Florida Climate Institute

http://FloridaClimateInstitute.org

FCI Overview and 2014 Goals

James W. Jones and Kalanithy Vairavamoorthy

April 10, 2014

http://FloridaClimateInstitute-UF.org

Florida Atlantic University | Florida International University | Florida State University | University of Central Florida | University of Florida | University of Miami | University of South Florida

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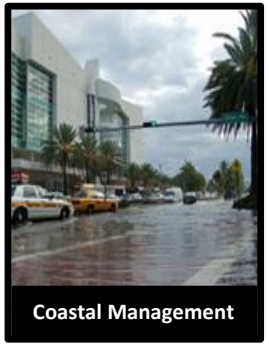
Outline

Brief History
Achievements
Where We Are Now
Future Plans of FCI



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FCI to date

- 2010 – UF and FSU form joint institute
- 2011– SUS Board of Governors Project (Climate Change Task Force – UF, FAU, FSU)
  - Symposium at UF in November (www.FloridaClimate.org) (175 attendees)
- 2012– Expansion of FCI to 6 universities
- Proposals submitted- cumulative (20) and funded (11) thru 2012
- 2013—Added 7th university (FIU)
- Will be submitting an LBR this summer to support our research and outreach efforts toward a more climate-resilient Florida

FAU Florida Atlantic University · Florida State University 1851 · FIU Florida International University · University of Central Florida · UF University of Florida · Miami · USF University of South Florida

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Where We Are Now

Florida Climate Institute
AT THE UNIVERSITY OF FLORIDA

UF UNIVERSITY of FLORIDA

James W. Jones (Director), W. Graham, Carolyn Cox (UF Coordinator)

FAU FLORIDA ATLANTIC UNIVERSITY

Len Berry, Nicole Hammer (FAU Coordinator)

FIU FLORIDA INTERNATIONAL UNIVERSITY

Rich Olson, Mike Sukop

FLORIDA STATE UNIVERSITY 1851

Eric Chassignet, Vasu Misra, Meredith Field (FSU Coordinator)

University of Central Florida

Scott Hagen, Reed Noss, Sonia Stephens (UCF Coordinator)

UNIVERSITY OF MIAMI

Ben Kirtman, Dave Letson

USF UNIVERSITY OF SOUTH FLORIDA

Kalanithy Vairavamoorthy, Gary Mitchum

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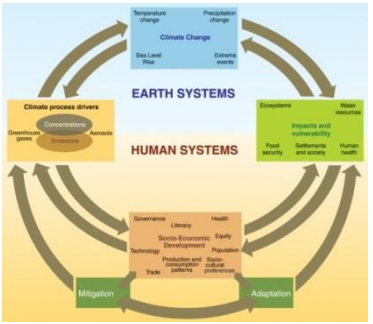
Florida Climate Institute AT THE UNIVERSITY OF FLORIDA

FCI Special Publication

Special Publication (Led by V. Misra, FSU):

- **FCI Special Issue of Journal of Environmental Change**

The Florida Climate Institute, the Southeast Climate Consortium, and UF Water Institute researchers partnered to produce a special issue in the Journal of Environmental Change to be released in August 2013. 15 UF faculty contributed to this publication. See full list of titles, authors, and collaborator http://www.floridaclimateinstitute-uf.org/wp-content/uploads/2013/06/recauthors.pdf



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Benefits to the State of Florida

- Produce and provide region-specific climate and sea level data used to reduce risks to Florida's economy and natural resources
- Design adaptation strategies for the increased resiliency of coastal communities for tourism, real-estate, infrastructure, and natural systems
- Foster the protection of ecosystems that provide habitat, water supply, and opportunities for recreation and tourism
- Develop crop varieties, technologies, and management systems to increase economic benefits and protect agricultural investments
- Work with urban water managers to design sustainable practices in the face of climate change and sea level rise
- Coordinate a broad range of STEM-based programs toward a climate-smart workforce
- Advance public climate literacy toward understanding climate vulnerability and making scientifically informed and environmentally sound decisions

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FCI Working Groups

The FCI has formed 6 working groups which include representatives from all 7 universities, agencies, and industry in the state. The aim of the FCI is to position Florida to become a center of excellence and leader in climate change and variability adaptation technologies, strategies, and expertise

I. Climate and Sea Level Rise Information for Florida, region

II. Beach and Coastal Resilience

III. Urban Water Management

IV. Ports and Navigational Channels

V. Agriculture and Forestry

VI. Public Health Impacts

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FCI 2014 Working Group Goals

These groups will each

- Produce a set of Frequently Asked Questions and answers for the state of Florida about the climate impacts and potential economic impacts on these various sectors
- Develop key partnerships for research and outreach activities to which state $ will be allocated
- Develop a budget for institutional support along with criteria for prioritization of projects likely to be of interest to state leaders
- Build a compelling argument for the appropriation of state funds to benefit the state of Florida and its economy

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Each Working Group will partner with industry and agencies through an idea-driven iterative process to:

1) Identify economic and environmental vulnerabilities

2) Assess and identify needs for research and education, including ideas for specific projects that would:

    a) Identify and employ best practices to reduce risks to our economy, natural resources, and infrastructure

    a) Capitalize on opportunities associated with anticipated changes in clilmate

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Draft Criteria for Selecting Activities

