

A satellite view of Earth from space, showing a large storm system with a distinct eye over the ocean. The image is partially obscured by green geometric shapes.

September 8, 2016

# **Seize the Day: Opportunities for Health Care**

Robin Guenther, FAIA, Perkins+Will  
Senior Advisor, Health Care Without Harm





## the good news

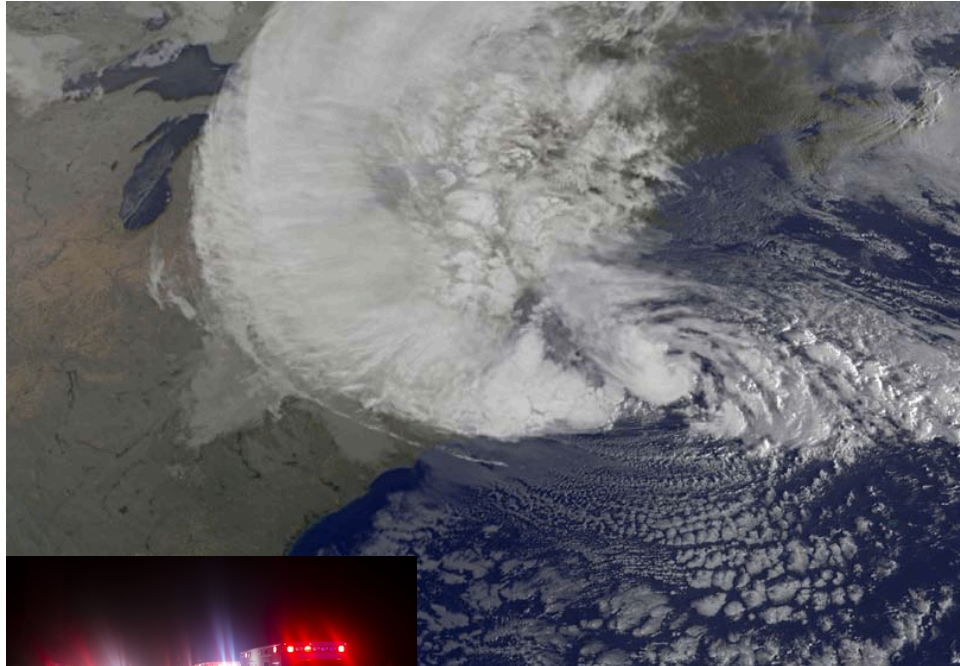
The health care sector can play a leading role in solving these problems. Through its massive buying power and mission-driven interest in preventing disease, the health care sector can help shift the entire economy toward sustainable, safer products and practices.

