

Regional Water Management: Adapting to Uncertain Water Supply and Demand

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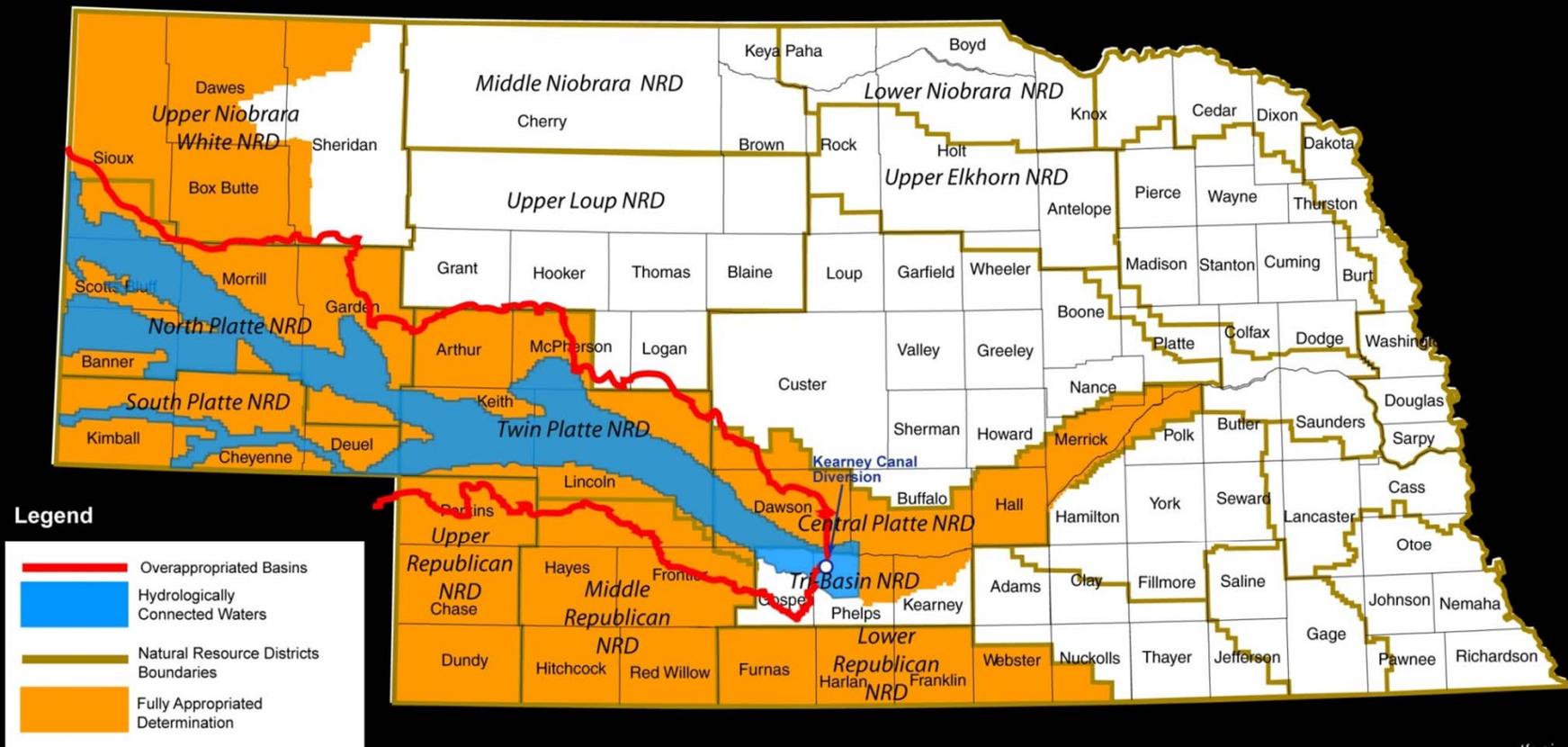
Overview

- Regional/Basin-wide planning
- How Nebraska manages water
- Dealing with uncertain water supplies:
adaptive management

Regional/Basin-Wide Planning

- FAB Report
- IMPs—Integrated Management Plans
- Conjunctive surface/groundwater approach
- *Adaptive*

