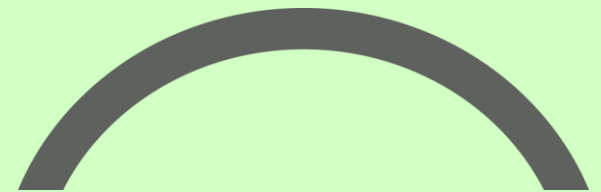


Ecoppia

Brandon Palin

Senior Director, Public Sector

Understand
our planet with AI.



Ecopia's History



2010 – 2013

- Spun core technology out of PhD research at **UWaterloo**
 - Commercialized services and refined **AI algorithms**, with a focus on building footprint mapping
-



2016

- Completed first continental-scale mapping initiative, for the Australian Government: **16 million buildings across 3 million sq. miles in 6 months**
-



2017 – 2018

- Generated complete map of every building in the USA: **169 million buildings across 3.1 million sq. miles in 6 months**
 - Transitioned from man made objects to high accuracy **land cover mapping**
-



2018–2021

- Focus on developing **advanced land-cover** for: smart cities, transportation engineering, autonomous vehicles, large scale state and federal operations, etc.
-



2022 – present

- Largest project to date mapping **51 countries** across Sub-Saharan Africa covering **9.3M sq. miles** – Including **416M buildings**, and **11M linear miles of roads in 8 months**
- Development of first **US Nationwide 3D land cover** map

Our Clients

Ecopia's data is embedded into **hundreds of customer applications**, spanning 100+ countries across the world.



Civil Engineers



Telecom



Government



Insurance



3D Land Cover Across The United States

Project: Build the first 3D nationwide high resolution landcover map of the USA

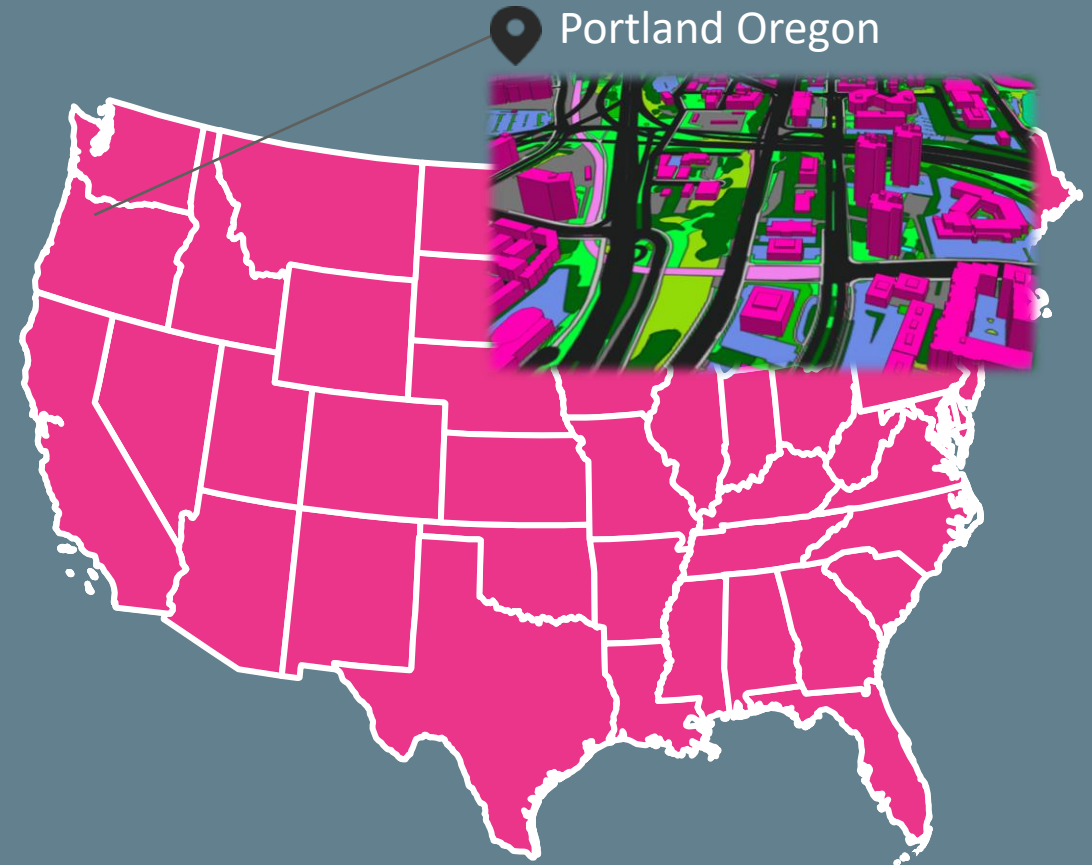
Data Input: 15–30cm stereo aerial imagery

