EPA's Environmental Justice Research Roadmap and Interagency Efforts on Climate Justice

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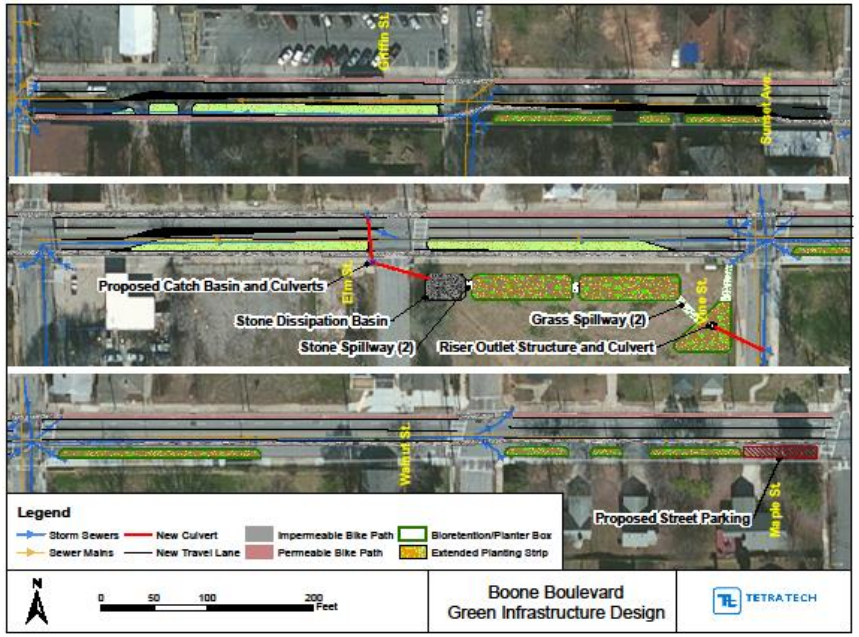
Environmental Justice Research Roadmap



Context

"Climate change is the biggest environmental challenge & public health issue of our time."

-6/23/15 Public Health & Climate Change Summit

"Our most vulnerable citizens, including children, older adults, ..people living in poverty are most at risk to the health impacts of climate change."

-8/3/15 Clean Power Plan

White House Effort on Climate Justice

FACT SHEET: Actions to Build Resilience to Climate Change Impacts in Vulnerable Communities

Federal Interagency Working Group on Environmental Justice (EJ IWG)

Climate Impacts Subcommittee and Educate, Motivate, and Innovate Climate Justice Initiative

Co-chairs
Valerie Zartarian (EPA) and Chris Trent (HUD)

CEQ, DHHS, DHS, DOE, FS, GSA, EPA, HUD, NOOA,USDA, USDOJ

EJ IWG Climate Impacts Subcommittee

Support collaboration across federal agencies and with communities with environmental justice concerns around climate change-related issues:

- Ensuring vulnerable populations are considered in agencies' climate adaptation activities
- Providing tools, systems, and policies to communities and businesses to mitigate impacts on natural resources and human health
- Ensuring broad communication around climate-change related issues
- Implement the Educate, Motivate & Innovate (EMI) Climate Justice Youth Project

Educate, Motivate, Innovate

Build the next generation of climate justice leaders

Expand collaborations with Minority Serving Institutions

Educate: Provide a two-way learning experience, access to information, platform to expand and share knowledge and ideas, and bridge the communication and capacity building gap.

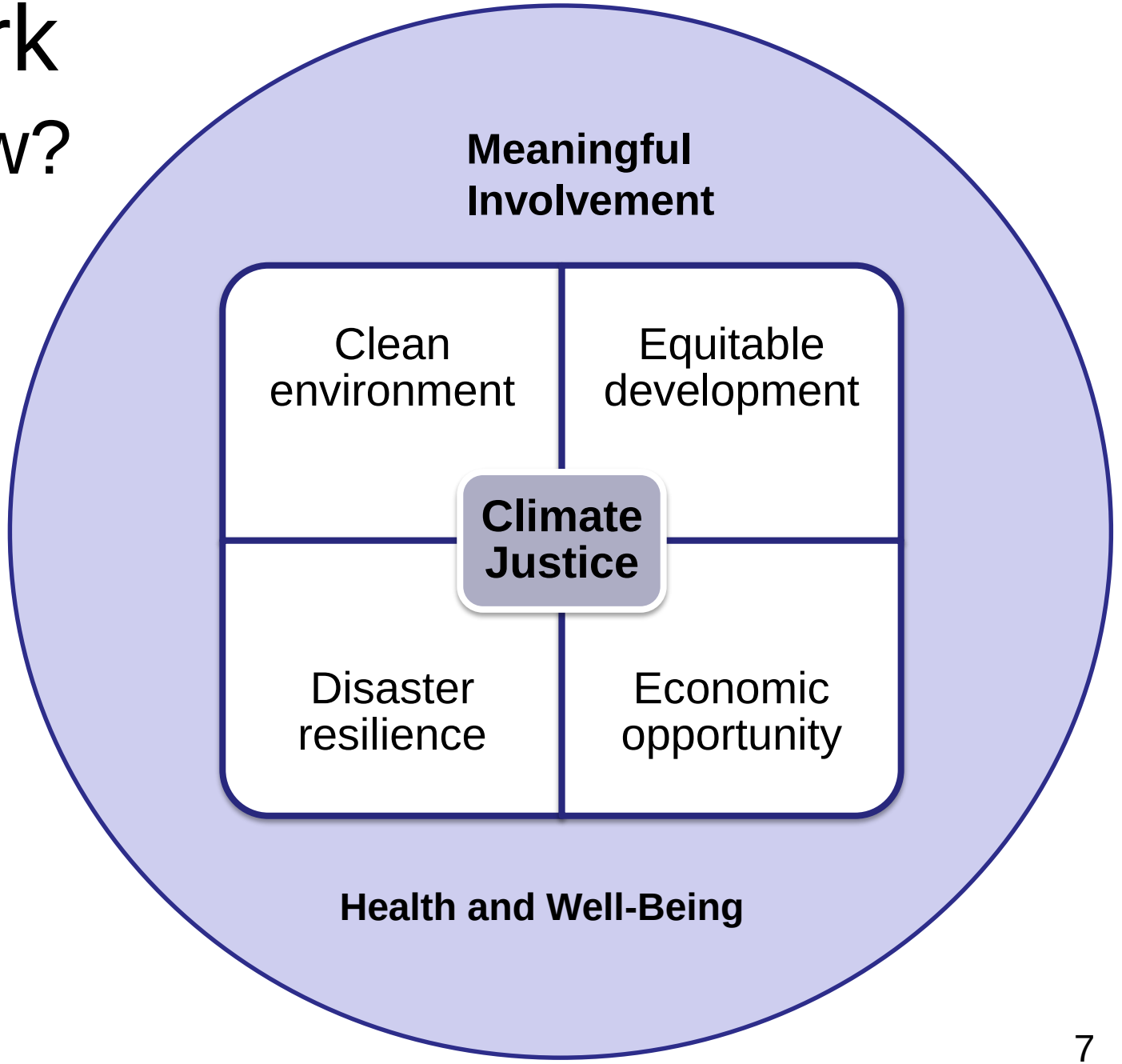
Motivate: Ignite interest, nurture growth and commitment to addressing the complex issues around climate change and Environmental Justice vulnerable communities.

