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# KZN Green Drought

6<sup>th</sup> February 2019

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**Sub-Directorate: ARDM**

**LET'S MAKE AGRICULTURE OUR CULTURE**

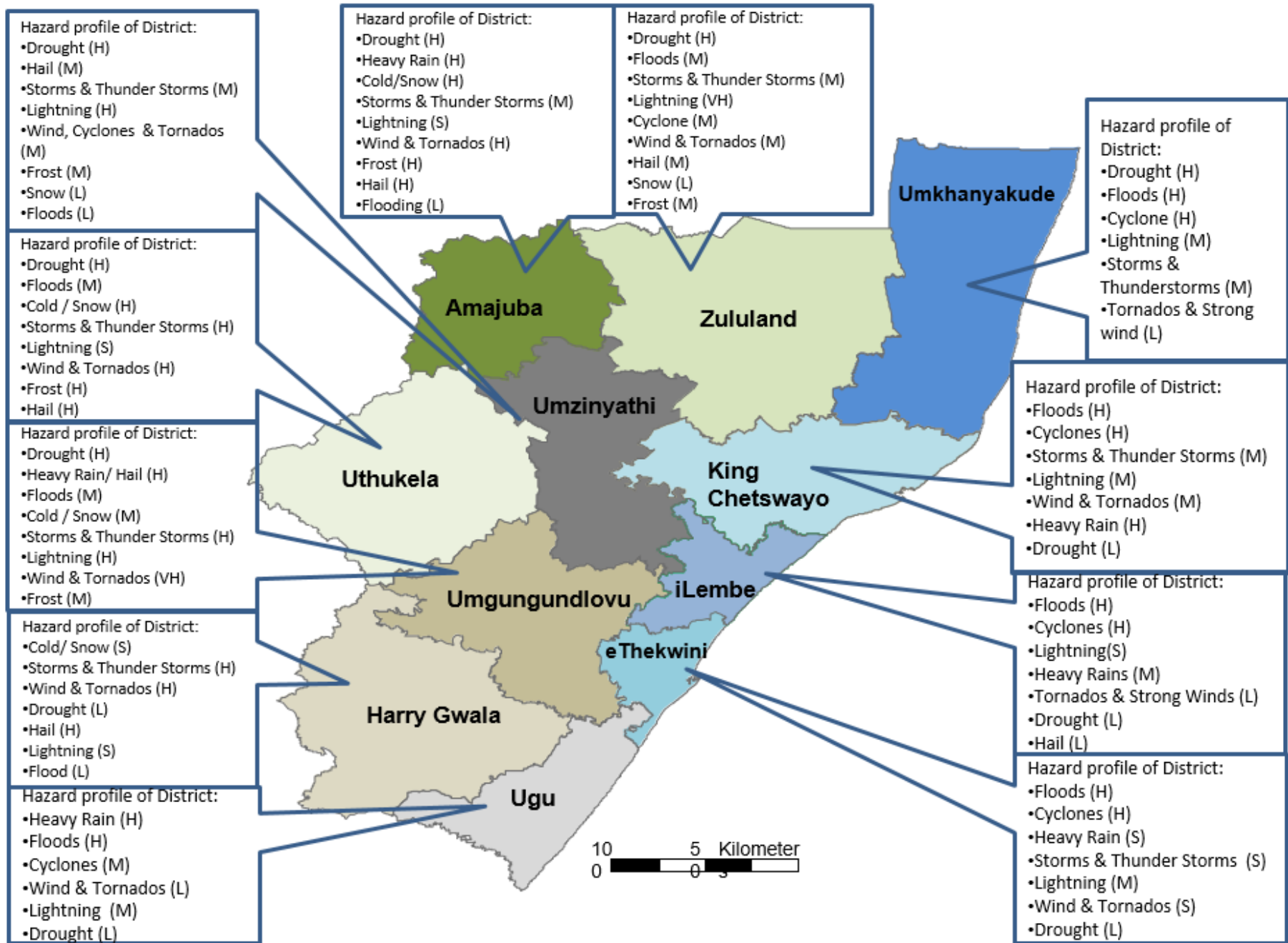




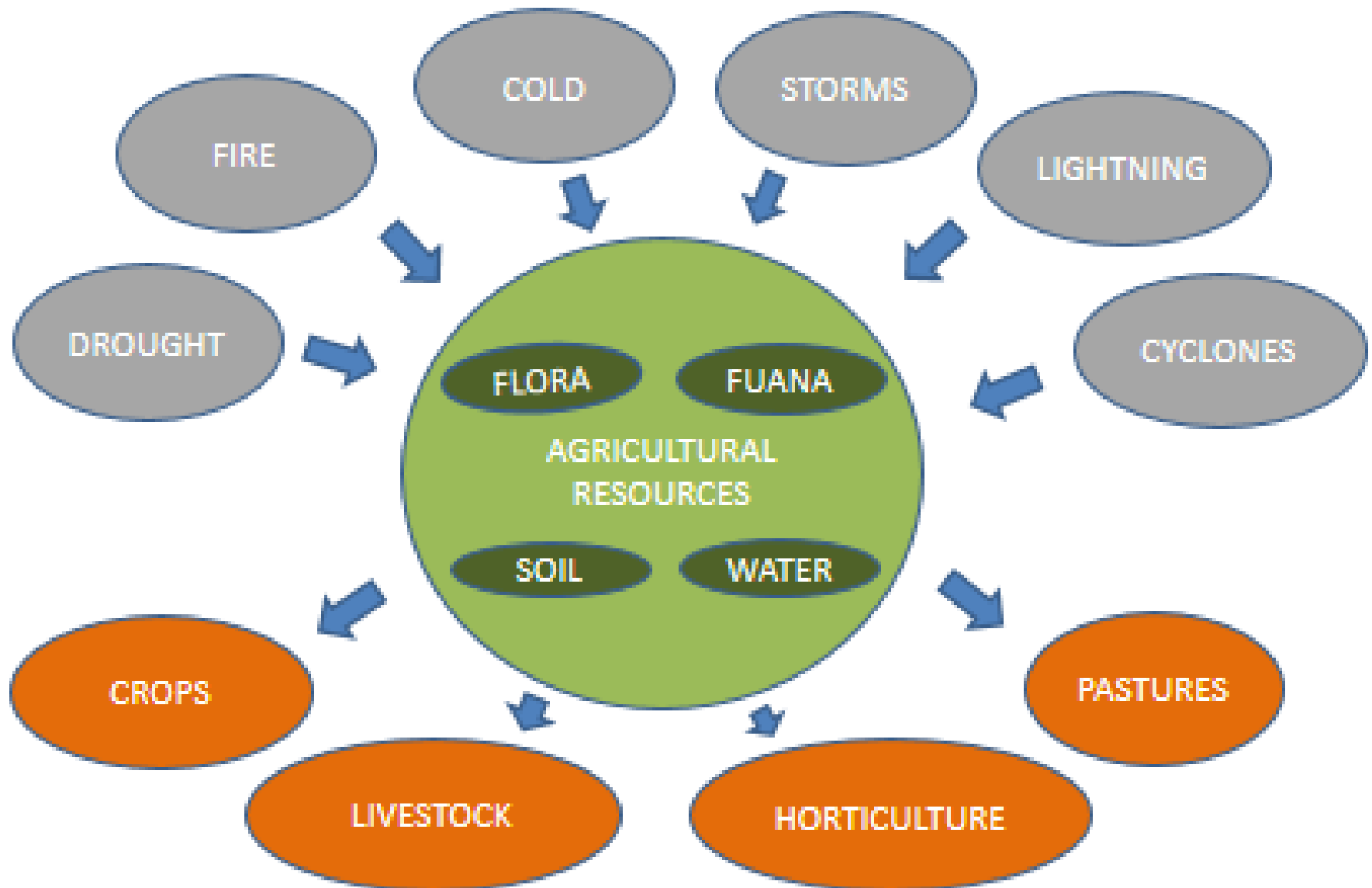
# Points of Discussion

- ◉ KZN: Summer Hazard Profile
- ◉ Weather and Climatic Conditions
- ◉ Dam Levels
- ◉ Rainfall trends
- ◉ Drought Indicators (SPI)
- ◉ Early Warning
- ◉ Fires
- ◉ Livestock
- ◉ Veld
- ◉ Pastures & Crops
- ◉ Incidents
- ◉ Pest & Diseases
- ◉ Drought Impact & Restrictions

# SUMMER HAZARD PROFILE



# Weather aberrations and the affected agricultural sectors





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# WEATHER & CLIMATIC CONDITIONS DAM LEVELS

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# WEATHER AND CLIMATIC CONDITIONS



- KZN is experiencing a “green drought.” Rainfall across the province has not been equal/evenly dispersed everywhere and unusual weather patterns have been experienced.
- There have been isolated storms with heavy downpours but the water table, farm dams and the provincial dams are not being replenished.
- Severe heat waves with high discomfort values were experienced through Sept to Nov as well as in December and January resulting in high evaporative demands on vegetation, soils and dams.



