Kimiwan Complex Cold Front Lab

In this lab, we will study how a mid-latitude cyclone and its accompanying cold front interact with the Kimiwan Complex Fire.

Dates: 15-16 May 2023

For this lab, please:

1. Use NOAA's near surface weather analysis tool:
   (https://www.wpc.ncep.noaa.gov/html/sfc-zoom.php)
   a. Identify the approximate date/time of the cold front that passed over the Kimiwan Complex Fire. Please give date/time in UTC and local time (2 points).

   b. Looking at the Peace River, AB weather station observations. Please describe the 2 meter temperature, and 10 meter wind speed/direction six hours BEFORE the cold frontal passage (3 points).

   c. Again, looking at the Peace River, AB weather station observations. Please describe the 2 meter temperature, and 10 meter wind speeds/direction six hours AFTER the cold frontal passage (3 points).

2. Looking at NASA's worldview tool: (https://worldview.earthdata.nasa.gov/)
   Activate the *Aqua / MOIDS Corrected Reflectance (True Color)* layer and *Fires and Thermal Anomalies (Day and Night) Terra and Aqua / MODIS*

   a. Describe the direction of the fire and smoke propagation on May 15 and May 16, 2023 (2 points).

   b. How does this compare with the surface weather station observations from questions 1b and 1c above? Are they similar? Why or why not? (2 points)

3. Use the Forecast Tools to analyze the synoptic weather conditions during the passage of the cold front (Int: 00Z Mon 15 May 2023).
   (https://www.eoas.ubc.ca/courses/atsc413/fct/forecast.html)
   a. Looking at the 50kPa Geopotential Heights and anomalies product. Please describe the synoptic weather conditions for the first 48 hours of the forecast. (3 points)

   b. Looking at the 85kPa Wind Speed and Direction product.
      i. Please describe the first 48 hours of the forecast. (2 points)

      ii. What time did you see a dramatic shift in wind speed and direction above the fire? (1 point)

4. Use the Forecast Tools to analyze the near-surface mesoscale weather conditions (Int: 00Z Mon 15 May 2023).
(https://www.eoas.ubc.ca/courses/atsc413/fct/forecast.html)

   a. Using two near-surface products of your choice. Please identify when the model predicted the time of the cold frontal passage at the fire. (1 point)

   b. What two products did you use, and how did you identify the time of the cold frontal passage at the fire? (3 points)

   c. How well did the model predict the timing of cold frontal passage compared to the observed time from question 1a? (1 point)

   d. Would you consider this to be a quality forecast in the context of the timing of the cold frontal passage at the fire? (1 point)