

Climate Briefing

12th December 2019

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TE KAUNIHERA Ā-ROHE O TE MATAU-A-MĀUI

Outline



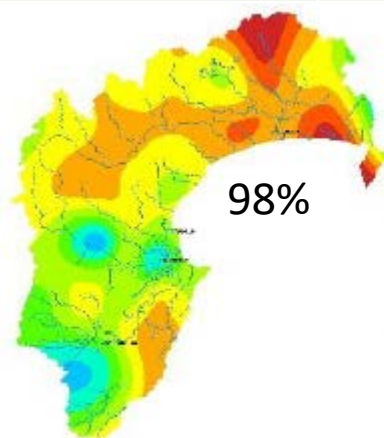
1. Rainfall and PET
2. Soil moisture
3. River flows
4. Ground water levels
5. Water use
6. Status and outlook of climate modes
7. Forecasts

An aerial photograph of a rugged coastal mountain range. The mountains are covered in dense, dry-looking vegetation, appearing in shades of brown and green. Below the mountains, a thick layer of white clouds or fog fills the valleys and extends to the sea. The sky is a clear, pale blue. The image is framed by a white, curved banner at the bottom and a dark blue curved line on the right side.

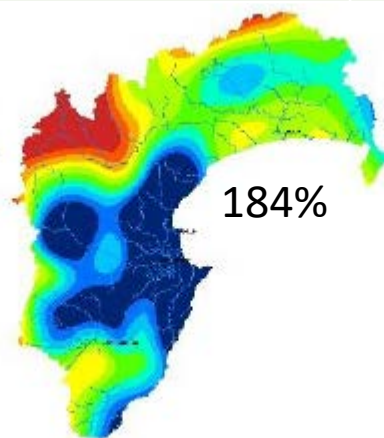
Current State – rainfall, PET and soil moisture

Current State - rainfall

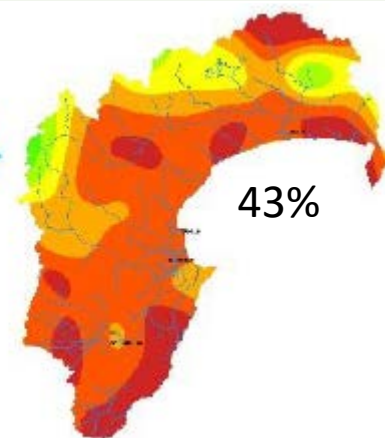
Area	August (%) 64%	September (%) 98%	October (%) 184%	November (%) 43%
Waikaremoana	72	67	121	69
Northern HB	52	64	131	43
Tangoio	36	89	234	38
Kaweka	82	85	179	62
Ruahine	116	125	141	34
Heretaunga Plains	52	131	265	35
Ruataniwha Plains	57	114	191	37
Southern HB	45	113	212	29



September 2019

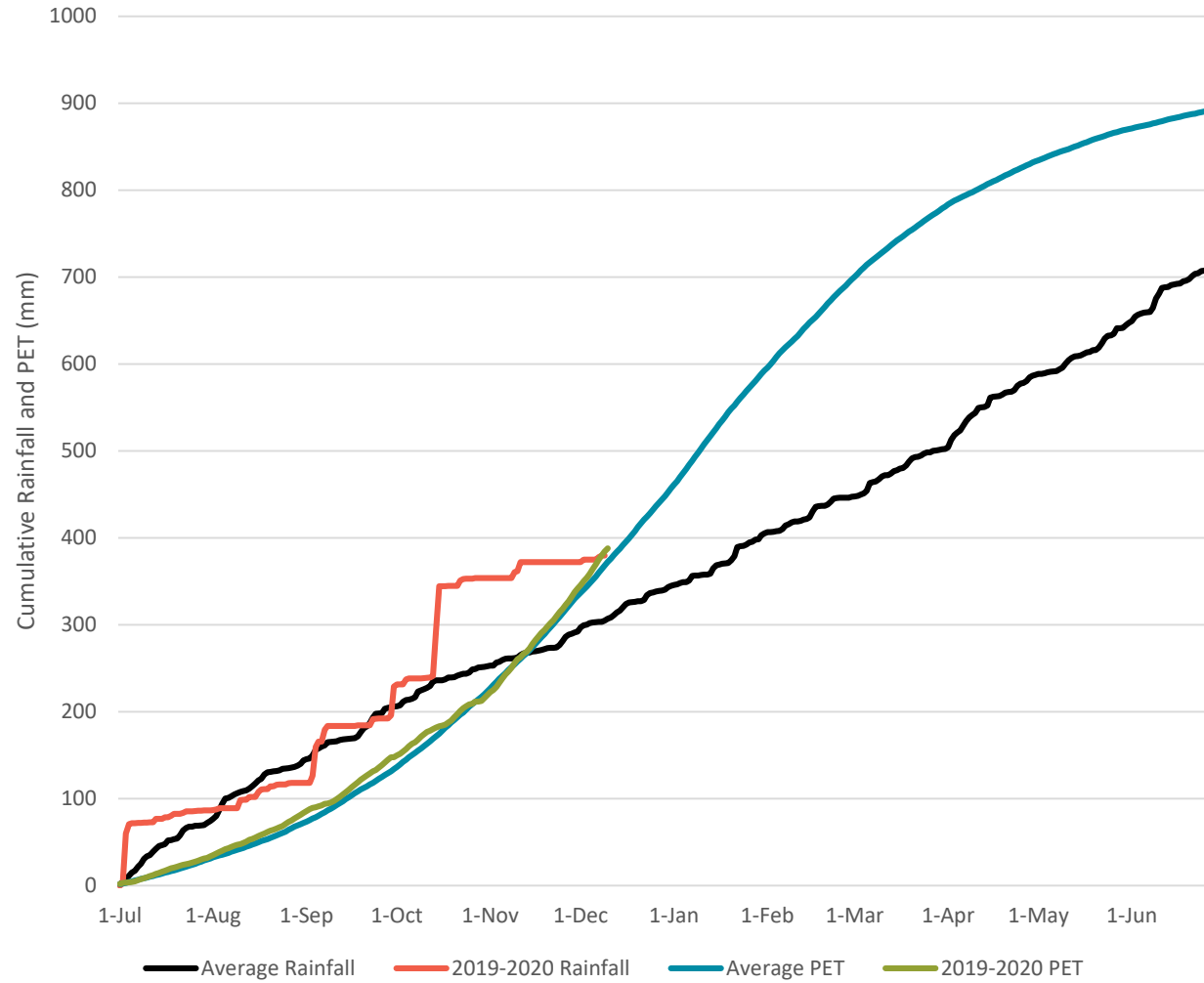


October 2019



November 2019

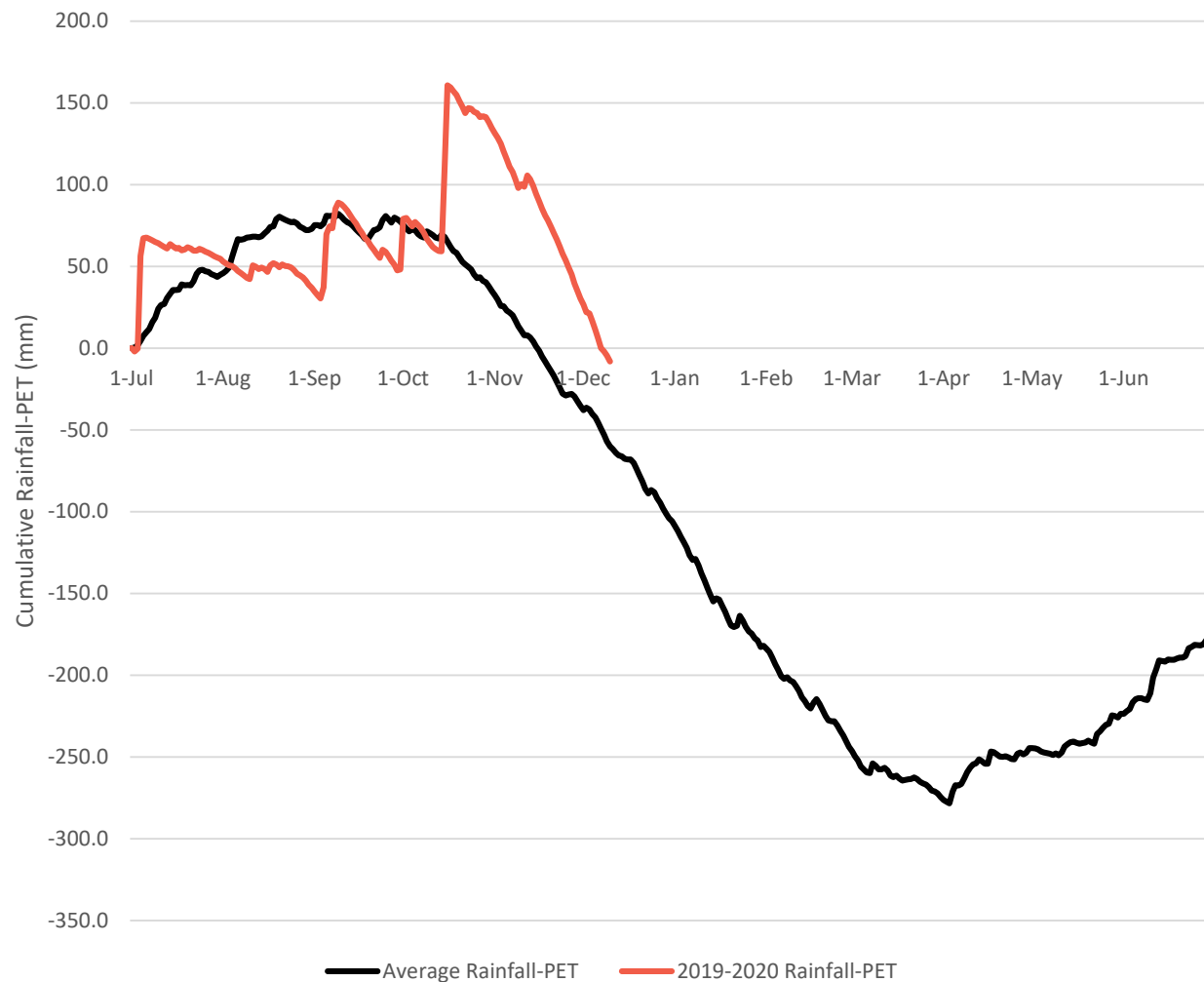
Bridge Pa Cumulative Rainfall and PET



Cumulative Rainfall & Potential Evapotranspiration (PET)

Average cumulative rainfall and average cumulative PET are calculated from July 2009 to July 2018.

