GROUNDWATER STATUS REPORT - WESTERN CAPE REGION

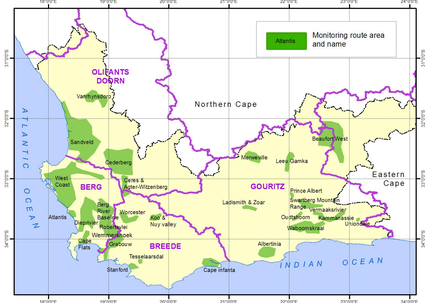
Hydrological year: 2013 - 2014

March 2015

The purpose of this map is to show broad trends in groundwater level and quality using data from the regional groundwater monitoring programmes.

Background

Twenty-nine monitoring routes comprising 800 sites in total are monitored across the Western Cape Region. Selected representative geosites indicate the general trend, providing an overview of the groundwater situation in the Western Cape Region at the end of the 2013-2014 hydrological year. The map summarizes the Annual Groundwater Status Report (GH 4178).



Water level monitoring point

National groundwater quality monitoring site

BERG — Water Management Area boundary and name

H40K — Quarternary Drainage Region boundary & number

River

Provincial boundary

Built-up area

Road

Water level graph legend: Water level

Quality graph legend: Calcium, Magnesium, Sodium, Chloride, Sulphate

Electrical Conductivity (EC)

Conclusions and Recommendations

The general picture is that groundwater is used sustainably across the Region.

Over abstraction in parts of the Sandveld and Klein Karoo only have local impact. Establishment of monitoring committees to collect data and source management solutions for these localities is recommended.

The aquifer in the general area of Vanrhynsdorp is over exploited for agriculture. The users are supported by Geohydrology in the monitoring and provision of management advice. It is recommended that no further groundwater use licenses are issued in the stressed parts of this aquifer.

The groundwater levels in the primary aquifers of the Berg Water management area near Langebaan are on a declining trend. This may be a result of climatic changes and/or increasing abstraction. Better management of this aquifer is needed to ensure that the aquifer is optimally used. The verification and validation of groundwater use in this area, and termination of any illegal groundwater use is recommended. Comprehensive Reserve determination, classification and development of a management plan for this aquifer is recommended to ensure that the aquifer is optimally used taking into account the societal and ecosystem needs.

Expansion of monitoring networks into new areas where groundwater development is expanding (e.g Kalbaskraal in the Berg WMA) and where Reserve studies indicate aquifers may be stressed (e.g. Gouritz WMA). More attention needs to be given to improving our understanding of groundwater–surface water interaction in monitoring network design. Expansion in the Karoo may be required depending on the Departmental needs associated with Shale Gas development.

Locality Map: RSA

Acknowledgement:
The assistance of the entire groundwater monitoring and data management team is acknowledged in the production of this report. Each member contributed by playing a role in one or more of the following:

- Maintaining the monitoring stations
- Collecting the field data
- Entering data to databases
- Data presentation / graphics production
- Reporting on their respective WMA's

Graphs extracted from CHART & HYDSTRA

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Note:
Interpretation and recommendations contained in this report are that of the geohydrologist responsible for the particular monitoring route.

Recommendations will, prior to implementation, need to be evaluated against the Region's Groundwater Monitoring Strategy that is currently in development.

The information presented reflects the current state of data, which in some instances may require further editing / cleaning.

OLIFANTS DOOR - BERG WMA

Groundwater water level

In the Olifants Doorn catchment area the most serious problems are in the Karst aquifer at Vanrhynsdorp where groundwater levels have over the long term been generally declining indicating the aquifers themselves are stressed. There are indications that the groundwater levels are now stabilizing but not recovering. The stabilization may be due to progressively higher recharge from rainfall in the 2012-2014 period.

For the rest of the Olifants Doorn area there are isolated declining water levels, especially in parts of the Sandveld, but these are usually caused by individual boreholes being over-abstracted and not the aquifers per se. Long term downward trends in the northern, central and southern parts of the Sandveld have reversed since 2005, and there is now a slight general rising trend. This rise may be a result of increased recharge, but rises are in some cases accentuated in the vicinity of production boreholes – indicating reduced abstraction in the vicinity. In the northern and southern Sandveld a groundwater level rise occurs particularly since 2011 in line with progressively higher annual rainfall from 2011-2014. In the Central Sandveld the groundwater levels are more stable.