- Clear target outcomes and pathway to achieve impacts in Florida's economy, workforce, environment
- Project has external support from external partners through in-kind, $, or personnel commitments.
- Project is well represented across partner universities; at least two FCI institutions must be involved
- Project activities are aligned with Florida's identified priorities and advance major economic sectors in Florida (Trade, Tourism, Ag)
- Project has explicit plan for use of research for the benefit of the state. Include plan, mechanism, and people who will assure project results are shared with stakeholders (business, agencies, and citizens) and not only other researchers

We're trying to address many questions….but need your help

HOW CAN WE DESIGN & BUILD MORE RESILIENT URBAN WATER SYSTEMS

How do we design our urban water systems to deal with uncertainties

How should our urban water systems respond to tighter GHG emission targets

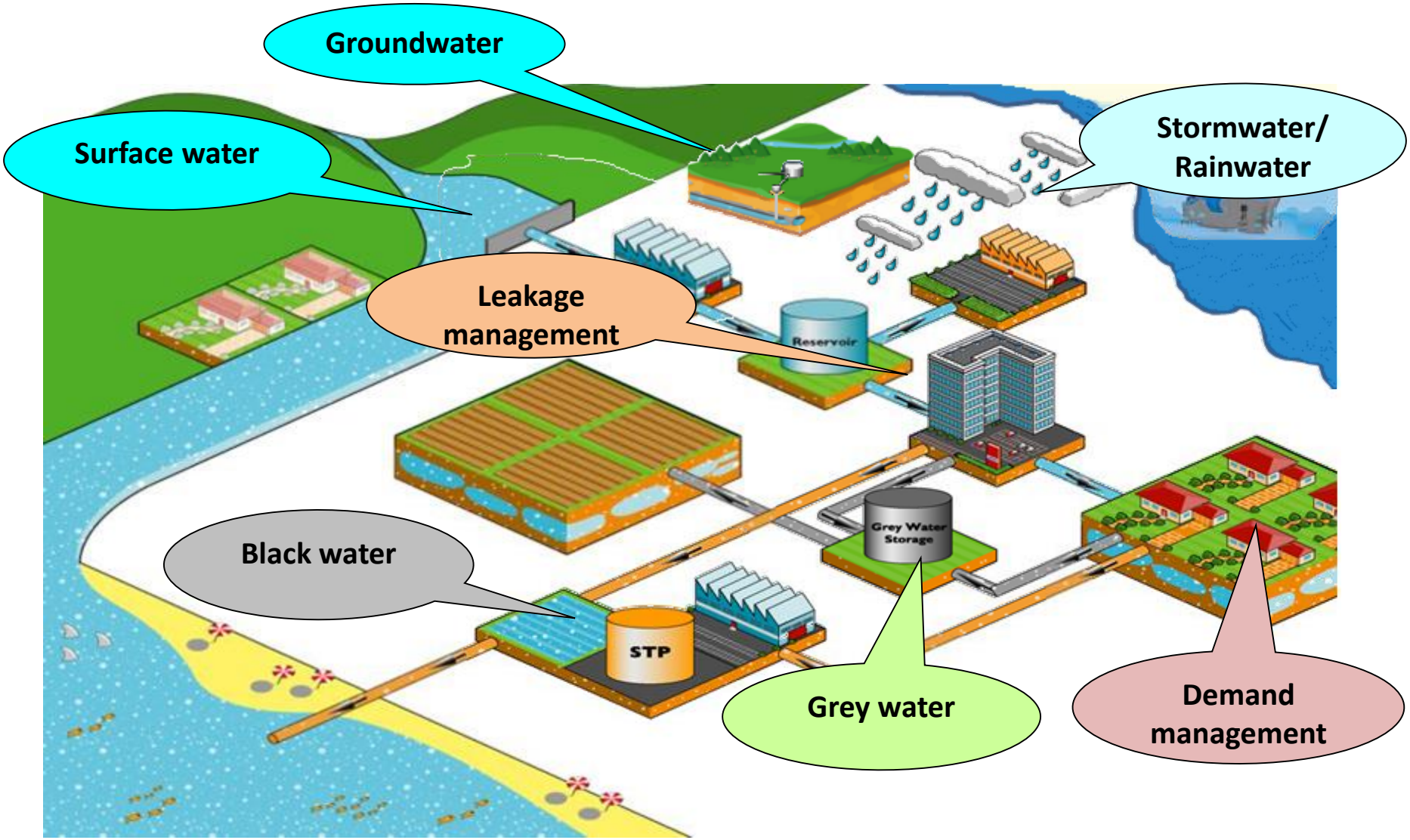
HOW CAN WE DO 'MORE WITH LESS' (RETHINK THE WAY WE USE AND REUSE WATER)

How do we transition our infrastructure to make it 'fit for purpose' to deal with climate change

