

The public health opportunity when planning initiatives to rebuild coastal structures

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- UConn Atmospheric Sciences Group (ASG) The ASG strives to facilitate educational, research, and outreach initiatives concerning the atmospheric and related sciences, and to foster knowledge transfer to advance public health and environmental sustainability.
- UConn Health, Division of Occupational and Environmental Medicine

Please note that this work is the sole responsibility of the author and does not necessarily represent the official views of NIOSH or any other agency.

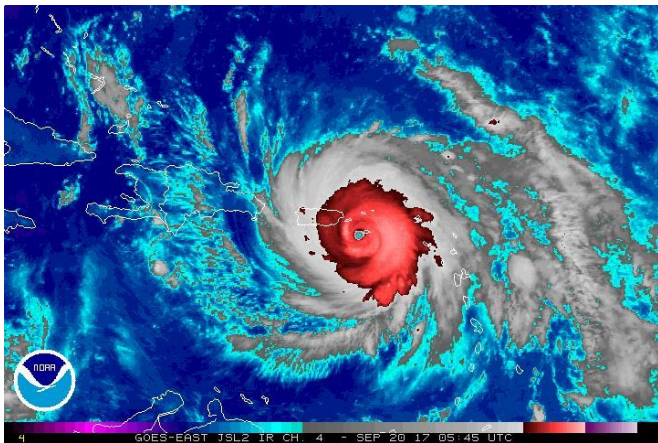
Catastrophic wet weather



Katrina
NASA/Goddard Space Flight Center Scientific
Visualization Studio <http://svs.gsfc.nasa.gov/cgi-bin/details.cgi?aid=3251> August 2005



Sandy
GOES View of Hurricane Sandy.
<http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=79553> October 28, 2012



GOES View of Hurricane Maria At it's strongest
September 20, 2017 about 05:45 UTC
<https://www.ospo.noaa.gov/Organization/History/imagery/Maria/index.html>



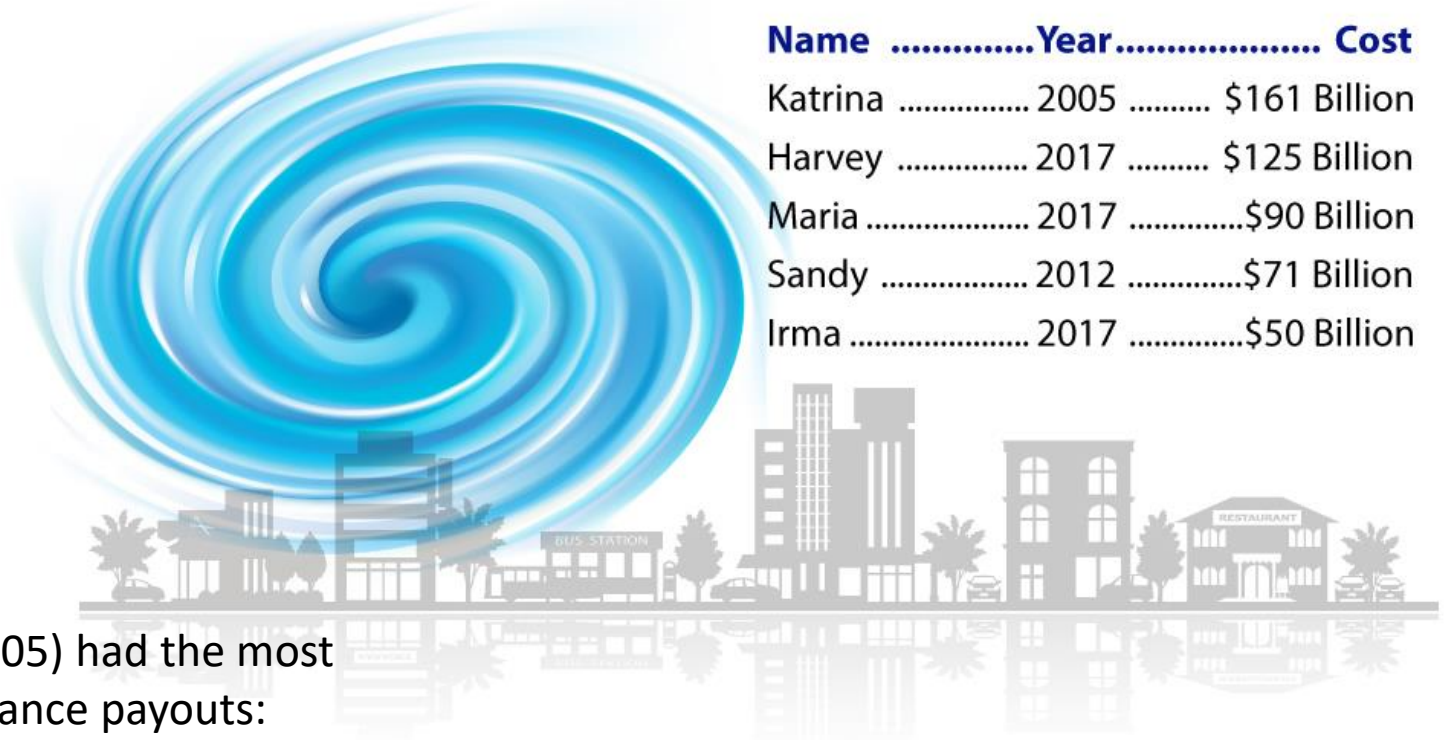
Heavy Snow in NE US
<http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=76267> October 30 2011



