

BUSINESS

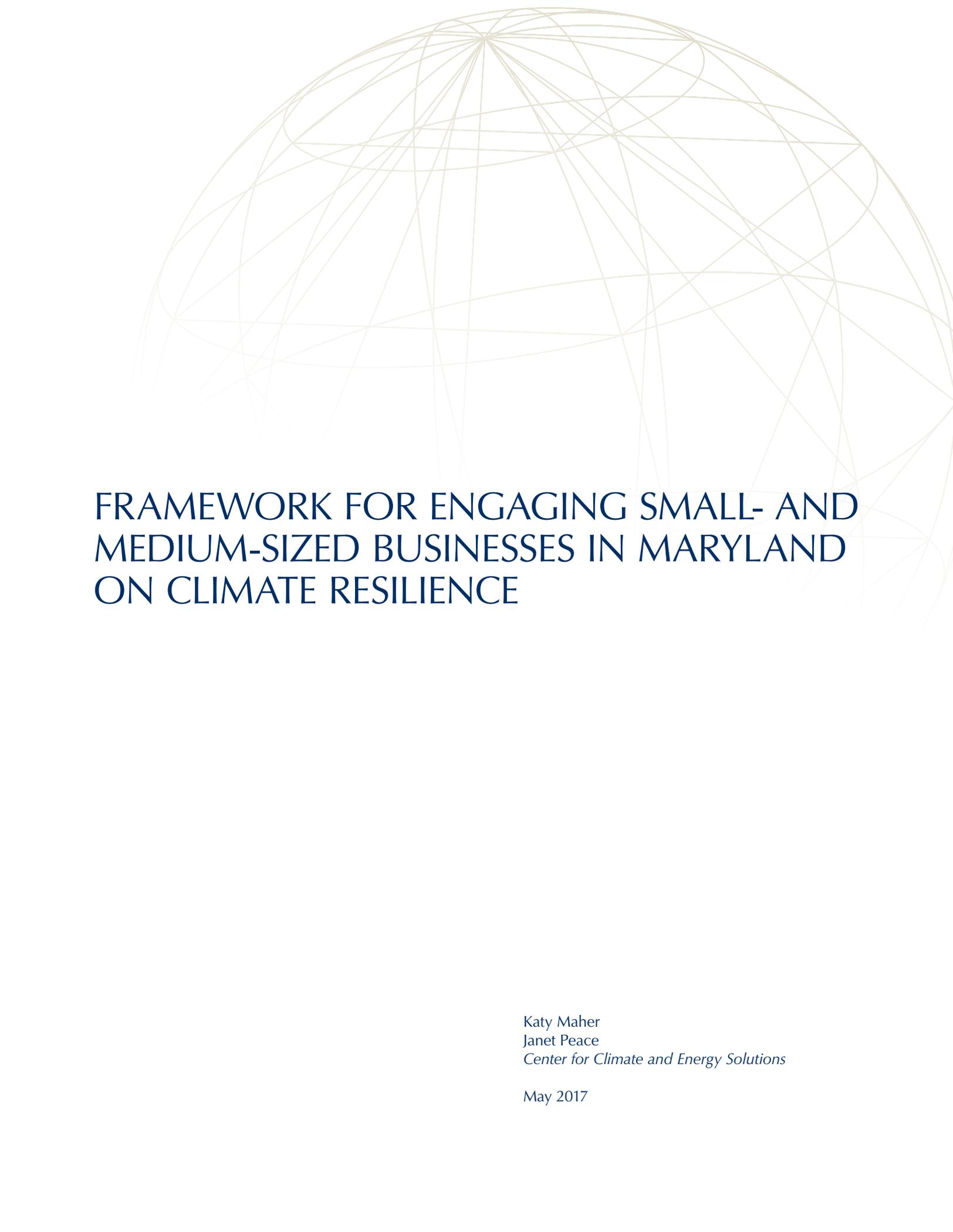
FRAMEWORK FOR ENGAGING SMALL- AND MEDIUM-SIZED BUSINESSES IN MARYLAND ON CLIMATE RESILIENCE



CENTER FOR CLIMATE
AND ENERGY SOLUTIONS

Katy Maher
Janet Peace
Center for Climate and Energy Solutions

May 2017



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The Center for Climate and Energy Solutions (C2ES) is an independent, nonpartisan, nonprofit organization working to forge practical solutions to climate change. Our mission is to advance strong policy and action to reduce greenhouse gas emissions, promote clean energy, and strengthen resilience to climate impacts. Learn more at www.C2ES.org.

CONTENTS

ACKNOWLEDGMENTS	iv
EXECUTIVE SUMMARY	v
I. INTRODUCTION	1
II. CLIMATE RISKS AND IMPACTS TO BUSINESSES	3
III. CHALLENGES, NEEDS, AND GAPS IDENTIFIED	5
IV. RECOMMENDATIONS FOR ENGAGING SMALL BUSINESSES	9
V. CONCLUSION	17
APPENDIX A: SURVEY	19
APPENDIX B: ADDITIONAL SURVEY DATA	21
APPENDIX C: OUTREACH TO ORGANIZATIONS	23
ENDNOTES	25

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EXECUTIVE SUMMARY

Climate and weather events can have significant impacts on businesses and the economy. Across Maryland, flooding between 2014 and 2016 caused more than \$5.5 million in property damage, and in 2012, crop insurance payouts resulting from drought, heat, excessive rain, and high winds amounted to more than \$28.7 million statewide. As the climate continues to change, these risks will only increase.

Small- and medium-sized businesses are often significantly impacted by weather events because they lack the ability to fully evaluate, prepare for, and respond to weather-related stresses. According to the Federal Emergency Management Agency, almost 40 percent of small businesses never reopen their doors following a disaster event. Many businesses are not aware of the risks they face from changing climate conditions, and may not have plans in place to respond and recover from weather events. This issue is especially important in Maryland, where small businesses—defined as those with fewer than 500 employees—contribute heavily to the state’s economy. More than 500,000 small businesses account for more than 97 percent of all businesses in Maryland, and employ about half of the state’s private workforce.

Small businesses are dispersed, diverse, and have few resources to deploy to understand and respond to climate risks. Business owners have limited time, staff, and financial resources to attend meetings or research how climate changes could impact them directly. C2ES conducted research on small- and medium-sized businesses in Maryland to determine how to assist them in planning for climate resilience. This report presents a framework designed to help state and local officials more effectively engage with small businesses on climate risks and resilience. This framework focuses on: using trusted messengers, leveraging existing channels, identifying new opportunities, and distributing targeted information to the small business community. Trusted messengers can help connect state and local officials to small businesses and serve as key channels for distributing information. A number of existing efforts at state and local levels could easily incorporate small business resilience into ongoing activities. There are also opportunities to create new programs and information on small business resilience, such as public-private partnerships or collaborative efforts at the local level.

Collaborating with businesses on resilience planning using this framework will be mutually beneficial for the public and private sectors. It provides an opportunity for state and local officials to better tailor resilience planning at the local level, which will help protect important local economies. Working together, state and local officials can help businesses protect their operations, and this engagement will give businesses an opportunity to have their voices heard by the state and local agencies they may not regularly interact with. Businesses, state and local officials, and other stakeholders all stand to benefit from collaborating on community resilience, and working together can help to overcome challenges and maximize resources to address climate change and extreme weather risks.

FIGURE ES-1: Framework for Engaging Small Businesses on Climate Resilience

Use trusted messengers	Leverage existing channels	Identify new opportunities	Distribute targeted information
<ul style="list-style-type: none">• Identify who businesses regularly engage with• Work with business networking organizations	<ul style="list-style-type: none">• Incorporate resilience into business activities• Expand resilience efforts to include businesses	<ul style="list-style-type: none">• Form public-private partnerships• Develop business resilience networks	<ul style="list-style-type: none">• Tailor the message• Identify steps businesses can take

I. INTRODUCTION

Small- and medium-sized businesses are often significantly impacted by weather events because they lack the ability to fully evaluate, prepare for, and respond to weather-related stresses. According to the Federal Emergency Management Agency (FEMA), almost 40 percent of small businesses never reopen their doors following a disaster event.¹ Many small businesses are not aware of the risks they face from changing climate conditions, and may not have plans in place to respond and recover from weather events. This issue is especially important in Maryland, where small businesses—defined as those with fewer than 500 employees—contribute heavily to the state’s economy. More than 500,000 small businesses account for more than 97 percent of all businesses in Maryland, and employ about half of the state’s private workforce.²

Small businesses are dispersed, diverse, and have few resources to deploy to understand and respond to climate risks. Business owners have limited time, staff, and financial resources to attend meetings or research how climate changes could impact them directly. Unless businesses understand how they will directly be impacted (positively or negatively), it can be difficult to solicit participation. Businesses that have no direct experience with weather impacts may also find it hard to see the importance of the issue.

