

# RESILIENCE GUIDE

## Newburyport, Massachusetts

Businesses Acting on Rising Seas | 2018







Plum Island, a barrier beach, during the winter of 2018  
Source: Bryon Eaton

## KNOW YOUR THREATS

Small businesses underpin our economic community, so addressing climate changes risks is crucial. There is a way to decrease your risk: enhance your business's resilience. Not only is this smart planning, but it can bring co-benefits in the form of increased revenue and customer loyalty. Businesses Acting on Rising Seas (BARS) is an educational campaign that provides information for local businesses to consider the impacts of climate change in their development and business plan. Get started today with Climate Action Business Association (CABA)!

Our changing climate is causing a higher frequency of extreme weather events such as storms, hurricanes, heat waves and floods. The National Oceanic and Atmospheric Administration found that weather-related disasters caused \$306 billion in damages across the US in 2017, a 40% increase over the previous record set in 2005.<sup>1</sup> The impact of these events on the employees, operations and finances of small business can be serious.<sup>2</sup> In the aftermath of Hurricane Sandy in 2012, one-quarter of the small businesses in New York and New Jersey that were severely impacted by the storm went out of business over the next two years.<sup>3</sup>

The National Oceanic and Atmospheric Administration & Army Corps of Engineers predict up to a 6.5 ft rise in global sea level by 2100, which is enough to swamp many East Coast cities and towns. Scientists expect increasing climate change impacts such as heat waves and coastal flooding due to sea level rise and storms, among other climate hazards, that may create sudden downswings in our economy that negatively affect small businesses.<sup>4</sup>

Massachusetts is particularly vulnerable to climate change impacts; it is ranked fourth in the nation for the most commercial properties at risk by the end of the century.<sup>5</sup> Storm surge potential is estimated between 5 and 7.5 feet above current average high tide, which correspond to the current 100-year flood and a 100-year flood as soon as 2050 respectively.<sup>6</sup> Studies indicate that there is an 80 percent chance of at "least one flood exceeding 10 feet by the end of the century."<sup>7</sup> The repercussions of these changes on our businesses, infrastructure, and communities would be both physically and economically destructive. With looming threats of climate change, our coastal communities represent some of the most vulnerable populations, and are in need of targeted investment.

## HOW DOES THIS AFFECT NEWBURYPORT?

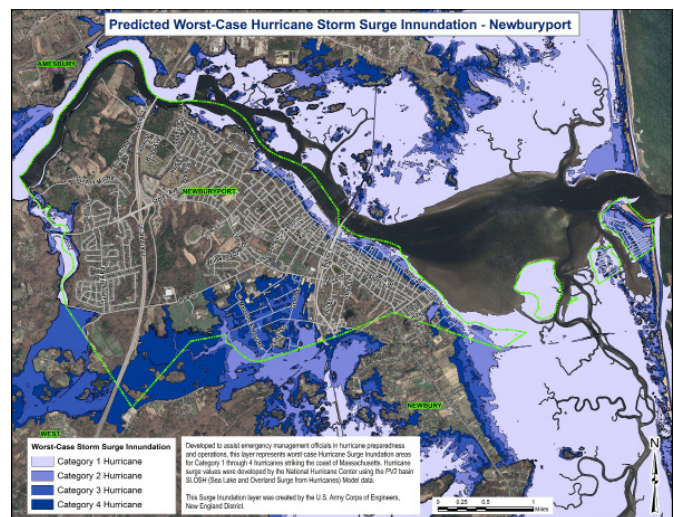
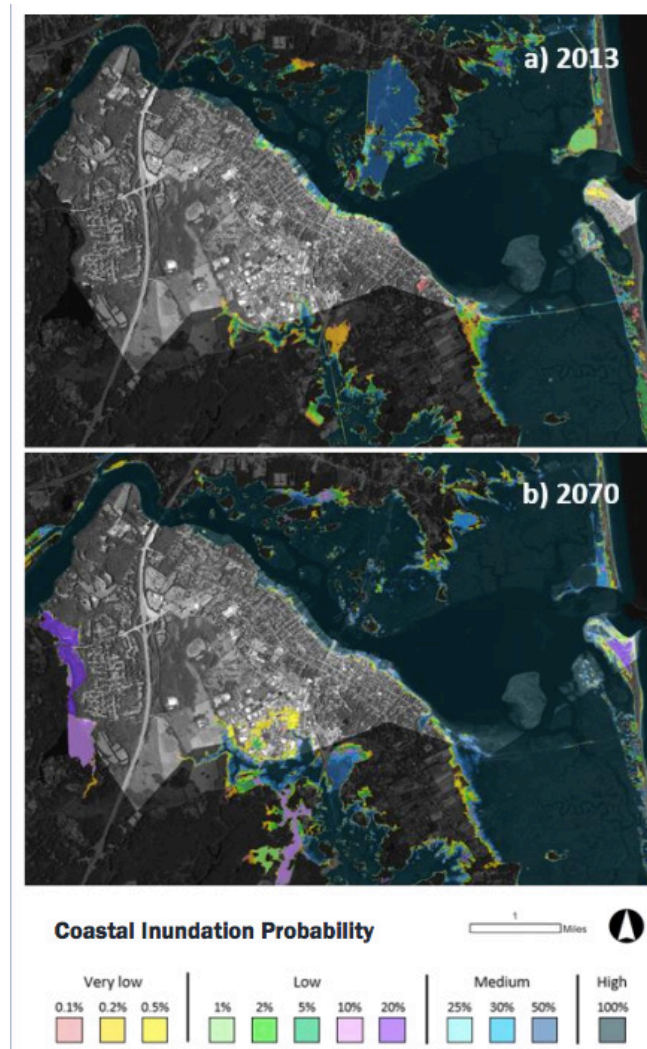
The Boston Business Journal found that the three nor'easter storms Massachusetts experienced from January through March cost Massachusetts businesses up to \$950 million in sales.<sup>8</sup>

