

June 2019 GWPC Produced Water Report – An Executive Summary



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John Baza
Director
Utah Division of Oil, Gas and Mining

GWPC Board member



GROUNDWATER

PROTECTION COUNCIL



PRODUCED WATER REPORT

Regulations, Current Practices & Research Needs

Leadership Team and Study Partners

Project Co-leaders

- Shellie Chard, ODEQ | John Baza, UDOGM

Introduction & Module 1 Leaders

- Shellie Chard | John Baza

Module 2 Leaders

- Scott Kell, ODOGRM | Tom Kropatsch, WOGCC

Module 3 Leaders

- Ken Harris, DOGGR | Nichole Saunders, EDF

GWPC Staff

- Mike Paque | Mike Nickolaus | Erica Carr

Contractors

- Michael Dunkel, Worley
- John Veil, Veil
Environmental Consulting

Financial Contributors

- US Department of Energy
- Environmental Defense
Fund
- American Petroleum
Institute
- Groundwater Research and
Education Foundation

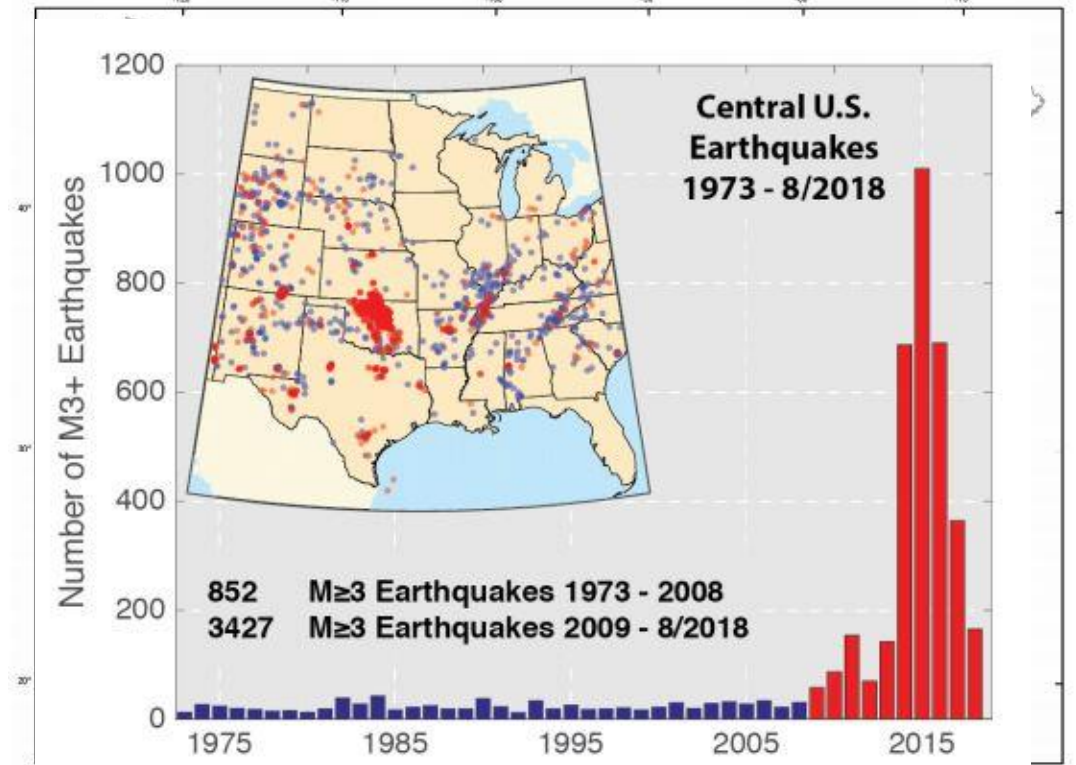
Report Goals

- **GWPC hopes this report will be used to:**
 - Educate the public
 - Encourage oil and gas industry, state and federal regulatory agencies to gather data
 - Inform new research
 - Expand the use of produced water in a manner that is protective of the environment and public health.



What is Driving the Produced Water Conversation?

