



# Farmer attitudes toward farm-level adaptation to increased weather variability

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**Climate change presents** a number of threats to the Corn Belt's predominant corn-soybean agricultural system. A key objective of the Sustainable Corn project is to conduct social science research to assess farmers' understanding of climate change and attitudes toward adaptive and mitigative practices and strategies. Toward that end, a survey of Corn Belt farmers was conducted in February and March 2012. This report summarizes a portion of that survey. More comprehensive results are available at: [sustainablecorn.org/What\\_Farmers\\_are\\_Saying/Farmer\\_Survey](http://sustainablecorn.org/What_Farmers_are_Saying/Farmer_Survey).

Attitudes are subjective evaluations of a specific object, idea, or policy. This survey collected data on midwestern farmer's attitudes toward a number of potential adaptive and mitigative actions. Adaptive actions are adjustments that farmers make as they anticipate or react to changing conditions that may place the farm enterprise at risk. Adaptive actions can be technological, economic, social, managerial, and/or institutional adjustments. They are often motivated by intentions to reduce risk and vulnerability of the farm enterprise. Mitigative actions are those that reduce greenhouse gas emissions or sequester carbon.

The survey measured farmers' attitudes toward 15 adaptation and mitigation items in three categories: (1) farmers' individual and collective efforts to protect land from increased weather variability; (2) the role of organizations and agencies in helping farmers prepare for increased weather variability; and, (3) farmers' perspectives on whether or not markets

## The Project

The Sustainable Corn Project is a USDA-funded transdisciplinary partnership among 11 institutions creating new science and educational opportunities. The project seeks to increase resilience and adaptability of midwestern agriculture by identifying farmer practices and policies that increase sustainability while meeting crop demand.

[sustainablecorn.org](http://sustainablecorn.org)

## The Survey

The farmer survey was carried out in partnership with the Useful to Useable (U2U) project, another USDA-funded climate and agriculture project. The 2012 survey was completed by 4,778 corn farmers with at least US\$100,000 of gross sales and a minimum of 80 acres of corn production.

## Where

The sample was stratified by 22 six-digit Hydrologic Code Unit (HUC) watersheds that cover a substantial portion of 11 Corn Belt states—Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, South Dakota, and Wisconsin. The 22 watersheds contain over half of U.S. corn and soybean acres.

for biomass, carbon credits and small grains should be developed. The items were preceded by the text, "Organizations, agencies, and individuals can do a number of things to prepare for or address potential changes in climate. Please provide your opinions on the following statements." They were rated on a five-point agreement scale from strongly disagree to strongly agree.

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**Source:** Loy, Adam, Jon Hobbs, J. Gordon Arbuckle Jr., Lois Wright Morton, Linda Stalker Prokopy, Tonya Haigh, Tricia Knoot, Cody Knutson, Amber Saylor Mase, Jean McGuire, John Tyndall, and Melissa Widholm. 2013. Farmer Perspectives on Agriculture and Weather Variability in the Corn Belt: A Statistical Atlas. CSCAP 0153-2013. Ames, IA: Cropping Systems Coordinated Agricultural Project (CAP): Climate Change, Mitigation, and Adaptation in Corn-based Cropping Systems. Available at [sustainablecorn.org](http://sustainablecorn.org).

TABLE 1 | Attitudes<sup>1</sup> toward various adaptive actions to prepare for potential changes in climate, percent of farmers who agree or strongly agree, by watershed.

