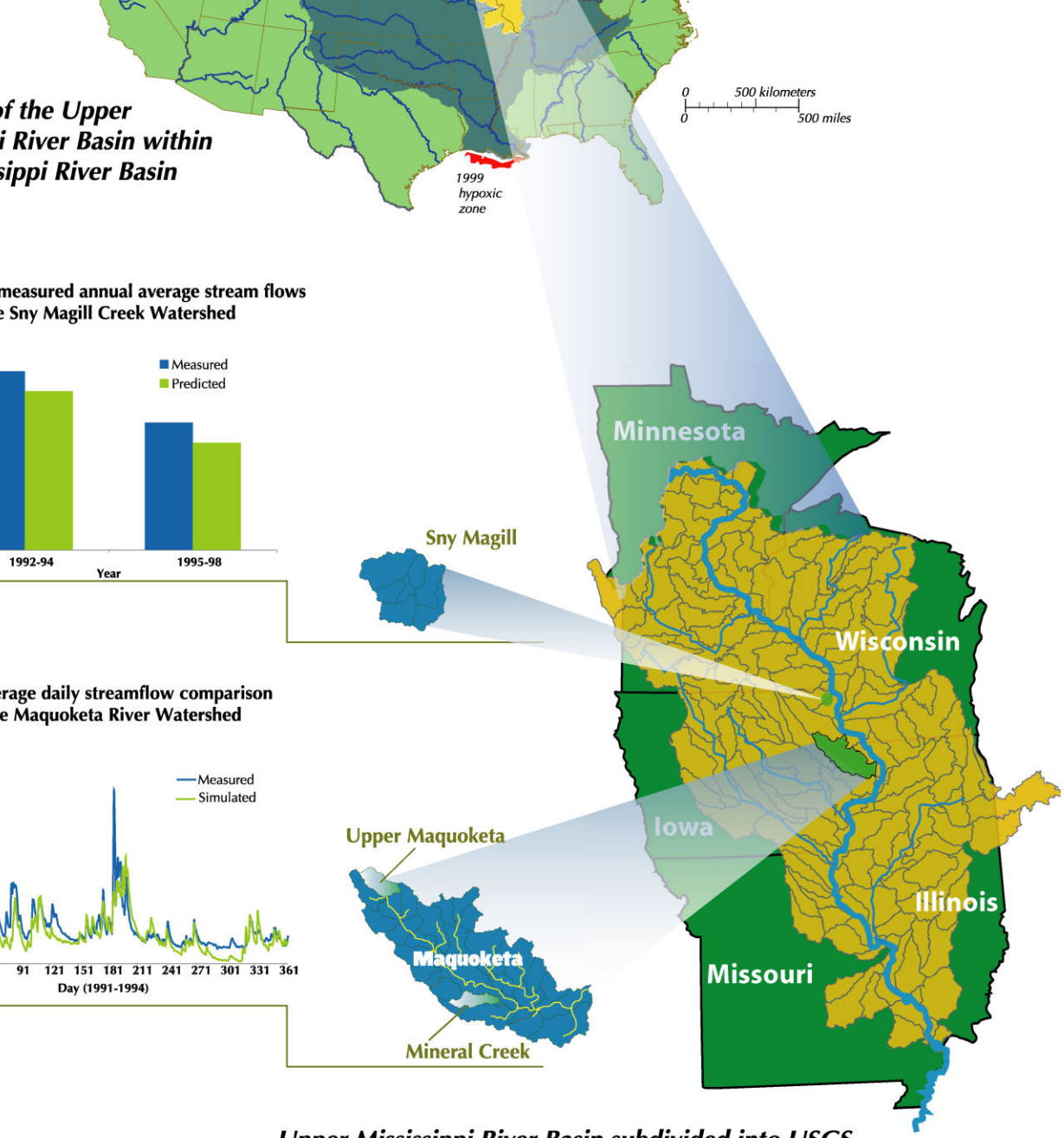

Upper Mississippi River Basin subdivided into USGS 8-digit watersheds, including the location of the Sny Magill, Upper Maquoketa, Mineral Creek, and Maquoketa River watersheds (the Maquoketa River watershed is a USGS 8-digit watershed)

(1) subdividing the overall basin into 131 subwatersheds that coincide v
boundaries established by the U.S. Geological Survey (USGS), and (2)
Hydrologic Response Units (HRUs) located within each of the 131 8-di
of homogeneous landuse and soil characteristics. The HRUs represent
similar landuse and soil types that are distributed throughout an 8-digit
spatial locations of the HRUs are not incorporated in the SWAT simulat

The second phase of the study will consist of calibrating and validating
model output at the UMRB outlet and other points with flow, sediment,
data collected by the USGS and other agencies. Initial testing of the mo
or is in progress for several smaller watersheds within the UMRB, inclu
Magill Creek (Saleh et al., 2002), 162 km^2 Upper Maquoketa River (Ga
km^2 Mineral Creek, and 4,855 km^2 Maquoketa River watersheds. Insig
will be incorporated into the calibration process of SWAT for the UMR

Multiple alternative land management scenarios will be executed with t
provide an assessment of which practices can lead to improved water qu
or improving current crop yield levels. Initially, a suite of policy scenar
the study region. Each scenario will then be executed within an econom
producer choice of crop rotation, tillage, fertilizer and manure rates (an
practice, and costs and returns at specific "points" (usually representing
ha) as defined in the U.S. Department of Agriculture (USDA) Natural R
(NRI) database. The water quality impact of each scenario will then be
(1) aggregating NRI points into HRUs based on similar soil types, crop
other characteristics as determined by the economic model, and (2) com
nitrogen, and phosphorus loadings for each scenario relative to those ca

CONCLUSION

It is anticipated that incorporating SWAT into the existing modeling fra
improved analysis of water quality impacts for the UMRB for current a
management practices.

REFERENCES

Arnold, J. G., R. Srinivasan, R. S. Muttiah, and J. R. Williams. 1998. Large Area Hy
Assessment; Part I: Model Development. *J. Amer. Water Resour. Assoc.* 34(1): 73-8

Arnold, J.G., Muttiah, R.S., Srinivasan, R. and Allen, P.M. (2000). Regional estimati
groundwater recharge in the Upper Mississippi river basin. *J. Hydrology* 227:21-40.

Arnold, J.G., Srinivasan, Muttiah, R.S. and Allen, P.M. (1999). Continental scale sim
balance. *J. Amer. Water Resour. Assoc.* 35(5): 1037-1051.

Babcock, B.A., Wu, J., Campbell, T., Gassman, P.W., Mitchell, P.D., Otake, T., Sien
(1997). RAPS 1997: Agriculture and environmental outlook. Center for Agricultural
Iowa State University, Ames, Iowa.

Gassman, P.W., E. Osei, A. Saleh, and L.M. Hauck. 2002. Application of an environ
system for watershed assessments. J. *Amer. Water Resour. Assoc.* 38(2):423-438.

Gassman, P. W., Wu, J., Mitchell, P.D., Babcock, B.A., Hurley, T.M. and S.W. Chur
U.S. agricultural policy on regional nitrogen losses. In: Proceedings of the 3rd Interna
Diffuse Pollution (Poster Papers), 31 Aug.-4 Sept., Edinburgh, Scotland. IAWQ, Lon

Saleh, A., P.W. Gassman, and C.L. Kling. 2002. Sny Magill Watershed Modeling Pr
Staff Report 01-95, Center for Agricultural and Rural Development, Iowa State Univ.
<http://www.card.iastate.edu/publications/databaseStuff/PDFFiles/01sr95.pdf>