

# CLIMATE CHANGE IMPACT REPORT

## SAMPLE CLIENT

Total Insured Value: \$63B

Generated on 30-April-2023

Account Engineer Name, Account Engineer  
Account Manager Name, Account Manager



# EXECUTIVE SUMMARY

Note: All currencies referenced are in U.S. dollars.

The climate is changing and affecting the risks that impact your locations now and in the future. Combining Engineering data from site visits with the latest insights into climate change, FM Global has prepared this proprietary report that helps you manage and report your physical climate-related risks and exposures. This analysis includes a breakdown of your acute and chronic risks at your visited locations, specified by peril, according to three different climate scenarios, in both the short-term (by 2030) and the long-term (by 2050). The information provided will help you build a resilient future for your organization.

## Total Insured Value (TIV) by location

Insured locations, where bubble size represents total insured value of the location.

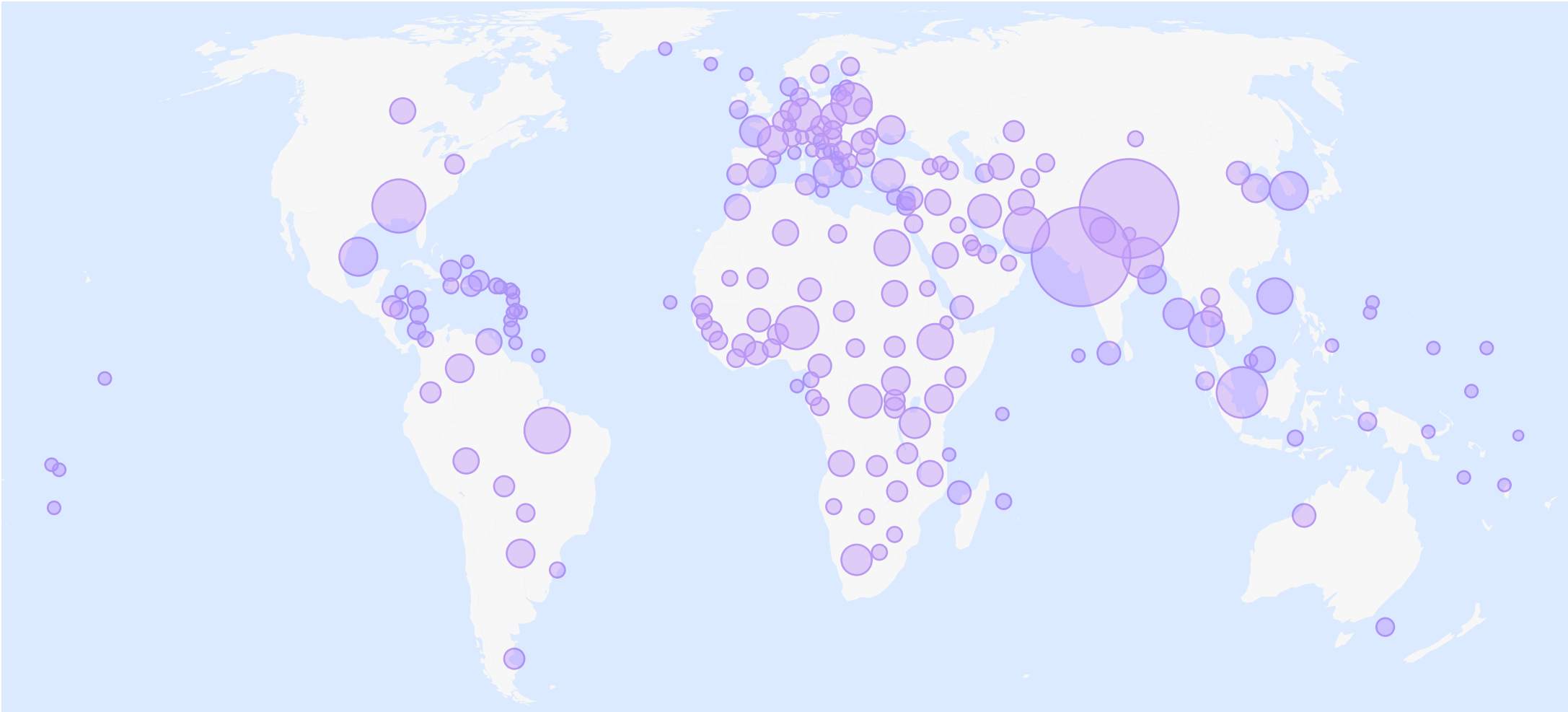
### TIV exposed

Property Value (PV)

