Screener Block

In what ZIP code do you currently reside?

What is your age?

What best describes you?

- Male
- Female
- Non-binary

Introduction

Dear respondent

I am writing to ask you to participate in a joint study that we are conducting with the University of Miami, Florida International University, and the National Oceanic and Atmospheric Administration (NOAA). We are asking people who live in areas affected by Hurricane Florence to complete this survey.

Your opinions are very important in helping us understand the concerns of people that live in areas vulnerable to hurricanes, and we would really appreciate your help. This is a short questionnaire that should take you no more than 15 minutes to complete.

Your participation in this survey is completely voluntary, and all responses will remain confidential. In accordance to research protocols, we are forbidden from sharing any of your personal information, which includes your name or any type of contact information. We are only allowed to share summary results from this study, and no individual responses will be circulated in any shape or form.

We really appreciate your time and collaboration, and we are looking forward to your input in this matter. It is only through the help of residents like you that we can provide information to NOAA for how they can better improve their current practices regarding the future hurricane forecast.

Sincerely,
David Letson
University of Miami
Rosenstiel School of Marine and Atmospheric Science

We care about the quality of our survey data and hope to receive the most accurate measures of your opinions, so it is important to us that you thoughtfully provide your best answer to each question in the survey.

Do you commit to providing thoughtful and honest answers to the questions in this survey?

- ○ I will provide my best answers
- ○ I will not provide my best answer
- ○ I can't promise either way

Section 0: Living Situation and Insurance Coverage

In this section we are going to ask a series of questions about your living situation and insurance coverage to better understand how people relate to the information provided by hurricane forecasts.

Do you own or rent your home?

- ○ Own
- ○ Rent
- ○ Other

How long have you lived in your current home/address?

☐ _____ Month(s)

☐ Years(s)

Do you have insurance against the potential damages of a hurricane? If so, select the coverage(s) that applies

- ☐ Wind damages
- ☐ Flood damages
- ☐ Homeowners Insurance
- ☐ Renters Insurance
- ☐ Other; please specify
- ☐ No Insurance

When did you first purchase this insurance policy?

When did you first purchase your longest held insurance policy?

What do you think the chances are of your local residence getting hit by another hurricane (i.e., experiencing hurricane force winds) in the **next five years**?

- 1 in 10,000
- 1 in 5,000
- 1 in 1,000
- 1 in 500
- 1 in 100
- 1 in 50
- 1 in 20
- 1 in 10
- 1 in 5
- 1 in 1

What do you think the chances are of your local residence getting hit (i.e., experiencing hurricane force winds) by another hurricane in the **next ten years**?

- 1 in 10,000
- 1 in 5,000
- 1 in 1,000
- 1 in 500

- 1 in 100
- 1 in 50
- 1 in 20
- 1 in 10
- 1 in 5
- 1 in 1

How well informed do you consider yourself about the risk that hurricanes present to your home?

- Not informed
- Very little
- Somewhat informed
- Moderately informed
- Very well informed

How well informed do you consider yourself about FEMA (Federal Emergency Management Agency) flood maps?

- Not informed
- Very little
- Somewhat informed
- Moderately informed

- ○ Very well informed

How well informed do you consider yourself about the National Flood Insurance Program (NFIP)?

- ○ Not informed
- ○ Very little
- ○ Somewhat informed
- ○ Moderately informed
- ○ Very well informed

Section 1. Your experience with a recent hurricane

People can experience hurricanes or tropical storms in a variety of ways. Some endure physical impacts, such as flooding or downed tree limbs, while others may miss time at work evacuating from or preparing for a storm that may not necessarily come their way. We would like to ask you about your experiences with past hurricanes and how they have affected you.

Did you experience Hurricane Florence?

- ○ Yes
- ○ No

Were you told by a government, police or fire official or news broadcast to evacuate your home when Hurricane Florence hit the area where you lived in 2018?

- ○ Yes
- ○ No
- ○ Not sure

Did you evacuate?

- ○ Yes
- ○ No

If you were told, would you have evacuated?

- ○ Yes
- ○ No

Was your home at the time damaged by Hurricane Florence?

- Yes
- No

What were the approximate monetary damages to your home from Hurricane Florence?
(If you do not know the exact number, please make the best guess possible. If you lost your entire house, please state the total approximate value of the structure of the house)

- $0 - $999
- $1,000 - $4,999
- $5,000 - $9,999
- > $10,000
- [ ] Total Loss

Did you have to be out of your home for an extended period of time after Hurricane Florence?

- No

- ○ Yes, for less than a week
- ○ Yes, for between a week and a month
- ○ Yes, for between 1 and 3 months
- ○ Yes, for between 3 and 6 months
- ○ Yes, for between 6 months and 1 year
- ○ Yes, for more than one year

Where did you receive hurricane forecast information from (select all that apply)?

- ☐ The National Hurricane Center
- ☐ The Weather Channel
- ☐ Local TV Station
- ☐ Weather Underground
- ☐ NOAA Radio
- ☐ National Weather Service, Local Weather Forecasting Office
- ☐ Word of mouth
- ☐ I did not receive information
- ☐ Another source; specify: [ ]

Was your evacuation decision influenced by the forecast(s) you heard?

- ○ Yes
- ○ No
- ○ Not sure

Could you rank the following pieces of forecast information in terms of importance for your decision? (1 implying the most important and 5 implying the least important)

	1	2	3	4	5
How strong the winds were forecasted to be	○	○	○	○	○
How high the storm surge was forecasted to be	○	○	○	○	○
The time of the storm's forecasted arrival	○	○	○	○	○
The path on which Florence was forecast to take	○	○	○	○	○
How much rainfall was forecasted in your area	○	○	○	○	○

Does your household have an evacuation plan in case a hurricane hits your neighborhood next year? Such a plan would include household communications, alternative shelter, evacuation route and means, dietary and medical needs, etc.

- Yes
- No
- Don't Know

How many people live together in your household (number of household members)?

How many of these people are dependents requiring adult supervision?

Section 2. Hurricane Forecast Attributes

Hurricanes cause an average of about $21.6 billion in damages to the US economy every year. One part of the effort to reduce these impacts is to properly forecast the storm and its characteristics to allocate mitigation efforts, prescribe evacuation alerts, and mobilize manpower in a

timely manner.

Currently, National Oceanic and Atmospheric Administration (NOAA), a federal agency under the US Department of Commerce is evaluating the reallocation of resources for the National Hurricane Center. These adjustments could have significant impacts on the publicly-funded research associated with hurricanes. These adjustments would be funded by tax revenues collected from US residents for the foreseeable future and NOAA would use the money only to be allocated to the National Hurricane Center.

Given the scope and cost of this project, it is important for us to learn the opinions of residents in your state. Some people might be willing to pay for these measures while others might not. For this reason, we are going to present you with an advisory referendum and ask you to vote “Yes” or “No” on the referendum. This way we will be able to know the percentage in favor and against the proposal at the proposed cost. Voting results from this study are not binding, but instead are advisory in nature. Results will be shared with local authorities and NOAA, and they may or

may not take this information into consideration.

Every hurricane forecast has four main components: i) Track, ii) Wind speed, iii) Storm surge, and iv) Rainfall. If you could rank which one of these components provides the most valuable information for you to make an evacuation decision, which one would you rank first, second, third, and fourth? (1 implying the most valuable and 4 implying the least valuable)

	1	2	3	4
Wind speed	○	○	○	○
Rainfall	○	○	○	○
Track	○	○	○	○
Storm surge	○	○	○	○

Intro

Please consider the advisory referendum below. The expected cost to your household may seem high but

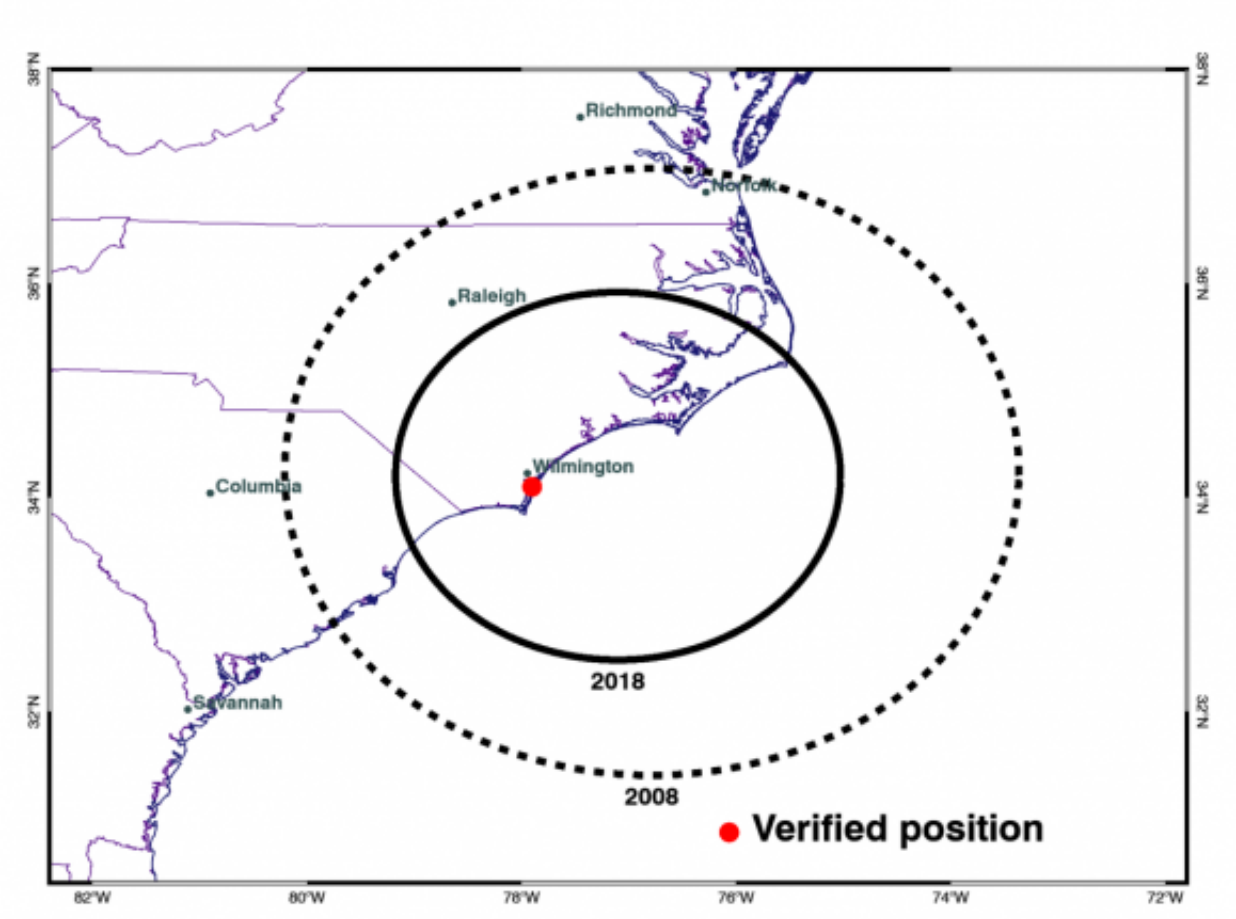
consider that hurricane research is costly, as it has to fund both human and physical capital.

