

# Responsive Management™



## **DELAWARE RESIDENTS' OPINIONS ON CLIMATE CHANGE AND SEA LEVEL RISE**

**Conducted by Responsive Management**

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**2010**

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The views contained in this report do not necessarily represent the views of the National Oceanic and Atmospheric Administration, the Delaware Department of Natural Resources and Environmental Control, or The Nature Conservancy.

Although numerous people assisted with this project, any errors, omissions, or typographical mistakes in the report are the sole responsibility of Responsive Management.

## **EXECUTIVE SUMMARY**

### **INTRODUCTION AND METHODOLOGY**

This study was conducted for the Delaware Department of Natural Resources and Environmental Control (DNREC) to determine Delaware residents' opinions on climate change and sea level rise. The study entailed a telephone survey of Delaware residents ages 18 years and older.

For the survey, telephones were selected as the preferred sampling medium (both landlines and cell phones) because of the almost universal ownership of telephones: 98.8% of Delaware residents own telephones—93.1% own landlines and 5.7% own cell phones only. Additionally, telephone surveys, relative to mail or Internet surveys, allow for more scientific sampling and data collection, provide higher quality data, obtain higher response rates, are more timely, and are more cost-effective. Telephone surveys also have fewer negative effects on the environment than do mail surveys because of reduced use of paper and reduced energy consumption for delivering and returning the questionnaires.

The sampling methodology entailed Random Digit Dialing (RDD), which ensures that all households with telephones (in Delaware, 98.8% of households) have an equal chance of being called to participate in the survey. RDD is the best methodology for maintaining a representative random sample of households, taking into account such issues as those without landlines, those unlisted by choice, new numbers, and those numbers that have been disconnected due to a move or change in residence. In this sense, RDD sampling helps to produce representative, scientifically defensible survey data, unlike samples drawn from telephone directories or other “lists,” which tend to under-represent unlisted households. The sample was purchased from Survey Sampling International ([www.surveysampling.com](http://www.surveysampling.com)), a company specializing in providing scientific telephone samples.

A central polling site at the Responsive Management office allowed for rigorous quality control over the interviews and data collection. Responsive Management maintains its own in-house telephone interviewing facilities. These facilities are staffed by interviewers with experience conducting computer-assisted telephone interviews on the subjects of natural resources and outdoor recreation. The telephone survey questionnaire was developed cooperatively by

Responsive Management and DNREC. Responsive Management conducted a pre-test of the questionnaire to ensure proper wording, flow, and logic in the survey.

Interviews were conducted Monday through Friday from 9:00 a.m. to 9:00 p.m., Saturday from noon to 5:00 p.m., and Sunday from 5:00 p.m. to 9:00 p.m., local time. The survey was conducted in December 2009. Responsive Management obtained a total of 1,505 completed interviews (from landlines and cell phones).

For the entire sample of Delaware residents ages 18 years and older, the sampling error is at most plus or minus 2.52 percentage points, based on a sample size of 1,505 and a population of 685,085 Delaware residents ages 18 years and older.

## **PERCEPTIONS OF IMPORTANT ENVIRONMENTAL ISSUES**

- Delaware residents were asked to rate their concern about 10 issues that the country faces, listed in Text Box 1 on the following page.
  - The economy (75% are *very* concerned) and health care (72%) top the list, as ranked by the percentage saying that they are *very* concerned about the issues.
  - A middle tier consists of public education (65%), national security (60%), energy resources (59%), social security (57%), the environment (55%), and crime rates (52%).
  - At the bottom of the ranking are climate change (36%) and sea level rise (30%), in the ranking by the percentage saying that they are *very* concerned.
    - Women, compared to men, are more likely to be *very* concerned about each of the issues listed below; the lone exception is the economy, where men and women have similar opinions.
    - Older people (65 years or older), compared to the two other age groups (ages 18 to 34 and ages 35 to 64), are more likely to be *very* concerned about health care, crime rates, and national security.

**Text Box 1**  
**Concern About Issues That the Country Faces**  
**(Ranked by the Percentage Who Are Very Concerned**  
**About the Following Issues)**

The economy  
Health care  
Public education  
National security  
Energy resources  
Social security  
The environment  
Crime rates  
Climate change  
Sea level rise

- Another series of questions asked residents to rate their concern about nine *environmental* issues in Delaware, listed in Text Box 2 below.
- At the top of the ranking by the percentage being *very* concerned (as well as the ranking by *very* or *somewhat* concerned) are three issues related to pollution: water pollution (76% are *very* concerned), toxic waste (72%), and air quality (65%).
  - A middle tier consists of habitat and wildlife-related issues: loss of forest habitat (58%), declining fish and wildlife populations (54%), and loss of marsh or wetlands (45%).
  - At the bottom are flooding (42%), climate change (36%), and sea level rise (32%).
    - Women, compared to men, are more likely to be *very* concerned about water pollution, climate change, sea level rise, and flooding.

**Text Box 2**  
**Concern About Environmental Issues That Delaware Faces**  
**(Ranked by the Percentage Who Are Very Concerned About the Following Issues)**

Water pollution  
Toxic waste  
Air quality  
Loss of forest habitat  
Declining fish and wildlife populations  
Loss of marsh or wetlands  
Flooding  
Climate change  
Sea level rise

- In a direct question, residents are split regarding worry about climate change: a slight majority of residents (53%) say they personally worry about climate change *a great deal* or *a moderate amount*, but just under a majority (46%) worry *only a little* or *not at all*.
  - Women, compared to men, are more likely to worry about climate change *a great deal*.
  
- Less than a majority of residents (39%) say that they personally worry about sea level rise *a great deal* or *a moderate amount*, while a large majority (60%) worry *only a little* or *not at all*.
  - Kent County residents, compared to residents of Sussex County and New Castle County, are the least likely to personally worry *a great deal* or *a moderate amount* about sea level rise ( $p < 0.05$ ).
  
- The survey also asked about residents' level of worry about the impacts of climate change on Delaware's environment, with slightly more concern than in either of the above questions: 60% worry *a great deal* or *a moderate amount*, while 39% worry *only a little* or *not at all*.

## **KNOWLEDGE AND AWARENESS OF CLIMATE CHANGE**

- The survey examined self-professed knowledge about climate change: 70% say that they know *a great deal* or *a moderate amount*, while 30% say that they know *a little* or *nothing*. The most common answer is *a moderate amount* (54%).
  - Men are more likely than are women to claim to know *a great deal* about climate change, and more educated people (i.e., those with at least a bachelor's degree) claim to know more about climate change compared to those with less education.
  - Those who say they know *a great deal* or *moderate amount* about climate change, compared to those who say they know *a little* or *nothing*, are more likely to worry about climate change *a great deal* or *moderate amount*.

- Self-professed knowledge about sea level rise is lower than about climate change: 40% say that they know *a great deal* or a *moderate amount*, while 59% say that they know *a little* or *nothing*. The most common answer is *a little* (40%).
  - As before, those who say they know *a great deal* or *moderate amount* about sea level rise, compared to those who say they know *a little* or *nothing*, are more likely to worry about sea level rise *a great deal* or *moderate amount* ( $p < 0.001$ ).
  
- The newspaper is the leading source of information about environmental issues in Delaware (52% get their information about the environment that way), followed by television (44%), the Internet (excluding the DNREC site) (30%), and magazines (14%). (In total, 32% use the Internet, including the DNREC site.)
  - Younger residents appear more likely to get information from the Internet and older residents appear more likely to get information from newspapers.
  
- Residents are split regarding whether there is enough available information about sea level rise: 39% say that there is enough available information, but 51% say that there is not enough available information.
  
- Residents were asked to name information topics related to sea level rise that they might want. Six topics were most commonly named, listed below.
  - Sea level rise in general (33% want more information on this).
  - Actions that can be taken to reduce impacts of sea level rise (26%).
  - Current or potential impacts of sea level rise (24%).
  - How sea level rise relates to climate change/global warming (23%).
  - How to protect property from sea level rise (19%).
  - Funding needs to address sea level rise in Delaware (18%).



## OPINION ON CLIMATE CHANGE AND WHETHER CLIMATE CHANGE IS HAPPENING

- A direct question asked residents to indicate how convinced they are that climate change is happening. The large majority (70%) are *completely* or *mostly* convinced that climate change is happening. At the other end, 27% are *not so* convinced or are *not at all* convinced. Similarly, 63% are *completely* or *mostly* convinced that sea levels are rising, and 33% are *not so* convinced or are *not at all* convinced that sea levels are rising.
  - Women, compared to men, are more likely to be either completely or mostly convinced that climate change is happening.
  - Residents in the higher education group (has at least a bachelor's degree), relative to those with less education, are more likely to be completely convinced that climate change is happening.
  
- When told that some scientists predict that sea levels will rise at least 1 to 3 feet in the next 100 years, the large majority of residents (62%) agree that this is a reasonable prediction; at the other end, 21% disagree.
  
- The survey also touched on perceptions of what most *scientists* think regarding climate change. Residents are split, with 42% thinking that most scientists think climate change is happening, and 42% thinking that there is a lot of disagreement among scientists about whether climate change is happening. Only 5% think that most scientists think that climate change is *not* happening.
  
- A series of six questions further explored residents' perceptions regarding whether climate change and sea level rise are happening, listed in Text Box 3 on the following page.
  - Large majorities *strongly* or *moderately* agree with the following: that scientists are right that climate change is occurring (79%), that climate change is contributing to the rise in sea levels (75%), that the state of Delaware needs to conduct more research to identify the impacts of sea level rise in Delaware (73%), and that the state of Delaware needs to conduct more research to identify the impacts of climate change in Delaware (71%).

- Less than a majority (40%) *strongly* or *moderately* agree that the impacts of climate change are greatly exaggerated.
- Interestingly, although the majority of residents agree that scientists are right that climate change is occurring and that climate change is contributing to the rise in sea levels, a small percentage of residents (22%) think that they have *personally experienced* the impacts of sea level rise.
  - Sussex County residents are the most likely to *strongly* agree that they have personally experienced the impacts of sea level rise
  - Non-coastal residents are more likely to *strongly* agree that climate change is contributing to the rise in sea levels, compared to coastal residents.
  - Coastal residents, relative to non-coastal residents, are more likely to *strongly* agree that they have experienced the impacts of sea level rise.

**Text Box 3****Perceptions Regarding Whether Climate Change and Sea Level Rise Are Happening (Ranked by the Percentage Who Strongly or Moderately Agree With the Following Statements)**

Scientists are right that climate change is occurring.

Climate change is contributing to the rise in sea levels.

The state of Delaware needs to conduct more research to identify the impacts of sea level rise in Delaware.

The state of Delaware needs to conduct more research to identify the impacts of climate change in Delaware.

The impacts of climate change are greatly exaggerated.

You (the respondent) have personally experienced the impacts of sea level rise.

- A question explored perceptions of *causes* of climate change. More residents think that climate change, if it is happening, is caused mostly by human activities (43%) than think it is caused mostly by natural changes in the environment (26%). In the middle, 27% think it is caused about equally by human activities and by natural changes in the environment.
  - New Castle County residents are the least likely to attribute climate change to mostly natural changes in the environment.

- A question about the terms “climate change” and “global warming” asked residents whether the terms are the same thing, whether they are different but related things, or whether they are unrelated things (DNREC considers them to be different but related). The most common answer (66%) is that they are different but related things.

## PERCEPTIONS OF CLIMATE CHANGE AS A THREAT

- Most residents (77%) consider climate change to be a threat, saying it is a *very* serious threat (38%) or a *somewhat* serious threat (39%). At the other end, 21% consider it to be a *not very serious* or *not at all serious threat*.
  - Women are more likely than are men to think that climate change is a *very* or *somewhat* serious threat.
- Six questions explored how much residents worry about various aspects of climate change, shown in Text Box 4 on the following page.
  - The most concern, in the ranking by the percentage worrying *a great deal* or *a moderate amount*, is regarding the impact of climate change on Delaware’s environment (61%). Four items follow, grouped together: worry about the impact on the respondent’s own quality of life in Delaware (54%), worry about climate change personally (53%), worry about the impacts of climate change on Delaware’s economy (52%), and worry about the problems sea level rise may cause (52%).
  - At the bottom, 39% said that they worry *a great deal* or *a moderate amount* about sea level rise personally.
    - Kent County residents, compared to residents of the other two counties, are the least likely to personally worry *a great deal* or *a moderate amount* about sea level rise.
    - Sussex County residents, compared to residents of the other two counties, are the most likely to worry *a great deal* or *moderate amount* about the problems that sea level rise may cause in Delaware.
    - Coastal residents are more likely than are non-coastal residents to worry *a great deal* or *moderate amount* about the problems sea level rise may cause in Delaware.

**Text Box 4****Amount of Worry About Specific Aspects of Climate Change  
(Ranked by the Percentage Who Worry a Great Deal or a Moderate Amount About  
the Following Issues)**

How much do you worry about the impacts of climate change on Delaware's environment?  
How much do you worry about the impacts of climate change on your quality of life in Delaware?  
How much do you personally worry about climate change?  
How much do you worry about the impacts of climate change on Delaware's economy?  
How much do you worry about the problems sea level rise may cause in Delaware?  
How much do you personally worry about sea level rise?

- Fifteen questions asked residents to indicate how much sea level rise is a threat to various locations (e.g., beaches, ocean-front towns, the state as a whole) or various other things (e.g., wildlife, the economy, public works systems), shown in Text Box 5 on the following page.
  - In looking at the ranking by the percentage saying that sea level rise is a *very serious threat*, three items stand out at the top: Delaware's beaches (53% say sea level rise is a *very serious* threat to this), ocean-front cities and towns in Delaware (48%), and marshes and wetlands in Delaware (42%).
  - A middle tier consists of seven items, each with from 30% to 34% saying sea level rise is a *very serious* threat: river-front cities and towns in Delaware (34%), the state of Delaware as a whole (33%), Delaware's wildlife populations (32%), Delaware's economy (32%), the United States as a whole (31%), the Mid-Atlantic states (30%), and Delaware's public works (30%).
  - There are five items in a bottom tier of items not considered by many to be greatly threatened by sea level rise: outdoor recreation in Delaware (24%), the respondent's local community (19%), the respondent personally (18%), the respondent's family (14%), and the respondent's property (13%).
    - Kent County residents, relative to residents of the other two counties, are the most likely to consider sea level rise to be *not at all a serious* threat to Delaware's economy, Delaware's public works systems, their local community, and their property.

- On the other hand, coastal residents, compared to non-coastal residents, are more likely to think that sea level rise is a *very serious* threat to river-front cities and towns in Delaware, outdoor recreation in Delaware, their local community, their property, their family, and them personally.

**Text Box 5**

**Items to Which Sea Level Rise May Be a Threat  
(Ranked by the Percentage Who Think Sea Level Rise is a Very Serious Threat to the Following)**

Delaware beaches  
 Ocean-front cities and towns in Delaware  
 Marsh and wetlands in Delaware  
 River-front cities and towns in Delaware  
 The State of Delaware  
 Delaware's wildlife populations  
 Delaware's economy  
 The United States  
 The Mid-Atlantic U.S.  
 Delaware's public works systems, such as public buildings, roads, and sewer systems  
 Outdoor recreation in Delaware  
 Your local community  
 You personally  
 Your family  
 Your property

- Delaware residents overwhelmingly think that Sussex County is the most threatened by sea level rise (78% named Sussex County); only 5% named either New Castle County or Kent County.
- Residents were asked to indicate when they think sea level rise will start to have impacts on the area in which they live in Delaware: 5 years, 10 years, 25 years, 50 years, or 100 years, or if they think that sea levels are not rising. Answers are spread fairly evenly among the possible responses. For instance, 14% think sea level rise is having an impact now, and 11% think it will have an impact in 100 years. The most common response is 25 years (17%).
  - Coastal residents, relative to non-coastal residents, are more likely to say that sea level rise is having impacts now. On the other hand, non-coastal residents are more

- likely to pick a date in the future when saying when they think that sea level rise will start to have impacts on the area in which they live.
- Men, compared to women, are more likely to think that sea level rise will start to have impacts in the distant future (rather than the near future or now) or to never have impacts.

## **PERCEPTIONS OF EFFICACY OF TAKING ACTION TO MITIGATE CLIMATE CHANGE**

- Thirteen questions explored whether residents think that human action can affect climate change or mitigate the effects of climate change, shown in Text Box 6 on page xii.
  - The top tier in the ranking shows conflicting opinion. The results suggest that residents believe that human actions can affect climate change, as large majorities *strongly* or *moderately* agree that the U.S. can take actions that will help reduce climate change (79%), that the impacts of climate change can be reduced by human efforts (76%), that there are many actions that can be taken to reduce climate change (72%), and that an individual can personally take actions that will help reduce climate change (70%). However, despite thinking that human actions can affect climate change, large majorities think that we (our society) should conduct more research before taking any action to address sea level rise (71%) and that we (our society) should conduct more research before taking any action to address climate change (68%).
  - Four statements are in the middle tier, showing that a slight majority, despite other opinions, think that action should be taken now and that action would be efficacious in addressing climate change. From 56% to 61% think that we (our society) should take immediate and drastic action to reduce the impacts of climate change (61%), that sea level rise can be reduced by human efforts (59%), that we (our society) should take immediate and drastic action to reduce the impacts of sea level rise (58%), and that climate change is something people can control (56%).
  - The bottom tier has three items, which support the above findings by showing that less than a majority are pessimistic about the efficacy of taking action to mitigate climate change. Less than a majority think that there is limited action that can be taken to reduce

climate change (46%), that the actions of a single person will not make any difference in reducing climate change (32%), and that the actions of a single country like the U.S. will not make any difference in reducing climate change (31%).

- Taken as a whole, the results suggest that people think that human action can mitigate the effects of climate change, but opinion is split regarding whether society should take *immediate* action or whether society should *conduct more research before* taking action.
  - Sussex County residents are the least likely, relative to residents of the other two counties, to *strongly* agree that climate change is something people can control.
  - New Castle County residents are the most likely, compared to residents of the other two counties, to *strongly* agree that the impacts of climate change can be reduced by human efforts, and to *strongly* or *moderately* agree that sea level rise can be reduced by human efforts.
  - Kent County residents, relative to residents of the other two counties, are the least likely to *strongly* agree that there are many actions that can be taken to reduce climate change.
  - Coastal residents, compared to non-coastal residents, are more likely to *strongly* agree that there are many actions that can be taken to reduce climate change.
  - Women, compared to men, are more likely to *strongly* agree that the impacts of climate change can be reduced by human efforts.

#### **Text Box 6**

#### **Statements Regarding Taking Action to Mitigate Climate Change**

**(Ranked by the Percentage Who Strongly or Moderately Agree With the Following Statements)**

The U.S. can take actions that will help reduce climate change.  
 The impacts of climate change can be reduced by human efforts.  
 There are many actions that can be taken to reduce climate change.  
 We should conduct more research before taking any action to address sea level rise.  
 You can personally take actions that will help reduce climate change.  
 We should conduct more research before taking any action to address climate change.  
 We should take immediate and drastic action to reduce the impacts of climate change.  
 Sea level rise can be reduced by human efforts.  
 We should take immediate and drastic action to reduce the impacts of sea level rise.  
 Climate change is something people can control.  
 There is limited action that can be taken to reduce climate change.  
 The actions of a single person like you will not make any difference in reducing climate change.  
 The actions of a single country like the U.S. will not make any difference in reducing climate change.

- Regardless of how many years residents believe it will take for sea level rise to affect their area, residents overwhelmingly think action should be taken to address or reduce the impacts of sea level rise *before impacts occur* (80%) rather than *as impacts begin* (8%) or *after impacts cause problems* (3%).

## MANAGEMENT STRATEGIES PERTAINING TO CLIMATE CHANGE

- The survey had a series of 11 questions regarding actions that could be taken and management strategies to address sea level rise, as shown in Text Box 7 on the following page.
  - In looking at the percentage who *strongly* support the actions/management strategies, two stand out at the top, both relating to building codes: avoiding building new structures in areas at risk from sea level rise (67%), and changing building codes and regulations to reduce risk in flood prone areas (63%).
  - A second tier includes funding research (44%), using dredged material to build up marsh areas at risk (40%), and elevating buildings using *private* funding (40%).
  - A third tier, at about a third each, includes two that require large capital outlays: building dikes, seawalls, and bulkheads (33%), and elevating land surfaces in areas at risk of sea level rise (30%). A third is the natural option: allowing beaches and wetlands to naturally migrate inland (29%).
  - At the bottom, with little support, are the three potential actions that each include using “government funds” to purchase land at risk of sea level rise (21%), to elevate buildings (18%), and to purchase frequently flooded properties (16%).



**Text Box 7****Support for Actions/Management Strategies to Mitigate the Effects of Sea Level Rise (Ranked by the Percentage Who Strongly Support the Following Actions/Management Strategies)**

Avoiding building new structures in areas at risk from sea level rise  
 Changing building codes and regulations to reduce risk in flood prone areas  
 Increasing funding for research  
 Using clean dredged material from waterways to build up marsh areas that are at risk from sea level rise  
 Elevating buildings in areas at risk from sea level rise using private funding  
 Building dikes, seawalls, and bulkheads to keep water back  
 Elevating the land surface in areas at risk from sea level rise  
 Allowing beaches and wetlands to naturally migrate inland  
 Purchasing or acquiring land and open space at risk from sea level rise from willing land sellers using government funds  
 Elevating buildings in areas at risk from sea level rise using government funds  
 Purchasing or buying out frequently flooded properties using government funds

- The survey asked residents whether they support or oppose having their local and state governments spend more money on public construction projects if it means that the structures can withstand or accommodate sea level rise in Delaware. They were informed before the question that such construction is more *expensive* than is construction that cannot withstand or accommodate sea level rise. The results suggest that residents are willing to pay the expense now so that construction will withstand sea level rise: 64% support, and 25% oppose.
  - In follow-up to the above question, those who opposed were further informed of the following: “What if you knew that it would save money and be less costly *long-term* for Delaware to construct structures to withstand or accommodate sea level rise?” Of those who opposed previously, 58% still oppose (most of them now *strongly* opposing), but just under a third (32%) now support.

**RESPONSIBILITY FOR TAKING ACTION**

- The survey asked nine questions about entities that should be doing more or doing less to address or reduce the impacts of sea level rise in Delaware. For each entity (shown in Text

Box 8 below), the survey asked respondents if they thought the entity should be doing more, about the same, or less than it is currently doing.

- Among the results of this series of questions as a whole, it is notable that, for each entity, the percentage of residents who say that the entity should be doing more (ranging from 45% up to 66%) far exceeds the percentage who say that the entity should be doing the same or less (ranging from 22% to 29%).
- At the top of the ranking by the percentage who say the entity should be doing *more* are corporations and industry (66%) and Delaware citizens (64%)—both at nearly two-thirds. Five entities are in the middle, all with from 56% to 59% giving the “doing more” response: state government officials, city/town government officials, county government officials, Delaware’s state legislators, and the U.S. Congress.

**Text Box 8**

**Entities That Should Be Doing More or Less to Address Sea Level Rise  
(Ranked by Percentage Who Think the Following Should be Doing More to Address  
Sea Level Rise)**

Corporations and industry  
 Delaware citizens  
 State government officials  
 The respondent’s city or town government officials  
 The respondent’s county government officials  
 Delaware’s state legislators  
 The U.S. Congress  
 Delaware’s governor  
 Delaware’s state agencies

- Most residents (55%) indicate that they would *not* be likely to attend a public meeting, informational session, or “webinar” in the next 12 months on sea level rise in Delaware. On the other end, 10% indicate being *very* likely. A similar question asked residents about their likelihood to write letters, send emails, or call elected officials in the next 12 months about sea level rise: 62% would be *not at all* likely, while only 9% indicate being *very* likely.

## DEMOGRAPHIC OVERVIEW

- Overall, several patterns emerged from the data regarding opinions and attitudinal tendencies among certain groups of Delaware residents. A few general observations follow (note that specific aspects of disparities in knowledge or concern have also been discussed above under various topic headings).
- In large part, women show more concern than do men about climate change and sea level rise, and they are generally more likely to consider climate change and sea level rise as threats. At the same time, men are more likely to say that they know *a great deal* or *moderate amount* about climate change and sea level rise than are women.
  - In general, men (as compared to women) are more likely to think that sea levels are not rising or that sea level rise will not begin to have impacts on Delaware until 50 or 100 years from now; on the other hand, women are more likely to think that sea level rise will have impacts in 25 years or less.
  - Delaware residents in a broad middle age group comprising 35- to 64-year-olds tend to show more concern about climate change, sea level rise, and the impacts associated with these than do those in the younger age group (18- to 34-year-olds) and older age group (65 years or older).
  - Coastal residents are more likely than are non-coastal residents to worry about the problems and impacts associated with sea level rise. One notable difference is that people who live in coastal areas tend to be more likely to consider sea level rise a threat to them personally, whereas those in non-coastal areas are more likely to consider sea level rise a threat to the state of Delaware but not to them personally.
  - Coastal residents are more likely to think that sea level rise is having an impact on Delaware now, whereas non-coastal residents are more likely to think that any impact from sea level rise will be in years to come. Coastal residents are also more likely to think that various government and non-government entities and agencies should be doing more to reduce the impacts of sea level rise.
  - More educated residents (i.e., those with at least a Bachelor's degree) are more likely, compared to those with less education, to claim to know a great deal or moderate amount about climate change and to be completely convinced that climate change is happening.

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## **INTRODUCTION AND METHODOLOGY**

This study was conducted for the Delaware Department of Environmental Control (DNREC) to determine Delaware residents' opinions on climate change and sea level rise. The study entailed a telephone survey of Delaware residents ages 18 years and older. Specific aspects of the research methodology are discussed below.

For the survey, telephones were selected as the preferred sampling medium (both landlines and cell phones) because of the almost universal ownership of telephones: 98.8% of Delaware residents own telephones—93.1% own landlines and 5.7% own cell phones only. Additionally, telephone surveys, relative to mail or Internet surveys, allow for more scientific sampling and data collection, provide higher quality data, obtain higher response rates, are more timely, and are more cost-effective. Telephone surveys also have fewer negative effects on the environment than do mail surveys because of reduced use of paper and reduced energy consumption for delivering and returning the questionnaires.

A central polling site at the Responsive Management office allowed for rigorous quality control over the interviews and data collection. Responsive Management maintains its own in-house telephone interviewing facilities. These facilities are staffed by interviewers with experience conducting computer-assisted telephone interviews on the subjects of natural resources and outdoor recreation. The telephone survey questionnaire was developed cooperatively by Responsive Management and DNREC. Responsive Management conducted a pre-test of the questionnaire to ensure proper wording, flow, and logic in the survey.

To ensure the integrity of the telephone survey data, Responsive Management has interviewers who have been trained according to the standards established by the Council of American Survey Research Organizations. Methods of instruction included lecture and role-playing. The Survey Center Managers and other professional staff conducted project briefings with the interviewers prior to the administration of this survey. Interviewers were instructed on type of study, study goals and objectives, handling of survey questions, interview length, termination points and qualifiers for participation, interviewer instructions within the survey instrument, reading of the survey instrument, skip patterns, and probing and clarifying techniques necessary for specific

questions on the survey instrument. The Survey Center Managers and statisticians monitored the data collection, including monitoring of the actual telephone interviews without the interviewers' knowledge, to evaluate the performance of each interviewer and ensure the integrity of the data. After the surveys were obtained by the interviewers, the Survey Center Managers and/or statisticians checked each completed survey to ensure clarity and completeness.

The sampling methodology entailed Random Digit Dialing (RDD), which ensures that all households with telephones (in Delaware, 98.8% of households) have an equal chance of being called to participate in the survey. RDD is the best methodology for maintaining a representative random sample of households, taking into account such issues as those without landlines, those unlisted by choice, new numbers, and those numbers that have been disconnected due to a move or change in residence. In this sense, RDD sampling helps to produce representative, scientifically defensible survey data, unlike samples drawn from telephone directories or other "lists," which tend to under-represent unlisted households. The sample was purchased from Survey Sampling International ([www.surveysampling.com](http://www.surveysampling.com)), a company specializing in providing scientific telephone samples.

Interviews were conducted Monday through Friday from 9:00 a.m. to 9:00 p.m., Saturday from noon to 5:00 p.m., and Sunday from 5:00 p.m. to 9:00 p.m., local time. A five-callback design was used to maintain the representativeness of the sample, to avoid bias toward people easy to reach by telephone, and to provide an equal opportunity for all to participate. When a respondent could not be reached on the first call, subsequent calls were placed on different days of the week and at different times of the day. The survey was conducted in December 2009. Responsive Management obtained a total of 1,505 completed interviews (from landlines and cell phones).

The software used for data collection was Questionnaire Programming Language (QPL). The survey data were entered into the computer as each interview was being conducted, eliminating manual data entry after the completion of the survey and the concomitant data entry errors that may occur with manual data entry. The survey instrument was programmed so that QPL branched, coded, and substituted phrases in the survey based on previous responses to ensure the integrity and consistency of the data collection.

The analysis of data was performed using Statistical Package for the Social Sciences as well as proprietary software developed by Responsive Management. The results were weighted by age, gender, and county of residence to be proportional to the total population of Delaware residents.

Crosstabulations were run of all of the questions by county of residence and by whether the respondent perceived himself/herself to be living in a coastal or non-coastal area. Throughout the report, each graph of the results overall is followed by a graph showing the crosstabulation by county and then a graph showing the crosstabulation by coastal/non-coastal residence. However, any differences between groups (e.g., Sussex versus Kent County residents, coastal versus non-coastal residents) are discussed only when the differences are notable *and* are statistically significant. Note that significance tests were run only on some of the crosstabulation graphs; others that did not have notable differences were not tested. Finally, select crosstabulations were run where appropriate (e.g., the flood insurance question was run among those who own their place of residence, some basic belief questions were run by age and gender).

In addition to the crosstabulation analyses discussed above, a nonparametric analysis examined how the various responses related to behavioral, participatory, and demographic characteristics. Responses for selected questions were tested by means of z-scores for relationships to behavioral, participatory, and demographic characteristics.

The z-score shows the strength of the relationship between the characteristic and the response to the question. Statistical significance falls into three categories. Those z-scores that have an absolute value of 3.30 or greater indicate a relationship that is so strong that it would happen by chance only 1 out of 1,000 times ( $p \leq 0.001$ ). Those z-scores that have an absolute value of 2.58 to 3.29 indicate a relationship that is so strong that it would happen by chance only 1 out of 100 times ( $p \leq 0.01$ ). Finally, those z-scores that have an absolute value of 1.96 to 2.57 indicate a relationship that is so strong that it would happen by chance only 5 out of 100 times ( $p \leq 0.05$ ).



The z-scores were calculated as shown in the formula below.

$$z = \frac{(p_1 - p_2)}{\sqrt{p(1-p) \left[ \frac{1}{n_1} + \frac{1}{n_2} \right]}}$$

where:  $n_1$  represents the number of observations in Group 1.  
 $n_2$  represents the number of observations in Group 2.  
 $p_1 = a/(a + b) = a/n_1$  and represents the proportion of observations in Group 1 that falls in Cell  $a$ . It is employed to estimate the population proportion  $\Pi_1$  (% of Group 1 who had specific characteristic).  
 $p_2 = c/(c + d) = c/n_2$  and represents the proportion of observations in Group 2 that falls in Cell  $c$ . It is employed to estimate the population proportion  $\Pi_2$  (% of Group 2 who had specific characteristic).  
 $p = (a + c)/(n_1 + n_2) = (a + c)/n$  and is a pooled estimate of the proportion of respondents who had specific characteristic in the underlying population.

(Equation from *Handbook of Parametric and Nonparametric Statistical Procedures*, 2<sup>nd</sup> Edition by David J. Sheskin. © 2000, Chapman & Hall/CRC, Boca Raton, FL.)

The characteristics examined in the nonparametric analysis are shown in the tabulation below.

<b>Nonparametric Analysis Variables Run</b>
Says he/she knows a great deal or a moderate amount about climate change.
Does not indicate knowing a great deal or a moderate amount about climate change.
Says he/she knows a little or nothing about climate change.
Thinks that "climate change" and "global warming" are the same thing and that the terms can be used interchangeably.
Thinks that "climate change" and "global warming" refer to two different things but are related.
Thinks that "climate change" and "global warming" refer to two unrelated things.
Thinks that climate change is a very serious threat.
Does not indicate thinking that climate change is a very serious threat.
Is completely convinced that climate change is happening.
Does not indicate being completely convinced that climate change is happening.
Thinks that most scientists think that climate change is happening.
Does not indicate thinking that most scientists think that climate change is happening.
Thinks that, if climate change is happening, it is caused mostly by human activities.
Does not indicate thinking that, if climate change is happening, it is caused mostly by human activities.
Worries a great deal or a moderate amount about climate change.
Does not indicate worrying a great deal or a moderate amount about climate change.
Says he/she knows a great deal or a moderate amount about sea level rise.
Does not indicate knowing a great deal or a moderate amount about sea level rise.
Says he/she knows a little or nothing about sea level rise.
Is completely or mostly convinced that sea levels are rising.
Does not indicate being completely or mostly convinced that sea levels are rising.
Worries a great deal or a moderate amount about the problems that sea level rise may cause in Delaware.

<b>Nonparametric Analysis Variables Run</b>
Does not indicate worrying a great deal or a moderate amount about the problems that sea level rise may cause in Delaware.
Thinks that sea level rise is a very or somewhat serious threat to the United States.
Does not indicate thinking that sea level rise is a very or somewhat serious threat to the United States.
Thinks that sea level rise is not a very serious or not at all a threat to the United States.
Thinks that sea level rise is a very or somewhat serious threat to the Mid-Atlantic United States.
Does not indicate thinking that sea level rise is a very or somewhat serious threat to the Mid-Atlantic United States.
Thinks that sea level rise is not a very serious or not at all a threat to the Mid-Atlantic U.S.
Thinks that sea level rise is a very serious threat to the State of Delaware.
Does not indicate thinking that sea level rise is a very serious threat to the State of Delaware.
Thinks that sea level rise is not a very serious or not at all a threat to the State of Delaware.
Thinks that sea level rise is a very serious threat to Delaware beaches.
Does not indicate thinking that sea level rise is a very serious threat to Delaware beaches.
Thinks that sea level rise is not a very serious or not at all a threat to Delaware beaches.
Thinks that sea level rise is a very serious threat to marshes and wetlands in Delaware.
Does not indicate thinking that sea level rise is a very serious threat to marshes and wetlands in Delaware.
Thinks that sea level rise is not a very serious or not at all a threat to the marsh and wetlands in Delaware.
Thinks that sea level rise is a very serious threat to ocean-front cities and towns in Delaware.
Does not indicate thinking that sea level rise is a very serious threat to ocean-front cities and towns in Delaware.
Thinks that sea level rise is not a very serious or not at all a threat to ocean-front cities and towns in Delaware.
Thinks that sea level rise is a very or somewhat serious threat to river-front cities and towns in Delaware.
Does not indicate thinking that sea level rise is a very or somewhat serious threat to river-front cities and towns in Delaware.
Thinks that sea level rise is not a very serious or not at all a threat to river-front cities and towns in Delaware.
Thinks that sea level rise is not a very serious or not at all a threat to outdoor recreation in Delaware.
Thinks that sea level rise is not a very serious or not at all a threat to Delaware's wildlife populations.
Thinks that sea level rise is not a very serious or not at all a threat to Delaware's economy.
Thinks that sea level rise is not a very serious or not at all a threat to Delaware's public works systems, such as public buildings, roads, and sewer systems.
Thinks that sea level rise is not a very serious or not at all a threat to his/her local community.
Thinks that sea level rise is not a very serious or not at all a threat to his/her property.
Thinks that sea level rise is not a very serious or not at all a threat to his/her family.
Thinks that sea level rise is a very or somewhat serious threat to him or her personally.
Does not indicate thinking that sea level rise is a very or somewhat serious threat to him or her personally.
Thinks that sea level rise is not a very serious or not at all a threat to him/her personally.
Disagrees that he/she has personally experienced the impacts of sea level rise.
Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less.

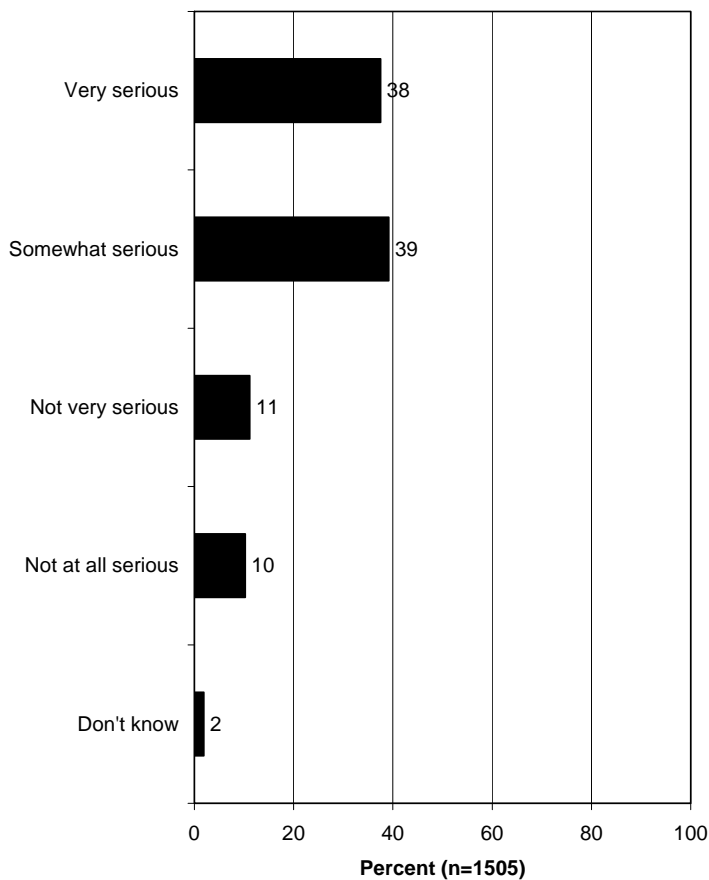
<b>Nonparametric Analysis Variables Run</b>
Either thinks that sea levels are not rising or that sea level rise will not start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now.
Strongly agrees with this statement: Scientists are right that climate change is occurring.
Does not indicate strongly agreeing with this statement: Scientists are right that climate change is occurring.
Agrees with this statement: Climate change is something people can control.
Does not indicate agreeing with this statement: Climate change is something people can control.
Strongly agrees with this statement: The State of Delaware needs to conduct more research to identify the impacts of climate change in Delaware.
Does not indicate strongly agreeing with this statement: The State of Delaware needs to conduct more research to identify the impacts of climate change in Delaware.
Agrees with this statement: The impacts of climate change are greatly exaggerated.
Does not indicate agreeing with this statement: The impacts of climate change are greatly exaggerated.
Strongly agrees with this statement: The impacts of climate change can be reduced by human efforts.
Does not indicate strongly agreeing with this statement: The impacts of climate change can be reduced by human efforts.
Supports allowing beaches and wetlands to naturally migrate inland to address sea level rise in Delaware or reduce its impacts.
Does not indicate support for allowing beaches and wetlands to naturally migrate inland to address sea level rise in Delaware or reduce its impacts.
Supports building dikes, seawalls, and bulkheads to keep water back to address sea level rise in Delaware or reduce its impacts.
Does not indicate support for building dikes, seawalls, and bulkheads to keep water back to address sea level rise in Delaware or reduce its impacts.
Strongly supports changing building codes and regulations to reduce risk in flood prone areas to address sea level rise in Delaware or reduce its impacts.
Does not indicate strong support for changing building codes and regulations to reduce risk in flood-prone areas to address sea level rise in Delaware or reduce its impacts.
Strongly supports avoiding building new structures in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts.
Does not indicate strong support for avoiding building new structures in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts.
Supports elevating the land surface in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts.
Does not indicate support for elevating the land surface in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts.
Strongly supports using clean dredged material from waterways to build up marsh areas that are at risk from sea level rise to address sea level rise in Delaware or reduce its impacts.
Does not indicate strong support for using clean dredged material from waterways to build up marsh areas that are at risk from sea level rise to address sea level rise in Delaware or reduce its impacts.
Strongly supports elevating buildings in areas at risk from sea level rise using private funding to address sea level rise in Delaware or reduce its impacts.
Does not indicate strong support for elevating buildings in areas at risk from sea level rise using private funding to address sea level rise in Delaware or reduce its impacts.
Supports elevating buildings in areas at risk from sea level rise using government funds to address sea level rise in Delaware or reduce its impacts.
Does not indicate support for elevating buildings in areas at risk from sea level rise using government funds to address sea level rise in Delaware or reduce its impacts.

<b>Nonparametric Analysis Variables Run</b>
Supports purchasing or buying out frequently flooded properties using government funds to address sea level rise in Delaware or reduce its impacts.
Does not indicate support for purchasing or buying out frequently flooded properties using government funds to address sea level rise in Delaware or reduce its impacts.
Supports purchasing or acquiring land and open space at risk from sea level rise from willing land sellers using government funds to address sea level rise in Delaware or reduce its impacts.
Does not indicate support for purchasing or acquiring land and open space at risk from sea level rise from willing land sellers using government funds to address sea level rise in Delaware or reduce its impacts.
Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts.
Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts.
Thinks that his or her city or town government officials should be doing more to address or reduce the impacts of sea level rise in Delaware.
Does not indicate thinking that his or her city or town government officials should be doing more to address or reduce the impacts of sea level rise in Delaware.
Thinks that his or her county government officials should be doing more to address or reduce the impacts of sea level rise in Delaware.
Does not indicate thinking that his or her county government officials should be doing more to address or reduce the impacts of sea level rise in Delaware.
Thinks that his or her state government officials should be doing more to address or reduce the impacts of sea level rise in Delaware.
Does not indicate thinking that his or her state government officials should be doing more to address or reduce the impacts of sea level rise in Delaware.
Thinks that Delaware's state legislators should be doing more to address or reduce the impacts of sea level rise in Delaware.
Does not indicate thinking that Delaware's state legislators should be doing more to address or reduce the impacts of sea level rise in Delaware.
Thinks that Delaware's governor should be doing more to address or reduce the impacts of sea level rise in Delaware.
Does not indicate thinking that Delaware's governor should be doing more to address or reduce the impacts of sea level rise in Delaware.
Thinks that Delaware's state agencies should be doing more to address or reduce the impacts of sea level rise in Delaware.
Does not indicate thinking that Delaware's state agencies should be doing more to address or reduce the impacts of sea level rise in Delaware.
Thinks that the U.S. Congress should be doing more to address or reduce the impacts of sea level rise in Delaware.
Does not indicate thinking that the U.S. Congress should be doing more to address or reduce the impacts of sea level rise in Delaware.
Thinks that corporations and industry should be doing much more to address or reduce the impacts of sea level rise in Delaware.
Does not indicate thinking that corporations and industry should be doing much more to address or reduce the impacts of sea level rise in Delaware.
Thinks that Delaware citizens should be doing more to address or reduce the impacts of sea level rise in Delaware.

<b>Nonparametric Analysis Variables Run</b>
Does not indicate thinking that Delaware citizens should be doing more to address or reduce the impacts of sea level rise in Delaware.
A primary source of his or her information about environmental issues in Delaware is the Internet, not including Department of Natural Resources and Environmental Control website.
A primary source of his or her information about environmental issues in Delaware is television.
A primary source of his or her information about environmental issues in Delaware is magazines.
A primary source of his or her information about environmental issues in Delaware is newspapers.
Would most like to have more information on sea level rise in general.
Would most like to have more information on how sea level rise relates to climate change / global warming.
Would most like to have more information on current or potential impacts of sea level rise.
Would most like to have more information on actions that can be taken to reduce impacts of sea level rise.
Would most like to have more information on how to protect property from sea level rise.
Would most like to have more information on funding needs / estimated budget to address sea level rise in Delaware.
Is very likely or somewhat likely to attend a public meeting, informational session, or "webinar" on sea level rise in Delaware in the next 12 months.
Is very likely or somewhat likely to write letters, send e-mails, or call your elected officials about sea level rise in the next 12 months.
Has been a Delaware resident for the mean of 30 years or more.
Has been a Delaware resident for less than the mean of 30 years.
Lives in New Castle County.
Lives in Kent County.
Lives in Sussex County.
Considers his or her place of residence to be a large city, urban area, or suburban area.
Considers his or her place of residence to be a small city or town.
Considers his or her place of residence to be a rural area.
Considers his or her place of residence to be in a coastal area.
Considers his or her place of residence to be in a non-coastal area.
Rents his or her current place of residence.
Owns his or her current place of residence.
Has flood insurance for his or her current place of residence.
Does not have flood insurance for his or her current place of residence.
Does not have any children, age 17 or younger, living in his or her household.
Has at least one child, age 17 or younger, living in his or her household.
Does not have a bachelor's degree.
Has a bachelor's degree or graduate degree.
Considers himself or herself to be white or Caucasian.
Considers himself or herself to be black or African-American.
Is between ages 18-34.
Is between ages 35-64.
Is age 65 or older.
Is male.
Is female.

The following explains how to interpret the nonparametric analyses results. Below is the graph from the report regarding thinking that climate change is a threat. It shows that 37.5% (rounded to 38% on the graph) of the entire sample of Delaware residents think that climate change is a *very serious* threat. The z-score analysis provides information regarding the differences in thinking climate change is a very serious threat among various mutually exclusive groups that make up the sample, such as the difference between respondents who have children in their household and respondents without children in their household and the difference between Delaware residents who live in a small city/town versus Delaware residents who live elsewhere.

**Q41. How serious a threat do you think climate change is?**



The table below shows the characteristics (i.e., responses to other questions) that are positively correlated with those 37.5% who think that climate change is a very serious threat. For example, residents of small cities/towns are more likely to think that climate change is a very serious threat than are those who do not live in a small city/town. (This row is in bold in the table below; it is in the table because the difference between the groups is statistically significant.) Note, however, that this does not mean that *all* small city/town residents think that climate change is a very serious threat (in fact, many do not); it simply means that small city/town residents are more likely to think that climate change is a very serious threat than are those not living in a small city/town. On the other hand, those who have children in their household are *not* more likely to think that climate change is a very serious threat than are those who do *not* have children in their household—the likelihood of thinking climate change is a serious threat is about the same in those two groups. (There is no row for this because the table shows only statistically significant correlations, and this variable has no statistically significant correlation associated with it.)

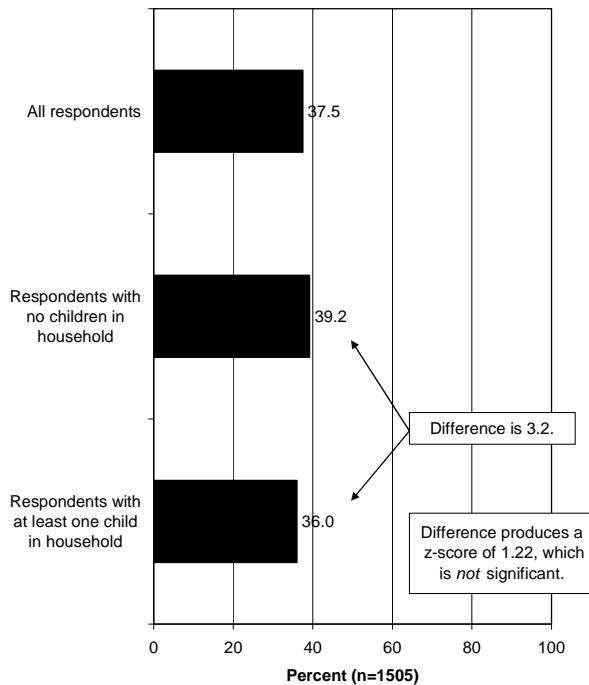
<b>Thinks that climate change is a very serious threat.</b>	<b>Z-SCORE</b>
Is completely or mostly convinced that sea levels are rising. ( $p \leq 0.001$ )	13.13
Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts. ( $p \leq 0.001$ )	12.04
Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less. ( $p \leq 0.001$ )	10.96
Thinks that Delaware's governor should be doing more to address or reduce the impacts of sea level rise in Delaware. ( $p \leq 0.001$ )	8.33
Strongly supports changing building codes and regulations to reduce risk in flood prone areas to address sea level rise in Delaware or reduce its impacts. ( $p \leq 0.001$ )	7.73
Is very likely or somewhat likely to write letters, send e-mails, etc. ( $p \leq 0.001$ )	6.73
Considers himself or herself to be black or African-American. ( $p \leq 0.001$ )	4.49
Lives in New Castle County. ( $p \leq 0.01$ )	3.1
Would most like to have more information on how to protect property from sea level rise. ( $p \leq 0.01$ )	3.02
Has been a Delaware resident for less than the mean of 30 years. ( $p \leq 0.01$ )	2.72
<b>Considers his or her place of residence to be a small city or town. (<math>p \leq 0.05</math>)</b>	<b>2.35</b>
Rents his or her current place of residence. ( $p \leq 0.05$ )	2.32
Is female. ( $p \leq 0.05$ )	2.19
INSIGNIFICANT AND NEGATIVE Z-SCORES OMITTED	

Two graphs follow that show specifically what the z-score calculations consider. These graphs show the percentages of various subgroups who think that climate change is a very serious threat. The first graph illustrates a non-significant z-score finding (has children in household versus

does not have children in household); the second graph illustrates a significant z-score finding (lives in small city/town versus does not live in a small city/town). Note that “Has children in household” is *not* on the z-score table previously shown because it does *not* have a significant correlation to thinking that climate change is a very serious threat; however, “Lives in a small city/town” is on the z-score table because that characteristic has a significant correlation to thinking that climate change is a very serious threat.

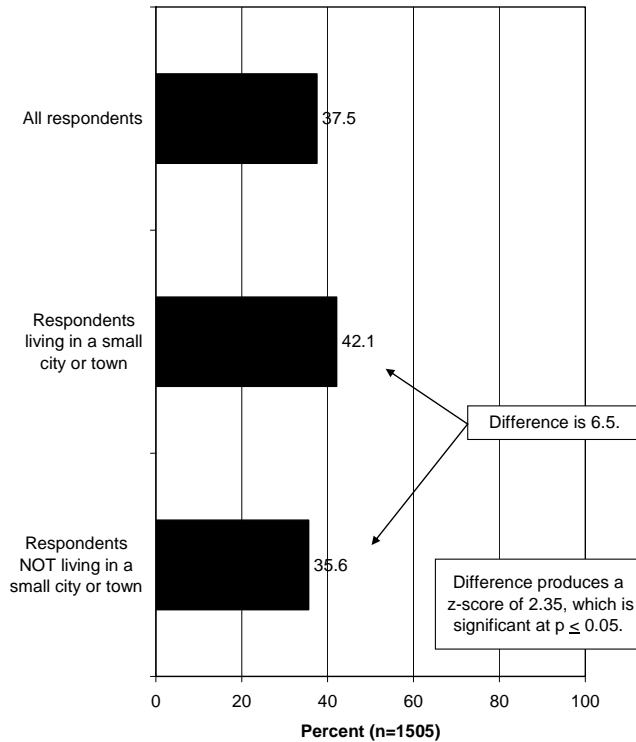
On the graphs, the first bar simply shows the percentage among all respondents who think that climate change is a very serious threat. Below the top bar are two bars for the percentage of various subgroups (on the first graph, “Has children in household” versus “Does not have children in household”; on the second graph, “Lives in small city/town” versus “Does not live in small city/town”) who think that climate change is a very serious threat. A text box shows the differences in these two latter bars. Note that there is not much difference in the two groups in the first graph, but there is a large difference between the two groups in the second graph.

**Q41. How serious a threat do you think climate change is? (Respondents who answered "Very serious" as their response.)**





**Q41. How serious a threat do you think climate change is? (Respondents who answered "Very serious" as their response.)**



On the following page is a table that shows all of the significant positive z-scores associated with thinking that climate change is a very serious threat, with the percentages of each subgroup who hold that opinion and the differences between them. (The bolded row corresponds with one of the two graphs on the previous pages.) This shows, for example, that 42% of those who live in a small city/town think that climate change is a very serious threat, but 36% of those who do not live in a small city/town think that climate change is a very serious threat.

<b>Thinks that climate change is a very serious threat.</b>	<b>Percent who responded that climate change was a very serious threat (among those in the group listed in the row)</b>	<b>Percent who responded that climate change was a very serious threat (among those NOT in the group listed in the row)</b>	<b>Percent difference</b>	<b>z-score</b>
Is completely or mostly convinced that sea levels are rising. ( $p \leq 0.001$ )	83	17	66	13.13
Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts. ( $p \leq 0.001$ )	54	24	30	12.04
Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less. ( $p \leq 0.001$ )	51	23	28	10.96
Thinks that Delaware's governor should be doing more to address or reduce the impacts of sea level rise in Delaware. ( $p \leq 0.001$ )	54	25	29	8.33
Strongly supports changing building codes and regulations to reduce risk in flood prone areas to address sea level rise in Delaware or reduce its impacts. ( $p \leq 0.001$ )	41	18	23	7.73
Is very likely or somewhat likely to write letters, send e-mails, etc. ( $p \leq 0.001$ )	56	31	25	6.73
Considers himself or herself to be black or African-American. ( $p \leq 0.001$ )	54	36	18	4.49
Lives in New Castle County. ( $p \leq 0.01$ )	41	33	8	3.1
Would most like to have more information on how to protect property from sea level rise. ( $p \leq 0.01$ )	45	36	9	3.02
Has been a Delaware resident for less than the mean of 30 years. ( $p \leq 0.01$ )	40	33	7	2.72
<b>Considers his or her place of residence to be a small city or town. (<math>p \leq 0.05</math>)</b>	<b>42</b>	<b>36</b>	<b>6</b>	<b>2.35</b>
Rents his or her current place of residence. ( $p \leq 0.05$ )	41	36	5	2.32
Is female. ( $p \leq 0.05$ )	40	35	5	2.19
<b>INSIGNIFICANT AND NEGATIVE Z-SCORES OMITTED</b>				

The z-score results are presented in the text; instead of showing the raw z-score, the write-up shows the statistical significance expressed as a p value, as discussed previously: either  $p \leq 0.05$ ,  $p \leq 0.01$ , or  $p \leq 0.001$ . In the first instance ( $p \leq 0.05$ ), the correlation would happen by chance only 5 out of 100 times. A statistical significance of  $p \leq 0.01$  means the correlation would happen by chance only 1 out of 100 times. Finally, a statistical significance of  $p \leq 0.001$  means the correlation would happen by chance only 1 out of 1,000 times.

Throughout this report, findings of the telephone survey are reported at a 95% confidence interval (or higher). For the entire sample of Delaware residents ages 18 years and older, the sampling error is at most plus or minus 2.52 percentage points. This means that if the survey were conducted 100 times on different samples that were selected in the same way, the findings of 95 out of the 100 surveys would fall within plus or minus 2.52 percentage points of each other. Sampling error was calculated using the formula described below, with a sample size of 1,505 and a population size of 685,085 residents ages 18 years and older.

### Sampling Error Equation

$$B = \left( \sqrt{\frac{N_p(.25)}{N_s} - .25} \right) (1.96)$$

Where: B = maximum sampling error (as decimal)  
 N<sub>P</sub> = population size (i.e., total number who could be surveyed)  
 N<sub>S</sub> = sample size (i.e., total number of respondents surveyed)

Derived from formula: p. 206 in Dillman, D. A. 2000. *Mail and Internet Surveys*. John Wiley & Sons, NY.

**Note:** This is a simplified version of the formula that calculates the maximum sampling error using a 50:50 split (the most conservative calculation because a 50:50 split would give maximum variation).

Note that some results may not sum to exactly 100% because of rounding. Additionally, rounding on the graphs may cause apparent discrepancies of 1 percentage point between the graphs and the reported results of combined responses (e.g., when “strongly support” and “moderately support” are summed to determine the total percentage in support).

## PERCEPTIONS OF IMPORTANT ENVIRONMENTAL ISSUES

- Delaware residents were asked to rate their concern about 10 issues that the country faces, listed in Text Box 1 below.
- The economy (75% are *very* concerned) and health care (72%) top the list, as ranked by the percentage saying that they are *very* concerned about the issues. (The timing of the survey—December 2009—may have some effect on these results, coming during one of the deepest recessions in decades and during the time Congress was debating and taking action on health care.)
  - A middle tier consists of public education (65%), national security (60%), energy resources (59%), social security (57%), the environment (55%), and crime rates (52%).
  - At the bottom of the ranking are climate change (36%) and sea level rise (30%), in the ranking by the percentage saying that they are *very* concerned.

**Text Box 1**  
**Concern About Issues That the Country Faces (Ranked by the Percentage Who Are Very Concerned About the Following Issues)**

The economy  
Health care  
Public education  
National security  
Energy resources  
Social security  
The environment  
Crime rates  
Climate change  
Sea level rise

- The above series was crosstabulated by gender. Women, compared to men, are more likely to be *very* concerned about each of the issues listed below that the country faces; the lone exception is the economy, where men and women have similar opinions.
- Public education ( $p \leq 0.001$ ).
  - Health care ( $p \leq 0.001$ ).
  - Crime rates ( $p \leq 0.01$ ).

- Social Security ( $p \leq 0.001$ ).
  - Energy resources ( $p \leq 0.05$ ).
  - The environment ( $p \leq 0.001$ ).
  - Climate change ( $p \leq 0.001$ ).
  - Sea level rise ( $p \leq 0.001$ ).
  - National security ( $p \leq 0.01$ ).
- The above series was crosstabulated by age. Older people, compared to the two other age groups, are more likely to be *very* concerned about three of the items:
- Health care ( $p \leq 0.05$ ).
  - Crime rates ( $p \leq 0.01$ ).
  - National security ( $p \leq 0.01$ ).
- Another series of questions asked residents to rate their concern about nine environmental issues in Delaware, listed in Text Box 2 below.
- At the top of the ranking by the percentage being *very* concerned (as well as the ranking by *very* or *somewhat* concerned) are three issues related to pollution: water pollution (76% are very concerned), toxic waste (72%), and air quality (65%).
  - A middle tier consists of habitat and wildlife-related issues: loss of forest habitat (58%), declining fish and wildlife populations (54%), and loss of marsh or wetlands (45%).
  - At the bottom are flooding (42%), climate change (36%), and sea level rise (32%).

**Text Box 2****Concern About Environmental Issues That Delaware Faces (Ranked by the Percentage Who Are Very Concerned About the Following Issues)**

Water pollution  
Toxic waste  
Air quality  
Loss of forest habitat  
Declining fish and wildlife populations  
Loss of marsh or wetlands  
Flooding  
Climate change  
Sea level rise

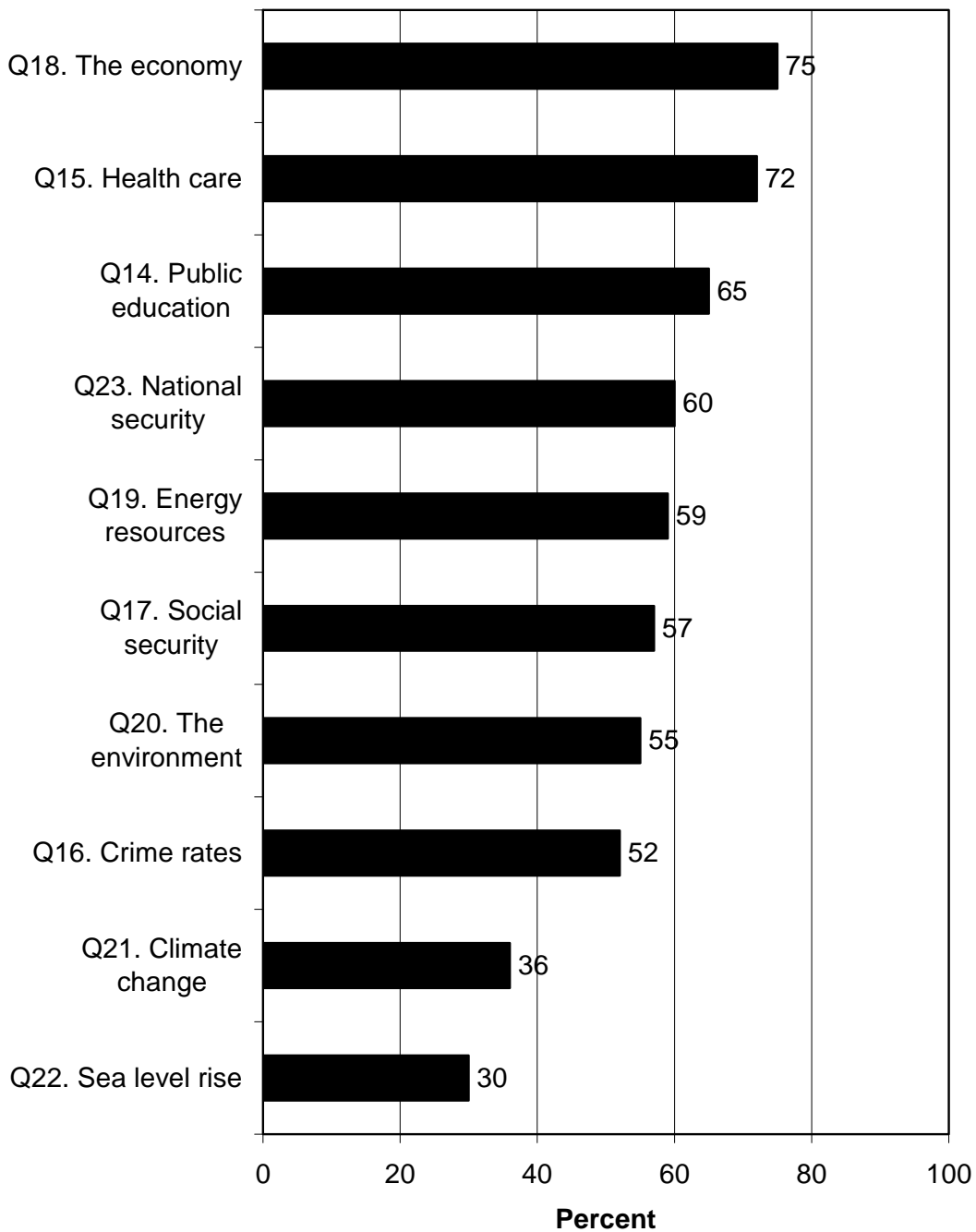
- The crosstabulation by county found several statistically significant differences in three of the questions in the above series.
  - Kent County residents, compared to residents of the other two counties, are the least likely to be concerned about air quality ( $p \leq 0.05$ ).
  - Kent County residents are the least likely to be concerned about climate change in Delaware ( $p \leq 0.05$ ).
  - Finally, Kent County residents are the least likely to be concerned about declining fish and wildlife populations in Delaware ( $p \leq 0.01$ ).
  
- In the above series, the crosstabulation by coastal/non-coastal found a marked difference on the question about concern regarding flooding: coastal residents, compared to non-coastal residents, are more likely to be *very* concerned about flooding in Delaware ( $p \leq 0.01$ ).
  
- The above series was crosstabulated by gender. Women, compared to men, are more likely to be *very* concerned about each of the environmental issues listed below:
  - Water pollution ( $p \leq 0.05$ ).
  - Climate change ( $p \leq 0.001$ ).
  - Sea level rise ( $p \leq 0.001$ ).
  - Flooding ( $p \leq 0.001$ ).
  
- The above series was crosstabulated by age.
  - Younger people, compared to the other two age groups, are more likely to be *very* concerned about water pollution in Delaware ( $p \leq 0.05$ ).
  - The middle age group, compared to the other two age groups, are more likely to be *very* concerned about toxic waste ( $p \leq 0.05$ ).
  - The middle age group, compared to the other two age groups, are more likely to be *very* concerned about air quality in Delaware ( $p \leq 0.05$ ).
  - The older age group, compared to the other two age groups, are *less* likely to be *very* concerned about flooding in Delaware ( $p \leq 0.01$ ).
  - The middle age group, compared to the other two age groups, are more likely to be *very* concerned about declining fish and wildlife populations ( $p \leq 0.001$ ).

- After the above series of questions, residents were asked if any other environmental issues concerned them: they most commonly gave a pollution-related answer.
  - The crosstabulation by county of residence found that Kent County residents are the most likely, compared to residents of the other two counties, to indicate that over-development/loss of open space is an environmental issue of concern in Delaware ( $p \leq 0.05$ ).
  
- In a direct question, residents are split regarding their worrying about climate change: a slight majority of residents (53%) say that they personally worry about climate change *a great deal* or *a moderate amount*, but just under a majority (46%) worry *only a little* or *not at all*. (Note that this question is included in the series of questions analyzed together in the section of this report titled “Perceptions of Climate Change as a Threat.”)
  - Women, compared to men, are more likely to worry about climate change *a great deal* ( $p \leq 0.001$ ).
  - The middle age group, compared to the other two age groups, are more likely to worry about climate change *a great deal*, and they are also more likely to worry *a moderate amount* ( $p \leq 0.001$ ).
  - Those who say they know a great deal or moderate amount about climate change, compared to those who say they know a little or nothing, are more likely to worry about climate change *a great deal* or *moderate amount* ( $p \leq 0.001$ ). (Note that this crosstabulation was based on a response to a later question regarding self-professed knowledge about climate change.)
  
- Less than a majority of residents (39%) say that they personally worry about sea level rise *a great deal* or *a moderate amount*, while a large majority (60%) worry *only a little* or *not at all*. (Note that this question is included in the series of questions analyzed together in the section of this report titled “Perceptions of Climate Change as a Threat.”)
  - Kent County residents, compared to residents of the other two counties, are the *least* likely to personally worry a great deal or a moderate amount about sea level rise ( $p \leq 0.05$ ).
  - The younger age group, compared to the other two age groups, show the least amount of worry about sea level rise ( $p \leq 0.05$ ).

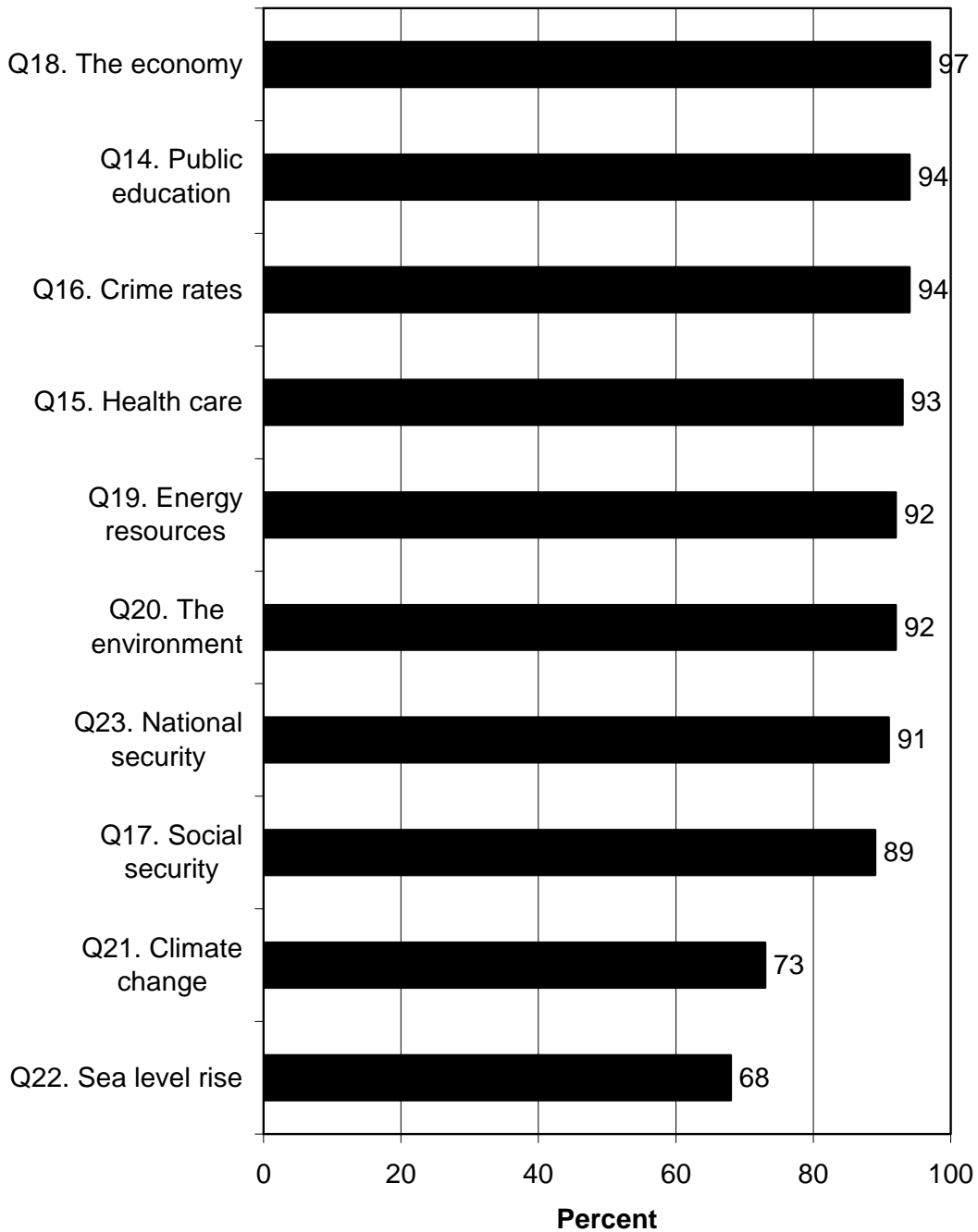
- Those who say they know a great deal or moderate amount about sea level rise, compared to those who say they know a little or nothing, are more likely to worry about sea level rise *a great deal* or *moderate amount* ( $p \leq 0.001$ ). (Note that this crosstabulation was based on a response to a later question regarding self-professed knowledge about sea level rise.)
- The survey also asked about residents' level of worry about the impacts of climate change on Delaware's environment, with slightly more concern than in either of the above questions: 60% worry *a great deal* or *a moderate amount*, while 39% worry *only a little* or *not at all*. (Note that this question is included in the series of questions analyzed together in the section of this report titled "Perceptions of Climate Change as a Threat.")



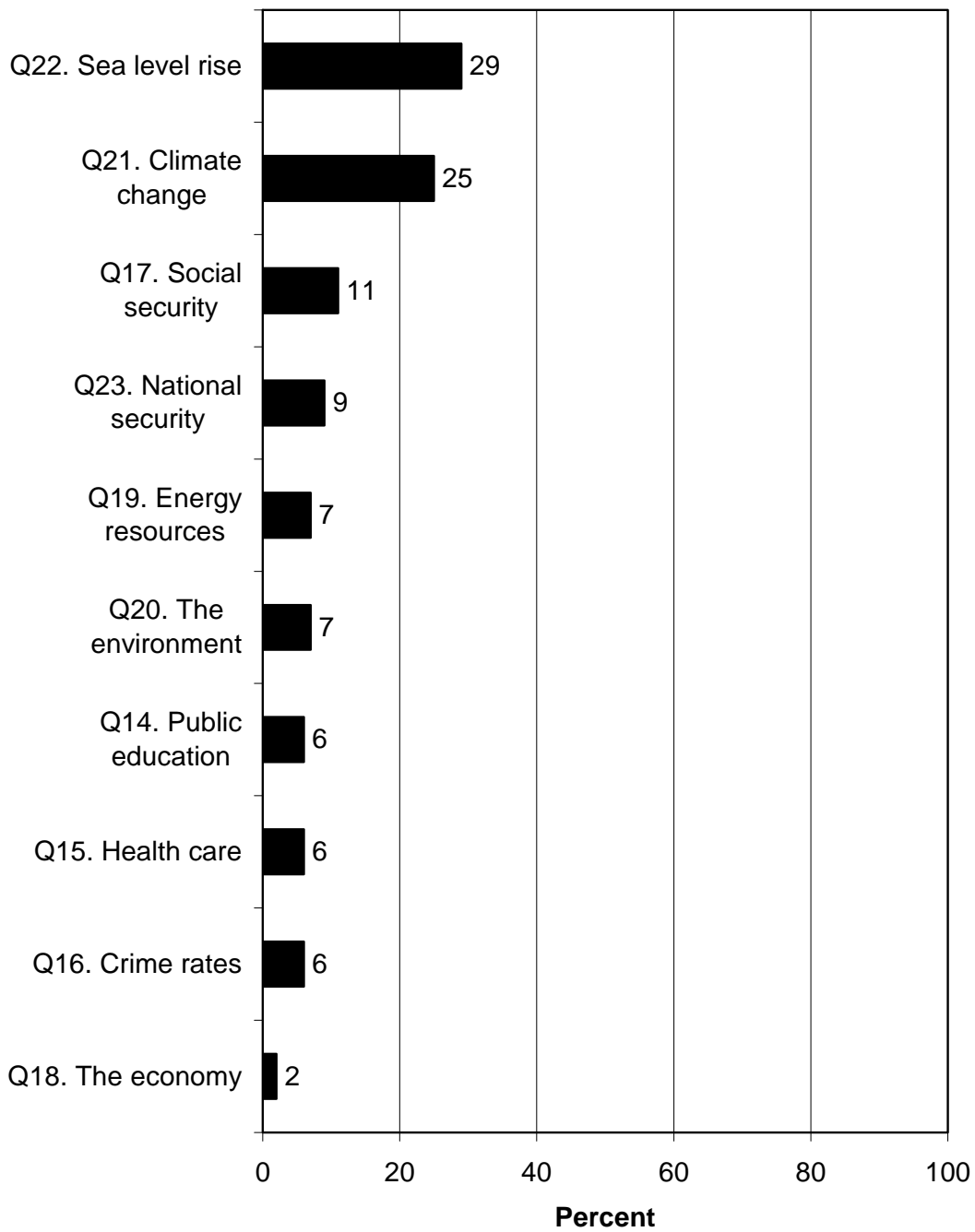
**Q14-23. Percent who are very concerned about the following issues that the country faces.**



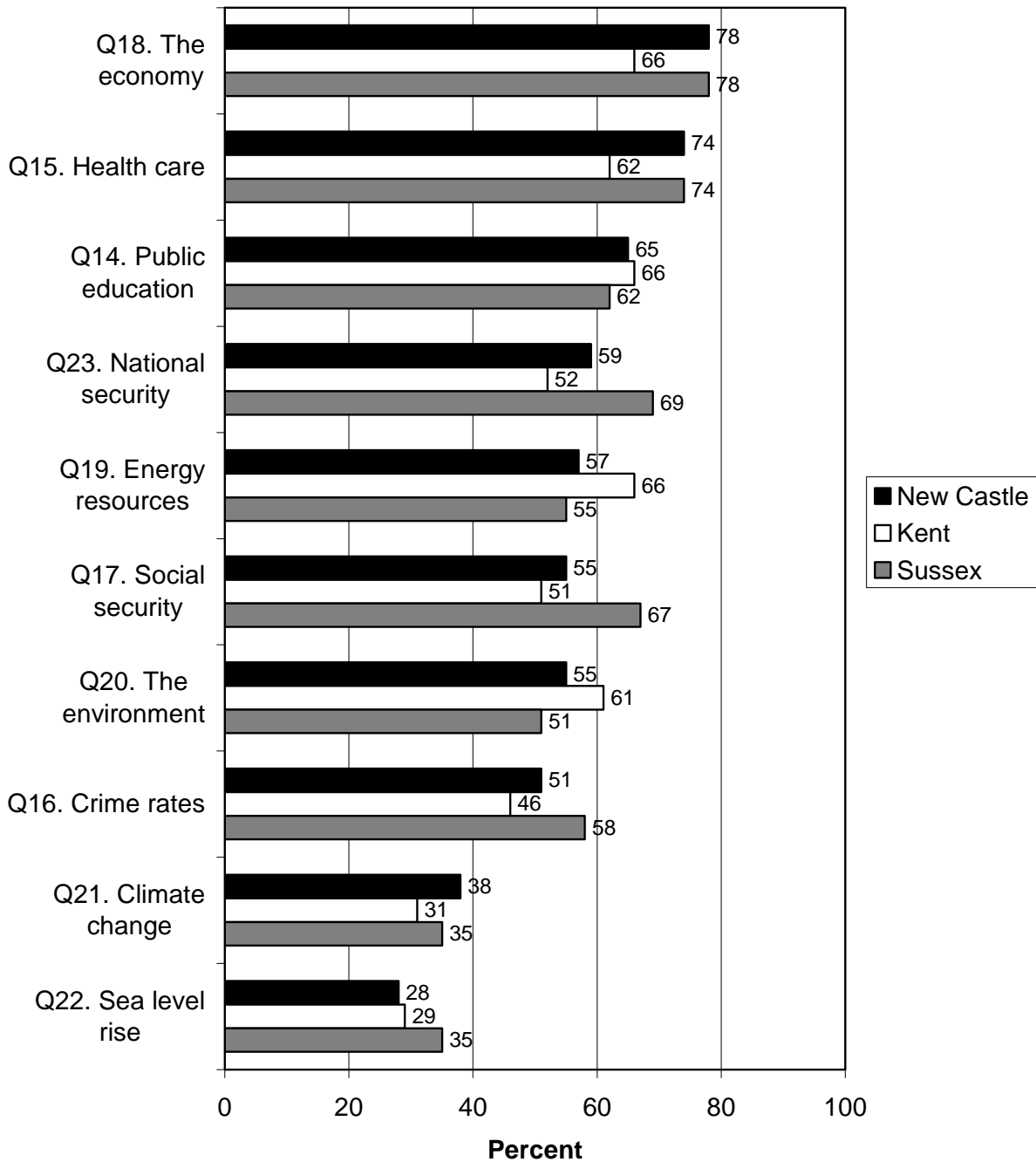
**Q14-23. Percent who are very or somewhat concerned about the following issues that the country faces.**



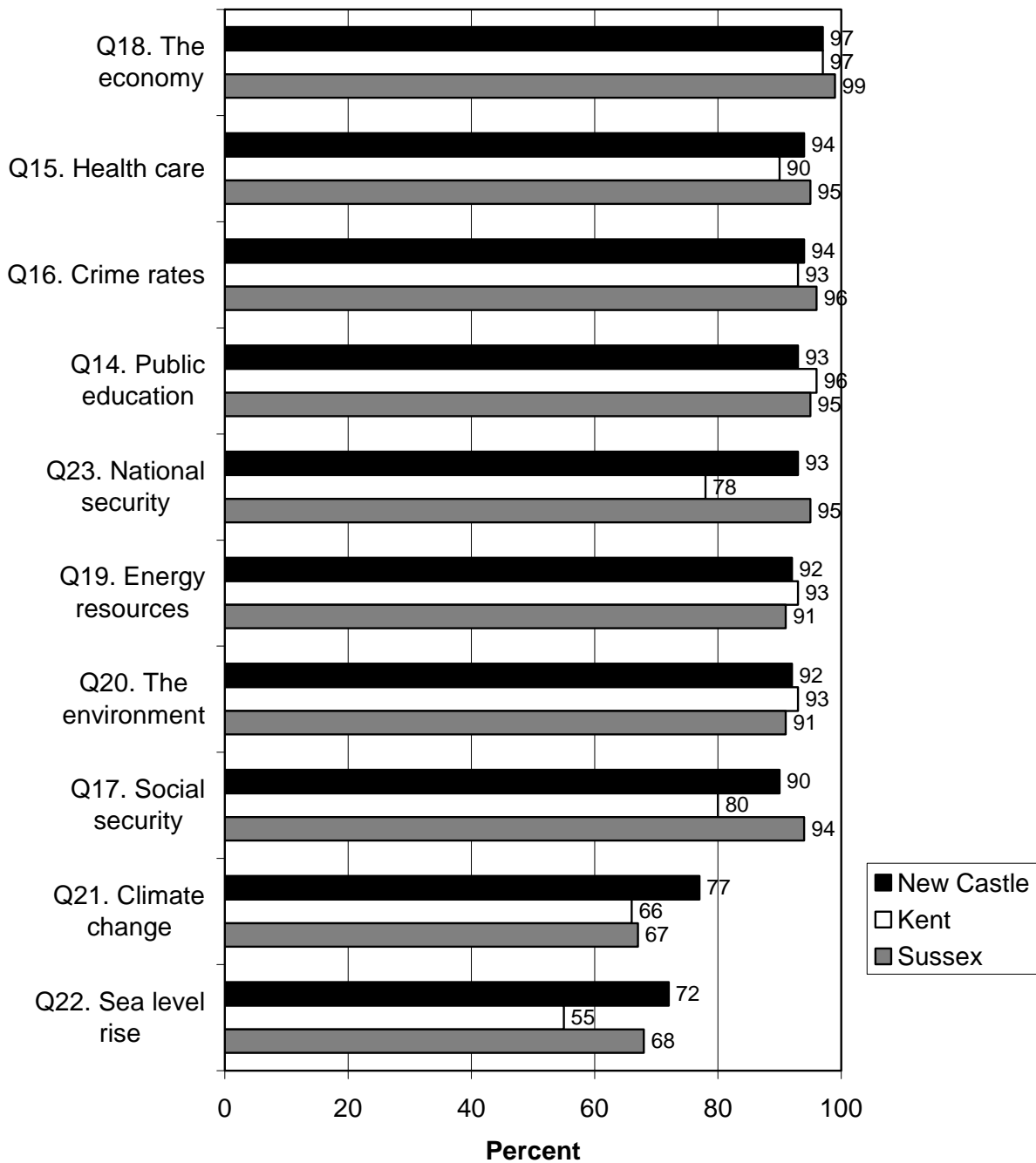
**Q14-23. Percent who are not at all concerned about the following issues that the country faces.**



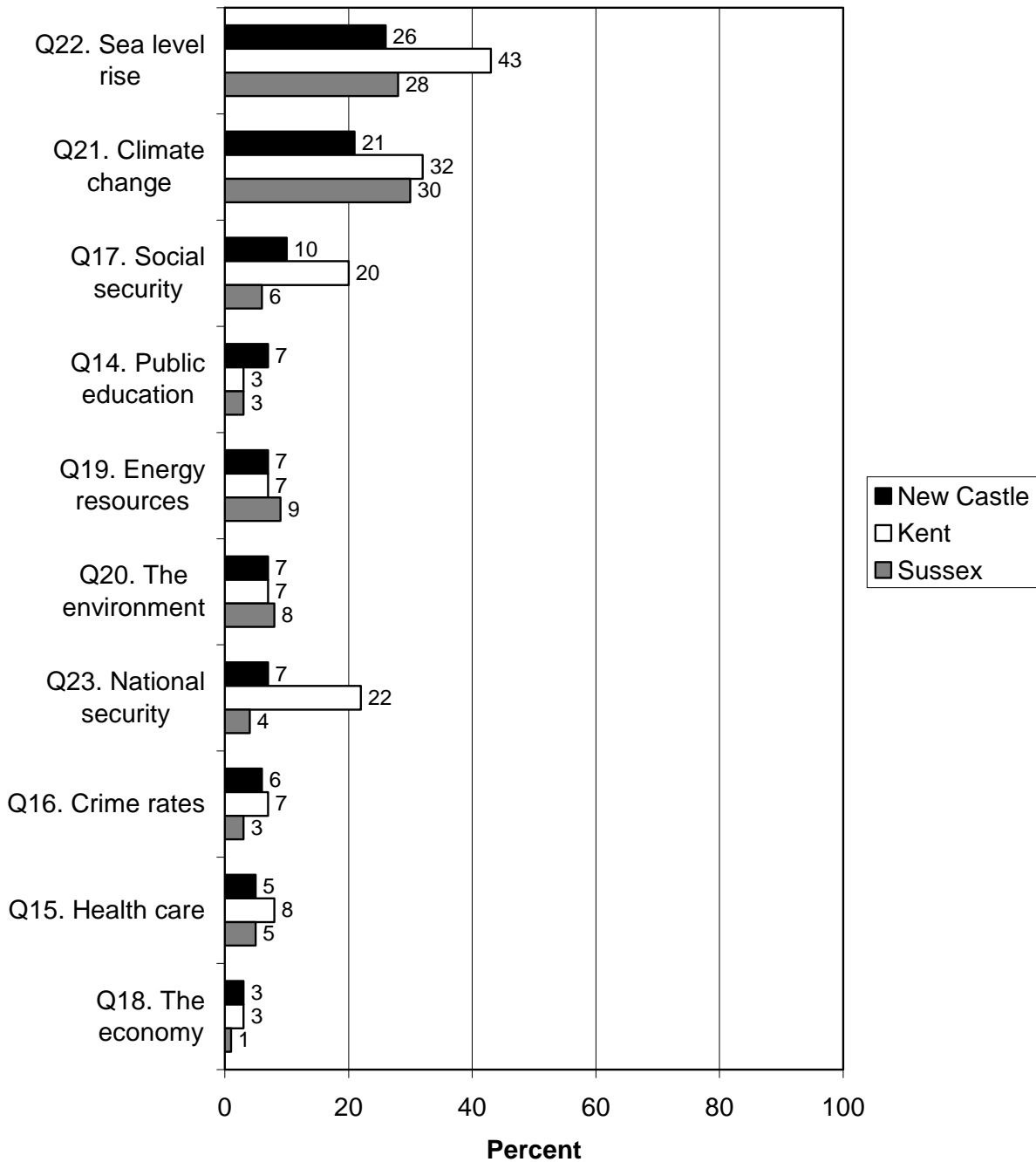
**Q14-23. Percent who are very concerned about the following issues that the country faces.**



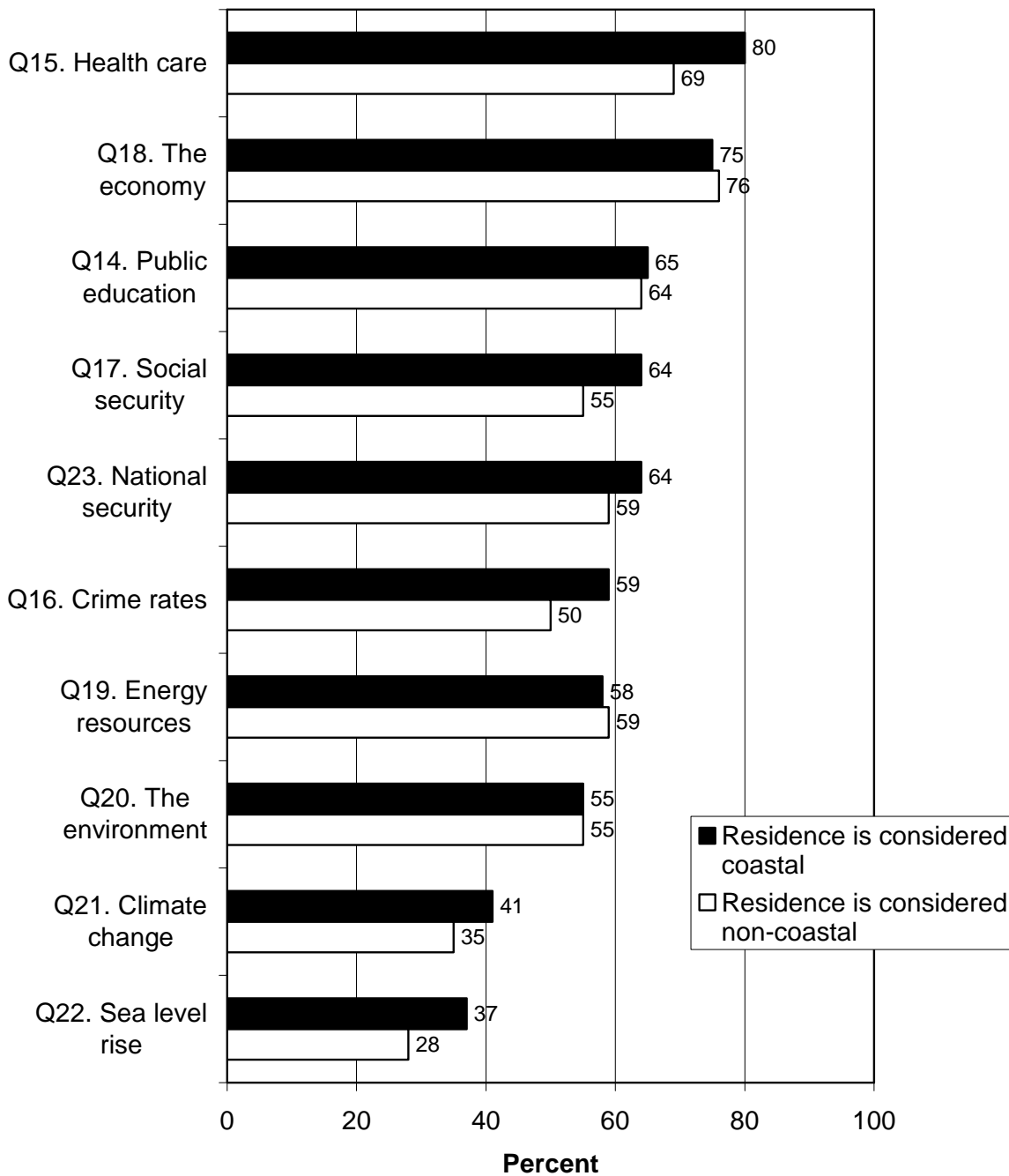
**Q14-23. Percent who are very or somewhat concerned about the following issues that the country faces.**



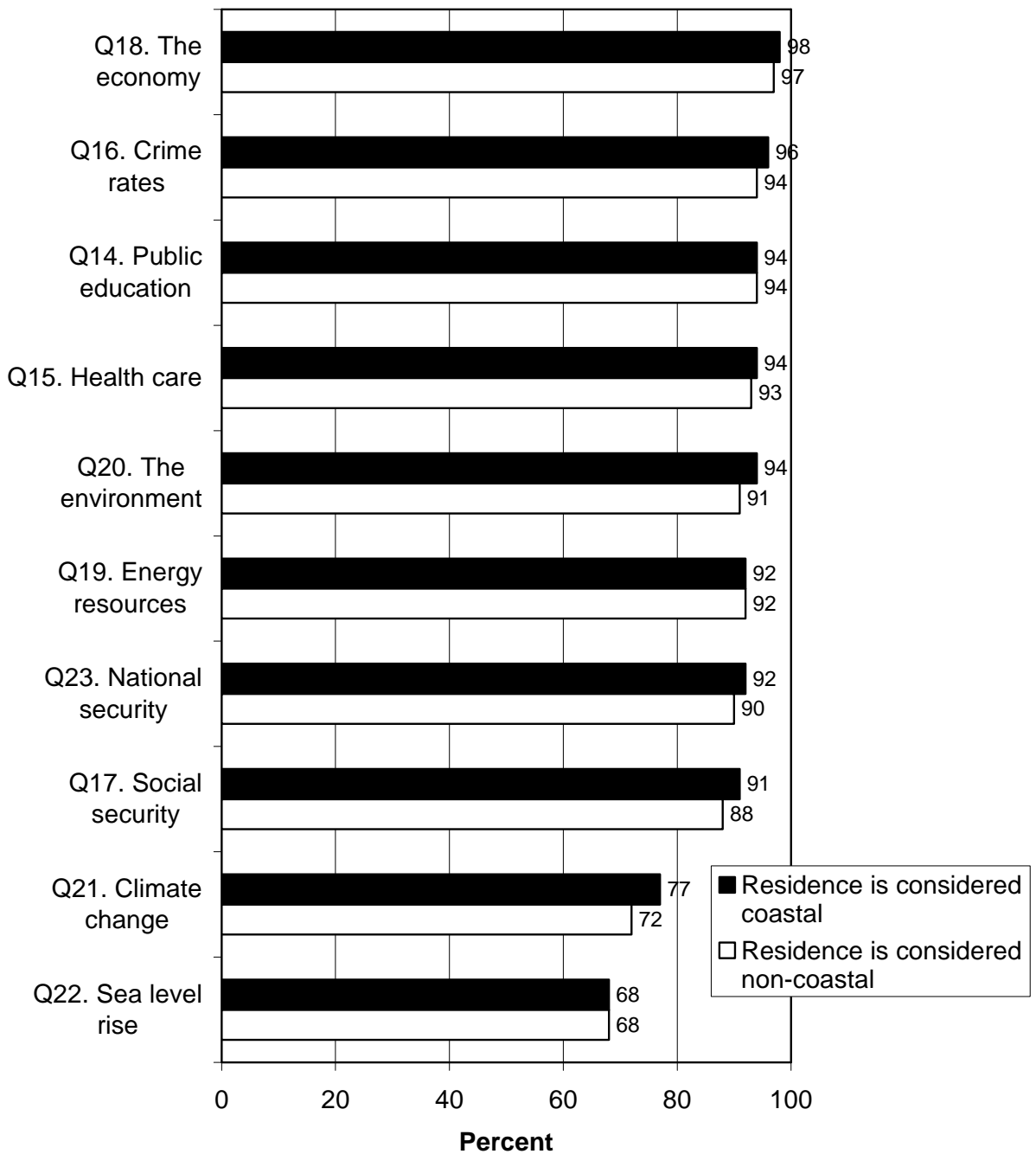
**Q14-23. Percent who are not at all concerned about the following issues that the country faces.**



**Q14-23. Percent who are very concerned about the following issues that the country faces.**

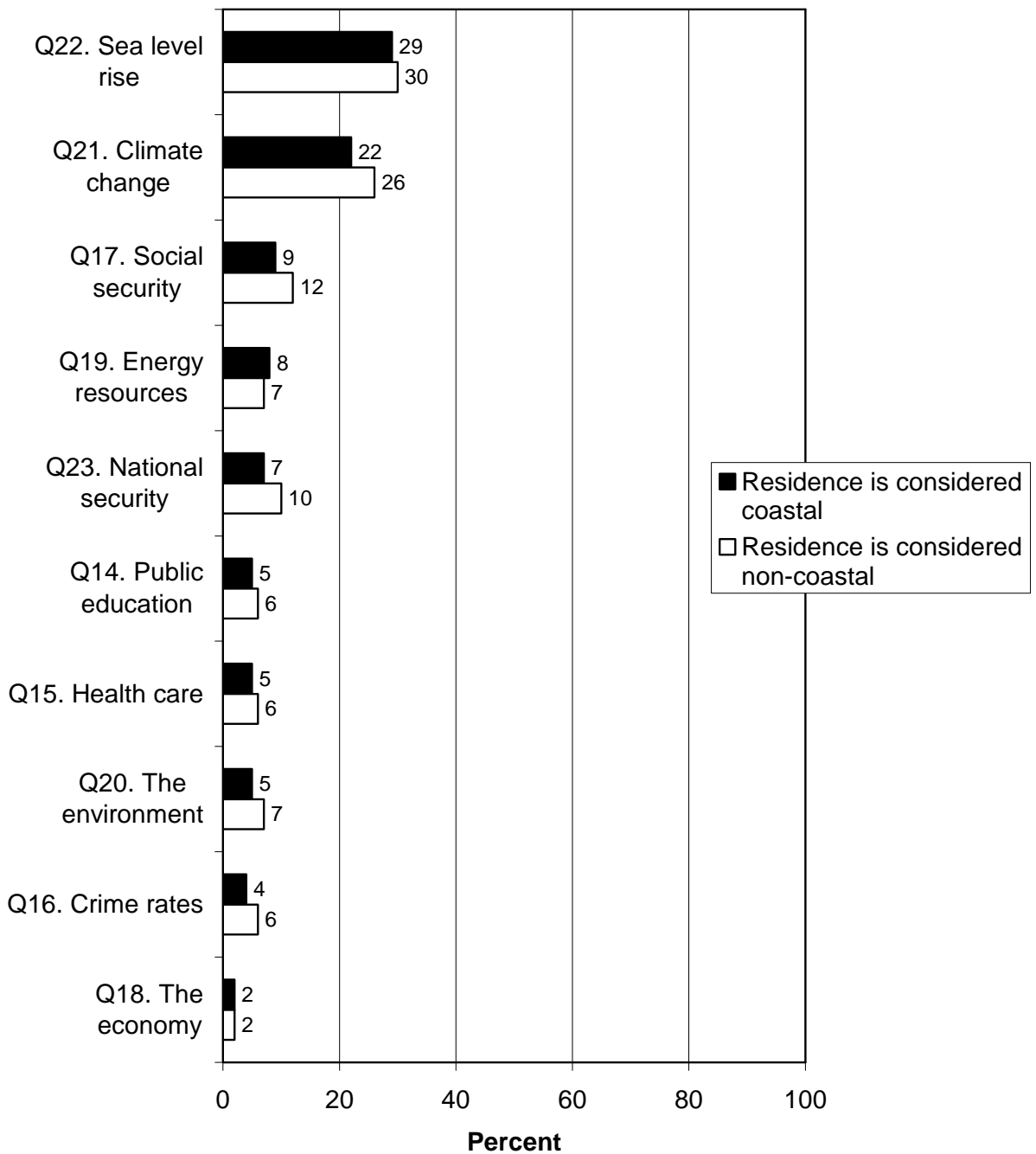


**Q14-23. Percent who are very or somewhat concerned about the following issues that the country faces.**

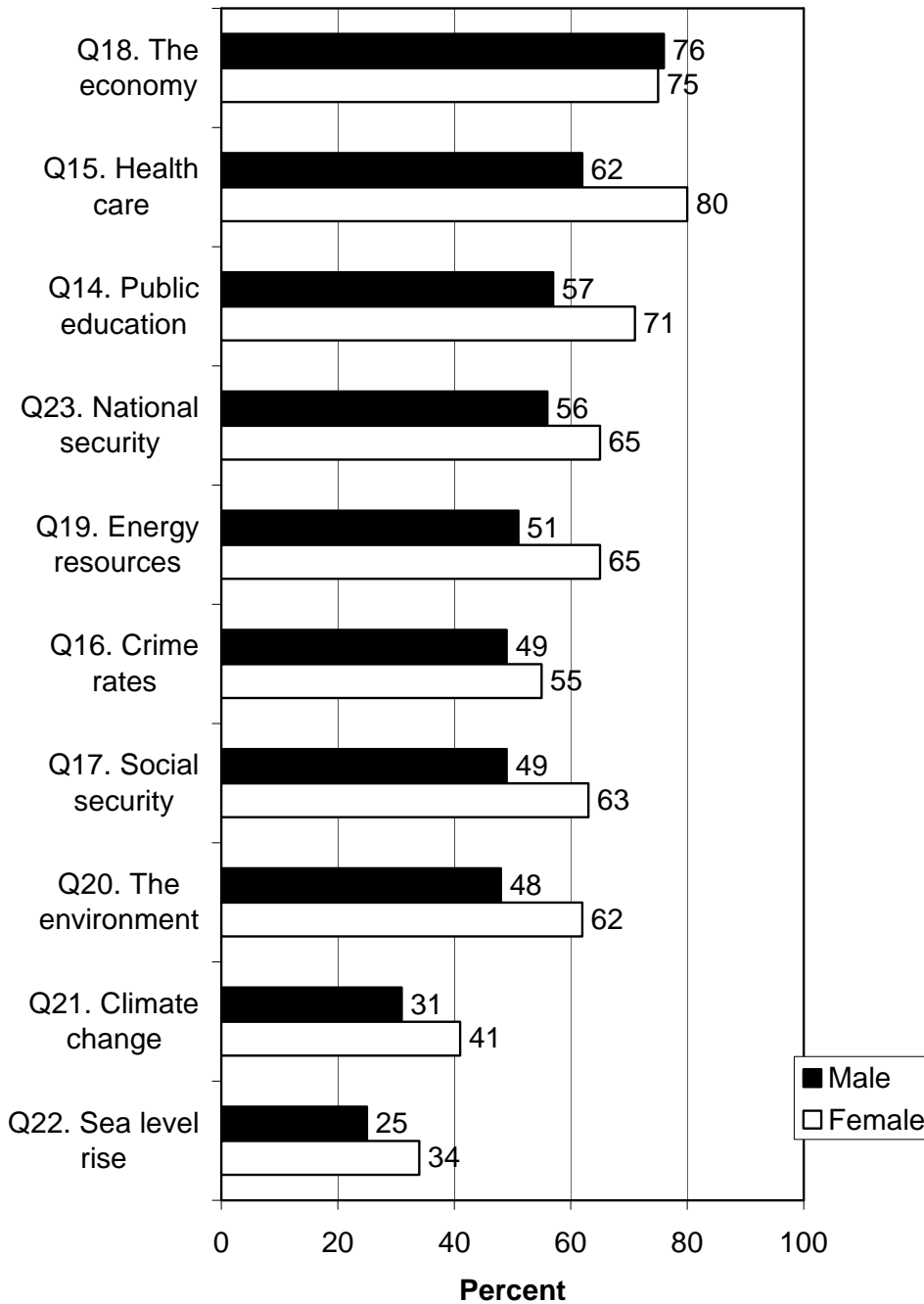




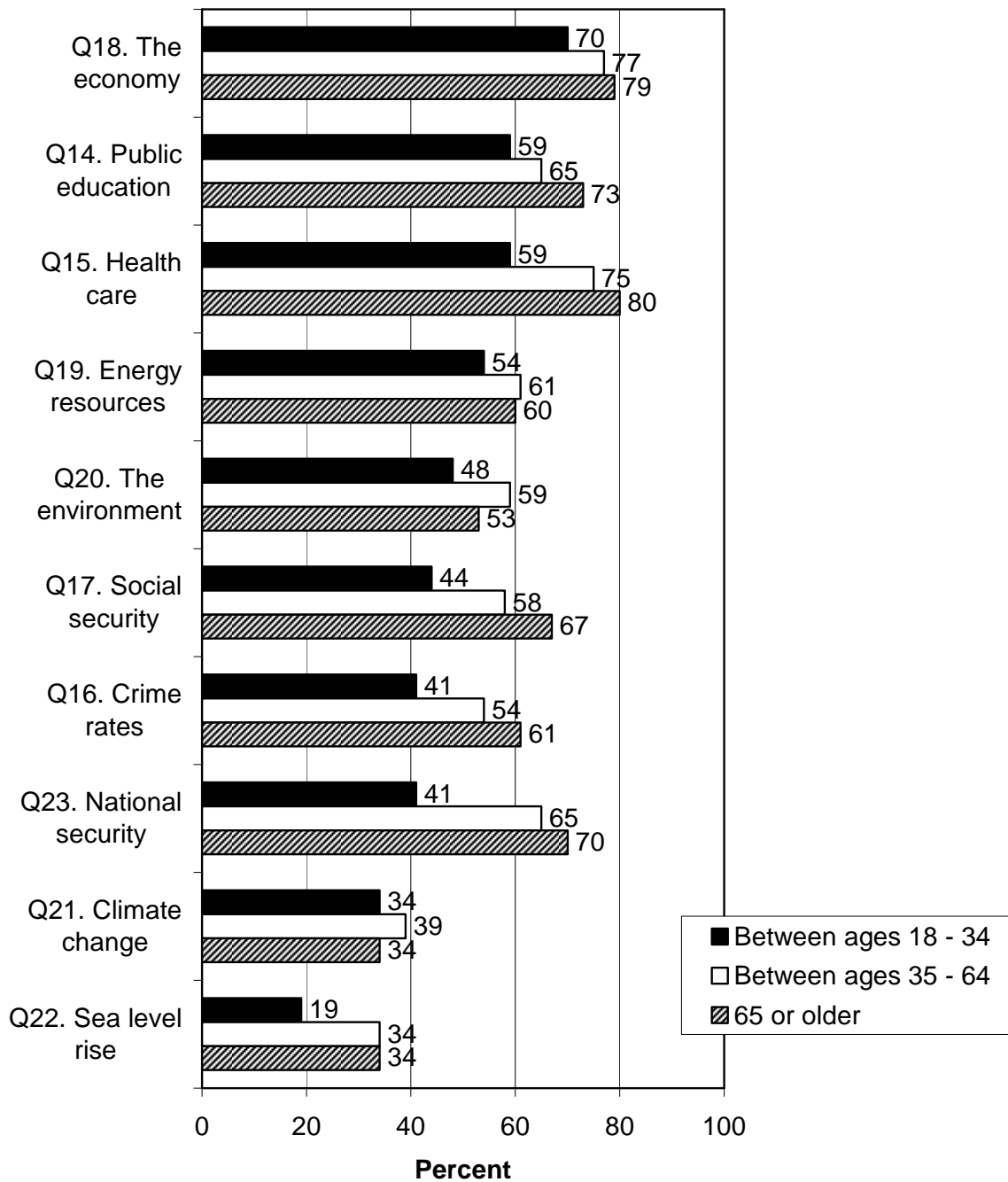
**Q14-23. Percent who are not at all concerned about the following issues that the country faces.**



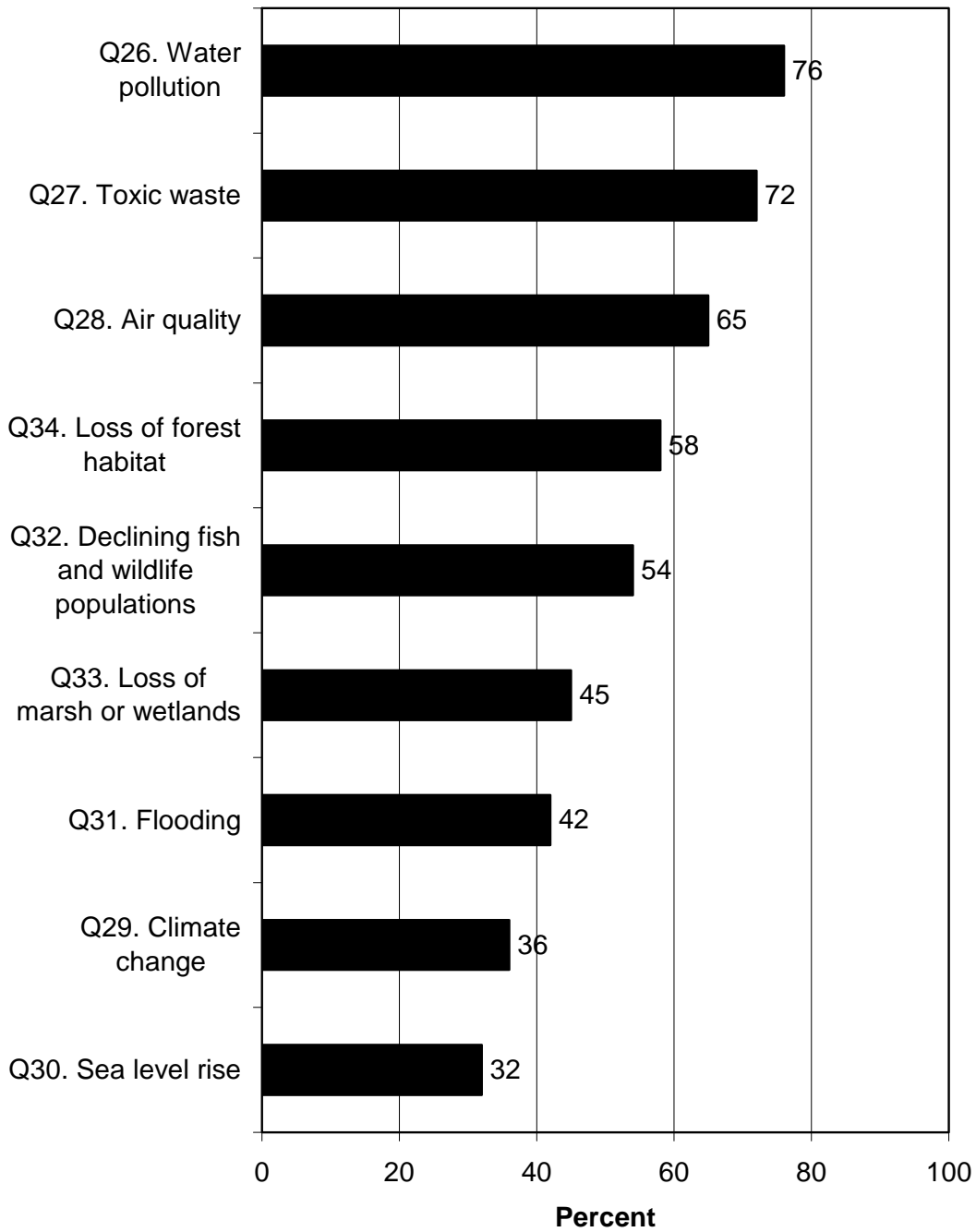
**Q14-23. Percent who are very concerned about the following issues that the country faces.**



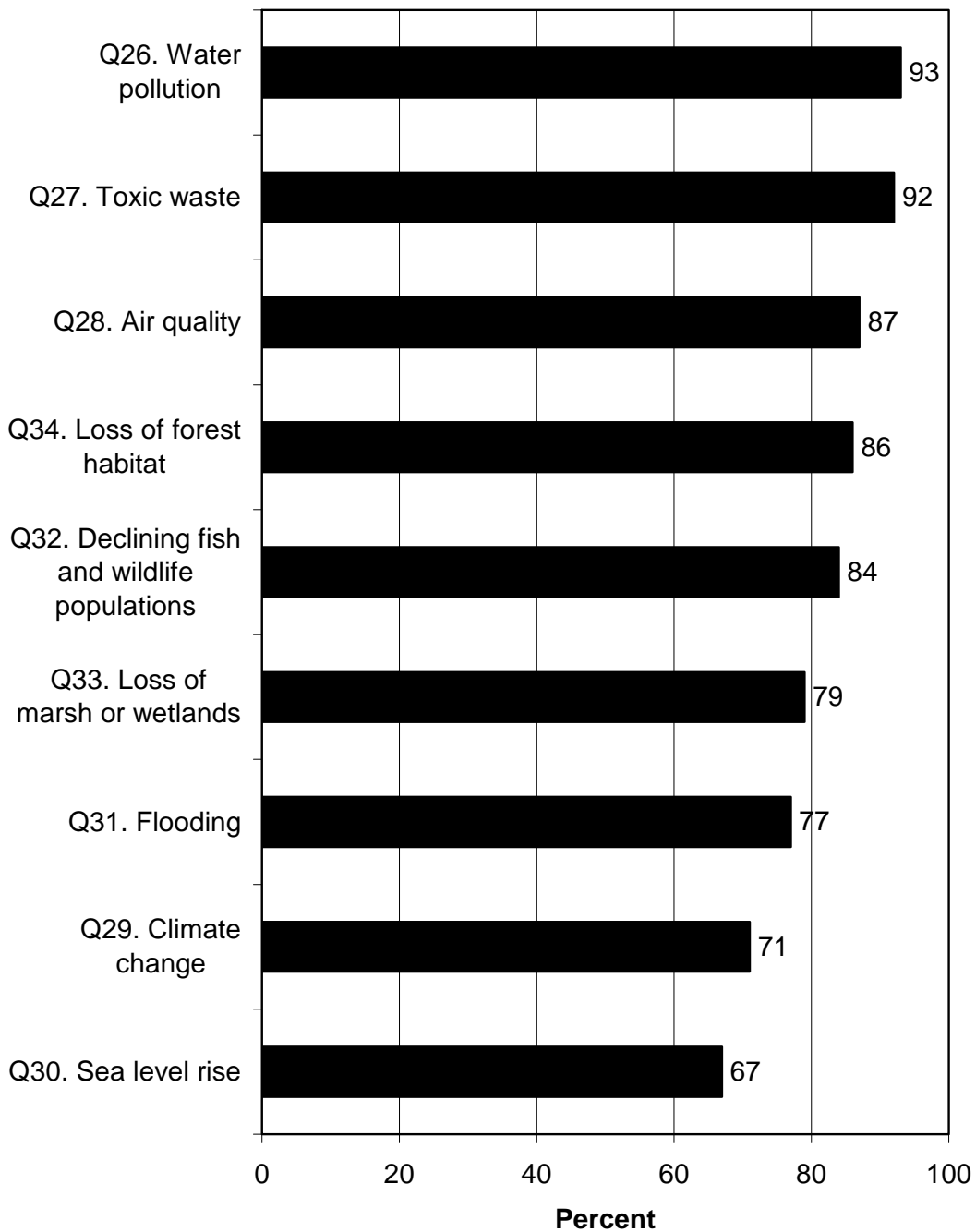
**Q14-23. Percent who are very concerned about the following issues that the country faces.**



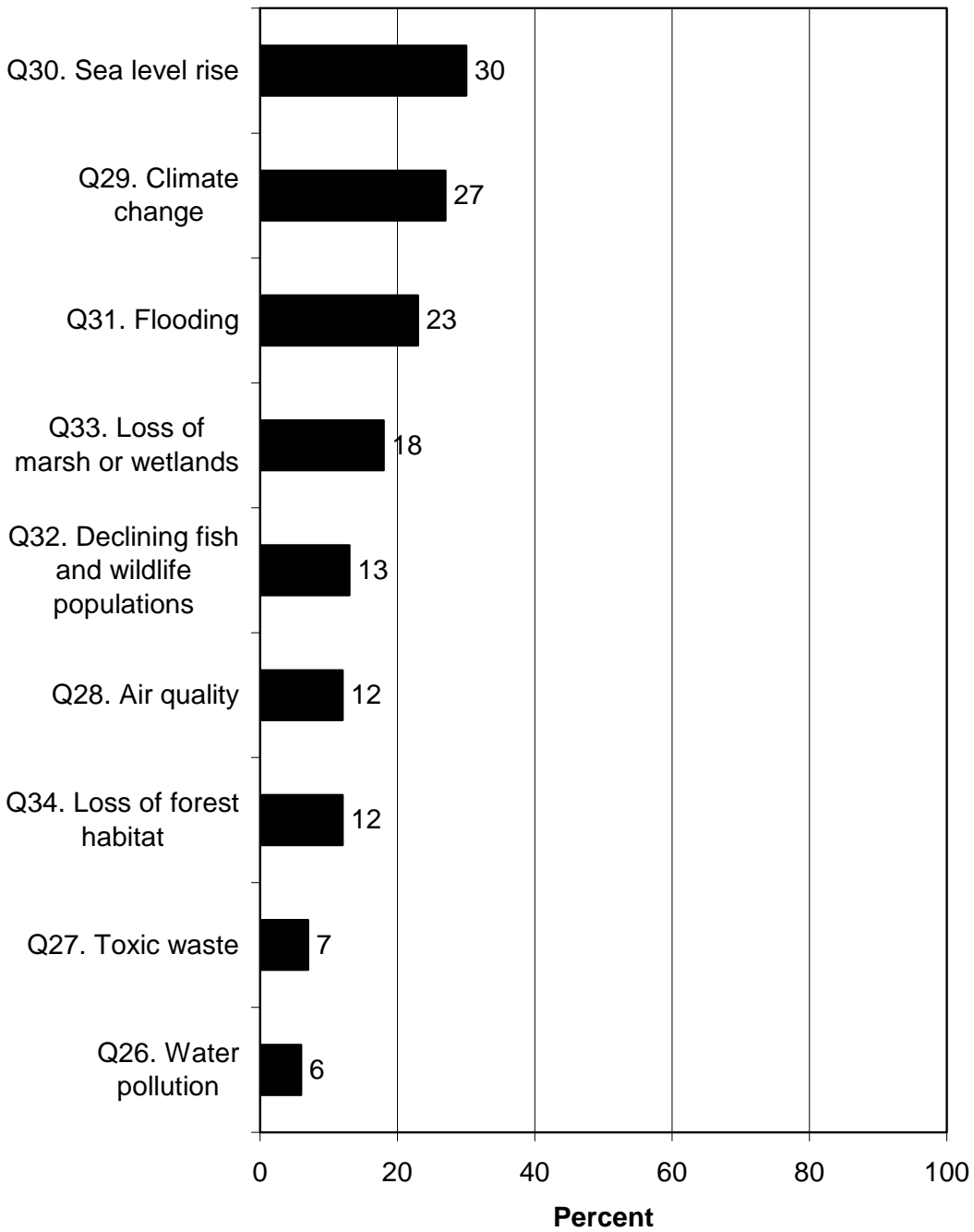
**Q26-34. Percent who are very concerned about the following environmental issues in Delaware.**



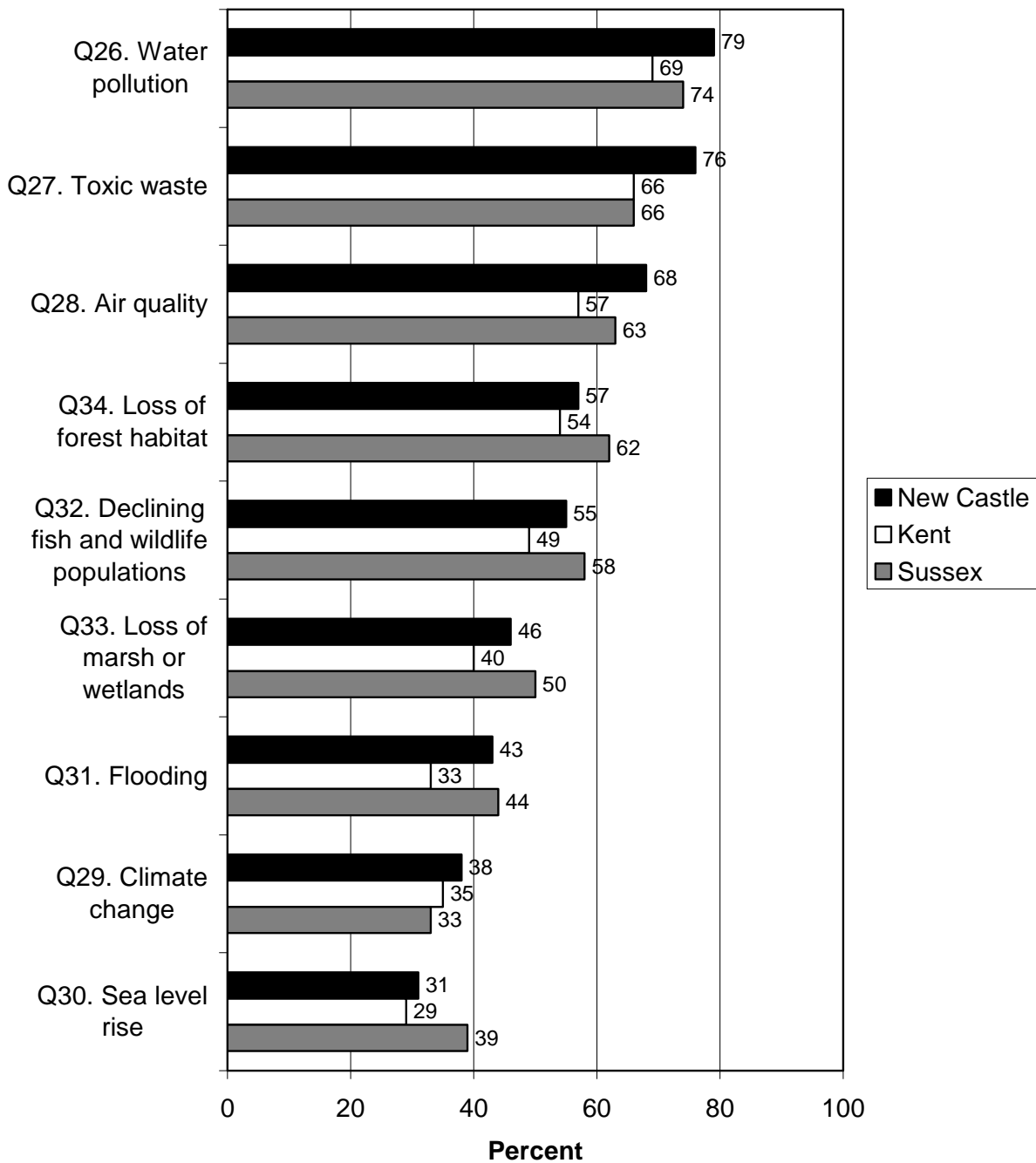
**Q26-34. Percent who are very or somewhat concerned about the following environmental issues in Delaware.**



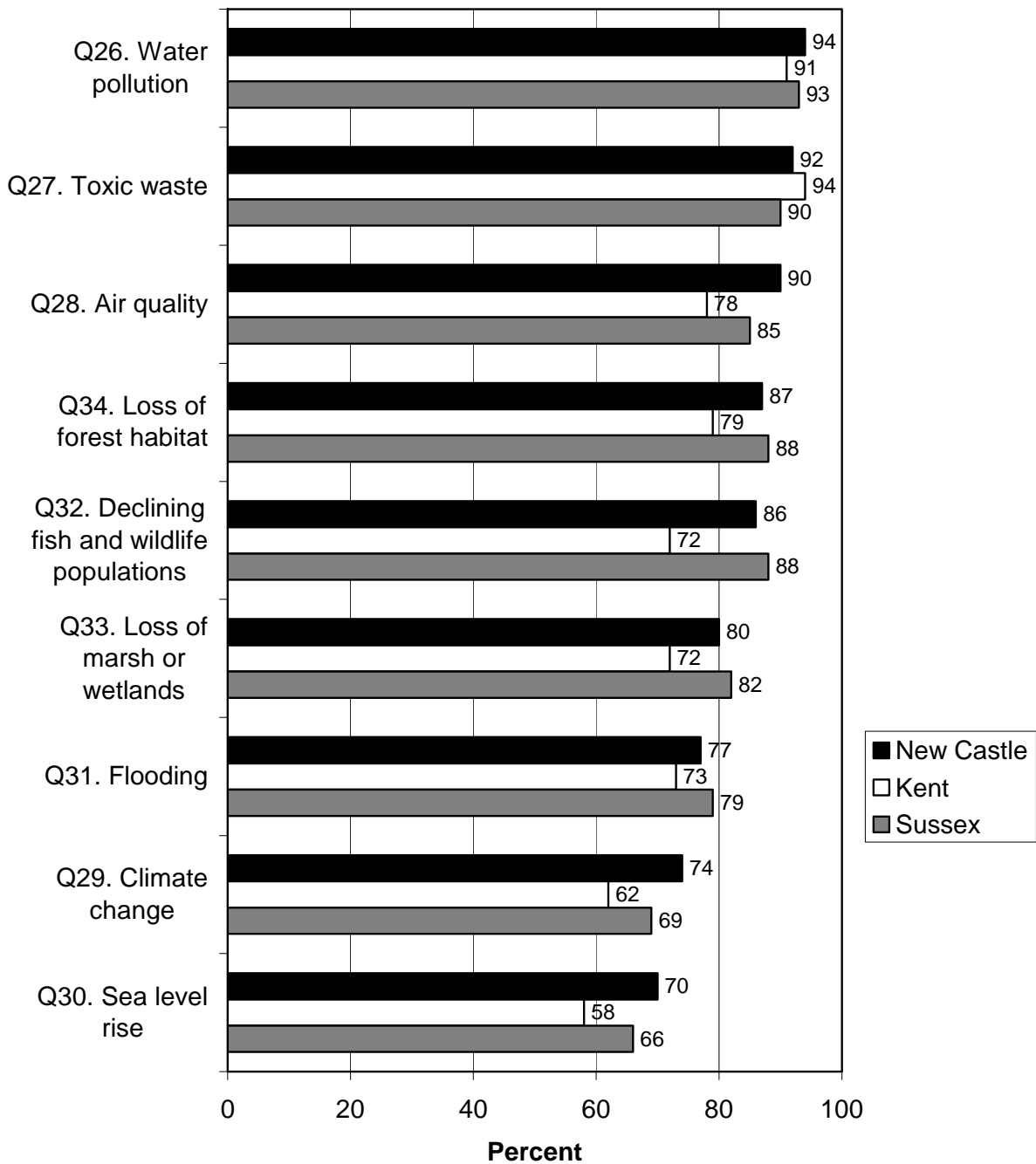
**Q26-34. Percent who are not at all concerned about the following environmental issues in Delaware.**



**Q26-34. Percent who are very concerned about the following environmental issues in Delaware.**

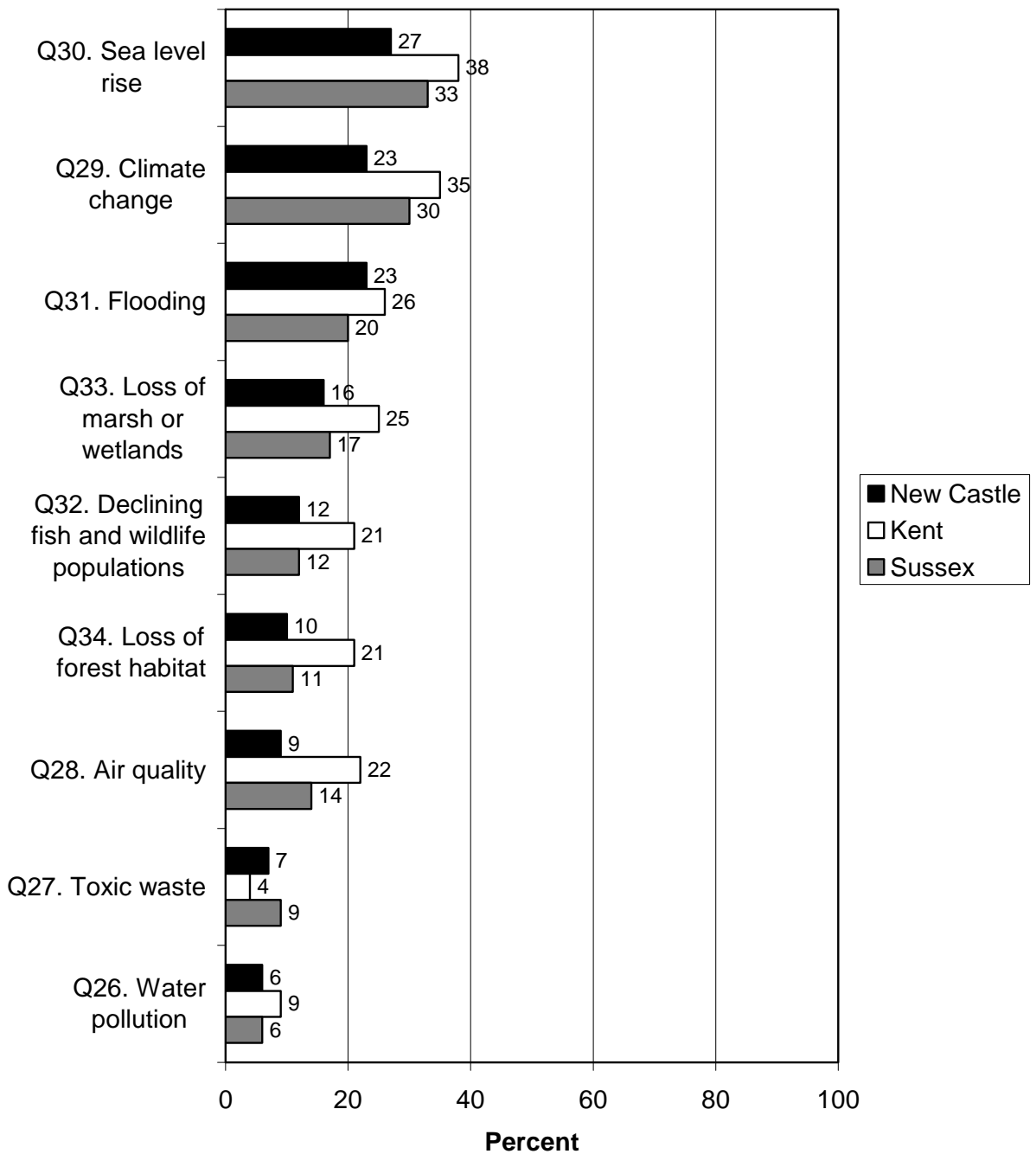


**Q26-34. Percent who are very or somewhat concerned about the following environmental issues in Delaware.**

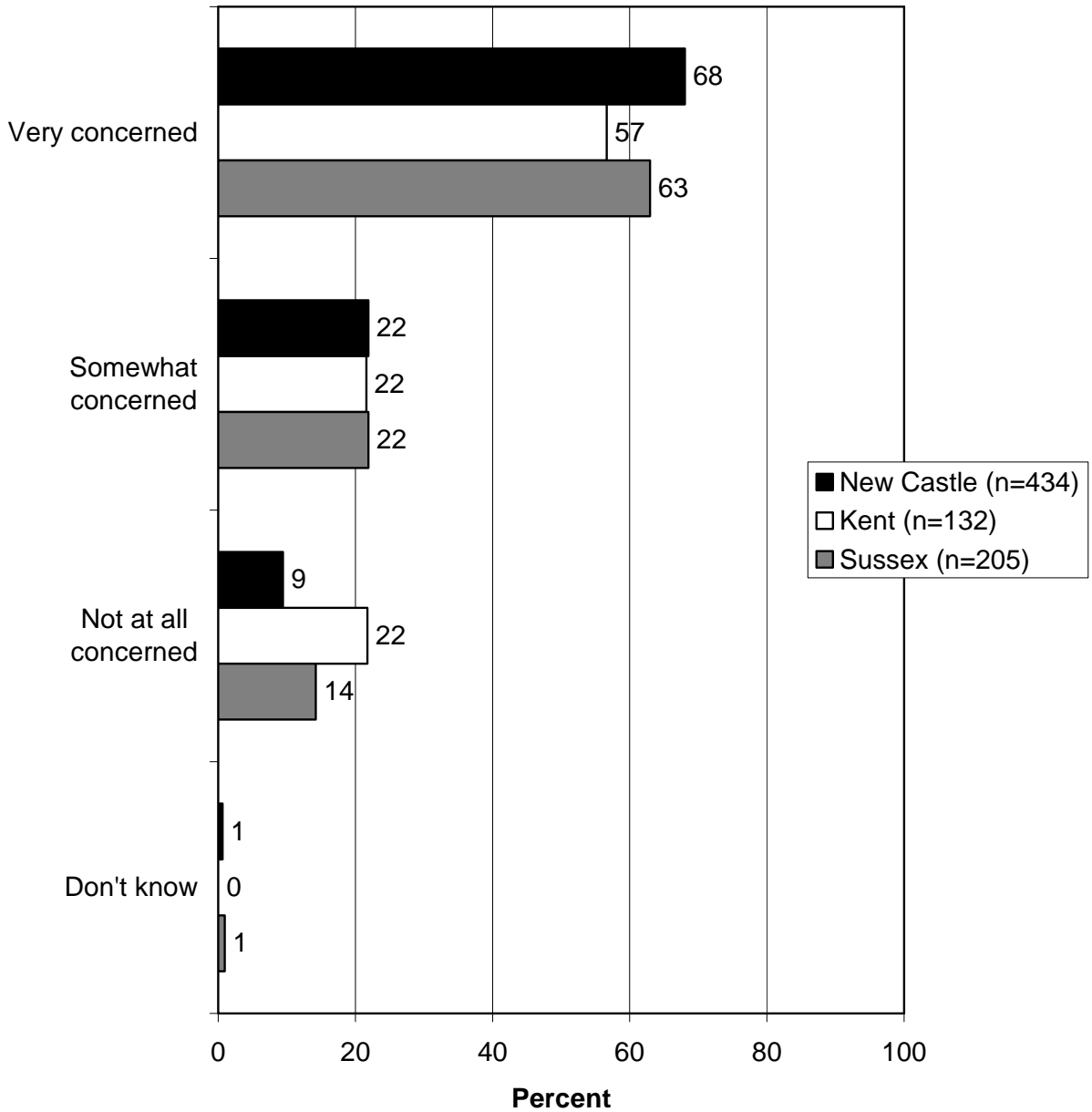




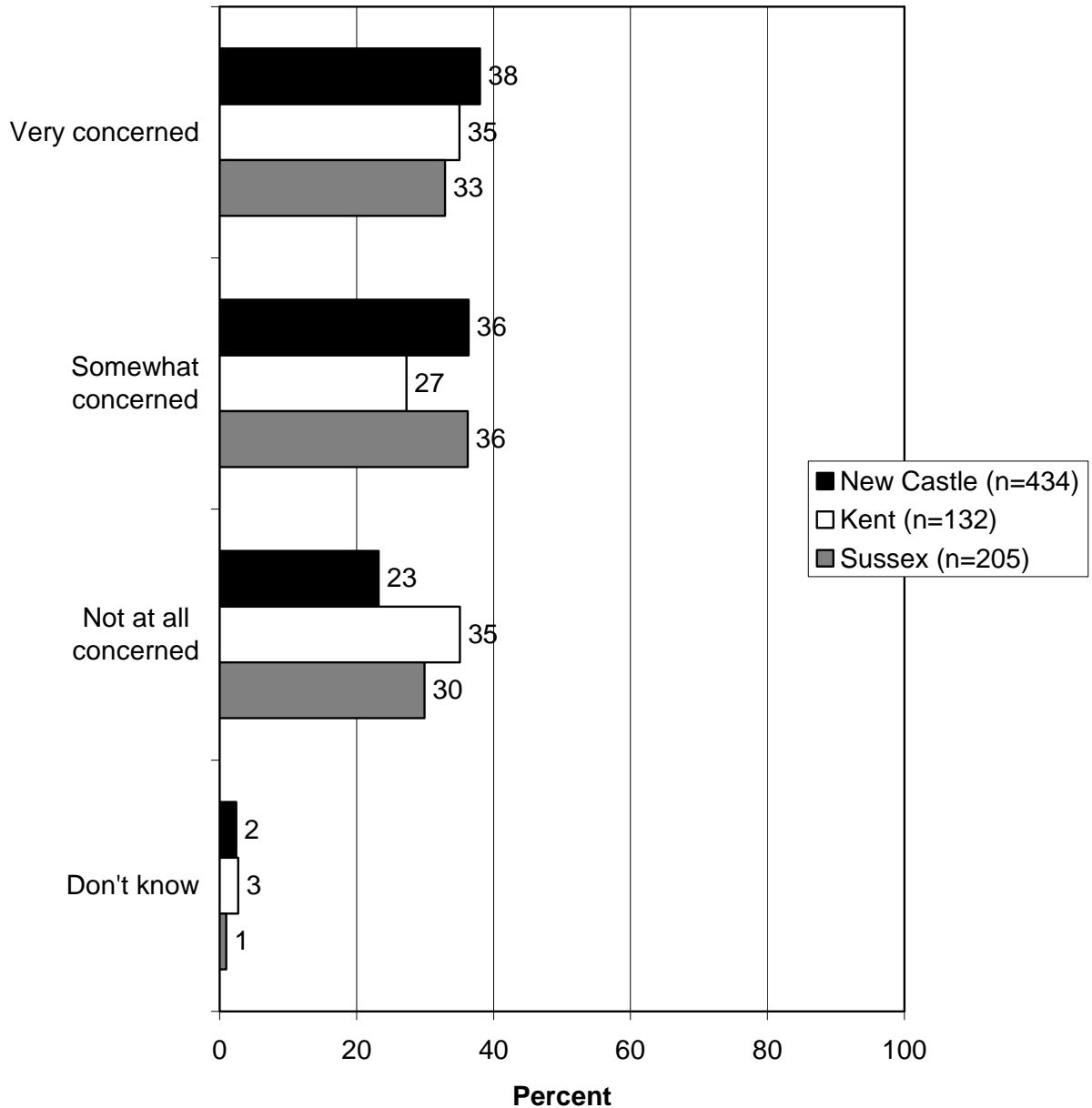
**Q26-34. Percent who are not at all concerned about the following environmental issues in Delaware.**



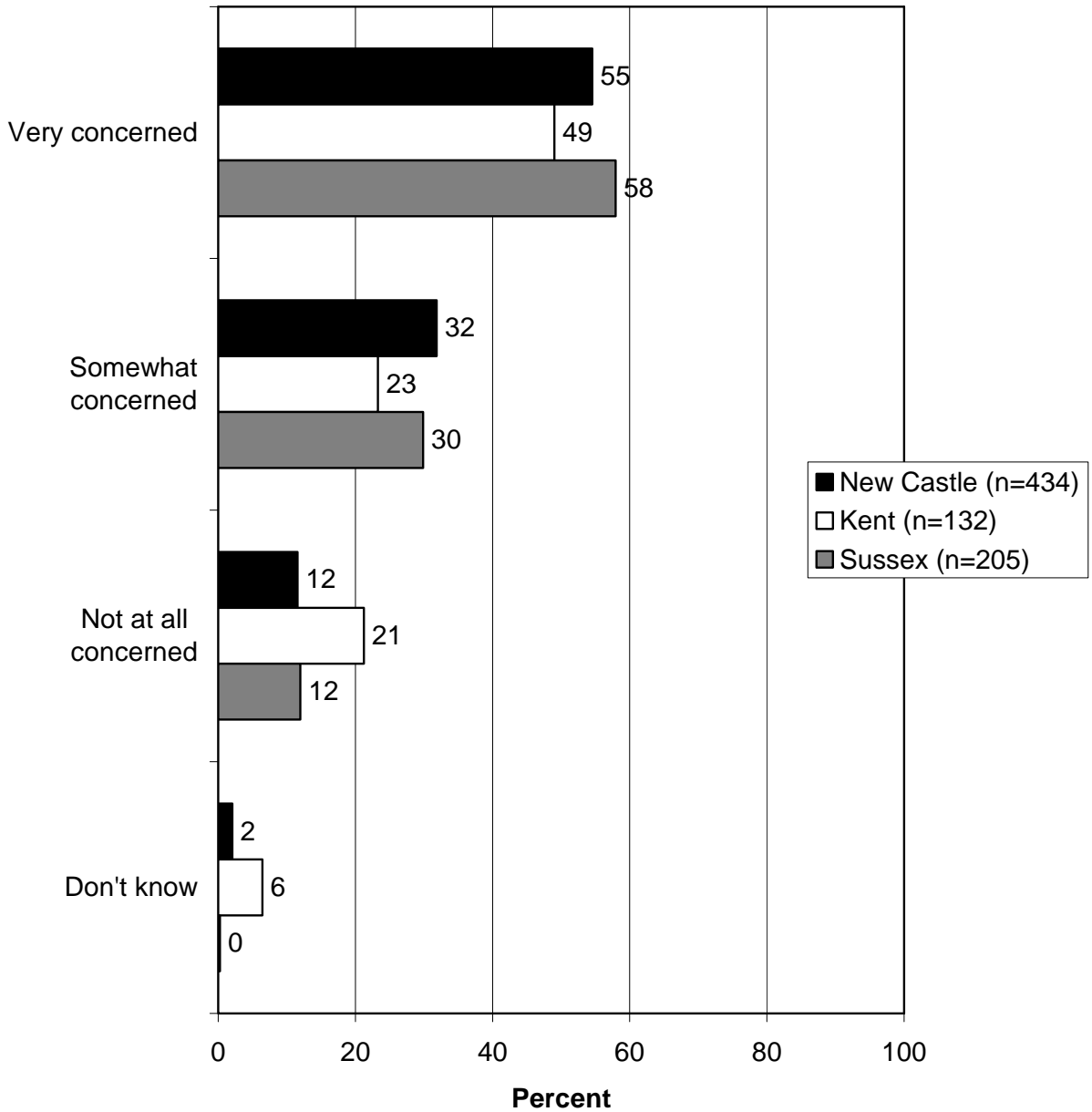
**Q28. Thinking specifically about environmental issues, how concerned are you about air quality in Delaware?**



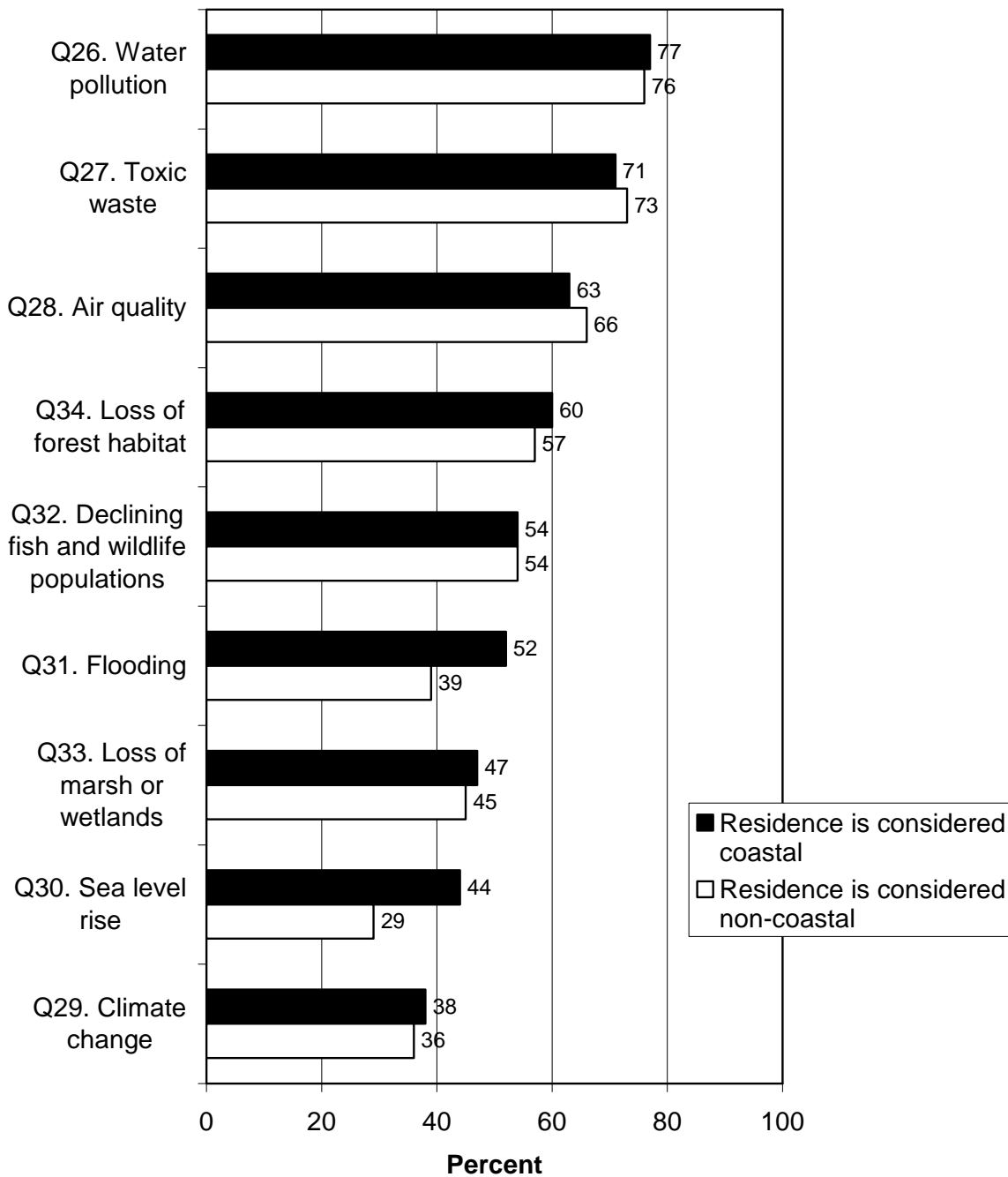
**Q29. Thinking specifically about environmental issues, how concerned are you about climate change in Delaware?**



