

# Water Quality and Conservation Practices in the Iowa River's South Fork Watershed

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<sup>1</sup>USDA/ARS National Soil Tilth Laboratory

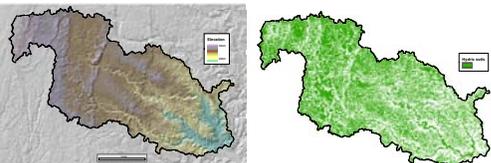
<sup>2</sup>USDA/ARS Grassland Soil & Water Res. Lab.

**Objective:** To determine how water quality is affected by agricultural practices at the scale of a large watershed.

Location map:



**Setting:** North-central Iowa  
Glacial terrain with hydric soils occupying potholes

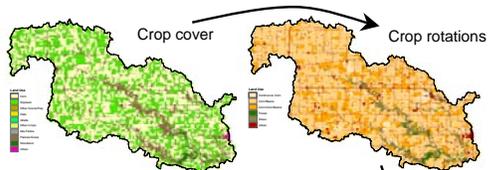


Artificial drainage and swine confinements (CAFOs) prominent



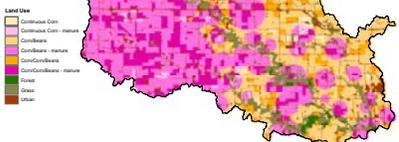
**Corn-bean rotations and manure applications:**

Rotations determined by overlaying successive years of Ntl. Agric. Statistics Serv. crop cover data



CAFO coverage (not shown)

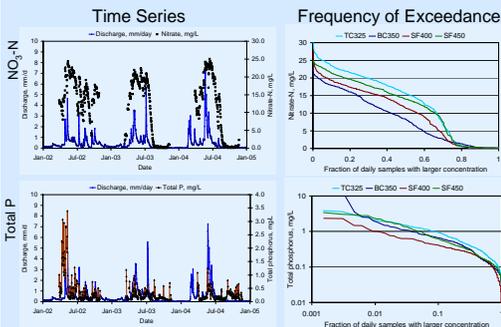
Estimated manure application areas



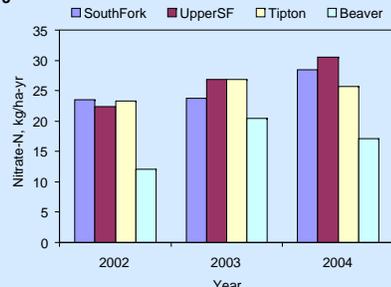
## Water quality monitoring on 3 tributaries



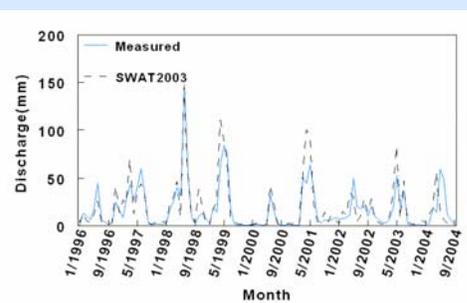
## Nutrient data summary (2002-2004)



## NO<sub>3</sub>-N loads

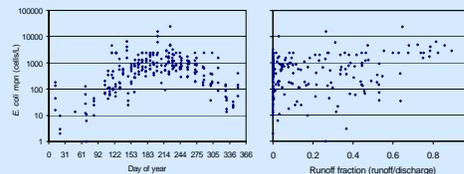


## Hydrologic calibration of SWAT at SF450

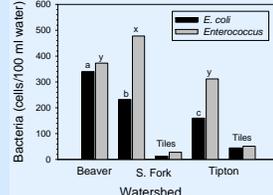


## E. coli and Enterococcus data summary

Variation in *E.coli* populations is influenced by variations of season (temperature) and hydrology (surface runoff).

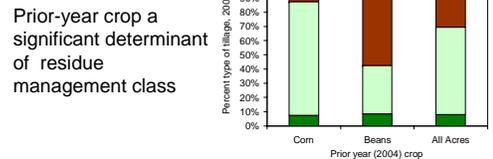
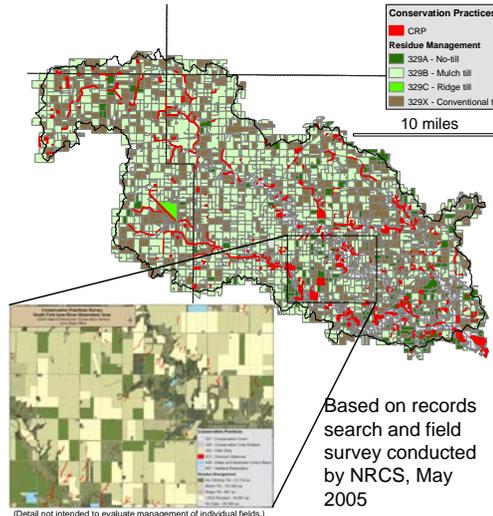


## Average (2002 - 2005)



Differences in stream water bacterial populations were found between tributaries. Beaver Creek populations are equivalent or greater than Tipton Creek suggesting sources other than swine manure are important. Tile water populations were much lower than stream water.

## Survey of Conservation Practices



## Conclusion

Priority needs for future improvements to conservation systems include: a) Nutrient management practices that reduce N leaching; b) Wetlands to remove nitrate from drainage water; and c) Options to better manage residue following soybeans, particularly when applying manure. Hydrologic calibration of SWAT for the watershed is completed.