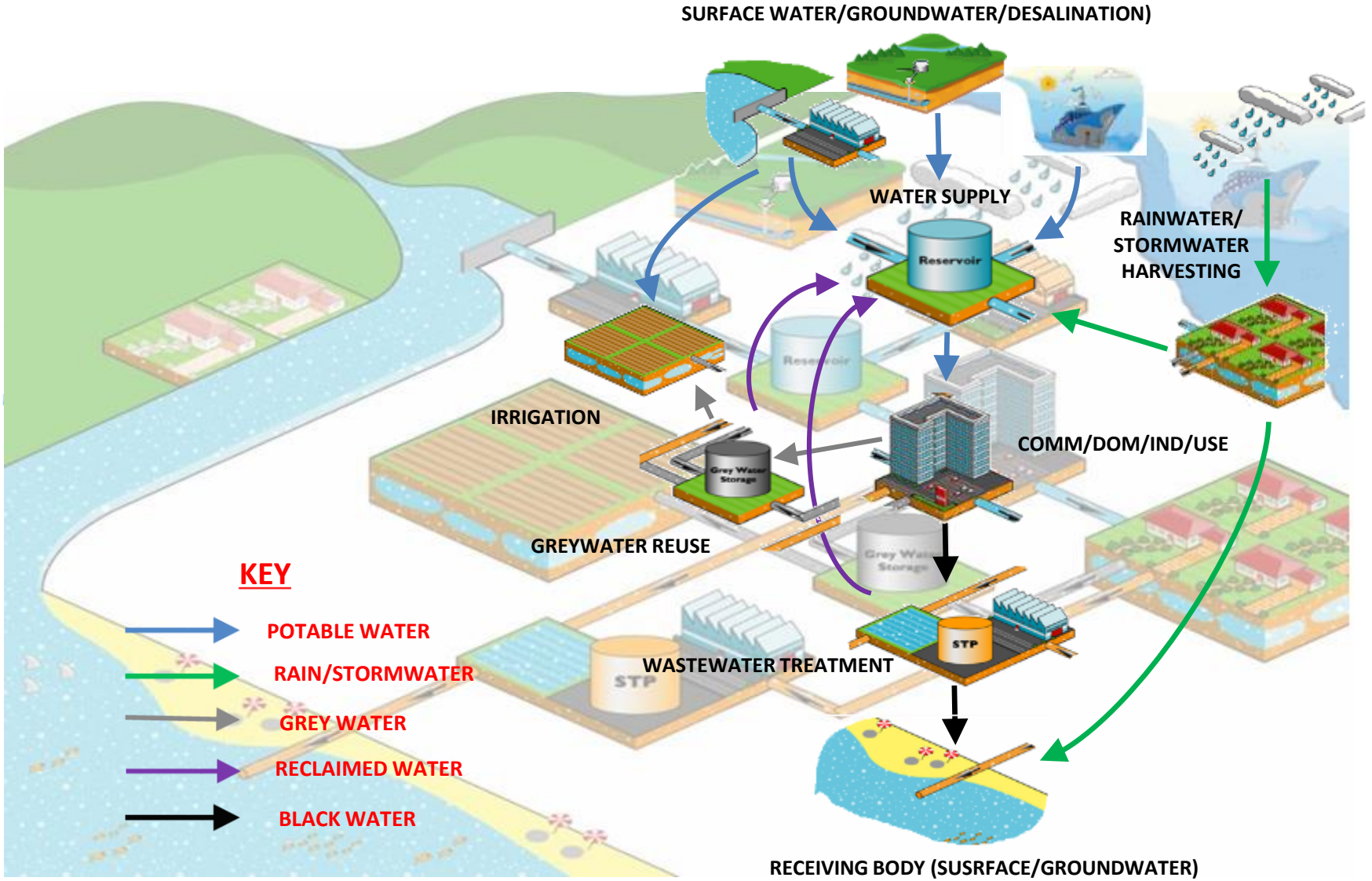
It's clear that our 19 c. approaches are not suited to deal with these challenges?

- Linear systems – use once and throw away
- Drinking water used for all purposes
- Systems centralized and fixed (no adaptive capacity)
- Stormwater viewed as a waste (not a resource).
- Institutions not conducive for integrated thinking
- Regulations stall innovation, are inflexible
- Urban form - no input from water professionals

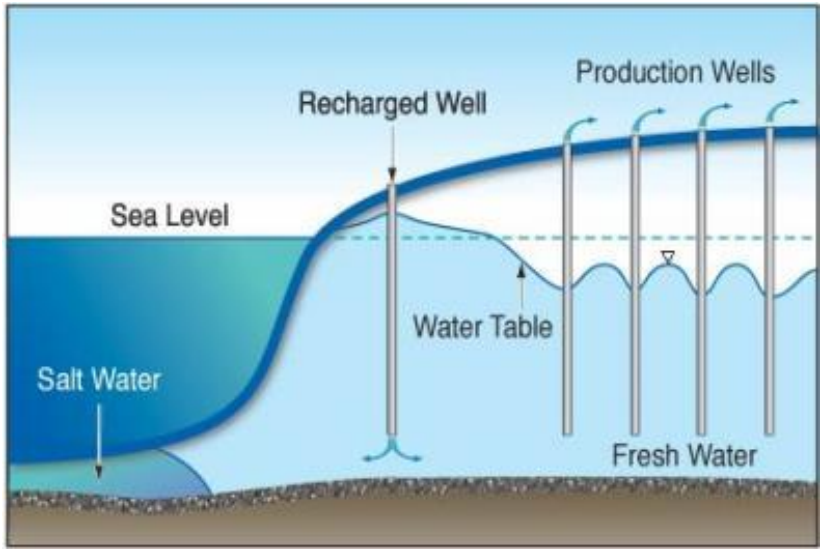
Productivity requires an integrated perspective of the urban water cycle

