

The Policy Environment Enabling Climate-Smart Agriculture in California

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UC DAVIS

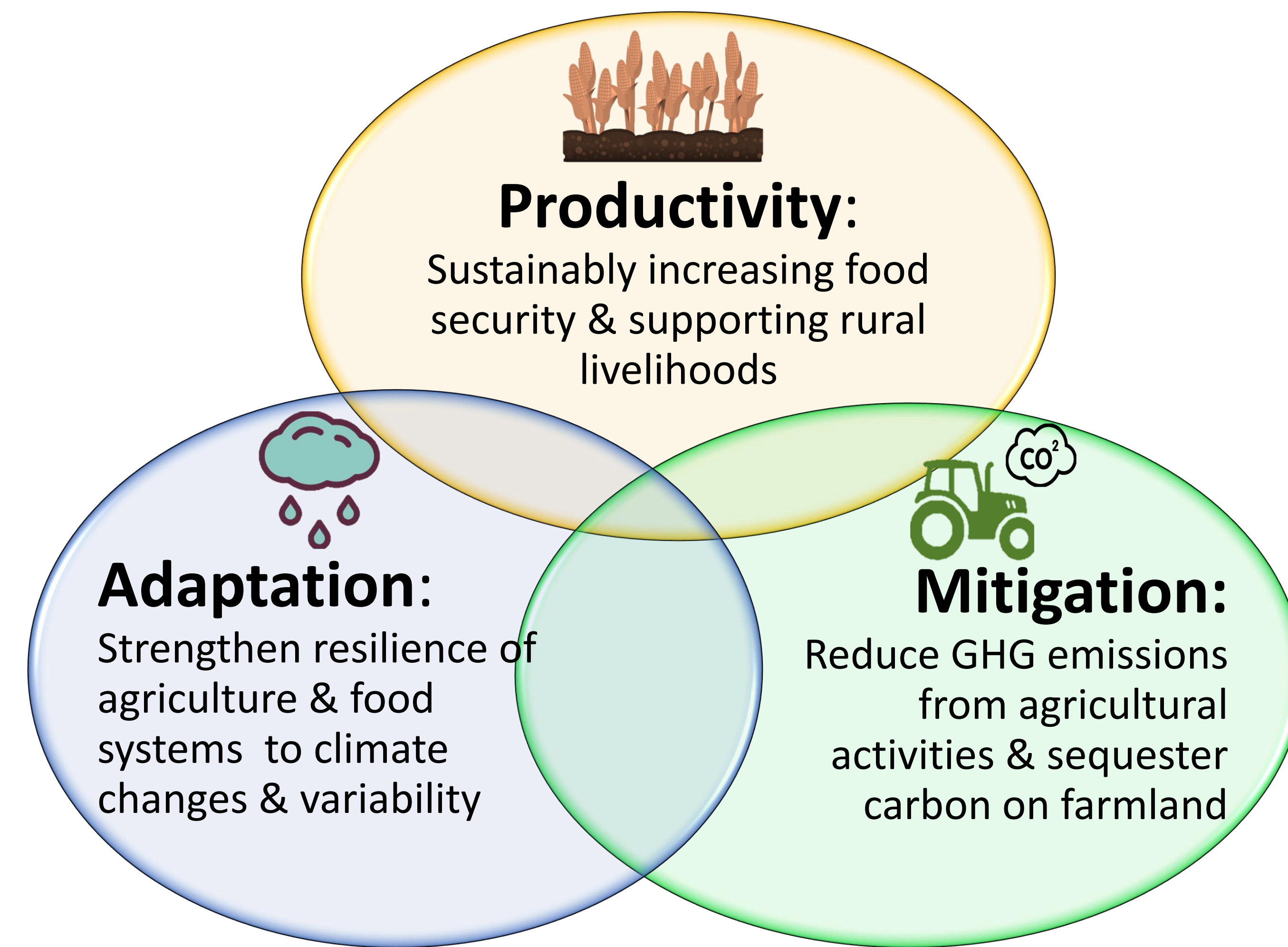
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WHAT IS CLIMATE-SMART AGRICULTURE?

