

Integrated Water Resources Management & the 'One Water' Frontier in North Carolina

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Traditional Water Resources Management

→ Built storage for water supplies

→ Treatment systems for drinking water

→ Sewer infrastructure

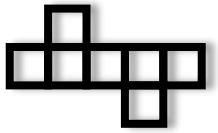
→ Wastewater treatment

→ Flooding protection/drainage systems

→ Point and nonpoint source pollution management

→ Water-reuse and conservation

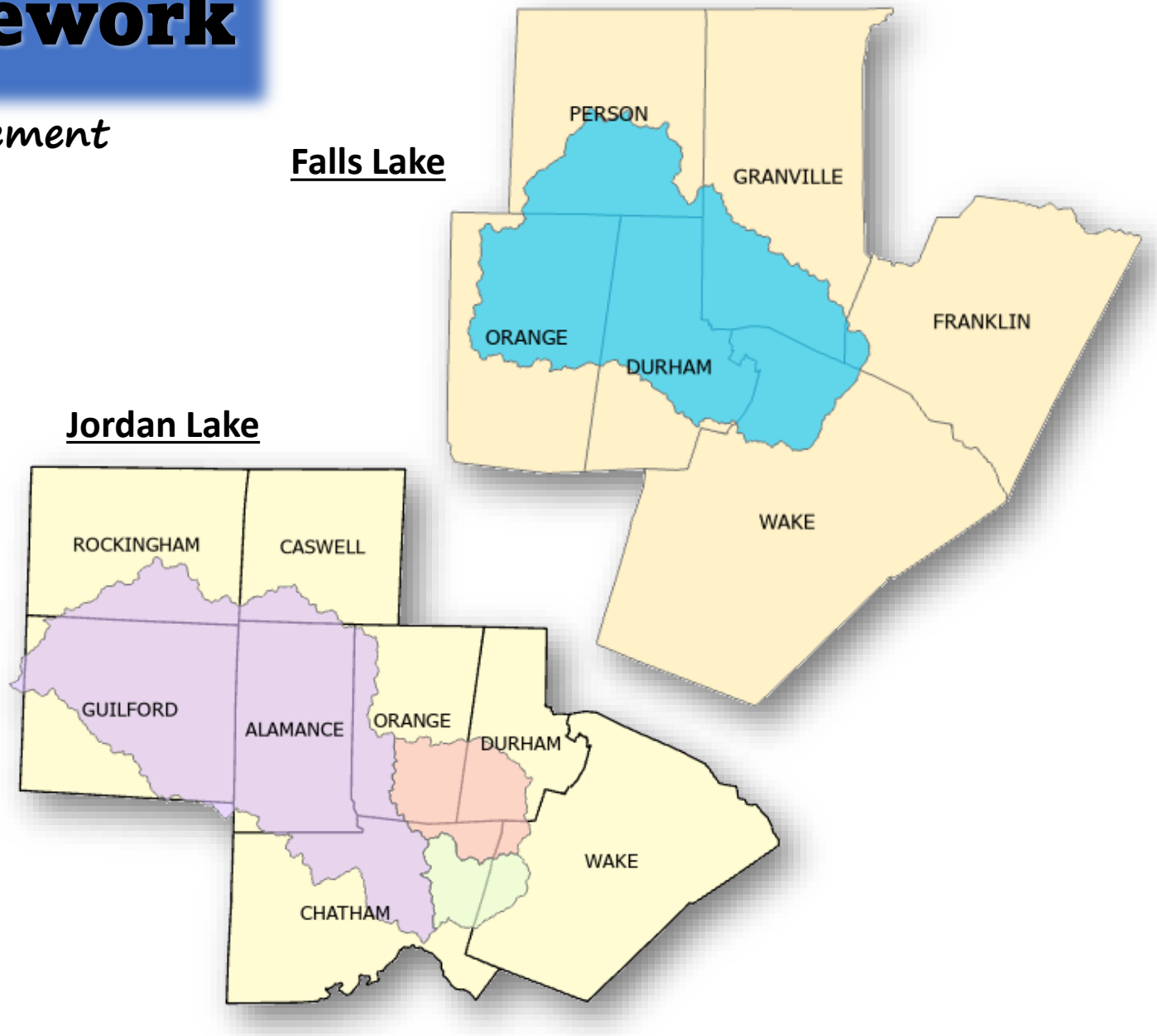
Water management systems historically have been designed and managed separately



