



FloodiQ.com



Your Detailed Flood iQ Report

79 Turkeyland Rd, Edgartown, MA 02539

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With sea levels rising at unprecedented rates, everyone has the right to understand their personal risk from tidal and storm surge flooding, today and in the near future.

This report was generated by Flood iQ, a free tool developed by the nonprofit First Street Foundation. Flood iQ uses the most advanced open source data from partners like:



US Army Corps
of Engineers



Contact Us

If you have any questions, issues, or suggestions for improvement, we'd love to hear from you. Please contact us at info@FloodiQ.com



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Your Flood Risk Overview: 2018-2033

Flooding impacts thousands of coastal properties today, and will affect even more as sea levels continue to rise. Depending on your property's location and elevation, your risks may vary by flood type and worsen over time.

Flooding Type	Current Risk	2033 Risk
Category 1 Hurricane	Severe	Severe
Category 3 Hurricane	Severe	Severe
Category 4 Hurricane	Severe	Severe
Highest Annual Tidal Flood	Minimal	Minimal
Frequent Tidal Floods	Minimal	Minimal
Category 5 Hurricane	Not Available*	Not Available*

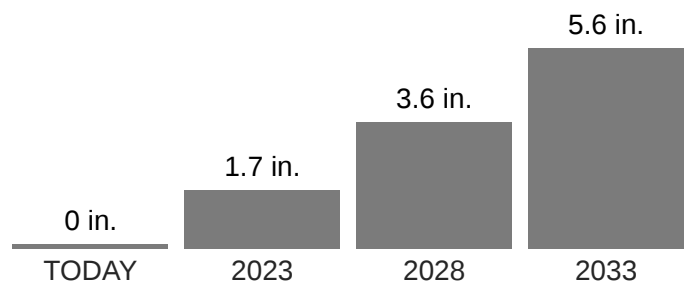


Why Is Flooding Becoming More Frequent?

Sea level rise is the main reason why a property's risk of flooding increases over time. As the ocean water rises, flooding becomes more frequent and reaches places it previously did not. Although America's sea level has only risen 3 inches in the last 20 years, flooding has increased by over 200% nationally (NOAA, 2016). Some regions, like the East and Gulf Coasts, are experiencing even faster rates of sea level rise and in greater danger from flooding.

Sea Levels Are Increasing

Sea levels in the area will increase by **5.64 in.** in the next **15** years, according to the US Army Corps of Engineers.



FEMA Flood Zone: X

FEMA flood maps underestimate flood risks because they are based on historical flood events, and do not incorporate sea level rise, which make flood risks worse.

As a **low to moderate** risk zone, FEMA estimates a less than 1% annual chance of flooding, meaning this property is outside the 100 year floodplain.



Your Hurricane Category 1 Flood Risk

Hurricanes can cause severe damage from wind, rain, and storm surge. Storm surge refers to the ocean water pushed towards the shore by the hurricane winds. The more severe the hurricane, the greater the wind speed and storm surge.