- Volume of produced water
- Fresh water stress due to rising and relocating populations and regional droughts
- Induced seismicity



Source: <https://myweb.rollins.edu/jsiry/Waterbasics.html>

Developing Solutions: A Modular Approach

MODULE 01

Regulatory & Legal Frameworks

This module describes the current legal and regulatory frameworks that address produced water. It also addresses changes that may need to occur to facilitate the use of produced water.

Leadership:

John Baza, Utah Division of Oil, Gas & Mining
Shellie Chard: Oklahoma DEQ, Water Quality

MODULE 02

Produced Water Use in the Oilfield

This module describes the current uses and potential future uses of produced water inside the oilfield. It defines the existing constraints of use and identifies the opportunities and challenges of expanded use.

Leadership:

Tom Kropatsch: Wyoming Oil & Gas Commission
Scott Kell: Ohio Department of Natural Resources

MODULE 03

Produced Water Use & Research Needs Outside the Oilfield

This module describes current and potential use of produced water outside the oilfield and identifies the research needs that will need to be addressed to facilitate expanded use.

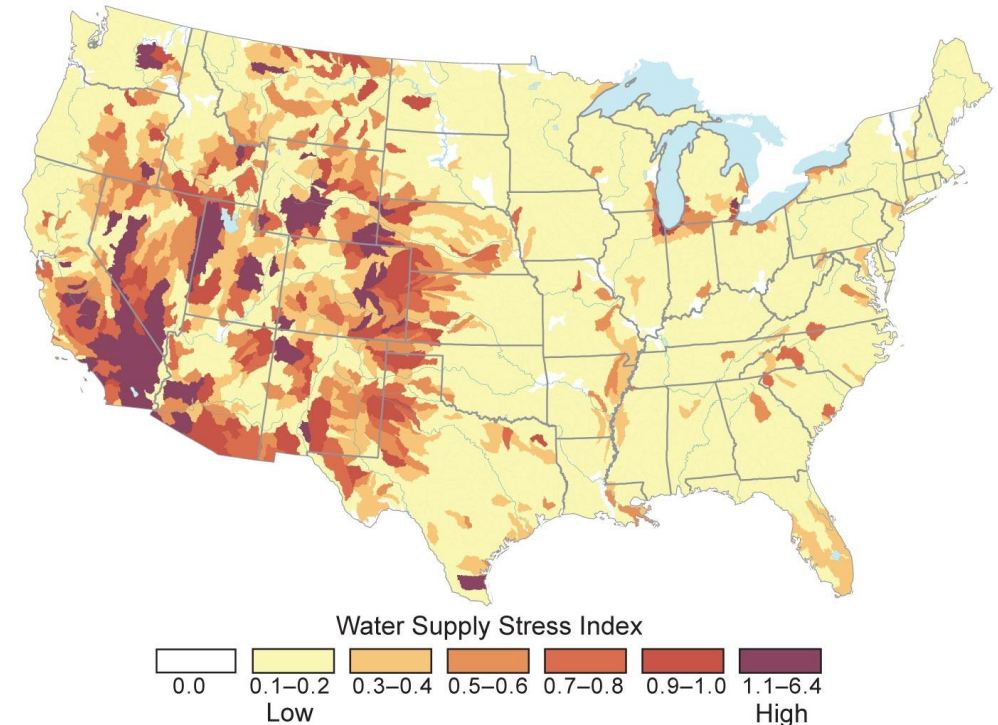
Leadership:

Ken Harris: California Department of Conservation
Nichole Saunders, Environmental Defense Fund