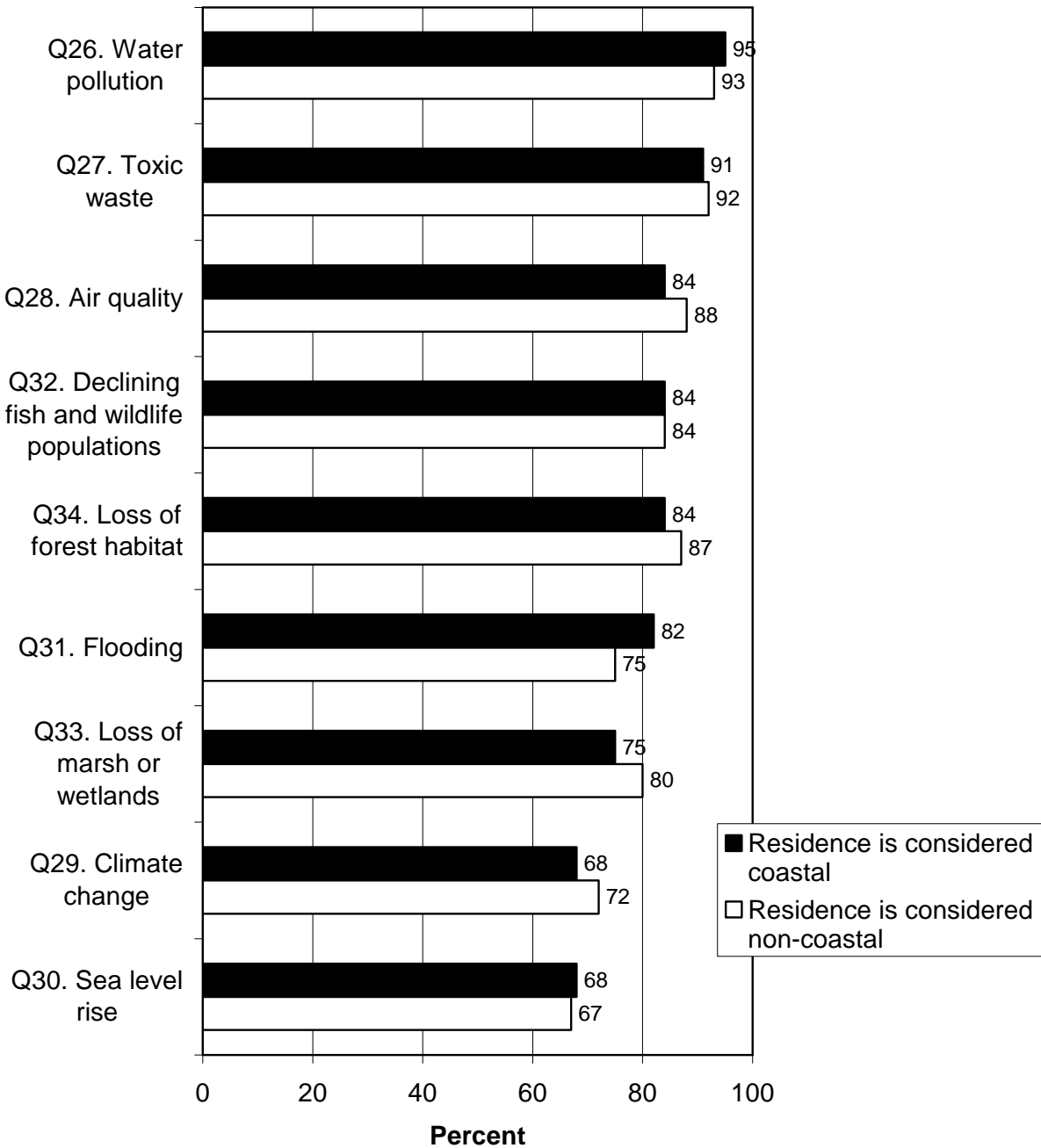
**Q32. Thinking specifically about environmental issues, how concerned are you about declining fish and wildlife populations in Delaware?**



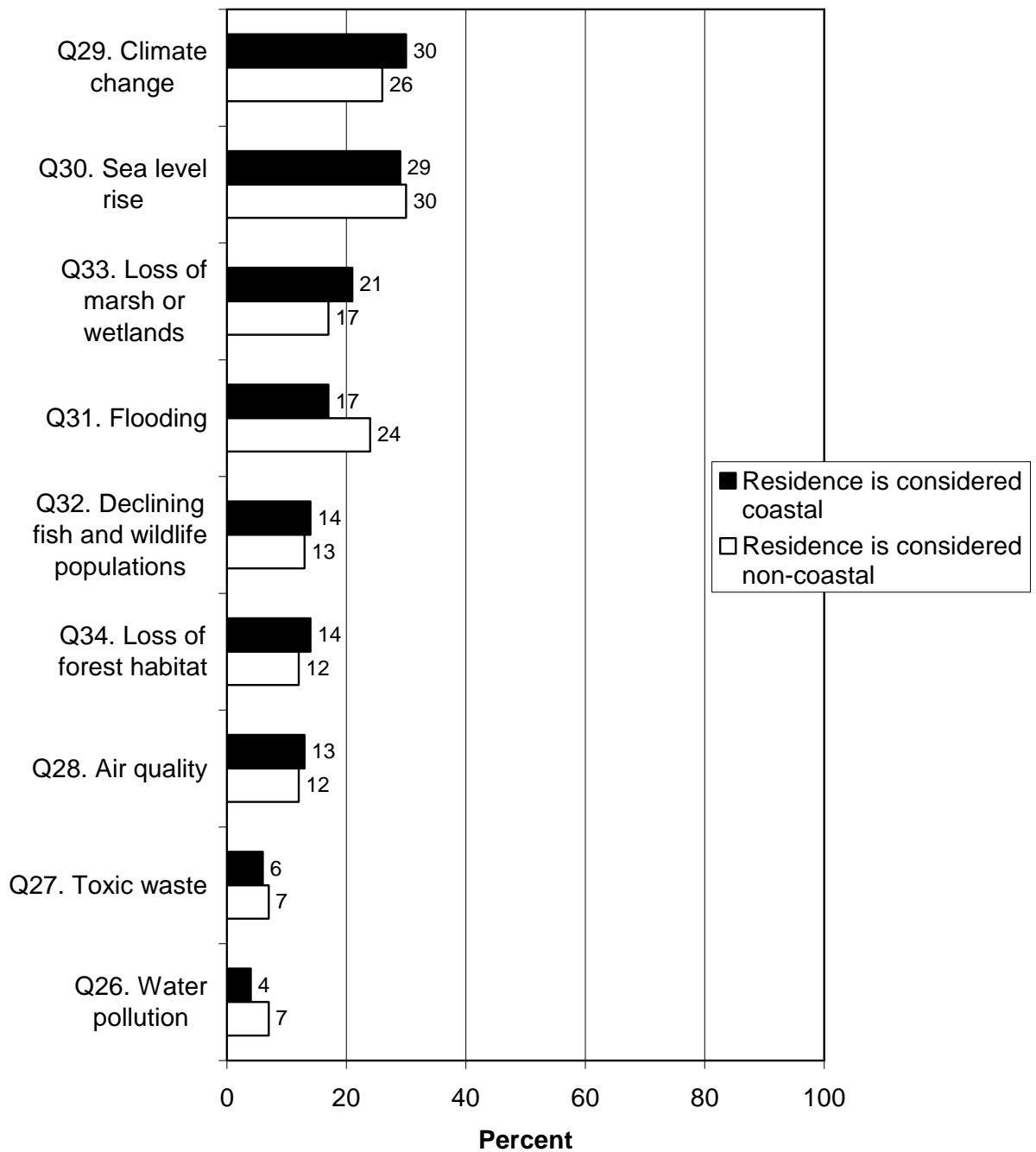
**Q26-34. Percent who are very concerned about the following environmental issues in Delaware.**



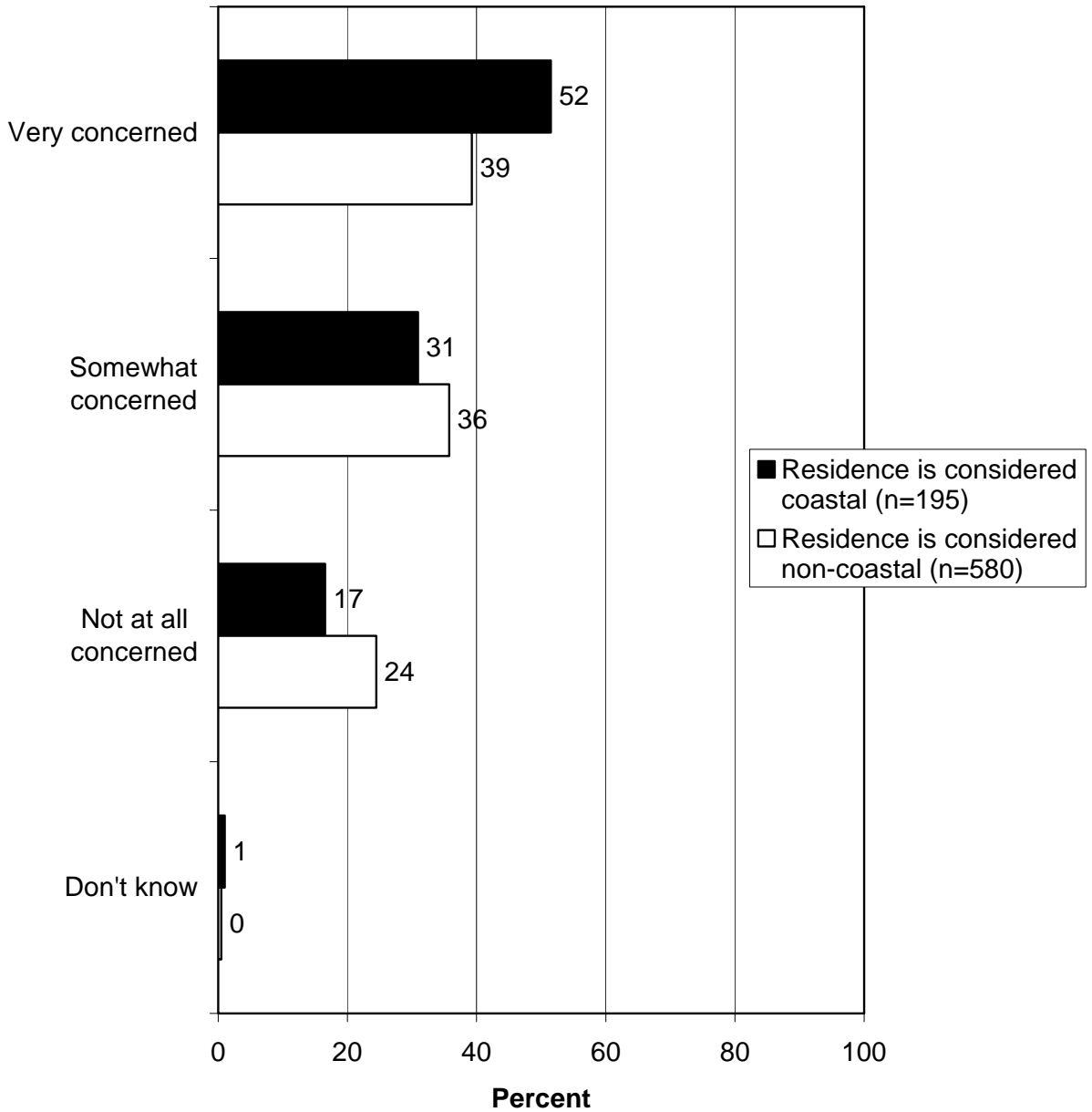
**Q26-34. Percent who are very or somewhat concerned about the following environmental issues in Delaware.**



**Q26-34. Percent who are not at all concerned about the following environmental issues in Delaware.**

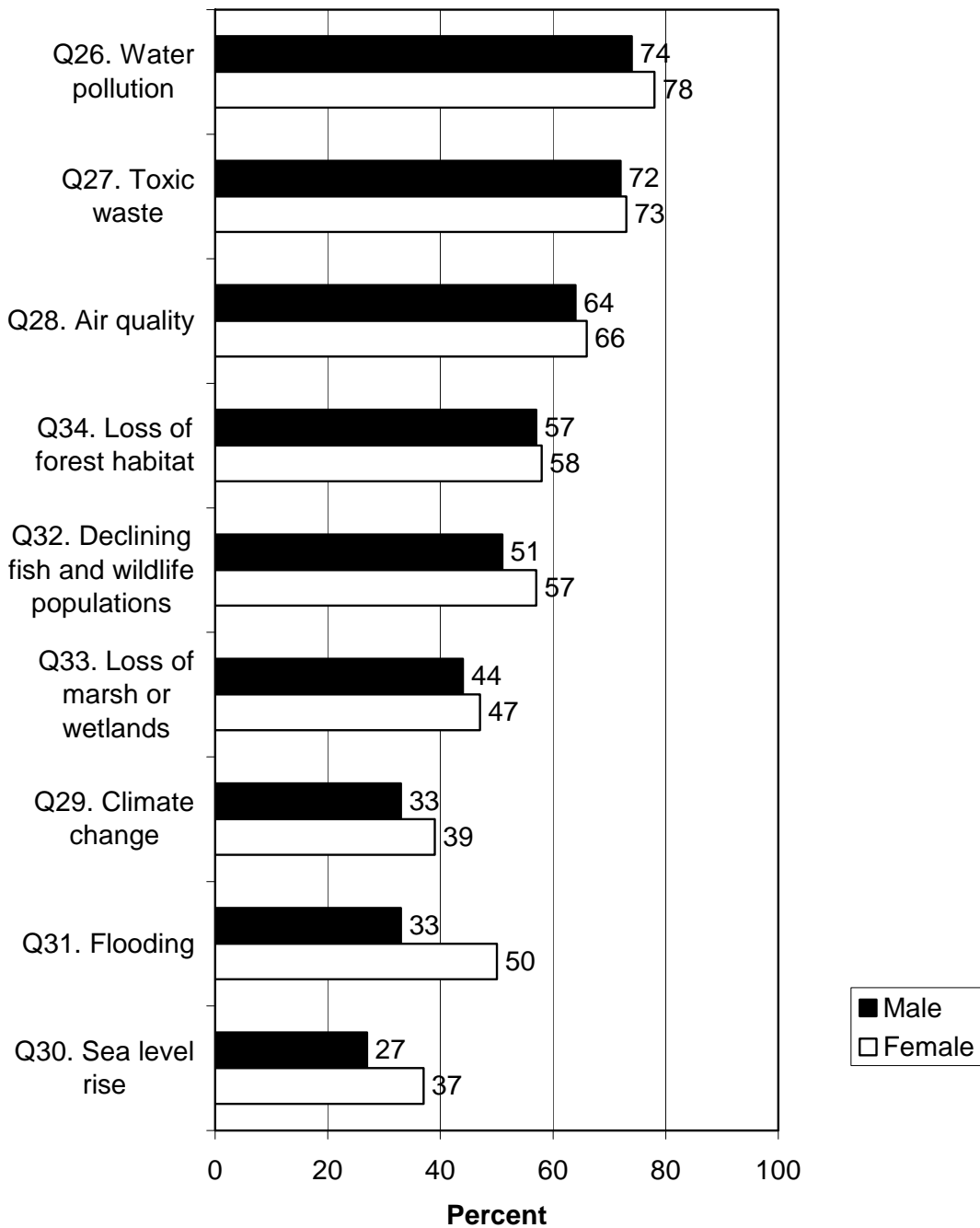


**Q31. Thinking specifically about environmental issues, how concerned are you about flooding in Delaware?**

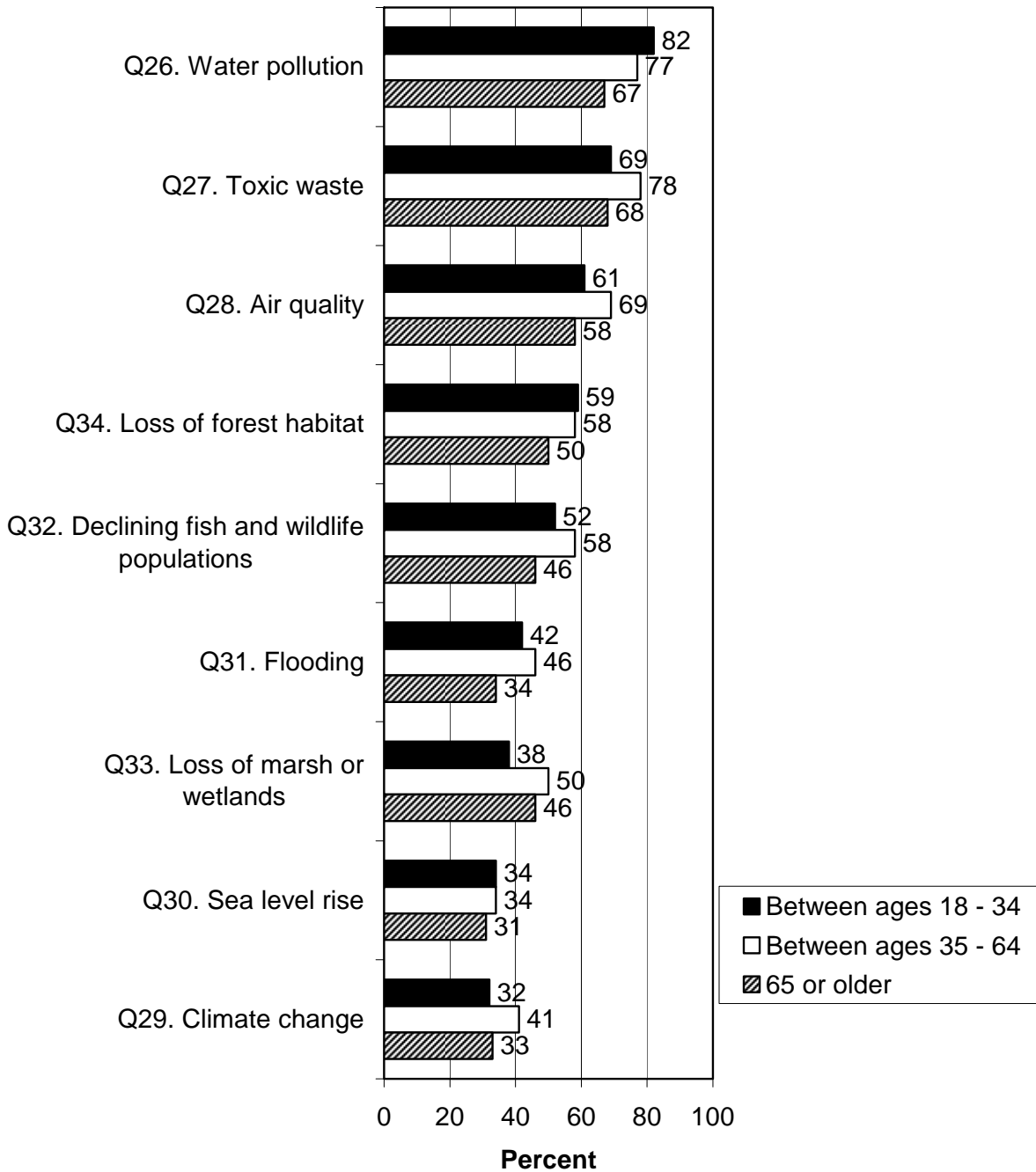




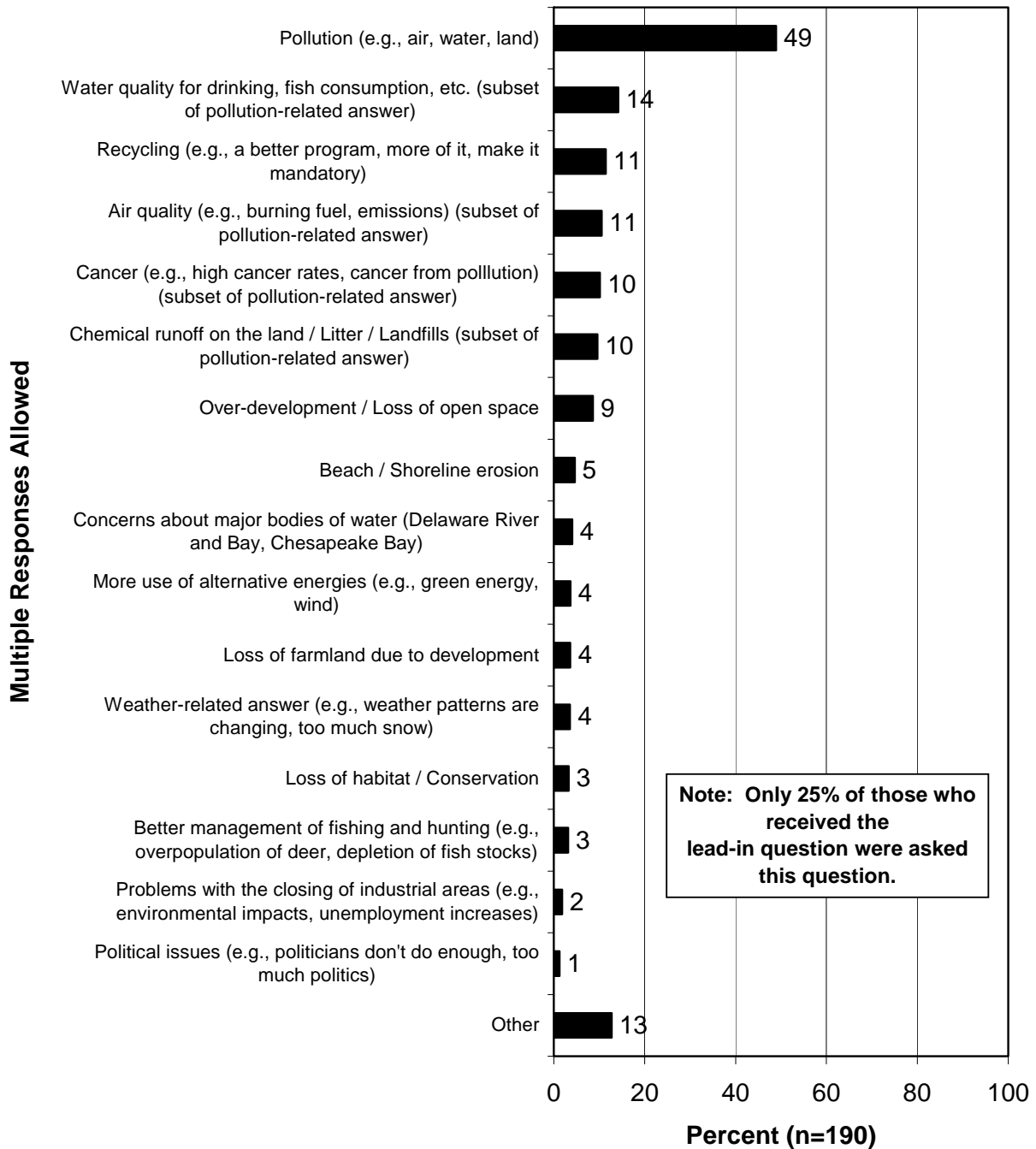
**Q26-34. Percent who are very concerned about the following environmental issues in Delaware.**



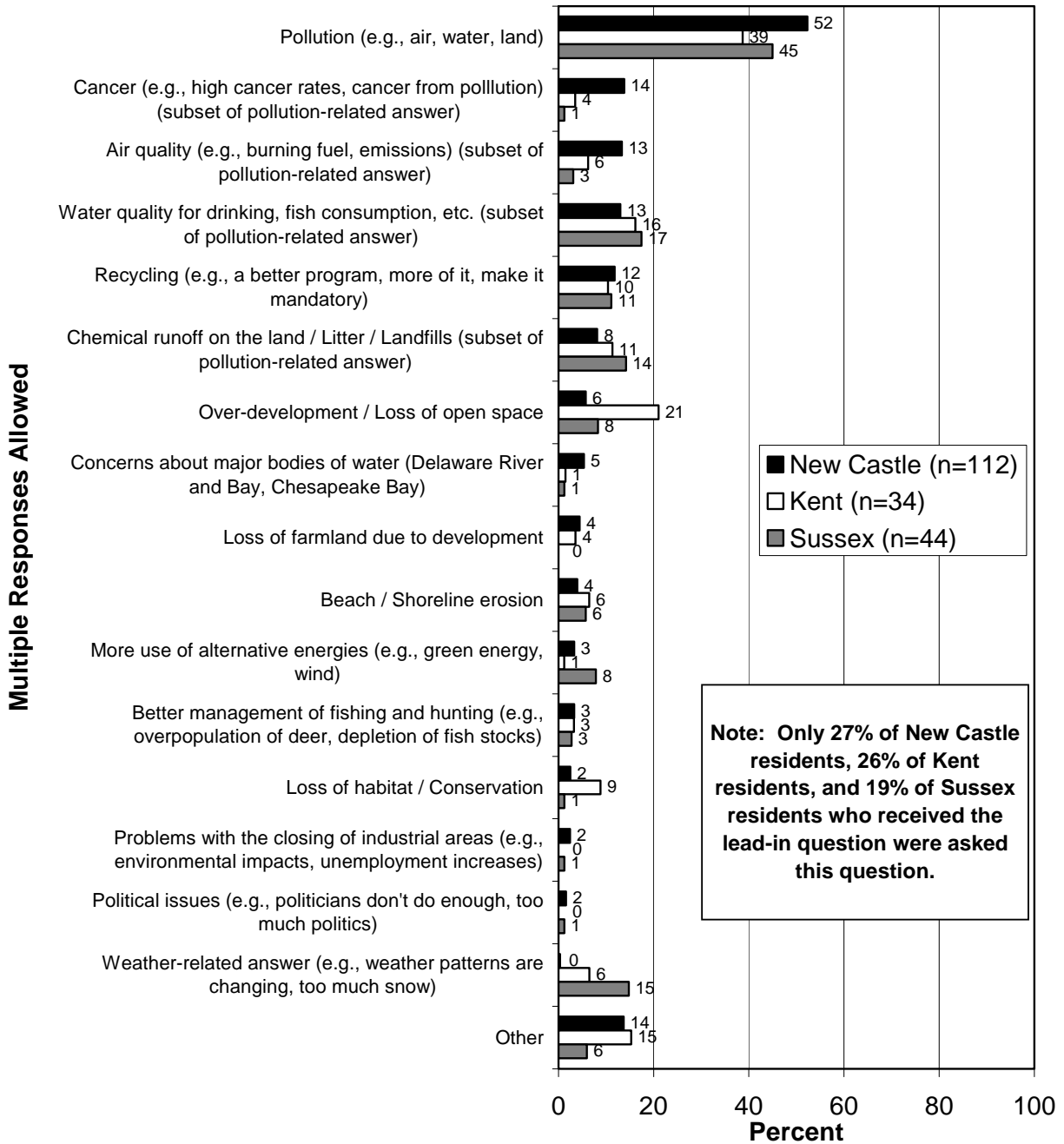
**Q26-34. Percent who are very concerned about the following environmental issues in Delaware.**



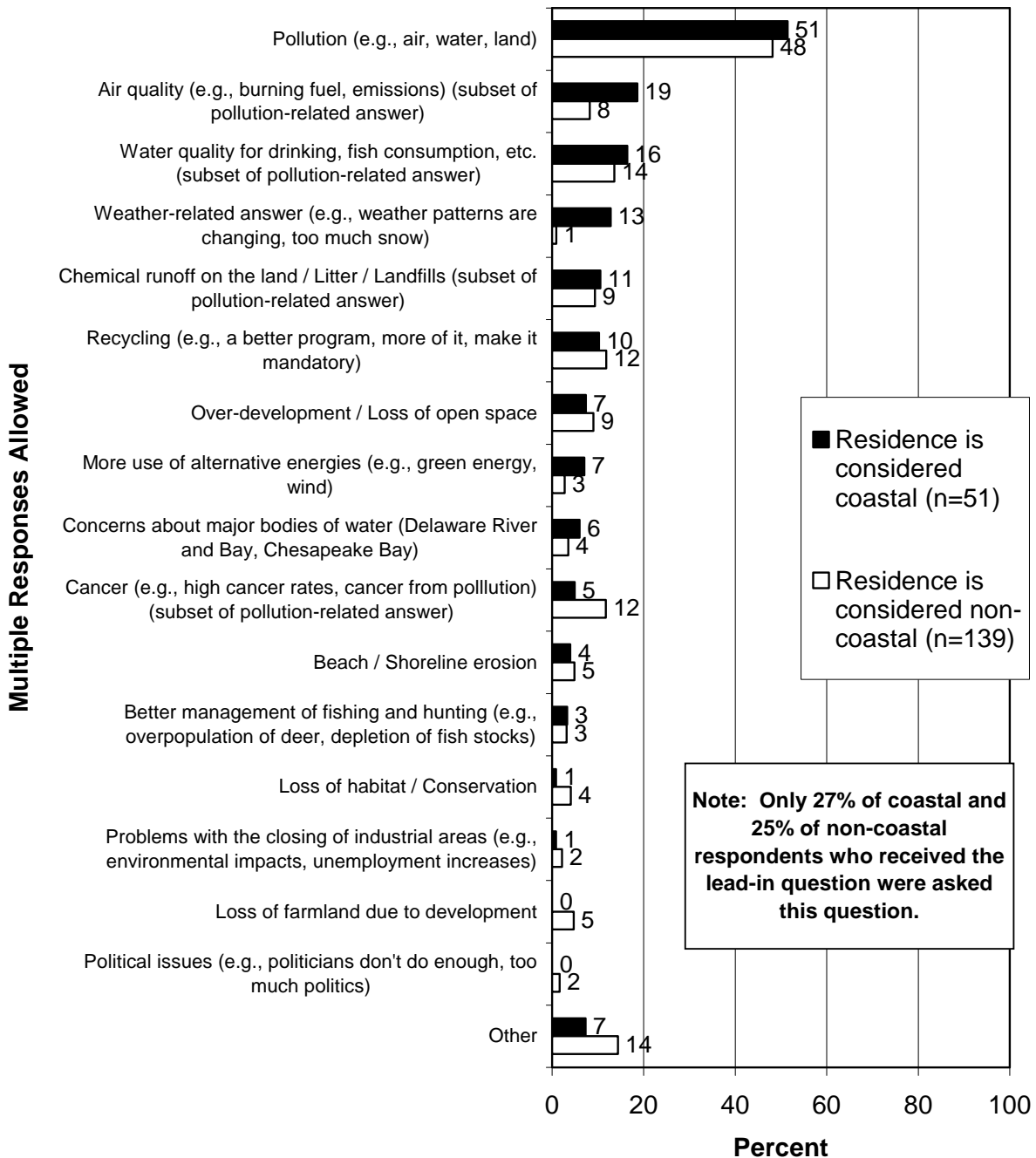
**Q36. What other environmental issues are you concerned about in Delaware? (Asked of those that have other environmental issues they are concerned about in Delaware.)**



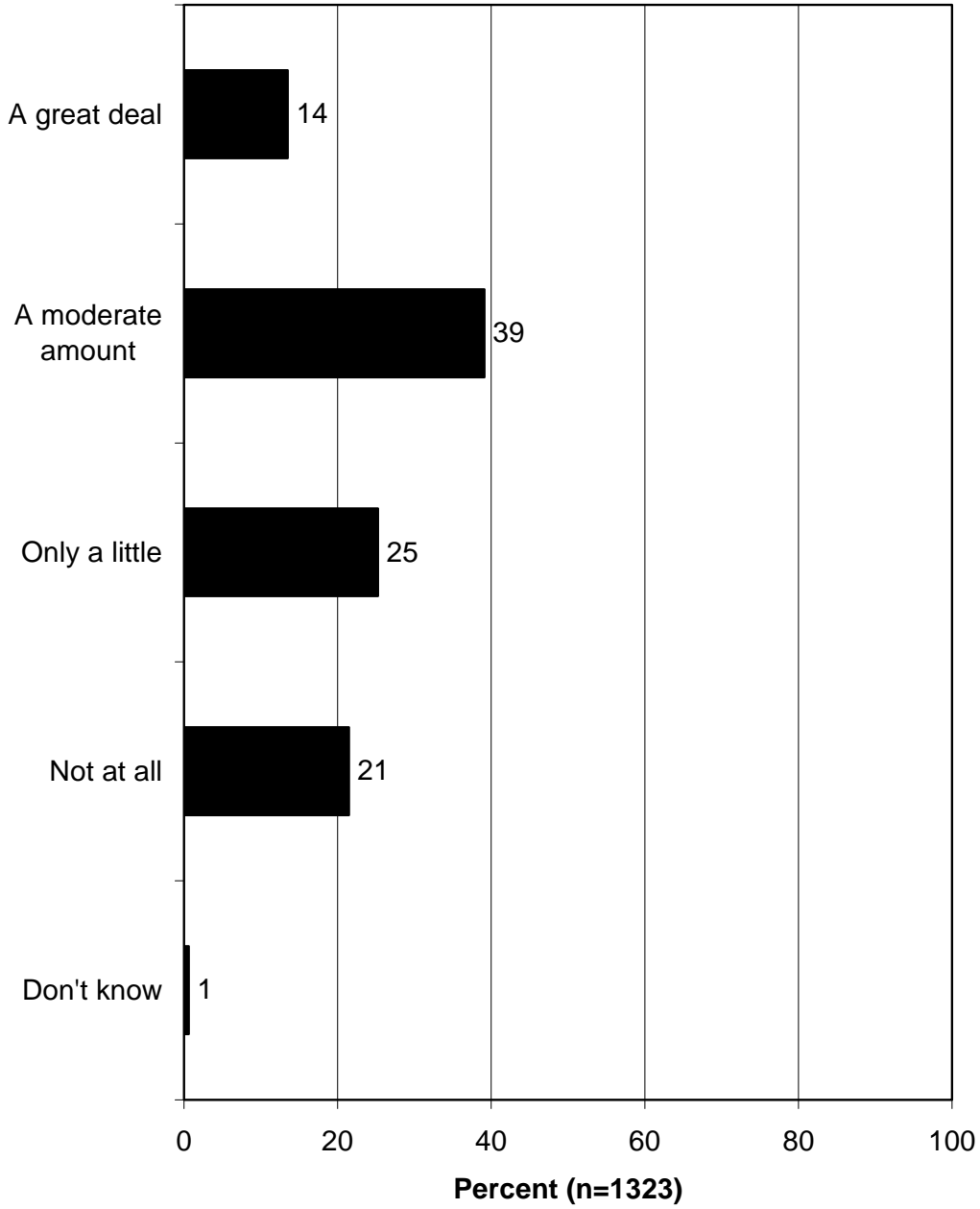
**Q36. What other environmental issues are you concerned about in Delaware? (Asked of those that have other environmental issues they are concerned about in Delaware.)**



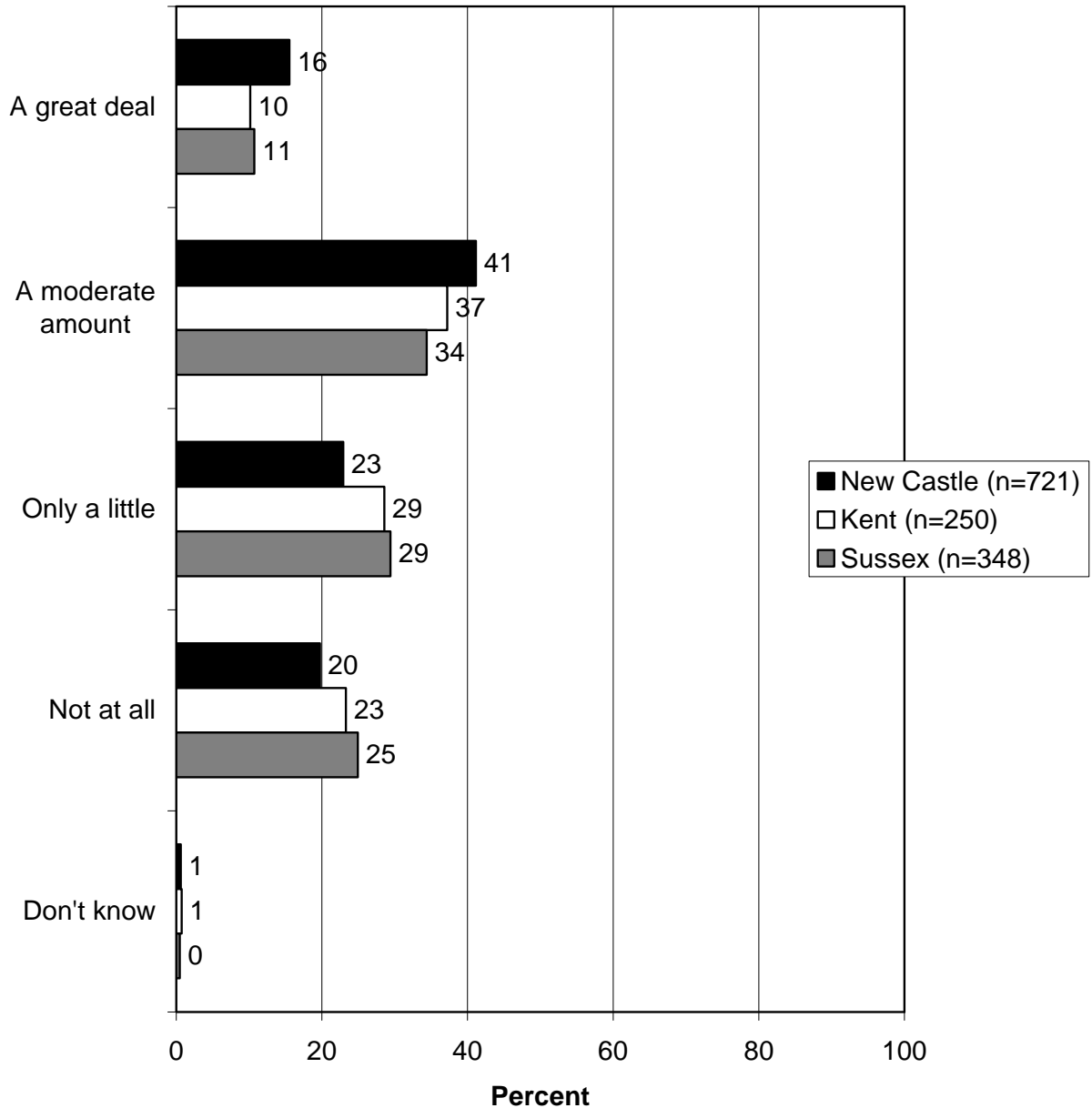
**Q36. What other environmental issues are you concerned about in Delaware? (Asked of those that have other environmental issues they are concerned about in Delaware.)**



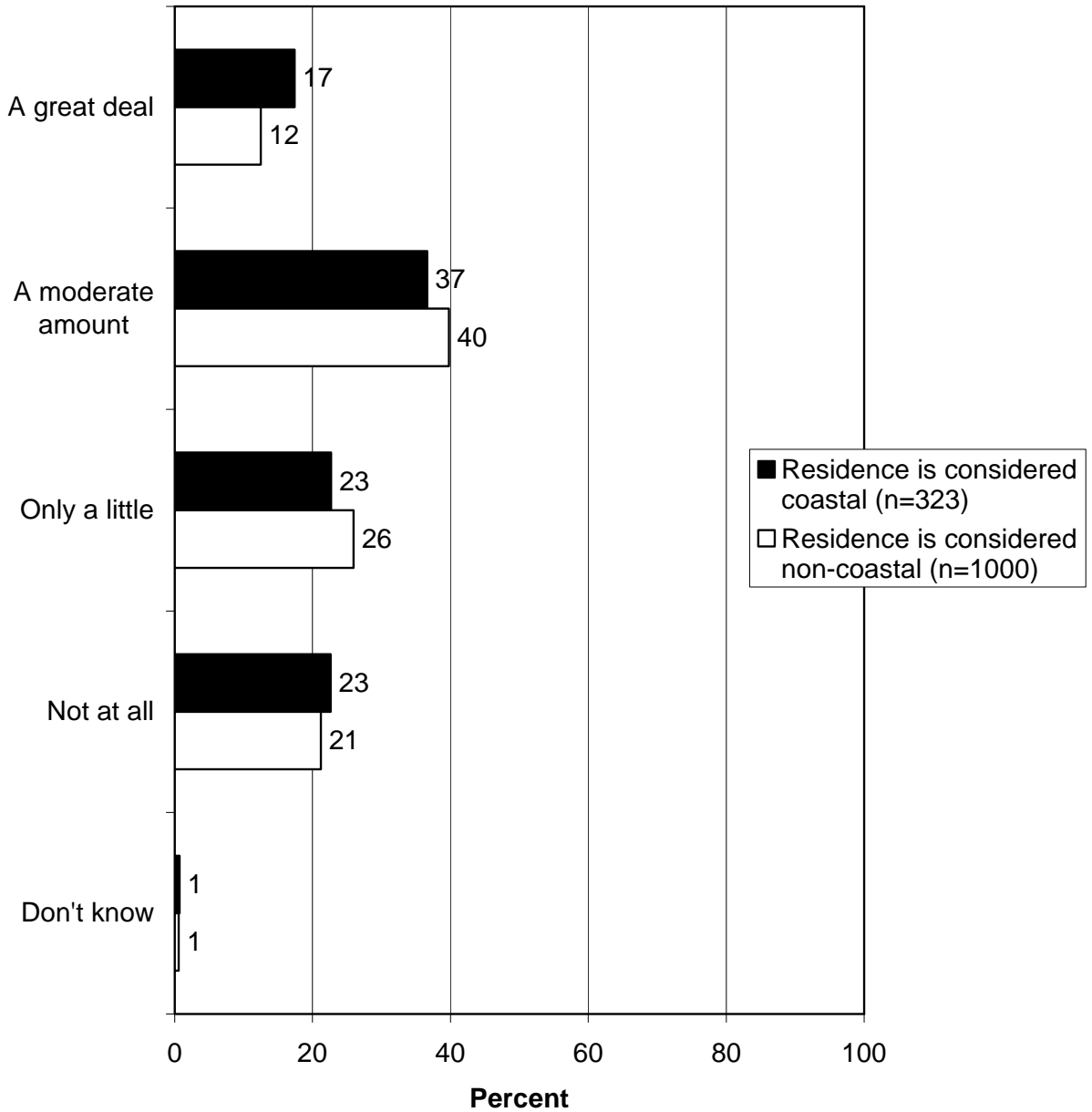
**Q47. How much do you personally worry about climate change?**



### Q47. How much do you personally worry about climate change?

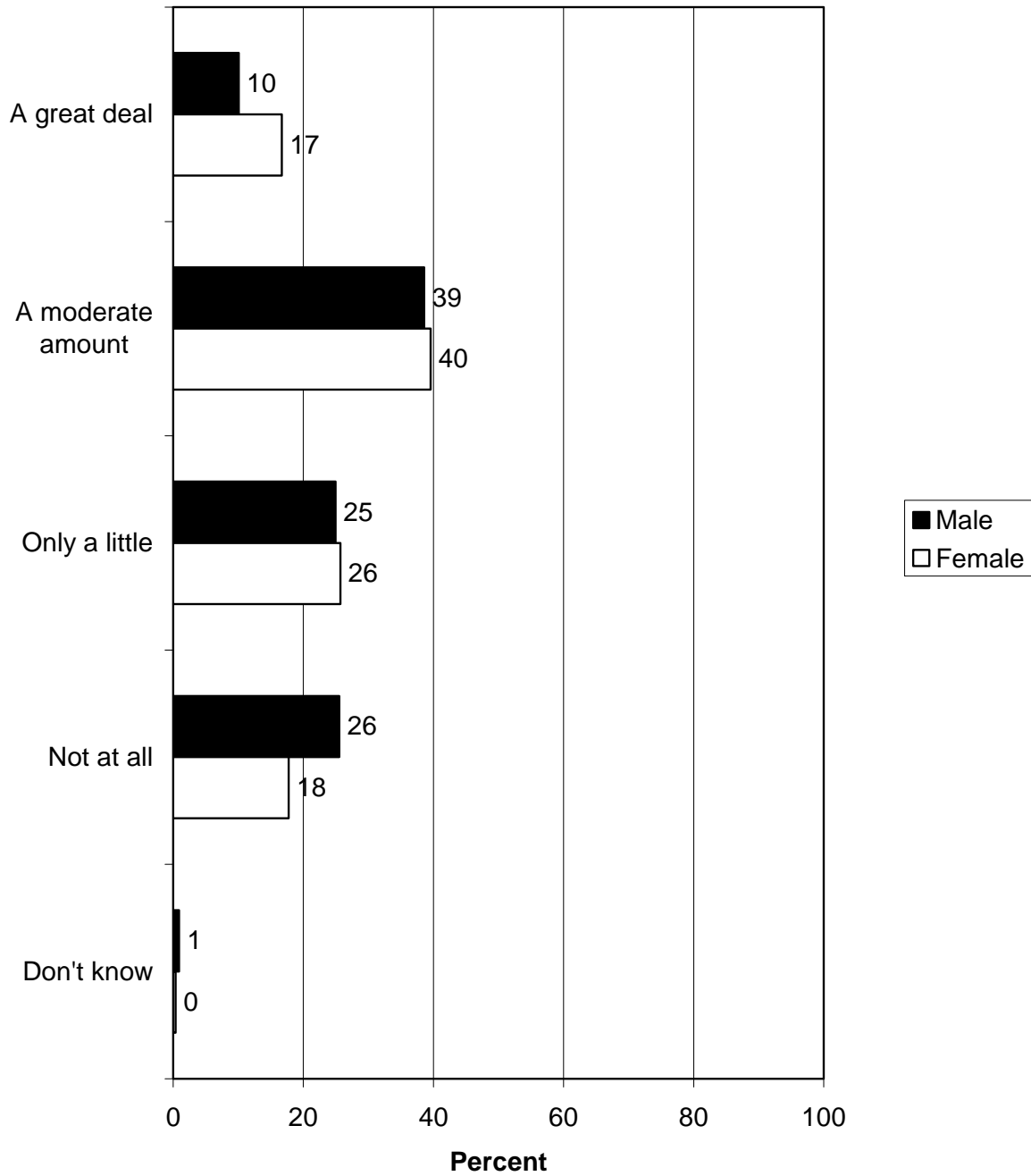


### Q47. How much do you personally worry about climate change?

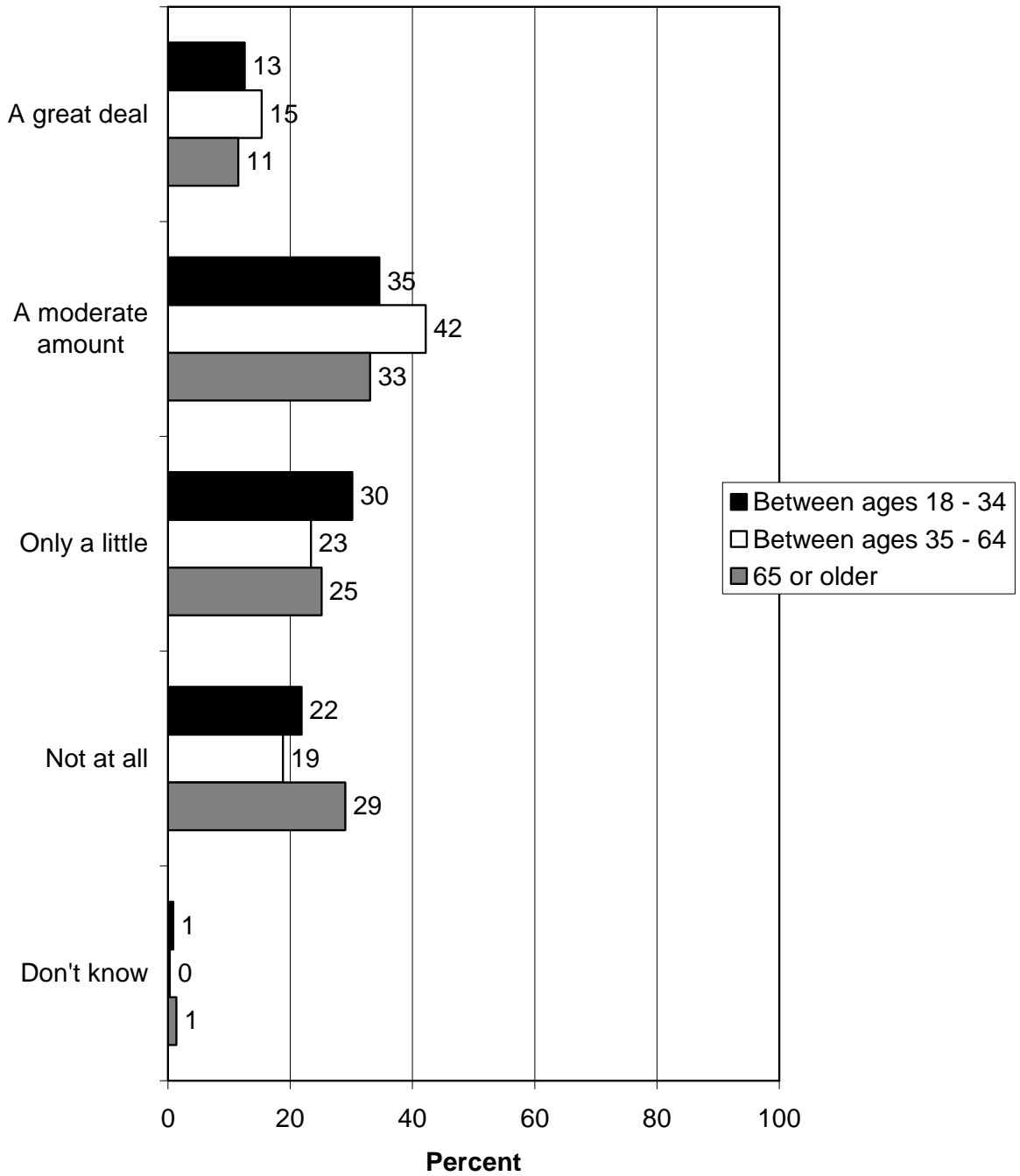




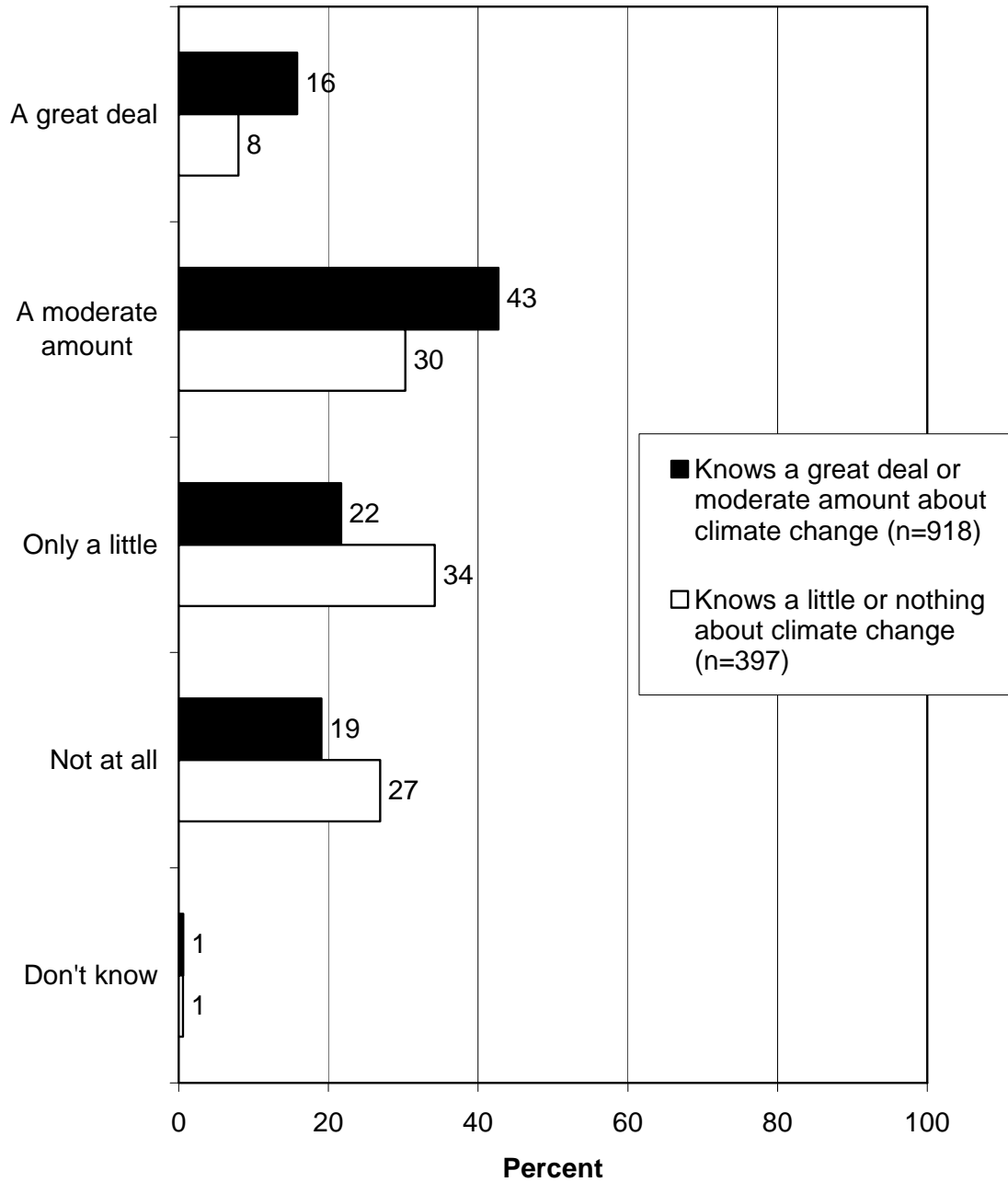
### Q47. How much do you personally worry about climate change?



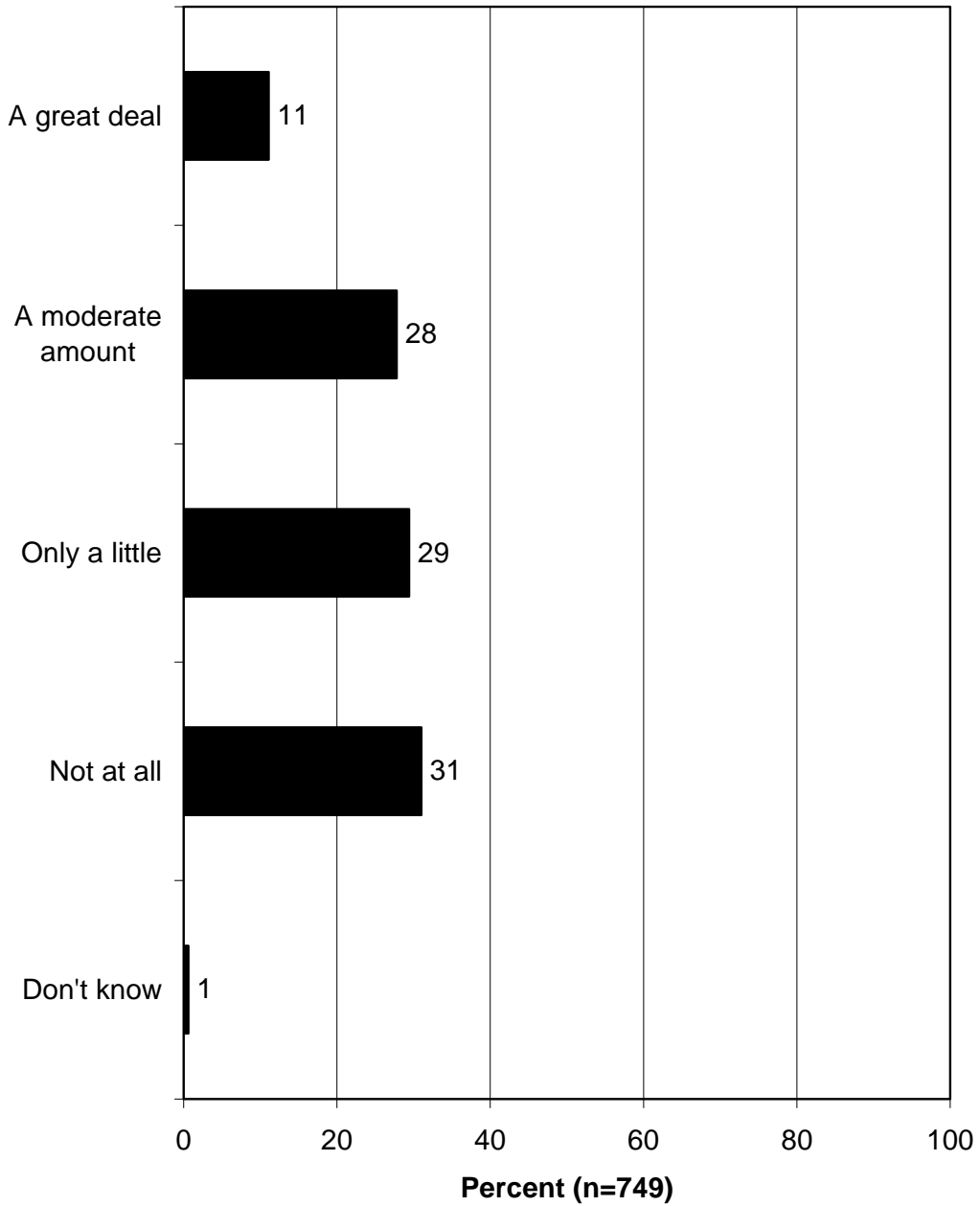
### Q47. How much do you personally worry about climate change?



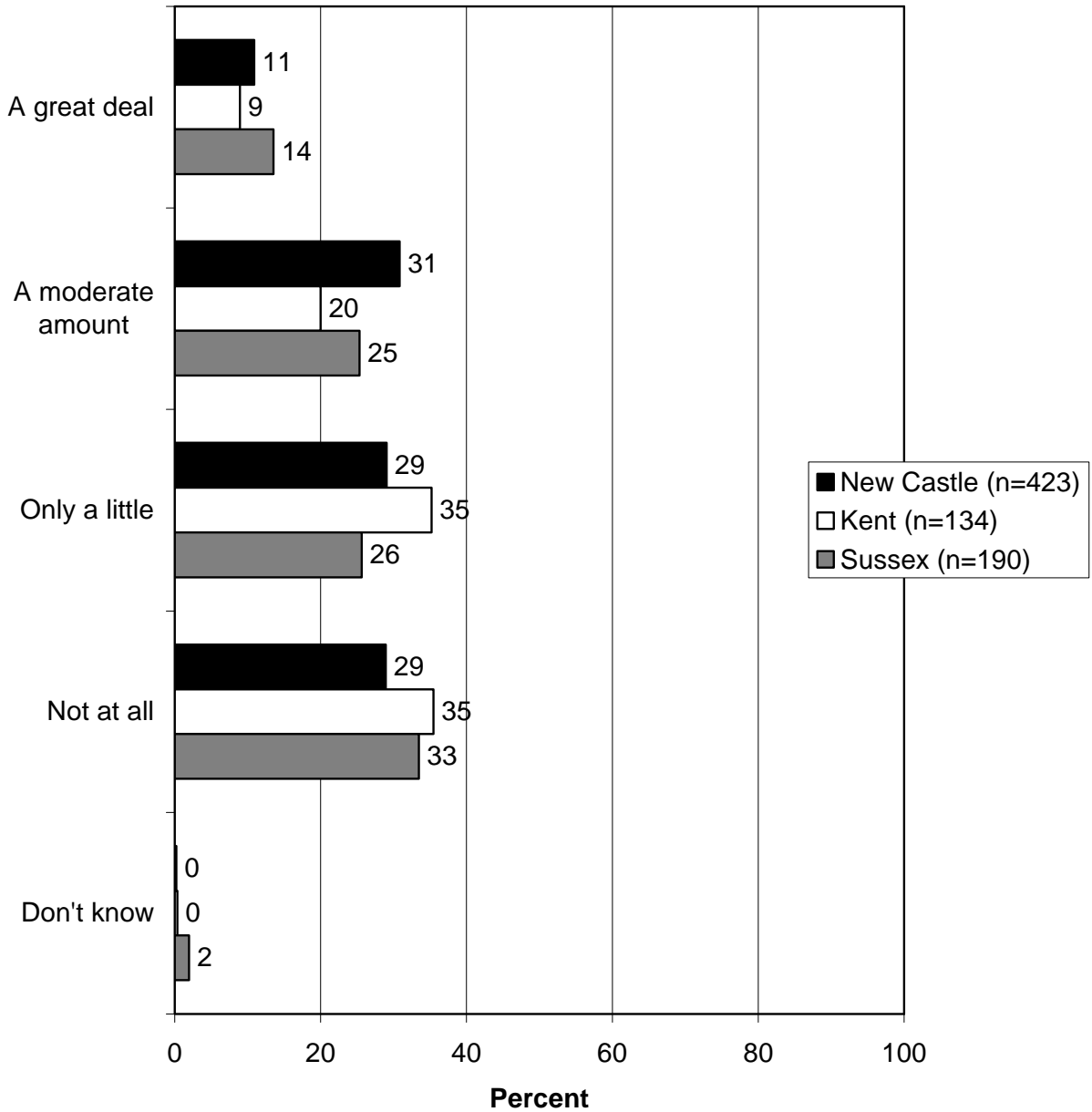
### Q47. How much do you personally worry about climate change?



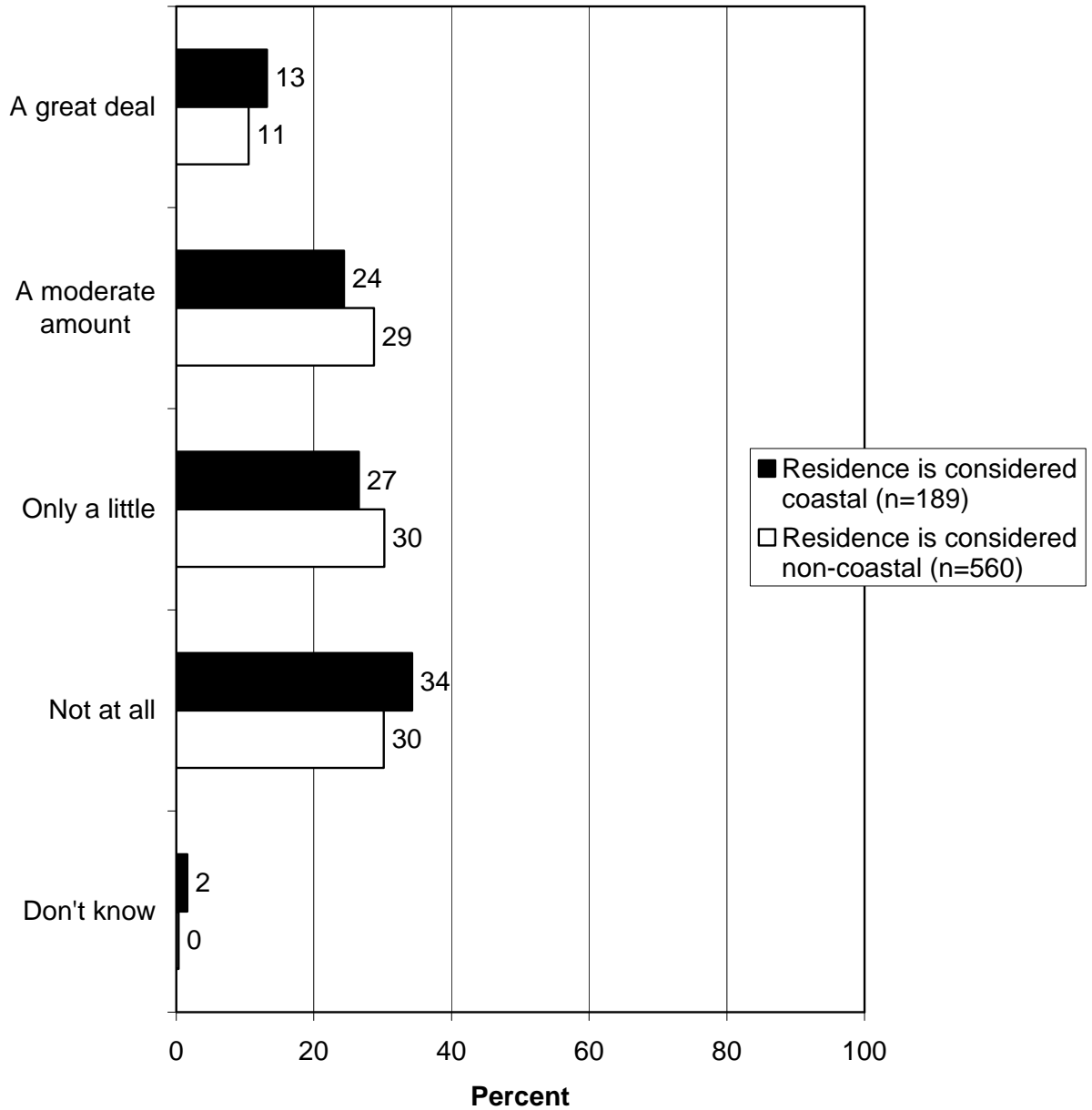
**Q55. How much do you personally worry about sea level rise?**



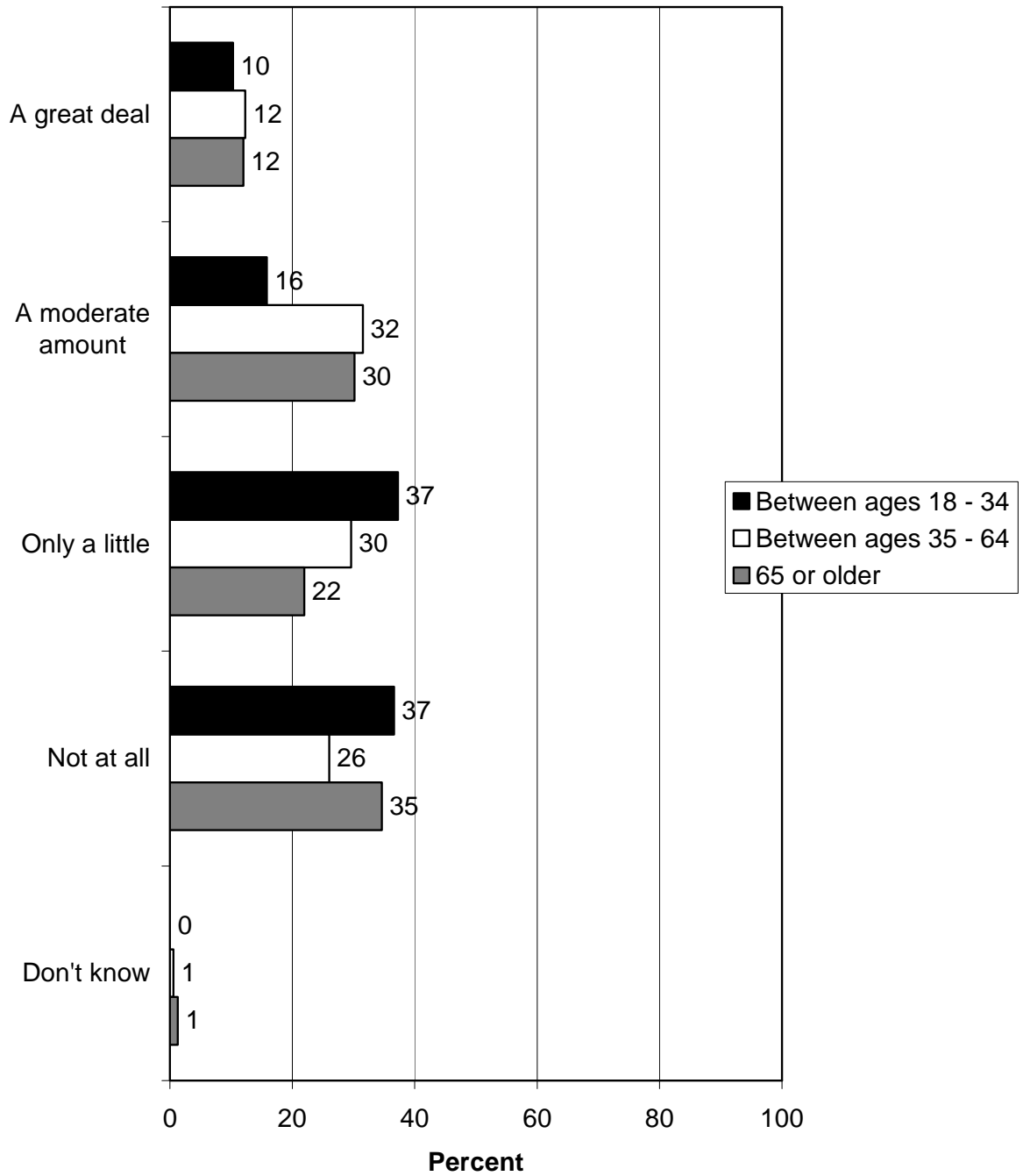
### Q55. How much do you personally worry about sea level rise?



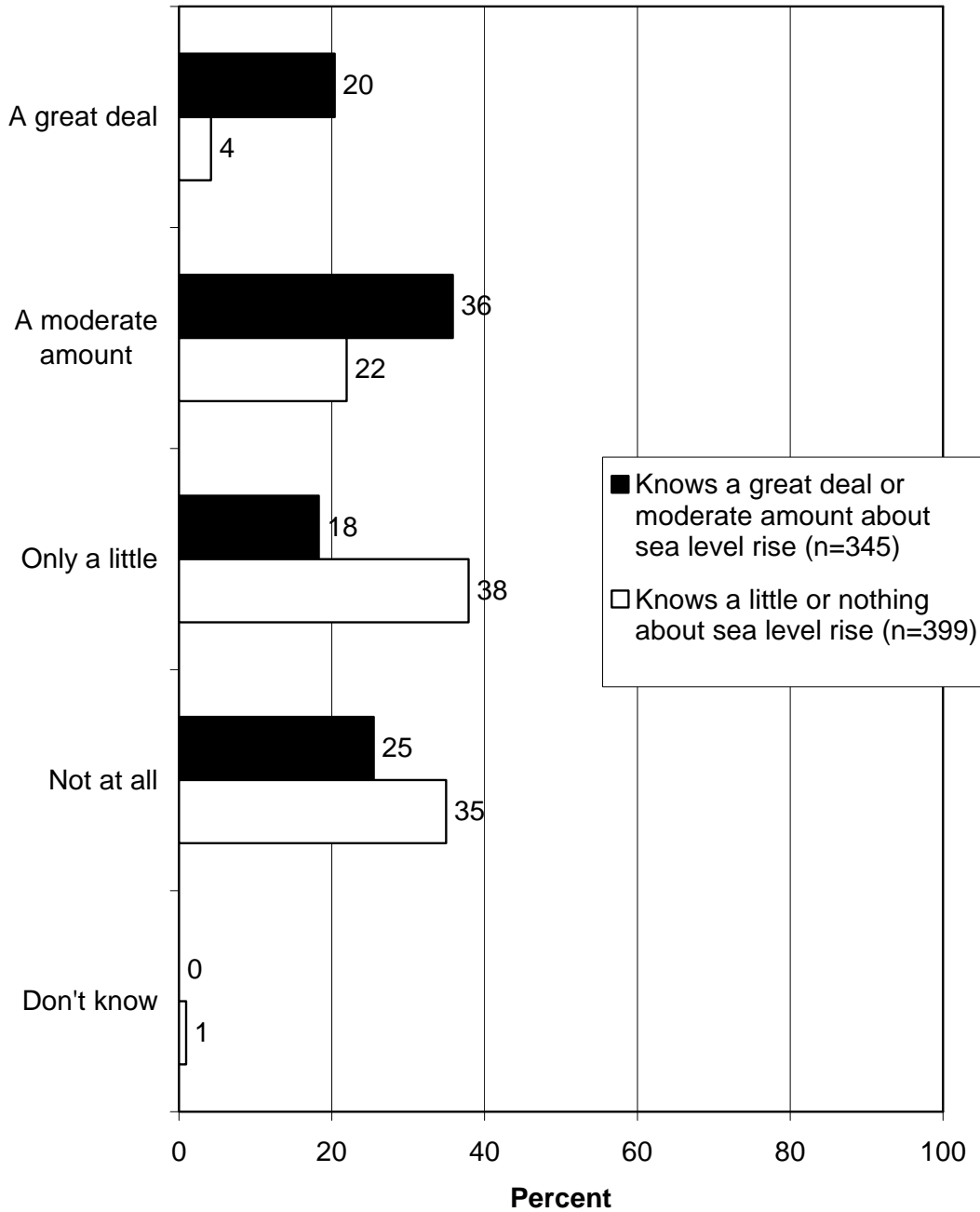
### Q55. How much do you personally worry about sea level rise?



### Q55. How much do you personally worry about sea level rise?

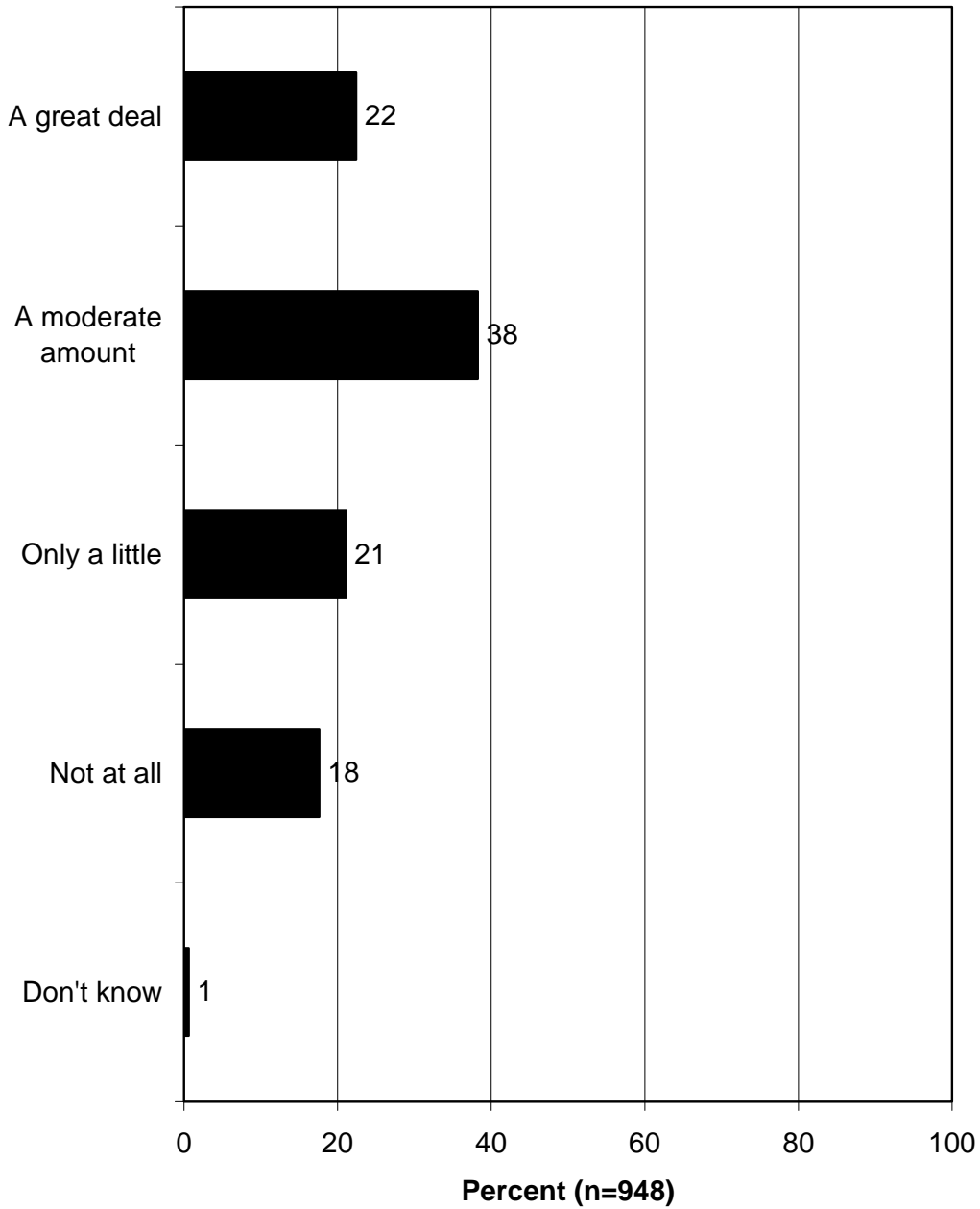


### Q55. How much do you personally worry about sea level rise?

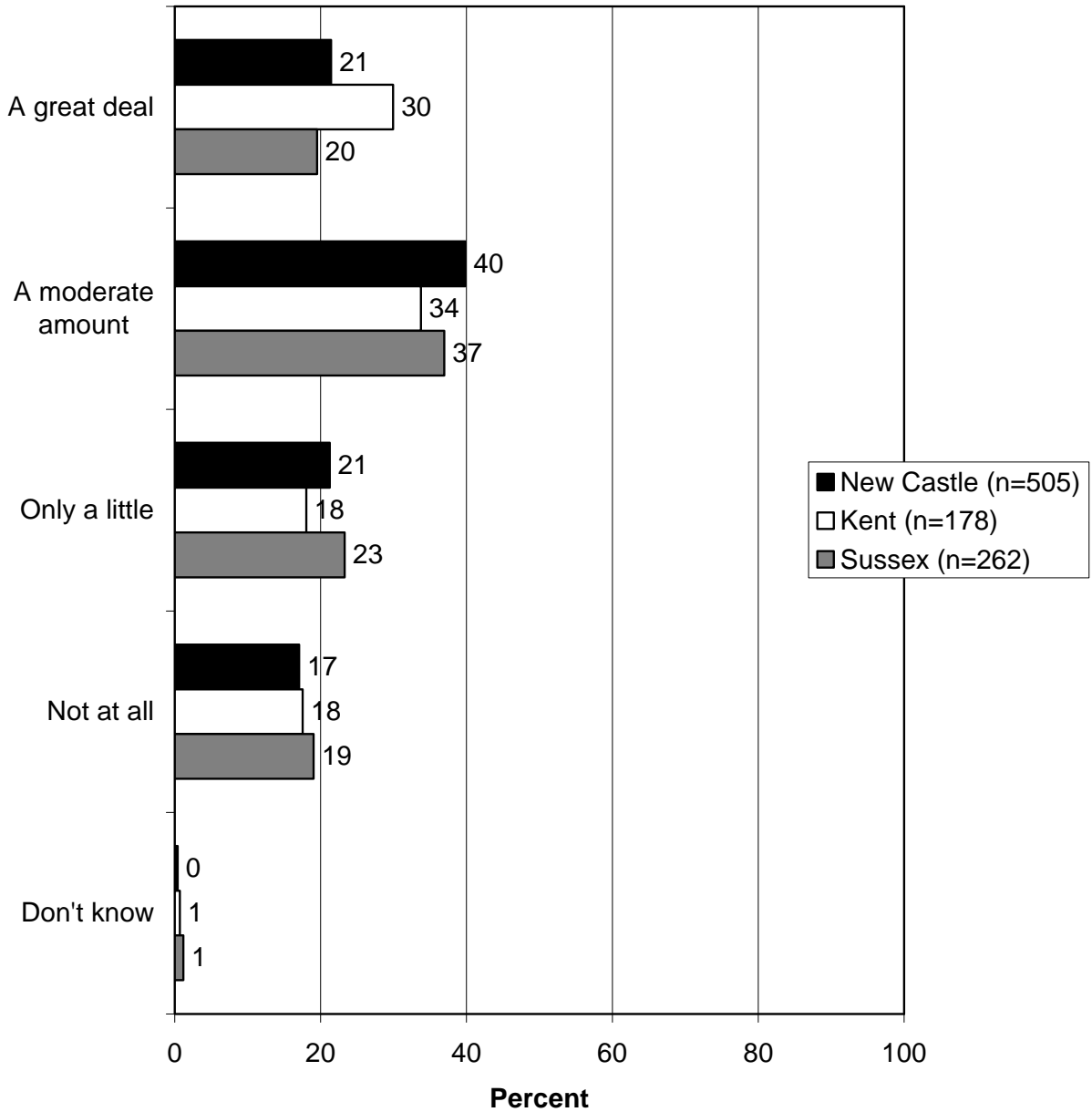




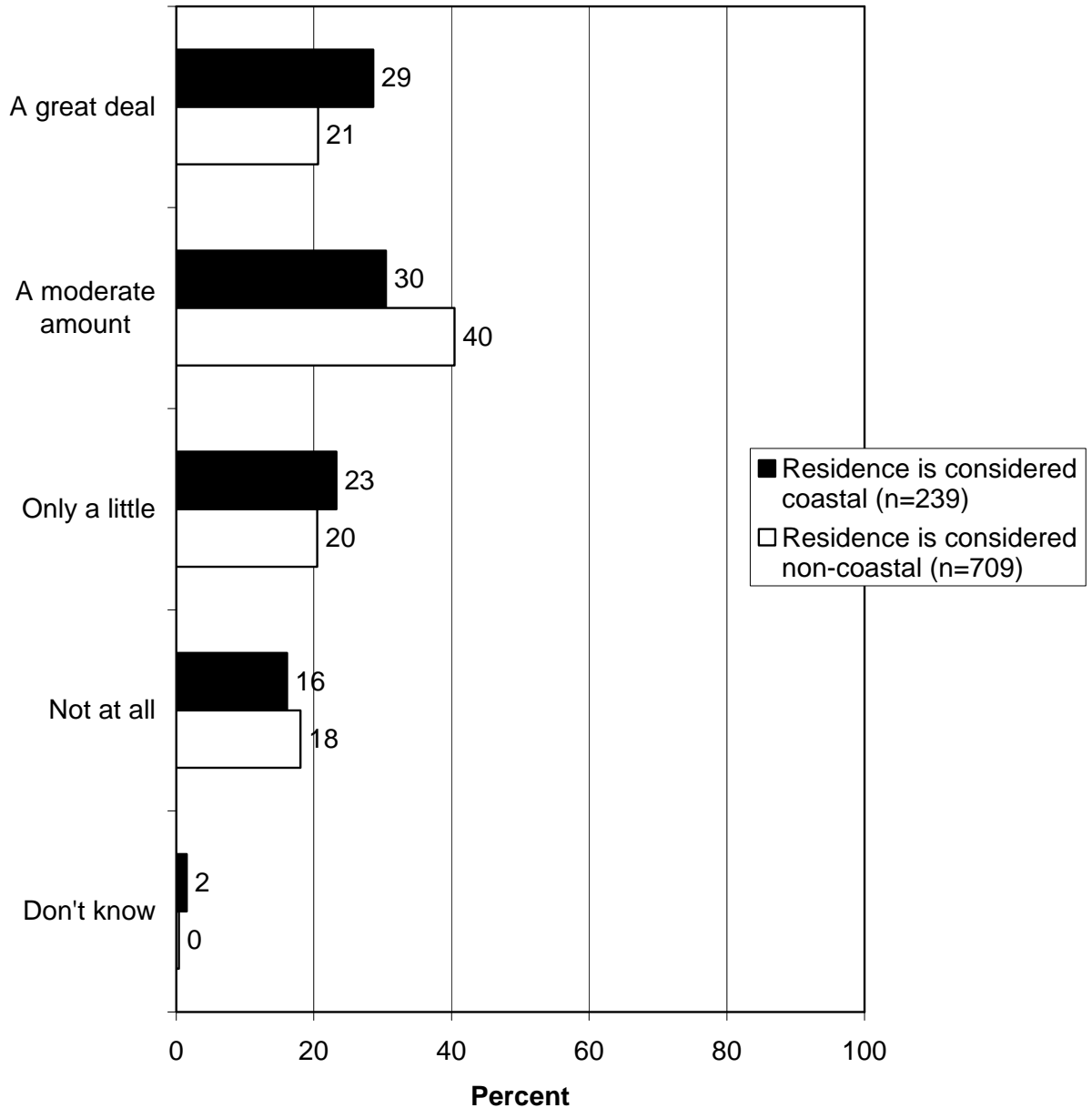
**Q48. How much do you worry about the impacts of climate change on Delaware's environment?**



**Q48. How much do you worry about the impacts of climate change on Delaware's environment?**



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## KNOWLEDGE AND AWARENESS OF CLIMATE CHANGE

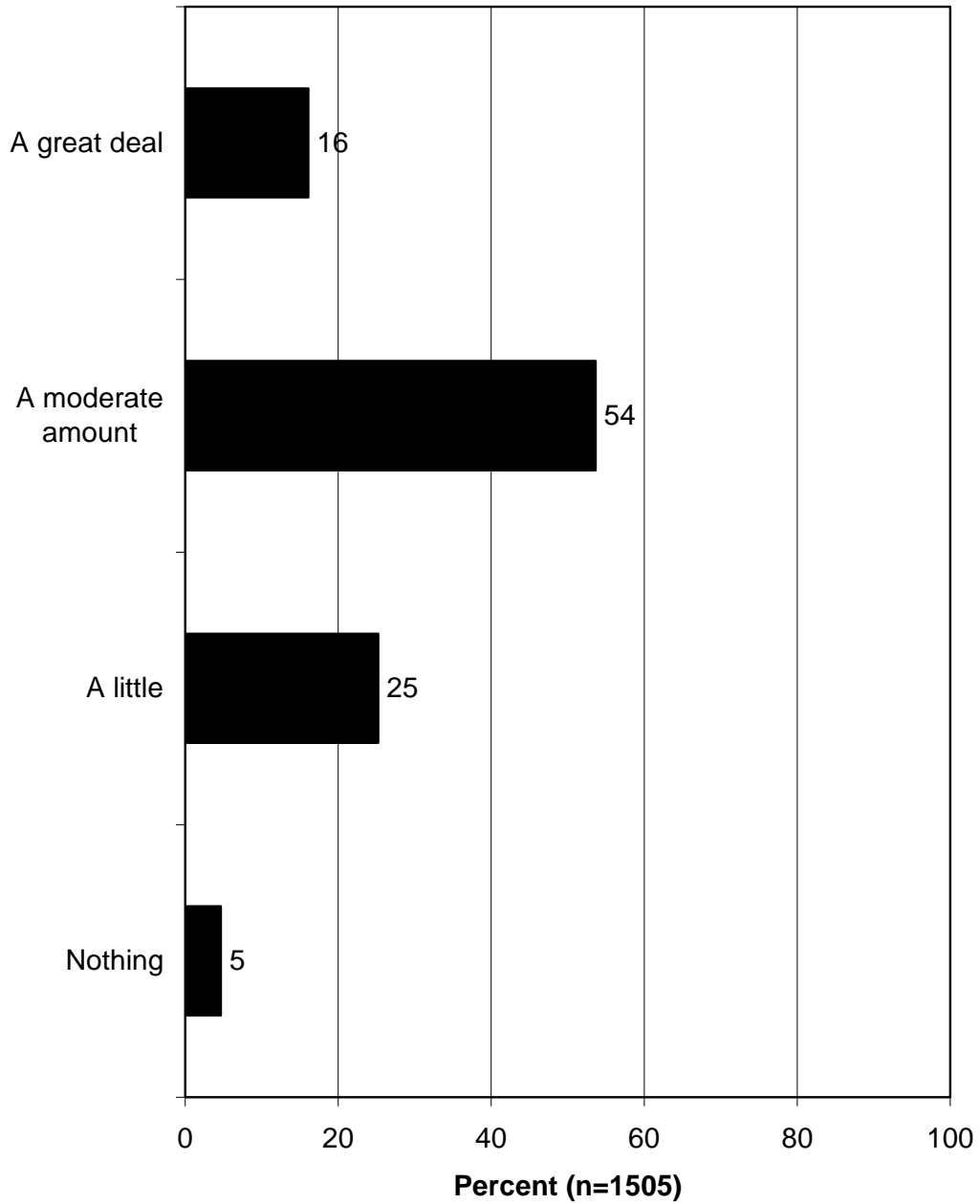
- The survey examined self-professed knowledge about *climate change*: 70% say that they know *a great deal* or *a moderate amount*, while 30% say that they know *a little* or *nothing*. The most common answer is *a moderate amount* (54%).
- The nonparametric analysis found that the following responses are correlated with saying he/she knows *a great deal* or *moderate amount* about climate change:
  - Says he/she knows a great deal or a moderate amount about sea level rise ( $p \leq 0.001$ ).
  - Shows concern about climate change and sea level rise (e.g., is completely or mostly convinced that sea levels are rising; worries a great deal or a moderate amount about climate change; thinks that climate change is a very serious threat) (all at  $p \leq 0.01$  or greater significance).
  - Thinks that sea level rise is a very or somewhat serious threat to him or her personally ( $p \leq 0.001$ ), a very serious threat to Delaware beaches ( $p \leq 0.05$ ), and a very or somewhat serious threat to the Mid-Atlantic United States ( $p \leq 0.05$ ).
  - Believes human efforts can improve climate change (e.g., agrees that climate change is something people can control; agrees that the impacts of climate change can be reduced by human efforts) (all at  $p \leq 0.05$  or greater significance).
  - On most questions, does not support any alterations in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate support for elevating buildings using government funds; does not indicate support for elevating the land surface; strongly supports avoiding building new structures) (all at  $p \leq 0.01$  or greater significance), but does support elevating buildings using private funding ( $p \leq 0.05$ ).
  - Supports allowing beaches and wetlands to naturally migrate inland to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.01$ ).
  - Thinks that the U.S. Congress ( $p \leq 0.01$ ) and corporations and industry ( $p \leq 0.05$ ) should be doing more to address or reduce the impacts of sea level rise in Delaware.
  - Primary sources of his or her information about environmental issues in Delaware are magazines ( $p \leq 0.001$ ), the Internet, not including Department of Natural Resources and Environmental Control website ( $p \leq 0.01$ ), and newspapers ( $p \leq 0.05$ ).
  - Would most like to have more information on actions that can be taken to reduce impacts of sea level rise ( $p \leq 0.05$ ).
  - Has a bachelor's degree or graduate degree ( $p \leq 0.001$ ).
  - Is male ( $p \leq 0.001$ ).
  - Owns his or her current place of residence ( $p \leq 0.001$ ).
  - Does not have any children, age 17 or younger, living in his or her household ( $p \leq 0.01$ ).
  - Is between ages 35-64 ( $p \leq 0.05$ ).
  - Considers his or her place of residence to be in a non-coastal area ( $p \leq 0.05$ ).
- The nonparametric analysis found that the following responses are correlated with saying he/she knows *a little* or *nothing* about climate change:

- Says he/she knows a little or nothing about sea level rise ( $p \leq 0.001$ ).
  - Does not show concern about climate change and sea level rise (e.g., does not indicate being completely or mostly convinced that sea levels are rising, does not indicate thinking that climate change is a very serious threat, is not worried about sea level rise) (all at  $p \leq 0.01$  or greater significance).
  - Does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.01$ ), and does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.01$ ).
  - Indicates sea level rise is not a very serious or not at all a threat to his/her family ( $p \leq 0.05$ ) or to him/her personally ( $p \leq 0.05$ ).
  - Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.05$ ).
  - Does not agree that climate change is something people can control ( $p \leq 0.001$ ).
  - Supports elevating the land surface ( $p \leq 0.001$ ) and elevating buildings using government funds ( $p \leq 0.01$ ) in areas at risk from sea level rise, but does not indicate strong support for avoiding building new structures ( $p \leq 0.01$ ) or elevating buildings using private funding ( $p \leq 0.05$ ) in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts.
  - Does not indicate support for allowing beaches and wetlands to naturally migrate inland to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.05$ ).
  - Does not indicate thinking that the U.S. Congress ( $p \leq 0.01$ ) or corporations and industry ( $p \leq 0.05$ ) should be doing more to address or reduce the impacts of sea level rise in Delaware.
  - Does not have a bachelor's degree ( $p \leq 0.001$ ).
  - Is female ( $p \leq 0.001$ ).
  - Rents his or her current place of residence ( $p \leq 0.001$ ).
  - The knowledge question was crosstabulated by gender. Men are more likely than are women to claim to know *a great deal* about climate change ( $p \leq 0.001$ ).
  - The knowledge question was crosstabulated by amount of education. More educated people claim to know more about climate change, compared to the other educational groups ( $p \leq 0.001$ ).
- Self-professed knowledge about *sea level rise* is lower than about climate change: 40% say that they know *a great deal* or *a moderate amount*, while 59% say that they know *a little* or *nothing*. The most common answer is *a little* (40%).
- The nonparametric analysis found that the following responses are correlated with knowing *a little* or *nothing* about sea level rise:
    - Says he/she knows a little or nothing about climate change ( $p \leq 0.001$ ).
    - Does not show concern about climate change and sea level rise (e.g., does not indicate being completely or mostly convinced that sea levels are rising, does not

- indicate thinking that climate change is a very serious threat, does not indicate worrying a great deal or a moderate amount about the problems that sea level rise may cause in Delaware) (all at  $p \leq 0.01$  or greater significance).
- Does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ), and does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.05$ ).
  - Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.001$ ).
  - Indicates sea level rise is not a very serious or not at all a threat to him/her personally ( $p \leq 0.001$ ).
  - Supports elevating buildings using government funds ( $p \leq 0.001$ ), elevating the land surface ( $p \leq 0.001$ ), building dikes, seawalls, and bulkheads to keep water back ( $p \leq 0.001$ ), using clean dredged material from waterways to build up marsh areas ( $p \leq 0.001$ ), and purchasing or buying out frequently flooded properties using government funds ( $p \leq 0.01$ ) in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts, but does not indicate strong support for changing building codes and regulations to reduce risk in flood-prone areas ( $p \leq 0.05$ ).
  - Does not indicate support for allowing beaches and wetlands to naturally migrate inland to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.05$ ).
  - Does not indicate thinking that corporations and industry ( $p \leq 0.01$ ) and Delaware's state agencies ( $p \leq 0.01$ ) should be doing more to address or reduce the impacts of sea level rise in Delaware.
  - Is between ages 18-34 ( $p \leq 0.001$ ).
  - Does not have a bachelor's degree ( $p \leq 0.001$ ).
  - Has at least one child, age 17 or younger, living in his or her household ( $p \leq 0.001$ ).
  - Rents his or her current place of residence ( $p \leq 0.001$ ).
  - Is female ( $p \leq 0.01$ ).
- The newspaper is the leading source of information about environmental issues in Delaware (52% get their information about the environment that way), followed by television (44%), the Internet (excluding the DNREC site) (30%), and magazines (14%). (In total, 32% use the Internet.)
- When the above question on information sources was crosstabulated by age, younger age groups appear more likely to get information from the Internet and older age groups appear more likely to get information from newspapers.
- Residents are split regarding whether there is enough available information about sea level rise: 39% say that there is enough available information, but 51% say that there is not enough available information (the rest are neutral).

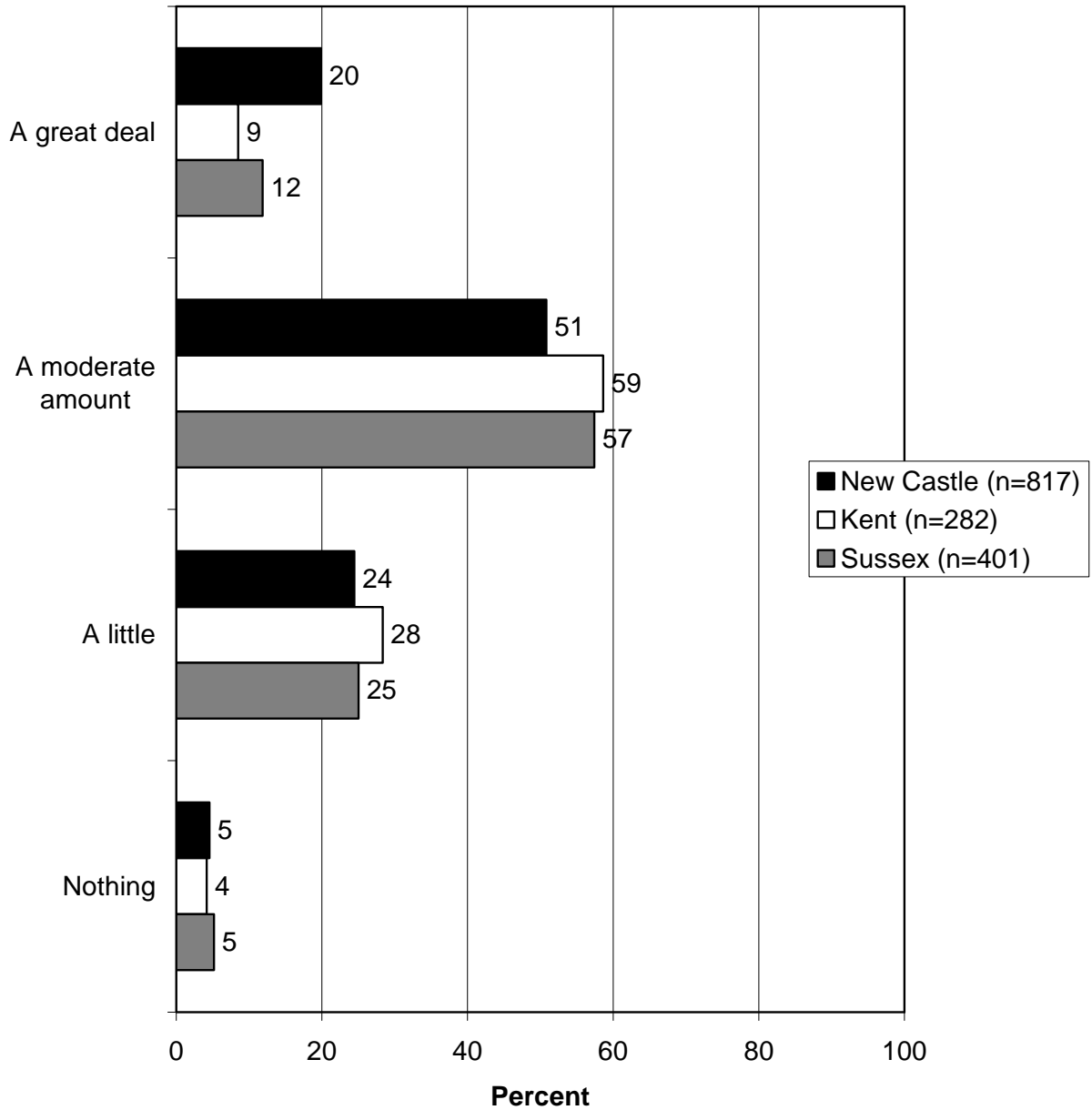
- Residents were asked to name information topics related to sea level rise that they might want. Six topics were most commonly named, listed below.
- Sea level rise in general (33% want more information on this).
  - Actions that can be taken to reduce impacts of sea level rise (26%).
  - Current or potential impacts of sea level rise (24%).
  - How sea level rise relates to climate change/global warming (23%).
  - How to protect property from sea level rise (19%).
  - Funding needs to address sea level rise in Delaware (18%).

**Q37. How much would you say you know about climate change?**

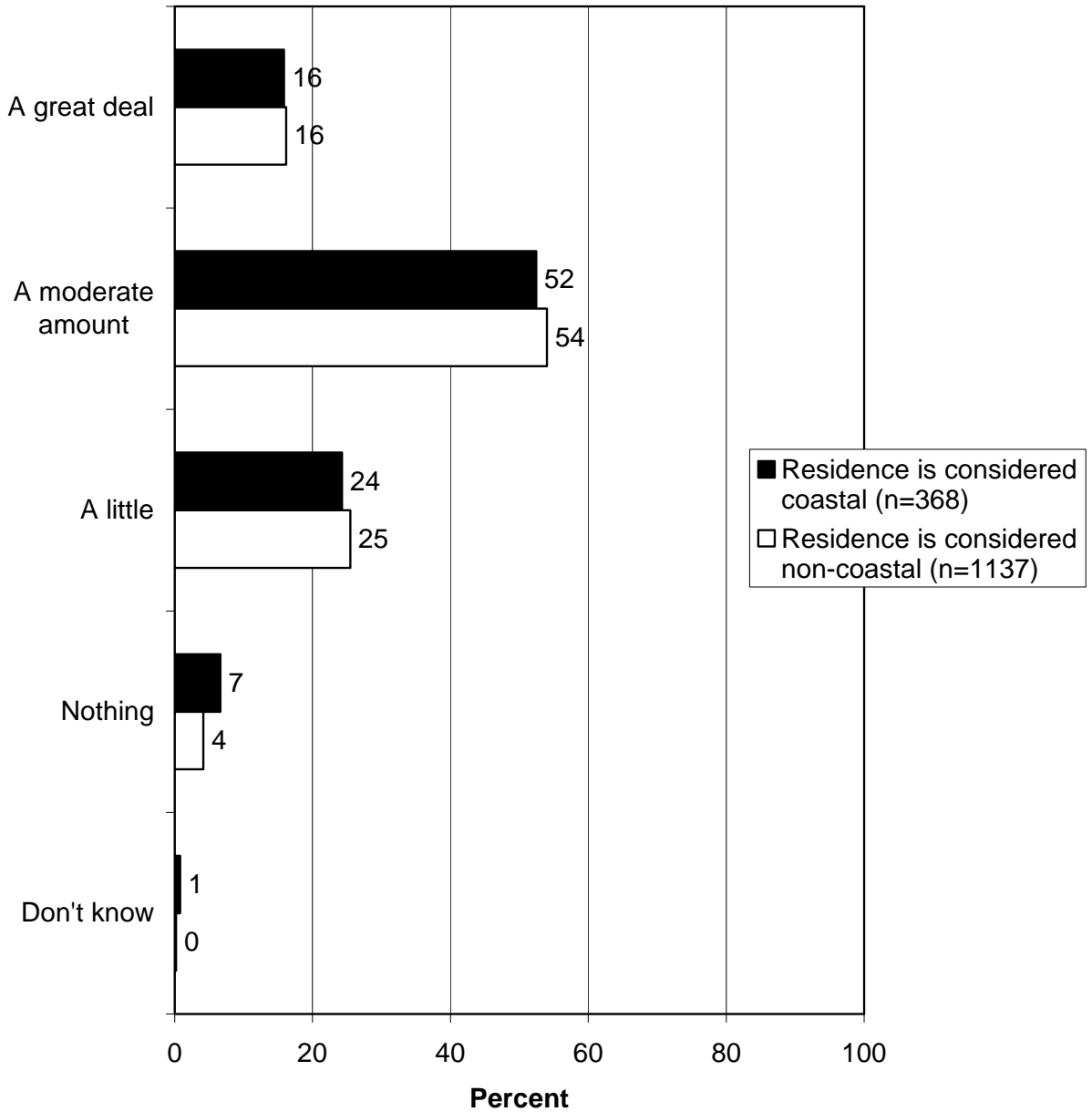




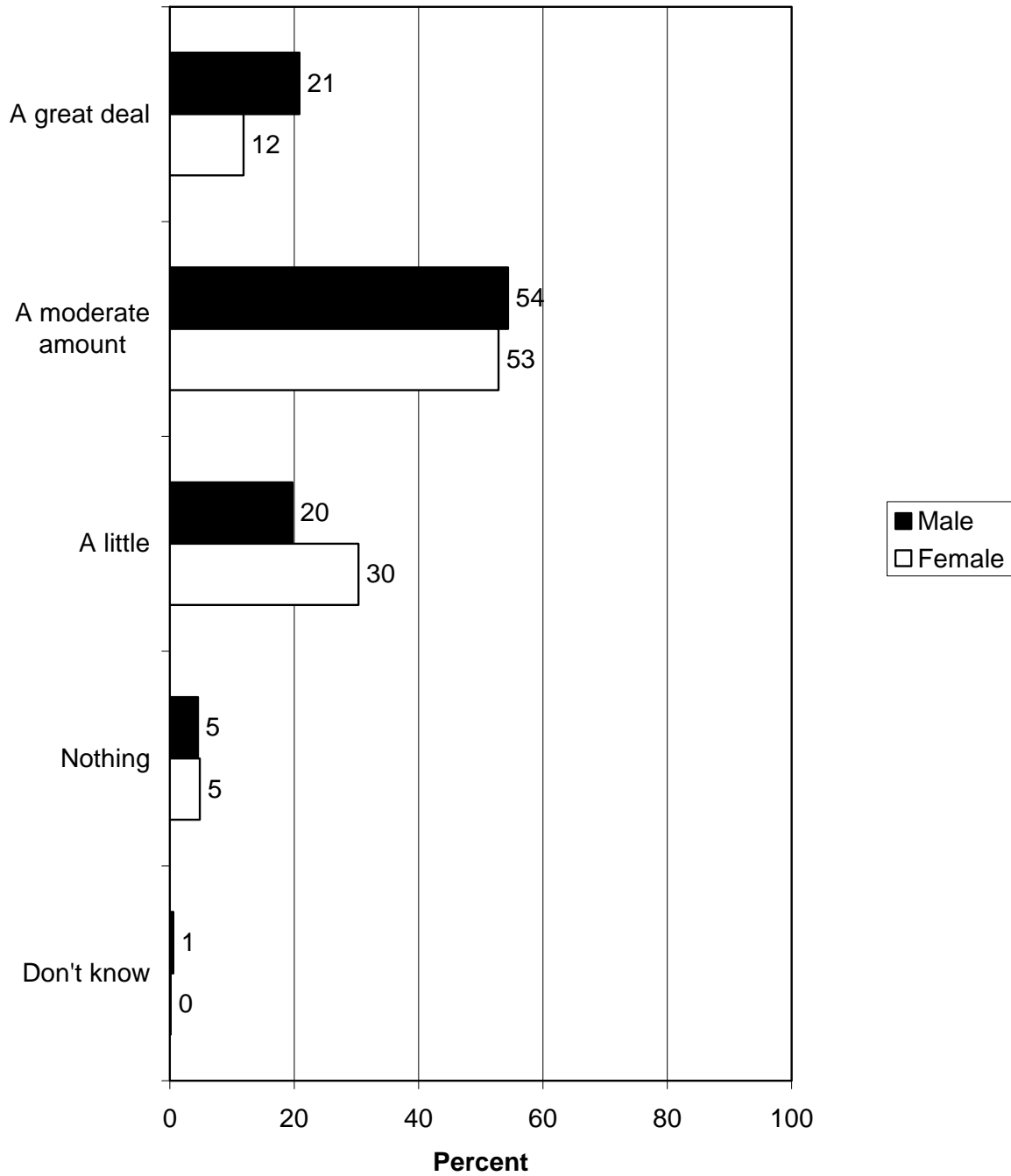
### Q37. How much would you say you know about climate change?



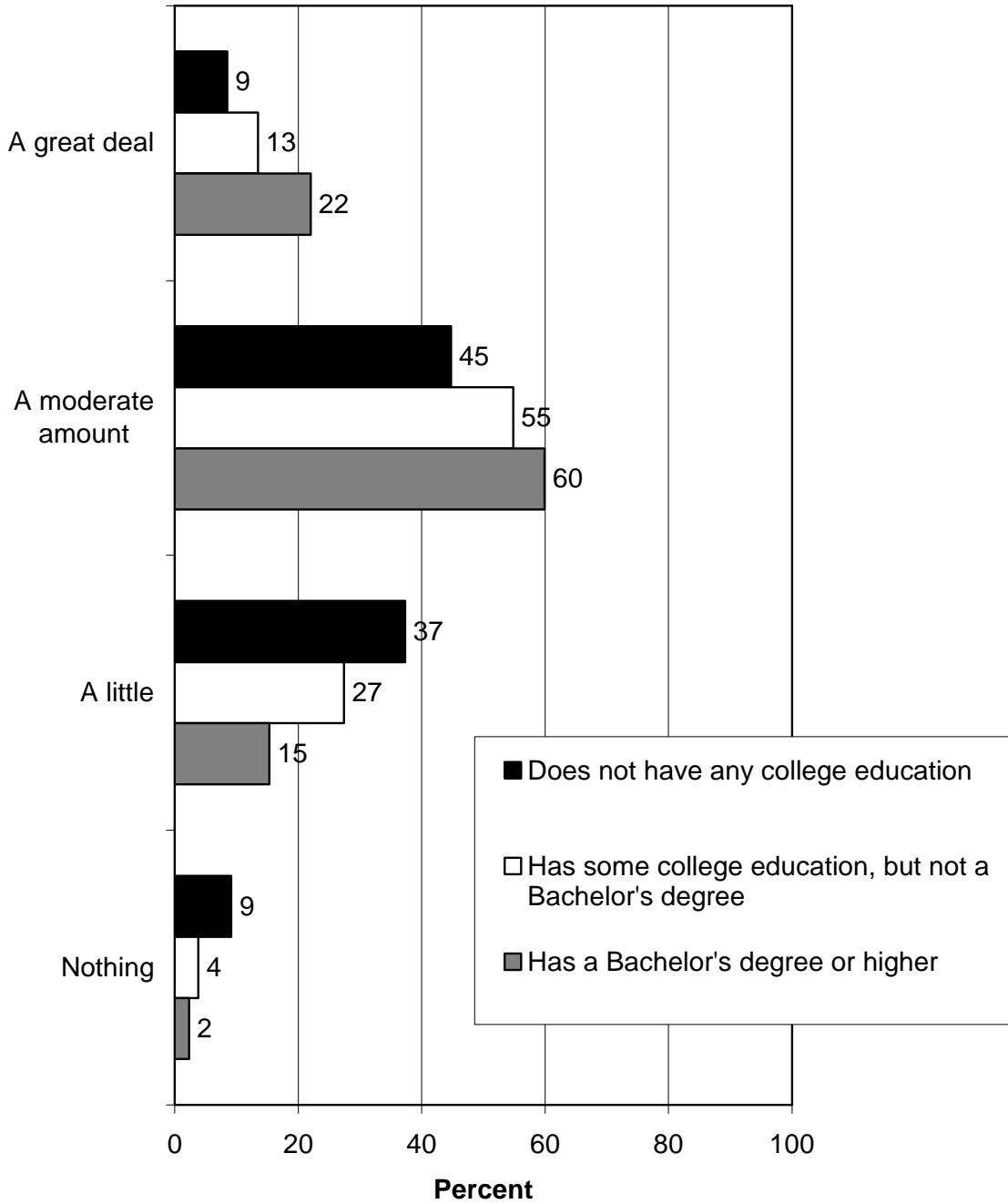
### Q37. How much would you say you know about climate change?



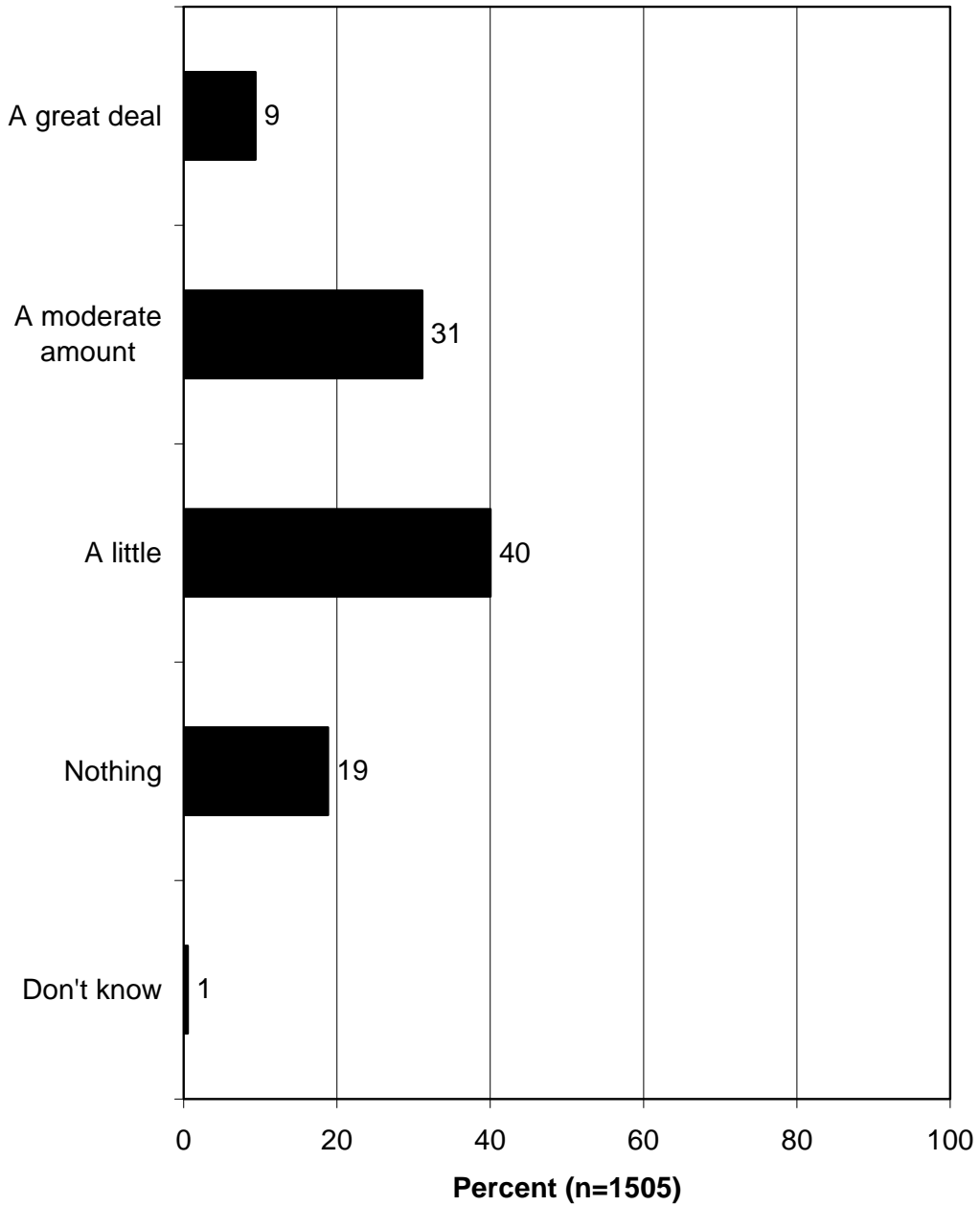
### Q37. How much would you say you know about climate change?



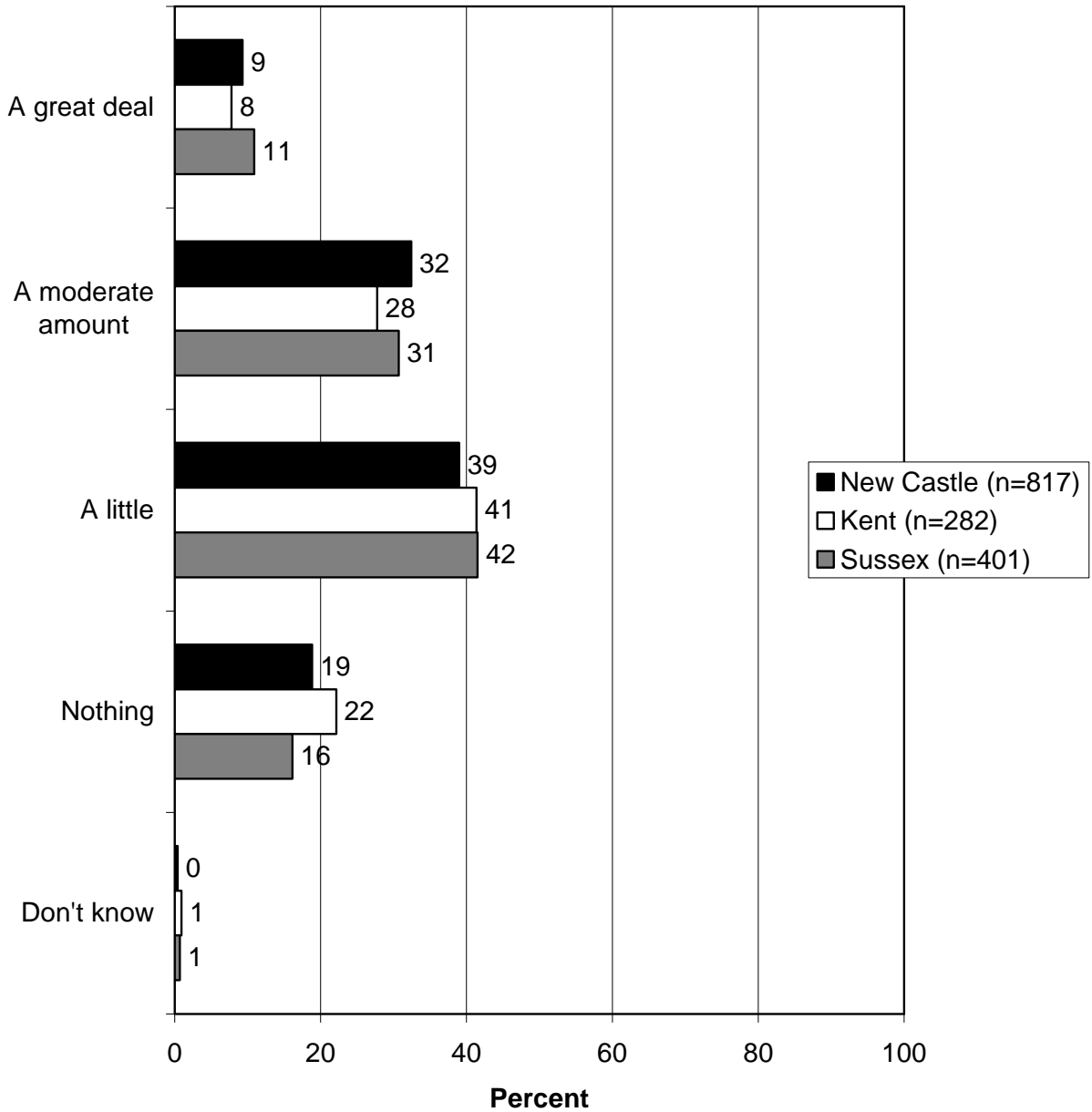
### Q37. How much would you say you know about climate change?



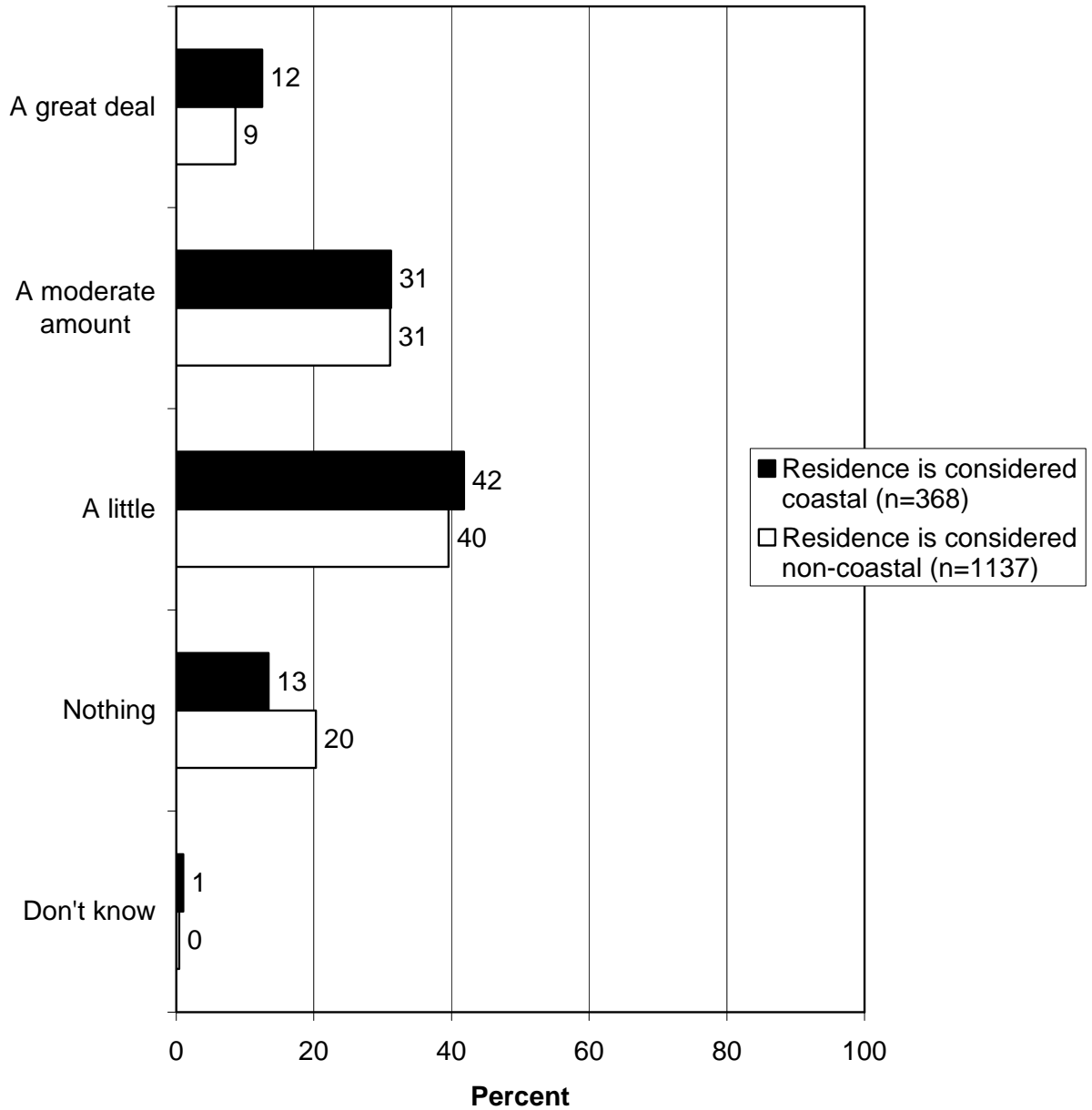
**Q51. How much would you say you know about sea level rise?**



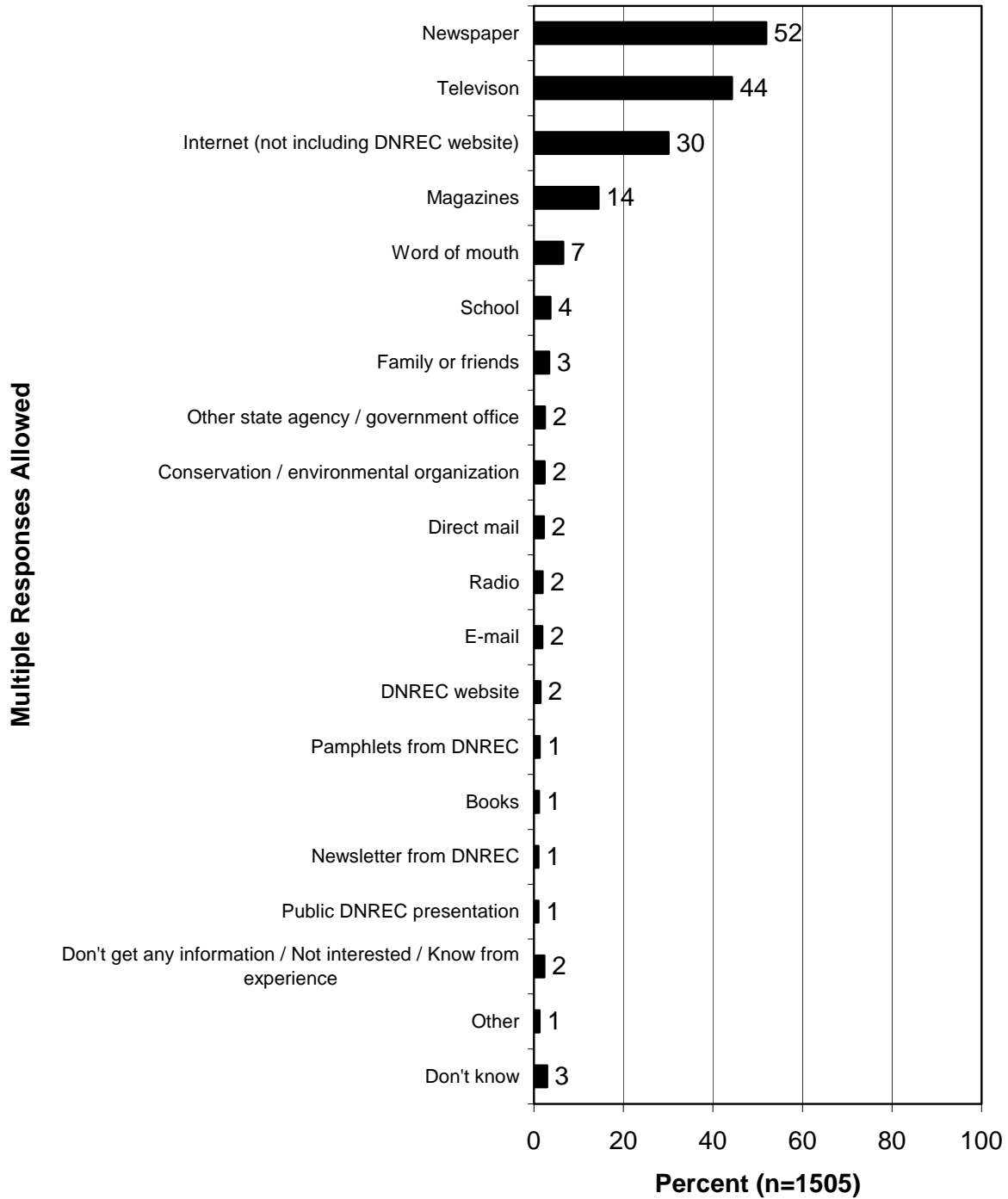
### Q51. How much would you say you know about sea level rise?



### Q51. How much would you say you know about sea level rise?

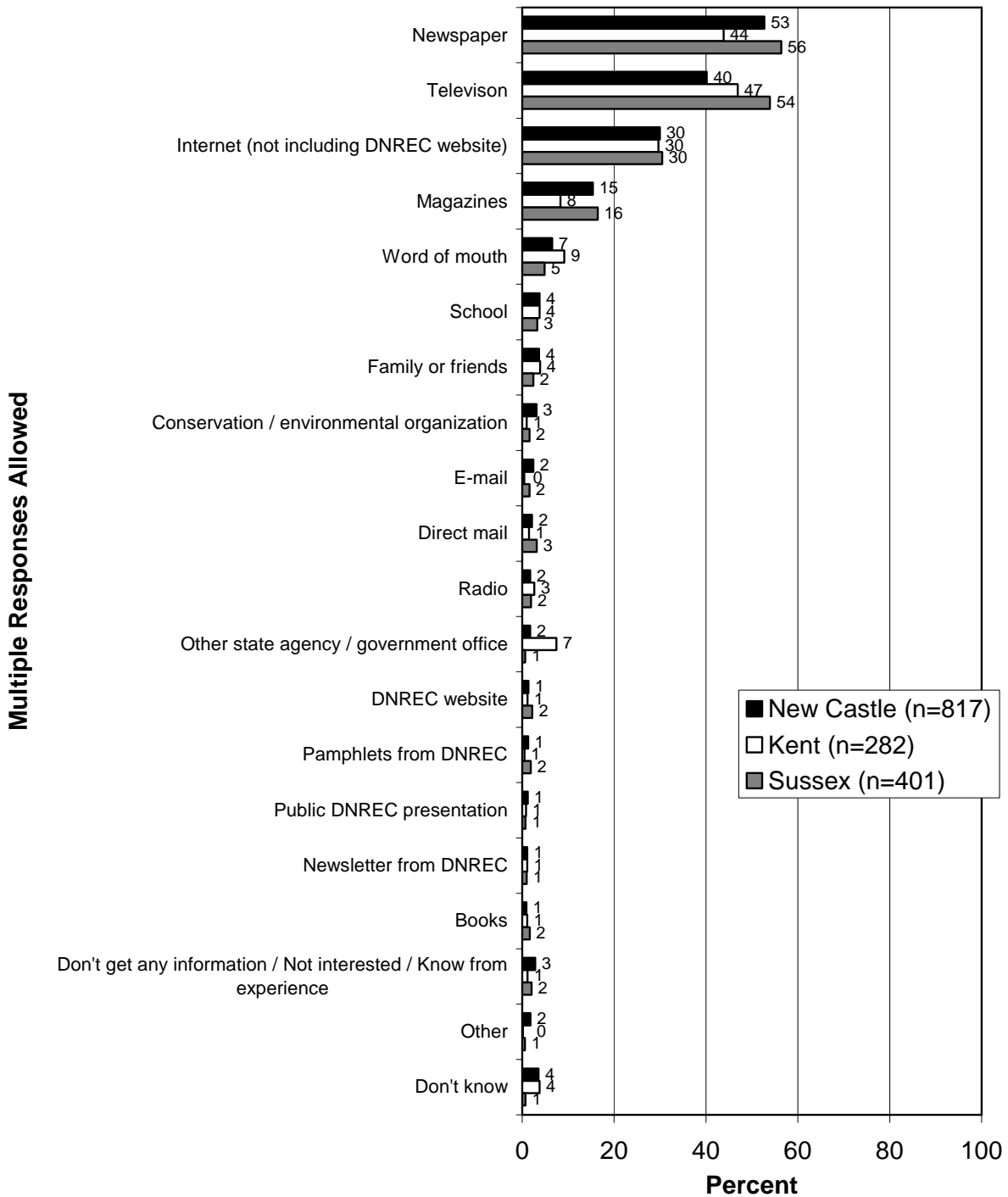


**Q136. Where do you get most of your information about environmental issues in Delaware?**

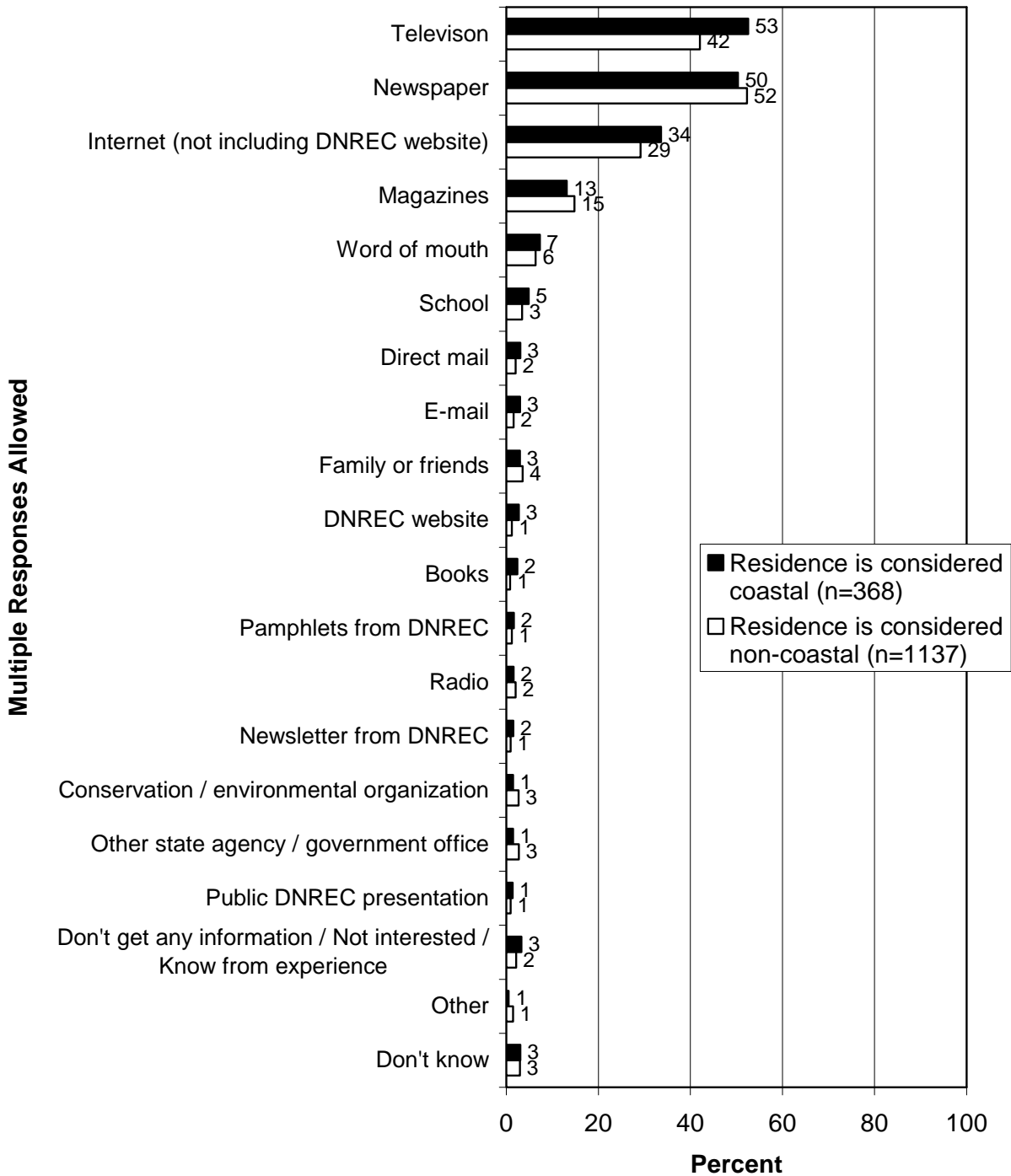




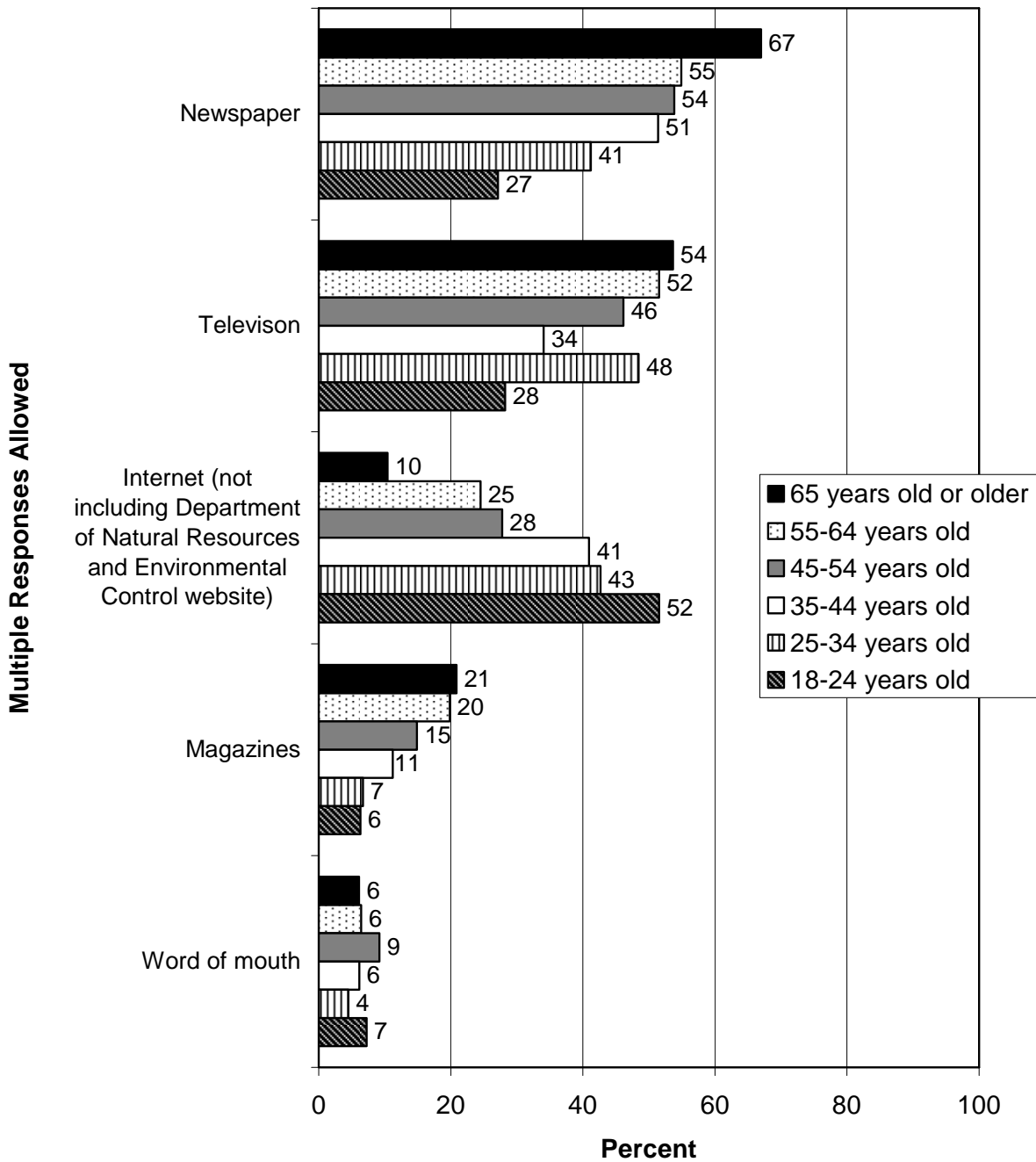
### Q136. Where do you get most of your information about environmental issues in Delaware?



