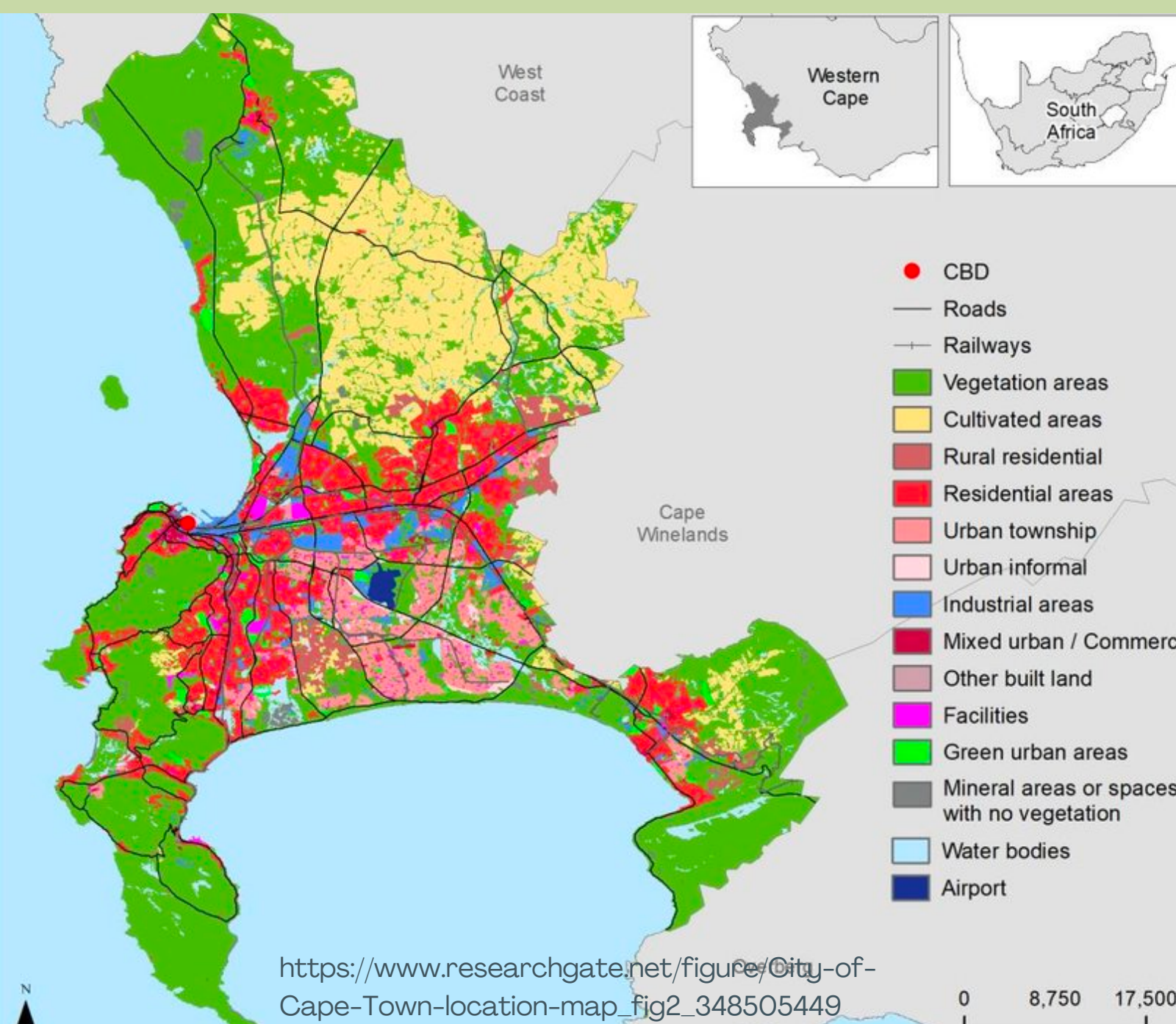


# WATER STRATEGIES

# CAPETOWN

## MAP OF CAPE TOWN



## THE ISSUE

A water crisis in the City of Cape Town, potentially leading to "Day Zero"