Bridge Pa Cumulative Rainfall-PET

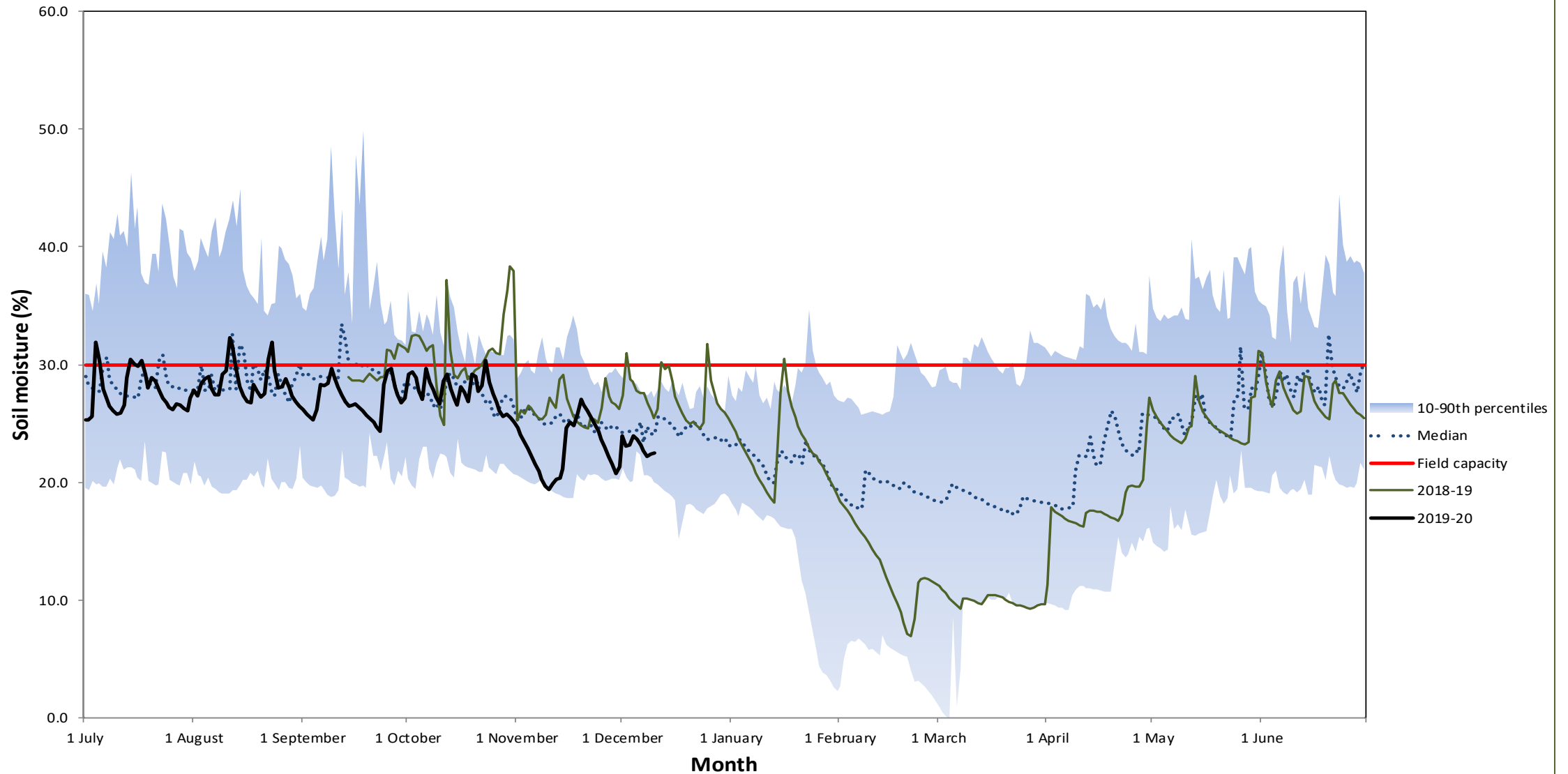


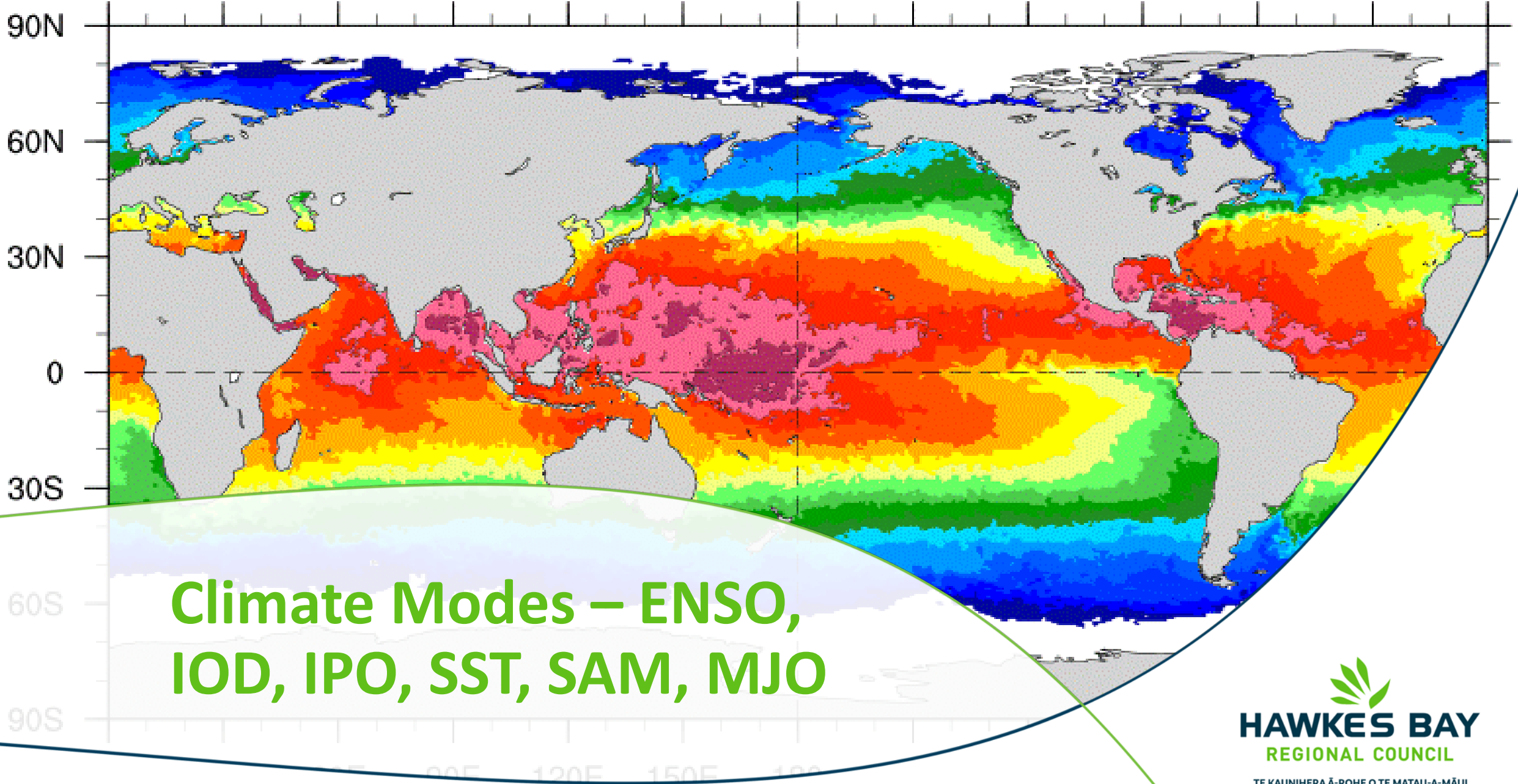
Cumulative Rainfall - Potential Evapotranspiration (PET)

Average cumulative rainfall and average cumulative PET are calculated from July 2009 to July 2018.

Current State – soil moisture

Taharua - Average Daily Soil Moisture (2008-19)