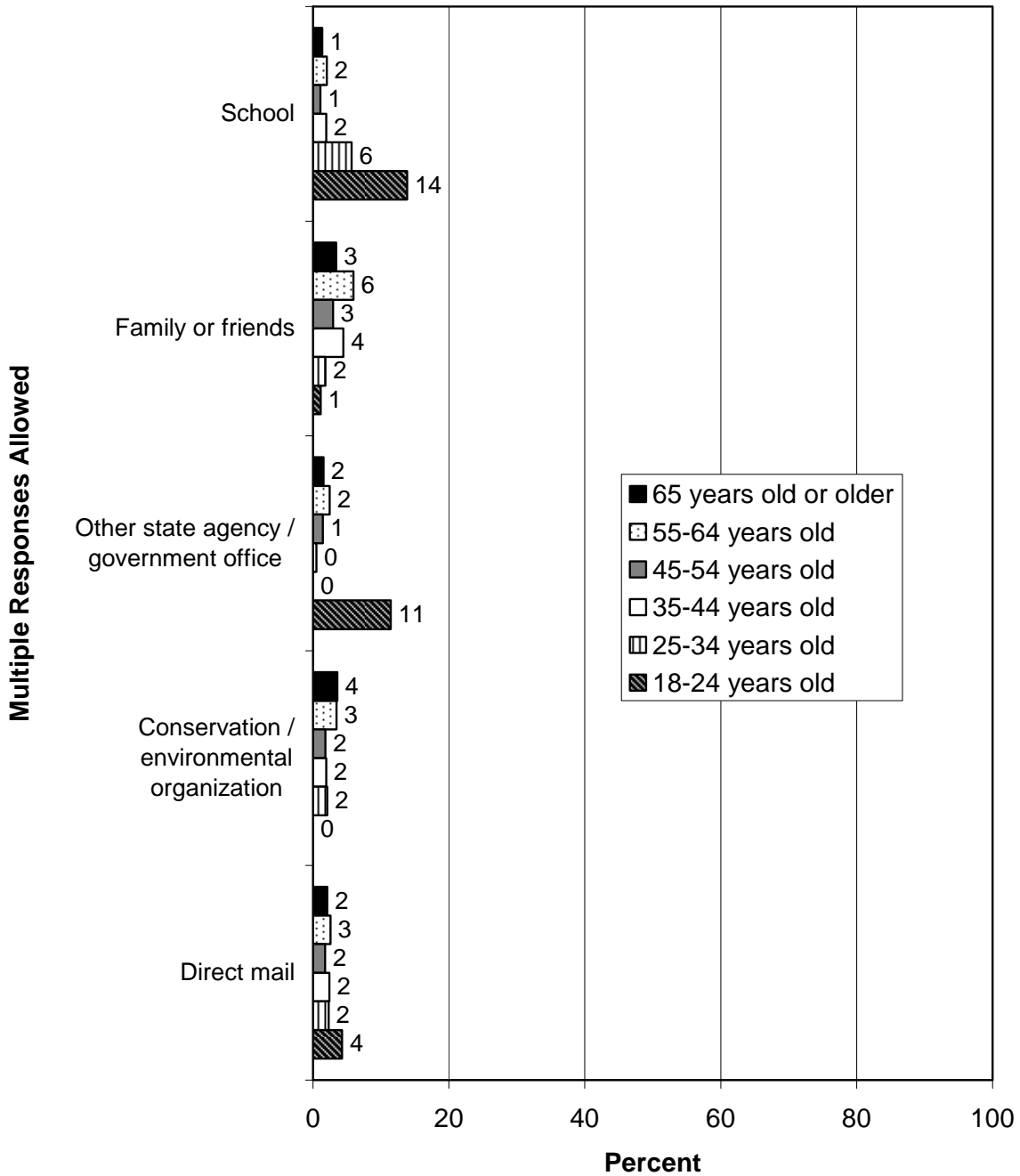
**Q136. Where do you get most of your information about environmental issues in Delaware?**



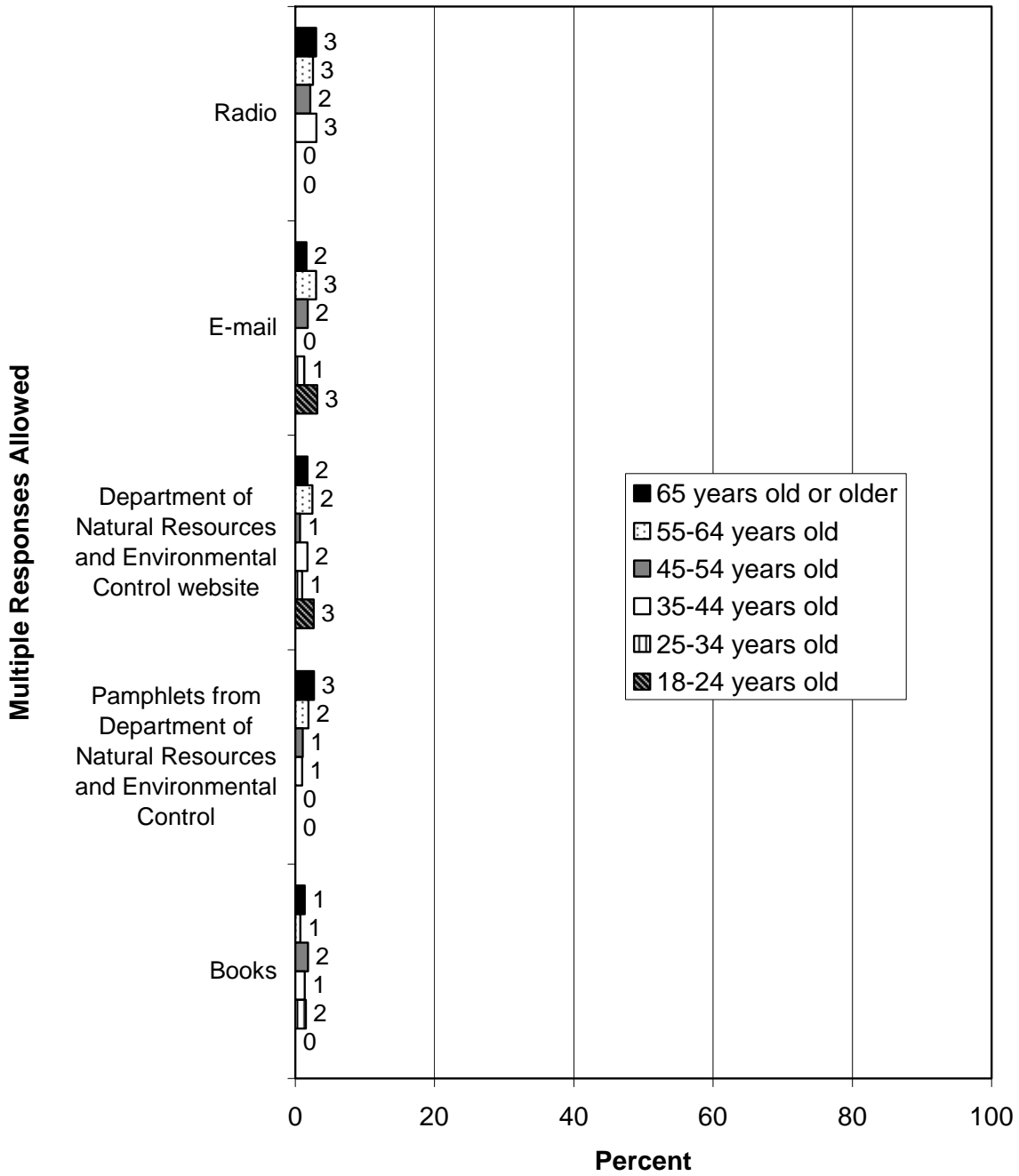
**Q136. Where do you get most of your information about environmental issues in Delaware?  
(Part 1)**



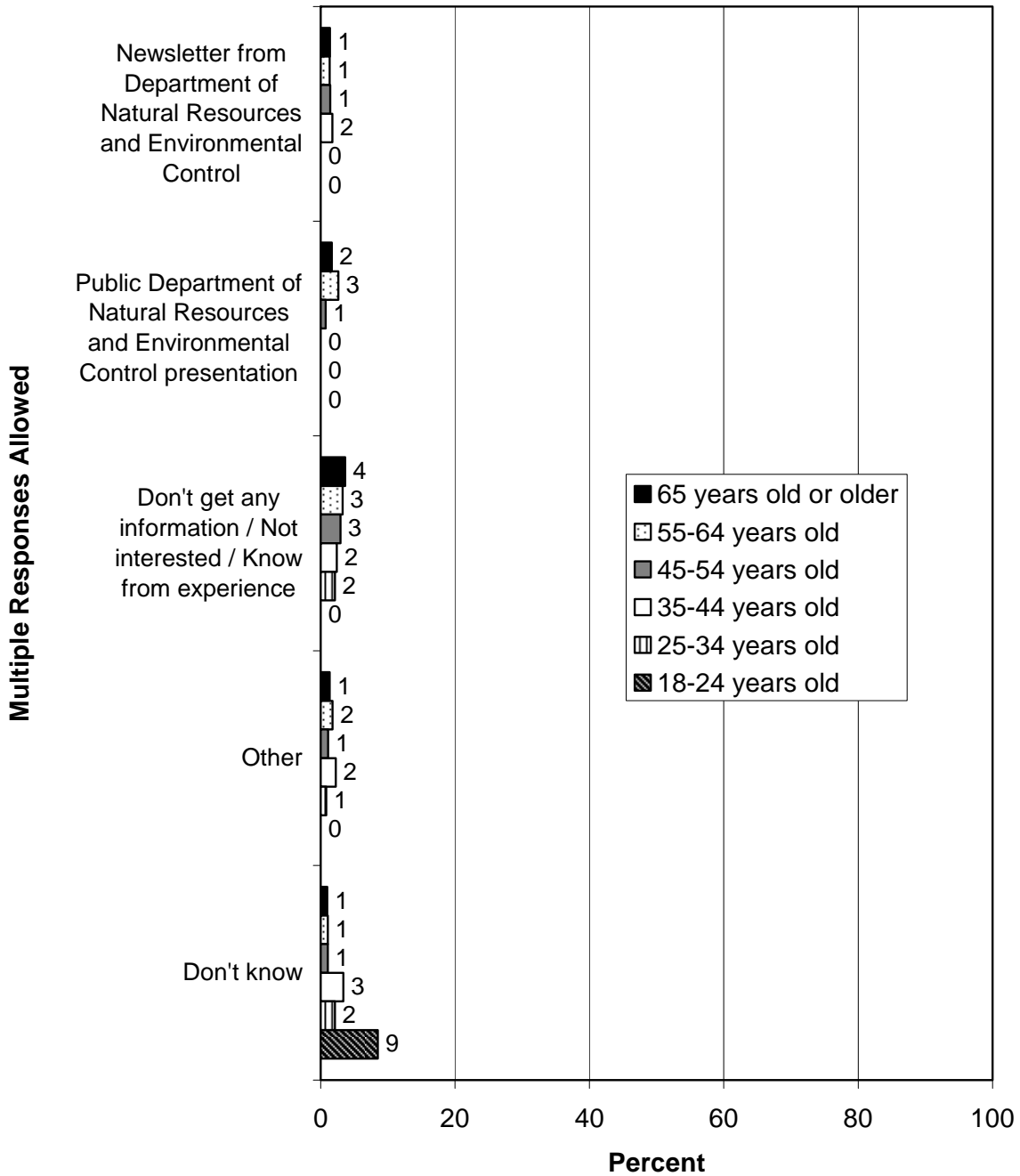
**Q136. Where do you get most of your information about environmental issues in Delaware?  
(Part 2)**



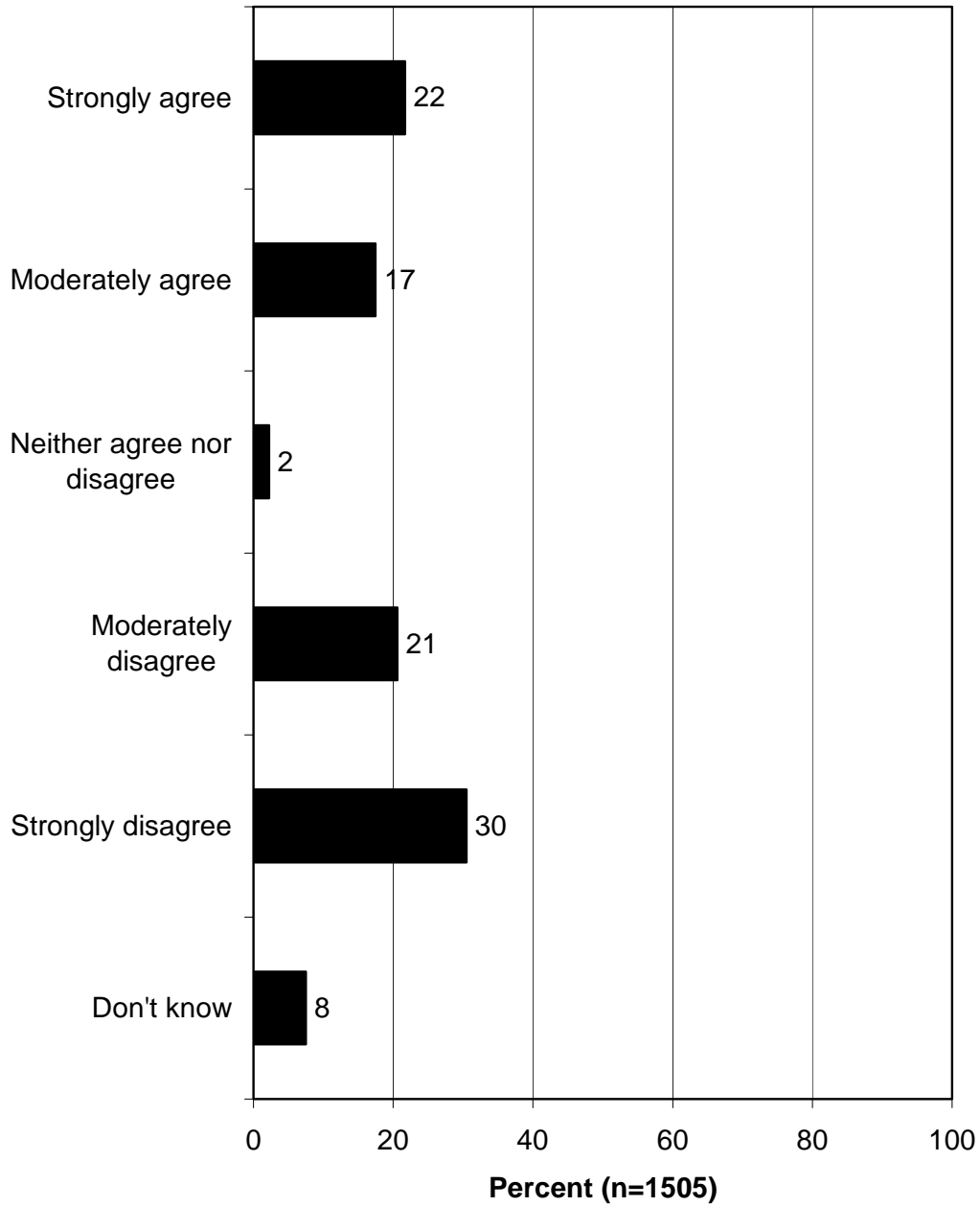
**Q136. Where do you get most of your information about environmental issues in Delaware?  
(Part 3)**



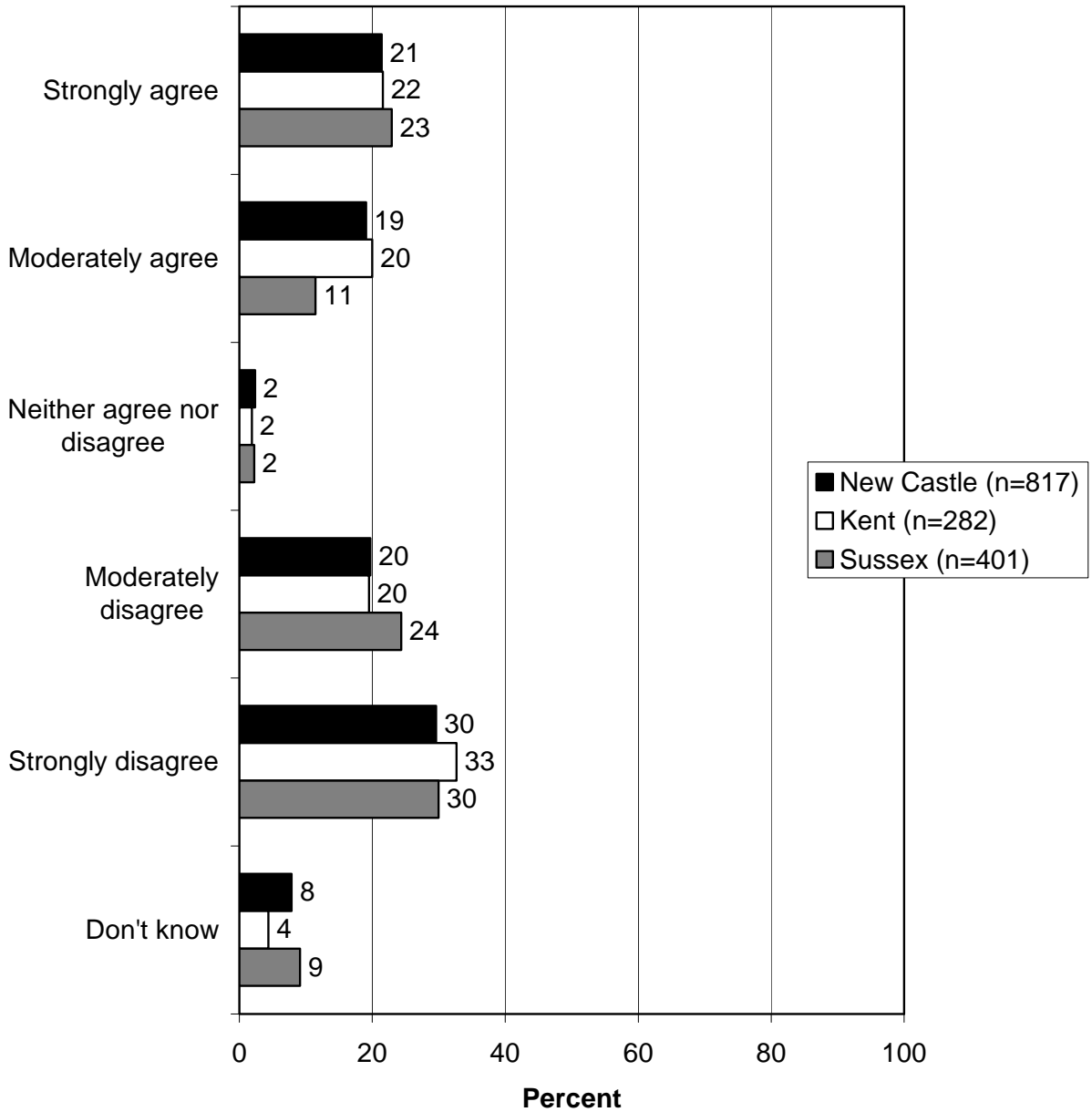
**Q136. Where do you get most of your information about environmental issues in Delaware?  
(Part 4)**



**Q138. Do you agree or disagree that there is enough available information about sea level rise?**

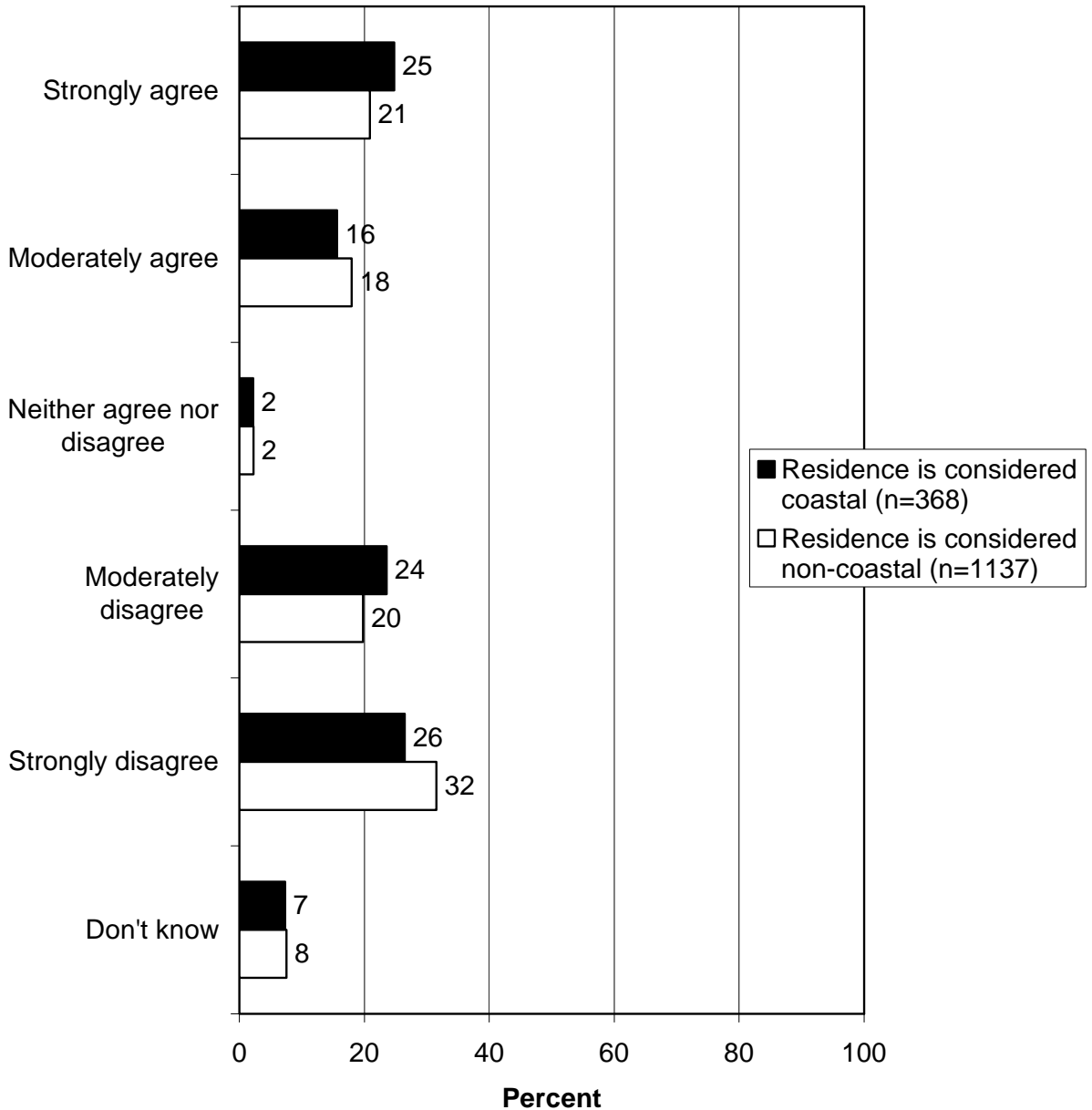


**Q138. Do you agree or disagree that there is enough available information about sea level rise?**

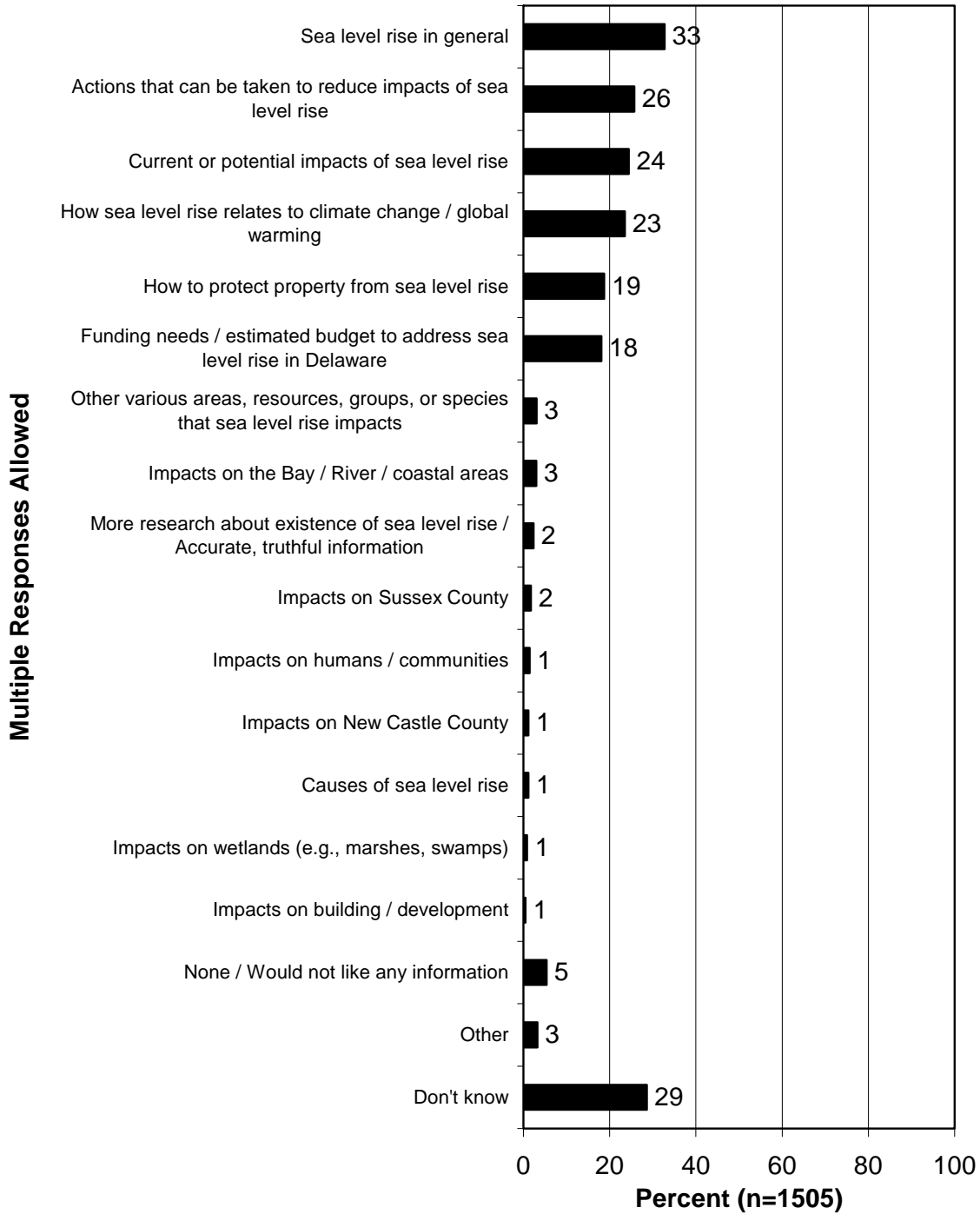




**Q138. Do you agree or disagree that there is enough available information about sea level rise?**

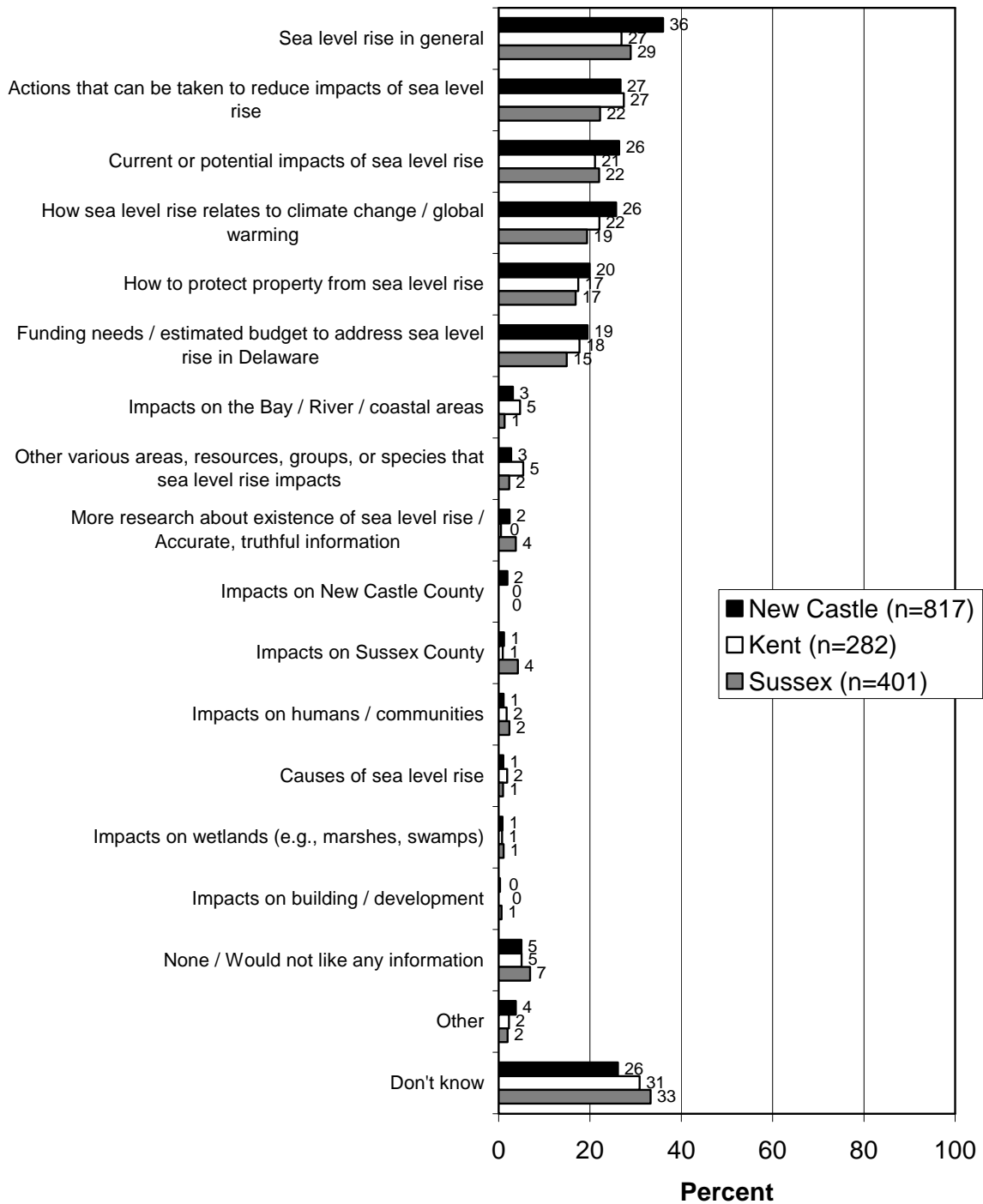


**Q141/142/143. What topics related to sea level rise would you most like to have more information on?**

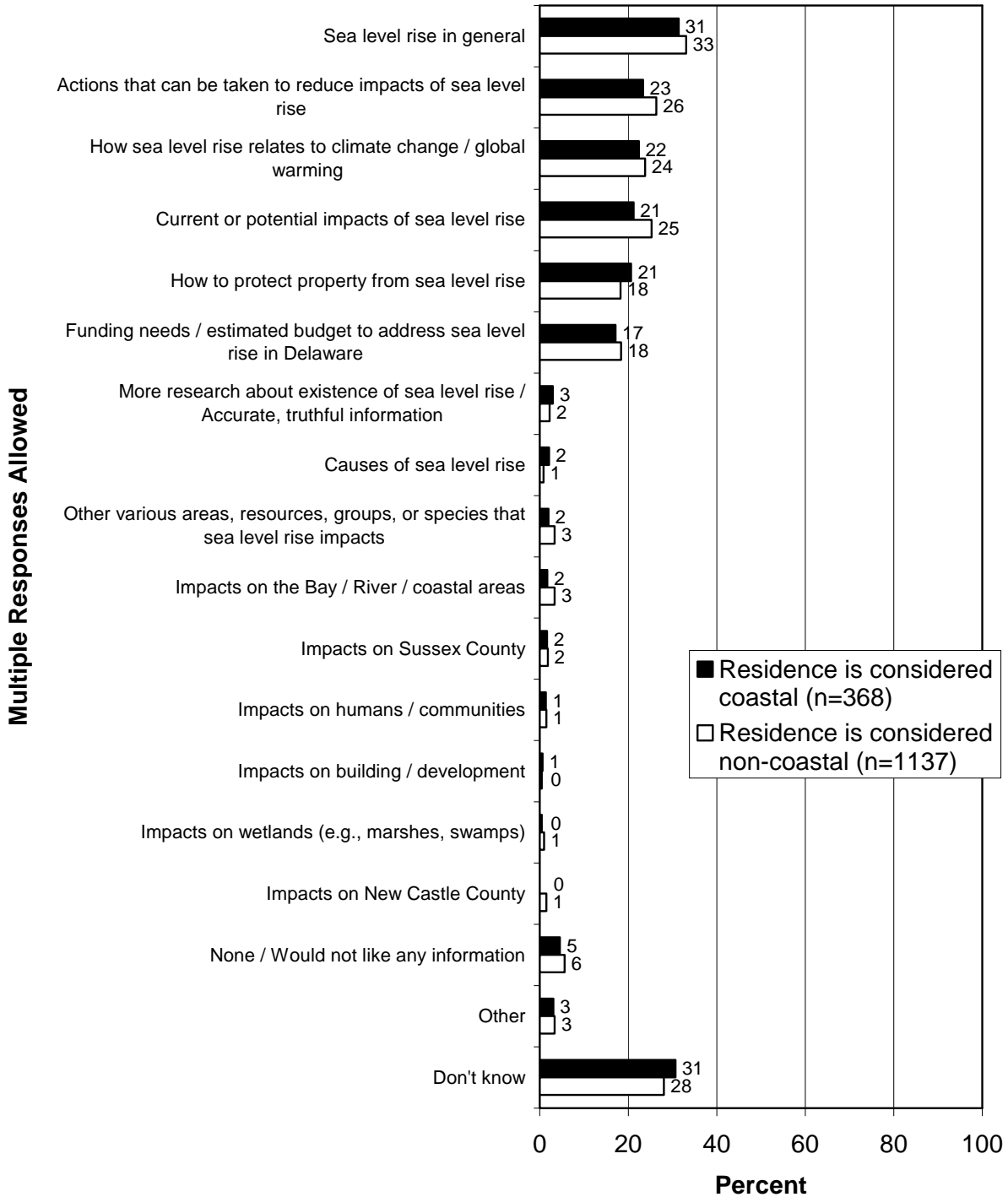


### Q141/142/143. What topics related to sea level rise would you most like to have more information on?

Multiple Responses Allowed



### Q141. What topics related to sea level rise would you most like to have more information on?



## OPINION ON CLIMATE CHANGE AND WHETHER CLIMATE CHANGE IS HAPPENING

- A direct question asked residents to indicate how convinced they are that climate change is happening. The large majority (70%) are *completely* or *mostly* convinced that climate change is happening. At the other end, 27% are *not so* convinced or are *not at all* convinced. Similarly, 63% are *completely* or *mostly* convinced that sea levels are rising, and 33% are *not so* convinced or are *not at all* convinced that sea levels are rising.
- The nonparametric analysis found that the following responses are correlated with being completely convinced that climate change is happening:
  - Says he/she knows a great deal or a moderate amount about sea level rise ( $p \leq 0.05$ ).
  - Shows concern about climate change and sea level rise (e.g., strongly agrees that scientists are right that climate change is occurring; thinks that climate change is a very serious threat; worries a great deal or a moderate amount about climate change) (all at  $p \leq 0.001$  or greater significance).
  - Thinks that sea level rise is a very or somewhat serious threat to him or her personally, a very or somewhat serious threat to the Mid-Atlantic United States, a very serious threat to Delaware beaches, a very serious threat to marshes and wetlands in Delaware, a very or somewhat serious threat to the United States, a very serious threat to ocean-front cities and towns in Delaware, a very serious threat to the State of Delaware, and a very or somewhat serious threat to river-front cities and towns in Delaware (all at  $p \leq 0.001$  or greater significance).
  - Thinks that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.001$ ).
  - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).
  - Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts. ( $p \leq 0.001$ )
  - Believes human efforts can improve climate change (e.g., agrees that the impacts of climate change can be reduced by human efforts; agrees that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
  - On most questions about how to improve areas at risk from sea level rise, supports any efforts to address sea level rise in Delaware or reduce its impacts (e.g., strongly supports changing building codes and regulations to reduce risk in flood prone areas; strongly supports avoiding building new structures; supports purchasing or acquiring land and open space at risk from sea level rise from willing land sellers using government funds) (all at  $p \leq 0.05$  or greater significance).
  - Thinks that the U.S. Congress ( $p \leq 0.001$ ), corporations and industry ( $p \leq 0.001$ ), Delaware's state legislators ( $p \leq 0.001$ ), Delaware citizens ( $p \leq 0.001$ ), Delaware's governor ( $p \leq 0.001$ ), Delaware's state agencies ( $p \leq 0.01$ ), his or her county government officials ( $p \leq 0.05$ ), his or her state government officials ( $p \leq 0.05$ ), and his or her city or town government officials ( $p \leq 0.05$ ) should all be doing more to address or reduce the impacts of sea level rise in Delaware.

- Would most like to have more information on actions that can be taken to reduce impacts of sea level rise ( $p \leq 0.01$ ).
  - Rents his or her current place of residence ( $p \leq 0.01$ ).
  - Considers his or her place of residence to be in a coastal area ( $p \leq 0.01$ ).
  - Considers his or her place of residence to be a small city or town ( $p \leq 0.05$ ).
- A crosstabulation by gender found that women, compared to men, are more likely to be either *completely* or *mostly* convinced that climate change is happening ( $p \leq 0.01$  on the combination of *completely* and *mostly* convinced).
  - A crosstabulation by amount of education found that residents in the higher education group (has at least a bachelor's degree), relative to the other educational groups, are more likely to be *completely* convinced that climate change is happening ( $p \leq 0.05$ ).
  - When told that some scientists predict that sea levels will rise at least 1 to 3 feet in the next 100 years, the large majority of residents (62%) agree that this is a reasonable prediction; at the other end, 21% disagree. (The remainder are neutral.)
  - Recall in related questions previously discussed that residents are split regarding their *worrying* about climate change: a slight majority of residents (53%) say that they personally worry about climate change *a great deal* or *a moderate amount*, but just under a majority (46%) worry *only a little* or *not at all*. However, less than a majority of residents (39%) say that they personally worry about sea level rise *a great deal* or *a moderate amount*, while a large majority (60%) worry *only a little* or *not at all*. (These graphs were previously discussed and are included in the section of this report titled "Perceptions of Important Environmental Issues.")
- The survey also touched on perceptions of what most *scientists* think regarding climate change. Residents are split, with 42% thinking that most scientists think climate change is happening, and 42% thinking that there is a lot of disagreement among scientists about whether climate change is happening. Only 5% think that most scientists think that climate change is *not* happening. (The remainder do not know.)
- The crosstabulation by county of residence found that New Castle County residents are the most likely, relative to residents of the other two counties, to have the view that most scientists think that climate change is happening ( $p \leq 0.05$ ).

- A crosstabulation by amount of education found that residents in the higher education group (has at least a bachelor's degree), compared to the other two educational groups, are more likely to say that most scientists think that climate change is happening ( $p \leq 0.001$ ).
- A series of six questions further explored residents' perceptions regarding whether climate change and sea level rise are happening, listed in Text Box 3 below.
- Large majorities *strongly* or *moderately* agree with the following: that scientists are right that climate change is occurring (79%), that climate change is contributing to the rise in sea levels (75%), that the state of Delaware needs to conduct more research to identify the impacts of sea level rise in Delaware (73%), and that the state of Delaware needs to conduct more research to identify the impacts of climate change in Delaware (71%).
  - Less than a majority (40%) *strongly* or *moderately* agree that the impacts of climate change are greatly exaggerated.
  - Interestingly, although the majority of residents agree that scientists are right that climate change is occurring and that climate change is contributing to the rise in sea levels, a small percentage of residents (22%) think that they have *personally experienced* the impacts of sea level rise.

**Text Box 3****Perceptions Regarding Whether Climate Change and Sea Level Rise Are Happening (Ranked by the Percentage Who Strongly or Moderately Agree With the Following Statements)**

Scientists are right that climate change is occurring.

Climate change is contributing to the rise in sea levels.

The state of Delaware needs to conduct more research to identify the impacts of sea level rise in Delaware.

The state of Delaware needs to conduct more research to identify the impacts of climate change in Delaware.

The impacts of climate change are greatly exaggerated.

You (the respondent) have personally experienced the impacts of sea level rise.

- The nonparametric analysis found that the following responses are correlated with **disagreeing** that he/she has personally experienced the impacts of sea level rise:
  - Knows little or nothing about sea level rise ( $p \leq 0.001$ ) or climate change ( $p \leq 0.05$ ).
  - Thinks that “climate change” and “global warming” refer to two different things but are related ( $p \leq 0.05$ ).
  - Does not show concern about climate change and sea level rise (e.g., does not indicate worrying a great deal or a moderate amount about the problems that sea level rise may cause in Delaware, does not indicate being completely or mostly convinced that sea levels are rising, does not indicate thinking that climate change is a very serious threat) (all at  $p \leq 0.001$  or greater significance).
  - Indicates sea level rise is not a very serious or not at all a threat to his/her family ( $p \leq 0.001$ ), to him/her personally ( $p \leq 0.001$ ), to his/her local community ( $p \leq 0.001$ ), to his/her property ( $p \leq 0.001$ ), to the State of Delaware ( $p \leq 0.001$ ), to Delaware's public works systems, such as public buildings, roads, and sewer systems ( $p \leq 0.001$ ), to the United States ( $p \leq 0.01$ ), to ocean-front cities and towns in Delaware ( $p \leq 0.01$ ), to Delaware beaches ( $p \leq 0.01$ ), to Delaware's wildlife populations ( $p \leq 0.01$ ), to the marsh and wetlands in Delaware ( $p \leq 0.05$ ), to river-front cities and towns in Delaware ( $p \leq 0.05$ ), to the Mid-Atlantic U.S. ( $p \leq 0.05$ ), or to Delaware's economy ( $p \leq 0.05$ ).
  - Does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.01$ ).
  - Indicates that climate change is caused by natural changes in environment ( $p \leq 0.01$ ).
  - Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.01$ ).
  - Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
  - Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - Does not strongly agree that the impacts of climate change can be reduced by human efforts ( $p \leq 0.01$ ).
  - Does not indicate support for purchasing or acquiring land and open space at risk from sea level rise from willing land sellers using government funds ( $p \leq 0.01$ ), changing building codes and regulations to reduce risk in flood-prone areas ( $p \leq 0.01$ ), elevating buildings in areas at risk from sea level rise using government funds ( $p \leq 0.05$ ), or purchasing or buying out frequently flooded properties using government funds ( $p \leq 0.05$ ) to address sea level rise in Delaware or reduce its impacts.
  - Supports allowing beaches and wetlands to naturally migrate inland to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.05$ ).
  - Does not indicate thinking that Delaware citizens ( $p \leq 0.001$ ), Delaware's state legislators ( $p \leq 0.001$ ), his or her state government officials ( $p \leq 0.001$ ), corporations and industry ( $p \leq 0.001$ ), his or her city or town government officials ( $p \leq 0.001$ ), his or her county government officials ( $p \leq 0.001$ ), the U.S. Congress ( $p \leq 0.01$ ), Delaware's state agencies ( $p \leq 0.01$ ), or Delaware's governor ( $p \leq 0.01$ ) should be doing more to address or reduce the impacts of sea level rise in Delaware.

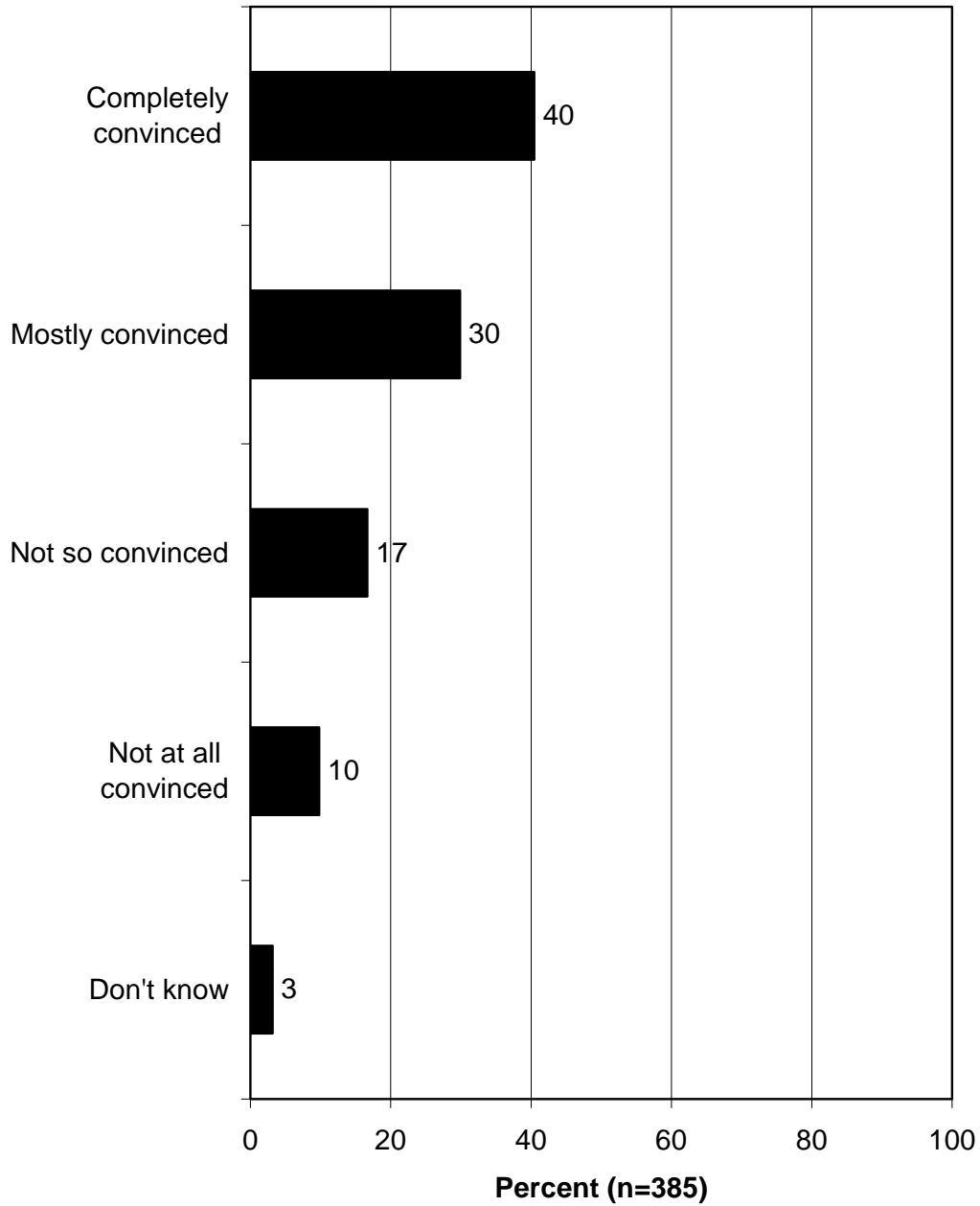


- Considers his or her place of residence to be in a non-coastal area ( $p \leq 0.001$ ).
  - Owns his or her current place of residence ( $p \leq 0.05$ ).
  - Considers his or her place of residence to be a large city, urban area, or suburban area ( $p \leq 0.05$ ).
  - Is male ( $p \leq 0.05$ ).
  - Lives in Kent County ( $p \leq 0.05$ ).
- In the above series, only one question had statistically significant differences in the crosstabulation by county of residence: Sussex County residents are the most likely to *strongly* agree that they have personally experienced the impacts of sea level rise ( $p \leq 0.01$ ).
- The crosstabulation by coastal/non-coastal found statistically significant differences on three questions from the above series regarding perceptions about whether climate change is happening.
- Interestingly, and somewhat counter-intuitively, the crosstabulation by coastal/non-coastal found that *non-coastal* residents are more likely to *strongly* agree that climate change is contributing to the rise in sea levels, compared to coastal residents ( $p \leq 0.05$ ).
  - The crosstabulation by coastal/non-coastal found that coastal residents, relative to non-coastal residents, are more likely to *strongly* agree that they have experienced the impacts of sea level rise ( $p \leq 0.001$ ).
  - Finally, coastal residents are more likely to *strongly* agree that the state of Delaware needs to conduct more research to identify the impacts of sea level rise ( $p \leq 0.05$ ).
- The crosstabulation by those convinced that climate change is happening/those not convinced found statistically significant differences on all six of the questions from the above series regarding perceptions about whether climate change is happening.
- Those convinced that climate change is happening are more likely to agree that scientists are right that climate change is occurring ( $p \leq 0.001$ ).
  - Those convinced that climate change is happening are more likely to *strongly* agree that the state of Delaware needs to conduct more research to identify the impacts of climate change in Delaware, and those *not* convinced that climate change is happening are more likely to *strongly* disagree that the state of Delaware needs to conduct more research to identify the impacts of climate change in Delaware ( $p \leq 0.001$ ).

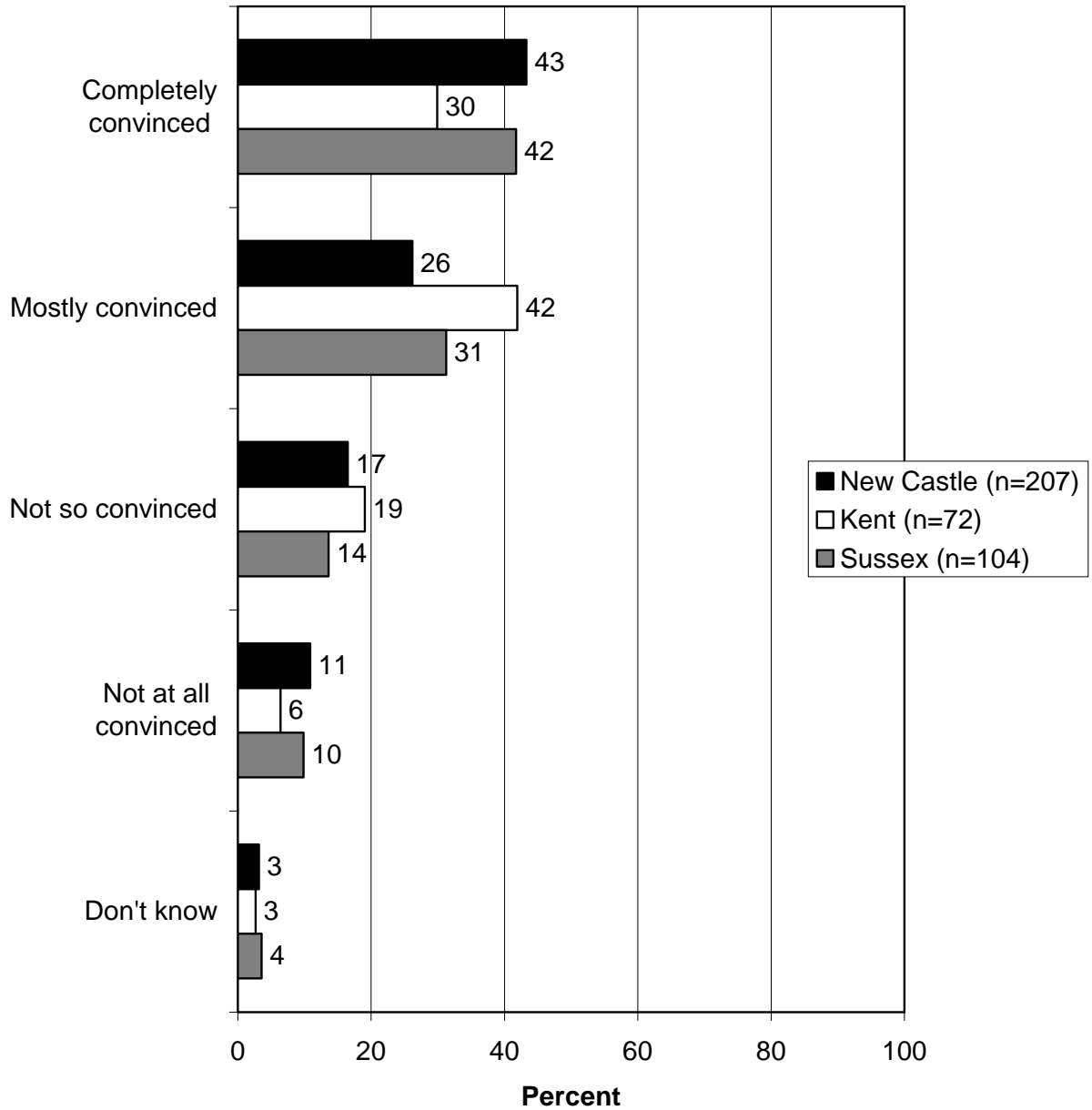
- Those convinced that climate change is happening are more likely to *strongly* disagree that the impacts of climate change are greatly exaggerated, and those *not* convinced that climate change is happening are more likely to *strongly* agree that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
  - Those convinced that climate change is happening are more likely to *strongly* agree that climate change is contributing to the rise in sea levels ( $p \leq 0.001$ ).
  - Those *not* convinced that climate change is happening are more likely to *strongly* disagree that they have personally experienced the impacts of sea level rise ( $p \leq 0.01$ ).
  - Those convinced that climate change is happening are more likely to agree that the state of Delaware needs to conduct more research to identify the impacts of sea level rise in Delaware, and those *not* convinced that climate change is happening are more likely to *strongly* disagree that the state of Delaware needs to conduct more research to identify the impacts of sea level rise in Delaware ( $p \leq 0.001$ ).
- A question explored perceptions of *causes* of climate change. More residents think that climate change, if it is happening, is caused mostly by human activities (43%) than think it is caused mostly by natural changes in the environment (26%). In the middle, 27% think it is caused about equally by human activities and by natural changes in the environment.
- The nonparametric analysis found that the following responses are correlated with thinking that, if climate change is happening, it is caused mostly by human activities:
    - Shows concern about climate change and sea level rise (e.g., thinks that climate change is a very serious threat; worries a great deal or a moderate amount about climate change; strongly agrees that scientists are right that climate change is occurring) (all at  $p \leq 0.05$  or greater significance).
    - Thinks that sea level rise is a very or somewhat serious threat to the Mid-Atlantic United States, a very or somewhat serious threat to the United States, a very or somewhat serious threat to him or her personally, a very or somewhat serious threat to river-front cities and towns in Delaware, a very serious threat to ocean-front cities and towns in Delaware, a very serious threat to the State of Delaware, a very serious threat to Delaware beaches, and a very serious threat to marshes and wetlands in Delaware (all at  $p \leq 0.001$  or greater significance).
    - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).
    - Believes human efforts can improve climate change (e.g., agrees that the impacts of climate change can be reduced by human efforts; agrees that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).

- Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - On all questions about how to improve areas at risk from sea level rise, supports any efforts to address sea level rise in Delaware or reduce its impacts (e.g., strongly supports avoiding building new structures; supports purchasing or acquiring land and open space from willing land sellers using government funds; strongly supports changing building codes and regulations to reduce risk in flood prone areas) (all at  $p \leq 0.05$  or greater significance).
  - Thinks that his or her county government officials, Delaware's state legislators, Delaware's state agencies, his or her city or town government officials, his or her state government officials, the U.S. Congress, Delaware's governor, Delaware citizens, and corporations and industry should all be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
  - Would most like to have more information on how sea level rise relates to climate change / global warming, how to protect property from sea level rise, funding needs / estimated budget to address sea level rise in Delaware, current or potential impacts of sea level rise, and actions that can be taken to reduce impacts of sea level rise (all at  $p \leq 0.001$  or greater significance).
  - Is female ( $p \leq 0.01$ ).
  - Lives in New Castle County ( $p \leq 0.01$ ).
  - Has at least one child, age 17 or younger, living in his or her household ( $p \leq 0.01$ ).
  - Is between ages 18-34 ( $p \leq 0.05$ ).
- The crosstabulation by county of residence found that New Castle County residents are the *least* likely to attribute climate change to mostly natural changes in the environment ( $p \leq 0.05$ ).
- A question about the terms “climate change” and “global warming” asked residents whether the terms are the same thing, whether they are different but related things, or whether they are unrelated things (DNREC considers them different but related). The most common answer (66%) is that they are different but related things.

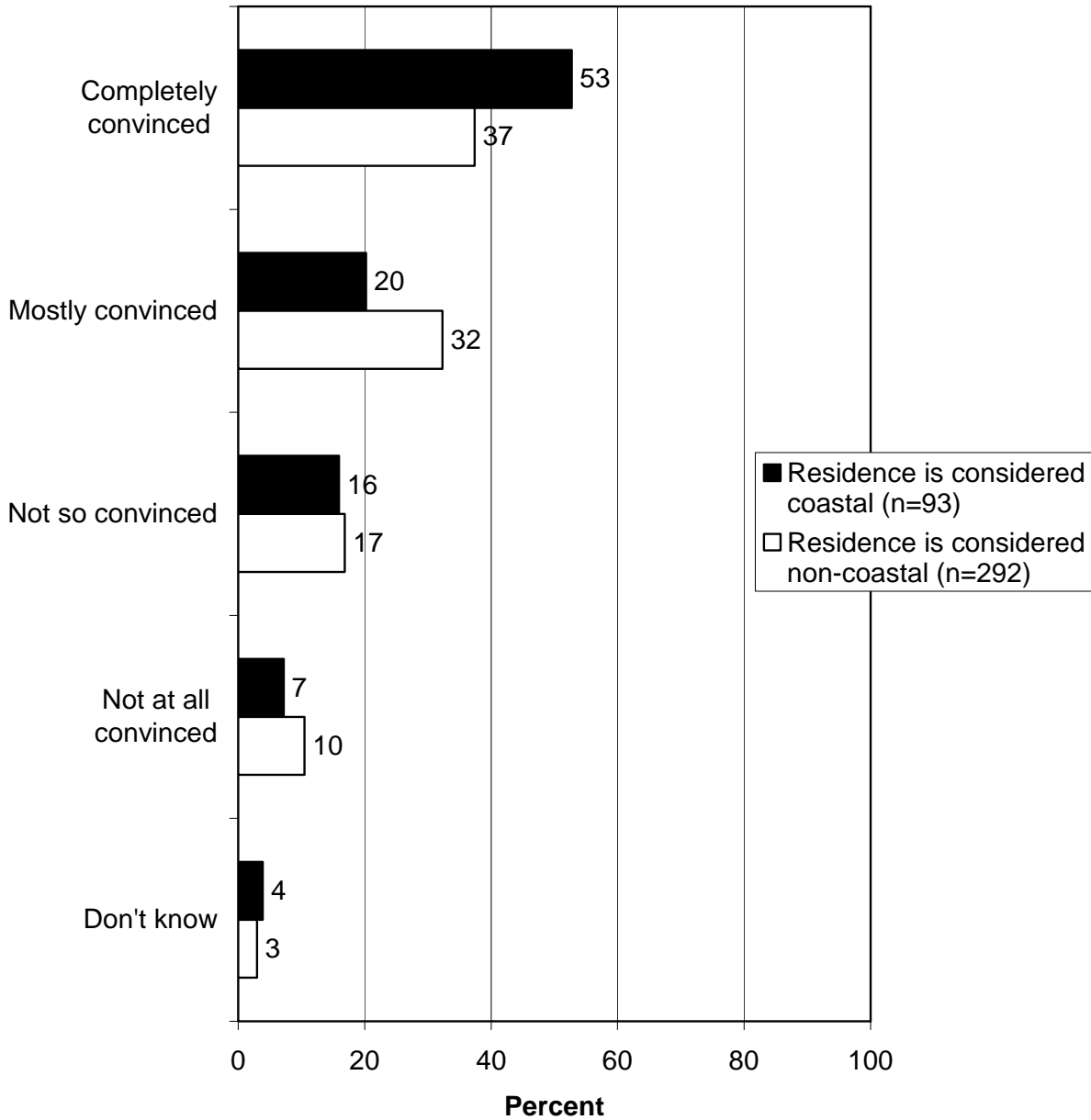
**Q43. How convinced are you that climate change is happening?**



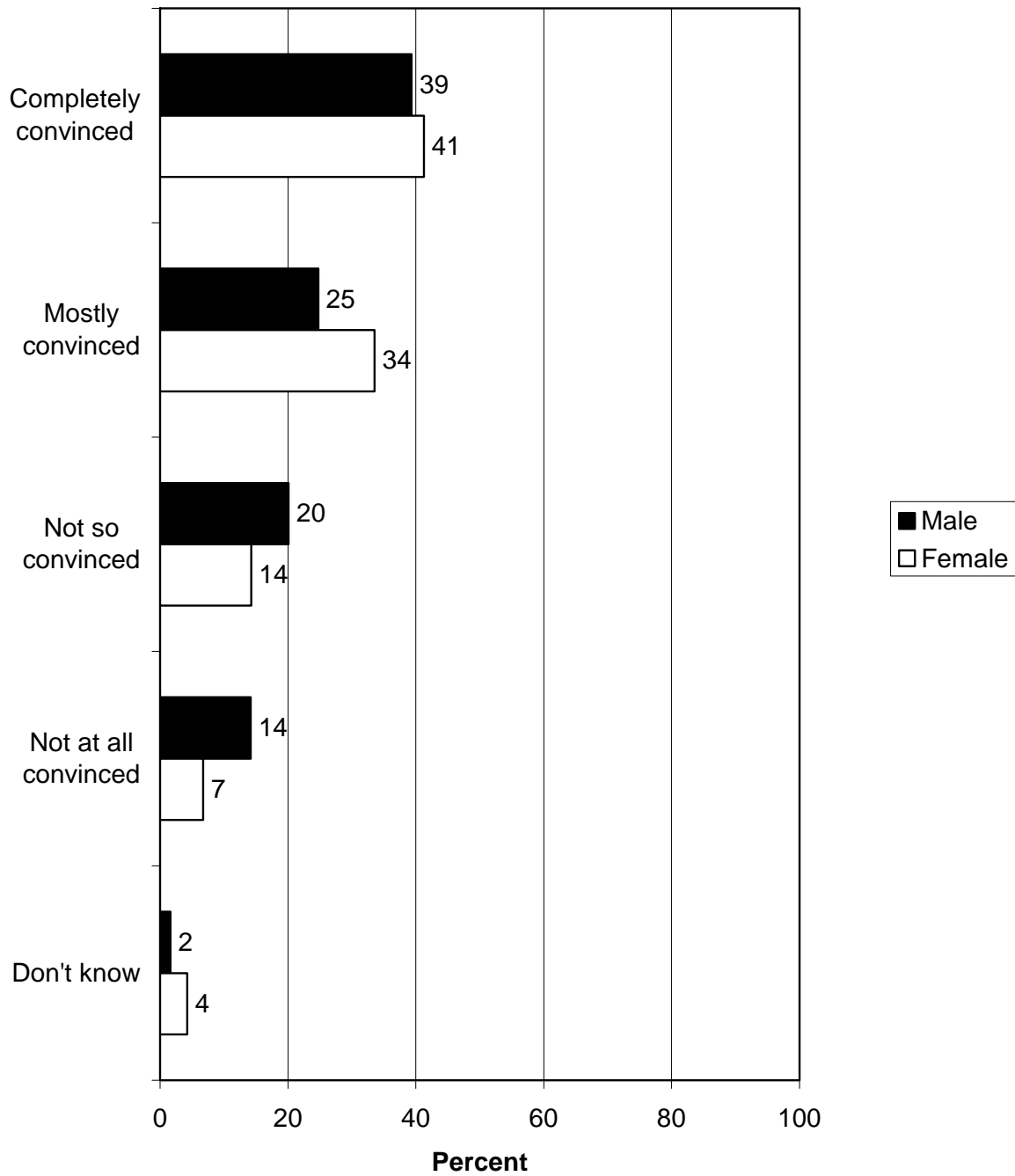
### Q43. How convinced are you that climate change is happening?



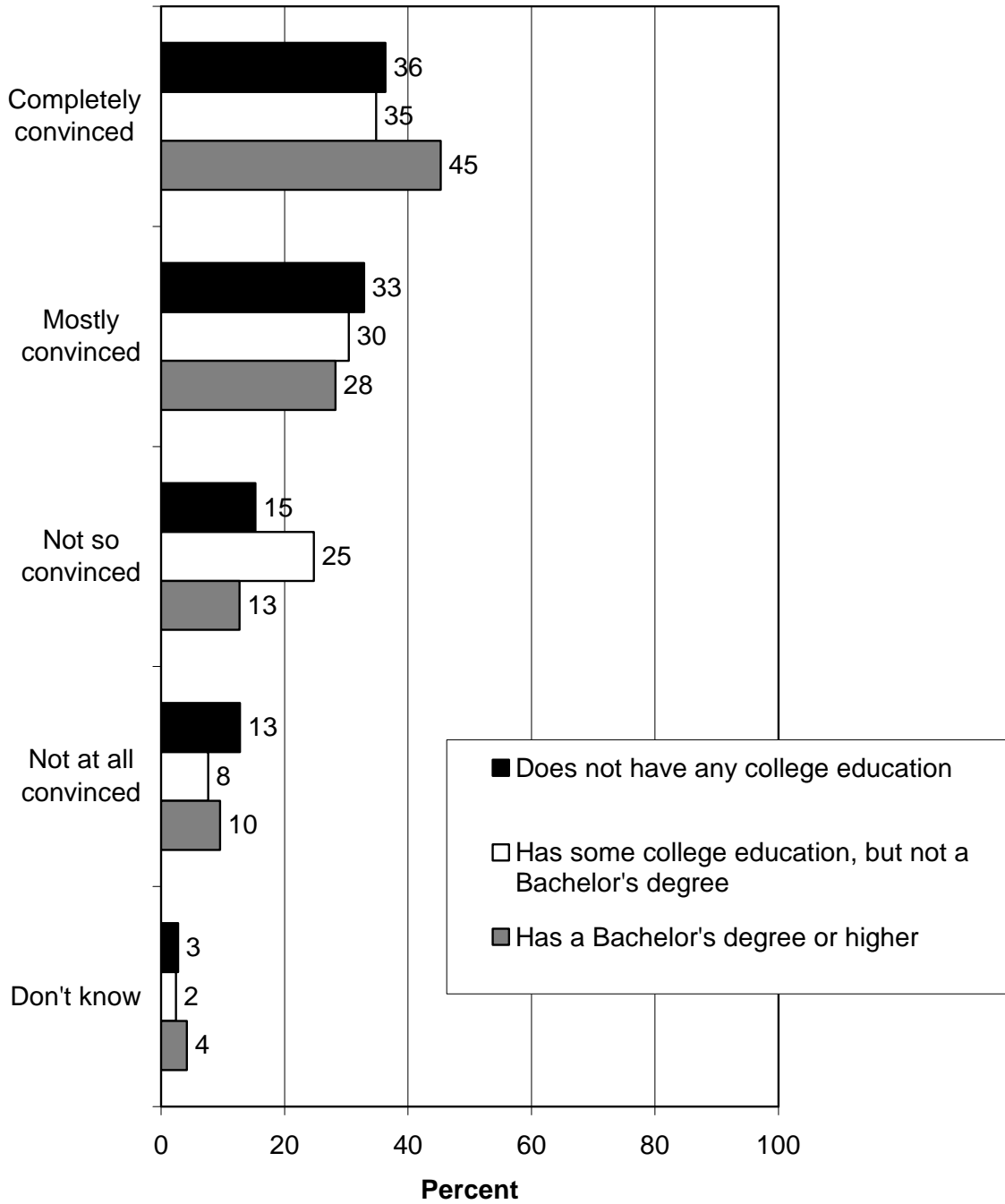
### Q43. How convinced are you that climate change is happening?



### Q43. How convinced are you that climate change is happening?

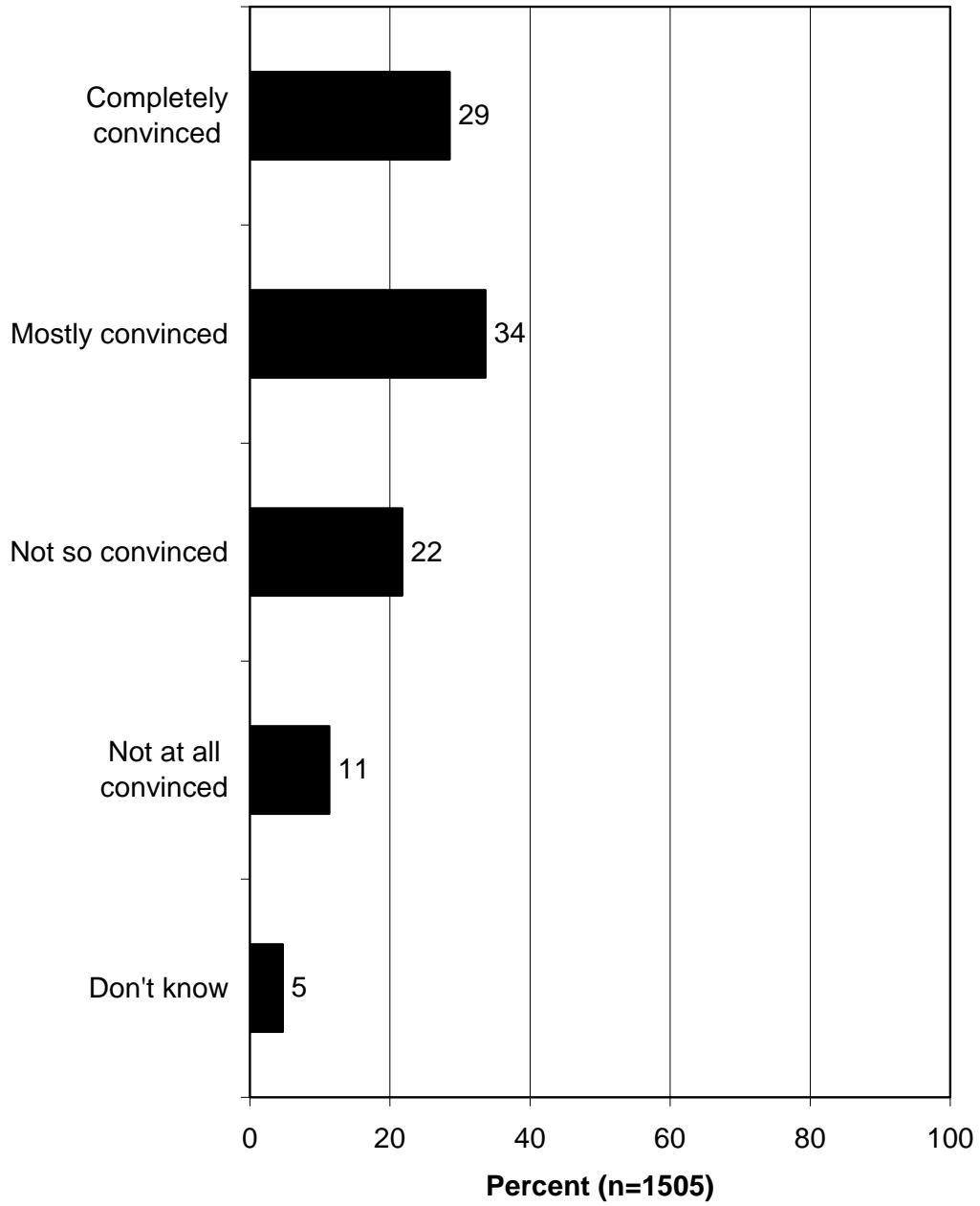


### Q43. How convinced are you that climate change is happening?

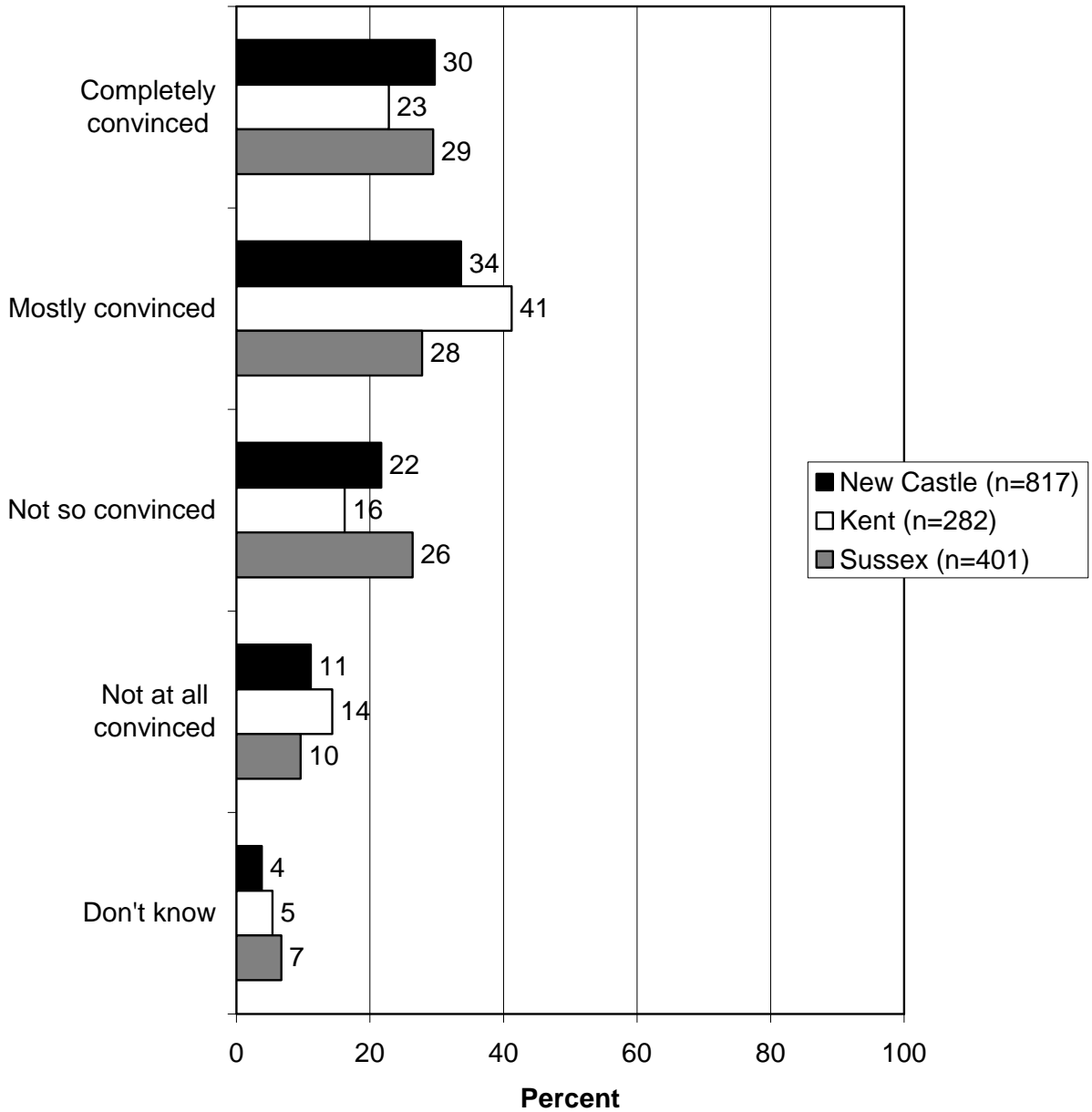




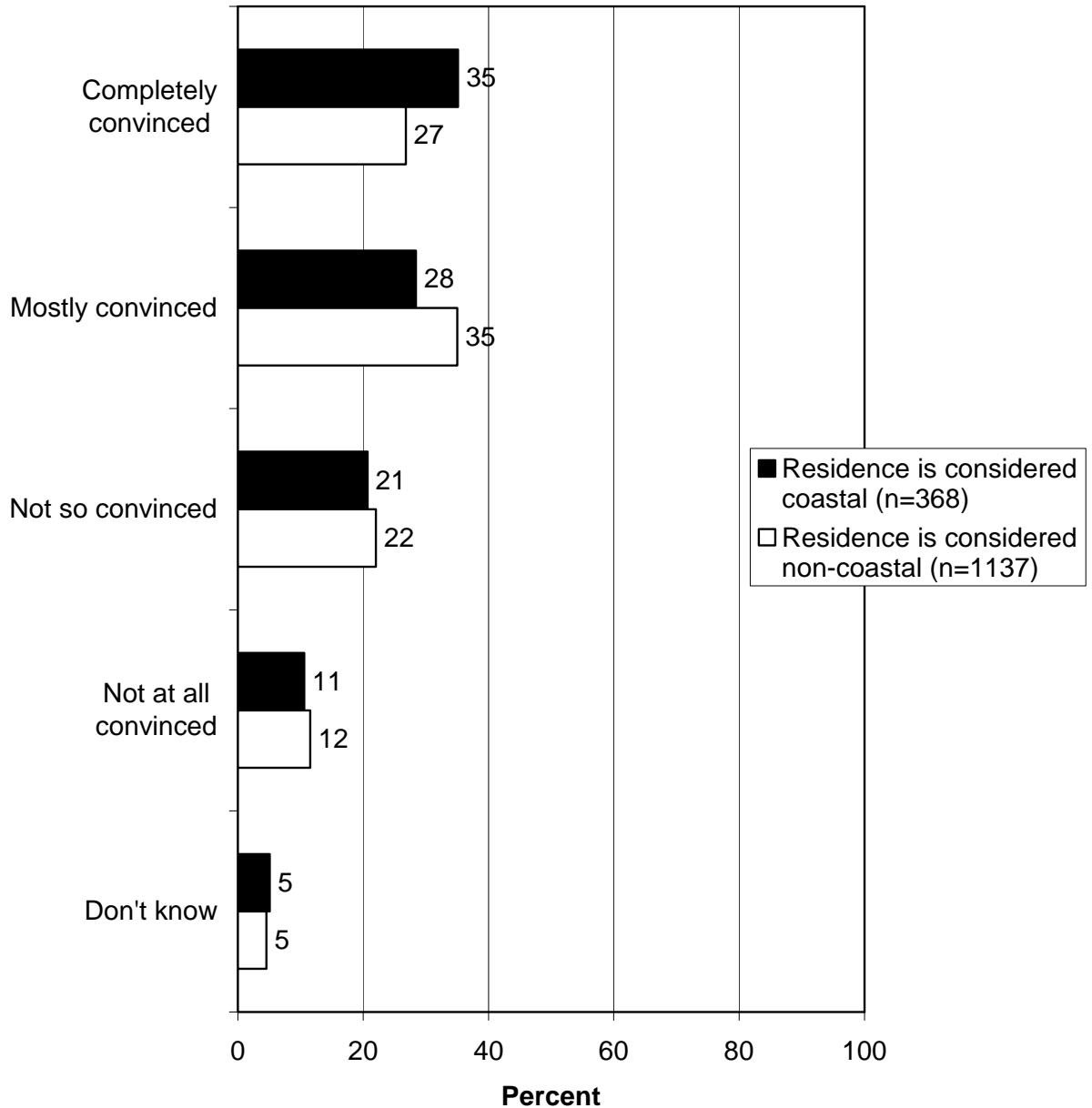
**Q53. How convinced are you that sea levels are rising?**



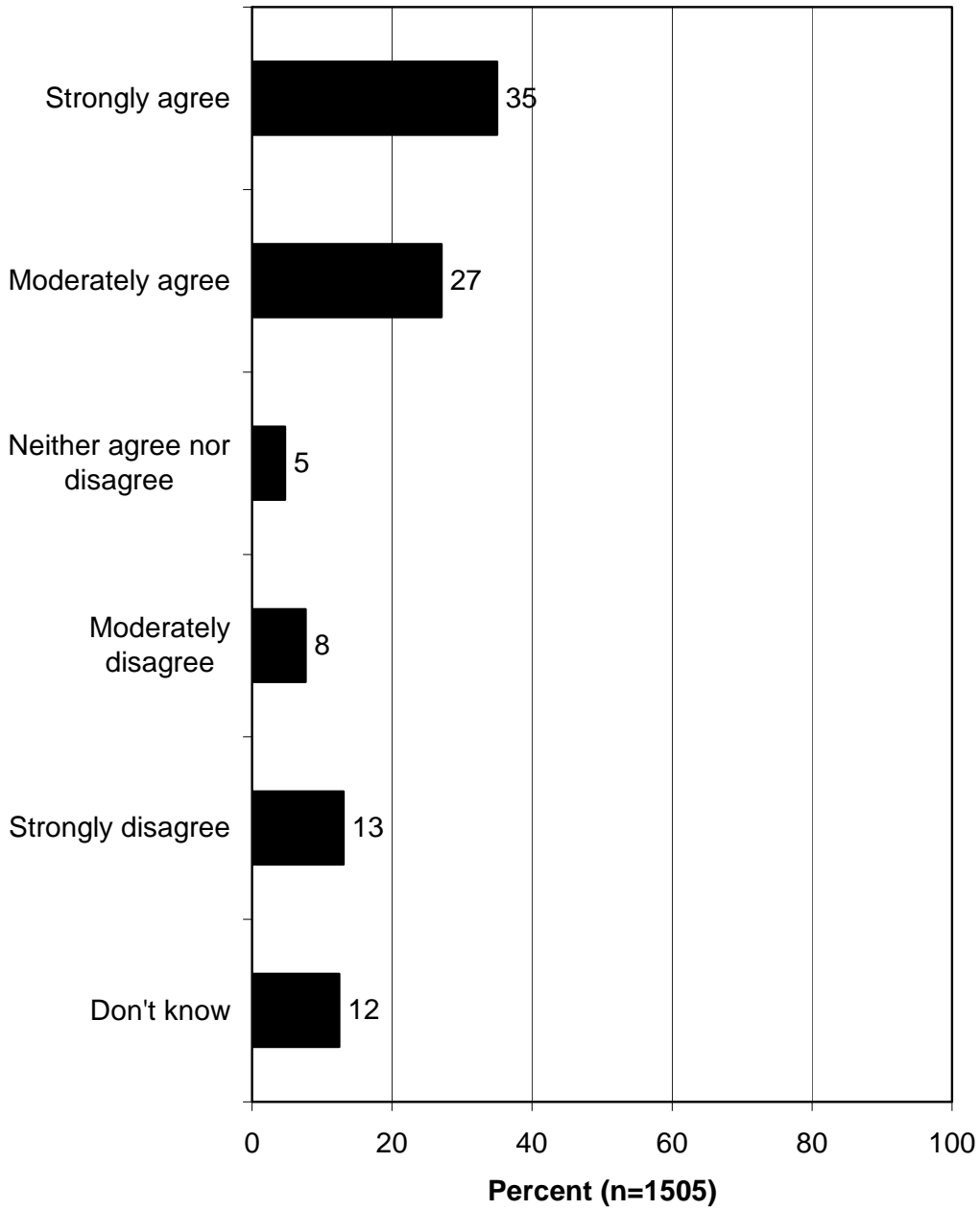
### Q53. How convinced are you that sea levels are rising?



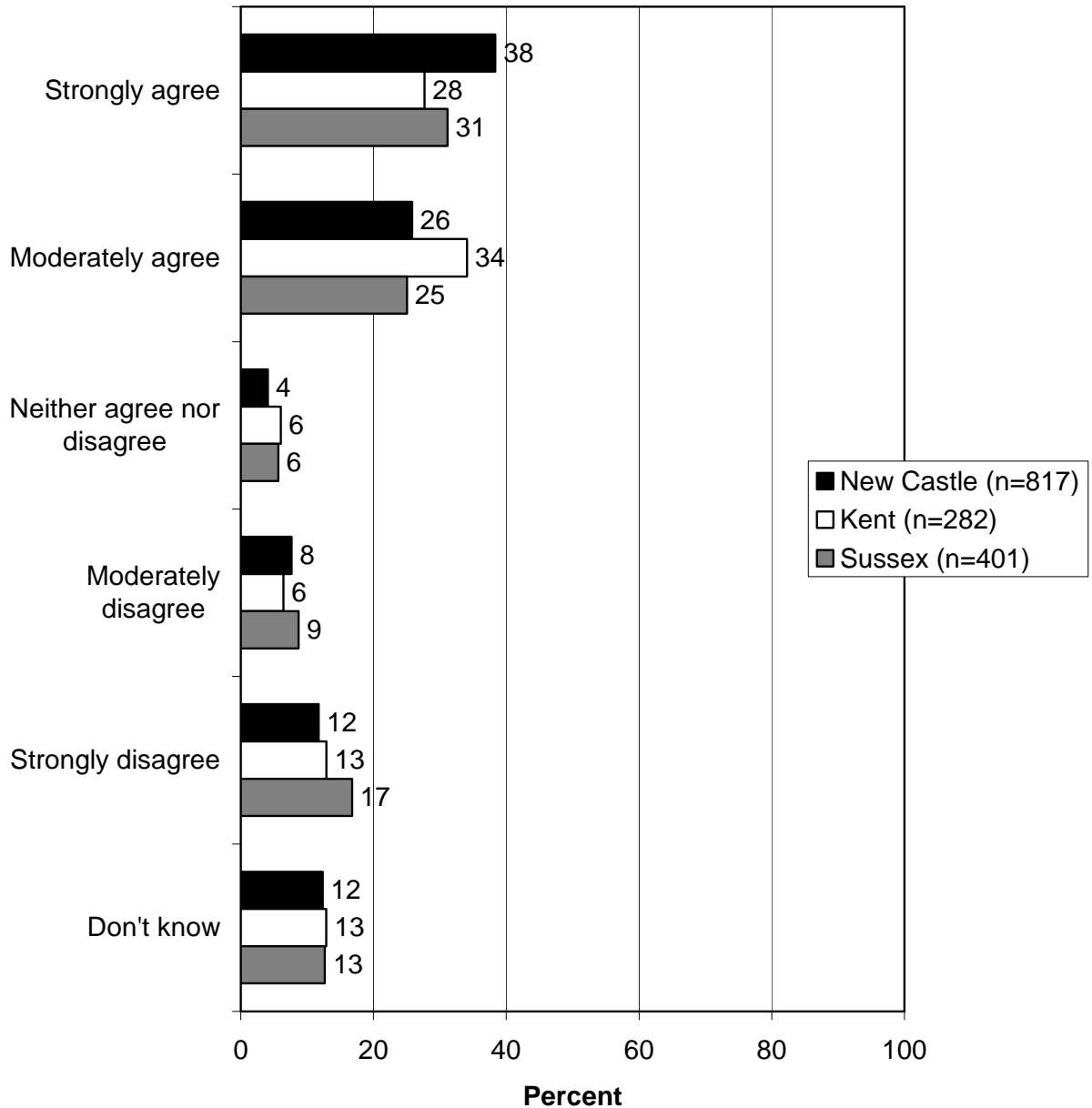
### Q53. How convinced are you that sea levels are rising?



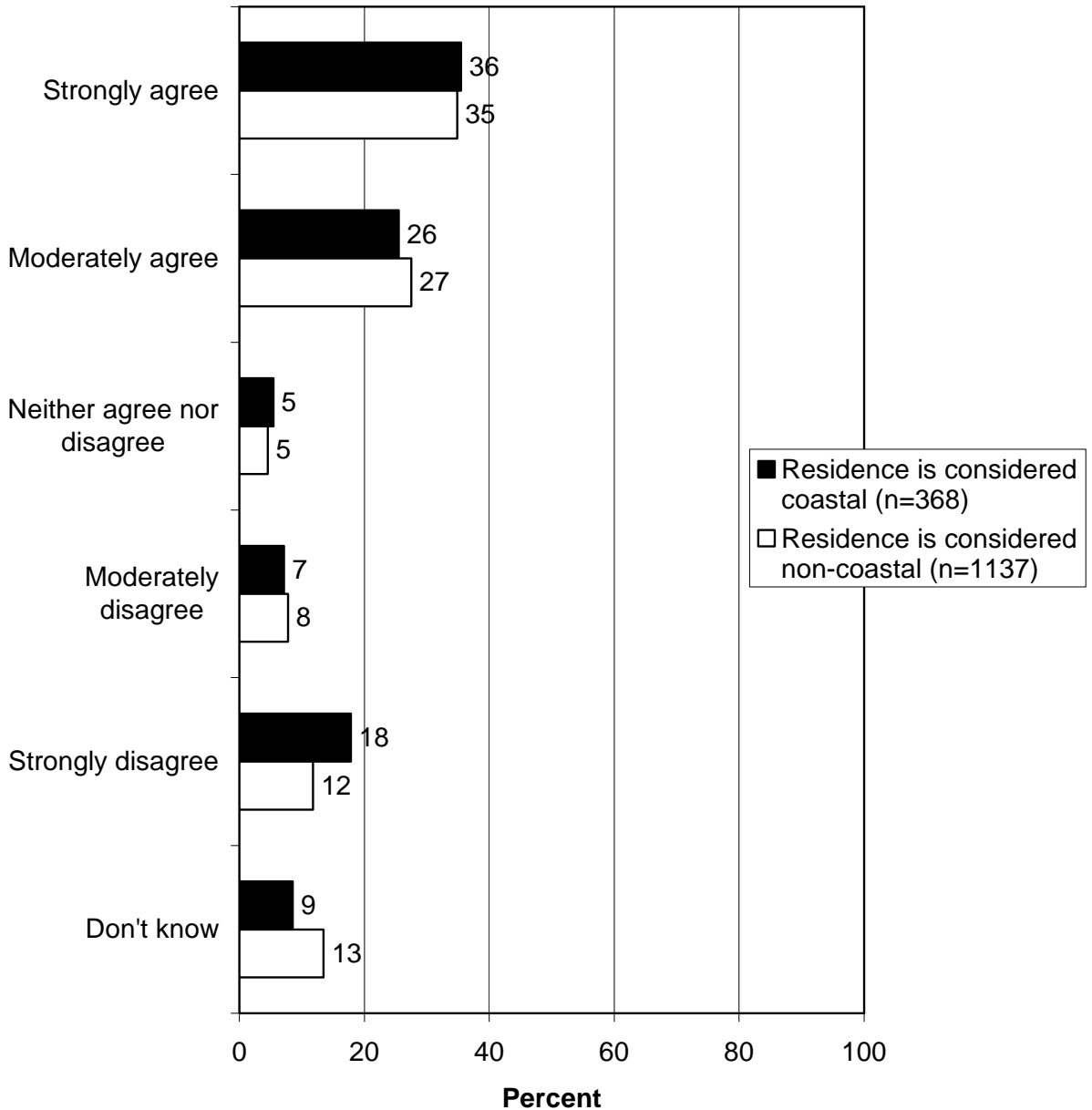
**Q105. Scientists predict that sea levels will rise at least 1 to 3 feet in the next 100 years. Do you agree or disagree that this is a reasonable prediction?**



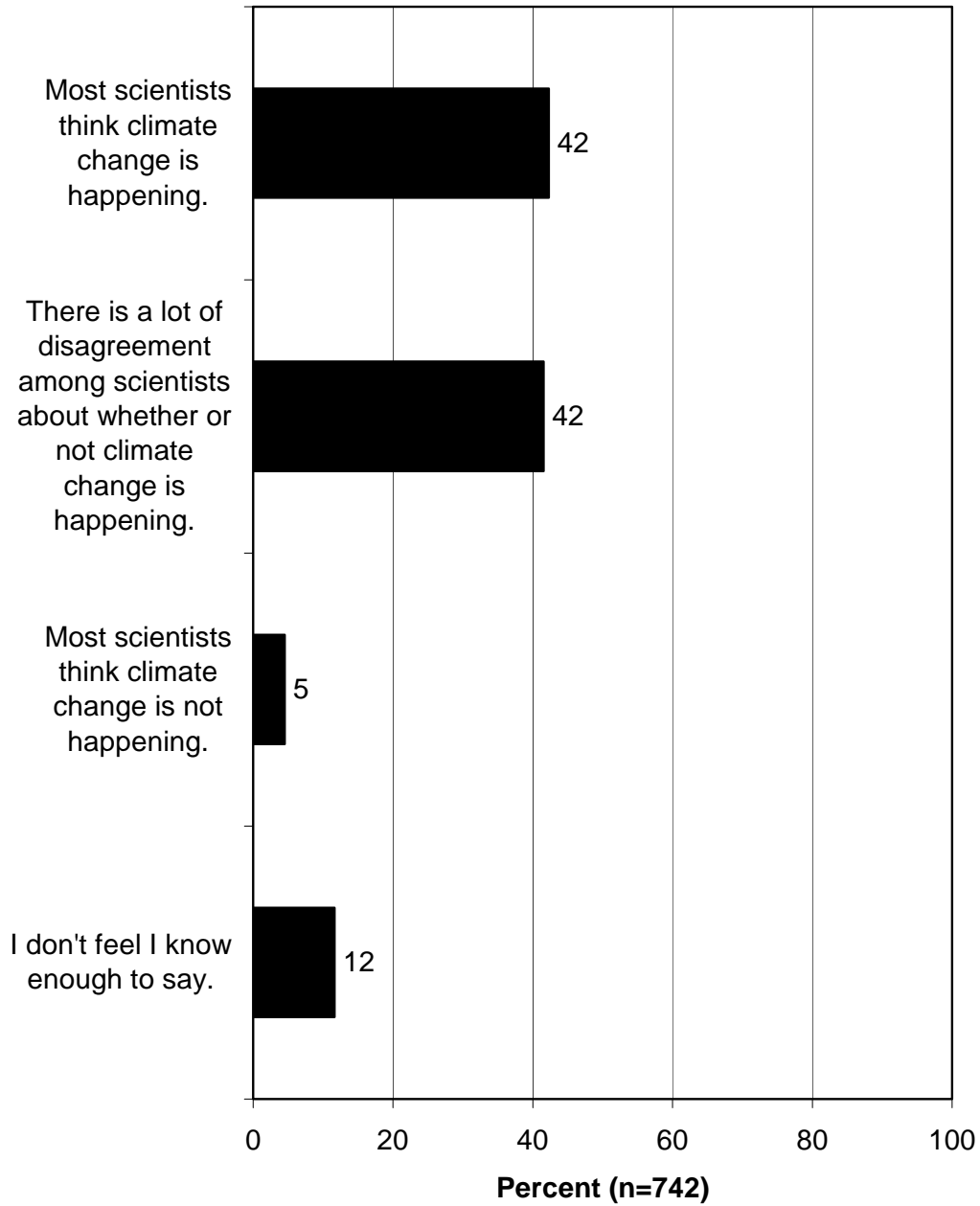
**Q105. Scientists predict that sea levels will rise at least 1 to 3 feet in the next 100 years. Do you agree or disagree that this is a reasonable prediction?**



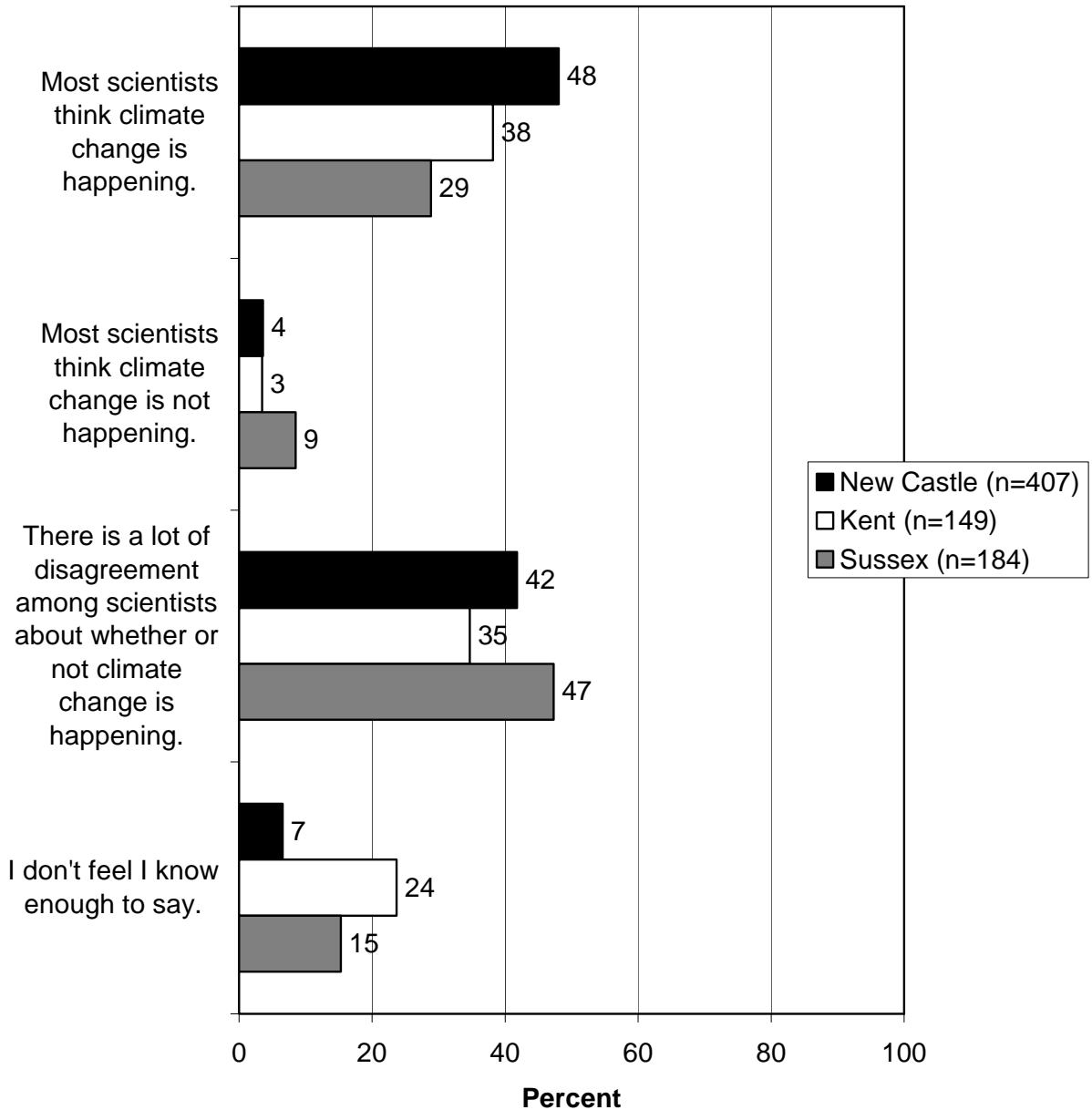
**Q105. Scientists predict that sea levels will rise at least 1 to 3 feet in the next 100 years. Do you agree or disagree that this is a reasonable prediction?**



**Q44. Which of the following statements best describes your own view of climate change?**

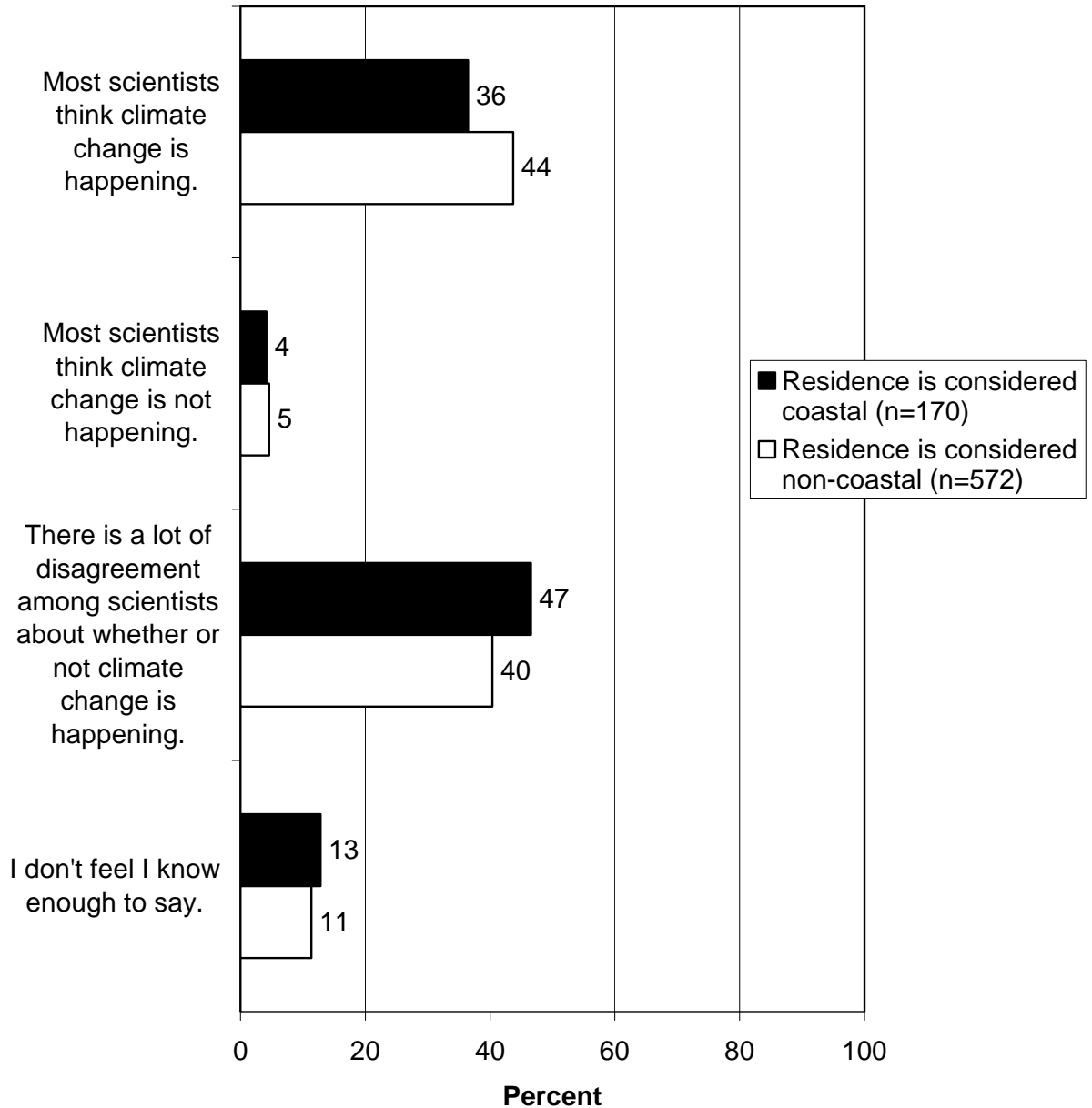


**Q44. Which of the following statements best describes your own view of climate change?**

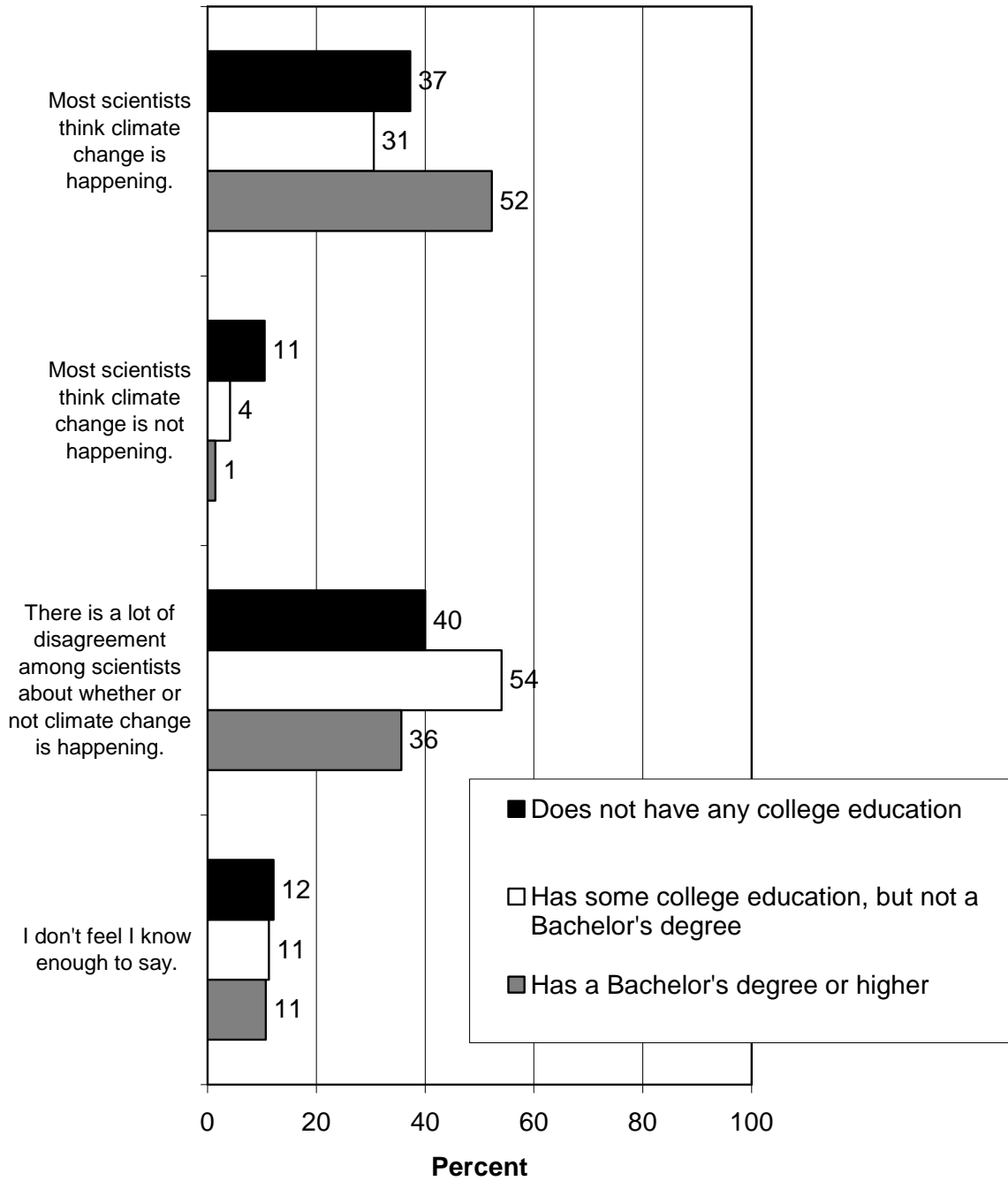




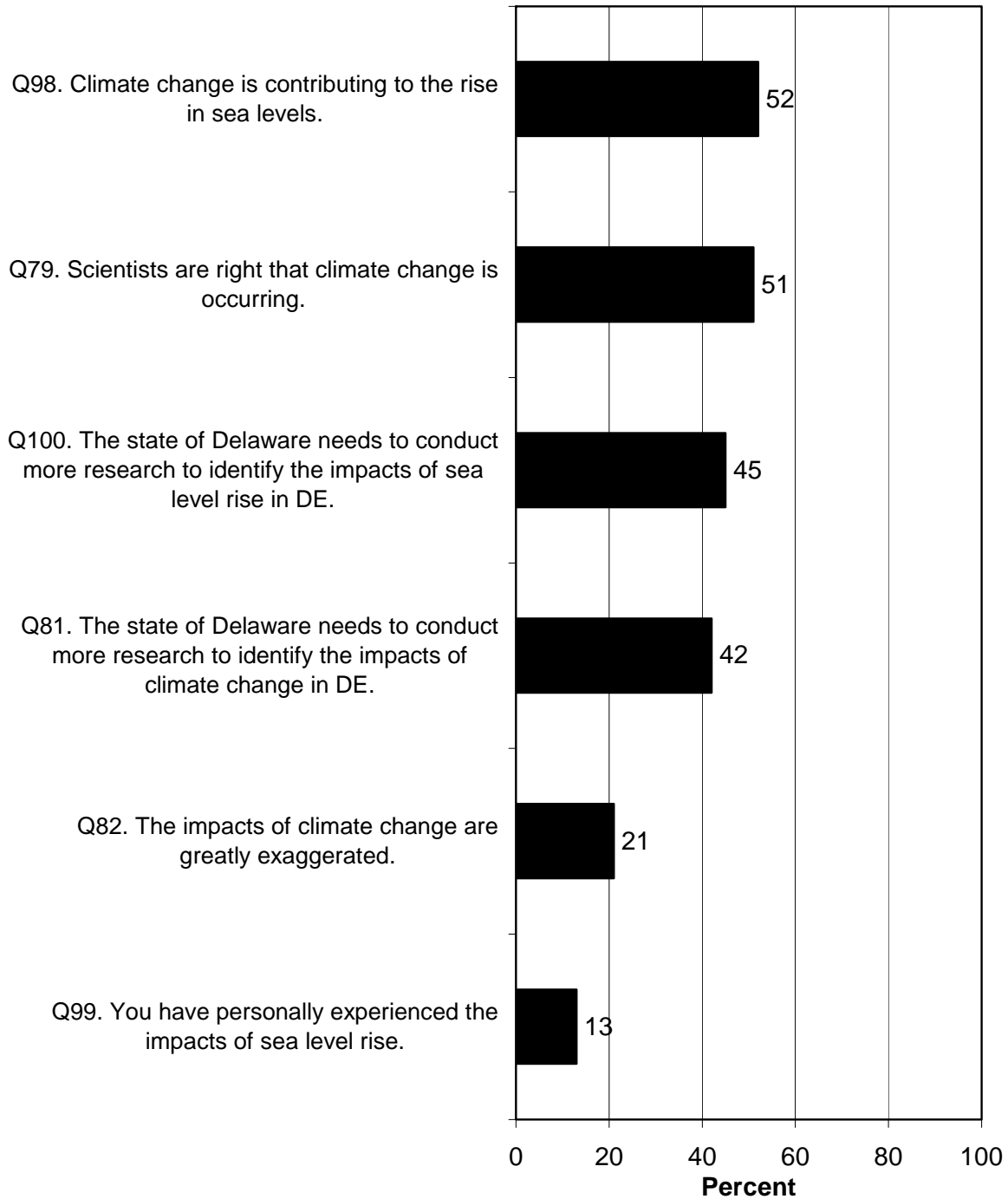
**Q44. Which of the following statements best describes your own view of climate change?**



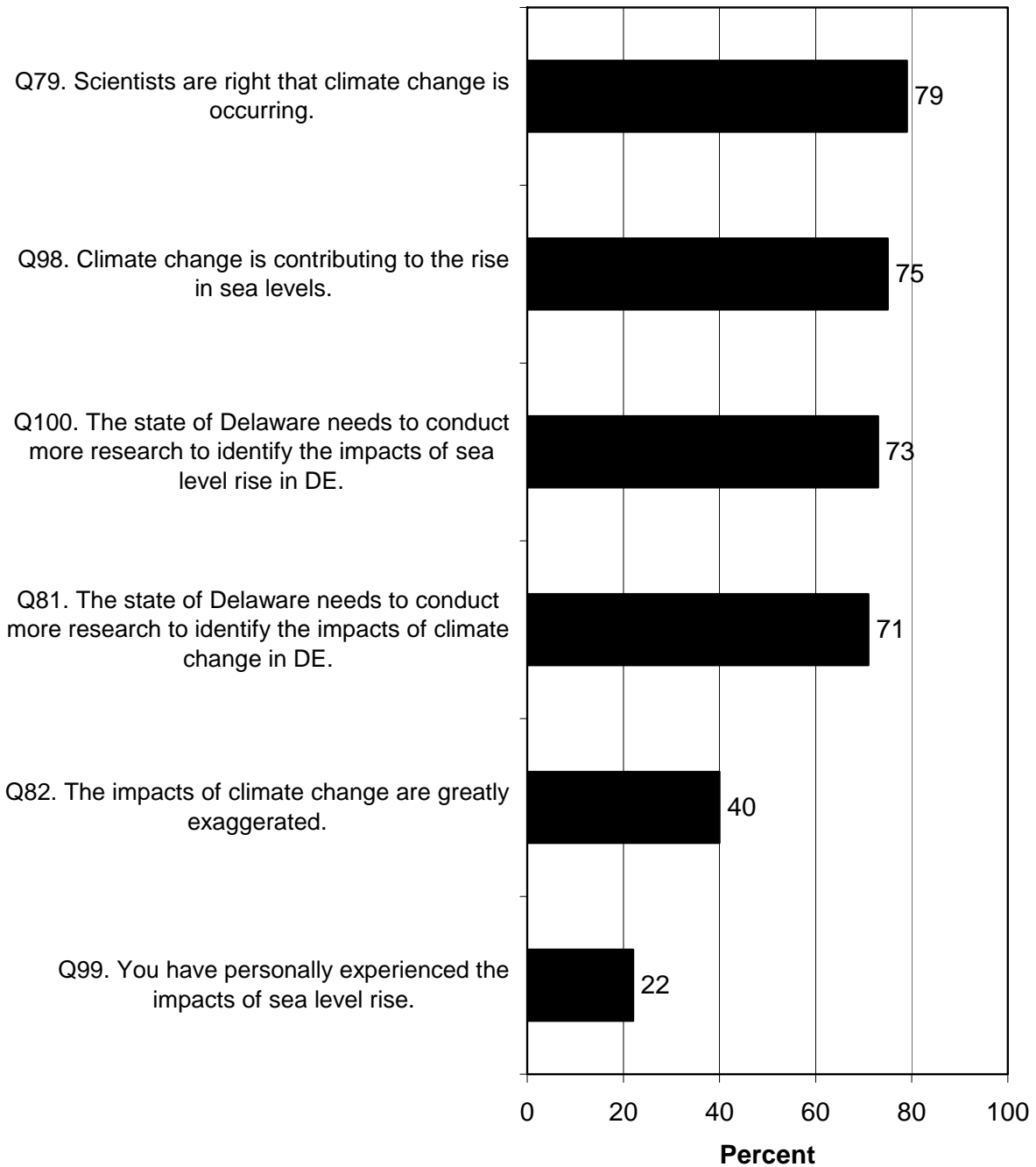
**Q44. Which of the following statements best describes your own view of climate change?**



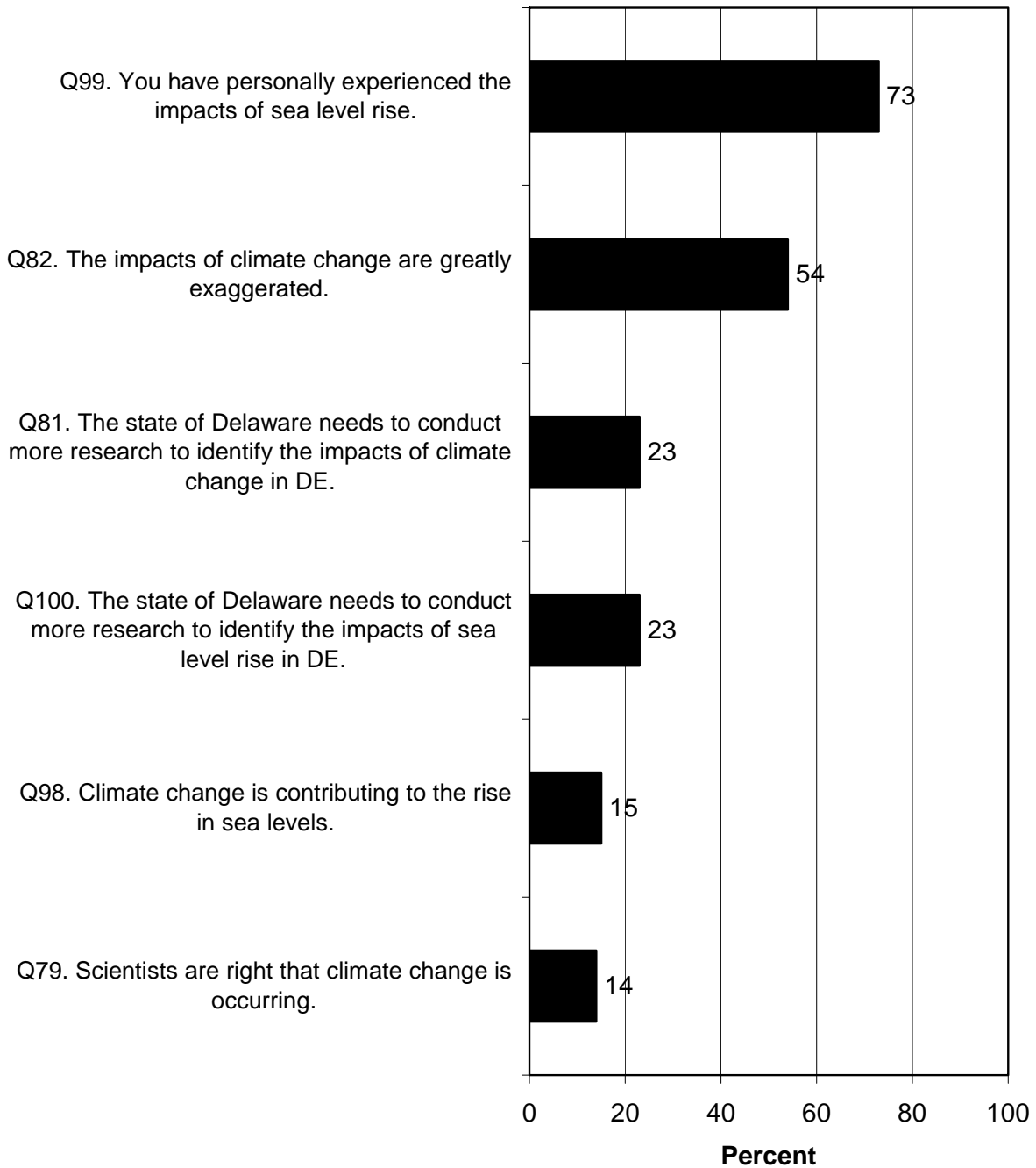
**Q79, 81-82, 98-100. Percent who strongly agree with the following statements about climate change and sea level rise.**



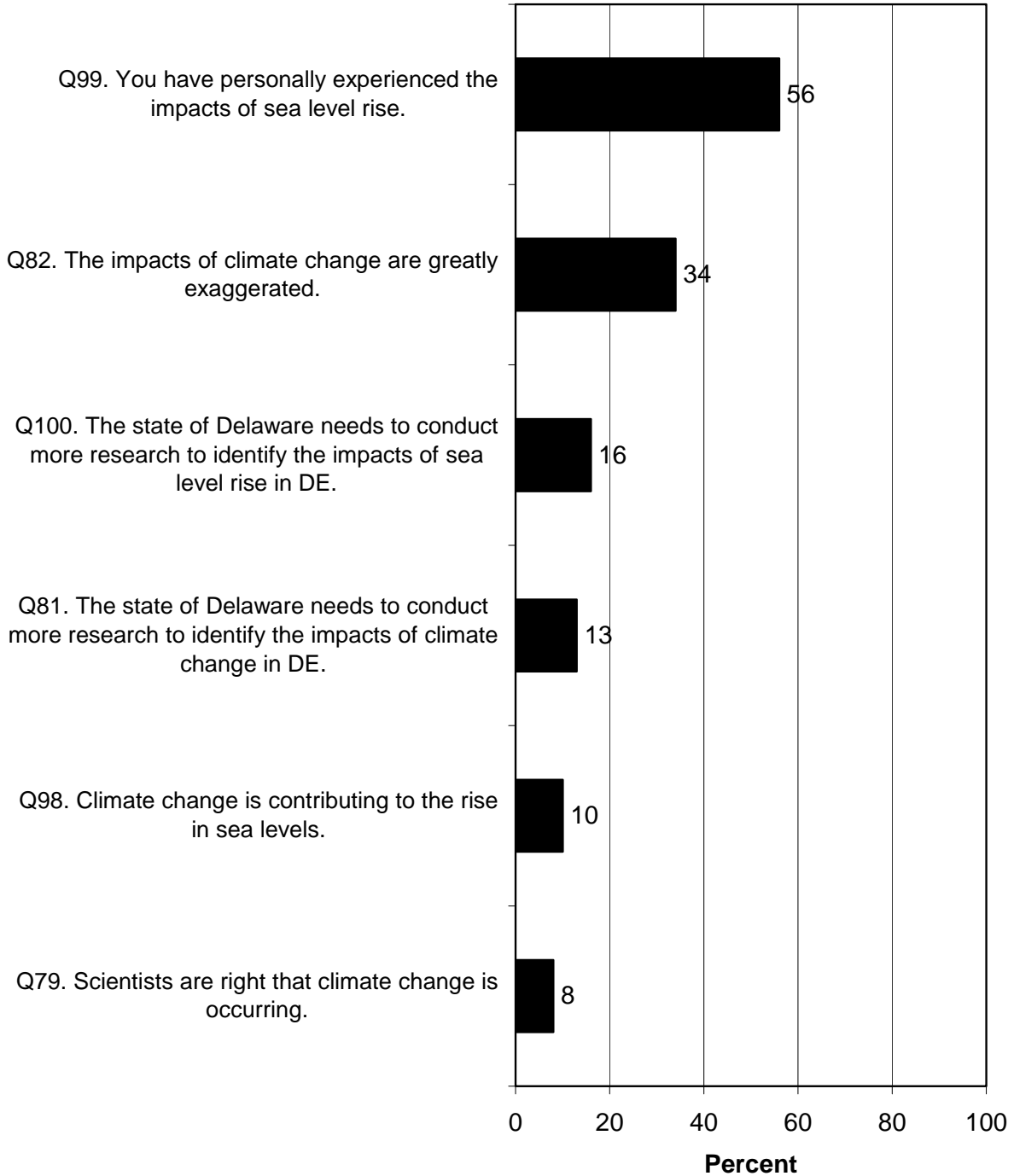
**Q79, 81-82, 98-100. Percent who strongly or moderately agree with the following statements about climate change and sea level rise.**



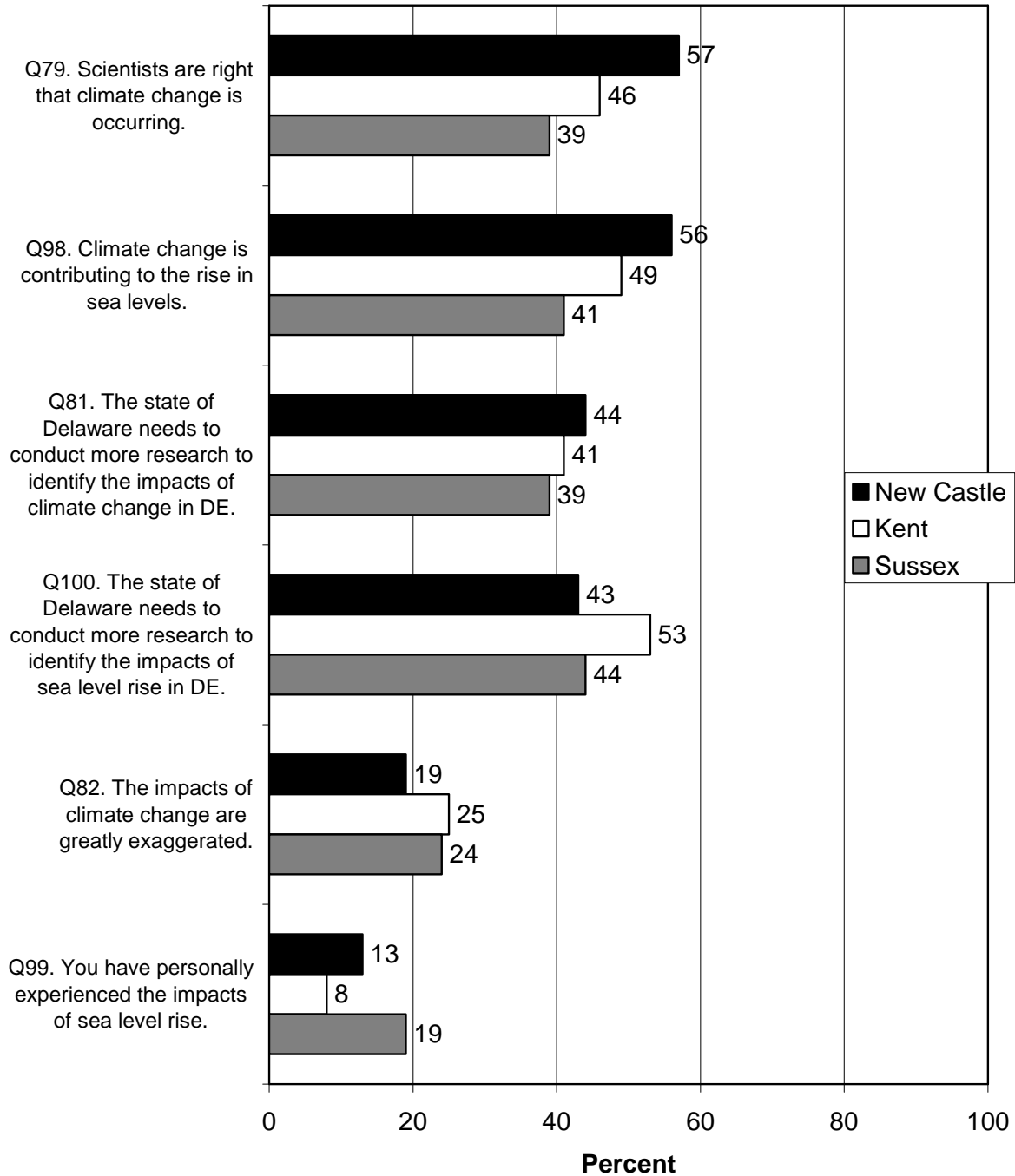
**Q79, 81-82, 98-100. Percent who moderately or strongly disagree with the following statements about climate change and sea level rise.**



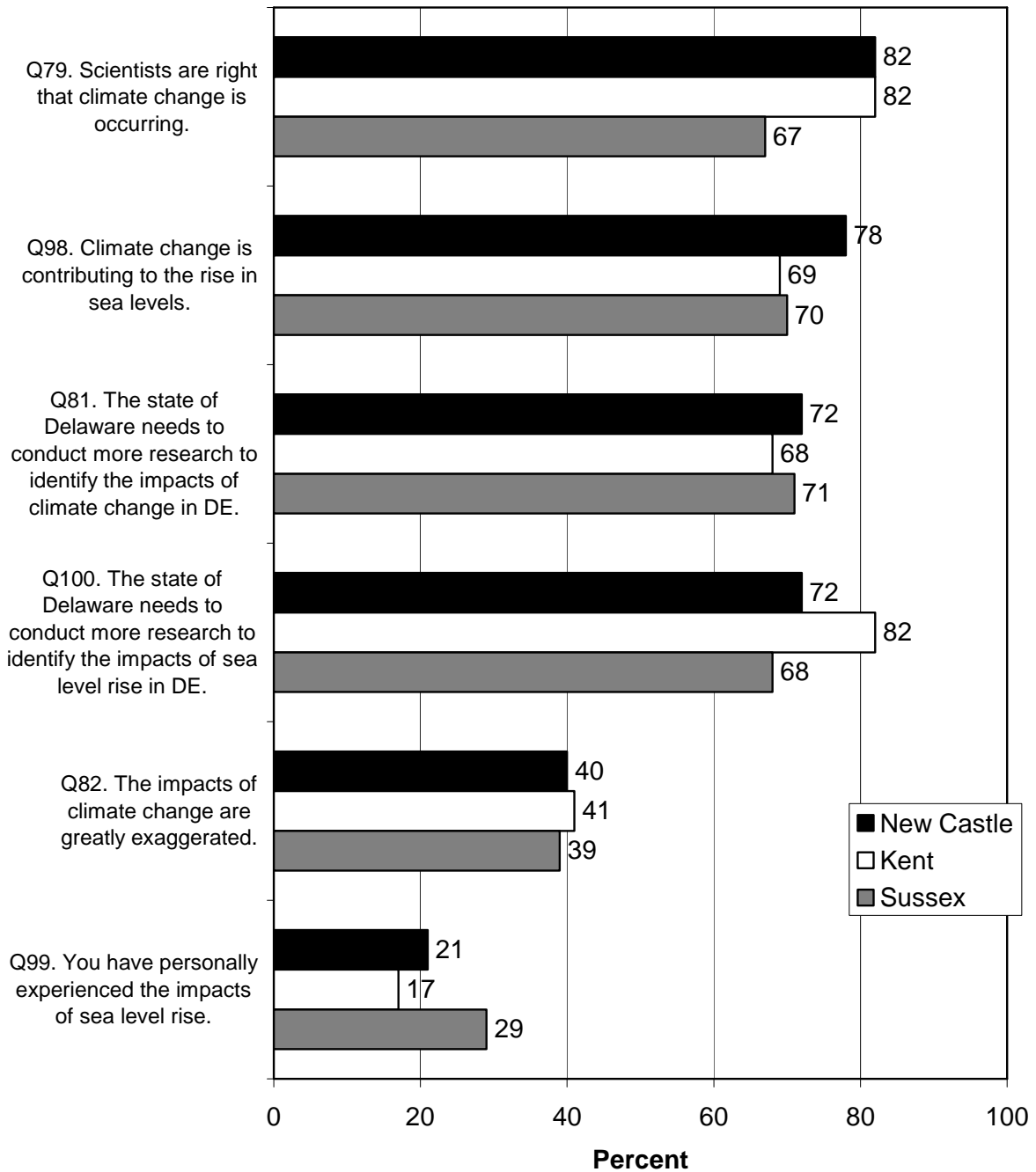
**Q79, 81-82, 98-100. Percent who strongly disagree with the following statements about climate change and sea level rise.**



**Q79, 81-82, 98-100. Percent who strongly agree with the following statements about climate change and sea level rise.**

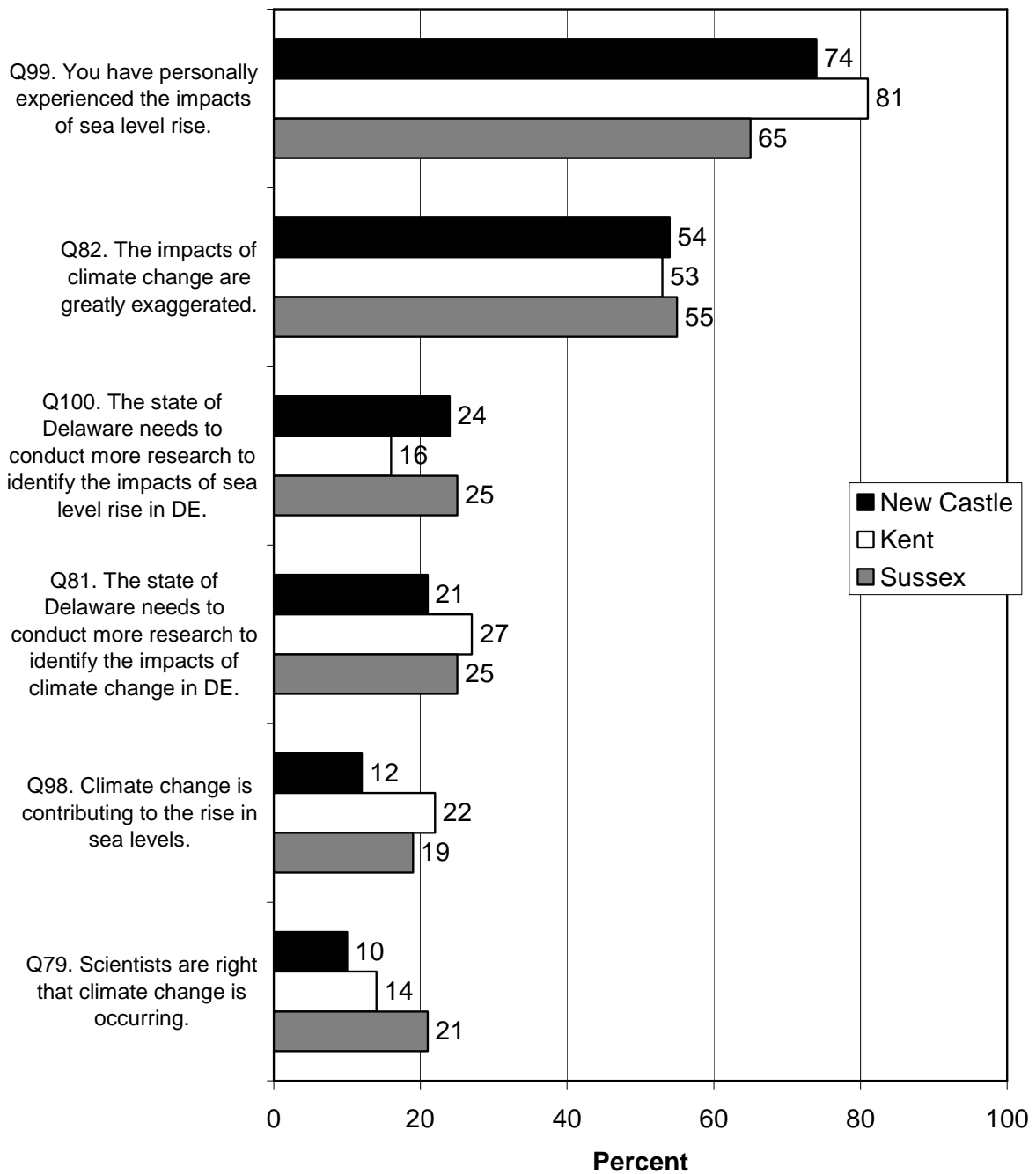


**Q79, 81-82, 98-100. Percent who strongly or moderately agree with the following statements about climate change and sea level rise.**

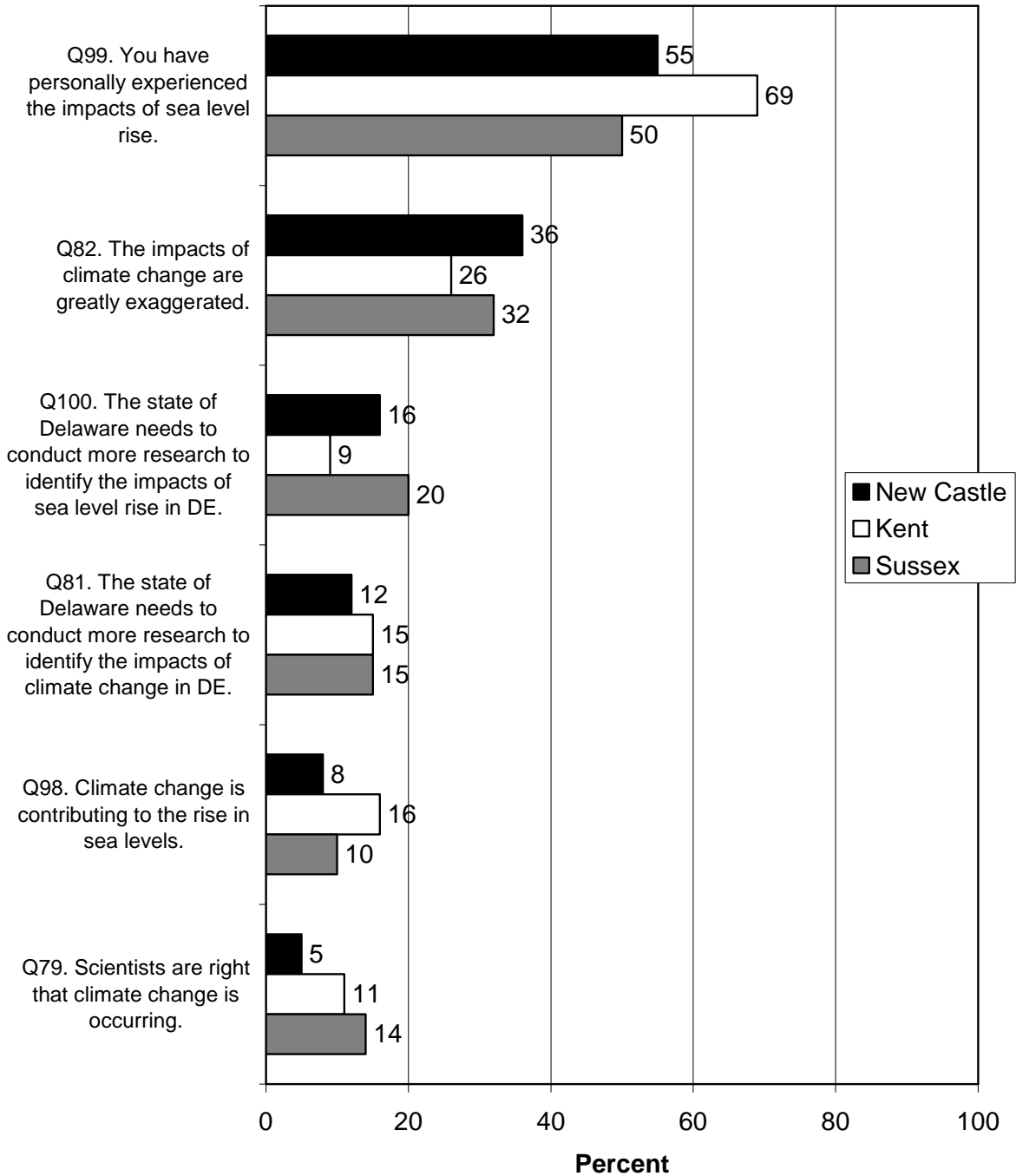




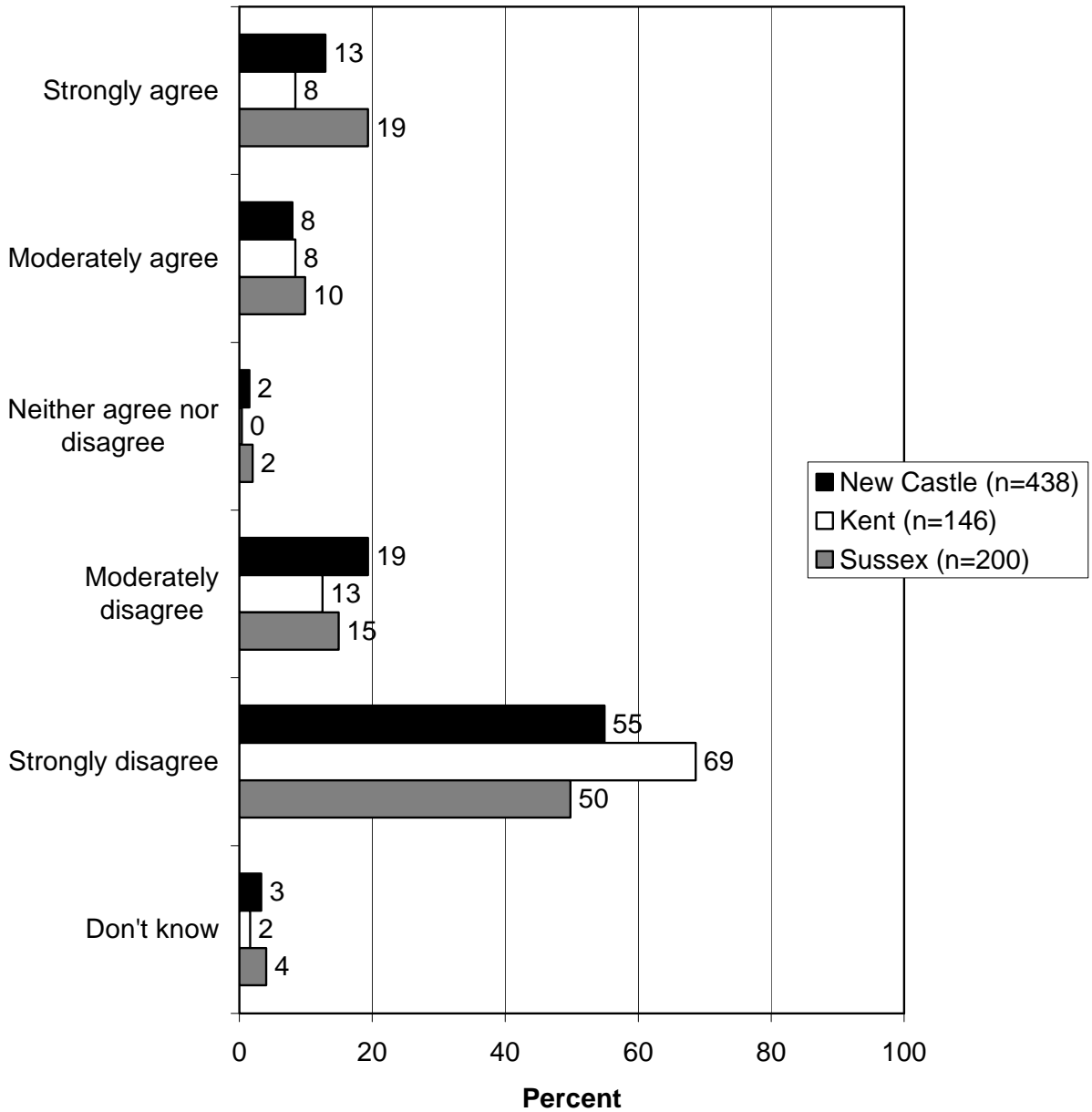
**Q79, 81-82, 98-100. Percent who moderately or strongly disagree with the following statements about climate change and sea level rise.**



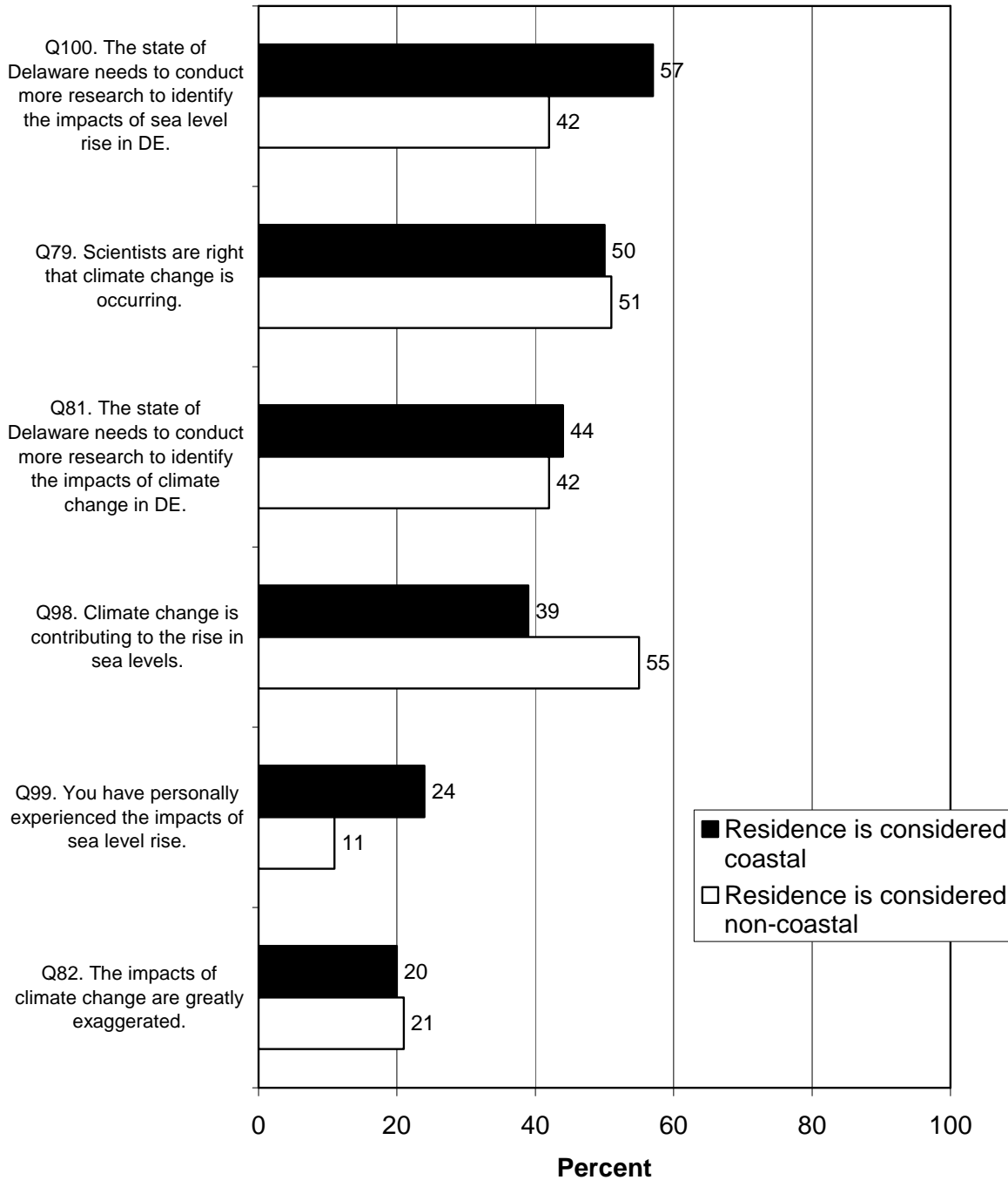
**Q79, 81-82, 98-100. Percent who strongly disagree with the following statements about climate change and sea level rise.**



