

Alex Wilson, Founder
Building Green, Inc. &
Resilient Design Institute

Transitioning To The New Build Environment



Rhett Lamb, Director
Planning Dept.
Keene, NH



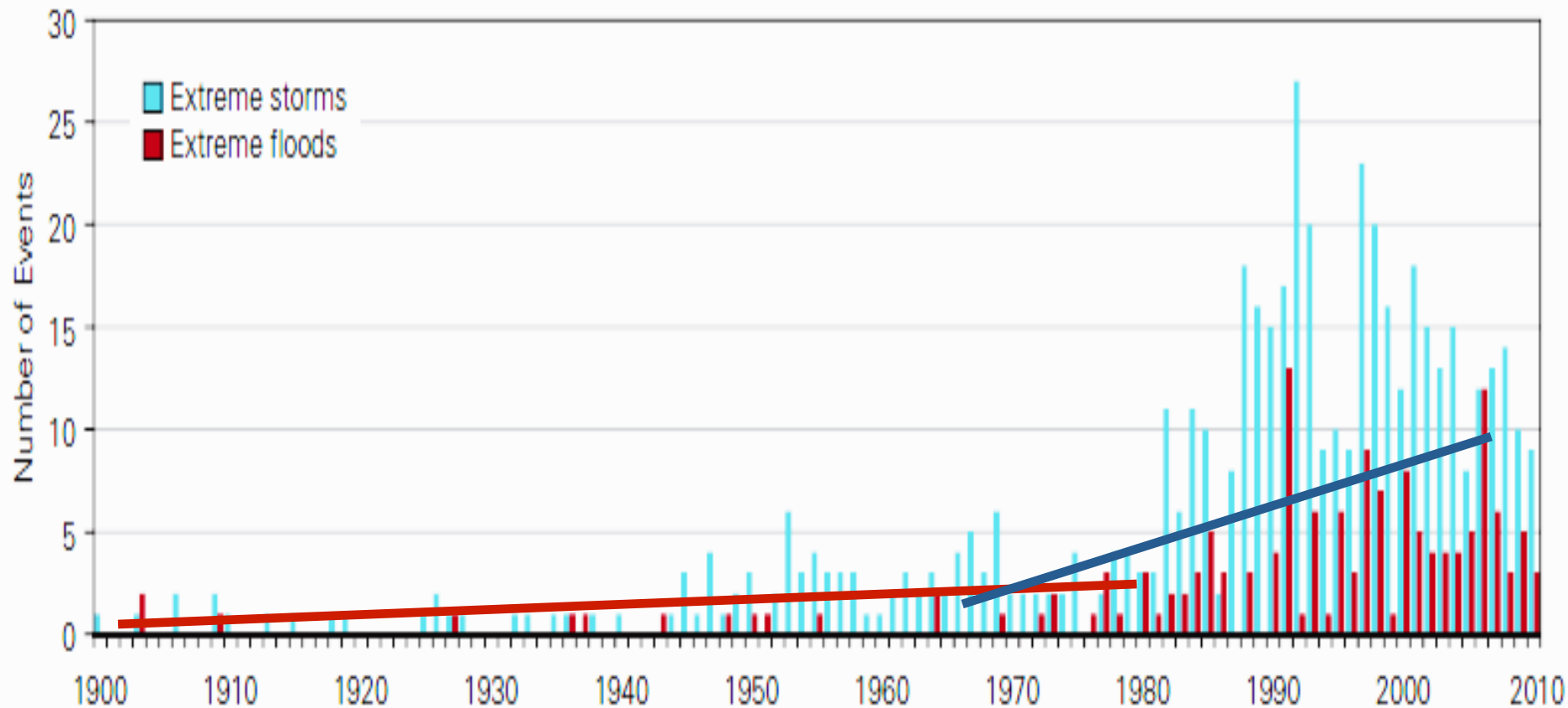
Cliff Sinnot, Director
Rockingham County (NH)
Planning Commission



Michael Simpson, Chair
Environmental Studies Dept.
Antioch University New England

Reaching Critical Thresholds

Number of Extreme Storms in US 1900-2010



Source: NRDC/Data from EM-DAT: the International Disaster Database (see Appendix A)

Highest Daily Discharge Lamprey River near Newmarket since 1934

Rank	Date	Discharge (cfs)
1	16-May-2006	8400
2	15-May-2006	7600
3	18-Apr-2007	7590
4	17-Apr-2007	7410
5	7-Apr-1987	7360
6	22-Oct-1996	6310
7	17-May-2006	6240
8	23-Oct-1996	6150
9	8-Apr-1987	5920
10	6-Apr-1987	5460
11	20-Mar-1936	5270
12	19-Apr-2007	4830
13	15-Mar-2010	4810
14	21-Mar-1936	4690
15	27-Feb-2010	4640

