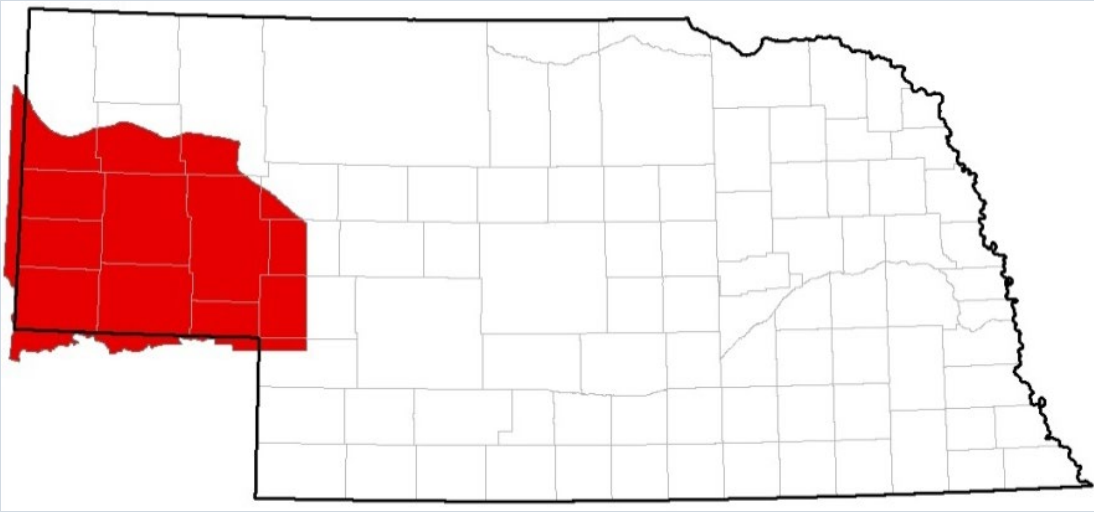


Conservation Study Irrigation Application Efficiency & Tillage Scenarios

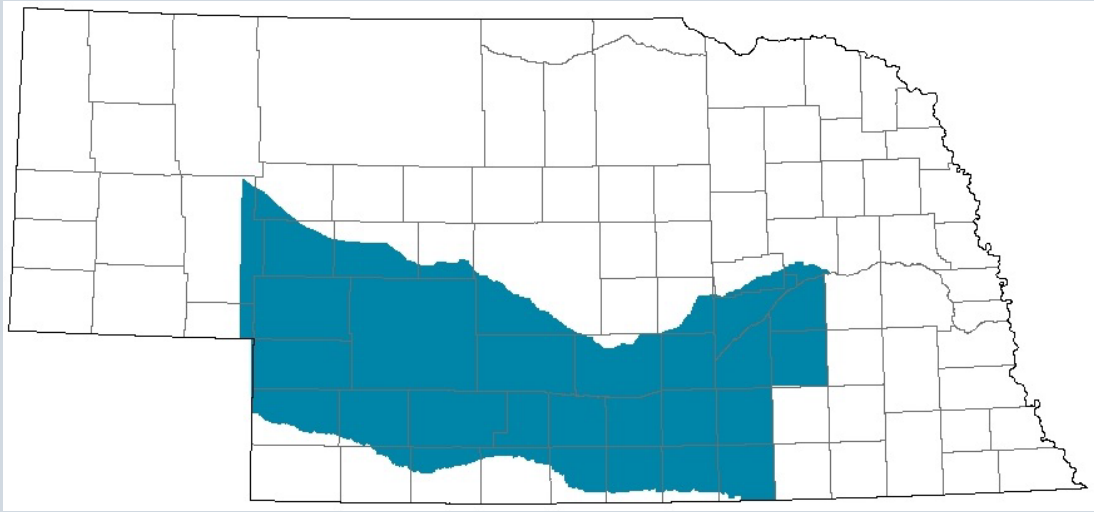
21 MARCH 2018

Modeling Tools and Process Review:

Previously developed integrated models were used to represent processes Dr. Eisenhauer discussed



Western Water Use Model
WWUM



Cooperative Hydrology Study Model
COHYST

Project Purpose:

Evaluate impacts that selected conservation practices have on aquifer conditions and streamflow

For this project, two conservation practices were selected for evaluation:

- Changes in Irrigation Application Efficiency (IAE)
- Changes in Tillage Practices (Till)

Conceptualization:

- Evaluate results at condition extremes
- Establish maximum expected envelope of results
 - **Does the envelope range indicate additional work would be beneficial?**

IAE Scenario:

Modifications for the IAE Scenario were developed by adjusting the Application Efficiency used in the models.

