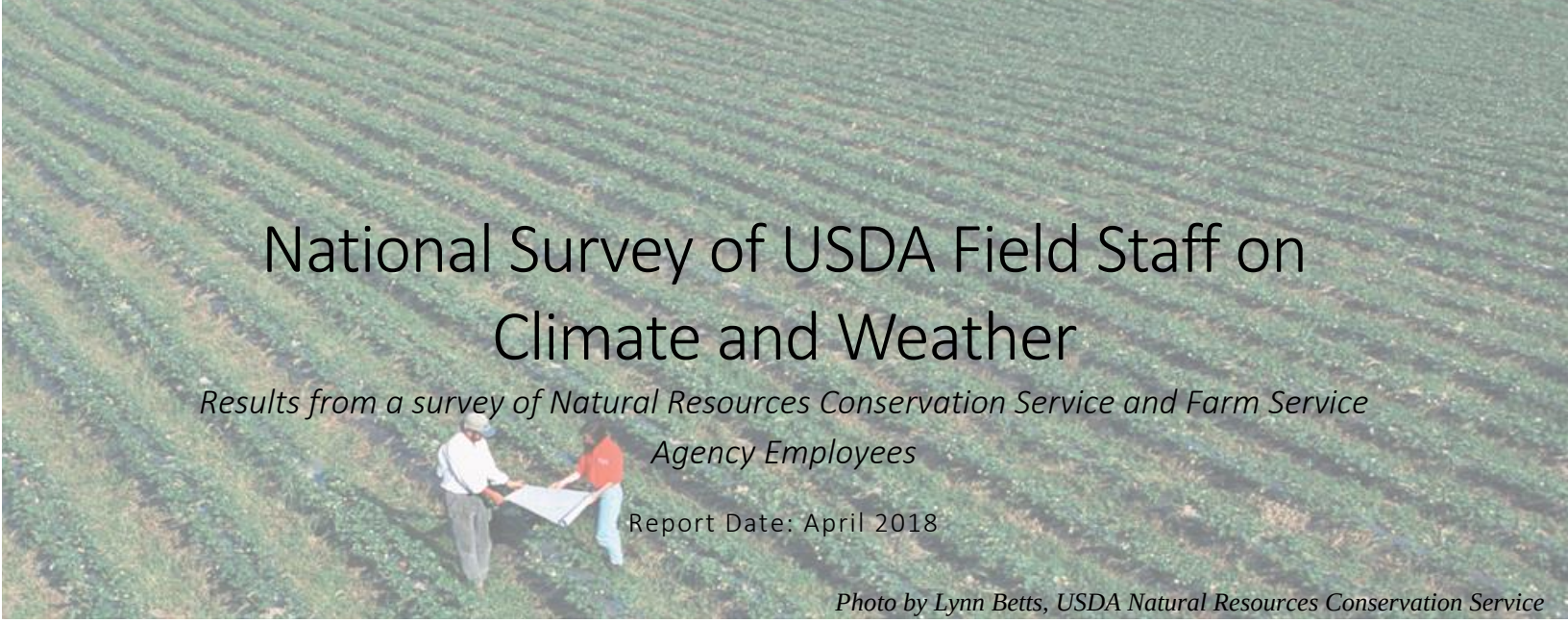

National Survey of USDA Field Staff on Climate and Weather

Results from a survey of Natural Resources Conservation Service and Farm Service Agency Employees

Report Date: April 2018

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Acknowledgements:
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Mary Carey, USDA Farm Service Agency
Dan Lawson, USDA Natural Resources Conservation Service, USDA Climate Hubs
Mike Wilson, USDA Natural Resources Conservation Service
Meredith T. Niles, University of Vermont
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Suggested citation:

Wiener, S., Roesch-McNally, G.E., and Schattman, R.E. (2018). *National survey of USDA Field Staff on Climate and Weather; Results from a survey of Natural Resources Conservation Service and Farm Service Agency Employees. Washington, DC: USDA Climate Hubs.*

USDA Climate Hubs
U.S. DEPARTMENT OF AGRICULTURE

FSA FARM SERVICE AGENCY

FOREST SERVICE US DEPARTMENT OF AGRICULTURE

United States Department of Agriculture NRCS Natural Resources Conservation Service

The University of Vermont

FARM SERVICE AGENCY:

NATIONAL SURVEY ON CLIMATE AND WEATHER

Prepared by Rachel Schattman (USDA Northeast Climate Hub), Sarah Wiener (USDA Southeast Climate Hub), and Gabrielle Roesch-McNally (USDA Northwest Climate Hub)

Key Points

65% of FSA employees who responded to the survey believe that it is important for producers to adapt to climate change to ensure the long-term viability of U.S. agriculture.

14% of respondents agreed or strongly agreed that they personally have the knowledge to help producers deal with weather-related threats.

→ Opportunities for future collaboration between FSA and other agency partners include outreach and education on climate- and weather-related issues by linking them to existing programs that help producers to reduce climate-related risks.

Project Overview

In November/December of 2016, a survey collaboratively designed by the USDA Climate Hubs, FSA, and the University of Vermont was administered to capture FSA field staffs' beliefs and attitudes related to climate change and potential impacts, as well as their perceptions about the risk that weather variability poses for U.S. farmers. The survey also investigated the types of climate and weather tools FSA staff currently use in their work with land managers. Over 10,000 FSA staff throughout the U.S. were contacted for the survey; in total 4,621 FSA staff responded (response rate = 42%, calculated using the RR4 method of the American Association for Public Opinion Research, AAPOR).

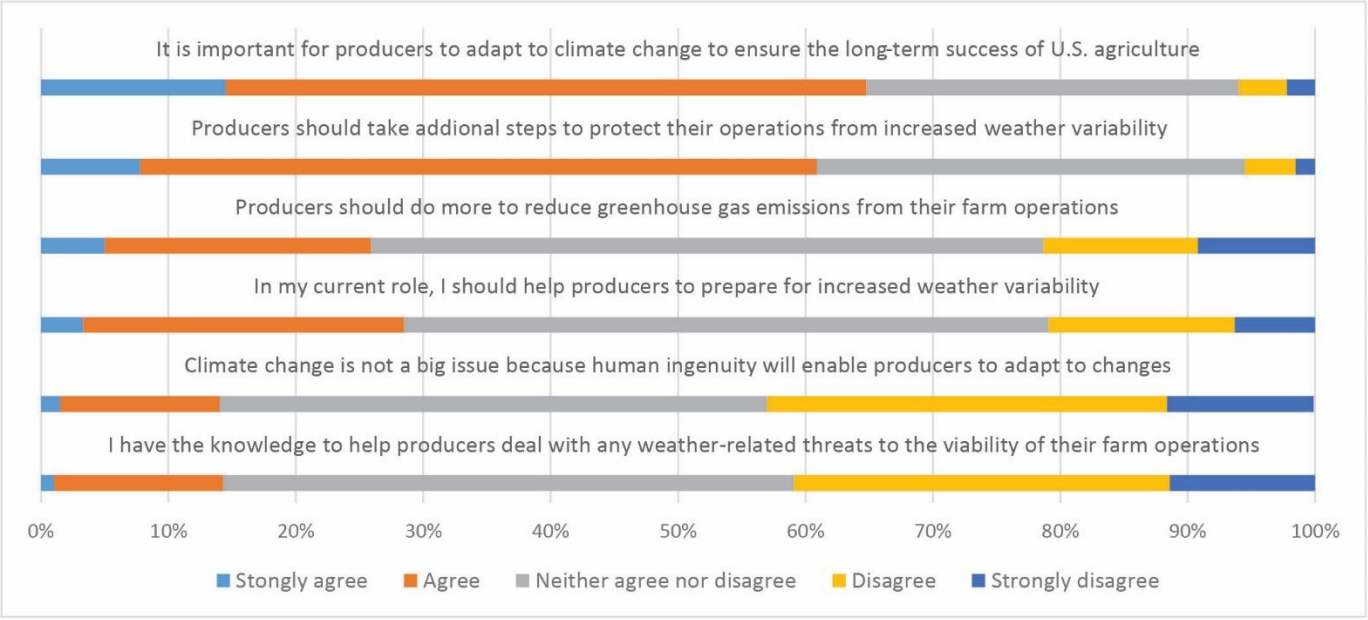

Figure 1: FSA respondents' percent agreement with climate and weather statements (n=3,572).

USDA Climate Hubs
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FSA FARM SERVICE AGENCY

The University of Vermont

Survey Result Highlights

FSA employees reported using weather and climate resources when discussing the following topics with producers: crop rotations/field assignments (32% of respondents); crop/variety choices (35%); purchasing crop insurance or enrolling in the Noninsured Crop Disaster Assistance Program (NAP) (51%); and planting or harvest schedules (42%). One third (33%) of respondents do not use historical weather trends and/or forecasts for any of the topics listed in the survey. Respondents do not use or are not familiar with many of the weather-related resources listed in the survey, with the exception of U.S. Drought Monitor (74% use this resource) and livestock heat indices (42% use these resources, which are often state-specific). Nearly one-third of respondents report using the Farmers' Almanac as a weather resource in their professional service.

When asked to rank level of concern for 18 different climate and weather effects, the majority of states and territories (40 out of 53) reported the most concern with longer dry periods and drought (Figure 2). Most respondents agree or strongly agree that there is increasing variable and unusual weather in their areas (59%), and that to cope with increasing climate variability, farming practices will need to change (54%). Additionally, nearly half (42%) agree or strongly agree that extreme weather events in recent years have affected the long-term management goals of producers, and that there is increased need for FSA's programs in their service area due to changing weather patterns (42%). One-third agree or strongly agree that they would like climate or weather forecasts to inform the services they provide in the future, while 61% agree or strongly agree that producers use climate information when making farm-related decisions.

Adapting to changing weather conditions is something the majority of respondents agree is important (Figure 1). Over half of respondents agreed or strongly agreed that producers should take additional steps to protect their operations from increased weather variability (61%), and that it is important for producers to adapt to climate change to ensure the long-term viability of U.S. agriculture (65%). However, only 14% agree or strongly that they personally have the knowledge to help producers deal with weather-related threats.

Discussion

The mission of the Climate Hubs is to develop and deliver science-based, region-specific information and technologies, with USDA agencies and partners, to agricultural and natural resource managers that enable climate-informed decision-making, and to provide access to assistance to implement those decisions. Based on the findings from this national level survey, we have identified three potential areas of future collaboration between the Climate Hubs and FSA: (1) provide training and support for FSA employees to work with and understand weather and climate data, tools, and resources; (2) better integrate specific weather and climate tools into specific FSA program areas; (3) hone outreach and education on climate- and weather-related issues by linking them to existing programs that help producers to reduce climate-related risks on farm (such as the Conservation Reserve Enhancement Program).

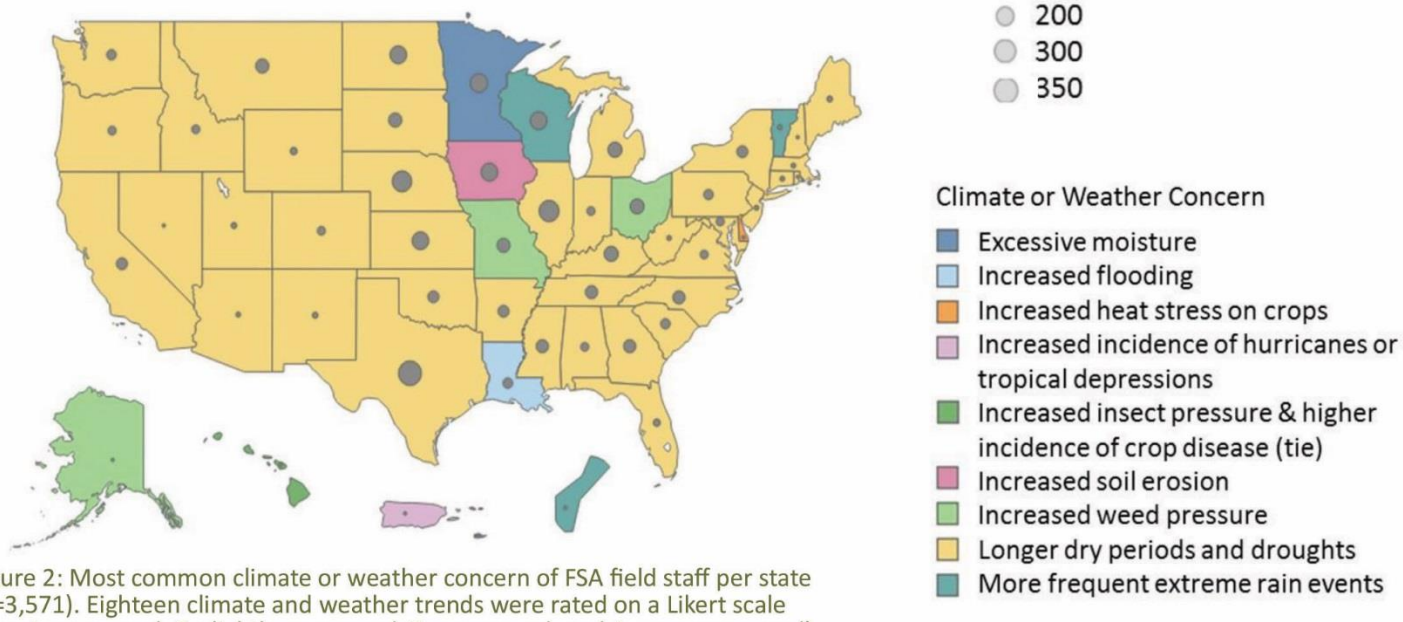

Figure 2: Most common climate or weather concern of FSA field staff per state (n=3,571). Eighteen climate and weather trends were rated on a Likert scale (1=not concerned; 2=slightly concerned; 3=concerned; and 4=very concerned).

Figures by Sarah Wiener. Photography credits: Rachel Schattman

NATURAL RESOURCES CONSERVATION SERVICE:

NATIONAL SURVEY ON CLIMATE AND WEATHER

Prepared by Gabrielle Roesch-McNally (USDA Northwest Climate Hub), Sarah Wiener (USDA Southeast Climate Hub), and Rachel Schattman (USDA Northeast Climate Hub)

June 2017

Key Points

70% of NRCS employees who responded to the survey believe that it is important for producers to adapt to climate change to ensure the long-term viability of U.S. agriculture.

49% of the respondents reported that they are confident in their ability to apply weather forecasts and information to the services that they provide.

→ Opportunities for future collaboration between NRCS and other agency partners include outreach and education on climate and weather-related issues by linking them to existing programs that help producers to reduce climate-related risks.

Project Overview

The USDA Climate Hubs, NRCS, and the University of Vermont collaboratively designed a survey, administered in February/March 2017, to capture NRCS field staff views and understanding related to climate change, weather variability, and potential impacts on agriculture. The survey also addressed NRCS employees' perceptions about the risk that weather variability poses for U.S. farmers. Over 8,000 NRCS employees nationwide were targeted and 1,893 NRCS staff completed the survey (response rate = 22.3%, calculated using the RR4 method of the American Association for Public Opinion Research, AAPOR). The three main positions held by respondents were District Conservationist (25%), Soil Conservationist (19%) and Soil Conservation/Engineering Technician (16%). The majority work at NRCS Service Centers (74%), followed by Area Offices (12%) and State Offices (10%).