When considering how to vote, please bear in mind that there may be other things that you would rather spend your money on. Think about your monthly budget and how much, if anything, you are willing to pay before casting your vote. Click the box labeled "I vote Yes" if you are in favor of covering the proposed cost; otherwise, vote “I vote No” if you are against.

Section 3. Track forecast: Status Quo

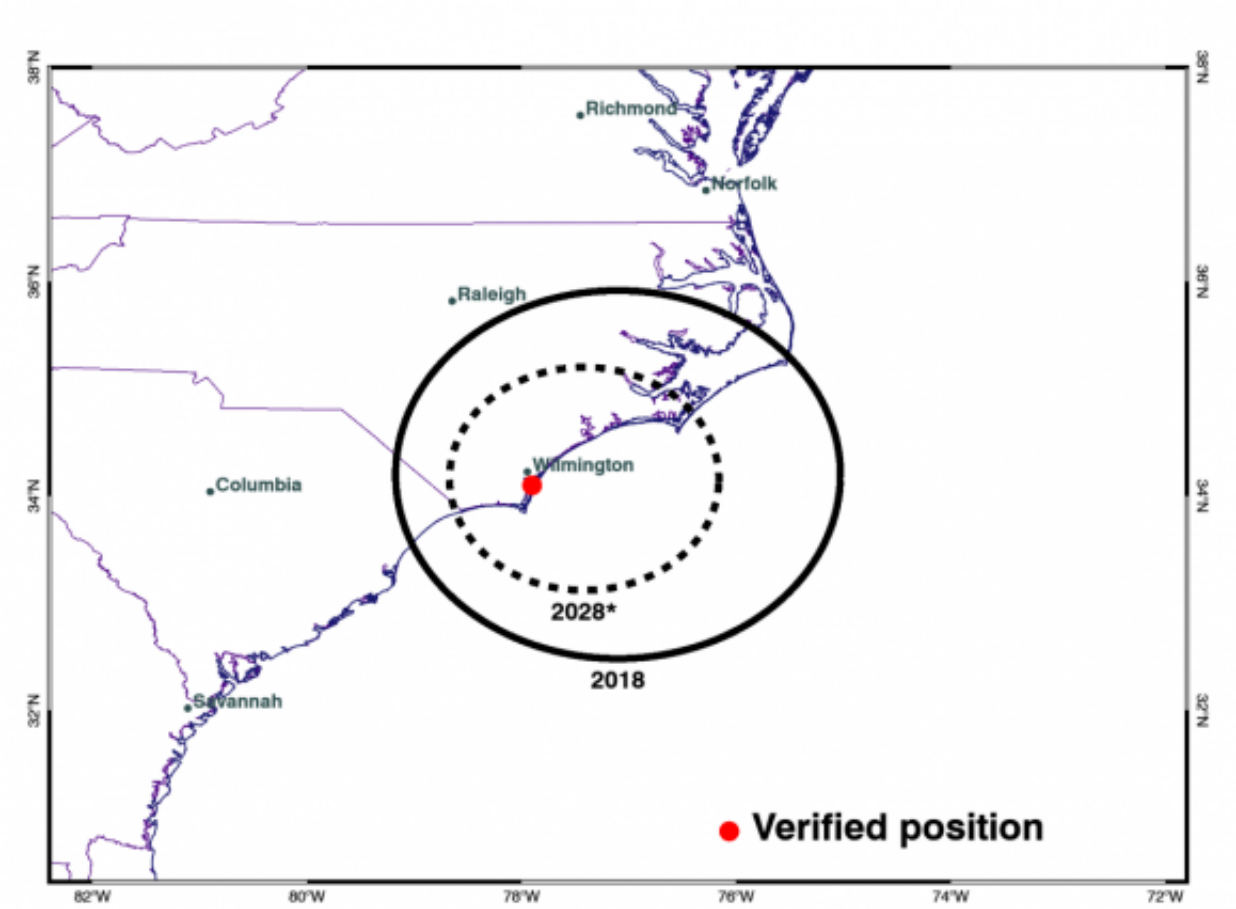
This image describes the progress in hurricane track forecast. Consider Hurricane Florence. The **dotted line** describes what would have been the 72-hour predicted landfall region if we had the same accuracy as in 2008. Over the last decade, forecasts have improved and reduced the track error by about **4.9%** annually, and thus allowed us to narrow down the potential landfall region to the **solid line** circle. The landfall regions are circles because of prediction error: while we say the storm will be

at a specific location in 72 hours (predicted landfall), it is equally likely that the storm will be anywhere else in the circle.



These improvements also mean that the time window for landfall for the 72-hour forecast, using Florence's actual forward speed as a reference, went from about **170 hours** in 2008, to about **103 hours** in 2018. This is equivalent to an improvement of about **40%** in error reduction over ten years.

Proposed changes are expected to reduce the error of track forecast even further. This rate of improvement would mean that the 72-hour predicted landfall for Florence, would look like the figure:



This level of progress means that the time window for landfall for the 72-hour forecast, using Florence's actual forward speed as a reference, would go from about **103 hours** in 2018, to about **62 hours** in 2028. This is equivalent to an improvement of about **40%** in error reduction over the next ten years.

The proposed changes would provide a service to all the U.S. population susceptible to hurricanes, and it will increase the taxes your household currently pays. Knowing that it would cost your household an extra **$${e://Field/Track%20SQ}** each year in additional taxes, how would you vote?

- I vote Yes
- I vote No

If the changes instead cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

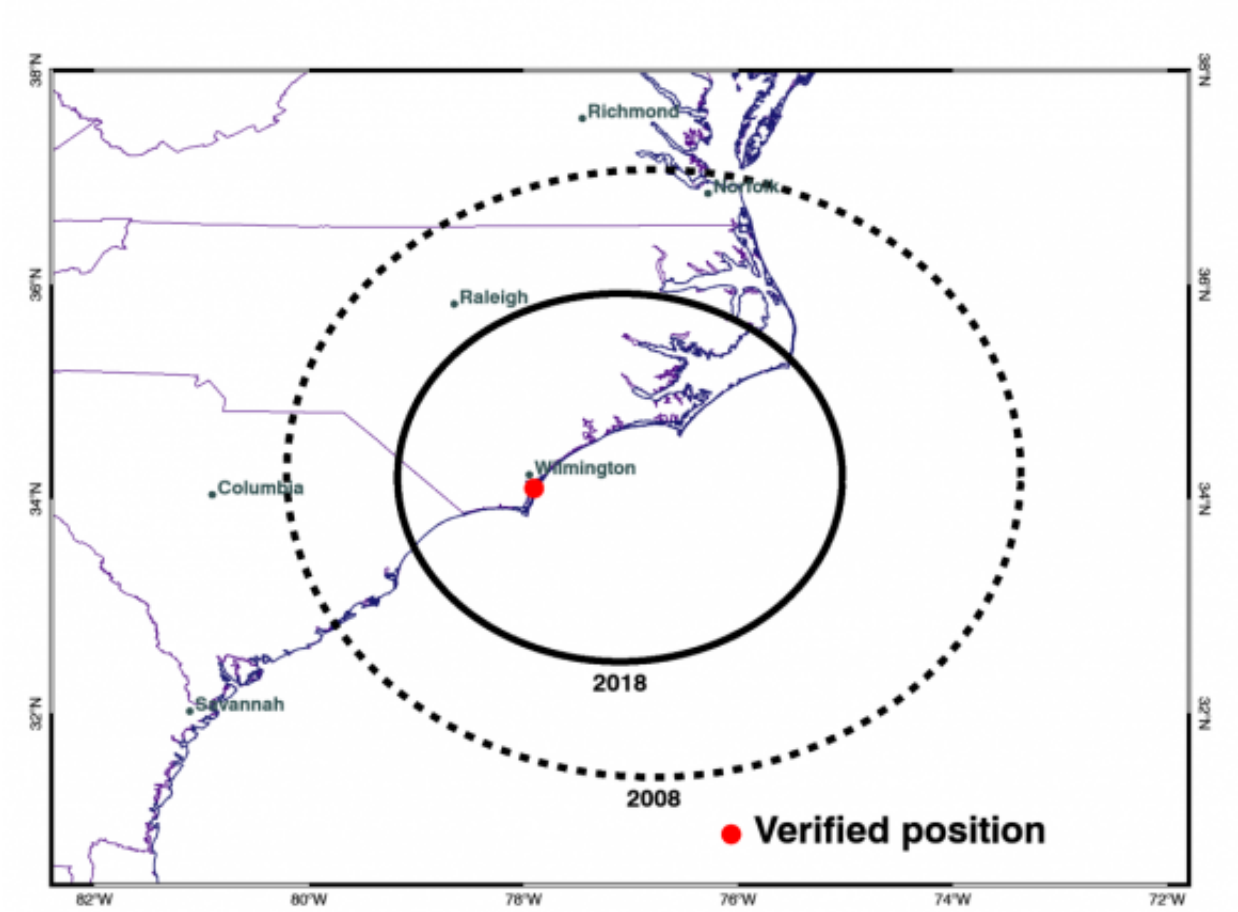
- I vote Yes
- I vote No

If the changes instead cost your household an extra **$ * 0.8 , 0) }** each year in additional taxes, how would you vote?

