



INKOMATI-USUTHU

CATCHMENT MANAGEMENT AGENCY



Hydronet Platform Development and Use at the IUCMA

Dr. Thomas Gyedu-Ababio

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Remote Sensing cooperation and benefits

Remote Sensing Cooperation with the Netherlands

- The IUCMA has a twinning relationship with Waterschap Groot Salland in the Netherlands.
- We cooperate on mutual learning on the use of remote sensing data and related tools to support our functions and in particular, our river operations.
- The IUCMA has also implemented a sophisticated real time river operations framework to manage our rivers and recognizes the benefit of remote sensing data in supporting and improving these operations.



Water Control Room Project

Water Control Room Project

- As a result of the mutual learning cooperation, the IUCMA and our partners successfully **submitted a funding proposal to develop a water control room using the Hydronet platform**, an innovative web based information sharing platform. The project development was co-funded by the PVW Programme of the Dutch Ministry of Foreign Affairs, who provided R2,25 million.
- This was in 2013 and the **IUCMA partnered with the South African Weather Service (SAWS) and HydroLogic to develop the CMA Water Control Room starters package**.
- In parallel to this, the **Hydronet platform was also used in a WRC project to develop a web based tool for the IUCMA** to visually indicate its performance against its objectives to DWS and stakeholders. This was appended onto the water control room project later.
- Thanks to this funding and the 2 year demonstration project, the CMA starters package has been successfully implemented and tested for the IUCMA and is available for other CMAs



Hydronet Platform

Applications

Water Control Room Project Applications

- **The outcome of these years of research the Water Control Room with several Hydronet applications** that meet the needs of the IUCMA and that can assist other CMAs.
- The Applications provide easy access to a wealth of essential hydrological and meteorological data to support our functions and operations.
- The following slides will summarise the applications included in the package.

Water Control Room Dashboard



The Water Control Room offers interactive and personalised dashboards where users can customise the information they want to receive in order to make the right decisions at the right time.

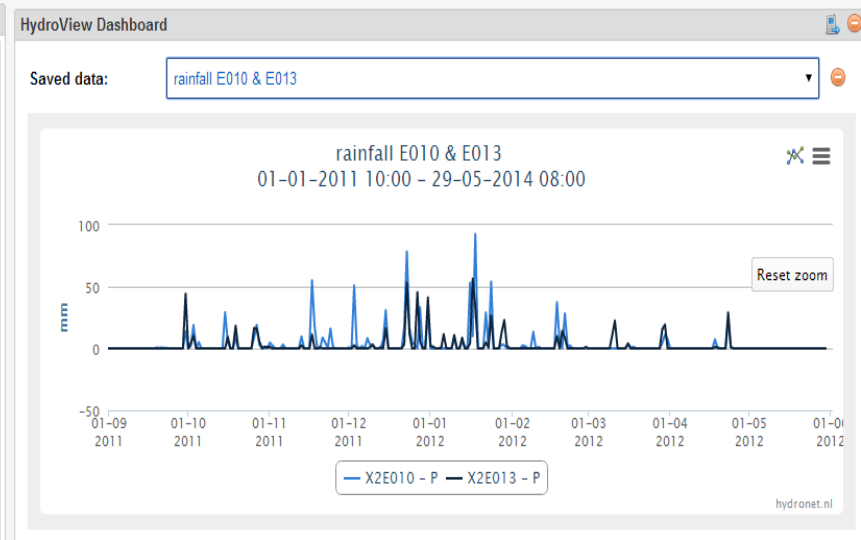
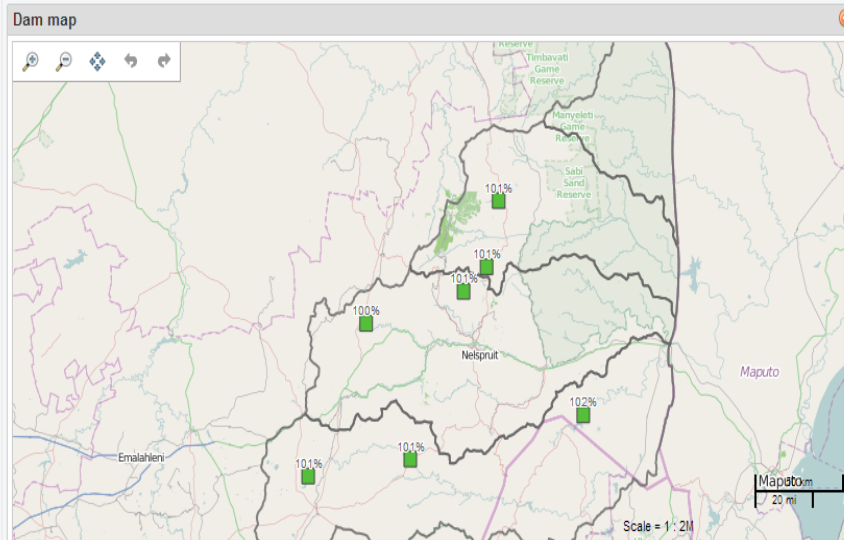
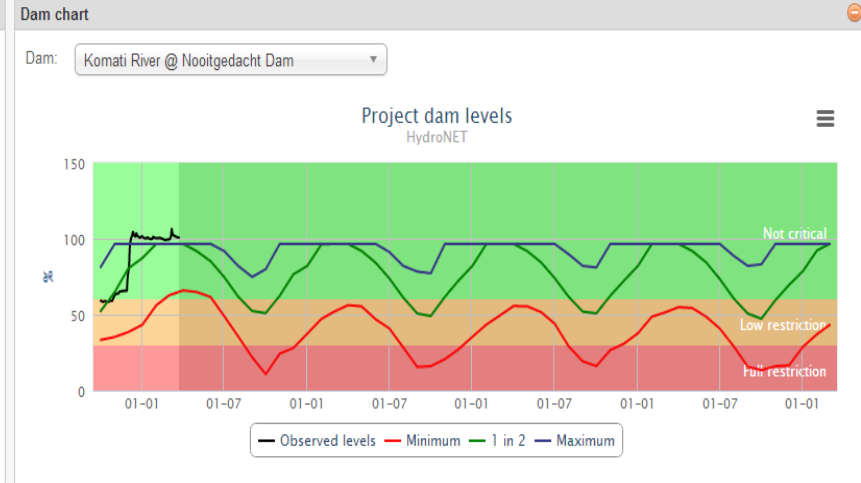
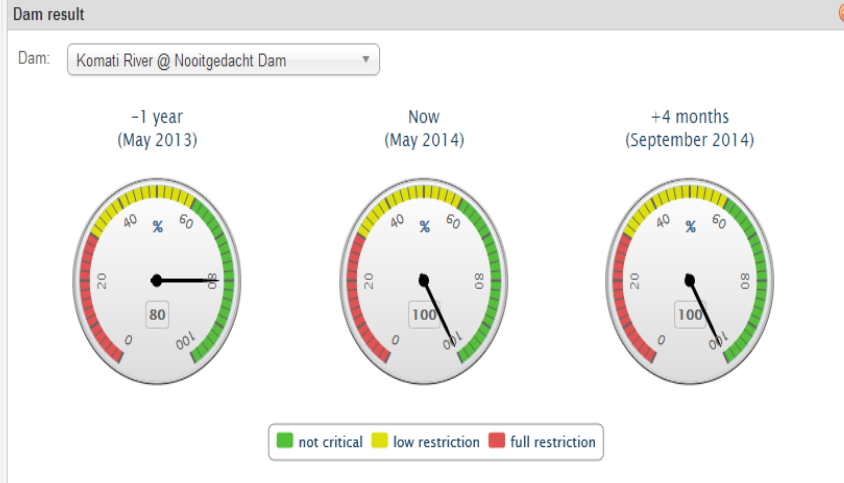
Water Control Room Dashboard