Innovate: Embrace the opportunity for creative thought and action.

Building a Framework

Who is impacted and how?

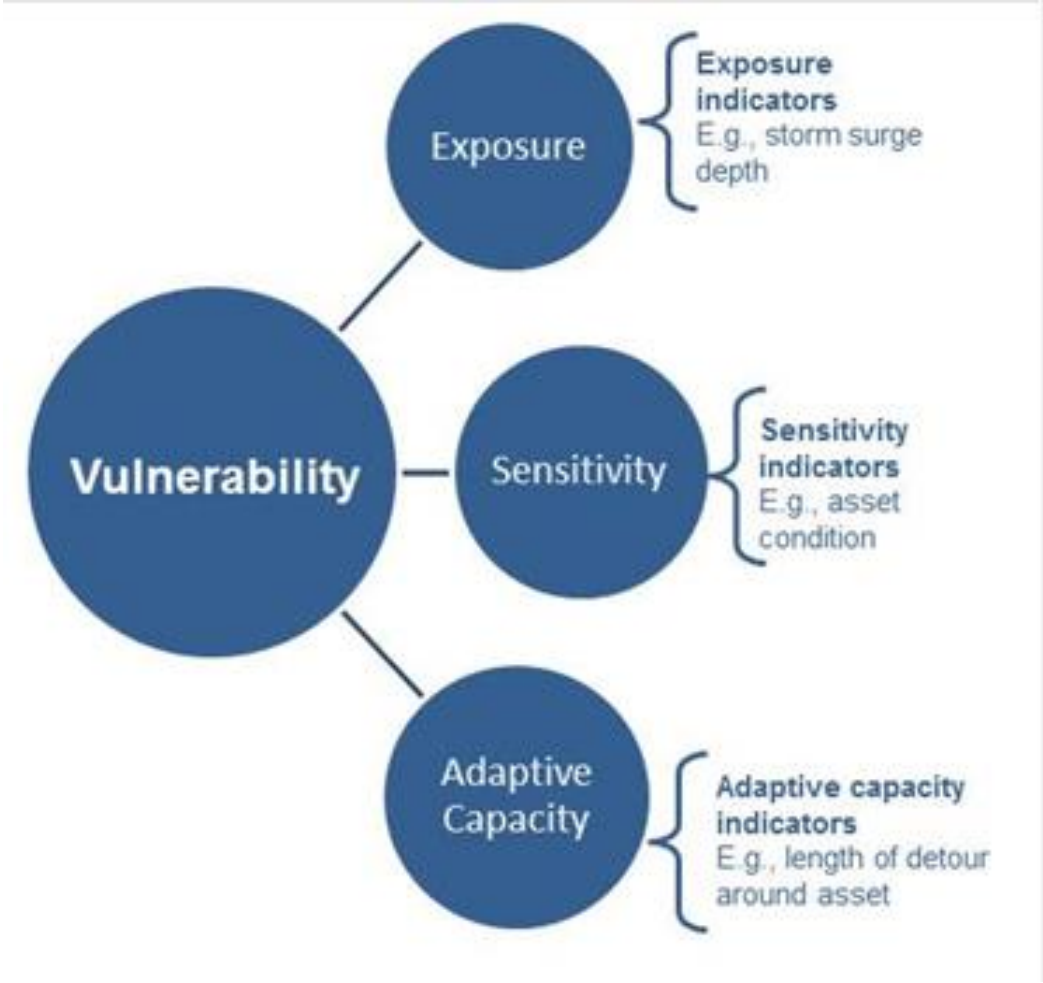
- Emphasis placed on concepts used by affected communities



