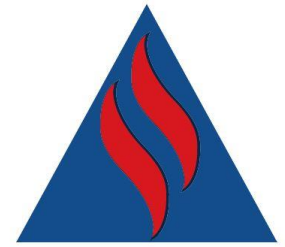




**Western Cape
Government**



FPASA

FIRE PROTECTION ASSOCIATION
OF SOUTHERN AFRICA

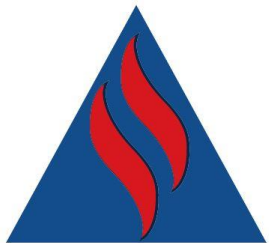
IMPACT OF EXTREME WATER SCARCITY ON FIRE FIGHTING PROTECTION SYSTEMS IN THE WESTERN CAPE PROVINCE

Prepared and Presented by:

Collin Deiner

Provincial Disaster Management Centre Head (PDMC)

Western Cape Province



FPASA

FIRE PROTECTION ASSOCIATION
OF SOUTHERN AFRICA

InFIReS 2018

Contents

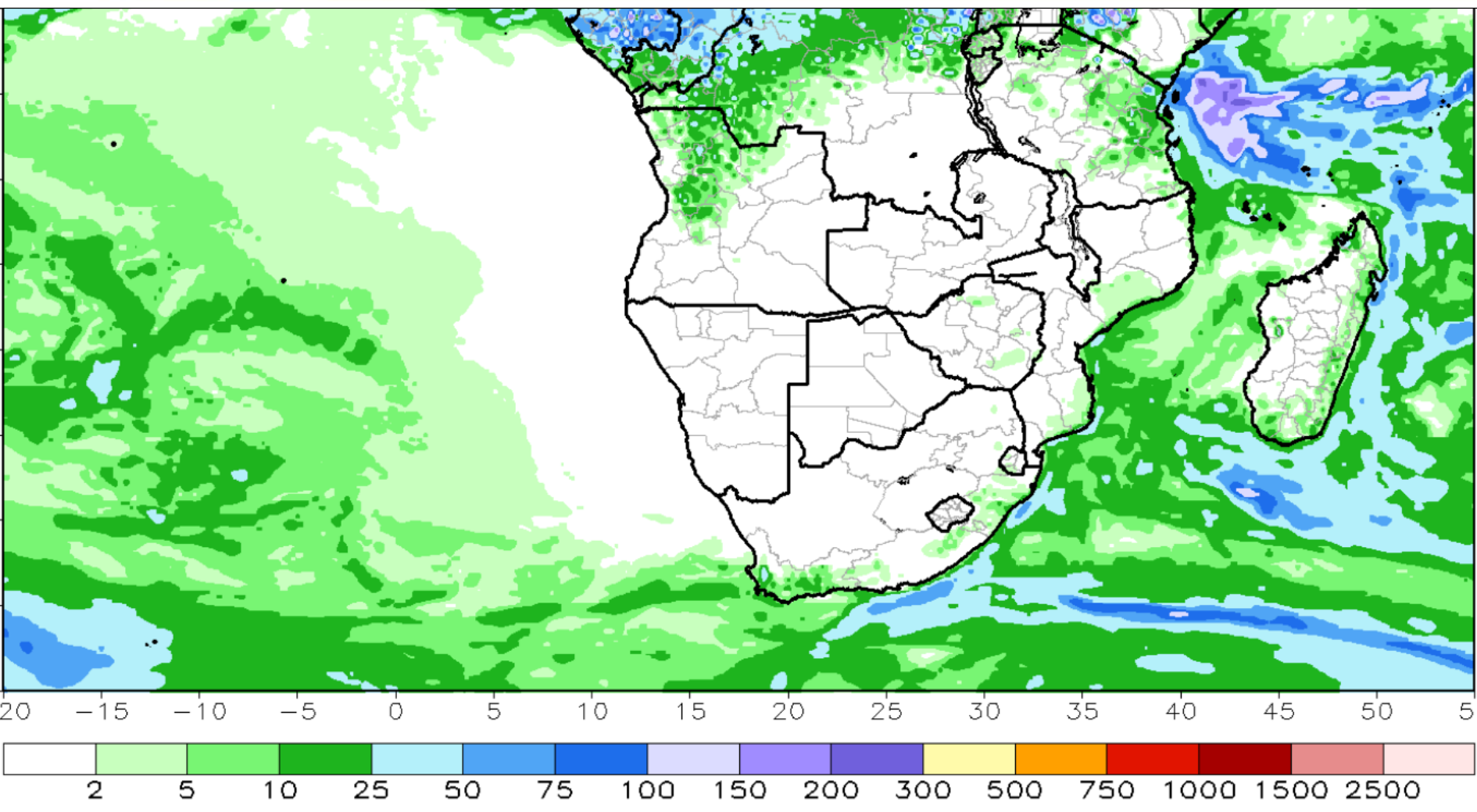
- Introduction
- Fire Disasters in the Western Cape 2017/18
- Fire Protection
 - Background
 - Fire Services: Strategies & Tactics
 - Fire Services: General Drought Response
 - Fire Services: Wildfire Operations
 - Implications for Insurance