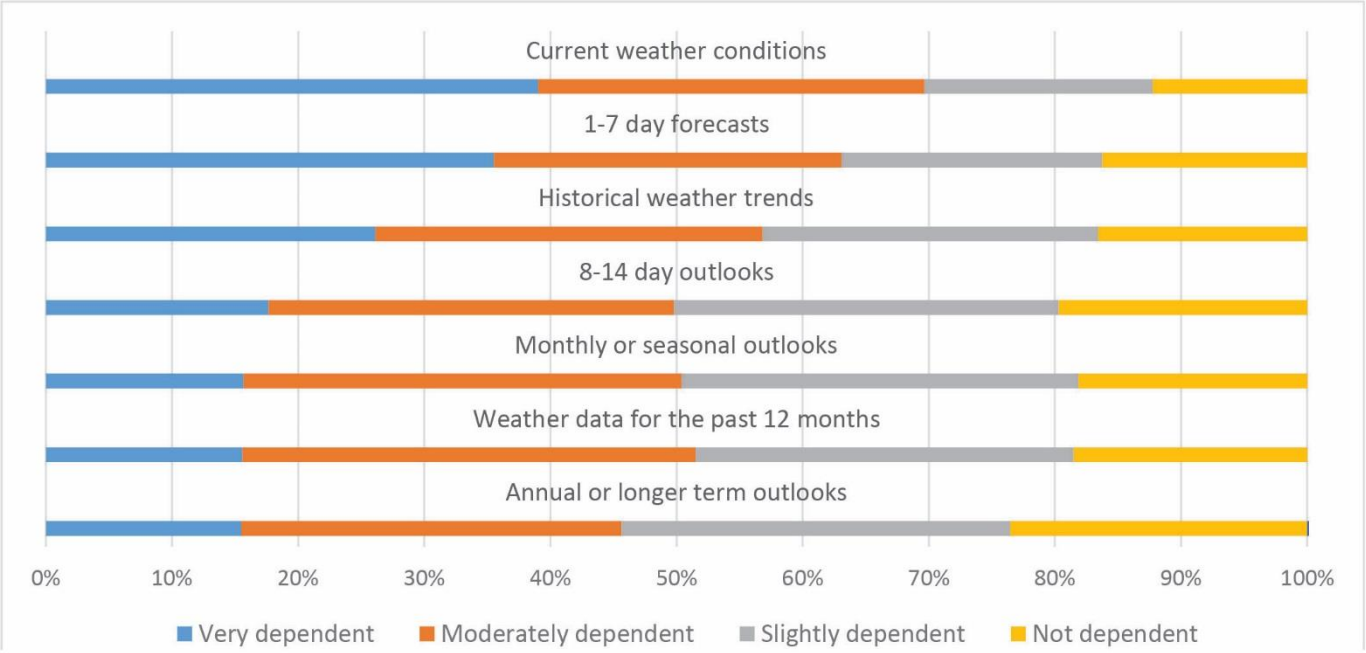

Figure 1: NRCS respondents reported dependency on weather and climate information

USDA Climate Hubs
U.S. DEPARTMENT OF AGRICULTURE

USDA United States Department of Agriculture
Natural Resources Conservation Service

The University of Vermont

Survey Result Highlights

NRCS employees most commonly integrate daily, weekly, or seasonal weather forecast information into guidance to clients for the following topics: in-field conservation practices (73%), grazing and forage management (71%), tillage (67%), livestock management systems (64%), and on-farm water management (60%). Survey respondents are most dependent on current and short-term weather information (1-7 day forecasts), and much less dependent on monthly and seasonal outlooks or annual and longer-term outlooks (Figure 1). Of 12 weather-related tools and resources, respondents most frequently use the U.S. Drought Monitor (68%), growing degree day tools (41%), and evapo-transpiration indices (38%).

NRCS employees reported regularly working with producers who have experienced adverse events/conditions in the past few years largely tied to extreme or variable weather events. Climate or weather trends reported to be the most concerning in each state vary (Figure 2). The majority of states and territories (29) reported producers are most concerned with longer dry periods/drought, followed by increased soil erosion (6), increased weed pressure (4), higher incidences of tree pathogens (4), and higher incidence of wildfire (3).

Most respondents (65%) agree or strongly agree that there is increasing variable and unusual weather in their areas, and that to cope with increasing climate variability farming practices will need to change (70% agree or strongly agree). More than half (52%) agree or strongly agree that extreme weather events in recent years have affected the long-term management goals of producers in their service area. Most respondents (65%) agree or strongly agree that producers use climate information when making farm-related decisions and 41% agree or strongly agree that there is an increased need for NRCS's programs in their service area due to changing weather patterns. The majority agree or strongly agree (66%) that they would like climate or weather forecasts to inform the services they provide in the future. While 53% of respondents believe that assisting producers to prepare for weather variability is part of their job, only 35% agree or strongly agree that they have the knowledge and technical skill to help producers deal with those threats.

Discussion

The mission of the Climate Hubs is to work with USDA agencies and partners to develop and deliver science-based, region-specific information and technologies to agricultural and natural resource managers, enabling climate-informed decision-making, and assisting in the implementation of those decisions. As a result of this survey analysis, we have identified three areas of potential collaboration between NRCS and the Climate Hubs: (1) providing greater access to and awareness of weather and climate related tools; (2) providing educational resources on the topic of climate science and global weather dynamics; (3) developing outreach and education messaging through the NRCS Public Affairs Division on climate and weather-related issues. Messaging could be linked to existing NRCS efforts, such as the Soil Health Initiative and to conservation practices that reduce risks, increase productivity, and build resilience across production sectors.

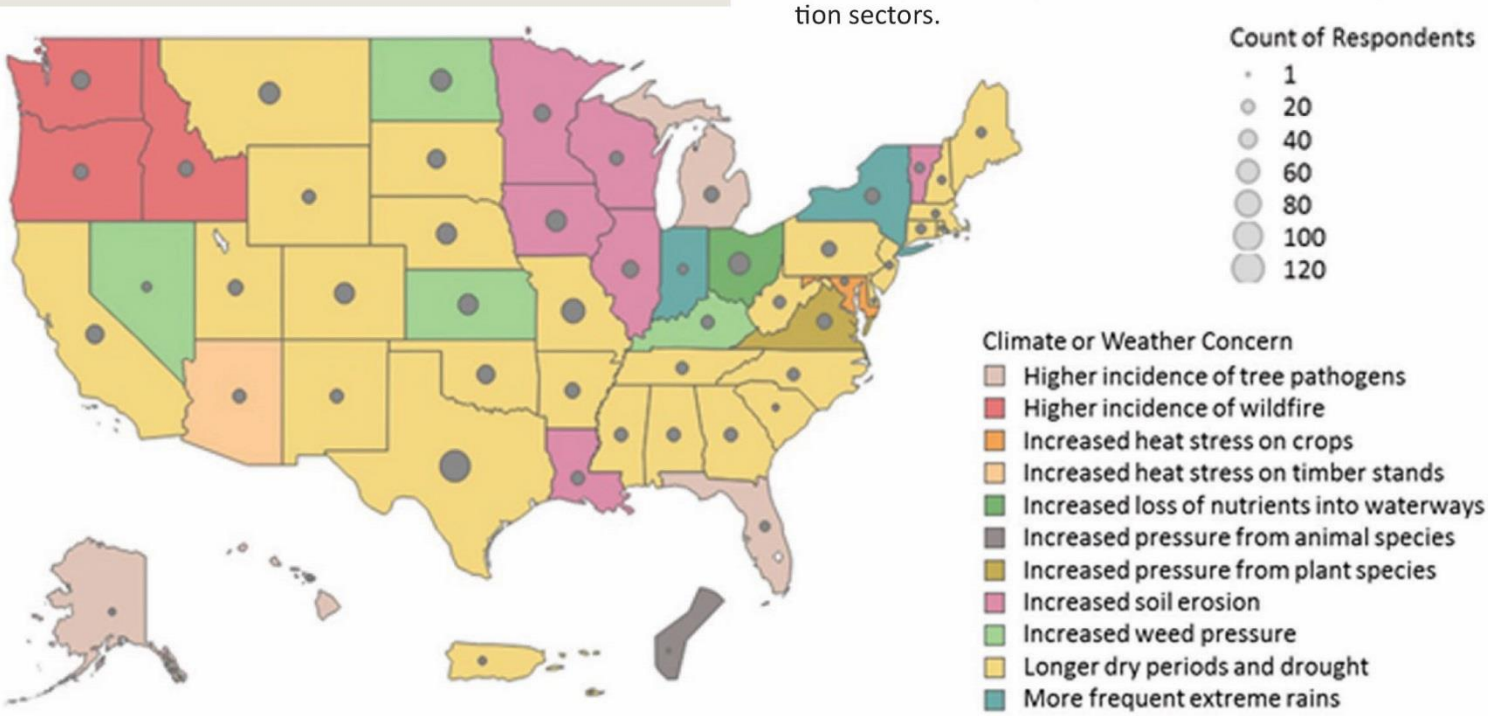

Figure 2: Most common climate or weather concern of NRCS field staff per state (n=1,376). Twenty-six climate and weather trends were rated on a Likert scale (1=not concerned; 2=slightly concerned; 3=concerned; and 4=very concerned

Figures by Sarah Wiener. Photography credits: Rachel Schattman

Contents

Introduction

Climate change adaptation and mitigation are issues critical to the long-term success of land management in the United States (Lal et al. 2011). USDA Natural Resources Conservation Service (NRCS) and Farm Service Agency (FSA) staff are in a unique position to support farmers, ranchers, and foresters to effectively adapt to changing weather patterns and climatic conditions through indemnities, low cost farm loans, conservation programs, and conservation technical assistance. Additionally, both agencies house a large number of employees that are in frequent contact with land managers through administration of these programs. To effectively provide this type of technical support to land managers, field staff must possess accurate information about climate change and weather variability, and applied knowledge about how these stressors are most likely to impact their clients.

If programmatic efforts can be made to improve climate-related technical assistance and support to NRCS and FSA clients, we must first understand (a) the level of knowledge about climate change that NRCS and FSA field staff possess, (b) the degree to which those field staff are comfortable or confident supporting farmers and ranchers on climate resiliency, and (c) the climate and weather stressors and related impacts about which service providers are most concerned. Once a baseline of these three variables is established, targeted professional development opportunities can be made available to ensure that field staff are poised to serve their clients in the context of more variable and extreme weather events driven by climate change.

To these aims, two surveys were collaboratively designed and administered by the USDA Climate Hubs, NRCS, FSA, and the University of Vermont to capture NRCS and FSA employee beliefs and attitudes related to climate change causes, potential impacts, and perceptions of climate-related risks specific to land management. Additional survey questions explored the types of climate and weather tools staff currently use in their work with land managers. The surveys were administered in November and December of 2016 (FSA), and February and March of 2017 (NRCS).

Methods

The surveys (see Appendices B and C) were designed and administered using the Dillman Tailored Design Method (Dillman et al. 2008), and were based on a template developed for the Useful to Useable project (https://mygeohub.org/groups/u2u) (See Prokopy et al. 2013). While the FSA and NRCS surveys followed the same themes and contained many identical questions, some questions and sub-questions were adapted to reflect the unique missions of the programs in those respective agencies. Human subjects research approval was granted by the Institutional Review Board at University of Vermont and the survey complies with exempt requirements under human subject research rules (UVM IRB Protocol Exemption Certification: CHRBSS: 17-0254). NRCS State Conservationists received letters from NRCS Deputy Chiefs, and FSA Deputy Administrators of Field Offices (DAFOs) were alerted to the survey via conference call. Employees were then sent an initial invitation to take the voluntary survey by State Conservationists and DAFOs, followed by three additional survey reminders sent each week during the course of a month.

Over 8,000 NRCS employees and 10,000 FSA employees throughout the U.S. were targeted for the survey. Employee contact information was gathered from publicly available service center directories. Employees with position titles that implied they did not work with land managers directly were filtered out from the final list of target respondents. The process of survey sample refinement was informed by both FSA and NRCS staff who have in-depth knowledge of their respective agencies. In total 4,621 FSA employees and 1,893 NRCS employees responded to the survey, resulting in response rates of 43% and 22%[1], respectively. The results of a non-response bias test suggests that there are few significant differences between survey respondents and non-respondents for both FSA and NRCS employees. However, the sample of NRCS respondents was slightly older than the target population of NRCS employees. As with all survey analysis, it may be that there are factors that influence response bias that are not accounted for. However, the results from this survey provide robust information on the challenges and opportunities associated with presenting weather and climate-related information to agency employees.

Although job titles were filtered to exclude those who do not work directly with land managers, respondents were also asked if they work directly with land managers at the beginning of the survey. For FSA and NRCS, 92% and 86% of respondents, respectively, indicated that they work directly with land managers. The results presented in the remainder of this report only include those who selected that they work directly with land managers.

Results

Respondent occupational highlights

Respondents from both agencies most commonly resided in county offices (FSA 95%; NRCS 74%; tables for this section can be found in Appendix A). The most frequent position descriptions held by NRCS respondents were District Conservationist (25%) and Soil Conservationist (19%), while FSA respondents most commonly reported being Program Technicians (56%) and County Executive Directors (22%). NRCS respondents were also asked about the sectors in which they work. The majority of NRCS respondents work directly with farmers (83%), followed by ranchers (51%), and forest landowners (44%)[2]. However, when asked in what sector they spend the majority of their time, 100% indicated that agriculture was their primary focus.

Respondents from both agencies were most likely to report highest participation in their programs by farms and ranches between 100-999 acres (FSA 54%; NRCS 47%). However, NRCS reported greater participation from small farms, defined as grossing less than $350k (48%), while FSA reported highest participation from midsize farms, defined as grossing $350k-$999,999 (49%). Of those NRCS employees who reported working with forest landowners, the majority of participation comes from small-scale operations that are between 20 and 199 acres (66%). FSA respondents reported grains, oilseeds, dry beans, and dry peas as the most common crop grown by the producers they serve (86%), followed by cattle and calves (80%), and alfalfa and other hay (71%). NRCS respondents reported that the majority of their clients produce cattle

[1] Calculated using AAOPR4 response rate calculator

[2] Percentages exceed 100% because participants were asked to choose all that apply.

and calves (83%), hay, forages and silages (70%), and grains, oilseeds, dry beans and dry peas (64%). Respondents were instructed to select all options that apply for this question.

Fewer than half of respondents reported operating, owning or having a financial stake in a farm or ranch (FSA 43%; NRCS 33%), and most of those employees reported that they manage, own, or invest in small farms, defined as gross sales less than $350,000 (FSA 75%; NRCS 83%). Fewer employees reported owning or having financial stake in a forest (NRCS 15%; this question was not asked of FSA respondents), and the majority of those respondents (87%) owned or had a stake in a small operation (under 2 million board feet per year). Only 3% of FSA respondents reported being a member of an FSA county or state committee.

Respondent demographic highlights

Most FSA respondents were white (86%), non-Hispanic (87%), and female (68%; tables for this section can be found in Appendix A). Most NRCS respondents were white (75%), non-Hispanic (71%), and male (63%). This is reflective of demographics for staff of both agencies. The average length of time employees have worked for their respective agencies and for USDA was 17 years. Slightly more than half of FSA respondents have completed either a 4-year college degree (46%) or a graduate degree (8%). The majority of NRCS respondents have completed a 4-year college degree (65%), with an additional 24% having completed a graduate degree. NRCS employees were also asked about their degree subject, and the most common responses were natural resource management (31%) and agronomy (21%).