State Water Planning

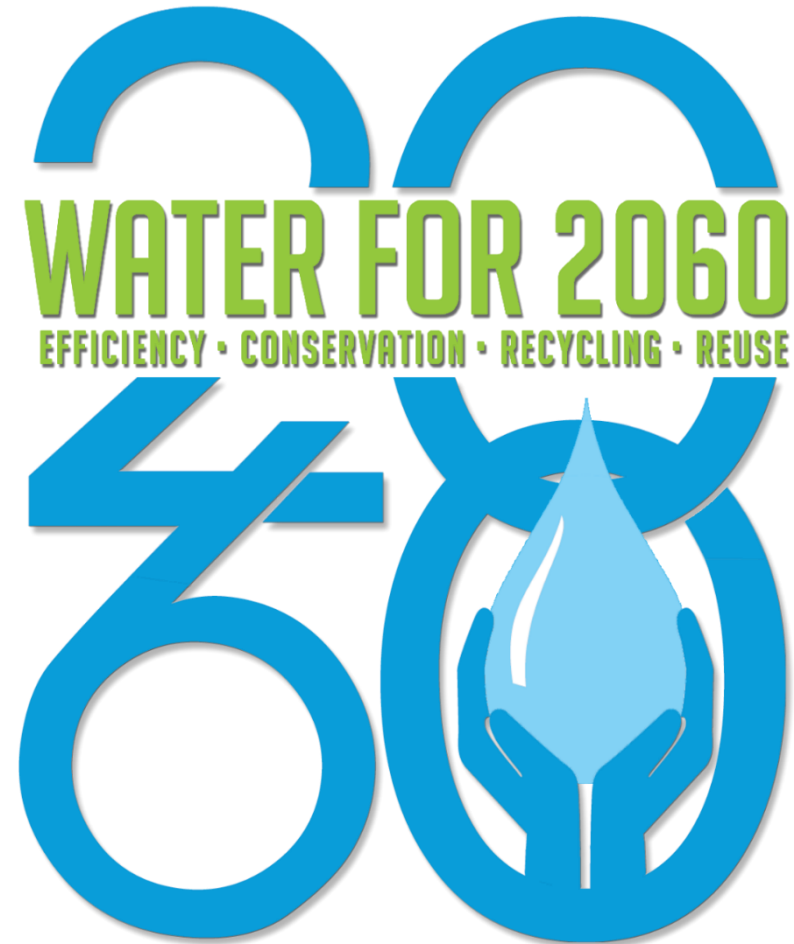
- Water planning is important to states as more regions are experiencing water shortages
- Only three of the six states reviewed in legal research include produced water as a component of their state water plans
- As treatment technology advances, populations grow and water scarcities become more pronounced, produced water could be looked at as a resource that could add to a state's water balance sheet.

Water Stress in the U.S.

