

Participatory Approach to Understanding Climate Change Impacts in an Agricultural Landscape in California's Central Valley

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Since the passage of the California Global Warming Solutions Act of 2006 (Assembly Bill 32), the agricultural community in California has begun to develop awareness for mitigation and adaptation to climate change. To address these issues, participatory information exchange is now underway among several types of stakeholders, e.g., academics, local and state governmental offices, NGOs, and farmer organizations.

One example of a research/extension project is a case study of potential adaptation to climate change in a representative California county, Yolo County, in the Sacramento Valley. Like many other agricultural counties in the state, it encompasses floodplains along a major river, intensive irrigated cropland of diverse horticultural and field crops, and grazed dry upland grasslands and savannas, as well as small urban communities.

A group of UC Davis scientists is evaluating the various options for mitigation and adaptation to climate change in Yolo County under IPCC A2 and B1 scenarios, using a participatory approach with several types of stakeholders that represent diverse interests, e.g., farmers, planners, regulatory agency personnel, and irrigation district managers. The project includes planning horizons for farmers, modeling of crop responses and greenhouse gas emissions, agricultural and resource economics, water resources and management, land use change and effects on biodiversity, environmental justice issues, and development of grower decision-making support systems for mitigation and adaptation to climate change.

The goals of the project are to:

1. Understand the vulnerability of a representative California agricultural landscape to climate change.
2. Determine the key biophysical and socioeconomic uncertainties that will affect mitigation and adaptation to climate change in this landscape.
3. Develop a blue-print for sustainable regional responses to climate change for California's agricultural counties.

By creating a series of potential scenarios for adaptation to climate change, it is possible to explore vulnerability and adaptive capacity of the current agricultural land uses and landscape types. For each of these scenarios, a 'storyline' has been developed that is plausible for the region, i.e., the IPCC A2 scenario has a 'regional enterprise' storyline, while the IPCC B1 scenario has a 'global sustainability' storyline. The projected outcomes of the different scenarios are being assessed using climate data provided by a statewide downscaled modeling project. A combination of modeling, GIS, and interview techniques are being used to examine the potential resilience to climate change for various segments of society, with emphasis on tradeoffs that occur in relation to agricultural sustainability, i.e., for supporting agricultural production, environmental quality and social well-being.

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