

## Agricultural Economic Impacts of Climate Change in Yolo County (Preliminary)

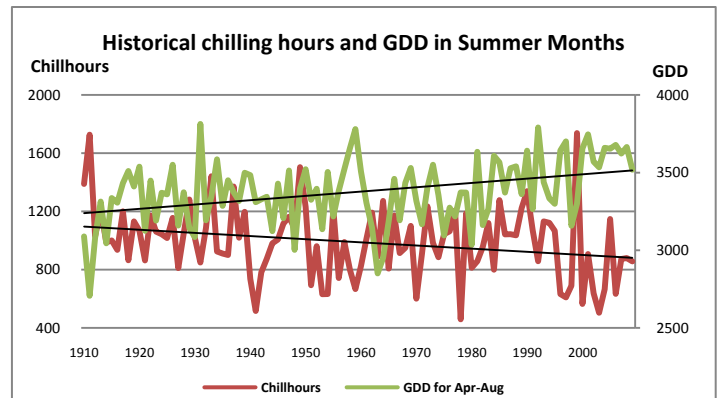
### Study objective

Document the history and projections of agriculturally relevant climate change in Yolo County and assess the impacts of climate and climate change on planted acreage of significant crops.

### History

- Within each crop category, one or a few crops account for most of crop revenue. About 80% of field crop revenue is from alfalfa, rice and wheat, almost 90% of fruit and nut revenue is from winegrapes, almonds and walnuts, and 90% of vegetable revenue is from processed tomatoes.
- Yolo agriculture has been moving toward more high revenue per acre crops, especially a shift out of barley and an increase in wine grapes and walnuts.
- Climate change in Yolo has meant mainly warmer minimum temperatures especially in the winter. Maximums have been declining or steady. Consequently, winter growing degree days (GDD) have increased and chill hours have declined.

	Acreage ('000)				Revenue
	2008		1948		\$ millions
Field crops	215	67%	290	87%	196 39%
Fruit & nuts	36	11%	16	5%	96 19%
Vegetables	43	14%	20	6%	113 23%
Other	25	8%	7	2%	97 19%
<b>Total</b>	<b>319</b>		<b>333</b>		<b>502</b>



### Projections

- IGCC B1 and A2 climate projections differ and show ups and downs though 2050 in significant measures such as GDD in summer and winter. Winter GDD rises especially for the b1 scenario after about 2035. Chill hours generally decline by 2050. The pattern differs by scenario and includes ups and downs over the period.
- We fit statistical models to the crop acreage history as functions of prices, climate, and other factors.
- Then we use estimated climate coefficients and climate forecasts to 2050 to project how planted acreage for major Yolo crops varies with the projected climate change in the future under each scenario.
- For example, Alfalfa acreage grew, declined and grew again over a 60-year history. Over this period, alfalfa acreage responds positively to winter growing degree days, which accounts for higher alfalfa acreage projected for 2050 under B1.
- Each crop has a unique relationship with climate patterns. Total field crop acreage continues to decline. Tomato acreage increases slightly by 2050 compared to 2008, but not compared to 1990, under both climate scenarios. Overall projected acre shifts due to climate change are relatively small.