2011 "Halloween Nor'easter"
West Hartford, Connecticut October 2011



The Top Five Costliest U.S. Hurricanes on Record



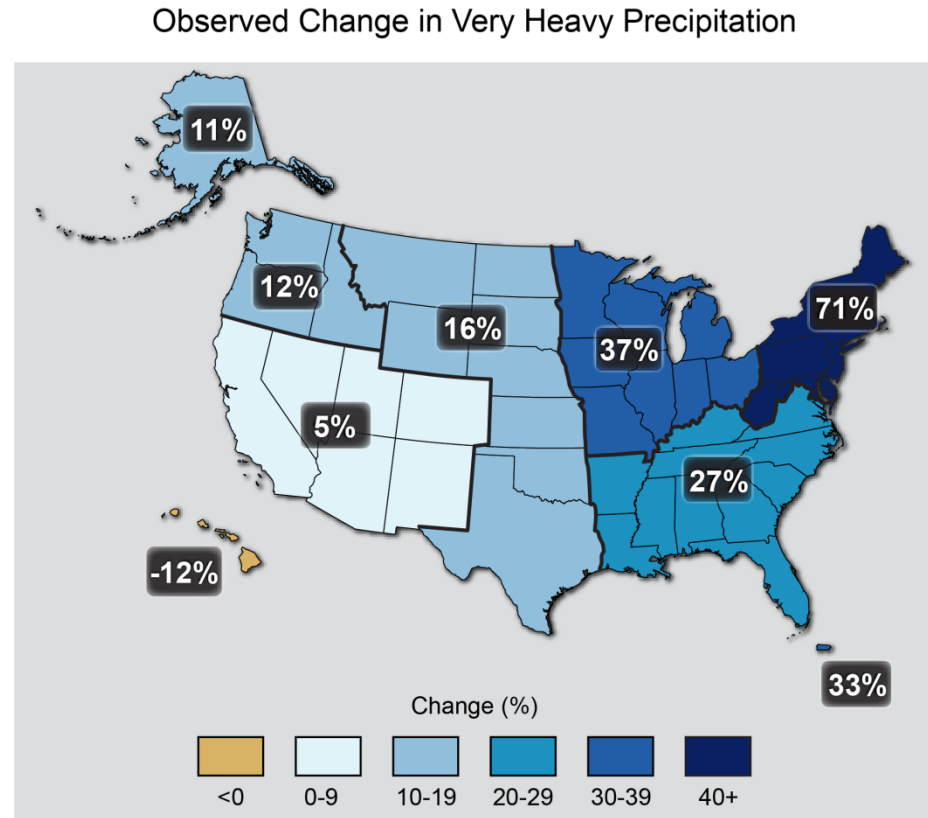
Name	Year.....	Cost
Katrina	2005	\$161 Billion
Harvey	2017	\$125 Billion
Maria	2017	\$90 Billion
Sandy	2012	\$71 Billion
Irma	2017	\$50 Billion

Katrina (2005) had the most flood insurance payouts: 167,985; \$16 billion; average paid loss \$97,140.