Height-Attributed Features

Buildings | Trees + Shrub | Bridges

Standard Land Cover Features

Building	Railway	Grass
Driveway	Sidewalk	Bare Land
Pavement	Road	Water Body
Parking	Swimming Pool	Sports Field



Completed 2022

The Why

Flooding

2020



2050



Sea level along US coastline is projected to rise an average of 10-12 inches over the next 30 years

Profound shift in coastal floodings as tide and storm surge heights increase and reach further inland



Growing Scale

- Average annual economic losses due to storm surge events have more than tripled over the past few decades
- Record-breaking surges observed in 2017 as Hurricane Harvey inundated coastal areas of Texas with a surge height of over 12 feet (3.7 meters).



Loss of Life

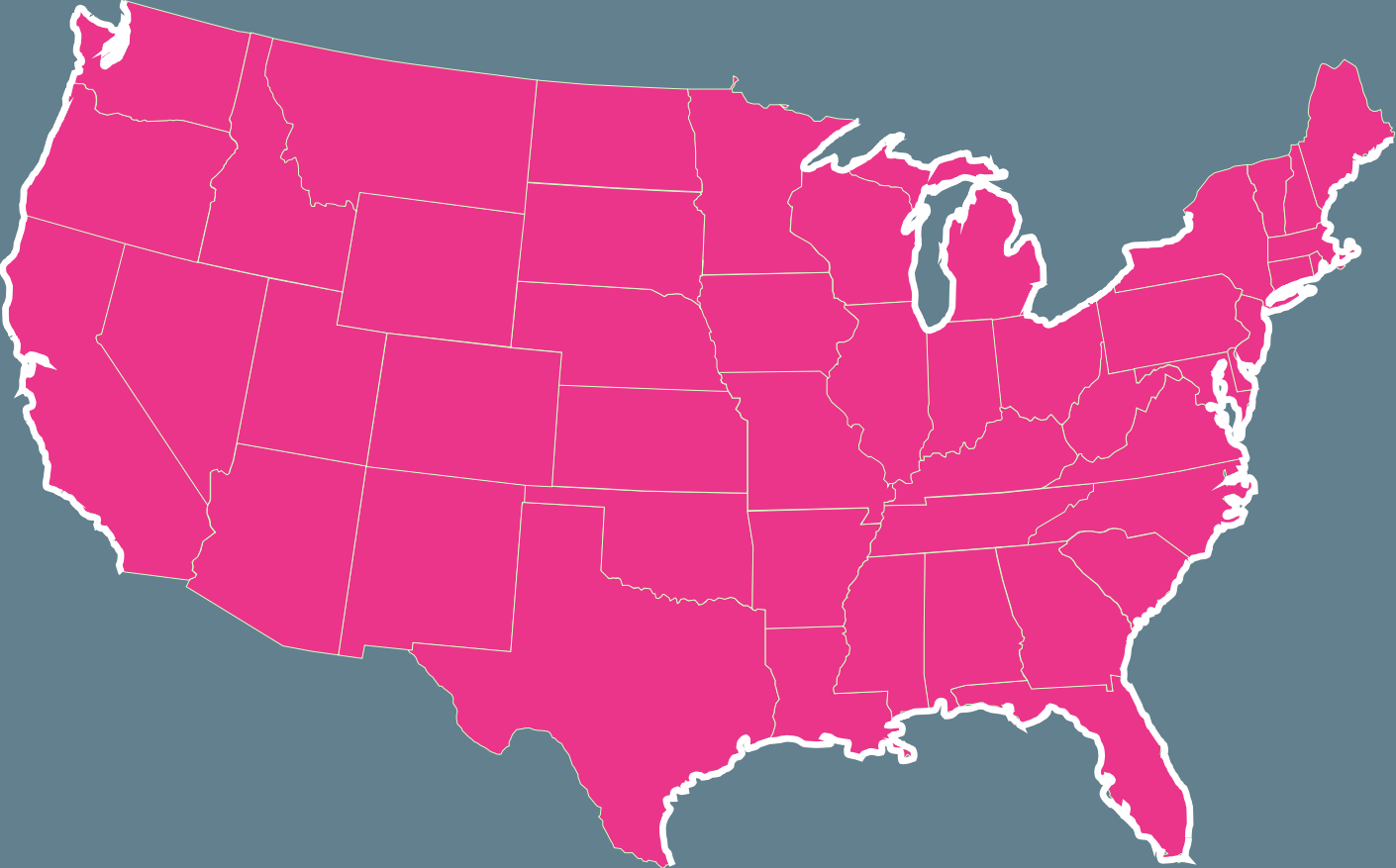
- Along the coastlines, storm surge is often the **greatest threat to life** and property from a hurricane
- At least 1500 lost their lives in Hurricane Katrina, and many of these deaths occurred as a result of storm surge