NC Regulatory Framework

Point & Nonpoint Source Nutrient Management

- Basis is NC's Chlorophyll-*a* standard
- Regulate pollutant sources in basins & watersheds
  - Model-based reduction goals
  - Fair, reasonable, and proportionate for source sectors



NC Regulatory Framework

Point & Nonpoint Source Nutrient Management

Regulated Sources



Stormwater

- Requires jurisdictions establish stormwater programs for new development
- Existing development on public land (state/federal)



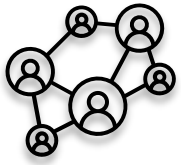
Wastewater

- Discharge limits
- Group compliance option



Agriculture

- Collective compliance approach N loss accounting on cropland and pastureland and assessing P loss risk



Multiple Sectors

- Riparian buffer requirements
- Fertilizer application requirements
- Nutrient offsets/trading

NC Regulatory Framework

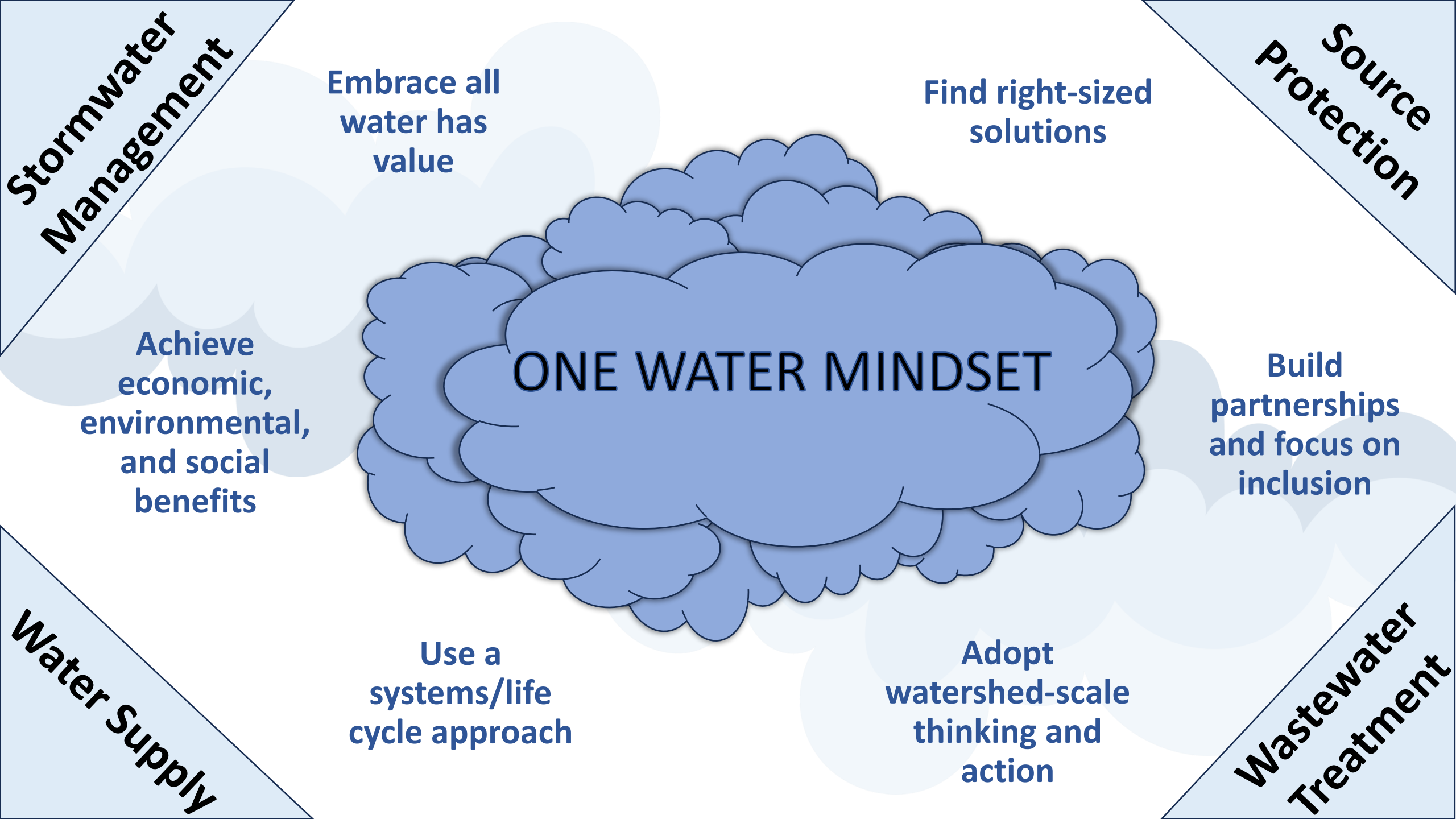
Point & Nonpoint Source Nutrient Management

