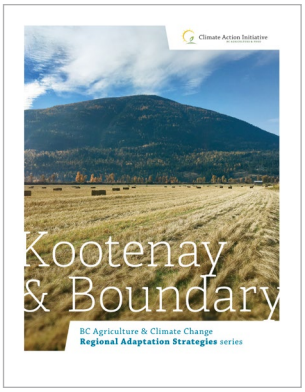
Climate & Agriculture Initiative BC

Kootenay & Boundary

Regional Adaptation Program | **AGRICULTURAL IMPACTS** | as assessed in 2019



The changes in climate projected for the Kootenay & Boundary region will have a range of impacts on agricultural production. Potential agricultural impacts are summarized the table below.

This table is extracted from the *Kootenay & Boundary Adaptation Strategies* full report, published in 2019 by the Climate & Agriculture Initiative BC. To read the full report, visit: *www.ClimateAgricultureBC.ca*

Projected Climate Changes	Projected Effects	Potential Agricultural Impacts
↗ Increase in average temperatures ↗ Increase in summer average and maximum temperatures ↗ Increase in number of days above 25°C and 30°C ↘ Decrease in summer precipitation	***Warmer & drier summers*** *(changing hydrological regime):* ▪ Lower summer stream flows ▪ More frequent and extended dry periods in summer	– Increase in agricultural water demand – Reduction in water supply availability – Increase in need for new/improved water storage and irrigation infrastructure – Reduction in water flows and water pressure in purveyed water systems (due to increased water demand) – Negative impacts to crop yields and quality (particularly non-irrigated crops) – Changes to timing and use of rangelands for grazing cattle – Forage crop losses and increase in livestock feed costs during dry years – Increase in pest pressure

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Projected Climate Changes	Projected Effects	Potential Agricultural Impacts
↗ Increase in summer temperatures, reduction in summer rainfall and periods of extreme heat (longer, warmer and drier summers) ↗ Increase in winter and spring temperatures (more rapid snowmelt, drier conditions)	***Increasing wildfire risk:*** ▪ More frequent and intensive wildfire events	– Damage and losses to agricultural assets and infrastructure – Increase in costs associated with preparing for, managing and responding to wildfire – Stress and psychological challenges for producers – Lost production during active wildfire and recovery period – Negative impacts to animal and crop health and productivity/ yield from smoke – Reduced human capacity and worker productivity (respiratory and cardiac illnesses) from smoke – Changes to pollinator behaviour – Long-term impacts to soil, hydrology and forest ecosystems – Increase in invasive species pressure in burned areas
↗ Increase in variability of conditions (including temperatures, precipitation and extremes)	***Increasing variability:*** ▪ Fluctuating and unpredictable seasonal conditions (temperature/ moisture) ▪ Increased uncertainty over frost timing (spring/fall)	– Damage to crops from extreme temperature fluctuations in late winter and early spring – Reduction in crop productivity and quality – Increased costs to adopt new farm practices/install infrastructure to mitigate risk – Shifting/unpredictable schedule for farm activities – Changes to pollinator behaviour
↗ Warmer winter and spring temperatures ↗ Increase in winter and spring precipitation ↗ Increase in extreme precipitation events	***Potential for increased flooding*** *(changing hydrological regime):* ▪ Increasing river flows in winter and spring ▪ Earlier peak stream flows/ freshet	– Risk of catastrophic flooding and damage to farm buildings and equipment – Impact to farm profitability due to crop or livestock losses – Increase in need for farm and community flood-readiness (and associated costs) – Disrupted access to local services/supply chains/transportation networks – Increase in pressure on flood-protection infrastructure
↗ Increase in average precipitation in winter ↗ Increase in intensity/ frequency of extreme rainfall events	***Extreme precipitation*** *(changing hydrological regime):* ▪ Potential for more rain-driven flood events ▪ Increase in excess moisture ▪ Increase in run-off	– Increase in site-specific flooding (and associated crop/ infrastructure losses) – Damage to riparian areas (erosion, washouts, silting) – Reduced access to fields and risk of soil compaction – Increase in pressure on farm drainage systems – Increase in risk of soil erosion and landslides – Reduced windows for crop development and seasonal tasks (pollination, planting, harvesting) – Increased disease pressure (from excess moisture)

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Projected Climate Changes	Projected Effects	Potential Agricultural Impacts
↗ Increase in average and maximum summer temperatures	***Increase in extreme heat events:*** ▪ Increasing number of days per year over 25°C and 30°C	– Increase in evapotranspiration and crop water demand – Risk of crop damage and loss (especially for crops without irrigation) – Negative impacts to livestock health and productivity – Increase in need for livestock and poultry cooling infrastructure
↗ Increase in average temperatures ↗ Increase in growing degree days ↗ Increase in frost free days ↗ Increase in winter minimum temperatures ~ Shift in precipitation patterns	***Changing crop suitability ranges:*** ▪ Changing seasonal conditions ▪ Changing production windows	– Increase in management complexity and cost (e.g., with season extension) – Inconsistent yield and quality of previously suitable crops – Difficulty in identifying suitable crops for changing conditions ***Potential Opportunities:*** + Increase in suitability for new varieties and new crops + Less winter kill of perennial crops (e.g., peach trees) + Opportunity for season extension and additional harvest of certain crops
↗ Increase in annual temperatures ↗ Increase in winter minimum temperatures ↗ Increase in spring precipitation and extreme rain events ↗ Drier summer conditions	***Changes in pests, diseases & invasive plants:*** ▪ Increasing winter survival rates ▪ Increasing number of cycles in a year ▪ Introduction of new pests and diseases ▪ Changing range/distribution of pests, diseases and invasive species	– Reduction in efficacy of previous pest management schedules and practices – Increase in management costs and complexity – More frequent and increased damage to crops – Impacts to livestock health (poisonous weeds/ poor pasture) – Reduction in forage and pasture quality/yield