



mzansiAmanzi

An MONTHLY outlook of Water in South Africa

A National, Monthly Surface Water Monitoring Web Service

Jens Hiestermann, GeoTerraImage



GEOTERRA
IMAGE

<https://www.water-southafrica.co.za>



A **monthly, national water monitoring service**, covering the whole of South Africa (and beyond).

<https://www.water-southafrica.co.za>



A monthly, national water monitoring service, covering the whole of South Africa (and beyond).

Based on **fully automated**, cloud-based remote sensing technologies.

<https://www.water-southafrica.co.za>



Benefits:

- **accurate, reliable, repeatable** data service
- **remote monitoring** (no fieldwork costs)

<https://www.water-southafrica.co.za>

mzansiAmanzi

A MONTHLY outlook of Water in South Africa!

Benefits:

- **accurate, reliable, repeatable** data service
- **remote monitoring** (no fieldwork costs)

Uses:

- water use **compliance monitoring** & licensing
- **water security** assessments
- water resource **management**
- ecosystem health **monitoring**

Mzansi Amanzi / Water South Africa

Product Summary:

- Technical spin-off from **automated land-cover mapping** activities

Mzansi Amanzi / Water South Africa

Product Summary:

- **Technical spin-off from automated land-cover mapping activities**
- **Operational**, regular and repeatable service (not research)

Mzansi Amanzi / Water South Africa

Product Summary:

- **Technical spin-off from automated land-cover mapping activities**
- **Operational, regular and repeatable service (not research)**
- **Uses **cloud-based technologies** and advanced **machine learning****

Mzansi Amanzi / Water South Africa

Summary:

- **Technical spin-off from automated land-cover mapping activities**
- **Operational, regular and repeatable service (not research)**
- **Uses cloud-based technologies and advanced machine learning**
- **Monthly updates** of surface water extent across South Africa

Mzansi Amanzi / Water South Africa

Product Summary:

- **Technical spin-off from automated land-cover mapping activities**
- **Operational, regular and repeatable service (not research)**
- **Uses cloud-based technologies and advanced machine learning**
- **Monthly updates of surface water extent across South Africa**
- **All water features > 0.25 ha mapped and identified**

Mzansi Amanzi / Water South Africa

Product Summary:

- **Technical spin-off from automated land-cover mapping activities**
- **Operational, regular and repeatable service (not research)**
- **Uses cloud-based technologies and advanced machine learning**
- **Monthly updates of surface water extent across South Africa**
- **All water features > 0.25 ha mapped and identified**
- **Time-series **trend analysis** and reporting**

Mzansi Amanzi / Water South Africa

Product Summary:

- **Technical spin-off from automated land-cover mapping activities**
- **Operational, regular and repeatable service (not research)**
- **Uses cloud-based technologies and advanced machine learning**
- **Monthly updates of surface water extent across South Africa**
- **All water features > 0.25 ha mapped and identified**
- **Time-series trend analysis and reporting**
- **Easy expansion across SADC (cross-border catchments)**

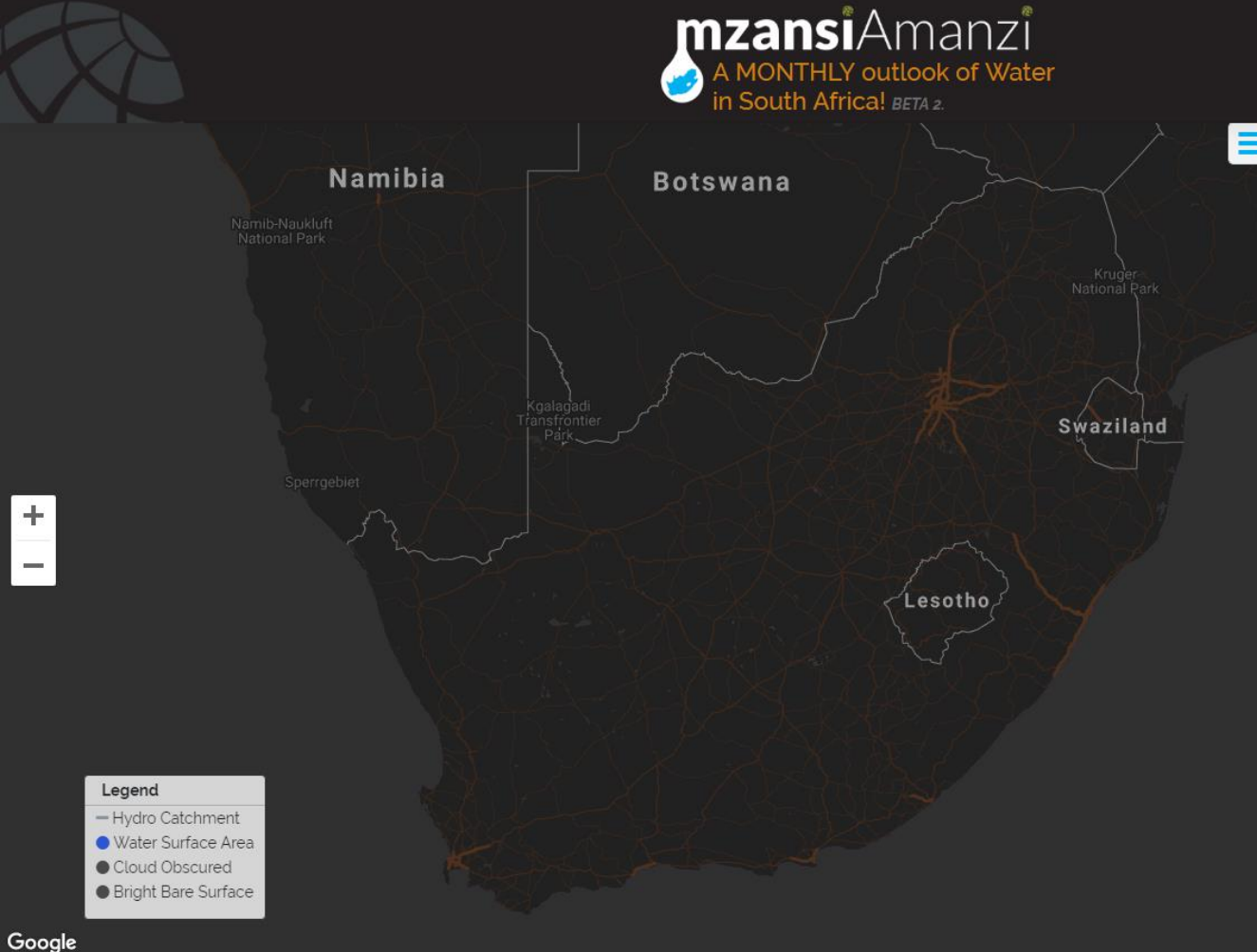
Mzansi Amanzi / Water South Africa

Product Summary:

- **Technical spin-off from automated land-cover mapping activities**
- **Operational, regular and repeatable service (not research)**
- **Uses cloud-based technologies and advanced machine learning**
- **Monthly updates of surface water extent across South Africa**
- **All water features > 0.25 ha mapped and identified**
- **Time-series trend analysis and reporting**
- **Easy expansion across SADC (cross-border catchments)**
- **Public access website**, future subscription data downloads

A quick look at the current web application...

Landing Page



☰

[About This Webpage](#) [Reset View](#)

Select Search Criteria ▾ Select an Option ▾

Search for a place, town, city...


