

# **Agricultural Drainage Management Systems Task Force**

March 2-3, 2010 meeting in St. Louis, MO

## **Agenda Overview**

### *March 2<sup>nd</sup>*

4:00 p.m. Convene with opening remarks and introductions

4:15 p.m. Presentation by Dr. Wayne Skaggs on use of modeling to quantify water quality trading benefits with discussion to follow.

6:00 p.m. Adjourn for dinner and discussion on your own

### *March 3<sup>rd</sup>*

8:00 a.m. Strategic Planning session with Administrative Panel made up of Sheryl Kunickis (NRCS), Steve Shafer (ARS), and Mary Ann Rozum (NIFA).

10:00 a.m. Update and discussion on CIG project by state

11:00 a.m. Overview of CIG final report – Leonard Binstock, ADMC

11:30 a.m. NRCS update on MRBI – Doug Toews

12:00 p.m. Break for lunch

1:30 p.m. Biofilters, filter products, wetlands: updates and discussions

2:30 p.m. next meeting discussion: place, date, agenda items, preparation

3:00 p.m. adjourn

## **March 3 – Strategic Planning Session**

The group began with introductions (see last page for list of participants) and an open discussion of impacts of the ADMS Task Force. These included

- NRCS Drainage Water Management standards approved
- Connectivity and collegiality. Cooperation with industry. Knowing that the best research is being done by members of the Task Force.
- 25% of cropland in the US requires drainage for optimal production. We have never before had a group that is active on drainage, and improving the management of it.
- The Task Force has done much more than a typical research committee, including education programs like drainage workshops in all 5 states that reach more than 1000 people/year.

## **Administrative panel**

**Sheryl Kunickis, NRCS**, reviewed many of the accomplishments. The ADMS TF is a grass roots effort of scientists and others who knew they could make a difference. We put together a charter that all three agencies signed. We have a Web presence and an Action Plan. We conducted bus tours, briefings in Washington including NRCS, FSA, EPA and Congressional staffers. We have been getting our message out and telling people how they gain. We have provided input on CSP. The NRCS Conservation Innovation Grants have supported drainage water management, including a grant to Minnesota, one to the ADMC and 5 states, and one to NC State. We are reaching out to other audiences, rather

than just meeting among ourselves. We organized symposia at national meetings of SWCS, Soil Science Society of America, and ASABE, and participated in the White House conference on cooperative conservation. Future opportunities include relating drainage management to climate change concerns (are we causing nitrous oxide, and exchanging one problem for another?), and opportunities for environmental markets.

**Mary Ann Rozum, NIFA**, brought up several important questions. First, how does drainage relate to key USDA goals (food security, biofuels, rural economic development, etc.)? She noted concerns about the increase in drainage, which has potential to cause more nitrogen and phosphorus downstream, increase in flooding, and potentially rising soil temperatures, and encouraged the Task Force to ask how we can mitigate these things. She perceives that EPA is looking at regulating tile lines, particularly if no impact is shown from drainage management. We need sociologist/economists to look at whether farmers are really going to improve management. Can drainage provide ecosystem services like flood mitigation? Also, we need partnerships with people who will buy credits downstream. How will there be assurance that the reductions are happening? Mitigating nutrients such as N and P through trading can also be an ecosystem service. While increasing soil temperatures are desirable for crop production, the resulting warmer and drier air over such large drained areas may be having climate change effects and mineralizing more organic matter that may have greenhouse gas implications.

She encouraged Task Force members to think about new AFRI grant opportunities on climate change and bioenergy production in conjunction with larger multidisciplinary groups. A third goal of AFRI grants is sustainable global food and bioenergy supplies. While drainage can clearly improve productivity, the sustainable goals will need to be kept in mind. New CIG grants opportunities are also coming soon. Are there new areas for this group to focus on, such as bioreactor design?

**Steve Shafer, ARS**, noted that he has less background with the ADMS Task Force than others, so focuses on research outputs. He encouraged the group to align with ARS Strategic goals. He also noted that the group has had success getting the message out, and now that it has been heard, it is important not to let it get away. He encouraged the Task Force to take every opportunity for getting the message out. Although there is no formal budget, drainage management is a high priority issue, and is supported by ARS.

Other comments included the following:

- Information sheets on each drainage management technology, in addition to DWM, would be helpful to NRCS.
- Missouri Environmental Coalition filed a petition for a TMDL for the Gulf of Mexico, and sees the MRBI as the response to that.
- Estimates of impact at landscape scale are needed. In order to have impact we need to work at broader scales. Tactical approach is not enough. This group could quantify nutrient benefits of the larger scale efforts.
- We need to realize that goal of increasing biofuels is in conflict with goal of improving ecosystems. FSA is promoting harvesting residue for biofuels, even while NRCS and ARS are promoting residue mgmt.

