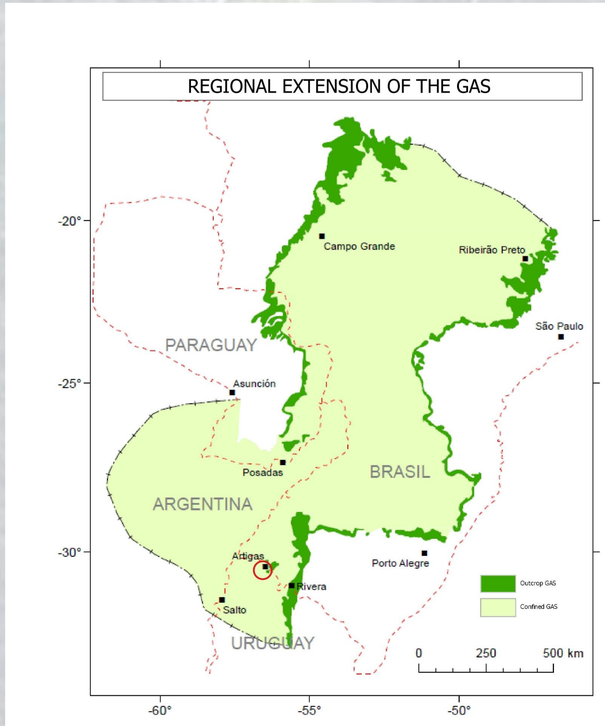
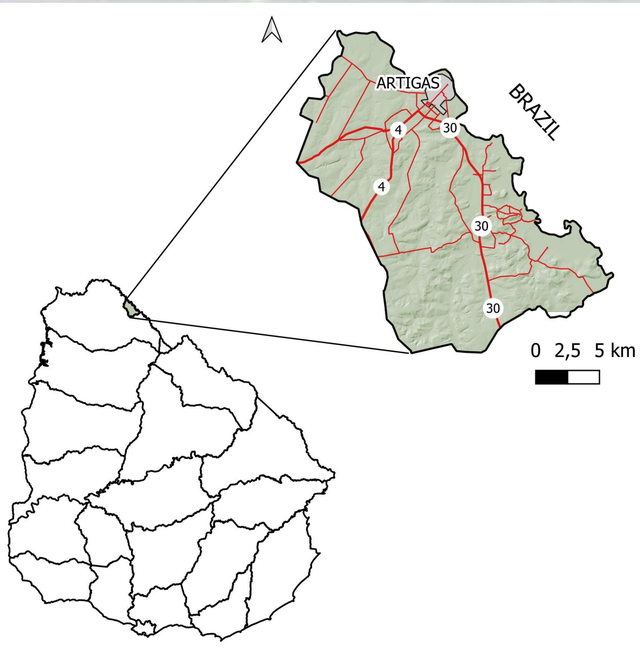
Integrated analysis of the Guaraní Aquifer System outcropping in the frontier city of Artigas (Uruguay) and the contribution to local organizations.

Samaniego, L.[1,2], Veroslavsky, G.[2,3], Manganelli, A.[1], Aubet, N.[4]

(1) Centro Regional para la Gestión de Aguas Subterráneas en América Latina y el Caribe (CeReGAS), Uruguay, Av. Rondeau 1665 P1, Montevideo, Uruguay. lsamaniego@ceregas.org, amanganelli@ceregas.org (2) PEDECIBA, Programa de Desarrollo de Ciencias Básicas, Montevideo, Uruguay gerardo@fcien.edu.uy (3) UDELAR, Facultad de Ciencias, Iguá 4225, Montevideo, Uruguay. (4) UTEC, Centro Sur, Francisco Antonio Maciel s/n, Durazno, Uruguay natalie.aubet@utec.edu.uy