Toggle Monthly Water Data

- Off July 2018 ?
- Off June 2018 ?
- Off May 2018 ?
- Off Long Term Extent ?
- Off Long Term Occurrence ?

Toggle Transparency

Toggle Catchment Boundaries

- Quaternary Catchment
- Tertiary Catchment
- None



Please click on the Quaternary to reveal its area statistic

Quick search tool for dam name or quaternary ID

mzansiAmanzi
A MONTHLY outlook of Water in South Africa! BETA 2.

Feedback

Legend

- Hydro Catchment
- Water Surface Area
- Cloud Obscured
- Bright Bare Surface

Witdraai Private Nature Reserve
Diepkloof Private Nature Reserve
Klein Ezeljagt Private Nature Reserve
Helderstroom Road

Dir. Olof Pass Road
Van Der Buij Pass Road
Van Der Buij Pass Road
Van Der Buij Pass Road

Toggle Monthly Water Data

- Off July 2018
- Off June 2018
- Off May 2018
- Off Long Term Extent
- Off Long Term Occurrence

Toggle Transparency

Toggle Catchment Boundaries

- Quaternary Catchment
- Tertiary Catchment
- None

Please click on the Quaternary to reveal its area statistic

DAM

THEEWATERSKLOOF DA...

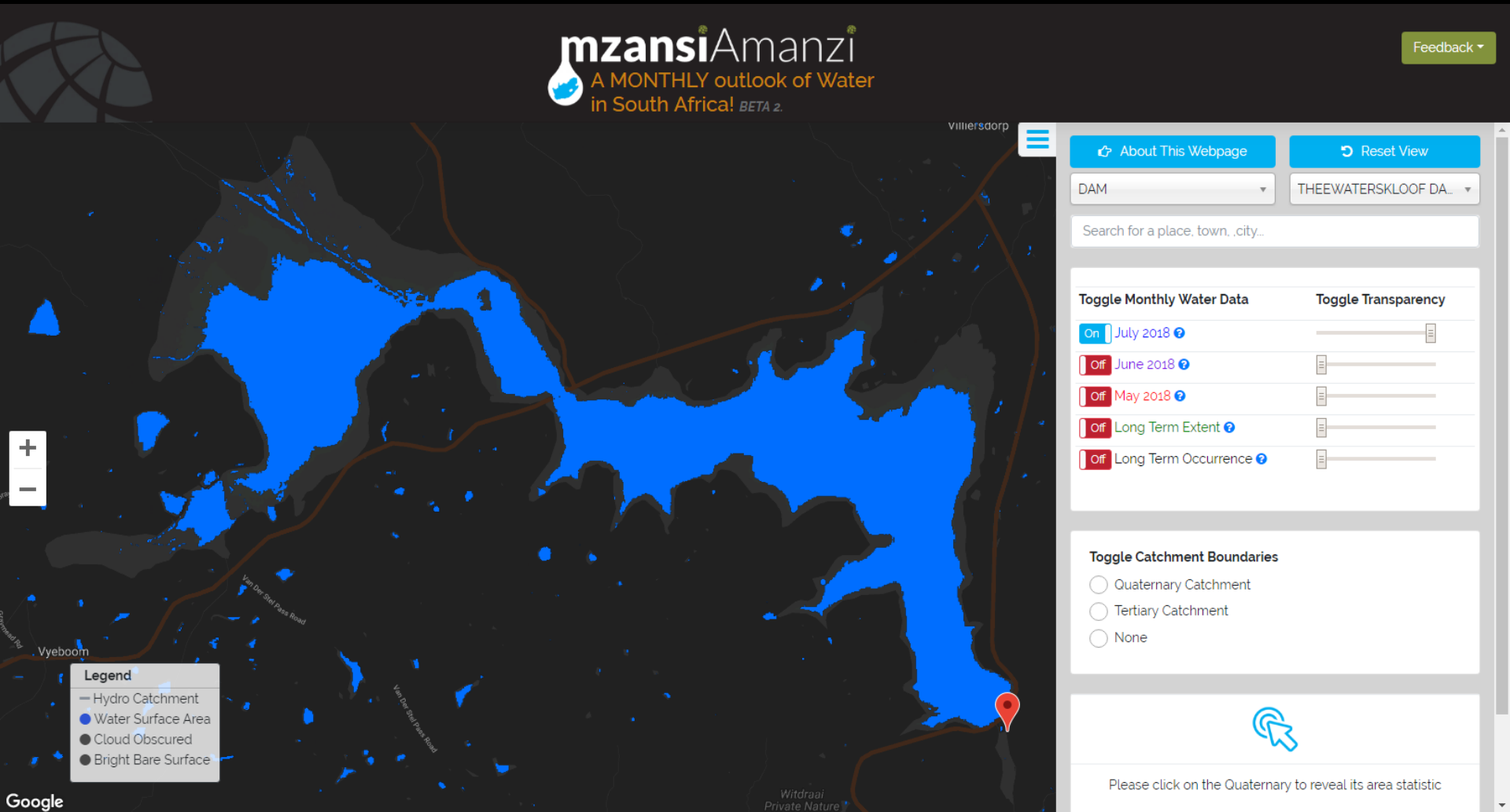
Search for a place, town, .city..

