



**URBAN CLIMATE CHANGE RESEARCH NETWORK**

# **Building the Knowledge Base for City Action on Climate**

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**Ciudades Sostenibles y Cambio Climatico**

**Lima, Peru**

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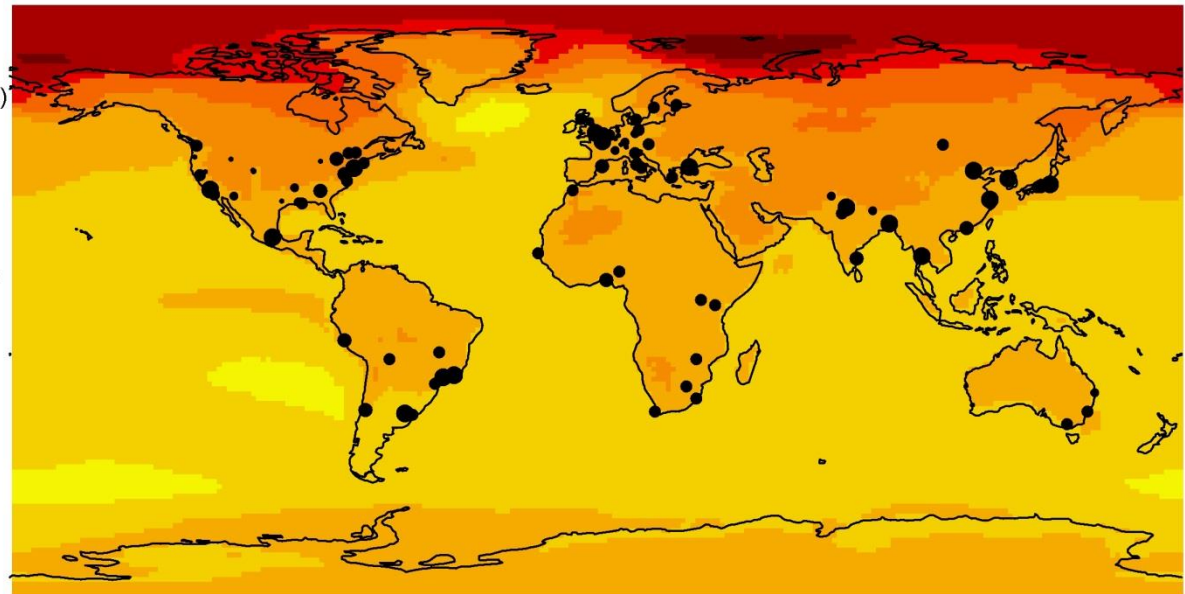
# Temperature Change 2050s and UCCRN Member Cities

## City Size

### Population of Metro Area

- Small (<500,000)
- Intermediate (500,000-1,000,000)
- Big (1,000,000-5,000,000)
- Large (5,000,000-10,000,000)
- Mega (>10,000,000)

### Temperature Change (Degrees C)



## UCCRN Member Cities

### Africa

Abuja  
Cape Town  
Dakar  
Durban  
Harare  
Johannesburg  
Kampala  
Nairobi  
Rabat  
Setif  
Sfax  
Lagos

### Asia

Bangkok  
Beijing  
Chennai  
Delhi  
Dhaka  
Eskisehir  
Hong Kong  
Jaipur  
Kathmandu  
Kyoto  
Nagoya  
Ningbo

### Australia/Oceania

Gold Coast  
Melbourne  
Parkville  
Sydney  
Townsville  
Wellington  
Wembley

### Europe

Aalborg  
Athens  
Barcelona  
Berlin  
Bonn  
Bristol  
Brussels  
Copenhagen  
Enschede  
Exeter  
Freiburg  
Geneva  
Glasgow  
Groningen  
Helsinki  
Istanbul  
Kokkola  
Leipzig  
London  
Luxembourg  
Naples  
Newcastle upon Tyne  
Oxford  
Paris  
Peterborough  
Planken  
Potsdam  
Rome  
Stockholm  
Stuttgart  
Tallinn  
Trieste  
Venice  
Vienna

