents and sample climate action plans for these groups in the future.

Finally, across all workshops there were comments related to the need to minimize emissions as well as maximizing resilience. While the actions presented in Workshop Nos. 2, 3 and 4 did not include minimizing emissions, Workshop No. 1 focused on these types of action. However, the fact that these sorts of actions came up again during the following workshops is helpful information for the Climate Action Plan team when making decisions on all strategies and actions in the Plan.

Below is a brief summary of the overarching themes that arose during each workshop.

Sea Level Rise - September 24, 2020

Overall, across all the polls, participants supported the presented actions with two or fewer participants choosing that no further actions were needed at this time. During the brainstorming session several items surfaced across multiple answers including regulatory actions to stop development in areas at risk to sea level rise, additional funding and support provided to local governments for implementation, and the need to act now.

Increased Temperatures - September 29, 2020

Overall, across all the polls participants supported the presented actions with three or fewer participants choosing that no further actions were needed at this time. During the brainstorming session several items surfaced across multiple answers including the importance of coordinating with other states in the region, increasing the use of renewable energy (like solar) in the state, concern for vulnerable populations, updates to industry regulations, and increasing engagement on resiliency actions with the private sector.

Heavy Precipitation and Flooding - October 1, 2020

Overall, across all the polls participants supported the presented actions. The only dissenting opinions were two participants choosing that no further actions were needed at this time in the “Outreach” category. During the brainstorming session several items surfaced across multiple answers including involving the private industry more in the discussions and supporting local governments to adapt. It is worth noting that many of the comments that came in during the brainstorming session related more to the workshop layout and content rather than the actions and strategies presented.

OTHER ENGAGEMENT

The state also held conversations about actions to minimize emissions. The first workshop in the series focused on minimizing emissions and was offered twice, once in the afternoon and once in the evening, to allow for as many participants as possible to attend. The summary for Workshop No. 1 is available on declimateplan.org.

To complement the virtual workshop series, the state launched an online survey on the project website (declimateplan.org) available from September 7 until October 16, garnering 96 total responses. The survey allowed people (particularly those unable to attend one of the virtual workshops) an opportunity to provide similar feedback to what was shared at the workshops.

The survey had similar goals to the virtual workshops. Respondents were presented with potential actions for maximizing resilience to climate change impacts and asked to rank those they believed the state should prioritize first. Additionally, the survey questions asked respondents to rank potential actions for minimizing greenhouse gas emissions based on respondent beliefs about emissions reduction impact. Respondents were also asked to indicate which of these actions they believed the state should prioritize first.

Survey results indicate that changing state policy regulations and building stakeholder support were the highest priority actions for Delaware to pursue to maximize resilience to climate change impacts.

Participants also indicated that renewable energy and zero emission vehicles were perceived by the public as the most impactful (and highest priority) actions to minimize greenhouse gas emissions. Comments from the survey also revealed the public's interest in reducing food waste, encouraging plant-based diets, reducing vehicle miles traveled, increasing opportunities for carbon capture and storage and expanding public transportation.

A copy of the full survey instrument and results of the online survey can be found in the Workshop No. 1 summary, posted on declimateplan.org.

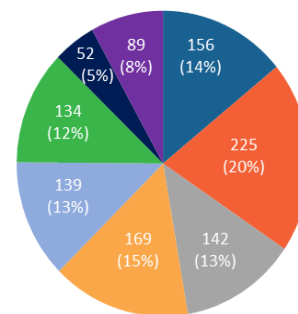


Responses to this Question: 84

MAXIMIZE RESILIENCE

Resilience to climate impacts is another key factor to consider in a climate action plan. Participants used a second priority allocation tool to indicate which resilience-enhancing action they wished to see Delaware pursue *first*. Each participant had a stack of 15 “stars” that they could allocate however they wanted across seven actions and to a “no additional actions needed” option. Below are the cumulative results from all survey respondents, both in terms of star count and percentage of total stars allocated.

Which Action First?



- Changes to State Program Plans
- Changes to State Policy Regulation
- Research and Monitoring
- Community and Stakeholder Support
- Improved Outreach
- Improve Facilities Infrastructure
- State Agency Administration
- No additional actions needed

Total stars allocated: 1,106

Detailed descriptions of the top 3 actions:

1. **Changes to State Policy Regulation:** Update current regulations and consider creating new regulations to address climate change impacts.
2. **Community and Stakeholder Support:** Provide up-to-date tools, training and other support to communities and other stakeholders.
3. **Changes to State Program Plans:** Update planning documents related to asset management, natural resources management, emergency response, and facility access.

APPENDICES

APPENDIX 1: Presentation Slides

Sea Level Rise – September 24, 2020

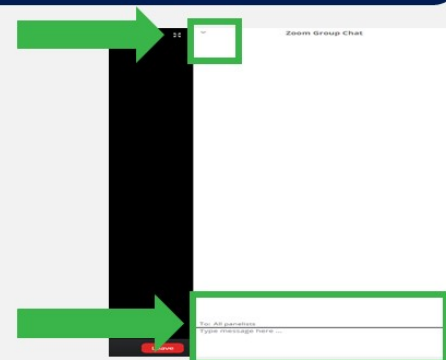
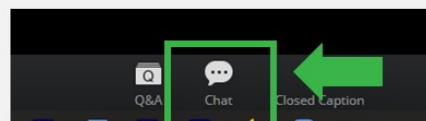


Virtual Workshop Logistics:

Tech Support

Get Tech Support

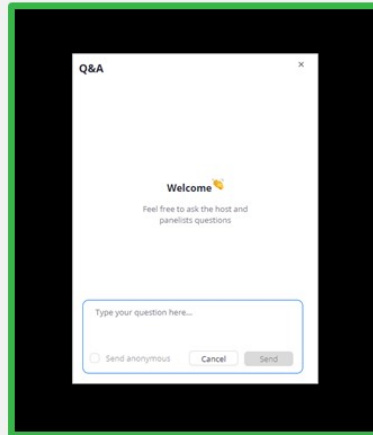
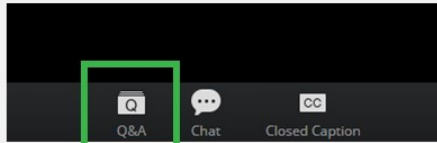
- Open your chat box.
- You can access the chat box by clicking the button at the bottom of your screen. A chat box will appear on the right side of your screen.
- Send a message to all panelists and someone will assist you. Please note that the other participants will NOT be able to see your question making it a private message.



2

Ask a Question or Submit a Comment

- Click the Q/A icon at the bottom of your screen to ask presenters questions or submit a comment.
- Presenters may not get to all questions, but they will try their best.
- If the Q&A function does not work, email questions or comments to declimateplan@delaware.gov anytime during the event.



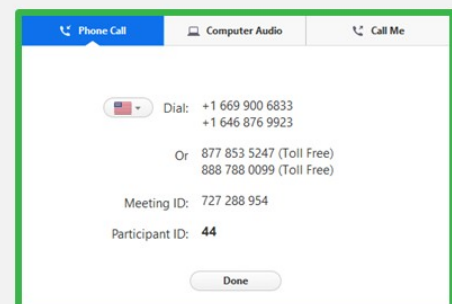
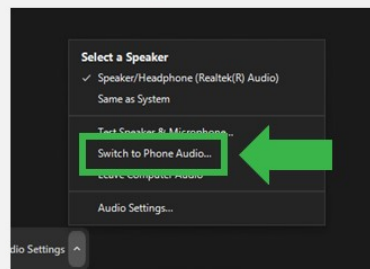
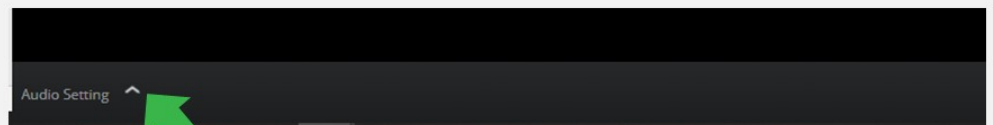
Virtual Workshop Logistics: Questions and Comments

3

Virtual Workshop Logistics: Audio

Make Sure Your Sound Works

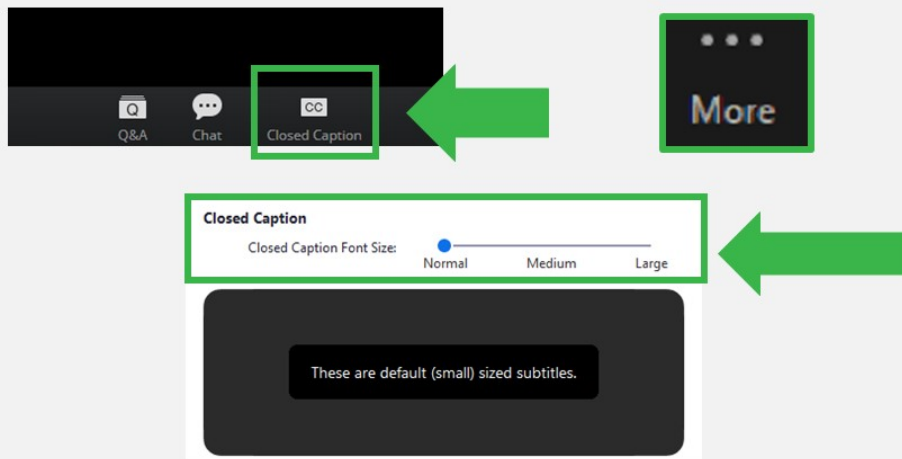
- If you're using speaker audio and it doesn't work, try re-starting Zoom or click the "up" arrow and "Switch to Phone Audio".



4

Closed Captioning

- To turn on captions, click the closed captioning icon at the bottom of your screen and select "Show Subtitle".
- To view captions that were typed previously, select "Show Full Transcript", a new pop-up will appear with the transcript.
- To change caption size, click the "Closed Caption" icon again and select "Subtitle Settings". Use the slider to change caption size.



Virtual Workshop Logistics:

Closed Captions

5

Agenda

5:30 p.m. – 5:40 p.m.

5:40 p.m. – 6 p.m.

6 p.m. – 6:45 p.m.

6:45 – 7 p.m.

7 p.m.

Workshop Introduction

Climate Change Impacts

Actions to Maximize Resilience

Questions and Wrap-up

Workshop Ends

6

Workshop Goals

Provide an overview of the Climate Action Plan and its development process.

Communicate how public input has shaped the planning process for the Climate Action Plan.

Provide overview of how actions identified for maximizing resilience were created.

Gather feedback on which actions to maximize resilience participants would like to see the state implement.

7

Workshop Facilitators and Presenters



Dr. Robert Scarborough
Division of Climate, Coastal and Energy
Delaware Coastal Management Program



Ms. Maggie Pletta
Division of Climate, Coastal and Energy
Delaware Coastal Management Program



Mr. Ian Yue
Division of Climate, Coastal and Energy
Climate and Sustainability Section



Ms. Kristen Thornton
Division of Climate, Coastal and Energy
Delaware Coastal Management Program



Ms. Nicole Marks
Division of Climate, Coastal and Energy
Delaware Coastal Management Program

8

Getting to Know You

Where are you from?

- 1) Delaware
- 2) Maryland
- 3) New Jersey
- 4) Pennsylvania
- 5) Other



9

Getting to Know You

Organizational Affiliation?

- 1) Concerned Citizen
- 2) State or Local Government
- 3) Non-Profit
- 4) Business
- 5) Other



11

Climate Action Plan Overview

- The Plan will include actions to **minimize** and **maximize**:
 - **Minimize** greenhouse gas emissions, major driver of climate change
 - **Maximize** resilience to climate change impacts (e.g., increased temperatures, sea level rise, more extreme weather)
- **Provide information and actions** for state leaders to use in decision-making
- **Plan Release Date:** Winter 2021

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DELAWARE'S **Climate Action Plan**

Implementing Delaware's Climate Action Plan will protect and strengthen:

- Our agricultural and tourism economies
- The natural places we enjoy for recreation
- Our infrastructure
- The health of our residents and visitors

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Developing the Climate Action Plan



Built on Past Efforts

- Statewide Sea Level Rise Planning Initiative
- Executive Order 41
- Literature Reviews



Interviewed Experts

- State Agencies
- Neighboring State Climate Programs
- Universities and Federal Agencies



Engaged Stakeholders

- Public Workshops in March
- Online Survey
- Submission of Comments

15



Climate Change Impact: Sea Level Rise



16

What's at risk from sea level rise?



Agriculture

- Groundwater for irrigation
- Land suitable for agriculture



Human Health

- Emotional health
- Physical health



Infrastructure

- Roads, bridges, and rail lines
- Water control structures



Natural Resources

- Beaches and dunes
- Coastal wetlands



Water Resources

- Freshwater riverine habitats
- Drinking water intakes

17



Agriculture



- Contributes \$8 billion annually to our economy
- Groundwater for irrigation
- Land suitable for agriculture

18



Human Health

- Emotional health
 - Strain of nuisance flooding
 - Loss of connections during relocation
- Physical health
 - Respiratory health
 - Contaminants
 - Unsafe driving conditions



19



Infrastructure



- Roads, bridges, and rail lines
 - Around 5% of all roads at risk
 - Flooding, erosion, reduced bridge clearance
 - Around 4% of rail lines
 - Periodic flooding, long term inundation, erosion
- Water control structures
 - Dams, dikes, and levees
 - Up to 78% at risk

20



Natural Resources

- Beaches and dunes
 - Erosion
 - Unable to migrate landward
- Coastal wetlands
 - Loss of ecosystem services
 - Unable to keep pace
 - Unable to migrate landward



21



Water Resources



Photo Credit: Brandywine Conservancy

- Freshwater riverine habitats
 - Recreational and commercial fish species
- Drinking water intakes
 - Surface water sources
 - Reduction in quality and reliability

22

Sea Level Rise Impacts



Agriculture

- Groundwater for irrigation
- Land suitable for agriculture



Human Health

- Emotional health
- Physical health



Infrastructure

- Roads, bridges, and rail lines
- Water control structures



Natural Resources

- Beaches and dunes
- Coastal wetlands



Water Resources

- Freshwater riverine habitats
- Drinking water intakes

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Recommendations

Management Plans

Outreach

Regulation and/or Policy

Facilities and Infrastructure
Design and Management

Research and Monitoring

Administrative Processes

Support for Communities
and Stakeholders

24



Management Plans

Update planning documents for natural resources, emergency response, state facilities, and Agency equipment.

Agency strategic plans.

Asset management plans for long-term maintenance, repair, and decommission decisions.

Natural resources and agricultural management and restoration plans.

Update emergency response and hazard mitigation plans.

25

Zoom Poll



From the list of actions choose all actions you think are most important for the state to implement.

26



Regulations and/or Policy

Update and/or change current regulations and policies to address protection and conservation of vulnerable and impacted resources.

Update Agency policies and guides.

Develop a comprehensive regulatory plan to protect and restore wetlands.

Evaluate opportunities to update the air quality permitting and regulatory process.

Review and update shoreline regulations to reduce risk to coastal properties.

Update the Coastal Zone Act regulatory process.

28

Zoom Poll



From the list of actions choose all actions you think are most important for the state to implement.

29



Research and Monitoring

Support monitoring of conditions and research that studies the impacts of climate change and methods of adapting.

Increase the number of adaptation pilot projects.

Review research and monitoring methodologies.

Continue and expand research on impacts to infrastructure and facilities.

Continue exploring impacts to human health and the costs of health care.

Continue, and expand, research, monitoring, and modeling of natural resources.

Develop and maintain a water resource database for use in planning and permitting decisions.

31



Zoom Poll

From the list of actions choose all actions you think are most important for the state to implement.

32



Support of Communities and Stakeholders

Help in the form of trainings, resources, and technical assistance.

Increase grant opportunities for communities for adaptation projects.

Provide outreach and tools to businesses.

Support programs and initiatives that help frontline communities adapt.

Assist local governments with updating ordinances/planning documents.

Provide outreach, trainings, and tools to the public and government agencies.

Assist local governments and water suppliers to identify vulnerabilities and adaptation actions.

Support agricultural community adaptation.

Support insurance industry adaptation.

34

Zoom Poll



From the list of actions choose all actions you think are most important for the state to implement.

35



Outreach

Messaging to stakeholders and the public on climate change impacts and adaptation.

Develop communication tools and resources, in both English and other languages.

Create targeted communication resources on climate change impacts.

Increase opportunities for consumers to understand their risks and how insurance can help them prepare and recover.

37



Zoom Poll

From the list of actions choose all actions you think are most important for the state to implement.

38



Facility and Infrastructure Design and Management

Plans and guides that that accounts for future climate conditions and sea level rise.

Prepare state facilities and equipment.

Update facility construction guides and standards.

40



Zoom Poll

From the list of actions choose all actions you think are most important for the state to implement.

41



Administrative Processes

Review and edit processes related to operational guidelines and documents on how Agencies do business.

Increase state Agency capacity to adapt through funding, staffing, and training.

Act as climate change adaptation leaders.

LEGISLATIVE HALL

43

Zoom Poll



From the list of actions choose all actions you think are most important for the state to implement.

LL

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DELAWARE'S

Climate Action Plan

What did we miss?

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DELAWARE'S

Climate Action Plan

Questions

- We will answer as many questions as possible that were submitted via the Q&A box.
- All questions from the Q&A box answered live or not will be collected, answered and uploaded on declimateplan.org.
- The question document will be uploaded by Friday, October 16th.

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Make Your Voice Heard



Register for an Upcoming Workshops

- Maximizing Resilience to Increased Temperatures
September 29, 5:30 p.m. to 7 p.m.
- Maximizing Resilience to Heavy Precipitation & Flooding
October 1, 5:30 p.m. to 7 p.m.



Provide Additional Feedback

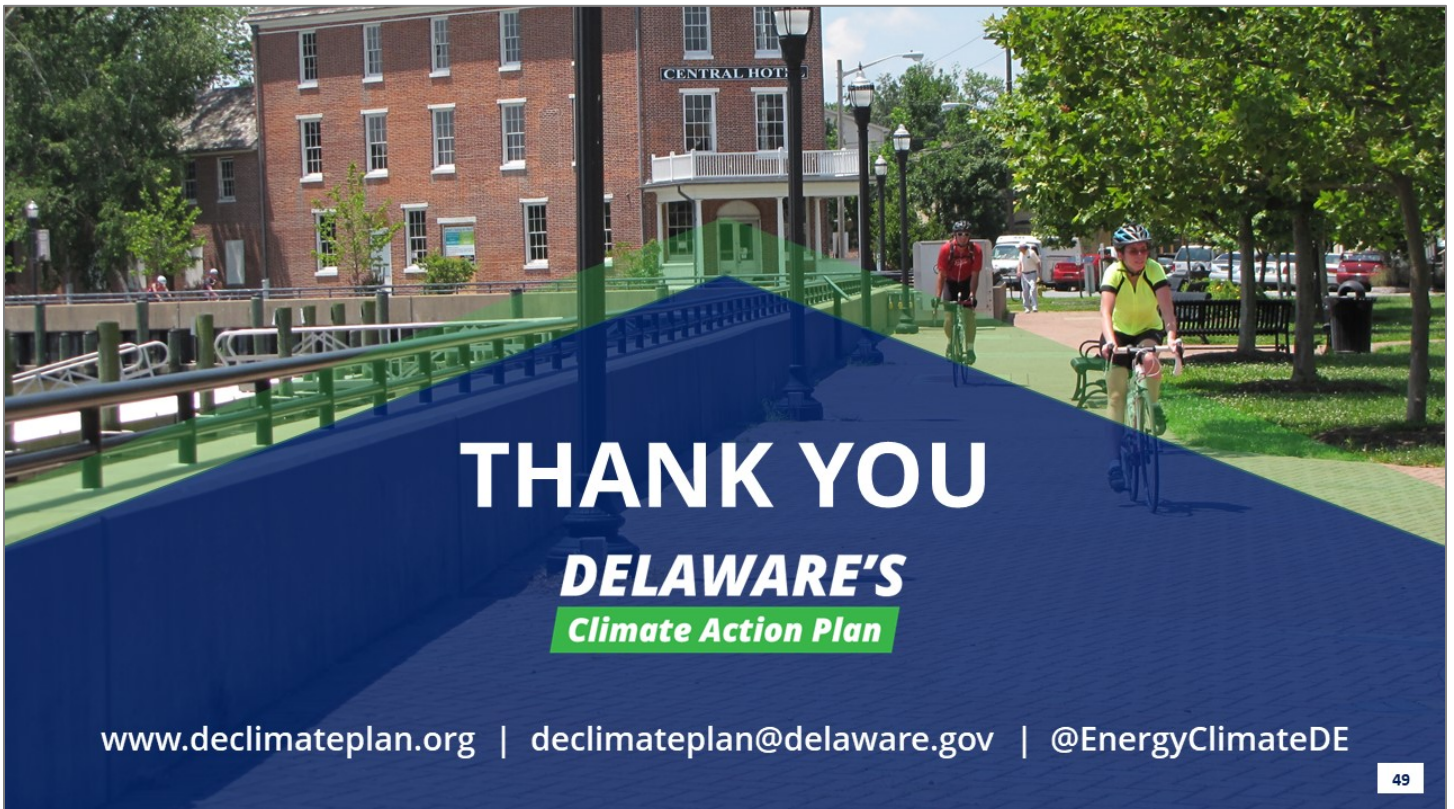
- Feedback can be submitted via an online feedback form at declimateplan.org until Friday, October 16th.
- Comments can be submitted via an online MetroQuest Survey found at declimateplan.org until Friday, October 16th.



