Theme: Canadian Fire Behavior Prediction (FBP) System

(See the Online Schedule for Week 6 for links)

A. FUEL TYPES (fb18)

1. List the 16 fuel types used in the FBP.
2. What are the characteristics of the C2 fuel type?
3. Common trees in Pacific Spirit Park (adjacent to UBC) include Douglas-fir, Western Hemlock, and Western Red-cedar. What FBP fuel type(s) apply to this forest ecosystem? Explain and justify your answers.

B. RATE OF SPREAD (ROS) (fb19)

1. Explain what is meant by Rate of Spread. What does it apply to?
2. If the initial spread index is ISI = 25, then what is the "basic rate of spread" (m/minute) for black spruce having a BUI of 150 ?
3. If this forest is on a mountain side with slope = 25%, then what is the value of the Spread Factor? What is the resulting rate of spread from this intermediate calculation.
4. If the background wind is blowing directly upslope with speed 5 m/s, then what is the final Rate of Spread value.
5. On the date that you are doing this assignment, make a screen capture of the NRCan rate of spread map, and state what is the value of the highest rate of spread anywhere in Canada from that map.

C. HEAD FIRE INTENSITY - COMPONENTS (fb20)

1. What or the roles of the Surface Fuel Consumption (SFC), Crown Fraction Burned (CFB), and Total Fuel Consumption (TFC) in determining the head fire intensity?
2. For Boreal Spruce, if the BUI = 50, then what is the likely SFC value (kg/m^2)?
3. If the predicted ROS is 5 m/minute faster than the critical ROS, then what is the likely CFB value for Boreal Spruce?
4. Given your answer for CFB from the previous question, what Crown Fuel Consumption (CFC) in kg/m^2 is likely for Boreal Spruce?
5. Given your previous answers, what is the value of Total Fuel Consumption for this Boreal Spruce?
6. Compare/contrast the equation for Head Fire Intensity to Byron's equation.

D. HEAD FIRE INTENSITY (HFI) - SIGNIFICANCE (fb21)

1. The results of equations described in section C above are nicely summarized in the Head Fire Intensity (HFI) graph in our course web page fb21 for the special case of Boreal Spruce with the special conditions mentioned for that graph. For those special conditions, use the graph to estimate the HFI (kW/m) for the case where ISI = 5 and BUI = 40.
2. For this same case, what is the likely value for Crown Fraction Burned?
3. For this same case, what is the Fire Intensity "Class" value?
4. For that Fire Intensity Class, what fire-fighting tactics are reasonable and safe?
5. Discuss the pros and cons of prescribed low-intensity fires vs. unplanned wildfires.

E. GUEST LECTURE: Mina Deshler on Public Safety Power Shutdowns (PSPS)

1. Why are PSPS done?
2. Where in N. America have been the most PSPS been done? Has BC Hydro done any?
3. What are pros and cons of PSPS.

F. TEAM BUILDING (if time)

1. Discuss with your teammates your desires for good teamwork.
2. Fill out the Skills Matrix.
3. Create a Team Charter for your group.