

Delaware's Climate Action Plan Virtual Public Workshop Series

Workshop No. 2- Maximizing Resilience to sea level rise

September 24, 2020, 5:30 p.m. to 7 p.m.

Closed Caption Transcript (edited)

Below you will find a slightly edited version of the live closed caption transcript that was taken during the Climate Action Plan virtual public workshop held via Zoom on September 24, 2020, 5:30 p.m. to 7 p.m. Closed captioning services were provided by a third party vendor, and the unedited transcript provided to the state was modified for readability by DNREC staff. Due to the nature of live captions, there may be misspellings, missed or miscaptions or other errors in this transcript. We regret these errors.

This transcript was modified to align with the presentation slides presented during the workshop. The slide numbers are indicated before the captions associated with that slide.

BEGIN TRANSCRIPT

Slide 1

>> All right. Good evening, everyone. The time is 5:32, so we're running just a little bit behind, but I think we should still be good. So we'll go ahead and get started.

Welcome to workshop number two in Delaware's Climate Action Plan virtual public workshop series. Today's workshop we'll look at potential actions the state can take to maximize resilience to sea level rise. My name is Ian Yue and I am your facilitator this evening.

We look forward to your questions and we are glad you are here. The workshop is recorded and will be posted at DEclimateplan.org along with a closed caption transcript of this workshop. Before we begin we would like to address a few housekeeping items.

Slide 2

First, if you have any technical issues throughout the workshop, please send a private message through the chat box.

The message should be directed to all panelists, and someone will be available to assist you. Please only use the chat box for technical assistance.

To access the chat box, click the chat box icon at the bottom of your screen. This will open a new chat window on the right side of your screen. Please note that although the window may indicate that chat box is a group chat, private replies to you will not be visible to other participants.

To close the chat box, click the down arrow in the top corner and select close chat box and we've included a URL link to the Zoom help center in the chat box as an additional resource.

Slide 3

During this workshop, you will also have the opportunity to ask a question or submit a comment related to the content of this workshop. For any questions or comments that do not have to do with technical support, please use the Q&A box. Again, the Q&A box is only meant for questions or comments related to the content of this workshop.

Technical support questions should be directed to the chat box. You can access the Q&A box by clicking the Q&A icon at the bottom of your screen. After you select the Q&A icon a new pop up screen will appear where you can submit your questions or comment.

We'll do our best to answer as many questions as we can. We have over 200 participants that were registered, so we may not get to all questions. Additionally, answers to some questions may require more information and thus will not be possible to where are be possible to answer live.

If you are calling in to the workshop, or otherwise do not have access to the Q&A box, you can also e-mail questions to declimateplan@delaware.gov.

Please note anything you type into the Q&A box will be viewable to all participants. In order to create a safe and positive experience for all workshop participants, we will not tolerate any offensive or inappropriate language, nor any kind of hate speech. If such language is used, it will be deleted immediately and the responsible participant will be removed from the workshop and unable to return.

Slide 4

We'd also like to give you some tips on using sound in Zoom. If you have any trouble with hearing the audio, you can try restarting Zoom, or you can try switching to using phone audio. If you would like to switch to phone audio, move your cursor to the bottom of your screen on the left where it says audio settings, and click the up arrow, in the menu that appears, select switch to phone audio.

This will cause a popup box to appear like the one on the screen. Please note the pop up box like you see on the screen is just an example box and the phone number and the meeting information will be different on your screen. If you have any trouble with this, please send a message in the chat box to all panelists and we will provide you with assistance.

If you are only able to join us by calling in this evening, the workshop recording of the full presentation and the polls will be made available for you to view within a week of tonight's workshop. As I mentioned previously, you can also submit feedback on the proposed actions and any questions that you have to declimateplan@delaware.gov throughout the workshop.

Slide 5

Also closed captioning is available. To view captions click the closed caption button at the bottom and select show subtitle on the menu that pops up.

If you don't see the closed caption icon, click the more button at the bottom of the screen and select either closed caption or show subtitle, whichever shows up on your end. If the captions move too quickly for you, click the closed caption icon and select show full transcript on the menu that pops up. If you need to change the size of the captions, click the closed caption icon, and select subtitle settings on the menu that pops up. A slider bar will appear where you can adjust the size of your captions.

Slide 6

Moving on into the agenda for the evening, you will see that we have a packed schedule. However, out of respect for your time, we will finish no later than 7:00 p.m.

We will begin by continuing our brief introduction of this workshop and using the Zoom polling feature to find out who has joined us all today.

Next, we will walk you through an overview of Delaware's Climate Action Plan and take a more in depth look at sea level rise and possible maximize resilience to it.

Finally as I mentioned, before we will have a live question and answer session where our presenters will answer any questions that have been submitted into the Q&A box throughout the night.

Slide 7

Our workshop this evening has a variety of goals that we hope to accomplish in our limited time together.

Goal number one is to provide an overview of the Climate Action Plan and its development process.

Goal number two is to communicate how public input has shaped the planning process for the Climate Action Plan.

Goal three is to provide an overview of our actions identified for maximizing resilience were created.

And our fourth and final goal is to gather feedback on which actions to maximize resilience participants would like to see the state implement.

Slide 8

This evening, we have several staff members who will be presenting information and assisting with the facilitation of the workshop.

First, Dr. Robert Scarborough is the Program Manager of the Delaware Coastal Management Program and will be our first presenter this evening. He's worked on climate impacts for the last decade and serves as the scientific expert on the Climate Action Plan coordination team.

Ms. Maggie Pletta is a coastal resiliency planner with the Delaware Coastal Management Program and will be our second presenter this evening. She is project manager responsible for the portion of the Climate Action Plan focused on maximizing resilience.

