



CLIMATE READY

BOSTON

***Results from Boston
Research Advisory Group
(BRAG)***

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WHAT'S IN
STORE FOR
BOSTON'S
CLIMATE?

CLIMATE RISK FACTORS



Sea Level Rise



Coastal Storms

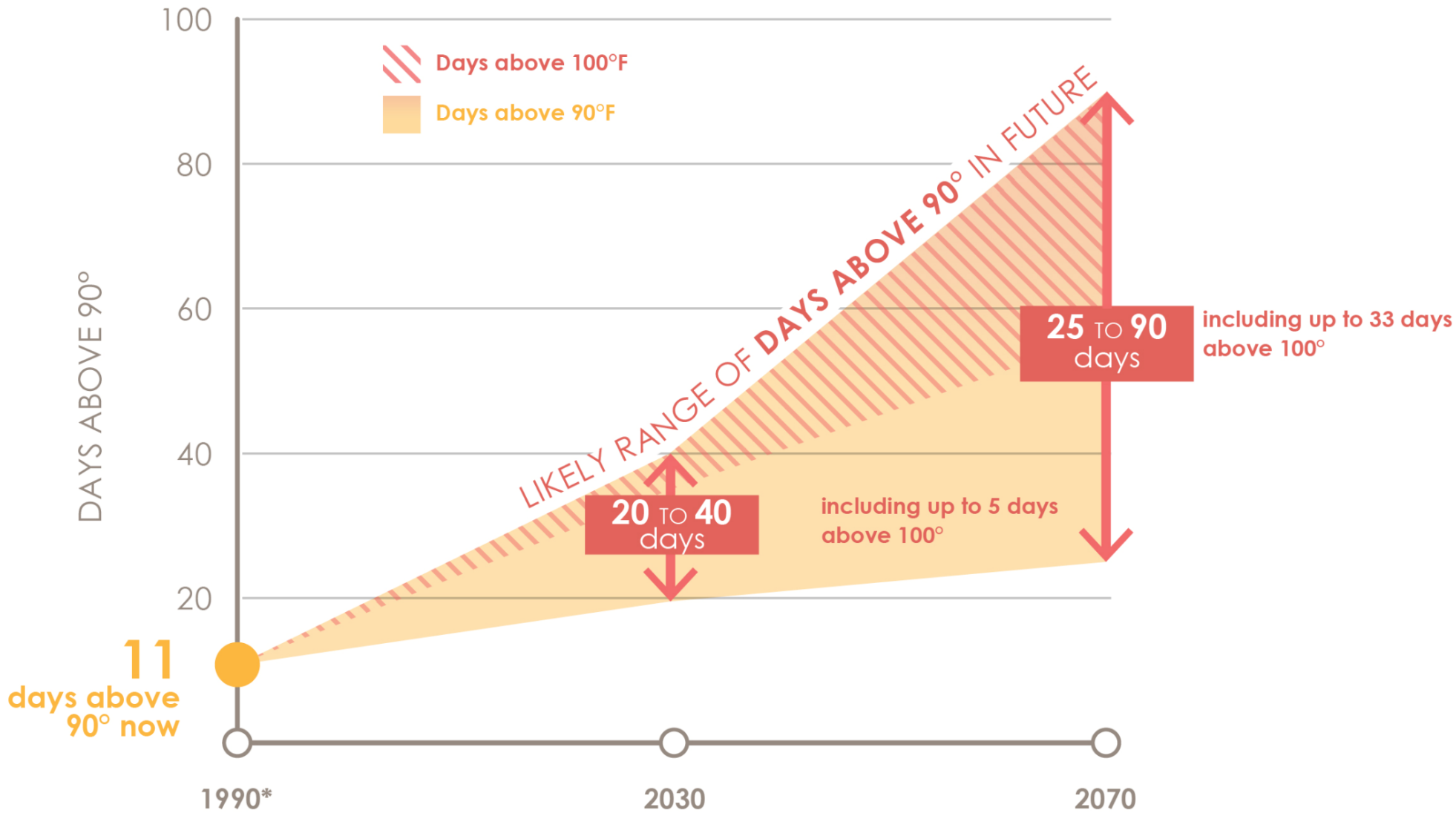