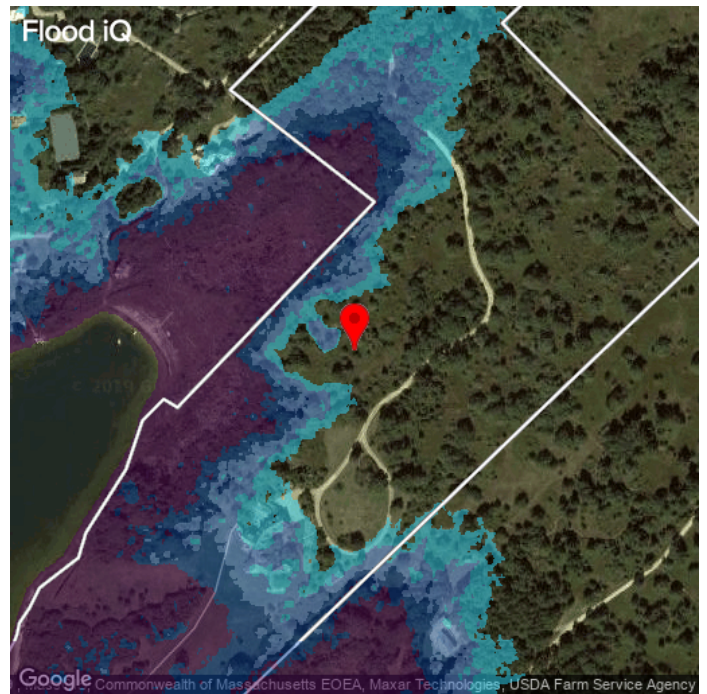
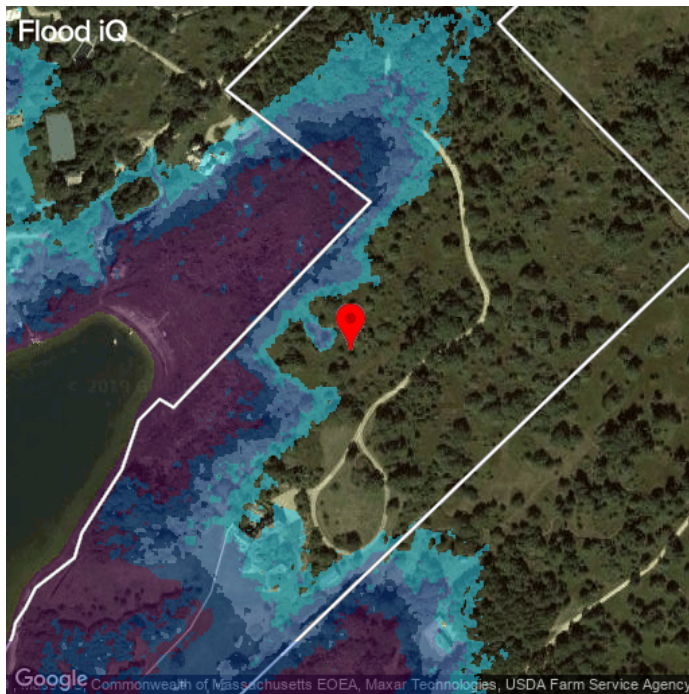
Category 1: Sustained winds of **74 – 95 mph**

Examples: Hurricane Matthew, South Carolina, 2016
Hurricane Sandy, New Jersey and New York, 2012

Property Risk Comparison Between 2018 and 2033

2018

2033



Map legend: Depth of flooding (feet) ■ <1 ■ 1 - 2 ■ 2 - 3 ■ 3+

2018: SEVERE
Amount of Property Flooded: 46%
Water Depth: 7 ft
Neighborhood Flooded: 80%
Roads Flooded: 20%

2033: SEVERE
Amount of Property Flooded: 50%
Water Depth: 7 ft
Neighborhood Flooded: 83%
Roads Flooded: 23%

Your property and surrounding neighborhood **are** at risk of flooding from a Category 1 hurricane's storm surge.

As sea levels rise, there is more water available that hurricanes can push onto land, which increases the potential risk and damage of flooding and can negatively impact property values nearby.



Your Hurricane Category 3 Flood Risk

Hurricanes can cause severe damage from wind, rain, and storm surge. Storm surge refers to the ocean water pushed towards the shore by the hurricane winds. The more severe the hurricane, the greater the wind speed and storm surge.