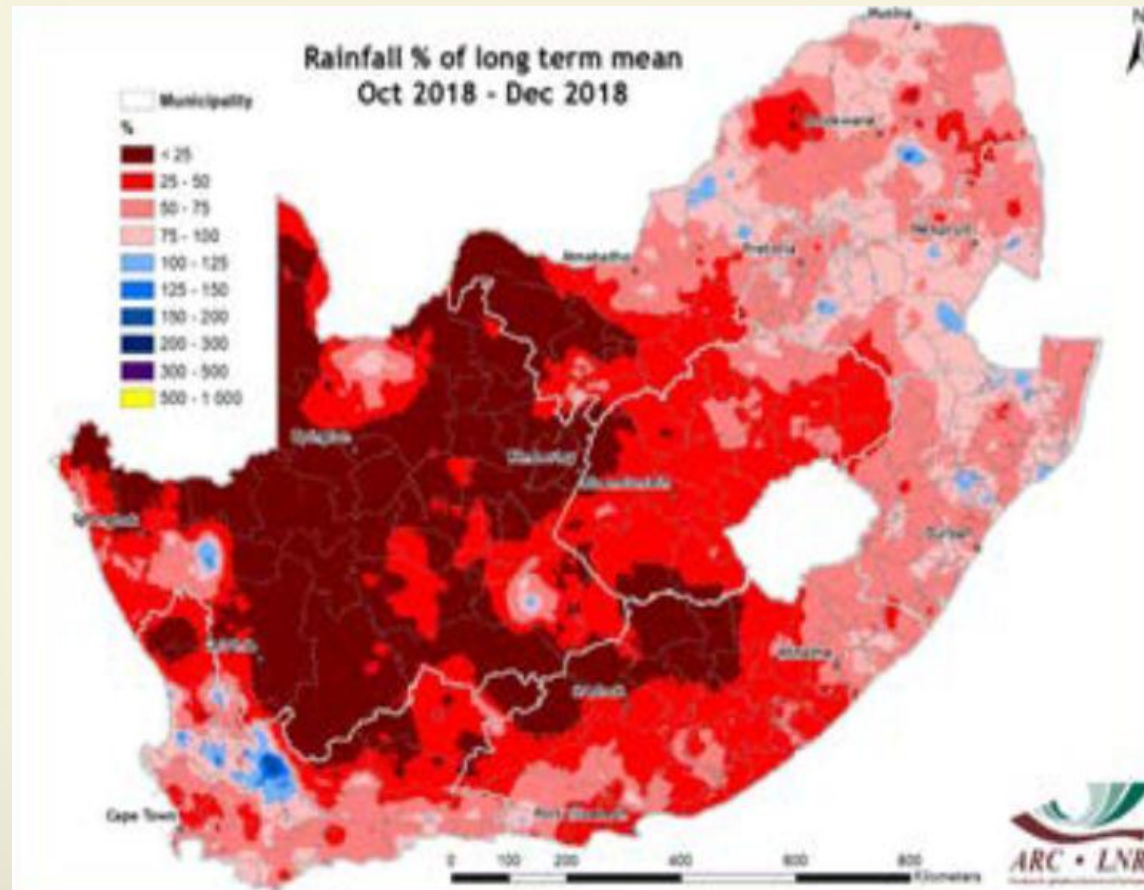


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# WEATHER AND CLIMATIC CONDITIONS

(Seasonal Rainfall)



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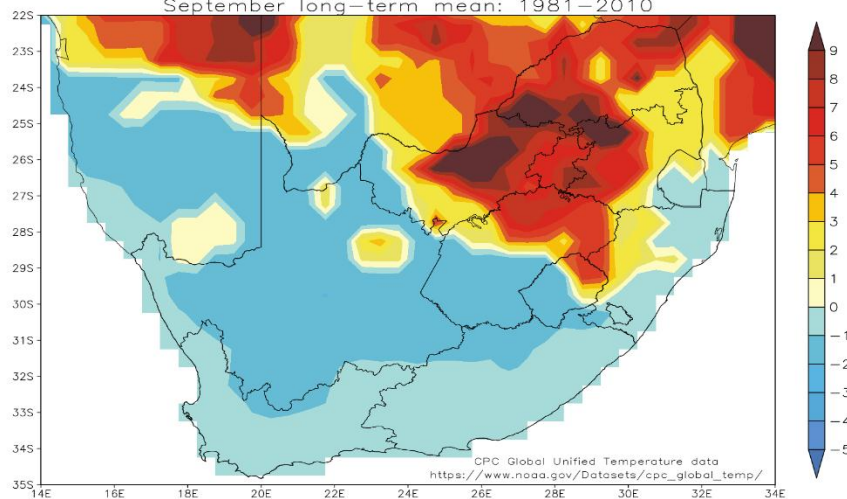
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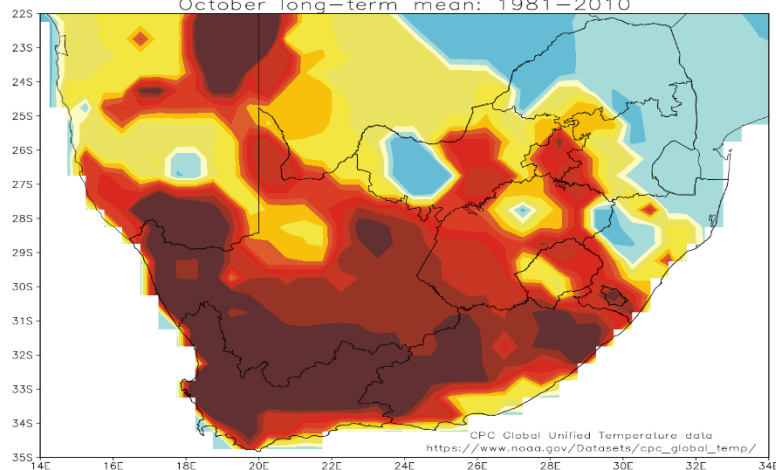
# HEAT WAVES DURING SEPTEMBER TO NOVEMBER 2018



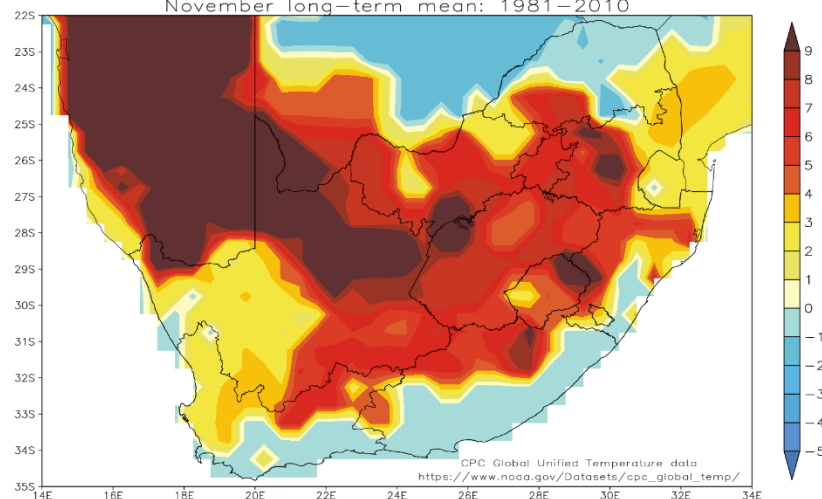
Heatwave day anomaly: September 2018  
September long-term mean: 1981–2010



Heatwave day anomaly: October 2018  
October long-term mean: 1981–2010



Heatwave day anomaly: November 2018  
November long-term mean: 1981–2010







# State of the dams Provincial Summary



- Average dam levels for KZN in June 2018 were 66% and as at 1<sup>st</sup> February 2019 were at 55.3%.
- KZN is 7,2% below the national average of 62,5%.
- Farm dam levels are in a very precarious state, the best being at about 70% and many are already dry.
- Irrigation dams and livestock watering dams are the biggest concern.
- Uthukela, Umzinyathi, Amajuba, Zululand and parts of Umgungundlovu (Mpofana) are particularly hardest hit.
- On many farms, springs that have historically never run dry are now dry.