**Extreme
Precipitation**



**Extreme
Temperatures**

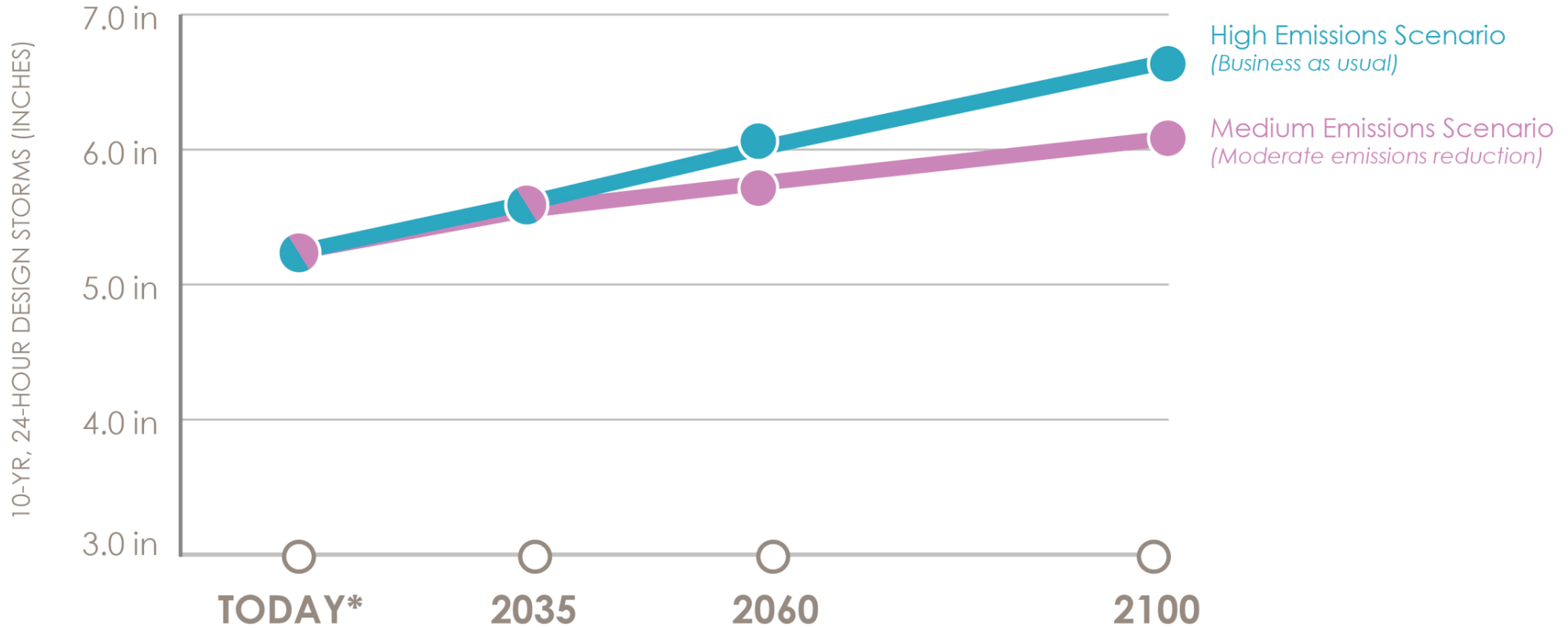
THE NUMBER OF VERY HOT DAYS WILL INCREASE



* Baseline represents historical average from 1971-2000

Upper values from high emissions scenario. Lower values from low emissions scenario.