### North America

Amherst  
Atlanta  
Aurora  
Baton Rouge  
Boston  
Boulder  
Cambridge  
College Park  
College Station  
East Lansing  
Englewood  
Eugene  
Guelph  
Hauppauge  
Idaho Falls  
Kingston  
Los Altos  
Los Angeles  
Martinez  
Mexico City  
Montreal  
Mountain View  
New Haven  
New Orleans  
New York  
Norfolk  
North Little Rock  
Nyack  
Ottawa  
Reno  
Sacramento  
Saint Catherines  
San Diego  
Seattle  
Toronto  
Tucson  
Washington DC  
Yardley

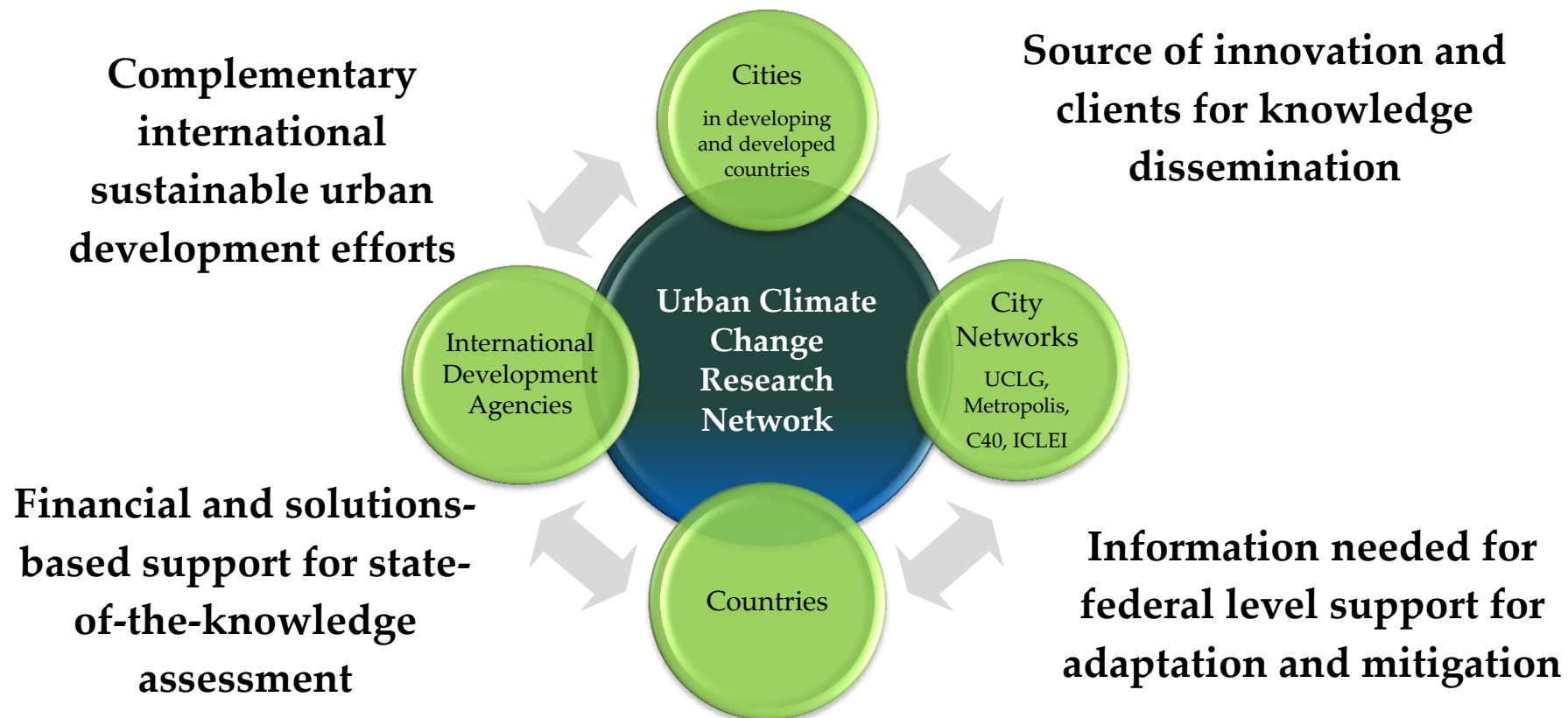
### South America

Brasilia  
Buenos Aires  
Concón  
Curitiba  
Lima  
Montevideo  
Rio de Janeiro  
Santa Cruz  
Santiago  
Sao Paulo

\*colors represent mean annual temperature change for a mid-range scenario (RCP4.5) from CMIP5 models (2040-2069 average minus 1971-2000 average).