HydroNET

HOME APPLICATIONS **DASHBOARD** HYDROSTORE COMMUNITY ADMIN TOOLS



Dashboard
Mobile Dashboard



RainMap



The RainMap application allows online access to historical and actual rainfall information for any location in the country, also between the gauges. The application automatically:

- collects and stores large amount of rainfall data from radars, satellites, numerical weather prediction models and automatic weather stations in real-time
- combines the different rainfall sources into a “best available” gridded rainfall product
- makes historical and actual precipitation data easily accessible via the web browser (no software installation needed).

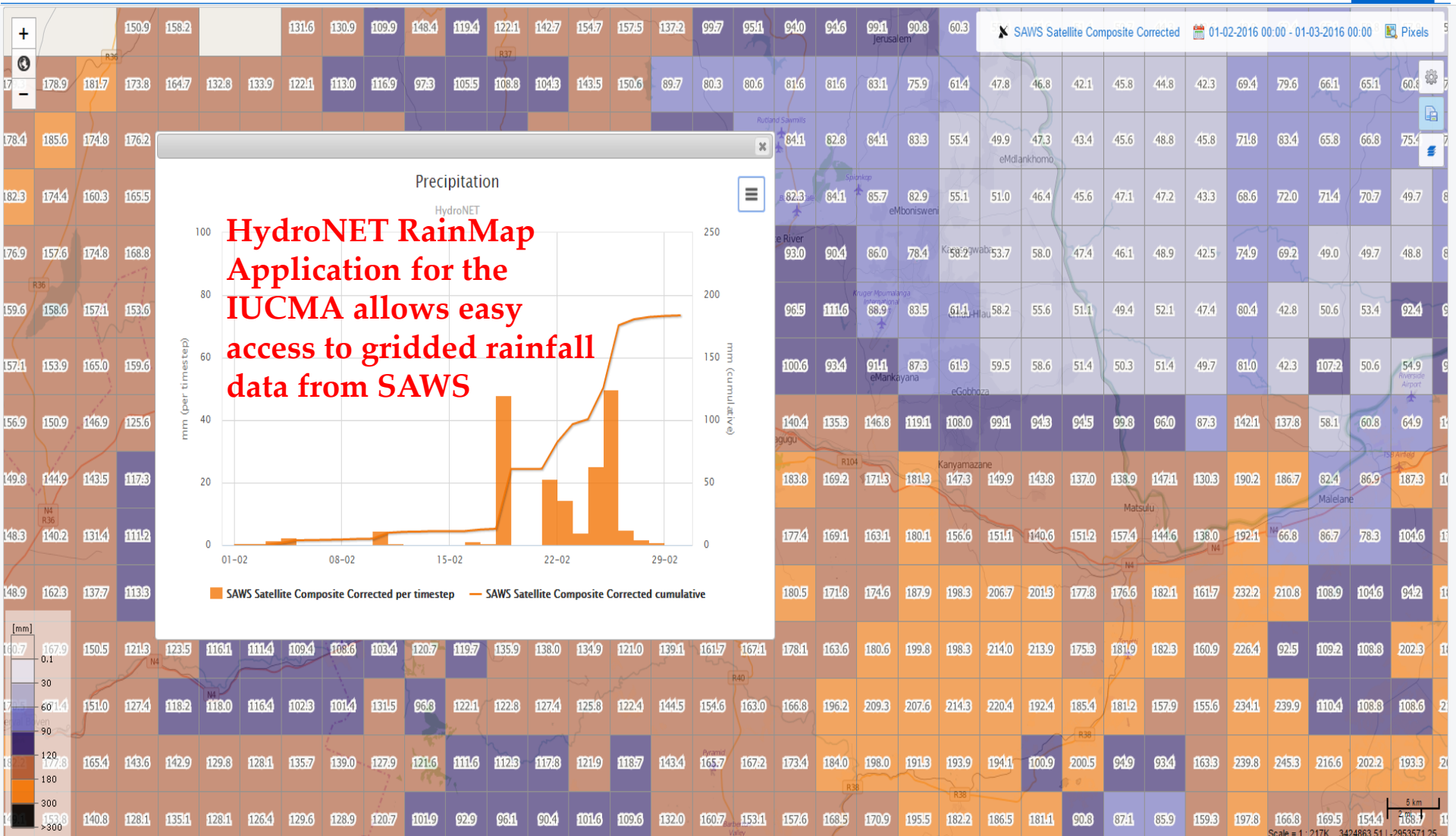