Additional Impacts

- Extensive property loss
- Erosion of beaches
- Damage to coastal habitats
- Destruction of infrastructure foundations such as roads, railroads, bridges, pipelines

Coastal Threat



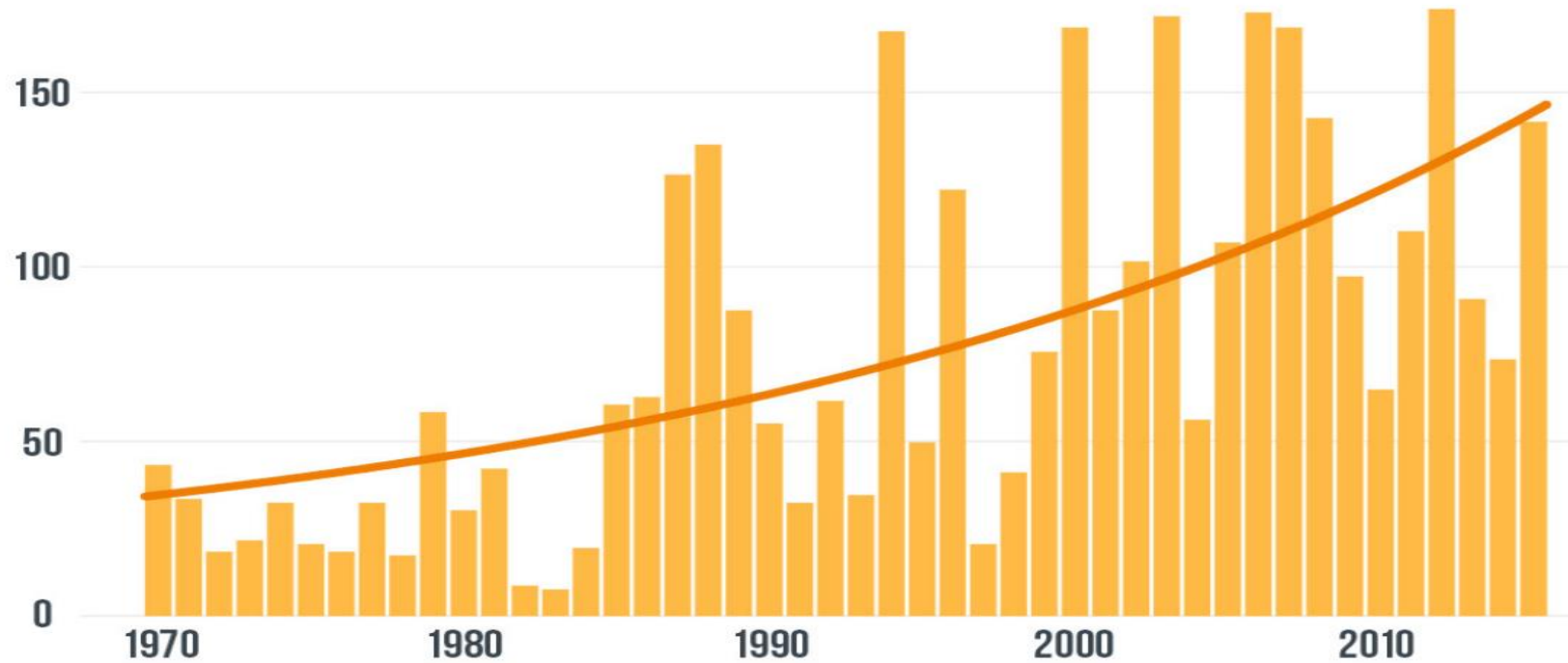
7,867,441 Buildings

 CONUS Coastline 1-Mile Buffer

Wildfires

Wildfires are growing in frequency and intensity, threatening communities, forests, and the economies that depend on them.

Number of fires larger than 1000 acres per year on U.S Forest Service land



Source: Climate Central analysis on U.S. Forest Service records

Since 2000, 15 forest fires in the United States have caused at least \$1 billion in damages each.



Extreme Heat / Urban Heat Islands

Elevated temperatures from heat islands can affect a community's environment and quality of life in multiple ways.



Increased Energy Consumption

Increase in air conditioning of 1-9% for every 2°F increase



Compromised Human Health

Leading cause of weather-related deaths over the last 30 years



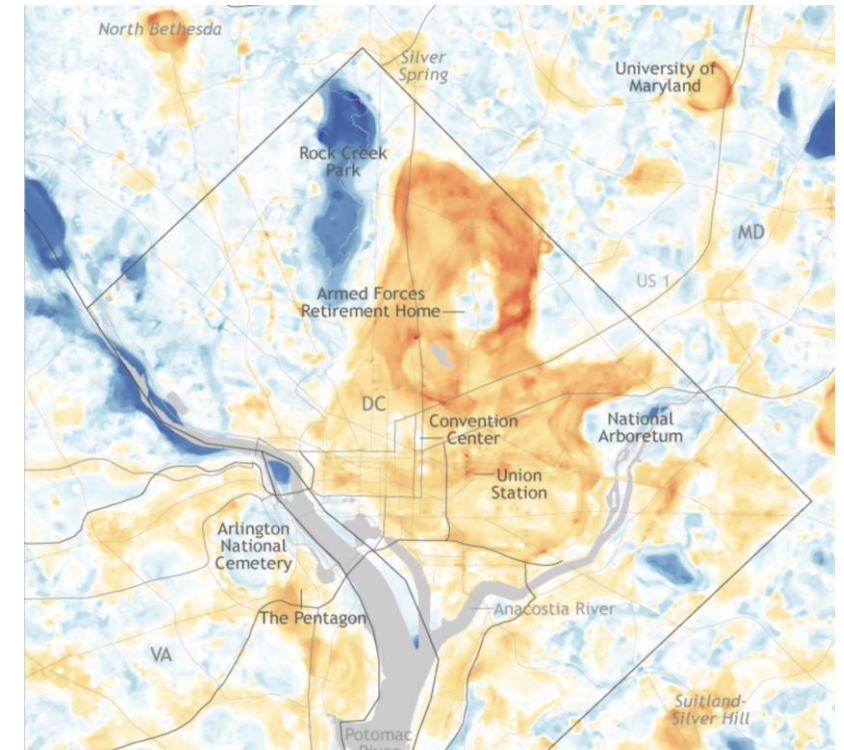
Impaired Water Quality

Hotter stormwater runoff flows into surrounding water bodies and causes rapid temperature changes



Elevated Emissions

Elevated temperatures can directly increase the rate of ground-level ozone formation



Afternoon (3pm) UHI temperature (°F)



Washington DC, Urban Heat Island Effect

The Problem

The total cost of **Climate Disasters** in USA since 1980 is roughly \$2.065 Trillion

Source: NOAA National Centers for Environmental Information



Flooding

Flooding causes widespread property damage, loss of life, and environmental disruption.



Wildfires

Wildfires destroy ecosystems, endanger lives, and degrade air quality.



Extreme Heat

Extreme Heat and Urban Heat Islands have a greater impact on marginalized communities and vulnerable populations.



**Average Annual Cost*
of Flooding in USA**

Source: NOAA
* last decade



**Spent Fighting
Wildfires in 2021**

Source: National Interagency Fire Center



**Heat-related Deaths
in USA in 2022**

Source: CDC

The Solution ... kind of

What is a Climate Resiliency Strategy?