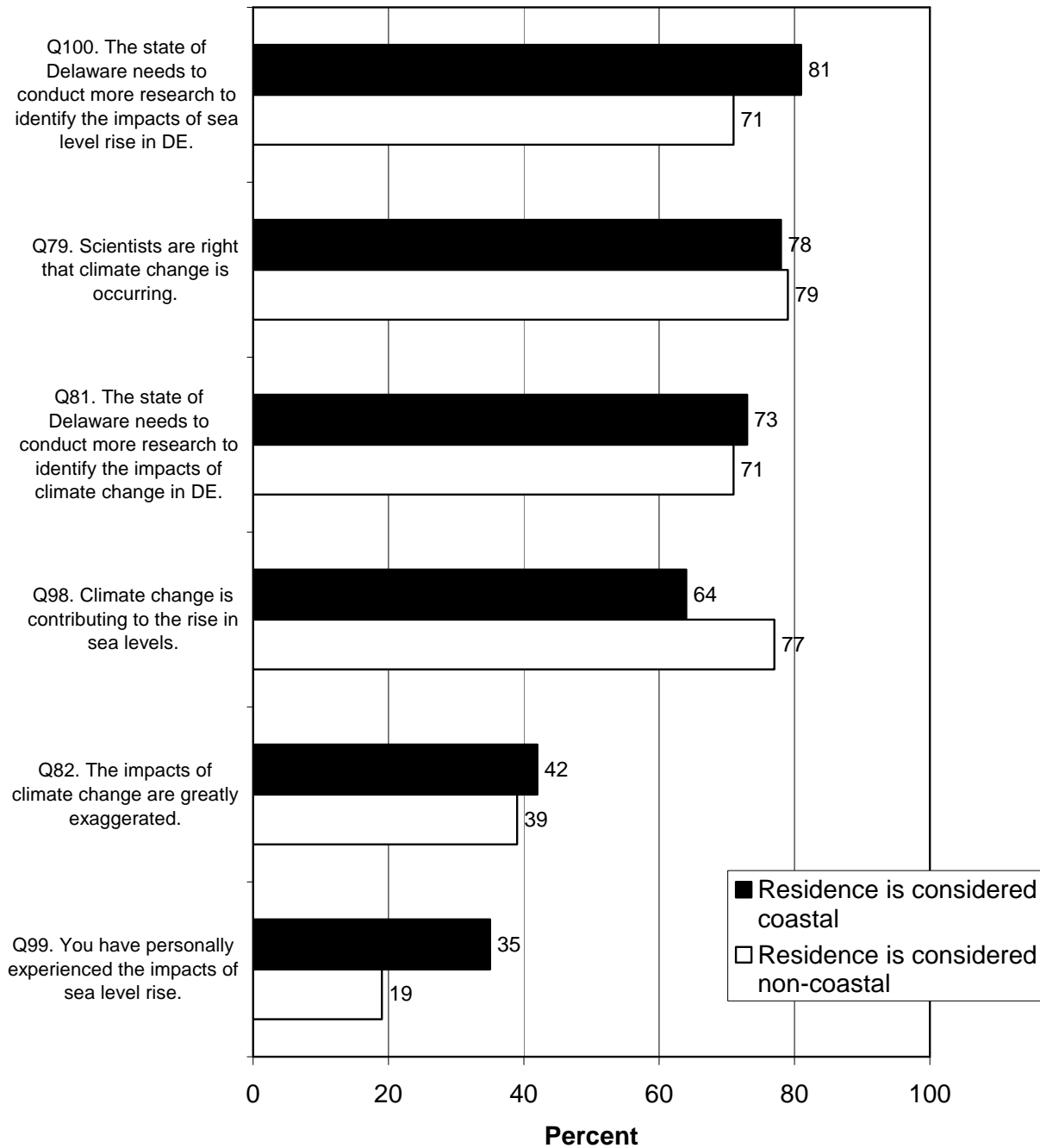
**Q99. Do you agree or disagree with this statement:  
You have personally experienced the impacts of  
sea level rise.**



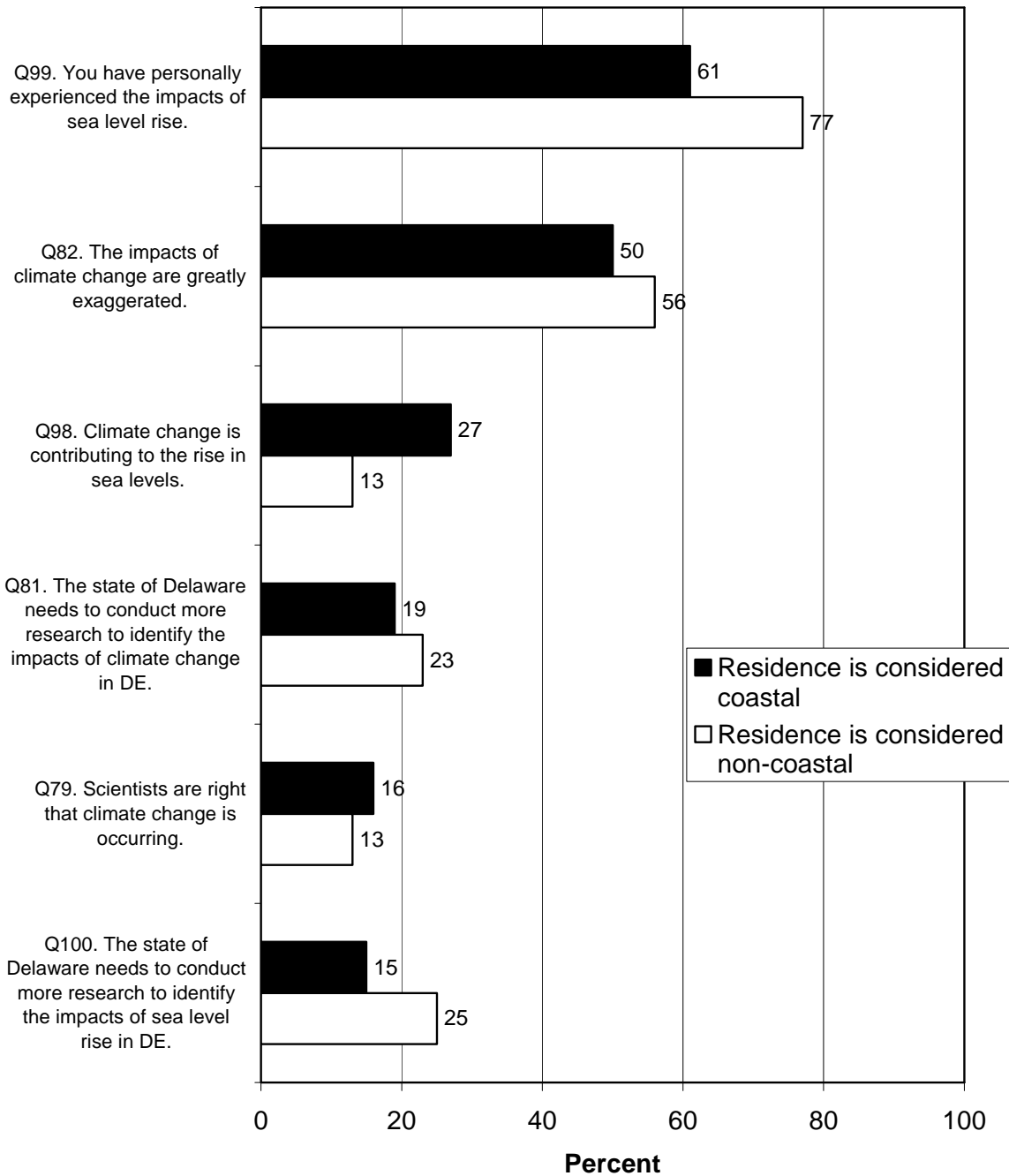
**Q79, 81-82, 98-100. Percent who strongly agree with the following statements about climate change and sea level rise.**



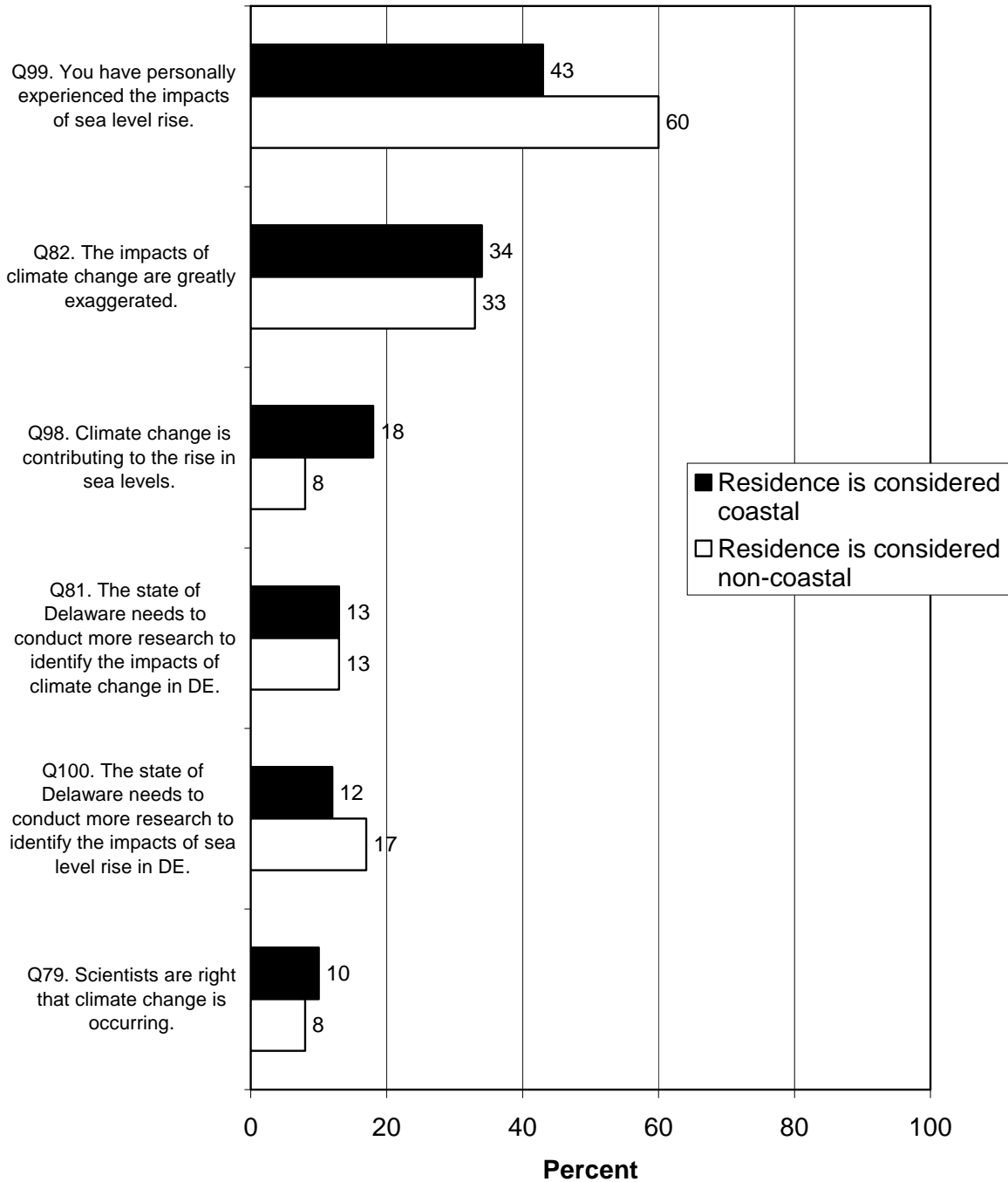
**Q79, 81-82, 98-100. Percent who strongly or moderately agree with the following statements about climate change and sea level rise.**



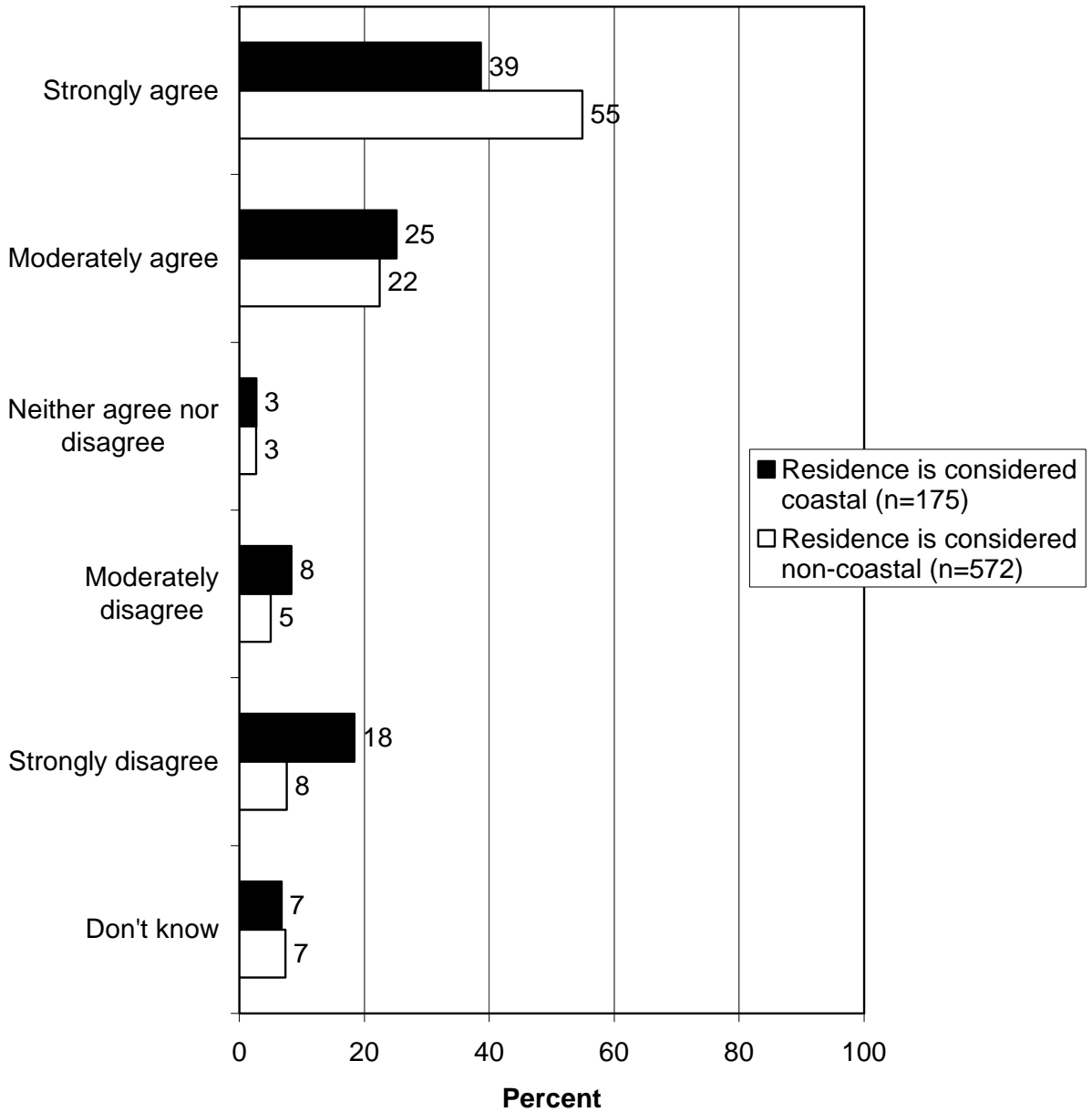
**Q79, 81-82, 98-100. Percent who moderately or strongly disagree with the following statements about climate change and sea level rise.**



**Q79, 81-82, 98-100. Percent who strongly disagree with the following statements about climate change and sea level rise.**

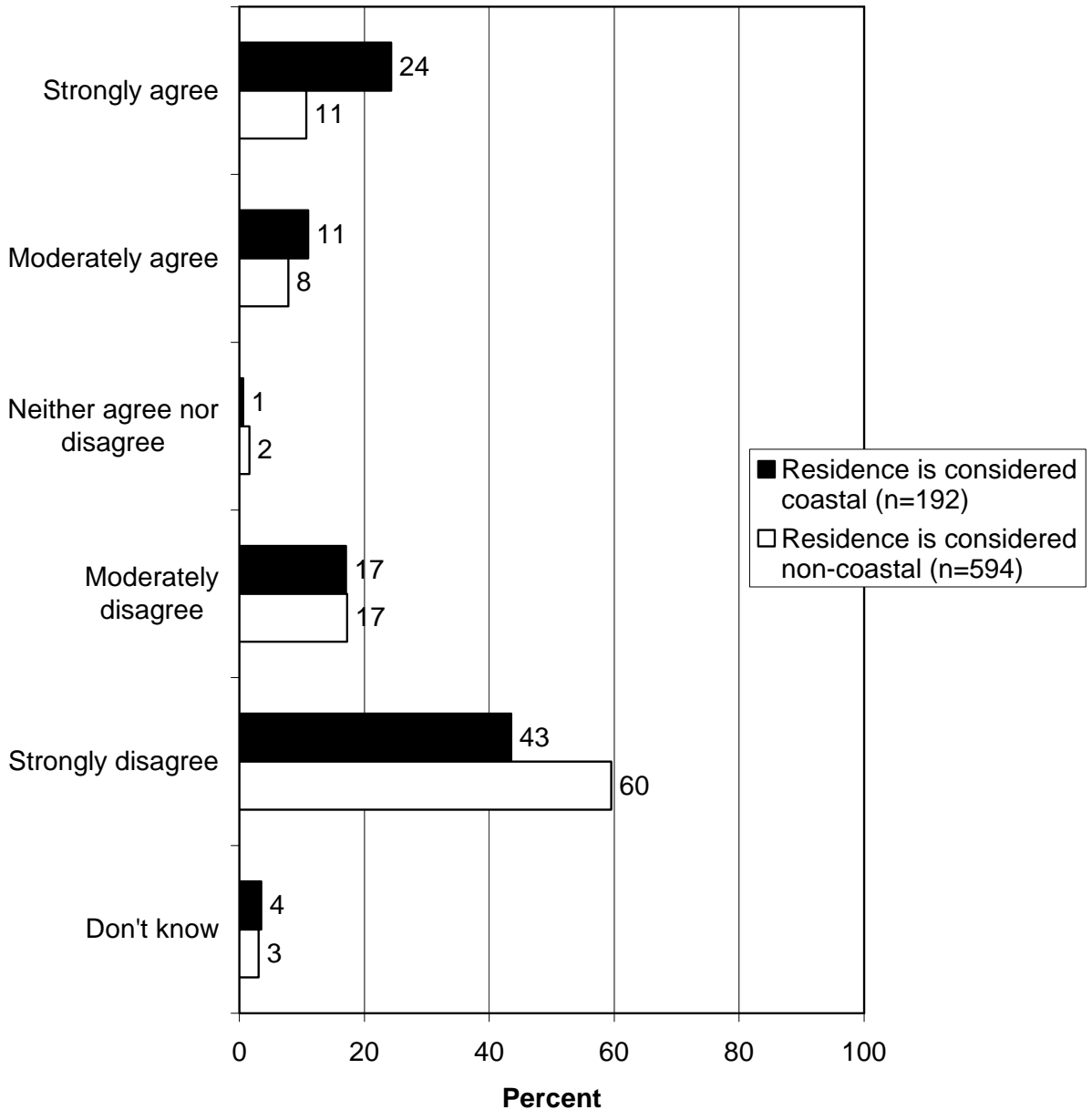


**Q98. Do you agree or disagree with this statement:  
Climate change is contributing to the rise in sea  
levels.**

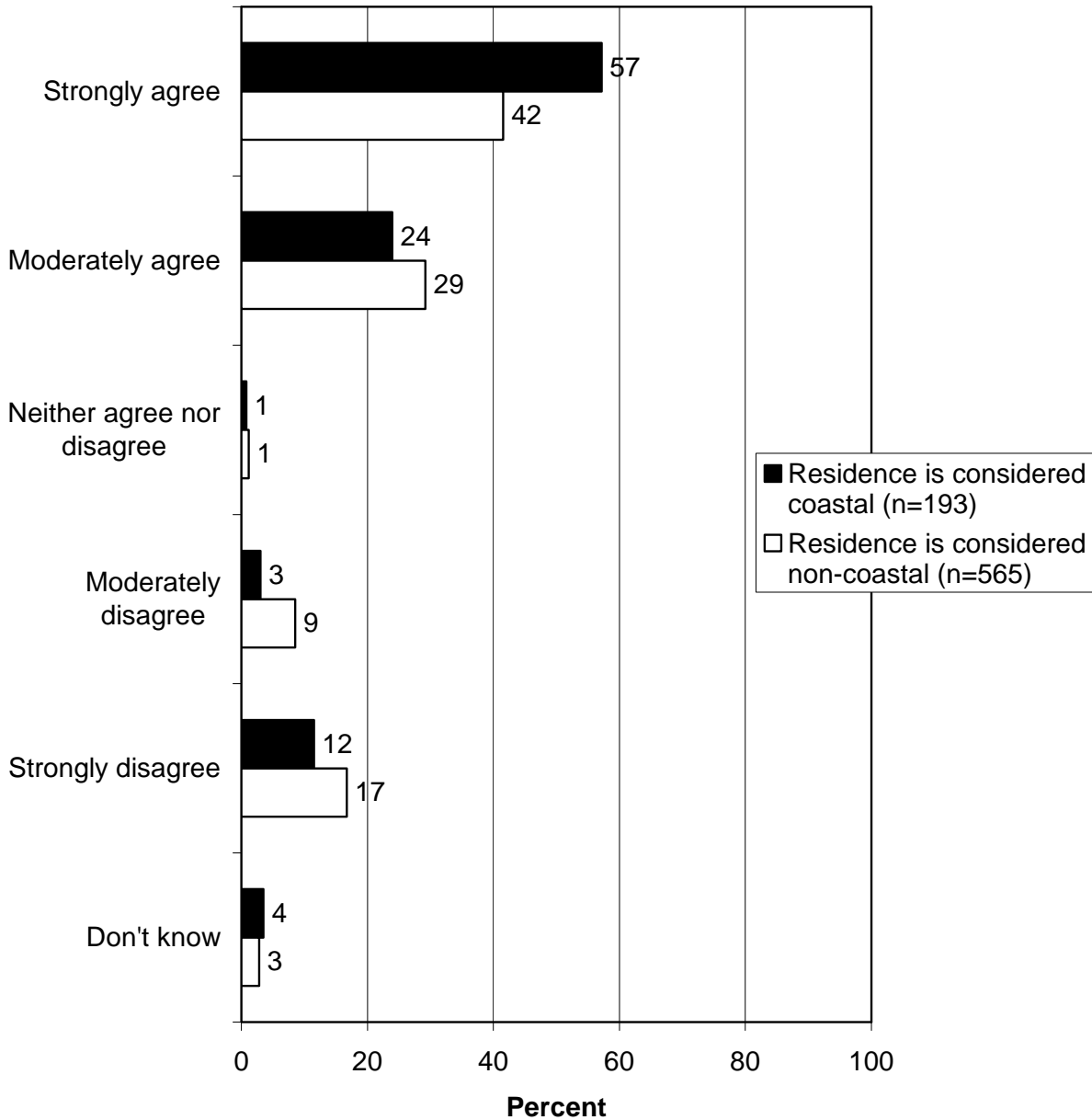




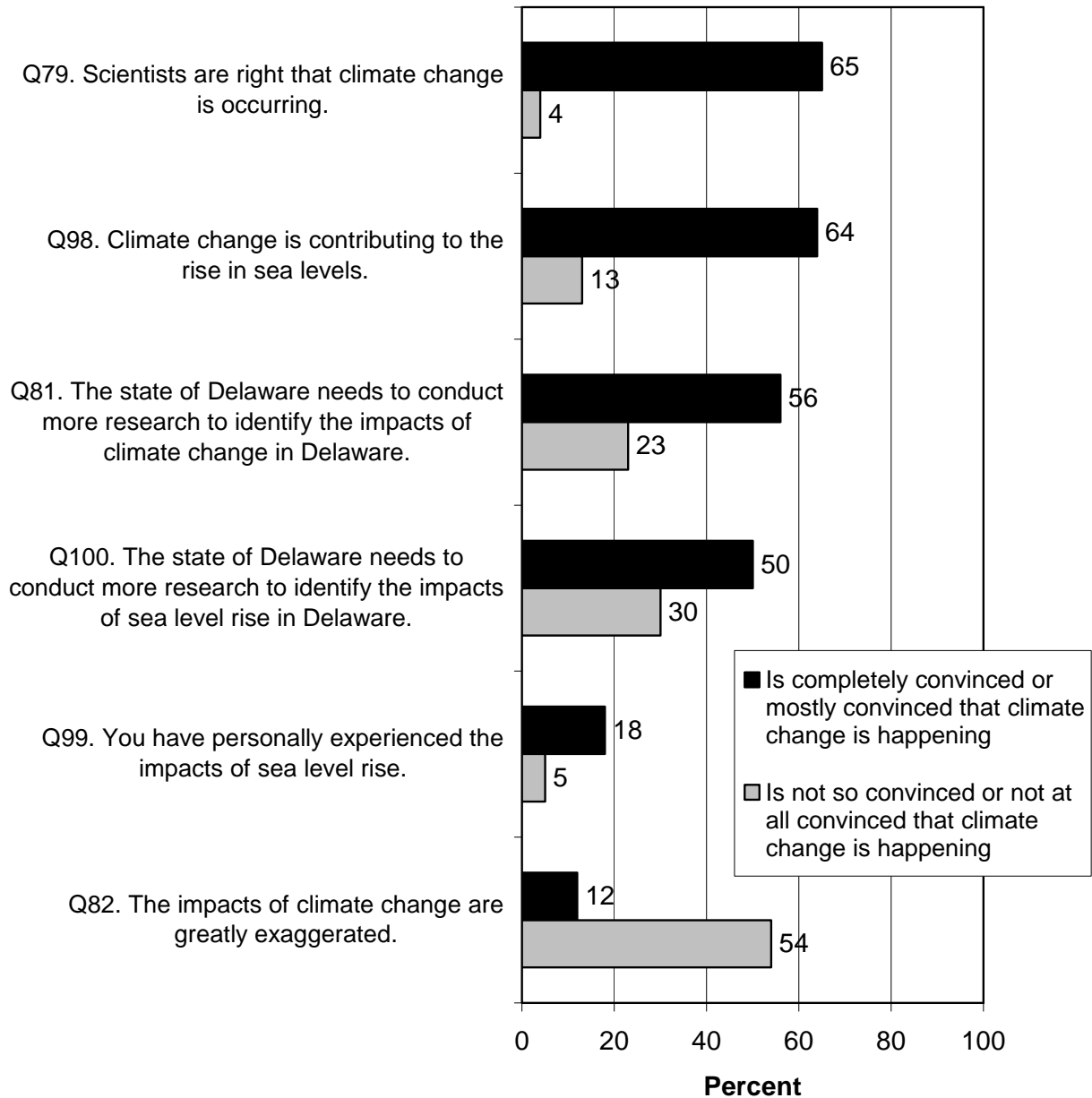
**Q99. Do you agree or disagree with this statement:  
You have personally experienced the impacts of  
sea level rise.**



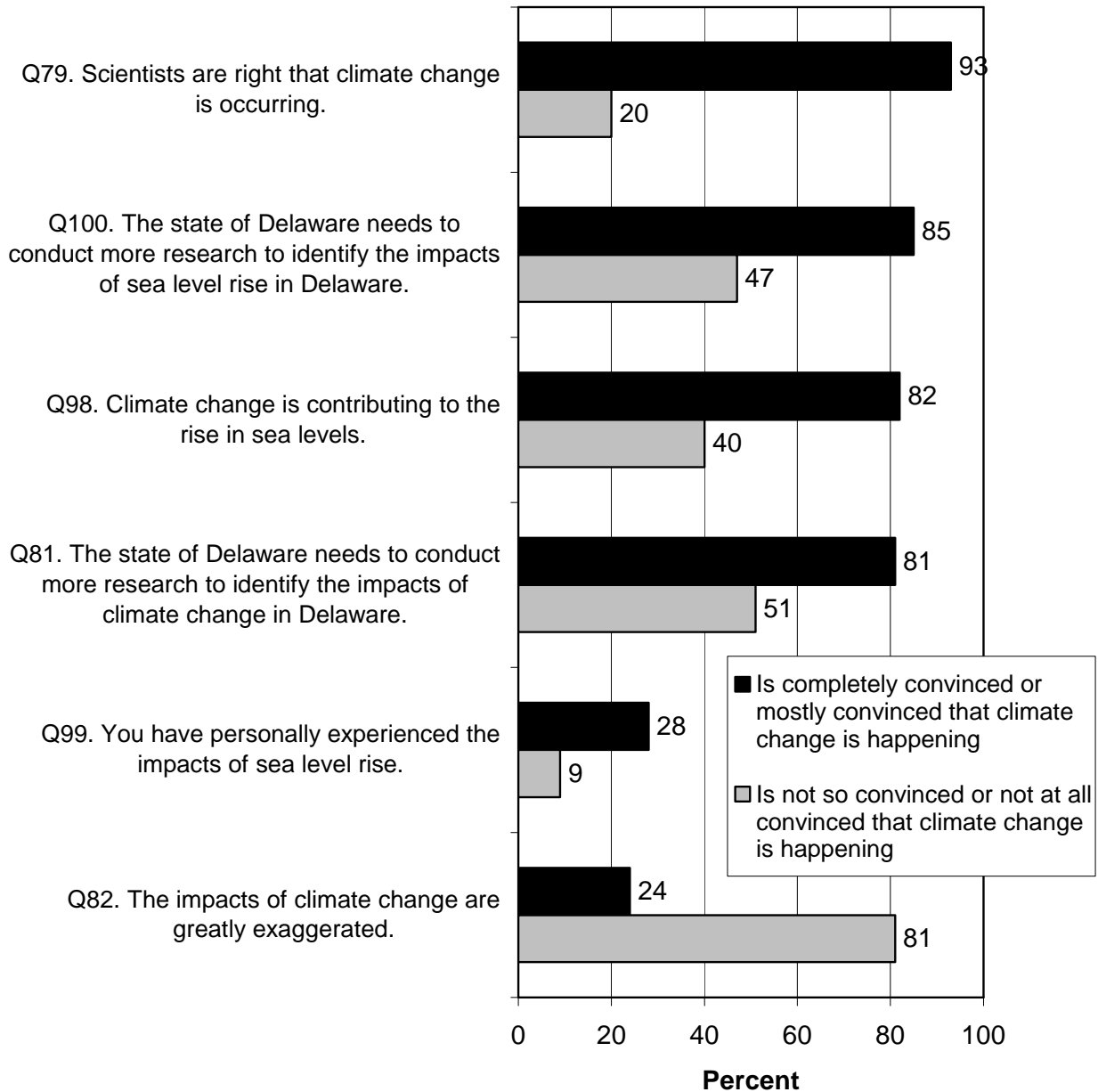
**Q100. Do you agree or disagree with this statement: The state of Delaware needs to conduct more research to identify the impacts of sea level rise in Delaware.**



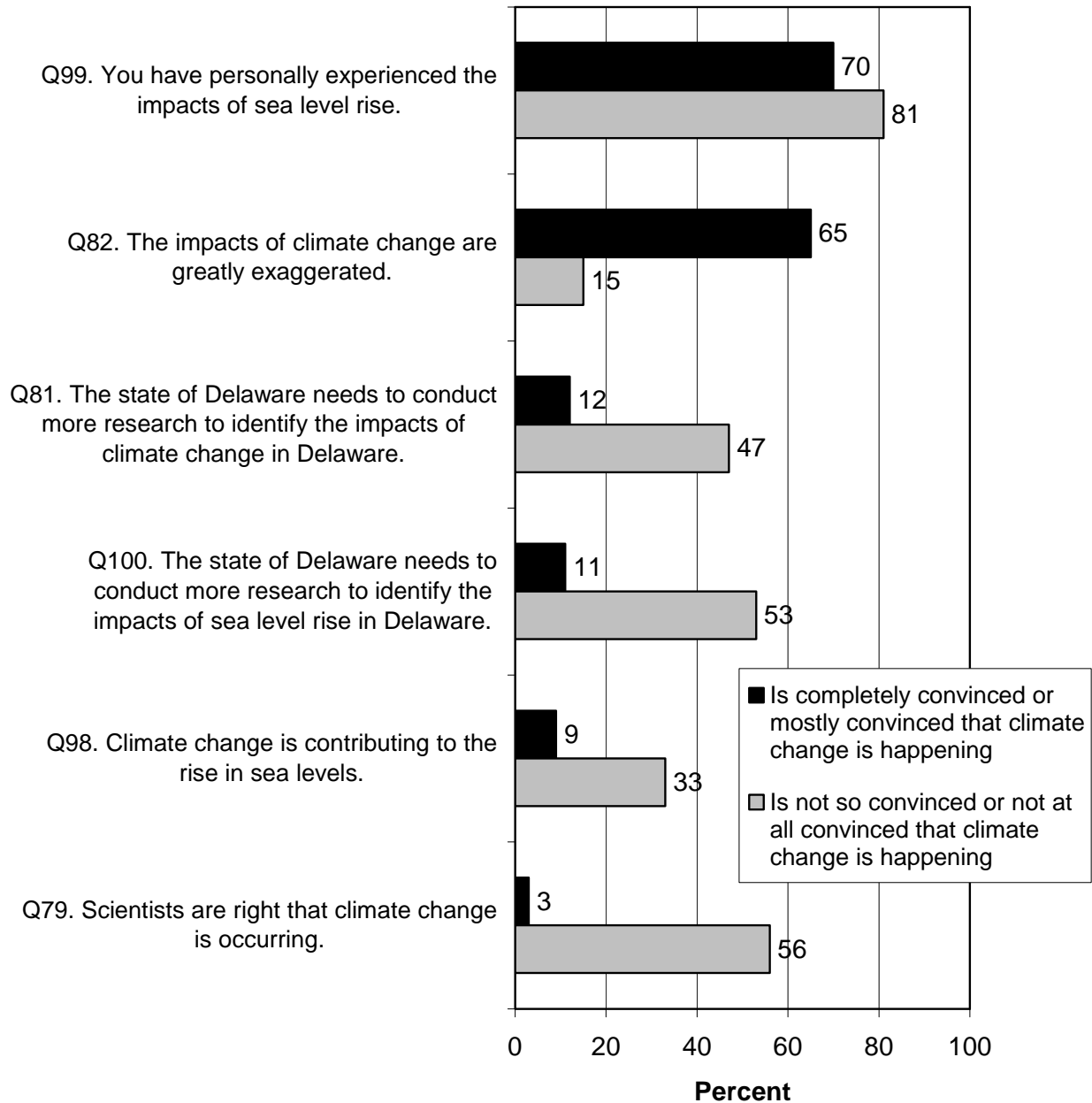
**Q79, 81-82, 98-100. Percent who strongly agree with the following statements about climate change and sea level rise.**



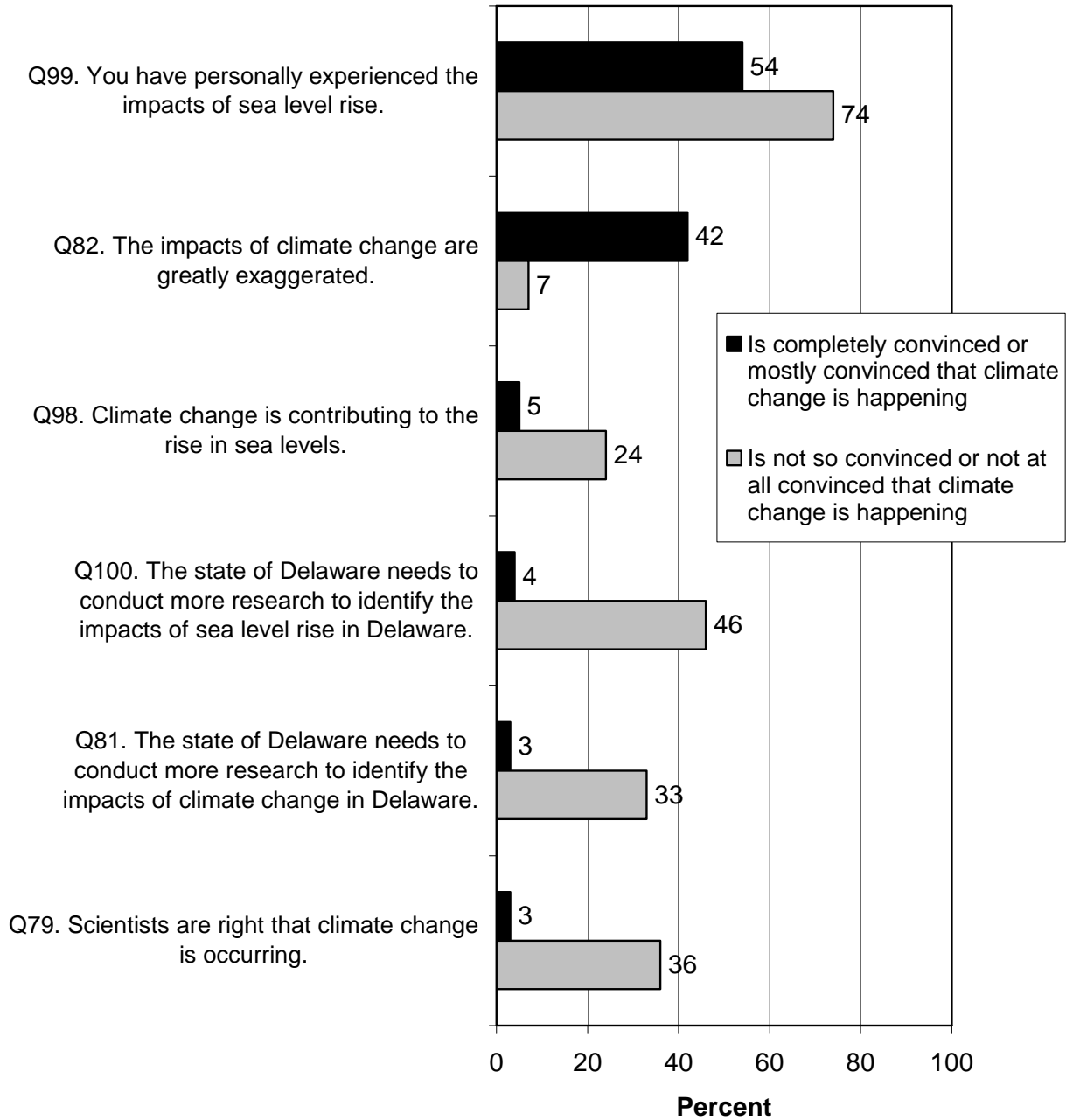
**Q79, 81-82, 98-100. Percent who strongly or moderately agree with the following statements about climate change and sea level rise.**



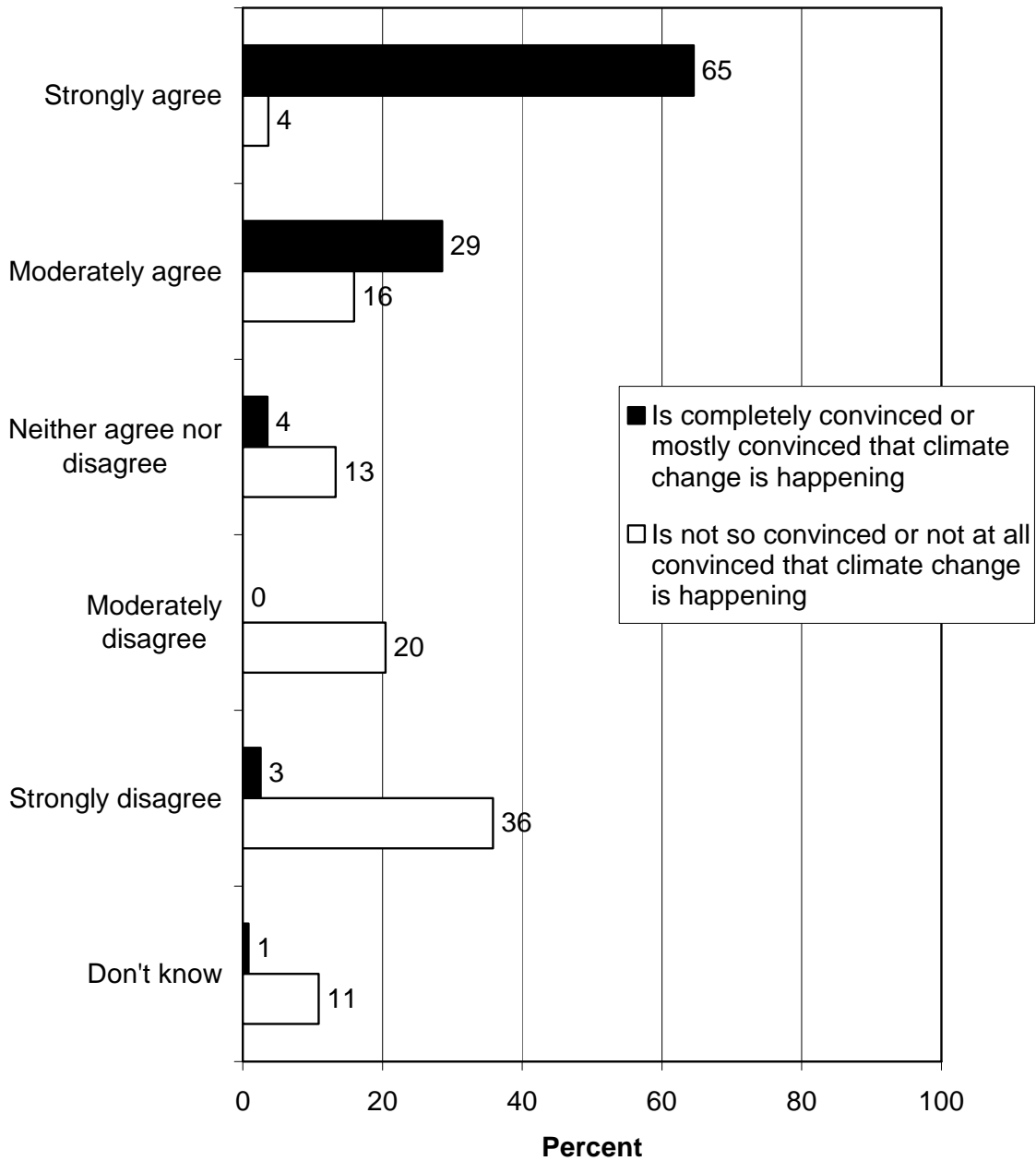
**Q79, 81-82, 98-100. Percent who moderately or strongly disagree with the following statements about climate change and sea level rise.**



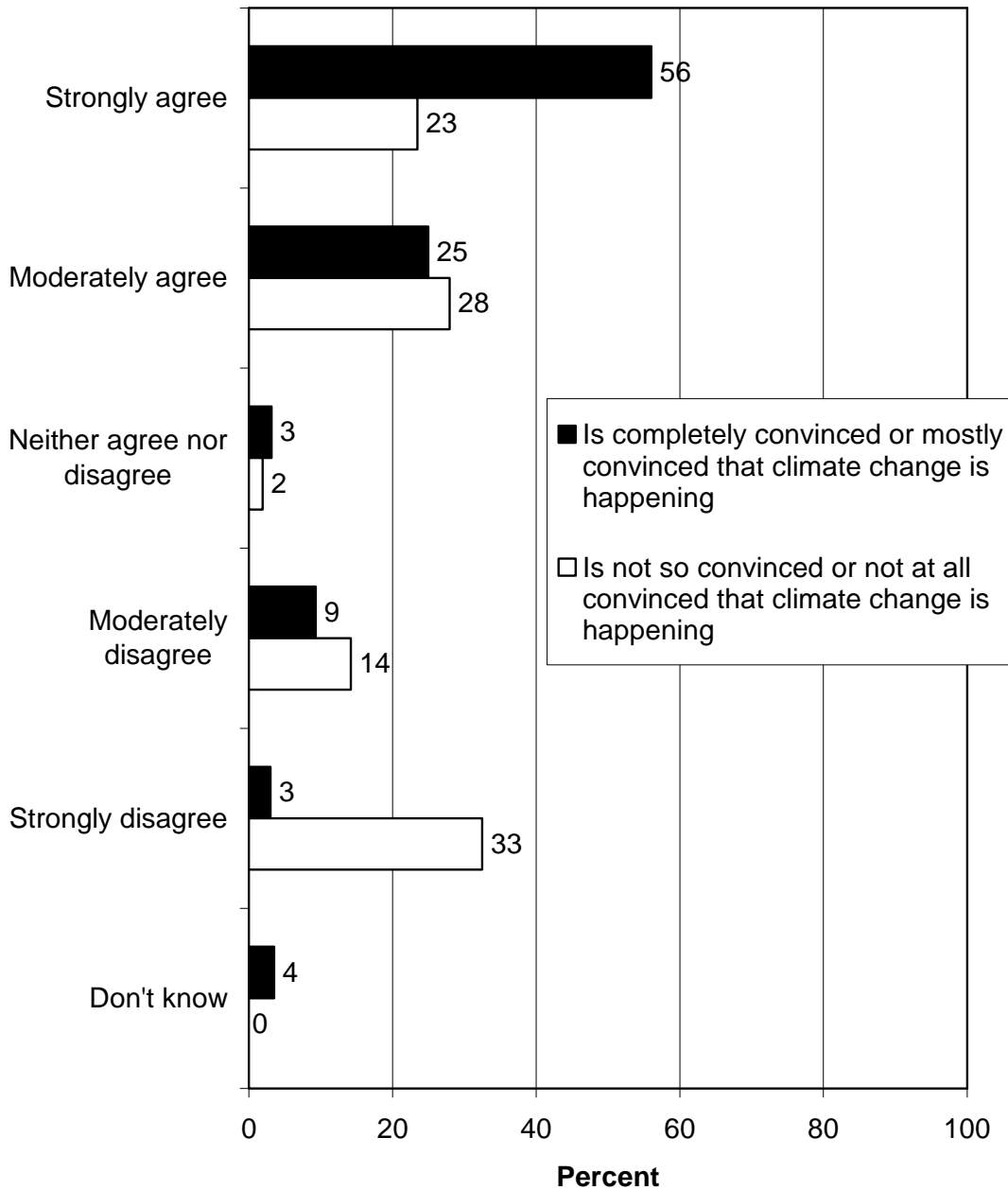
**Q79, 81-82, 98-100. Percent who strongly disagree with the following statements about climate change and sea level rise.**



**Q79. Do you agree or disagree with this statement:  
Scientists are right that climate change is  
occurring.**

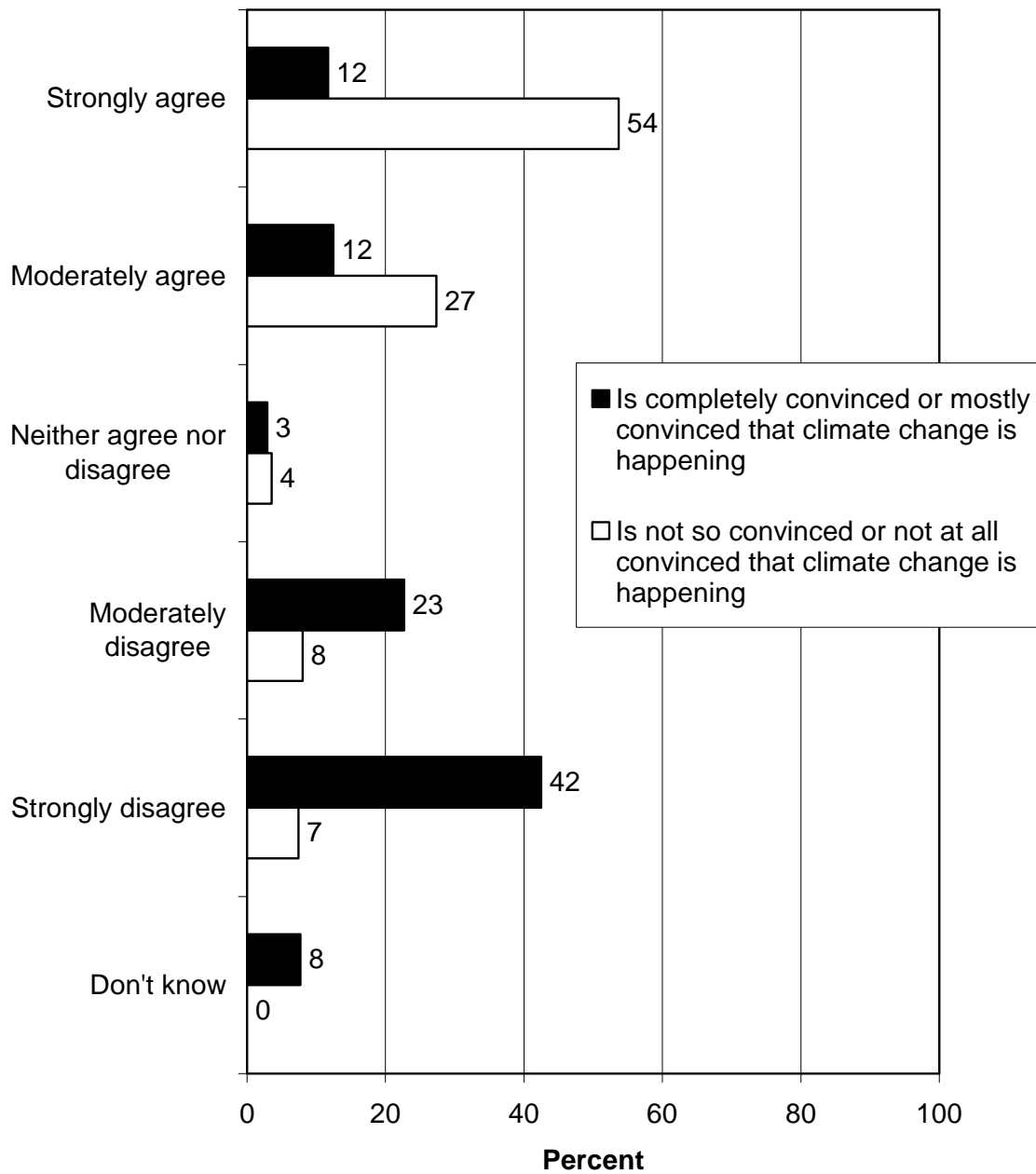


**Q81. Do you agree or disagree with this statement:  
The state of Delaware needs to conduct more  
research to identify the impacts of climate change  
in Delaware.**

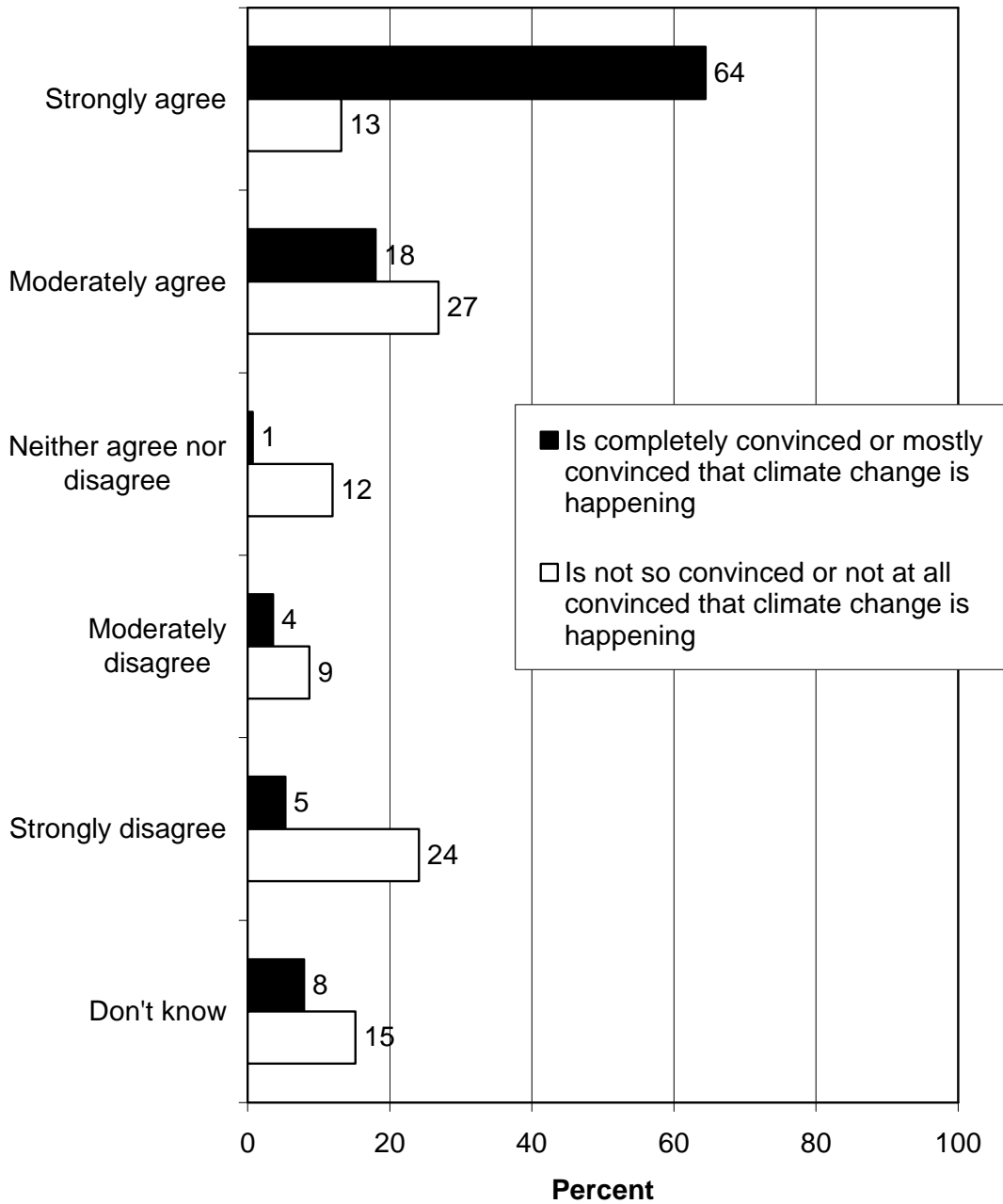




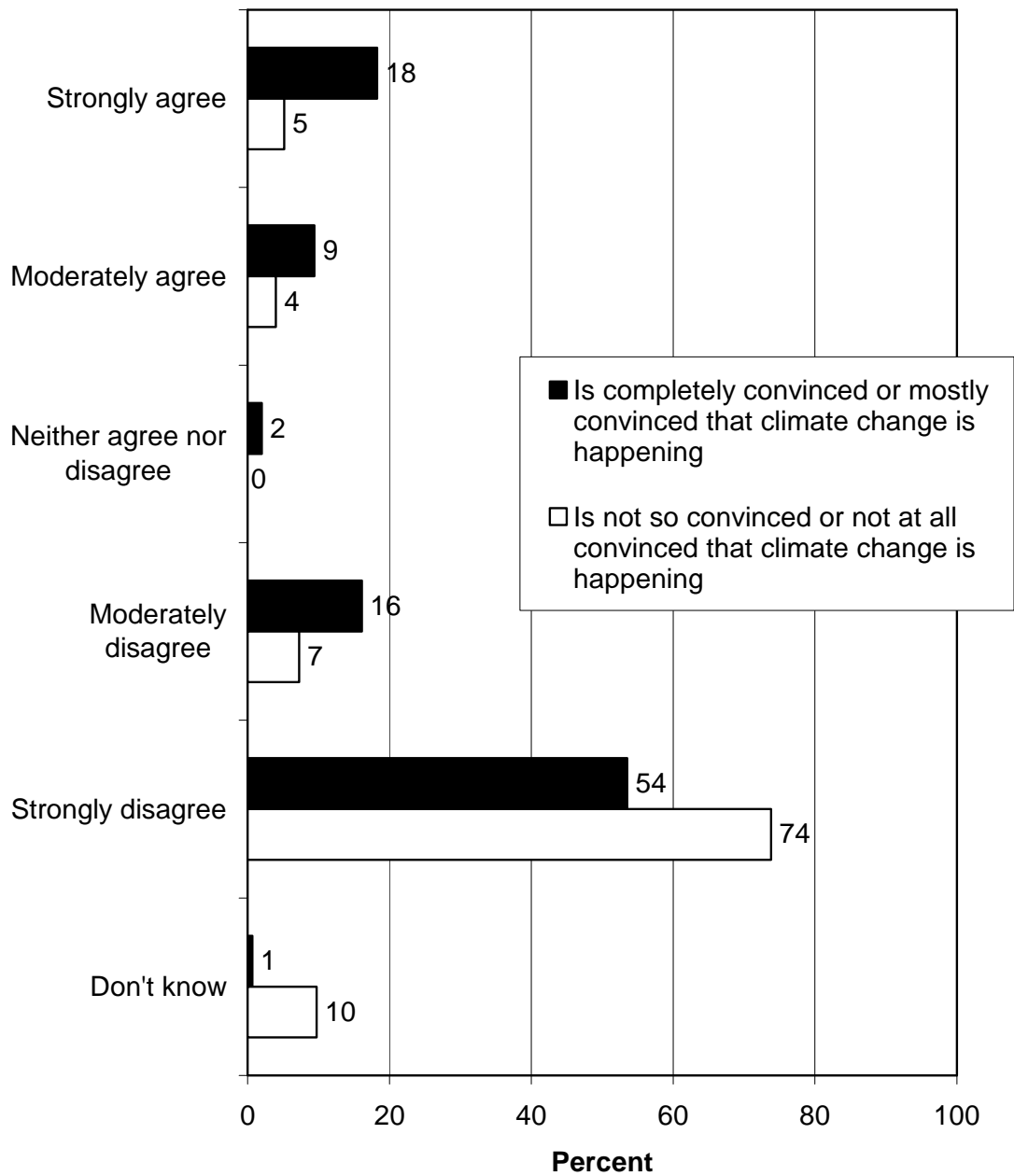
**Q82. Do you agree or disagree with this statement:  
The impacts of climate change are greatly  
exaggerated.**



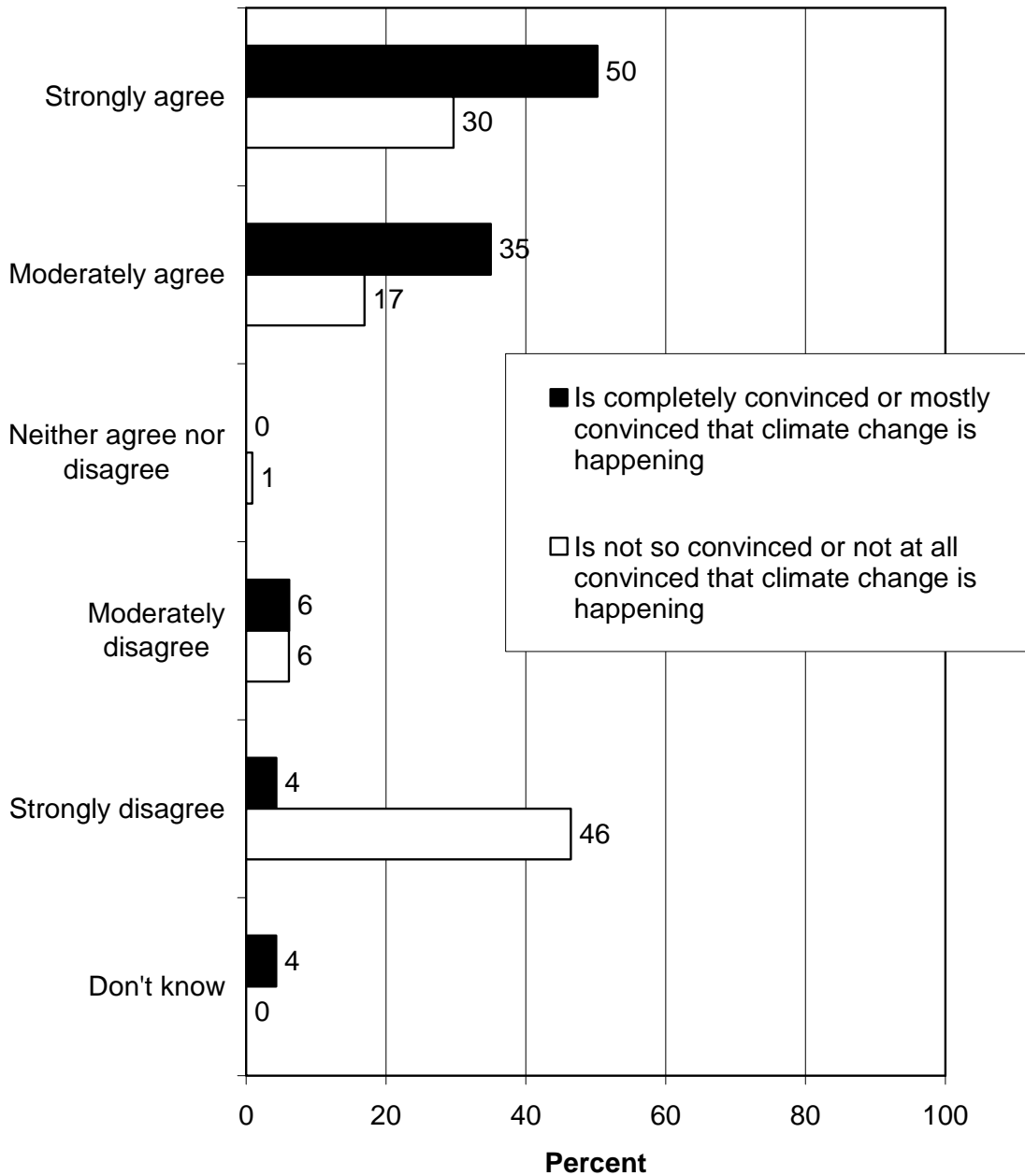
**Q98. Do you agree or disagree with this statement:  
Climate change is contributing to the rise in sea  
levels.**



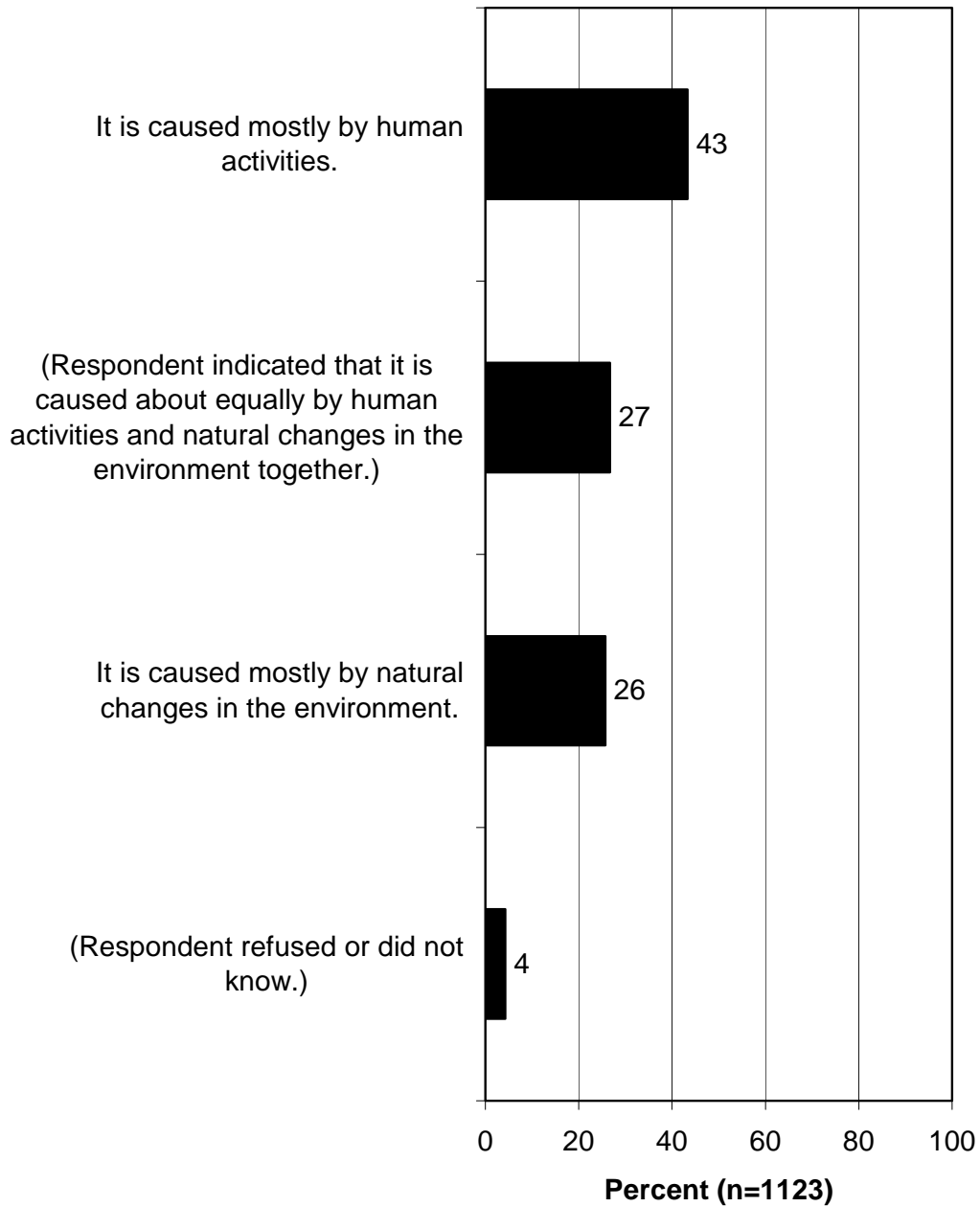
**Q99. Do you agree or disagree with this statement:  
You have personally experienced the impacts of  
sea level rise.**



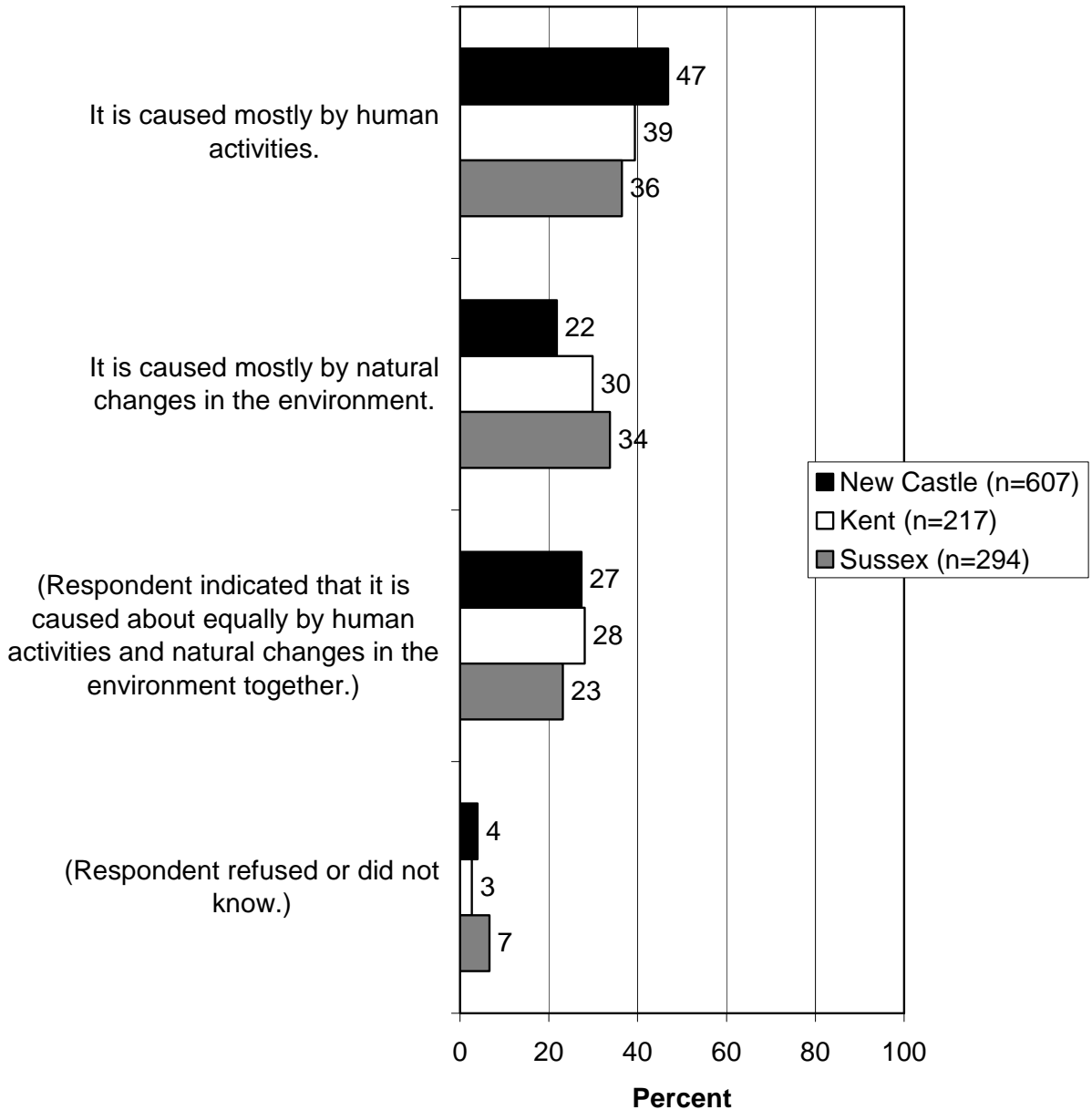
**Q100. Do you agree or disagree with this statement: The state of Delaware needs to conduct more research to identify the impacts of sea level rise in Delaware.**



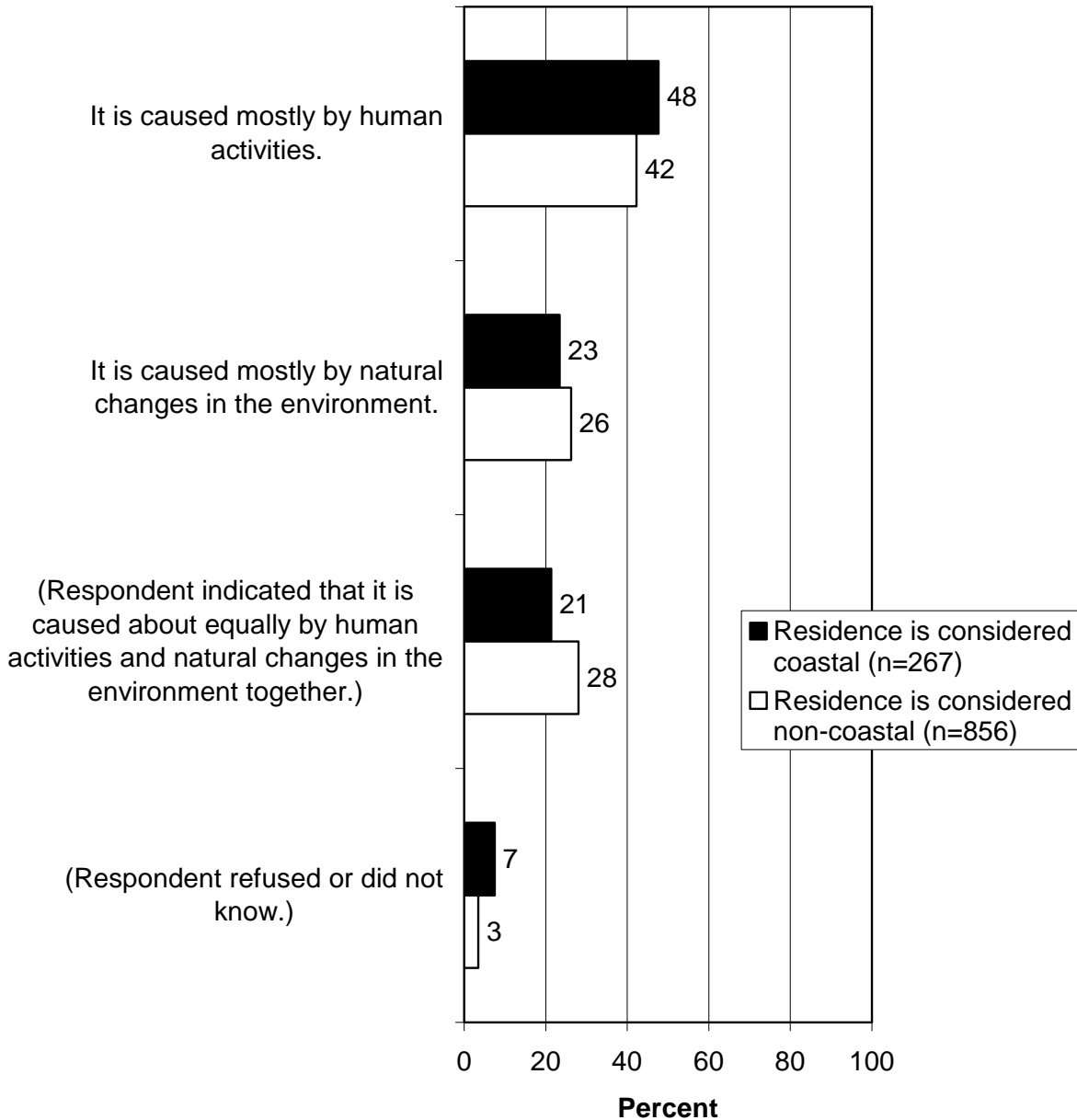
**Q45. If climate change is happening, which of these factors is causing it? Please tell me which comes closer to your own view.**



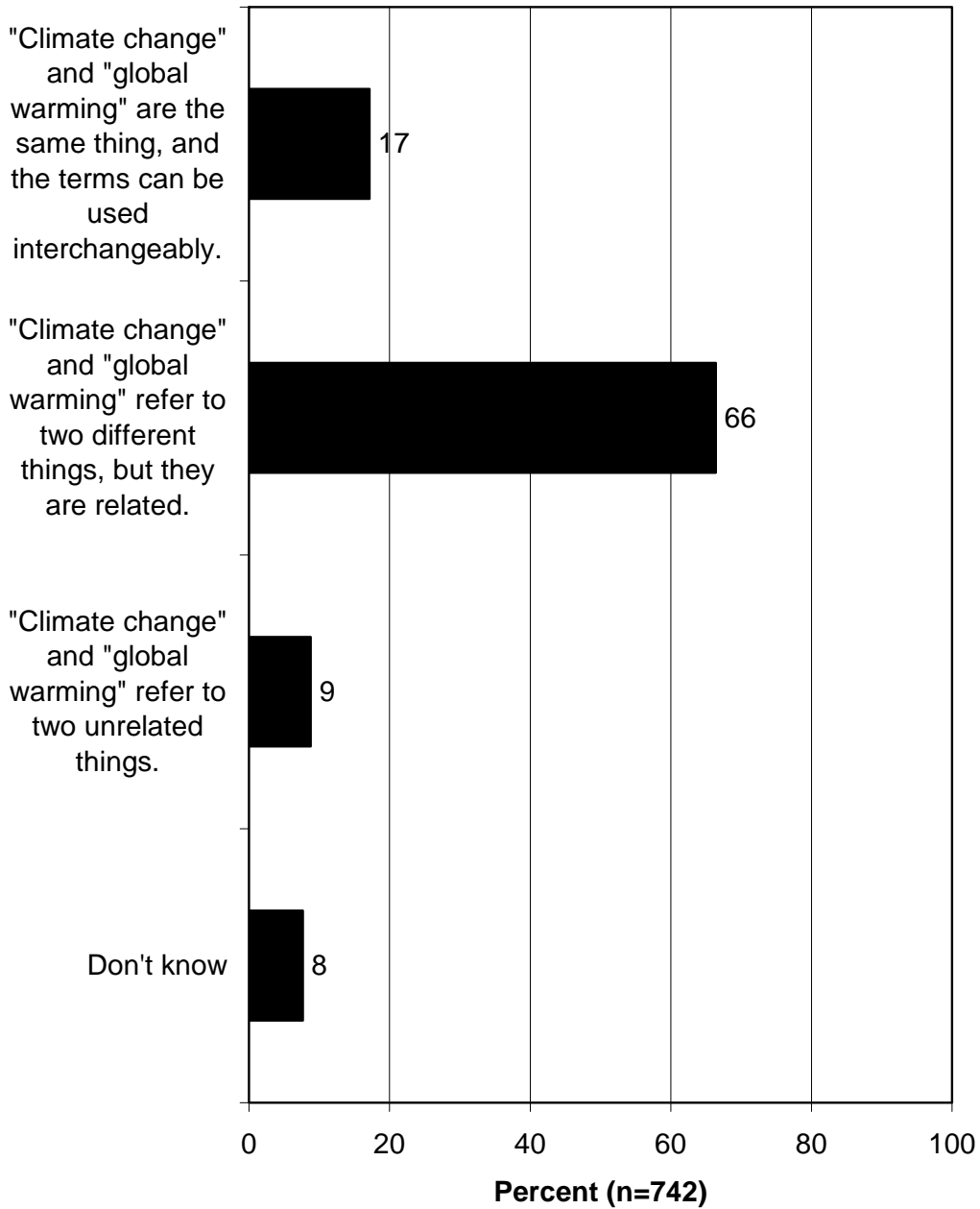
**Q45. If climate change is happening, which of these factors is causing it? Please tell me which comes closer to your own view.**



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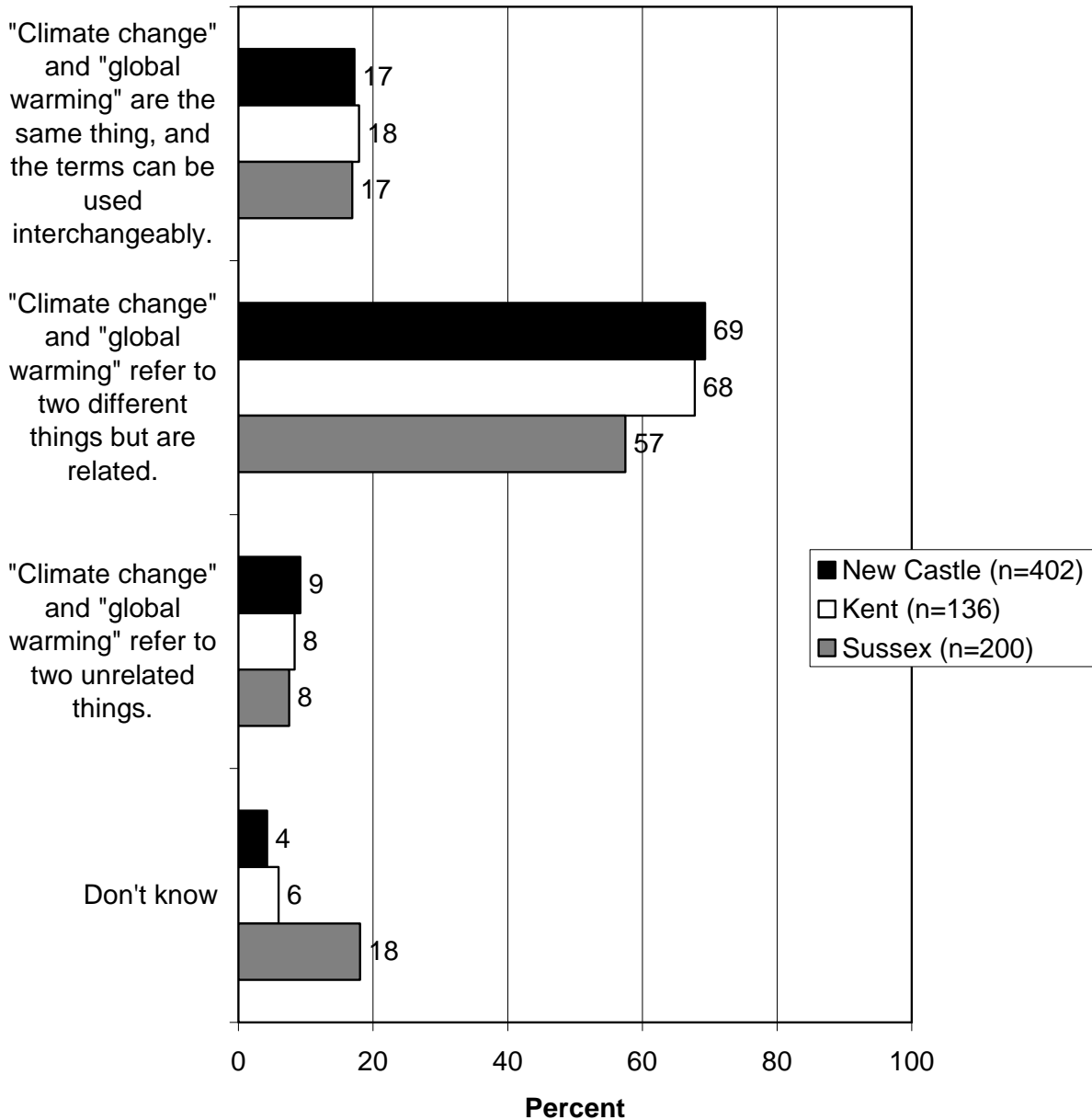


**Q39. Which of the following best describes your opinion of the terms "climate change" and "global warming"?**

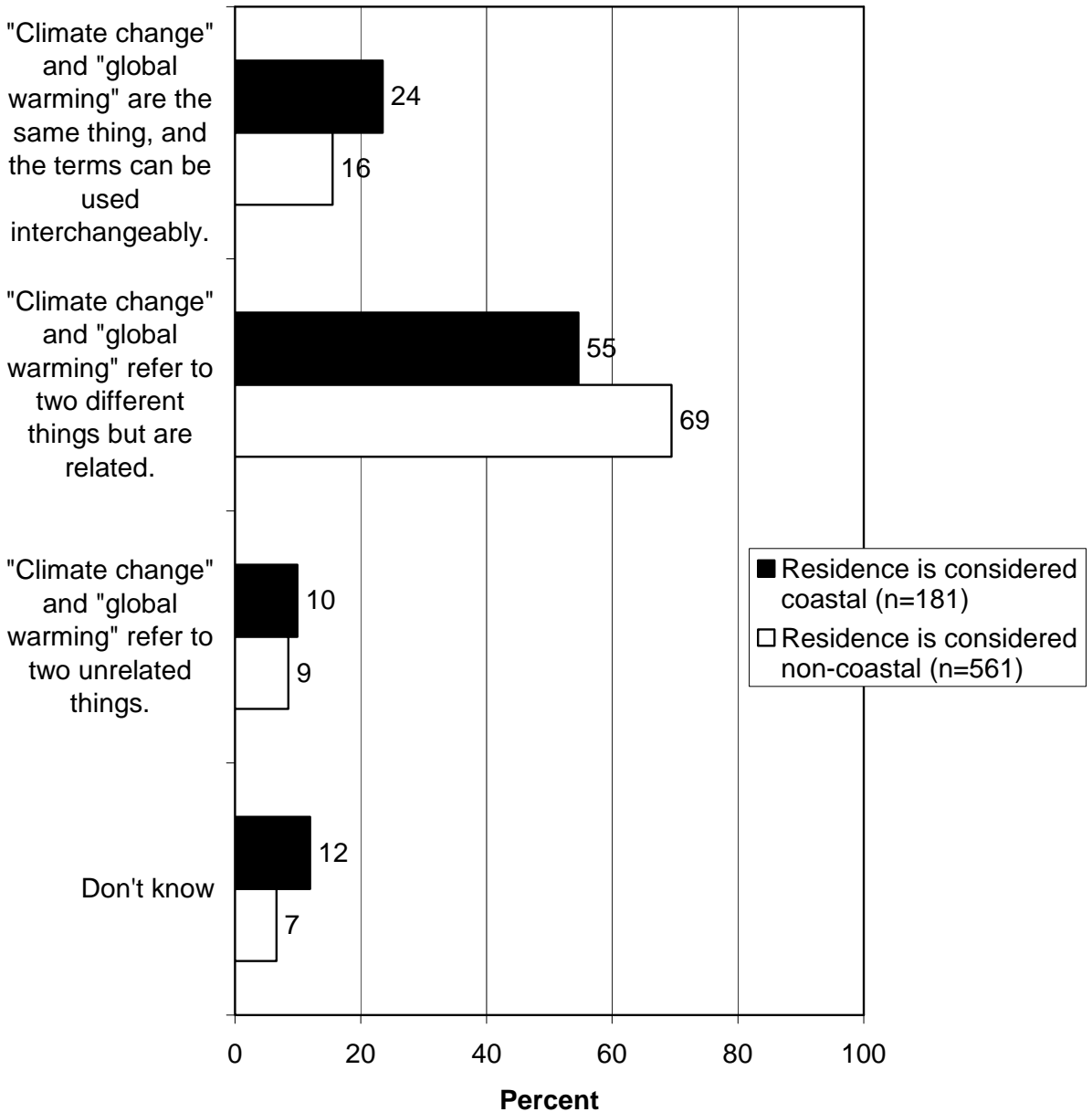




**Q39. Which of the following best describes your opinion of the terms "climate change" and "global warming"?**



**Q39. Which of the following best describes your opinion of the terms "climate change" and "global warming"?**



## PERCEPTIONS OF CLIMATE CHANGE AS A THREAT

- Most residents (77%) consider climate change to be a threat, saying it is a *very* serious threat (38%) or a *somewhat* serious threat (39%). At the other end, 21% consider it to be a *not very serious* or *not at all serious threat*.
  - The nonparametric analysis found that the following responses are correlated with thinking that climate change is a very serious threat:
    - Says he/she knows a great deal or a moderate amount about climate change ( $p \leq 0.001$ ) and sea level rise ( $p \leq 0.001$ ).
    - Shows concern about climate change and sea level rise (e.g., worries a great deal or a moderate amount about climate change; is completely or mostly convinced that sea levels are rising) (all at  $p \leq 0.001$  or greater significance).
    - Thinks that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.001$ ).
    - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).
    - Thinks that sea level rise is a very or somewhat serious threat to him or her personally, a very serious threat to ocean-front cities and towns in Delaware, a very or somewhat serious threat to the Mid-Atlantic United States, a very or somewhat serious threat to the United States, a very serious threat to the State of Delaware, a very serious threat to Delaware beaches, a very or somewhat serious threat to river-front cities and towns in Delaware, and a very serious threat to marshes and wetlands in Delaware (all at  $p \leq 0.001$  or greater significance).
    - Believes human efforts can improve climate change (e.g., agrees that the impacts of climate change can be reduced by human efforts; agrees that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
    - Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
    - On all questions about how to improve areas at risk from sea level rise, supports any efforts to address sea level rise in Delaware or reduce its impacts (e.g., strongly supports changing building codes and regulations to reduce risk in flood prone areas; strongly supports avoiding building new structures; supports purchasing or acquiring land and open space from willing land sellers using government funds) (all at  $p \leq 0.001$  or greater significance).
    - Thinks that the U.S. Congress, Delaware's state legislator, Delaware's state agencies, Delaware's governor, corporations and industry, his or her state government officials, his or her county government officials, Delaware citizens, and his or her city or town government officials should all be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
    - Would most like to have more information on how sea level rise relates to climate change / global warming ( $p \leq 0.001$ ), actions that can be taken to reduce impacts of sea level rise ( $p \leq 0.001$ ), sea level rise in general ( $p \leq 0.001$ ), current or potential impacts of sea level rise ( $p \leq 0.001$ ), how to protect property from sea level rise

- ( $p \leq 0.01$ ), and funding needs / estimated budget to address sea level rise in Delaware ( $p \leq 0.01$ ).
- Lives in New Castle County ( $p \leq 0.01$ ).
  - Has been a Delaware resident for less than the mean of 30 years ( $p \leq 0.01$ ).
  - Considers his or her place of residence to be a small city or town ( $p \leq 0.05$ ).
  - Rents his or her current place of residence ( $p \leq 0.05$ ).
  - Is female ( $p \leq 0.05$ ).
- In the crosstabulation by gender, the results show that women are more likely than are men to think that climate change is a *very* or *somewhat* serious threat ( $p \leq 0.001$  on the combination of *very* and *somewhat* serious threat).
- Six questions explored how much residents worry about various aspects of climate change, shown in Text Box 4 below.
- The most concern, in the ranking by the percentage worrying *a great deal* or *a moderate amount*, is regarding the impact of climate change on Delaware's environment (61%). Four items follow, grouped together: worry about the impact on the respondent's own quality of life in Delaware (54%), worry about climate change personally (53%), worry about the impacts of climate change on Delaware's economy (52%), and worry about the problems sea level rise may cause (52%).
  - At the bottom, only 39% said that they worry *a great deal* or *a moderate amount* about sea level rise personally.

**Text Box 4****Amount of Worry About Specific Aspects of Climate Change  
(Ranked by the Percentage Who Worry a Great Deal or a Moderate Amount About the Following Issues)**

- How much do you worry about the impacts of climate change on Delaware's environment?
- How much do you worry about the impacts of climate change on your quality of life in Delaware?
- How much do you personally worry about climate change?
- How much do you worry about the impacts of climate change on Delaware's economy?
- How much do you worry about the problems sea level rise may cause in Delaware?
- How much do you personally worry about sea level rise?

- The nonparametric analysis examined in detail one of the questions in the above series about the amount of worry Delaware residents have about the problems that sea level rise may cause in Delaware.
- The nonparametric analysis found that the following responses are correlated with worrying a great deal or a moderate amount about the problems that sea level rise may cause in Delaware:
    - Says he/she knows a great deal or a moderate amount about sea level rise ( $p \leq 0.001$ ) and climate change ( $p \leq 0.01$ ).
    - Thinks that sea level rise is a very or somewhat serious threat to him or her personally, a very serious threat to Delaware beaches, a very or somewhat serious threat to the United States, a very or somewhat serious threat to river-front cities and towns in Delaware, a very or somewhat serious threat to the Mid-Atlantic United States, a very serious threat to ocean-front cities and towns in Delaware, a very serious threat to the State of Delaware, and a very serious threat to marshes and wetlands in Delaware (all at  $p \leq 0.001$  or greater significance).
    - Shows concern about climate change and sea level rise (e.g., worries a great deal or a moderate amount about climate change; is completely or mostly convinced that sea levels are rising; thinks that climate change is a very serious threat) (all at  $p \leq 0.001$  or greater significance).
    - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).
    - Thinks that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.05$ ).
    - Believes human efforts can improve climate change (e.g., agrees that the impacts of climate change can be reduced by human efforts; agrees that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
    - Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
    - On most questions about how to improve areas at risk from sea level rise, supports any efforts to address sea level rise in Delaware or reduce its impacts (e.g., supports purchasing or acquiring land and open space from willing land sellers using government funds; supports elevating buildings using government funds; supports elevating the land surface) (all at  $p \leq 0.001$  or greater significance).
    - Thinks that his or her state government officials, Delaware's state legislators, Delaware's governor, Delaware's state agencies, his or her city or town government officials, his or her county government officials, Delaware citizens, the U.S. Congress, and corporations and industry should all be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
    - Would most like to have more information on funding needs / estimated budget to address sea level rise in Delaware, how to protect property from sea level rise, actions that can be taken to reduce impacts of sea level rise, how sea level rise relates to

- climate change / global warming, sea level rise in general, and current or potential impacts of sea level rise (all at  $p \leq 0.001$  or greater significance).
- Primary sources of his or her information about environmental issues in Delaware are television ( $p \leq 0.01$ ), and the Internet, not including Department of Natural Resources and Environmental Control website ( $p \leq 0.01$ ).
  - Rents his or her current place of residence ( $p \leq 0.01$ ).
  - Lives in Sussex County ( $p \leq 0.01$ ).
  - Considers his or her place of residence to be a small city or town ( $p \leq 0.01$ ).
  - Is female ( $p \leq 0.05$ ).
  - Has at least one child, age 17 or younger, living in his or her household ( $p \leq 0.05$ ).
  - Does not have a bachelor's degree ( $p \leq 0.05$ ).
- The crosstabulation by county of residence found statistically significant differences on two of the questions in the above series regarding the amount of worry about various aspects of climate change and sea level rise.
- Kent County residents, compared to residents of the other two counties, are the *least* likely to personally worry *a great deal* or *a moderate amount* about sea level rise ( $p \leq 0.05$ ).
  - Sussex County residents, compared to residents of the other two counties, are the most likely to worry *a great deal* or *moderate amount* about the problems that sea level rise may cause in Delaware ( $p \leq 0.05$ ).
- The crosstabulation by coastal/non-coastal found statistically significant differences on one question in the above series regarding the amount of worry about various aspects of climate change and sea level rise. Coastal residents are more likely than are non-coastal residents to worry *a great deal* or *moderate amount* about the problems sea level rise may cause in Delaware ( $p \leq 0.01$ ).
- Fifteen questions asked residents to indicate how much sea level rise is a threat to various locations (e.g., beaches, ocean-front towns, the state as a whole) or various other things (e.g., wildlife, the economy, public works systems), shown in Text Box 5 on the following page.
- In looking at the ranking by the percentage saying that sea level rise is a *very serious threat*, three items stand out at the top: Delaware's beaches (53% say sea level rise is a

*very serious* threat to this), ocean-front cities and towns in Delaware (48%), and marshes and wetlands in Delaware (42%).

- A middle tier consists of seven items, each with 30% to 34% saying sea level rise is a *very serious* threat to it: river-front cities and towns in Delaware (34%), the state of Delaware as a whole (33%), Delaware's wildlife populations (32%), Delaware's economy (32%), the United States as a whole (31%), the Mid-Atlantic states (30%), and Delaware's public works (30%).
- There are five items in a bottom tier of items not considered by many to be greatly threatened by sea level rise: outdoor recreation in Delaware (24%), the respondent's local community (19%), the respondent personally (18%), the respondent's family (14%), and the respondent's property (13%).

#### **Text Box 5**

#### **Items to Which Sea Level Rise May Be a Threat**

**(Ranked by the Percentage Who Think Sea Level Rise is a Very Serious Threat to the Following)**

Delaware beaches  
Ocean-front cities and towns in Delaware  
Marsh and wetlands in Delaware  
River-front cities and towns in Delaware  
The State of Delaware  
Delaware's wildlife populations  
Delaware's economy  
The United States  
The Mid-Atlantic U.S.  
Delaware's public works systems, such as public buildings, roads, and sewer systems  
Outdoor recreation in Delaware  
Your local community  
You personally  
Your family  
Your property

- The nonparametric analysis examined in detail two questions from the above series about the items to which sea level rise may be a threat.
  - The nonparametric analysis found that the following responses are correlated with thinking that sea level rise is a very serious threat **to the State of Delaware**:
    - Says he/she knows a great deal or a moderate amount about sea level rise ( $p \leq 0.001$ ).
    - Thinks that sea level rise is a very serious threat to Delaware beaches, a very or somewhat serious threat to him or her personally, a very serious threat to ocean-front cities and towns in Delaware, a very serious threat to marshes and wetlands in Delaware, a very or somewhat serious threat to the Mid-Atlantic United States, a very or somewhat serious threat to the United States, and a very or somewhat serious threat to river-front cities and towns in Delaware (all at  $p \leq 0.001$  or greater significance).
    - Shows concern about climate change and sea level rise (e.g., thinks that climate change is a very serious threat; is completely or mostly convinced that sea levels are rising; worries a great deal or a moderate amount about climate change) (all at  $p \leq 0.001$  or greater significance).
    - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).
    - Thinks that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.001$ ).
    - Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
    - Believes human efforts can improve climate change (e.g., agrees that the impacts of climate change can be reduced by human efforts; agrees that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
    - On most questions about how to improve areas at risk from sea level rise, supports any efforts to address sea level rise in Delaware or reduce its impacts (e.g., strongly supports changing building codes and regulations to reduce risk in flood prone areas; supports purchasing or buying out frequently flooded properties using government funds; strongly supports elevating buildings using private funding) (all at  $p \leq 0.05$  or greater significance).
    - Thinks that Delaware's state legislators, the U.S. Congress, corporations and industry, his or her city or town government officials, Delaware citizens, Delaware's state agencies, his or her county government officials, his or her state government officials, and Delaware's governor should all be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
    - Would most like to have more information on current or potential impacts of sea level rise ( $p \leq 0.01$ ).
    - A primary source of his or her information about environmental issues in Delaware is television ( $p \leq 0.05$ ).
    - Is female ( $p \leq 0.05$ ).
    - Considers his or her place of residence to be a small city or town ( $p \leq 0.05$ ).



- The nonparametric analysis found that the following responses are correlated with thinking that sea level rise is a very or somewhat serious threat **to him or her personally**:
  - Says he/she knows a great deal or a moderate amount about sea level rise ( $p \leq 0.001$ ), and climate change ( $p \leq 0.001$ ).
  - Shows concern about climate change and sea level rise (e.g., worries a great deal or a moderate amount about climate change; is completely or mostly convinced that sea levels are rising; worries a great deal or a moderate amount about the problems that sea level rise may cause in Delaware) (all at  $p \leq 0.001$  or greater significance).
  - Thinks that sea level rise is a very or somewhat serious threat to the Mid-Atlantic United States, a very or somewhat serious threat to the United States, a very serious threat to Delaware beaches, a very or somewhat serious threat to river-front cities and towns in Delaware, a very serious threat to the State of Delaware, a very serious threat to ocean-front cities and towns in Delaware, and a very serious threat to marshes and wetlands in Delaware (all at  $p \leq 0.001$  or greater significance).
  - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).
  - Thinks that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.001$ ).
  - Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - On most questions about how to improve areas at risk from sea level rise, supports any efforts to address sea level rise in Delaware or reduce its impacts (e.g., supports elevating buildings using government funds; supports building dikes, seawalls, and bulkheads to keep water back; supports elevating the land surface) (all at  $p \leq 0.05$  or greater significance).
  - Believes human efforts can improve climate change (e.g., agrees that climate change is something people can control; agrees that the impacts of climate change can be reduced by human efforts) (all at  $p \leq 0.001$  or greater significance).
  - Has flood insurance for his or her current place of residence ( $p \leq 0.001$ ).
  - Would most like to have more information on actions that can be taken to reduce impacts of sea level rise ( $p \leq 0.001$ ), current or potential impacts of sea level rise ( $p \leq 0.001$ ), funding needs / estimated budget to address sea level rise in Delaware ( $p \leq 0.001$ ), sea level rise in general ( $p \leq 0.001$ ), how sea level rise relates to climate change / global warming ( $p \leq 0.01$ ), and how to protect property from sea level rise ( $p \leq 0.05$ ).
  - Is female ( $p \leq 0.001$ ).
  - Considers his or her place of residence to be in a coastal area ( $p \leq 0.001$ ).
  - Lives in Sussex County ( $p \leq 0.01$ ).
  - Is between ages 18-34 ( $p \leq 0.05$ ).

- The nonparametric analysis also examined in detail questions from the above series for which respondents viewed sea level rise as **not a very serious** or **not at all a threat**.
- The nonparametric analysis found that the following responses are correlated with indicating that sea level rise is not a very serious or not at all a threat to **the United States**:
    - Thinks that “climate change” and “global warming” refer to two unrelated things ( $p \leq 0.001$ ).
    - Indicates sea level rise is not a very serious or not at all a threat to the Mid-Atlantic U.S., to the State of Delaware, to Delaware beaches, to him/her personally, to his/her family, to the marsh and wetlands in Delaware, to ocean-front cities and towns in Delaware, to Delaware's public works systems, such as public buildings, roads, and sewer systems, to river-front cities and towns in Delaware, to his/her property, to Delaware's economy, to his/her local community, or to Delaware's wildlife populations (all at  $p \leq 0.001$  or greater significance).
    - Does not show concern about climate change and sea level rise (e.g., does not worry about climate change, does not indicate being completely or mostly convinced that sea levels are rising, does not indicate thinking that climate change is a very serious threat) (all at  $p \leq 0.001$  or greater significance).
    - Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
    - Does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ), and does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.001$ ).
    - Indicates that climate change is caused by natural changes in environment ( $p \leq 0.001$ ).
    - Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.01$ ).
    - Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
    - Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
    - Does not believe human efforts can improve climate change (e.g., does not strongly agree that the impacts of climate change can be reduced by human efforts, does not agree that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
    - On most questions, does not support any alterations in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate strong support for changing building codes and regulations to reduce risk in flood-prone areas, does not indicate support for purchasing or acquiring land and open space from willing land sellers using government funds, Does not indicate support for elevating buildings in areas using government funds) (all at  $p \leq 0.01$  or greater significance).
    - Supports allowing beaches and wetlands to naturally migrate inland to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.05$ ).

- Does not indicate thinking that Delaware citizens, Delaware's state legislators, his or her county government officials, his or her state government officials, his or her city or town government officials, the U.S. Congress, Delaware's governor, Delaware's state agencies, or corporations and industry should be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
- Gets most of his or her information about environmental issues in Delaware from magazines ( $p \leq 0.05$ ).
- Is male ( $p \leq 0.001$ ).
- Considers his or her place of residence to be a rural area ( $p \leq 0.05$ ).
- The nonparametric analysis found that the following responses are correlated with indicating that sea level rise is not a very serious or not at all a threat to **the Mid-Atlantic U.S.**:
  - Indicates sea level rise is not a very serious or not at all a threat to the United States ( $p \leq 0.001$ ), to the State of Delaware ( $p \leq 0.001$ ), to him/her personally ( $p \leq 0.001$ ), to Delaware beaches ( $p \leq 0.001$ ), to the marsh and wetlands in Delaware ( $p \leq 0.001$ ), to his/her family ( $p \leq 0.001$ ), to ocean-front cities and towns in Delaware ( $p \leq 0.001$ ), to his/her property ( $p \leq 0.001$ ), to river-front cities and towns in Delaware ( $p \leq 0.001$ ), to Delaware's public works systems, such as public buildings, roads, and sewer systems ( $p \leq 0.001$ ), to his/her local community ( $p \leq 0.001$ ), to Delaware's economy ( $p \leq 0.001$ ), or to outdoor recreation in Delaware ( $p \leq 0.05$ ).
  - Does not show concern about climate change and sea level rise (e.g., does not worry about climate change, does not indicate being completely or mostly convinced that sea levels are rising, does not indicate thinking that climate change is a very serious threat) (all at  $p \leq 0.001$  or greater significance).
  - Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
  - Does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ), and does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.001$ ).
  - Indicates that climate change is caused by natural changes in environment ( $p \leq 0.001$ ).
  - Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.05$ ).
  - Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
  - Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - On all questions about how to improve areas at risk from sea level rise, does not support any efforts to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate strong support for changing building codes and regulations to reduce risk in flood-prone areas, does not indicate strong support for avoiding building new structures, does not indicate support for elevating buildings using government funds) (all at  $p \leq 0.05$  or greater significance).

- Does not believe human efforts can improve climate change (e.g., does not agree that climate change is something people can control, does not strongly agree that the impacts of climate change can be reduced by human efforts) (all at  $p \leq 0.001$  or greater significance).
- Does not indicate thinking that Delaware citizens, the U.S. Congress, Delaware's governor, Delaware's state legislators, his or her state government officials, his or her city or town government officials, his or her county government officials, Delaware's state agencies, or corporations and industry should be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
- Is male ( $p \leq 0.01$ ).
- Owns his or her current place of residence ( $p \leq 0.05$ ).
- The nonparametric analysis found that the following responses are correlated with indicating that sea level rise is not a very serious or not at all a threat to **the State of Delaware**:
  - Thinks that “climate change” and “global warming” refer to two unrelated things ( $p \leq 0.05$ ).
  - Indicates sea level rise is not a very serious or not at all a threat to the Mid-Atlantic U.S., to Delaware beaches, to the United States, to the marsh and wetlands in Delaware, to him/her personally, to ocean-front cities and towns in Delaware, to river-front cities and towns in Delaware, to his/her family, to outdoor recreation in Delaware, to his/her property, Delaware's wildlife populations, to Delaware's public works systems, such as public buildings, roads, and sewer systems, or to his/her local community (all at  $p \leq 0.001$  or greater significance).
  - Does not show concern about climate change and sea level rise (e.g., does not indicate being completely or mostly convinced that sea levels are rising, does not worry about climate change, does not indicate worrying a great deal or a moderate amount about the problems that sea level rise may cause in Delaware) (all at  $p \leq 0.001$  or greater significance).
  - Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
  - Does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ), and does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.001$ ).
  - Indicates that climate change is caused by natural changes in environment ( $p \leq 0.001$ ).
  - Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.001$ ).
  - Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
  - Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - On most questions, does not support any alterations in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate

- support for purchasing or acquiring land and open space from willing land sellers using government funds, does not indicate support for purchasing or buying out frequently flooded properties using government funds, does not indicate strong support for changing building codes and regulations to reduce risk in flood-prone areas) (all at  $p \leq 0.05$  or greater significance).
- Does not believe human efforts can improve climate change (e.g., does not agree that climate change is something people can control, does not strongly agree that the impacts of climate change can be reduced by human efforts) (all at  $p \leq 0.001$  or greater significance).
  - Does not indicate thinking that Delaware citizens ( $p \leq 0.001$ ), his or her city or town government officials ( $p \leq 0.001$ ), his or her county government officials ( $p \leq 0.001$ ), his or her state government officials ( $p \leq 0.001$ ), the U.S. Congress ( $p \leq 0.001$ ), Delaware's state legislators ( $p \leq 0.001$ ), Delaware's governor ( $p \leq 0.001$ ), corporations and industry ( $p \leq 0.001$ ), or Delaware's state agencies ( $p \leq 0.01$ ) should be doing more to address or reduce the impacts of sea level rise in Delaware.
  - Is male ( $p \leq 0.01$ ).
- The nonparametric analysis found that the following responses are correlated with indicating that sea level rise is not a very serious or not at all a threat to **Delaware beaches**:
    - Thinks that “climate change” and “global warming” refer to two unrelated things ( $p \leq 0.01$ ).
    - Indicates sea level rise is not a very serious or not at all a threat to the marsh and wetlands in Delaware, to ocean-front cities and towns in Delaware, the State of Delaware, to the United States, to the Mid-Atlantic U.S., to river-front cities and towns in Delaware, to outdoor recreation in Delaware, to Delaware's wildlife populations, to Delaware's economy, to his/her family, to his/her property, or to his/her local community (all at  $p \leq 0.001$  or greater significance).
    - Does not show concern about climate change and sea level rise (e.g., does not worry about climate change, does not indicate being completely or mostly convinced that sea levels are rising, is not worried about sea level rise) (all at  $p \leq 0.001$  or greater significance).
    - Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
    - Does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ), and does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.001$ ).
    - Indicates that climate change is caused by natural changes in environment ( $p \leq 0.001$ ).
    - Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.01$ ).
    - Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
    - Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).

- On most questions, does not support any alterations in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate support for elevating the land surface, does not indicate support for purchasing or acquiring land and open space from willing land sellers using government funds, does not indicate strong support for changing building codes and regulations to reduce risk in flood-prone areas) (all at  $p \leq 0.01$  or greater significance).
- Does not believe human efforts can improve climate change (e.g., does not strongly agree that the impacts of climate change can be reduced by human efforts, does not agree that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
- Does not indicate thinking that Delaware citizens ( $p \leq 0.001$ ), his or her state government officials ( $p \leq 0.001$ ), his or her county government officials ( $p \leq 0.001$ ), his or her city or town government officials ( $p \leq 0.001$ ), Delaware's state legislators ( $p \leq 0.001$ ), Delaware's governor ( $p \leq 0.001$ ), the U.S. Congress ( $p \leq 0.001$ ), Delaware's state agencies ( $p \leq 0.001$ ), or corporations and industry ( $p \leq 0.01$ ) should be doing more to address or reduce the impacts of sea level rise in Delaware.
- Is male ( $p \leq 0.001$ )
- Lives in Sussex County ( $p \leq 0.01$ ).
- Has been a Delaware resident for the mean of 30 years or more ( $p \leq 0.01$ ).
- Does not have any children, age 17 or younger, living in his or her household ( $p \leq 0.05$ ).
- The nonparametric analysis found that the following responses are correlated with indicating that sea level rise is not a very serious or not at all a threat to **the marsh and wetlands in Delaware**:
  - Thinks that “climate change” and “global warming” refer to two unrelated things ( $p \leq 0.01$ ).
  - Indicates sea level rise is not a very serious or not at all a threat to Delaware beaches ( $p \leq 0.001$ ), to ocean-front cities and towns in Delaware ( $p \leq 0.001$ ), to the State of Delaware ( $p \leq 0.001$ ), to river-front cities and towns in Delaware ( $p \leq 0.001$ ), to the Mid-Atlantic U.S. ( $p \leq 0.001$ ), to him/her personally ( $p \leq 0.001$ ), to the United States ( $p \leq 0.001$ ), to outdoor recreation in Delaware ( $p \leq 0.001$ ), to Delaware's wildlife populations ( $p \leq 0.001$ ), to Delaware's economy ( $p \leq 0.001$ ), to his/her family ( $p \leq 0.001$ ), to Delaware's public works systems, such as public buildings, roads, and sewer systems ( $p \leq 0.001$ ), or to his/her property ( $p \leq 0.01$ ).
  - Does not show concern about climate change and sea level rise (e.g., does not worry about climate change, does not indicate being completely or mostly convinced that sea levels are rising, is not worried about sea level rise) (all at  $p \leq 0.001$  or greater significance).
  - Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
  - Does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ), and does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.001$ ).
  - Indicates that climate change is caused by natural changes in environment ( $p \leq 0.001$ ).

- Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.05$ ).
- Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
- Does not believe human efforts can improve climate change (e.g., does not strongly agree that the impacts of climate change can be reduced by human efforts, does not agree that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
- On most questions, does not support any alterations in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate support for purchasing or buying out frequently flooded properties using government funds, does not indicate support for elevating the land surface, does not indicate support for purchasing or acquiring land and open space from willing land sellers using government funds) (all at  $p \leq 0.05$  or greater significance).
- Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
- Does not indicate thinking that Delaware citizens ( $p \leq 0.001$ ), his or her state government officials ( $p \leq 0.001$ ), Delaware's state legislators ( $p \leq 0.001$ ), his or her county government officials ( $p \leq 0.001$ ), Delaware's governor ( $p \leq 0.001$ ), his or her city or town government officials ( $p \leq 0.001$ ), the U.S. Congress ( $p \leq 0.001$ ), Delaware's state agencies ( $p \leq 0.001$ ), or corporations and industry ( $p \leq 0.01$ ) should be doing more to address or reduce the impacts of sea level rise in Delaware.
- Does not have flood insurance for his or her current place of residence ( $p \leq 0.01$ ).
- Is male ( $p \leq 0.001$ ).
- Lives in Sussex County ( $p \leq 0.01$ ).
- Is between ages 35-64 ( $p \leq 0.01$ ).
- Has been a Delaware resident for the mean of 30 years or more ( $p \leq 0.01$ ).
- Owns his or her current place of residence ( $p \leq 0.05$ ).
- The nonparametric analysis found that the following responses are correlated with indicating that sea level rise is not a very serious or not at all a threat to **ocean-front cities and towns in Delaware**:
  - Indicates sea level rise is not a very serious or not at all a threat to river-front cities and towns in Delaware, to Delaware beaches, to the marsh and wetlands in Delaware, to the State of Delaware, to Delaware's wildlife populations, to outdoor recreation in Delaware, to him/her personally, to Delaware's economy, to the United States, to the Mid-Atlantic U.S., to Delaware's public works systems, such as public buildings, roads, and sewer systems, to his/her family, or to his/her local community (all at  $p \leq 0.001$  or greater significance).
  - Does not show concern about climate change and sea level rise (e.g., does not worry about climate change, does not indicate being completely or mostly convinced that sea levels are rising, does not indicate thinking that climate change is a very serious threat) (all at  $p \leq 0.001$  or greater significance).
  - Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).

- Indicates that climate change is caused by natural changes in environment ( $p \leq 0.001$ ).
- Does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ), and does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.001$ ).
- Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.01$ ).
- Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
- Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
- Does not believe human efforts can improve climate change (e.g., does not strongly agree that the impacts of climate change can be reduced by human efforts, does not agree that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
- On all questions about how to improve areas at risk from sea level rise, does not support any efforts to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate strong support for changing building codes and regulations to reduce risk in flood-prone areas, does not indicate support for purchasing or acquiring land and open space from willing land sellers using government funds, does not indicate support for elevating the land surface) (all at  $p \leq 0.05$  or greater significance).
- Does not indicate thinking that his or her state government officials, Delaware's state legislators, Delaware citizens, his or her county government officials, his or her city or town government officials, the U.S. Congress, Delaware's governor, Delaware's state agencies, or corporations and industry should be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
- Is male ( $p \leq 0.001$ ).
- Owns his or her current place of residence ( $p \leq 0.001$ ).
- Has been a Delaware resident for the mean of 30 years or more ( $p \leq 0.01$ ).
- The nonparametric analysis found that the following responses are correlated with indicating that sea level rise is not a very serious or not at all a threat to **river-front cities and towns in Delaware**:
  - Indicates sea level rise is not a very serious or not at all a threat to ocean-front cities and towns in Delaware, to outdoor recreation in Delaware, to the marsh and wetlands in Delaware, to Delaware's wildlife populations, to Delaware beaches, to him/her personally, to Delaware's economy, to the State of Delaware, to Delaware's public works systems, such as public buildings, roads, and sewer systems, to the United States, to the Mid-Atlantic U.S., to his/her local community, or to his/her property (all at  $p \leq 0.001$  or greater significance).
  - Does not show concern about climate change and sea level rise (e.g., does not worry about climate change, does not indicate being completely or mostly convinced that



- sea levels are rising, does not indicate thinking that climate change is a very serious threat) (all at  $p \leq 0.001$  or greater significance).
- Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
  - Indicates that climate change is caused by natural changes in environment ( $p \leq 0.001$ ).
  - Does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ), and does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.001$ ).
  - Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.05$ ).
  - Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
  - Does not believe human efforts can improve climate change (e.g., does not strongly agree that the impacts of climate change can be reduced by human efforts, does not agree that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
  - On all questions about how to improve areas at risk from sea level rise, does not support any efforts to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate strong support for changing building codes and regulations to reduce risk in flood-prone areas, does not indicate strong support for avoiding building new structures, does not indicate support for purchasing or acquiring land and open space from willing land sellers using government funds) (all at  $p \leq 0.01$  or greater significance).
  - Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - Does not indicate thinking that Delaware's governor, Delaware citizens, Delaware's state legislators, his or her state government officials, the U.S. Congress, his or her county government officials, Delaware's state agencies, or his or her city or town government officials should be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
  - Gets most of his or her information about environmental issues in Delaware from the Internet, not including Department of Natural Resources and Environmental Control website ( $p \leq 0.05$ ).
  - Is male ( $p \leq 0.001$ ).
  - Owns his or her current place of residence ( $p \leq 0.01$ ).
  - Has at least one child, age 17 or younger, living in his or her household ( $p \leq 0.05$ ).
- The nonparametric analysis found that the following responses are correlated with indicating that sea level rise is not a very serious or not at all a threat to **outdoor recreation in Delaware**:
    - Indicates sea level rise is not a very serious or not at all a threat to river-front cities and towns in Delaware ( $p \leq 0.001$ ), to Delaware's wildlife populations ( $p \leq 0.001$ ), to Delaware's economy ( $p \leq 0.001$ ), to him/her personally ( $p \leq 0.001$ ), to ocean-front cities and towns in Delaware ( $p \leq 0.001$ ), to the marsh and wetlands in Delaware

- ( $p \leq 0.001$ ), to Delaware's public works systems, such as public buildings, roads, and sewer systems ( $p \leq 0.001$ ), to Delaware beaches ( $p \leq 0.001$ ), to his/her local community ( $p \leq 0.001$ ), to the State of Delaware ( $p \leq 0.001$ ), to his/her property ( $p \leq 0.001$ ), to his/her family ( $p \leq 0.001$ ), or to the Mid-Atlantic U.S. ( $p \leq 0.05$ ).
- Does not show concern about climate change and sea level rise (e.g., does not worry about climate change, does not indicate being completely or mostly convinced that sea levels are rising, does not indicate thinking that climate change is a very serious threat) (all at  $p \leq 0.001$  or greater significance).
  - Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
  - Does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.001$ ), and does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ).
  - Indicates that climate change is caused by natural changes in environment ( $p \leq 0.001$ ).
  - Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
  - On most questions, does not support any alterations in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate support for elevating the land surface, does not indicate support for purchasing or acquiring land and open space from willing land sellers using government funds, does not indicate support for building dikes, seawalls, and bulkheads to keep water back) (all at  $p \leq 0.01$  or greater significance).
  - Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - Does not strongly agree that the impacts of climate change can be reduced by human efforts ( $p \leq 0.001$ ), and does not agree that climate change is something people can control ( $p \leq 0.05$ ).
  - Does not indicate thinking that the U.S. Congress, Delaware citizens, Delaware's governor, Delaware's state agencies, his or her county government officials, his or her state government officials, Delaware's state legislators, corporations and industry, or his or her city or town government officials should be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
  - Does not have flood insurance for his or her current place of residence ( $p \leq 0.05$ ).
  - Gets most of his or her information about environmental issues in Delaware from the Internet, not including Department of Natural Resources and Environmental Control website ( $p \leq 0.01$ ).
  - Is male ( $p \leq 0.001$ ).
- The nonparametric analysis found that the following responses are correlated with indicating that sea level rise is not a very serious or not at all a threat to **Delaware's wildlife populations**:
    - Thinks that “climate change” and “global warming” refer to two unrelated things ( $p \leq 0.05$ ).

- Indicates sea level rise is not a very serious or not at all a threat to outdoor recreation in Delaware, to Delaware's economy, to Delaware's public works systems, such as public buildings, roads, and sewer systems, to river-front cities and towns in Delaware, to him/her personally, to ocean-front cities and towns in Delaware, to his/her local community, to the marsh and wetlands in Delaware, to Delaware beaches, to the State of Delaware, to his/her property, to his/her family, or to the United States (all at  $p \leq 0.001$  or greater significance).
- Does not show concern about climate change and sea level rise (e.g., does not worry about climate change, does not indicate being completely or mostly convinced that sea levels are rising, does not indicate thinking that climate change is a very serious threat) (all at  $p \leq 0.001$  or greater significance).
- Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
- Does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ), and does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.001$ ).
- Indicates that climate change is caused by natural changes in environment ( $p \leq 0.001$ ).
- Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.01$ ).
- Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
- Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
- Does not believe human efforts can improve climate change (e.g., does not strongly agree that the impacts of climate change can be reduced by human efforts, does not agree that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
- On all questions about how to improve areas at risk from sea level rise, does not support any efforts to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate strong support for changing building codes and regulations to reduce risk in flood-prone areas, does not indicate support for purchasing or buying out frequently flooded properties using government funds, does not indicate support for elevating buildings using government funds) (all at  $p \leq 0.05$  or greater significance).
- Does not indicate thinking that Delaware citizens, the U.S. Congress, Delaware's state agencies, his or her state government officials, Delaware's state legislators, Delaware's governor, his or her county government officials, corporations and industry, or his or her city or town government officials should be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
- Does not have flood insurance for his or her current place of residence ( $p \leq 0.01$ ).
- Is male ( $p \leq 0.001$ ).
- Has been a Delaware resident for the mean of 30 years or more ( $p \leq 0.01$ ).
- Has a bachelor's degree or graduate degree ( $p \leq 0.05$ ).
- Considers his or her place of residence to be a rural area ( $p \leq 0.05$ ).

- The nonparametric analysis found that the following responses are correlated with indicating that sea level rise is not a very serious or not at all a threat to **Delaware's economy**:
  - Says he/she knows a great deal or a moderate amount about climate change ( $p \leq 0.05$ ).
  - Thinks that “climate change” and “global warming” refer to two unrelated things ( $p \leq 0.05$ ).
  - Indicates sea level rise is not a very serious or not at all a threat to Delaware's wildlife populations, to outdoor recreation in Delaware, to Delaware's public works systems, such as public buildings, roads, and sewer systems, to him/her personally, to river-front cities and towns in Delaware, to his/her local community, to ocean-front cities and towns in Delaware, to the marsh and wetlands in Delaware, to the United States, to Delaware beaches, to his/her property, to his/her family, or to the Mid-Atlantic U.S. (all at  $p \leq 0.001$  or greater significance).
  - Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
  - Does not show concern about climate change and sea level rise (e.g., does not worry about climate change, does not indicate being completely or mostly convinced that sea levels are rising, does not indicate thinking that climate change is a very serious threat) (all at  $p \leq 0.001$  or greater significance).
  - Does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.001$ ), and does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ).
  - Indicates that climate change is caused by natural changes in environment ( $p \leq 0.001$ ).
  - Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.05$ ).
  - Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
  - On all questions about how to improve areas at risk from sea level rise, does not support any efforts to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate strong support for changing building codes and regulations to reduce risk in flood-prone areas, does not indicate support for purchasing or buying out frequently flooded properties using government funds, does not indicate support for purchasing or acquiring land and open space from willing land sellers using government funds) (all at  $p \leq 0.05$  or greater significance).
  - Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - Does not believe human efforts can improve climate change (e.g., does not strongly agree that the impacts of climate change can be reduced by human efforts, does not agree that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
  - Does not indicate thinking that Delaware citizens, his or her state government officials, his or her city or town government officials, his or her county government officials, Delaware's state legislators, Delaware's governor, the U.S. Congress,

- Delaware's state agencies, or corporations and industry should be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
- Gets most of his or her information about environmental issues in Delaware from the Internet, not including Department of Natural Resources and Environmental Control website ( $p \leq 0.05$ ).
  - Is male ( $p \leq 0.001$ ).
  - Has a bachelor's degree or graduate degree ( $p \leq 0.05$ ).
- The nonparametric analysis found that the following responses are correlated with indicating that sea level rise is not a very serious or not at all a threat to **Delaware's public works systems, such as public buildings, roads, and sewer systems**:
    - Thinks that “climate change” and “global warming” are the same thing and that the terms can be used interchangeably ( $p \leq 0.01$ ).
    - Indicates sea level rise is not a very serious or not at all a threat to his/her local community, to Delaware's wildlife populations, to him/her personally, to Delaware's economy, to his/her family, to his/her property, to outdoor recreation in Delaware, to river-front cities and towns in Delaware, to the United States, to the Mid-Atlantic U.S., to the State of Delaware, to ocean-front cities and towns in Delaware, or to the marsh and wetlands in Delaware (all at  $p \leq 0.001$  or greater significance).
    - Does not show concern about climate change and sea level rise (e.g., does not indicate worrying a great deal or a moderate amount about the problems that sea level rise may cause in Delaware, does not indicate being completely or mostly convinced that sea levels are rising, does not indicate thinking that climate change is a very serious threat) (all at  $p \leq 0.001$  or greater significance).
    - Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
    - Does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ), and does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.001$ ).
    - Indicates that climate change is caused by natural changes in environment ( $p \leq 0.001$ ).
    - Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.001$ ).
    - Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
    - On all questions about how to improve areas at risk from sea level rise, does not support any efforts to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate strong support for changing building codes and regulations to reduce risk in flood-prone areas, does not indicate support for elevating buildings using government funds, does not indicate support for building dikes, seawalls, and bulkheads to keep water back) (all at  $p \leq 0.001$  or greater significance).
    - Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).

- Does not believe human efforts can improve climate change (e.g., does not strongly agree that the impacts of climate change can be reduced by human efforts, does not agree that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
- Does not indicate thinking that the U.S. Congress, Delaware citizens, Delaware's governor, Delaware's state legislators, Delaware's state agencies, his or her state government officials, his or her county government officials, corporations and industry, or his or her city or town government officials should be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
- Is male ( $p \leq 0.001$ ).
- Lives in Kent County ( $p \leq 0.001$ ).
- Considers his or her place of residence to be in a non-coastal area ( $p \leq 0.01$ ).
- Considers his or her place of residence to be a rural area ( $p \leq 0.01$ ).
- The nonparametric analysis found that the following responses are correlated with indicating that sea level rise is not a very serious or not at all a threat to **his/her local community**:
  - Thinks that “climate change” and “global warming” refer to two unrelated things ( $p \leq 0.001$ ).
  - Indicates sea level rise is not a very serious or not at all a threat to his/her property, to him/her personally, to his/her family, to Delaware's public works systems, such as public buildings, roads, and sewer systems, to Delaware's economy, to Delaware's wildlife populations, to outdoor recreation in Delaware, to river-front cities and towns in Delaware, to the United States, to the Mid-Atlantic U.S., to the State of Delaware, to ocean-front cities and towns in Delaware, or to Delaware beaches (all at  $p \leq 0.001$  or greater significance).
  - Does not show concern about climate change and sea level rise (e.g., does not indicate thinking that climate change is a very serious threat, does not indicate worrying a great deal or a moderate amount about the problems that sea level rise may cause in Delaware, does not indicate being completely or mostly convinced that sea levels are rising) (all at  $p \leq 0.001$  or greater significance).
  - Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
  - Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.001$ ).
  - Does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ), and does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.001$ ).
  - Indicates that climate change is caused by natural changes in environment ( $p \leq 0.001$ ).
  - Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
  - Does not believe human efforts can improve climate change (e.g., does not agree that climate change is something people can control, does not strongly agree that the

- impacts of climate change can be reduced by human efforts) (all at  $p \leq 0.001$  or greater significance).
- On all questions about how to improve areas at risk from sea level rise, does not support any efforts to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate support for elevating buildings using government funds, does not indicate strong support for changing building codes and regulations to reduce risk in flood-prone areas, Does not indicate support for purchasing or acquiring land and open space from willing land sellers using government funds) (all at  $p \leq 0.01$  or greater significance).
  - Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - Does not indicate thinking that the U.S. Congress, Delaware's governor, Delaware's state agencies, Delaware citizens, his or her city or town government officials, corporations and industry, Delaware's state legislators, his or her state government officials, or his or her county government officials should be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
  - Does not have flood insurance for his or her current place of residence ( $p \leq 0.001$ ).
  - Gets most of his or her information about environmental issues in Delaware from newspapers ( $p \leq 0.05$ ).
  - Considers his or her place of residence to be in a non-coastal area ( $p \leq 0.001$ ).
  - Is male ( $p \leq 0.001$ ).
  - Lives in Kent County ( $p \leq 0.001$ ).
  - Has a bachelor's degree or graduate degree ( $p \leq 0.05$ ).
- The nonparametric analysis found that the following responses are correlated with indicating that sea level rise is not a very serious or not at all a threat to **his/her property**:
    - Thinks that “climate change” and “global warming” refer to two unrelated things ( $p \leq 0.01$ ).
    - Indicates sea level rise is not a very serious or not at all a threat to his/her family ( $p \leq 0.001$ ), to him/her personally ( $p \leq 0.001$ ), to his/her local community ( $p \leq 0.001$ ), to Delaware's public works systems, such as public buildings, roads, and sewer systems ( $p \leq 0.001$ ), to the Mid-Atlantic U.S. ( $p \leq 0.001$ ), to the United States ( $p \leq 0.001$ ), to the State of Delaware ( $p \leq 0.001$ ), to Delaware's economy ( $p \leq 0.001$ ), to Delaware's wildlife populations ( $p \leq 0.001$ ), to outdoor recreation in Delaware ( $p \leq 0.001$ ), to river-front cities and towns in Delaware ( $p \leq 0.001$ ), to Delaware beaches ( $p \leq 0.001$ ), or to the marsh and wetlands in Delaware ( $p \leq 0.01$ ).
    - Does not show concern about climate change and sea level rise (e.g., does not indicate being completely or mostly convinced that sea levels are rising, does not indicate worrying a great deal or a moderate amount about the problems that sea level rise may cause in Delaware, is not worried about sea level rise) (all at  $p \leq 0.001$  or greater significance).
    - Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
    - Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.001$ ).

- Does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.01$ ), and does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.05$ ).
- Indicates that climate change is caused by natural changes in environment ( $p \leq 0.05$ ).
- Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
- On most questions, does not support any alterations in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate support for building dikes, seawalls, and bulkheads to keep water back, does not indicate support for purchasing or acquiring land and open space from willing land sellers using government funds, does not indicate support for elevating buildings using government funds) (all at  $p \leq 0.05$  or greater significance).
- Does not believe human efforts can improve climate change (e.g., does not agree that climate change is something people can control, does not strongly agree that the impacts of climate change can be reduced by human efforts) (all at  $p \leq 0.001$  or greater significance).
- Does not indicate thinking that the U.S. Congress ( $p \leq 0.001$ ), Delaware's governor ( $p \leq 0.001$ ), Delaware citizens ( $p \leq 0.001$ ), Delaware's state legislators ( $p \leq 0.001$ ), Delaware's state agencies ( $p \leq 0.001$ ), his or her city or town government officials ( $p \leq 0.001$ ), his or her state government officials ( $p \leq 0.001$ ), his or her county government officials ( $p \leq 0.001$ ), or corporations and industry ( $p \leq 0.01$ ) should be doing more to address or reduce the impacts of sea level rise in Delaware.
- Does not have flood insurance for his or her current place of residence ( $p \leq 0.001$ ).
- Considers his or her place of residence to be in a non-coastal area ( $p \leq 0.001$ ).
- Is male ( $p \leq 0.001$ ).
- Has at least one child, age 17 or younger, living in his or her household ( $p \leq 0.01$ ).
- Lives in New Castle County ( $p \leq 0.01$ ).
- The nonparametric analysis found that the following responses are correlated with indicating that sea level rise is not a very serious or not at all a threat to **his/her family**:
  - Thinks that “climate change” and “global warming” refer to two unrelated things ( $p \leq 0.001$ ).
  - Says he/she knows a little or nothing about climate change ( $p \leq 0.05$ ).
  - Indicates sea level rise is not a very serious or not at all a threat to his/her property, to him/her personally, to his/her local community, to the United States, to the Mid-Atlantic U.S., to Delaware's public works systems, such as public buildings, roads, and sewer systems, to the State of Delaware, to Delaware beaches, to Delaware's economy, to the marsh and wetlands in Delaware, to Delaware's wildlife populations, to ocean-front cities and towns in Delaware, or to outdoor recreation in Delaware (all at  $p \leq 0.001$  or greater significance).
  - Does not show concern about climate change and sea level rise (e.g., does not indicate being completely or mostly convinced that sea levels are rising, does not indicate worrying a great deal or a moderate amount about the problems that sea level rise may cause in Delaware, does not indicate thinking that climate change is a very serious threat) (all at  $p \leq 0.001$  or greater significance).



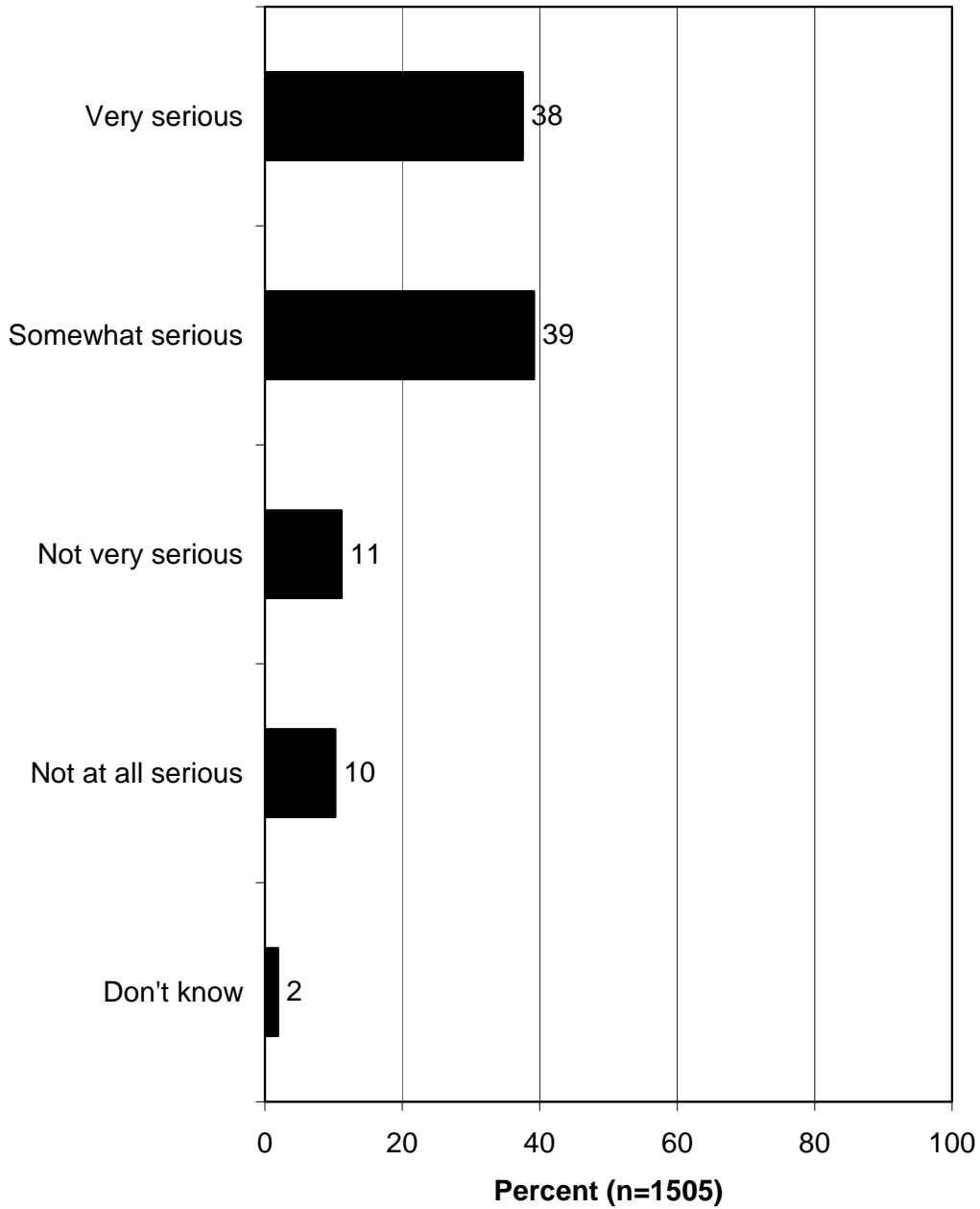
- Does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ).
- Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
- Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.001$ ).
- Indicates that climate change is caused by natural changes in environment ( $p \leq 0.01$ ).
- Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
- On all questions about how to improve areas at risk from sea level rise, does not support any efforts to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate support for elevating buildings using government funds, does not indicate support for purchasing or buying out frequently flooded properties using government funds, does not indicate support for building dikes, seawalls, and bulkheads to keep water back) (all at  $p \leq 0.05$  or greater significance).
- Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
- Does not believe human efforts can improve climate change (e.g., does not agree that climate change is something people can control, does not strongly agree that the impacts of climate change can be reduced by human efforts) (all at  $p \leq 0.001$  or greater significance).
- Does not indicate thinking that Delaware's governor ( $p \leq 0.001$ ), the U.S. Congress ( $p \leq 0.001$ ), Delaware citizens ( $p \leq 0.001$ ), his or her state government officials ( $p \leq 0.001$ ), Delaware's state legislators ( $p \leq 0.001$ ), his or her city or town government officials ( $p \leq 0.001$ ), his or her county government officials ( $p \leq 0.001$ ), Delaware's state agencies ( $p \leq 0.001$ ), or corporations and industry ( $p \leq 0.05$ ) should be doing more to address or reduce the impacts of sea level rise in Delaware.
- Does not have flood insurance for his or her current place of residence ( $p \leq 0.05$ ).
- Considers his or her place of residence to be in a non-coastal area ( $p \leq 0.01$ ).
- Has been a Delaware resident for the mean of 30 years or more ( $p \leq 0.05$ ).
- Is between ages 35-64 ( $p \leq 0.05$ ).
- Is male ( $p \leq 0.05$ ).
- Is age 65 or older ( $p \leq 0.05$ ).
- The nonparametric analysis found that the following responses are correlated with indicating that sea level rise is not a very serious or not at all a threat to **him/her personally**:
  - Thinks that “climate change” and “global warming” refer to two unrelated things ( $p \leq 0.001$ ).
  - Knows little or nothing about sea level rise ( $p \leq 0.001$ ) or climate change ( $p \leq 0.05$ ).
  - Indicates sea level rise is not a very serious or not at all a threat to his/her family, to his/her property, to his/her local community, to the Mid-Atlantic U.S., to the State of Delaware, to Delaware's public works systems, such as public buildings, roads, and sewer systems, to the United States, to outdoor recreation in Delaware, to Delaware's wildlife populations, to Delaware's economy, to river-front cities and towns in

- Delaware, to Delaware beaches, to the marsh and wetlands in Delaware, or to ocean-front cities and towns in Delaware (all at  $p \leq 0.001$  or greater significance).
- Does not show concern about climate change and sea level rise (e.g., does not indicate worrying a great deal or a moderate amount about the problems that sea level rise may cause in Delaware, does not indicate being completely or mostly convinced that sea levels are rising, does not worry about climate change) (all at  $p \leq 0.001$  or greater significance).
  - Agrees that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
  - Does not indicate strongly agreeing with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ), and does not indicate thinking that most scientists think that climate change is happening ( $p \leq 0.001$ ).
  - Disagrees that he/she has personally experienced the impacts of sea level rise ( $p \leq 0.001$ ).
  - Indicates that climate change is caused by natural changes in environment ( $p \leq 0.001$ ).
  - Either thinks that sea levels are not rising or that sea level rise won't start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
  - On most questions, does not support any alterations in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate support for elevating buildings using government funds, does not indicate support for building dikes, seawalls, and bulkheads to keep water back, does not indicate support for elevating the land surface) (all at  $p \leq 0.001$  or greater significance).
  - Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - Does not believe human efforts can improve climate change (e.g., does not agree that climate change is something people can control, does not strongly agree that the impacts of climate change can be reduced by human efforts) (all at  $p \leq 0.001$  or greater significance).
  - Does not indicate thinking that the U.S. Congress, Delaware citizens, Delaware's governor, his or her city or town government officials, Delaware's state legislators, his or her state government officials, Delaware's state agencies, his or her county government officials, or corporations and industry should be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
  - Does not have flood insurance for his or her current place of residence ( $p \leq 0.001$ ).
  - Is male ( $p \leq 0.001$ ).
  - Considers his or her place of residence to be in a non-coastal area ( $p \leq 0.01$ ).
  - Is age 65 or older ( $p \leq 0.05$ ).
  - Owns his or her current place of residence ( $p \leq 0.05$ ).

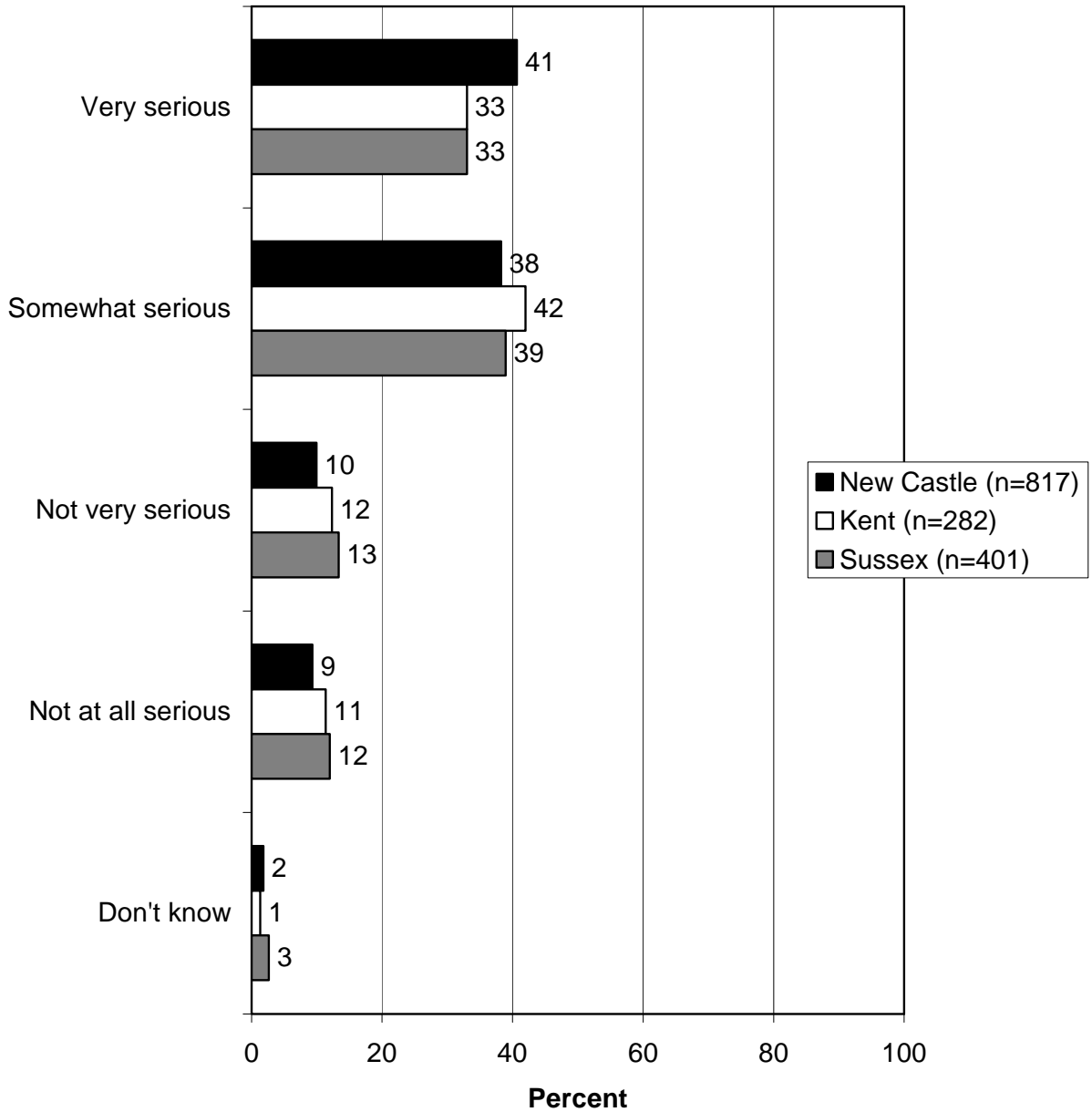
- Several questions in the above series had notable differences in responses when crosstabulated by county of residence.
  - Kent County residents, relative to residents of the other two counties, are the most likely to consider sea level rise to be a *very* serious threat to **Delaware's beaches** ( $p \leq 0.05$ ).
  - Kent County residents, relative to residents of the other two counties, are the most likely to consider sea level rise to be *not at all* a serious threat to **Delaware's economy** ( $p \leq 0.05$ ).
  - Kent County residents, relative to residents of the other two counties, are the most likely to consider sea level rise to be *not at all* a serious threat to **Delaware's public works systems** ( $p \leq 0.01$ ).
  - Kent County residents, relative to residents of the other two counties, are the most likely to consider sea level rise to be *not at all* a serious threat to **their local community** ( $p \leq 0.001$ ).
  - Kent County residents, relative to residents of the other two counties, are the most likely to consider sea level rise to be *not at all* a serious threat to **their property** ( $p \leq 0.01$ ).
  
