



In this Issue:

How a forest dries out

The Fine Fuel Moisture Code and how a wildfire can start

How can you tell if forest fuels are dry?

About Coastal

The Coastal Fire Centre area was hit with lightning from June 20–21, which resulted in 18 fires. Most of these fires were in remote locations at a high elevation. None of these fires threatened structures or homes. Crews have been working steadily to bring these fires under control.

It is expected that some of these fires are slumbering underground. Please call in **columns** of smoke to 1 800 663-5555 or *5555 on cells. These calls help us triangulate in on the fires and helps us assess them quickly.

How a forest dries out

All BC Wildfire Service operational staff have an understanding of how a forest dries out and how various weather factors affect this process. This allows them to prepare effectively for wildfires and then use suitable suppression tactics should a wildfire occur.

The BC Wildfire Service uses the Canadian Forest Fire Danger Rating System to help assess forest fire dangers. In general, it provides information about the potential for a wildfire to start and its probable rate of spread. The basic principles of this system are taught at the BC Wildfire Service’s new recruit boot camp every year, so that all of our firefighters have an understanding of how it works.

Different parts of the forest will dry out at different rates. The smallest fuels, such as surface litter and cured (dried) grass — as well as organic material up to two centimetres below the forest floor — will dry out most quickly. The moisture content of these fuels is affected by precipitation, wind, relative humidity and temperature.

Although these fuels can dry out quickly, it takes relatively little precipitation to increase their moisture content. The same cannot be said for larger fuels and fuels located further underground. The moisture content of the smallest forest fuels (and the top two centimetres of organic material on the forest floor) will dictate whether a fire is likely to start and how fast it could spread.

Fuels that are considered to be medium-sized (five to 10 centimetres in diameter) and the “duff layer” of the soil (two to 10 centimetres below ground level) don’t dry out as quickly as fine fuels and the first two centimetres of surface litter. The moisture content of the duff layer and medium-sized fuels is affected by rain, temperature and relative humidity, but not by wind. The drying effect of wind on fuels of this size and at this depth is negligible. It also takes considerably more precipitation to increase the moisture content of these fuels after a drying period.

The moisture content of the medium-sized fuels and the duff layer will dictate how much fuel may be consumed and how much heat may be produced during a wildfire. These factors contribute to the rate of spread and will influence the drying rate for other fuels within or near the fire.

The largest fuels and the deepest layer of organic material take the longest to dry out during a period with no precipitation. Their moisture content is affected by rain and temperature, but not by wind or relative humidity. It takes a more substantial amount of rain to increase their moisture content after a drying period than it takes for smaller fuels and organic material at shallower depths.

The moisture content of the deepest layer of organic material is of interest to BC Wildfire Service firefighters and operational staff because it is a direct indicator of how challenging their “mop-up” activities on a wildfire might be (such as extinguishing hot spots). If this layer is particularly dry, the fire will be able to “dig in” and smoulder well below the surface, sometimes several metres deep in coastal fuel types.

Observed from above ground, this type of fire may appear to be out, but it is actually still actively burning below the ground. Eventually, such a fire can burn out tree root systems, create deep and hazardous ash pits, and/or move further underground to areas of unburned fuel. To completely extinguish wildfires that are burning in this deeper layer of fuel, firefighters have to dig down until they find the source of the heat.

Depending on the size of the wildfire and other factors, these kinds of fuels may continue burning until fall or winter weather arrives. In other cases, fires in this layer of organic material can “overwinter” (e.g. in parts of the B.C. interior that were heavily impacted by the 2017 fire season). This means that the fire smoulders underground all winter, reappearing as hot spots once the warmer and drier weather returns.

The Fine Fuel Moisture Code and how a wildfire can start

Whether they're human-caused or lightning-caused, all wildfires are started by an input of heat. This can take the form of a lightning strike, a campfire ember that was carried away by wind, a dropped match, a spark from an exhaust system, or some other source.

Whether or not this heat will trigger a wildfire depends largely on the current value of one of three moisture codes that are part of the Canadian Forest Fire Danger Rating System. If the fuel that the heat source reaches is too wet, the fuel will not catch fire. Anyone who has tried to light a campfire using wet wood and no dry kindling (or other dry starting material) knows this well.

The Fine Fuel Moisture Code is a numerical value that provides information about the smallest sizes of fuel, such as leaf litter, dried (cured) grass, and organic material in the top two centimetres of earth. Information from weather stations (temperature, precipitation, relative humidity and wind) is used to help calculate the Fine Fuel Moisture Code.