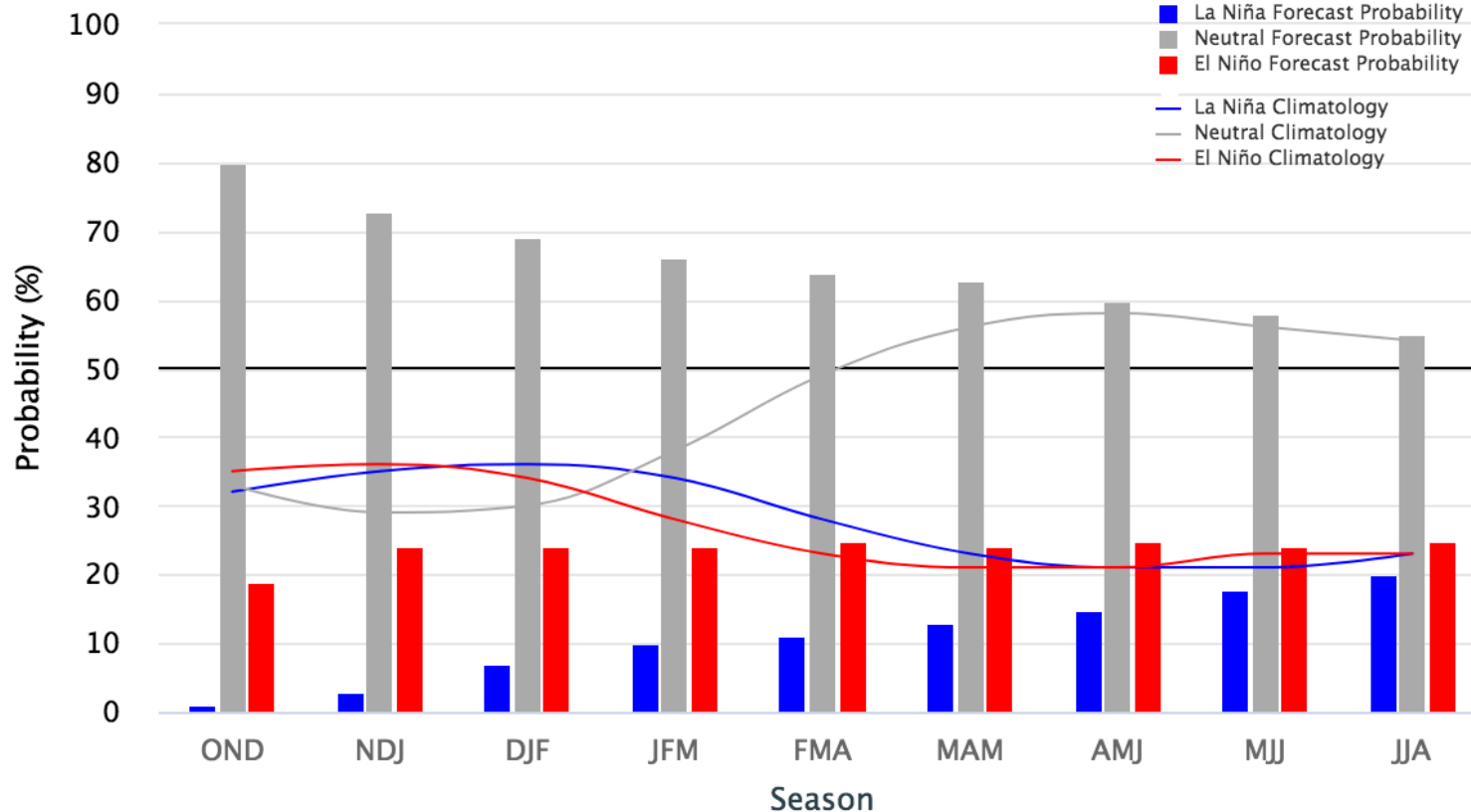




Climate Modes – ENSO, IOD, IPO, SST, SAM, MJO

Early–November 2019 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: $-0.5\text{ }^{\circ}\text{C}$ to $0.5\text{ }^{\circ}\text{C}$

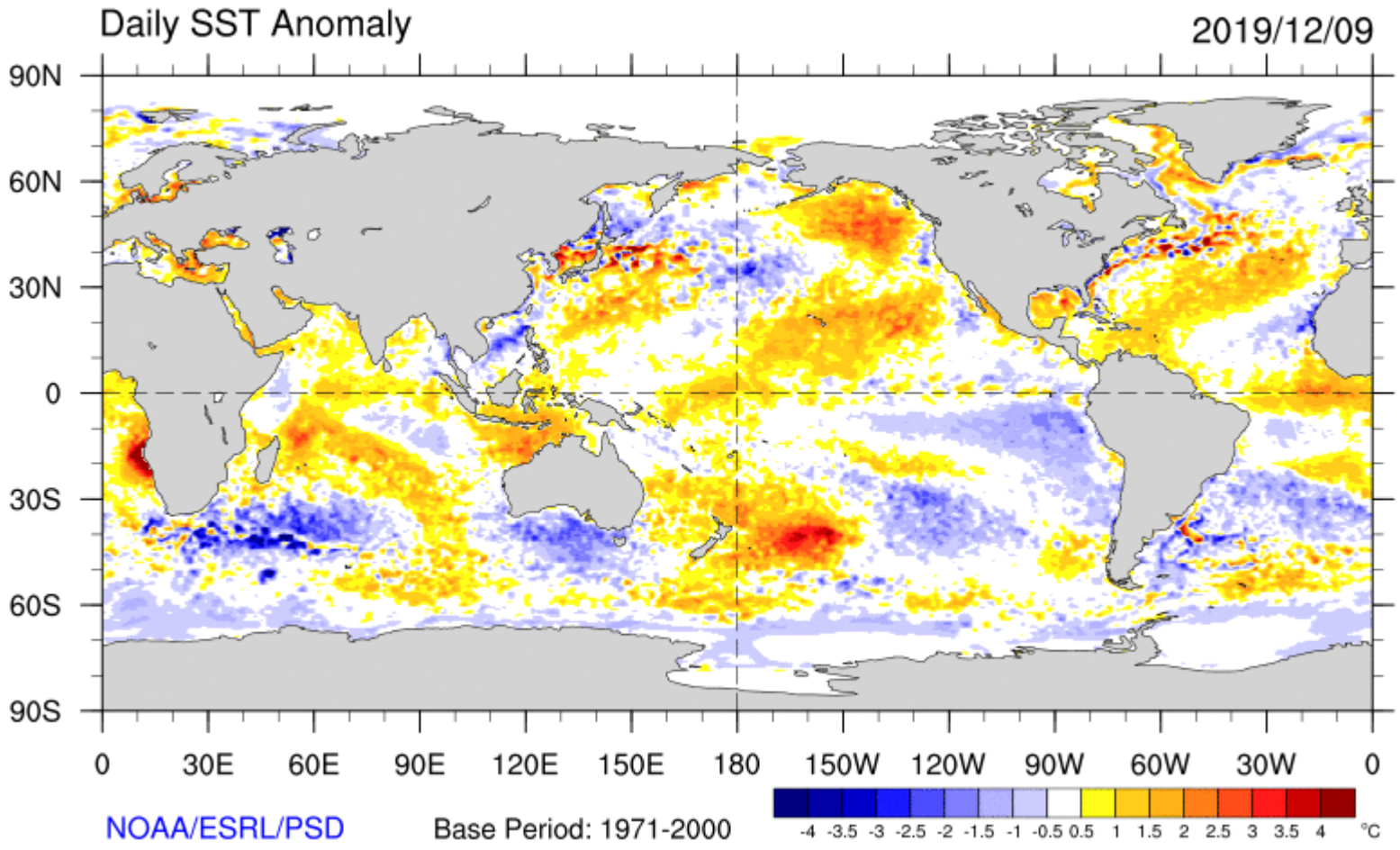


EL NIÑO – SOUTHERN OSCILLATION (ENSO)

NEUTRAL

Source:

