

Program Evaluation Report

Extension Response to June 2008 Floods



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Evaluation team

Study design and report prepared by Ellen Taylor-Powell and Patrick Walsh with review by Dave Williams. Specialist interviews conducted by Rhonda Lee. Specialist interviews analyzed by Linda Kustka. Zoomerang survey support by Jason Lemahieu. Project support by Mindy Hart.

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Photo sources:

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Executive Summary

In early June 2008, record rainfall initiated widespread flooding across southern Wisconsin. Many counties received in excess of six inches of rain over two days, with some areas reporting 12-16 inches over the rainfall period. The flooding caused tens of millions of dollars in damages, including lost planted crops (about 40% was lost, mainly corn and soybean), soil erosion, water pollution, weakened and damaged infrastructure, flooding of homes and businesses. Governor Doyle declared the June 2008 floods, the "...worst flooding in state's history" (Gov. Doyle, 9/17/08). In late June 2008, President Bush declared 30 southern Wisconsin counties to be federal major disaster areas (FEMA-1768-DR).

The expansive nature of this flooding challenge provided UW-Extension with an opportunity to evaluate the institution's contribution to emergency response and mitigation throughout southern Wisconsin. By collecting information from county faculty in the affected counties and campus based specialists who provided information for local decision making, a picture of how Extension was involved during the flooding emerged. Thirty-six county educators completed an online survey reporting their work across twenty-five counties and two water basins. Nineteen state specialists were interviewed as well as a review of relevant documents. The evaluation showed how Extension's targeted and timely support for local citizens and communities made a positive difference in improving the effectiveness of local response and remediation activities. It also indicated areas in which additional training and communication could assist Extension faculty to be more effective in natural disaster situations.

Challenges faced by affected communities

Extension clientele faced a variety of personal and economic challenges from the 2008 flooding in southern Wisconsin. Preeminent were the impacts on local businesses, especially agriculture and horticulture. Already planted crops were destroyed by the floodwaters, with an assessment necessary to determine the extent of financial loss and whether an alternative crop could still be replanted. The short and long term impacts of the flooding on soil quantity and quality were extremely important in these agriculturally dependent communities.

The floodwaters, contaminated with fertilizer, pesticides, sewerage, and other materials, created widespread concern about the quality of surface and ground water, especially from private wells. The potential impacts on public health of mold and mildew in flooded buildings, basements, and infrastructure, along with worries about structural safety, raised additional questions and increased stress in affected families. There was also a continuing need for information about how to document losses and to access state and federal emergency management resources.

Extension's response

Central web site. Within hours of the start of the June 2008 floods, Extension expanded a central web site, ExtensionResponds (www.uwex.edu/ces/ag/issues/ExtensionResponds-Flood.html) to host and share resources and information. The web site contained the best available information developed by Cooperative Extension campus specialists and county educators across its broad expertise base and provided links to the national Extension Disaster Education Network (EDEN), other Wisconsin resources and other states and federal

web sites. It was used extensively by individuals in the flooded areas, statewide media, Wisconsin elected officials, the Wisconsin Counties Association, the Wisconsin Towns Association, the state's three major agricultural papers and many other state agencies, including the Wisconsin Department of Agriculture, Trade and Consumer Protection. This site was also the lead link on Governor Doyle's web site during the flooding crisis.

Local action. Each of the twenty-five counties and two water basins reported on in this evaluation faced a unique set of circumstances. The county Extension educators became involved even as the flood waters were rising, backed up by campus-based specialists. They disseminated information through their many distribution channels, worked on-site with producers and businesses, responded to phone calls and email, worked with the mass media to provide articles, press releases and interviews, helped people access state and federal assistance, assisted in official loss and damage estimates, held meetings and events, supported local, state and federal emergency management agencies to insure rapid and effective service.

State level support. As quickly as county educators started to respond so did the state specialists, providing needed state level support across an array of disciplinary expertise including agronomy, soil, crop and dairy sciences, solid and hazardous waste, business development, water quality, food safety, family care giving, child and families studies, and geology. State specialists developed resources, delivered relevant research knowledge, worked across agencies and distributed information through the media and their varied communication channels. They capitalized on their professional and technical networks that stretch across the UW-system, the region and the nation making it possible to access and share information widely. They collaborated with state and federal agencies to provide educational programs, disseminate information, facilitate the emergency response and ensure that shared information was clear and consistent with state and federal policy.

Ongoing Assistance. Despite the fact that floodwaters receded in most areas by July 2008, Extension county offices continued to provide post-crisis information during the remediation phase. There was a continuing need for information and support to seek federal and state assistance, file necessary paperwork, develop loss reports, monitor longer term flood impacts on crops and water quality, and facilitate local long term recovery planning. Extension's role in the response to the flood did not end with the receding of the floodwaters.

Through a multi-prong approach, Extension was able to provide timely, accurate and relevant information and assistance to those impacted while the threat existed, not after it had passed. Clientele were able to make informed decisions about how to react, decreasing their health and economic risks and saving response time. Local and state agencies were assisted helping them to more effectively and efficiently perform their emergency response work. Across the region, thousands of Wisconsin citizens were assisted and benefited through Extension's efforts.

Extension's impact

The evaluation shows the unique contribution that Extension makes in time of emergency, often resulting in resources being available that otherwise would not be. Local clientele came to Extension for timely, factual, and unbiased information, which reduced economic and health risks and speeded recovery. Extension helped local citizens access public resources and technical information to assess damage and

move forward. Local Extension offices brought the best information from around the country directly to their communities to meet the local need. Extension's response contributed to positive impacts across ten broad impact areas for individuals, families, businesses, communities and agencies from reduction of stress and anxiety, to preserved or improved health conditions, to reduced losses and risks, to improved local and state agency performance.

Improving extension's response capability

The evaluation highlighted the need for continuing capacity building in emergency response for county and state Extension faculty. Clarification of role and increased coordination are recommended as well as training in the Incident Command System. As often happens in emergency situations, responsibilities can become confused. In some counties, Extension's official role as part of the county response effort was unclear.

Background

Over the weekend of June 7 and 8, a stalled weather system brought record rainfall to southern Wisconsin followed by another bout of intensive rain one week later. During the initial two-day period 4-7 inches of rain fell in many counties. By June 13, total precipitation throughout south-central Wisconsin exceeded 10 inches with 12-16 inches in some areas (USGS, 2009, <http://wi.water.usgs.gov/surface-water/flood2008/conditions.html>). This rain fell on already saturated soils due to wet conditions that started in August 2007 and record snowfall over the 2007-2008 winter and resulted in what Gov. Doyle called the “worst flooding” in the state’s history. In late June 2008, President Bush declared 30 southern Wisconsin counties to be federal major disaster areas (FEMA-1768-DR).

An estimated 40 percent of the cropland in the region, mainly in corn and soybeans, was lost for the season, and tens of millions of dollars in damage resulted due to crop loss, erosion, environmental degradation, damaged infrastructure, and flooding of homes and businesses. The Kickapoo River rose several feet above flood stage, destroying most of the village of Gays Mills which had been badly flooded in the August 2007 floods. Flood damage in Vernon County alone exceeded \$60 million. A breach at Lake Delton caused the lake to empty and resulted in a setback for the \$1 billion Wisconsin Dells tourism industry.

The disaster area covered 30 counties—Adams, Calumet, Columbia, Crawford, Dane, Dodge, Fond du Lac, Grant, Green, Green Lake, Iowa, Jefferson, Juneau, La Crosse, Kenosha, Manitowoc, Marquette, Milwaukee, Monroe, Ozaukee, Racine, Richland, Rock, Sauk, Sheboygan, Vernon, Walworth, Washington, Waukesha and Winnebago.

The extensive flooding involved UW-Extension county offices in a variety of ways. First, it required county Extension office staff in every affected county to move quickly to provide their own expertise and work with campus specialists to help local clientele and communities mitigate the impacts of the flooding. Second, many county faculty and staff were themselves affected by the flood, and thus needed to respond to threats to their own families’ health and property. Each county office addressed a unique set of challenges as it assisted local and state emergency response professionals meet the immediate threats of the rising floodwaters and provide timely information to reduce long-term impacts.

Purpose of the Evaluation

The extensive nature of this flooding challenge provided UW-Extension with an opportunity to evaluate the institution’s ability to respond to emergencies. In the fall of 2008, Extension administration initiated a formal evaluation to answer three main questions: What did Extension do in responding to the June floods? What difference did it make? And what can be learned from the 2008 response that will help the institution prepare for future emergency situations? Evaluation results were to be reported to internal and external stakeholders and used to plan for future emergencies.