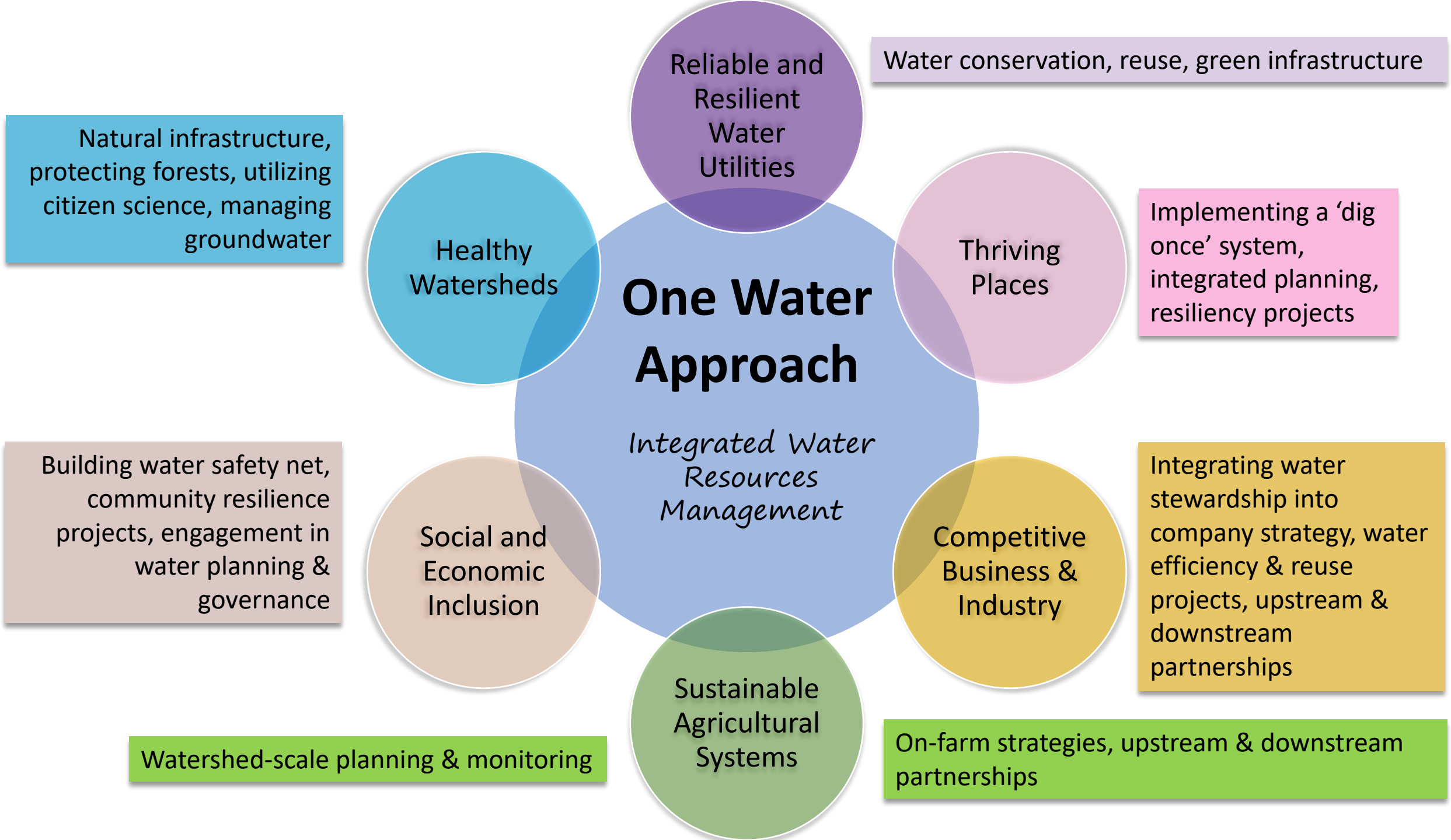
Challenges

- Reactive
- Does not encourage cross-sector collaboration
- Limited collaboration and stakeholder involvement in development (esp. initial strategies)
- Focus is on meeting water quality standard and not ancillary benefits (land conservation, flood reduction, water storage, etc.)
- Resource and time-intensive to develop
- Subject to interventions (legislative action, etc.)

Today's Water Challenges

- Water Quality: Existing and emerging contaminants
- Water Quantity: Flooding and drought
- Climatic changes & uncertainty
- Aging infrastructure
- Declining investment
- Disproportionate investment


Stormwater Management
Source Protection
Embrace all water has value
Find right-sized solutions
ONE WATER MINDSET
Achieve economic, environmental, and social benefits
Build partnerships and focus on inclusion
Water Supply
Wastewater Treatment
Use a systems/life cycle approach
Adopt watershed-scale thinking and action


Reliable and Resilient Water Utilities
Water conservation, reuse, green infrastructure
Natural infrastructure, protecting forests, utilizing citizen science, managing groundwater
Healthy Watersheds
One Water Approach
Integrated Water Resources Management
Thriving Places
Implementing a 'dig once' system, integrated planning, resiliency projects
Building water safety net, community resilience projects, engagement in water planning & governance
Social and Economic Inclusion
Competitive Business & Industry
