

Project: “Monitoring Sea-water intrusion in coastal aquifers and Testing pilot projects for its mitigation” Interreg CBC Italy-Croatia 2014.-2020.

Priority Axis: Safety and resilience

Specific objective: Improve the climate change monitoring and planning of adaptation measures tackling specific effects, in the cooperation area

(D_5.1.4) Web-tool for data storing and querying (in Croatian)

Work Package 5: Transferring

Activity 1: Neretva plan of adaptation

Partner in charge: PP4 (UNIST-FGAG)

Partners involved: PP4 (UNIST-FGAG), PP5 (CROATIAN WATERS), PP6 (DUNEA)

Final version

Public report

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Contents

Introduction.....	2
Web tool accessibility.....	3
Web tool – Croatian version.....	4
Web App – English version	12
List of figures.....	19

Introduction

During the third project period, Croatian project partners developed and released a web and mobile phone application to enable the real time insight of the surface and groundwater parameters as:

- Piezometric head;
- Temperature;
- Electrical conductivity

The idea of App development has been based on the fact to make those data accessible to land users, farmers, citizens, stakeholders and other target groups interested in this product. In general, App can be used in both ways, as a web and mobile application and does not require any kind of login, thus making those data public.

Following the Application Form content and putting into operation App for real time saltwater values to be used in general way, the idea of web tool for data storing and querying was set up to be implemented into the App for real time monitoring implemented within the Neretva site. This leads to a unique system which offers both, insight to data observed on site in real time, and database with historical data sets available for download.

Web tool accessibility

Web tool accessibility point can be found at: <http://neretva.waveform.hr/dashboard> the same as for App.

Prior the use, user can choose between two modes. Web tool which provides information on sensor locations and real time data sets or download area which enables the download of available historical data sets for specific period.