Irrigation Efficiency Scenario compared two model runs:

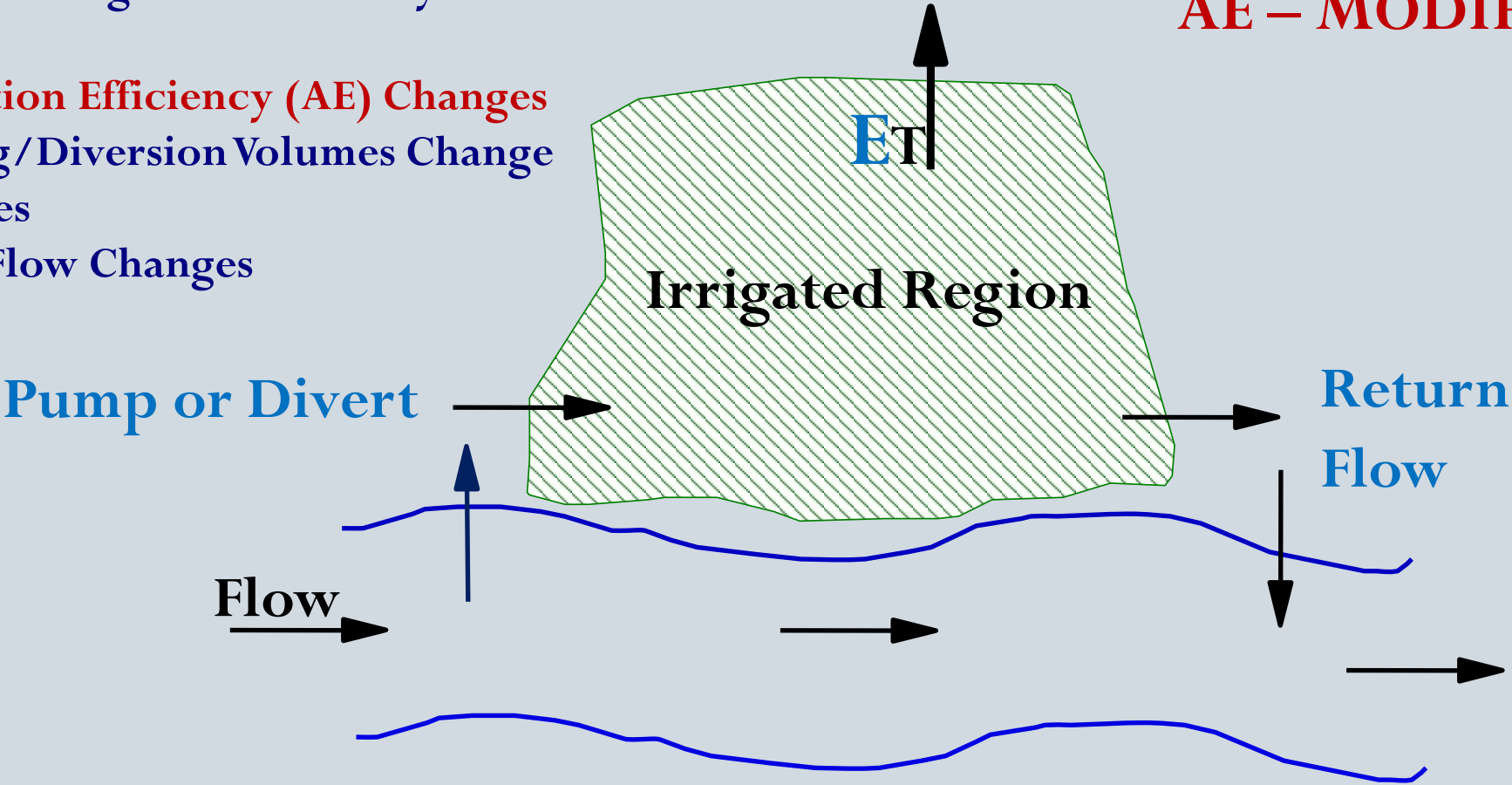
- Baseline Condition
 - Flood irrigation used an application efficiency (AE) of 65%
 - Center Pivot irrigation AE ranged from 70-85% depending on the year
- High Irrigation Efficiency Scenario
 - All irrigation applied at 95% AE rate

IAE Scenario

Improved Irrigation Efficiency

- Application Efficiency (AE) Changes
- Pumping/Diversion Volumes Change
- E Changes
- Return Flow Changes

AE – MODIFIED



Till Scenario:

Modifications for the tillage scenario were developed by modifying the tillage practices represented in the model.