Use of climate and weather tools

To understand how field staff use climate and weather resources, respondents were asked to report the types of resources they use, which they are most familiar with, and the programmatic context in which they applied these resources. The most common topics that were informed by weather trends and/or forecasts for FSA employees were crop yields (55%), purchasing crop insurance or NAP (Non-insured Crop Disaster Assistance Program; 51%), and planting or harvest schedules (42%; Figure 1). The top three topics for NRCS were in-field conservation practices (73%), grazing and forage management (71%), and tillage decisions (66%; Figure 2). Overall, 33% of FSA respondents and 8% of NRCS respondents do not use historical weather trends and/or forecasts for any of the topic options listed in the survey.

Respondents were also asked about their dependence on climate and weather information from a temporal perspective. Again, NRCS employees reported greater dependence overall on the suite of information included in this survey question than FSA employees (Figures 3 and 4). Both FSA and NRCS employees most commonly reported being very or moderately dependent on information related to current weather conditions (FSA 55%; NRCS 70%) with dependence diminishing with longer-term forecasts. Respondents from both agencies reported being very or moderately dependent on monthly or seasonal outlooks (FSA 37%; NRCS 50%) and annual or longer term outlooks (FSA 29%; NRCS 46%) much less frequently. Regarding historical data, NRCS respondents were more often very or moderately dependent on historical weather trends (57%), while FSA employees were more dependent on weather data from the past 12 months (40%).

Respondents do not use or are not familiar with many of the weather-related resources listed in the survey (Table 1). The U.S. Drought Monitor is the only tool that is used by over half of respondents in both agencies (FSA 74%; NRCS 66%). Nearly one-third of respondents from both agencies report using the Farmers' Almanac as a weather resource (FSA 30%; NRCS 28%). Though the Farmers' Almanac contains historical weather data, it is not regarded as an accurate source of weather forecasts (Masters, 2013; Samenow, 2016).

Table 1: Responses to, "Do you use the following weather-related resource?" Question adapted from Prokopy et al. 2013.

	Agency	Rank	Use	Don't use	Not familiar with
U.S. Drought Monitor or Outlook	FSA	1	74%	18%	8%
	NRCS	1	66%	27%	6%
Livestock Heat Index	FSA	2	42%	38%	20%
Cattle Heat Stress Forecast	NRCS	6	18%	60%	23%
Growing Degree Day Tools	FSA	5	18%	49%	34%
	NRCS	2	41%	42%	17%
Farmer's Almanac	FSA	3	30%	60%	10%
	NRCS	5	28%	69%	3%
Satellite Data/Indices of Water or Soil Nitrogen Status, Precip or Temp	FSA	4	22%	49%	30%
	NRCS	4	30%	45%	26%
Evapotranspiration Index	FSA	9	4%	51%	45%
	NRCS	3	39%	43%	18%
Crop Disease Forecasts	FSA	6	15%	52%	32%
	NRCS	8	16%	53%	31%
Insect Forecasts	FSA	7	13%	53%	35%
	NRCS	7	17%	52%	31%
Forage Dry Down Index	FSA	8	8%	55%	37%
	NRCS	10	11%	57%	32%
USDA Climate Hubs Tool Shed	NRCS	9	13%	48%	39%
COMET-Farm	NRCS	11	8%	52%	40%
Adaptation workbook for forest management	NRCS	12	7%	49%	44%

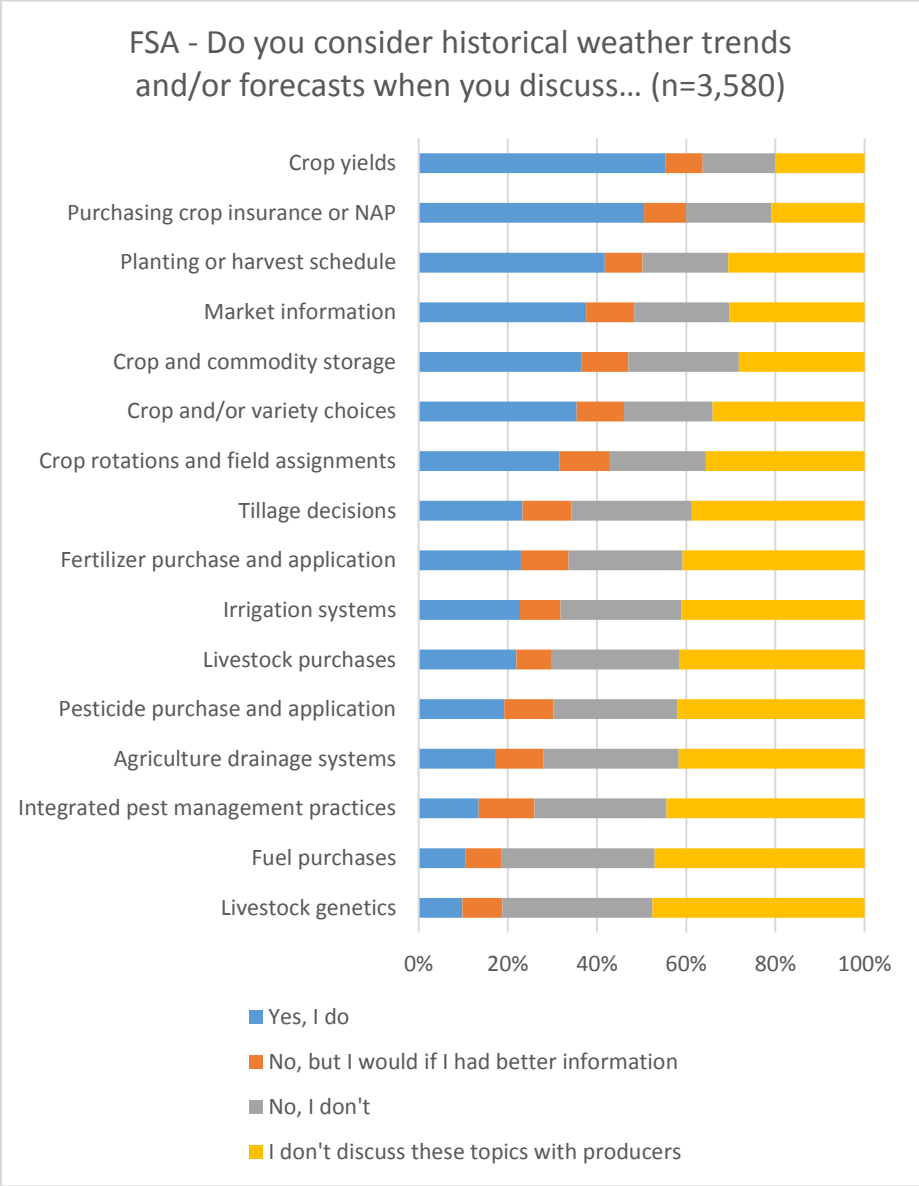

Figure 1: FSA responses to, "Do you consider historical weather trends and/or forecasts when you discuss..." Questions adapted from Prokopy et al. 2013.

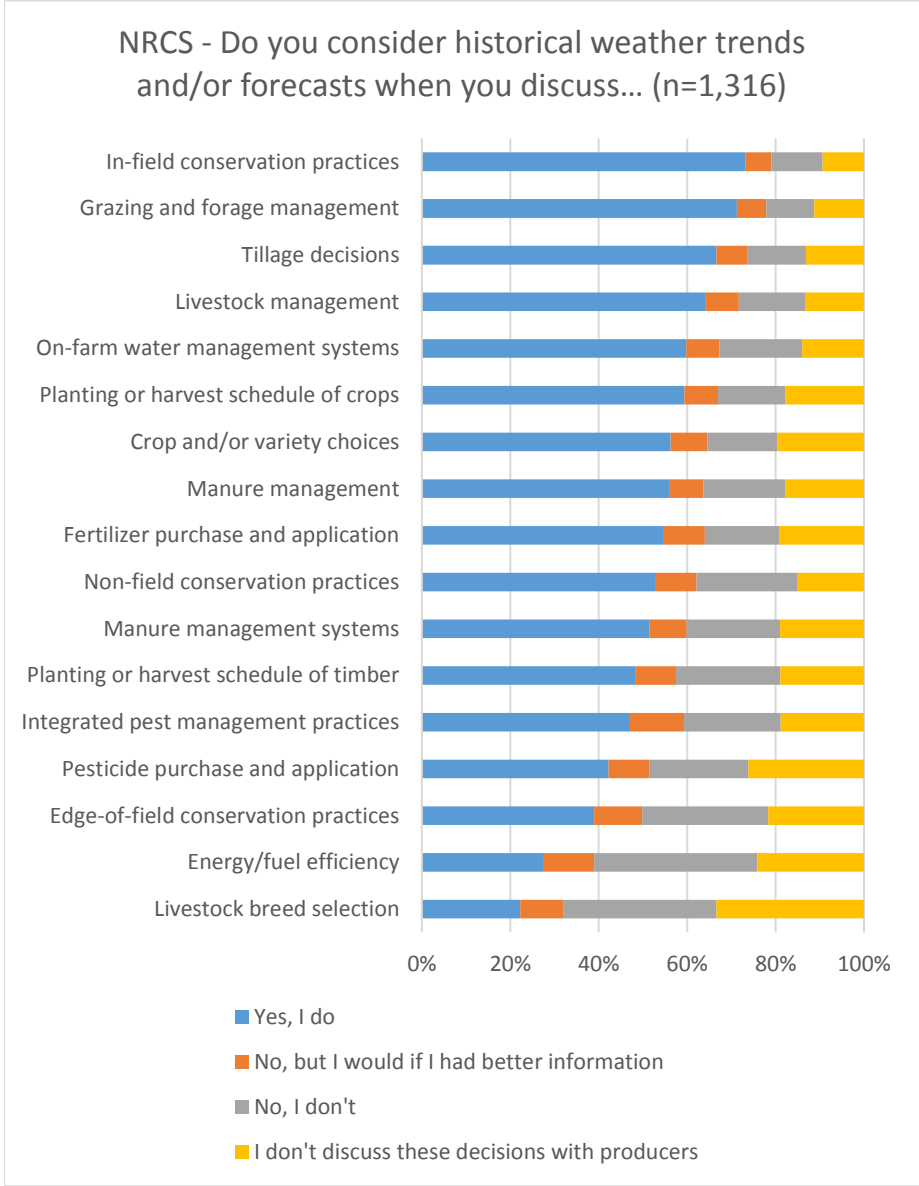

Figure 2: NRCS responses to, "Do you consider historical weather trends and/or forecasts when you discuss..." Questions adapted from Prokopy et al. 2013.

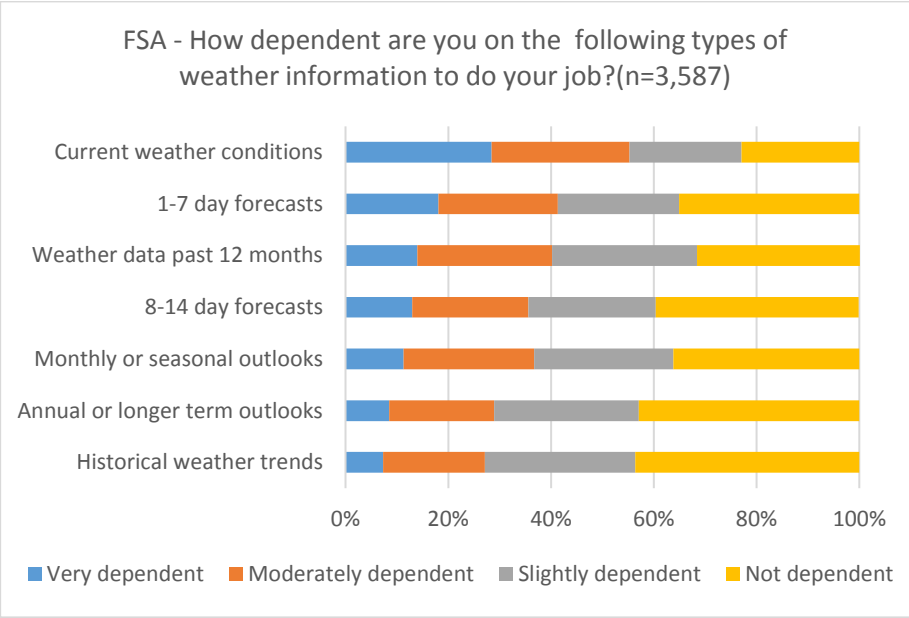

Figure 3: Dependence on weather information in job of FSA respondents. Questions adapted from Prokopy et al. 2013.

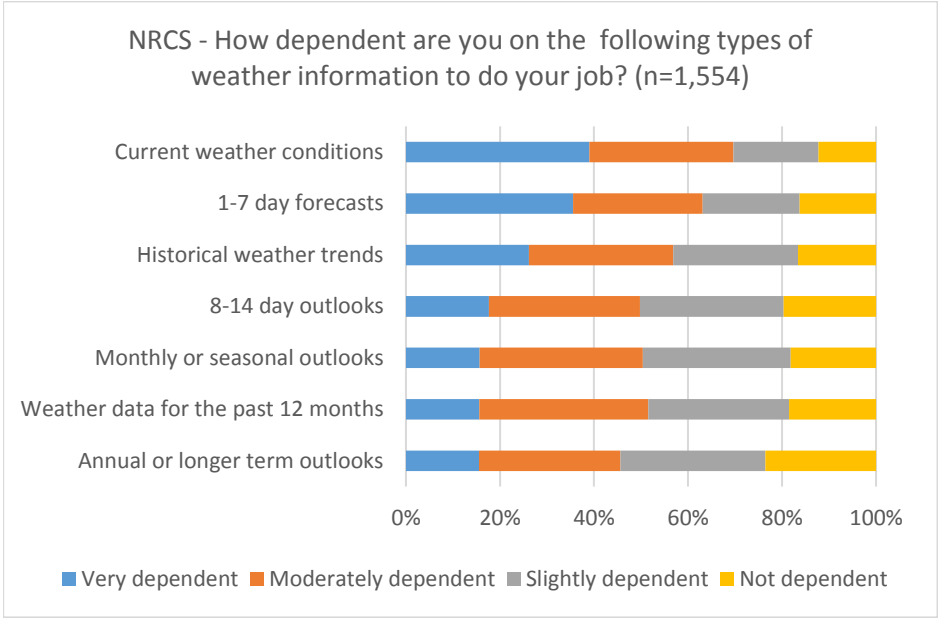

Figure 4: Dependence on weather information in job of NRCS respondents. Questions adapted from Prokopy et al. 2013.

Perspectives on climate change

A strong majority of respondents from both agencies believe that climate change is occurring (FSA 77%; NRCS 81%; Figure 5), but there is disagreement about what is causing climate change. The most common answer from both agencies is that it is caused by a mix of natural and human causes (FSA 46%; NRCS 36%), while others believe it is mostly human caused (FSA 13%; NRCS 27%), or mostly naturally caused (FSA 18%; NRCS 18%). Some do not think there is sufficient evidence to say whether climate change is occurring or not (FSA 21%; NRCS 17%), and a small proportion do not think climate change is occurring at all (FSA 3%; NRCS 2%).