Fully and Overappropriated Areas

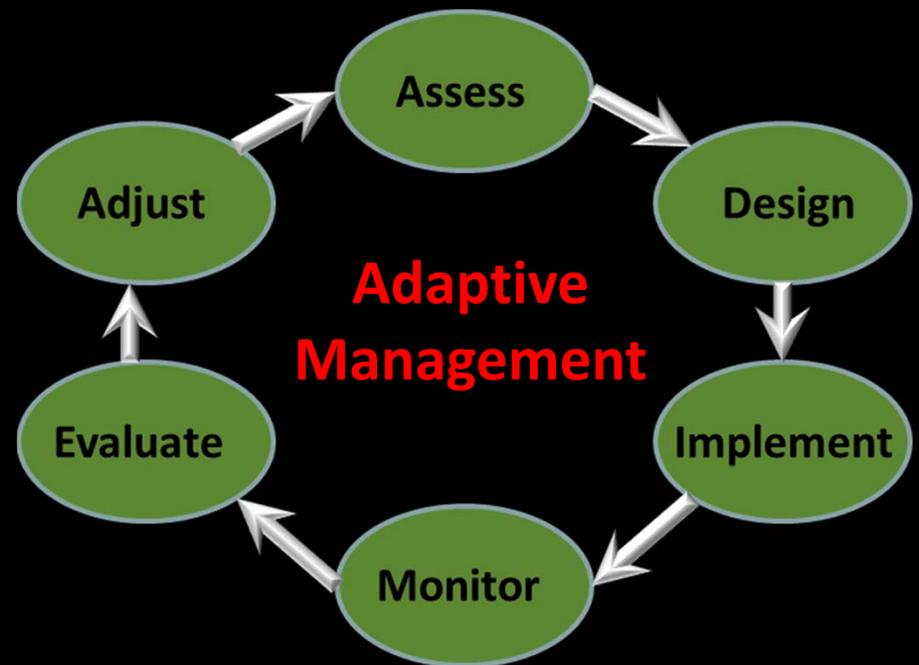


LB 962- Fully Appropriated and Overappropriated Areas as of September 21, 2011

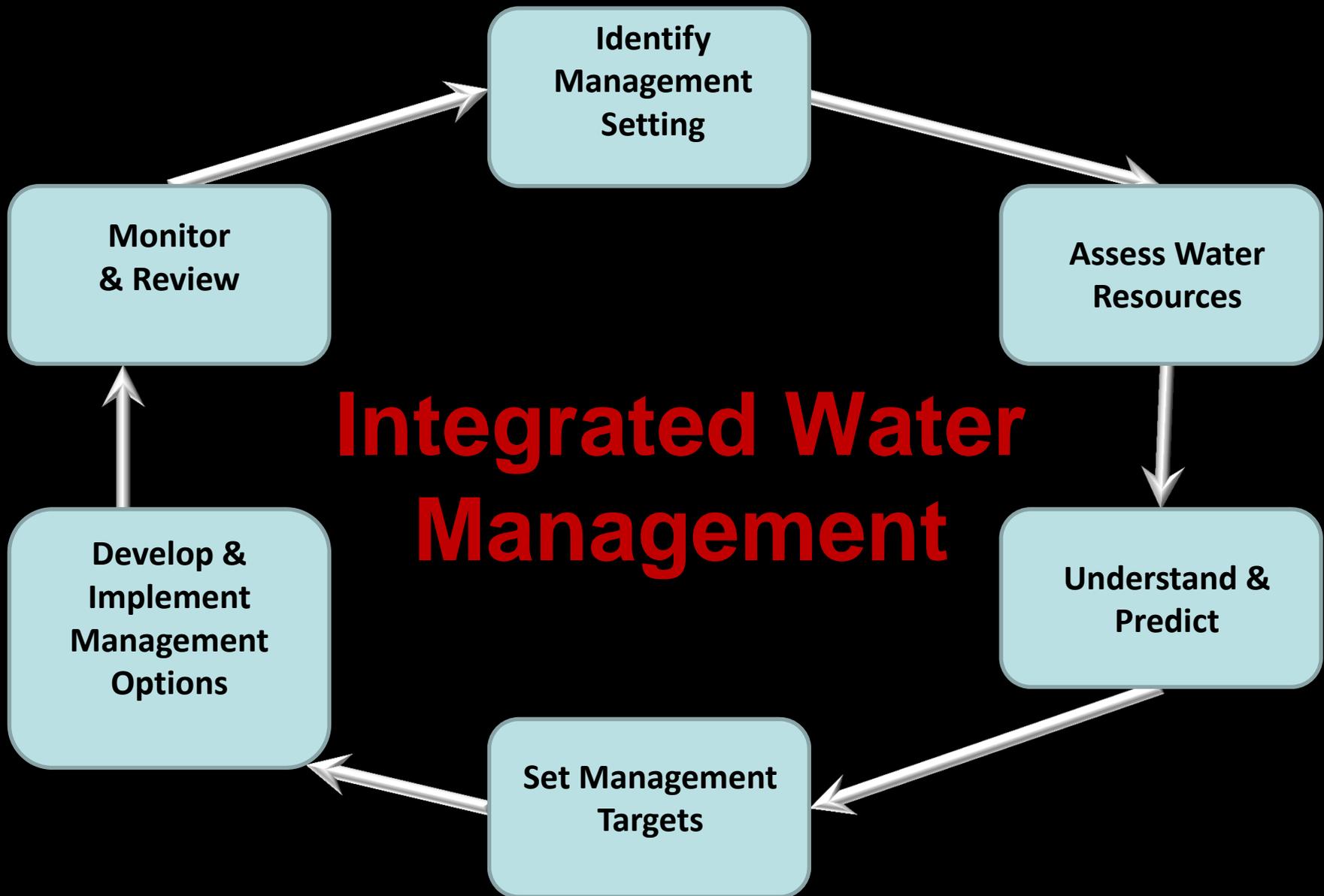
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What is it?