The main objective of this work is to determine how to assist small- and medium-sized businesses in Maryland in planning for climate resilience. To further this objective, C2ES conducted research by:

- Reviewing existing resources aimed at small businesses and local resilience planning;

- Conducting interviews with stakeholders, including businesses and business organizations, state and local officials, NGOs, and others; and
- Developing and distributing a survey on climate resilience to Maryland small businesses.

The survey instrument was designed to help identify how small business have been impacted by extreme weather and climate change, their information needs, and how they would prefer to engage on these issues in the future. This short survey was distributed to small businesses throughout Maryland through various contacts, including business networks, chambers of commerce, NGOs, and state and local agencies. The survey is included in **Appendix A**. The various organizations that were contacted as part of this research are listed in **Appendix C**.

While this report provides a summary of the research, it also offers recommendations for both state and local officials on how to engage with small businesses, resources and information needs, and generally, how to best support businesses in enhancing resilience to extreme weather and climate change.

Our recommendations build on previous studies of engagement with businesses (large and small), information gathered from conversations with individual businesses, NGOs, business organizations, local and state officials, and the results of the survey. Survey results are included throughout the report and in **Appendix B**. The types of organizations that were contacted are included in **Appendix C**.

II. CLIMATE RISKS AND IMPACTS TO BUSINESSES

Climate and weather events can have significant impacts on businesses and the economy. Since 1980, the U.S. has experienced 200 weather and climate disasters where overall damages/costs reached or exceeded \$1 billion, with the total cost of these 200 events exceeding \$1.1 trillion.³

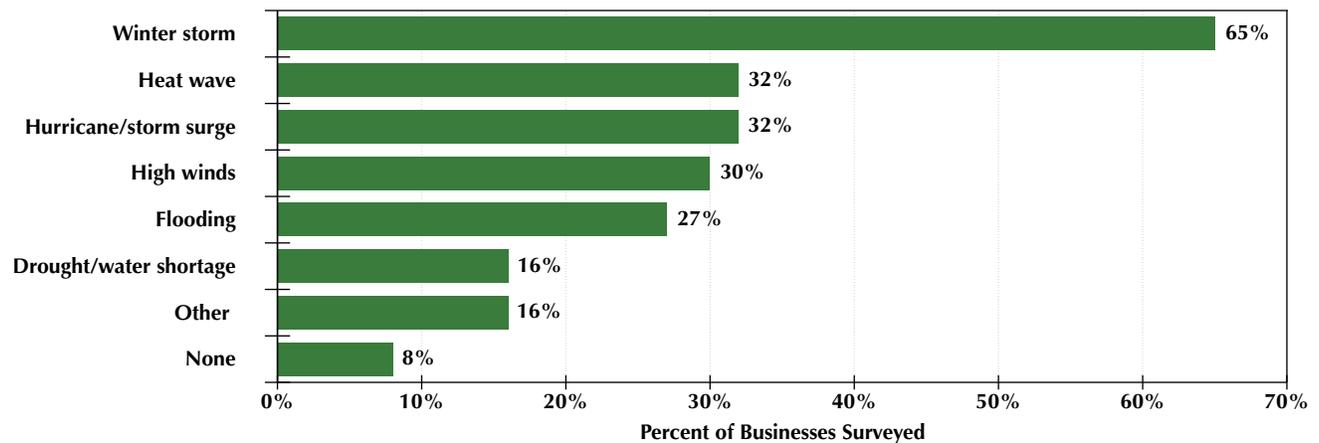
Several of these disastrous events have occurred in Maryland. From 2014 to 2016, flooding caused more than \$5.5 million in property damage statewide,⁴ and in 2012, crop insurance payouts across Maryland resulting from drought, heat, excessive rain, and high winds, amounted to more than \$28.7 million.⁵ Small business survey respondents identified winter storms as the most prominent event they have faced in the last five years, followed by hurricanes/storm surges and extreme heat (Figure 1).

Most of the survey respondents (59 percent) indicated that weather events disrupted operations, with 35 percent experiencing temporary closures (Figure 2). Weather

events also caused personnel impacts for 43 percent of survey respondents, whose staff were unable to make it to work. Other weather impacts included damage to roofs, impacts to animal welfare, and increased hours necessary to make up for temporary closures.

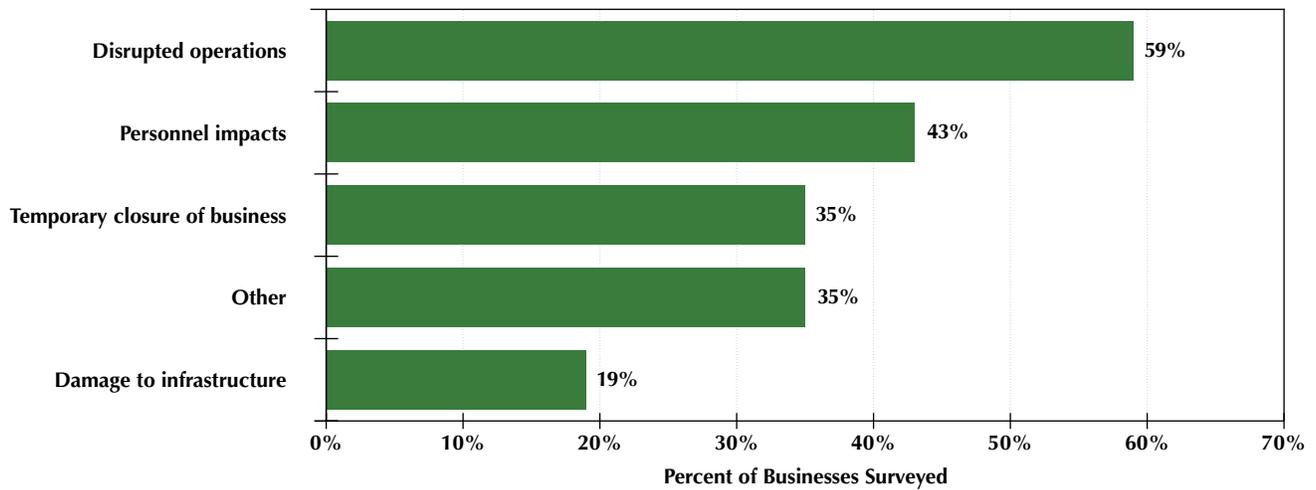
Impacts and costs from weather and climate change are expected to increase. Maryland is expected to face higher temperatures, increased precipitation, extreme weather events, sea level rise, and other impacts because of the changing climate. Projections suggest the state could face between 2 and 5 feet of sea level rise over the next century, putting \$15 billion in property value at risk. These changes will impact buildings, energy systems, human health, infrastructure, agriculture, natural resources, and other sectors throughout Maryland. According to the American Climate Prospectus data for the state of Maryland, annual costs to the labor, health, and energy sectors from these impacts could average over \$5.5 billion by the end of the century.⁶

FIGURE 1: Types of Weather Events that have Impacted Maryland Businesses in Past Five Years



Source: C2ES survey, 2016

FIGURE 2: Types of Impacts Experienced by Businesses from Weather Events in Past Five Years



Source: C2ES survey, 2016

The costs of weather events and long-term climate change will be borne by both businesses and state and local agencies. A recent display of the significant impacts

extreme weather can have on small businesses was experienced in Ellicott City, Maryland, when it was hit by a major flood in the summer of 2016 (**Box 1**).

Box 1. Case Study—Ellicott City, Maryland

On July 30, 2016, Ellicott City experienced an extreme precipitation event, receiving more than six inches of rainfall in two hours. This event caused severe flash flooding and extensive damage to the historic city, and resulted in two fatalities. While the city had experienced flooding before, the National Weather Service identified this as a thousand-year rainfall event.⁷ The event damaged 90 businesses and 107 homes, and caused more than \$22 million in damages to infrastructure.^{8,9} As of early 2017, the city is still in the process of recovery and repair, and is looking to improve flood protection for the future. While some businesses have been able to reopen, others were forced to close permanently.