Watershed (HUC6)	Farmers should take additional steps to prepare them for increased weather variability	I should take additional steps to prepare for increased weather variability	Farmers should invest more in agricultural drainage to prepare for increased precipitation	Farmers should invest more in irrigation systems to prepare for more frequent drought
All Watersheds	65	58	47	17
Loup	62	47	18	31
Middle Platte	59	51	28	47
Elkhorn	65	51	24	30
Big Blue	60	51	20	30
Lower Platte	66	58	29	25
Big Sioux	70	60	45	15
Missouri-Little Sioux	65	57	42	15
Missouri-Nishnabotna	68	65	35	13
Minnesota	68	59	59	17
Des Moines	60	55	56	12
Iowa	67	54	49	13
Black Root	67	56	30	14
Skunk Wapsipinicon	63	62	54	10
Maquoketa Plum	67	53	38	9
Lower Illinois	61	57	51	16
Rock	66	59	39	19
Kaskaskia	76	70	52	15
Upper Illinois	68	61	58	15
Wabash	66	63	59	16
Patoka-White	73	68	62	19
Southeastern Lake Michigan	62	57	53	36
Western Lake Erie	66	59	68	18

<sup>1</sup>Attitudes were measured on a 5-point agreement scale: strongly disagree, disagree, uncertain, agree, strongly agree.

## Survey Results

This report presents data for four items that measure farmers' attitudes toward potential responses to increased weather variability: (1) Farmers should take additional steps to protect farmland from increased weather variability; (2) I should take additional steps to protect the land I farm from increased weather variability; (3) Farmers should invest more in agricultural drainage systems to prepare for increased precipitation; and, (4) Farmers should invest more in irrigation systems to prepare for more frequent drought.

Across all watersheds, two thirds (65%) of respondents agreed that farmers should take additional steps to prepare for increased weather variability (table 1). Agreement with this

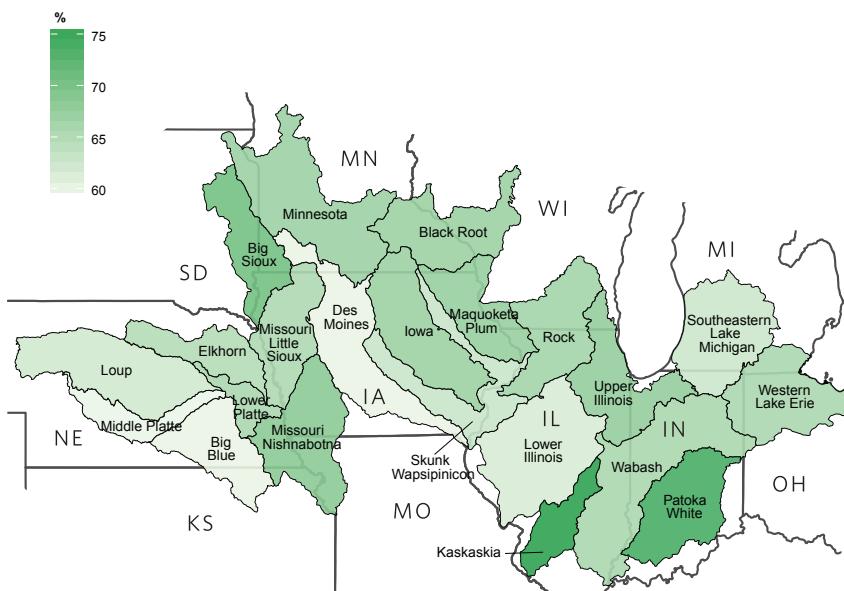


FIGURE 1 | Farmers should take additional steps to protect farmland from increased weather variability, percent agree or strongly agree.

statement ranged from a low of 59% in Middle Platte watershed to a high of 76% in Kaskaskia watershed (figure 1).

In addition, almost six in ten farmers (58%) agreed that they as individuals should take additional steps to protect land against risks posed by increased weather variability (table 1). The level of agreement varied across watersheds, from a low of 47% in Loup watershed to a high of 70% in Kaskaskia watershed (figure 2).



