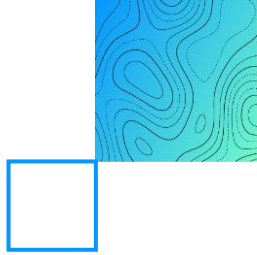


## PANEL:

# The Urgency of Climate Risk Management in Commercial Real Estate





**WILLY ACCAME**

Industry Advisor  
National Center for  
Atmospheric Research



**KEVIN FAGAN**

Senior Director – Head of  
CRE Economic Analysis  
Moody's Analytics



**BRETT BASS**

R&D Associate  
Oak Ridge National  
Laboratory



**KEVIN SCROGGIN**

Director of Risk Management  
LaSalle Investment  
Management

## Property Resilience Assessment Standard

### Update on ASTM Work Group 62996

October 13, 2022



## Why Develop a Property Resilience Assessment Standard?

- Regulatory and stakeholder pressure to document and disclose physical climate risk
- Financial community and ownership seek to evaluate, document and account for physical climate risk
- Providers are generating climate risk assessments with wide variation in scope
- Transparency and consistency is needed. Risk information should be provided alongside site observations and resilience recommendations



## Benefits of Developing a Property Resilience Assessment Standard

- User and Provider communities will benefit from the consistency provided by an ASTM standard
- Require transparency for scope, resolution, resources, return periods, and resilience measures
- Align with existing ASTM due diligence standards already in place (ESA, PCA, Seismic)
- May generate the basis for future hazard-specific practices under ASTM