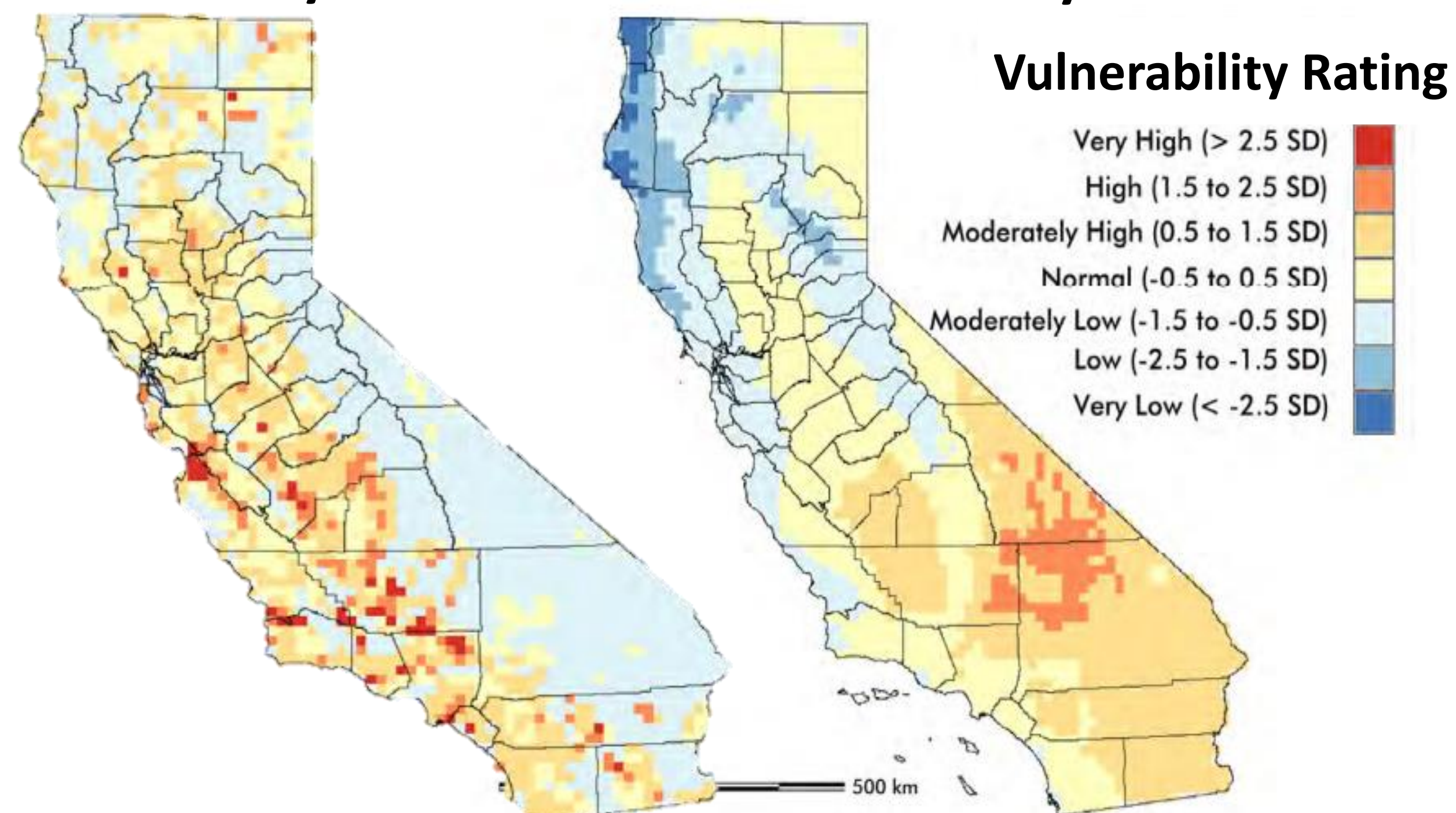
CSA is a framework to balance multiple dimensions of agricultural transformations needed under climate change^{3,4}



CALIFORNIA AGRICULTURE FACING CLIMATE CHANGE CHALLENGES:

- ❖ **Increasing temperatures** → decreased chill hours for perennial crops; increasing extreme heat days that stress farm laborers, livestock, and crops; expanding pest & weed ranges; earlier snowmelt & reduced natural water storage
- ❖ **Variable precipitation** → increasing frequency & severity of drought & floods; greater dependence on groundwater
- ❖ **Sea level rise** → salinization of soils & fresh water resources