(35 CMIP5 models)

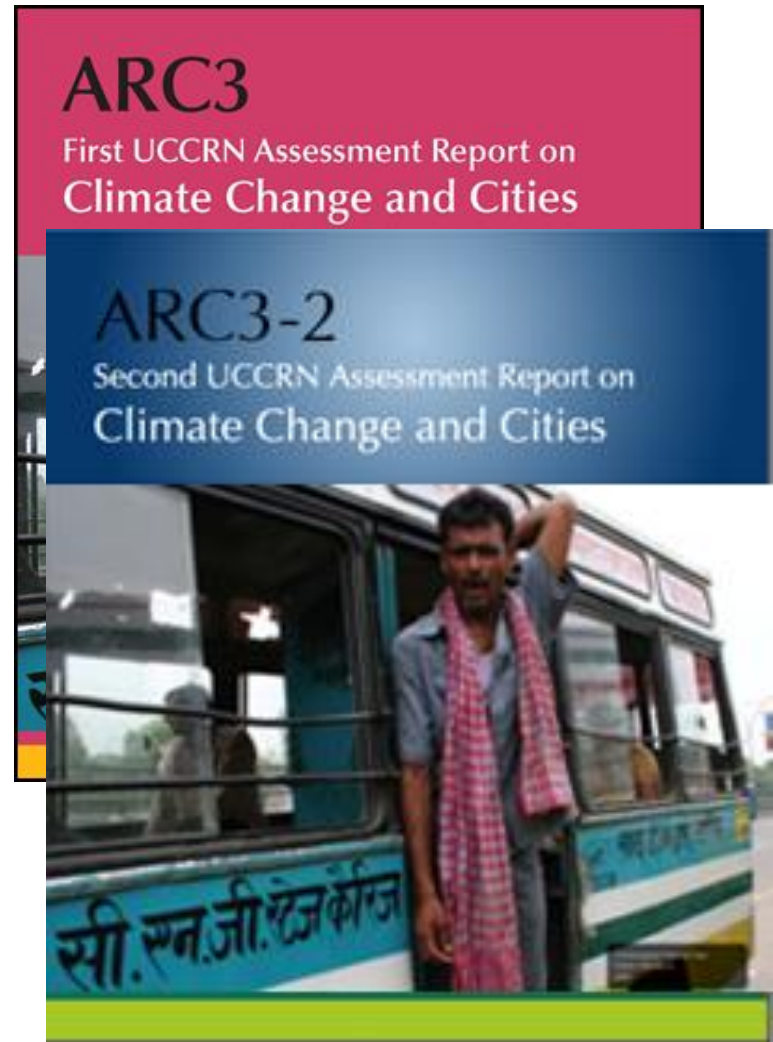
# Catalytic Role of the Urban Climate Change Research Network



# Urban Climate Change Research Network

**UCCRN Mission:** *Enable cities to fulfill their climate change leadership potential in both mitigation and adaptation*

- Consortium of **500+ scholars and practitioners** from <100 developed and developing cities
- Major publication – *First UCCRN Assessment Report on Climate Change and Cities (ARC3)*, a **four-year** effort by **100 authors** from **50+ cities**
- *Second UCCRN Assessment Report on Climate Change and Cities (ARC3-2)*, in process, to be published by COP 2015



(Cover TBD)



**Durban Adaptation Charter for Local Governments  
as adopted on the 4<sup>th</sup> December 2011 of the occasion of the  
“Durban Local Convention: adapting to a changing climate”  
- towards COP17/CMP7 and beyond -**

**UCCRN ARC3-2  
Chapters**

**Cross-Cutting Themes**

1. *Mainstreaming adaptation as a key informant of all local government development planning*

**Urban Climate Science**

2. *Understand climate risks through conducting impact and vulnerability assessments*

**Environmental Equity and Justice**

3. *Prepare and implement integrated, inclusive and long-term local adaptation strategies designed to reduce vulnerability*

**Mitigation and Adaptation**

4. *Ensure that adaptation strategies are aligned with mitigation strategies*

**Cross-Cutting Themes; Housing and Informal Settlements**

5. *Promote the use of adaptation that recognises the needs of vulnerable communities and ensures sustainable local economic development*