Evaluation Methods

The evaluation was designed to answer administration's questions, in particular to document the nature and scope of the Extension response as a prerequisite for determining what difference the Extension involvement made. Everyone felt that Extension had been very active in helping to mitigate the disaster but there was no record of what had been done or who had been involved. Consequently, the evaluation had to identify those involved – county educators and state specialists – and then solicit information from them about their flood-related work. It was decided to use a mixed method evaluation design involving a web-based survey of county-based educators, interviews with specialists, and a document review of all relevant materials.

The Web-based Zoomerang survey was completed by 36 educators involved in the flood response. These educators came from all four program areas (Table 1) across twenty-five counties and two water basins. See Appendix 1 for list of counties and sites.

Table 1. Number of survey respondents by program area (n=36 county educators)

Program Area	Number of respondents	# of counties/sites
ANRE	16	15
Family Living	11	11
CNRED	6	4 ctys; 2 water basins
4-HYD	1	1
Other	2	
TOTAL	36	

Telephone interviews were conducted with 19 specialists identified as having assisted in the 2008 flood response. See Appendix 2 for list of specialists. They represent varied disciplines including agronomy, soil, crop and dairy sciences, solid and hazardous waste, business development, water quality, food safety, family care giving, child and families studies, and geology. The document review included an analysis of data from the ExtensionResponds Web site, various reports, media releases and success stories submitted to the Planning and Results system. The information from all these sources, summarized through descriptive statistics and content analysis, is presented below.

Layout of the report. We have included as much of the data as possible in this report. This was done in order to: show the scope and nature of the response; acknowledge the time and effort that people took to provide information; illustrate the type of data that is available for evaluative purposes; and to capture the data in one place for use in other targeted communication pieces. Many examples are included and quotations are sprinkled throughout the report to illustrate points and contextualize the findings. They are indicated with quotation marks and written in italics. Names and identifying information are omitted as much as possible.

The report starts with a discussion of the situation facing county Extension offices across southern Wisconsin in June 2008. Thereafter, the report is organized by the questions the evaluation was designed to answer.

EVALUATION FINDINGS

What was the situation in June 2008 facing Extension?

The extensive flooding caused numerous problems for Wisconsin residents. As the floodwaters rose, UW-Extension offices found themselves dealing with a multitude of questions and issues. The following list provides an overview of these issues:

“In a county that produces over 1.5 billion worth of agricultural sales in a year, growers needed answers to a problem of epic proportions.”

1. Agricultural Production

- Management of flooded crops and land, including fields that could not be replanted; field damage mitigation
- Replanting possibilities and options, particularly for corn and soybeans; replanting intervals and herbicide considerations; alternative forage crops; flood-tolerant varieties; late and prevented-planting crop insurance coverage
- Soil fertility and nitrogen loss due to flooding; cost-effective fertilizer decisions to take account of fertilizer losses; nutrient loss and replacement
- Crop loss and damage estimates; federal loss reporting; county loss estimates; assisting FEMA in setting priorities and determining damage
- Crop disease: identification and management of disease
- Pests and pesticide issues; disposal of damaged pesticides
- Management of organic crops
- Livestock management, including managing cattle health risks (such as preventing mastitis and ensuring milk quality), feed inventory management, manure runoff and nutrient management, pasture assessments, pricing alfalfa (standing and already harvested), safety of harvested material, handling of damaged hay
- Financial management, including crop insurance questions, working with insurance companies, inventory and losses, cash flow, and interactions with lenders and suppliers
- Care of lawns, gardens and landscape plants that had been underwater
- Impact on home and commercial gardens; management of gardens
- Marketing; marketing plan adjustments; marketing produce in new locations

2. Food Safety

- Use of garden produce from flooded areas
- Use of canned goods that had been in flood waters
- Food use after refrigerator or freezer outages

3. Water Quality

- Groundwater quality
- Well contamination; options for private wells that were flooded
- Safety of drinking water from private wells and public sources
- Safety questions for those who boat, swim or are otherwise in contact with local lakes and rivers

4. Cleanup and Recovery

- Drying out and disinfecting basements and furnishings
- Dealing with mold and mildew in the home; handling wet clothing and carpets; decisions regarding keeping or tossing flood-damaged furniture; questions regarding rummage sale purchases
- Sewage backup; septic system problems
- Hazardous wastes stored in basements

5. Family Health

- Health needs of families
- Stress

6. Infrastructure Damage and Conservation

- Municipal storm water management; drainage
- Soil and water management; soil erosion; control of flood waters
- Conservation structure damage and repairs; drainage systems
- Road and interstate flooding

7. Resources available

- FEMA; available disaster programs, financial assistance, loans and grants
- Community resources and assistance available

What did Extension do in responding to the June 2008 floods?

Extension responded with a multi-strategy response consisting of three primary actions: (1) a central web site, (2) broad-based local action, and (3) state level support. Besides these actions at the time of the flood, Extension supports recovery and preparedness planning in an ongoing way in many counties.

Central Web Site

Within hours of the start of the June 2008 floods, Extension established a central Web site called ExtensionResponds (www.uwex.edu/ces/ag/issues/ExtensionResponds-Flood.html) in order to host and share resources and information. Extension had developed a web site in response to the August 2007 floods so it quickly built upon the existing site and populated it with

materials across all topic areas, not just agriculture. It provided links to the national Extension Disaster Education Network (EDEN) as well as to other state and federal web sites.

The ExtensionResponds site was used extensively by individuals in flooded areas, statewide media, Wisconsin elected officials, the Wisconsin Counties Association, the Wisconsin Towns Association, the state’s three major agricultural papers, and by many other state agencies, including the Wisconsin Department of Agriculture, Trade and Consumer Protection. More than 3,500 people visited the site during the flooding period (Table 2). Many others gained access through the more than 2,000 sites that were linked to ExtensionResponds.

Table 2. ExtensionResponds web site statistics, 2008

	Total number	Daily average
Page views for period 6/1/08-8/15/08	3,566	13.47
Page views for period 6/1/08-12/31/08	4,832	10.97
Links on other sites	2,100	

ExtensionResponds was the first link on many county Web sites and the lead link on Governor Doyle’s Web site during the flooding crisis.

Local Action

Each county faced a unique set of circumstances. Extension educators became involved even as the flood waters were rising. They were backed up by campus-based specialists who brought disciplinary expertise to the particularities of the local crisis.

What did this local action look like? The survey results indicate that Extension educators most frequently distributed information, responded to individual requests via phone and email, worked with the media and worked with individuals on-site (Table 3). The table also reports slight differences in activity depending upon audience and need that reflect the nature of the 2008 flood and its impact on agriculture. Producers and businesses were more likely to receive a mix of activities, including individual and on-site assistance. One county educator reported, *“As each producer situation and needs were different, the greatest successes came from individual contacts.”* Individuals and families more frequently received assistance through telephone and email.

Table 3. Number and percent of Extension educators involved in different activities by audience

Activity	Local Business Ag producers n=20	Community Businesses n=6	Individuals families n=22	Homeowner n=9
1. Distributed info/educational materials	17 (89%)	4 (100%)	15 (79%)	6 (86%)
2. Responded to individual requests via phone, email, etc.	17 (89%)	2 (50%)	16 (84%)	5 (71%)

Activity	Local Business Community		Individuals families	Homeowner
	Ag producers	Businesses		
3. Worked with the media	16 (84%)	3 (75%)	11 (58%)	6 (86%)
4. Worked with individuals on-site	11 (58%)	3 (75%)	7 (37%)	2 (29%)
5. Helped individuals access information and services, e.g., state and federal assistance	11 (58%)	3 (75%)	5 (26%)	2 (29%)
6. Assisted with official loss/damage estimates	14 (74%)	2 (50%)	1 (5%)	0 (0%)
7. Developed new educational materials/resources	9 (47%)	2 (50%)	3 (16%)	1 (14%)
8. Facilitated networking; support services	8 (42%)	1 (25%)	4 (21%)	0 (0%)
9. Held meetings/events	3 (16%)	0 (0%)	1 (5%)	0 (0%)

Qualitative data from the survey and specialist interviews add further description to the nine activities listed in Table 3.

1. Distributed information and educational materials

Extension profited from using existing materials including those that had been used in the 2007 flood – resources that were ready to go or that could be quickly up-dated or modified, for example, materials on food safety, pest management, business loan applications, family care and stress.

The materials that were distributed during the 2008 flood included the range of Extension educational resources: fact sheets, short and long articles; bulletins; slide presentations; press releases; checklists; charts; decision aids; guides; publications; newsletters (flood-related information inserted into existing newsletters and newsletters that were specially developed).