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IUCMA RainMap Application

HydroNET

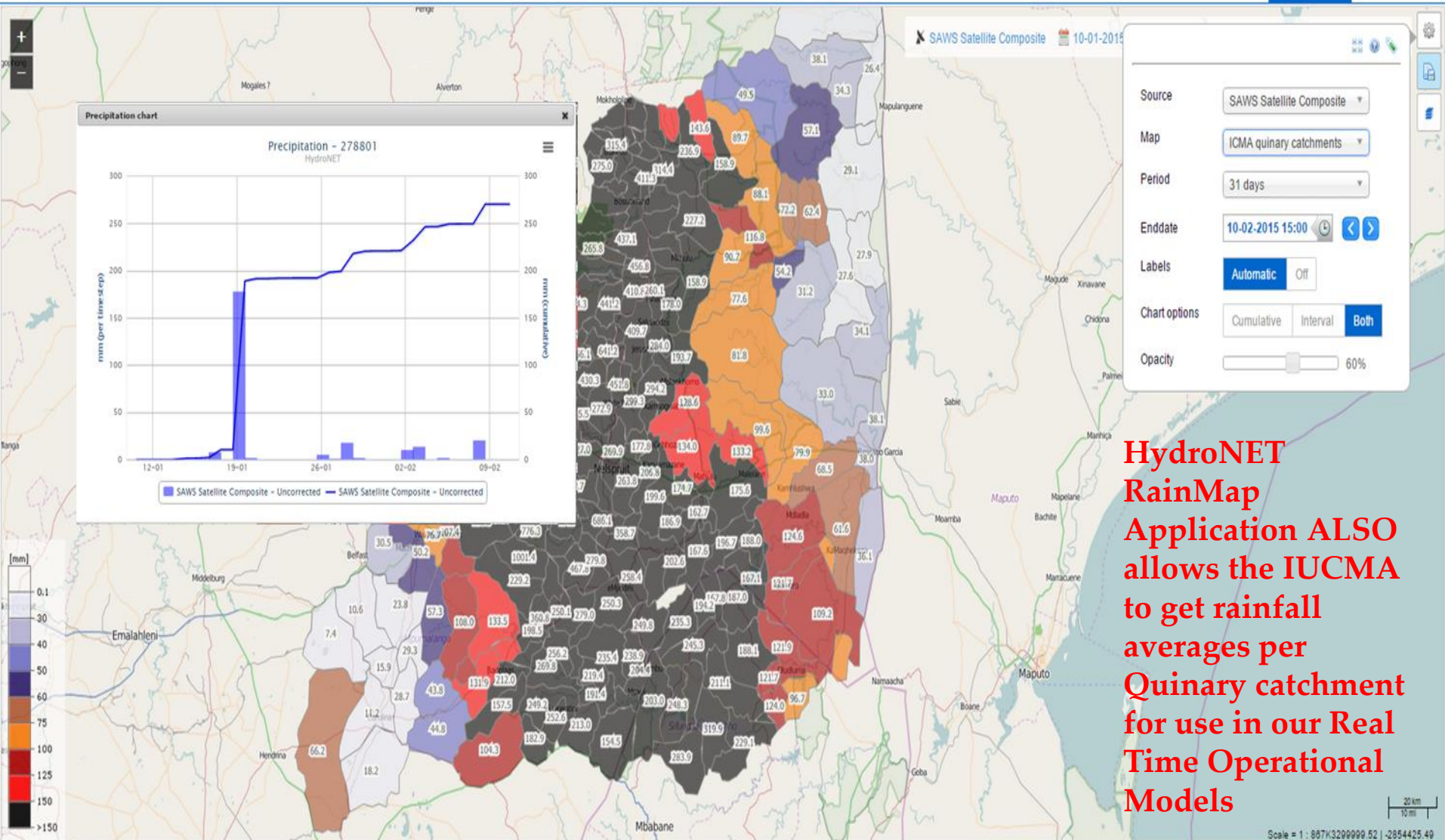
HOME DASHBOARD APPLICATIONS



IUCMA RainMap Application

HydroNET

HOME DASHBOARD APPLICATIONS HYDROSTORE

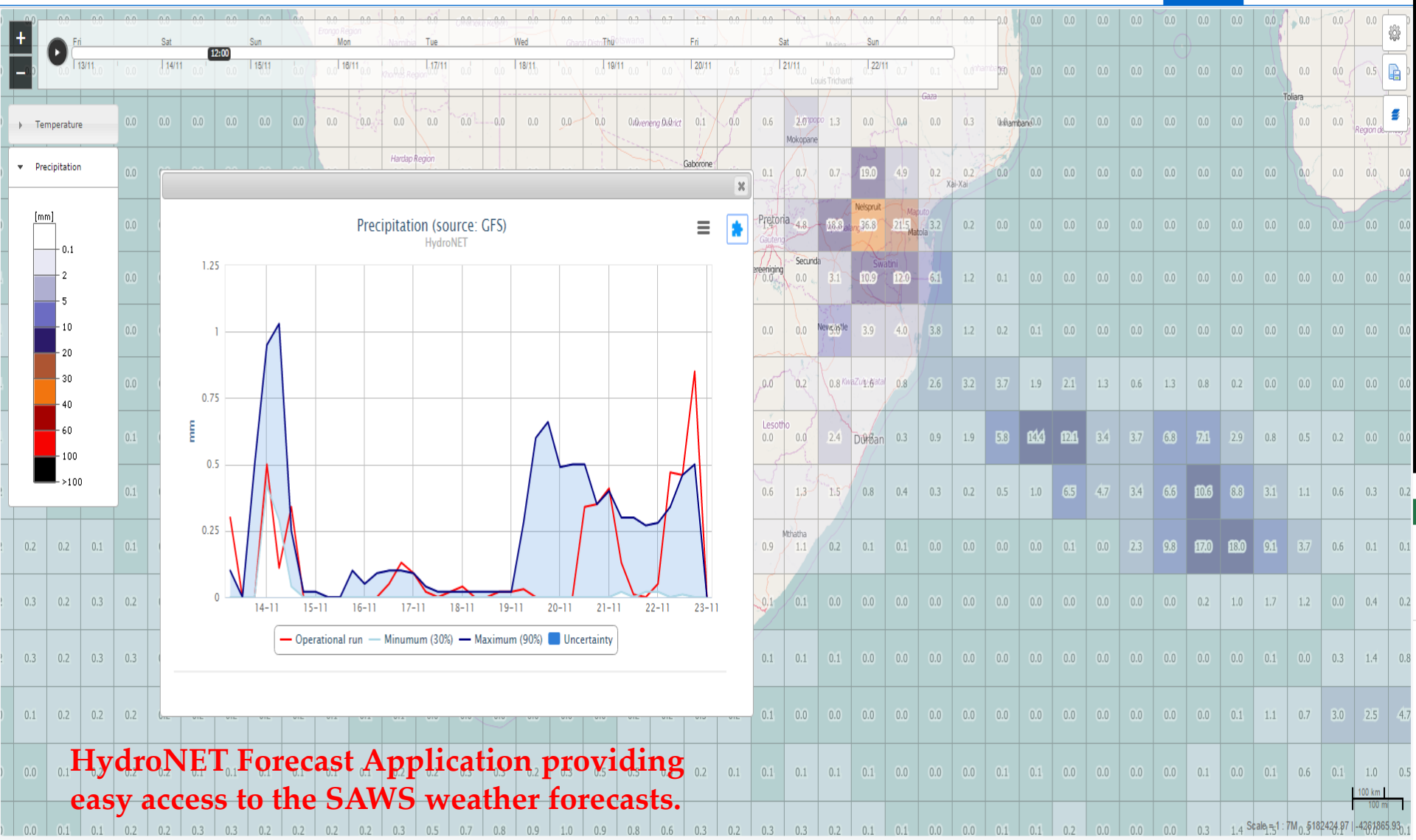


Forecast



The Weather Forecast application allows **easy online access to the weather forecast from the South African Weather Service**, incorporated into an interactive geographical map. The precipitation forecast will be provided for any location in the country. Just click on the map, and the forecast will be presented in a graph. Select the locations and the dashboard gives an overview of the most recent weather information on every rain storm.