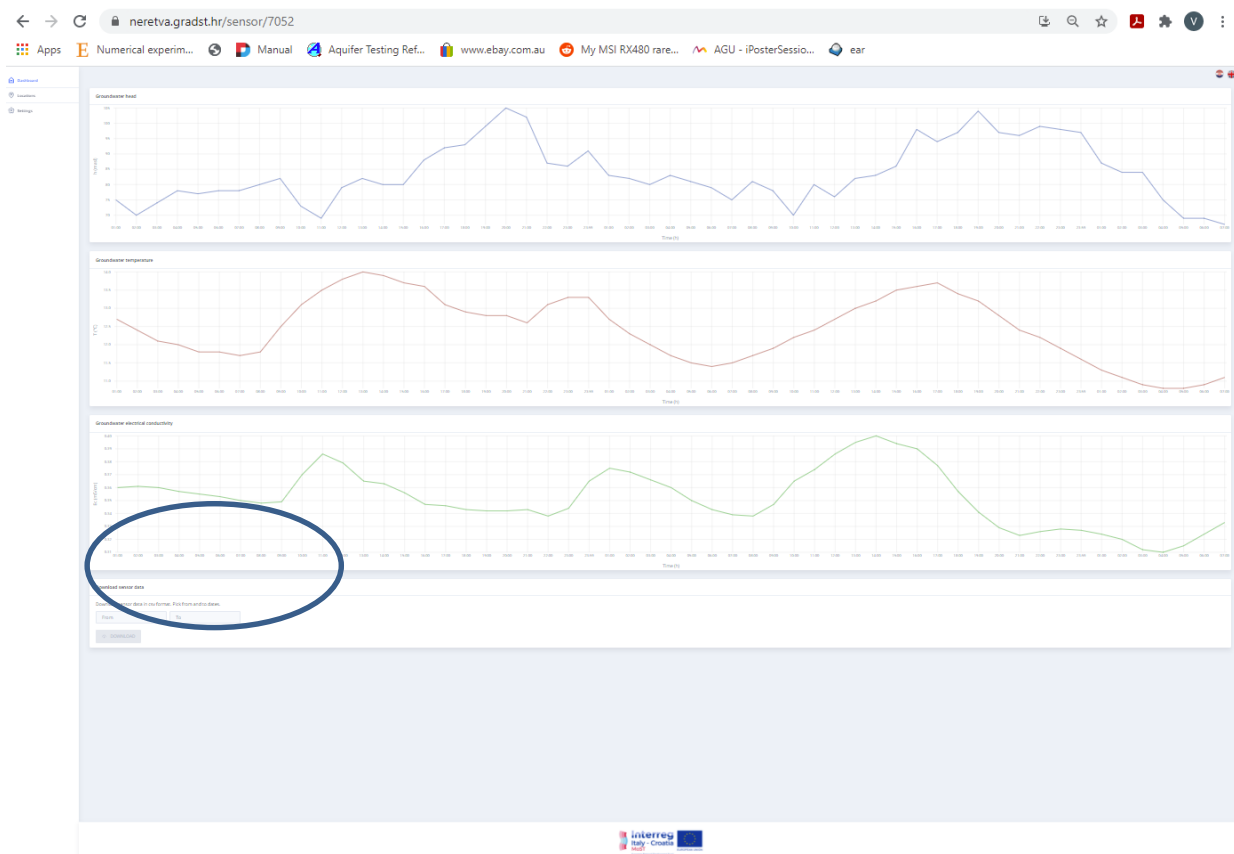


Figure 1 Web tool for data storing and acquisition on MoST Web App

Otherwise, it can be downloaded to smart phones and operated as mobile App. Both, App and Web tool are developed to be used in either English or Croatian language so the user has to pick between those two options.

Web tool – Croatian version

Below, in Figure 2 to Figure 5 Web app is shown with its front end and interface for end users in Croatian language. First step in reaching in situ observed data via Web tool is to select appropriate location and probe as shown in Figure 2 and Figure 3.

