

# New Zealand Seasonal Fire Danger Outlook 2018/19 ISSUE: South Island, October 2018



### Current fire danger situation & outlook:

Welcome to the first fire danger outlook for the 2018/19 fire season. The purpose of these monthly outlooks is to provide a heads up on the progression of fire danger as we transition from spring to summer and, later, into autumn. It aims to forewarn fire agencies of current and potential fire danger conditions that can be used as a prompt for local and regional discussions on fire potential (which depends on fuel conditions (i.e. grass curing), risks of ignitions, recent fire history and fire management resources available in an area, as well as climate and fire weather). Now is the chance to start your pre-planning (if you haven't done so already), by discussing where conditions are at where they are heading, and how this can drive awareness about what this might mean in your patch and for your neighbours.

Conditions across the South Island are currently low. Winter resulted in New Zealand being mostly wet. Low fire climate severities and fire danger currently exist in most areas of the South Island (Figures 1 & 5). The wet winter is reflected in the current FWI System codes and indices, which indicate that fuel moistures are high, and noticeably damper than at the same time last year (Figures 5-6 & 7-8). The exception being Central Otago, where the DC values are creeping up to moderate to high levels.

Soil moisture levels are currently at, or close to, capacity for this time of the year (Figure 3). However, soil moisture is currently slightly below normal for the Nelson/Marlborough high country and North Canterbury (Figure 4). Mild winter conditions for some localities have also resulted in abundant grass growth. One of the major climate drivers for New Zealand is the El Niño– Southern Oscillation (ENSO). The ENSO Outlook currently remains at El Niño WATCH. International models suggest that we are still in a Neutral phase, with the possibility of transitioning towards a weak El Niño over the next three-month period (68% chance over October – December 2018). This is unlikely to be a normal text book El Niño, as we will likely experience variance from south westerly air flow patterns typically experienced during traditional El Niño events.

The climate outlook for October – December 2018 is for higher pressure than normal to the west and south west of New Zealand and anticyclonic conditions extending over the country, interspersed by southerly and south-westerly winds. Cool nights and mornings are expected for October, with late season frosts and fog. This spring, temperatures are forecast to be average, except the north of the South Island (below average). Rainfall is predicted to be below normal to near normal for all regions. Soil moistures and river flows are forecast to be below or near normal.

Fire dangers and severity for October are expected to be low for most of the South Island. There are no specific areas to currently watch out for very high to extreme fire potential. The fire season years of 2004/05 and 2006/07 are possibly good indicators for what to expect during a weak El Niño this coming fire season (Figure 9). As we transition from spring to summer, expect to see fire dangers increase, especially for Otago, Canterbury and Marlborough. We may also be in for a similar season to last year, where rain events kept the fire danger and fire climate severity low until the Christmas holiday period, before increasing dramatically after New Year's for eastern locations in the South Island.



Figure 1. Monthly average Severity Rating for: current (left), last year (middle), & 2004/05 Neutral year followed by a weak El Niño (right).

### EXPECTED CLIMATE OUTLOOK:

The ENSO (El Niño – Southern Oscillation) currently remains neutral in the tropics. The ENSO Outlook currently remains at El Niño WATCH (which means there is a more than 50% chance of an El Niño developing in 2018). There is a good chance (but no guarantee) of an El Niño forming in the next 4 to 6 weeks.

International climate models indicate that the tropical Pacific will transition towards El Niño over the next three-month period (NIWA predicts a 68% chance over October – December 2018). The probability of El Niño conditions establishing by Autumn 2019 (March – May) remains high 71%. If El Niño conditions form before Christmas, it is likely to be a weak event, and the impacts on New Zealand's weather may not run true to a typical El Niño climate pattern. It is not expected to be of a similar intensity to what was experienced during 2015-16, 1997-98, or 1982-83 and therefore different impacts are expected. This means we will likely see deviations from the typical south westerly air flow patterns typically experienced during traditional El Nino events. But ENSO is just one of several climate drivers that can influence New Zealand's rainfall and temperature patterns.

It is forecasted that New Zealand will experience higher pressure than normal over the South Island and to the south and west of the country, and lower than normal pressure to the northeast of New Zealand. This will lead to uncharacteristic southeast to northeast air flows over New Zealand. This atmospheric pattern will likely bring about cold nights and mornings, as well as frost and fog for early spring. Warm seas may help lessen the effects of cold air masses.

### This month: October 2018

The Southern Ocean will continue to affect our weather across the country. For the start October, cooler southwesterlies are expected (8 to 14 October). However, in the second half of the month, drier than normal conditions across the southwest of both Islands are expected.

