



EESI - Low-Carbon Small Business and Post-COVID Recovery | 09/30/2020 | @azavea

Supporting Small Businesses with SBIRs



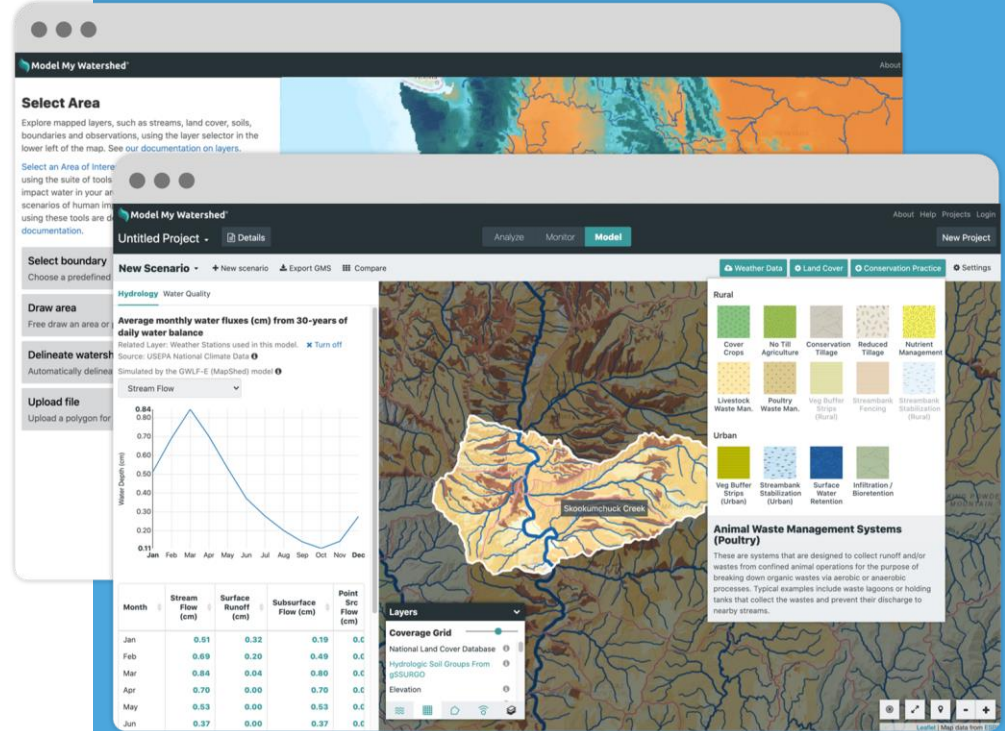
Jessica Cahail (she/her)

Product Manager, Temperate / Raster Foundry

jcahail@azavea.com

About Azavea

- 50 person small business
- Philadelphia based
- We build technologically advanced solutions for geospatial data visualizations and analysis



Our Mission

Advance the state of the art in geospatial technology and apply it for civic, social and environmental impact.