Help Improve Our Workshops

- Complete a brief questionnaire emailed to you within 24 hours to help us improve how we collect public input and host public workshops.

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49

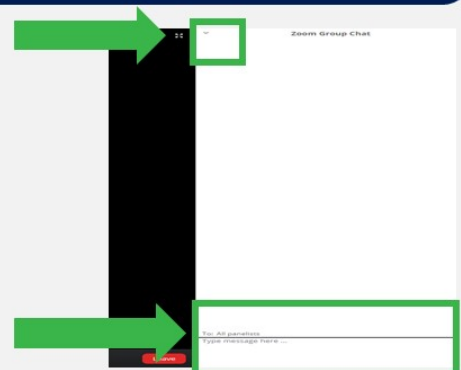
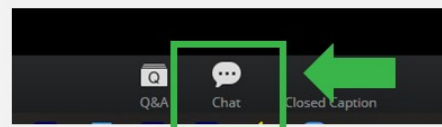


Virtual Workshop Logistics:

Tech Support

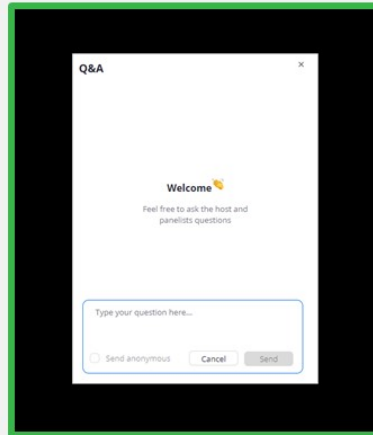
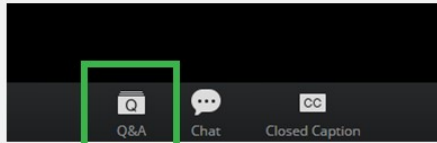
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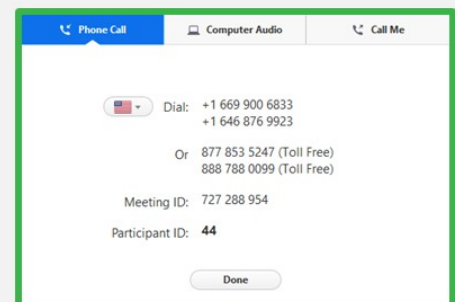
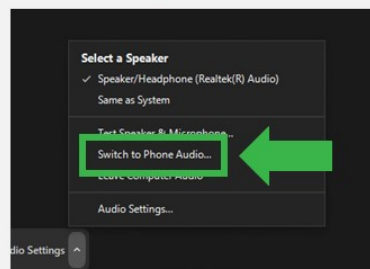
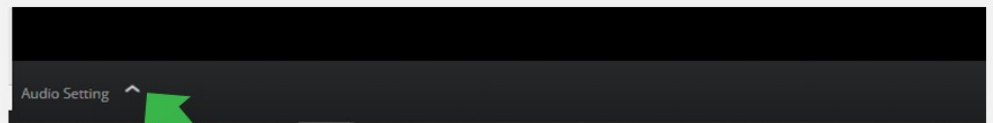
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3

Virtual Workshop Logistics: Audio

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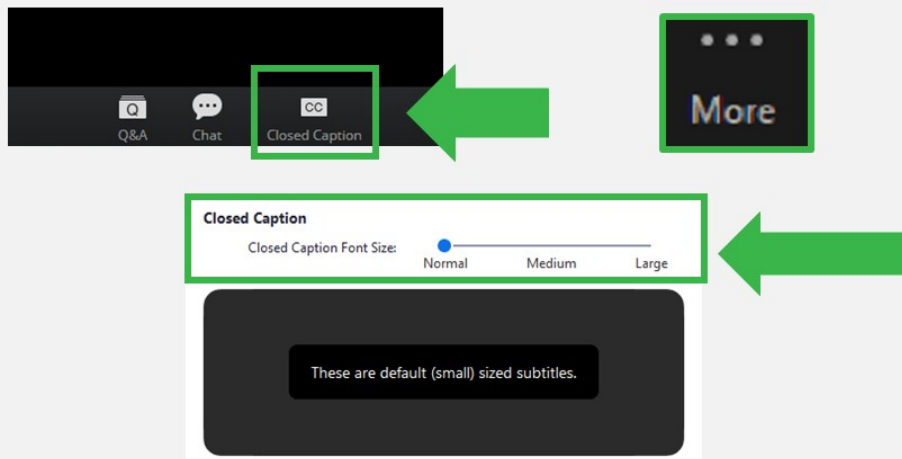
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Ms. Kristen Thornton
Division of Climate, Coastal and Energy
Delaware Coastal Management Program



Ms. Nicole Marks
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Getting to Know You

Where are you from?

- 1) Delaware
- 2) Maryland
- 3) New Jersey
- 4) Pennsylvania
- 5) Other



9

Getting to Know You

Organizational Affiliation?

- 1) Concerned Citizen
- 2) State or Local Government
- 3) Non-Profit
- 4) Business
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Climate Action Plan Overview

- The Plan will include actions to **minimize** and **maximize**:
 - **Minimize** greenhouse gas emissions, major driver of climate change
 - **Maximize** resilience to climate change impacts (e.g., increased temperatures, sea level rise, more extreme weather)
- **Provide information and actions** for state leaders to use in decision-making
- **Plan Release Date:** Winter 2021

13

DELAWARE'S *Climate Action Plan*

Implementing Delaware's Climate Action Plan will protect and strengthen:

- Our agricultural and tourism economies
- The natural places we enjoy for recreation
- Our infrastructure
- The health of our residents and visitors

14

Developing the Climate Action Plan



Built on Past Efforts

- Statewide Sea Level Rise Planning Initiative
- Executive Order 41
- Literature Reviews



Interviewed Experts

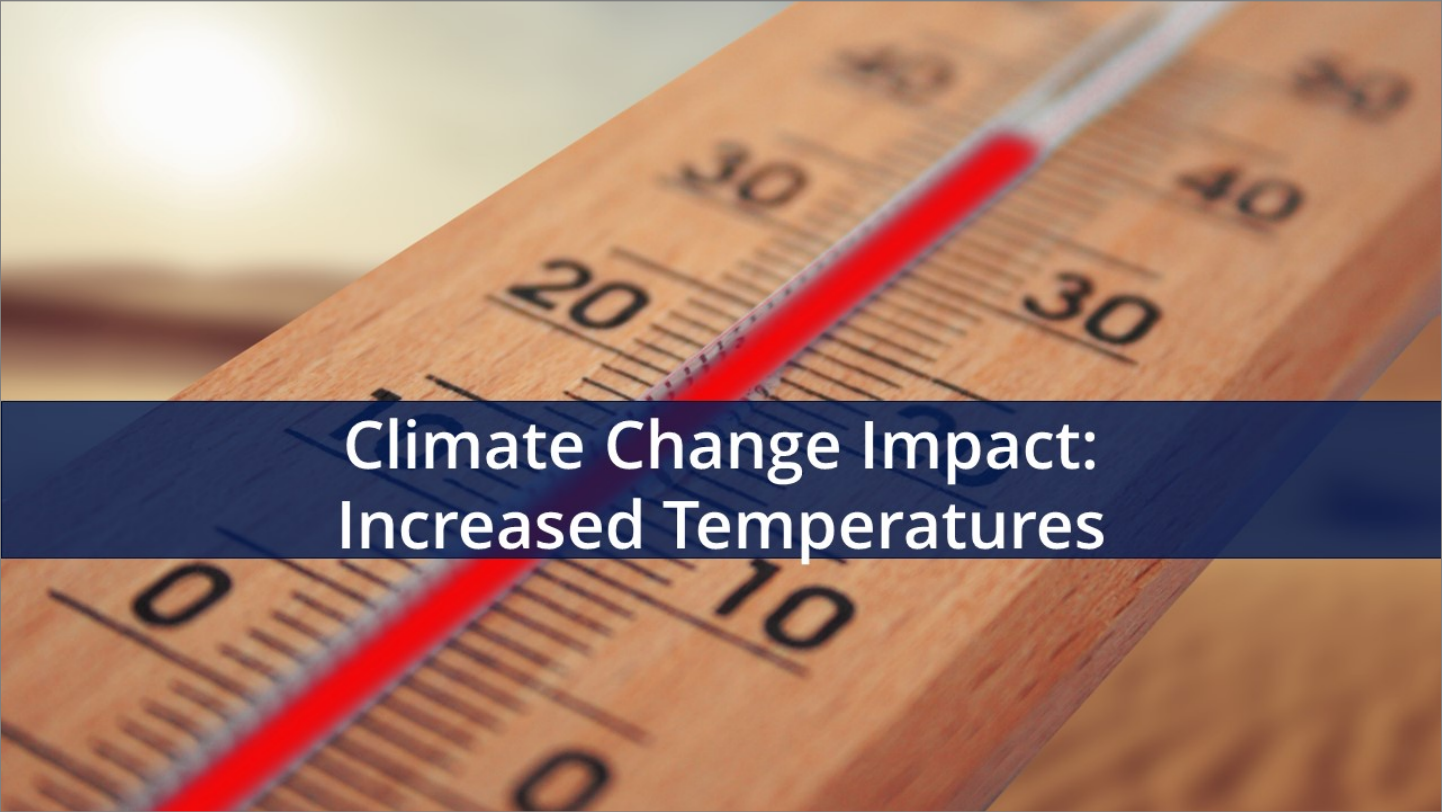
- State Agencies
- Neighboring State Climate Programs
- Universities and Federal Agencies



Engaged Stakeholders

- Public Workshops in March
- Online Survey
- Submission of Comments

15



Climate Change Impact:
Increased Temperatures

What's at risk from increased temperatures?



Agriculture

- Crop and livestock health
- Costs of farming



Human Health

- Vector borne diseases
- Heat related illnesses



Infrastructure

- Energy generation
- Roads, bridges, and rail lines



Natural Resources

- Wildlife and plant health
- Wildlife food sources



Water Resources

- Water use
- Water quality

17



Agriculture



- Contributes \$8 billion annually to our economy
- Crop and livestock health
 - Reduced yields
 - Weed competition
 - Heat stress
- Costs of farming
 - Increased irrigation needs

18



Human Health

- Vector borne diseases
 - West Nile and EEE
 - Lyme disease
- Heat related illnesses
 - Vulnerable populations



19



Infrastructure



- Energy generation
 - Increase in demand
 - Damage to infrastructure
- Roads, bridges, and rail lines
 - Buckling and rutting of roads
 - Damage to bridge supports
 - Damage to tracks
 - Disruptions to operations

20



Natural Resources

- Wildlife health
 - Increase in insects
 - Disruptions to hibernation
- Plant health
 - Mismatched blooming
 - Increased vulnerability
- Wildlife food sources



21



Water Resources



- Water use
 - Increased demand
 - Decreased availability
- Water quality
 - Drinking water
 - Aquatic habitats

22

What's at risk from increased temperatures?



Agriculture

- Crop and livestock health
- Costs of farming



Human Health

- Vector borne diseases
- Heat related illnesses



Infrastructure

- Energy generation
- Roads, bridges, and rail lines



Natural Resources

- Wildlife food sources
- Wildlife and plant health



Water Resources

- Water use
- Water quality

23

Recommendations

Management Plans

Outreach

Regulation and/or Policy

Facilities and Infrastructure
Design and Management

Research and Monitoring

Administrative Processes

Support for Communities
and Stakeholders

24



Management Plans

Update planning documents for natural resources, emergency response, state facilities, and Agency equipment.

Agency strategic plans.

Natural resources and agricultural management and restoration plans.

25

Zoom Poll



From the list of actions choose all actions you think are most important for the state to implement.

26



Regulations and/or Policy

Update and/or change current regulations and policies to address protection and conservation of vulnerable and impacted resources.

Update Agency policies and guides.

Evaluate opportunities to update the air quality permitting and regulatory process.

28



Zoom Poll

From the list of actions choose all actions you think are most important for the state to implement.

29



Research and Monitoring

Support monitoring of conditions and research that studies the impacts of climate change and methods of adapting.

Increase the number of adaptation pilot projects.

Continue, and expand, research, monitoring, and modeling of natural resources.

Expand research and modeling on the reduction of greenhouse gas emissions.

Continue exploring impacts to human health and the costs of health care.

31



Zoom Poll

From the list of actions choose all actions you think are most important for the state to implement.

32



Support of Communities and Stakeholders

Help in the form of trainings, resources, and technical assistance.

Increase grant opportunities for communities for adaptation projects.

Support agricultural community adaptation.

Support programs and initiatives that help frontline communities adapt.

Provide outreach, trainings, and tools to the public and government agencies on health impacts.

Provide outreach, trainings, and tools to the public and government agencies.

34



Zoom Poll

From the list of actions choose all actions you think are most important for the state to implement.

35



Outreach

Messaging to stakeholders and the public on climate change impacts and adaptation.

Develop communication tools and resources, in both English and other languages.

Create targeted communication resources on climate change impacts.

Increase climate change education programming offered by state Agencies.

37



Zoom Poll

From the list of actions choose all actions you think are most important for the state to implement.

38



Facility and Infrastructure Design and Management

Plans and guides that that accounts for future climate conditions and sea level rise.

Prepare state facilities and equipment.

Update facility construction guides and standards.

40



Zoom Poll

From the list of actions choose all actions you think are most important for the state to implement.

41



Administrative Processes

Review and edit processes related to operational guidelines and documents on how Agencies do business.

Plans and training policies that support the health and safety of personnel.

Improve data collection and sharing across State Agencies support regulatory and policy decisions.

Increase state Agency capacity to adapt through funding, staffing, and training.

Act as climate change adaptation leaders.

43

Zoom Poll



From the list of actions choose all actions you think are most important for the state to implement.

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DELAWARE'S

Climate Action Plan

What did we miss?

46

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Make Your Voice Heard



Register for our Upcoming Workshop

- Maximizing Resilience to Heavy Precipitation & Flooding
October 1, 5:30 p.m. to 7 p.m.



Provide Additional Feedback

- Feedback can be submitted via an online feedback form at declimateplan.org until Friday, October 16th.
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Help Improve Our Workshops

- Complete a brief questionnaire emailed to you within 24 hours to help us improve how we collect public input and host public workshops.

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THANK YOU

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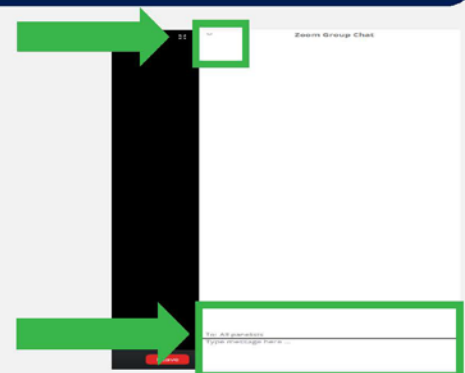
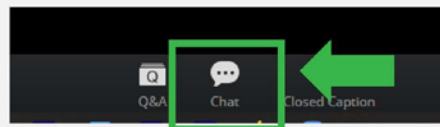


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Tech Support

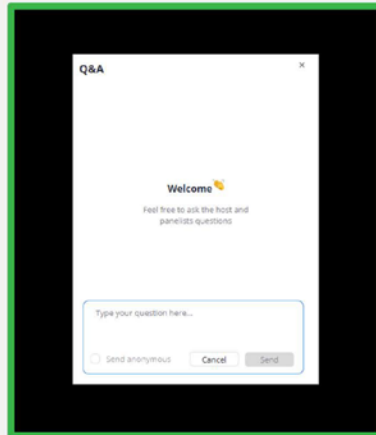
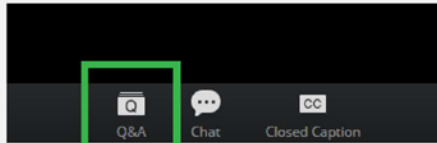
Get Tech Support

- Open your chat box.
- You can access the chat box by clicking the button at the bottom of your screen. A chat box will appear on the right side of your screen.
- Send a message to all panelists and someone will assist you. Please note that the other participants will NOT be able to see your question making it a private message.



Ask a Question or Submit a Comment

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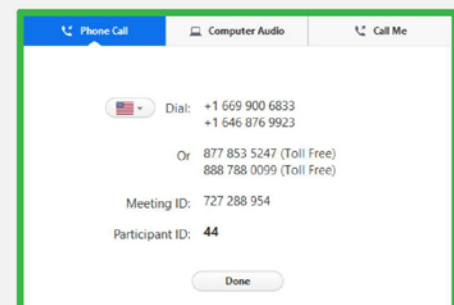
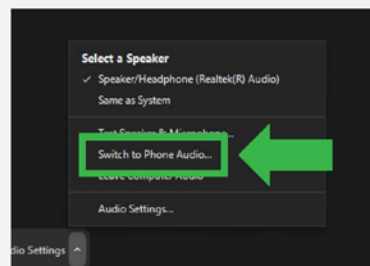
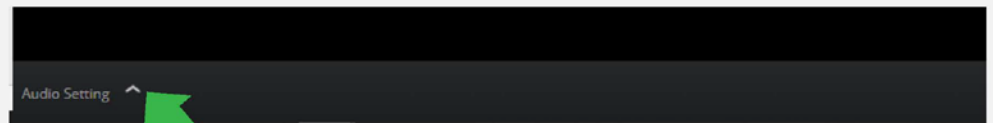
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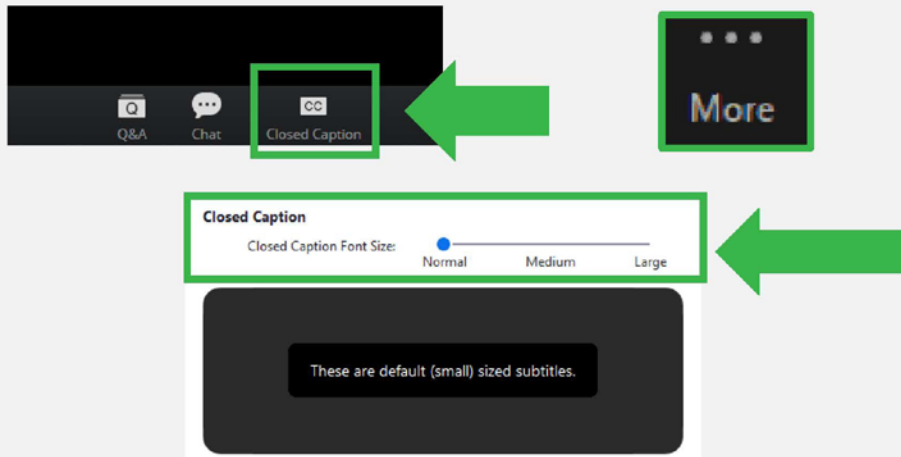
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- **Provide information and actions** for state leaders to use in decision-making
- **Plan Release Date**: Winter 2021

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Developing the Climate Action Plan



Built on Past Efforts

- Statewide Sea Level Rise Planning Initiative
- Executive Order 41
- Literature Reviews



Interviewed Experts

- State Agencies
- Neighboring State Climate Programs
- Universities and Federal Agencies



Engaged Stakeholders

- Public Workshops in March
- Online Survey
- Submission of Comments

15



Climate Change Impact: Heavy Precipitation and Flooding



What's at risk from heavy precipitation?



Agriculture

- Field conditions
- Crop and livestock health



Human Health

- Mold and disease
- Emergency response



Infrastructure

- Dams, levees, and water control structures
- Roads, culverts, and bridges



Natural Resources

- Beaches and dunes
- Coastal and riparian habitats



Water Resources

- Drinking water systems
- Sewer and stormwater systems

17



Agriculture



- Contributes \$8 billion annually to our economy
- Field Conditions
 - Flooded fields
 - Loss of nutrients
- Crop and livestock health
 - Crop damage during storms
 - Increased pests

18



Human Health

- Mold and Disease
 - Increased mold production
 - Waterborne pathogens
- Emergency response
 - Increased need
 - Access issues



19



Infrastructure



- Dams, levees, and water control structures
 - Overtopping
 - Damage to structures
- Roads, culverts, and bridges
 - Damage to structure and function

20



Natural Resources

- Beaches and dunes
 - Erosion
- Coastal and riparian habitats
 - Changes in salinity
 - Streambank erosion



21



Water Resources



- Drinking water
 - Increased filtration
- Sewer and stormwater systems
 - Overflow
 - Localized flooding

22

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Water Resources

- Drinking water systems
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Recommendations

Management Plans

Outreach

Regulation and/or Policy

Facilities and Infrastructure
Design and Management

Research and Monitoring

Administrative Processes

Support for Communities
and Stakeholders

24



Management Plans

Update planning documents for natural resources, emergency response, state facilities, and Agency equipment.

Update current natural and agricultural land protection programs.

Asset management plans for long-term maintenance, repair, and decommission decisions.

Update emergency response and hazard mitigation plans.

25

Zoom Poll



From the list of actions choose all actions you think are most important for the state to implement.

26



Regulations and/or Policy

Update and/or change current regulations and policies to address protection and conservation of vulnerable and impacted resources.

Update Agency policies and guides.