Temperatures will be variable, from somewhat warmer in the first week of October (except over the south of the South Island), to well below average across the country in the second week. In the second half of the month, average to cooler temperatures will likely continue.

### Further ahead: October - December 2018

Further ahead (November – December 2018), higher than normal pressure to the west and southwest of New

Zealand is expected. Anticyclonic conditions extending over the country, interspersed by episodes of southerly and southwesterly winds, are also expected. New Zealand may also experience cold nights and mornings, as well as frost and fog for early spring. Warm seas may help lessen the effects of cold air masses.

#### For the next three months:

Temperatures are forecast to be average for all regions, except the north of the South Island, where temperatures are forecast to be below average or near average. Rainfall totals are forecast to below normal or near normal for all regions. Soil moisture levels and river flows are forecast to be below normal or near normal for all regions of New Zealand.

### Regional breakdown (Figure 2):

- Temperatures are most likely to be:
- Below average (40% chance) or near average (35%) for Tasman, Nelson, Marlborough and Buller;
- Near average (45% chance) for West Coast, Alps and foothills, coastal Canterbury, inland and east Otago, and Southland.

#### Rainfall totals are most likely to be:

 Normal (40% chance) or below normal (35% chance) for Tasman, Nelson, Marlborough, Buller, West Coast, Alps and foothills, coastal Canterbury, Otago, and Southland.

#### Soil moisture levels are most likely to be:

- Below normal (45% chance) or near normal range (40% chance) for Tasman, Nelson, Marlborough, Buller, coastal Canterbury, east Otago, and Southland;
- Near normal (40% chance) or below normal (40% chance) for West Coast, Alps and foothills, and inland Otago

### Last month: September 2018

September resulted in higher than normal pressure for the South Island. This caused a drier than usual September for most regions. Nelson recorded only 29mm of rain (35% of its September normal), while Hokitika observed 95mm (37%, its second driest September in 55 years). In contrast, it was wet across inland Otago due to the two rain/snow events; while Dunedin recorded 46mm (107% of its September normal).

There was an extremely cold start to the month, however temperatures rebounded in the middle. Temperatures ended up close to the September average in most areas. The exceptions were along the east coast of both Islands.

Over the past 6 months, the Southern Ocean has been



Figure 2. Outlook for Oct - Dec 2018: air temperature (left), rainfall (middle), available soil moisture (right). Source: NIWA.

the main driver for New Zealand's weather. The Southern Ocean was stuck in a positive phase (quiet mode), which enabled higher than normal pressure over the country. Compared to the previous five months before, there was regular switching between stormy and quiet modes (dry).

Sea surface temperatures (SSTs) around New Zealand's coastline varied considerably in September. The waters around the coast were cooled during the prolonged cold southerly at the start of September. Water temperatures rebounded in the middle of the month but then cooled again at the end. The sea is currently cooler than normal, except for the waters around the lower half of the South Island (warmer than usual).

### What would El Niño mean for New Zealand?

New Zealand's climate is influenced by two key natural cycles: The El Niño-Southern Oscillation (ENSO) and the Interdecadal Pacific Oscillation (IPO). Both these operate over the Pacific Ocean and beyond, and cause fluctuations in the prevailing trade winds and in the strength of the subtropical high-pressure belt. Although ENSO events have an important influence on New Zealand's climate, it accounts for less than 25% of the year to year variance in seasonal rainfall and temperature.

El Niño events are typically (but not always) associated with stronger and/or more frequent westerly winds over summer in New Zealand, following more south-westerlies in spring. Such a circulation pattern can lead to wetter than normal conditions to the west of the Southern Alps and drier conditions in northern and eastern regions of both Islands.

Note though that indications for the current El Niño event potentially developing suggest that it will not follow these typical climate patterns. If it develops, it is likely to only be a weak event and we will likely see deviations from the typical south westerly air flow patterns, and the Southern Ocean influences continuing to influence weather across the country.

### Grass growth:

During spring, grasses are undergoing a period of growth, and much of the country side is looking green and lush. Typically, if a fire started in these fuels, fire spread would be difficult. Any burning will produce small flame heights and low intensities for easy suppression.

In some areas, the presence of dead matted material from the previous season's growth (thatch) can contribute to the ease of a fire starting and spreading. The material is often hidden underneath lush green grass that appears to have low curing (30 - 50%). However, thatch can increase a fires ability to carry and sustain a fire. These fires will typically produce small flame heights and spread in a patchy manner.

Dead material can also come about from frost curing. As we transition from winter into spring, the potential for a fire to ignite and spread is increased as the curing process kicks off in these fuels (formation of seed heads and loss of seeds).

Wetter than normal soils, combined with mild winter conditions, have led to abundant grass growth in many areas. Once this dries out, these higher than normal fuel loads could contribute to increased fire intensities.