**Ecosystems, Biodiversity, and Ecosystem Services; Water and Wastewater**

6. *Prioritise the role of functioning ecosystems as core municipal green infrastructure*

**Economics and Finance**

7. *Seek the creation of direct access to funding opportunities*

**Mitigation and Adaptation**

8. *To develop an acceptable, robust, transparent, measureable, reportable and verifiable (MRV) register*

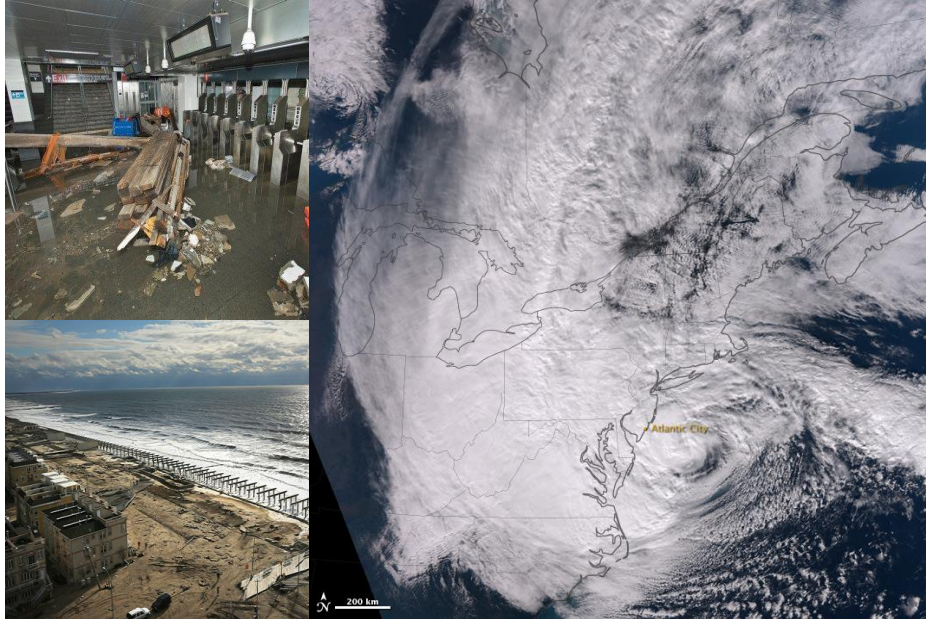
**Governance**

9. *Promote multi-level and integrated governance and advocate for partnerships with sub-national and national governments on local climate action*

**UCCRN/ARC3**

10. *Promote partnerships at all levels and city-to-city cooperation and knowledge exchange*

# *Cities have Experience in Responding to Climate-related Disasters*



Hurricane Sandy, October 2012, New York

## Key lessons

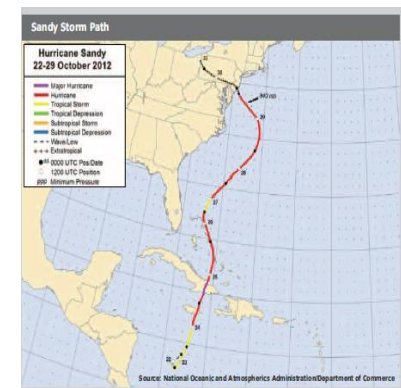
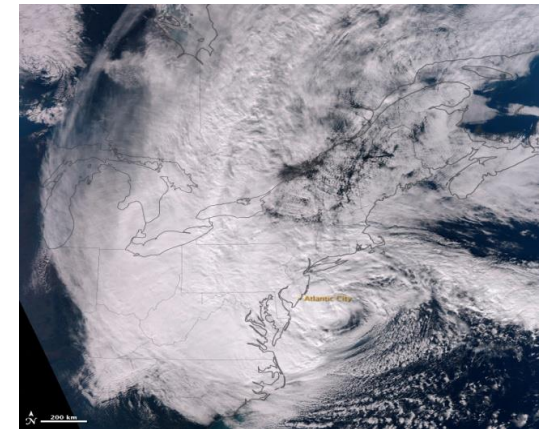
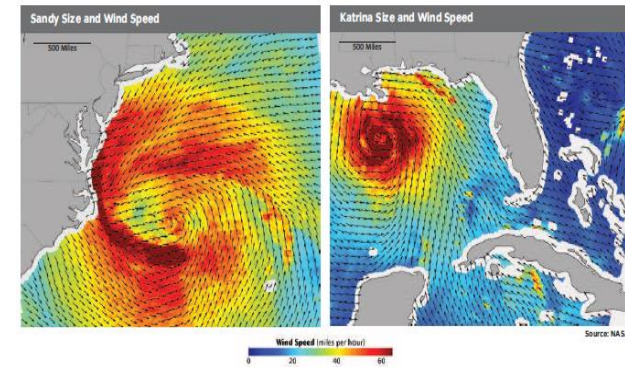
- Climate disasters are product of interactions between natural processes and human interactions
- Cities on front lines experiencing the power of climate disruption on citizens
- Preparedness is paramount
- Climate change will increase these risks