The City of Newburyport is particularly vulnerable to sea level rise and climate hazards due to its coastal location in in Essex County, Massachusetts.

Newburyport's proximity to the Merrimack River, the Little River, and the Parker River has led to several flooding events in downtown Newburyport and in the Newburyport Business Park. Plum Island, a barrier beach, is also subject to frequent flooding and increased erosion.

Studies by the National Wildlife Federation report that "over 20% (2.39 square miles) of Newburyport falls within the FEMA 1% flood zone (often referred to as the 100-year flood zone)." Geospatial analysis found over "800 residential, commercial, industrial, and institutional structures" are within the 1% flood zone. These structures and assets have been appraised and valued at over \$203 million dollars. In a "worst case storm scenario in 2070, about 14% of the area within" Newburyport's borders would be "under water from penetrating storm surge."<sup>10</sup>

"The built-up momentum in the Earth's climate system guarantees that change will continue for some time," as a result, "more specific preparation for the foreseeable effects of climate change is necessary."<sup>11</sup> Learn how you can be part of the solution and prepare.



**Left:** Newburyport, Massachusetts, coastal inundation—probability maps showing modeled hazard zones in (a) 2013 (present day) and (b) 2070.

**Above:** Depicts the predicted worst-case hurricane surge inundation for Category 1-4 hurricanes striking in Newburyport. Map courtesy of Joe Teixeira.

**“SMALL BUSINESSES ARE  
LIKELY TO BE HIT THE HARDEST  
BY THE STORMS’ CUMULATIVE  
ECONOMIC IMPACT.”**

— Evan Gold Executive Director at Planalytics  
(Pennsylvania-based firm that provides weather  
research to businesses)<sup>9</sup>



## 8 THINGS YOU CAN DO RIGHT NOW

1

### **Know your risk**

Do you know your operational risks from climate change? It is important to be aware of the direct impacts climate change could pose on your business assets and operations. Look at local flood maps and locate your building to determine your susceptibility to floods. When thinking of expansion, determine if it is best to invest in your property or reevaluate your location. Determine if you should “buy, sell, build, or move.”<sup>12</sup>

2

### **Plan for different scenarios**

Climate change is multi-faceted — there are many different types of impacts you should be prepared for. Sea level rise could damage infrastructure and leave your business without much-needed supplies. Extreme heat could suppress sales and increase your energy costs. Not only will having a comprehensive plan allow you to prepare for the varying impacts of climate change, but it will keep customers coming back. If your business is prepared for a heat wave, for example, it may act as a cooling center for the community, providing additional value through this, sometimes life-saving, service.

3

### **Develop an emergency plan**

It is crucial to know what to do when a critical situation strikes. Develop a step-by-step emergency plan: include information on emergency communications and transportation. There should always be at least one person on the ground who knows the exact standard operating procedures in case of emergency. Have a disaster supply kit ready at all times.<sup>13</sup> Check out [www.ready.gov](http://www.ready.gov)<sup>14</sup> for disaster specific preparedness tips.