<https://coast.noaa.gov/states/fast-facts/hurricane-costs.html>

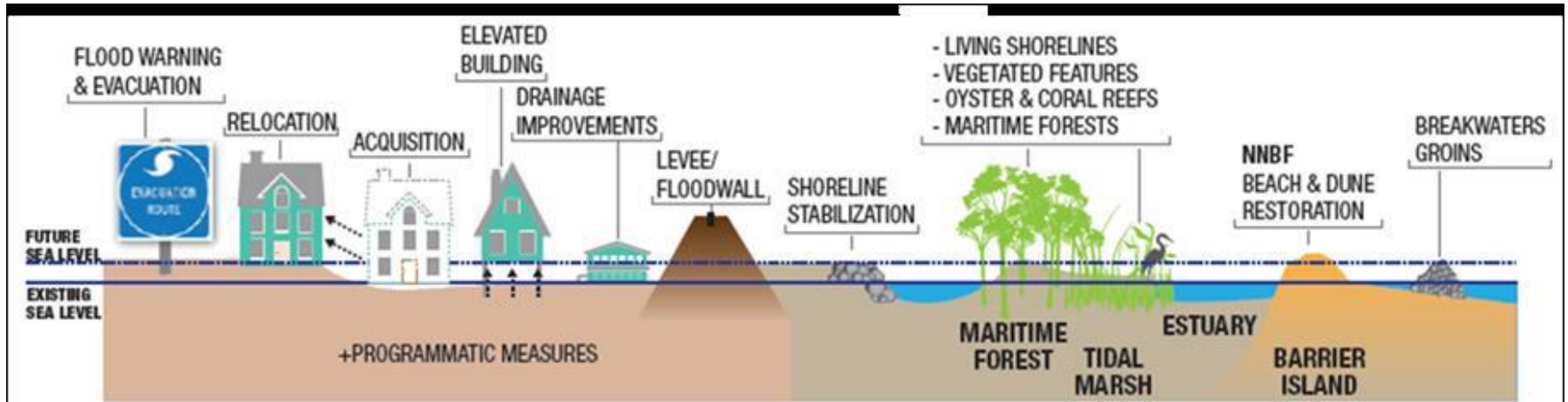
Wet weather

- Climate Change = more severe storms & rain bombs!!
- Water/damage higher up in buildings, and buildings affected farther from coastline and waterways.
- Substantial reach touches communities broadly



[National Climate Assessment Report](http://nca2014.globalchange.gov/report/our-changing-climate/heavy-downpours-increasing)
<http://nca2014.globalchange.gov/report/our-changing-climate/heavy-downpours-increasing>