- Several questions in the above series had notable differences in responses among coastal versus non-coastal residents.
  - In the above series, the crosstabulation by coastal/non-coastal found that coastal residents are more likely to think that sea level rise is a *very* serious threat to **river-front cities and towns** in Delaware, compared to non-coastal residents ( $p \leq 0.001$ ).
  - Coastal residents are more likely, relative to non-coastal residents, to think that sea level rise is a *very* serious threat to **outdoor recreation** in Delaware ( $p \leq 0.01$ ).
  - Coastal residents are more likely than are non-coastal residents to think that sea level rise is a *very* serious threat to **their local community** ( $p \leq 0.001$ ).
  - Coastal residents, relative to non-coastal residents, are more likely to think that sea level rise is a *very* serious threat to **their property** ( $p \leq 0.001$ ).
  - Coastal residents, compared to non-coastal residents, are more likely to think that sea level rise is a *very* serious threat to **their family** ( $p \leq 0.001$ ).

- Finally, in the above series, the crosstabulation by coastal/non-coastal found that coastal residents are more likely, relative to non-coastal residents, to think that sea level rise is a *very* serious threat to **them personally** ( $p \leq 0.001$ ).
- Delaware residents overwhelmingly think that Sussex County is the most threatened by sea level rise (78% named Sussex County); only 5% named either New Castle County or Kent County.
- The crosstabulation by county of residence found that New Castle County residents, relative to residents of the other two counties, are the most likely to think that New Castle County is the most threatened by sea level rise ( $p \leq 0.001$ ). (Nonetheless, a large majority of residents of each county think that Sussex County is the most threatened.)
- Residents were asked to indicate when they think that sea level rise will start to have impacts on the area in which they live in Delaware: 5 years, 10 years, 25 years, 50 years, or 100 years, or if they think that sea levels are not rising. Answers are spread fairly evenly among the possible responses. For instance, 14% think sea level rise is having an impact now, and 11% think it will have an impact in 100 years. The most common response is 25 years (17%).
- The crosstabulation by coastal/non-coastal found that coastal residents, relative to non-coastal residents, are more likely to say that sea level rise is having impacts *now* ( $p \leq 0.001$ ). On the other hand, non-coastal residents are more likely to pick a date in the future when saying when they think that sea level rise will start to have impacts on the area in which they live.
  - Men, compared to women, are more likely to think that sea level rise will start to have impacts in the distant future (rather than the near future or now) or to never have impacts ( $p \leq 0.001$ ).

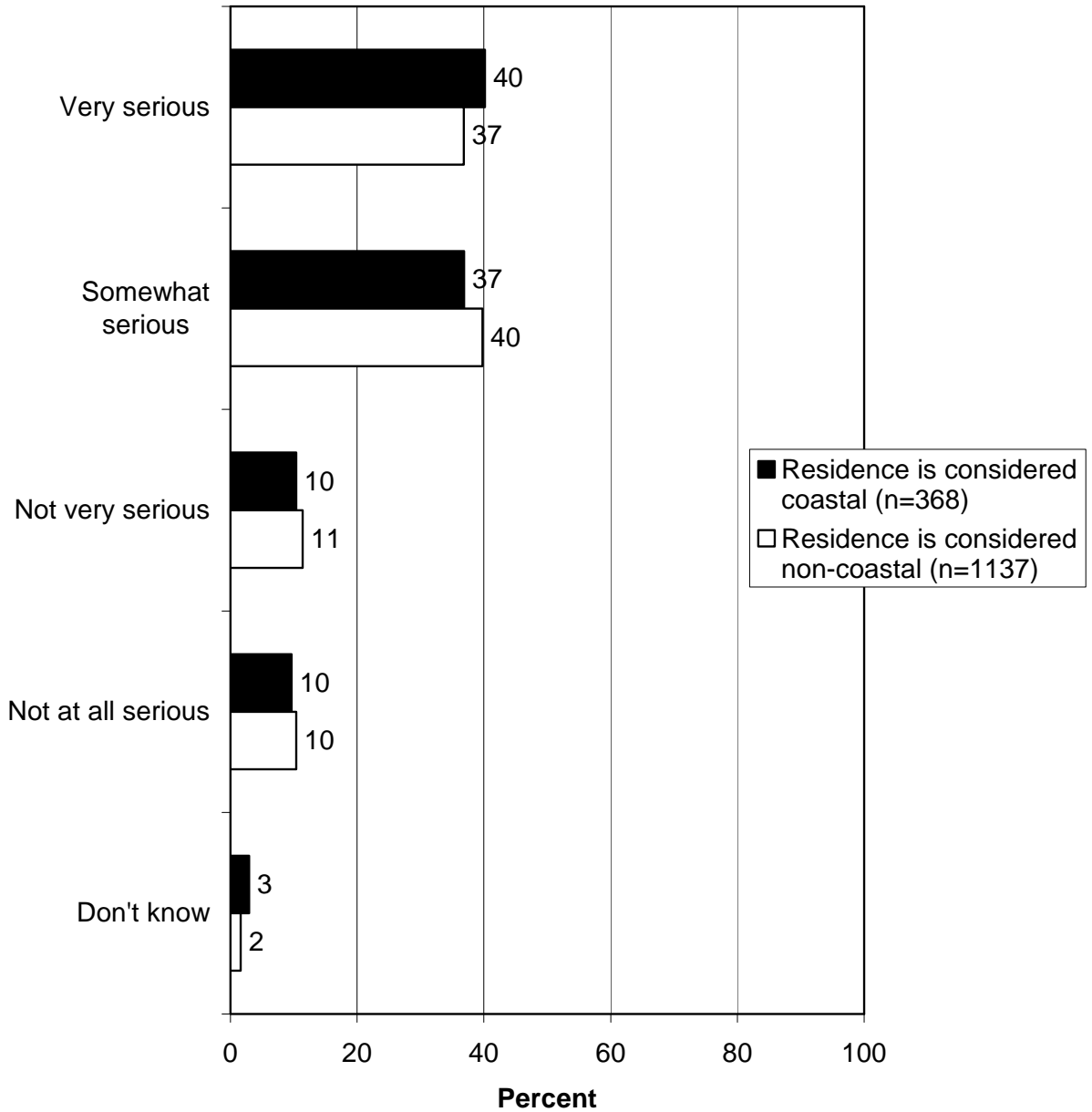
**Q41. How serious a threat do you think climate change is?**



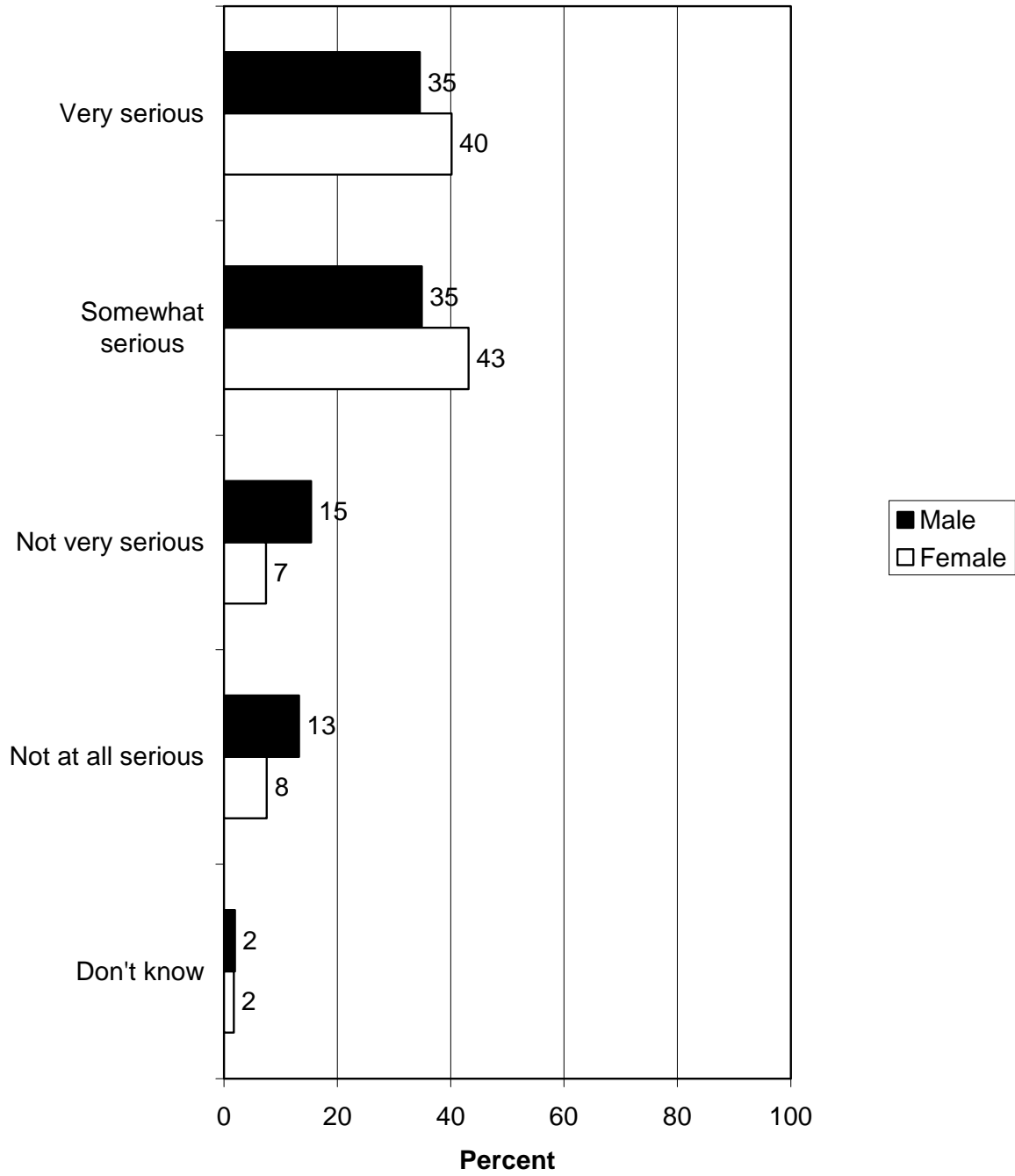
### Q41. How serious a threat do you think climate change is?



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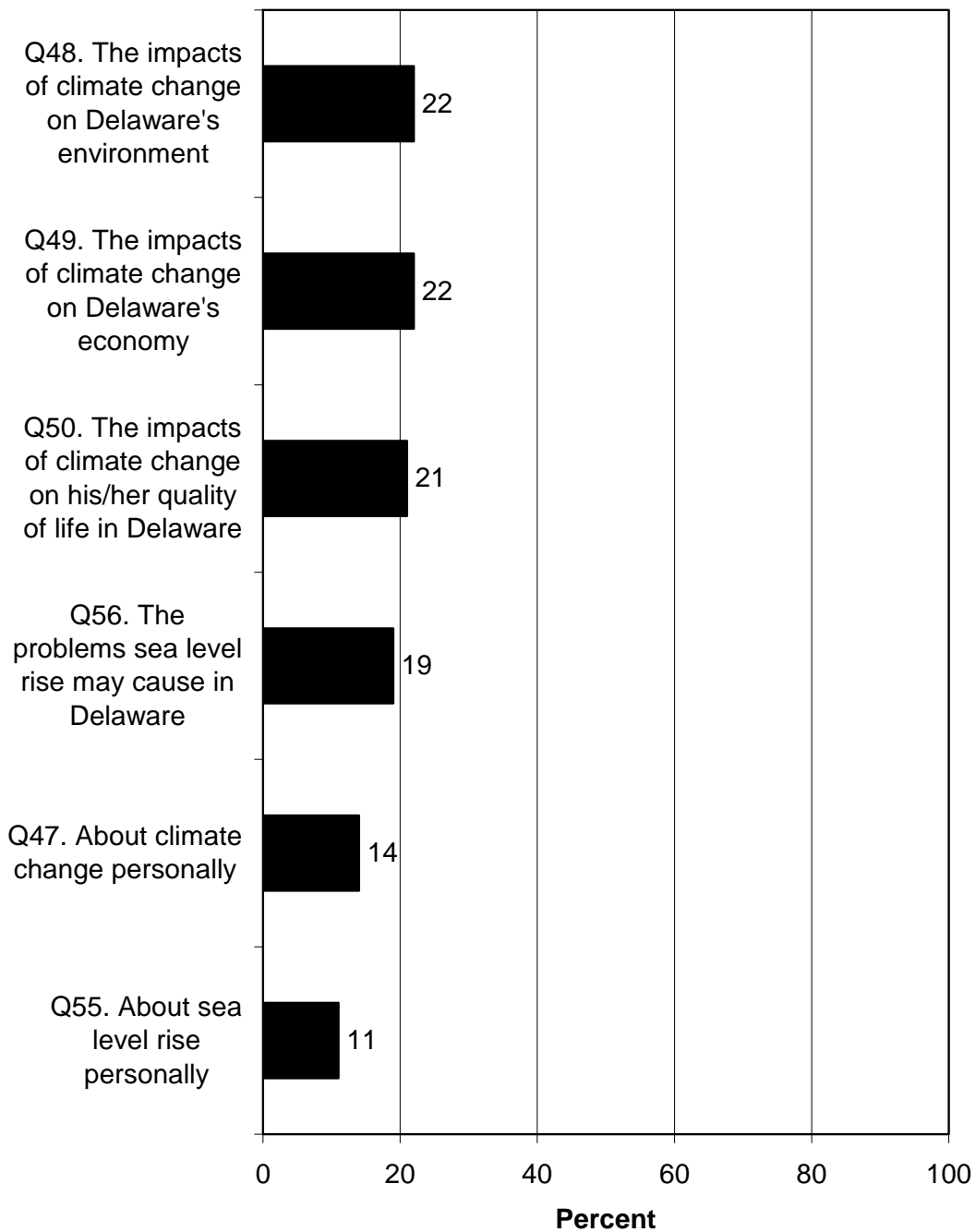


### Q41. How serious a threat do you think climate change is?

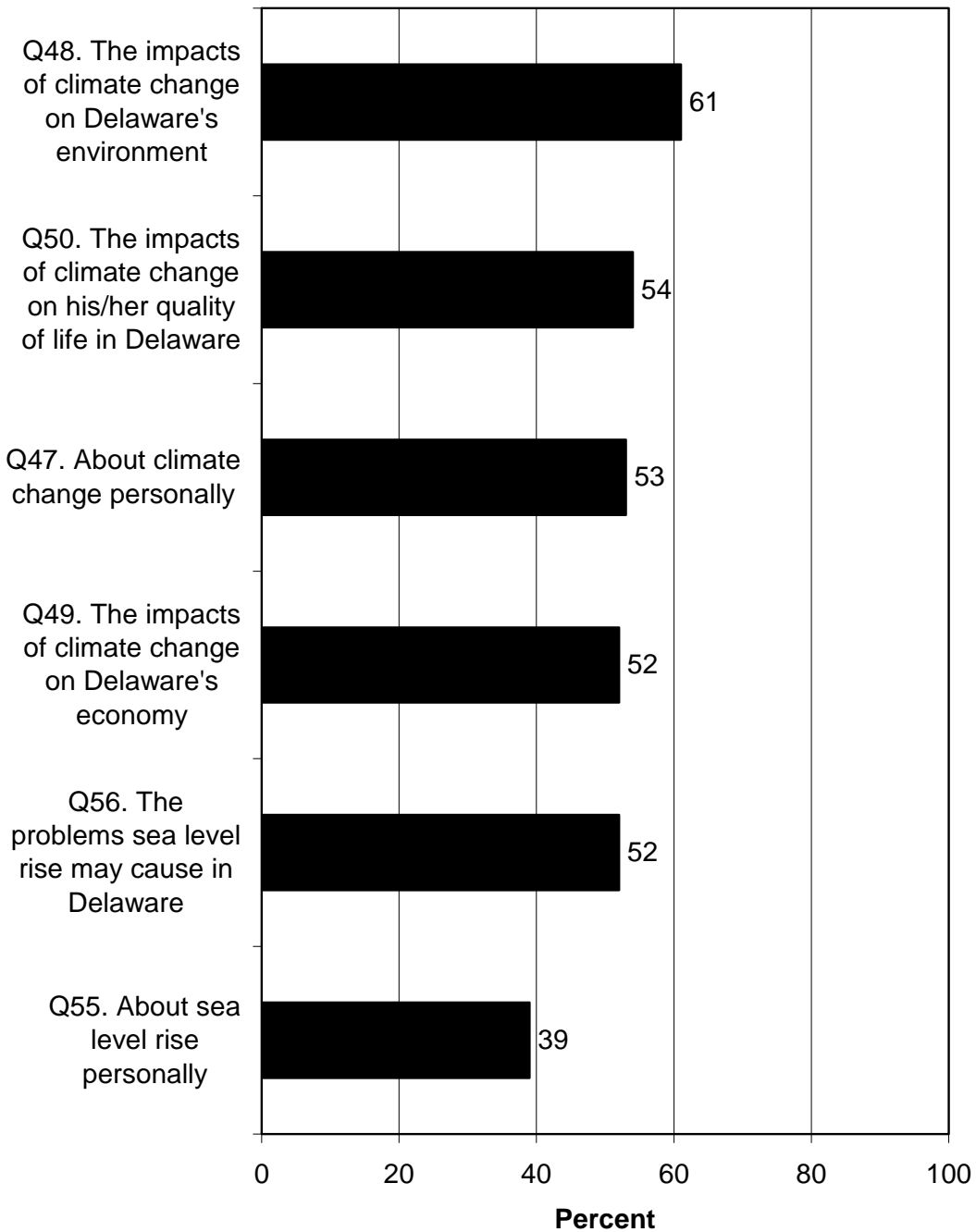




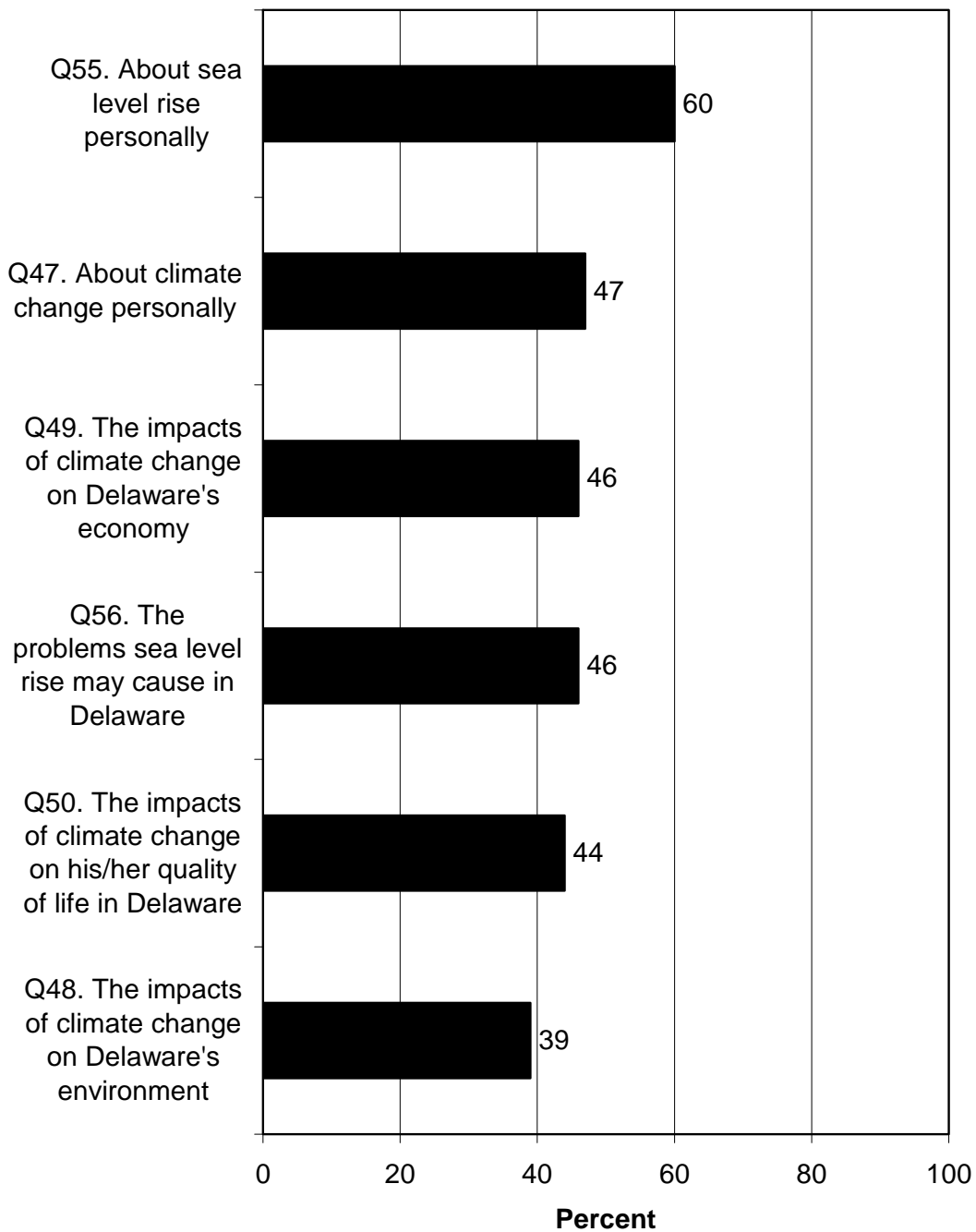
**Q47-50, 55-56. Percent who worry a great deal about the following issues concerning climate change and sea level rise.**



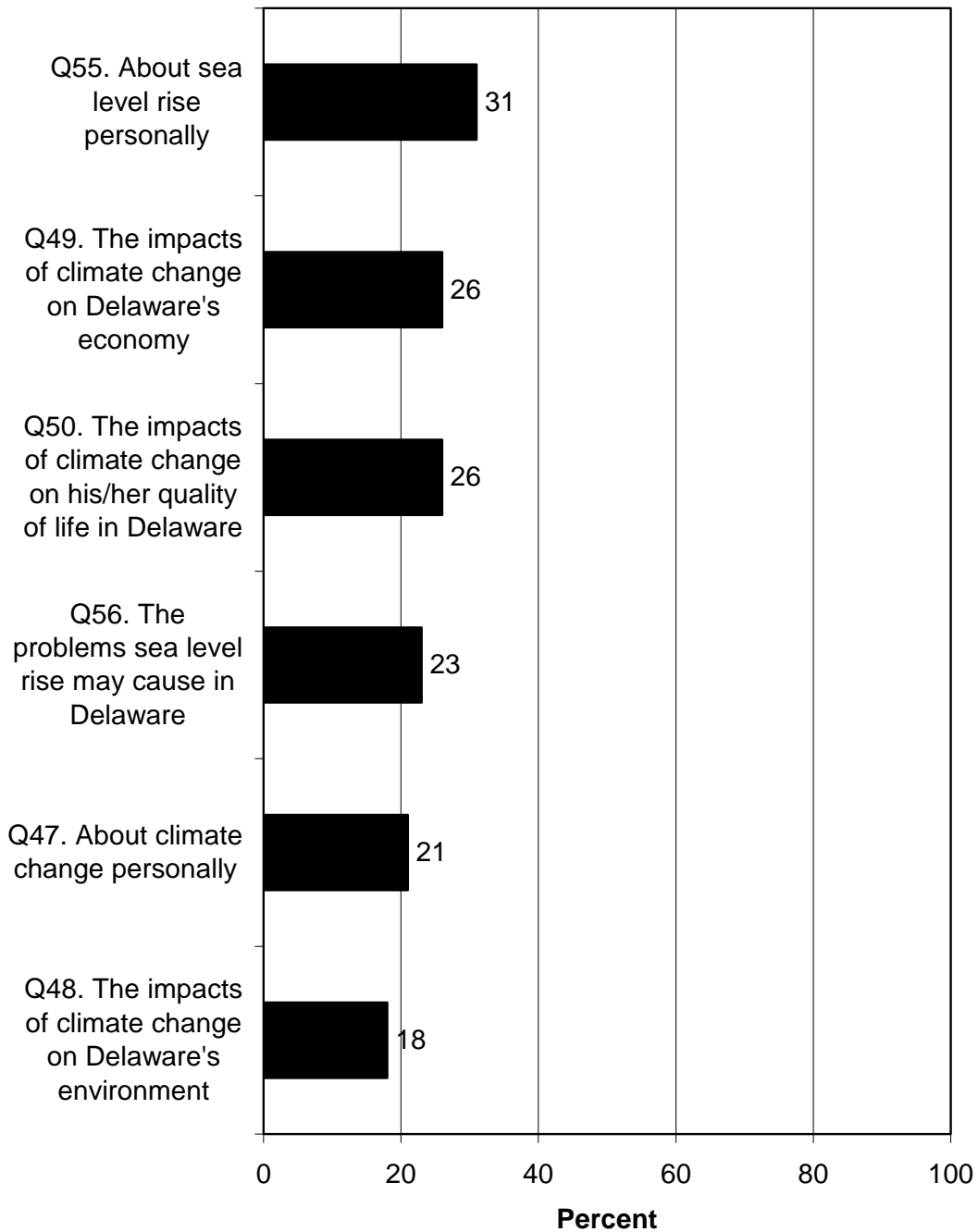
**Q47-50, 55-56. Percent who worry a great deal or a moderate amount about the following issues concerning climate change and sea level rise.**



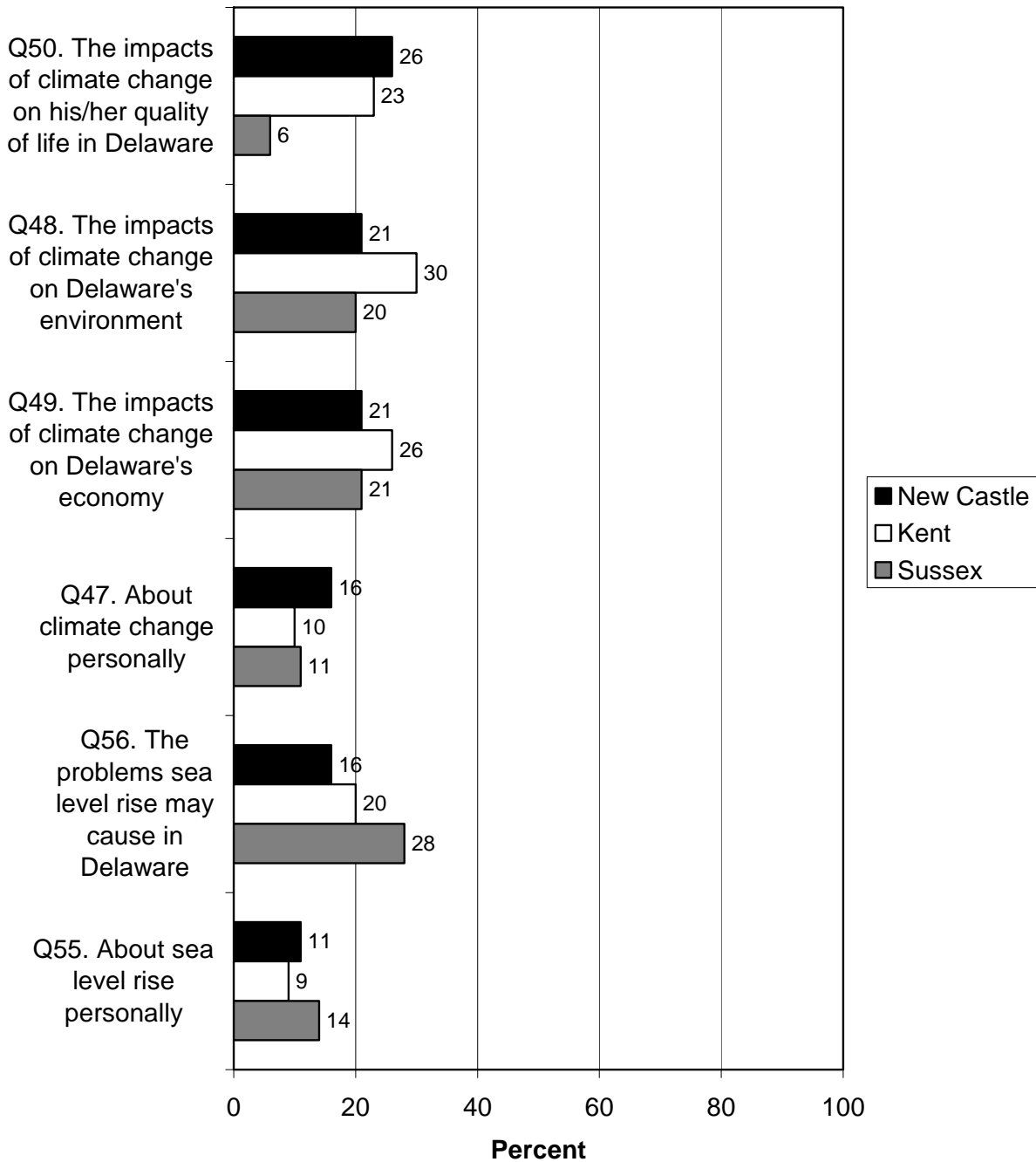
**Q47-50, 55-56. Percent who worry only a little or not at all about the following issues concerning climate change and sea level rise.**



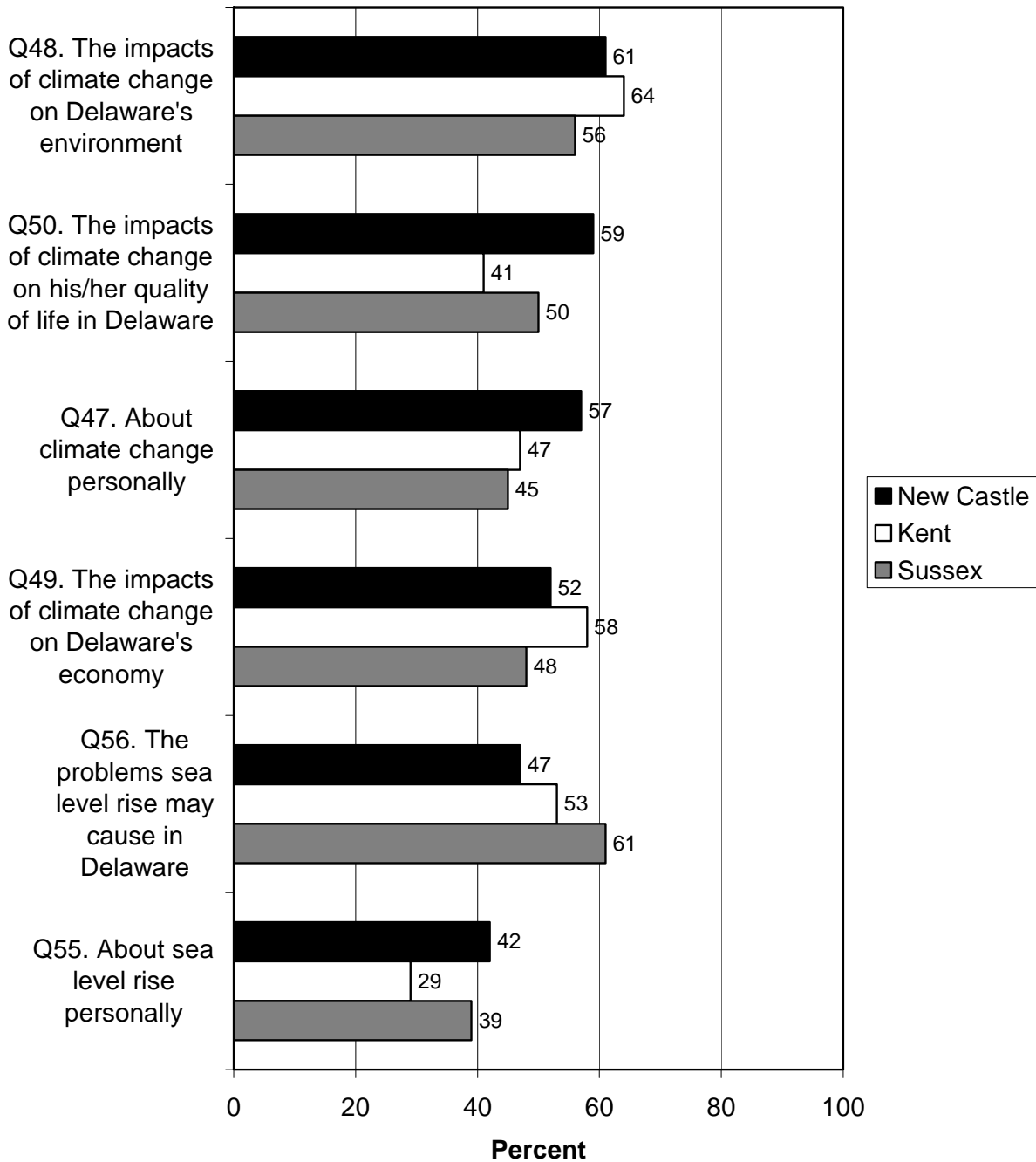
**Q47-50, 55-56. Percent who do not worry at all about the following issues concerning climate change and sea level rise.**



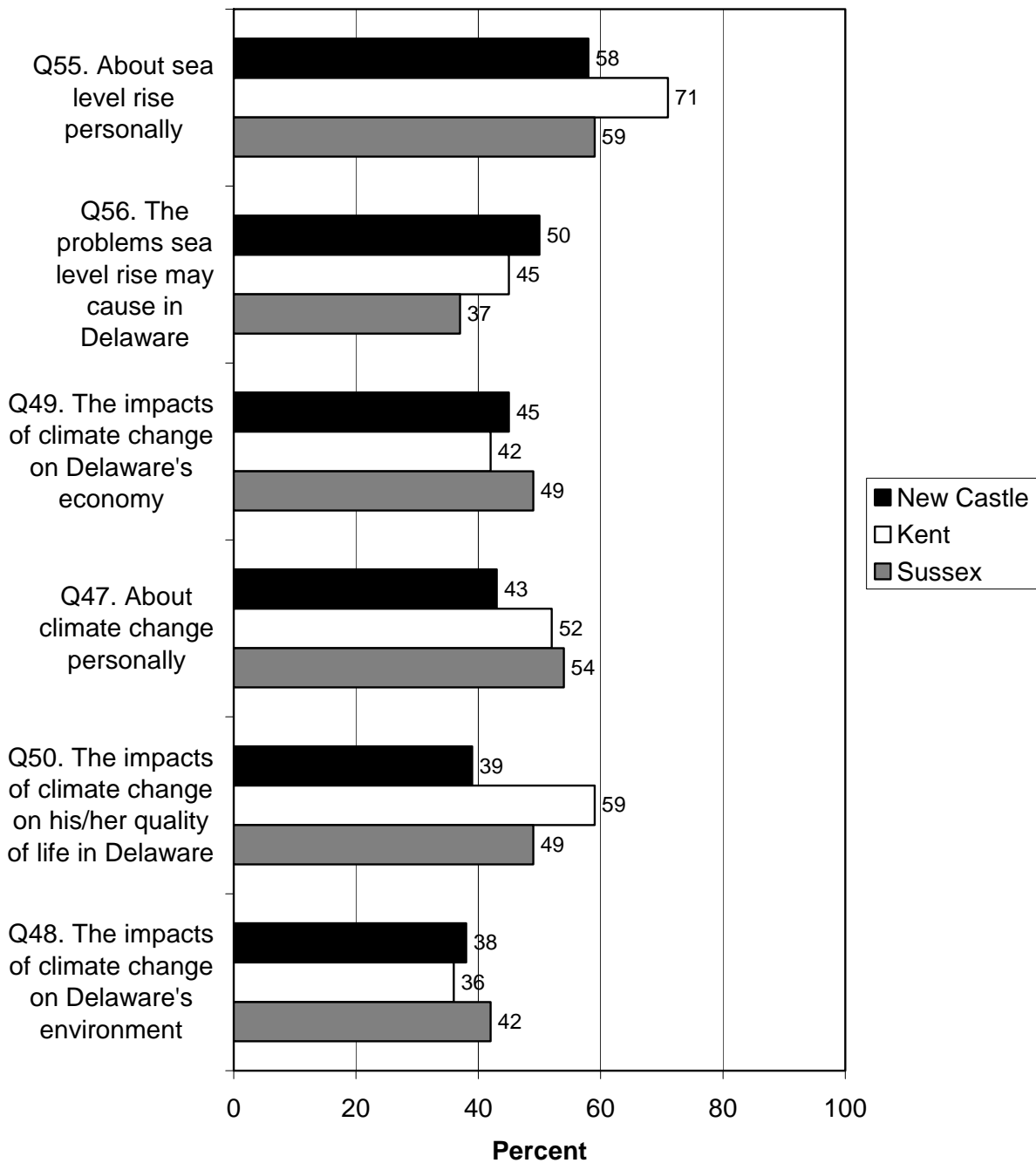
**Q47-50, 55-56. Percent who worry a great deal about the following issues concerning climate change and sea level rise.**



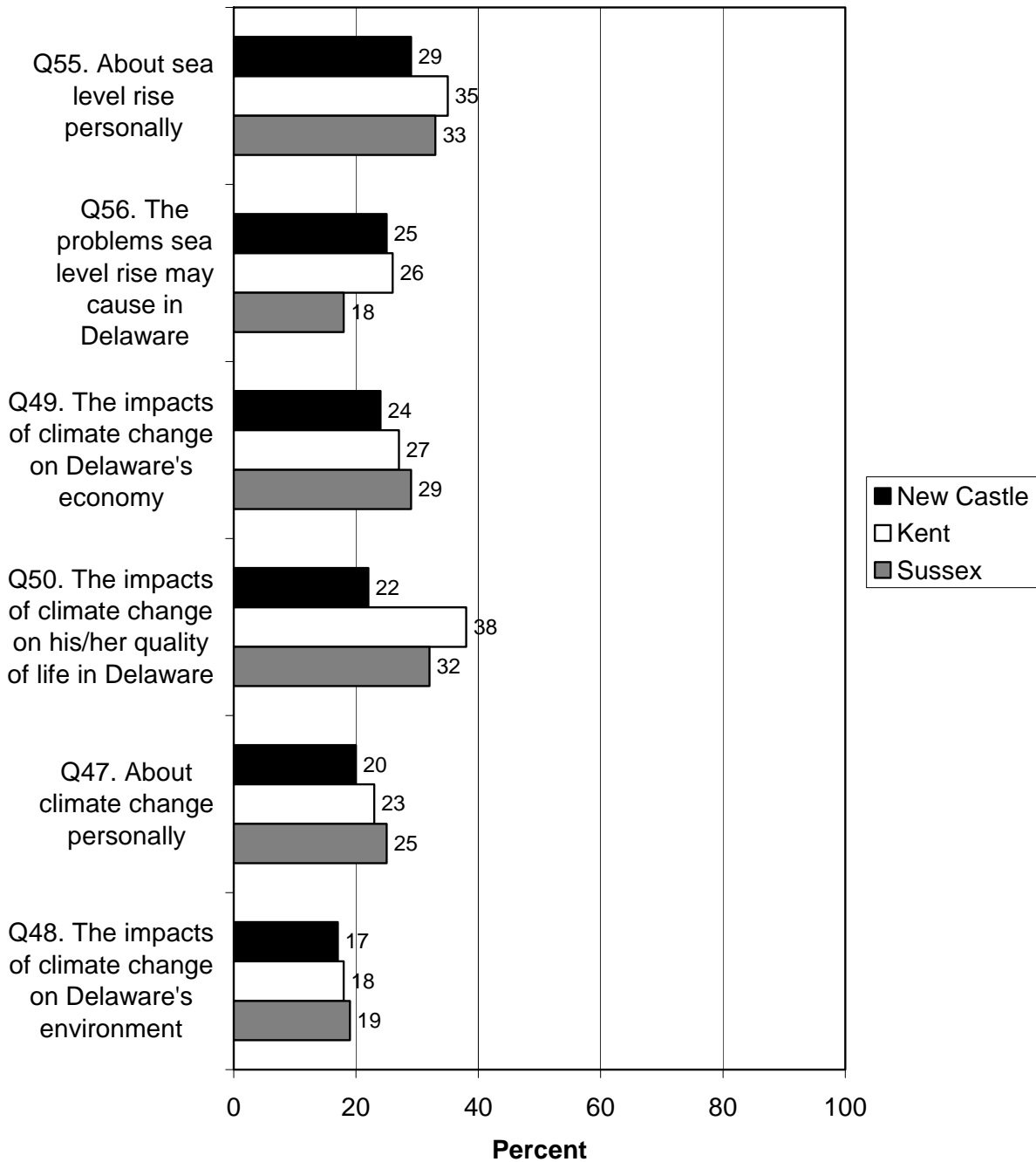
**Q47-50, 55-56. Percent who worry a great deal or a moderate amount about the following issues concerning climate change and sea level rise.**



**Q47-50, 55-56. Percent who worry only a little or not at all about the following issues concerning climate change and sea level rise.**

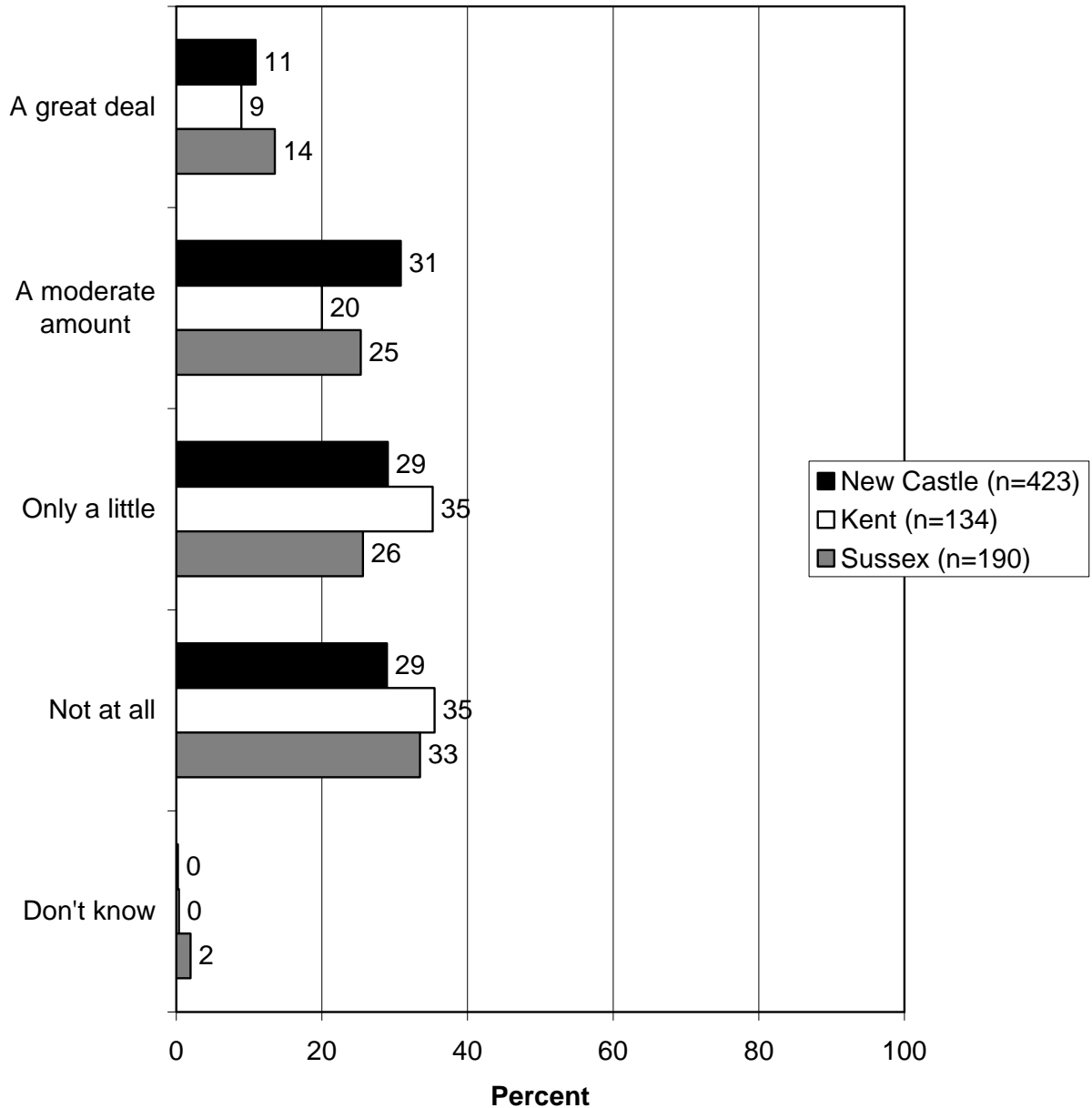


**Q47-50, 55-56. Percent who do not worry at all about the following issues concerning climate change and sea level rise.**

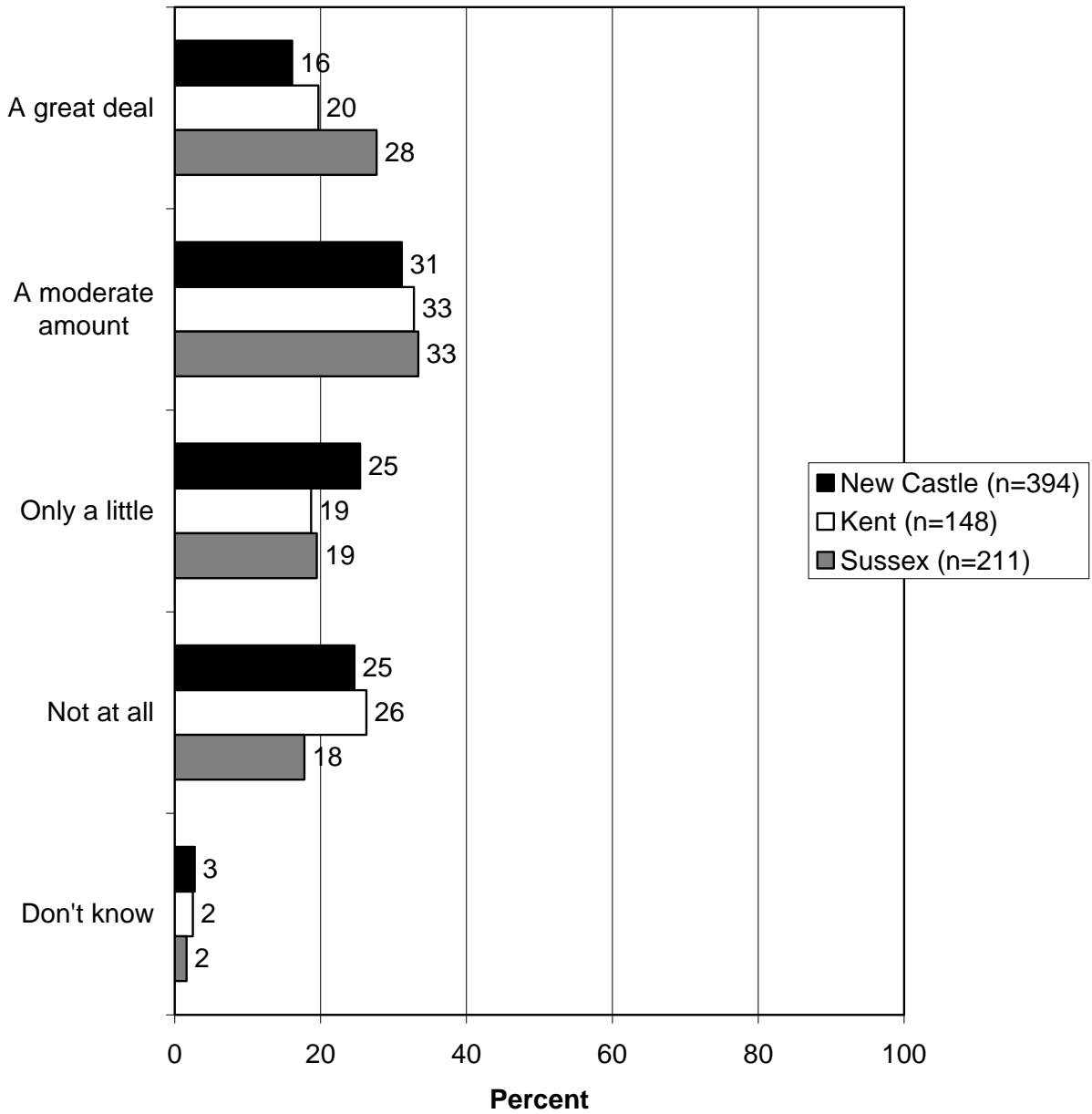




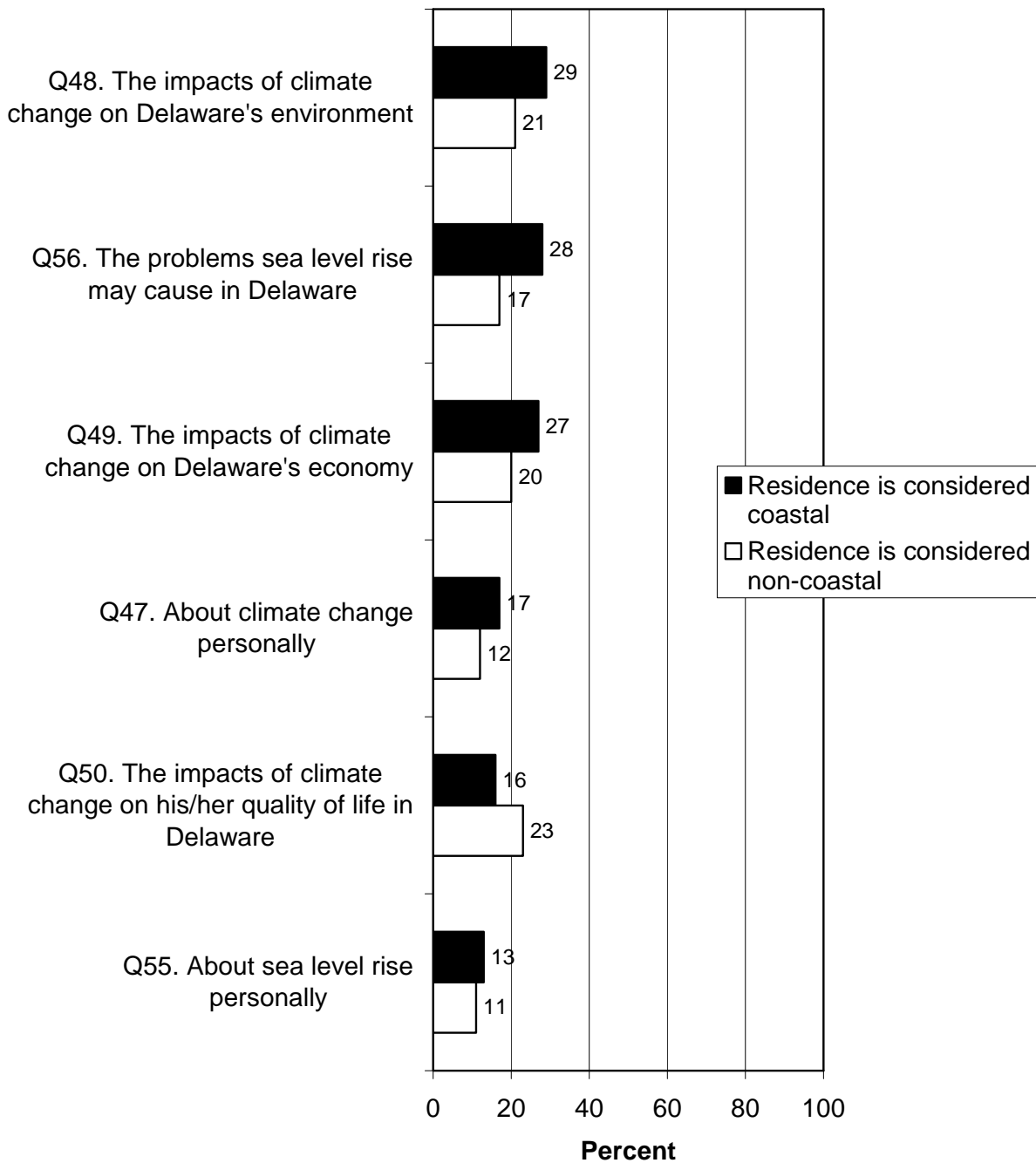
### Q55. How much do you personally worry about sea level rise?



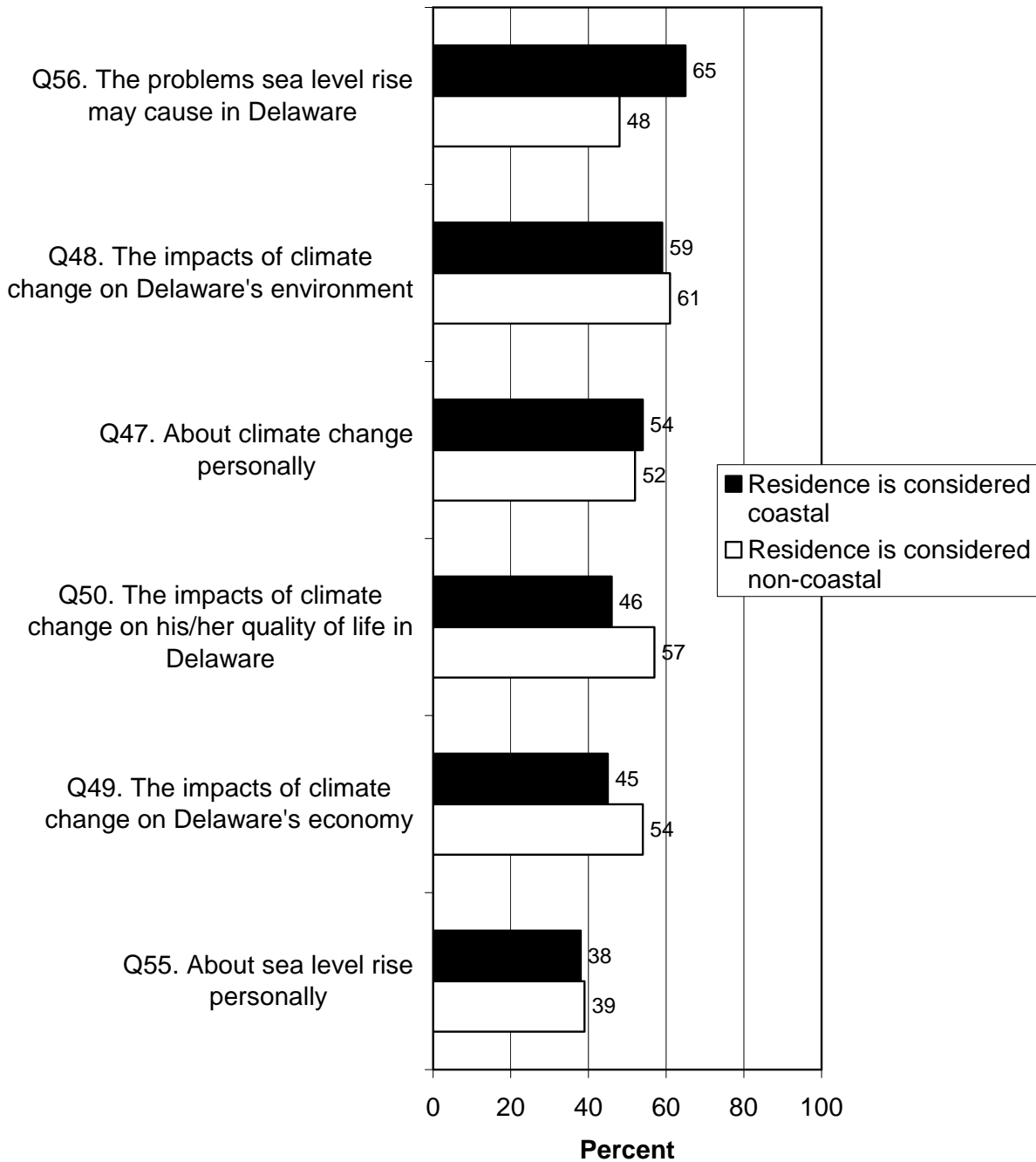
### Q56. How much do you worry about the problems sea level rise may cause in Delaware?



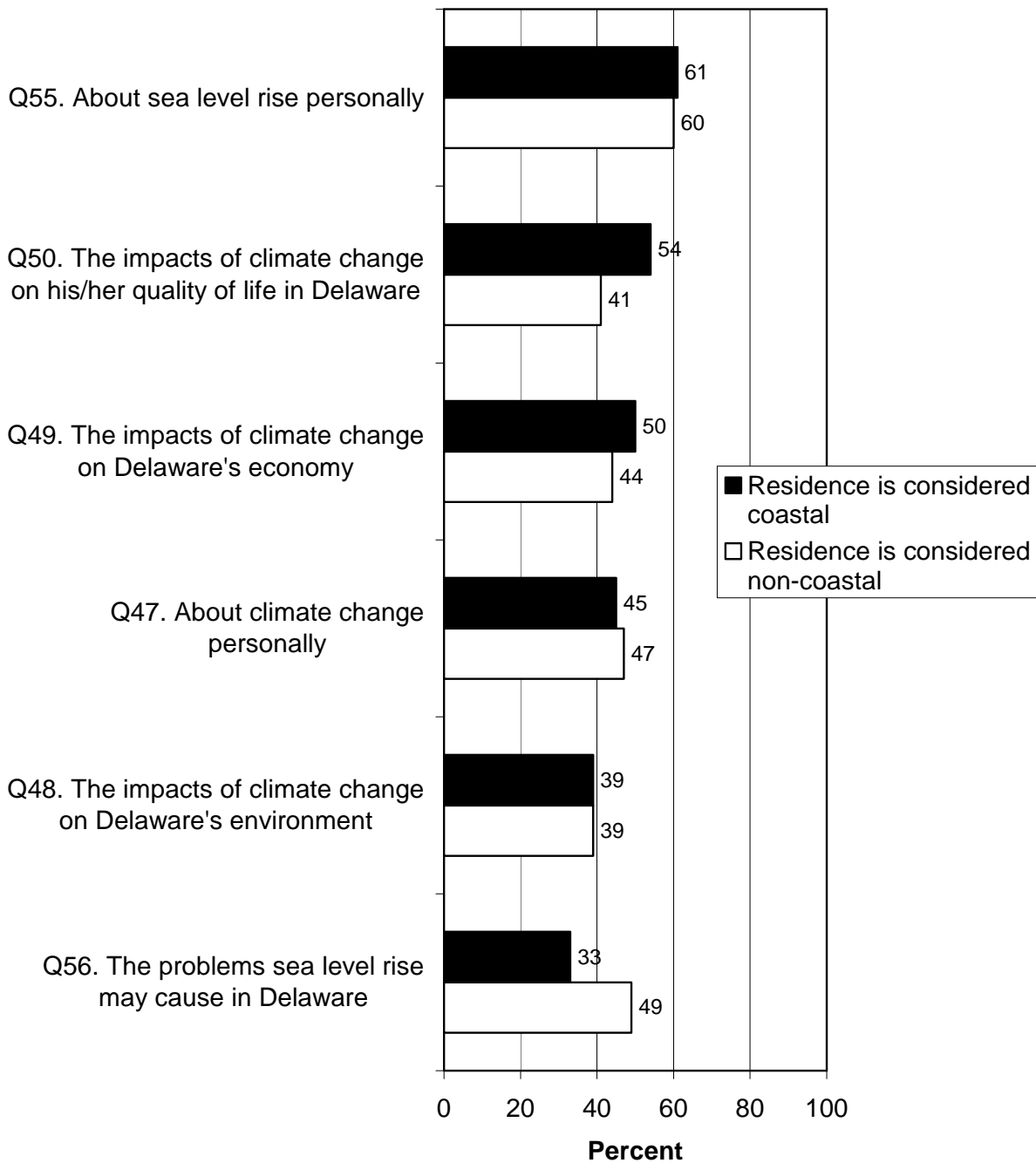
**Q47-50, 55-56. Percent who worry a great deal about the following issues concerning climate change and sea level rise.**



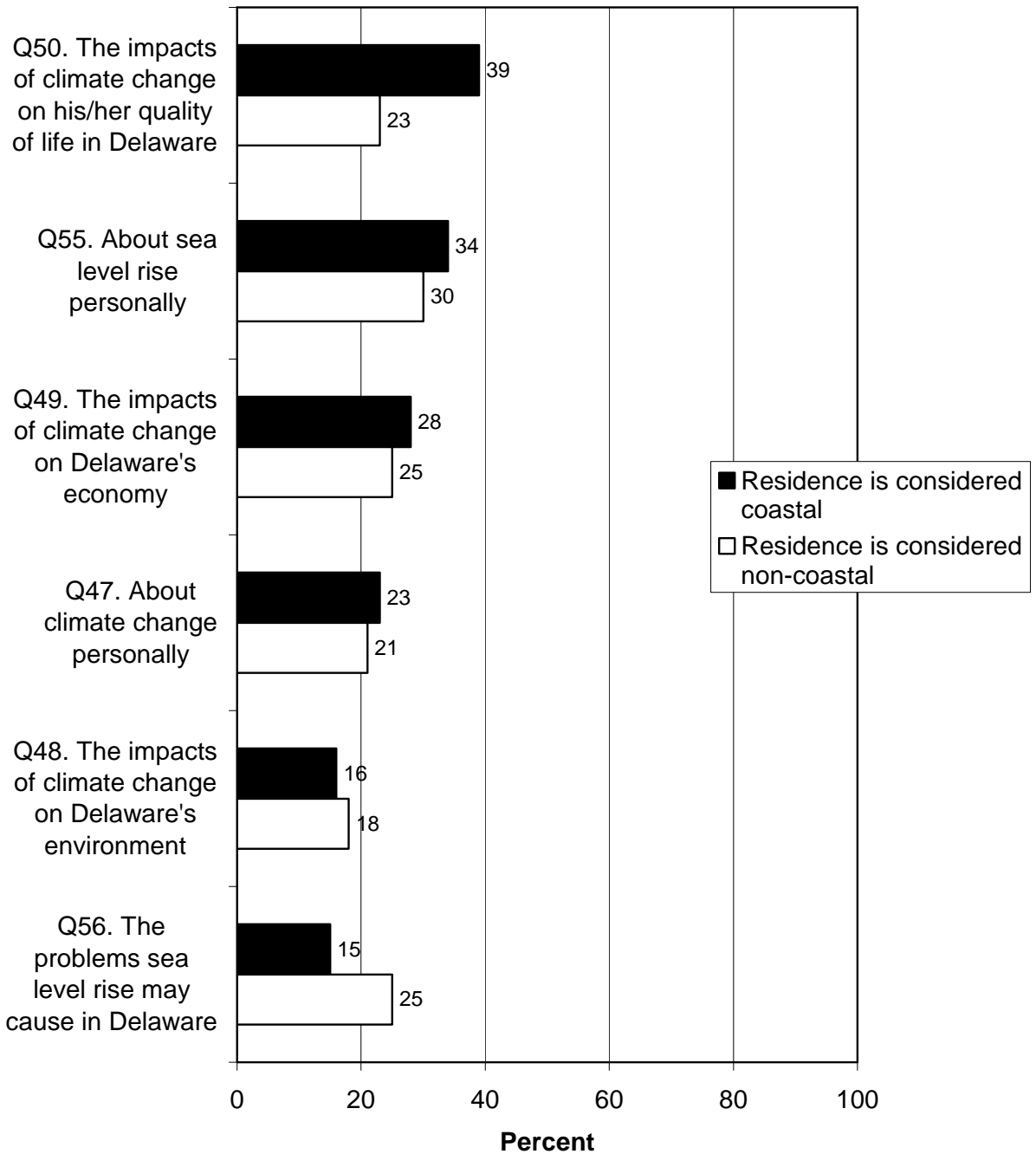
**Q47-50, 55-56. Percent who worry a great deal or a moderate amount about the following issues concerning climate change and sea level rise.**



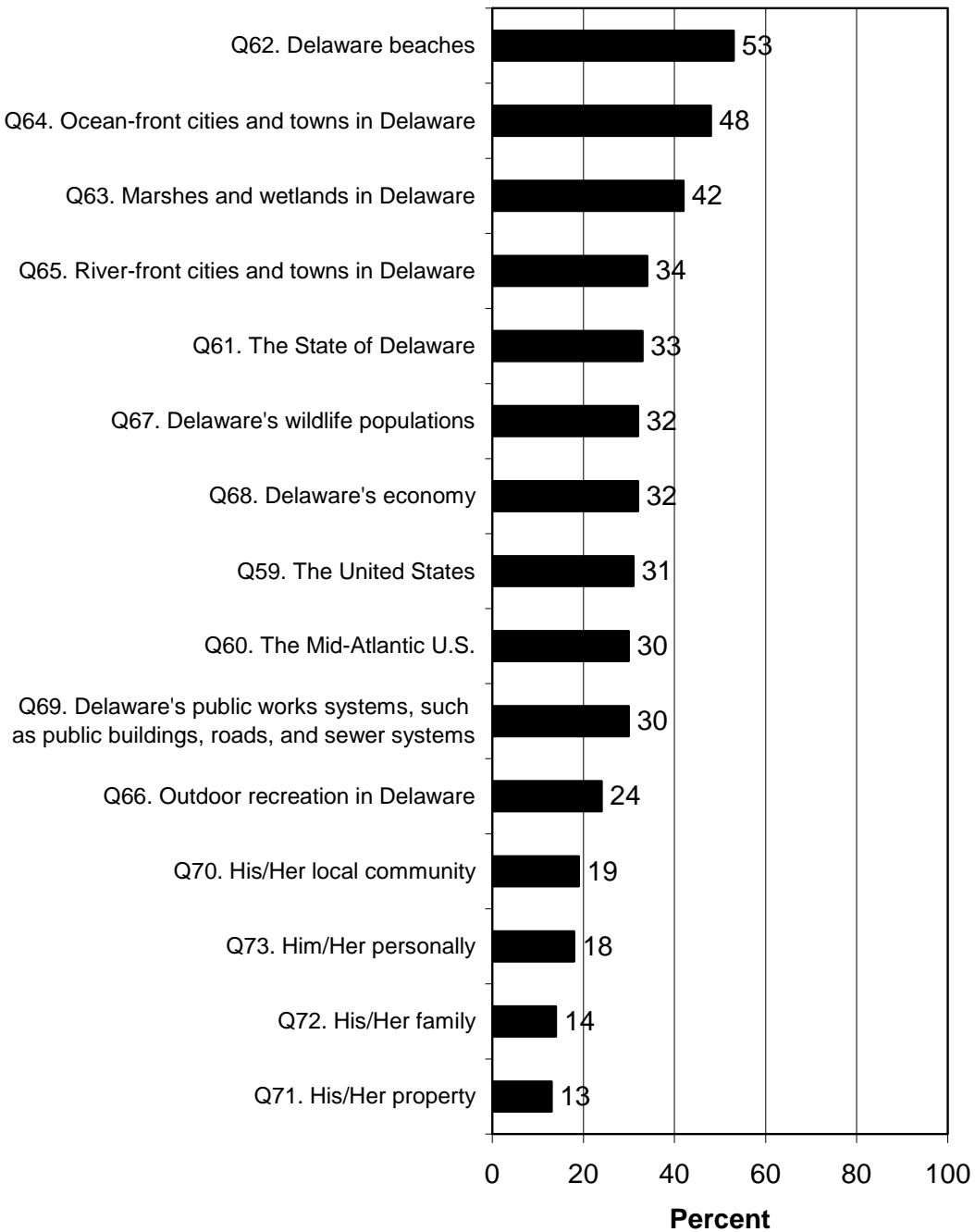
**Q47-50, 55-56. Percent who worry only a little or not at all about the following issues concerning climate change and sea level rise.**



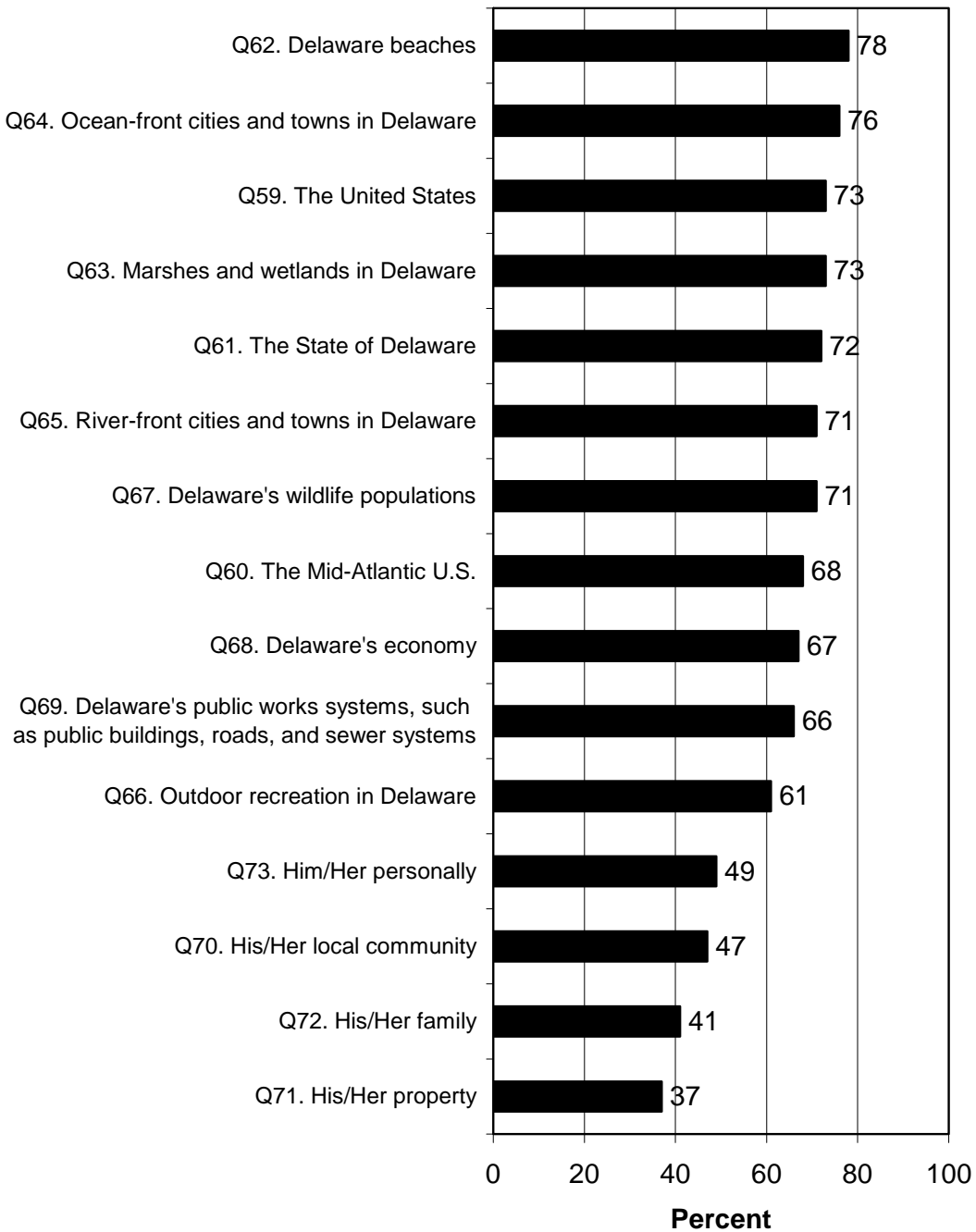
**Q47-50, 55-56. Percent who do not worry at all about the following issues concerning climate change and sea level rise.**



**Q59-73. Percent who think sea level rise is a very serious threat to the following.**

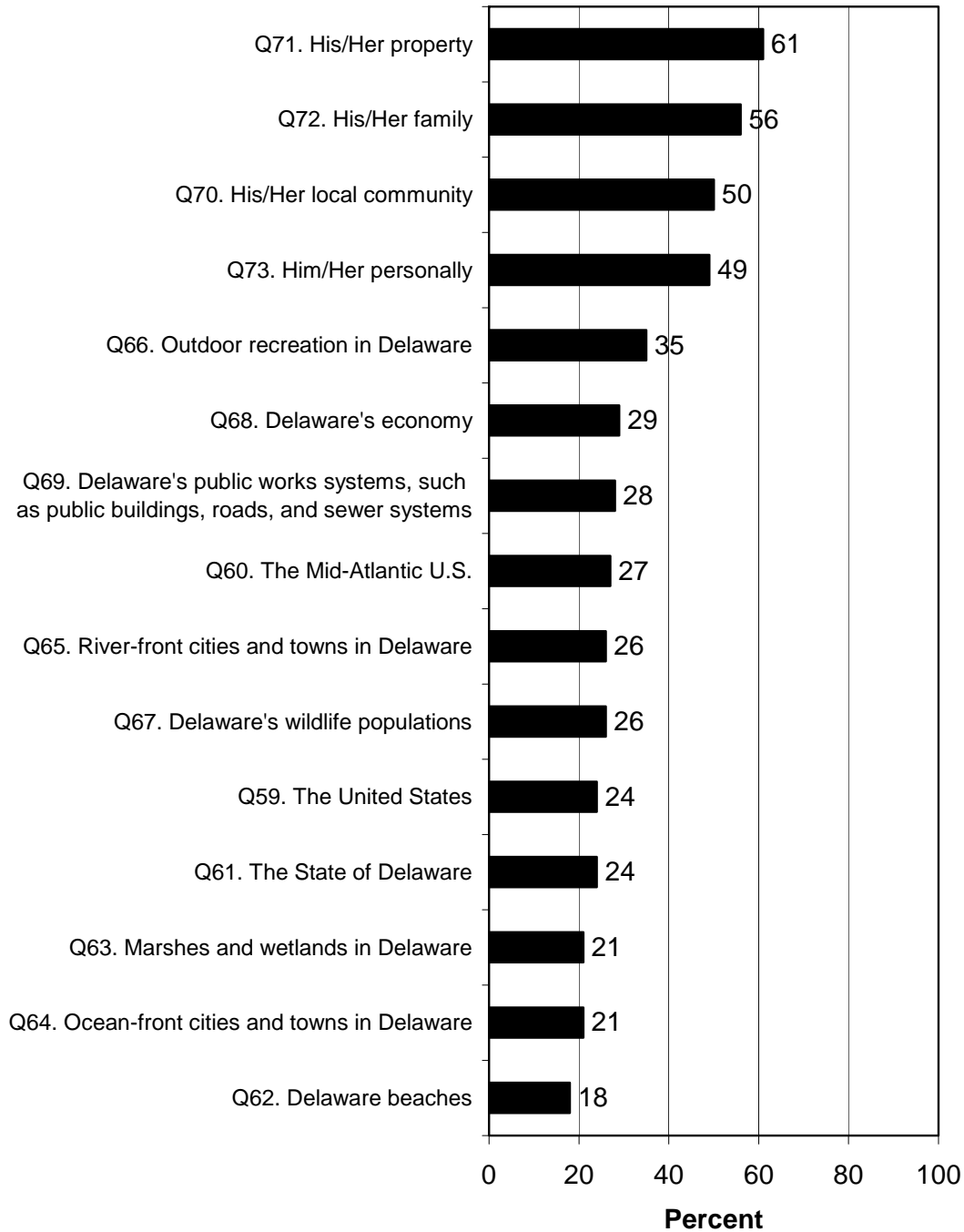


**Q59-73. Percent who think sea level rise is a very or somewhat serious threat to the following.**

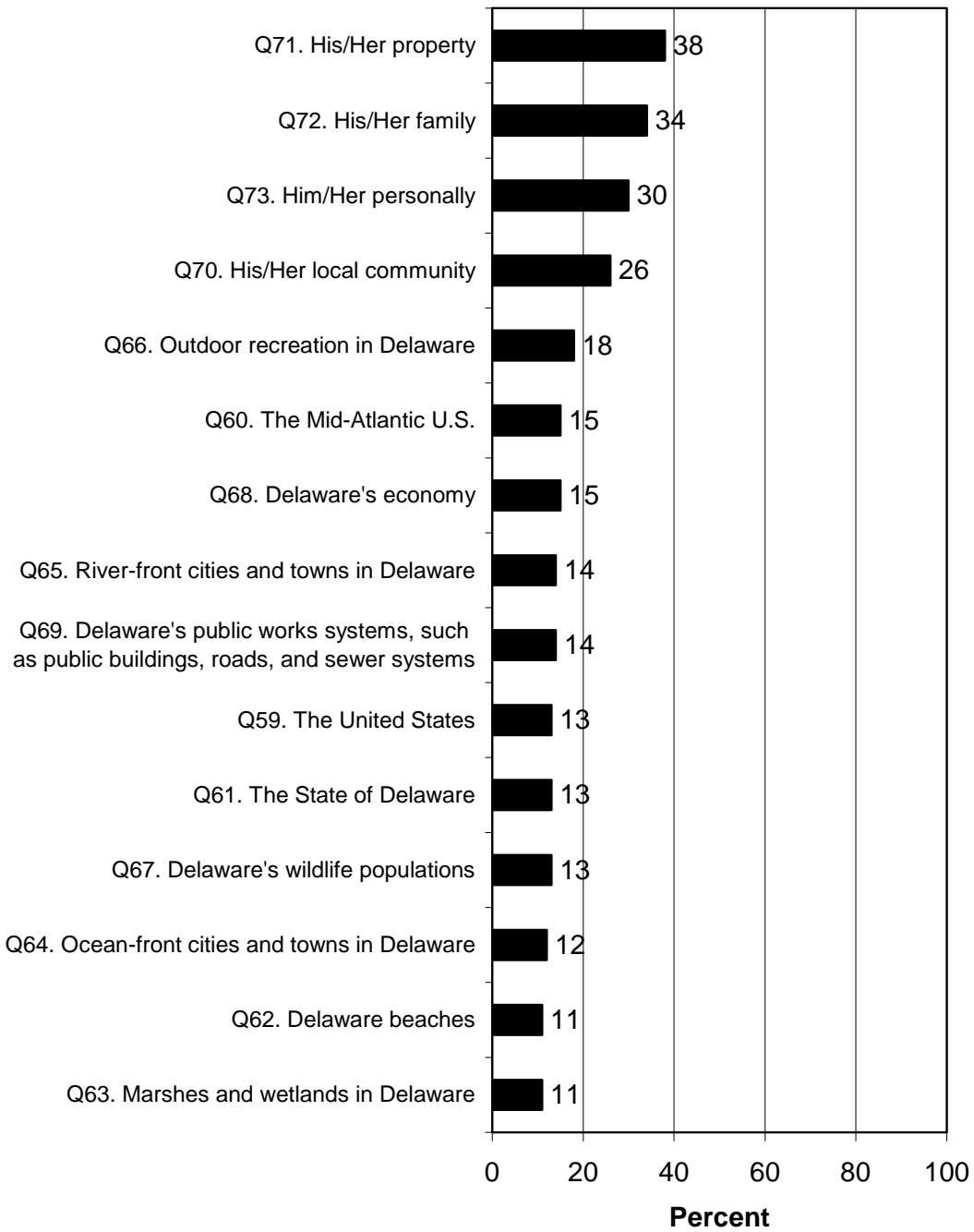




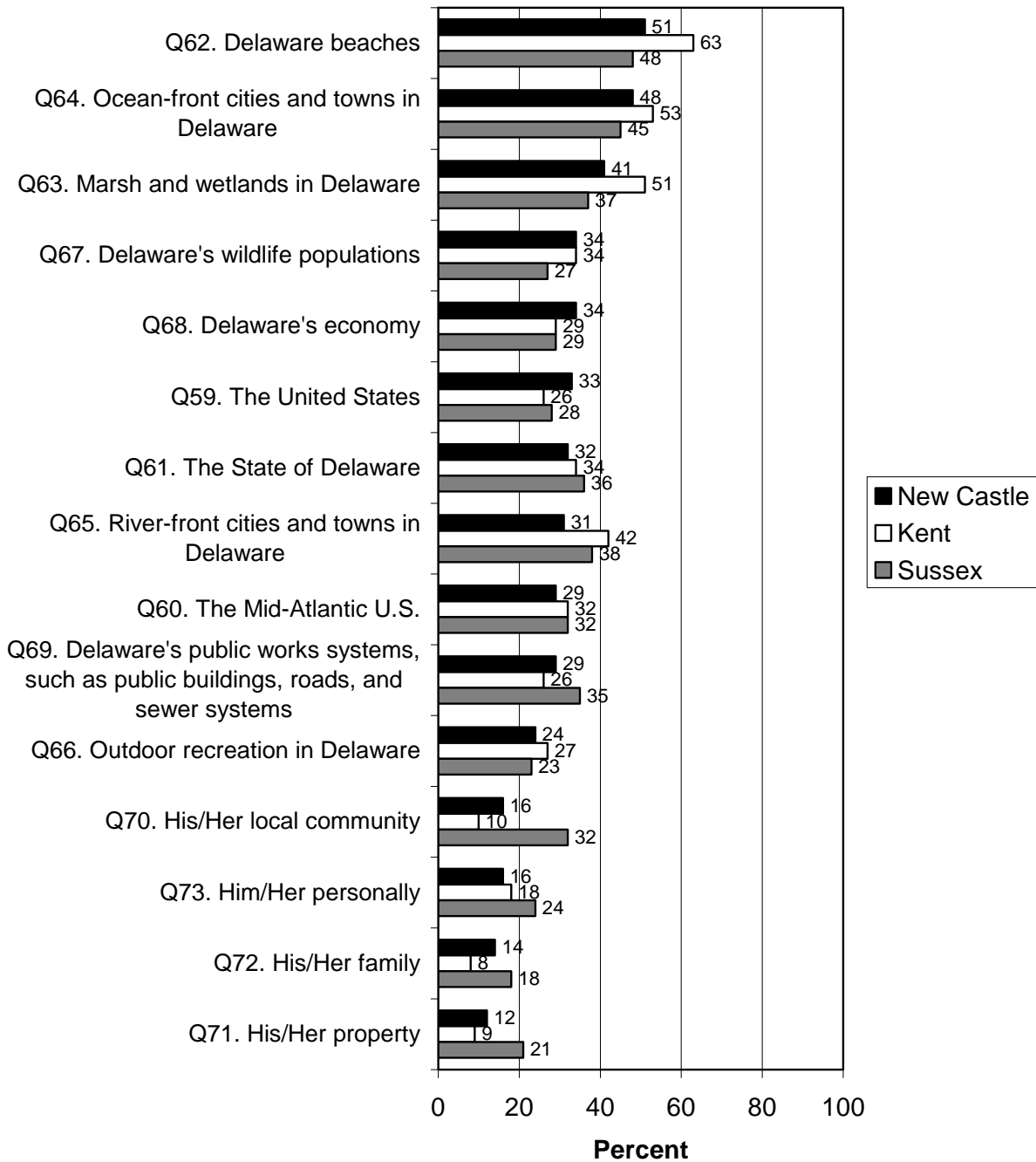
**Q59-73. Percent who think sea level rise is not a very serious or not at all a serious threat to the following.**



**Q59-73. Percent who think sea level rise is not at all a serious threat to the following.**



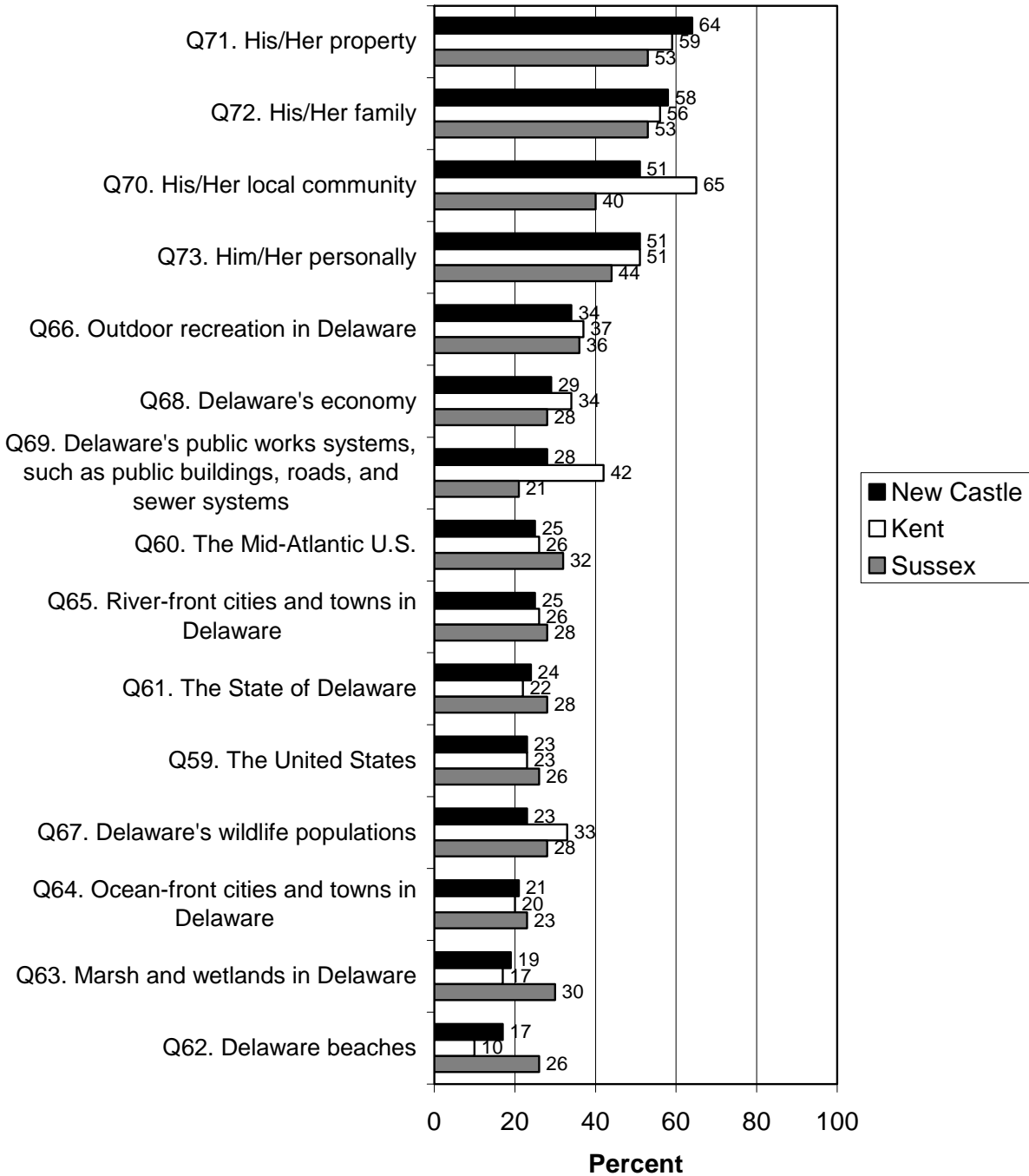
**Q59-73. Percent who think sea level rise is a very serious threat to the following.**



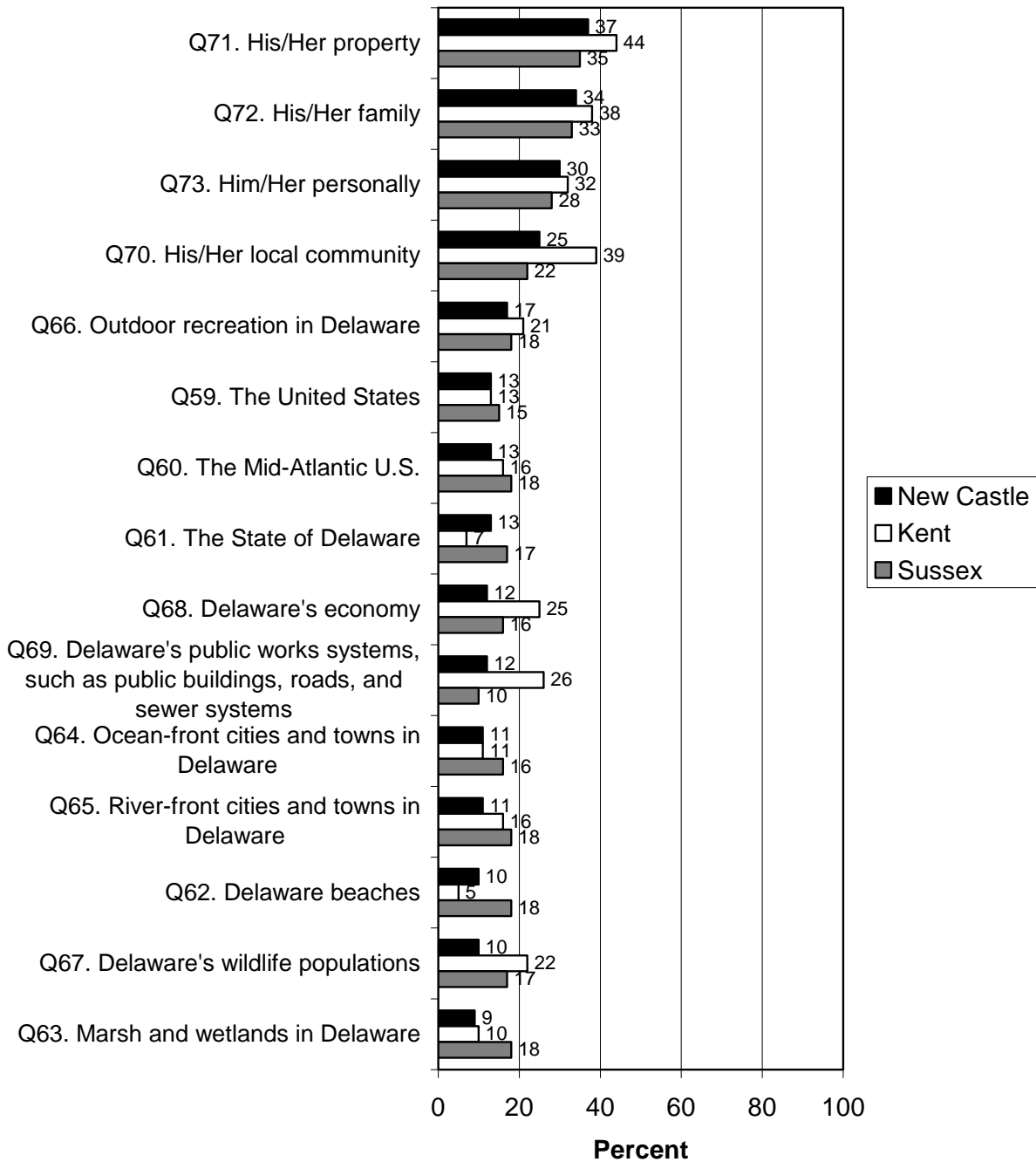
**Q59-73. Percent who think sea level rise is a very or somewhat serious threat to the following.**



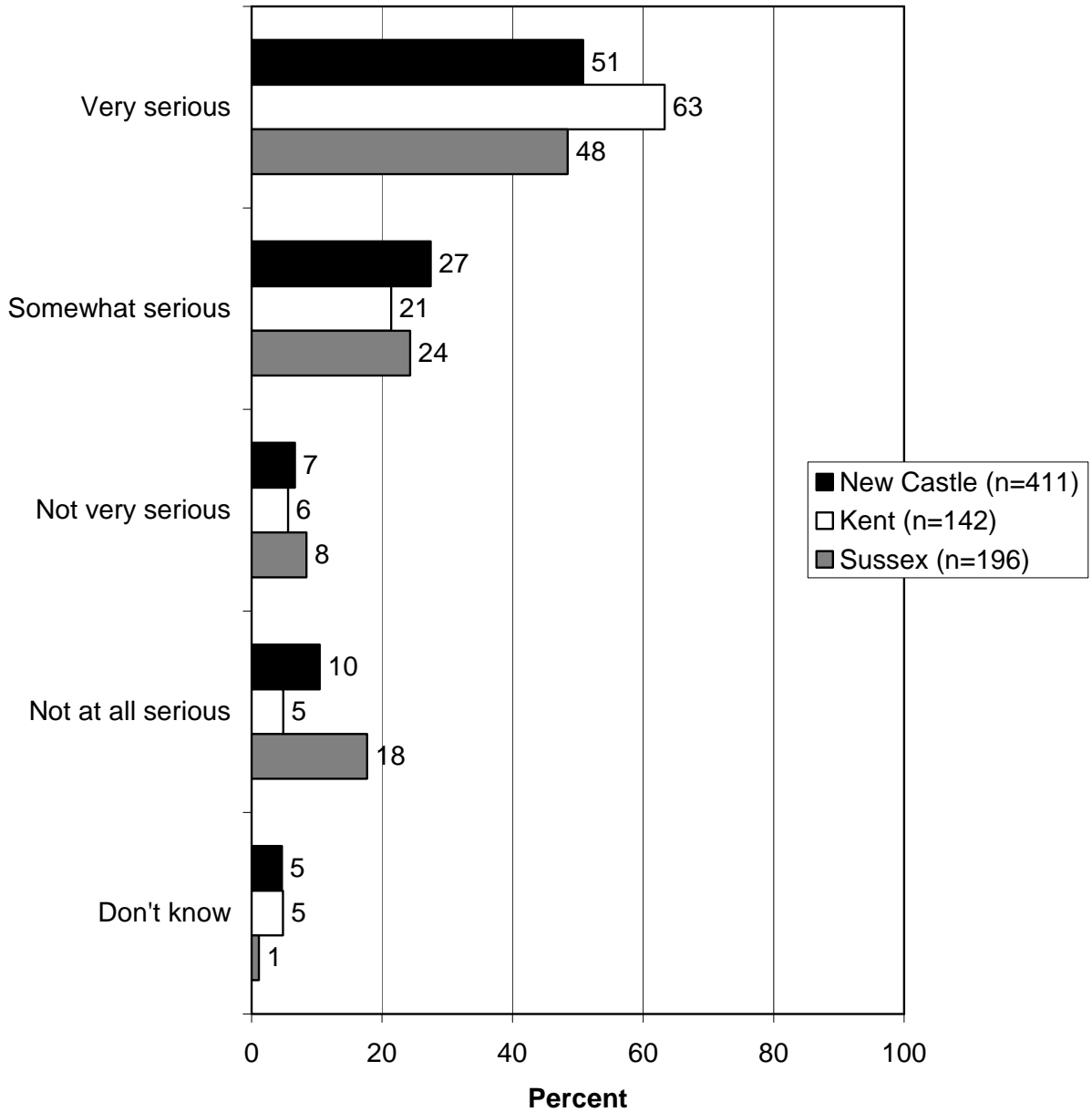
**Q59-73. Percent who think sea level rise is not a very serious or not at all a serious threat to the following.**



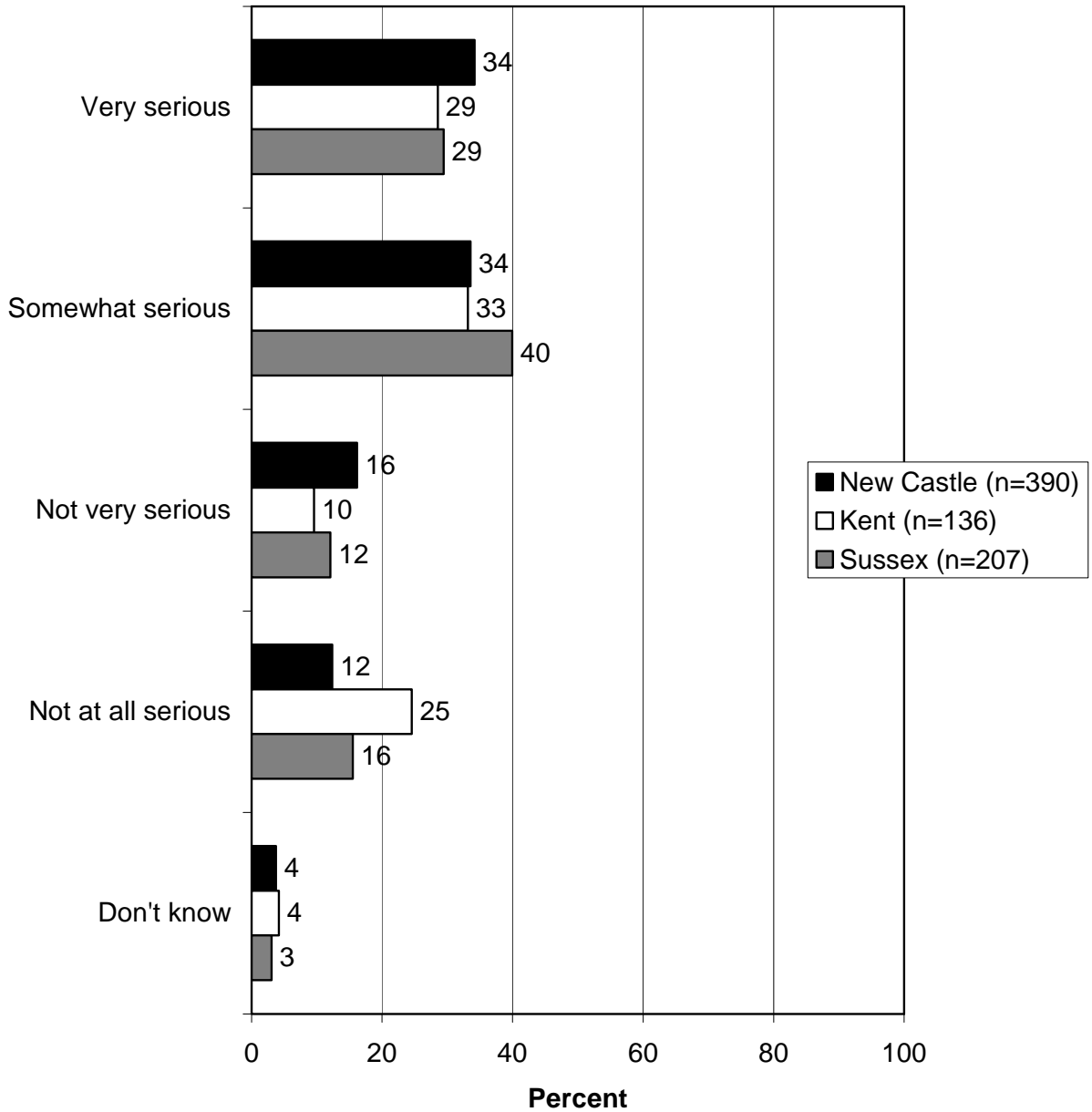
**Q59-73. Percent who think sea level rise is not at all a serious threat to the following.**



**Q62. How serious a threat do you think sea level rise is to Delaware beaches?**

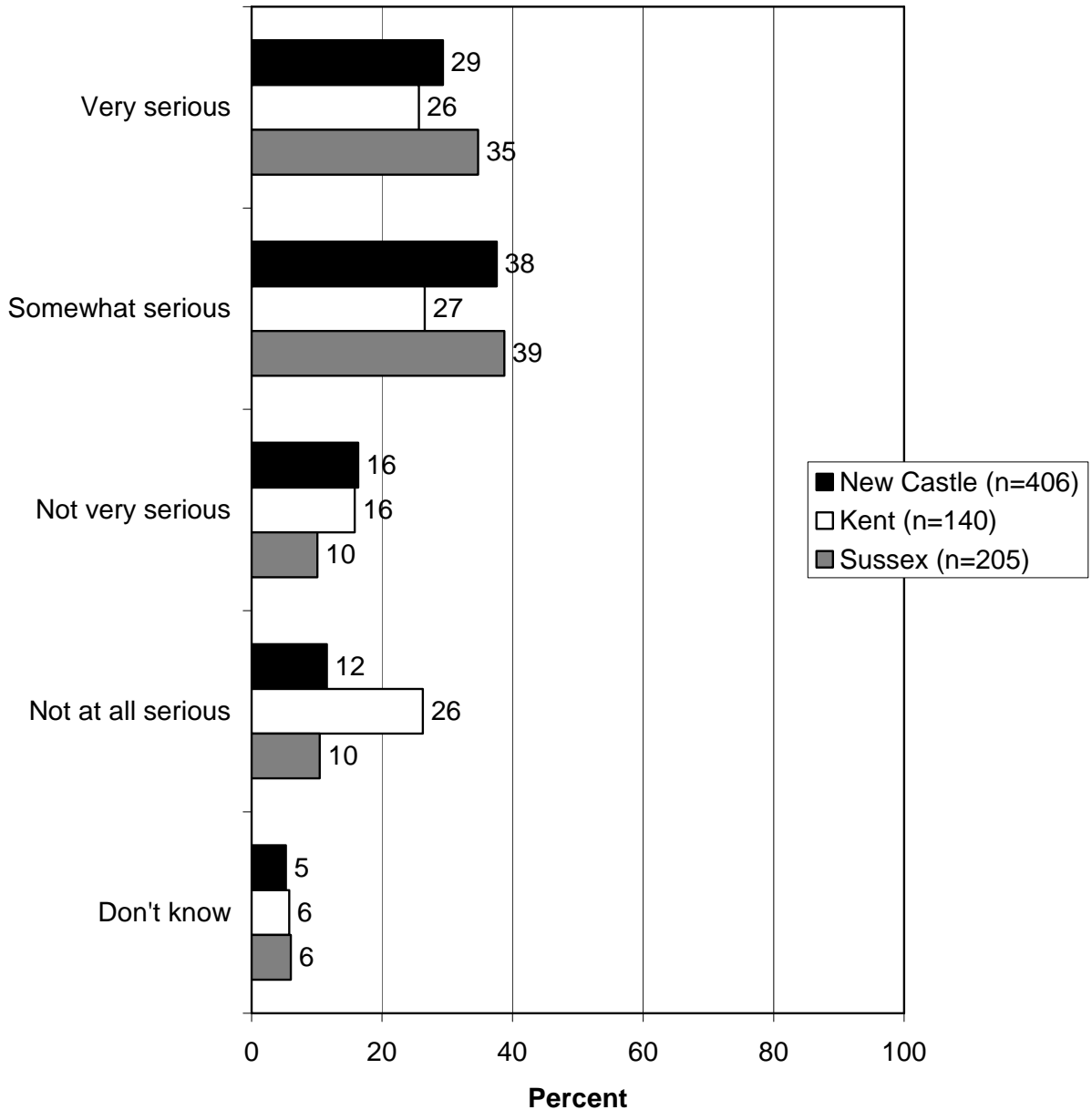


### Q68. How serious a threat do you think sea level rise is to Delaware's economy?

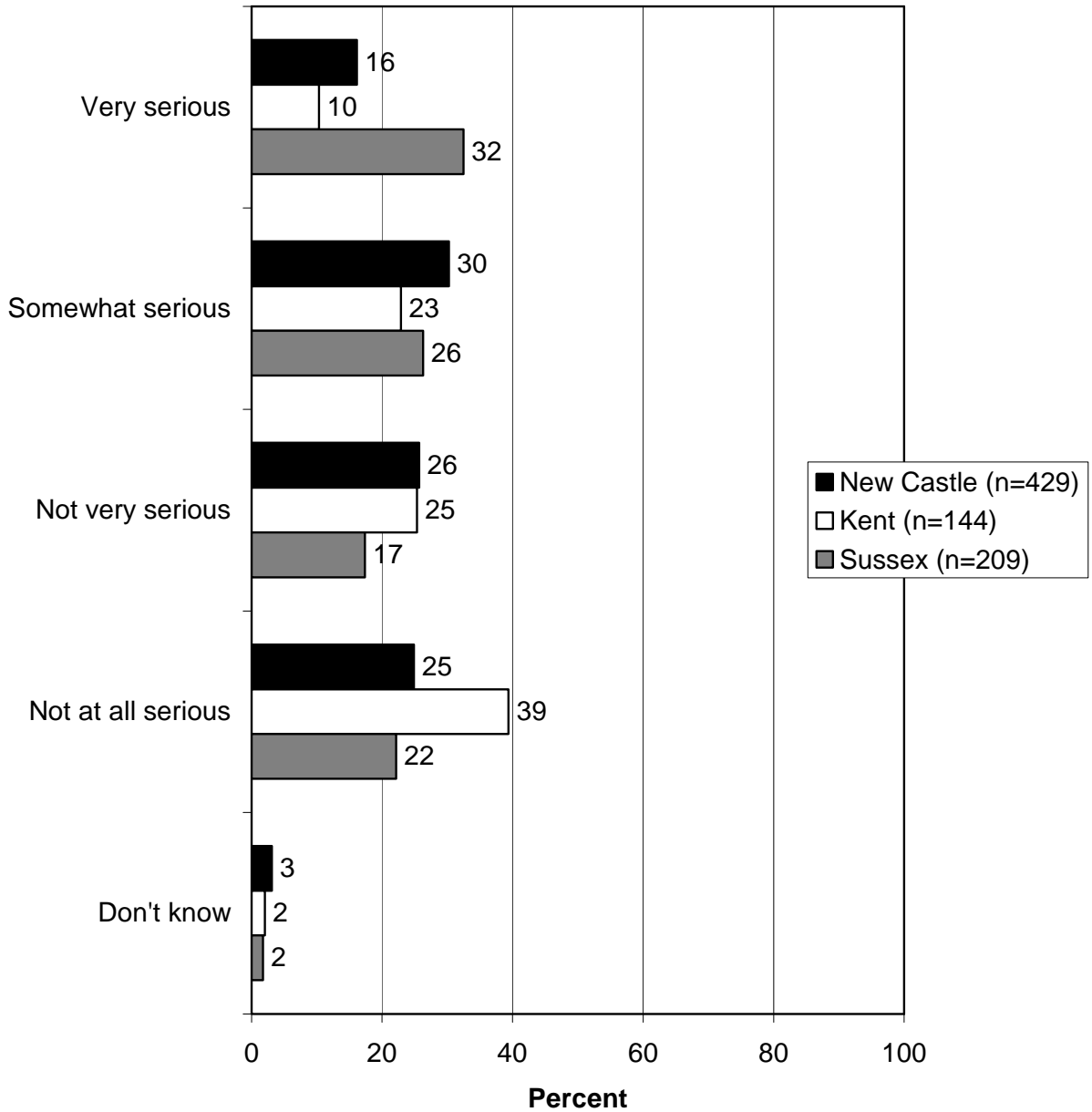




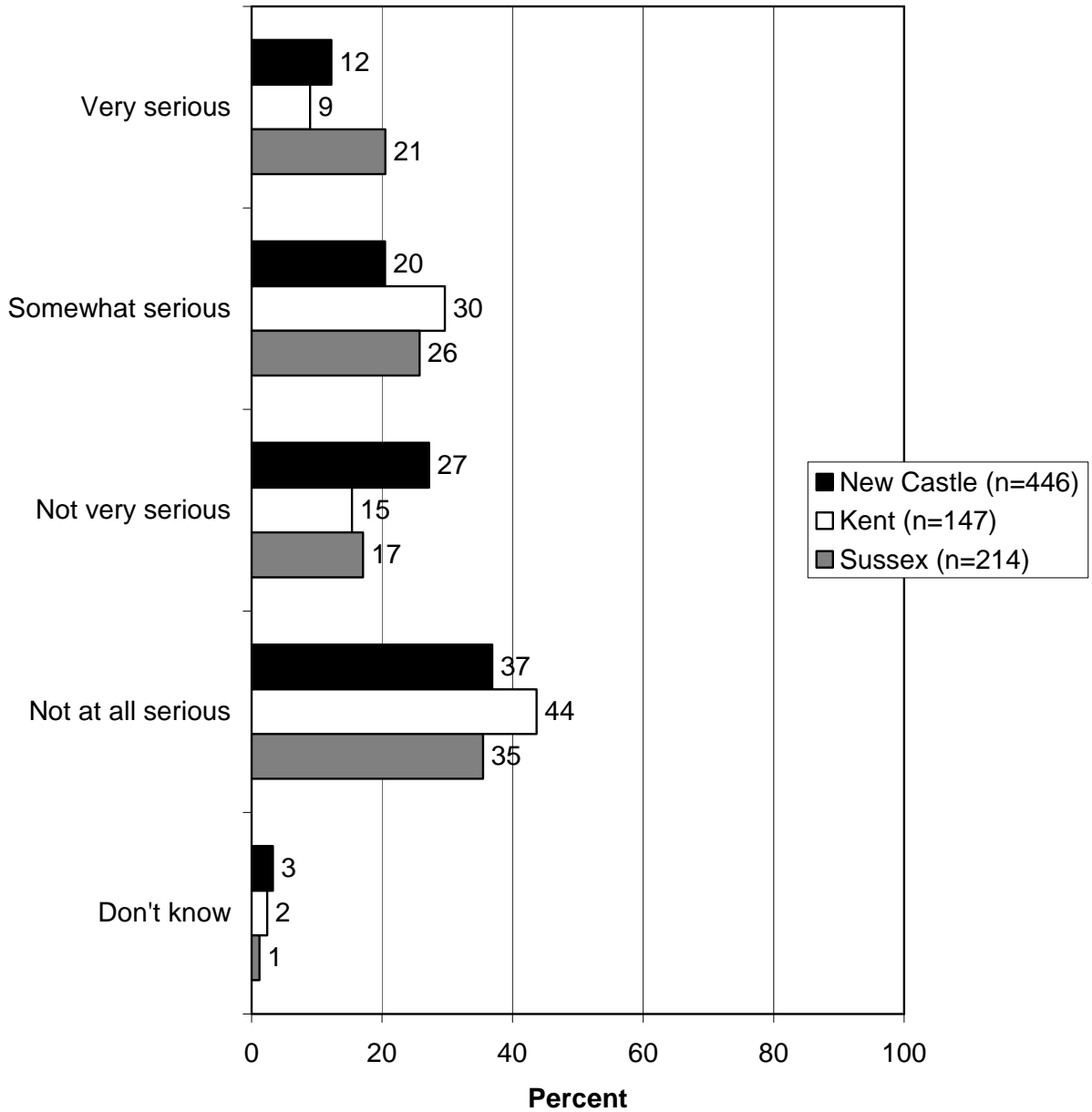
**Q69. How serious a threat do you think sea level rise is to Delaware's public works systems, such as public buildings, roads, and sewer systems?**



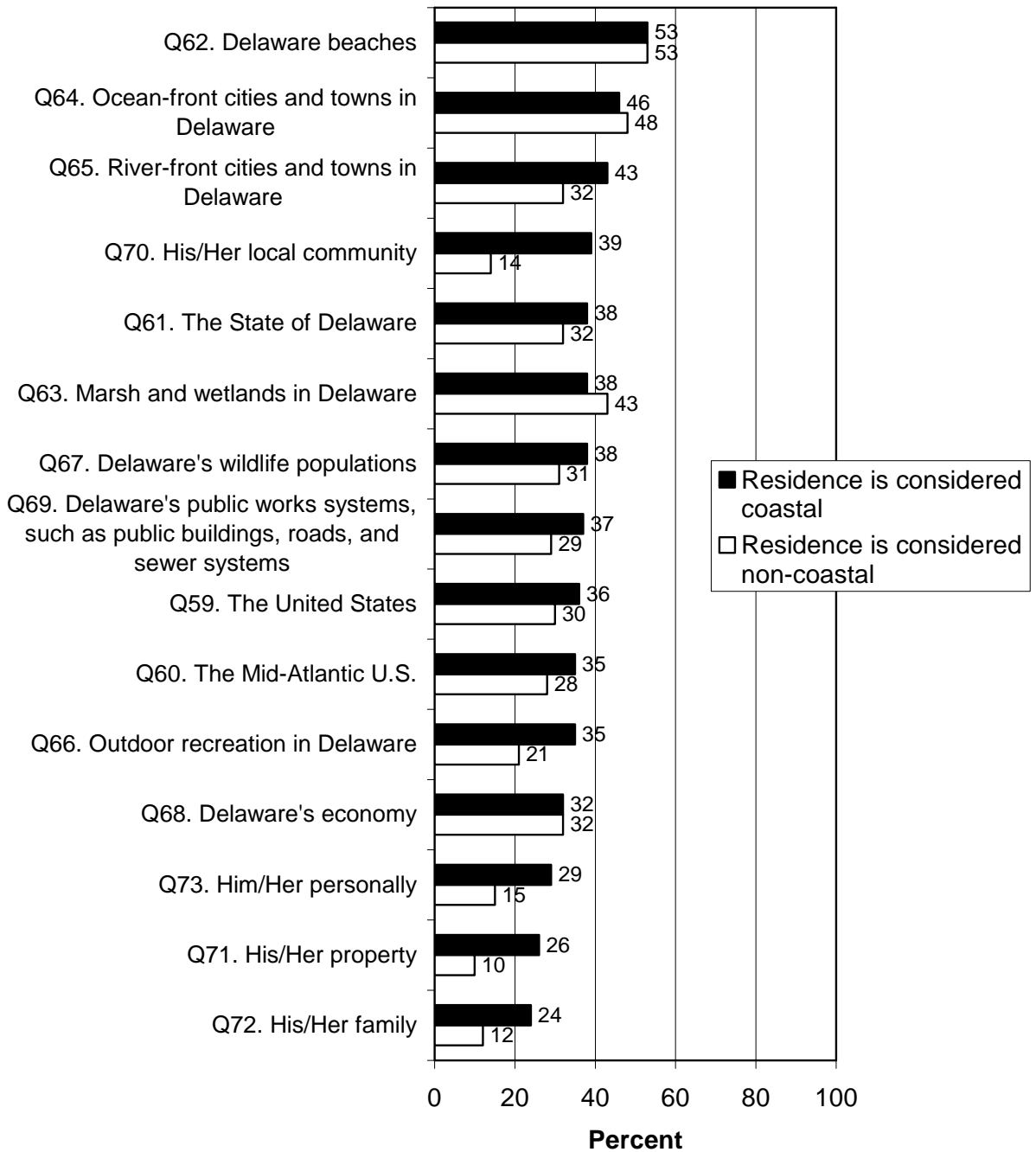
### Q70. How serious a threat do you think sea level rise is to your local community?



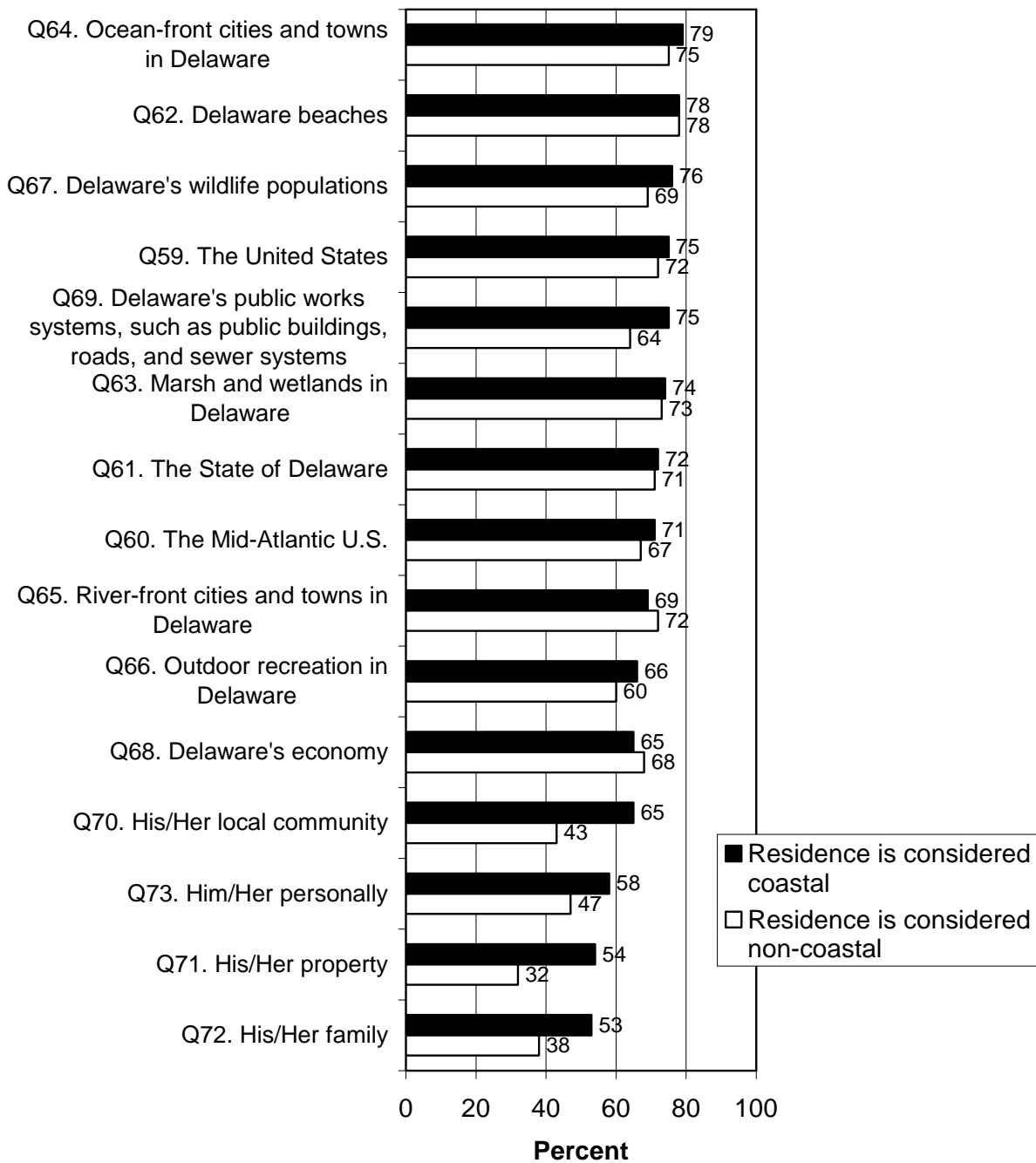
**Q71. How serious a threat do you think sea level rise is to your property?**



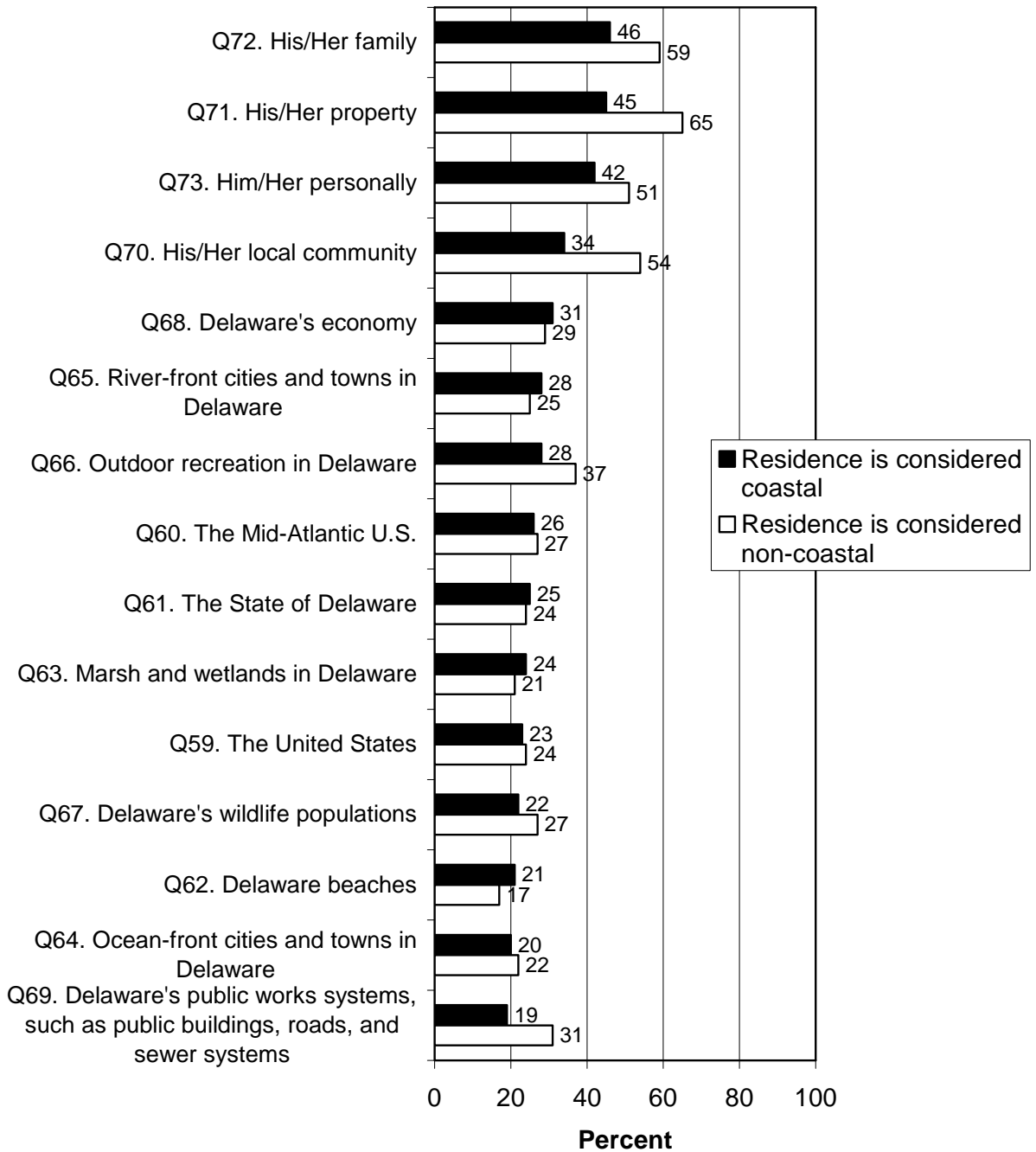
**Q59-73. Percent who think sea level rise is a very serious threat to the following.**



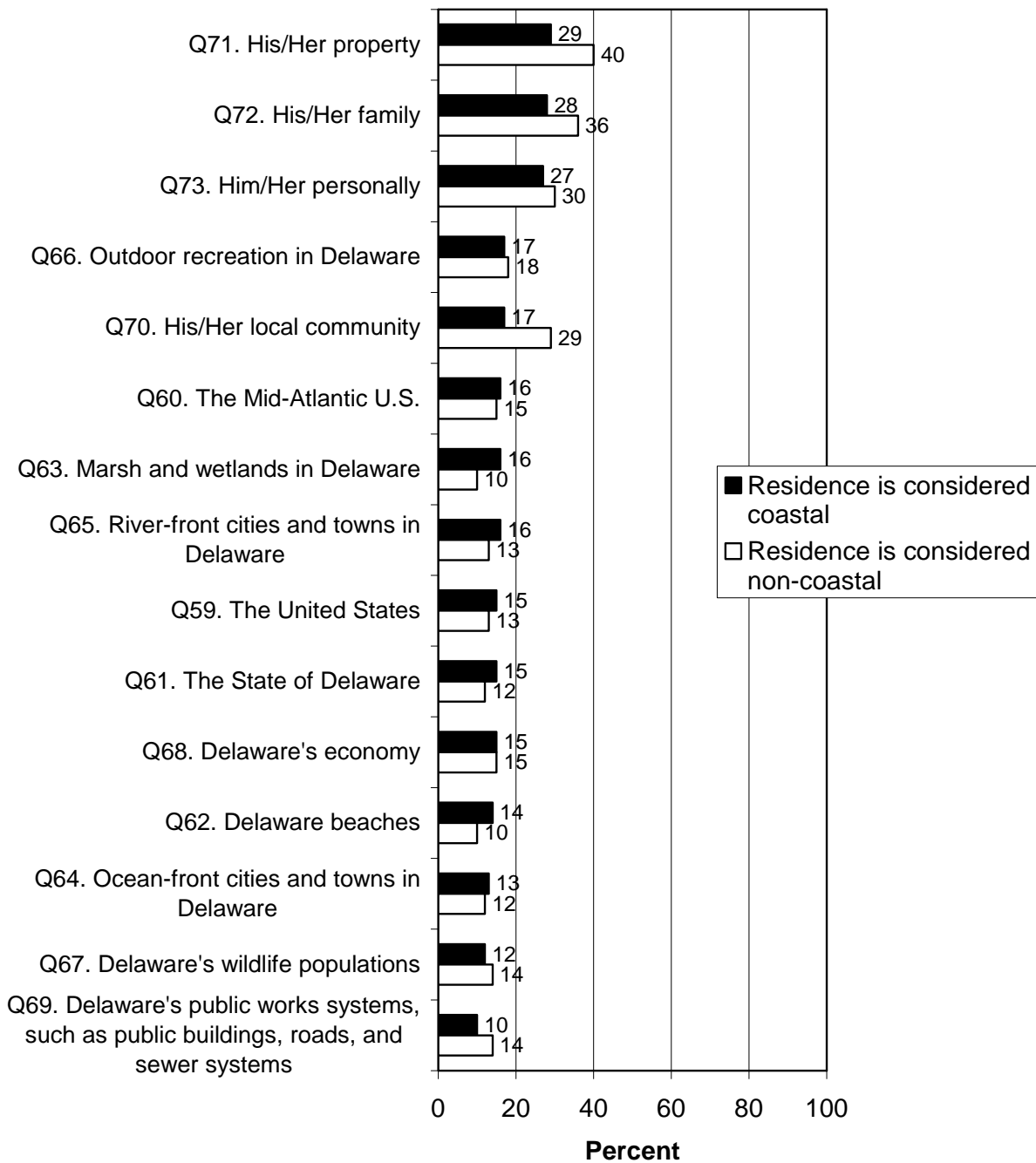
**Q59-73. Percent who think sea level rise is a very or somewhat serious threat to the following.**



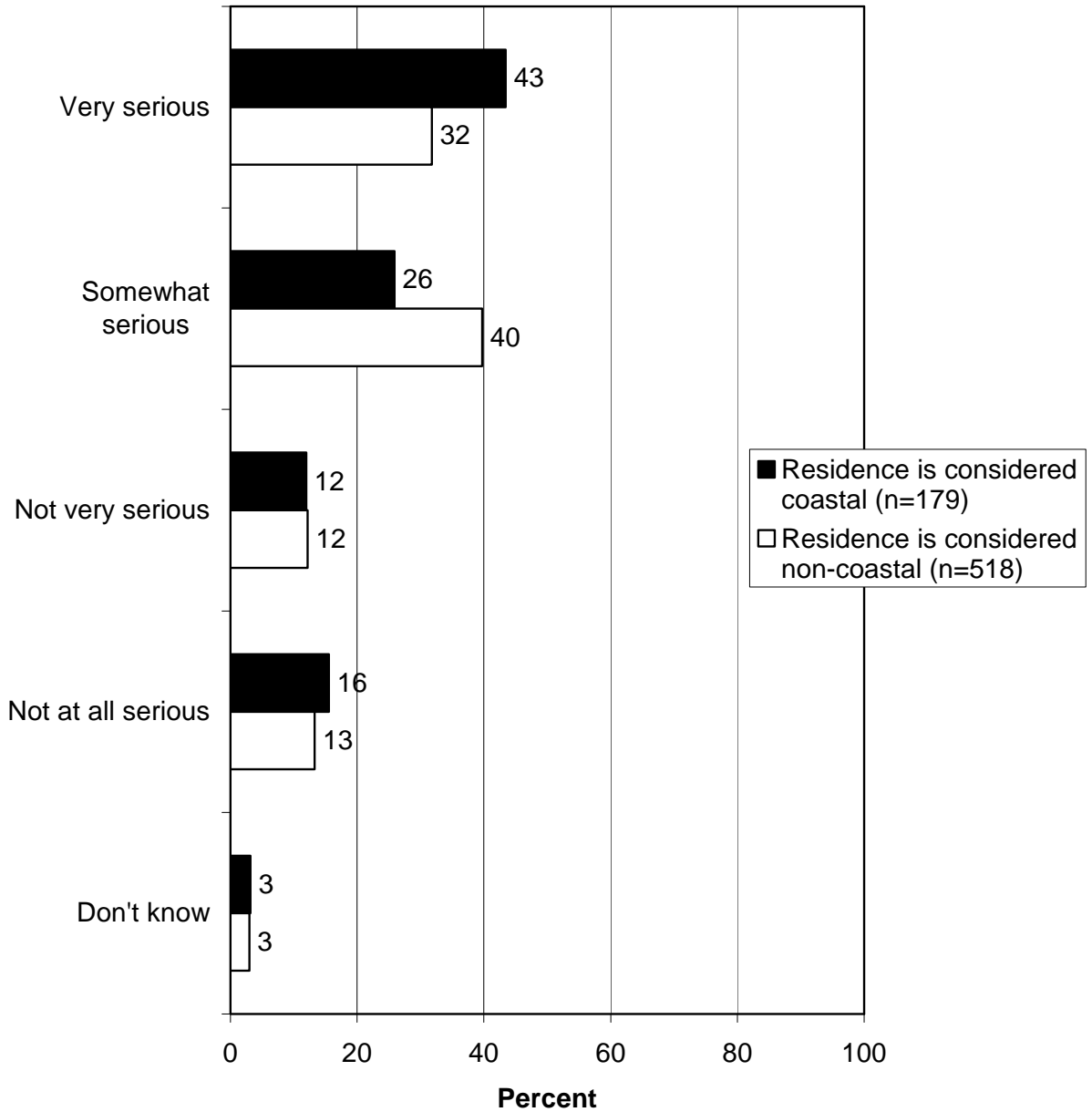
**Q59-73. Percent who think sea level rise is not a very serious or not at all a serious threat to the following.**



**Q59-73. Percent who think sea level rise is not at all a serious threat to the following.**

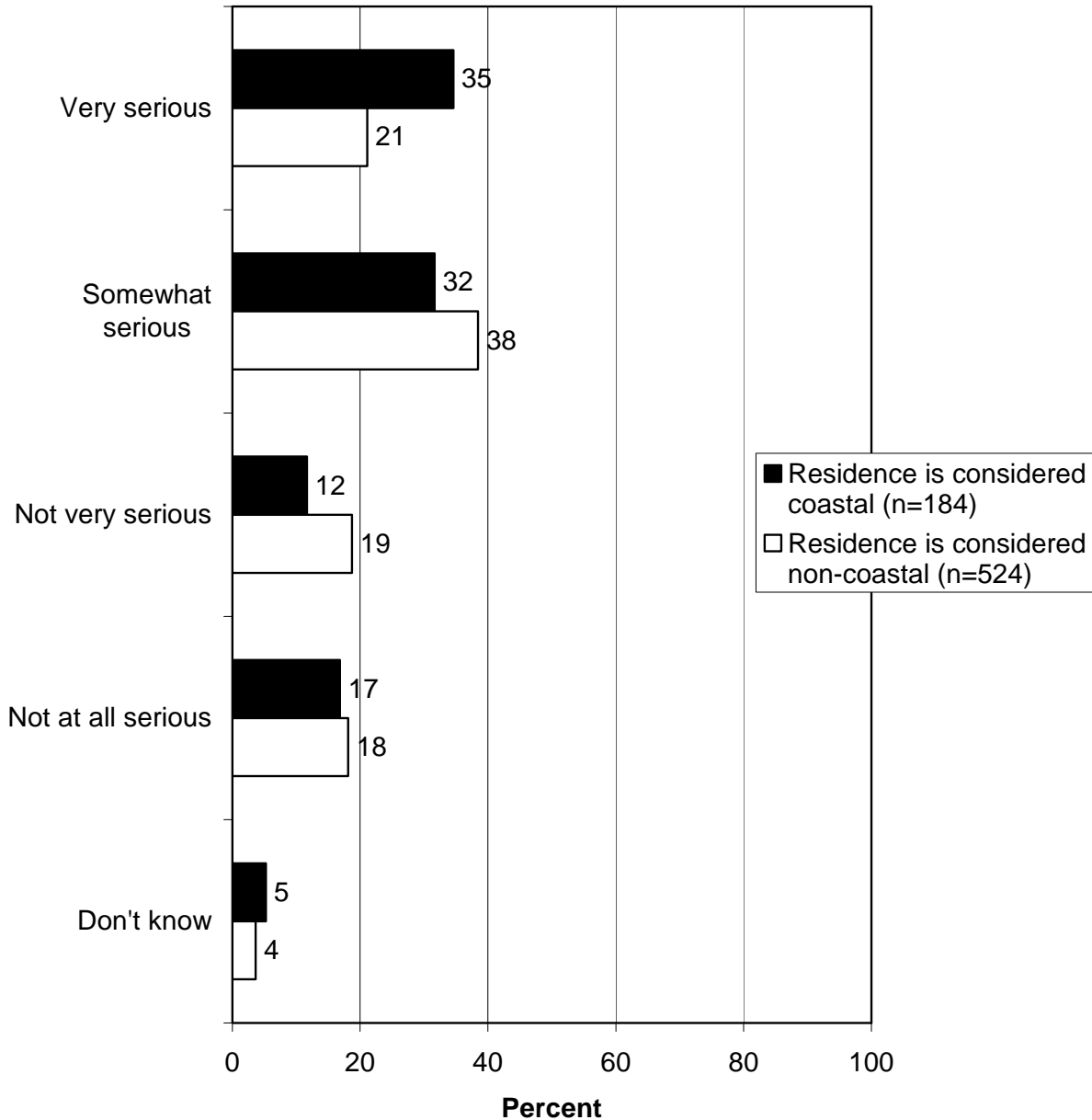


**Q65. How serious a threat do you think sea level rise is to river-front cities and towns in Delaware?**

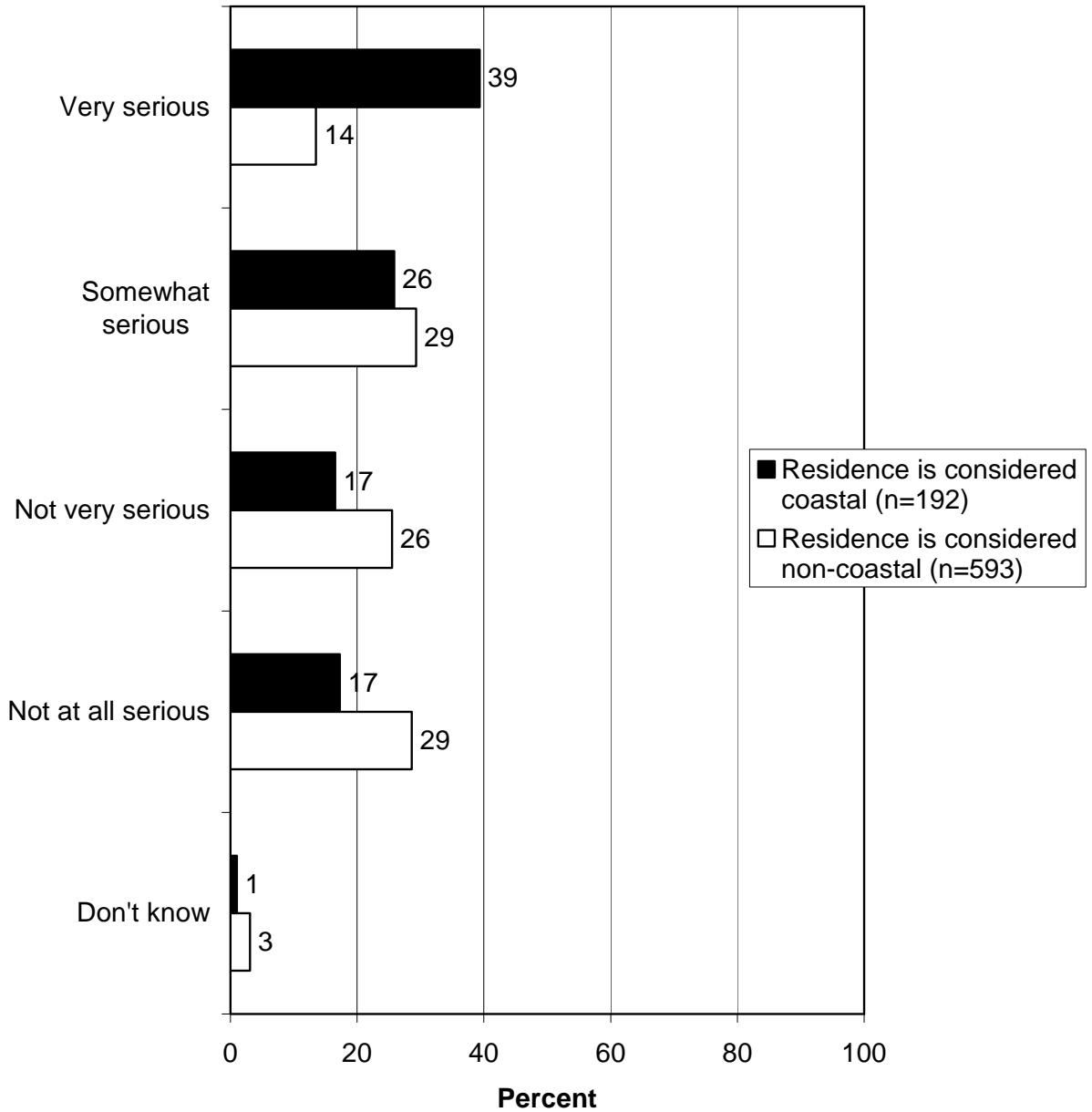




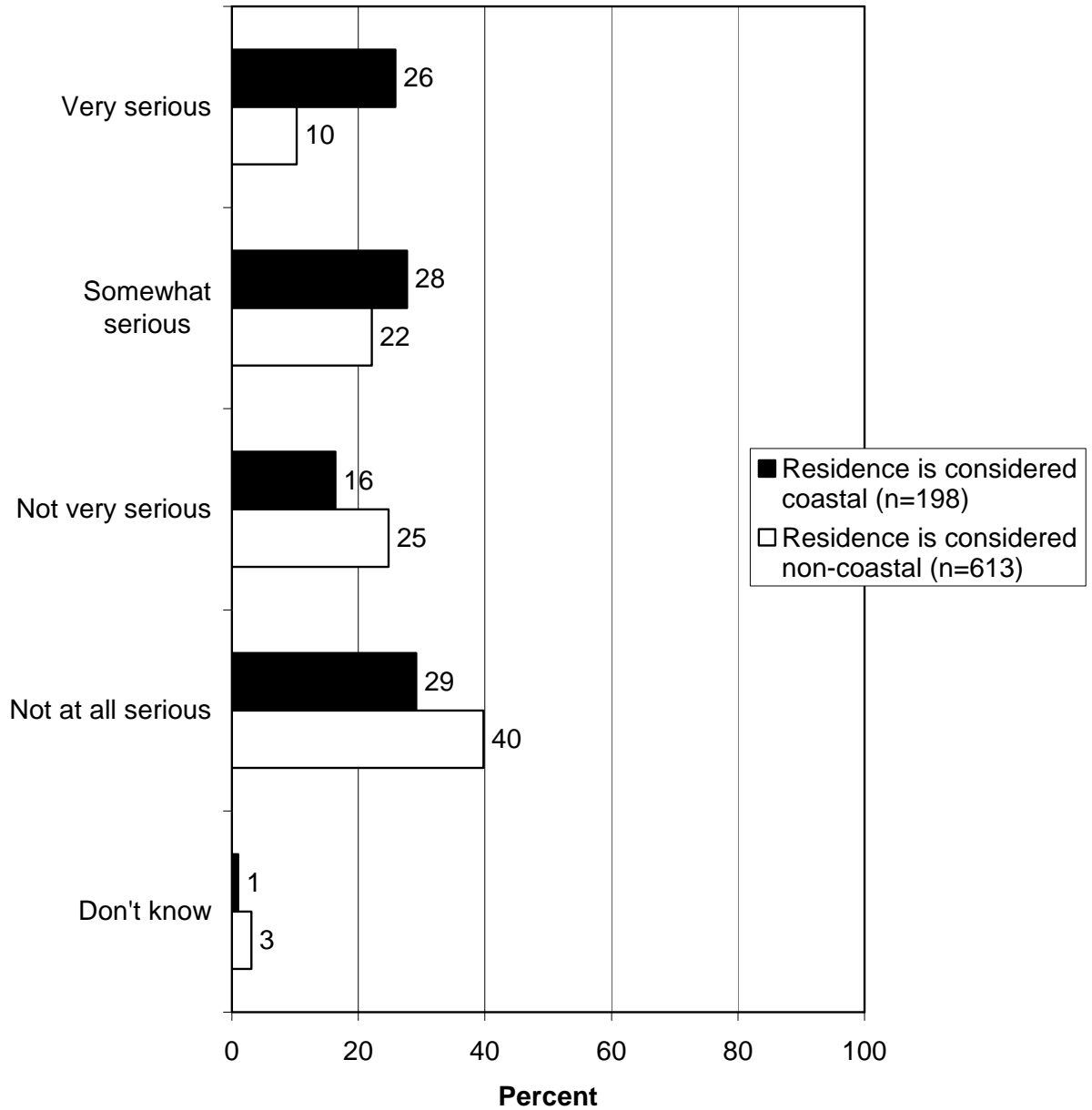
**Q66. How serious a threat do you think sea level rise is to outdoor recreation in Delaware?**



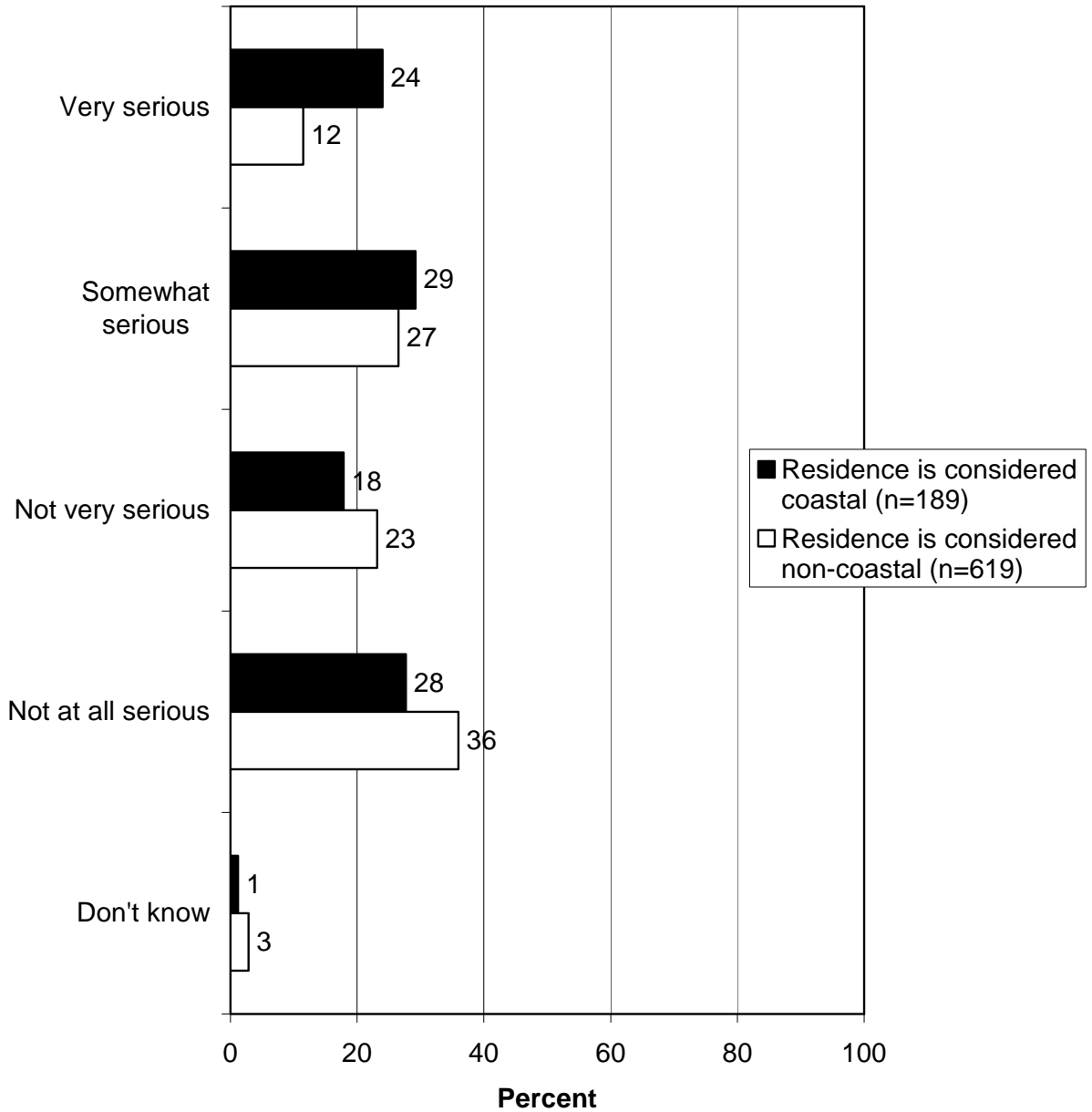
### Q70. How serious a threat do you think sea level rise is to your local community?