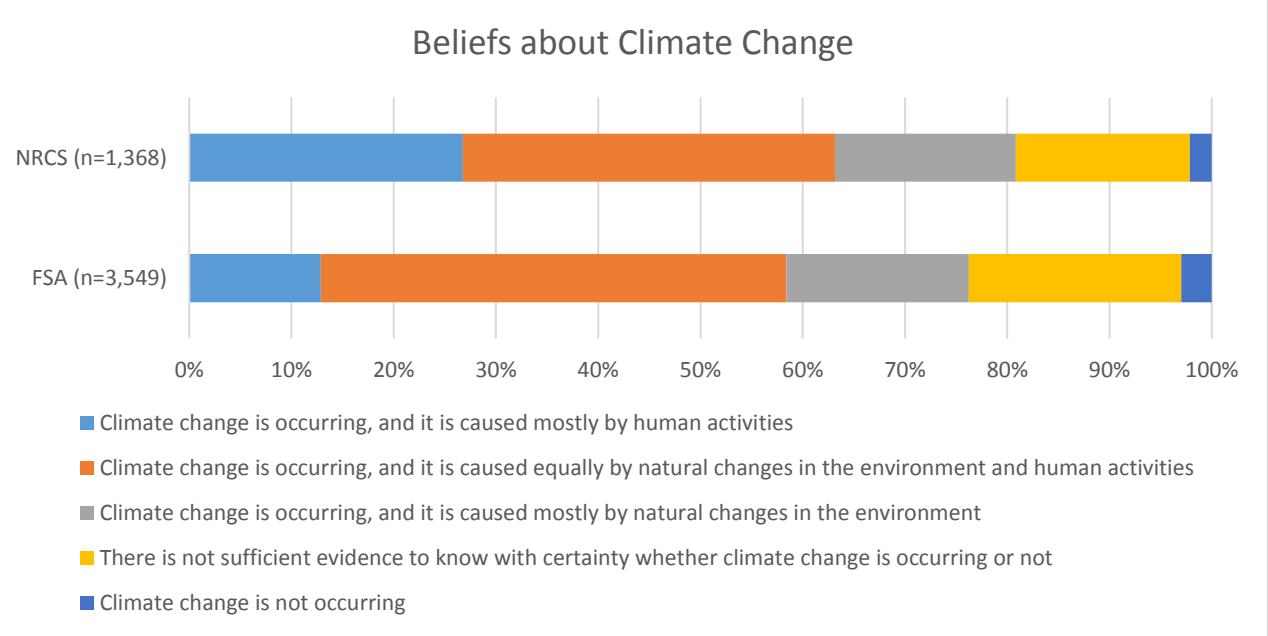

Figure 5: Respondent beliefs about climate change. Question adapted from Prokopy et al. 2013.

Attitudes regarding climate and weather risks

Respondents were asked to indicate their level of agreement with several statements (Tables 2-4) related to climate and weather, and related impacts on producers, service provision, and agriculture in general, the results of which are described in the next three sub-sections. Statements on use of climate and weather data and comfort with these resources were also included in this same question format (statements adapted from Prokopy et al. 2013). Agreement was indicated on a five point Likert scale: (1) strongly disagree; (2) disagree; (3) neither agree nor disagree; (4) agree; (5) strongly agree. Though not included in the FSA survey, a distinction between weather and climate was added to the beginning of the NRCS survey. At the beginning of the NRCS survey, weather was defined as "changing conditions of the earth's atmosphere over short periods of time (e.g. minutes to months)," and climate was defined as "trends in the earth's atmosphere over relatively longer periods of time (e.g. decades to centuries)."

Perspectives on land managers

A majority of respondents from both agencies strongly agree or agree that weather has become more variable or unusual in the past five years (FSA 59%; NRCS 65%; Table 2), and to cope with increasing climate variability, a change in farming practices is important for long-term success (FSA 54%; NRCS 67%). However, fewer than half of respondents from both agencies strongly agree or agree that changes in weather patterns are *currently* hurting producers in their service areas (FSA 37%; NRCS 38%). Overall, NRCS respondents were more likely than FSA respondents to agree that weather is becoming increasingly variable, that extreme weather is affecting long-term management goals of land managers, and that farmers must adapt. Respondents from the two agencies were aligned in that they agree that producers are currently using climate information for decision making, that changes in weather patterns are hurting producers in their service area, and that farms that have not used their programs in the past will become more vulnerable going forward.

Perspectives on service provision

Over half of NRCS respondents strongly agree or agree that they want climate or weather forecasts to inform client decisions (63%; Table 3); far fewer FSA respondents want climate or weather forecasts to inform the services they provide[3] (34%). However, far fewer respondents from both agencies reported confidence in their ability to apply weather forecasts and information in their services (FSA 26%; NRCS 47%). Overall, NRCS respondents were more confident in their ability to apply weather forecasts and information to their services and that other service providers consult with them, but there was greater agreement regarding whether or not there will be an increased need for each agency's programs due to changing weather patterns.

Perspectives on climate and weather impacts

Well over half of respondents from both agencies strongly agree or agree that it is important for producers to adapt to climate change to ensure long-term success of US agriculture (FSA 65%;

[3] NRCS and FSA respondents were asked to indicate agreement with slightly different statements. NRCS employees were presented with the statement, "I would like climate or weather forecasts to inform the client decisions," while FSA respondents were presented with the statement, "I would like climate or weather forecasts to inform the services I provide."

NRCS 72%; Table 4). Similar responses were reported when the same question was asked about forestry (71%) and rangeland (69%), for those NRCS employees who report working directly with each of those types of land managers. Over half of respondents from both agencies also strongly agree or agree that producers should take additional steps to protect their operations from increased weather variability (FSA 61%; NRCS 68%). NRCS respondents were more likely than FSA respondents to believe that they personally should play a role in assisting producers in adapting their operations (FSA 29%; NRCS 52%). Regardless, a significant proportion from both agencies believe this to be a part of their job, but far fewer respondents believe they have the knowledge and technical skills to help producers deal with weather-related threats to their operations (FSA 14%; NRCS 34%).

Table 2: Agreement with statements about producers; ranked on a five point Likert scale: (1) strongly disagree; (2) disagree; (3) neither agree nor disagree; (4) agree; (5) strongly agree. Questions adapted from Prokopy et al. 2013.

	Agency	Rank	Mean	Std. Dev.	N	% Strongly Agree/Agree
In the past 5 years, I have noticed more variable/unusual weather in my area	FSA	2	3.55	0.98	3624	59%
	NRCS	2	3.79	1.12	1373	65%
To cope with increasing climate variability, changing farming practices is important for the long-term success of producers in my service area	FSA	3	3.52	0.92	3615	54%
	NRCS	1	3.84	1.09	1361	67%
Producers use climate information when making farm-related decisions	FSA	1	3.65	0.90	3591	61%
	NRCS	4	3.66	0.94	1361	63%
Extreme weather events in recent years have affected the long-term management goals of producers in my service area	FSA	4	3.28	0.96	3609	42%
	NRCS	6	3.45	1.02	1365	50%
Changes in weather patterns are hurting the producers in my service area	FSA	6	3.21	0.98	3619	37%
	NRCS	7	3.26	1.06	1367	38%
Farms in my service area that historically have not had an interest or need for FSA/NRCS's programs are or will become more vulnerable moving forward	FSA	5	3.25	0.94	3603	40%
	NRCS	8	3.24	1.03	1363	40%
Producers in my service area have suffered due to inaccurate weather information in the past	FSA	7	3.04	0.88	3611	26%
	NRCS	9	3.24	0.90	1362	33%
Accurate or near-accurate weather information has benefitted producers in my service area in the past	NRCS	3	3.70	0.82	1372	64%
To cope with increasing climate variability, changing forestry practices is important for the long-term success of the producers in my service area	NRCS	5	3.62	1.11	703	56%
Changes in weather patterns are benefiting the producers in my service area	NRCS	10	2.73	0.84	1365	13%

Table 3: Agreement with statements about service provision; ranked on a five point Likert scale: (1) strongly disagree; (2) disagree; (3) neither agree nor disagree; (4) agree; (5) strongly agree. Questions Adapted from Prokopy et al. 2013.

	Agency	Rank	Mean	Std. Dev.	N	% Strongly Agree/Agree
I would like climate or weather forecasts to inform the services I provide	FSA	2	3.21	0.83	3595	34%
I would like climate or weather forecasts to inform the client decisions	NRCS	1	3.70	0.84	1361	63%
I believe there is an increased need for FSA/NRCS programs in my service area due to changing weather patterns	FSA	1	3.31	0.98	3606	42%
	NRCS	3	3.34	1.10	1371	45%
I am confident in my ability to apply weather forecast and information to the services I provide	FSA	3	3.04	0.81	3592	26%
	NRCS	2	3.38	0.90	1335	47%
Extension staff, crop advisors, and formal or informal advisors involved in agriculture often consult with me	FSA	5	2.62	1.00	3597	19%
	NRCS	5	2.95	1.02	1297	30%
In the past, inaccurate weather information has negatively affected the quality of the services I provide	FSA	4	2.57	0.80	3590	7%
	NRCS	6	2.76	0.80	1316	13%
Weather forecasts and information are not available when I need them for the services I provide	FSA	6	2.56	0.78	3598	8%
	NRCS	7	2.50	0.83	1337	10%
In the past, accurate weather information has positively affected the quality of the services that I provide	NRCS	4	3.31	0.77	1329	38%

Table 4: Agreement with statements about climate change and natural resources; ranked on a five point Likert scale: (1) strongly disagree; (2) disagree; (3) neither agree nor disagree; (4) agree; (5) strongly agree. Questions adapted from Prokopy et al. 2013.

	Agency	Rank	Mean	Std. Dev.	N	% Strongly Agree/Agree
It is important for producers to adapt to climate change and ensure the long-term success of U.S. agriculture	FSA	1	3.71	0.84	3569	65%
	NRCS	2	3.86	0.92	1322	72%
Producers should take additional steps to protect their operations from increased weather variability	FSA	2	3.62	0.75	3564	61%
	NRCS	4	3.74	0.86	1372	68%
In my current role, I should help producers to prepare for increased weather variability	FSA	3	3.05	0.88	3567	29%
Assisting producers to prepare for increased weather variability is a part of my job	NRCS	5	3.44	0.95	1371	52%
Producers should do more to reduce greenhouse gas emissions from their farm operations	FSA	4	3	0.95	3562	26%
	NRCS	6	3.38	1.06	1361	49%
I have the knowledge and technical skill to help producers deal with any weather-related threats to the viability of their operation	FSA	5	2.63	0.89	3572	14%
	NRCS	8	3.07	0.91	1373	34%
Climate change is not a big issue because human ingenuity will enable producers to adapt to changes	FSA	6	2.61	0.9	3566	14%
	NRCS	11	2.4	0.98	1373	11%
It is important for producers to adapt to climate change to ensure the long-term success of U.S. forestry	NRCS	1	3.88	0.89	697	71%
It is important for producers to adapt to climate change to ensure the long-term success of U.S. rangeland	NRCS	3	3.79	0.97	814	69%
Producers should do more to reduce greenhouse gas emissions from their forestry operations	NRCS	7	3.25	1.04	701	39%
I am concerned that available best management practice technologies are not effective enough to protect the producers I advise from the impacts of climate change	NRCS	9	2.99	0.96	1369	30%
There's too much uncertainty about the impacts of climate change to justify advising or discussing with producers any changes to their management practices and strategies	NRCS	10	2.94	1.08	1375	32%

Climate and weather concerns

Respondents were asked to rank a list of climate concerns on a four-point Likert scale: (1) not concerned; (2) slightly concerned; (3) concerned; (4) very concerned. Results are aggregated nationally (Figures 6-10), and presented in terms of the most common climate concern per state (Figures 11 and 12). For both FSA and NRCS, the most common climate concern in terms of number of states that ranked it highest and the nationally aggregated mean was longer dry periods and droughts. For FSA, this concern covered the vast majority of states, but for NRCS there was a greater diversity of concerns, which likely has to do with the different mission areas of these two agencies. The second most common concern for both agencies was more frequent extreme rains, followed by increased flooding. Other results show geographic patterns, such as concern over higher incidence of wildfire in the northwest, and concern over increased soil erosion in the Upper Midwest and Great Lakes region.

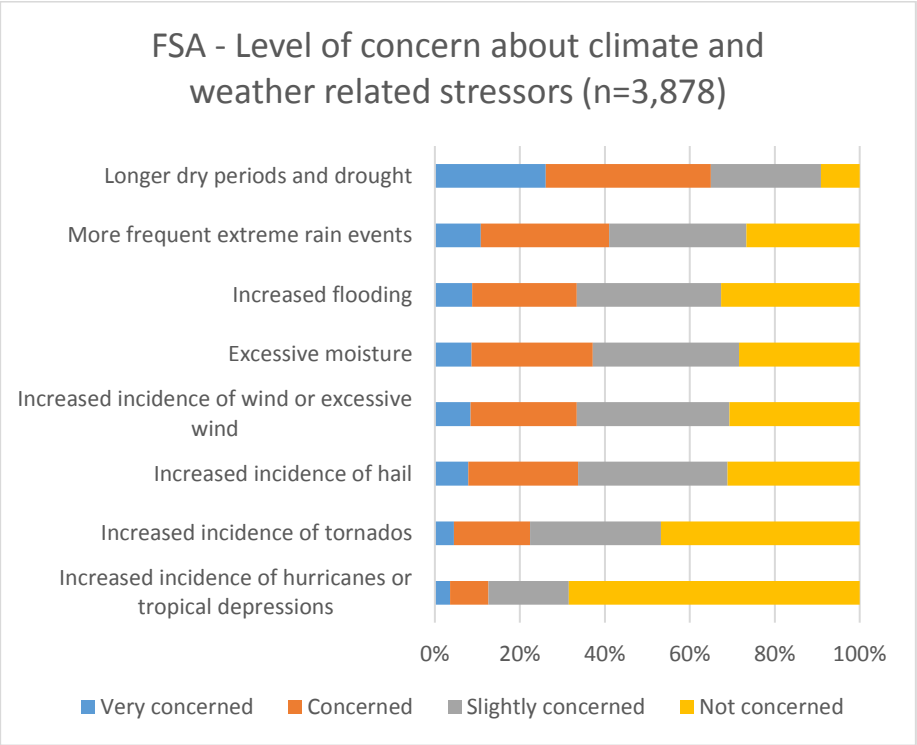

Figure 6: Level of concern about climate and weather stressors among FSA respondents. Questions adapted from Prokopy et al. 2013.