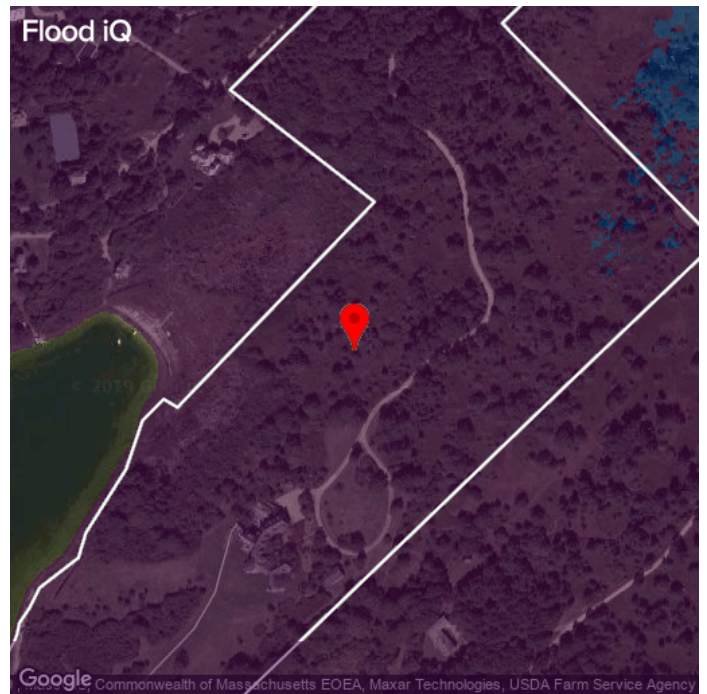
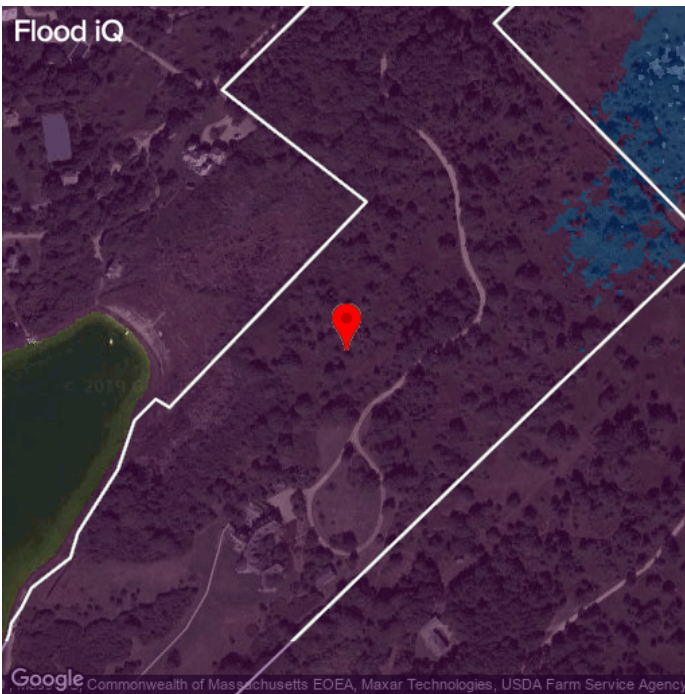
Category 3: Sustained winds of **111 – 129 mph**

Examples: Hurricane Katrina, Louisiana, 2005
Hurricane Irma, Florida, 2017

Property Risk Comparison Between 2018 and 2033

2018

2033



Map legend: Depth of flooding (feet) ■ <1 ■ 1 - 2 ■ 2 - 3 ■ 3+

2018: SEVERE

Amount of Property Flooded: 100%

Water Depth: 11 ft

Neighborhood Flooded: 100%

Roads Flooded: 100%

2033: SEVERE

Amount of Property Flooded: 100%

Water Depth: 11 ft

Neighborhood Flooded: 100%

Roads Flooded: 100%

Your property and surrounding neighborhood **are** at risk of flooding from a Category 3 hurricane's storm surge.

As sea levels rise, there is more water available that hurricanes can push onto land, which increases the potential risk and damage of flooding and can negatively impact property values nearby.



Your Hurricane Category 4 Flood Risk

Hurricanes can cause severe damage from wind, rain, and storm surge. Storm surge refers to the ocean water pushed towards the shore by the hurricane winds. The more severe the hurricane, the greater the wind speed and storm surge.

Category 4: Sustained winds of **130 – 156 mph**

Examples: Hurricane Harvey, Texas, 2017.

Property Risk Comparison Between 2018 and 2033

2018

2033



Map legend: Depth of flooding (feet) ■ <1 ■ 1 - 2 ■ 2 - 3 ■ 3+

2018: **SEVERE**

Amount of Property Flooded: **100%**

Water Depth: **11 ft**

Neighborhood Flooded: **100%**

Roads Flooded: **100%**

2033: **SEVERE**

Amount of Property Flooded: **100%**

Water Depth: **11 ft**

Neighborhood Flooded: **100%**

Roads Flooded: **100%**

Your property and surrounding neighborhood **are** at risk of flooding from a Category 4 hurricane's storm surge.

As sea levels rise, there is more water available that hurricanes can push onto land, which increases the potential risk and damage of flooding and can negatively impact property values nearby.



Call Your Officials

While there are many solutions for individuals, the greatest impact can be made by elected officials investing in flood prevention—thereby reducing the cost of flood insurance in their communities and protecting property values. Contact your local elected official and ask what they're doing to address flooding and sea level rise.

How can communities prevent flooding and prepare for sea level rise?

Investing Proactively

Protecting communities before disaster strikes is cheaper than repairing afterward. Every \$1 spent on mitigation for flooding results in \$7 of savings.

Building Back Stronger

Communities damaged from flooding and natural disasters need to build back stronger than they were, so they aren't similarly damaged when disastrous events happen again.

Future-Proof Planning

By setting building codes and planning infrastructure that can withstand foreseen changes, communities can help ensure they are protected against future floods and natural disasters.