RAINFALL FROM STORMS WILL INCREASE

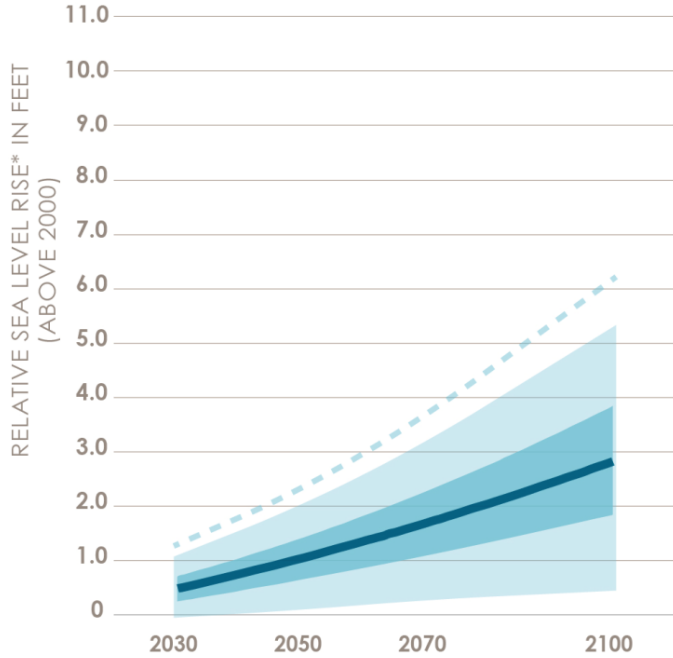


* "Today" baseline represents historical average from 1948-2012
Confidence intervals are not available for these projections but are likely large,
so these numbers should be considered as the middle of a large range

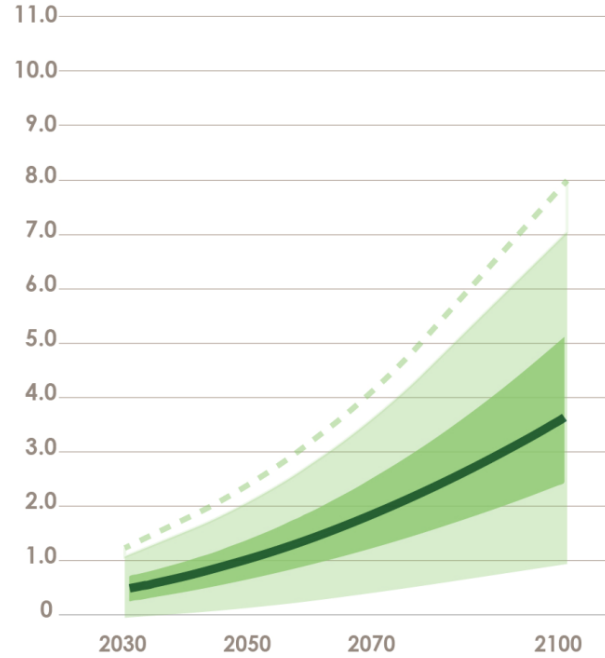
Data Source:
Boston Water & Sewer Commission

GREENHOUSE GAS EMISSIONS REDUCTIONS IMPACT FUTURE SEA LEVELS IN BOSTON

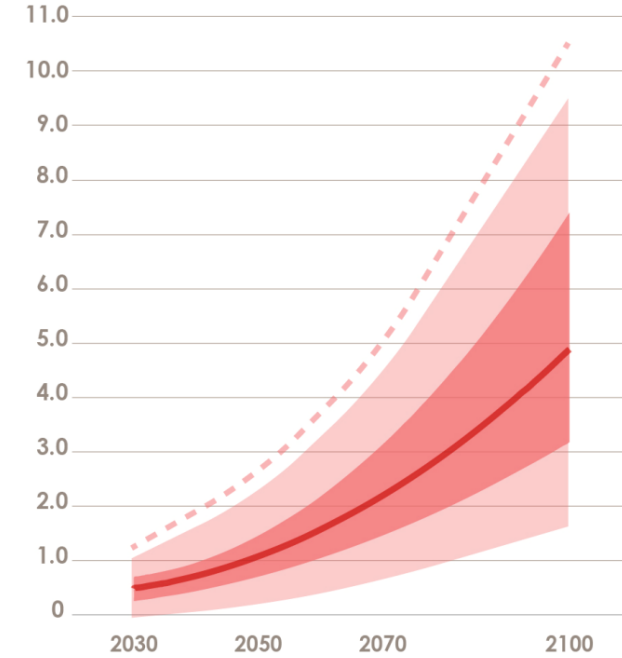
LOW EMISSIONS SCENARIO (MAJOR EMISSIONS REDUCTION)



MEDIUM EMISSIONS SCENARIO (MODERATE EMISSIONS REDUCTION)