Develop a comprehensive regulatory plan to protect and restore wetlands.

28



Zoom Poll

From the list of actions choose all actions you think are most important for the state to implement.

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Research and Monitoring

Support monitoring of conditions and research that studies the impacts of climate change and methods of adapting.

Continue and expand research on impacts to infrastructure and facilities.

Continue, and expand, research, monitoring, and modeling of natural resources.

Collaborate within the Mid-Atlantic region to identify research opportunities.

Continue exploring impacts to human health and the costs of health care.

31



Zoom Poll

From the list of actions choose all actions you think are most important for the state to implement.

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Support of Communities and Stakeholders

Help in the form of trainings, resources, and technical assistance.

Increase grant opportunities for communities for adaptation projects.

Provide outreach and tools to communities and homeowners.

Support programs and initiatives that help frontline communities.

Provide outreach, trainings, and tools to the public and agencies.

Assist local governments and water suppliers to identify vulnerabilities and adaptation actions.

Provide outreach, trainings, and tools to the public and agencies on health impacts.

Assist local governments with updating ordinances/planning documents.

34

Zoom Poll



From the list of actions choose all actions you think are most important for the state to implement.

35



Outreach

Messaging to stakeholders and the public on climate change impacts and adaptation.

Develop communication tools and resources, in both English and alternate languages.

Create targeted communication resources on climate change impacts.

37



Zoom Poll

From the list of actions choose all actions you think are most important for the state to implement.

38



Facility and Infrastructure Design and Management

Plans and guides that that accounts for future climate conditions and sea level rise.

Prepare state facilities and equipment.

Update facility construction guides and standards.

40



Zoom Poll

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41



Administrative Processes

Review and edit processes related to operational guidelines and documents on how Agencies do business.

Plans and training policies that support the health and safety of personnel.

Improve state Agency ability to respond to extreme events and other disasters.

Increase state Agency capacity to adapt through funding, staffing, and training.

Act as climate change adaptation leaders.

43



Zoom Poll

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44

DELAWARE'S *Climate Action Plan*

What did we miss?

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DELAWARE'S *Climate Action Plan*

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THANK YOU


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APPENDIX 2: Informational Handouts


Sea Level Rise





DELAWARE'S Climate Action Plan

A Plan to Maximize Resilience to Sea Level Rise


Major Causes of Sea Level Rise

**Melting Ice**
Warmer temperatures are causing ice sheets on land to melt and drain into the ocean.


**Subsidence**
The land in Delaware has been sinking since the end of the last ice age about 11,000 years ago.

**Thermal Expansion**
As water warms it expands taking up more space, meaning the ocean has a greater overall volume.


Sea Level Rise in Delaware




Sea levels at the Lewes tide gauge have risen more than **one foot since 1900** and are expected to rise an **additional 9-23 inches by 2050**.
(Delaware Sea Level Rise Technical Committee, 2017)



Delaware lies within a sea level rise “hotspot” where **sea levels could rise faster and higher than** elsewhere due to a combination of rising seas and sinking land. Sea level rise at Bowers Beach, Delaware, is climbing at a rate faster than anywhere else on the Atlantic coast. *(U.S. Geological Survey, 2012)*



In 2019 Lewes experienced nine separate days of flooding and it is projected that by 2050 the town could experience anywhere **between 50 and 135 high tide flooding events per year**. *(National Oceanographic and Atmospheric Administration, 2020)*



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Handout Front



What's at Risk?

**Agriculture**

- Groundwater for irrigation
- Land suitable for agriculture

**Human Health**

- Emotional health
- Physical health

**Infrastructure**

- Roads, bridges, and rail lines
- Water control structures

**Natural Resources**

- Beaches and dunes
- Coastal wetlands

**Water Resources**

- Freshwater riverine habitats
- Drinking water intakes

Building Resilience

The state of Delaware is exploring actions that they can take to help the state adapt to climate change. The items below represent the seven main areas where actions can be taken to help the state build resilience to sea level rise.

**Regulation and/or Policy**
changes that address protection and conservation of vulnerable and impacted resources.

**Facility and Infrastructure Design and Management**
that accounts for future climate conditions and sea level rise.

**Administrative Processes**
related to operational guidelines and documents on how Agencies do business.

**Management Plans** for natural resources, emergency response, state facilities, and Agency equipment.

**Research and Monitoring**
that studies the impacts of climate change and methods of adapting.

**Support for Communities and Stakeholders** in the form of trainings, resources, and technical assistance.

**Outreach** to stakeholders and the public on climate change impacts and adaptation.



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Handout Back


Increased Temperatures

DELAWARE'S


Climate Action Plan

A Plan to Maximize Resilience to Increased Temperatures


Current Temperature Trends



Average Annual Temperature in DE as of 2012 had increased by 2° F since 1900 and warmed at a rate of about 0.2° F per decade.
(Delaware Department of Natural Resources and Environmental Control, 2014)




2010s Were the Hottest Decade on Record with 2016 being the hottest year in NOAA's 140-year record with 2019 being the second hottest year.
(National Oceanic and Atmospheric Administration, 2020)




The Mosquito Season in Delaware is on average 25 days longer now than it was during the decade of 1980 to 1989.
(Climate Central, 2013)


Projected Temperature Trends




The average temperature in Delaware is projected to **increase 2.5 to 4.5° F by 2050** from the average temperature in 2012, with **up to an 8° F increase by 2100**.
(Delaware Department of Natural Resources and Environmental Control, 2014)



Historically, days above 100°F in Delaware have occurred less than once per year. By 2050, Delaware is projected to have **2-8 days per year to reach above 100°F**.
(Delaware Department of Natural Resources and Environmental Control, 2014)




Nights where it doesn't cool off below 80°F in Delaware are rare, less than one per decade. By mid century, Delaware climate projections indicate an average of **3-5 nights per year where nighttime temps stay above 80°F**.
(Delaware Department of Natural Resources and Environmental Control, 2014)



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Handout Front

What's at Risk?




Agriculture

- Crop and livestock health
- Costs of farming




Human Health

- Vector borne diseases
- Heat related illnesses




Water Resources

- Water use
- Water quality



Infrastructure

- Energy generation
- Roads, bridges, and rail lines




Natural Resources


- Wildlife food sources
- Wildlife and plant health

Building Resilience


The state of Delaware is exploring actions that they can take to help the state adapt to climate change. The items below represent the seven main areas where actions can be taken to help the state build resilience to increased temperatures.




Regulation and/or Policy changes that address protection and conservation of vulnerable and impacted resources.




Facility and Infrastructure Design and Management that accounts for future climate conditions and sea level rise.




Administrative Processes related to operational guidelines and documents on how Agencies do business.




Management Plans for natural resources, emergency response, state facilities, and Agency equipment.




Research and Monitoring that studies the impacts of climate change and methods of adapting.



Support for Communities and Stakeholders in the form of trainings, resources, and technical assistance.




Outreach to stakeholders and the public on climate change impacts and adaptation.



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Handout Back

Heavy Precipitation and Flooding




DELAWARE'S


Climate Action Plan

A Plan to Maximize Resilience to Changes in Precipitation and Extreme Weather


Precipitation in Delaware



Precipitation in Delaware over the last century has averaged 45 inches per year.
(Delaware Department of Natural Resources and Environmental Control, 2014)




Seasonal Precipitation Averages are fairly equal across all seasons with only minor differences in precipitation amounts.
(Delaware Department of Natural Resources and Environmental Control, 2014)




Nor'easters are the most common coastal storms in Delaware bringing strong winds, heavy precipitation, and flooding.
(NOAA National Environmental Satellite, Data, and Information Services, 2017)


Projected Precipitation Trends




Average precipitation is expected to **increase about 10% by 2100**. The number of very wet days, **2 inches or more of rainfall in 24 hours**, is also projected to increase.
(Delaware Department of Natural Resources and Environmental Control, 2014)



In the winter months average precipitation is projected to increase and will be more likely in the form of **rain rather than snow**.
(Delaware Department of Natural Resources and Environmental Control, 2014)



An increase in the **frequency and intensity of heavy precipitation events** is projected over the next century. This is **consistent with current observed trends** and the projected trends for the entire Eastern United States.
(Delaware Department of Natural Resources and Environmental Control, 2014)



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Handout Front



What's at Risk?



Agriculture

- Field conditions
- Crop and livestock health



Human Health

- Mold and disease
- Emergency response



Water Resources

- Drinking water systems
- Sewer and stormwater systems



Infrastructure

- Roads, culverts, and bridges
- Dams, levees, and water control structures



Natural Resources

- Beaches and dunes
- Coastal and riparian habitats

Building Resilience

The state of Delaware is exploring actions that they can take to help the state adapt to climate change. The items below represent the seven main areas where actions can be taken to help the state build resilience to precipitation changes and extreme weather.



Regulation and/or Policy

changes that address protection and conservation of vulnerable and impacted resources.



Facility and Infrastructure Design and Management

that accounts for future climate conditions and sea level rise.



Administrative Processes

related to operational guidelines and documents on how Agencies do business.



Management Plans

for natural resources, emergency response, state facilities, and Agency equipment.



Research and Monitoring

that studies the impacts of climate change and methods of adapting.



Support for Communities and Stakeholders

in the form of trainings, resources, and technical assistance.



Outreach

to stakeholders and the public on climate change impacts and adaptation.



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Handout Back

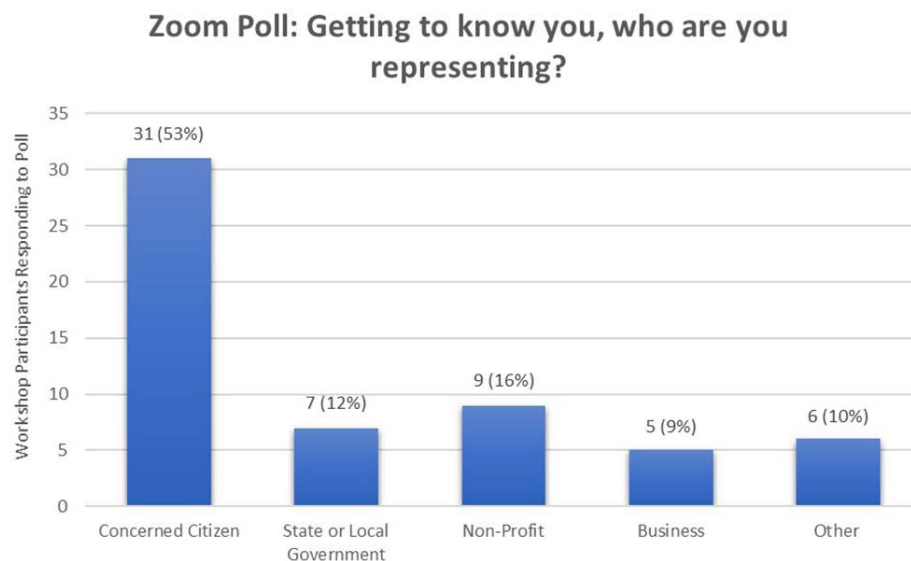
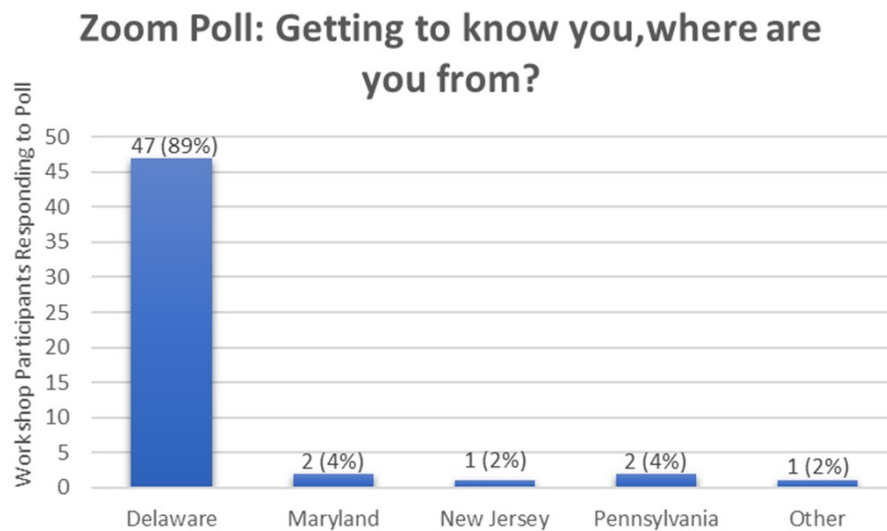
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APPENDIX 3: Polling

Polling Questions and Responses – September 24, 2020

Zoom Poll: Getting to know you, where are you from?	
A.	Delaware
B.	Maryland
C.	New Jersey
D.	Pennsylvania
E.	Other

Zoom Poll: Getting to know you, who are you representing?	
A.	Concerned Citizen
B.	State of Local Government
C.	Non-Profit
D.	Business
E.	Other



Zoom Poll: Recommendation 1

From the list of actions choose all actions you think are most important for the state to implement.

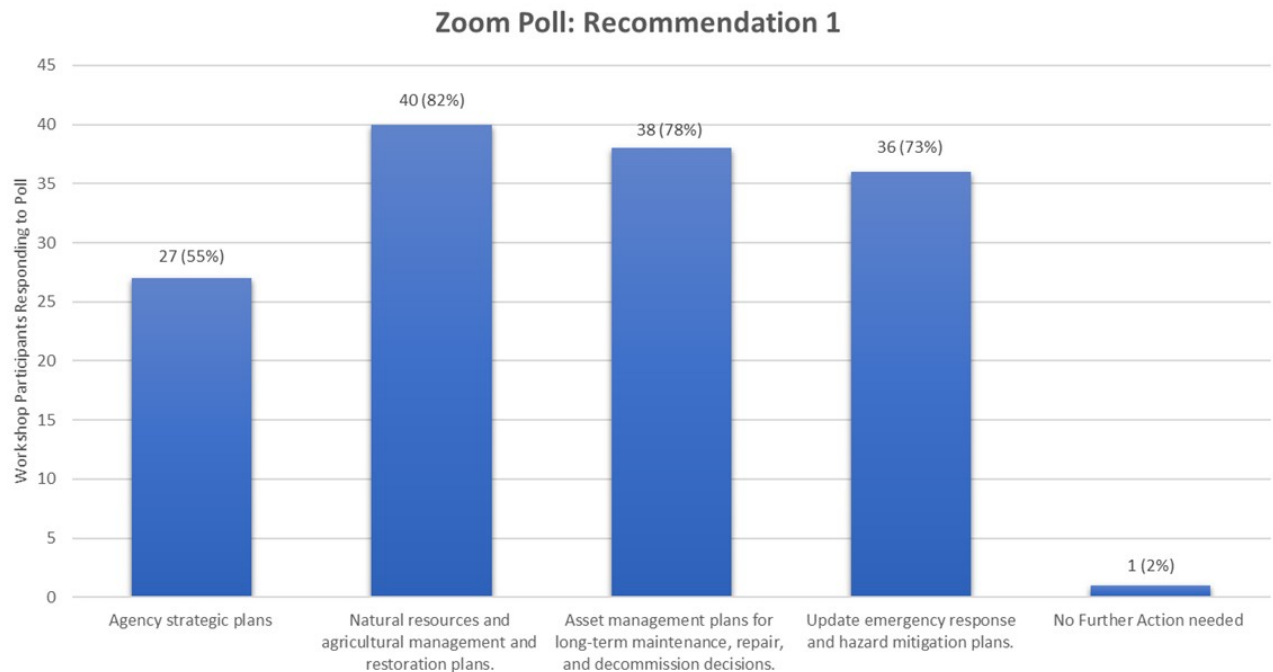
A. Agency strategic plans.

B. Natural resources and agricultural management and restoration plans.

C. Asset management plans for long-term maintenance, repair and decommission decisions.

D. Update emergency response and hazard mitigation plans.

E. No further action needed.



Zoom Poll: Recommendation 2

From the list of actions choose all actions you think are most important for the state to implement.

A. Update Agency policies and guides.

B. Evaluate opportunities to update the air quality permitting and regulatory process.

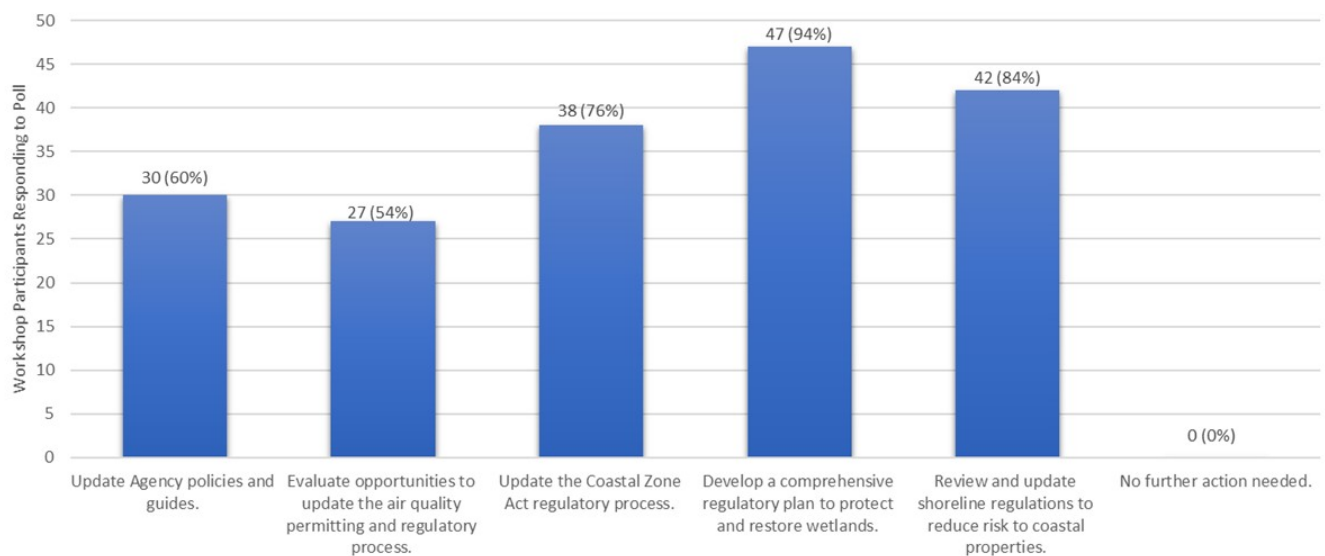
C. Update the Coastal Zone Act regulatory process.

D. Develop a comprehensive regulatory plan to protect and restore wetlands.

E. Review and update shoreline regulations to reduce risk to coastal properties.

F. No further action needed.

Zoom Poll: Recommendation 2



Zoom Poll: Recommendation 3

From the list of actions choose all actions you think are most important for the state to implement.

A. Increase the number of adaptation pilot projects.

B. Continue and expand research on impacts to infrastructure and facilities.

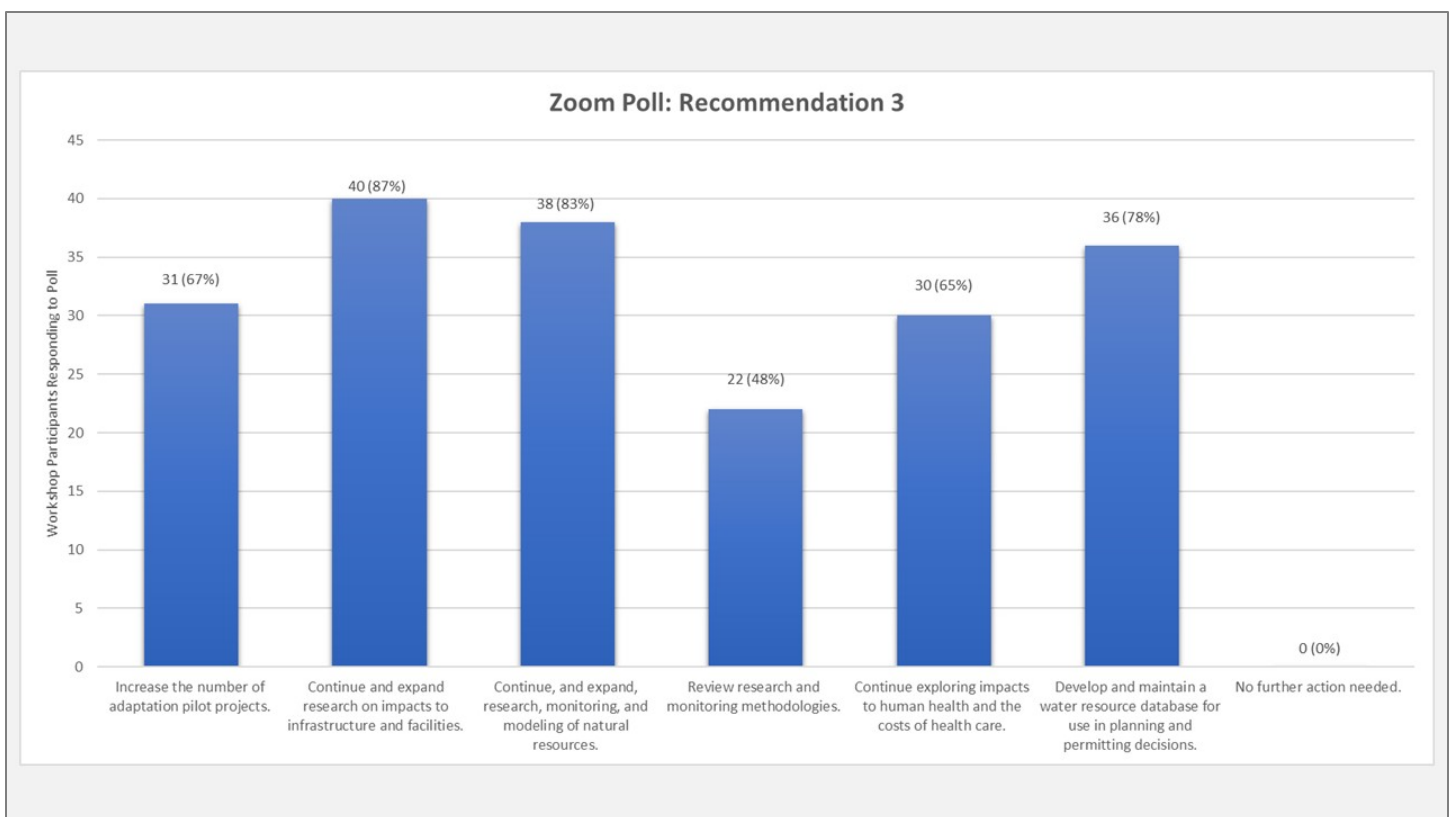
C. Continue and expand, research, monitoring and modeling of natural resources.