Integrating water stewardship into company strategy, water efficiency & reuse projects, upstream & downstream partnerships
Sustainable Agricultural Systems
Watershed-scale planning & monitoring
On-farm strategies, upstream & downstream partnerships

NC One Water Activity

Upper Neuse River Basin Association

- Members
  - Six counties
  - Seven municipalities
  - One water utility
  - Soil and water conservation districts
- Active External Stakeholders
  - Agriculture
  - Environmental groups
  - Land conservation organizations
  - NC Department of Environmental Quality (DEQ) Division of Water Resources (DWR)
  - NC Department of Transportation (DOT)
  - NC Department of Agriculture and Consumer Services (NCDA&CS)

Falls Lake Watershed



NC One Water Activity

Upper Neuse River Basin Association:

- Collected four years of monitoring data in the watershed and the lake
- Developed a watershed model to better understand sources of loading
- Developed three lake water quality models to illustrate impacts on water quality
- Worked with other researchers and organizations
- Met with internal and external stakeholders to discuss recommendations

All this was done to make strategy improvements

MISSION

The Mission of the UNRBA is to preserve the water quality of the Upper Neuse River Basin through innovative and cost-effective pollution reduction strategies, and to constitute a forum to cooperate on water supply issues within the Upper Neuse River Basin by:

1. *Forming a coalition of units of local government, public and private agencies, and other interested and affected communities, organizations, businesses and individuals to secure and pool financial resources and expertise;*
2. *Collecting and analyzing information and data and developing, evaluating and implementing strategies to reduce, control and manage pollutant discharge; and*
3. *Providing accurate technical, management, regulatory and legal recommendations regarding the implementation of strategies and appropriate effluent limitations on discharges into the Upper Neuse River Basin.*

NC One Water Activity

Innovative Project Highlight

Falls Lake Alternative Rule Implementation – Existing Development

- Manageable, collaborative, voluntary approach
- Jurisdictions commit to reasonable investments reducing nutrient loading
- Activities known to be beneficial, but that do not have State-approved nutrient credits, are eligible to be funded (e.g. land conservation)

NC One Water Activity

Conclusions on Watershed Needs for a Revised Falls Lake Nutrient Strategy

- Additional large-scale nutrient load reductions are not achievable
- Protecting forests and other natural areas is key to long-term management
- Long-term nutrient management will be the most effective approach
- Collaborative action is needed to protect this resource and maintain uses
- A watershed organization is recommended to coordinate activities and partnerships

Unrba

NC One Water Activity

UNRBA Agricultural Recommendations

Support the local food and fiber economy and slow additional land loss

Allow local governments to provide funding support

Utilize existing organizations and state programs to deliver funds and services

Foster collaboration by removing agriculture's separate collective nutrient reduction requirement

Identify projects and opportunities that benefit agriculture and improve water quality

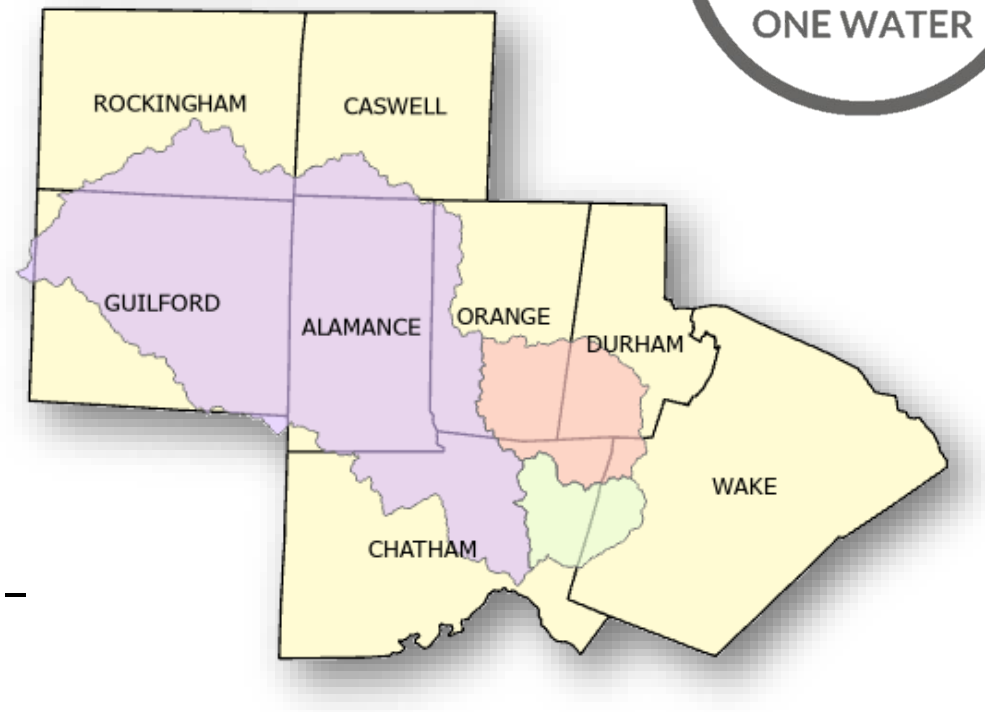
Formalize partnerships with agriculture and include representation in watershed organization

NC One Water Activity

Jordan Lake One Water (JLOW)

