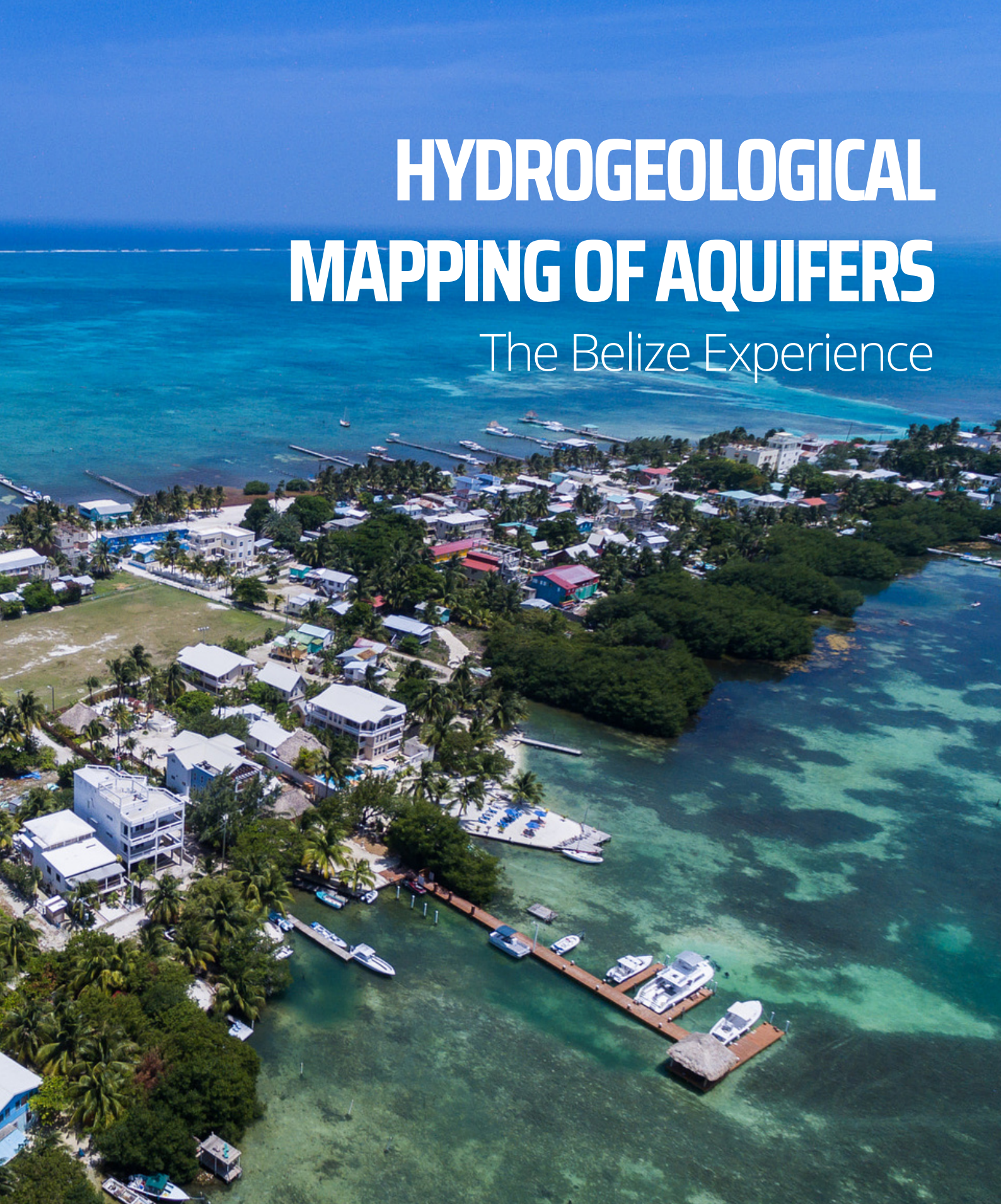


HYDROGEOLOGICAL MAPPING OF AQUIFERS

The Belize Experience



Global Water
Partnership
Caribbean

Case Study

HYDROGEOLOGICAL MAPPING OF THE AQUIFER IN THE NORTHERN DISTRICTS OF BELIZE

BACKGROUND

In northern Belize, there is a dearth of information and understanding on the availability and quality of groundwater resources. Despite the rising demand brought on by the expansion of both formal and informal village water delivery systems as well as agricultural activity, there is no national program for collecting systematic data about groundwater that is focused on water quality or quantity.

From October 2021 to October 2022, and funded by the **Small-scale Integrated Water Resources Management (IWRM) Grants** from the **Global Water Partnership-Caribbean (GWP-C, The National Hydrological Service of Belize** developed and implemented an initiative that filled in these knowledge gaps by supplying information that would be part of a larger monitoring and research program for the regional aquifer of northern Belize.

ACTIONS TAKEN

Data collecting in the target districts, compilation of deliverables to expand on the data analysis, and data collection were the three project tasks that were anticipated. Fieldwork was conducted by the Principal Hydrologist and a dedicated driver from the Ministry of Natural Resources over the course of two and a half months. The form that specified the parameters to be collected was used for data collection. Rapid well assessments were part of the data gathering process in the majority of the one hundred and two (102) villages, communities, and settlements that make up the project area. In seventy-seven (77) of those localities, rapid assessments were conducted.

The data was put together in an electronic format by the NHS staff after the data collection session was finished. A national call for proposals for consulting services titled "**Development of regional groundwater contour map and small-scale regional groundwater hydrological monitoring network**" was published, inviting qualified water resources experts to submit competitive bids. After that, a meeting was held to discuss the project's launch and an inception report was created and approved for the consultancy's execution.

OUTCOMES

The specific results achieved are the following:

1. A georeferenced and characterised groundwater well inventory data set.
2. A report about data on groundwater levels in the Districts of Orange Walk and Corozal.
3. A baseline for groundwater in the north of the country.
4. Groundwater flow characteristics in geo-referenced wells.

Overall, data gathered through the project's activities will be compiled into a number of essential management tools that are being created alongside it. To counteract the detrimental environmental effects occurring on the New River Watershed since 2019, a watershed management plan is being created. Additionally, it will help with the execution of the aquifer investigation that will be conducted in the same project area and contribute to Belize's national adaptation planning for integrated water resources management.



Figure 1: Some of the wells and pumps in northern Belize that were visited during the on-site data collection.

LESSONS LEARNED

Three (3) unexpected obstacles were encountered during the project's implementation: equipment failure - which was difficult to diagnose and fix; persons' unwillingness of to be interviewed; and two (2) deaths in the family of the officer in charge of the project's execution and implementation.

Only one bid, which was above the threshold of the anticipated funds for the consultancy, was received in response to the advertisement. The YSI Temperature and EC probe replacement kit could be purchased and cleared by the NHS' recurrent budget, allowing all budget money to go toward the Consultancy fee to afford value, according to analysis of the probable re-tendering bid, associated cost, and project timetable for execution.

The National Hydrological Service of Belize made the following decisions to prevent these problems from occurring in upcoming projects:

1. Hire a trustworthy instrument technician to assess the functionality of the proposed equipment. This extends to the regular residence of the current personnel at the Hydrology Service.
2. If at all feasible, seek out additional project assistance from external sources other than regular staff, as this might have helped with unforeseen delays and incidents.

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Key Themes: Hydrogeological mapping - Integrated Water Resources Management (IWRM) - Groundwater Management – Hydrology - Belize