+

-

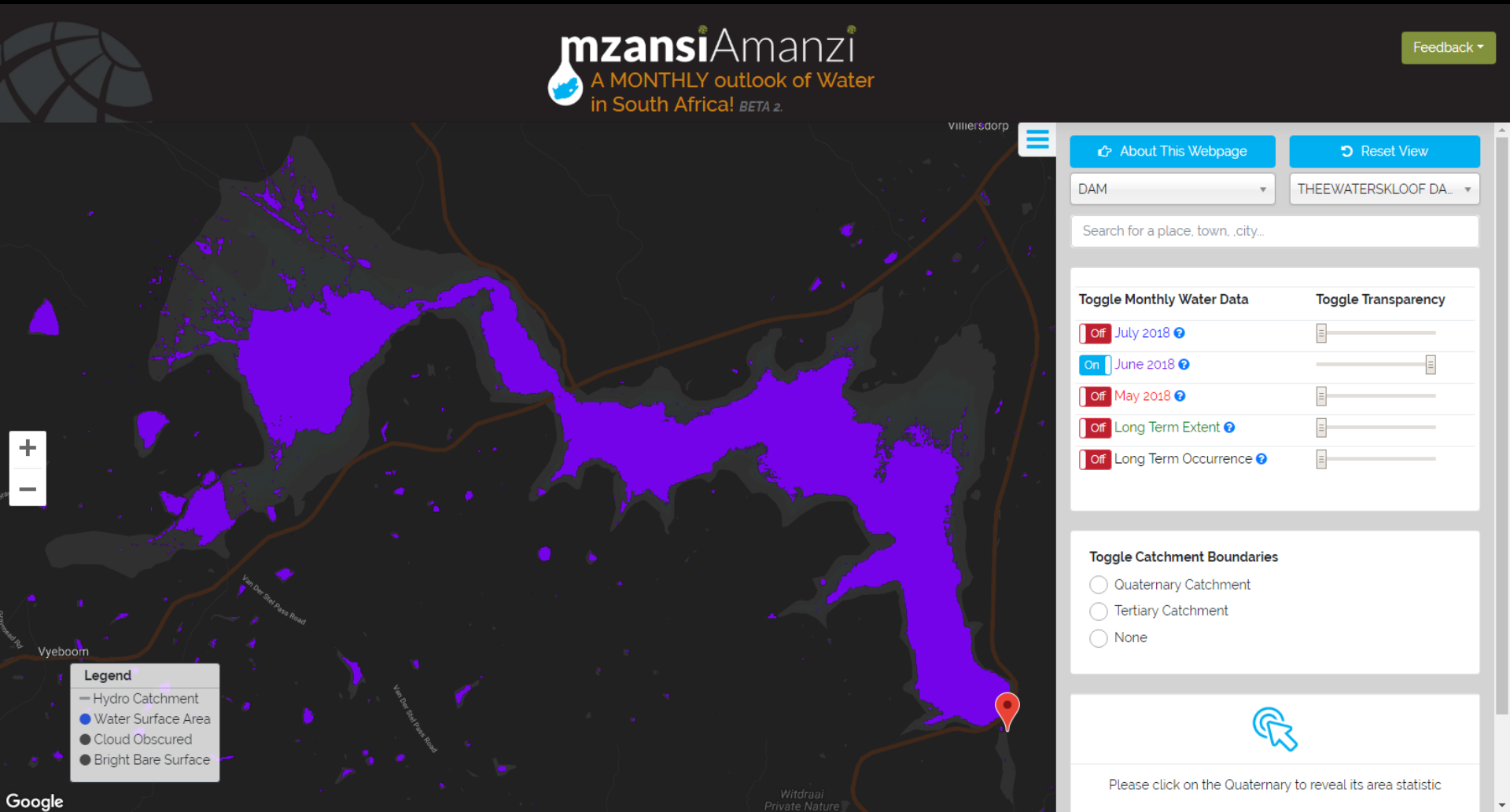
Google

Theewaterskloof Dam: CURRENT month water



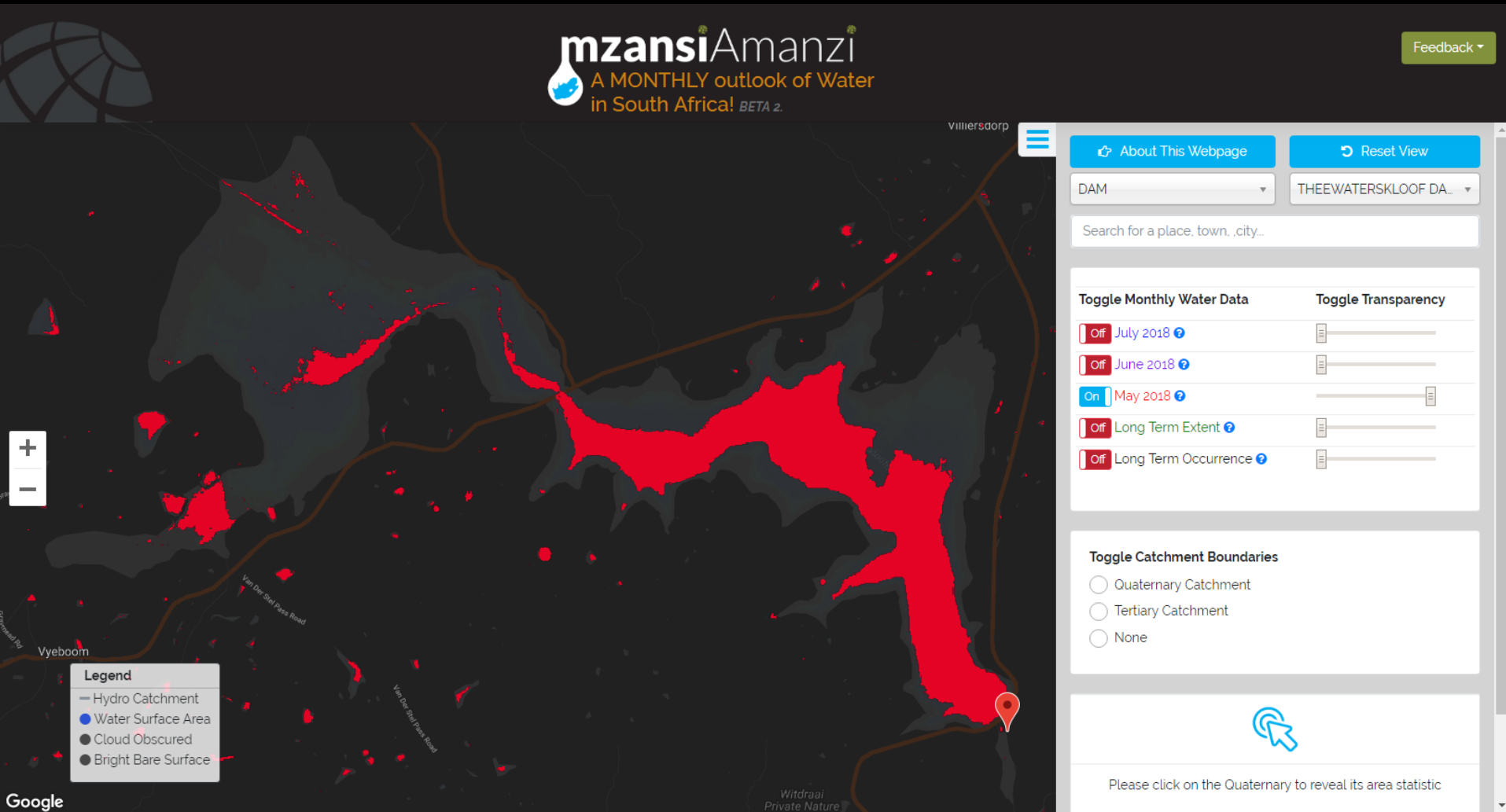
(July 2018)

