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# Nebraska's Conservation Effects Assessment Program (CEAP) Project: Year 1 Update

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## Abstract Text:

The effectiveness of nineteen years of improved water and nitrogen water management in reducing groundwater nitrogen concentrations that average twice the USEPA Maximum Contaminant Level is being evaluated in an irrigated corn-growing area in Nebraska's central Platte valley. Within the 145,200-acre Conservation Effects Assessment Program study area, statistical approaches are being used to evaluate the effects of irrigation and N inputs, budgeting for soil and water N and improved water management on groundwater nitrate concentrations. During the first year a significantly large and unplanned effort was undertaken to reorganize, consolidate and validate nitrogen and water use data from more than 26,000 annual producer reports and to pair the attributes of approximately 2400 irrigation wells with producer data for input into an Access-created database that allows complex queries to be performed easily. In the two noncontiguous townships targeted in the first year, annual temporal and spatial changes in groundwater N concentrations are being evaluated. In both townships screened intervals of approximately 50 irrigation wells drilled into the low-nitrate secondary aquifer were identified by working with well drillers on a well-by-well basis. Six wells screened in one or both aquifers were sampled to determine N concentrations variations during the irrigation season. An unusually wet summer precluded weekly sampling which is rescheduled for 2008. Groundwater N concentrations in the ~50-ft saturated thickness were profiled at 5-foot intervals at three locations on three north-south transects spaced across the study area. Recharge during the unusually wet summer caused N concentrations to be significantly lower in the shallow groundwater of the eastern transect while concentrations on the western transect were typically uniform with depth. The same locations will be profiled in summer 2008 to determine changes during a growing season with normal precipitation.

## Impact Statement:

Our project is designed to assess whether neneteen years of nitrogen and irrigation water managemnet have improved groundwater quality with respect nitrate. The project will also assess which management alternatives provide the greatest positive impact on reducing nitrogen leaching to shallow groundwater. Clearly, the CEAP project results will impact future water and nutrient management practices in Nebraska.