# IS OUR HEALTHCARE INFRASTRUCTURE RESILIENT TO CLIMATE CHALLENGES?





**Charity Hospital and VAMC**  
New Orleans, LA  
(Hurricane Katrina, 2005)



**NYU Langone and Bellevue**  
New York, NY  
(Hurricane Sandy, 2012)

# The Lancet Commission



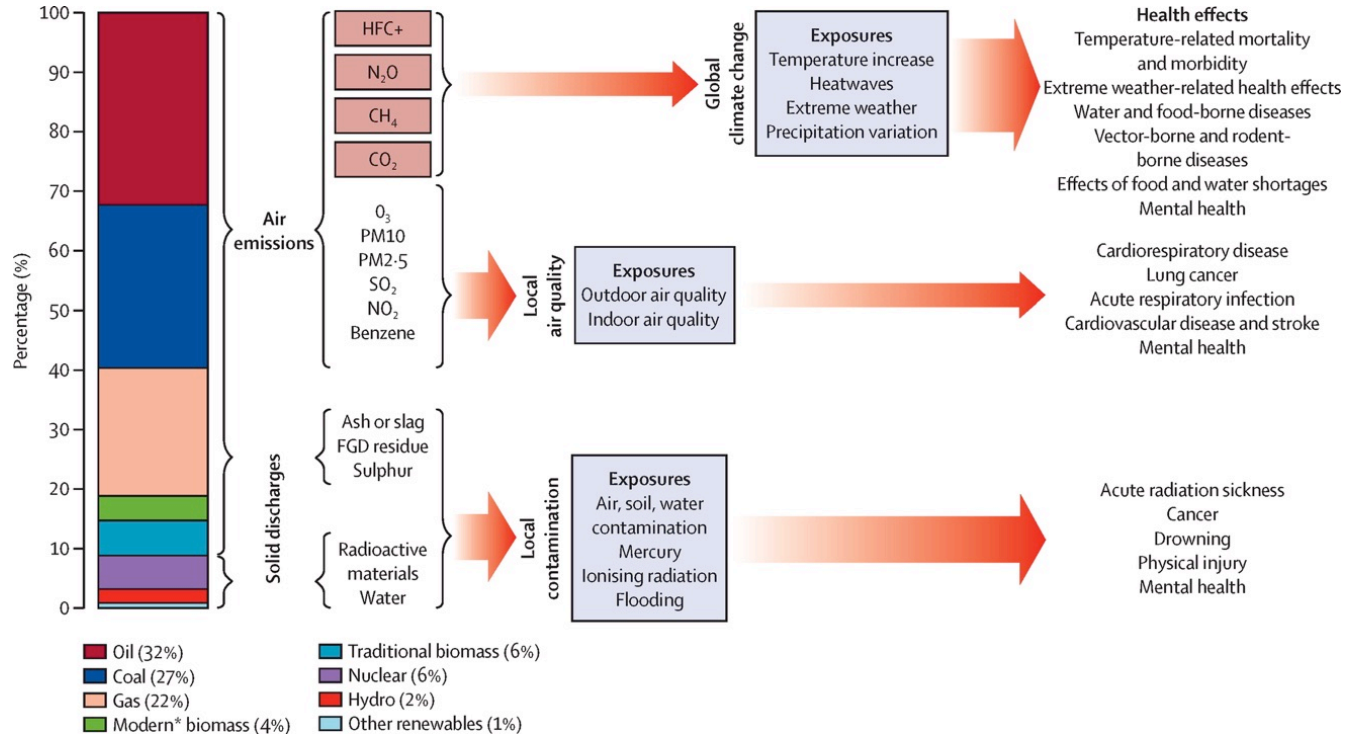
“The effects of climate change are being felt today, and future projections represent an unacceptably high and potentially catastrophic risk to human health.”



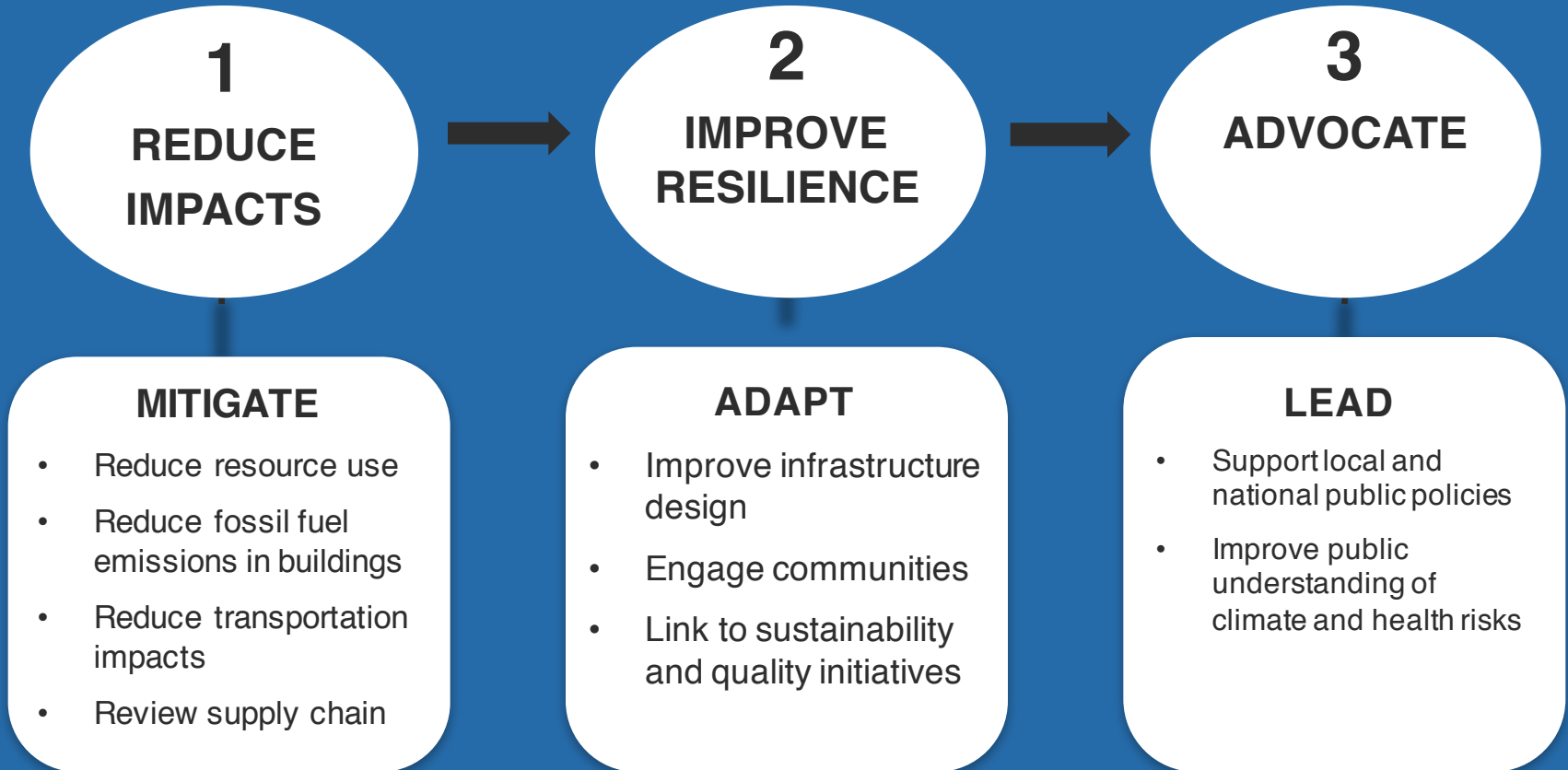
“Hospitals and health systems, particularly in more industrialized settings, have a significant carbon footprint.”

