



Water, Energy and Agriculture Initiative

GOAL.

To maximize the efficiency with which water and energy resources are used to sustain economic development and water conservation in Nebraska agriculture.

PARTNERS.

The *Water, Energy and Agriculture Initiative* (WEAI) was created in 2008 among the following partners: Nebraska Public Power District through the Nebraska Center for Energy Sciences Research, the Nebraska Corn Board, the Nebraska Soybean Board and the Agricultural Research Division at the University of Nebraska–Lincoln.

PHASE 1: 2008 – 2012

Five research projects were competitively selected in late 2008 and early 2009. Work was completed in 2012. The Phase 1 projects are:

1. ***Energy Conservation through Improved Irrigation Pumping Plant Performance***
 - William Kranz, Northeast Research and Extension Center (wkranz1@unl.edu)
2. ***Improving the Efficiency of Water and Energy Use in Nebraska's Irrigation Soybean Production Systems***
 - James Specht, Agronomy and Horticulture (jspecht1@unl.edu)
3. ***Benchmarking Corn Water Productivity in Nebraska Irrigated Cropping Systems***
 - Kenneth Cassman, Agronomy and Horticulture (kcassman1@unl.edu)
4. ***Evaluation of Biofuel Driven Irrigation Pumps and/or Electric Generators for Use During Peak Electricity Demand***
 - Milford Hanna, Biological Systems Engineering (mhanna1@unl.edu)
5. ***Optimization of Irrigation Efficiency of Center-pivot Systems Using Spatial and Temporal Data Integration***
 - Derrel Martin, Biological Systems Engineering (dmartin2@unl.edu)

PHASE 2: 2013 – 2015.

Three research projects were competitively selected in early 2013. The Phase 2 projects are:

1. ***Developing CornSoyWater: A Web-based Decision Aid for Corn and Soybeans in Nebraska***
 - Haishun Yang, Agronomy and Horticulture (hyang2@unl.edu)
 - The overall goal is to build on *SoyWater*, the successful web-based irrigation tool for soybeans developed from the WEAI – Phase 1 project titled, *Improving the Efficiency of Water and Energy Use in Nebraska's Irrigation Soybean Production Systems*; and to develop *CornSoyWater* as an online tool for corn producers.
2. ***Improving Irrigation Water and Energy Use Efficiency through Accurate Spatial and Temporal Management***
 - Joe Luck, Biological Systems Engineering (jluck2@unl.edu)
 - The overall goal is to build on the data gained from the WEAI - Phase 1, *Optimization of Irrigation Efficiency of Center-pivot Systems Using Spatial and Temporal Data Integration*; and to develop a decision support system for site-specific irrigation using multiple spatial data layers.
3. ***Efficient and Cost-effective Load Management Programs to Maximize Crop Yield for Rural Public Power Districts***
 - Sohrab Asgarpoor, Electrical Engineering (sasgarpoor1@unl.edu)
 - The approach for this project is to obtain (in cooperation with staff from Nebraska Public Power District) and compare all load control programs offered by more than twenty rural power districts and cooperatives in Nebraska. These programs will be evaluated in terms of effectiveness (limited peak demand hours) and efficiency (maximizing crop production at the lowest cost).