4

### **Know your insurance policy**

Make sure that your policy covers damages that may be caused by extreme weather events. Be aware that not all general insurance includes flood insurance. Based on flood risk determined in step 1, you may need a separate plan. Homes and businesses with mortgages from federally regulated or insured lenders in high-risk flood areas are required to have flood insurance. The National Flood Insurance Program, administered by the Federal Emergency Management Agency (FEMA), offers flood insurance that can be purchased through most leading insurance companies.

5

### **Take stock of your infrastructure**

Certain parts of infrastructure may be more at risk than others. For example, if your basement is susceptible to flooding, it should not be used to store items that could be damaged by standing water. Other resiliency measures include having a back-up generator, use of waterproof paint<sup>15</sup> next to equipment that uses electricity, and passive air-cooling.<sup>16</sup>

6

### **Crucial redundancy**

Redundancy is a measure of security that ensures continuous operations. There are three basic things that any business needs in order to operate: supply, inventory on hand, and the ability to reach the customer. In this case, redundancy means having more than one way to ensure that you have secured supply and delivery. If you only have a relationship with one supplier, your operations will be at risk if they suffer business interruptions, which can be caused by climate change impacts.

7

### **Engage with your community**

Talk with your community. Let your customers know what your business is doing to prepare for sea level rise and extreme weather events. Make sure they understand the value of resilience and opportunities that it presents. To drive climate awareness in your community, your business can set up an event with a local government authority to discuss your community’s preparedness for climate change. Simultaneously, your business location will become a center of community engagement if you decide to spread knowledge about climate change preparedness.

8

### **Get involved in planning and policy**

Join the conversation about climate change on the policy level. Call your state legislators or city councilors to let them know your stance on climate issues that most directly impact your business, such as carbon pricing. Meanwhile, use CABA as your most up-to-date source of information about what is happening at the State House.

## HOW CABA CAN HELP

CABA is a Boston-based business association that mobilizes local businesses to take action on climate change. Our mission is to stop the climate crisis and protect the local economy by empowering businesses. We aim to serve as a source of best practices and help you build a resilient business in a region that will be heavily influenced by the changing climate in the coming years.

By joining our member-based organization, you receive full access to CABA's network of businesses. Engaging with a number of like-minded business owners is critical to evaluating new opportunities and cultivating a sense of community. We work with businesses of all shapes and sizes. We believe that in order for Massachusetts to become a truly resilient state, it is necessary for all local businesses to adopt a resilient way of thinking.

All businesses approach their operations differently. CABA has the resources, staff and tools to help businesses become more sustainable and profitable in the long run. Our metric-driven sustainability program helps our member businesses evaluate their options and delivers value-adding components by making small adjustments within their business models. Find us at [cabaus.org](http://cabaus.org).

## MORE RESOURCES

### GREAT MARSH COASTAL ADAPTATION PLAN

<https://www.nwf.org/greatmarshadaptation>

Use this site to view the Coastal Adaptation Plan, a collaborative venture between six coastal communities in northeastern Massachusetts. It provides in-depth data on specific neighborhoods at risk in Newburyport.

### RESILIENT MA

<http://www.resilientma.org/map/>

Use this site to visit The Executive Office of Energy and Environmental Affairs interactive mapping program.

### FEMA FLOOD MAPS

<https://www.cityofnewburyport.com/sites/newburyportma/files/file/firms2014.pdf>

Use this site to determine your flood risk based on your location in Newburyport.

### CLIMATE CENTRAL SURGING SEAS ANALYSIS

<http://sealevel.climatecentral.org/>

Use this website to determine your county's level of risk and your potential for flooding.

### CONTACT YOUR CITY'S MUNICIPAL VULNERABILITY PREPAREDNESS CONTACT

Julia Godtfredsen | Conservation Administrator  
[jgodtfredsen@cityofnewburyport.com](mailto:jgodtfredsen@cityofnewburyport.com) | 978-465-4400  
<https://www.mass.gov/municipal-vulnerability-preparedness-mvp-program>

### FLOOD INSURANCE

[www.floodsmart.gov](http://www.floodsmart.gov)

Use this website to find out whether you are already covered or need to buy a separate flood insurance plan.

### THE COMMONWEALTH OF MASSACHUSETTS

[www.malegislature.gov](http://www.malegislature.gov)

Use this resource to find and contact your legislator to inform them about your concerns regarding climate-related legislation.

