Data Article

Groundwater level and electrical conductivity datasets acquired within pumping tests on Ilovik Island in Croatia

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ABSTRACT

The small karst island of Ilovik is the most southern of inhabited islands in the Croatian part of the Adriatic Sea. During summer tourist season the number of inhabitants increases significantly, and securing the additional freshwater quantities was needed. Given the hydrogeological and geomorphological setting of the island, possibility of brackish groundwater exploitation was considered. Hence, borehole drilling accompanied with pumping tests at three specified locations was carried out. During the pumping tests in two campaigns, groundwater level was measured manually every 2 hours in boreholes, while groundwater electric conductivity and temperature were periodically measured in situ. The sea level was observed at the reference point located near port. Given dataset consists of electrical conductivity, temperature, groundwater and seawater levels. The research article connected with these data (Terzić et al., 2020) provides hydrogeological interpretation of brackish groundwater lens on small karst island.

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**Specifications Table**

| Subject                  | Earth and Planetary Sciences (Geology) |
|--------------------------|----------------------------------------|
| Specific subject area    | Karst hydrogeology, pumping test, groundwater-seawater interaction |
| Type of data             | Table                                   |
| How data were acquired   | Groundwater levels, and groundwater electric conductivity, and groundwater temperature were measured in boreholes with GmbH & Co. KG Seba Hydrometrie KLL-Q in situ probe. Seawater level fluctuations were measured at the reference point on coast with water level gauge. |
| Data format              | Raw                                     |
| Parameters for data collection | Boreholes were located and drilled after a bulk research program, and pumping test data were collected within the two pumping campaigns in different hydrological conditions – during relatively high and low groundwater levels. The data refers to groundwater (level, electrical conductivity and temperature) and seawater (level). |
| Description of data collection | Short-term pumping tests were done and groundwater/seawater levels were measured at the end of February and beginning of March, 2004, for all three boreholes. For all boreholes groundwater electrical conductivity and temperatures were measured as well. Long-term pumping was done in the two chosen boreholes, BIL-2 and BIL-3, at the end of October and beginning of November, 2004. Groundwater electrical conductivity and temperature were observed. The sea level was also measured manually every two hours. |
| Data source location     | Institution: Croatian Geological Survey |
|                          | City/Town/Region: Ilovik Island         |
|                          | Country: Croatia                        |
|                          | Latitude and longitude (and GPS coordinates, if possible) for collected samples/data: Island Ilovik 44.450938°N, 14.550362°E |
| Data accessibility       | With the article                        |
| Related research article | J. Terzić, D. Grgec, J. Lukač Reberski, A. Selak, I. Boljat, M. Filipović, Hydrogeological estimation of brackish groundwater lens on a small Dinaric karst island: case study of Ilovik, Croatia, Journal of Hydrology: Regional Studies (in press) |

**Value of the Data**

- The electrical conductivity, groundwater/seawater levels are baseline for providing a unique insight into groundwater dynamics and characteristics of the transition zones between freshwater-brackish water-seawater.
- Data can be useful for both hydrologists and hydrogeologists in their research of karst island environment. Based on the electrical conductivity, groundwater and seawater levels data, the costs of brackish groundwater exploitation can be lowered, thus benefiting water suppliers and researchers dealing with the water management as well.
- The dataset can be used as an input for planning of water resource use and securing sufficient quantities of drinking water, having in mind tourist pressure on the island’s water supply system during summer months. The data can be used for pumping test interpretations using different methods.

1. **Data Description**

The location of boreholes and sea water level gauge in island Ilovik can be seen in Fig. 1, while their coordinates are shown in Table 1. Ilovik island is located at the following coordi-
Fig. 1. Map of island Ilovik with the location of boreholes and sea water level gauge.
Table 1
Coordinates of boreholes and sea water level gauge.

| Name   | Description            | Latitude (N) | Longitude (E) | Elevation (m a.s.l.) |
|--------|------------------------|--------------|---------------|---------------------|
| B-1    | borehole               | 44.453217°   | 14.548373°    | 51.21               |
| B-2    | borehole               | 44.456222°   | 14.543239°    | 51.06               |
| B-3    | borehole               | 44.454744°   | 14.549464°    | 40.73               |
|        | water level gauge      | 44.459819°   | 14.549431°    | 0.89                |

coordinates of the World Geodetic System (WGS84): 14.550362N and 44.450938E. Fig. 1 shows the coordinates according to the Croatian Terrestrial System (HTRS96), the official reference coordinate system for map projections in Croatia.

The dataset contains two tables Short_term_pumping_test_data.xlsx and Long_term_pumping_test_data.xlsx. Short_term_pumping_test_data table has two sheets. In the first sheet pumping test data presenting groundwater levels in all three wells (BIL-1, BIL-2 and BIL-3), sea level, electrical conductivity (EC) values and pumping rates for the pumped wells are shown. The second sheet includes data on EC values and temperatures within each borehole, measured after the pumping test. Long_term_pumping_test_data table has four sheets. The first two sheets present groundwater levels and pumping rates for the two pumped boreholes (BIL-2 and BIL-3). The third sheet presents data for all three pumped wells (BIL-1, BIL-2 and BIL-3) along with EC and sea level values, while the fourth sheet comprises EC and temperature values within each borehole before and after the pumping test.

2. Experimental Design, Materials and Methods

The dataset covers observation from three boreholes located at the Dinaric karst island of Ilovik, which is located on the border of two types of Köppen’s climate classification, Csa Mediterranean climate with hot summer and Csb, Mediterranean climate with warm summer [1]. Island of Ilovik has an area of 5.51 km² with the highest peak of 91 m a.s.l.

In the period from 24th of February to 1st of March, 2004, short-term pumping tests were performed with Grundfos pump (1.2 kW). Groundwater electric conductivity and temperature were measured in boreholes with Seba Hydrometrie GmbH & Co. KG KLL-Q in situ probe. Groundwater levels were measured using the Seba Hydrometrie GmbH & Co. KG KLL077-KLL089 Water Level. Based on the initial pumping test data, only two boreholes were chosen for long-term pumping tests. Long-term pumping was done in boreholes BIL-2 and BIL-3 at from October and beginning of November, 2004. EC and temperature were determined during the pumping. The groundwater level was measured manually every two hours for all three boreholes (BIL-1, BIL-2 and BIL-3). The sea level was also measured manually in the same interval, at the coast using water level gauge.

Ethics statement

Not relevant.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships which have, or could be perceived to have, influenced the work reported in this article.
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Supplementary Materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.dib.2021.107180.

References

[1] J. Terzić, J., Grgec, D., Lukač Reberski, J., Selak, A., Boljat, I., Filipović, M., Hydrogeological Estimation of Brackish Groundwater Lens on a Small Dinaric Karst Island: Case Study of Ilovik, Croatia, CATENA, 204, DOI: https://doi.org/10.1016/j.catena.2021.105379