The Fine Fuel Moisture Code is a "closed" code that ranges from 0 up to 101. The higher the Fine Fuel Moisture Code, the less moisture there is in the fuel. (Some moisture codes do not have an upper limit and are referred to as "open" codes).

The Fine Fuel Moisture Code is an indicator of the likelihood of a wildfire starting if there is a sufficient source of heat. If the code in a given area is below 77, ignition becomes very difficult and a fire is unlikely to start because the fuel in that area contains a good deal of moisture. Between 78 and 86, wildfires will start about half of the time. Between 87 and 94, ignition is generally easy and wildfires are likely to start. If the value is above 94, ignition can be expected almost 100% of the time, since the fuel in that area contains very little moisture.

The Fine Fuel Moisture Code is used by BC Wildfire Service operational staff (in conjunction with two other moisture codes and other variables in the Canadian Forest Fire Danger Rating System) to get an idea of when and where wildfires are most likely to start and how a wildfire will behave if it does start.

The Canadian Forest Fire Danger Rating System and prevention

The BC Wildfire Service's fire prevention staff use information from the Canadian Forest Fire Danger Rating System when deciding whether to implement a prohibition on open burning or other activities that could start a wildfire. By examining the system's codes and indexes, they determine how likely it is for a wildfire to start, how it may spread and what kind of fire behaviour it may exhibit.

Past experience and current trends also help fire prevention staff determine when a prohibition is necessary to help prevent human-caused wildfires and protect public safety. A prohibition is implemented by a legal order written by BC Wildfire Service officials, and the decision to implement that order is not taken lightly.

Officials who enact a prohibition must do so using their best professional judgement and must be able to point to specific factors to justify that decision. A careful consideration of relevant Canadian Forest Fire Danger Rating System codes and indexes is one of these factors.



Please have a safe Canada Day weekend and stay tuned to gov.bc.ca/wildfirebans for any changes to the prohibitions in effect in the Coastal Fire Centre.

How can you tell if forest fuels are dry?

The BC Wildfire Service uses the Canadian Forest Fire Danger Rating System to provide information about a variety of factors related to wildfire risk, including how dry the layers of a forest are.

The Canadian Forest Fire Danger Rating System is computer-based, and various kinds of technology are used to gather the weather data that it analyzes. In addition, BC Wildfire Service ground crews carry small, basic “weather stations” to measure site-specific weather conditions that include wind speed, temperature and relative humidity — all of which influence fire behaviour.

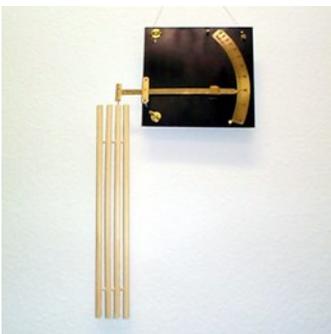
However, there are ways that forest professionals can measure the moisture content of fuels without using sophisticated weather information technology and computers. One method is the use of “fuel moisture sticks” that weigh exactly 100 grams each when they’re absolutely dry. The fuel moisture sticks are left in the area of interest until their moisture content is equivalent to that of the light to medium fuels in the area. The increase in the stick’s weight (due to the absorption of moisture) is then used to determine the moisture content of fuels in the area that are the same size as the fuel moisture sticks. The sticks can also be used to help calculate the Fine Fuel Moisture Code.

The use of fuel moisture sticks illustrates that information about the moisture content of forest fuels can be gathered without the use of complex technology. Here are some other ways that you can get an idea of how dry forest fuels are, simply by paying attention the next time you are out in the forest:

- During a drought, leaves will droop and “wobble” more in a light breeze, because the plant is experiencing a loss of rigor in its tissues due to a lack of water. The leaves may also “cup” toward their undersides in an effort to reduce airflow over the small openings located there, since moisture can be lost through those openings. As a drought progresses, you may see leaves that would normally be a deep green colour begin to turn lighter before turning yellow altogether and potentially dropping off the plant.
- Another way to gauge the moisture content of forest fuels is to take note of how easily a small twig snaps. Twigs (with the diameter of a pencil or smaller) will break sharply without bending when they are dry. The snapping sound that they make can also give you an idea of how dry they are. The snapping sound of dry twigs tends to become sharper as a drought progresses, in much the same way as dry leaves will crunch underfoot while rain-soaked leaves will not.

