



DEVELOPMENT OF A NATIONAL INTEGRATED WATER INFORMATION SYSTEM (NIWIS) WP 10722

Information Document for NIWIS Dashboards

Draft Version 1.0

April 2015



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Acronyms and Abbreviations

Acronym / Abbreviation	Definition
DWS	Department of Water and Sanitation
NIWIS	National Integrated Water Information Systems
NWRS	National Water Resource Strategy
RQS	Resource Quality Services
RWQO	Resource Water Quality Objective
WARMS	Water Authorization Registration Management System
WMA	Water Management Area
WS	Water Services
WSA	Water Service Authority
WUA	Water Use Application



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Executive Summary

This document serves as a user manual for the National Integrated Water Information System and as such has the following limitations / cautions related to this information:

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1 Introduction

This document is, in its current state, an interim user manual. The document will be progressively updated until the NIWIS project is fully completed.

1.1 Objective of this User Guide

The objective of an “Information” function is to provide assistance to the user, to improve the interaction and experience with the system.

The overall goal of this manual is to guide the user to a better interaction with the NIWIS system by understanding how it functions and where the different functions of the systems can be accessed.

1.2 What is NIWIS?

NIWIS is an acronym for **N**ational **I**ntegrated **W**ater **I**nformation **S**ystem.

The NIWIS System consists of a set of dashboards to enable managers to make a quick assessment of the water situation in South Africa. The NIWIS dashboards represent the data in an interactive manner that is user friendly and easy to navigate and understand.

The level of complexity of the dashboards has purposefully been kept to a level suitable for senior managers, and for the public at large. Consider for example the dashboard of your vehicle, and then consider the dashboard within a large aircraft. The dashboard in a car provides the driver with an easy to understand overview of critical aspects related to the car. An aircraft on the other hand has numerous dials and dashboards which are really only understandable to trained pilots.

NIWIS aims to serve water information through a number of easy to understand dashboards, without getting into too many technical details. The dashboards are designed to give an overview at National level, Provincial or WMA level, and where possible at the level of individual items (e.g. dams, weirs etc.). NIWIS will be a living system, not only is it plausible, but also encourages that new ideas emerge to improve the dashboards over time.

2 Dashboard Structure

This section will give an overview of the web page structure, how to navigate the pages and the different elements shown on each of the individual dashboards. A detailed description of each dashboard will be given from Chapter 3.

All the dashboards are all very similar in structure. The menu bar is present at the top. [A]. This can be used to easily navigate between dashboards. [B] illustrates the map which is interactive. (e.g. Zoom in, Zoom out and select) and the relevant detailed information is shown in region [C]. Map controls are depicted in region [D].

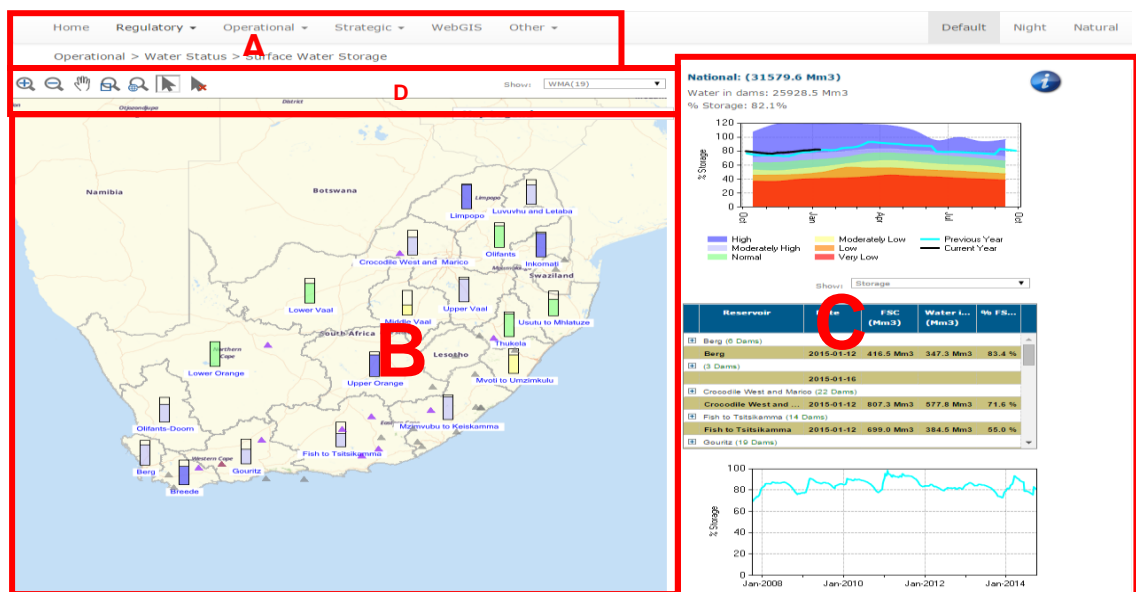


Figure 2-1: NIWIS dashboard structure

2.1 Top Menu



Figure 2-2: NIWIS Top Menu

NIWIS dashboards are structured and subdivided into categories as follows:

- Home – Home or Landing page
- Regulatory – For example, Wastewater quality and drinking water quality
- Operational – For example, surface water storage and river flows
- Strategic – For example, groundwater reserve and monitoring networks
- Web-GIS
- Other - refers to system related dashboards, e.g. last data imported, contact information of the dashboard champions and system administrators.








2.2 Map Controls



Figure 2-3: Selection Control Panel


The map controls are used to interact with the map, to enable the user to navigate to and select items on the map. When an item is selected, detailed information will be displayed in region (C). The table below explains the functionality of each map control.

Table 2-1: A list of map controls used in NIWIS and their functions

ICON	NAME	FUNCTION
	Zoom in	Manipulate a display so as to make it larger and possibly more detailed.
	Zoom out	Manipulate a display so as to make it smaller and possibly less detailed.
	Pan	To move while continuing to expose, enabling a contiguous view and enrichment of context.
	Zoom by drawing a box	Select an area by drawing a box around it.
	Zoom to full extent	Manipulate a display to so as to take it to the original size
	Select feature	Select the polygon on the map to display its information.
	Clear Selection and Zoom Out	Clears all selections and restores to full extent

2.2.1 Zoom in

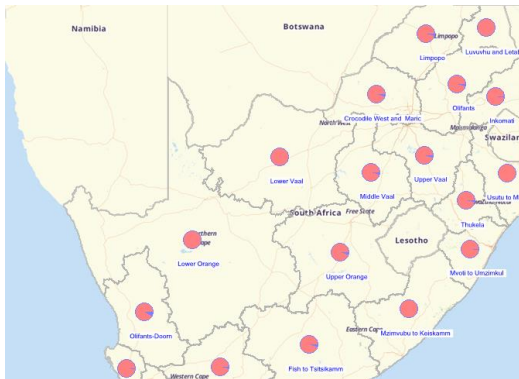
The first level of zoom is at the national scale, and depending on which information is to be displayed on the map, it could be at a Provincial or Water Management Area (WMA) level. The zoom in functionality is used to zoom in to a specific location on the map. Select this tool with the mouse.

To view more details on the map for a specified WMA or Province, one must use the Zoom in () icon as defined above. Select the icon and click on the map where to zoom in. This allows for a further drill down, whereby all the activities within one quaternary can be displayed on a map.

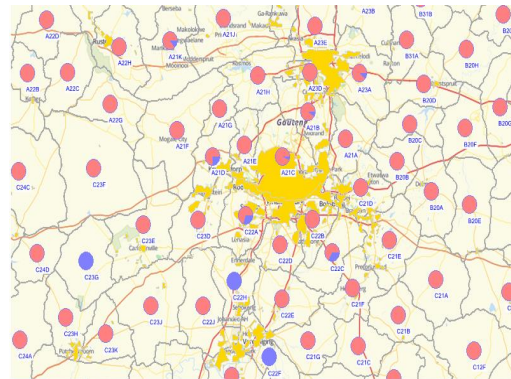


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This map is zoomed to full extent with all information displayed at WMA level.

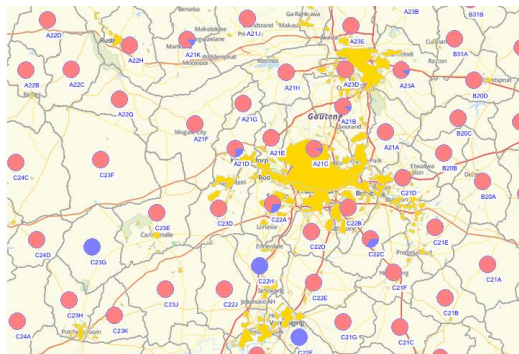


This is the same map, zoomed in to show more details for a selected area within a selected WMA.

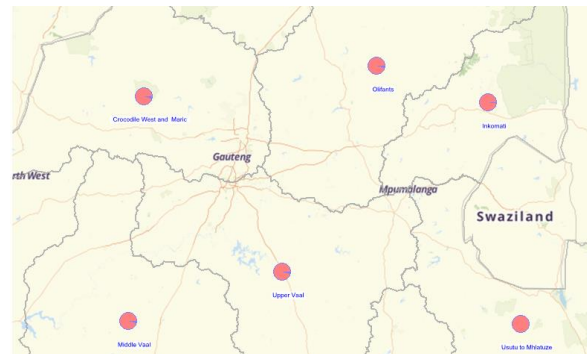
2.2.2 Zoom out

The zoom out functionality (🔍) is used to zoom out from a specific location on the map (display less information on the map if one had zoomed in to display more information before). Select this tool with the mouse. This functionality will be used to display information up to the national scale.

The two maps below demonstrate the concepts of zooming in and zooming out. Select the icon and click on the map where to zoom out from. The map displayed on the left is zoomed in (drilled down to more details) while the one on the right is zoomed out (more area displayed but less details).



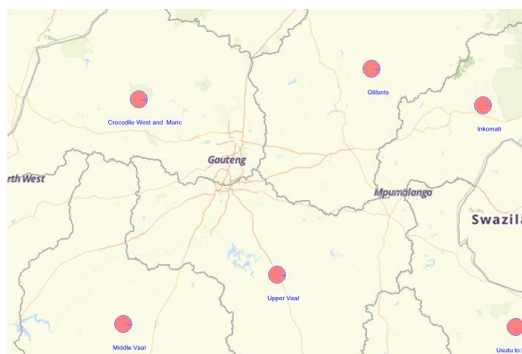
This map is zoomed in to show more details for individual indicators



This is the same map zoomed out to provide a less detailed overview of an area

2.2.3 Pan

The pan (📏) functionality is used to move (re-centre) the map. Select this tool with the mouse. Either select on the map and the map will centre on that point or select on the map and drag it to reposition the map centre. This can move the map in all directions (North, South, East or West)



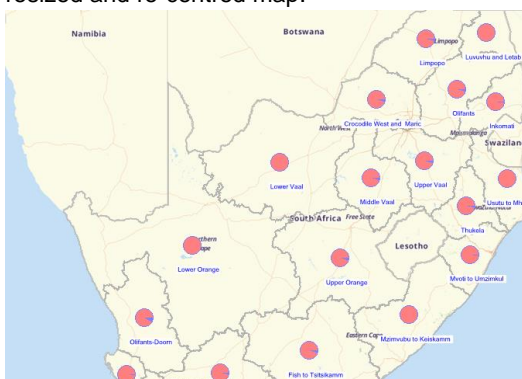
This map provides overview for indicators at a few zoomed in areas



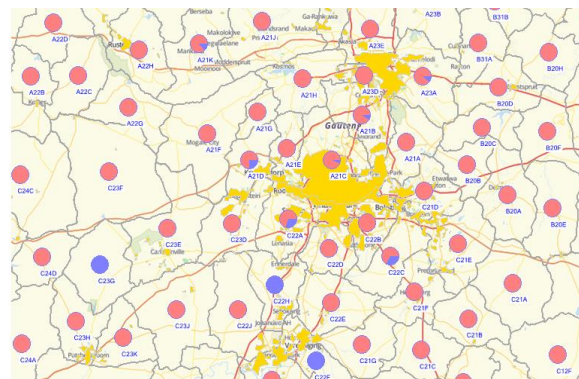
This is the same map with similar zoom in level, but for a slightly different overview of an area.

2.2.4 Zoom by drawing a box

The “Zoom by drawing a box” (📏) functionality is used to either zoom in or zoom out the map by drawing a rectangle around the area to zoom to. Select this tool with a mouse by selecting the icon and left-click and drawing the rectangle on the map while still left clicking. Release the left clicking to display the resized and re-centred map.



This map is zoomed to full extent with all information displayed at WMA level.



This is the same map, zoomed in to show more details for a selected area within a selected WMA.

2.2.5 Zoom to full extent

The “Zoom to full extent” (🌐) functionality is used to zoom out to the full viewing area. Select this tool by selecting the icon and the map will automatically refresh to full view (national scale). It will provide the information for either a province or a WMA within which the selection was done.

2.2.6 Select feature

The “Select feature” (📍) functionality selects features on the map and gets information about them. The selected features are highlighted in colour on the map. Select this tool with the mouse, and then select features on the map for which information is desired. When using this tool, either click on the map to select a feature or drag a rectangle around the area to select feature.

2.2.7 Clear Selection and Zoom Out

The “Clear Selection and Zoom Out” (🗑️) functionality clears the selected features highlighted in colour on the map and listed in the table. This will provide information at a national scale, aggregated at either Provincial or WMA level (depending on the level of information provided by the data source).

3 Home Page

The “Home” or Landing page is the main dashboard displayed when accessing the NIWIS system. It serves as a starting point to navigate through the NIWIS system.

On the left it provides a link to the DWS website as well as a search tool which helps users to search using keywords to find information within the NIWIS system [A]. Area (B) depicts a featured dashboard, selected by the System Administrator.

In region (C), there are three important indicators predetermined by the system administrator to provide the user with a first glance status of such indicators, for example, surface water storage, groundwater status and non-revenue water.

Region (D) at the bottom of the page, is a quick link (carousel-type menu) that can be used to access all the dashboards. It should be noted that this menu is only available on the home page.

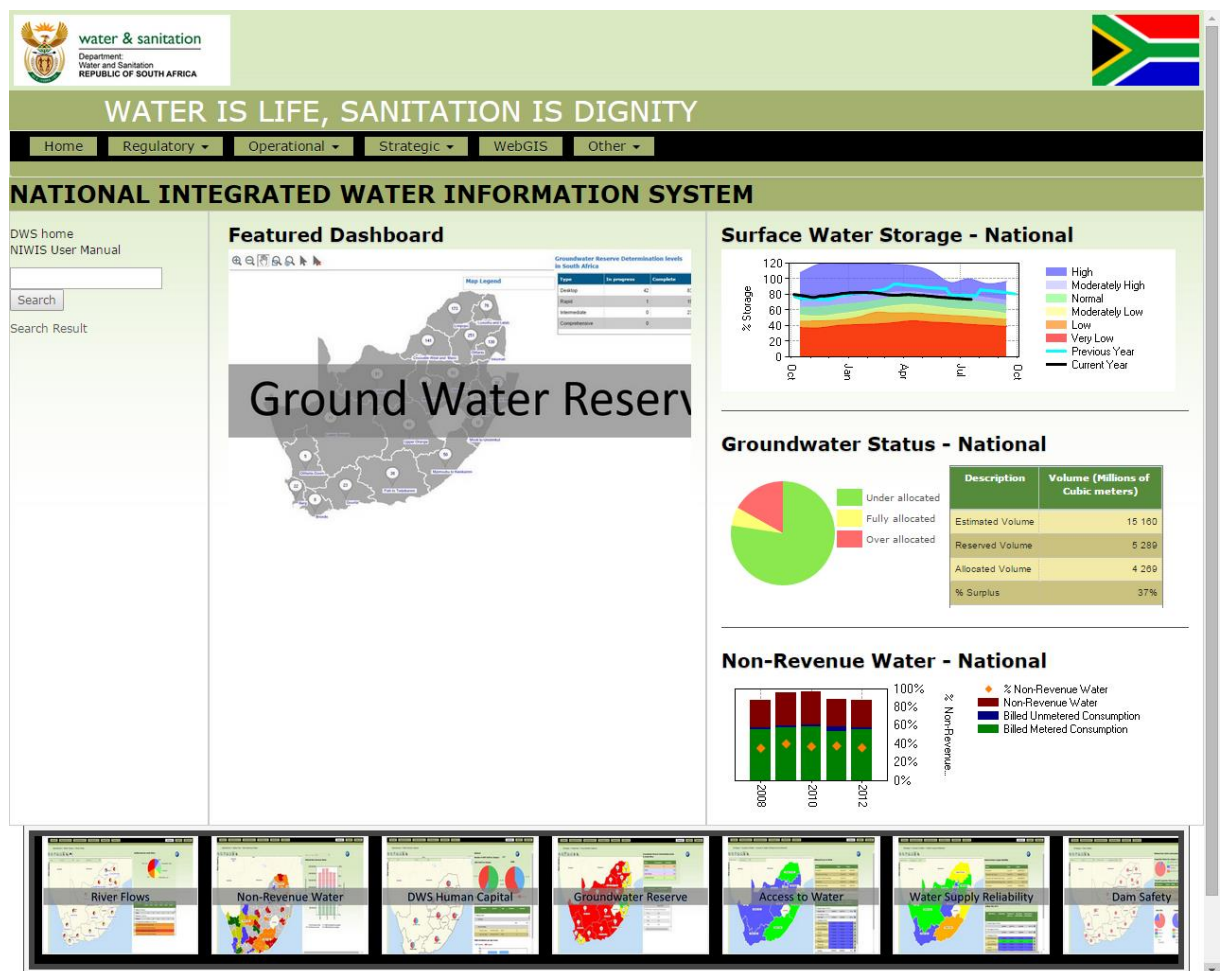


Figure 3-1: NIWIS Home Page



4 Regulatory Dashboards

4.1 Overview

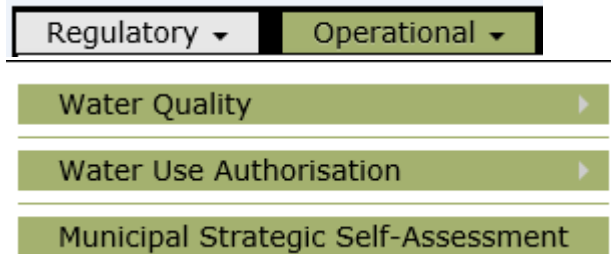


Figure 4-1: Selecting a Regulatory dashboard from a dropdown list

Regulatory dashboards deal with compliance and describe the goal that the department aspires to achieve in their efforts to ensure that personnel are aware of and take steps to comply with relevant laws and regulations.

Figure 4-2 shows an example of one of the Regulatory dashboards in NIWIS.

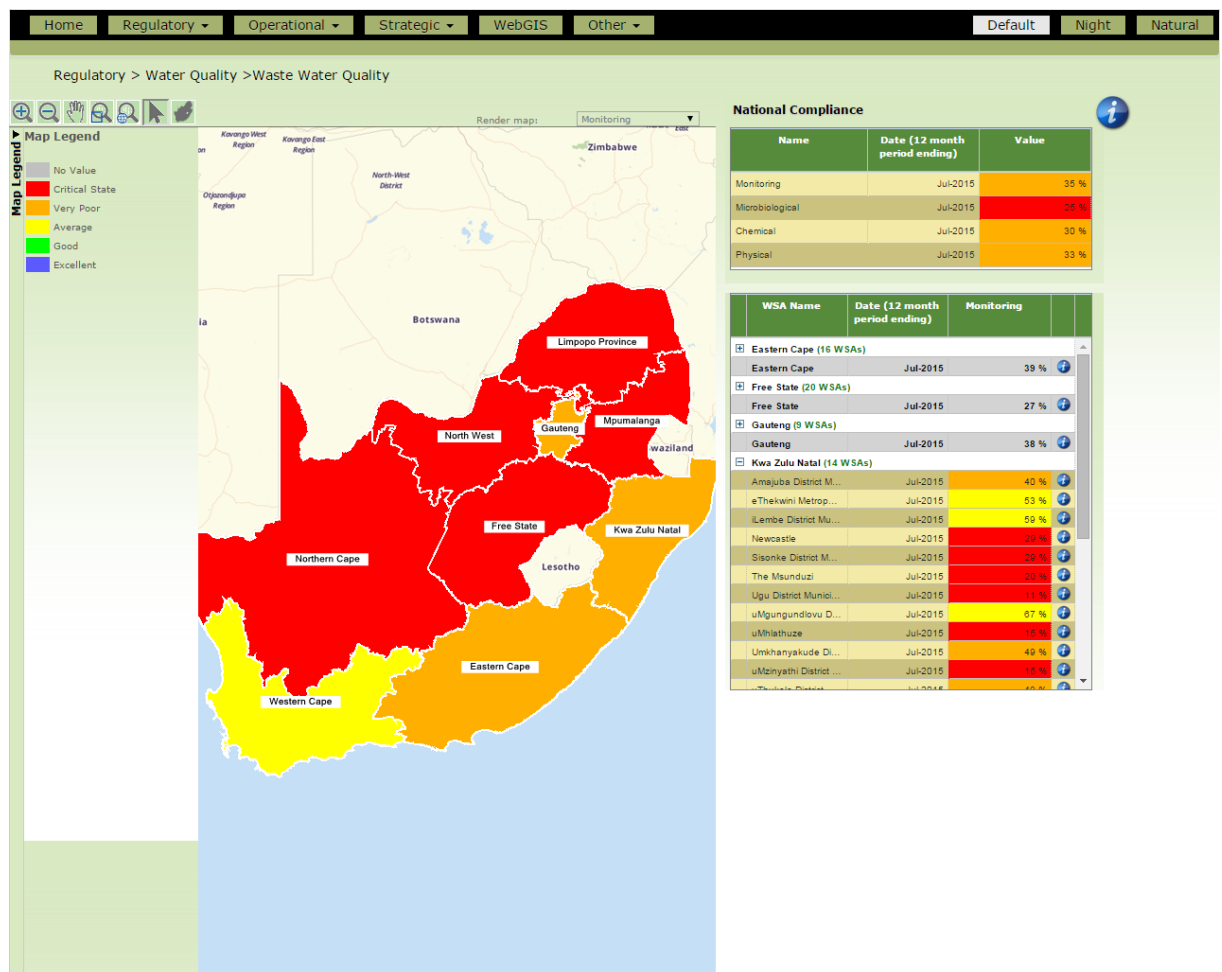


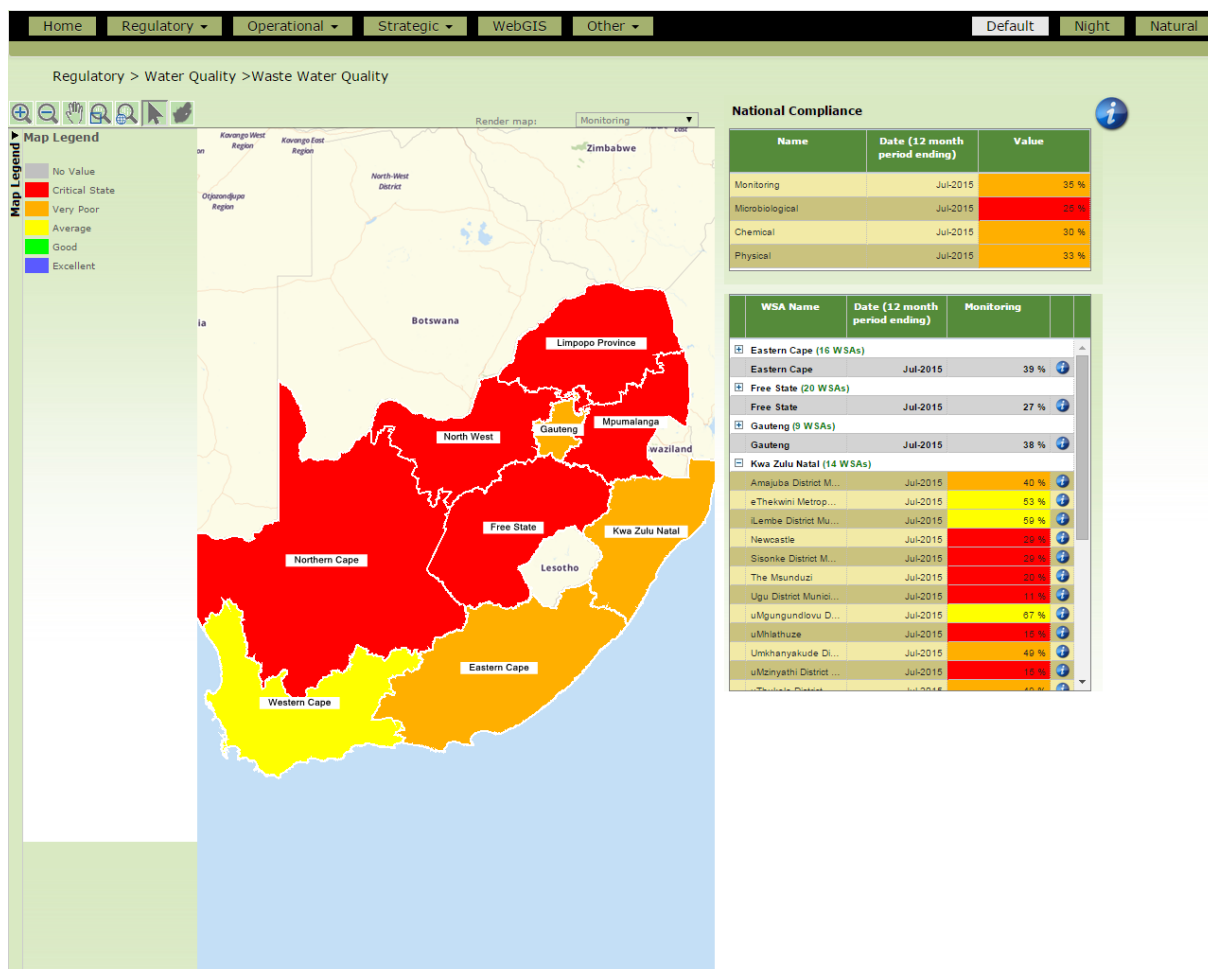
Figure 4-2: One of the Regulatory dashboards in NIWIS

4.2 Water Quality

4.2.1 Waste Water Quality

Information Page Related To The “Waste Water Quality” Dashboard

To access the Wastewater Quality dashboard, the user should navigate as follows:
Regulatory>Water Quality>Waste Water Quality



What does this dashboard relate to

The Waste Water Quality (WWQ) dashboard provides the user with a National, Provincial presentation of Effluent and Monitoring Compliances for a 12 month period. Effluent Compliance includes the following three categories: Microbiological, Chemical & Physical. Effluent Compliance is calculated based on actual samples taken and tests conducted on Determinants within these three categories. Monitoring Compliance is calculated on number of tests done vs. number of tests required per Determinant.

Contacts details of person/s who championed this dashboard

Mrs Zanele Mupariwa. Telephone (012) 336 6938.

What type/s of questions does the information product aim to answer

The product provides the user with a view of the quality of waste water effluent in a given area in terms of Effluent Compliance (Microbiological, Chemical & Physical). The Monitoring Compliance will provide the user with an indication whether waste water is being monitored according to the Sampling Programmes within the given areas.



Geographical representation of the data indicates both the Effluent and Monitoring compliance down to the lower level (WSA's). The WSA view will be a rolled up view of all the WWTW (Wastewater Treatment Works) within the giving WSA.

Data / Information discussion

Data used to generate the information

What data is used?

Data is captured directly (by WSA's/WWTW) on the Green Drop System Website (GDS). Calculations are automated in the GDS Website to determine Effluent & Monitoring compliances.

How is it extracted and from where?

The data is extracted via Macro Planning processes and procedures from the Green Drop System (GDS) database.

How often is it extracted?

The data is captured and compliances calculated on a daily basis. Data extracts are done on a monthly basis in order to build a 12 month period view.

Business processes related to the data

N/A

The algorithms / equations used to convert data into information

NIWIS calculates the performance grading for presentation purposes based on the following Performance Grading:

Compliance below 80%:  Compliance between 80-90%:  Compliance between 90-95%:  Compliance above 95%: 

Key assumptions made

That the user has been provided with access to Effluent & Monitoring Compliance information for wastewater quality within a given area. Data displayed is a reflection of data as entered by WSAs/WWTW. Any WSA/WWTW not entering information in the GDS will not be represented in NIWIS displayed data.

Are there any limitations / cautions related to using this information?

Yes, refer to the paragraph below:

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Links to other sources of related information

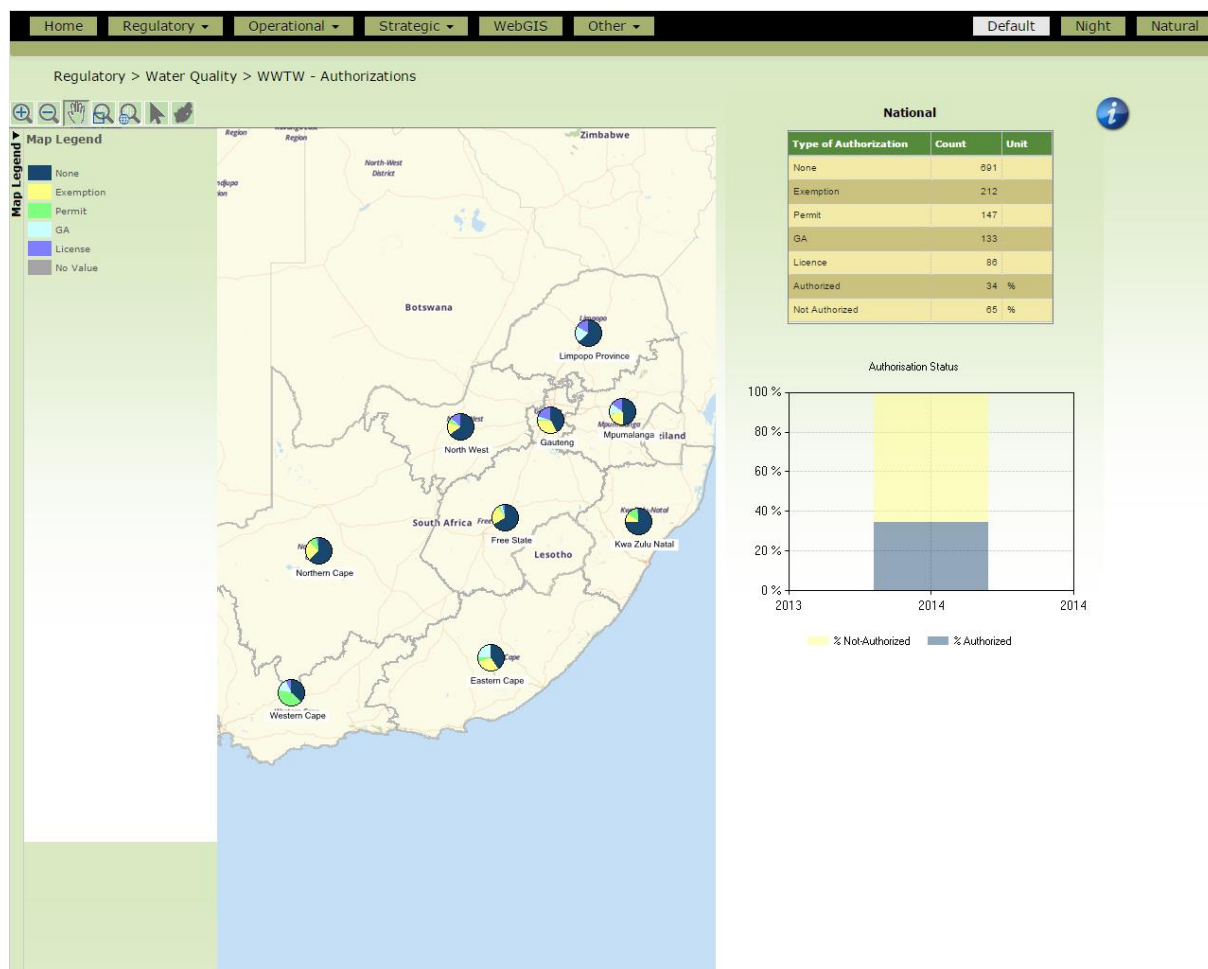
www.dwa.gov.za/greendrop

www.dwa.gov.za/wsk

4.2.2 Wastewater Treatment Works Authorisations

Information Page Related To The “Wastewater Treatment Works Authorisations” Dashboard

To access this dashboard, the user should navigate as follows:
Regulatory>Water Quality>WWTW – Authorisations.



Authorisation status of the Wastewater Treatment Works (WWTW) in South Africa

What's the main purpose of the dashboard?

Contacts details of person/s who championed this dashboard:

Karlien de Villiers, reachable on +27 12 336 7547 and Nonto Mtshali, reachable on +27 12 336 7617.

What type/s of questions does the information product aim to answer:

The dashboard aims to answer the following questions:

- Number of WWTWs in SA/ Region/ Local Municipality
- Number of WWTWs that are authorised
- Type of authorisation (GA/ Licence/ Permit/ Exemption)
- Whether authorisations are still valid or have expired
- % of authorised and unauthorised WWTWs per region
- Water uses involved in

Data / Information discussion:

- Data used to generate the information
 - What data is used?
 - Information provided by Provincial Operations (Regions).
 - Data from Water Use Authorisation and Administration (Letsema).
 - Green Drop Reports.
 - How is it extracted and from where?
 - Provincial Operations (Regions) verify information on inventory list send to them.
 - Excel spreadsheets provided by Water Use Authorisation and Administration (Letsema).
 - Green Drop Reports as become available.
 - How often is it extracted?
 - Provincial Operations (Regions) verify information on a yearly basis.
 - Data from Water Use Authorisation and Administration (Letsema) is requested on a monthly basis
 - Green Drop Reports are available every second year.
 - Business Processes related to Data
 - WMS
 - Green Drop System
 - The algorithms / equations used to convert data into information
 - Key Assumptions
 - Graphs
 - Summaries of authorisation status per Region
- Are there any limitations / cautions related to using this information?

The database is updated frequently as we become aware of:

- new WWTWs or WWTWs that have been decommissioned
- the change in authorisation status of the WWTWs

Therefore we need a contact person to send the updated inventory to on maybe a quarterly basis. The real time data is not verified. One has to be cautious when using the data.

