

Kootenay & Boundary Region

OPTIONS TO EXPAND AVAILABILITY OF WEATHER STATION DATA & DECISION-SUPPORT TOOLS

PROJECT BACKGROUND

This project evolved through consultations with agricultural producers during the development of the *Kootenay and Boundary Agricultural Adaptation Strategies* where the need for improved regional weather monitoring and access to decision support tools consistently emerged as a priority theme. As climate change increases weather variability and shifts baseline “normals” for temperature, precipitation and other climate indicators — improving producer access to locally relevant weather data and analysis tools will support responsive and timely farm management decision-making (e.g. timing of pest treatments, timing of plantings and harvests, etc.) while enhancing broader understanding of how much the baseline “normals” are shifting.

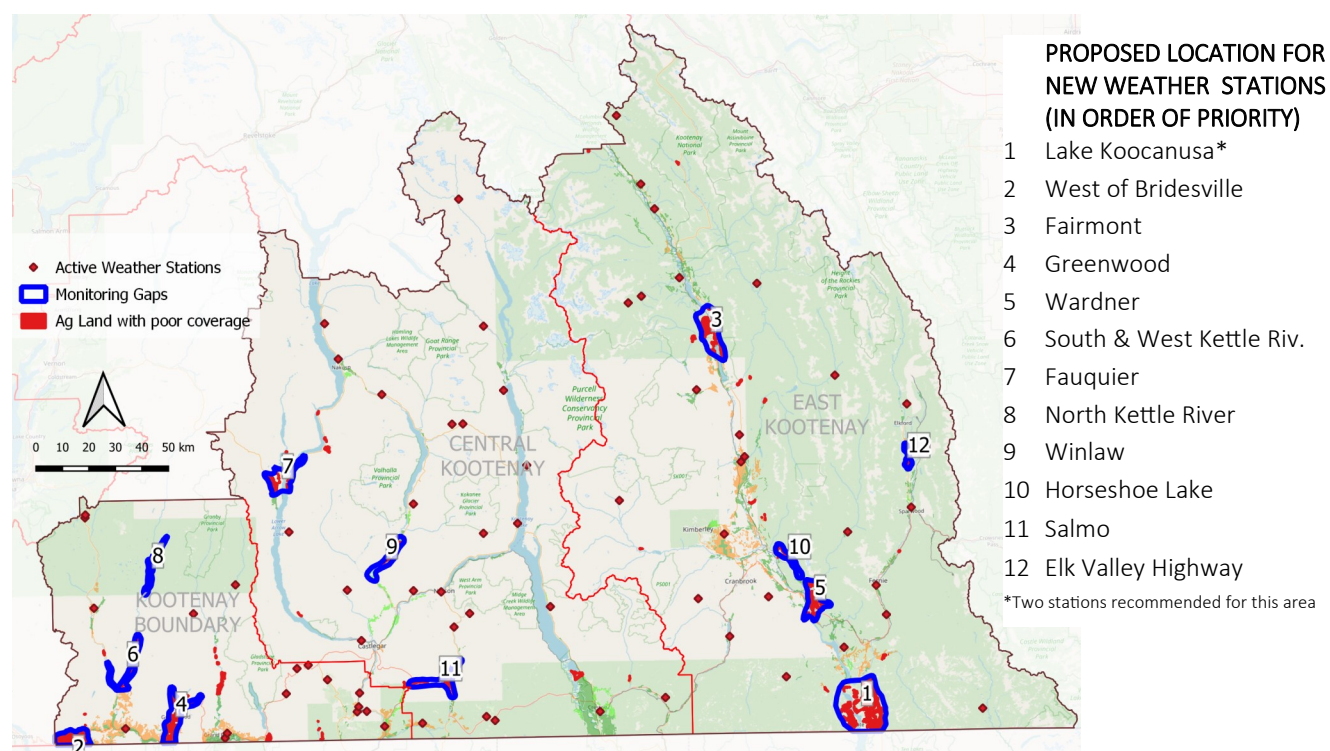
PROJECT OBJECTIVES

1. Assess the distribution and coverage of weather monitoring stations in the Kootenay and Boundary regions to identify monitoring gaps that are relevant to agriculture.
2. Identify options and strategies to address the identified monitoring gaps.
3. Recommend platforms to make weather data and data analysis tools easily available to the agriculture sector.

