

Food System Resilience in U.S. Cities

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Jennifer Otten, PhD, RD, Associate Professor, University of Washington

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Next-Generation Food Shock Modeling



Hurricane Katrina

Hurricane Katrina left more than 1,800 deaths in its wake, caused \$100 billion in damages, destroyed or compromised over 800,000 housing units and ultimately left thousands homeless.

(Credit: Michael Appleton/NY Daily News Archive/Getty Images)

Long-Lasting Effects on Food Access

Am J Public Health. 2011 Mar;101(3):482-4. doi: 10.2105/AJPH.2010.196659. Epub 2011 Jan 13.

The effects of Hurricane Katrina on food access disparities in New Orleans.

Rose D¹, Bodor JN, Rice JC, Swalm CM, Hutchinson PL.

 Author information

Abstract

Disparities in neighborhood food access are well documented, but little research exists on how shocks influence such disparities. We examined neighborhood food access in New Orleans at 3 time points: before Hurricane Katrina (2004-2005), in 2007, and in 2009. We combined existing directories with on-the-ground verification and geographic information system mapping to assess supermarket counts in the entire city. Existing disparities for African American neighborhoods worsened after the storm. Although improvements have been made, by 2009 disparities were no better than prestorm levels.

2 years post:

- half city's supermarkets still closed
- 1 of 2 walmarts permanently closed
- # of food access points decreased by 62%

Long lasting effects on the food industry

Seafood Industries Devastated by Hurricane

By JEREMY ALFORD SEPT. 8, 2005

BATON ROUGE, La., Sept. 8 - [Louisiana](#) officials said today that the commercial and recreational seafood industries along the coastline were

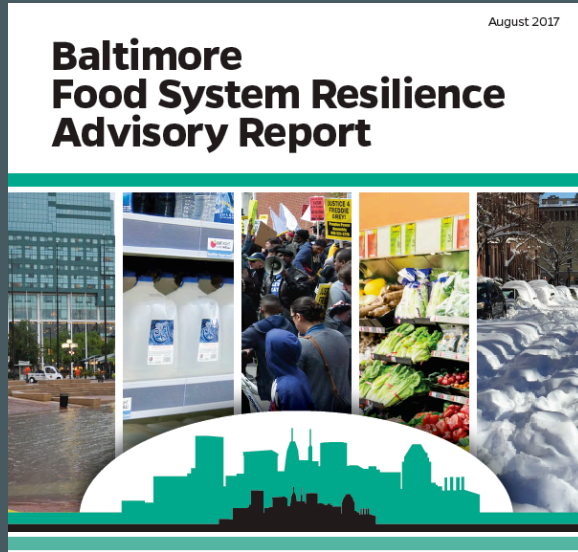
After Katrina and BP, Louisiana fishermen battle back from the brink

After a rough decade, the fishing industry around New Orleans is struggling to recover from the lingering damage from Katrina and the BP oil spill

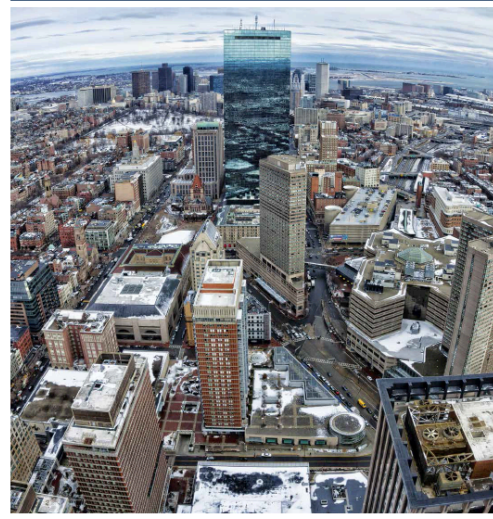
Lessons Learned from recent shocks: sources of vulnerability

- Location of buildings in areas “at risk” of impact.
- It helps to have a diverse and “global” food system.
- Trucks! Roads, bridges, tunnels are critical points.
- Smaller retail outlets are less resilient.
- Food banks are the backbone of urban food safety nets.
- D-SNAP and WIC are insufficient/inflexible in prolonged aftermath.
- Public agency policies/practices may impede efforts!

U.S. urban food policy is starting to incorporate food systems in resilience planning. Most are natural disaster focused.