#### The finer details:

Grassland curing will affect fire behaviour in several ways: it increases the amount of dead material present and affects fuel moisture content. The result is an increased chance of fire ignition, fire intensity and rates of spread.

The moisture content of fine grass fuels (as well as pine litter and other fine fuels) also dramatically affects the ignition potential and ability of a wildfire to spread. High amounts of moisture increase the heat and thermal conductivity of fuel, so that more heat is required for the fuel to reach its ignition temperature. As grasses cure, and become drier, less heat is required to ignite and sustain a fire.



Figure 3. Soil moisture deficits as of <u>01/10/2018</u>. Source: NIWA.

Note: Soil moisture deficit means the amount of water needed to bring the soil moisture content back to field capacity, which is the maximum amount of water the soil can hold.



Figure 4. Soil moisture anomaly as of <u>01/10/2018</u>. Source: NIWA.

Note: Soil moisture anomaly means the difference between the historical normal soil moisture deficit (or surplus) for a given time of year and actual soil moisture deficits.

### **Background info**

The intention of these monthly outlooks is to provide a heads up on current and potential fire danger for the North and South Islands. This is not a detailed fire seasonal outlook for specific localities, nor does it summarise fire potential (which depends on fuel conditions (i.e. grass curing), risks of ignitions, recent fire history and fire management resources available in an area as well as weather and climate).

It should be used as a prompt for local and regional discussions/debates on fire potential, and where things are at, where it is heading, and to drive awareness about what this might mean in your patch and for your neighbours. Now is the chance to carry out your preplanning if you haven't done so already.

#### Fine Fuel Moisture Code (FFMC)

An indicator of the relevant ease of ignition and flammability of fine fuels.

0 - 74	Difficult
75 - 84	Moderately easy
85 - 88	Easy
89 - 91	Very easy
92 +	Extreme easy

#### **Buildup Index (BUI)**

Combines the DMC and DC, and represents the total amount of fuel available for combustion.

0 - 15	Easy control
16 - 30	Not difficult
31 - 45	Difficult
46 - 59	Very difficult
60 +	Extremely difficult

**Duff Moisture Code (DMC)** A rating of the average moisture content of loosely compacted organic soil layers (duff/humus) of moderate depth, and medium-sized woody material

0 - 10	Little mopup needs
11 - 20	Moderate
21 - 30	Difficult
31 - 40	Difficult & extended
41 +	Difficult & extensive

**Initial Spread Index (ISI)** Combines the effect of wind speed and the FFMC, providing a numerical rating of potential fire spread rate.

0 - 3	Slow rate of spread
4 - 7	Moderate fast
8 - 12	Fast
13 - 15	Very fast
16 +	Extremely fast

**Daily Severity Rating (DSR)** A numerical rating of the daily fire weather severity at a particular station, based on the FWI. It indicates the increasing amount of work and difficulty of controlling a fire as fire intensity increases. The DSR can be averaged over any period to provide monthly or seasonal severity ratings.

**Monthly Severity Rating (MSR)** is the average of the DSR values over the month. DSR and MSR captures the effects of both wind and fuel dryness on potential fire intensity, and therefore control difficulty and the amount of work required to suppress a fire. It allows for comparison of the severity of fire weather from one year to another.

### Acknowledgements:

Fire Danger interpretation was from information gathered from the Average Monthly Maps for: Severity Rating, FWI, BUI, ISI, DC, DMC, FFMC. These maps were obtained from the Fire and Emergency New Zealand's Fire Weather System powered by Eco Connect.

Information on the Expected Climate Outlook was gathered from:
 MetService, Rural Monthly outlooks:

- www.metservice.com/rural/monthly-outlook
- NIWA, Seasonal Climate outlook: www.niwa.co.nz/climate/sco
- Australian Bureau of Meteorology Climate outlooks http://www.bom.gov.au/climate/ahead/?ref=ftr

## Front Cover Image: 2017 Fire season fam

2017 Fire season familiarisation, pumps training (Veronica Clifford, Scion).

If you are keen to submit a weather and fire related photo that will appear on the front page, please email:

- a high resolution image(s)
- with details on the location and the photographer's name and organisation.
- to: Veronica.Clifford@scionresearch.com

**Drought Code (DC)** A rating of the average moisture content of deep, compact, organic soil layers, and a useful indicator of seasonal drought effects on forest fuels and amount of smouldering in deep duff layers and large logs.

0 - 100	Little mopup needs
101 - 175	Moderate
176 - 250	Difficult
251 - 300	Difficult & extended
301 +	Difficult & extensive

#### Fire Weather Index (FWI)

Combines the ISI and BUI to indicate the potential head fire intensity of a spreading fire (on level terrain).

