New Zealand Seasonal Fire Danger Outlook 2017/18

ISSUE: South Island, January 2018

SCION
FORESTS ▪ PRODUCTS ▪ INNOVATION

Current fire danger situation & outlook:

New Zealand experienced unsettled weather during December, where hot and dry conditions see-sawed with cool, wet weather. Some locations were closing in on thresholds for enforcing prohibited fire seasons, however fronts with moderate rainfall drove the fire indices back down again.

On average, Very High and Extreme fire potential currently exists along eastern areas of the South Island, including: Nelson, Marlborough, West Coast (Reefton – Westport) North & South Canterbury, Otago, Southland and Stewart Island. The elevated fire dangers across the South Island are the result of continued warm temperatures and an extended dry run for many. Low fire danger and fire climate severity exists elsewhere across the south (Figure 1 & 5). Nelson, Marlborough, North & South Canterbury, and Otago were experiencing, on average, Very High to Extreme BUI, DC and DMC values (Figures 5-6 & 7-8). However, if heavy rainfalls forecast over coming days for much of the South Island eventuate, then fire dangers could be reduced significantly in many areas

Regions currently experiencing severely to extremely drier than normal soil conditions include Otago (Queenstown lakes and Central), Southland (Invercargill), West Coast (Reefton to Westport), and North and South Canterbury (Fig 3). Significant rainfall events at the beginning of January helped to alleviate extremely drier than normal soil conditions elsewhere. Soils are drier than normal for northern areas of the West Coast, Canterbury high country, and Southland (Figure 4). It has been wetter than normal for Marlborough/Kaikoura and coastal North Canterbury for this time of the year.

The current El Niño-Southern Oscillation (ENSO) state remains a weak La Niña. International climate models are anticipating this La Niña state to be short lived, but persist for the next three months (January – March 2018). Typically, ENSO events peak in December or January. Most models are predicting a transition back to ENSO Neutral during autumn 2018 (April – June 2018).

The outlook for the next three months is for further unsettled weather. Higher pressures than normal will dominate the east and south of the country, while lower pressure than normal is forecast over the Tasman Sea area, extending over the country. Warm coastal and ocean waters are set to continue, which will influence the likelihood of significant rain events. Temperatures are forecasted to be above average across the country. Rainfall amounts are predicted to be equally near normal or above normal for the South Island.

Looking ahead, the west and north of both Islands are expected to run wet in January, with about average rainfall elsewhere. Temperatures at or slightly above average are predicted for all regions. As a result, fire danger and fire climate severities for January are expected to continue to elevate for locations along the east coast (Figures 1 & 5). The fire season years of 2016/17, 2013/14, 2012/13 & 2008/09 are potentially good indicators for what to expect this coming fire season (Figure 9).

Regions to watch for elevated fire activity in January are: Nelson, along the east coast (Marlborough, Canterbury, and Otago), and Southland. However, any major rain events in the next few days or weeks will provide some welcome relief and reduce the fire dangers and severities.

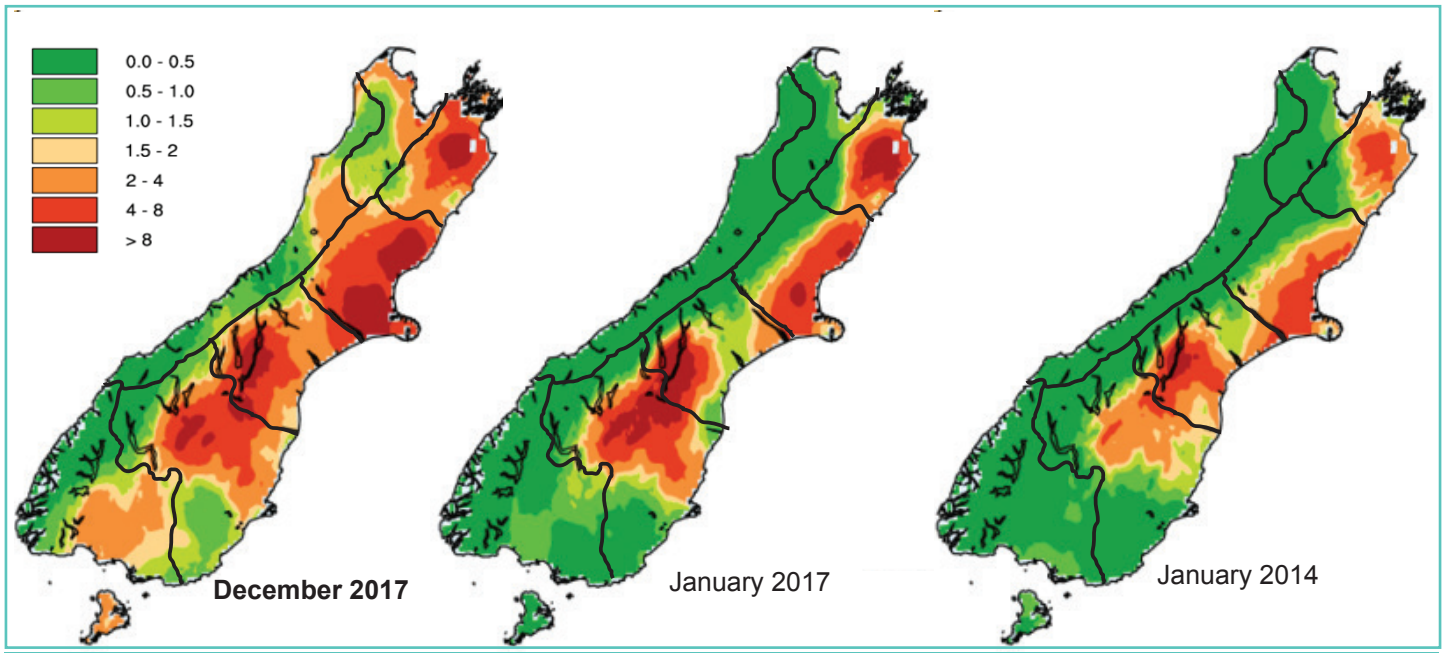


Figure 1. Monthly average Severity Rating for: current (left), last year (middle), 2013/14 Neutral year followed by a weak La Niña (right).

EXPECTED CLIMATE OUTLOOK:

Currently, the El Niño-Southern Oscillation (ENSO) remains a weak La Niña despite some ocean and atmospheric indicators of La Niña easing in the past month (December 2017). This is due to transient weather factors, and does not indicate an early easing of the La Niña event itself. International climate models suggest La Niña thresholds will remain for a further 3 months (January – March 2018), then return to ENSO-neutral conditions over April – June 2018.

New Zealand coastal waters have continued to be much warmer than average, between 2 and 5 degrees above average for the time of year. This "marine heat wave" is likely to continue for at least part of the next 3 months (January – March 2018).

This month: January 2018

The first week was dominated by a rapidly developing low pressure system, which brought heavy rain and broke the dry spell for many in the north and east of the South Island.

For the remainder of January, westerlies will start firing up over the South Island, resulting in a forecast for above average rainfall for the west of the South Island. Near normal rainfall is forecast for the remainder of the South Island. Average temperatures are forecast for the remainder of the month.

Soil moisture (Figure 3 & 4)
Soil moisture levels improved very significantly in the northern two-thirds, caused by heavy rain in early Jan. However, the lower South Island has missed out on this rainfall and soil moisture levels have continued to decrease as a result. The driest soils across the South Island compared to normal for this time of the year are found in southern Southland.

The only current hotspot in the South Island is a sizeable one which covers far southern Canterbury as well as a majority of Otago and Southland.