1. PRIORITY STATION LOCATIONS

The Kootenay and Boundary region is vast and topographically complex with a diversity of climatic conditions that vary over short distances. There are nearly 60 active weather stations in the region and operators include Environment and Climate Change Canada, provincial government departments, BC Hydro, and Farmwest, as well as a number of personal weather stations that are owned by individuals and businesses (not shown on map below). There is an insufficient number of regional climate stations to adequately represent the climatic variability of the region, leaving large areas with inadequate monitoring. In addition, many of the existing stations are not located in close proximity to agricultural land and weather data is often not made available to the public.

Based on the coverage provided by current weather stations, 12 key locations have been identified and ranked in order of priority to improve the regional weather monitoring of agricultural land. A total of 13 new stations would provide adequate coverage for 99% of farmland in the Kootenay & Boundary region. The priority areas are shown on the map below.



The region's stakeholders should consider implementing a weather monitoring approach that addresses both regional (broad coverage for many producers) and local (specific coverage for high value production areas) monitoring needs. Regional stations will cover a larger geographic area and provide general information and tools for producers and government agencies. Local stations are intended to monitor the more variable weather conditions at the farm scale, providing direct benefit to growers. For high value crops that require a higher degree of management, weather stations can be installed within the crop itself to accurately represent the temperature and moisture characteristics that will influence the development of the crop, as well as pests and diseases.

2. WEATHER STATION EQUIPMENT



Davis Vantage Pro2/ROM Communications station (left) and the METER ATMOS41/ZL6 all-in-one station (right)

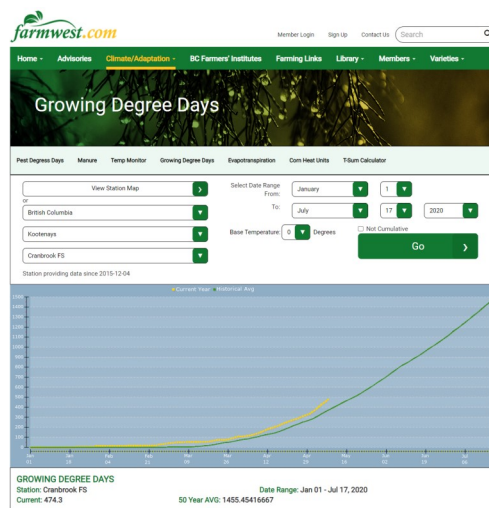
A higher density of moderately priced weather stations, if adequately maintained, can provide greater value than a sparse network of high-end, higher-cost weather stations. A typical weather station should measure temperature, relative humidity, wind speed, wind direction, and solar radiation. Leaf wetness sensors are recommended for areas that would rely on disease risk models.

Two types of weather stations are recommended; the Davis Vantage Pro2/ROM Communications station and the METER ATMOS41/ZL6 all-in-one station. Both are comparably priced (approximately \$1,500—\$2,000 CAD, plus ongoing annual network fees) and are well-suited for regional and local monitoring.

3. WEATHER DATA PLATFORM AND WEATHER FORECASTING

A weather data platform should provide an intuitive user-interface that presents weather station data in a clear and succinct manner, while providing a positive user-experience. If the Kootenay and Boundary region proceeds in enhancing its weather monitoring capabilities through the installation of new weather stations, a near-term strategy for making weather station data available to producers will be required.

Farmwest offers a basic set of agronomic tools (such as GDD and T-Sum calculators, corn-heat units and evapotranspiration estimates). Farmwest also provides daily weather reports and 7-day weather forecasts, although these weather forecasts are linked to ECCC stations which do not provide accurate sub-regional forecasts. Weather station data on the Farmwest site is not available in real-time (or at hourly/multi-hourly intervals) and most weather data sets are not available for download (to enable further analysis). Farmwest also does not have an automated quality control process and this



Farmwest website interface (showing GDD accumulation for Cranbrook FS weather station)

As the Kootenay and Boundary region develops its weather monitoring capabilities, a near-term strategy for having a platform is to tie in with Farmwest for a basic set of data analysis tools. Depending on how Farmwest develops and its level of funding, the region should consider collaborating with other regions to build a more customized platform.

To improve weather forecasting capabilities of a weather data platform it is strongly recommended that Farmwest, or any other weather platform that is developed, consider incorporating a gridded forecast (listed on page 47 of the report). This would greatly improve the spatial resolution at which any sort of recommendations or advisories can be issued. Detailed requirements will need to be brought to the forecast providers to establish pricing