Introduction

- There is scientific consensus that the Western Cape will become relatively drier as climate systems adjust with climate change driven by global warming.
- This will most likely see the southward (pole ward) shift of the westerly winds which will block the movement of cold fronts onto the Southern African peninsula, thereby reducing rainfall on the region.
- There is no significant indication that increased rainfall activities will occur during the summer (June-July-Aug) season for the south western parts of the country.
- Temperatures are expected to be largely above normal for most parts of the country during the spring and early summer periods.
- **We need 3 to 4 years of good rainfall to return to a normal situation**

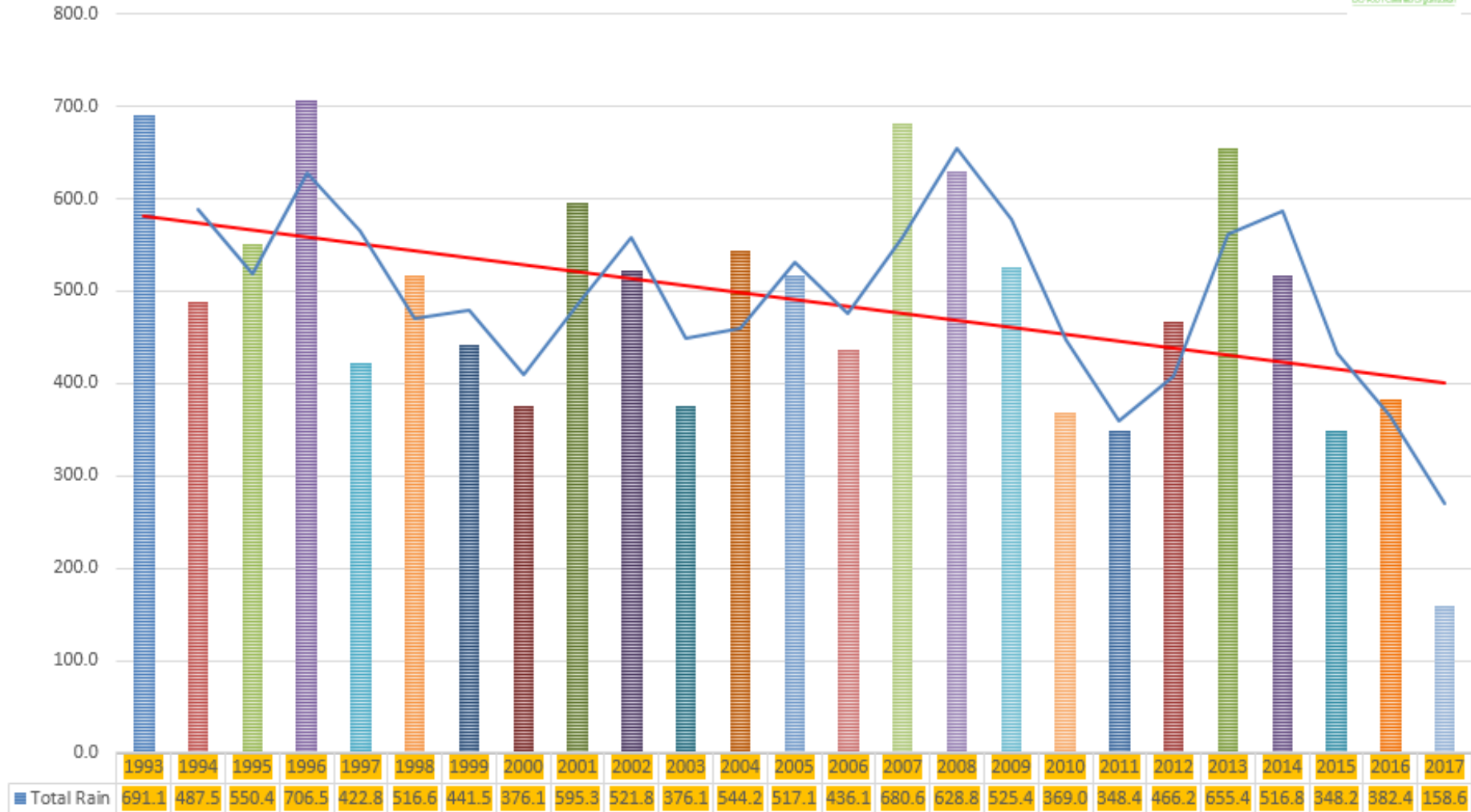
GFS week1 Total Rainfall (mm)