- We can wring our hands because problem is so big, or we can address it where we can. Right now we are in the process of replacing drainage systems from the 1940s and 1950s. There is an opportunity to improve designs to match the systems to the soil. We shouldn't drain more than we need to drain and we should place controls to reflect that we don't need the same drainage all the time.
- Sociologists have methods for determining implementation, through theories of diffusion of innovation, etc. Sociologists could give us a survey of methods.
- Water treatment plant operators are frustrated about why they have to pay to take out nitrate.
- Nutrient trading raises questions. The old model for conservation is "I have to lower soil erosion to meet T". The new model is "I'll send it downstream and maybe I can trade for it."
- The group needs an action plan or business plan. Discuss how you want the organization to look, how do you get proactive, and inform administrators of what your needs are, and how you are going to meet them.
- A lot of things have changed, and technology is one big change. Roundup-Ready soybeans went from 5% to 90% acceptance in 3 years. Other technologies have taken a generation or more.
- We have to figure out how to deliver those services in a new way. EQIP funding is a landowner program. CSP is a producer program. We need to focus on delivery of services.

Norm Fausey proposed a draft action plan, for future discussion.

## Results from Conservation Innovation Grant Project

**Indiana:** Nathan Utt presented Indiana results for drain flow, yield, soil properties, and crop nutrient uptake. Decrease in drainage volume is lower than in other sites (11 to 20%). This could be due to (1) less aggressive management, since the goal was to manage 6 inches below the lowest point in the field in the winter, 2 feet below the lowest spot in the growing season. However there was considerable relief between lowest spot and other points in the field, and this resulted in less management. (2) The drains were generally widely spaced, reducing the DWM impact. The impact of the practice depends on the difference between the drained field and natural drainage. DWM brings it closer to natural drainage.

**Minnesota:** Gary Sands reported that the DWM project has had mixed results, with some years yields higher from managed side, sometimes lower. Several other drainage management practices were also discussed. There are many bioreactors that are being intensively monitored. Mark Dittrich reported on focus groups held around the state on drainage. One concern raised for two-stage ditches was increased flooding downstream. This can be controlled with the culvert, which they recommend be sized for only a 1-inch drainage coefficient. This was not the goal of two-stage ditches, but is the perception and may be the actual effect.

**Illinois:** A field day was held with many non-farmers in attendance. The producer at one of the DWM demonstration sites is concerned about yield reduction, which he perceives is due to compaction. We need to provide clear information.

**Iowa:** Dan Jaynes reported that drainage water management sites have generally had 20-40% reduction in drain flow. A little less in total nitrate reduction. There seems to be a little more yield response with soybeans than corn, although that may be just the particular years that were in each crop. The CREP wetland program is very popular, and negotiations are being held to install wetlands in conjunction with increasing drainage capacity overall. Bioreactors are going strong, and they are still looking at saturated buffers.

**Ohio:** Larry Brown said that flow data is measured using V-notch weirs, so a compound rating curve is needed to calculate flow. Rating curves were developed for 8 inch, but some structures are different sizes. Yield increases observed in at least one of the two years at each site, but it is not very much (1 to 18 bu/acre). Monitoring will continue for the next few years at all sites. He suggested reading the article in the Des Moines Register (<http://www.desmoinesregister.com/apps/pbcs.dll/article?AID=20102170339>), as well as a response by the Dean of Agriculture and Secretary of Agriculture.

**North Carolina:** Mohammed Youssef reported on the CIG project, which includes assistance to producers through an online advisory. There has been a very good response to this, and they plan to apply for another CIG to develop it into a more automated system, with the potential to be used for water quality trading. They have found that interaction with the advisors, including NRCS and Extension, is vital.

**Canada:** Mark Sunohara manages the Watershed Evaluation of BMPs (WEB) project. They have recently gotten funding for three more years. Results are similar to what has been reported by others. They are moving into manured fields, and are working with Mohammed Youssef to run DRAINMOD on four years of data. They realize that more demonstration and outreach is needed as well. They are working with contractors and drainage boards to put out a fact sheet. They would like to look at greenhouse gases in the future, including on the manured fields.

