

4th SADC GROUNDWATER CONFERENCE

10th -12th of November 2021
VIRTUAL CONFERENCE



Developing the Hydrogeological Map of Namibia

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International Association
of Hydrogeologists
the World-wide Groundwater Organisation



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British
Geological
Survey



Outline of Presentation

- Introduction
- Background
- Process and Work flow
- Outputs of the Process
- Conclusion

Introduction

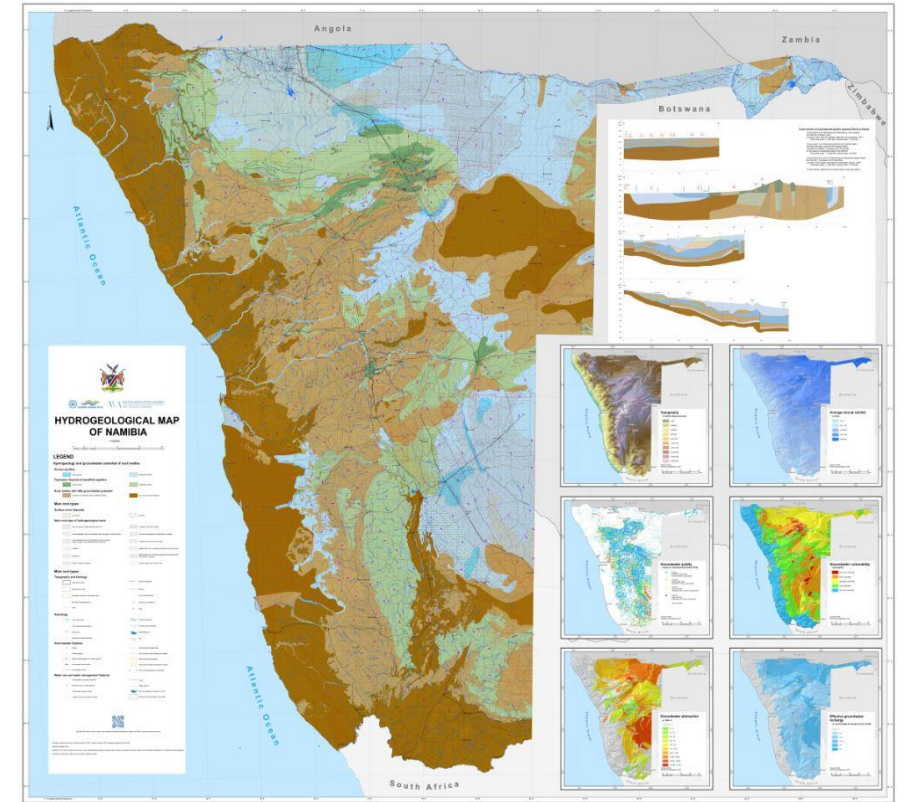
- In 2016 SADC-GMI through a World Bank Project (with a fiscal value of USD10M), afforded SADC member states the opportunity to partake in one of the sub-component of the project,
- **The Infrastructure for improved groundwater utilisation, management and protection** was just that component, and involved the developing, making available and training on design-tools related to the assessment of Groundwater infrastructure, infrastructure solutions to groundwater challenges, etc.
- The funding that was made available to the 16 member states amounted to USD2.2M, with a total of **USD150 000 allocated to Namibia**

Introduction

- As Namibia we put forward a proposal to review and update the Hydrogeological Map of Namibia “The Map” and to integrate/merge the map with the National groundwater database (GROWAS II) and Water Information System (www.namis.com)
- This proposal was accepted as fulfilling the necessary requirements and objectives and theme of the sub-grant of the project sub-component.