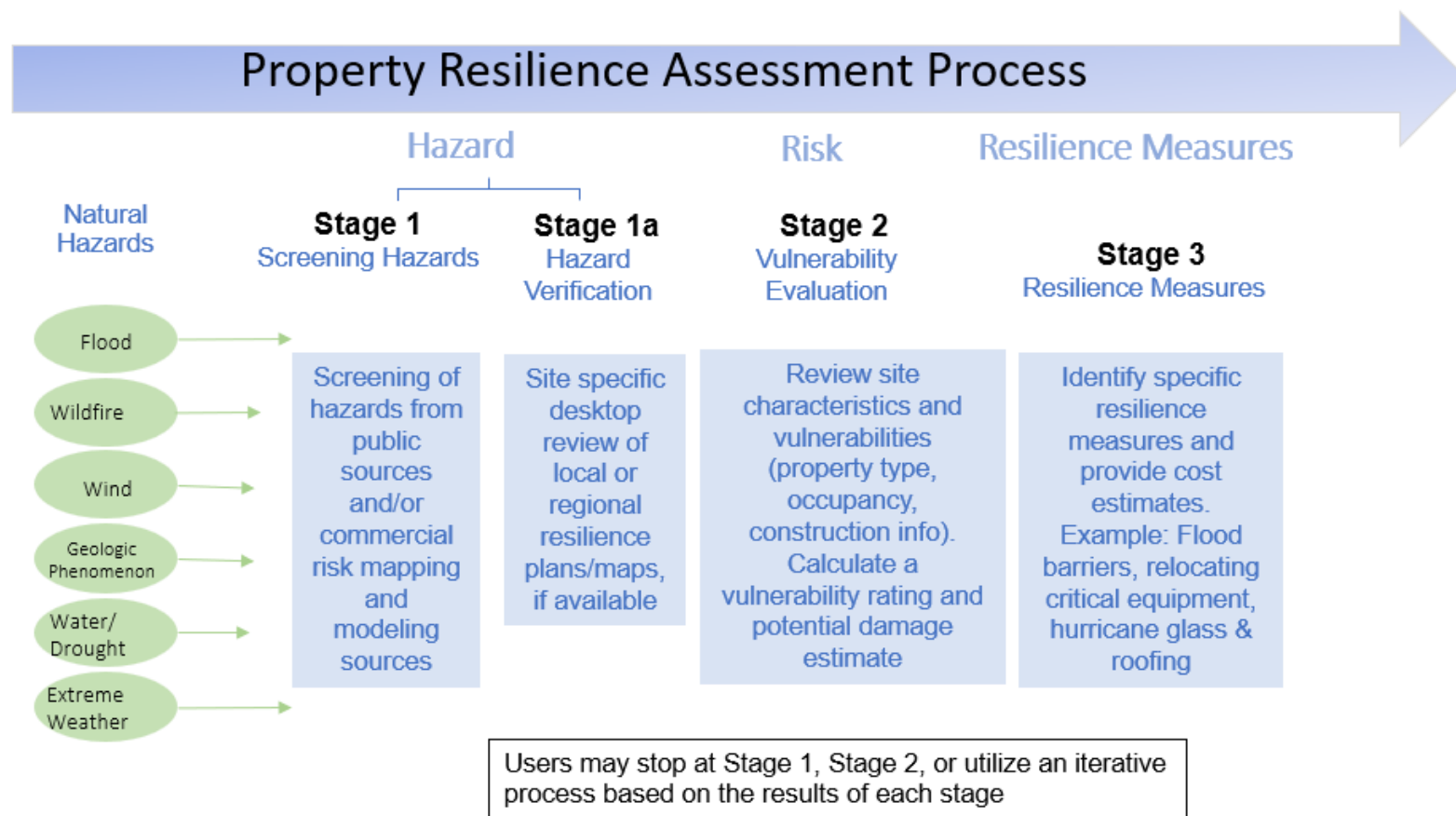


## Task Group Participation

- Adaptation International
- BREEAM US
- Insurance Institute for Business & Home Safety
- NCAR
- US Resiliency Council
- Building Technology Inc
- Climate Advisory
- Fannie Mae
- Freddie Mac
- Virginia PACE
- Institute for Sustainable Communities
- ASCE
- Enterprise Communities
- ULI Resilience Program
- GAF
- Turner Construction
- Academia
- Resilience Youth Network
- Resilient Design Institute
- Institute for Sustainable Communities
- 40/86 Mortgage Capital
- Chase
- JP Morgan Asset Management
- Prologis
- Heitman
- Panattoni
- Citizens Bank
- PGIM Real Estate
- CIT
- Revantage / Blackstone
- LBA Realty
- US Bank
- Met Life
- Principal Financial
- LaSalle
- TA Realty
- Amazon Web Services
- Equity Residential
- Regions Bank
- PCCP
- EY
- LivCor
- AEI
- Apex Companies
- Arup
- BBG
- Cannon Design
- Simpson Gumpertz
- Marx/Okubo
- Climate Advisory
- TRI
- Dewberry
- Bureau Veritas
- EM Partners
- EBI
- EFI Global
- Partner Energy
- EPM
- Nova
- Verdani
- Intertek
- TRC
- Haselton Baker
- McCarter & English
- Moody's
- Lightbox
- RMS
- Measurbl
- Risk Footprint
- Climate Check
- EPIC Insurance
- ResCentric
- SPA Risk
- MSCI
- MunichRe
- Envirosite
- True Flood Risk
- SPA Risk
- ImageCat

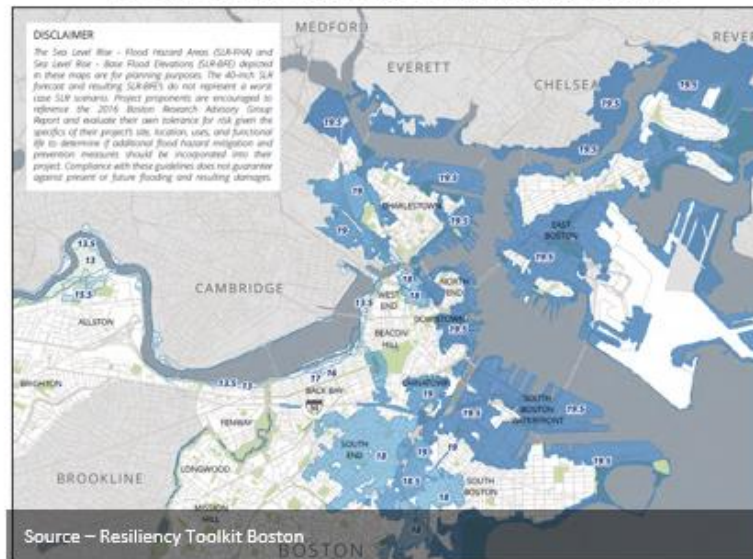


## Developing a Framework:



## Stage 1 – Hazard Screening/Verification

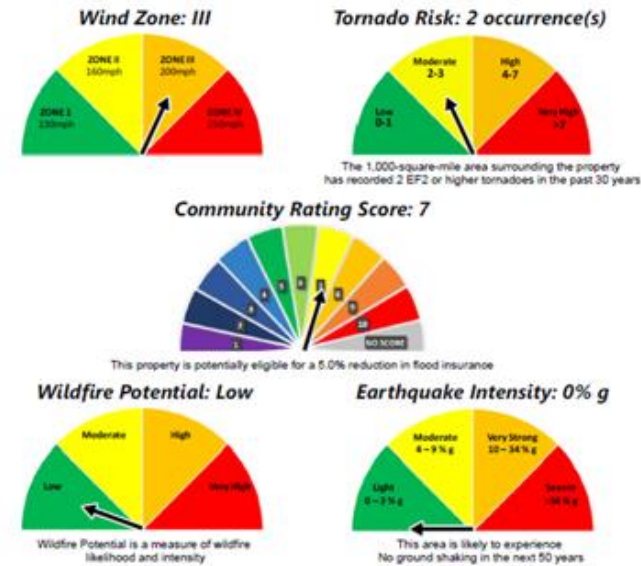
BPDA Sea Level Rise-Flood Hazard Area Map



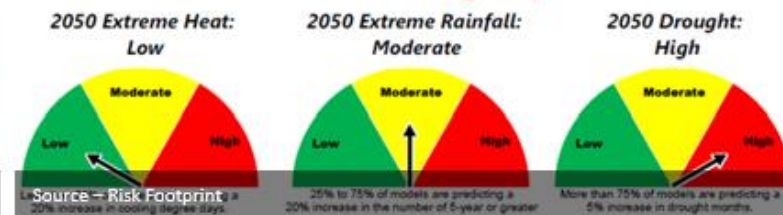
Climate Hazard	Risk Level	Site Score	Country Benchmark
Floods	Low	7	17
Heat Stress	Medium	39	44
Hurricanes & Typhoons	None	0	18
Sea Level Rise	None	0	6
Water Stress	Medium	35	45

Source – Moody's ESG

Natural Hazards and Climate Change Impacts



Future Climate Change Impacts





## Stage 2 – Building Vulnerability & Sensitivity Evaluation

- Site Inspection
- Consider Natural of occupancy / type of use (sensitivities)
- Rating system or calculations of probable maximum loss or value at risk
- Consider building characteristics (vulnerabilities)
- Assess vulnerabilities and sensitivities to the hazards identified in Stage 1



