Extreme Heat in Massachusetts

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Purpose of CIA

- Evaluate combined environmental, health, and socioeconomic conditions in or near Environmental Justice (EJ) populations.
- Provide context for air permit decisions under 310 CMR 7.02(14).
- Promote data-driven, transparent analysis of community conditions and potential incremental impacts.

Indicators and Data Categories

- **Air Quality & Climate Indicators**
  $PM_{2.5}$, Ozone, Diesel PM, Traffic Proximity, Air Toxics Cancer Risk, Respiratory Hazard Index, Impervious Surface
- **Nearby Regulated Sites**
  Including permitted air facilities, waste facilities, TRI sites, etc.
- **Population Characteristics & Health Indicators**
  Asthma in Schools, Blood Lead, Low Birth Weight, Premature Deaths, COPD, Coronary Heart Disease
- **Socioeconomic Indicators**
  Low Income, Community of Color, English Isolation, Under 5 Years, Over 65 Years
- **Sensitive Receptors**
  Schools, Child Care Centers, Long-Term Care, Public Housing, Prisons

Exploring Heat Integration & Next Steps

Heat is **NOT** currently an official indicator.

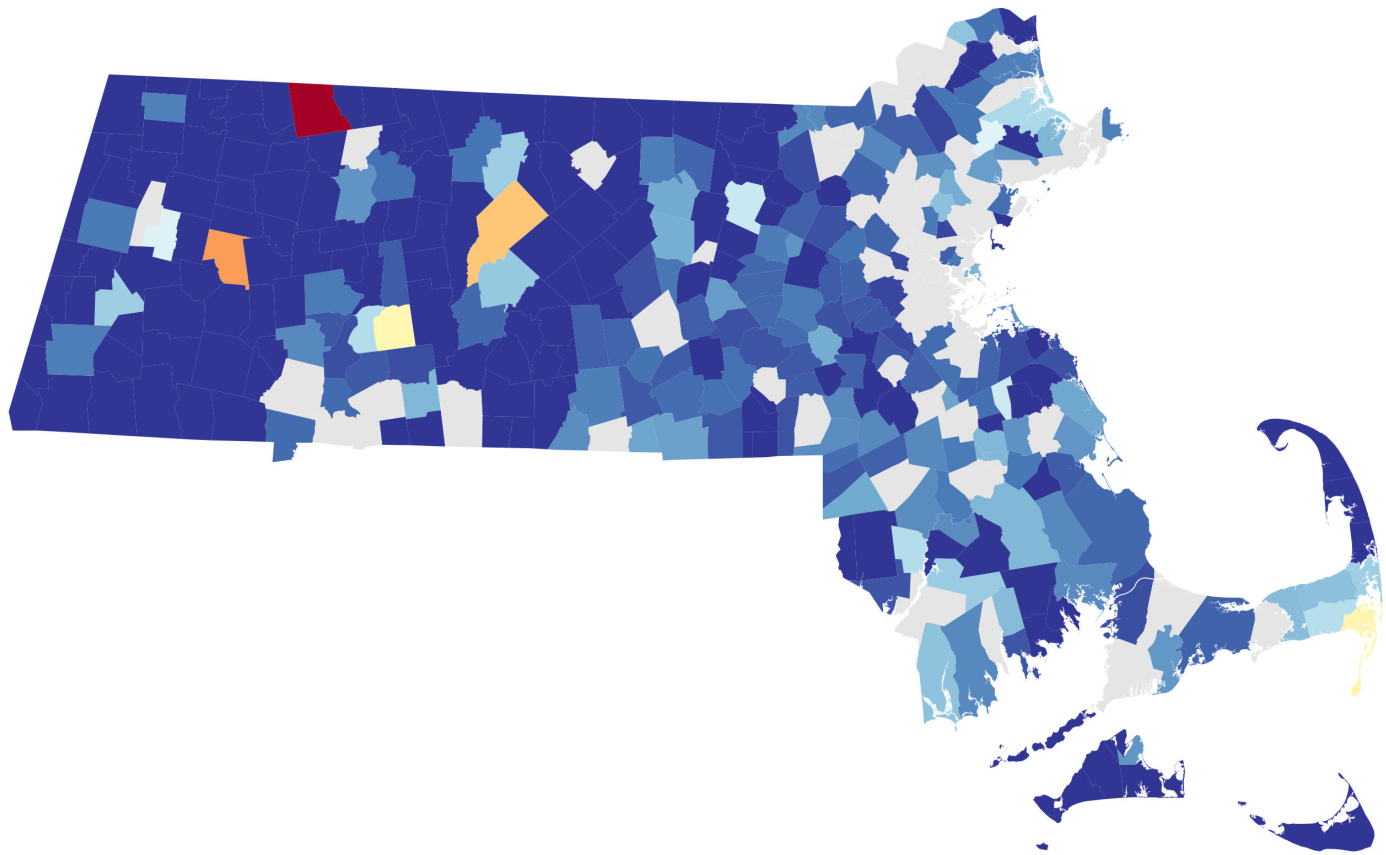
We are exploring data sources and methods to evaluate heat exposure in EJ areas.