“By moving toward low-carbon health systems, health care can become more resilient to the impacts of climate change, save money, and lead by example.”

# Fossil Fuels and Health



# Health Care's Role



# MITIGATE

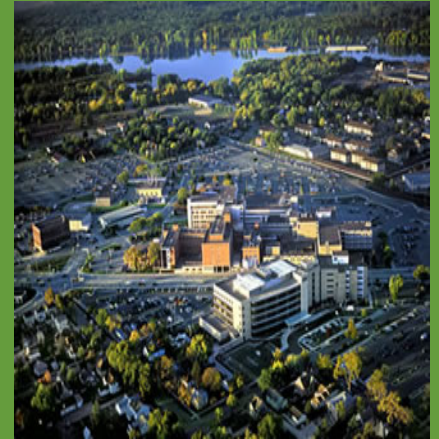
Reduce Energy And Water Use



# *Energy Independent by 2014*

“We did not set out to be the greenest health system. We set out to make the air better for our patients to breathe, control our rising energy costs and help our local economy.”

–Jeff Thompson, MD  
Gundersen Health System 2014







- Low-energy design
- Passive design strategies – operable windows
- On-site power generation
- On-site renewable energy



- Low water use design
- Recycled and reclaimed water reuse
- Independent water source

**Kiowa Memorial Hospital**  
Greensburg, KN  
(EF-5 tornado, 2008)

## Press Release

# Kaiser Permanente Pledges Bold 2025 Environmental Performance to Benefit People and Planet

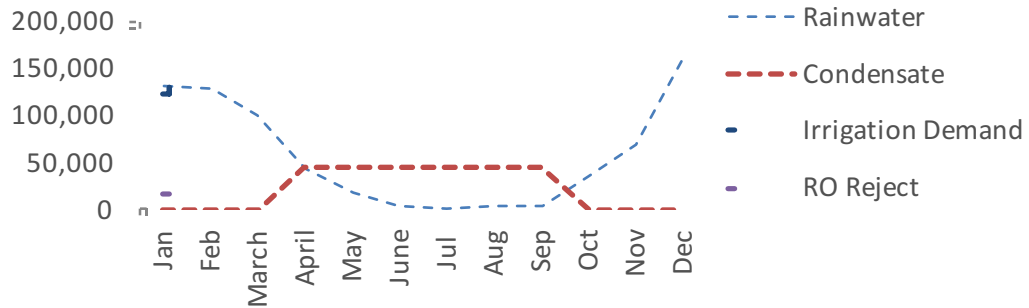
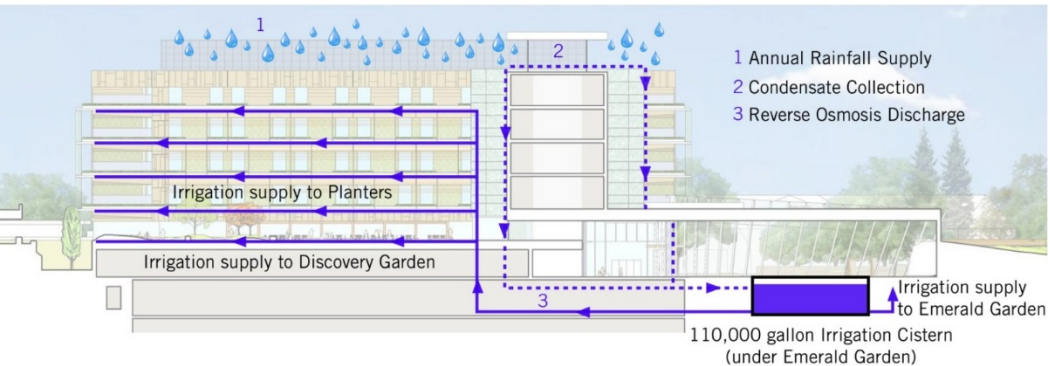
Already a global leader in climate action, organization sets in motion its most ambitious plan ever for a healthier future