## Stage 3 – Resilience Measures

**Protection:** Strategies to reduce a building's vulnerability to extreme weather:

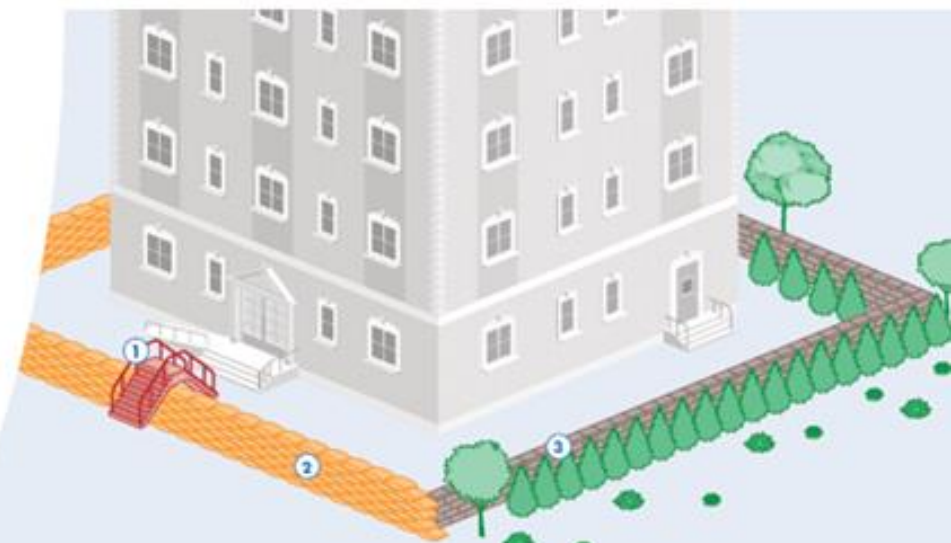
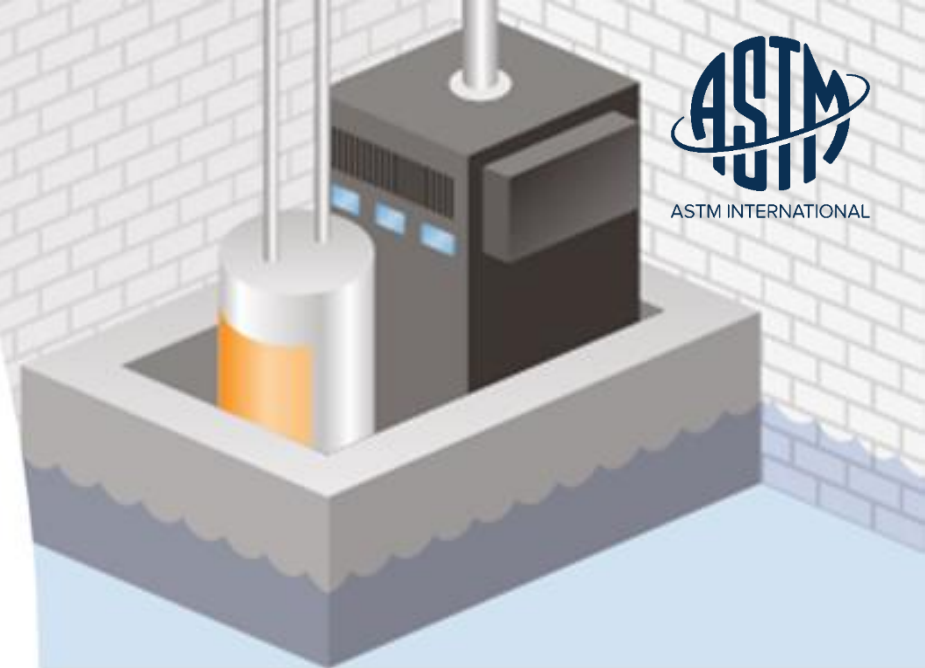
- Site perimeter floodproofing
- Hardening of roofs and windows
- Backflow valves and sump pumps

**Adaption:** Strategies that improve a building's ability to adapt to changing climate conditions:

- Elevated equipment and living space
- Stormwater management
- Window shading and distributed heating/cooling

**Back-up:** Strategies that provide critical needs when a facility loses power or other services:

- Backup power to critical systems
- Emergency Lighting
- Access to potable water



① Provide entry and exit over barriers.

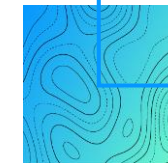
② Temporary flood barriers can be deployed before a flood.

③ Permanent barriers can be part of landscaping or security plans.

## The Role of the PRA Reviewer

- Professional in architecture, engineering, or science, 3-5 years experience in building performance, natural hazard mitigation, and/or building resilience fields
- Manages PRA from start to finish and interfaces with the User. Obtains climate risk assessment, generally from a third-party provider.
- Retains “hazard screening reviewer”, “field observer”, and “hazard specialists” as needed. Recommends Stages 2 and/or 3 be performed.
- Reviews and signs PRA