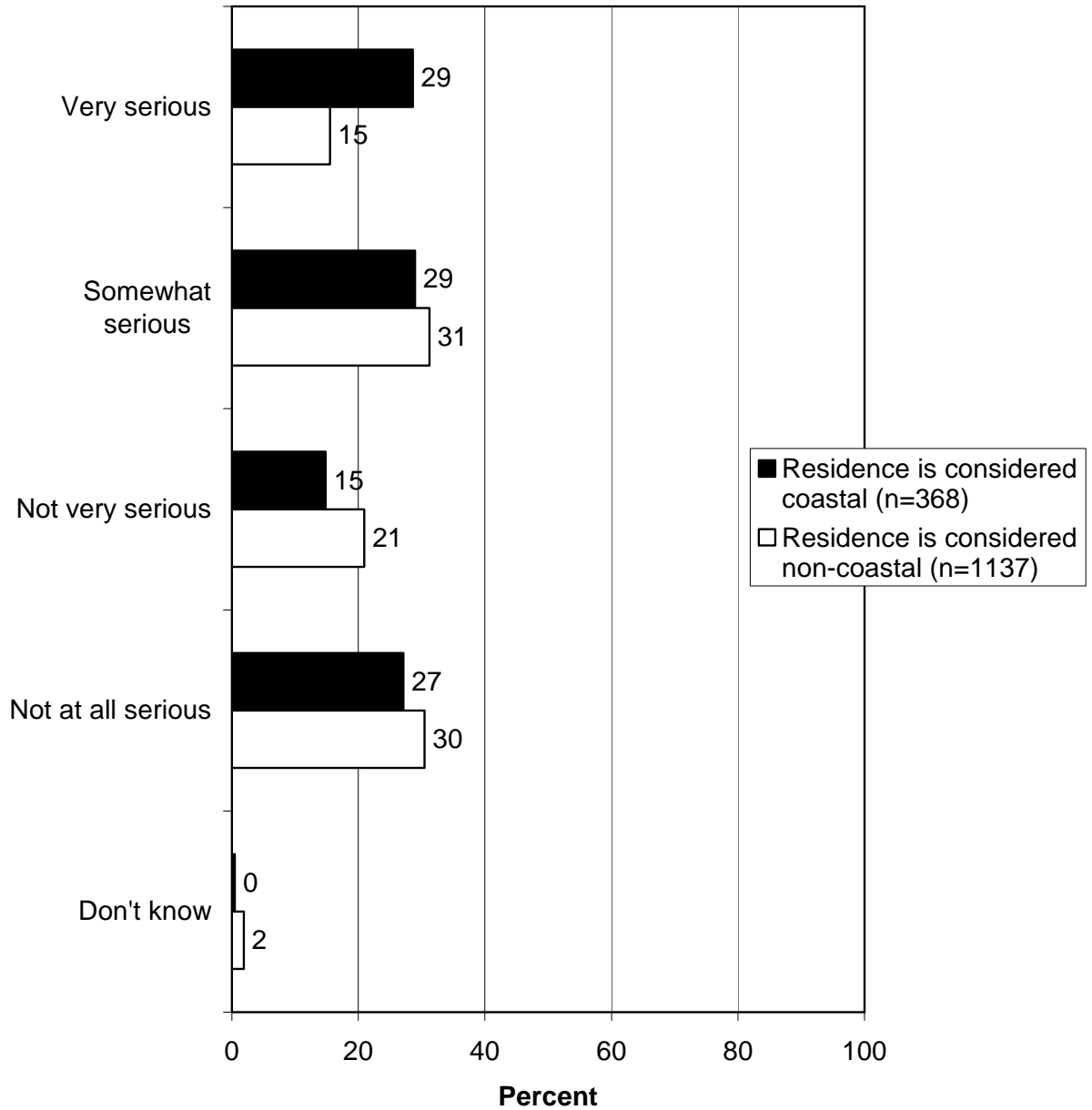
**Q71. How serious a threat do you think sea level rise is to your property?**



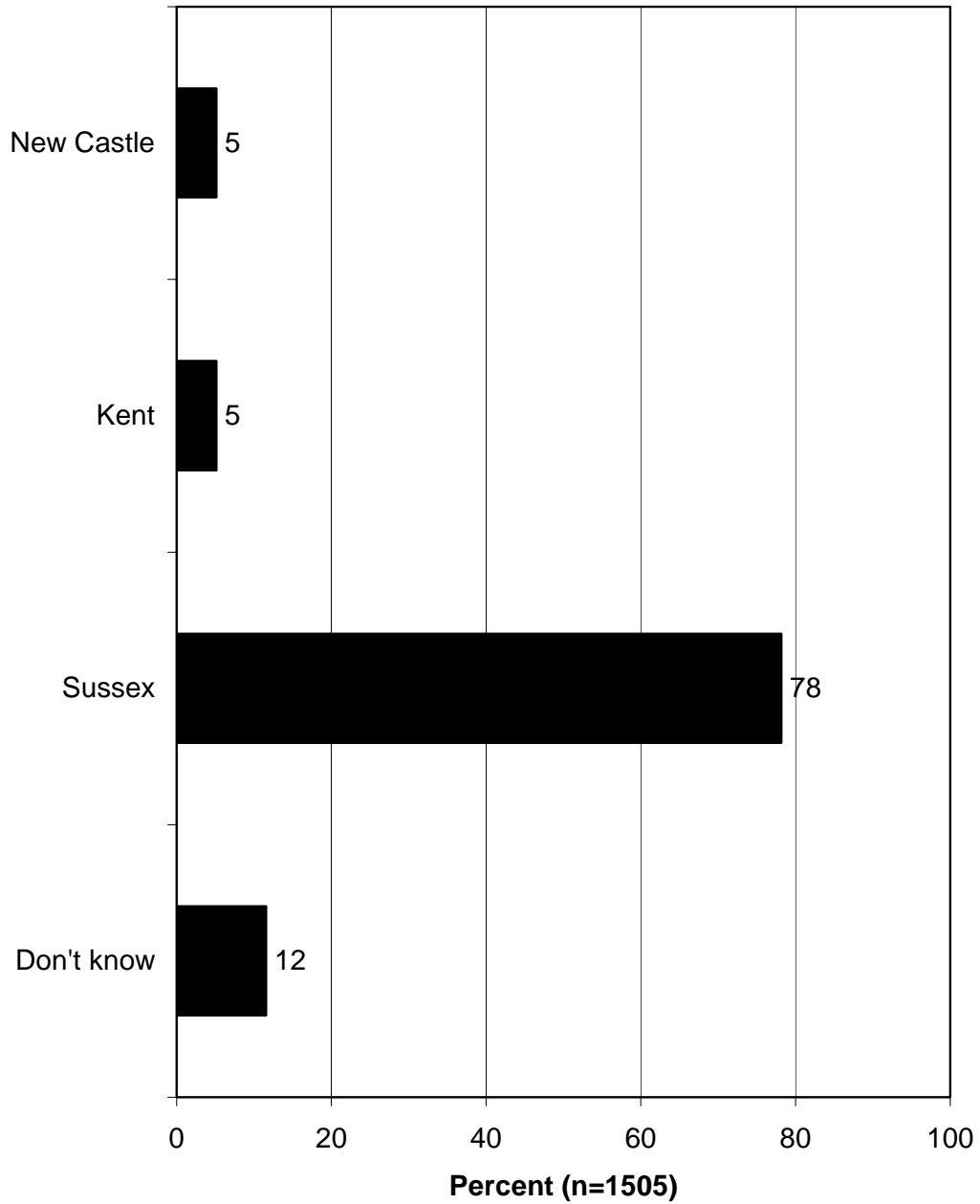
### Q72. How serious a threat do you think sea level rise is to your family?



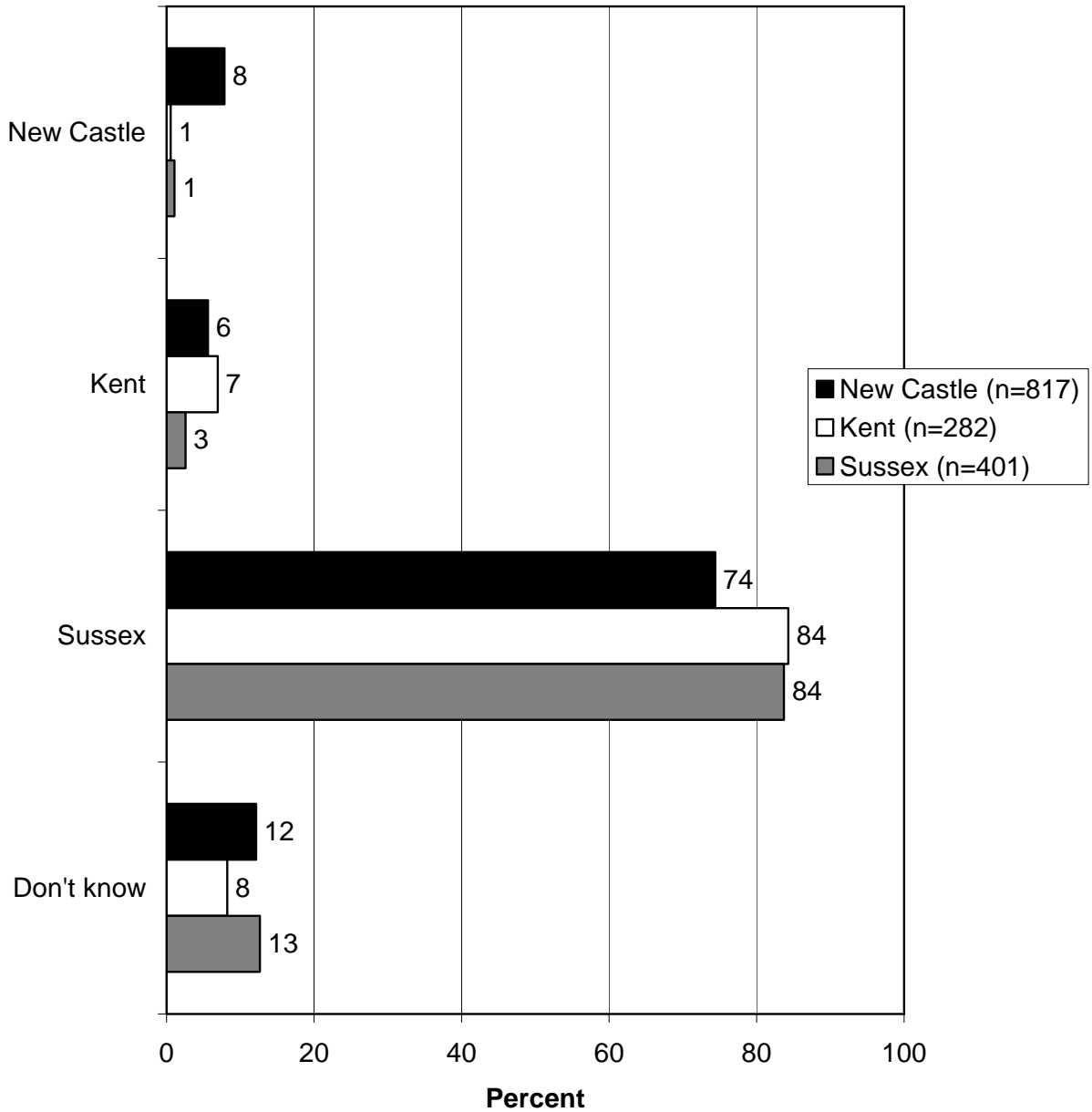
**Q73. How serious a threat do you think sea level rise is to you personally?**



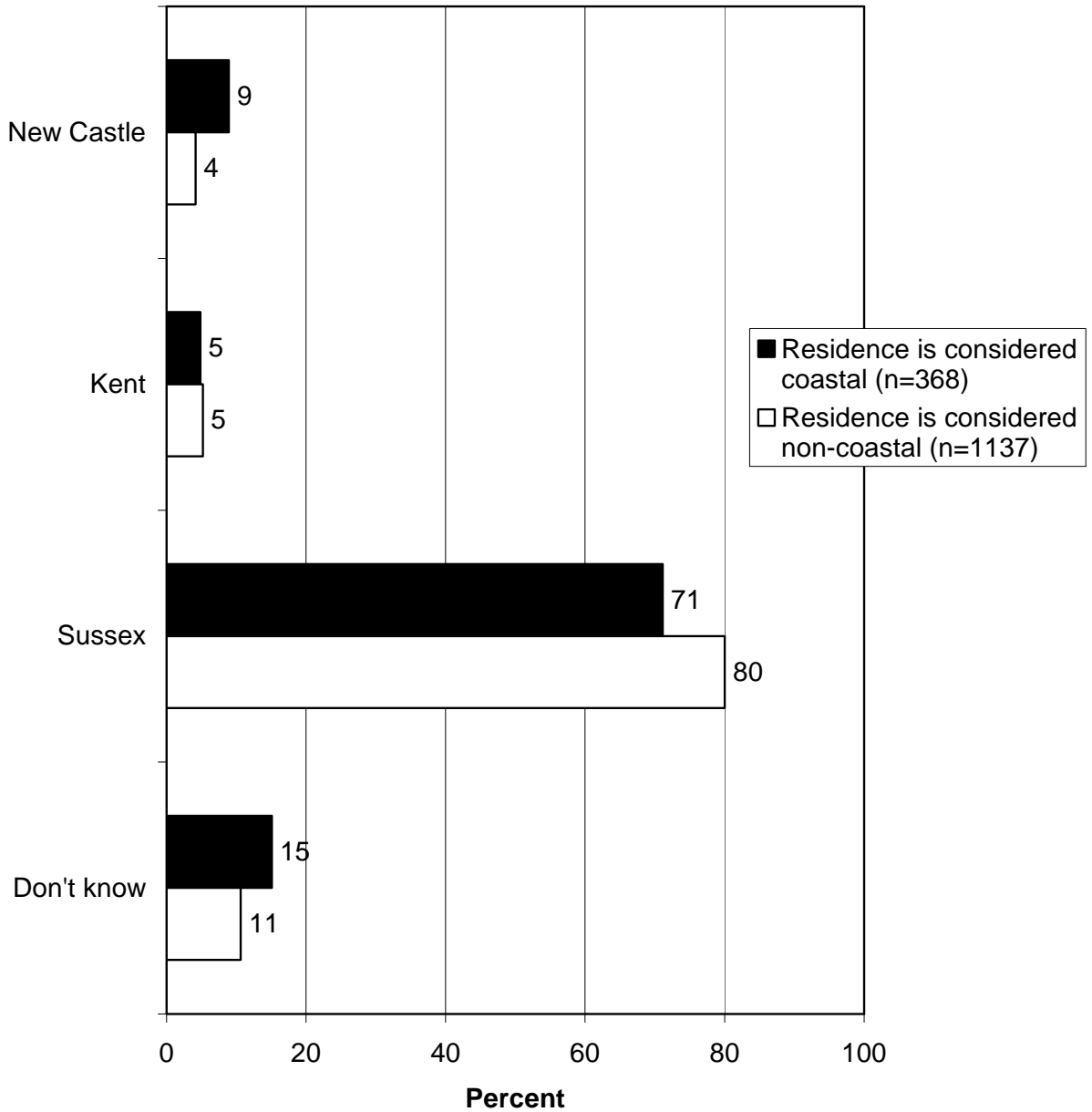
**Q74. In your opinion, which Delaware county is most threatened by sea level rise?**



**Q74. In your opinion, which Delaware county is most threatened by sea level rise?**

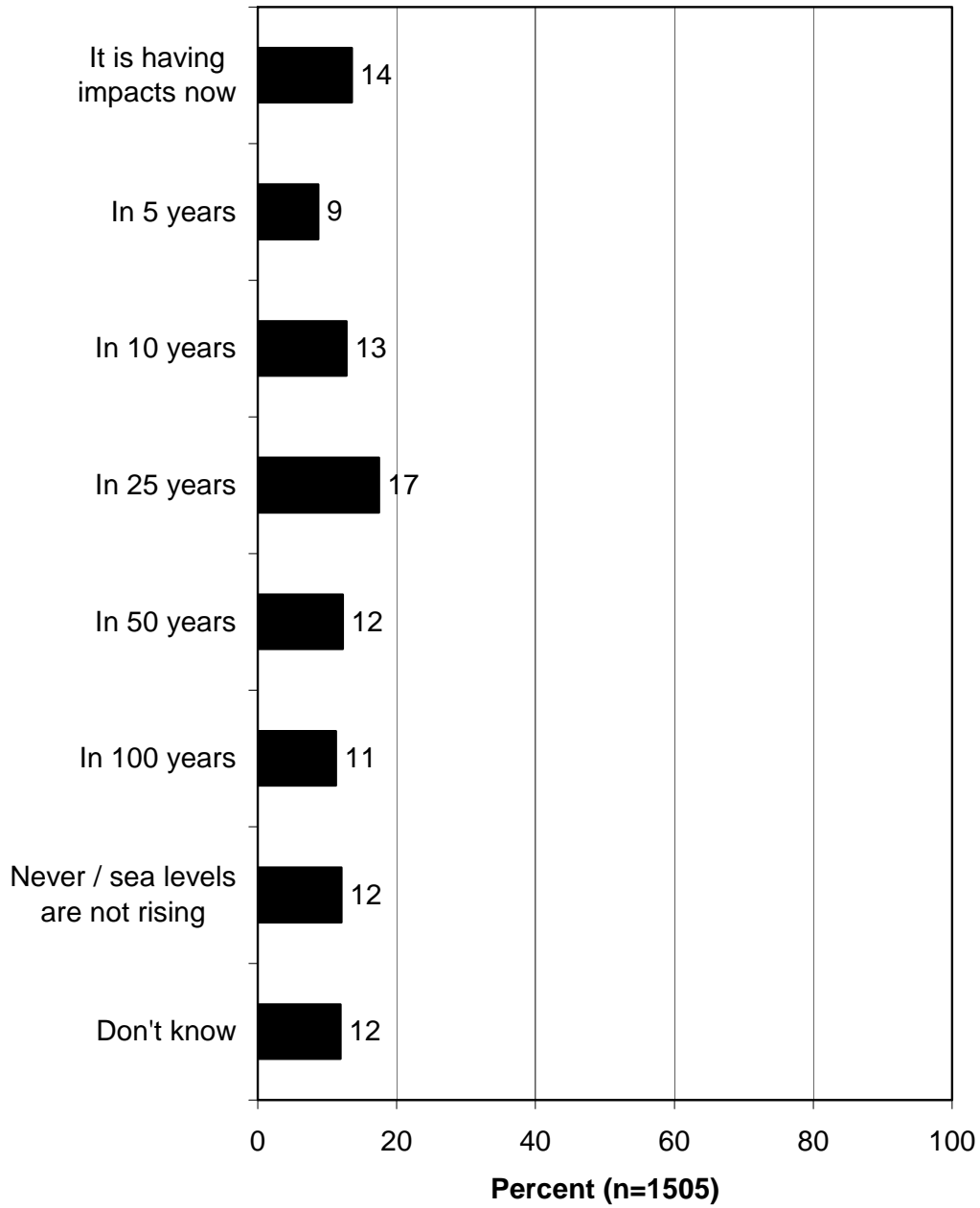


**Q74. In your opinion, which Delaware county is most threatened by sea level rise?**

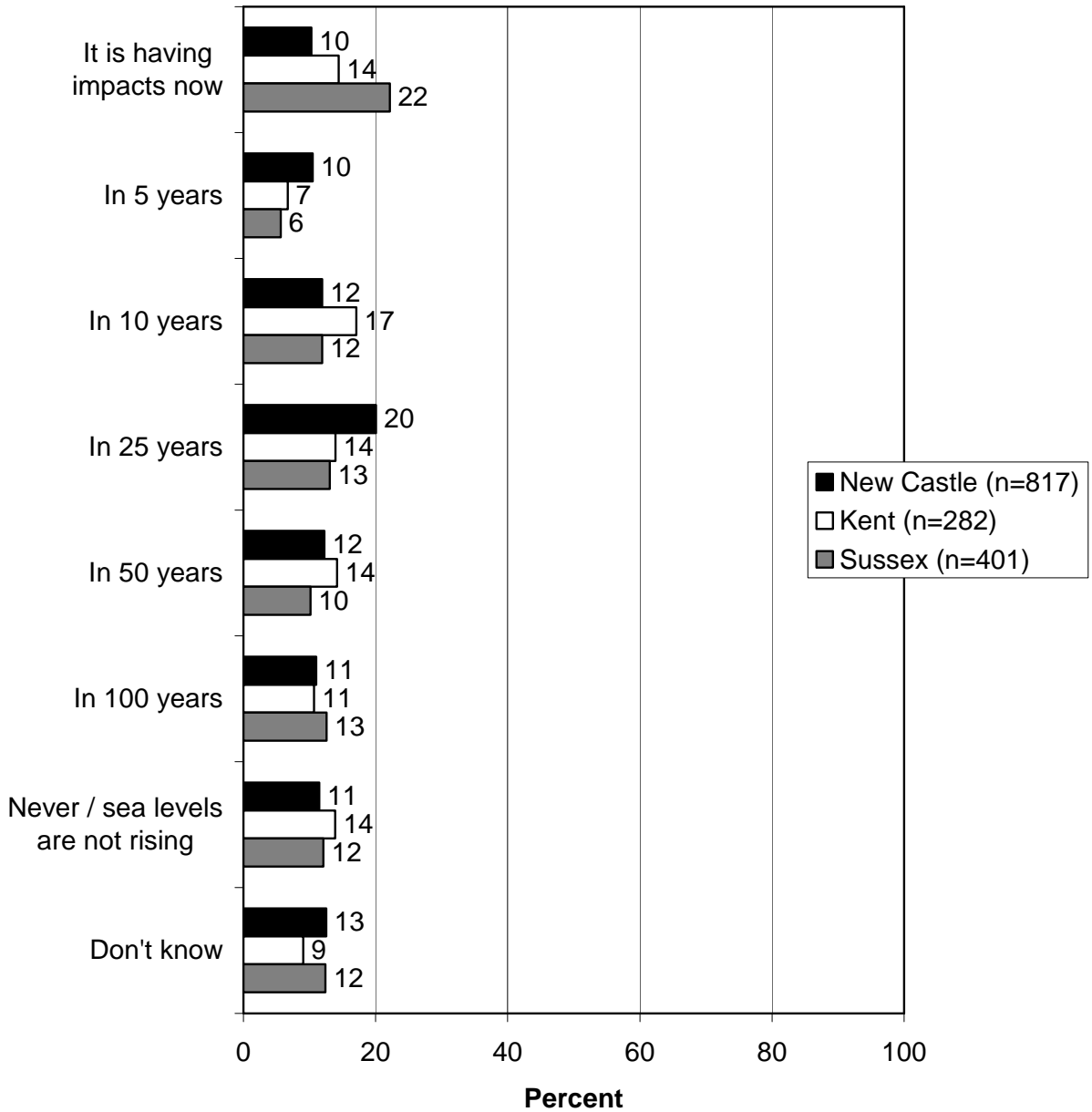




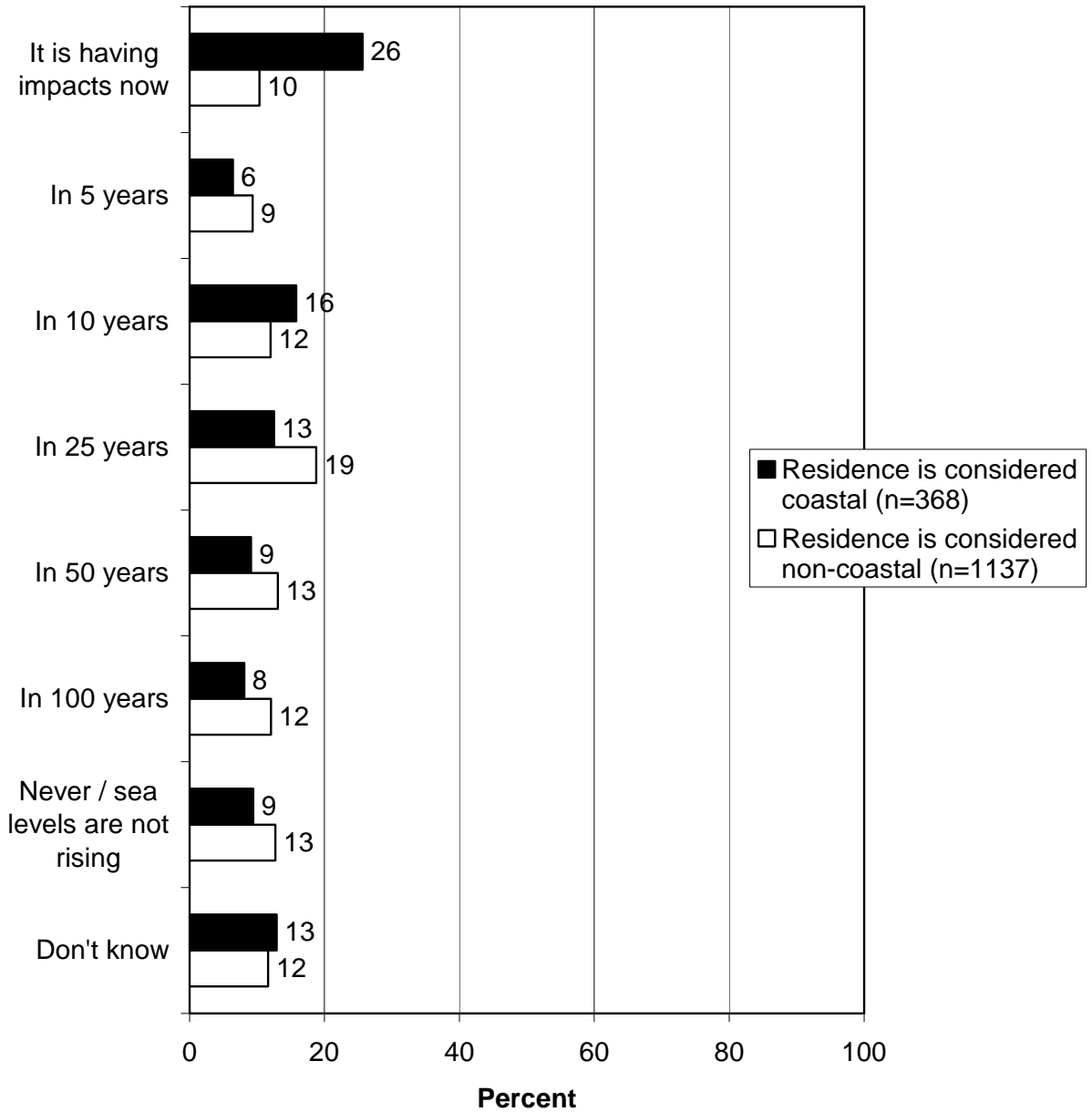
**Q75. When do you think sea level rise will start to have impacts on the area where you live in Delaware?**



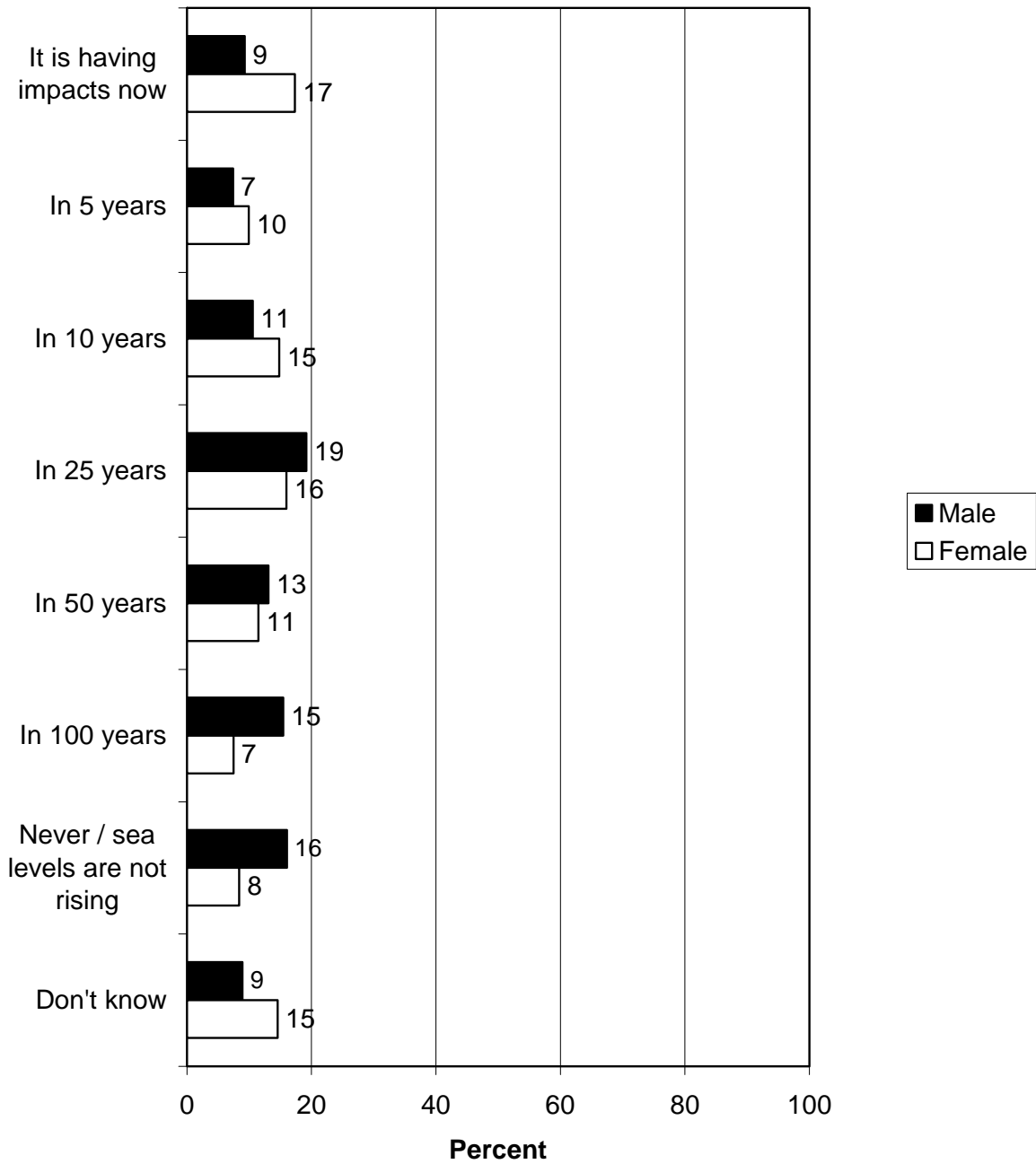
**Q75. When do you think sea level rise will start to have impacts on the area where you live in Delaware?**



**Q75. When do you think sea level rise will start to have impacts on the area where you live in Delaware?**



**Q75. When do you think sea level rise will start to have impacts on the area where you live in Delaware?**



## POTENTIAL ACTIONS PERCEIVED TO AFFECT CLIMATE CHANGE

### PERCEPTIONS OF EFFICACY OF TAKING ACTION TO MITIGATE CLIMATE CHANGE

- Thirteen questions explored whether residents think that human action can affect climate change or mitigate the effects of climate change, shown in Text Box 6 on the following page.
  - The top tier in the ranking shows conflicting opinion. The results suggest that residents believe that human actions can affect climate change, as large majorities *strongly* or *moderately* agree that the U.S. can take actions that will help reduce climate change (79%), that the impacts of climate change can be reduced by human efforts (76%), that there are many actions that can be taken to reduce climate change (72%), and that an individual can personally take actions that will help reduce climate change (70%). However, despite thinking that human actions can affect climate change, large majorities think that we (our society) should conduct more research before taking any action to address sea level rise (71%) and that we (our society) should conduct more research before taking any action to address climate change (68%).
  - Four statements are in the middle tier, showing that a slight majority, despite other opinions, think that action should be taken now and that action would be efficacious in addressing climate change. From 56% to 61% think that we (our society) should take immediate and drastic action to reduce the impacts of climate change (61%), that sea level rise can be reduced by human efforts (59%), that we (our society) should take immediate and drastic action to reduce the impacts of sea level rise (58%), and that climate change is something people can control (56%).
  - The bottom tier has three items, which support the above findings by showing that less than a majority are pessimistic about the efficacy of taking action to mitigate climate change. Less than a majority think that there is limited action that can be taken to reduce climate change (46%), that the actions of a single person will not make any difference in reducing climate change (32%), and that the actions of a single country like the U.S. will not make any difference in reducing climate change (31%).
  - Taken as a whole, the results suggest that people think that human action can mitigate the effects of climate change, but opinion is split regarding whether society should take *immediate* action or whether society should *conduct more research before* taking action.

**Text Box 6****Statements Regarding Taking Action to Mitigate Climate Change  
(Ranked by the Percentage Who Strongly or Moderately Agree With the Following Statements)**

The U.S. can take actions that will help reduce climate change.  
 The impacts of climate change can be reduced by human efforts.  
 There are many actions that can be taken to reduce climate change.  
 We should conduct more research before taking any action to address sea level rise.  
 You can personally take actions that will help reduce climate change.  
 We should conduct more research before taking any action to address climate change.  
 We should take immediate and drastic action to reduce the impacts of climate change.  
 Sea level rise can be reduced by human efforts.  
 We should take immediate and drastic action to reduce the impacts of sea level rise.  
 Climate change is something people can control.  
 There is limited action that can be taken to reduce climate change.  
 The actions of a single person like you will not make any difference in reducing climate change.  
 The actions of a single country like the U.S. will not make any difference in reducing climate change.

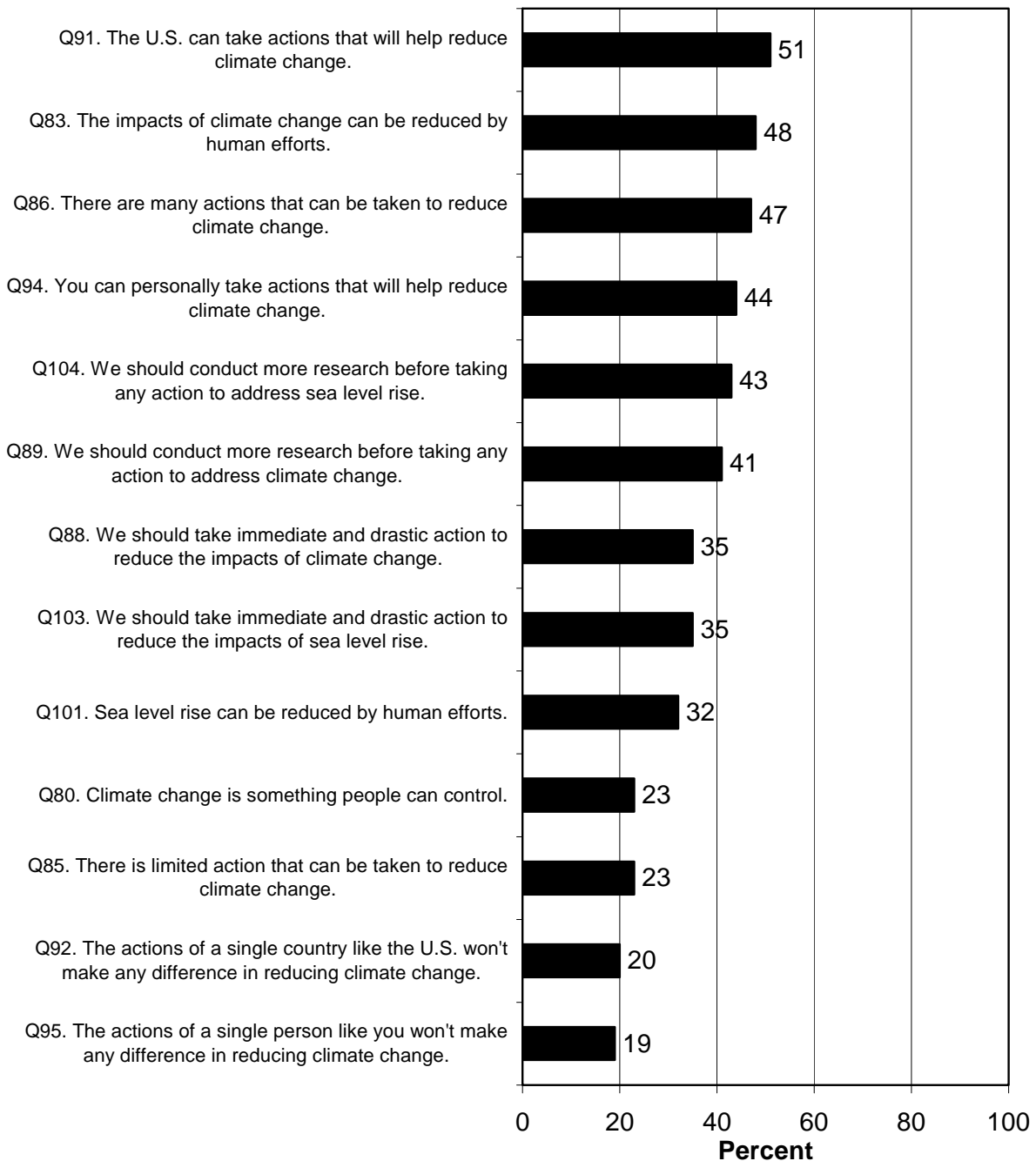
- One statement from the above series was examined in detail in the nonparametric analysis:  
 The impacts of climate change can be reduced by human efforts.
  - The nonparametric analysis found that the following responses are correlated with *strongly* agreeing with the statement that the impacts of climate change can be reduced by human efforts:
    - Says he/she knows a great deal or a moderate amount about climate change ( $p \leq 0.05$ ).
    - Thinks that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.001$ ).
    - Shows concern about climate change and sea level rise (e.g., strongly agrees that scientists are right that climate change is occurring; thinks that climate change is a very serious threat; is completely or mostly convinced that sea levels are rising) (all at  $p \leq 0.001$  or greater significance).
    - Thinks that sea level rise is a very or somewhat serious threat to the United States, a very or somewhat serious threat to river-front cities and towns in Delaware, a very or somewhat serious threat to the Mid-Atlantic United States, a very serious threat to ocean-front cities and towns in Delaware, a very serious threat to Delaware beaches, a very or somewhat serious threat to him or her personally, a very serious threat to marshes and wetlands in Delaware, and a very serious threat to the State of Delaware (all at  $p \leq 0.001$  or greater significance).
    - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).

- On all questions about how to improve areas at risk from sea level rise, supports any efforts to address sea level rise in Delaware or reduce its impacts (e.g., strongly supports changing building codes and regulations to reduce risk in flood prone areas; strongly supports avoiding building new structures; supports purchasing or acquiring land and open space from willing land sellers using government funds) (all at  $p \leq 0.01$  or greater significance).
  - Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - Thinks that his or her county government officials, his or her state government officials, Delaware's state legislators, corporations and industry, his or her city or town government officials, Delaware's state agencies, Delaware citizens, Delaware's governor, and the U.S. Congress should all be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
  - Would most like to have more information on funding needs / estimated budget to address sea level rise in Delaware ( $p \leq 0.001$ ), actions that can be taken to reduce impacts of sea level rise ( $p \leq 0.001$ ), how to protect property from sea level rise ( $p \leq 0.001$ ), how sea level rise relates to climate change / global warming ( $p \leq 0.001$ ), current or potential impacts of sea level rise ( $p \leq 0.001$ ), and sea level rise in general ( $p \leq 0.01$ ).
  - A primary source of his or her information about environmental issues in Delaware is the Internet, not including Department of Natural Resources and Environmental Control website ( $p \leq 0.05$ ).
  - Is female ( $p \leq 0.001$ ).
  - Rents his or her current place of residence ( $p \leq 0.001$ ).
  - Lives in New Castle County ( $p \leq 0.001$ ).
  - Is between ages 35-64 ( $p \leq 0.05$ ).
  - Considers his or her place of residence to be a small city or town ( $p \leq 0.05$ ).
- Four questions in the above series regarding whether residents think that human action can affect climate change showed statistically significant differences in the crosstabulation by county of residence.
- Sussex County residents are the *least* likely, relative to residents of the other two counties, to *strongly* agree that climate change is something people can control ( $p \leq 0.01$ ).
  - New Castle County residents are the most likely, compared to residents of the other two counties, to *strongly* agree that the impacts of climate change can be reduced by human efforts ( $p \leq 0.05$ ).
  - Kent County residents, relative to residents of the other two counties, are the *least* likely to *strongly* agree that there are many actions that can be taken to reduce climate change ( $p \leq 0.05$ ).

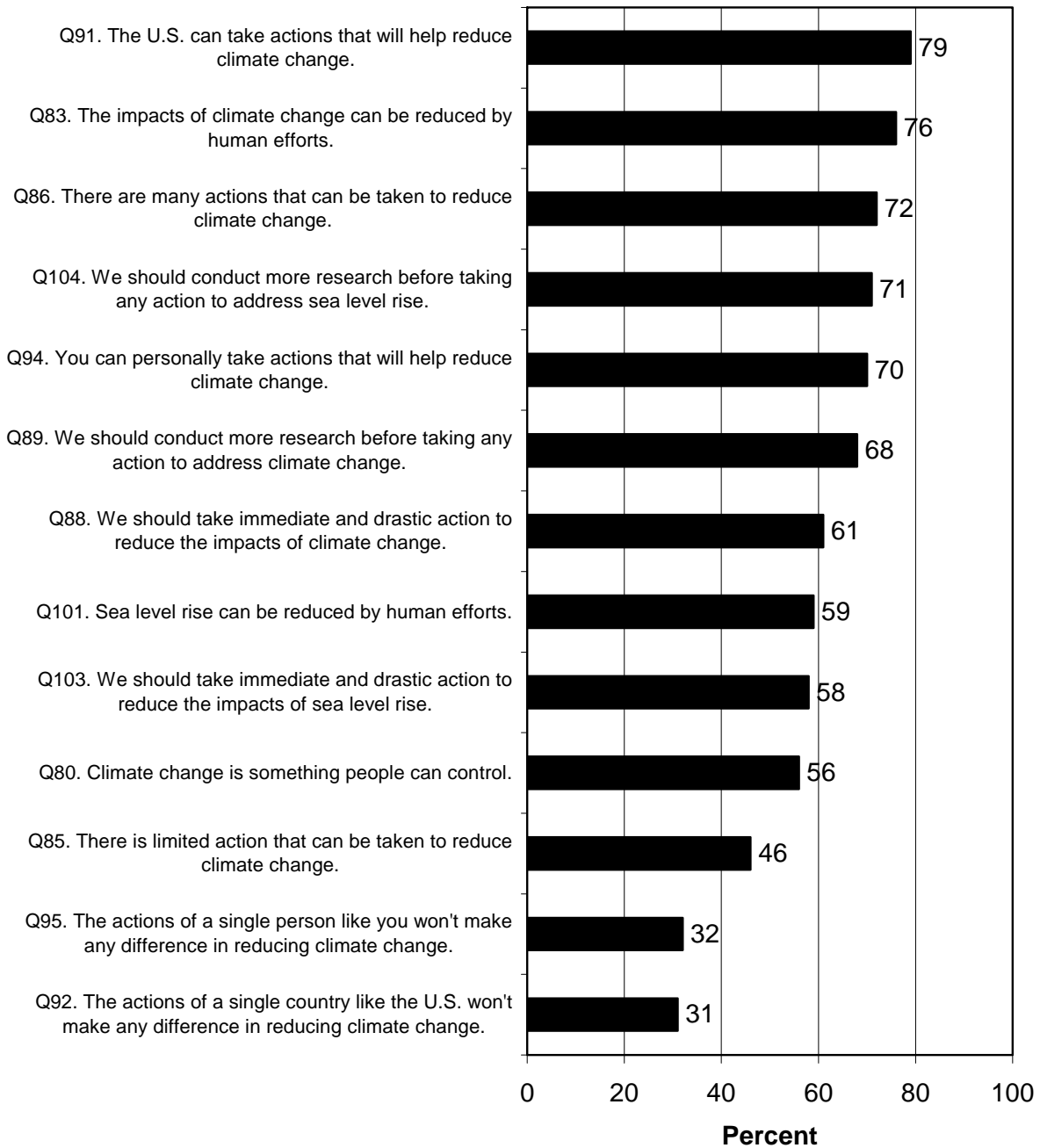
- Finally in this series, New Castle County residents are the most likely, relative to residents of the other two counties, to *strongly* or *moderately* agree that sea level rise can be reduced by human efforts ( $p \leq 0.05$ ) (see graph on page 180).
- The crosstabulation by coastal/non-coastal found that coastal residents, compared to non-coastal residents, are more likely to *strongly* agree that there are many actions that can be taken to reduce climate change ( $p \leq 0.05$ ). This was the only question from the above series with a marked difference in the coastal/non-coastal crosstabulation.
- One question in the above series was crosstabulated by gender to determine if differences existed. Women, compared to men, are more likely to *strongly* agree that the impacts of climate change can be reduced by human efforts ( $p \leq 0.001$ ).
- Regardless of how many years residents believe it will take for sea level rise to affect their area, residents overwhelmingly think action should be taken to address or reduce the impacts of sea level rise *before impacts occur* (80%) rather than *as impacts begin* (8%) or *after impacts cause problems* (3%). (The remainder either said that sea levels are not rising or that they do not know when action should be taken.)



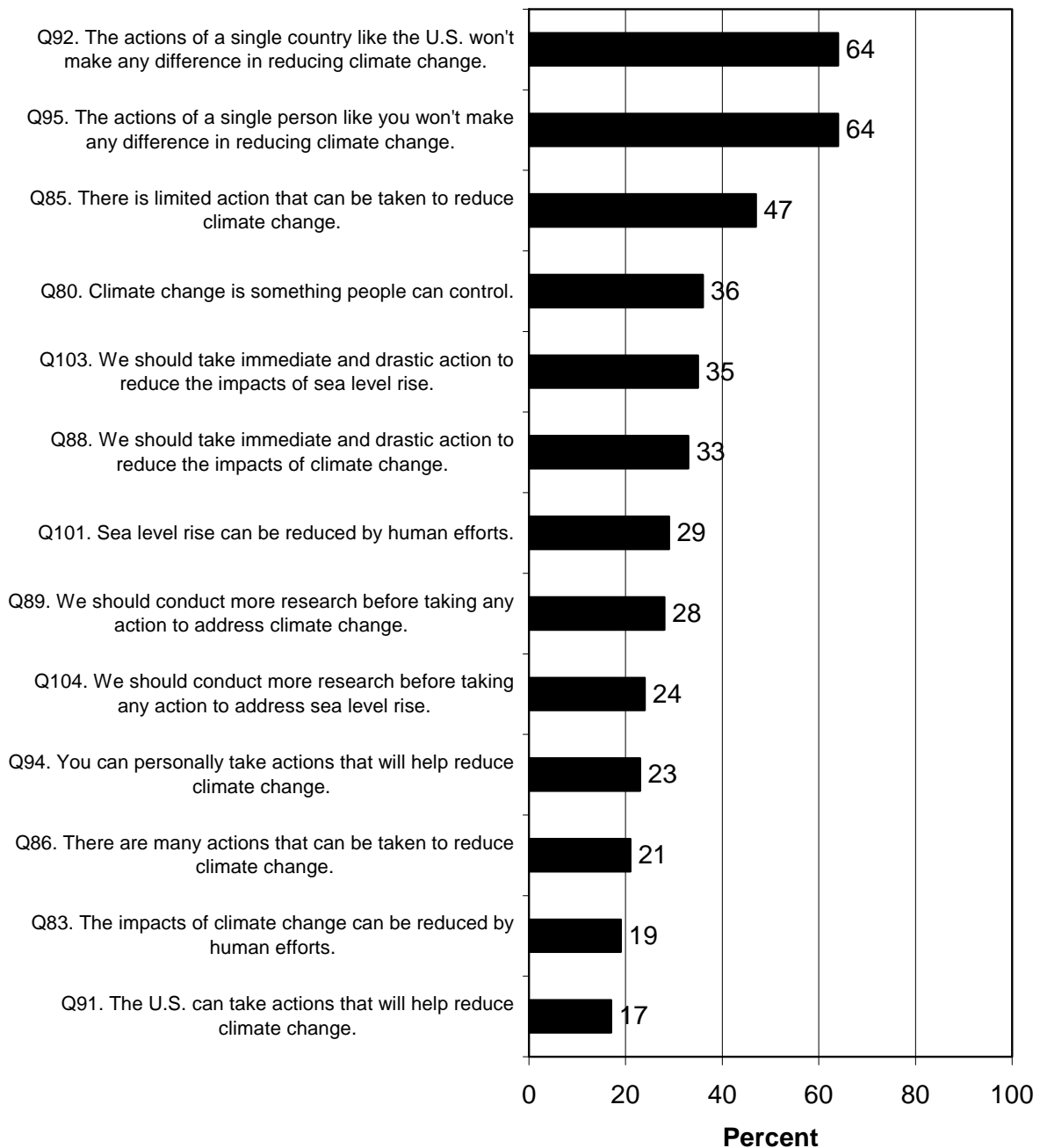
**Q80, 83, 85-86, 88-89, 91-92, 94-95, 98-101, 103-104.**  
**Percent who strongly agree with the following**  
**statements about climate change and sea level rise.**



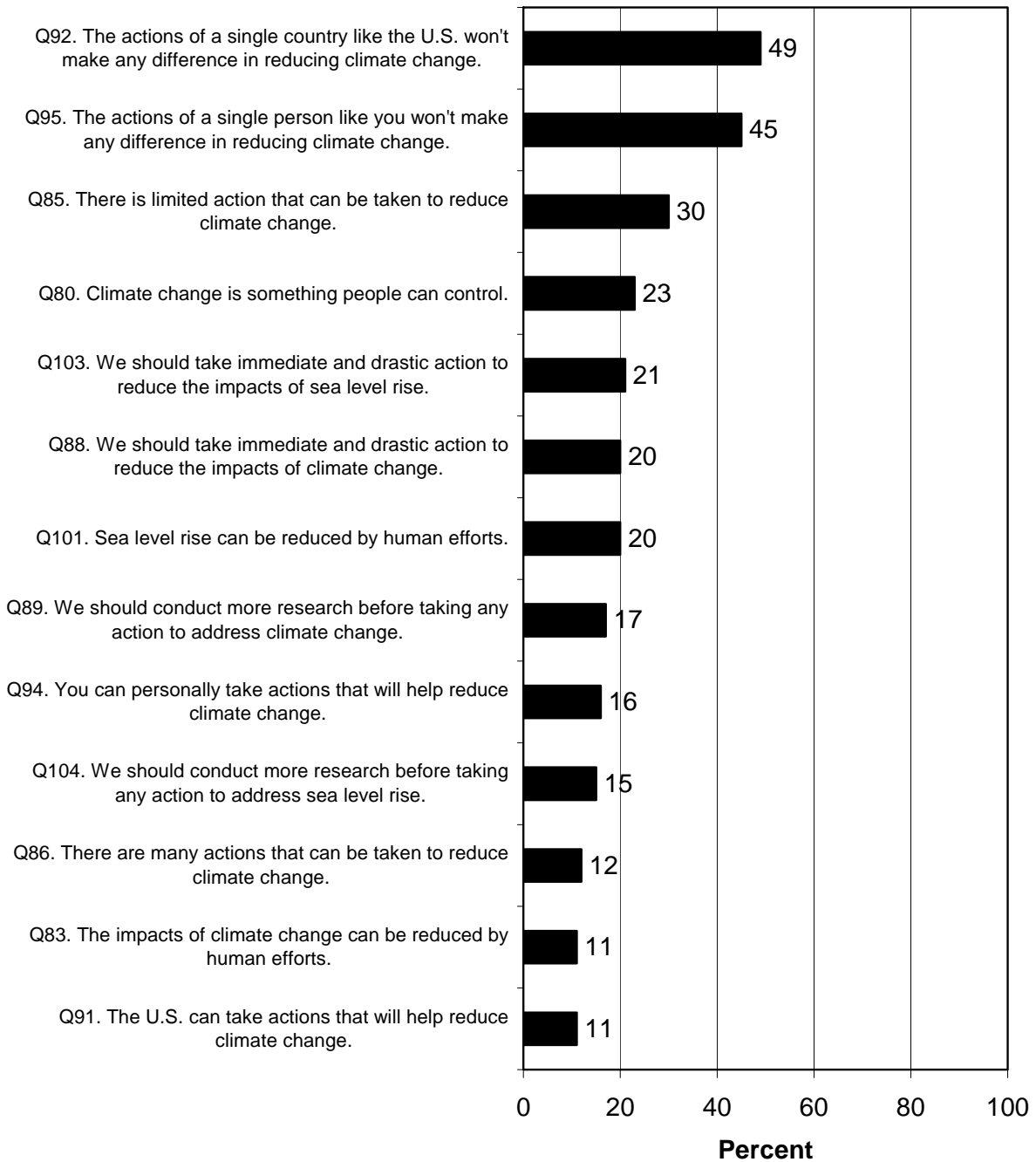
**Q80, 83, 85-86, 88-89, 91-92, 94-95, 98-101, 103-104.  
Percent who strongly or moderately agree with the  
following statements about climate change and sea  
level rise.**



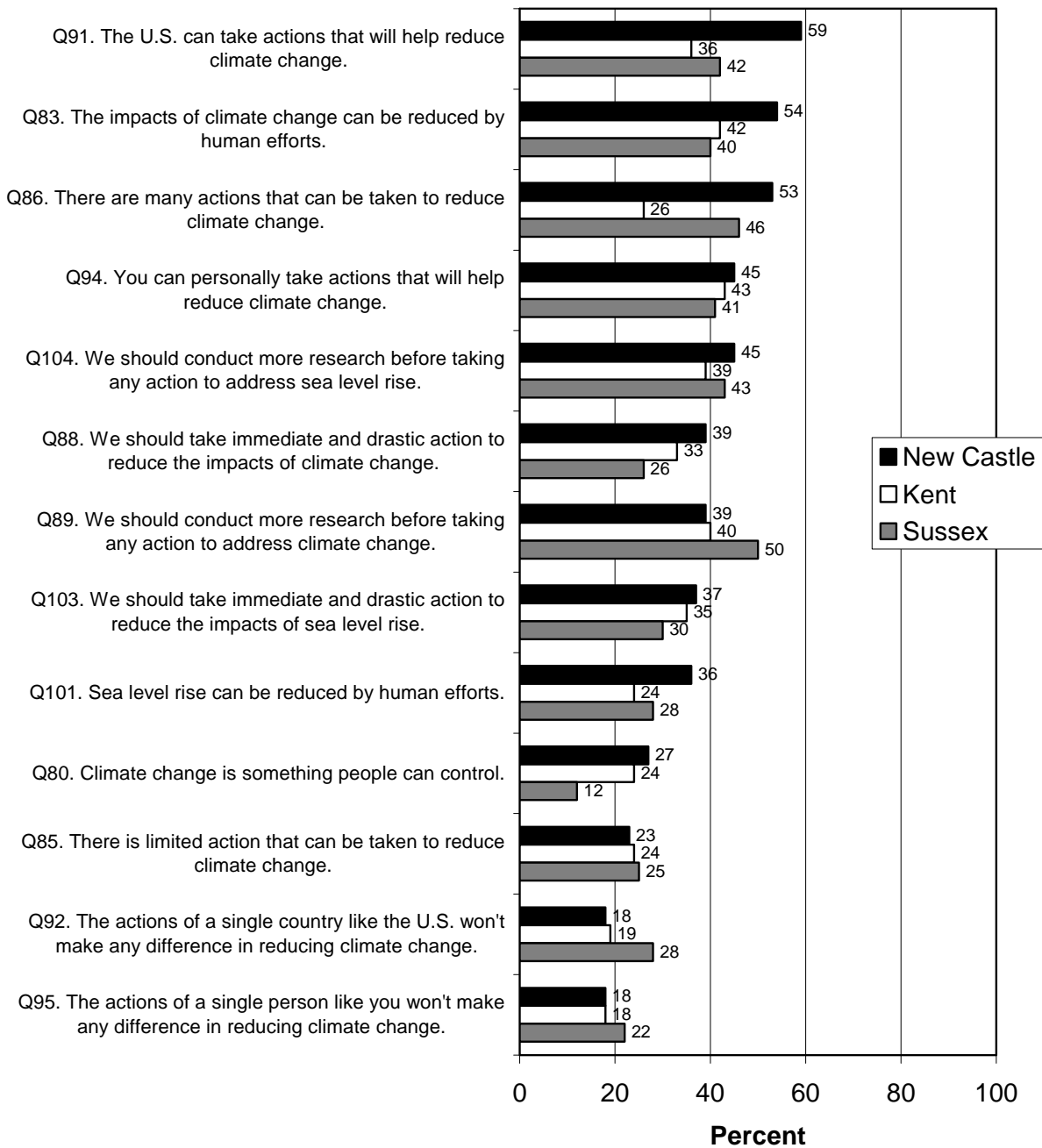
**Q80, 83, 85-86, 88-89, 91-92, 94-95, 98-101, 103-104.  
Percent who moderately or strongly disagree with  
the following statements about climate change and  
sea level rise.**



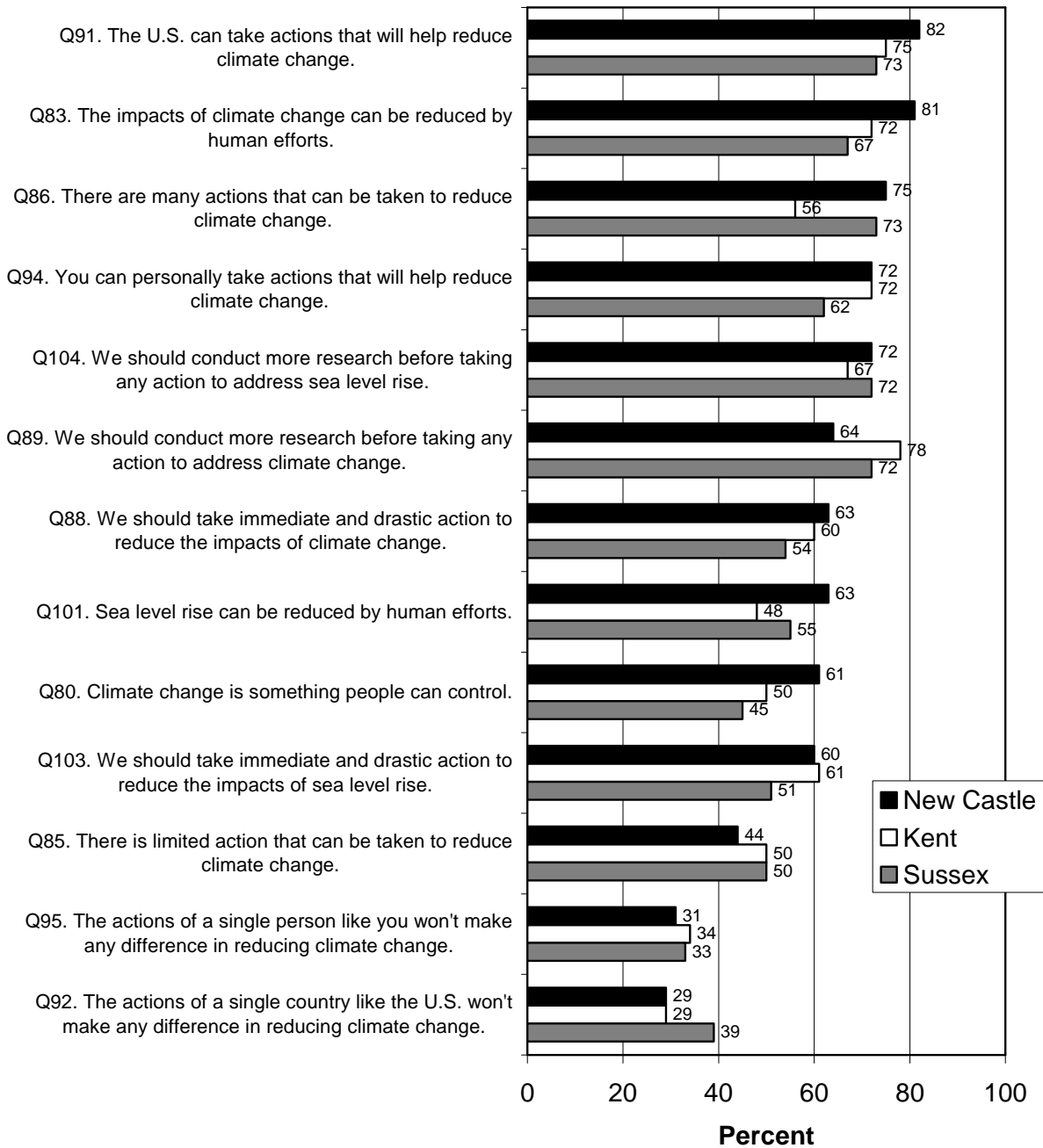
**Q80, 83, 85-86, 88-89, 91-92, 94-95, 98-101, 103-104.  
Percent who strongly disagree with the following  
statements about climate change and sea level rise.**



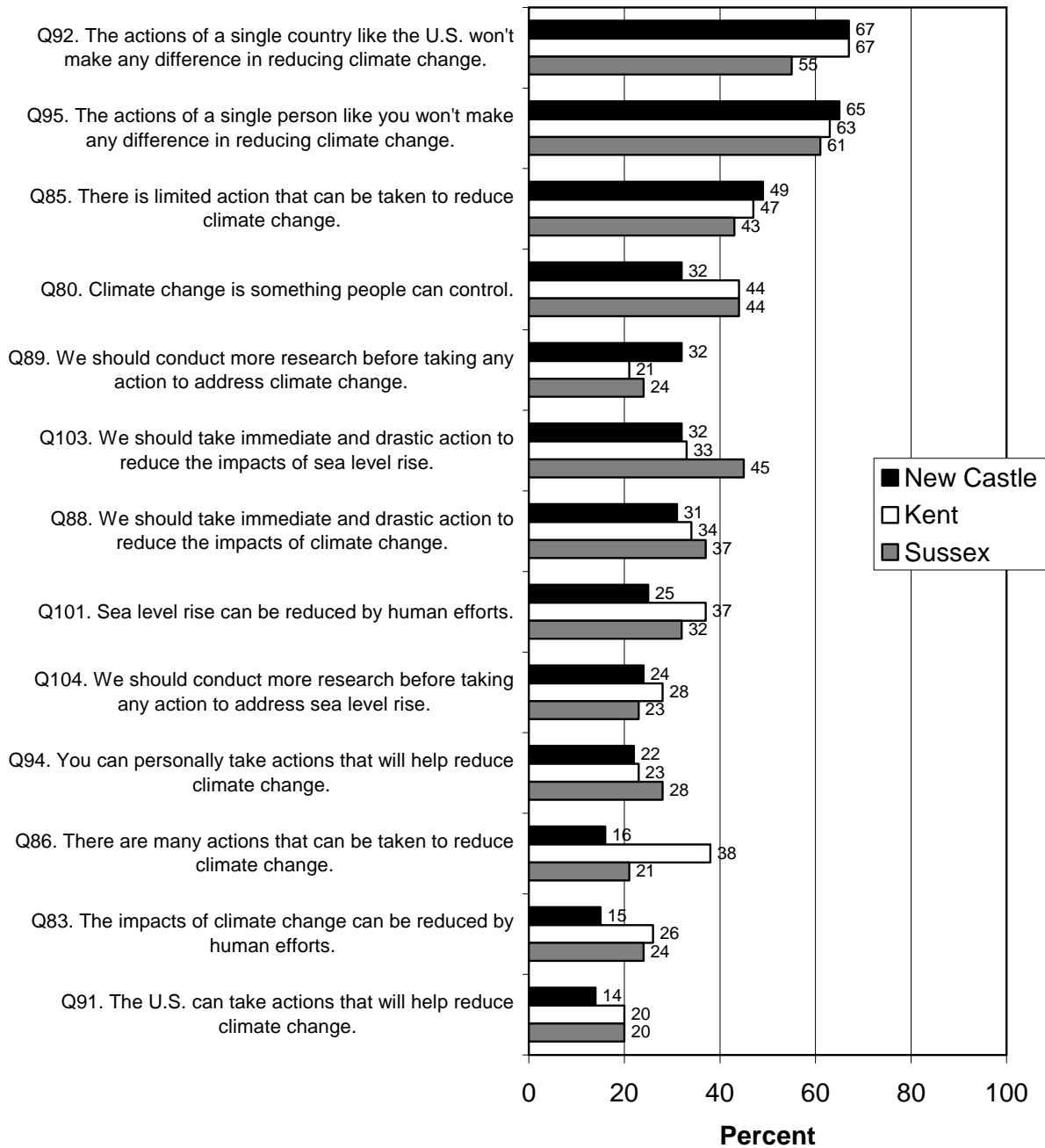
**Q80, 83, 85-86, 88-89, 91-92, 94-95, 98-101, 103-104.**  
**Percent who strongly agree with the following**  
**statements about climate change and sea level rise.**



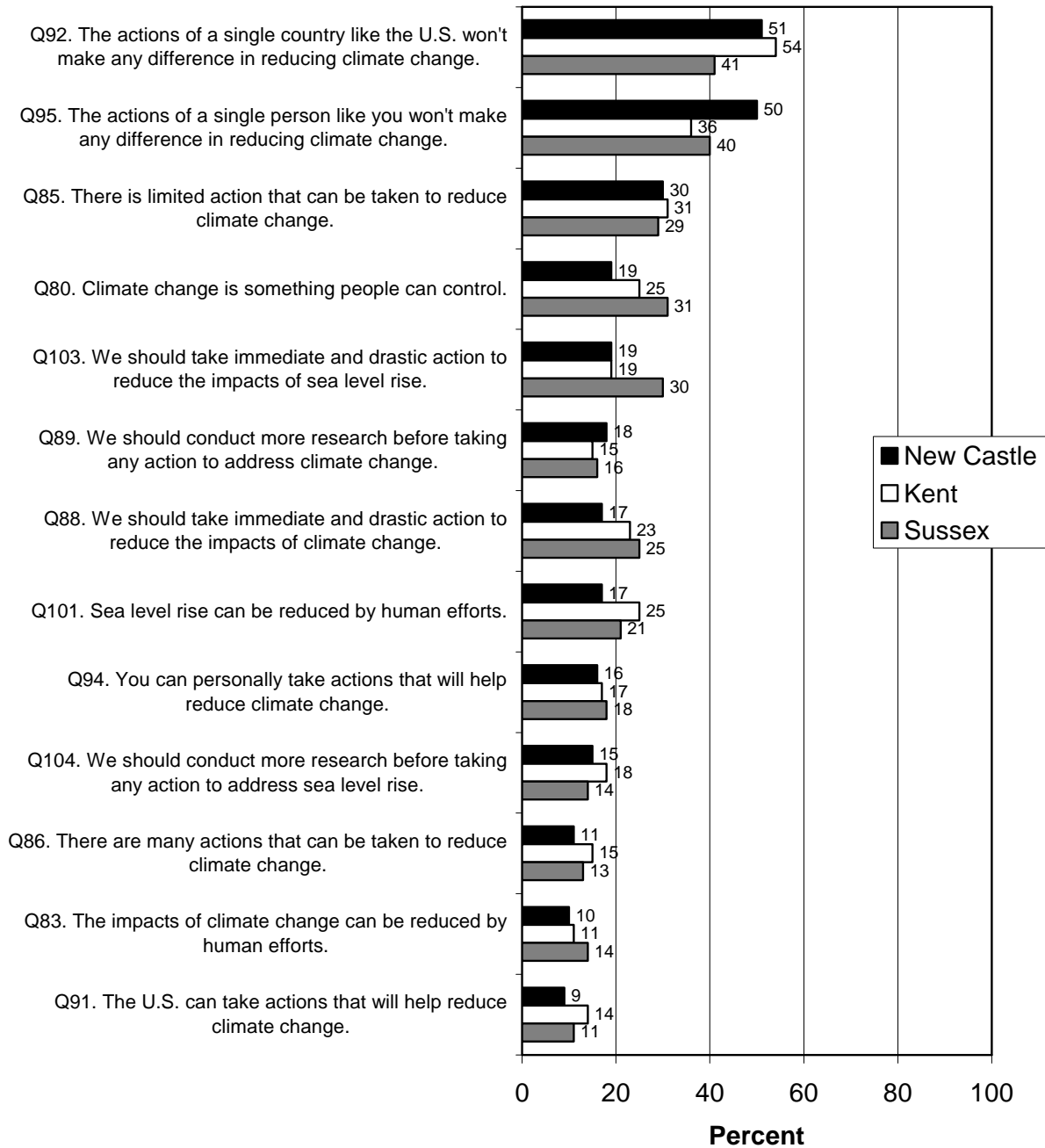
**Q80, 83, 85-86, 88-89, 91-92, 94-95, 98-101, 103-104.  
Percent who strongly or moderately agree with the  
following statements about climate change and sea  
level rise.**



**Q80, 83, 85-86, 88-89, 91-92, 94-95, 98-101, 103-104.  
Percent who moderately or strongly disagree with  
the following statements about climate change and  
sea level rise.**

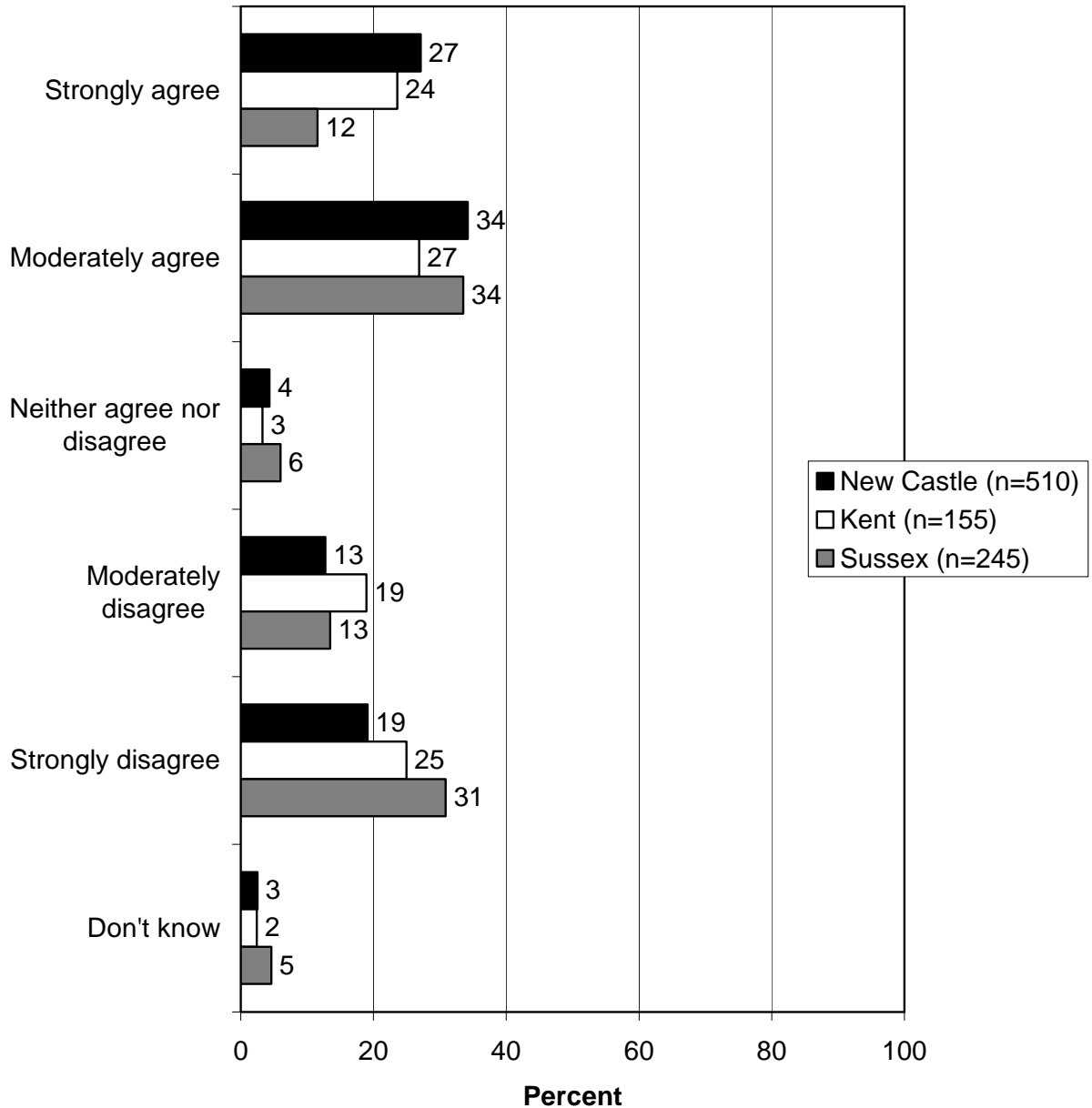


**Q80, 83, 85-86, 88-89, 91-92, 94-95, 98-101, 103-104.**  
**Percent who strongly disagree with the following**  
**statements about climate change and sea level rise.**

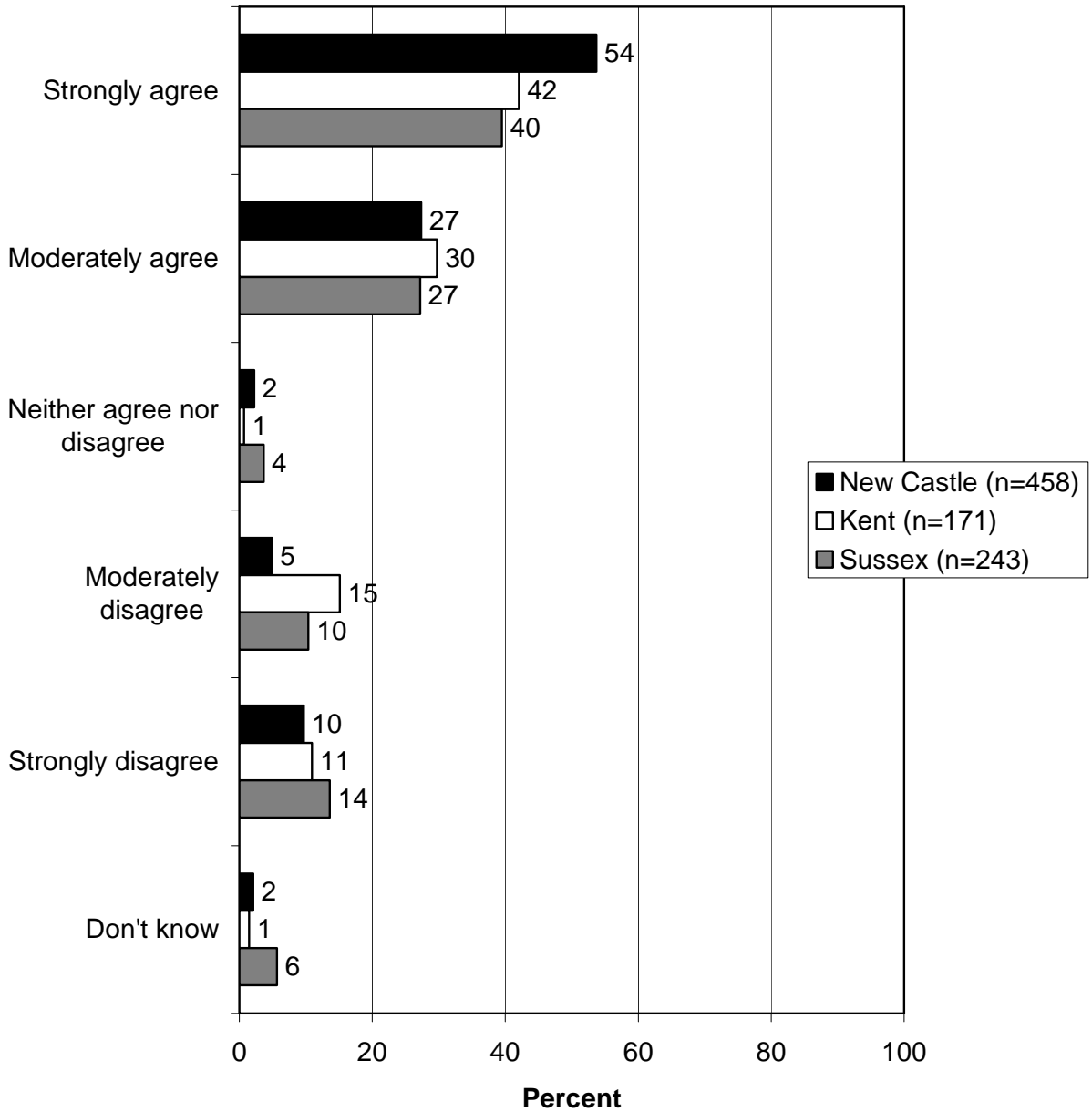




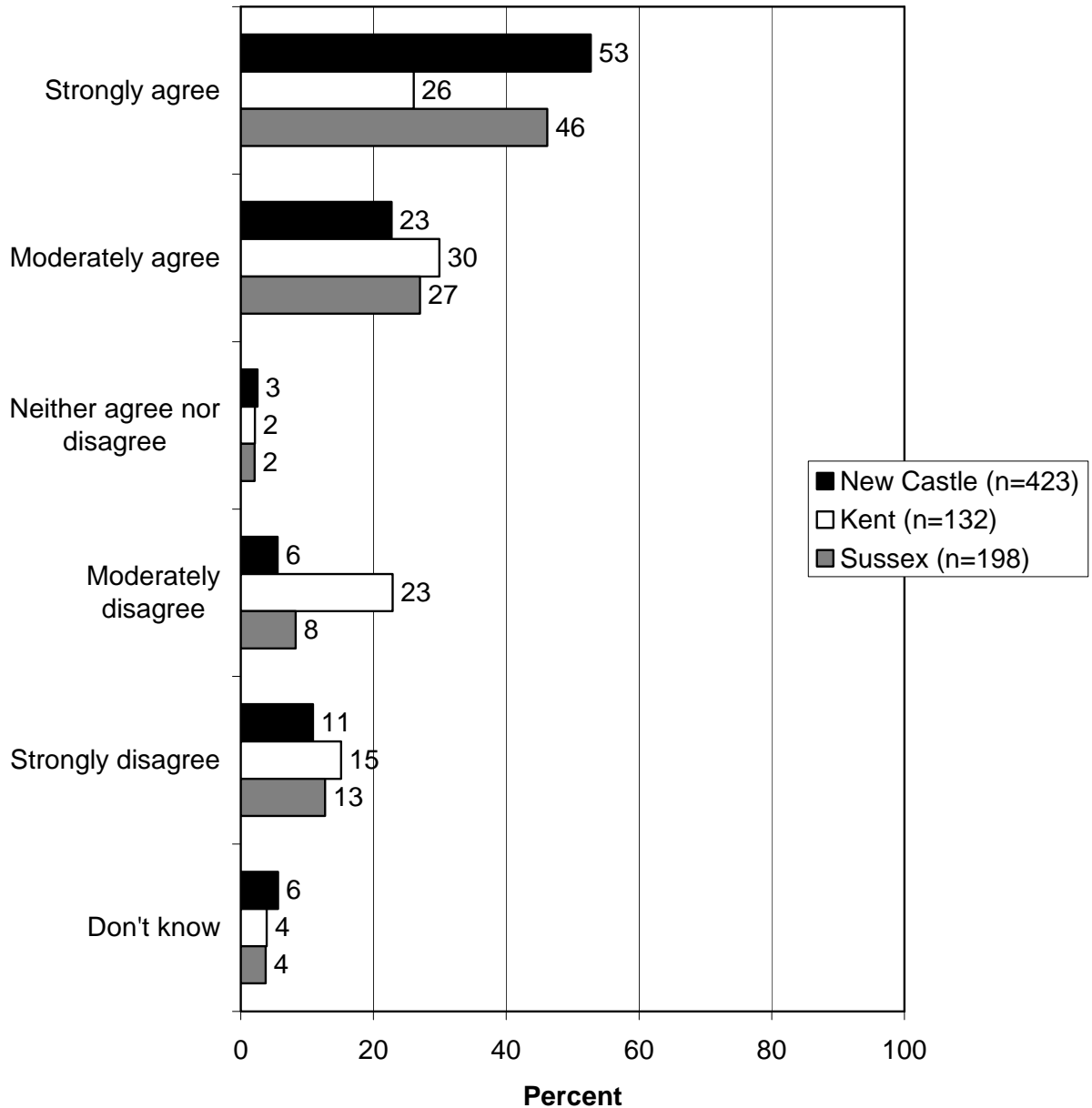
**Q80. Do you agree or disagree with this statement:  
Climate change is something people can control.**



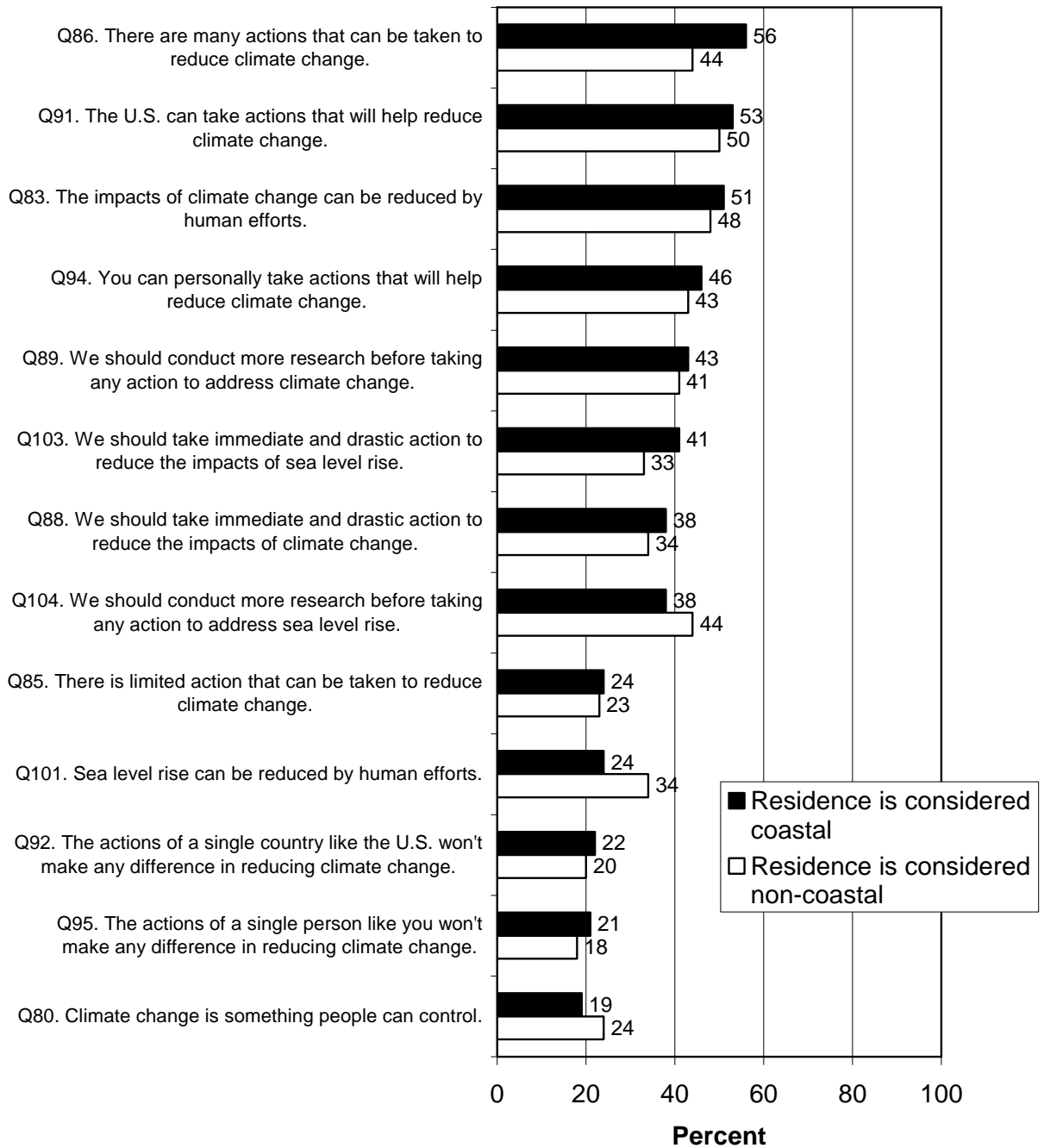
**Q83. Do you agree or disagree with this statement:  
The impacts of climate change can be reduced by  
human efforts.**



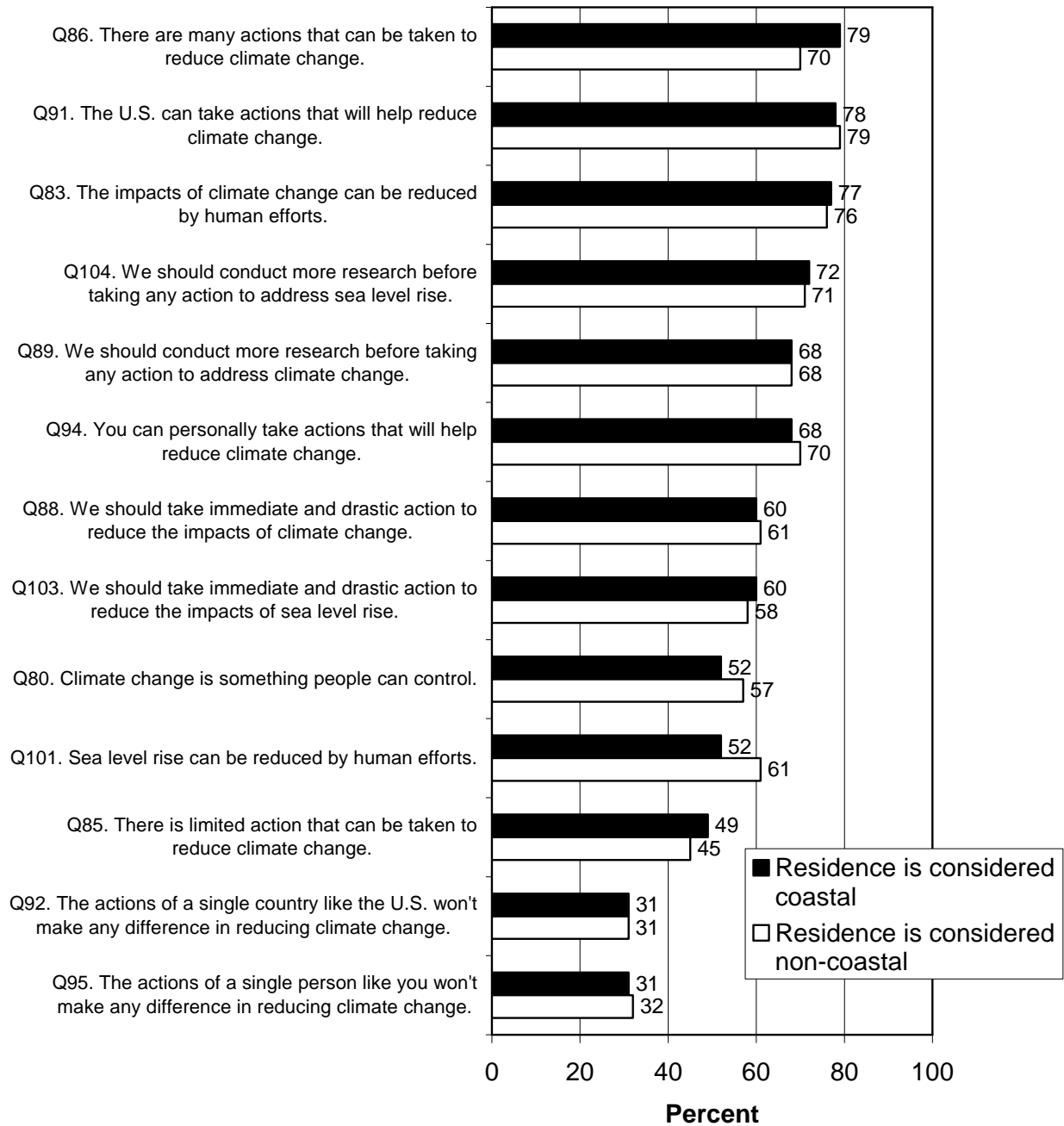
**Q86. Do you agree or disagree with this statement:  
There are many actions that can be taken to reduce  
climate change.**



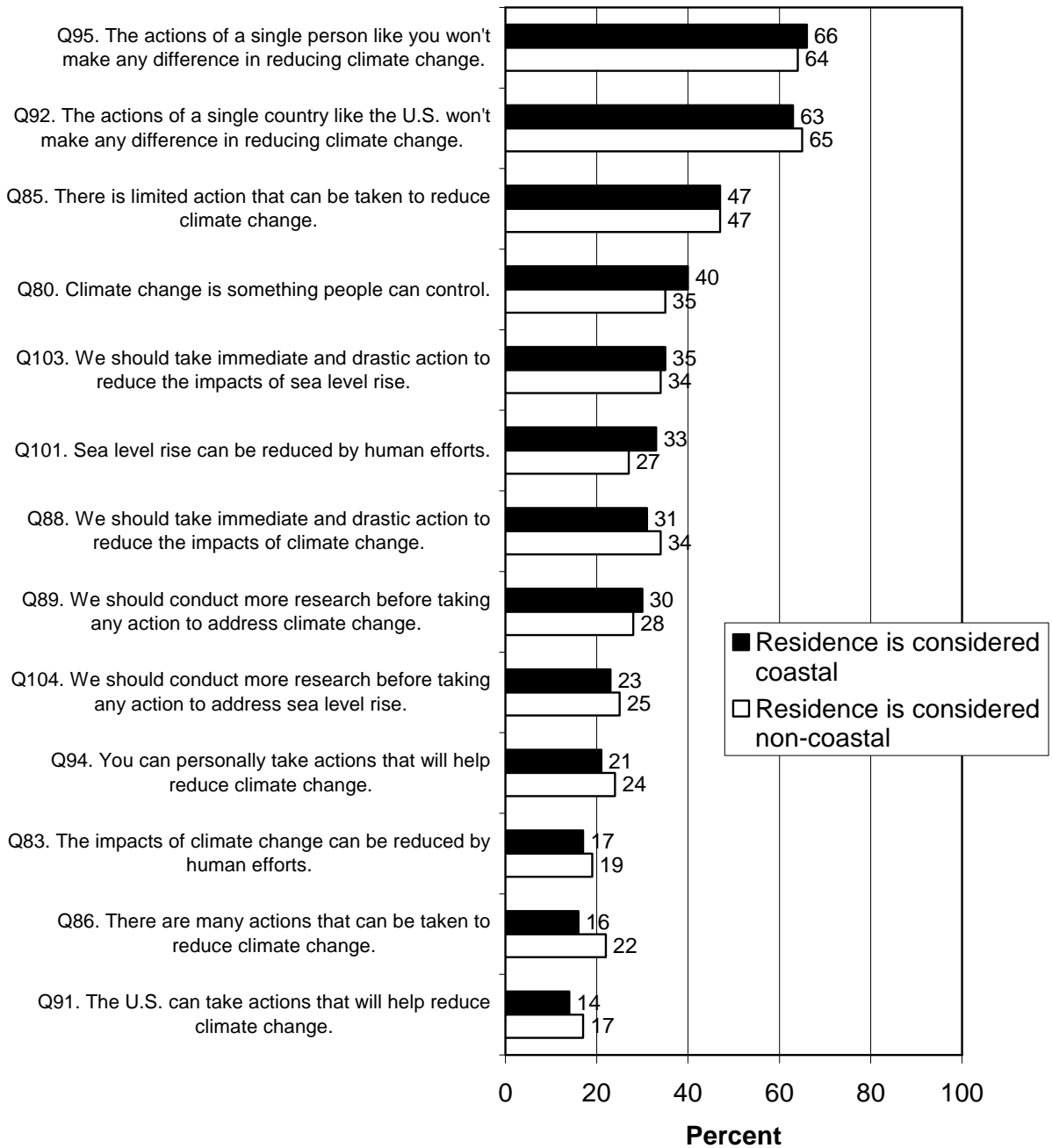
**Q80, 83, 85-86, 88-89, 91-92, 94-95, 98-101, 103-104.**  
**Percent who strongly agree with the following**  
**statements about climate change and sea level rise.**



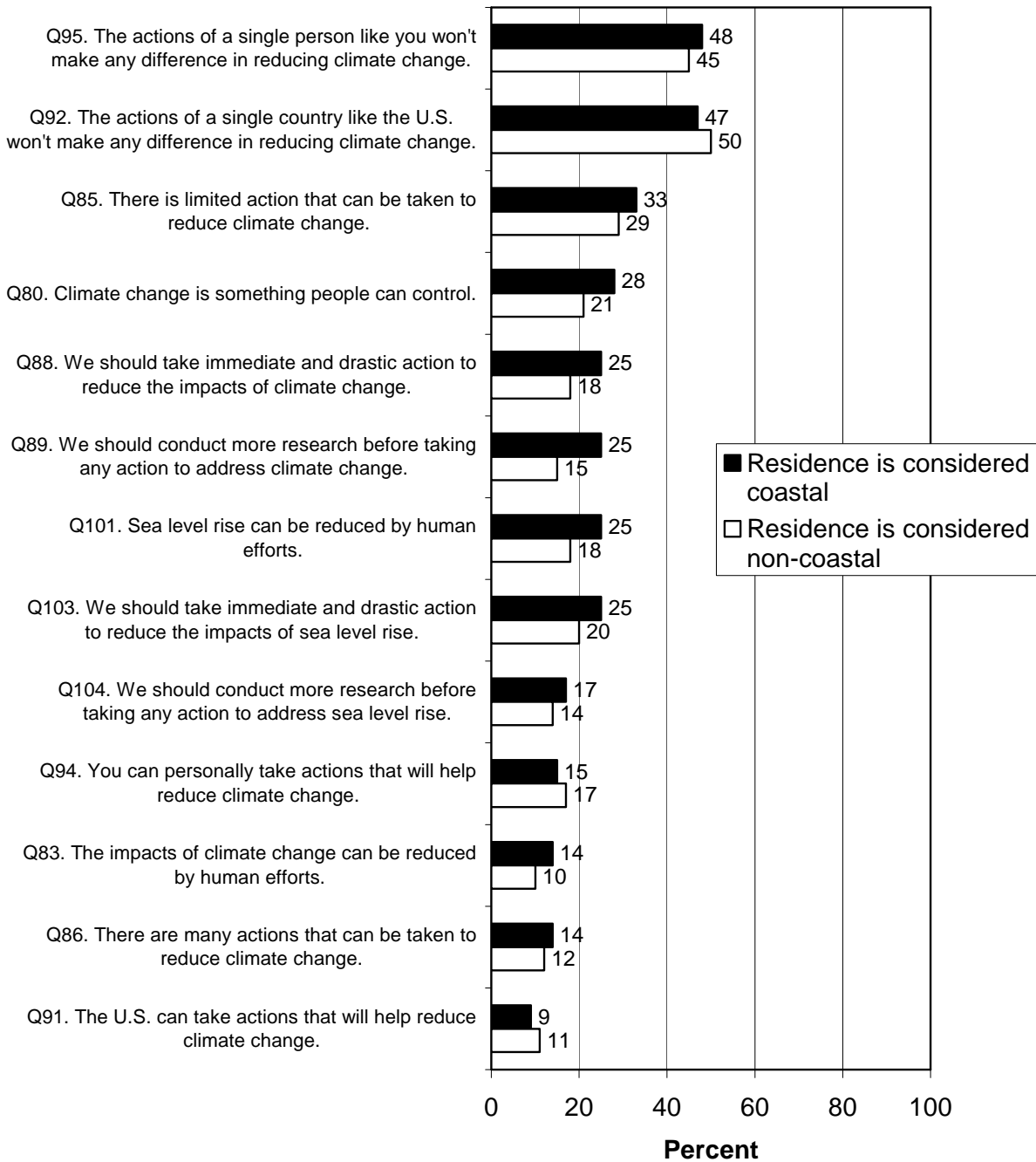
**Q80, 83, 85-86, 88-89, 91-92, 94-95, 98-101, 103-104.  
Percent who strongly or moderately agree with the  
following statements about climate change and sea  
level rise.**



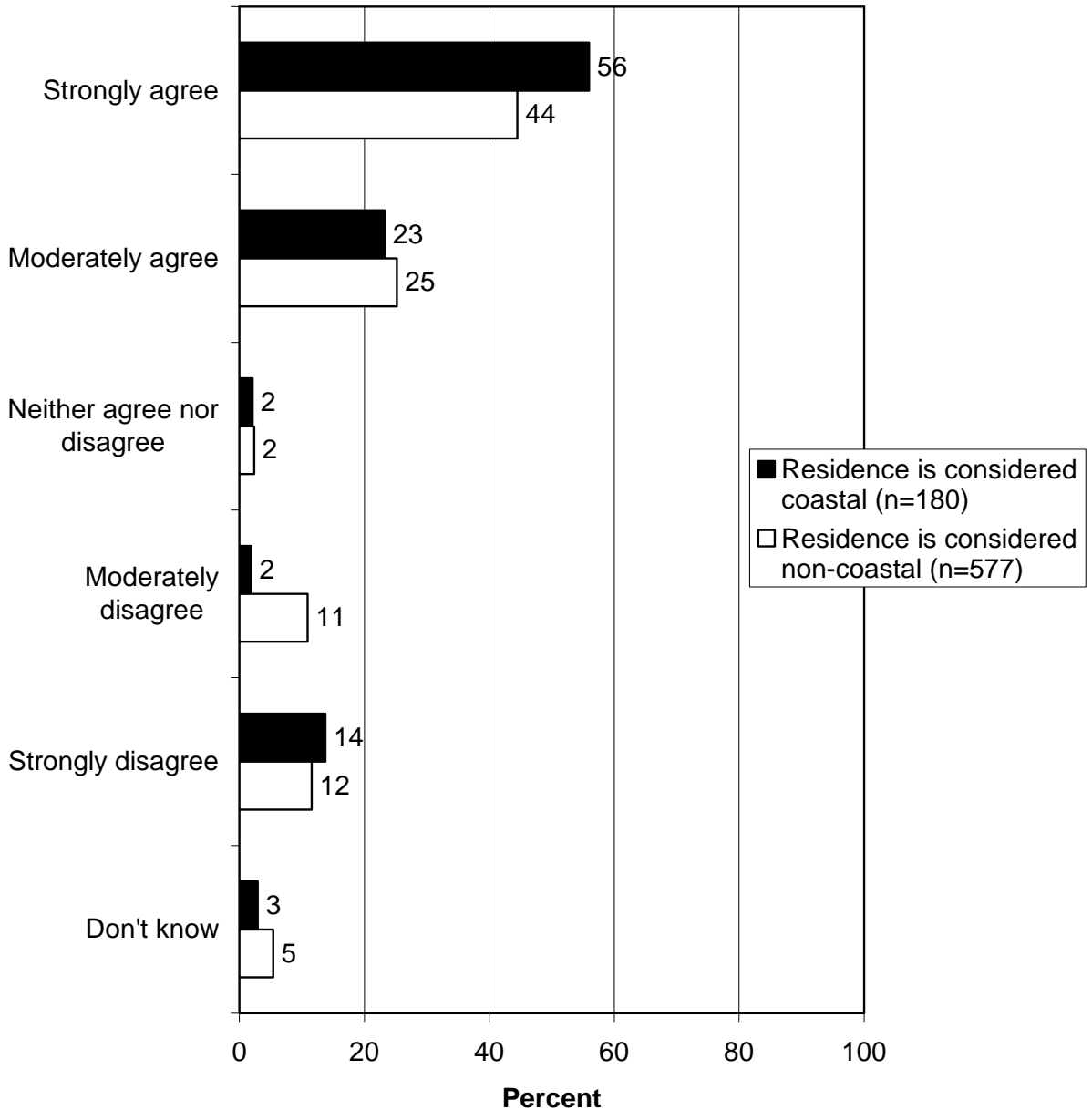
**Q80, 83, 85-86, 88-89, 91-92, 94-95, 98-101, 103-104.**  
**Percent who moderately or strongly disagree with**  
**the following statements about climate change and**  
**sea level rise.**



**Q80, 83, 85-86, 88-89, 91-92, 94-95, 98-101, 103-104.  
Percent who strongly disagree with the following  
statements about climate change and sea level rise.**

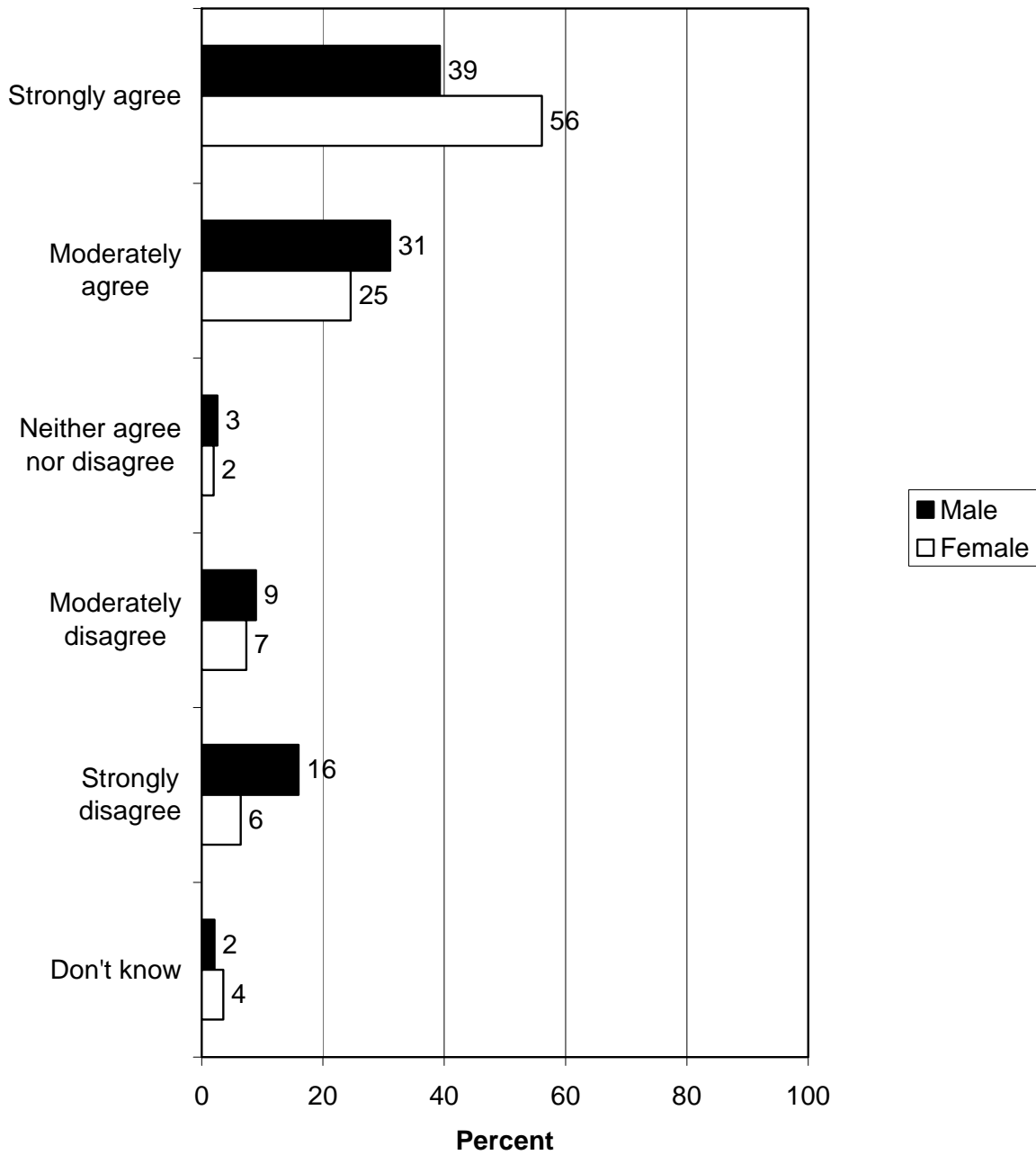


**Q86. Do you agree or disagree with this statement:  
There are many actions that can be taken to reduce  
climate change.**

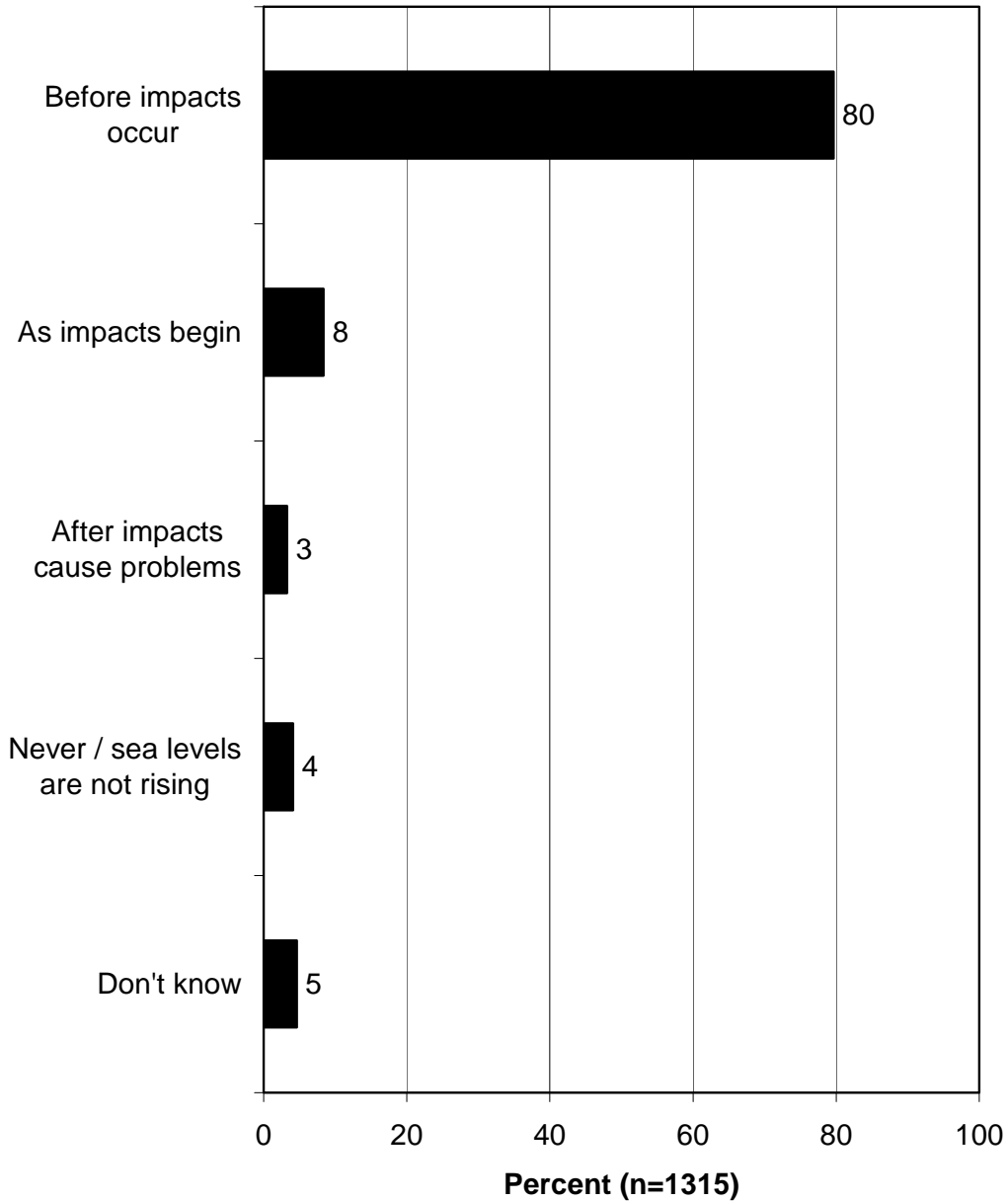




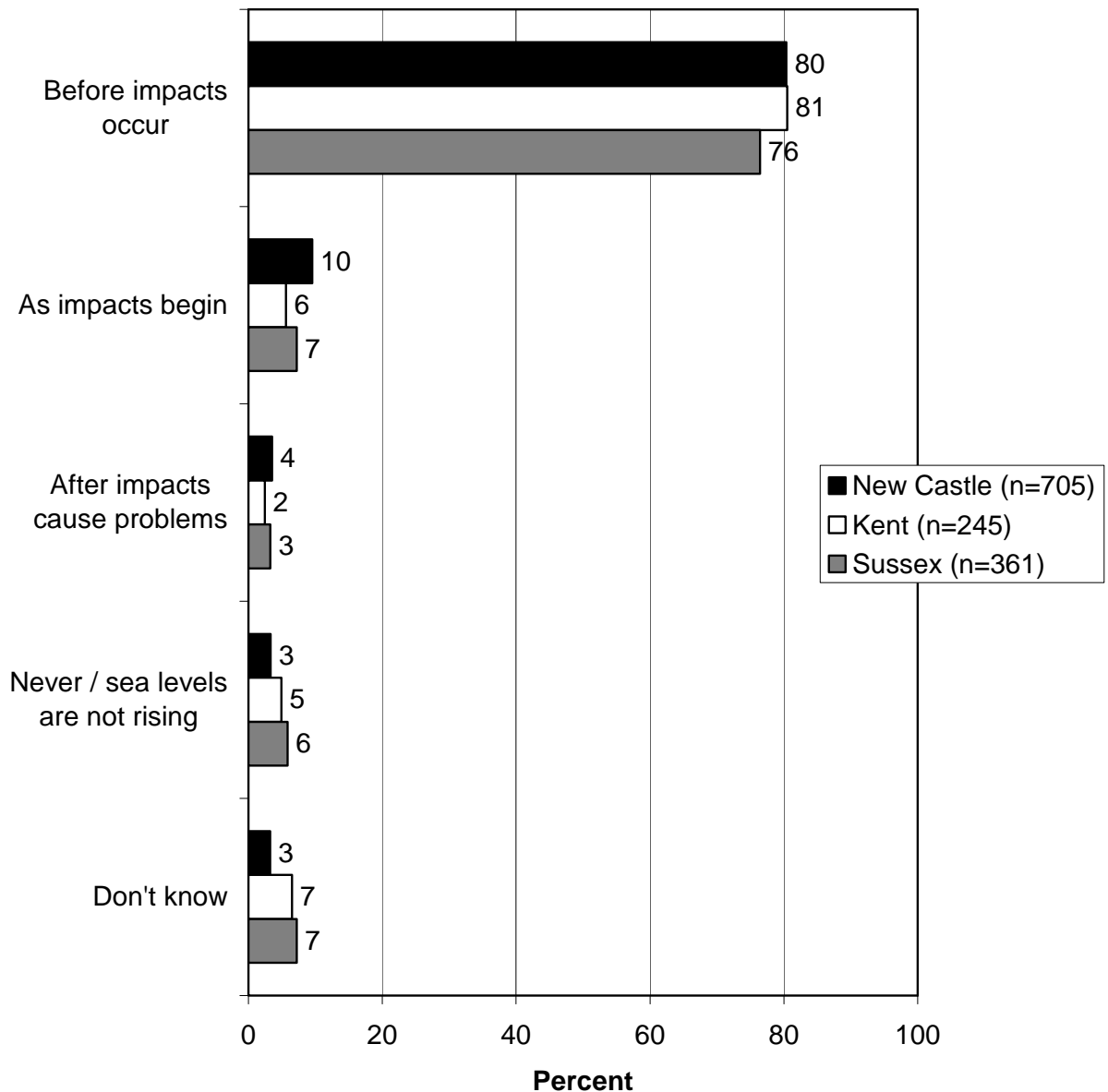
**Q83. Do you agree or disagree with this statement:  
The impacts of climate change can be reduced by  
human efforts.**



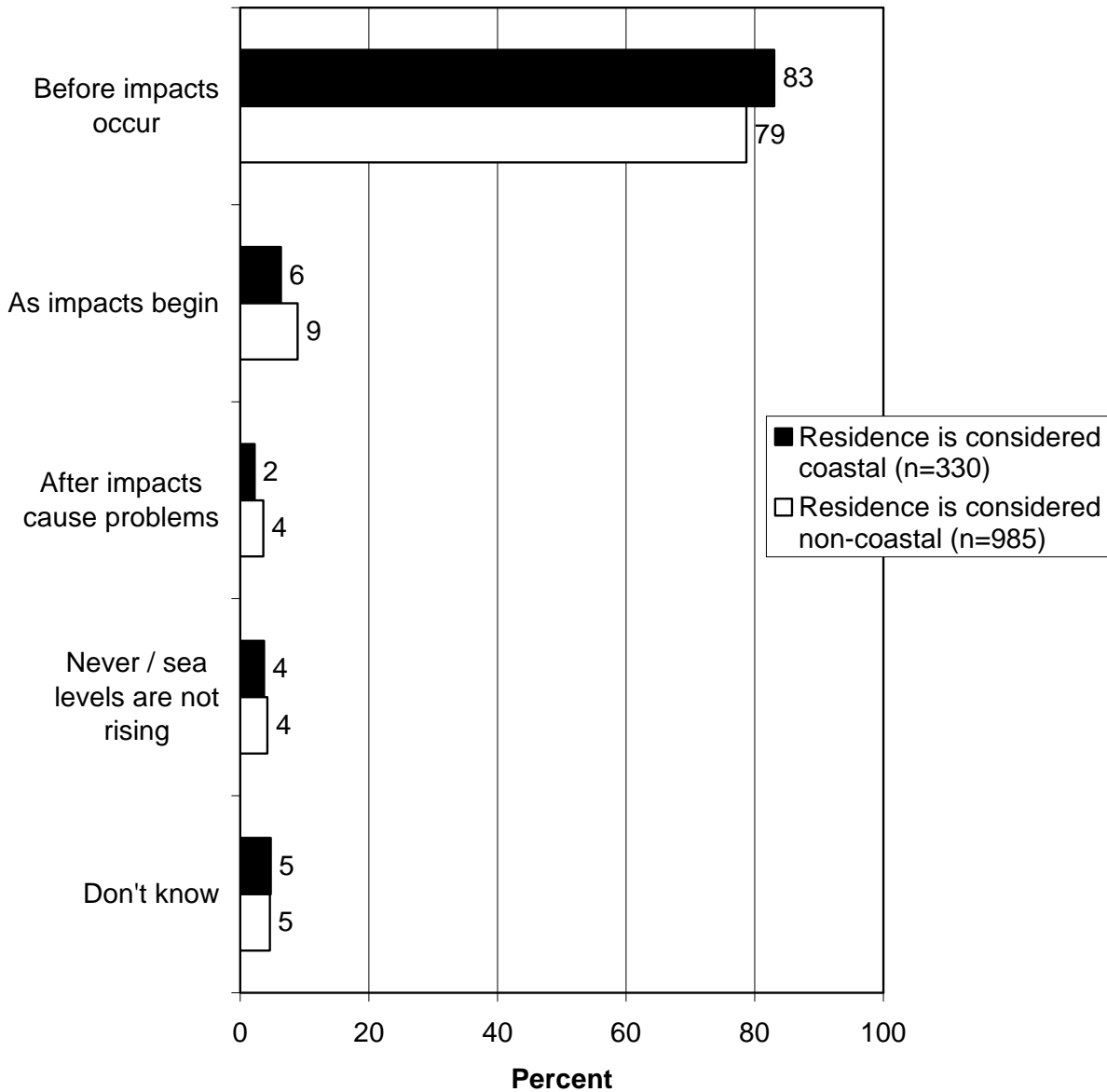
**Q76. When do you think action should be taken to address or reduce the impacts of sea level rise in the area where you live in Delaware? (Asked of those who think sea level rise will start to have impacts on the area where they live in Delaware.)**



**Q76. When do you think action should be taken to address or reduce the impacts of sea level rise in the area where you live in Delaware? (Asked of those who think sea level rise will start to have impacts on the area where they live in Delaware.)**



**Q76. When do you think action should be taken to address or reduce the impacts of sea level rise in the area where you live in Delaware? (Asked of those who think sea level rise will start to have impacts on the area where they live in Delaware.)**



## MANAGEMENT STRATEGIES PERTAINING TO CLIMATE CHANGE

- The survey had a series of 11 questions regarding actions that could be taken and management strategies to address sea level rise, as shown in Text Box 7 below.
- In looking at the percentage who *strongly* support the actions/management strategies, two stand out at the top, both relating to building codes: avoiding building new structures in areas at risk from sea level rise (67%), and changing building codes and regulations to reduce risk in flood prone areas (63%).
  - A second tier includes funding research (44%), using dredged material to build up marsh areas at risk (40%), and elevating buildings using *private* funding (40%).
  - A third tier, at about a third each, includes two that require large capital outlays: building dikes, seawalls, and bulkheads (33%), and elevating land surfaces in areas at risk of sea level rise (30%). A third is the natural option: allowing beaches and wetlands to naturally migrate inland (29%).
  - At the bottom, with little support, are the three potential actions that each include using “government funds” to purchase land at risk of sea level rise (21%), to elevate buildings (18%), and to purchase frequently flooded properties (16%). (The obverse of this is the set of graphs showing the percentages in opposition to these potential actions, which again highlights the antipathy toward using government funding: these three are at the top of the rankings both by *strongly* oppose and by *strongly* or *moderately* oppose.)

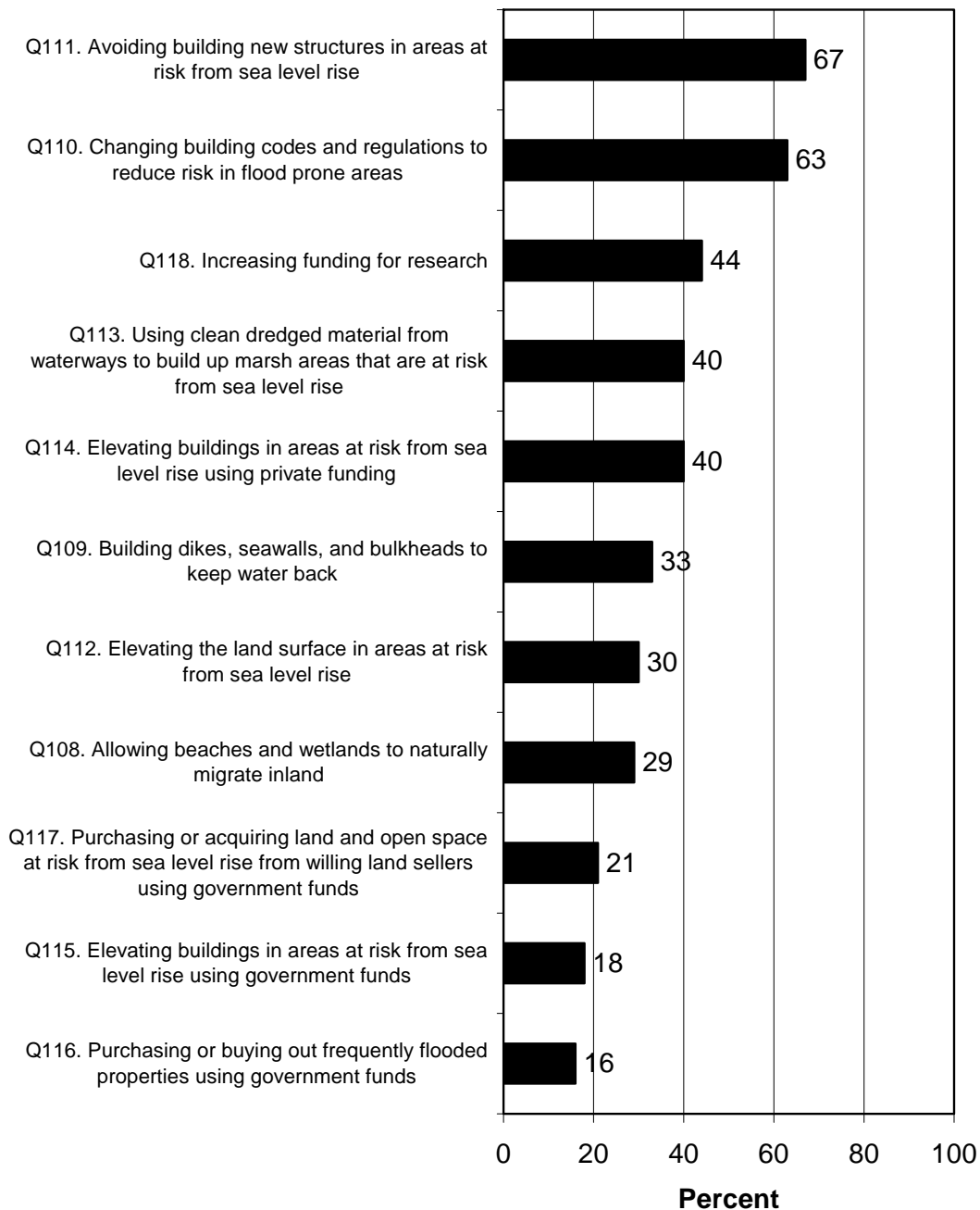
### Text Box 7

#### Support for Actions/Management Strategies to Mitigate the Effects of Sea Level Rise (Ranked by the Percentage Who Strongly Support the Following Actions/Management Strategies)

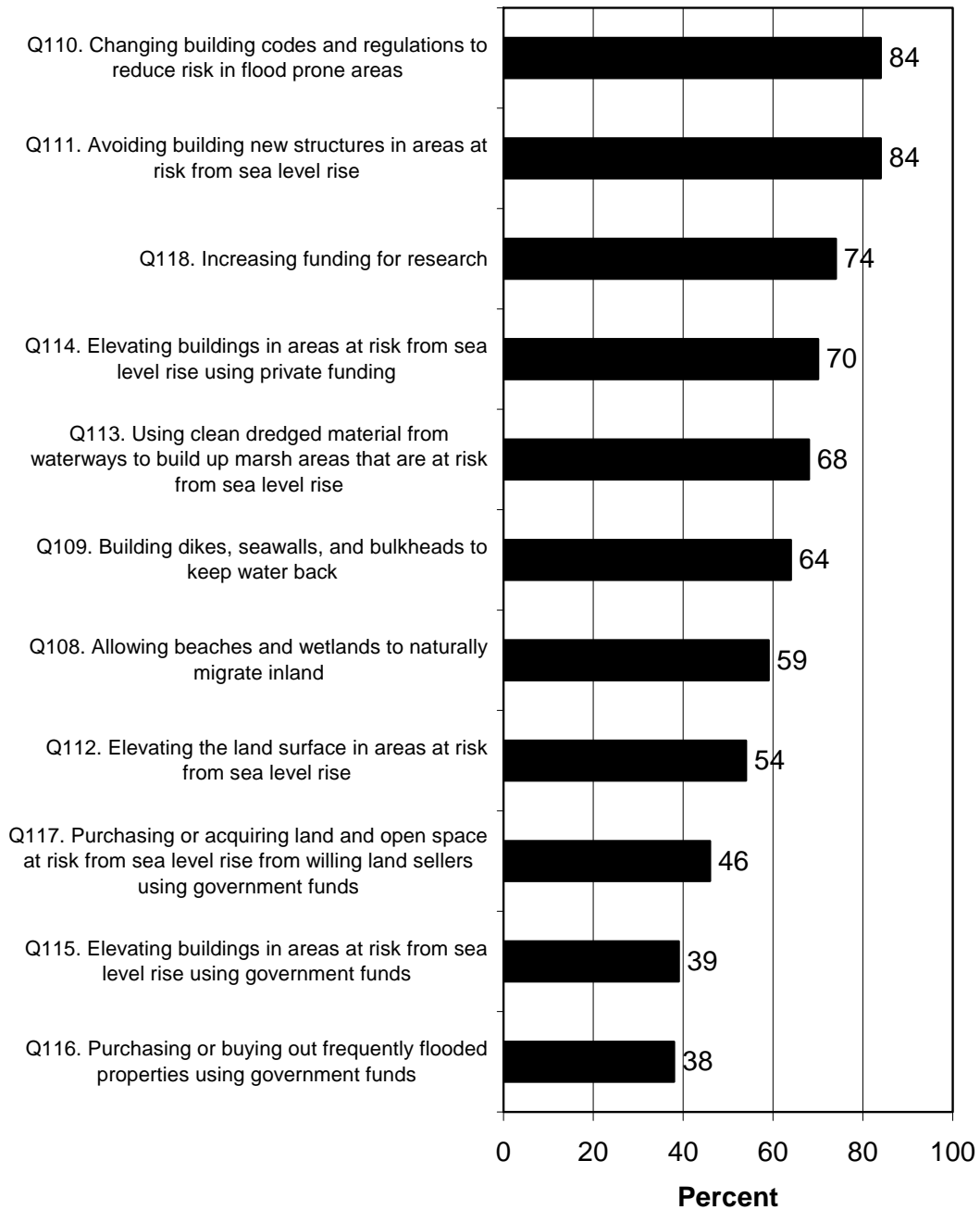
Avoiding building new structures in areas at risk from sea level rise  
 Changing building codes and regulations to reduce risk in flood prone areas  
 Increasing funding for research  
 Using clean dredged material from waterways to build up marsh areas that are at risk from sea level rise  
 Elevating buildings in areas at risk from sea level rise using private funding  
 Building dikes, seawalls, and bulkheads to keep water back  
 Elevating the land surface in areas at risk from sea level rise  
 Allowing beaches and wetlands to naturally migrate inland  
 Purchasing or acquiring land and open space at risk from sea level rise from willing land sellers using government funds  
 Elevating buildings in areas at risk from sea level rise using government funds  
 Purchasing or buying out frequently flooded properties using government funds

- Crosstabulations by county of residence found statistically significant differences on four of the questions in the above series.
- Kent County residents, relative to residents of the other two counties, are the most likely to *strongly* or *moderately* support **elevating the land surface** in areas at risk ( $p \leq 0.05$ ).
  - Kent County residents, relative to residents of the other two counties, are the most likely to *strongly* or *moderately* support **buying out frequently flooded properties** using government funds ( $p \leq 0.05$ ).
  - Kent County residents, relative to residents of the other two counties, are the most likely to *strongly* or *moderately* support **purchasing land and open space** at risk from sea level rise using government funds ( $p \leq 0.05$ ).
  - Finally in this series, Sussex County residents, relative to residents of the other two counties, are the most likely to *strongly* or *moderately* support **increasing funding for research** ( $p \leq 0.01$ ).
- The survey asked residents whether they support or oppose having their local and state governments spend more money on public construction projects if it means that the structures can withstand or accommodate sea level rise in Delaware. They were informed before the question that such construction is more *expensive* than is construction that cannot withstand or accommodate sea level rise. The results suggest that residents are willing to pay the expense now so that construction will withstand sea level rise: 64% support, and 25% oppose.
- In follow-up to the above question, those who opposed were further informed of the following: “What if you knew that it would save money and be less costly *long-term* for Delaware to construct structures to withstand or accommodate sea level rise?” Of those who opposed previously, 58% still oppose (most of them now *strongly* opposing), but just under a third (32%) now support.