Resilient Food Systems, Resilient Cities: Recommendations for the City of Boston



MAY 2015



Others cities too. Not always consistently

The logo for C40 Cities, featuring the text "C40" in a large, bold, white sans-serif font above the word "CITIES" in a smaller, bold, white sans-serif font, both set against a solid green square background.

Food Systems Network Focus Areas

The Food Systems Network works with cities to progress their priorities in the following areas:

- Sustainable Diets
- Regenerative agriculture
- Food Distribution and **Resiliency** – strengthening resiliency and supporting sustainable food logistics to develop a safe and energy efficient municipal public market system, including hubs and wholesale markets.
- Food Waste
- Governance

A wide banner image showing a coastal city with a large body of water in the foreground, many sailboats, and a dense urban area with buildings and trees in the background. The text "C40 CITIES" is overlaid in the center in a large, bold, white sans-serif font.

C40 CITIES

Around the world, C40 cities are taking bold climate action, leading the way towards a healthier and more sustainable future.

Other efforts offer an opportunity to include food.

City Profiles
Seattle, WA, USA

Climate Resilient Cities

A Primer on Reducing Vulnerabilities to Disasters

// CITY DESCRIPTION

King County and its largest city, Seattle, Washington, along with the Emergency Preparedness Bureau, have been deemed major contributors to the discourse on climate change impacts and cities.



THE WORLD BANK

Global Facility for
Disaster Reduction and Recovery



International Strategy for
Disaster Reduction

Resilient Food Systems, Resilient Cities: Recommendations for the City of Boston



MAY 2015



Homes in Seaside Heights, New Jersey sit in ruins on the Atlantic Ocean waterfront after being destroyed by Hurricane Sandy on October 31, 2012. At least 147 people were reportedly killed by Sandy, and New Jersey suffered massive damage and power outages.

PHOTOGRAPH BY MARIO TAMA, GETTY IMAGES

ENVIRONMENT | REFERENCE

Hurricane Sandy, explained

Superstorm Sandy was actually several storms wrapped together, which made it one of the most damaging hurricanes ever to make landfall in the U.S.

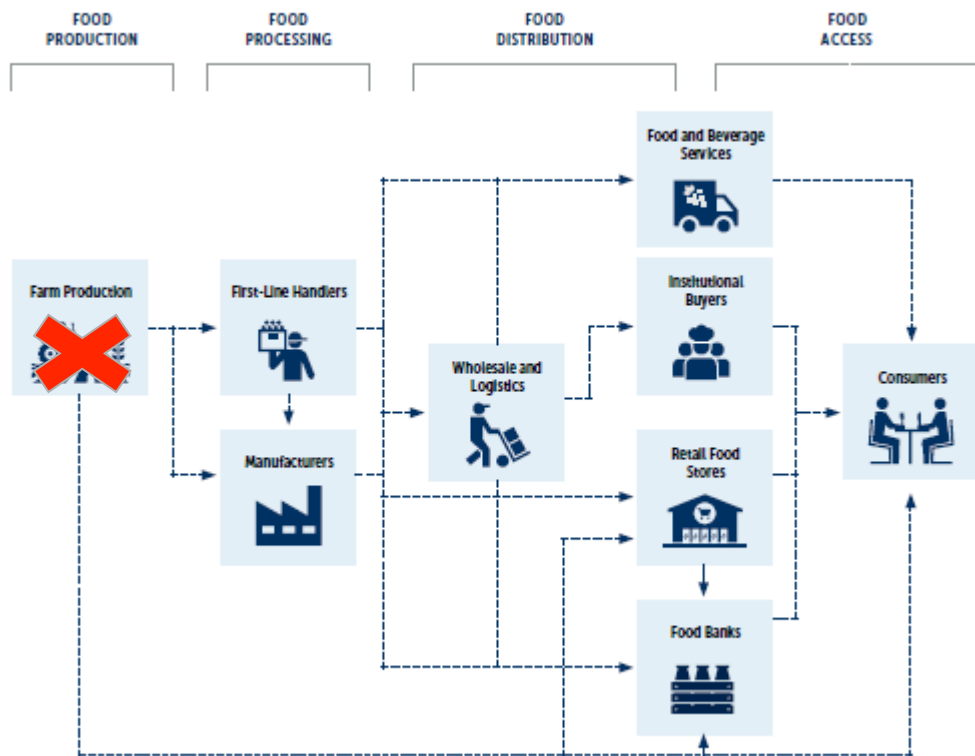


THE RESILIENCE OF AMERICA'S URBAN FOOD SYSTEMS: EVIDENCE FROM FIVE CITIES

Kimberly Zeuli and Austin Nijhuis
JANUARY 2017

Los Angeles
New York City
New Orleans, Louisiana
Madison, Wisconsin
Portland, Maine (Great recession)