- Pro-active approach to address opportunities & issues
- Combines surface and groundwater management
- Jointly developed with local NRDs
- Basin-wide, systematic approach
- Flexible—Adaptive Management

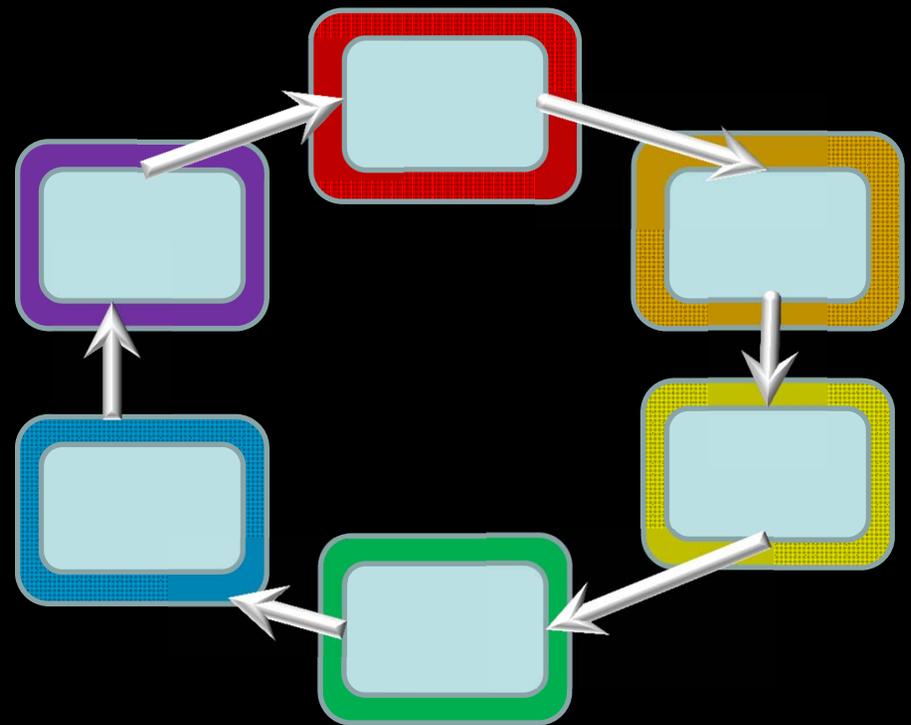


Integrated Water Management



Integrated Management Plans: Adaptive Water Management

- **Identify** the basin goals and concerns
- **Assess** the water supply and water demands
- Develop an **Understanding** of the basin to **Predict** system response to perturbations
- Set management **Goals**
- **Implement** surface & groundwater controls
- **Monitoring Plans** to **Evaluate** project ability to meet goals