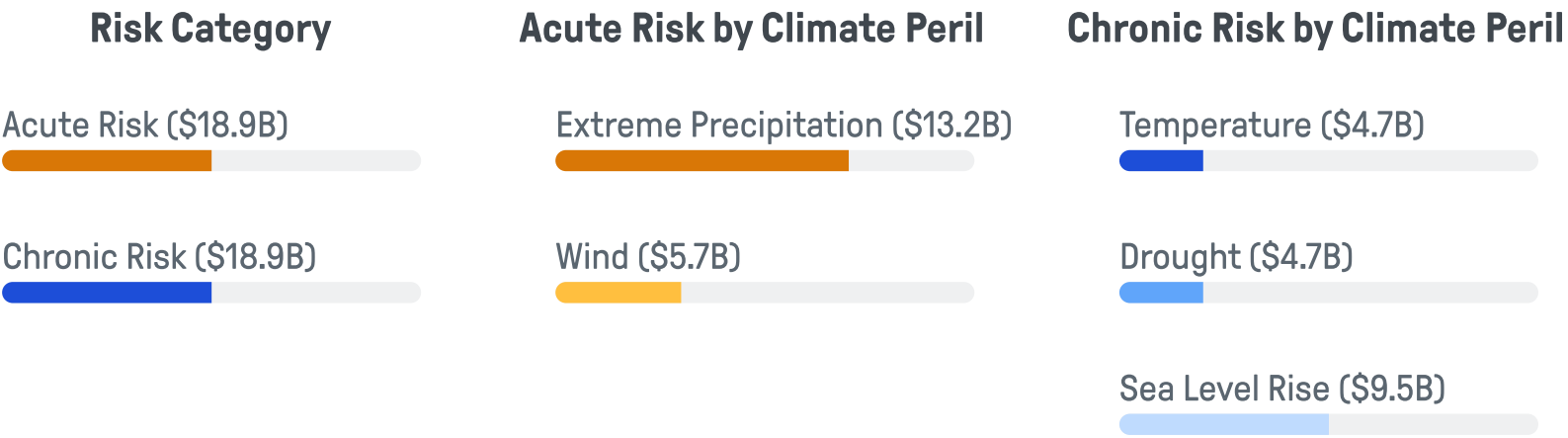
\$22.7B

Business Interruption (BI)

\$15.1B



Geographical distribution of the selected SAMPLE CLIENT insured and visited locations. Bubble size represents total insured value (\$USD) for each location.



# EXTREME PRECIPITATION

Extreme precipitation often leads to flooding. Heavy precipitation events are projected to become more intense and more frequent in most regions of the world with additional global warming. The increasing number or intensity of extreme rainfall events will make flooding more probable.

Shown here are your locations with the largest exposure to changes in extreme precipitation in the short-term (by 2030), including a breakdown by property value (PV) and business interruption (BI), and an outlook for climate change impacts at those locations in the long-term (by 2050).

### Total Insured Value (TIV) Exposed

Property Value (PV)