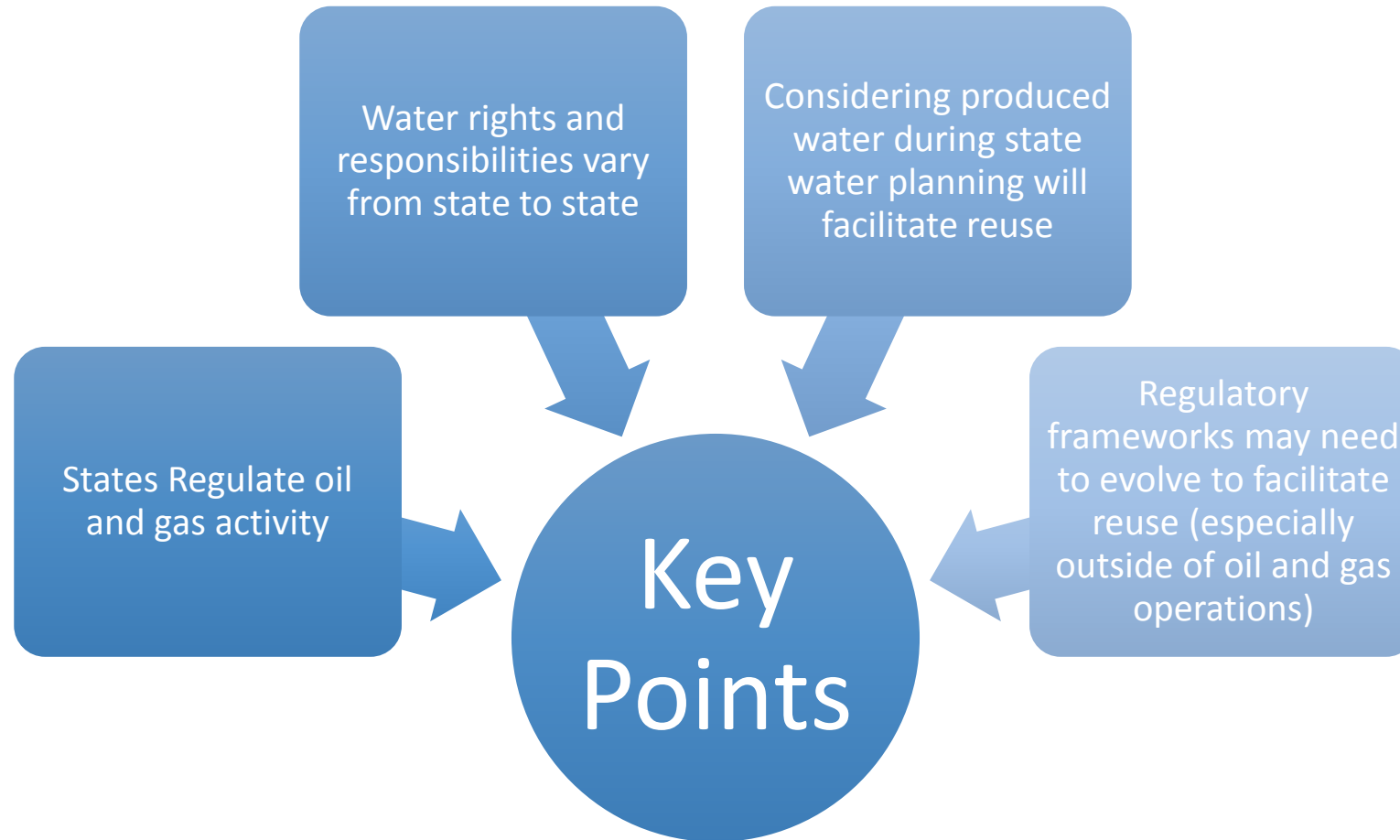


State Example: Oklahoma

- Oklahoma –
 - Developed a comprehensive water plan for state based on 13 geographic regions
 - Legislative action created goal for state to use no more fresh water in 2060 than in 2010 (Water 2060 Act)
 - All water sources considered including brackish groundwater, produced water, and reuse of reclaimed water from municipal or industrial processes
 - Included conservation methods



