The developing 2026-2027 El Niño-Southern Oscillation (ENSO) El Niño

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ABOUT THE AUTHOR

Michael Pierre de Villiers was born in Durban, South Africa. He was trained to World Meteorological Organization class one meteorologist and multi-discipline weather forecaster in the South African Weather Service where he reached the rank of Director. He served on a weather ship in the South Atlantic. He served on World Meteorological Organization expert teams and was World Meteorological Organization rapporteur for the Africa region. He was also a commercial pilot and flying instructor. More recently he was a weather forecaster in the United Arab Emirates, then in England. Now retired.

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2026-08-30

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INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA) Climate Prediction Center (24th August 2026) sea surface temperatures for the 2026-2027 season (Northern Hemisphere autumn and winter and Southern Hemisphere spring and summer), indicate a very strong El Niño-Southern Oscillation (ENSO) El Niño event.

El Niño is the name used for episodes of warmer than normal sea surface temperature typically in the central-east equatorial Pacific. La Niña is the episodes of cooler than normal sea surface temperature. The Niño 3.4 region (5°S-5°N,120°W-170°W) is usually the region most often used as an indicator of El Niño or La Niña episodes when the anomaly is ≥ +0.5°C or ≥ -0.5°C, respectively. Anomalous seasons of El Niño or La Niña occur periodically, typically peaking during the Northern Hemisphere winter/Southern Hemisphere summer.

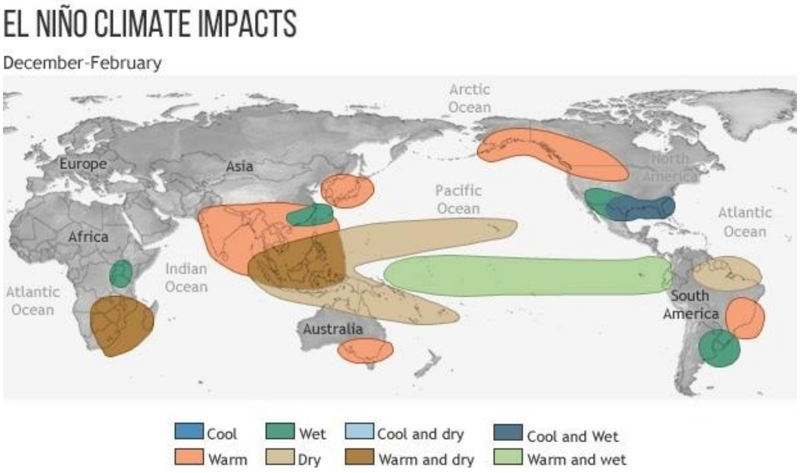
The ENSO Relative Oceanic Nino Index for May-July 2026 was 1.0 having increased from 0.0 in March-May "with a greater than 90% chance of a very strong event during the Northern Hemisphere" autumn and winter 2026-27 (NOAA, 24th August 2006). The May-July Oceanic Niño Index (ONI) was 1.4 (NOAA, 22nd August 2026). There is a "69% chance of a historic event that would exceed the strength of previous El Niño events dating back to 1950," that is greater than +2.5 value (NOAA, 13th August 2026). The last time the index exceeded 2.0 was during the 2015-2016 season when it reached 2.3 during November to January, being 2.0 or higher from September-November 2015 to December-February 2016 (NOAA, 13th August 2026).

The very strong El Niño event forecast by NOAA, is supported by the United Kingdom Met Office (Madge, 21st August 2026). A source in a Daily Mail article, Mr Hausfather of Berkeley Earth (!?), states that this "might be the strongest El Niño event in 500 or even 1,000 years" (Daily Mail, 21st August 2026). It is not understood how this claim can be made since most reliable ENSO data are only available from 1950. Although there is another, arguably less reliable, table dating from 1870 (known to the author) that has an index value of +2.5 in the 1877-1878 season (NOAA, 28th August 2026).

The Australian Government Bureau of Meteorology also reports a current "relative Niño 3.4 index value of +2.20 °C for the week ending 9 August 2026. This value is indicative of a strong El Niño" (BOM, 11th August 2026). The Bureau of Meteorology emphasises that this does not necessarily mean a strong effect on Australia's climate. There are other teleconnection influences within the tropics. More prominent among them are the Madden-Julian Oscillation (MJO) and the Indian Ocean Dipole (IOD). These can either strengthen or weaken the El Niño effect depending upon their development phase and position.

The South African Weather Service states there is already indication that there will be "significant areas of below-normal rainfall associated with the expected strong El Niño during early summer (SAWS, 31st July 2026).

There are various global maps published by different organisations as to the effect of El Niño or La Niña on the world's weather during a year. While basically in agreement there are



variations. The figure left curtesy of the NOAA El Niño Theme Page shows the global effect that El Niño can have on the world's weather for the months of December to February; the Northern Hemisphere winter. Other maps that indicate the effect on temperature and precipitation, are referenced but not shown. Namely, those of the Met Office and the European Commission (Met Office, 11th August 2026, Madge, 21st August 2026 and European Commission, 15th June 2026). These combine annual effects into single maps. Among other considerations, it must be kept in mind that the regions shown in the maps are not necessarily geographically exact within which there can be seasonal locational shifts and variable effect. Some regions can experience the effect of El Niño but not La Niña and vice versa. The maps do indicate severity or probability of effect in places.

While the ENSO effect is primarily a tropical phenomenon and less defined elsewhere, it can have significant effect on Europe. Of interest in this article is the effect of the developing El Niño event on temperature and precipitation in Australia and New Zealand, South Africa and Europe.

In Australia and New Zealand in the Southern Hemisphere summer, depending on the source map, El Niño is known to bring:
NOAA: December-February, warmer weather to the south-east while dry in the far north.
Met Office: Warmer eastern Queensland January-April while drier May-January. Warmer New South Wales and Victoria October-March while drier August-December. Warmer South Australia and the south of Western Australia September-December and drier January-February. Only the Met Office mentions colder in New Zealand April-November.
European Commission: Mostly warmer and drier, except the south-western half of Western Australia while a stronger response with a stronger El Niño.

In South Africa:
NOAA: December-February, warm and dry except the Western Cape and the western part of the Northern Cape.
Met Office: All of South Africa warmer December to April except the extreme western part and drier except the extreme western and southern parts.
European Commission: Warmer and drier November-March with a stronger response with a stronger El Niño.

Europe in the Northern Hemisphere winter, depending on the source map:
NOAA: No effect.
Met Office: Warmer Spain and France eastward to southern Germany, Italy and western Balkans states October-November while colder Scandinavia January-Februart, but not during strong events. Precipitation wetter August-November for Spain and south-west France. Madge (21st August 2026) mentions increased chance of wetter, stormier conditions for NW Europe, including the UK, in autumn and early winter.

European Commission: Warmer July-November and February-June with an unprecedented El Niño (synonyms; extraordinary, unparalleled). Colder January-May with a very strong to weak El Niño.

During the coming Northern Hemisphere winter/Southern Hemisphere summer. Europe may experience warmer than normal winter weather, perhaps colder later while wetter SW Europe, wetter and stormier United Kingdom (European Commission, 15th June 2026 and Madge, 21st August 2026).

This article inspects the effect of very strong and strong El Niño events on temperature and precipitation in Australia and New Zealand, South Africa and Europe, as an indication of what may occur during the 2026 to 2027 event. In this respect, past very strong El Niño mean monthly evolution maps are shown and discussed. Combined very strong and strong events from 1950 to present, have been included to provide another indication of El Niño effect on these areas. All El Niño events greater than moderate for these locations are provided in an attempt to determine whether the broader strength of El Niño events supports the expected general pattern of temperature and precipitation anomalies from moderate to very strong.

METHOD

ENSO events usually reach their maximum effect during the Northern Hemisphere autumn and winter. Based on past events, maps were created of temperature and precipitation anomalies that occurred during the December to February (DJF) period using the Oceanic Niño Index (ONI version 6) 1950 to 2026 data set (NOAA, 22nd August 2026). Events were selected when the ONI exceeded very strong (≥+2.0), strong (1.5-1.9) and the two combined (≥+1.5) for Europe, Australia and New Zealand and South Africa. A data set was created of all El Niño events that exceeded ≥+1.0 ENSO index. The three very strong El Niño events in the data set are also discussed based on mean monthly evolution maps.

The NOAA Physical Sciences Laboratory Monthly/Seasonal Climate Composites programme was used to create the maps. Anomalies were measured against WMO Climatological Standard Normal for the most recent 30-year reference period: 1991-2020. Bear in mind that the sample data are small and the results can be misleading. There are only 3 events for the very strong (≥ +2.5) category, 6 events for the strong (1,5-1.9) category and 9 in the combined very strong and strong (≥+1.5) category in the NOAA Oceanic Niño Index (ONI) data from 1950 to present. There are 14 events in the combined ≥+1.0 data set (NOAA, 22nd August 2026).

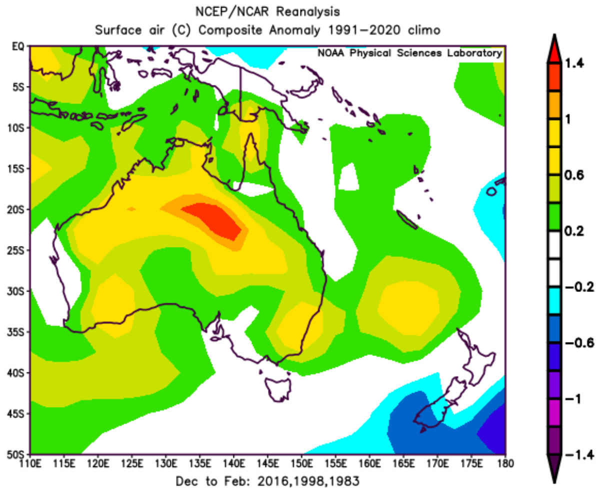
The programme has two different precipitation anomaly maps. One contains data from 7000 stations from 1982 to present. It has less quality-controlled data than the V2020 combined map. The V2020 map has quality-controlled data from nearly 10 times more sites with record durations of 10 years or more, created by using 0.5°, 1.0° and 2.5° grids with interpolated stations that are then superimposed on the on the GPCC Climatology V2020 in the corresponding resolution, thereby providing a more accurate precipitation reanalysis.

