

# Climate Change

## RANCHING SUSTAINABILITY ANALYSIS QUICK TIPS



### What is climate change?

Climate change is the significant and persistent change in climate over time. There is robust scientific consensus that human activities, especially emissions of CO<sub>2</sub> and other greenhouse gases, over the last 50 years have contributed significantly to the measured global warming trends. These changes are likely to accelerate in the future. Even small temperature changes have profound effects on weather patterns, water availability, ecosystems, and human health.



### Climate change scenarios

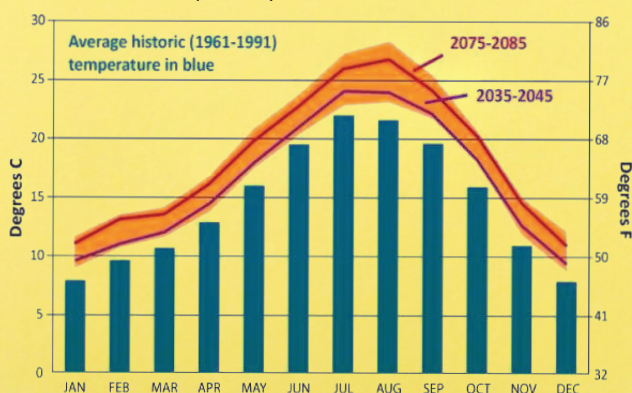
- Expect increasingly hotter temperatures over the next 50 years
- Increasing drought frequency
- More frequent and higher intensity storms with consequent flooding
- Increased erosion due to drought and storms
- Water supplies will become increasingly scarce
- Increasing and higher intensity wildfires
- Increased spread of invasive species

Etc...heavier precipitation (increased runoff and erosion potential, increased damage to flowers and fruit that provide scenic benefits and support wildlife), altered timing, more severe droughts, fewer cold/frost days and decreased snow cover—more snow melt and flooding in winter compared to gradually recharging groundwater and water supplies, leading to less soil moisture during summer; more frequent El Niño (ENSO) weather events etc.; increased evaporative losses (from plants, soils, and water bodies), increased occurrence of storms, alter nutrient cycles that influence water quality, changes in amount and timing of precipitation and runoff; effect on microbial processes—soil microbes that decompose organic matter and release nutrients for plant uptake; sea level rise will increase saltwater intrusion into coastal ecosystems and aquifers

### PREDICTED CLIMATE CHANGE

#### Hotter and Drier by Late Century!

Average monthly temperatures and future projections (Orange band) for San Luis Obispo County.



### What does this mean for ranchers and rangeland?

- Less water for plants and animals, greater demand due to warmer daytime and overnight temperatures
- Plants stressed by heat and water are more susceptible to pests and diseases
- Lesser carrying capacity for grazing animals
- Increased disease pressure on livestock
- Increased cost of supplemental feed (due to adverse effects on crop yields)

- Increased household food costs
- Increased pressure to reduce livestock emissions
- According to the US global report (full name, p71), "Forage quality in pastures and rangelands generally declines with increasing carbon dioxide concentration because of the effects on plant nitrogen and protein content, reducing the land's ability to supply adequate livestock feed."
- Increased heat, disease, and weather extremes are likely to reduce livestock productivity.
- Slow down water/reduce runoff – keep soil and water on your ranch where your forage plants and animals can make use of it
- Grazing management to control invasive plants and optimize forage, and maximize carbon sequestration (offset livestock gas emissions)
- Also maintain woodlands etc. for carbon sequestration, cooling/evapotranspiration/shade for livestock
- Encourage mix of annual and perennial grasses and forbs as well as trees and shrubs to create a diverse plant community which will be resilient to changing conditions (e.g., perennials usu have deep roots, access deeper water in soil, and therefore more drought tolerant; trees and shrubs as shade for animals and other plants)

## What can I do?

...similar to preparing for drought

...adapt and mitigate to improve resilience to climate variability

...diversify income (reduce dependence on livestock for income)

- If don't have already, develop and implement a grazing plan as part of your overall ranch plan,...prepare for drought...hope for the best, plan for the worst
- Reduce or eliminate use of (need for ) supplemental feed to avoid rising costs
- Flexible stocking rates to keep the land healthy
- Manage/improve soil organic matter, (fertility and water holding capacity)

- Better utilization of forage through selective breeding, class/type of livestock (i.e., animals that do well on what nature provides – conform to range conditions), multi-species grazing, training livestock to eat weeds
- Be prepared for drought but also floods – develop a plan that allows you to deal with wet or dry conditions
- Improve water conservation and storage on the range as well as around the house
- Use artificial structures to collect rainwater for livestock and wildlife

### What is the RSA?

A voluntary program developed by California ranchers for use by the California ranching community, the Ranching Sustainability Analysis is a proactive self-assessment tool to foster successful practices and help ranchers achieve sustainability—**long-term economic, environmental, and social viability.**

### Assessment Categories

- Livestock Management
- Soil Management
- Forage Management
- Biodiversity and Wildlife Conservation
- Regulations and Regulators
- People and Relationships
- Economics
- Energy
- Monitoring
- Pest Management
- Water Quality



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