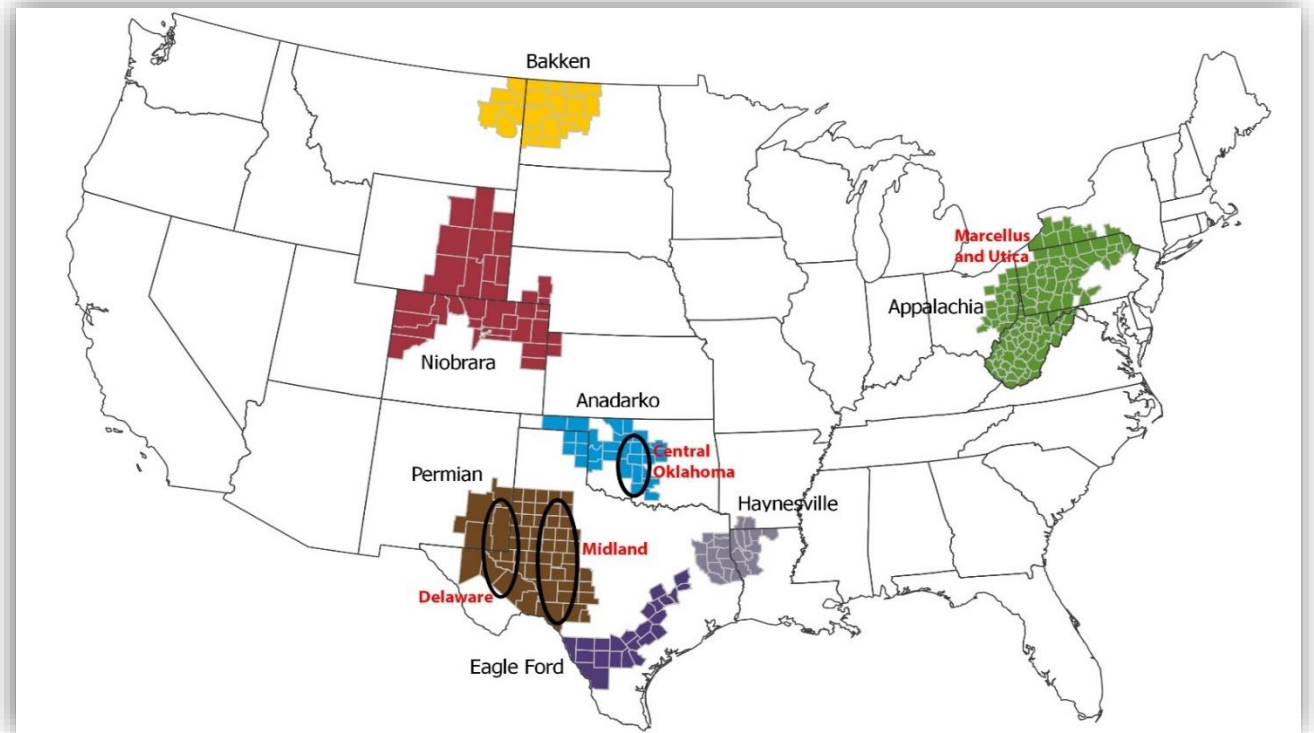
Module 1 Summary



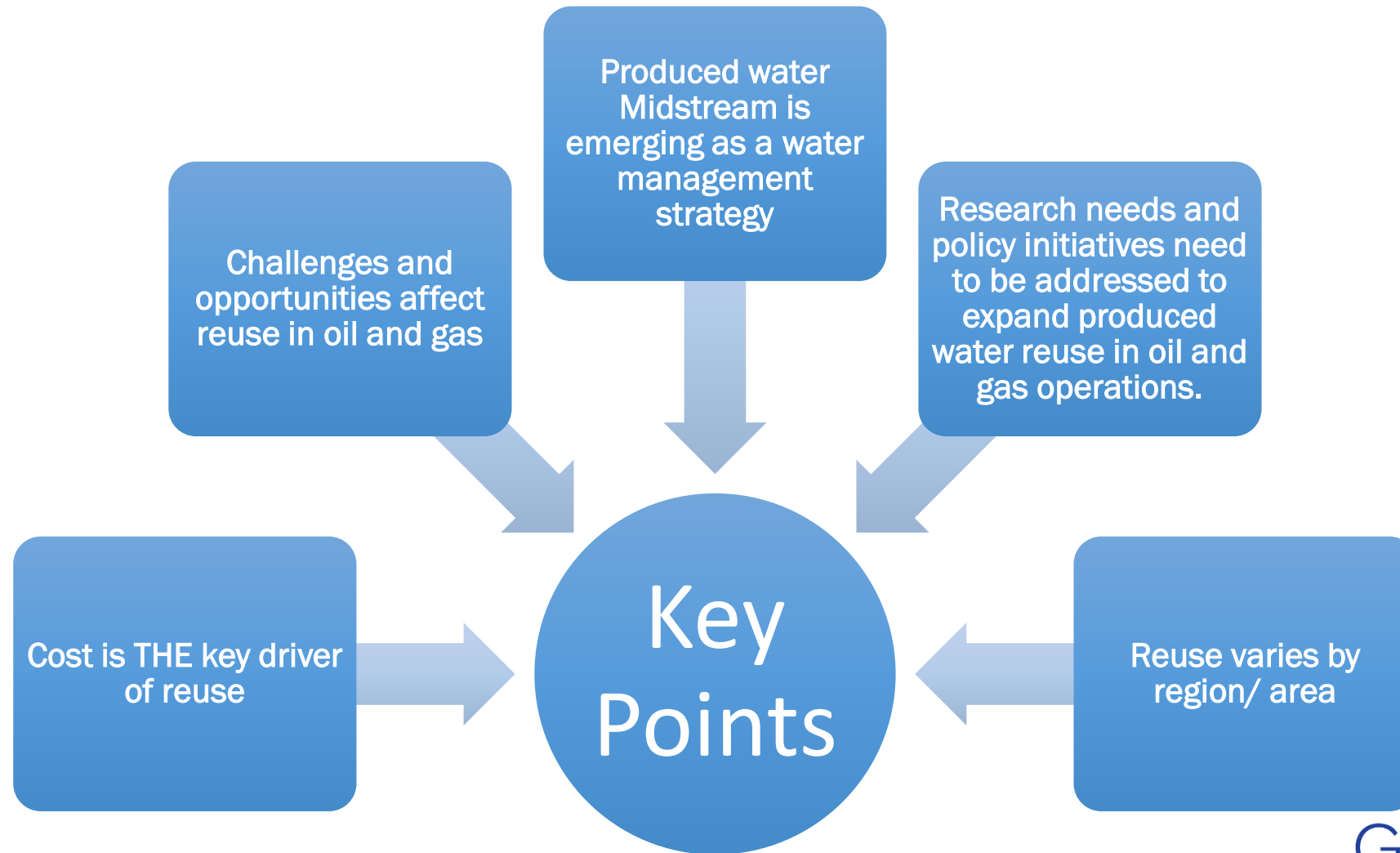
Module 2: Basins Studied/Profiled in this Report