0 - 5	Low fire intensity
6 - 12	Moderate
13 - 20	High
21 - 29	Very High
30 +	Extreme

e	0 - 1	0 - 1 Low fire behaviour potential					
1 - 3 Moderate fire potential							
	3 - 7	High to very high fire potential					
s	7 +	Extreme fire behaviour potential					



Figure 5. Current Monthly Average for the: Fire Weather Index (top), Buildup Index (middle) and Initial Spread Index (below).

Figure 6. Average Monthly values of: Fire Weather Index (top), Buildup Index (middle) and Initial Spread Index (below); for the same time as last year (left) and during the 2004/05 Neutral year followed by a weak El Niño (right).



Figure 7. Current monthly average for the: Drought Code (top), Duff Moisture Code (middle) and the Fine Fuel Moisture Code (below). Figure 8. Average monthly values of: Drought Code (top), Duff Moisture Code (middle) and Fine Fuel Moisture Code (below); for the same time as last year (left) and during the 2004/05 Neutral year followed by a weak El Niño (right).



### **Regional Summaries**

### Tracking of trends in BUI, DC and CDSR:

Comparisons of fire dangers for individual indicator stations for different regions are shown in tabular format. Trends for Drought Code (DC), Buildup Index (BUI) and Cumulative Daily Severity Rating (CDSR) are provided for all stations in a PDF format on the Scion website: <u>https://www.scionresearch.com/rural-fire-research</u>

For those who are interested in tracking fire season trends for all your weather stations on a more frequent basis (as opposed to the monthly analysis done here), you can contact Scion Rural Fire Research for the Excel sheets, and R scripts (to make the graphs in pdfs). The more detailed regional graphs highlight where the Buildup Index (BUI), Drought Code (DC) and Cumulative Daily Severity Rating (CDSR) values sit in comparison with previous fire seasons. The graphs display:

- Bold red line is the current fire season,
- · Bold black line is the long-term average,
- Light grey shaded areas indicate the range based on historical max and min values,
- We've also colour coded the 2004/05 & 2006/07 fire season years which were regarded as Neutral years transitioning to a weak El Niño season, similar to predictions for this coming season (yellow & blue lines).

### Northern South Island: Nelson-Tasman

### Soil moisture:

- Soils across the region are generally close to storage capacity, holding a lot of moisture (Figure 3).
- The soil moisture anomaly map shows soils are slightly drier than normal for Nelson, and gradually transition to about normal for coastal locations (Figure 4).

- Stations to watch are: Currently, there are no stations that are reporting significant values.
- BUIs currently range between 6 and 14. This indicates that heavy and medium fuels are not available for combustion and there should be little control difficulties.
- BUI values are above the historical averages for this time of year, and above that seen in the 2004/05 weak El Niño year.
- Maximum BUIs typically peak between 100 and 160 in late February or March.
- DCs are currently around 20 to 50, indicating that there is little sign of drought and a low risk of extended mop up needs in deep organic and heavy fuels.
- DC values are generally above their historical averages and the 2004/05 weak El Niño fire season. The exception being Hira (below average).
- Maximum DC values typically peak between 320 and 650 near the end of February or March.
- CDSRs are generally trending below or on trend with the historical averages and the 2004/05 fire season.
- Current fire severity and fire danger are, on average, Low to Moderate across the region (Figure 1 & 5).
- With forecasted below average temperatures, and normal to below normal rainfall, expect fire dangers and seasonal severity to begin to gradually rise over the next month (in the absence of any major rain events).

Station Name	BUI trends		DC trends		CDSR trends	
	vs. average	vs. 2004/05	vs. average	vs. 2004/05	vs. average	vs. 2004/05
Hill and High country						
Big Pokororo 2 raws	well above	well above	above	above	on trend	slightly above
Dovedale raws	slightly above	slightly above	slightly above	slightly above	below	on trend
Western Boundary raws	above	above	above	above	above	above
Murchison raws	slightly above	on trend	slightly above	slightly above	well below	on trend
St Arnaud raws	well above	NA	above	NA	on trend	NA
Coastal						
Takaka Aerodrome raws	new station	new station	new station	new station	new station	new station
Hira raws	on trend	on trend	slightly below	on trend	well below	below
Nelson raws *	above	above	slightly above	above	below	on trend
Nelson Aero aws *	slightly above	above	on trend	slightly above	below	on trend

### Marlborough-Kaikoura

### Soil moisture:

- Soils across the region are generally near field capacity, holding a lot of moisture (Figure 3).
- The soil moisture anomaly map shows a transition from being slightly drier than normal in the west (inland) to about normal along the east coast for this time of the year (Figure 4).