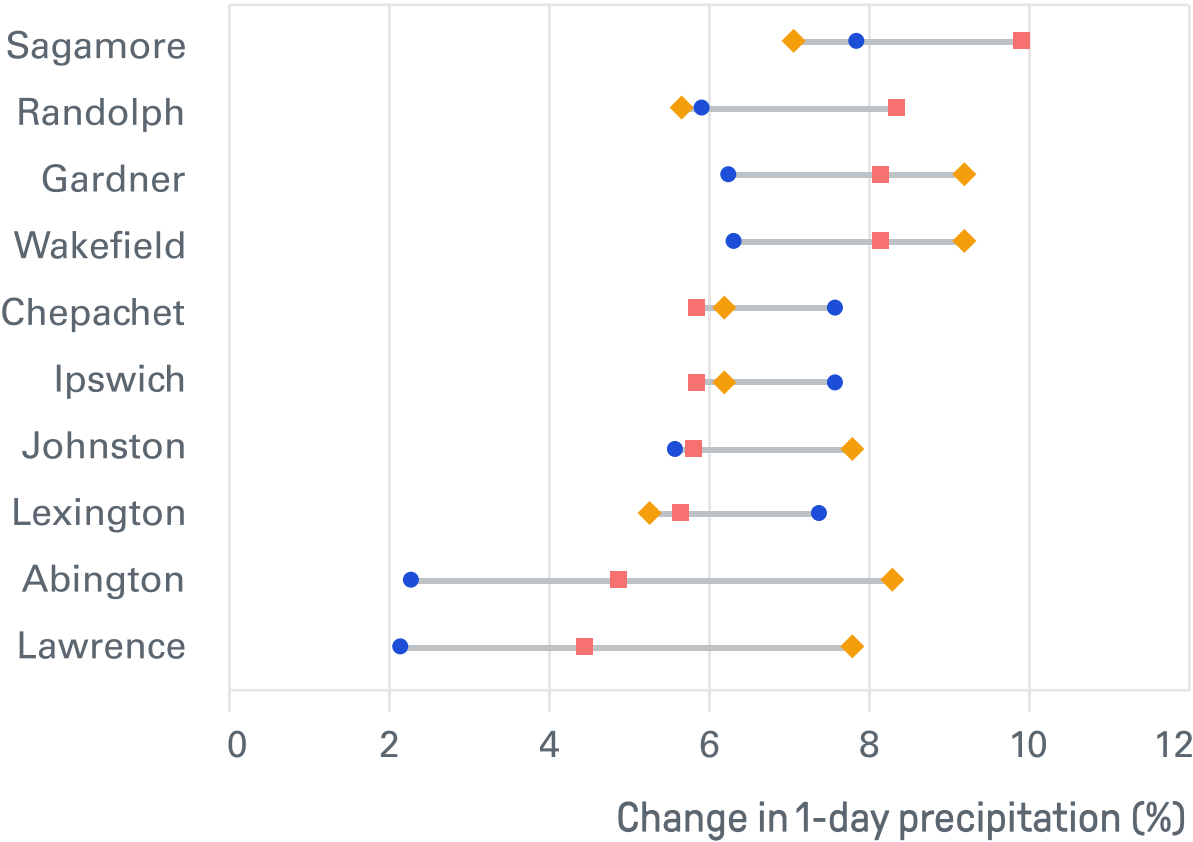
**\$7.9B**

Business Interruption (BI)

**\$5.3B**

### Climate Change Scenarios

• Low • Intermediate • High



### Ten locations with the largest (short-term) climate change impact, ranked by TIV

Location	TIV	PV	BI	Short-term	Long-term
Sagamore	\$1.8B	\$251.3M	\$1.5B	0.5 - 1.5 %	0.8 - 4.9 %
Randolph	\$934.7M	\$394.7M	\$540.0M	6.3 - 9.2 %	10.6 - 38.6 %
Gardner	\$828.2M	\$814.7M	\$13.5M	6.3 - 9.2 %	10.6 - 38.6 %
Wakefield	\$809.5M	\$303.3M	\$506.3M	5.6 - 8.3 %	1.6 - 29.3 %
Chepachet	\$643.0M	\$265.0M	\$378.0M	2.4 - 8.2 %	9.4 - 28.0 %
Ipswich	\$528.0M	\$187.6M	\$340.3M	5.6 - 7.8 %	10.5 - 24.2 %
Johnston	\$445.5M	\$0	\$445.5M	2.2 - 7.8%	8.2 - 26.4 %
Lexington	\$89.7M	\$89.7M	\$0	5.8 - 7.6 %	8.3 - 21.7 %
Abington	\$72.1M	\$72.1M	\$0	5.8 - 7.6 %	8.3 - 21.7 %
Lawrence	\$44.3M	\$3.8M	\$40.5M	5.3 - 7.4 %	8.0 - 23.8 %

Note: All currencies referenced are in U.S. dollars.

# WIND

Damaging winds can be produced by several atmospheric phenomena including tropical cyclones, winter storms, thunderstorms, and tornados. Projected changes in the frequency and intensity of extreme winds due to climate change depend on changes in the frequency and intensity of each of these storm types.

Shown here are your locations with the largest exposure to changes in wind speeds in the short-term (by 2030), including a breakdown by property value (PV) and business interruption (BI), and an outlook for climate change impacts at those locations in the long-term (by 2050).

### Total Insured Value (TIV) Exposed

Property Value (PV)

