ITRC (Interstate Technology & Regulatory Council). 2023. Managed Aquifer Recharge Guidance MAR-1. Washington, D.C.: Interstate Technology & Regulatory Council, MAR Team. https://mar-1.itrcweb.org/.



The combination of climate change and growing demand for fresh water has resulted in an increase in the vulnerability and scarcity of freshwater supplies around the world. Managed Aquifer Recharge (MAR) is a process that is becoming an increasingly important method for improving and supplementing subsurface freshwater storage and ecosystems with an additional benefit of reducing flood risk, managing stormwater, mitigating subsidence, and controlling saltwater intrusion.

This Managed Aquifer Recharge guidance provides a basic understanding of MAR and its applications through the presentation of:

- A **model of the MAR process** illustrating the four key components of MAR and their interaction.
- An **overview of the applications of MAR** and the role in addressing climate change impacts through sustainability and resilience in water resources management.
- **Information on the key components of MAR** and the critical considerations for each component in the design of a MAR project.
- **Case studies** illustrating the various applications of MAR.

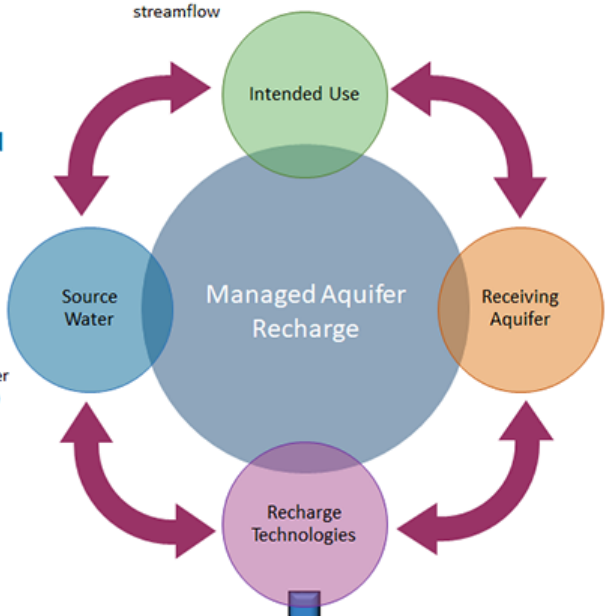
Click on the shapes and subject areas on the following figure to go to that section of the Guidance

What do you need to accomplish?

- Water supply resilience (storage and recovery)
- Improve groundwater quality
- Mitigation against saltwater intrusion
- Use of flood water/use of stormwater
- Subsidence reduction
- Protection of riparian ecosystems/maintenance of streamflow

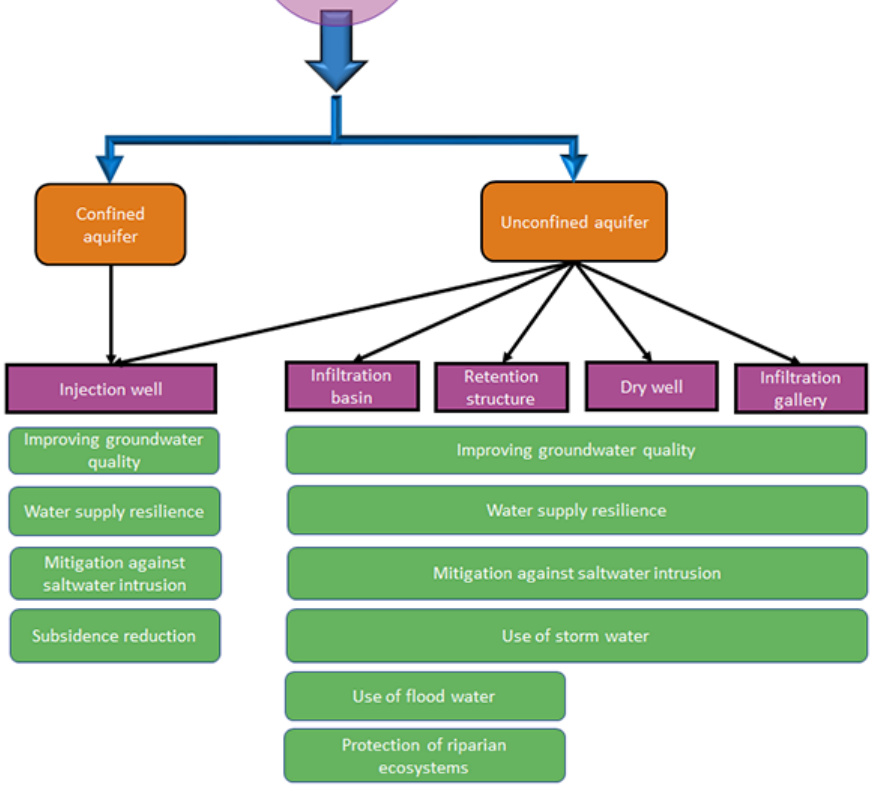
Information you may need to know about the Source Water:

