Environmental Finance Center
Syracuse University

Community Resiliency : What is it?

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Sea Grant New York

What is resiliency?

A resilient community is one in which residents and institutions have the capacity to prepare for, respond to, and recover from events and trends with minimal outside assistance.

Proactive vs. Reactive

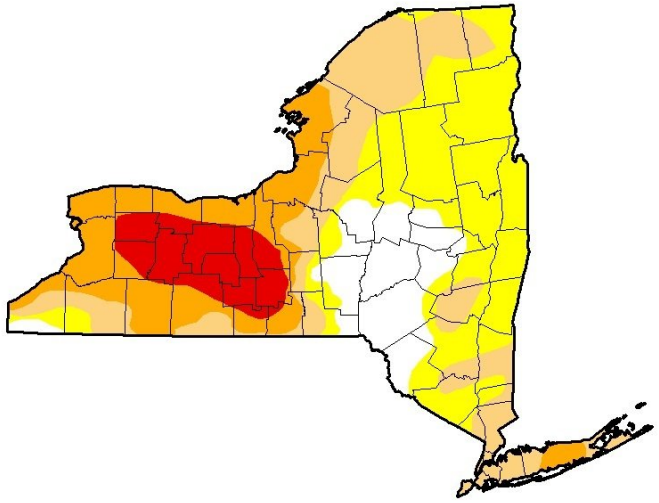

Sometimes
we don’t
know we’re
not resilient

How do we rebuild?

Resiliency Considerations

Community resiliency can include:

- Municipal financial health
- Community financial health
  - Is your portfolio diversified? Consider:
    - community demographics
    - Commerce
    - relation to neighboring communities
- Environment:
  - water supply,
  - impacts from storms,
  - drought,
  - social, cultural, and economic changes
- Adaptation to ~~{Climate}~~ Change
- Social, cultural, and economic changes