Theewaterskloof Dam: PREVIOUS month water



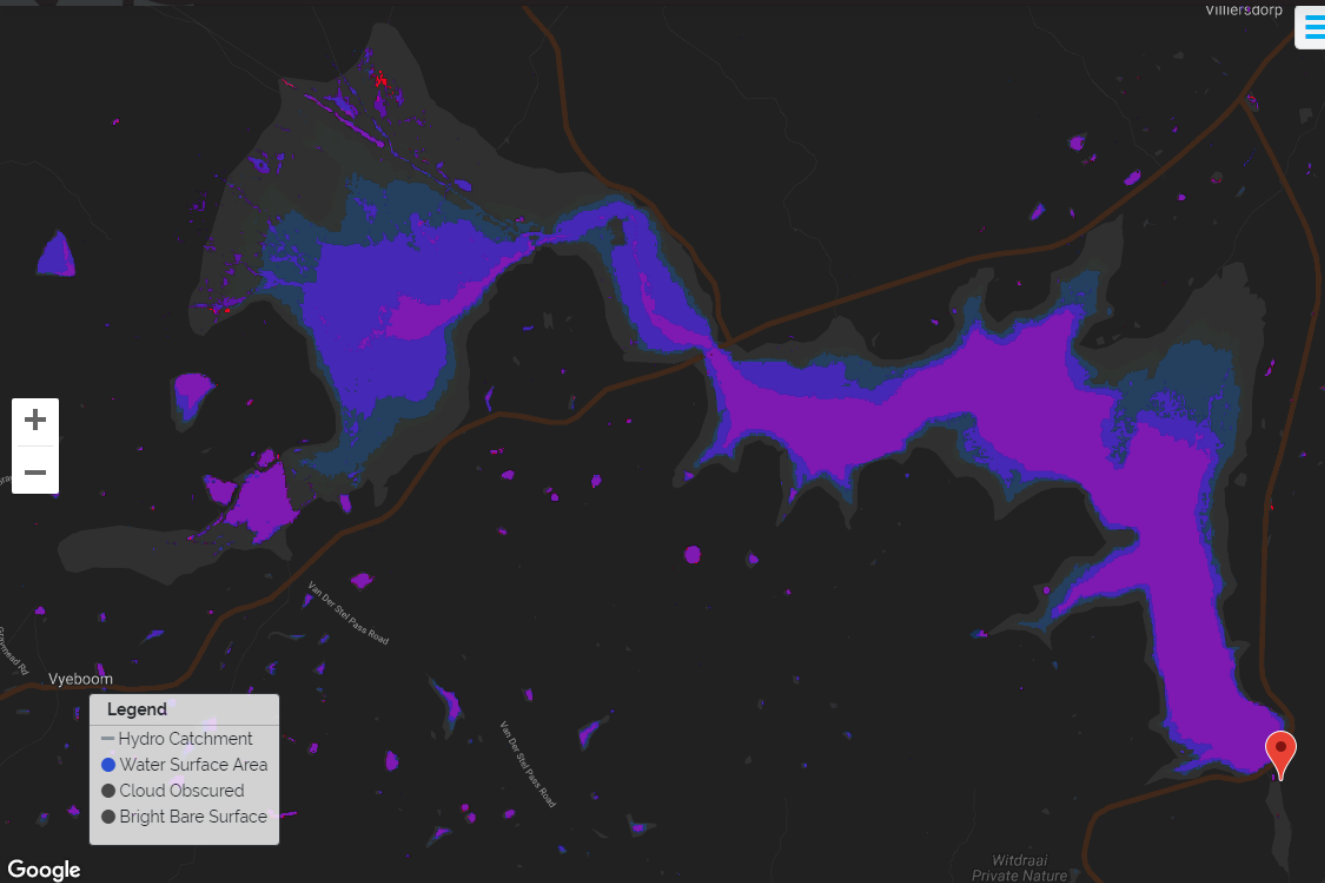
(June 2018)

Theewaterskloof Dam: PRE-PREVIOUS month water



(May 2018)

Theewaterskloof Dam: 3 months comparison



Buttons: About This Webpage, Reset View

DAM [dropdown] THEEWATERSKLOOF DA... [dropdown]

Search for a place, town, city...

Toggle Monthly Water Data

- July 2018 ?
- June 2018 ?
- May 2018 ?
- Long Term Extent ?
- Long Term Occurrence ?

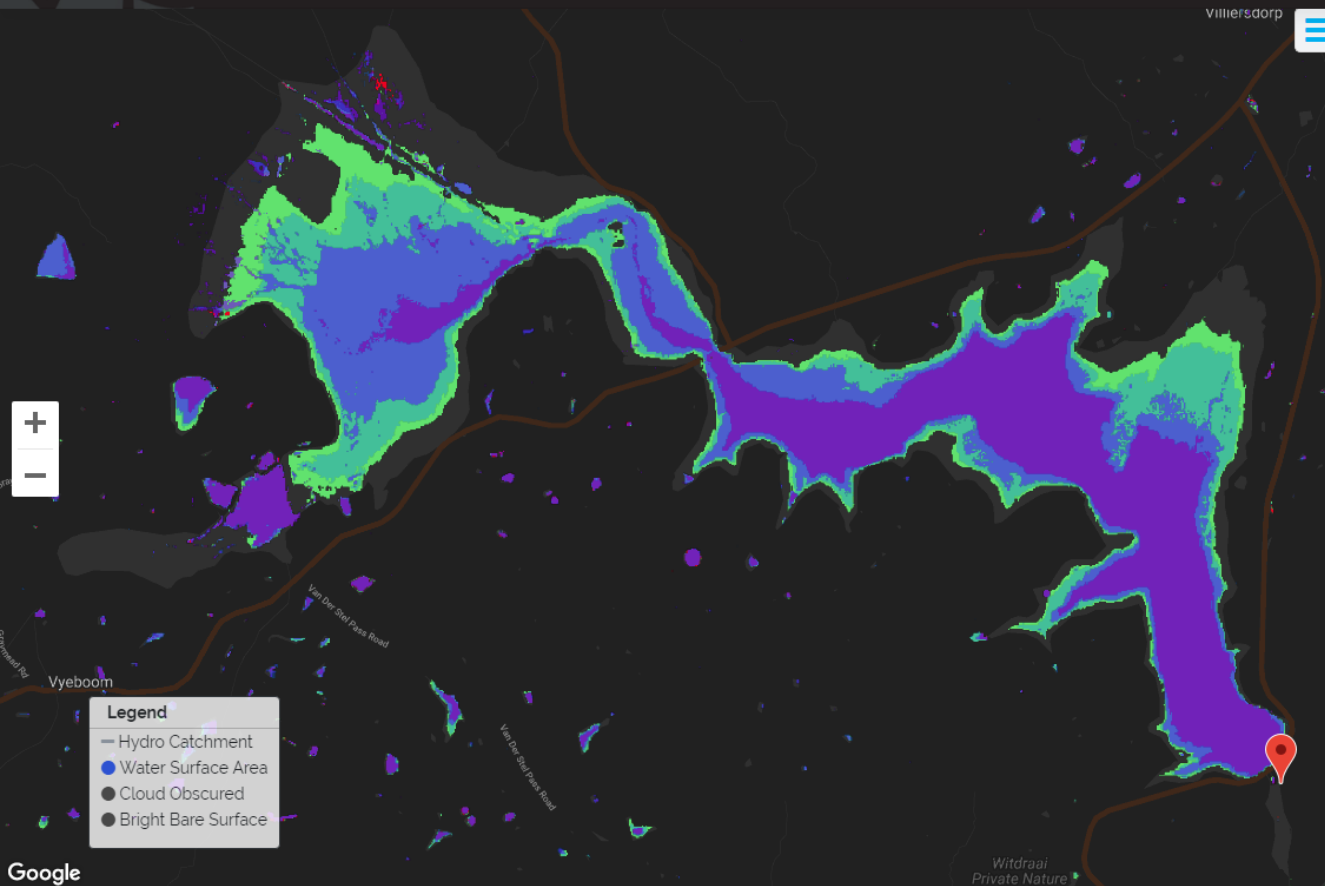
Toggle Transparency

Toggle Catchment Boundaries

- Quaternary Catchment
- Tertiary Catchment
- None

Please click on the Quaternary to reveal its area statistic

Comparing against a long-term recorded extent



Buttons: About This Webpage, Reset View

DAM: THEEWATERSKLOOF DA...

Search for a place, town, city...