Seven basins profiled

- Appalachia
- Bakken
- Eagle Ford
- Haynesville
- Niobrara/ DJ
- Oklahoma
- Permian



Module 2 Summary

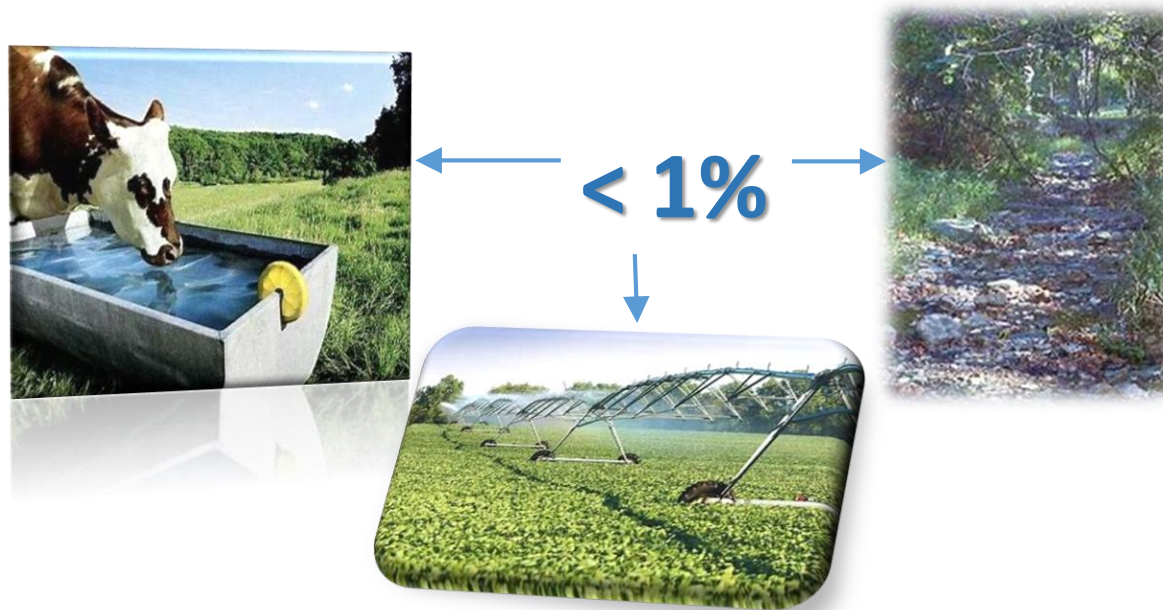


Module 3: The Road Ahead

- The most complicated and forward looking challenge
- Some small scale efforts exist
- Moving with caution
- Research needs on all fronts – environmental impact



Current reuse outside of oil and gas operations is minimal but many opportunities exist.