May 17, 2016



carbon positive

**Kaiser Permanente**  
Oakland, California



## Lucile Packard Children's Hospital at Stanford

Palo Alto, California

# ADAPT

Improve Healthcare Infrastructure Resilience

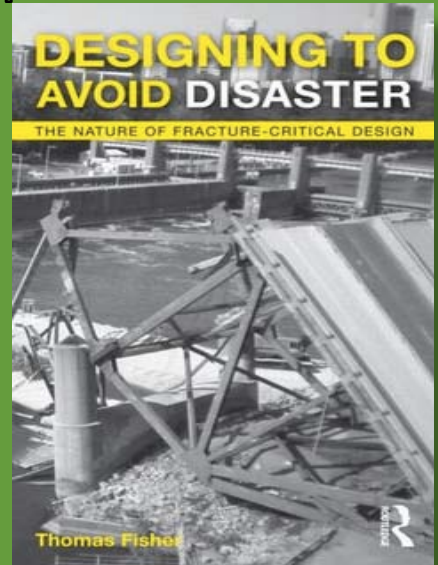


# Fracture Critical

“...going forward, good design and planning will be based on the understanding that nothing will work as planned, or even at all.

We are at our best when we have imagined, and accounted for, the worst.”

–Thomas Fisher  
University of Minnesota



# Focus on patient health and safety and provider outages that will strain the healthcare system:

- 1 Reduce the risk of emergency evacuations
- 2 Be able to take on acute emergent patient needs (during and after)
- 3 Avoid extended facility outages that strain the system
- 4 Reduce how many patients cannot access their normal provider

Minimize disruptions in the **healthcare system** in order to preserve the wellbeing and health of staff, patients and community

Operate continuously

*or*

Re-open quickly

## Key strategies

- 1 Ensure critical healthcare providers' operability through redundancy and the prevention of physical damage
- 2 Reduce barriers to care during and after emergencies

# *Goals of Resilient Healthcare*

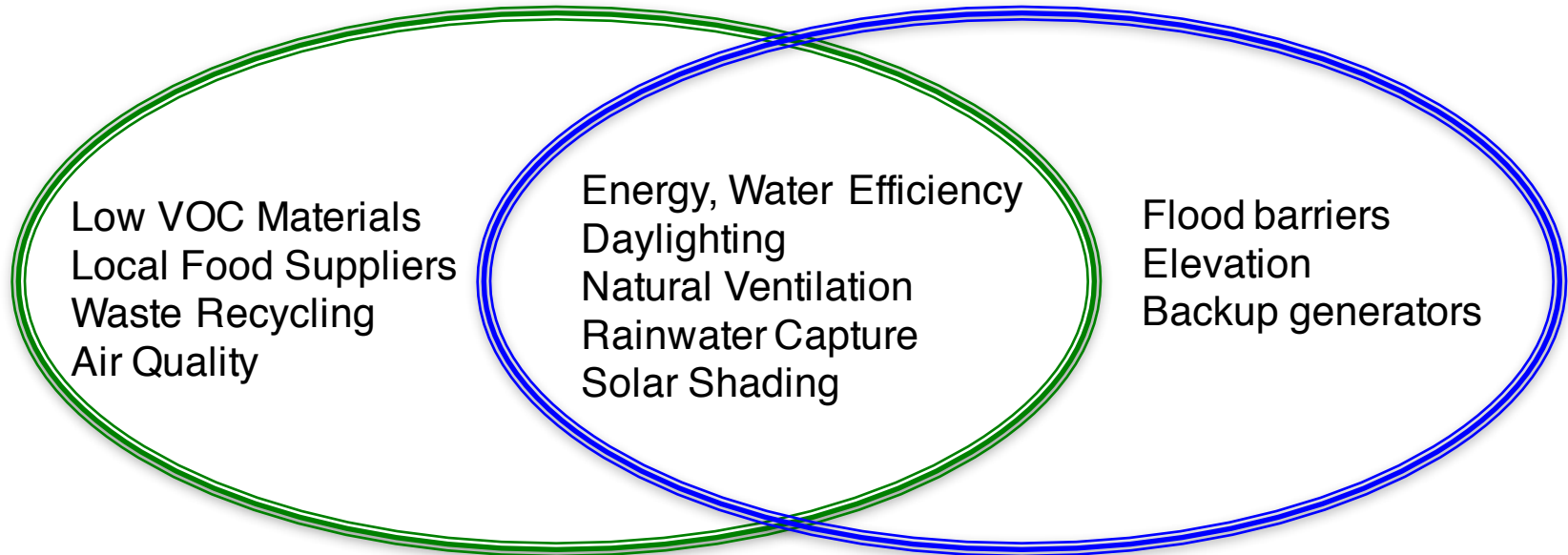
- functioning well under stress
  - successful adaptation
    - self reliance
  - social capacity