D. Review research and monitoring methodologies.

E. Continue exploring impacts to human health and the costs of health care.

F. Develop and maintain a water resource database for use in planning and permitting decisions.

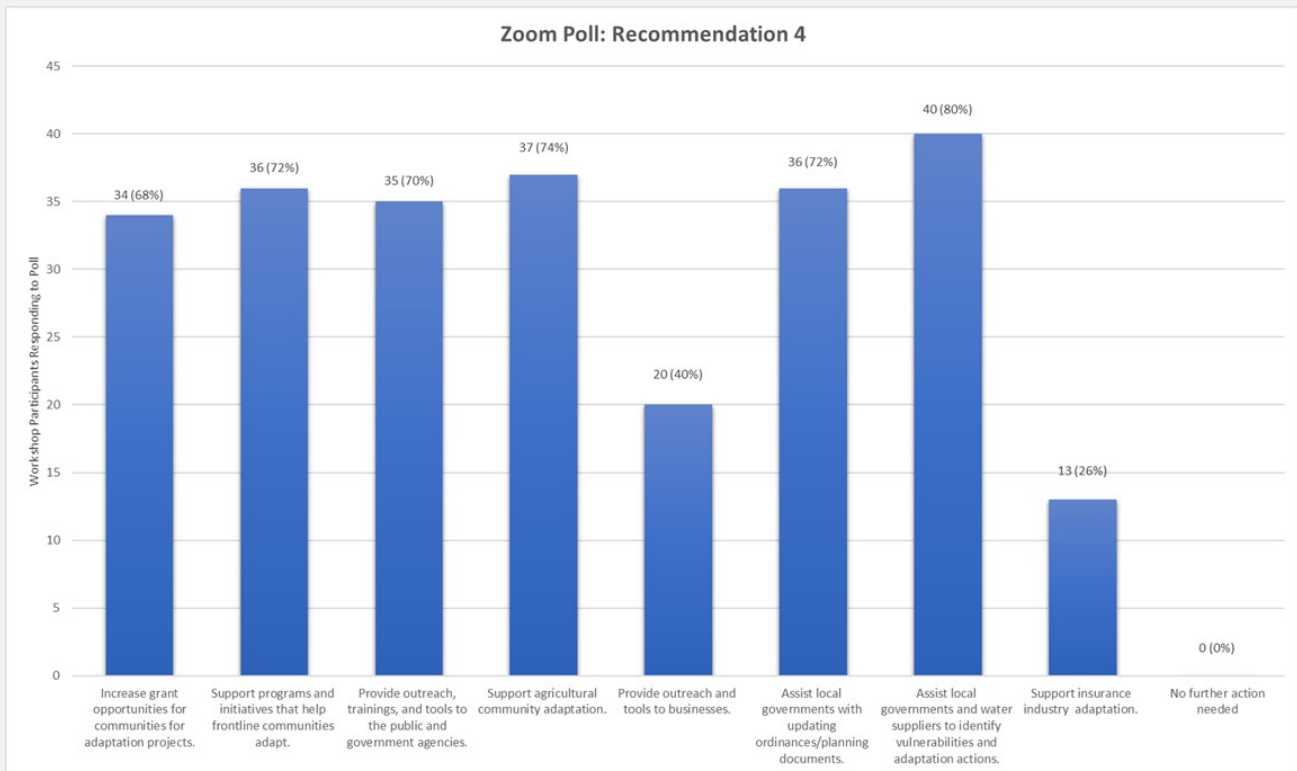
G. No further action needed.



Zoom Poll: Recommendation 4

From the list of actions choose all actions you think are most important for the state to implement.

- A. Increase grant opportunities for communities for adaptation projects.
- B. Support programs and initiatives that help frontline communities adapt.
- C. Provide outreach, trainings and tools to the public and government agencies.
- D. Support agricultural community adaptation.
- E. Provide outreach and tools to businesses.
- F. Assist local governments with updating ordinances/planning documents.
- G. Assist local governments and water suppliers to identify vulnerabilities and adaptation actions.
- H. Support insurance industry adaptation.
- I. No further action needed.



Zoom Poll: Recommendation 5

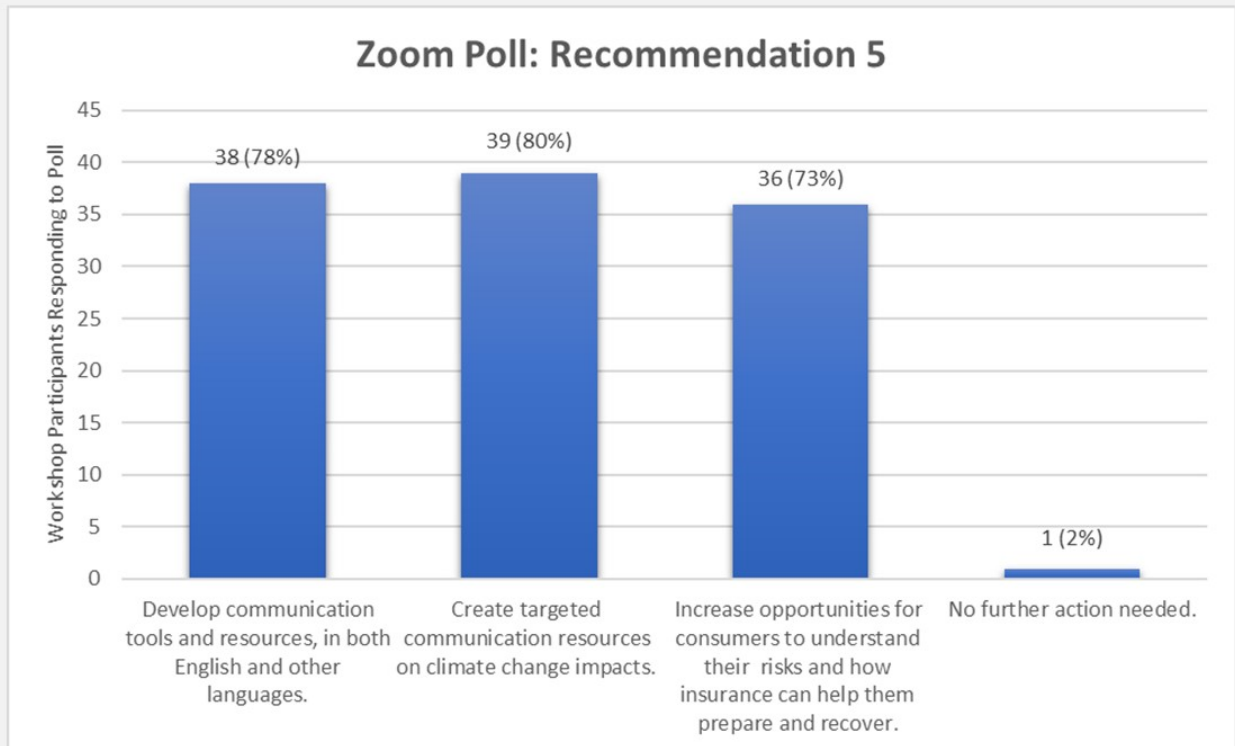
From the list of actions choose all actions you think are most important for the state to implement.

A. Develop communication tools and resources, in both English and other languages.

B. Create targeted communication resources on climate change impacts.

C. Increase opportunities for consumers to understand their risks and how insurance can help them prepare and recover.

D. No further action needed.



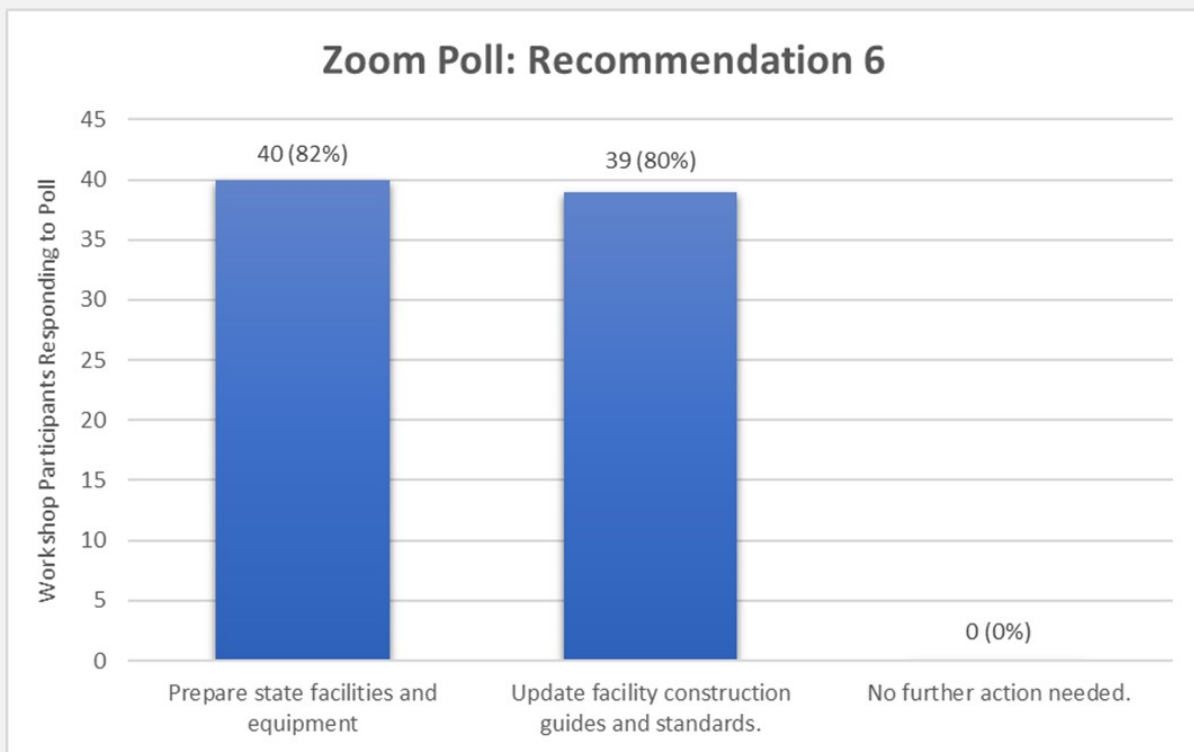
Zoom Poll: Recommendation 6

From the list of actions choose all actions you think are most important for the state to implement.

A. Prepare state facilities and equipment.

B. Update facility construction guides and standards.

C. No further action needed.



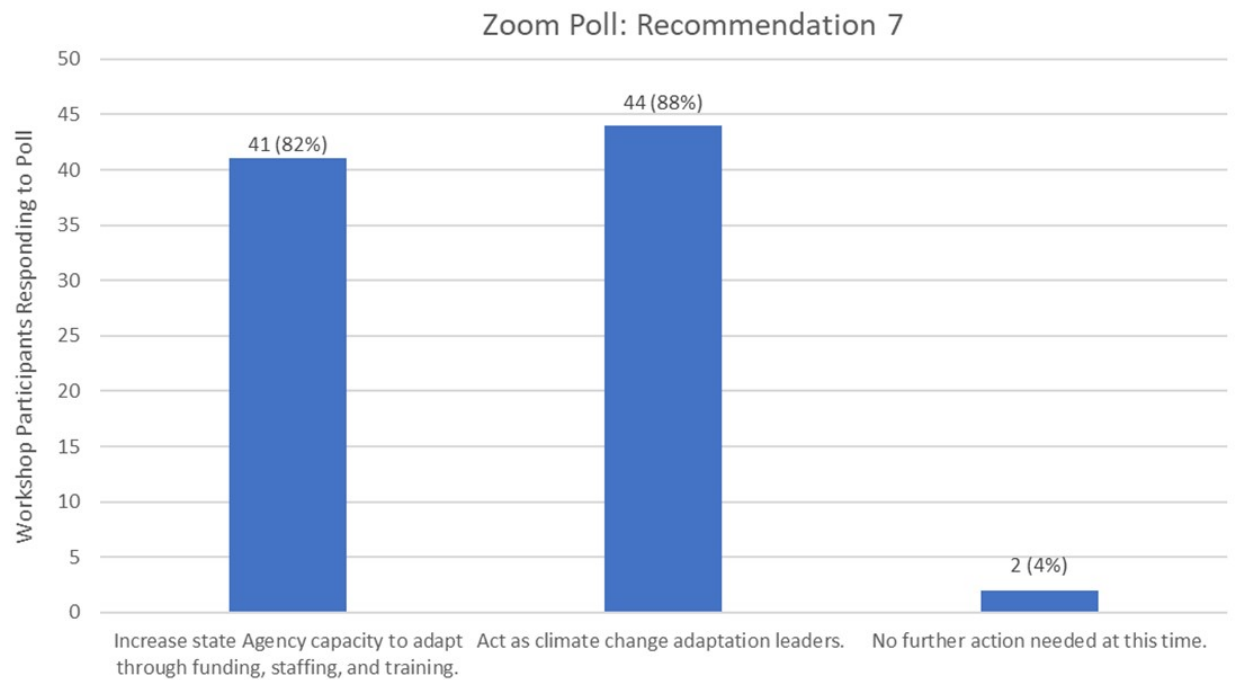
Zoom Poll: Recommendation 7

From the list of actions choose all actions you think are most important for the state to implement.

A. Increase state Agency capacity to adapt through funding, staffing and training.

B. Act as climate change adaptation leaders.

C. No further action needed.



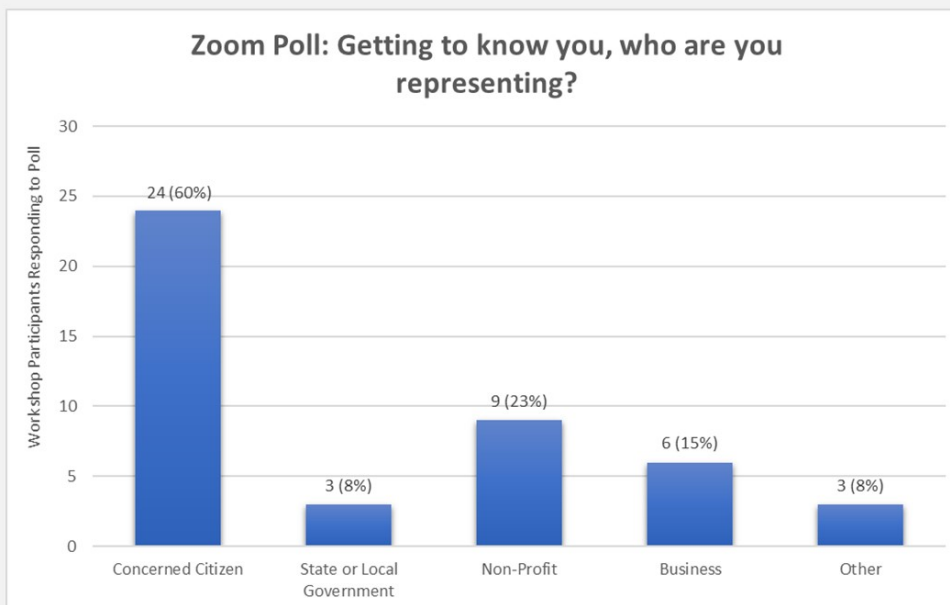
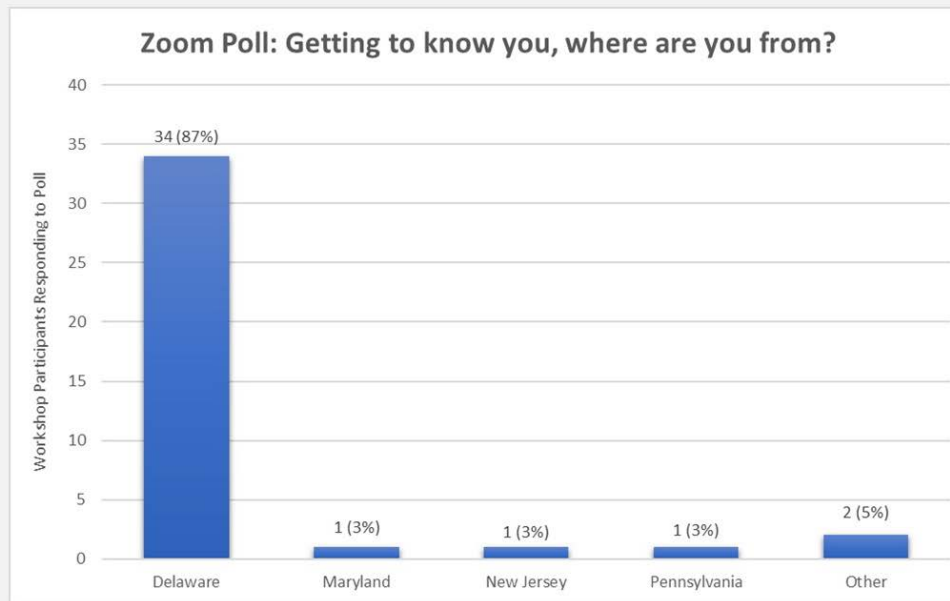
Polling Questions and Responses – September 29, 2020

Zoom Poll: Getting to know you, where are you from?

- A. Delaware
- B. Maryland
- C. New Jersey
- D. Pennsylvania
- E. Other

Zoom Poll: Getting to know you, who are you representing?

- A. Concerned Citizen
- B. State of Local Government
- C. Non-Profit
- D. Business
- E. Other



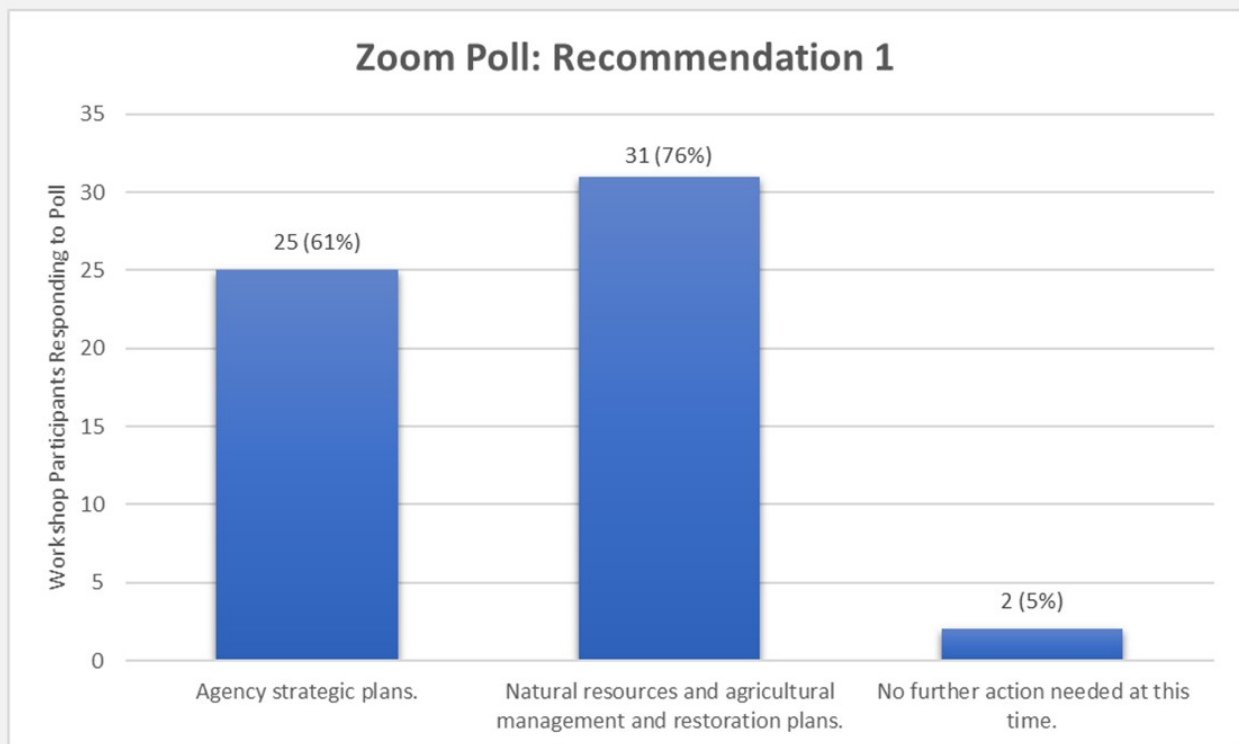
Zoom Poll: Recommendation 1

From the list of actions choose all actions you think are most important for the state to implement.