- ○ I vote Yes
- ○ I vote No

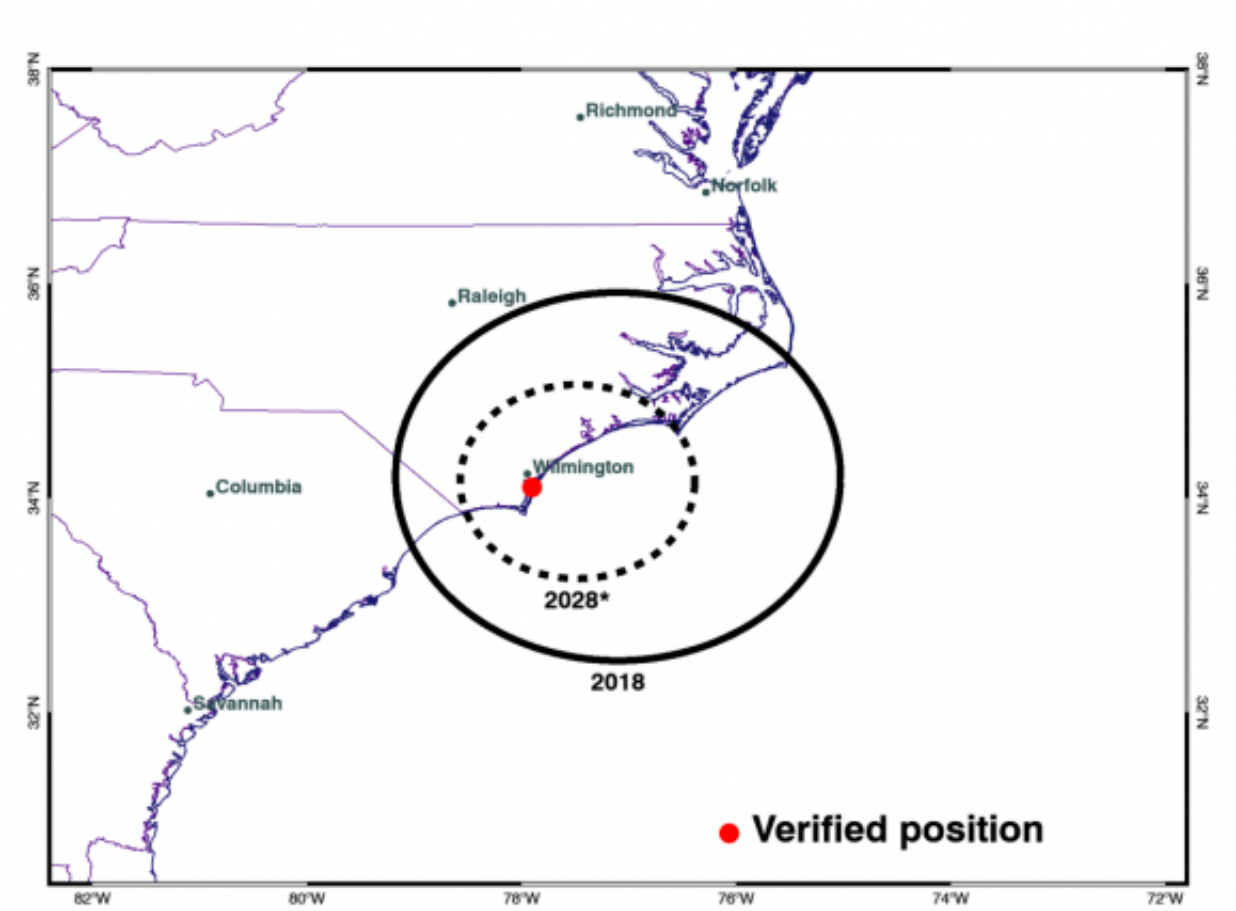
Section 3. Track forecast : +20%

This image describes the progress in hurricane track forecast. Consider Hurricane Florence. The **dashed line** describes what would have been the 72-hour predicted landfall region if we had the same accuracy as in 2008. Over the last decade, forecasts have improved and reduced the track error by about **4.9%** annually, and thus allowed us to narrow down the potential landfall region to the **solid line** circle. The landfall regions are circles because of prediction error: while we say the storm will be at a specific location in 72 hours (predicted landfall), it is equally likely that the storm will be anywhere else in the circle.



These improvements also mean that the time window for landfall for the 72-hour forecast, using Florence's actual forward speed as a reference, went from about **170 hours** in 2008, to about **103 hours** in 2018. This is equivalent to an improvement of about **40%** in error reduction over ten years.

Proposed changes are expected to reduce the error of track forecast even further. This rate of improvement would mean that the 72-hour predicted landfall for Florence, would look like the figure:



This level of progress means that the time window for landfall for the 72-hour forecast, using Florence's actual forward speed as a reference, would go from about **103 hours** in 2018, to about **54 hours** in 2028. This is equivalent to an improvement of about **48%** in error reduction over the next ten years.

The proposed changes would provide a service to all the U.S. population susceptible to hurricanes, and it will increase the taxes your household currently pays. Knowing that it would cost your household an extra **$${e://Field/Track%20p20}** each year in additional taxes, how would you vote?

- I vote Yes
- I vote No

If the program instead would cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

- I vote Yes
- I vote No

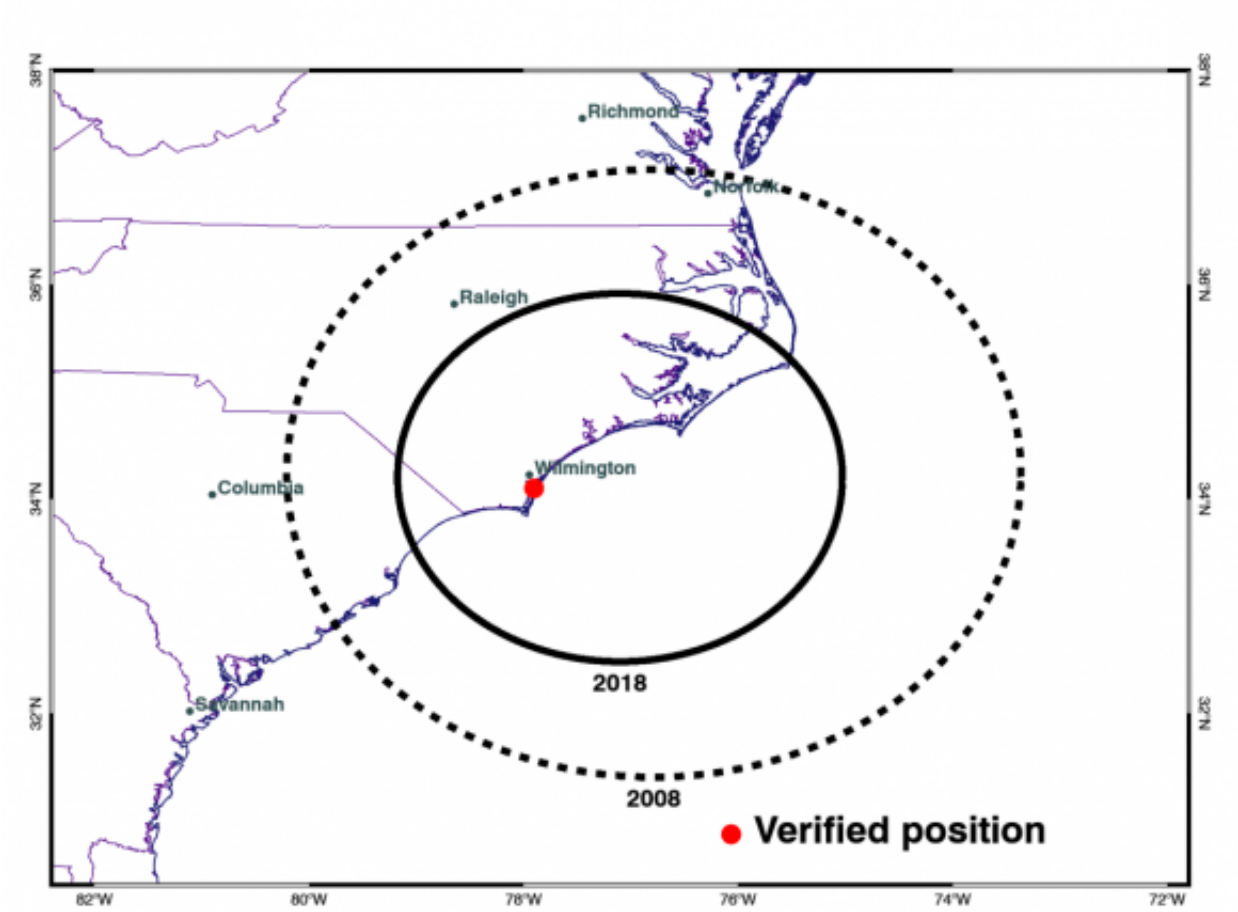
If the program instead would cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

- I vote Yes

○ I vote No

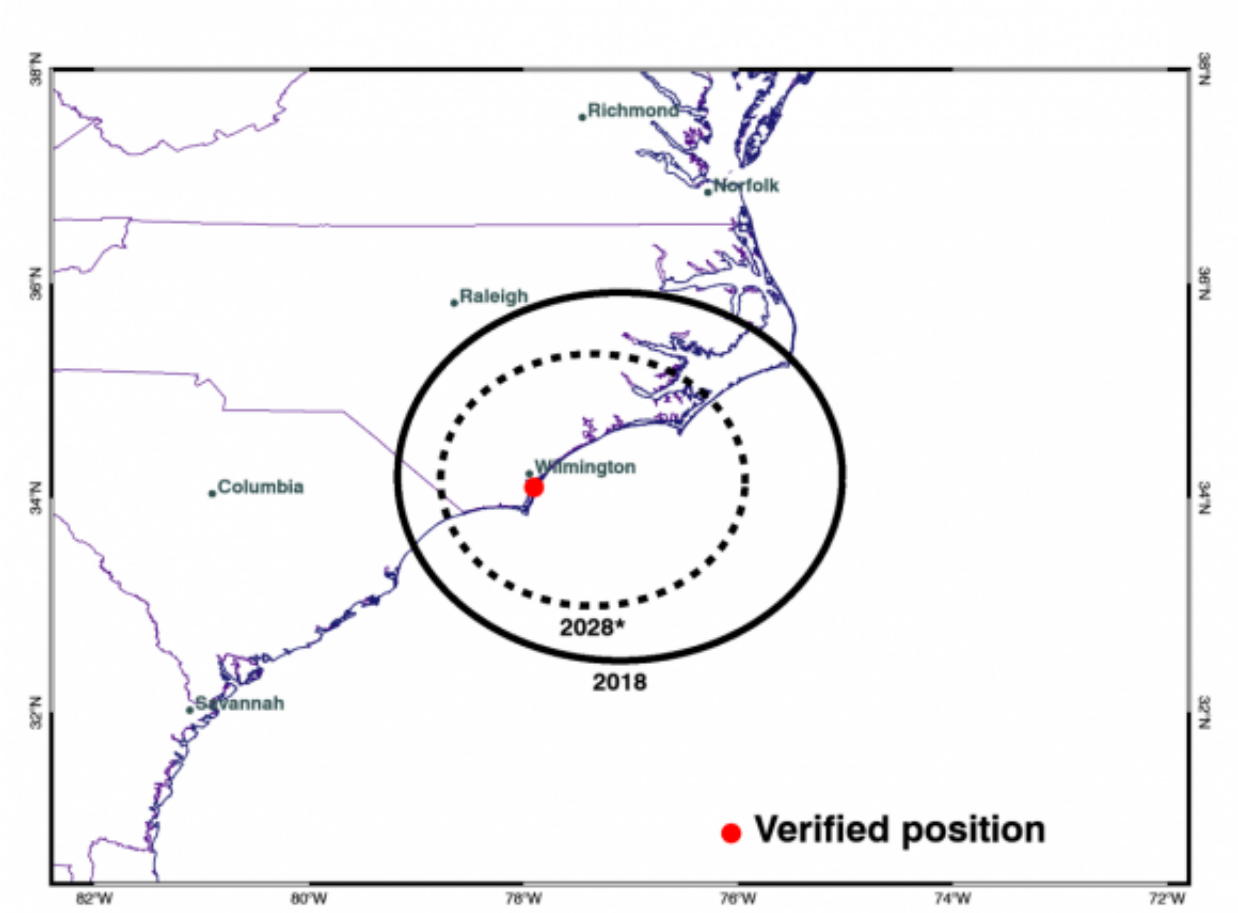
Section 3. Track forecast: -20%

This image describes the progress in hurricane track forecast. Consider Hurricane Florence. The **dashed line** describes what would have been the 72-hour predicted landfall region if we had the same accuracy as in 2008. Over the last decade, forecasts have improved and reduced the track error by about **4.9%** annually, and thus allowed us to narrow down the potential landfall region to the **solid line** circle. The landfall regions are circles because of prediction error: while we say the storm will be at a specific location in 72 hours (predicted landfall), it is equally likely that the storm will be anywhere else in the circle.