Figure 1: Gamka Dam is Bone Dry

<https://www.timeslive.co.za/news/south-africa/2018-01-27-cape-town-does-indeed-have-water-plan-sahrc/>

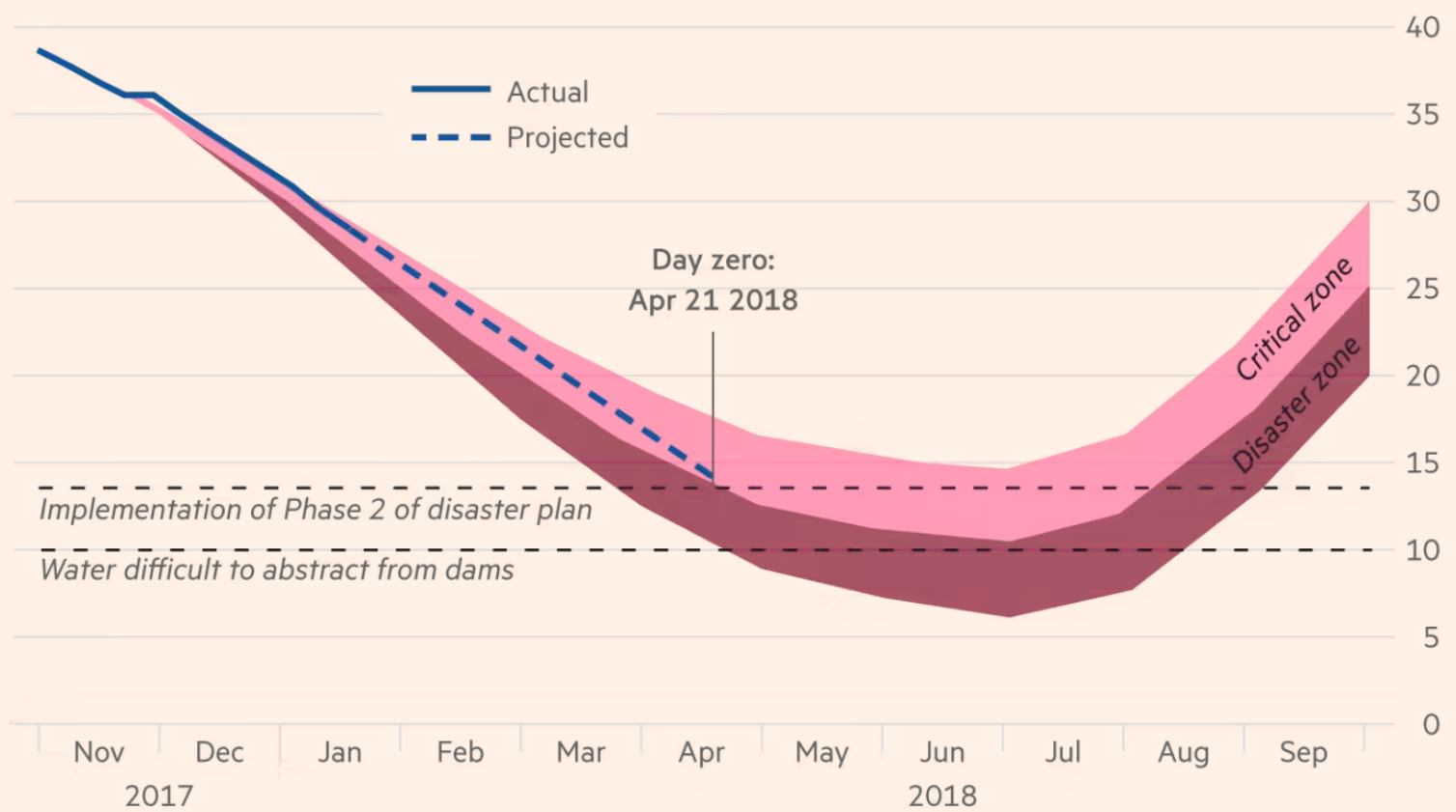


# COUNTDOWN TO "DAY ZERO"

Figure 2: Countdown to Day Zero

## Countdown to Day Zero

Western Cape water supply system weekly dam drawdown tracker, supply (%)