I've already introduced myself, Ian Yue, and I am a resiliency planner with DNREC's Climate and Sustainability Programs section, and I will be your facilitator this evening and am helping develop the part of the climate plan focusing on minimizing greenhouse gas emissions.

Ms. Kristen Thornton is a planner with the Delaware Coastal Management Program and will be assisting me with facilitation this evening.

And finally Ms. Nicole Marks a Coastal Management Fellow with the Delaware Coastal Management Program, Nicole will be providing technical assistance.

Slide 9

Now we'd like to learn about you all, as well. Throughout this evening we'll be using the Zoom polling feature to collect your feedback. So, to get you familiar with the polling feature, we're going to do two quick polling questions. These polls are completely optional and you do not need to answer any question that you do not wish, however we certainly encourage your participation.

Our first polling question to get to know you is, where are you from?

Our options are Delaware, Maryland, New Jersey, Pennsylvania, or other.

So I'll have Maggie open up the poll and we'll keep it open for about 30 seconds, so go ahead and submit your responses. Quite a number of them coming in right now.

So we'll keep the poll open for about ten more seconds. And I see most of the results are in now. I'll go ahead and close the poll and share the results.

So, unsurprisingly, about 90 % of those of you who are on the call are from Delaware, though we do have some people coming from Maryland, New Jersey, Pennsylvania, as well as some other states.

Slide 10

All right. So, our second question to get to know you is this, why have you joined us all tonight, and what organization, if any are you representing? Are you a concerned citizen? Are you representing state or local government? You're representing nonprofit? Private business? Or other?

I'll go ahead and have Maggie open up the poll and give you-all about 30 seconds to answer this poll. So we have some good responses coming in.

I'll keep the poll open for about ten more seconds so keep on submitting those responses if you haven't done so yet. About five more seconds, so if you haven't submitted, go ahead and submit something now. And I will go ahead and end polling and share the results with you all.

So we have about two-thirds of you representing as concerned citizens. We're glad to have you on the call and have some good representation from local governments and nonprofit and other representation from private businesses as well as those who signified themselves as representing some other entity.

So thank you for helping us get to know you a little bit more, and it's great to know who we have here at the workshop. I'm now going to turn over the mic to Dr. Scarborough, so go ahead and take it away, Bob.

Slide 11

>> Thank you. Before we dive deeper into the main topic of Maximizing Resilience to Sea Level Rise, I would like to show you a purpose of the plan and its development. The climate plan will outline possible actions that minimize and maximize. So, what do we mean by that?

We want to minimize emission of carbon dioxide, methane, and industrial refrigerants into our atmosphere. These are the primary causes of the climate change we are currently experiencing. If you would like to learn more about this part of the plan, you can view the recording of last week's workshops on mitigation, which will soon be posted on the website. A link to the web page where you can access the recording has been added to the chat box.

The plan will also include how we can maximize our resilience to climate change impacts. This is what we are going to focus on this evening, specifically on sea level rise during this presentation. Future workshops next week will address adaptation to other impacts of climate change.

The biggest thing to understand about the plan is that it will be providing state agencies and others what are the steps they can take to prepare the state for climate change. The workshop series will continue next week and after reviewing the feedback we receive from these workshops we'll begin drafting the plan. Once complete the plan will be made public in the winter of 2021.

Slide 12

Once the plan is released it will help strengthen different sectors of our state to help of protect the economy, infrastructure, natural resources and human health and safety. By addressing all aspects we hope the state is better prepared for higher temperatures, sea level rise and extreme weather events.

Slide 13

To create the plan we employed multiple methods to guarantee we gather the most information and input.

The plan builds on past efforts to address climate change and sea level rise in Delaware. In 2010, the sea level rise advisory committee was formed to address these impacts and the committee included representatives from state agencies, academia, business, and nonprofit organizations for an equal voice in the table. Their work resulted in the sea level rise recommendation report. We reviewed the recommendations outlined in the report to identify what actions have been implemented and where additional efforts are still needed.

The second guiding document was the climate framework for Delaware. This document was one of the outcomes of the previous administrations, Executive Order 41, that instructed state agencies to prepare for climate change. The report included discrete actions each of the cabinet agencies could take to help them adapt to change. Many of these actions were implemented, but there are still some areas that need additional attention. Similar to the sea level rise report, we reviewed the report's actions to identify areas where further effort may still be needed. Finally we conducted a literature review of the climate action plans from other mid-Atlantic and northeast states to identify possible actions that were successful in those states.

Our next step was interviewing the various agency experts to understand where they see climate change impacts and possible actions they can take to address these. By conveying the information of technical experts to leadership all proposed actions are variable and address the needs of their stakeholders. Similar to the literature review we spoke with other agencies to identify other implementable actions and identified possible actions where we could work on together to use our available resources as efficiently as possible.

Finally, we reviewed peer reviewed articles, documents, and other reports on sea level rise impacts and adaptations from federal and other organizations and universities.

Lastly we engaged stakeholders, Delaware's residents and visitors through public workshops in March and online feedback forms. This current workshop series is a continuation of this effort to ensure that we are meeting the needs of the public and keeping everyone informed.

Now that we have discussed the purpose of the plan and how it's being developed I'm turning you over to Ms. Maggie Pletta who will walk you through the impacts of sea level rise in our state and some of the proposed actions the state can take to prepare.

Slide 14

>> Thanks, Bob. Before I begin discussing the impacts of sea level rise this evening I wanted to do a quick housekeeping reminder for any participants who may have joined us late.

If you have any technical difficulties or questions please use the chat box that can be accessed by the chat button on the bottom of the screen and send a message to all panelists and someone will be able to help you.

For any questions or comments on the content please use the Q&A box that can be accessed at the bottom of your screen. We will do our best to answer as many questions as we can during the live question and answer portion towards the end of the time we have this evening.