These improvements also mean that the time window for landfall for the 72-hour forecast, using Florence's actual forward speed as a reference, went from about **170 hours** in 2008, to about **103 hours** in 2018. This is equivalent to an improvement of about **40%** in error reduction over ten years.

Proposed changes are expected to reduce the error of track forecast even further. This rate of improvement would mean that the 72-hour predicted landfall for Florence, would look like the figure:



This level of progress means that the time window for landfall for the 72-hour forecast, using Florence's actual forward speed as a reference, would go from about 103 hours in 2018, to about 80 hours in 2028. This is equivalent to an improvement of about 32% in error reduction over the next ten years.

The proposed changes would provide a service to all the U.S. population susceptible to hurricanes, and it will increase the taxes your household currently pays. Knowing that it would cost your household an extra **$${e://Field/Track%20m20}** each year in additional taxes, how would you vote?

- I vote Yes
- I vote No

If the program instead would cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

- I vote Yes
- I vote No

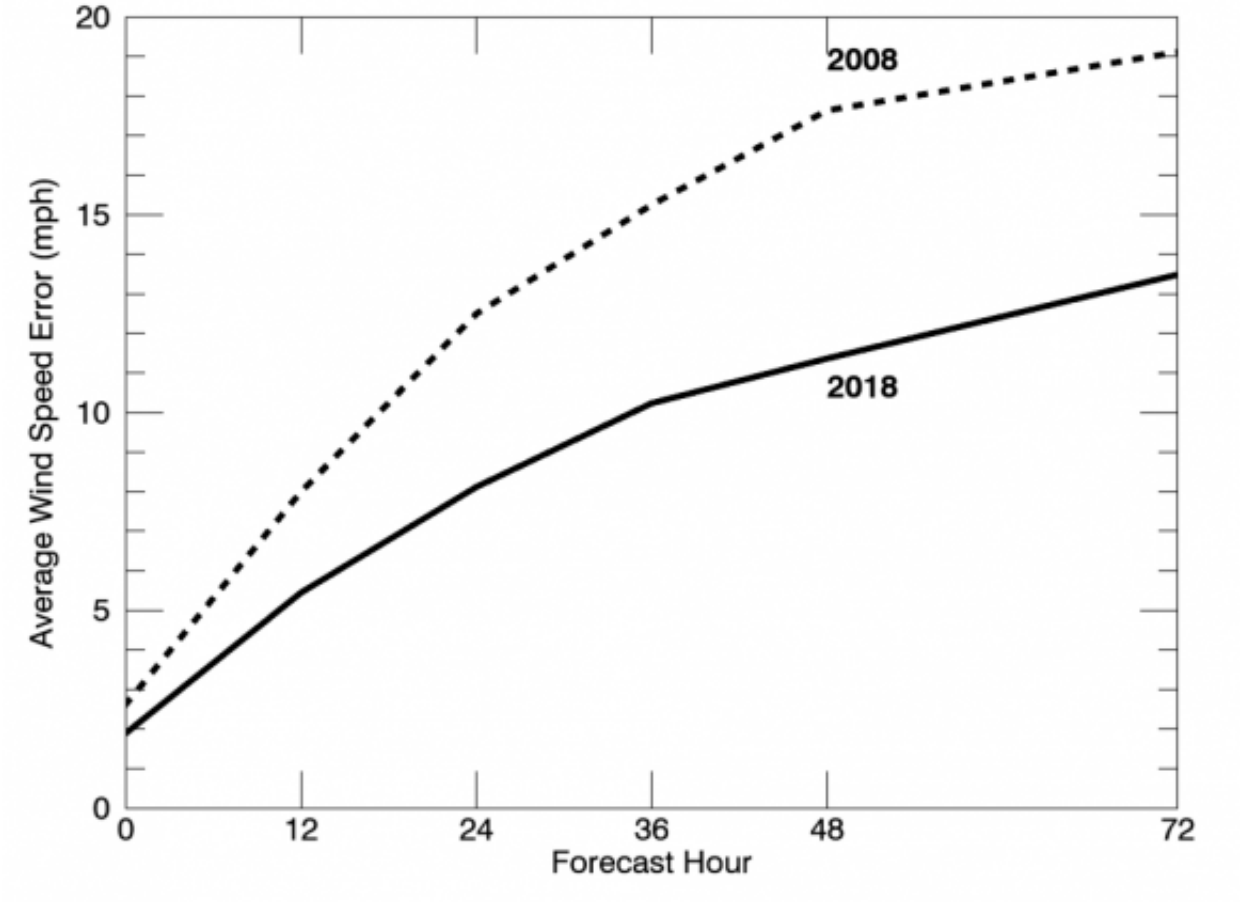
If the program instead would cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

- I vote Yes

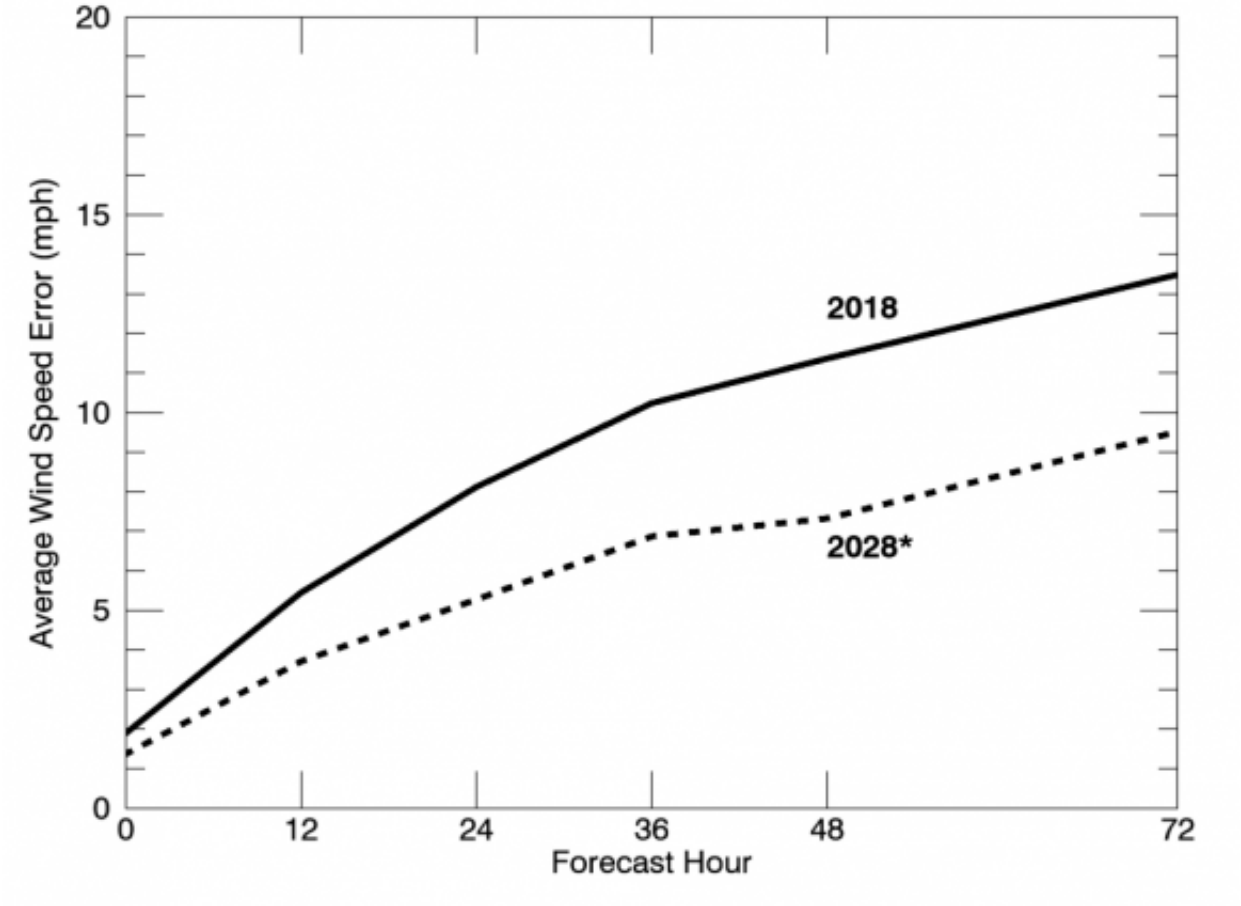
○ I vote No

Section 4. Wind speed forecast: Status Quo

This image describes the progress in error reduction for hurricane wind speed forecast over the last decade for a 72-hour forecast. The X-axis represents how far into the future the forecast predicts wind speed, while the Y-axis shows the average error associated with that prediction. The **dotted line** represents the **accuracy in 2008**, while the **solid line** represents the **accuracy in 2018**. Note that that errors increase because predictions farther into the future are less precise; in other words, they have larger errors. The closer the lines are to zero, the better the forecast.



Proposed changes are expected to reduce the wind speed forecast error even further. This rate of improvement would mean that the 72-hour predicted wind speed would have the following margins of error:



This level of progress means that the error margin for the 72-hour forecast, using Florence as a reference, would go from about **+/- 13 mph** in 2018, to about **+/- 9.5 mph** in 2028. This is equivalent to an improvement of about 29% in error reduction over the next ten years.

The proposed changes would provide a service to all the U.S. population susceptible to hurricanes, and it will increase the taxes your household currently pays.

Knowing that it would cost your household an extra **$${e://Field/Wind%20SQ}** each year in additional taxes, how would you vote?