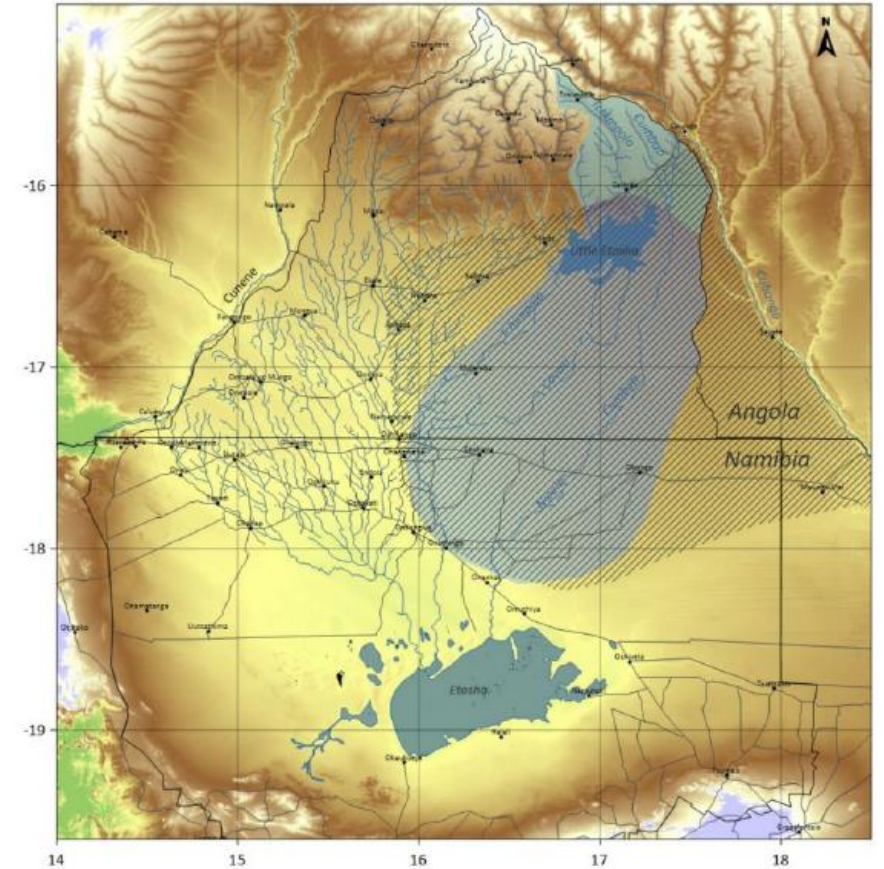
Background

- The Hydrogeological Map of Namibia and its accompanying handbook, was first published in December 2001, with an unrevised second edition in 2011.
- And in order to fulfil the mandate of Ministry of Agriculture Water and Land Reform's as the custodian of groundwater resources in Namibia, the Ministry saw it fit to review and provide an update of this long standing tools which is widely used for groundwater management



Background

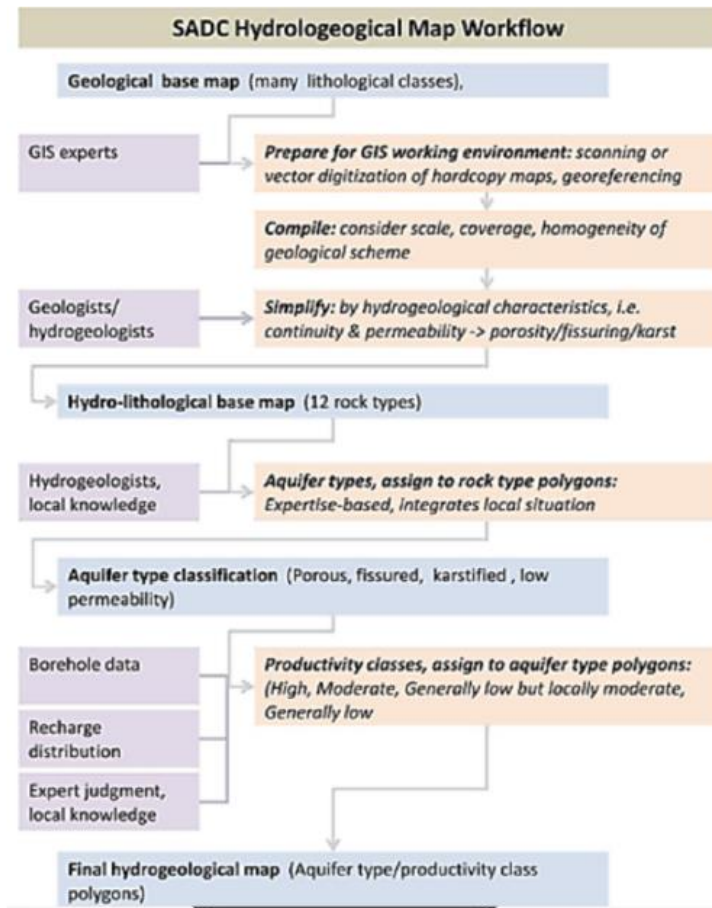
- During the 20 year interim period since the initial map, there have been many developments within the Geohydrological sector in Namibia.
- These developments include amongst others the discovery and delineation of the transboundary area known as the Cubango Megafan and Ohangwena Groundwater System. These recently discovered groundwater systems hold certain strategic importance for future water security in these and other parts of the country.