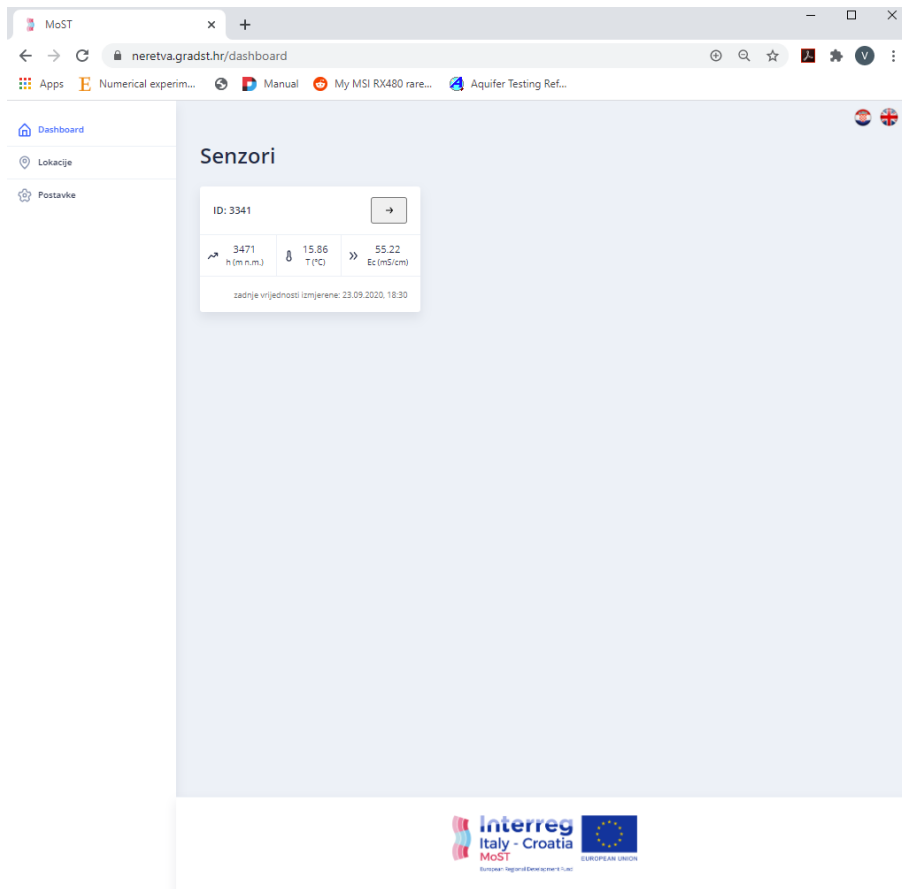


Figure 2 User interface of the MoST Web App

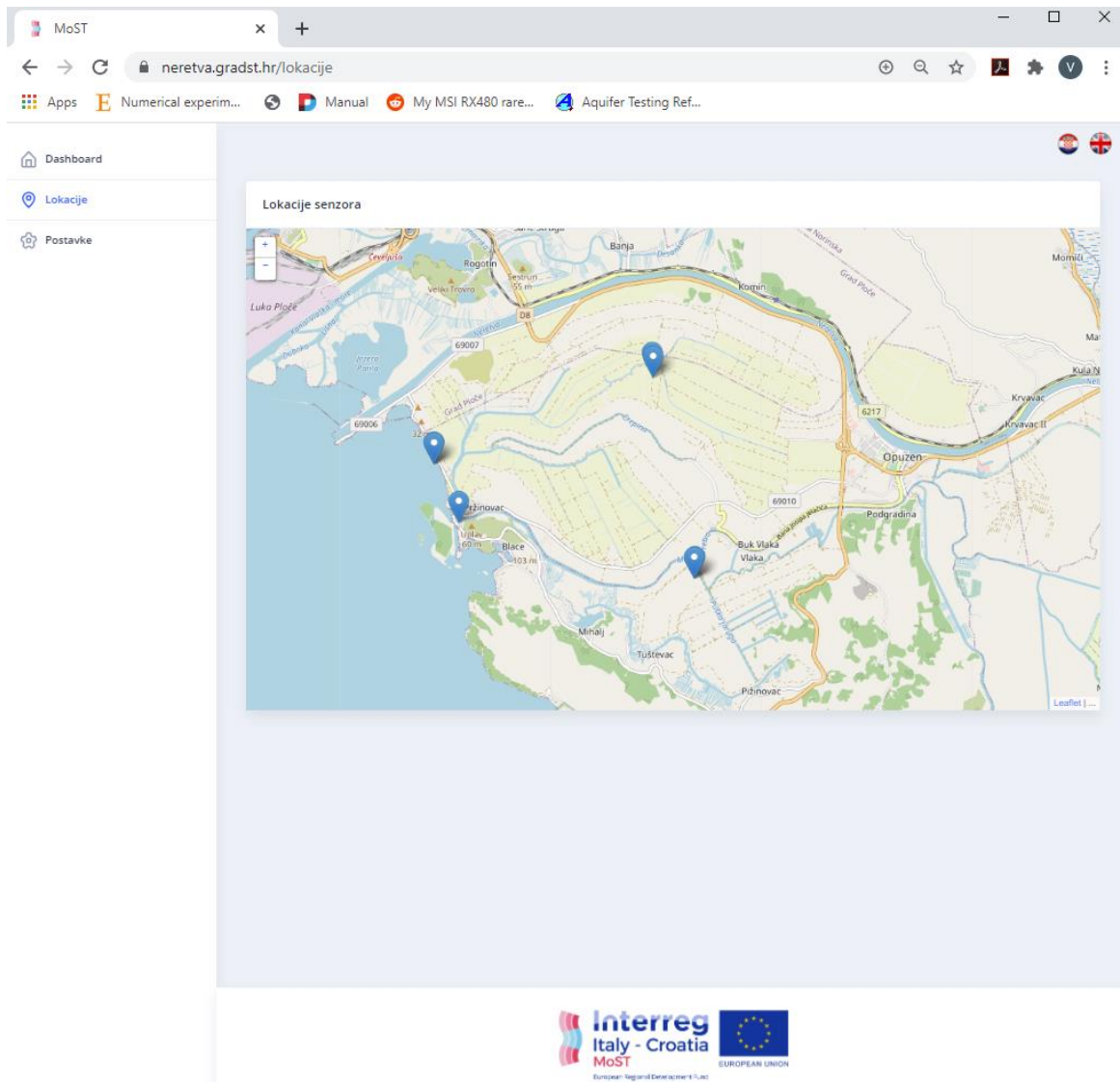


Figure 3 User interface of the MoST Web App – selection of the probes and sensor location/s

After selection of the probe of interest, the user can choose between two options: i) whether to get insight to real time piezometric head, temperature and electrical conductivity values (Figure 4) or ii) to use Web tool as a source of data sets observed during past period of defined length (Figure 5).