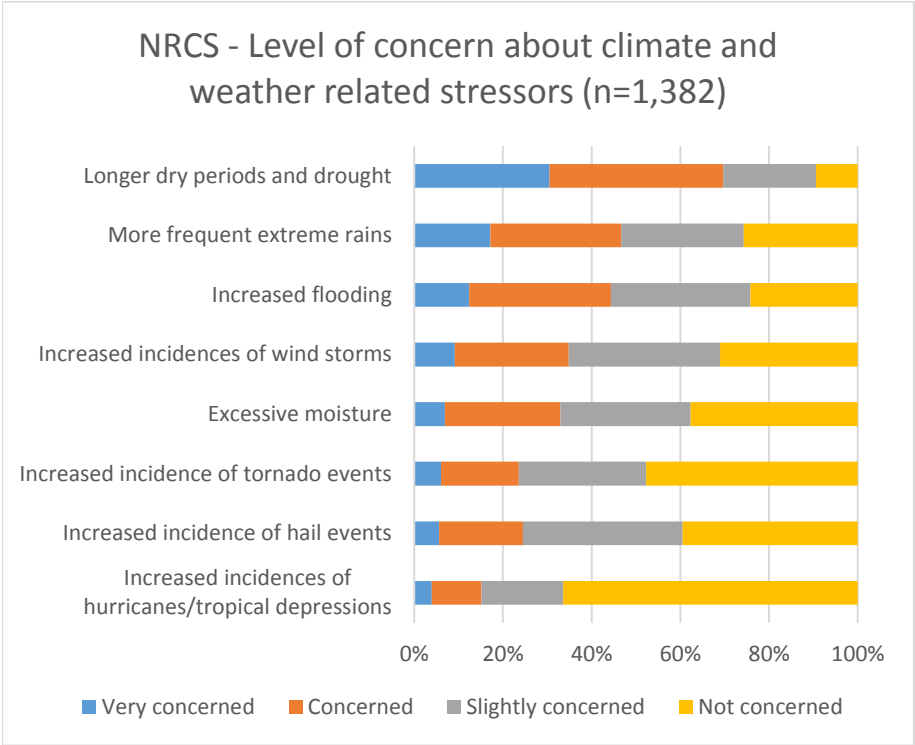

Figure 7: Level of concern about climate and weather stressors among NRCS respondents. Questions adapted from Prokopy et al. 2013.

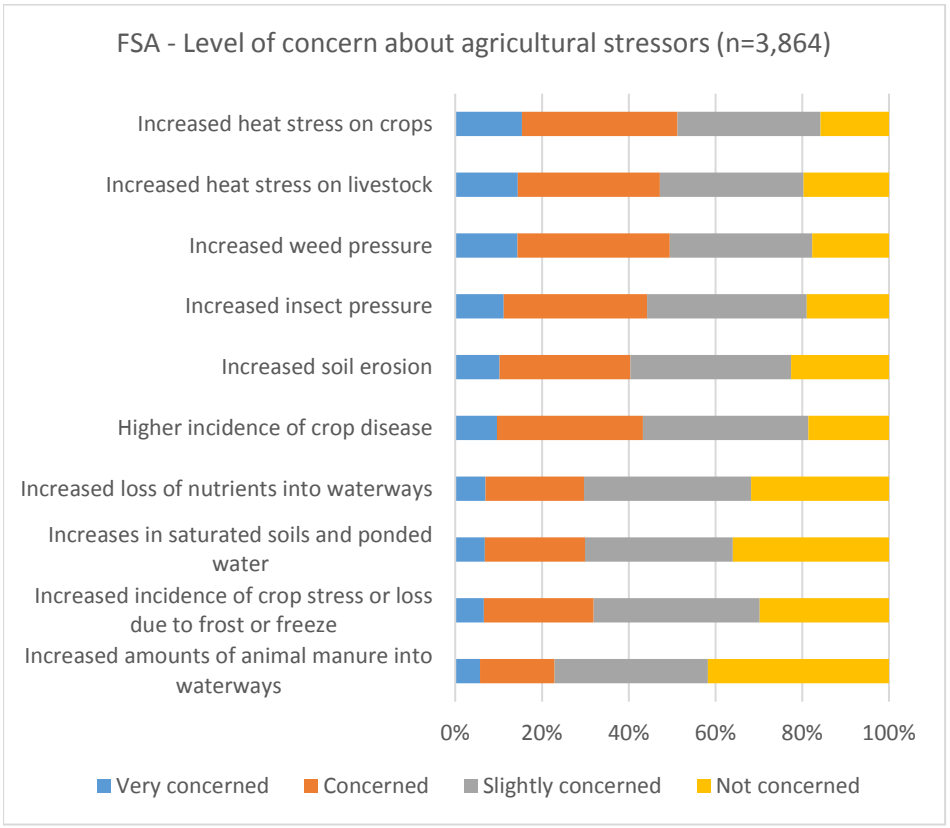

Figure 8: Level of concern about agricultural stressors among FSA respondents. Questions adapted from Prokopy et al. 2013.

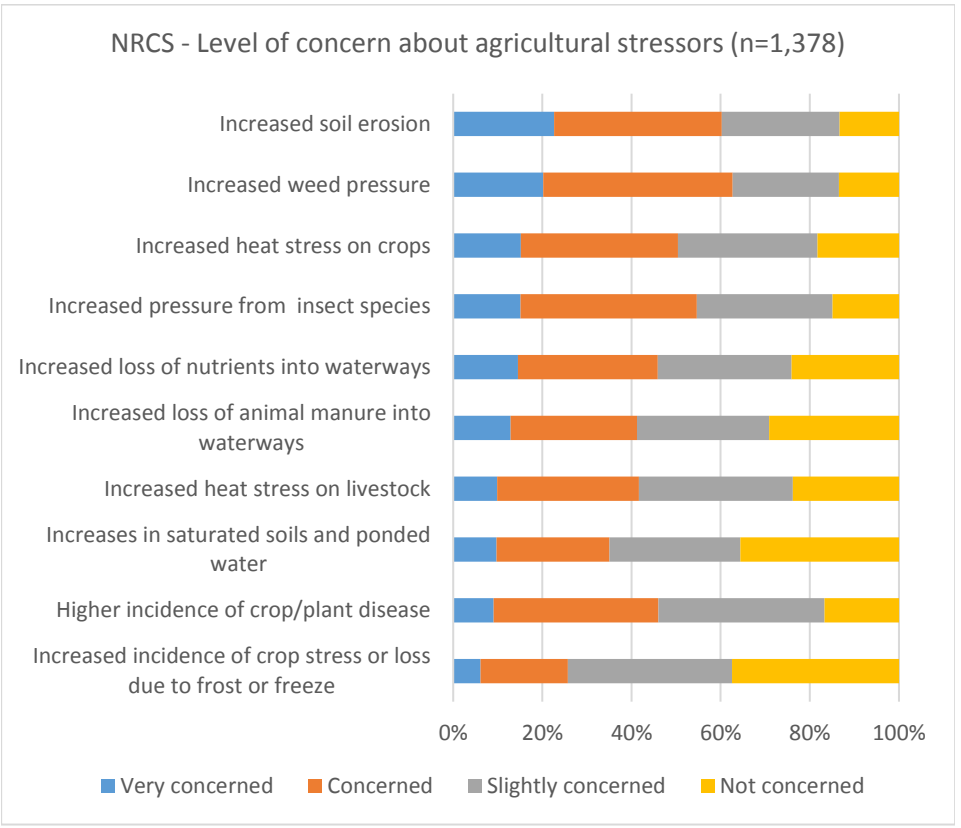

Figure 9: Level of concern about agricultural stressors among NRCS respondents. Questions adapted from Prokopy et al. 2013.

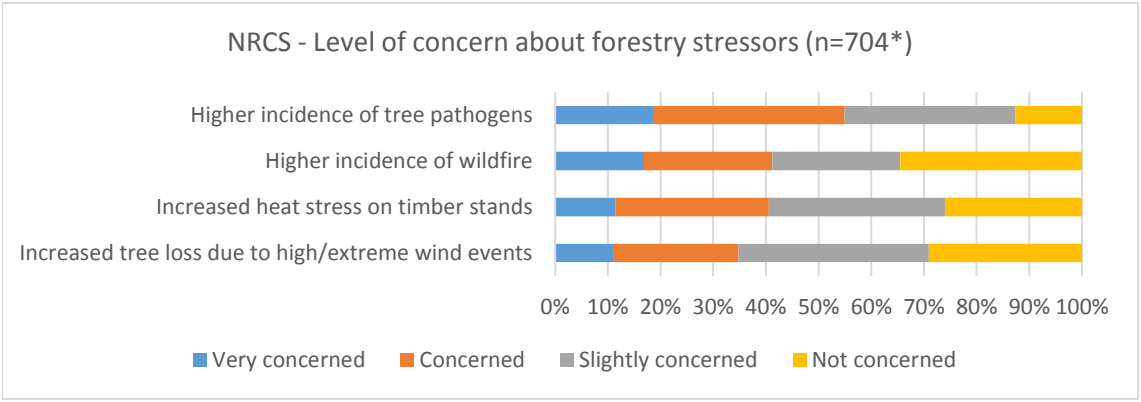

Figure 10: Level of concern about forestry stressors among NRCS respondents
**Only those who responded that they work with forest land owners were given these statements, with the exception of "higher incidence of wildfire." For that statement, n=1,380)*

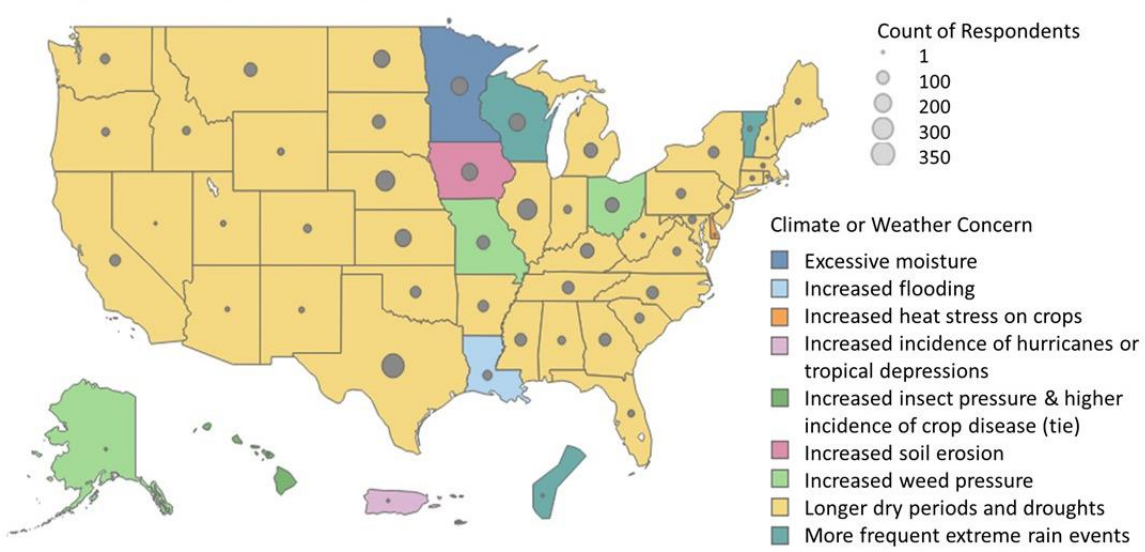

Figure 11: Most common climate or weather concern of FSA respondents by state (n=3,571)

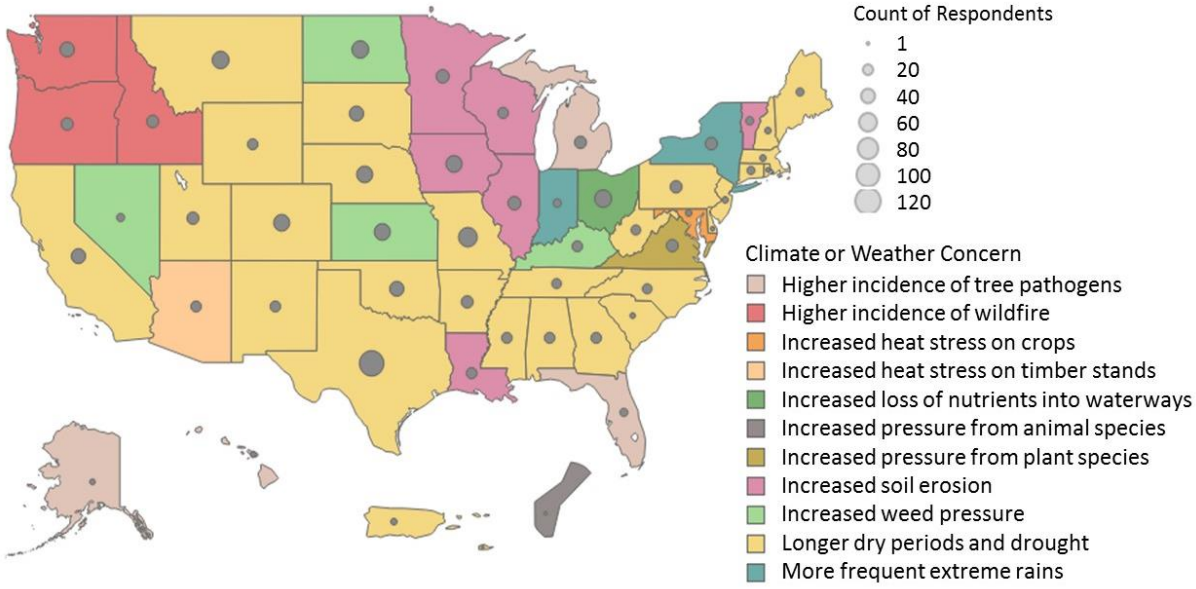

Figure 12: Most common climate or weather concern of NRCS respondents by state (n=1,376)

Conclusion

The mission of the Climate Hubs is to work with USDA agencies and partners to develop and deliver science-based, region-specific information and technologies to agricultural and natural resource managers, enabling climate-informed decision-making, and assisting in the implementation of those decisions. The missions of NRCS and FSA include supporting conservation management of agricultural, range, and forested lands in the United States. The USDA Climate Hubs, NRCS, and FSA work together to support land managers as they adapt to more variable and extreme weather associated with climate change.

Multiple opportunities were identified in this survey, including a disparity between the amount of field staff who want to use weather and climate resources during service provision and those who are confident in their ability to do so. A significant proportion expressed interest in their role in assisting land managers in adapting to climate change, but support is needed to determine the appropriate avenues. Additionally, there are several tools and resources about which staff are unfamiliar or not using. As a result of this survey analysis, we identified four areas of potential collaboration between FSA, NRCS, and the Climate Hubs:

1. Provide training and support for FSA and NRCS employees to work with and understand weather and climate data, tools, and resources, with a focus on those climate and weather stressors of greatest concern.
2. Better integrate specific weather and climate tools into specific FSA and NRCS program areas and existing tools used by these agencies.
3. Hone outreach and education on climate- and weather-related issues by linking them to existing programs that help producers reduce climate-related risks on farm (such as the Conservation Reserve Enhancement Program).
4. Develop outreach and education messaging through the USDA Public Affairs Division on climate and weather-related issues. Messaging could be linked to existing agency efforts, such as the NRCS Soil Health Initiative, directly tied to conservation practices, and aligned with conservation compliance expectations that reduce risks, increase productivity, and build resilience across sectors.

U.S. agriculture and natural resources sectors will need to adapt to a changing climate to ensure the resilience of diverse agricultural, rangeland, and forestry sectors. The Climate Hubs, in partnership with FSA and NRCS, under the broader mission of OneUSDA, are well-staged to support USDA agencies in providing the best available science, tools, and communication resources to address climate impacts and support agency employees to assist land managers in reducing climate risks now, and in the future.