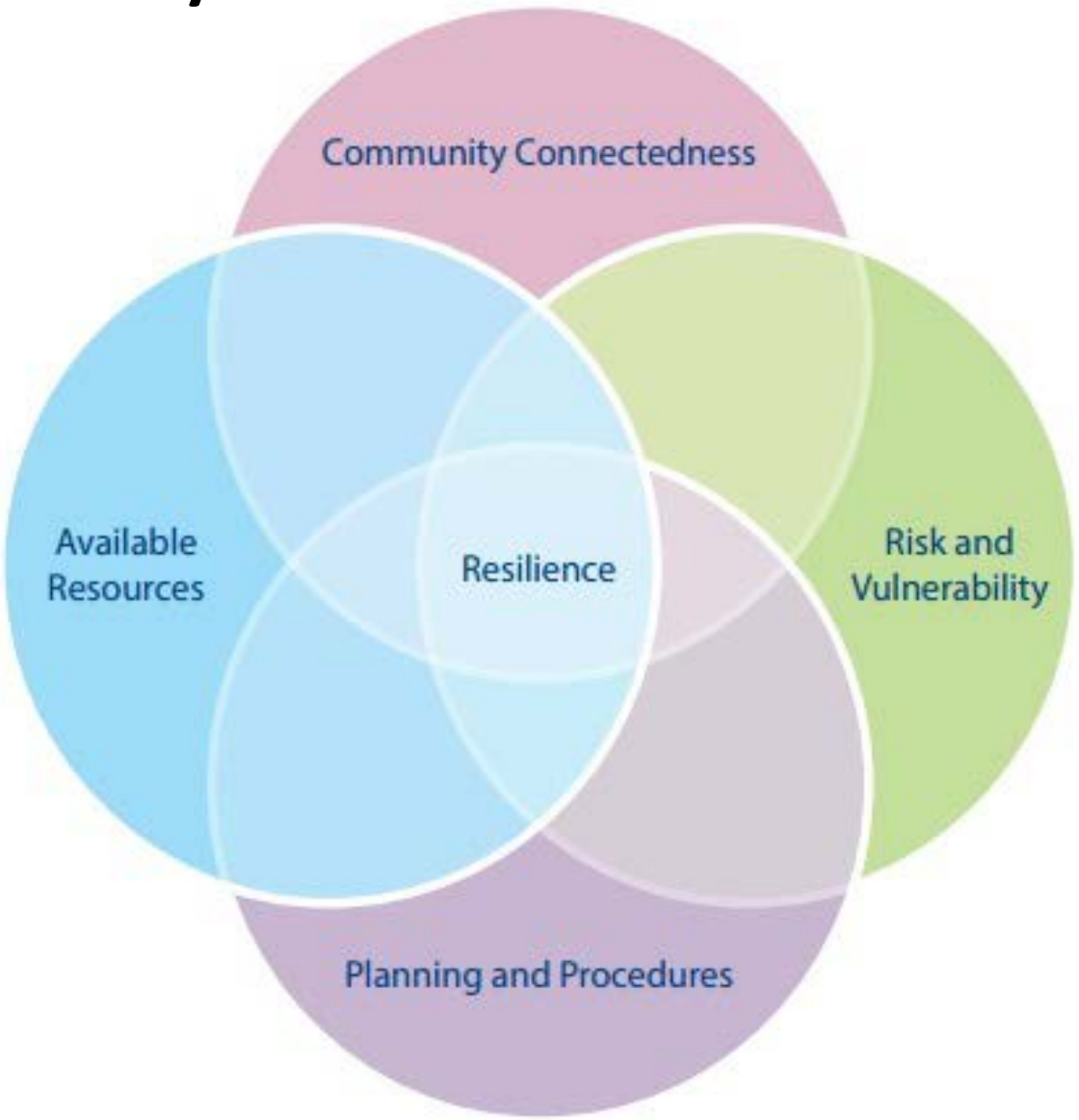
4 Rs of Resiliency

Redundancy

Robust

Resources

Rapid Response



Planning for Resiliency

Comprehensive Plans

Zoning

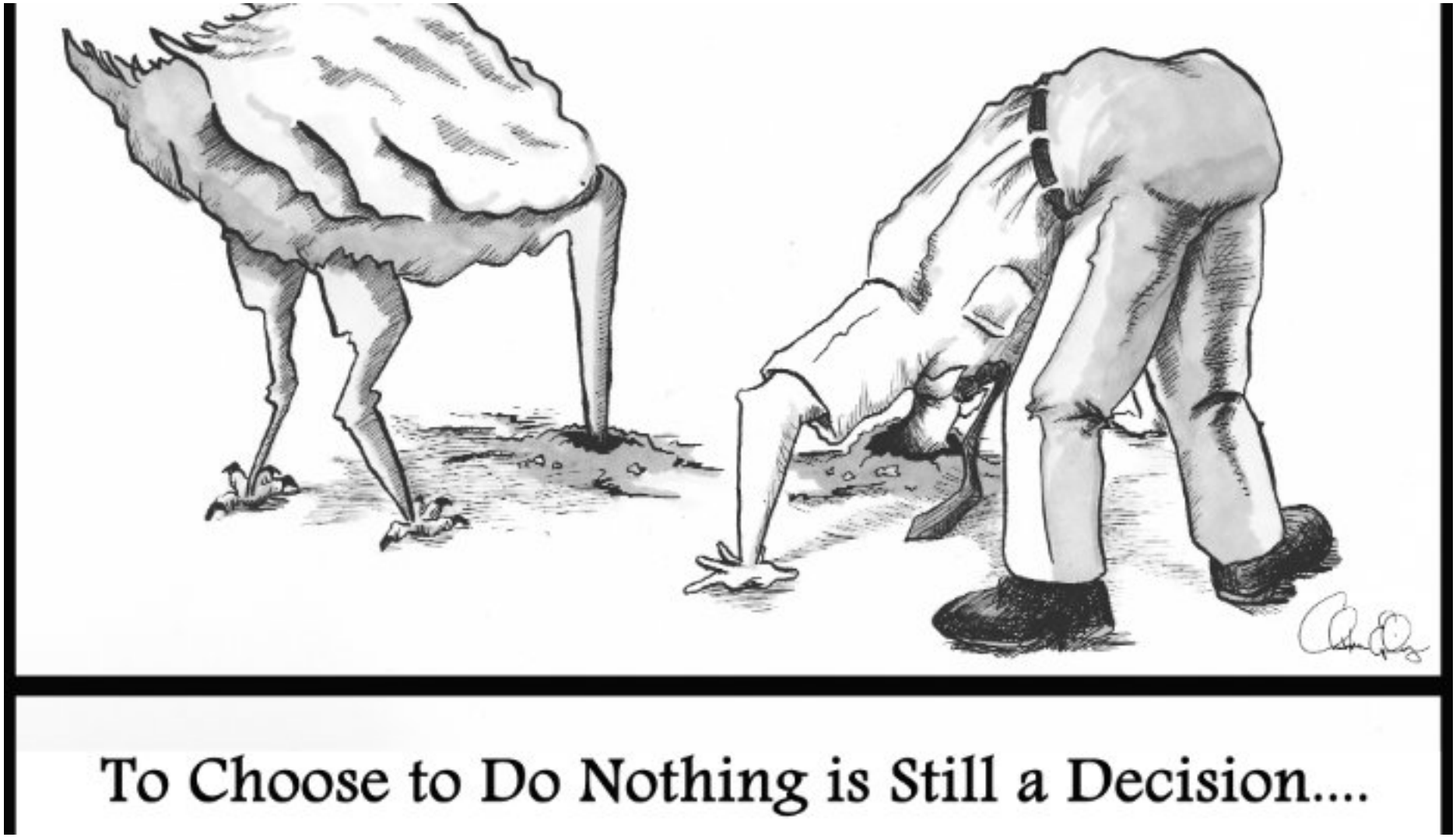
Asset Management Planning

Capital Improvement Planning

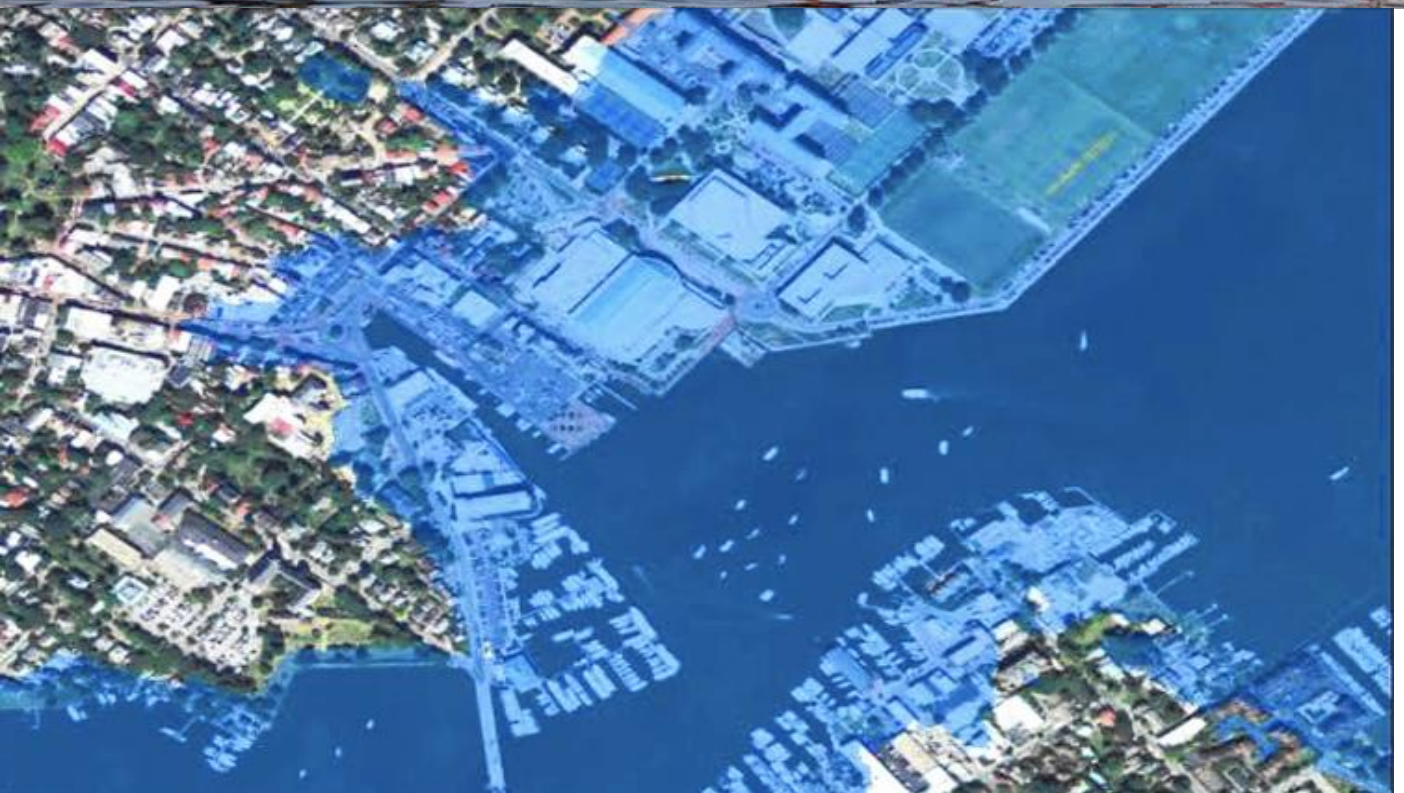
Land-Use Planning

RISK ASSESSMENT MATRIX				
SEVERITY / PROBABILITY	Catastrophic (1)	Critical (2)	Marginal (3)	Negligible (4)
Frequent (A)	High	High	Serious	Medium
Probable (B)	High	High	Serious	Medium
Occasional (C)	High	Serious	Medium	Low
Remote (D)	Serious	Medium	Medium	Low
Improbable (E)	Medium	Medium	Medium	Low
Eliminated (F)	Eliminated			

But, why bother?



Annapolis, MD



40 tidal flooding events per year, when there used to be very few

Venice Italy: Today

2011: Lourdes Hospital, Binghamton

What building resiliency looks like: Binghamton-Johnson City Joint STP Case Study

BJCJSTP's existing measures to protect the plant from high flow events:

- Sand bags as temporary flood barriers
- System performance models
- Weather forecast monitoring
- Emergency Response Plan for flooding events

Potential Adaptive Measures for Binghamton-Johnson City Joint Sewage Treatment Plant

	ADAPTIVE MEASURE	DESCRIPTION	ESTIMATED COST