Next closed captioning is available and accessed by the closed caption box at the bottom of your screen.

And a final reminder that any obscene, inappropriate, or any hate speech input into the Q&A box will be deleted and the person responsible will be removed. We will monitor very closely to ensure it's a safe and enjoyable experience.

And finally, the presentation will be upload uploaded within a week tonight and throughout the workshop submit questions at declimateplan.org.

And let's move on to the meat and potatoes of the presentation. We have prepared a short video of the causes of impacts of sea level rise. Give me one second and I'm going to switch over to that video for you.

Give me one moment. It looks like I have something -- let me stop that share. I apologize for that. One second.

[\[Impacts of Sea Level Rise Video\]](#)

VIDEO TRANSCRIPT

>> Climate change has far reaching impacts on the State of Delaware and one of the greatest impacts we face is rising sea levels. Delaware has the lowest average elevation of any state and has already experienced over a foot of sea level rise at the Lewes tide gauge since 1900. By 2050, sea levels will rise an additional one to two feet, and by 2100 up to five feet, according to predictions in the sea level rise Technical Report prepared by the Delaware Sea-Level Rise Technical Committee in 2017.

Sea level rise is occurring in Delaware because of subsidence and climate change. Subsidence is the sinking of the land and has occurred since the end of the last ice age when the large glaciers retreated to the poles.

As the global average temperature increases, the oceans become warmer causing them to expand. Additionally, as land ice melts, more water is added to the oceans increasing their overall volume.

While at first glance it may seem that sea level rise will only affect coastal communities, in reality, the impacts are much further reaching. From transportation infrastructure to the economy, all sectors will experience the effects of sea level rise. Most of the water used for drinking and irrigation below the canal comes from groundwater supplies. As sea levels rise, groundwater may be inundated with saltwater, making it unusable for consumption and for use on farm fields.

However, some of the greatest impacts will be on our wastewater and transportation infrastructure. By necessity most wastewater treatment facilities are located along waterways that will experience higher water levels leading to flooding. Raw sewage could be released if these facilities flood. With higher water levels in the rivers, storm sewers may backup causing overflows throughout the system.

Roads and bridges will be affected throughout the state with up to 5% of all roadways becoming inundated. Roadways in Sussex county and along the Route 9 corridor are expected to experience the highest impacts. Damage and loss of roadways will shape both the safety of our citizens and the economy.

The challenges of sea level rise may sound daunting but if we work together now to adapt, we can ensure a safe, livable, and economically vibrant state. Join us throughout the Climate Action Plan process in 2020 to make your voice heard and help strengthen the state's response to sea level rise.

END VIDEO TRANSCRIPT

Slide 15

>> Hey, Maggie, just so you know, you are on mute.

>> Oh, goodness. Always coming back and forth. Thank you for letting me know. I greatly appreciate it.

So, now that we've seen that video, we're going to go through a little bit more of the impacts. As you heard, sea level rise is already occurring in our state and is projected to continue. Before we discuss possible adaptation actions the state could take we're going to dive a little bit deeper into the sector-specific impacts of sea level rise.

Slide 16

The first sector we will discuss is we will see impacts in the agricultural community. According to a University of Delaware study, agriculture adds annually about 8 billion dollars to the Delaware economy, so any disruptions to this sector would have wide-reaching ramifications for the state.

One way sea level rise can impact agriculture is through saltwater intrusion used for irrigation and can result in a loss of available irrigation water, resulting in higher costs to farmers to access useable water.

Another impact is saltwater inundation on agriculture fields and as sea levels rise, may lose land due to flooding and reduces the health soil due to the increase in salt content.

Slide 17

The next sector we're going to discuss is human health. People can be impacted both emotionally and physically from rising sea levels.

Emotional health can be diminished in a variety of ways. Areas that experience frequent nuisance flooding can strain the emotional well-being of a person because of the continual need to replace belongings and repair or adapt homes with the worry eventually the home may become unlivable.

Additionally, for individuals and families that make a decision to move they can lose the sense of community and connection they had with their neighbors and friends. This loss of connection can cause harm to their emotional well-being.

Physical health can also be damage because of risks involved with more frequent nuisance flooding. Flooding of homes and other building can lead to higher rates of mold production than harm the respiratory system.

And coastal areas flooded septic systems may fail and additionally areas with increased nuisance flooding of roads create unsafe driving conditions if individuals decide or have no other option to drive through the flooded roadways.

Slide 18

This brings us to the next sector, infrastructure represented by the roads, bridges, and rail lines of the state, as well as all water control structures.

According to the sea level rise vulnerability assessment, about 5% of all roadways and bridges in the state are located in areas that could be inundated under the high-end of sea level rise projection of around 5 feet. To put this in perspective, that means approximately 484 miles of roads could become in updated under the highest scenario if adaptations are not taken as a result of flooding, erosion of road basins, and river sediment around bridges and piers, and approximately 4% of railway lines are located in areas where they could be impacted sea level rise resulting in long-term flooding, and erosion adaptations are not taken.

Water control structures of concern are dams, dikes and levees that can be found throughout the state and are made of earth and other materials and built to power mills or create agricultural land and today they protect humans and infrastructure in flood-prone areas.

Dams and levees impacted on a daily basis from wind, waves and tides, and other natural forces that can weaken or damage the structure. sea level rise could exacerbate these existing impacts which could hasten their need for repair and replacement.

According to the sea level rise Assessment at the highest sea level rise scenario, up to 78% of these structures could be impacted by sea level rise if adaptations are not undertaken.

Slide 19

The next sector we can be impacted in our state are natural resources.