III. CHALLENGES, NEEDS, AND GAPS IDENTIFIED

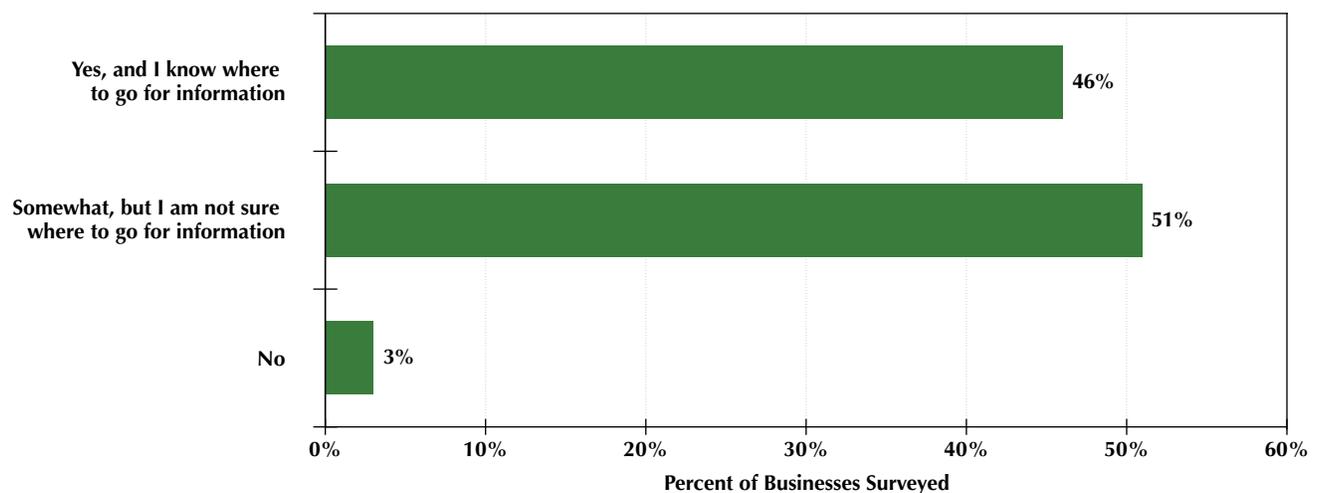
AWARENESS

A major challenge for small businesses can be awareness—both in understanding the types of potential risks that climate change and extreme weather pose to their business, as well as knowing what potential options and solutions can enhance resilience. Understanding of potential risks is often based on direct experience with extreme weather events. For example, a recent study of small businesses in New Orleans found that businesses who had not experienced Hurricane Katrina often lacked both awareness of the extreme weather risks and the tools necessary for planning for disaster events.¹⁰ Companies that have had to take steps to protect their assets from an extreme weather event often have a better understanding of the risks, associated costs, and the business case for investing in resilience. Major weather events such as Hurricanes Katrina and Sandy, for example, significantly increased awareness of climate

and weather vulnerabilities among businesses in the affected regions.¹¹ Impacts to energy infrastructure have prompted many utilities in the Northeast to consider upgrading equipment and facilities to better ensure the delivery of electricity during storm events and protect the long-term resilience of the grid.¹²

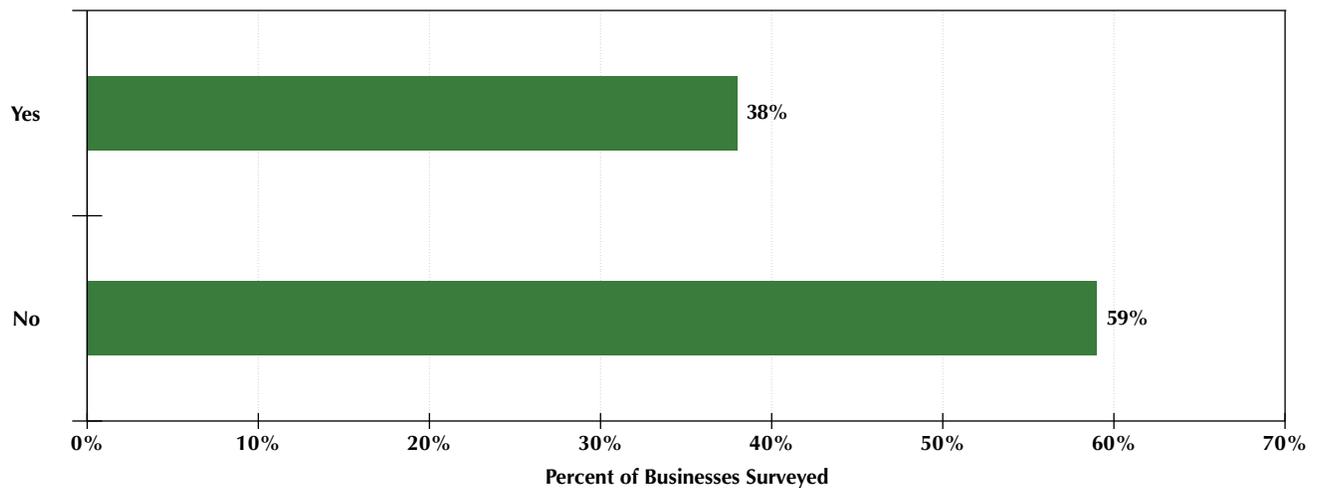
Of the small businesses surveyed, 46 percent indicated that they were aware of their risks and knew where to go for more information (Figure 3). However, even more respondents (51 percent) were only somewhat aware of their risks and indicated that they were unsure where to go for more information. Furthermore, while 98 percent of the businesses surveyed had experienced impacts from extreme weather events, only 38 percent of these businesses changed their operations or planning in response (Figure 4). These results suggest that awareness of climate risk goes beyond just knowing about climate change or its risks, but

FIGURE 3: Responses from Business Surveyed on Whether they are Aware of how Extreme Weather or Changes in the Climate Could Impact their Business



Source: C2ES survey, 2016

FIGURE 4: Responses from Businesses on Whether They Changed any of their Operations or Planning in Response to a Weather Event



Source: C2ES survey, 2016

also understanding the potential impacts and how to minimize those risks.

Small business is not alone in this issue. Even though the number of Americans who believe that climate change is increasing (currently 70 percent),¹³ the literature suggests that there is a disconnect between the belief in climate and action to address this risk.¹⁴ This disconnect may exist because risks may not be readily observable, are not seen as immediate dangers, or are difficult to understand because the hazards may come in multiple forms (e.g., flooding, changes in growing season, drought, and sea level rise).¹⁵ Given the risks and the importance of small businesses to Maryland, it is clear that businesses would benefit from additional information on climate and weather risks, and what actions can be taken to reduce risks and prepare themselves now to be more resilient in the future.

LACK OF ACCESSIBLE RESOURCES

While the majority of the businesses that completed our survey indicated that they were at least somewhat aware of how extreme weather or changes in the climate could impact their business, more than half (51 percent) did not know where to get additional information (Figure 3). A significant amount of effort in the last eight years has been devoted to making information on climate risk

more available through numerous reports and websites, as well as workshops and conferences on this topic. Again, however, small businesses have limited resources and time to devote to this issue and if they don't feel that this risk is immediate they may not prioritize actively searching for these resources.

An additional challenge is that many available resources do not directly address local risks that would be most relevant to small business. Locally relevant information, however, can be easy to create or distribute. One option that might be helpful for small businesses is the use of web-based visualization where the user can directly see the risks in their area. Various visualization tools are available online for free:

- U.S. Climate Resilience Toolkit's Climate Explorer: <https://toolkit.climate.gov/tools/climate-explorer>
- National Aeronautics and Space Administration's Climate International: <http://climatedata.us/>
- National Oceanic and Atmospheric Administration's (NOAA) Sea Level Rise Viewer: <https://coast.noaa.gov/digitalcoast/tools/slr>
- NOAA's CanVis: <https://coast.noaa.gov/digitalcoast/tools/canvis>
- NOAA's Coastal Flood Exposure Mapper: <https://coast.noaa.gov/digitalcoast/tools/flood-exposure.html>

- Climate Central’s Surging Seas: <http://sealevel.climatecentral.org>
- The Nature Conservancy’s Coastal Resilience Mapping Portal: <http://maps.coastalresilience.org/network> (focused on certain geographic areas, but provides an example of a visualization tool)
- University of British Columbia’s Future Delta 2.0 game: <http://futuredelta2.ca> and Delta-RAC Sea Level Rise Adaptation Visioning Study: <http://delta-adaptation-bc.org> (focused on British Columbia, but provide examples of visualization tools)

Research suggests that *seeing* potential risks may be significantly more effective than simply *hearing* about risks.¹⁶ Increasing awareness of risks and providing usable information is essential to help ensure that small businesses enhance their resilience to extreme events.

