Jesse Bradley, Assistant Director
Margeaux Carter, Integrated Management Specialist

SUSTAIN
NeDNR’s New Modeling Application

Jesse Bradley, Assistant Director
Margeaux Carter, Integrated Management Specialist
Groundwater Models

- Goal has been to have statewide groundwater modeling tools... we’re almost there
Climate Model

Weather Data & Precipitation & Temperature

Crop Characteristics
Soils Characteristics
Management Characteristics
Irrigation System Characteristics

Soil Water Balance Model
CropSim

Soil Water Balance
Net Irrigation Requirement
Evapotranspiration Deep Percolation Runoff

Spatial and Temporal Distribution

Weather Station Location
Soils Coverage

Regionalized Soil Water Balance Model

Regional Estimates of the Water Budget Elements

Input Files for the Groundwater Model

Land Use Data
Irrigation Volumes
Irrigation Methods

Soil Water Balance Grid Coverages - NIR, DP, RO

Reference ET

Soils Coverage

Land Use Data
Irrigation Volumes
Irrigation Methods

Regional Estimates of the Water Budget Elements

Input Files for the Groundwater Model

Regionalized Soil Water Balance Model
SUSTAIN
(Sustainable Use Scenario Tool for Analysis and Informing Nebraskans)

Climate Data
Land use Data
Soil Data

WATERSHED MODEL

Recharge Data
Pumping Data

GROUNDWATER MODEL

Groundwater Levels
Baseflow Changes
SUSTAIN Utilizes Existing Groundwater Models

- Improve access to watershed model results (land use, pumping, recharge)
- GUI for model analysis (recharge and pumping changes)
- View results at the county, NRD, or user defined level
UNW Model
SUSTAIN

Live Demo…
Summary

- Management Questions that can be Evaluated with SUSTAIN:
  - Water budget questions:
    - How many irrigated acres are in an area?
    - How much pumping occurs in an area?
    - Is the pumping in an area more or less than the recharge?
  - How do baseflows and water levels change as a result of increases or decreases in recharge?
    - Canal recharge projects
    - Conjunctive management activities
  - How do baseflows and water levels change due to increases or decreases in pumping?
    - Allocations
    - New wells
    - Retirements
Summary

NeDNR Plans for Moving Forward:

• Finalize application

• Document methods and create tutorials for users

• Incorporate additional models
  o Northern Missouri-Tribs Model
  o CeNEB Model
  o COHYST Model
  o Blue Basins Model

Input from potential users is welcome!