These materials were distributed through the many and varied communication channels used by Extension that facilitated rapid distribution to large numbers of people. These communication mechanisms included:

- Postal mail – to established lists or specific addresses
- Email – county, state and group list serves maintained by Extension and other organizations
- Face-to-face – materials distributed at fairs, meetings and local events
- Newsletters – maintained by county educators and state specialists.
- Web – postings on the ExtensionResponds site, the EDEN site, and the Web sites of counties and individual specialists
- Web – blogs
- Teleconferences

- Telephone
- Public meetings
- Magazines and agricultural trade newspapers (*Agri View*, *Wisconsin Agriculturalist*, and others)
- Radio, newspaper and television: local, state and national media

Information distributed by Extension often was picked up by other individuals, organizations, and commodity and special interest groups and distributed even more widely. For instance, an article posted in the *Wisconsin Crop Manager Soil Report* was picked up by *Agri View* and other media. The widespread use of email and internet delivery made this type of wider diffusion even more prevalent.

Also, other agencies solicited Extension for materials and information to distribute through their own channels (e.g., an article written for the DNR's Urban and Community Forestry Newsletter). Or, the Extension material was sent to another organization and then automatically distributed through its channels (web sites and list serves). One specialist reporting on this process explained that he wrote an article that he posted on the Extension web site and emailed to two other statewide organizations; one of the organizations then posted the article to its Web site and distributed it through its list-serve. Within one day the article had reached about 1,000 people.

Likewise, the local Emergency Centers distributed Extension information. Educators often were asked by their local Emergency Center for information and resources that the center could distribute to the public.

2. Responded to individual requests via phone, email, in office

Individual requests for assistance ranged across the issues facing residents, businesses and communities in the flooded areas. In the words of one county educator, "*Extension is one of the first calls that most people make to get information and resources.*" And, from another, "*The county UWEX office is the referral of choice.*"

Many responded to calls for advice on alternatives for disrupted cropping practices and replanting options. "*There was a lot of uncertainty for farmers about replanting. Spring flooding caused the loss of some planted crops and the delayed planting of others, resulting in changes in both the type and variety of crops to re-plant.*"

Other Extension educators dealt with queries related to crop insurance and disaster assistance, related to natural resources and hazardous materials, or related to unique aspects of the 2008 flood. "*One individual, an organic farmer, brought in plant samples for identification; these plants were growing in sediments deposited by floods and had never been seen on the property prior to the flood,*" reported one Extension educator. Other educators provided support to offset the psychological stress that affects individuals and families in time of disaster. Many responded to requests from private well owners about water safety and distributed free well-water testing kits. Such advice paid off – "*Our well testing rate remained high for two months following the flooding,*" reported one Extension educator.

Besides handling the calls and requests at the county Extension office, Extension educators also handled phones and call-ins at other agencies. For example, they

assisted public health departments, social service agencies, and the local emergency centers in responding to calls and distributing information.

3. Worked with the mass media: radio, television and newspapers

Extension educators provided articles, notes, and press releases on such topics as flood safety and gardens, general food safety, and crop insurance, gave interviews and conducted call-in radio programs to help people make informed decisions. One extension educator created a photo gallery of flood photos that was used by various media outlets. Appendix 3 provides a sample of over 20 flood-related news items that mentioned UW-Extension for the period June 13-25, 2008. Extension faculty are often called by media contacts who view Extension information as accurate and unbiased. Comments submitted by county educators provide additional examples:

- In Richland County, press releases carrying Extension information were estimated to have reached more than 80,000 people.
- In Dodge County, local newspaper and radio station reached over 80,000 people
- In La Crosse County, 90-second segments aired three times on one local CBS affiliate
- Winnebago County – one local cable access site was estimated to have reached 30,000 people with Extension information
- Jefferson County – weekly press releases and radio program reached the county’s population

4. Worked with individuals on-site; provided technical assistance

Extension educators walked fields, discussed management for specific cropping situations, advised on potential marketing plan adjustments, worked with businesses to complete loan applications, provided advice on handling damage, discussed safety issues with homeowners, and tested for bacteria in lakes, rivers and recreational areas. One educator assisted her local United Way in designing and conducting a survey to assess family needs. Another educator coordinated with the Economic Development Association and Small Business Development Center (SBDC) to offer business counseling and facilitated a business focus group that resulted in an economic development and flood recovery tour to inform the town’s long-range planning. In yet another case, an educator and state specialist teamed up to merge the results of a 20-year geology study with a flow model to educate people during a town meeting about why the area flooded as background for long-range flood planning.

5. Helped people access information and services

This often involved helping people gain access to state and federal assistance; helping them complete applications; or connecting them to other agencies and services (e.g., referring them to the Groundwater Center at UW-Stevens Point for groundwater testing; or to the SBDC for business counseling).

An example of this type of assistance comes from one educator, *“In my Extension capacity I work with the County Snowmobile Association. So when the flood washed away culverts, bridges and sections of trails, I contacted the County Emergency Management Coordinator and FEMA reps to see if the group qualified. I filled out FEMA paper work and submitted it on behalf of the County Snowmobile Clubs. The*

group received \$75,000 grant to cover damages reported.” In another case, an educator worked with the county emergency management, Federal Emergency Management Agency (FEMA) and the Farm Service Agency (FSA) to organize a resource booth at the emergency center to help agricultural producers be able to report crop losses and apply for the FSA emergency loan program.

6. Assisted with official loss/damage estimates

For many of the agricultural educators, this was a major part of their work. These official crop loss estimates and financial loss estimates were made for specific townships and counties, as well as for the state overall – essential for disaster declarations and relief applications. In the words of one county educator, *“We were able to take some of the guess work out of the damage estimates.”*

Educators developed spreadsheets and helped develop web-based reporting forms for county producers to report their crop, building and livestock losses. They served as the agricultural representatives for local, state and federal reporting. One educator reported on assisting the county parks commission in developing damage estimates for all the parks and snowmobile trails that resulted in \$7,000 in federal aid.

7. Developed new educational materials/resources

Various new educational materials were developed during the 2008 flood that will add to the growing repository of UW-Extension flood resources. Several of the teams (e.g., Team Grains, Team Forage, Water Team) developed materials or sets of materials related to the team’s subject matter expertise. For a sample list of items that specialists developed and reported on during their interviews, see Appendix 4.

Examples of other materials that were developed included:

- a “flood edition newsletter” produced by the combined force of agents in Dane, Columbia, Sauk and Jefferson that reached 3,400 producers and resulted in over 200 telephone or face to face contacts with growers
- practical recommendations (e.g., on filing planting and replanting claims; on how to work with the insurance company)
- reviews of current scientific research used as background materials or to create new articles, such as one focused on children’s response to floods based on child development research from other natural and manmade disasters
- geological and groundwater models to explain reasons for the Sauk County flood conditions
- charts and examples for assessing nitrogen loss in fields

8. Facilitated networking, coordination and support services

While the quantitative data show fewer county educators involved in this type of activity (refer to Table 3), many of the narrative comments indicate otherwise. The under-reporting may be a function of the way the question was worded. Much of what Extension does is in collaboration with others. One would assume this to be true especially during a disaster. County educators worked in collaboration with or assisted other departments, county board committees and local officials.

Again, the nature and scope of the activities that are reported in this category are varied. Extension educators helped coordinate activities to facilitate FEMA response; facilitated meetings with local, state and federal agencies; connected municipal water resource managers with the water basin educator program; coordinated with SBDC in order to provide business counseling and facilitate long-term planning; connected 4-H community service to restore a park after the flood damage; coordinated volunteer groups in flood clean-up. Specialists networked and coordinated efforts across technical fields (e.g., plant pathology and agronomy); across agencies; and across local and state stakeholders.

In many cases, the networks and collaborative relationships that Extension facilitated allowed access to information and services that would not have been otherwise available. In the words of one educator, *“My access to the DNR and to information about surface water quality allowed me to provide answers to questions by Emergency Management that they were unable to answer adequately before my assistance.”* In another case, an Extension specialist connected the commercial manure haulers with local municipalities to provide equipment and pumping services to small town and communities across southern Wisconsin. The pumps kept water from backing up into homes and reduced damage to public and private property. They were credited with saving the property of many residents and businesses, reducing the need for sandbags, and speeding up the recovery process that had obvious economic and psychological impacts. Finally, one county educator reported on his work with the Solid Waste and Recycling Committee to set up a collection process for nylon shipping bags from a local industry that were used as sandbags during the flood. The system will continue with local feed dealers dropping off nylon feed bags for use in future disasters.

A question on the survey asked county educators about their collaboration with others in providing assistance to particular audiences. The results, seen in Table 4, probably reflect the type of assistance that was needed and delivered.