The typical Delaware beach includes a berm, or beach area, and a dune system and is constantly changing due to wave actions, wind and coastal currents. However, as sea levels rise, shoreline erosion can increase and due to development directly behind the dune line, the dune system is unable to migrate creating a narrow strip of beach between the dune and shoreline and coastal communities may become more susceptible to flooding and impact home and businesses.

Damages to major tourism and attractions would have far reaching damage on the economy. According to a report from the Delaware tourism office in 2018, the tourism industry brings in three point eight billion dollars in gross economic product each year. Loss of the tourism revenue from our beaches would have a direct impact on the state's economy.

Our coastal lands will be impacted by sea level rise, and wetlands. Wetlands are on the boundary between land and water. They provide a variety of benefits including habitat for commercially important species, the removal of sediments and other pollutants from waterways and protection against storm surge and flooding.

According to the sea level rise Assessment, between 97% and 99 % of our coastal tidal wetlands could be lost due to sea level rise if they were unable to migrate landward or accrete, means the buildup of sediments that increases the elevation of the marsh. Wetlands naturally migrate over time to adjust in water level.

However, if there are structures directly behind the wetland areas or sea levels rise too quickly wetlands are unable to keep pace. If these areas are reduced or lost, the benefits they provide will be lost, as well.

Slide 20

The final resource we're going to discuss this evening that can be impacted by sea level rise are fresh water riverine habitats and drinking water intakes.

The Delaware estuary is an example where there is a mixture of freshwater and saltwater. The freshwater comes from our rivers and streams that empty into the Delaware river and the bay.

These rivers and streams are important habitat for recreational and commercial fish species. As sea levels rise, salt levels can rise upriver into the freshwater habitats impacts the types of species present.

Some may be able to move upriver, while others may not due to body design or water infrastructure that block their path and a change in sea levels near an intake pipe, can impact the quality and reliability of fresh water with thousands of residents. If changes to these intake pipe locations or filter is required, the cost may be substantial.

Slide 21

Now that we have covered the causes of sea level rise and what is at risk we will now discuss ideas the state can take to adapt to reduce the impacts of sea level rise.

Slide 22

As Bob mentioned before, we reviewed a variety of resources and spoke with a cross-section of experts to identify possible actions that can be taken to help the state adapt.

This work led us to come up with seven overarching recommendations categories that contain multiple actions. I'm going to go through each of the proposed recommendations and actions with implementation examples. Please note that the implementation examples given here are to demonstrate possible actions might take.

For each recommendation category, there will be a short anonymous poll to gather feedback on which actions you think are the most important for the state to implement. That means there will be a total of seven polls this evening.

If answering polls is not your thing, then feel free to submit questions, comments and feedback about the actions into the Q&A box or at DEclimateplan.org. We will use the feedback you provide to identify come actions are most supported by the public and which actions would need additional review.

Slide 23

The first recommendation category is a state agency should update planning documents and outline agency actions and the management of resources. The actions are not listed in any particular order as we go through them this evening.

The first action is related to updating agency strategic plans to incorporate the impacts to sea level rise into their decision-making process. An example of how this can be implemented is excluding information on how our state will prepare historically and significant structures to reduce damage or loss from sea level rise.

The second action is the incorporation of sea level rise impact considerations and natural resource and agricultural management and restoration plans. The goal of this action is to ensure our state's natural and agricultural resources are managed and restored in ways and ensured to continue to thrive for future generations. An example of this is identifying and incorporation adaptation actions that can be taken for saltwater inundation in the death of trees and harm the tree and cause its death.

The third action is updating and creating asset management plans that outline long-term goals and decision milestones of when to maintain an asset and the cost of upkeep outweigh the benefits of keeping it, and can include coastal elements and build structures. An example would be a plan that identifies when to stop maintaining a public trail in an area that is consistently flooded. Making these plans and decision points now will help save the money -- sorry, save the state money and focus budgets on investing in longer-lasting improvements.

The final action in this category is to update our emergency response and hazard mitigation plans to incorporate the impacts of sea level rise on current plans. An example would be to reevaluate evacuation routes in the state to identify if some roads are no longer safely accessible during storm events because of the effects of the storm on top of already higher sea levels.

Slide 24

Now that you know a little bit about the recommendation, we're going to launch our first poll. Once I launch the poll, a small pop up box is going to appear on your screen just as it did earlier.

You can make the box larger for the longer statements by pulling it to the side to make it larger area. However, it will not make the font any larger, which I apologize for. If you have any trouble, send a message to the chat box and someone can provide you with assistance.

Okay based on the list of actions and recommendation category, please choose all actions you think are the most important for the state to implement. And I will launch that poll. And I'll leave the poll open for about a minute to give everyone ample time to respond.

Okay. We see some good amount of votes coming in. We'll leave it open for just a little bit longer. If seems the responses are slowing down, so if you weren't able to add in your input, please feel free to add it into the Q&A box so we can have it.

[POLL]

I'm going to go ahead end the poll and it looks like we have 84% support the natural resource and agriculture and management restoration plans and there is also a pretty decent amount of support in the management plans for long-term maintenance repair and decisions as well as updating emergency response and hazard mitigation plans. So thank you-all for your great feedback.

Slide 25

So our next recommendation category is updating change some of the state's current regulations or policies to incorporate updated data and resource vulnerabilities. Again, please note that the implementation examples given here are just to demonstrate potential actions agencies might take.

The first action is to update current agency policy and guidelines to incorporate the impacts of sea level rise. An example would be updating the management plan requirements of chemical waste generators to include how the entity will react and prepare for sea level rise at their site. This could help reduce the possibility of an accidental release of contaminants into the water and soil.

The next is to explore and evaluate ways the air quality permitting and regulatory process can be updated to include impacts of sea level rise and an example is reviewing sea level rise projections at a specific site approving a new air quality permit, ensuring a new structure is not built at risk to sea level rise.

