



NIFA's Climate Portfolio contributes significantly to the mission of USDA to provide leadership on agriculture production, natural resources management, food security, food safety, and climate-related issues based on sound public policy, the best available science, and efficient management. Its goal is to develop sustainable agriculture and forestry based strategies for:

1. **Adaptation** – Maximize resiliency and reduce the impact of climate variability and change on the stability and productivity of agriculture and forest agroecosystems under changing climates by providing producers and decision makers with new and sustainable management methods and technologies.
2. **Mitigation** – Reduce atmospheric greenhouse gas emissions in agricultural and forestry production systems and optimize carbon sequestration potential in agriculture and forest working lands by providing producers and decision makers with new and sustainable management methods and technologies which can also contribute to the emerging economic opportunities of a carbon-based market system.
3. **Climate Science Education and Extension** – Increase the number of agriculture scientists, educators and extension professionals in the workforce with the skills and knowledge to address societal issues and improve the understanding of climate variability and change, its impacts, and options for sustainable food production and environmental stewardship.

**Regional Approaches for Adaptation to and Mitigation of Climate Variability and Change:** Under this portfolio element, large scale projects of a regional nature bring together a multi-state, multi-institutional, and trans-disciplinary team to integrate scientific discoveries and technology with practical application. These projects accomplish all three functions of the NIFA knowledge system (*i.e.*, research, education, and extension) focused around its portfolio goals (see above). Project participants serve as a team that conducts targeted research, education and extension activities to address a significant regional issue with respect to greenhouse gas mitigation and adaptation through increased resiliency in agriculture and forestry production and sustainable natural resources management under variable climates.

**Climate Adaptation and Mitigation in Agroecosystems:** Under this portfolio element, projects address the science and science delivery for adaptation and mitigation across a broad range of US agricultural production systems including forest and range systems. Project activities lead to tangible short and long-term outcomes with net positive social, environmental, and economic impacts that can be sustained and integrated with existing and future agricultural and forestry systems. Long-term outcomes include the development of new varieties of plants and animals, identifying new strategies for agriculture and forest production systems for adaptation to climate variability and change; and advance sustainable use of natural resources.

**Fundamental research into climate variability and change in agroecosystems:** Under this portfolio element, fundamental and interdisciplinary research seeks to better understand the impacts and feedbacks of global and climate change on agricultural systems and provide potential adaptation and mitigation strategies, as well as development of decision support tools for land, ecosystem and water resource managers. These projects will develop the science base and infrastructure to support a new generation of coupled Earth System models to improve attribution and prediction of high-impact regional weather and climate, to initialize seasonal-to-decadal climate forecasting, and provide predictions of impacts on adaptive capacities and vulnerabilities of agricultural, forest, environmental and human systems.

**Science Delivery and Decision Support:** The NIFA Climate Portfolio aims to further develop the delivery of scientific research to support public discussion and planning, adaptive management, and policy making. Science delivery and decision support require communication between scientists, extension professionals and stakeholders to define the problems to be addressed, the nature of tools to be developed, the expected information to be provided, and the approach for describing levels of confidence and key uncertainties. This requires integrating knowledge from many diverse fields across science and non-science disciplines and making credible information available to stakeholders, educational entities, and the public.

**Climate Science Education and Extension:** There is a critical need to increase the number of agriculture scientists, educators and extension professionals in the workforce with the skills and knowledge to address climate variability and change and improve the understanding and options for sustainable agriculture production and environmental stewardship. This effort includes enhancing education and training for students, postdoctoral researchers and extension professionals to enable cross-disciplinary experience in climate change science and create new agriculture and forestry job opportunities. The portfolio will broaden the application of climate science to address societal impacts by engaging industry, academic and professional associations, and private foundations; and enhancing international research coordination and cooperation.

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