### MERRIMACK VALLEY REGION MULTI-HAZARD MITIGATION PLAN UPDATE

[http://mvpc.org/wp-content/uploads/MV-Multi-Hazard-Mitigation-Plan-Update\\_Nov-2015.pdf](http://mvpc.org/wp-content/uploads/MV-Multi-Hazard-Mitigation-Plan-Update_Nov-2015.pdf)

Use this website to review hazard mitigation planning coverage across the entire Merrimack Valley Planning District.

### CONTACT US

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**Cover picture:** Flooding in downtown Newburyport during the winter of 2018 on the boardwalk adjacent to the Black Cow Restaurant. Photo courtesy of the City of Newburyport. **1** Levy, David L. Financing Climate Resilience. Compiled by Rebecca Herst and Emily Moothart. Boston, MA: Sustainable Solutions Lab, University of Massachusetts Boston, 2018. PDF. **2** Stockton, Nick. "Climate Change Is Going to Be Expensive-For Everybody." Wired. June 30, 2017. <https://bit.ly/2N67Zcl>. **3** Maloy, Leslie Anderson. "REPORT: Small Business Impacts from Climate Change, Extreme Weather." American Sustainable Business Council. November 07, 2016. <https://bit.ly/2KfeNqK>. **4** Warne, Kennedy. "Sea Level Rise." National Geographic. April 07, 2017. <https://bit.ly/1f2Cola>. **5** "New Study Finds 89,000 Massachusetts Homes Worth \$63 Billion Will Be at Risk from Tidal Flooding." Union of Concerned Scientists. June 18, 2018. <https://bit.ly/2Ku8w6r>. **6** Douglas, Ellen, Paul Kirshen, Vivien Li, Chris Watson, and Julie Wormser. The Boston Harbor Association. "Preparing for the Rising Tide: Executive Summary." **7** Climate Central. Sea level rise and coastal flood exposure: Summary for Massachusetts. Surging Seas Risk Finder. July 21, 2016. <https://bit.ly/2yOoVRZ>. **8** Ryan, Greg. "Mass. Businesses' Losses from Winter Storms Could near \$1 Billion." Bizjournals.com. March 13, 2018. <https://bit.ly/2IA6pvY>. **9** Ryan, Greg. "Mass. Businesses' Losses from Winter Storms Could near \$1 Billion." Bizjournals.com. March 13, 2018. <https://bit.ly/2IA6pvY>. **10** Schottland, Taj, Melissa G. Merriam, Christopher Hilke, Kristen Grubbs, and Wayne Castonguay. "Great Marsh Coastal Adaptation Plan." December 01, 2017. Accessed June 12, 2018. <https://www.nwf.org/greatmarshadaptation>. **11** "A Climate of Progress: City of Boston Climate Action Plan Update 2011." June 19, 2018. [goo.gl/foNwn1](http://goo.gl/foNwn1). **12** "See Your Local Sea Level and Coastal Flood Risk." Climate Central. <https://bit.ly/2KywjW>. **13** "Build A Kit." Know the Facts, Be Empowered! | Ready.gov. <https://www.ready.gov/kit>. **14** "Be Informed." Know the Facts, Be Empowered! | Ready.gov. <https://www.ready.gov/be-informed>. **15** Webster, T., and A. Joseph. "What Is Waterproof Paint?" WiseGEEK. May 25, 2018. <https://bit.ly/2IEaxSL>. **16** Cortez, Kriselle. "Passive Cooling." Academia.edu [http://www.academia.edu/7699985/Passive\\_cooling](http://www.academia.edu/7699985/Passive_cooling).



## BUSINESS RESILIENCE WORKSHEET

In case of flooding or other emergency, please call:

Insurance Provider Information:

Regional Emergency Planning Team Information:

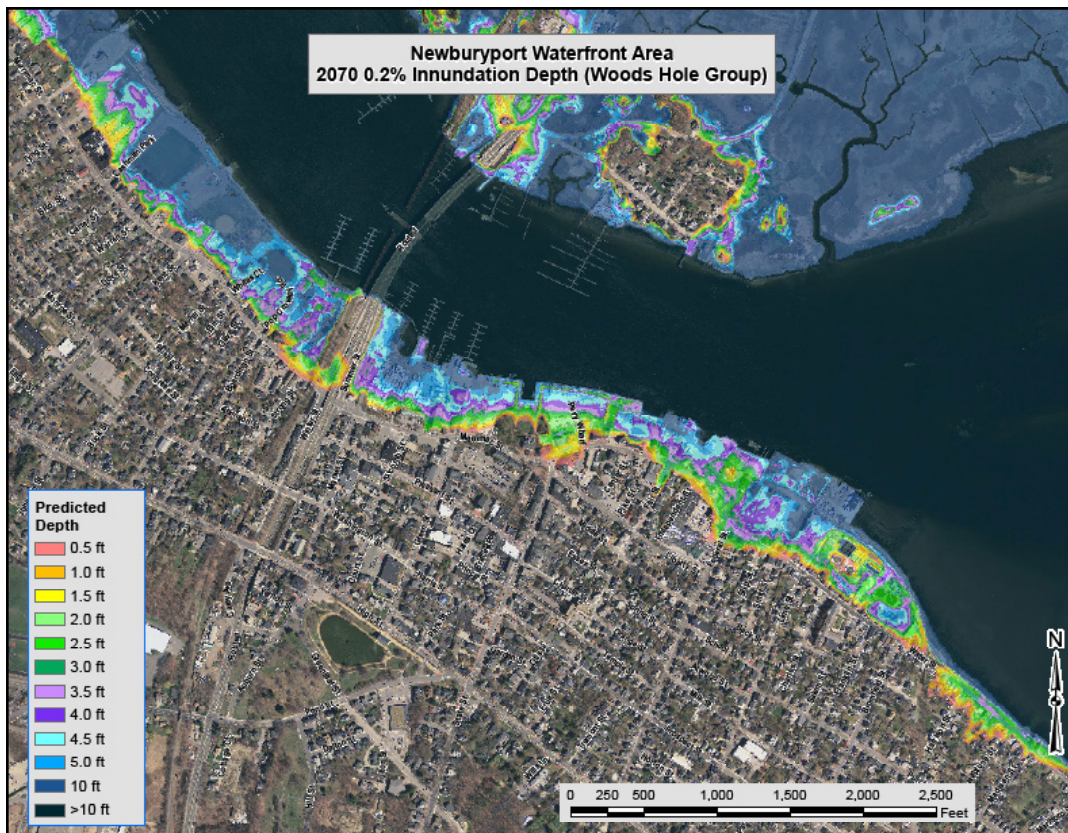
Fire Department Contact:

- ☐ I have assessed my inventory
- ☐ I know where my business (assets and operations) is most vulnerable
- ☐ I have begun to prepare for future extreme weather events that may cause power outages and flooding
  - ☐ I own a backup generator
  - ☐ I used waterproof paint
  - ☐ I have equipment that uses passive air-cooling
  - ☐ I replaced inefficient heating and cooling systems
  - ☐ I updated insulation (making sure it is functional)
- ☐ I have redundancy built into my supply chain (more than one way to ensure that I have secured supply and delivery)
- ☐ I have developed a step-by-step emergency plan that includes information on emergency communications and transportation.
- ☐ I have a emergency preparedness kit (food, medicine and water)
- ☐ My staff knows where to meet during an emergency
- ☐ I have enrolled with my city/ town for emergency alerts
- ☐ I checked my insurance policy to ensure it covers damages that may be caused by extreme weather events

I am engaging in climate action measures:

- ☐ recycling
- ☐ composting
- ☐ geothermal energy
- ☐ solar energy
- ☐ bike share program
- ☐ reduced energy use
- ☐ energy efficient systems
- ☐ I participated in a MassSave Energy Assessment
- ☐ I have developed a community network to rely on in disaster situations
- ☐ I have let my customers know what my business is doing to prepare for sea level rise and extreme weather events
- ☐ I have joined the conversation about climate change and communicated with my city councilors, state legislators, and federal representatives
- ☐ I have joined the Climate Action Business Association to learn about best practices and gain further assistance to fully embrace a resilient way of thinking (email [Kristin.kelleher@cabaus.org](mailto:Kristin.kelleher@cabaus.org) and mention BARS for free membership until January 2019)
- ☐ I am Climate Resilient.





## SUPPLEMENTAL MAPS

**Top:** Depicts a 0.2% inundation depth, also known as a 500 year flood, in the Newburyport waterfront area in 2070 (Woods Hole Group).

**Bottom:** Depicts a 0.2% inundation depth, also known as a 500 year flood, in Newburyport business park in 2070 (Woods Hole Group). These flooding events will occur more frequently.

Maps courtesy of Joe Teixeira.