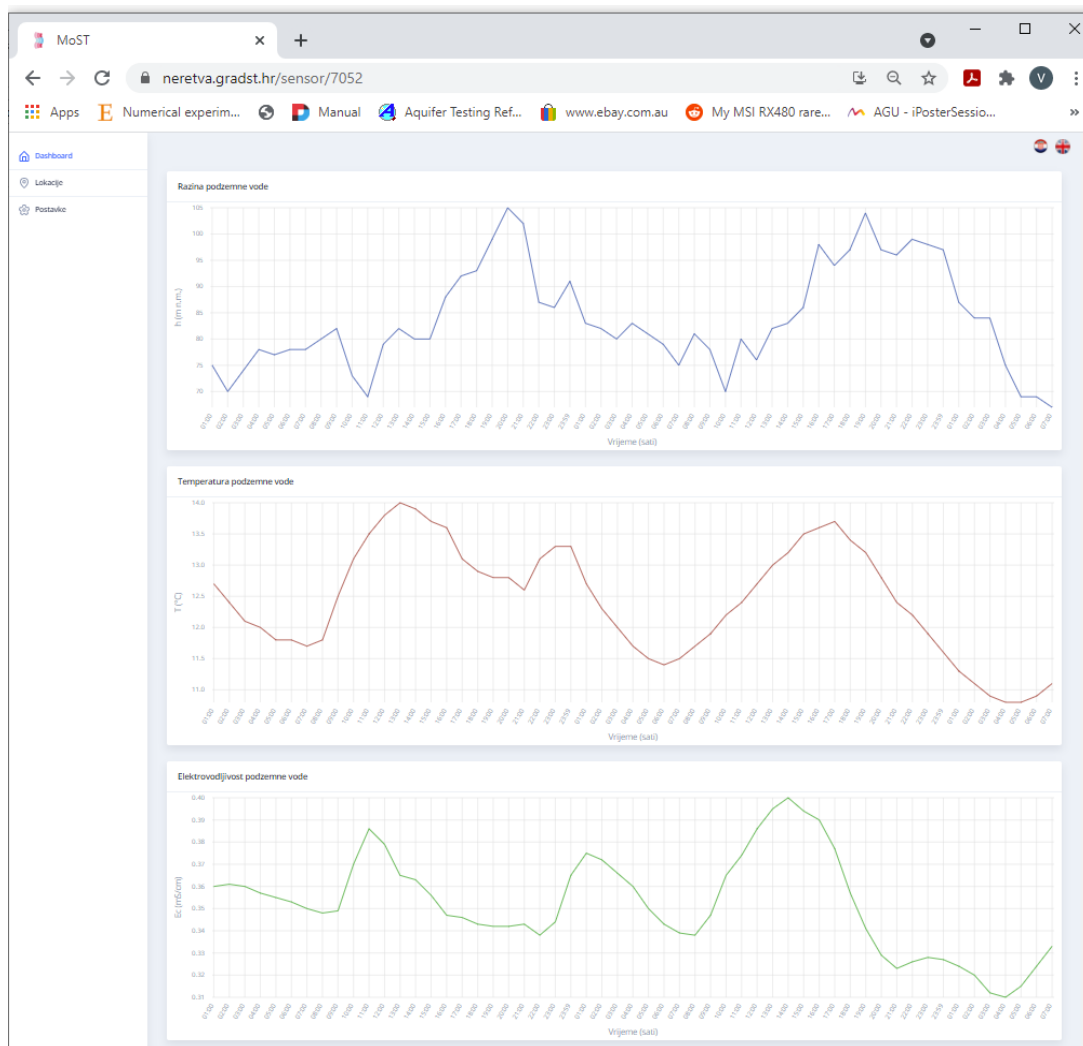


Figure 4 User interface of the MoST Web App – insight to real time values of piezometric head, temperature and electrical conductivity from selected sensor