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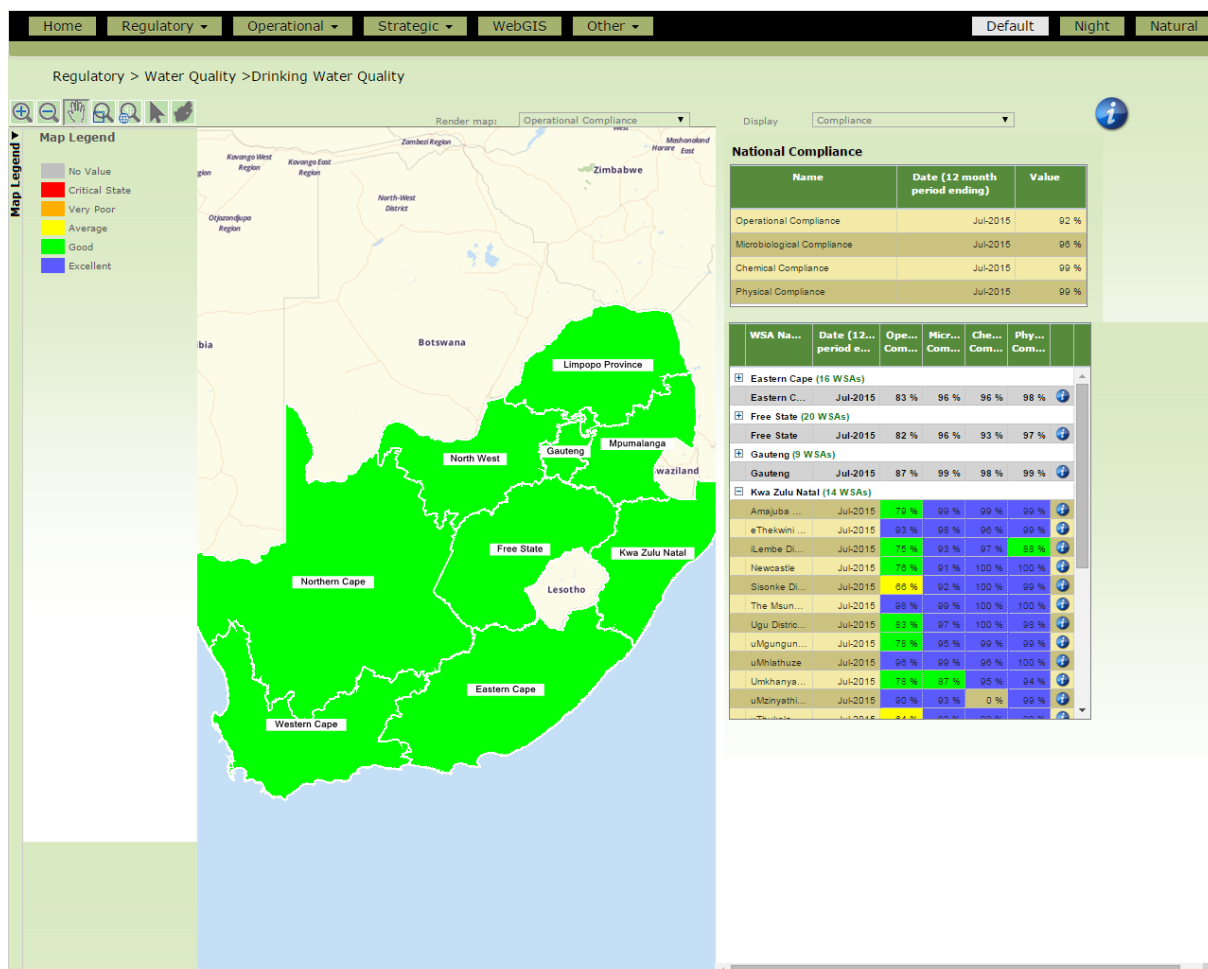
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- WMS
- Green Drop System
- www.eWISA.co.za

4.2.3 Drinking Water Quality

Information Page Related To The “Drinking Water Quality” Dashboard

To access this dashboard the user should navigate to:
Regulatory>Water Quality>Drinking Water Quality.



This dashboard's map color coding represents the Drinking Water Quality compliance and monitoring status, as indicated on the map legend.

The Drinking Water Quality dashboard map can be rendered for the following status:

- Operational
- Microbiological
- Physical or
- Chemical.

The Dashboard can be viewed in two modes, namely:

- Compliance or
- Monitoring

The table at the top right shows the aggregated summary information of the selected map area. It provides the information on the four statuses, and includes the dates of the last update as well as the values (as a percentage of total monitoring/compliance status). The second table provides aggregated detail information for the selected map area, for all the four compliance/monitoring statuses.



The Drinking Water Quality information is provided by Water Services and is updated monthly.

Are there any limitations / cautions related to using this information?

Yes, please refer to the section below:

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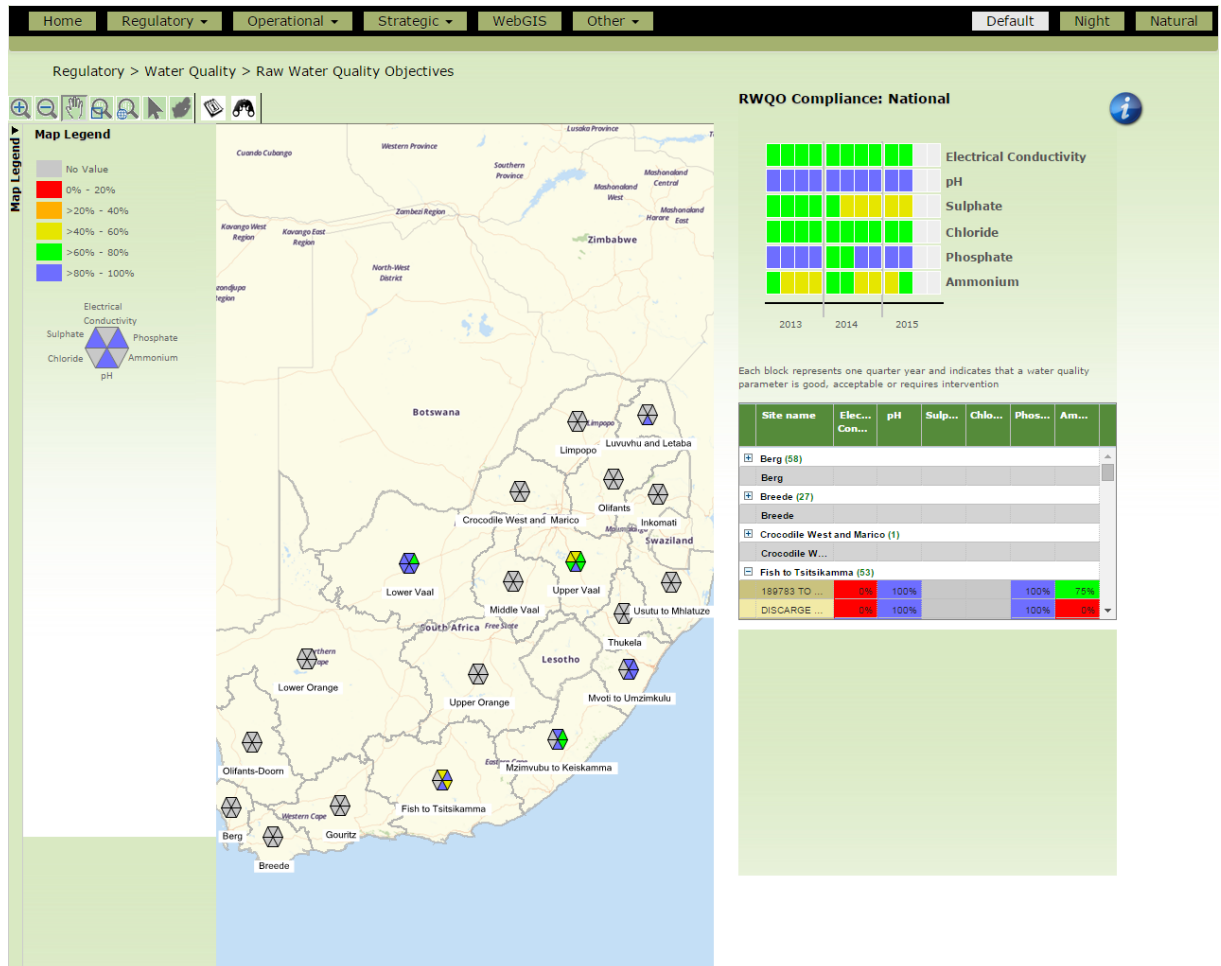
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4.2.4 Raw Water Quality Objectives

Information Page Related To The “Raw Water Quality Objectives” Dashboard

To access this dashboard, the user should navigate as follows:
Regulatory>Water Quality>Raw Water Quality Objectives



What does this dashboard relate to

This dashboard shows if Resource Water Quality Objectives (RWQOs) which have been set for 6 water quality parameters (i.e. electrical conductivity, pH, sulphate, chloride, phosphate, ammonia) for various geographic locations are being complied with or not. So in short, this is a compliance / non-compliance dashboard related to RWQOs. There may be cases where data is not available for all 6 water quality parameters. A “no value” indication is given when data is not available. RWQOs are set for a number of other water quality parameters. The 6 water quality parameters included in this dashboard have been chosen as they are likely to be of concern in all catchments.

What is the main purpose of the dashboard?

The dashboard highlights where (i.e. the geographic location) areas of non-compliance against the RWQOs with details of the type of water quality parameter/s that is/are not being complied with. The Department of Water and Sanitation will investigate areas where non-compliance against the RWQOs is taking place. It can take several weeks to months for the water quality data to be verified and made available for use. The implication is that this dashboard is not suited for day-to-day operational management decisions in catchments, but rather more for planning and oversight roles.



Does non-compliance against one or more of the 6 water quality parameters indicate a health risk to society?

No, not necessarily. The RWQOs may have been set to a very high standard. So non-compliance against the standard does not automatically mean there is a health hazard.

It does indicate that the RWQO may have been set at an unrealistically strict level of protection for a given area, and/or that illegal activities may be taking place which contribute to the non-compliance. The non-compliance indicator serves as an alert to DWS to investigate the situation closer.

Also bear in mind that it can take several months for water quality samples to be fully processed and for the readings to be uploaded to the information system (WMS) used to determine if the readings comply or don't comply with the RWQO standards for the 6 water quality parameters. As the information may be a few months old it may not reflect the present water quality conditions.

Is the RWQO dashboard to be used for operational or for planning purposes?

It can take weeks to months for observed water quality readings to be verified and uploaded into the information system used to store this information (WMS). Given this fact, the information is not real-time or near-real time in nature, and is thus more suited for use in planning exercises. If the water quality readings are verified and uploaded with a short turn-around time, the dashboard could be used to help guide operational water management decisions.

Why are RWQOs set?

RWQOs are set to help ensure the protection of water resources. Once the water quality objectives are set, the water resources need to be managed so as to achieve the water quality objectives (targets). In certain river systems the ambition may be to have a very high level of protection, and high water quality objectives may be set. Other river systems may be seen as "working rivers", and the water quality objectives may be set to a lower standard. In all cases the water quality objectives must be set at a level of protection that is strict enough so as not to compromise the health and safety of South Africans. The setting of the RWQO's has an impact on the number and nature of water use licenses that can be issued in a catchment.

How by whom are the RWQOs set?

The RWQOs are set by the DWS following intensive stakeholder discussions and interactions. During these interactions the impact of various RWQOs on water use licensing is discussed. The review of the RWQOs will probably not take place in time period increments of less than 5 years.

For which geographic locations are the RWQOs set?

RWQOs are set to coincide with the geographic locations of water quality monitoring sites. RWQOs may be set for certain of these water quality monitoring sites, but not necessarily for all of them. The NIWIS RWQO dashboard gives an indication of the sites for which RWQOs exist. RWQOs are set for a stretch of a river, the actual upper and lower values for each RWQO depends on the users in that section, the biology as well as the natural condition.

Have RWQOs been set for the entire SA?

RWQO's have been set for the whole of South Africa, however currently the RWQOs for the Upper Vaal have been captured into the WMS system.

Contacts details of person/s who championed this dashboard:

Ms Lebo Mosoa (012) 336-7564 & Mr Geert Grobler (012) 336-8691 & Mr Pieter Viljoen (012) 336-7514

What type/s of questions does the information product aim to answer:

The primary question this information product aims to answer is... "where are the RWQO's not being complied with in South Africa". This helps to identify hot-spots, which can help direct investigations and further action.

Data / Information discussion

What data is used?

There are two types of data required to generate this dashboard.

- The first being the RWQOs which are set at different geographic locations for the 6 water quality parameters.
- The second is a time-series of verified observed water quality readings for the 6 water quality parameters.

How is data extracted and from where?

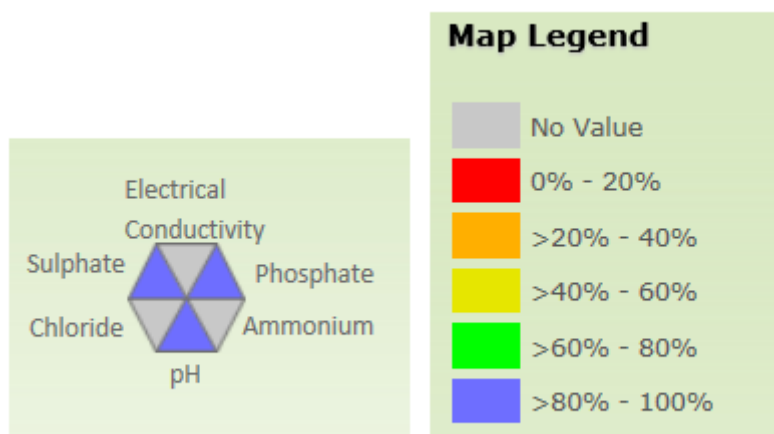
Water quality samples are taken and analysed by RQS on set intervals. Several water quality parameters can be measured from one sample. The water quality parameter results are validated, and then captured in the WMS database. The validation and upload into WMS can take a period of several months. A stored procedure (i.e. a script in the WMS database), which when initiated compares the values of the observed verified water quality readings against the RWQO's. NIWIS initiates the stored procedure every Sunday evening.

Calculations done in NIWIS

From the activation of the stored procedure in the WMS database, NIWIS captures a time-series of compliance or non-compliance for each of the 6 water quality parameters. A further calculation is then done in NIWIS to determine the percentage of readings that are compliant over a moving 12 month period.

- If no compliance value is observed (over the 12 month period), the icons on the map will be coloured grey.
- If 0-20% compliance is observed (over the 12 month period), the icons on the map will be coloured red.
- If a 20-40% compliance level is observed, then icons on the map will be coloured orange.
- If a 60-80% compliance level is observed, then icons on the map will be coloured green.
- If an 80-100% compliance level is observed, then icons on the map will be coloured blue.

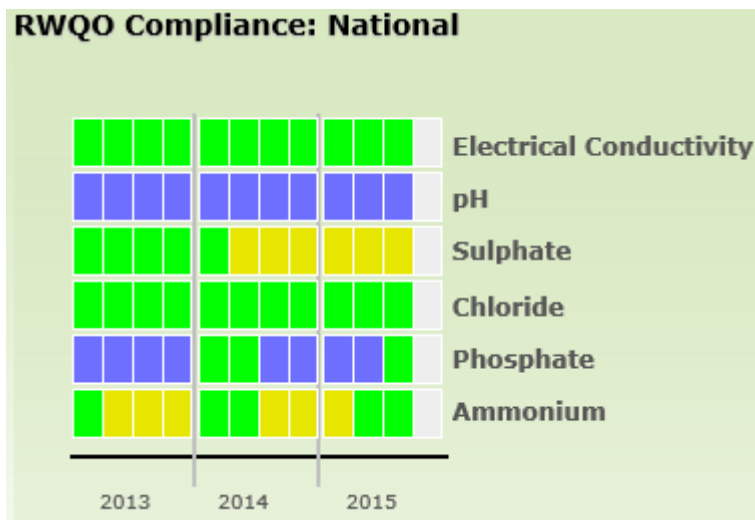
A hexagonal icon has been developed to allow for 6 of the water quality parameters to be included in one icon. The hexagon wedges (slices) are then coloured to show the percentage level of compliance as described above.



In addition to the 12-month calculations undertaken for the icons on the map, icons are developed to show the quarterly performance, using the same colour coding as detailed above.



RWQO Compliance: National



Key assumptions made

- That the observed water quality readings have been correctly verified, and that not errors or omissions have taken place when storing the information into WMS.
- That the RWQO standards have been appropriately captured in WMS
- That the calculation procedures to determine compliance or non-compliance are being done correctly.

Are there any limitations / cautions related to using this information?

Yes, please refer to the section below:

- The verification process of the data can take weeks to months. The implication is that data is not real-time or near-real time.
- There could be errors in the data (i.e. the verification process, and/or the storing process).
- The RWQOs have not been captured for the entire country in WMS yet.
- The RWQO Dashboard only considers 6 water quality parameters.

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Quality

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- all error corrections and/or enhancements of data will be offered free of charge to the Department Water and Sanitation.

Status

Data is continuously updated. The data set(s) supplied are already historical on the day of supply. Department Water and Sanitation has no duty to ensure the recipient of the data receives subsequent updates. It is the responsibility of the recipient of the data to request subsequent updates.

Acknowledgement

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Links to other sources of related information

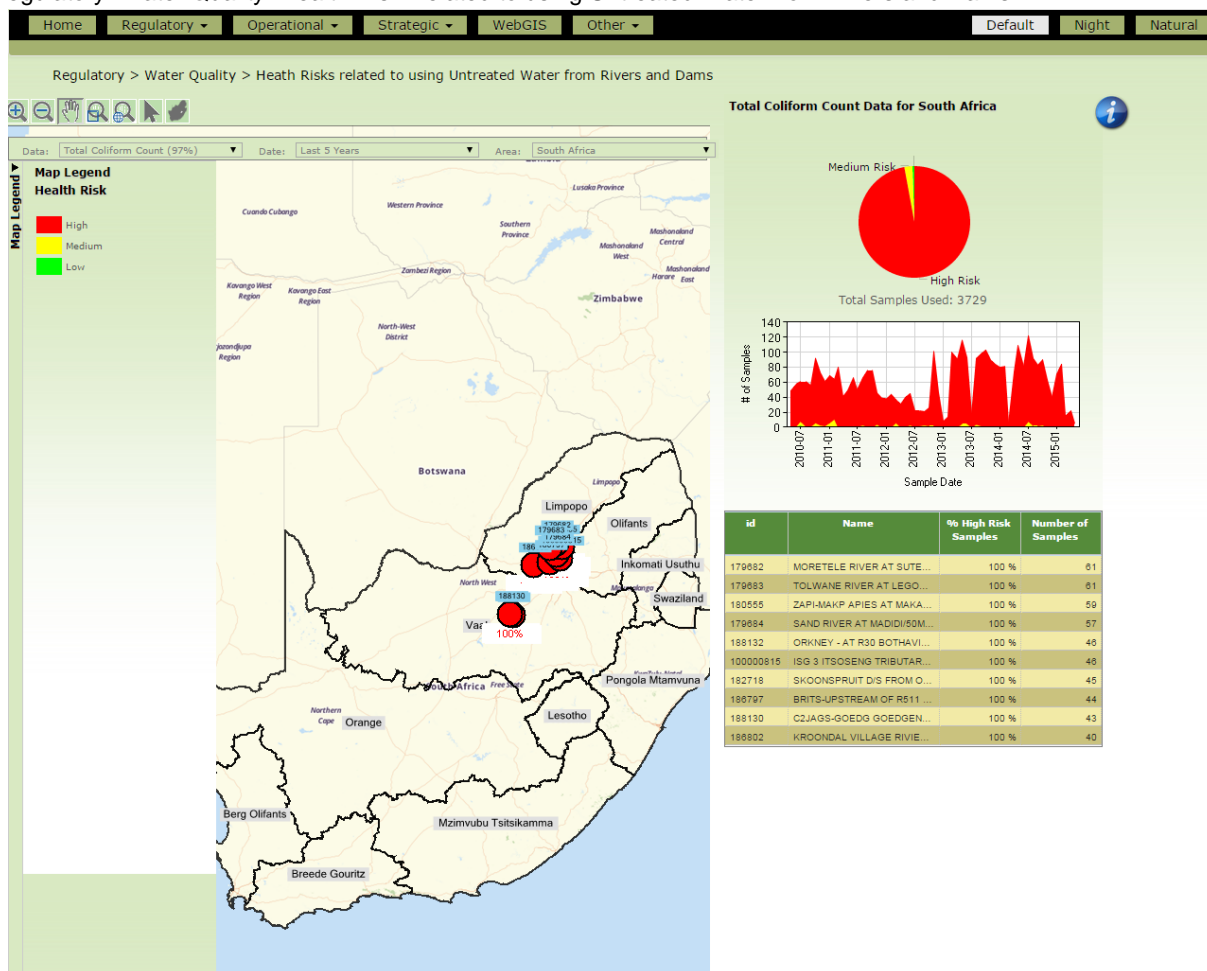
- A link to information related to the South African water quality guidelines, 1996 can be found at: [South African water quality guidelines, 1996](#)
- A link to Reserve Determination Measures (RDM) can be found at: [Reserve Determination Measures](#)

4.2.5 Health Risk Related to using Untreated Water from Rivers and Dams

Information Page Related To The “Untreated Surface Water and Human Health Risks” Dashboard

To access this dashboard the user should navigate as follows:

Regulatory>Water Quality>Health Risk Related to using Untreated Water from Rivers and Dams



With the **water quality** information available to the DWS, we would like to show where untreated surface water (i.e. untreated water in dams and rivers) is, or has been, of such poor quality that it could pose a health risk to those who drink it.

What is water quality?

The term "water quality" describes the microbiological, physical and chemical properties of water that determine its fitness for use. Many of these properties are controlled or influenced by substances which are either dissolved or suspended in the water.

What types of questions does the information product aim to answer?

The dashboard aims to answer the following questions:

- What problematic water quality constituents pose the greatest risk to human health in areas where they are routinely measured?
- Where do we know that drinking untreated water may be risky? The dashboard includes a map of communities to give an idea of where people are likely to be exposed to risk.
- What are the trends of the problem constituents at sites where routine measurements are available?

What is the main purpose of the dashboard?

The main purpose is to provide an overview of some potential water related health risks people are exposed to in South Africa. This information can help guide necessary intervention.

What are some limitations associated with this dashboard?

Some limitations include:

- Financial constraints limit the geographic extent of the monitoring network and the frequency of monitoring. Many water bodies in South Africa are not sampled or the results are not available on the central database. Reporting on the potential health risks of water bodies in South Africa is restricted to those with adequate information.
- Some monitoring sites have very few recent analyses. Water quality can vary over time, so the analysed information available may have missed water pollution events.
- It can take months for sampled water to be analysed, and then captured in WMS. The water risk information may thus be outdated by the time it is in NIWIS.
- Hundreds, even thousands, of potentially harmful compounds may be present in water, but facilities are only available for measuring a selected few.

What information is used to determine if the water quality poses a risk to human health?

The water samples taken by the Department of Water and Sanitation are compared to water quality guidelines captured in the 2nd edition of the South African Water Quality Guidelines (DWAF, 1996) and Health Guidelines: Drinking Water Quality (Department of Health, 1995). A well-illustrated summary of these guidelines is captured in the document entitled "**The Quality of Domestic Water Supplies, Volume 1: Assessment guide**". The document can be downloaded by clicking on this **LINK**. The South African water quality guidelines are based on research here and in other countries on the recommended amounts of various substances in drinking water. The guidelines are currently under review in order to better estimate the risk to users.

What water quality health risk related constituents are considered in this dashboard?

The dashboard considers the water quality constituents in Table 1: not all are equally hazardous. The table includes an indicator of moderate risk for information – the actual analytical process uses five or more ranges.

Table 1: A summary of water quality variables, effects and the values at which moderate risk occurs. Please consult <https://www.dwa.gov.za/iwqs/AssessmentGuides/AssessmentGuide/AssessmentGuide.pdf> for details.

Variable	Effects	Moderate Risk
Electrical conductivity (total dissolved salts)	Electrical conductivity is a general indicator of total dissolved salts (TDS). It is a measure of whether the water tastes drinkable and is capable of slaking thirst.	< 370 mS/m
pH	pH has a marked effect on the taste of the water and also indicates possible corrosion	4.5 to 10.0



	problems. Low pH can cause copper, zinc and cadmium to be more soluble and therefore toxic.	
Turbidity	Turbidity affects the appearance, and thus the aesthetic acceptability, of the water. Turbidity is high in surface waters after heavy runoff. It is sometimes associated with contamination by microbial pathogens whose presence in water suggests faecal contamination with disease producing bacteria, viruses and protozoa.	< 20 NTU
<i>E. coli</i>	<i>E. coli</i> is an indicator organism whose presence in the water suggests faecal contamination with disease producing bacteria, viruses and protozoa.	(definitely < 10)
Faecal coliform	Faecal coliform counts are another indicator of the possible presence of disease-causing organisms in the water. They are a sign of faecal contamination.	< 10 counts / 100mL
Total coliforms	Total coliforms are a more general indicator of microbial pathogens and ineffective disinfection.	< 100 counts / 100mL
Free available chlorine(residual chlorine)	Free available chlorine is a measure of the effectiveness of the disinfection of treated municipal water. It is unlikely to be present in water resources..	
Arsenic	Arsenic may be present in groundwater, particularly in mining areas and can cause arsenic poisoning.	< 0.2 mg/L
Cadmium	Cadmium usually occurs along with zinc in acidic waters where it may have been dissolved from appliances.	< 0.02 mg/L
Copper	Copper affects the colour of the water and can cause	< 2 mg/L



	diarrhoea. Chronic exposure can cause Wilson's disease in susceptible individuals. Normally occurs only when copper piping is used to carry water with a low pH value.	
Zinc	Zinc affects the taste of water and people are unlikely to be able to drink toxic amounts.	< 20 mg/L for taste
Iron	Iron affects the taste of the water and may cause a reddish brown discolouration.	< 5 mg/L
Nitrate and nitrite	Nitrate and nitrite are common in borehole samples, particularly in areas of intensive agricultural activity, downstream of sewage works or where pit latrines are used. Severe toxic effects are possible in infants.	< 20 mg/L for infants
Fluoride	Fluoride is often elevated in groundwater in hot, arid areas. While essential in low concentrations, high concentrations of fluoride can cause damage to the skeleton and mottling of teeth.	< 1.5 mg/L
Chloride	Chloride is often elevated in hot, arid areas, and on the western and southern Cape coasts (particularly in groundwater). It causes nausea and vomiting at very high concentrations, so voluntary consumption is likely.	< 600 mg/L
Sulphate	Saline water with high sulphate concentrations causes diarrhoea, particularly in users not accustomed to drinking water containing sulphate.	< 600 mg/L
Sodium	Sodium affects the taste of the water. Often high in hot, arid areas and on the western and southern Cape coasts, particularly in groundwater.	< 400 mg/L
Calcium	Calcium can cause scaling and	< 300



	can reduce the lathering of soap, but is unlikely to be toxic.	mg/L
Magnesium	Magnesium affects the taste of the water. It is bitter at high concentrations. Common in some areas, it accentuates the effect of sulphate in causing diarrhoea.	< 200 mg/L
Manganese	Manganese is a common reason for brown or black discolouration of fixtures and for stains in laundry, but is unlikely to affect human health.	< 4 mg/L
Potassium	Potassium affects the taste of the water and is bitter at elevated concentrations.	< 100 mg/L
Hardness, Total	Hardness is a combination of calcium and magnesium. It is associated with scaling and inhibition of soap lathering, but is unlikely to be toxic.	< 600 mg/L

When comparing the analysed value of each respective constituent against the constituents are classified as being either (i) ideal water quality, (ii) good water quality, (iii) marginal water quality, (iv) poor water quality, or (v) unacceptable water quality.

For the purposes of this dashboard, these five categories have been re-categorised as follows:

Ideal water quality	No health risk
Good water quality	No health risk
Marginal water quality	Medium health risk
Poor water quality	High health risk
Unacceptable water quality	High health risk

Is this dashboard for operational or for planning purposes?

Water Quality sampling and analysis can take weeks to months before the result can be verified and uploaded into the information system used to store this information (WMS). Only once the information is stored in the WMS can the calculations be done to assess the risk of observed and analysed water quality concentrations to the people's health. The information is generally therefore not real-time or even near-real time in nature, and is thus more suited for planning. If verified water quality readings become available more quickly, the dashboard might help in guiding operational water management decisions. Note that water boards and municipalities test the water that they provide at a greater frequency and with a shorter turnaround time.



Contacts details of person/s who championed this dashboard:

Elijah Mogakabe, MogakabeE@dwa.gov.za, Tel: 082 808 9844, and

Mike Silberbauer, SilberbauerM@dwa.gov.za, Tel: 082 908 2895

Data / Information discussion:

○ What data is used?

The dashboard uses water quality information derived from monitoring data compared with water quality guidelines. NIWIS then aggregates this information into three classes.

○ How is data extracted and from where?

RQIS and regional staff collect water quality samples at prescribed intervals, and submit them for analysis at RQIS or other appointed laboratories. The water quality results are validated, and then captured in the WMS database. The validation and upload into WMS can take several months. A stored procedure, which is a script in the WMS database, compares the values of the observed verified water quality readings against water quality guidelines. The stored procedure for annual information uses the yearly median values of each variable in the above table and compares it to the guidelines for drinking water. The stored procedure for monthly values uses the monthly mean value of each variable and compares it to the guidelines.

The stored procedure reports sites where the annual median or 95th percentile for any variable exceeds the lower boundary of the drinking water or domestic use guidelines containing one of these descriptions: serious health effects, serious risk, danger, increasing risk, increasing health risk, acute health risk, burns, chronic health, chronic effects, dehydration, poisoning, diarrhoea, definite health risk

The classes are (i) ideal water quality, (ii) good water quality, (iii) marginal water quality, (iv) poor water quality, or (v) unacceptable water quality. For ease of interpretation, NIWIS collapses the five classes into three.

○ Calculations done in NIWIS to attempt to answer the key questions

To answer the question "what are the problematic water quality constituents in a geographic area, e.g. National, WMA or local site", NIWIS performs the following analysis:

National scale	Let the count of the number of high risk classes found across all monitoring stations in South Africa for each constituent be X . Let the total number of high risk classes of all constituents in South Africa, be Y . Divide X by Y . Then rank the result from worst to best.
WMA scale	Let the count of the number of high risk classes found in all



	<p>monitoring stations in a selected WMA for each constituent be A. Let the total count by the total number of high risk classes of all constituents in the selected WMA, be B. Divide A by B. Finally rank the result from worst to best.</p>
Local site	<p>Let C be the count of the number of high risk classes at the site of interest for each constituent. Let D be the total number of high risk classes of all constituents at the site. Divide C by D. Lastly, rank the result from worst to best.</p>

To map at National or WMA level which monitoring sites have high records of red (high risk) classes for a given constituent, the following calculation is done:

National	<p>Let the count of the number of high risk classes for a given constituent at each monitoring site in South Africa, be E. Let the total number of constituent high risk classes for all monitoring sites in South Africa, be F. Divide the E by F for each respective site. As a final step, rank the result from worst to best.</p>
WMA	<p>Let the count of the number of high risk classes for a given constituent at each monitoring site in the selected WMA, be G. Also let the total number of constituent high risk classes for all monitoring sites in the WMA, be H. Divide the G by H for each respective site. In finality, rank the result from worst to best.</p>

To show the trends at National and WMA scale, the total numbers of red, green and yellow classes per month for a given constituent are counted. The counts are displayed in a stacked bar graph.

Key assumptions

- Monitoring is geographically and temporally uniform.
- All constituents have the same monitoring frequency at a monitoring site.



- The observed water quality readings are correct and no errors or omissions have taken place when storing the information on WMS.
- The calculation are appropriate.
- The analytical procedures have detected all hazardous substances.

Are there any limitations / cautions related to using this information?

- Data collection varies in intensity across WMAs, thus the National and WMA results are inherently biased. Always check the data at the local site scale before drawing conclusions. Sometimes the classification may be based on the result of a single sample.
- Some analyses are more expensive, so they may be performed less frequently and the results may appear to be less meaningful than they are, when aggregated in this way.
- The process of verifying the data can take weeks to months. Results are therefore not real-time or near-real time.
- Errors may occur during data capture or verification.
- Hundreds of toxic substances exist, and DWS can only analyse a few of them.

Links to other sources of related information

<https://www.dwa.gov.za/iwqs/default.aspx>
<https://www.dwa.gov.za/iwqs/wms/default.aspx>

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4.3 Water Use Authorisation

4.3.1 Water Use Licence Application Monitoring

Information Page Related To The “Water Use Licence Application Monitoring” Dashboard

To access this dashboard the user should navigate as follows:

Dashboard under Construction

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Acknowledgement

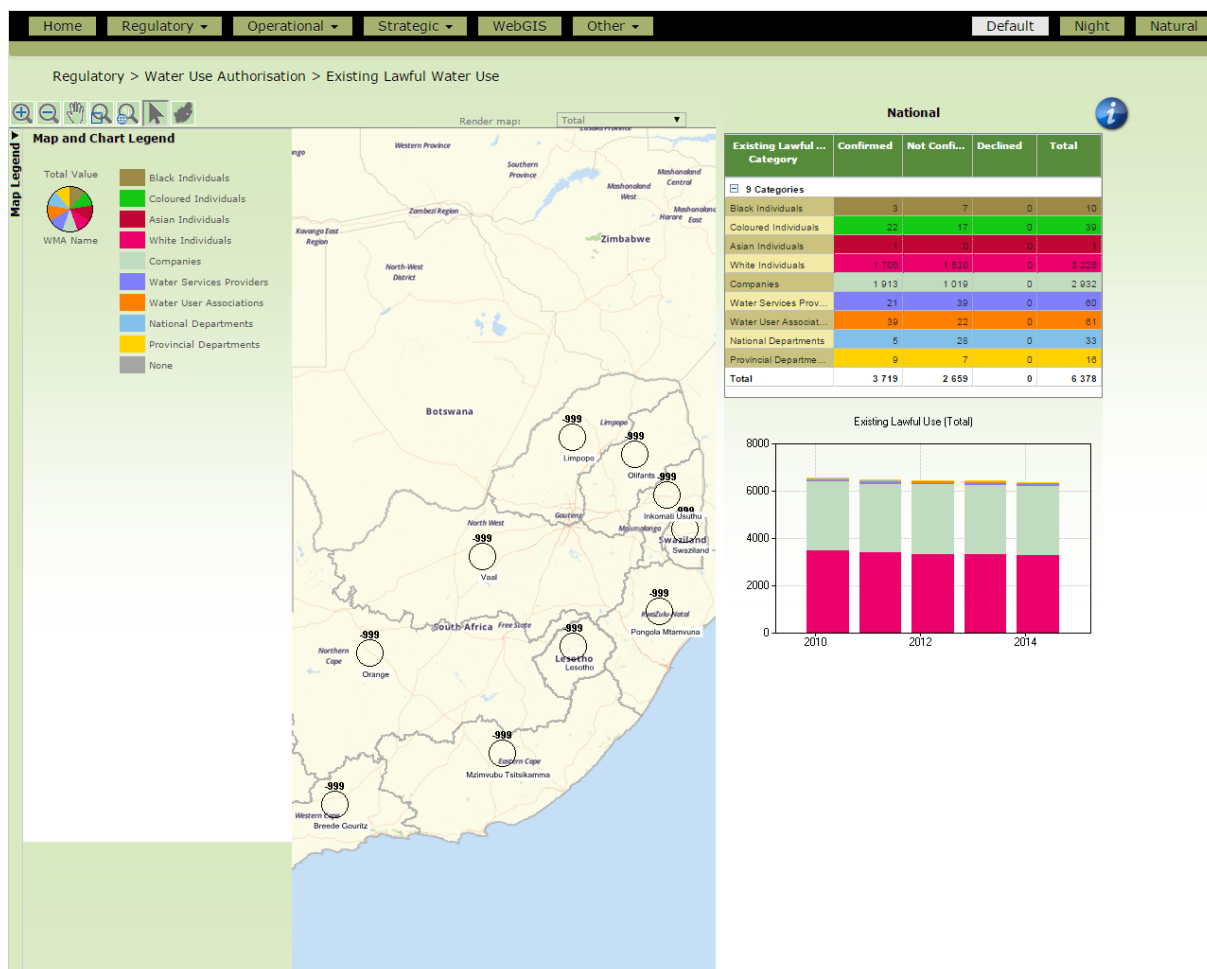
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4.3.2 Existing Lawful Water Use

Information Page Related To The “Existing Lawful Water Use” Dashboard

To access the Existing Lawful Water Use dashboard, the user should go the following path:
Regulatory>Water Use Authorisation>Existing Lawful Water Use.



