

# The Data Conservancy: A Digital Research and Curation Virtual Organization

## RS-Cities: A Data Conservancy-Class Problem

Partner organizations: Johns Hopkins University (Lead institution), Cornell University, Encyclopedia of Life (Marine Biological Laboratory), Fedora Commons, National Center for Atmospheric Research, National Snow and Ice Data Center, Portico, Tessella, Inc., University of California Los Angeles, University of Illinois at Urbana-Champaign

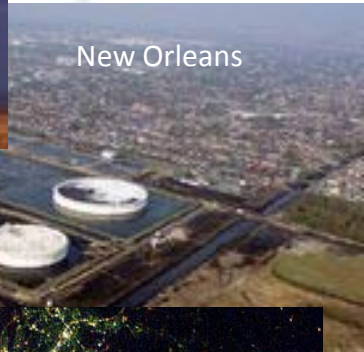


# Outline

- I. RS-Cities Social and Environmental Science Research (a DC user case)**
- II. A Data Conservancy-Class Problem
- III. Data synthesis tools for the Urban Resilience Observatory (URO)

# Resilient and Sustainable Cities: (RS-Cities)

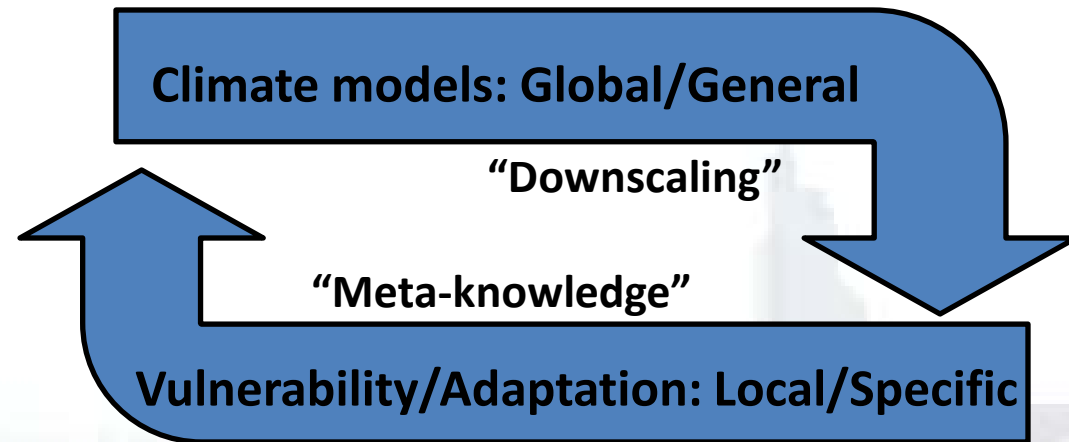
- ❑ Cities are sources of **innovative responses**, yet **these aren't effective**
- ❑ “Business-as-usual” is no longer adequate to understand and respond to complex global challenges
- RS-Cities seeks to contribute to a deliberate and transformative urban transition by
  - Conducting **interdisciplinary research**
  - Developing **cutting-edge modes of scientific inquiry** about the multiscale processes shaping urban
    - Emissions (**drivers**)
    - **Impacts, vulnerabilities and resilience**
    - Capacities to respond (**governance**)



# Patterns of urban vulnerability/resilience across cities

## Goal:

Identify fundamental causes and patterns of vulnerability unique-to and shared-by cities as diverse as New Orleans, Lusaka and Santiago



### Meta-knowledge research:

- Analyzes many case-studies to
  - Uncover patterns/correlations/regularities in scientific claims
  - Infer beliefs, preferences, methods, tools, **data**
- Uses meta-analysis, systemic reviews

Evans and Foster (2011, Science)