SERVICES WE OFFER

 Software Engineering

 User Experience Design

 Data Analysis & Visualization

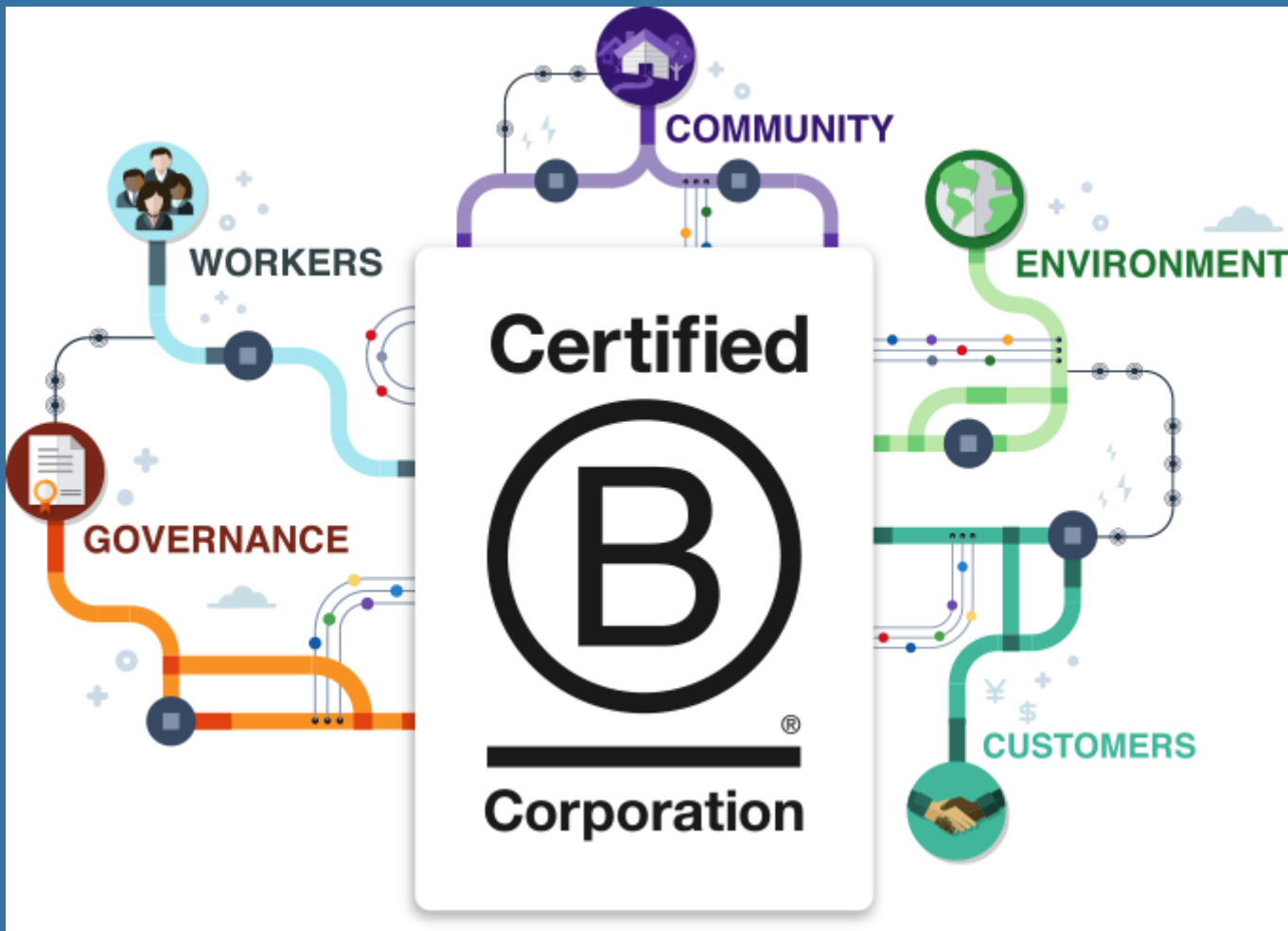
 Machine Learning & AI

 Code & Architecture Review

 Research & Development

AREAS OF EXPERTISE

- Civic engagement
- Climate change
- Conservation
- Disaster Risk Management
- NewSpace
- Transportation
- Remote Sensing





Small Business Innovation Research Grants

(SBIR)

- <https://www.sbir.gov/>
- Eligibility
 - US- based for-profit
 - >50% owned/controlled by citizens or permanent resident
 - <500 employees
 - Project must focus on research & development

Goals

- Meet federal **research and development needs**
- Increase private-sector **commercialization** of innovation derived from federal research and development funding
- Stimulate technological **innovation**
- Foster and encourage **participation** in innovation and entrepreneurship by women and socially/economically disadvantaged individuals
- Foster **technology transfer** through cooperative R&D between small businesses and research institutions (STTR)

https://www.sbir.gov/sites/default/files/SBA_SBIR_Overview_March2020.pdf

Phase I

Concept Development
6 months – 1 year
~ \$50,000 – 250,000

Phase II

Prototype Development
24 months
~ \$500,000 – 1.5M

Phase III

Commercialization
Not SBIR funding

https://www.sbir.gov/sites/default/files/SBA_SBIR_Overview_March2020.pdf

SBIR Awards

Phase I

10 since 2006



Current example-
flood inundation modeling
using synthetic aperture
radar

Phase II

8 since 2008



Current example-
hyperspectral imagery
processing for oil spill and
tree mortality detection