**Q108-118. Percent who strongly support the following potential actions that could be taken to address sea level rise in Delaware or reduce its impacts.**

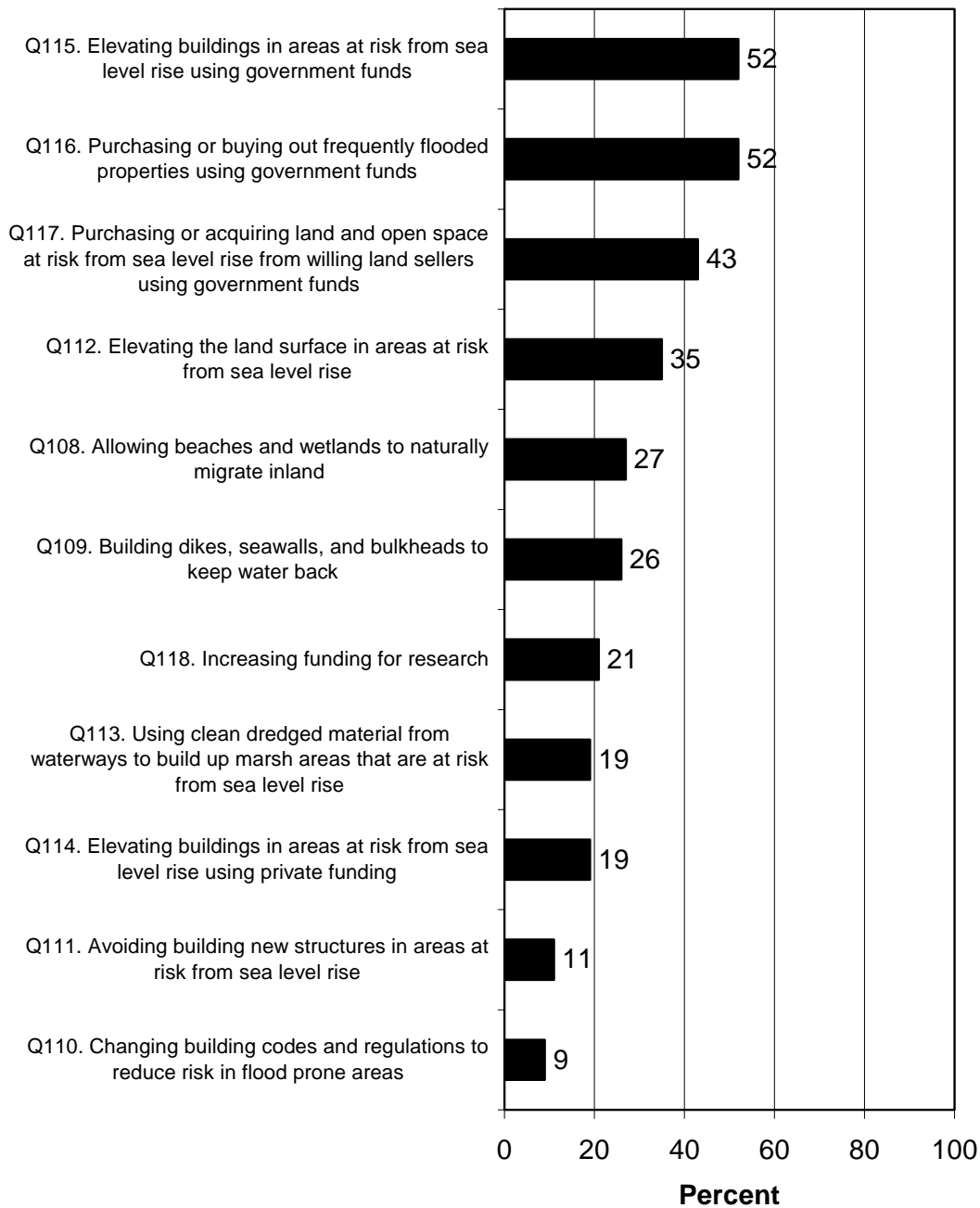


**Q108-118. Percent who strongly or moderately support the following potential actions that could be taken to address sea level rise in Delaware or reduce its impacts.**

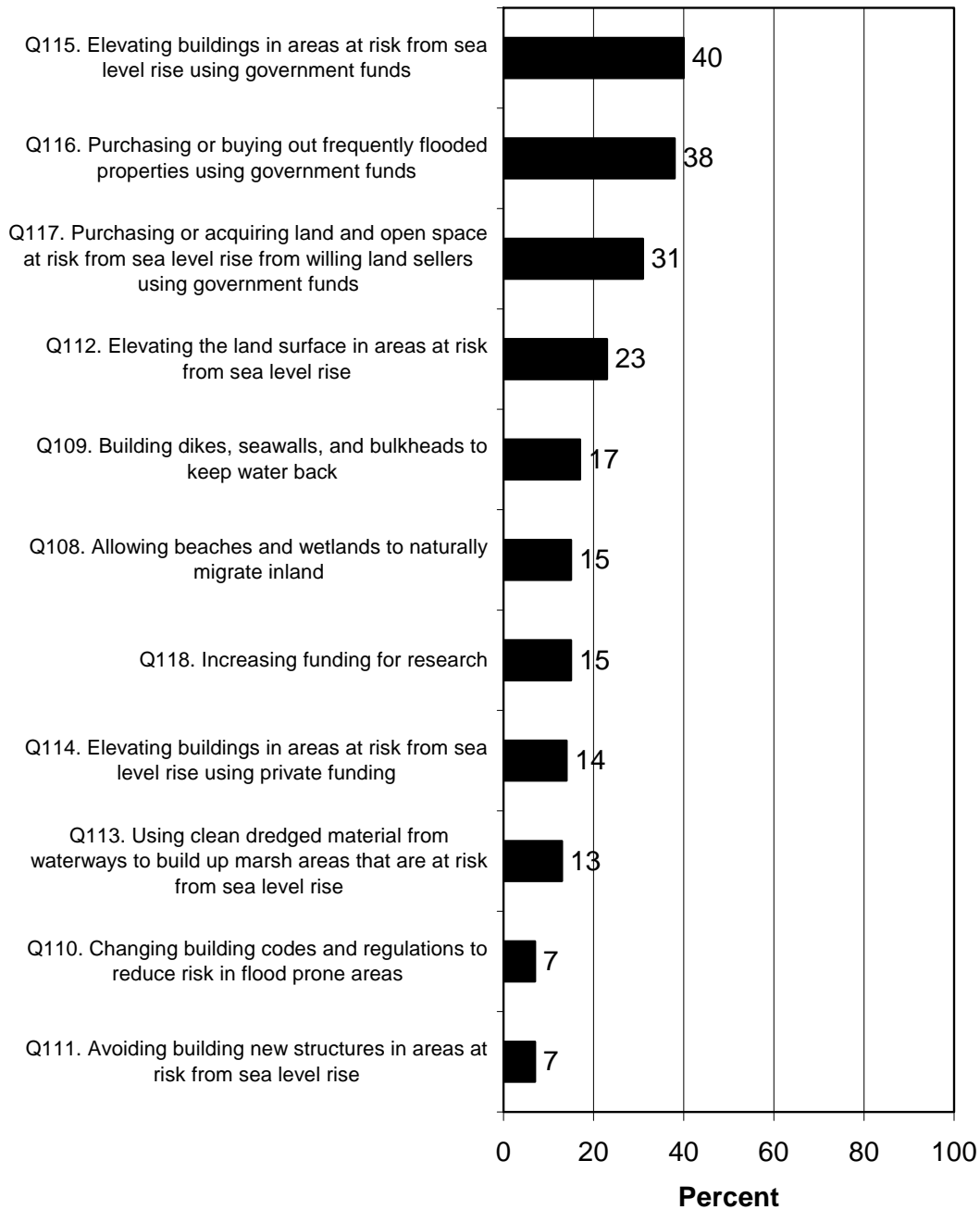




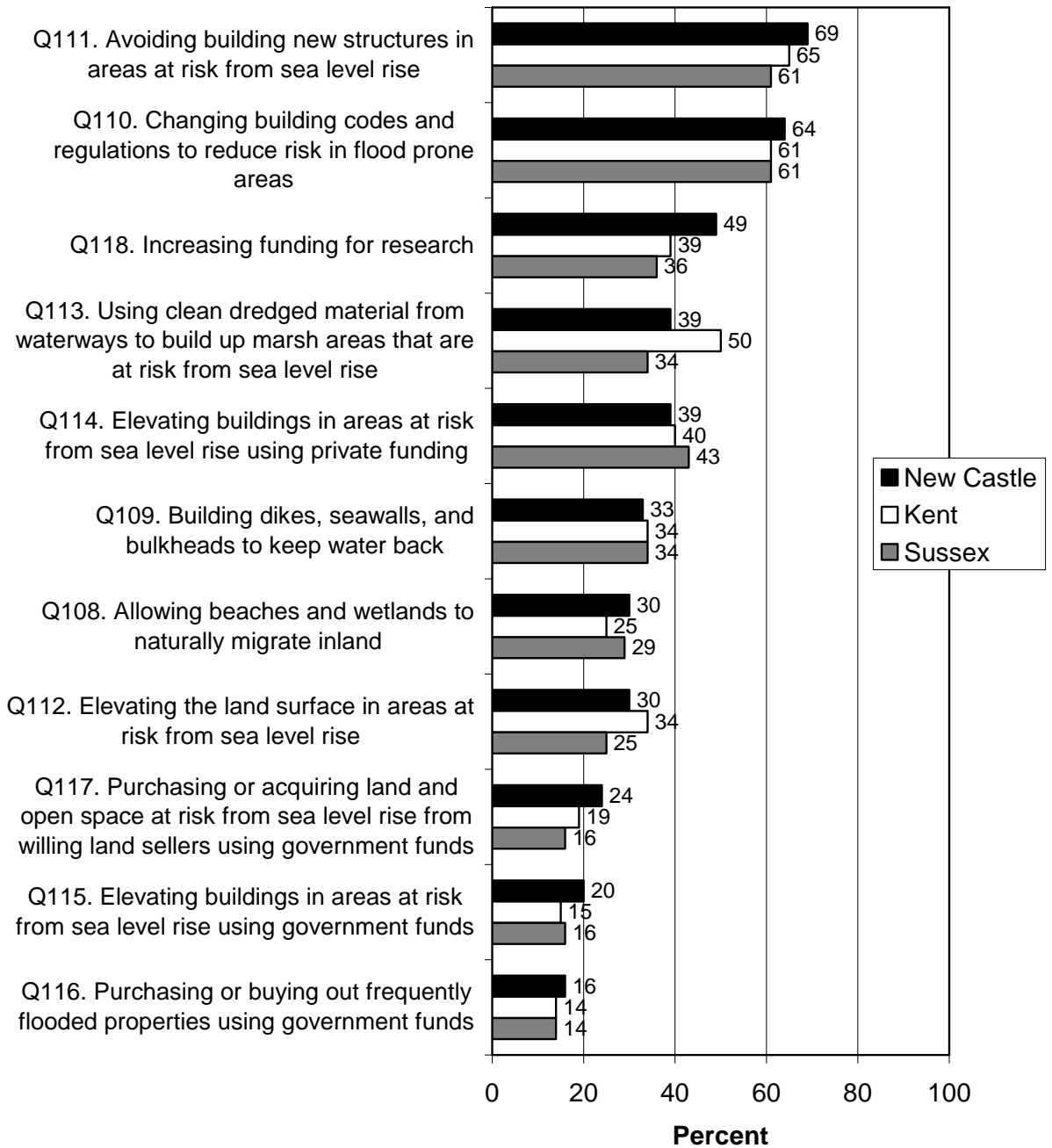
**Q108-118. Percent who moderately or strongly oppose the following potential actions that could be taken to address sea level rise in Delaware or reduce its impacts.**



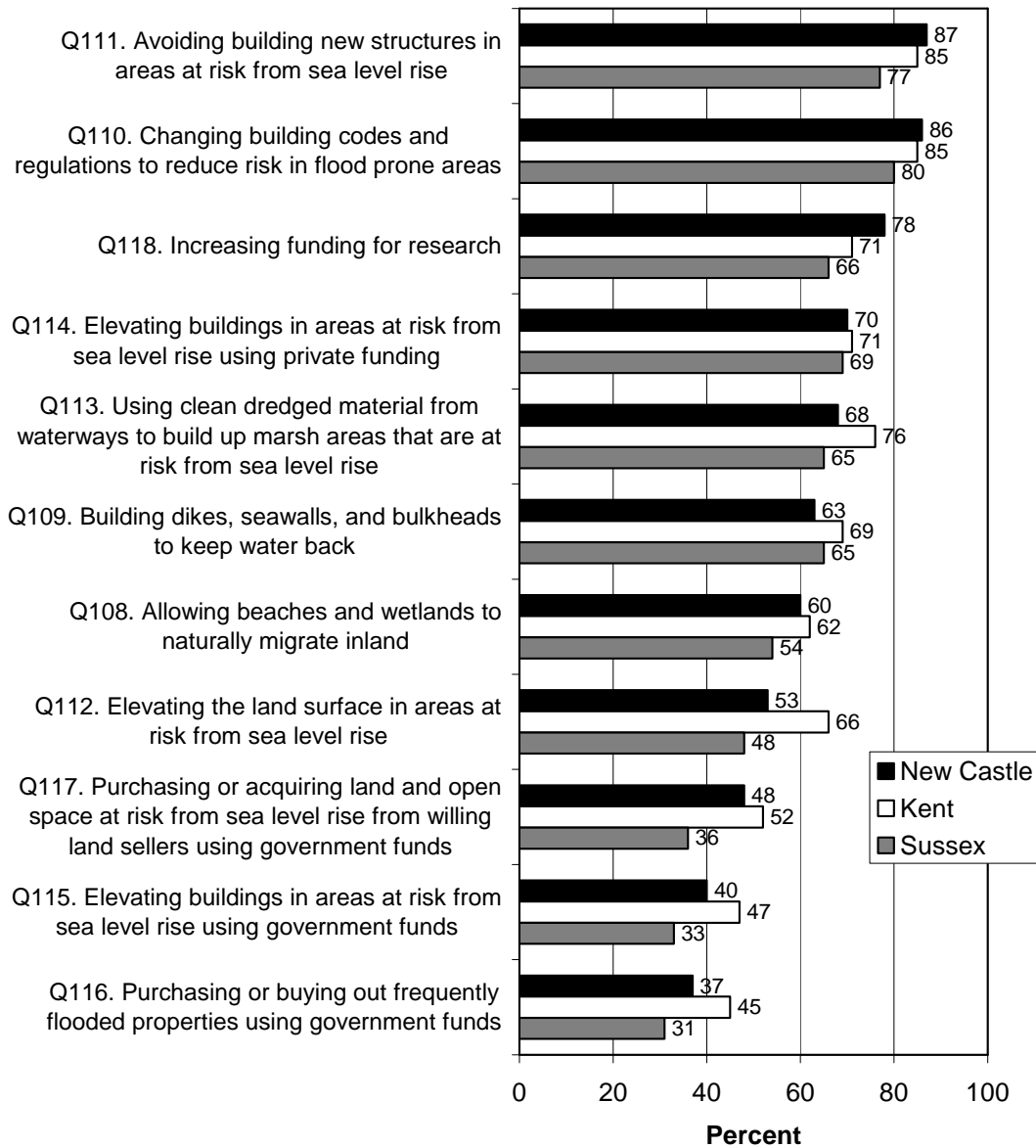
**Q108-118. Percent who strongly oppose the following potential actions that could be taken to address sea level rise in Delaware or reduce its impacts.**



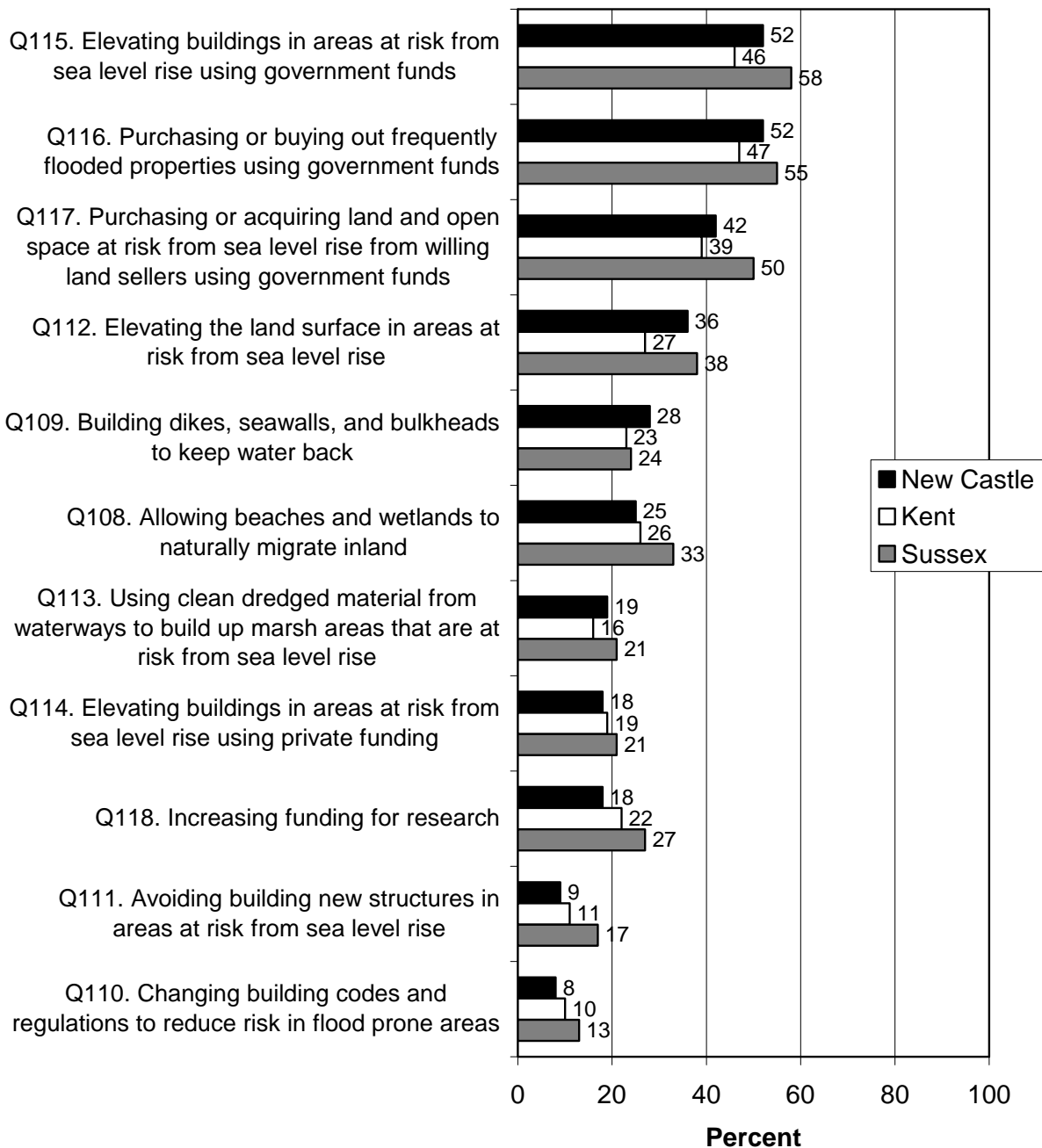
**Q108-118. Percent who strongly support the following potential actions that could be taken to address sea level rise in Delaware or reduce its impacts.**



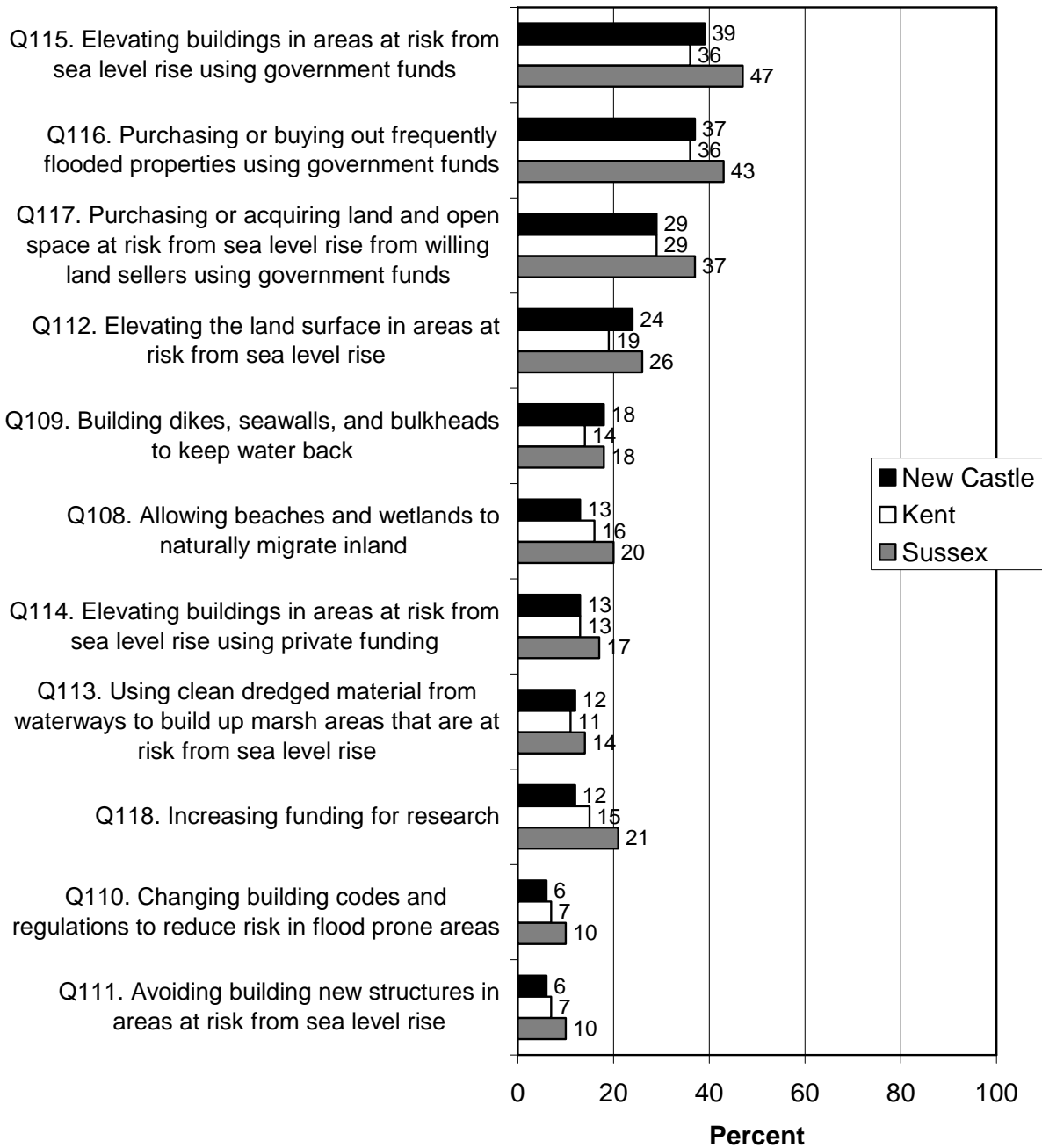
**Q108-118. Percent who strongly or moderately support the following potential actions that could be taken to address sea level rise in Delaware or reduce its impacts.**



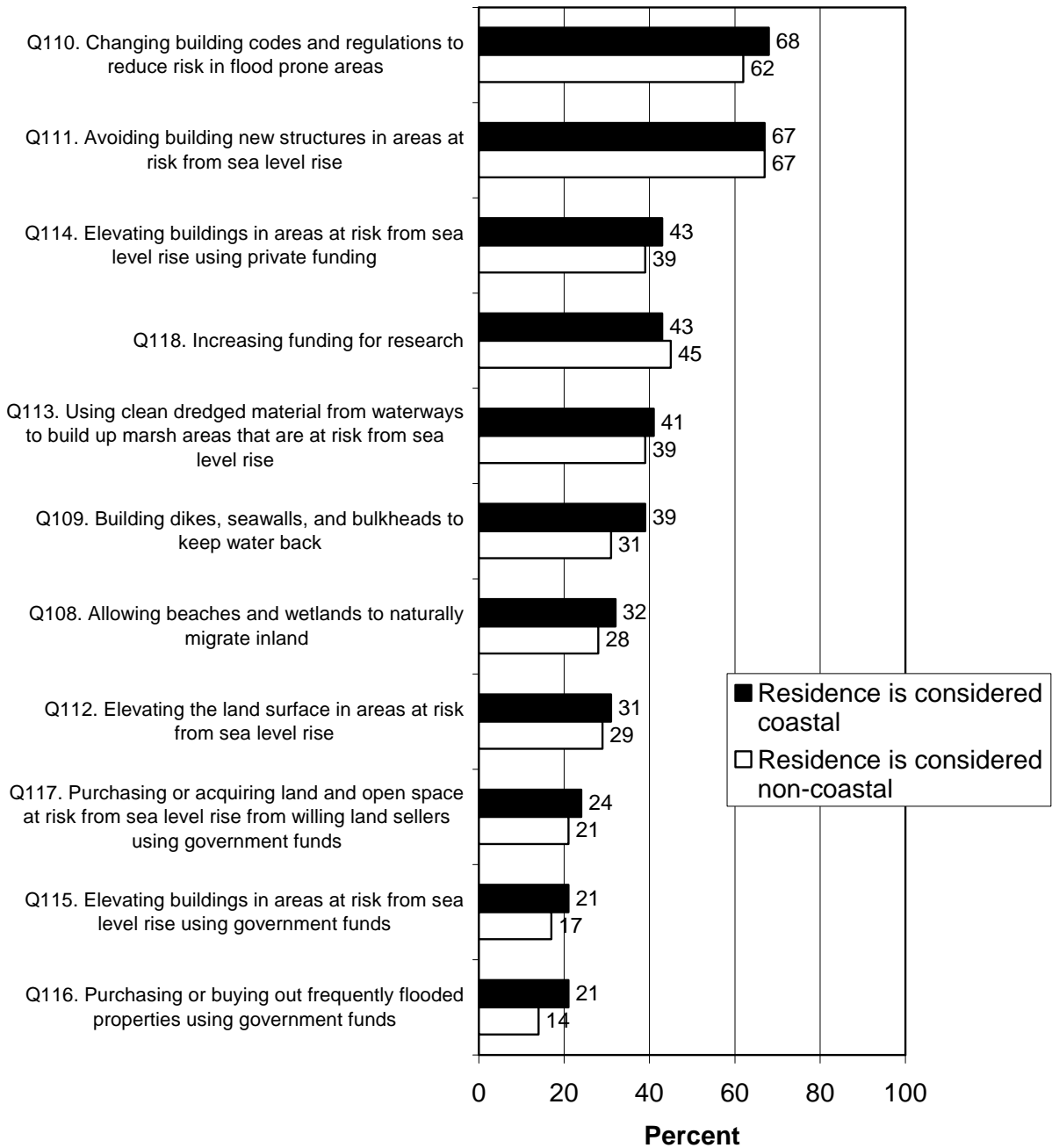
**Q108-118. Percent who moderately or strongly oppose the following potential actions that could be taken to address sea level rise in Delaware or reduce its impacts.**



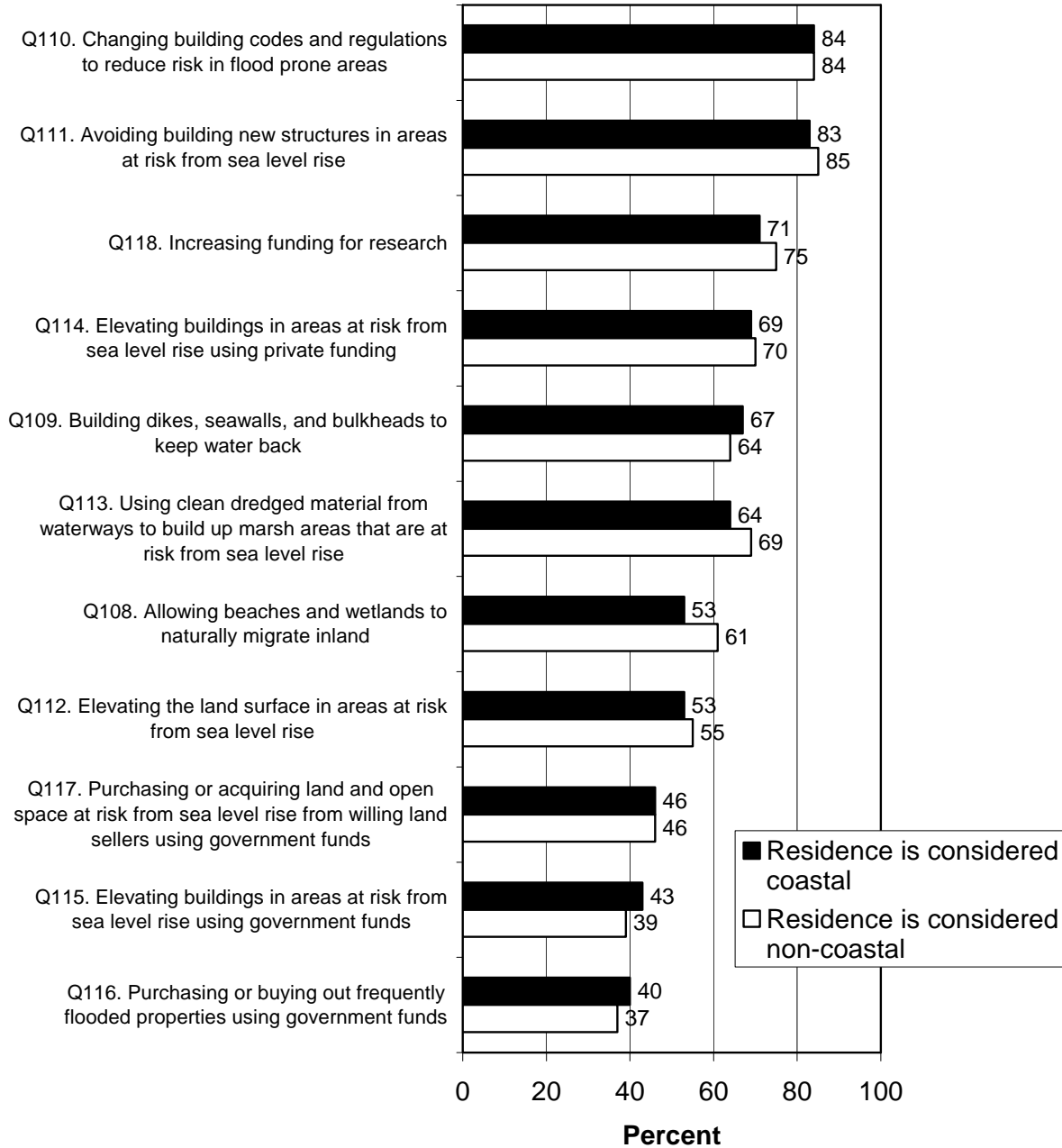
**Q108-118. Percent who strongly oppose the following potential actions that could be taken to address sea level rise in Delaware or reduce its impacts.**



**Q108-118. Percent who strongly support the following potential actions that could be taken to address sea level rise in Delaware or reduce its impacts.**

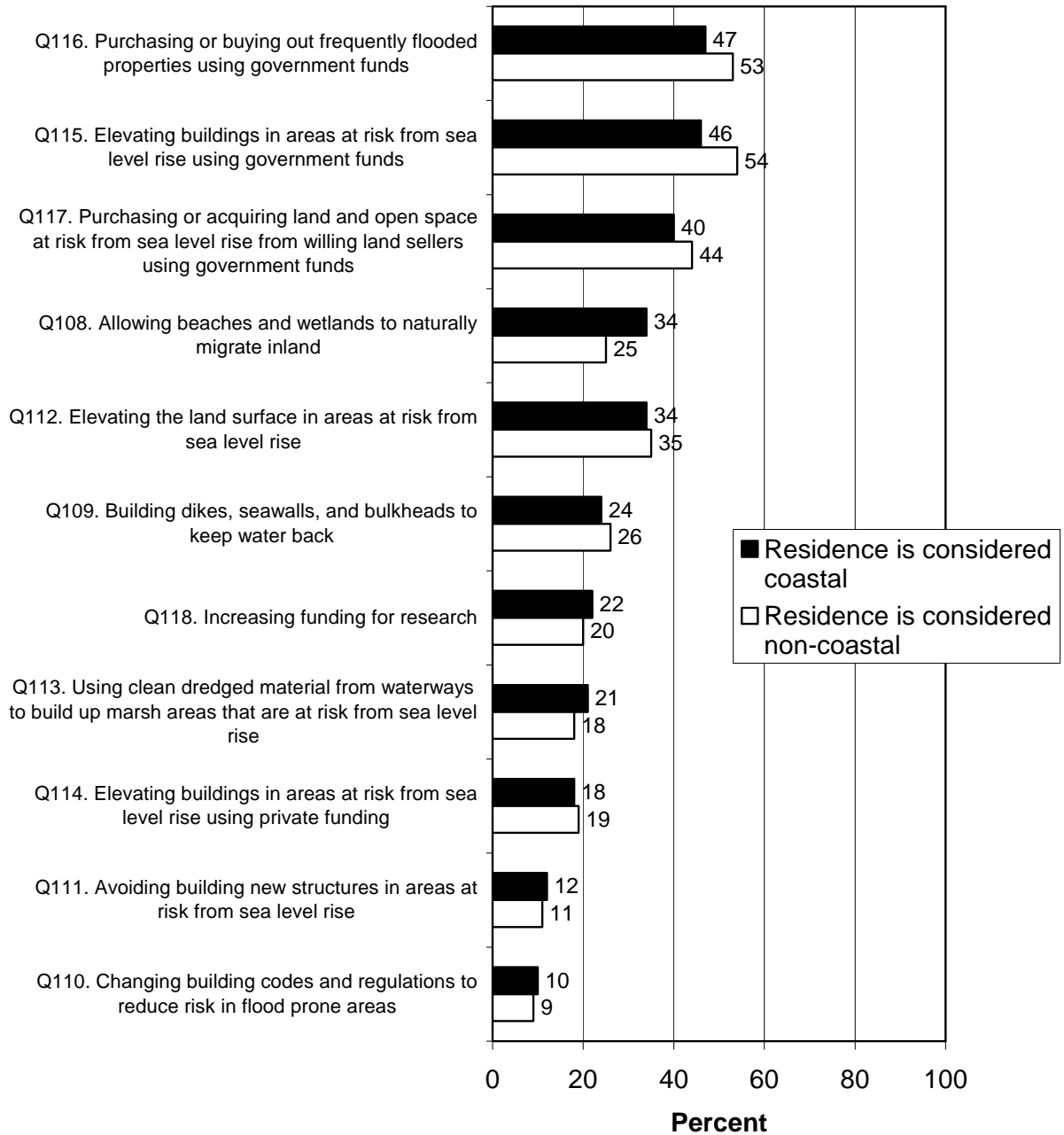


**Q108-118. Percent who strongly or moderately support the following potential actions that could be taken to address sea level rise in Delaware or reduce its impacts.**

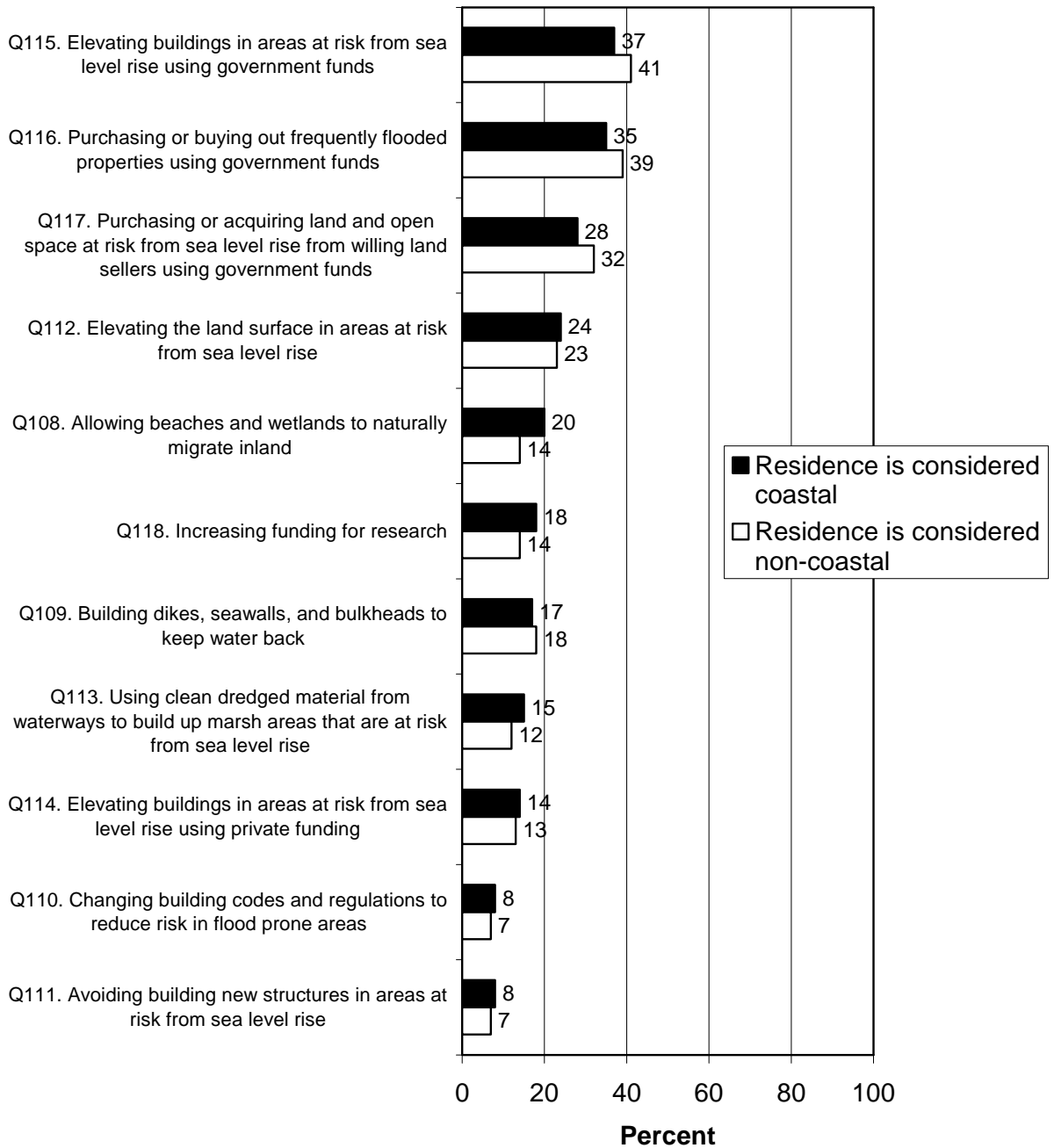




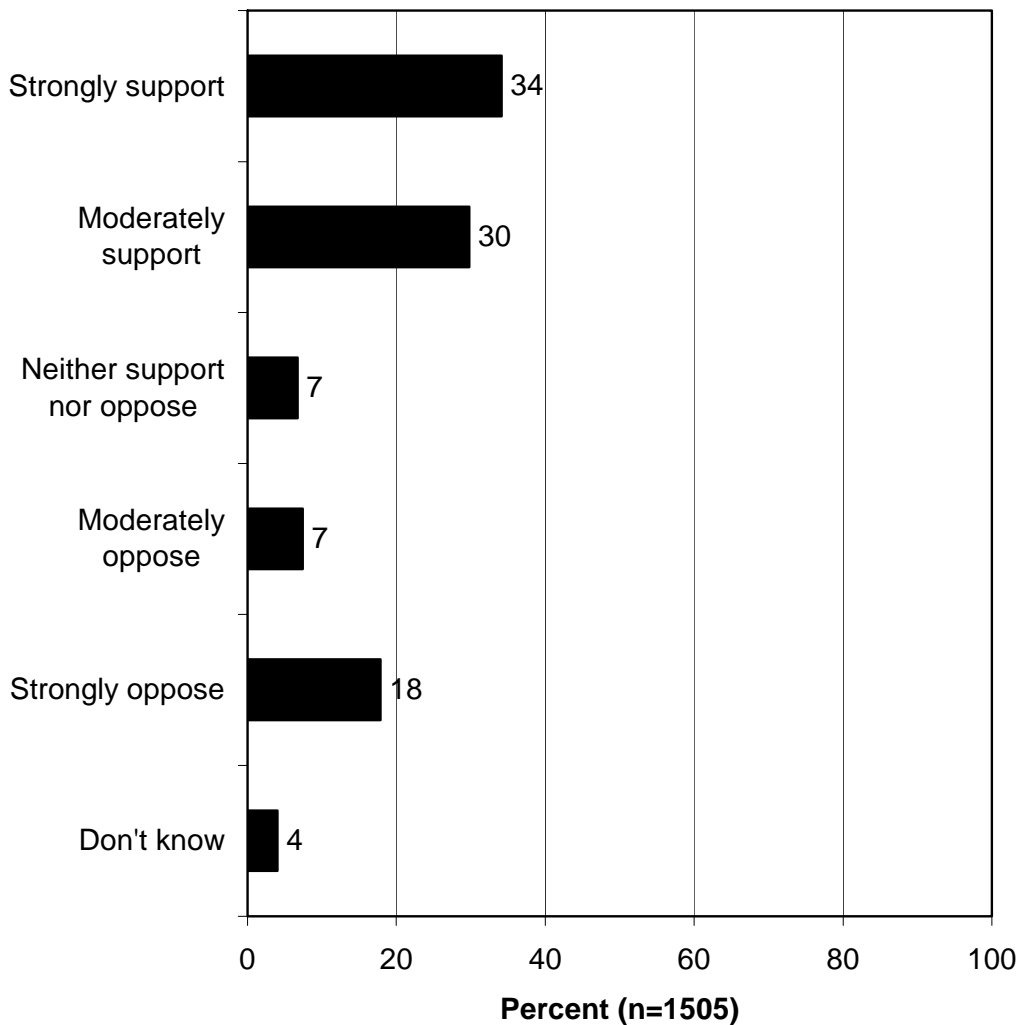
**Q108-118. Percent who moderately or strongly oppose the following potential actions that could be taken to address sea level rise in Delaware or reduce its impacts.**



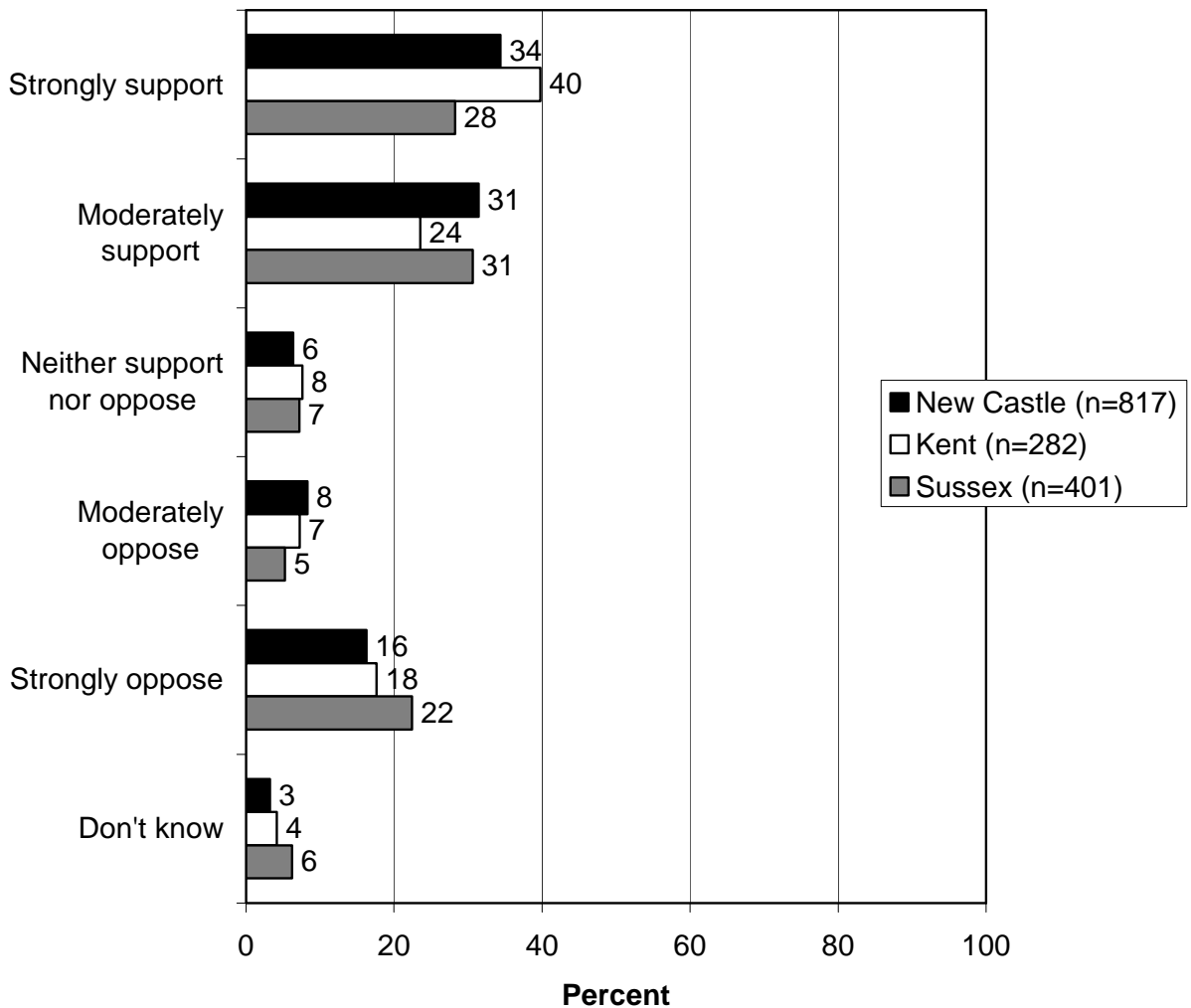
**Q108-118. Percent who strongly oppose the following potential actions that could be taken to address sea level rise in Delaware or reduce its impacts.**



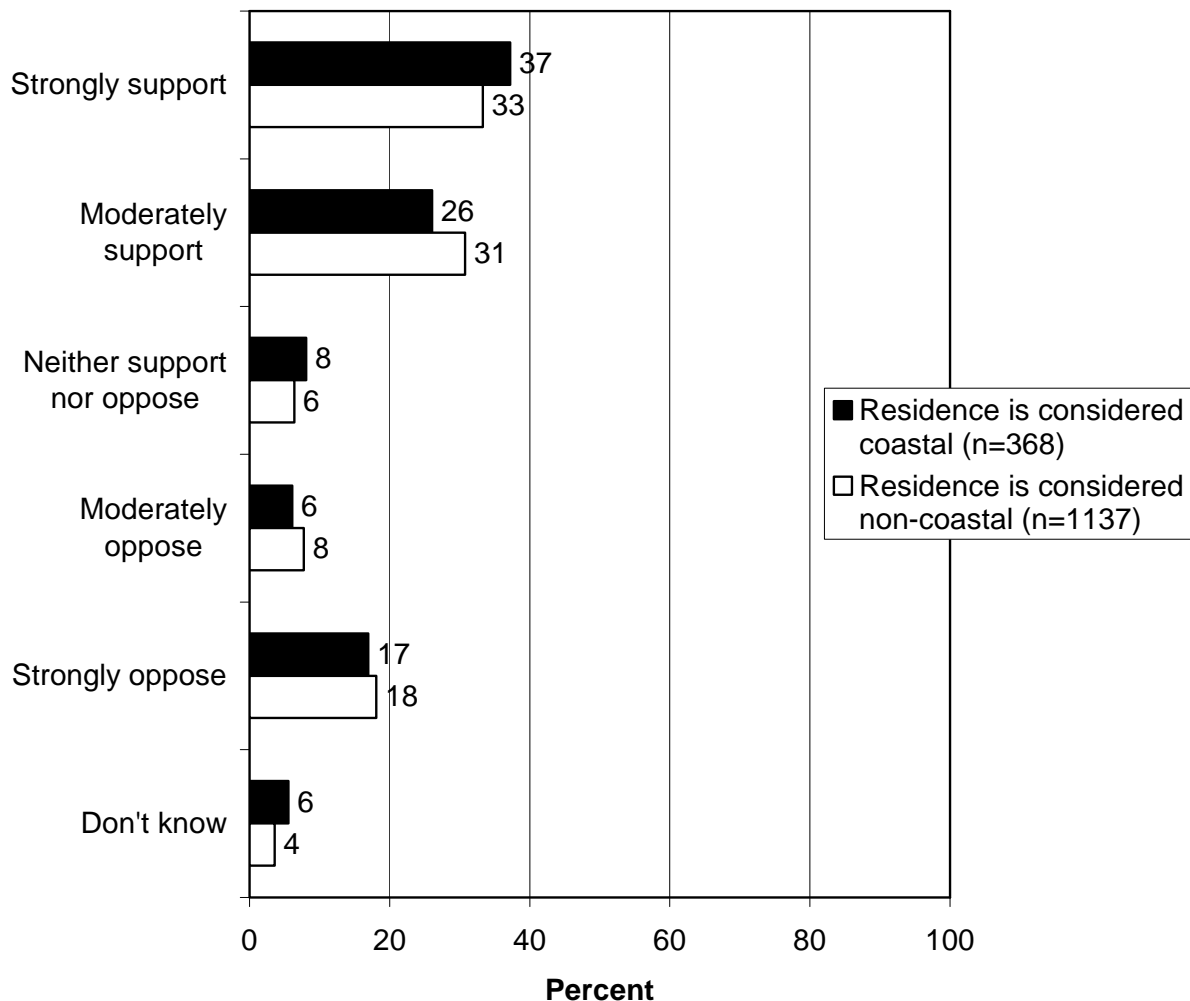
**Q119. Please consider that your local and state governments in Delaware could construct public buildings and other structures, such as roads and sewer systems, to withstand or accommodate sea level rise but that doing so would be more expensive than constructing structures that could not. Would you support or oppose your local and state governments spending more money on public construction projects if it meant the structures could withstand or accommodate sea level rise in Delaware?**



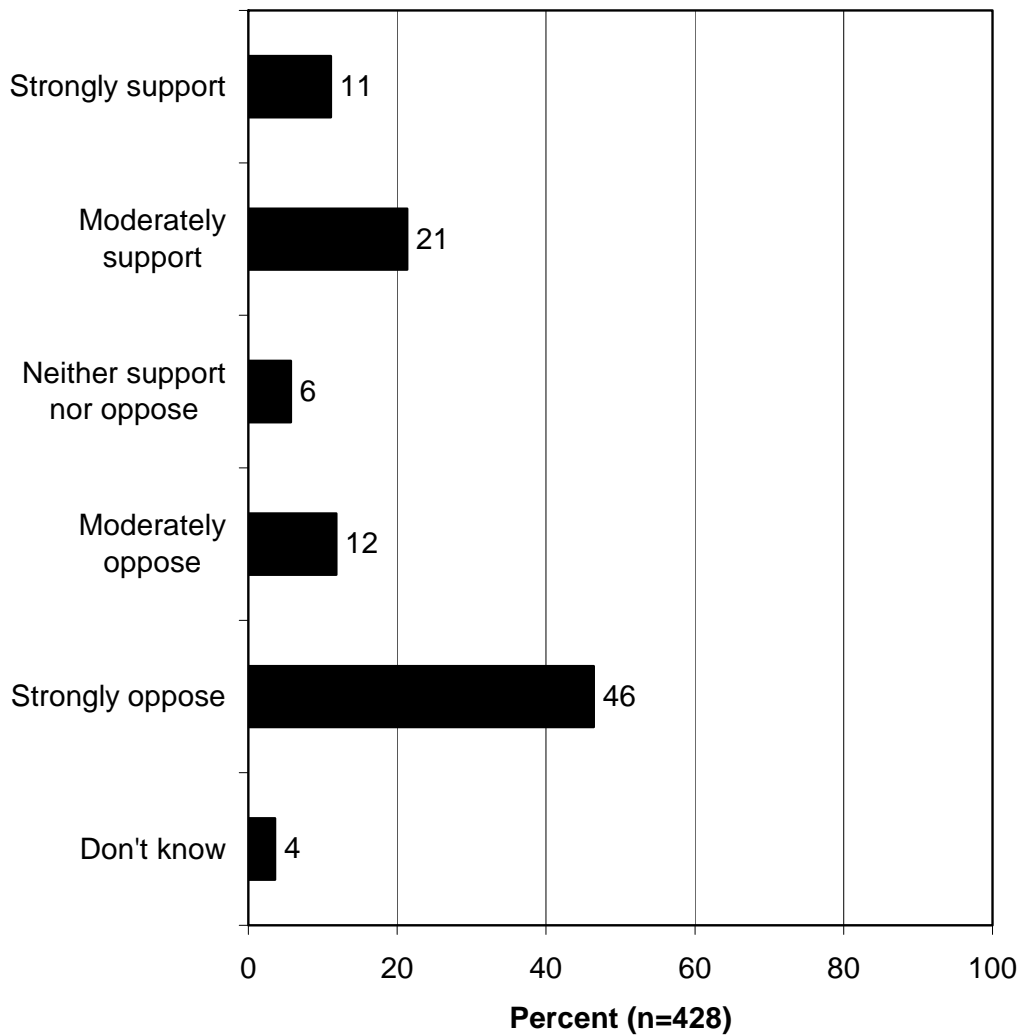
**Q119. Please consider that your local and state governments in Delaware could construct public buildings and other structures, such as roads and sewer systems, to withstand or accommodate sea level rise but that doing so would be more expensive than constructing structures that could not. Would you support or oppose your local and state governments spending more money on public construction projects if it meant the structures could withstand or accommodate sea level rise in Delaware?**



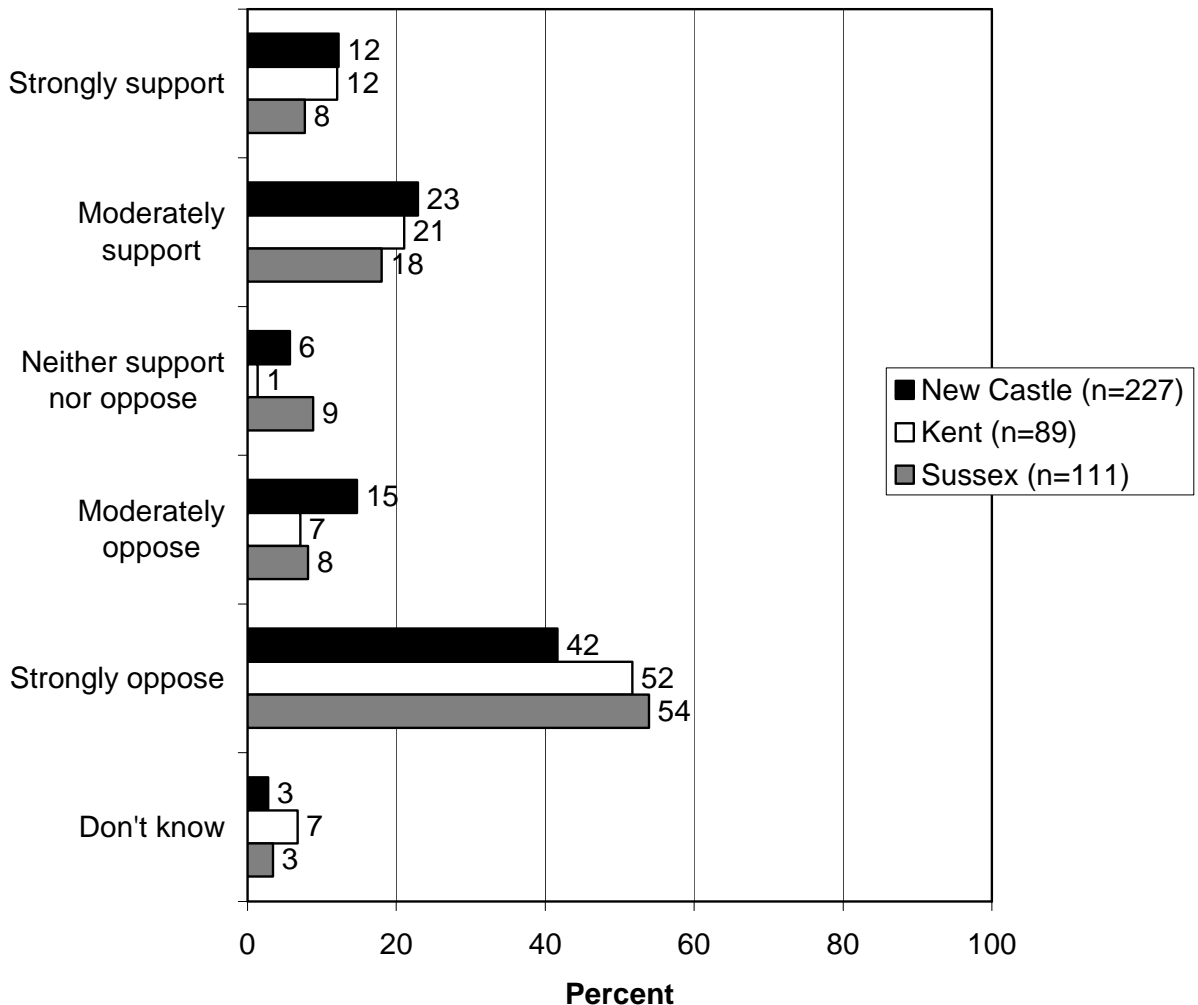
**Q119. Please consider that your local and state governments in Delaware could construct public buildings and other structures, such as roads and sewer systems, to withstand or accommodate sea level rise but that doing so would be more expensive than constructing structures that could not. Would you support or oppose your local and state governments spending more money on public construction projects if it meant the structures could withstand or accommodate sea level rise in Delaware?**



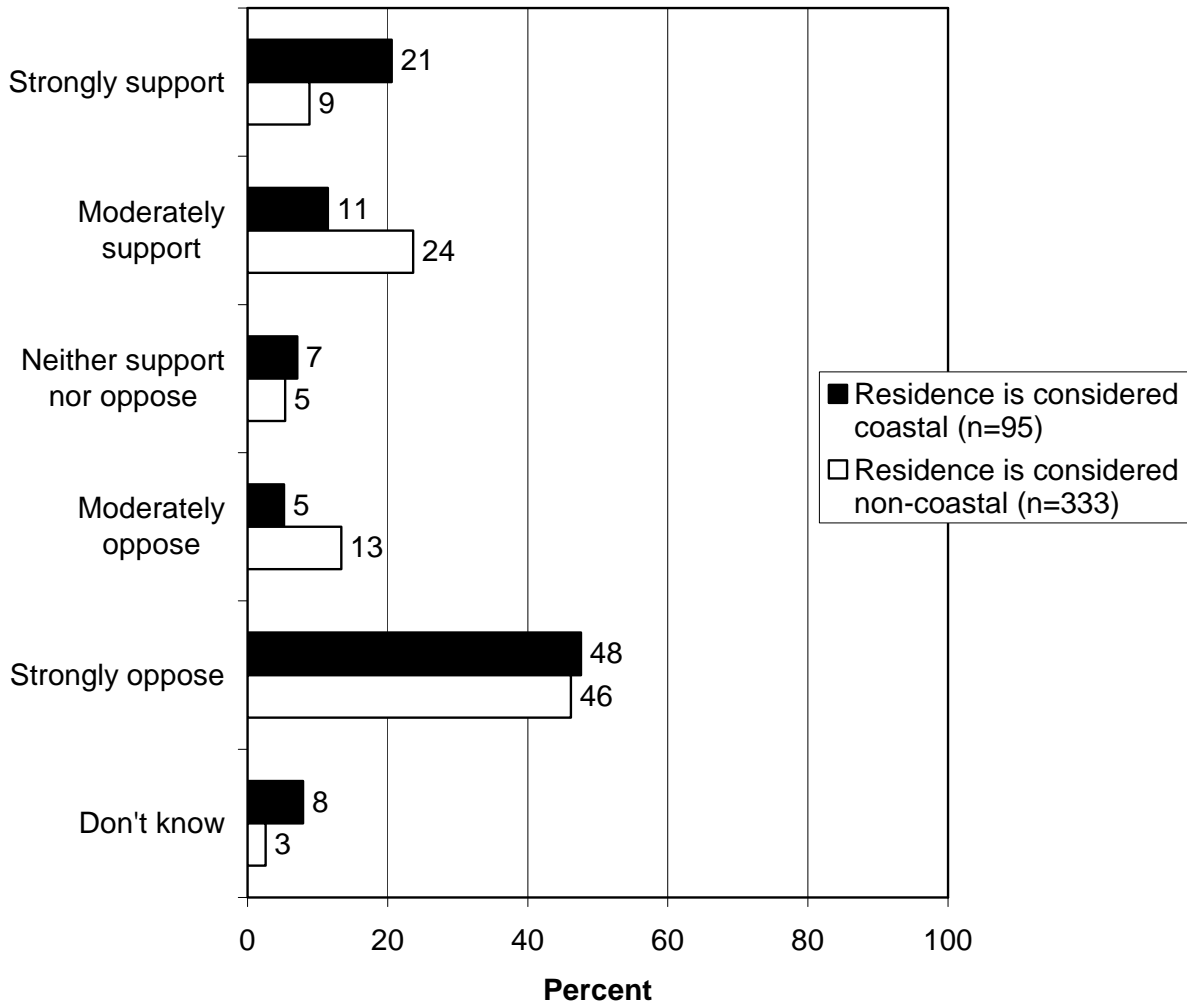
**Q120. What if you knew it would save money or be less costly long-term for Delaware to construct structures to withstand or accommodate sea level rise? Would you support or oppose your local and state governments spending more money on public construction projects? (Asked of those who oppose their local and state governments spending more money on public construction projects if it meant the structures could withstand or accommodate sea level rise in Delaware.)**



**Q120. What if you knew it would save money or be less costly long-term for Delaware to construct structures to withstand or accommodate sea level rise? Would you support or oppose your local and state governments spending more money on public construction projects? (Asked of those who oppose their local and state governments spending more money on public construction projects if it meant the structures could withstand or accommodate sea level rise in Delaware.)**



**Q120. What if you knew it would save money or be less costly long-term for Delaware to construct structures to withstand or accommodate sea level rise? Would you support or oppose your local and state governments spending more money on public construction projects? (Asked of those who oppose their local and state governments spending more money on public construction projects if it meant the structures could withstand or accommodate sea level rise in Delaware.)**





## RESPONSIBILITY FOR TAKING ACTION

- The survey asked nine questions about entities that should be doing more or less to address or reduce the impacts of sea level rise in Delaware. For each entity (shown in Text Box 8 below), the survey asked respondents if they thought the entity should be doing more, about the same, or less than it is currently doing.
- Among the results of this series of questions as a whole, it is notable that, for each entity, the percentage of residents who say that the entity should be doing more (ranging from 45% up to 66%) far exceeds the percentage who say that the entity should be doing the same or less (ranging from 22% to 29%).
  - At the top of the ranking by the percentage who say the entity should be doing *more* are corporations and industry (66%) and Delaware citizens (64%)—both at nearly two-thirds. Five entities are in the middle, all with from 56% to 59% giving the “doing more” response: state government officials, city/town government officials, county government officials, Delaware’s state legislators, and the U.S. Congress.

### **Text Box 8**

#### **Entities That Should Be Doing More or Less to Address Sea Level Rise (Ranked by Percentage Who Think the Following Should be Doing More to Address Sea Level Rise)**

Corporations and industry  
Delaware citizens  
State government officials  
The respondent’s city or town government officials  
The respondent’s county government officials  
Delaware’s state legislators  
The U.S. Congress  
Delaware’s governor  
Delaware’s state agencies

- The nonparametric analysis examined in detail many of the questions in the above series about the entities that should (or should not) be doing more to address sea level rise.
  - The nonparametric analysis found that the following responses are correlated with thinking that his or her **city or town government officials** should be doing more to address or reduce the impacts of sea level rise in Delaware:
    - Thinks that sea level rise is a very or somewhat serious threat to him or her personally, a very or somewhat serious threat to the United States, a very or somewhat serious threat to the Mid-Atlantic United States, a very serious threat to Delaware beaches, a very serious threat to marshes and wetlands in Delaware, a very serious threat to ocean-front cities and towns in Delaware, a very serious threat to the State of Delaware, and a very or somewhat serious threat to river-front cities and towns in Delaware) (all at  $p \leq 0.001$  or greater significance).
    - Shows concern about climate change and sea level rise (e.g., worries a great deal or a moderate amount about climate change; worries a great deal or a moderate amount about the problems that sea level rise may cause in Delaware; strongly agrees that scientists are right that climate change is occurring) (all at  $p \leq 0.05$  or greater significance).
    - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).
    - Thinks that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.001$ ).
    - On all questions about how to improve areas at risk from sea level rise, supports any efforts to address sea level rise in Delaware or reduce its impacts (e.g., supports purchasing or acquiring land and open space from willing land sellers using government funds; supports purchasing or buying out frequently flooded properties using government funds; supports elevating buildings using government funds) (all at  $p \leq 0.05$  or greater significance).
    - Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
    - Believes human efforts can improve climate change (e.g., agrees that the impacts of climate change can be reduced by human efforts; agrees that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
    - Thinks that his or her county government officials, his or her state government officials, Delaware citizens, Delaware's state legislators, the U.S. Congress, Delaware's state agencies, Delaware's governor, and corporations and industry should all be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
    - Would most like to have more information on how sea level rise relates to climate change / global warming, actions that can be taken to reduce impacts of sea level rise, funding needs / estimated budget to address sea level rise in Delaware, sea level rise in general, how to protect property from sea level rise, and current or potential impacts of sea level rise (all at  $p \leq 0.001$  or greater significance).

- A primary source of his or her information about environmental issues in Delaware is the Internet, not including Department of Natural Resources and Environmental Control website ( $p \leq 0.001$ ).
- Rents his or her current place of residence ( $p \leq 0.001$ ).
- Has at least one child, age 17 or younger, living in his or her household ( $p \leq 0.001$ ).
- Is between ages 18-34 ( $p \leq 0.001$ ).
- Is female ( $p \leq 0.01$ ).
- Has been a Delaware resident for less than the mean of 30 years ( $p \leq 0.05$ ).
- Does not have a bachelor's degree ( $p \leq 0.05$ ).
- The nonparametric analysis found that the following responses are correlated with thinking that his or her **county government officials** should be doing more to address or reduce the impacts of sea level rise in Delaware:
  - Thinks that sea level rise is a very or somewhat serious threat to the United States, a very or somewhat serious threat to him or her personally, a very or somewhat serious threat to the Mid-Atlantic United States, a very serious threat to marshes and wetlands in Delaware, a very serious threat to Delaware beaches, a very serious threat to ocean-front cities and towns in Delaware, a very or somewhat serious threat to river-front cities and towns in Delaware, and a very serious threat to the State of Delaware (all at  $p \leq 0.001$  or greater significance).
  - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).
  - Shows concern about climate change and sea level rise (e.g., thinks that climate change is a very serious threat; worries a great deal or a moderate amount about climate change; worries a great deal or a moderate amount about the problems that sea level rise may cause in Delaware) (all at  $p \leq 0.05$  or greater significance).
  - Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - On all questions about how to improve areas at risk from sea level rise, supports any efforts to address sea level rise in Delaware or reduce its impacts (e.g., supports purchasing or acquiring land and open space from willing land sellers using government funds; supports elevating buildings using government funds; strongly supports changing building codes and regulations to reduce risk in flood prone areas) (all at  $p \leq 0.01$  or greater significance).
  - Believes human efforts can improve climate change (e.g., agrees that the impacts of climate change can be reduced by human efforts; agrees that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
  - Thinks that his or her state government officials, his or her city or town government officials, Delaware's state legislators, Delaware's governor, Delaware citizens, Delaware's state agencies, the U.S. Congress, and corporations and industry should all be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
  - Has flood insurance for his or her current place of residence ( $p \leq 0.01$ ).
  - Would most like to have more information on how sea level rise relates to climate change / global warming ( $p \leq 0.001$ ), funding needs / estimated budget to address sea

- level rise in Delaware ( $p \leq 0.001$ ), how to protect property from sea level rise ( $p \leq 0.001$ ), actions that can be taken to reduce impacts of sea level rise ( $p \leq 0.001$ ), sea level rise in general ( $p \leq 0.001$ ), and current or potential impacts of sea level rise ( $p \leq 0.01$ ).
- Rents his or her current place of residence ( $p \leq 0.001$ ).
  - Is female ( $p \leq 0.01$ ).
  - Considers his or her place of residence to be in a coastal area ( $p \leq 0.01$ ).
  - Considers his or her place of residence to be a small city or town ( $p \leq 0.05$ ).
- The nonparametric analysis found that the following responses are correlated with thinking that his or her **state government officials** should be doing more to address or reduce the impacts of sea level rise in Delaware:
    - Shows concern about climate change and sea level rise (e.g., worries a great deal or a moderate amount about the problems that sea level rise may cause in Delaware; thinks that climate change is a very serious threat; worries a great deal or a moderate amount about climate change) (all at  $p \leq 0.05$  or greater significance).
    - Thinks that sea level rise is a very or somewhat serious threat to him or her personally, a very or somewhat serious threat to the United States, a very or somewhat serious threat to the Mid-Atlantic United States, a very serious threat to ocean-front cities and towns in Delaware, a very serious threat to Delaware beaches, a very or somewhat serious threat to river-front cities and towns in Delaware, a very serious threat to marshes and wetlands in Delaware, and a very serious threat to the State of Delaware (all at  $p \leq 0.001$  or greater significance).
    - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).
    - Thinks that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.001$ ).
    - On all questions about how to improve areas at risk from sea level rise, supports any efforts to address sea level rise in Delaware or reduce its impacts (e.g., supports purchasing or acquiring land and open space from willing land sellers using government funds; supports purchasing or buying out frequently flooded properties using government funds; supports elevating buildings using government funds) (all at  $p \leq 0.01$  or greater significance).
    - Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
    - Believes human efforts can improve climate change (e.g., agrees that the impacts of climate change can be reduced by human efforts; agrees that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
    - Thinks that Delaware's state legislators ( $p \leq 0.001$ ), his or her county government officials ( $p \leq 0.001$ ), Delaware's governor ( $p \leq 0.001$ ), his or her city or town government officials ( $p \leq 0.001$ ), Delaware's state agencies ( $p \leq 0.001$ ), Delaware citizens ( $p \leq 0.001$ ), the U.S. Congress ( $p \leq 0.001$ ), and corporations and industry ( $p \leq 0.01$ ) should all be doing more to address or reduce the impacts of sea level rise in Delaware.

- Would most like to have more information on actions that can be taken to reduce impacts of sea level rise, how sea level rise relates to climate change / global warming, how to protect property from sea level rise, sea level rise in general, funding needs / estimated budget to address sea level rise in Delaware, and current or potential impacts of sea level rise (all at  $p \leq 0.001$  or greater significance).
- A primary source of his or her information about environmental issues in Delaware is the Internet, not including Department of Natural Resources and Environmental Control website ( $p \leq 0.01$ ).
- Rents his or her current place of residence ( $p \leq 0.001$ ).
- Is female ( $p \leq 0.001$ ).
- Has at least one child, age 17 or younger, living in his or her household ( $p \leq 0.001$ ).
- Is between ages 18-34 ( $p \leq 0.01$ ).
- The nonparametric analysis found that the following responses are correlated with thinking that the **U.S. Congress** should be doing more to address or reduce the impacts of sea level rise in Delaware:
  - Says he/she knows a great deal or a moderate amount about climate change ( $p \leq 0.01$ ).
  - Shows concern about climate change and sea level rise (e.g., worries a great deal or a moderate amount about climate change; thinks that climate change is a very serious threat; is completely or mostly convinced that sea levels are rising) (all at  $p \leq 0.001$  or greater significance).
  - Thinks that sea level rise is a very or somewhat serious threat to him or her personally, a very or somewhat serious threat to the United States, a very or somewhat serious threat to the Mid-Atlantic United States, a very serious threat to marshes and wetlands in Delaware, a very serious threat to ocean-front cities and towns in Delaware, a very serious threat to Delaware beaches, a very or somewhat serious threat to river-front cities and towns in Delaware, and a very serious threat to the State of Delaware (all at  $p \leq 0.001$  or greater significance).
  - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).
  - Thinks that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.001$ ).
  - Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - On all questions about how to improve areas at risk from sea level rise, supports any efforts to address sea level rise in Delaware or reduce its impacts (e.g., supports elevating buildings using government funds; supports purchasing or acquiring land and open space from willing land sellers using government funds; supports elevating the land surface) (all at  $p \leq 0.01$  or greater significance).
  - Believes human efforts can improve climate change (e.g., agrees that climate change is something people can control; agrees that the impacts of climate change can be reduced by human efforts) (all at  $p \leq 0.001$  or greater significance).
  - Thinks that Delaware's state agencies, Delaware's governor, Delaware citizens, corporations and industry, Delaware's state legislators, his or her city or town

- government officials, his or her county government officials, and his or her county government officials should all be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
- Has flood insurance for his or her current place of residence ( $p \leq 0.05$ ).
  - Would most like to have more information on actions that can be taken to reduce impacts of sea level rise ( $p \leq 0.001$ ), how sea level rise relates to climate change / global warming ( $p \leq 0.001$ ), funding needs / estimated budget to address sea level rise in Delaware ( $p \leq 0.01$ ), sea level rise in general ( $p \leq 0.05$ ), and how to protect property from sea level rise ( $p \leq 0.05$ ).
  - A primary source of his or her information about environmental issues in Delaware is magazines ( $p \leq 0.01$ ).
  - Considers his or her place of residence to be a large city, urban area, or suburban area ( $p \leq 0.01$ ).
  - Is female ( $p \leq 0.05$ ).
- The nonparametric analysis found that the following responses are correlated with thinking that **corporations and industry** should be doing much more to address or reduce the impacts of sea level rise in Delaware:
    - Says he/she knows a great deal or a moderate amount about sea level rise ( $p \leq 0.01$ ) and climate change ( $p \leq 0.05$ ).
    - Shows concern about climate change and sea level rise (e.g., worries a great deal or a moderate amount about climate change; thinks that climate change is a very serious threat; strongly agrees that scientists are right that climate change is occurring) (all at  $p \leq 0.001$  or greater significance).
    - Thinks that sea level rise is a very or somewhat serious threat to him or her personally ( $p \leq 0.001$ ), a very serious threat to ocean-front cities and towns in Delaware ( $p \leq 0.001$ ), a very or somewhat serious threat to river-front cities and towns in Delaware ( $p \leq 0.001$ ), a very or somewhat serious threat to the United States ( $p \leq 0.001$ ), a very serious threat to the State of Delaware ( $p \leq 0.001$ ), a very or somewhat serious threat to the Mid-Atlantic United States ( $p \leq 0.001$ ), a very serious threat to Delaware beaches ( $p \leq 0.001$ ), and a very serious threat to marshes and wetlands in Delaware ( $p \leq 0.05$ ).
    - Thinks that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.001$ ).
    - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).
    - Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
    - On most questions about how to improve areas at risk from sea level rise, supports any efforts to address sea level rise in Delaware or reduce its impacts (e.g., strongly supports changing building codes and regulations to reduce risk in flood prone areas; strongly supports avoiding building new structures; supports purchasing or acquiring land and open space from willing land sellers using government funds) (all at  $p \leq 0.05$  or greater significance).

- Believes human efforts can improve climate change (e.g., agrees that the impacts of climate change can be reduced by human efforts; agrees that climate change is something people can control) (all at  $p \leq 0.001$  or greater significance).
- Thinks that the U.S. Congress ( $p \leq 0.001$ ), Delaware's state agencies ( $p \leq 0.001$ ), Delaware citizens ( $p \leq 0.001$ ), his or her city or town government officials ( $p \leq 0.001$ ), Delaware's governor ( $p \leq 0.001$ ), his or her county government officials ( $p \leq 0.001$ ), Delaware's state legislators ( $p \leq 0.001$ ), and his or her state government officials ( $p \leq 0.01$ ) should all be doing more to address or reduce the impacts of sea level rise in Delaware.
- Has flood insurance for his or her current place of residence ( $p \leq 0.01$ ).
- A primary source of his or her information about environmental issues in Delaware is television ( $p \leq 0.01$ ).
- Would most like to have more information on how sea level rise relates to climate change / global warming ( $p \leq 0.01$ ), funding needs / estimated budget to address sea level rise in Delaware ( $p \leq 0.01$ ), and how to protect property from sea level rise ( $p \leq 0.05$ ).
- Is between ages 35-64 ( $p \leq 0.001$ ).
- Is female ( $p \leq 0.05$ ).
- Rents his or her current place of residence ( $p \leq 0.05$ ).
- The nonparametric analysis found that the following responses are correlated with thinking that **Delaware citizens** should be doing more to address or reduce the impacts of sea level rise in Delaware:
  - Thinks that sea level rise is a very or somewhat serious threat to him or her personally, a very or somewhat serious threat to the United States, a very or somewhat serious threat to the Mid-Atlantic United States, a very serious threat to marshes and wetlands in Delaware, a very or somewhat serious threat to river-front cities and towns in Delaware, a very serious threat to Delaware beaches, a very serious threat to ocean-front cities and towns in Delaware, and a very serious threat to the State of Delaware (all at  $p \leq 0.001$  or greater significance).
  - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).
  - Shows concern about climate change and sea level rise (e.g., worries a great deal or a moderate amount about climate change; is completely or mostly convinced that sea levels are rising; thinks that climate change is a very serious threat) (all at  $p \leq 0.001$  or greater significance).
  - Thinks that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.001$ ).
  - On most questions about how to improve areas at risk from sea level rise, supports any efforts to address sea level rise in Delaware or reduce its impacts (e.g., supports purchasing or acquiring land and open space from willing land sellers using government funds; supports elevating buildings using government funds; supports purchasing or buying out frequently flooded properties using government funds) (all at  $p \leq 0.001$  or greater significance).

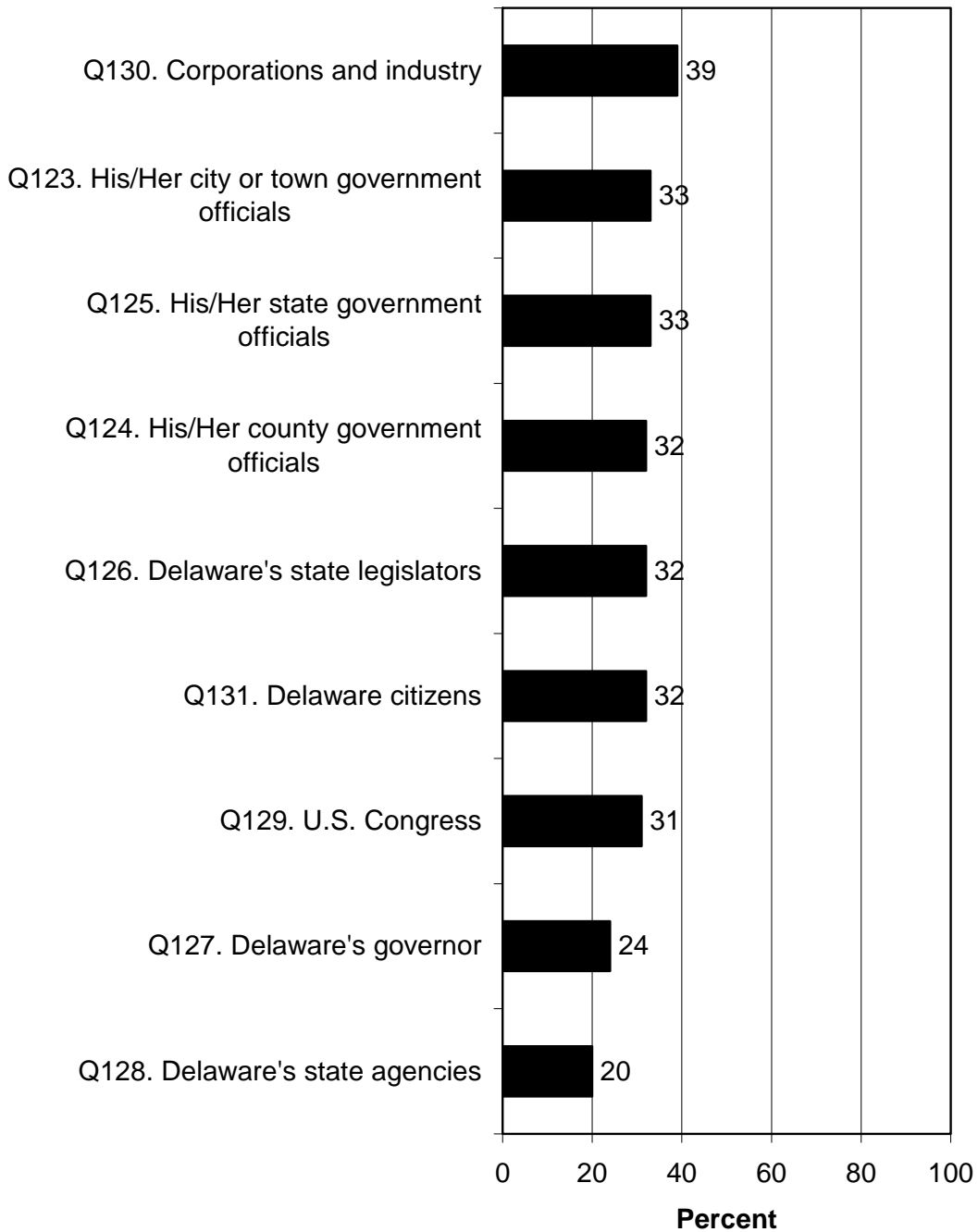
- Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - Believes human efforts can improve climate change (e.g., agrees that climate change is something people can control; agrees that the impacts of climate change can be reduced by human efforts) (all at  $p \leq 0.001$  or greater significance).
  - Thinks that his or her city or town government officials, his or her county government officials, the U.S. Congress, his or her state government officials, corporations and industry, Delaware's state agencies, Delaware's state legislators, and Delaware's governor should all be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
  - Would most like to have more information on actions that can be taken to reduce impacts of sea level rise, how sea level rise relates to climate change / global warming, funding needs / estimated budget to address sea level rise in Delaware, how to protect property from sea level rise, sea level rise in general, and current or potential impacts of sea level rise (all at  $p \leq 0.001$  or greater significance).
  - A primary source of his or her information about environmental issues in Delaware is the Internet, not including Department of Natural Resources and Environmental Control website ( $p \leq 0.01$ ).
  - Rents his or her current place of residence ( $p \leq 0.001$ ).
  - Is female ( $p \leq 0.001$ ).
  - Has at least one child, age 17 or younger, living in his or her household ( $p \leq 0.01$ ).
  - Is between ages 18-34 ( $p \leq 0.01$ ).
- The crosstabulation by coastal/non-coastal found statistically significant differences on two of the questions in the above series. In that series, the crosstabulation by coastal/non-coastal found that coastal residents, relative to non-coastal residents, are more likely to think that the following should do *much* more to address or reduce the impacts of sea level rise in Delaware:
- Their county government ( $p \leq 0.05$ ).
  - Delaware's state agencies ( $p \leq 0.01$ ).
- Most residents (55%) indicate that they would *not* be likely to attend a public meeting, informational session, or "webinar" in the next 12 months on sea level rise in Delaware. On the other end, 10% indicate being *very* likely. A similar question asked residents about their likelihood to write letters, send emails, or call elected officials in the next 12 months about sea level rise: 62% would be not at all likely, while only 9% indicate being *very* likely.



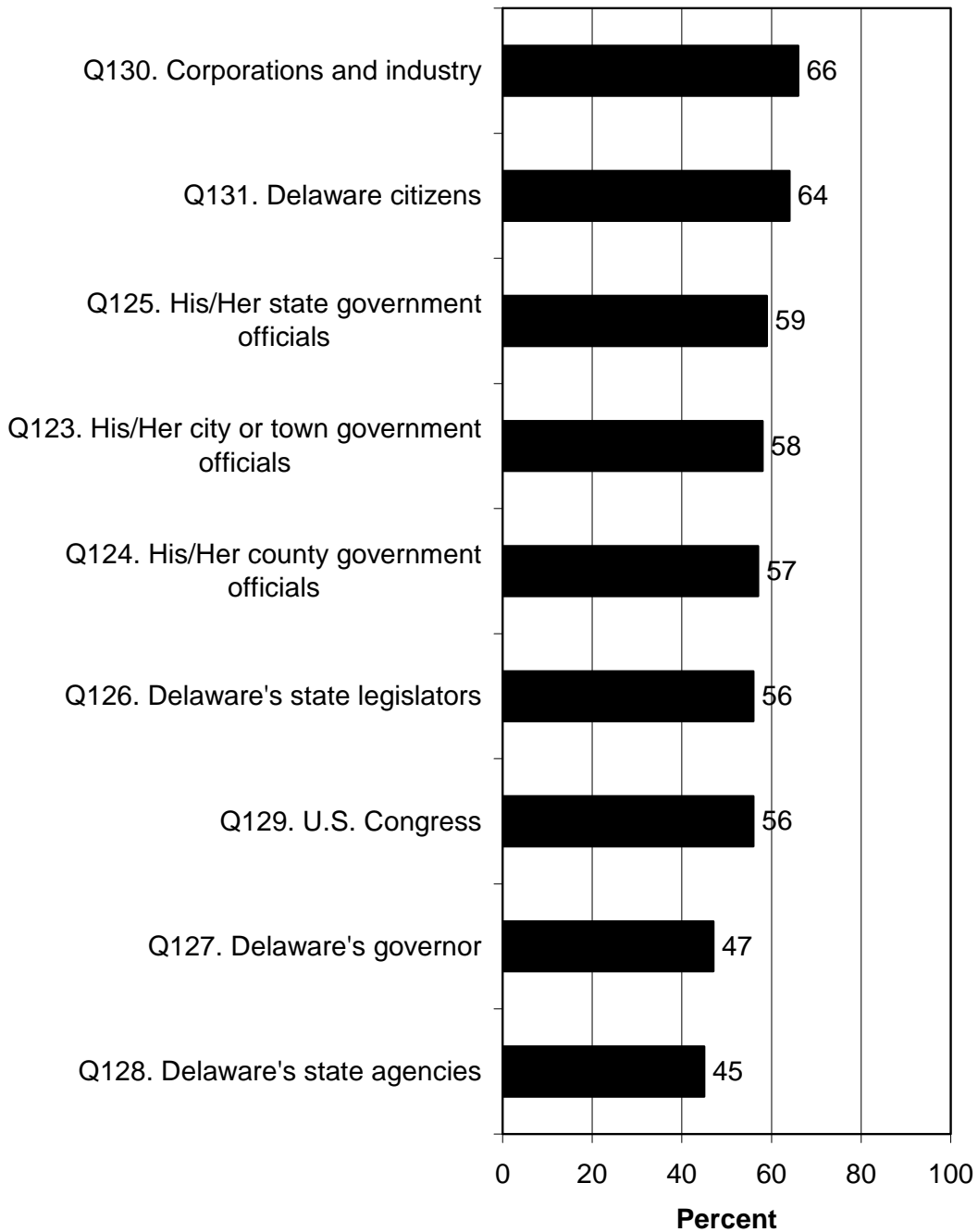
- The nonparametric analysis found that the following responses are correlated with being very likely or somewhat likely to attend a public meeting, information session, or “webinar” on sea level rise:
  - Says he/she knows a great deal or a moderate amount about climate change ( $p \leq 0.001$ ) and sea level rise ( $p \leq 0.001$ ).
  - Shows concern about climate change and sea level rise (e.g., worries a great deal or a moderate amount about climate change, worries a great deal or a moderate amount about the problems that sea level rise may cause in Delaware, is completely or mostly convinced that sea levels are rising) (all at  $p \leq 0.001$  or greater significance).
  - Does not indicate agreeing that the impacts of climate change are greatly exaggerated ( $p \leq 0.001$ ).
  - Strongly agrees with the statement that scientists are right that climate change is occurring ( $p \leq 0.01$ ), and thinks that most scientists think that climate change is happening ( $p \leq 0.05$ ).
  - Thinks that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.05$ ).
  - Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).
  - On most questions, supports alterations in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts (e.g., strongly supports changing building codes and regulations to reduce risk in flood prone areas, strongly supports avoiding building new structures, supports purchasing or buying out frequently flooded properties using government funds) (all at  $p \leq 0.05$  or greater significance).
  - Believes human efforts can improve climate change (e.g., agrees that climate change is something people can control; agrees that the impacts of climate change can be reduced by human efforts) (all at  $p \leq 0.001$  or greater significance).
  - Thinks that Delaware's governor, Delaware's state legislators, Delaware's state agencies, his or her state government officials, his or her county government officials, the U.S. Congress, his or her city or town government officials, corporations and industry, and Delaware citizens should all be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
  - Has flood insurance for his or her current place of residence ( $p \leq 0.05$ ).
  - Would most like to have more information on actions that can be taken to reduce impacts of sea level rise, funding needs / estimated budget to address sea level rise in Delaware, how to protect property from sea level rise, current or potential impacts of sea level rise, sea level rise in general, and how sea level rise relates to climate change / global warming (all at  $p \leq 0.001$  or greater significance).
  - Gets most of his or her information about environmental issues in Delaware from the Internet, not including Department of Natural Resources and Environmental Control website ( $p \leq 0.05$ ), and newspapers ( $p \leq 0.05$ ).
  - Is between ages 35-64 ( $p \leq 0.001$ ).
  - Owns his or her current place of residence ( $p \leq 0.05$ ).

- The nonparametric analysis found that the following responses are correlated with being very likely or somewhat likely to write letters, send e-mails, or call elected officials about sea level rise:
  - Says he/she knows a great deal or a moderate amount about sea level rise ( $p \leq 0.001$ ) and climate change ( $p \leq 0.001$ ).
  - Shows concern about climate change and sea level rise (e.g., worries a great deal or a moderate amount about climate change, thinks that climate change is a very serious threat, is completely or mostly convinced that sea levels are rising) (all at  $p \leq 0.01$  or greater significance).
  - Thinks that most scientists think that climate change is happening ( $p \leq 0.001$ ), and strongly agrees with the statement that scientists are right that climate change is occurring ( $p \leq 0.001$ ).
  - Thinks that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.001$ ).
  - Does not indicate agreeing that the impacts of climate change are greatly exaggerated ( $p \leq 0.05$ ).
  - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).
  - Believes human efforts can improve climate change (e.g., agrees that climate change is something people can control; agrees that the impacts of climate change can be reduced by human efforts) (all at  $p \leq 0.001$  or greater significance).
  - Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
  - Supports purchasing or acquiring land and open space at risk from sea level rise from willing land sellers using government funds ( $p \leq 0.001$ ), Supports purchasing or buying out frequently flooded properties using government funds ( $p \leq 0.05$ ), and Strongly supports elevating buildings in areas at risk from sea level rise using private funding ( $p \leq 0.05$ ) to address sea level rise in Delaware or reduce its impacts.
  - Thinks that his or her county government officials, Delaware's state legislators, his or her city or town government officials, his or her state government officials, the U.S. Congress, Delaware's state agencies, Delaware's governor, corporations and industry, and Delaware citizens should all be doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.001$  or greater significance).
  - Has flood insurance for his or her current place of residence ( $p \leq 0.05$ ).
  - Would most like to have more information on how sea level rise relates to climate change / global warming ( $p \leq 0.001$ ), sea level rise in general ( $p \leq 0.01$ ), how to protect property from sea level rise ( $p \leq 0.05$ ), and current or potential impacts of sea level rise ( $p \leq 0.05$ ).
  - Considers his or her place of residence to be a small city or town ( $p \leq 0.01$ ).
  - Lives in New Castle County ( $p \leq 0.01$ ).
  - Is between ages 35-64 ( $p \leq 0.01$ ).
  - Considers his or her place of residence to be in a coastal area ( $p \leq 0.01$ ).
  - Has a bachelor's degree or graduate degree ( $p \leq 0.05$ ).

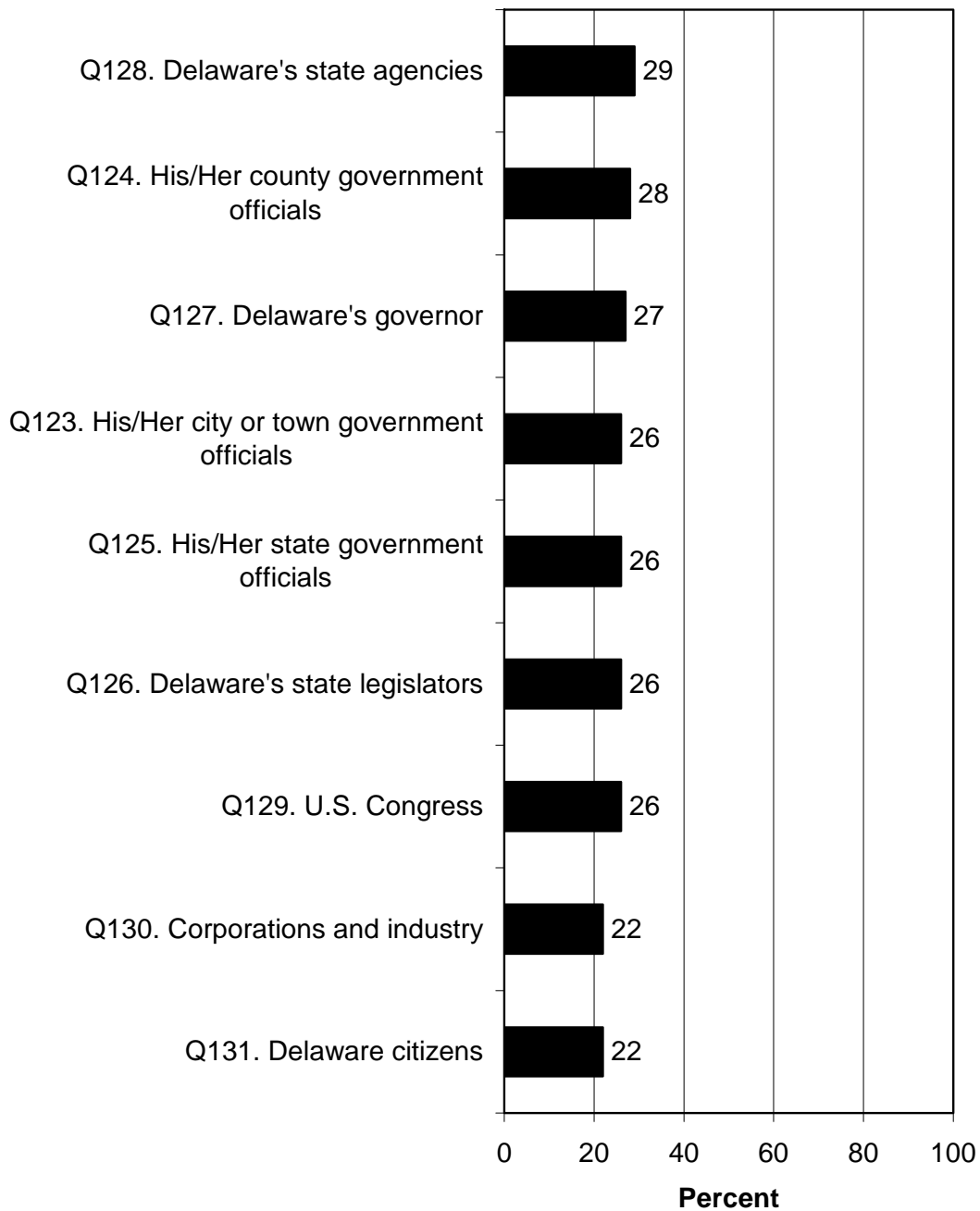
**Q123-131. Percent who think the following should be doing much more to address or reduce the impacts of sea level rise in Delaware.**



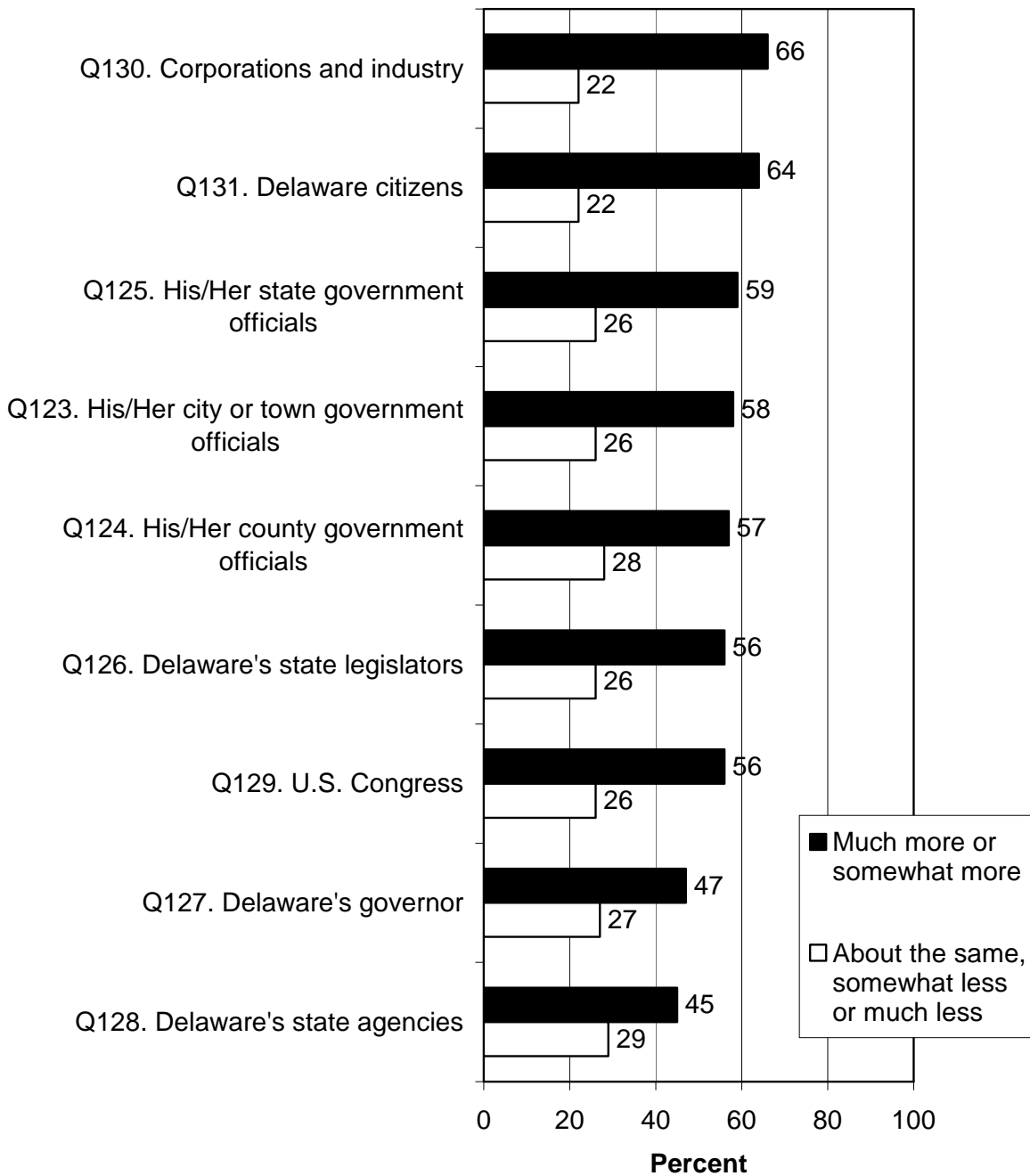
**Q123-131. Percent who think the following should be doing much or somewhat more to address or reduce the impacts of sea level rise in Delaware.**



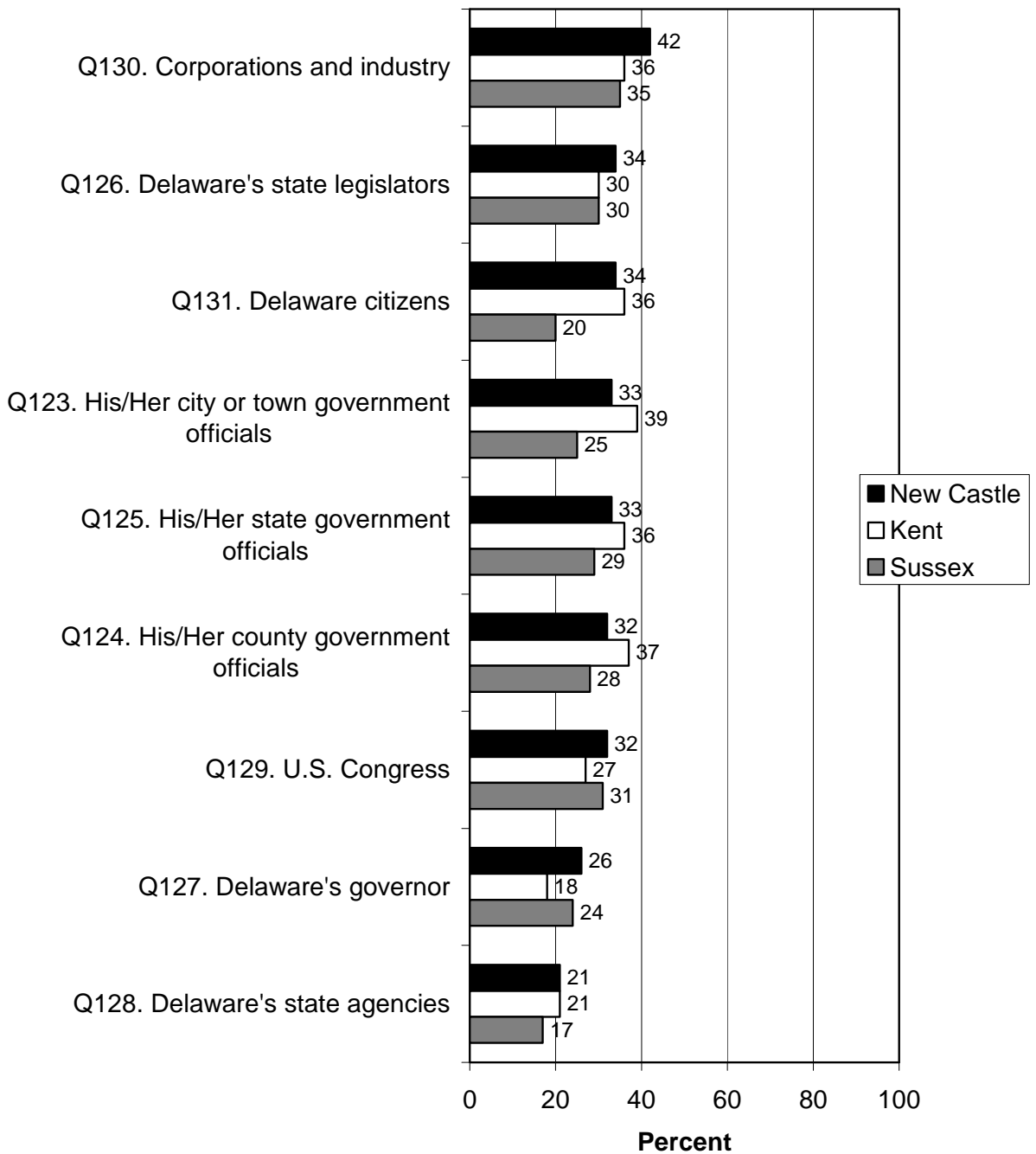
**Q123-131. Percent who think the following are doing the right amount or should be doing less to address or reduce the impacts of sea level rise in Delaware.**



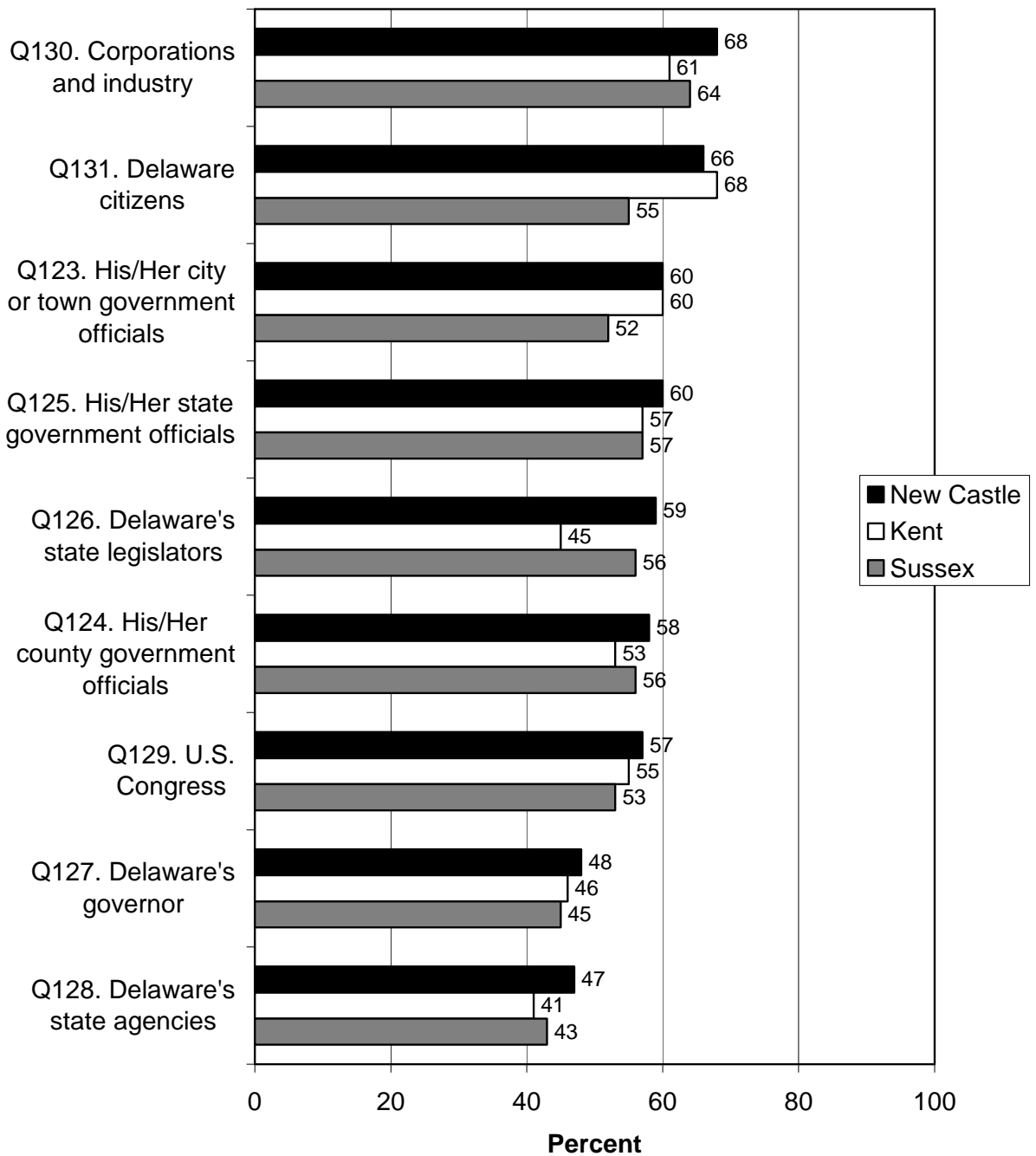
**Q123-131. Percent who think the following should be doing more/about the same or less to address or reduce the impacts of sea level rise in Delaware.**



**Q123-131. Percent who think the following should be doing much more to address or reduce the impacts of sea level rise in Delaware.**

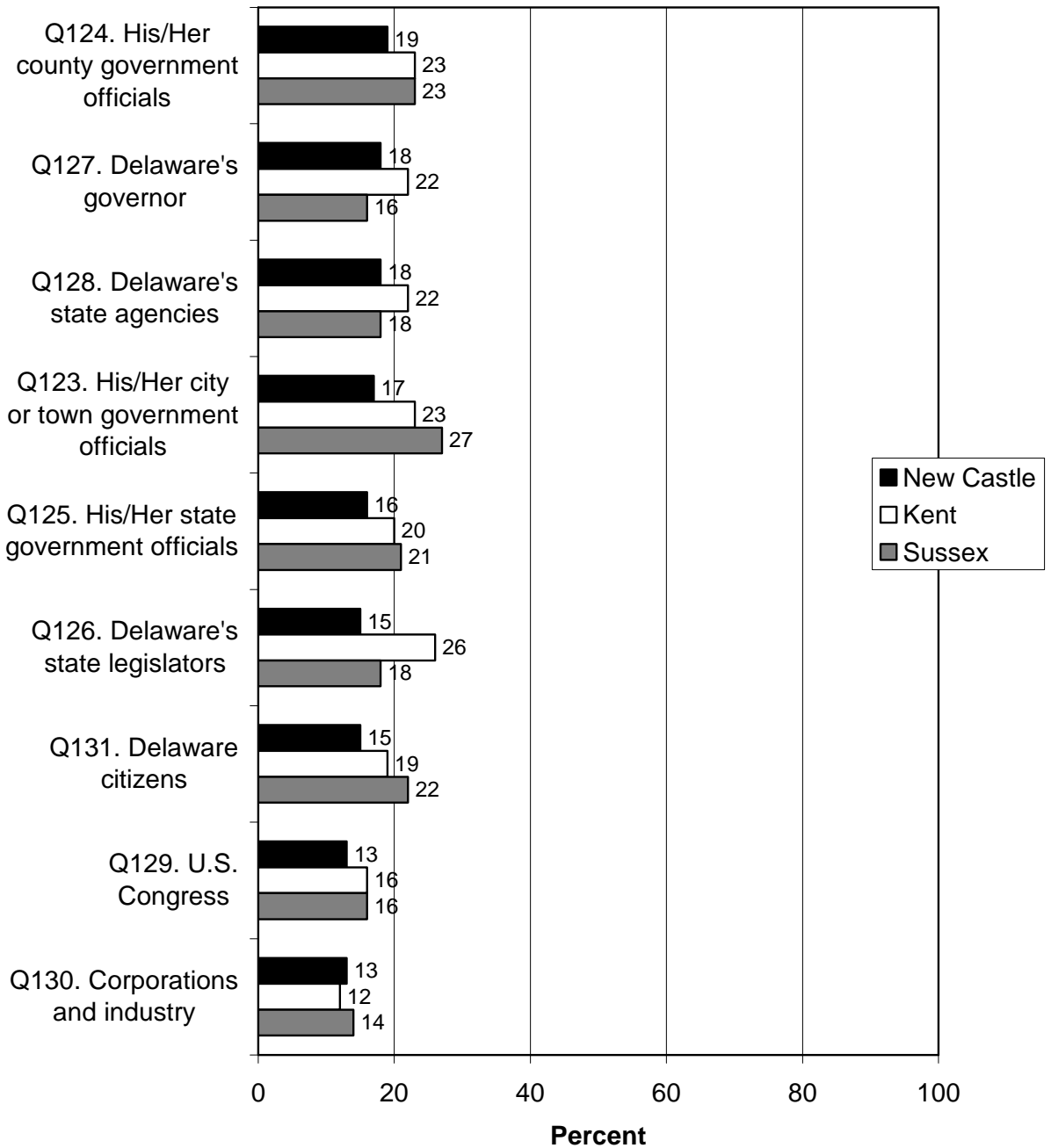


**Q123-131. Percent who think the following should be doing much or somewhat more to address or reduce the impacts of sea level rise in Delaware.**

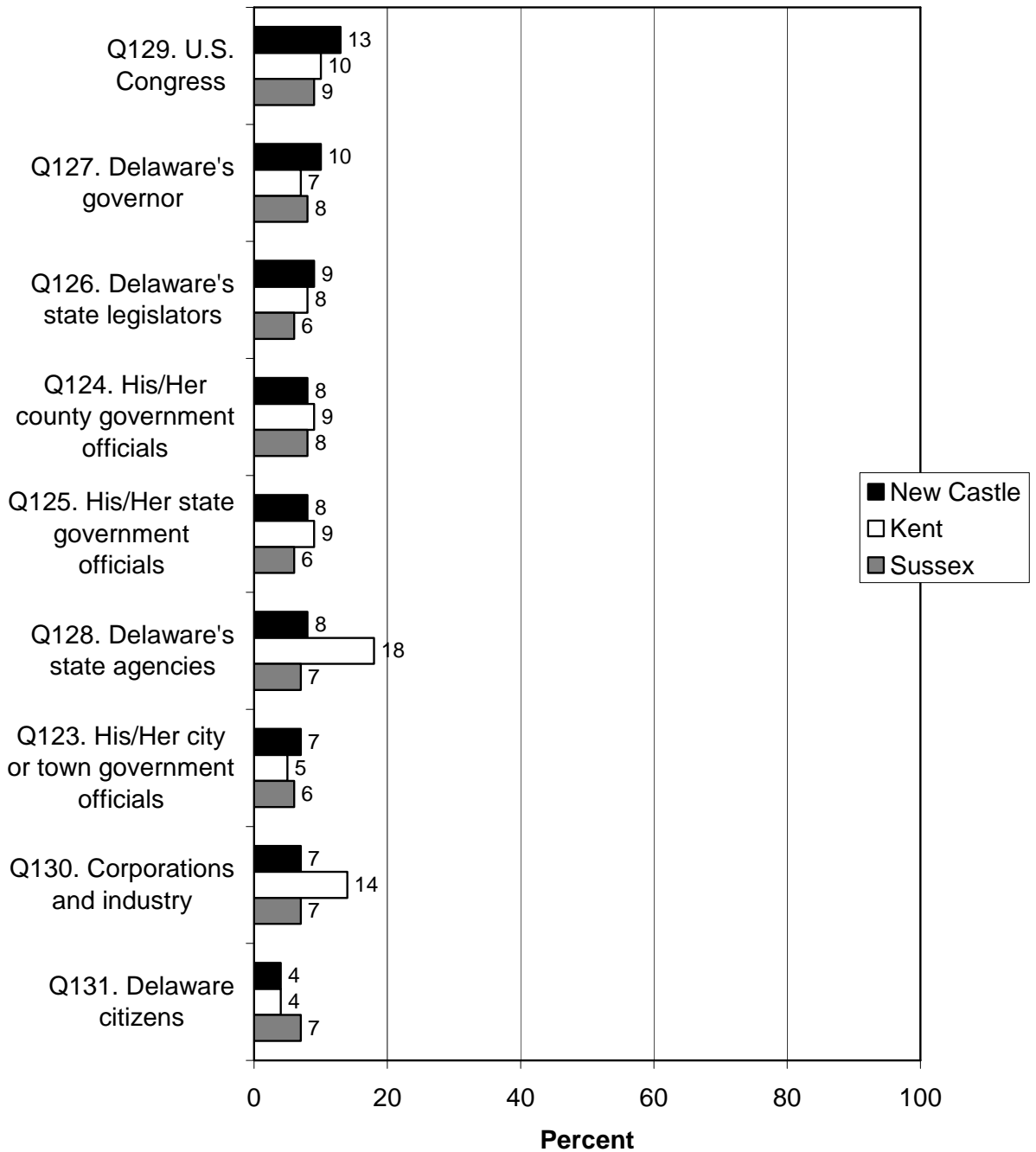




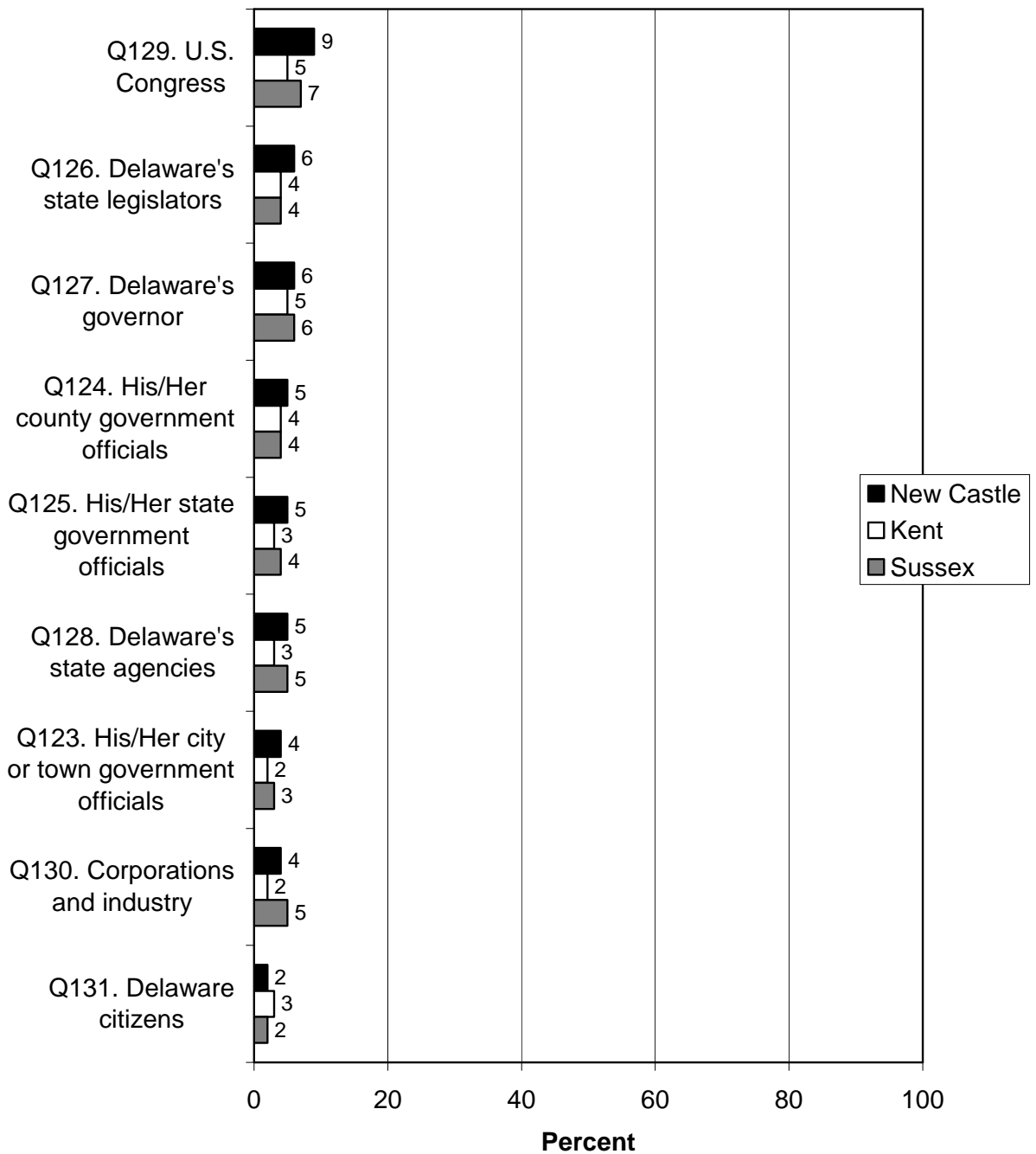
**Q123-131. Percent who think the following are currently doing about the right amount to address or reduce the impacts of sea level rise in Delaware.**



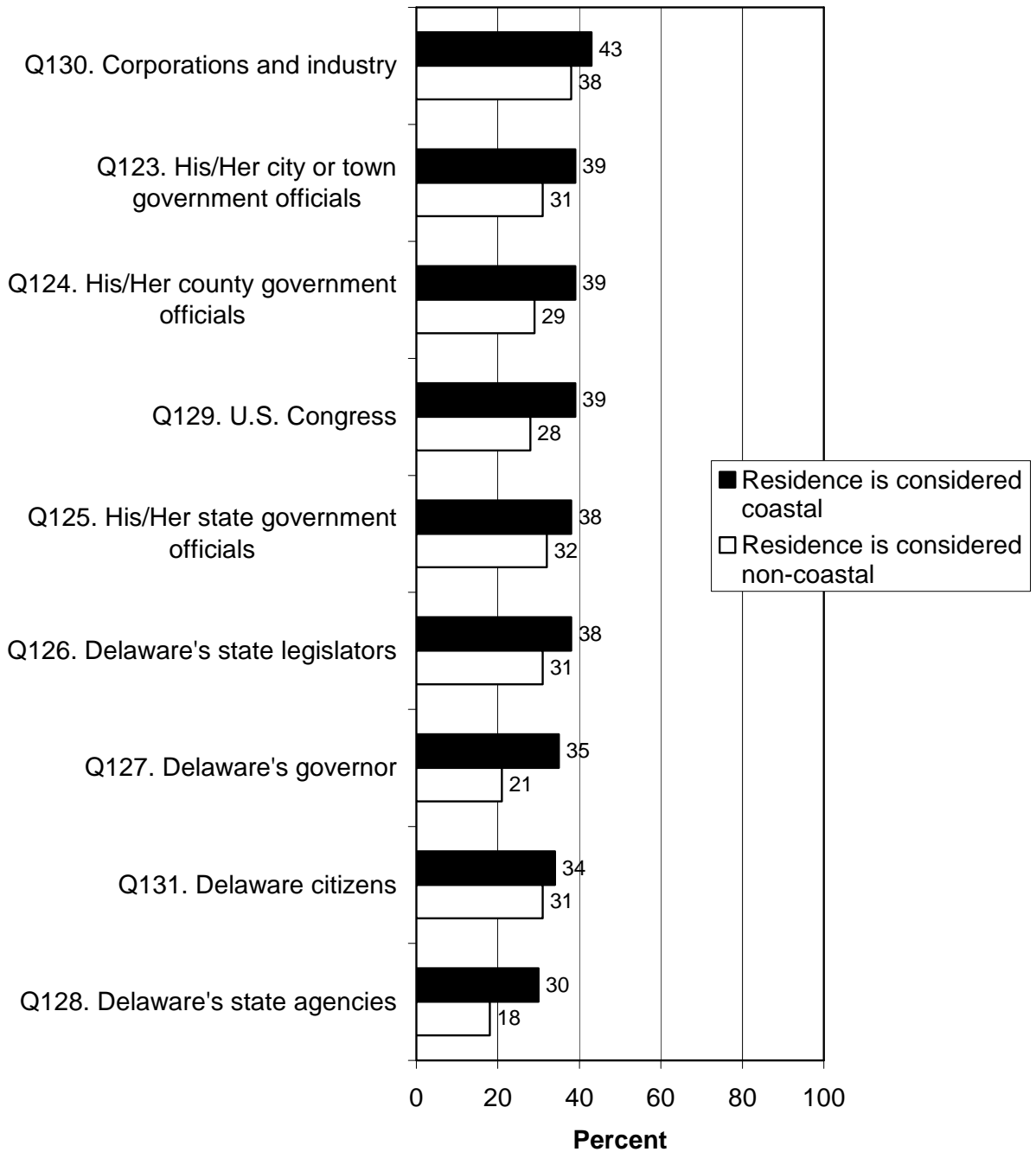
**Q123-131. Percent who think the following should be doing somewhat or much less to address or reduce the impacts of sea level rise in Delaware.**



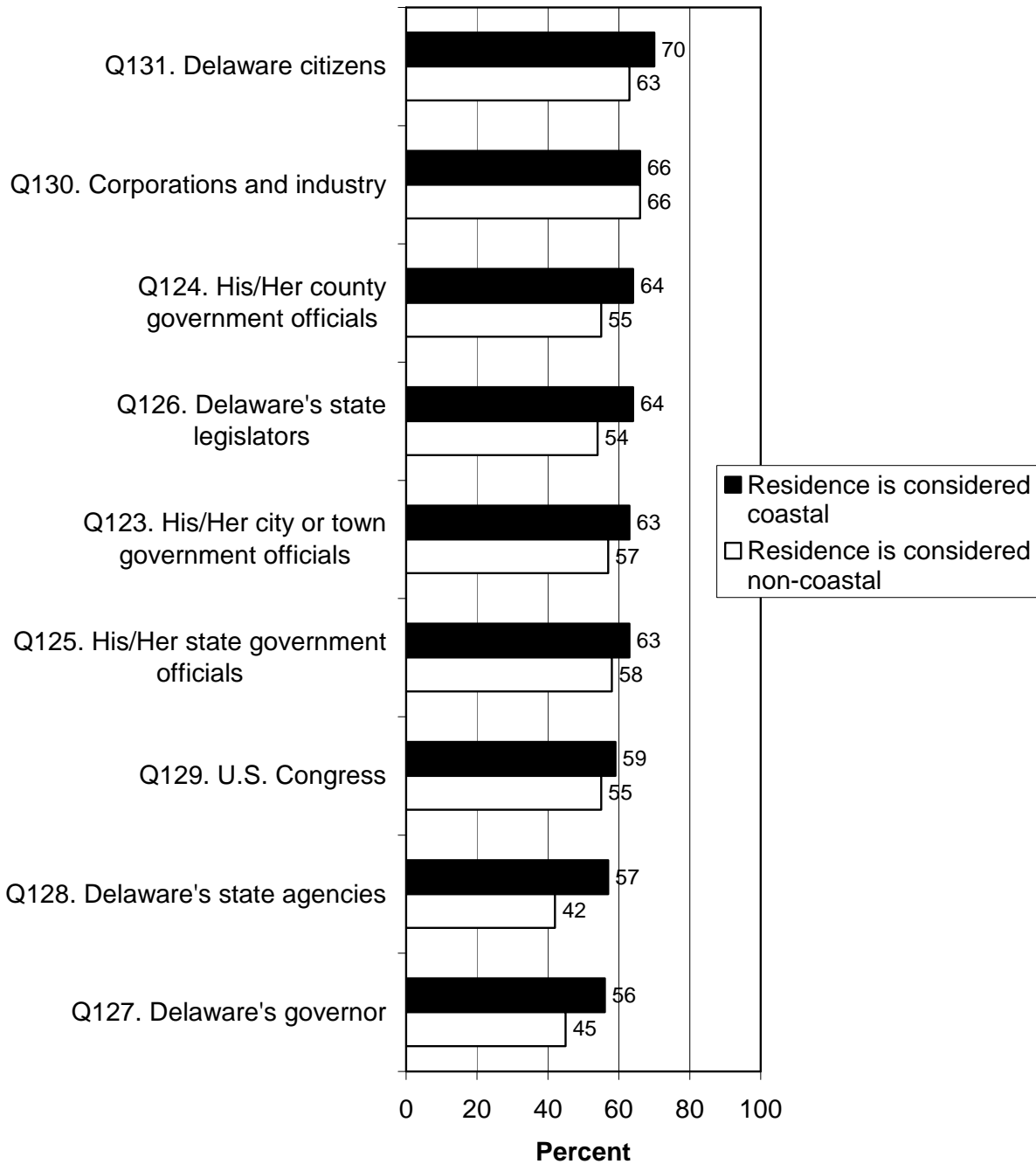
**Q123-131. Percent who think the following should be doing much less to address or reduce the impacts of sea level rise in Delaware.**



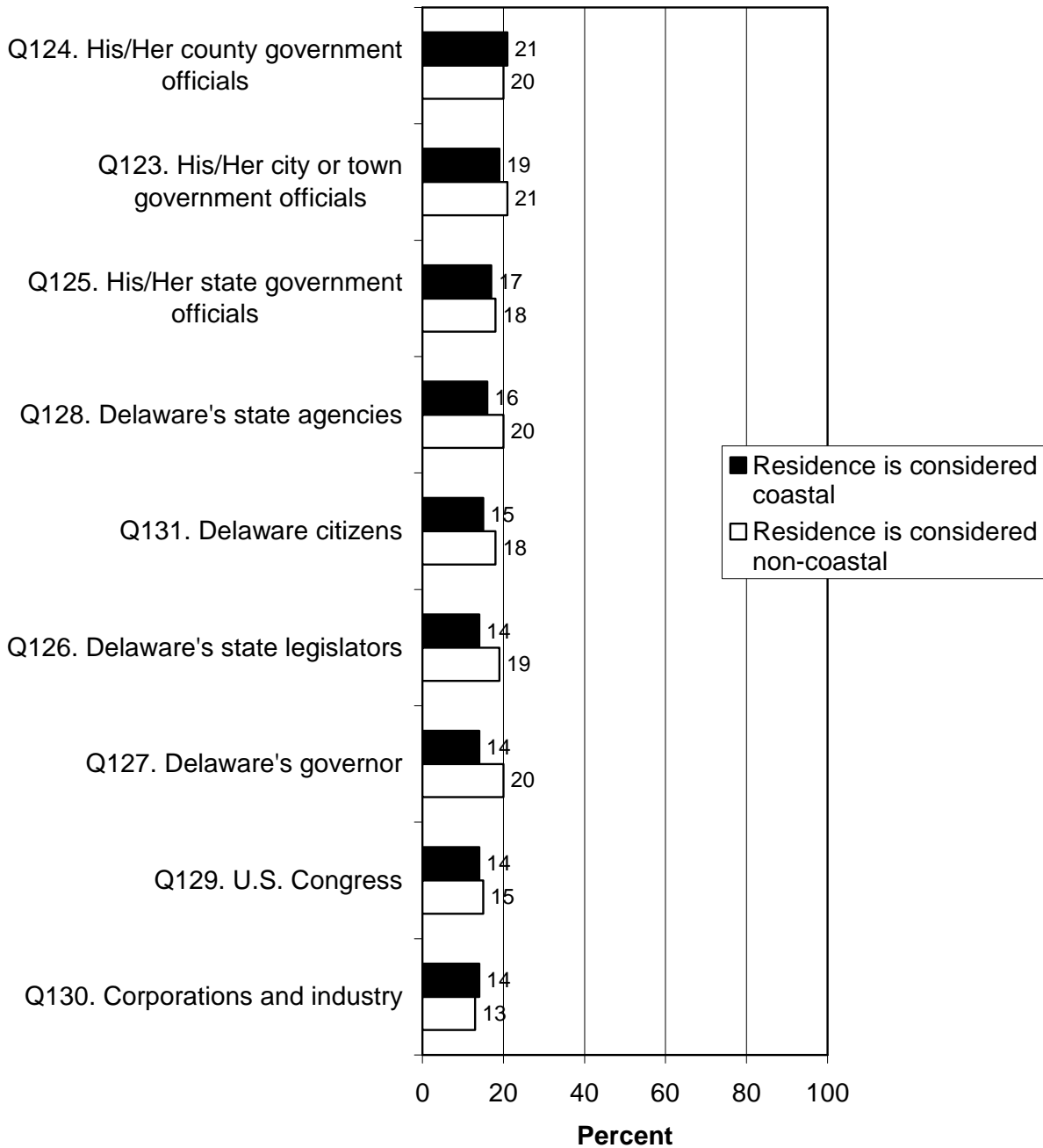
**Q123-131. Percent who think the following should be doing much more to address or reduce the impacts of sea level rise in Delaware.**



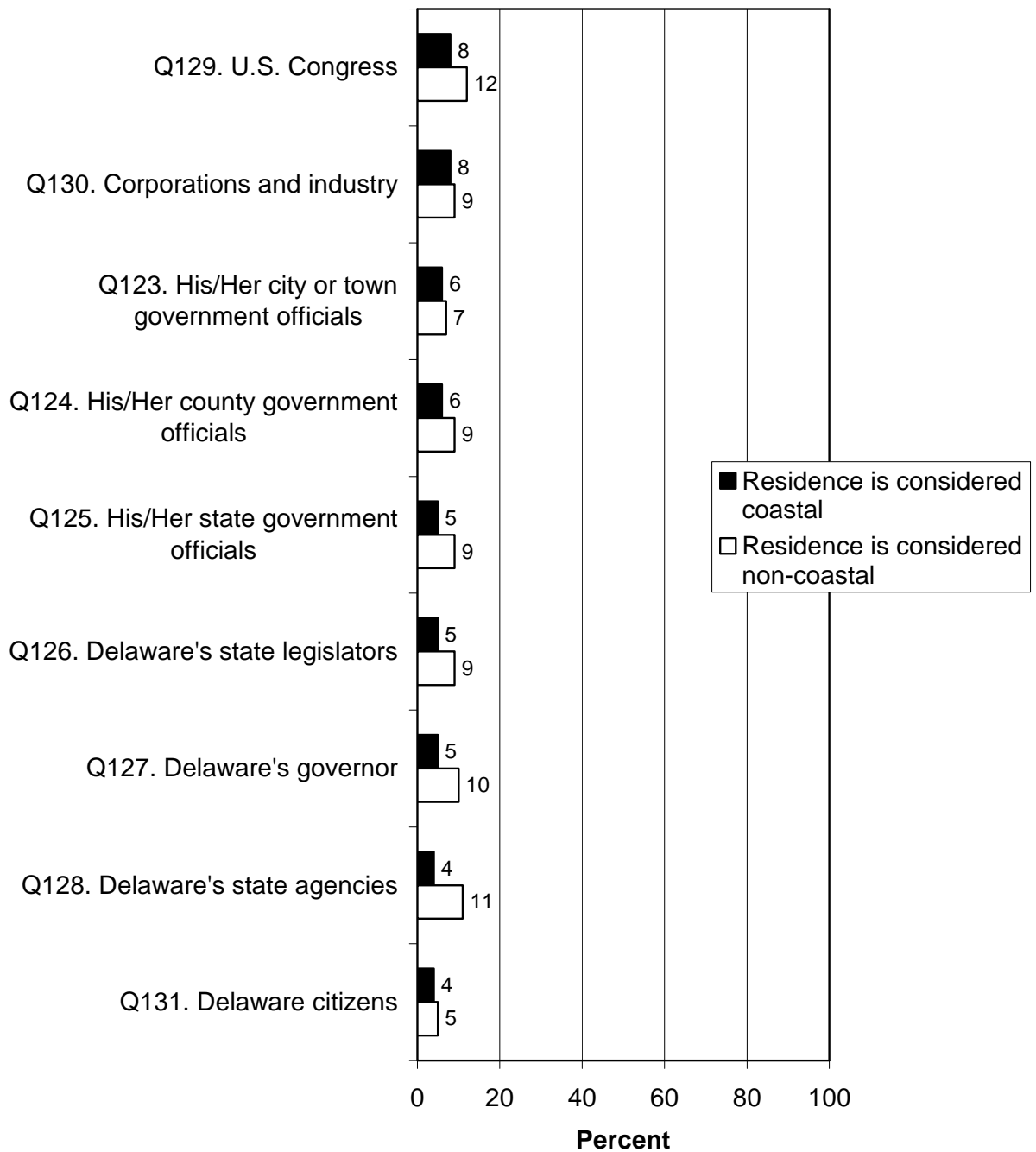
**Q123-131. Percent who think the following should be doing much or somewhat more to address or reduce the impacts of sea level rise in Delaware.**



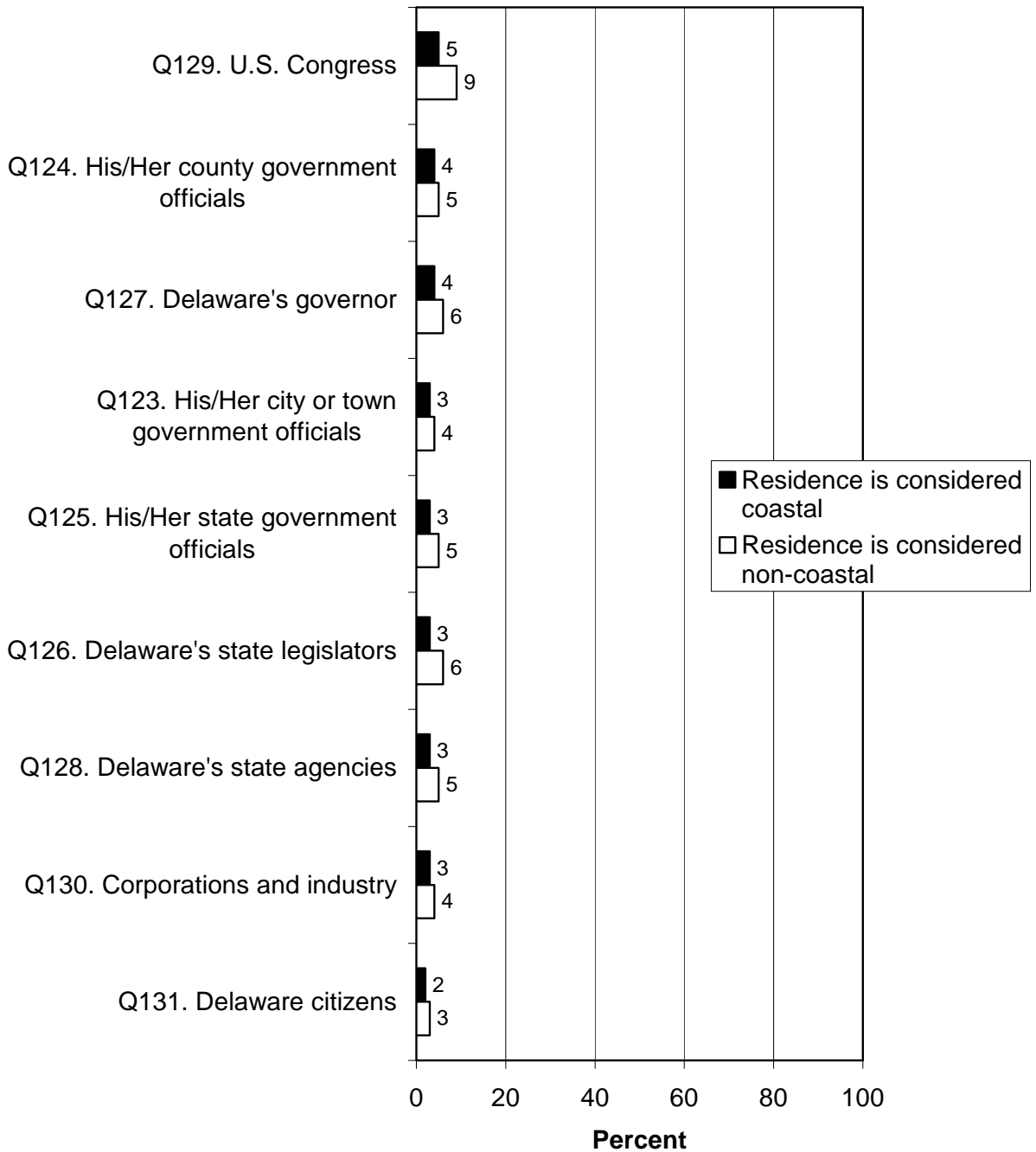
**Q123-131. Percent who think the following are currently doing about the right amount to address or reduce the impacts of sea level rise in Delaware.**



**Q123-131. Percent who think the following should be doing somewhat or much less to address or reduce the impacts of sea level rise in Delaware.**

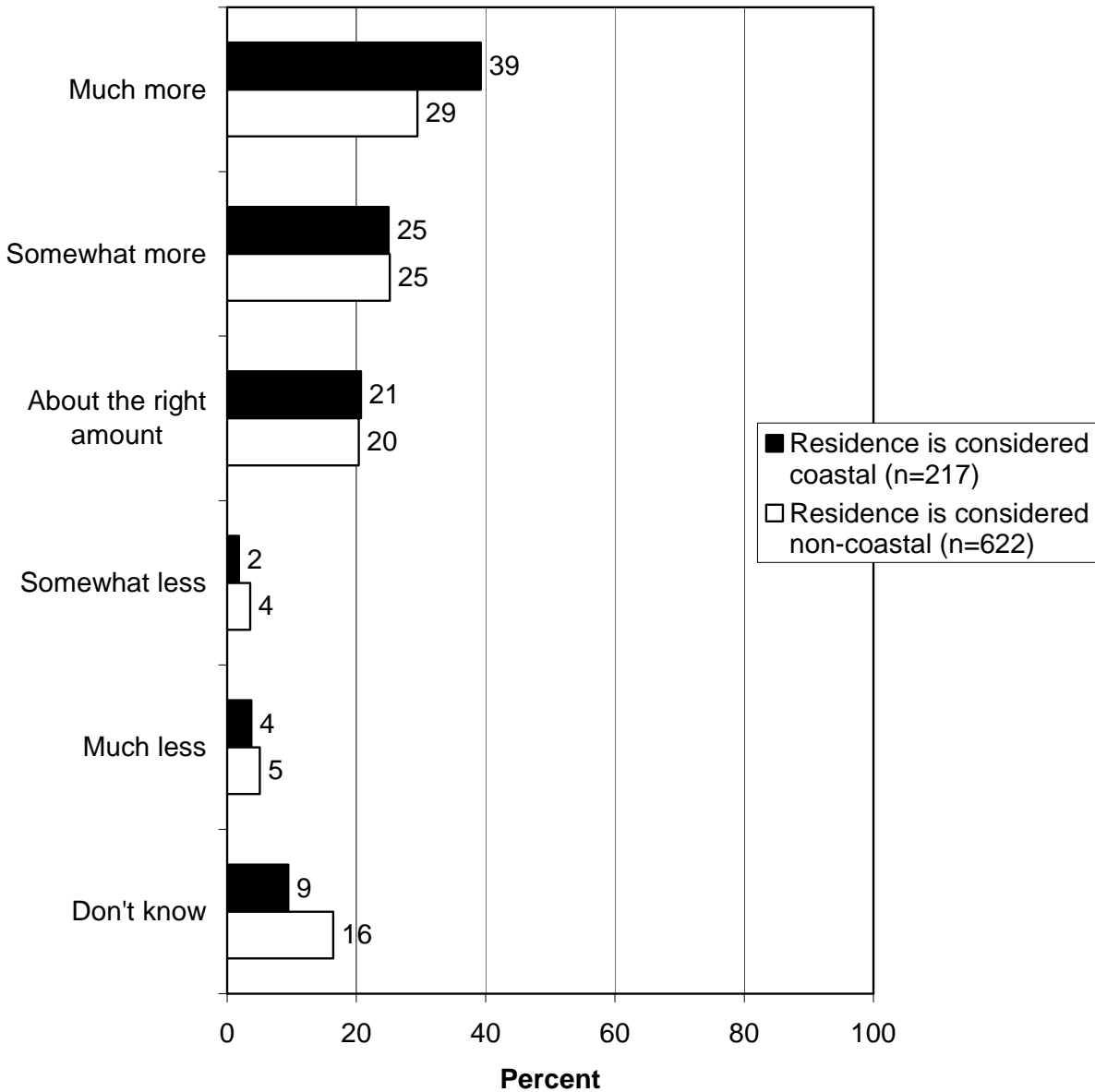


**Q123-131. Percent who think the following should be doing much less to address or reduce the impacts of sea level rise in Delaware.**

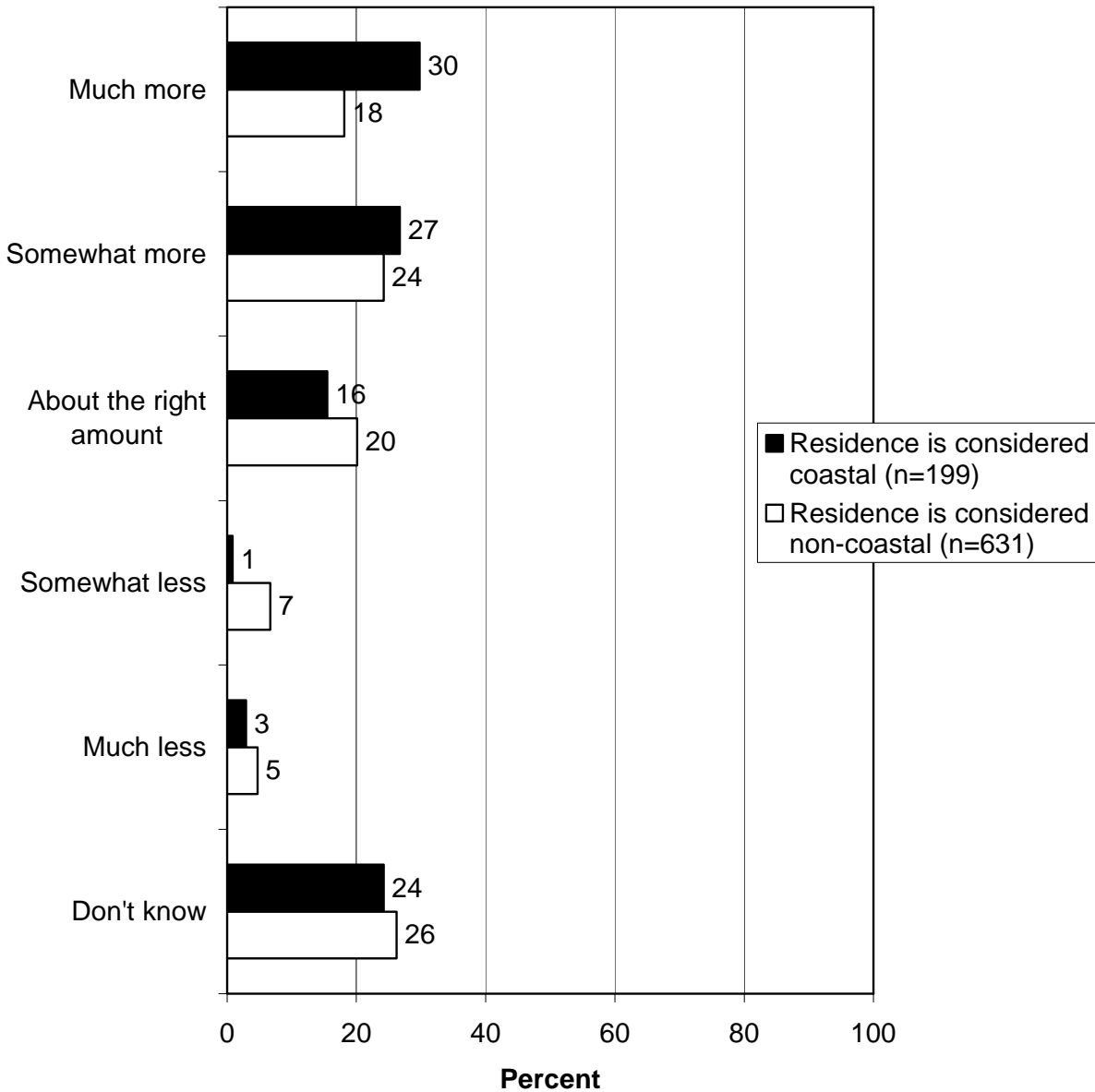




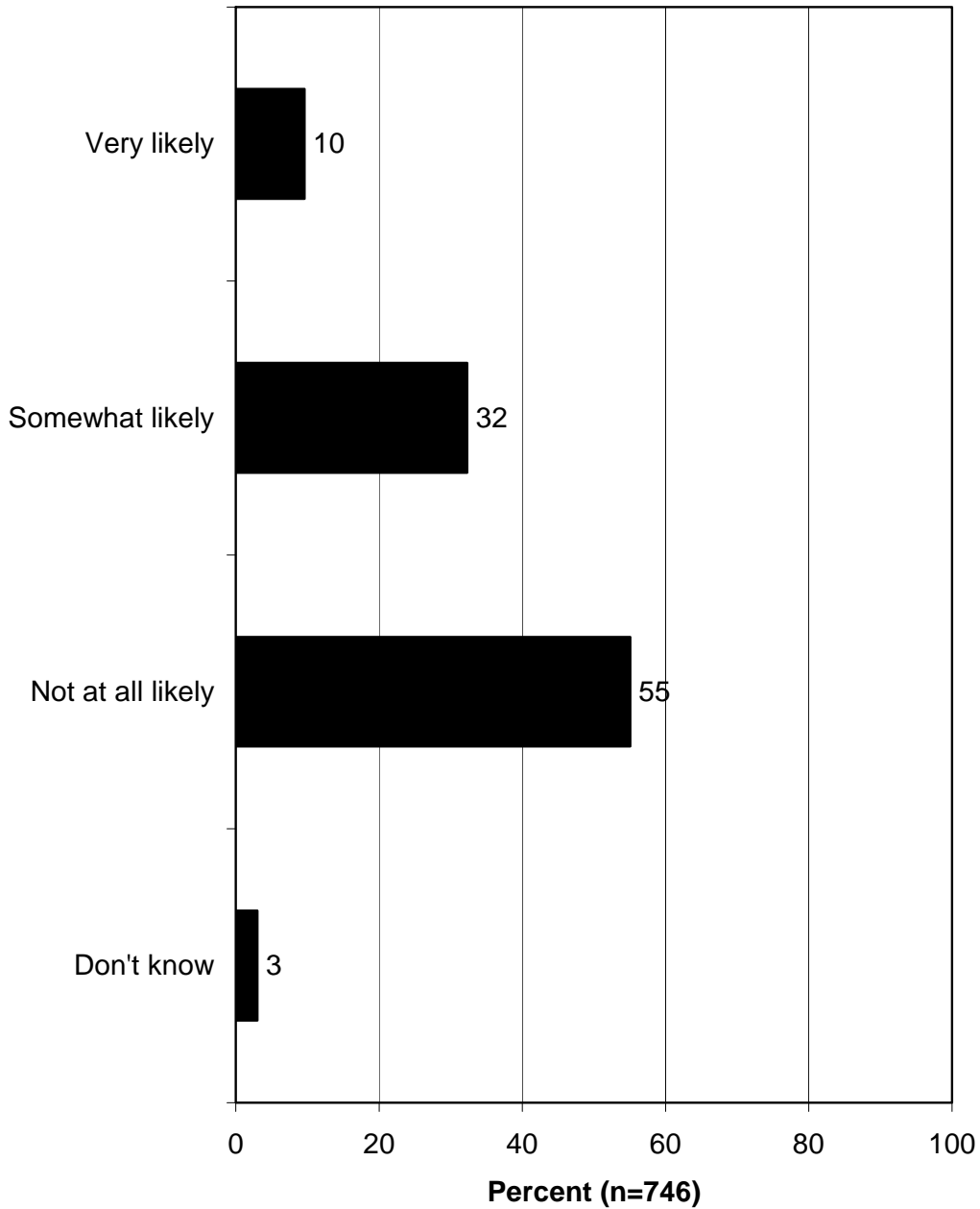
**Q124. Do you think your county government officials should be doing more or less to address or reduce the impacts of sea level rise in Delaware or are they currently doing about the right amount?**



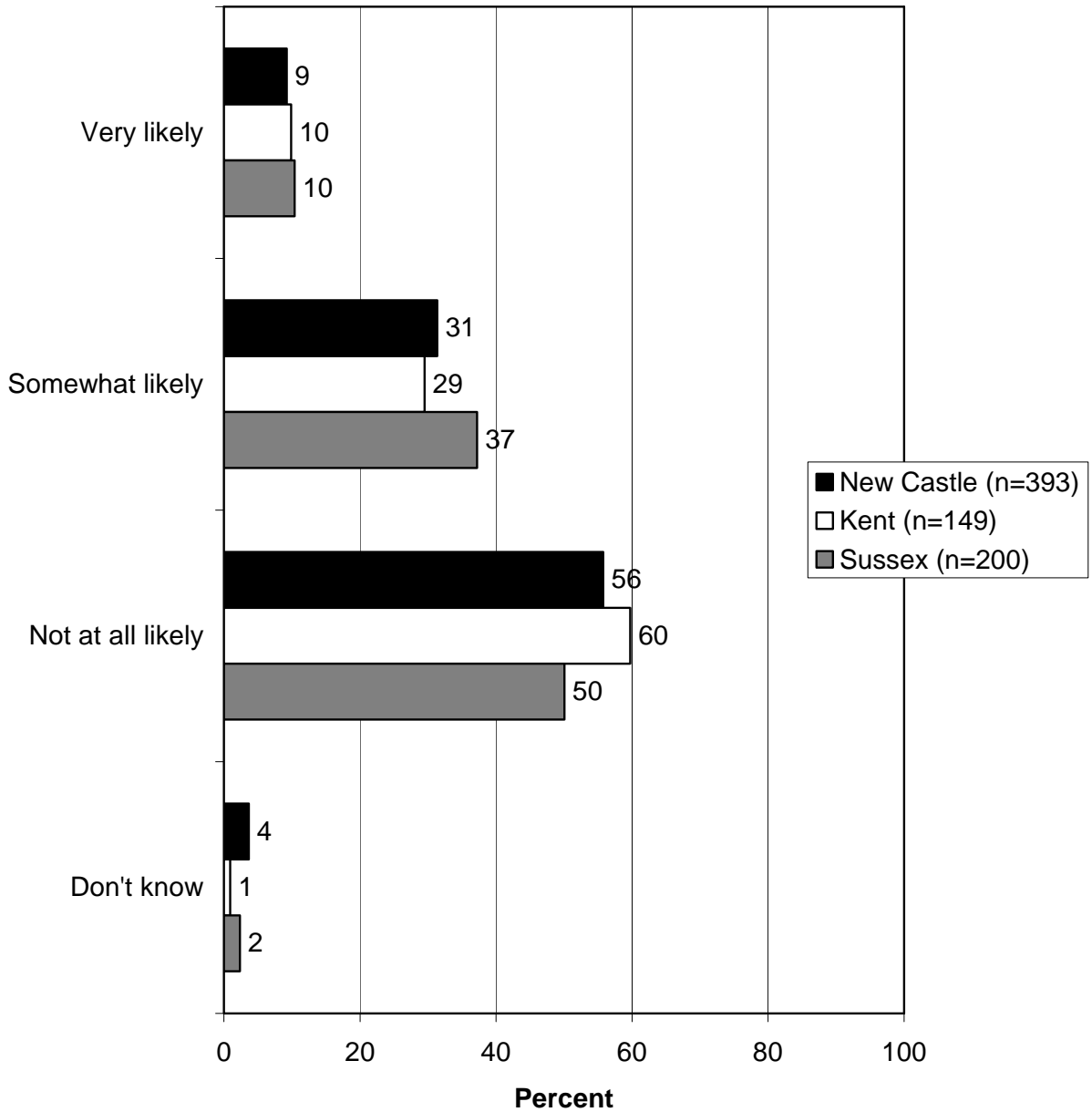
**Q128. Do you think Delaware's state agencies should be doing more or less to address or reduce the impacts of sea level rise in Delaware or are they currently doing about the right amount?**



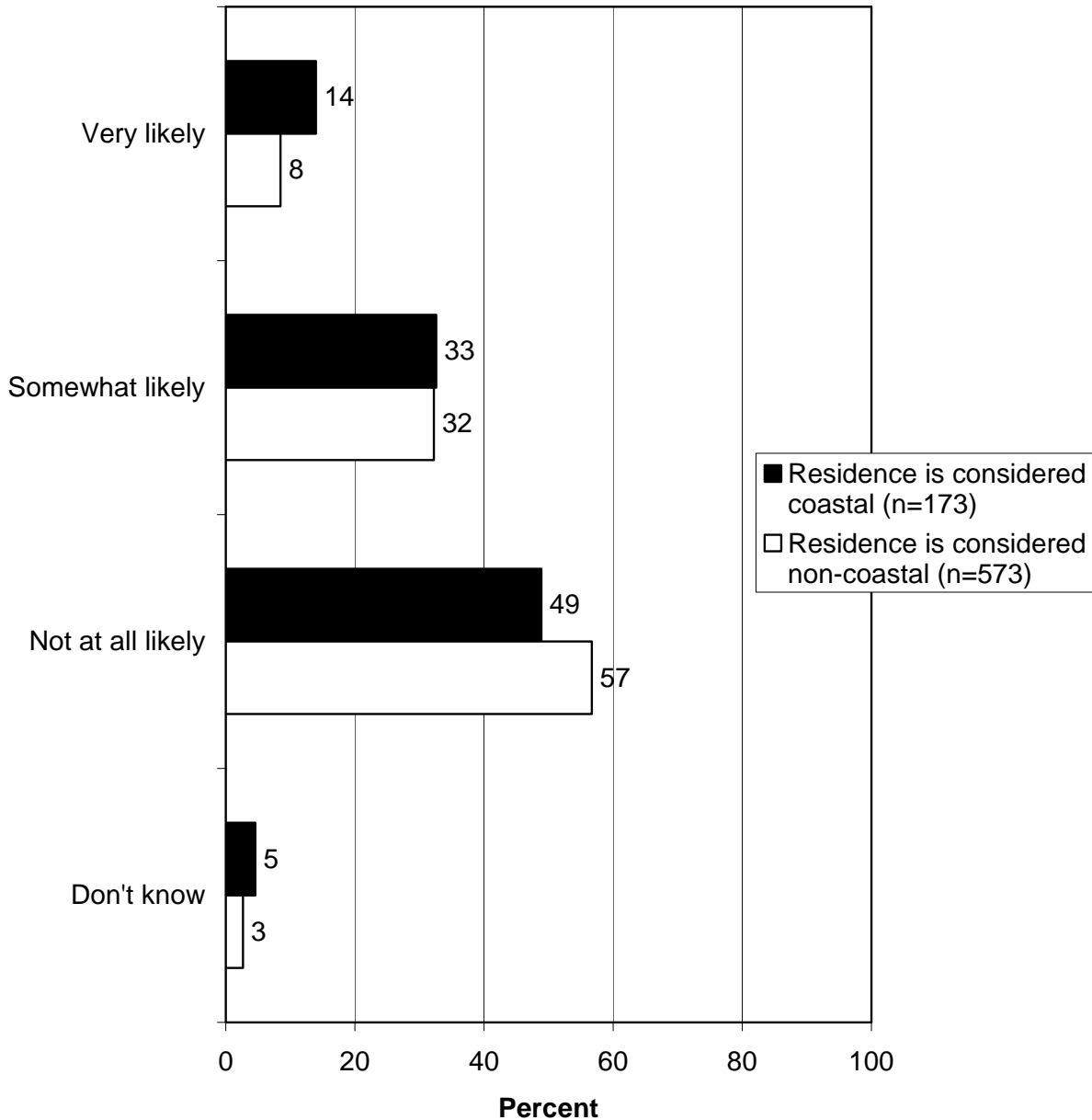
**Q145. How likely are you to attend a public meeting, informational session, or "webinar" on sea level rise in Delaware in the next 12 months?**



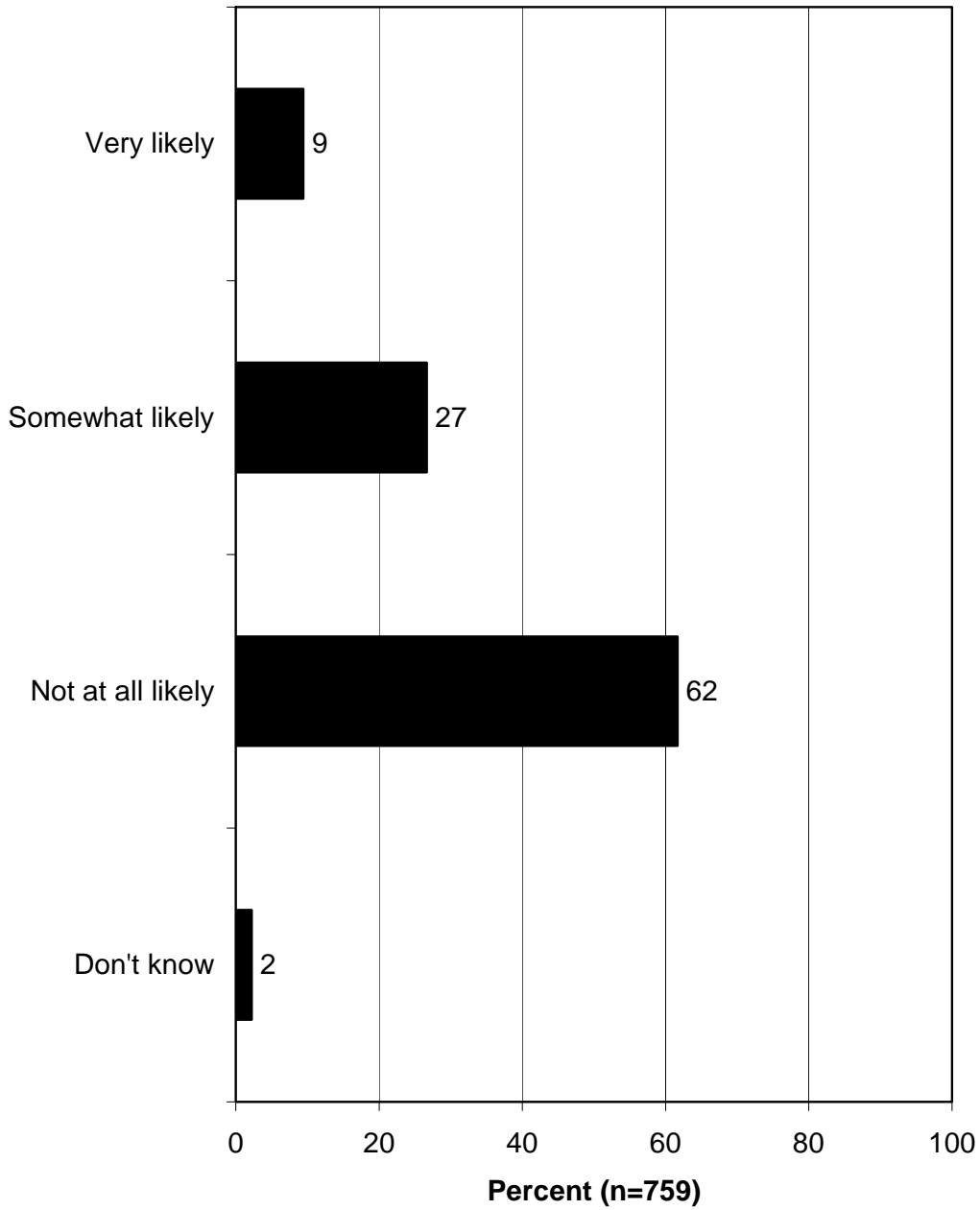
**Q145. How likely are you to attend a public meeting, informational session, or "webinar" on sea level rise in Delaware in the next 12 months?**



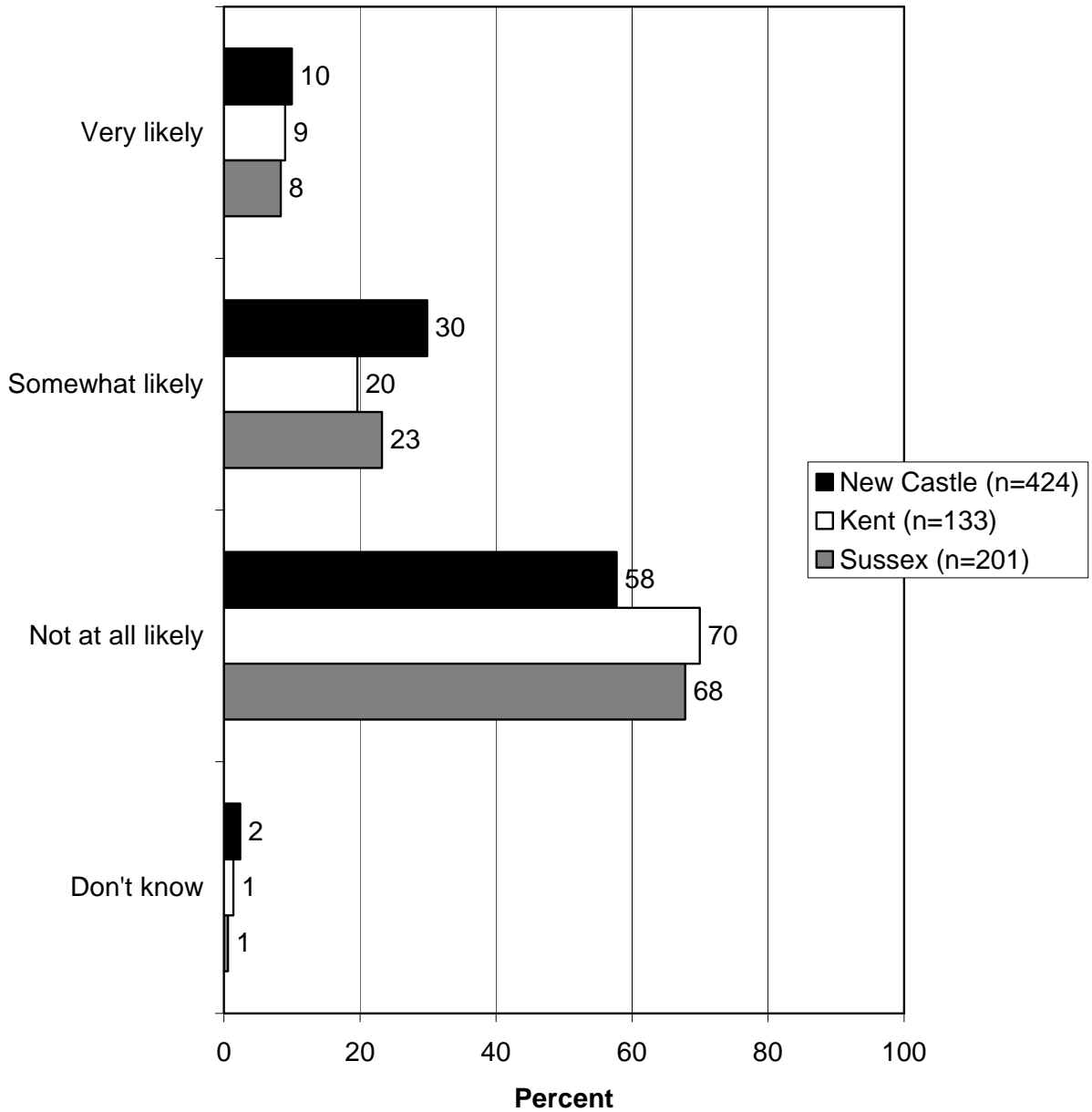
**Q145. How likely are you to attend a public meeting, informational session, or "webinar" on sea level rise in Delaware in the next 12 months?**



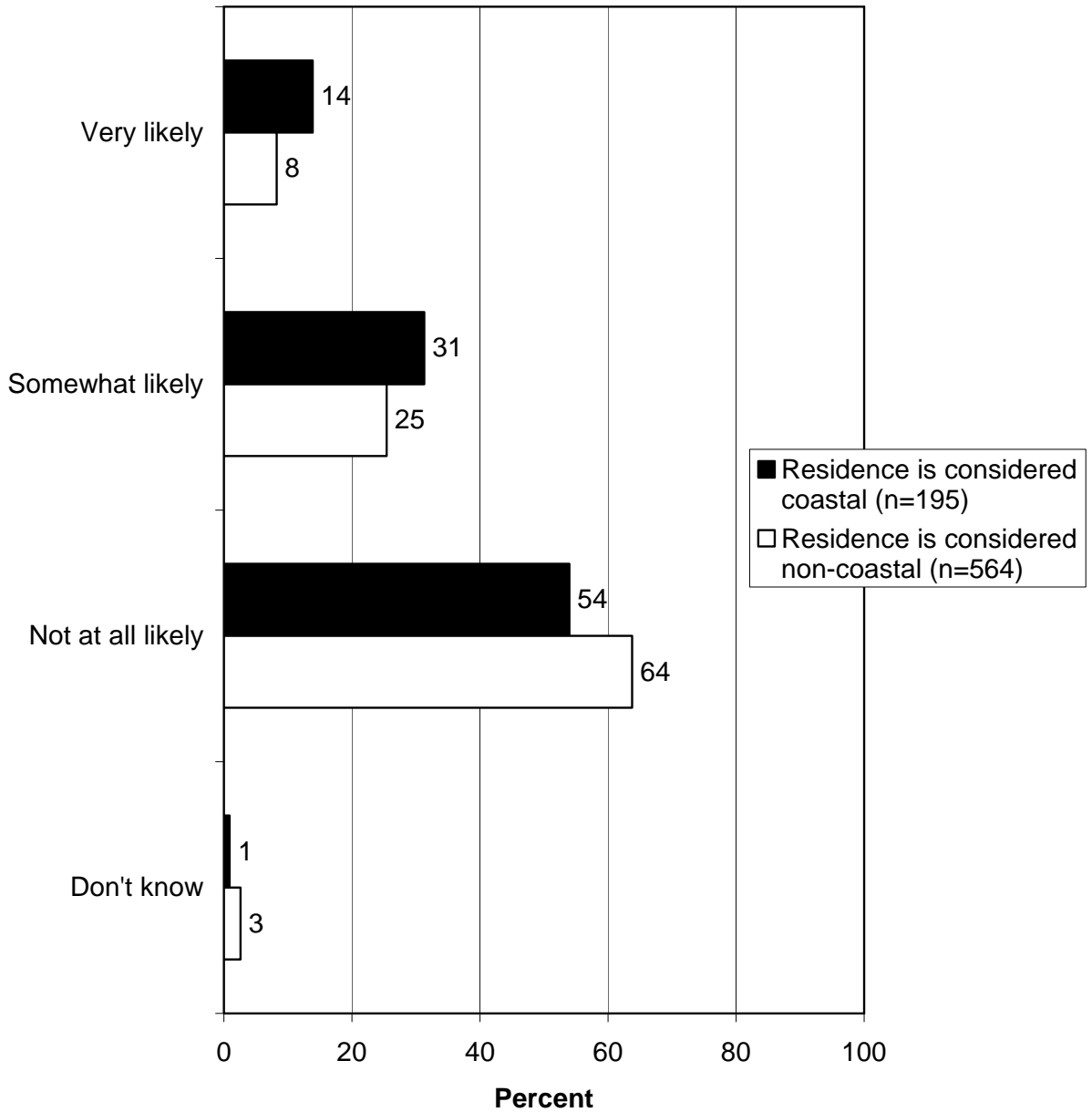
**Q146. How likely are you to write letters, send emails, or call your elected officials about sea level rise in the next 12 months?**



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## DEMOGRAPHIC DATA

- Ethnicity of Delaware residents is shown: 76% indicate being white or Caucasian.
  - Sussex County is the most white of the three counties, in the crosstabulation by county of residence ( $p \leq 0.001$ ).
  