Table 4. Number and percent of county educators who collaborated with others in providing assistance by target audience

Target audience	# who responded	Collaborated with others
Agricultural producers	19	17 (89%)
Individuals and families	18	12 (67%)
Homeowners	4	2 (50%)
Businesses	2	2 (100%)

9. Held meetings and other events

Local educators least frequently held meetings and events (Table 3) as part of their flood response. Meetings hosted or co-sponsored by Extension for local residents included educational tours, demonstrations, teleconferences, and special meetings. The number of people attending these gatherings ranged from 5 to more than 200. Examples include:

- a two-day Flood Assessment Workshop facilitated by Extension to assess the county's flood response and provide ideas for improving procedures and processes
- a conservation practices tour for resource managers of 15 county sites to reveal what works and what doesn't as a visual comparison of different management strategies
- a full day Economic Development and Flood Recovery Tour featuring Mineral Point and Darlington was co-sponsored by FEMA and Extension and offered key strategies for downtown economic development and flood mitigation
- a workshop for regional water resource managers to identify ways to proactively manage water resource systems (storm water, waste water or drinking water) and prevent damage to municipal infrastructure and the environment
- a small grains twilight meeting attended by 35 local small grain producers and company representatives
- a teleconference of ethanol companies to address risk management related to corn prices and procurement
- a tillage and conservation event focusing on reducing soil erosion was held at the Arlington research station in August

Extension also held meetings for its own Extension faculty and staff and affiliated people to keep themselves updated on local flood conditions and to share pertinent information. Often teleconference meetings, these venues enabled county educators to have the most relevant research to apply locally. Within the first week of the flooding, Team Grains organized such a statewide teleconference to discuss the flood situation and damage and cropping decisions that would be needed. Professional development workshops have continued since the flood to discuss lessons learned and inform Extension's response to emergencies.

10. Part of the official county emergency response effort

Where an emergency response was activated, county Extension educators served as members of the local emergency committee or board, attended meetings, and also served as office staff, answering questions and handling phone calls, assisting with official crop loss estimates or helping the emergency centers in their other operations. Fourteen of the 36 educators reported serving in these roles. Extension often provided Emergency Centers with information – resources and materials – to give to the public and to workers to distribute when they visited homes – resources that otherwise might not have been available.

“I serve on the County Emergency Board, so I met on two occasions with one FSA person and one NRCS person to determine crop losses for the federal report. I have also just recently been asked to calculate crop losses for the Town of Spring Green because they are doing a hazard mitigation and flood control investigation, and need the information specifically for their township.”

“When the ...Emergency Management Director was getting calls regarding the safety of boating, swimming or just contact with local lakes and rivers

about two weeks after the rains stopped, I was able to identify which lakes and beaches had regular bacterial testing and provide information on blue-green algae toxicity. I was also able to provide her with several Web links that she could refer people to.”

State Level Support

“We had information either ahead of or when producers were asking questions.”

As quickly as county educators started to respond so did the state specialists, providing state level support to the local action. State specialists developed resources, communicated with and supported the local educators, delivered relevant research knowledge, worked across agencies and distributed information through all their usual communication channels. They accessed their professional networks that stretch across the UW-system, the region and the nation making it possible to access and share information widely.

State specialists advised, worked with, and responded to a variety of people (besides county educators) including: the banking community, small business centers, local economic development staff, emergency preparedness staff, local officials, the news media, crop consultants, manufacturing companies, FEMA representatives, state agency personnel, crop scouts, municipal water resource managers, and seed dealers.

“We brought together resources from around the UW system to provide education and training that probably would not be possible without us.”

They collaborated with state and federal agencies to provide educational programs, disseminate information and facilitate the emergency response. In one case, Extension conducted an online survey of all its county educators to provide crop loss and damage estimates needed by the Wisconsin Department of Agriculture, Trade and Consumer Protection for state disaster reporting. State specialists worked with emergency management agencies to insure that shared information was clear and was consistent with state and federal policy. They connected county educators with appropriate agencies, answered follow-up questions, and provided more specialized assistance as needed. They provided input and review of official reports, such as an editorial review and content writing for a special report to the Governor on the agricultural impacts of the 2008 Wisconsin flood. See Appendix 5 for list of collaborators reported by state specialists.

Many state specialists serve on state, regional and national committees that allowed them to bring additional resources to bear on the flood crisis and to facilitate coordination. For example, a state Extension specialist who sits on the state Hazard Mitigation Team reported, *“The state Hazard Mitigation Team is comprised of most of the state agencies and during the flood FEMA was part of it and took part in the discussions. At that level, all the state agencies and key federal agencies, including Health and Human Services and FEMA, were involved in sharing information and making sure they were as responsive as they could be.”* Another specialist spoke about her work with the national eXtension network, *“I immediately connected with an eXtension colleague from Florida since they’ve had so much experience with floods and she has a national reputation and has testified in Washington. I knew her work was good and well respected. I identified a number of resources and articles that I thought were relevant for Wisconsin and asked for them to be linked on the ExtensionResponds web site for our counties to access easily.”*

UW-Extension benefits from being a part of the national Extension Disaster Education Network (EDEN) through which information and expertise are shared across the country. For the June 2008 floods, particular sharing occurred among the affected Midwest states – Iowa, Indiana, Illinois, Missouri, Minnesota and

Wisconsin. *“There was a lot of back-and-forth in terms of requesting information from people, like the information that had been created in Wisconsin to look at the impact of flooding on crop health and on pesticide and fertilizer movement. We made sure that people in the other states were aware of those because they were getting some similar questions in their states about what farmers can do after this flood to recover. There was a lot of multi-state back-and-forth that went on, providing information to each other and learning how other people were coping with the problem so that we could apply their methods in our state.”*

Another example of how specialists contribute during an emergency response comes from another specialist interview, *“A question came in regarding the safety of harvested materials. We were made aware that the Department of Agriculture had drafted some guidelines. We reviewed those to make sure those fit with what we would also recommend. Then we took that material one step further. Because part of this protocol for evaluating the safety of fresh market produce was testing, we had some materials for the meat safety work that we do that had looked at testing. We were able to add to that and provide growers with a list of recommended tests that they would run if they needed to have some kind of documentation of safety. Then we also gave them contact information for testing labs across the state where they might go. Then we provided assistance in evaluating the results from the get-go. If the results say this, this is what you do, and here’s the research that says how you should evaluate the results you would find. We identified the labs, told them what tests to ask for and then how to interpret the results.”*

Ongoing Assistance

In many counties, Extension continues to support recovery and preparedness efforts. In the words of one educator, *“There is still a lot happening in response to the flood.”* Extension provides ongoing support in a number of ways, including:

- Support to individual producers and residents in their recovery
- Work with local officials on long-term recovery and assisting as part of long-term recovery committees
- Follow-up assessments on flood damage; on crops that developed disease problems; and on the effects on crop yield potential in 2009
- Assistance with follow-up paper work for FEMA grants
- Monthly webinars to help farmers deal with next year’s predicted high costs of fertilizer and seed (webinars are planned through March 2009)
- Monitoring field and crop quality situation over winter
- Grant writing for follow-up work (e.g., tools for municipal water managers to evaluate their systems)
- Conducting workshops, meetings and conferences on such topics as: how to proactively manage water and prevent damage; strip tillage; implications of floods on crop production

Comments from various study respondents illustrate the nature of this ongoing support:

“We spent a lot of our last month or two doing field visits to answer specific questions that have come up. We have been actually addressing grower and county agent concerns through being out and about – we actually walk the fields through harvest to identify and assess any potential plant disease.”

“I continue to receive requests for information about UW-Extension expertise in hydrogeology-related flooding. Incidentally, as a result of my work, our county has taken steps to develop a countywide groundwater study, county officials are asking how that study can be used to predict and mitigate the effects of flooding.”

Who was reached?

Another aspect of the evaluation question, “What did Extension do in responding to the June floods?” is “Who was reached – who potentially benefited?”

As seen in Table 5, the greatest number of the educators (61%) assisted individuals and families in 18 of the 27 sites. Fifty-six percent of the 36 educators reached agricultural producers in 19 counties/water basins. Homeowners, local officials and businesses made up the rest of the audiences who received assistance in 9, 9, and 6 counties respectively. See Appendix 6 for breakdown of audience for each county/site.

Table 5. Audiences reached by Extension educators (36 county educators; 27 sites)

Audience	# (%) of educators	Number of counties/sites
Individuals/families: food, water safety and family health issues	22 (61%)	18
Agriculture producers	20 (56%)	19
Homeowners – cleanup and recovery issues	9 (25%)	9
Local officials/governments	9 (25%)	9
Businesses	6 (17%)	6

In terms of which type of agricultural producer received Extension assistance, crop farmers were the primary beneficiaries across the 19 counties, representing those who were heaviest hit by the flood damage (Table 6).