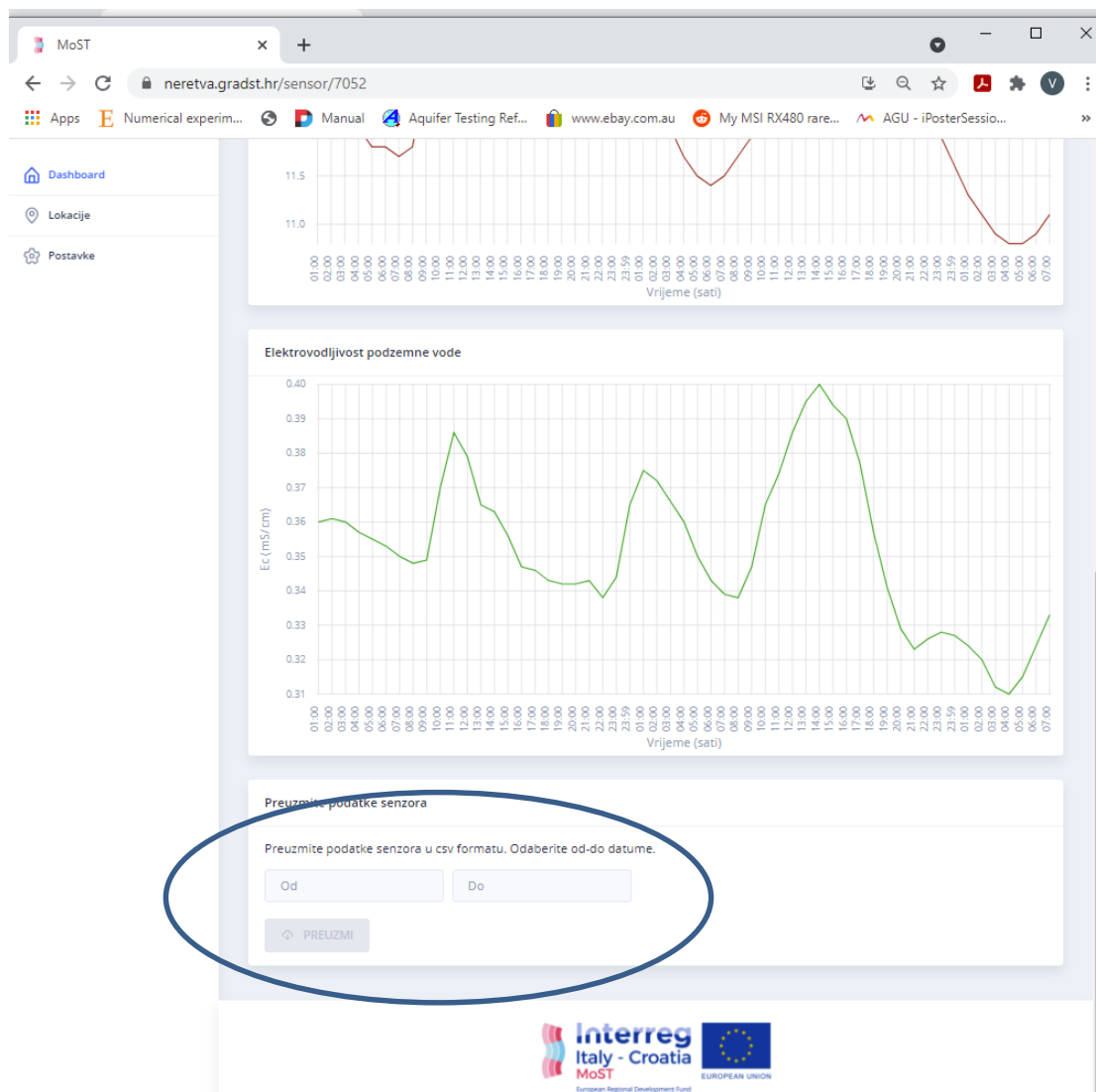


Figure 5 User interface of the MoST Web tool - location of the Web tool interface for data storing and querying