https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf



**INTERDECADAL PACIFIC
OSCILLATION**

POSITIVE

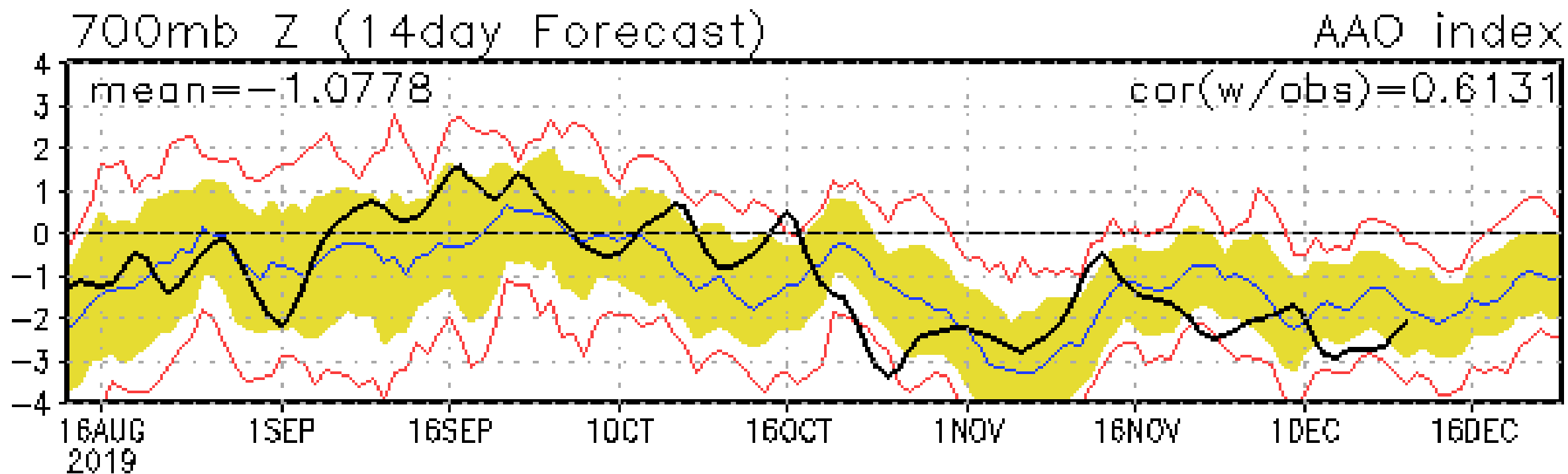
INDIAN OCEAN DIPOLE

POSITIVE

<https://www.esrl.noaa.gov/psd/map/clim/sst.shtml>

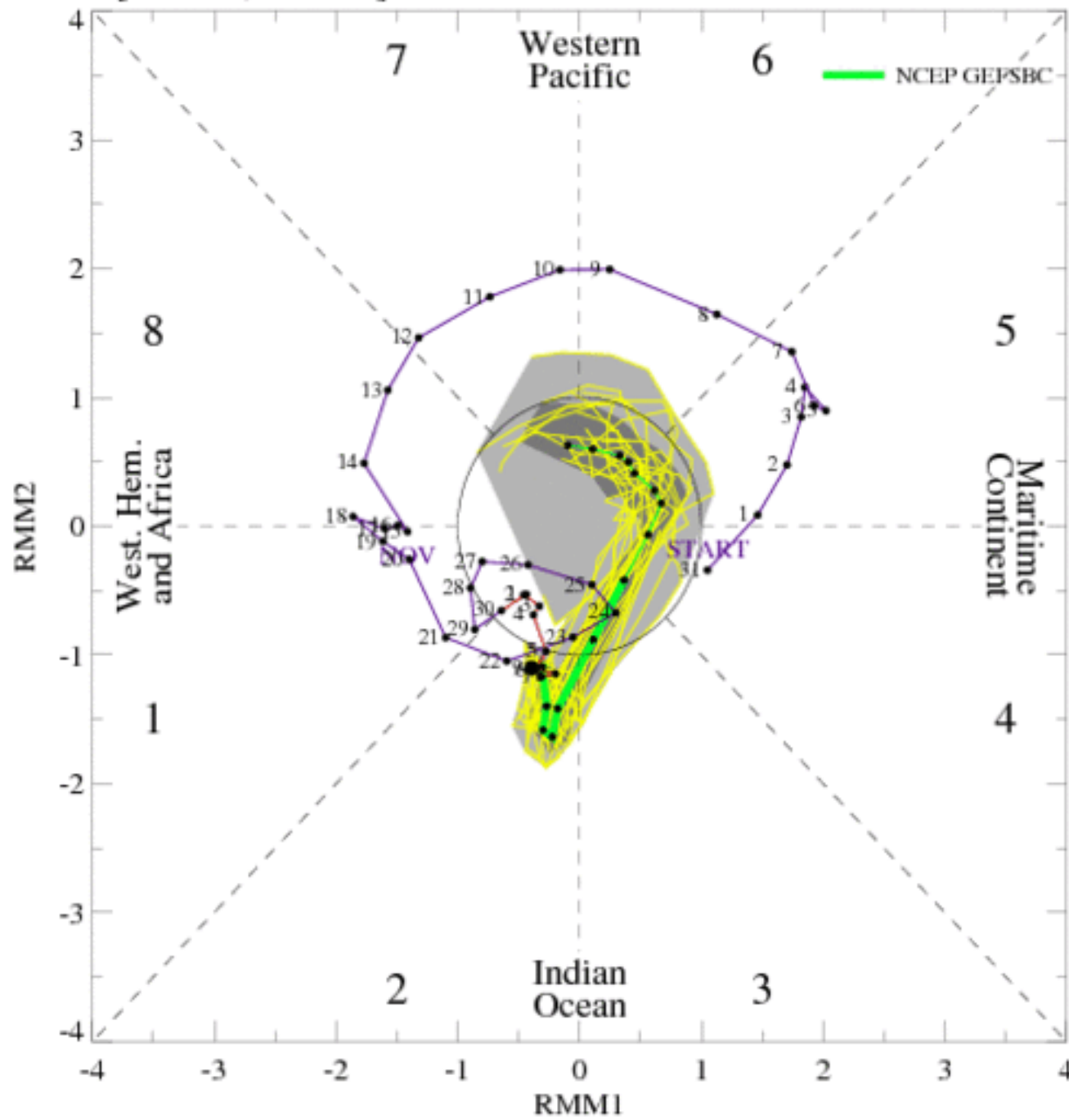
SEA SURFACE TEMPERATURES ABOVE AVERAGE

SOUTHERN ANNULAR MODE (SAM)



https://www.cpc.ncep.noaa.gov/products/precip/CWlink/daily_ao_index/aao/aao.sprd2.gif

[RMM1, RMM2] forecast for Dec-10-2019 to Dec-24-2019



MADDEN-JULIAN OSCILLATION

Sources:

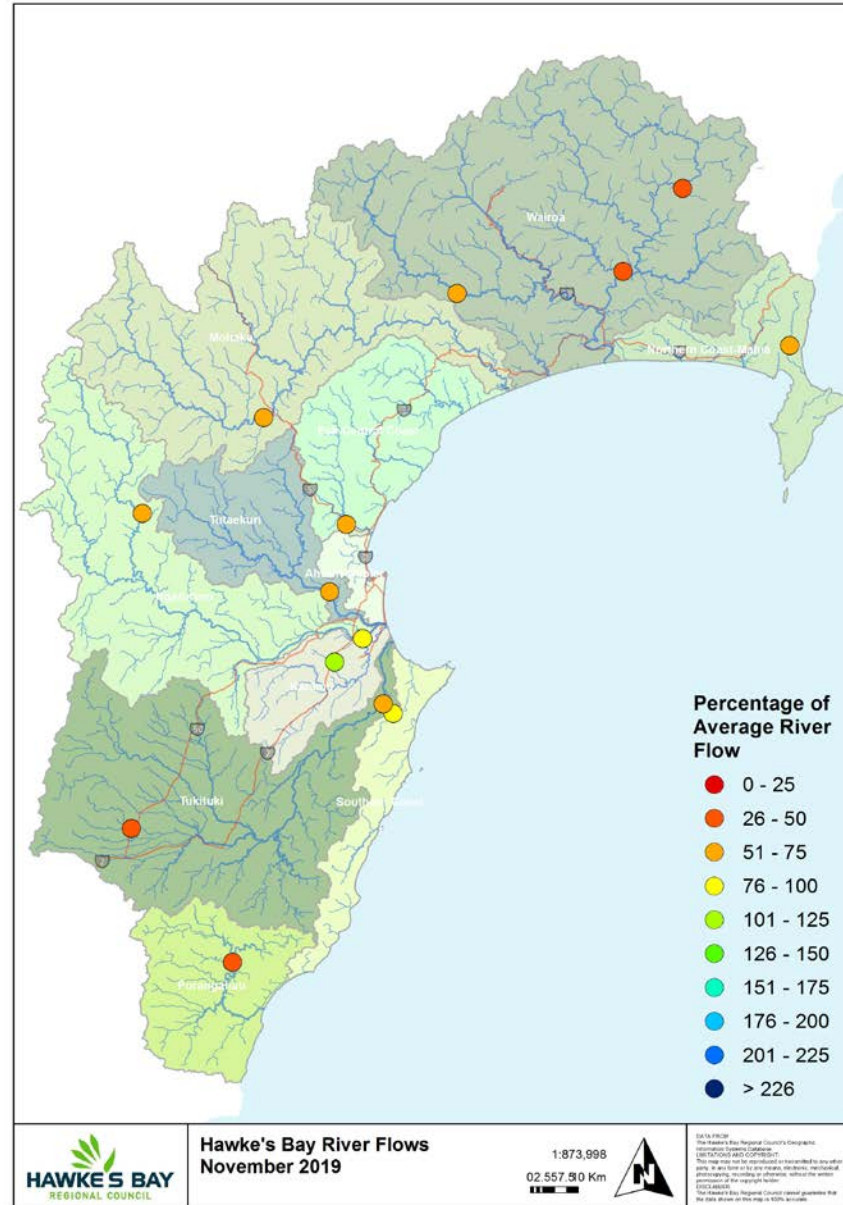
<http://www.bom.gov.au/climate/mjo/>

<https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/foregfs.shtml>

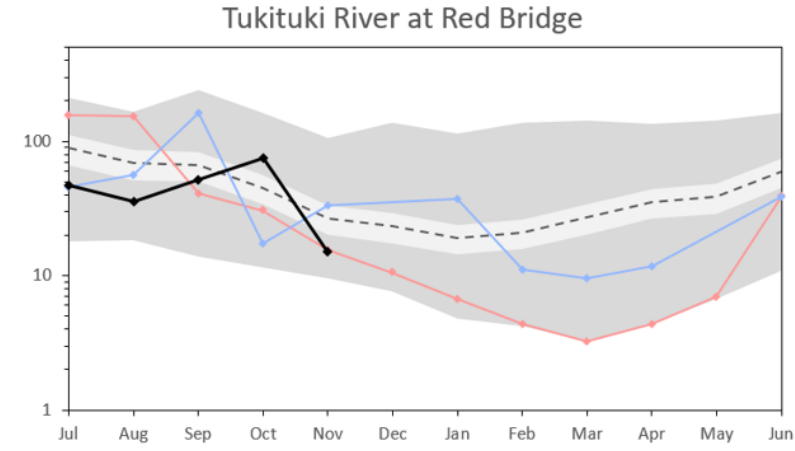
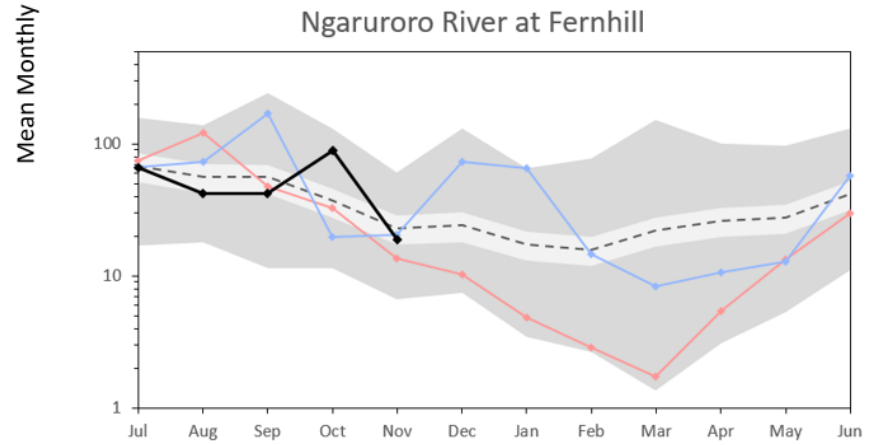
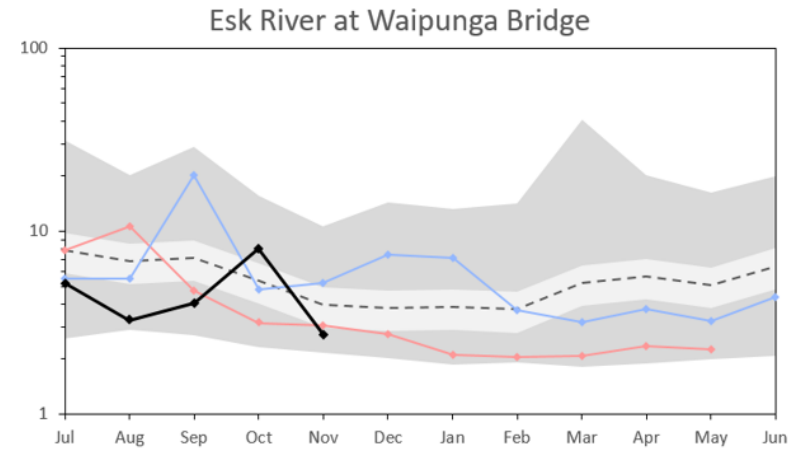
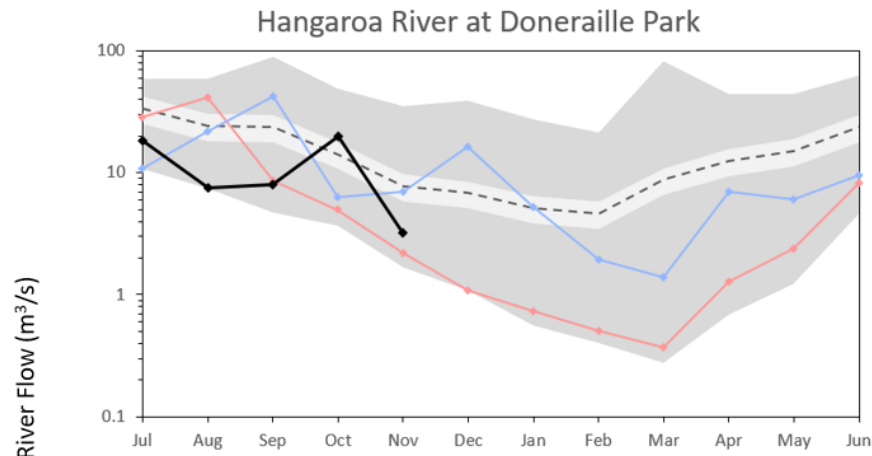