Expanded Opportunities for Reuse

Outside Oil & Gas Industry

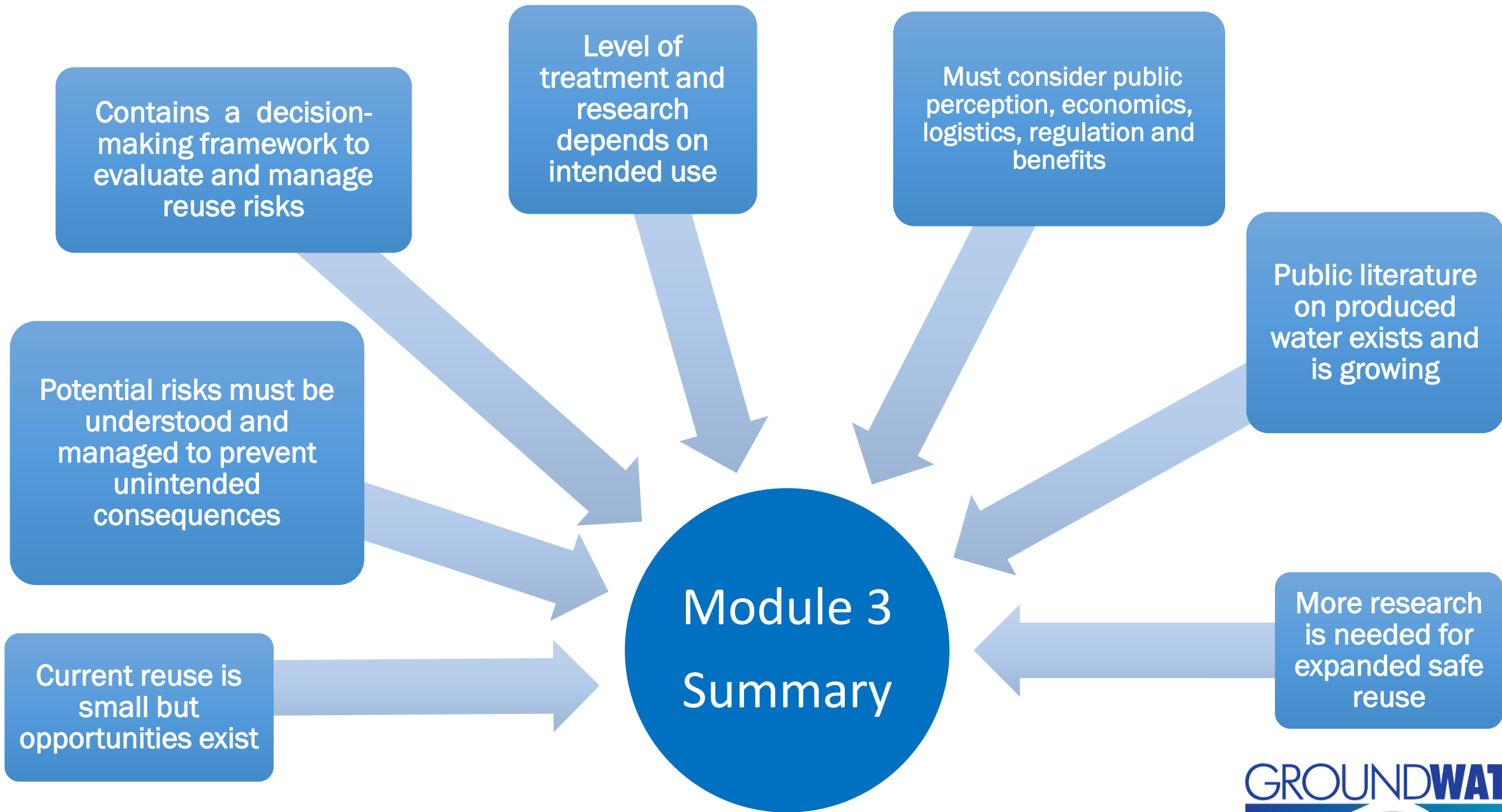
- Possibilities for further reuse with additional research
 - Land Application (e.g., irrigation)
 - Discharges to Surface or Ground Water
 - Industrial Use (e.g., cooling water)

WAY Down the Road

Potable Reuse



Potential risks must be well understood and appropriately managed in order to prevent unintended consequences.