Using PRISM daily maximum temperature (Tmax) data to calculate the number of days exceeding 85°F as a potential heat exposure metric.

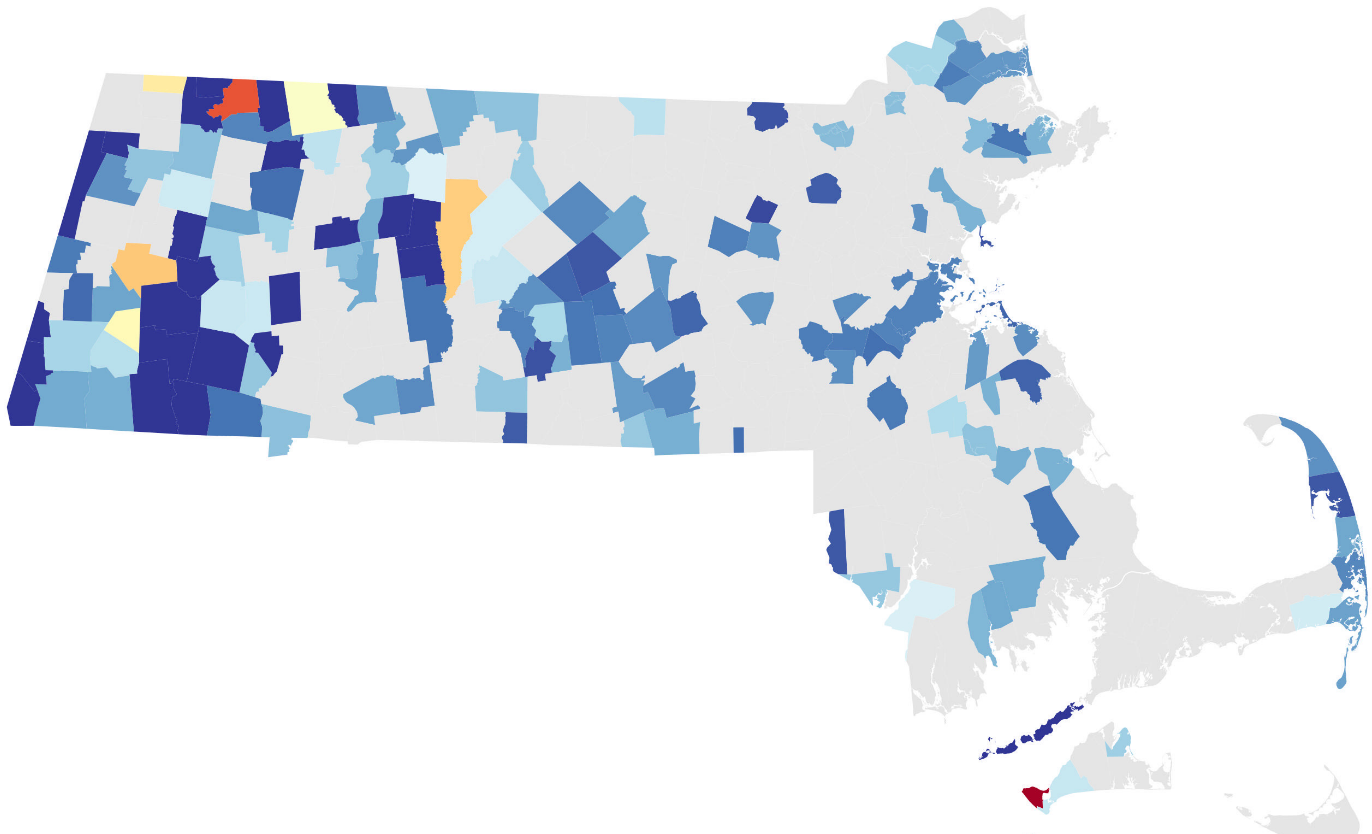
Goal: understand how heat interacts with air pollution and health burdens.