River flows

River flow sites



River flows in November

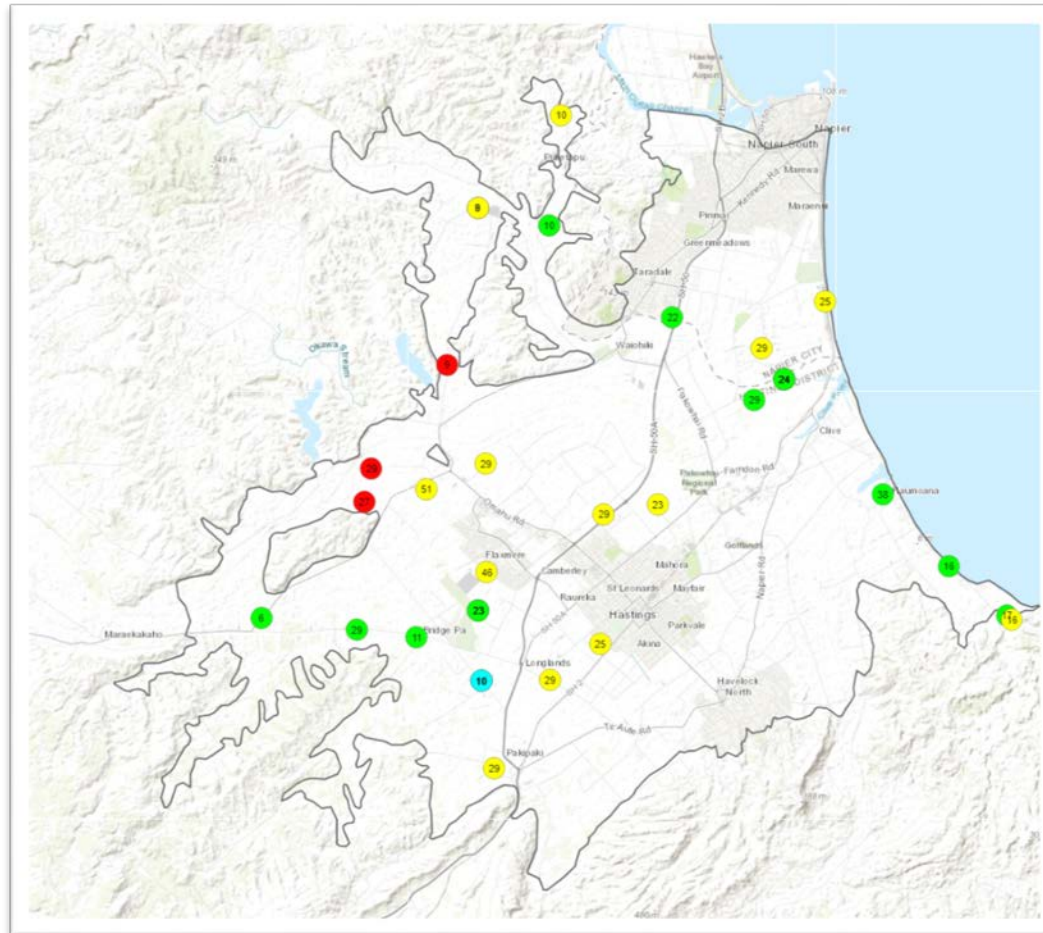


Long-term Range
 Normal Range
 Long-term Mean
 2012-2013
 2018-2019
 2019-2020



Groundwater levels

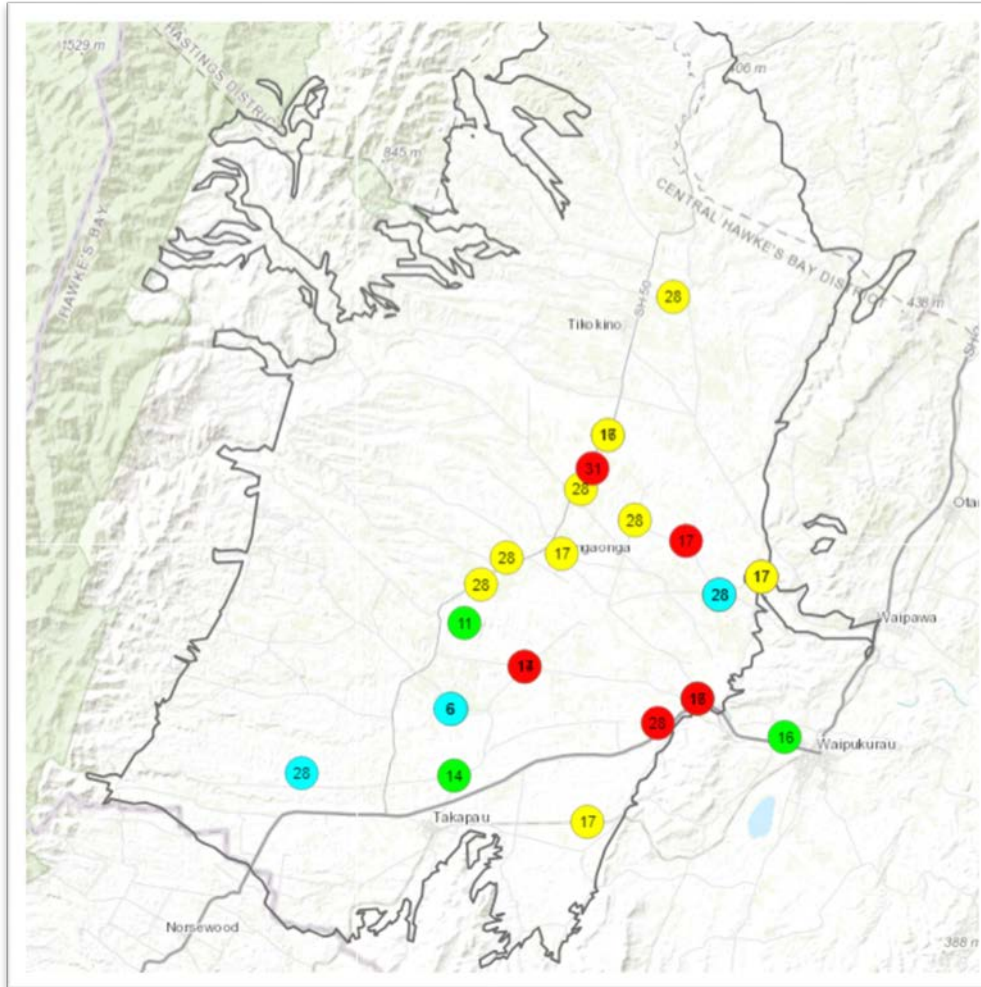
Heretaunga Plains



Legend

- highest recorded
- above normal
- normal
- below normal
- lowest recorded
- 12 Years of monitoring

Ruataniwha Plains



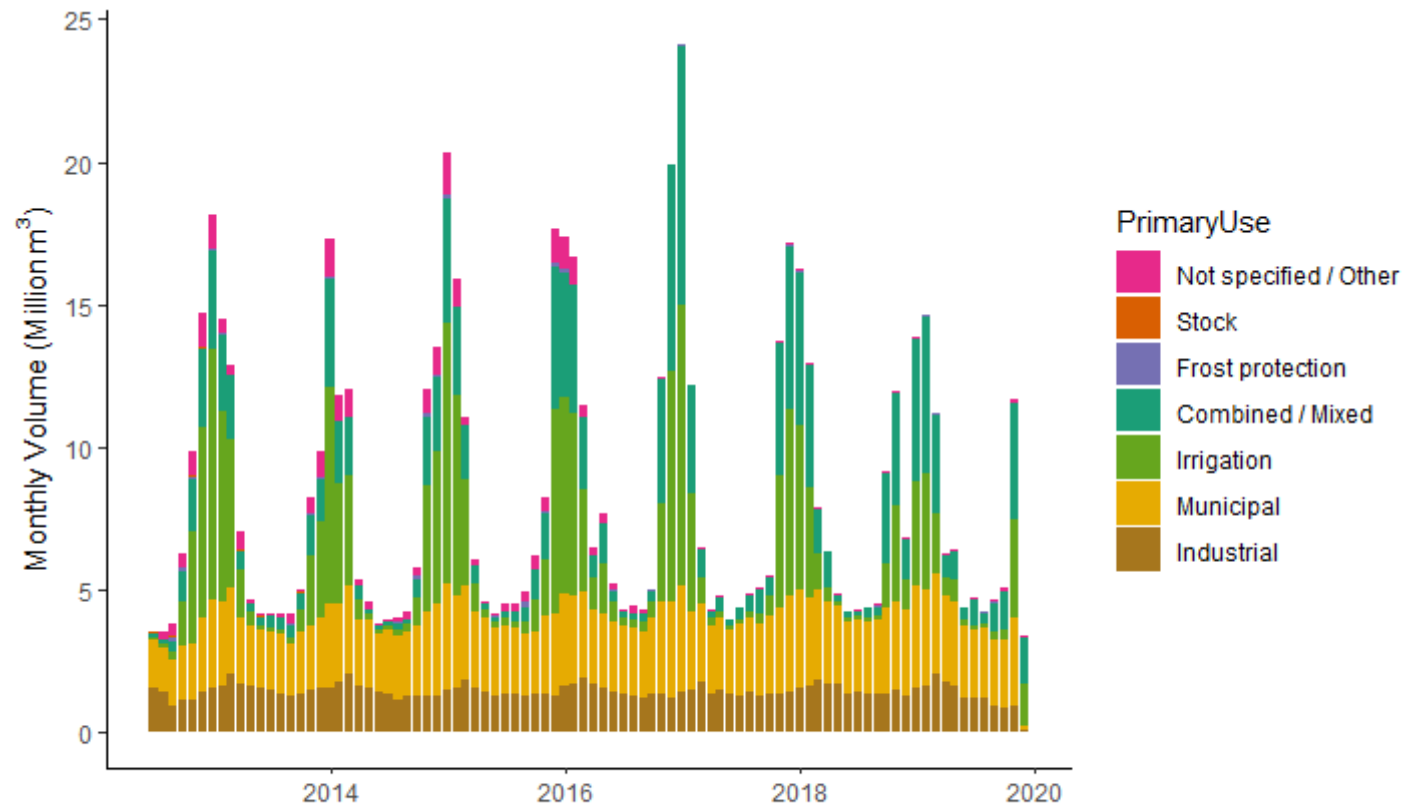
Legend

- highest recorded
- above normal
- normal
- below normal
- lowest recorded
- 12 Years of monitoring



Water use

Hawke's Bay Water Use By Activity 2012 - 2019



Based on data available on 09/12/2019 .