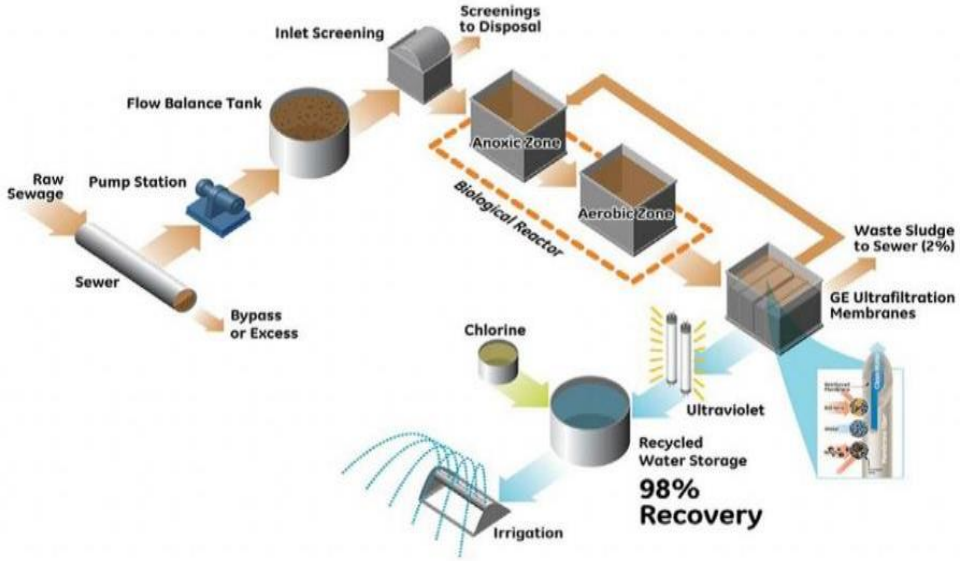


Integrated modelling allows us to connect all flows with productive uses



Change in perspectives leads to new thinking…that makes us more resilient





Tertiary: **Irrigation**

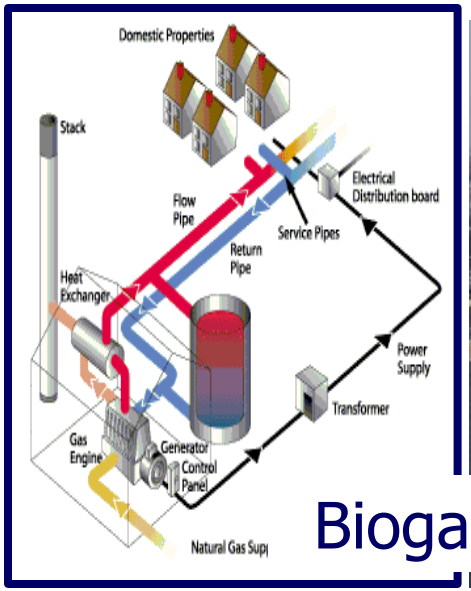
2nd+RO+MF: **AAR**