Toggle Monthly Water Data

- July 2018
- June 2018
- May 2018
- Long Term Extent
- Long Term Occurrence

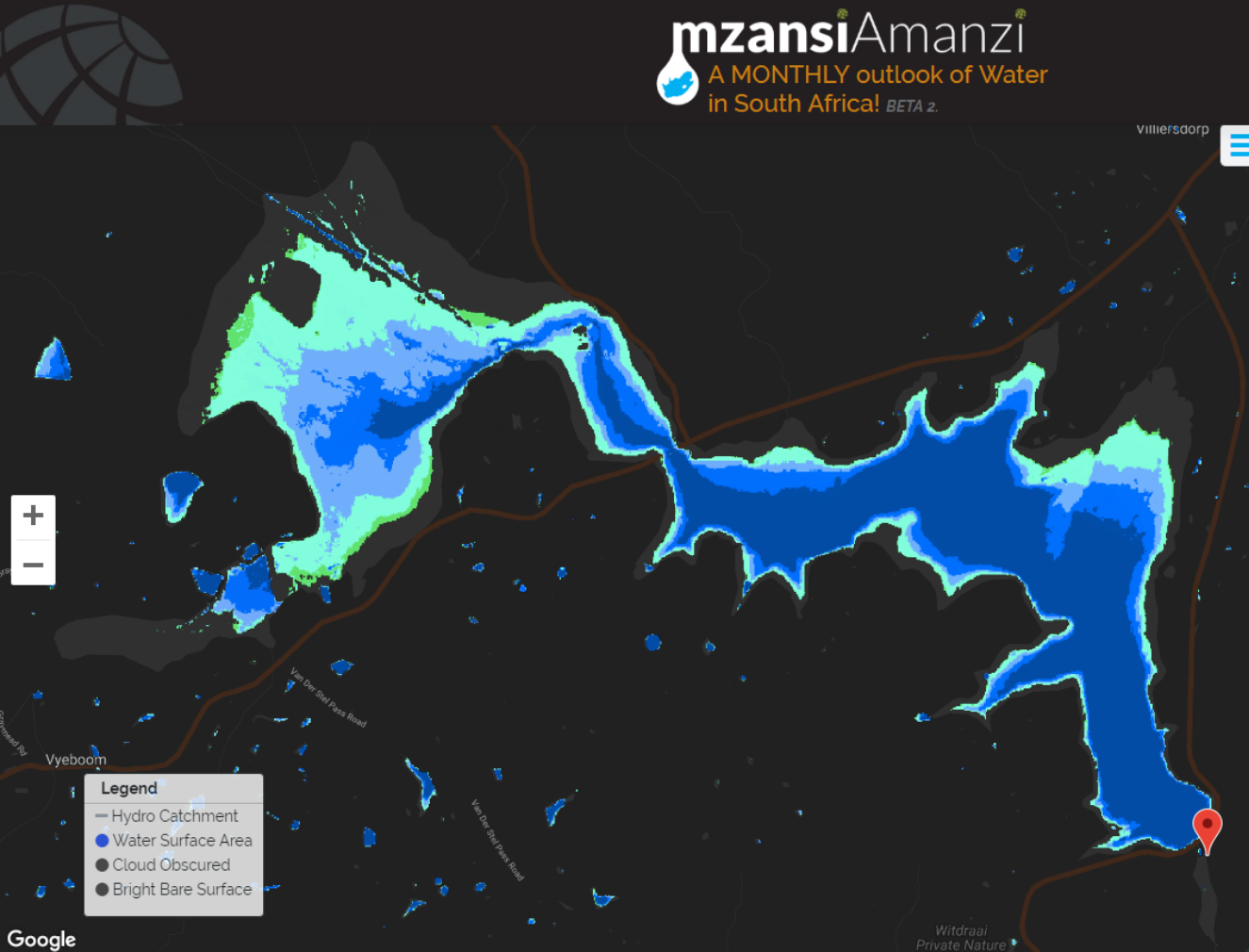
Toggle Transparency

Toggle Catchment Boundaries

- Quaternary Catchment
- Tertiary Catchment
- None

Please click on the Quaternary to reveal its area statistic

Long-term water occurrence (index)



villiersdorp

About This Webpage Reset View

DAM THEEWATERSKLOOF DA...

Search for a place, town, city...

Toggle Monthly Water Data

- Off July 2018 ?
- Off June 2018 ?
- Off May 2018 ?
- Off Long Term Extent ?
- On Long Term Occurrence ?

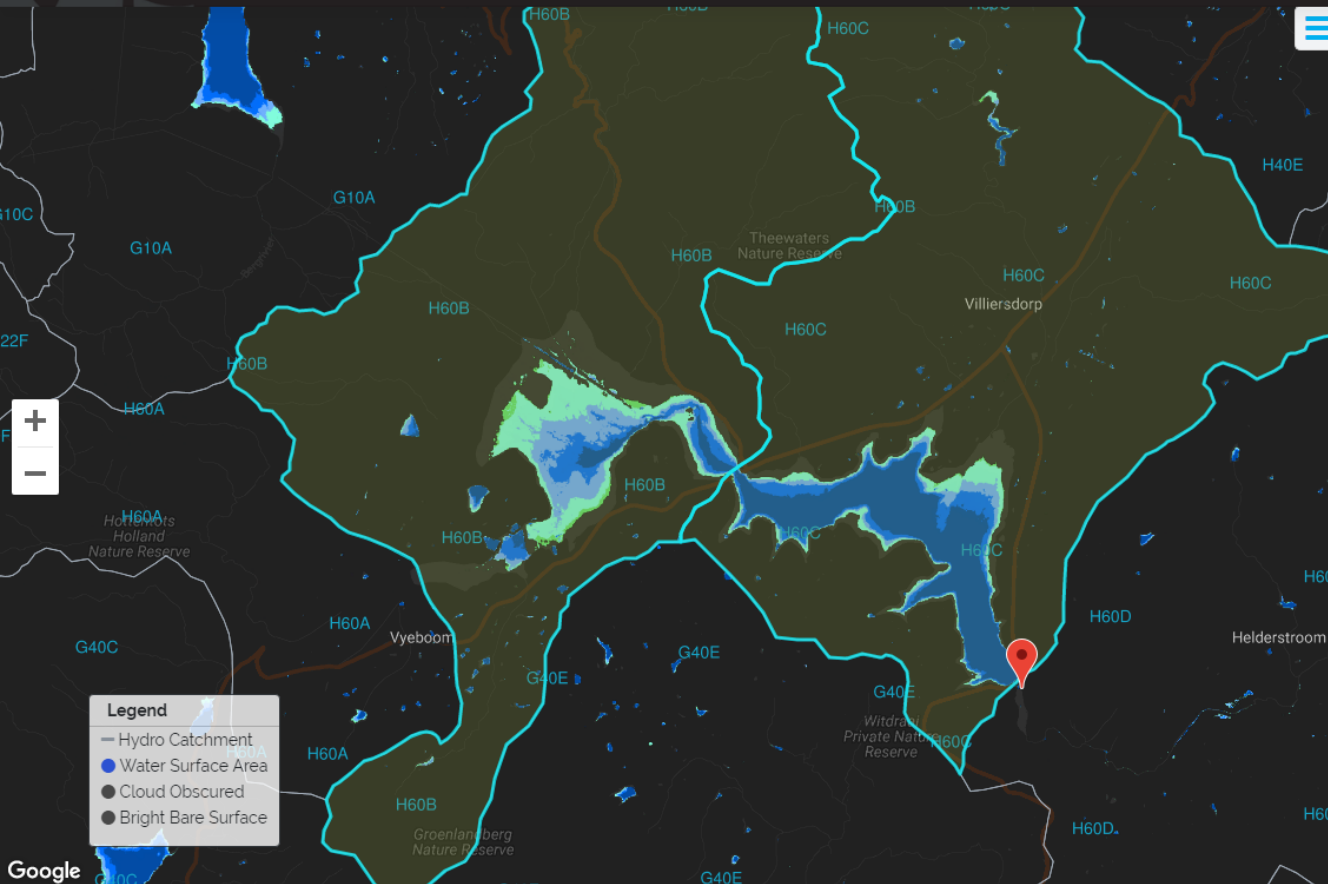
Toggle Transparency

Toggle Catchment Boundaries

- Quaternary Catchment
- Tertiary Catchment
- None

Please click on the Quaternary to reveal its area statistic

Quaternary catchment trends & reporting



[About This Webpage](#) [Reset View](#)

DAM THEEWATERSKLOOF DA...