Critical zone = partial compliance with Department of Water and Sanitation restrictions, normal evaporation, winter rainfall same as for 2017  
Failure zone = inadequate compliance with Department of Water and Sanitation restrictions maximum evaporation, winter rainfall same as for 2017  
Source: City of Cape Town  
© FT

<https://www.ft.com/content/8a438352-fc76-11e7-a492-2c9be7f3120a>

## WHAT IS IT?

Day Zero for Cape Town was defined as a situation in which all the town water reserves had less than 13.5% water left.

## WHAT DAY WAS IT SCHEDULED?

In January 2018, it was scheduled to occur on April 22nd, 2018.

## WHAT WOULD HAPPEN ON DAY ZERO?

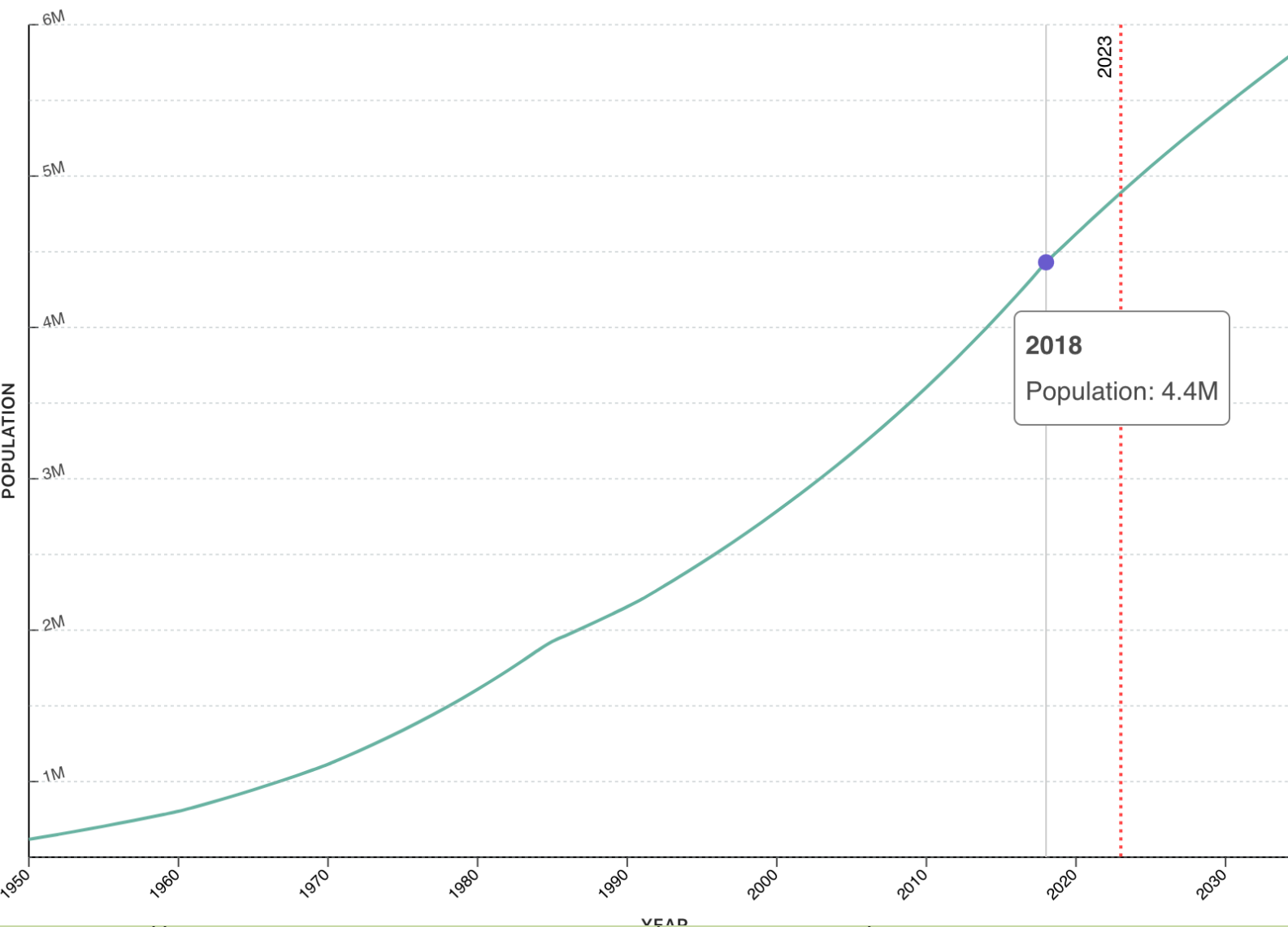
- Cape Town will be the first major city to run out of water
- The city's water supply be switched off
- Water collection points will be set up for the residents
- Residents will be limited to 25 liters of water a day