Ending: 18z31May2017

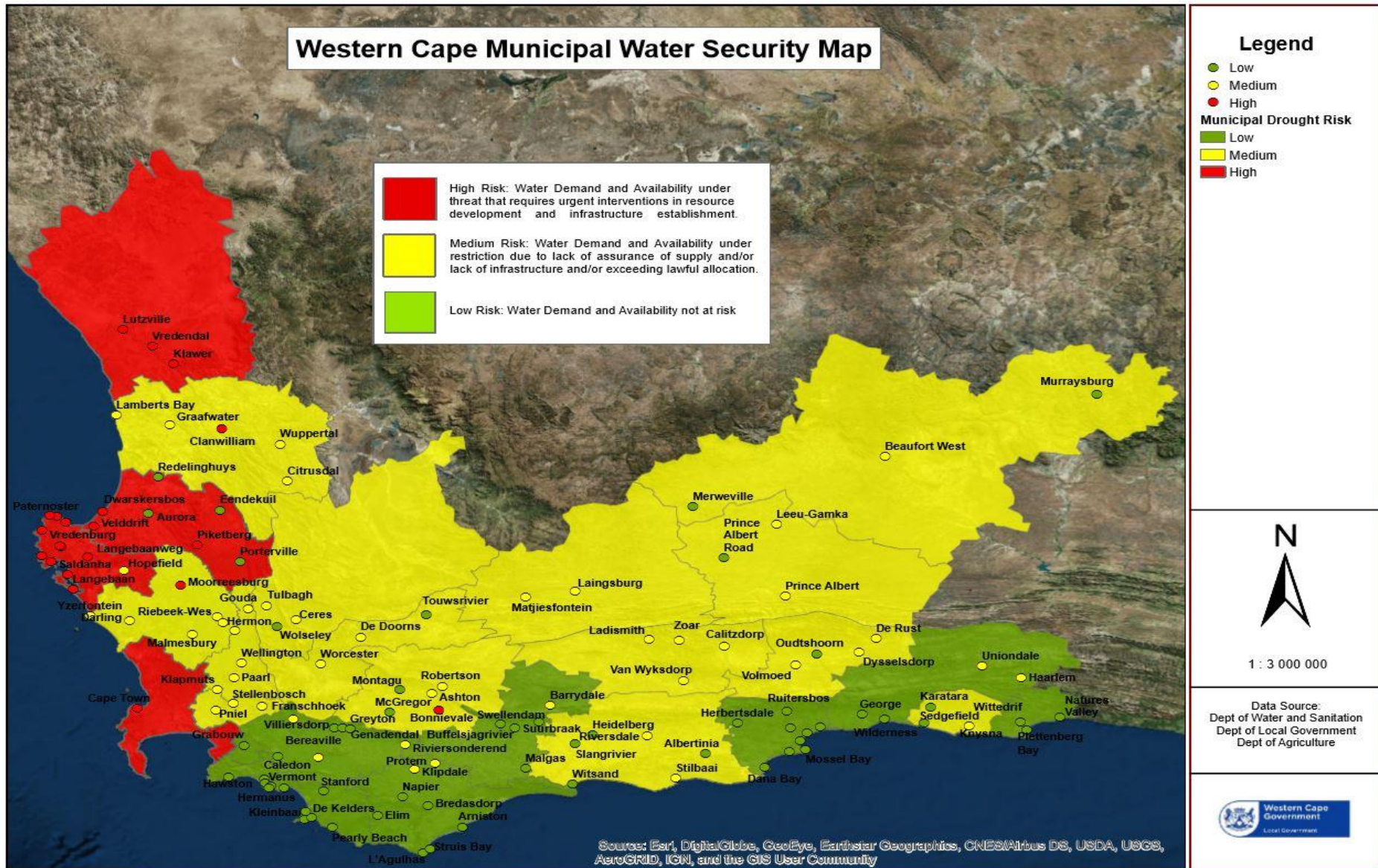


Annual Rainfall figures for Cape Town Weather Office: 1993 till current.