- I vote Yes
- I vote No

If the changes instead cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

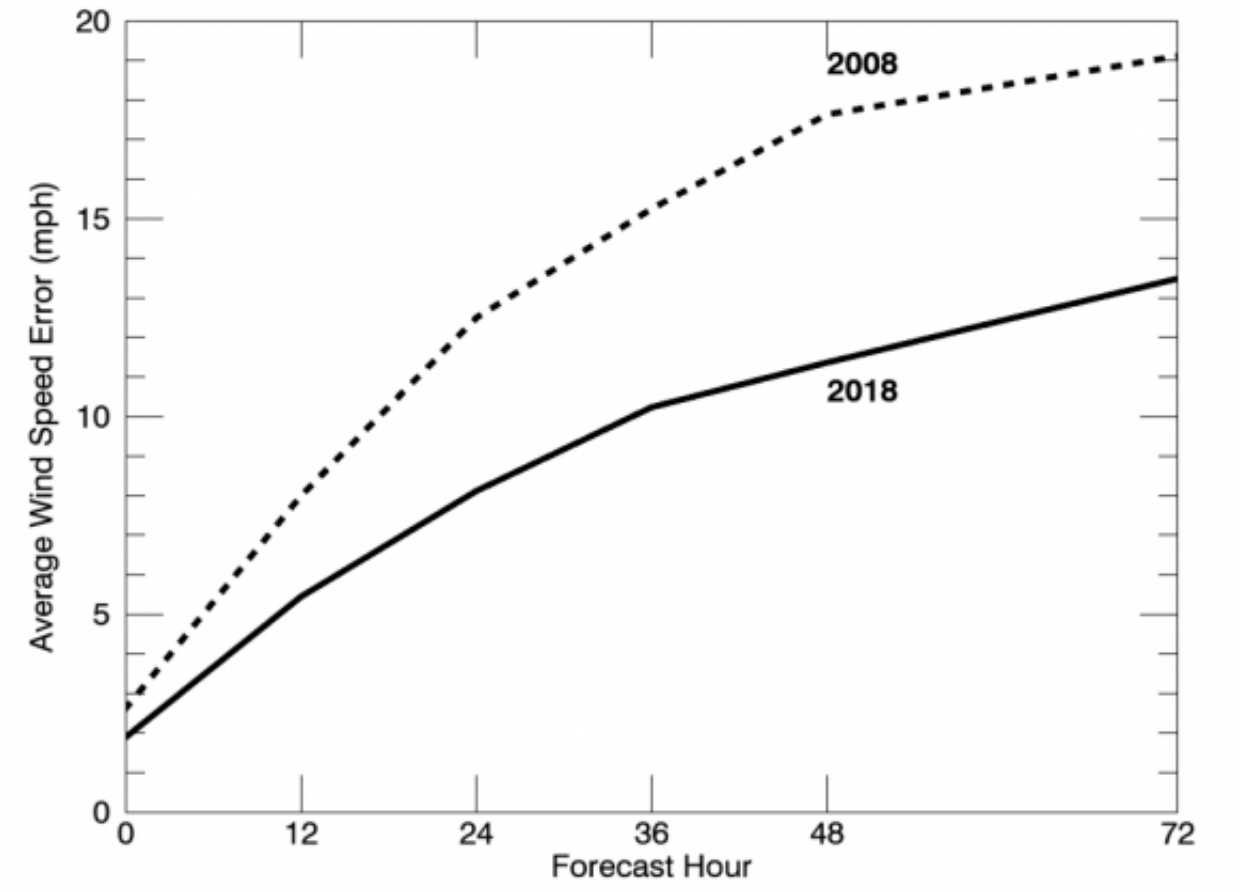
- I vote Yes
- I vote No

If the changes instead cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

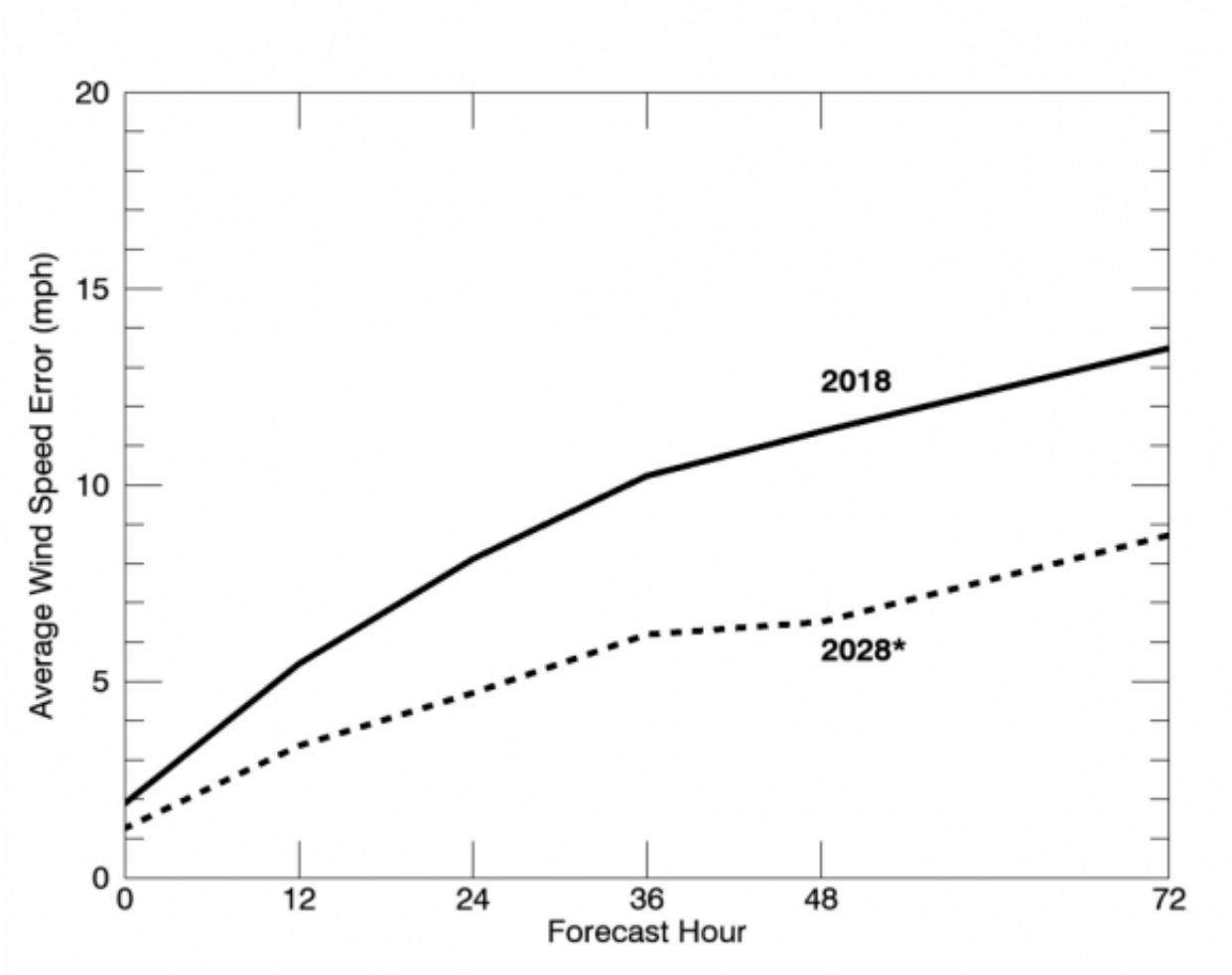
- I vote Yes
- I vote No

Section 4. Wind speed forecast: +20%

This image describes the progress in wind speed forecast error reduction over the last decade for a 72-hour forecast.. The X-axis represents how far into the future the forecast predicts wind speed, while the Y-axis shows the average error associated with that prediction. The **dotted line** represents the **accuracy in 2008**, while the **solid line** represents the **accuracy in 2018**. Note that that errors increase because predictions farther into the future are less precise; in other words, they have larger errors. The closer the lines are to zero, the better the forecast.



Proposed changes are expected to reduce the wind speed forecast error even further. This rate of improvement would mean that the 72-hour predicted wind speed would have the following margins of error:



This level of progress means that the error margin for the 72-hour forecast, using Florence as a reference, would go

from about **+/- 13 mph** in 2018, to about **+/- 8.7 mph** in 2028. This is equivalent to an improvement of about 35% in error reduction over the next ten years.

The proposed changes would provide a service to all the U.S. population susceptible to hurricanes, and it will increase the taxes your household currently pays. Knowing that it would cost your household an extra **$${e://Field/Wind%20p20}** each year in additional taxes, how would you vote?

- I vote Yes
- I vote No

If the changes instead cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

- I vote Yes
- I vote No

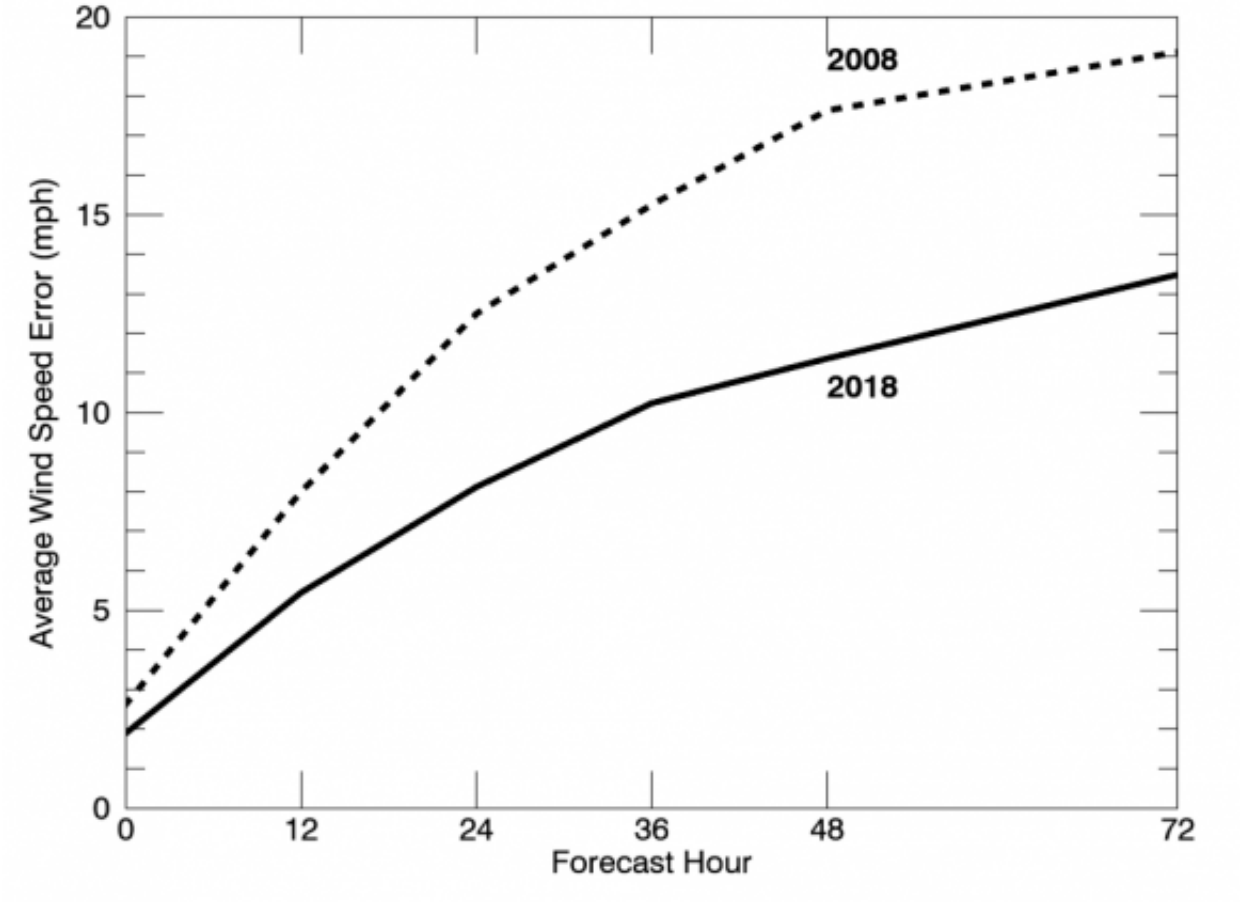
If the changes instead cost your household an extra **${Invalid Expression}** each year in additional taxes, how

would you vote?