What does this dashboard relate to: general description

This dashboard relates to “existing lawful water use” as an authorisation type. Existing lawful water use was a mechanism to bridge the gap between the old legislation and the new National Water Act (NWA). It was only intended as an interim measure to allow water use to continue until it can be converted to a licence.

An existing lawful water use is a water use that lawfully took place in the period two years before the commencement of the NWA. This allowed water use that lawfully took place to continue until such time as it can be converted into a licence. However, if you were not using water in the two years before the NWA was promulgated, but there was good reason why not, you can apply to have your water use declared as an existing water use. You can also apply to have the extent of your existing lawful water use verified at any stage, or the Department can ask you to apply for this verification.

This process is undertaken in two stages namely:

- **Validation** - confirms how much water you were using in the two years prior to the promulgation of the NWA, and whether this was correctly registered.



- **Verification** - confirms if the water use in that period was lawful. The Department use a variety of techniques to do this including satellite and aerial photography, irrigation water use models, and interviews with the water users.

Contacts details of person/s who championed this dashboard

Khutso Mabela, National Register of Water Use, 012 3367121, mabelak@dws.gov.za

What type/s of questions does the information product aim to answer

The dashboard provides statistics on water uses in a particular water management area that were:-

- confirmed as existing lawful water use,
- declined as existing lawful water use, and
- Those that are still to be confirmed as existing lawful water use.

This assists the Department of Water and Sanitation to manage the water resources and ensure fair water allocation. Thus the dashboard is suited for planning and oversight roles.

More information on existing lawful water use can be obtained from the link:

<http://www.dwa.gov.za/WAR/determine.aspx>

Data / Information discussion

Data used to generate the information

What data is used?

The WARMS database is used. The database is on DWS's network and the server is located at DWS head office.

How is extracted and from where?

Data is extracted using a Python script that connects to the WARMS database and executes a SQL query on the database, the filtered data is then copied to the temporary table in the NIWIS database before more processing is done on the data.

How often is it extracted?

Data is extracted monthly.

The algorithms / equations used to convert data into information

Select all licenses where the status is not deleted and the finding_reason_id is 2, 9 or 11. Count the number of licenses per financial year per WMA and Nationally for the following categories:

Total number of licenses,

Licenses awarded to individuals (per population group),

Licenses awarded to companies, licenses awarded to Water Services Providers,

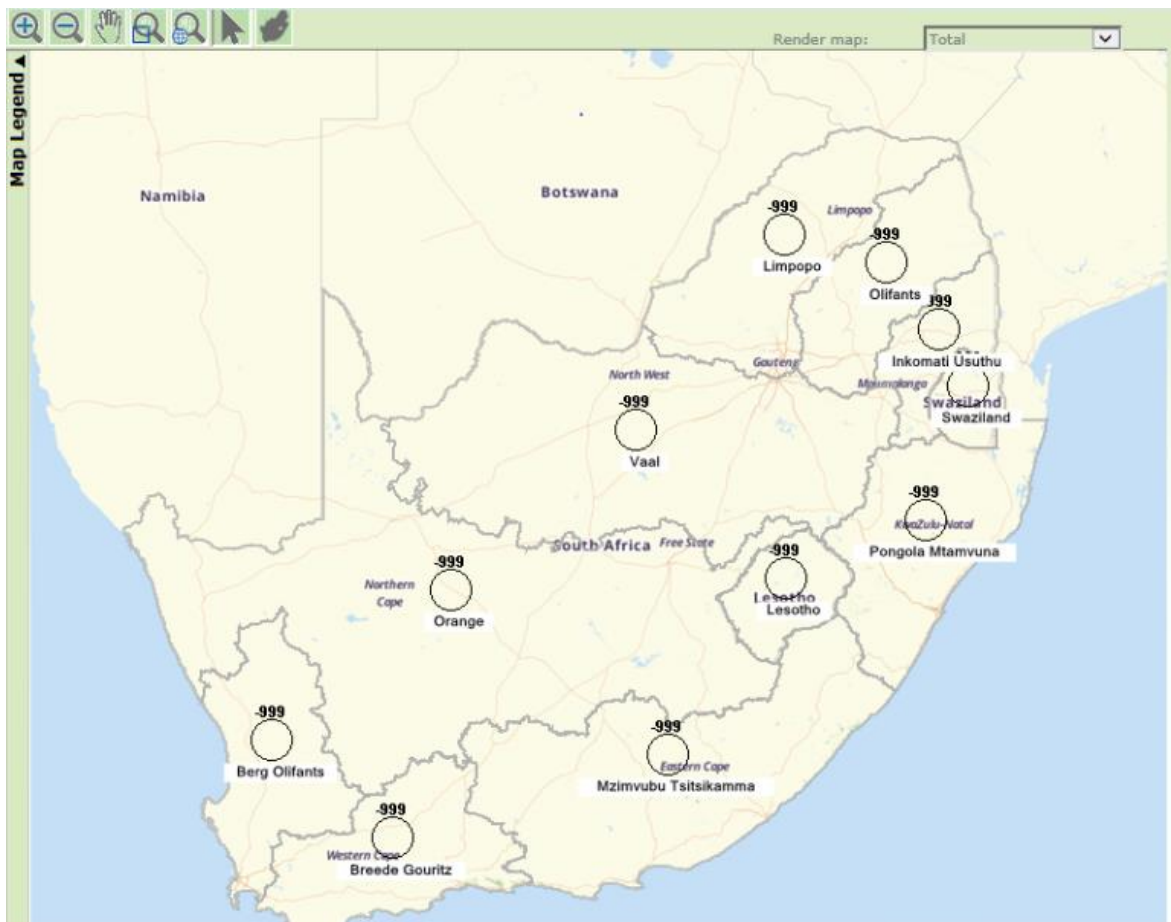
Licenses awarded to Water User Associations,

Licenses awarded to National Departments,

Licenses awarded to Provincial Departments



National - Total	
General Authorization	General Authorizations for current financial year
9 Categories	
Black Individuals	8
Coloured Individuals	0
Asian Individuals	0
White Individuals	55
Companies	1 284
Water Services Providers	1 370
Water User Associations	8
National Departments	288
Provincial Departments	261
Total	3 268



Are there any limitations / cautions related to using this information?

The verification process of the data can take months to years.



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Links to other sources of related information

More information on existing lawful water use can be obtained from the link:

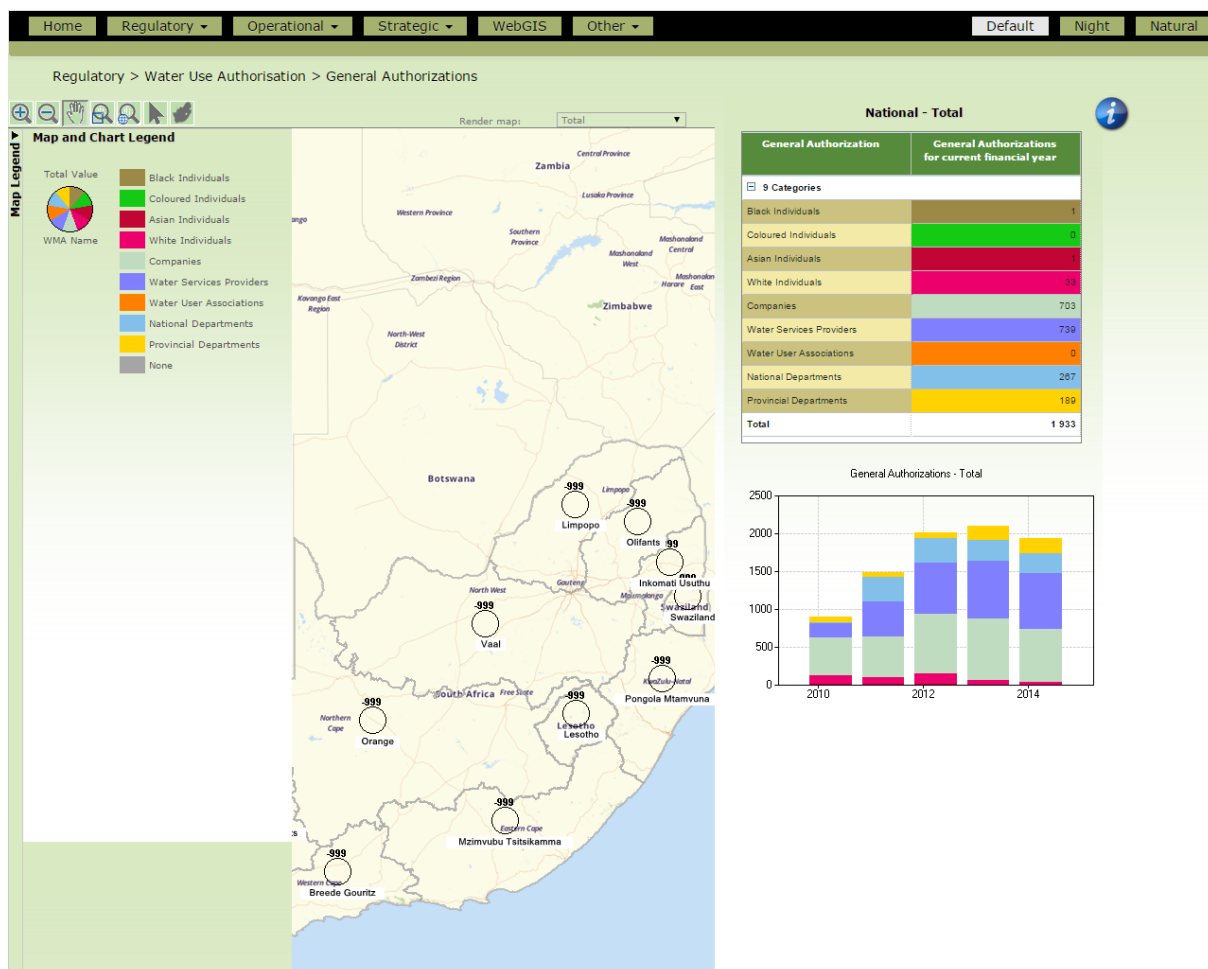
<http://www.dwa.gov.za/WAR/determine.aspx>

<http://www.dwa.gov.za/WAR/authorised.aspx>

4.3.3 General Authorisations

Information Page Related To The “General Authorisations” Dashboard

To access this dashboard navigate as follows on the dashboard:
Regulatory>Water Use Authorisation>General Authorisations



What does this dashboard relate to: general description

General Authorisations allow the Department of Water & Sanitation to authorise large numbers of people to take up water without the need for a licence. This general authorisation can be limited to a specific group of people, and/or specific water resources. This has several advantages namely:

- Smaller scale emerging users would not need to be ready to apply for a licence.
- General authorisations can be adapted for specific regional and social needs.
- General authorisations can promote the uptake of smaller amounts of water by many people - and hence can have a greater impact on poverty.
- They can reduce the administrative burden.
- They can allow for the gradual uptake of water by the poor, paralleled with the gradual reduction of use by existing lawful water users.
- General authorisations support the Water Allocation Reform process, both within compulsory licensing and in other areas, to make it easier for the rural poor to take up water.

Contacts details of person/s who championed this dashboard

Khutso Mabela, National Register of Water Use, 012 3367121, mabelak@dws.gov.za

**What type/s of questions does the information product aim to answer**

The dashboard provides statistics on general authorisations that were processed by the Department of Water & Sanitation in respect of water management area, relevant national water act section 21 water use, and it also depicts the statistics of general authorisations in the hands of historically disadvantaged individuals and historically advantaged individuals.

This assists the Department of Water and Sanitation to manage the water resources and ensure fair water allocation. Thus the dashboard is suited for planning and oversight roles.

Data / Information discussion**Data used to generate the information****What data is used?**

The WARMS database is used; the database is on DWS's network and the server is located at DWS head office.

How is extracted and from where?

Data is extracted using a Python script that connects to the WARMS database and executes a SQL query on the database, the filtered data is then copied to the temporary table in the NIWIS database before more processing is done on the data.

How often is it extracted?

Data is extracted monthly.

The algorithms / equations used to convert data into information

Select all licenses where the status is not deleted and the ga_id is set. Count the number of licenses per financial year per WMA and Nationally and per section 21 categories for the following:

Total number of licenses,

Licenses awarded to individuals (per population group),

Licenses awarded to companies,

Licenses awarded to Water Services Providers,

Licenses awarded to Water User Associations,

Licenses awarded to National Departments,

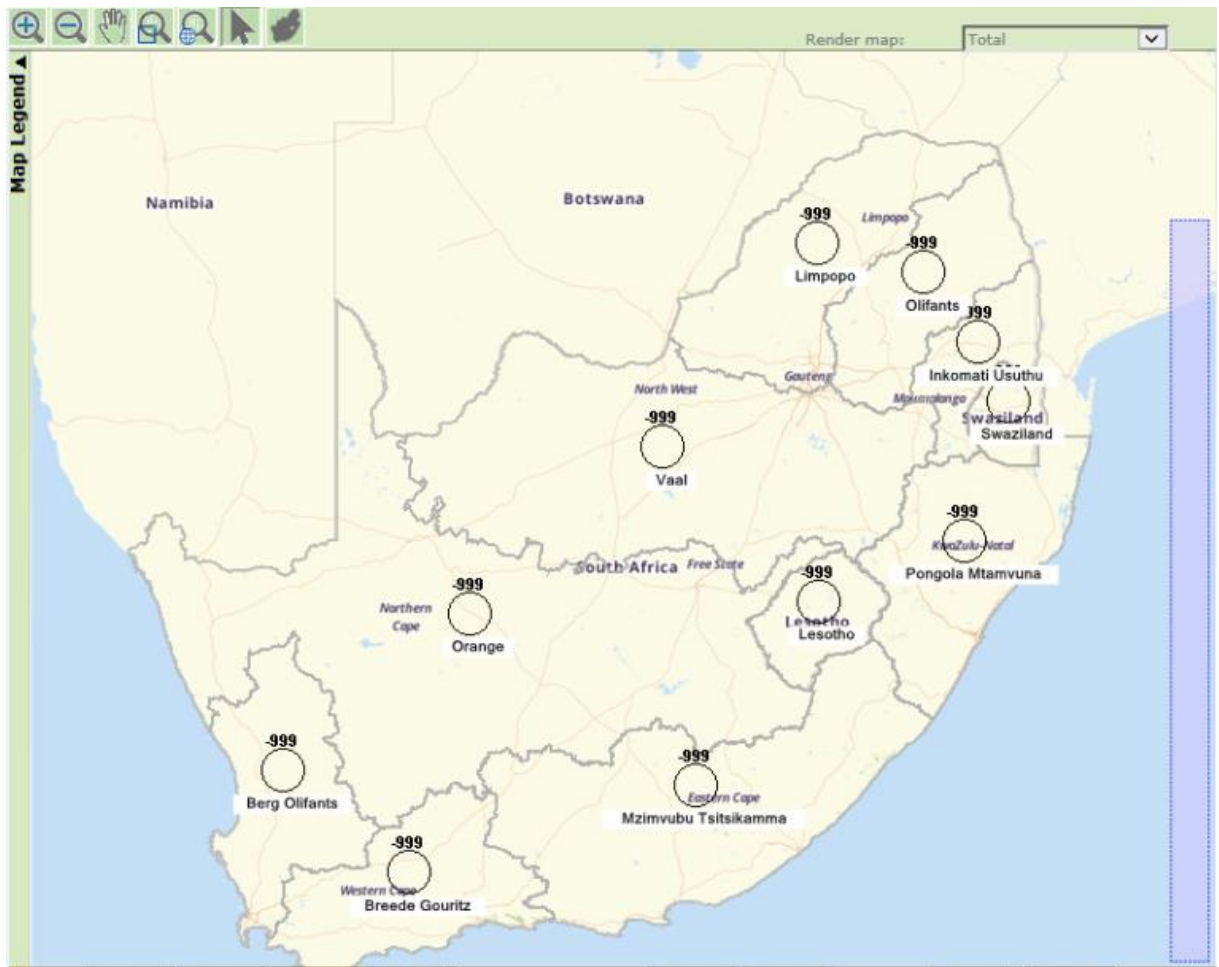
Licenses awarded to Provincial Departments.

National - Total	
General Authorization	General Authorizations for current financial year
9 Categories	
Black Individuals	8
Coloured Individuals	0
Asian Individuals	0
White Individuals	55
Companies	1 284
Water Services Providers	1 370
Water User Associations	8
National Departments	288
Provincial Departments	281
Total	3 268



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Are there any limitations / cautions related to using this information?

Due to license backlog capturing some of the information may not be in WARMS.

Links to other sources of related information

<https://www.dwa.gov.za/WAR/generalauthorisations.aspx>



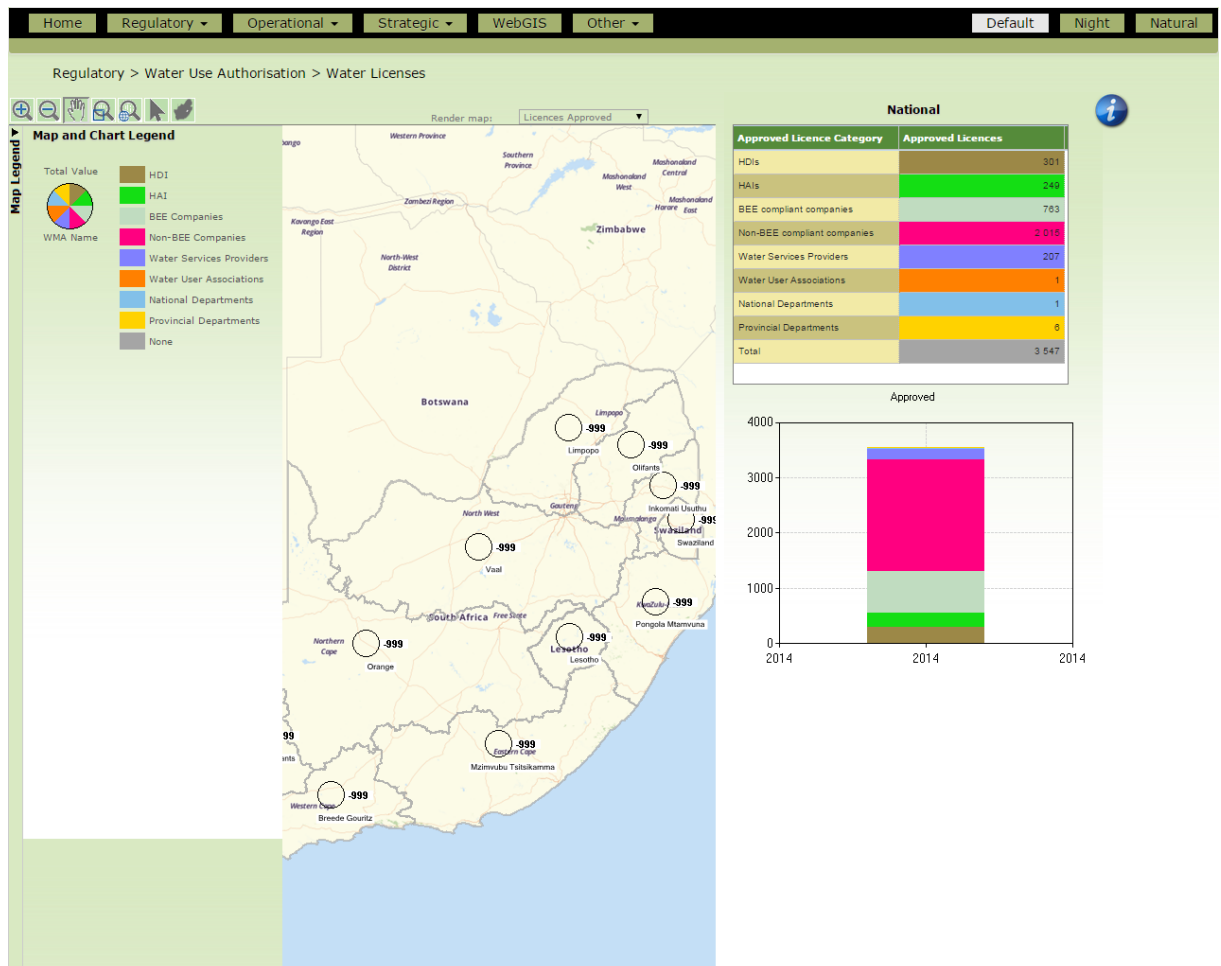
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4.3.4 Water Licences

Information Page Related To The “Water Licences” Dashboard

To access this dashboard, the user should navigate as follows:
Regulatory>Water Use Authorisation>Water Licences



What does this dashboard relate to?

South Africa's National Water Act (NWA) replaced all previous rights to water use with an entitlement under the new Act. The NWA now only makes provision for one "right" to water, the Reserve. This is the water required for basic human needs and to maintain water ecosystem functioning. Except for the water required for this Reserve and basic human needs use, all other water uses must be authorised by the Department of Water & Sanitation or a Catchment Management Agency (CMA). Beside schedule 1, general authorisations, existing lawful water use, license water use is one of the authorisation type which water can be authorised. Thus this dashboard provides statistics on the number of license issued by the Department of Water and Sanitation.

Contacts details of person/s who championed this dashboard

Khutso Mabela, National Register of Water Use, 012 336 7121, mabelak@dws.gov.za

What type/s of questions does the information product aim to answer

The dashboard provides statistics on licenses that were processed by the Department of Water & Sanitation in respect of:

- declined,
- granted, and
- withdrawn.



Moreover, it also depicts the statistics of licenses in the hands of historically disadvantaged individuals and historically advantaged individuals. This assists the Department of Water and Sanitation to manage the water resources and ensure fair water allocation. Thus the dashboard is suited for planning and oversight roles.

Data / Information discussion

Data used to generate the information

What data is used?

The WARMS database is used, the database is on DWS's network and the server is located at DWS head office

How is extracted and from where?

Data is extracted using a Python script that connects to the WARMS database and executes a SQL query on the database, the filtered data is then copied to the temporary table in the NIWIS database before more processing is done on the data.

How often is it extracted?

Data is extracted monthly.

The algorithms / equations used to convert data into information

Select all licenses where the status is not deleted and the legal code is not 21(e), 21(f), 21(g), 21(h) or 21(i). Count the number of licenses per financial year per WMA and Nationally for the following categories:

Total number of licenses,

Licenses awarded to individuals (HDI and HAI),

Licenses awarded to companies,

Licenses awarded to Water Services Providers,

Licenses awarded to Water User Associations,

Licenses awarded to National Departments,

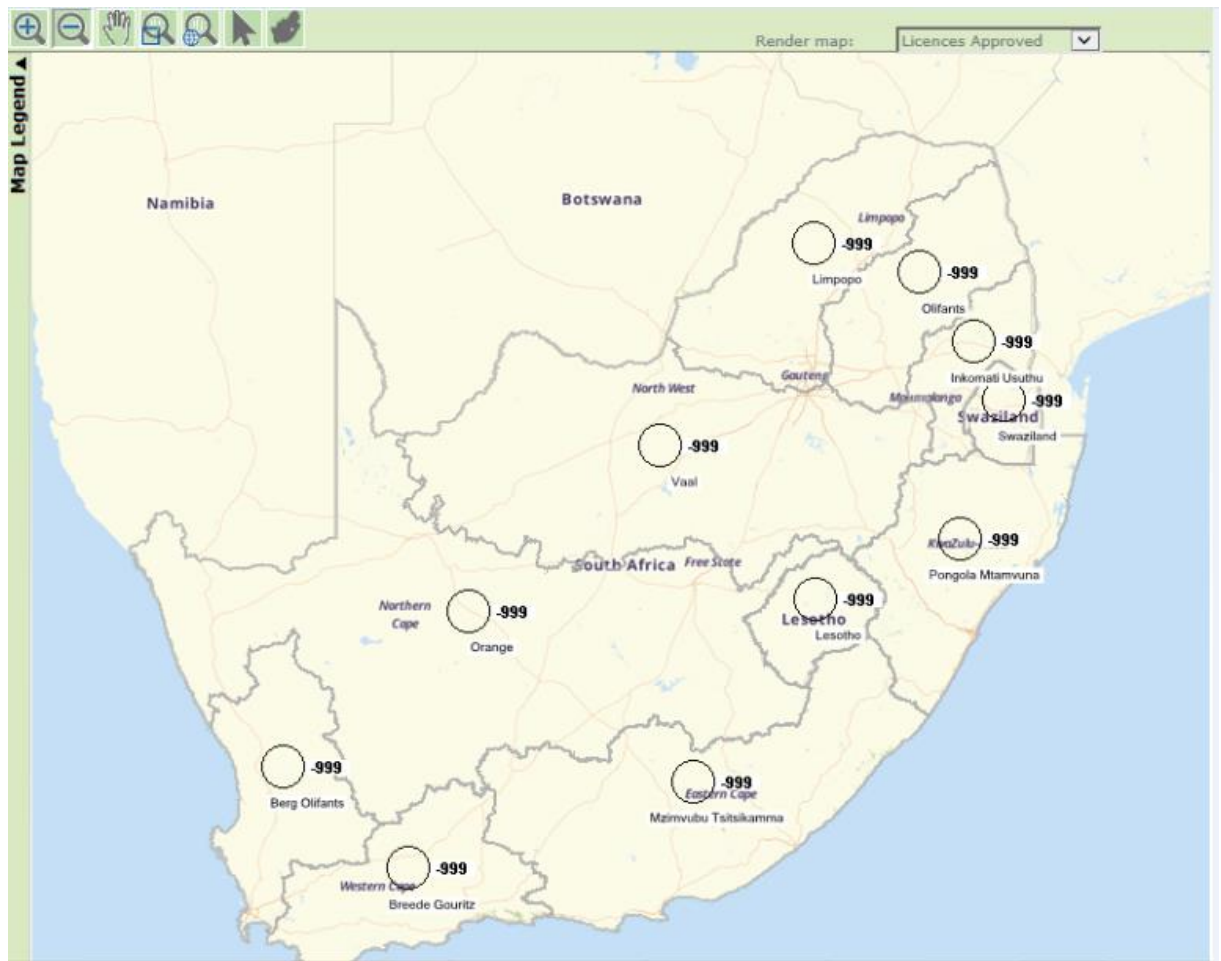
Licenses awarded to Provincial Departments

National	
Approved Licence Category	Approved Licences
HDI's	475
HAIs	337
BEE compliant companies	812
Non-BEE compliant companies	3 037
Water Services Providers	381
Water User Associations	4
National Departments	2
Provincial Departments	7
Total	5 055



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Are there any limitations / cautions related to using this information?

Due to license backlog capturing some of the information may not be in WARMS.

Links to other sources of related information

<http://www.dwaf.gov.za/WAR/authorised.aspx>

<http://www.dwaf.gov.za/WAR/licenceprocess.aspx>

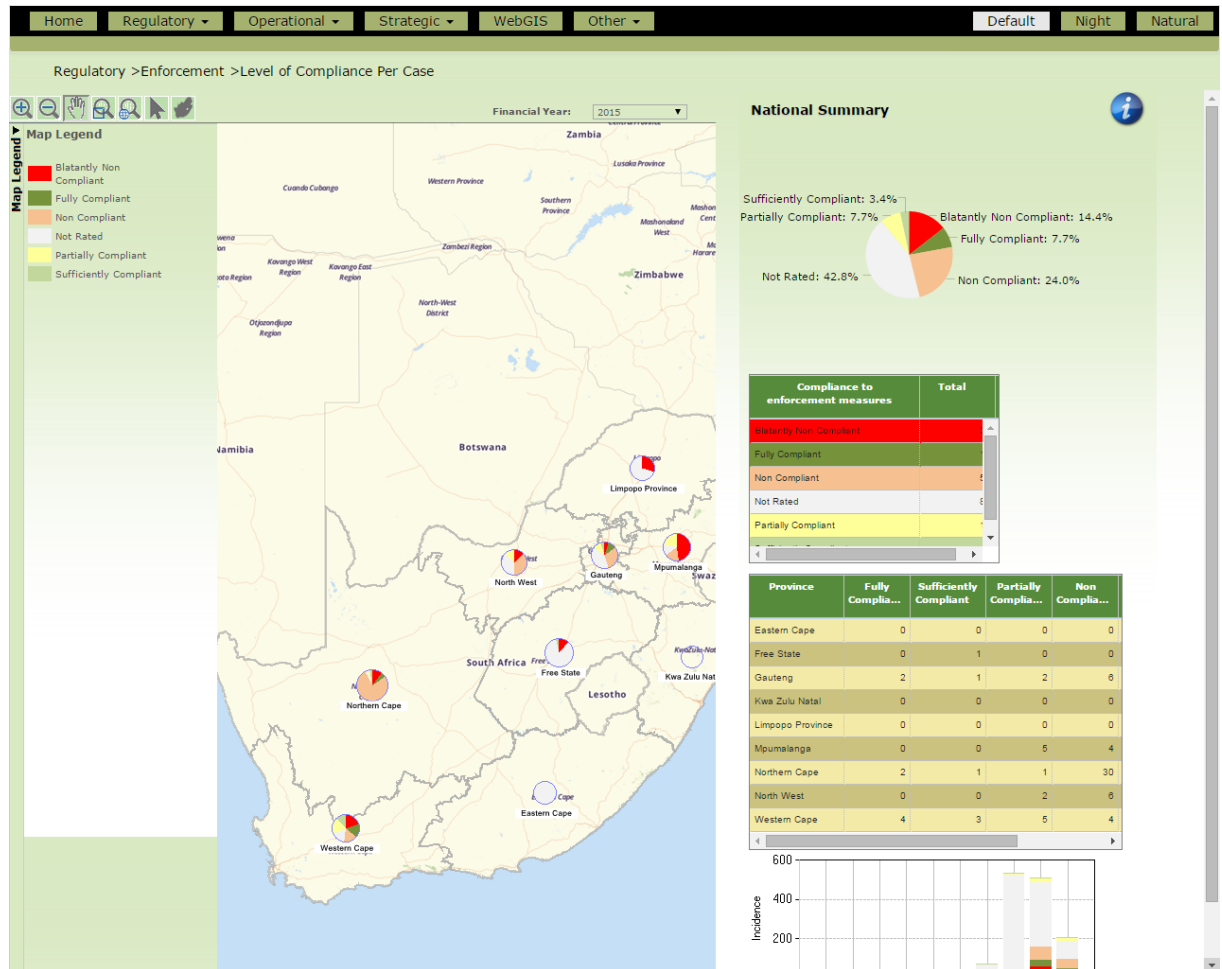


4.4 Compliance Monitoring

4.4.1 Level of Compliance per Case

Information Page Related To The “Legal Compliance” Dashboard

To access this dashboard, the user should navigate to:
Regulatory>Enforcement>Level of Compliance per Case



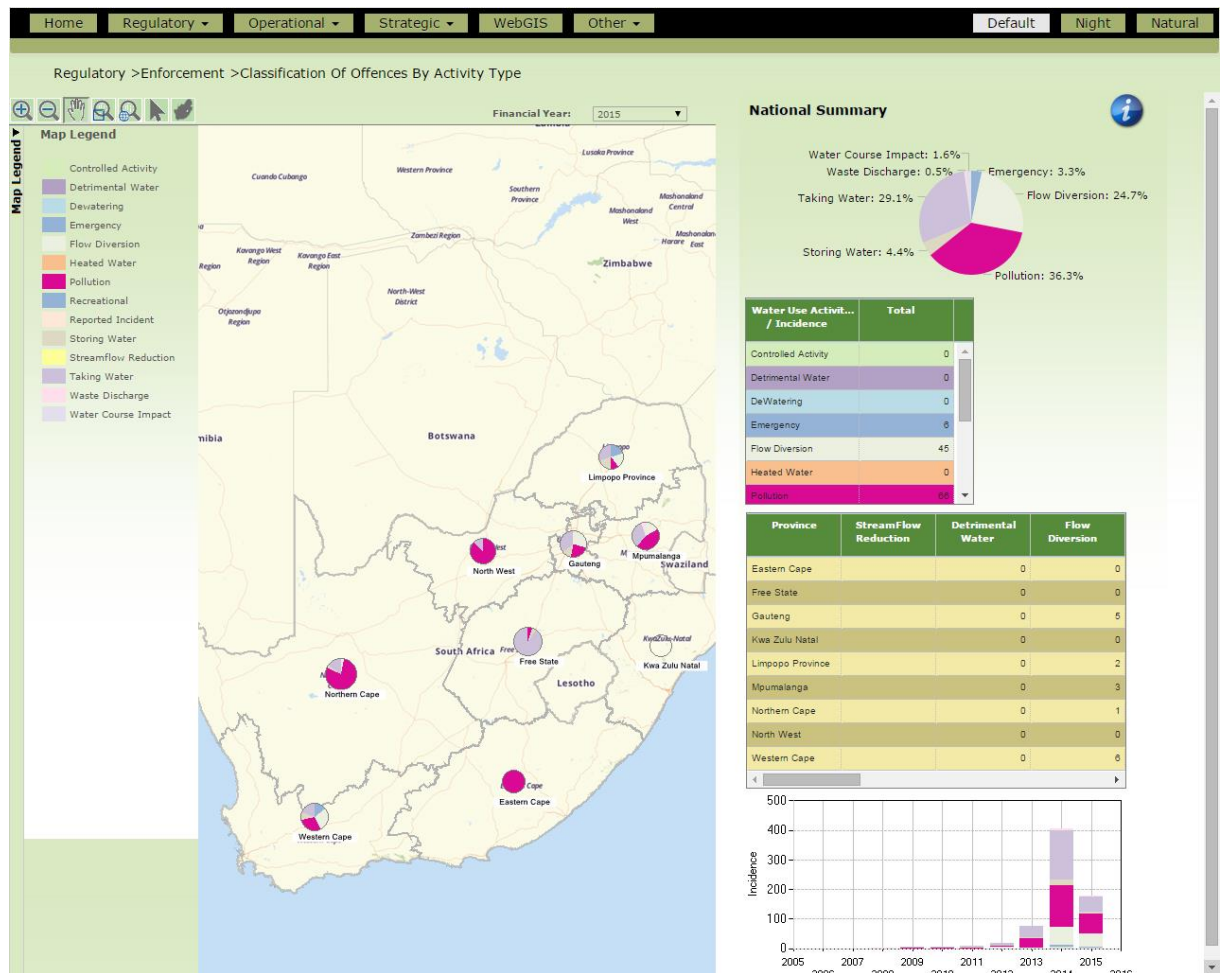

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4.4.2 Classification of Offences by Activity Type

Information Page Related To The “Classification Of Offences By Activity Type” Dashboard

To access this dashboard the user should navigate as follows:
Regulatory>Enforcement>Classification of Offences By Activity Type.