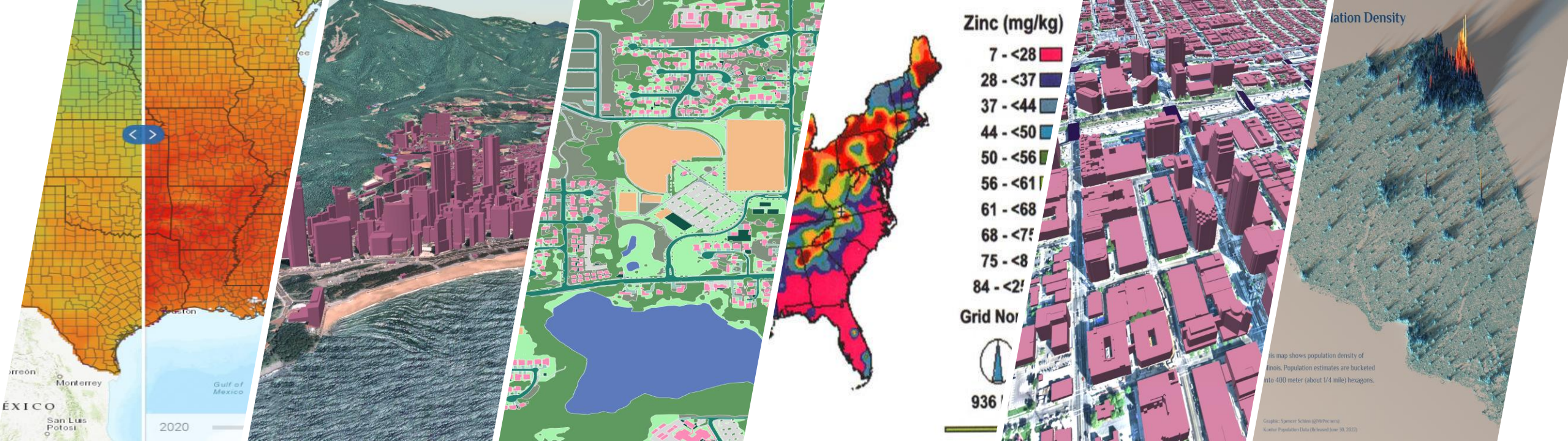
1. Assessing Climate Risks & Vulnerabilities
2. Developing Adaptation Plans
3. Building Resilient Infrastructure
4. Protecting Ecosystems
5. Enhancing Community Resilience
6. Investing in Research & Development

"A climate resiliency strategy refers to a comprehensive and integrated set of actions, policies, and measures designed to help individuals, communities, and ecosystems adapt and withstand the impacts of climate change. It involves proactive planning, risk assessment, and management aimed at enhancing the capacity of natural and human systems to cope with the changing climate conditions. " – **Chat GPT**

Geospatial Strategy

1. Risk Assessment & Vulnerability Mapping
2. Land Use Planning & Management
3. Infrastructure Planning & Design
4. Emergency Response & Preparedness
5. Natural Resource Management
6. Community Engagement & Awareness

** Key terms for funding applications **



Climate Data

Elevation Data

Land-Use/Cover Data

Natural Resource Data

Infrastructure Data

Demographic Data

How does Geospatial data fit into the mix?

Climate Data: Climate data is critical to understand how climate is changing and how it may affect different regions and communities.

Elevation Data: Elevation data provides information on the height and slope of land and helps identify areas that are susceptible to flooding and other climate hazards.

Land-Use/Cover Data: Land use and land cover data help identify areas that are vulnerable to climate change impacts, such as urban heat islands and deforestation.

Natural Resource Data: Natural resource data provides insights into the resilience of natural systems and their ability to adapt to climate change.

Infrastructure Data: Infrastructure data helps identify critical infrastructure that may be vulnerable to climate hazards.

Demographic Data: Demographic data helps identify vulnerable populations and inform decisions on how to target interventions and investments.

Case Study

Geospatial Data How Geospatial Data Drives Resilient Communities

Brandon Palin
Senior Director, Public Sector

brandon@ecopiatech.com