FIGURE 2. THE FOOD SYSTEM



Source: Adapted from Nisheim, Malden C., Maria Orta, and Peggy Tsai Yih, eds. *A framework for assessing efficacy of the food system*. National Academies Press, 2015.



FOOD PROCESSING

Vulnerability:
Processing plants located in "at risk" areas

Analysis: Location of milk processing plants



FOOD DISTRIBUTION

Vulnerability: Distribution centers and wholesale facilities located in "at risk" areas

Analysis: Location of (1) primary warehouse suppliers of city's supermarkets (2) city warehouse suppliers

Vulnerability: Extended closure of limited transportation routes

Analysis: (1) redundancy of Interstates and U.S. highways connecting food warehouse suppliers to food retailers and (2) exposure of transportation routes to extended closures post-disaster



FOOD RETAIL

Vulnerability: Limited and "at risk" food retail at neighborhood level

Analysis: (1) compare food retail stores per capita in each neighborhood with food retail stores per capita in city; (2) compare share of supermarkets in each neighborhood with city average; and (3) measure share of food retail stores in each neighborhood that are located in "at risk" areas



FOOD INSECURITY

Vulnerability: Higher food insecurity at neighborhood level

Analysis: Compare share of SNAP recipients in each neighborhood to city average

Vulnerability: Food bank located in "at risk" area and insufficient capacity to meet greater demand

Analysis: (1) location of food bank; (2) ability of food bank to meet current demand; and (3) food bank plans to meet increased demand over extended period of time

"At risk" areas are defined as the impact area of the natural disaster risk being analyzed.



GOVERNMENT POLICIES & PRACTICES

Vulnerability: Creates barriers for food businesses returning to normal operations post-disaster

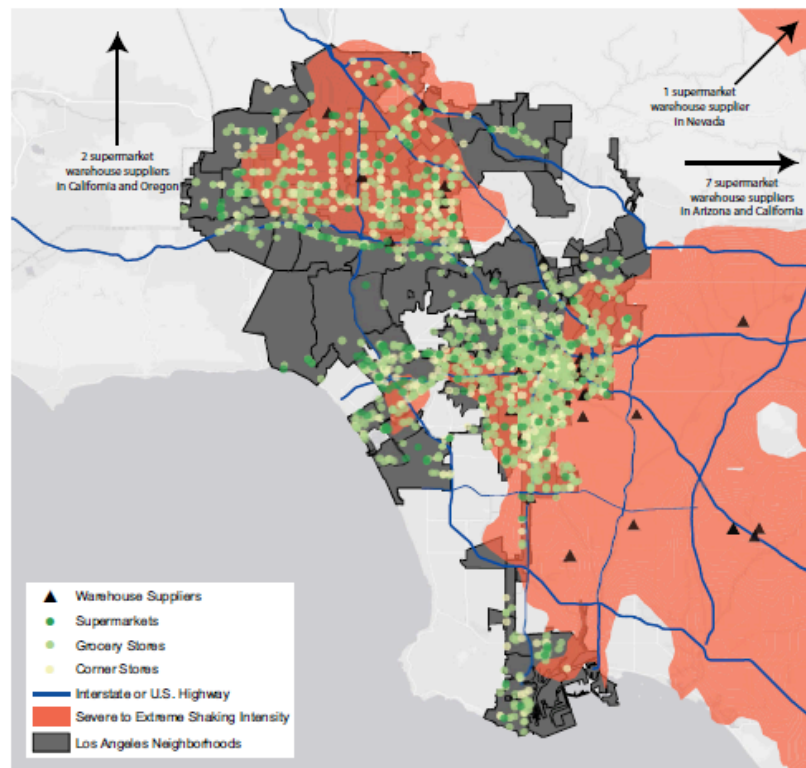
Analysis: Post-disaster food safety inspection process, construction permit process, transportation restrictions for food trucks, and communication and preparedness planning with private sector