# Provincial Dam Levels Summary

## 04 February 2019

Source: DWS



Summary Provinces	Full Supply Capacity $10^6\text{M}^3$	Water in Storage $10^6\text{M}^3$	Last Year %Full	Last Week %Full	This Week %Full
EC Eastern Cape	1807.2	1047.9	59.6	56.0	58.0
FS Free State	15945.3	11203.0	64.2	71.5	70.3
G Gauteng	128.1	120.9	92.5	92.8	94.4
KN Kwazulu-Natal	4801.8	2655.6	54.3	55.3	55.3
L Lesotho	2362.6	735.1	33.3	31.4	31.1
LP Limpopo	1522.3	916.7	64.9	59.8	60.2
M Mpumalanga	2538.6	1746.1	77.0	67.8	68.8
NC Northern Cape	147.3	97.7	76.6	68.8	66.3
NW North West	868.1	503.5	67.2	57.5	58.0
S Swaziland	333.8	294.6	75.2	80.8	88.3
WCo Western Cape - Other rainfall	268.9	51.1	23.4	18.3	19.0
WCw Western Cape - Winter rainfall	1596.8	820.9	23.8	52.9	51.4
WC Western Cape - Total	1865.7	872	23.8	47.9	46.7
<b>GRAND TOTAL</b>	32320.8	20193.0	59.3	62.9	62.5



# KZN Dams Summary



- Rivers and streams are below normal with some having stopped flowing.
- Any run-off from summer storms and rainfall will firstly go towards replenishing ground water and farm dams before there is sufficient to replenish major dam levels.
- Despite the rainfall received, the soil moisture levels, low water tables, high evaporative and consumer demands, the dams have continued to drop daily instead of increasing which should be the case during the summer rainfall season.



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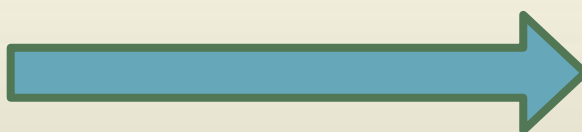
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# KZN Dam Levels: November 2018

Source: DWS



Dam		Full Capacity (x10 <sup>6</sup> m <sup>3</sup> )	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19
			%	%	%	%	%	%	%	%	%	%	%	%	%
ALBERT FALLS	uMngeni	288,15	21,33	27,14	40,77	54,22	56,50	54,55	51,78	48,89	47,13	44,96	40,3	37,15	33,81
BIVANE	Bivane River	114,10											#66,5	65,36	73,47
CRAIGIEBURN	Mnyamvubu	22,47	100,45	100,45	100,64	100,27	100,27	98,52	94,00	92,30	84,95	79,92	71,7	71,48	66,5
DRIEL	uThugela	8,69	95,07	103,03	95,07	95,07	93,46	95,72	96,71	90,30	93,46	99,37	96,6	98,37	96,71
GOEDERTROUW	Mhlathuze	301,26	35,40	35,44	36,27	37,24	46,16	47,44	47,46	47,66	47,64	47,04	46,1	45,98	45,01
HAZELMERE	Mdloti	37,13	60,41	61,24	68,03	74,52	74,98	73,50	71,59	68,89	67,95	56,91	49,7	47,24	44,06
HLUHLUWE	Hluhluwe	25,89	61,80	101,13	100,29	97,49	100,57	99,02	96,10	93,51	90,43	86,71	84,7	90,03	88,43
INANDA	uMngeni	241,69	63,17	63,59	69,95	76,88	75,59	73,29	70,35	68,44	67,04	64,67	61,3	62,57	61,23
KLIPFONTEIN	Wit Mfolozi	18,09	95,79	100,33	100,98	99,83	99,51	95,63	91,53	86,51	82,82	76,69	68,4	83,11	91,07
LAVUMISA		0,38	26,06	26,06	26,06	26,06	26,06	26,06	26,06	26,06	26,06	26,06	26,06	26,06	26,06
MEARNS WEIR	Mooi	5,12	113,57	99,30	113,96	105,75	102,62	49,84	48,87	65,68	55,51	54,53	48,9	69,59	47,11
MIDMAR	uMngeni	235,42	88,46	99,09	100,61	100,23	100,00	98,79	95,11	95,04	95,18	95,11	94,4	93,63	93,19
NAGLE	uMngeni	23,24	73,03	66,79	77,98	91,58	75,49	68,26	70,32	72,00	73,72	62,45	68,2	80,61	80,65
NTSHINGWAYO	Ngagane	194,56	90,77	89,79	92,27	91,44	91,27	88,48	86,71	84,33	81,39	77,32	73,0	71,28	68,25
PONGOLAPOORT	uPongolo	2267,07	36,31	37,58	42,18	44,95	45,53	44,95	44,24	43,68	43,58	42,91	42,2	42,60	42,01
SPIOENKOP	uThugela	270,64	80,62	100,38	100,52	100,12	100,05	98,91	92,43	89,82	86,18	82,62	80,1	77,92	73,7
SPRING GROVE	Mooi	139,46	81,52	100,36	101,08	100,36	96,40	93,88	92,16	85,06	76,84	67,6	57,6	52,42	47,45
STERKFONTein		2616,90	94,28	94,28	94,91	95,97	96,17	95,76	95,51	95,23	94,78	94,63	94,5	94,25	93,9
WAGENDRIFT	Boesmans	55,90	102,25	101,50	102,63	100,75	100,64	100,27	100,18	100,09	96,69	90,38	83,8	81,65	80,7
WOODSTOCK	uThugela	373,25	71,76	98,60	99,77	95,55	96,23	96,69	96,30	95,85	93,52	92,62	89,7	94,25	89,18
ZAATHOEK	Slang	184,63	89,78	92,95	98,98	100,21	98,66	96,69	94,44	91,42	88,76	86,67	82,4	80,86	77,27
Total Capacity (x 100000 m cub)		4802,20	2439,52	2828,50	3025,39	3131,03	3169,45	3131,03	3044,59	2996,57	2924,54	2919,74	2722,85	2698,84	2655,62
Percentage		100,00	50,80	58,90	63,00	65,20	66,00	65,20	63,40	62,40	60,9	60,8	56,7	56,2	55,3



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# Rainfall



- The following weather stations have received less rainfall than the long term average for December 2018:
- Makhathini
- Mandini
- Mt Edgecombe
- Margate
- Ladysmith
- Mooi River
- Greytown
- Ixopo
- Kokstad
- Paddock
- Cedara
- Since 2012 we have been in a dry spell