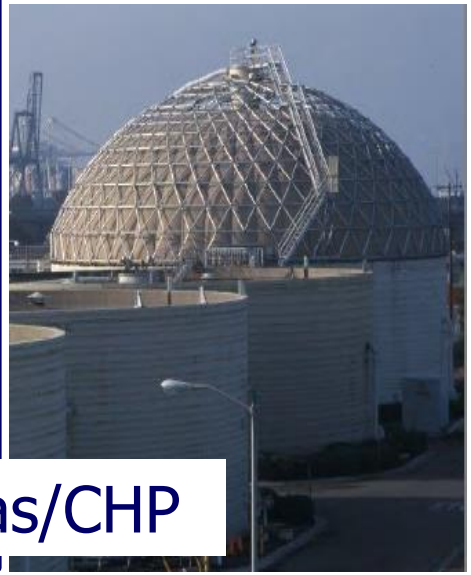
Nitrified: **Cooling**

RO: **Refinery**

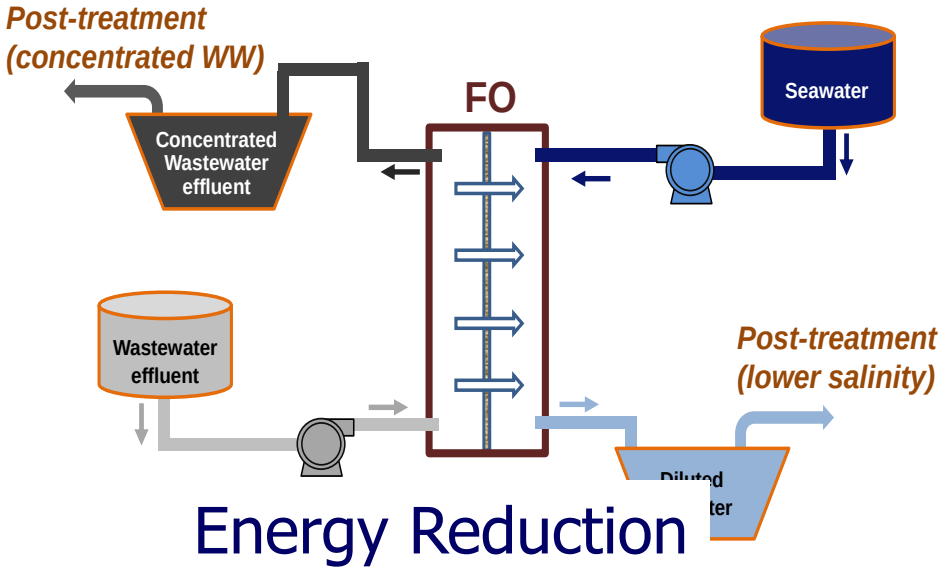
RO(x2): **Refinery**

Change in perspectives leads to new thinking…that makes us more resilient





Biogas/CHP

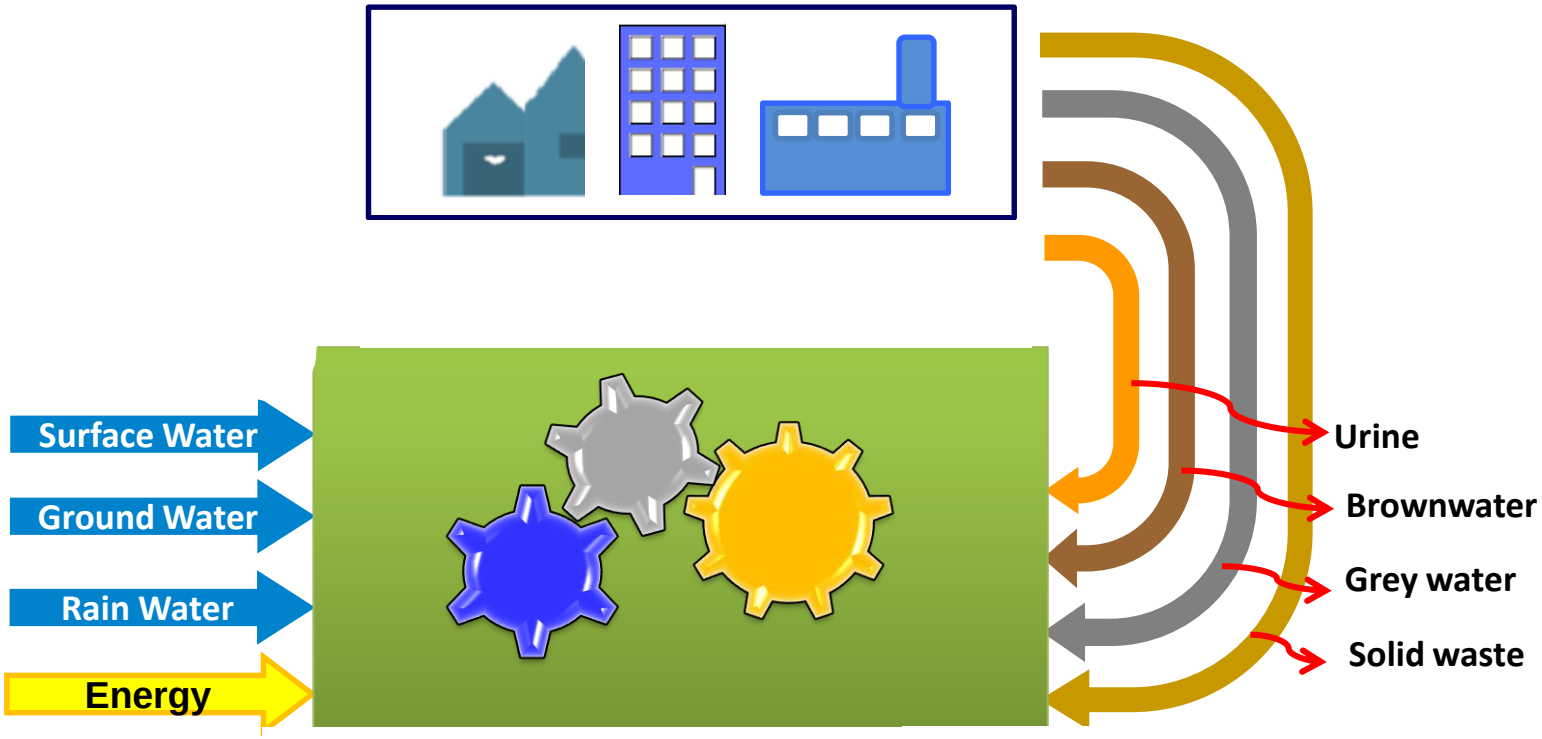


Energy Reduction