Industrial and Water Supply have a base usage year round.

Irrigation and related uses have the largest seasonal variation.

Combined / Mixed category consists of consents with multiple uses specified, often “Irrigation and Frost” or “Irrigation and ...”

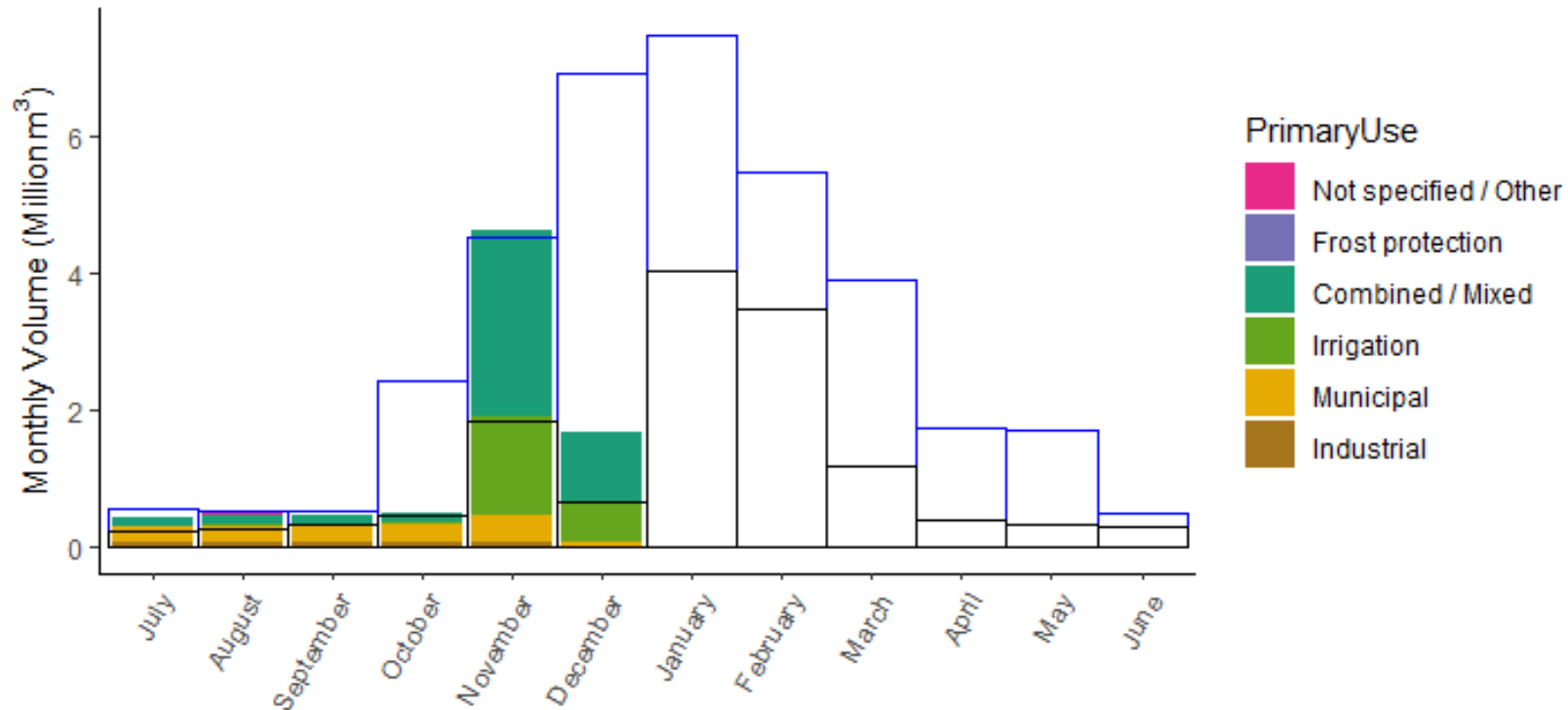
Tukituki water use

Summary Of Monthly Water Use In The Tukituki Catchment.

The stacked bars show this year's data.

The blue line represents the maximum water use between July 2012 and July 2019.

The black line represents the minimum water use between July 2012 and July 2019.



Based on data available on 09/12/2019 .

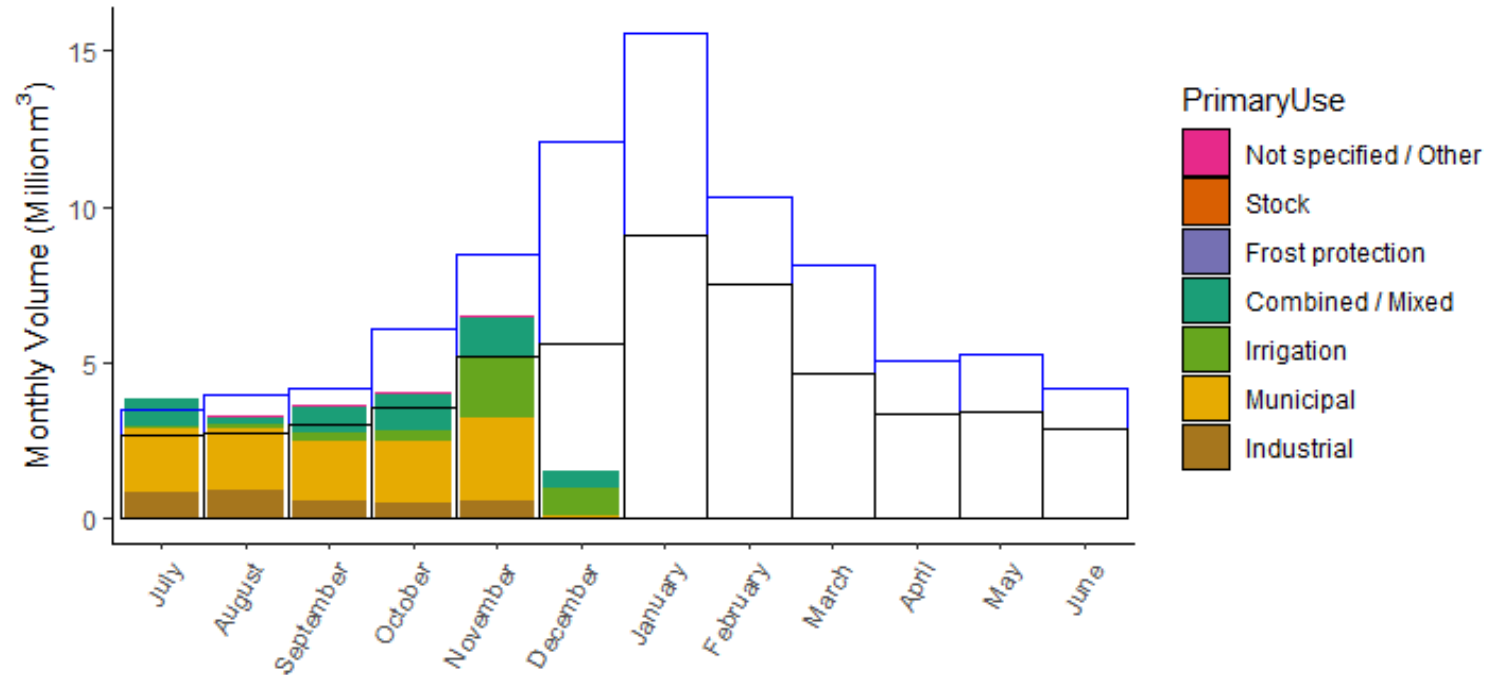
TANK water use

Summary Of Monthly Water Use In The TANK Catchments.