Crop Vulnerability Index⁵ Climate Vulnerability Index⁵



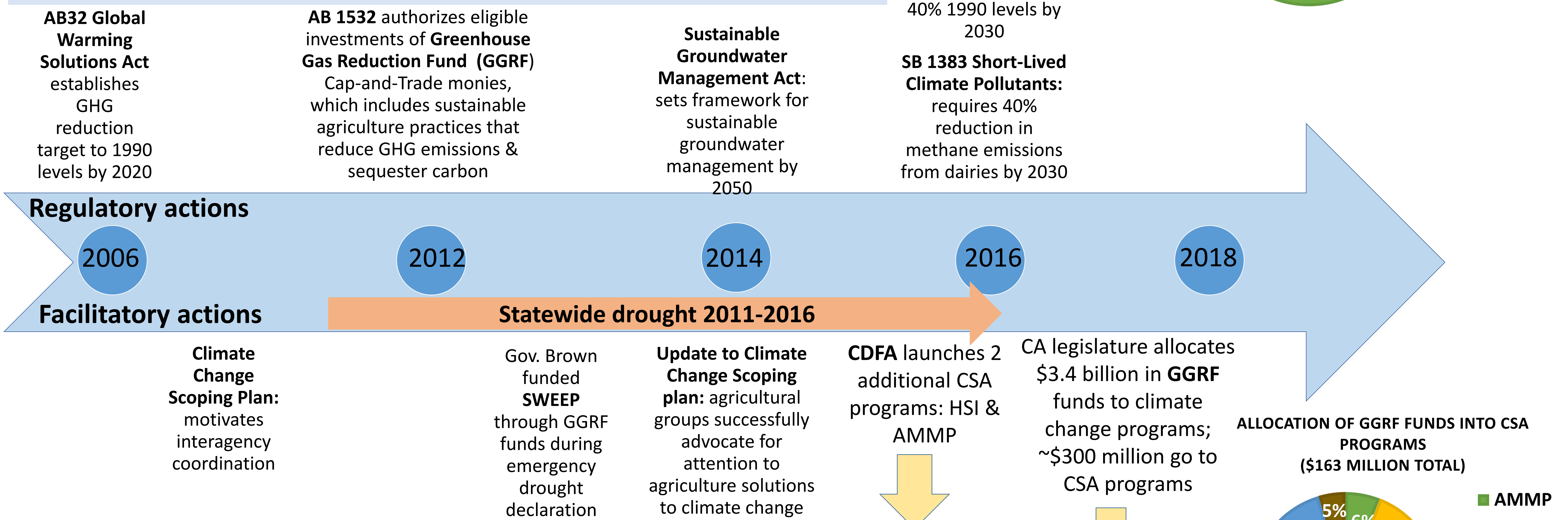
Vulnerability Indices integrate agriculturally-relevant variables for crop sensitivity to temperature and precipitation changes, crop dominance, pesticide use, and predicted climate changes to create predicted vulnerability scores for 2020-2050 (Source: Jackson, et al. 2012)

References: ³Lipper et al. (2014) *Climate-smart agriculture for food security*. ⁴FAO (2013) *Climate-smart agriculture*. ⁵Jackson et al. (2012) *Vulnerability and Adaptation to Climate Change in CA Agriculture*. ⁶CalCAN Climate Smart Agriculture Programs