Things you can do to protect your property

Buying flood insurance

Water damage is the most common type of insurance claim in the United States, but typical homeowner's insurance doesn't cover flooding. Flood insurance premiums vary by location and risk, with the average cost about \$700 per year.

Raising the expensive stuff

Raising HVAC systems, plumbing, and electric meters to floors above flood levels can prevent future damage to expensive systems, and may help reduce flood insurance premiums. On average, this solution costs \$6,000.

Elevating your house

Houses can be raised above flood levels by using six-foot tall wooden stilts or concrete blocks. It is easier for a new home to be built higher, but existing homes can also be raised at a median cost of \$130,000 per home.

Relocating

To relocate to higher ground, a house is lifted off its foundation, hauled to a new site, and lowered onto a new foundation. Price depends on house size, distance moved, and other factors, ranging upwards of \$150,000.

Learn more on how individuals, mayors, governors, and Congress can work together to prevent future floods at www.SeaLevelRise.org/solutions.

Appendix A: Methodology

Flood risks are created by combining publicly available data, including: elevation data from the United States Geologic Survey and county governments, historic tide gauge readings from the National Oceanic and Atmospheric Administration (NOAA), local sea level variation from NOAA, storm surge predictions from the National Weather Service / NOAA, sea level rise predictions from the United States Army Corps Of Engineers and property details from state and county governments offices.

Projected Sea Level Rise

Sea level rise has tripled in the last decade, and the rate is expected to continue increasing. The US Army Corps of Engineers has developed sea level rise scenarios for tidal gauges across the US. Because the rate of sea level rise differs by location, we use the tidal gauge(s) closest to the property to determine sea level rise projections.

Flood Projections

Frequent tidal flood risks are determined by mapping your property's elevation against the highest daily tide levels from the National Oceanic and Atmospheric Administration (NOAA) and calculating the likelihood of high tide flooding at least 10 days a year.

To project your property's risk of flooding from each year's highest annual high tide, your area's expected rate of sea level rise is incorporated into your area's highest historical inundation levels from each year.

To determine your hurricane storm surge risk, your property's elevation data is used in conjunction with the National Oceanic and Atmospheric Administration (NOAA) SLOSH models to determine where storm surge may occur.

Your neighborhood flooding percentage refers to the properties and roads within 1/4 mile radius of your property that could experience the given flooding. Road flooding percentage is calculated by analyzing all the roads in 1/10th of a mile radius around your property. Roads with any amount of flooding are included in the percentage.

Property Value Loss

Millions of property sale transactions have been analyzed to quantify the impact that proximity to tidal flooding has on resale value. To isolate and measure the average impact of tidal flood risks, properties with comparable characteristics, but different flood risks, are compared against one another. Our methodology also accounts for other, external impacts that can affect property values, like the 2008 recession and general market trends.

A property's impact / loss of property value is calculated based on the property's characteristics, lot and road flood projections, and the average impact of tidal flooding risk on the property values in your local area. Projections assume value loss remains consistent over time and does not accelerate.

Property Data

Sea level rise has tripled in the last decade, and the rate is expected to continue increasing. The US Army Corps of Engineers has developed sea level rise scenarios for tidal gauges across the US. Because the rate of sea level rise differs by location, we use the tidal gauge(s) closest to the property to determine sea level rise projections.

Elevation Data

Elevation data comes from the United States Geological Survey and county governments. Elevation data sets are updated periodically and may not account for newer updates that may impact flood risk, such as recently raised homes or roads.

Tidal Data for Highest Tide and Nuisance Flooding Level

The National Oceanic and Atmospheric Administration's (NOAA) Vertical Datum Transformation tool is used for determining the local mean sea level and local mean higher high water (MHHW), which is the average highest tide of each day. By specifying the coordinates of sampling points in the tool, we can determine the high tide or mean sea levels (using NAVD 88 datum) at the local level. <https://vdatum.noaa.gov/>

Hurricane Storm Surge Data

In order to help coastal regions prepare for storm surges, the National Weather Service (NWS) of NOAA runs computer simulations called Sea, Lake, and Overland Surges from Hurricanes (SLOSH) models to determine the extent to which hurricanes may propel water inland. Different parameters such as storm category, tide level, direction, and speed are included in the model, and for each combination of variables a Maximum Envelope of Water (MEOW) is calculated. These parameters are varied for each category of storm, testing the impact of various storm directions and wind conditions, and Maximum of Maximums (MOMs) are calculated to determine the highest possible inundation level within a SLOSH grid for any given storm category. <http://slosh.nws.noaa.gov/sloshPub/index.php>

Sea Level Rise Predictions

In order to determine current sea level and predicted sea level in the future, we use the United States Army Corps of Engineers (USACE) High Sea Level Rise curve. This curve was selected for future predictions because it is closest to the historical trend. The curve also has specific sea level rise numbers for different parts of the country.