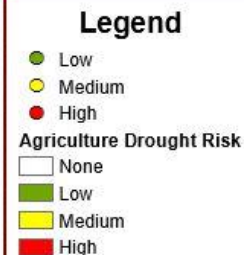
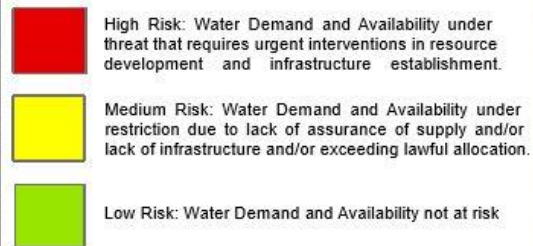
CAPE TOWN WEATHER OFFICE CLIMATE #: 0021178A3
ANNUAL RAINFALL IN MILLIMETERS



Municipal and Town Water Security



Western Cape Agriculture Water Security Map



1 : 3 000 000

Data Source:
Dept of Water and Sanitation
Dept of Local Government
Dept of Agriculture



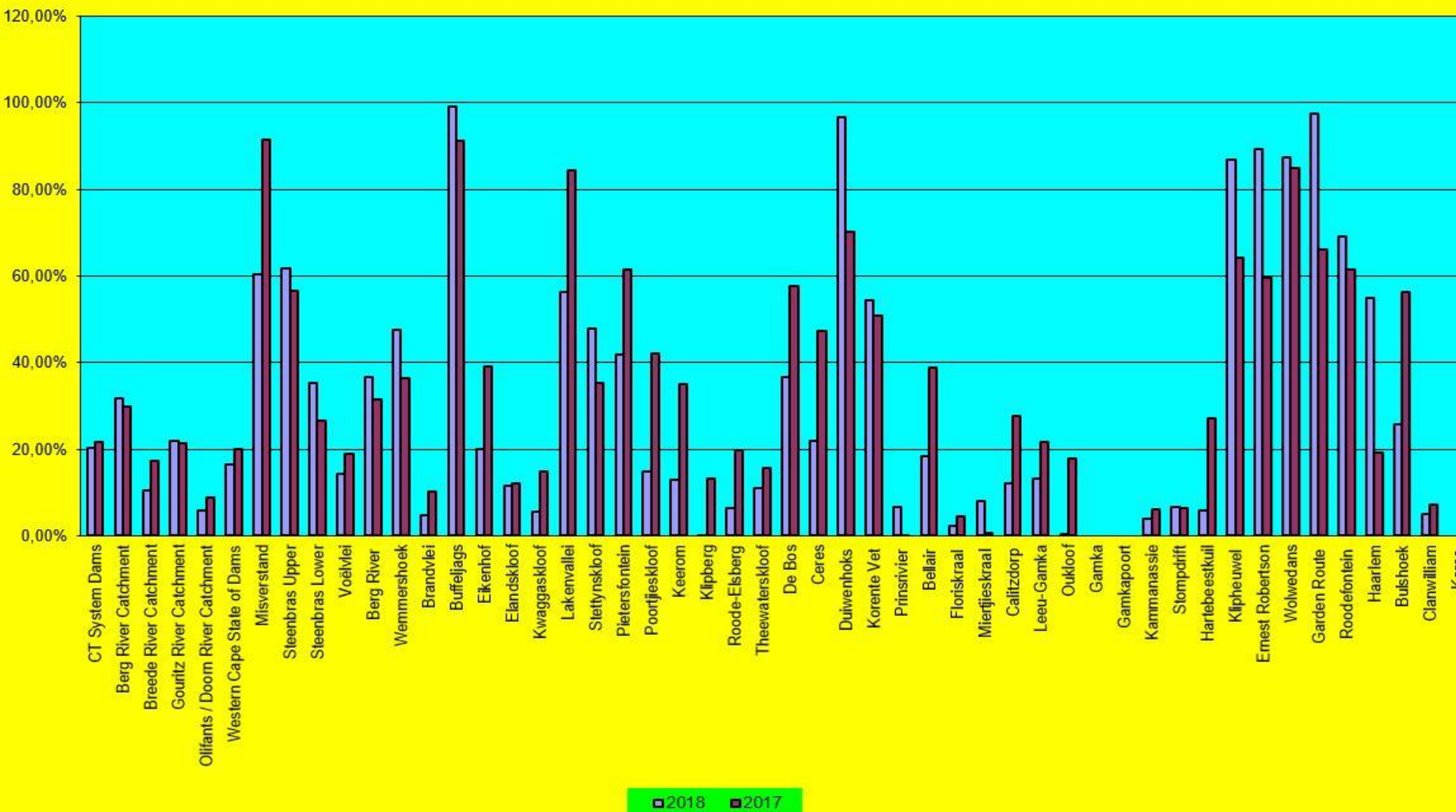
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



