Application of Modeling Tools for Water Accounting and Conjunctive Management

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Overview

• Modeling Tools
• Implementation of Tools
• Specific Projects
• Educational Tools
What is Conjunctive Management?

- Adaptive process to maximize use while minimizing impacts
- Allows for wide range of management options
- Can meet multiple objectives:
  - Water quality
  - Environmental conditions
Conjunctive Water Management

1. Identify Management Setting
2. Assess Water Resources
3. Understand & Predict
4. Set Management Targets
5. Develop & Implement Management Options
6. Monitor & Review

The cycle starts with identifying the management setting, followed by assessing water resources, understanding and predicting, setting management targets, developing and implementing options, and finally monitoring and reviewing the process.
How will modeling tools help to *conjunctively* manage water?

- Estimate water supply/demand
- Understand surface/groundwater relationships
  - Spatial
  - Temporal
- Test management options before implementation
Aiding in management option choices

• What happens when all surface water users switch to groundwater?
• What are the impacts of surface water recharge projects—which locations are better than others?
• How long might it take to see the impact of retiring irrigated acres?
• SW wet years, GW dry years?
What modeling tools are being developed?

- Groundwater models
- Surface water/operations models
- Land use models
- Economic models (Niobrara)
Areas
Niobrara

- **Water Challenges**
  - Northwestern: groundwater declines-frequent administration

- **Opportunities**
  - Temporal water excesses—Potential

- **Current Model Development**
  - Groundwater, surface water operations, land use, economic, and climate models
Platte-COHYST

- **Water Challenges**
  - Water administration, PRRIP
- **Opportunities**
  - Temporal excesses—Potential
  - Current Recharge Project/Study
  - Excess Flow Report
- **Current model development**
  - COHYST2010, land use, and surface water operations models
Republican

- Water Challenges
  - Variable supply
  - Equitable surface-groundwater solutions
- Water Opportunities
  - Temporal excesses—Potential
- Current model development
  - Groundwater model (RRCA)
  - Surface water operations model
Educational

- Model tools to explain hydrologic relationships
  - Simplified
  - User-friendly—can adjust inputs
  - Web-based—no special software required
Thank You

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