- Stations to watch are: Keneperu Head, Awatere Valley & Upper Clarence.
- BUIs across the region currently range between 5 and 30. This indicates that heavy and medium fuels are not readily available for combustion in most locations, and there should be little difficulty of control. The exceptions being Mid Awatere Valley & Upper Clarence (50s), where heavy and medium fuels are becoming available, and there would be some level of control difficulty.
- BUI values vary across the region, ranging from above to below their historical averages for the same time of the year.
- Stations across the region typically peak at BUI values of 110 to 260 in February or March.
- DCs are currently ranging between 5 and 50, indicating that heavy and deep organic fuels are becoming available, and there is a risk of moderate to difficult mop-up needs in heavy fuels. The exceptions being Keneperu Head, Mid Awatere Valley, & Upper Clarence where DC values are higher (100+), so there is some risk of moderate to difficult mop-up needs.
- DC values across the region are generally below their historical averages for this time of year.
- Maximum DC values typically reach a peak (600 1200) near the end of February or March.
- CDSRs are generally below their long-term averages. The exceptions being Mid Awatere Valley & Upper Clarence (trending above average).
- Fire severities and fire danger across the region currently range, on average, from Low to Moderate (Figure 1 & 5).
- With forecasted below average temperatures, and normal to below normal rainfall, expect fire dangers and seasonal severity to continue to gradually rise over the next month (in the absence of any major rain events).

Station Name	BUI trends		DC trends		CDSR trends	
	vs. average	vs. 2004/05	vs. average	vs. 2004/05	vs. average	vs. 2004/05
Sounds	·				-	
Keneperu Head raws	well above	well above	well above	well above	on trend	slightly above
Rai Valley raws	slightly below	below	below	below	below	below
Koromiko raws	new station	new station	new station	new station	new station	new station
Hill and High country						
Onamalutu raws	slightly below	NA	below	NA	below	NA
Landsdowne raws	well above	NA	above	NA	well above	NA
Tor Darroch raws	well above	NA	well above	NA	well above	NA
Ward raws	on trend	NA	below	NA	well below	NA
Mid Awatere Valley raws	new station	new station	new station	new station	new station	new station
Molesworth raws	slightly above	slightly below	below	below	slightly below	slightly below
Upper Clarence raws	new station	new station	new station	new station	new station	new station
Glenveigh Kaikoura raws	above	NA	below	NA	on trend	NA
Plains						
Lower Wairau raws	new station	new station	new station	new station	new station	new station
Blenheim Aero aws	below	below	below	below	well below	well below
Awatere Valley raws	below	below	well below	well below	below	below
Coastal						
Cape Campbell SYNOP	below	below	below	below	slightly below	slightly below
Kaikoura SYNOP	slightly above	on trend	below	slightly below	below	below

### **Central South Island:**

### West Coast

### Soil moisture:

- Soils across the region are at field capacity (Figure 3).
- The soil moisture anomaly map shows that soil moisture is about normal for this time of the year (Figure 4).

- Stations to watch are: Haast Junction (check rain gauge).
- BUI values are ranging between 0 and 3. This indicates that heavy and medium fuels are not readily available for combustion and the difficulty of control will be easy. The exception being Haast Junction (25), which may require a check of the rain gauge.
- Most BUI levels are below their historical averages and the levels observed during the 2004/05 weak El Niño fire season.
- Maximum BUIs typically peak in early March, reaching values of 40 to 100.
- DCs are currently ranging between 1 and 5, indicating little to no mop-up requirements. The exception being Haast (95), where values indicate fuels are becoming more available and there could be a risk of more extended mop-up needs.
- DC values are below their historical averages, and the levels seen in 2004/05 for the same time of year.
- Maximum DC values typically reach a peak (325 425) near the end of January or February.
- CDSRs are generally below normal levels for this time of the year and those seen during the 2004/05 fire season.
- Fire severity and danger for this region are currently Low (Figure 1 & 5).
- With forecasted near average temperatures, and normal to below normal rainfall, expect fire dangers and seasonal severity to begin to gradually rise over the month (in the absence of any major rain events).

Station Name	BUI trends		DC trends		CDSR trends	
	vs. average	vs. 2004/05	vs. average	vs. 2004/05	vs. average	vs. 2004/05
Hill and High country						
Reefton ews	below	slightly below	below	below	well below	on trend
Maruia raws	new station	new station	new station	new station	new station	new station
Nelson Creek raws	below	below	below	below	well below	well below
Lake Brunner raws	new station	new station	new station	new station	new station	new station
Coastal						
Karamea raws	new station	new station	new station	new station	new station	new station
Westport Aero aws	below	below	well below	well below	on trend	slightly above
Charleston raws	new station	new station	new station	new station	new station	new station
Hokitika raws #	well below	well below	well below	well below	well below	well below
Hokitika Aero SYNOP #	well below	well below	well below	well below	well below	well below
Haast SYNOP *	on trend	slightly above	below	slightly below	well below	well below
Haast Junction raws *	well above	well above	well above	well above	well above	well above

### Canterbury

(includes Selwyn, Christchurch, Waimakariri and Hurunui).