Conclusions

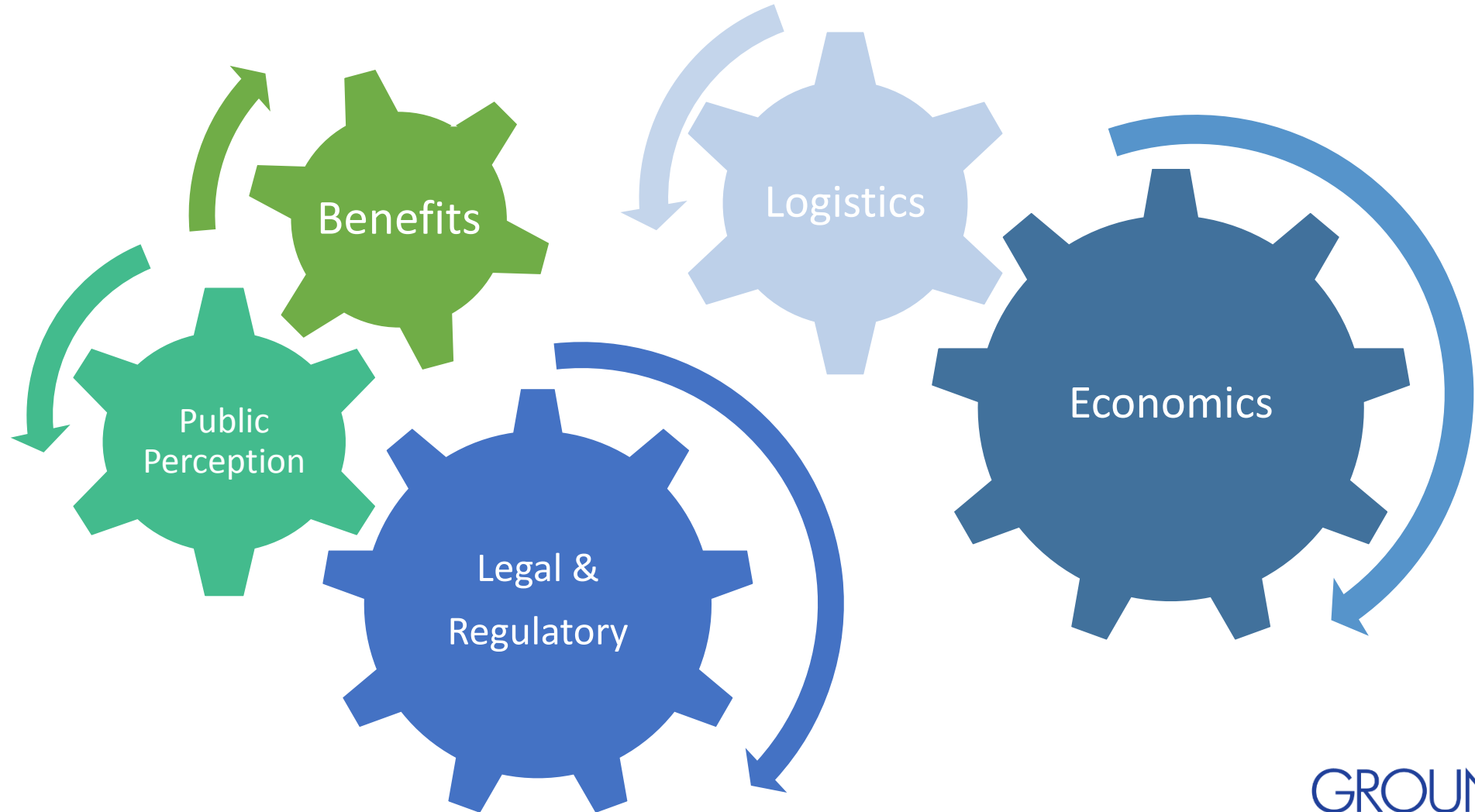
- Reuse is possible and may be cost effective in the right situations
- Oil & gas companies and end users must work together
- Regulators can look for ways to allow reuse projects but must ensure environmental and public health protection
- Expanding reuse opportunities may require regulatory or legislative solutions
 - Ownership of produced water
 - Transfer of ownership
 - Determination of liability
 - Human health and safety concerns
 - Environmental risk and mitigation concerns

Principal Report Conclusion

Produced water reuse has local potential but requires careful thought.



Practical Considerations



GWPC's Next Steps

- The GWPC Board passed a resolution in September that created a GWPC National Produced Water Task Force to continue to address topics presented in the Produced Water Report.
- The Task Force will seek technical assistance and collaboration from USEPA, USDOE, and other governmental and non-governmental stakeholders.
- The Task Force will convene regular meetings, conduct studies, and provide education and training to further advance the goals and recommendations of the Produced Water Report.
- The first such meeting will be a Produced Water Symposium planned for Spring 2020.

Questions

About the GWPC | www.GWPC.org

Online Report | www.GWPC.org/resources/publications