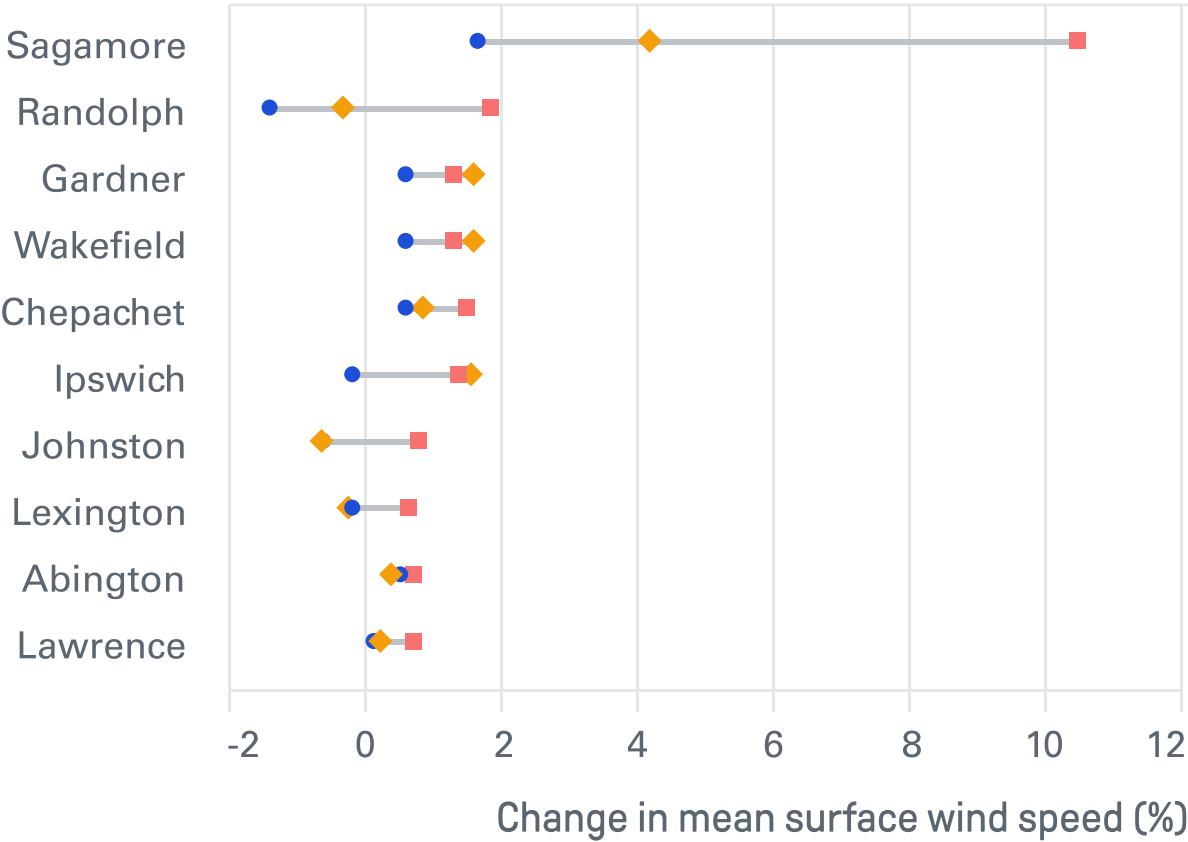
**\$3.4B**

Business Interruption (BI)

**\$2.3B**

### Climate Change Scenarios

• Low • Intermediate • High



### Ten locations with the largest (short-term) climate change impact, ranked by TIV

Location	TIV	PV	BI	Short-term	Long-term
Sagamore	\$1.8B	\$251.3M	\$1.5B	1.5 - 10.5 %	2.7 - 12.9 %
Randolph	\$934.7M	\$394.7M	\$540.0M	-1.2 - 1.9 %	-1.5 - 3.9 %
Gardner	\$828.2M	\$814.7M	\$13.5M	0.5 - 1.5 %	0.8 - 4.9 %
Wakefield	\$809.5M	\$303.3M	\$506.3M	0.5 - 1.5 %	0.8 - 4.9 %
Chepachet	\$643.0M	\$265.0M	\$378.0M	0.5 - 1.4 %	-0.1 - 2.2 %
Ipswich	\$528.0M	\$187.6M	\$340.3M	-0.1 - 1.4 %	-0.3 - 1.3 %
Johnston	\$445.5M	\$0	\$445.5M	-0.7 - 0.8 %	-2.4 - -1.0 %
Lexington	\$89.7M	\$89.7M	\$0	-0.2 - 0.7 %	0.4 - 1.3 %
Abington	\$72.1M	\$72.1M	\$0	0.3 - 0.6 %	-1.4 - 0.5 %
Lawrence	\$44.3M	\$3.8M	\$40.5M	0.0 - 0.6 %	0.2 - 3.3 %

# TEMPERATURE

Temperatures are rising globally. Heatwaves are becoming more frequent and intense. Extreme heat can lead to thermal stress on equipment, increase the demand for cooling, and potentially overwhelm power grid infrastructure. These factors elevate the likelihood for physical damage or business interruption.