Sustainability

Sustainability and Resilience

Resilience





Texas Medical Center, Houston, Texas (SOM Site Master Planning)

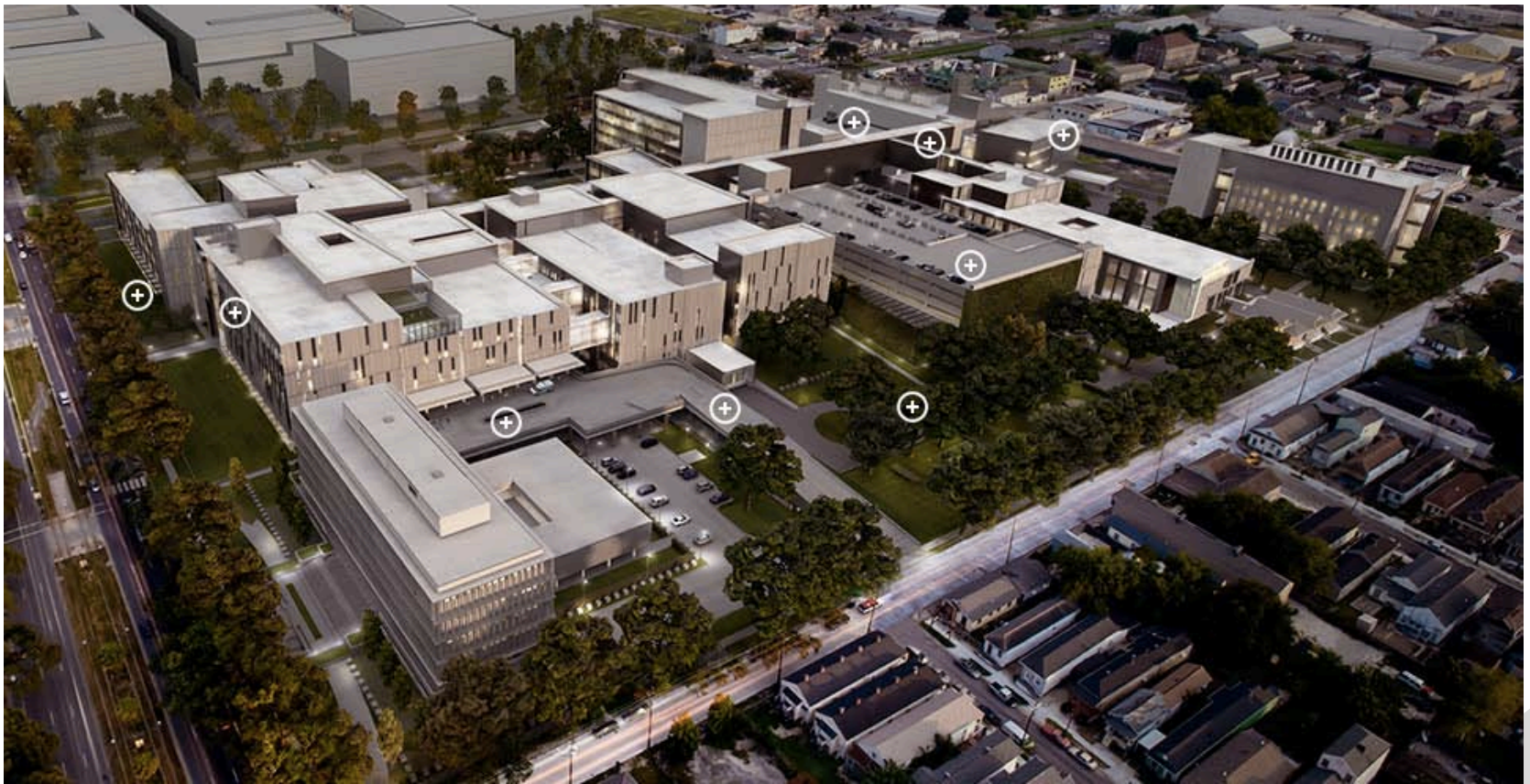


Completed early in 2006, Brays Bayou Marsh at Mason Park is near the mouth of Brays Bayou. The marsh is an award-winning partnership project.