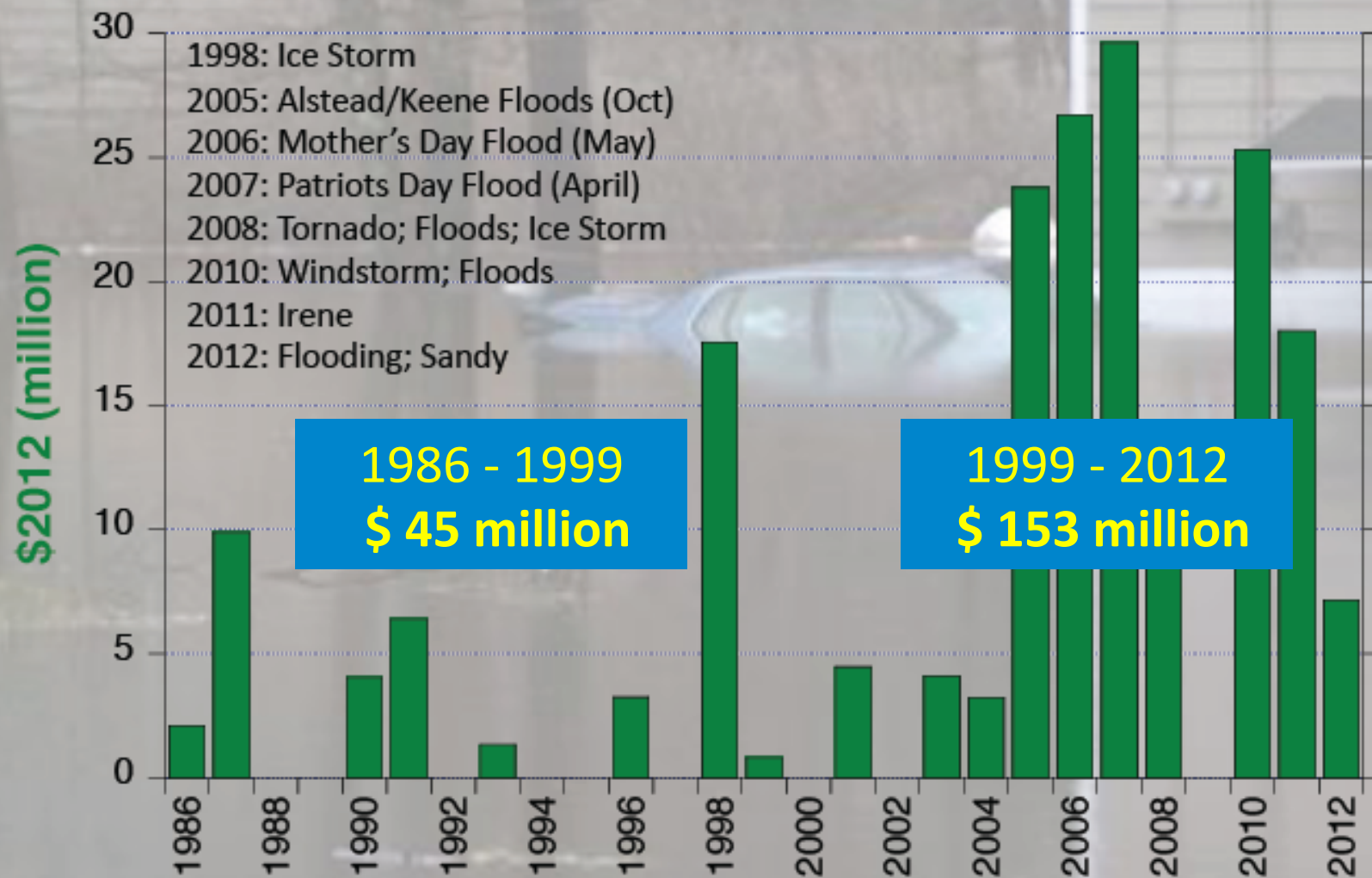
Of 15 largest events since 1934:

- 13 have occurred in last 24 years
- 10 have occurred in last 15 years
- 5 have occurred in last 7 years

Presidentially Declared Storm-Related NH Disasters

- **2003-2012**
 - **14 Declared Disasters**
 - **1 Tropical Storm**
 - **11 Severe Storms (1 Fall Snow Storm)**
 - **2 Winter Storms**
- **1953-1999**
 - **14 Declared Disasters**

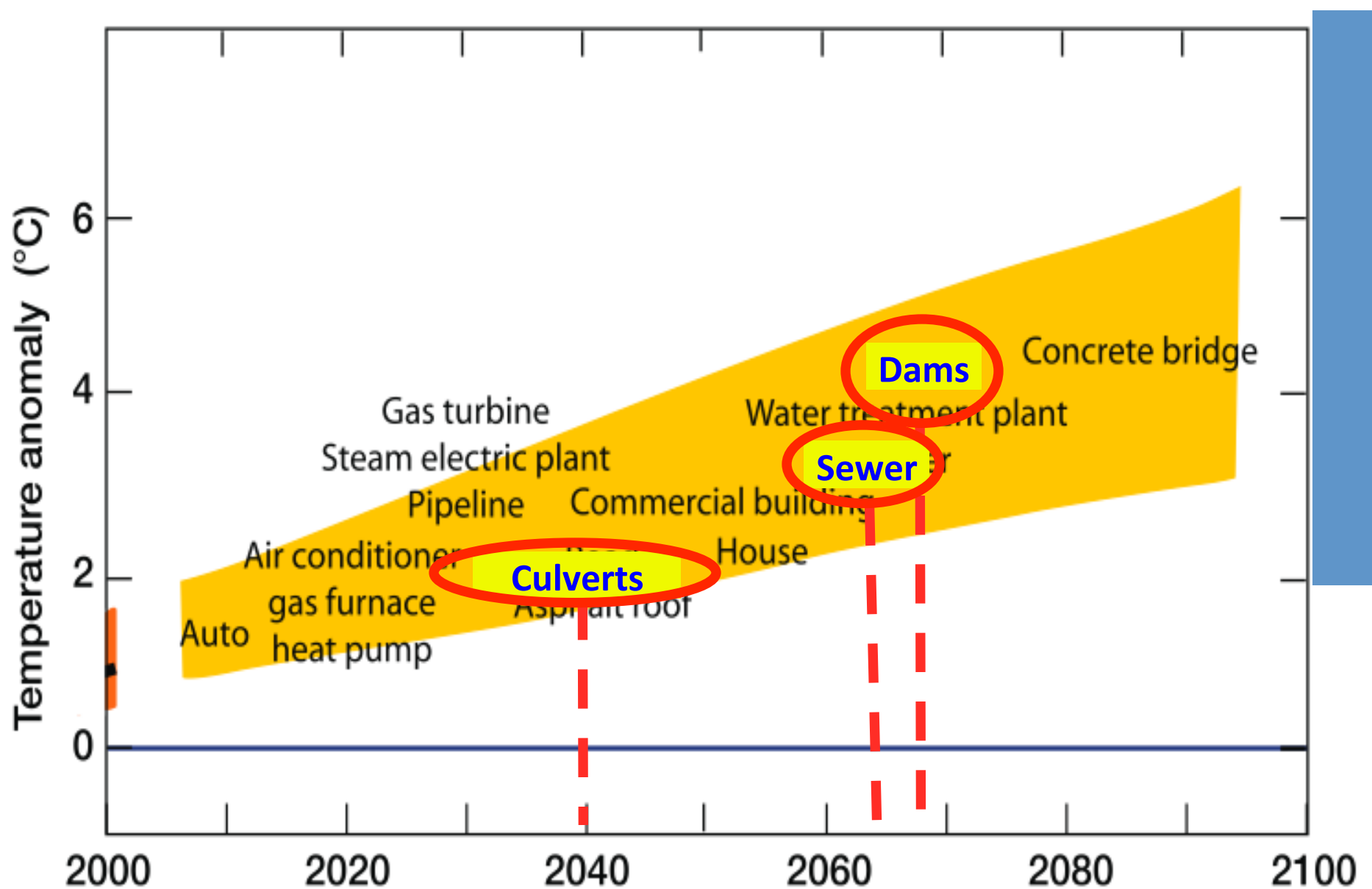
Federal Expenditures on Presidentially Declared Disasters And Emergency Declarations in NH