- The majority of Delaware residents (60%) do *not* have children living at home. The graph also shows the number of children in households among those with children at home.
  
- Education levels of Delaware residents are shown: 69% have taken some college or trade school coursework; 44% have a Bachelor's degree, with or without a higher degree.
  
- Residents' years of residency in Delaware are shown, with about a quarter having moved into the state within the last 10 years. The mean is 28.1 years.
  - The crosstabulation by county of residence found Sussex County residents, relative to residents of the other two counties, have generally lived in Delaware for a shorter amount of time ( $p \leq 0.001$ )—in other words, Sussex County residents are more likely, compared to other residents, to have moved into Delaware within the past 20 years.
  - The crosstabulation by coastal/non-coastal found that coastal residents, relative to non-coastal residents, have generally lived in Delaware for a shorter amount of time ( $p \leq 0.001$ )—in other words, the coastal residents are more likely, compared to other residents, to have moved into Delaware within the past 20 years.
  
- Delaware residents are about equally divided into large city or urban area/suburban area (48%) and small city or town/rural area (48%) (the remainder did not or could not say).
  - New Castle County residents, relative to residents of the other two counties, are the most urban or suburban; Kent and Sussex County residents are the most rural ( $p \leq 0.001$ ).

- The survey asked residents, regardless of where they live, if they consider their place of residence to be coastal or non-coastal: 21% say they live in a coastal area, and 79% say they live in a non-coastal area.
  - Sussex County residents are the most likely, of residents of the three counties, to consider their place of residence as coastal ( $p \leq 0.001$ ).
  
- A graph shows percentages renting versus owning their residences.
  - Residents in the 18-24 years of age category are the most likely, of residents of the six age categories, to rent and not own their place of residence ( $p \leq 0.001$ ).
  
- Among homeowners, 21% have flood insurance. This graph was run only among homeowners because flood insurance is more applicable to those with mortgages than to those who simply pay rent. Note that National Flood Insurance requirements apply to many mortgages.
  
- Age and gender of respondents are shown (note that these survey data were weighted to match Census figures for the state of Delaware).
  
- The nonparametric analysis included several demographic variables: gender, considering residence to be coastal or non-coastal, county of residence, and having flood insurance. These variables are discussed below.
  - **Gender:** The nonparametric analysis found that the following responses are correlated with being **male**:
    - Says he/she knows a great deal or a moderate amount about climate change ( $p \leq 0.001$ ) and sea level rise ( $p \leq 0.01$ ).
    - Either thinks that sea levels are not rising or that sea level rise will not start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
    - Does not indicate thinking that sea level rise is a very or somewhat serious threat to him or her personally ( $p \leq 0.001$ ), a very or somewhat serious threat to river-front cities and towns in Delaware ( $p \leq 0.001$ ), a very or somewhat serious threat to the United States ( $p \leq 0.001$ ), a very serious threat to ocean-front cities and towns in Delaware ( $p \leq 0.001$ ), a very serious threat to Delaware beaches ( $p \leq 0.001$ ), a very serious threat to marshes and wetlands in Delaware ( $p \leq 0.001$ ), or a very or somewhat serious threat to the Mid-Atlantic United States ( $p \leq 0.05$ ).

- Does not show concern about climate change and sea level rise (e.g., agrees with the statement that the impacts of climate change are greatly exaggerated; does not indicate being completely or mostly convinced that sea levels are rising; does not indicate strongly agreeing that scientists are right that climate change is occurring) (all at  $p \leq 0.05$  or greater significance).
- Does not indicate thinking that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.01$ ).
- On most questions about how to improve areas at risk from sea level rise, does not indicate supporting efforts to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate support for elevating the land surface; does not indicate support for elevating buildings using government funds; does not indicate strong support for using clean dredged material from waterways to build up marsh areas) (all at  $p \leq 0.05$  or greater significance).
- Does not indicate strongly agreeing with the statement that the impacts of climate change can be reduced by human efforts ( $p \leq 0.001$ ).
- Does not indicate thinking that Delaware citizens ( $p \leq 0.001$ ), his or her state government officials ( $p \leq 0.001$ ), his or her city or town government officials ( $p \leq 0.01$ ), his or her county government officials ( $p \leq 0.01$ ), Delaware's state legislators ( $p \leq 0.01$ ), corporations and industry ( $p \leq 0.05$ ), or Delaware's governor ( $p \leq 0.05$ ) should be doing more to address or reduce the impacts of sea level rise in Delaware.
- A primary source of his or her information about environmental issues in Delaware is the Internet, not including Department of Natural Resources and Environmental Control website ( $p \leq 0.001$ ).
- Considers his or her place of residence to be a rural area ( $p \leq 0.001$ ).
- Owns his or her current place of residence ( $p \leq 0.05$ ).
- **Gender:** The nonparametric analysis found that the following responses are correlated with being **female**:
  - Does not indicate knowing a great deal or a moderate amount about climate change ( $p \leq 0.001$ ) or sea level rise ( $p \leq 0.01$ ).
  - Thinks that sea level rise is a very or somewhat serious threat to him or her personally ( $p \leq 0.001$ ), a very or somewhat serious threat to river-front cities and towns in Delaware ( $p \leq 0.001$ ), a very or somewhat serious threat to the United States ( $p \leq 0.001$ ), a very serious threat to Delaware beaches ( $p \leq 0.001$ ), a very serious threat to ocean-front cities and towns in Delaware ( $p \leq 0.001$ ), a very serious threat to marshes and wetlands in Delaware ( $p \leq 0.001$ ), a very serious threat to the State of Delaware ( $p \leq 0.05$ ), and a very or somewhat serious threat to the Mid-Atlantic United States ( $p \leq 0.05$ ).
  - Shows concern about climate change and sea level rise (e.g., is completely or mostly convinced that sea levels are rising; strongly agrees that scientists are right that climate change is occurring; worries a great deal or a moderate amount about climate change) (all at  $p \leq 0.05$  or greater significance).
  - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.001$ ).

- Thinks that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.01$ ).
- On most questions about how to improve areas at risk from sea level rise, supports any efforts to address sea level rise in Delaware or reduce its impacts (e.g., supports elevating the land surface; supports elevating buildings using government funds; strongly supports using clean dredged material from waterways to build up marsh areas) (all at  $p \leq 0.05$  or greater significance).
- Strongly agrees with the statement that the impacts of climate change can be reduced by human efforts ( $p \leq 0.001$ ).
- Thinks that Delaware citizens ( $p \leq 0.001$ ), his or her state government officials ( $p \leq 0.001$ ), Delaware's state legislators ( $p \leq 0.01$ ), his or her city or town government officials ( $p \leq 0.01$ ), his or her county government officials ( $p \leq 0.01$ ), Delaware's governor ( $p \leq 0.05$ ), corporations and industry ( $p \leq 0.05$ ), and the U.S. Congress ( $p \leq 0.05$ ) should all be doing more to address or reduce the impacts of sea level rise in Delaware.
- Would most like to have more information on actions that can be taken to reduce impacts of sea level rise ( $p \leq 0.001$ ), funding needs / estimated budget to address sea level rise in Delaware ( $p \leq 0.001$ ), how to protect property from sea level rise ( $p \leq 0.001$ ), sea level rise in general ( $p \leq 0.01$ ), current or potential impacts of sea level rise ( $p \leq 0.05$ ), and how sea level rise relates to climate change / global warming ( $p \leq 0.05$ ).
- Primary sources of his or her information about environmental issues in Delaware are television ( $p \leq 0.01$ ) and newspapers ( $p \leq 0.05$ ).
- **Coastal or Non-Coastal.** The nonparametric analysis found that the following responses are correlated with considering his or her place of residence to be in a **coastal** area:
  - Worries a great deal or a moderate amount about the problems that sea level rise may cause in Delaware ( $p \leq 0.001$ ), and is completely convinced that climate change is happening ( $p \leq 0.01$ ).
  - Thinks that sea level rise is a very or somewhat serious threat to him or her personally ( $p \leq 0.001$ ).
  - Thinks that sea level rise will start to have impacts on the area where he or she lives in Delaware in 25 years or less ( $p \leq 0.01$ ).
  - Does not indicate support for allowing beaches and wetlands to naturally migrate inland to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.05$ ).
  - Thinks that Delaware's state agencies ( $p \leq 0.001$ ), Delaware's governor ( $p \leq 0.01$ ), his or her county government officials ( $p \leq 0.01$ ), and Delaware's state legislators ( $p \leq 0.01$ ) should be doing more to address or reduce the impacts of sea level rise in Delaware.
  - Has flood insurance for his or her current place of residence ( $p \leq 0.001$ ).
  - A primary source of his or her information about environmental issues in Delaware is television ( $p \leq 0.001$ ).
  - Lives in Sussex County ( $p \leq 0.001$ ).
  - Considers his or her place of residence to be a small city or town ( $p \leq 0.001$ ).
  - Rents his or her current place of residence ( $p \leq 0.01$ ).
  - Has been a Delaware resident for less than the mean of 30 years ( $p \leq 0.05$ ).

- Does not have any children, age 17 or younger, living in his or her household ( $p \leq 0.05$ ).
- **Coastal or Non-Coastal.** The nonparametric analysis found that the following responses are correlated with considering his or her place of residence to be in a **non-coastal** area:
  - Says he/she knows a great deal or a moderate amount about climate change ( $p \leq 0.05$ ).
  - Either thinks that sea levels are not rising or that sea level rise will not start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.001$ ).
  - Does not indicate thinking that sea level rise is a very or somewhat serious threat to him or her personally ( $p \leq 0.01$ ).
  - Does not indicate worrying a great deal or a moderate amount about the problems that sea level rise may cause in Delaware ( $p \leq 0.05$ ).
  - Does not indicate being completely convinced that climate change is happening ( $p \leq 0.05$ ).
  - Supports allowing beaches and wetlands to naturally migrate inland to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.01$ ).
  - Does not indicate thinking that Delaware's state agencies ( $p \leq 0.01$ ) or Delaware's state legislators ( $p \leq 0.05$ ) should be doing more to address or reduce the impacts of sea level rise in Delaware.
  - Does not have flood insurance for his or her current place of residence ( $p \leq 0.001$ ).
  - Would most like to have more information on current or potential impacts of sea level rise ( $p \leq 0.01$ ), and actions that can be taken to reduce impacts of sea level rise ( $p \leq 0.05$ ).
  - Considers his or her place of residence to be a large city, urban area, or suburban area ( $p \leq 0.001$ ).
  - Lives in New Castle County ( $p \leq 0.001$ ).
  - Owns his or her current place of residence ( $p \leq 0.001$ ).
  - Has a bachelor's degree or graduate degree ( $p \leq 0.001$ ).
  - Lives in Kent County ( $p \leq 0.001$ ).
  - Has been a Delaware resident for the mean of 30 years or more ( $p \leq 0.05$ ).
- **County of Residence.** The nonparametric analysis found that the following responses are correlated with living in **New Castle** County:
  - Shows concern about climate change and sea level rise (e.g., strongly agrees that scientists are right that climate change is occurring; thinks that most scientists think that climate change is happening; worries a great deal or a moderate amount about climate change) (all at  $p \leq 0.01$  or greater significance), but does not indicate worrying a great deal or a moderate amount about the problems that sea level rise may cause in Delaware ( $p \leq 0.01$ ).
  - Strongly agrees with the statement that the impacts of climate change can be reduced by human efforts ( $p \leq 0.001$ ).
  - Thinks that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.01$ ).

- Agrees with the statement that climate change is something people can control ( $p \leq 0.001$ ).
- Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
- Strongly supports avoiding building new structures in areas at risk from sea level rise to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.05$ ).
- Thinks that Delaware's state legislators should be doing more to address or reduce the impacts of sea level rise in Delaware ( $p \leq 0.05$ ).
- Would most like to have more information on sea level rise in general ( $p \leq 0.001$ ), how sea level rise relates to climate change / global warming ( $p \leq 0.05$ ), and current or potential impacts of sea level rise ( $p \leq 0.05$ ).
- Considers his or her place of residence to be a large city, urban area, or suburban area ( $p \leq 0.001$ ).
- Considers his or her place of residence to be in a non-coastal area ( $p \leq 0.001$ ).
- Has a bachelor's degree or graduate degree ( $p \leq 0.001$ ).
- Has been a Delaware resident for the mean of 30 years or more ( $p \leq 0.001$ ).
- Rents his or her current place of residence ( $p \leq 0.05$ ).
- Is between ages 35-64 ( $p \leq 0.05$ ).
- **County of Residence.** The nonparametric analysis found that the following responses are correlated with living in **Kent** County:
  - Thinks that sea level rise is a very serious threat to Delaware beaches ( $p \leq 0.01$ ), and a very serious threat to marshes and wetlands in Delaware ( $p \leq 0.05$ ).
  - On half of the questions about how to improve areas at risk from sea level rise, supports efforts to address sea level rise in Delaware or reduce its impacts (e.g., supports elevating the land surface; strongly supports using clean dredged material from waterways to build up marsh areas; supports purchasing or buying out frequently flooded properties using government funds) (all at  $p \leq 0.05$  or greater significance).
  - Does not indicate thinking that Delaware's state legislators should be doing more to address or reduce the impacts of sea level rise in Delaware ( $p \leq 0.01$ ).
  - Does not have flood insurance for his or her current place of residence ( $p \leq 0.01$ ).
  - Considers his or her place of residence to be a rural area ( $p \leq 0.001$ ).
  - Does not have a bachelor's degree ( $p \leq 0.001$ ).
  - Considers his or her place of residence to be in a non-coastal area ( $p \leq 0.001$ ).
- **County of Residence.** The nonparametric analysis found that the following responses are correlated with living in **Sussex** County:
  - Does not show concern about climate change and sea level rise in general (e.g., does not indicate strongly agreeing that scientists are right that climate change is occurring; does not indicate thinking that most scientists think that climate change is happening; does not indicate worrying a great deal or a moderate amount about climate change) (all at  $p \leq 0.05$  or greater significance), but worries a great deal or a moderate amount about the problems that sea level rise may cause in Delaware ( $p \leq 0.01$ ).

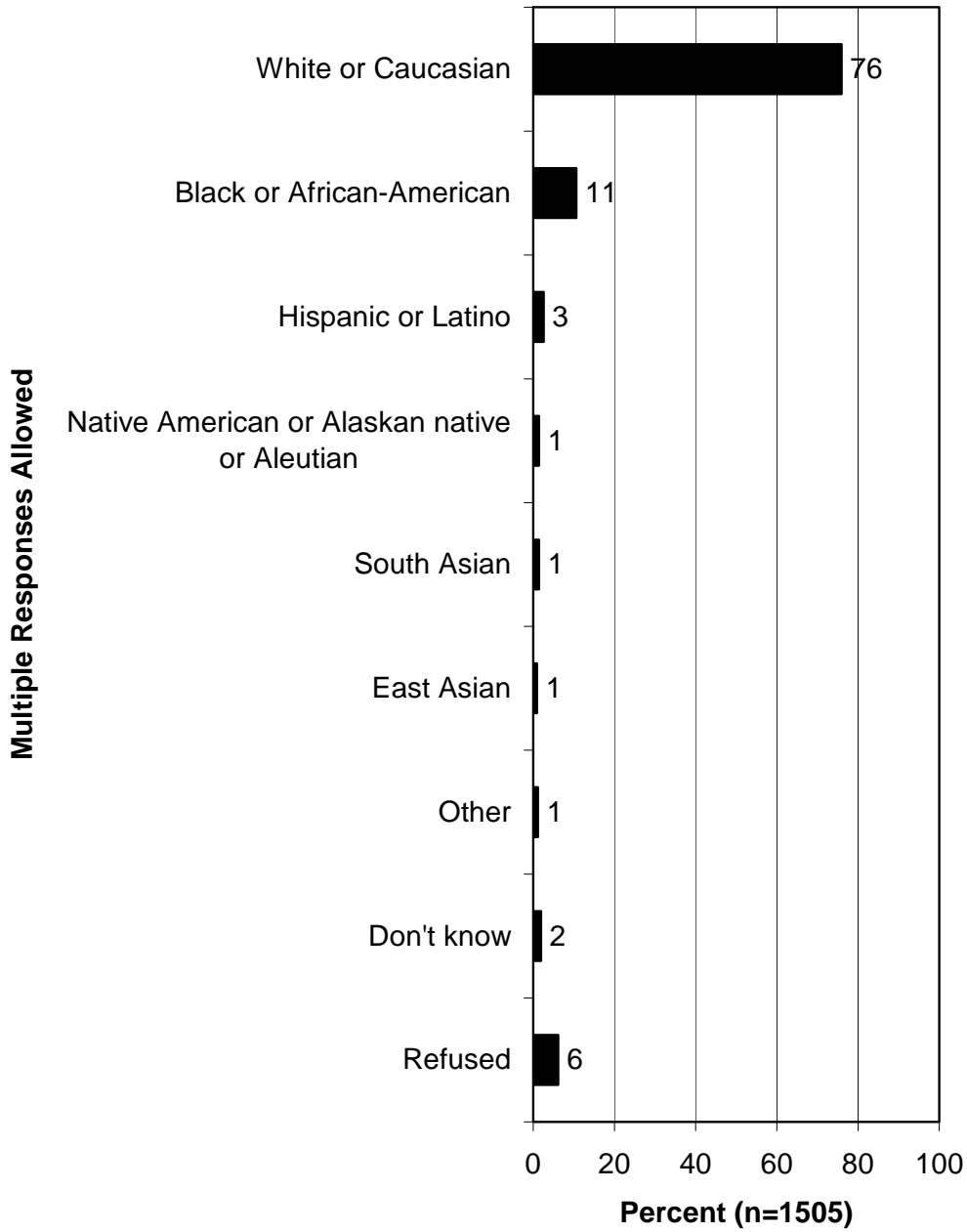
- Does not indicate strongly agreeing with the statement that the impacts of climate change can be reduced by human efforts ( $p \leq 0.01$ ).
- Thinks that sea level rise is a very or somewhat serious threat to him or her personally ( $p \leq 0.01$ ).
- Does not indicate thinking that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.05$ ).
- On half of the questions about how to improve areas at risk from sea level rise, does not indicate supporting efforts to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate support for purchasing or acquiring land and open space from willing land sellers using government funds; does not indicate support for elevating buildings using government funds; does not indicate support for purchasing or buying out frequently flooded properties using government funds) (all at  $p \leq 0.05$  or greater significance).
- Does not indicate agreeing with the statement that climate change is something people can control ( $p \leq 0.001$ ).
- Does not indicate strong support for increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
- Does not indicate thinking that Delaware citizens ( $p \leq 0.01$ ) or his or her city or town government officials ( $p \leq 0.05$ ) should be doing more to address or reduce the impacts of sea level rise in Delaware.
- Has flood insurance for his or her current place of residence ( $p \leq 0.001$ ).
- A primary source of his or her information about environmental issues in Delaware is television ( $p \leq 0.001$ ).
- Considers his or her place of residence to be in a coastal area ( $p \leq 0.001$ ).
- Considers his or her place of residence to be a rural area ( $p \leq 0.001$ ).
- Considers his or her place of residence to be a small city or town ( $p \leq 0.001$ ).
- Is age 65 or older ( $p \leq 0.001$ ).
- Has been a Delaware resident for less than the mean of 30 years ( $p \leq 0.001$ ).
- Does not have a bachelor's degree ( $p \leq 0.001$ ).
- Owns his or her current place of residence ( $p \leq 0.01$ ).
- **Flood Insurance.** The nonparametric analysis found that the following responses are correlated with **having flood insurance** for his or her current place of residence:
  - Thinks that sea level rise is a very or somewhat serious threat to him or her personally ( $p \leq 0.001$ ).
  - Worries a great deal or a moderate amount about climate change ( $p \leq 0.05$ ).
  - On most questions about how to improve areas at risk from sea level rise, supports any efforts to address sea level rise in Delaware or reduce its impacts (e.g., supports elevating buildings using government funds; supports building dikes, seawalls, and bulkheads to keep water back; supports purchasing or buying out frequently flooded properties using government funds) (all at  $p \leq 0.05$  or greater significance).
  - Strongly supports increasing funding for research to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.05$ ).
  - Thinks that his or her county government officials, Delaware's state agencies, corporations and industry, Delaware's governor, and the U.S. Congress should be

- doing more to address or reduce the impacts of sea level rise in Delaware (all at  $p \leq 0.05$  or greater significance).
- Considers his or her place of residence to be in a coastal area ( $p \leq 0.001$ ).
  - Lives in Sussex County ( $p \leq 0.001$ ).
  - Owns his or her current place of residence ( $p \leq 0.001$ ).
  - Considers his or her place of residence to be a rural area ( $p \leq 0.001$ ).
  - Has at least one child, age 17 or younger, living in his or her household ( $p \leq 0.05$ ).
- **Flood Insurance.** The nonparametric analysis found that the following responses are correlated with **not having flood insurance** for his or her current place of residence:
    - Does not indicate thinking that sea level rise is a very or somewhat serious threat to him or her personally ( $p \leq 0.001$ ).
    - Does not show concern about climate change and sea level rise (e.g., does not indicate worrying a great deal or a moderate amount about climate change; does not indicate thinking that climate change is a very serious threat; does not indicate strongly agreeing that scientists are right that climate change is occurring) (all at  $p \leq 0.05$  or greater significance).
    - Does not indicate thinking that, if climate change is happening, it is caused mostly by human activities ( $p \leq 0.05$ ).
    - Either thinks that sea levels are not rising or that sea level rise will not start to have impacts on the area where he or she lives in Delaware until 50 to 100 years from now ( $p \leq 0.05$ ).
    - On some of the questions about how to improve areas at risk from sea level rise, does not indicate supporting efforts to address sea level rise in Delaware or reduce its impacts (e.g., does not indicate support for elevating buildings using government funds; does not indicate support for purchasing or buying out frequently flooded properties using government funds; does not indicate support for building dikes, seawalls, and bulkheads to keep water back) (all at  $p \leq 0.05$  or greater significance).
    - Supports allowing beaches and wetlands to naturally migrate inland to address sea level rise in Delaware or reduce its impacts ( $p \leq 0.001$ ).
    - Does not indicate strongly agreeing with the statement that the impacts of climate change can be reduced by human efforts ( $p \leq 0.05$ ).
    - Does not indicate thinking that his or her city or town government officials ( $p \leq 0.05$ ) or Delaware's state agencies ( $p \leq 0.05$ ) should be doing more to address or reduce the impacts of sea level rise in Delaware.
    - A primary source of his or her information about environmental issues in Delaware is television ( $p \leq 0.001$ ).
    - Considers his or her place of residence to be in a non-coastal area ( $p \leq 0.001$ ).
    - Considers his or her place of residence to be a large city, urban area, or suburban area ( $p \leq 0.001$ ).
    - Is between ages 35-64 ( $p \leq 0.001$ ).
    - Does not have any children, age 17 or younger, living in his or her household ( $p \leq 0.001$ ).
    - Owns his or her current place of residence ( $p \leq 0.001$ ).
    - Has been a Delaware resident for the mean of 30 years or more ( $p \leq 0.001$ ).
    - Has a bachelor's degree or graduate degree ( $p \leq 0.01$ ).

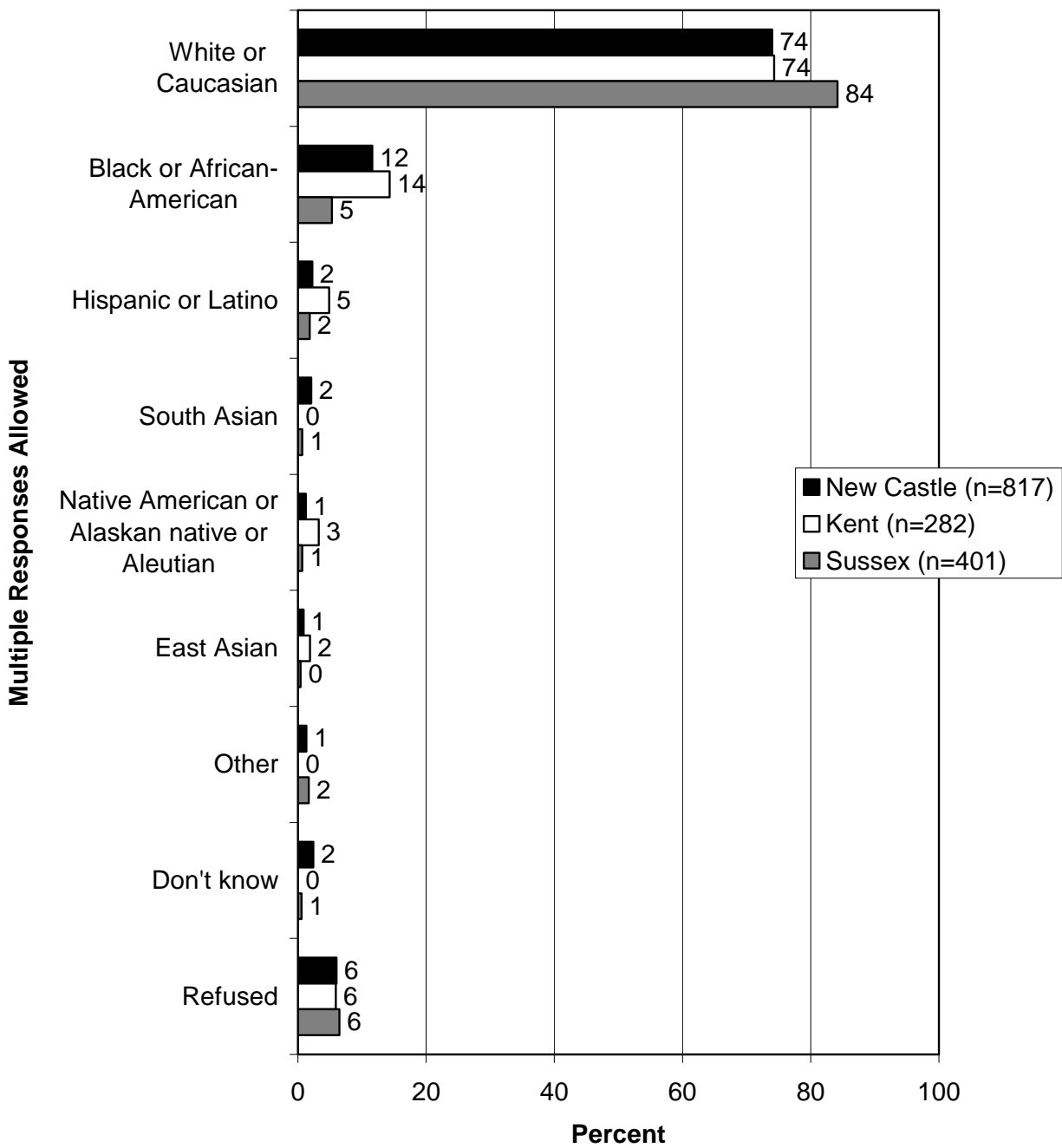


- Lives in Kent County ( $p \leq 0.01$ ).
- Rents his or her current place of residence ( $p \leq 0.01$ ).

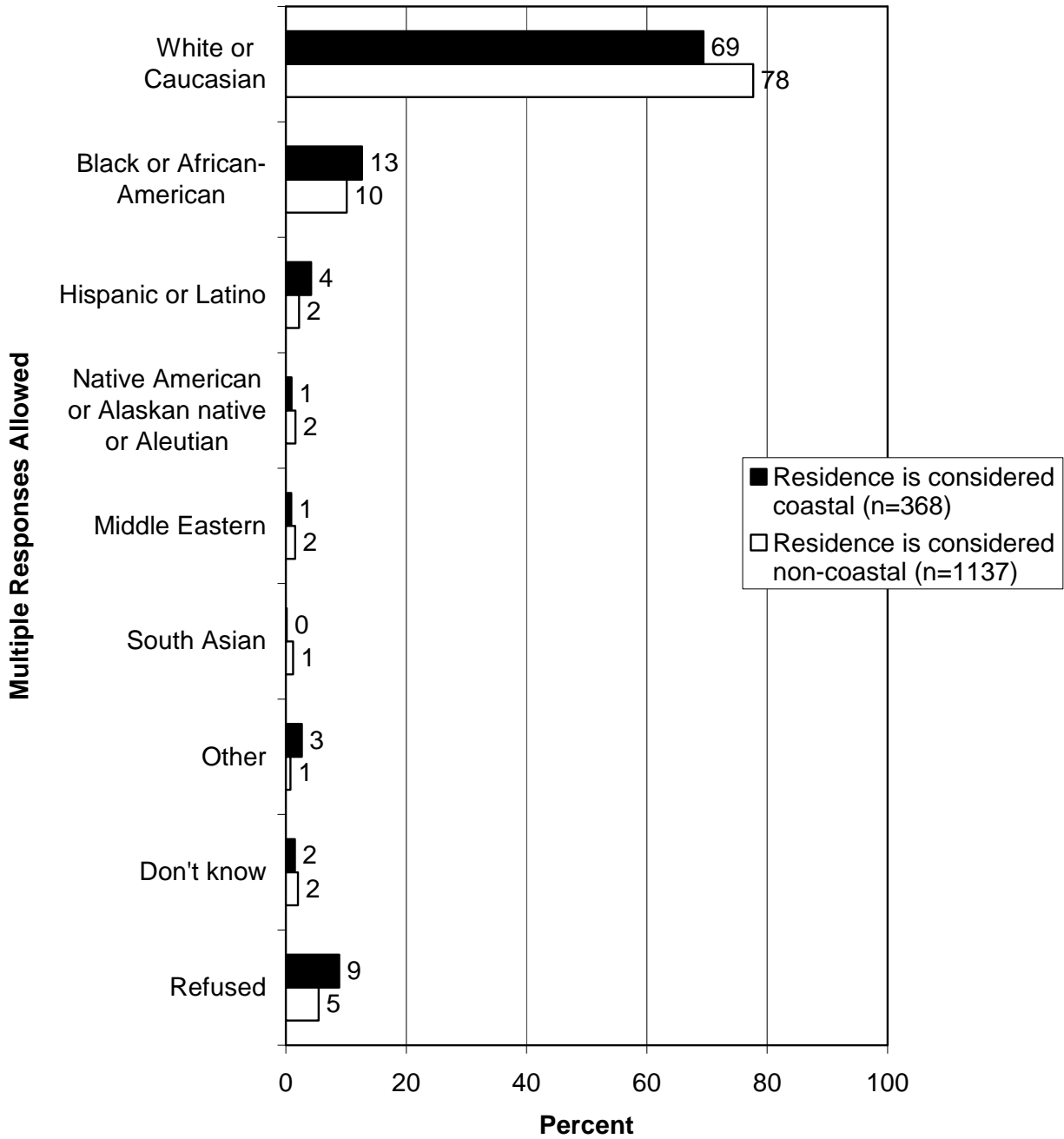
**Q161. What races or ethnic backgrounds do you consider yourself, and please mention all that apply?**



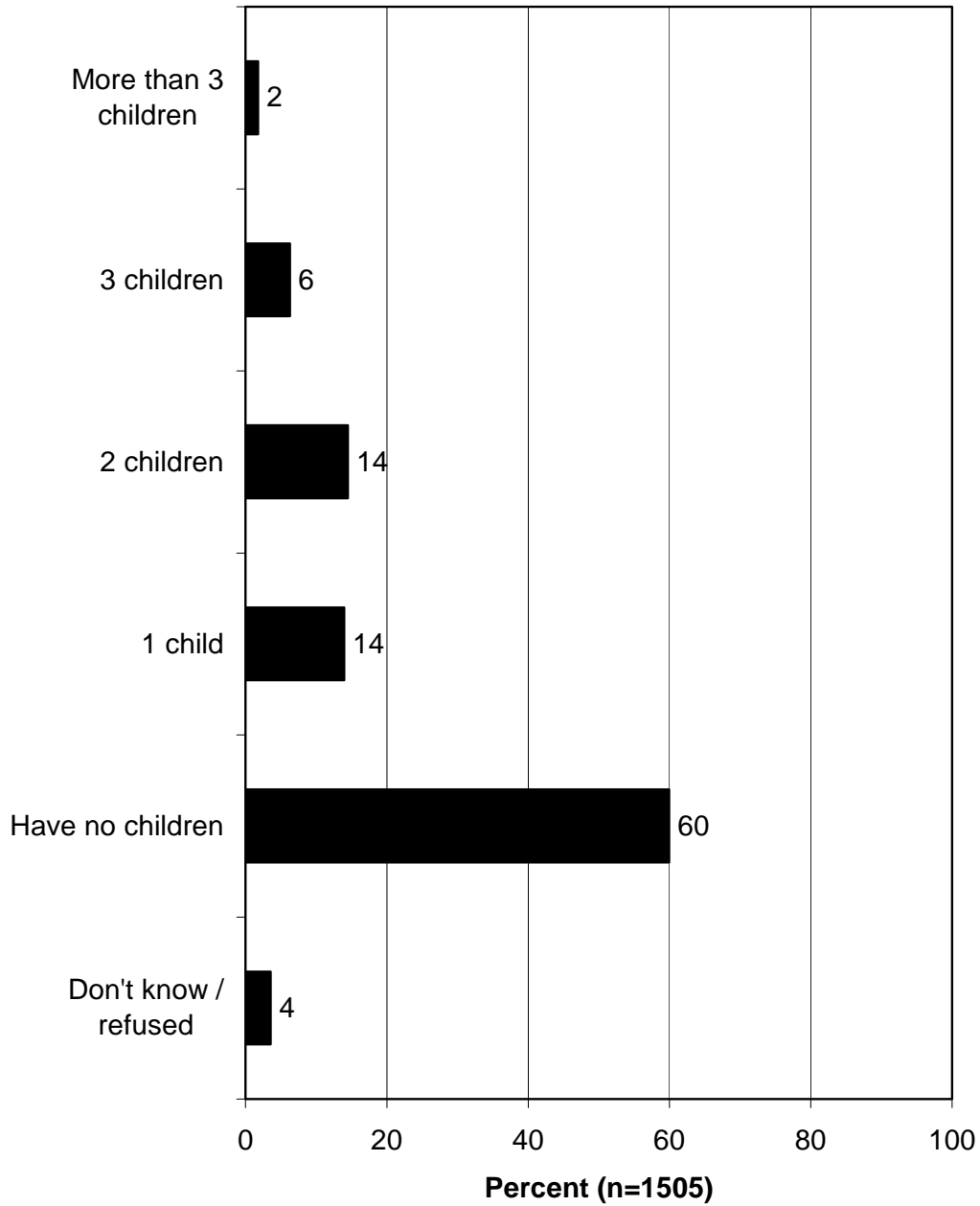
**Q161. What races or ethnic backgrounds do you consider yourself, and please mention all that apply?**



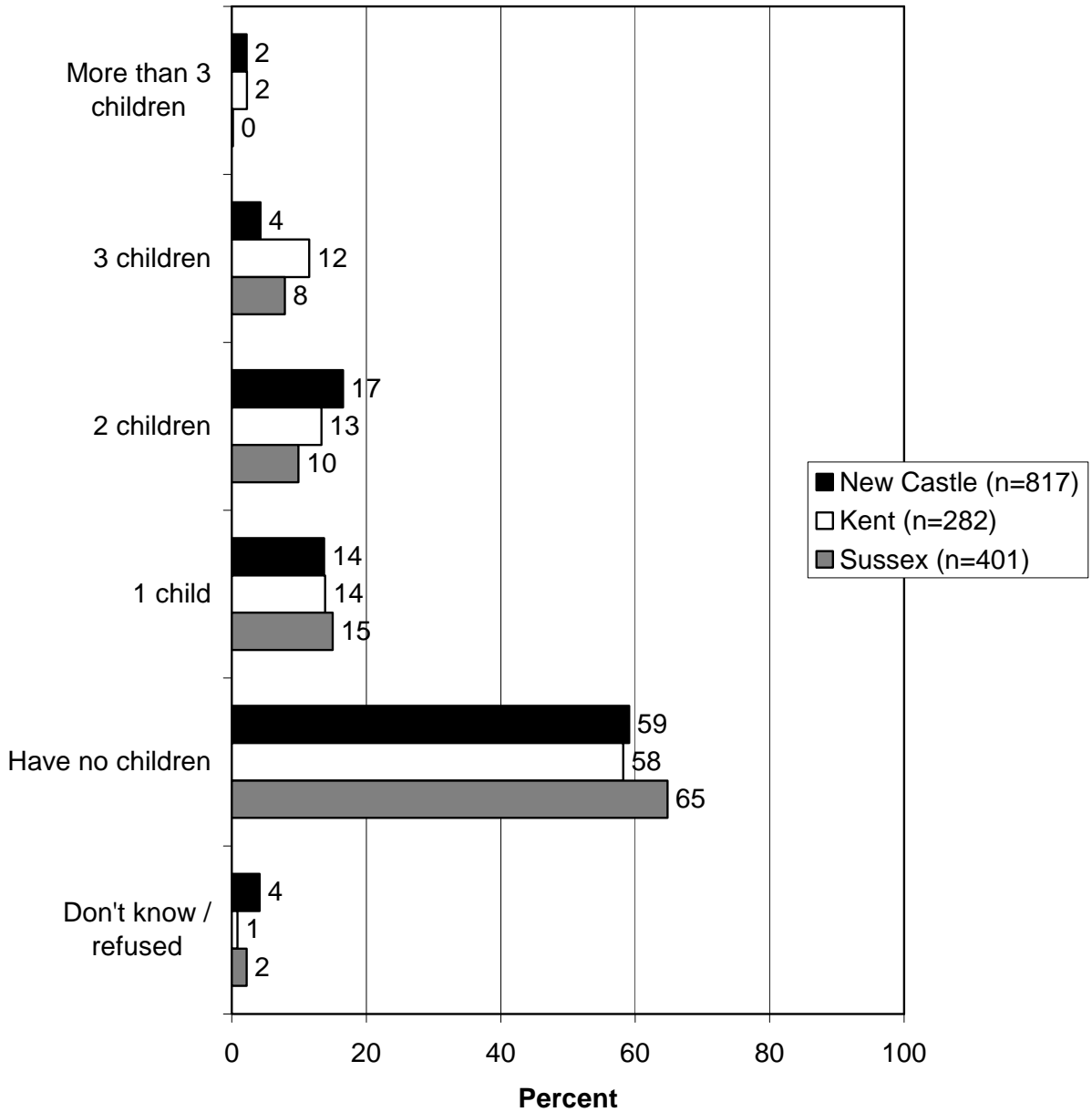
**Q161. What races or ethnic backgrounds do you consider yourself, and please mention all that apply?**



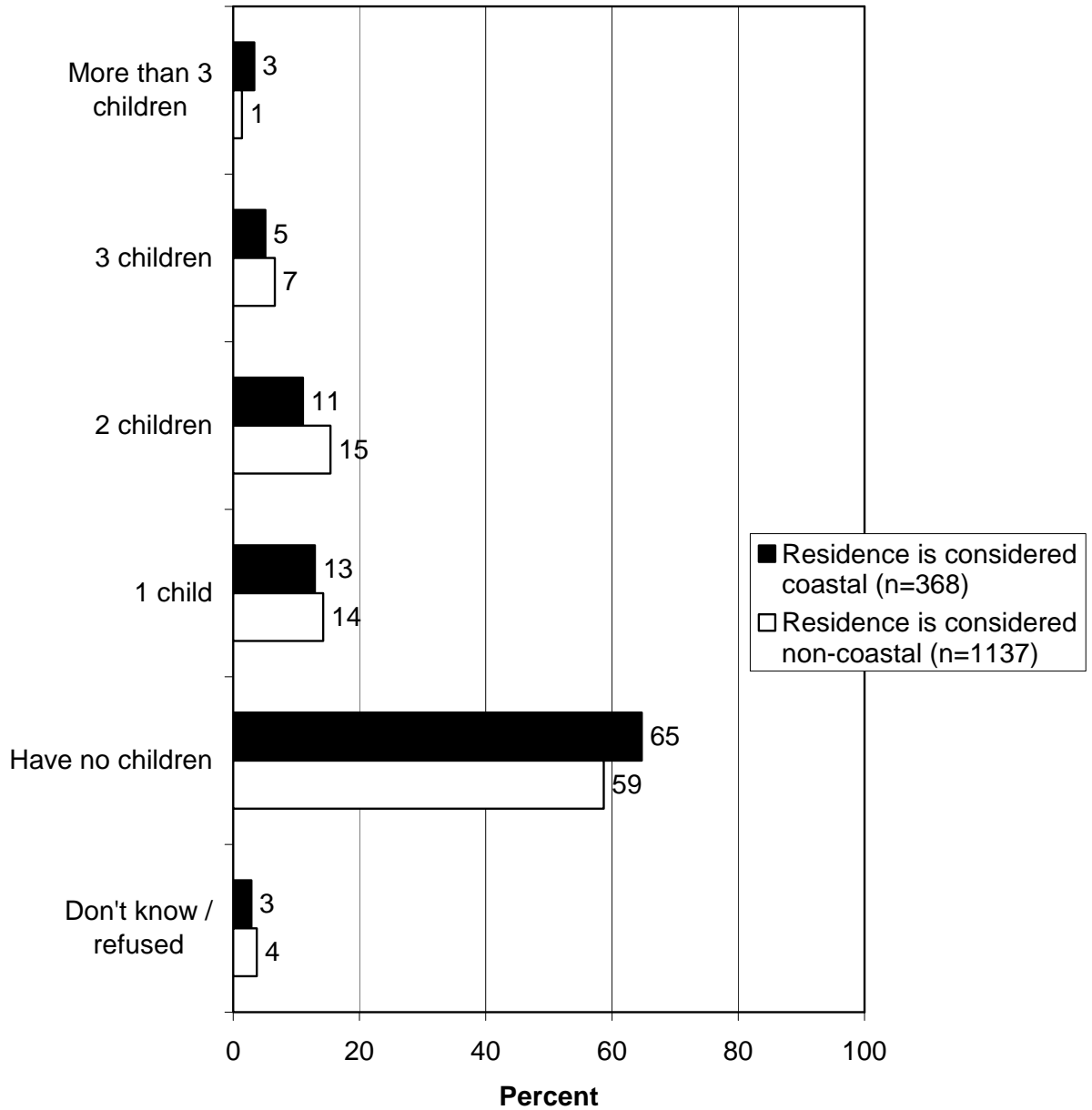
**Q156. How many children, age 17 or younger, do you have living in your household?**



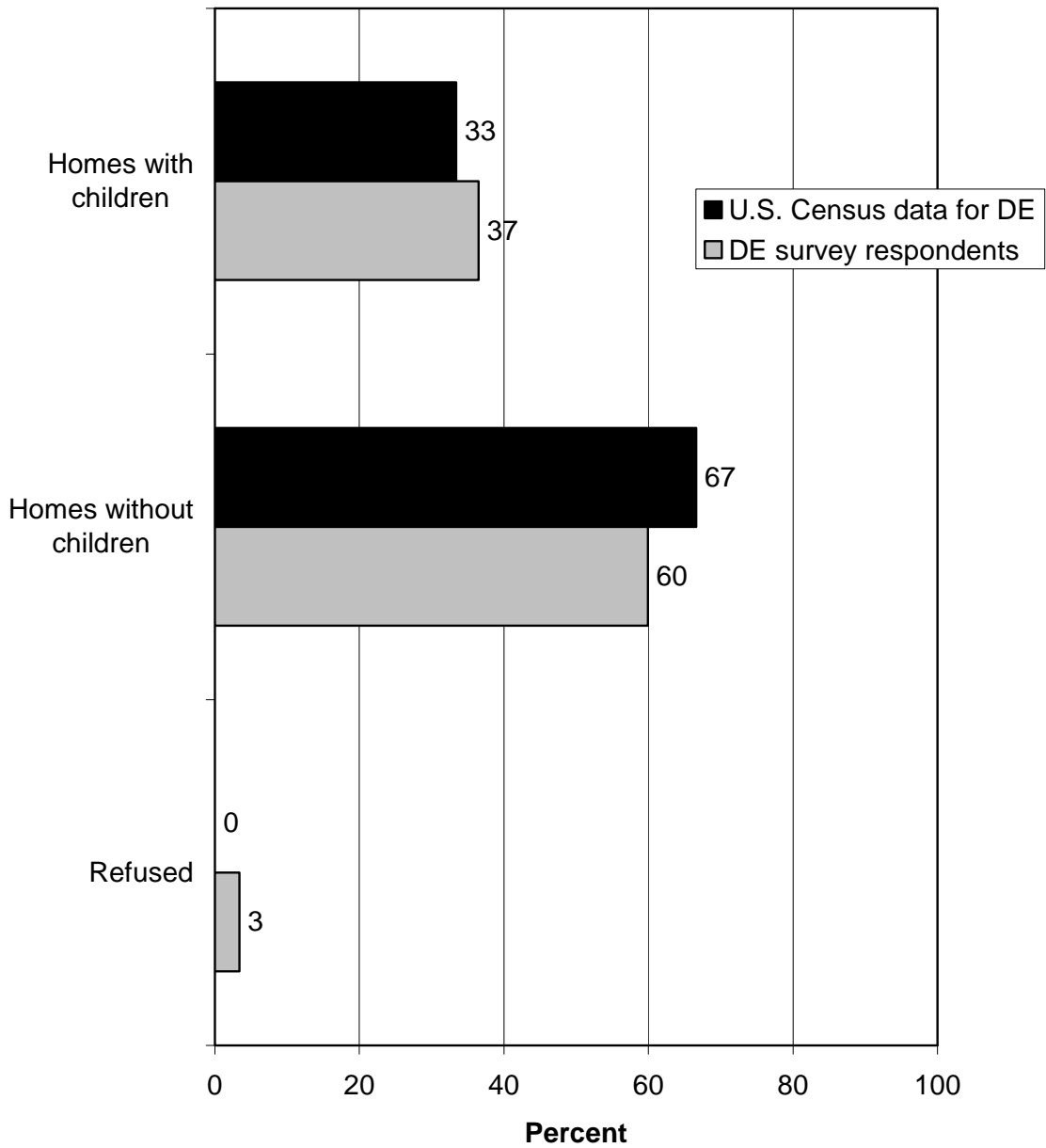
**Q156. How many children, age 17 or younger, do you have living in your household?**



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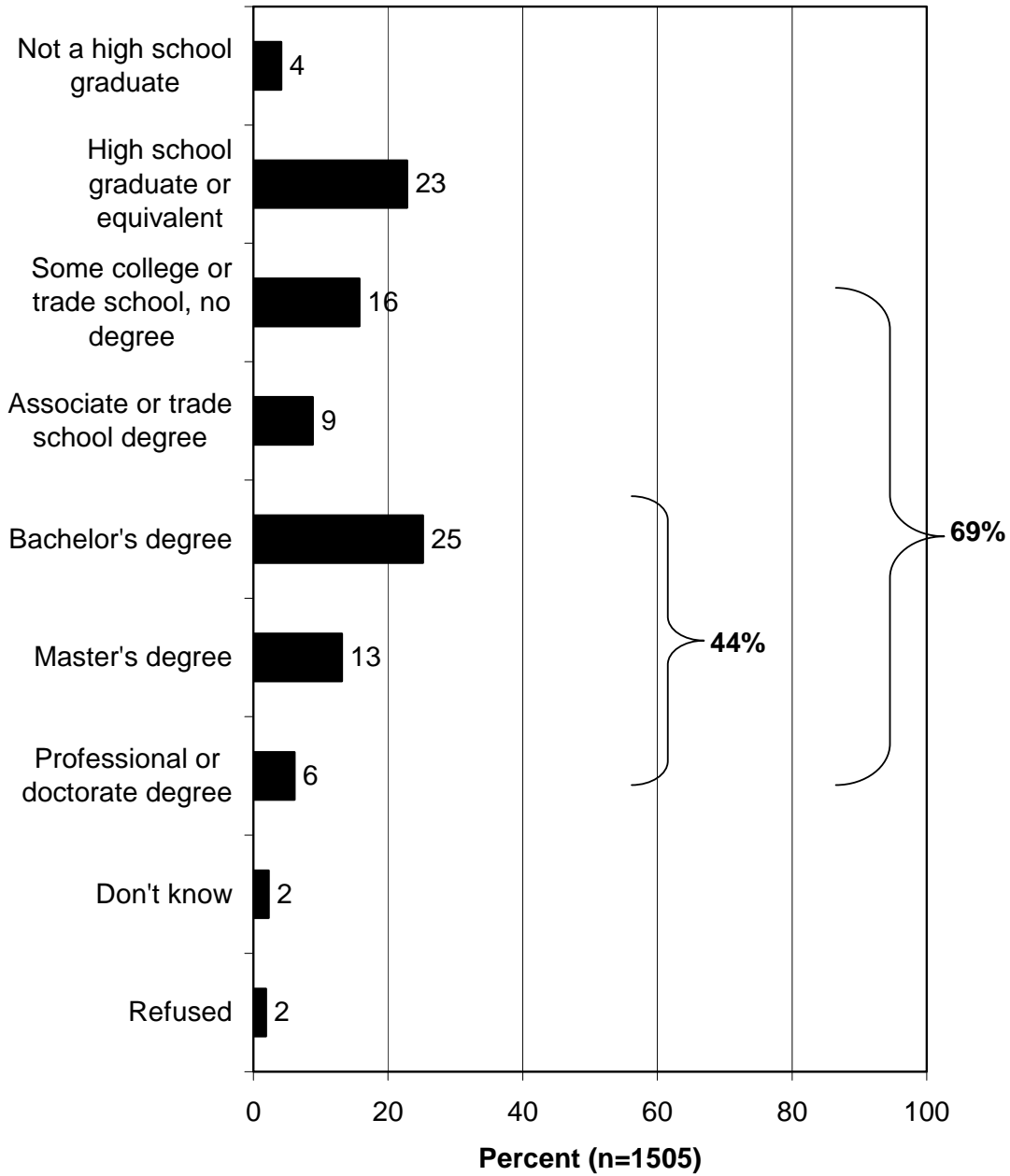


**Q156. How many children, age 17 or younger, do you have living in your household?**

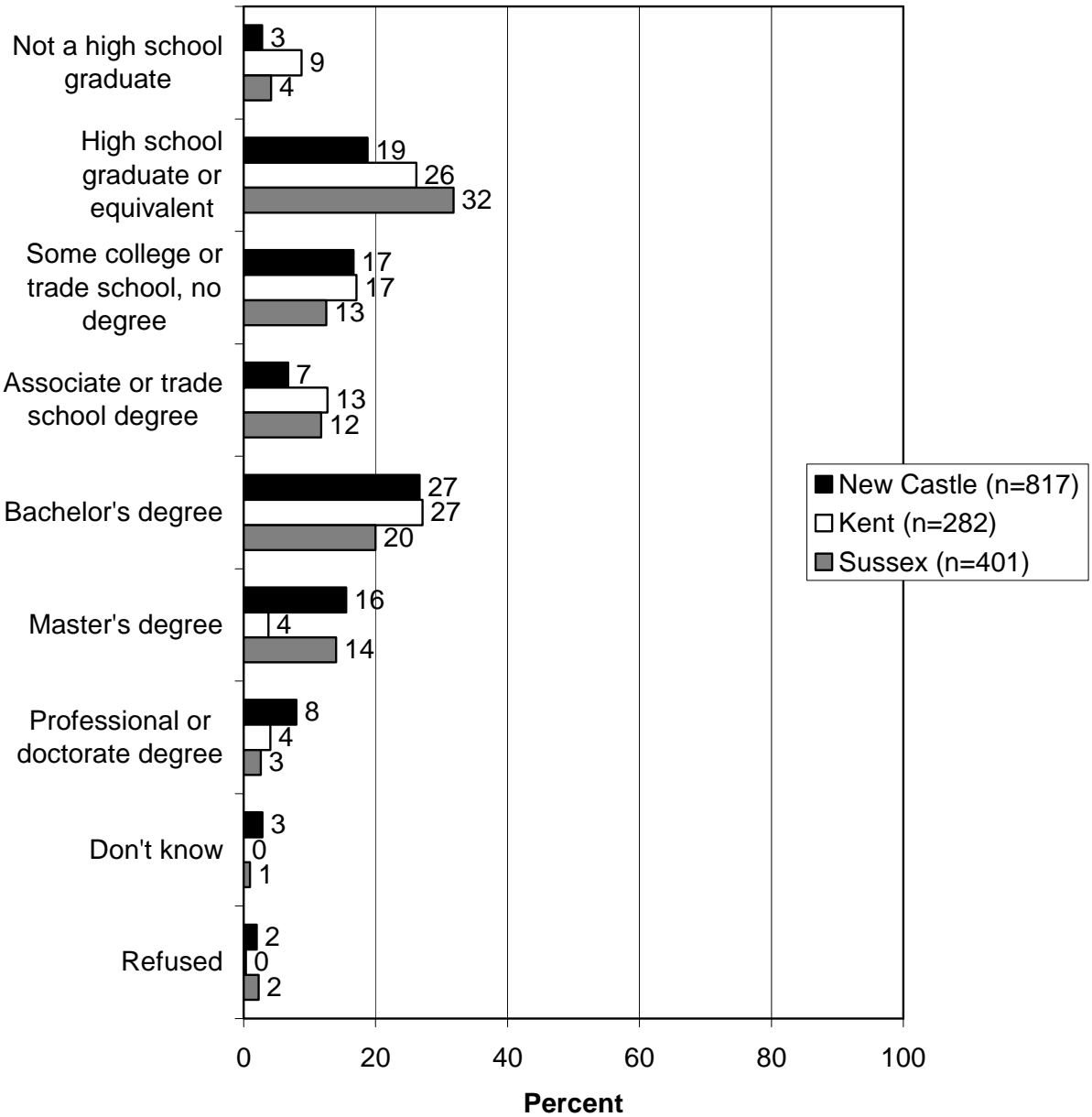




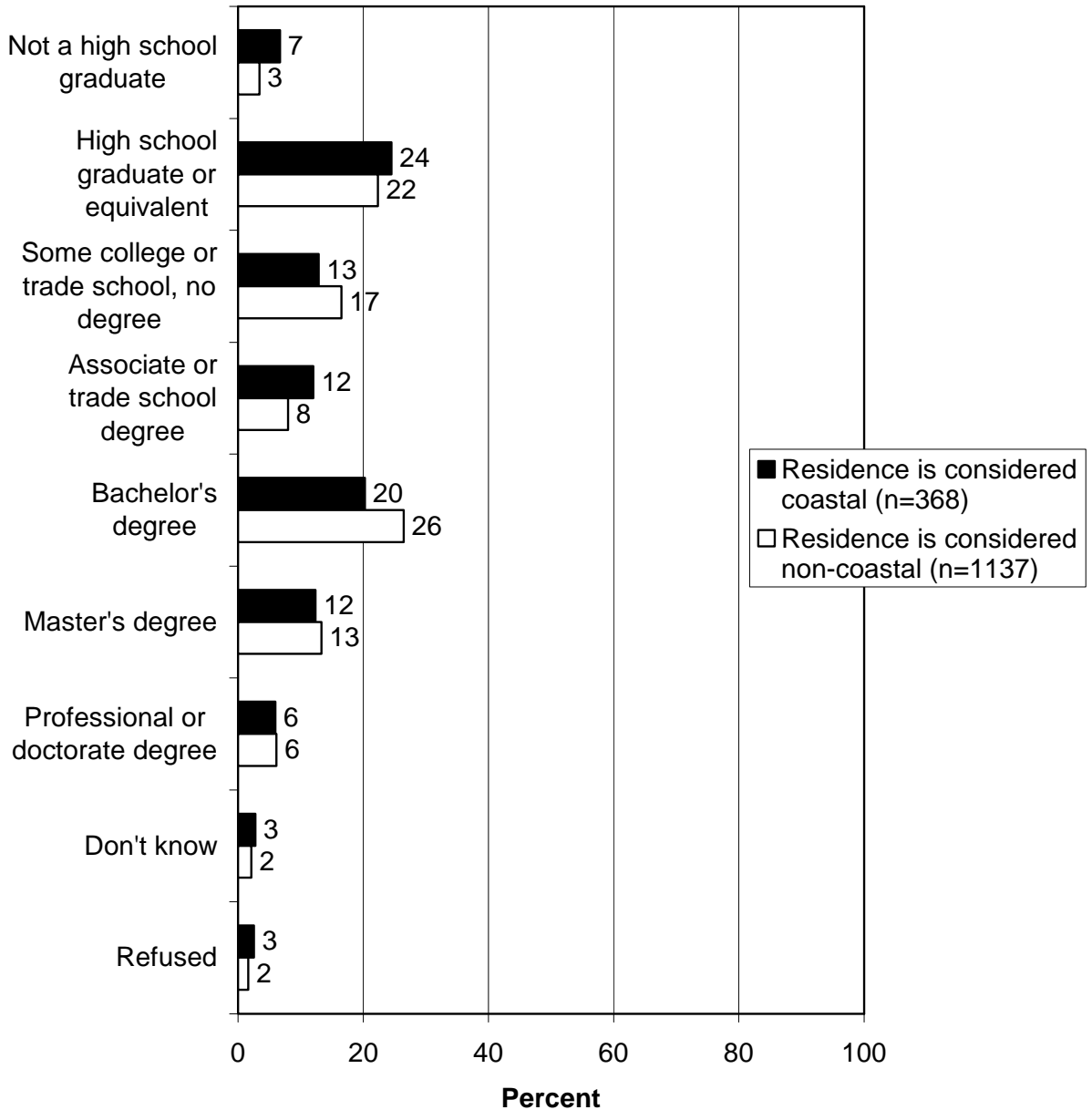
**Q158. What is the highest level of education you have completed?**



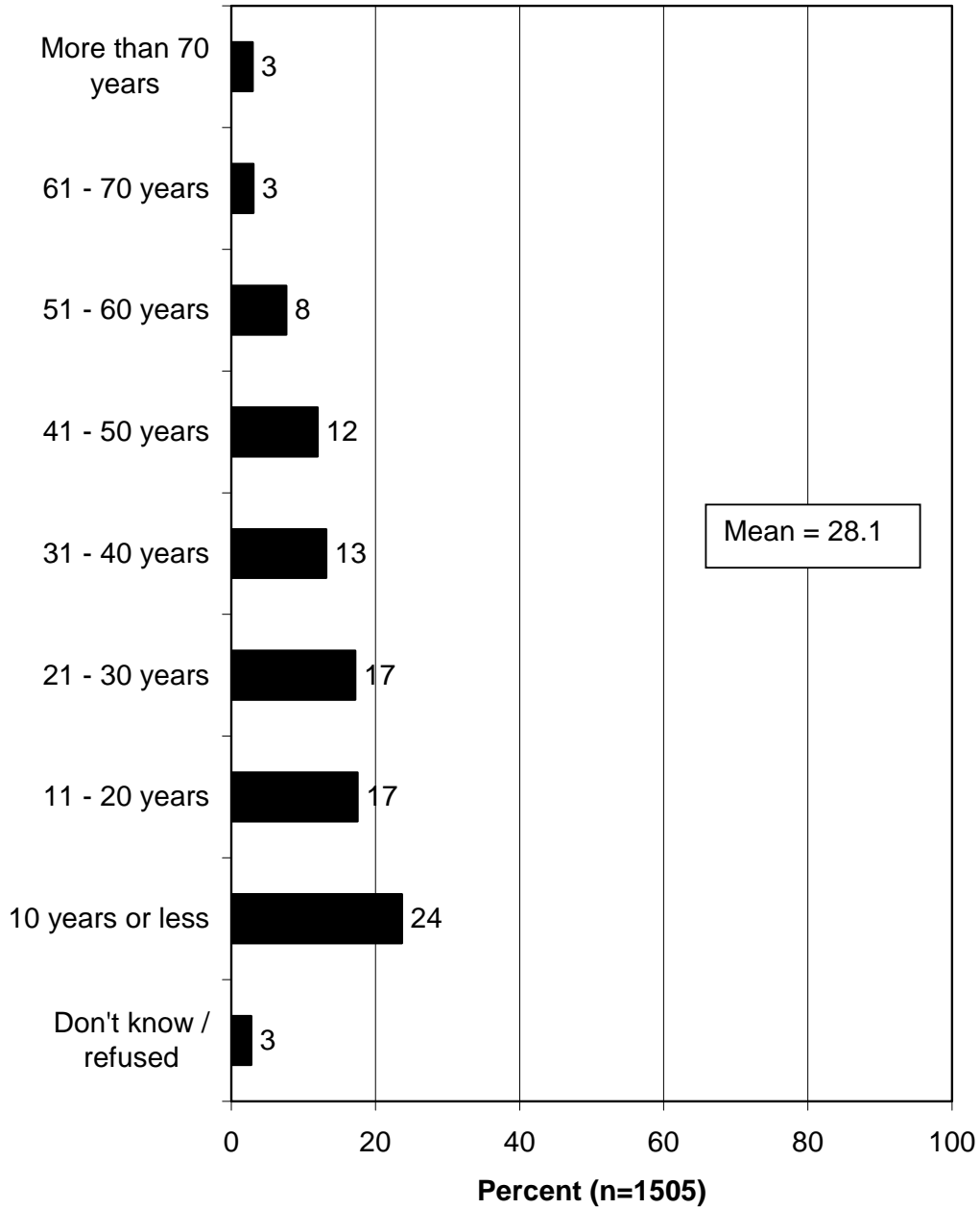
**Q158. What is the highest level of education you have completed?**



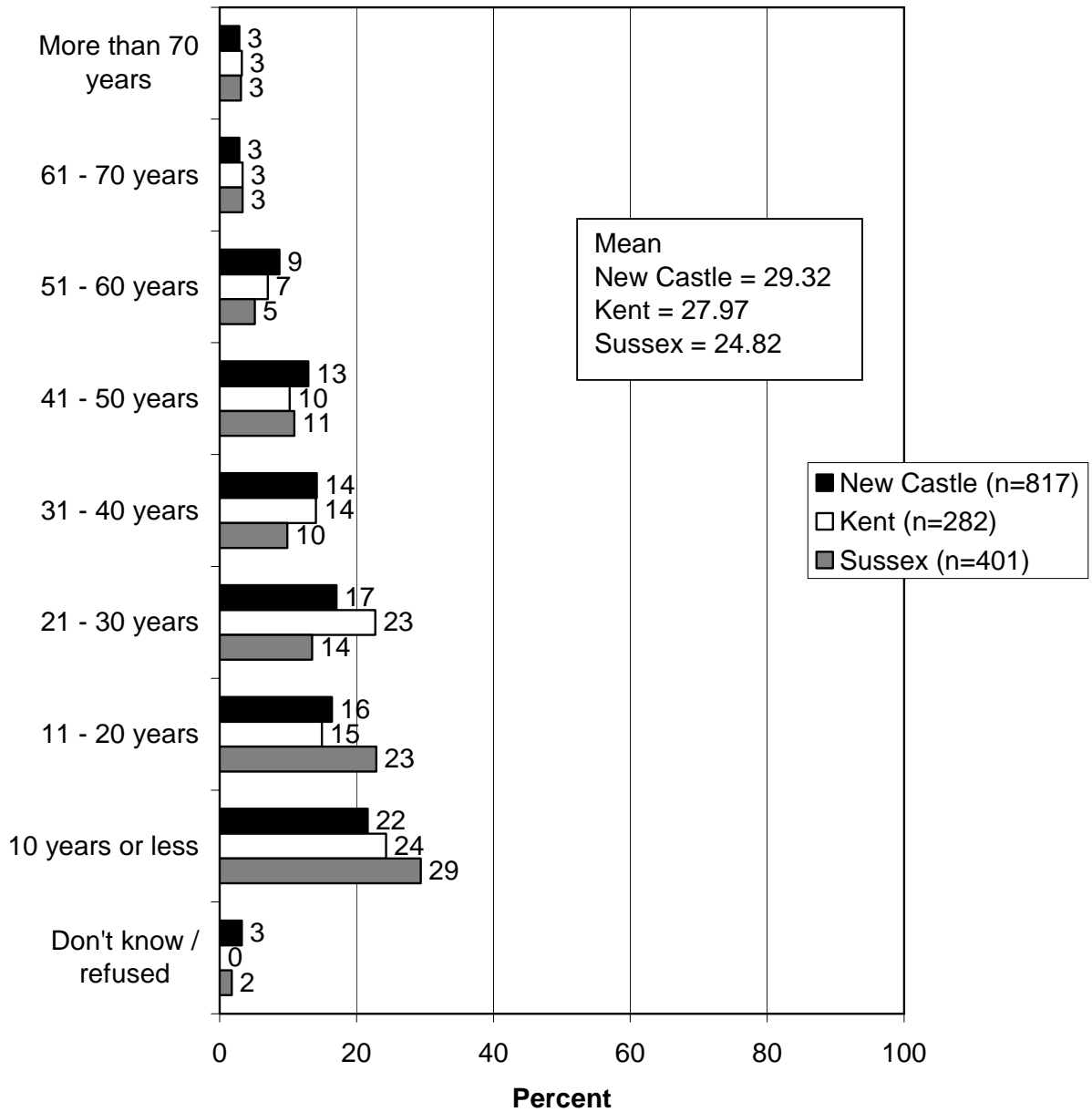
**Q158. What is the highest level of education you have completed?**



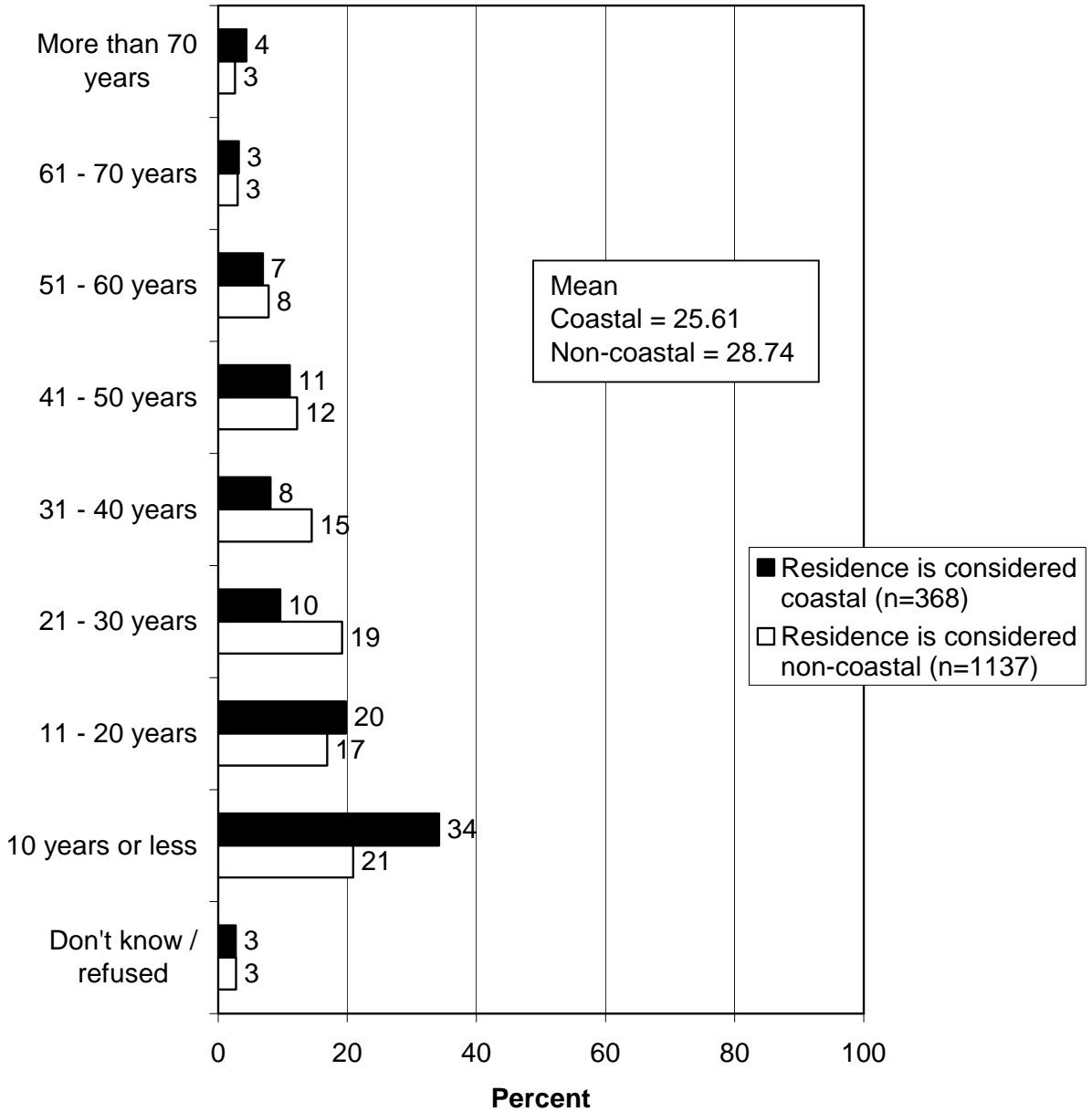
### Q148. How many years have you lived in Delaware?



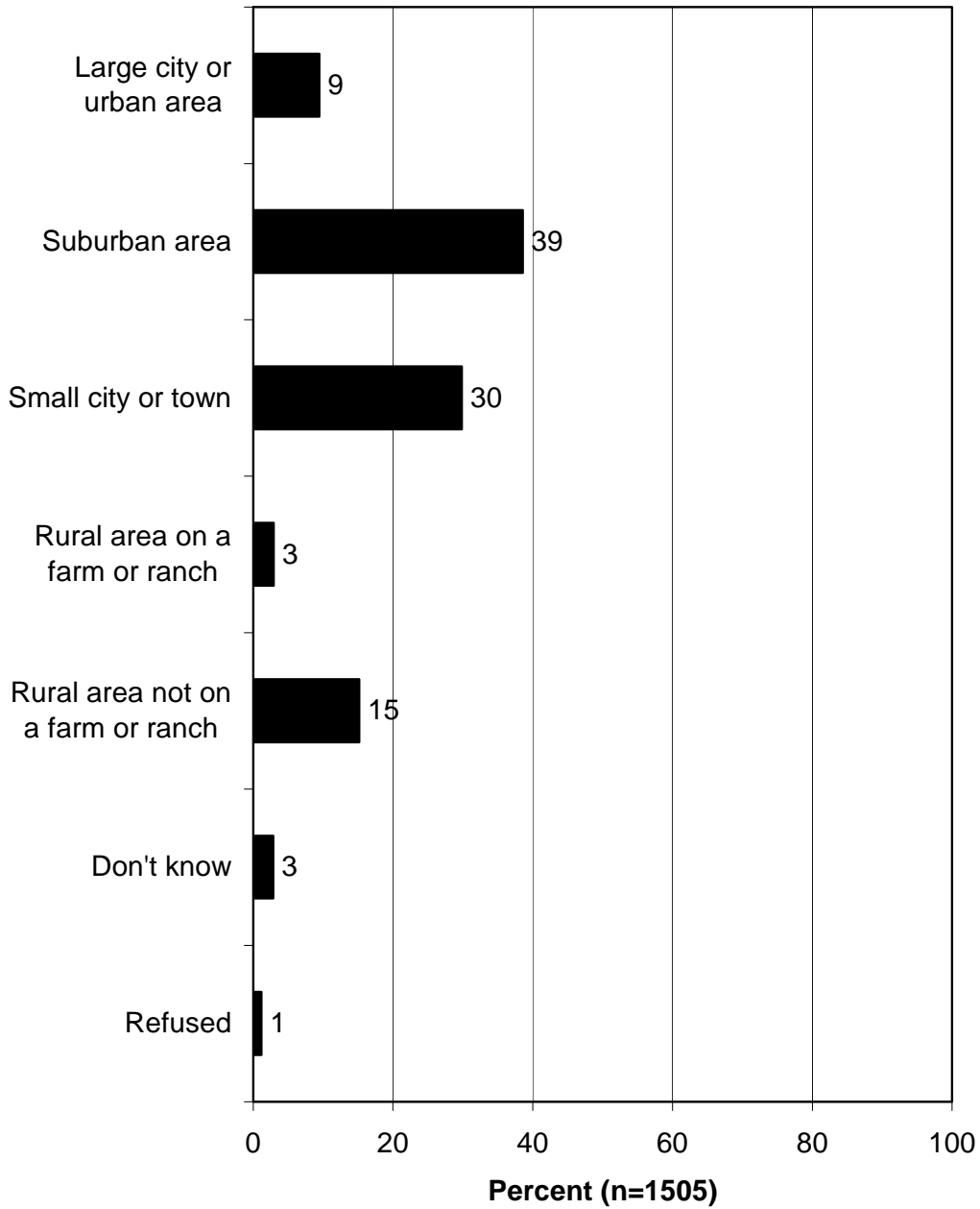
**Q148. How many years have you lived in Delaware?**



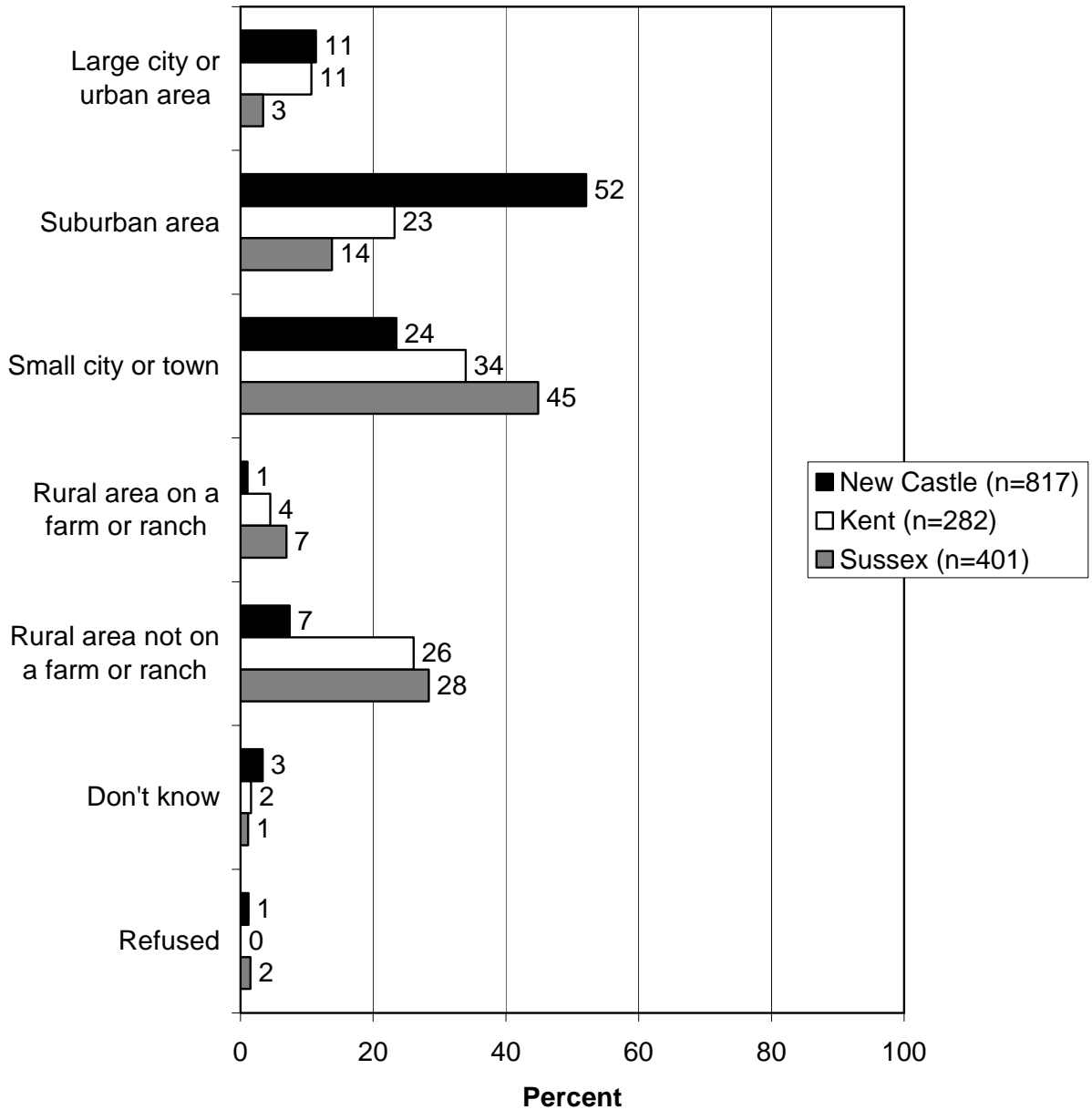
**Q148. How many years have you lived in Delaware?**



**Q152. Do you consider your place of residence to be a large city or urban area, a suburban area, a small city or town, a rural area on a farm or ranch, or a rural area not on a farm or ranch?**

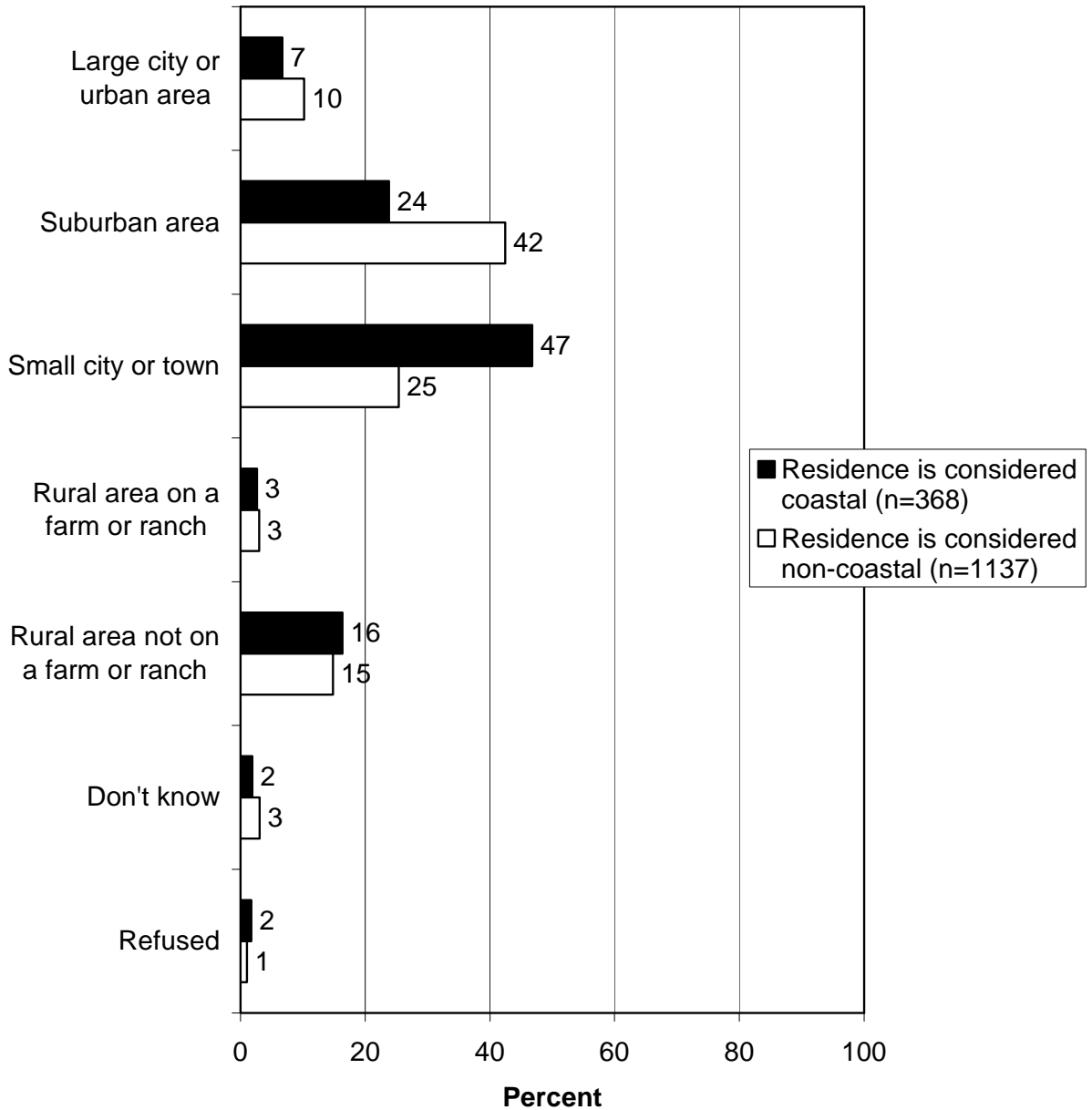


**Q152. Do you consider your place of residence to be a large city or urban area, a suburban area, a small city or town, a rural area on a farm or ranch, or a rural area not on a farm or ranch?**

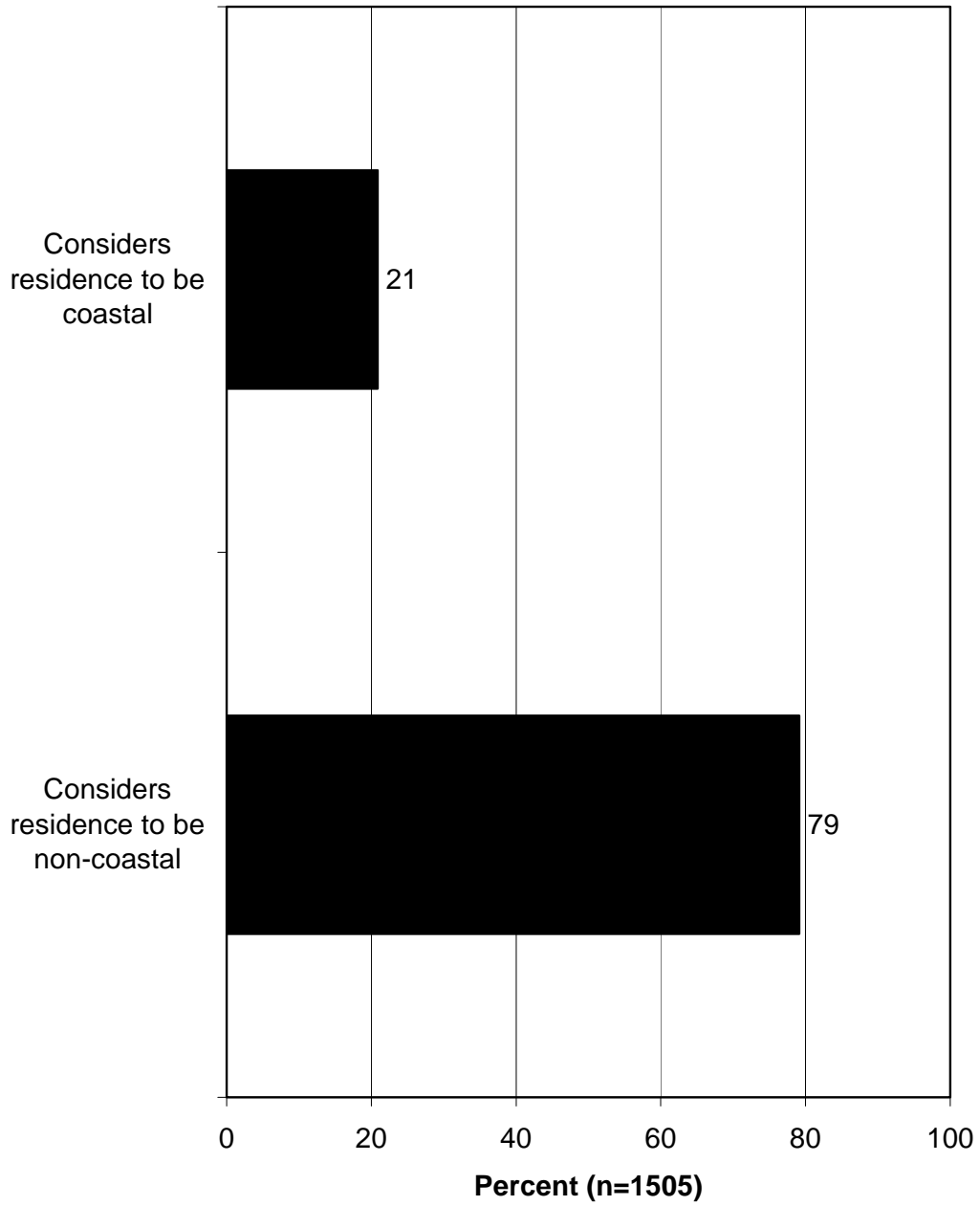




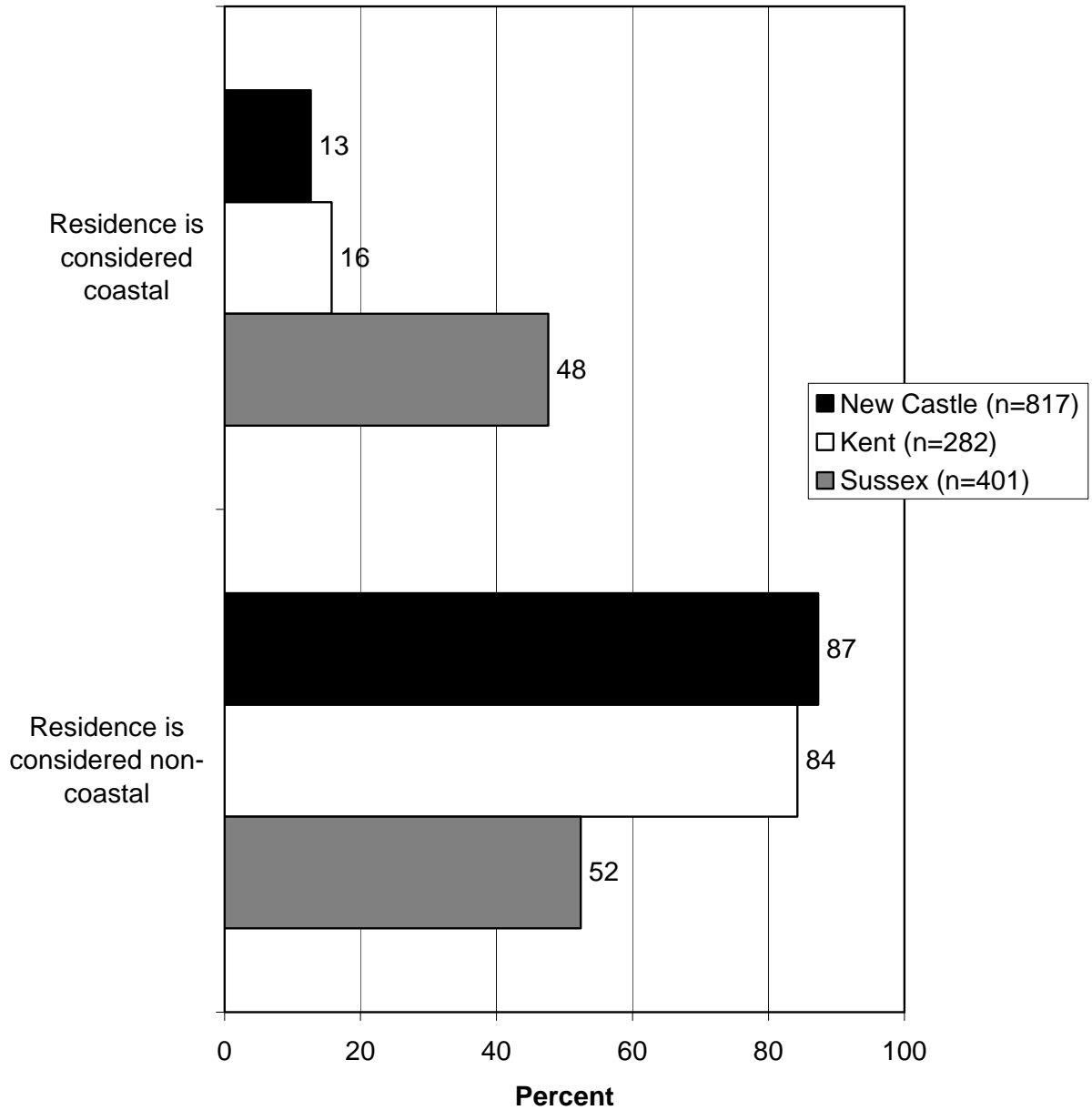
**Q152. Do you consider your place of residence to be a large city or urban area, a suburban area, a small city or town, a rural area on a farm or ranch, or a rural area not on a farm or ranch?**



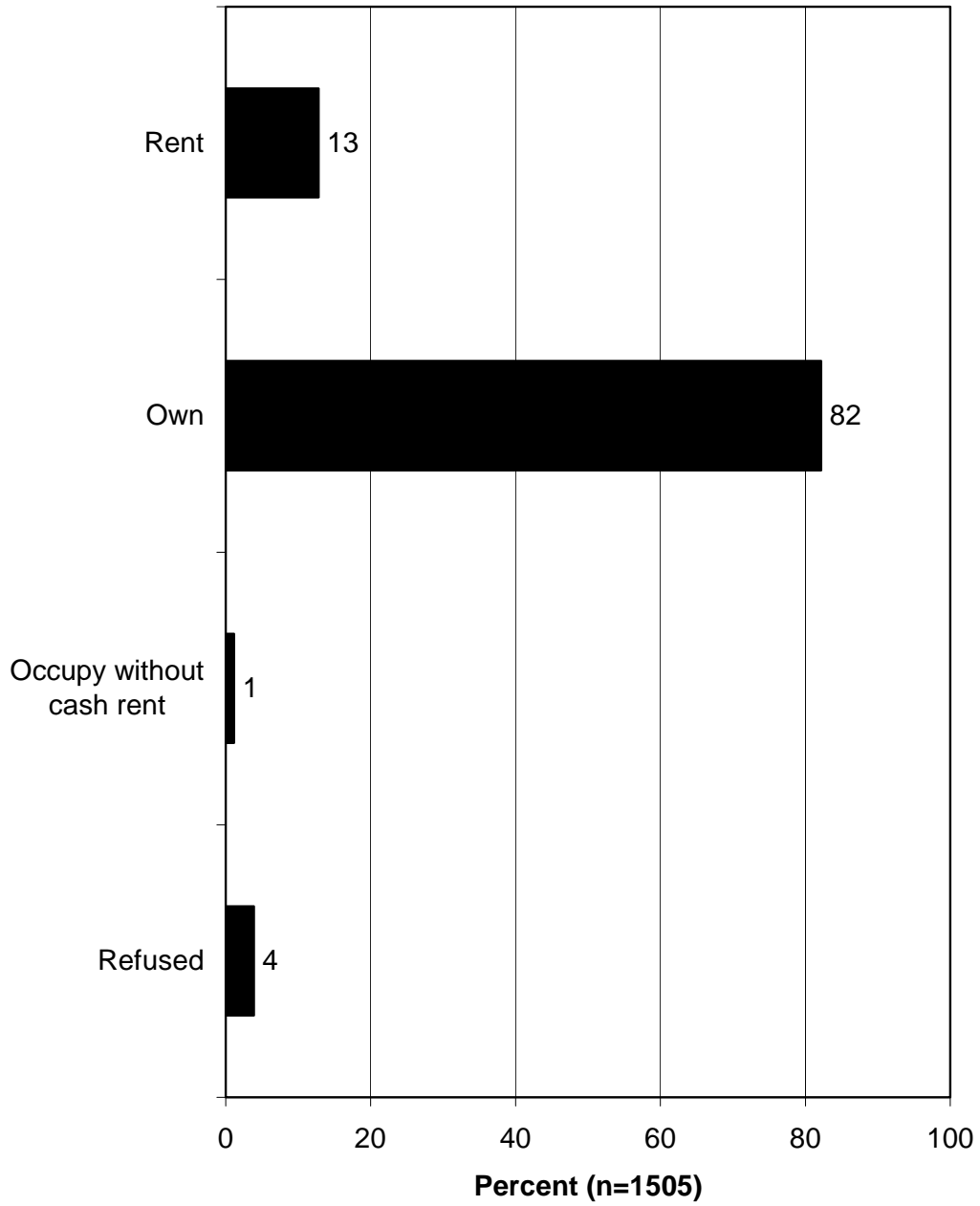
**Q153. Do you consider your place of residence to be in a coastal or non-coastal area?**



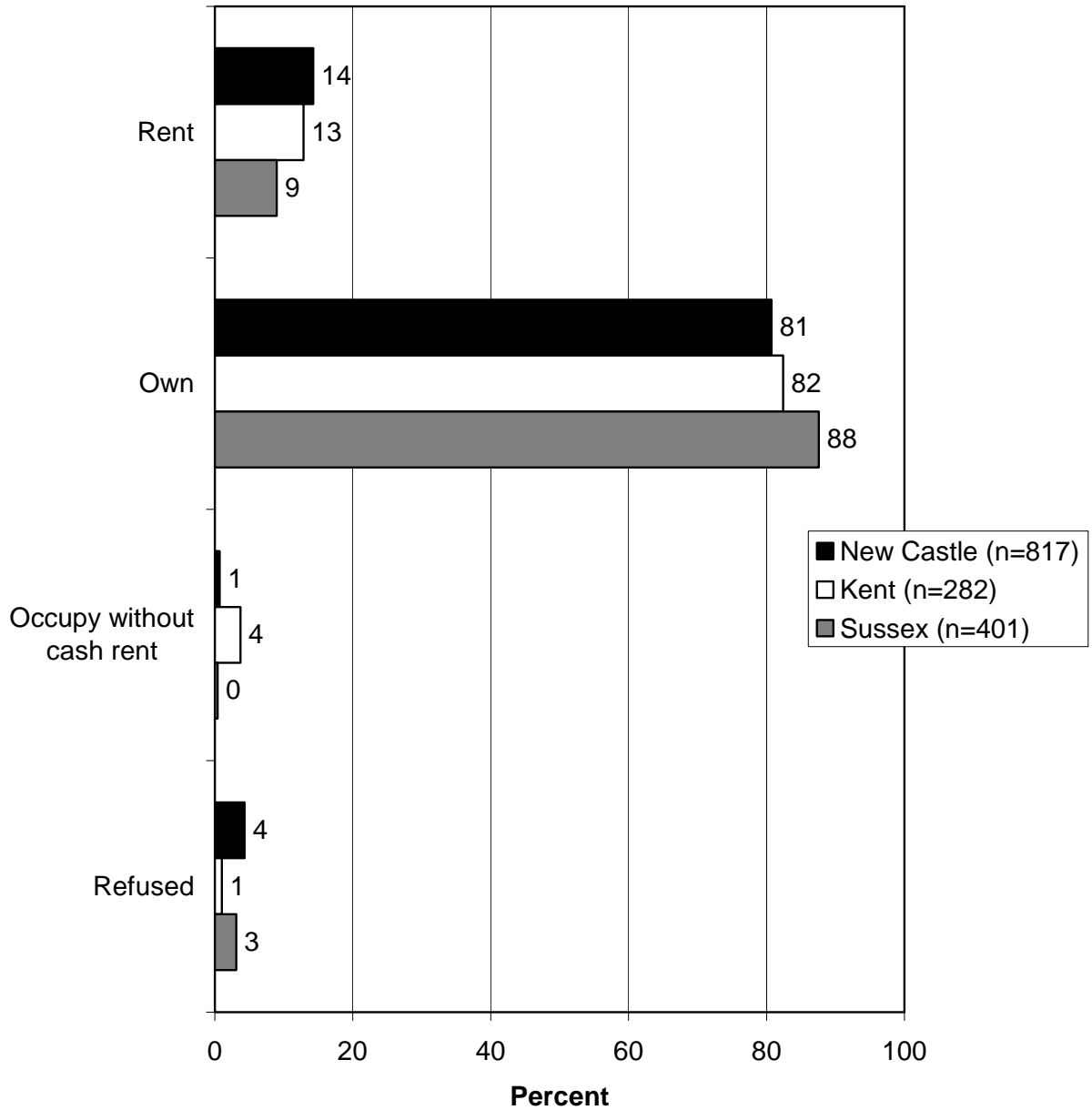
**Q153. Do you consider your place of residence to be in a coastal or non-coastal area?**



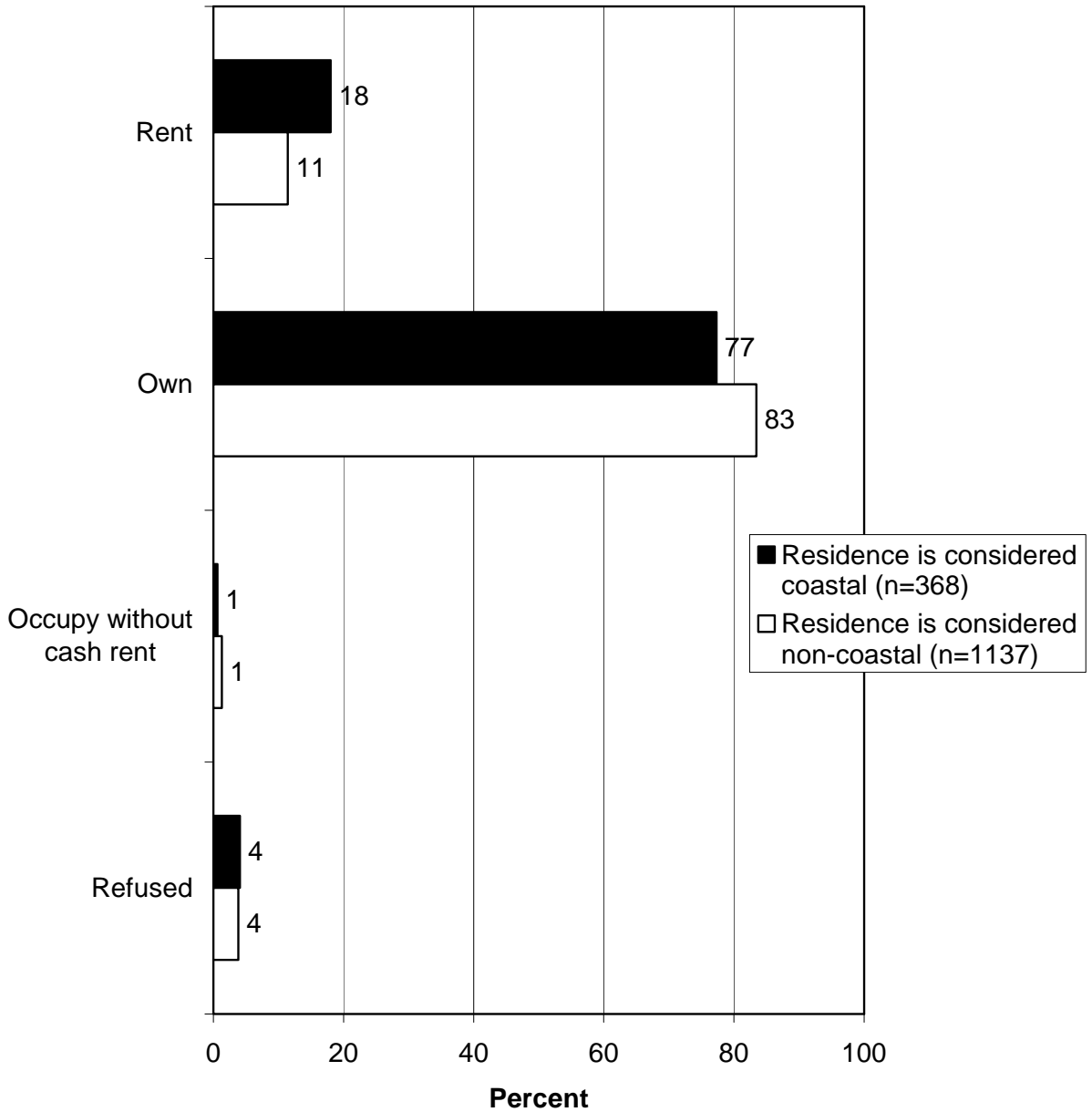
**Q154. Do you rent or own your current place of residence?**



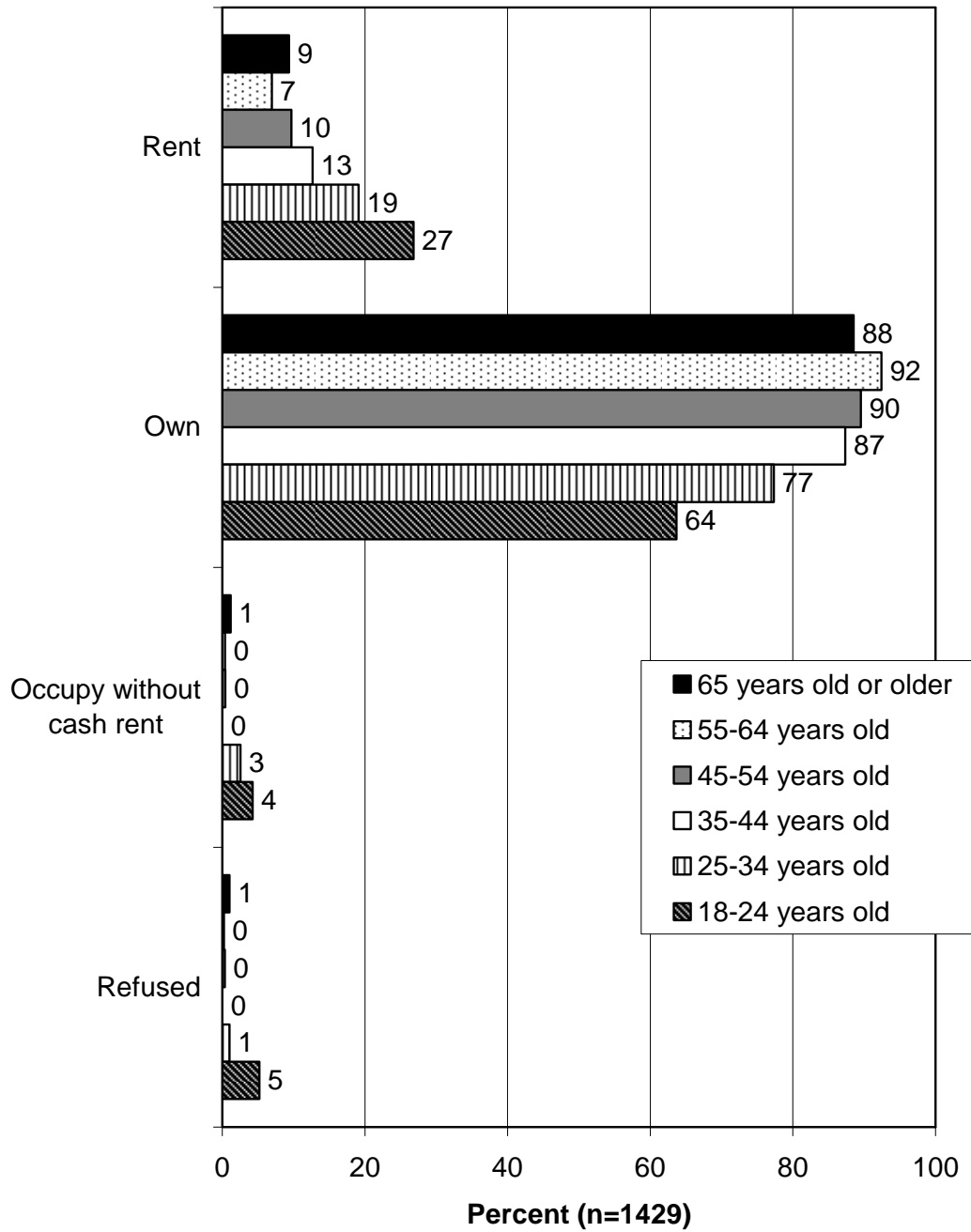
### Q154. Do you rent or own your current place of residence?



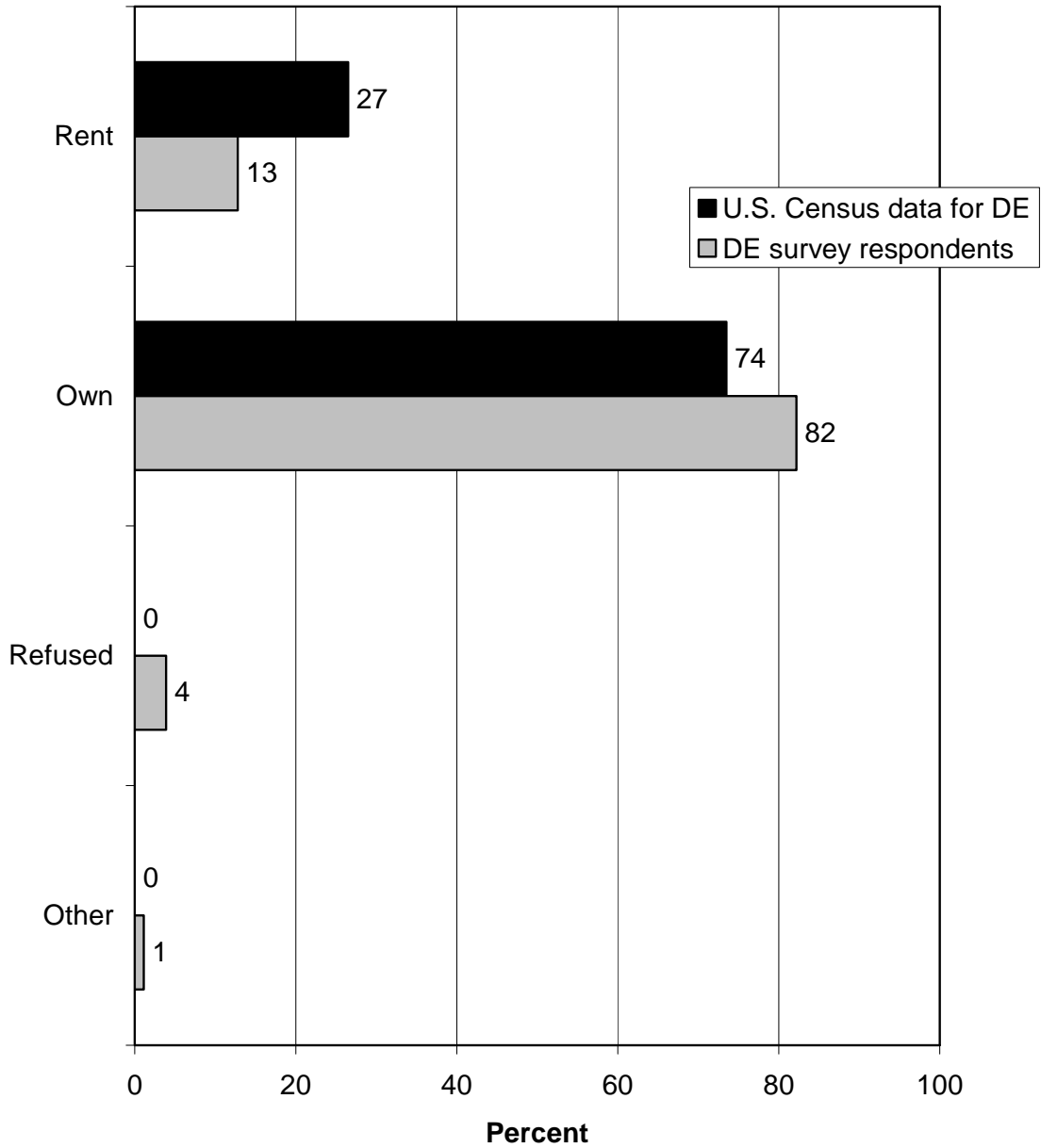
### Q154. Do you rent or own your current place of residence?



### Q154. Do you rent or own your current place of residence?

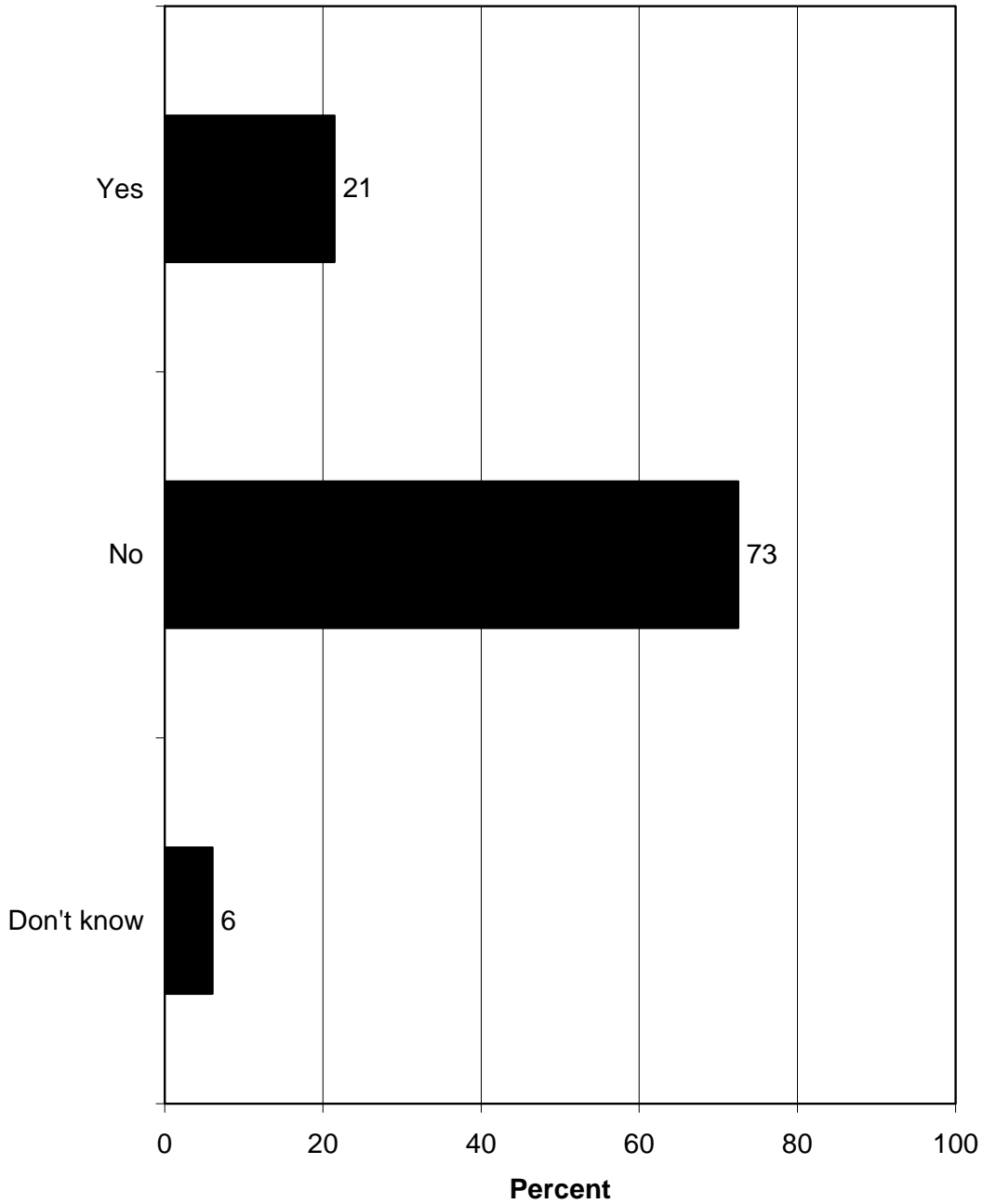


### Q154. Do you rent or own your current place of residence?

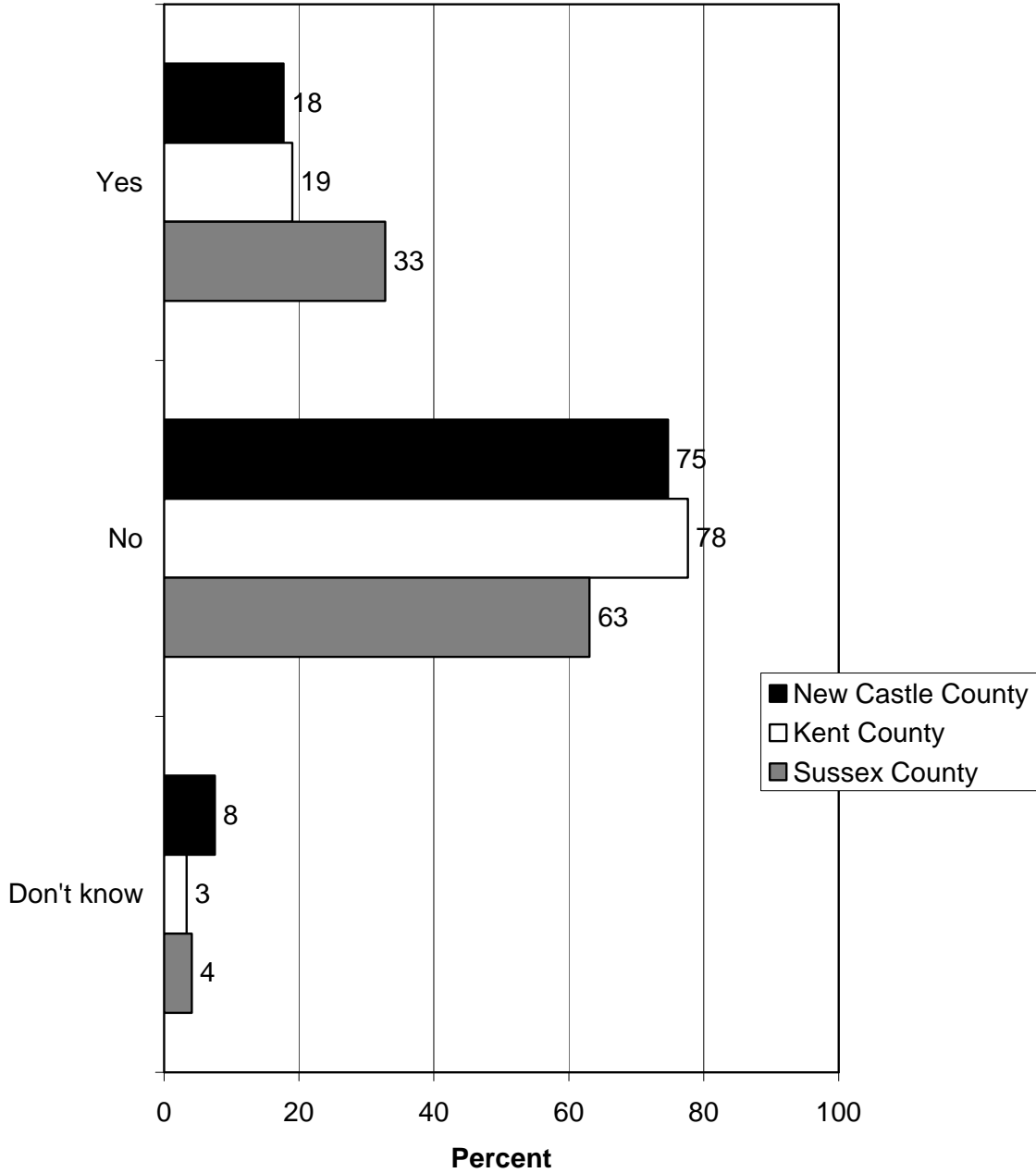




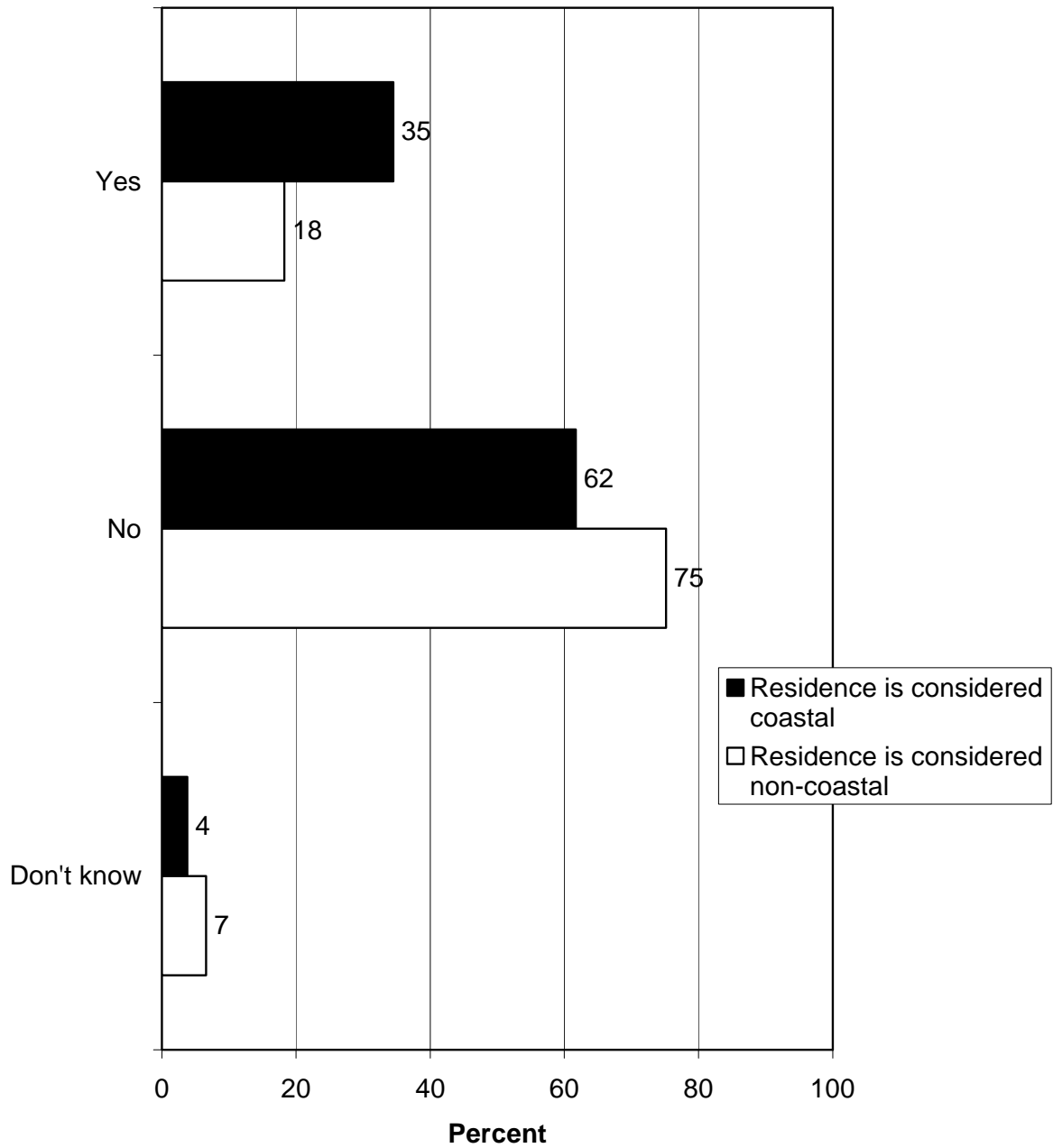
**Q155. Do you have flood insurance for your current place of residence?  
(Of those who own their current place of residence.)**



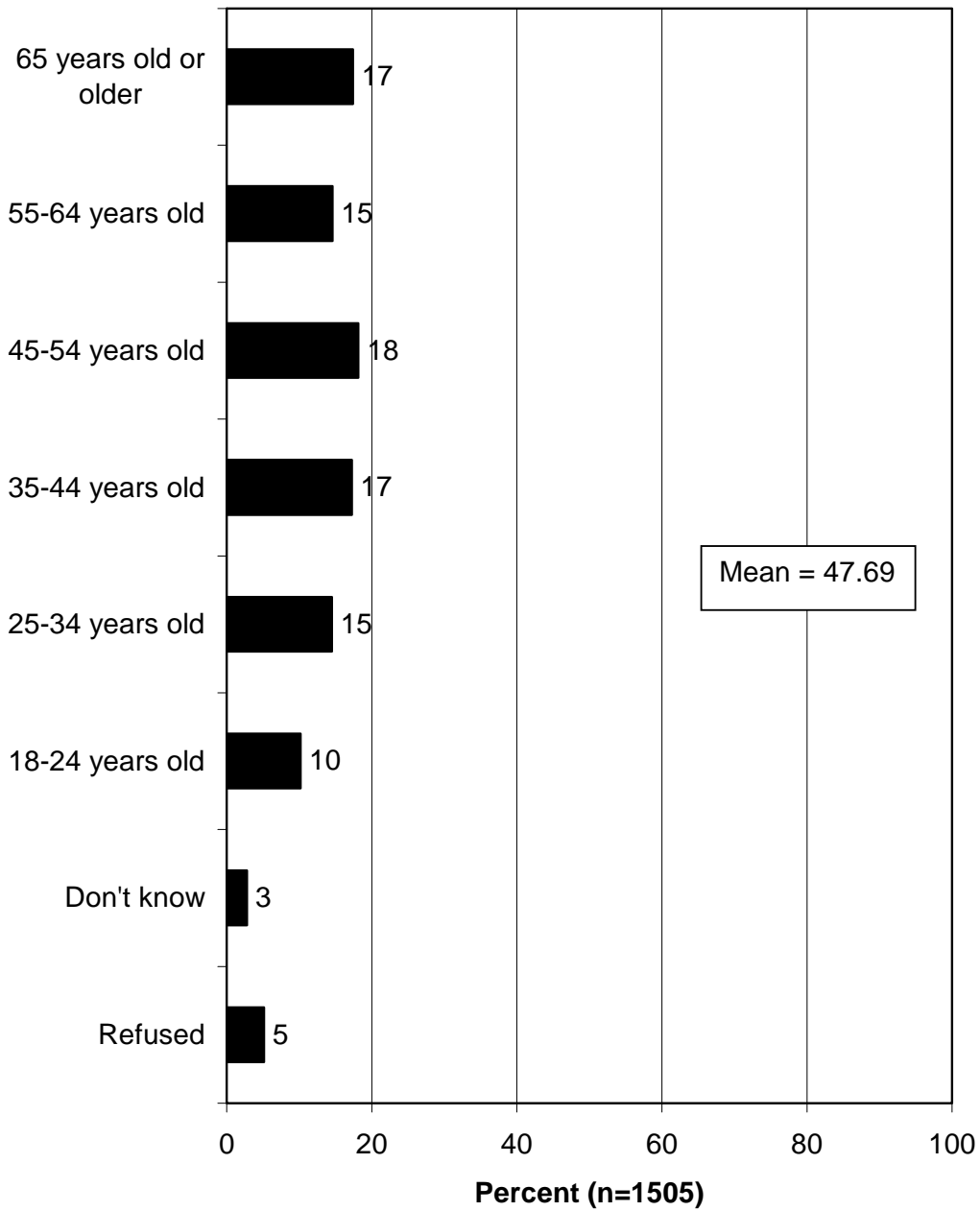
**Q155. Do you have flood insurance for your current place of residence?  
(Of those who own their current place of residence.)**



**Q155. Do you have flood insurance for your current place of residence?  
(Of those who own their current place of residence.)**



### Q163. Respondent's age.



**Q168. Respondent's gender (observed, not asked, by interviewer).**



## **ABOUT RESPONSIVE MANAGEMENT**

Responsive Management is a nationally recognized public opinion and attitude survey research firm specializing in natural resource and outdoor recreation issues. Its mission is to help natural resource and outdoor recreation agencies and organizations better understand and work with their constituents, customers, and the public.

Utilizing its in-house, full-service, computer-assisted telephone and mail survey center with 45 professional interviewers, Responsive Management has conducted more than 1,000 telephone surveys, mail surveys, personal interviews, and focus groups, as well as numerous marketing and communications plans, need assessments, and program evaluations on natural resource and outdoor recreation issues.

Clients include most of the federal and state natural resource, outdoor recreation, and environmental agencies, and most of the top conservation organizations. Responsive Management also collects attitude and opinion data for many of the nation's top universities, including the University of Southern California, Virginia Tech, Colorado State University, Auburn, Texas Tech, the University of California—Davis, Michigan State University, the University of Florida, North Carolina State University, Penn State, West Virginia University, and others.

Among the wide range of work Responsive Management has completed during the past 20 years are studies on how the general population values natural resources and outdoor recreation, and their opinions on and attitudes toward an array of natural resource-related issues. Responsive Management has conducted dozens of studies of selected groups of outdoor recreationists, including anglers, boaters, hunters, wildlife watchers, birdwatchers, park visitors, historic site visitors, hikers, and campers, as well as selected groups within the general population, such as landowners, farmers, urban and rural residents, women, senior citizens, children, Hispanics, Asians, and African-Americans. Responsive Management has conducted studies on environmental education, endangered species, waterfowl, wetlands, water quality, and the reintroduction of numerous species such as wolves, grizzly bears, the California condor, and the Florida panther.

Responsive Management has conducted research on numerous natural resource ballot initiatives and referenda and helped agencies and organizations find alternative funding and increase their memberships and donations. Responsive Management has conducted major agency and organizational program needs assessments and helped develop more effective programs based upon a solid foundation of fact. Responsive Management has developed websites for natural resource organizations, conducted training workshops on the human dimensions of natural resources, and presented numerous studies each year in presentations and as keynote speakers at major natural resource, outdoor recreation, conservation, and environmental conferences and meetings.

Responsive Management has conducted research on public attitudes toward natural resources and outdoor recreation in almost every state in the United States, as well as in Canada, Australia, the United Kingdom, France, Germany, and Japan. Responsive Management routinely conducts surveys in Spanish and has also conducted surveys and focus groups in Chinese, Korean, Japanese, and Vietnamese.

Responsive Management's research has been featured in most of the nation's major media, including CNN, ESPN, *The Washington Times*, *The New York Times*, *Newsweek*, *The Wall Street Journal*, and on the front pages of *The Washington Post* and *USA Today*.

Visit the Responsive Management website at:

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