# FACTORS

## 1. POPULATION GROWTH

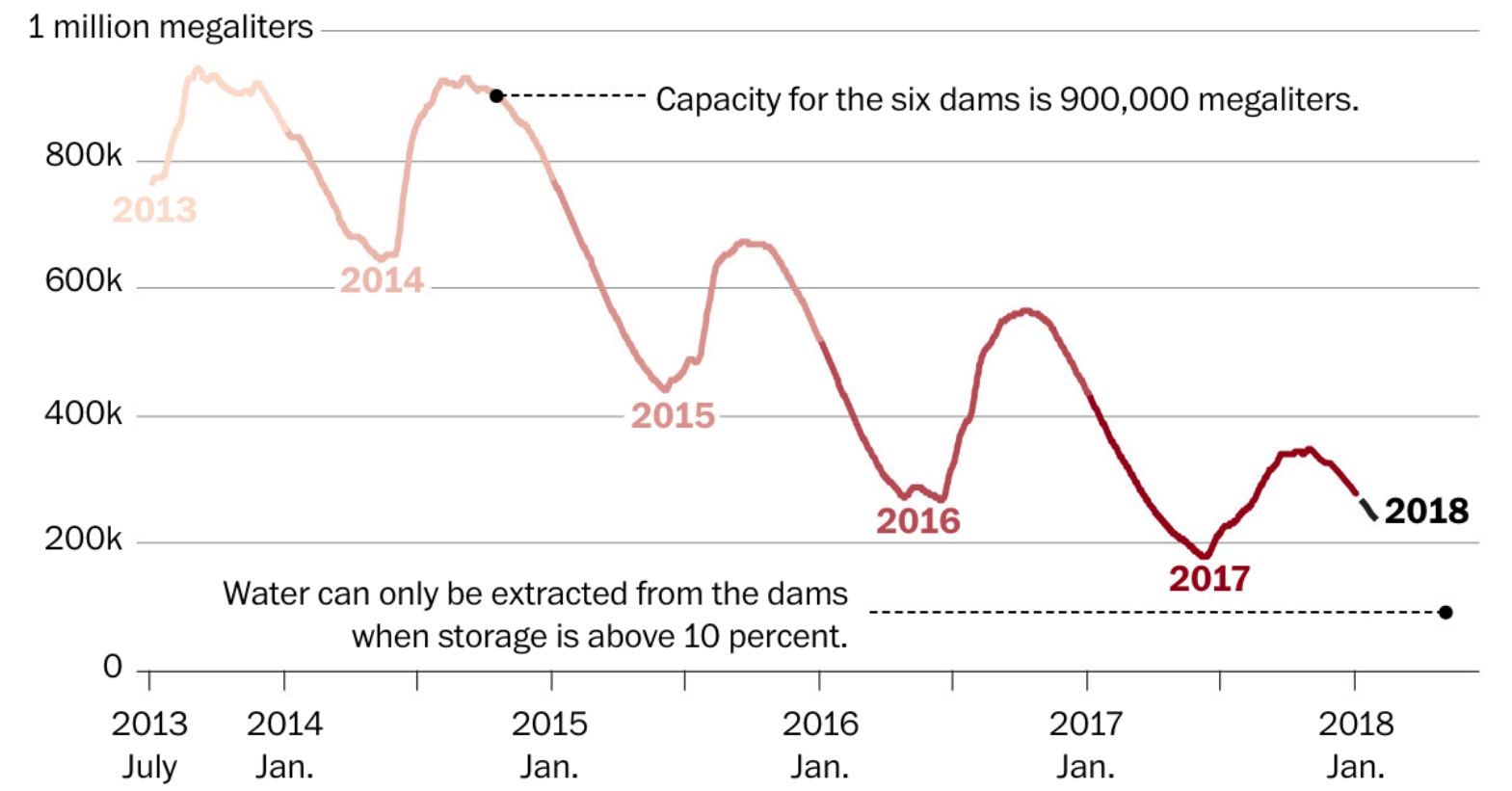
- A 71% population increase in just 20 years, whereas the dam water storage only increases by 17%. This results in an increase in water demand that exceeds the water supply.
- The risk from a tourist haven and hub for the wine industry