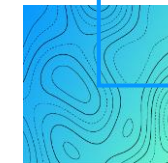


## Financial Perspective



**KEVIN FAGAN**

Senior Director – Head of  
CRE Economic Analysis,  
Moody's Analytics



## Investor Perspective



**KEVIN SCROGGIN**

Director of Risk Management,  
LaSalle Investment  
Management



LIGHTBOX

**PRISM**  
2022



# Climate Change Risk Management

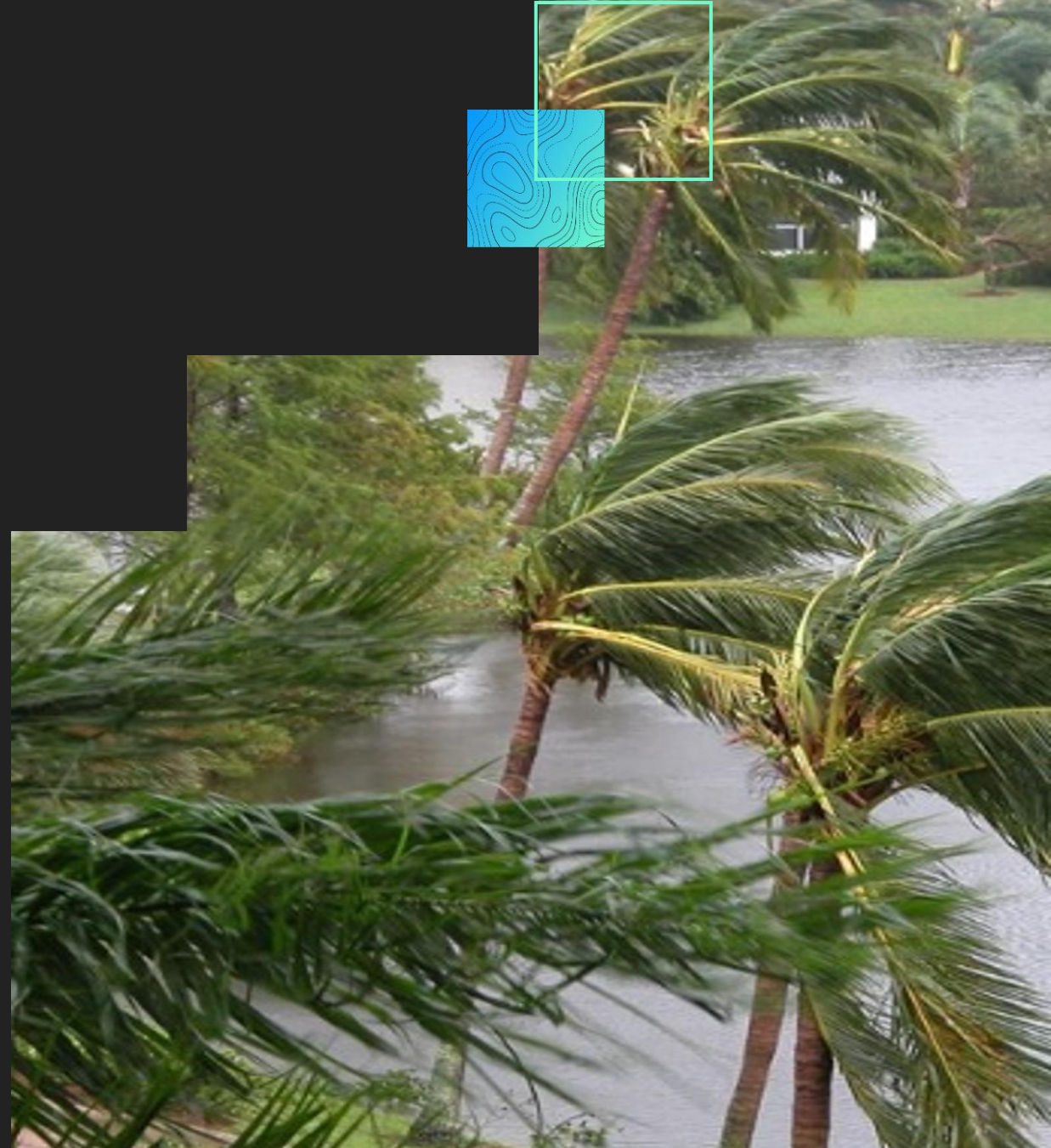


LIGHTBOX



## Climate risk brings with it risk and opportunities, if we know where to look.

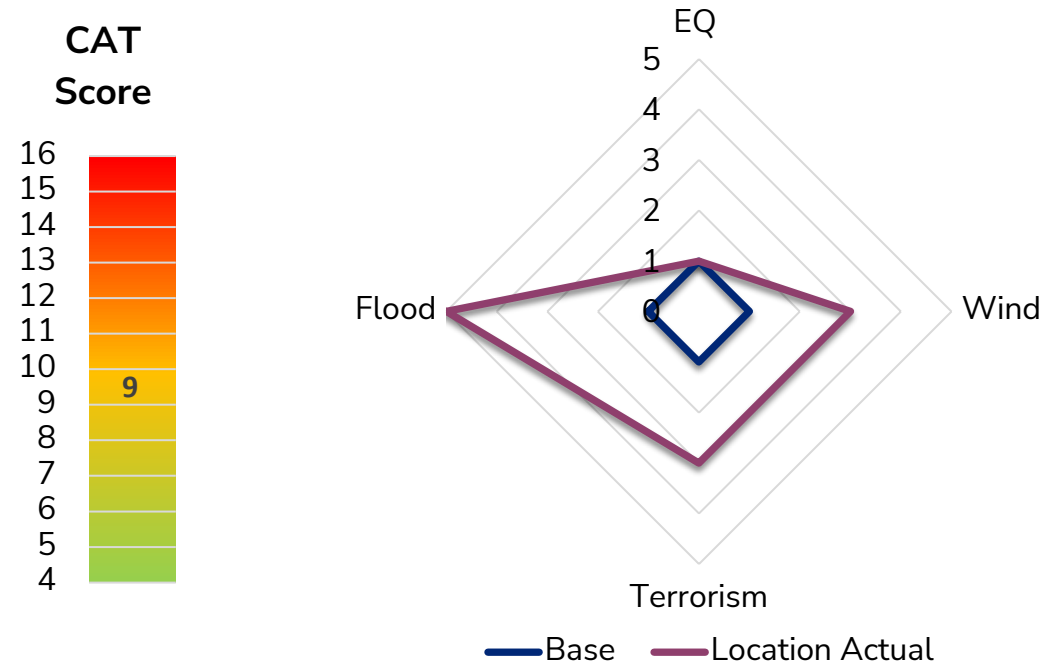
The attention given to climate risk is accelerating around the world as more evidence of change becomes recognized. We're seeing the impacts of a changing climate more frequently in the news while many are more frequently feeling the impacts in their daily lives and in their pocketbooks. **Climate risk is a complex and nuanced issue for the real estate industry that brings with it risks and opportunities -if we know where to look.**