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# Rainfall

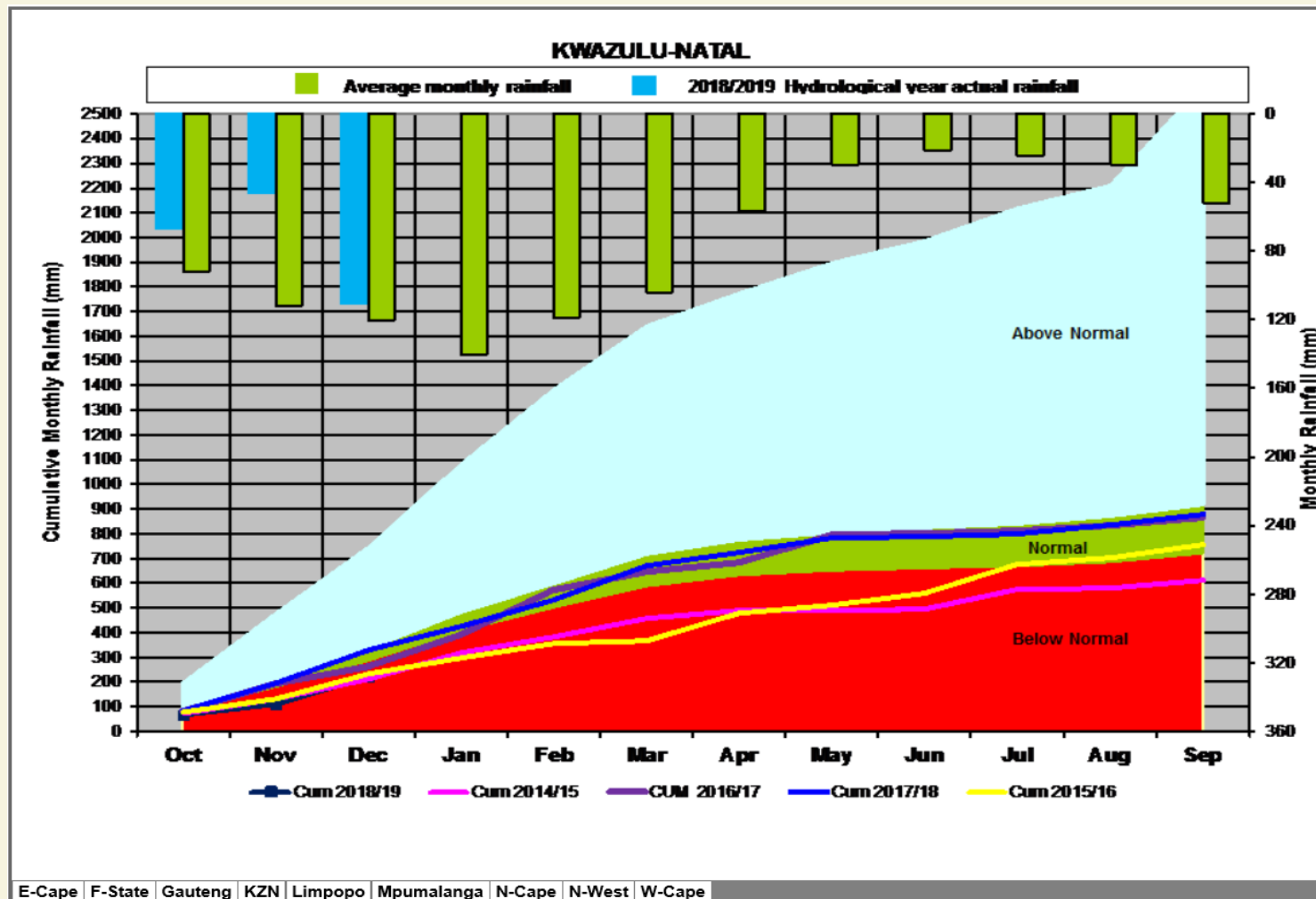


- The following weather stations have received less rainfall than the long term average for January 2019:
- Cedara: 37%
- Estcourt: 51%
- Royal National: 51%



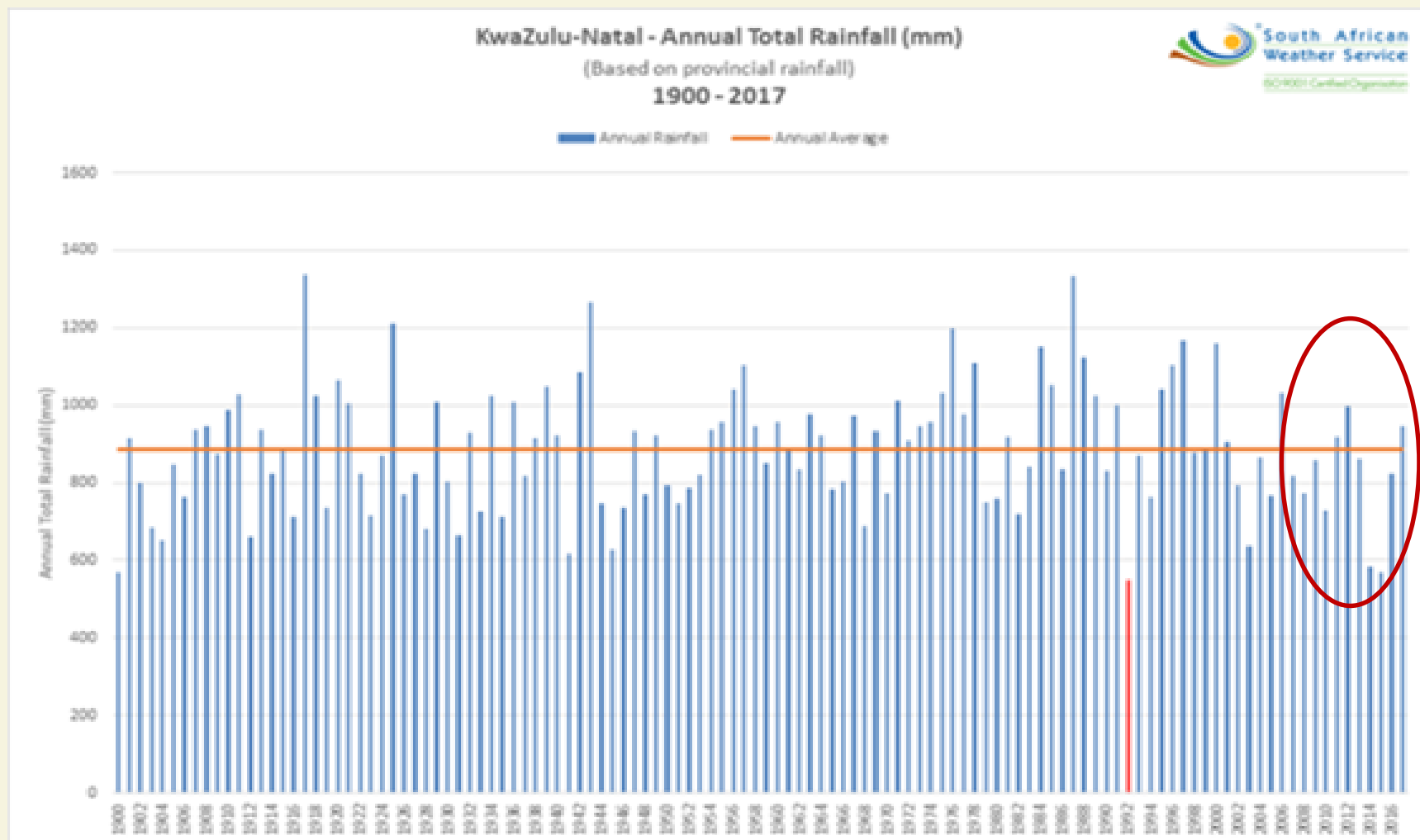
# Rainfall trends from 2014/15 to 2017/18/19

Ref.: DWS



# SAWS Rainfall Graph – 1900 to 2017

(Ref. DWS presentation 15 November 2018)





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# DROUGHT

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# Drought Monitoring

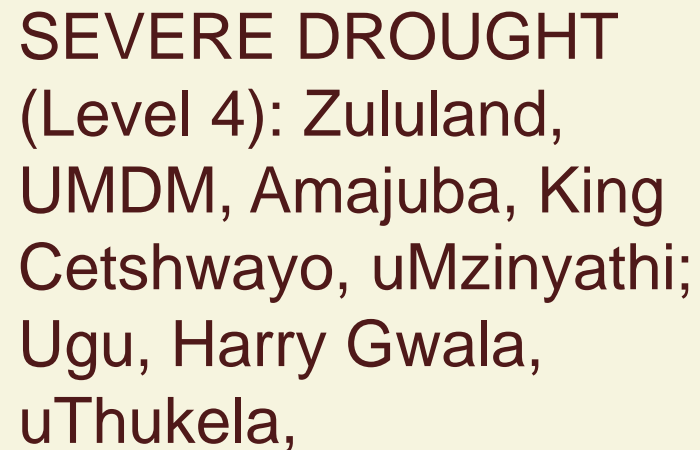
- ◉ Drought is Monitored by using Indicators
- ◉ Indicators are based on meteorological and hydrological variables, such as:
  - precipitation,
  - stream flows,
  - soil moisture,
  - reservoir storage, and
  - groundwater levels