A. Agency strategic plans.

B. Natural resources and agricultural management and restoration plans.

C. No further action needed.



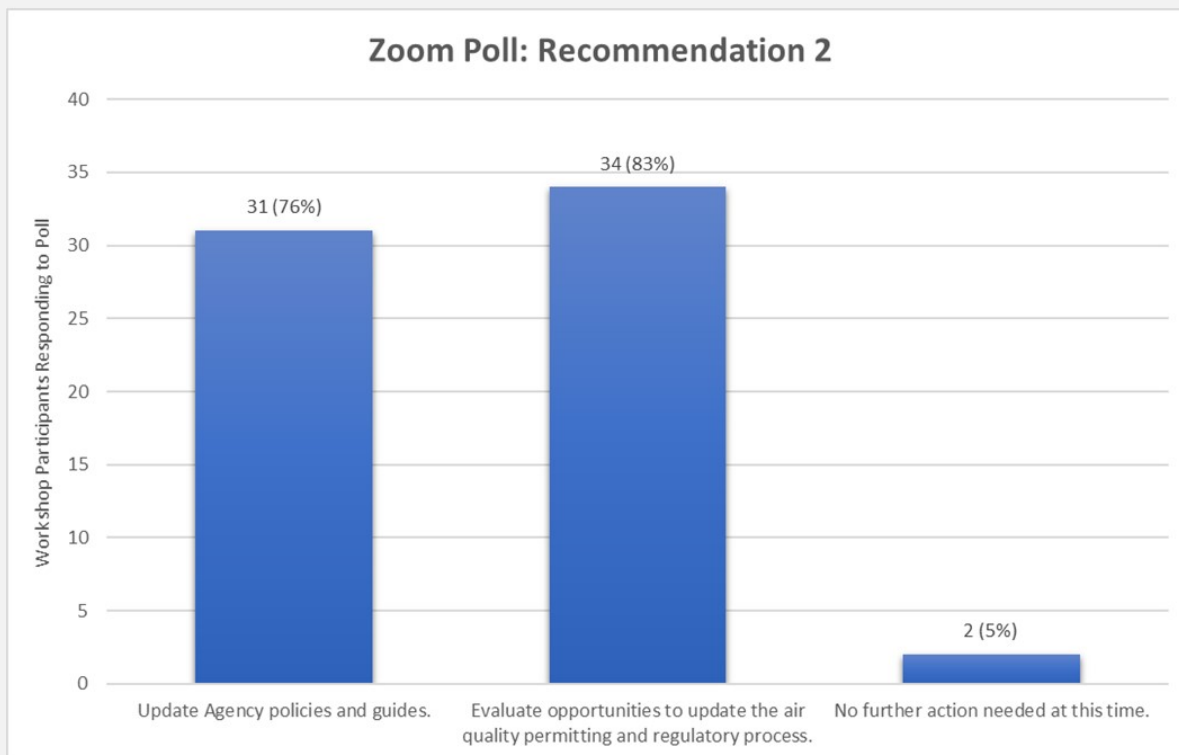
Zoom Poll: Recommendation 2

From the list of actions choose all actions you think are most important for the state to implement.

A. Update Agency policies and guides.

B. Evaluate opportunities to update the air quality permitting and regulatory process.

C. No further action needed.



Zoom Poll: Recommendation 3

From the list of actions choose all actions you think are most important for the state to implement.

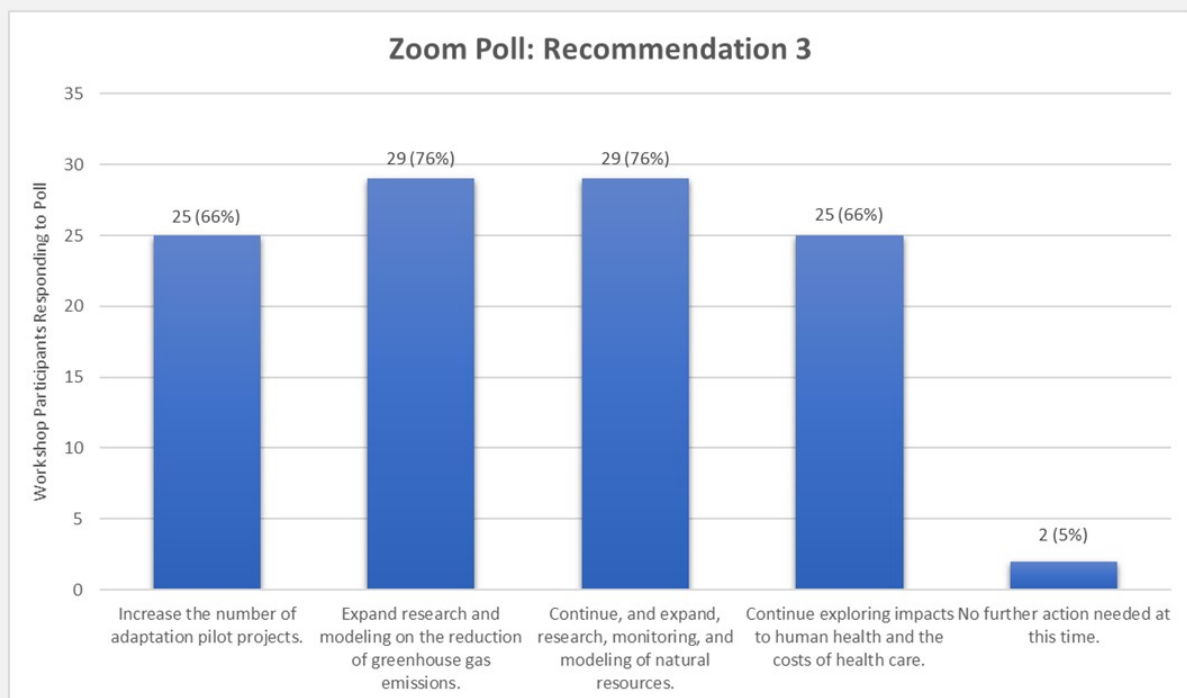
A. Increase the number of adaptation pilot projects.

B. Expand research and modeling on the reduction of greenhouse gas emissions.

C. Continue and expand, research, monitoring and modeling of natural resources.

E. Continue exploring impacts to human health and the costs of health care.

F. No further action needed.



Zoom Poll: Recommendation 4

From the list of actions choose all actions you think are most important for the state to implement.

A. Increase grant opportunities for communities for adaptation projects.

B. Support programs and initiatives that help frontline communities adapt.

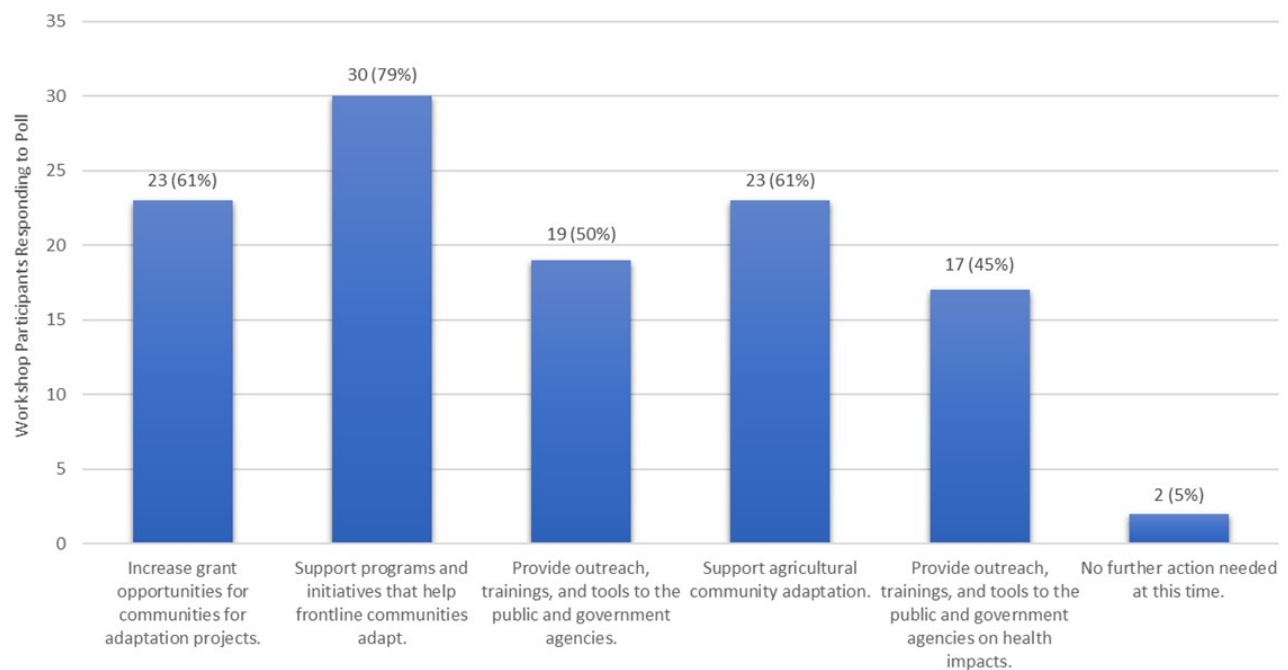
C. Provide outreach, trainings and tools to the public and government agencies.

D. Support agricultural community adaptation.

E. Provide outreach, trainings and tools to the public and government agencies on health impacts.

F. No further action needed.

Zoom Poll: Recommendation 4



Zoom Poll: Recommendation 5

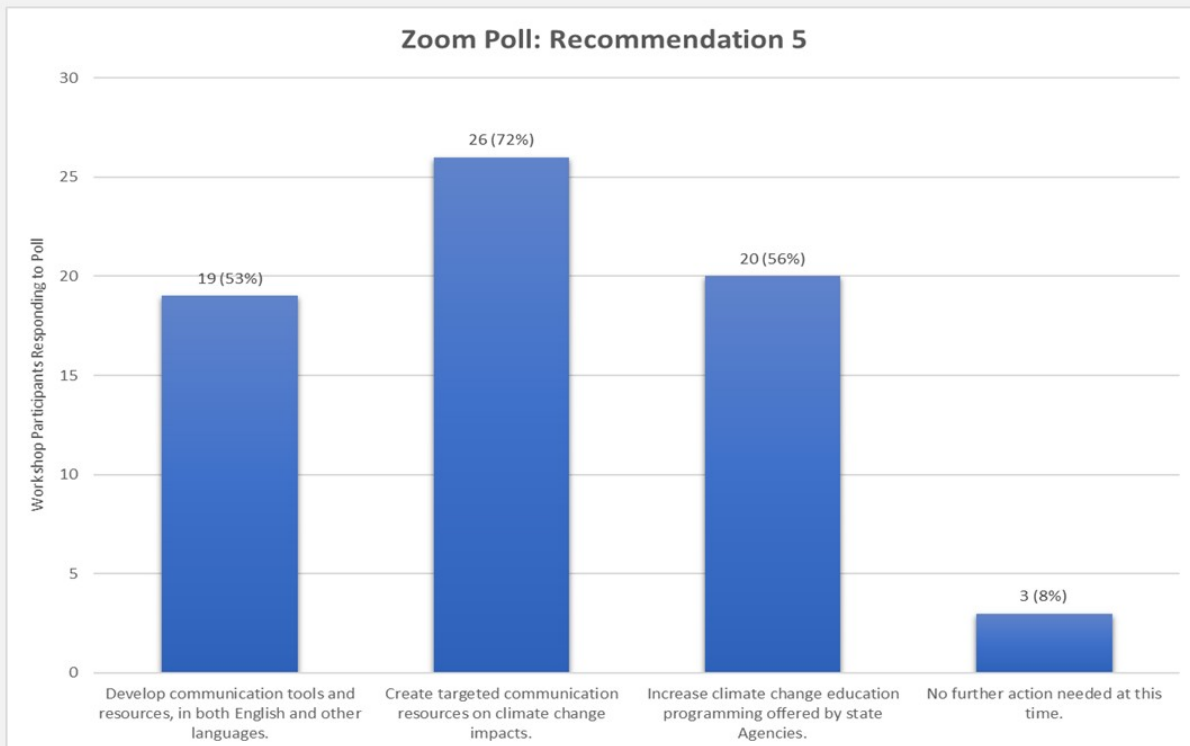
From the list of actions choose all actions you think are most important for the state to implement.

A. Develop communication tools and resources, in both English and other languages.

B. Create targeted communication resources on climate change impacts.

C. Increase climate change education programming offered by state Agencies.

D. No further action needed.



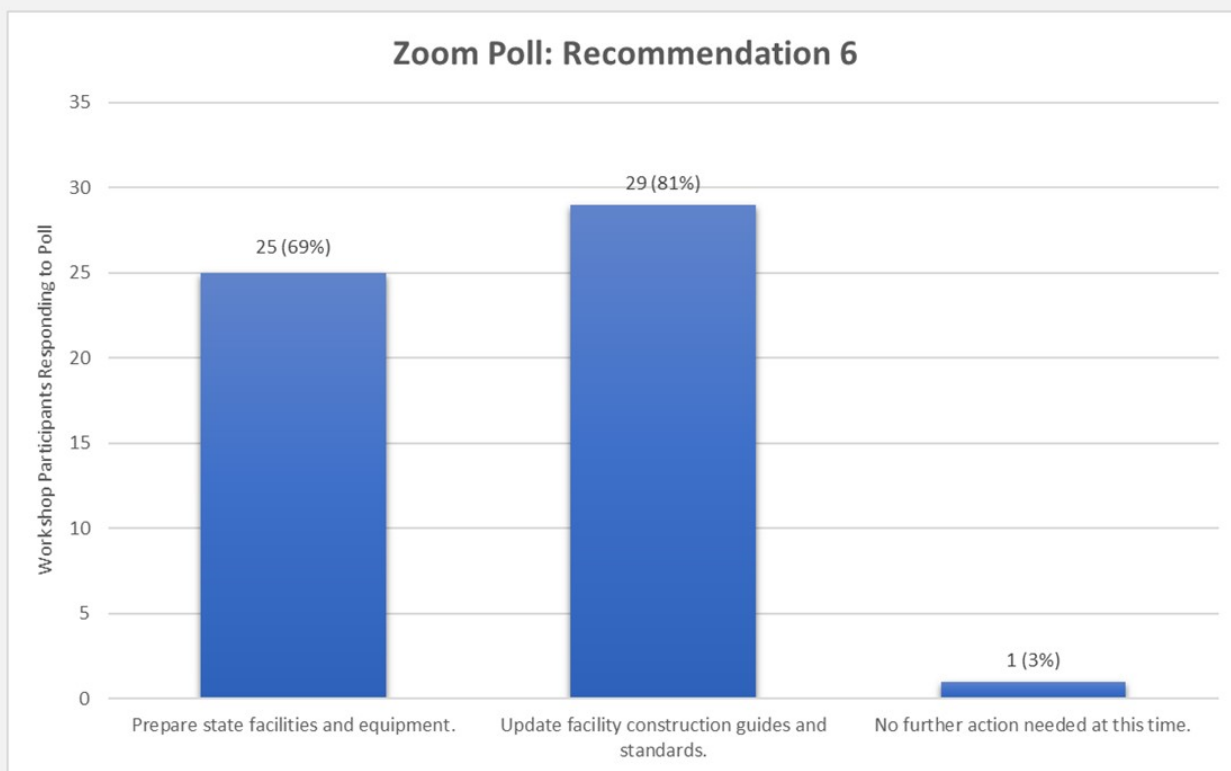
Zoom Poll: Recommendation 6

From the list of actions choose all actions you think are most important for the state to implement.

A. Prepare state facilities and equipment.

B. Update facility construction guides and standards.

C. No further action needed.



Zoom Poll: Recommendation 7

From the list of actions choose all actions you think are most important for the state to implement.

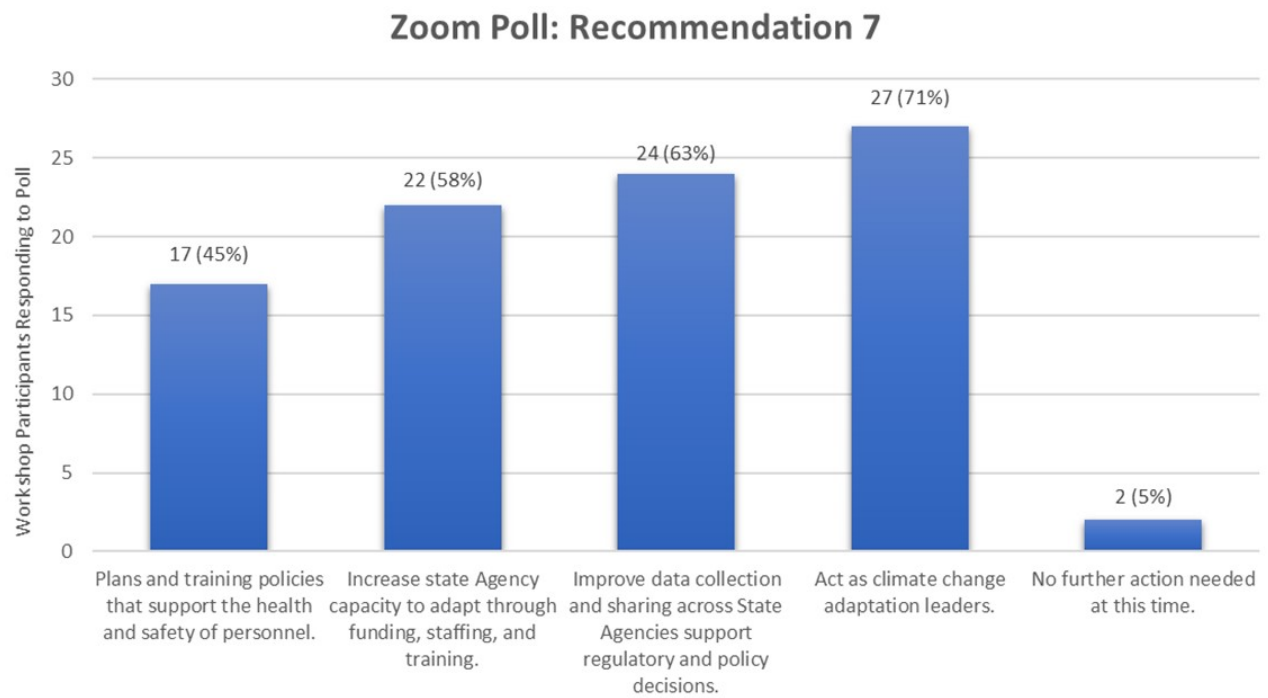
A. Plans and training policies that support the health and safety of personnel.

B. Increase state Agency capacity to adapt through funding, staffing and training.

C. Improve data collection and sharing across State Agencies support regulatory and policy decisions.

D. Act as climate change adaptation leaders.

E. No further action needed.



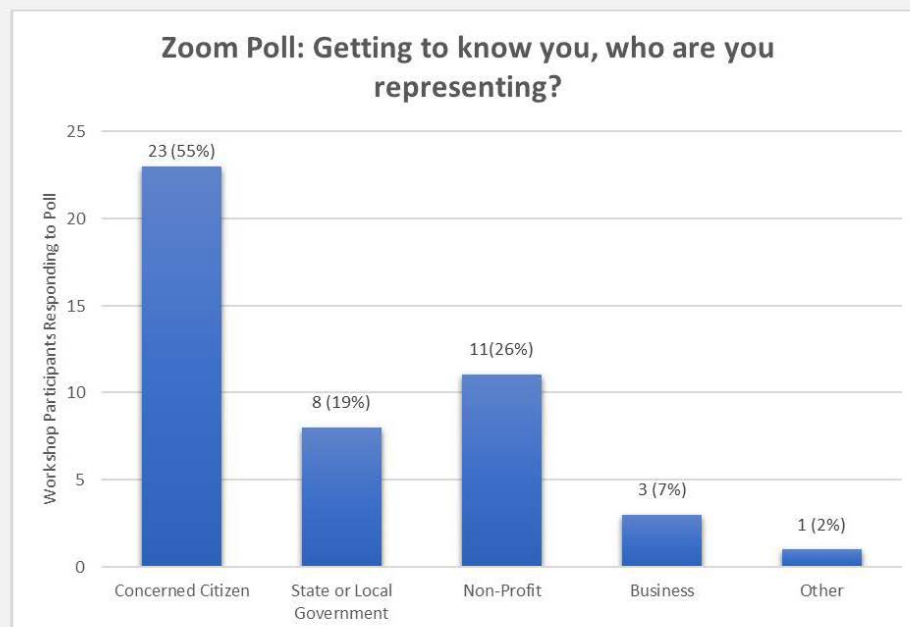
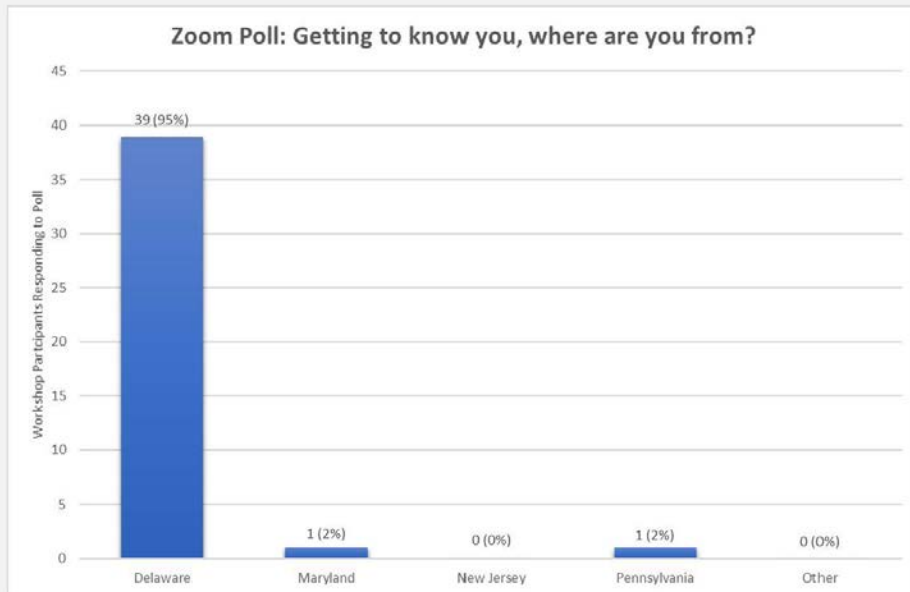
Polling Questions and Responses – October 1, 2020

Zoom Poll: Getting to know you, where are you from?