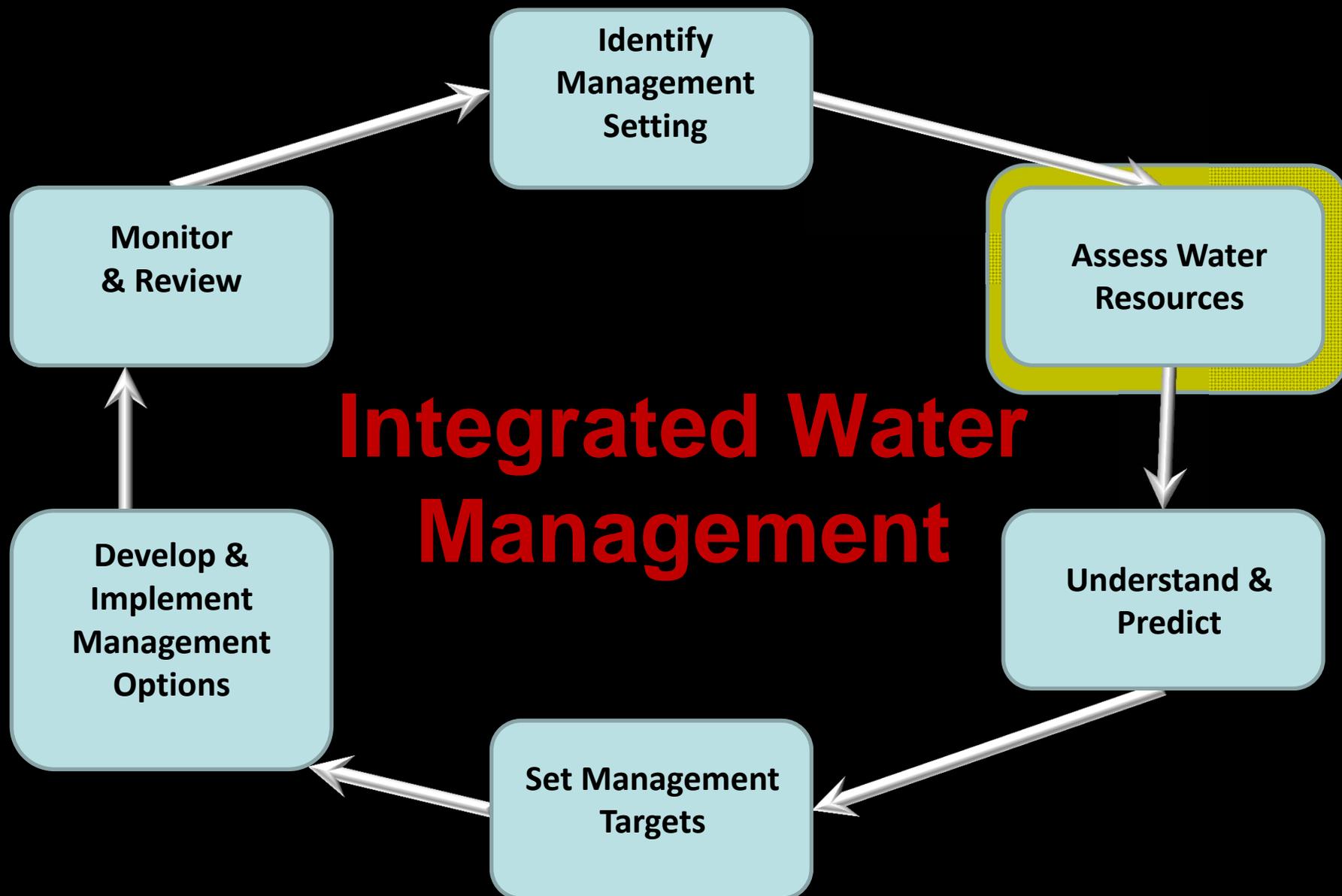


Management Setting

- First step in the cycle—may be adjusted through the adaptive management process
- Work with local NRDs, stakeholders, and public to determine local concerns
- ‘What do we want to do?’