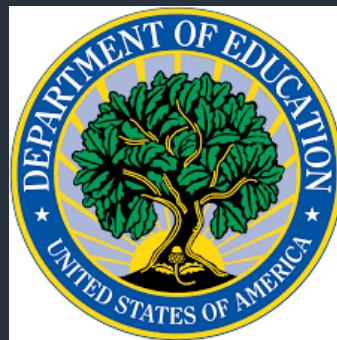
Resulting products

5 products



OpenTreeMap
Raster Foundry
HunchLab
GroundWork
Temperate

Awarding Agencies



Impact of Awards

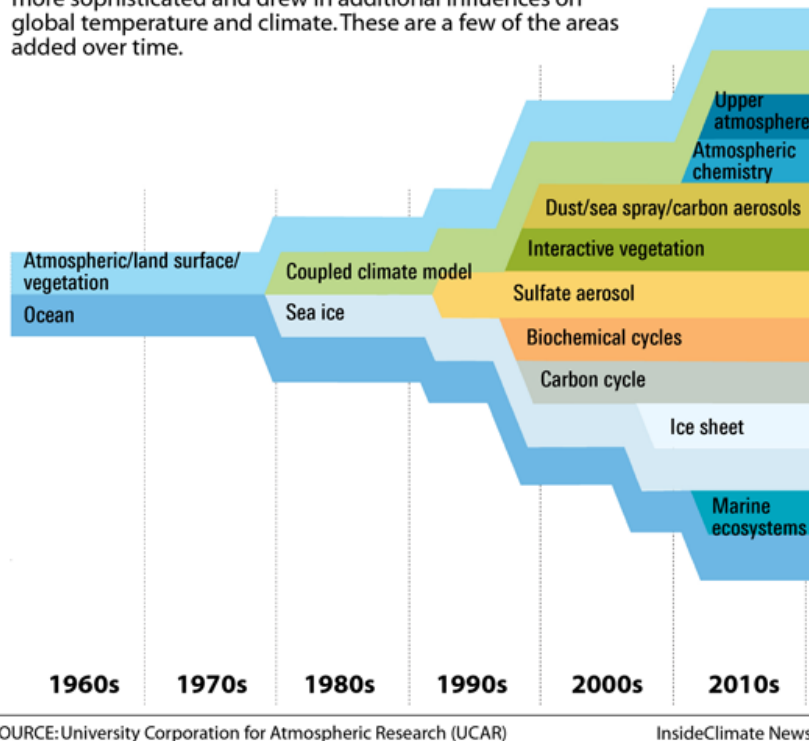
- Roughly \$7.5m awarded between the agencies over 15 years (avg \$500K/yr)
- We've supported a number of engineering positions over the last decade with this funding
- In 2019, our research/tools that began as SBIR projects accounted for more than 40% of Azavea's revenue - commercialization of innovation and additional R&D investment has driven growth of the company
- We default to open source. These projects have led to thousands of lines of open-source code, leading to positive Impacts for countless companies and individuals
- Many awards focus on fast employment growth sectors (e.g., New Space and remote sensing over past 5 years)

Making public data usable

- Temperature and precipitation data from 1950 to 2100 (historic and projected)
- Based on the Intergovernmental Panel on Climate Change (IPCC)'s Coupled Model Intercomparison Project Phase 5 (CMIP5)
- Localized Constructed Analogs (LOCA) for North America
- Global Daily Downscaled Projections (NEX-GDDP) for the remainder
- Two carbon scenarios (RCP 4.5 and RCP 8.5)

Growth of Climate Modeling

As computing power expanded, climate modeling became more sophisticated and drew in additional influences on global temperature and climate. These are a few of the areas added over time.