Forecast



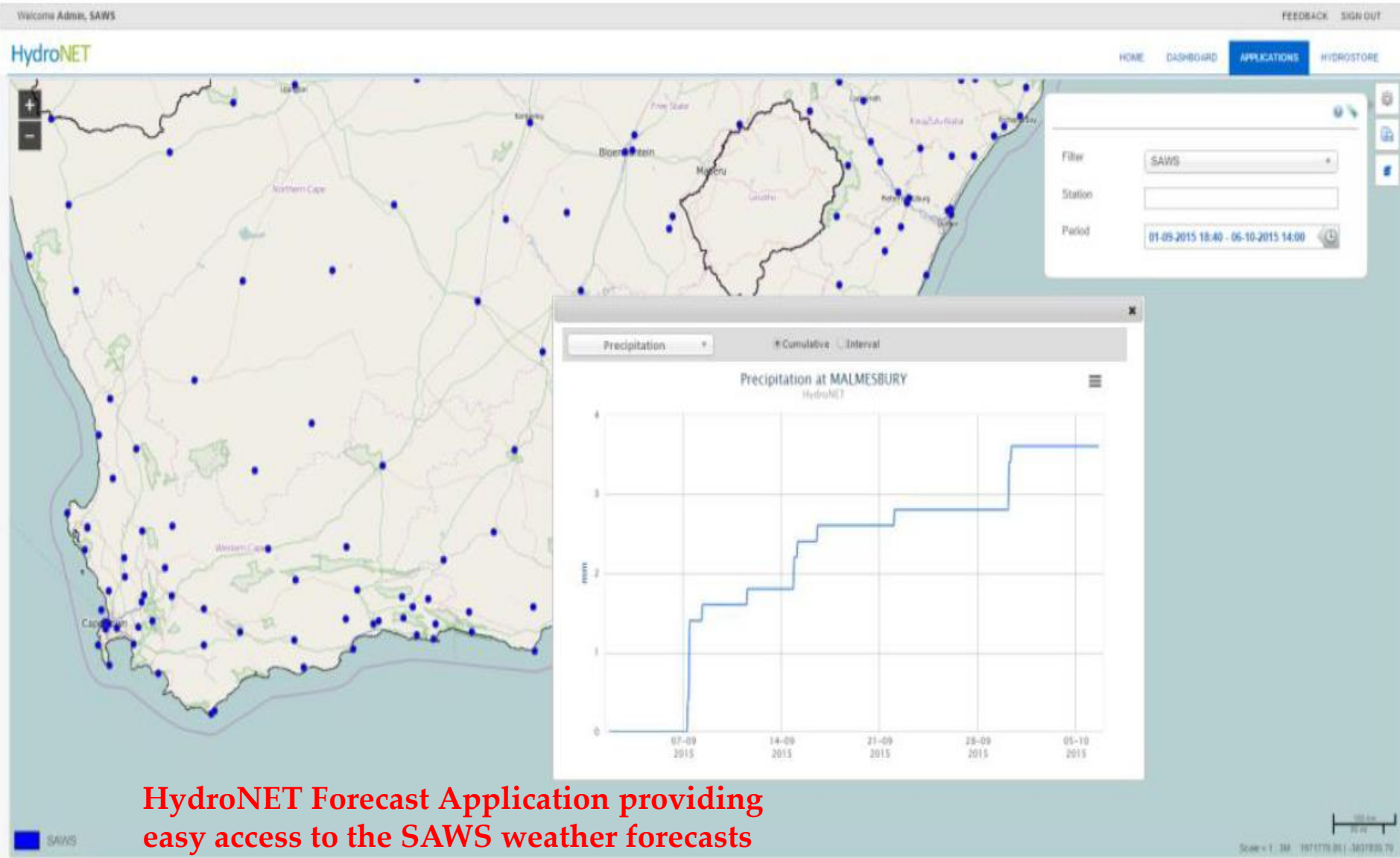
HydroNET Forecast Application providing easy access to the SAWS weather forecasts.