### Soil moisture:

- Soils are generally near field capacity, especially in the high country, but transitioning to 50% of storage capacity along the east coast (Figure 3).
- The soil moisture anomaly map indicates soil conditions are about normal for this time of the year for the Selwyn
  district and Banks Peninsula. The exceptions are for the Waimakariri & Hurunui districts, which are showing slightly
  drier than normal conditions (Figure 4).

- Stations to watch are: Forest Plains.
- BUIs are now typically ranging between 6 and 21, indicating that heavy and medium fuels are not readily available for combustion and the difficulty of control will generally be easy to moderate.
- In general, BUI levels are on trend with the historical averages for this time of year, and the levels observed during the 2004/05 weak El Niño fire season.
- BUI values usually peak around January February (170).
- DCs are generally ranging between 0 and 80. These values indicate that there is little sign of drought at present, and a low risk of extended mop up needs in deep organic or heavy fuels. The exceptions being Omihi & Bottle Lake Forest (90s) which indicates that medium to heavy fuels are becoming available and there could be more extended mop-up needs.
- DC values are below the historical averages for this time of year and generally on trend with the levels observed during the 2004/05 season. The exceptions being Forest Plains (above average).
- Maximum DC values typically reach a peak (600 to 800) near the end of February or March.
- CDSRs are below their historical averages for this time of the year, and those seen during the 2004/05 fire season.
- Fire severities and fire danger across the region currently range, on average, from Low to Moderate (Figure 1 & 5).
- With forecasted near average temperatures, and normal to below normal rainfall, expect fire dangers and severity to continue to rise over the next month (in the absence of any major rain events).

Station Name	BUI trends		DC trends		CDSR trends		
	vs. average	vs. 2004/05	vs. average	vs. 2004/05	vs. average	vs. 2004/05	
North Canterbury							
Balmoral raws	below	below	below	below	below	below	
Cheviot raws	new station						
Omihi raws	new station						
Ashley raws	on trend	on trend	slightly above	slightly above	on trend	on trend	
Hill and High country							
Hanmer Forest ews	above	slightly above	on trend	on trend	slightly below	on trend	
Cass raws	new station						
Lees Valley raws	above	above	above	above	slightly below	on trend	
Oxford raws	slightly above	NA	on trend	NA	below	NA	
Snowdon raws	on trend	on trend	below	on trend	below	on trend	
Plains							
Forest Plains raws #	well above	NA	above	NA	on trend	NA	
McLeans raws #	slightly above	slightly below	slightly below	slightly below	below	below	
Christchurch Aero S	slightly above	slightly below	slightly below	on trend	below	below	
Burnham raws	slightly below	slightly below	below	slightly below	below	below	
Motukarara raws	slightly below	slightly above	below	on trend	below	below	
Leeston raws	slightly below	slightly above	slightly below	slightly above	well below	well below	
Coastal							
Bottle Lake Forest raws	slightly below	below	below	slightly below	on trend	slightly below	
Godley Head raws	new station						
Diamond Harbour raws	new station						
Le Bons Bay aws Aero *	below	on trend	well below	well below	slightly below	slightly below	
Panama Road raws *	below	on trend	well below	below	below	below	
Southbridge raws	new station						

### Mid-South Canterbury

(includes the Rakaia river south, i.e. Ashburton, Timaru, Mackenzie and Waimate).

#### Soil moisture:

- Soils are generally near field capacity, especially in the high country, but transitioning to 50% of storage capacity in eastern coastal locations (Figure 3).
- The soil moisture anomaly map indicates soil conditions are about normal for this time of the year for Mid and South Canterbury. The exception is Mackenzie district, which is showing slightly drier than normal conditions (Figure 4).