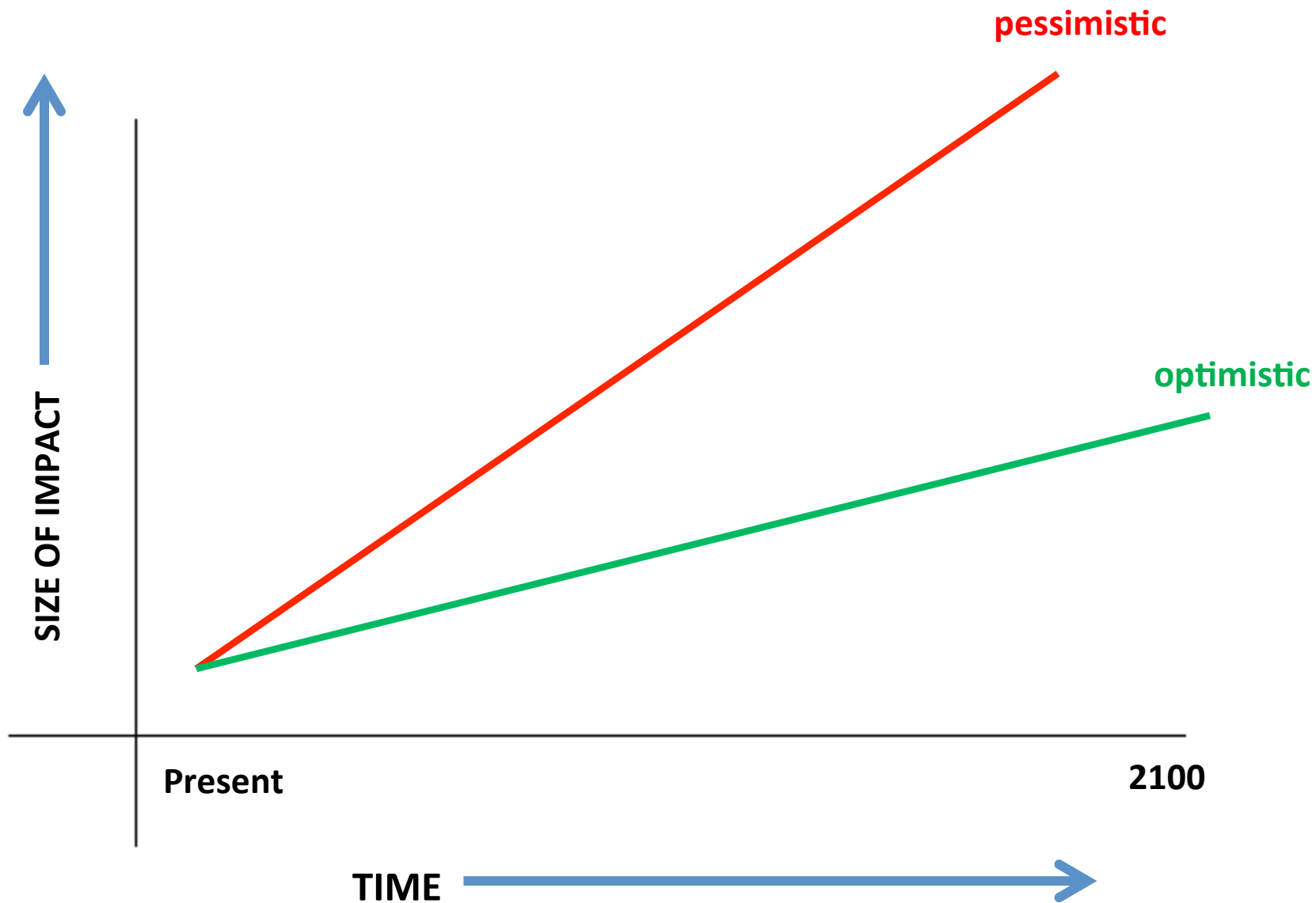


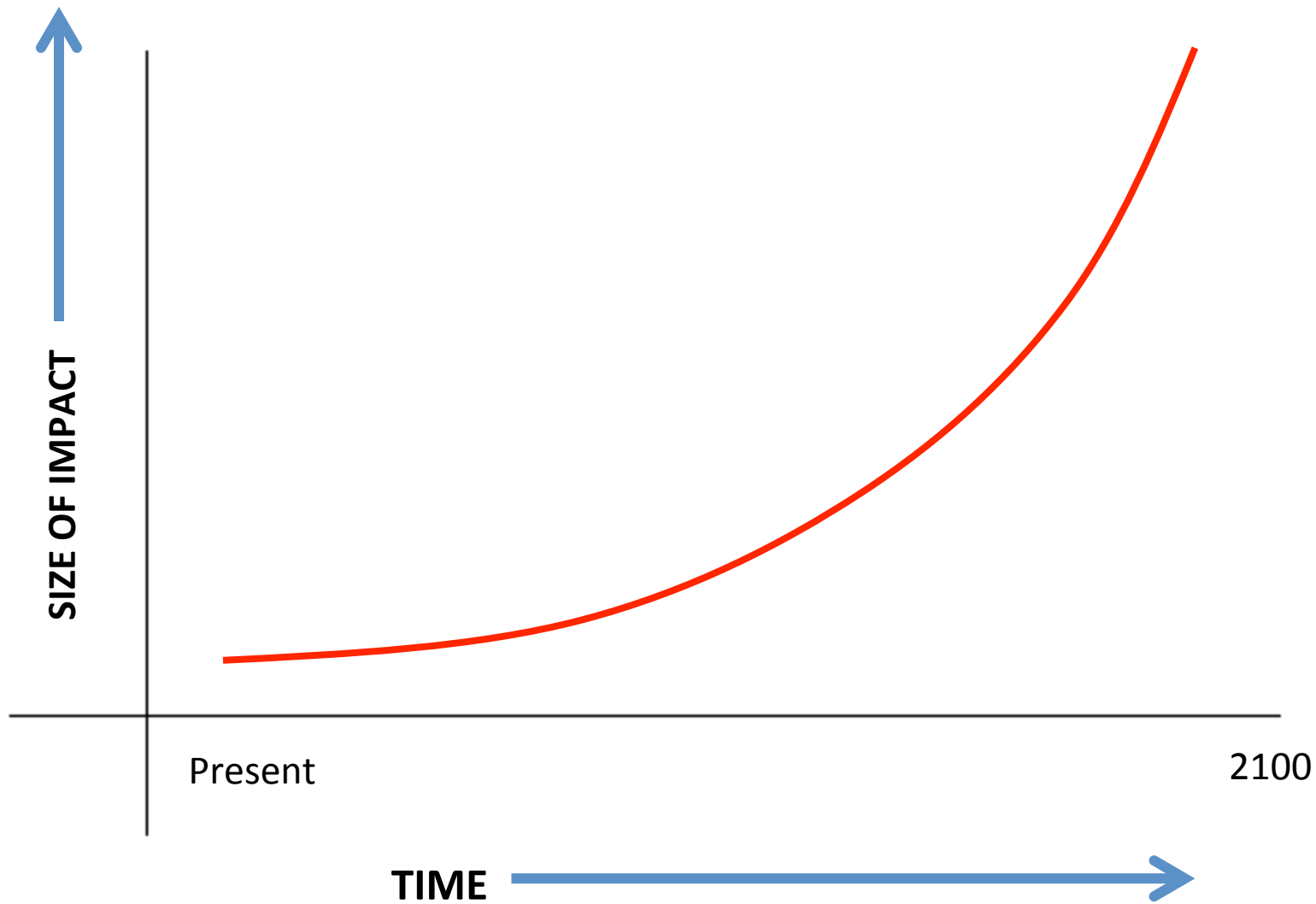


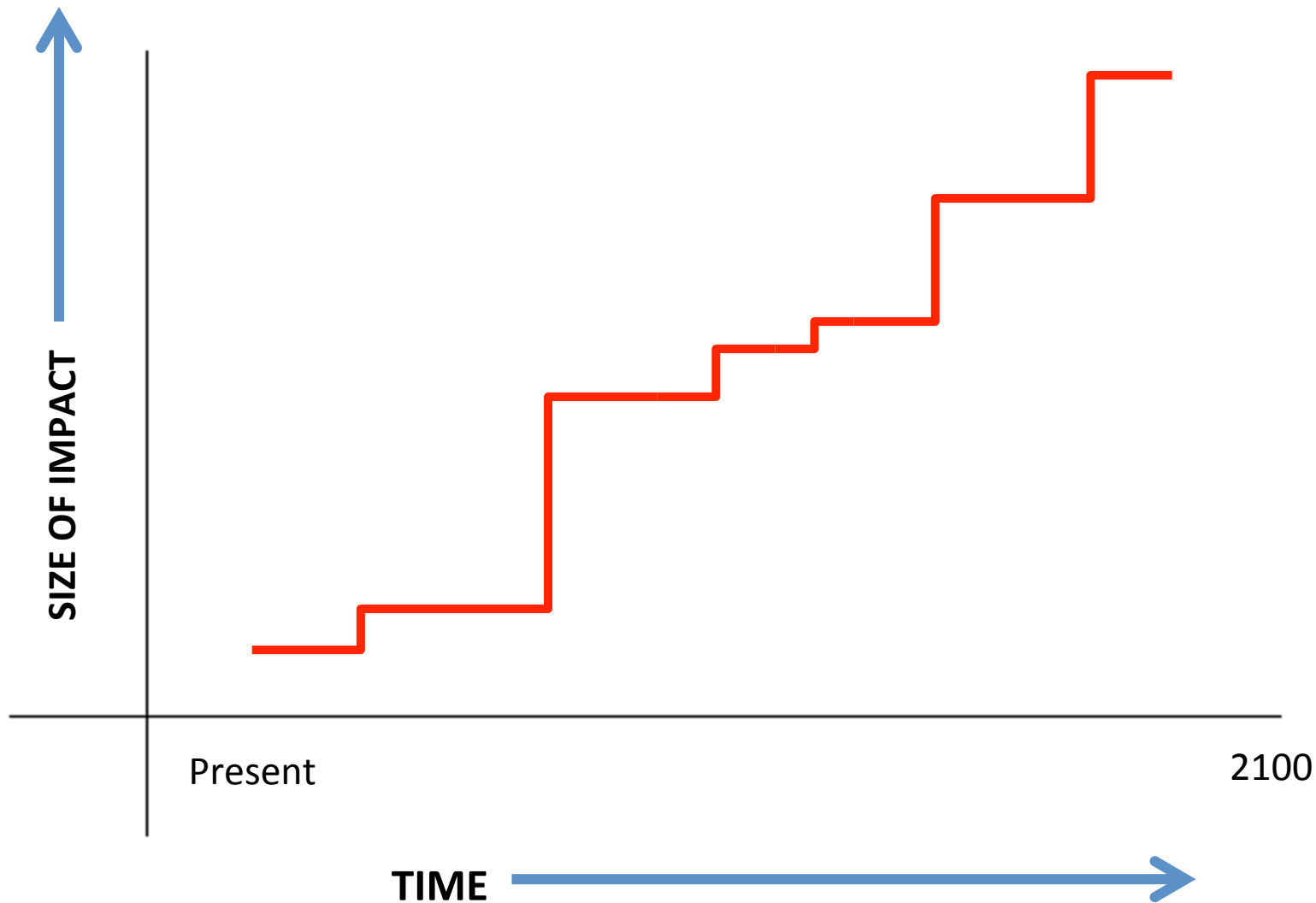


TIME FOR PLANNING









October 2005

Total cost \$7,814
FEMA contribution \$5860

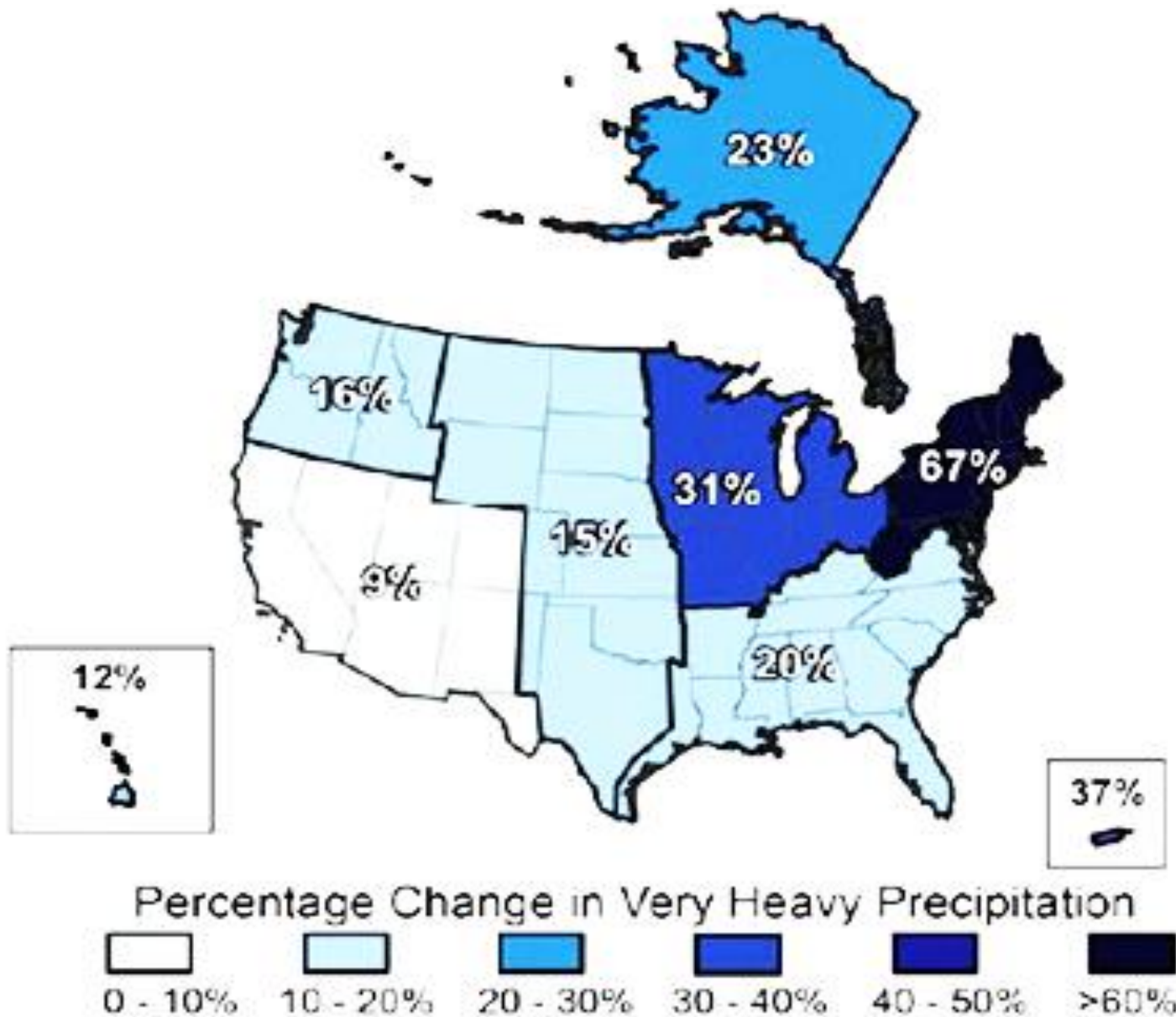


Belvedere Road Keene, NH

May 2012

Total cost \$422,569
FEMA contribution \$316,776





A Changing Landscape



Courtesy of UCONN Cooperative Extension

Drainage system vulnerability

Recent Conditions

WITH Population Growth

AND more Extreme Rainfall