Stations



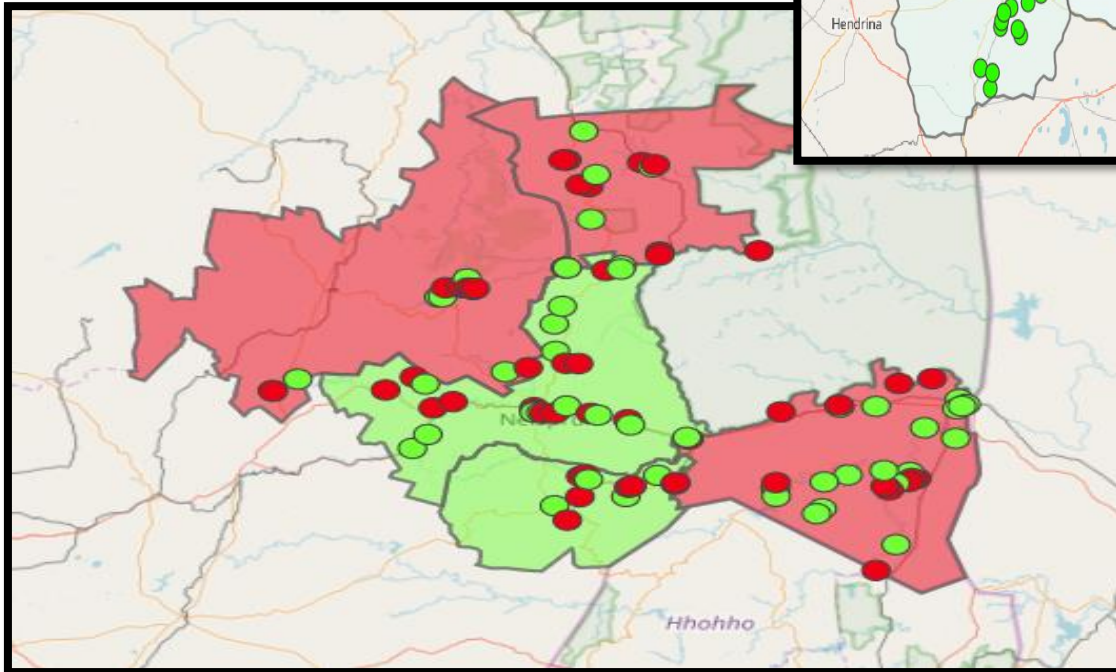
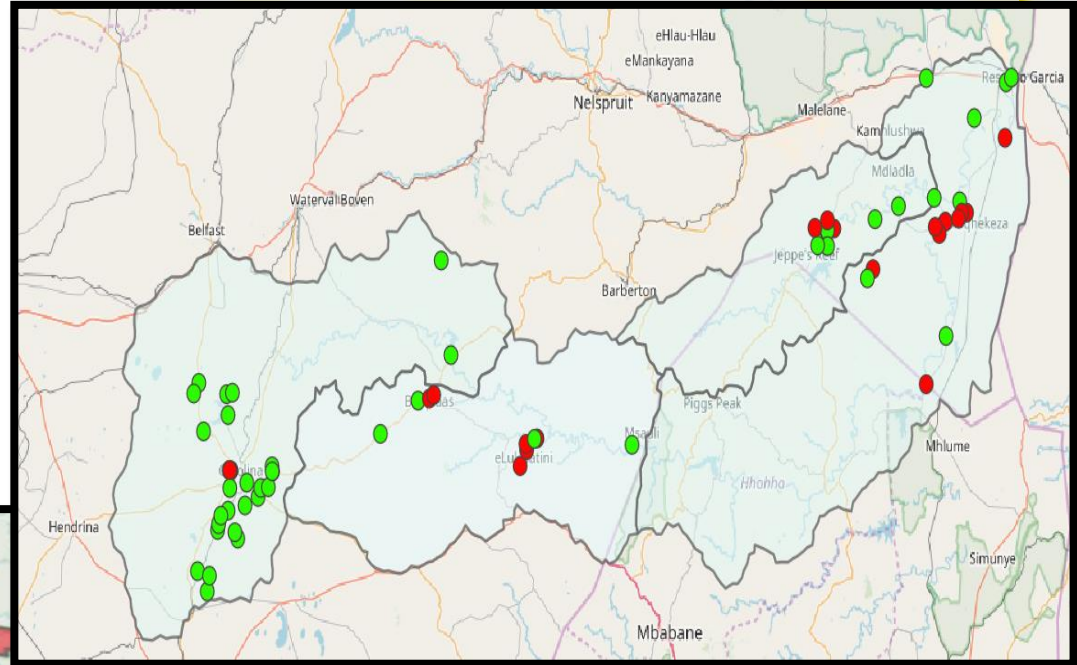
The Weather Station **application allows direct access to actual and historical time series from the automatic weather stations of the South African Weather Service.** The Stations application automatically collects large amount of gauge data from SAWS and makes