- A. Delaware
- B. Maryland
- C. New Jersey
- D. Pennsylvania
- E. Other

Zoom Poll: Getting to know you, who are you representing?

- A. Concerned Citizen
- B. State of Local Government
- C. Non-Profit
- D. Business
- E. Other



Zoom Poll: Recommendation 1

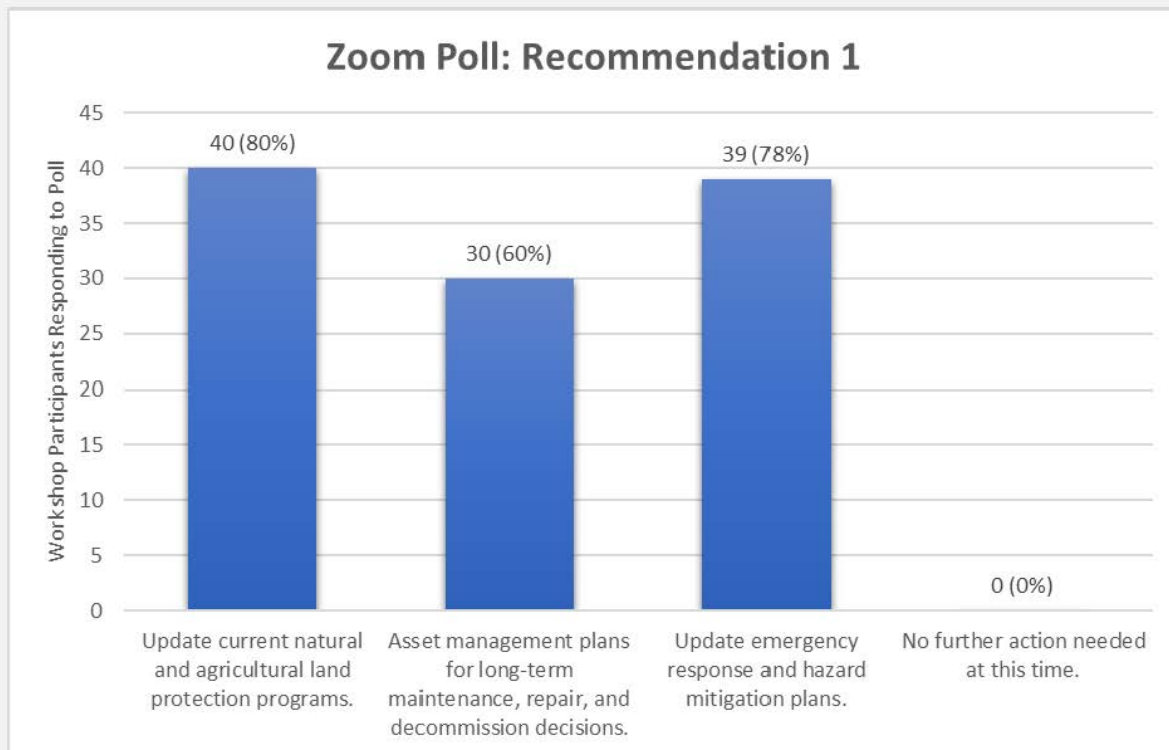
From the list of actions choose all actions you think are most important for the state to implement.

A. Update current natural and agricultural land protection programs.

B. Asset management plans for long-term maintenance, repair and decommission decisions.

C. Update emergency response and hazard mitigation plans.

D. No further action needed.



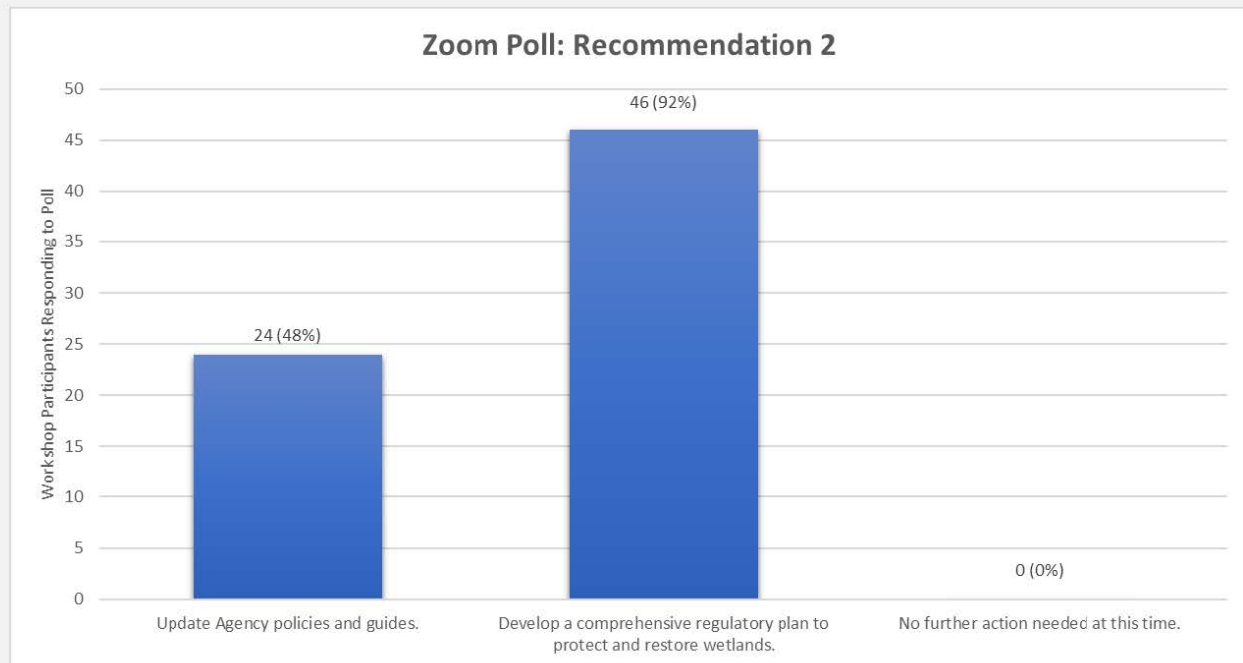
Zoom Poll: Recommendation 2

From the list of actions choose all actions you think are most important for the state to implement.

A. Update Agency policies and guides.

B. Develop a comprehensive regulatory plan to protect and restore wetlands.

C. No further action needed.



Zoom Poll: Recommendation 3

From the list of actions choose all actions you think are most important for the state to implement.

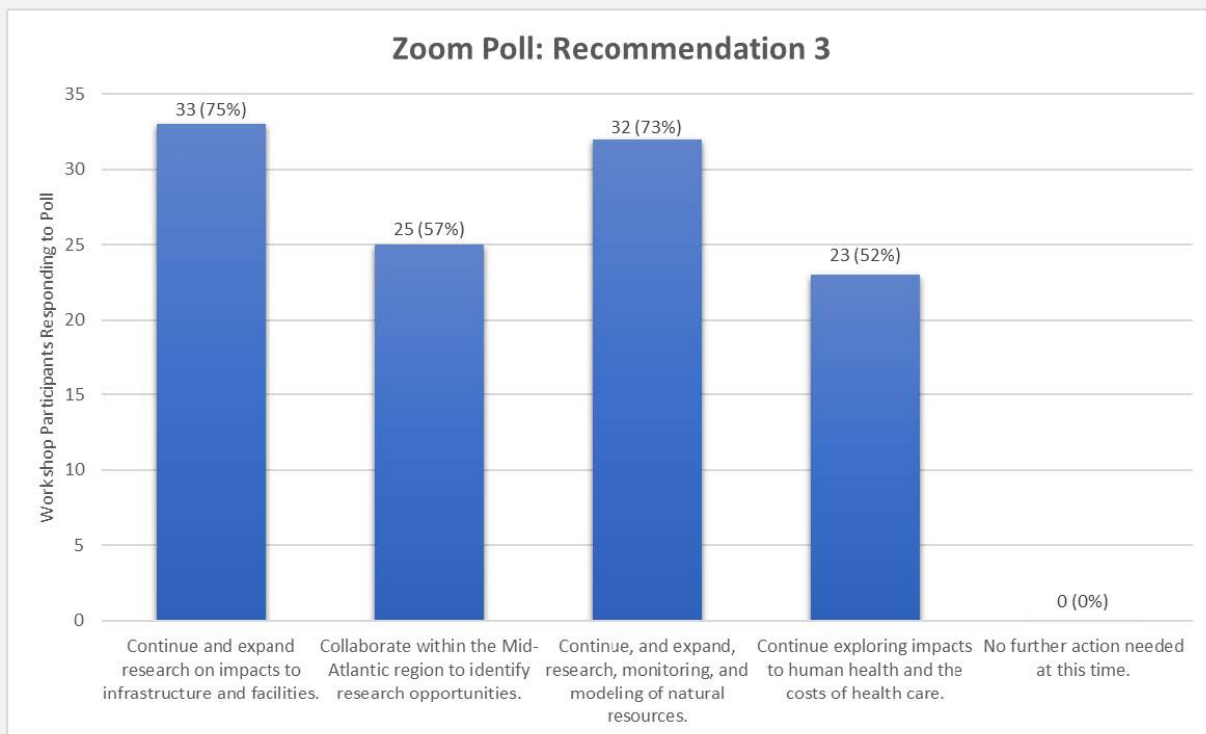
A. Continue and expand research on impacts to infrastructure and facilities.

B. Collaborate within the Mid-Atlantic region to identify research opportunities.

C. Continue and expand, research, monitoring and modeling of natural resources.

D. Continue exploring impacts to human health and the costs of health care.

E. No further action needed.



Zoom Poll: Recommendation 4

From the list of actions choose all actions you think are most important for the state to implement.

A. Increase grant opportunities for communities for adaptation projects.

B. Support programs and initiatives that help frontline communities adapt.

C. Assist local governments and water suppliers to identify vulnerabilities and adaptation actions.

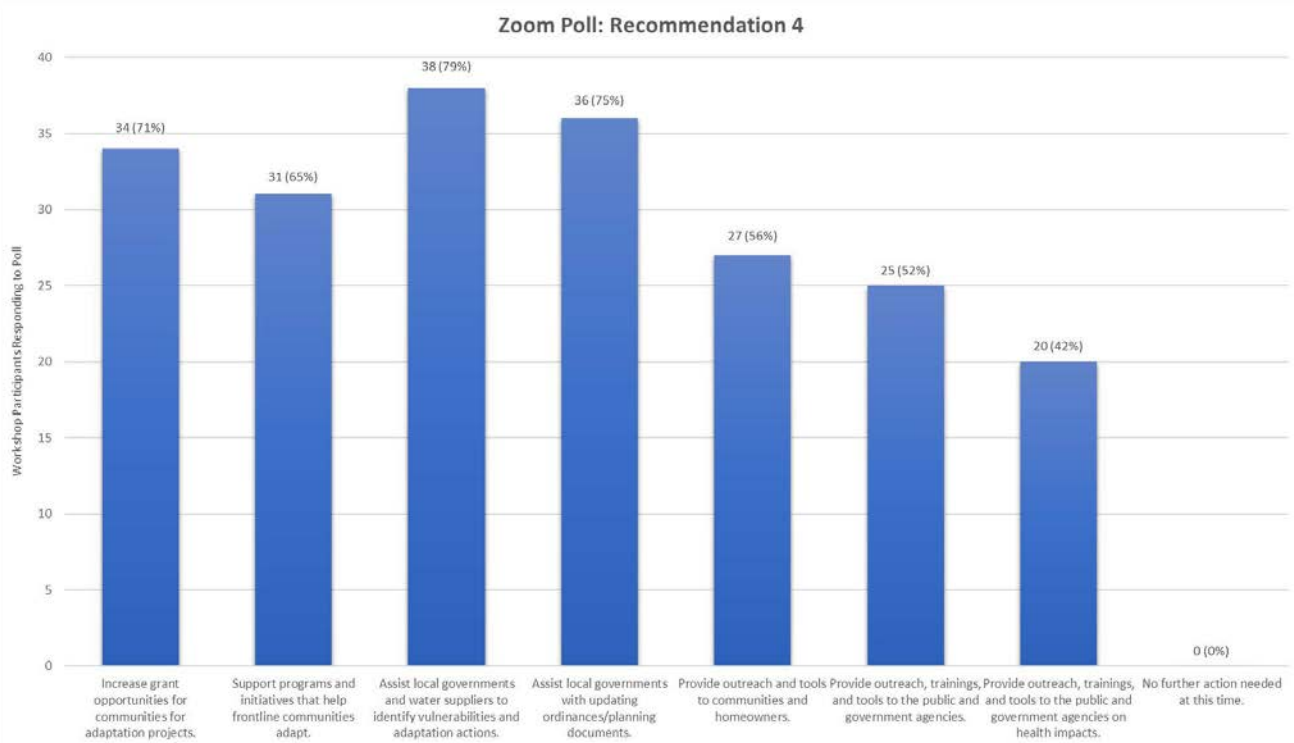
D. Assist local governments with updating ordinances/planning documents.

E. Provide outreach and tools to communities and homeowners.

F. Provide outreach, trainings and tools to the public and agencies.

G. Provide outreach, trainings and tools to the public and agencies on health impacts.

H. No further action needed.



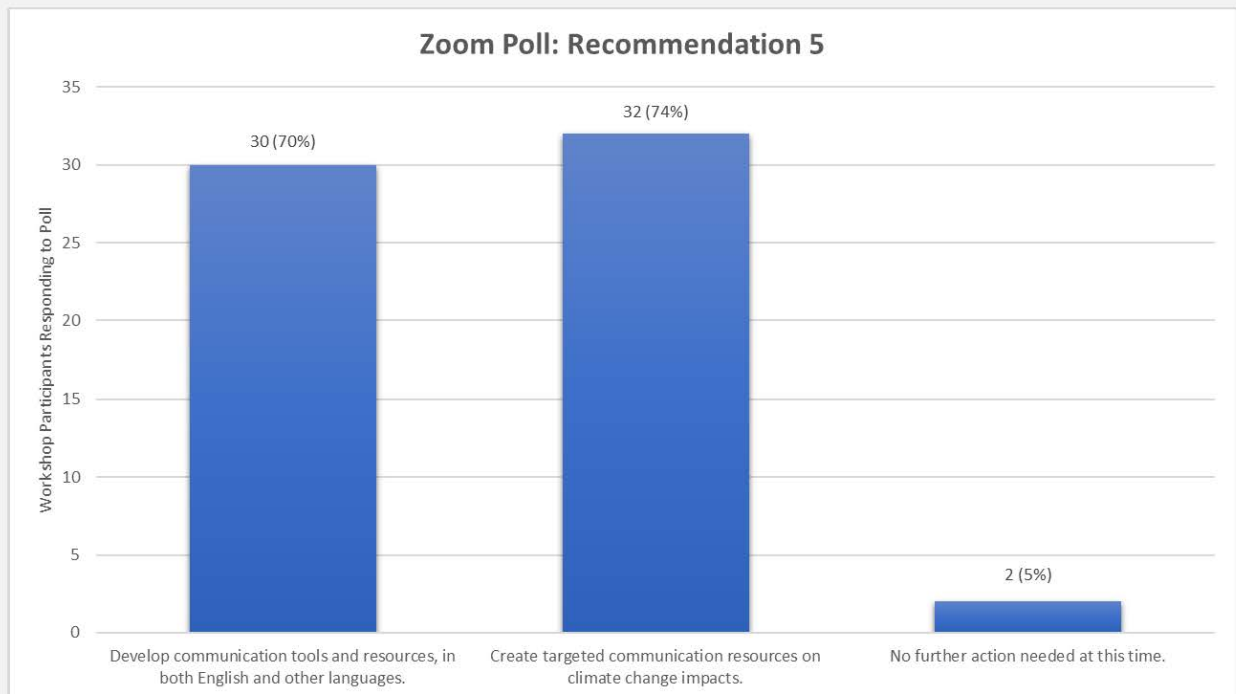
Zoom Poll: Recommendation 5

From the list of actions choose all actions you think are most important for the state to implement.

A. Develop communication tools and resources, in both English and other languages.

B. Create targeted communication resources on climate change impacts.

C. No further action needed.



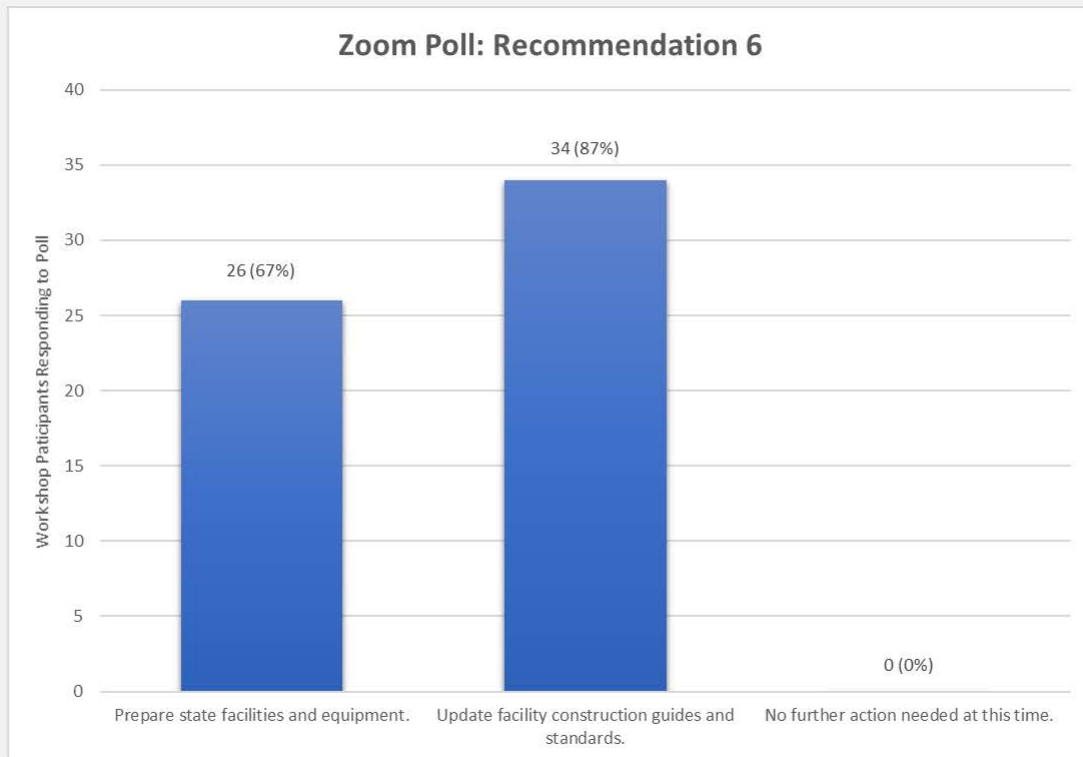
Zoom Poll: Recommendation 6

From the list of actions choose all actions you think are most important for the state to implement.

A. Prepare state facilities and equipment.

B. Update facility construction guides and standards.

C. No further action needed.



Zoom Poll: Recommendation 7

From the list of actions choose all actions you think are most important for the state to implement.