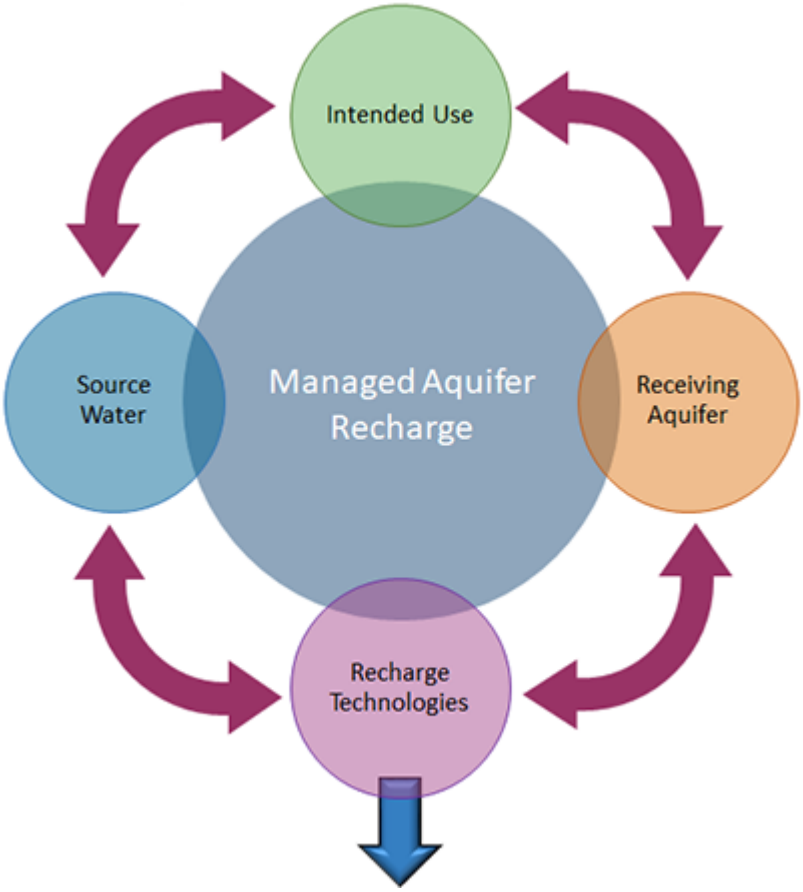
- Source water origin
- Source water availability
- Chemical characterization
  - Physical, chemical, biological, radiological
- Geochemical compatibility between the source water and receiving aquifer (native groundwater + aquifer matrix)
- Water quality regulatory standards
  - State and/or federal
- Potential pre-treatment



Information you may need to know about the Receiving Aquifer:

- Hydrogeologic setting
- Storage potential
- Site conditions and land use
- Geotechnical considerations
- Mineralogy
- Native groundwater quality
- Geochemical compatibility: source water - receiving aquifer





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- Confined Aquifer
- Injection well
- Go to Injection well section
- Improving groundwater quality
- Water supply resilience
- Mitigation against saltwater intrusion
- Subsidence reduction
- Unconfined Aquifer
- Infiltration basin
- Go to Infiltration basin section
- Improving groundwater quality
- Water supply resilience
- Mitigation against saltwater intrusion
- Use of storm water
- Use of flood water
- Protection of riparian ecosystems
- Retention structure
- Go to Retention structure section
- Improving groundwater quality
- Water supply resilience
- Mitigation against saltwater intrusion
- Use of storm water
- Use of flood water
- Protection of riparian ecosystems
- Dry well
- Go to Dry well section
- Improving groundwater quality
- Water supply resilience

- Mitigation against saltwater intrusion
- Use of storm water
- Infiltration gallery
- Go to Infiltration gallery section
- Improving groundwater quality
- Water supply resilience
- Mitigation against saltwater intrusion
- Use of storm water