EJ IWG Activity

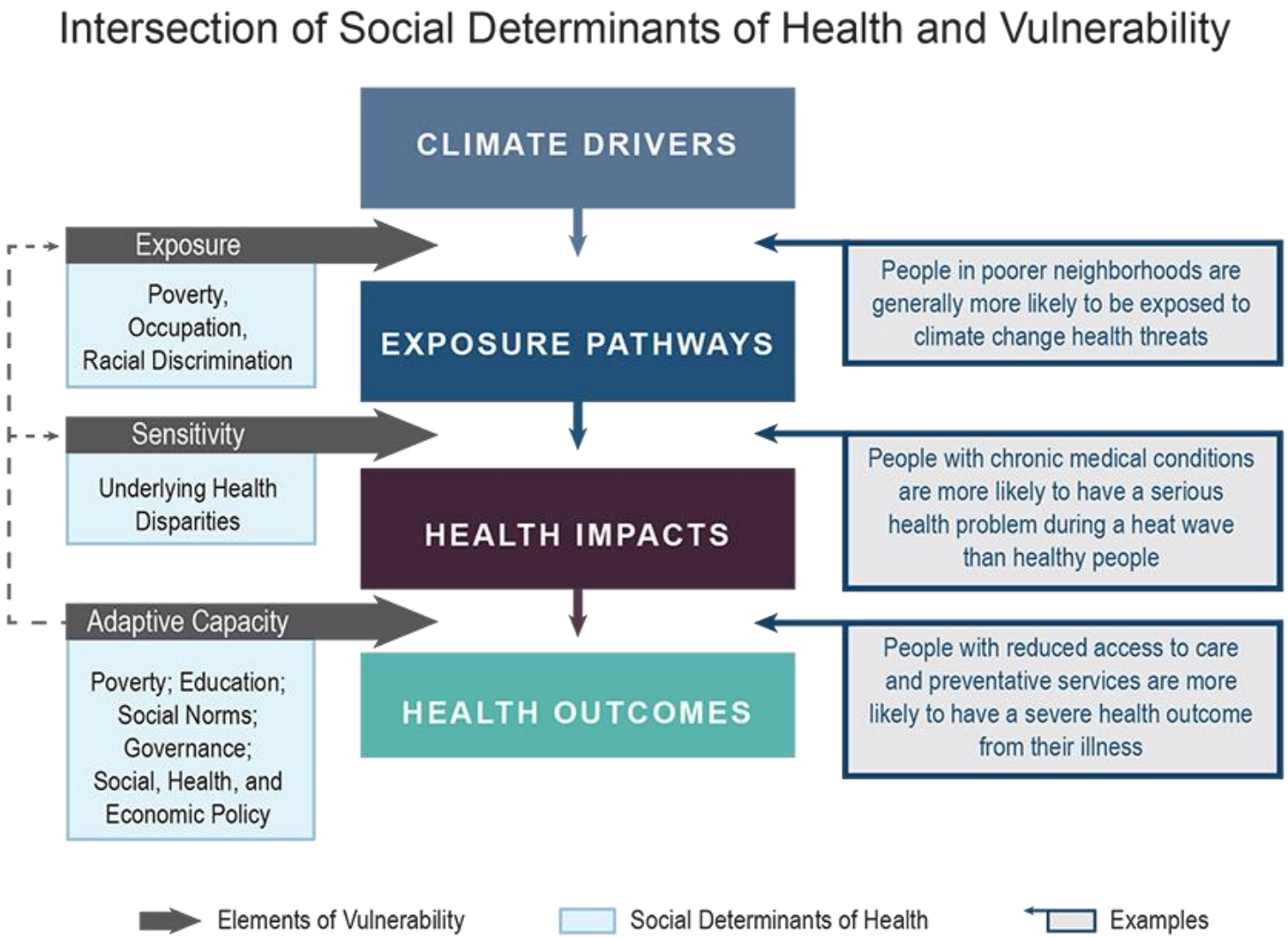
Building a Framework

- Emphasis placed on concepts used by affected communities
- And includes the concepts in a model that can be used any agency to consider how climate justice can be incorporated into its work.



Building a Framework

Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.”



EJ IWG and EPA

USGCRP, 2016

Environmental Justice Research Roadmap

EPA's Goal :

All communities and persons across the Nation enjoy the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, work, and play.

Environmental Justice Goal: That this protection is extended to overburdened communities – minority, low income, tribal populations or communities in the US that potentially experience disproportionate environmental hazards and risks.

Environmental Justice Research Roadmap

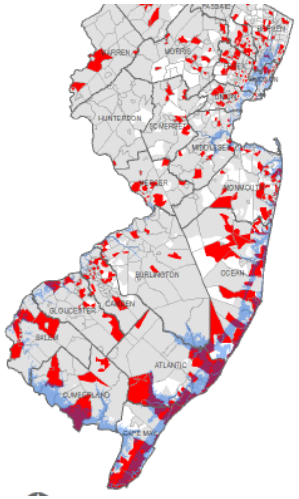
Environmental Justice Research Roadmap presents how the Agency's Office of Research and Development is integrating EJ-related scientific research across its six national research programs.

Four science challenges

1. Decision support, citizen science, and community engagement
2. Environmental health disparities and cumulative assessment
3. Tribal sustainability and well being
4. Climate justice

Climate Justice - Problem Statement

- Climate-related health risks are expected to be greater for overburdened communities and vulnerable populations



Example:
Vulnerable Populations & Sandy Storm Surge - Rutgers, 2014

- Research needed on disproportionate impacts of cumulative exposures from climate stressors, to inform adaptation efforts
- Complex issue requiring “systems approach” for solutions

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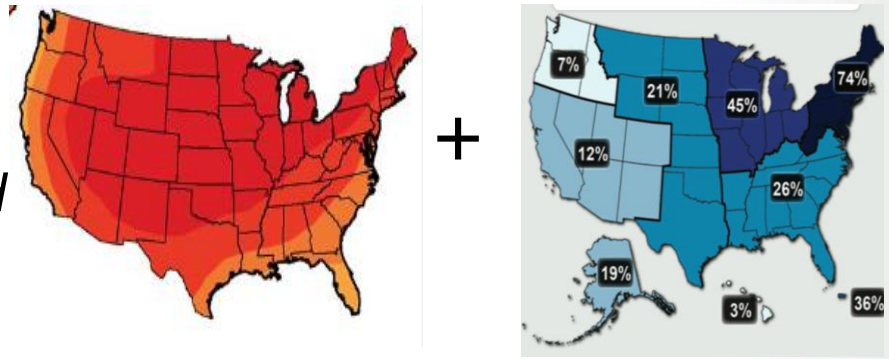
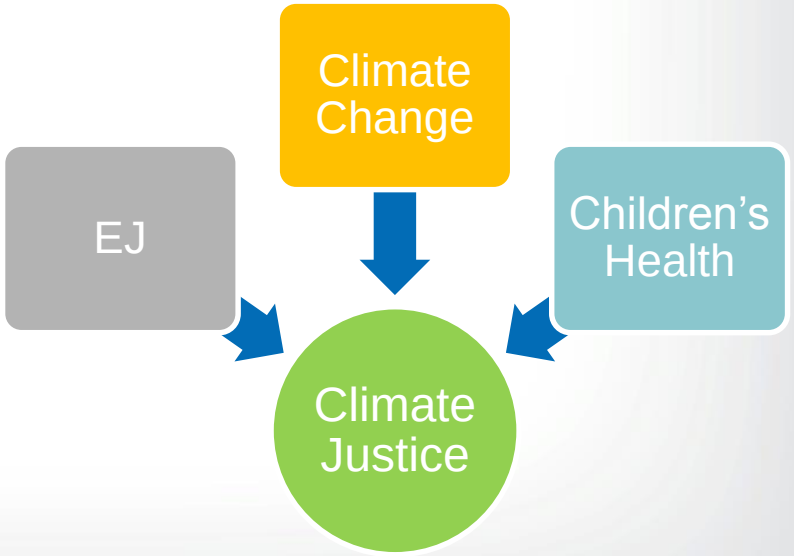
Overarching Questions to be Addressed

- Where and who are the most climate-vulnerable populations?
  - *initially considering proximity to flood zones & contaminated sites, then heat/drought stressors for cumulative impacts*

Extreme Heat + Flooding



- What are potential exposures and health disparities of disproportionately impacted populations?