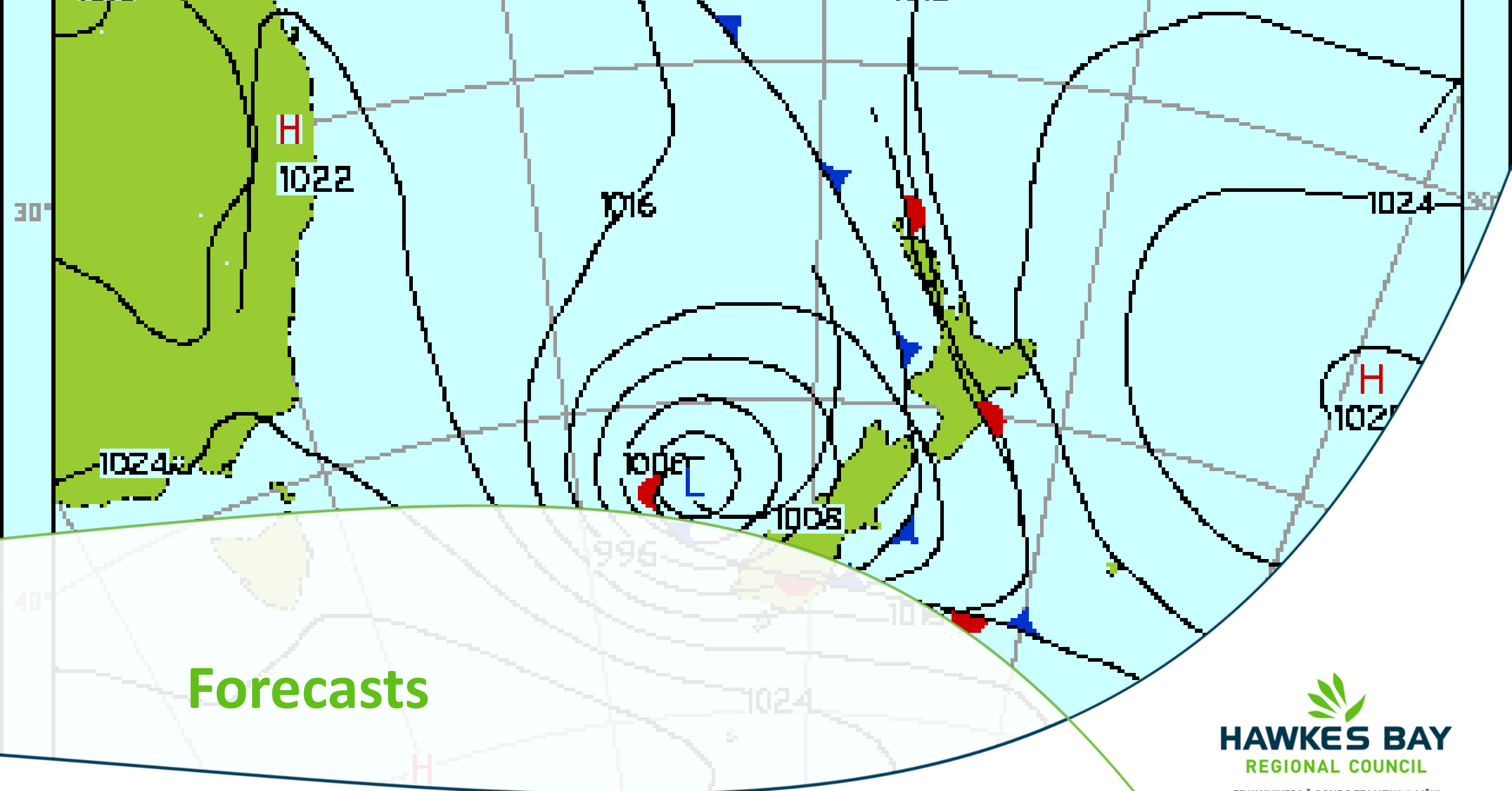
The stacked bars show this year's data.

The blue line represents the maximum water use between July 2012 and July 2019.

The black line represents the minimum water use between July 2012 and July 2019.



Based on data available on 09/12/2019 .



1024

H
1022

1016

L
1008

1008

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1024

Forecasts

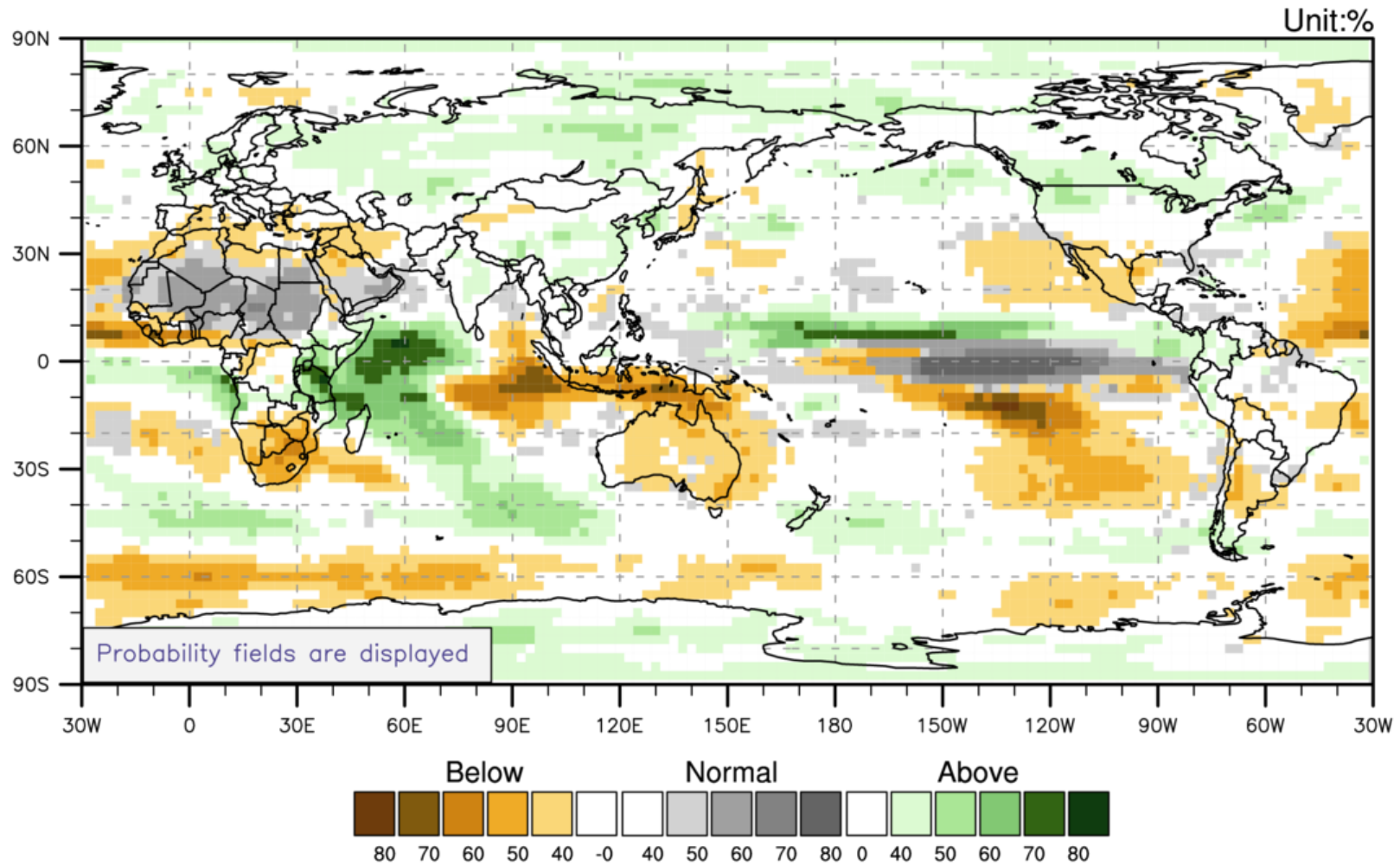
NIWA Seasonal Forecast

December 2019 to February 2020

- Temperatures are most likely to be above average (55% chance)
- Rainfall totals are most likely to be near normal (40% chance)
- Soil moisture levels are most likely to be near normal (30-35% chance)

<https://www.niwa.co.nz/climate/seasonal-climate-outlook>

Precipitation for December 2019-February 2020



Issued: 20 Nov, 2019

© APEC Climate Center


HAWKES BAY
REGIONAL COUNCIL

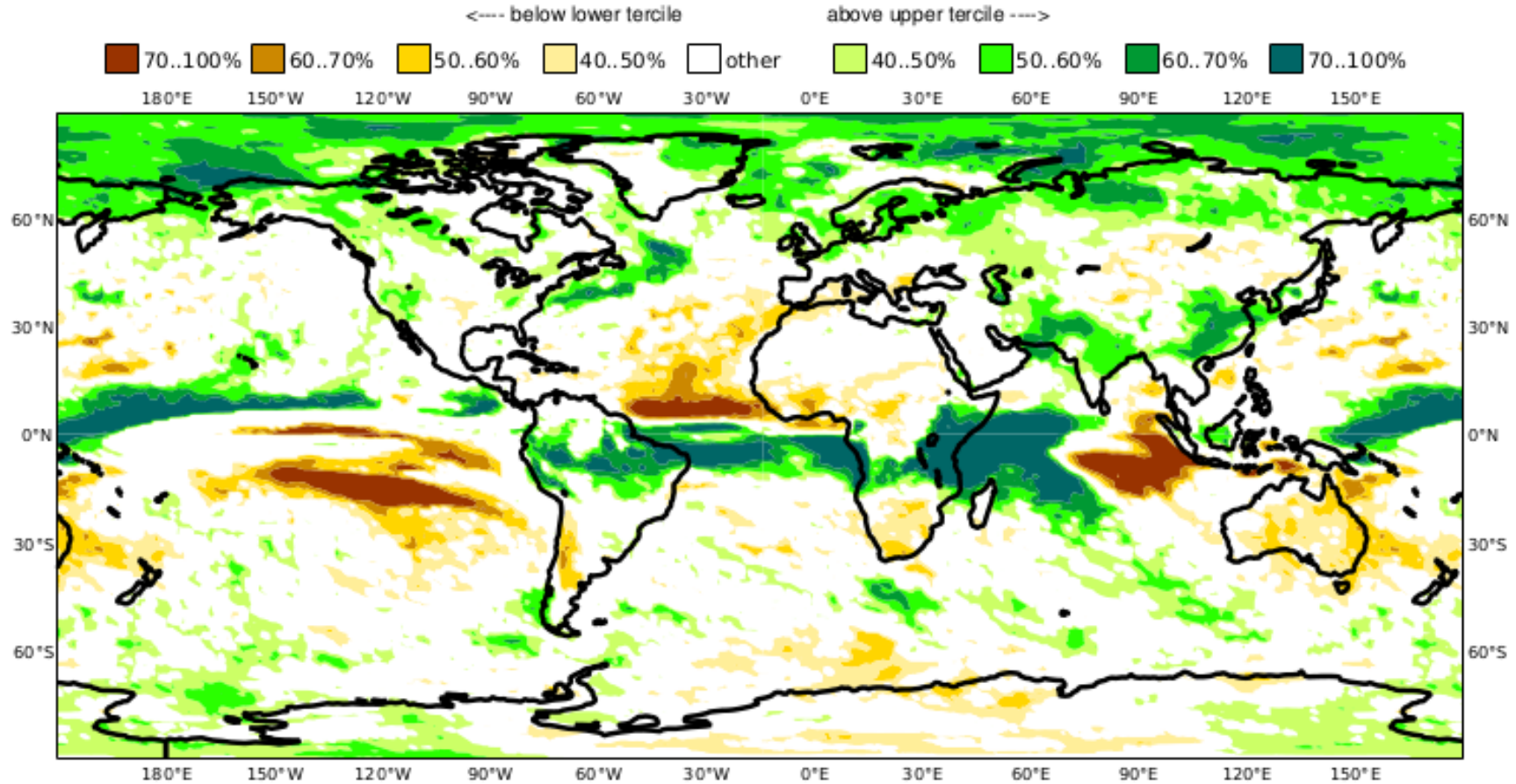
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C3S: Met Office contribution
Prob(most likely category of precipitation)