Shown here are your locations with the largest exposure to increasing temperatures in the short-term (by 2030), including a breakdown by property value (PV) and business interruption (BI), and an outlook for climate change impacts at those locations in the long-term (by 2050).

### Total Insured Value (TIV) Exposed

Property Value (PV)

**\$2.8B**

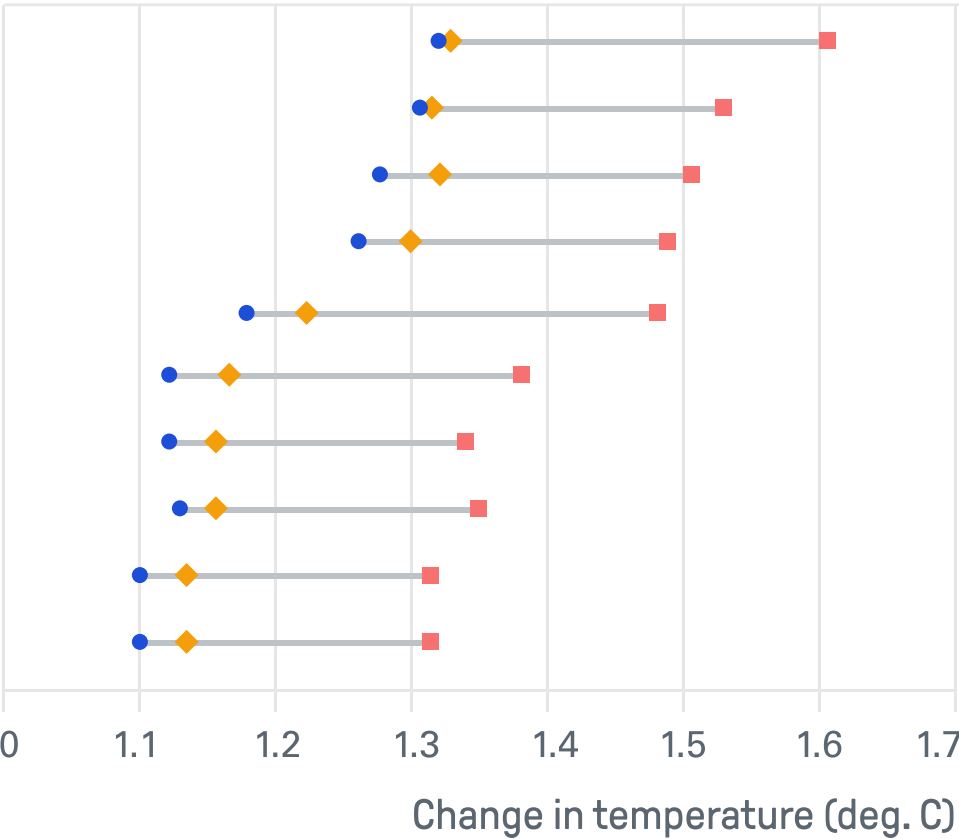
Business Interruption (BI)

**\$1.9B**

### Climate Change Scenarios

• Low • Intermediate • High

Sagamore  
Randolph  
Gardner  
Wakefield  
Chepachet  
Ipswich  
Johnston  
Lexington  
Abington  
Lawrence



### Ten locations with the largest (short-term) climate change impact, ranked by TIV

Location	TIV	PV	BI	Short-term	Long-term
Sagamore	\$1.8B	\$251.3M	\$1.5B	1.3 - 1.6 °C	2.0 - 6.5 °C
Randolph	\$934.7M	\$394.7M	\$540.0M	1.3 - 1.5 °C	2.0 - 6.4 °C
Gardner	\$828.2M	\$814.7M	\$13.5M	1.3 - 1.5 °C	1.9 - 6.1 °C
Wakefield	\$809.5M	\$303.3M	\$506.3M	1.2 - 1.5 °C	1.9 - 5.9 °C
Chepachet	\$643.0M	\$265.0M	\$378.0M	1.2 - 1.4 °C	1.7 - 5.5 °C
Ipswich	\$528.0M	\$187.6M	\$340.3M	1.1 - 1.3 °C	1.7 - 5.5 °C
Johnston	\$445.5M	\$0	\$445.5M	1.1 - 1.3 °C	1.7 - 5.5 °C
Lexington	\$89.7M	\$89.7M	\$0	1.1 - 1.3 °C	1.7 - 5.4 °C
Abington	\$72.1M	\$72.1M	\$0	1.1 - 1.3 °C	1.7 - 5.3 °C
Lawrence	\$44.3M	\$3.8M	\$40.5M	1.1 - 1.3 °C	1.7 - 5.3 °C

# DROUGHT

Climate change has contributed to increases in drought in some areas of the world. More intense or prolonged droughts can lead to diminishing water resources, increasing operational risks, and potentially more severe wildfires.