# Early Work – ‘Cat’ Score Development

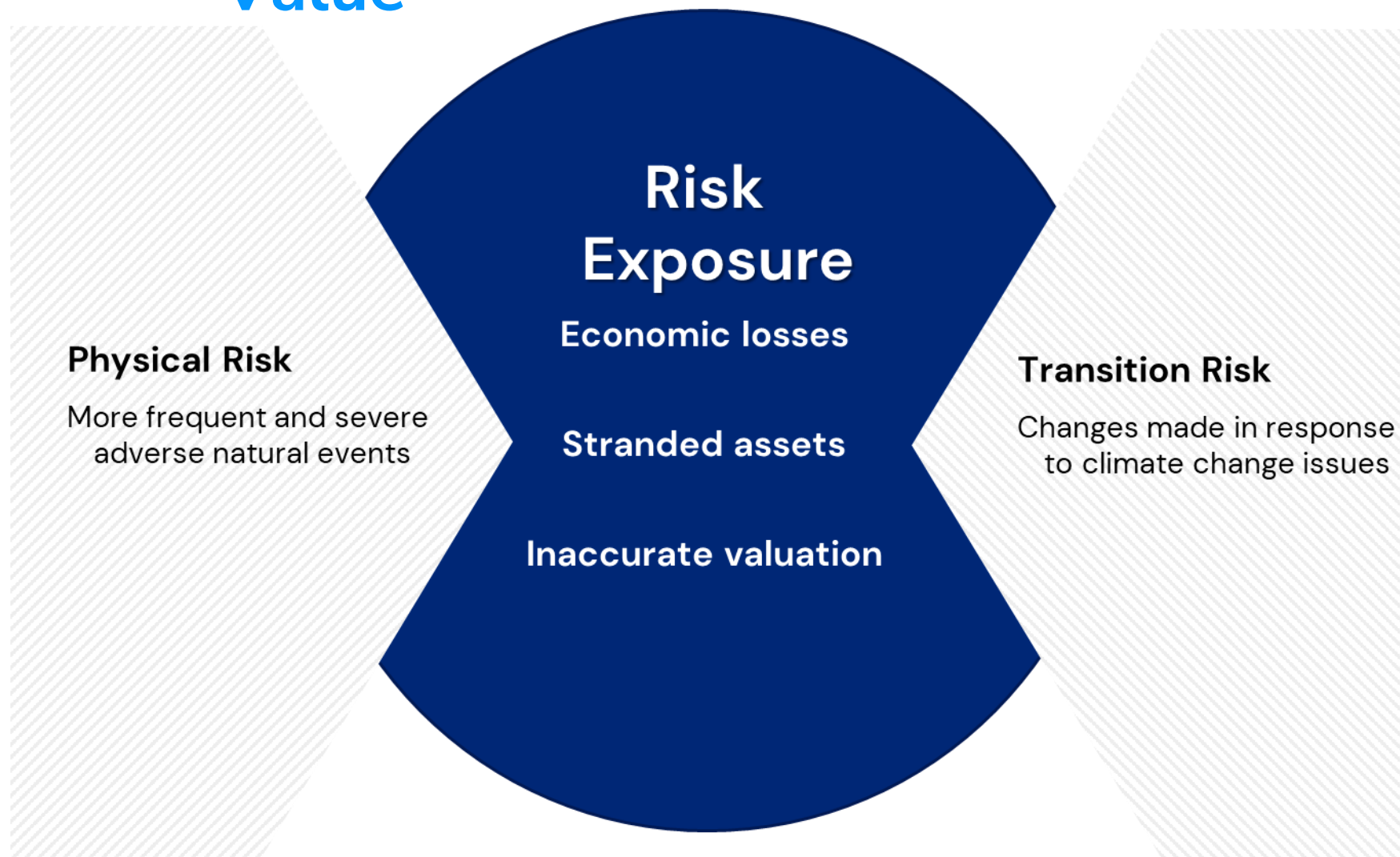
## Post Hurricane Harvey - 2017

### Location CAT Score



Base Premium	CAT Adjusted Premium	Difference
\$43,512	\$123,171	\$79,660

## Risks - Impacts to Real Estate Value



# Tools and standards for better future pricing in climate risk



Mapping physical risk for current portfolios and potential acquisitions



Incorporate climate risk into due diligence and investment decision-making processes



Incorporate additional physical adaptation and mitigation measures for assets at risk



Explore strategies to mitigate risk: portfolio diversification and investing directly in mitigation measures



# Physical climate risk

## How to choose, use and better understand analytics

Consider the following:

1. How do physical risk analytics firms **measure climate change** and what to they measure?
2. How are real estate investment firms **assessing and addressing** physical risk data in their business today?
3. To what extent, if any, is current physical risk **priced into commercial real estate**?
4. How can real estate investors and climate risk analytics providers **improve decision making**?

*“ ... and challenges related to translating complex science into real estate decisions.”*

[View more in the full report from LaSalle and ULI.](#)



# Climate Risk Analysis Moves Into Investment Process

Collaborate closely with partners in the insurance industry.

Not too long ago, many investors looked to insurance as their silver bullet for covering physical climate risk. Investors have become increasingly aware that [insurance is traditionally provided on shorter horizons than most investment holding periods](#), and that coverage may increase in cost or simply become unavailable as physical climate risk accelerates.

We are [working with our insurance providers to understand how they are using climate risk modeling](#) and over what time horizon they are doing this analysis.

By understanding Insurer's approach, we may be able to [better predict the path of insurance costs/availability and where coverage may actually cease altogether](#).



## Climate Risk Analysis generates opportunities

### Opportunities might include:

- Achieving financial outperformance by anticipating climate change impacts
- Hardening standing assets to withstand hazard events
- Diversifying portfolios across hazards and potential impacts
- What other opportunities can you identify in your role?