The next potential action is to review the state's Coastal Zone Act regulatory process to ensure all CZA permitted activities in the coastal zone include sea level rise considerations. The recent coastal zone Coastal Zone Conversion Permit Act made sea level rise and coastal storm plans a requirement for post alternative industry uses at existing sites However, this plan is not required for current, but new permitted facilities under a standard CZA permit. This potential action would help ensure the safety of those who live and work close to these areas, but also increase the financial stability and resilience of the business.

The next action is to develop a comprehensive wetland regulatory plan that helps protect and restore wetland habitats. As I mentioned, wetlands are likely to be severely impacted by sea level rise and when they are impacted and lost, the services they provider lost along with them.

An example action is to update the wetland maps to incorporate potential wetland migratory areas by identifying and protects areas where they can migrate inland while alerting landowners about the possibility of needlessly spending money to develop an area that may not be accessible to them in the future due to sea level rise.

The final action in this category is to review and update shoreline regulations to reduce the risk to coastal properties and human safety. An example would be reviewing the current building set back line on the coast to ensure it is located was most effective in protecting both habitat and coastal structures. By reviewing and updating the line, if necessary, the risk of damage to property and human life is diminished, which not only saves money for the property owner, but also to the state.

Slide 26

Those are all the actions for the recommendation, and now that you know a little bit more about them, we're going to launch our next poll. So, again, I'm going to launch it and please choose all actions you think are the most important for the state to implement, or if you do not believe any of them are, you can choose no further action needed at this time.

Okay. We have some answers coming in. We'll leave it open for just a little bit longer so that everyone gets a chance. I'll leave it for just a little bit more as the answers continue to trickle in a little bit. Okay. It seems the answers have stopped coming in. We'll go ahead and end the poll.

[POLL]

So it looks like there is about 93% of everyone on the call this evening supports the development of a comprehensive regulatory plan to protect and restore wetlands. There is also some support on changing the CZA regulation process, as well as reviewing and updating shoreline regulations to reduce risk to coastal properties. So thank you-all for that.

Before we move to the next one, I just want to do a quick reminder, that any comments or questions should be submitted via the Q&A box and the chat box is for any technical support issues. So just a good little housekeeping reminder.

Slide 27

Our next recommendation is to support monitoring and research of the impacts of climate change and adaptation actions and can be used to help guide decisions to ensure state resources are managed as efficiently as possible.

The first action is to increase the number -- let me pop that up. Sorry about that. The first is to increase the number of adaptation pilot studies to test adaptation practices for large scale implementation for the installation of living shorelines to protect against erosion and provide habitat to species and may be more resilience to sea level rise and produce water energy and weakened test of suitability by property owners as an alternate measure to protect against sea level rise.

The next action is to continue and expand research, monitoring and modeling of our natural resources. This is an important piece, because the results can be applied to make fiscally responsible decisions that ensure the protection of our natural resources and the services they provide they provide to residents and an example cell to continue studies on studies on side studies on sediment se sediment secretion to our wetland marshes to survive and protect its sea level scenarios. By studying the rates of via secretion, we can identify areas that may need restoration to help preserve the valuable services they provide.

Our next action is to continue and expand research on the impacts of sea level rise to infrastructure and facilities. By understanding the impacts, adaptation actions can be taken now, as well as creating plans on how adaptation can occur in the future. An example is to study how sea level rise may damage drainage systems and short of adapt adaptation resources and measures can be provided to prepare can be provided to prepare them for sea level rise. By being proactive now, some costs can be avoided in the future.

The next action is to review current research and monitoring methodologies. Sea level rise how environmental scientists are able to collect data may be to ensure human sure human safety. For example, if marsh stability requires no water on the surface, researchers may need to adjust methods or planning protocols to ensure all data collected are an accurate representation of current conditions.

The next action on this category is to continue and expand the impacts of climate change in sea level rise on human health and the cost of healthcare. As I mentioned, before, both the physical and emotional health of our residents can be impacted by sea level rise. To be able to -- I am sorry -- to be most effectively address these impacts, additional researches need to be conducted. For example, conducting and whether conducting a health impact assessment to discuss the health consequences of sea of sea level rise to help healthcare providers be proactive in their response.

The final action in this recommendation is create and maintain a water resource database for use in planning and permitting decisions. By having one comprehensive database to use, it could help streamline the permitting and decision-making process saving resources and time. For

example, this database could contain the location and conditions of all water level monitoring sites and wastewater treatment to identify facilities most at risk to sea level rise and to take action now to help them adapt.

Slide 28

So with that, we're going to go ahead into the next poorly into the next poll. Before I launch it I want to do a quick remind are of how we're going to be using your feedback in the planning process. We'll be using to be use it to identify actions are most supported by the public and which need additional review.

As before you can choose all, as many, or as few of you like of the actions that you think are most important for the state to implement. I'm going to go ahead and launch this poll and I've leave it a little bit longer since they're a little bit longer statements for you to for you to read through.

Okay. We're having some good information coming in and working -- still coming in a little bit. It seems to be slowing down closer to the number we've had previously. We'll hold on just a little bit longer. I will also mention I saw a question come in about if the poll results will be available and they will be included in the workshop summary avail I can't summary available in the website so you'll be able to see the results of the anonymous polling.

[POLL]

So it looks like we've had answers stop coming in so I'm going to end the poll and share the results. About 87% of everyone on the call supports the continue of expansion and impact facilities. There is also a good amount of support to continue expanding research monitoring and modeling of our natural resources, as well as developing a water resource database for use and planning and permitting decisions.

Slide 29

So before we start our next recommendation category, I to let you know it has the greatest number of actions, because it is identifying ways that state agencies can provide support to communities and other stakeholders in the state to adapt to sea level rise and climate change. There is going to be good decent amount of them, but hang in there. And also a reminder that the implementation examples I'm going to be giving you are just here to demonstrate potential actions that agencies might take.