## Texas Medical Center

Houston, TX

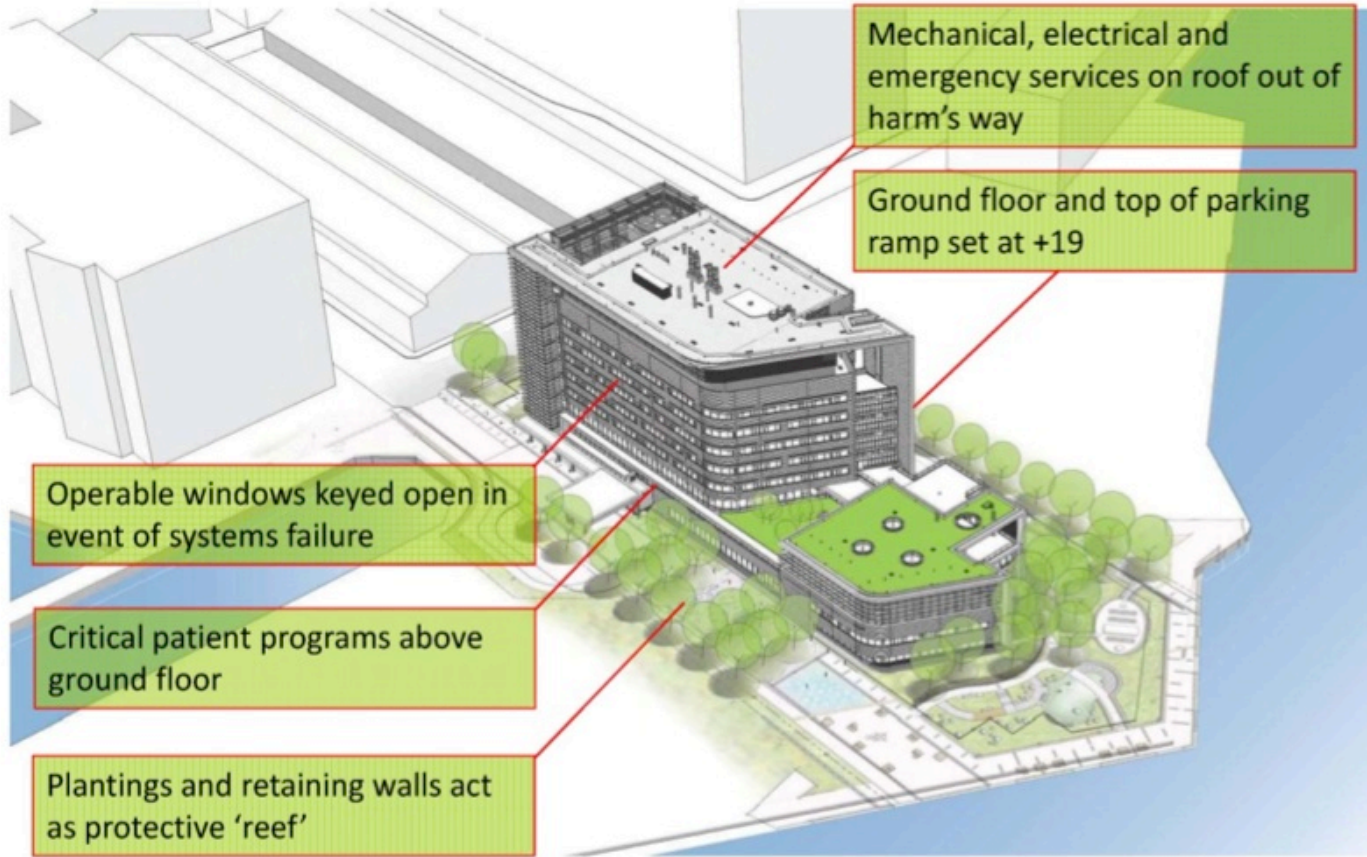
Since Tropical Storm Allison, 2001



**Charity Hospital and VAMC**  
New Orleans, LA  
(Hurricane Katrina, 2005)



**Spaulding Rehabilitation Hospital**  
Boston, MA



Mechanical, electrical and emergency services on roof out of harm's way

Ground floor and top of parking ramp set at +19

Operable windows keyed open in event of systems failure

Critical patient programs above ground floor

Plantings and retaining walls act as protective 'reef'

# LEAD

Educate and advocate locally and globally for climate policies



# The President's Climate Action Plan- June 2013

THE PRESIDENT'S PLAN WILL

## PREPARE THE U.S. FOR THE IMPACTS OF CLIMATE CHANGE

### WE'VE MADE GREAT PROGRESS



The Administration and partners developed national strategies to help decision makers address the impacts of climate change on freshwater resources — fish, wildlife, and plants — and oceans.