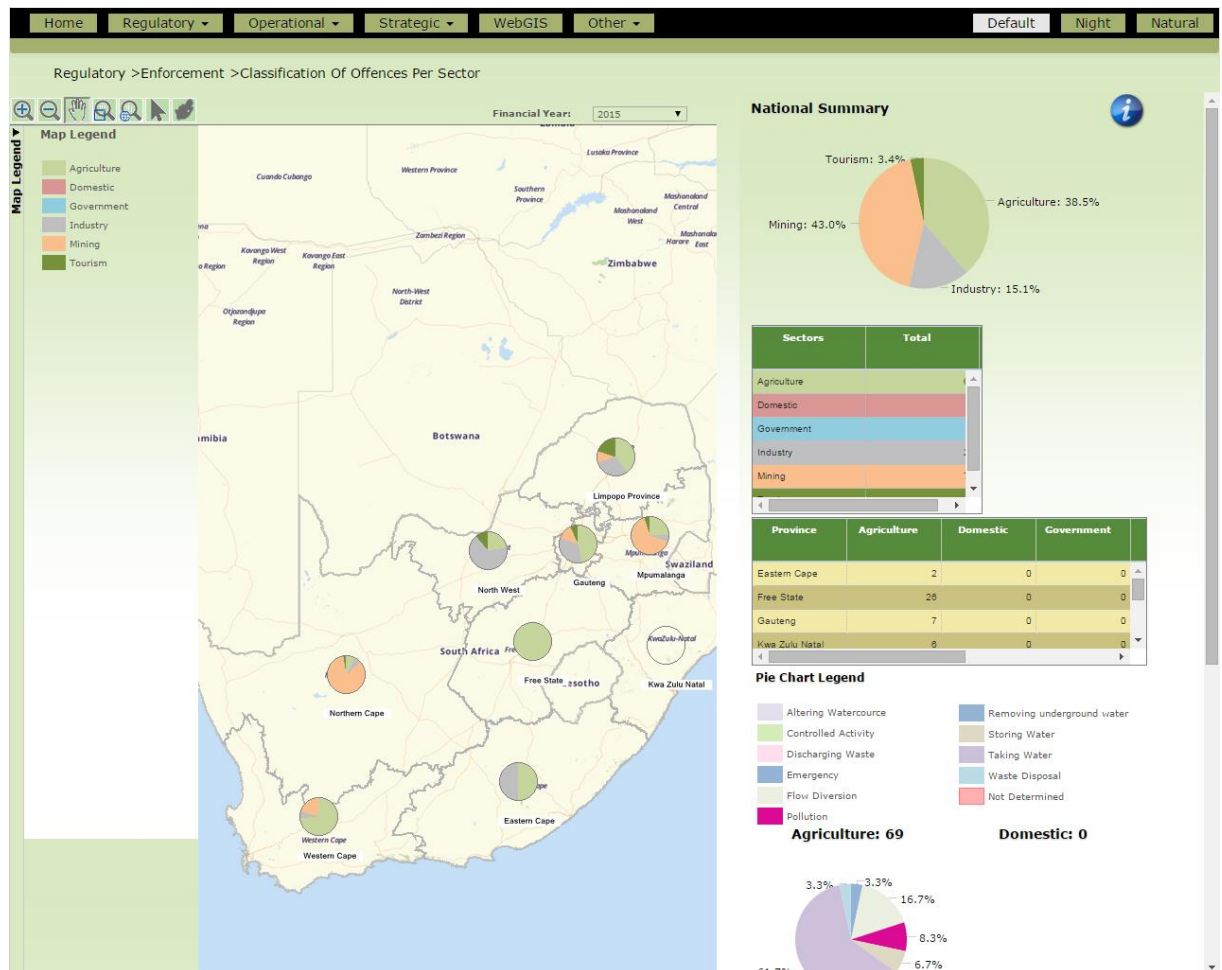

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4.4.3 Classification of Offences per Sector

Information Page Related To The “Classification Of Offences Per Sector” Dashboard

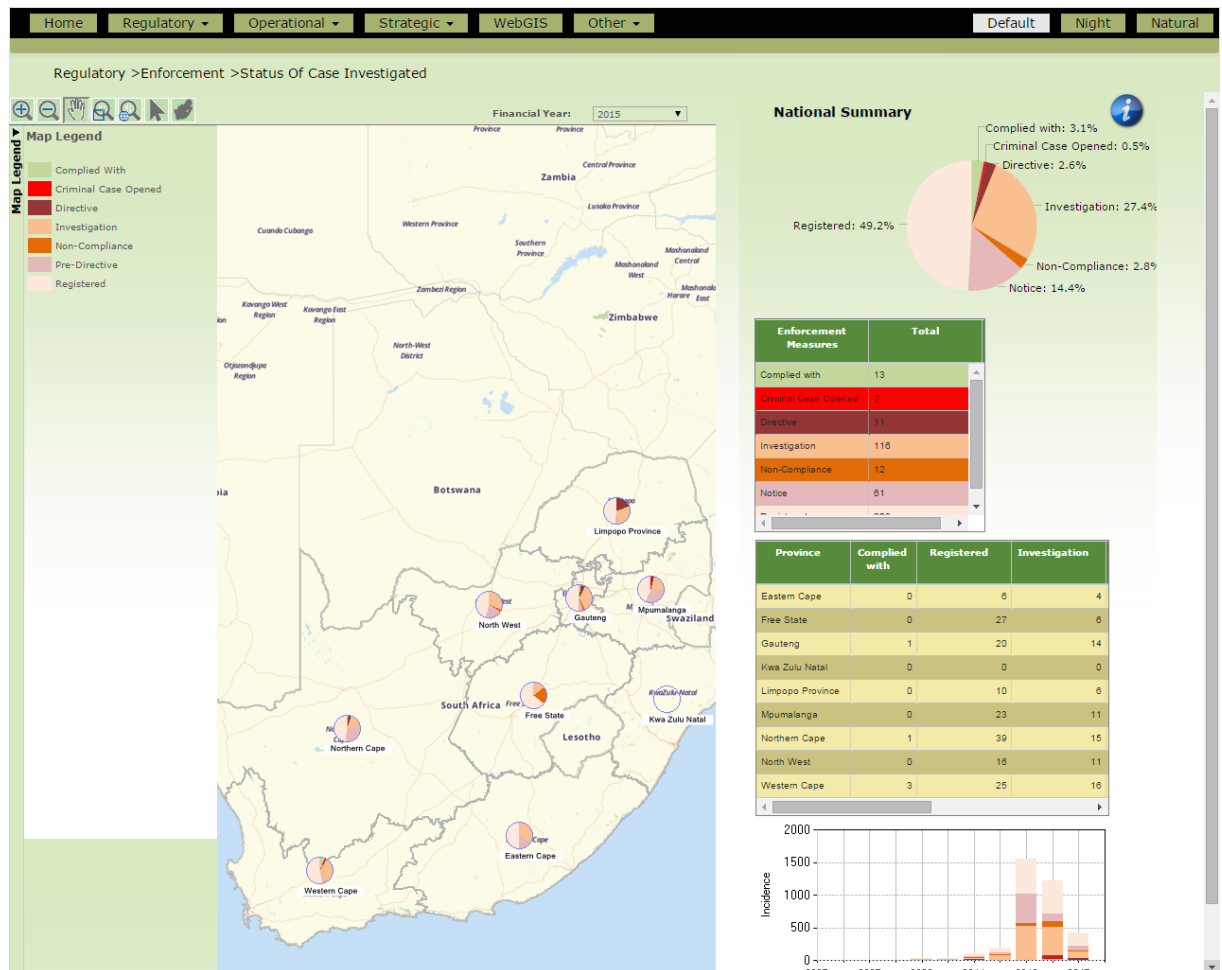
To access the dashboard, the user should navigate to:
Regulatory>Enforcement>Classification of Offences per Sector.



4.4.4 Status of Case Investigated

Information Page Related To The “Status Of Legal Processes” Dashboard

To access this dashboard, the user should navigate to:
Regulatory>Enforcement>Status of Case Investigated



4.5 Institutional Oversight

Information Page Related To The “Institutional Oversight” Dashboard

To access this dashboard the user should navigate as follows:

Dashboard Under Construction

What does this dashboard relate to?

The directorate Institutional Oversight is responsible for performing a regulatory function for DWS in relation to other water institutions in South Africa. These institutions include Water Boards, Catchment Management Agencies, the Water Research Commission, Trans Caledon Tunnel Authority and Water User Associations. This is to ensure that these institutions are adequately performing the functions that have been delegated to them, as specified in the National Water Act, by the minister of DWS. One of the regulatory functions, specifically related to Water Boards, is the Shareholder Compact that is entered into by DWS and each water Board. The Shareholder Compact documents the mandated key performance measures and indicators to be attained by the water board as agreed between the DWS and the governing board of the institution. The key performance indicators that are reported via this agreement forms the basis of this content displayed on this dashboard.

Contacts details of person/s who championed this dashboard

Mr Faud Moerat, Deputy Director: Institutional Oversight, Department of Water and Sanitation

E-mail: MoeratF@dws.gov.za

What type/s of questions does the information product aim to answer?

The dashboard aims to answer the following questions:

Are the Water Boards in South Africa meeting the agreed performance targets on a quarterly basis?

The DWS and all Water Boards enter into an annual agreement where performance target are defined relating to different aspects of the Water Board business. These targets are related to specific indicators, and the Water Boards are mandated to provide updates on a quarterly basis. The DWS uses the results from these indicators to perform part of their required regulatory function.

Data / Information discussion

The data for this dashboard is supplied by Water Boards every quarter, and then captured into a defined spreadsheet template. The information is then exported directly for display on the NIWIS system. The targets for the same indicators may be different for different Water Boards, and there for comparison in absolute values terms between different Water Boards should be avoided.

Are there any limitations / cautions related to using this information?

If more clarification is required on the information displayed, please contact the Directorate Institutional Oversight, at the details above. Also, please refer to the section below:

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The exploitation of the data for commercial purposes is not included in this permission to use the data. All requests for additional right of use must be requested in writing to the Department Water and Sanitation, addressed to Mr. Andy Sambo (Email: SamboM@dws.gov.za). Data may not be used for requested purpose before written approval has been received.

Quality

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Status

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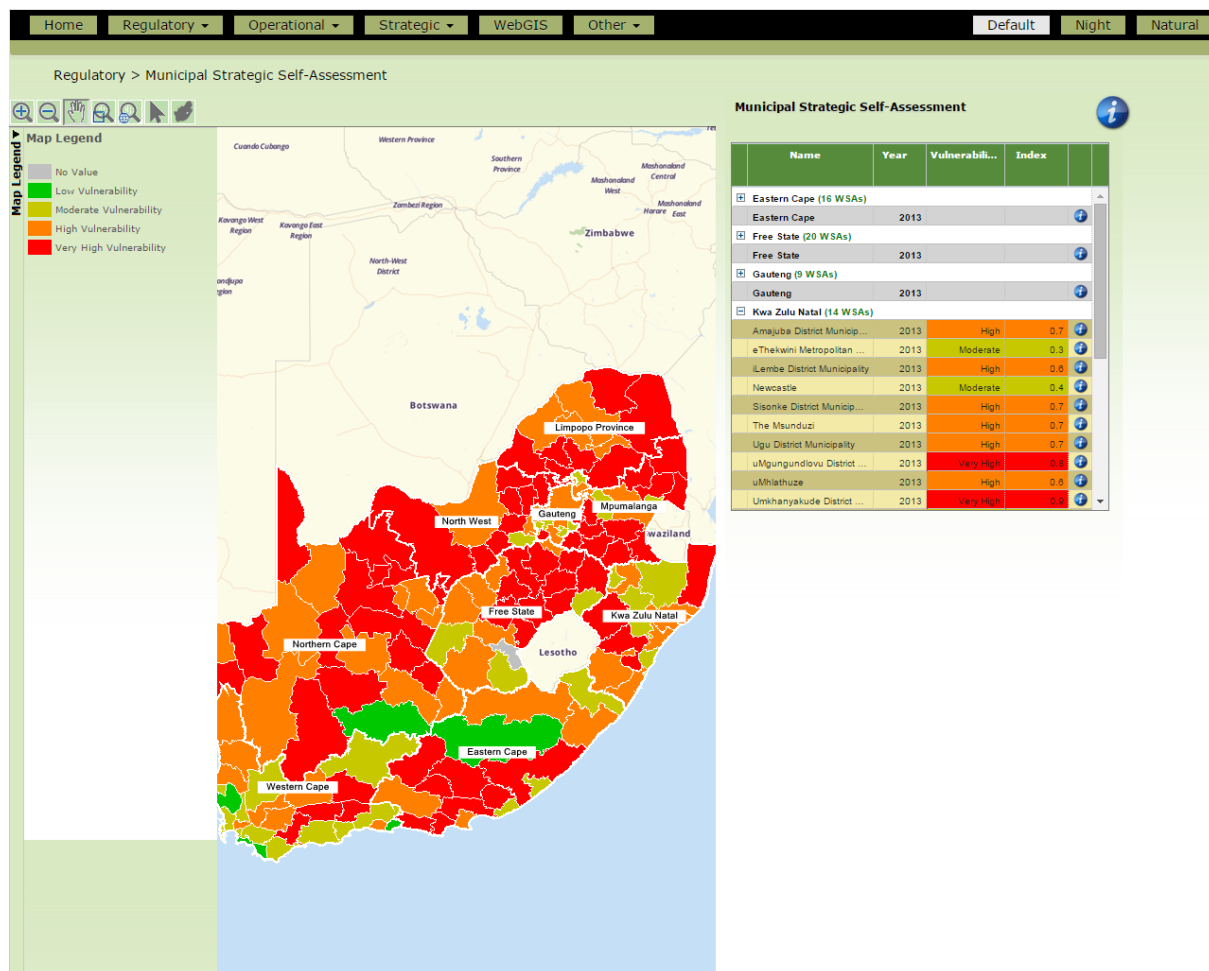


4.6 Municipal Strategic Self Assessment

Information Page Related To The “Municipal Strategic Self-Assessment” Dashboard

To access this dashboard, navigate as follows:

Regulatory>Municipal Strategic Self-Assessment



What does this dashboard relate to

The Municipal Services Strategic Assessment, (MuSSA), provides information used to determine the overall business health of a Water Services Authority. By identifying key municipal vulnerabilities across a range of business attributes it allows municipalities to effectively plan and direct their resources to areas of concern, and the Department of Water and Sanitation (DWS) and the sector to provide more focussed support.

Contacts details of person/s who championed this dashboard

Mr Allestair Wensley. Telephone number (012) 336 8767

What type/s of questions does the information product aim to answer

The MuSSA asks 5 questions for each of the below 16 key business health attributes.

1. Water Services Development Planning
2. Management Skill Level (technical)
3. Staff Skill Levels
4. Technical Staff Capacity
9. Infrastructure Asset Management
10. Operation and Maintenance of assets
11. Financial Management
12. Revenue Collection



5. Water Resource Management

6. Water Conservation and Demand Management

7. Drinking Water Safety and Blue Drop Status

8. Wastewater/Environmental Safety

9.

Data /Information discussion

Data used to generate the information

What data is used?

Relevant senior municipal officials are asked to answer 80 questions related to the water services function as defined above.

How is it extracted and from where?

Information provided by each municipality enables each area or attribute to be allocated a score. This is then depicted in a spider diagram. The data is stored in the Water Services Knowledge System (WSKS) database. Data can be extracted via the Macro Planning processes and procedures, as provided, directly from the database.

How often is it extracted?

MuSSA assessments were done in 2011, 2013 and 2014. It is now an annual process. NIWIS can extract data as and when required using the Macro Planning processes and procedures.

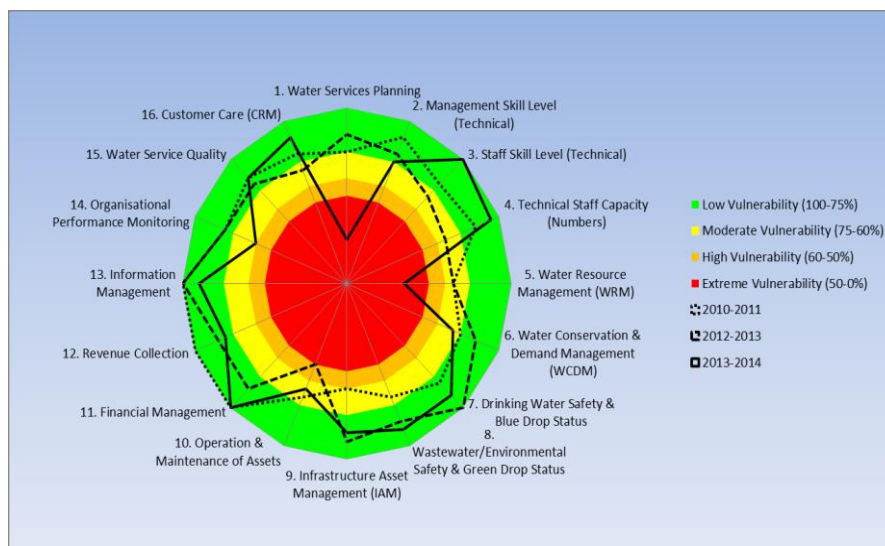
Business processes related to the data

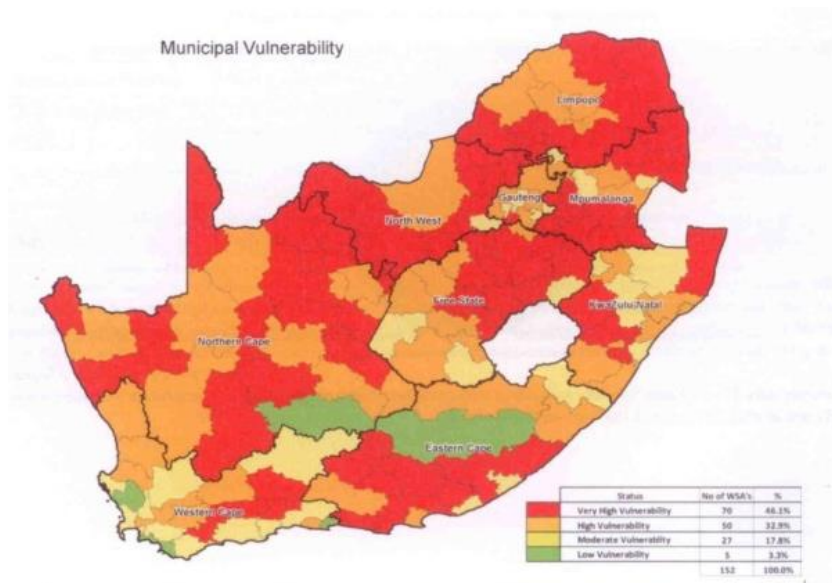
A Vulnerability Index is derived from the spider outputs. This index factors in and weights the attributes thereby determining the overall Water Services business vulnerability for use in prioritising support to Water Services Authorities. When multiple years are depicted on the spider diagram, trends can be identified.

The algorithms / equations used to convert data into information.

Performance grading for presentation purposes is based on the following:

MUSSA Vulnerability Index	Performance Grade
0-50%	Extreme vulnerability
50-60%	High vulnerability
60-75%	Moderate vulnerability
75-100%	Low vulnerability





Key assumptions made

It is accepted that the municipal officials answer the questions accurately and with integrity.

Are there any limitations / cautions related to using this information?

Yes please refer to the paragraph below:

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Quality

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Status

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Links to other sources of related information

www.dwa.gov.za/wsks



5 Operational Dashboards

5.1 Overview

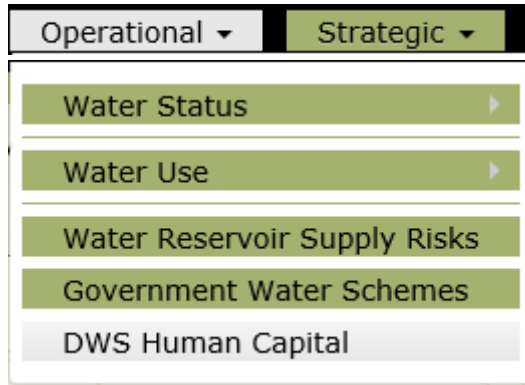


Figure 5-1: Selecting an Operational dashboard from a dropdown list

Operational dashboards house those dashboards that deal with daily, weekly or monthly project benchmarks that implement larger strategic objectives. Operational dashboards are mainly tactical, and are set out with strategic objectives in mind and provide a means for management to break down larger strategies into workable tasks.

Figure 5-2 shows an example of one of the currently completed Operational dashboards in NIWIS.

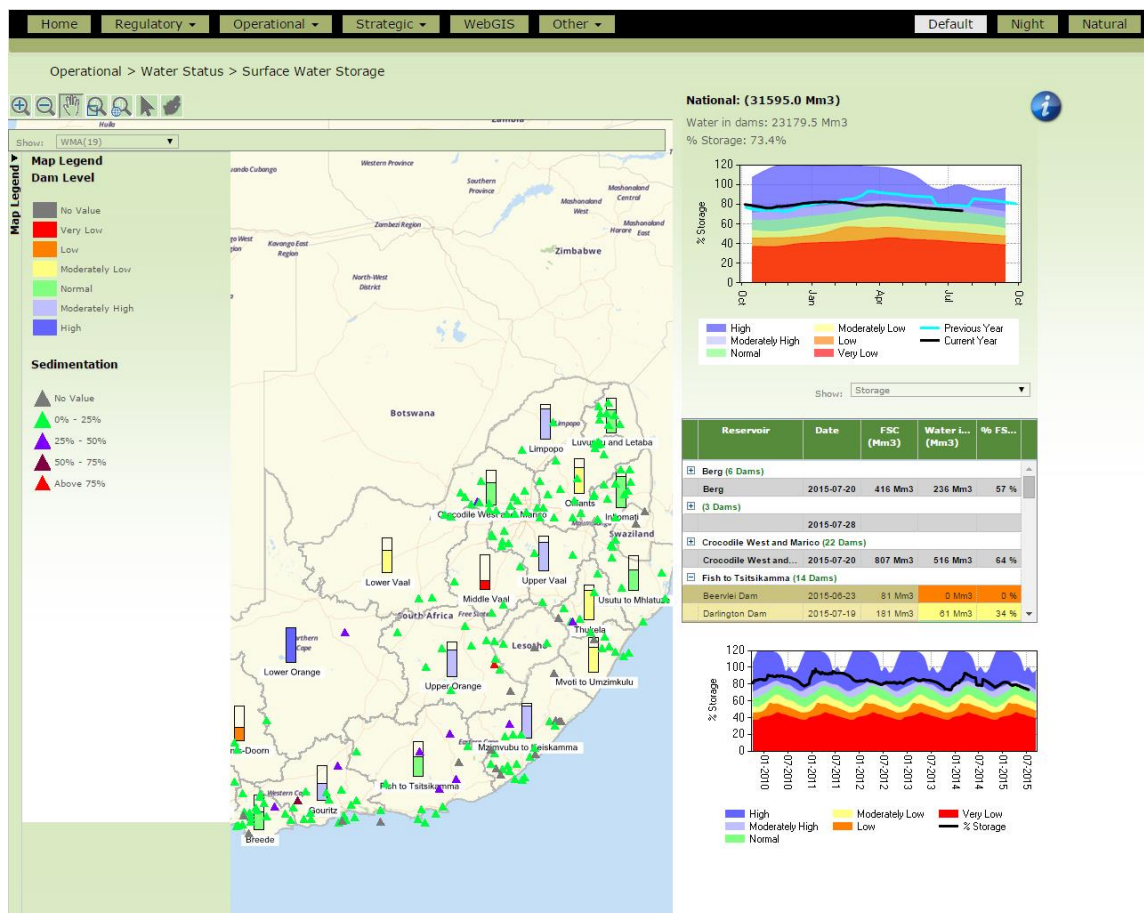


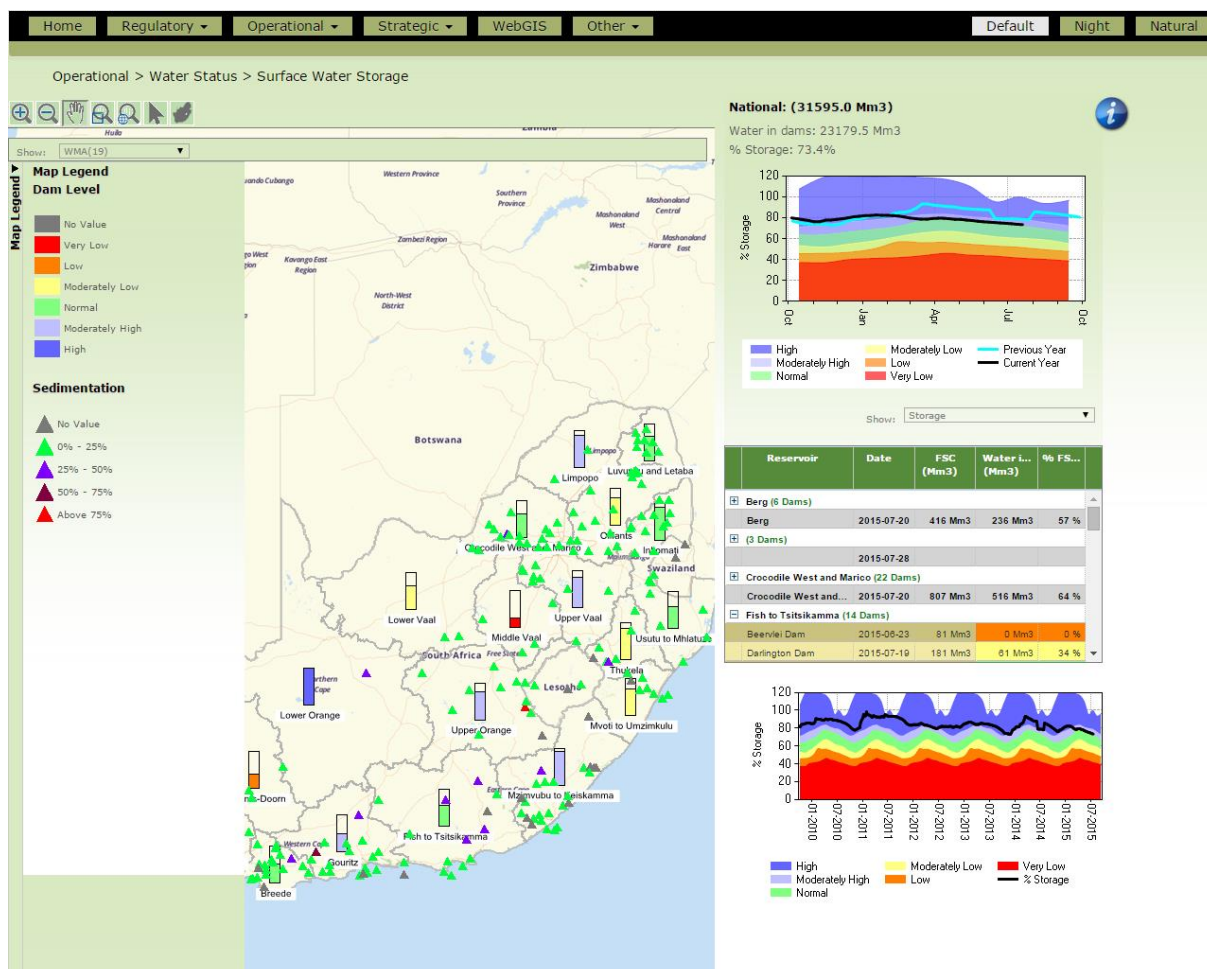
Figure 5-2: One of the Operational dashboards in NIWIS

5.2 Water Status

5.2.1 Surface Water Storage

Information Page Related To The “Surface Water Storage” Dashboard

To access this dashboard the user should navigate as follows:
Operational>Water Status>Surface Water Storage



The Surface Water Storage dashboard indicates volume of water stored in Dams. The aggregated Surface Water Storage can be viewed per:

- WMA
- WMA 2012
- Province
- Catchment

The map shows a bar chart representing the percentage storage or the selected areas or individual dam depending on zoom level as well as a sedimentation indicator

The Right hand panel shows overview of the amount of water stored in each WMA, province or Catchment, as well as the national total. The table shows a list of all dams in a selected area with dam names, full supply capacity, current storage, date and sedimentation.

FSC = Full Supply Capacity
Sed = Sedimentation
Mm³ = Million Cubic Meters



$1\text{m}^3 = 1000$ Litres

$1\text{Mm}^3 = 1\,000\,000\,000$ Litres

Are there any limitations / cautions related to using this information?

Yes, please refer to the section below:

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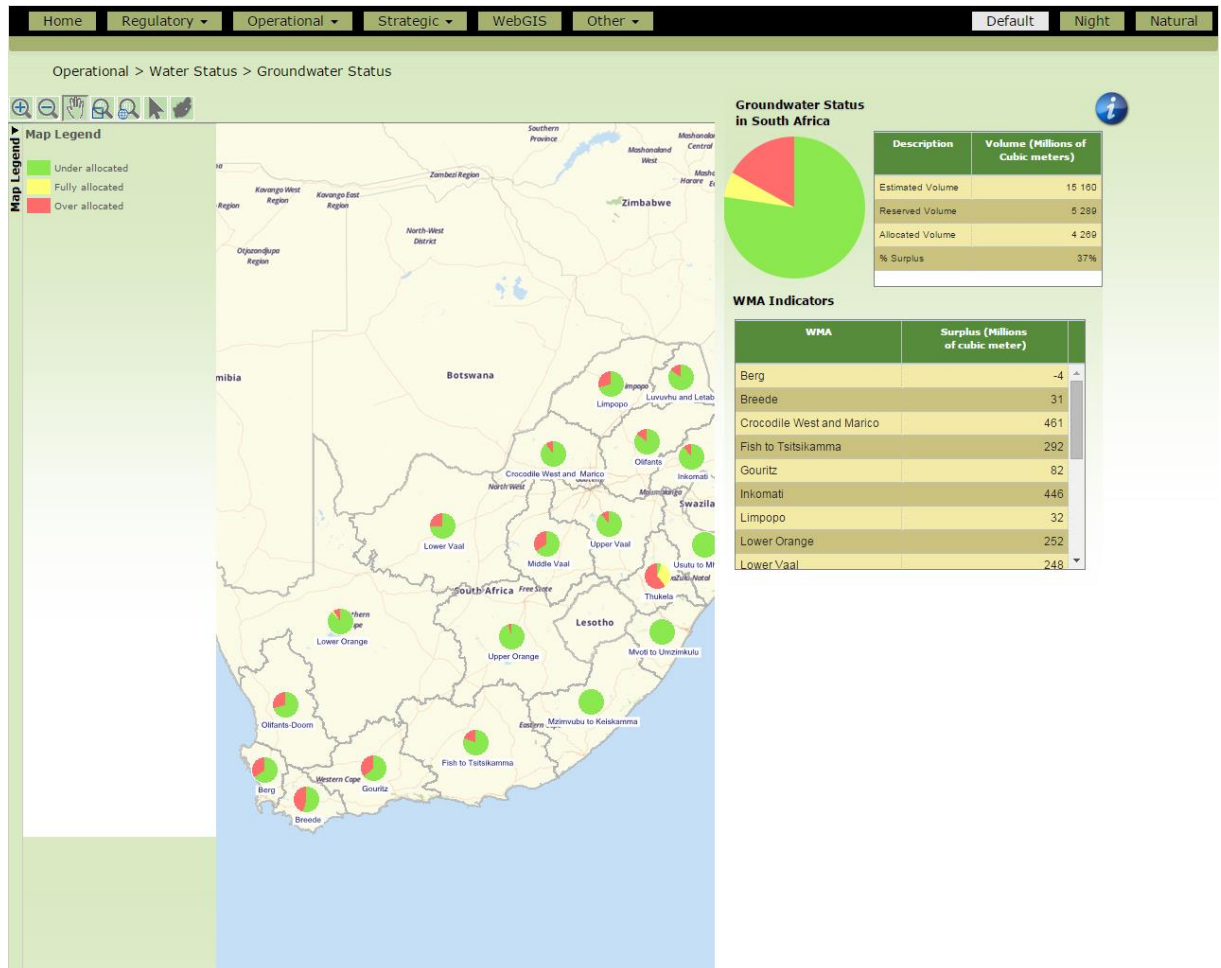
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5.2.2 Groundwater Status

Information Page Related To The “Groundwater Status” Dashboard

To access this dashboard, the user should navigate as follows:
Operational>Water Status>GroundwaterStatus



The dashboard shows the distribution between over allocated, fully allocated and under allocated areas with respect to ground water availability.

The allocation status is calculated as:

$$V_{\text{available}} = V_{\text{recharge}} - V_{\text{reserve}} \text{ (0 by default)} - V_{\text{allocated}} \text{ (if available)}$$

Where

- $V_{\text{available}}$ is the recorded volume as reported by the Groundwater department
- V_{reserve} is the groundwater reserve as reported by RDM
- $V_{\text{allocated}}$ is the amount of groundwater that has been made available for abstraction as recorded with WARMS

For clarity, this can be re-written to show the terms by their data sources as:

$$V_{\text{available}} = V_{\text{UGEP Dry}} - V_{\text{Reserve Tracker}} - V_{\text{WARMS}}$$

For further clarity, the terms have been assigned letters during the champion discussions:

$$V_{\text{available}} = V_A - V_B - V_C$$



The class shall then be determined according to the following rule:

- Negative %_{allocated}: over allocated
- 0 – 94 %_{allocated}: under allocated
- 95 – 105 %_{allocated}: fully allocated
- Greater than 105 %_{allocated}: over allocated

The right hand side dashboard shows existing, allocated, reserved and surplus volume for the Nation. This value is based on existing data on a quaternary catchment scale. However if new data is available on a resource scale then the availability may be changed.

Are there any limitations / cautions related to using this information?