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Process and Workflow



- The actual upgrade or updating of the Map followed the guideline of the preparation of hydrogeological maps published by SADC (SADC, 2010).
- The review process included using, the latest and most up to date geological and groundwater data and information available from recent groundwater projects and discoveries.

Process and Workflow

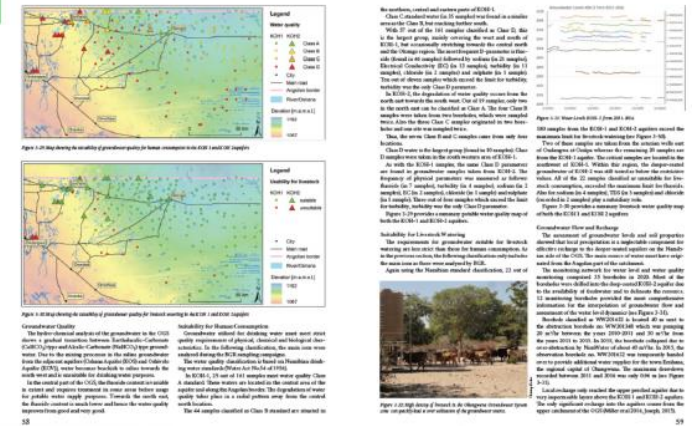
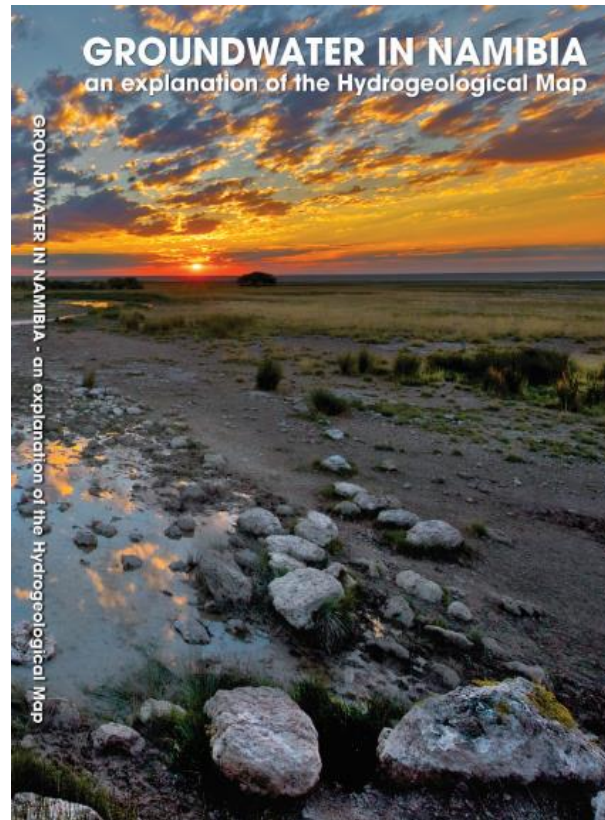
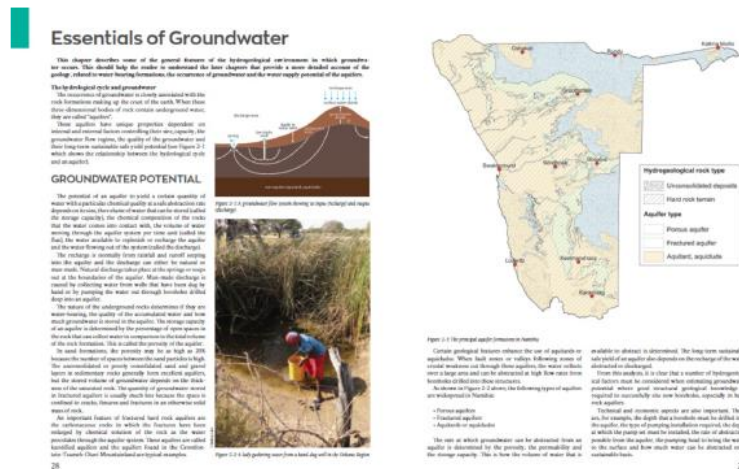
- From Geological base maps the data is prepared, compiled and the simplified into **Hydro-lithological base maps** based on the hydrogeological characteristics of the lithological classes
- Hydrogeologist with local knowledge then use the Hydro-lithological base maps and assign/classify aquifer type
- NB that borehole data, recharge distribution and expert judgment and local knowledge be used in order to produce the Final hydrogeological map with aquifer type and productivity classes

Outputs of the Process

- “The Map” provides a detailed description of an aquifer or an aquifer system and contains amongst other features:-
 - Location of drilling, production and monitoring wells;
 - Geometric delineation of aquifers, aquitards and aquicludes;
 - The piezometric situation in the aquifers; and
 - Distribution of hydraulic and hydrochemical parameters