Search for a place, town, city...

Toggle Monthly Water Data

- Off July 2018
- Off June 2018
- Off May 2018
- Off Long Term Extent
- On Long Term Occurrence

Toggle Transparency

Three horizontal sliders for transparency control.

Toggle Catchment Boundaries

- Quaternary Catchment
- Tertiary Catchment
- None

[Reset Selection](#)

Quaternary Catchment ID
H60C, H60B

During Western Cape's Water Crisis Period

AUGUST 2017 SEPTMBER 2017 OCTOBER 2017 NOVEMBER 2017 DECEMBER 2017 JANUARY 2018

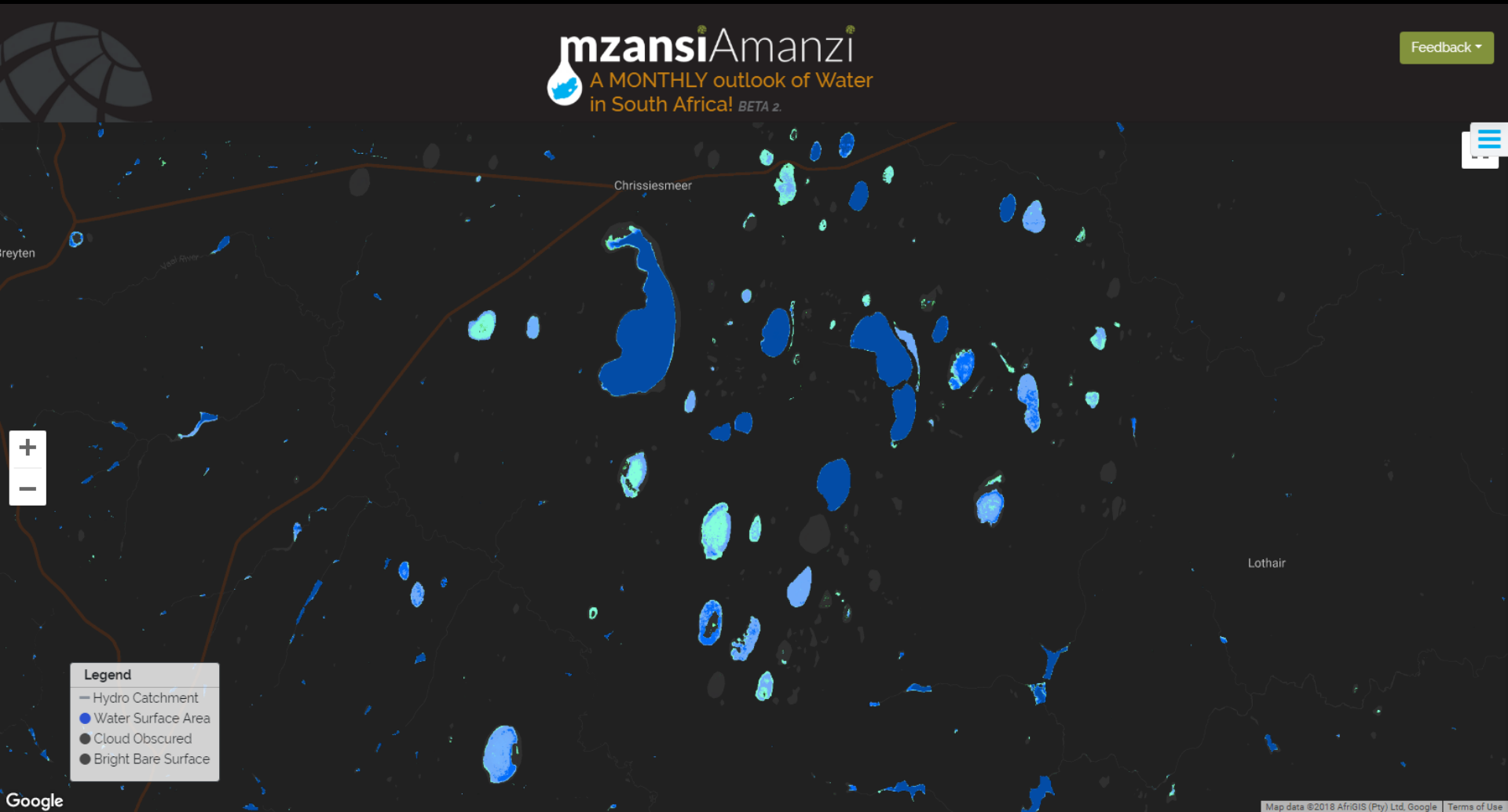


Theewaterskloof Dam, Cape Town, Western Cape, South Africa

Source: www.water-southafrica.co.za GEOTERRA IMAGE

Some other regional examples in southern
Africa

Chrissiemeer Pans, Mpumalanga

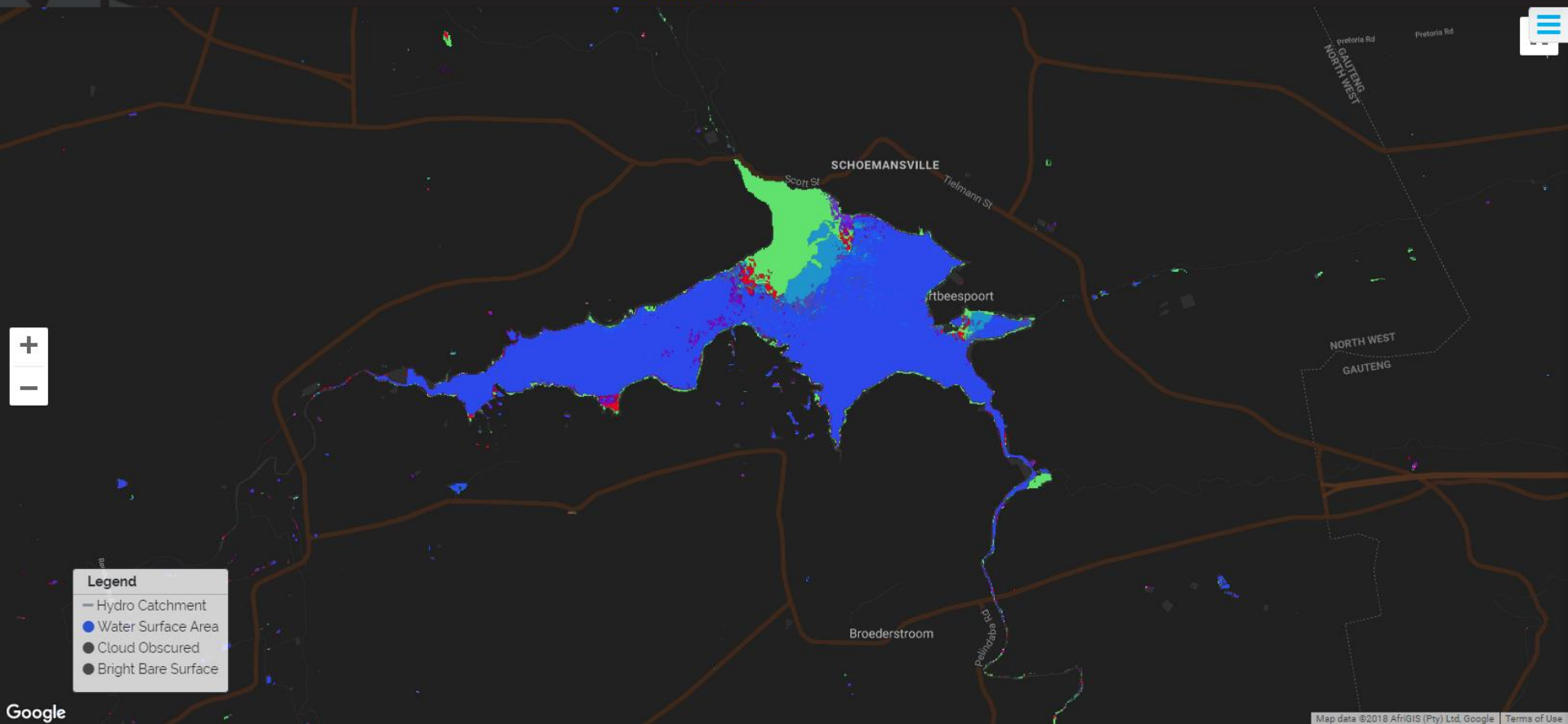


Long-term occurrence shows drought resilience

Hartbeespoort Dam

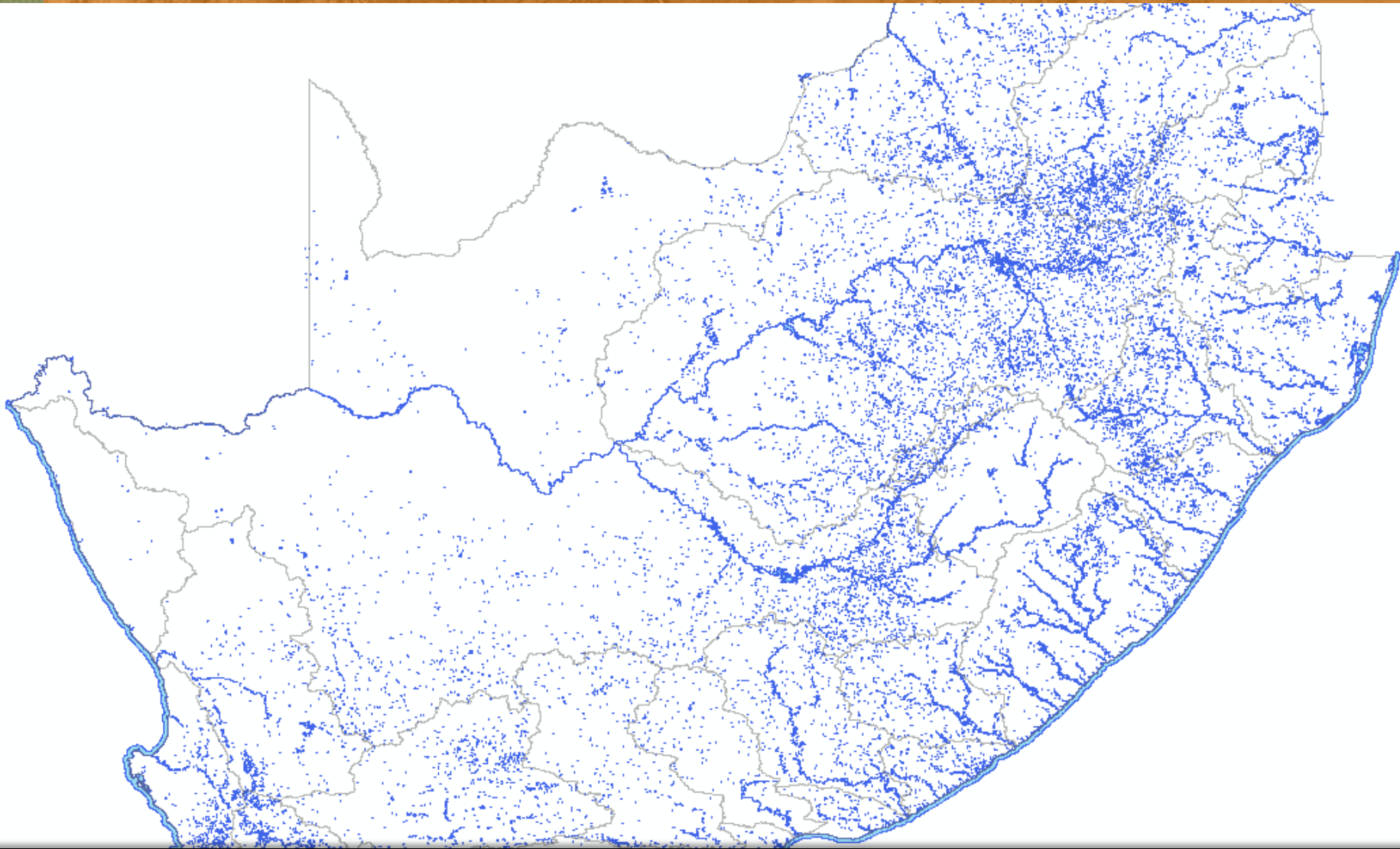
mzansiAmanzi
A MONTHLY outlook of Water
in South Africa! BETA 2.