Table 6. Agricultural producers reached by the Extension response (n=20 county educators)

Agricultural producer	# (%) of county educators
Crop farmers	18 (95%)
Dairy and livestock producers	16 (84%)
Fish farmers	0

Agricultural producer	# (%) of county educators
Horticulturalists	6 (32%)
Fruit and vegetable growers	8 (42%)
Horse owners	3 (16%)
Other	2 (11%)

Questions on the survey and in the interviews asked Extension educators to report or estimate the numbers of people reached through both direct and indirect means for each audience. Numbers of direct contacts reported by county educators on the survey are seen in Table 7. About half of the educators working with each audience provided the requested information. One mentioned that he kept a phone log.

Table 7. Numbers reached through direct means (individual contacts, meetings, events) by audience (estimates)

Audience	# of educators reporting	Numbers reached			Estimated total
		Range	Median	Mean	
Producers	11	5-220	30	54	594
Individuals/families	12	3-50	11	17	203
Homeowners	4	2-25	8	11	42
Businesses	1				15

And, from the specialist interviews, the following numbers were recorded:

Meetings/tours/event	Estimated number
Town and village officials	100
Two workshops	80
Strip tillage expo	400
Bus tour to learn from flooding	35

Data that were provided by the county educators and state specialists for indirect contacts are presented in Tables 8 and 9. These data provide some indication of numbers of people reached through different outlets. They do not account for all the radio programs, electronic and print materials and news releases that were disseminated. Also, the numbers do not account for any ripple effect – pick-up and distribution through other means. And, the numbers do not signify actual use of information or benefit to the user.

Table 8. Estimated number of people reached through different distribution channels as reported by county educators

Print material, radio, TV	Estimated numbers reached
Columbia county newsletter	1,100
Dane county newsletter	2000

Print material, radio, TV	Estimated numbers reached
Dodge county newspaper and radio	80,000+
Fond du Lac newsletter	1,000
Jefferson and Waukesha newsletter	1,100
Jefferson County	80,000 (cty pop)
Richland county press releases	80,000
Winnebago, local cable	30,000

Table 9. Estimated number of people reached through different distribution channels as reported by state specialists

Circulation of print, electronic media	Estimated numbers reached
Midwest forage assn (23 states and provinces)	650
AgriView weekly circulation	14,000
DNR newsletter	700
Children's stress article	1,000+
Wisconsin Soy Sentinel	12,000
Corn and Soybean Digest	147,000
Use of Website/blog	Estimated number
Wisconsin Crop Manager Website, Jan-Sept	60,000
Wisconsin Crop Manager website (June page views)	169,000
Downloads in June of "Assessing Flood Damage to Soybeans" article	331

The diffusion process is complex and unclear. A great deal of Extension information, advice and assistance was diffused beyond the initial contact, often through electronic networks that are difficult to track. It might be assumed that any educational information distributed through radio, television and newspapers reached large numbers of people – the population in general. Extension press releases and articles were distributed by the media in many, if not all, of the affected counties. Comments from the survey and interviews referred to the “general public” benefiting from the Extension information in adding to their understanding of the floods, what to do and the floods impact on their county environment and economy.

Concerning the number of agricultural producers reached by Extension information, one state specialist offered, *“We know that over a half a million acres of forage cropland was affected and since many farmers have a couple hundred acres of forage, we are led to believe that we impacted 2,000-3,000 growers in those regions of the state.”*

What difference did the Extension response make?

Extension Contributions

Many factors emerged from the evaluation that speak to the difference Extension made to the 2008 flood emergency response across Southern Wisconsin. These are categorized into four main contributions:

1. Extension was seen as a trusted local source of information and advice that is particularly needed in a time of crisis. Where the Extension office and staff have visible and positive relations with its communities, it provided a known and ready ‘go to’ place – a personal touch – that relieved anxieties and stress.

“During times of catastrophe people hear many different messages about what to do. Historically, I think the fact that our Extension folks are seen as credible in the community means that when they tell people something, the people believe them and they get the help they need right away. They don’t try ten different places. They go to our folks, get what they want and save themselves time and energy, which they really need in a catastrophe to respond.”

“A specific example was a farm wife that called in tears about how the flooding was going to end their career in farming and create a bankruptcy situation. A week after speaking with her to provide advice on who to contact for assistance of many kinds, I called her back. She was so happy to know that I was checking back with her and said she had never expected that from anyone. She reported that she had visited with FSA, reported the crop loss, was eligible for an emergency loan and things were looking much better for her farm. She thanked me sincerely for showing the concern and empathy for her situation.”

“...people were relieved to be able to have answers to their questions and have additional support during such a stressful time.”

“The local Extension offices were seen as places where people could get information... this included FEMA, state agencies and others who were trying to cope with the floods.”

2. Extension provided timely, factual and relevant information. Timely, accurate, relevant information and support are especially critical during a crisis situation. Because Extension educators live in the communities where they work, they were able to start work immediately and knew exactly what was needed. In the words of one, *“We are here and can be responsive to emerging issues with appropriate resources.”* And from another, *“We had relevant, user-friendly information to share within hours of the flooding.”* This often meant that resources were available that otherwise would not have been.

County and state educators attributed the speed with which Extension responded and the relevance of the assistance to a number of things:

- existing communication channels, such as distribution lists, email, Web presence; Wisline teleconference network; local county networks
- information and resources that were on hand and ready to go; past experience with floods and other types of disasters
- county to campus connections and networks – agents in communities are backed up by state specialists who had special expertise and resources

“We had timely information that helped farmers get through the current crisis as well as prepare for the “down the road” issues such as feed shortages that might occur due to flood damage.”

- state specialists who conduct research in Wisconsin under real agricultural conditions, with and in Wisconsin businesses, communities and families.
- county to county networks that allowed Extension staff in different counties to expand their reach and impact, to access other resources, and to share information
- established relationships with other agencies, emergency staffs and media
- established connections with state, regional and national networks and individuals with expertise and experience in flood emergencies
- a team structure that facilitated sharing, communications and forums for education, training and support.

The following quotations illustrate these points:

“We were literally out there... as the rain was falling, as the crops were deluged, there were people already out speaking and helping the agents understand what would happen to fertilizer, what would happen to soil health, what would happen to crop health, what potential crops they could think about planting after the water went down and what people could do to reduce the amount of impact on their homes and their businesses. The system reacted very quickly. Our county agents did a great job of quickly moving into the areas where their clientele needed help, and accessing specialists and our resources as well as resources from other networks, to make sure people had the best information. They didn’t wait until the flood was over. They started talking to them as the water was still sitting on their land. People could anticipate what their first response was to mitigate the damage.”

“What makes this all possible really is good communication and interaction between agents and specialists. We are usually pretty technically savvy so we can get out this information in terms of printed materials so growers can make the best decisions they can. The ultimate work comes down to the growers and what can be done on their own property, but at least they can get the information and be informed in terms of all the options that might be available to them. A lot of that has to do with the relationships agents have within their counties and with their own county emergency staff.”

“...we have a very strong group of county educators, a very knowledgeable group. With their own experiences, they know what to expect in many situations. I think what’s nice is that our work is that sort of interaction between the specialist and the county educator. With the sort of questions that come up, we can actively communicate with one another.”

“Team Forage responded while it was still raining, as crops were deluged. The team pooled information and efforts to make farmer recommendations, wrote materials related to hay and distributed them by email, posted info on the Web site, and held a statewide

conference for Extension agricultural agents to enable them to be able to discuss the flood's effect on crops, to discuss post-flood cropping options, and to be able to measure flood damage."

Many county educators spoke glowingly of the support they received from the state. *"The support from the state was wonderful"*, said one. *"The specialists were amazing,"* said another.

3. Extension provided expert, unbiased knowledge based on research – knowledge which was related to specific commodities, geologies, horticultural practices, or family health issues. Relevant and timely information is necessary but not sufficient. Accurate information is also necessary. Extension's cadre of county educators and state specialists offered up-to-date, current information based on research findings and experience. They also are connected to a vast network of regional and national colleagues and resources to augment their own expertise.

"That's my role as a specialist. I'm spending every day, or as much time as I need to, to look up the most up-to-date, the most current information and make interpretations based on my background. We can look up or call colleagues who may be dealing in the same situation, or may have dealt with it three or four years ago, and learn how they handled it."