Yes, please refer to the section below:

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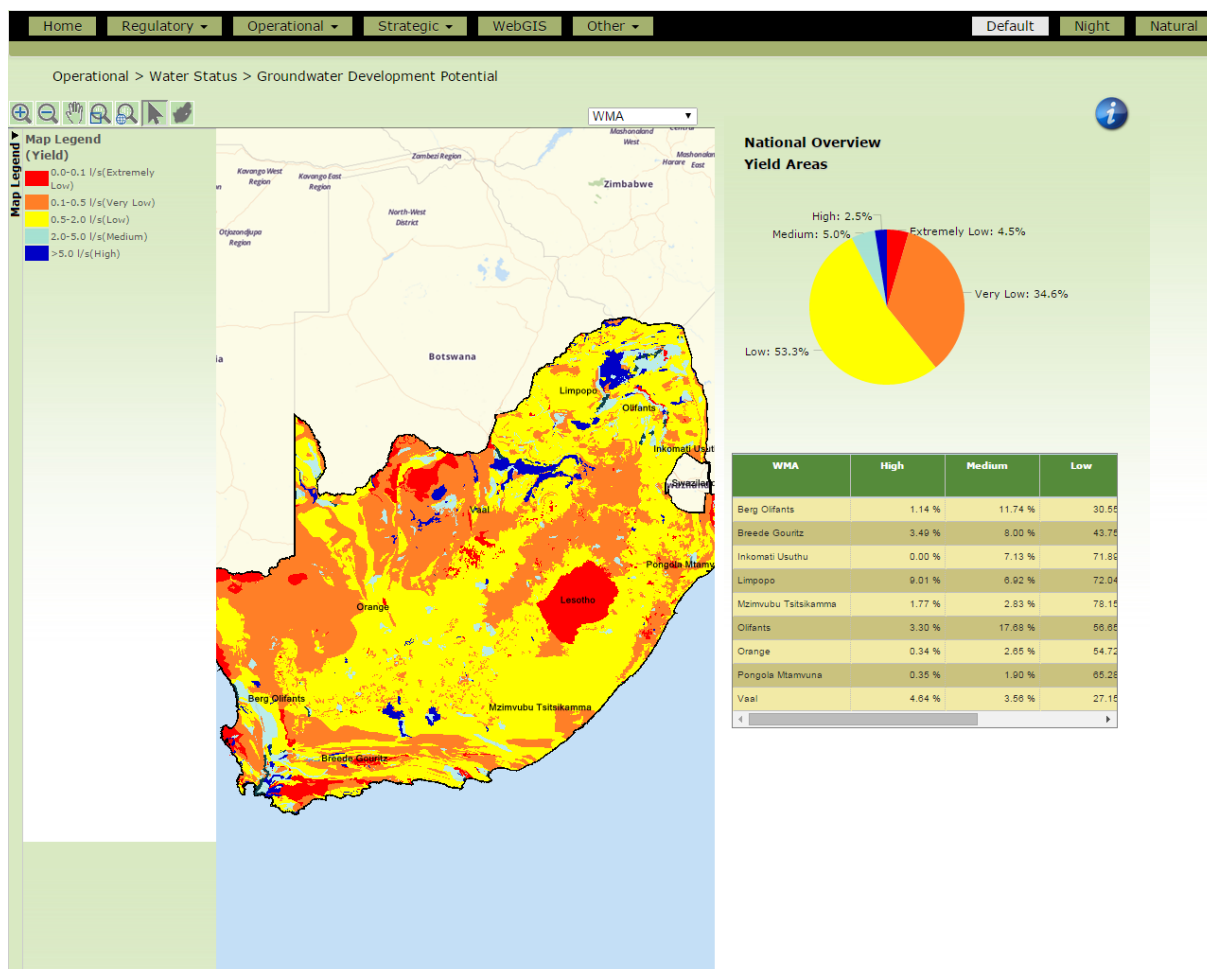
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5.2.3 Groundwater Development Potential

Information Page Related To The “Groundwater Development Potential” Dashboard

To access the dashboard, the user should navigate to:
Operational>Water Status>Groundwater Development Potential



What does this dashboard relate to :

The dashboard aims to depict areas where there is a potential for further groundwater development. The maps show where different aquifer types occur and how the water could be extracted (e.g. hand-pump, motorised pump etc.).

What is the main purpose of the dashboard?

The maps aim to give an overview of where groundwater development potential exists.

What system of classification has been used for the groundwater development potential?

The groundwater potential has been classed as follows:

Extremely low development potential: – very little groundwater can be found in these aquifer classes and should any water be found, a wind pump or hand pump could be installed. At best this could be enough for individual household and/or stock watering (few animals) supplies.

Very low development potential: - one can generally expect enough water for either hand- and/or wind pumps, i.e. small supplies for small communities and/or stock watering or single households. Little additional groundwater could be available for community gardening or other poverty alleviation actions. Many boreholes will have to be drilled to obtain a yield at the high-end of the range.



Low development potential: - enough water for either hand- and/or wind pumps, i.e. small supplies for small communities and/or stock watering or single households can easily be achieved. Additional groundwater for community gardening or other poverty alleviation actions will be available. At the high-end of the yield range larger communities from single boreholes and well-fields supplying large communities would be possible. However, due to large variability in borehole yields, an appreciable amount of boreholes will have to be drilled to obtain a yield at the high-end of the range. Pumping at 2l/s for 8 hours per day, 2000 persons, @25l/day can be supplied comfortably.

Medium development potential:— domestic water supplies for large villages, towns and small-scale irrigation from several boreholes, would be achievable in aquifers with medium development potential. The amount of boreholes to be drilled before high-end yields that can be expected depends on the variability of borehole yields. Wellfields and the concomitant benefit for the management of aquifer(s) make the development of groundwater within medium high potential aquifers very attractive. Pumping at 5l/s for 8 hours per day 5000 persons, @25l/day, can be supplied comfortably.

High development potential: – Large-scale irrigation and/or large village and even large town supplies can be obtained from these aquifers.

Contacts details of person/s who championed this dashboard

Mr Bayanda Zenzile (zenzileb@dws.gov.za), Mr Ernst Bertram (bertrame@dws.gov.za).

What type/s of questions does the information product aim to answer

- What percentage of South Africa's (or WMA, or municipal) surface area can be classified as having (i) and extremely low, (ii) a very low, (iii) low, (iv) medium or (v) high development potential, and
- What is the groundwater development potential at a given geographic location, and what type of device would be appropriate to abstract the water.

Data / Information discussion

What data is used?

The data source is the hydro-geological map series developed by the Department of Water and Sanitation. The maps are captured in electronic (GIS) and printed-paper formats.

Are there any limitations / cautions related to using this information?

The scale of the maps was 1:500,000 thus the data is a broad overview. The quality of the data was dependent on the number of borehole information available, which varies spatially over South Africa.

Links to other sources of related information

[DWS Groundwater Home Page http://www.dwa.gov.za/groundwater/](http://www.dwa.gov.za/groundwater/)

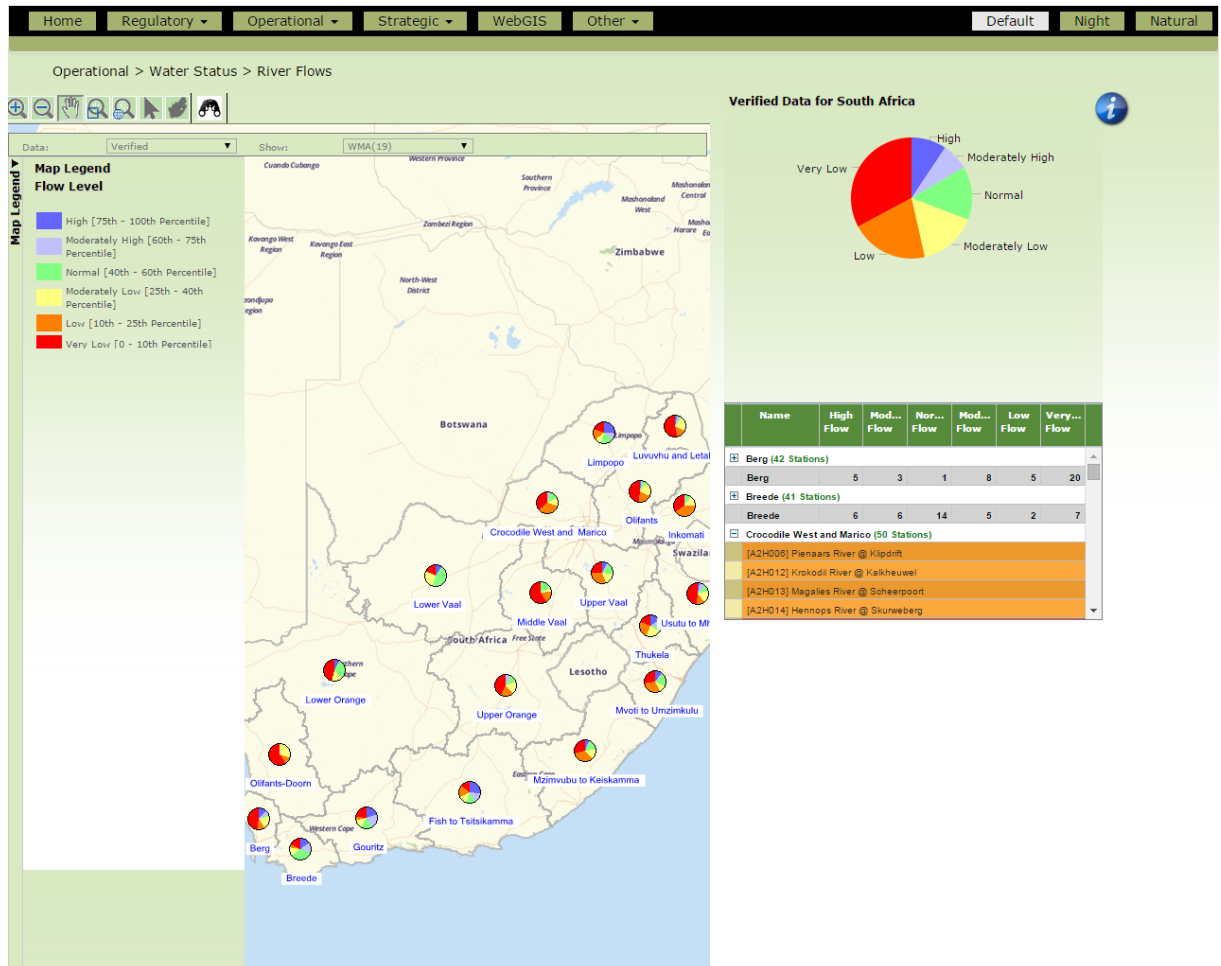
[Borehole Water Association http://www.bwa.co.za/](http://www.bwa.co.za/)

[Groundwater Division of the GSSA http://www.gwd.org.za/](http://www.gwd.org.za/)

5.2.4 River Flows

Information Page Related To The “River Flows” Dashboard

To access this dashboard the user should navigate as follows:
Operational>Water Status>River Flows



This dashboard relates to flows in South African rivers. This dashboard is an integrated dashboard which shows:

- 1.Count of gauges within defined thresholds at national, WMA, and Qauternary levels
- 2.Historically observed and verified river flow data
- 3.Unverified real-time data, and
- 4.Flow timeseries as compared to the band of thresholds

Whats the main purpose of the dashboard?

The main purpose is to show the current flows (unverified real-time data), statistics of verified data, and in a graph format to compare timeseries of gauge against historically observed flow thresholds. A review of the graph will thus indicate if the current flows are higher than, lower than or similar to average flow conditions observed for the same time of the year in previous years. This information can help water users and water managers with operational decisions related to water.

2. Contacts details of person/s who championed this dashboard:



Mr Musariri Musariri. Scientific Manager Hydrological Services. Telephone number (012) 336 7949.

3. What type/s of questions does the information product aim to answer:

The dashboard aims to answer the following questions:

- What are the real time (unverified) observed flows
- What are the historical verified observed flows for the past hydrological year
- How do the current flows compare to the observed flows of the past (for the same month)
- What is the count of gauges below and above Normal flow levels at national, WMA and Quaternary levels

4. Data / Information discussion:

- Data used to generate the information
 - What data is used?
 - The historically observed and validated data resides in the HYDSTRA database
 - The unverified real-time data resides in the FLOOD MANAGEMENT SYSTEM database
 - Which weirs (flow gauging stations) are included in this dashboard?

The weirs were selected using the following criteria:

- If the flow gauges are real-time enabled, they are included. There are 77? real-time enabled flow gauges.
- Flow gauges that are not real time enabled will also be considered, but due to the large number of these gauges only a select few will be prioritised for inclusion in the dashboard.
- The weirs have to have a long data set
- The weirs have to be currently operational
- Where a few weirs exist in close proximity to one another, the most suitable option is identified.
- How is it extracted and from where?
- A script is run annually to determine the flow percentiles of observed flows in the Hydstra database. The percentiles include the 99%, 90%, 75%, 50%, 25%, 1%. The percentiles are then captured in NIWIS.
- A second script is run weekly which captures the time series of observed flows verified flows uploaded to HYDSTRA since the previous week
- A script is run to collect the real-time observed flow data. The data is only captured for the flow (or nearest recorded flow) to 6am, 12pm, 6pm, 12am
- Data Processing in NIWIS

The data is updated annually on 1 April but can be extracted by NIWIS as and when required through the Macro Planning processes and procedures provided. In NIWIS a plot is made of the historically observed (and verified) flows for the current hydrological year, as well as the unverified real-time information against the percentiles of past years. The percentiles are computed for each month of the year.

The diagram below illustrates what is shown in NIWIS.

- Key Assumptions
- That the observed flow readings have been correctly verified, and that no errors or omissions have taken place when storing the information into HYDSTRA.
- Are there any limitations / cautions related to using this information?

Yes, please refer to the below:

The real time data is not verified. One has to be cautious when using the data.

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Quality

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Status

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Flow Levels

- High Flow: 100th Percentile (The highest flow in data set for the month)
- Moderately High: 75th Percentile
- Normal: 60th Percentile
- Moderately Low: 40th Percentile
- Low: 25th Percentile
- Very Low: 10th Percentile

A percentile is a measure used in statistics indicating the value below which a given percentage of observations in a group of observations fall. For example, the 20th percentile is the value (or score) below which 20 percent of the observations may be found.

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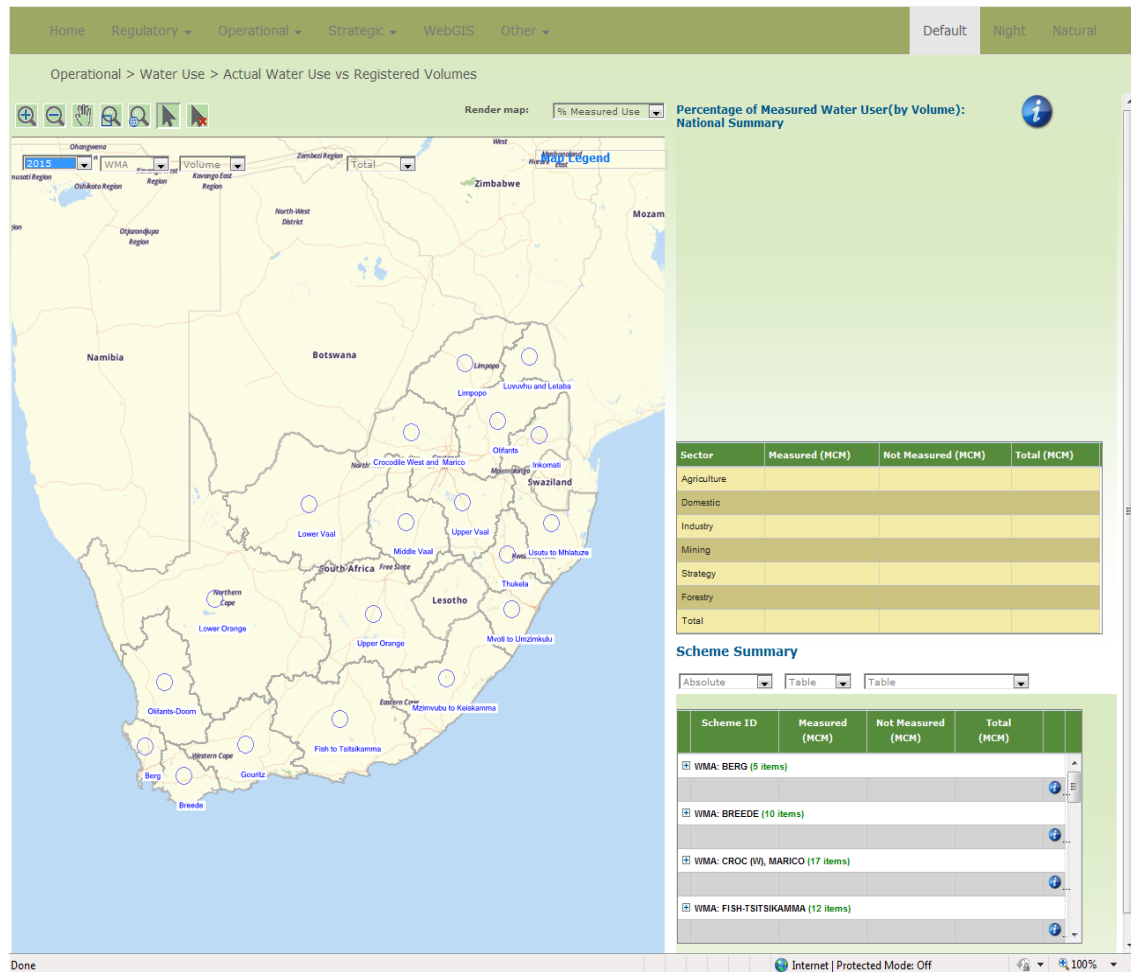
5.3 Water Use

5.3.1 Actual Water Use vs Registered Volumes

Information Page Related To The “Actual Water Use vs Registered Volumes” Dashboard

To access this dashboard the user should navigate as follows:

Operational>Water Use>Actual Water Use vs Registered Volumes





water & sanitation

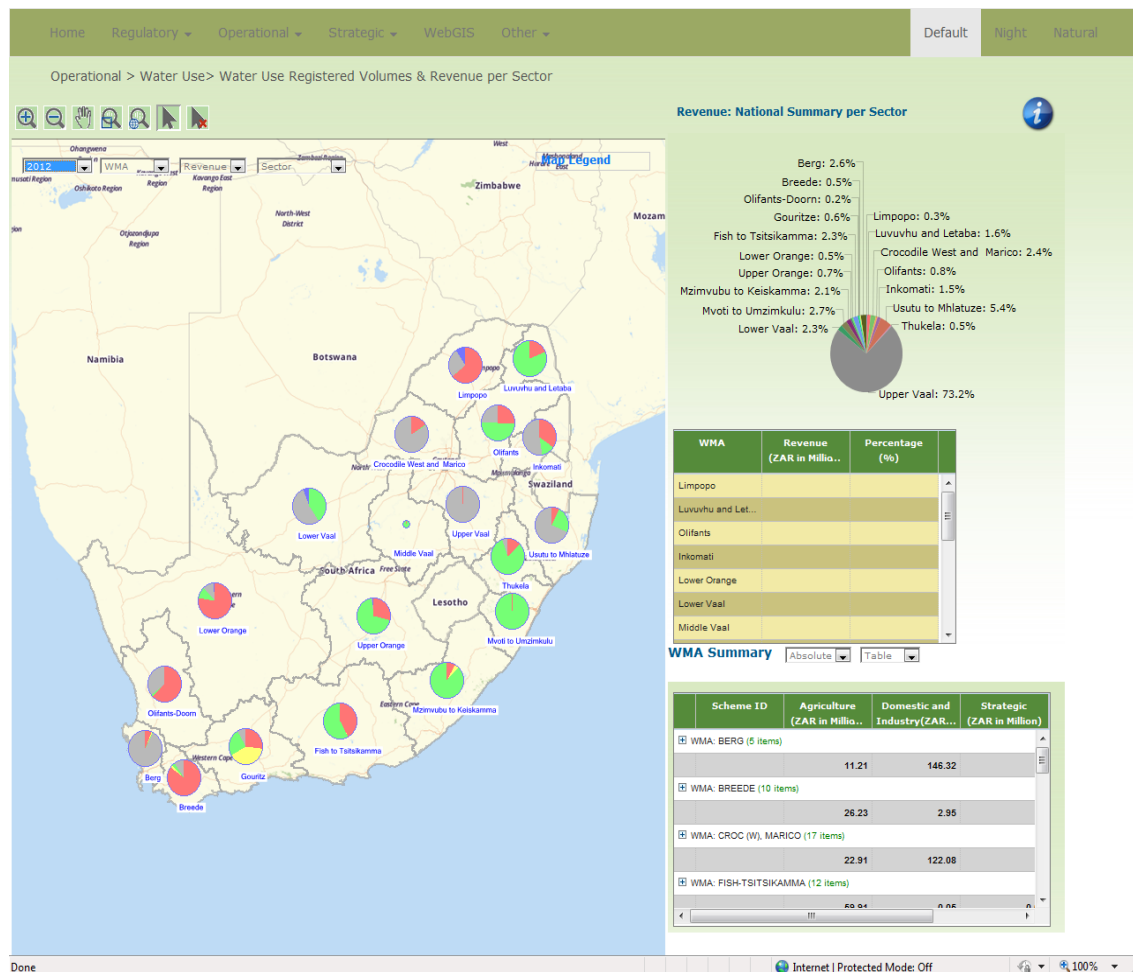
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

5.3.2 Water Use Registered Volumes and Revenue per Sector

Information Page Related To The “Water Use Registered Volumes and Revenue per Sector” Dashboard

To access this dashboard the user should navigate as follows:

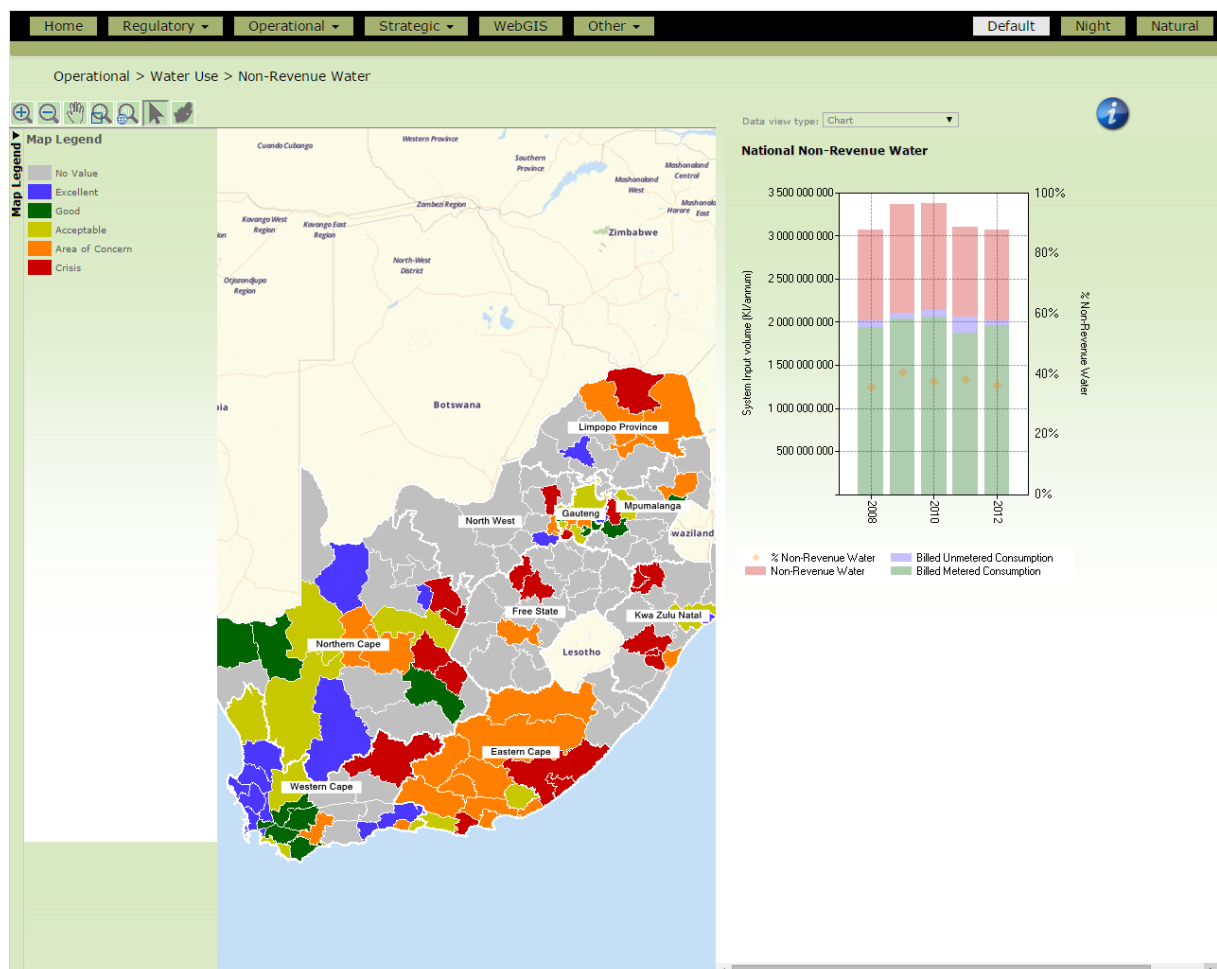
Operational>Water use>Water Use Registered Volume & Revenue per Sector



5.3.3 Non-Revenue Water

Information Page Related To The “Non-Revenue Water” Dashboard

To access this dashboard the user should navigate to:
Operational>Water Use>Non-Revenue Water



What does this dashboard relate to

Water usage can be split into different components by means of a water balance. Most important amongst these components are total potable water consumption, (or system input volume), water losses and non-revenue water, (i.e. water for which no payment is received). Presentation of these components, (as well as a number of other components), allows one to interrogate and compare municipal water service performance, as well as to get provincial and national perspectives.

Contacts details of person/s who championed this dashboard

Allestair Wensley. Telephone number: (012) 336 8767

What type/s of questions does the information product aim to answer

A water balance and/or its main components allow one to consider:

- overall water consumption trend against water resources, to determine resource adequacy;
 - its per capita consumption, to identify excessive water usage;
 - water losses indicates the water system condition; and
 - non-revenue water indicates the financial viability of the service.
- Geographical presentation of the data is possible.

Data / Information discussion

Data used to generate the information

What data is used?

Data from the Water Services Knowledge System (WSKS) is used. This is based on information received from municipalities over a number of years.

Where information is not available other sources of information such as the All Towns Studies is used and failing this default values are generated per municipal category. At any time about half of municipalities can provide information, but this equates to about 75% of water consumed.

How is extracted and from where?

Data is provided in the form of the water balance components directly from municipalities. The data is extracted via Macro Planning processes and procedures directly from the WSKS database.

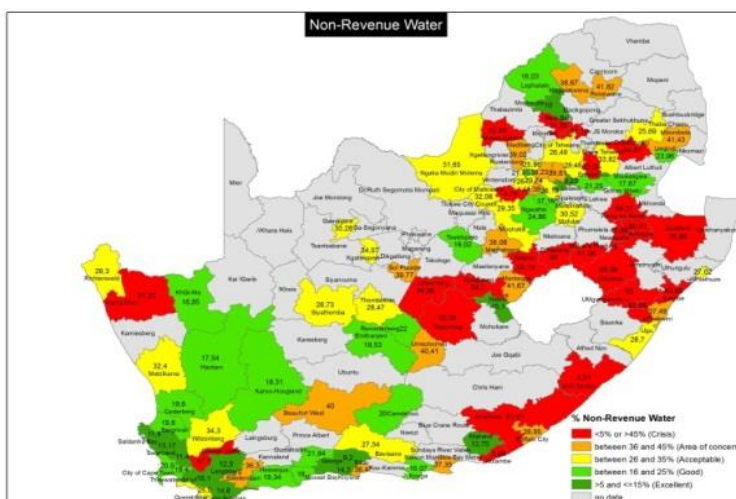
How often is it extracted?

Limited assessments were done in 2002, 2005, 2007, 2010 and 2012. Starting in 2014 these assessments will be done through the “No Drop” process, which will take place every second year. Data can be extracted by NIWIS as and when required through the Macro Planning processes and procedures provided. Business processes related to the data. Information obtained needs to be checked and its reliability ascertained, data gaps need to be filled, and strategic information extracted.

The algorithms / equations used to convert data into information.

Excel pivot tables and charts are used to facilitate data interpretation. Performance grading for presentation purposes is based on the following:

Non-revenue water and water losses	Performance Grade
>50%	Very poor
40-50%	Poor
30-40%	Fair
20-30%	Good
<20%	Excellent



Key assumptions made

That municipalities are providing accurate data.

Are there any limitations / cautions related to using this information?

Yes there are - refer to the paragraph below:



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Quality

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Status

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Links to other sources of related information

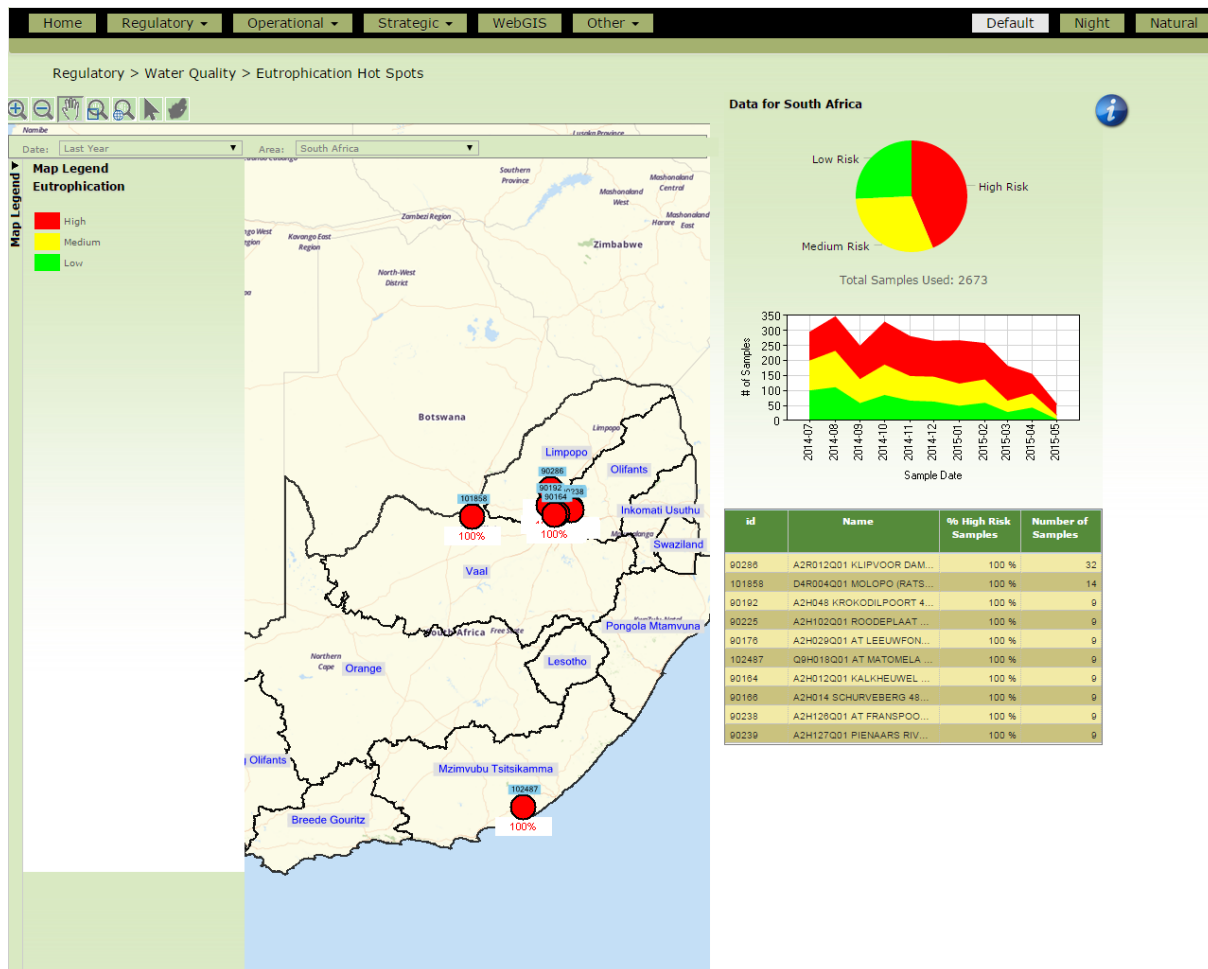
www.dwa.gov.za/wskw

5.4 Water Quality

5.4.1 Eutrophication Hot Spots

Information Page Related To The “Eutrophication” Dashboard

To access this dashboard the user should navigate to:
Regulatory>Water Quality>Eutrophication Hot spots



What does this dashboard relate to

This dashboard provides an overview of the human resources in the DWS. The following type of information is provided in this dashboard:

- The total number of people working in DWS, which can be broken down into:
 - The number of people in various age categories (e.g. 20-35, >35-50, >50 years of age)
 - The gender of the people in the various age categories
 - The skills profiles of the employees, i.e. engineers, scientists, other
 - The race profile of the human resources per age category can be shown
- The number of vacant posts for engineers, scientists and other can be shown.

What is the main purpose of the dashboard?

The purpose of the dashboard is to give an overview of the demographics of the employees in DWS, i.e. how many people are employed, is the workforce aged or quite young, where are vacant posts, are the skills profiles of the regional offices similar etc.



This type of information helps to identify possible deficiencies in the work-force, and also allows for an improved appreciation of the skills competence in DWS.

What divisional reporting of human resources is possible in NIWIS?

Human resources information will be reported on per province and national picture, with a breakdown of the information being available for employees in:

- The National Water Resources Infrastructure (NWRI) unit,
- The regional offices, and
- The head office (this category is only applicable for the province of Gauteng)

Is information of DWS staff available for many years?

The structure of the Department of Water has changed over the years. For example, a few years ago it was the department of Water Affairs and Forestry, thereafter it was re-structured to be the Department of Water and Environmental Affairs (DWAE), and recently it has been restructured to be the Department of Water and Sanitation. The Department has kept accurate records of its staff, however due to the changing nature of the Department it is difficult to report on staff over a period of a number of years. This dashboard gives a snap-shot of the DWS staff as at the 2014/15 DWS financial year.

Contacts details of person/s who championed this dashboard

Mr Indhurin Govender, 012 336-7638, Email: govenderi@dws.gov.za

What type/s of questions does the information product aim to answer:

The dashboard helps to answer the following types of questions:

- What is the age profile of the DWS employees (i.e. is it an relatively young or old workforce)
- What is the gender breakdown of the workforce
- What is the race profile of the workforce
- What number of engineers and scientists are employed
- What number of job vacancies exist in DWS

The dashboard can allow a comparison to be made of human resources (age, race, skills etc.) between the various provinces, and also between NWRI, regional office and head office.

Data / Information discussion

Data used to generate information

What data is used?

Human resource information is extracted from the DWS PERSAL database. PERSAL is the human resource management system of the DWS.

How is data extracted and from where?

The data required for the NIWIS dashboards are extracted from PERSAL as csv files on a monthly basis. The extracted files are then saved on the n-drive of the DWS. The csv files are imported via a script that is initiated monthly. The imported files are saved in the MIKE CUSTOMISED database.

Calculations done in NIWIS

Few calculations are required in NIWIS. The dashboards utilise the information from PERSAL which has been stored in the NIWIS database.

Key assumptions made

The assumption is made that the procedures to extract the data from PERSAL are appropriate.

Are there any limitations / cautions related to using this information?

There could be errors in the data (occurring during data capture or verification).