# Hurricane Sandy

## Storm Itself

- **Storm timing** coincided almost exactly with astronomically high, high tide
- **Tropical-storm-force winds extended 1,000 miles** from end to end, making it more than three times the size of Hurricane Katrina
- Storm surge combined with high tide created a **storm tide of over 14 feet** above Mean Lower Low Water at the Battery, highest water level on record
- Sandy followed an **unusual storm track**, turning sharply west just as it was reaching another peak of intensity



# Hurricane Sandy New York City Impacts

- 44 deaths, 80% from drowning
- Major flooding  
7 subway lines under East River, 3 tunnels closed
- 90,000 buildings in the inundation zone
- ~2 million without power
- ~\$19 billion in damage
- Unforeseen impacts included gas shortages, hospital evacuations, and fires



South Ferry Subway Station, Manhattan  
December 12, 2012

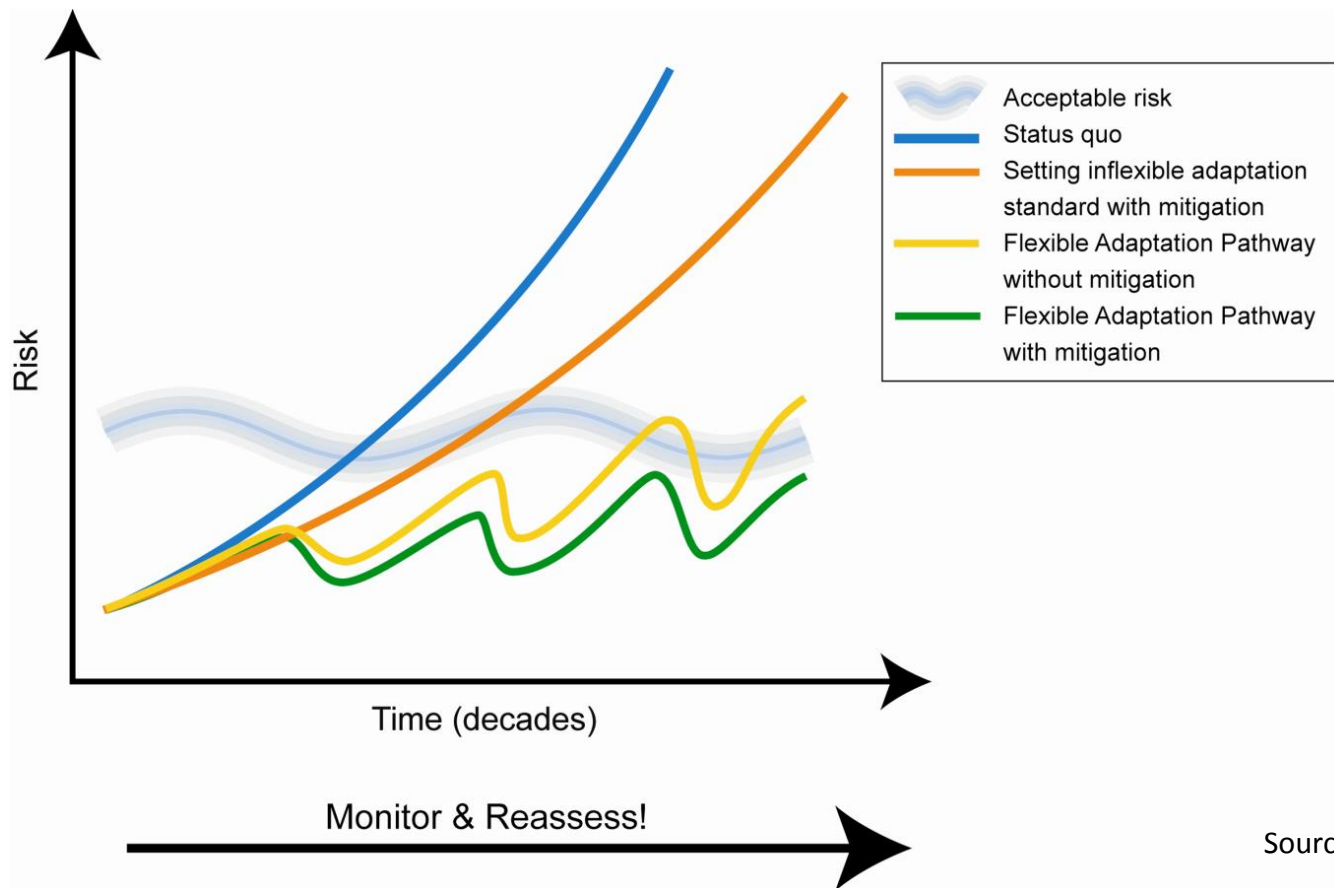
Source: D. Bader



# Flexible Adaptation Pathways

Climate change adaptation as a risk management issue

Flexible Adaptation Pathways as the response



Source: Yohe and  
Leichenko  
NPCC, 2010

# Some Lessons Learned . . .

1. Emerging findings show importance of community groups in immediate disaster response
2. Hurricane Sandy grounded, reinforced, and expanded the NYC flexible adaptation approach
3. Metropolitan region approach needed: 'The Tale of Two States and One City'
4. Federal, state, and municipal agencies are struggling to coordinate on scenarios
5. Every city needs 'Science in place . . . Science in time'

## ***Hurricane Sandy as Tipping Point***

# Best Practices for Metropolitan Regions

- **Leadership**
  - Set explicit goals by high-level metropolitan region leaders in regard to development of climate resilience
- **Coordination**
  - Create liaison office that organizes the interactions between the relevant groups throughout the region
- **Climate Information**
  - Use latest scientific data and methods available
- **Civil Society**
  - Identify community needs and want
- **Implementation**
  - Create partnerships among municipal, state, national, and international bodies for financing.