Further ahead: January - March 2018

New Zealand's climate is expected to be dominated by the very warm ocean waters present in the Tasman Sea and surrounding coastal waters. This will influence air temperatures and the likelihood of significant rainfall events. For the next three months, higher pressures than normal are forecasted for the east and south of the country, while lower pressure than normal is forecast over the Tasman Sea area, extending over the country. This pressure pattern is expected to be associated with unsettled conditions and north-easterlies.

For the next three months (January – March 2018):
Temperatures are forecast to be above average for all. Near normal or above normal rainfall amounts are most likely for the north of the South Island. Near normal soil moistures and river flows are predicted for the north of the South Island, with the remaining locations likely to be below or near normal.

Breakdown (Figure 2):

Temperatures are most likely to be:

- above average (70% chance) for Tasman, Nelson, Marlborough, Buller, West Coast, Alps and foothills, inland Otago, Southland, coastal Canterbury & east Otago.

Rainfall totals are most likely to be:

- equally likely to be near normal (40% chance) or above normal (35% chance) for Tasman, Nelson, Marlborough, Buller, West Coast, Alps and foothills, inland Otago, Southland, coastal Canterbury & east Otago.

Soil moisture levels are most likely to be:

- near normal (45% chance) for Tasman, Nelson, Marlborough & Buller;
- equally likely to be in the near normal range (45% chance) or below normal range (40% chance) for West Coast, Alps and foothills, inland Otago, & Southland;
- equally likely to be near normal (40% chance) or below normal (40% chance) for coastal Canterbury & eastern Otago.

Last month: December 2017

Looking back, December was notably warm with low to modest rainfall amounts. High pressure dominated the weather map, and was particularly intense during the first half of the month. However, during the second half of the month, fronts started to move up the country bringing some welcome showers or rain, but these were not generally yielding large rainfall totals. Christchurch, Westport and Hokitika experienced their longest summer dry spell.

Hot spells saw temperatures in many South Island locations peak around 30-32C. It was the warmest December at Dunedin (since 1962), Queenstown (1968) and Oamaru (1967), while it was the second warmest December on record at Invercargill (since 1948) and Christchurch (1953).

The combination of hot temperatures and lack of rainfall resulted in a sharp plummet in soil moisture levels across the country. Severe soil moisture deficits were recorded by mid-month for many regions. It was a very dry December for Westport, Hokitika, Christchurch, Invercargill and Blenheim, before the onset of regular

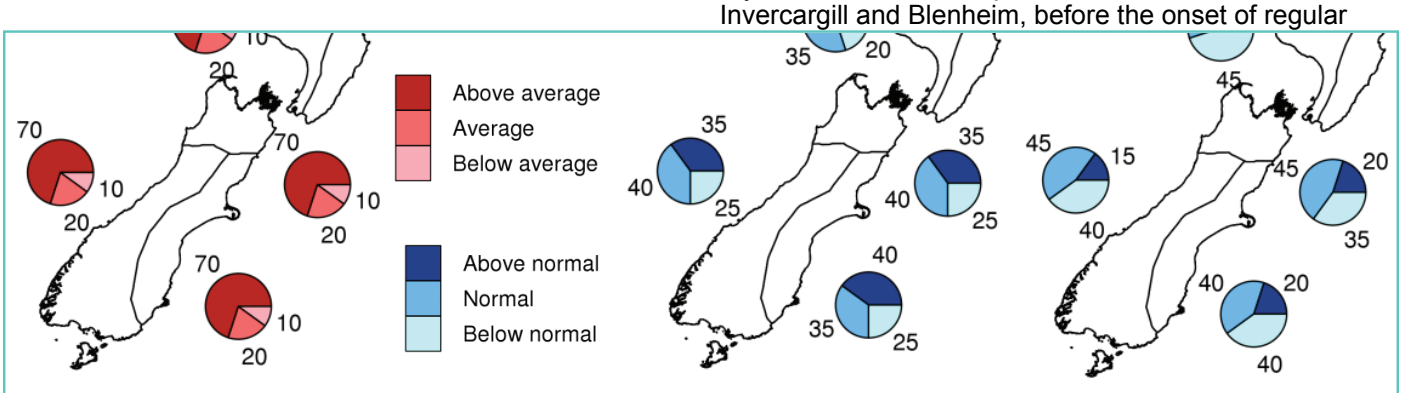


Figure 2. Outlook for Jan - Mar 2018: air temperature (left), rainfall (middle), available soil moisture (right). Source: NIWA.

showers began to break the dry spell.

Grass growth:

With temperatures rising, strong winds and grasslands drying out, there is an increased risk of grass fires for some areas. Grass fires in cured fuels can start easily and travel fast. Some areas would have experienced abundant grass growth over the last month, increasing the fuel loading.

As summer progresses, grasses continue to dry out and will eventually die or become dormant. Grass will start appearing straw coloured and this will progress until there is no green (chlorophyll) left in the grass and the yellow hue becomes bleached, at this point, the grass is considered 100% cured. Heavy and prolonged rains can delay the curing process until the onset of hot dry weather conditions, when curing will proceed rapidly. Rainfall before 60% curing will prolong grass life and slow the curing process, while rainfall after 60% will not delay the curing of mature grass.

Some landscapes may already appear a mixture of green and brown as grasses begin the curing phase. Areas experiencing a lack of rainfall for several weeks will likely have a cured landscape already. Grass curing over a landscape is most likely to be patchy over a series of paddocks/area, especially during the 40-80% curing period. Curing can also be patchier with variations to topography and species type. Above 80% curing, fuel moisture content begins to be significantly influenced by environmental factors (humidity and temperature and wind speed). The moisture content of fine grass fuels (but not limited to pine litter and other fine fuels) dramatically affects the ignition potential and spread characteristics of a wildfire.

The finer details:

Typically, grasses undergo curing in late spring/early summer, where the plant dies or becomes dormant following flowering and seed drop. As grasses cure, the amount of dead material increases, heightening the potential for fire to ignite and spread. When grasses cure and fuel moisture content decreases, there is less heat required to ignite the grass. As a result, more heat is released as it combusts. Burning under these conditions can produce large to very high flame heights (2 m+) and fires can spread quickly, be very intense and much more difficult to suppress.

In areas that are still favouring grass growth (mild temperatures and high soil moistures), they will typically remain lush green landscapes. Normally, 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. However, caution should be taken for some areas, as the presence of dead matted material from the previous season's growth (thatch) can contribute to the ease of a fire starting and spreading. This material is often hidden underneath lush green grass that appears to have low curing (30 - 50%). However, thatch can increase the ability of grass fuels to carry and sustain a fire. These fires will typically produce small flame heights and spread in a patchy manner.

What would La Niña mean for New Zealand?

La Niña tends to warm the ocean surrounding New Zealand, which encourages frequent lows and sub-tropical storms for the north, occasionally stretching down as far as Canterbury. During a La Niña, north-easterly and easterly winds are more frequent, resulting in the risk of heavy rain and flooding. New Zealand is typically warmer than average during a La Niña, although there are regional and seasonal exceptions.

La Niña typically brings more storms, clouds, humidity and rain to the north and east of New Zealand. During a La Niña summer, anticyclones are more frequent, bringing dry weather.

With a weak La Niña expected, it means our 'local' climate players (the Southern Ocean southerlies and Tasman Sea lows) will continue to take turns ruling our weather. This is a good reminder that local climate patterns (blocking Highs over or near New Zealand, Lows over the Tasman Sea or to the north of the country, and the southern ocean storms) generally 'trump' climate patterns such as El Niño and La Niña.