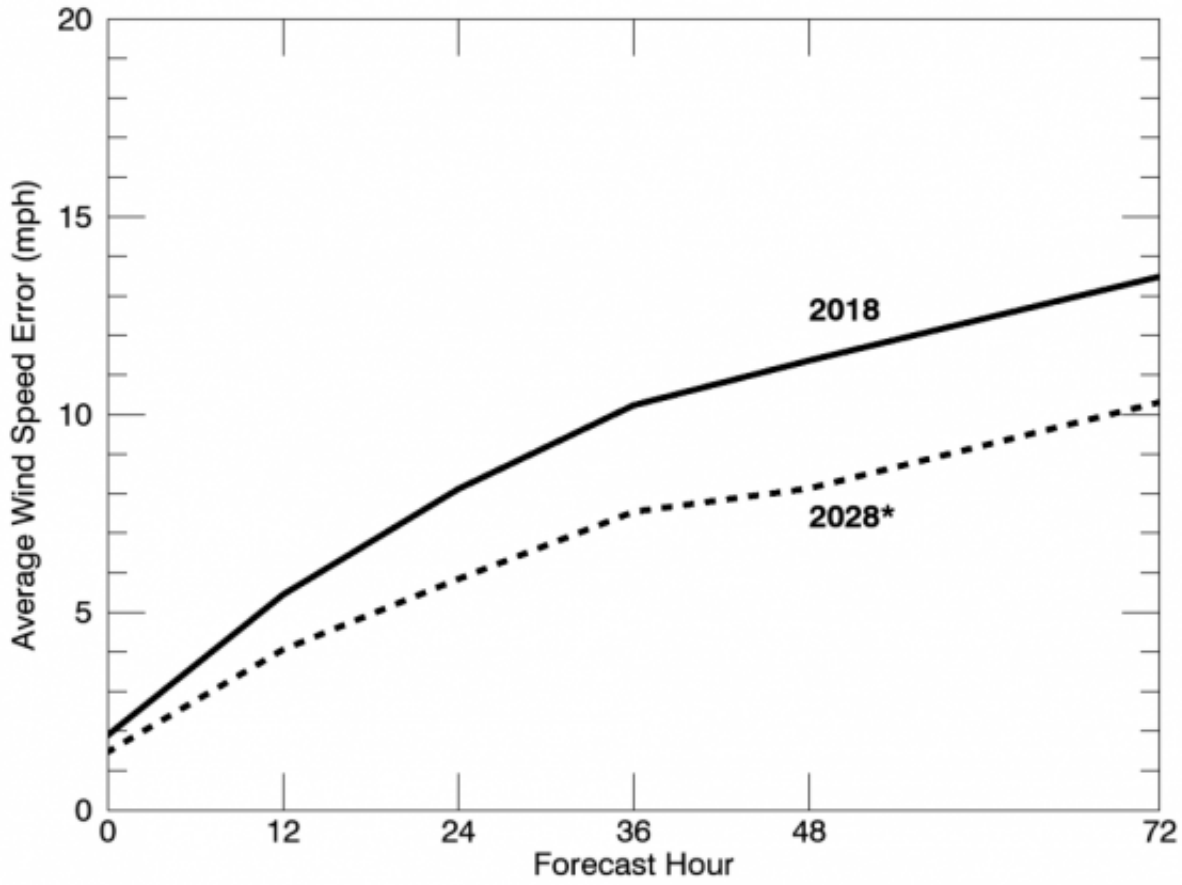
- ○ I vote Yes
- ○ I vote No

Section 4. Wind speed forecast: -20%

This image describes the progress in wind speed forecast error reduction over the last decade for a 72-hour forecast. The X-axis represents how far into the future the forecast predicts wind speed, while the Y-axis shows the average error associated with that prediction. The **dotted line** represents the **accuracy in 2008,** while the **solid line** represents the **accuracy in 2018**. Note that that errors increase because predictions farther into the future are less precise; in other words, they have larger errors. The closer the lines are to zero, the better the forecast.



Proposed changes are expected to reduce the wind speed forecast error even further. This rate of improvement would mean that the 72-hour predicted wind speed would have the following margins of error:



This level of progress means that the error margin for the 72-hour forecast, using Florence as a reference, would go from about **+/- 13 mph** in 2018, to about **+/- 10.4 mph** in 2028. This is equivalent to an improvement of about 24% in error reduction over the next ten years.

The proposed changes would provide a service to all the U.S. population susceptible to hurricanes, and it will increase the taxes your household currently pays. Knowing that it would cost your household an extra

$${e://Field/Wind%20m20} each year in additional taxes, how would you vote?