Figure 3: Population Growth in Cape Town



<https://worldpopulationreview.com/world-cities/cape-town-population>

Figure 4: The volume of water stored in Big six dams is on decline



<https://www.washingtonpost.com/graphics/2018/world/capetown-water-shortage/>

## 2. GOVERNMENT MISMANAGEMENT

Criticized for the lack of forward-thinking in developing new water sources and infrastructures. The slow pace of procurement, the high level of bureaucracy, and the lack of urgency from the government are factors that drove the water crisis.



### 3. SEVERE DROUGHT

Figure 5: Drought in Cape Town

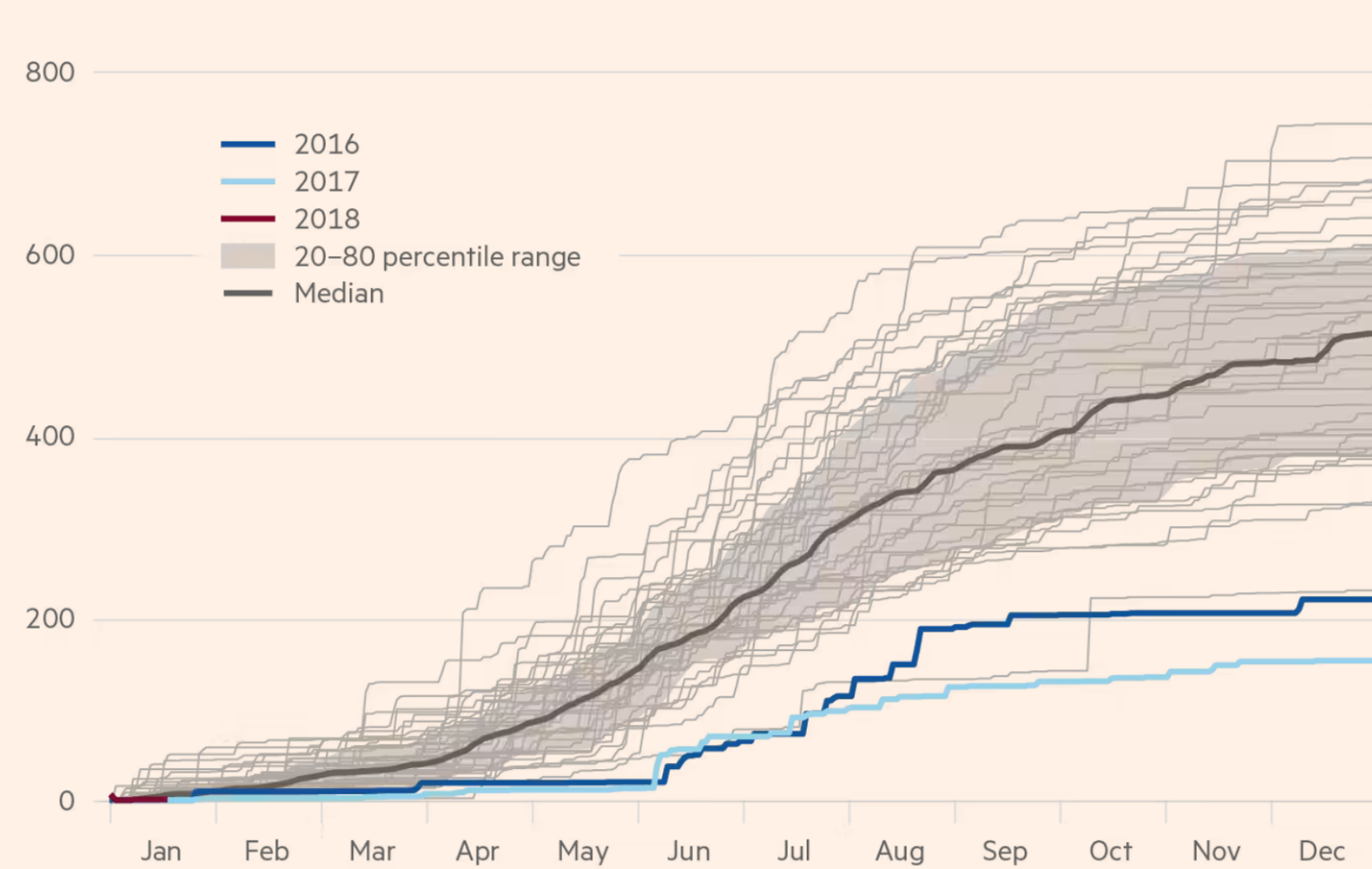


Extreme drought from 2015 to 2017 that disturbed the planning of the Water Department. The decrease in rainfall results from climate change specifically changes in the atmospheric and oceanic circulation.

Figure 6: Lack of Rainfall in Cape Town

Lack of rainfall is principal cause of Cape Town’s water crisis

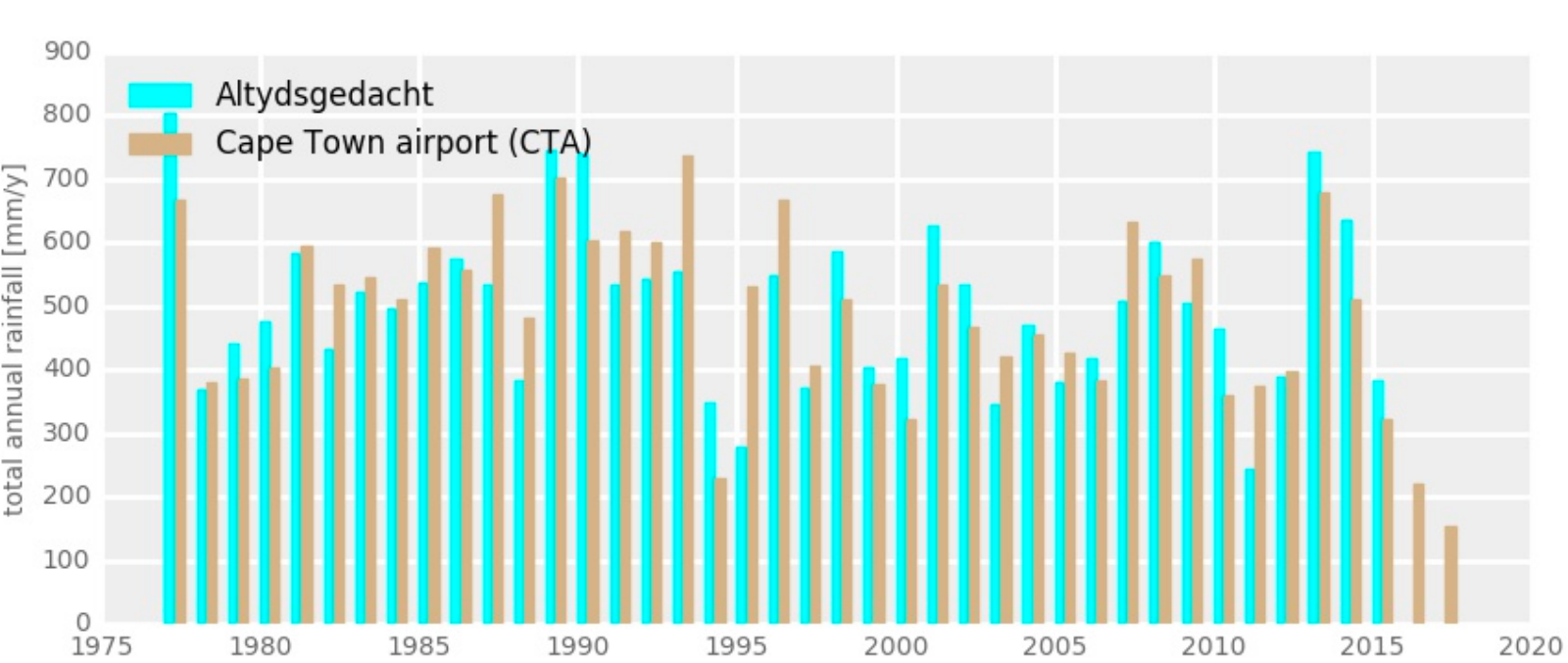
Accumulated daily rainfall at Cape Town Airport (mm)