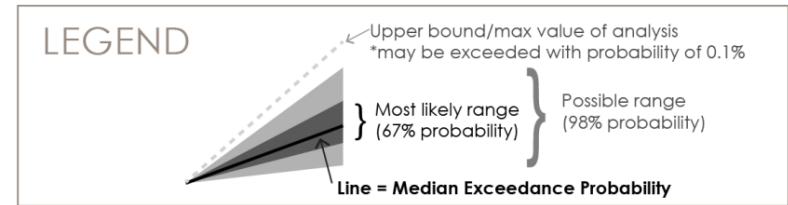


HIGH EMISSIONS SCENARIO (BUSINESS AS USUAL)



* Relative sea level rise is the change in sea level resulting from a combination of increases in ocean height and decreases in land surface elevation ("subsidence").

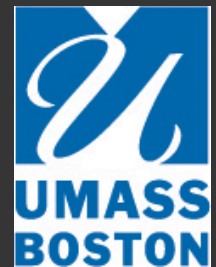
Data Source: BRAG Report



UMASS BOSTON + MAPC +UHI

The Greater Boston Research Advisory Group (G-BRAG)

Oct 1, 2018 through Dec 31, 2021



Overview

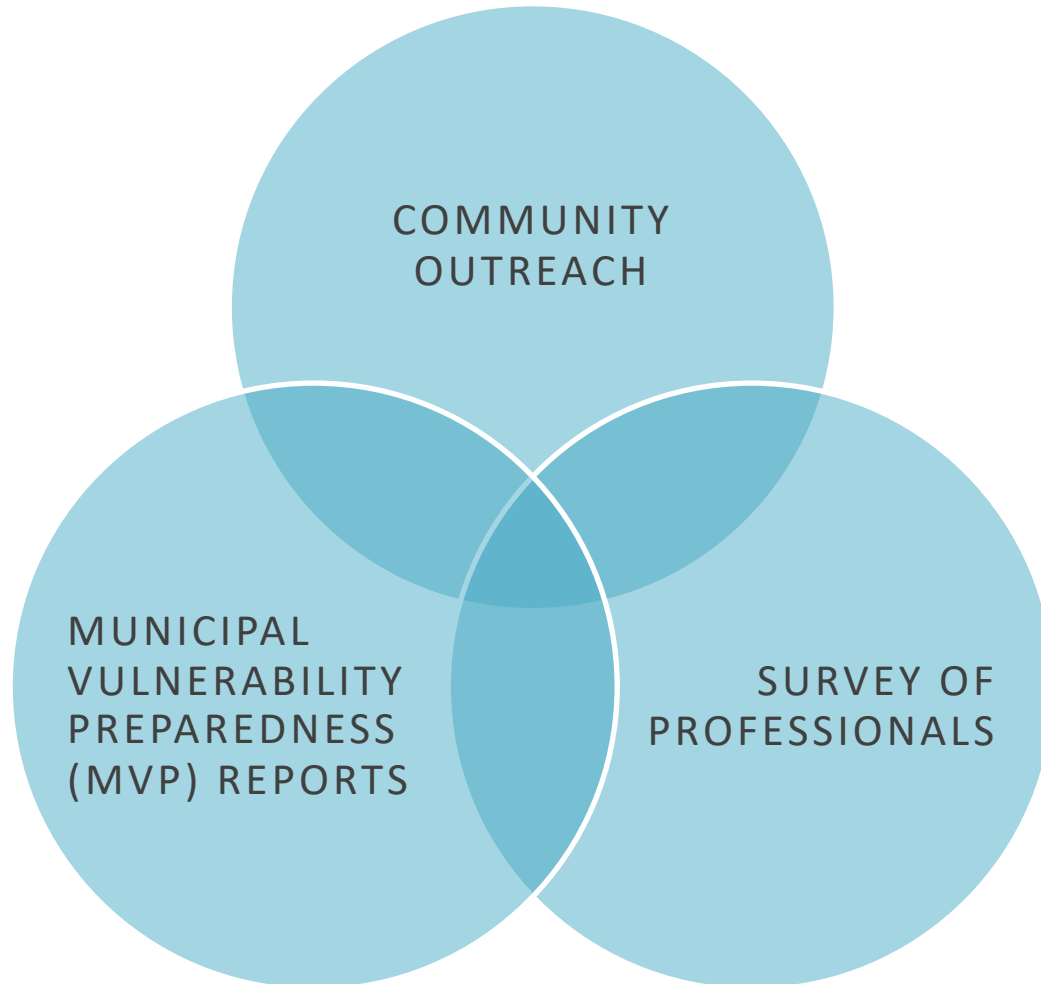
- Using best published information and scientific expertise, update and expand the climate change projections of the 2016 BRAG report to the entire Metropolitan Area Planning Council (MAPC) region – the 101 cities and towns within the Greater Boston Area
- Produce one to two Special Reports on topics of interest to the region
- Managed by the School for the Environment at UMass Boston (E Douglas and P Kirshen, Joint Principal Investigators), Engagement by Urban Harbors Institute with Engagement Assistance from the MAPC