Tillage Scenario compared two model runs:

- Baseline Condition
 - Tillage practices trended through time
- Minimum Tillage Scenario
 - Limited tillage practices generally to a single planting operation

Till Scenario

Minimum (Reduced) Tillage

Tillage Practices Change

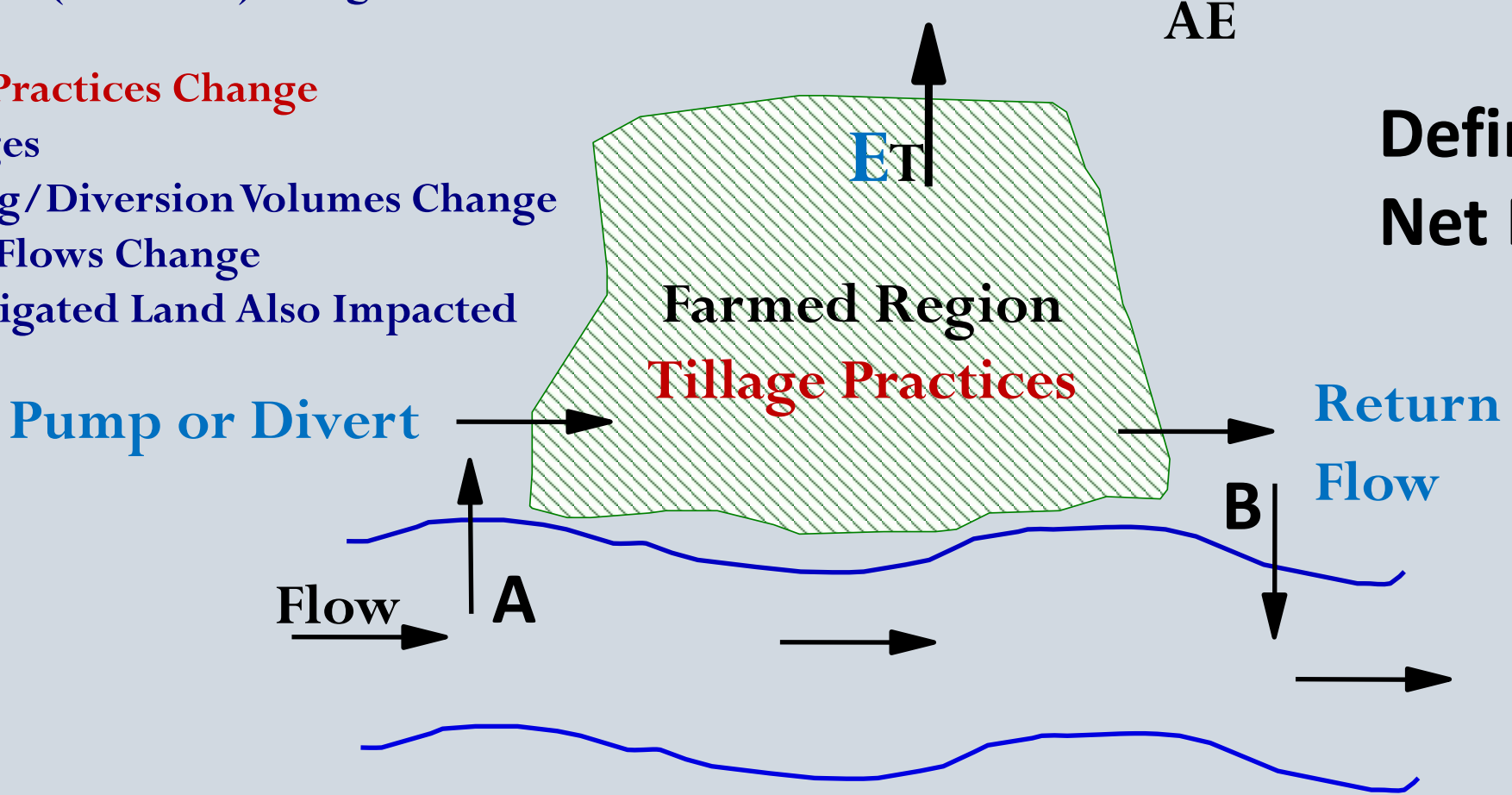
E Changes

Pumping/Diversion Volumes Change

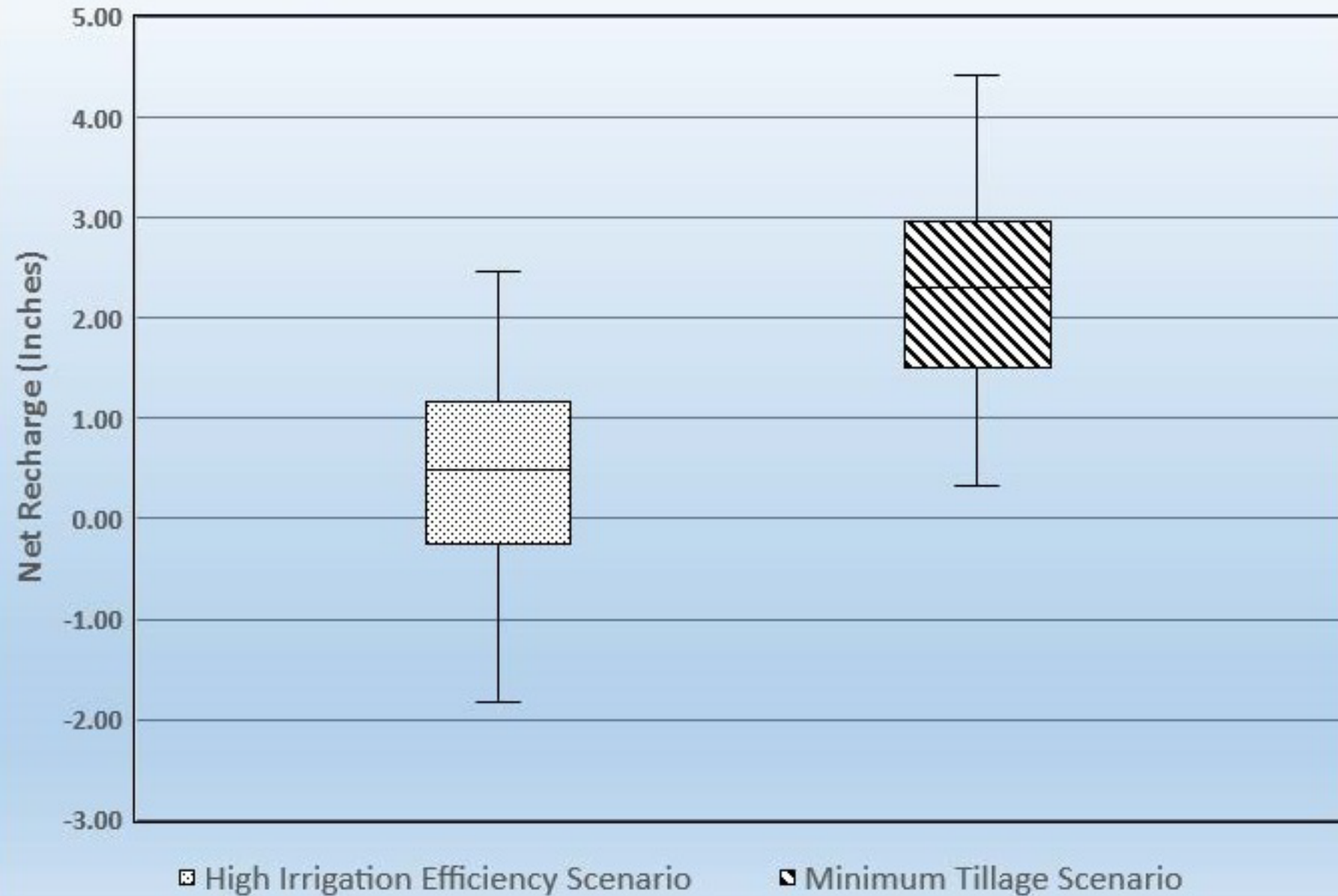
Return Flows Change

Non-Irrigated Land Also Impacted

Definition:
Net Recharge: B-A



Range of Net Recharge Values - "Envelope" Scenario



Net Recharge:

**Recharge Change
– Pumping Change**

**Positive = Aquifer Gaining Water
Negative = Aquifer Losing Water**

Graph represents the distribution of average annual depths computed as the volumetric change divided by the acres impacted in the scenario.

Out of the 10,500,000 acres in the combined NRD areas, the scenarios impacted:

IAE Scenario: 2,350,000 acres

Till Scenario: 3,100,000 acres

Evaluation Summary

1. Results from the tillage scenario show a higher potential total impact on available water supplies compared to results from the irrigation efficiency scenario.
2. Results from the other modeling tools (surface water model and the ground water model) can provide insight to the timing and availability aspects of the water budget changes
3. Considerations for additional analysis
 - Evaluate how representative modeled tillage practices are to those actually “on the ground” or are likely to become “on the ground”

Thank You