- What are key social/behavioral & environmental factors & their inter-relationships
  - *to inform public health-related climate adaptation efforts?*

Climate Justice

Factors

- Identify indicators for community resilience
- Identify factors of health disparities and vulnerability to impacts of climate change

Methods

- Construct Climate vulnerability indices
- Methods to assess urban resilience
- EnviroAtlas, Green Infrastructure Wizard, other tools to illustrate ecosystem services and other potential adaptation approaches
- Identify tools such as Green Infrastructure to address climate change stressors

Community Engagement

- Working with communities on HIA and other structured decision approaches to consider options to reduce the impact of severe weather events, reduce heat stress
- Work with Tribes and their TEK to increase the adaptive capacity

Metrics: Where we are, where we want to be

Sustainability is the capacity for:
- human health and well being
- economic vitality and prosperity
- environmental resource abundance

continuity

fitness

Resilience is the capacity to:
- overcome unexpected problems
- adapt to change (e.g., sea level rise)
- prepare for and survive catastrophes

- Community environmental resilience index
- Community resilience screening index
- Wildfire vulnerability index

Creating a Community Wildfire Smoke Exposure Vulnerability Index

Current Research:

- *Community Wildfire Smoke Exposure Vulnerability Index*
  - *Integrate maps*
    - *vulnerability to fire risk*
    - *vulnerability to health effects of smoke*

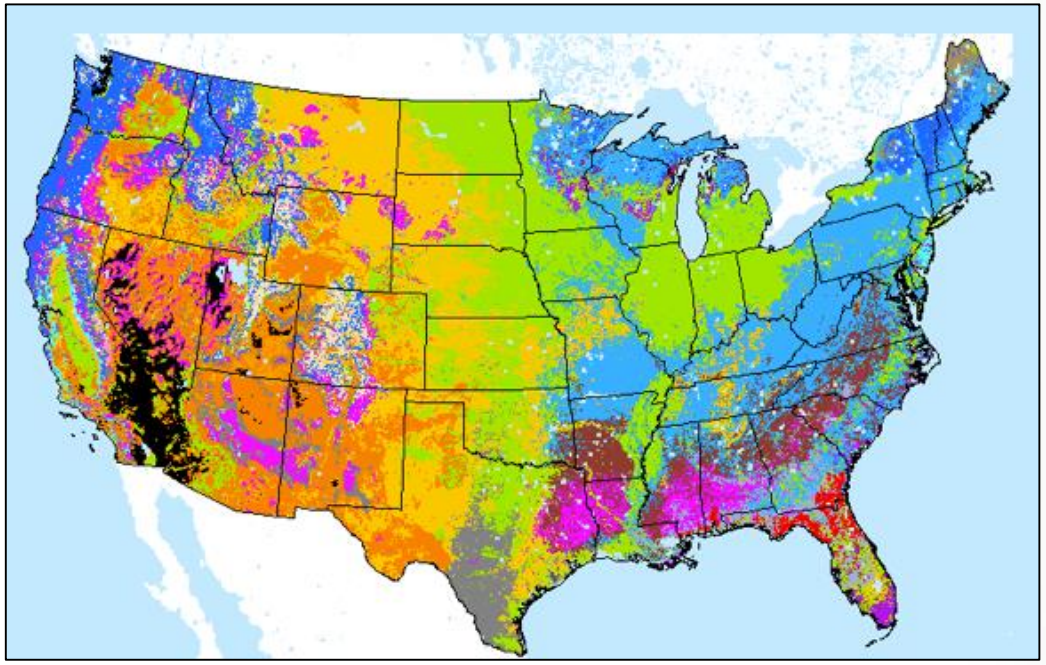
  With

    - *in vitro and in vivo differential toxicity of fuels*

Potential Impact

- *Target outreach programs to high risk communities*
- *Deliver information to protect communities*
- *Make data available to other federal partners, state and local officials*

USFS Wildland Fire Assessment System: Fuel Types



URL:wfas.net/images/firedanger/NFDR_Fuel_Model.png

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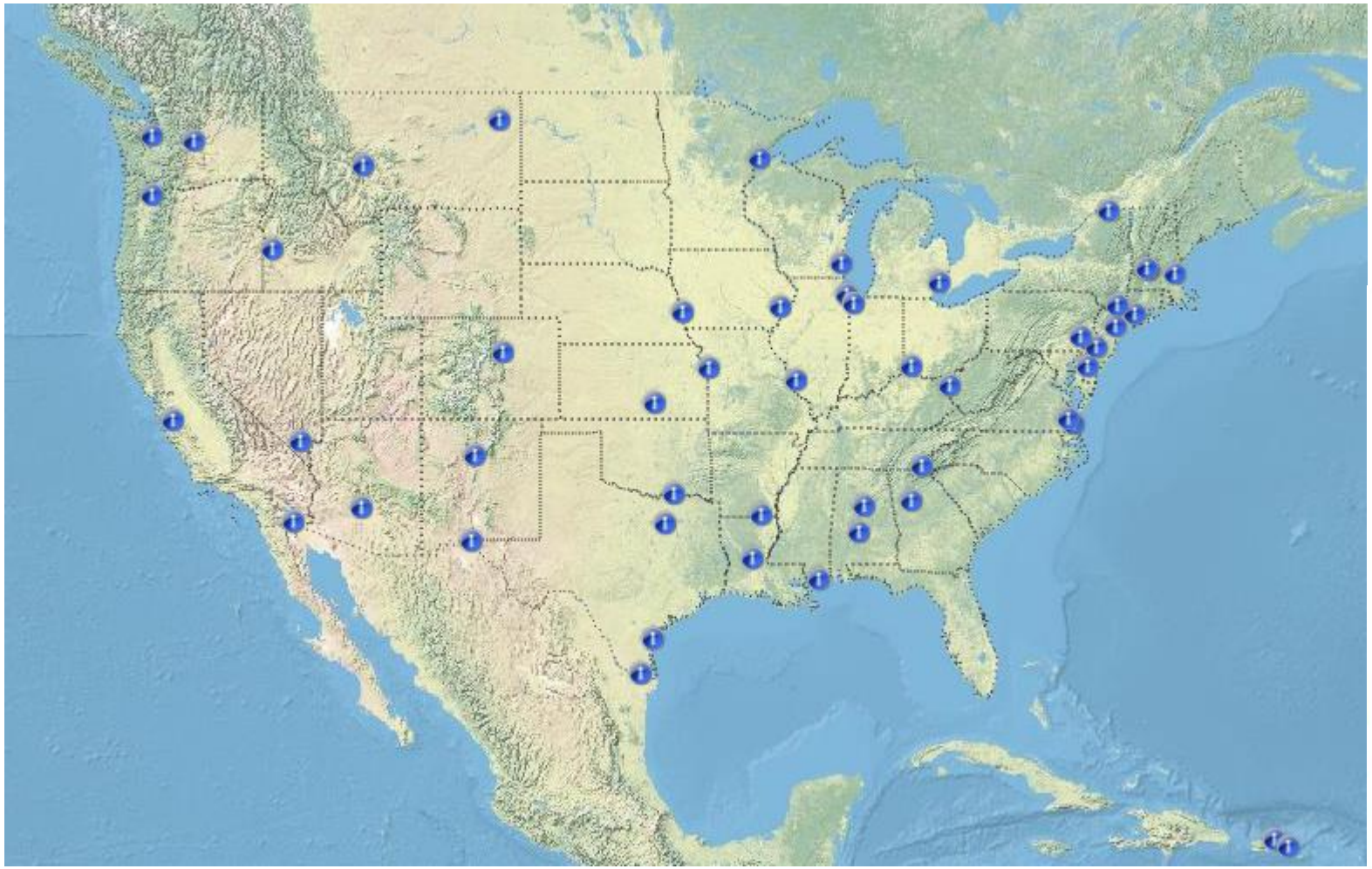
https://www3.epa.gov/airnow/wildfire_may2016.pdf