Nutrient Recovery

Heat Recovery

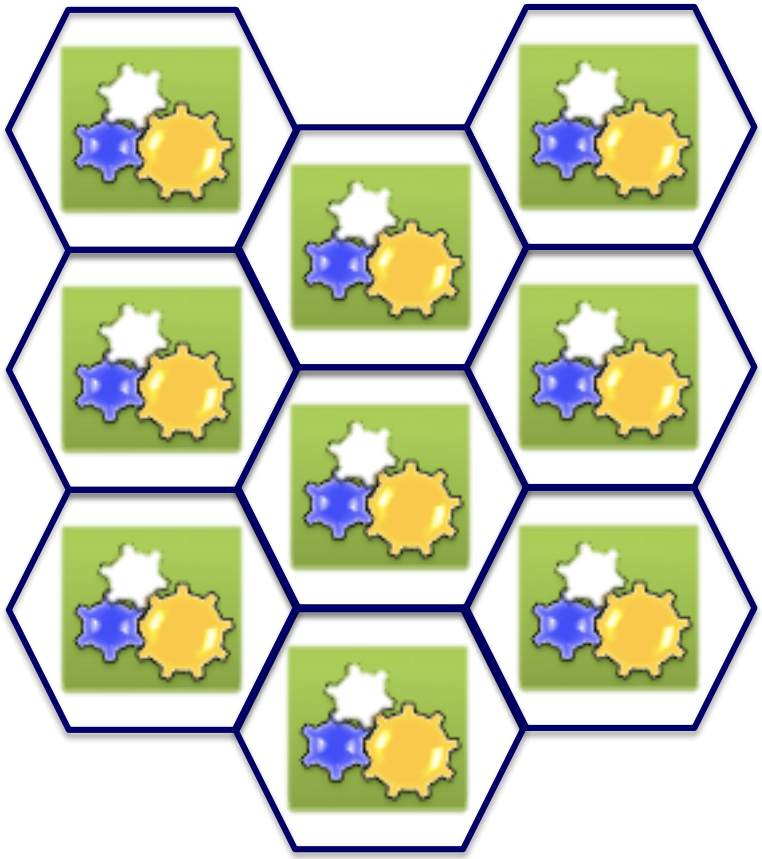
Change in perspectives leads to new thinking...that makes us more resilient



These perspectives lead to a more decentralized type of thinking?

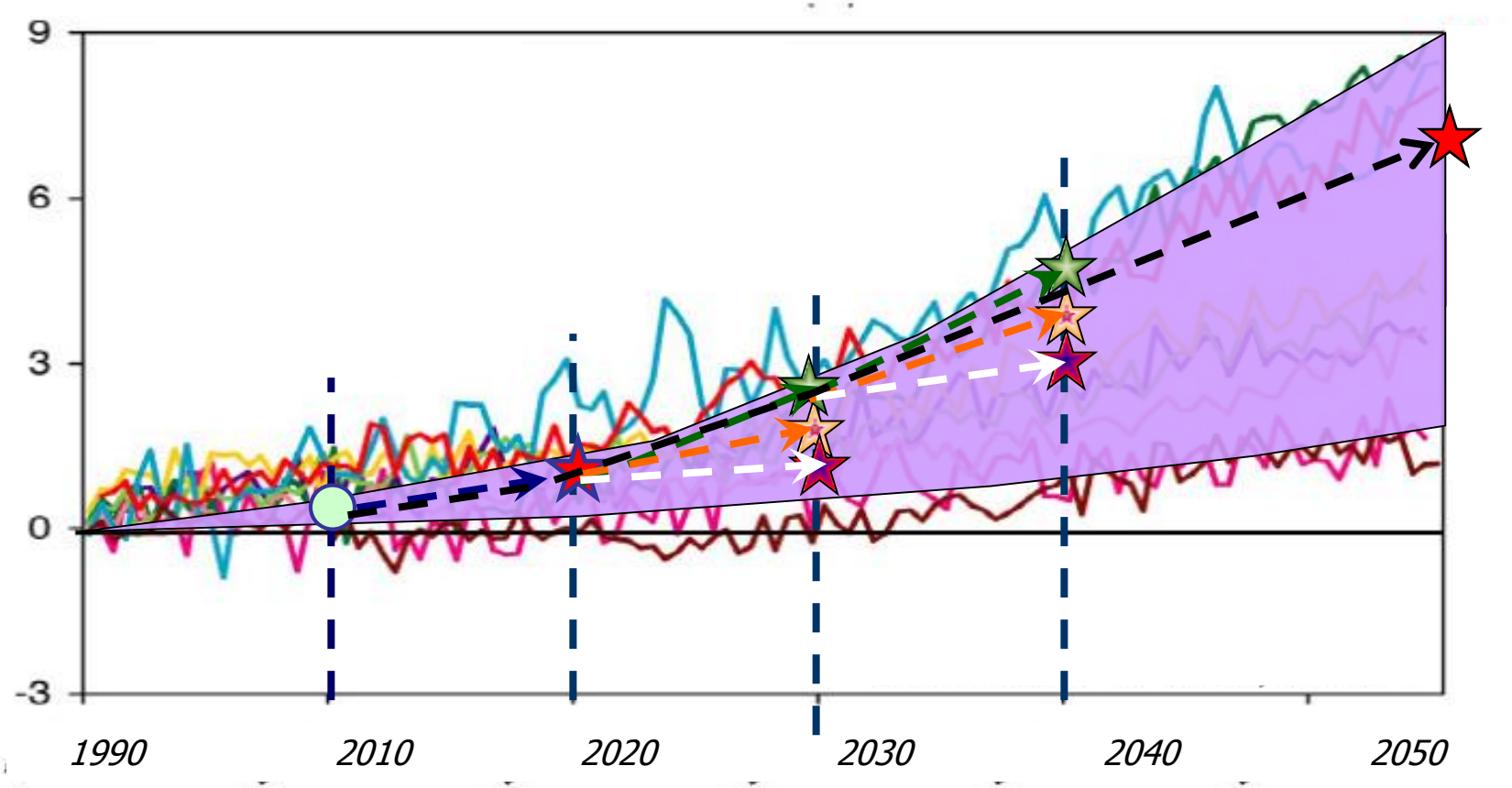
Decentralization well suited for:

- Energy recovery (heat recovered and used close to source)
- Minimizing energy consumption (for moving water)
- Source separation (to maximize nutrient recovery)
- Adjusted growth (to deal with rapid growing cities)
- Increased resiliency (dampens the propagation of failures)

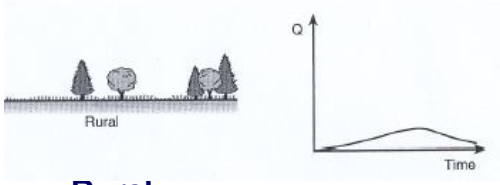


Inund

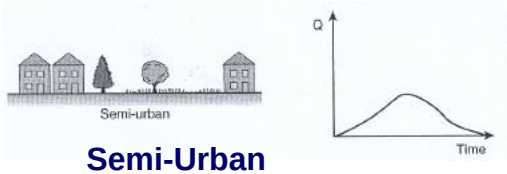
We need to be adaptive in an uncertain world



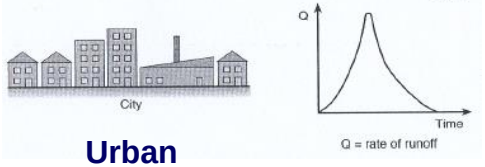
Modular systems gives you adaptive capacity