The first action in this recommendation is to increase grant opportunities for communities to adapt, as well as update current grant programs to prioritize activities that actively consider the impacts of climate change in sea level rise in the plan. An example could be creating a grant program specifically for our front line on environmental justice communities to help them adapt. These communities are often experience some of the worst impacts of climate of climate change in sea level rise but have the least amount of resources to adapt. When adapting to sea level rise, it is important, but all actions identify ways to increase equity for adaptation in our state.

Follow along in the same path, our next action is to support programs and initiatives that help our front line communities adapt. I know this sounds similar to the previous example, this one is more focused on connecting and supporting the communities to learn about and use existing available resources. This action is all about building relationships and identifying opportunities for equitable adaptation.

Our next action is to provide outreach, training, and tools to the public and government agencies to increase their understanding of the impacts of climate change and best practices of adaptation. Currently, there are a variety of organizations and resources available related to this action. Certainly this is much more continuing to continuing to do the work and expanding opportunities when able. An example is incorporating sea level rise information into homeowner ship counseling and other communications. Making this information readily available will help home buys home buyers make informed decisions when purchasing a home.

Our next action is specifically looking at ways to help vibrant agriculture community and industry adapt to climate change and sea level rise. An example of this is to incorporate information about near-term sea level rise projections in communication materials and possible actions agricultural producers can take to adapt. By providing the information and having the conversations with our agriculture community, we can work together to identify ways to ensure the industry remains a strong part of the Delaware economy.

Similar to the last action, we also want to provide outreach and tools to both our large corporate-level businesses and our small local businesses that are integral to our state's character and economy. An example of this could be encouraging new businesses or current businesses looking to expand to build in areas that are more resilience to climate change and sea level rise. By helping business owners choose locations that have -- I'm sorry locations with less risk to sea level rise and can reduce costs and protect them from future damage.

The next action is to assist local governments with updating and implementing of the ordinances and planning documents. Many municipalities have a small staff that may not have the time or technical knowledge to make the updates. One example of the support that could be provided is drafting model ordinances or plans that can then be reviewed by local leadership and adjusted to adjusted to meet their specific needs. By doing the initial legwork and research in

updates to ordinances reduces burden on limited staff to focus efforts on implementing adaptation adaptations and other community issues.

Similar to the last action, this one is providing support and assistance to local governments and water suppliers to identify vulnerabilities and adapt adaptation actions. As I mentioned, sea level rise can impact water drinking resources, water for irrigation and wastewater treatment plans which are vital to the residents and our economy. An example is working with water suppliers who rely on service water to identify areas of future concern and creating a plan now of how and when to make adjustments. By identifying problems now and being proactive, it may save money to both supplier and the consumer.

The final action in this recommendation is to support the insurance industry to adapt to climate change. At the national level, the insurance industry has started conversations on our climate change and sea level rise may impact how they do business. An example of what can be done here in Delaware is to support these conversations and encourage insurance providers to develop new technologies, practices, and business models that are responsive to the emerging risk. By working with the industry and encouraging possible changes it can protect consumers directly in limiting risks and ensuring the cost of insurance remains accessible to all of our residents.

Slide 30

Thank you for hanging in there with me. I know it was a big recommendation category with a variety of action. Upside is that was our largest category and the next three have a few -- couple fewer actions, so we've gotten through the hard part of the evening.

So as before we're going to do a -- I'm going to launch the poll the poll so that you can choose which actions you think are most important for the state to implement. As this has much -- kind of longer statements, I'm going to leave it open for just a little bit longer, so everyone has a chance to read through everything that is here. Again if you need to spread it out, you can pull the sides of the poll box to make it a little bit larger. I'm going to go ahead and launch little bit longer, so everyone has a chance to read through everything that is here.

We have a variety of answers coming in now. now. Okay. I can see the answers are starting to slow down. I'll leave it open for just a little bit longer since there are so many possible actions to read through. Okay. And it looks like we have the same amount as the other questions. I'm going to go ahead and close it. If you didn't get a chance to add your feedback, feel free to add a comment into the Q&A box for us.

[POLL]

So I'm looking at the results. I see there is about 79 % of our support of assisting local governments and water supplier suppliers to identify vulnerabilities and adapt now. We have about 72% of -- oops. We have about 72 % of support for programs and initiatives that help our front line communities adapt, as well as kind of spread out, the same amount for outreach and tools to the public and government agencies. Agriculture community. And it looks like pretty well -- a lot of these actions are something that are supported by those of you on the call tonight.

So I'll go ahead and stop that and with that poll, we are at our halfway mark and only have three more polls to go. We've made it three four. Just three more. So if you need a little time to stretch or move around, grab a drink, now's the time, because wear on the downward slope.

Slide 31

Our next recommendation, although similar to the last one focuses on outreach in providing education to the public and stakeholders and the impacts of climate change and possible adaptation actions. Again, these examples given here are just potential actions to demonstrate some activities that agencies may take.

The first action is to produce communication tools and materials in English, as well as alternate languages. The United States Census Bureau reports that between 2014 and 2018, 13% of Delaware's population spoke a language other than English when at home. This shows a need that when agencies are producing communication resources about the impacts to sea level rise and climate change there is a need to provide languages other than English to ensure all residents of our state are reached and have the information they need to adapt to sea level rise.

The next action is to tailor communication for specific targeted audiences based on the projected audiences that may impact them. An impact would be to create communication products specifically for residents that are most vulnerable to health impacts from sea level rise through tailoring messages and resources ensures the right information is given to the residents who need it most.