# Drought Monitor Levels



Drought Level	Index		Description	Objective	Target
Normal	1	<1	Sufficient water to meet human and ecosystem needs	Normal	Ongoing reductions in community water wastage
Drought Advisory	2	1.1 – 1.9	1 <sup>st</sup> indications of a potential water supply problem	Voluntary conservation	Minimum 10% reduction
Minor Drought	3	2.0 – 2.9	Potentially serious ecosystem or socioeconomic impacts	Voluntary conservation and restrictions	Minimum additional 20% reduction
Severe Drought	4	3.0 – 3.9	Water supply insufficient to meet socio-economic and ecosystem needs	Voluntary conservation, restrictions and regulatory response	Maximum reduction of use
Emergency Drought	5	>4.0	Loss of Supply - loss of a community's potable or fire fighting supply	Emergency response	Ensure health and safety



## MINOR DROUGHT (Level 3): uMkhanyakude, eThekweni, iLembe





# IMPACT: DROUGHT



- **Status of drought in your respective provinces,**
  - Severe
- **Current conditions and impact,**
  - Veld green but no bulk
  - Crops in many areas are water stressed
  - Livestock in a fair to poor condition
- **Intervention measures by the province,**
  - Currently nothing
- **Possible needs,**
  - Water supply
  - Feed for winter
- **Extraordinary measures which may be implemented to remedy the situation (e.g. regulations on water restrictions, veld/livestock ratio etc.),**
  - Water is still being tankered in communal areas
  - Farmers **MUST** consider reducing livestock numbers to the feed/fodder available



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# FORECAST

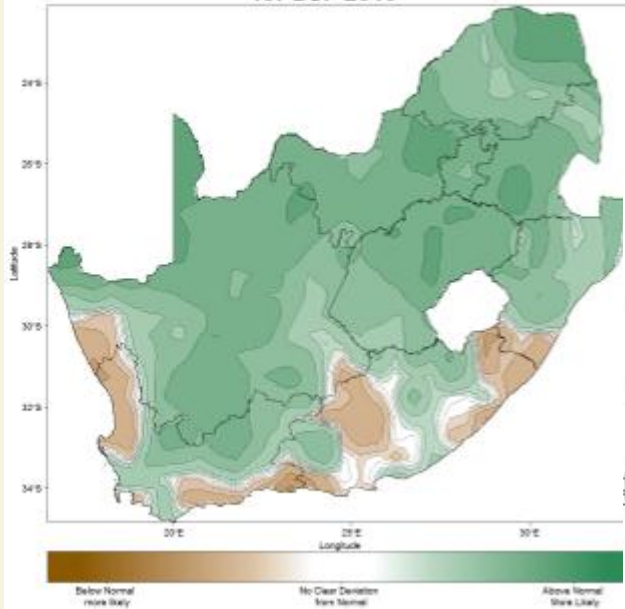
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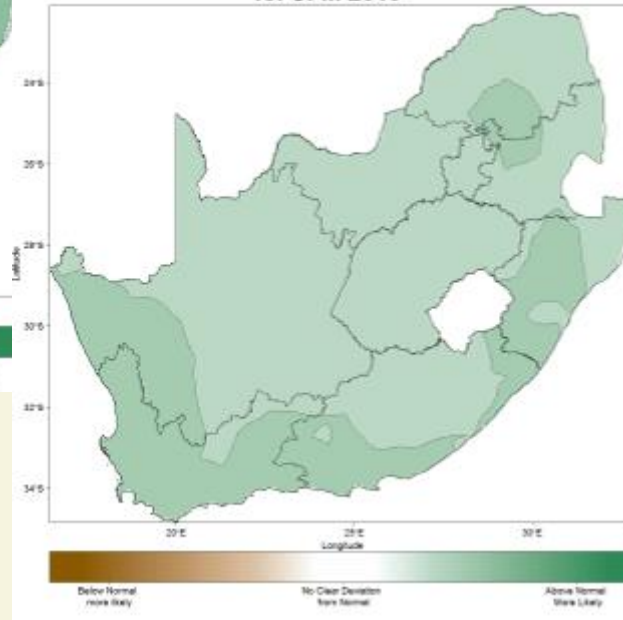


# Seasonal Forecast: Precipitation

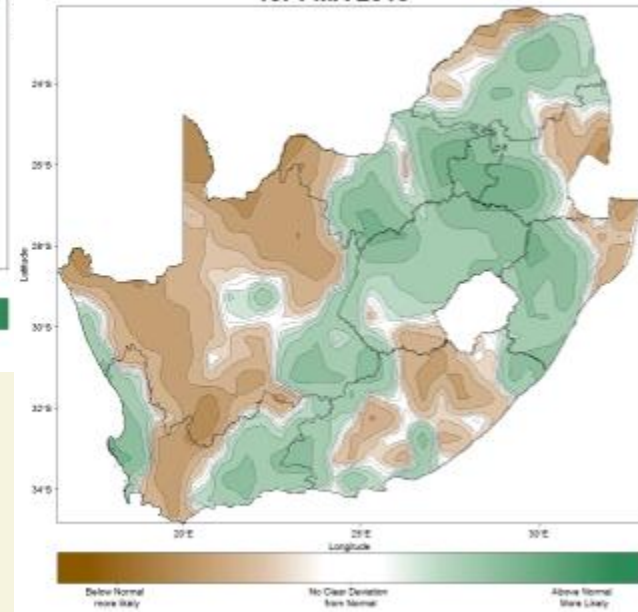
Expected Precipitation Conditions  
for DJF 2019



Expected Precipitation Conditions  
for JFM 2019

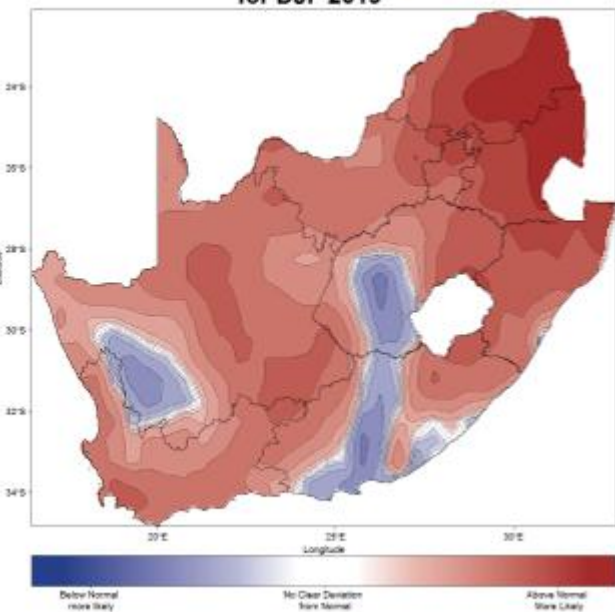


Expected Precipitation Conditions  
for FMA 2019

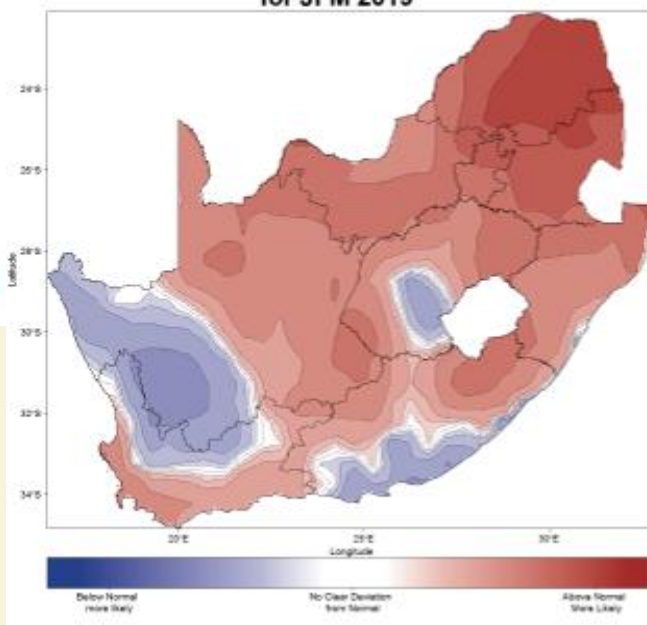


# Seasonal Forecast: Minimum Temperature

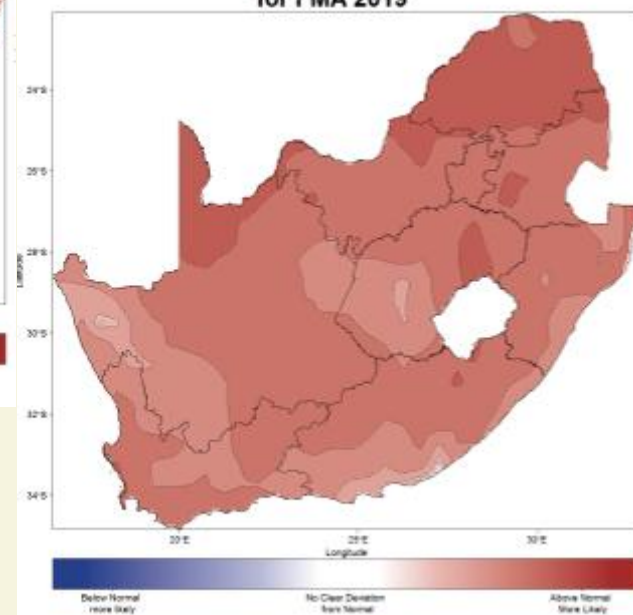
Expected Min. Temp. Conditions  
for DJF 2019



