

Costa Rica

Capital city: San José
Inhabitants: 5 Million



INSTITUTIONAL SETTING AND PURPOSE

The Water Directorate (DA) under the Ministry of Environment and Energy (MINAE) of Costa Rica, together with the Costa Rican Institute of Aqueducts and Sewers (AyA) and the National Groundwater, Irrigation and Drainage Service (SENARA) operates several quantitative networks of manual groundwater monitoring and coordinates one automatic network:

1. Automated registration of data via telemetric transmission (Real Time Groundwater Monitoring System, SIMASTIR), and semi-automated transmission (alliance with the Public Utility Company of Heredia, ESPH)
2. Manual monitoring with monthly frequency.

The main objective of these networks is to provide data on the state of groundwater and its long-term trends, and technical information for the proper planning of national policies by regulatory agencies. The data generated is also used to analyse the dynamics of aquifers in the face of climatic variations.

With these monitoring records, representatives of the Institutional Technical Committee (CTI) of Aquifer Management (conformed by Executive Decree 38449-MINE_MAG, DA (as coordinator), AyA and SENARA) proceed to analyse and interpret variations in groundwater levels. Results are made public either by presentation in communities and/or at the National Information System for Integrated Water Resource Management (SINGHIR) online platform.

CHARACTERISTICS OF THE NETWORK

SIMASTIR (Figure 1) is a national coverage project initiated in 2016 in the province of Guanacaste and extended to the provinces of Heredia and Alajuela by the end of 2020. Monitoring wells record hourly groundwater levels, temperature, and electrical conductivity (in some locations). In the case of automatic transmission, the recorded data is transmitted every 12 hours by cellular signal to the operations centre located at DA offices, where the data is stored and added to the historical records. In the case of semi-automatic transmission, the data is sent monthly by ESPH staff to DA, by email.

The current distribution of the SIMASTIR network by province is as follows:

- **Guanacaste:** 44 groundwater monitoring sites distributed in the following aquifers: right margin Sardinal-Tempisque, Nimboyores, Huacas-Tamarindo, Nicoya, Caimital, Cóbano - Montezuma, Playa Panamá, Coco, Brasilito, Potrero.
- **Alajuela:** 10 groundwater monitoring sites in Aguas Zarcas and Pital aquifers.
- **Heredia:** 21 groundwater monitoring sites in Barba and Colima Superior aquifers. The equipment and maintenance of these monitoring sites is under the responsibility of ESPH, which voluntarily shares the information recorded with SIMASTIR.

The manual network monitors groundwater levels monthly in 300 wells strategically distributed over 10 aquifers located mainly in Guanacaste and the Central Pacific area.



Figure 1 – Images from the SIMASTIR project

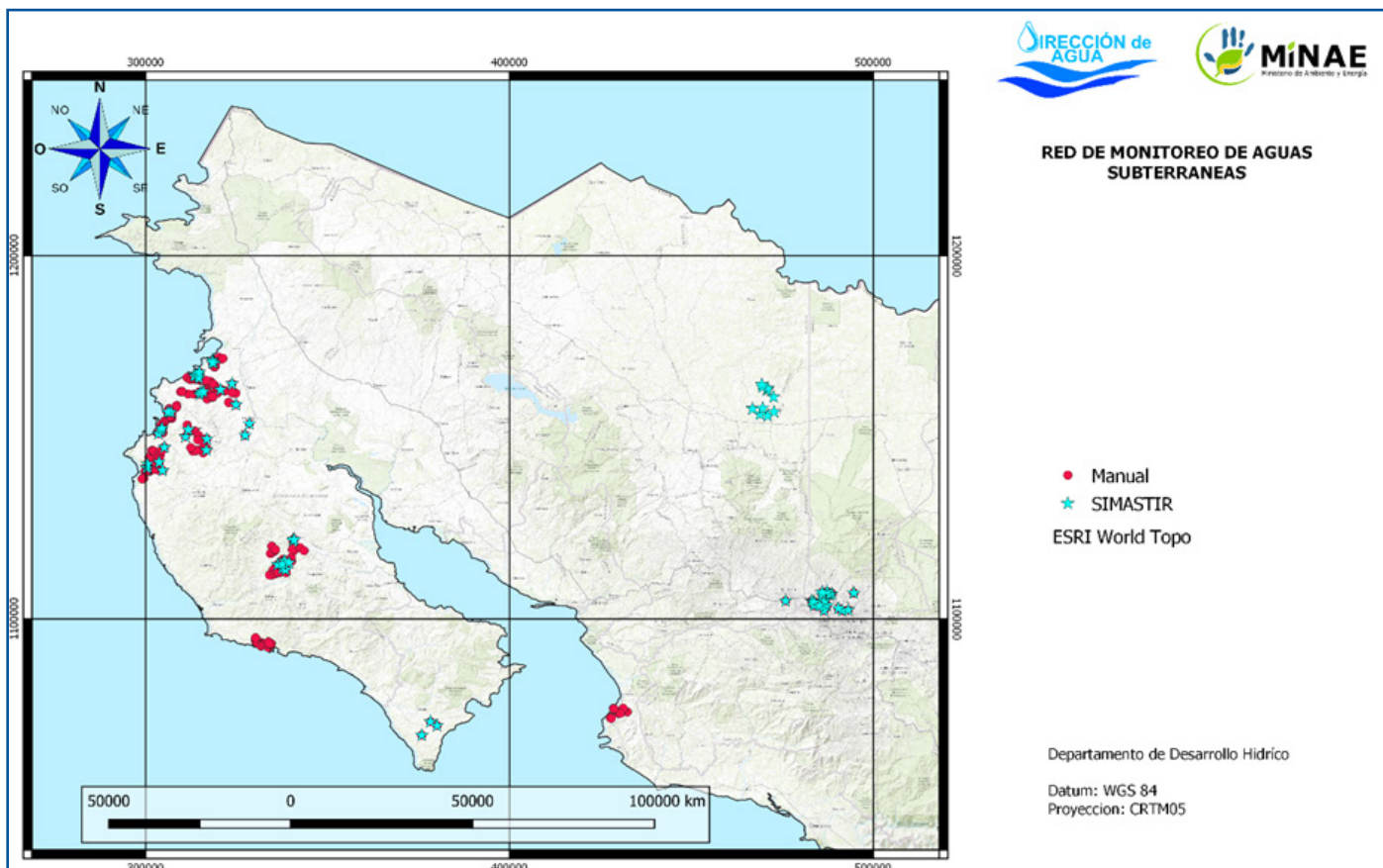


Figure 2 – Groundwater Monitoring Network of Costa Rica (source: DA under MINAE)

PROCESSING AND DISSEMINATION

Reports made by DA and CTI Aquifers Management are available online. Unprocessed records can be obtained from DA by request. Other detailed data from the monitoring sites can be seen using the SINIGIRH map viewer.

Sources

- **Aquifer Management, Water Directorate (DA) of Costa Rica** - <http://www.da.go.cr/gestion-de-acuiferos>;
- **Feedback from DA** - received on 06-02-2020;
- **Feedback from DA (answer to form)** - coordinated by CeReGAS and received in 2019;
- **Sardinal Aquifer documents** - <http://www.da.go.cr/documentos-acuifero-sardinal>;
- **SINIGIRH map viewer** - <http://mapas.da.go.cr/mapnew.php>; and
- **Ministry of Environment and Energy of Costa Rica (MINAE), Water Directorate (DA), 2017. Real Time Groundwater Monitoring System (SIMASTIR), in Spanish** - Unpublished report. 15 pages.