- I vote Yes
- I vote No

If the changes instead cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

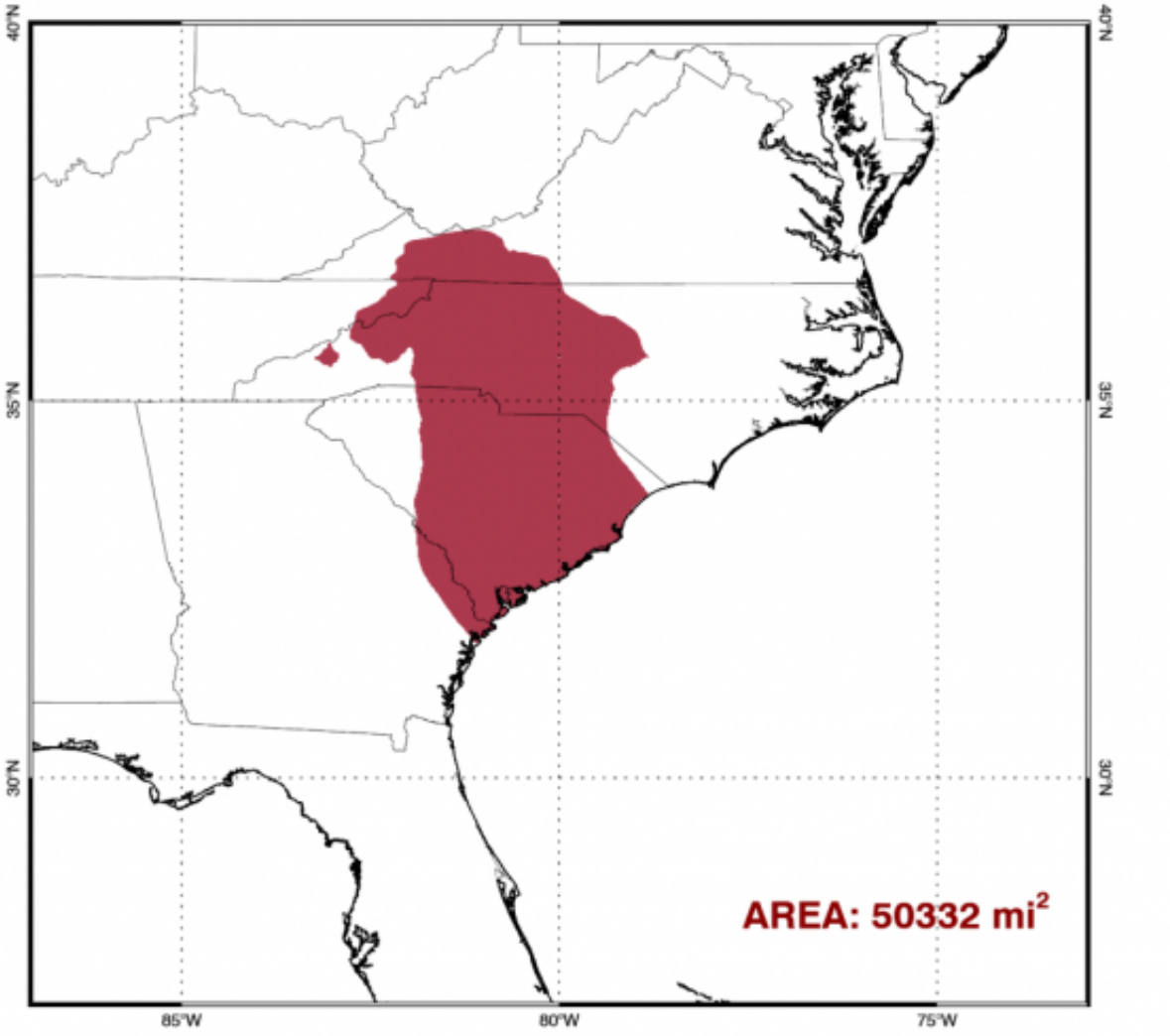
- I vote Yes
- I vote No

If the changes instead cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

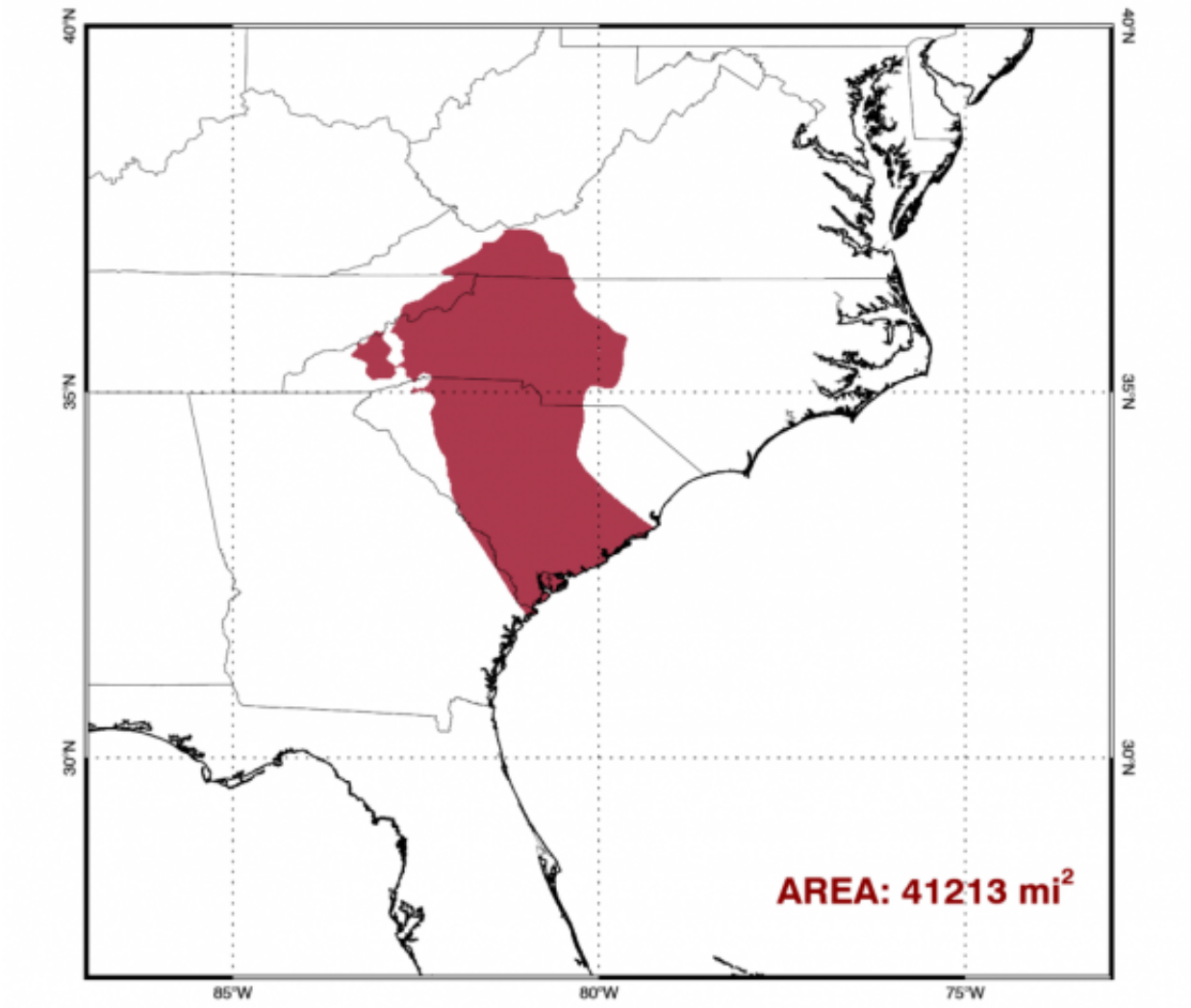
- I vote Yes
- I vote No

Section 5. Rainfall forecast: Status Quo

This image describes the accuracy of a rainfall forecast. Consider Hurricane Florence. The **shaded area** describes the area susceptible to an underforecast by at least one inch of rain. In other words, the area that could receive one inch or more of rain than what the model would predict 72 hours before landfall. Over the last decade, forecasts have improved and reduced the rain forecast error by about **4.9%** annually, and thus allowed us to narrow down the actual rain significantly. This is equivalent to an improvement of about **40%** in error reduction over ten years.



Proposed changes are expected to reduce the error in rain forecast even further. This improvement would mean that the 72-hour area susceptible to underforecast for Florence, would look like the figure:



This level of progress means that the area receiving at least one inch of rain over what was expected, using Florence as a reference, would go from about **50,300 squared miles** in 2018, to about **41,200 squared miles** in 2028. This is equivalent to an improvement of about **18%** in error reduction over the next ten years.

The proposed changes would provide a service to all the U.S. population susceptible to hurricanes, and it will

increase the taxes your household currently pays. Knowing that it would cost your household an extra **$${e://Field/Rain%20SQ}** each year in additional taxes, how would you vote?

- I vote Yes
- I vote No

If the changes instead cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

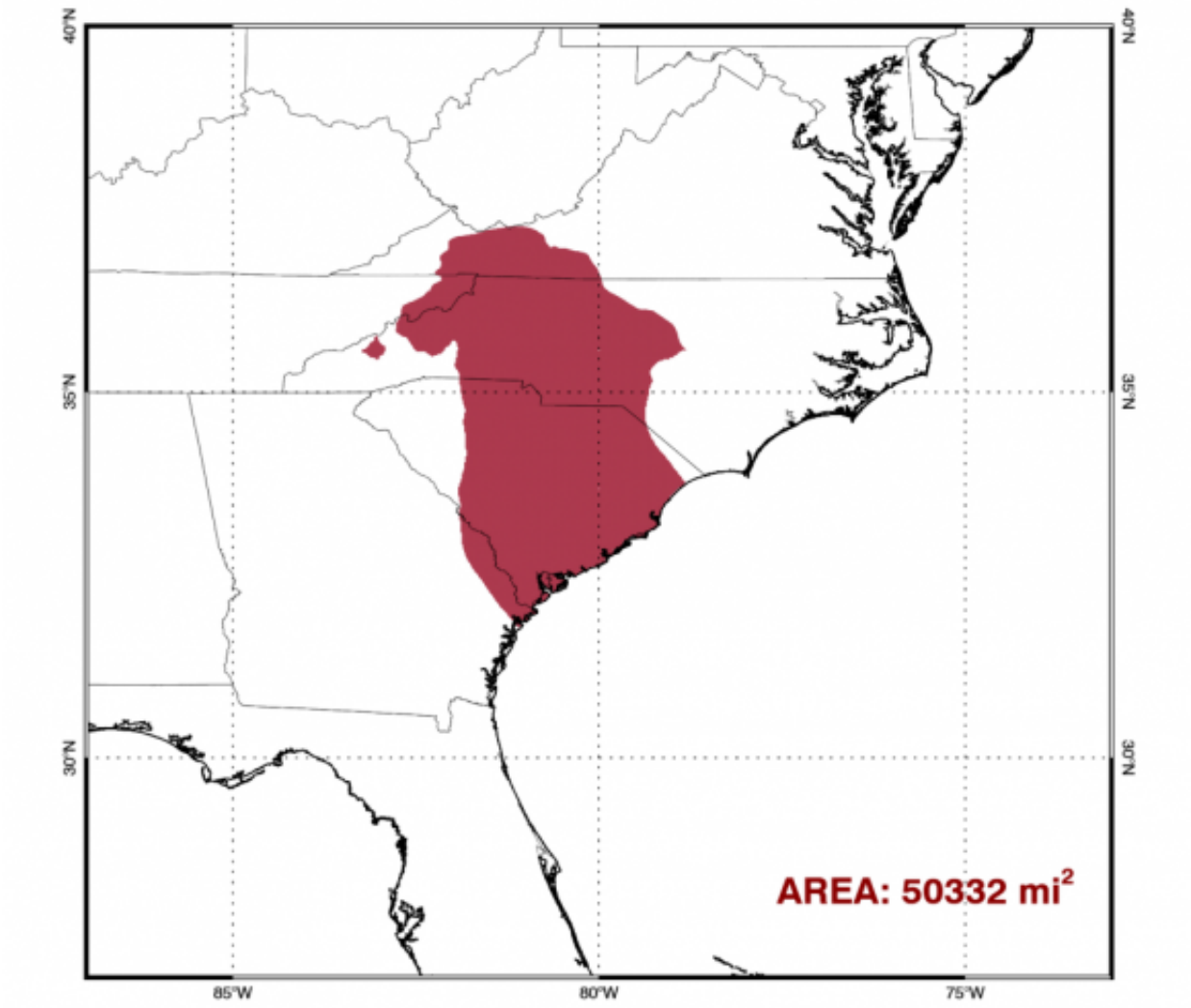
- I vote Yes
- I vote No

If the changes instead cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

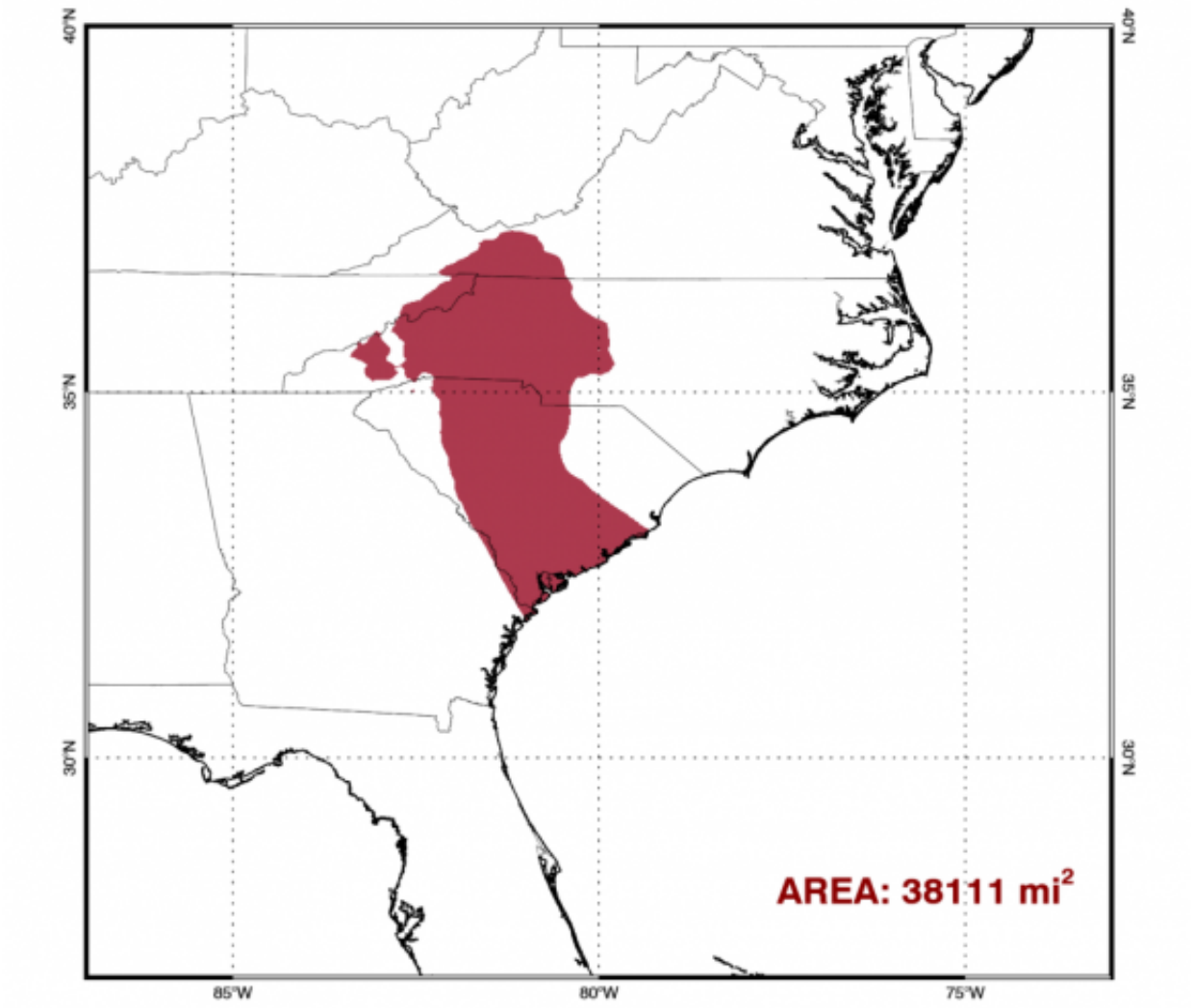
- I vote Yes
- I vote No

Section 5. Rainfall forecast: +20%

This image describes the accuracy of a rainfall forecast. Consider Hurricane Florence. The **shaded area** describes the area susceptible to an underforecast by at least one inch of rain. In other words, the area that could receive one inch or more of rain than what the model would predict 72 hours before landfall. Over the last decade, forecasts have improved and reduced the rain forecast error by about **4.9%** annually, and thus allowed us to narrow down the actual rain significantly. This is equivalent to an improvement of about **40%** in error reduction over ten years.