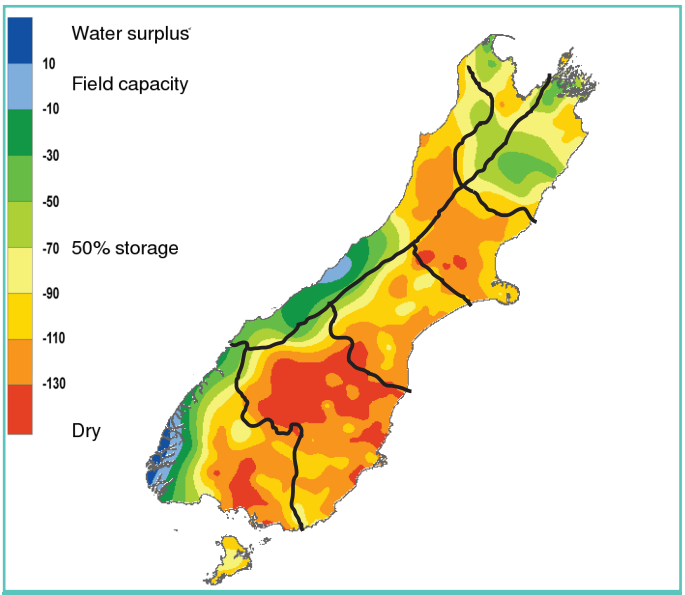


Figure 3. Soil moisture deficits as of 08/01/2018.
Source: NIWA.

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.

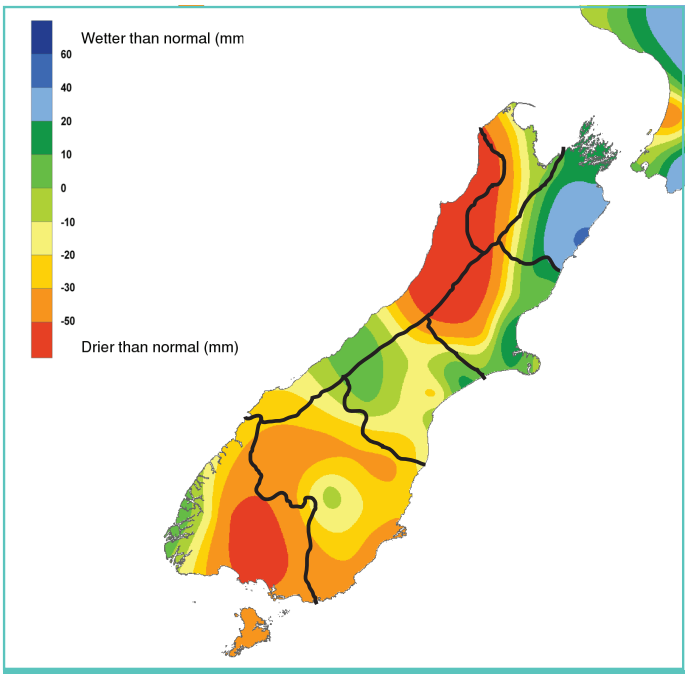


Figure 4. Soil moisture anomaly as of 08/01/2018.
Source: NIWA.

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 pre-planning 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

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

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

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

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

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

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.

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

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 National Rural Fire Authority Fire Weather System powered by Eco Connect.

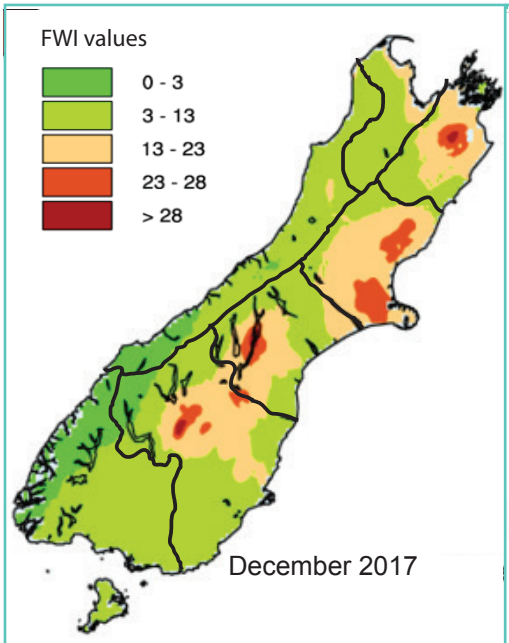
Information on the Expected Climate Outlook was gathered from:

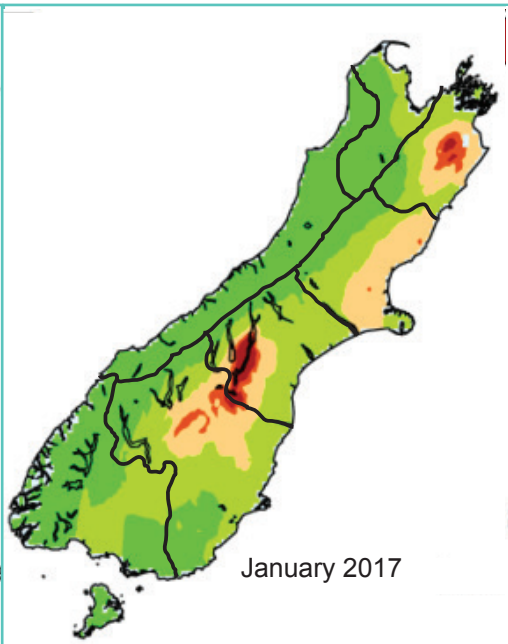
- MetService, Rural Monthly outlooks: www.metservice.com/rural/monthly-outlook
- NIWA, Seasonal Climate outlook: www.niwa.co.nz/climate/sco
- Australian Bureau of Meteorology Climate outlooks http://www.bom.gov.au/climate/ahead/?ref=ftr

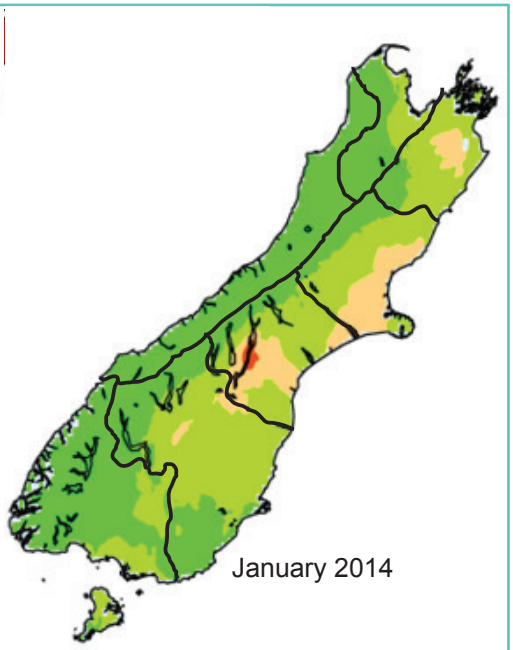
Front Cover Image:
2017 Prescribed burn, Otago. (Veronica Clifford, Scion).