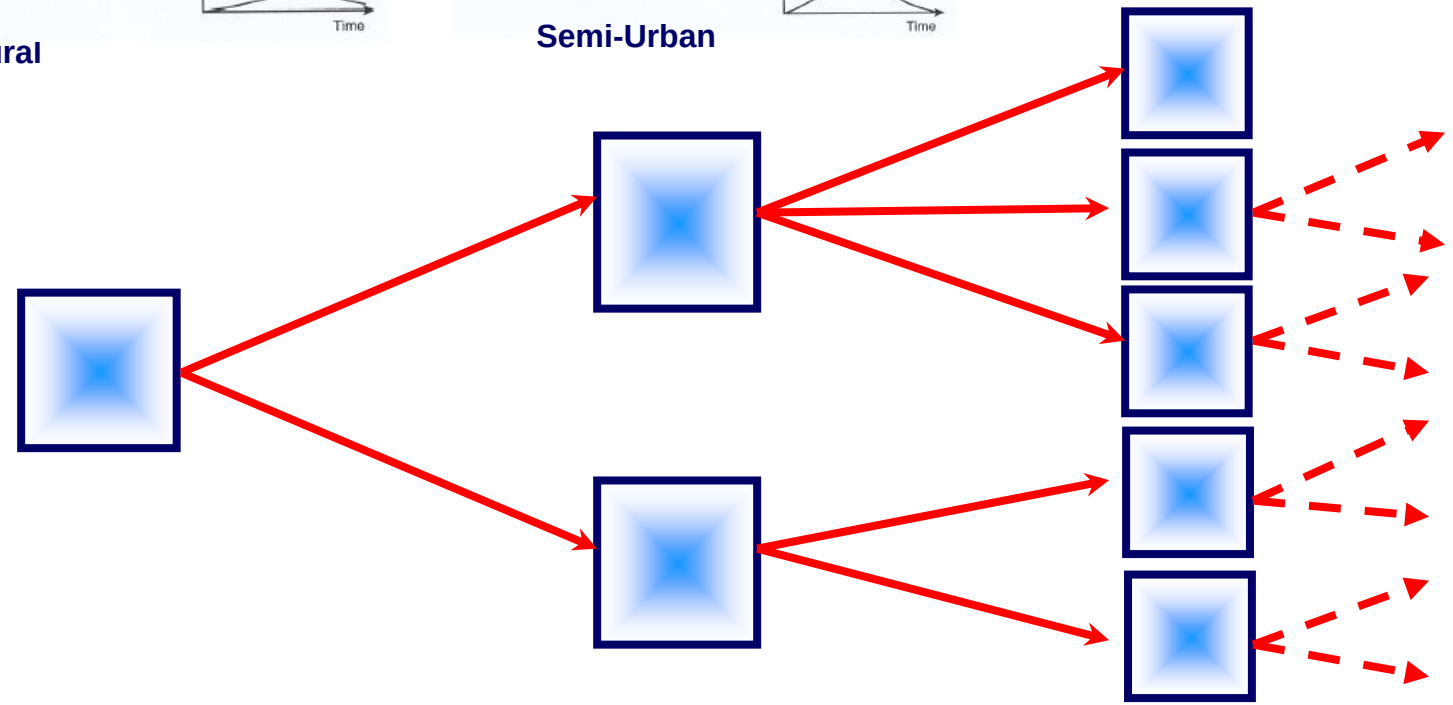
Rural



Semi-Urban



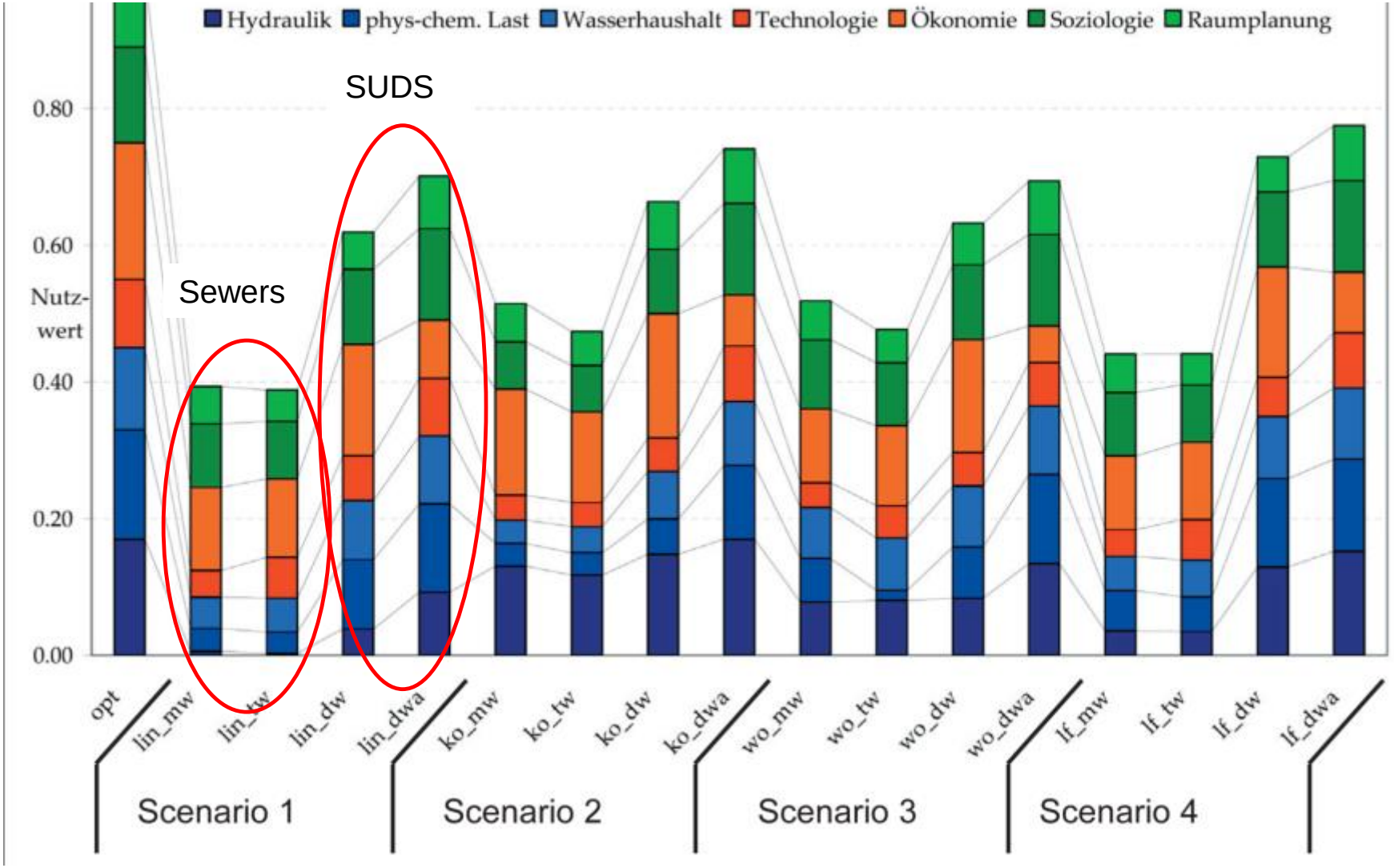
Urban



Time

Case Study: Kupferzell Germany

SUDS provide higher flexibility than sewers



Helm 2007

Eckart, Sieker, Vairavamoorthy (2010)

Choices Before Us

Questions for Discussion

1. What research and education projects are needed to help water utilities obtain the climate and sea level information they need to manage water supplies and make more “climate smart” decisions?
2. How can FCI work with WCA members to bridge the gap between researchers, innovators and the water sector in order to maximize the uptake of research and innovation to influence practice and policy…..describe possible mechanisms to operationalize this?
3. What critical needs and problems are you facing that the LBR support can help to develop solutions for AND support the continuing evolution of WCA?
4. What benefits can be accrued in relation to climate resiliency by changing our perspectives of urban water management (i.e. productive use, integration, beneficiation)?