**Overall CIG Project:** Leonard Binstock spoke about the results of the CIG project. The first deadline was draft reports on February 15, and he is now looking at those reports from each site. A Minnesota site had a 23 bu/acre increase with DWM this year, but other results for yield are mixed. The final submission will be in April.

Leonard Binstock announced that he is retiring. He spoke about the great changes he has seen over his life, including drainage of a slough (paid for by SCS) that is one of the best fields in the neighborhood. He remembers the 1985 farm bill, the first time conservation was tied to payment. Farmed wetlands were defined in the rule-making, and 25 years later we are still working on farmed wetlands. He is disturbed that producers are not at the table. He recalled building a research facility at Waseca, MN in 1999, which

attracted about 350 people to the drainage research symposium. He expressed appreciation for working with Mark Dittrich for 15 years.

Mark Dittrich presented Leonard Binstock with a plaque celebrating his many contributions.

### **Date and place for next meeting.**

- One possibility would be to meet in Indiana and take a field trip to see 2-stage ditches
- Another is to meet in collaboration with the ARS #211 national program review, which is the week of Labor Day.

### **NRCS Update**

Doug Toews presented the watersheds eligible for MRBI in the Mississippi Basin. There were a number of questions about monitoring. There will be edge-of-field monitoring, but watersheds were not specifically chosen this year to build on existing stream monitoring. The Agricultural Water Enhancement Project (AWEP) has money for drainage water management, but most of the funding went to irrigation last year, so there are opportunities for DWM. They are looking to pilot ecosystem services projects, and are working with organizations like the Sand County Foundation.

There is an opportunity to inform our leadership better about DWM, especially now with CIG results. We lack information about drainage. There is a whole book with Agricultural Census information on irrigation acres. There is probably twice as much drained land, but no information. We need to follow up with NASS to do more as far as drainage information. NRCS has implemented 1 million acres/year of irrigation water management, probably 1/3 of all irrigated land. But there are only 5000 acres/year in drainage water management. We need to raise our efforts. Food security gives us an opportunity to frame drainage water management in terms of food security. We need to set some goals in terms of number of acres. He also noted that the new Conservation Innovation Grant is coming out soon.

### **LUNCH**

The afternoon discussion ranged widely, focusing on communication and other outputs we should develop together. Ideas for what we should develop are listed here, together with other ideas.

- Case studies, with a couple nice photos, overview of the system, summarize experience. Each state should attempt this with their best sites.
- Water quality practice sizing guide. You go through a calculator and say “I have this many acres on this soil type, and I want to treat x amount of my nitrate. How big does the wetland and buffer have to be? How much P can I remove with a blind inlet? A tool that planners could use.
- Annual report would be helpful.
- Library of technical papers. Extension publications could go in there. Cover crop council has something like this. Everyone will send publications from their CVs.

Jane Frankenberger will organize – maybe a google spreadsheet or a form to fill in.

- ARS CEAP has dynamic bibliography. Ask Joe Makuch.
- Gary Sands will do a Facebook page for ADMS Task Force. (It was noted that USDA blocks Facebook on their computers, but the Secretary and others have pages so must be acceptable.)
- Marketing plan. What do we have to sell? If there was something like the pipe sizing guide based on Manning’s equation that would help people move from thinking it’s a nice idea to something they can actually use. Marketing encourages someone to do something to accomplish their needs. Effectively market the practice for wide implementation and acceptance
- A statement on regulation/nutrient trading as a way to mitigate nutrients. Roadmap to nutrient trading.
- Work on next farm bill. Many groups are starting to do this now.
- Poster for CIG showcase at SWCS meeting in St. Louis
- Articles in Successful Farming. It was noted that there have been quite a few, linked from ADMC web page.
- Special issue in SWCS. This was an idea a few years ago, but did not get done.
- One comment from the focus groups in Minnesota was “What about this practice is conservation? “ They don’t see it. Pipes are going in the ground, so doesn’t seem like conservation. Conservation is more easily seen for wildlife or soil. Water is used.

**Action Item:** Norm Fausey will do the first draft of a Business Plan, then work with leadership (Toews, Jaynes, Frankenberger), then send to others. A summary is to define our niche, goals, how to achieve them.

#### Future plans and strategies

- Let’s choose a goal like 25,000 acres of DWM in 3 years. (Currently 5000 acres).
- Jeff Frey will send information on NAWQA sites to everyone.
- Using web technologies such as Live Meeting were suggested to continue discussion of the Plan between now and fall meeting .
- We could also use Live Meeting or other web technologies during our regular meetings, so that others, for example State Conservationists, could join us more easily.

The meeting adjourned at 3 pm.

### Attendees

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