Place-Based Opportunities

"Making a Visible Difference"
EPA Administrator Initiative

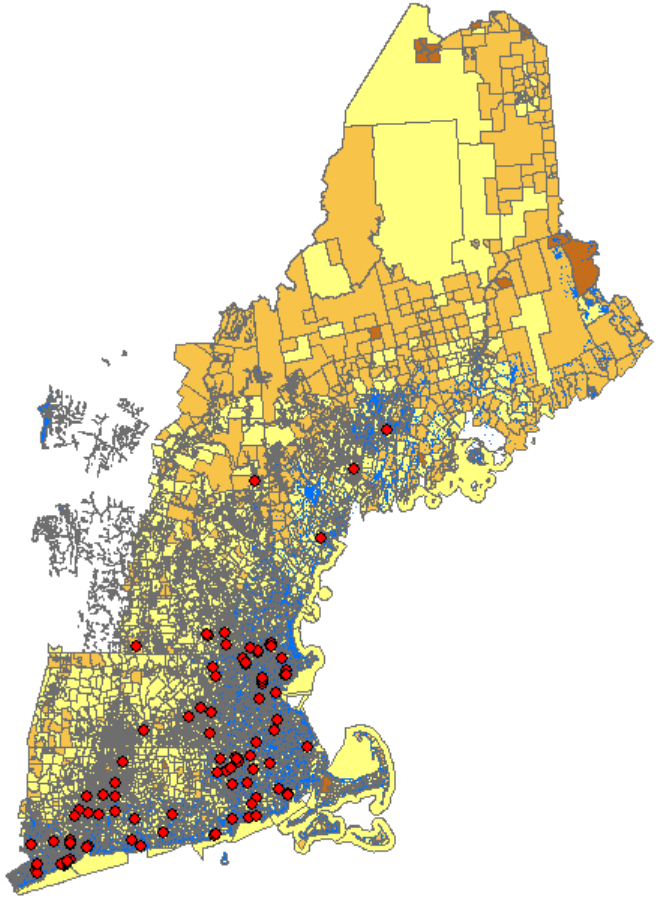


Birmingham City Councilor William Parker describes local concerns to EPA Region 4 Administrator Heather Toney during a tour of North Birmingham.

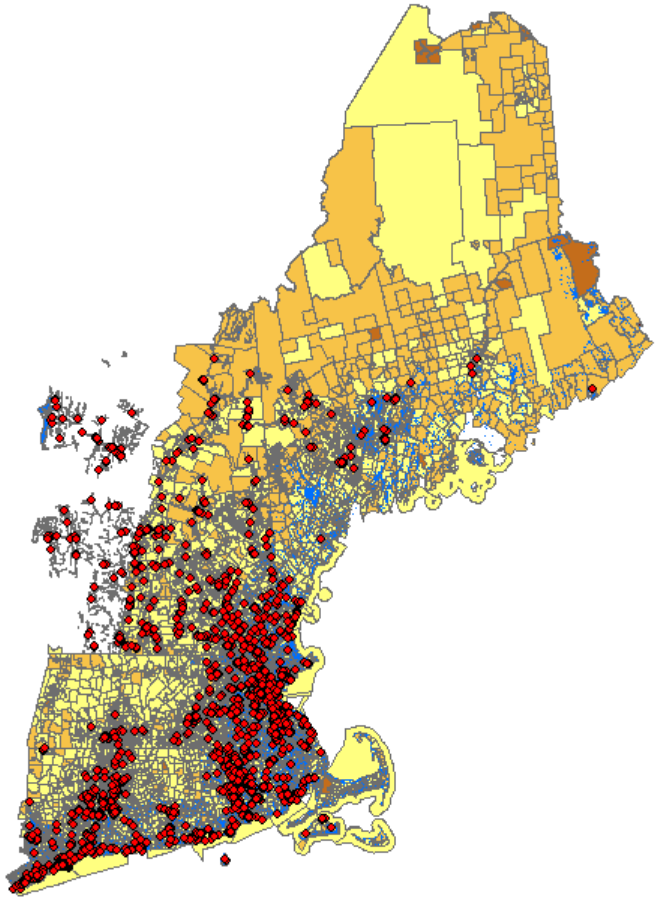
INITIAL RESULTS – Regional Scale

GIS mapping & statistical analyses to identify communities/populations in New England vulnerable to flooding at contaminated sites, and key factors