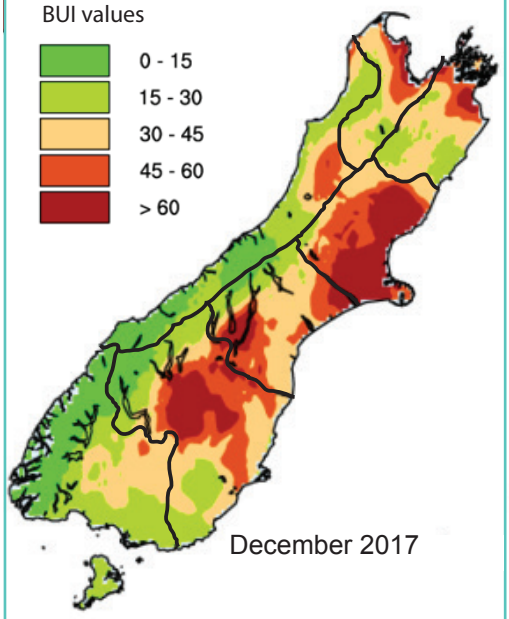
If you are keen to submit a weather and fire related photo that will appear on the front page, please email:

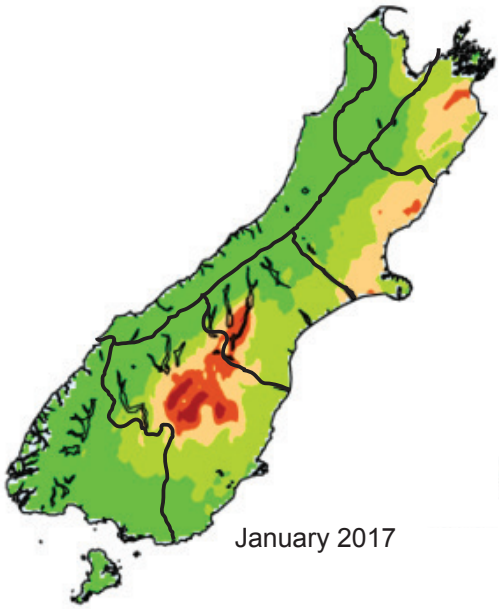
- a high resolution image(s)
- with details on the location and the photographer's name and organisation.
- to: Veronica.Clifford@scionresearch.com

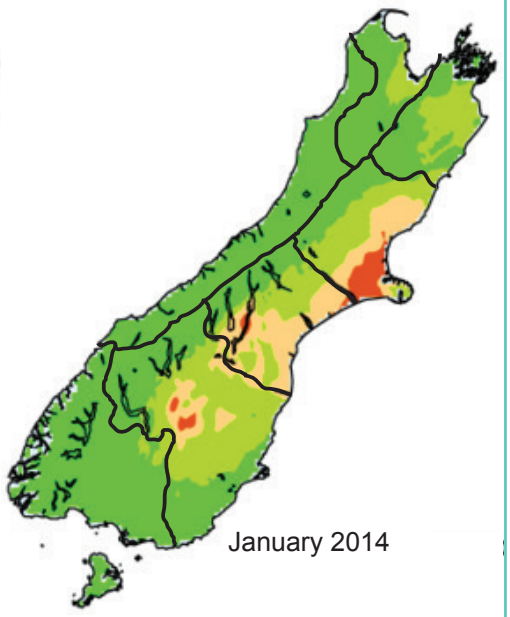


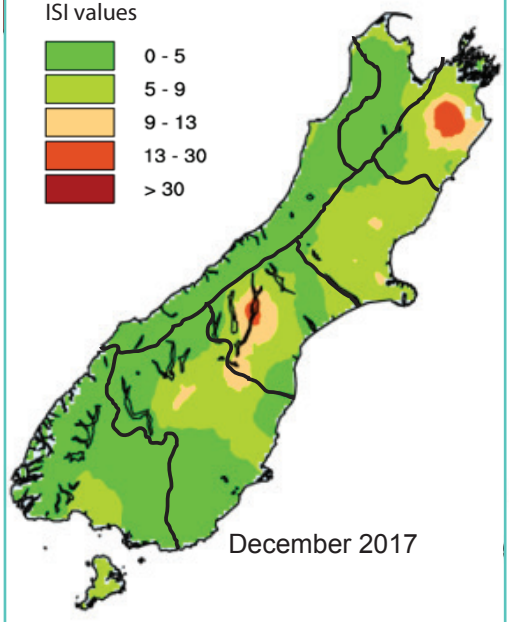


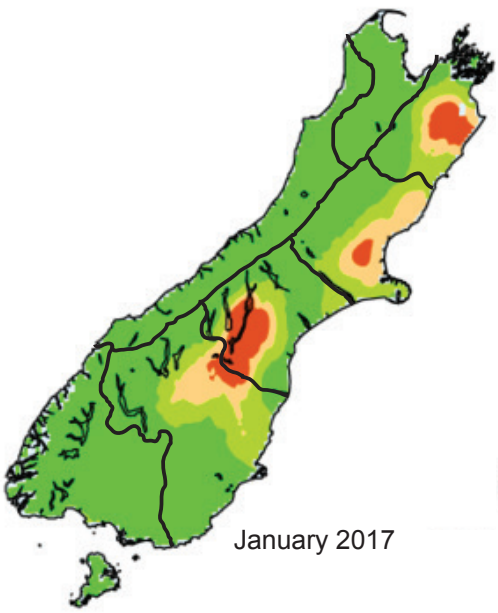












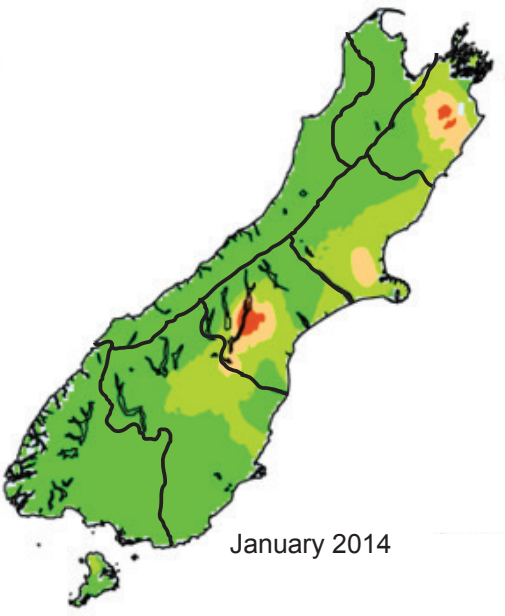


Figure 5. Current Monthly Average for the: Fire Weather Index (top), Buildup Index (middle) and Initial Spread Index (below).

Figure 6. Average Monthly values of: Fire Weather Index (top), Buildup Index (middle) and Initial Spread Index (below); for the previous year and during the 2013/14 Neutral year followed by a weak La Niña year.