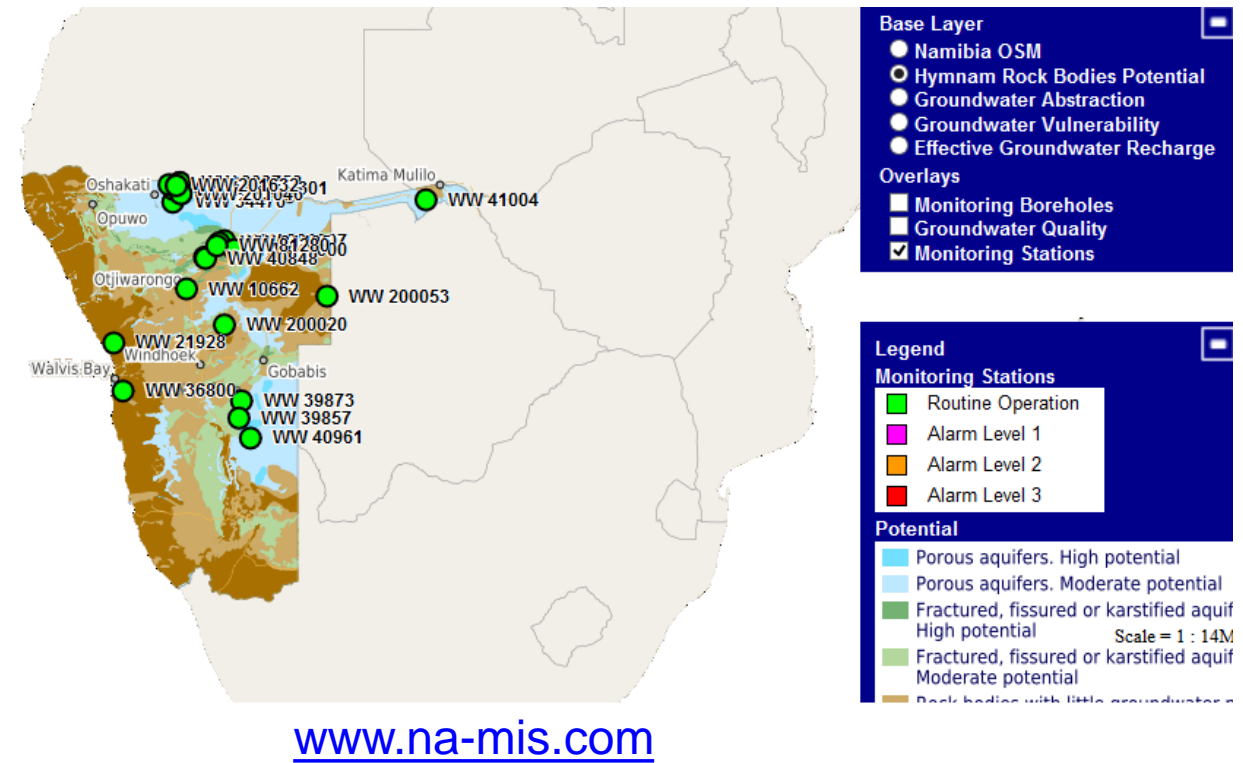
Outputs of the Process

- An accompanying handbook describes the maps and how they were developed, summarising information on groundwater in Namibia, its sparsity or abundance and it aims to provide a stern backbone of information for the management of Namibia's groundwater resources.