References

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- Old Dominion University. 2016. "The Hampton Roads Sea Level Rise Preparedness and Resilience Intergovernmental Pilot Project Phase 2 Report: Recommendations, Accomplishments and Lessons Learned." [www.floodingresiliency.org].
- Wdowinski, S., Bray, R., Kirtman, B.P., and Wu, Z. 2016. "Increasing flooding hazard in coastal communities due to rising sea level: Case study of Miami Beach, Florida." [www.sciencedirect.com].

1. What is sea level rise, and how does it impact my flood risks?

Sea level rise refers to the global phenomenon of oceans levels becoming higher over time as they increase in volume. The two main global contributors to sea level rise are melting ice from land such as glaciers and ice sheets and thermal expansion, which relates to the ocean getting warmer and expanding. You can learn more about sea level rise at www.SeaLevelRise.org

Sea level rise is the main reason why a property's risk of flooding increases over time. As the ocean water rises, flooding becomes more frequent or reaches places it previously did not. Though the sea level has only risen by a few inches, flooding has increased by over 200% nationally (NOAA, 2016).

2. How are Flood iQ and FEMA flood maps different?

1. Flood iQ is based on current sea levels and applies the projected sea level rise forecast from the Army Corps of Engineers to predict future flooding while FEMA flood maps are based on historical flooding events and do not include sea level rise. We are showing where the water is likely to be in the future and include sea level rise projections, while FEMA maps show where the likelihood of flooding will occur again based on past trends. In other words, FloodiQ is deterministic, while FEMA is probabilistic.

2. Flood iQ uses current data, while 15% of FEMA flood maps have not been updated since the 1970s or 1980s, and none of the maps include future sea level rise.

3. FloodiQ separates potential causes of flooding, while FEMA's Special Flood Hazard Areas (SFHA) combine the risks from storm surge, riverine, and other sources together.

3. Do Flood iQ projections include rain?

Our flood risk projections do **not** include rain, which can increase the severity of both tidal flooding and hurricane storm surge. Because sea levels are rising, there is greater pressure on storm drains, which means high tides can push through drain pipes and spill out onto nearby streets (causing flooding even without rain), and storm surge can take longer to clear.

4. How does flooding impact home value?

Flooding in the future can cause loss in home value today.

Your home value may already be affected by future sea level rise flooding. The rise of frequent flooding in the last 12 years has already decreased average home value by roughly \$7,000 a year for high flood risk homes.

Properties that are not at-risk, but near roads that flood, are also losing value.

Properties near roads that will flood completely in 15 years during tidal floods are already decreasing in value by approximately \$3.71 per square foot annually, almost \$8,900 for the average home size.

High risk properties are more likely to be put on the market.

Properties with high flood risks are more likely to be put on the market each passing year. As sea levels rise and increase their risk, fewer people want to buy these homes, and the purchase price declines.

Learn more about the research from Columbia University on flooding and property values here:

<https://link.springer.com/article/10.1007%2Fs11113-018-9473-5>

Appendix D: About Us

Flood iQ is an interactive online service of First Street Foundation designed to help homeowners, homebuyers, and business owners understand their flood risk and how to protect their property, business, and community.

First Street Foundation is a registered 501(c)(3) not-for-profit organization that applies all its energies, in a non-partisan manner, to helping individuals, businesses, and government officials at the local, state, and federal levels develop a sense of urgency to understand and take action to deal with the immediate challenges posed by higher tides and greater flooding.

First Street Foundation
247 Water Street, Unit 401
Brooklyn, New York 11201
833.827.5223

First Street Foundation is registered in the State of New York as a 501(3)(c) organization. Our Form 990, financials and 501(c)(3) documentation can be provided on request. © 2017-2018 First Street Foundation. All rights reserved.



Disclaimer

The estimate provided by this tool is First Street Foundation's estimated percentage of flood risk under each scenario, and is computed with a proprietary formula using publicly available data from third parties. The percentages provided by this tool are estimates and assume no improvements to infrastructure that could reduce flooding in the future. We encourage users to supplement this information by conducting their own additional research. The percentages are not to be relied upon for property sale, purchase, mortgage, or any related purposes. First Street Foundation is not liable for any claim or loss resulting from the information provided on this report.