Shown here are your locations with the largest exposure to changes in drought in the short-term (by 2030), including a breakdown by property value (PV) and business interruption (BI), and an outlook for climate change impacts at those locations in the long-term (by 2050).

### Total Insured Value (TIV) Exposed

Property Value (PV)

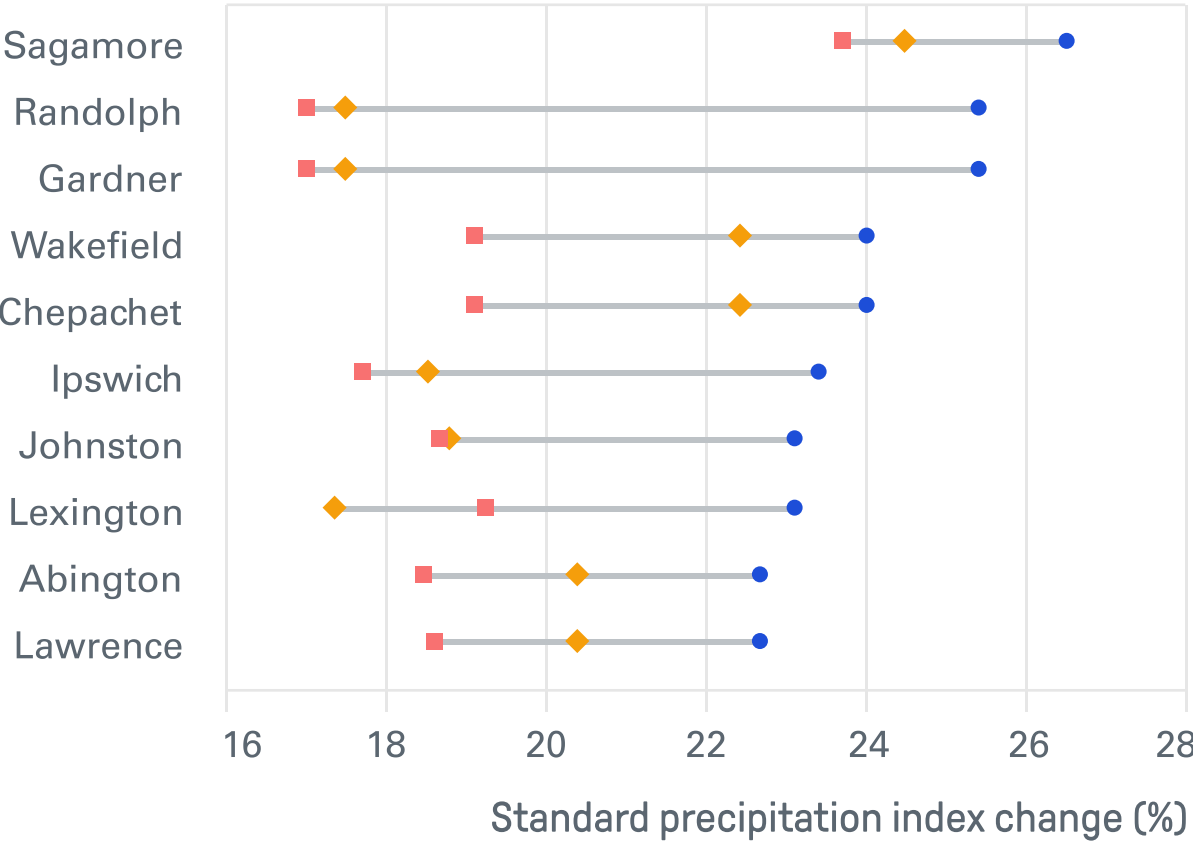
**\$2.8B**

Business Interruption (BI)