5.5 Sanitation

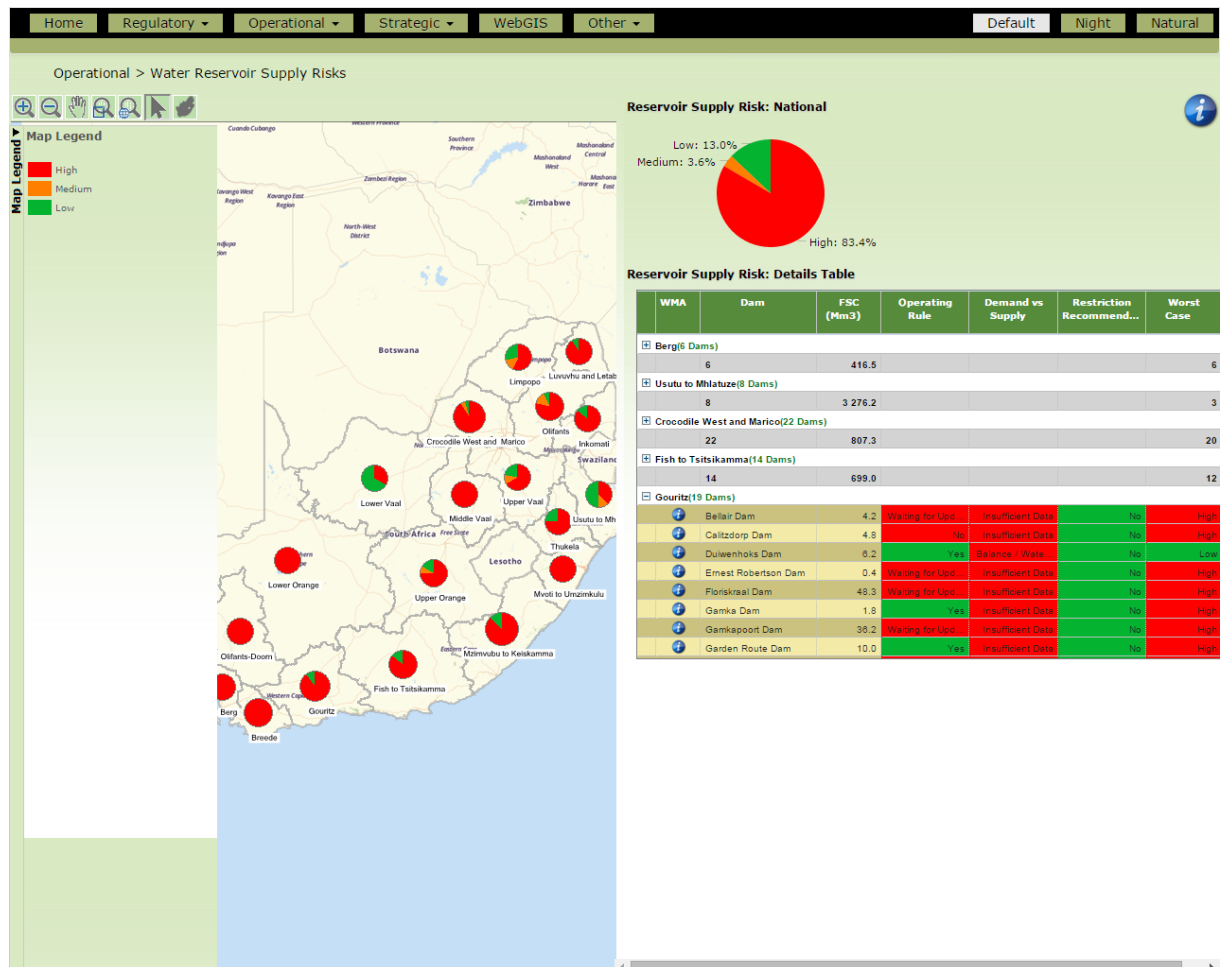
No data currently available.



5.6 Water Reservoir Supply Risks

Information Page Related To The “Water Reservoir Supply Risks” Dashboard

To access this dashboard the user should navigate to:
Operational>Water Reservoir Supply Risks



The following information described in this section will be shown on the NIWIS summary dashboard. It will also be the contextual help that is shown with a new window when a user selects the help / info icon on the dashboard.

What does this dashboard relate to?

This dashboard is a high level summary of water supply risks that may be associated with major Reservoirs in South Africa. These reservoirs are monitored through the Systems Operation Sub-Directorate, which fall under Water Resources Planning Systems (WRPS). The risks relate to water restrictions, operating rules and available yield versus demands.

During times of drought, or in cases where there is an over allocation of water, water supply to different water use sectors needs to be restricted. The level of restriction imposed to different sectors is determined from the operating rules that have been determined for a particular reservoir or supply system. Complex water resources system models are used to determine these rules, and they are specific to unique systems. The operating rules consider aspects such as specific water supply assurance levels required by different water use sectors. They also consider the water required to sustain a functional water ecosystem.



Contacts details of person/s who championed this dashboard

Mr Simon Malose Ngoepe (Pr.Sci.Nat.), Water Resource Planning Systems (Systems Analysis)
Sedibeng Building 879, Private Bag X313, 185 Francis Baard street, Pretoria,
Telephone: +2712 336 6967, Email: ngoepem@dws.gov.za

What type/s of questions does the information product aim to answer?

The dashboard aims to answer the following questions:

Are operating rules developed for the Reservoir?

- An updated operating rule means that the framework is in place to implement restrictions if required. This lessens the risk associated with long term water supply, because it can be actively managed.
- Having no, or outdated operating rules is a risk to water supply. Not knowing how to restrict water users when required could lead to restrictions that are not severe enough, leading to potential failure of the resource, or which are too severe, which can negatively impact the users.

What is the available yield and what amount of water is allocated to different sectors?

The amount of water allocated to water users is typically the amount of water to which they are legally entitled to in a year with no restrictions. The amount of water allocated for use should always be less than the available system yield (the ability of the reservoir to supply the demand). Therefore, it is important to show the amount of water allocated to different sectors, and then compare it to the determined yield for the reservoir. Yields are also determined at different assurance levels of supply, and this information is also shown.

Are any water restrictions currently being imposed?

It is important for water resource management to have a summary of where water restrictions are currently being implemented, and what the level of restriction for the different water use sectors is. This data is shown at the individual reservoir level.

Does DWS have access to data from the Reservoir?

It is not possible to assess the requirement for restrictions if DWS does not have access to updated and accurate information from the reservoir. Having access to updated data therefore a key risk area for reservoir supply, and is indicated through the dashboard. DWS needs to gather this data for important reservoirs, even those owned by municipalities or other 3rd parties.

What is the latest and most relevant document related to operating rules?

The dashboard also provides a link to the latest and most relevant document that is available online. This is useful if more detailed information is required by the user.

Data / Information discussion

The data is captured into a National Summary spreadsheet by a system Analyst at WRPS. The data is then imported into the NIWIS system for viewing on the dashboard.

The data is typically updated annually or biannually for certain large reservoir systems. This decision is typically made at the end of the wet season, when the volume of water stored (which is assumed to be at the maximum level after the wet season) can be analysed in relation to the expected demands. In summer rainfall areas, this date is typically the 1st May, and in winter rainfall areas it is the 1st November. In large systems, a second date is usually added at the start of the wet season.

The data shown on the dashboard is typically updated whenever the D:WRPS-SO makes changes to the dataset. The last date for which analyses were made is shown for each individual reservoir, under the "restrictions" section of the pop-up view.

The operating rules that are developed rely on complex water resources systems models to derive the rules and analyse the requirement for restrictions. As such, it is a technical exercise that is undertaken by water resource specialists.



Are there any limitations / cautions related to using this information?

The data is based on the best data that is available to WRPS. The conditions reflected on the dashboard could change significantly subsequent to the last time that data was collected and / or analysed.

Links to other sources of related information

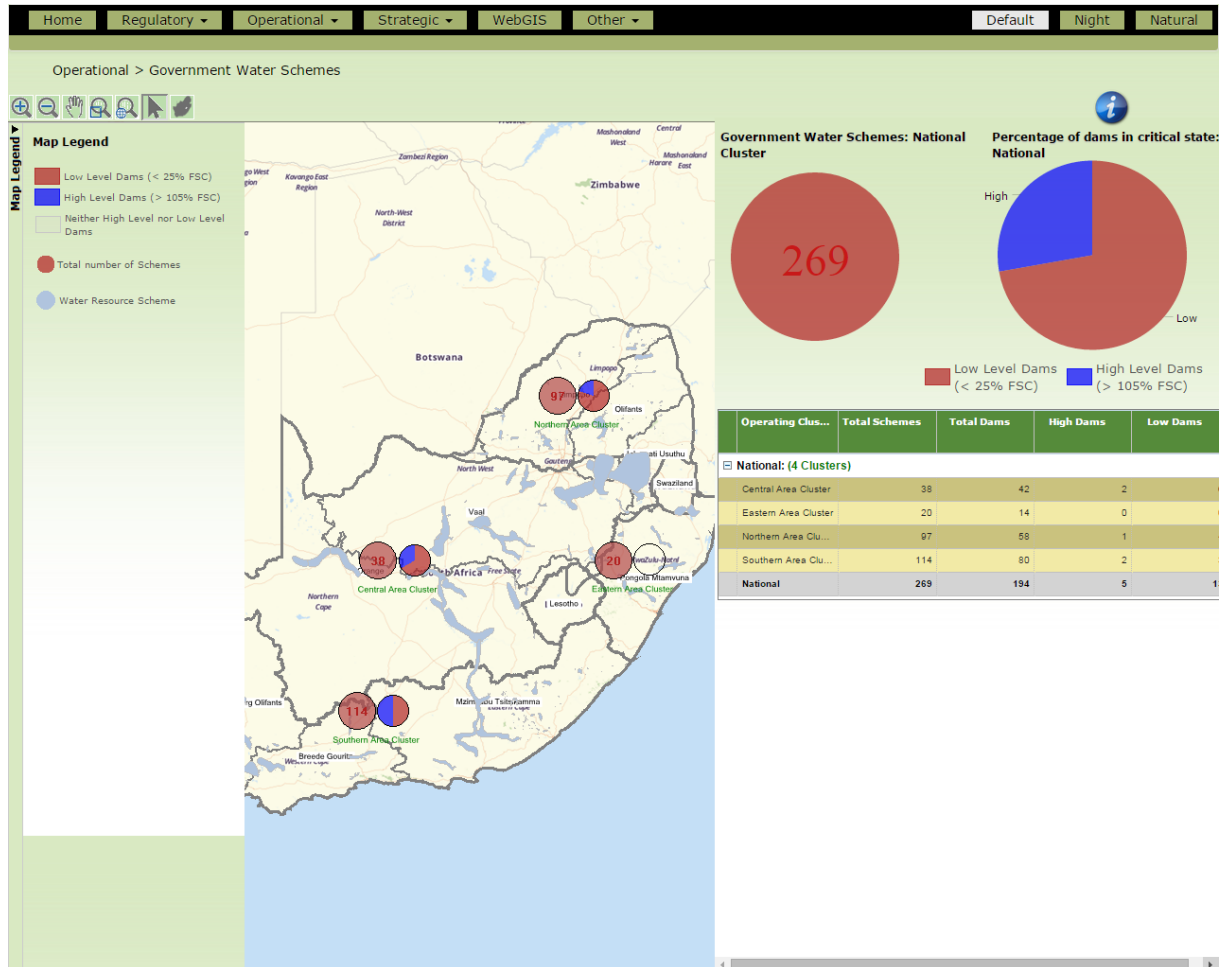
The following link is for the Integrated Water Resources Planning Chief Directorate at DWS, and is the location of the document portal where all water resources planning related documents are stored.

<https://www6.dwa.gov.za/iwvp/>

5.7 Government Water Schemes

Information Page Related To The “Government Water Schemes” Dashboard

To access this dashboard the user should navigate as follows:
Operational> Government Water Schemes



The following information described in this section will be shown on the NIWIS summary dashboard. It will also be the contextual help that is shown with a new window when a user selects the help / info icon on the dashboard.

What does this dashboard relate to?

This dashboard provides an overview of the various GWS within the different Operational Clusters. The dashboard should provide an overview of where the different schemes are within specific areas in South Africa. Additionally, the dashboard will provide information on the levels of different DWS reservoirs and for those dams with operating rules will be displayed graphically on a “Levels vs Operating Rules” plot.

What is the main purpose/s of the dashboard?

The focus of the Government Water Schemes (GWS) dashboard is to provide an overview of the locality of the GWS in South Africa. This information should enable the viewer to get an understanding of where different schemes are in the country and aggregate the resulting scheme related information at operational cluster level.



Contacts details of person/s who championed this dashboard:

Leonardo Manus
Chief Director
Infrastructure Operations
Tel: 012 336 7386
E-mail: ManusL@dws.gov.za

Zanele Bopape
Senior Specialist
Strategic Asset Management Directorate
Tel: 012 336 8137
E-mail: BopapeZ@dws.gov.za

What type/s of questions does the information product aim to answer?

The key information to report as part of these case management dashboard is as follows:

- Where are the GWSs located within the country
- What are the dam levels in these schemes
- What are the flows (inflows and outflows)
- What are the dams operating rules

Data / Information discussion

What data is used?

Data is provided from HYDSTRA system as well as the two spreadsheets (Asset Register and Operating Rules) and is summarised to a Cluster scale.

Which stations are included in this dashboard?

No stations are included in the dashboard but individual point specific information is obtained for the specific schemes. This information is summarised to a Cluster level.

How is data extracted and what is the source

The data shown in the dashboard shall directly reflect the information provided by the data provider. The main processing requirement will be the aggregation of information from an individual point level to an aggregated level for the country and the Operational Clusters. This will require some processing in the GIS background layers where point information is aggregated against the Cluster polygons. There will be no manipulation of information in the database and the indicators provided will be directly derived from the data provided in the HYDSTRA system as well as the Operating Rules spreadsheet and Asset Register spreadsheet.

Data Processing in NIWIS

Data processing involves some spatial aggregation to a Cluster and National level. Percentage information is derived and reported in a pie chart.

Key assumptions made

- The schemes shapefile used is the most accurate information available.
- All the information has GIS capabilities to be displayed spatially
- Asset Register information has captured the information accurately, and the information collected is the most complete information available
- Operating Rules information is available.

Are there any limitations / cautions related to using this information?

Yes, please refer to the section below:

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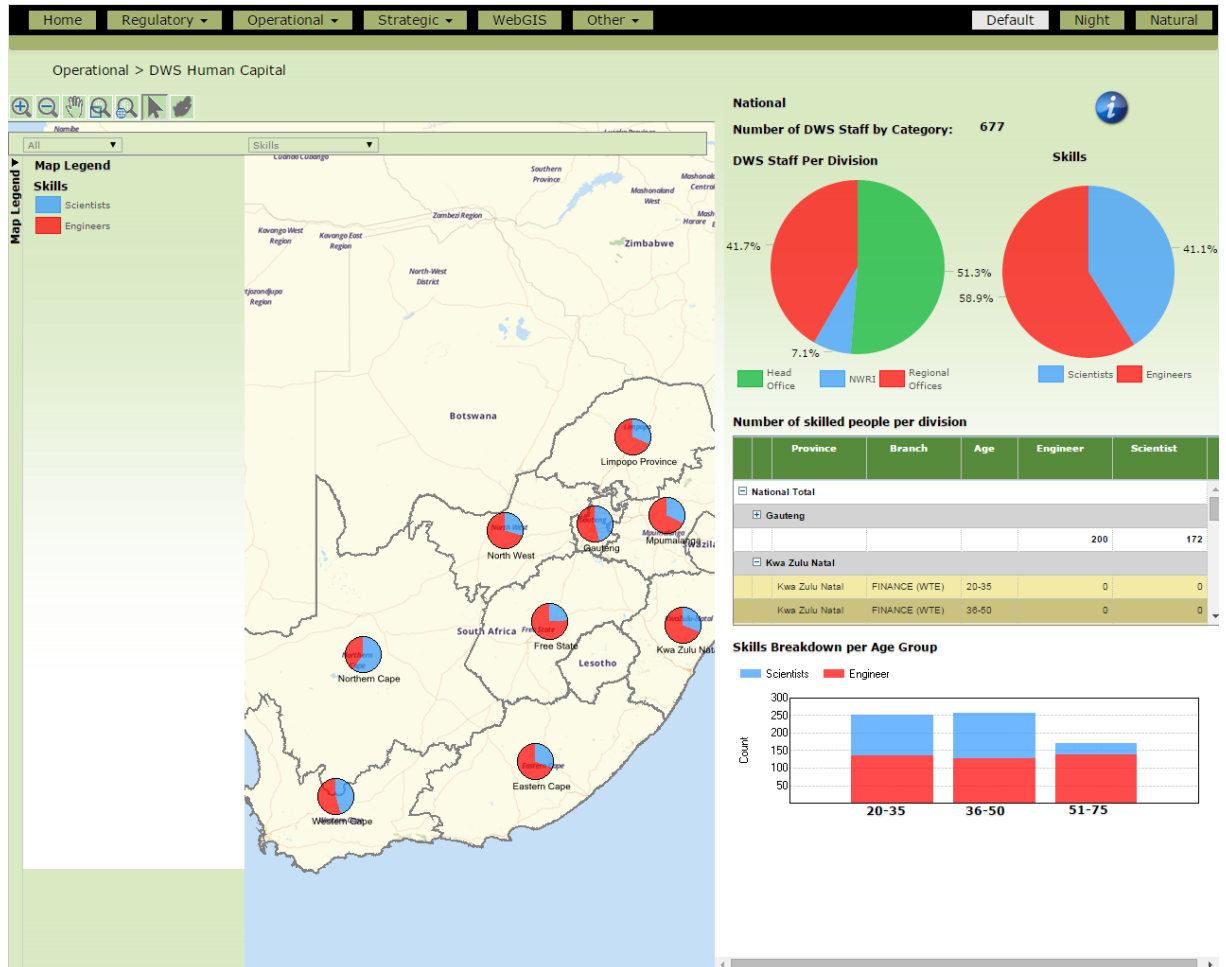
Links to other sources of related information

The dashboard will integrate information from different data sources, from formal HYDSTRA database to spreadsheets for Operating Rules for dams as well as NWRIB Asset Register.

5.8 DWS Human Capital

Information Page Related To The “DWS Human Capital” Dashboard

To access this dashboard, the user should navigate to:
Operational>DWS Human Capital



This dashboard provides an overview of the human resources in the DWS. The following type of information is provided in this dashboard:

- The total number of people working in DWS, which can be broken down into:
 - The number of people in various age categories (e.g. 20-35, >35-50, >50 years of age)
 - The gender of the people in the various age categories
 - The skills profiles of the employees, i.e. engineers, scientists
 - The race profile of the human resources per age category can be shown
- The number of vacant posts for engineers, scientists can be shown.

What is the main purpose of this dashboard?

The purpose of the dashboard is to give an overview of the demographics of the employees in DWS, i.e. how many people are employed, is the workforce aged or quite young, where are vacant posts, are the skills profiles of the regional offices similar etc. This type of information helps to identify possible deficiencies in the work-force, and also allows for an improved appreciation of the skills competence in DWS.



What divisional reporting of human resources is possible in NIWIS?

Human resources information will be reported on per province and national picture, with a breakdown of the information being available for employees in:

- The National Water Resources Infrastructure (NWRI) unit,
- The regional offices, and
- The head office (this category is only applicable for the province of Gauteng)

Is information of DWS staff available for many years?

The structure of the Department of Water has changed over the year. For example, a few years ago it was the department of Water Affairs and Forestry, thereafter it was re-structured to be the Department of Water and Environmental Affairs (DWAE), and recently it has been restructured to be the Department of Water and Sanitation. The Department has kept accurate records of its staff, however due to the changing nature of the Department it is difficult to report on staff over a period of a number of years. This dashboard gives a snap-shot of the DWS staff as at the 2014/15 DWS financial year.

Contacts details of person/s who championed this dashboard

Mr Indhurin Govender, 012 336-7638, Email: govenderi@dws.gov.za

What type/s of questions does the information product aim to answer

The dashboard helps to answer the following types of questions:

- What is the age profile of the DWS employees (i.e. is it an relatively young or old workforce)
- What is the gender breakdown of the workforce
- What is the race profile of the workforce
- What number of engineers and scientists are employed
- What number of job vacancies exist in DWS

The dashboard can allow a comparison to be made of human resources (age, race, skills etc.) between the various provinces, and also between NWRI, regional office and head office.



Data / Information discussion

What data is used?

Human resource information is extracted from the DWS PERSAL database. PERSAL is the human resource management system of the DWS.

How is data extracted and from where?

The data required for the NIWIS dashboards are extracted from PERSAL as csv files on a monthly basis. The extracted files are then saved on the n-drive of the DWS. The csv files are imported via a script that is initiated monthly. The imported files are saved in the MIKE CUSTOMISED database.

Calculations done in NIWIS

Few calculations are required in NIWIS. The dashboards utilise the information from PERSAL which has been stored in the NIWIS database.

Key assumptions made

The assumption is made that the procedures to extract the data from PERSAL are appropriate.

Are there any limitations / cautions related to using this information?

There could be errors in the data (occurring during data capture or verification).

Are there any limitations / cautions related to using this information?

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Acknowledgement

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6 Strategic Dashboards

6.1 Overview



Figure 6-1: Selecting a Strategic dashboard from a dropdown list

Strategic dashboards are those dashboards that deal with long-term organizational goals that help to convert a mission statement from a broad vision into more specific plans and projects.

Figure 6-2 shows an example of one of the currently completed Strategic dashboards in NIWIS.

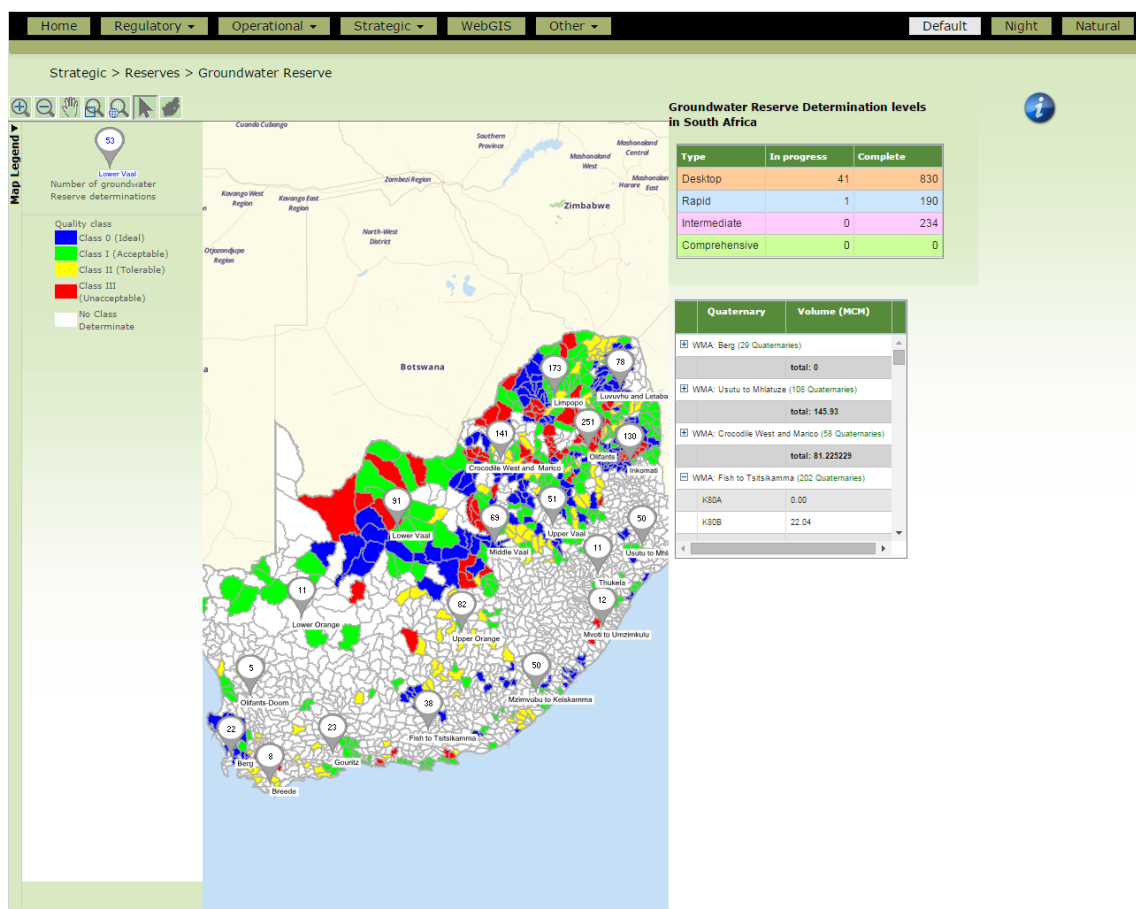


Figure 6-2: One of the Strategic dashboards in NIWIS



water & sanitation

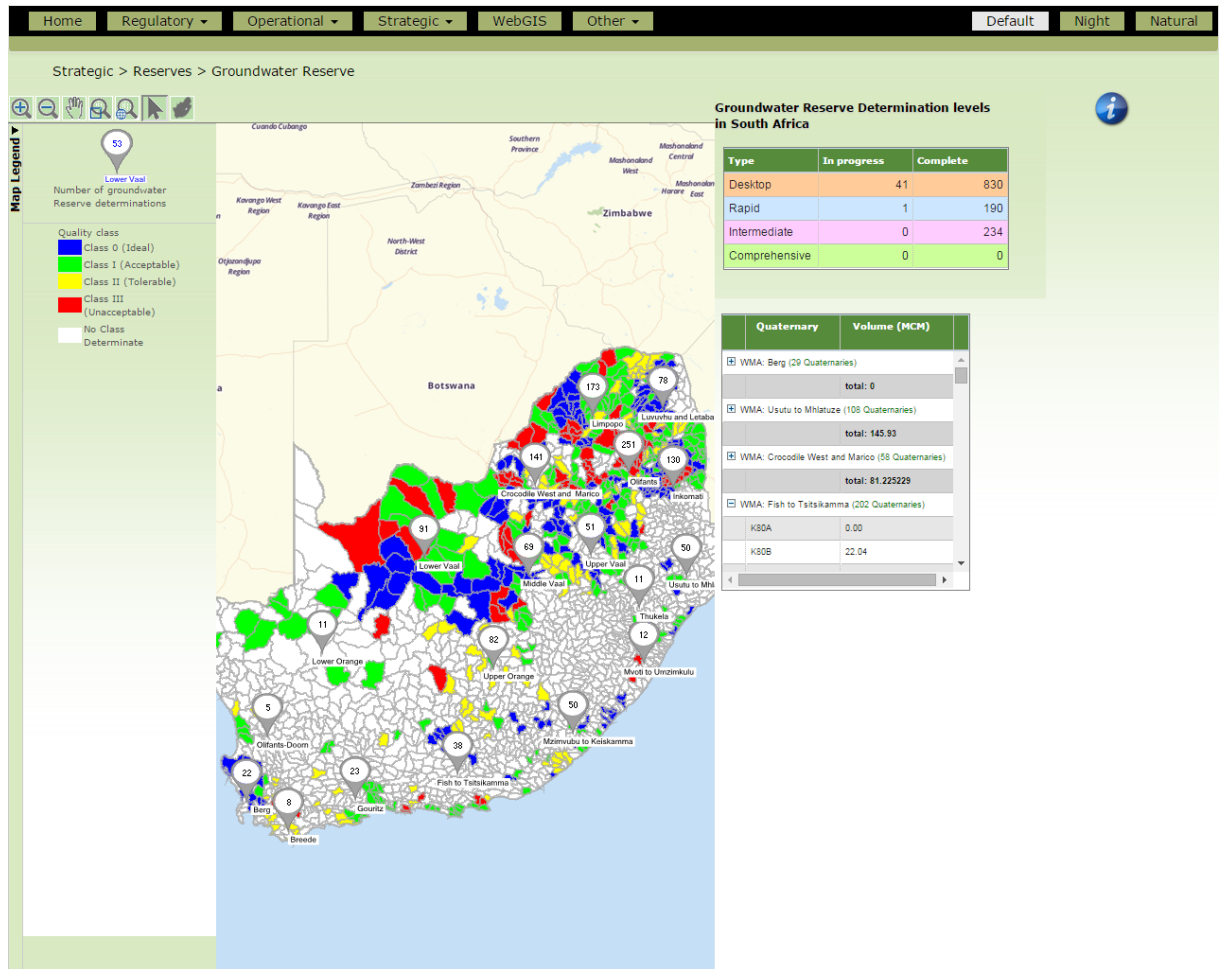
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Water and Sanitation
REPUBLIC OF SOUTH AFRICA

6.2 Reserves

6.2.1 Groundwater Reserve

Information Page Related To The “Groundwater Reserve” Dashboard

To access the dashboard the user should navigate to:
Strategic>Reserves>Groundwater Reserve



The Environmental Water Requirement (Reserve) is determined in different areas at different levels of confidence according to the level of stress and importance of the water resources in specific areas. Different Reserve assessments can be provided from quaternary catchment scale up to the entire country.

The levels of classification of the groundwater Reserve determination are: Desktop, Rapid, Intermediate and Comprehensive. This dashboard provides an indication of the status of groundwater Reserve determination in the country and represents this in a map and table.

Are there any limitations / cautions related to using this information?

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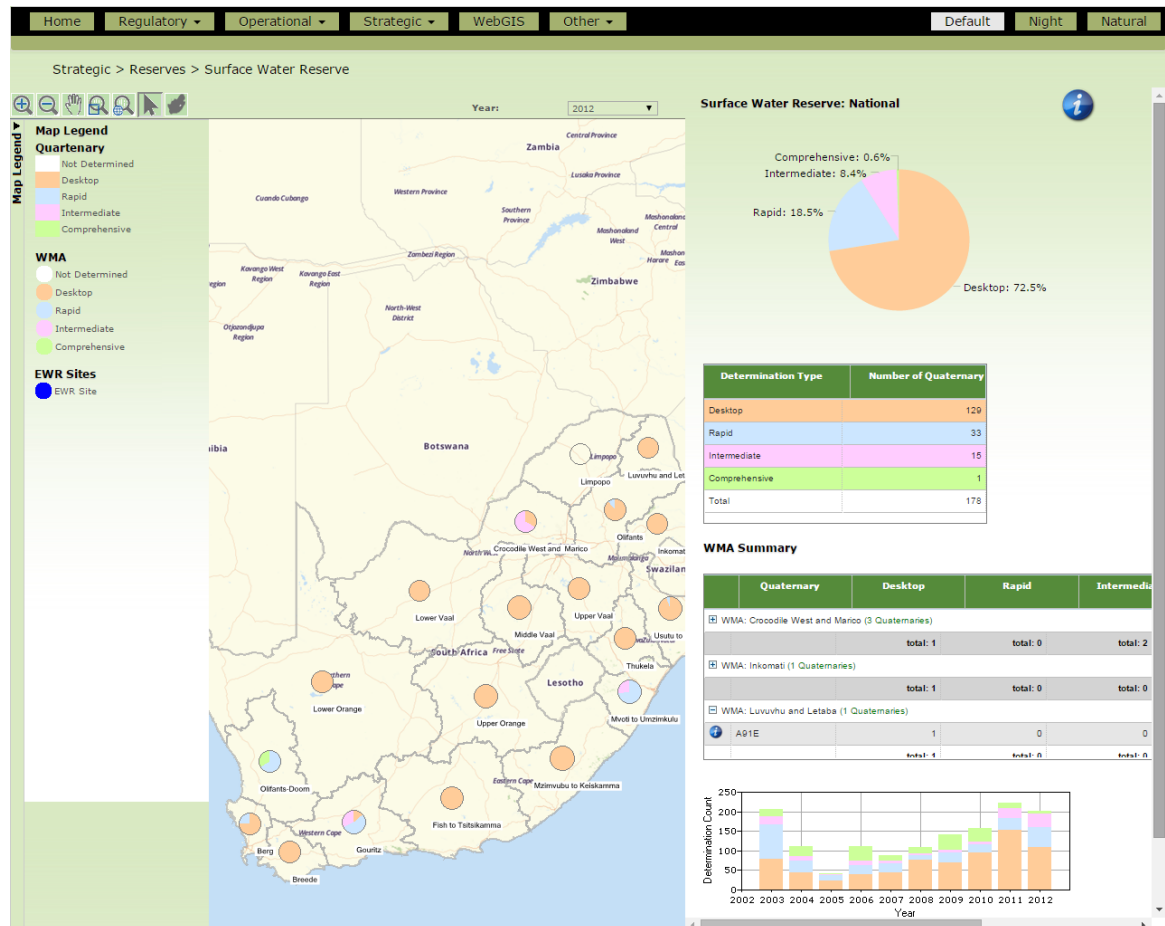
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6.2.2 Surface Water Reserve

Information Page Related To The “Surface Water Reserve” Dashboard

To access this dashboard the user should navigate as follows:
Strategic>Reserves>Surface Water Reserve



It relates to an information system that can be used as a database on historic data, to store new information and provide information for water management decisions. This dashboard gives an indication of the number of Surface Water Reserves approved to date, for selected periods and the level of Reserve Determination (i.e. Desktop, Rapid, Intermediate and Comprehensive). It provides prudent and baseline information for reporting purposes on State of Water Resources, for planning and budgetary purposes, monitoring and auditing and input into new studies.

Contacts details of person/s who championed this dashboard:

Ms. Barbara Weston, Scientific Manager +2712 336 8221 +27 83 631 0801, WestonB@dwa.gov.za,
Office: Emanzini C9

What types of questions does the information product aim to answer:

The dashboard aims to answer the following questions:

- Number of approved Surface Water Reserve to date;
- The different levels of Reserves determined;
- Dates when the Reserves were approved;



- Latest reserves that supersede previous reserves
- Geographical coverage of reserves in RSA;
- Indicated where Reserve studies are still required;
- Date when Reserves approved; etc

Data / Information discussion:

All Surface Water Reserve information is saved on the N-drive database and contains information about approved Reserves, reports, current studies as discussed under point 1 and 2.

Are there any limitations / cautions related to using this information?

Yes, please refer to the below:

- The process of verifying the data can take weeks to months. The implication is that results are not real-time or near-real time.
- Errors may occur during data capture or verification.
- Hundreds of toxic substances exist, and DWS can only analyse a few of them.
- Data collection varies in intensity across WMAs, so the National and WMA results are inherently biased. Always check the data at the local site scale before drawing conclusions. Sometimes the classification may be based on the results of a single sample.

Copyright

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Links to other sources of related information

- NFEPA's;
- PES/EIS database;
- Reconciliation studies and the availability of water
- NWRS and CMS;
- EIS's
- River health database etc


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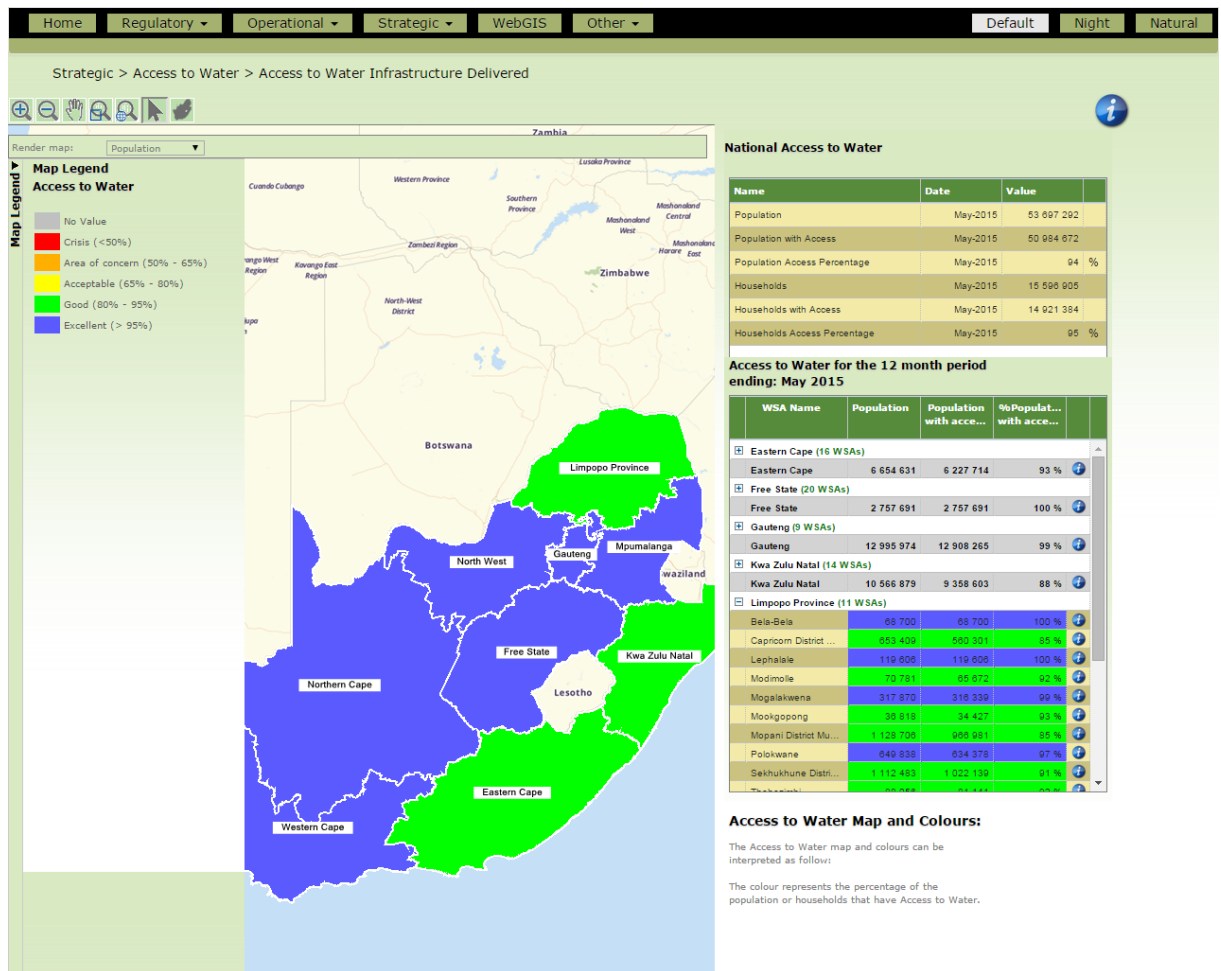
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6.3 Access to Water

6.3.1 Access to Water Infrastructure Delivered

Information Page Related To The “Access To Municipal Water Scheme Infrastructure” Dashboard

To access this dashboard the user should navigate as follows:
Strategic>Access to Water>Access to Water Infrastructure Delivered



What does this dashboard relate to

The Access to Water dashboard provides the user with a national as well as provincial presentation/s of people and households with access to basic water supply infrastructure at RDP or higher levels of service. RDP or higher service levels are regarded as tapped (safe) water through a communal stand pipe within 200m from the dwelling, water in the yard or water in the dwelling. Access to water infrastructure does not consider the functionality of the water supply scheme i.e. whether it is fully operational with no interruptions in supply or not.