RECOVERY AND REBUILDING

When businesses are significantly impacted by a weather event, there will be costs for recovery and rebuilding. While insurance may cover some losses, many businesses will need additional funding to recover and make up for the revenue lost during closure. Damage caused by flooding is often not covered by standard insurance policies. According to a study done by The Hartford insurance company, some small businesses that were affected by Hurricane Sandy were surprised to learn that certain losses were not covered by a standard business owner’s

policy. For example, loss of income caused by a power outage occurring off premises may not be covered under a standard policy.¹⁷ For this reason, it is important for businesses to review what is covered by their insurance so they can take the proper precautionary steps.

Businesses and their employees also rely on repairs to public infrastructure like roads, bridges, and seawalls, and may not be able to reopen until this infrastructure is repaired. Stakeholders we interviewed noted that is often not clear to businesses how the process of rebuilding and repair works, and what public agencies are doing to prevent future damages. This finding was echoed in a survey of small businesses in the New Orleans area.¹⁸ There is generally a priority on building back as soon as possible, and some businesses are concerned about the long-term protection of their area if similar events were to occur again in the future.¹⁹

In addition, some businesses are required to meet historic preservation standards when rebuilding and implementing resilience actions. It is likely that there will be tension with these historic preservation requirements and building to withstand the more extreme weather. This will likely be a concern for many communities in Maryland that have historic designations. Most recently, the Ellicott City flood highlighted the need to better understand aging infrastructure and raised the question of how to rebuild a historic area while still enhancing resilience.

IV. RECOMMENDATIONS FOR ENGAGING SMALL BUSINESSES

This research and additional literature^{20,21} highlight the need for more outreach and education to small businesses to communicate information on potential risks and solutions for enhancing resilience to extreme weather and climate change. As described in the previous section, there are various challenges with engaging small businesses on these issues and a number of strategies can be used to improve engagement. We have developed a framework that outlines the recommendations for engaging with small businesses on weather and climate resilience (**Figure 5**).

USE TRUSTED MESSENGERS

Many stakeholders we spoke with highlighted the importance of using trusted messengers, like local business associations or civic groups, as a conduit for climate information to small business. Businesses may be more receptive to information coming from an individual or an organization that they already know and regularly interact with. Often these trusted messengers understand the needs and challenges of small business and may be sending other types of information that these businesses use. For example, in the agricultural community, farmers interact regularly with Department of Agriculture Extension Offices, soil conservation districts,

and other organizations involved in agricultural management. Information on climate change risks and resilience communicated through these trusted messengers may be more likely to reach the small business target audience and be effectively communicated than if this information originates from a group unknown to the audience.

A variety of organizations in Maryland are focused on small businesses issues and have regular communication with business owners. These organizations hold meetings and events, distribute information and resources, and provide opportunities for small businesses. In addition, they have pre-established distribution networks with names, email addresses, and other contact lists, and because of this, can potentially be more efficient at communicating information on climate resilience.

Local city or county chambers of commerce regularly communicate with Maryland small businesses. The goal of any chamber of commerce is to further the interests of local businesses, advocate for the business community, and promote local economic growth. Throughout Maryland, there are more than 50 **chambers of commerce** that represent individual cities, counties, and metropolitan regions. In addition, the Maryland Chamber of Commerce provides statewide support to small businesses.

FIGURE 5: Framework for Engaging Small Businesses on Climate Resilience



While engagement with the entire chamber of commerce is important, it can also be useful to target communication efforts to subsets within a chamber. Many chambers, for example, have environmental committees or other committees/workgroups dedicated to issues relevant to climate resilience planning (e.g., economic development, legislative). The advantages of engaging with chamber environmental committees are that businesses involved in these committees are often already aware of some of the climate change issues and are interested in learning more. These committees can serve as an entry point for wider communication to the chamber at large and other businesses in the region.

Trade associations and other business organizations/networks also connect with small businesses, and can provide an opportunity to engage specific sectors, industries or regions with targeted information. For example, climate change impacts and resilience solutions for the agricultural community can be communicated through extension offices and soil conservation districts. Local economic development groups can serve as conduits to real estate, construction, and building companies.

Maryland has a number of specific trade associations, as well as local branches of nationwide trade associations.

Some examples of these associations and networks are provided in **Table 1** below.

Nonprofits and community organizations can also have connections to business networks. Maryland has many organizations focused on environmental issues, and some of these groups have done targeted outreach to small businesses on a variety of topics. For example, the **Alliance for the Chesapeake Bay’s Businesses for the Bay (B4B)** program encourages businesses within the Chesapeake Bay watershed to take voluntary and measurable actions to support protection and restoration of the Bay and help the public understand the valuable role of the business community in sustaining the health of the Chesapeake Bay and its watershed. In 2014, for example, the Chesapeake Conservancy partnered with Intel to host the **Chesapeake Hackathon**, a multi-day event that focused the programing efforts of students, professors, local businesses, and other interested individuals to create innovative applications to help local governments and conservation organizations relate large climate datasets to local planning decisions.

Civic engagement organizations like the Rotary Club and Lions Club also interact with local business owners. Several local officials we spoke to had provided

TABLE 1: Maryland Business Associations and Networks

SECTOR	ORGANIZATION	WEBSITE
<i>General</i>	Small Business Majority	smallbusinessmajority.org/states/maryland
	Economic Development Association	medamd.com
	Economic Development Corporation	medco-corp.com
	Better Business Bureau	bbb.org/greater-maryland
	Small Business Development Center	mdsbdc.umd.edu
<i>Agriculture</i>	Agricultural Resource Council	marylandagriculture.org
	Agricultural & Resource-Based Industry Development Corporation	marbidco.org
	Farm Bureau	mdfarmbureau.com
	Southern MD Agricultural Development Commission	smadc.com
	University of MD Extension	extension.umd.edu
	Wineries Association	marylandwine.com
<i>Manufacturing</i>	Manufacturing Extension Partnership	mdmep.org
	Regional Manufacturing Institute	rmiofmaryland.com
<i>Marine</i>	Marine Trades Association	mtam.org
<i>Restaurants</i>	Restaurant Association	marylandrestaurants.com
<i>Transportation</i>	Motor Truck Association	mmtanet.com

information about climate risks and impacts at civic organization meetings. Flyers, infographics, and other information can be handed out at these meetings to ensure small business representatives hear about the issues and the resources available to them.

To provide relevant resources for these organizations, it might be useful to develop a survey to distribute to these organizations that could include questions like:

- Do you discuss climate change issues with businesses?
- Do you discuss extreme weather and preparedness with businesses?
- How does your organization assist businesses?
- What types of issues are the businesses you interact with most concerned about?

This type of survey could help to pinpoint the key organizations to focus on and help identify the best methods of communication.

LEVERAGE EXISTING CHANNELS

There are some natural entry points where climate resilience can be addressed through regular business activities or existing programs. Local and state agencies often already interact with businesses on preparedness, emergency planning, flood management, long-term planning, and economic development. In addition, many climate resilience initiatives are underway at the local, state, and regional level within Maryland. Leveraging these existing channels can help in engaging the small business community on climate change resilience.

Incorporate Resilience into Business Activities

City and county departments regularly interact with businesses for specific purposes. For example, when a new business is formed, owners must talk to various local agencies to meet city, county, or state requirements (e.g., planning, permitting, public works). In addition, a new business may interact with economic development and tourism departments. Information on climate risks and resilience can be incorporated into these activities. For example, when applying for a permit, a business could be given maps of sea level rise projections for the region to help them understand future risks. Tourism and economic development departments could develop a strategy to market the area as a “resilient community,” and could designate businesses that have taken steps to enhance resilience.