Greater Boston Voices Climate Change Concerns

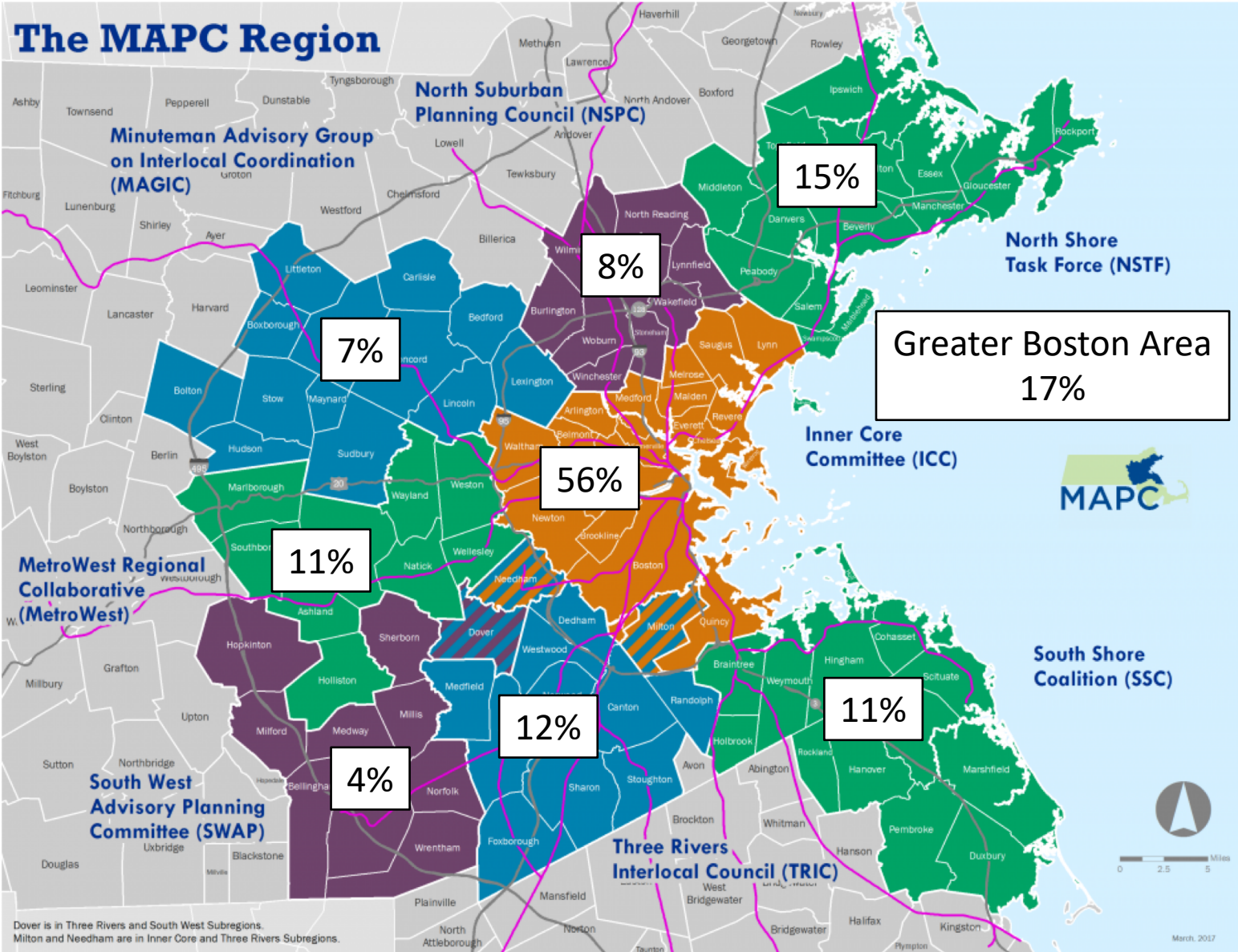
METHODS

Purpose: To determine what climate change information is most useful to communities when planning and preparing for climate change