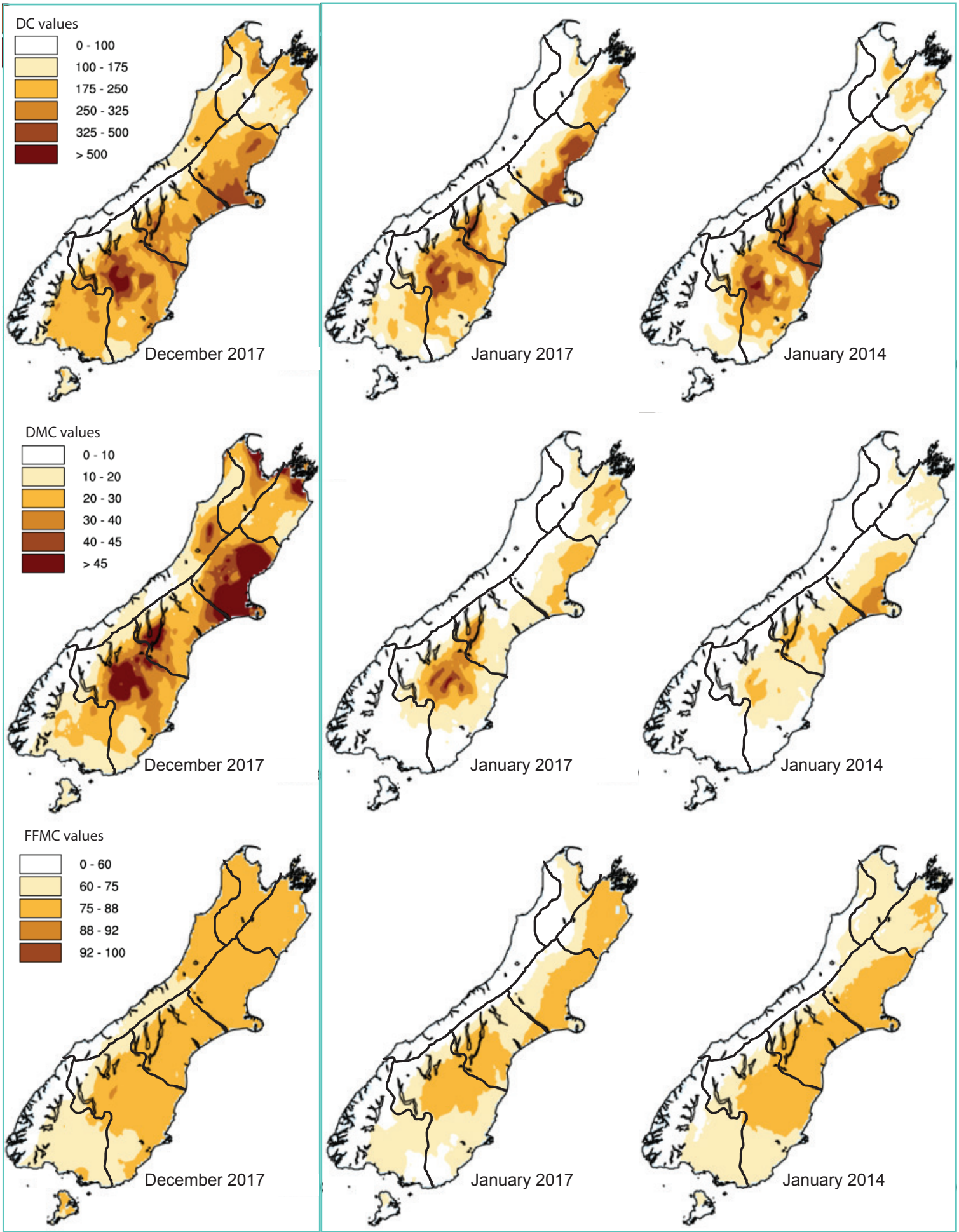


Figure 7. Current monthly average for the: Drought Code (top), Duff Moisture Code (middle) and the Fine Fuel Moisture Code (below).

Figure 8. Average monthly values of: Drought Code (top), Duff Moisture Code (middle) and Fine Fuel Moisture Code (below); for the previous year, and the 2013/14 Neutral year followed by a weak La Niña year.

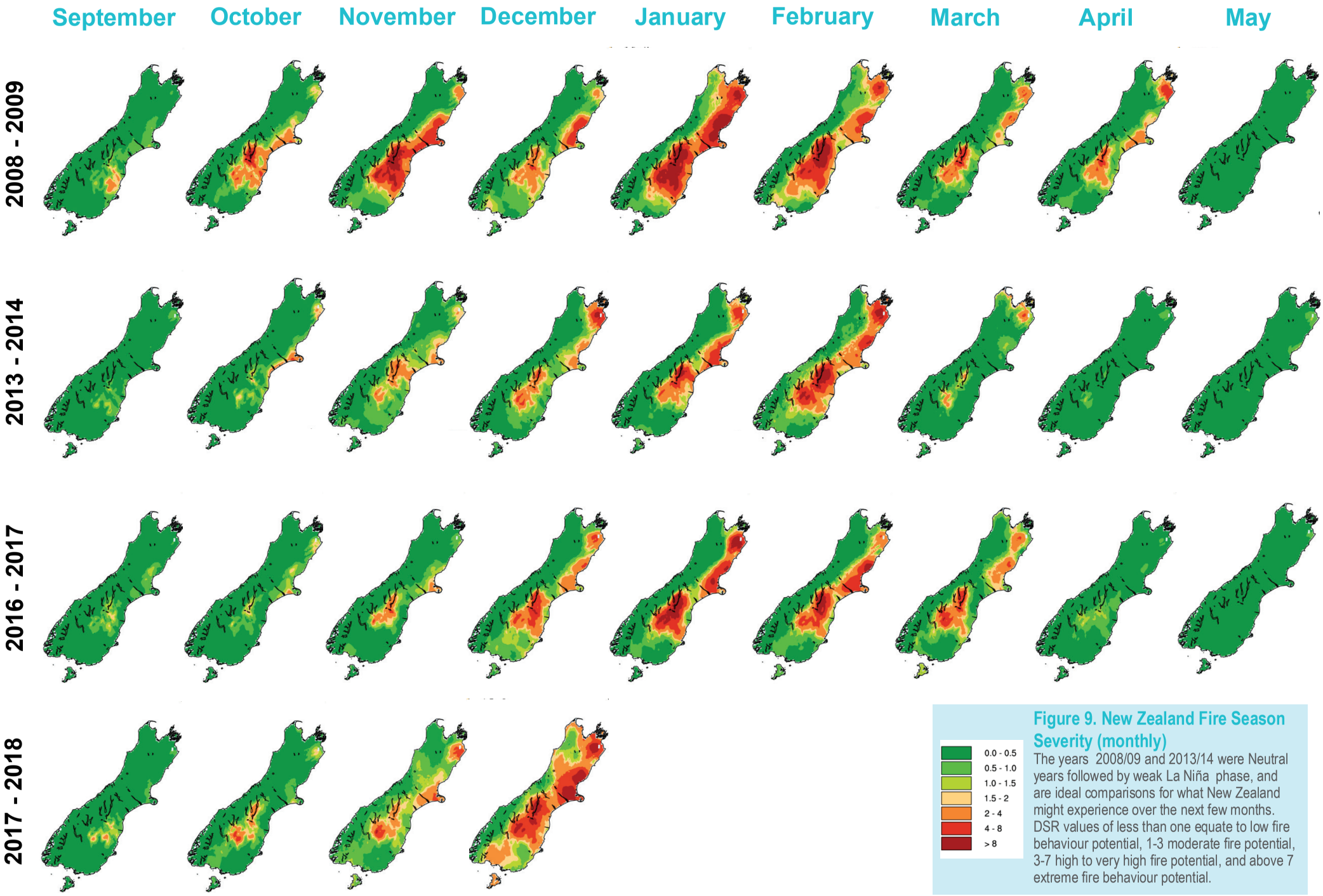


Figure 9. New Zealand Fire Season Severity (monthly)

The years 2008/09 and 2013/14 were Neutral years followed by weak La Niña phase, and are ideal comparisons for what New Zealand might experience over the next few months. DSR values of less than one equate to low fire behaviour potential, 1-3 moderate fire potential, 3-7 high to very high fire potential, and above 7 extreme fire behaviour potential.

Tracking of trends in BUI, DC and CDSR:

Comparisons of fire dangers for individual indicator stations for different regions are shown overleaf due to increasing fire activity and an increasing likelihood for fire danger and severity across the country. This is 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. 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 download the summary PDF graphs and Excel sheets, and R scripts (to make the pdfs) using the link to the right:

Link: https://www.dropbox.com/sh/1qy0b1rauv0t6g4/AAC4ziYCv9FUP6a5o7R-HHjna?dl=0

The more detailed regional outlooks highlight where 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 mins
- We've also colour coded the 2013/14 Neutral year followed by a weak La Niña season blue.

Northern South Island:

Nelson-Tasman

Soil moisture:

- Soil moisture is generally at 50% capacity, being slightly wetter in the Golden Bay and southern locations, but showing signs of drying in Nelson (Figure 3).
- The soil moisture anomaly map shows a transition from soils being much drier than normal in the west to about normal in the east of the region (Figure 4).