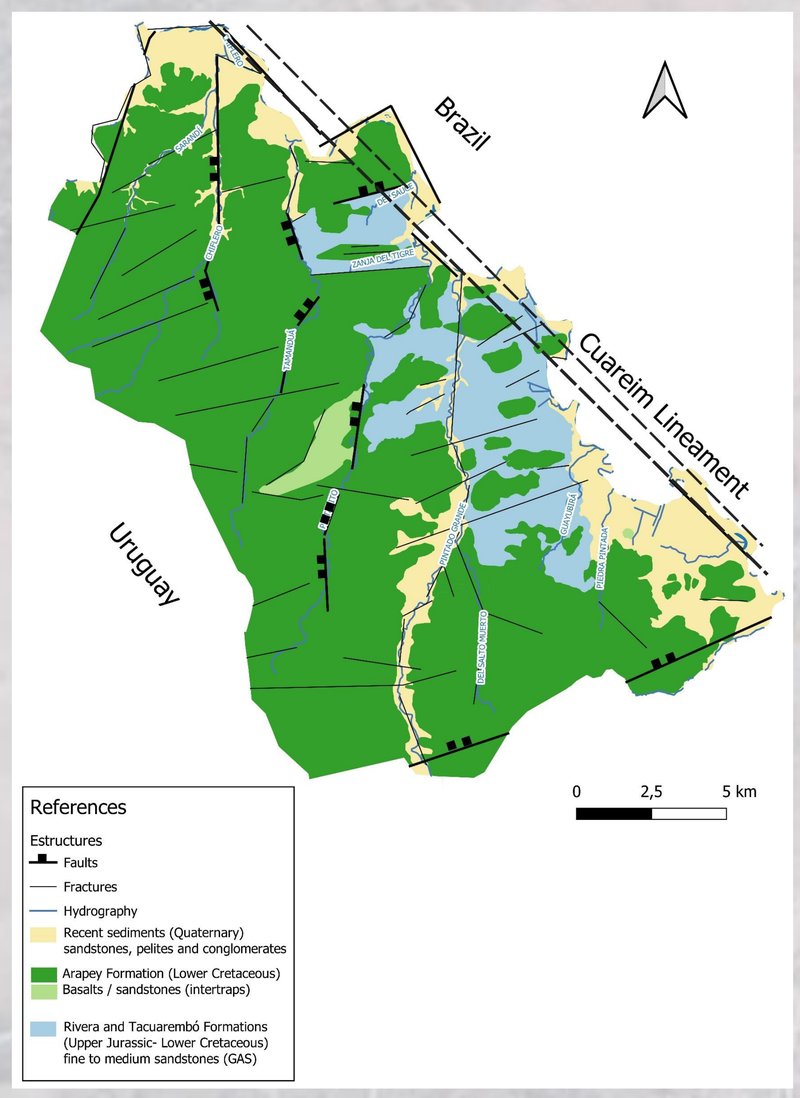
The Guarani Aquifer System (GAS) is located in South America and is shared by Argentina, Brazil, Paraguay and Uruguay in an area that exceeds 1,000,000 km^2. Its characteristics are not homogeneous throughout the region, there are areas where it is outcropping and others where it is confined with up to 1000 meters of basalt. This makes the vulnerability of GAS high in some places and low in others where the arrival of contaminants to its waters from the surface is almost impossible due to the great thickness of basalts that confine it.





This work focuses on studying the outcropping zone of GAS found in the city of Artigas and its surroundings (Uruguay). In that city, a large percentage of the water for human supply comes from the GAS and another part of the Cuareim River. Both the GAS and the Cuareim River are transboundary with Brazil.

There were no antecedents in the area that studied in detail and in an integrated manner the geology, hydrogeology, geochemistry of GAS, although this resource is widely used in the city and this use increases in the rural areas of the area, where they are mainly dedicated to the cultivation of tobacco. Based on detailed knowledge of the area, it was possible to create vulnerability maps of the area, which it is hoped will be used in the future as a guide for environmental institutions that have to grant permits.



To carry out a better investigation, close contact was made with several local organizations, mainly with Obras Sanitarias del Estado (in spanish), which is the state company in charge of human supply and sanitation in that area. This public company supported by providing data on its wells and their construction and geological profiles, they also allowed us to take samples from their wells to characterize the water. Contact with other state agencies such as the National Water Directorate and the National Mining and Geology Directorate also contributed a lot to the study, providing their data. In this way it is being possible to generate a study that in the future can be used by all these organizations and is even improving their database by completing missing information.

Centro Regional para la Gestión de Aguas Subterráneas en América Latina y el Caribe

FACULTAD DE CIENCIAS UDELAR fcien.edu.uy

UTEC Universidad Tecnológica

Acknowledgments:

The authors thank the Agencia Nacional de Investigación e Innovación FMV Project _1_2019_1_155736 and the L.S. postgraduate scholarship. Likewise, the support of PEDECIBA Geociencias is appreciated.