**\$1.9B**

### Climate Change Scenarios

• Low • Intermediate • High



### Ten locations with the largest (short-term) climate change impact, ranked by TIV

Location	TIV	PV	BI	Short-term	Long-term
Sagamore	\$1.8B	\$251.3M	\$1.5B	23.3 - 26.6 %	39.4 - 80.8 %
Randolph	\$934.7M	\$394.7M	\$540.0M	16.9 - 25.4 %	35.4 - 66.7 %
Gardner	\$828.2M	\$814.7M	\$13.5M	16.9 - 25.4 %	35.4 - 66.7 %
Wakefield	\$809.5M	\$303.3M	\$506.3M	19.1 - 24.0 %	37.8 - 69.4 %
Chepachet	\$643.0M	\$265.0M	\$378.0M	19.1 - 24.0 %	37.8 - 69.4 %
Ipswich	\$528.0M	\$187.6M	\$340.3M	17.7 - 23.4 %	33.9 - 71.2 %
Johnston	\$445.5M	\$0	\$445.5M	18.7 - 23.2 %	32.8 - 67.9 %
Lexington	\$89.7M	\$89.7M	\$0	17.4 - 23.1 %	38.3 - 68.9 %
Abington	\$72.1M	\$72.1M	\$0	18.6 - 22.9 %	35.0 - 67.1 %
Lawrence	\$44.3M	\$3.8M	\$40.5M	18.6 - 22.9 %	35.0 - 67.1 %



# SEA LEVEL RISE

Global mean sea levels are rising because global warming accelerates the loss of ice on land and increases the volume of water in the world’s oceans. The rise in sea levels, paired with the potential for stronger storms, increases the flood risk in coastal regions.

Shown here are your locations with the largest exposure to rising sea levels in the short-term (by 2030), including a breakdown by property value (PV) and business interruption (BI), and an outlook for climate change impacts at those locations in the long-term (by 2050).

### Total Insured Value (TIV) Exposed

Property Value (PV)

\$5.7B

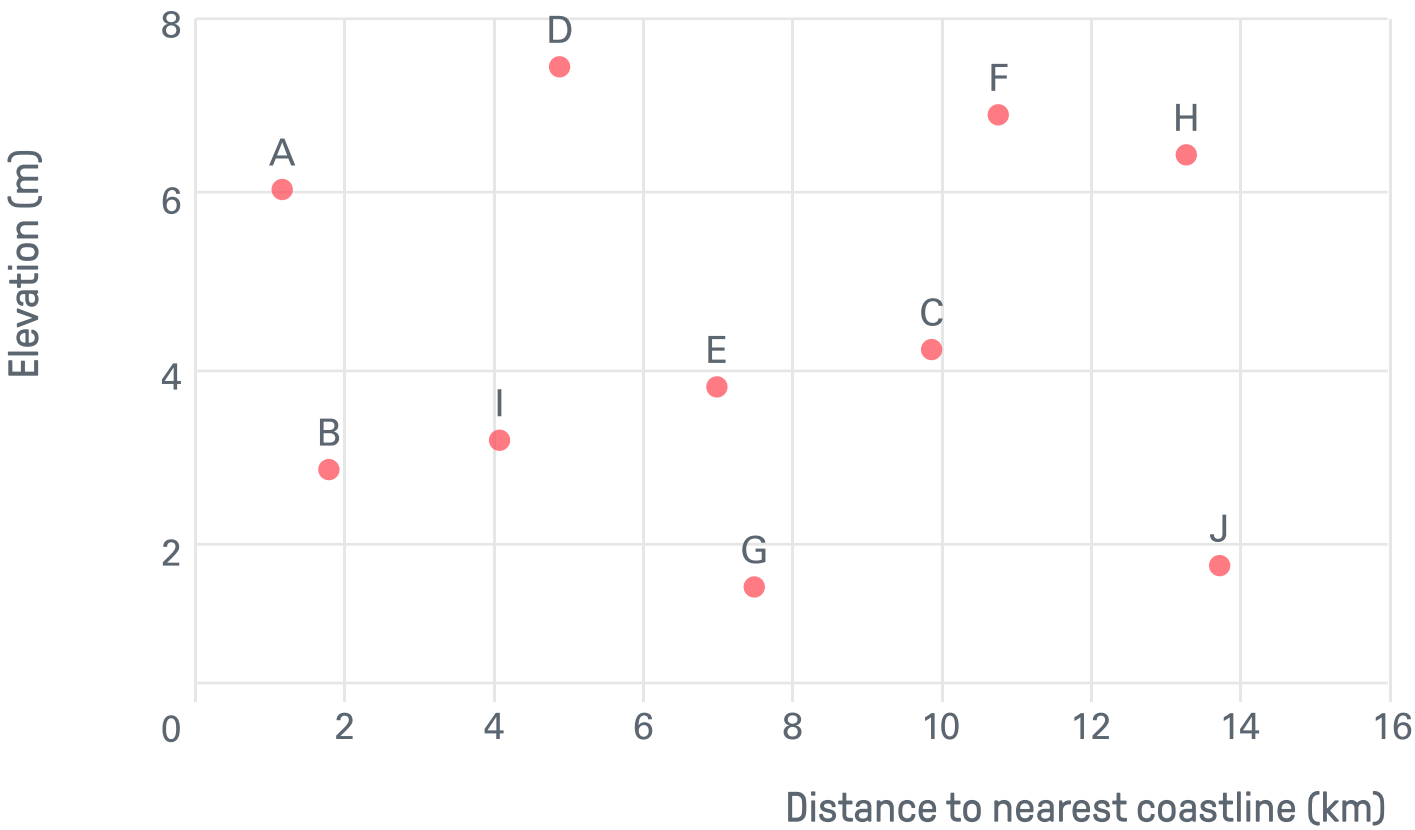
Business Interruption (BI)