WESTERN CAPE DAM LEVELS

COMPILED ON: 2018/05/07 10:52

Dam	Date	Gauge Plate Reading (m)	Rainfall for the last 7 days (mm)	% Full This Week	% Full Last Week	% Full Last Year	Discharge (m³/s)	RL (m)	Area (Ha)	Full Storage Capacity (Nett x 10 ⁶ m³)	Nett Volume This Week (x10 ⁶ m³)
Cape Town System Dams Consist of : Wemmershoek-; Voëlvlei-; Steenbras Upper and Lower- ; Theewaterskloof Dam and Berg River Dam											
Cape Town System Dams (Combined)	07/05/2018	N/A	N/A	20,43	20,50	21,70	N/A	N/A	N/A	889,29	181,66
Berg River Catchment	07/05/2018	N/A	N/A	31,79	31,75	29,86	N/A	N/A	N/A	415,72	132,15
Breede River Catchment	07/05/2018	N/A	N/A	10,45	10,49	17,21	N/A	N/A	N/A	1058,26	110,57
Gouritz River Catchment	07/05/2018	N/A	N/A	22,05	22,47	21,27	N/A	N/A	N/A	268,42	59,18
Olifants / Doorn River Catchment	07/05/2018	N/A	N/A	5,76	5,55	8,88	N/A	N/A	N/A	128,24	7,39
Western Cape State of Dams	07/05/2018	N/A	N/A	16,53	16,60	20,03	N/A	N/A	N/A	1870,64	309,28



Longer Term Climate Outlook

- More frequent severe weather events
- Increases in temperature in many regions and resulting changes in precipitation patterns
- Estimated that by 2050, rainfall in the Western Cape is likely to have **decreased by 30%**
- More flooding events → less infiltration and recharge of ground water.
- Quality of the water resource, as impacted on by human activities, becomes even more important
- More fires and droughts → poorer water quality (erosion)



Western Cape Climate Change Response Strategy and Action Plan

Fire Disasters in the Western Cape



Western Cape
Government



FPASA

FIRE PROTECTION ASSOCIATION
OF SOUTHERN AFRICA

Fire Disasters in the Western Cape

- The **Western Cape** is generally regarded as the most disaster prone province if the recent major incidents that have befallen us is any indication.
- Not only does the Province have to cope with the **protracted drought** which is currently ravaging us, we were also hit with **severe weather (storm)** which caused unmeasurable damage, so much so that a decision was made to close schools. On the back of the storm, **fires broke out in Bitou and Knysna** which affected the environment, agricultural sector, formal and informal housing and municipal infrastructure.
- Fires also occurred in **Imizamo Yethu, Hout Bay** where a number of people were displaced and led to loss of live. **Swarthland Hospital in Malmesbury** was also damaged due to a separate fire.

Imizamo Yethu (Hout Bay) Fire

11 MARCH 2017

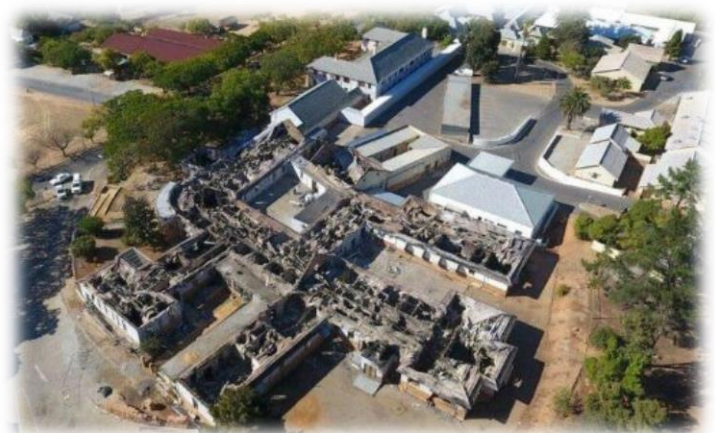
- Four fatalities;
- 2194 structures destroyed;
- 97 000 people displaced;
- Massive electrical, water and sanitation infrastructure damage.