On average across all watersheds, 47% of respondents agreed that farmers should invest more in agricultural drainage to prepare for increased precipitation (table 1). The percentage of farmers who believed that they should invest more in agricultural drainage was lowest in Loup watershed (18%) and highest in Western Lake Erie watershed (68%) (figure 3). Fewer than one in five respondents (17%) across all watersheds agreed that farmers should invest more in irrigation systems to prepare for more frequent drought (table 1). Respondents in Maquoketa Plum watershed had the lowest level of agreement (9%) and respondents in Middle Platte watershed had the highest level of agreement (47%) with the statement (figure 4).

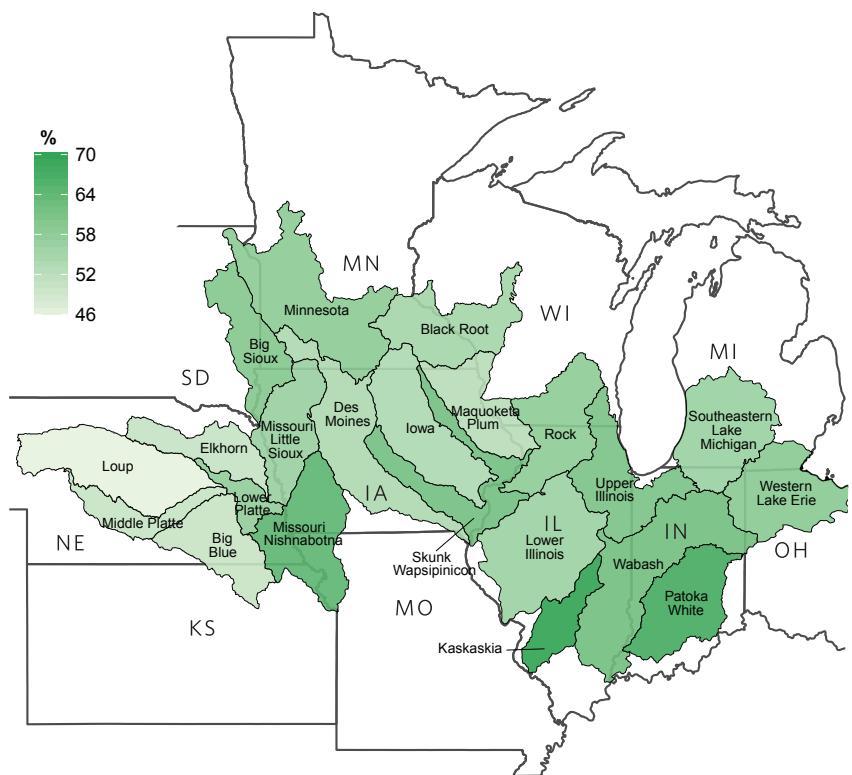


FIGURE 2 | I should take additional steps to protect the land I farm from increased weather variability, percent agree or strongly agree.