#### PROGRESS:

In 2013, federal agencies released Climate Change Adaptation plans for the first time, outlining strategies to protect their operations, missions, and programs from the effects of climate change.

#### PROGRESS:

The US Global Change Research Program, NOAA, USACE, and FEMA developed and released interactive sea-level rise maps and a calculator to aid rebuilding efforts in NY and NJ after Superstorm Sandy.

### THERE'S MORE WORK TO DO

Moving forward, the Obama Administration will help states, cities, and towns build stronger communities and infrastructure, protect critical sectors of our economy as well as our natural resources, and use sound science to better understand and manage climate impacts.



### SUPPORT CLIMATE-RESILIENT INVESTMENTS

at the community level by removing policy barriers, modernizing programs, and establishing a short-term task force of state, local, and tribal officials to advise on key actions the federal government can take to support local and state efforts to prepare for climate change.

### REBUILD AND LEARN FROM SUPERSTORM SANDY

by piloting innovative strategies in the Superstorm Sandy-affected region to strengthen communities against future extreme weather and other climate impacts and building on a new, consistent flood risk reduction standard established for the Sandy-affected region, agencies will update their flood-risk reduction standards for all federally-funded projects.



### LAUNCH AN EFFORT TO CREATE SUSTAINABLE AND RESILIENT HOSPITALS

In the face of climate change through a public-private partnership with the healthcare industry.



### PROVIDE TOOLS FOR CLIMATE RESILIENCE

Including existing and newly developed climate preparedness tools and information that state, local, and private-sector leaders need to make smart decisions.



## Primary Protection: Enhancing Health Care Resilience for a Changing Climate



U.S. Department of Health and Human Services

December 2014

HHS Sustainable and Climate Resilient Health Care Facility Initiative

### ELEMENT 1 CHECKLIST

Yes = Action completed    Green = Action in progress or incomplete    Yellow = No action planned or taken    Red = Action not taken    N/A = Does not apply

GENERAL	Value	Rank
<b>1.0.1</b> Does your health care facility receive notifications of weather warnings, alerts, and advisories for the following hazard conditions?		
• Extreme heat	<input type="radio"/> Yes <input type="radio"/> No	
• Extreme cold	<input type="radio"/> Yes <input type="radio"/> No	
• Extreme weather – freezing rain, blizzard, ice storm, hail, snow	<input type="radio"/> Yes <input type="radio"/> No	
• Drought	<input type="radio"/> Yes <input type="radio"/> No	
• Wildfire	<input type="radio"/> Yes <input type="radio"/> No	
• Tornado	<input type="radio"/> Yes <input type="radio"/> No	
• Flash Floods and/or Coastal Floods	<input type="radio"/> Yes <input type="radio"/> No	
• Hurricanes or Severe Storms	<input type="radio"/> Yes <input type="radio"/> No	
• Airborne or landfalling	<input type="radio"/> Yes <input type="radio"/> No	
• Poor air quality and smog	<input type="radio"/> Yes <input type="radio"/> No	
• Water-borne contamination and/or diseases	<input type="radio"/> Yes <input type="radio"/> No	
• Vector-borne diseases	<input type="radio"/> Yes <input type="radio"/> No	

#### STEP 1: Understand Climate Risks

"Climate vulnerability assessment" is the analysis of the expected impacts, risks and adaptive capacity of a site and gradual effects of climate change. A vulnerability assessment is more than simple measurement of the past weather events resulting from climate change includes an assessment of the ability to adapt.

Value	Rank
<b>1.1.1</b> Is local or regional government conducting climate risk and vulnerability assessments for the healthcare sector?	<input type="radio"/> Yes <input type="radio"/> No
• If "yes", are these assessments regularly updated with emerging data and climate science?	<input type="radio"/> Yes <input type="radio"/> No
<b>1.1.2</b> Does local government communicate to your organization and the community information on local extreme weather hazard trends, including likely hazard impacts?	<input type="radio"/> Yes <input type="radio"/> No
<b>1.1.3</b> Does your organization have partnerships with universities or other climate and health-focused organizations to inform your understanding of climate and health risks?	<input type="radio"/> Yes <input type="radio"/> No
<b>1.1.4</b> Does disaster risk assessment inform local development policies? (Are local and municipal government executive action on climate change identified in existing development policies?)	<input type="radio"/> Yes <input type="radio"/> No
<b>1.1.5</b> If the answers above are "no", has your organization conducted an independent climate risk assessment?	<input type="radio"/> Yes <input type="radio"/> No
• If the answer is "yes", does your organization utilize the resultant information as a basis of strategy?	<input type="radio"/> Yes <input type="radio"/> No
<b>1.1.6</b> Based on your response to the questions above, rank your level of climate risk understanding.	<input type="radio"/> 1 = Emerging <input type="radio"/> 2 = Poor

#### STEP 2: Assess Community Preparedness and Vulnerability

A resilient health care facility is dependent in part on the climate resiliency of the broader community. Climate may create risks in your community that can affect your health care facility. The community may have limited or vulnerability factors (e.g., institutional, demographic, socio-economic) may increase future risks. Step 2 assess each campus or unique facility location.