- Stations to watch are: Currently, there are no stations that are reporting significant values, but keep an eye on Cannington.
- BUIs across the region currently range from 1 to 20. This indicates that heavy fuels are not readily available for combustion and the difficulty of control will generally be easy to moderate.
- BUI levels across the region are below their historical averages for this time of the year, and generally on trend with the levels observed during the 2004/05 weak El Niño fire season.
- Maximum BUIs typically peak near the end of February or March (some in January), reaching values of 40 to 150.
- DC values are varied across the region, currently ranging between 2 and 80. The exceptions being: Timaru Coastal (145), Timaru Aero (132), Cannington (210), Cattle Creek (128) & Waihaorunga (114), however even these are falling below historical levels for this time of the year. These higher values indicate that deep organic layers and heavy fuels are drying in some locations, where there will be a risk of moderate to difficult mop-up requirements.
- Across the region, DC values are generally below the historical averages for this time of year.
- Maximum DC values typically peak during February or March (225 to 900).
- CDSRs are generally below the historical averages for this time of year, and those seen during the 2004/05 fire season.
- Fire severities and fire danger across the region currently range, on average, from Low to Moderate (Figure 1 & 5).
- With forecasted near average temperatures and normal to below normal rainfall, expect fire dangers and seasonal severity to continue to rise over the month (in the absence of any major rain events), especially in the Mackenzie.

Station Name	BUI trends		DC trends		CDSR trends		
	vs. average	vs. 2004/05	vs. average	vs. 2004/05	vs. average	vs. 2004/05	
Hill and High country							
Glenaan station raws	on trend	NA	on trend	NA	well above	NA	
Hakatere raws	on trend	slightly above	slightly below	on trend	below	below	
Mount Somers raws	below	slightly below	below	on trend	below	on trend	
Mt Cook ews	above	NA	below	NA	above	NA	
Clayton raws	well below	NA	well below	NA	below	NA	
Glentanner raws	new station	new station	new station	new station	new station	new station	
Tekapo raws	slightly below	on trend	below	on trend	on trend	slightly above	
Geraldine forest raws	below	NA	below	NA	slightly below	NA	
Pukaki Aero raws	below	on trend	below	on trend	below	slightly below	
Cattle Creek raws	below	NA	slightly below	NA	below	NA	
Waihaorunga raws	below	below	slightly below	below	slightly below	slightly below	
Plains							
Ashburton Plains 2 raws	new station	new station	new station	new station	new station	new station	
Ashburton Aero raws	below	below	below	below	below	below	
Cannington raws	below	slightly below	on trend	on trend	below	below	
Waimate forest raws	below	NA	below	NA	on trend	NA	
Coastal							
Timaru Coastal raws *	slightly below	on trend	slightly below	below	below	below	
Timaru Aero SYNOP *	slightly below	on trend	slightly below	below	below	below	

### Lower South Island:

### Otago

### Soil moisture:

- Soils are at storage capacity or water surplus for Queenstown Lakes and coastal Otago, whereas Central Otago is
- near field capacity (Figure 3). These moist conditions are also reflected in the soil moisture anomaly map, which shows soils are wetter than normal for this time of the year in Queenstown Lakes and coastal locations, and about normal for Central locations (Figure 4).

- Stations to watch are: Currently, there are no stations that are reporting significant values. But keep an eye on Central Otago (Otematata, Tara Hills, Lauder, Cromwell, Clyde, Butchers Dam, Ranfurly) and some coastal stations (Oamaru & Windsor).
- Current BUI values across the region generally range from 0 to 15. These indicate that medium and heavy fuels are not readily available for combustion and the control difficulty will generally be easy. An exceptional stations is Otematata (30).
- BUI values across the region are generally below the historical averages and the 2004/05 weak El Niño fire season at the same time of year.
- Maximum BUIs typically peak around the end of February or March (some locations January or April), reaching values of 60 to 200.
- DC values vary across the region, ranging from 0 to 80. The exceptions being Butchers Dam (242), Clyde 2 (252), Ranfurly (145), Lauder (214), Cromwell (221), Windsor (139), Oamaru (160), Otematata (283) & Tara Hills (104), where heavy fuels and deep organic layers are becoming available and will likely present moderate to difficult mop-up requirements.
- DC values observed across the Otago region are below their historical averages and the 2004/05 fire season values for this time of year.
- CDSRs are generally on trend or below the historical averages for the same time of year.
- Fire severities and fire danger across the region currently range, on average, from Low to Moderate (Figure 1 & 5).
- With forecasted near average temperatures and normal to below normal rainfall, expect fire dangers and seasonal severity to continue to rise over the month, especially for Central and coastal Otago (in the absence of any major rain events)