Coastal flood improvement plans

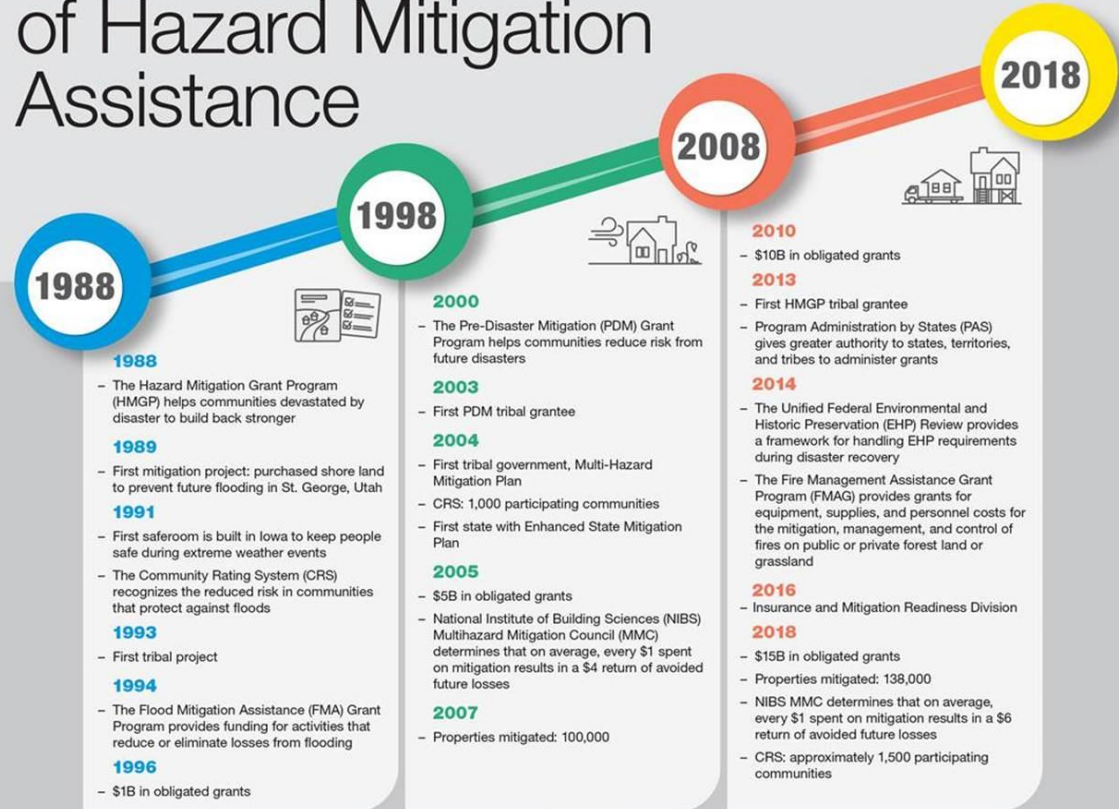


Carter et al. 2019 Flood Resilience and Risk Reduction:
Federal Assistance and Programs Congressional Research Service
<https://crsreports.congress.gov>
R45017

Federal Emergency Management Agency/FEMA, US Department of Homeland Security



30 Years of Hazard Mitigation Assistance



LEGISLATIVE MILESTONES

- 1988** Robert T. Stafford Disaster and Emergency Assistance Act
- 1993** Hazard Mitigation and Relocation Assistance Act
- 1994** National Flood Insurance Reform Act
- 2000** Disaster Mitigation Act
- 2006** Post Katrina Emergency Management Reform Act
- 2012** Biggert-Waters Flood Insurance Reform Act
- 2013** Sandy Recovery Improvement Act
- 2014** Homeowner Flood Insurance Affordability Act

Table 1. Selected Federal Programs That Support Flood Resilience and Risk Reduction Improvements

(dollars in millions [M] or billions [B])

Program	Agency/ Dept.	Type of Assistance	FY2019 Funding ^a	FY19/FY20 Supp. Funds ^b
Flood-Specific Programs				
Flood Mitigation Assistance	FEMA	Grant	\$160 M	—
Flood Damage Reduction Projects	USACE	Federal share of project	\$946 M	\$1.775 B
Flood-Related Continuing Authorities Programs	USACE	Federal share of project	\$19.5 M	up to \$25 M
Emergency Watershed Protection—Floodplain Easements	USDA	Floodplain easement	\$0	\$435 M
Mitigation and Resilience Programs				
Pre-Disaster Mitigation (PDM)	FEMA	Grant	\$250 M ^c	—
Hazard Mitigation Grant Program	FEMA	Grant	Unknown, determined per disaster	Not directly; see program description.
Watershed and Flood Prevention	USDA	Grant	\$197 M (discretionary) \$47 M (mandatory)	—
National Coastal Resilience Fund and Emergency Coastal Resilience Fund (administered by NFWF)	NOAA	Grant	\$30 M	\$50 M
Multipurpose Programs				
Clean Water State Revolving Fund ^d	EPA	Loans and other subsidization	\$1.694 B	—
Water Infrastructure Finance and Innovation Act (WIFIA) Program	EPA	Credit assistance (e.g., loan or loan guarantee)	\$60 M to cover subsidy costs of ≈\$6 B of credit assistance	—
Community Development Block Grant (CDBG)	HUD	Grant	\$3 B	—
CDBG Section 108 Loan Guarantees	HUD	Loan guarantee	\$300 M loan-commitment ceiling	—
CDBG—Disaster Recovery	HUD	Grant	—	\$2.431 B; P.L. 115-254; \$1.680 B

Source: Congressional Research Service.