Floodplain management workgroups are part of many cities and counties throughout Maryland, with committees that hold regular meetings (e.g., the **Historic Ellicott City Flood Workgroup**). Some of these workgroups have appointed members, but many of these meetings are open to the public, so businesses could attend and participate. While some businesses participate in these groups, more small businesses could be included in these discussions. Businesses may not be aware of these groups or know how they could participate. Participating in floodplain management discussions would help small businesses learn about the areas at risk and understand what local agencies are doing to address flooding. These forums could also act as an opportunity to communicate to small businesses about flood insurance and flood protection measures. Of the businesses surveyed by C2ES, 27 percent indicated a need for more information on flood maps for their area. Additionally, as flood maps are updated at the federal and local level, businesses can be informed about any changes.

Expanding Resilience Efforts to Include Businesses

Maryland has many different climate resilience efforts underway throughout the state. To date, most of these efforts have focused on the public sector, focusing on action at the state and local level. Including the private sector in these efforts will be important to facilitate communication with business stakeholders and address challenges and needs that the business community faces.

Leveraging State Activities

Five state agencies are collaborating on Maryland’s Resiliency Partnership—working to leverage funding, personnel, and projects to support efforts that integrate floodplain management, hazard mitigation, and coastal resiliency. As the Partnership moves forward with the strategies defined in the Strategic Implementation Plan of the 2016 State Hazard Mitigation Plan, it will be important to consider the needs of small businesses. One option for doing this could be to have the Partnership expand to include the Maryland Department of Commerce, which can address small business issues.

Business rely on public infrastructure for many needs, including transportation of supplies and personnel via roads, bridges, and ports. Maryland’s State Highway Administration has conducted modeling and analysis to assess the vulnerability of the state’s bridges and roads, and is completing detailed vulnerability studies of both

state and local roads for all tidally influenced counties in the state. The results of these assessments will be important to communicate to the business community. The Maryland Port Authority and the Maryland Aviation Administration are also taking steps to enhance the resilience of port and airport facilities. Small businesses may not be aware of these efforts and how they will personally be impacted by climate risks that could significantly impact public infrastructure.

The Maryland Commission on Climate Change Adaptation and Response Working Group (ARWG) is tasked with developing a comprehensive strategy for reducing the state's vulnerability to climate change impacts. The ARWG currently has no private sector representation, with most members representing state and local agencies or NGOs. The ARWG could include one or more representatives of the business sector, including a representative from the small business community. The ARWG could also form a sub-group or a separate Commission working group that focuses on business issues related to climate change.

Leveraging NGO Activities

The Eastern Shore Land Conservancy (ESLC) and Antioch University's Center for Climate Preparedness and Community Resilience piloted a regional capacity building project for climate resilience on the Eastern Shore, which launched the Eastern Shore Coastal Resilience Facilitated Community of Practice. This Community of Practice includes participants from five county governments (Caroline, Dorchester, Kent, Queen Anne's, and Talbot), three municipalities (Cambridge, Chestertown, and Oxford), four state agencies (Department of Natural Resources, Maryland Department of the Environment, Maryland Emergency Management Agency, and the Critical Area Commission), four academic institutions (University of Maryland Sea Grant Extension, University of Maryland Center for Environmental Science, Washington College, and Chesapeake College), and one nonprofit organization (ESLC). The goals of this effort will be to facilitate collaboration and assist communities in resilience planning. While businesses have not yet been part of the initial pilot activities, the Community of Practice has identified the need to incorporate businesses into the collaborative process.

IDENTIFY NEW OPPORTUNITIES

While there are many existing channels for small business resilience to be addressed, there are also opportunities to develop new programs, partnerships, and resources to further delve into these issues. State and local agencies can leverage trusted messengers by developing new information and training materials (or utilizing existing materials that are available) for small businesses on resilience and distributing to those messengers. This "**train the trainer**" approach would involve educating the trusted messengers on climate change risks and resilience options relevant to their particular area, and then helping those individuals and groups to spread the message to their networks. It would also provide an opportunity for state and local agencies to communicate the actions that are being taken to address climate risks in Maryland.

There are various models for train the trainer programs. For example, the U.S. Environmental Protection Agency (EPA) has created a website on [resilience training and exercises for drinking water and wastewater utilities](#). These resources are available to state and local agencies to educate water utilities on risks and resilience options, and can also be used by water utilities to educate their communities on water resilience issues. EPA has also developed [training on climate adaptation for local governments](#), which includes information for local officials on communicating climate risks. The [U.S. Climate Resilience Toolkit](#) has a list of training resources available for different audiences on a variety of different climate topics.

Collaboration and Partnerships

Because it will be difficult for state and local officials to reach all small businesses, it will be important to **encourage collaboration** among businesses to help address business needs on resilience planning. State and local agencies can help foster this collaboration in Maryland by providing opportunities for networking, knowledge sharing, and communication among small businesses on climate change issues. This will also allow for businesses to engage in discussions on solutions and explore cost-sharing opportunities. One example of collaboration involves establishing a statewide business resilience network. Creating a business resilience network could allow for small businesses to communicate

with each other about their challenges and opportunities through workgroups, email listservs, online forums, meetings and events. A business resilience network could be hosted by various groups, such as nonprofits engaged in climate activities, business associations or networks, universities, or state and local agencies.

Public-private partnerships offer opportunities for state and local officials to communicate and collaborate with businesses over a longer timeframe. Partnerships can take various forms, including voluntary commitments, holding regular events, and directed resilience implementation projects. With many existing activities in Maryland related to business and environmental issues, partnerships could be incorporated into these established programs. However, creating new public-private partnerships provides an opportunity for state and local agencies to develop initiatives focused specifically on climate resilience.

Small businesses could also benefit from **collaborating with large businesses** to use their risk management expertise and emergency planning resources. Larger businesses may be using small businesses as suppliers or customers and therefore see a direct benefit in improving the resilience of the small business community. This natural interdependence suggests that small businesses may be able to partner with larger businesses in their region to help better understand risks and explore strategies for maintaining regional business continuity. For example, large businesses can have agreements with small business to share information and resources on extreme events. Large businesses often have employee

emergency trainings and drills that could be attended by small businesses to help increase awareness and understanding of preparedness. Large businesses may also be able to deploy staff and emergency resources to help small businesses recover during extreme events. Pacific Gas and Electric Company, a large utility in California, is an example of a large business taking steps to enhance community resilience by giving out grants that encourage collaboration between local governments, businesses, academics, and NGOs.²²

DISTRIBUTE TARGETED INFORMATION

The information and resources that small businesses need depends on several factors, including the business' geographic location, sector, and level of awareness regarding climate and weather risks. In some sectors and areas within the state, businesses are aware of climate change and extreme weather impacts. Businesses in coastal areas and agricultural communities deal with changing weather conditions, and often have some understanding of potential future risks. However, some businesses lack information on climate risks and could benefit from additional targeted outreach and education. Of the businesses surveyed, by C2ES, 27 percent identified the need for more information on flood maps and 43 percent identified the need for more detailed information on how future climate changes could impact their region or sector.

In speaking with businesses directly and through the survey, it is clear that many businesses need more information on how they can take steps to better protect

Box 2. Examples of Business Collaboration

Several communities across the country have created climate collaboratives, which serve as an opportunity to organize a variety of different stakeholder groups around the climate issues of concern for a particular region.

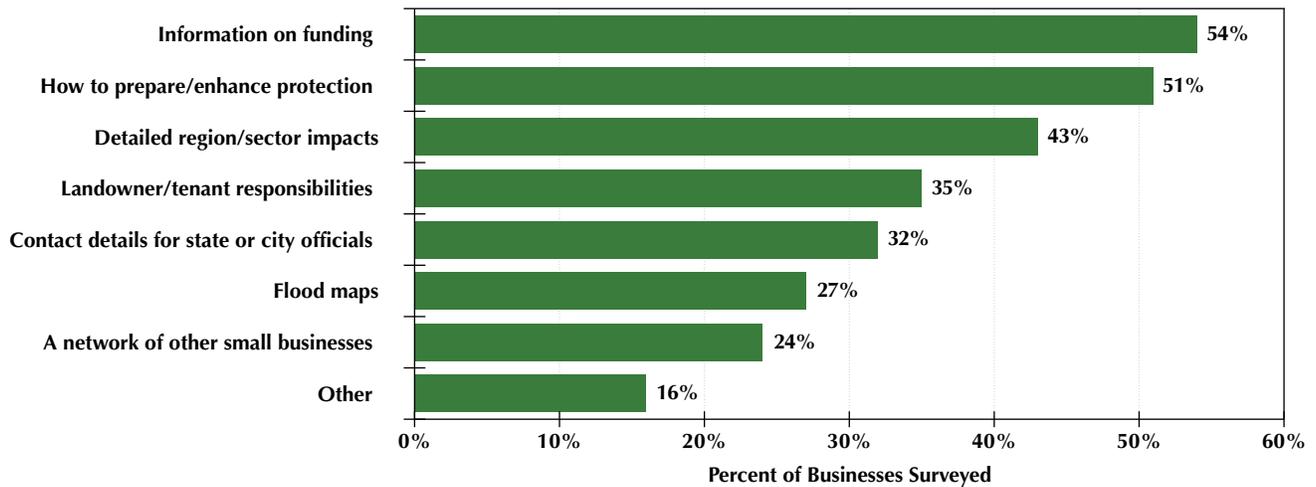
The **Detroit Climate Action Collaborative** is an initiative that includes community groups, universities, state agencies, city leaders, environmental and public health organizations, and Detroit businesses and institutions. These stakeholders are working together to plan for carbon pollution reductions and climate change preparedness.