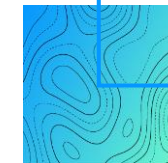


## LaSalle's integration with many different disciplines

### OPPORTUNITIES ACROSS ALL DEPARTMENTS IN THE FIRM

We constantly try to find the opportunities  
in the market that take our clients ahead  
of trend





# Energy Management Perspective



**BRETT BASS, PH.D.**

R&D Staff Member  
Grid Interactive Controls  
Group, Oak Ridge National  
Laboratory

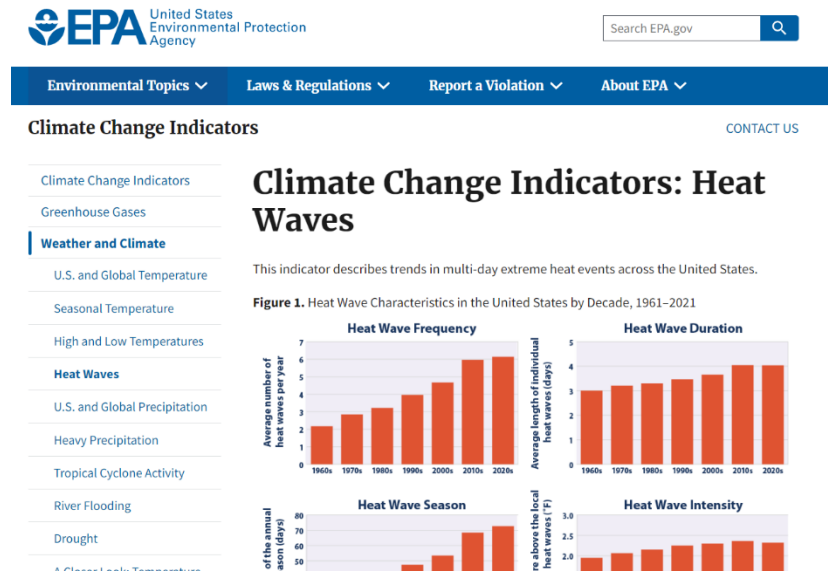


## Why Model Building Energy?

- Replicate behavior of buildings
- Understand how changes will affect buildings
- Develop optimal solutions to changed environment



<https://abcnews.go.com/US/california-blackouts-power-grid/story?id=89460998>



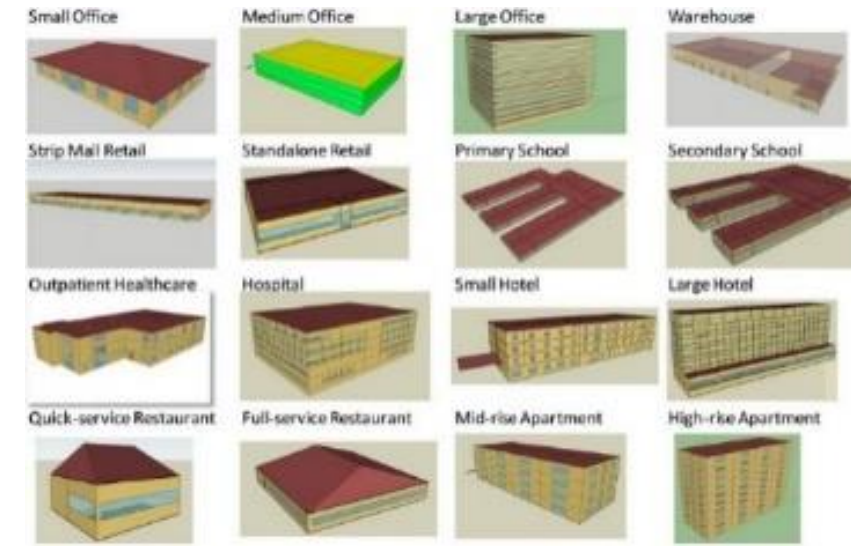
<https://www.epa.gov/climate-indicators/climate-change-indicators-heat-waves>

## AutoBEM

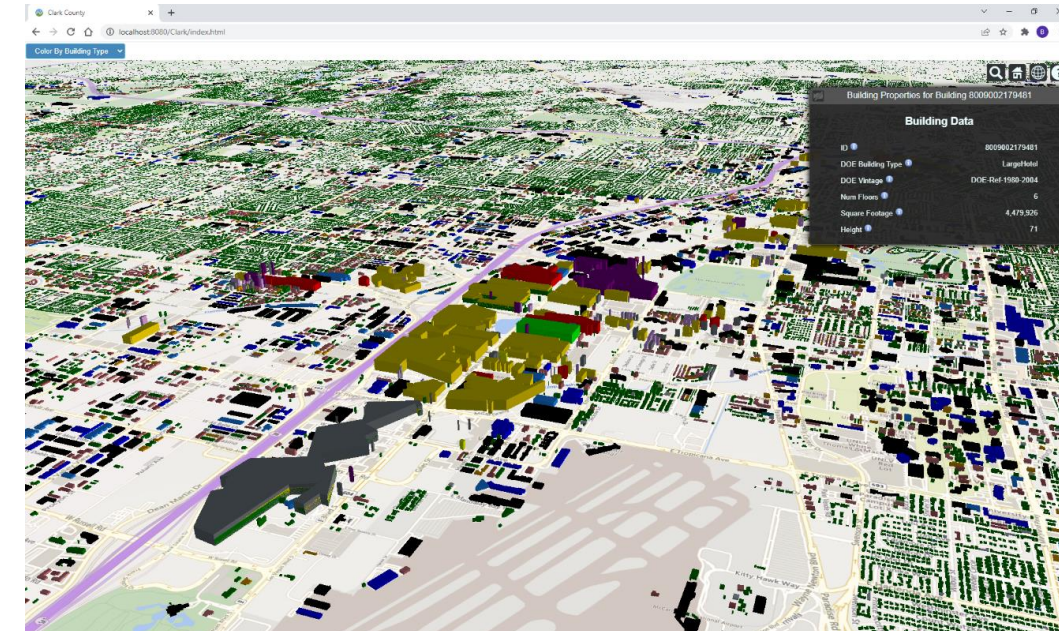
- AutoBEM takes set of building properties as inputs
  - Building Footprint
  - Building Height
  - Building Type
  - Building Age
- LightBox parcel data can be used to generate building energy models