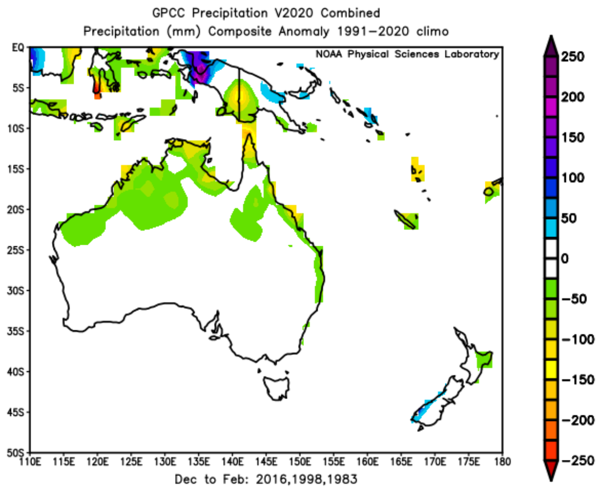
The drawback is that when using the 1982 to present precipitation product it ignores any events prior to 1982. This is not an issue in the very strong (≥ +2.0) ENSO index precipitation anomaly maps. However, in the strong (1.5-1.9) category, it does exclude three years prior to 1982 (1973, 1966 and 1958). Bear this in mind, it will be seen that there are markedly different results between the two precipitation reanalysis methods.

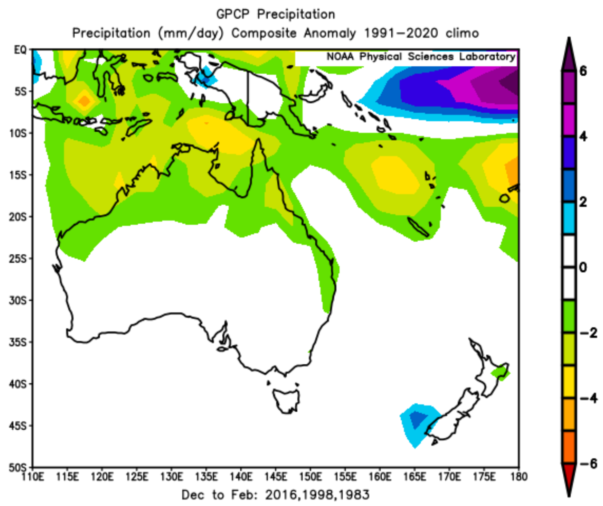
RESULTS AND DISCUSSION

1. Very strong DJF (≥ +2.0) ONI

Australia and New Zealand

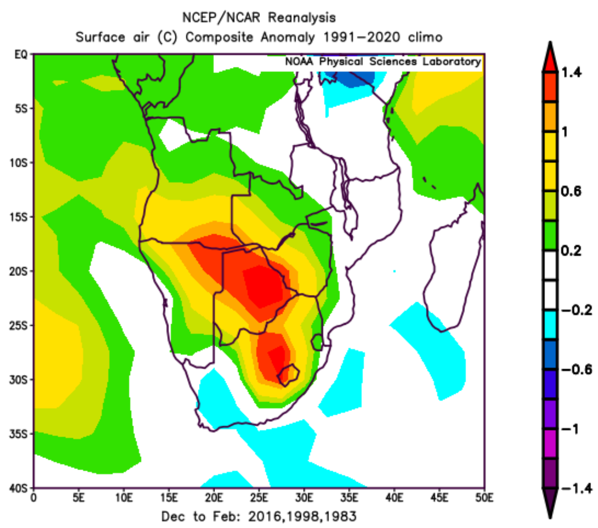


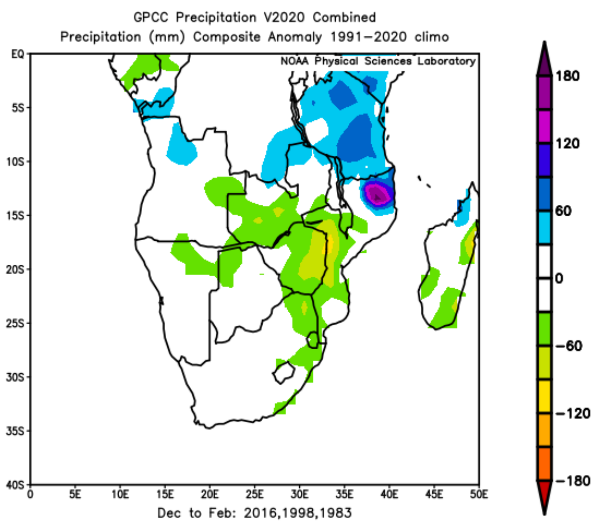


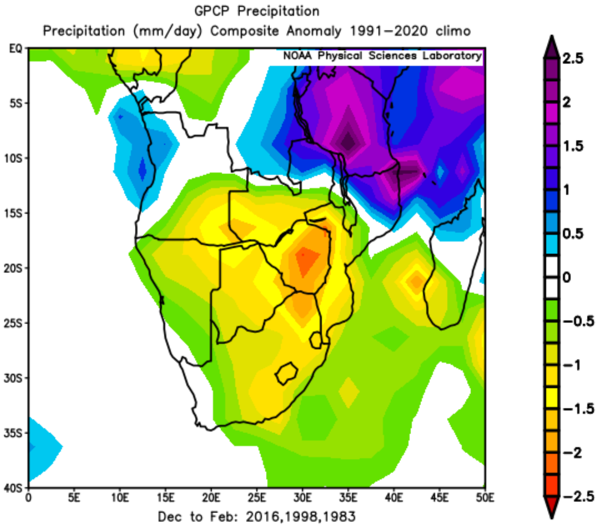


Although only 3 very strong El Niño events there is clear indication that temperature anomalies will be above normal while precipitation should be around normal to slightly below normal in the north and far east. The 1982 to present map (left) indicates a bigger area of drier north and far east of Australia than the V2020 map. Nevertheless, above normal temperatures with precipitation widely 50-200mm in the summer months it is likely to be hot and dry enough for wild/bush fires to be a problem. New Zealand has mostly around normal anomalies, although lower (colder) anomalies in the south.

South Africa

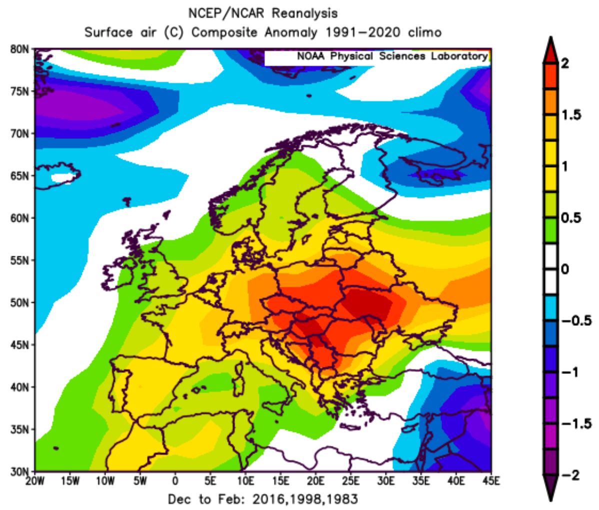


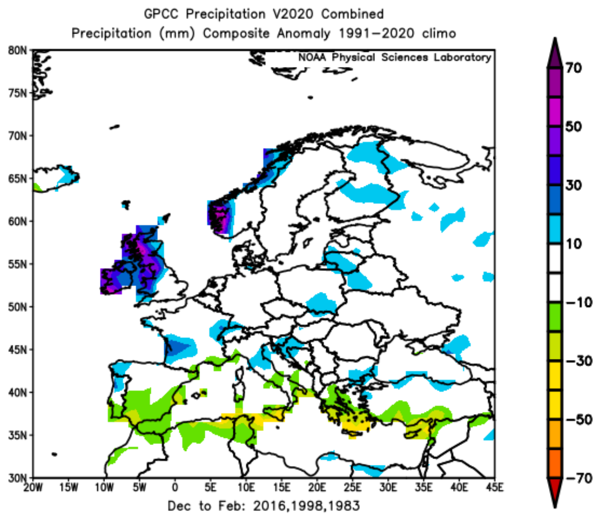


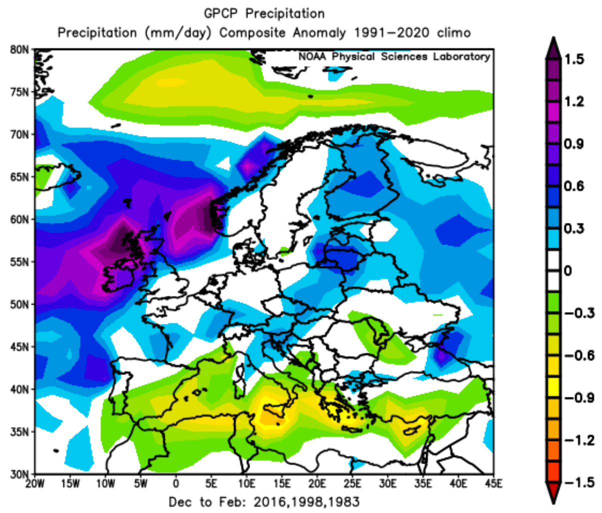


A clear indication of above normal temperature anomalies over the greater part of South Africa, although lower (cooler) SW part with mostly normal precipitation anomalies, although crucially lower (drier) in the more eastern summer rainfall area with around 50% less of normal precipitation, locally 75%. The 1982 to present map, on the left, presents widespread lower (drier) anomalies and much lower mm/day in the east. The two different methods of presenting precipitation anomalies makes comparison difficult. Nevertheless, the impression is of drier and much warmer than normal weather.