Carter et al. 2019 Flood Resilience and Risk Reduction: Federal Assistance and Programs Congressional Research Service <https://crsreports.congress.gov/R45017>

*Catastrophic weather, our coasts in peril,
significant resources lost, and increasing
likelihood for more!!!!*

So

what is the “public health opportunity” ????

Public Health



“the art and science of preventing disease, prolonging life and promoting health through the organized efforts of society” (WHO/Acheson 1988)

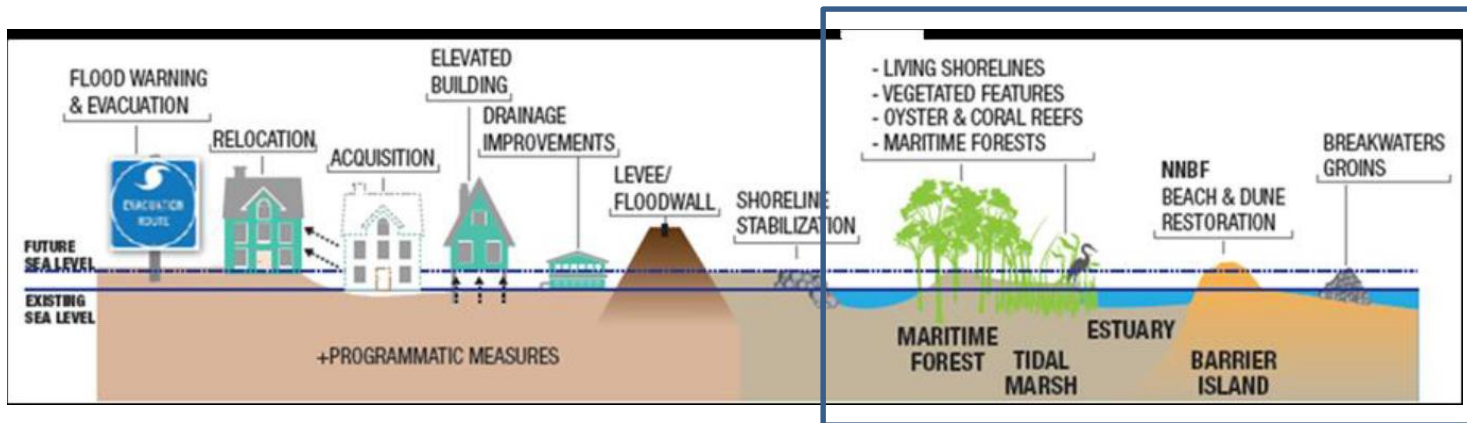


“the art and science dealing with the protection and improvement of community health by organized community effort and including preventive medicine and sanitary and social science” (Merriam Webster).



- “Public health is the science of protecting and improving the health of people and their communities... as small as a local neighborhood, or as big as an entire country or region of the world” (CDC Foundation)

Relook: Actions to make coasts more resilient to storms



Carter et al. 2019 Flood Resilience and Risk Reduction:
Federal Assistance and Programs Congressional Research Service
<https://crsreports.congress.gov>
R45017

Benefits

- Less flooding events will mean **less threat to housing and other structures, mitigation to erosion and more protection for resources.**
- Mitigating storm severity will **reduce interruptions to medical care access, disruption to power, and damage to infrastructure.**
- These actions could also provide desirable environmental and health promotion improvements such as **recreational possibilities that benefit mental and physical health.**

Is this enough? Can we do more?

What will these actions do for public health?

Prevent disease?

Improve health of the community?

Address in-place needs?