- Members (so far)
  - 5 cities and towns
  - 1 county
  - 1 state department
  - 3 nonprofits
  - 2 businesses/business coalitions
- Partners
  - NC Department of Agriculture & Consumer Services – Division of Soil and Water Conservation
  - NC Department of Environmental Quality
  - Regional Councils of Government
  - Soil and Water Conservation Districts

Jordan Lake Watershed



MISSION

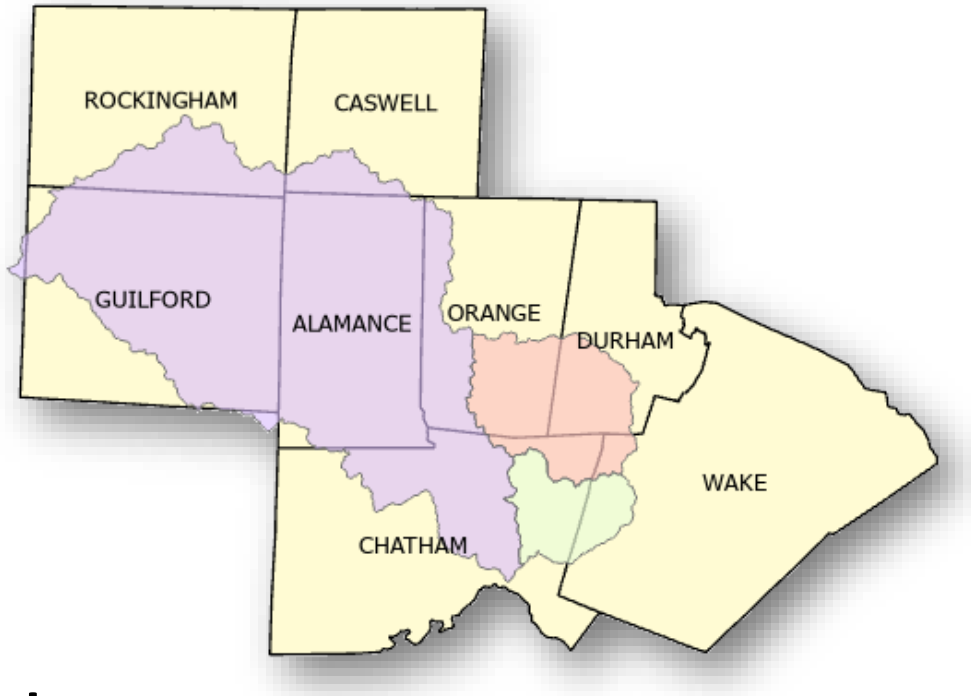
*JLOW aims to help Jordan Lake Watershed stakeholders meet the shared goal of finding **cost-effective**, **mutually beneficial solutions** that protect our water resources and communities. All who live or work in the Jordan Lake Watershed are affected by the management of Jordan Lake's water quantity and quality and **our water future depends on our collaboration**.*

NC One Water Activity

Jordan Lake One Water (JLOW)

- Pursuing organization formalization
- Creating equitable organizational governance structures
- Anticipate working with NC Department of Environmental Quality to co-develop a regulatory framework for the Jordan Lake watershed that works for all stakeholders

Jordan Lake Watershed



Water quality improvement for strategy compliance is an objective, but not the organization's end goal!

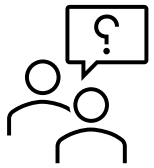
The Frontier

Much remains to be tested, but mindsets and approaches to water resource management in NC are slowing changing!



- Transition from nutrient ‘pound-accounting’ approaches
- Build on cooperation & collaboration
- Create watershed organizations with upstream & downstream stakeholders & multiple source sectors to structure to engagement, foster new ideas, & encourage collaborative work
- Utilize investment-based compliance options & watershed funding pools for cross-sector collaboration
- Pursue & implement projects achieving multiple benefits (social, environmental, economic)
- Develop adaptive programs with periodic re-evaluation

Questions?



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