Europe





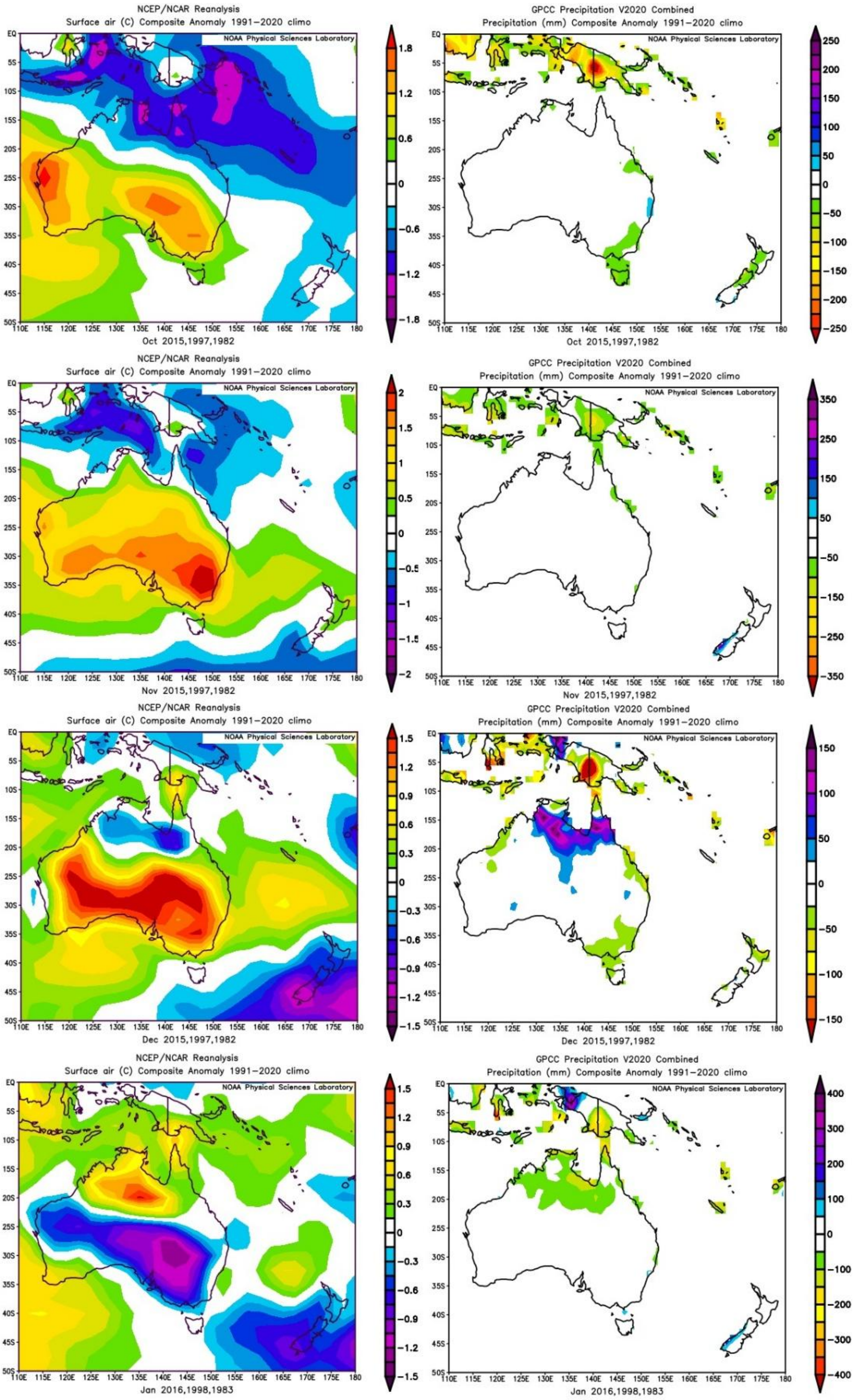


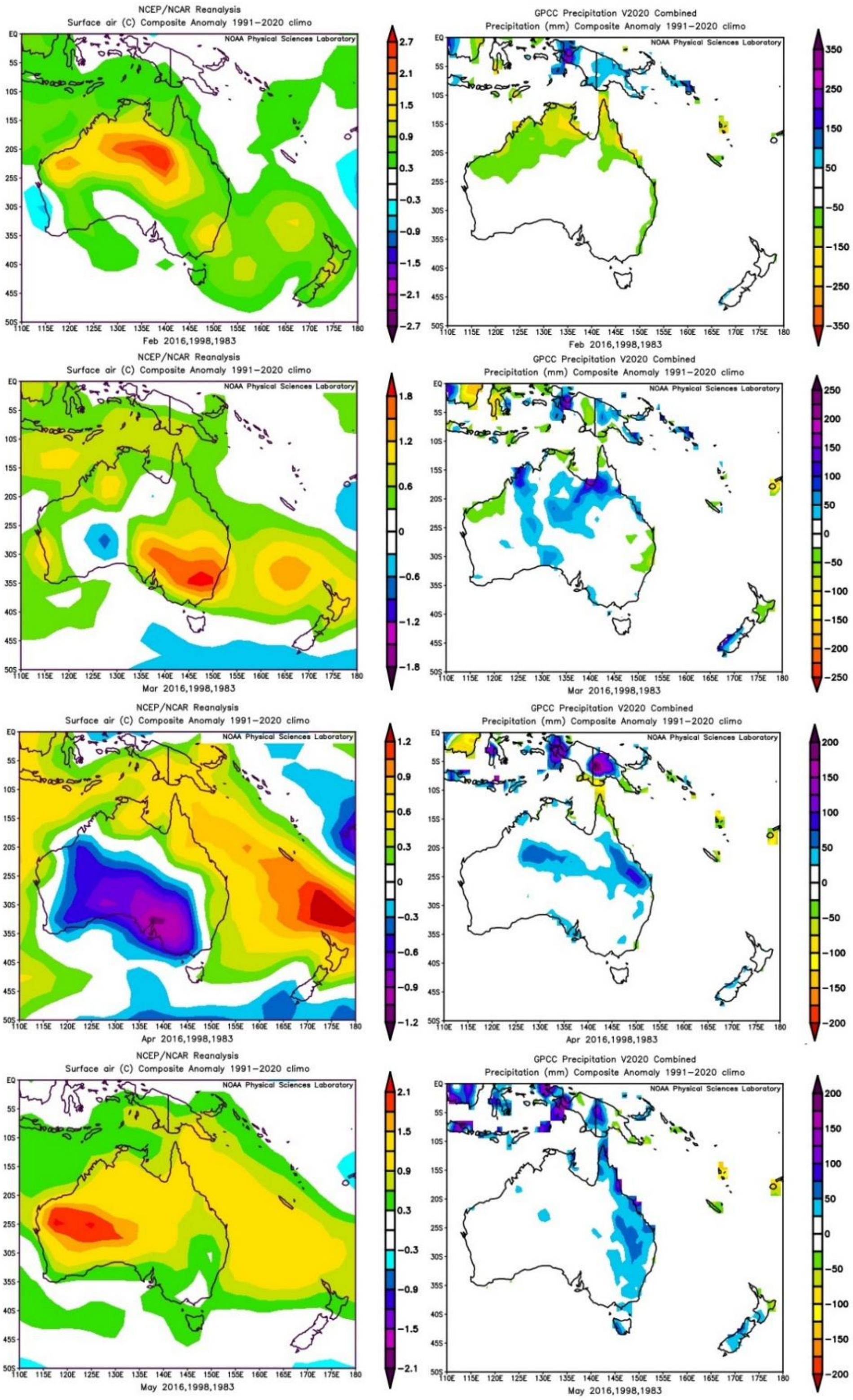
Widely above normal temperature anomalies indicated, particularly in the east. Precipitation anomalies widely around normal with a tendency to slightly above normal, especially the greater part of the British Isles. Possibly flooding risk. Meanwhile, lower (drier) than normal for the Mediterranean winter rainfall area. Slightly above normal precipitation indicated for the Alps. However, with higher temperatures there is a question whether this means less snow. On the other hand, given the higher precipitation for the Scotland highland there may be heavier snow. The 1982 to present map, on the left, has a very similar precipitation pattern to the V2020 map, although more prominent extremes. One may conclude warmer and wetter Europe associated with a very strong El Niño event.

2. VERY STRONG (≥ +2.0) ONI MEAN MONTHLY MAPS

Combined monthly maps for the three very strong El Niño events were inspected. Namely, the 2015-2016, 1997-1998 and 1982-1983 seasons for the eight months from autumn (October) to the following Spring (May).