Value	Rank
<b>1.2.1</b> Are local government organizations equipped with knowledge, experience and resources to manage disaster risk reduction and climate change adaptation at a community or neighborhood level?	<input type="radio"/> Yes <input type="radio"/> No
<b>1.2.2</b> Are there existing partnerships between the community, healthcare organization and local authorities to reduce climate vulnerability in the surrounding communities?	<input type="radio"/> Yes <input type="radio"/> No
<b>1.2.3</b> Does the local government support vulnerable local populations (particularly elderly children) to actively participate in risk reduction decision making, policy making, planning and implementation?	<input type="radio"/> Yes <input type="radio"/> No

## CLIMATE RISKS AND COMMUNITY VULNERABILITIES ASSESSMENT

HHS Sustainable and Climate Resilient Health Care Facility Initiative

### ELEMENT 1 RESOURCES

#### STEP 1: Climate Risk Assessment

##### KEY RESOURCES FOR CLIMATE PROJECTIONS

###### Climate Inspector

**U.S. Climate Resilience Toolkit**  
This website allows the user to review four different climate projections for any given location. Explore projected changes in temperature or precipitation, and download maps, trend data, or projected annual cycle data. This requires some understanding of the variation between climate models.

###### NOAA Climate Change Portal

**National Oceanic and Atmospheric Administration (NOAA)**  
This website allows the user to display or download climate projection output from the Coupled Model Intercomparison Project (CMIP5) that informed the IPCC Fifth Assessment Report. It contains user-friendly drop-down menus of models, atmospheric fields, and time.

##### KEY RESOURCES FOR MAPPING GRAPHICS

###### CoViz

**U.S. Climate Resilience Toolkit**  
This tool allows the user to apply a map of a campus or facility to better visualize sea level rise projection impacts. The downloadable photo-editing program (software download required) gives you the power to generate "after" pictures illustrating possible futures. Use it to show how sea level rise might change a familiar scene, or to help stakeholders develop a shared vision of the end state of a building project.

###### Coastal Change Analysis Program (C-CAP) Land Cover Atlas

**U.S. Climate Resilience Toolkit**  
This online data viewer provides user-friendly access to regional land cover and land cover change information developed through the National Oceanic and Atmospheric Administration (NOAA) Coastal Change Analysis Program (C-CAP). The Land Cover Atlas eliminates the need for desktop geographic information system software, or advanced technical expertise, by processing C-CAP data for the user and providing easy access to that distilled information. The tool summarizes general change trends (such as forest losses or new development) and can highlight specific changes of interest (salt marsh losses to open water, or evergreen forest losses to development, for instance).

###### ClimateRisk.us

**U.S. Climate Resilience Toolkit**  
This website allows the user to zoom to any location in the contiguous United States and move a slider across the map to compare projected change in temperature and precipitation. It also allows the user to compare conditions by decade under a mitigation scenario (reduced emissions) and a high-emissions scenario.

###### Coastal Flood Exposure Mapper

**National Oceanic and Atmospheric Administration**  
This website allows the user to overlay risk maps and produce a unified image. It provides local maps to stimulate discussions about the people, places, and natural resources exposed to coastal flooding. Users create a collection of maps showing risk from various hazards.

###### Climate Outlook

**U.S. Climate Resilience Toolkit**  
This website allows the user to access outlook maps showing experts' judgments regarding changes for above-, below-, or near-average temperature and precipitation, as well as potential hazards and drought conditions, with timescales ranging from weeks to years.

###### FEMA Flood Map Center

**Federal Emergency Management Agency (FEMA)**  
On this website, users can find, view, analyze, and print flood hazard maps from FEMA for a specific facility or larger community to identify threats and risks. It provides user-friendly flood risk mapping for a specific location or facility.

<http://toolkit.climate.gov/topics/human-health/building-climate-resilience-health-sector>

# December 15: the White House highlights health sector resilience





## Mitigation

Reducing health care's own carbon footprint

## Adaptation

Preparing for the impacts of extreme weather and the shifting burden of disease

## Leadership

Educating staff and the public while promoting policies to protect public health from climate change