<https://insideclimatenews.org/content/graphic-growth-climate-modeling>



TEMPERATE

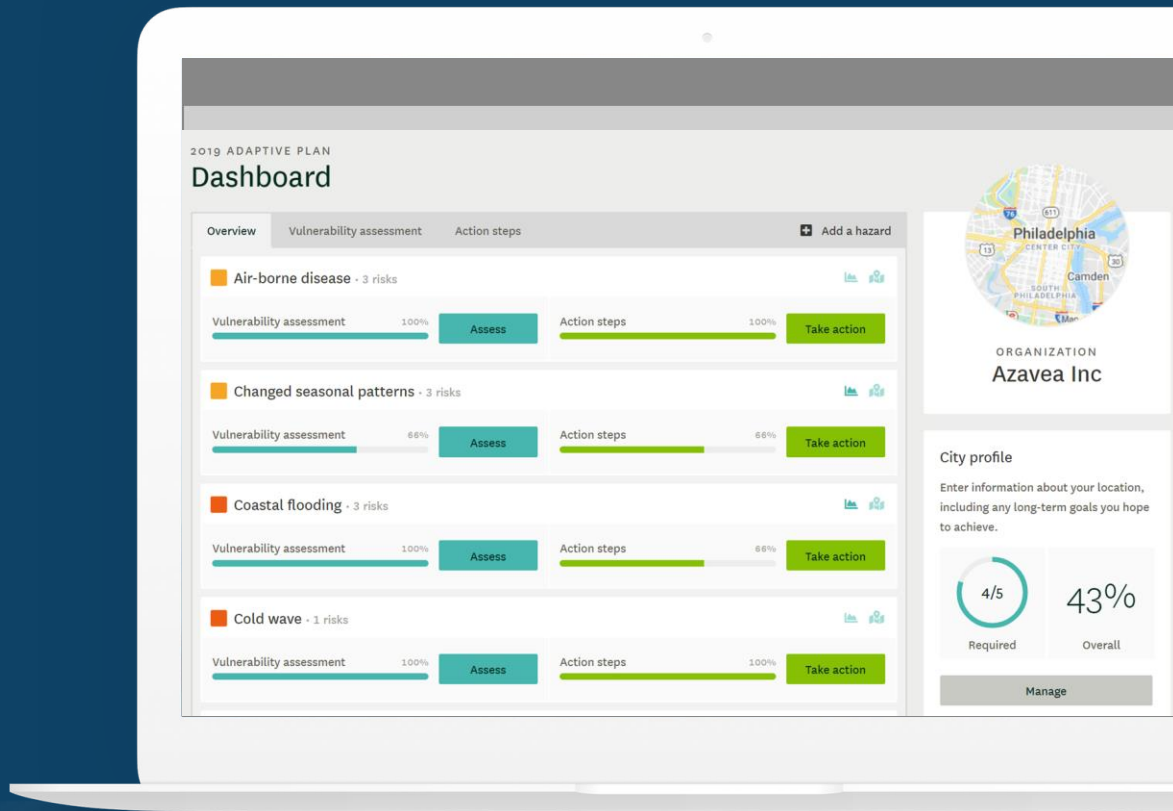
your adaptation planning companion

US Dept. of Energy (DE- SC0011303)
Phase I&II

US Dept. of Agriculture (NIFA-SBIR-006649)
Phase I



Data in Action *Temperate.io*



- Low-cost subscription-based decision support tool
- Designed for small- to mid-sized communities with limited planning resources
- Enables generalists to create vulnerability assessments and adaptation plans with confidence
- Addresses a workforce capacity issue that continues to exist as communities can't afford to focus on sustainability

Highlight potential priorities

Your city's top hazards

The hazards selected here will help you start your vulnerability assessment. You can always add additional hazards later. Click the "x" to remove any hazards that you don't think belong in your assessment.

The hazards below have been **pre-selected** based on Philadelphia, PA's location.

Calculations use the average of the projections for the years 2025–2035. See the [Methodology](#) page for more information.



Extreme hot days

3.8F above current hottest day



Heat waves

2.7 more heat waves each year



Rain storms

0.68 more intense storms each year



River flooding

0.68 more intense storms each year

Contextualize climate data in decision-making

ASSESS THE POTENTIAL IMPACT OF

Extreme hot days on public health

1 Identify risk

2 Hazard


3 Potential impact

4 Adaptive capacity


5 Review

Hazard

Climate data

How will extreme hot days change over time? 

Probability of this hazard occurring

Select 

How often do you expect this hazard to occur in the next five years?

Less frequent

No change

More frequent

Not sure

How intense do you expect this hazard to be in the next five years?