Australia

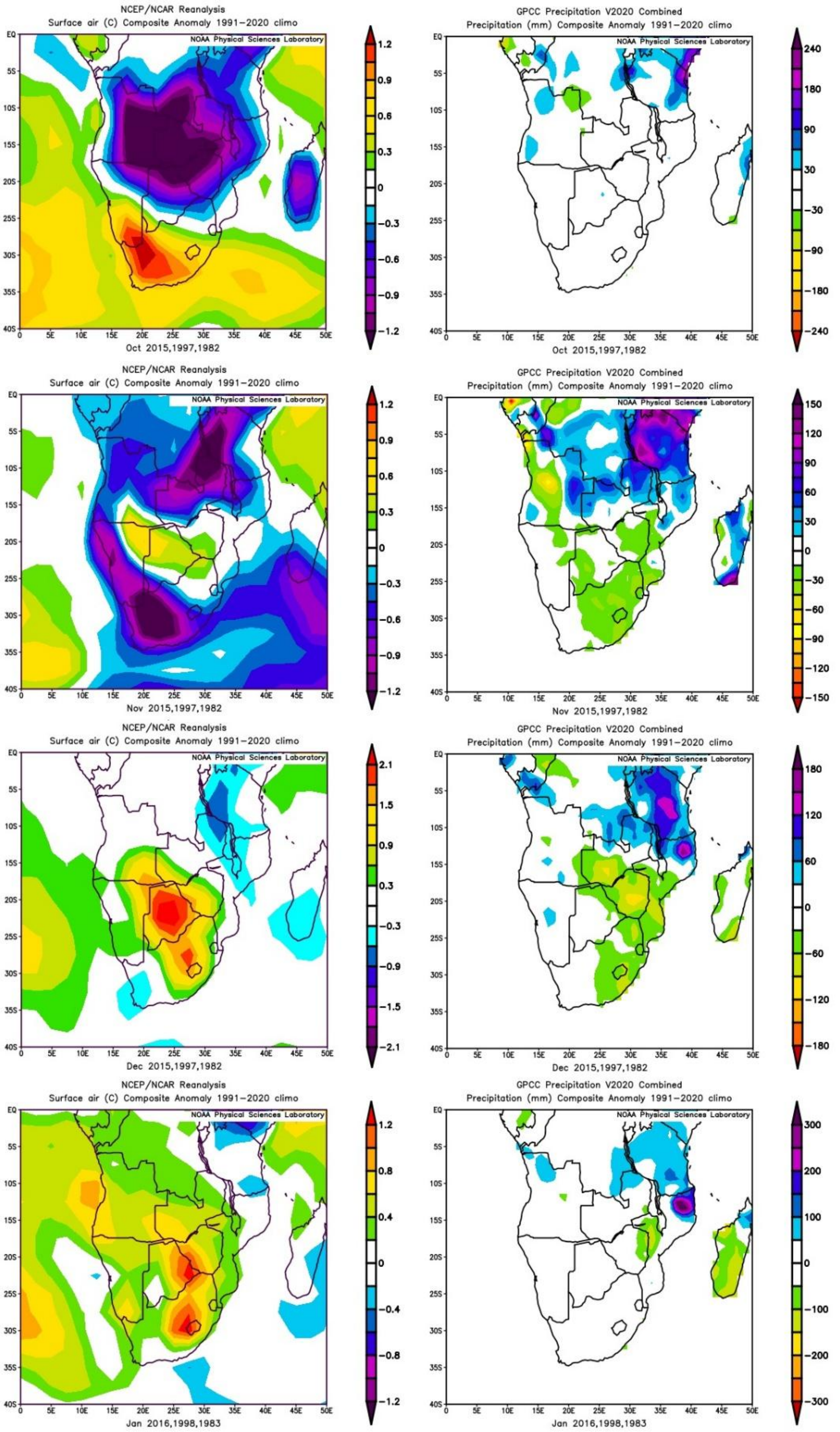


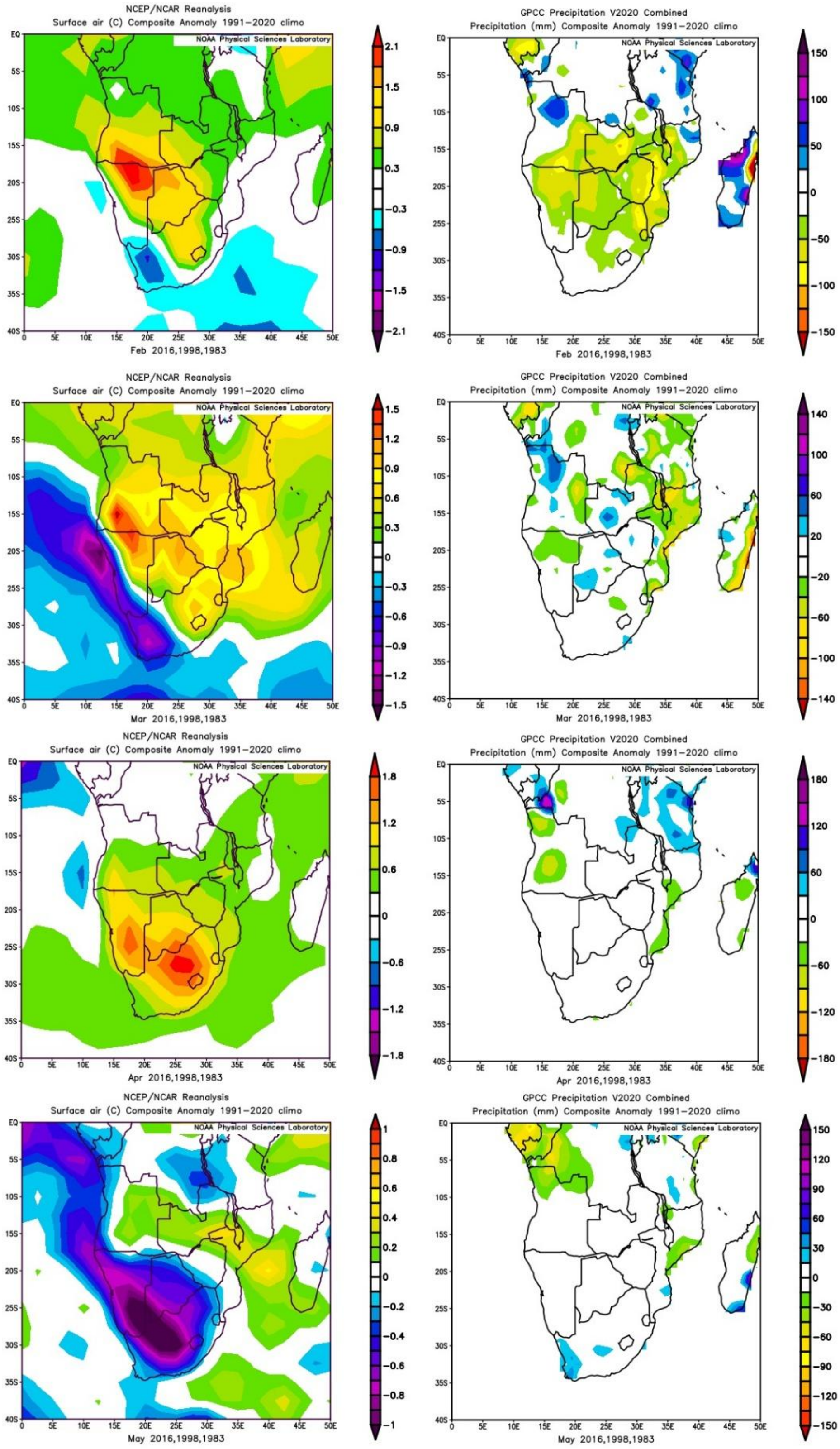


Australia is dominated by higher than normal temperature anomalies (hotter) with widely normal precipitation anomalies, although noteworthy areas of higher precipitation anomalies (wetter) from March. An exception being December when lower temperature anomalies and marked higher precipitation anomalies occurred in the far north. Inspection of the January mean monthly sea level pressure (not shown) reveal that during all three years high pressure became centred off the western south coast allowing the influx air from the south-east and markedly lower temperature anomalies. Marked lower temperature anomalies in April are more difficult to explain without more thorough investigation. During 1983 there was split and less dominant high pressure (and higher precipitation anomalies). Possibly enough disruption and less warm air in circulation to explain the lower mean temperature anomalies.

New Zealand varies between warmer and cooler than normal and wetter in two months.