Continued collaboration with partners such as HAQAST to enhance compound stressors data and analysis.

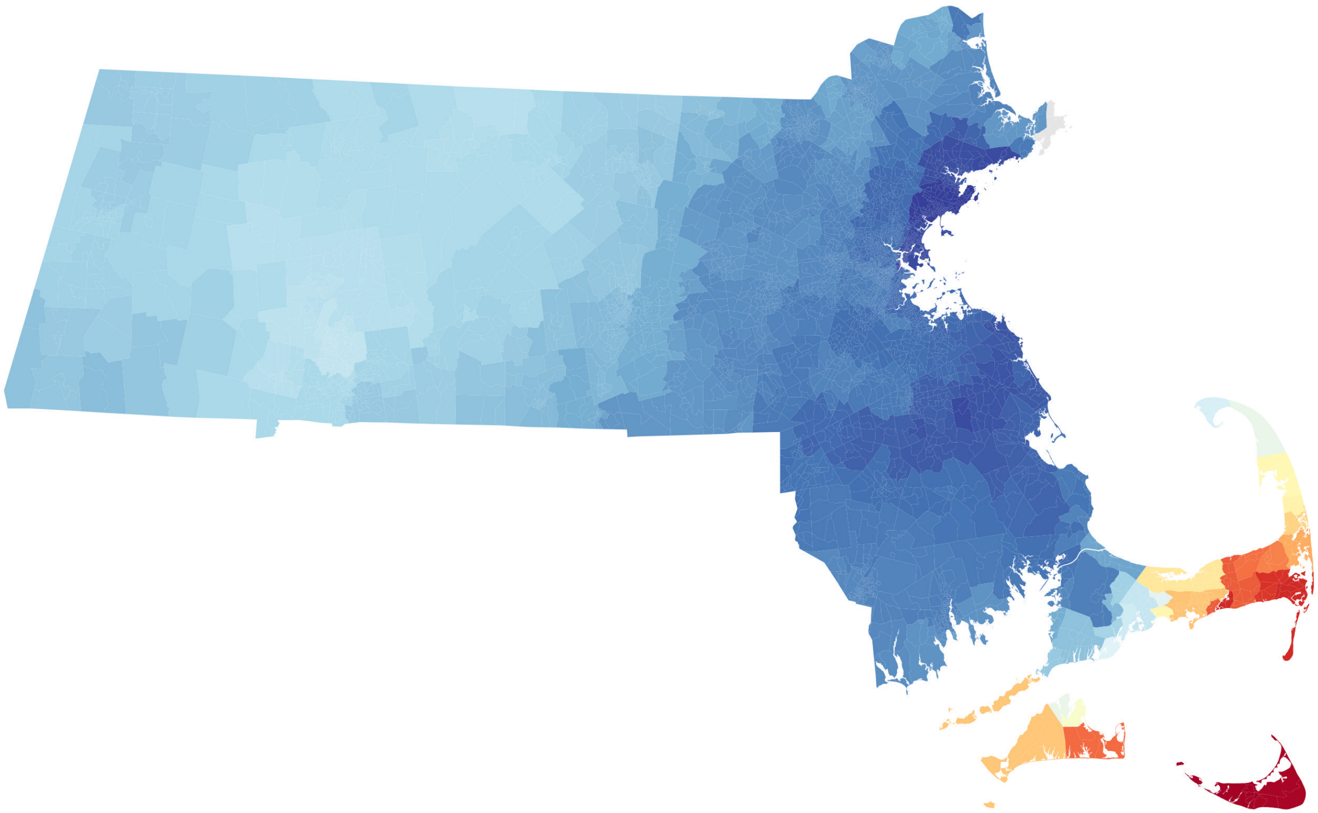
Heat-Related Hospitalization Rate (MDPH) at Municipality Level



