

Tick and Climate Change - 3 West



Climate change and tick-borne diseases: A One Health approach in Alberta, British Columbia, and Saskatchewan



Statement of purpose

As the climate continues to change there is an urgent need to improve the capacity of communities, front-line health workers, public health practitioners and health services institutions in Alberta, BC, and Saskatchewan to detect and respond to emerging ticks and tick-borne diseases of concern for human and animal health

Context of the project

Climate change is predicted to cause significant impacts on the three western provinces. Large portions of Alberta and Saskatchewan expected to experience higher temperatures and lower levels of precipitation (leading to droughts), while BC expects higher levels of precipitation. This project aims to fill critical evidence gaps on the impact of climate change on ticks and tick-borne diseases in Canada's three western provinces.



One Health in action

One Health is a cross-sectoral, multi-disciplinary, collaborative approach that recognizes the interconnection between humans, animals, and their shared environment. A diverse team was brought together, aiming at increasing our understanding of current and potential future risk determinants for tick-borne diseases in people and animals in Alberta, BC, and Saskatchewan. A harmonized approach to climate and tick-borne disease modelling and genetic sequencing of tick-borne pathogens will strengthen inter-agency partnerships and provide value for money for partner organizations.

Goal 1: improve cross-sectoral monitoring and surveillance capacity for tick-borne diseases in Alberta, BC, and Saskatchewan



Objective 1: Improve detection, monitoring and surveillance of *Ixodes* spp. ticks and tick-borne pathogens in Alberta, BC, and Saskatchewan

Objective 2: Increase access to, and analysis of, human and animal case data on tick-borne diseases in Alberta, BC, and Saskatchewan

Objective 3: Improve availability of tick-borne disease (*Anaplasma* spp., *Borrelia* spp, and *Ehrlichia* spp) genomes originating from ticks in Western Canada



Goal 2: improve cross-sectoral prediction and response capacity for climate-driven vectors and tick-borne diseases in Alberta, BC, and Saskatchewan

Objective 4: Enhance prediction and response capacity for climate-driven vectors and tick-borne diseases in Alberta, BC, and Saskatchewan

Objective 5: Improve availability and access to evidence-based information on climate-driven vectors and tick-borne disease for communities and vulnerable populations in Alberta, BC, and Saskatchewan

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Goal 3: Alberta, BC, and Saskatchewan have strengthened One Health capacity to address climate-driven infectious diseases

Objective 6: Improve collaboration and information exchange between public, animal, and environmental health professionals and policy makers within and between Alberta, BC, and Saskatchewan

Ticks and pathogens explored



Ticks

Black-legged ticks: *Ixodes* sp
 Rocky Mountain wood tick: *Dermacentor andersonii*
 American Dog tick: *Dermacentor variabilis*
 Winter ticks: *Dermacentor albipictus*
 Asian longhorned ticks: *Haemaphysalis longicornis*

Pathogens

Anaplasma phagocytophilum
Ehrlichia sp
Borrelia sp
Babesia microti



Expected outcomes

- Synthesis of existing data on tick and tick-borne pathogens
- Enhanced surveillance of ticks
- Genome sequences of TBD pathogens
- Predictive risk maps under different climate change scenarios
- Improved information exchange and collaboration
- Policy dialogues
- Strengthened One Health capacity - trainees

Project partners



BC Centre for Disease Control
 Centre for Coastal Health
 BC Ministry of Forest, Lands and Natural Resource Operations
 BC Ministry of Agriculture
 BC Ministry of Health
 University of Calgary
 Alberta Health Services

University of Regina
 Roy Romanow Provincial Laboratories
 Canadian Lyme Disease Research Network
 University of Guelph
 IDEXX Laboratories



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