South Africa



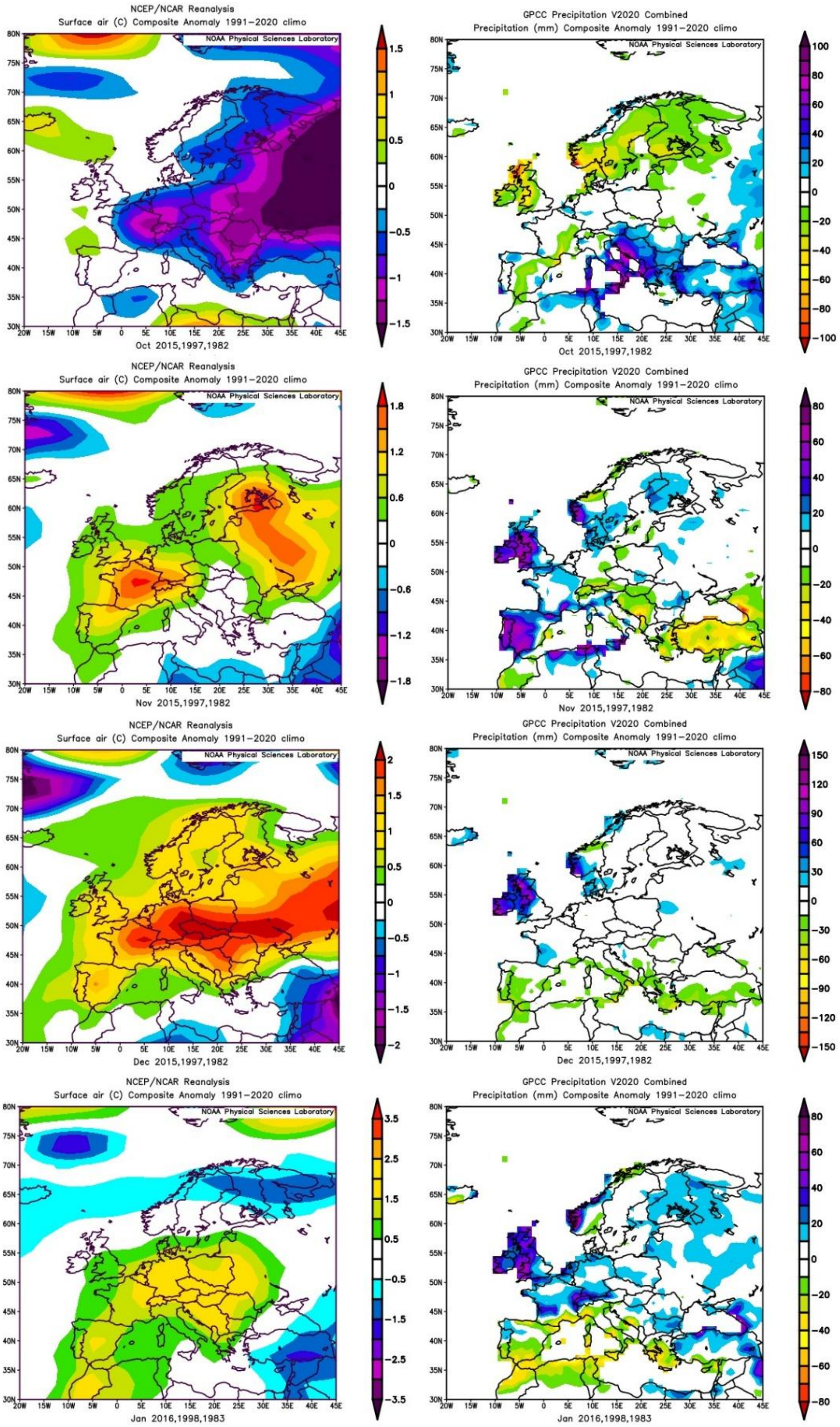


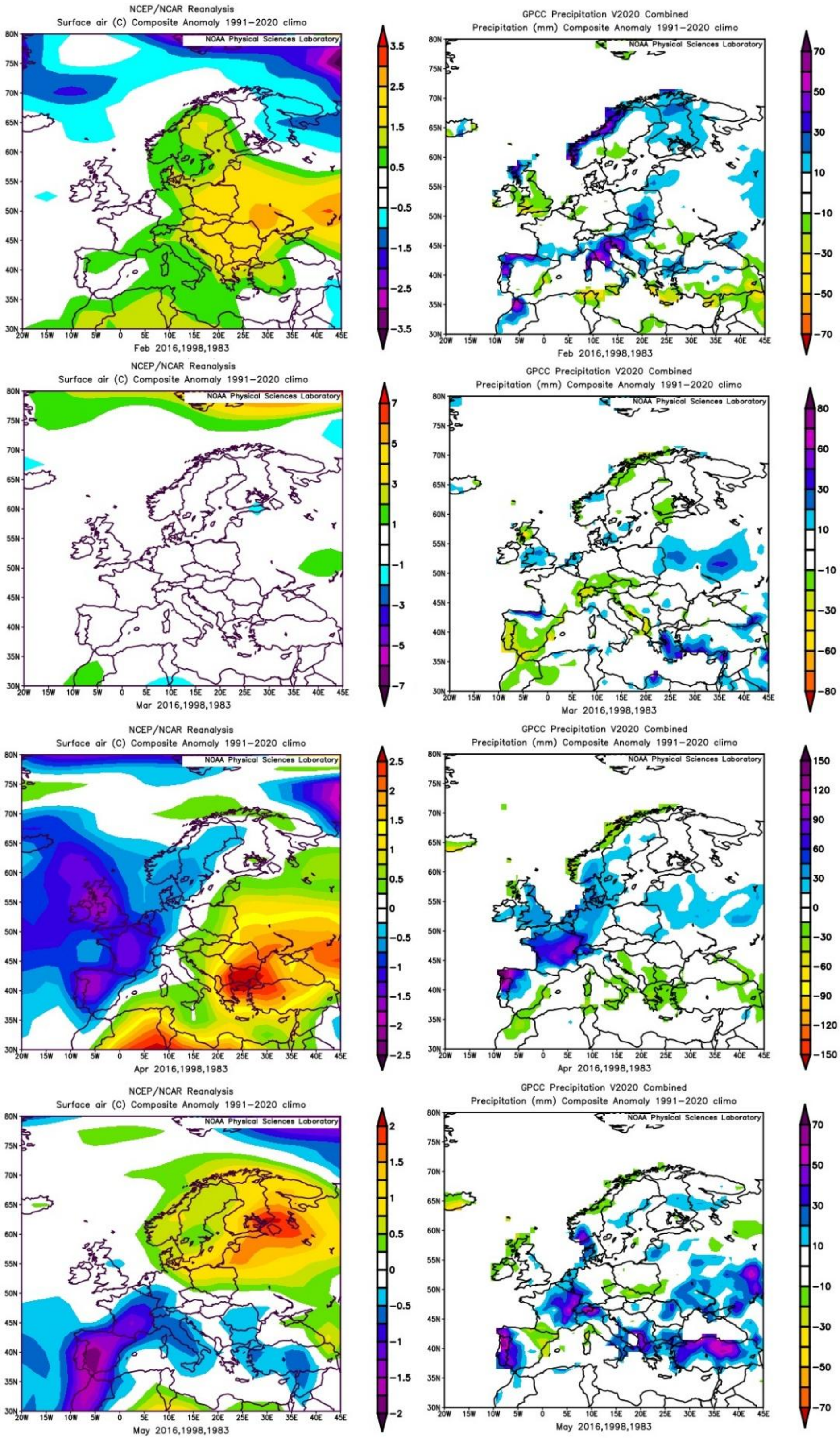
The monthly mean temperature anomalies are markedly above normal (hotter) from December to April. This coincided with a higher mean monthly pressure cell over the eastern interior separate from the Indian Ocean anticyclone (sea level pressure not shown). Precipitation anomalies are normal to slightly below normal (drier), but markedly below normal during November, December and February. The latter driest over large part of southern Africa.

During March and May, Atlantic Ocean Anticyclone intensification brought the intrusion of lower temperature anomalies to the south-west of South Africa (sea level pressure not shown).

The winter rainfall South-West Cape normal, as expected, wetter in May going into winter.

Europe





After a colder and drier October but wetter south-east Europe, monthly mean temperature anomalies are considerably above normal (less cold) for the winter months of November to February. Meanwhile, precipitation anomalies are normal to slightly above normal except considerable higher over the United Kingdom in November to January. Inspection of sea level pressure for these months (not shown) revealed dominant lower pressure from Iceland to north of Scandinavia with higher pressure centred over the Mediterranean. The result is a mostly south-westerly air flow bringing milder and wetter weather, but drier over the Mediterranean winter rainfall area, although milder than normal.

The March mean sea level pattern maintained lower pressure from Iceland to north of Scandinavia with higher pressure centred over the Mediterranean, but transitioning to lower pressure over Europe in April and May. Normal temperature anomalies changing to lower than normal while becoming more widespread wetter than normal. It is interesting that the United Kingdom, France and Spain have much lower temperature anomalies (colder) and higher precipitation anomalies (wetter) in April.

How do sections 1 and 2 compare with the characteristics stated in the introduction?

Before being too judgemental, it must be remembered that the NOAA, Met Office and European Commission El Niño maps, unless otherwise specified, apply broadly across the range of Niño strengths, whereas this comparison is limited to the 3 past very strong events.

Australia was shown to have widely above normal temperature anomalies (warmer). While all the sources mentioned, NOAA, Met Office and European Commission mentioned warmer, the European Commission was closest regarding the spread of warmer weather. The section 1 DJF mean temperature anomalies showed the north of Australia with the highest (warmest) values. Meanwhile, most of the monthly maps in section 2 showed higher anomalies in varying locations across the south. This is a better fit with the Met Office analysis. No significant effect was evident over New Zealand in section 1 but the monthly maps varied between warmer and less warm with two wetter months. Only the Met Office mentions colder in New Zealand April-November.

Precipitation correlation was generally not good. Section 1 DJF and section 2 monthly maps, indicated mostly normal precipitation, lower (drier) in the most northerly part. Considerably wetter in December in the far north while with noticeably higher (wetter) areas for March and April and in the more eastern part in May. The European Commission was probably more accurate with drier than normal to March.

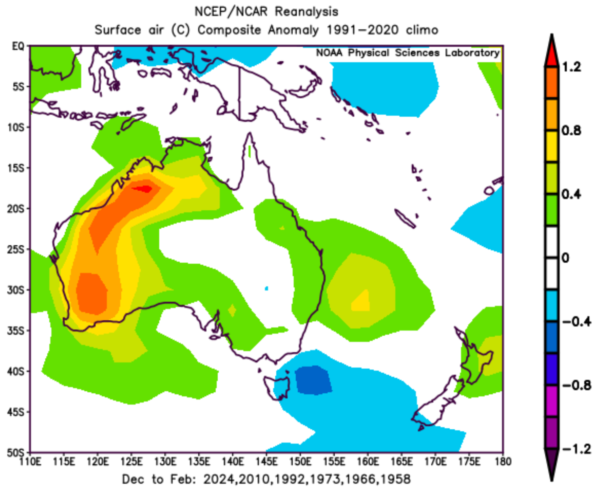
South Africa maps displayed widely above normal anomalies in the DJF section 1 (while lower (less warm in the south-west) and from December to April in section 2. This was closely mirrored in the NOAA, Met Office and European Commission effect maps. There lower precipitation (drier) maps were an over estimation of the section 1 and 2 maps. The exception being the more widely drier months of November, December and February in section 2 and interestingly the widely drier 1950 to present supposedly less accurate map in section 1.

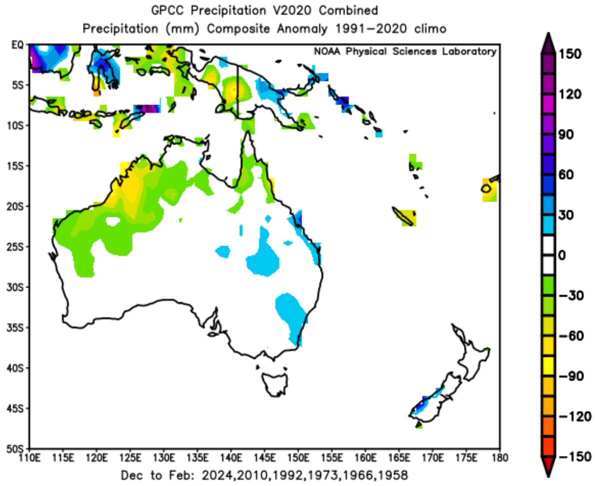
The Europe section 1 DJF temperature anomaly map has widely above normal temperature anomalies, particularly eastern Europe. As to be expected, after a colder October, most of the section 2 monthly temperature anomaly maps indicate a milder winter and colder western Europe in April. The European Commission has the best fit, warmer except December in an unprecedented El Niño. The Met Office has a warmer Europe, normal in the east while Scandinavia colder in strong events January and February. This coincides with a colder Scandinavia in January in section 2. NOAA registers no effect.