"I think what we offer is a knowledge base that is very unique. To illustrate it most clearly, I am a plant pathologist so within agriculture or production agronomy, for lack of a better word, I am a specialist. I am even more specialized because I focus on the organisms that can cause disease. That's a skill set that a lot of people in other agencies would have, but I feel we have a unique network whether it's our county agents, our industry contacts, or regional colleagues, because we're communicating and working with them in collaborative joint activities. I think we are probably the most up-to-date group to provide the information because we spend every day on it. Most of us, in particular in my area, we're in the same situation that the growers are. We are conducting field trials. I had plots under water. I was asking the same questions of myself: What might we expect? Will we lose the plot? It's that kind of inherent working knowledge that makes us unique."

"I have actual real research on these things. That makes our advice fundamentally different and sometimes unexpected. Sometimes we advise things that are unexpected because we're not just basing our advice on the common notions that get passed around continuously through newspaper articles and such. I think we brought something unique and quite a bit more valid."

"It was interesting that there were issues surrounding this flooding that were very contentious, but generally, the people who are in the trenches trying to solve the problem, for the most part, are just really happy to have someone or some organization that can come in and provide them with some good solid information. That gives them a place to start from and a place to work forward from. A lot of times the contention comes from lack of understanding of what the

problem really is. There is the specific problem, for instance, they say homes are flooded. Where the contention comes in is when people start blaming one another for why the flooding occurred or saying 'if the town hadn't done this, this wouldn't have happen' or 'if the state hadn't done this, this wouldn't have happened.' Very often when you come in with good scientific information, you can take a lot of those things off the table right away. When homes get flooded, people's emotions are high, of course, especially when it's flooding that persists for so long. It helps anyone if you can understand what's going on. It's a natural event. It's not some action by some other group that caused this."

4. Extension provided multiple delivery strategies necessary to fit the educational needs of different people in different situations. As an educational institution with expertise in adult and non-formal education, communications, and outreach delivery, Extension was able to use an integrated, multi-strategy approach in its flood response to meet the needs.

Positive Impacts on Flood Victims

Evidence of impact was seen throughout this report in the presentation of the findings. Summarized below are 10 impact areas in which Extension's contribution positively benefited individuals, families, producers, businesses and communities across southern Wisconsin. These may serve as the basis for more focused outcome and impact measurement in the future. These results may not be attributable to Extension alone; they indicate the result of Extension's contributions.

Impact areas:

"Village officials developed understanding that flooding was related to widespread ground water issue...that understanding helped them move forward."

1. Increased awareness and knowledge. People increased their understanding and knowledge, for example, the attributes and value of effective land and water conservation practices; the nature and reason of flooding; what state and federal disaster resources were available and procedures to obtain them; how to handle flooded basements and properties; the need to talk with the crop insurance adjusters before tilling up a field to avoid losing crop insurance refunds; how to remediate flood damaged property; and how to protect family health.

One client who participated in the Economic Development and Flood Recovery Tour observed, *"A lot of questions were answered in my mind about how to protect our Village. ...the tour showed innovative, simple and even common sense approaches to flood proofing-applicable to both business and residential structures. I was also inspired by how they turned the flood plain into a profitable campground. On the return trip home we talked about the things we'd seen and the possibilities for Gays Mills.*

2. Increased skills and abilities. Many people increased their skills and abilities in being able to deal with their situation and to plan for future emergencies such as how to assess the cost/yield benefits of alternative decisions; how to assess flood damage and environmental quality; and how to plan for future floods.

3. Improved decision making. Extension's contributions helped individuals, businesses, local government officials and communities make

informed decisions related to crop and field management; lawn and garden management; fertilizer, pesticide and herbicide use; financial management; food and water safety; family health; conservation practices; and preparedness planning.

4. Increased access to resources and financial assistance such as water testing; disaster assistance, and private sector assistance (e.g., manure pumpers). Extension's assistance, in particular, with estimates of crop losses and damage assessments led to disaster declarations that made financial assistance available. Many residents were successful in gaining necessary resources with economic, environmental and human payoffs.

“One of my most important reminders to producers was to apply for the Trait Loss Refund from their seed dealer, if they had crops with technology fees, before tilling the field and replanting. A majority of producers were ready to replant their fields and would have lost the \$30 to \$93 per bag of the Trait Loss Refund had they not applied for the refund on their lost acreage prior to replanting.”

5. Reduced stress and anxiety. Extension's presence and assistance helped reduce the stress and anxiety of people affected by the flood. Many people were relieved to have a known source to answer their questions and where they could receive support during the difficult and stressful time.

6. Reduced losses and risks. As a result of Extension information and support, producers, businesses, families and communities were able to reduce their losses and risks; e.g., fertilizer recommendations, alternative crops to plant. In the words of one educator, *“Producers were able to salvage something out of a shortened growing season by planting alternative crops and using alternative practices.”*

7. Preserved or improved health conditions, for example through well and groundwater testing, averting food contamination, and safe handling of wastes.

8. Reduced environmental and economic losses and damage. Individuals, businesses and communities were able to reduce their losses and property damage as a result of the Extension contributions; for example, flood and waste waters did not back up into basements nor close downtowns; market gardeners found alternative markets for their produce. From one educator, *“Many producers I worked with were able to forward market at least a portion of their production at price levels exceeding \$6 per bushel and in some situations \$7 per bushel.”*

9. Improved preparedness planning. Families, businesses and communities are better equipped and are involved in emergency planning – preparing and managing these events in the future versus seeing them as a one-time event. Improved planning should help mitigate disasters in the future

10. Improved local and state agency performance. Extension helped coordinate local action, helped enable Emergency Centers be better equipped and able to perform their function, and provided information and assistance to local and state agencies that helped them accomplish their duties (e.g., disaster reporting) and perform more effectively and efficiently.

How can Extension be better prepared for the next emergency?

County educators and state specialists provided more than 45 comments touching on the question of how Extension's capacity to respond to an emergency might be improved. Their comments fell into seven categories: Extension role; communications; strategies; coordination; training; challenges; and lessons learned.

In sum, they suggested that Extension should clarify its role in emergency situations and ensure that faculty and staff, particularly new personnel, are aware and oriented to roles and responsibilities. They called for greater inter-agency coordination and communications to avoid duplication and competing information; and for greater sharing, coordination and support across Extension – who to go to for what including a “go to” spot on the web and increased cross-county sharing during a crisis. They suggested developing templates to quickly present a unified Extension look and creating searchable and indexed data banks of emergency information and disaster-related articles/materials. Those who have received training in the Incident Command System (ICS) recommend this for others as well as establishing personal relationships with emergency management units. Such relationships are considered key to an effective local response. Several educators recommended that the planning and reporting system include a designated place for capturing the emergency response effort. Others reiterated the need for ongoing documentation of experiences and lessons learned to inform future preparedness and response.

What did we learn?

Local action involved a mix of activities, most prominently the distribution of information, individualized assistance, and help with official loss/damage estimates. Extension faculty and staff worked side-by-side with local communities, farmers and businesses as well as with local, state and federal agencies to respond to the floods. Each county and situation was different: the nature and scope of the disaster; the reasons for the disaster; who was affected and how – their needs and issues; competencies, resources and roles at the local level. Extension worked to customize the response to the local situation.

While the nature of the flood hit agriculture and the cropping sector in particular, the needs and issues were widespread. Individuals and families dealing with food, water safety and family health issues needed Extension assistance as well as local emergency units, businesses, planning groups and officials. A mix of expertise at the county office level and within state specialist ranks was required. Further analysis of who across Extension responded, how and why may be useful.

The ExtensionResponds Web site was widely used. It contained resources relevant to all facets of a flood disaster, not just agriculture. Electronic technologies used by Extension facilitated rapid, wide dissemination and sharing of information. National networks such as EDEN and eXtension provided valuable resources.

Although flood waters had receded in most areas by July 2008, the need for local assistance had not. Extension's role continues long after an initial crisis is over.

Various factors enabled Extension to be able to respond quickly with relevant, factual and unbiased information – Extension's local presence; state expertise research base; past experience and existing resources; multiple communication channels; multi-pronged outreach strategies; wide networks of resources and expertise on which to

draw; existing relationships and collaborations; and the county to county and county to campus connections. Many of these factors are unique to Extension, positioning Extension to play an important role in disaster mitigation and recovery.

The partnership of the county staff working with campus specialists allowed the development of targeted and unique educational materials to address specific local situations. Specialists moved quickly and effectively to support local efforts with meetings, one-on-one support, resource development and delivery. Extension's community-campus-regional-national network helped meet the crisis and speed recovery.

Individuals, families and businesses benefited in many ways that resulted in reduced health, economic and environmental risks. Ten impact areas were identified with examples of positive impacts ranging from increases in knowledge, skills and improved decision making to improved preparedness planning, access to resources and financial assistance and reduction in stress, risks and economic and environmental losses.

Local, state and federal disaster agency personnel received valuable support from local Extension offices in reaching affected citizens with information and advice.