In the Berg catchment the water levels are generally stable, normal seasonal groundwater level fluctuations are evident (e.g. the Cape Flats aquifer). In the West Coast inland of Langebaan, the Adamboerskraal and Elandsfontein aquifers show an overall long term general groundwater level decline since groundwater level monitoring started in the 1980's. Water levels declined abnormally steeply since October 2010, in the absence of the normal recharge during the winter rainfall season of 2011. The better rainfall especially in the 2013 winter season stabilized the downward trend but in 2014 the slight downward trend continues. The decline may be the combined result of climatic changes in the area, together with increased abstraction.
In the mountainous inland area to the east of the Berg catchment, the groundwater levels are relatively high. Levels rose steeply in the late 2013 and early 2014 as a result of good recharge due to heavy rainfall events, thereafter declining slightly during the drier mid-winter period.

The aquifers of the Table Mountain Group in the Sandveld and Cederberg areas are quickly recharged during winter months, after the dry summer groundwater abstraction period.

Groundwater Quality

In general the groundwater hydrochemical character has not changed significantly. An exception is the increasing sodium chloride trend along the west coastal zone at Cape Town, Yzerfontein and Graafwater. Despite this trend the water quality is not deteriorating significantly, the electrical conductivity remaining within historical limits.

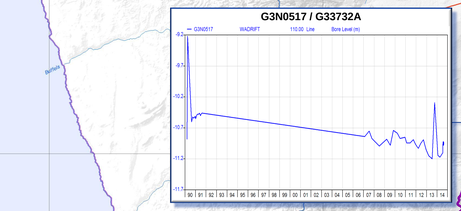
In the monitoring period 2003-2014 the groundwater quality in the Sandveld is showing signs of deteriorating, possibly due to agricultural practices. Localised quality improvements are noted in the vicinity of boreholes where agricultural abstraction has ceased.
In the Berg catchment the water quality is generally consistent, with no significant improvement or degradation trends. An exception is the Philippi farming area on the Cape Flats, where a decline in groundwater quality has been reported.

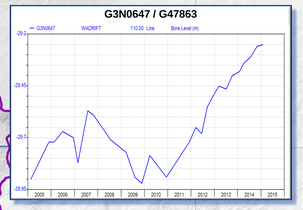
BREEDE - GOURITZ WMA

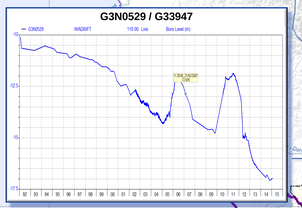
Groundwater levels
In the Breede-Gouritz WMA's the groundwater levels have recovered from the 2010 drought, and are generally high and relatively stable. Subsequent to the drought there is a slight upward groundwater level trend, in line with progressively higher recharge per annum from 2011 to 2013. Good recharge in late 2013 early 2014 resulted in a further relatively sharp water level rise, but during the subsequent drier than normal winter months the groundwater water level stabilized and in some instances declined marginally.

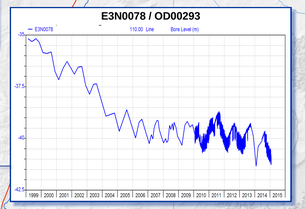
Good baseline monitoring records are being built up in the vicinity of imminent large scale Table Mountain Group aquifer developments for Oudtshoorn and the City of Cape Town.

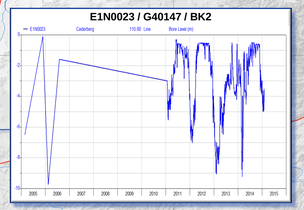
Groundwater Quality
In general the groundwater hydrochemical character is stable. Unexplained long term Sodium Chloride decline is observed at the coastal monitoring sites at Gansbaai, Bredasdorp, Stilbaai and George. This trend is opposite to that observed on the west coast, and further work would be required to determine the cause (e.g. weather pattern / sea spray changes).