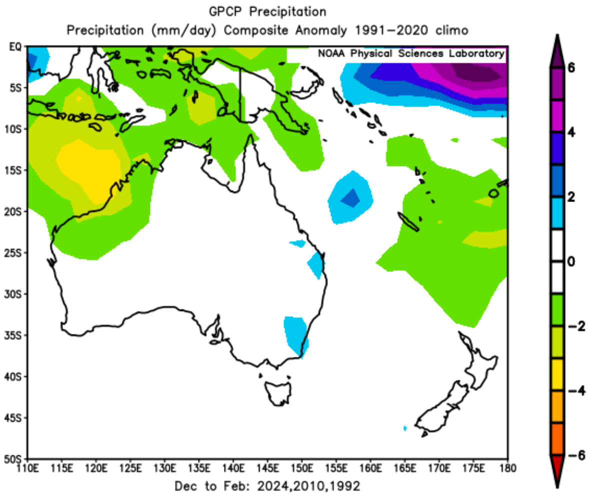
Europe precipitation anomalies in section 1 and 2 indicate normal to slightly above normal precipitation, well above for the UK. The Met office has wetter August-November for Spain and south-west France. NOAA and the European Commission, no comment.

3. Strong DJF (1.5 to 1.9) ONI.

Australia and New Zealand



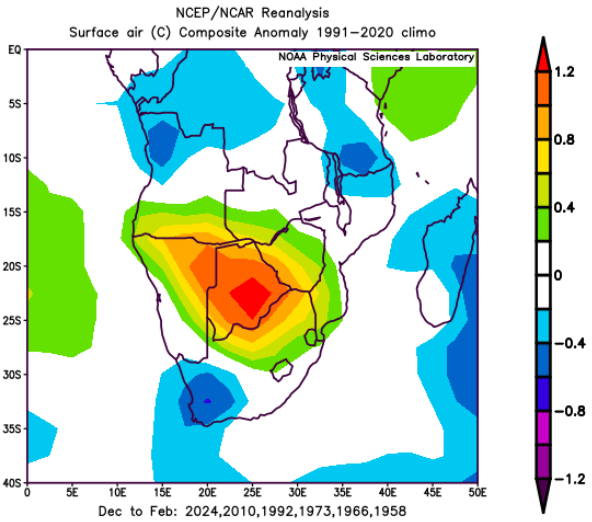


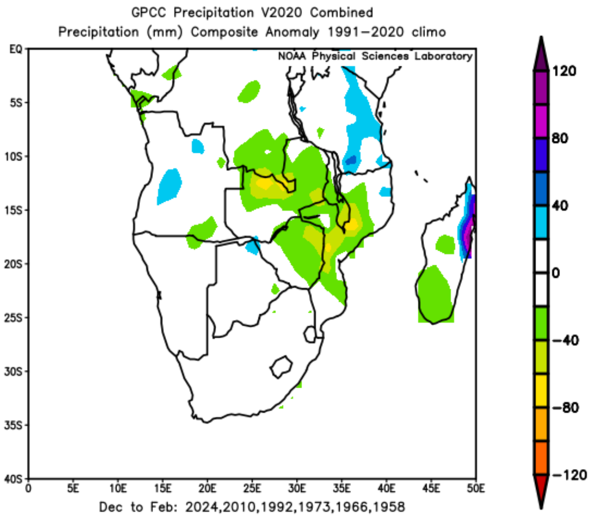


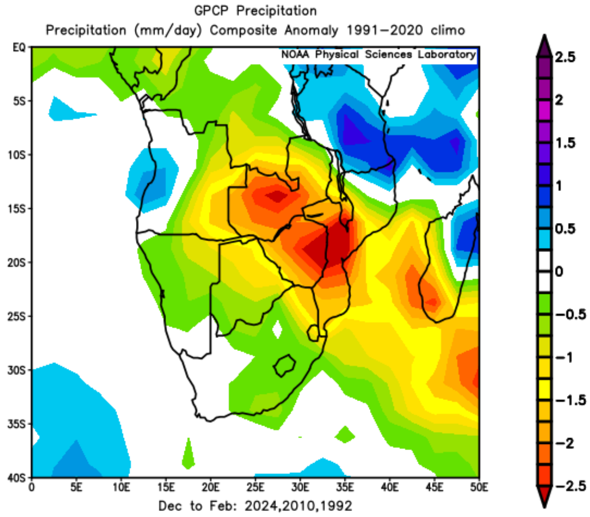
There is a marked change from the very strong section 1. Above normal temperature anomalies shift to the west while largely around normal in the east. Lower than normal precipitation anomalies remain in the north-west in the V2020 map while normal to slightly above normal precipitation anomalies in the east. This pattern is broadly repeated in the map on the left, but a shift from the same map type in the very strong section 1. Over New Zealand above normal temperature anomalies over North Island, mostly normal over South Island with normal precipitation.

This marked change was not expected by the author. It is possibly the consequence of the small data sets and or other teleconnection influence.

South Africa





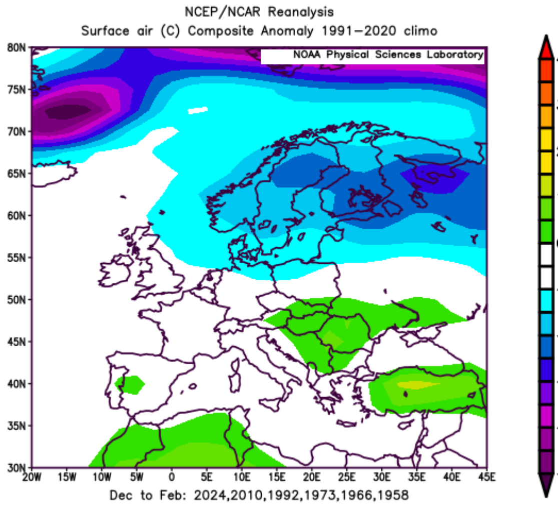


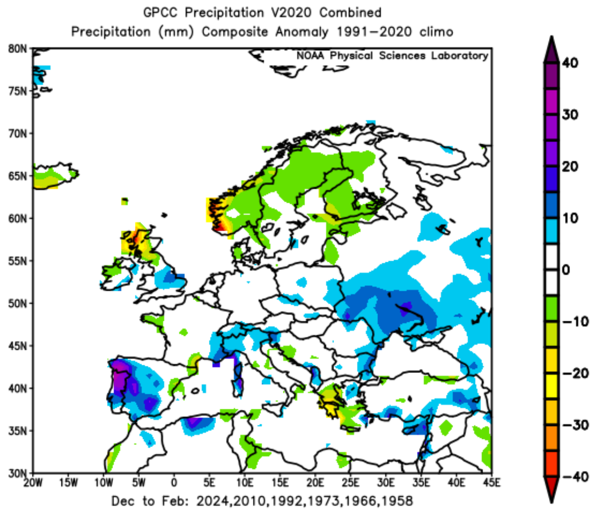
Widely warmer than normal, although more marked lower than normal temperatures anomalies (milder) in the south-west, similar to the very strong section 1. The V2020 map shows around normal precipitation and not too different from the very strong map.

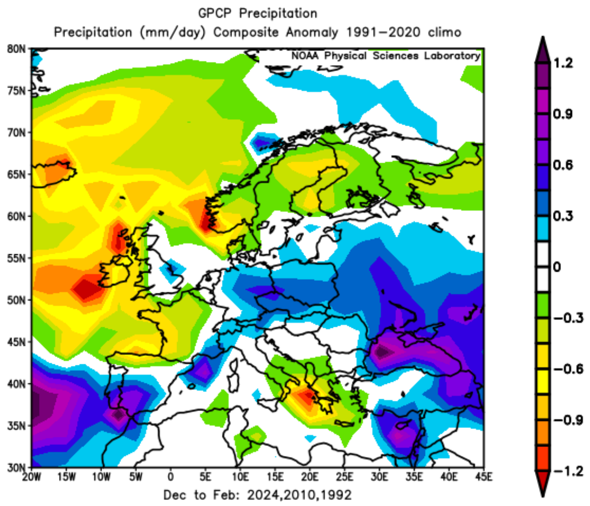
For what it is worth, the map on the left, with only three recent years in the period prior to 1982, remains consistent with the very strong map in section 1, that is drier than normal over the summer rainfall area.

It is generally in good agreement with the very strong (≥ +2.0) section 1.

Europe





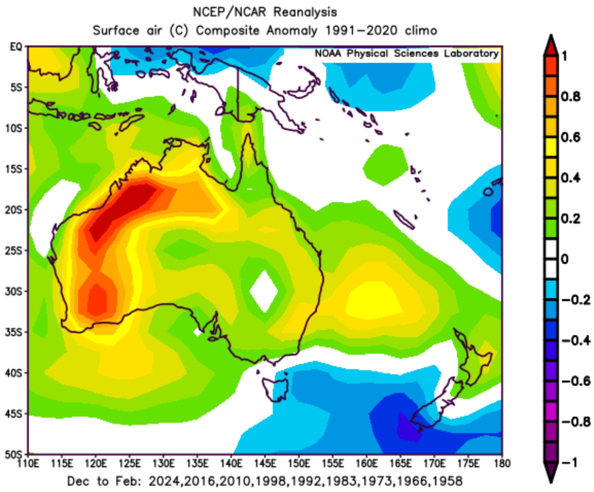


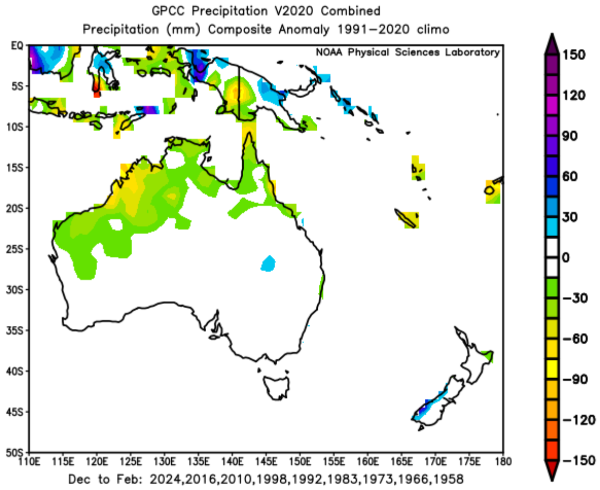
Marked temperature anomaly change compared with the strong category section 1. Widely around normal temperature anomalies, below to well below over Scandinavia with below normal precipitation. Otherwise, precipitation anomalies normal with above normal in the usual winter rainfall Mediterranean region and less wet over the British Isles, compared with very wet in the very strong section 1.