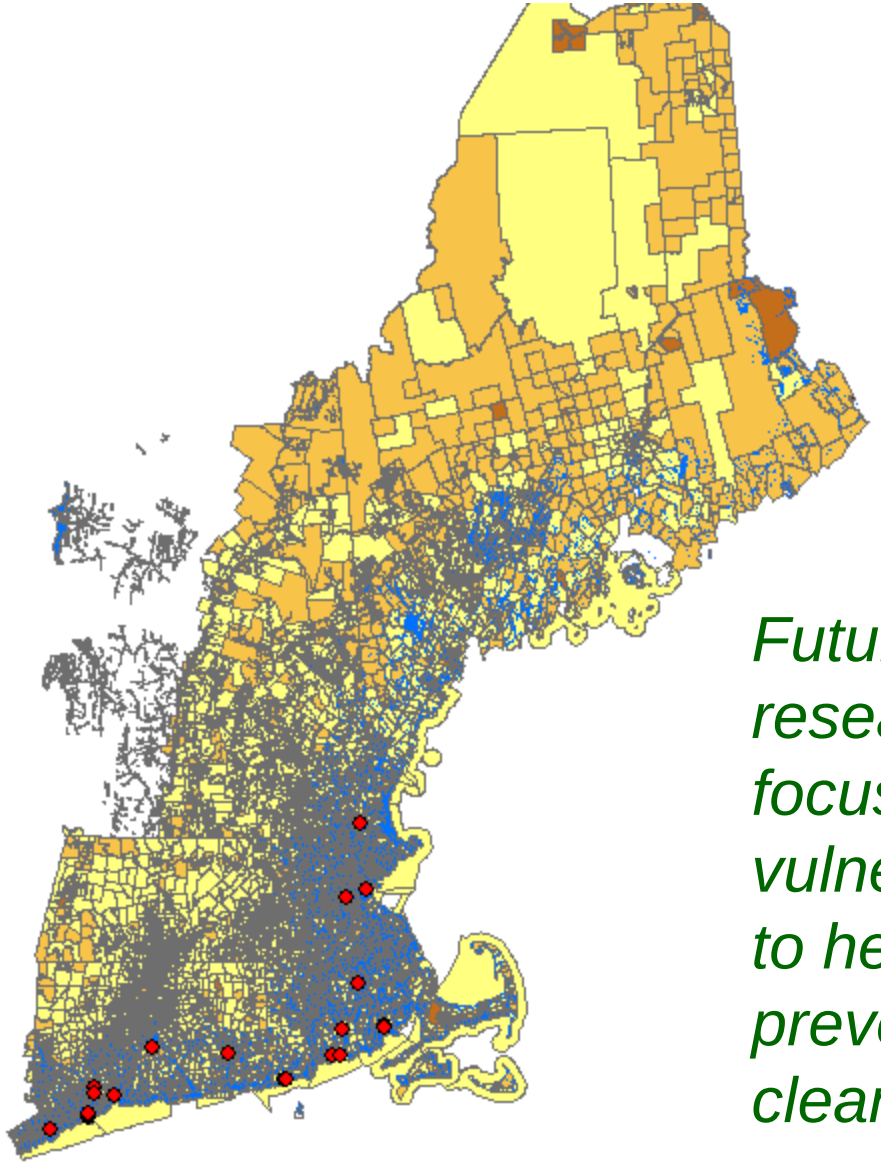
Superfund sites within 100 year flood zone



Facility sites within 100 year flood zone

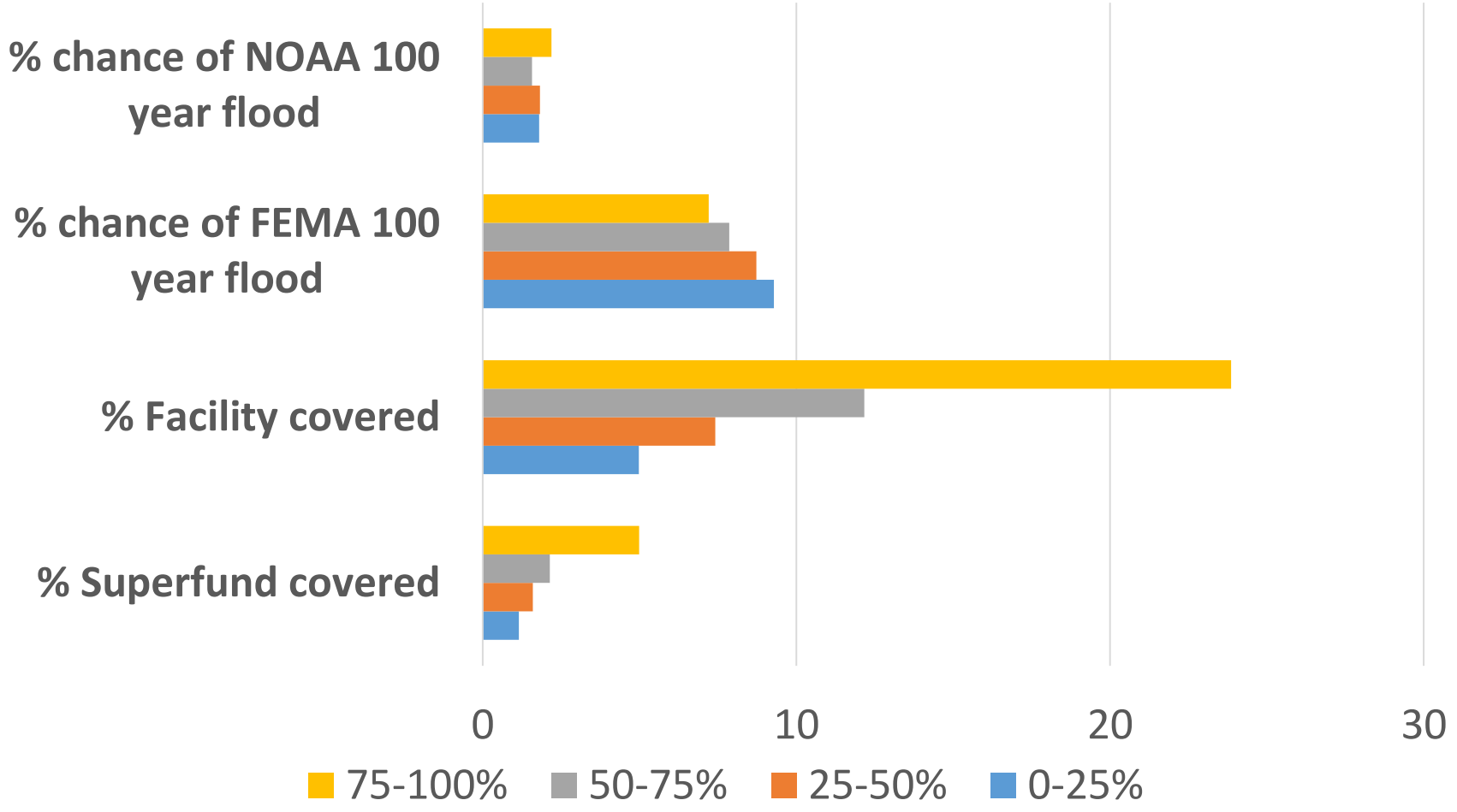


Superfund sites, Elevation 0-2m, within 100 year flood zone



Future exposure research can focus on these vulnerable sites to help prioritize prevention & cleanup efforts.