Fire weather codes and indices:

- Stations to watch are: Murchison

- BUIs currently range between 15 to 30. This indicates that heavy and medium fuels are becoming available for combustion and the difficulty of control is increasing. The exception is Murchison (45), where any fires would be difficult to control.
- BUI values, having dropped, are now on trend or below the historical average, except Murchison which is above average levels.
- Maximum BUIs typically peak between 110 and 160 in late February or March.

- DC's are currently generally around 150 to 300, indicating the heavy and deep organic fuels are becoming readily available, and that there is a risk of moderate to difficult mop-up needs in heavy fuels.
- DC values are generally above the historical average, and also those observed during the weak La Niña fire season of 2013/14.
- Maximum DC values typically reach a peak (350) near the end of February or March.

- CDSRs are generally trending above the historical average and the 2013/14 fire season.
- Current fire severity and fire danger are, on average, Very High for Golden Bay and Nelson, and Low to Moderate for the remaining areas of the Tasman district (Figure 1 & 5).
- With forecast warmer temperatures and above normal rainfall for January, expect fire dangers and fire climate severity to continue to be elevated across the Nelson-Tasman region. However, any major rain events will provide some added relief.

Station Name	BUI trends		DC trends		CDSR trends	
	vs. average	vs. 2013/14	vs. average	vs. 2013/14	vs. average	vs. 2013/14
Hill and High country						
Big Pokororo 2 raws	above	above	above	above	well above	well above
Dovedale raws	below	slightly above	slightly above	above	above	above
Western Boundary raws	on trend	above	slightly above	above	above	above
Murchison raws	above	above	above	above	slightly above	above
St Arnaud raws	above	above	well above	well above	slightly above	slightly above
Coastal						
Takaka Aerodrome raws	NA	NA	NA	NA	NA	NA
Hira raws	below	on trend	on trend	on trend	slightly below	on trend
Nelson raws *	below	slightly above	above	above	slightly above	slightly above
Nelson Aero aws *	below	slightly above	above	above	above	above

Marlborough-Kaikoura

Soil moisture:

- Soil moistures levels are generally at 50% capacity across the region. Soils are slightly drier in Marlborough, and slightly wetter in Kaikoura and the Sounds (Figure 3).
- The soil moisture anomaly map (Figure 4) shows a transition from soils being slightly drier than normal in the west (inland) to wetter than normal along the east coast.

Fire weather codes and indices:

- Stations to watch are: Molesworth

- BUIs across the region currently range between 10 to 35. This indicates that heavy and medium fuels are becoming available for combustion and the difficulty of control is increasing. The exception is Molesworth (60), where heavy and medium fuels are available and a fire would be difficult to control.
- BUI values are currently below the historical average, but are similar to the conditions seen in the weak La Niña fire season of 2013/14.
- Stations across the region typically peak at BUI values of 110 and 260 in February or March.

- DC's have dropped in early January, and are currently ranging between 30 to 250 indicating the heavy and deep organic fuels are becoming available, and there is a risk of moderate to difficult mop-up needs in heavy fuels. The exception is Molesworth (300), where there could be difficult and extensive mop-up needs.
- DC values across the region are generally below the historical averages.
- Maximum DC values typically reach a peak (600 - 1200) near the end of February or March.

- CDSRs are split below, at, or above the long-term average.
- Fire severity and danger are currently, on average, High to Extreme (Figure 1 & 5).
- With forecast warmer temperatures and above normal rainfall for January, expect fire dangers and fire climate severity to continue to be elevated across the Marlborough & Kaikoura regions. However, any major rain events will provide some added relief.

Station Name	BUI trends		DC trends		CDSR trends	
	vs. average	vs. 2013/14	vs. average	vs. 2013/14	vs. average	vs. 2013/14
Sounds						
Keneperu Head raws	below	on trend	below	below	on trend	slightly above
Rai Valley raws	below	slightly above	on trend	slightly above	above	above
Koromiko raws	NA	*NA*	NA	*NA*	NA	*NA*
Hill and High country						
Onamalutu raws	below	on trend	below	on trend	on trend	on trend
Landsdowne raws	slightly below	above	above	above	well above	NA
Tor Darroch raws	above	NA	well above	NA	on trend	NA
Ward raws	well below	NA	well below	NA	below	NA
Mid Awatere Valley raws	NA	NA	NA	NA	NA	NA
Molesworth raws	on trend	above	on trend	slightly above	slightly below	slightly above
Upper Clarence raws	NA	NA	NA	NA	NA	NA
Glenveigh Kaikoura raws	well below	NA	well below	NA	well below	NA
Plains						
Lower Wairau raws	below	NA	well below	NA	NA	NA
Blenheim Aero aws	below	slightly above	slightly below	on trend	slightly below	on trend
Awatere Valley raws	below	on trend	well below	well below	below	slightly below
Coastal						
Cape Campbell SYNOP	below	slightly above	below	on trend	on trend	on trend
Kaikoura SYNOP	below	on trend	below	below	below	below

Central South Island:

West Coast

Soil moisture:

- Soil moistures are dry in the Buller and Grey districts (Reefton to Westport), but nearing field capacity in the south (Fig 3). The soil moisture anomaly shows soils are much drier than normal in the north of the region and slightly drier for this time of the year in the south (Figure 4).

Fire weather codes and indices:

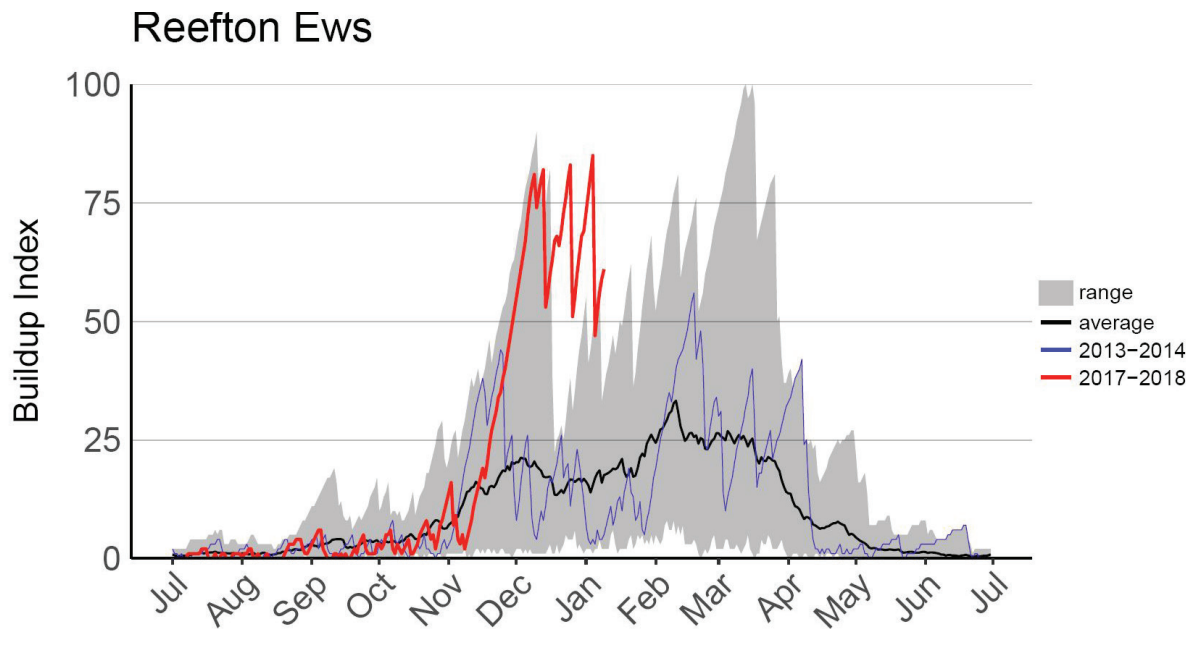
- Stations to watch are: Reefton, Maruia, Nelson Creek & Westport

- BUIs are ranging between 5 to 25 along the coast. This indicates that heavy and medium fuels are not readily available for combustion and the difficulty of control will generally be easy.
- However, inland stations are between 30 to 60, with stations of note being Reefton (60), Maruia (50) & Nelson Creek (45). Any fires in these areas would be more difficult to control.
- Most BUI levels are above the historical average and the 2013/14 weak La Niña fire season.
- Maximum BUIs typically peak in early March, reaching values of 40 and 100.