With community involvement,
successful ecological improvement
can help reduce **health disparity**



“local development visions” would serve to
reduce social inequity (IPCC 2012)



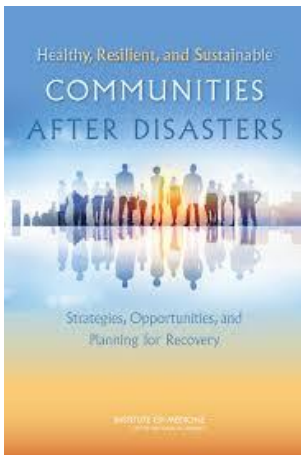
“optimally healthy community” / improve
health and economic status by involving
the community that is most directly
affected by disasters (IOM 2015)

*Will using National Environmental Policy Act, “Environmental Justice” and community participation requirements in the panoply of environmental programs be enough to truly raise health status of our communities, and insure fewer **unintended consequences** that injure?*

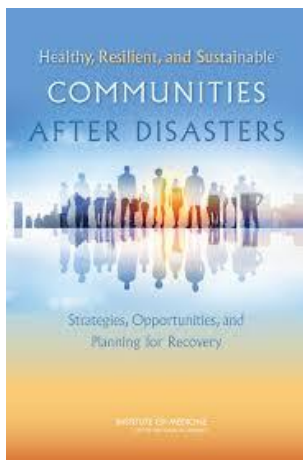
*Is there guidance on how to best **involve those most impacted by severe weather threat** when directing the huge commitment allocated for coastal resilience and rebuilding efforts so we do more to raise health status while addressing the coastal vulnerability?*

Communities can transform in a host of ways

The Institute of Medicine convened an expert committee to explore the process for preparing and responding to disasters with an eye to utilizing the resources to *“advance the long-term health, resilience, and sustainability of a community and its residents. Pursuit of this under realized social goal begins with a vision of a healthy, resilient, and sustainable community and requires a recovery approach that incorporates health considerations into every step of the planning process, informed by an assessment of community health and vulnerability”* (IOM 2015).



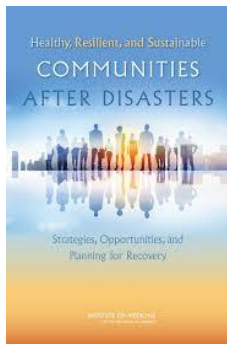
Institute of Medicine 2015. Healthy, Resilient, and Sustainable Communities After Disasters: Strategies, Opportunities, and Planning for Recovery. Washington, DC: The National Academies Press.
<https://doi.org/10.17226/18996>.



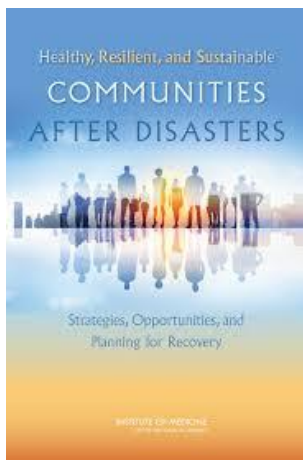
Healthy, Resilient, and Sustainable Communities After Disasters: Strategies, Opportunities, and Planning for Recovery

Utilizing resources, engaging community

- Acknowledges importance of building efforts to maintain critical infrastructure add resiliency
- Advocates for community engagement
- Proposes that recovery resources from FEMA and other public and private sources could be utilized to also raise population status— but how?



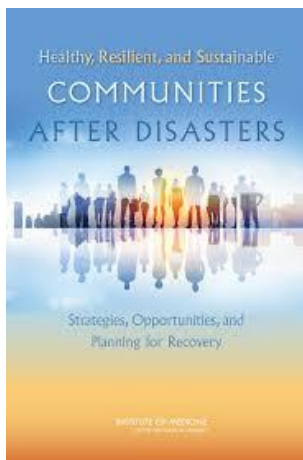
- Four Stages to use both in pre and post disaster activities:
 - Visioning
 - Assessment
 - Planning
 - Implementation
- Community roles
 - Make decisions around resources and priorities with an eye to health and welfare
 - Identify workforce opportunities
 - Disseminate information
 - Develop “community health assessments”