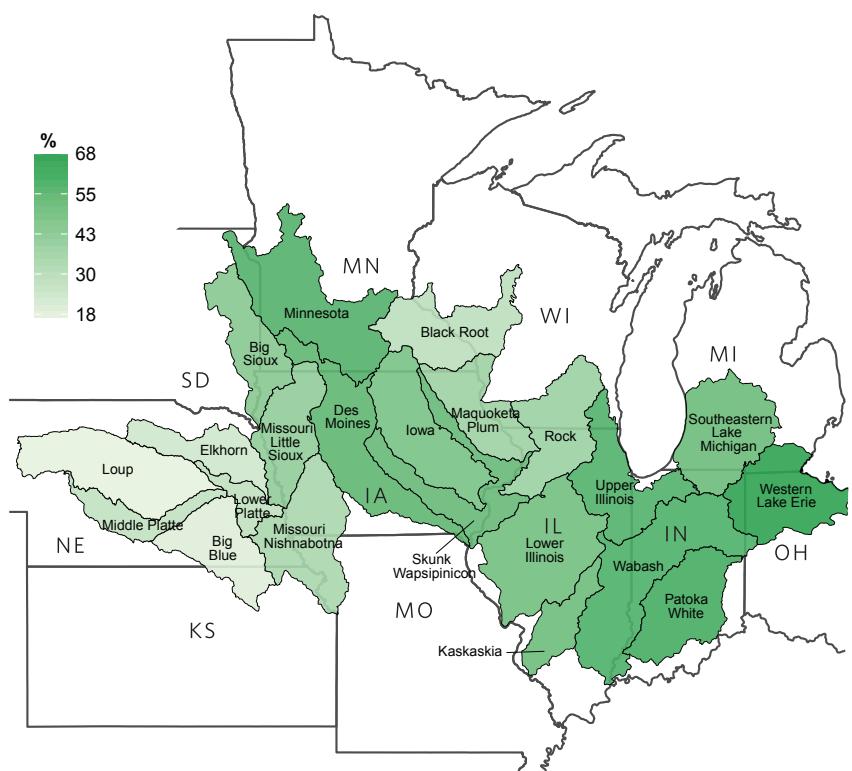
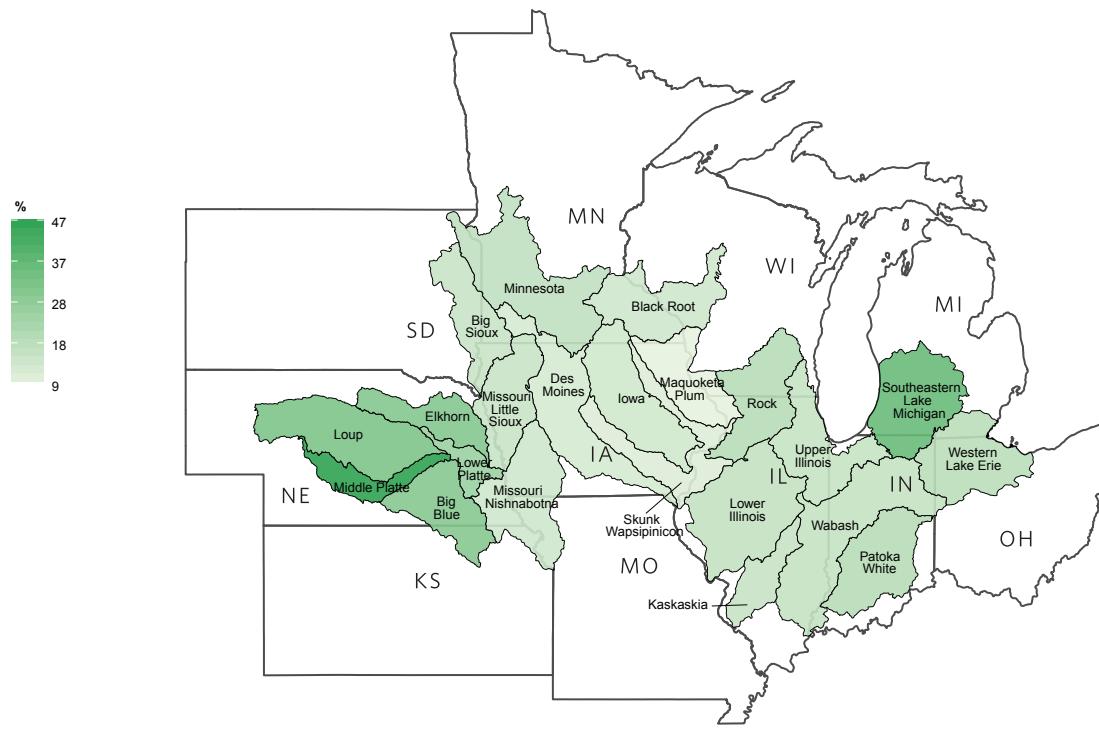


FIGURE 3 | Farmers should invest more in agricultural drainage systems to prepare for increased precipitation, percent agree or strongly agree.



**FIGURE 4 |** Farmers should invest more in irrigation systems to prepare for more frequent drought, percent agree or strongly agree.

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