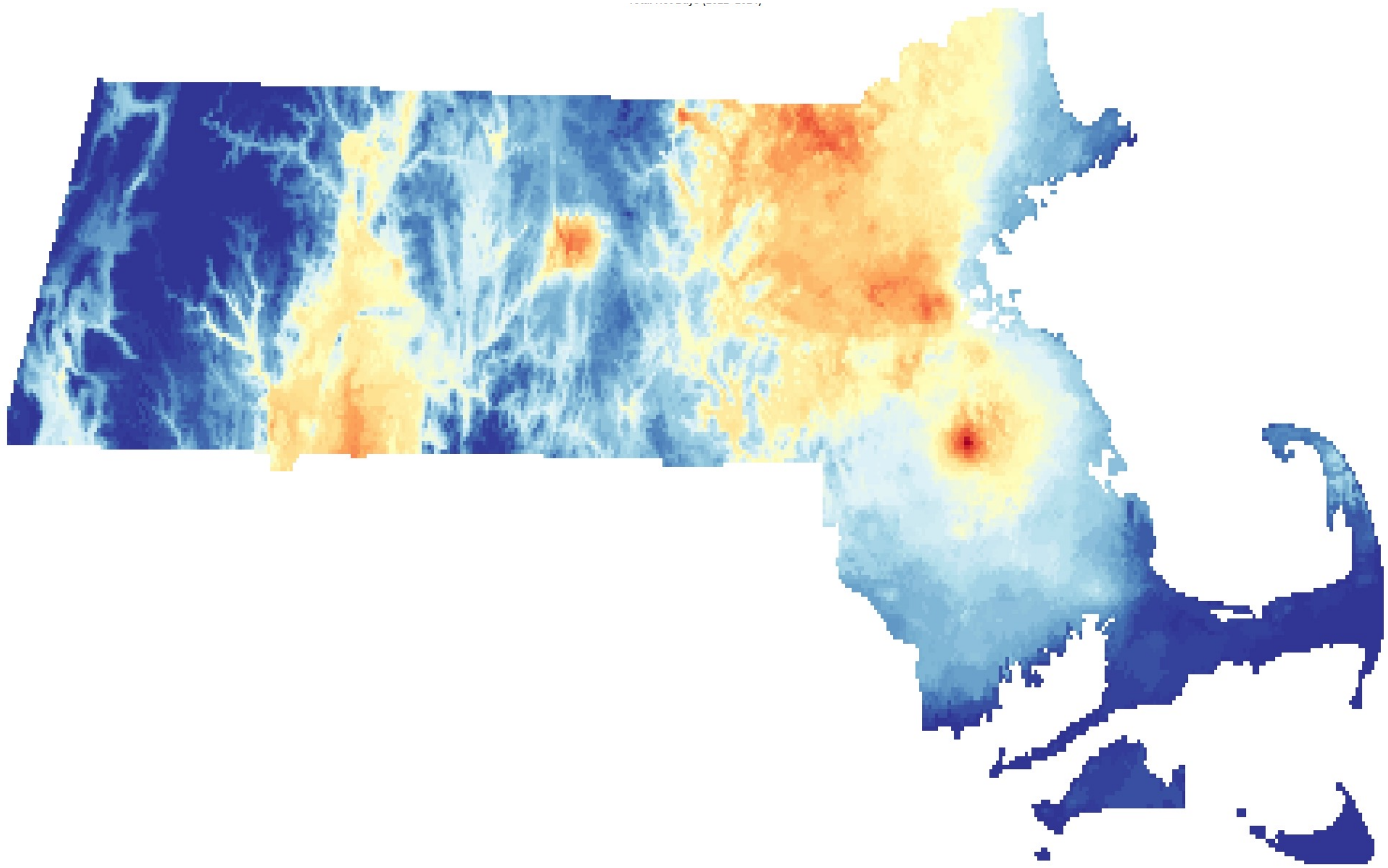
Heat-Related Emergency Visit Rate (MDPH) at Municipality Level