Relationship between 6 EJ factors and flood zones, Superfund sites, & other facilities in New England



Conclusions – National &Regional Scale

- Vulnerable places, people identified via GIS & spatial analyses
  - Flood-vulnerable coastal U.S. Superfund sites & New England facilities
  - Of the U.S. residents within 0.25 miles of Superfund sites with a very high Coastal Vulnerability Index, ~40% are minority
  - As distance residing near Superfund sites ↓, % minorities & language isolation ↑; same trend for other EJ variables

- Key factors identified
  - Low income, ethnic minority, linguistic isolation most significant of ones considered
  - Other vulnerability & resiliency factors to be considered in future

- Similar results for U.S. & New England
  - Transferable methods

INITIAL RESULTS – Local Scale

GIS mapping & statistical analyses to identify issues, key factors, and develop community outreach and educational materials in Lawrence, MA,

Lawrence MA: Making a Visible Difference (MVD)

The Community

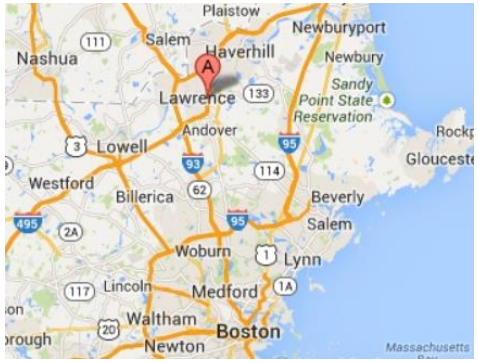
- 25 miles north of Boston; 7 square miles
- 74% Latino, 29% below poverty, 18% unemployment
- 1 Grocery Store for 78,000
- Highest youth obesity rates in MA
- 3 rivers, 70% combined sewers

The Issues

- CSOs; Merrimack River water quality
- Water supply resilience
- Eco-services and sustainability
- Drivers: Urban development, climate change, and aging water infrastructure

Expectations

- Tangible assistance to community: water strategy developmental assistance; water supply resilience assessment & 10% design
- Public education on water link to wellbeing
- **Maps for targeted communications & EJ**



First Steps:
Meet with Community Stakeholders, Mayor & City Staff

What does the community want/need?

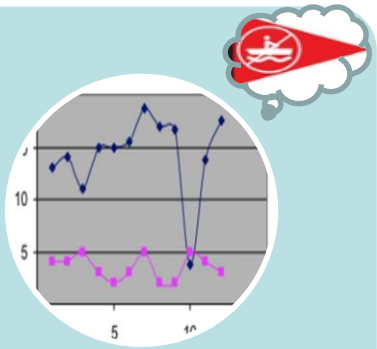
What areas can EPA support?

Water Strategy: *Stakeholder Concerns*

Water Strategy: *EPA Outputs*

Mapping:

E-coli, flood zones, CSOs, EJ variables, local knowledge of water use, modeling risk of GI illness



Modeling:

GI illness risk from historic data

Real-time water quality based on 2 new EPA monitors

Resiliency Planning:

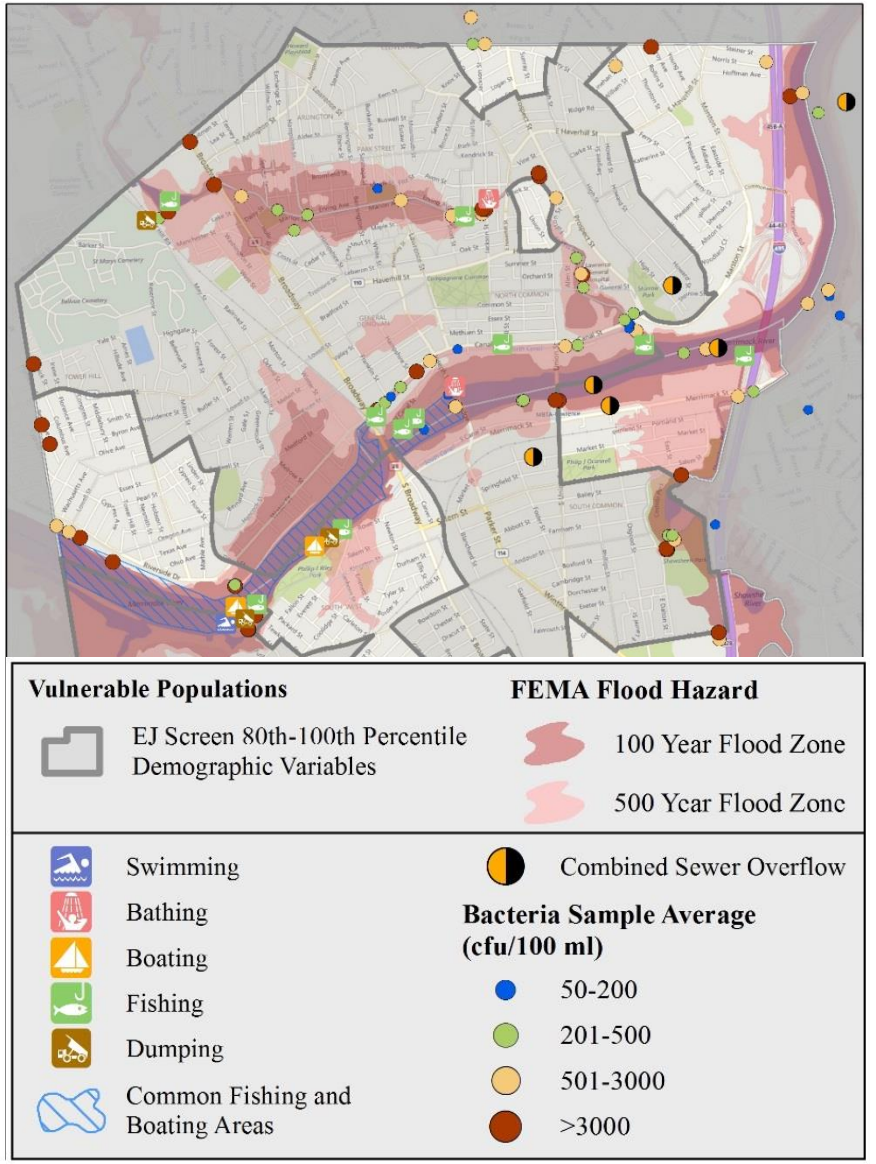
Water treatment plant optimization

10% engineering design

Communicate results

Mapping to Inform Decision-Making: *Local Knowledge Database*

- Technical assistance
- Emergency preparedness outreach & education
- Pollution prevention
- Emergency response
- Public notification

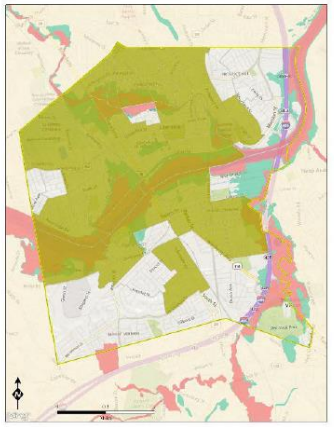


Mapping to Inform Decision-Making: *Using EPA's EJ Screen Tool*

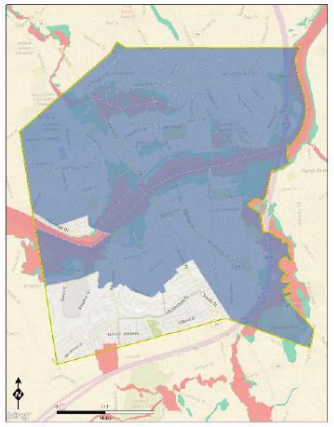
Vulnerable Populations and Flood Zones in Lawrence, MA