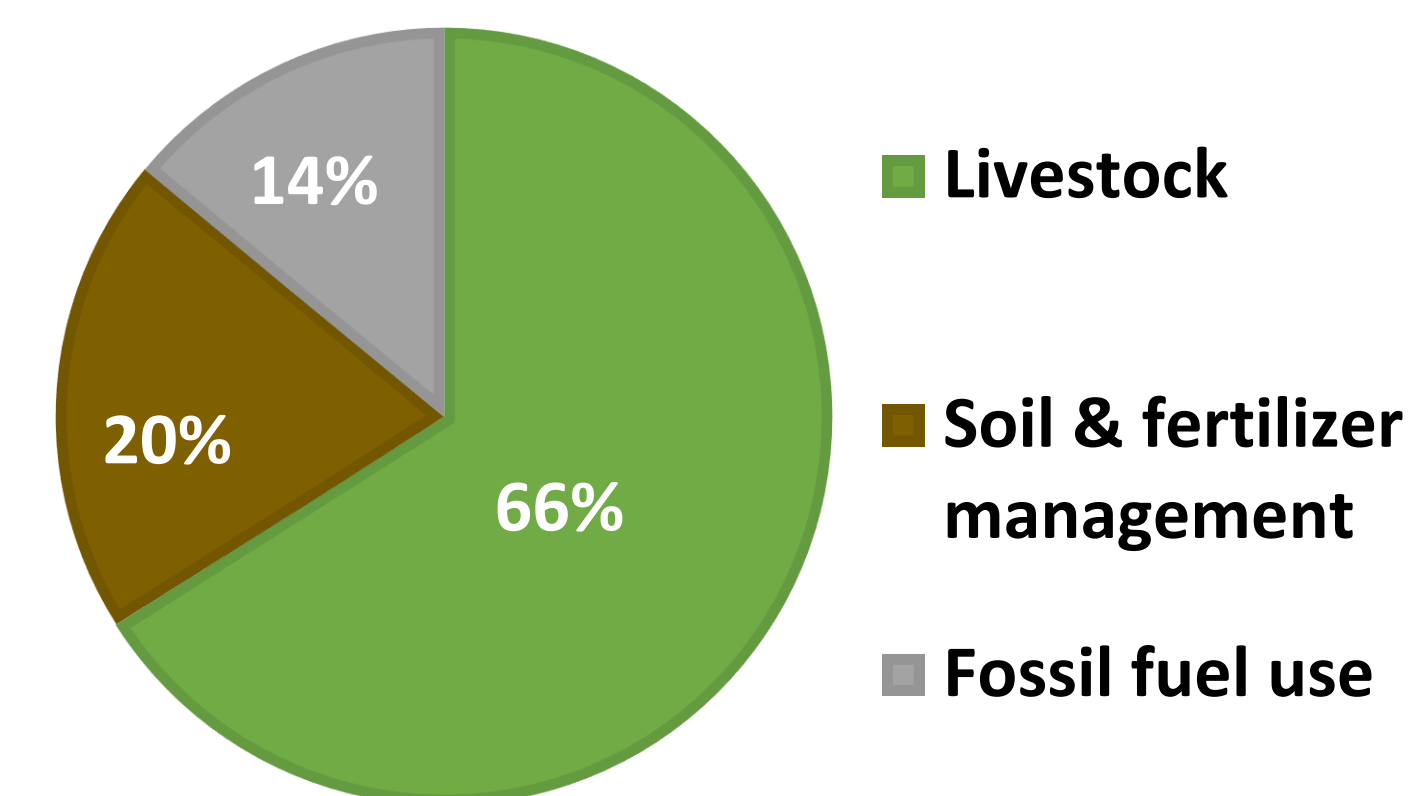
DEVELOPMENT OF CSA INITIATIVES IN CALIFORNIA

Ambitious policymaking to reduce GHG emissions (AB 32) initiated collaboration across governmental agencies and NGO actors, increased scientific research, and developed a financing mechanism via Cap-and-Trade monies (GGRF) that the agricultural sector has opportunistically taken advantage of to develop CSA opportunities. Severe drought motivated efforts to improve water use efficiency and governance.