The **Washington Climate Collaborative** is a coalition of Washington state workers, farmers and businesses working toward addressing climate issues.

California has a number of **regional climate collaboratives**, which include public, private, and nonprofit members committed to preparing for the emerging impacts of climate change.

Also in California, the **Capital Region Business Resiliency Initiative** is a collaborative effort to increase the resilience of the Sacramento regional economy by increasing the preparedness of the business community, and particularly the small business community.

FIGURE 6: Types of Resources Needed by Businesses Surveyed in Order to Address Extreme Weather and Climate Risks



Source: C2ES survey, 2016

themselves and enhance resilience to climate change. Of the businesses surveyed, again, 51 percent identified the need for resources on how to prepare for and enhance protection against extreme events. Several businesses suggested that when providing education and communication on climate and weather risks, it is helpful to hear more than just what the potential impacts are, and to focus on what can be realistically done by small businesses.

Information on resilience could include:

- A checklist or steps to take to prepare your business for extreme weather and long-term climate change
- Web-based visualizations of climate risks around the state
- Examples of options for flood proofing or other weatherproofing in practice
- Case studies of small businesses that have enhanced their resilience
- Low-cost, easy upgrades that businesses can make (e.g., energy-efficiency improvements that can help reduce energy costs during extreme heat or cold events)
- Examples of policies that could help improve community resilience (e.g., building codes, model ordinances)

- Descriptions of small business options for insurance coverage (for both renters and owners)
- A list of grants and loans available to Maryland small businesses for both resilience planning and post-event recovery

Funding for protective measures and other resilience solutions is a major concern for many small businesses. Of the businesses surveyed, 54 percent identified the need for more information on funding for energy efficiency, flood protection, or other measures. Businesses were unsure where to look for financial resources—which could include federal and state grants/funding, private sources of funding, or collaborative opportunities for cost sharing. Financial resources become increasingly important for small businesses after extreme events when rebuilding and repairing occurs. After the 2016 flooding in Ellicott City, many of the small businesses set up public fundraising websites to help pay for cleanup and repairs needed to reopen.

Other types of information needs identified by businesses included:

- Information about landowner / tenant responsibilities for addressing weather events
- Contact details for state or city officials who can provide information on climate and extreme weather risks

- A network of other small businesses experiencing the similar risks and impacts
- An expert who can speak with businesses about their risks and potential options

Key Considerations

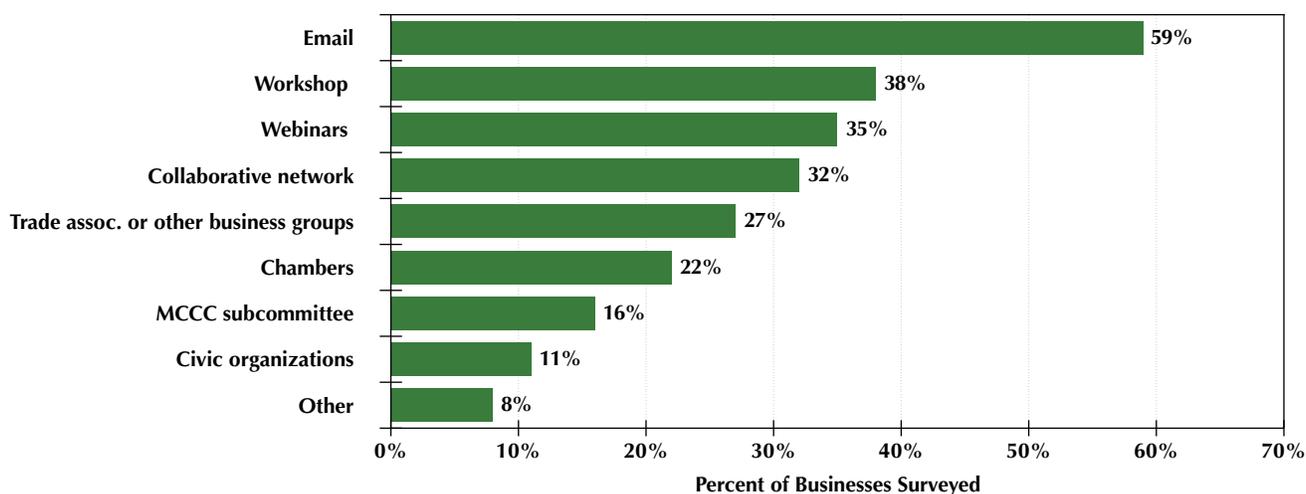
Distributing relevant information to small businesses may include utilizing existing resources or developing new targeted resilience materials. As information is distributed, there are several key considerations to keep in mind.

As with any audience, communicating climate change information to businesses requires **tailoring the message** appropriately. Using the term “climate change”—which may be less understood in some cases—may fail to gain the attention or interest of some businesses. In speaking with various stakeholders, we found that asking businesses how they have been impacted by weather is a more effective way to start the conversation. Many businesses have experience with weather events, and see a more direct link to their impacts. In addition, focusing on more near-term climate changes helps businesses understand what they can expect in their lifetimes. Tools that help business visualize these impacts have also shown to be effective. For example, maps that illustrate the changing nature of flooding or sea level rise over time can often be more effective than just describing these changes.

However, it is still important to emphasize the message that climate change is expected to contribute to extreme events becoming more intense and more frequent. This will help businesses understand the importance of taking action to increase resilience now, rather than having reactionary responses after extreme events occur. An important message of resilience is that it will help prepare communities for the “new normal” of future climate and weather conditions.

Several communities in Maryland, including Baltimore and Annapolis, have had success in engaging small businesses in hazard mitigation planning. Successful engagement in these and other cases came about through long-term **relationship building and communication**. Local officials can work to develop relationships with small businesses and business organizations to improve transparency in public planning processes and ensure that the business community is represented and heard. Relationships with the small business community can be built through activities like direct communication to businesses, attending chamber meetings, and partnering with business networking organizations. One local official who was interviewed emphasized that building relationships with the business community requires regular communication, and can take time to build trust and understanding. Local officials can also help to encourage small businesses to participate in neighborhood and community groups. Various studies

FIGURE 7: Preferred Method(s) of Engagement on Extreme Weather and Climate Risks Indicated by Businesses Surveyed



Source: C2ES survey, 2016

on small business resilience have found businesses that were involved in their neighborhood groups often had more decision-making power and a better understanding of local vulnerabilities.^{23, 24}

The best **method of communicating** with small businesses will depend on the purpose of the effort and types of businesses. However, the businesses we surveyed indicated interest in both attending state or local agency-hosted workshops or in-person meetings as well as receiving information via email or participating in webinars. While in-person communication can sometimes

be more effective, virtual presentations of information (through websites, webinars, and online meetings) can also help to further networking and engagement between the public and private sector.

A number of different resources are available from federal and state agencies, NGOs, and other groups on small business resilience planning. While most of these resources focus on business continuity during extreme events, they could be used as a starting point for businesses to plan for changing climate conditions.