Expected Min. Temp. Conditions  
for JFM 2019



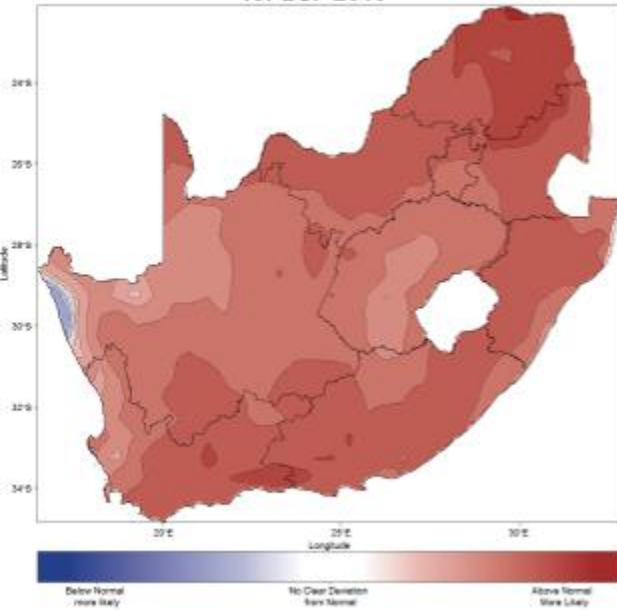
Expected Min. Temp. Conditions  
for FMA 2019



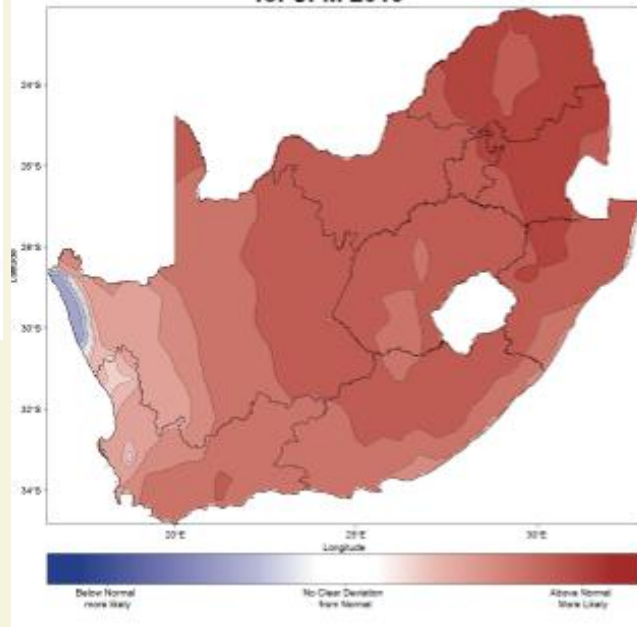


# Seasonal Forecast: Maximum Temperature

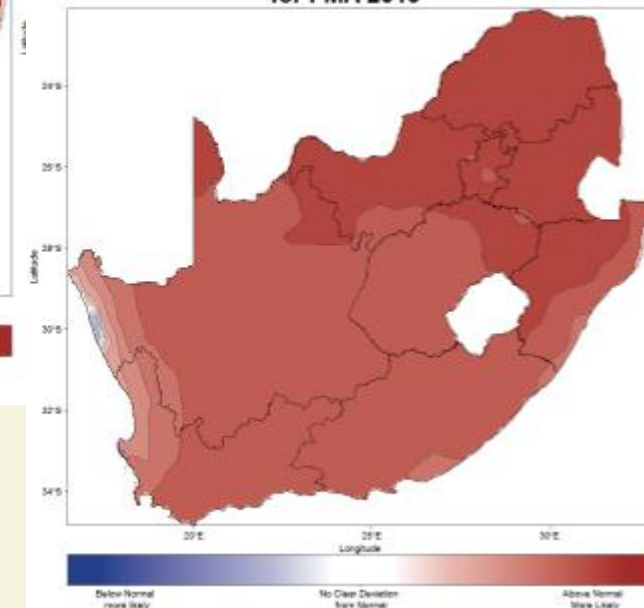
Expected Max. Temp. Conditions  
for DJF 2019



Expected Max. Temp. Conditions  
for JFM 2019



Expected Max. Temp. Conditions  
for FMA 2019





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# FIRES

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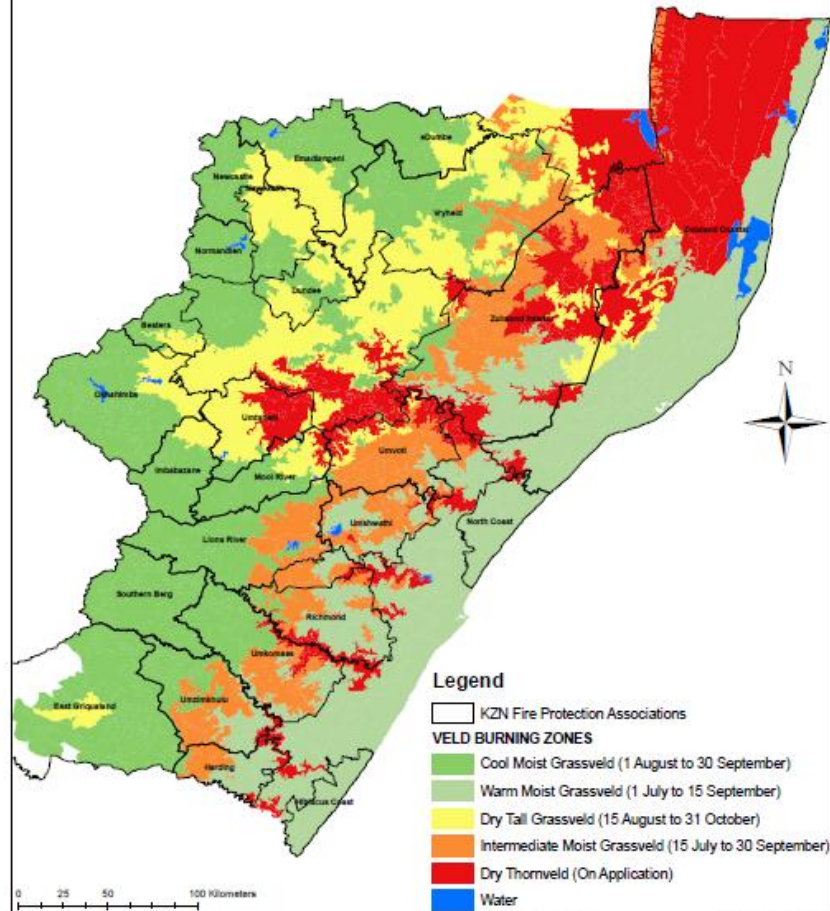


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## KWAZULU-NATAL VELD BURNING ZONES



### Legend

KZN Fire Protection Associations

#### VELD BURNING ZONES

- Cool Moist Grassveld (1 August to 30 September)
- Warm Moist Grassveld (1 July to 15 September)
- Dry Tall Grassveld (15 August to 31 October)
- Intermediate Moist Grassveld (15 July to 30 September)
- Dry Thornveld (On Application)
- Water



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Prepared by: Cobus Botha  
Natural Resources Section  
Cedara  
DARD  
033 3559391  
Cobus.Botha@kzndard.gov.za