CULVERT FLOW STATUS

Baseline w/5 acre buildout

- INADEQUATE
- MARGINAL
- ADEQUATE
- N/A - Open Channel
- CULVERT LOCATION

1,000 0 2,000 Feet
1:50,000

Cartographix Notes:
Data Sources: ESRI, NH GRANIT, NRCO STATSGO
All display names fixed at 1:34000 with a 8x10" data name.
Prepared by: Thomas Crossin M.S., EIT
Antioch New England Graduate School, 2005
Using: ESRI ArcGIS v.9.1
Cartoline v.6 derived using Cartoline v.1.22
File: W8Mode10.rptx 120506040 1.mxd

CULVERT FLOW STATUS

Baseline w/1 acre buildout

- INADEQUATE
- MARGINAL
- ADEQUATE
- N/A - Open Channel
- CULVERT LOCATION

1,000 0 2,000 Feet
1:50,000

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CULVERT FLOW STATUS

Climate Change w/1 acre buildout

- INADEQUATE
- MARGINAL
- ADEQUATE
- N/A - Open Channel
- CULVERT LOCATION

1,000 0 2,000 Feet
1:50,000

Cartographix Notes:
Data Sources: ESRI, NH GRANIT, NRCO STATSGO
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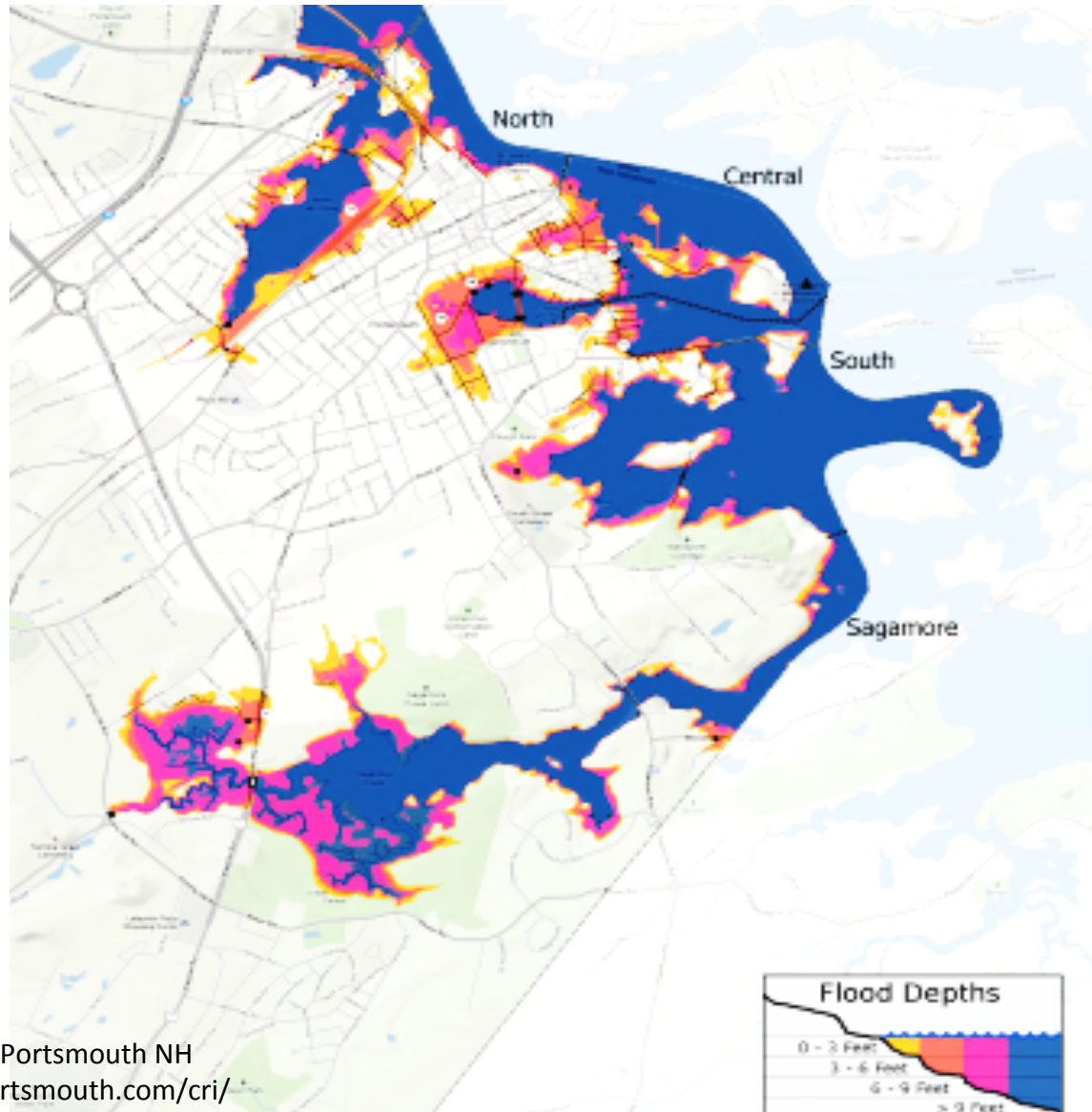
REPLACE (YES, TRANS, or NO)