it accessible via Internet. Press the button and you will automatically receive the requested information as graph, picture or in an Excel file.

Stations



HydroNET Forecast Application providing easy access to the SAWS weather forecasts

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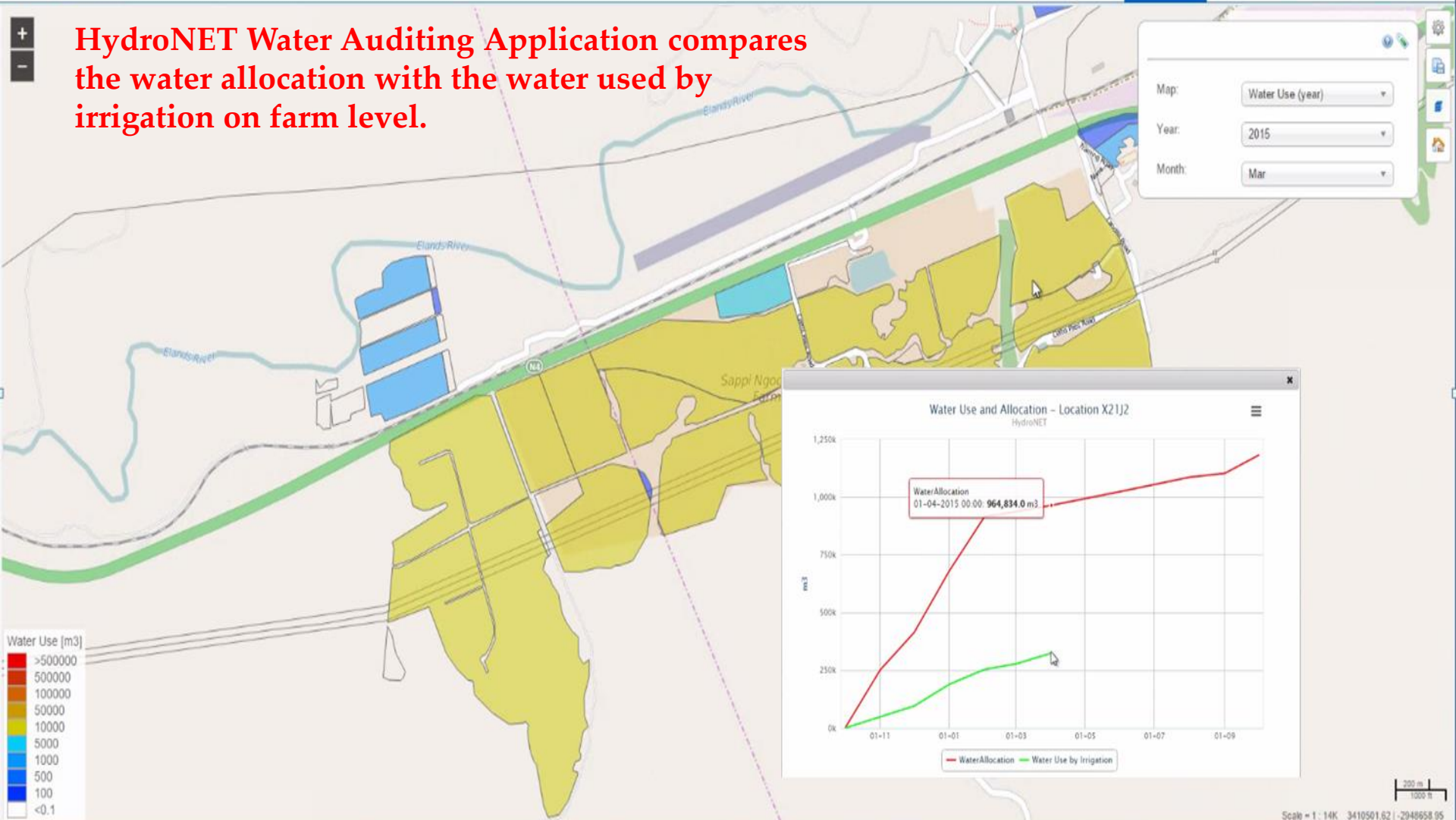
Water Auditing