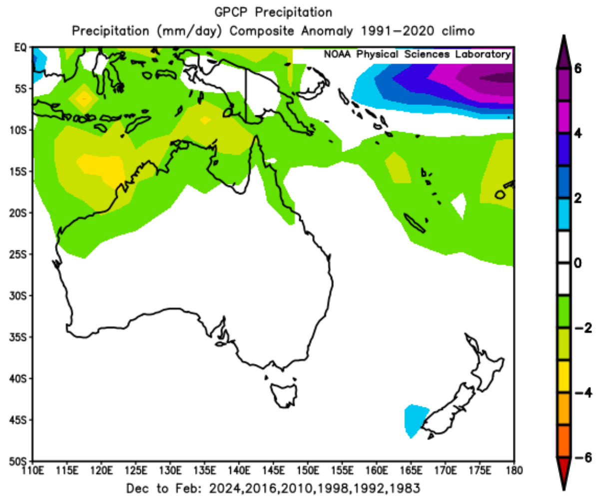
Bear in mind only 3 years considered, the map left with only data prior to 1982 is almost the complete opposite from the companion map in the very strong section 1 and distinct. Markedly lower (drier) than normal precipitation in the north and west, higher (wetter) than normal over eastern Europe and northern Italy to Spain.

4. Very strong plus strong DJF (≥+1.5) ONI.

Australia and New Zealand



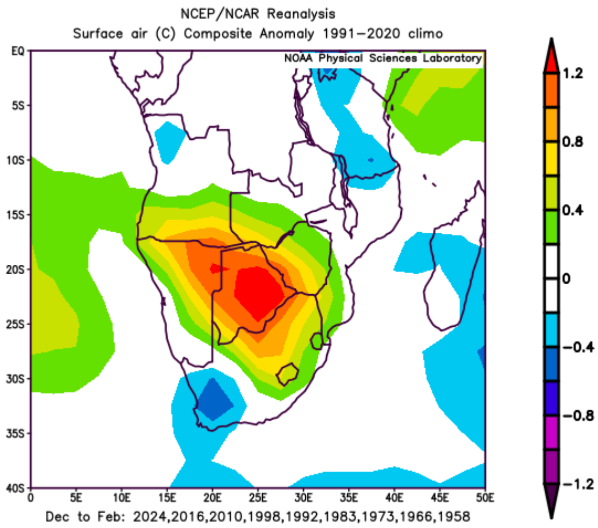


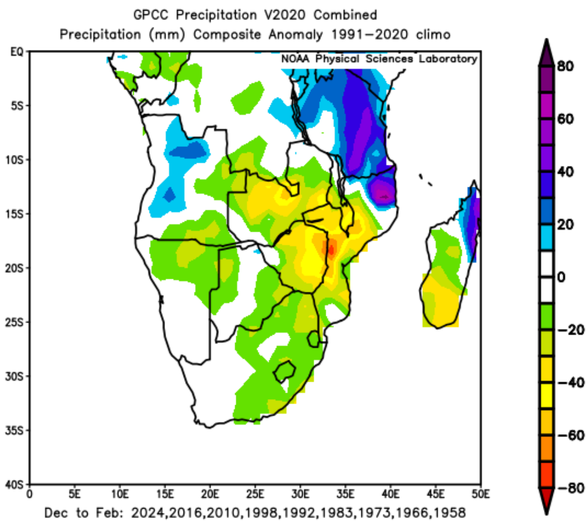


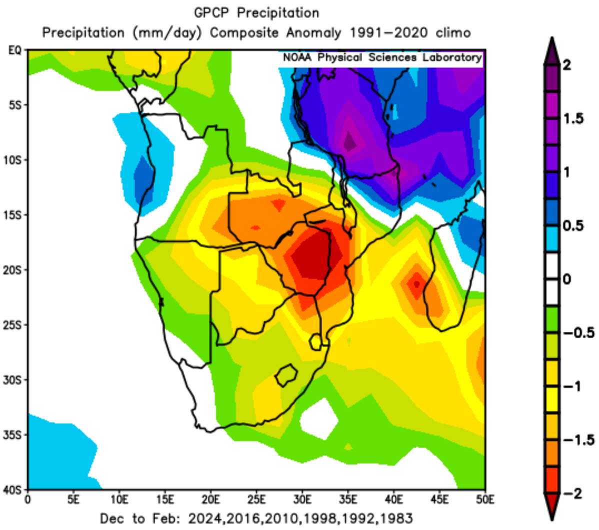
An interesting change from the very strong El Niño pattern. Still above normal temperature anomalies, but with the emphasis shifted to the west and north-west. Still widely around normal precipitation with a below normal shift to the north-west. Doubtless due to the higher number of strong events. A similar 1982 to present map pattern, even though it is minus three years available in the V2020 map.

New Zealand higher temperature anomalies (warmer) in the north and lower than normal (colder) in the south. Widely around normal precipitation, isolated slightly above in the south-west.

South Africa

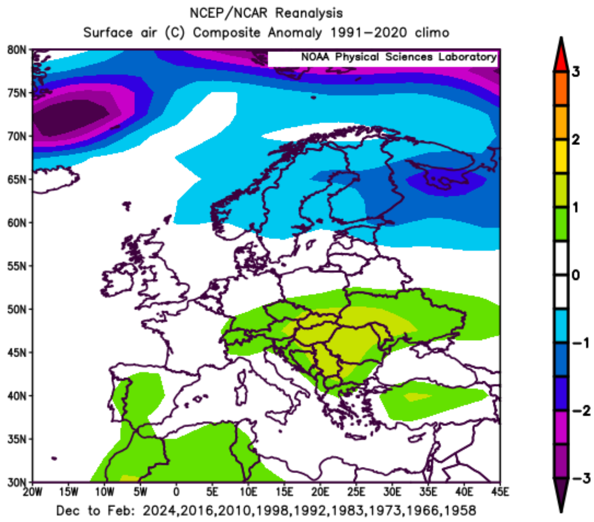


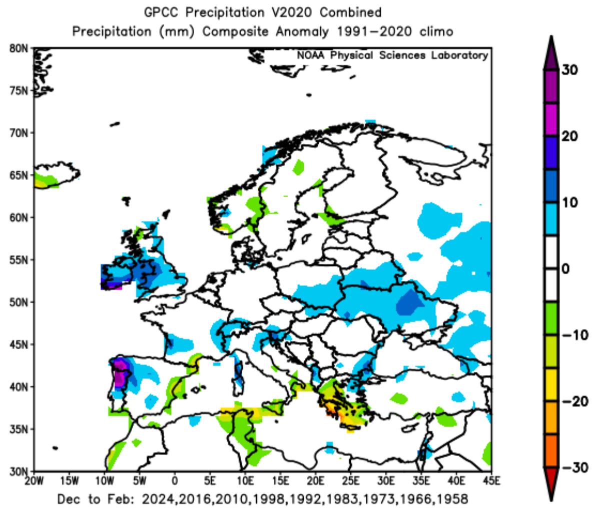


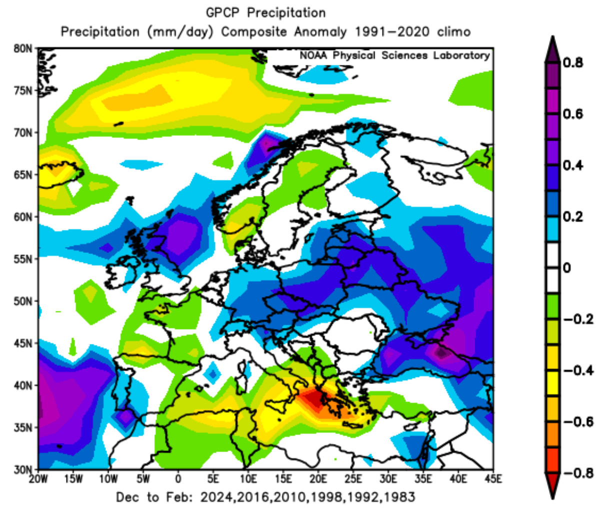


The pattern of above normal temperature anomalies is similar to the very strong El Niño, although the south-west of the country now appears markedly lower (less warm). Precipitation is presented more widely drier than normal in the east. Bearing in mind that the yearly data now includes very strong years, one gets the impression that, whether a strong or very strong event, precipitation is going to be widely below normal in the summer rainfall area with some areas up to 40% below normal. The 1982 to present map, minus 3 years is more widely dry and very similar to the very strong map in section 1.