FOOD ACCESS

Vulnerabilities

- Locational: buildings in “at risk” areas
 - ◆ 75 miles of city: typical range of hurricane force winds
- Food processing: processing plants in “at risk” areas
- Food distribution: suppliers in “at risk” areas, transportation routes
 - ◆ Excluding fuel supplies, “last mile” transportation
- Food retail: at the neighborhood level, the mix by type, location in “at risk” areas
- Food insecurity: pre-existing rates by neighborhood, local food pantries/banks
- Governmental: have a plan, food safety inspections, construction permits, food transportation restrictions

FIGURE 4. LOS ANGELES FOOD SYSTEM



Sources: Dun and Bradstreet's Hoover's Database (2016); U.S. Geological Survey, *Earthquake Planning Scenario ShakeMap: Shakeout Scenario* (2008); Zillow, *Zillow Neighborhood Boundaries* (n.d). Warehouse suppliers were identified using City or State business data and as those publicly listed on websites, annual reports and industry reports as suppliers for supermarkets operating in Los Angeles.

Recommendations of the King County Farms and Food Roundtable



June 2014



A 25-Year Vision for Washington State's Food System

Prospectus - June 2017 - Washington Food System Roundtable



Strategy 9.3: Strengthen food system resilience through identifying and addressing adaptation challenges and opportunities

9.3.1: Assess and monitor local climate impacts

9.3.2: Assess the ability of the Washington food and agricultural system to withstand natural disasters and infrastructure interruptions and propose adaptations

9.3.3: Strengthen local food system linkages between production and consumption

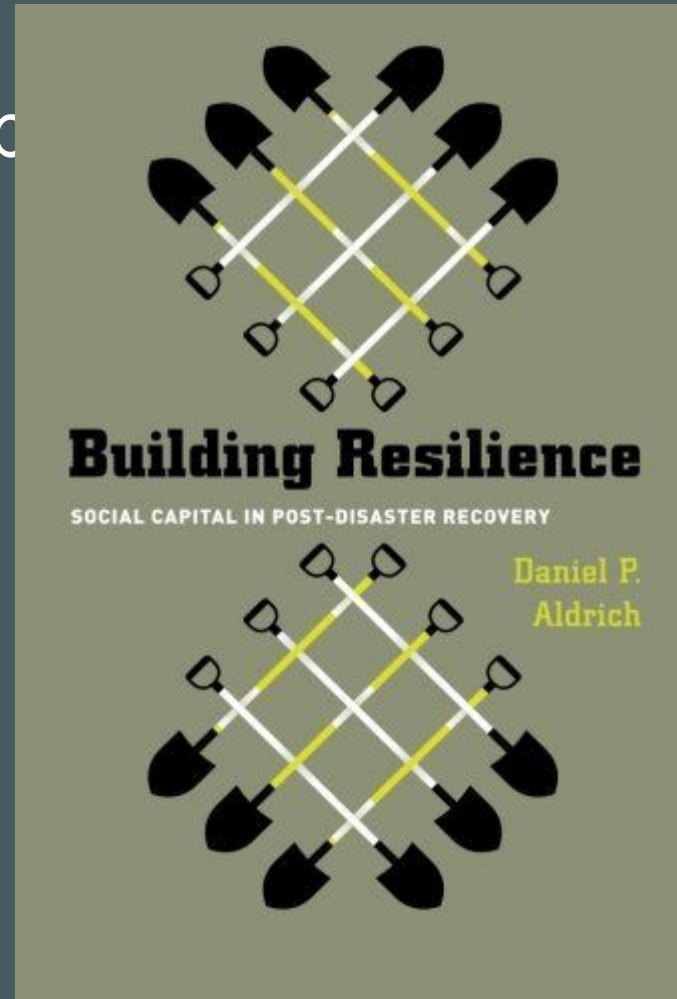
Reflection on recent efforts in U.S. cities

1. Cities lack data

- Origin of foods
- Distribution
 - Paths, # trucks in/out and times of day, use of ports and rail
- Food retail (proportions)
- Food exporting cities' impacts on food supply to other cities

Including data on social capital

- Community level social networks



2. Every city will have unique food system vulnerabilities

- Assessments, consistent metrics needed
- Tools?