OpenStudio



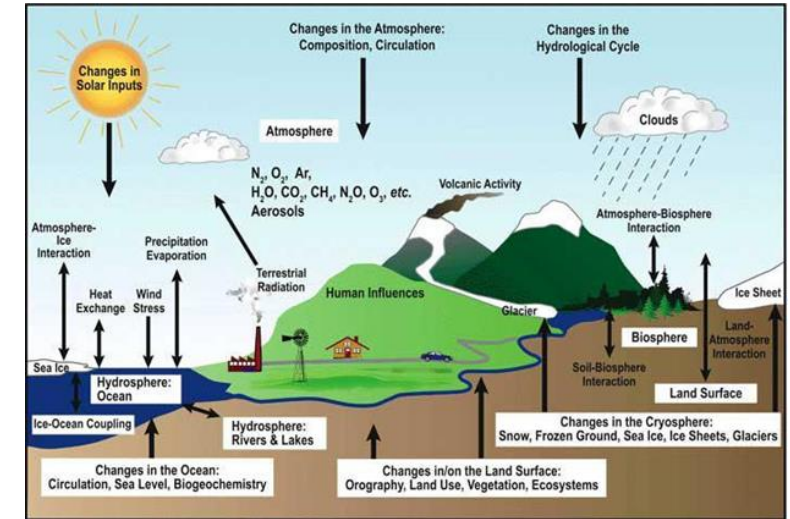
DOE Prototype Buildings



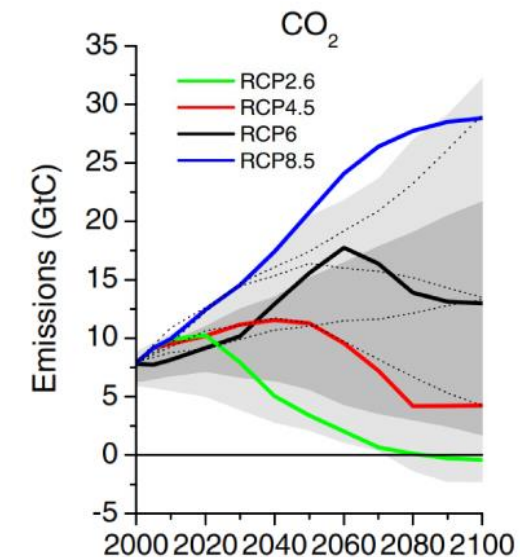
Clark County (Las Vegas) Modeling Example

## Climate Model Projections

- How atmosphere, oceans, land, and sea ice interact
- Projections of future weather validated against measured data
- Various climate scenarios
- Can be morphed into weather data for simulation

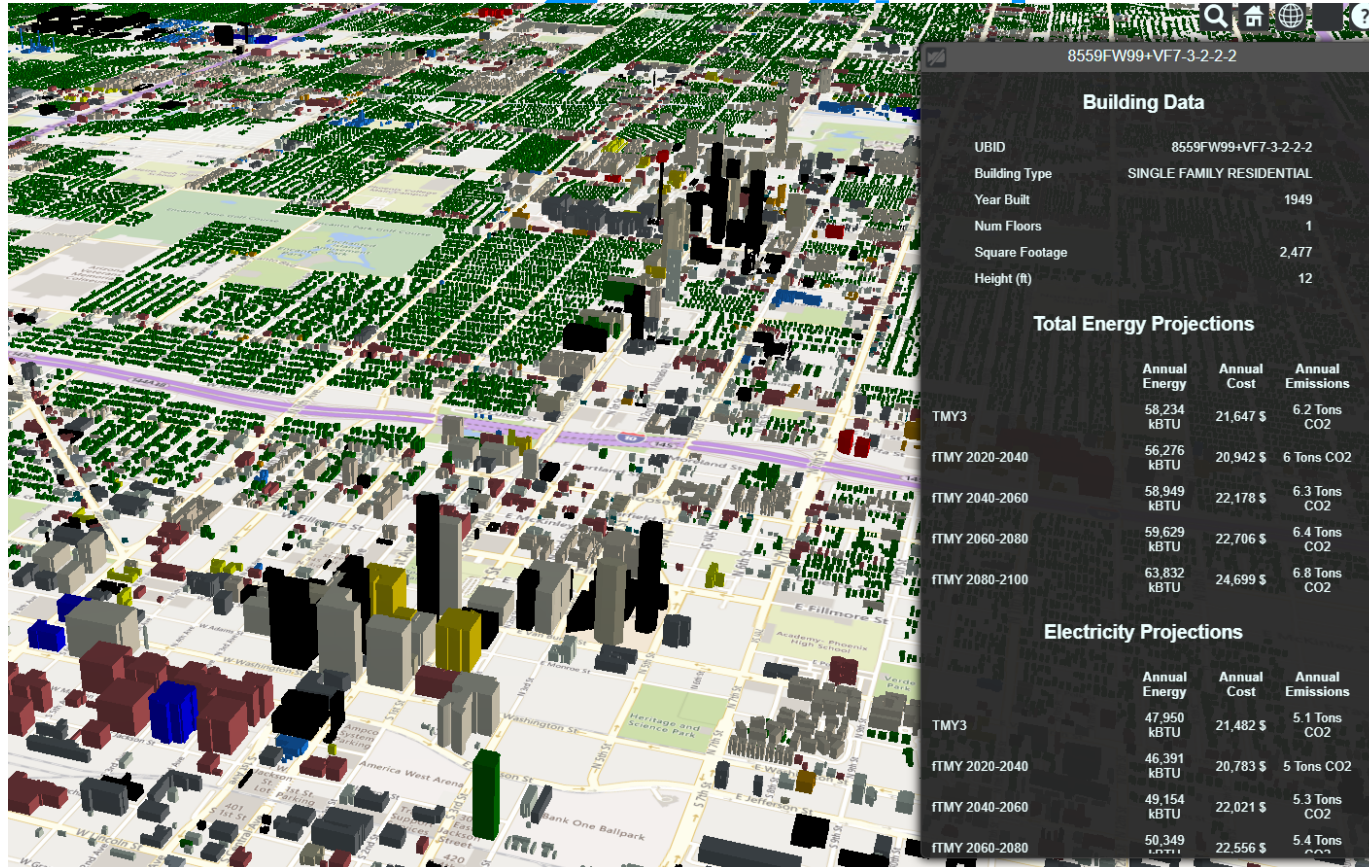


[https://archive.ipcc.ch/publications\\_and\\_data/ar4/wg1/en/faq-1-2.html](https://archive.ipcc.ch/publications_and_data/ar4/wg1/en/faq-1-2.html)