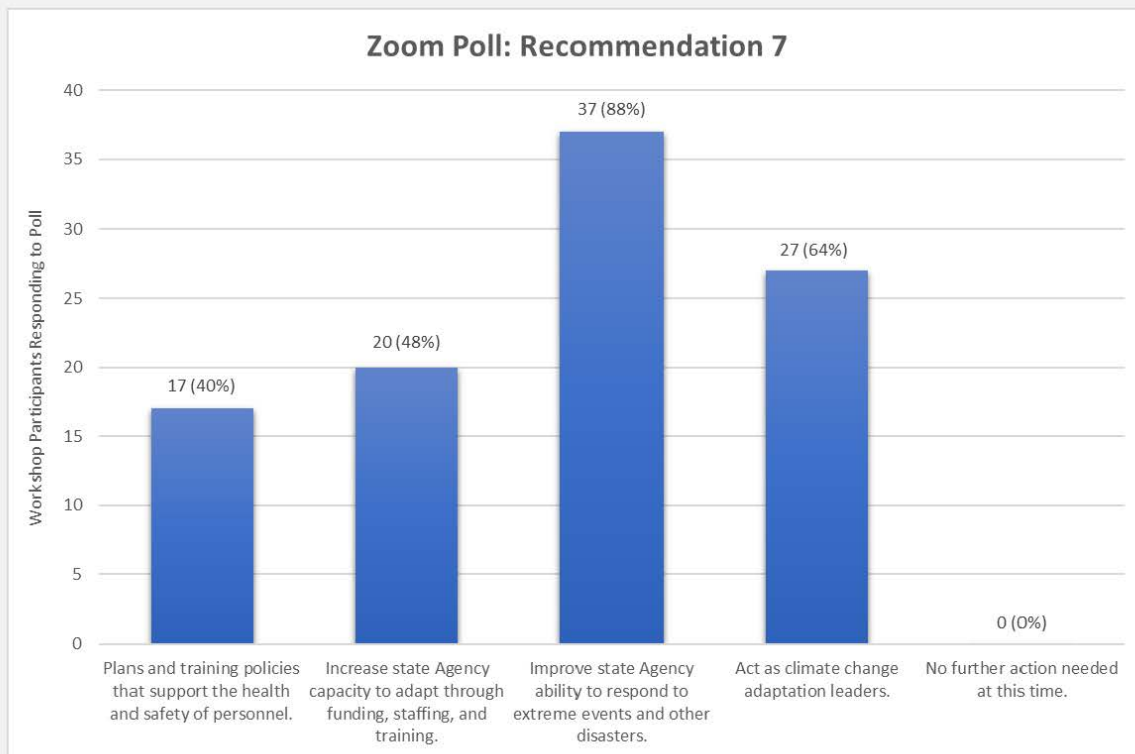
A. Plans and training policies that support the health and safety of personnel.

B. Increase state Agency capacity to adapt through funding, staffing and training.

C. Improve state Agency ability to respond to extreme events and other disasters.

D. Act as climate change adaptation leaders.

E. No further action needed.



APPENDIX 4: Questions and Answers

This appendix provides a list of questions that were submitted during the September 24 and 29 and October 1 sessions. Unless otherwise noted, the questions below are worded "as submitted" by workshop participants. In some cases, DNREC staff either modified the wording of the questions for clarity or consolidated questions that were asked more than once into a single entry; any questions that fall into either of these categories are preceded by an asterisk (*) and changes are indicated in brackets, as applicable. DNREC aimed to maintain the integrity and spirit of all questions that were modified or consolidated.

This appendix also provides answers to participant questions. These answers come from DNREC's Division of Climate, Coastal and Energy in consultation with technical experts from within DNREC and other state agencies.

A complete list of web links embedded in this document is provided at the end of the appendix.

Additional comments provided by participants during the presentation or breakout or wrap-up sessions are provided in Appendix 5.

Questions Related to Coastal Development

Q: *What is being done in the area of managing coastal development?

A: In Delaware decisions on zoning, ordinances and development are made at the county and municipal level, however DNREC's Shoreline and Waterways Program under the [Beach Preservation Act](#) regulates how far seaward construction can occur along the Atlantic Coast Beaches and in the Delaware Bay up to Pickering Beach. The regulations were updated in 2016. The "no-build" line has remained the same since 1972.

In addition, significant effort is made by state agencies including DelDOT, DNREC, University of Delaware's Institute for Public Administration and the Office of State Planning Coordination to assist local governments make good land use decisions. DNREC offers grants for resilient and sustainable development and co-hosts the Resilient and Sustainable Communities League.

Q: How do you keep people from building in threatened areas without a complaint of "taking"?

A: In Delaware, decisions on zoning, ordinances and development decisions are made at the county and municipal level.

Q: Why do we continue to allow development in flood prone areas?

A: In Delaware decisions on zoning, ordinances and development are made at the county and municipal level. While the state can provide recommendations and guidance to avoid developing in flood prone areas it cannot dictate to the county and municipalities where they allow or block development from occurring. The [National Flood Insurance Program \(NFIP\)](#) does require participating communities to adopt floodplain management standards that meet or exceed FEMA's minimum standards. Additionally the newer versions of the [International Building Code](#), specifically the 2018, 2015, 2012 and 2009 I-Codes, have also incorporated floodplain management provisions that meet or exceed NFIP minimum requirements.

Q: *Can we create a statewide freeboard requirement above the National Flood Insurance Program (NFIP) minimum and extend the minimum into the X zones?

A: Freeboard is the elevation of a building's lowest floor to a height above the minimum base flood elevation during the initial construction process. Typical requirements call for an additional 1-3 feet above base flood elevation.

The state does not have the authority at this time to create a statewide freeboard requirement. The state does however have the ability to work with municipalities and counties to identify opportunities and update codes to require a higher freeboard. The state has a model floodplain ordinance which it encourages communities to adopt. This model ordinance includes freeboard and other best practices for flood risk reduction. A majority of the communities in the state that participate in the NFIP have already adopted higher standards such as a freeboard requirement.

The State also encourages communities to participate in the [NFIP Community Rating System](#). It is a "voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum program requirements." As a result of participating in the program flood insurance premium rates are discounted to reflect the reduced flood risks.

Questions Related to Transportation Infrastructure

Q: *Route 9 south of New Castle floods regularly in even relatively minor storms. DelDOT has told us the road is on their schedule for improvement in 2035. Why so far in the future? I know money is an issue but is the flooding risk even considered?

A: While we cannot speak for DelDOT, we have passed along the question and a full answer will be forthcoming. In the meanwhile, you may be interested in viewing DelDOT's [Strategic Implementation Plan for Climate Change, Sustainability & Resilience for Transportation](#), the [Capital Transportation Plan \(CTP\)](#), the [CTP Prioritization Criteria](#) and the [WILMAPCO Regional Transportation Plan](#).

Q: Have you compiled stats on how much roadway and other infrastructure will be impacted from 10 feet of sea level rise?

A: The Delaware [Sea Level Rise Vulnerability Assessment](#) provides estimates of roadway inundation and infrastructure up to 1.5 meters. Ten feet of sea level rise is outside of the state's planning scenarios for this century.

DelDOT's Response: Sea level rise is a significant concern for the Department of Transportation as they have seen its impacts already with not only storm events, but high tide flooding events. To work toward solutions to address the resiliency of the network, DelDOT has reviewed various scenarios of sea level rise and its effect on the infrastructure. In fact, there was a recent study completed on the SR 9 corridor from the Kent County line up to New Castle to show the effects of sea level rise and how DelDOT could plan for it. DelDOT has also started to include language in their design manuals for the inclusion of sea level rise scenarios when planning and designing infrastructure. This is very important as the state's infrastructure has design lives of decades so DelDOT has to plan today while designing the transportation network of the future.

Questions Related to Sea Level Rise Data and Projections

Q: What studies did you rely upon in projecting future magnitude of sea level rise?

A: The reference material and methods used to project future sea level rise for Delaware can be found in the [Delaware Geological Survey report Recommendation of Sea-Level Rise Planning Scenarios for Delaware](#) available online.

Q: Within what future time periods do you project different degrees of sea level rise?

A: Our projections include planning scenarios for 2030, 2050, 2080 and 2100. The below table is from the [Delaware Geological Survey report Recommendation of Sea-Level Rise Planning Scenarios for Delaware](#)

Year	Delaware SLR Planning Scenarios		
	Low	Intermediate	High
2030	0.11 m / 0.36 ft	0.22 m / 0.72 ft	0.33 m / 1.08 ft
2050	0.22 m / 0.72 ft	0.40 m / 1.31 ft	0.58 m / 1.90 ft
2080	0.42 m / 1.38 ft	0.74 m / 2.43 ft	1.11 m / 3.64 ft
2100	0.52 m / 1.71 ft	0.99 m / 3.25 ft	1.53 m / 5.02 ft

Q: *Did your projection of maximum of 5 feet take into consideration new information about Antarctic and Greenland ice shelf/sheet melting released within the past 2 months?

A: When the [projections were initially created in 2012](#) we used the best available science at that time, which had some information in relation to the melting shelf and sheet. When the [projections were updated in 2017](#) the best available science was used which included the impacts of the melting shelf and sheet. Although there is no set timetable of when the projections will be updated again, they will be updated in the future and will include the best available science at that time.

Q: What if sea level rise is much faster than now considered?

A: The best available science was used to develop current projections. Although there is no set timetable of when the projections will be updated, however it is our intent to periodically update these planning scenarios as new information is available. We will use the best available science at that time and the information will be relayed to all parties to incorporate into their plans as much as is feasible.

Questions Related to Temperature Data

Q: What is the course of your temperature increase projections? When was it last updated?

A: Temperature projections for the state are to the year 2100. Temperature projection data can be viewed at the [Delaware Climate Projections Portal](#).

These projections were prepared for the [Delaware Climate Change Impact Assessment](#), which was released in February 2014. The Office of the Delaware State Climatologist actively monitors observed temperature values and provides real-time data through the [Delaware Environmental Observing System](#).

Q: *Are you going to update the projections as new updated data is made available?

A: We are actively considering when to update our climate projections based on new climate models and data; however, the state has not made any decisions on this yet. Given the significant resources it takes to update projections, the state will want to determine when it is most cost-effective to do so. If an update is undertaken the best available science at that time will be used.

Questions Related to Water Resources and Infrastructure

Q: *In evaluating impacts upon river water supply sources did you consider drought scenarios?

A: Yes, as part of the [2014 Delaware Climate Impact Assessment](#) the impacts of drought scenarios were considered in relation to water resources.

Q: How periodically does the State study the potential/actual impairment of dams, levees or other water control infrastructure?

A: [The Delaware Dam Safety Regulations](#) require all regulated High hazard dams to be inspected annually and Significant hazard dams to be inspected at least once every 2 years to detect any signs of deterioration, developing weakness or unsafe conditions. Levees in the [US Army Corps of Engineers Rehabilitation and Inspection Program](#) are inspected based on the requirements of the program.

Q: Are there good opportunities for physical infrastructure improvements such as improvements to existing facilities such as dikes, levies, breakwaters, etc. that would be beneficial for both sea level rise and protection from storms, particularly storm surges?

A: Building or improving flood control structures so they are resilient to today's storm surge, long term sea level rise and future storm tides is a best practice adaptation strategy being employed in infrastructure planning statewide. In addition, wetland restoration, like the major wetland restoration project in South Wilmington, have been constructed to provide flood abatement today and be resilient to sea level rise. Communities could consider applying for a [FEMA Building Resilient Infrastructure and Communities Grant](#) to obtain funding for such infrastructure improvement projects.

Q: What is the state's plan for the stormwater management resources, i.e. retention ponds, with the effect that sea level rise will have on those resources?

A: Stormwater management is overseen by DNREC's Division of Watershed Stewardship and is highly regulated. The need to update the regulations was identified in the [2014 Climate Framework for Delaware](#) as an action that could help the state build resiliency and prepare for climate change.

The [Stormwater Regulations and technical standards](#) were promulgated and went into effect in February 2019 and apply to new development and redevelopment projects. The regulations emphasize runoff reduction practices, which are expected to be adequate for minimizing new stormwater loads.

While the updated regulations do not have any specific requirements related to planning for sea level rise the [Standard Guidelines for Operation and Maintenance of Stormwater BMPs](#) advises that all stormwater management structures are reviewed on an annual basis to ensure they are performing properly. During these reviews if the structure is not functioning properly then updates will be made.

Q: Are there plans to replace individual septic systems, especially in Sussex County, with municipal sewage projects where reasonable? Would this lessen impact when flooding occurs?

A: Sussex County Sanitary Sewer District expansions are managed at the county level. A [listing of proposed and approved sewer projects](#) can be found online. As additional land is annexed into a Sewer District and the sewer infrastructure is expanded into the area, existing residents who are on septic systems are afforded the option of connecting to the County sewer and properly abandoning their individual septic system. Connection of residents with onsite individual septic systems to centralized sewer in flood prone areas and/or areas that may be impacted by sea level rise would lessen environmental impacts from septic drain field inundation in those areas.

Q: *Are there combined sewer overflow issues located in places other than Wilmington?

A: Currently the only combined sewer overflow systems in the state are in Wilmington and a few small sections of New Castle County. However, these areas are actively being addressed to update and remove combine sewer overflows. The town of Laurel used to have a combined sewer overflow system, but it has been recently reconstructed and no longer functions as a combined sewer.

Questions Related to Equitable Adaptation

Q: *What percentage of state agency leadership involved in climate change actions, environmental leadership and environmental education are considered a person of color (POC) or diverse? If the percentages are low, what are you doing to increase diversity?

A: Diversity in state government is important. In fact, Delaware's Department of Human Resources, through its [Division of Diversity and Inclusion](#), works with state agencies to "cultivate access, equity, diversity and inclusion throughout state government," including "supporting the recruitment and retention of employees from historically underrepresented groups".

Q: Can we think about transportation equity and having electric busses and less automobiles using fossil fuels?

A: The transition to electric vehicles (and other zero emission vehicles) is a key strategy for the state; more information about potential emission reductions from zero emission vehicles is available in the [Technical Greenhouse Gas Mitigation Analysis Report](#) produced by ICF for DNREC in 2020. The state has a number of [programs already aimed at clean transportation](#).

The Delaware Authority for Regional Transit (DART) currently owns and operates 14 electric buses, eight of which run routes in Wilmington and New Castle. DART plans on adding another six electric buses over the next two years, bringing the total fleet to 20. In addition, in August 2020, the Delaware Transit Corporation, which operates DART, received a Federal Transit Authority grant to install an approximately 60,000 square foot solar array in Dover to help power the six buses that operate in Kent County.

Q: *Does Delaware have plans for helping vulnerable populations during high heat events?

A: Currently there is the [Low Income Home Energy Assistance Program](#) offered through the Division of Health and Social Services (DHSS) that offers the Summer Cooling Assistance Program. This program operates during the months of June-August and helps pay for electricity to cool homes with air conditioning during the hot, humid summer months. In addition to receiving a grant to offset the high costs of electricity to air condition a home, some populations may be eligible to receive a room sized air conditioning unit. Additionally, when there are extreme heat events DHSS will release a list of cooling sites available across the state, most of which are public libraries.

Q: How do you plan to inform people for whom English is NOT their first language?

A: We plan on working with [DNREC's Community Ombudsman](#) who is the liaison between DNREC and communities throughout the state. This position works with underserved communities to ensure their interests and problems are addressed by DNREC; this includes populations of individuals whose first language is not English.

Questions Related to How the Plan was Created

Q: Why not include private sector and individuals in the plan?

A: This Plan is being developed specifically for the state to identify what actions it can take to minimize emissions and maximize resilience to climate change. The Plan may include state actions that support its communities, businesses and individuals to adapt.

Q: Have you given thought to making suggestions to residential, commercial and industrial customers on how to better prepare now while you are working on the plan?

A: There are a variety of resources available to residential, commercial and industrial customers some examples include: the [Resilient and Sustainable Communities League](#), the [Delaware Coastal Training Program](#), the [Preliminary Land Use Service](#), the [Delaware Sea Grant Marine Advisory Service](#), the [Delaware Cooperative Extension](#), the [DNREC Community Ombudsman](#), the [DNREC Small Business Ombudsman](#) and the [Delaware Climate Action Plan webpage](#).

Q: *Are there any new or innovative ideas being considered in the plan?

A: DNREC has been working with stakeholders to come up with innovative climate action solutions that are consistent with what our technical data (both climate change impacts and emissions reduction) supports as being impactful areas of investment.

Q: What were the major lessons learned by reviewing other states' Climate Action Plans? Which elements were successful, and which were less successful?

A: The major lessons learned from other state plans are that actions need support from the public and state agencies to be effectively implemented, actions that require small changes in how the state does business can have significant impacts and that actions need to be specific.

Success of a plan can be measured in whether a plan was implemented after it was complete. Plans that had strong public support, listed specific actions and established ways of monitoring progress over time were likely to have higher rates of implementation.

Q: Are there disaster plans for storms?

A: Yes, the Delaware Emergency Management Agency (DEMA) has an [All-Hazard Mitigation Plan](#) that outlines how emergency agencies will respond during a hazardous event. It includes coastal flooding, storms, hurricanes, coastal erosion and inland flooding to name a few of the natural hazards included in the plan. The plan was most recently updated in 2018.

Q: Have you studied "managed retreat" from higher flood risk areas? Where will residents and businesses relocate to in your projections?

A: According to the [Georgetown Climate Center](#) "managed retreat is the voluntary movement and transition of people and ecosystems away from vulnerable coastal areas, is increasingly becoming part of the conversation as coastal states

and communities face difficult questions on how best to protect people, development, infrastructure and coastal ecosystems from sea-level rise, flooding and land loss." Various adaptation measures have been studied, including managed retreat. DNREC will continue to provide the science and technical assistance to local communities so that informed decisions can be made.

Questions Related to Communication and Education

Q: *How will you educate everyone on the widespread effects of sea level rise that will be experienced statewide and not just along the coast?

A: As the Plan is still in development, we are unsure yet how the state will address this issue.

Q: *Would it be possible to save on costs and provide valuable work experience to offer environmental study college students a work/intern experience in exchange for college credit?

A: Currently DNREC has a variety of internship programs, however there are not currently any that offer college credit. DNREC partners routinely with students enrolled in courses at the University of Delaware, Delaware State University, Wesley College and Delaware Technical College to complete projects for DNREC as part of their coursework.

Q: *What can you do to target communication and education to Sussex County Council?

A: Activities may build on programs that already exist like the [Delaware Coastal Training Program](#) and the [Resilient and Sustainable Communities League](#).

Q: Are there plans to expand the social media outreach (Instagram, TikTok) to gather more interest from Millennial and Gen Z populations in Delaware or surrounding areas?

A: DNREC is utilizing Facebook, Twitter and Instagram to educate and connect with stakeholders.

Q: *Will there be more communication to residents in the future about safety in relation to climate change impacts?

A: There will be on-going engagement with our residents and communities to continue these kinds of conversations.

Q: This is surely outside the scope of DNREC, but what actions do you think would be most helpful for non-profits to take in advocating to make it illegal for people to build in areas susceptible to flooding and storm surge and sea level rise?

A: In Delaware, decisions on zoning, ordinances and development are made at the county and municipal level.

Questions Related to Community Adaptation

Q: *It would be very helpful to know what other communities have done and in what circumstances. What worked, what didn't and why?

A: Being able to review actions undertaken previously by others is an excellent way to uncover new ideas and identify resiliency best practices. Although not a comprehensive list of all resiliency activities across the state the [Resilient Communities Partnership \(RCP\)](#) website includes details about projects undertaken through the RCP, as well as the previous Coastal Management Assistance Grant Program. Additionally, the [Resilient and Sustainable Communities League](#) works closely with communities and are a resource that could provide details on additional actions not completed as part of the RCP.

Q: *Are any grants to communities available at present, either matching or not?

A: To find current grant opportunities for building resilience visit the [Delaware Database for Funding Resilient Communities](#).

Questions Related to Energy Infrastructure

Q: Where does the department stand on increased distributed generation (microgrid) to support critical facilities?

A: Grid-scale renewable energy in Delaware has historically been developed through the state's [Renewable Portfolio Standard](#): a state law that requires Delaware's utilities acquire an increasing percentage of their electricity from renewable resources. Based on the results of our greenhouse gas emissions modeling analysis, a Renewable Portfolio Standard remains an important strategy for reducing emissions in the state using grid-scale renewable energy.

Additionally, DNREC's Energy Section is reviewing options to create a grant program that supports pilot research projects that explore things like energy storage, micro-grids and other technologies for grid resilience.

Q: *What suggested actions, or potential actions, is the state looking at to protect energy generation facilities?

A: The state has the [Energy Assurance Plan](#) that is a comprehensive manual for state government leaders charged with the responsibility of ensuring the health, welfare and safety of the citizens of the state during periods of energy emergencies. The plan describes the way the state will respond if an energy shortage of a substantial nature occurs or appears imminent. The plan was updated in 2019 and is periodically reviewed to ensure it is meeting the state's energy needs during an emergency event.

Q: Where does the state stand with respect to encourage offshore wind?

A: Delaware's utilities continue to acquire a portion of their electricity from renewable resources, including wind energy sources.

Delaware's utilities continue to acquire a portion of its electricity from renewable resources, including wind energy sources. With regards to in-state wind generation, DNREC manages the state's [Green Energy Program](#), which provides incentives for renewable energy projects including wind. Additionally, DNREC is actively looking into issues related to wind energy in Delaware, including, most recently, transmission impacts of offshore wind to the state. Establishing larger scale in-state wind generation for the state will require the input and collaboration of numerous stakeholders including state government leaders (both executive and legislative), Delaware's public service commission, the state's utilities, labor organizations, environmental organizations and other affected communities and groups.

Q: How can the state make the use of solar generation of power more complete?

A: Solar generation of power is one of the renewable energy strategies the state could pursue. In fact, solar energy is part of the state's Renewable Portfolio Standard: a state law that requires Delaware's utilities acquire an increasing percentage of their electricity from renewable resources (including a certain percentage from solar energy sources, specifically).