TABLE 2: Small Business Resilience Planning Resources

RESOURCE	DESCRIPTION	LINK
<i>Preparedness Resources for Businesses</i>	Maryland’s Emergency Management Agency (MEMA) provides links to different resources for businesses on preparedness	http://mema.maryland.gov/Pages/business.aspx
<i>Private Sector Integration Program</i>	MEMA offers this program to facilitate communication, situational awareness, and information sharing between MEMA and organizations of the private sector	http://mema.maryland.gov/community/Pages/PSIPWelcome.aspx
<i>National Disaster Help Desk for Business</i>	The U.S. Chamber of Commerce Foundation, with support from the Office Depot Foundation, provides this service (1-888-MY-BIZ-HELP) to help connect businesses to available resources from local government, federal agencies, nonprofits, other businesses, and the community	https://www.uschamberfoundation.org/disaster-response-and-community-resilience/disaster-help-desk
<i>Prepare My Businesses</i>	Education, planning, testing and disaster assistance from the U.S. Small Business Administration and Agility Recovery Solutions	www.preparemybusiness.org
<i>Emergency Preparedness</i>	Resources on planning for disasters from the U.S. Small Business Administration	https://www.sba.gov/managing-business/running-business/emergency-preparedness
<i>Business Continuity Planning</i>	The Insurance Institute for Business and Home Safety provides this business continuity tool to help plan for any type of business interruption	http://disastersafety.org/ibhs-business-protection/ofb-ez-business-continuity/
<i>Business Continuity Planning Suite</i>	Software with business continuity plan training and exercises created by the U.S. Department of Homeland Security	https://www.ready.gov/business-continuity-planning-suite

V. CONCLUSION

Small businesses face significant risks with increasing climate change and extreme weather events—both in Maryland and communities across the country. These risks include potential damage to buildings and infrastructure, delay of operations, and temporary or permanent closure, and as the climate continues to change, these risks will only increase. The lack of awareness of these risks, limited availability and understanding of available resources, and the focus on recovery after an event (rather than actions that can reduce risk) all contribute to the challenges that small business face to becoming more climate resilient. Maryland has more than 500,000 small businesses that represent more than 97 percent of all businesses in the state and employ about half of the state’s private workforce.²⁵ To ensure a vital economy, it is important to help protect the resilience of small businesses throughout the state and create an environment where small businesses can continue to develop and thrive even as climate impacts increase.

State and local officials (as well as other stakeholders) can help small businesses in this effort by 1) providing them with resources that increase their awareness and understanding of risks (for example, through impact visualizations), and 2) helping them understand what they can do to reduce their risks and better prepare for extreme events (for example, by helping them develop business continuity plans or connecting them to local partners). In this report, we have presented a framework to help state and local officials in engaging small businesses on climate resilience. This framework focuses on: identifying trusted messengers, using existing channels,

identifying new opportunities, and distributing targeted information to the small business community. Trusted messengers can help connect state and local officials to small businesses and serve as key channels for distributing information. A number of existing efforts at state and local levels could easily incorporate small business resilience into ongoing activities. There are also opportunities to create new programs and information on small business resilience, such as public-private partnerships or collaborative efforts at the local level.

Collaborating with businesses on resilience planning using this framework will be mutually beneficial for the public and private sectors. It provides an opportunity for state and local officials to better tailor resilience planning at the local level, which will help protect important local economies. While business needs vary by sector and location, directly engaging them will make local, state and regional plans better and will increase business awareness and preparedness. State and local officials often understand climate vulnerabilities, or may have access to experts and resources that can provide more detailed information on risks. Working together, state and local officials can help businesses protect their operations, and this engagement will give businesses an opportunity to have their voices heard by the state and local agencies they may not regularly interact with. Businesses, state and local officials, and other stakeholders all stand to benefit from collaborating on community resilience, and working together can help to overcome challenges and maximize resources to address climate change and extreme weather risks.

APPENDIX A: SURVEY

SURVEY FOR MARYLAND SMALL- AND MEDIUM-SIZED BUSINESSES ON EXTREME WEATHER AND CLIMATE RESILIENCE

Small- and medium-sized businesses are the backbone of Maryland's economy, and can be affected by extreme weather events and climate change. We are interested in learning how your business has dealt with weather events, and how local and state officials can be helpful on this topic.

Maryland is expected to face higher temperatures, increased precipitation, extreme weather events, sea level rise, and other impacts due to climate change. Annual economic costs to the labor, health, and energy sectors could be more than \$5.5 billion by the end of the century. Maryland is projected to experience between 2.1 and 5.7 feet of sea level rise over the next century, putting \$15 billion in property value at risk. These changes will impact buildings, energy systems, human health, infrastructure, agriculture, natural resources, and other sectors throughout Maryland.

Please complete this survey by **October 31, 2016**. We appreciate your input and thank you for your time! Survey is also available online at:

<https://www.surveymonkey.com/r/HDHWD9N>

1. What types of extreme weather events have impacted your business in the past 5 years? (check any that apply)
 - Flooding
 - High winds
 - Hurricane / storm surge
 - Drought / water shortage
 - Heat wave
 - Winter storm
 - None
 - Other (please specify) _____

2. Please identify the type(s) of impact (check any that apply)
 - Damage to infrastructure
 - Temporary closure of business
 - Disrupted operations
 - Personnel impacts
 - Other (please specify) _____

3. Did you change any of your operations or planning following these events?
 - No
 - Yes (please explain) _____

4. Are you aware of how extreme weather or changes in the climate could impact your business?
 - Yes, and I know where to go for information on these risks
 - Somewhat, but I am not sure where to go for more information on these risks
 - No

5. What kind of information / resources / assistance do you need from local officials in order to address extreme weather and climate risks? (check any that apply)

- Flood maps
- Details on how future climate changes will impact your region or sector
- Information about funding for energy efficiency, flood protection, or other measures
- Resources on how to prepare for and enhance protection against extreme events
- Information about landowner / tenant responsibilities for addressing weather events
- Contact details for state or city officials who can provide information on climate and extreme weather risks
- A network of other small businesses experiencing the similar risks and impacts
- Other (please specify) _____

6. How would you prefer to engage with local / state officials and other businesses on extreme weather and climate risks? (check any that apply)

- Workshop hosted by a state or local agency
- Webinars on risks, tools, and resources
- Trade associations or other business representative groups
- Chambers of commerce
- Civic organizations (e.g., Rotary Clubs, Lions Clubs)
- Information sent by email
- Create a new subcommittee for businesses on the Maryland Climate Change Commission
- A new collaborative network of businesses focused on this topic
- Other (please specify) _____

7. What sector is your business in?

- Agriculture
- Aquaculture or other marine trades
- Retail
- Manufacturing
- Infrastructure
- Real estate
- Information / technology
- Service
- Other (please specify) _____

8. Is your business a minority- or women-owned business?

- Yes No

9. What geographic region does your business cover?

- Nationwide
- Mid-Atlantic region
- State of Maryland
- City or county (please specify) _____

10. Please provide your email address to enter for a chance to win one of five \$100 prizes. (It will only be used for this research and will not be shared externally. Notices about upcoming webinars and resources related to extreme weather and climate impacts in Maryland will be provided via email, but you may opt out at any time.) Email: _____