- DCs are ranging between 200 to 340 north of Greymouth, indicating difficult and extended mop-up requirement in this area, and 50 to 140 south of this indicating moderate mop-up requirements.
- DC values are above the historical average, and the levels seen in 2013/14 for the same time of year. Many stations in the north are at record highs.
- Maximum DC values typically reach a peak (325 - 425) near the end of January or February.

- CDSRs are generally well above normal levels for this time of the year.
- Fire severity and danger for this region are currently, on average, High to Very High in the north (Westport to Reefton) and Low to Moderate elsewhere (Figure 1 & 5). With forecast warmer temperatures and above normal rainfall for January, expect fire dangers and fire climate severity to continue to be elevated. However, any major rain events will provide some added relief.

Station Name	BUI trends		DC trends		CDSR trends	
	vs. average	vs. 2013/14	vs. average	vs. 2013/14	vs. average	vs. 2013/14
Hill and High country						
Reefton ews	well above	well above	well above	well above	well above	well above
Maruia raws	NA	NA	NA	NA	NA	NA
Nelson Creek raws	well above	well above	well above	well above	well above	well above
Lake Brunner raws	NA	NA	NA	NA	NA	NA
Coastal						
Karamea raws	NA	NA	NA	NA	NA	NA
Westport Aero aws	above	above	well above	well above	well above	well above
Charleston raws	NA	NA	NA	NA	NA	NA
Hokitika raws #	slightly above	above	above	above	well above	NA
Hokitika Aero SYNOP #	slightly above	above	above	above	well above	NA
Haast SYNOP *	on trend	slightly above	slightly above	above	above	slightly above
Haast Junction raws *	below	on trend	on trend	slightly above	above	above



Canterbury

(includes Selwyn, Christchurch, Waimakariri and Hurunui).

Soil moisture:

- Soils are dry across Canterbury, and extremely dry in pockets of Selwyn (Figure 3).
- The soil moisture anomaly map (Figure 4) shows a transition from drier than normal soils in the high country and across the plains to wetter than normal along the coast.

Fire weather codes and indices:

- Stations to watch are: Hanmer, Balmoral and Forest Plains

- BUIs have dropped and are now typically ranging between 15 to 35, indicating that heavy and medium fuels are not as available for combustion and the difficulty of control will generally be easier. The exceptions are: Hanmer Forest (35), Balmoral (50) and Forest Plains (65), where values indicate that fuels are readily available for combustion and difficulty of control for any fire outbreaks will range from moderately to extremely difficult. [The BUI indicated for Motukarara is unable to be confirmed due to apparent problems with the rain gauge since Oct.]
- In general, BUI levels are now below the historical average for this time of year.
- BUIs usually peak around January - February (170).

- DC's are generally ranging between 150 to 300. These values indicate that deep organic layers and heavy fuels are drying out, and there will be a risk of extended mop-up requirements. Exceptions are: Cass (60), Panama Rd (100), Balmoral (350) & Forest Plains (450), where mop-up would be prolonged and extensive.
- DC values for North Canterbury and the Hill & High Country are generally on trend or above the historical average and values during the 2013/14 season for the same time of year. Values for the Plains and Coastal areas are generally below the historical average and 2013/14 fire season.
- Maximum DC values typically reach a peak (600 to 800) near the end of February or March.

- CDSRs are split below, at, or above the historical average.
- Fire severity and danger are currently, on average, High to Extreme (Figure 1 & 5).
- With forecasted warmer temperatures and near normal rainfall for January, expect fire dangers and fire climate severity to remain elevated and, in the absence of major rain events, potentially increase.

Station Name	BUI trends		DC trends		CDSR trends	
	vs. average	vs. 2013/14	vs. average	vs. 2013/14	vs. average	vs. 2013/14
Northern Canterbury						
Balmoral raws	slightly below	slightly above	on trend	slightly above	on trend	slightly above
Cheviot raws	NA	NA	NA	NA	NA	NA
Omihi raws	NA	NA	NA	NA	NA	NA
Ashley raws	below	on trend	on trend	above	on trend	slightly above
Hill and High country						
Hanmer Forest ews	slightly below	slightly above	above	above	well above	well above
Cass raws	NA	NA	NA	NA	NA	NA
Lees Valley raws	slightly below	slightly above	above	above	on trend	above
Oxford raws	NA	NA	NA	NA	NA	NA
Snowdon raws	below	on trend	slightly below	slightly above	well above	well above
Plains						
Forest Plains raws #	slightly above	slightly above	above	above	slightly above	above
McLeans raws #	below	below	below	below	slightly below	on trend
Christchurch Aero	below	below	slightly below	on trend	slightly above	above
Burnham raws	below	below	on trend	on trend	slightly above	slightly above
Motukarara raws	well above	well above	well above	well above	above	above
Leeston raws	below	below	slightly below	on trend	slightly below	slightly above
Coastal						
Bottle Lake Forest raws	below	below	well below	well below	above	above
Godley Head raws	NA	NA	NA	NA	NA	NA
Diamond Harbour raws	NA	NA	NA	NA	NA	NA
Le Bons Bay aws Aero *	below	slightly below	below	below	slightly below	below
Panama Road raws *	below	slightly below	well below	well below	below	below
Southbridge raws	NA	NA	NA	NA	NA	NA

Mid-South Canterbury

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

Soil moisture:

- Soils are generally dry across the region, being slightly dry (at 50% capacity) in the high country (Figure 3).
- The soil moisture anomaly map shows soils are slightly drier than normal, except Ashburton and Mackenzie districts where it's about normal for this time of the year (Figure 4).

Fire weather codes and indices:

- Stations to watch are: Tekapo & Cannington

- BUIs across the region currently range from 5 to 45. This indicates that, in some places, medium and heavy fuels will be available for combustion and there will be a level of difficulty for control of any fires that occur. The exceptions are: Glenaan Station (55), Tekapo (80), Cannington (60) & Cattle Creek (60).
- BUI levels across the region are generally below the historical average for this time of year, except those stations noted above, which are above the average.
- Maximum BUIs typically peak near the end of February or March (some in January), reaching values of 40 to 150.

- DC values currently range between 140 to 330. This indicates that deep organic layers and heavy fuels are drying in some locations. The higher values indicate there will be moderate to difficult mop-up requirements. The exceptions are: Geraldine Forest (25), Mt Cook (100), Tekapo (420) & Cannington (450).
- Across the region, DC values are generally above the historical average, although some stations are slightly below.
- Maximum DC values typically peak during February or March (225 to 900).

- CDSRs are generally below the historical average for this time of year.
- Fire severities and danger for South Canterbury are currently, on average, High to Extreme (Figure 1 & 5).
- With forecast warmer temperatures and near normal rainfall for January, expect fire dangers and fire severity to remain elevated and, in the absence of major rain events, potentially increase over the next month.