Europe







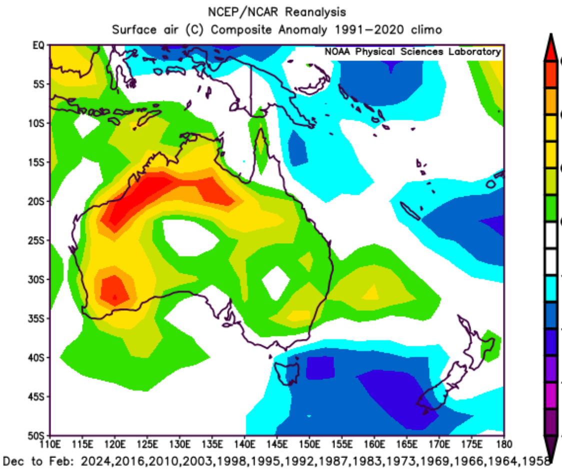
The combined temperature anomaly aspect is far removed from the expected warmer than normal Europe. The combination of the 6 years from the strong El Niño category in section 2 with three from very strong section 1 El Niño, has resulted in a swing toward the strong 1.5 to 1.9 index pattern.

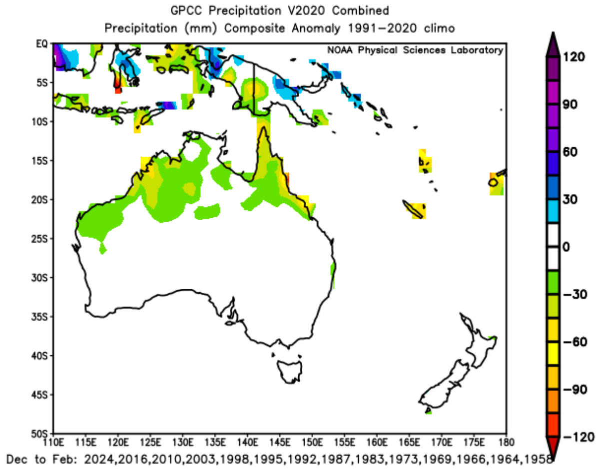
The combined precipitation pattern remains broadly consistent, if somewhat higher anomalies (wetter) over eastern Europe, the south and the British Isles. This is accentuated in the map with only anomaly years from 1982, albeit lower anomalies (drier) than normal from Spain to Scandinavia.

5. Combined DJF ONI events from Moderate (≥+1.0) to very strong ((≥+2.0)

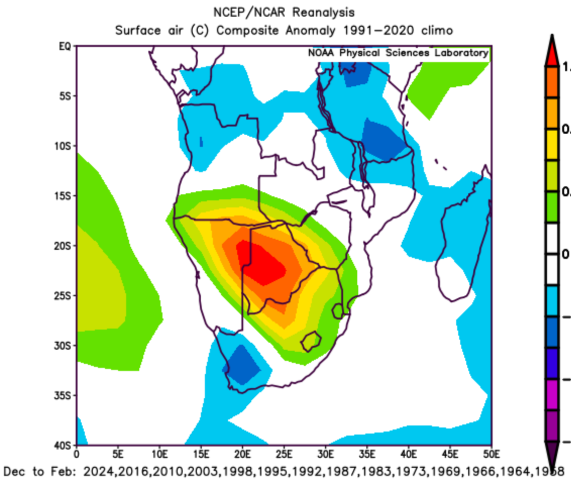
This data set dispensed with the 1982 to present precipitation anomaly map. Its limited number of years would be a complete distraction from the 14 years extracted from the ONI version 6 1950 to 2026 data set. The 14 years consisted of 3 very strong events, 6 strong and 5 moderate.

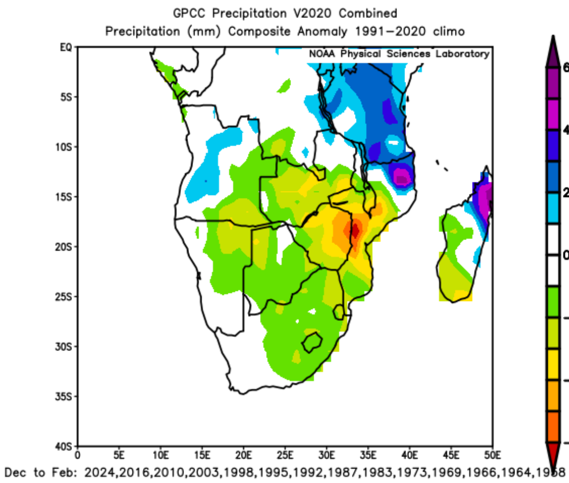
Australia and New Zealand



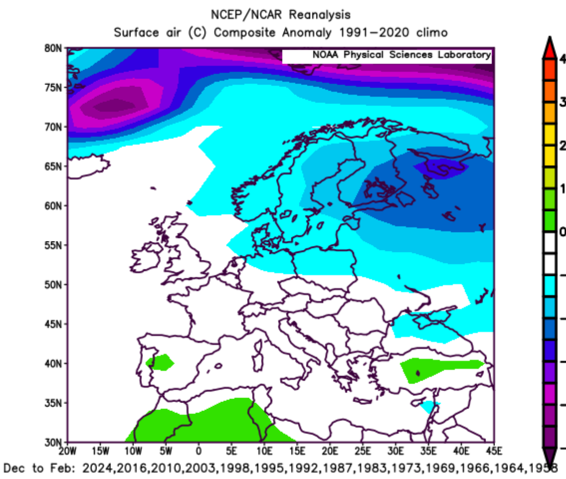


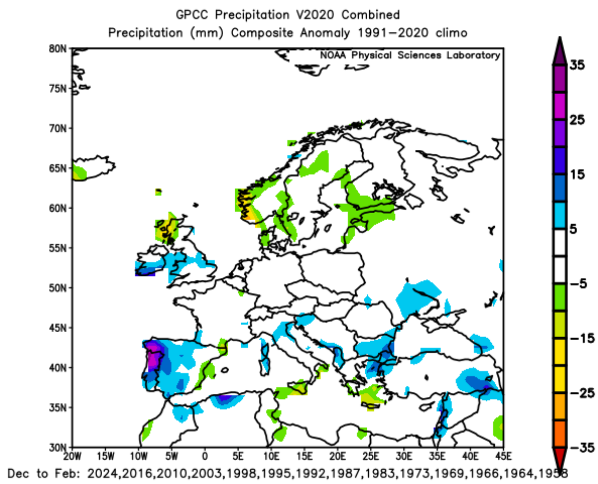
South Africa





Europe





Australia and South Africa retain the higher temperature anomalies that are distinctive in the previous sections. Similarly, the precipitation is at best normal in Australia with a tendency to below normal. South Africa has a more distinct below normal bias. On the other hand, the distinctly warmer and wetter pattern in Europe seen in section 1, the very strong El Niño, is now absent. Temperature anomalies are widely around normal and noticeably below normal over Scandinavia. Precipitation anomalies are also mostly around normal. The accepted winter rainfall Mediterranean area has a slight bias toward higher anomalies (wetter), while Scandinavia has lower anomalies (drier). The United Kingdom is a mixture between slightly below to slightly above anomalies.

CONCLUSION

The data sets are too small to provide conclusive evidence to confirm the stated facts of El Niño's effect on the regions under examination.

Other teleconnection influences within the tropics can either strengthen or weaken the El Niño effect depending upon their development phase and position. For example, the Madden-Julian Oscillation (MJO) and the Indian Ocean Dipole (IOD).

Broadly speaking the NOAA, Met Office and European Commission El Niño effect maps gave a reasonable indication of the effect of El Niño on the locations discussed. Their disadvantage is that they are a reflection of all scale El Niño events across the year, except the NOAA map that is DJF specific. Being more of a curiosity than contributing to the objective of this study how well they fared will not be repeated here. One is referred to the section How do sections 1 and 2 compare with the characteristics stated in the introduction? Or the links to the maps in the reference section.

Very strong El Niño

The effect of a very strong El Niño (sections 1 and 2); Australia is expected to be warmer/hotter than normal (particularly in the south) and dry enough for wild/bush fires to be a problem. New Zealand is expected to experience around normal temperatures and precipitation although lower than normal temperatures in the south; South Africa is expected to be much warmer/hotter than normal with below normal precipitation, particularly the summer rainfall region with the risk of a drought; Europe is expected to be milder than normal, much milder in the east becoming colder during April and May. Tending toward wetter than normal and much wetter than normal British Isles. Possibly flooding risk and heavy snow for the Scotland Highlands. The winter rainfall Mediterranean is expected to be drier than normal.

Combination strong and strong/very strong El Niño

When comparing the DJF 6 strong El Niño events (section 3) with the combined 6 strong and 3 very strong events (total 9 events in section 4), there is considerable similarity between the two. Probably due to the 6:3 ratio. Strong events being more dominant.

Warmer/hotter western Australia remains the same, although normal to slightly warmer over central and eastern parts becomes widely warmer than normal in the combined scenario. Precipitation remains drier than normal in the north-west. Otherwise, around normal precipitation without some slightly wetter areas in the east in section 3, the strong El Niño.

New Zealand stays around normal, except for the removal of warmer North Island section 3, the strong El Niño.

South Africa no temperature difference. Warmer/hotter than normal, less warm than normal south-west, same as for a very strong El Niño. Widely normal precipitation becomes drier than normal in the combined section 4 over the summer rainfall region and westward to the Free State and Eastern Cape. This is also increased drier than the very strong category El Niño

Europe very similar temperature anomalies between the two categories. Mostly normal. but slightly warmer south-eastern Europe and less than normal Scandinavia. This may be considered the total reverse of a very strong El Niño that is widely much less cold. Precipitation a mixture of normal and slightly wetter, but wetter than normal British Isles and western Spain. Again, a change from a very strong El Niño that has much wetter British Isles less dry Scandinavia and Spain.

Moderate through very strong El Niño

Finally, when considering the total DJF 14 combined moderate through very strong DJF events, in section 5, there is surprisingly little difference from the combined strong/very strong section 4 for Australia and South Africa. Even temperate latitude New Zealand with the hint of warmer North Island and hint of less warm South Island.

Europe loses the milder south-east Europe have around normal temperatures and retains colder Scandinavia. The precipitation pattern remains a mixture of normal and patches of wetter weather, although slightly less wet British Isles and wetter Spain while normal to slightly drier Scandinavia.

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