Integrated Water Management

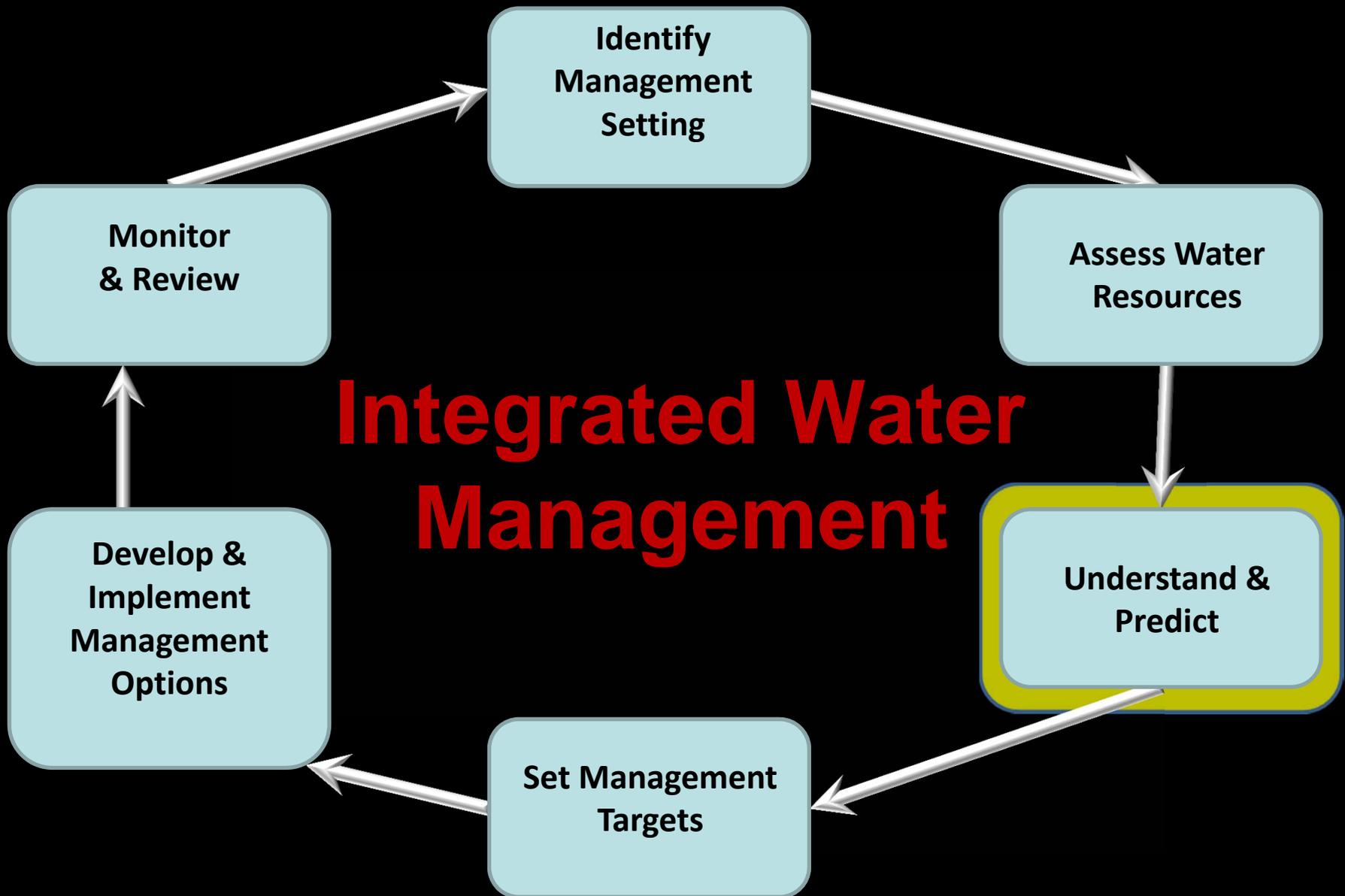


Assessing Water Resources: Understanding the Water Supply

- Water Budgets & Transient Models are imperative to understanding the system
- Uses must be understood in order to quantify the water supply
- The undepleted “Virgin” streamflow is our water supply
- Use more than this supply—borrow from storage
- Is there available supply?
 - Excess flows
 - Increase storage
 - Easier than increasing supply



Integrated Water Management

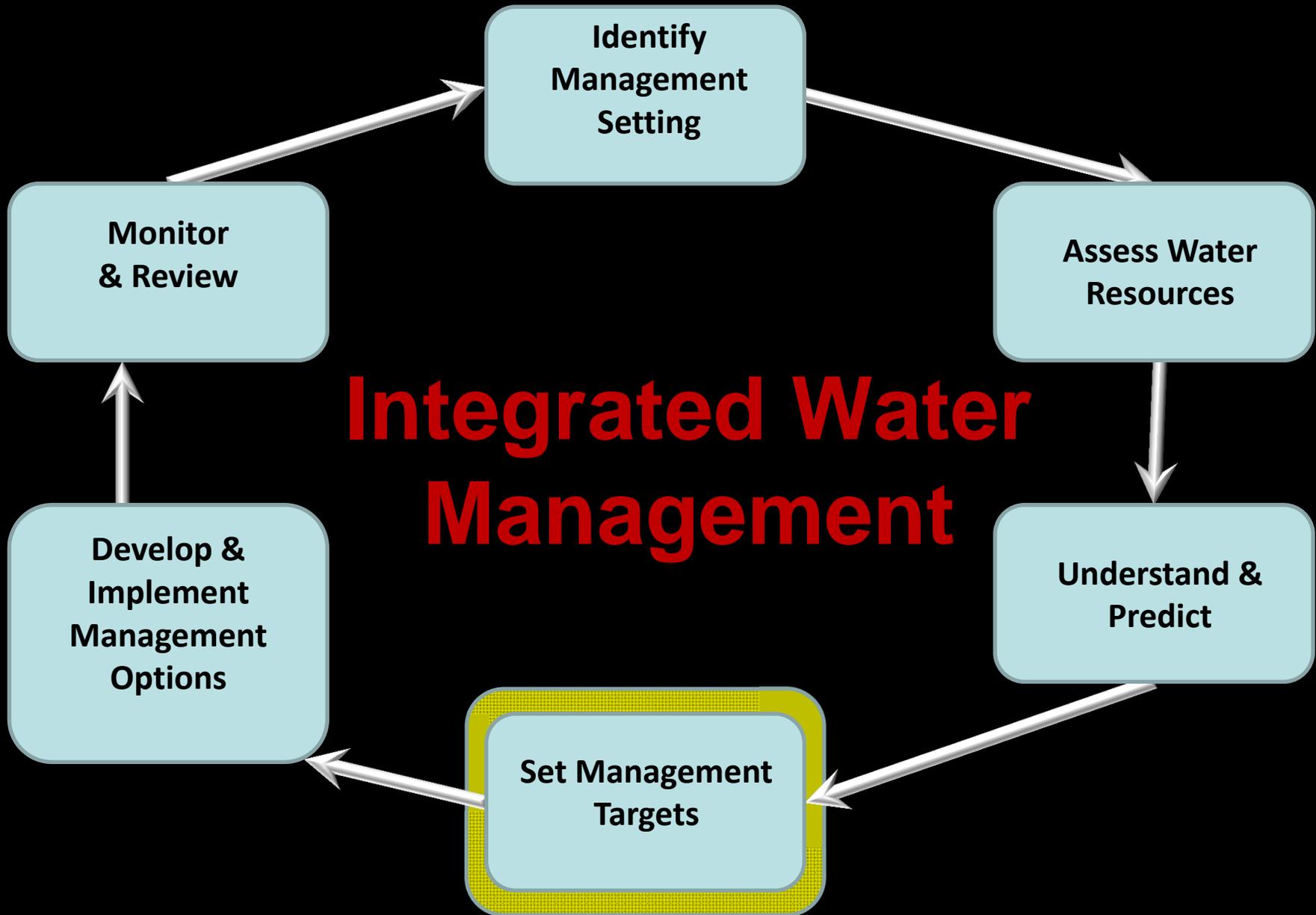


Understand & Predict

- Again, Water Budgets & Transient Models are essential to develop an understanding of the system
- Develop understanding of system dynamic—Potential system response to changing climate variability
- Retiming supplies