Station Name	BUI trends		DC trends		CDSR trends	
	vs. average	vs. 2013/14	vs. average	vs. 2013/14	vs. average	vs. 2013/14
Hill and High country						
Glenaan station raws	well above	NA	well above	NA	above	NA
Hakatere raws	on trend	slightly above	above	above	below	below
Mount Somers raws	below	on trend	above	above	below	on trend
Mt Cook ews	above	above	above	above	well above	well above
Clayton raws	below	NA	well above	NA	well below	NA
Glentanner raws	NA	NA	NA	NA	NA	NA
Tekapo raws	above	above	above	above	on trend	on trend
Geraldine forest raws	below	NA	well below	NA	well below	NA
Pukaki Aero raws	slightly below	slightly above	below	on trend	below	on trend
Cattle Creek raws	well above	NA	above	NA	below	NA
Waihaorunga raws	slightly below	slightly above	slightly above	above	below	on trend
Plains						
Ashburton Plains 2 raws	NA	NA	NA	NA	NA	NA
Ashburton Aero raws	below	below	slightly below	slightly below	slightly below	slightly above
Cannington raws	slightly above	above	above	above	slightly below	slightly above
Waimate forest raws	below	NA	above	NA	well below	NA
Coastal						
Timaru Coastal raws *	below	below	on trend	slightly below	below	below
Timaru Aero SYNOP *	below	below	on trend	slightly below	below	on trend

Lower South Island:

Otago

Soil moisture:

- Soils are dry across the region, and extremely dry in the Central Otago and Queenstown lakes districts (Figure 3).
- The soil moisture anomaly map shows about normal soil moistures for this time of the year (Figure 4).

Fire weather codes and indices:

- Stations to watch are: Hawera Flats / Wanaka, Queenstown Aero, Cromwell, Lauder, Clyde & Butchers Dam.

- Current BUI values across the region generally range from 15 to 60. These indicate that in some locations medium and heavy fuels will be available for combustion and there will be a level of difficulty for control.
- However, there are many locations with elevated BUIs: Tara Hills (100), Windsor (70), Hawera Flats / Wanaka (90-140), Queenstown Aero (90-120), Otematata (90), Cromwell (140), Lauder (100), Ranfurly (85), Clyde (125) & Butchers Dam (115).
- BUI values across the region are generally above the historical average and the 2013/14 weak La Niña fire season.
- Maximum BUIs typically peak around the end of February or March (some locations January or April), reaching values of 60 to 200.

- Current DC values across the region generally range between 280 to 660, except Glendhu (70), Clyde (815), Butchers Dam (815) & Cromwell (860). These indicate that heavy fuels and deep organic layers are available, and likely present difficult and extensive mop-up requirements.
- DC values observed across the Otago region are generally above, to well above, the historical average and the 2013/14 fire season values for this time of year.
- DCs typically peak during February or March (300 to 800).

- CDSRs are split below, at, or above the historical average.
- Fire severities and fire danger across the region currently range, on average, from High to Extreme (Figure 1 & 5).
- Expect fire dangers and severity to continue to increase this month with forecast warm temperatures and near normal rainfall.

Station Name	BUI trends		DC trends		CDSR trends	
	vs. average	vs. 2013/14	vs. average	vs. 2013/14	vs. average	vs. 2013/14
Waitaki						
Tara Hills aws	above	above	slightly above	above	below	on trend
Oamaru North raws #	on trend	slightly above	slightly above	above	below	on trend
Oamaru Aero aws #	slightly below	slightly above	on trend	above	below	on trend
Windsor ews	above	above	above	above	below	slightly above
Oamaru aws	above	above	above	above	below	on trend
Herbert raws	well above	well above	above	above	below	slightly above
Macrae s raws	slightly above	above	above	above	slightly below	slightly above
Queenstown lakes						
Wanaka Aero aws *	above	above	above	above	on trend	slightly above
Hawera Flats raws *	above	well above	above	above	slightly above	above
Queenstown Aero S ^	well above	well above	well above	well above	well above	well above
Queenstown Aero R ^	above	above	well above	well above	above	above
Central Otago						
Naseby Forest raws	NA	NA	NA	NA	NA	NA
Otematata raws	slightly above	above	above	above	on trend	above
Cromwell ews	above	above	well above	well above	above	above
Dansey Pass raws	on trend	slightly above	on trend	slightly above	below	on trend
Lauder ews	above	above	above	above	slightly above	above
Ranfurly ews	above	above	above	above	slightly above	above
Clyde 2 ews	above	above	well above	well above	well above	well above
Butchers Dam raws	slightly above	above	above	above	slightly above	above
Rock and Pillar raws	slightly above	above	slightly above	above	below	on trend
Glendhu raws	slightly below	slightly above	slightly below	slightly above	slightly below	slightly above
Dunedin						
Bucklands raws	slightly above	above	above	above	below	on trend
Traquair raws	on trend	slightly above	well above	well above	on trend	above
Dunedin Aero SYNOP	on trend	slightly above	above	above	on trend	above

Otago continues:

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

Southland

Soil moistures:

- Soil moisture levels are extremely dry in central and inland parts of the region (including Stewart Island) (Figure 3).
- This is reflected in the soil moisture anomaly map (Figure 4)., where soils are drier than normal across the region, especially in central and inland areas.

Fire weather codes and indices:

- Stations to watch are: Garston, Tisbury
-
- Currently, BUI values are ranging between 15 and 45. This indicates that, in some places, medium and heavy fuels will be available for combustion and there will be a level of difficulty for control of any fires that occur.
- BUIs across this region are generally above the historical average for this time of year, except Barnhill, Tanner Road & Wilderness, which are below average. All stations are above the values observed during the 2013/14 weak La Niña season.
- Maximum BUIs typically reach between 40 and 125 during late January or February.
-
- Current DC values across the region range between 240 and 380, except Stewart Island (200). These indicate that, for some locations, deep organic layers and heavy fuels are dry, likely resulting in difficult mop-up.
- DC values are generally well above the average and the 2013/14 weak La Niña fire season for this time of the year. Many stations are at record highs for this time of year.
- DCs typically peak during February and March (200 to 500).
-
- CDSRs are generally on trend or above the historical average and 2013/14 fire season for this time of the year.
- Fire severity and fire danger across the region are, on average, ranging between Moderate to Very High (Fig 1 & 5).
- With expected warm temperatures and near normal rainfall, fire danger and severity will continue to increase, especially as soils continue to dry in central locations.

Station Name	BUI trends		DC trends		CDSR trends	
	vs. average	vs. 2013/14	vs. average	vs. 2013/14	vs. average	vs. 2013/14
Eastern Southland						
Gore aws	slightly above	above	above	above	on trend	slightly above
Slopedown raws	slightly above	above	well above	well above	on trend	slightly above
Central Southland						
Garston raws	slightly above	above	well above	well above	above	above
Barnhill raws	slightly below	slightly above	above	above	on trend	slightly above
Lumsden aws	on trend	slightly above	above	above	above	above
Otama raws	NA	NA	NA	NA	NA	NA
Tanner Road raws	below	NA	well above	NA	well above	NA
Wreys Bush raws	on trend	slightly above	well above	well above	above	above
Tuatapere raws	slightly above	above	well above	well above	on trend	on trend
Invercargill Aero SYNOP	above	above	well above	well above	above	above
Tisbury raws	well above	NA	well above	NA	well above	NA
Western Southland						
Wilderness raws	below	NA	well above	NA	well above	NA
Manapouri Aero aws	on trend	slightly above	above	above	slightly above	above
Blackmount raws	on trend	slightly above	well above	well above	well above	well above
Stewart Island						
Stewart Island raws	NA	NA	NA	NA	NA	NA
South West Cape SYNOP	above	above	well above	well above	well above	well above