Chief Resilience Officer
City Department of Public Health
City Economic Development Department
City Emergency Management Office
City Environment and Sustainability Department
City Food Policy Council
City Office of Food Initiatives
City Office of Small Business Development
City Planning Department
City Transportation Department
Federal Emergency Management Agency (for region)
Food Bank
Food Distribution Company
Food Policy Center
Food Processing and Packaging Company
Food Retail Store
Food Retail Trade Association
Food Safety Net Organization
Harbor Association
Regional Planning Agency
State Department of Agriculture
State Emergency Management Department
Utility Company

The number of food sector organizations needed at the table for resilience planning.

(Policy hat: Intersections cushions the blow of new political regimes and can help provide political cover for hard decisions.)

Emerging leaders/partners

Food Insecurity and the Economy

2:45 p.m. - 3:45 p.m.

Room TBD

Moderators

MURIEL BOWSER

Mayor of the District of Columbia

Co-Chair, Food Policy Task Force

PAUL SOGLIN

Mayor of Madison

Co-Chair, Food Policy Task Force



Infrastructure

Innovation

Inclusion

Welcome

To the 87th Winter Meeting of The United States Conference of Mayors

January 23-25, 2019

Capital Hilton Hotel

Washington, DC

3. Should food production be included? And, how?

Agroecology and Sustainable Food Systems

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/wjsa21>

Resilience in Agriculture: Small- and Medium-Sized Farms in Northwest Washington State

Bryant Hammond ^a , Gigi Berardi ^b & Rebekah Green ^a

How Are This Year's Wildfires Impacting Specialty Crops?



By Carol Miller | September 5, 2018



There isn't much historical data to fall back on. "We don't have a lot of research on smoke because it's not something that we encounter frequently,"

Tim Waters, a regional vegetable specialist for Washington State University, told NPR.

- Delayed harvests
- Lower yields
- Increase soil-borne pathogens

FOOD FOR THOUGHT

As Wildfires Rage, Smoke Chokes Out Farmworkers And Delays Some Crops

August 29, 2018 · 5:03 AM ET

Heard on Morning Edition

ANNA KING

FROM NORTHWEST NEWS NETWORK



Workers in dust masks wash fresh red bell peppers in smoky conditions outside of Eltopia, Wash. Even with the masks, the smoke is still causing tight chests, itchy eyes and dry throats.

Anna King/Northwest News Network



A picture of the Nine Mile Fire which burned in Okanogan County in 2015. Gary DeVon/Okanogan Valley Gazette-Tribune

ENVIRONMENT

Fires, Floods, Destruction: Washington Copes With Worsening Climate Change

From rising sea levels and crop failures to dying forests and fish, Washington state is struggling

How climate change is affecting Washington winemaking

Originally published February 17, 2017 at 7:00 am



A harvester picks grapes at The Benches Vineyard in the eastern Horse Heaven Hills in Benton County as the Columbia River flows toward Oregon. Washington wine country... (Andy Perdue) [More](#) ▾

Small [the owner] has kept careful notes every year (on temperatures, rainfall, growing degree days and brix levels). “They are no longer applicable. It’s a moving target.”

“We don’t know what wines will taste like in the future, how well they will age or how well they will go with food,” Small said, noting that the alcohol levels in his wines significantly since the early 1980s, due in part to climate change.

4. Where's water (and air)?

“The effect of major wildfires on drinking water supplies can also be severe....Water treatment plants in those places were overwhelmed by sedimentation, dissolved organic carbon, and chemicals that were released by fire.”



5. Ways to do this?



The National Coalition for Dialogue & Deliberation (NCDD) is a network of innovators who bring people together across divides to discuss, decide, and take action together effectively on today's toughest issues. NCDD serves as a gathering place, a resource center, a news source, and a facilitative leader for this vital community of practice.

DELIBERATIVE DEMOCRACY CONSORTIUM

DDC is an alliance of leading organizations and scholars working in the field of public engagement, participation, and deliberation. While the DDC's primary arena of action is in North America, we are part of a global learning community dedicated to the same fundamental values and goals.



Participatory processes are needed that unite science, policy, and practice and can weigh values.