The final action in this recommendation is to increase opportunities for consumers to understand their risks and how insurance can help prepare -- help them prepare and recover as I stated earlier, sea level rise can possibly increase risk to residents, so providing information to residents is important to help choose the insurance that is best for them. An example is by adding sea level rise impacts to the department of Delaware flood insurance web page, by updating the web page consumers can access information that can inform their insurance decisions from one place instead of needing to view multiple web pages.

Slide 32

As before we're going to let you know a little bit more. We're going to launch the poll. Again, you're going to be choosing from the list of actions, all that you think are most important for the state to implement. So we'll go to -- and there we go. Okay.

[POLL]

We're having some good information coming in right now. Answers are slowing down just a little bit, so we'll give everyone an opportunity to respond. Okay. So we're going to end the polling. It looks like the support is pretty well spread out between all three of the actions. Just a little bit more on creating targeted communication resources. So it's pretty well supported throughout.

So before we go on to the next one, I just want to do a quick reminder any comments or questions should be you should be you should be submitted via Q&A box and the chat box is for any technical support issues, that way we can keep things a little bit more organized and make our Q&A session a little bit more efficient.

Slide 33

Our next recommendation category concerns updating facility infrastructure design and management plans to account for future climate and sea level rise impacts. Although this recommendation has only two general actions, it is because these actions can encompass a variety of implementation strategies and opportunity for state agencies to take to prepare for facilities and infrastructure.

The first action is to prepare state facilities and equipment for climate change impacts to sea level rise. As I mentioned, just now this can be a broad action that could be implemented in a variety of ways. Some examples include incorporating sea level rise projections and deciding decisions of new state buildings, updating phone lines, to promote state offices to ensure sure good network connective connectivity and working to identify future possible access issues to facility facilities. The incorporation of these types of considerations can save money and reduce interruptions in state services.

The second action is update facility construction guides and manuals to account for climate change impacts in sea level rise. By updating design guides and manuals now, it can help protect buildings in the future from sea level from sea level rise, which could result in less damage to the buildings, saving the state money on repairs.

Slide 34

So as I mentioned, this recommendation category has the new specific actions, however it is an important recommendation to consider. So I'm going to go ahead and just as we have before we're going to have a poll to see which actions you think are most important to implement, or if no action is needed at this time.

[POLL]

Okay. Answers are starting to slow down so we'll keep it open for just a little bit longer so everyone has an opportunity. Okay. And it looks like we're almost to the amount that have been responding this evening.

So I'm going to go ahead and end the poll and it looks like there is support for both of the actions that they've both equally -- soon to be equally as important that we consider as we move forward with this plan.

Slide 35

So we will go on to our -- we officially reached our final recommendation reviewing and editing current administrative action actions by state agencies. Again, just please just please note that the implementation examples are to demonstrate potential actions agencies might take.

The first action is to increase state agency capacity to support adapt adaptation to climate change and sea level rise through fund shall through funding, staffing, and training. Many of the adaptation actions may need additional resources as the current available resources may not be enough to implement some of the possible actions. Thus, identifying new resource opportunities will be important piece to maximize resilience in Delaware.

And the final action is to climate change with adaptation leaders in the state and region and while our state may be small, provides close collaboration with communities and the state's agencies and through our and through our work we can provide valuable work to other states in the region and help regional and national resilience for business businesses, residents, and intra~ and infrastructures.

Slide 36

So we have reached our final poll of the evening. We just want to briefly remind you we'll be using the feedback you provide us in the polls committee comments polls and the comments to identify which actions are most supported by the public and which actions will need additional review.

We'll launch our final poll. And here we go. Okay. It's starting to slow down. It seems to be the number of votes we've been getting this evening. I'll leave it open for just a little bit longer. Okay. So it looks like we've had everyone chime in. We're going to end the poll.

[POLL]

And again, there is a little bit of no action needed at this time. However, there is a good amount of support to make us climate change adaptation leaders, as well as identify ways to increase agency capacity. So, we'll go ahead and stop that.

And I want to thank you -all for participating and providing your valuable feedback to help shape how Delaware will maximize its resilience to sea level rise. I'm going to hand you back over to Ian who will lead you in your next activity.

Slide 37

>> Thanks, Maggie. So as you just heard we have identified a number of possible actions that state agencies can take to help Delaware maximize resilience to sea level rise, but we also acknowledge that we may have missed something that you believe should have been included.

Unfortunately, due to the large turnout of people to this to this virtual work hope virtual workshop tonight we won't be able to host a live discussion between participants and the DENREC team, but we still want to hear your ideas so we are going to open up the Q&A box together your ideas for ideas for additional actions to maximize resilience to sea level rise and I know a number of you have already submitted some ideas and comments, which is great, but we wanted to give space for others who may have been processing all the information as Maggie was going through it, to also provide that type of feedback.

Just as a reminder, that in order to create a safe and positive to safe and positive experience for all workshop participant participants we'll not tolerate any offensive or inappropriate language or hate speech so if any such language is used it will be delete the immediately and will be removed from the workshop and unable to return. Now we have established those ground rules, the Q&A box is open and waiting for your ideas.

We will spend the next five minutes collecting your ideas for maximizing for Maximizing Resilience to sea level rise and while you -all brainstorm these ideas we're going to play a little background music to get the creative juices flowing. I'll check back in with you in just a few minutes.

[Music]

You'll hear the music slowing down, but you still have another two and a half minutes to give your ideas on how to maximize resilience to sea level rise, so keep those ideas coming in and I'll check back in just a little bit.

[Music]

We're coming down to our final minute so if you have any last-minute ideas, please put them in to the Q&A All right.

[Music]

Thank you-all for providing all of that great feedback and ideas into our Q&A box. We look forward to reviewing your ideas in greater detail after the workshop. If you are still typing up your ideas, don't worry, feel free to keep submitting them to the Q and A box and we'll take a look at them after the workshop.