Station Name	BUI trends		DC trends		CDSR trends			
	vs. average	vs. 2004/05	vs. average	vs. 2004/05	vs. average	vs. 2004/05		
Waitaki								
Tara Hills aws	below	below	below	on trend	below	on trend		
Oamaru North raws #	well below	well below	below	below	below	below		
Oamaru Aero aws #	below	on trend	on trend	on trend	below	slightly below		
Windsor ews	well below	well below	slightly below	below	below	below		
Oamaru aws	slightly below	NA	slightly below	NA	below	NA		
Herbert raws	below	NA	well below	NA	below	NA		
Macrae s raws	below	on trend	slightly below	on trend	on trend	on trend		
Queenstown lakes								
Hawera Flats raws *	below	below	well below	well below	below	on trend		
Wanaka Aero aws*	below	slightly below	below	on trend	below	on trend		
Queenstown Aero R ^	below	on trend	below	on trend	below	on trend		
Queenstown Aero S ^	below	on trend	below	on trend	on trend	slightly above		
Central Otago								
Otematata raws	new station	new station	new station	new station	new station	new station		
Naseby Forest raws	well below	NA	well below	NA	well below	NA		
Cromwell ews	well below	NA	below	NA	on trend	NA		
Dansey Pass raws	well below	NA	below	below	below	below		
Lauder ews	well below	well below	slightly below	below	below	below		
Ranfurly ews	well below	NA	well below	well below	below	slightly below		
Clyde 2 ews	below	on trend	slightly below	on trend	slightly below	slightly above		
Butchers Dam raws	well below	NA	slightly below	NA	below	NA		
Rock and Pillar raws	well below	well below	below	well below	below	below		
Glendhu raws	well below	well below	well below	well below	above	above		
Dunedin								
Bucklands raws	well below	NA	slightly below	NA	slightly above	NA		
Traquair raws	well below	well below	well below	well below	slightly below	on trend		
Dunedin Aero SYNOP	below	below	below	below	below	slightly below		

### Otago continues:

Station Name	BUI trends		DC trends		CDSR trends			
Clutha								
Tapanui raws	below	below	below	slightly below	on trend	on trend		
Waipahi raws	well below	NA	well below	NA	well above	NA		
Glenledi raws	on trend	slightly above	below	below	slightly below	on trend		
Nugget Point aws	on trend	slightly above	on trend	slightly above	above	well above		

### Southland

### Soil moistures:

- Soils conditions across the region are at field capacity, while Stewart Island is near field capacity (Figure 3).
- The soil moisture anomaly map shows a transition from about normal soils in south-western locations to slightly
  wetter than normal for north-eastern locations. Stewart Island is showing slightly drier than normal soil conditions for
  this time of the year (Figure 4).

- Stations to watch are: Currently, there are no stations that are reporting significant values.
- BUI values are currently ranging between 0 and 7. This indicates that heavy fuels are not readily available for combustion and the difficulty of control will be easy.
- BUIs across this region are generally below their historical averages for this time of year, and the levels observed during the 2004/05 weak El Niño year.
- Maximum BUIs typically reach between 40 and 125 during late January or February.
- DC values are currently ranging between 1 and 15 across the region. These values indicate that there is little sign of drought at present, and a low risk of extended mop up needs in deep organic or heavy fuels.
- DC values are generally below their historical averages and the 2004/05 weak El Niño fire season for this time of the year.
- DCs typically peak during February and March (200 to 500).
- CDSRs are generally on trend with the historical average and 2004/05 fire season for this time of the year. The exception being South West Cape on Stewart Island (above average).
- Fire severity and fire danger across the region are, on average, Low (Figure 1 & 5).
- With forecasted below average temperatures, and normal to below normal rainfall, expect fire dangers and seasonal severity to begin to gradually rise over the month (in the absence of any major rain events).

Station Name	BUI trends		DC trends		CDSR trends			
	vs. average	vs. 2004/05	vs. average	vs. 2004/05	vs. average	vs. 2004/05		
Eastern Southland								
Gore aws	below	below	well below	well below	slightly above	above		
Slopedown raws	above	above	on trend	slightly above	slightly below	slightly above		
Central Southland								
Garston raws	well below	well below	well below	well below	slightly below	NA		
Barnhill raws	below	on trend	below	below	below	on trend		
Lumsden aws	well below	well below	well below	well below	below	on trend		
Otama raws	new station	new station	new station	new station	new station	new station		
Tanner Road raws	well below	NA	well below	NA	above	NA		
Wreys Bush raws	well below	well below	well below	well below	on trend	above		
Tuatapere raws	well below	well below	well below	well below	below	on trend		
Invercargill Aero SYNOP	well below	well below	well below	well below	above	above		
Tisbury raws	well below	NA	well below	NA	well above	NA		
Western Southland								
Wilderness raws	on trend	NA	slightly below	NA	slightly above	NA		
Manapouri Aero aws	below	on trend	below	on trend	well below	on trend		
Blackmount raws	below	below	below	below	above	above		
Stewart Island								
Stewart Island raws	new station	new station	new station	new station	new station	new station		
South West Cape SYNOP	well below	well below	well below	well below	well above	well above		