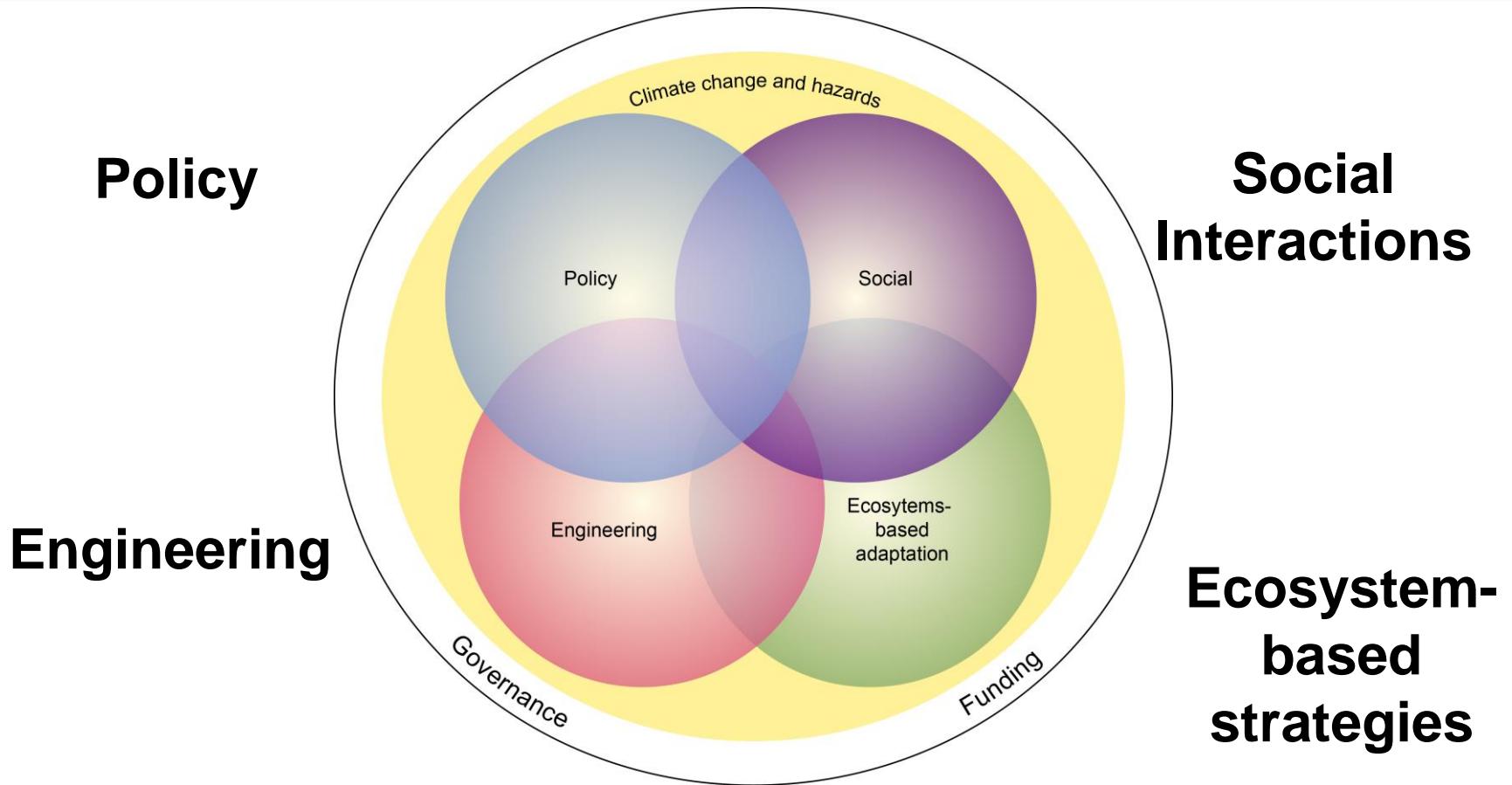
# Key Players in Metropolitan Resilience (1)

Key Player	Roles and Responsibilities
<b>Governments</b>	<b>Roles: Lead City, Metropolitan Region Municipal, State, and National Governments</b>  <b>Responsibilities: Establishing councils, commissions, and task forces; coordinating key groups; conducting local risk assessments; setting policies and funding large-scale investments and projects</b>
<b>Citizen Groups</b>	<b>Roles: Grass-roots efforts in individual metropolitan regions; local chapters of international organizations; local non-profit groups engaged in community efforts</b>  <b>Responsibilities: Information gathering for metropolitan planners and decision-makers; information dissemination to public; assessing social vulnerabilities</b>

# Key Players in Metropolitan Resilience (2)

<b>Infrastructure Managers</b>	<b>Roles: Managing critical metropolitan region infrastructure</b> <b>Responsibilities: Developing and implementing resilience planning to protect against climate events</b>
<b>Private Sector</b>	<b>Roles: Insurance companies; utility providers; other businesses</b> <b>Responsibilities: Designing, planning, and executing implementation of resilience measures and adaptation strategies; ensuring compliance with new regulations</b>
<b>Knowledge Providers</b>	<b>Roles: Academics from universities, government agencies, and private sector research groups</b> <b>Responsibilities: Co-generating climate risk information with decision-makers; tailoring information to the needs of individual metropolitan regions; communicating climate risk information and uncertainties to decision-makers and the public</b>

# Portfolio Approach to Resilience Actions



Policy, social, engineering, and ecosystems interact to respond to changing climate and coastal hazards. Overlapping areas illustrate opportunities for adaptation and resilience strategies that combine components of each domain.



# References and Links

- Urban Climate Change Research Network ([www.uccrn.org](http://www.uccrn.org))
- Consortium for Climate Risk in the Urban Northeast ([www.ccrun.org](http://www.ccrun.org))
- NYSERDA ClimAID ([www.nyserda.ny.gov/climaid](http://www.nyserda.ny.gov/climaid))
- New York City Panel on Climate Change report available online at ([www.nyas.org](http://www.nyas.org))