Feedback

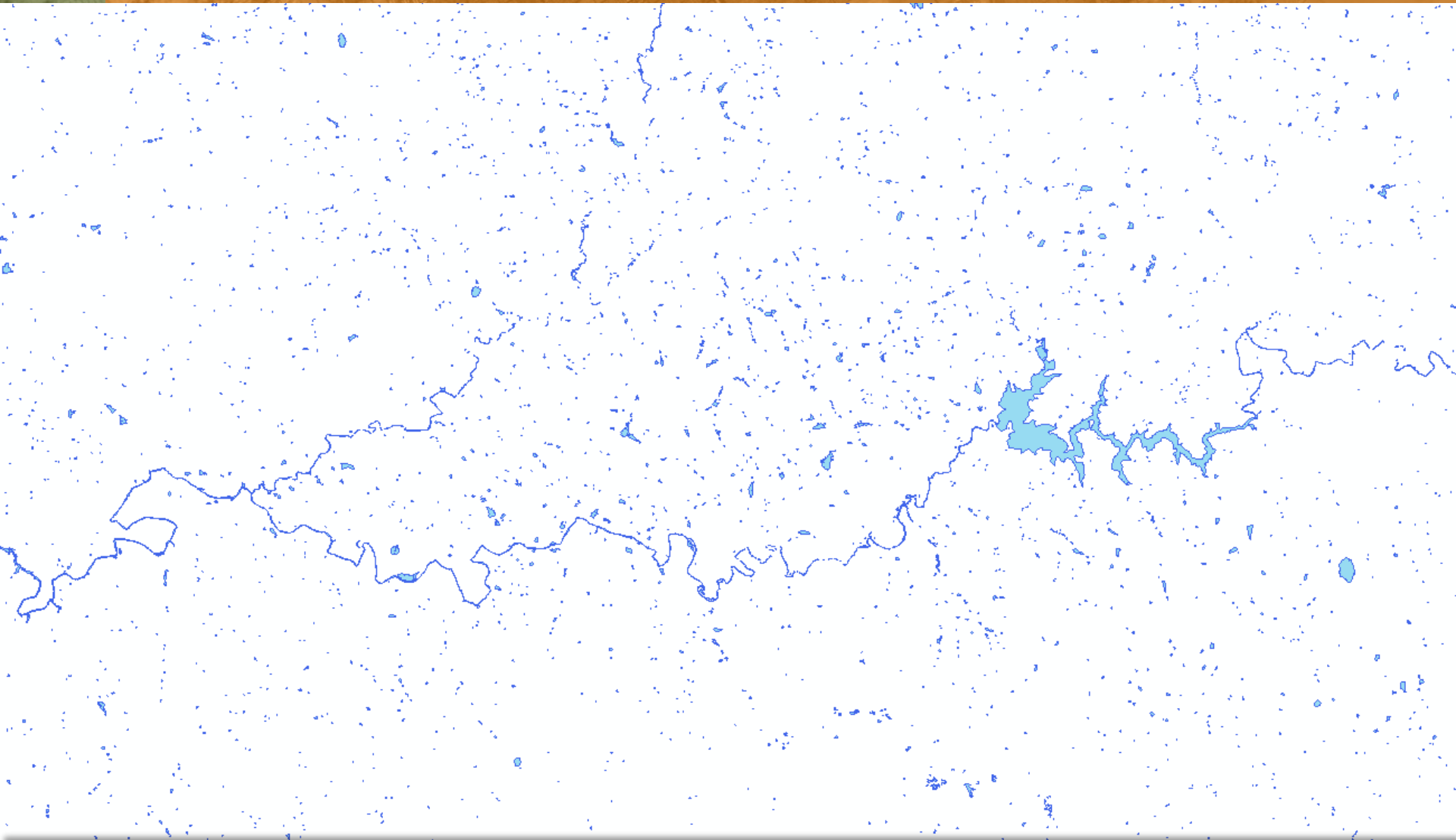


3 months movement of water hyacinth 'islands'

GIS shape file extraction of combined surface water areas across South Africa, 01-2016 to 03-2018.





GIS shape file extraction of combined surface water areas across South Africa, 01-2016 to 03-2018 (detail).



Close-Up Liuwa Plains – Zambia

Legend

 Cloud

 Water

May 2017



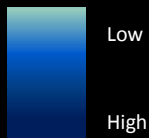
April 2018



GEO TERRA
IMAGE

Occurrence of Water, Liuwa Plains – Zambia

Occurrence



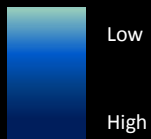
May 2017



April 2018

Occurrence of Water, Okavango – Botswana

Legend



May 2017

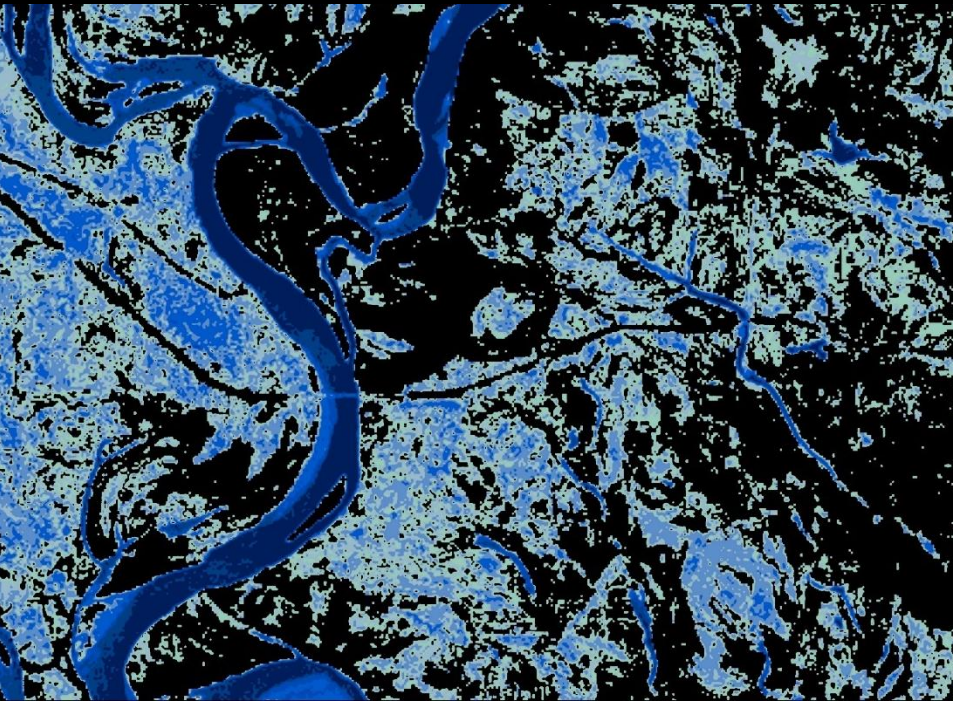


April 2018

Comparing GTI Water Classification to Hi-Res Google Imagery

May 2017 to April 2018

April 2016



Water Occurrence
Multi-temporal

Google Earth Imagery
Single Snapshot

Mzansi Amanzi : the next steps

EKOSOURCE

Mzansi Amanzi : the future

Additional monthly reporting content:

- Individual **water volume** estimates for all **significant dams**



Partnership with GTI

Mzansi Amanzi : the future

Additional monthly reporting content:

- Individual water volume estimates for all significant dams
- **Water volume** estimates for each **quaternary catchment**



Partnership with GTI

Mzansi Amanzi : the future

Additional monthly reporting content:

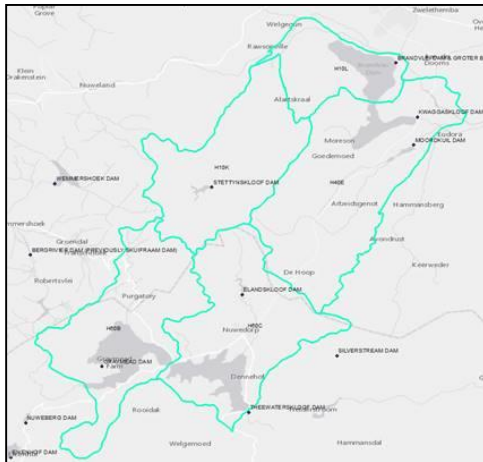
- Individual water volume estimates for all significant dams
- Water volume estimates for each quaternary catchment
- **Future predictive flow and volume** estimates



Partnership with GTI

Mzansi Amanzi : Sample datasets

Monthly water data: Jan 2016 – May 2018



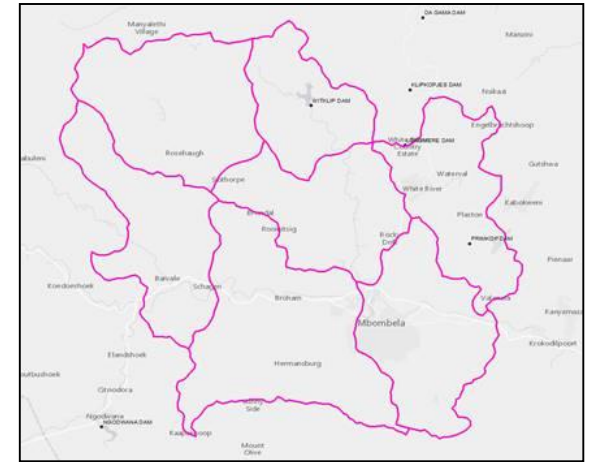
Breede (Theewaterskloof)

H40 E,L, H60 B,C, H10 K



Umgeni (Midmar / Albert Falls)

U20 B,C,D,E,F, V20 D,E,F



Mbombela (Nelspruit Surrounds)

X22 B,C,D,E,F,H,J

Raster TIFF file formats, 2 x information classes (water_[1] & cloud obscured_[2]), Geographic coordinates

Mzansi Amanzi : thank you !

<https://www.water-southafrica.co.za>