# Meta-knowledge ; meta-data

## Meta-knowledge

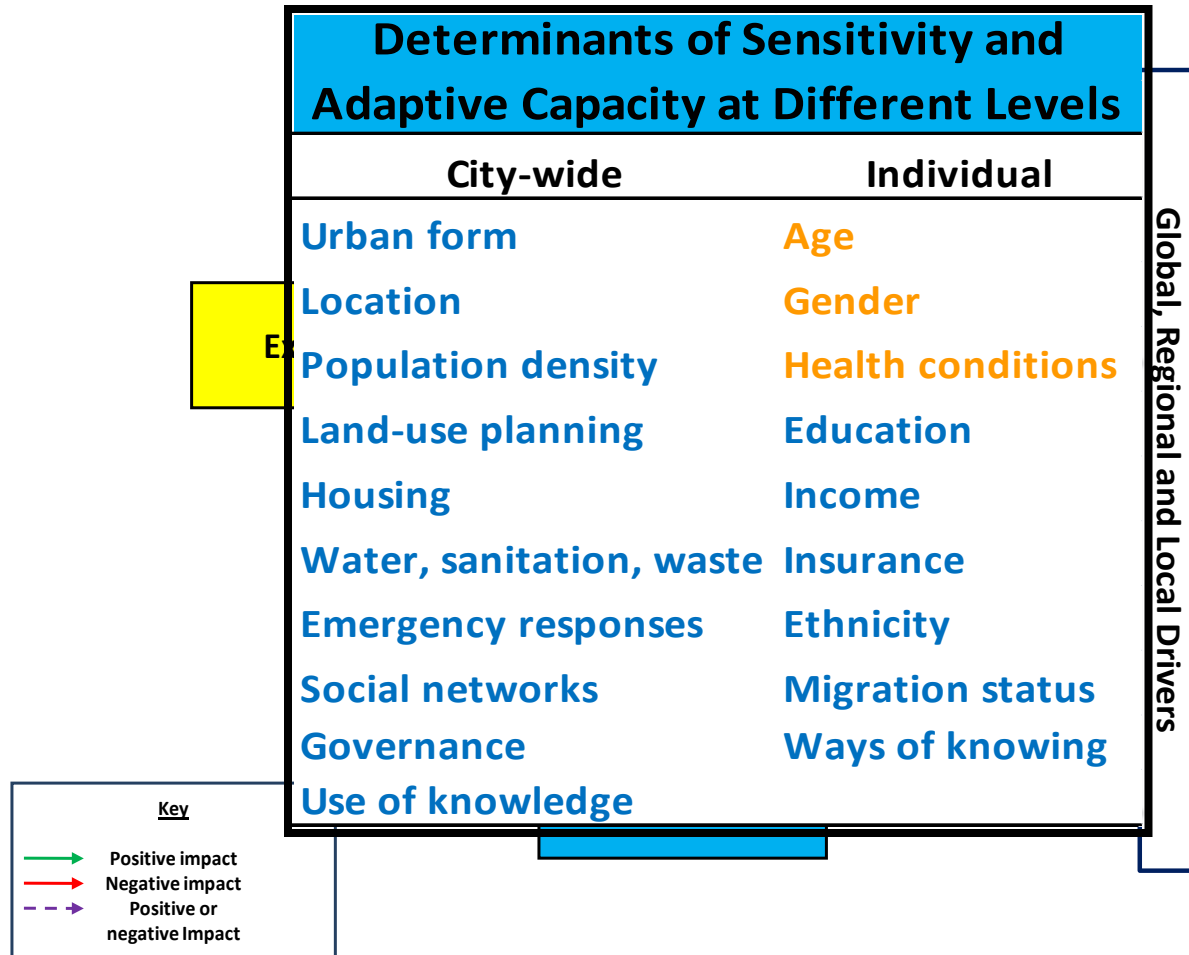
- **Meta-framework on dimensions/determinants of urban vulnerability (done)**
- **Main lineages (identified)**
- **Narratives of causation (underway)**
- **Data-curation requirements (meta-data, underway)**

## Main findings so-far:

- ✓ **Urban vulnerability is a multifaceted and wicked problem**
- ✓ **Discrepancies of existing approaches exist in**
  - ✓ **Focus**
  - ✓ **Definition of key terms**
  - ✓ **Methods**
  - ✓ **Policy implications**
  - ✓ **Data practices**

# Each dimension is a universe onto itself

- It has different variables (data requirements) that...
- Change depending on level of analysis (scale)