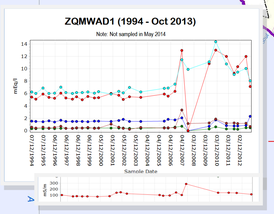


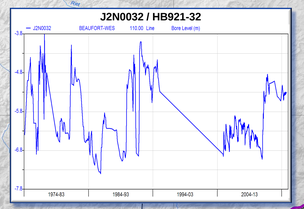


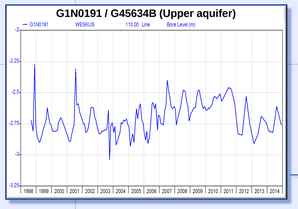


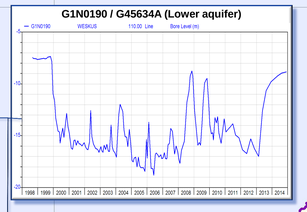


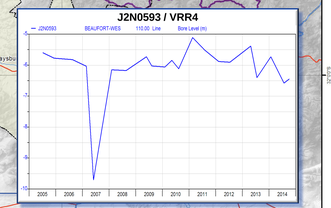


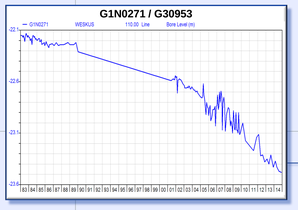


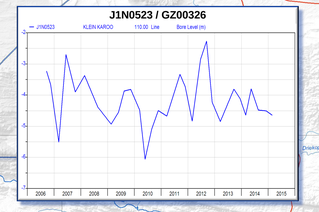


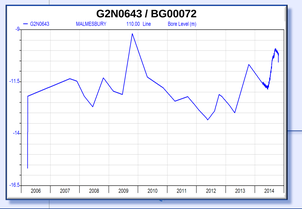


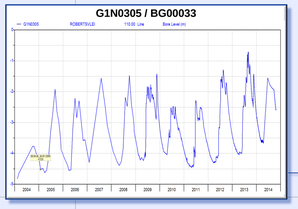


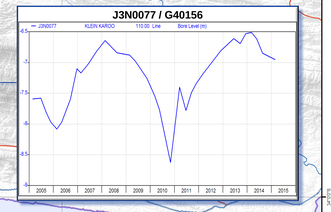


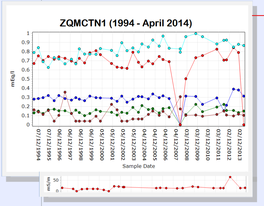


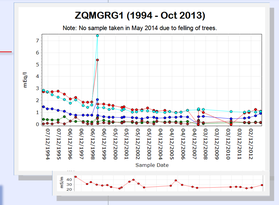


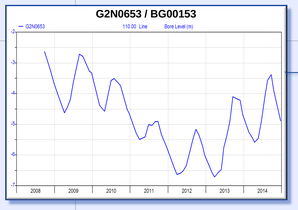


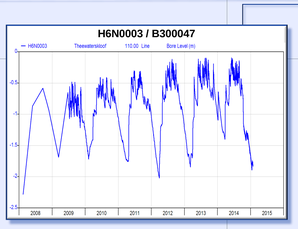


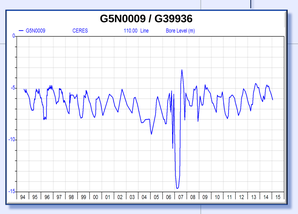


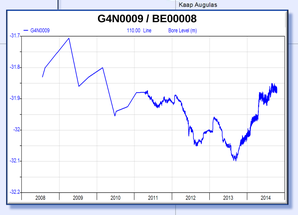


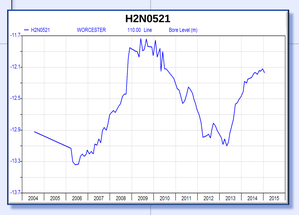


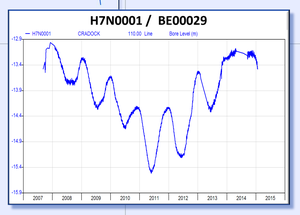












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