Swartland Hospital Fire

18 MARCH 2017

- The fire was caused when a sub-contractor was working on the roof installing the “torch on” the bitumen based waterproofing.
- The extent of the fire damage covers approximately an area of 2,500m²;
- The buildings and everything inside was destroyed.
- **Damage of approximately R118 871 586** was incurred which included infrastructure, major and minor equipment, ICT infrastructure and linen.



Garden Route Fire

6 – 11 JUNE 2017

- Knysna/Bitou municipalities worst affected;
- 973 homes destroyed (560 houses damaged);
- Initial 2 600 people displaced;
- More than 2 000 permanent and part-time jobs affected;
- Extensive municipal infrastructure damages; and
- 15 700 ha of pineland plantations/ environment destroyed.



Fire Protection



Western Cape
Government



FPASA

FIRE PROTECTION ASSOCIATION
OF SOUTHERN AFRICA

Background (1)

- Water: Prime medium for most Firefighting operations (Both Urban & Rural)
- Water pressure & flow reduction also impact design criteria and features of certain passive fixed fire suppression & smoke control systems
 - In most cases based on a specific flow & pressure
 - Almost exclusively provided by municipalities
- High risk occupancies: Independent or “Duplicate” supply required
 - Size & volume generally determined by risk category
- New Buildings
 - Still subject to NBR, SANS Codes & Local By-Laws.
 - Due to water pressure no longer being guaranteed by municipality or AHJ requires developers to submit rational design i.t.o water supply.
 - Developers still “Deemed to satisfy” requirements of Sec. T & W (SANS 10400)
 - System must be designed to provide required level of fire protection.

Background (2)

- Most chemical firefighting agents & additives - water dependant (wetting agents, surfactants, foam).
- Dry- & inert gas chemical agents are not water dependant – limited & specific application.
- Water reticulation systems in municipal areas are integrated (No separate systems feeding hydrants etc) – Potable water used for fire suppression.

Fire Services: Strategies & Tactics

- Fire Services are acutely aware of the challenges & have adapted their operational procedures accordingly.
- Strategies & tactics are implemented based on the exigencies of the incident.
- Increasing Pre-determined Attendance
- Increasing Weight & Speed of response in areas where water supply challenges are expected: More resources in a shorter space of time (e.g. additional tankers to compensate for anticipated challenges).
- More focus on mode of attack (Defensive vs offensive)
- Using non-potable water where possible.

Fire Services: General Drought Response

- Standard hydrant & equipment test reduced to absolute minimum
- Training exercises replaced by “dry drills”.
- Fire Stations aligning to general water saving measures;
 - Installing “jojo” tanks;
 - Fitting demand management devices for domestic station use;
 - Water saving practices
- City of Cape Town: Acquired six (6) Vacuum Tankers to access grey water.
- Boreholes used to replenish water tanks.
- Fire prevention & early detection therefore becomes paramount in avoiding major losses. Good awareness promoting good housekeeping becomes more important than ever.

Fire Services: Wildfire Operations

- Bigger focus on rapid aerial attack: Maximum early response informed by Fire Danger Index & AFIS.
 - First hour response implemented in 2014
 - Increased number of aircraft, runways.
 - Specialised ground attack teams introduced in 2016.
- More defensive operations in rural/low risk areas.
- Use of non-potable water/sea water (higher risk of contamination & engine damage)

Implications for Insurance

- Inability of Municipalities to guarantee uninterrupted water supply brings high levels of uncertainty around fire risk protection and raises insurance risk about normal tolerance levels.
- Concerns have been raised by
 - South African Insurance Association (SAIA)
 - FPASA
 - ASIB
- City planning for “Day Zero”
 - Day Zero = 13.5% water availability.
 - Water to Hospitals, Commercial Centre, Informal Settlements to remain on.
- Major Hazard Installations (Koeberg, Chevron, PetroSA, CTIA) have dedicated water supplies (Further measures afoot to augment CTIA).
- COCT currently obtaining legal opinion on issue of water supply for firefighting – Onus still on the risk owner to ensure adequate insurance
- Businesses/property owners should engage their insurers on this issue

Thank you