Sources: Saws; GSOD; Climate System Analysis Group at the University of Cape Town  
© FT

<https://www.ft.com/content/8a438352-fc76-11e7-a492-2c9be7f3120a>

Figure 7: Cape Town's Annual Rainfall



[https://www.csag.uct.ac.za/wp-content/uploads/2017/08/fig3\\_alt-cta.jpg](https://www.csag.uct.ac.za/wp-content/uploads/2017/08/fig3_alt-cta.jpg)

## **SOLUTION**

### **URBAN WATER MANAGEMENT:**

Declared water emergency to avoid “Countdown to Day Zero”:

- Household: 87 liters per day per person then tightened further to 50 liters per day per person.
  - One shower a day, no more than 10 liters if also washing hair.
  - One machine wash of laundry per week.
  - One liter of water for cooking
  - One liter for pets.
  - One toilet flush per day.
  - One sink washing of dishes per day
  - Two liters of brushing teeth and washing hands
  - Three liters of drinking water
  - Five liters for cleaning the house (every 2 days)
- Bans: ban filling public pools with local water, air-conditioning, car washing, and using drinkable water for gardening. Showerheads and taps are replaced with water-efficient technologies.
- Reducing the city’s water pressure
- Raising water tariff residents who continue to use large amount of water

Figure 8: Let's Beat Day Zero

## **LET’S BEAT DAY ZERO WITH 50ℓ OR LESS PER DAY**





# How Does It Solve the Issue?

The city's average daily consumption dropped from 1,200 ML (million liters) in 2015 to just 500 ML in 2018. It prevents Day Zero from occurring.

## SOCIAL

structural changes, contributed to a large-scale shift in many residents' attitudes and behaviors toward water use. Many residents reduced their water consumption as they are aware of the water use. (become water-wise and adopted new habits).

Figure 9: Resident Fills a Bucket at Newlands Spring



<http://english.news.cn/20220322/84eac03a67774ba2a26949d255b860b6/439eb8659cd9457c8cf4f01eae3272f1.jpg>

Figure 10: Resident Queuing for water



<https://www.cntraveller.in/story/day-zero-what-happens-when-cape-town-runs-out-of-water/>



# ECOLOGICAL

High increase in dam levels, from 11% on March 9, 2018, to 100% on Oct. 2, 2020. The city is able to stabilize and improve the water system.

Figure 11: Cape Town Dam Levels by 2020

See the reading for the week, 13 July 2020.