Less intense

No change

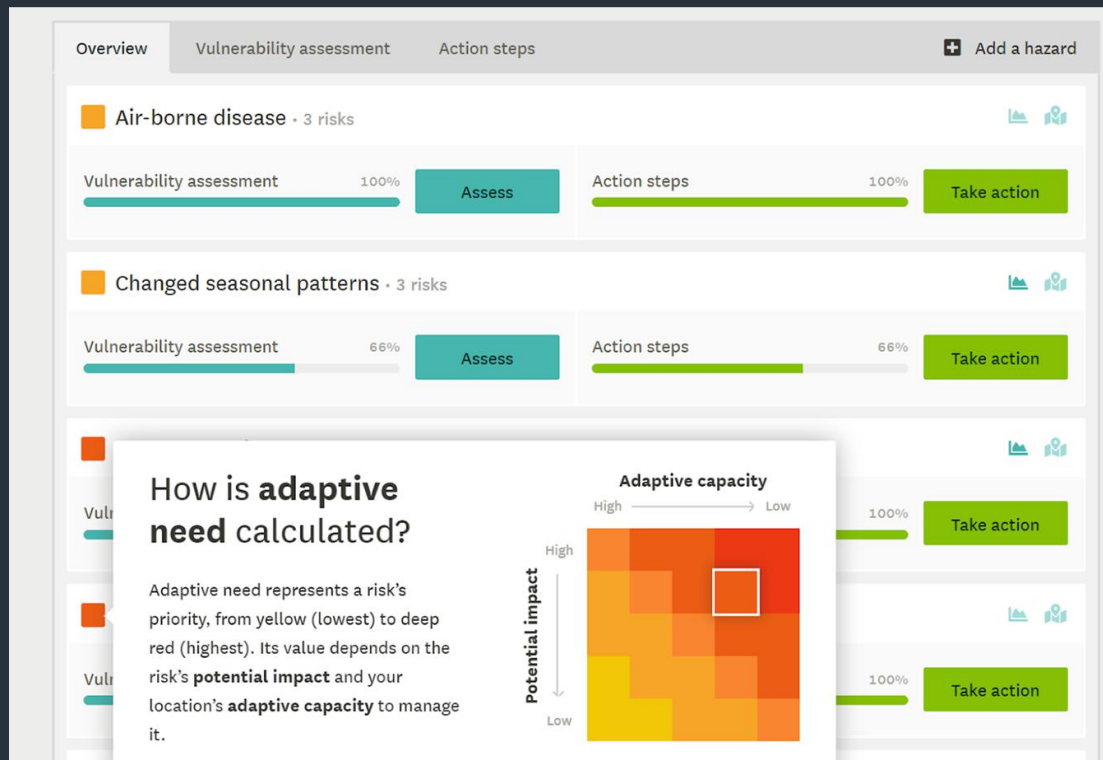
More intense

Not sure

[Finish assessment later](#)

Skip stepNext

Prioritize action according to assessment



The screenshot displays the TEMPERATE interface with three tabs: Overview, Vulnerability assessment, and Action steps. A '+ Add a hazard' button is in the top right. Three risk entries are shown:

- Air-borne disease - 3 risks**: Vulnerability assessment is 100% (blue bar), and Action steps are 100% (green bar). Buttons for 'Assess' and 'Take action' are present.
- Changed seasonal patterns - 3 risks**: Vulnerability assessment is 66% (blue bar), and Action steps are 66% (green bar). Buttons for 'Assess' and 'Take action' are present.
- Unlabeled risk**: Vulnerability assessment is 100% (blue bar), and Action steps are 100% (green bar). Buttons for 'Assess' and 'Take action' are present.

A modal window titled 'How is adaptive need calculated?' is overlaid on the third risk entry. It contains the following text:

How is adaptive need calculated?

Adaptive need represents a risk's priority, from yellow (lowest) to deep red (highest). Its value depends on the risk's **potential impact** and your location's **adaptive capacity** to manage it.

The modal also features a heatmap titled 'Adaptive capacity' with axes for 'Potential impact' (High to Low) and 'Adaptive capacity' (High to Low). The heatmap shows a color gradient from yellow (low) to red (high), with a white square highlighting a specific area in the top-right corner.

Accelerate learning through shared strategies

Take action to mitigate the potential impact of coastal flooding on each of the communities in your region.

Take action

RECOMMENDED

Begin with suggested actions

We've gathered actions that some cities have undertaken over the years and will recommend some for you to start with.

[Get started](#)

[No thanks. I'll start from scratch.](#)

Suggested actions

When faced with similar challenges, cities in your region have chosen to undertake the following actions.

Develop stricter flood regulations for critical facilities


City: Baltimore, MD
Date planned: October 1, 2013

[Show less](#)

[Choose and customize](#)

Source: Disaster Preparedness and Planning Project: Combined All Hazards Mitigation and Climate Adaptation Plan

Continue to identify and improve coordination with Key Partners including private sector, State partners, Federal partners, community, universities and industry leaders through Local Emergency Planning Committee

City: Baltimore, MD
Date planned: October 1, 2013
Categories: 

[Show less](#)

[Choose and customize](#)

Source: Disaster Preparedness and Planning Project: Combined All Hazards Mitigation and Climate Adaptation Plan



For most of the communities we work with, adaptation work has **come to a halt.**

Impact of COVID

Coronavirus makes investing in climate adaptation more urgent than ever

ARAME TALL | JUNE 10, 2020

This page in: English



2 February 2019 - Bargny, Senegal. A young girl holds her sister. Her house is partly destroyed now because of the rising waters. Photo: Vincent Tremeau/The World Bank

<https://blogs.worldbank.org/climatechange/coronavirus-makes-investing-climate-adaptation-more-urgent-ever>



Building long-term resilience is seldom seen as a priority, least of all during a pandemic. But there is a wealth of evidence to demonstrate that doing so is a smart investment.

ARAME TALL

<https://blogs.worldbank.org/climatechange/coronavirus-makes-investing-climate-adaptation-more-urgent-ever>

SBIR funding helps companies like Azavea enable communities **to build climate resilience**. Those funds can impact us all.

Thank you!

Jessica Cahail (she/her)
jcahail@azavea.com