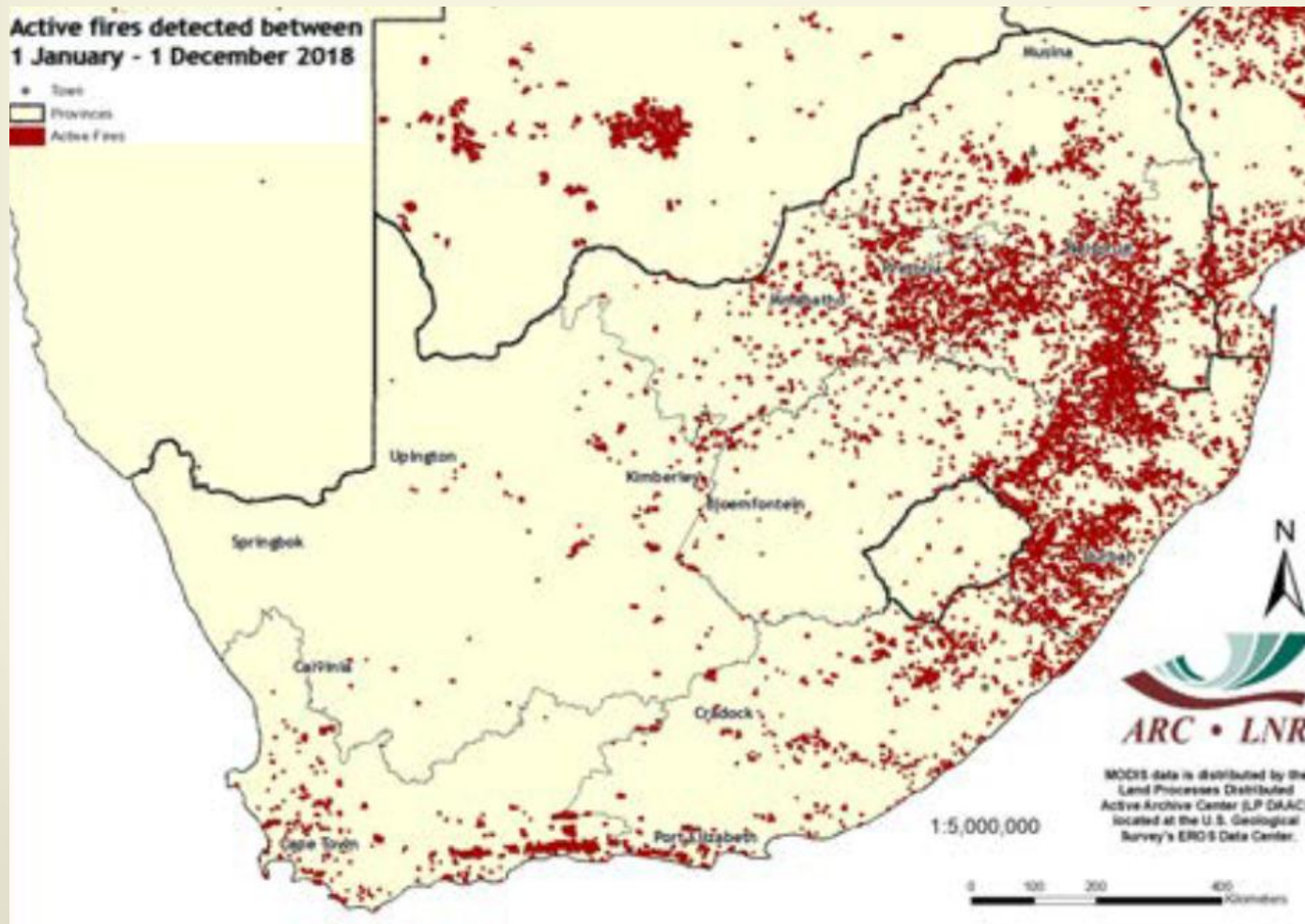
Date: 12/09/2017

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# Active Fires from January to December 2018





# Fire Impact 2018



- During December, KZN had fewer fires than the average.
- However, for the 2018 year, KZN experienced the highest number of fires of all the provinces, being significantly higher than the average.
- Most fires occurred over Amajuba, Uthukela, Umgungundlovu, Ugu and Harry Gwala districts.



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# LIVESTOCK

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# IMPACT: LIVESTOCK



- ◉ Livestock condition is deteriorating although is still variable in those areas where veld has been depleted.
- ◉ Uthukela District, specifically Okhahlamba: livestock losses from lack of grazing and water.
- ◉ Other badly affected areas: Amajuba, Umzinyathi and Harry Gwala.





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# IMPACT: LIVESTOCK



## Number of households owning cattle



South Africa







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# VELD

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# IMPACT: VELD



- ◉ The countryside in general remains very variable depending on rains and heat units received.
- ◉ There are only two months left of the growing season.
- ◉ NDVI indicate growth however require bulk.