For more information about the Canadian Forest Fire Danger Rating System, visit: gov.bc.ca/wildfiredanger

For more information on fuel moisture sticks, visit: <https://www.fs.fed.us/t-d/pubs/pdfpubs/pdf05512347/pdf05512347dpi72.pdf>



From left to right: fuel moisture sticks; an example of how a plant may look in various stages of drought; a basic ‘weather station’ that is used by BCWS crews

Fires to Date

Total	68
Lightning	20
Person	48

Number of fires since last Newsletter (June 8)

Total	29
Lightning	18
Person	29

Fire Danger Rating today



Current Prohibitions (within BCWS jurisdictional area)

Category 2 open fires are prohibited in the Coastal Fire Centre except in the Haida Gwaii Natural Resource District and the 'Fog Zone.' Also prohibited in this area are: fireworks, firecrackers, sky lanterns, burning barrels or cages and binary exploding targets.

Campfires are still permitted, if small (no larger than 0.5m x 0.5m), situated well, attended at all times, and most importantly—put out COLD when you leave the fire site.

For more information, go to www.gov.bc.ca/wildfirebans

Wildfire news

Coastal Fire Centre

About Coastal

After a warm May, June has brought some cooler weather and precipitation to the Coastal Fire Centre. The rain has helped rehydrate the forests and made all of us here at the Coastal Fire Centre happier.

However, the weather pattern is now trending to drier and warmer conditions. The Coastal Fire Centre is well-prepared for this wildfire season; new and seasonal staff have returned and we have processes in place to obtain additional firefighting resources if needed. Our staff have been attending regular training sessions to prepare them for whatever this fire season will bring.

Remember that, in some areas, not much rain will get through the canopy of our beautiful forests to reach the ground. Materials on the forest floor can therefore remain quite dry and could catch fire easily. Starting a campfire too close to those flammable materials increases the risk that it could escape.

There was recently a wildfire on Vancouver Island

that was caused by fireworks. Having a wildfire caused by fireworks at this point in the season demonstrates how dry our forests can get, particularly under the forest canopy. Leading up to the Canada Day long weekend, we'd like to provide some information on the use of fireworks.

There is currently a Category 2 open burning prohibition in place throughout the Coastal Fire Centre, with the exception of the Haida Gwaii Natural Resource District and the "Fog Zone". In those areas where Category 2 fires are prohibited, fireworks are also prohibited.

To get permission to set off fireworks while this prohibition is in place, an exemption must be approved by the BC Wildfire Service, or else the local government in that area must have a bylaw in place that allows people to light them. To obtain an exemption, proponents must describe their proposed activities and commit to managing the potential wildfire risk by implementing extra safety measures.



Weather

SYNOPSIS: A weak upper trough taps into limited Pacific moisture as it pushes inland over the region today bringing cloudier skies and cooler temperatures to most areas while some interior sections of Pemberton, Sunshine Coast, and the Mid Coast see temperatures remaining well above seasonal normals. Isolated light showers favour parts of the Island, Fraser zone, and western sections of the Sunshine Coast and Pemberton zones this morning and early afternoon, shifting to inland valleys of the Mainland later today (favouring higher terrain). Isolated (minor) showers favour the southern half of the Fraser zone overnight. Full recoveries should be seen throughout all areas & elevations with patchy low cloud & fog likely in each zone by Saturday morning. A narrow upper ridge drifts eastward over the region on Saturday bringing sunnier skies and generally warmer & drier conditions with little to no convective activity and increasing inflow winds in the usual inlets & valleys of the Island and Mainland.

OUTLOOK: A cold front approaches from the northwest on Sunday, likely becoming positioned SW to NE along a line from roughly Port Alberni, over Jervis Inlet to Pemberton Meadows by mid-afternoon. Conditions within the warm and dry airmass ahead of the feature should support crossover conditions with temperatures

in the mid to upper twenties and increasing pre-frontal (southeasterly or southerly) winds while areas to the north and west see increasing cloud, temperatures in the teens to low twenties and scattered showers (risk of an embedded thunderstorm) along with increased & likely gusty post-frontal (westerly or northwesterly) winds. Gustly winds should continue across the region through Sunday night. Wind speeds in most areas Sunday and Sunday night should come up into the 12-25km/hr range with greater values at higher elevations, in some inlets & valleys, and near large bodies of water. Humidities should trend higher within the cooler airmass following the frontal passage. Temperatures should cool to or slightly below seasonal normals (teens to low twenties) on Monday with gusty winds and a mix of sun and cloud. Risk of the odd isolated eastward-tracking convective shower or thunderstorm on Monday. A narrow upper ridge building offshore should support a transition to a drier and slightly warmer northwesterly flow by Tuesday that should bring temperatures up into the mid-twenties with humidities in many inland valleys of the Mainland (and potentially Island) dipping below 25% in the afternoon while gusty inflow winds continue. There is reduced risk of the odd isolated afternoon shower or thunderstorm Tuesday afternoon.