Community health assessment

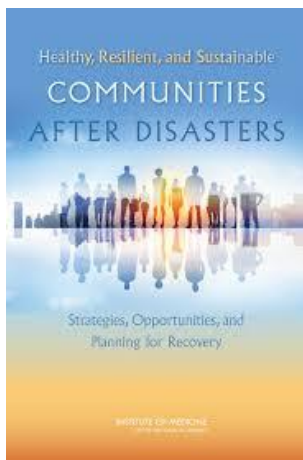
Glossary:

*“A **systematic examination** of the health status indicators for a given population that is used to **identify key problems and assets** in a community. The ultimate goal of a community health assessment is to **develop strategies** to address the community’s health needs and identified issues. A variety of tools and processes may be used to conduct a community health assessment; the essential ingredients are community engagement and collaborative participation.” (IOM 2015, emphasis added).*



Part 2: Health improvement plan Elements of a Healthy Community, pg.51

- A safe, healthy, and aesthetically pleasing physical environment
- An inclusive, supportive social environment
- A high-quality, comprehensive health system



“POST-DISASTER OPPORTUNITIES TO ADVANCE HEALTHY COMMUNITIES”, page 61

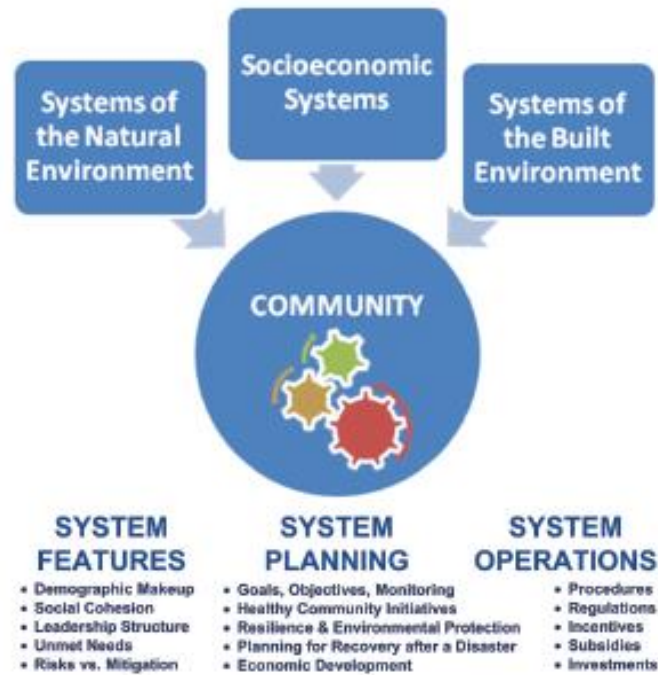


FIGURE 2-2 Illustration of the systems perspective of a community when contemplating options after a disaster.
SOURCE: B. Hokanson/PLN Associates.

Leveraging resources wisely and effectively

- Engage a wide array of stakeholders and community members in “healthy community visioning” to identify concerns and opportunities associated with proposed action
- Employ openness/ transparency in information gathering and reporting
- Assess health and exposure risks
- Integrate public health impacts into planning decisions
- Include sound ecological management practices to address public health impacts and reduce unintended health consequences (ie vector control for mosquitos that come with increasing marsh areas) and
- Incorporate place-based strategies for the impacted community that are intentionally designed to support public health and welfare

Elements of place-based strategies that support public health

- A multi-faceted team with members from the affected communities engaged in efforts to address housing, community development, environmental management, occupational safety, and public health
- Housing strategies that increase “healthy housing”
- Infrastructure development that encourages active life styles – trails, bike paths, sidewalks, parks
- More access to “critical goods (healthy food), community services (medical care) and amenities (libraries, schools, recreational/physical fitness facilities”) IOM report.
- Employment expansion for the community
- Health recovery plans and actions
- Worker occupational health and safety planning and training, and
- Systems to monitor health indicators in the community during construction and after to provide on going data to inform continuing actions to raise health status

Thank you and final thoughts

“Cherish our institutions that foster inquiry and science, our environment that gives us beauty and sustenance, and our communities that provide the center for all experience”

Paula Schenck, January 15, 2020.



America's Founding Documents

The Declaration: Mural by Barry Faulkner

<https://www.archives.gov/founding-docs/declaration-mural>