The Water Auditing application provides easy insight in the water use through irrigation by farmers. Based on satellite information **an estimation is made on the water use by irrigation for each field. The water use is compared with the water allocations from the WARMS database to monitor the water use in the area and to identify possible areas with excessive water use. By using this application CMAs are able to monitor the water use by irrigation in a large area and on a regular basis (monthly).**

Water Auditing

HydroNET Water Auditing Application compares the water allocation with the water used by irrigation on farm level.



STEEP Dashboard



The steep dashboard (also called the Strategic Adaptive Operational Governance Dashboard) provides insight in the status of the social (S), technical (T), environmental (E), economical (E) and political (P) key performance indicators. Via an interactive map, the status of the indicators are presented in easy to understand traffic light coloured maps and graphs.

- By using the STEEP Dashboard, the IUCMA is able to simply and visually report on its progress against its objectives.

STEEP Dashboard

HydroNET

HOME

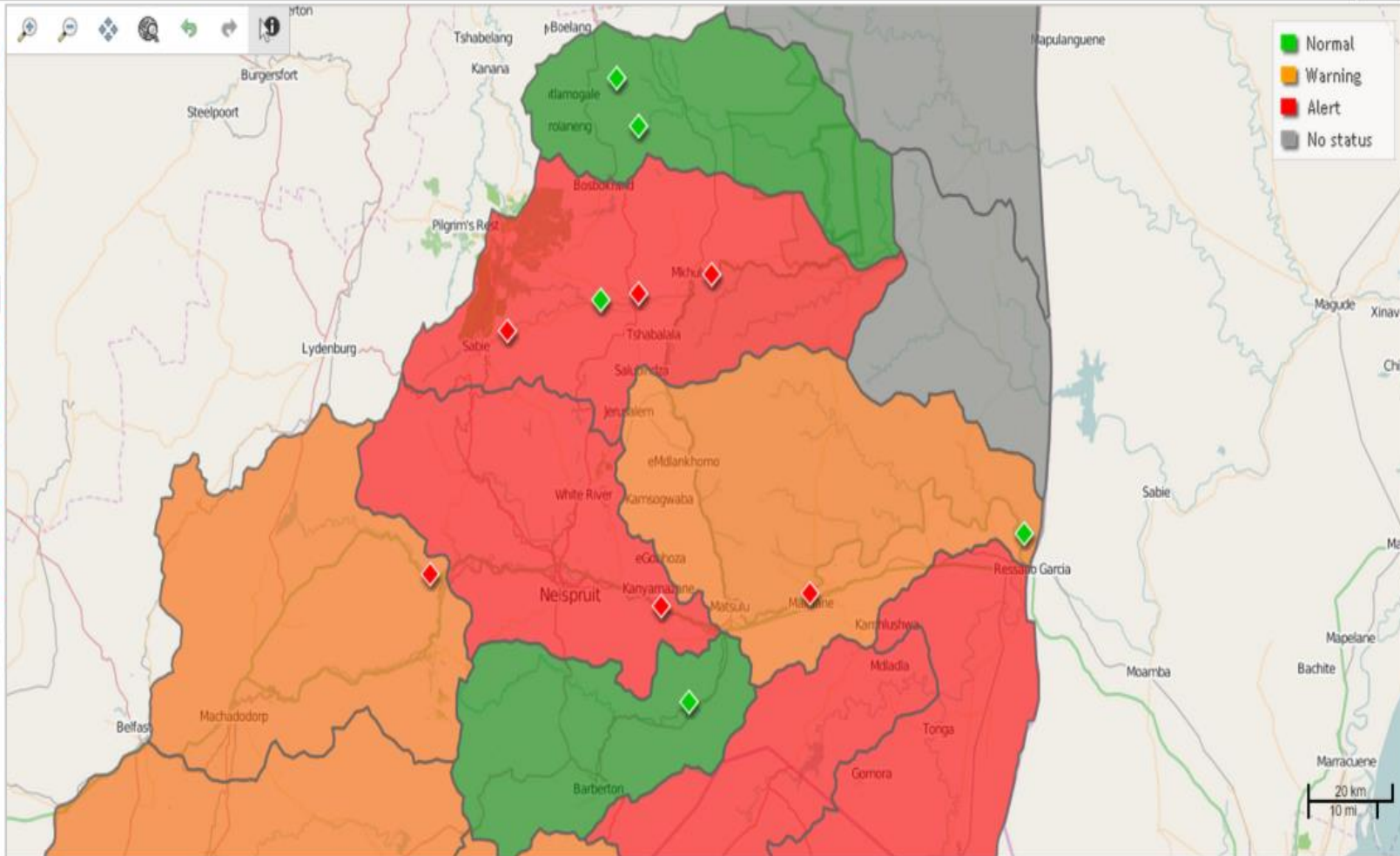
DASHBOARD

APPLICATIONS

HYDROSTORE

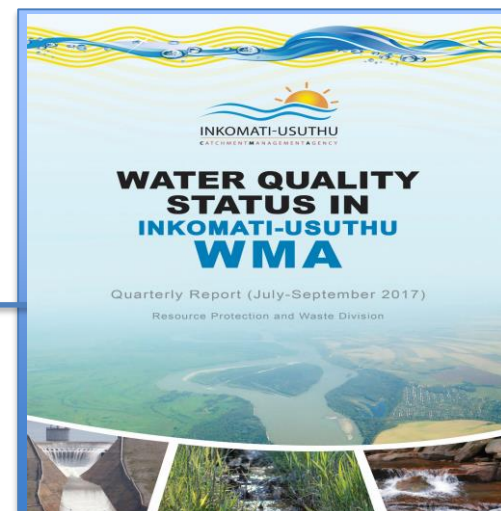
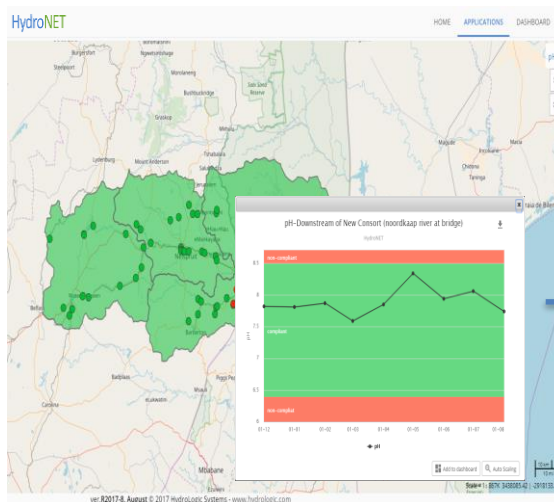
2013/04/01 - 2013/10/16

- Overview
- Social
- Technical
- Environmental
 - EWR
 - Quality
 - pH**
 - Conductivity
 - NH3-N
 - PO4
 - E. Coli
 - Biological
 - Fish
 - Inverts
- Economic
- Political



AUTOMATED REPORTS

- The maps and charts can be incorporated in the quarterly reports to the board and to the stakeholders.
- A live link is used: When the data is updated in HydroNET, it is updated in the reports as well.
- This saves a lot of time that can be used to work on solutions for a better quality of the rivers





Water Control Room

Benefits

Benefits

- Real-time access to the historical, current and predicted precipitation data from the South African Weather Service.
- All our water data is presented in clear GIS maps and graphs that can easily be configured. No expert knowledge is required.