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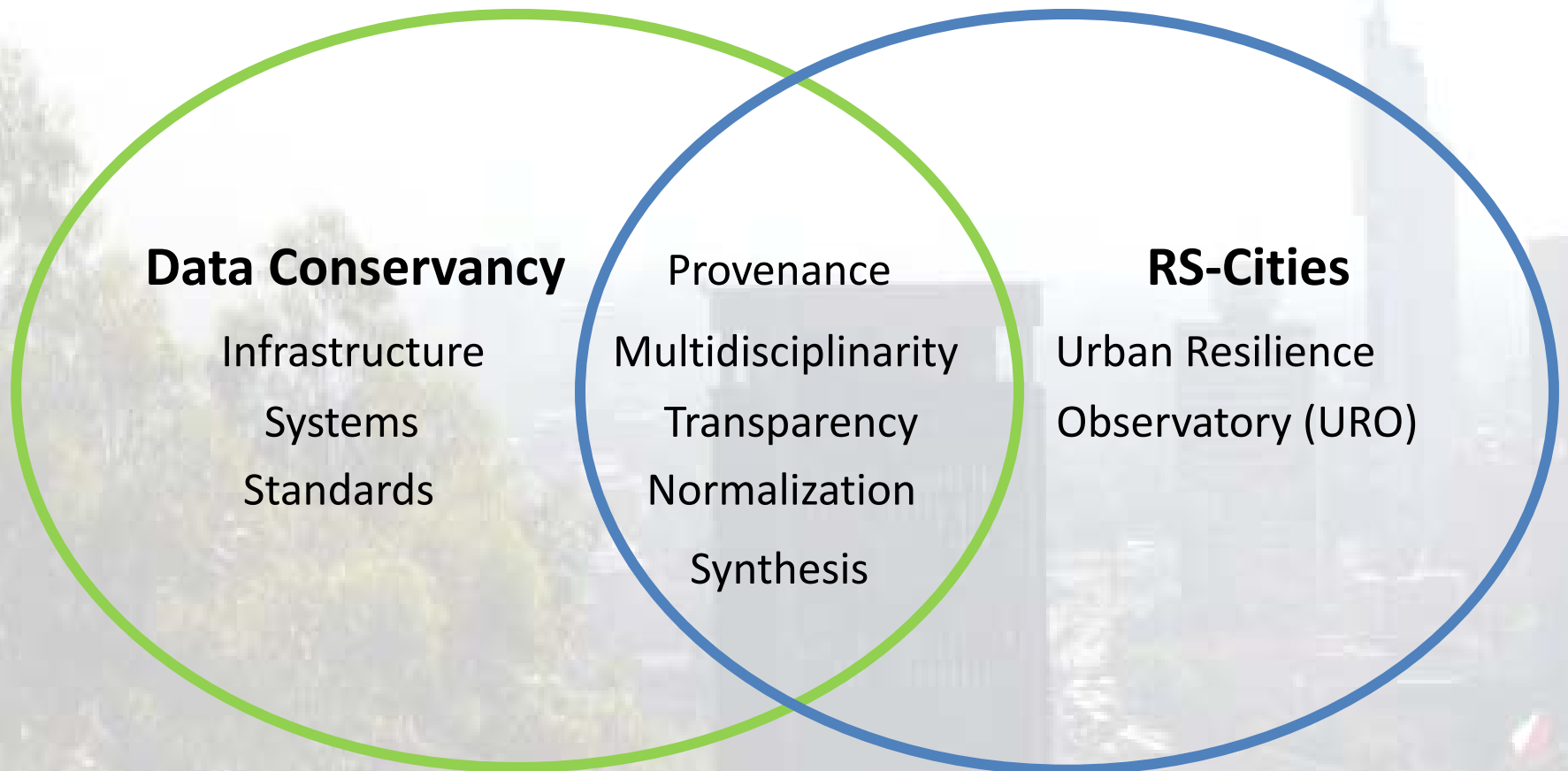
# RS-Cities:

## A Data Conservancy-Class Problem

- **Data provenance and preservation problem**
  - Meta-knowledge: 170 case studies including hundreds of datasets, uncertainty regarding data preservation and accessibility
  - In some cases, more data are available than are used in this specific study – maintain links to additional data for future researchers
- **Transparency problem**
  - With missing data, science is not reproducible
- **Interdisciplinary data problem**
  - Few consistent and compatible protocols and tools due partially to multi-disciplinary nature of the data
- **Integration and synthesis problem**
  - Variations in data , methods and framing practices
  - Semantics problem
    - Definitions, e.g.: population density, city boundaries, GHG scopes
  - Data organization
    - Schemas, structures, metadata, accessibility



# RS-Cities: A Data Conservancy-Class Problem



# Methods and Goals

- **Meta-knowledge (RS-Cities)**
  - Goal: exploring determinants of urban vulnerability and identifying dominant **lineages** (methods, tools data)
  - Meta-framework and meta-analysis
  - 170 case studies of urban vulnerability and resilience
- **Action Research (DC)**
  - Goal: understanding data and data practices
    - Expert interviews of selected case study authors
    - Analysis of data use in case studies
    - Survey of case study authors
- **Proof of concept (IRD)**
  - Goal: Quantitative data synthesis tool (social and environmental data)

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# Urban Resilience Observatory

*Vulnerability to Climate Change*

## 1. Select Your Parameters ...

Unit of Observation (**Day**)



Spatial Scale (**Metro Area**)



Geographic Area (**USA**)

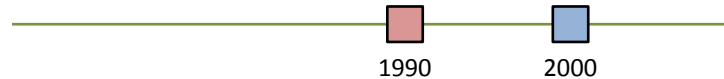


North America

USA

Hazard Type (**Temp Change**)

Time Period (**1990 to 2000**)



[+ add another time period ...](#)


Impacted Sector (**Health**)



Submit





An aerial photograph of a city, likely Boulder, Colorado, with a dense urban landscape in the foreground and a range of large, rugged mountains covered in snow in the background under a clear blue sky.

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# Thank you!

**RS-Cities**

**Exploring key intersections between  
urban development and environment**

<http://library.ucar.edu/>

<http://www.ral.ucar.edu/csap/themes/rs-cities.php>