The effectiveness and efficiency of Extension's local response depends greatly on personal relationships, trust and inter-agency collaboration.

It is difficult to track numbers who are reached and who benefit from Extension's disaster assistance. Information is picked up and redirected through multiple and often unknown channels. It appears certain, however, that across the region, thousands of Wisconsin citizens were assisted through and benefited from Extension's efforts.

There is a need to continue improving the emergency response skills of county and state educators, clarify responsibilities and improve communications and collaboration across UW-Extension and inter-agency. A few counties, in particular, seemed to respond as a team but it is unclear whether that influences response effectiveness.

An evaluation such as this produces a wealth of data. The many open-ended questions on the survey and the specialist interviews revealed many insights that could be turned into structured questions for future evaluations. Some questions need rewording and further validation. Agents and specialists often do not have information necessary for measuring impact. Keeping contact information and evidence of benefits is important for federal reporting as well as other reporting needs. Collecting information from local residents and users of the Extension assistance (producers, agency representatives, businesses, and local officials) would be useful to determine value and benefit.

Recommendations

Review all the suggestions that were provided about how to improve Extension's response in emergencies and determine next steps.

Train all county Extension faculty in the Incident Command System (ICS) used by federal and state emergency management agencies. The ICS establishes protocols for local emergency response and should help define the official local role of Extension

offices and staff in future crisis response situations along with other county employees.

Create a specific place within the Extension Planning and Results System (PRS) for reporting on emergencies. Include indicators and specifications for data to be collected and reported as detailed in this report. A search of the PRS in February 2009 yielded 7 success stories and 4 impact statements – clearly not representative of the 2008 Extension response.

This evaluation focused on describing the response from the perspective of those in Extension who were most involved. Additional sources of information would be helpful. Further study is necessary to explore best practices and what works well/not well under different conditions. An ongoing collection of lessons learned from disaster response should be considered.

Appendix 1. List of counties/water basins involved in 2008 flood (survey data)

County/Water basin	# of respondents	Program area
1. Calumet	1	ANRE
2. Columbia	4	ANRE, FL, CNRED, 4-HYD
3. Crawford	3	ANRE, CNRED, FL
4. Dane	1	ANRE
5. Dodge	1	ANRE
6. Fond du Lac	1	ANRE
7. Grant	1	CNRED
8. Green	1	ANRE
9. Iowa	2	ANRE, FL
10. Jefferson	1	ANRE
11. Juneau	1	FL
12. Kenosha	1	Other
13. LaCrosse	2	ANRE (2)
14. Manitowoc	2	ANRE, FL
15. Marquette	1	ANRE
16. Not listed	1	
17. Racine	1	FL
18. Richland	1	FL
19. Rock	1	ANRE
20. Sauk	2	ANRE, FL
21. Sheboygan	1	CNRED
22. Vernon	1	FL
23. Walworth	1	FL
24. Washington	1	ANRE
25. Winnebago	1	FL
Lower Wisconsin River Basin	1	CNRED
Upper/lower Rock River	1	CNRED
Totals		
25 counties		
2 water basins	36	

ANRE: 16 educators, 15 counties

FL: 11 educators, 11 counties

CNRED: 6 educators, 4 counties; 2 water basins

4-HYD: 1 educator, 1 county

Counties where ANRE county educators reported flood response activity

Calumet
Columbia
Crawford
Dane
Dodge
Fond du Lac
Green
Iowa
Jefferson
LaCrosse
Manitowoc
Marquette
Rock
Sauk
Washington
15 counties

Counties where FL educators reported flood response activity

Columbia
Crawford
Iowa
Juneau
Manitowoc
Racine
Richland
Sauk
Vernon
Walworth
Winnebago
11 counties

Counties and water basins where CNRED agents reported flood response activities

Columbia
Crawford
Grant
Sheboygan
Lower Wisconsin River Basin
Upper/Lower Rock River
4 counties and 2 water basins

County where 4-HYD county agent reported involvement

Columbia

Appendix 2. List of specialists interviewed (19 specialists)

Name of specialist	Program Area	Disciplinary area
Chris Boerboom	ANRE	Weed science Agronomy
Paul Esker	ANRE	Plant pathology – field crops
Carrie Laboski	ANRE	Soil Science
Paul Mitchell	ANRE	Agriculture and applied economics
Joe Lauer	ANRE	Agronomy - Corn
Laura Jull	ANRE	Horticulture – woody ornaments
Shawn Conley	ANRE	Soybean and small grains Agronomy
Pamela Ruegg	ANRE	Dairy – milk quality
Dan Undersander	ANRE	Agronomy - forage
Dick Wolkowski	ANRE	Soil science
Pat Walsh	CNRED	Solid and hazardous waste
David Liebl	CNRED	Solid and hazardous waste
Tim Baye	CNRED	Business development
Kevin Erb	CNRED	Water quality
Barb Ingham	FL	Food safety
Mary Brintnall-Peterson	FL	Family care giving- Aging
Dave Riley	FL	Child and family studies
Madeline Gotkowitz	WGNHS	Hydrogeology
John Attig	WGNHS	Quaternary geology

ANRE - Agriculture and Natural Resources

CNRED - Community, Natural Resources and Economic Development

FL - Family Living

WGNHS - Wisconsin Geological and Natural History Survey

Appendix 3. Flood related news coverage

The following clips are samples of flood-related news coverage mentioning UW-Extension between June 13-25, 2008

[Farmers try to keep their profits afloat](#) Greater Milwaukee Today - WI

Joe Bollman, the crops and soil agent for the **University of Wisconsin**-Jefferson extension, said it's too late in the season to replant corn. ...

[Experts say state crop losses will be extensive](#) Chicago Tribune - United States

UW-Extension crops agent David Fischer says in Dane County alone, farmers collectively could lose more than \$20 million as a result of ruined crops.

[Farmers Clean Up After Floods](#) WKBT - La Crosse, WI

Were talking the end of June, beginning of July before they can start planting again," says Tim Rehbein of the **UW Extension** Office. ...

[Crops not hit as hard as in other parts of state](#) Leader-Telegram - Eau Claire, WI

There's just a few soybeans to plant yet in some of the wetter fields that don't drain well," said Jerry Clark, crops and soils educator for **UW-Extension** in ...

[Section of I-94 still closed, farmers hurt and Lake Delton gets ...](#) New Richmond News - New Richmond, WI

University of Wisconsin-Madison agronomist Joe Lauer says it's too late to replant corn except for livestock feed and Sheboygan County ag agent Mike Ballweg ...

[Corn drowns just as global demand soars](#) Milwaukee Journal Sentinel - Milwaukee, WI

Crop insurance isn't a substitute for lost acreage, said Mike Ballweg, a **University of Wisconsin Extension** agent in Sheboygan County. ...

[Rainfalls cause nitrogen loss](#) Beaver Dam Daily Citizen - Beaver Dam, WI

Dr. Carrie Laboski, **University of Wisconsin-Madison Extension** soil scientist, explains how to evaluate the potential for nitrogen loss and corrective ...

[Farmers seeing a soggy outlook](#) Green Bay Press Gazette - Green Bay, WI

... been really detrimental to the alfalfa and getting it harvested," said Aerica Opatik, ag agent with Kewaunee County **University of Wisconsin-Extension**. ...

[Livestock weather the floods](#) Wisconsin Radio Network - Madison, WI

That could be a good sign, according to Dave Wachter, **UW-extension** Dairy and Livestock agent in Grant and Lafayette Counties. "Well, it's possible that ...

[Storms take toll on area crops](#) La Crosse Tribune - La Crosse, WI

"The majority of crops are OK" in Monroe County, said Bill Halfman, that county's **UW-Extension** agriculture adviser. "They're behind where they were the last ...

[County crop loss from storms estimated at \\$20M](#) Herald Times Reporter - Manitowoc, WI

... severe storms that swept through Manitowoc County last week, said Scott Gunderson, county **University of Wisconsin-Extension** dairy agent, on Wednesday. ...

[Farms absorb huge hit](#) The Reporter - Fond du Lac, WI

"It's been pretty extensive," said Mike Rankin, a crops and soil agent for the **University of Wisconsin Extension** Office in Fond du Lac. ...

[UW-Extension Responds to the Flood](#) Wisconsin Ag Connection - Marshfield, WI

Extension Responds provides accurate, objective, research-based information developed in partnership by UW-System and **UW-Extension** faculty and Cooperative ...

[Feeling the Flood at Your Supermarket](#) WBAY - Green Bay, WI

"It's a big chunk," **UW Extension** ag. agent Mark Hagedorn said. An estimate on crop damage in Wisconsin should be available within a week.