Critical EJ Screen Variables in the 80th-100th Percentile per Census 2010 Block Group

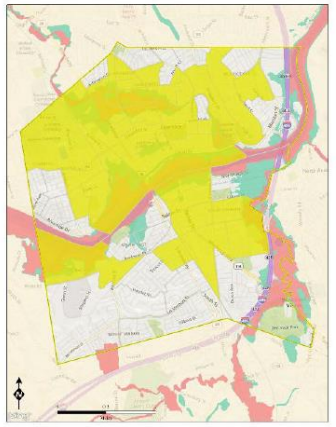
% Minority



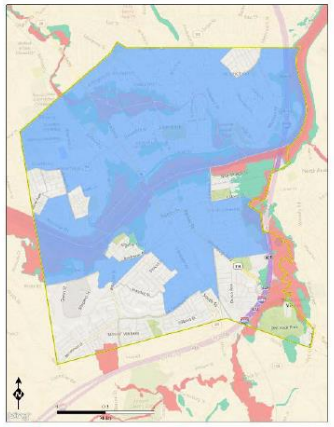
% Linguistic Isolation



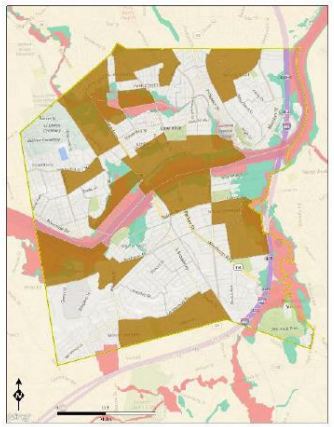
% Low Income



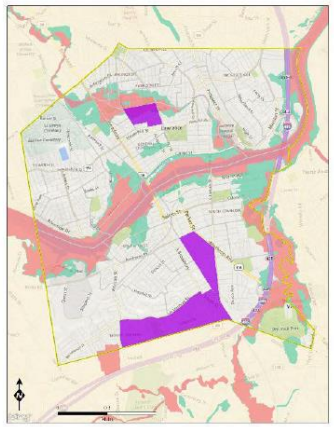
% Less than High School



% Under Age 5

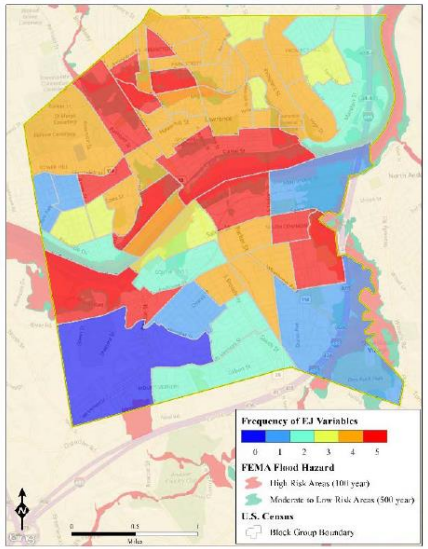


% Over Age 64



Critical EJ Variable Frequency Composite

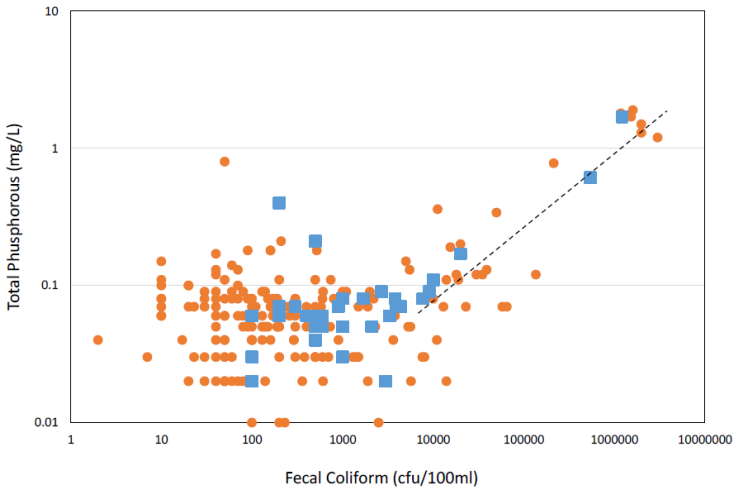
Weighted Sum Raster file (overlaying FEMA FIRM flood zones) depicting the frequency of the six aforementioned EJ variables that fall within the 80th – 100th percentile per Census 2010 Block Group. **The Red and Orange zones are considered most vulnerable.**



Modeling to Inform Decision-Making:

- Quantitative microbial risk assessment (QMRA)
  - Water Quality Data Collection -
    - Historical Data
    - Real time Data- Water quality monitoring stations at the intakes for the Lawrence Water Treatment Plant and the Andover Water Treatment Plant.
- Water quality notification programs
- Water Treatment Plant Optimization & Resiliency

Turbidity, TP, TOC, Precipitation, T …



Anticipated Impact

Provide relevant information to inform targeted solutions:

- ❑ Technical assistance efforts
  - Identifying optimal locations for Green Infrastructure efforts
  - Identifying EPA tools to inform sustainable development

- ❑ Emergency preparedness outreach and education
  - Translated fact sheets (e.g., asthma/mold, debris management)
  - How to reach impacted individuals beyond the web/printed materials
  - Community resiliency checklists & revitalization plans
  - Identifying community cooling areas and info with communities

- ❑ Pollution prevention efforts
  - e.g., Chemical storage in small shops near flood zones

- ❑ Emergency response
  - Outreach and coordination with health agencies
  - Conversation at local level about debris management areas, mold issues, power outages (from an EJ perspective), transportation issues, food access

Conclusion

- EJ Interagency Working Group Climate Impacts Subcommittee established to
  - Support collaboration across federal agencies and with communities with environmental justice concerns around climate change-related issues
  - Ensure that vulnerable populations are considered in agencies' climate adaptation activities
- EPA's EJ Research Roadmap is an integral part of EPA's EJ 2020 Action Plan
  - It describes EPA's development of science and technology to address needs for community engagement through access to science; understanding health and exposure disparities for cumulative assessment, tribal science, and climate justice
- EPA's Climate related research includes the development of metrics, visualization tools, and place-based research to identify and plan for climate-related stressors in overburdened communities

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EPA Contributors and EJ IWG Climate Impact Subcommittee

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EPA United States Environmental Protection Agency

Disclaimer

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