<https://skepticalscience.com/rcp.php?t=1>





Scenario	Average Dry Bulb Temperature (°F)
2020-2040	24.1
2040-2060	25.8
2060-2080	26.6
2080-2100	29.1

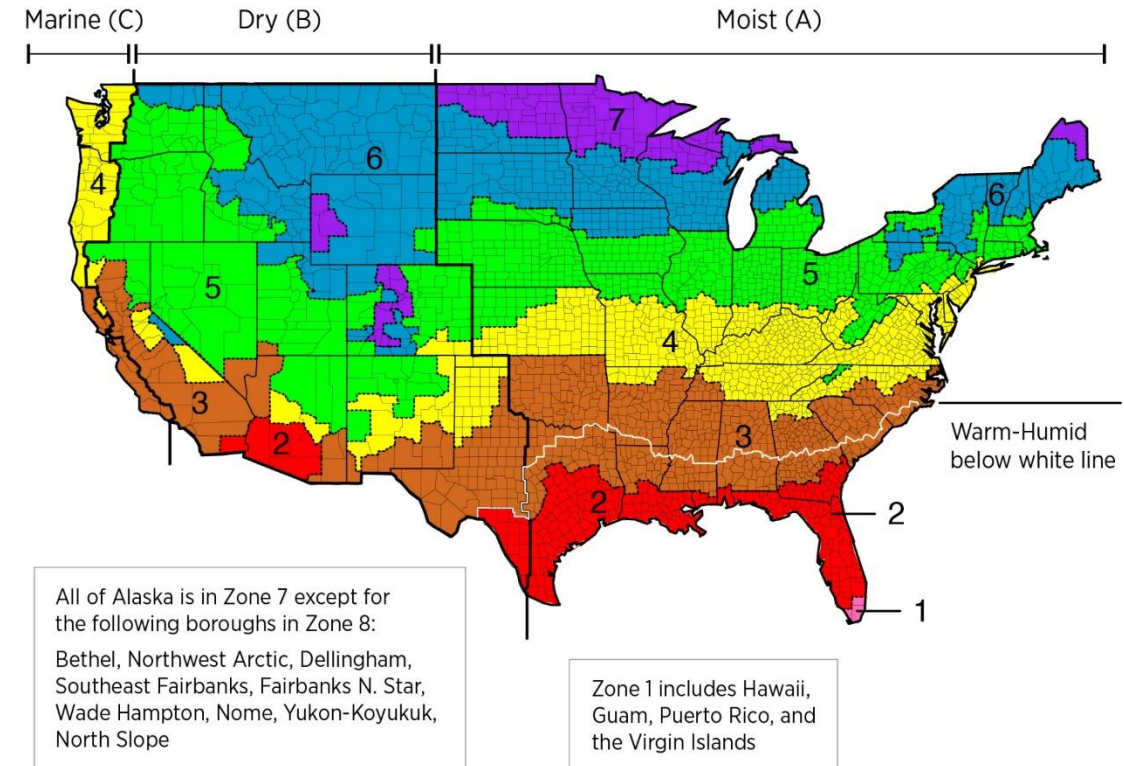
Scenario	Total Energy	Electricity	Natural Gas
2020-2040	0.24 Quads	0.20 Quads	0.04 Quads
2040-2060	4.4%	5.5%	-2%
2060-2080	5.7%	7.9%	-7%
2080-2100	12.7%	17%	-11.3%

Scenario	Total Costs	Total Emissions
2020-2040	\$ 8.5 Billion	26 Million Tons CO2
2040-2060	5%	4.4%
2060-2080	6.9%	5.7%
2080-2100	15%	12.7%

Scenario	July Total Energy
2020-2040	0.03 Quads
2040-2060	9%
2060-2080	12.3%
2080-2100	20.7%

## How do we prepare for these changes?

- Different climate zones require different solutions
- Where do we allocate our investments?
  - Building technology and retrofits

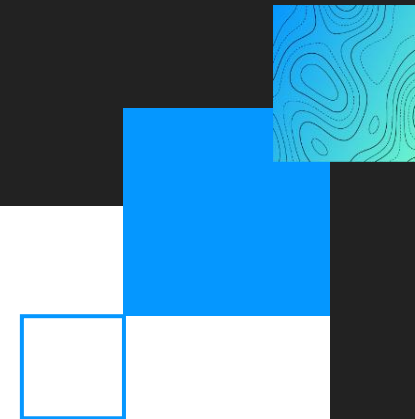


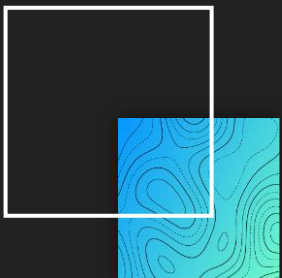
<https://basc.pnnl.gov/images/iecc-climate-zone-map>



## Key Takeaways

- ASTM PRA will help provide transparency and consistency to the CRE User community. Climate risk analytics will be enhanced by site observations and resilience recommendations
- Need input from Kevin Fagen here
- Investors are anticipating climate change impacts, hardening standing assets and diversifying portfolios across hazards and potential impacts
- Building energy demand will change as future climate changes. We need to manage future demand by investing in energy technology and retrofits





LIGHTBOX

PRISM

2022

