Responses to questions from our group to
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what type of research is currently being done in SD on watershed management issues

I'm not sure what may actively be going on as far as watershed-scale research (unfortunately communication among different research groups and departments is not always good, so keeping track of different research is not always easy). Carter Johnson has been doing some research related to a complex of wetlands north of Brookings related to some of the wetland modeling work that he's been doing for a number of years, which, although geared specifically towards wetlands, involves watershed management. The Bad River project (funded in part by an EPA/SD DENR 319 grant) should be finished or finishing up. That one was focused on sediment loading in the Bad River from channel erosion and uplands and involved several people (Dave and Sharon Clay, Sandy Smart, Suzette Burckhard, and perhaps others). There has been some work at the Oak Lake Station looking at the Oak Lake watershed and impacts on the lake.

Historically, I believe Chuck Ullery did some work related to water quality and watershed management on the Big Sioux, but I'm not familiar with the actual research.

what research you think would be helpful?

As far as applied research designed to help specifically answer questions related to the water issues in South Dakota, something that would be useful to have would be watershed scale models developed for the Big Sioux and James River basins (and perhaps also the Vermillion, Upper Minnesota, etc.). That would then allow for the ability to evaluate different land and water management practices and their potential impacts on both water flows and water quality. Although no model is perfect, they are very useful for looking and evaluating different what-if scenarios. I've identified this in answer to your question about research, some or all of this type of modeling work could be done by consultants (and probably more quickly and efficiently). I know RESPEC Consulting has been involved in watershed modeling in the Big Sioux as part of the TMDL effort there.

Given the huge increase in drainage activity occurring in eastern South Dakota, some other research that would be helpful would be to look at what the impacts of the impacts of this drainage on water quantity and quality. We're just getting started on the ground floor with research related to this (summaries of the projects that are beginning can be found here: http://www.sdstate.edu/abe/research/natural/index.cfm), but there is much to be done. Even though ag drainage has been done for over 100 years in some areas of the Corn Belt, we still don't have a good understanding on drainage impacts on flow at the watershed scale. As we look at some of the conservation drainage practices that are being developed, we know that they help

reduce nutrient losses, but the still unanswered questions are where do the nutrients (and the water go)? We have some ideas, but we don't know all the answers yet, so there is work to be done to address those questions to ensure that we are just shifting problems around.

the $64,000 question: is there a solution for northeast South Dakota's water issues?

That ought to be worth more than $64,000 <grin>. Since I'm an engineer, my response would be sure, we can probably engineer solutions to most or all of the water issues in northeast South Dakota. However, the real test is whether those solutions would be economically, politically, and socially feasible. For instance, it would be relatively straightforward to drain or pump in order to lower Bitter Lake, but figuring out how to pay for it and getting past all of the permitting hurdles and the inevitable politics and lawsuits along the way would be huge challenges. Likewise with the issues on the James and in the James River Basin. I think any improvements would have to come from prioritizing the problems and then breaking the higher priority problems down into smaller, more achievable, chunks and then getting started with those. Then if you have some success with those, you could hopefully start building momentum. If you start with the big problems, it seems to me, the obstacles and opposition to any solutions are going to be overwhelming.

how long does it take for a farmer to recover the expense of tiling?

It depends, of course, on the size of the system, type of system (targeted or pattern tiled) and especially the climatic conditions following the installation. Folks that installed tile around 2009-2011 may have payed for their systems in 1-3 years because of the extremely wet conditions we had, and I heard that anecdotally from several producers. Under more 'normal' conditions, a 5 to 10 year payback might be more typical.