DJF 2019/20

Nominal forecast start: 01/11/19

Ensemble size = 50, climate size = 672

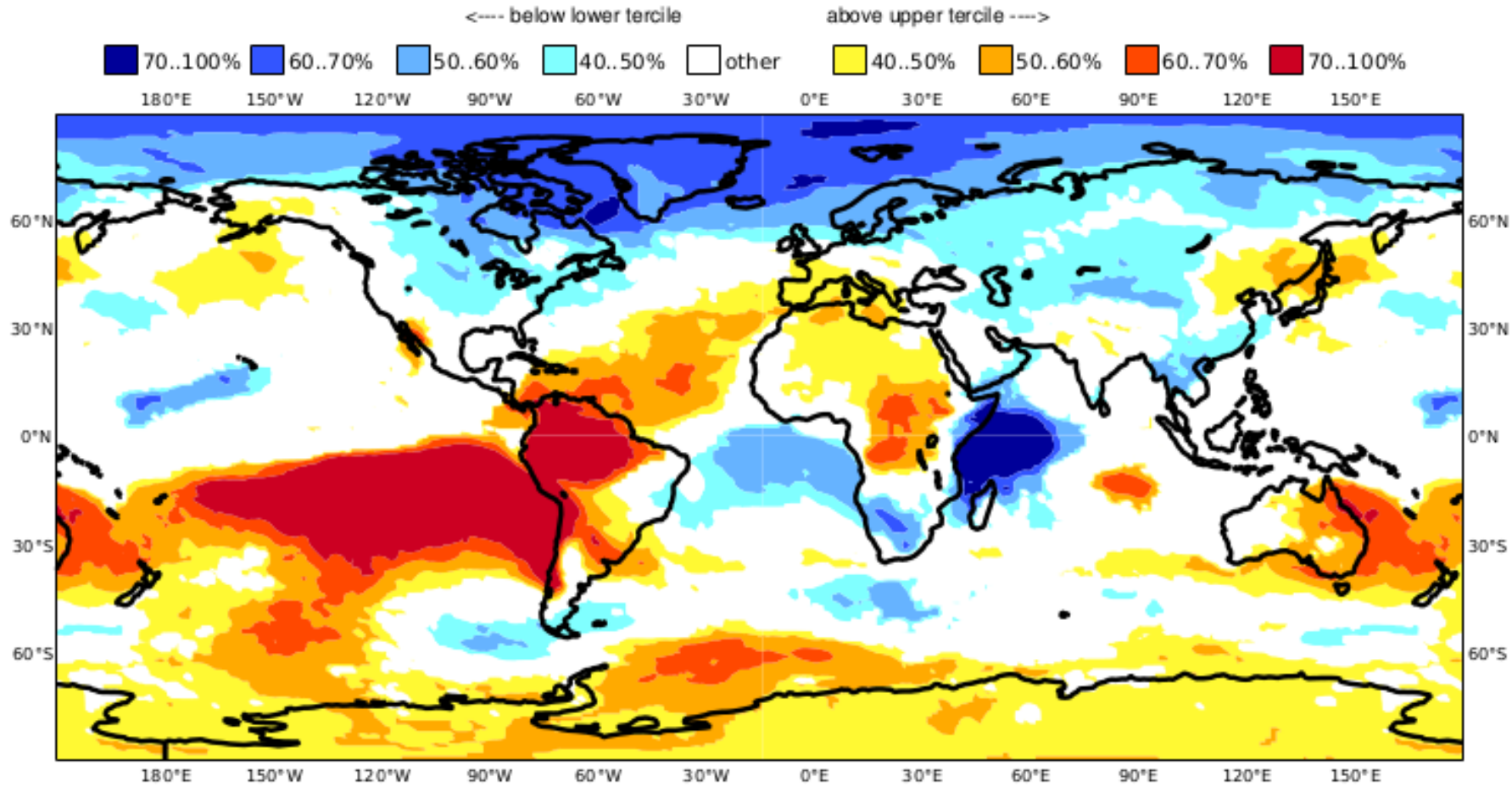


C3S: Met Office contribution
Prob(most likely category of MSLP)

DJF 2019/20

Nominal forecast start: 01/11/19

Ensemble size = 50, climate size = 672



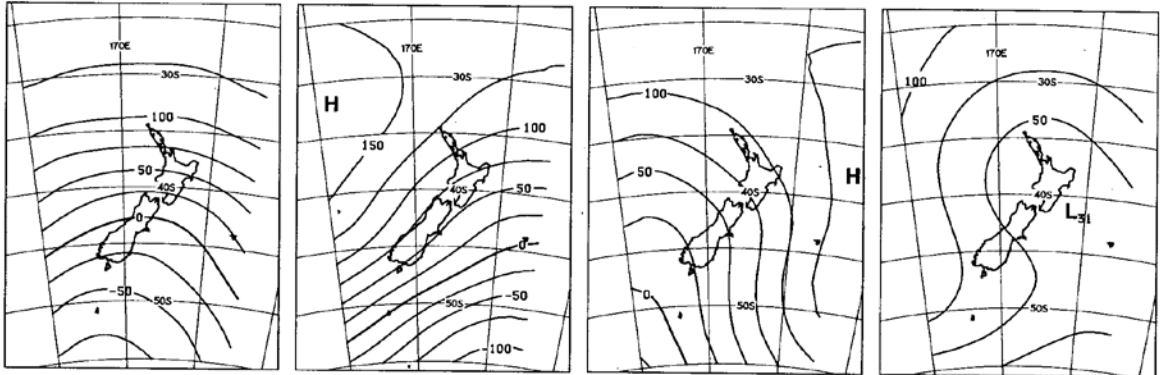
“Trough” group

T - 12.3%

SW - 11.3%

TNW - 7.6%

TSW - 7.3%



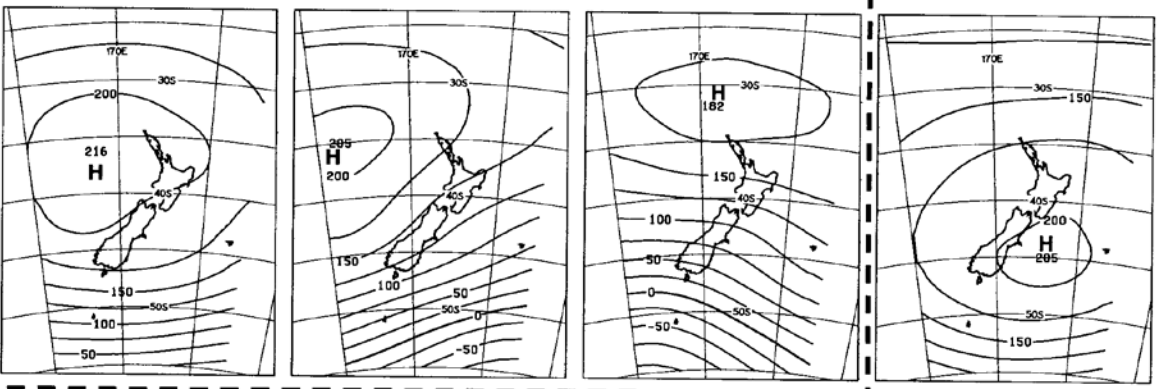
“Zonal” group

H - 12.9%

HNW - 6.9%

W - 4.8%

HSE - 13.7%



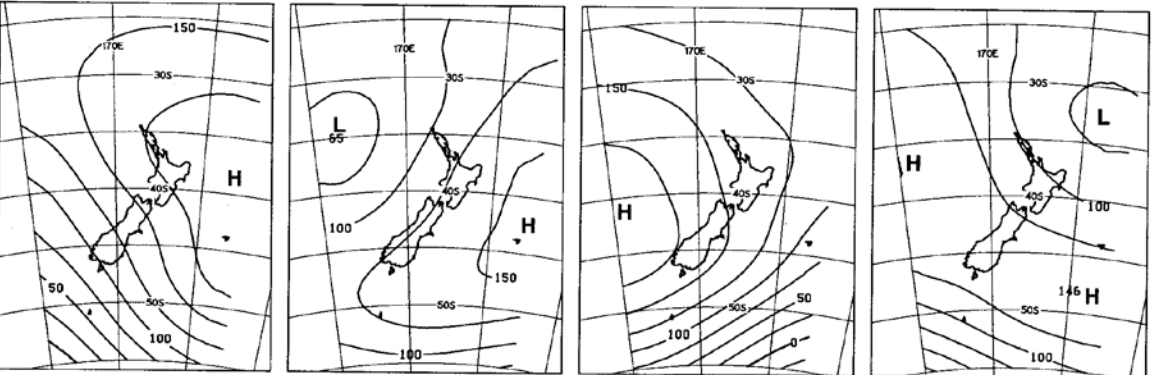
“Blocking” group

HE - 7.1%

NE - 6.3%

HW - 5.4%

R - 4.7%



Twelve Kidson Weather Types

SPRING	Waikaremoana	Northern HB	Tangoio	Kaweka	Ruahine	Heretuanga Plains	Ruataniwha Plains	Southern HB
T	1	-12	-5	-2	28	-7	-18	-12
SW	-10	-20	-24	-37	-5	-32	-39	-30
TNW	5	26	15	9	5	19	18	15
TSW	36	38	27	27	-8	55	47	41
H	-12	-18	-28	-38	-44	-26	-10	-10
HNW	-1	4	-10	-23	-15	-24	-7	-1
W	-28	-19	-14	-1	34	-19	-14	2
HSE	-14	4	8	19	8	3	4	2
HE	-16	-22	-5	-6	-13	-3	3	-4
NE	2	3	13	34	7	19	19	11
HW	5	26	15	9	5	19	16	15
R	35	37	62	26	55	48	30	44

Correlation (r) between the seasonal frequency of Kidson Weather Types and seasonal rainfall at sites with 30 year records