- YES
- TRANS
- NO

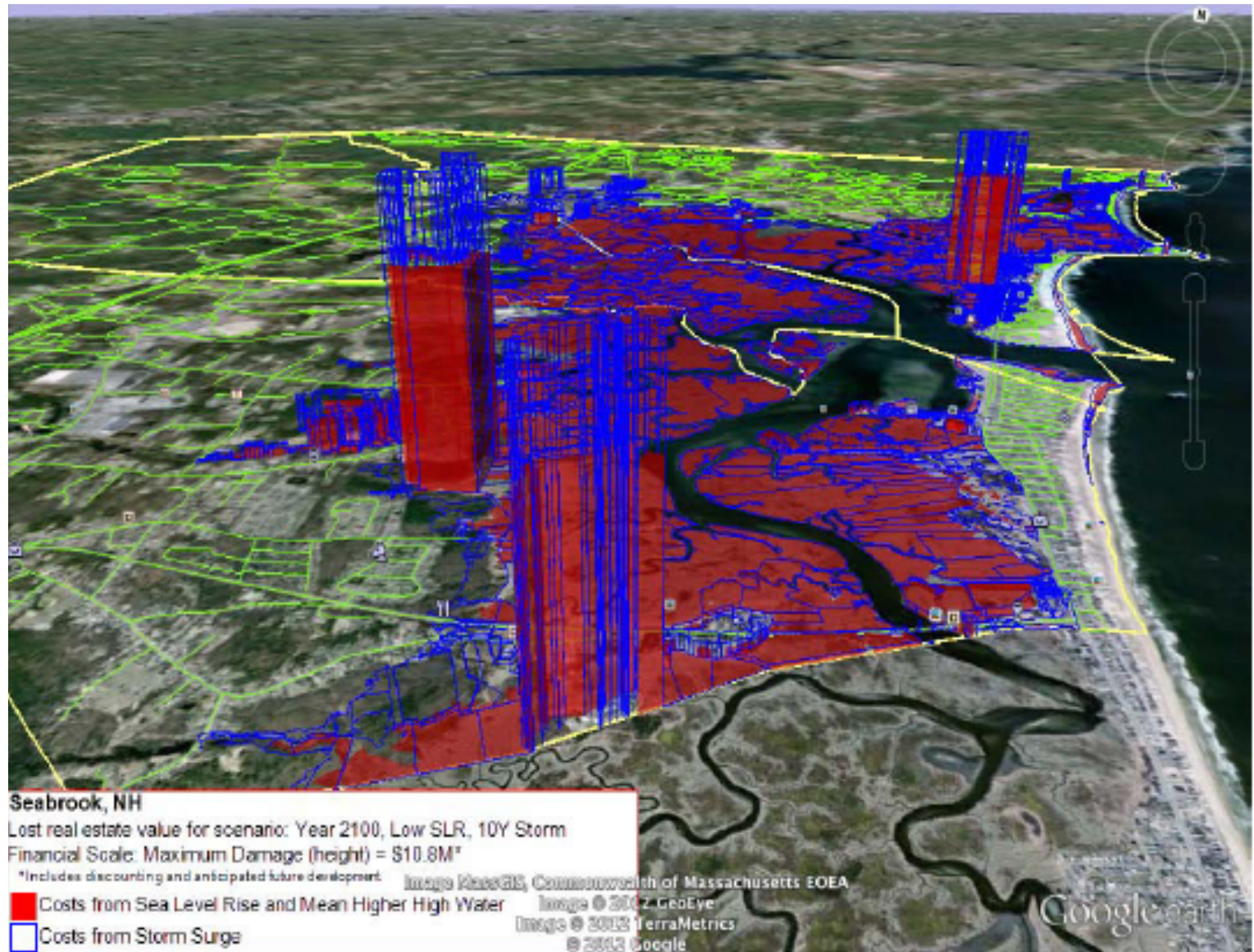
Trans = transitional



Critical Infrastructure Impacts from 13.5 Sea Level Rise Storm Surge



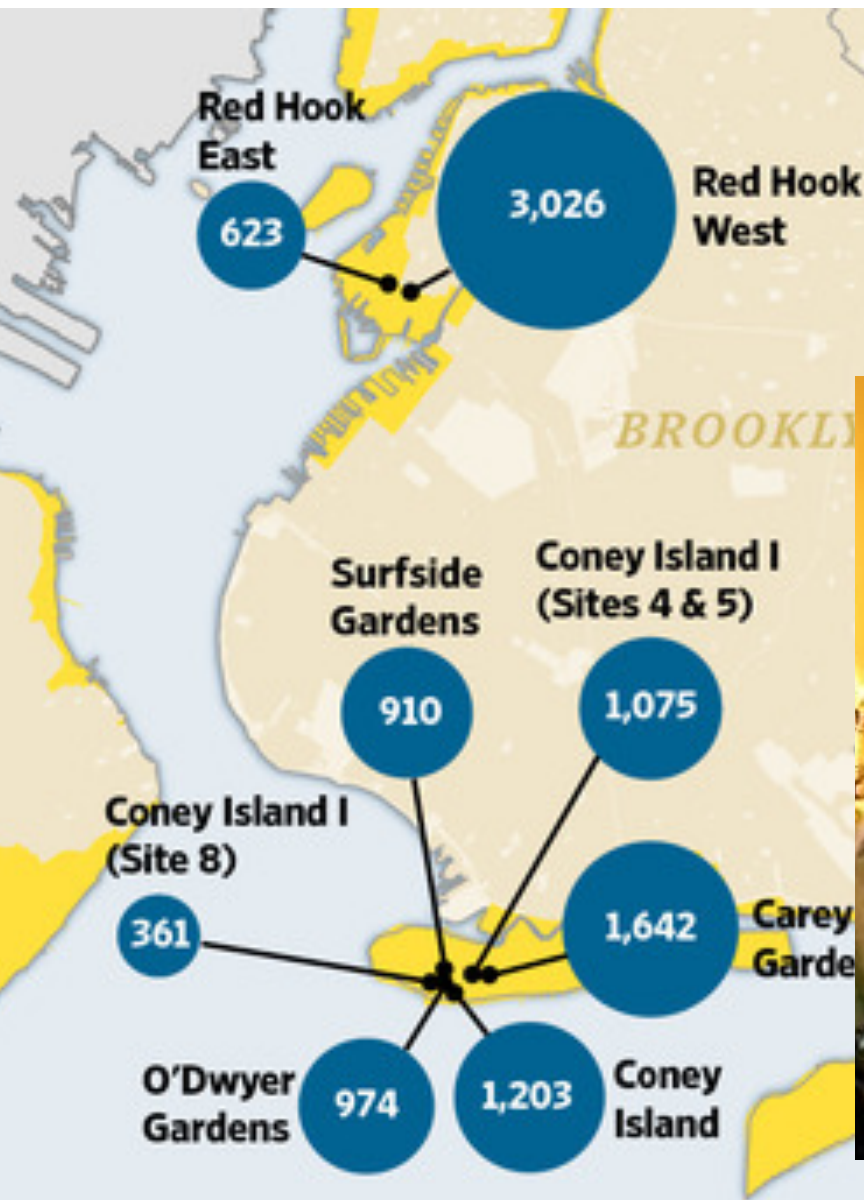
Location and Relative Size of Lost Real Estate Value Due to Sea Level Rise