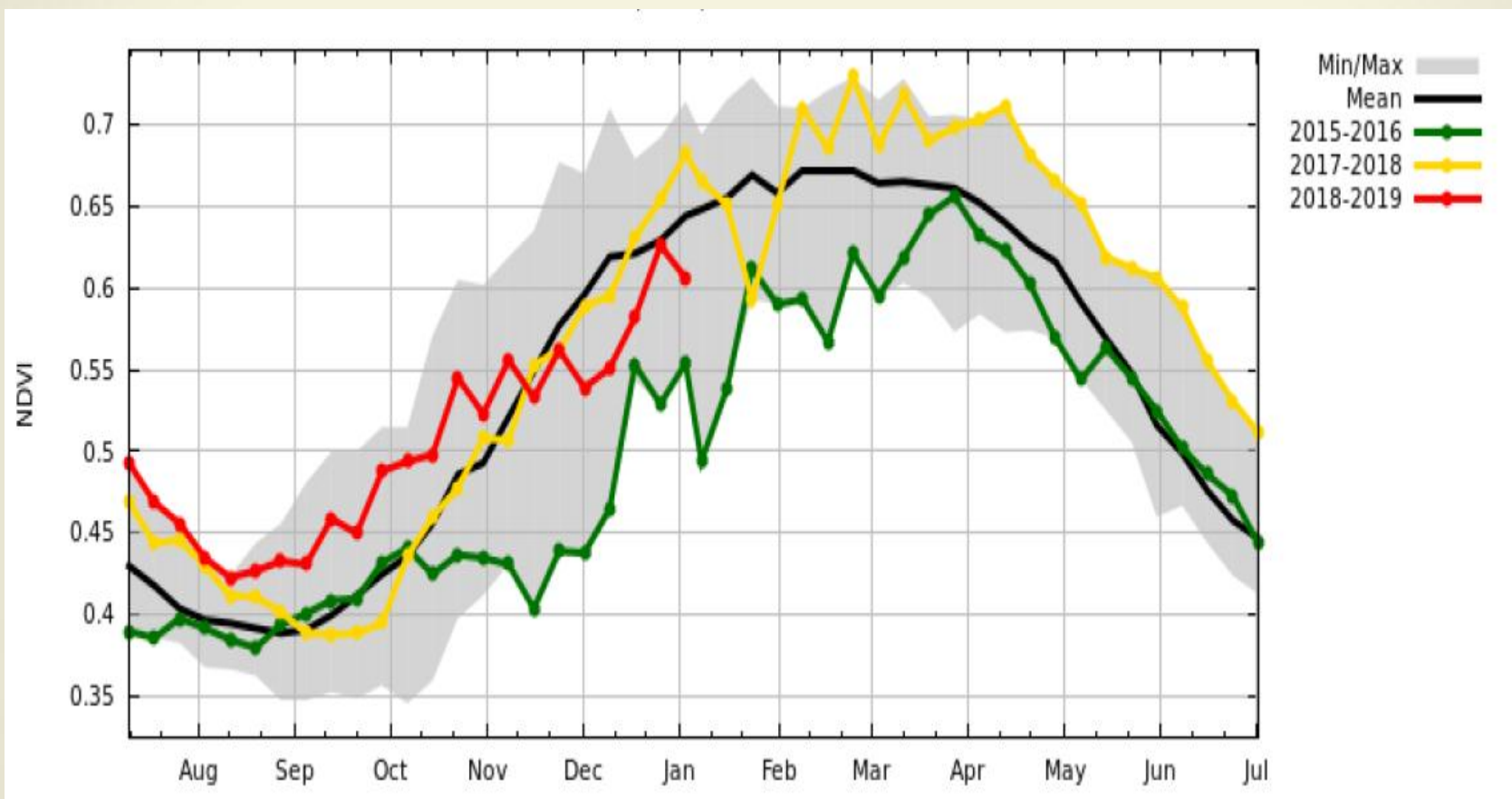


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# NDVI

NDVI basically measures the amount of  
green foliage available



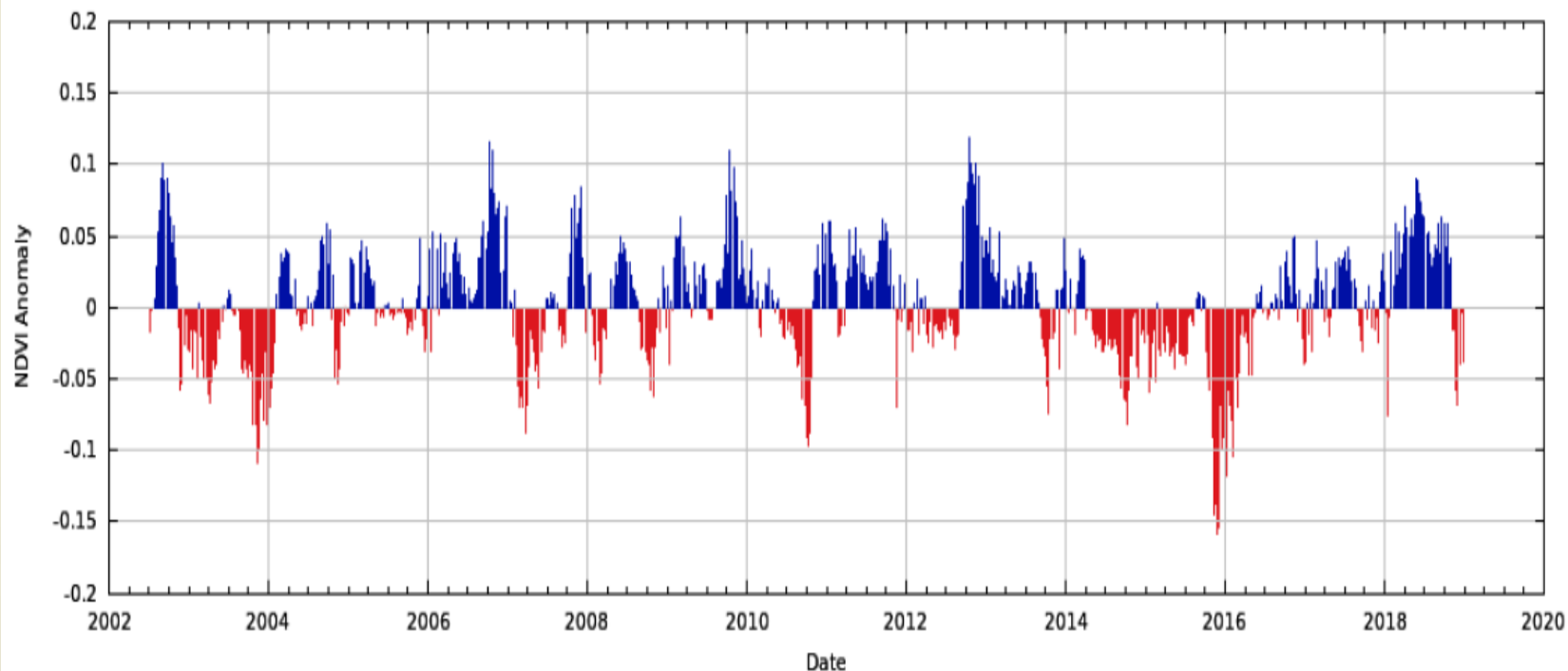


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# KwaZulu-Natal NDVI deviation from normal





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# PASTURES & CROPS

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# IMPACT: PASTURES AND CROPS



- **Summer pastures:**
- No significant improvement since the beginning of the summer season due to the hot, dry conditions and heat waves.
- Irrigated pastures and higher rainfall areas are developing bulk slowly.
- There are only two months of the summer growing season left.





# IMPACT: PASTURES AND CROPS



- ◉ **Summer crops:**
- ◉ Plantings for summer crops such as maize for grain and silage, as well as soya are complete.
- ◉ Many areas have been affected by hail and the opposite extreme of no precipitation – Okhahlamba, Mpofana, Magut, Richmond, Pongola, Jozini and Umvoti where complete loss of crops occurred. (Maize and vegetables.)



# IMPACT: PASTURES AND CROPS



- ◉ **Summer crops:**
- ◉ Irrigation dams are running dry.
- ◉ Many farm irrigation dams are heavily silted and therefore do not have the capacity high-tech pivot irrigation systems were designed for.
- ◉ Crops especially in the Loskop area are suffering from drought





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# INCIDENTS

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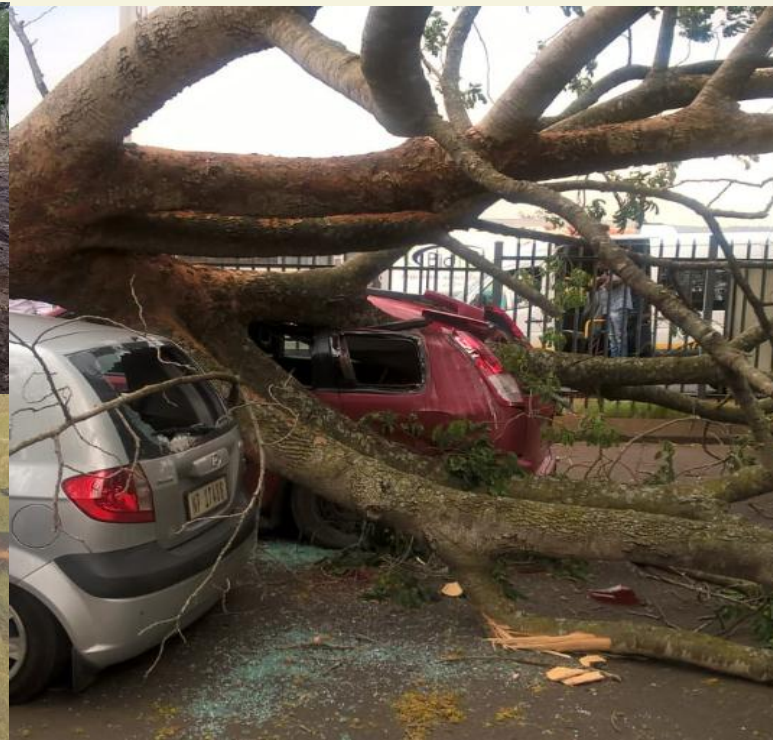




# IMPACT: INCIDENTS



- ◉ **Weather-related incidents:** many farmers have experienced crop losses due to either hail damage or lack of rainfall and/or irrigation
- ◉ As mentioned, some livestock has been killed by lightning.
  - Livestock losses due to lightning has been reported in Nkandla and Jozini
  - Storm damage in Umgungundlovu





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# PESTS & DISEASES

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# IMPACT: PESTS & DISEASES



- **Fall Army Worm:** has been detected on Cedara. The affected areas have been sprayed and daily scouting is occurring.
- FAW is affecting mainly late-planted maize and all farmers are advised to monitor their crops daily.



# SUMMARY



## SUMMER rainfall region

- The previous summer rainfall season received below-normal rainfall over some agricultural important areas
- The rainfall so far, has been below-normal
- Above-normal warm conditions occurred over most areas
- Biomass is relatively low over parts of the summer rainfall region as the previous summer rainfall season received below-normal rainfall over large parts.



# SUMMARY



## SUMMER rainfall region

- December 2018 and January 2019 were characterised by hot, dry conditions (heat waves) with intermittent thunderstorms and a few misty-drizzle days.
- These storms caused damage/losses to livestock, crops, dwellings and infrastructure.
- The KZN dam levels are decreasing daily instead of increasing due to below-normal rainfall, little to no run-off reaching these dams, high demand and evaporation.
- Vegetation, be it veld, crops or pastures have not had favourable conditions for healthy growth and accumulation of bulk ahead of the winter season.
- Livestock condition is therefore not good and destocking is recommended.



## agriculture & rural development

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Department:  
agriculture  
& rural development  
**PROVINCE OF KWAZULU-NATAL**



# Thank you