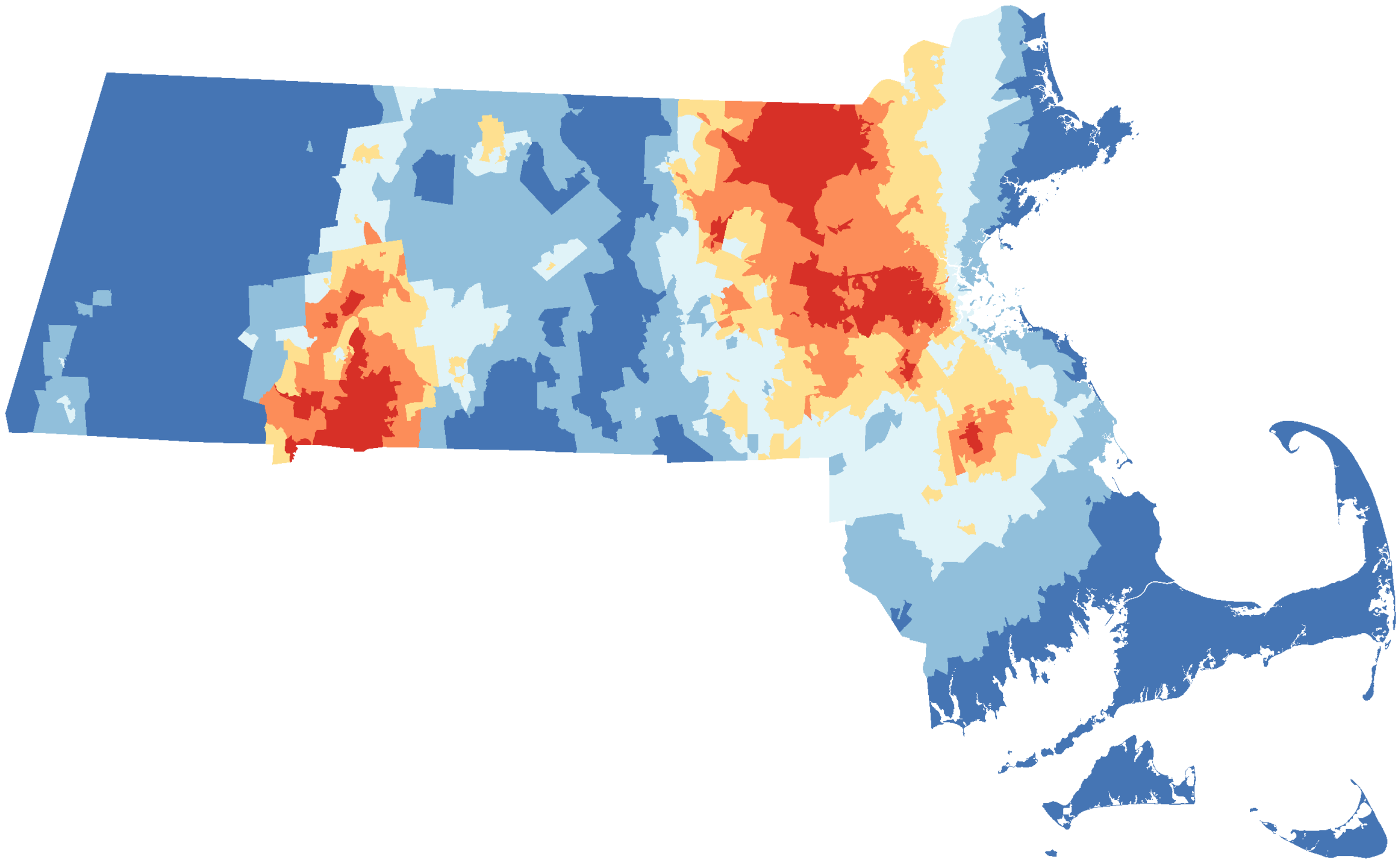
Average number of days in which daily high temperature exceeded the 90th percentile of historical daily high temperatures at Block Group Level



Using PRISM 800-m Resolution count of days over 90°F across Massachusetts



PRISM Data: Daily Max Temperature over 85°F at Block Group Level



Potential Role of Satellite and NASA Data

Current Status

- The CIA framework currently relies on state and federal ground-based datasets (EPA, DPH, CDC, ACS).
- Satellite data are not yet incorporated, but we recognize their potential for enhancing spatial coverage and consistency.

Future Opportunities

- NASA datasets (e.g., MODIS, VIIRS, TROPOMI) could help fill gaps in pollutant and temperature data.
- Could support contextual analyses of regional air quality and emerging heat indicators.
- Collaboration with NASA/HAQAST can help evaluate data quality and integration methods for future use.

Thank you!