\$3.8B

Note: All currencies referenced are in U.S. dollars.

### Ten locations with the largest (short-term) climate change impact

Locations by level of impact: ● Largest impacted



### Ten locations with the largest (short-term) climate change impact, ranked by TIV

Location	TIV	PV	BI	Short-term	Long-term
A. Sagamore	\$1.8B	\$251.3M	\$1.5B	0.2 m	0.3 m
B. Randolph	\$934.7M	\$394.7M	\$540.0M	0.2 m	0.4 m
C. Gardner	\$828.2M	\$814.7M	\$13.5M	0.1 m	0.3 m
D. Wakefield	\$809.5M	\$303.3M	\$506.3M	0.2 m	0.3 m
E. Chepachet	\$643.0M	\$265.0M	\$378.0M	0.2 m	0.5 m
F. Ipswich	\$528.0M	\$187.6M	\$340.3M	0.2 m	0.3 m
G. Johnston	\$445.5M	\$0	\$445.5M	0.1 m	0.5 m
H. Lexington	\$89.7M	\$89.7M	\$0	0.2 m	0.3 m
I. Abington	\$72.1M	\$72.1M	\$0	0.1 m	0.4 m
J. Lawrence	\$44.3M	\$3.8M	\$40.5M	0.2 m	0.3 m

# GLOSSARY

## Exposure

**Climate Exposed Location:** An insured facility visited by FM Global Field Engineering within the past five years that is exposed to at least one of the five climate perils in the Climate Change Impact Report.

**Total Insured Value Exposed:** Breakdown of total insured value of all climate exposed locations, by property value and business interruption.

## Climate Risks

**Acute:** Event-driven physical risks, including the increased severity of extreme weather events such as tropical cyclones or floods.

**Chronic:** Longer-term shifts in climate patterns such as sustained higher temperatures, changes in drought, and sea level rise.

## Climate Change Scenarios

**RCP:** Representative Concentration Pathways describe the future evolution of CO<sub>2</sub> concentration in the atmosphere in response to greenhouse gas emissions and the radiative forcing induced by it at the top of the atmosphere, which in turn affects global temperatures.

**Low:** Based on the RCP 2.6 scenario, the radiative forcing is limited to 2.6 W/m<sup>2</sup>. This scenario is considered the best case for limiting climate change impacts. It requires a major turnaround in climate policies and concerted worldwide actions to reduce greenhouse gas emissions drastically.

**Intermediate:** Based on the RCP 4.5 scenario, the radiative forcing is limited to 4.5 W/m<sup>2</sup>. This scenario assumes a stabilization of greenhouse gas emissions by 2050 and declining afterwards.

**High:** Based on the RCP 8.5 scenario, the radiative forcing is assumed to increase up to 8.5 W/m<sup>2</sup>. This scenario represents a possible worst-case scenario with continued rise in greenhouse gas emissions.

## Variables

**Mean Temperature:** Mean near-surface air temperature.

**Maximum Temperature:** Maximum of daily maximum near-surface air temperature.

**Maximum 1-day Precipitation:** Maximum precipitation amount accumulated over a 24-hour period.

**Maximum 5-day Precipitation:** Maximum precipitation amount accumulated over a 5-day period.

**Standardized Precipitation Index:** Index that compares cumulated precipitation for 6 months with the climatological precipitation distribution.

**Consecutive Dry Days:** Maximum number of consecutive dry days with precipitation amounts of less than 1 mm.

**Wind:** Mean near-surface wind speeds.

**Sea Level Rise:** Sea level rise due to melting of ice on land and increasing volume of water in the world's oceans.



# REFERENCES

IPCC, "Summary for Policymakers," in Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change., V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou Masson-Delmotte, Ed.: Cambridge University Press, 2021, pp. 3-34.

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