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Appendices:

Appendix A: Respondent demographic and occupational figures

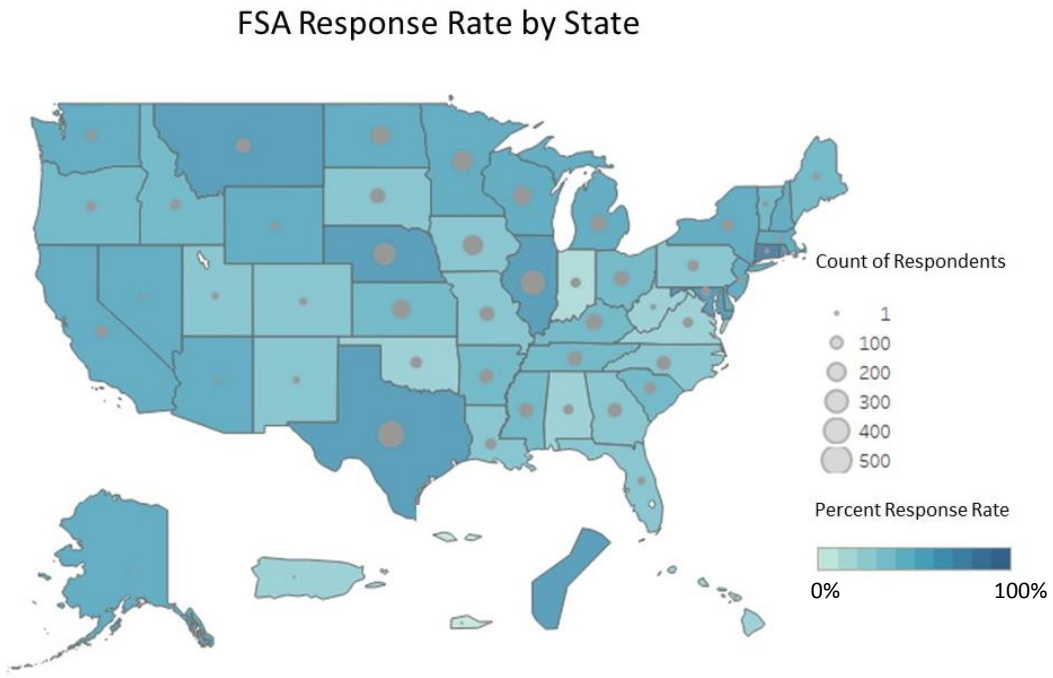

Figure A1: Count of FSA respondents to climate and weather survey by state (n=4,238)

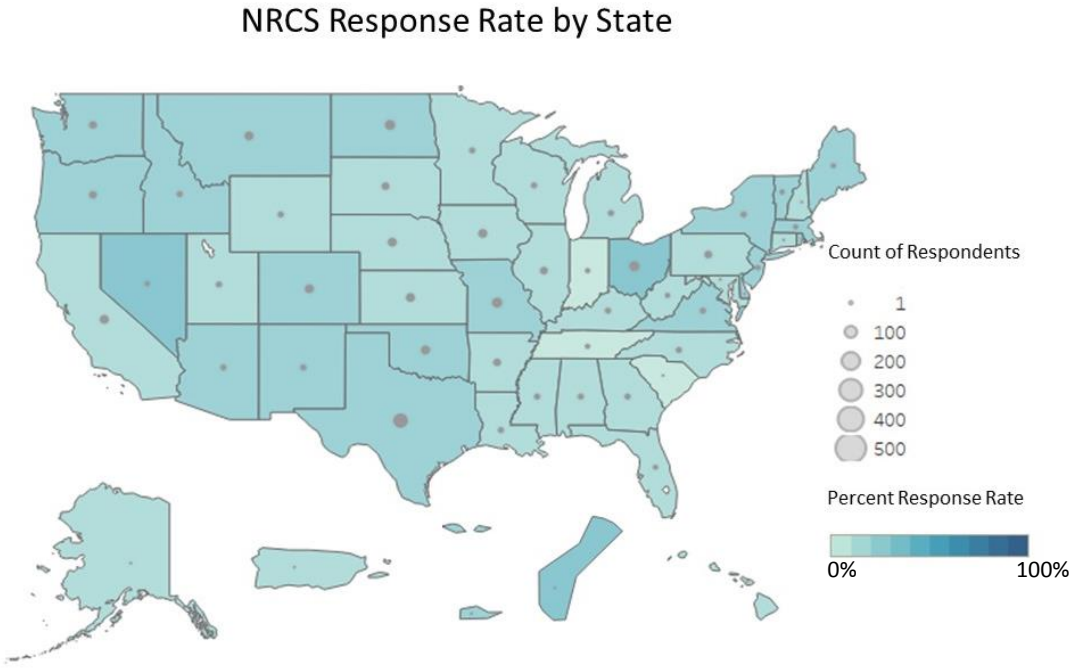

Figure A2: Count of NRCS respondents to climate and weather survey by state (n=1,893)

Table A1: Response to the question, "In your current job, do you work directly with producers on a regular basis?"

	FSA Count	FSA %	NRCS Count	NRCS %
Yes	4,238	92%	1,597	86%
No	383	8%	260	14%

Table A2: Location/work jurisdiction of respondents

	FSA (n=3,601)	NRCS (n=1,365)
County Office	95%	74%
Area Office	NA	12%
State Office	3%	10%
Regional Office/Technology Support Center[1]	NA	1%
Other	1%	3%

[1]Individuals associated with Regional Offices or Technology Support Centers were intentionally excluded from the sample, as their position titles do not suggest working directly with land managers

Table A3: Position titles of FSA and NRCS respondents (only top 5 reported)

FSA (n=3,469)		NRCS (n=1,364)	
Program technician	56.1%	District Conservationists	24.5%
County executive director	22.1%	Soil Conservationist	18.6%
Farm loan officer	4.5%	Soil Conservation/Engineering Technician	15.8%
Key or lead program technician	4.0%	Engineer	7.8%
Farm loan manager	3.9%	Resource Conservationist	7.8%

Table A4: NRCS responses to, "Please indicate whether you work with the following land managers in your daily activities (select all that apply)."

	Percent	Count (multiple answers allowed)
Farmers	83%	1568
Forest Landowners	44%	831
Ranchers	51%	960
I do not work with land managers in my daily activities	14%	260

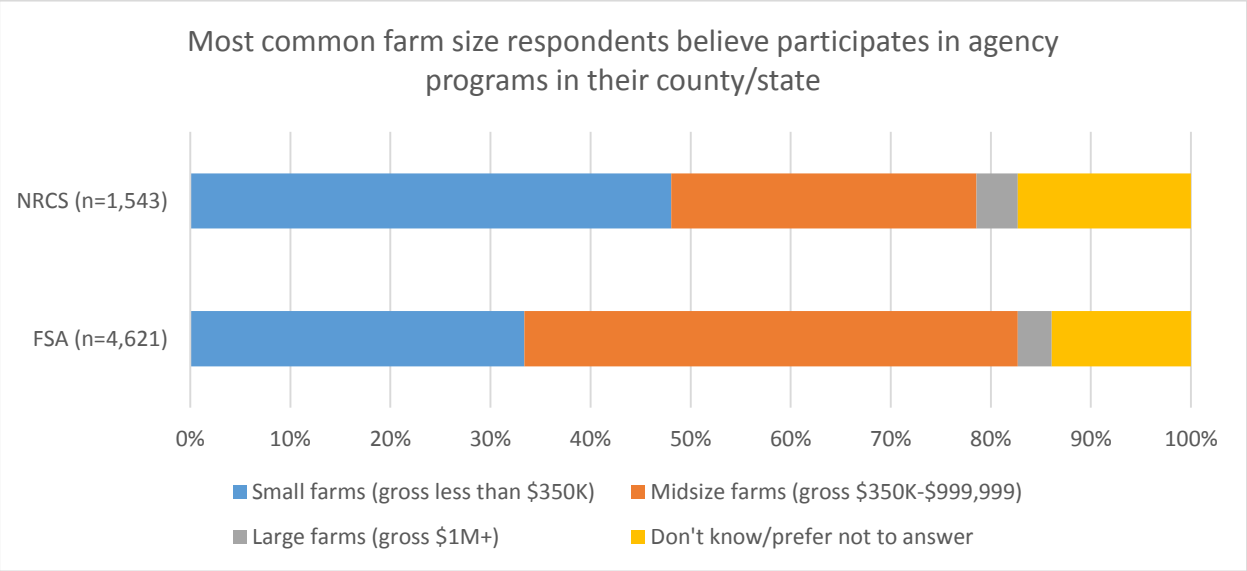

Figure A3: Most common farm size in gross revenue that respondents from FSA and NRCS report working with in dollars.

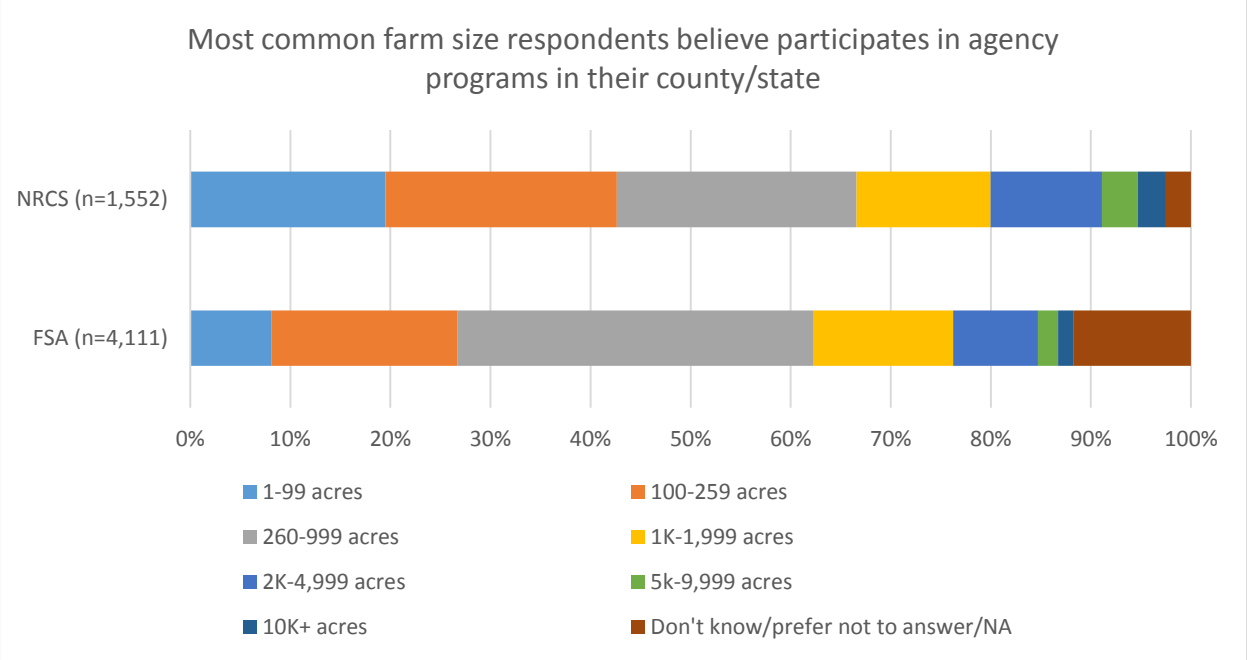

Figure A4: Most common operation size in total acres that respondents believe characterize farmers who use participate in agency programs in their county/state.

Table A5: Responses to "What do your customers typically grow/produce?" (check all that apply)

	FSA (n=4,120)	NRCS (n=1,556)
Alfalfa and other hay	71.3%	70.44%
Aquaculture	5.0%	3.79%
Cattle and calves	80.3%	82.65%
Dairy/milk from cows	40.8%	32.46%
Forest/timber products	Not Asked	37.40%
Fruits, tree nuts, and berries	18.8%	18.12%
Grains, oilseeds, dry beans, and dry peas	85.8%	64.07%
Hogs and pigs	30.2%	17.87%
Non-timber forest products	Not Asked	5.40%
Nursery, greenhouse, floriculture, sod…	13.8%	11.89%
Other livestock and livestock products	23.5%	24.49%
Other row crops	26.2%	20.24%
Poultry and eggs	18.7%	19.99%
Vegetables, melons, potatoes, and sweet potatoes	33.6%	31.75%
Other (write in)	4.70%	4.50%

Table A6: Respondents who own, operate, or have a financial state in a farm or forest land

	FSA Farm Ownership/ Stake (n=4,118)	NRCS Farm Ownership/ Stake (n=1,559)	NRCS Forest Ownership/ Stake (n=1,559)
Yes	43%	33%	15%
No	52%	61%	81%
Prefer not to answer	5%	6%	4%

Table A7: Size of farming or forestry operations in which respondents have a financial interest

Farm Ownership/Stake	**FSA (n=1,621)**	**NRCS (n=516)**
Large farms (gross sales $1,000,000 or more)	3%	1%
Midsize farms (gross sales between $350,000-$999,999)	16%	8%
Small farms (gross sales less than $350,000)	75%	83%
Prefer not to answer	7%	9%
Forest Ownership/Stake		**NRCS (n=216)**
Industrial forest landowner (average harvest **over** 2 million board feet/year)		>1%
Small forest landowner (average harvest **under** 2 million board feet/year)		87%
Prefer not to answer		13%

Table A8: Race of respondents compared to agency population

	FSA Agency (n = 12,593)	FSA Survey (n=3,840)	NRCS Agency	NRCS Survey (n=1,361)
American Indian/ Alaska Native	1%	2%	2%	3%
Asian	1%	0%	1%	0%
Black or African American	5%	2%	9%	2%
Native Hawaiian or other Pacific Islander	<1%	0%	<1%	1%
More than one/other*	1%	NA	2%	2%
White	90%	86%	86%	75%
Prefer not to Answer	NA	10%	NA	17%

Table A9: Ethnicity of respondents

Ethnicity	FSA (n=3,534)	NRCS (n=1,329)
Hispanic or Latino	3%	5%
Not-Hispanic or Latino	87%	75%
Other/Prefer not to answer	10%	24%

Table A10: Sex of respondents compared to agency population

	FSA Agency	FSA Survey (n=3,548)	NRCS Agency	NRCS Survey (n=1,362)
Male	32%	26%	63%	63%
Female	68%	67%	37%	24%
Prefer not to answer	NA	7%	NA	12%

Table A11: Age breakdown of respondents

Age	FSA Agency	FSA Respondents (n=3,078)	NRCS Agency	NRCS Respondents (n=1,271)
20-29	6%	12%	9%	8%
30-39	16%	17%	26%	22%
40-49	19%	17%	22%	21%
50-59	40%	41%	32%	31%
60-69	19%	13%	10%	17%

Table A12: Highest level of education of respondents

	FSA (n=3,916)	NRCS (n=1,394)
Some formal edu, less than high-school	0%	0%
High-school graduate/GED	10%	2%
Some college	19%	4%
2-year college or tech degree	15%	5%
4-year college	46%	65%
Graduate degree	8%	24%
Prefer not to answer	4%	