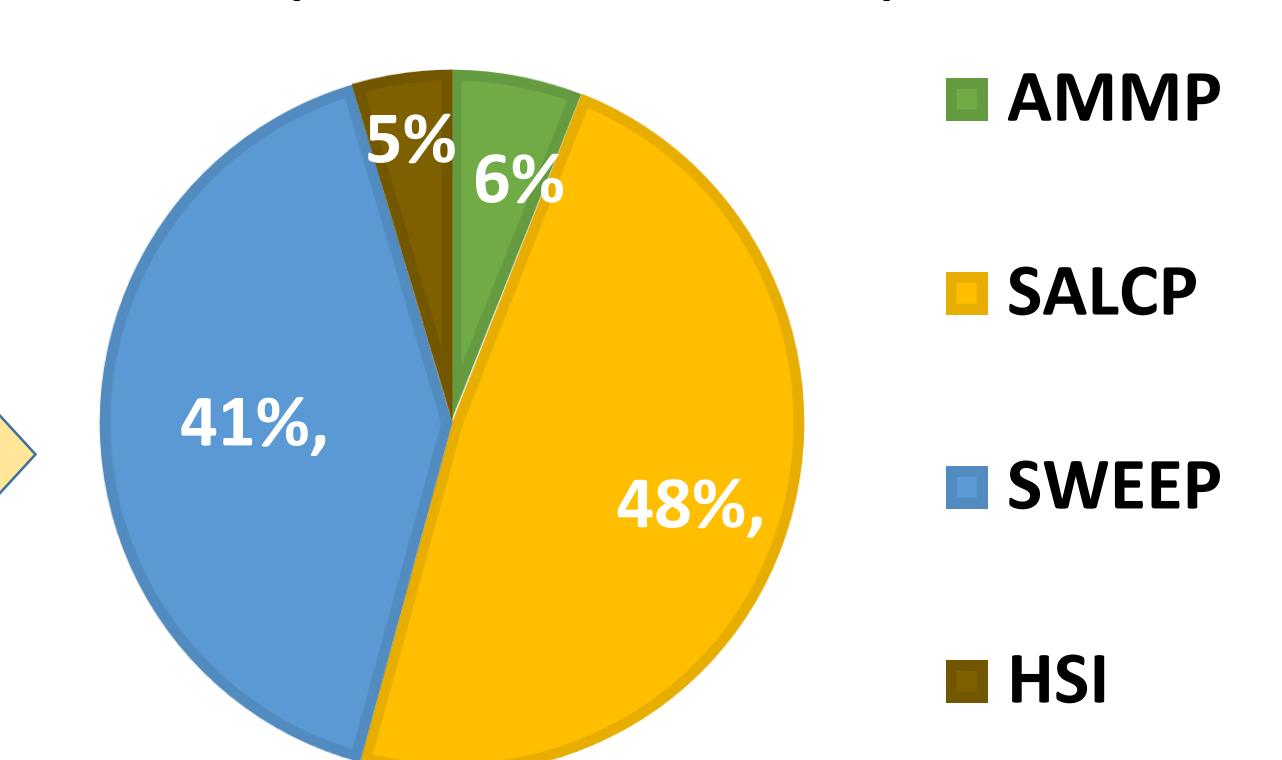
Timeline of policy events contributing to CSA development⁶