Feeling the Cold

The New York Housing Authority still has 15,743 residents without heat and hot water after Sandy.

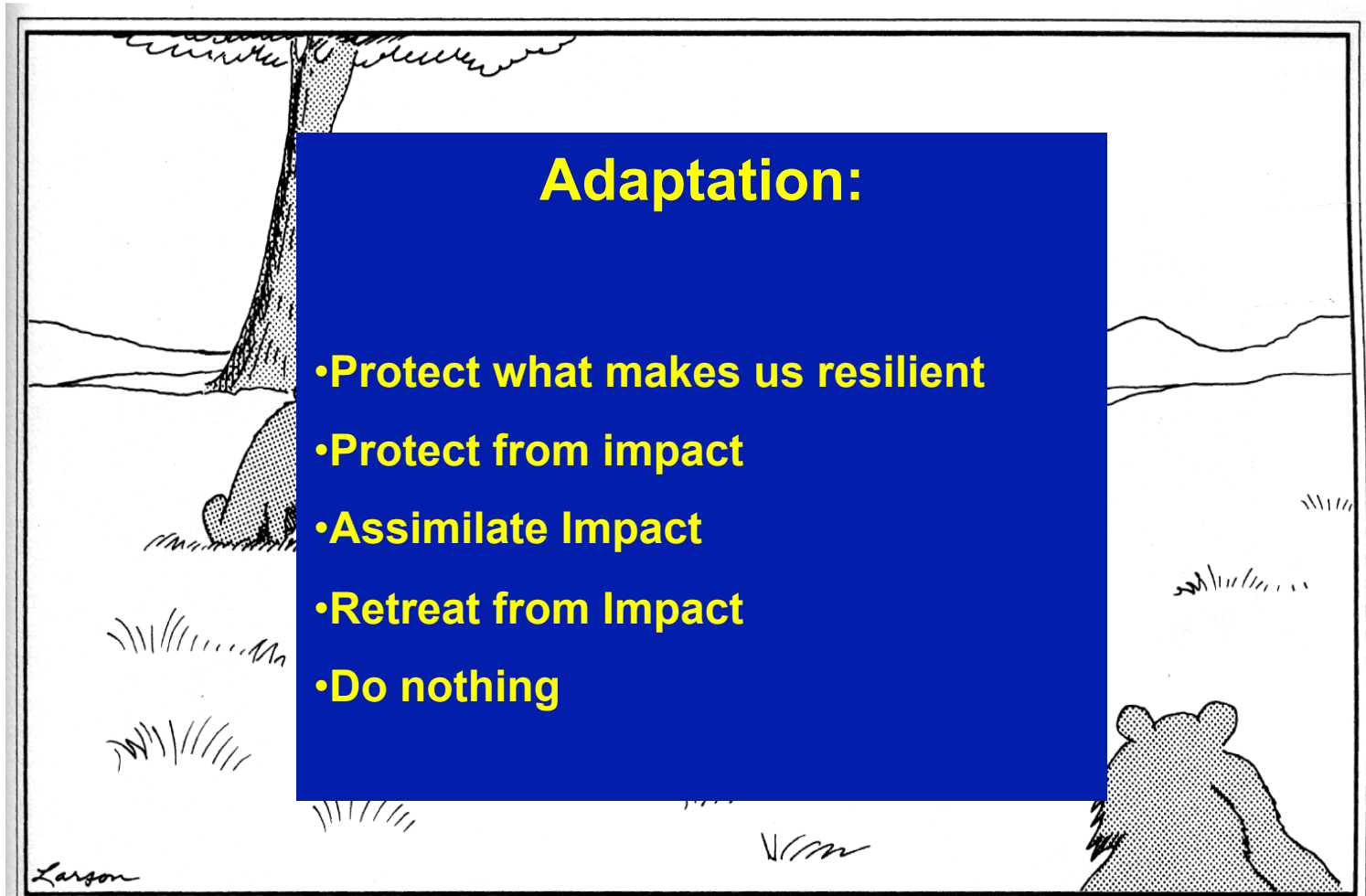
■ 'Zone A' flood evacuation areas



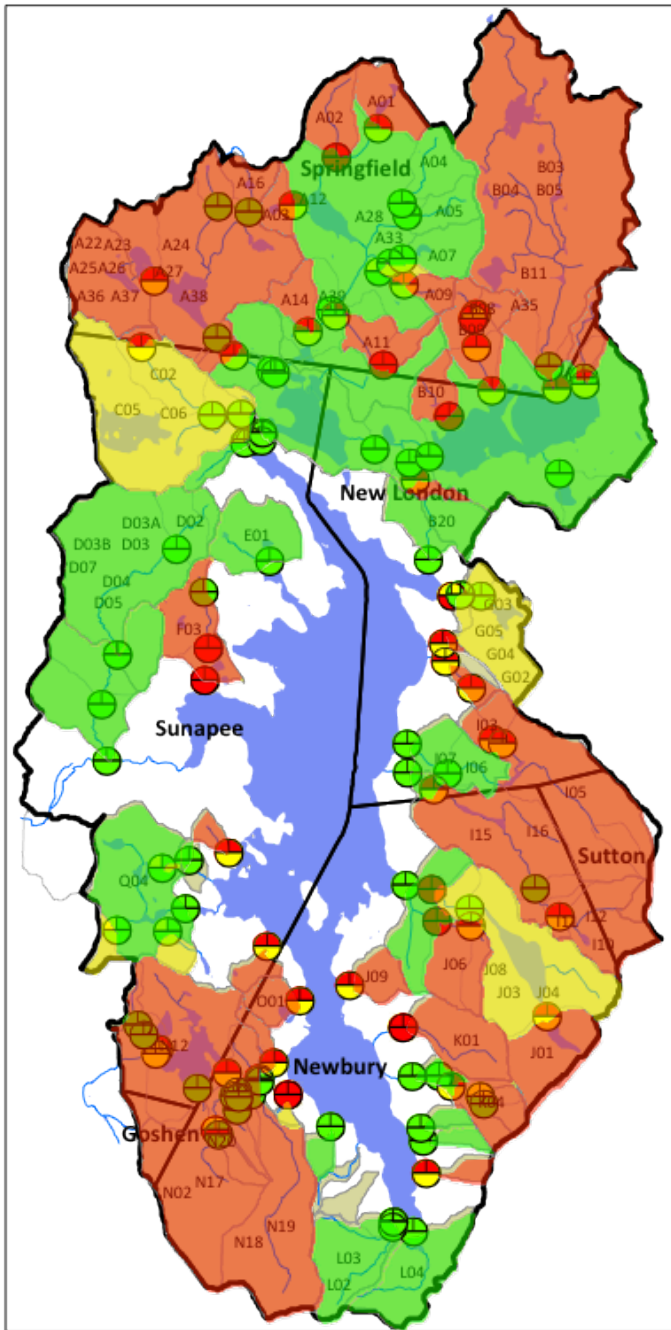
Source: New York City Housing Authority

The Wall Street Journal

Adapting to Change



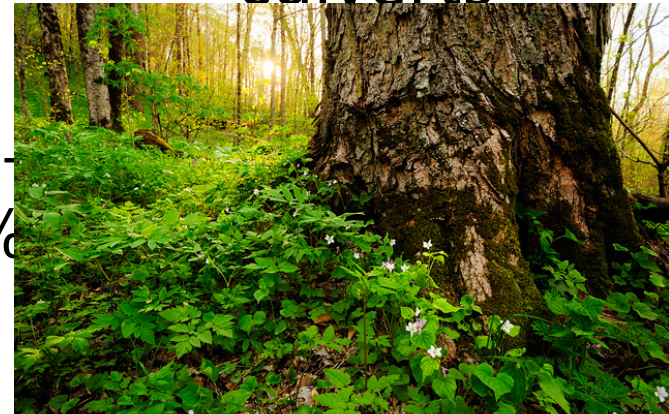
“Drive, George, drive! This one’s got a coat hanger!”