[Damage figures pour in](#) Beaver Dam Daily Citizen - Beaver Dam, WI

Matt Hanson, **UW Extension** crops and soils agent, said the staggering \$29 million in crop damages translated into 45000 combined acres of corn, soybeans, ...

[Experts: Dams would make flooding worse](#) Baraboo News Republic - Baraboo, WI

One of the dams just downstream of Circus World Museum made water levels higher near the historic site, said **University of Wisconsin-Baraboo Extension** Lower ...

[UW Offers State Farmers Help](#) Wisconsin Agriculturist - WI

As publicly funded institutions, University of Wisconsin-Madison and **UW-Extension** are committed to helping Wisconsin and our neighbors rebuild and recover ...

[USDA estimates \\$15 million in damages to Rock County crops](#) Janesville Gazette - Janesville WI

Some producers said it will mean a dent in grain for their cattle, and **UW Extension** Agent Jim Stute said it's not likely any of the fields can be replanted. ...

[County board chairman offers his thanks for hard work](#) Vernon County Broadcaster - Viroqua WI

... Sheriff's Department, Solid Waste, County Corporation Counsel, Zoning, Unit on Aging, **UW-Extension**, Red Cross, Donation and Volunteer Coordinators, ...

[Plenty of health concerns as waters recede](#) Janesville Gazette - Janesville, WI

Phil Pellitteri, **UW Extension** entomologist with UW-Madison, has been warning people that just because we're experiencing a 100-year flood, the correlation ...

[Column: Follow steps to keep food safe during emergencies](#) Wausau Daily Herald - Wausau, WI

If you would like more information on food safety please feel free to contact Jackie Carattini, Family Living Agent for **UW-Extension** Marathon County at ...

AgriView. Article "Crop Insurance, Disaster Assistance: Tips for Working Through the Rules" summarized extension bulletins for flood of 2008. June 19, 2008.

Media Newswire. Press Release "Tips/Perspectives on the Impact of Midwest Flooding" (http://media-newswire.com/release_1067772.html) included links to "Disaster Assistance for Uninsured Farmers Affected by Recent Flooding" and gave contact information. June 17, 2008.

Mitchell, P.D. 2008. Flooding on the Farm: The Effects of Floods on Agriculture. Storm Water Solutions Runoff, Feature article in August 2008 e-newsletter,

<http://www.estormwater.com/Flooding-on-the-Farm-article9528>

"Intricate workings of water described at town meeting" Aug. 6, 2008 Home News – Spring Green, WI

Appendix 4. List of resources developed by UW-Extension specialists (sample, not all)

P. Mitchell

Disaster Assistance for Uninsured Farmers Affected by Recent Flooding: June 11:
<http://www.aae.wisc.edu/mitchell/CropInsurance/Disaster%202008.pdf>

Late and Prevented Planting Coverage and Replant Provisions for Wisconsin Farmers, June 9

http://www.aae.wisc.edu/mitchell/CropInsurance/Late_Prevented_Planting.pdf

Practical Recommendations for Farmers Filing Late and Prevented Planting or Replant Claims: How to Work with Your Agent and Insurance Company jun 11:

<http://www.aae.wisc.edu/mitchell/CropInsurance/Recommendations%20for%20Farmers%202008.pdf>

New Disaster Programs in the 2008 Farm Bill August 18:

http://www.aae.wisc.edu/mitchell/CropInsurance/New_Disaster_Programs.pdf

New Disaster Assistance for Wisconsin Farmers Affected by the 2008 Floods August 18: http://www.aae.wisc.edu/mitchell/CropInsurance/Disaster_Assistance_for_2008.pdf

Slide presentation in Platteville on new farm bill requirements, including what farms need to do now to be eligible for aid for June flood damage 9/10/2008:

<http://www.aae.wisc.edu/mitchell/CropInsurance/NewFarmBillRequirements.ppt>

Ted Baye in Grant County was the agent who was the lead contact for that meeting.

D. Riley

“Tips for helping children handle stress of an emergency”

K. Erb

“Manure Applicators ‘Save the Downtown’” Professional Nutrient Applicators Association of Wisconsin Newsletter, June 2008.

<http://www.wimanuremgt.org/spreaderlog/index.cfm>

M. Gotkowitz & J. Exo

“The Role of Geology and Groundwater in 2008 Flooding in the Spring Green Area”

M. Gotkowitz & J. Attig

Slide presentation “Water and the Valley – Issues Underlying the Flood of 2008”

J. Lauer

“Planting Corn in June and July! – What can you expect?” Agronomy Advice, June 2008

“Flooding Impacts on Corn Growth and Yield”

D. Liebl

“Climate Change Discussion” Water Team Meeting, June 2008

“Responding Effectively to Climate Variability” Workshop Agenda, July 10, 2008

S. Grabow

“Flood Response Assessment Workshops: Proceedings Report” August, 2008

Wisconsin Crop Manager, June 12, 2008

[http://ipcm.wisc.edu/Portals/0/Blog/Files/17/564/WCM_15\(14\)b.pdf](http://ipcm.wisc.edu/Portals/0/Blog/Files/17/564/WCM_15(14)b.pdf)

E. Cullen “Corn Rootworm Hatch Update for Wisconsin”

B. Jensen “Seedcorn Maggot Injury to Soybean”

“Diagnosing Early Season Corn Insect Damage

P. Mitchell, “Replant Provisions and Late & Prevented Planting for Insured Crops”

“Disaster Assistance for Uninsured Farmers Affected by Recent Flooding”

- “Practical Recommendations for Farmers Filing Late and Prevented Planting or Replant Claims: How to Work with Your Agent and Insurance Company”
- S. Conley & P. Esker, “Assessing Flood Damage to Soybean”
- B. Hudelson, A. Joy, A. Gibbs, & B. Weber “UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update”
- P. Esker, & S. Conley, “Winter Wheat Update For Early June and Wheat Diseases”
- C. Boerboom, “Herbicides, Rain, and Replanting”
- P. Esker “Folicur Registered with EPA for Barley and Wheat”
- C. Laboski, “Potential for Nitrogen Loss from Heavy Rainfalls”
- A. Bussan, “Potato and Vegetable Crop Update”
- R. Groves, “Vegetable Insect Update”
- J. Colquhoun, “Herbicide considerations when replanting after crop failure”
- W. Stevenson, “Vegetable Disease Update”

Appendix 5. List of collaborators reported during specialist interviews

Five said there were no other collaborators in their flood relief work. Some of the collaborators listed below might be more recipients of service.

University Network:

- Iowa State Agronomy colleague
- Madison campus
- University of Missouri Professor Grover Shannon
- UWEX Team Grains
- UWEX Team Forage

State/National Organizations:

- Assn of Flood Plan Managers
- Dept of Ag: Food Safety Division
- Dept of Ag Trade & Consumer Protection
- DNR
- FEMA
- Hazard Mitigation Team
- Health & Human Services
- National Corn Growers Assn.
- Professional Nutrient Applicators
- Small Business Development Center
- Soil Conservation and Soil Erosion
- State Dept of Transportation
- State Emergency Management
- US Geological Survey Water Resource Division
- Wisconsin Corn Growers Association
- Wisconsin Farm Bureau

Local Organizations:

- Banks
- Chambers of Commerce
- Economic Development executives & their boards,
- Local, municipal governments
- Waste water districts: Madison, Milwaukee

Individuals Mentioned:

- Larry Bowman at River Falls
- Carrie Laboski
- Ken Potter, UW-Madison Engineering
- Russ Raeder, USDA Farm Service Agency, who really understands disaster relief
- Dick Wolkowski

Various multi-state collaboratives.

Appendix 6. List of audiences reached by county/water basin (n=36 educators)

County	# of respondents	Involved Ag Producers	Involved individuals, families	Involved Homeowners	Involved businesses	Involved Youth
Calumet	1	x				
Columbia	4	x	x	x	x	
Crawford	3	x	x		x	x
Dane	1	x			x	
Dodge	1	x				x
Fond du Lac	1	x				
Grant	1					x
Green	1	x				
Iowa	2	x	x	x		x
Jefferson	1	x	x	x	x	
Juneau	1		x			
Kenosha	1	x				
LaCrosse	2	x	x			x
Manitowoc	2	x	x			x
Marquette	1	x	x		x	
Racine	1		x			x
Richland	1		x	x		
Rock	1	x	x			
Sauk	2	x	x			x
Sheboygan	1		x	x		
Vernon	1		x	x		
Walworth	1	x	x	x		
Washington	1	x				
Winnebago	1		x	x		x
Not listed	1	x	x	x	x	
Water Basins -Lower WI River -Upper/lower Rock	2	x	x			
Totals	36	19	18	9	6	9