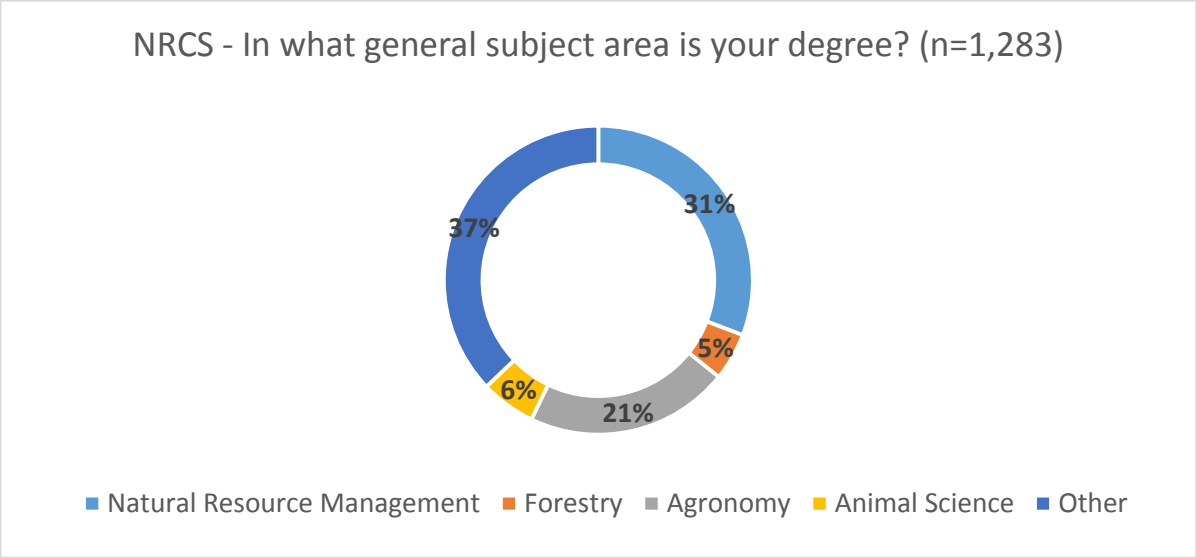

Figure A5: General subject area of degree for NRCS respondents

FSA Survey

Intro *Thank you for taking time to answer the following questions about your role as an agricultural service provider and your thoughts about weather-related risk. Your answers will be used to improve USDA program administration, as well as contribute to important research on U.S. agriculture and adapting to a changing climate. The survey should take you approximately 20 minutes to complete.*

 Indicates that the question, sub-question, or answer choice is visible to respondents who report working with *any* land managers in their daily activities (Farmer by Iain Hector from Noun Project)

Questions and sub-questions without an icon are visible to all respondents

* Indicates a question taken or adapted from Prokopy et al. 2013

In your current job, do you work directly with producers on a regular basis?

- ○ Yes
- ○ No


Which of the following farm size (in sales) do you estimate has the highest participation rate in FSA programs in your state (if you work for a State Office) or County (if you work for a County Office)?

- ○ Small farms (gross sales less than $350,000)
- ○ Midsize farms (gross sales between $350,000-$999,999)
- ○ Large farms (gross sales $1,000,000 or more)
- ○ Don't know or prefer not to answer


Which of the following farm size (in acres) do you estimate has the highest participation rate in FSA programs in your state (if you work for a State Office) or County (if you work for a County Office)?

- ○ 1-99 acres
- ○ 100-259 acres
- ○ 260-999 acres
- ○ 1,000-1,999 acres
- ○ 2,000-4,999 acres
- ○ 5,000-9,999 acres
- ○ 10,000 acres or more
- ○ Don't know or prefer not to answer

What do your customers typically grow/produce? (check all that apply)

- ☐ Dairy/milk from cows
- ☐ Alfalfa and other hay
- ☐ Cattle and calves
- ☐ Grains, oilseeds, dry beans, and dry peas
- ☐ Other row crops (e.g. tobacco, cotton and cottonseed)
- ☐ Nursery, greenhouse, floriculture, sod, cut Christmas trees and other short-rotation woody crops, and other specialty crops
- ☐ Vegetables, melons, potatoes, and sweet potatoes
- ☐ Fruit, tree nuts, and berries
- ☐ Poultry and eggs
- ☐ Other livestock and livestock products: horses, ponies, mules, burros, and donkeys, sheep, goats, wool, mohair, and milk other than cow
- ☐ Aquaculture
- ☐ Hogs and pigs
- ☐ Other _____

In addition to working for FSA, do you operate, own, or have a financial interest in a farm or farms?

- ○ Yes
- ○ No
- ○ Prefer not to answer

If response to previous question is yes: Please indicate the average size of the farm or farms in which you have financial interest(s) (select one).

- ○ Small farm (gross sales less than $350,000)
- ○ Midsize farm (gross sales between $350,000-$999,999)
- ○ Large farm (gross sales $1,000,000 or more)
- ○ Prefer not to answer

Are you currently a member of an FSA County or State Committee?

- ○ Yes
- ○ No
- ○ Prefer not to answer

 Do you consider historical weather trends and/or forecasts when you discuss the following topic areas with producers, either formally or informally?*	Yes, I do	No, but I would if I had better information	No, I don't	I don't discuss these topics with producers
Crop rotations and field assignments	○	○	○	○
Crop and/or variety choices	○	○	○	○
Livestock purchases	○	○	○	○
Livestock genetics	○	○	○	○
Fertilizer purchase and application	○	○	○	○
Pesticide purchases and application	○	○	○	○
Fuel purchases	○	○	○	○
Purchasing crop insurance or NAP coverage	○	○	○	○
Tillage decisions	○	○	○	○
Integrated pest management practices	○	○	○	○
Planting or harvest schedule	○	○	○	○
Irrigation systems	○	○	○	○
Agricultural drainage systems	○	○	○	○
Market information (e.g., commodity prices, futures forecasts)	○	○	○	○

Crop and commodity storage	○	○	○	○
Crop yields (individual or county)	○	○	○	○

In general, how dependent are you on the following types of weather information to do your job?*

	Not dependent	Slightly dependent	Moderately dependent	Very dependent
Historical weather trends	○	○	○	○
Weather data for the past 12 months	○	○	○	○
Current weather conditions	○	○	○	○
1-7 day forecasts	○	○	○	○
8-14 day outlooks	○	○	○	○
Monthly or seasonal outlooks	○	○	○	○
Annual or longer term outlooks	○	○	○	○

Do you use any of the following weather-related resources? Note that these resources may be accessible via newsletters, websites, meetings, radio, and other sources and they may not have the exact same name listed here.*

	Use	Don't use	Not familiar with
Crop disease forecasts	○	○	○
Insect forecasts	○	○	○
Evapotranspiration (ET) index	○	○	○
Growing degree day tools	○	○	○
Forage dry down index	○	○	○
U.S. Drought Monitor or Outlook	○	○	○
Livestock heat index	○	○	○
Satellite data/indices of water or soil nitrogen status, precipitation or temperature	○	○	○
Farmers' Almanac	○	○	○
Other	○	○	○

Please indicate your level of agreement with each of the following statements.*	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
In the past 5 years, I have noticed more variable/unusual weather in my area	○	○	○	○	○
To cope with increasing climate variability, changing farming practices is important for the long-term success of the producers in my service area	○	○	○	○	○
Changes in weather patterns are hurting the producers in my service area	○	○	○	○	○
Producers in my service area have suffered due to inaccurate weather information in the past	○	○	○	○	○
I would like climate or weather forecasts to inform the services I provide	○	○	○	○	○
Extreme weather events in recent years have affected the long-term management goals of producers in my service area	○	○	○	○	○
Extension staff, crop advisors, and formal or informal advisors involved in agriculture often consult with me	○	○	○	○	○
Weather forecasts and information are not available when I need them for the services I provide	○	○	○	○	○
I am confident in my ability to apply weather forecasts and information to the services I provide	○	○	○	○	○

In the past, inaccurate weather information has negatively affected the quality of the services I provide	○	○	○	○	○
Producers use climate information when making farm-related decisions	○	○	○	○	○
I believe there is an increased need for FSA's programs in my service area due to changing weather patterns	○	○	○	○	○
Farms in my service area that historically have not had an interest or need for FSA's programs are or will become more vulnerable moving forward.	○	○	○	○	○

Some producers have experienced the following adverse events or conditions in the past few years. To what degree do you think these conditions will impact agricultural production in your service area in the future?*	Not concerned	Slightly concerned	Concerned	Very concerned
Increased flooding	○	○	○	○
Excessive moisture	○	○	○	○
Longer dry periods and drought	○	○	○	○
Increased weed pressure	○	○	○	○
Increased insect pressure	○	○	○	○
Higher incidence of crop disease	○	○	○	○
More frequent extreme rain events	○	○	○	○
Increases in saturated soils and ponded water	○	○	○	○
Increased heat stress on crops	○	○	○	○
Increased incidence of crop stress or loss due to frost or freeze	○	○	○	○
Increased heat stress on livestock	○	○	○	○
Increased loss of nutrients into waterways	○	○	○	○
Increased amounts of animal manure into waterways	○	○	○	○

Increased soil erosion	○	○	○	○
Increased incidence of wind or excess wind	○	○	○	○
Increased incidence of tornados	○	○	○	○
Increased incidence of hurricanes or tropical depressions	○	○	○	○
Increased incidence of hail	○	○	○	○

There is increasing discussion about climate change and its potential impacts. Please select the statement that best reflects your beliefs about climate change.*

- ○ Climate change is occurring, and it is caused mostly by natural changes in the environment
- ○ Climate change is occurring, and it is caused mostly by human activities
- ○ Climate change is occurring, and it is caused equally by natural changes in the environment and human activities
- ○ Climate change is not occurring
- ○ There is not sufficient evidence to know with certainty whether climate change is occurring or not

Given what you believe to be true about the potential impacts of climate change on agriculture in the United States, to what degree do you agree with the following statements?*

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I have the knowledge to help producers deal with any weather-related threats to the viability of their farm operations	○	○	○	○	○
Climate change is not a big issue because human ingenuity will enable producers to adapt to changes	○	○	○	○	○
Producers should take additional steps to protect their operations from increased weather variability	○	○	○	○	○
In my current role, I should help producers to prepare for increased weather variability	○	○	○	○	○
It is important for producers to adapt to climate change to ensure the long-term success of U.S. agriculture	○	○	○	○	○
Producers should do more to reduce greenhouse gas emissions from their farm operations	○	○	○	○	○

Please indicate your highest level of education.

- ○ Some formal education, less than high-school
- ○ High school graduate/ GED
- ○ Some college
- ○ 2-year college degree or technical degree
- ○ 4-year college degree
- ○ Graduate degree (MS, MD, PhD etc.)
- ○ Prefer not to answer

In what state or territory is your duty station located?

Respondents are presented with list of 50 states and US territories

In what county is your duty station located?

_____

Which of the following FSA program areas would you estimate has the highest level of producer participation in your service area (by number of producers)?

- ○ Price support (MPP dairy, MAL, LFP, RTCP, Cotton Ginning Cost Share, etc.)
- ○ Farm Loans (Farm Storage Facility Loans, Farm Operating Loans, Microloans, Emergency Loans, etc.)
- ○ Revenue loss coverage (ARC, PLC)
- ○ Risk Management/disaster assistance (NAP, ELAP, TAP, LFP, LIP, etc.)
- ○ Energy programs (BCAP, etc.)
- ○ Conservation programs/practices (CRP, CREP, GRP, etc.)

Please check the three programs or task areas in which you spend the majority of your time.

- ☐ Price support (MPP dairy, MAL, LFP, RTCP, Cotton Ginning Cost Share, etc.)
- ☐ Farm Loans (Farm Storage Facility Loans, Farm Operating Loans, Microloans, Emergency Loans, etc.)
- ☐ Revenue loss coverage (ARC, PLC)
- ☐ Risk Management/disaster assistance (NAP, ELAP, TAP, LFP, LIP, etc.)
- ☐ Energy programs (BCAP, etc.)
- ☐ Conservation programs/practices
- ☐ Outreach and education
- ☐ Compliance, crop reporting, acreage reporting, business partner, farm records, etc.
- ☐ Loss adjustment/measurement services
- ☐ Geographic Information Systems (GIS) and Imagery

- [ ] Information Technology (IT)
- [ ] Administrative (banking, file management, office operations, etc.)

In what year were you born?

_____

For how many years have you worked for FSA?

_____

For how many years have you worked for the USDA?

_____

Which of the following describes your work jurisdiction?

- ○ I work in a county office
- ○ I work in a state office
- ○ Other

If the respondent indicates working at a county level: What is your current position at FSA?

- ○ Program Technician
- ○ Key or Lead Program Technician
- ○ County Executive Director
- ○ Administrative Technician
- ○ County Office Trainee (COT)
- ○ Farm Loan Manager
- ○ Farm Loan Officer
- ○ Farm Loan Officer Trainee (FLOT)
- ○ Farm Loan Analyst
- ○ Other (please write in) _____

If the respondent indicates working at a state level: What is your current position at FSA?

- ○ GIS Specialist
- ○ Administrative Officer
- ○ Agricultural Program Specialist
- ○ Farm Program Chief
- ○ Farm Loan Program Chief
- ○ Program Technician
- ○ County Operations Reviewer
- ○ Public Affairs Specialist
- ○ Other _____

If the respondent indicates working in an "other" type of office: What is your current position (job title) at FSA?

_____

What is your gender identity?

- ○ Male
- ○ Female
- ○ Prefer not to answer

What is your race?

- ○ American Indian or Alaska Native
- ○ Asian
- ○ Black or African American
- ○ Native Hawaiian or Other Pacific Islander
- ○ White
- ○ Prefer not to answer

What is your ethnicity?

- ○ Hispanic or Latino
- ○ Not Hispanic or Latino
- ○ Prefer not to answer

If there is anything else you want to share with us on this topic, please type it into the text box below.

_____

_____

_____

_____

_____

Would you like to receive a summary report of the research findings? *If you choose to click yes, we will not associate your email address with any answers you gave to survey questions. Your answers will remain confidential.*

○ Yes (please write in your email address)

_____

○ No

NRCS Survey

Thank you for taking time to answer the following questions about your role as a natural resource conservation service provider and your thoughts about weather and climate related risk. Your answers will be used to improve USDA program administration, as well as contribute to important research on natural resource management and adapting to a changing climate. The survey should take you approximately 20 minutes to complete.

Throughout the course of the survey, you will note that there are questions about both weather and climate, which are two separate but connected concepts. Weather refers to changing conditions of the earth's atmosphere over short periods of time (e.g., minutes to months) and climate refers to trends in the earth's atmosphere over relatively longer periods of time (e.g., decades to centuries).

 Indicates that the question, sub-question, or answer choice is visible to respondents who report working with *any* land managers in their daily activities (Farmer by Iain Hector from the Noun Project)

 Indicates that the question, sub-question, or answer choice is visible to respondents who report working with farmers in their daily activities (Corn by Anniken & Andreas from Noun Project)

 Indicates that the question, sub-question, or answer choice is visible to respondents who report working with forest landowners in their daily activities (Tree by Deemak Daksina S from Noun Project)

 Indicates that the question, sub-question, or answer choice is visible to respondents who report working with ranchers in their daily activities (Cow by Bakunetsu Kaito from Noun Project)

Questions and sub-questions without an icon are visible to all respondents

* Indicates a question taken or adapted from Prokopy et al. 2013

Please indicate whether you work with the following land managers in your daily activities (select all that apply):

- [ ] Farmers
- [ ] Forest landowners
- [ ] Ranchers
- [ ] I do not work with land managers in my daily activities

 In what sector do you spend the majority of your time as an NRCS employee?