Large
Spatially
distributed
cultural



Mid-
35%
form:
d



YES

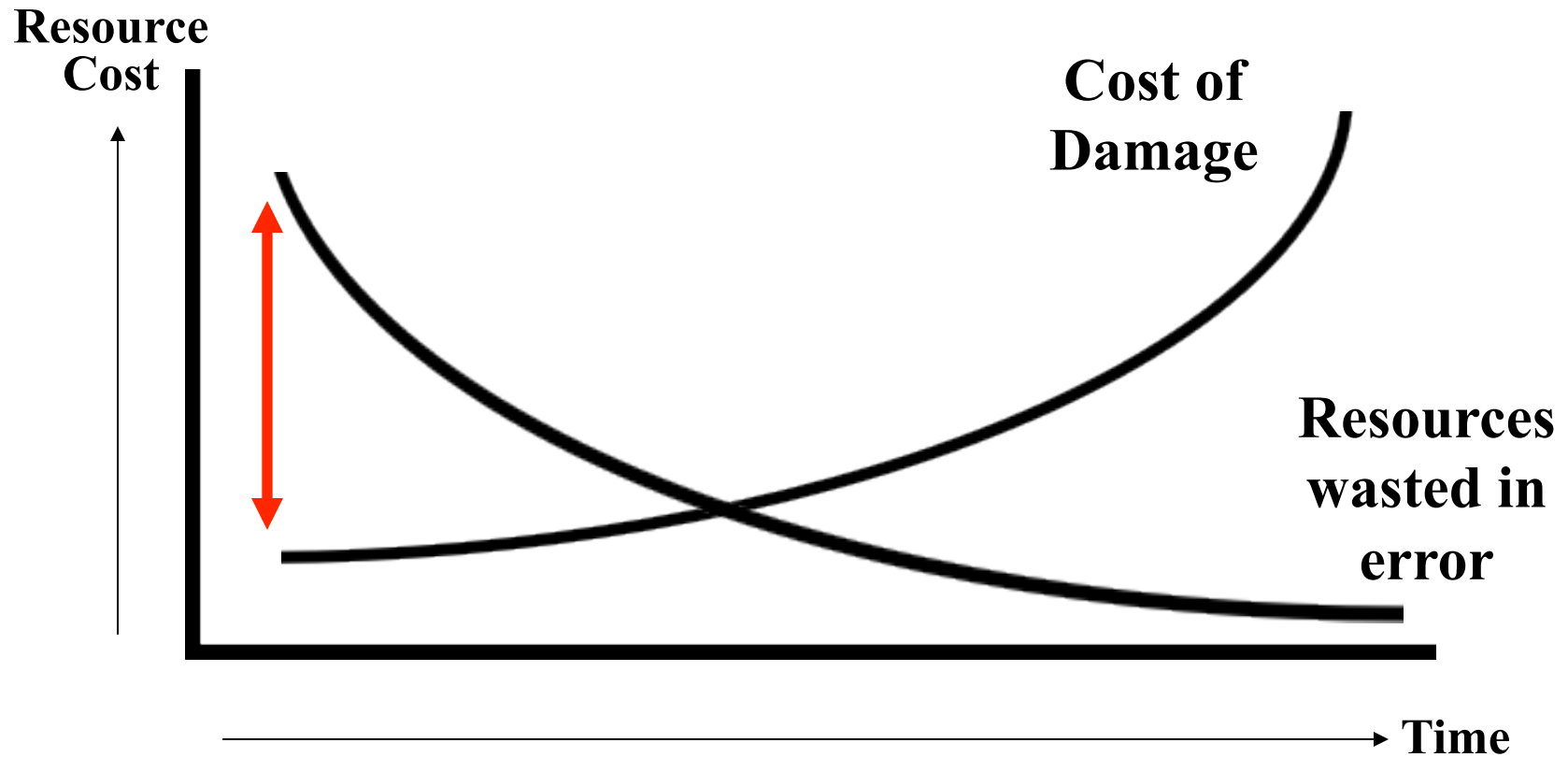


C
A
L

Uncertainty Can Not Be the Reason for Inaction



Cost of Inaction



Whitcomb Mill Road

STATUS

Road Crossing
Upgrade

\$ 56,000

FEMA Response: \$ 28,000

Engineer's Estimate to
Repair Road

\$ 93,000

Nested Stakeholder Map: Sunapee Basin Vulnerability Assessment