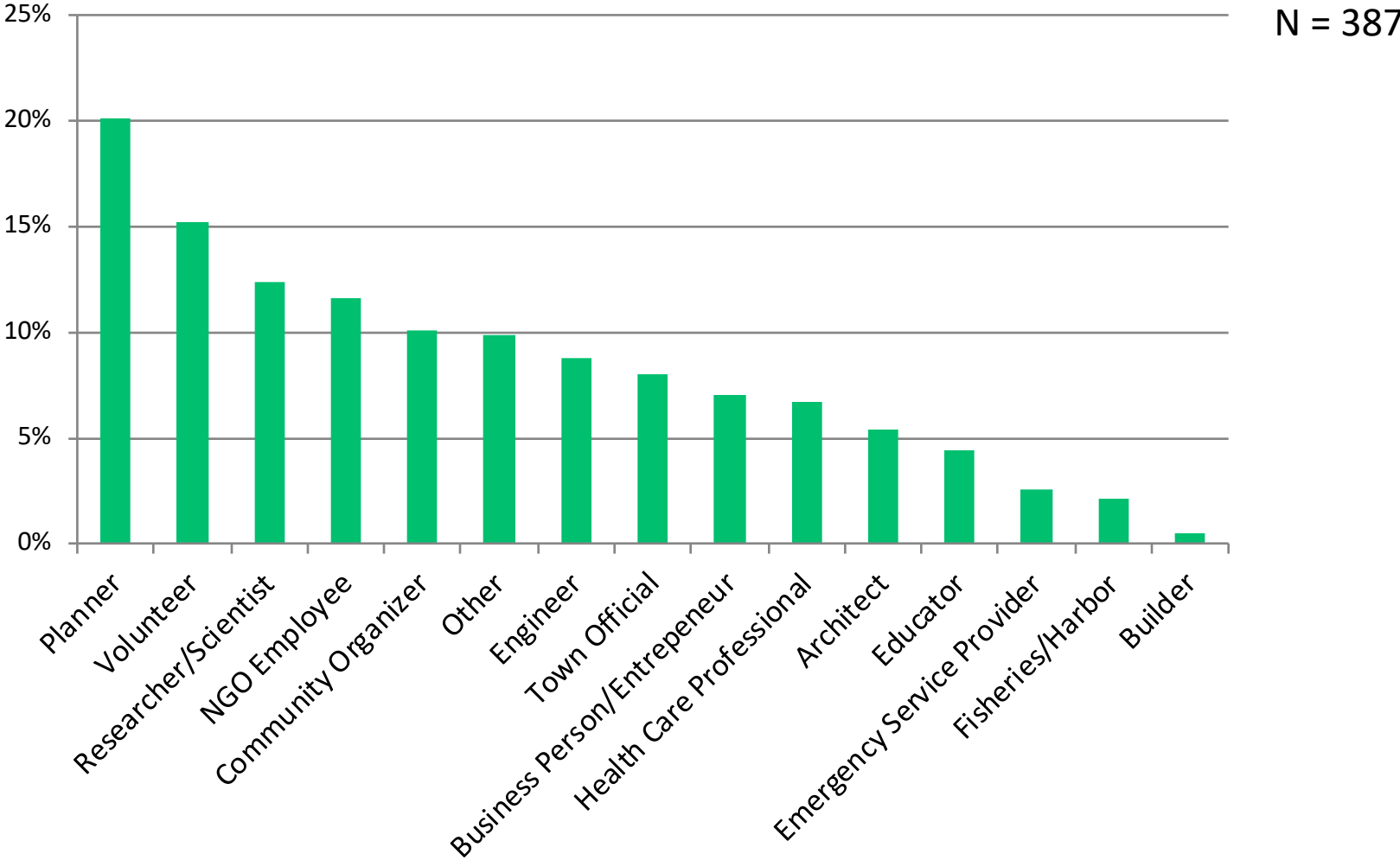


METHODS: Survey

N = 396



METHODS: Survey – Profession of Survey Respondent




Results



Results: Survey of Professionals

Do you think climate change is currently impacting, or will impact in the future, the Massachusetts city(ies)/town(s) where you work?

98% yes



*What climate change risk
factors concern Greater
Boston communities?*

*Risk Factor: type of climate or weather
event causing an impact. Examples
include temperature, sea level rise, and
extreme precipitation.*

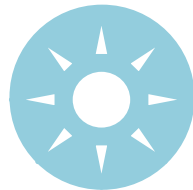
Results: Summary

SEA LEVEL RISE COASTAL STORMS



Sea Level Rise
Coastal Erosion
Flooding
Storm Surge
Saltwater
Intrusions
Groundwater
Wind

TEMPERATURE HUMIDITY



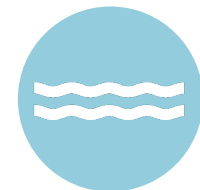
Extreme Cold
Extreme Heat
Extreme/Subtle
Temp. Changes
Seasonal Changes

PRECIPITATION INLAND STORMS



Flooding
Stormwater
Groundwater
Drought
Erosion
Wind
Snow, Rain,
Hail, Ice

MARINE TEMPERATURE & ENVIRONMENT

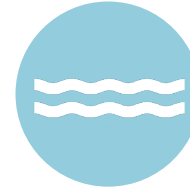
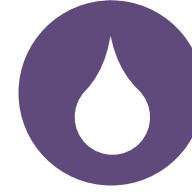
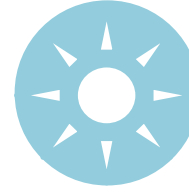


Temperature
Circulation
Marine
chemistry
Habitats
Marine life
Coastal
businesses

IMPACTS

precipitation

inland storms



Transportation



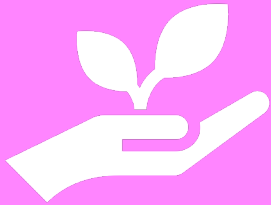
Property



Utilities



Stormwater



Natural
Resources