APPENDIX B: ADDITIONAL SURVEY DATA

FIGURE B1: Sectors of Businesses Surveyed

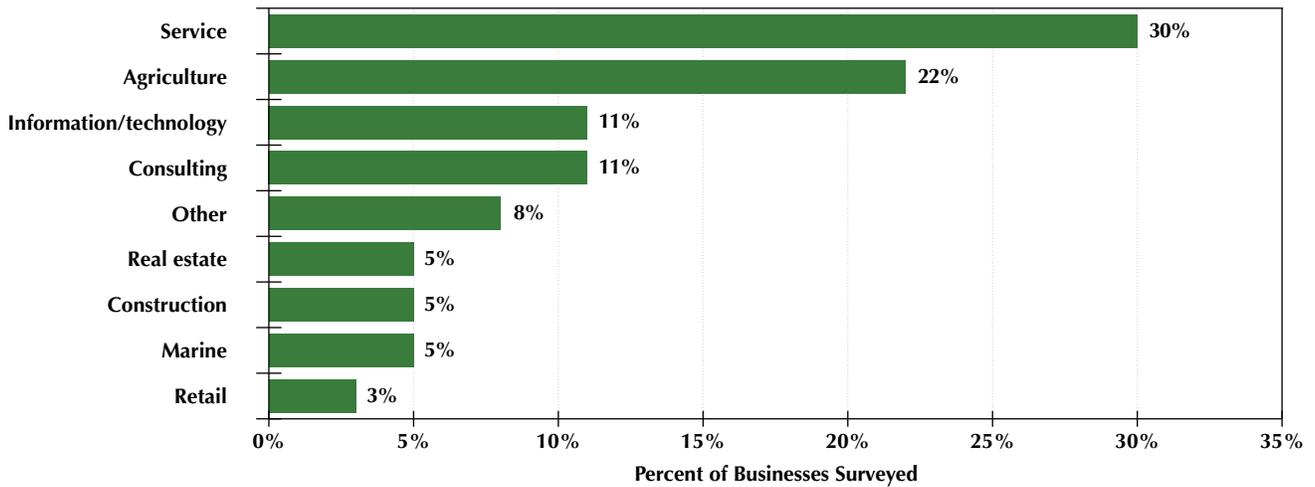


FIGURE B2: Minority- or Woman-Owned Businesses

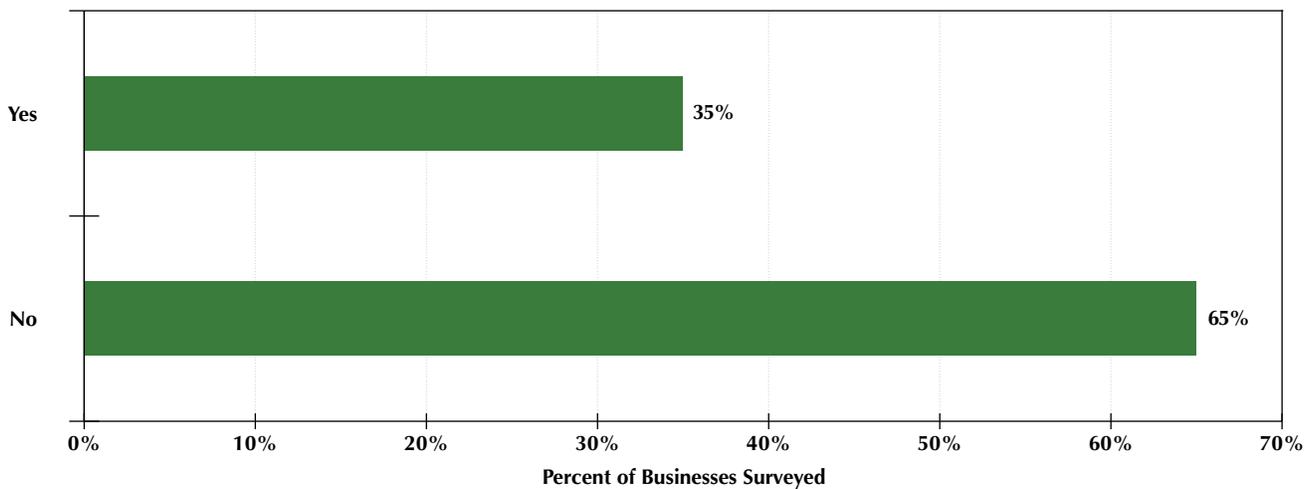
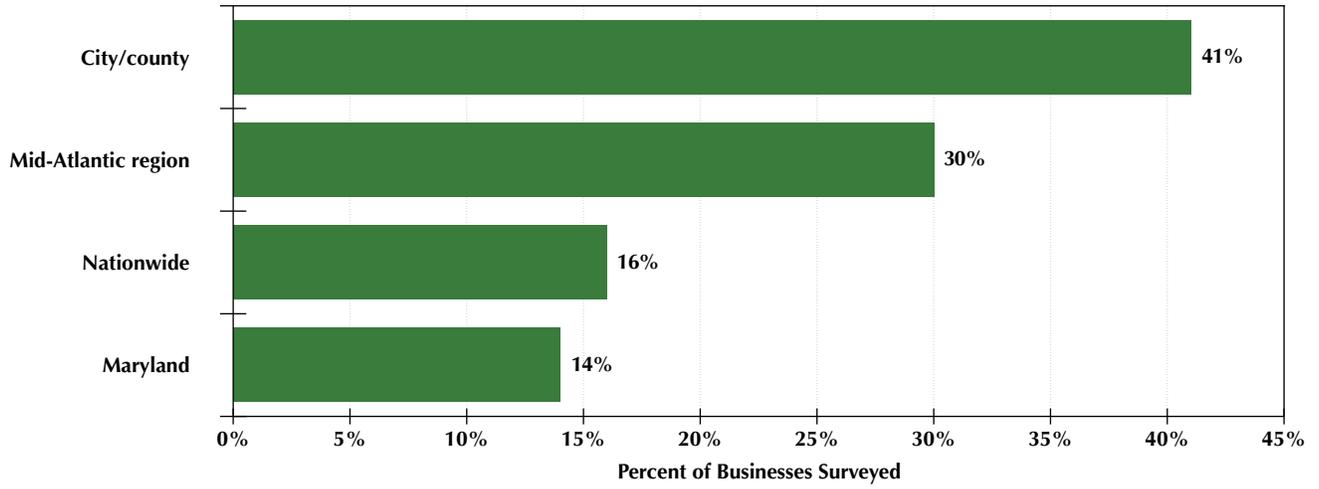


FIGURE B3: Geographic Coverage of Businesses Surveyed



Note: City and counties indicated by respondents – Prince George’s County (3); Eastern Shore (2); Howard County (2); Anne Arundel County (2); Carroll County (1); Dorchester County (1); Montgomery County (1); Talbot County (1); and Assateague (1)

APPENDIX C: OUTREACH TO ORGANIZATIONS

List of organizations / groups with which we conducted outreach

- Chambers of commerce and other business organizations
 - Outreach to 30 city and county chambers of commerce:
 - Aberdeen
 - Anne Arundel
 - Baltimore County
 - Baltimore Washington Corridor
 - Carroll County
 - Chesapeake Gateway
 - Crisfield Area
 - Dorchester
 - Gaithersburg-Germantown
 - Garrett County
 - Greater Bethesda
 - Greater Catonsville
 - Greater Silver Spring
 - Hagerstown-Washington County
 - Howard County
 - Maryland state
 - Montgomery County
 - Northern Anne Arundel County
 - Ocean Pines
 - Olney
 - Pocomoke Area
 - Potomac
 - Prince George’s
 - Queen Anne’s County
 - Rockville
 - Severna Park
 - Somerset County
 - Southern Anne Arundel
 - St. Mary’s County
 - West County
 - Outreach to 12 business networking organizations
 - Alliance for the Chesapeake Bay – Business for the Bay
 - Baltimore Source Link
 - Greater Maryland Better Business Bureau
 - Maryland Agricultural and Resource-Based Industry Development Corporation
 - Maryland Economic Development Association
 - Maryland Economic Development Corporation
 - Maryland Manufacturing Extension Partnership
 - Maryland Motor Truck Association
 - Maryland Small Business Majority
 - Maryland Wineries Association
 - Regional Manufacturing Institute of Maryland
 - Restaurant Association of Maryland
- City and county offices
 - Outreach to 15 city and county offices
 - City of Annapolis
 - City of Baltimore
 - City of Cambridge
 - Dorchester County
 - Ellicott City Flood Workgroup
 - Howard County
 - Kent County
 - Metropolitan Washington Council of Governments
 - Montgomery County
 - Ocean City
 - Somerset County
 - St. Mary’s County
 - Talbot County
 - Town of Oxford
 - Worcester County
 - Outreach to 11 state agencies:
 - Maryland Center for Preparedness Excellence
 - Maryland Department of Agriculture
 - Maryland Department of Commerce
 - Maryland Department of the Environment
 - Maryland Department of Natural Resources
 - Maryland Emergency Management Agency
 - Maryland Energy Administration
 - Maryland Insurance Administration
 - Maryland Port Administration
 - Maryland Silver Jackets
 - NOAA Chesapeake Bay Office
- NGOs and Academics
 - Outreach to 4 NGOs and Academics
 - Chesapeake Conservancy
 - Eastern Shore Land Conservancy
 - University of Maryland Environmental Finance Center
 - Urban Land Institute

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The Center for Climate and Energy Solutions (C2ES) is an independent, nonpartisan, nonprofit organization working to forge practical solutions to climate change. Our mission is to advance strong policy and action to reduce greenhouse gas emissions, promote clean energy, and strengthen resilience to climate impacts. Learn more at www.C2ES.org.



2101 Wilson Blvd., Suite 550
Arlington, VA 22201
P: 703-516-4146
F: 703-516-9551

WWW.C2ES.ORG