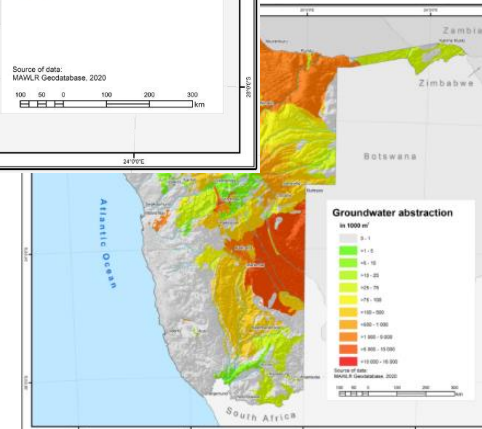
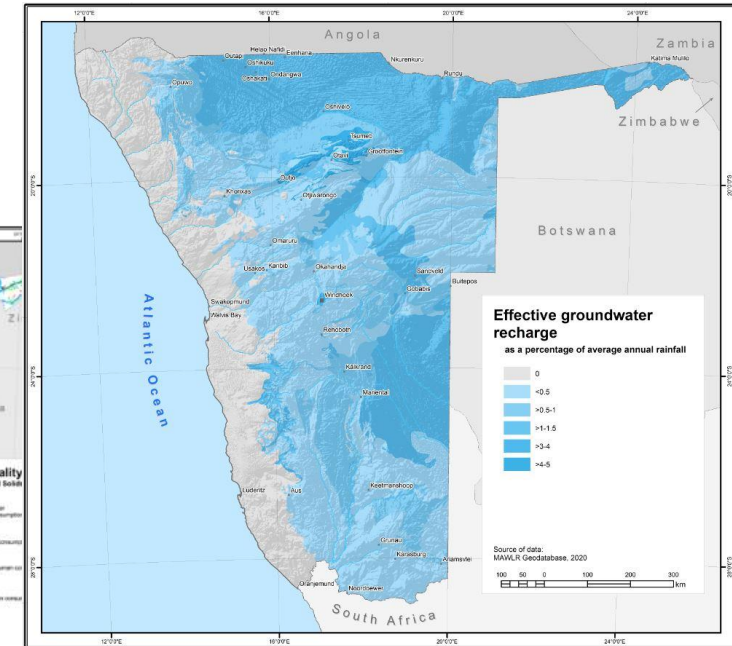
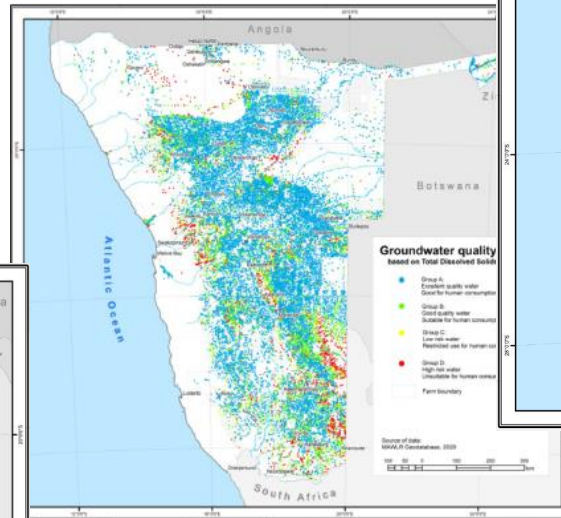
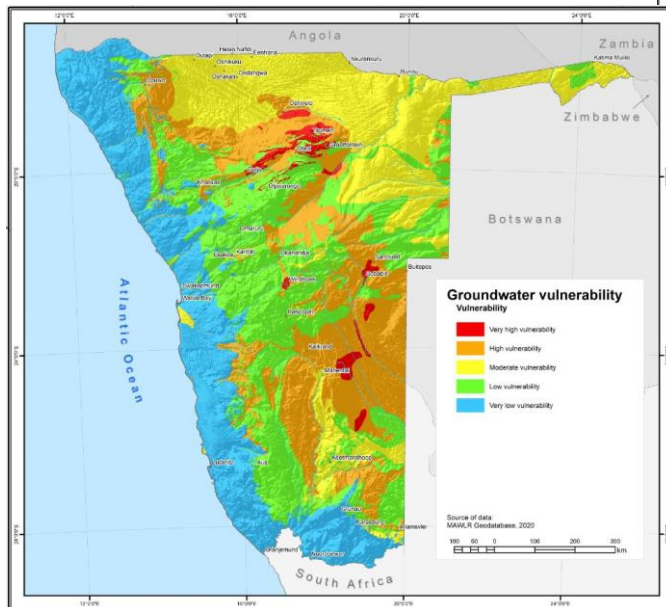
Outputs of the Process

- As part of this new edition, the Ministry was inspired to use the latest technology to develop a digital application to make the map digitally available to the Namibian people and groundwater stakeholders.
- The introduction of telemetry systems have improved the response time for data capture from boreholes.
- An important example of a digital technology advance and its benefit to groundwater management



Outputs of the Process

- Various Insert maps were produced
 - Effective Groundwater Recharge
 - Groundwater Vulnerability
 - Groundwater quality, and
 - Groundwater Abstraction



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Conclusion

- The purpose of “The Map” and the explanation book is to provide the Public and decision makers with accurate information about the occurrence, quality, utilisation and vulnerability of groundwater resources in the country.
- Ideally, it must provide answers to questions of “where”, “what” and “how much” groundwater resources are available over time.

The End



Special Thanks to SADC-GMI and The World Bank,
Water Associates Namibia
and Groundwater fraternity in Namibia

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