Emergency
Response



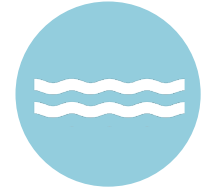
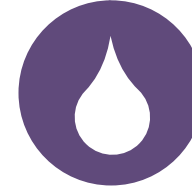
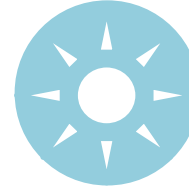
Economy/
Society



Governance/
Management

RESULTS

precipitation
inland storms



Risk Factor

Flooding

Stormwater

Water Quality

Groundwater

Drought

Precipitation

Erosion

Well Data

Snow

Water Resources

Aquifer Levels

Impact

Transportation

Property

Utilities

Stormwater

Natural Resources

Emergency
Response/Public Safety/
Public Health

Economy/Society

Governance/Management

Design Value

100 year flood level

River flooding

Number of storms

Stormwater drainage rates

Change in groundwater
levels

Duration of drought

Shoreline composition

Number of days of
Precipitation

Consecutive days of
precipitation

Aquifer volume

Well Data

SPECIAL REPORTS



Groundwater



Stormwater and Regional Flooding




Trees



Disease Outbreak



Glaciers And Ice Melt



Accurate Heat Maps



Local Agriculture



Marine Resources/
Ocean Acidification



Feasibility Of
Managed
Retreat



Saltwater
Intrusion



Housing
Market/Property
Values



Shoreline
Management



Climate Change
Mitigation



Contaminated
Sites Risk



Native and
Invasive Species



GBRAG Special Report #1:
Groundwater

Dr. Jayne F. Knott, PhD
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University of Massachusetts Boston