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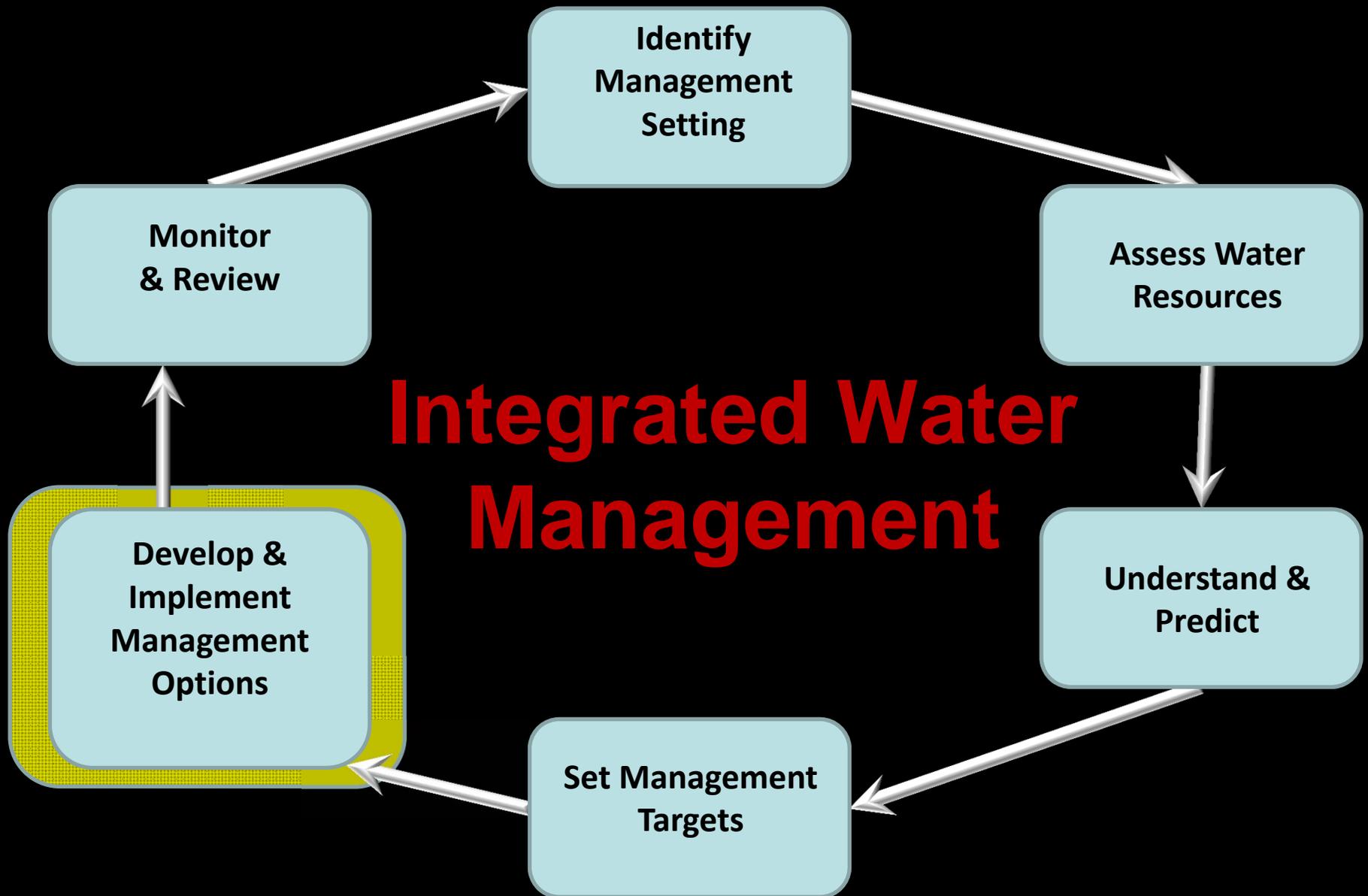


Set Management Targets

- The challenge is to manage the water supply and its current and future variability, in:
 - Time
 - Location
 - Types of Use
- What are the current and future needs?
- When/where does more water need to be available?