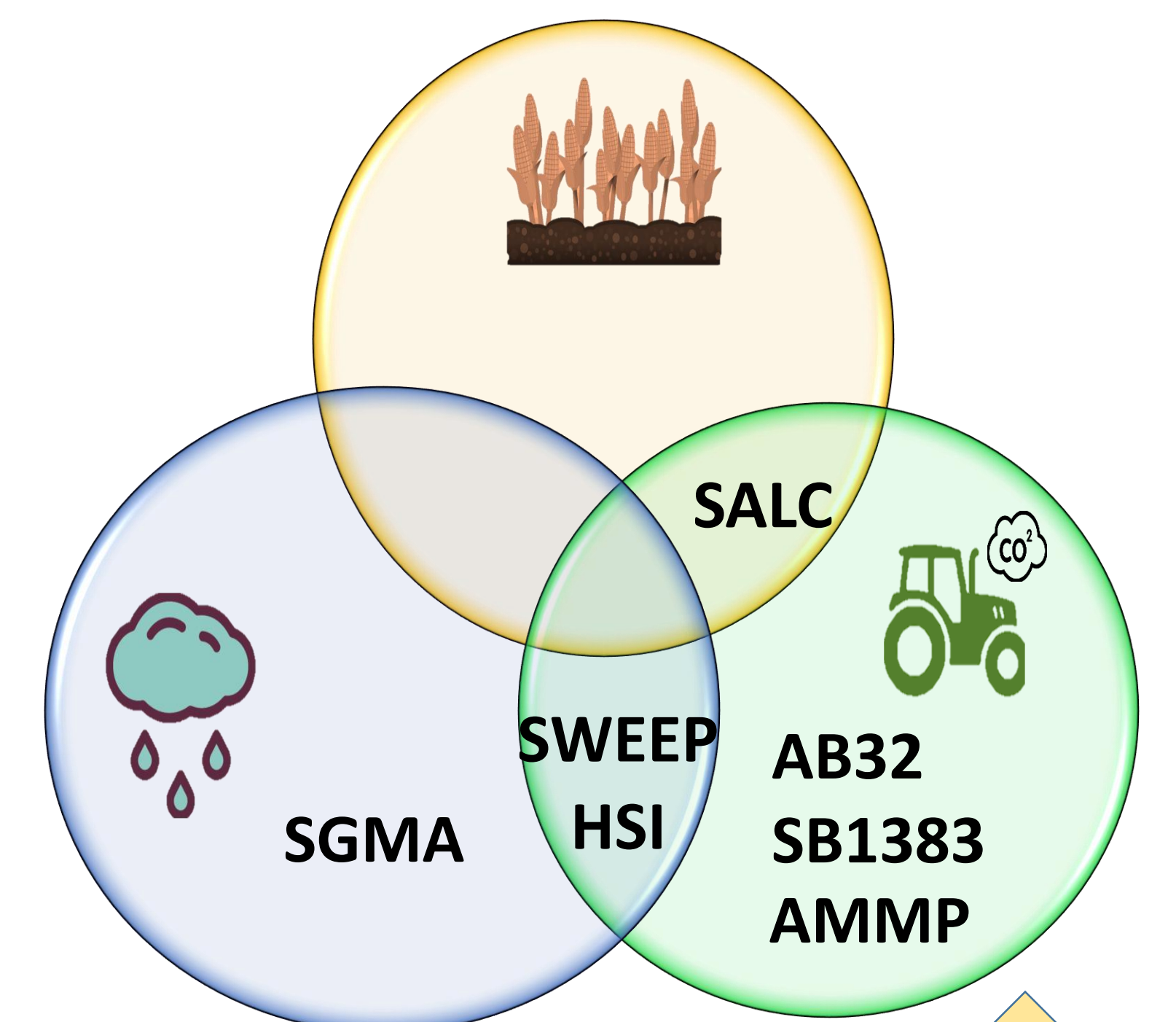
CALIFORNIA AGRICULTURE GHG CONTRIBUTIONS = 8% OF TOTAL STATE EMISSIONS (~35MMTCO2E)



ALLOCATION OF GGRF FUNDS INTO CSA PROGRAMS (\$163 MILLION TOTAL)



DISTRIBUTION OF CURRENT CSA EFFORTS ACROSS 3 CSA GOALS



CSA Program ⁶	Program Goals	Existing projects	GHG reductions	Administering agency
Sustainable agricultural lands conservation program (SALCP)	Reduce GHG emissions associated with urban sprawl & ag land conversion; fund ag easements	80,000 acres in 25 counties	42 million MTCO2e reductions over 30 years	Department of Conservation, Strategic Growth Council
State Water Efficiency and Enhancement Program (SWEEP):	Update irrigation systems to improve efficiency to save energy and conserve water	606 farms in 33 counties	>300,000 MTCO2e reductions in 10 years	Department of Food and Agriculture
Healthy Soils Initiative (HSI)	Incentivize BMP adoption to store soil in carbon, reduce soil erosion & increase water holding capacity	86 farms in 31 counties	>115,000 MTCO2e reductions in 10 years	Department of Food and Agriculture
Alternative Manure Management Program (AMMP)	Subsidize dairy and livestock installation of methane-emission reduction technologies (i.e. manure digesters)	17 farms in 7 counties	>360,000 MTCO2e reductions in 5 years	Department of Food and Agriculture

NEXT STEPS TO ADVANCE CSA IN CALIFORNIA

- ❖ Assess how current CSA efforts meet 3 CSA goals (mitigation, adaptation, productivity) and where additional attention will be needed
- ❖ Assess where synergies and tradeoffs exist between various CSA efforts (e.g. increasing irrigation efficiency vs. recharging groundwater)
- ❖ Increase coordinated policy-making around complex inter-linked issues (e.g. water governance & irrigation mgmt; water quality & soil mgmt)
- ❖ Increase policy learning by continuing to build relationships with other states and countries developing CSA plans
- ❖ Improve consistency of funding mechanisms to sustain long-term efforts, either through long-term GGRF allocations or alternative mechanisms