Contacts details of person/s who championed this dashboard

Mr Allestair Wensley. Telephone number (012) 336 8767.

What type/s of questions does the information product aim to answer

The product aims to provide the user with the number of people and households with access to basic water supply infrastructure. This obviously also provides the number of people without access to basic water supply infrastructure, commonly referred to as the water backlog/water needs.



Geographical presentation of the data indicating the level of access to water supply on Provincial and Water Services Authority (WSA) level is possible.

Data / Information discussion

Data used to generate the information

What data is used?

Data from the Water Services Knowledge System (WSKS) is used. This is based on results of STATS SA Censuses as well as annual General Household Surveys, aligned with and updated by the Department of Water and Sanitation (DWS) Macro Planning data. Data is generated on settlement level and is based on the water supply service level provided such as water in house, in yard or from a communal standpipe, borehole, spring, dam, river, or other source. Based on the service level definitions, the WSKS determines who has access to at and/or above RDP water supply service levels and who does not.

How is it extracted and from where?

The data is extracted via Macro Planning processes and procedures directly from the Water Services Knowledge System database.

How often is it extracted?

The data is updated annually on 1 April but can be extracted by NIWIS as and when required through the Macro Planning processes and procedures provided.

Business processes related to the data

N/A

The algorithms / equations used to convert data into information

NIWIS calculates the performance grading for presentation purposes based on the following Performance Grading:

Backlog/Water needs %	Performance Grade
Between 50 and 100%	Crisis
Between 35 and 49.99%	Area of concern
Between 20 and 34.99	Acceptable
Between 5 and 19.99	Good
0 – 4.99	Excellent

Key assumptions made

That the user has been provided with access to at least RDP level water supply, with no consideration of scheme functionality i.e. whether the scheme is still fully operational with no interruptions.

Are there any limitations / cautions related to using this information?

Yes, please refer to the section below:

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Links to other sources of related information

www.dwa.gov.za/wsk

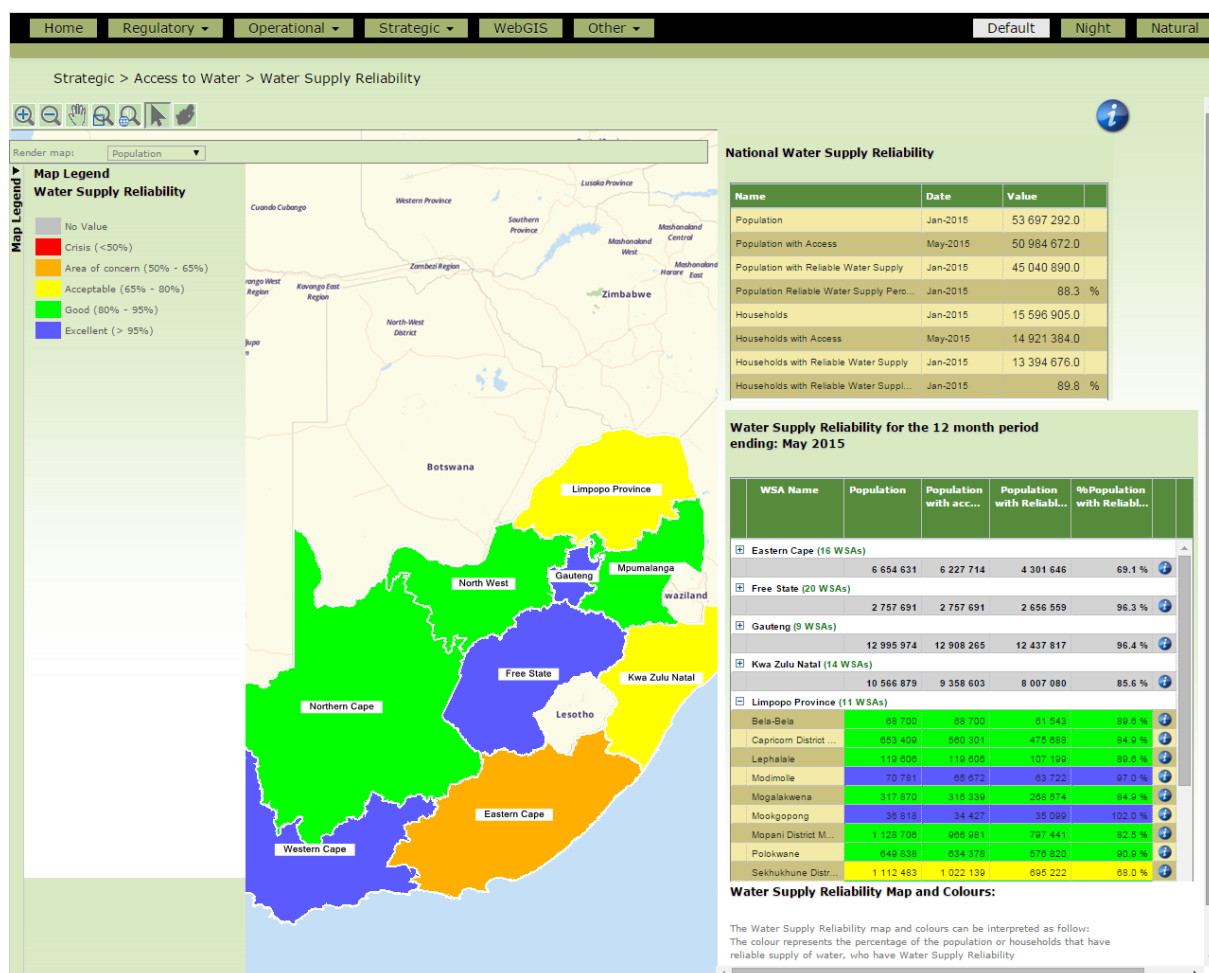
www.statssa.gov.za



6.3.2 Water Supply Reliability

Information Page Related To The “Access To Functional Municipal Water Scheme Infrastructure” Dashboard

To access this dashboard the user should navigate as follows:
Strategic>Access to Water>Water Supply Reliability



The Access to FunctionalMunicipal Water Scheme Infrastructure dashboard indicates the percentage to population and households that have access to reliable drinking water through functional water delivery infrastructure.

This dashboard's map colour coding represent the Access to FunctionalMunicipal Water Scheme Infrastructure status, as indicated on the map legend.

The Access to Functional Municipal Water Scheme Infrastructure dashboard map can be rendered to one of the following statuses:

- Population
- Households

The table at the top right shows the aggregated summary information of the selected map area. The second table provides aggregated detail information for the selected map area. Both tables provide the information on percentage and number of population and households that have access to drinking water.



The Access to Functional Municipal Water Scheme Infrastructure information is provided by Water Services and is updated annually.

What does this dashboard relate to

The Access to Functional Municipal Water Scheme Infrastructure dashboard provides the user with a national as well as provincial presentation/s of people and households with access to reliable and functional basic water supply infrastructure at RDP or higher levels of service. RDP or higher service levels are regarded as tapped (safe) water through a communal stand pipe within 200m from the dwelling, water in the yard or water in the dwelling. Access to Functional Municipal Water Scheme Infrastructure considers the functionality of the water supply scheme i.e. whether it is fully operational with no interruptions in supply or not. Therefore, it portrays the actual level of access to water.

Contacts details of person/s who championed this dashboard

Mr AllestairWensley. Telephone number (012) 336 8767.

What type/s of questions does the information product aim to answer

The product aims to provide the user with the number of people and households with access to reliable and functional basic water supply infrastructure. This obviously also provides the number of people without access to reliable basic water supply infrastructure, commonly referred to as the water backlog/water needs. Geographical presentation of the data indicating the level of access to water supply on Provincial and Water Services Authority (WSA) level is possible.

Data / Information discussion

Data used to generate the information

What data is used?

Data from the Water Services Knowledge System (WSKS) is used. This is based on results of STATS SA Censuses as well as annual General Household Surveys, aligned with and updated by the Department Water and Sanitation (DWS) Macro Planning data. Data is generated on settlement level and is based on the water supply service level provided such as water in house, in yard or from a communal standpipe, borehole, spring, dam, river, or other source. Based on the service level definitions, the WSKS determines who has access to at and/or above RDP water supply service levels and who does not.

How is it extracted and from where?

The data is extracted via Macro Planning processes and procedures directly from the Water Services Knowledge System database.

How often is it extracted?

The data is updated annually on 1 April but can be extracted by NIWIS as and when required through the Macro Planning processes and procedures provided.

Business processes related to the data

N/A

The algorithms / equations used to convert data into information

NIWIS calculates the performance grading for presentation purposes based on the following Performance Grading:

Backlog/Water needs %	Performance Grade
Between 50 and 100%	Crisis
Between 35 and 49.99%	Area of concern
Between 20 and 34.99	Acceptable
Between 5 and 19.99	Good
0 – 4.99	Excellent



Key assumptions made

That the user has been provided with access to at least RDP level water supply, with no consideration of scheme functionality i.e. whether the scheme is still fully operational with no interruptions.

Are there any limitations / cautions related to using this information?

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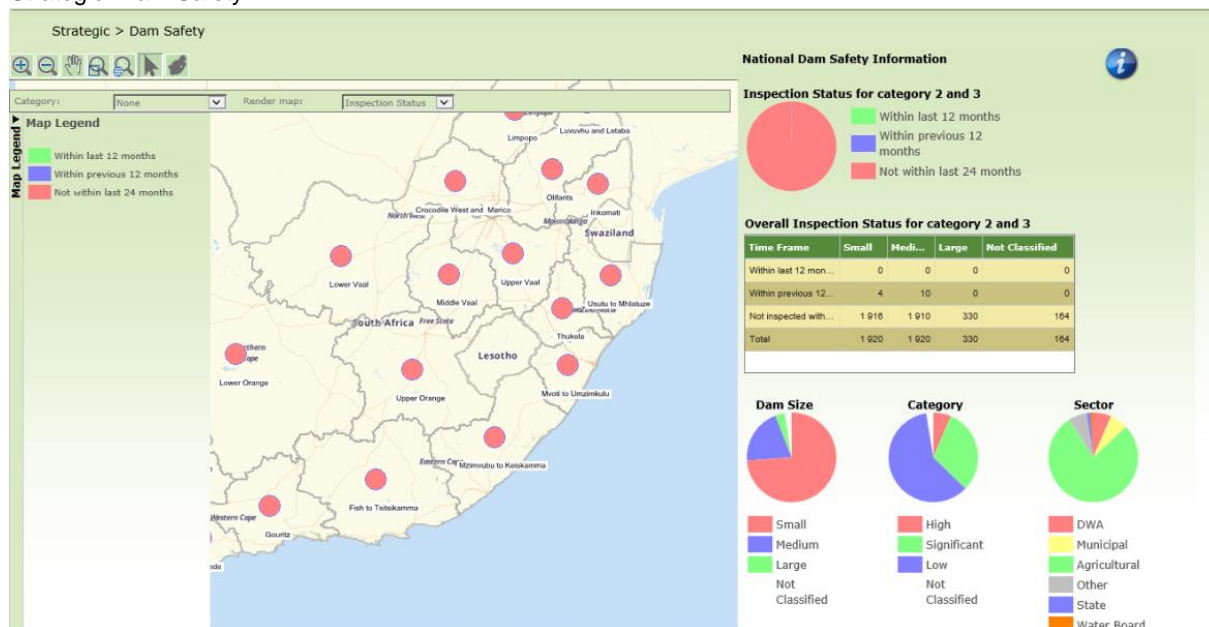
www.dwa.gov.za/wsk

www.statssa.gov.za

6.4 Dam Safety

Information Page Related To The “Dam Safety” Dashboard

To access this dashboard the user should navigate as follows:
Strategic>Dam Safety



This dashboard's map color coding represents inspection status – displays the distribution of dams that have been inspected within the last 12 months period, within the previous 12 months period and before that.

The dashboard map can be rendered as per following indicators:

- Inspection Status
- Dam Size
- Hazard Category
- Sector

The pie chart at the top right shows the aggregated summary information of the selected map area. The table at the right shows the overall inspection status of all dams of different categories e.g. Small, Medium and Large.

Note that all statistics are based on dam counts e.g.: count of small dams vs count of medium dams vs count of large dams.

Are there any limitations / cautions related to using this information?

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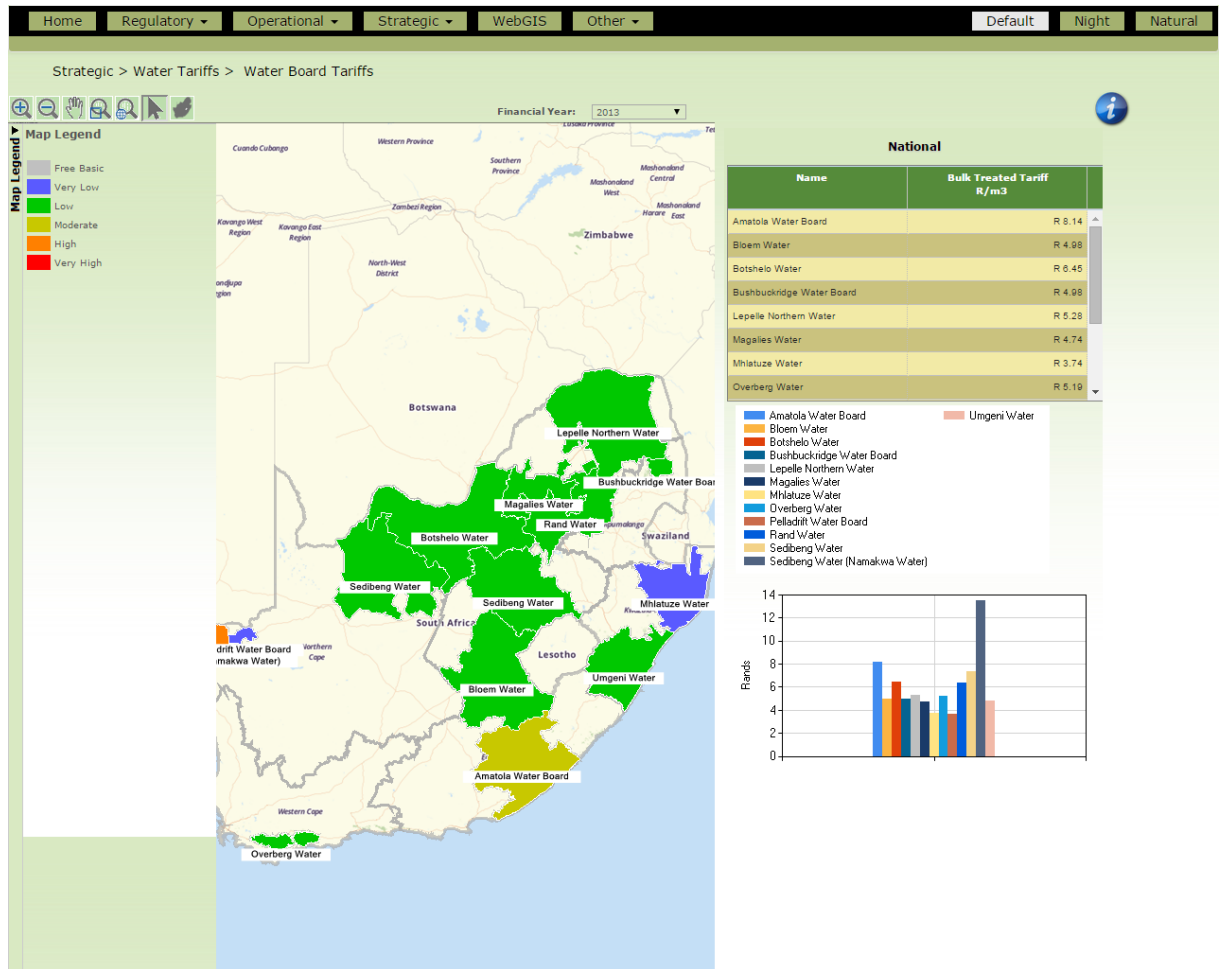


6.5 Water Tariffs

6.5.1 Water Board Tariffs

Information Page Related To The “Water Board Tariffs” Dashboard

To access this dashboard the user should navigate as follows:
Strategic>Water Tariffs>Water Board Tariffs



The Water Tariffs - Water Boards dashboard indicates Water Tariffs for Water Boards.

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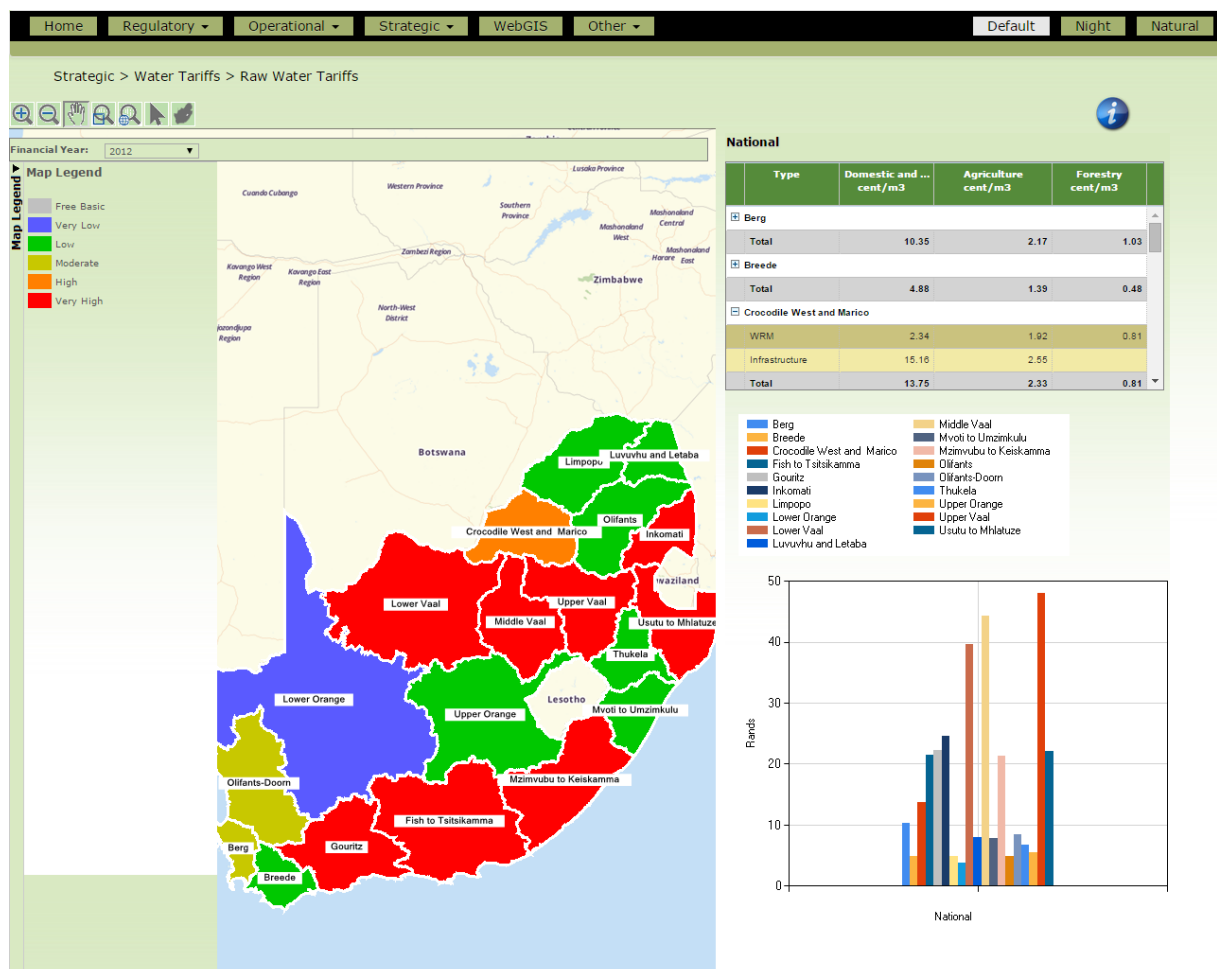
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6.5.2 Raw Water Tariffs

Information Page Related To The “Raw Water Tariffs” Dashboard

To access this dashboard the user should navigate as follows:
Strategic>Water Tariffs>Raw Water Tariffs



The Water Tariffs - Raw Water dashboard indicates Raw Water Tariffs.

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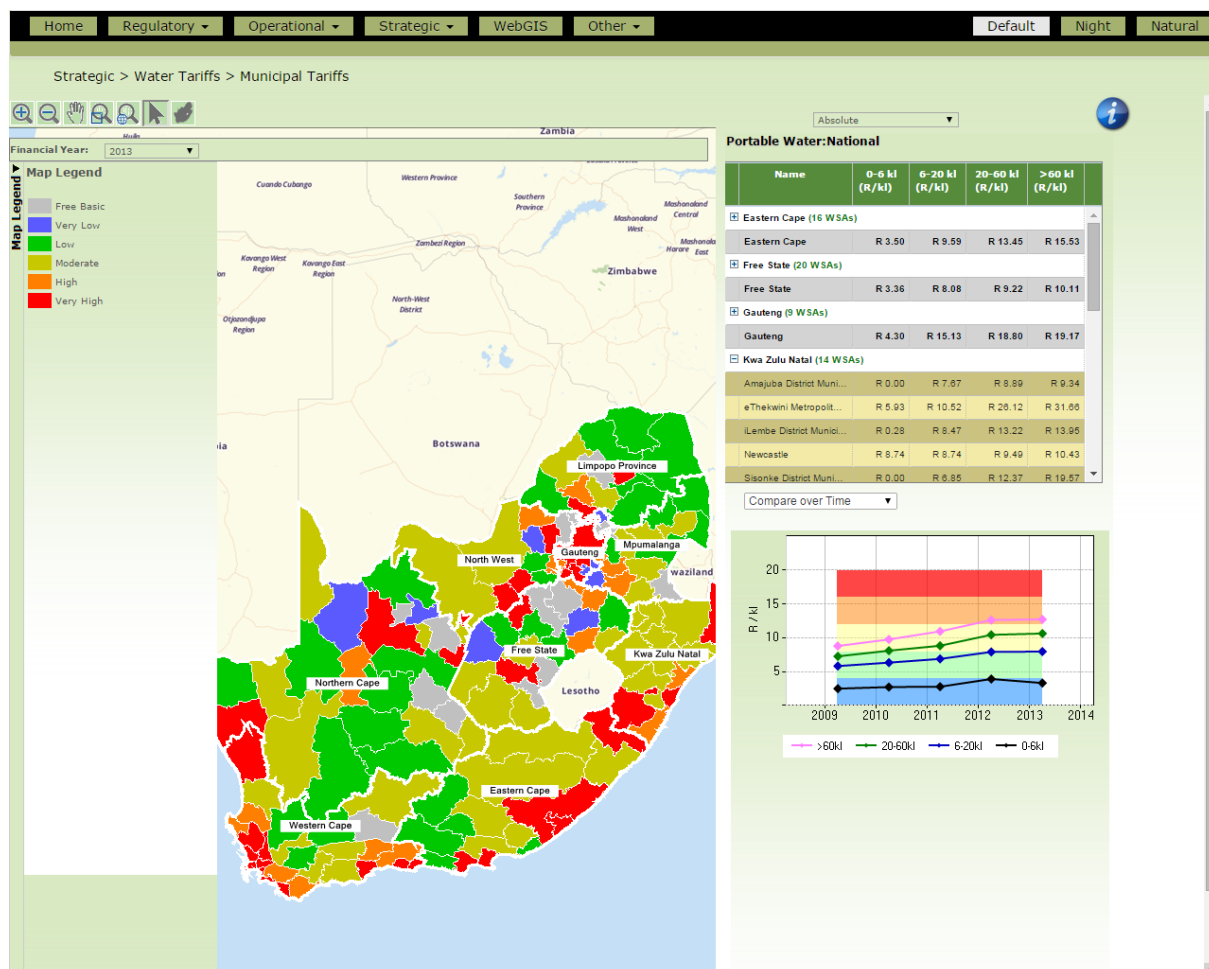
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6.5.3 Municipal Tariffs

Information Page Related To The “Municipal Tariffs” Dashboard

To access this dashboard, the user should navigate as follows:
Strategic>Water Tariffs>Municipal Tariffs



The Water Tariffs - Municipalities dashboard indicates Water Tariffs for Municipalities.

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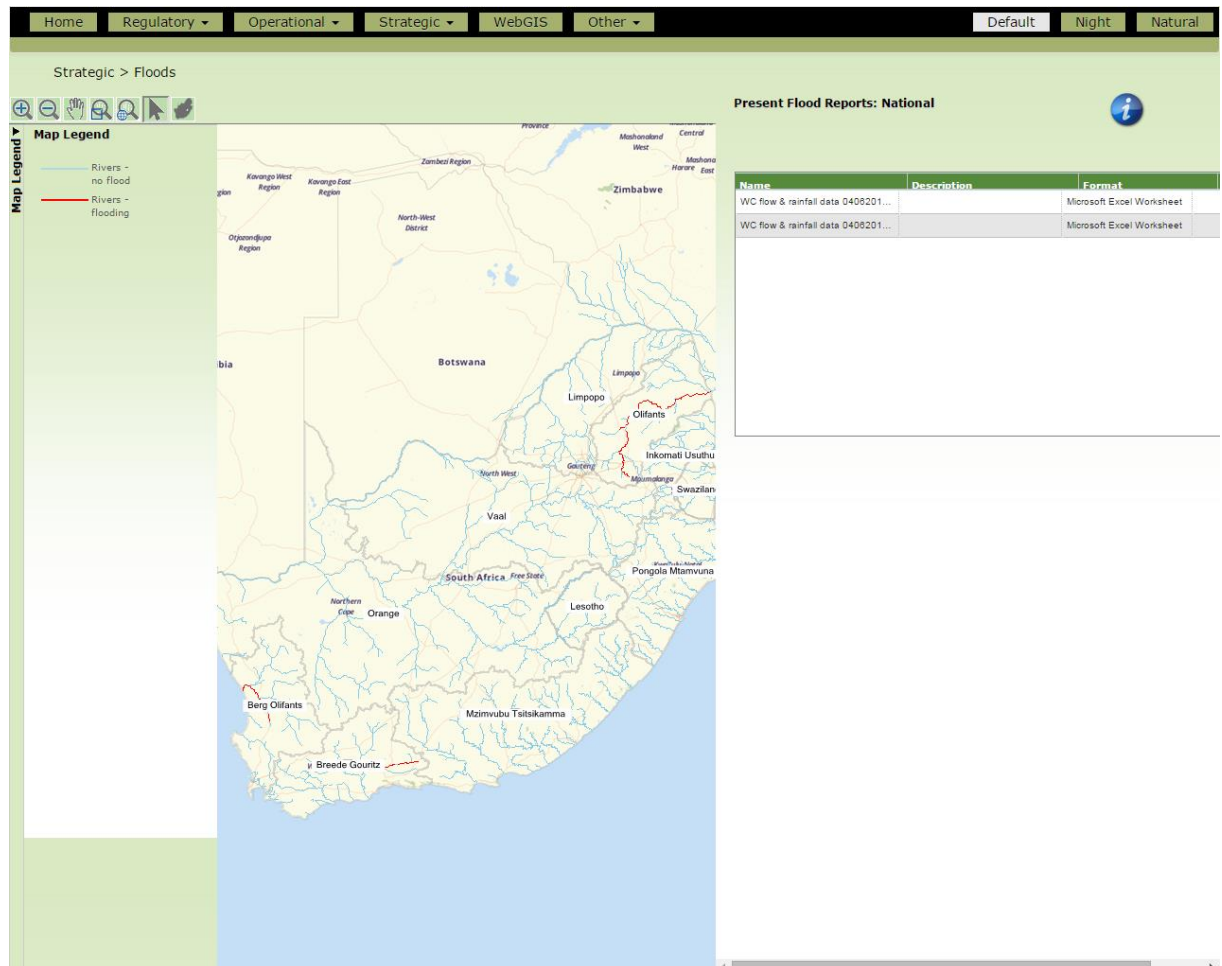
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6.6 Floods

Information Page Related To The “Floods” Dashboard

To access this dashboard the user should navigate as follows:
Strategic>Floods



- Flood reports related to floods currently being experienced, and
- Flood reports of past flood events

The dashboard can cater for flood reports related to any of the primary rivers in South Africa. Currently flood reports are generated for the Orange/Vaal System, the Limpopo River System and the Inkomati River System.

What is the main purpose of the dashboard?

The purpose of the dashboard is to provide reports published by DWS Flood department about floods currently in progress, as well as reports published related to past floods. These reports can help people to prepare themselves for floods which are imminent or which are in progress, or to review information related to past flood events which the people can use for planning purposes.



How will the user of the system know if a flood is in progress, or if a flood warning is being issued?

The Department of Water and Sanitation will prepare a flood report for existing or imminent floods. Once this report is uploaded to the NIWIS system, it will be available in the Floods Dashboard.

- Are there different types of flood reports?
- Yes. The following flood report types exist:
- A flood warning report
- A flood status update report
- A post high flow season reports (once the flood event has ended)

What information will the flood report include?

The flood report usually contains the following type of information:

Contacts details of person/s who championed this dashboard:

Dr Dennis Dlamini, Scientific Manager: Streamflow Hydraulics, Directorate: Hydrological Services,
Telephone: 012 336 7900

What type/s of questions does the information product aim to answer:

- Where are flood events imminent or taking place?
- What information is available about these flood events
- What did the flood reports look like for historical flood events?

Data / Information discussion:

The following data/information is used to generate the flood reports:

- Real time river flow information
- Real time information related to dam levels
- Observed rainfall
- Predicted rainfall
- Output from hydraulic modelling
- Feedback from on-the-ground reports

Are there any limitations / cautions related to using this information?

The flood reports are generated by DWS staff, and should thus to a large extent be free of errors or omissions. All information contained in the flood reports should however be used carefully. Yes, please refer to the below:

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Quality

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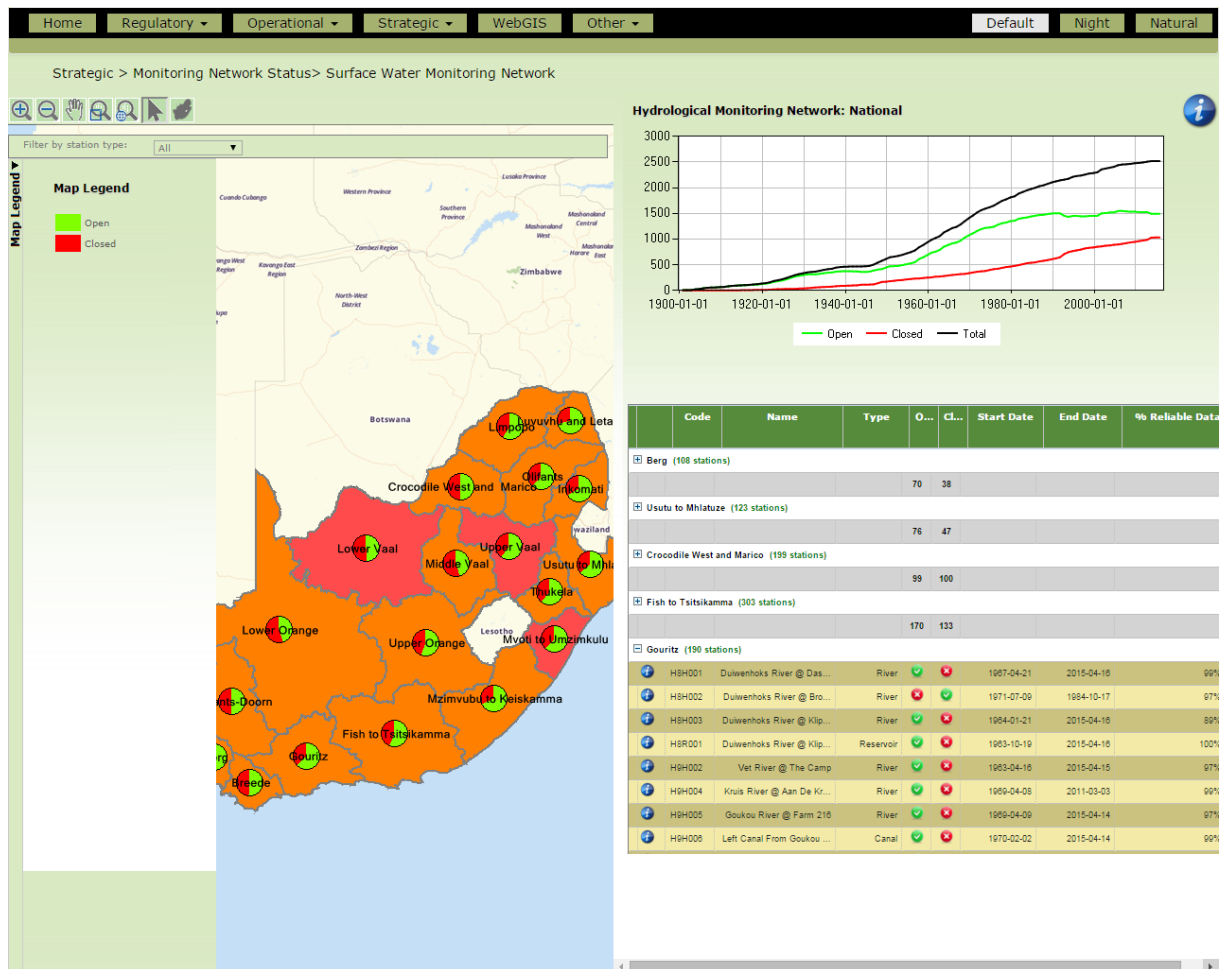


6.7 Monitoring Networks Status

6.7.1 Surface Water Quantity Monitoring Network

Information Page Related To The “Surface Water” Dashboard

To access this dashboard the user should navigate as follows:
Strategic>Monitoring Networks Status>Surface Water Monitoring Network



What does this dashboard relate to?