Integrated Water Management

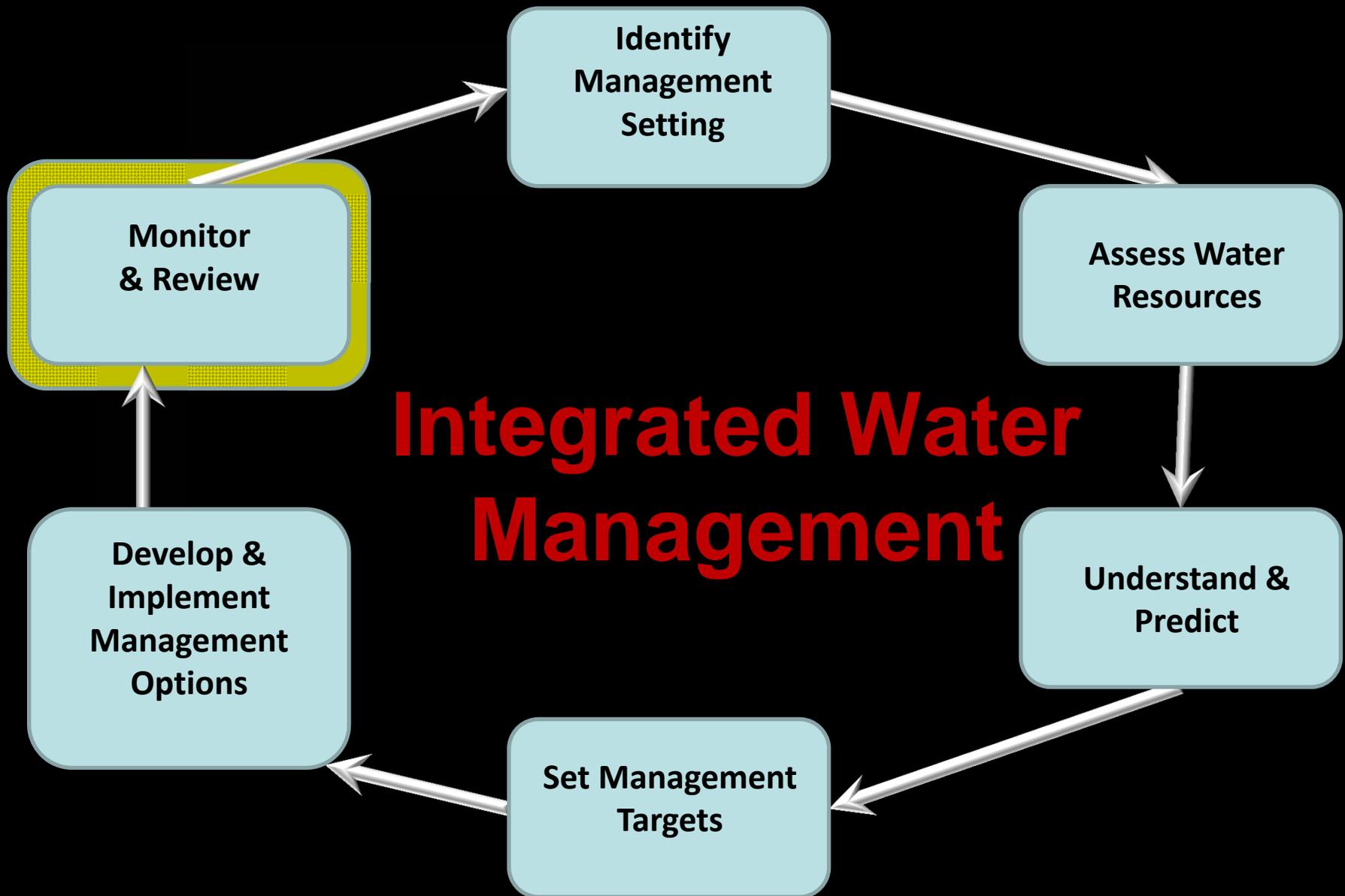


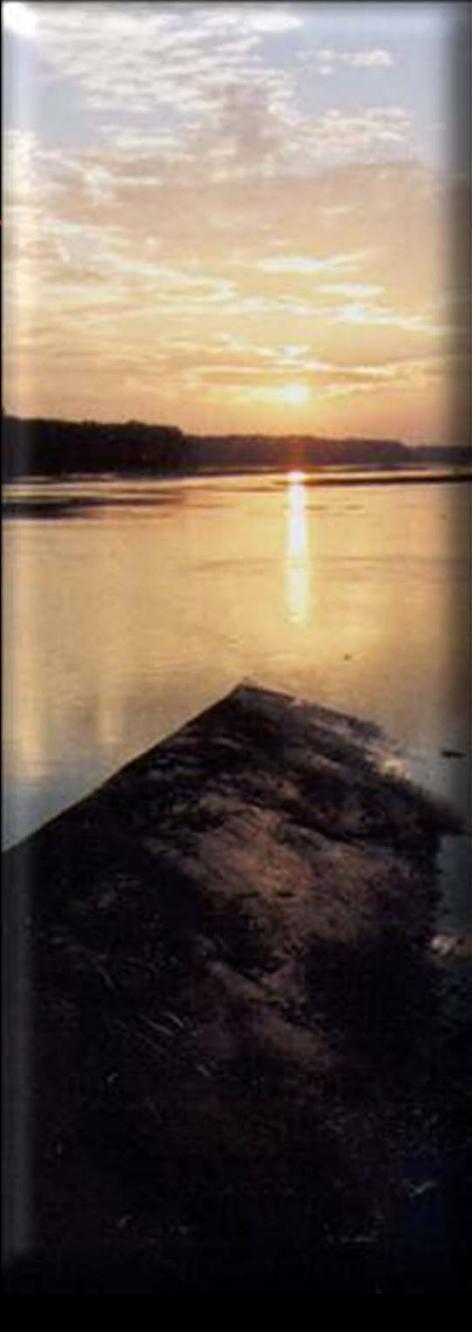
Management Options

- Input from stakeholders and public for potential list of goals & objectives
- Customized to local opportunities or needs
- Currently projects in Platte & Niobrara Basins to develop water management options
- Maximize benefits
- Minimize impacts



Integrated Water Management



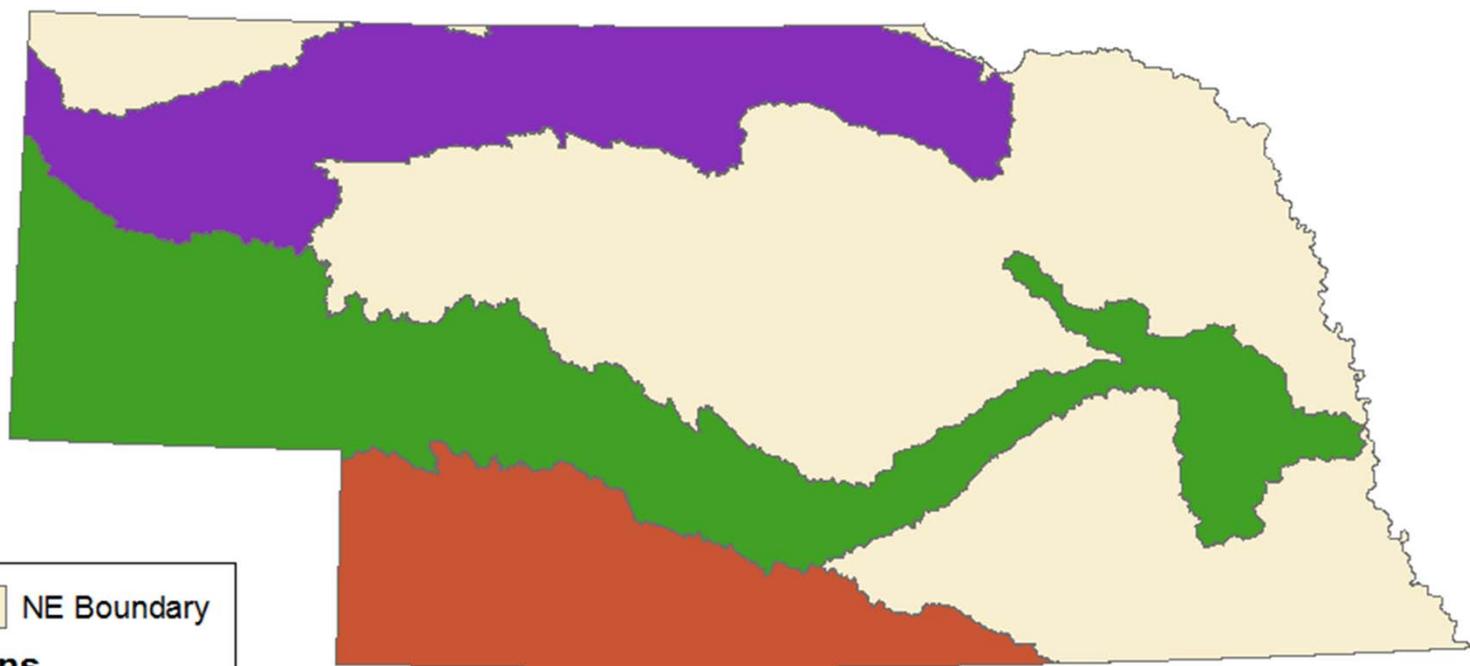


Monitor & Evaluate

- Key to understanding impacts of management actions
- If goals or objectives are not being met—can modify actions
- Incorporate new science or data
- Learning process
- No course or actions are ‘set in stone’

Evaluate

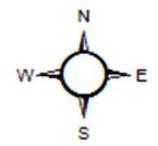
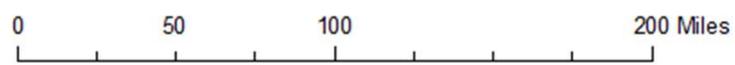
- Adaptive nature allows quick adjustments to *changes* in *water supply* and water demand
- Process on-going, never finalized as climate constantly changes
- Allows ability to adjust—regardless of uncertainty in future water supplies



NE Boundary

Basins

- Niobrara
- Platte
- Republican



Summary

- IMPs flexible and adaptable to changes in water supply/system dynamics
- Evaluated annually to assess changes, i.e. changes in climate variability



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