	Back-up generators	Three (3) back-up generators and diesel storage tanks to provide power for the entire plant and related processes during future power outages.	$50,000 - $150,000
	Alternate wastewater capabilities	Develop redundant treatment processes. Development or replacement could include entire facility or just critical portions to support operations when damage or loss occurs.	$3,000,000 - $10,000,000
	Hydrologic barrier	Develop hydrologic barriers to counter flooding. Manipulating natural landscapes to absorb or redirect flooding is often more aesthetic than building structures. Construction and design must consider projected flood magnitudes and local hydrography.	$750,000 - $1,250,000
	Flood wall	Construct a flood wall for protection against high flow events. Construction and design is 1.5 feet of freeboard above the 2011 storm event level.	$1,750,000 - $4,000,000
	Submersible pumps	Install submersible pumps that will not be significantly impacted by flood waters entering the plant.	$1,500,000 - $3,000,000
	Raise electrical equipment	Raise electrical equipment above the 2011 flood level.	$50,000 - $100,000
	Raise VFDs	Raise the Variable Frequency Drives (VFDs) at least one foot above the 2011 flood level.	$50,000 - $100,000
	Flood risk management plan	Develop phased, adaptive risk management plan for urban flood risks and treatment requirements that will prioritize the ability to limit or prevent damage to the facility during floods. Integrating observations, process models and decision frameworks provides a powerful suite of tools to anticipate potential flood scenarios and deal with flood damage.	$7,500 - $10,000
	Water tight doors	Install water tight doors at critical infiltration points to mitigate impacts of flood waters on plant and equipment.	$200,000 - $500,000
	Permeable pavement	Install permeable pavement at the facility to allow for infiltration of stormwater through the pavement surface reducing runoff (and localized flooding). Could be constructed from porous asphalt, porous concrete, and interlocking pavers.	$100,000 - $350,000
	Flood models	Build integrated flood models for catchments and urban drainage. Beyond many current hydrologic and flood models, these new models should ensure that changing climate conditions can be accommodated in models and that these models include topographic information (GIS) and risk assessment components.	$35,000 - $75,000
	Quick disassembly pumps	Retrofit existing pumps to make it easier to disassemble them and remove them in advance of a flooding event. Costs include the retrofitting and the cost to remove them for one event.	$50,000 - $100,000

Best for last:

Let’s hear about the program partners and what they do in the realm of Resiliency.