This dashboard shows the surface water monitoring points that are managed by the DWS. It shows the trends over time relating to the number of open and closed stations, according to different site types. These trends are shown since coordinated hydrological monitoring started in South Africa in the early 1900s. It also shows the percentage of reliable data available per site, and provides a link to the online DWS Hydstra data portal for users to access the information. Meta data associated with each monitoring site is also provided, and it is possible for users to analyse the available points in relation to their needs.

From a management perspective, the dashboard shows the average time it takes to upload and quality assure data in the Hydstra database for different WMA areas in South Africa. This data can be used to identify areas where improvement can be made to avoid potential delays in the availability of hydrological information.

Contacts details of person/s who championed this dashboard

Mr Musariri Musariri, Scientific ManagerHS: Hydrological Information, Emanzini Building, Private Bag X313, 185 Francis Baard Street, Pretoria, Telephone: +2712 336 7949, Email: MusaririM@dws.gov.za



What type/s of questions does the information product aim to answer?

The dashboard aims to answer the following questions:

What are the trends in surface water monitoring by DWS in relation to the number of open versus closed sites?

The number of active monitoring sites in South Africa peaked during the 1970s and 80s when many large water resources infrastructure development projects were completed. Since then, the number of monitoring locations has been fairly constant, but with no further expansion in the network. It is important for managers to be aware of the number of monitoring locations, especially due to the importance of water related data being required for effective water resources management.

Where are the surface water monitoring sites in South Africa, differentiated by type?

The dashboard shows in map and table format the location and type of sites in the different regions of South Africa. The user is also able to access more details of the site by clicking the 'view' link in the table. Details shown per site include the record length, or period of data, that is available at the different sites, and what percentage of the data is considered reliable by DWS.

Data / Information discussion

All hydrological data collected by DWS is stored in a commercial hydro-informatics database called Hydstra. The data is collected by automatic systems in the field, which is maintained and operated by DWS regional office staff. The dataset that is available is over 100 years for certain monitoring locations. The information collected is critical for the effective and sustainable management of water resources in South Africa.

Are there any limitations / cautions related to using this information?

There are no limitations / cautions associated with using the information on this dashboard. However, when it comes to the actual data supplied by DWS from Hydstra, the correct understanding and data analysis techniques should be applied when using the data. More details can be requested from the contact person above.

Also, please refer to the paragraph below:

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Links to other sources of related information

The following link is for the hydrology website at DWS, with further links to relevant information about hydrological monitoring done by DWS.

<http://www.dwa.gov.za/hydrology/>

References

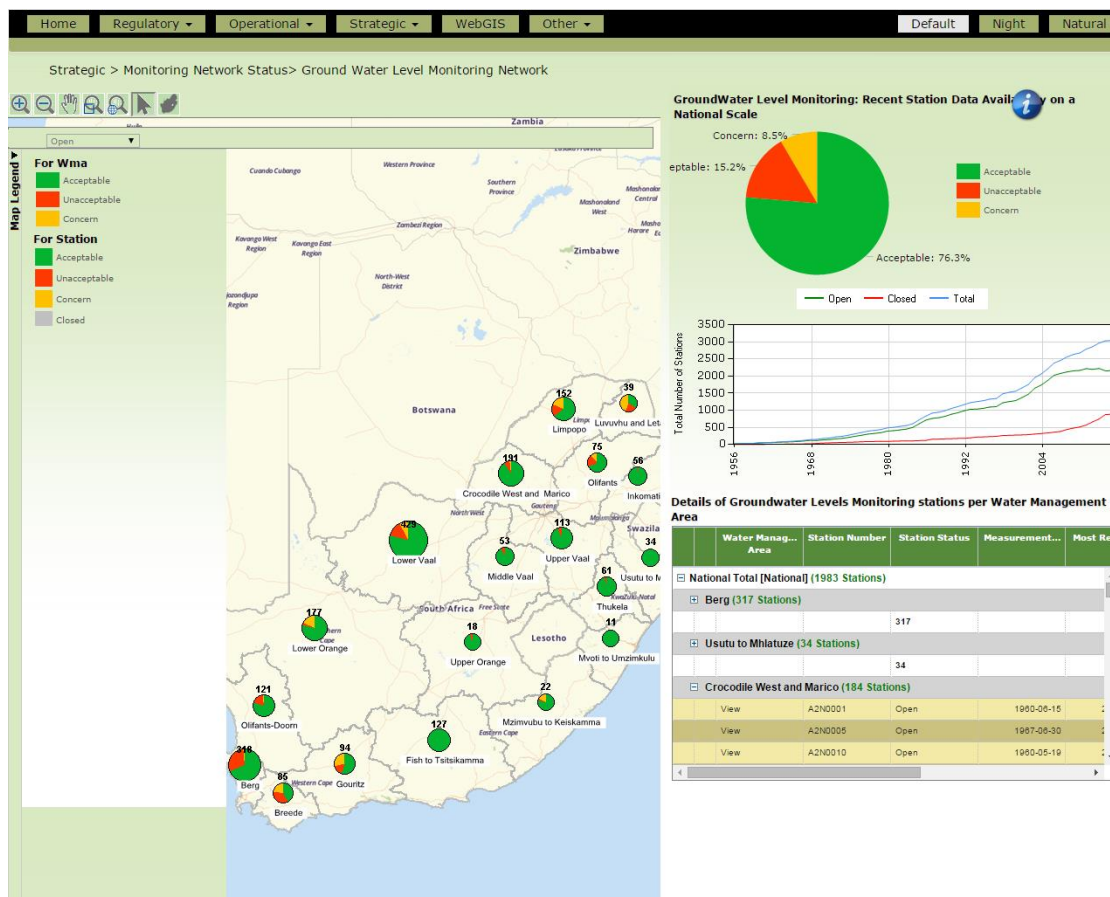
Wessels, P, and Rooseboom, A. 2008. **Flow-gauging structures in South African rivers, Part 1: An overview**. ISSN 0378-4738. Water SA Vol. 35 No. 1 January 2009, Pretoria, South Africa

6.7.2 Ground Water Level Monitoring Network

Information Page Related To The “Groundwater Quantity Monitoring Network” Dashboard

To access this dashboard the user should navigate as follows:

Strategic>Monitoring Networks Status>Ground Water Level Monitoring Network



This dashboard shows the groundwater monitoring points that are managed by the DWS. It shows the trends over time relating to the number of open and closed stations. These trends are shown since coordinated groundwater monitoring started in South Africa. It also shows the percentage of reliable data available per station. A key reporting item of the dashboard is the number of stations that have recent data available, which is commensurate with the frequency at which monitoring is undertaken. This frequency varies from fine time scale electronic reading at some stations, to manual biannual readings at others. Meta data associated with each monitoring station is also provided, and it is possible for users to analyse the available points in relation to their needs.

From a management perspective, the dashboard shows the number of stations with data that is considered acceptable, of concern, and unacceptable relative to the monitoring frequency of the station. It can be used to identify those regions, and stations, where there are many stations with data that needs to be uploaded into the Hydstra database.

What type/s of questions does the information product aim to answer:

The dashboard aims to answer the following questions:

What are the trends in surface water monitoring by DWS in relation to the number of open versus closed stations?

The number of active groundwater monitoring stations in South Africa peaked during the 1970s and 1980s. Since this period, the number of stations with active monitoring has been declining. It is important for managers to be

aware of the number of monitoring locations, especially due to the importance of groundwater related data being required for effective management and utilisation of the resource.

How does the most recent data in the database for a specific station compare with the specified monitoring frequency of that station. This is referred to as the 'Recent Data Availability Status'.

- Monitoring stations are visited by technicians at different time intervals, for example monthly, quarterly, biannually or on an infrequent basis. Once data has been collected at the station, there is a delay associated with processing and upload of the data into the Hydstra database. The management criteria are that this delay should not take more than 2 months. Therefore, if a station is visited on a monthly basis, the latest available data should be within a 3 month period relative to the current date. If the available data is not within this period, the dashboard will start to show a concern status for the station, and if the delay is even larger, it will display an unacceptable status. The thresholds for the different 'Recent Data Availability Status' for defined monitoring frequencies is summarised in the table below:

The 'Recent Data Availability Status' is then summarised per provincial Hydrology office and / or region. These summaries can be used to identify those regions where possible improvements need to be made.

What is some of the station specific Meta data associated with monitoring locations?

- The dashboard shows in a table format some of the Meta data that is relevant for the groundwater monitoring stations. This information is extracted from relevant fields in Hydstra, and allows the user of the dashboard to have access to some additional details of the stations. This is the information that is shown in the pop-up window.

Data / Information discussion:

All groundwater data collected by DWS is stored in a commercial hydro-informatics database called Hydstra. The data is collected in the field at monitoring stations which are maintained and operated by DWS regional office staff. The information collected is critical for the effective and sustainable management of groundwater resources in South Africa.

Are there any limitations / cautions related to using this information?

There are no limitations / cautions associated with using the information on this dashboard. The information on the 'Recent Data Availability Status' is a reflection of the current dataset stored in the database. If a station is marked as 'concern', or 'unacceptable', it does not mean that the entire station is of concern or unacceptable. It rather means that the last available data point is older than expected, relative to the monitoring frequency that has been specified for the station.

When it comes to the actual groundwater data supplied by DWS from Hydstra, the correct understanding and data analysis techniques should be applied when using the data. More details can be requested from the contact person above.

Contacts details of person/s who championed this dashboard:

Mr BayandaZenzile

Scientific Manager

HS: Hydrological Services

Emanzini Building, Private Bag X313, 185 Francis Baard Street, Pretoria

Telephone: +2712 336 7309

Email: ZenzileB@dwa.gov.za

Links to other sources of related information



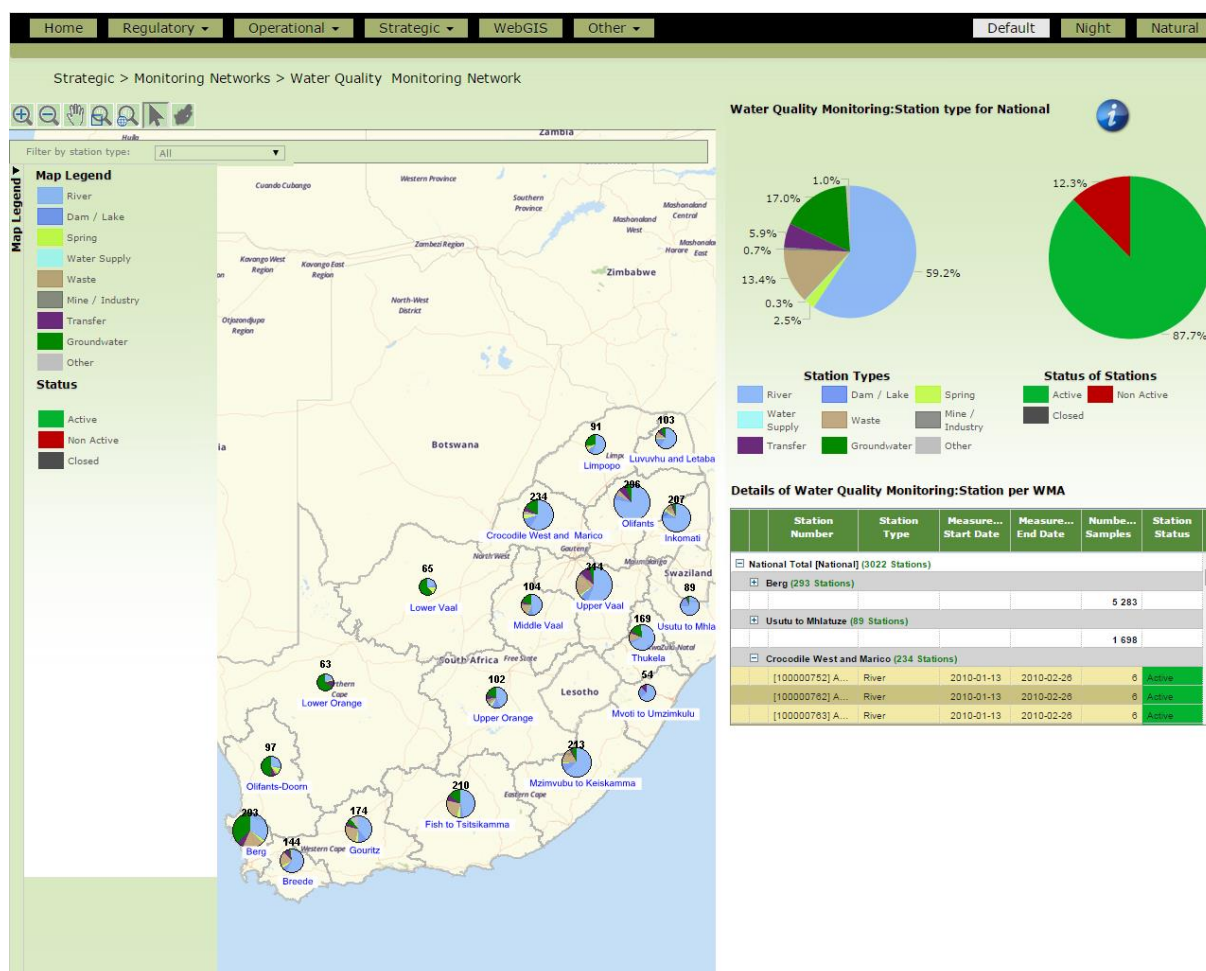
The following link is for the groundwater section website at DWS, with further links to relevant information about groundwater monitoring done by DWS. There are also other information products (GIS maps) available on the website.

<http://www.dwaf.gov.za/groundwater/>

6.7.3 Water Quality Monitoring Network

Information Page Related To The “Water Quality Monitoring Network” Dashboard

To access this dashboard the user should navigate as follows:
Strategic>Monitoring Networks>Water Quality Monitoring Network



What does this dashboard relate to?

Functioning aquatic ecosystems and an adequate supply of usable water are fundamental to the survival and development of any nation, and particularly so for water-stressed countries like South Africa. The term useable is directly associated to the quality of water, which needs to be of an acceptable standard. Extensive monitoring programs are required for DWS to monitor the status of water quality in South Africa, and the objective of this dashboard is to summarise the extent of this network.

What type/s of questions does the information product aim to answer?

- Where are the points in South Africa where water quality is monitored, and for which the data is stored in the WMS?
- What is the breakdown of these locations in terms of the types of sites, such as rivers, dams, waste water treatment, water supply, etc.?
- Where are the active/non-active water quality monitoring points in South Africa?
- What is the available data at individual site level for point in the WMS system?



Data / Information discussion

The source data for this dashboard is the WMS system. The WMS is a suite of computer programmes developed for the Department of Water and Sanitation to provide information for water resource monitoring and management in South Africa. The system is maintained by Resource Quality Information Services (RQIS). RQIS provides national water resource managers with aquatic resource data, technical information, guidelines and procedures that support the strategic and operational requirements for assessment and protection of water resource quality. Functioning aquatic ecosystems and an adequate supply of usable water are fundamental to the survival and development of any nation, and particularly so for water-stressed countries like South Africa. For more details on WMS and contacts for access to data, please visit: www.dwaf.gov.za/iwqs/wms/.

Are there any limitations / cautions related to using this information?

The water quality monitoring dashboard provides a snapshot of the WMS database and may lag behind the live database. The WMS database is the definitive data source. Please see above regarding WMS. Also, please refer to the paragraph below:

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Contacts details of person/s who championed this dashboard

Dr Nadene Slabbert, Director, Resource Quality Information Services, Telephone: +2712 808 9515/ +2712 808 9619, Email: SlabbertN@dws.gov.za



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Links to other sources of related information

The following link is for the RQIS and WMS website at DWS, with further links to relevant information about water quality monitoring done by DWS. There are also other information products available on the website.

www.dwaf.gov.za/iwqs/

www.dwaf.gov.za/iwqs/wms/

www.dwaf.gov.za/iwqs/gis_data/



7 Web-GIS

7.1 WebGIS Dashboard

The Web-GIS brings a new dashboard to NIWIS as well as layout improvements to existing dashboards. The new dashboard comprises of a large interactive web map which can be configured to display layers from all the existing dashboards in NIWIS.

The user has the power to configure the map as desired and thereby create a view of NIWIS data that is not found on the existing dashboards. Figure 7-1 and Figure 7-2 provide an overview of the functionality of the Web-GIS in its simplified form. The tiles and layers are already predefined and preloaded into the system for the user to link to the map.

One of the biggest incentives of using the Web-GIS is its capability of using mobile device to access NIWIS. The panel with the table and charts are moved to a position under the map to allow full functionality of viewing.

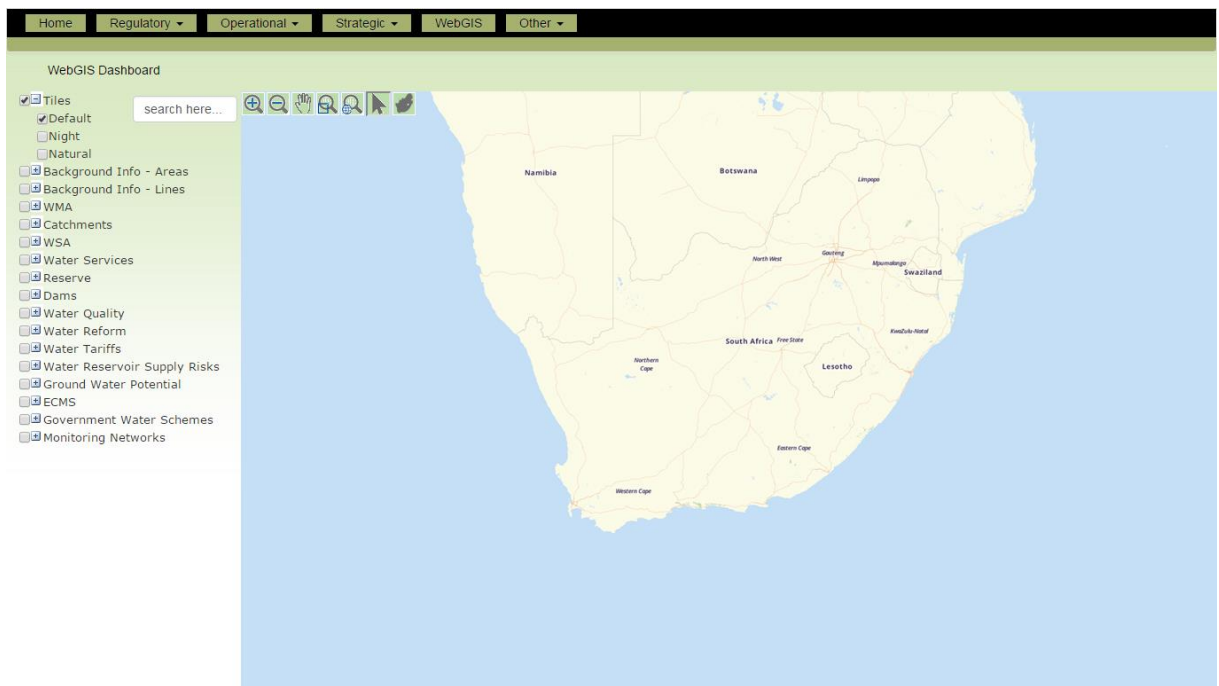


Figure 7-1: Web-GIS overview with tiles, layers and a map

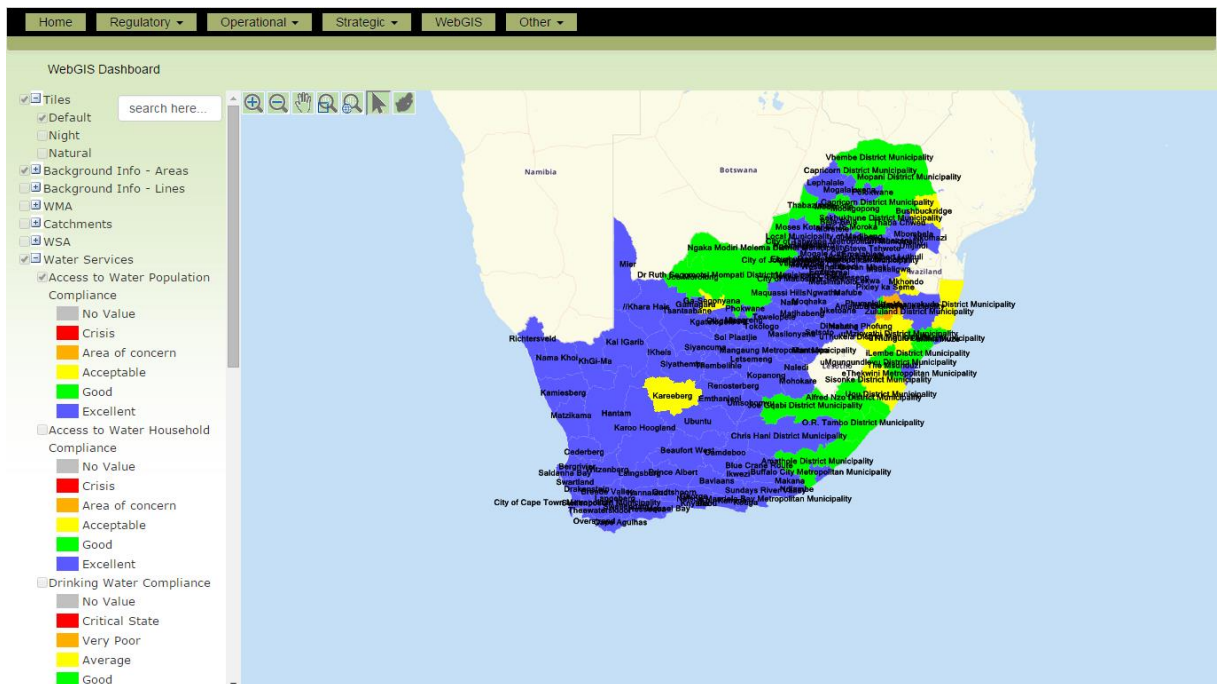


Figure 7-2: Web-GIS overview with tiles, layers and map with a selected zoomed in layer

Map tiles are usually visually well-presented and designed in terms of colour, label fonts and size, alignment of overlapping features, level of detail, and relative sizing of features such as roads and populated areas.

It is proposed that a set of four map tiles are generated and used as part of the background layers available to NIWIS. As the map tiles cover the entire mapped area, they have a strong bearing on the colour theme, and look and feel of the resulting map. The three map tile themes are as follows:

1. Default theme

This theme uses a full colour range in order to provide map tiles which are standalone recognizable. An advantage of this layer is that the full colour range means that map features such as roads, towns, conservancy areas and water bodies are styled using typical colours to make them easily recognizable. A disadvantage of this is that the combination of these tiles with other NIWIS indicators on the map may result in colour clashes and incompatibilities. An example of this scheme is seen below:



Figure 7-3. Default theme map tiles

2. Night theme

This theme uses a dark background colour highlighted with light green populated areas. The names of settlements and administrative boundaries are included in the map tiles. The tiles are less detailed than the default theme, which makes them well suited for the overlay of NIWIS indicators such as pie charts and shaded polygons. The generally dark theme allows NIWIS indicator data to stand out while still providing location context to the user. The relative sizing of location names indicates which locations have a larger population, or which locations are administratively more important than others.

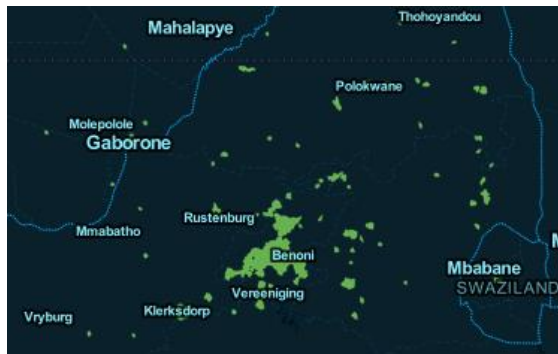


Figure 7-4 Night theme map tiles

3. Natural theme

In order to provide a close representation of the topography and vegetation of the landscape, the natural theme uses techniques such as hill shading and vegetation density in order to provide a view of the country. Conservation areas are clearly demarcated using a darker shade of green, whilst administrative boundaries, location names, and transport features are included on the map in order to provide location context. The softer, more natural appearance of the map tiles make them well suited for the overlay of NIWIS data indicators.



Figure 7-5 Natural theme map tiles

8 Other

8.1 Overview

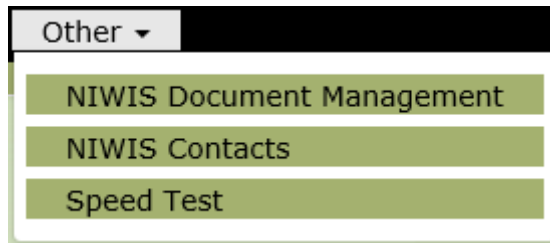


Figure 8-1: Information Menu for NIWIS

The “Other” menu is an information menu for NIWIS. Information such as contact details of the NIWIS administrators, document management as well as hit counter for a number of visitations to the site can be found on this menu.





8.2 NIWIS Status

Information Page Related To The “NIWIS Status” Dashboard

To access this dashboard the user should navigate as follows:

Other>NIWIS Status

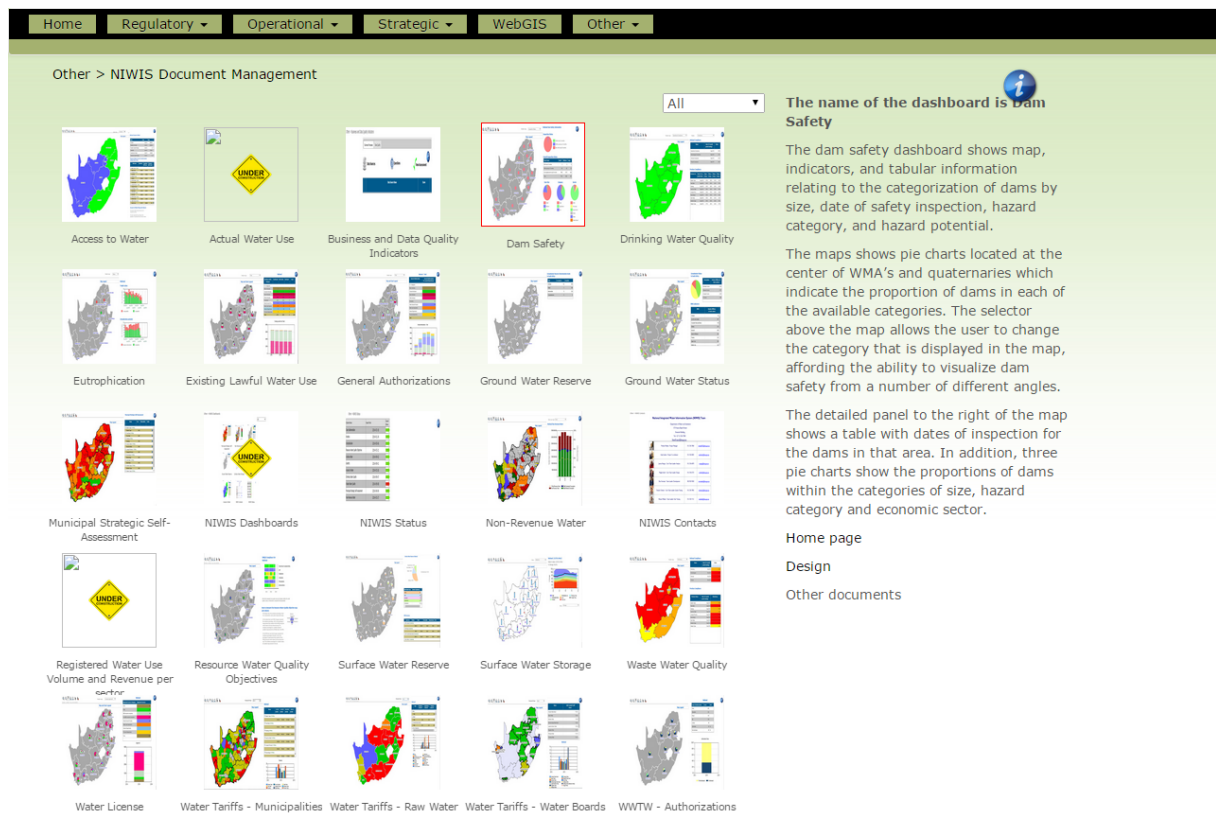
Home Regulatory Operational Strategic WebGIS Other			Default	Night	Natural
Other > NIWIS Status					
System Name	Import Date	Import Status			
Dam Sedimentation	2014-03-18				
Hydstra	2014-01-24				
Eutrophication	2014-12-05				
Resource Water Quality Objectives	2015-03-09				
Surface Water	2015-03-31				
WARMS	2015-03-01				
Access to Water	2015-04-01				
Drinking Water Quality	2015-03-25				
Waste Water Quality	2015-03-25				
Municipal Strategic Self Assessment	2014-04-04				
Non-Revenue Water	2015-03-08				

8.3 NIWIS Document Management

Information Page Related To The “NIWIS Document Management” Dashboard

To access this dashboard the user should navigate as follows:

Other>NIWIS Document Management



The NIWIS Document Management dashboard assists with the management of knowledge related to completed dashboards, dashboards being developed and dashboards that are being considered.

The dashboards have been included based on the business needs and functional requirements that were established during the inception phase and after discussion with DWA's NIWIS team and relevant DWA stakeholders.

The document details the dashboards in terms of:

- Relation to the business needs and functional specification established during the inception phase
- Use cases that the dashboards will support
- A series of mock-ups and user stories that demonstrates how to use the dashboards
- Specific functional requirements
- Data foundation and business process for sustaining the dashboard

Are there any limitations / cautions related to using this information?

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8.4 NIWIS Contacts

Information Page Related To The “NIWIS Contacts” Dashboard

To access this dashboard the user should navigate as follows:

Other>NIWIS Contacts

Home Regulatory Operational Strategic WebGIS Other

Other > NIWIS Contacts

Contacts for Help & Feedback

Department of Water and Sanitation
173 Francis Baard Street
Emanzini Building
Tel: +27 12 336 7500

Public help
NIWIS_Support@dws.gov.za

Internal DWS Help
sitasc@dws.gov.za

Moloko Matlala - Project Manager	(012) 336 8592	matlalam2@dws.gov.za
Andy Sambo - Project Co-ordinator	(012) 336 8403	sambom@dws.gov.za
Justice Nungu - Analysis (Team Leader)	(012) 336 6870	nungui@dws.gov.za
Gilbert Mashapa - Analysis	(012) 336 7210	mashapam@dws.gov.za
Magda Smidt - Design & Development (Team Leader)	(012) 336 6733	smidtm@dws.gov.za
Bongizenzo Nyawo - Design and Development	(012) 336 7208	nyawob@dws.gov.za
Mxolisi Mukhwana - Data Acquisition & Management (Team Leader)	(012) 336 6747	mukhawanam@dws.gov.za
Mfanelo Mtombela - Data Acquisition and Management	(012) 336 8915	ntombelam@dws.gov.za
Chuene Chokoe - System Testing (Team Leader)	(012) 336 7865	chokoec@dws.gov.za

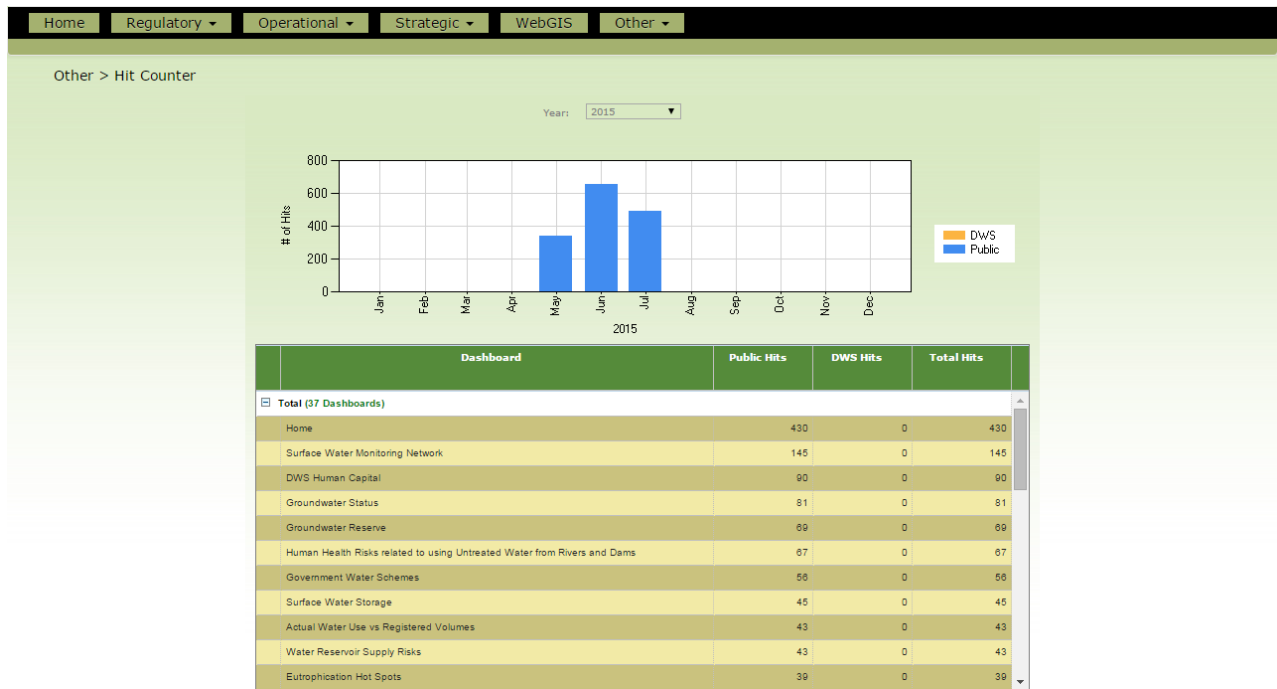


8.5 Hit Counter

Information Page Related To The “Hit Counter” Dashboard

To access this dashboard the user should navigate as follows:

Other>Hit Counter





8.6 Business and Data Quality Indicators

Information Page Related To The “Business and Data Quality Indicators” Dashboard

To access this dashboard the user should navigate as follows:
Other>Business and Data Quality Indicators

Home Regulatory Operational Strategic WebGIS Other

Other > Business and Data Quality Indicators

Business Processes Data Quality

Data Sources Questions New Assessment

Data Source Name	Score
CP (3 Assessments)	★★★★★ (3.5)
JR (2 Assessments)	★★★ (1.4)
Rudolf (2 Assessments)	★★★★ (2.3)
Assessment on 2015-02-10 10:54:29 by Guest (4 Questions)	★★★★ (2.3)
q1	★★★ (2.0)
q2	★★★★ (3.0)
q3	★★★★ (2.0)
Was the data on time???	★★★★ (3.0)
Assessment on 2014-10-29 11:19:09 by Guest (3 Questions)	★★★ (2.2)
WMS (3 Assessments)	★★★ (-0.4)

Export Table