Major dams	13/7/2020	Previous week	% 2019
Berg River	93.8	82.4	90.3
Steenbras Lower	71.2	56.6	54.7
Steenbras Upper	101.3	99.7	88.2
Theewaterskloof	69.0	59.7	51.5
Voëlvlei	63.8	58.9	66.3
Wemmershoek	65.8	50.6	53.5
Total Stored MI	<u>652 721</u>	<u>570 612</u>	<u>551 236</u>
% Storage	72.7	63.5	61.4

<https://www.capetownetc.com/wp-content/uploads/2020/07/Screen-Shot-2020-07-13-at-1.58.03-PM.png>

# ECONOMIC

A lowering of tariffs and relaxation of restrictions for commercial and industrial water use from 45% to 40%

## Residential Tariffs:

- 0 – 6 kL: Down from R28.90/kL to R21,19 kL
- 6 – 10,5 kL: Down from R46/kL to R34,43/kL
- 10 – 35 kL: Down from R120,27 to R52,39/kL
- Above 34k L: Down from R1 000/kL to R300/kL

## Commercial Tariffs:

- Down from R45,75/kL to R37,50/kL



<div>CAPE TOWN WATER CRISIS</div> <div>FACT FILE</div>	
Weather	Cape Town has a Mediterranean climate of warm, dry summers and winter rainfall.
Western Cape Water Supply System	The water system relies almost entirely on rainfall. They are stored in 6 principal dams including Theewaterskloff, Wemmershoek, Steenbras Lower, Steenbras Upper, Voëlvlei. and Berg River Dam.
Water Use	Use approximately 64% of the total water supply. 29% for agriculture and 7% for other urban areas.
Government Failure	Faces internal conflicts within the Democratic Alliance (DA) as they failed to respond to the water crisis with immediate effect.
Economic Impact	The national agriculture sector lost 37,000 jobs, pushing 50,000 people below the poverty line. It accelerated consumer inflation and led to rising food prices.
Hydrological Poverty	Day Zero as the "middle-class crisis" because the poorest barely had any water to start with. Inequality: the rich resent that water will be turned off for them, but not the poor.
Free Water Policy	In Cape Town, registered low-income(indigent) households with a direct water and sanitation connection get their 6000 liters of water per month free of charge.
Spring Water in Newlands	residents go to fill buckets of water from the spring in Newlands for free. It is opened with new safety regulations which also cut down plastic use.
Other Responses	supply augmentation, alternative water supply, water-efficient farming, water-saving campaign at schools.
Award	won an award from the International Water Association as the first city to reduce water demand by half in just three years. Cape Town is now becoming the top 1 water-saving country in the world.



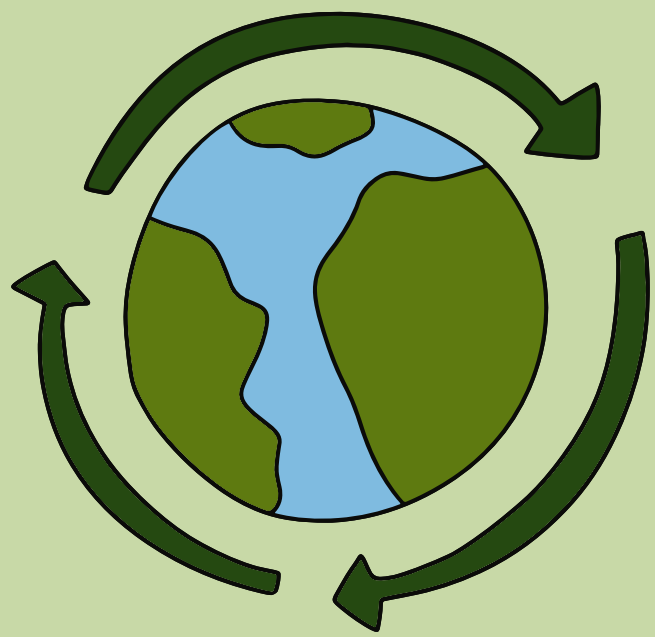
# PERSPECTIVES

## DEEP ECOLOGIST

They believe in the intrinsic importance of nature for the humanity of man. This means that reducing water consumption is important for bio rights and people should use water efficiently.

People should not be using water if there is a risk of it running out.

Instead of relying on and developing more technologies, they should conserve the water.



## CORNUCOPIANS



Believe that man will always find a way out of any difficulties.

In this case, the residents and industrials should still consume water as it is crucial for the economy.

However, they may go against the idea of water consumption reduction because less water available can negatively impact the economy. (no water to do certain activities).

They also believe that technology and developing water dams will help solve the issue more quickly.