

## Project Overview

**Intern:** Matthew Graham

**Major:** Mechanical Engineering

**School:** University of Nebraska-Lincoln

### Project Description

This projects included installing watermark moisture sensors, along with their data loggers and other various tools to collect data with growers who have not had experience using these tools. It has also included the installation of ET gauges that are read manually and mechanically. The goal of using this equipment is to maximize crop water use. Nine sets of sensors, one for each pivot, were installed for seven producers on approximately 1,090 irrigated acres. These seven producers operate a combined total of 62 pivots on a total of 10,800 acres. Other projects involved gathering data on irrigation systems to determine any inefficiencies. These in-depth analyses were performed for four systems for three producers. These three producers operate a total of 14 pivots on a combined total of 3350 acres.



### Pollution Prevention Benefits

There is potential for a great savings of energy and reduction of GHG releases due to the implementation of watermark sensors. In addition, by making a few recommendations for irrigation systems there is potential for great benefits. Pollution prevention benefits are summarized in Table 1 below.

**Table 1: Pollution Prevention Results**

Focus Area	Total Possible Annual Savings per year	Total Possible Annual Greenhouse Gas Reduction (CO <sub>2</sub> equivalent/yr)	Total Possible Water Reduction (MG/year)
Pump and Engine Upgrades	\$4,330	16 Metric Tons	0 MG
Watermark sensors	\$15,900	112 Metric Tons	83 MG
Flow Meters	\$980	13 Metric Tons	7 MG
<b>Total</b>	<b>\$21,200/year</b>	<b>141 Metric Tons/year</b>	<b>90 MG/year</b>

Additional indirect or intangible benefits include:

- Prevent contamination to groundwater causing less effect on groundwater levels
- Decrease time of operation resulting in reduced GHG emissions