- ○ Agriculture
- ○ Forestry
- ○ Ranching

Which of the following categories best describes the size of farm/ranch operation you typically work with?

- ○ 1-49 Acres
- ○ 50-99 Acres
- ○ 100-259 Acres
- ○ 260-999 Acres
- ○ 1,000-1,999 Acres
- ○ 2,000-4,999 Acres
- ○ 5,000-9,999 Acres
- ○ 10,000+ Acres
- ○ Not applicable

Which of the following farm/ranch size (in gross annual sales) do you estimate has the highest participation rate in NRCS programs in your state (if you work for a State Office), area (if you work in an Area Office), or County (if you work for a County Office)?

- ○ Small farms - Low sales (gross
- ○ Small farms - Moderate sales (gross $150,000-349,999)
- ○ Midsize farms (gross sales between $350,000-$999,999)
- ○ Large farms (gross sales $1,000,000 or more)
- ○ Don’t know/Prefer not to answer

 Which of the following categories best describes the size of operation of forest landowner that you typically work with?

- ○ 1-9 Acres
- ○ 10-19 Acres
- ○ 20-49 Acres
- ○ 50-99 Acres
- ○ 100-199 Acres
- ○ 200-499 Acres
- ○ 500-999 Acres
- ○ 1000+ Acres
- ○ Not applicable

 What do your customers typically grow/produce? (check all that apply)

- ☐  Grains, oilseeds, dry beans, and dry peas
- ☐  Other row crops (e.g. tobacco, cotton and cottonseed)
- ☐  Vegetables, melons, potatoes, and sweet potatoes
- ☐  Fruits, tree nuts, and berries
- ☐  Nursery, greenhouse, floriculture, sod, cut Christmas trees and other short-rotation woody crops, and other specialty crops
- ☐  Forest/timber products

☐  Non-timber forest products

☐  Aquaculture

☐  Dairy/milk from cows

☐  Cattle and calves

☐  Hay, forages, or silages

☐  Poultry and eggs

☐  Hogs and pigs

☐  Other livestock and livestock products: horses, ponies, mules, burros, donkeys, sheep, goats, wool, mohair, and milk other than cow

☐ Other (write in) _____

In addition to working for NRCS, do you operate, own, or have a financial stake in a farm or ranch?

○ Yes

○ No

○ Prefer not to answer

If respondent answered "yes" to previous question: Please indicate the average size of your farm(s) or ranch(es).

- ○ Small farms (gross sales less than $350,000)
- ○ Midsize farms (gross sales between $350,000-$999,999)
- ○ Large farms (gross sales $1,000,000 or more)
- ○ Prefer not to answer

In addition to working for NRCS, do you operate, own, or have a financial stake in forest land?

- ○ Yes
- ○ No
- ○ Prefer not to answer

If respondent answered "yes" to previous question: Which of the following best describes your forestry operation?

- ○ Small forest landowner (average harvest **under** 2 million board feet/year)
- ○ Industrial forest landowner (average harvest **over** 2 million board feet/year)
- ○ Prefer not to answer

Do you consider weather forecasts (daily, weekly, or seasonal) when you discuss the following topic areas with producers, either formally or informally? If you do not work directly with producers, please skip this entire question.*	Yes, I do	No, but I would if I had better information	No, I don't	I don't discuss these decisions with producers
 Crop rotations and field assignments	○	○	○	○
Crop and/or variety choices	○	○	○	○
 Livestock management	○	○	○	○
 Livestock breed selection	○	○	○	○
 Manure management	○	○	○	○
 Fertilizer purchase and application	○	○	○	○
Pesticide purchase and application	○	○	○	○
Energy/fuel efficiency	○	○	○	○
 Tillage decisions	○	○	○	○
 Integrated pest management practices	○	○	○	○
 Planting or harvest schedule of crops	○	○	○	○
 Planting or harvest schedule of timber	○	○	○	○

 Grazing and forage management	○	○	○	○
 On-farm water management systems	○	○	○	○
Edge-of-field conservation practices (saturated buffers, bioreactors, etc.)	○	○	○	○
 In-field conservation practices (cover crops, grassed waterways, terraces, etc.)	○	○	○	○
 Manure management systems (including production, collection, storage, treatment, transfer, and utilization)	○	○	○	○
Non-field conservation practices (constructed wetlands, grassland restoration, etc.)	○	○	○	○

In general, how dependent are you on the following types of weather information when delivering NRCS technical guidance (if you work directly with producers), or in the course of your regular job duties (if you do not work directly with producers)?*

	Not dependent	Slightly dependent	Moderately dependent	Very dependent
Historical weather trends	○	○	○	○
Weather data for the past 12 months	○	○	○	○
Current weather conditions	○	○	○	○
1-7 day forecasts	○	○	○	○
8-14 day outlooks	○	○	○	○
Monthly or seasonal outlooks	○	○	○	○
Annual or longer term outlooks	○	○	○	○

Do you use any of the following weather-related resources? Note that these resources may be accessible via newsletters, websites, meetings, radio and other sources and they may not have the exact same name listed here.*	Use	Don't use	Not familiar with
 Crop disease forecast	○	○	○
 Insect forecast	○	○	○
 Evapotranspiration (ET) index	○	○	○
 Growing degree day tools	○	○	○
 Forage dry down index	○	○	○
U.S. Drought monitor/outlook	○	○	○
 Cattle Heat Stress Forecast	○	○	○
Satellite data/indices of water or soil nitrogen status, precipitation or temperature	○	○	○
 Farmers' Almanac	○	○	○
 Adaptation workbook for forest management	○	○	○
COMET-Farm	○	○	○
USDA Climate Hubs Tool Shed	○	○	○

Other (write-in)	○	○	○

Please indicate your level of agreement with each of the following statements. *	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	N/A
In the past 5 years, I have noticed more variable/unusual weather in my area	○	○	○	○	○	○
 To cope with increasing climate variability, changing farming and ranching practices are important for the long-term success of the producers in my service area	○	○	○	○	○	○
 To cope with increasing climate variability, changing forestry practices is important for the long-term success of the producers in my service area	○	○	○	○	○	○
Changes in weather patterns are hurting the producers in my service area	○	○	○	○	○	○
Changes in weather patterns are benefiting the producers in my service area	○	○	○	○	○	○
Producers in my service area have experienced adverse impacts due to inaccurate weather information in the past	○	○	○	○	○	○
Accurate or near-accurate weather information has benefitted producers in my service area in the past	○	○	○	○	○	○
I would like climate or weather forecasts to inform the client decisions	○	○	○	○	○	○

Extreme weather events in recent years have affected the long-term management goals of producers in my service area	○	○	○	○	○	○
Extension staff, crop advisors, and formal or informal advisors involved in natural resource management often consult with me	○	○	○	○	○	○
Weather forecasts and information are not available when I need them for the services I provide	○	○	○	○	○	○
I am confident in my ability to apply weather forecasts and information to the services I provide	○	○	○	○	○	○
In the past, inaccurate weather information has negatively affected the quality of the services I provide	○	○	○	○	○	○
In the past, accurate weather information has positively affected the quality of the services that I provide	○	○	○	○	○	○
Producers use climate information when making management-related decisions	○	○	○	○	○	○
I believe there is an increased need for NRCS programs in my service area due to changing weather patterns	○	○	○	○	○	○
Producers in my service area that historically have not had an interest or need for NRCS programs are or will become more vulnerable moving forward	○	○	○	○	○	○

Some producers have experienced the following adverse events or conditions in the past few years. To what degree do you think these conditions will impact agricultural and forestry production in your service area in the future?*	Not concerned	Slightly concerned	Concerned	Very concerned
Increased flooding	○	○	○	○
Excessive moisture	○	○	○	○
Longer dry periods and drought	○	○	○	○
Increased weed pressure	○	○	○	○
Increased pressure from **insect** species	○	○	○	○
Increased pressure from **plant** species	○	○	○	○
Increased pressure from **animal** species	○	○	○	○
 Higher incidence of crop/plant disease	○	○	○	○
 Higher incidence of tree pathogens	○	○	○	○
Higher incidence of wildfire	○	○	○	○
More frequent extreme rains	○	○	○	○
Increases in saturated soils and ponded water	○	○	○	○
 Increased heat stress on crops	○	○	○	○

 Increased heat stress on timber stands	○	○	○	○
 Increased incidence of crop stress or loss due to frost or freeze	○	○	○	○
 Increased heat stress on livestock	○	○	○	○
Increased loss of nutrients into waterways	○	○	○	○
 Increased loss of animal manure into waterways	○	○	○	○
Increased soil erosion	○	○	○	○
 Increased tree loss due to high/extreme wind events	○	○	○	○
Increased wildlife herbivory or predation	○	○	○	○
Increased incidence of hail events	○	○	○	○
Increased incidence of tornado events	○	○	○	○
Increased incidences of hurricanes/tropical depressions	○	○	○	○
Increased incidences of wind storms	○	○	○	○
Reduced snowpack/ frozen ground impacting harvest activities	○	○	○	○

There is increasing discussion about climate change and its **potential** impacts. Please select the statement that best reflects your beliefs about climate change.*

- ○ Climate change is occurring, and it is caused mostly by natural changes in the environment
- ○ Climate change is occurring, and it is caused mostly by human activities
- ○ Climate change is occurring, and it is caused equally by natural changes in the environment and human activities
- ○ Climate change is not occurring
- ○ There is not sufficient evidence to know with certainty whether climate change is occurring or not

Given what you believe to be true about the potential impacts of climate change on natural resource management (farms, forests, rangelands) in the United States, to what degree do you agree or disagree with the following statements? *	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I have the knowledge and technical skill to help producers deal with any weather-related threats to the viability of their operation	○	○	○	○	○
There's too much uncertainty about the impacts of climate change to justify advising or discussing with producers any changes to their management practices and strategies	○	○	○	○	○
Climate change is not a big issue because human ingenuity will enable us to adapt to changes	○	○	○	○	○
I am concerned that available best management practice technologies are not effective enough to protect the producers I advise from the impacts of climate change	○	○	○	○	○
Producers should take additional steps to protect their land from increased weather variability	○	○	○	○	○
Assisting producers to prepare for increased weather variability is a part of my job	○	○	○	○	○
 It is important for producers to adapt to climate change to ensure the long-term success of U.S. agriculture	○	○	○	○	○
 It is important for producers to adapt to climate change to ensure the long-term success of U.S. forestry	○	○	○	○	○

 It is important for producers to adapt to climate change to ensure the long-term success of U.S. rangeland	○	○	○	○	○
 Producers should do more to reduce greenhouse gas emissions from their farm operations	○	○	○	○	○
 Producers should do more to reduce greenhouse gas emissions from their forestry operations	○	○	○	○	○

Please indicate your highest level of education.

- ○ Some formal education, less than high-school
- ○ High school graduate/ GED
- ○ Some college
- ○ 2-year college degree or technical degree
- ○ 4-year college degree
- ○ Graduate degree (MS, MD, PhD etc.)

If the answer to the previous question indicated a 2-year, 4-year, or graduate degree: In what general subject area is your degree?

- ○ Natural Resource Management
- ○ Forestry
- ○ Agronomy
- ○ Animal Science
- ○ Other (write in) _____

In what state or territory is your duty station located?

Respondents are presented with list of 50 states and US territories

Which of the following program areas would you estimate has the highest level of participation among producers in your service area based on total number of participants?

- ○ Agriculture Management Assistance (AMA)
- ○ Conservation Easement Programs (ACEP, GRP, HFRP, WRP, etc.)
- ○ Conservation Stewardship Programs (CSTP, CSP, etc.)
- ○ Conservation Technical Assistance (CTA, GLCI, Soils, NRI, etc.)
- ○ Conservation Reserve Program (CRP)
- ○ Environmental Quality Incentives Program (EQIP)

Please check the three **programs areas** in which you spend the majority of your time:

- [ ] Agriculture Management Assistance (AMA)
- [ ] Conservation Easement Programs (ACEP, GRP, FRPP, HFRP, WRP, etc.)
- [ ] Conservation Innovation Grants (CIG)
- [ ] Conservation Stewardship Programs (CSTP, CSP, etc.)
- [ ] Conservation Technical Assistance (CTA, GLCI/CPGL, Soils, NRI, etc.)
- [ ] Conservation Reserve Program (CRP)
- [ ] Environmental Quality Incentives Program (EQIP, WHIP)
- [ ] Landscape Planning (EWP, PL566 Watershed Operations, Planning, Rehabilitation)

Please check the top three **program initiatives, projects, and/or activities** in which you spend the majority of your time:

- [ ] Administrative (accounting, file management, office operations, information technology, etc.)
- [ ] Conservation Compliance (Determinations for eligibility or compliance)
- [ ] Landscape-Level Projects (RCPP projects, Chesapeake Bay, Everglades, Migratory Birds, Prairie Pothole, Targeted Forestry, WLFW, Sage Grouse, Longleaf Pine, Lesser Prairie-Chicken, Monarchs, Honey Bees, etc.)
- [ ] Technical Services and Products (Technology Transfer, Resource Inventory and Assessment (CEAP, NRI, SNOTEL, Soil Survey); Practice Design, layout and evaluation; Site-Specific, Area,

Community, and or Watershed level Plan Development, Educational and Demonstration Projects, International Projects)

☐ Training, Quality Assurance, Supervision, Management (Spot Checks, Program Reviews, Appeals, Mediation, Conservation Compliance Reviews, Training, Supervision, Management)

☐ Water-based Initiatives (NWQI, MRBI, Ogallala Aquifer, Driftless Area, etc.)

☐ General Farm Bill program delivery other than initiatives (planning, contracting, implementing, certifying, etc.)

In what year were you born?

_____

For how many years have you worked for NRCS?

_____

For how many years have you worked for USDA?

_____

Where is your current position at NRCS located?

- ○ NRCS Service Center
- ○ Area Office
- ○ Regional Office/Technology Support Center
- ○ State Office
- ○ Other (write in) _____

What is your current position at NRCS?

- ○ Soil Conservation/Engineering Technician
- ○ Soil Conservationist
- ○ Resource Conservationist
- ○ Range Conservationist
- ○ Soil Scientist
- ○ Engineer
- ○ Forester
- ○ Wildlife Biologist
- ○ Agronomist
- ○ Area Conservationists
- ○ District Conservationists
- ○ Assistant State Conservationist- Field Operations
- ○ Assistant State Conservationist- Program
- ○ State Resource Conservationist
- ○ State Conservationist
- ○ Education/Outreach Specialist
- ○ Stewardship Coordinator
- ○ Administrative Staff
- ○ Regional Scientist (specify): _____

- ○ Other (write-in): _____
- ○ Prefer not to answer

What is your gender identity?

- ○ Male
- ○ Female
- ○ Prefer not to answer

What is your race?

- ○ American Indian or Alaska Native
- ○ Asian
- ○ Black or African American
- ○ Native Hawaiian or Other Pacific Islander
- ○ White
- ○ Other (write-in) _____
- ○ Prefer not to answer

What is your ethnicity?

- ○ Hispanic or Latino
- ○ Not-Hispanic or Latino
- ○ Other (write-in) _____
- ○ Prefer not to answer

Would you like to receive a summary report of the research findings? *If you choose to click yes, we will not associate your email address with any answers you gave to survey questions. Your answers will remain confidential.*

- ○ Yes (write in email address) _____
- ○ No