Proposed changes are expected to reduce the error in rain forecast even further. This improvement would mean that the 72-hour area susceptible to underforecast for Florence, would look like the figure:



This level of progress means that the area receiving at least one inch of rain over what was expected, using Florence as a reference, would go from about **50,300 squared miles** in 2018, to about **38,100 squared miles** in 2028. This is equivalent to an improvement of about **25%** in error reduction over the next ten years.

The proposed changes would provide a service to all the U.S. population susceptible to hurricanes, and it will

increase the taxes your household currently pays. Knowing that it would cost your household an extra **$${e://Field/Rain%20p20}** each year in additional taxes, how would you vote?

- I vote Yes
- I vote No

If the changes instead cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

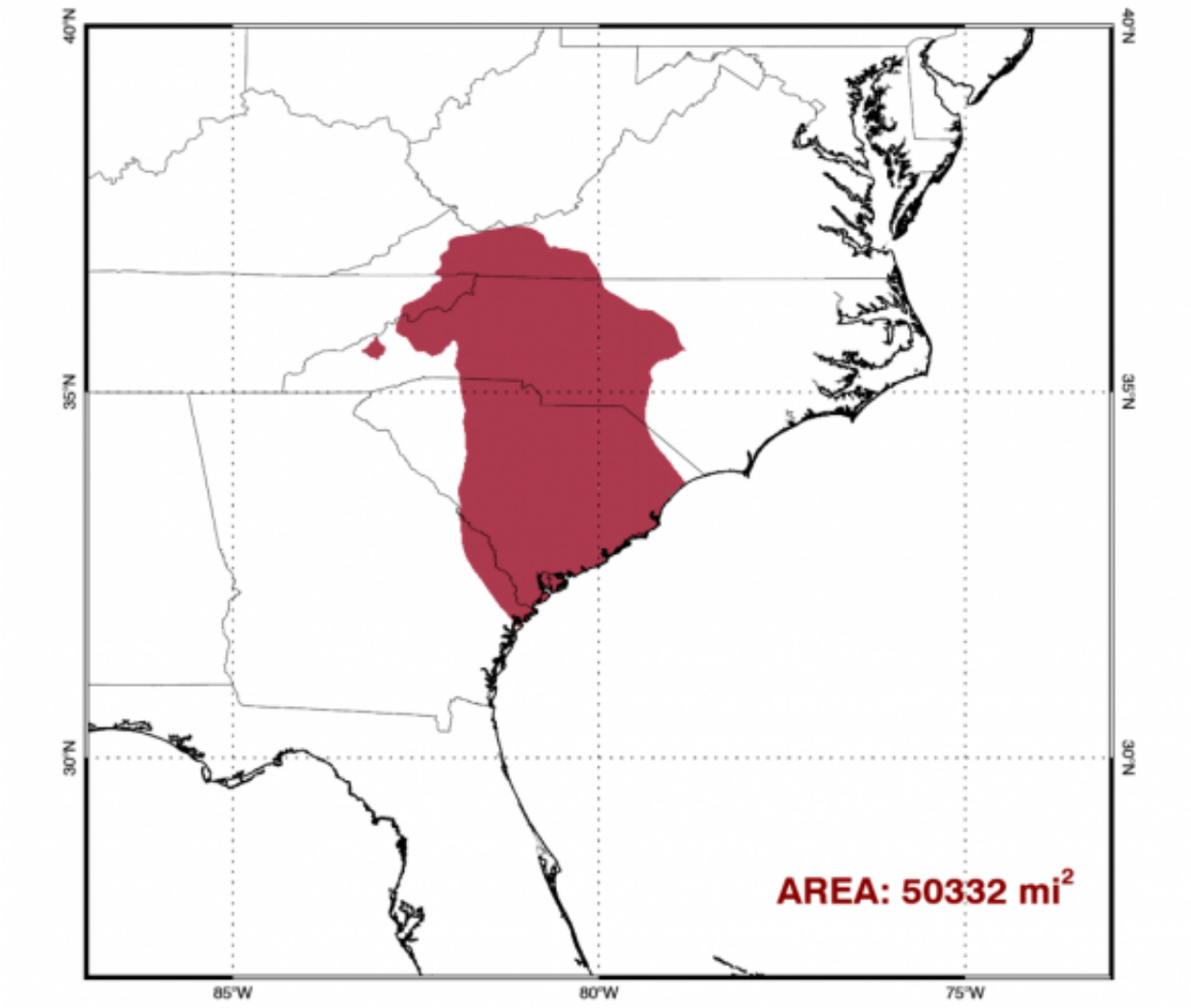
- I vote Yes
- I vote No

If the changes instead cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

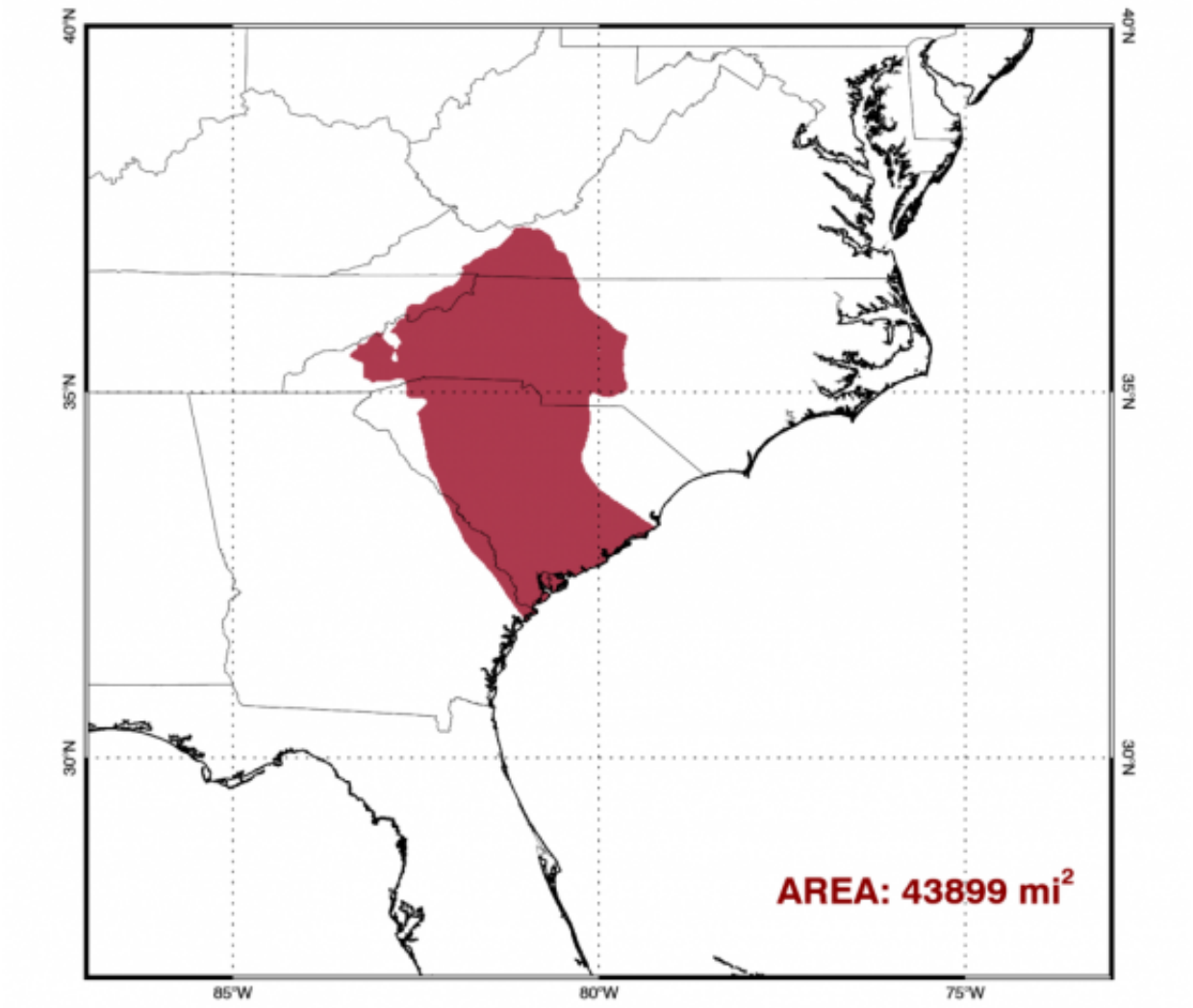
- I vote Yes
- I vote No

Section 5. Rainfall forecast: -20%

This image describes the accuracy of a rainfall forecast. Consider Hurricane Florence. The **shaded area** describes the area susceptible to an underforecast by at least one inch of rain. In other words, the area that could receive one inch or more of rain than what the model would predict 72 hours before landfall. Over the last decade, forecasts have improved and reduced the rain forecast error by about **4.9%** annually, and thus allowed us to narrow down the actual rain significantly. This is equivalent to an improvement of about **40%** in error reduction over ten years.



Proposed changes are expected to reduce the error in rain forecast even further. This improvement would mean that the 72-hour area susceptible to underforecast for Florence, would look like the figure:



This level of progress means that the area receiving at least one inch of rain over what was expected, using Florence as a reference, would go from about **50,300 squared miles** in 2018, to about **43,900 squared miles** in 2028. This is equivalent to an improvement of about **12%** in error reduction over the next ten years.

The proposed changes would provide a service to all the U.S. population susceptible to hurricanes, and it will

increase the taxes your household currently pays. Knowing that it would cost your household an extra **$${e://Field/Rain%20m20}** each year in additional taxes, how would you vote?

- I vote Yes
- I vote No

If the changes instead cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

- I vote Yes
- I vote No

If the changes instead cost your household an extra **${Invalid Expression}** each year in additional taxes, how would you vote?

- I vote Yes
- I vote No

Section 6. Final questions

It is important for us to know why you voted the way you did. Please click ALL possible reasons that apply to you.

- [ ] I believe that my taxes are too high already and am against any initiative that will increase them
- [ ] I feel that homes and businesses in areas at risk should cover their own losses
- [ ] I believe that funding this project is well worth it to me
- [ ] I would like to see these changes implemented, but I cannot afford to pay much for it
- [ ] It was difficult for me to decide which option to choose
- [ ] I do not have enough information on this issue to make a comfortable decision
- [ ] I am not worried about hurricanes
- [ ] I did not read the information on the proposal carefully
- [ ] I do not trust the federal government to solve this serious problem
- [ ] Other, please specify

To what degree do you believe that the decisions from you and other survey participants will be taken into consideration by public authorities?

- ○ Very likely

- Likely
- Moderately likely
- Somewhat likely
- Not likely

To what degree do you believe that the decision from you and other survey participants will affect whether internal changes will be incorporated by the Department of Commerce and NOAA?

- Very likely
- Likely
- Moderately likely
- Somewhat likely
- Not likely