Delaware has made steady progress on solar power generation. Solar photovoltaic capacity in Delaware has grown from 2.3 megawatts at the end of 2008 to more than 120 MW today, and the state is home to more than 6,000 solar energy installations. Moreover, most of the solar energy used to meet the solar requirement of the [Renewable Portfolio Standard](#) is generated in Delaware.

The current Renewable Portfolio Standard expires in 2025, but there is the potential for it to expand beyond 2025. Governor Carney, for instance, indicated in his 2020 State of the State address that he would like to set a new Renewable Portfolio Standard with 40% of Delaware's energy coming from renewable sources by 2035. Based on the results of the state's recent [greenhouse gas emissions modeling analysis](#), a Renewable Portfolio Standard remains an important strategy for reducing emissions in the state.

Miscellaneous Questions

Q: *Will the poll results be available after tonight's webinar?

A: Yes, all poll results are included in each of the workshop presentations that can be accessed on the [Delaware Climate Action Plan website](#).

Q: Given the clear change in casualty insurance risk that is occurring what is the State doing to understand how other States are adjusting to the withdrawal of casualty insurers from the insurance market for coverage of coastal area risks of property or businesses?

A: Delaware Department of Insurance Response: Markets in certain areas of the United States that have experienced multiple major catastrophes (repeated western wildfires and back-to-back storms in the Gulf region, for example) have experienced some adverse effects on the availability of commercial casualty insurance. Delaware has been fortunate to not have experienced a contraction in the commercial casualty insurance market in recent years. Rather, as some carriers leave Delaware, we are seeing others come in to fill the void. Additionally, companies are increasingly relying on ever more sophisticated modeling, including artificial intelligence, to help them more accurately predict risk and better price their products. The Delaware Department of Insurance actively monitors the Delaware and national markets in cooperation with our neighboring states and as an engaged participant on relevant committees of the National Association of Insurance Commissioners.

Q: How can enforcement of current regulations prohibiting pollution be made more effective?

A: DNREC relies on our residents and visitors to help report environmental violations, so that they can be corrected as quickly as possible.

Everyone is encouraged to call the [DNREC's Environmental Crimes Unit](#) Emergency Response Line **1-800-662-8802** to report environmental complaints, spills, releases, trash dumping and more. You will be asked **when** and **where** and for your **name** and **contact information** (which will be kept confidential).

Embedded Web Links

- Beach Preservation Act: <https://delcode.delaware.gov/title7/c068/index.shtml>
- National Flood Insurance Program (NFIP): <https://www.fema.gov/flood-insurance>
- International Building Code: <https://www.iccsafe.org/products-and-services/i-codes/2018-i-codes/ibc/>
- NFIP Community Rating System: <https://www.fema.gov/flood-insurance/rules-legislation/community-rating-system>
- DelDOT's Strategic Implementation Plan for Climate Change, Sustainability & Resilience for Transportation: https://deldot.gov/Publications/reports/SIP/pdfs/SIP_FINAL_2017-07-28.pdf
- Capital Transportation Plan (CTP): <https://deldot.gov/Publications/reports/CTP/index.shtml>
- CTP Prioritization Criteria: https://deldot.gov/Publications/reports/CTP/pdfs/DelDOT_project_prioritization_criteria_summary.pdf?cache=1602674455331?cache=1602674916423
- WILMAPCO Regional Transportation Plan: <http://www.wilmapco.org/Rtp/2050/2050RTP.pdf>
- Delaware Sea Level Rise Vulnerability Assessment 2012: <http://www.dnrec.delaware.gov/coastal/Documents/SeaLevelRise/AssesmentForWeb.pdf>
- Delaware Geological Survey report Recommendation of Sea-Level Rise Planning Scenarios for Delaware 2017: <https://www.dgs.udel.edu/sites/default/files/projects-docs/Delaware%20SLR%20Technical%20Report%202017.pdf>
- Delaware Climate Projections Portal: <http://cema.udel.edu/declimateprojections/>
- Delaware Climate Change Impact Assessment: http://www.dnrec.delaware.gov/energy/Documents/Climate%20Change%202013-2014/DCCIA%20interior_full_dated.pdf
- Delaware Environmental Observing System (DEOS): <http://www.deos.udel.edu/>
- The Delaware Dam Safety Regulations: <https://regulations.delaware.gov/AdminCode/title7/5000/5103.shtml#TopOfPage>
- US Army Corps of Engineers Rehabilitation and Inspection Program: <https://www.mvp.usace.army.mil/Missions/Emergency-Management/Rehabilitation-Inspection/>
- FEMA Building Resilient Infrastructure and Communities (BRIC) Grant: <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>
- 2014 Climate Framework for Delaware: <http://www.dnrec.delaware.gov/energy/Documents/The%20Climate%20Framework%20for%20Delaware.pdf>

- Delaware Stormwater Regulations: <https://regulations.delaware.gov/AdminCode/title7/5000/5101.shtml>
- Standard Guidelines for Operation and Maintenance of Stormwater BMPs: http://www.dnrec.delaware.gov/swc/Drainage/Documents/Sediment%20and%20Stormwater%20Program/2019%20February/Regulatory%20Guidance%20Documents%202019/Std%20Guidelines%20for%20OandM%20_EFF%20FEB%202019.pdf
- Sussex County Sewer Projects: <https://sussexcountyde.gov/proposed-projects-schedules>
- Delaware Department of Human Resources, Division of Diversity and Inclusion: <https://dhr.delaware.gov/diversity/>
- Technical Greenhouse Gas Mitigation Analysis Report: https://declimateplan.org/wp-content/uploads/2020/09/DNREC-Technical-Report_FINAL-9-3-20-CLEAN.pdf
- Clean Fuel and Transportation Initiatives: <https://dnrec.alpha.delaware.gov/climate-coastal-energy/clean-transportation/>
- Low Income Home Energy Assistance Program (LIHEAP): <https://www.dhss.delaware.gov/dhss/dssc/liheap.html>
- DNREC's Community Ombudsman: <https://dnrec.alpha.delaware.gov/community-services/community-ombudsman/>
- Resilient and Sustainable Communities League (RASCL): <https://www.derascl.org/>
- Delaware Coastal Training Program: <https://dnrec.alpha.delaware.gov/coastal-programs/planning-training/coastal-training/>
- Preliminary Land Use Service (PLUS): <https://stateplanning.delaware.gov/plus/>
- Delaware Sea Grant Marine Advisory Service: <https://www.deseagrant.org/extension-1>
- Delaware Cooperative Extension: <https://www.udel.edu/canr/cooperative-extension/>
- DNREC Small Business Ombudsman: <https://dnrec.alpha.delaware.gov/community-services/business-assistance/>
- Delaware Climate Action Plan Website: <https://declimateplan.org/>
- DEMA All Hazard Mitigation Plan: <https://dema.delaware.gov/contentFolder/pdfs/HazardMitigationPlan.pdf>
- Georgetown Climate Center: <https://www.georgetownclimate.org/>
- Resilient Communities Partnership: <https://dnrec.alpha.delaware.gov/coastal-programs/planning-training/resilient-communities/#:~:text=The%20Resilient%20Community%20Partnership%20program,strategies%20at%20the%20local%20level>
- Delaware Database for Funding Resilient Communities: <https://www.bidenschool.udel.edu/research-public-service/ddfrc>
- Delaware's Energy Assurance Plan (EAP): http://www.dnrec.delaware.gov/energy/Documents/Delaware_Energy_Assurance_Plan.pdf
- Delaware's Renewable Portfolio Standard: <https://dnrec.alpha.delaware.gov/climate-coastal-energy/renewable/portfolio-standards/>
- DNREC Environmental Crimes Unit: <https://dnrec.alpha.delaware.gov/community-services/enforcement/>

APPENDIX 5: Comments from Workshop Participants

This appendix provides a list of comments provided by workshop participants during the September 24 and 29 and October 1 sessions. Questions that were submitted by workshop participants can be found in Appendix 6.

DNREC provided clarification on some of the comments below, including redacting personally-identifiable information. These clarifications are indicated with italicized text in brackets.

Comments from the Sea Level Rise Session – September 24, 2020

It would be useful for the state to develop a standard set of criteria by which agencies evaluate their long term maintenance strategies (to include decisions such as retreat) so there is consistency in decision making.
You might consider having the poll be a ranking of actions instead of just in or out of consideration.
Not sure human health but other social factors such as how some groups are disproportionately impacted by SLR - and why
Community decision makers like Sussex County Council, Town Councils or City government officials need to have serious and immediate education on CC & SLR. The grant monies would be to used for remediation, but as we know Sussex County needs to CHANGE it's present stance on growth, building new subdivisions, how they handle human waste and the waste & pollution from the massive Poultry Industry which dominates Delmarva.
Grant opportunities should be for both planning efforts and on the ground projects. Communities need assistance with both.
Stress, clarify economic risks/benefits of taking climate action
Wouldn't it be clever if the state were to stop its support of Ft. DuPont, a poster child for what not to do in climate change adaptation?
Prospective home buyers should be mandated to receive education on probable sea level rise impacts to the properties they are considering.
Information should be made available to everyone throughout the state in all applicable languages. SLR/CC is impacting the state now. Time is of the essence. There are really 8 years left.DE will have a dramatic change to a series of islands.
The building of subdivisions in coastal areas needs to stop.
Given the clear change in casualty insurance risk that is occurring what is the state doing to understand how other States are adjusting to the withdrawal of casualty insurers from the insurance market for coverage of coastal area risks of property or businesses?
Public engagement and education for civic associations and local citizen-based groups will be helpful in shaping the understanding of impacts in Delaware and what Delawareans can do to adapt or building resilience.
I think an important action is to work with FEMA to stop paying to rebuild multiple times in the same locations.
We need to be honest with citizens about the probabilities of sea level rise impact in their towns and the real possibility of having to retreat to higher ground.
We should ban any new construction in flood plains.
Monitor how sea level rise effects the land, air and water species.
Legislative action at the state level to mandate removal or abandonment of properties as sea level encroaches.
We should work on sea level rise by addressing the problem of global warming, reducing GHGs. Everything else is band aids.
We should set zero combustion by 2030 goal for the state for all vehicles and new buildings
Also impact on plants and their locations compared to a year baseline.
Discussion of a "managed retreat" policy from higher flood risk areas whether within shore areas or river wetlands is needed. There is some higher ground within the State, the Eastern Shore and Wilmington region [including PA].
Mycorrhizal research???
This survey made me remember the vulnerability of non-English speakers in our state. It is so important to be sure that these communities have ways to communicate during times of disaster.

We should enable community solar installations in the state to support decarbonization.
We're only as resilient as our most vulnerable communities, and unfortunately minority and low-income communities will be disproportionately affected by climate change. Please incorporate/advance efforts to address inequities in coastal adaptation, protection and restoration policies and efforts.
The flood plain is three dimensional, so incentivizing construction to go to Finished Floor at flood plain + five or six feet instead of one foot would get buildings some extra height above the danger zone.
We should require climate resilient and net zero construction for all new commercial and residential construction
Find opportunities to put "teeth" in the plan. Some recommendations should not be voluntary.
Require all new State buildings and vehicles to be as green as possible. Like all new vehicles be electric and add solar to all buildings. Build electric charging stations throughout the state.
Interstate regional relocation strategies need to be considered given the need to facilitate households and businesses that opt to relocate to relocate more closely to those they know or with whom they do business.
I understand that UD is working with flood prone towns to figure out how to raise their main streets - rather than encourage this, why not work with UD to plan for future relocation of these towns
Would it be possible to save on costs and provide valuable work experience to offer environmental study college students a work/intern experience in exchange for college credit? Young people have great ideas and enthusiasm. And they are mostly likely to be invested in the future.
Can we create a statewide freeboard requirement above the NFIP minimum and extend the minimum into the X zones?
It seems that there needs to be more done with the developers and real estate ventures, in general, to provide a sensible action plan for smartly developing and to even move economic centers away from the dangerous flood-prone areas.
University research incentives?
Require all new buildings moving forward (ASAP from now) within the 5' sea level inundation area to be built or not built at all accordingly. Work with insurance to not give flood insurance to new construction within the 5'
Actually give the public some input on the strategies. These polls are confirmation bias heavy, and the majority answering in the affirmative gives you very little data about where to send limited resources.
Update building code requirements to account for future projections. Promote natural infrastructure solutions.
The designated evacuation routes are inadequate. It is essential to train and inform the public on how to survive a massive storm/wind/rain. In Sussex, the fire departments are all volunteer. I believe there is only one water rescue team but it is not trained for a flood or storm emergency. WWTPs are not "state of the art" unless land application of waste and wastewater is considered the latest innovation. More thought, planning and investment needs to go into WWTP to prevent pollution and tainted drinking water supply for most of the state. In Sussex County, all drinking water comes from the aquifer via municipal, community and private wells. There is very little protection.
I think having a plan for the state will be great and a good next step is to make a plan for the communities or provide consistent guidance on steps they can take. examples include have a resilience officer, conduct vulnerability assessments, create and implement local adaptation plans, etc.

Comments from the Increased Temperatures Session – September 29, 2020

I would like to see more actions to mitigate climate impacts as opposed to just adaptation to increased temperatures.
I believe collaboration with those states that also border on the Chesapeake Bay is very important on the issues of climate change and environmental preservation.
If you increase education, it is imperative that you provide those educational opportunities in the languages spoken by the most vulnerable populations. So many of these people cannot speak or read English and yet live in some of the most vulnerable areas!
It will be very important to have discussions with the basic 5-8% who are consistently saying "No further actions needed". What is their thinking? Reasonable, useful, or basic climate change deniers?
Where does the state stand with respect to encourage offshore wind? This is needed to reduce the greenhouse gases released into the atmosphere thus reduces the projected increase in temps.
Provide cooling stations in low income neighborhoods.
Perhaps the state is content to hold the amount of green energy production to about 26% which is way too low.
State and city collaboration on implementation of best practice extreme heat planning and response, example neighborhood buddy systems, working with neighborhood cooling stations, such as churches.
Solar required on all schools. It's educational and saves money.
Why not include private sector and individuals in the plan? Can get broader support and impact.
In Sussex County a very important target group for communication and education is the County Council! What can you do there?
Public education at all levels is very important.
I think we need to update state facilities first and then develop guidelines for future constructions.
Safety of outside workers is most important.
I agree with NAME REDACTED, that we need to engage in conversations with those who fell no further action is necessary. Don't know if that is possible. But we need to have that conversation in a safe and respectful manner.
It is time for DE to develop a realistic review of the types of industries that are promoted, nurtured, bailed out here. The major industries pollute and destroy the state's natural resources, air/land/water. DE seems to have the attitude of allowing these heavy polluters and environment destroyers that any business is good business. The Chemical & massive poultry industries are destroying the state. If all the water, surface and aquifers are becoming increasingly polluted, no one will be able to survive - in any temperature scenario, It's all very complicated. Unlimited growth of subdivisions and these polluting industries is not sustainable. These grant programs are simply a drop in the bucket on what is needed to build all the proper infrastructures needed. This would be proper, high tech sewage & wwtps, not to mention roads and bridges. DE needs to take a strong stance against these mega industries that use the land, water and air as an open cesspool for industrial and agro-industrial waste.
This process should include consideration of the social disruption, unrest and costs that will result from climate change.
Mandate solar roofing for new communities being built.
More electric cars in the state fleet and county and city/police fleets. 800 MW of offshore wind needed to drive prices down to under 7 cents/kwh.
Agriculture and Delaware's natural resources are important to the state's economy and enjoyment by residents and tourists. Attention should be given to the impact of increased temperature on the senior population and vulnerable population that comes to 25% of the entire population.
I agree that our state policies should not continue to support industries and investments that are causing climate impacts.
I would like to see consideration of more imaginative and specific recommendations that take account of the specific resiliency issue addressed in the Plan.
Solar panels required on all new construction.
Sponsor new and support existing environmental clubs in schools to foster support from younger generations.
The ideas offered in the voting seem limited to procedural and policy efforts by government agencies when we need a more aggressive approach such as wind energy and solar energy implementation.

Take measures to increase capacity and resilience of the grid to be able to handle more days with higher temperatures.
DE and DNREC need to take a stance on the newest type of industry. There are companies in at least 5 other states that want to bring their human waste/sludge to DE for land application. DE is already overloaded by it's inability to process both human and CAFO (from the POULTRY Ind.)
Buy solar in big solar farms to reduce costs to cities and other purchasers.
I encourage the Plan taking account of the possibility that Delaware residents will move from the state in response to increased temperatures associated with climate change.
I agree with NAME REDACTED!!! RE: DE and DNREC need to take a stance on the newest type of industry. There are companies in at least 5 other states that want to bring their human waste/sludge to DE for land application. DE is already overloaded by it's inability to process both human and CAFO (from the POULTRY Ind.)
Plant many trees in heat islands.
Educate citizens/companies on actions they can take to mitigate climate change, whether that be saving energy, minimizing food waste, driving less, or whatever. We don't necessarily need to make our own materials - can also amplify others (other federal or state)
Have you given thought to making suggestions to residential, commercial and industrial customers on how to better prepare now while you are working on the plan? One idea is to ask homeowners to consider planting more trees on their properties; another ask developers to replant 2 trees for each one they take down ...
Improve the building code to super insulation on all new construction.
Many white roofs in cities.
Working across departments, DNREC, Agriculture, Forestry, transportation, to promote best practices and create new, low impact ways for Delawareans to live and grow our economy. Leverage our most important resource, our knowledgeable implementation and program managers to educate our policy makers and encourage innovation in the private sector. We have to actively promote and cultivate sustainable practices.
People who are especially vulnerable to high heat events should know about cool refuges available. They might need a buddy system of others who can provide assistance.
Increase the RPS to 100%.
I encourage consideration that agriculture either will move out of the state or into greenhouses because of increased temperatures. Greenhouses will increase farmers' capital costs.
Promote community solar.
DNREC has so much useful information and recommendations which are essentially not applicable because there are no regulations or ordinances which apply them. Examples are the DNREC recommendations given in the PLUS process. Very important info, but no teeth!
Suggest supporting Ag extension/university research projects on helping crops adapt to climate change - breeding disease resistant crops, for example.
Thank You!!!!
Keep on keeping on!!
I encourage that in developing the State Action Plan on the increased heat phenomenon DNREC pay especially close attention to actions/policies of the Western and Southwestern states.

Comments from the Heavy Precipitation and Flooding Session – October 1, 2020

For future use: it would be much better when you show options of proposed actions, you should have a scale 1-10 for each so people could respond the degree of interest they have in a particular option.
For future workshops, I recommend not having the presenters read off prepared text. This is terribly boring and hard to pay attention to... I also wish there had been more discussion of the specific examples of the actions. Things like "Update policies" or "Provide information to the public" are something that should be done constantly anyway, regardless of climate change. In my view, these are not useful recommendations. The specific examples have been more interesting but seem very spotty and aren't part of your survey. Lastly, asking what is "most" important is confusing; usually one would only pick one to be "most" important.
Definitely think protecting wetlands is one of the highest priorities for adaptation for DE
What are you planning for protecting our electric distribution infrastructure from these expected increasing threats: flooding, damage to wiring from trees falling and other weather threats.
Remediation is very expensive and few small communities can afford it. They also are usually primarily run by volunteer councils, mayors, planning commissions, etc They need professional guidance from the experts at DNREC and other agencies regarding best actions for their circumstances. They also need help with funding.
Should include businesses, private schools, non-profits in the effort
It would help to have more examples. Sometimes it was hard to distinguish options from each other.
The key to any of this is enough funding to implement changes and provide funding to communities and businesses who need to adapt
No match grants and prioritizing frontline communities of low income residents are top priorities.
It would be very helpful to know what other communities have done and in what circumstances. What worked? What didn't work? Why. This presentation feels like planning to make a plan. We want to know what action to take in our situation.
Protecting wetlands is a high priority to me. Also, assessing value / potential of reclaiming lands that were wetlands and are key for protection in spite of the issues this creates.
I would suggest skipping the part about the impact of climate change to allow time for discussion concrete actions. I suspect that those attending this workshop already know that climate change is a threat to our state.
Increased density should be encouraged to preserve green open space.
You should include the possibility of much greater storm surges because. hurricanes are expected to increase in intensity as seas increase in temperature.
There will need to be continuing dialogue about what the state is doing as we face new challenges.
I would like to see included in the plan more questions pertaining to health of residents and the elements that are impacting our health in this coronavirus climate. How are gas emissions affecting COPD and Asthma. Can we think about transportation equity and having electric busses and less automobiles using fossil fuels? Also, sea level rise in our vulnerable communities being affected as opposed to facility management and those infrastructure are needed but not at the expense of human quality of life.
Green infrastructure should be required on a sliding scale depending on the amount of impervious coverage proposed by a project in suburban areas.
We will need to move infrastructure currently near the DE River and ocean to be farther away or protected somehow.
I did not have consistent communication to receive the webinar properly. Since communication is important, will there be more towers or other means of communication for residents to communicate for safety in the future?
I can help you reach out to council and have information on development in Sussex County. EMAIL REDACTED
DNREC does regulate construction along the coast through the Beach Preservation Act: http://www.dnrec.delaware.gov/swc/Shoreline/Pages/ShorelineConstruction.aspx