Slide 38

So we are going to enter into the enter the question and answer workshop, where our presenters will answer as many questions as they can that were submitted.

As I mentioned, we may not be able to get to all the questions, but we'll go ahead and start answering them now.

So Bob, let me go ahead and start with you. There is some questions that asked about what studies do we as the state rely upon, in projecting future magnitude of sea level rise?

>> Yes, Ian. Back in when we did the first sea level rise impact study we had a technical group that was formed that looked at all the data models and came up projections for the advisory committee to use. One of the outcomes of the advisory committee is the state should periodically update these values, so in 2017, we contacted with the Delaware survey to form a new technical advisory committee, and to look at the current models and data and they came up with a slightly different approach than what we used before and looked at competency at competence levels for sea level rise over the next years.

And one was 5 % that would reach that level or above. The values actually came out very close to our original values, so for the 95% and the 2100 it was 1.71 feet or 0.25 meters. The intermediate was .99 meters or 3.25 feet, and it was 5.02 feet, so that's where that number came in.

One of the of the questions was have we considered the greater ice melt that we're seeing lately in the Antarctic, and I said that was done in 2017, so whatever data was out then, we will update this probably around the 2022, apply to see what extra data is out there, and get better results

that we can use in our projections in the future. Great, this probably around the 2022 , apply to see what extra data is out there, and get better results that we can use in our projections in the future.

>>Great, thanks, Bob. Maggie, someone asked a question about mentioning they were concerned about allowing development in flood-prone areas. Is this something that the state has decision-making -making power over, or is -- how -- what can people do if they're concerned about allowing development in flood-prone areas?

>> That's an excellent question, Ian. This is a plan for what state agencies can do, so Delaware is a home rule state, which means decisions on development, and zoning and ordinances are made at the local, and county level, and that's where the work will need to go in and one of the actions is to really support those local municipalities and updates and changes to ensure that building, you know, is not put in to flood prone areas that could be impacted.

>> Thank you, Maggie. Another question came in saying many people think sea level rise only impacts people along the coast, but many of areas of Delaware contain title water bodies that will be affected by sea level rise. How will we as the state or what other some opportunities are educating everyone on the state of the widespread effects of sea level rise?

>>So although I didn't include it tonight as one of the exemplified actions, another example that we could do is to create a comprehensive outreach strategy about sea level rise for all state agencies to implement so that could be a possibility. There is also opportunities to increase and include information about sea level rise in educational programs for students. So there is a variety of methods, but it's one of those that's going to be a consistent, working together to get the information out.

> > One last question we have time for and I think Bob may be the most appropriate person to ask this question to. Has the state done any studies on how many of our roadways or other infrastructure will be impacted by sea level rise?

>> Yes. Back in our sea level rise advisory committee, the coastal programs did an in depth study of all state infrastructure land uses, vulnerable populations, and whatever. We do have that available, I think probably available on the Delaware climate plan website. If not we can get it there, but it's a vulnerability assessment sea level rise which we use for that study which were a meter and a half. I think the question was specifically on roads and I think at the high level, it was somewhere around 5% of the roads in Delaware would be impacted by sea level rise.

>> Perfect. Thank you so much, Bob.

>> There was a couple other questions I'll touch on, because they're very short.

>> Absolutely.

>>Is it one was do we consider drought scenarios? That will be addressed next week in one of those workshops.

And how periodically does the state inspect dams and levees. The Department of Natural Resources does have a dam safety program, which does inspections along with the Department of Transportation. Many of the dams also are roadways, so the two programs kind of split their duties on that, mostly handling the ones that service roadways, too. But they are inspected periodically.

>> Perfect. Thank you, Bob. Unfortunately, we are at time. We can't ask any more questions live right now, but we will be consolidating and answering all questions from this evening in a single document on our website DEclimateplan.org. You can expect that document to be up on our website by Friday, October 16th.

So, if we didn't get to your question tonight, don't worry, we will be sure that we are capturing your question and answering whatever questions that we are able to do. So, if again, you are still typing up questions in our chat box, go ahead and continue doing so, and we'll be sure to capture that in our document, as document, as well.

Slide 29

So as we wrap up this workshop we have a few final remarks and next steps we wanted to share with you all.

The workshop recording along with a closed captioned transcript will be made available on our website DEclimateplan.org in the coming days. And the question and answer document soon after.

We have two more workshops coming up in our Climate Action Plan virtual workshop series. Next Tuesday, September 29th, we will be looking at possible actions to maximize resilience to increase temperatures. And next Thursday, October 1st, we will have our final workshop where we'll be looking at possible actions to maximize resilience to heavy precipitation and flooding. Both workshops like tonight run from 5:30 to 7 p.m., and registration is required to attend, so if you've got registered go to DEclimateplan.org to do so.

We'll continue to collect feedback through October 16th, and can be provided through our interactive survey and comment form available on our website. For more information on providing feedback through either the survey or the comment form visit our website. I'm going to sound like a broken record here, at DEclimateplan.org.

Finally, carrying out virtual workshop workshops are new for us. We are always looking for ways to improve. Within 24 hours, you'll be receiving a brief question area to ask you how the workshop went and how we can improve.

You can fill out this form for this workshop specifically or fill out the form after you've gone through all the workshop you plan to attend. Either way is fine and we are interested in your feedback. We hope you take the time to complete this form and are actively working on improving workshops and will use feedback we receive in between workshops to improve the remaining workshops in the series.

Slide 40

So thank you so much for joining us this evening, and for providing us with all of your valuable insights and ideas.

Please keep connected with us on our website, by e-mail, and by social media.

Enjoy the rest of your evening and we look to forwarding with you soon. Have a great night, everyone.

END TRANSCRIPT