- Using the GIS maps and graphs, all users within the IUCMA will get a quick oversight on the current status of the water system. This enables CMA's having continuous insight on the status of the Catchment and allows us to perform strategic adaptive operational governance.
- Detailed insight on water use by irrigation by making use of Earth Observation data from Satellites allows efficient compliance monitoring of large areas of irrigated land.
- The applications in HydroNET are web-based and accessible through all regular web-browsers. No software development or software installation is needed and updates are provide automatically.
- All graphs and maps can easily be exported as image or CSV file for easy reporting or use in external systems.





What do CMAs need to Implement?

Installation Needs

- No software installation needed.
- Need an Internet Browser. Software is accessible via the Internet via a username and password.
- To make use of HydroNET, the CMAs need to sign the HydroNET order form.
- Some configuration needs to be done. The amount of configuration depends on the application:
 - RainMap: Need Quaternary/Quinary Catchment GIS Shapefiles per CMA to be able to calculate rainfall averages per polygon.
 - Stations: no information and no configuration needed.
 - Forecast: no information and no configuration needed.
 - Water auditing: Need WARMS / allocation info per farm; shapefile of all farm boundaries, landcover showing all fields and crop types in WMA;

Installation Needs

- STEEP: this application asks more time from CMAs and from HydroNET as it measures a lot of CMA data. It needs all the CMA KPIs in their APPs as well as other data such as water quality/quantity data, runoff etc. All this then needs to be converted into the 5 Social, Technical, Environmental, Economical and Political indicators. Then HydroNET must link with a database where the data is stored. It can link directly to the NIWIS database as this database contains a lot of data for the whole country. With this link all CMAs can already set up a first version of a STEEP dashboard quickly.



Thank You!