Web tool for data storing and querying screen is set up in bottom left corner of App interface (Figure 5). To access observed data, end user has to define the length of data series, by definition of starting and ending date as demonstrated in Figure 6. Ending point in accessing observed data

series is shown in Figure 7. After selection of appropriate interval of interest, Web tool offers a download option and csv format delivery to personal computer. Print screen of downloaded file (Figure 8) with clear structure of downloaded file and available data sets can be easily adapted to users need.

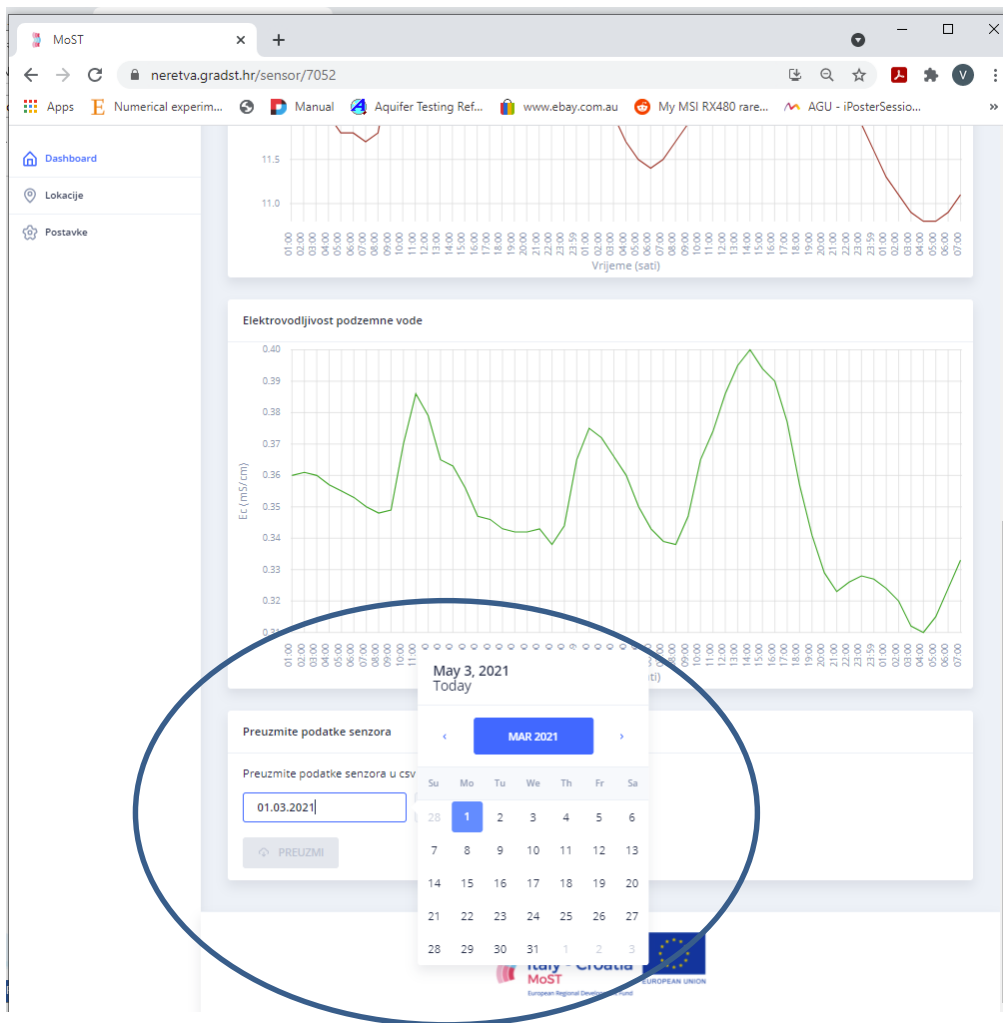


Figure 6 User interface of the MoST Web tool - location of the Web tool interface for data storing and querying with option to select interval of interest

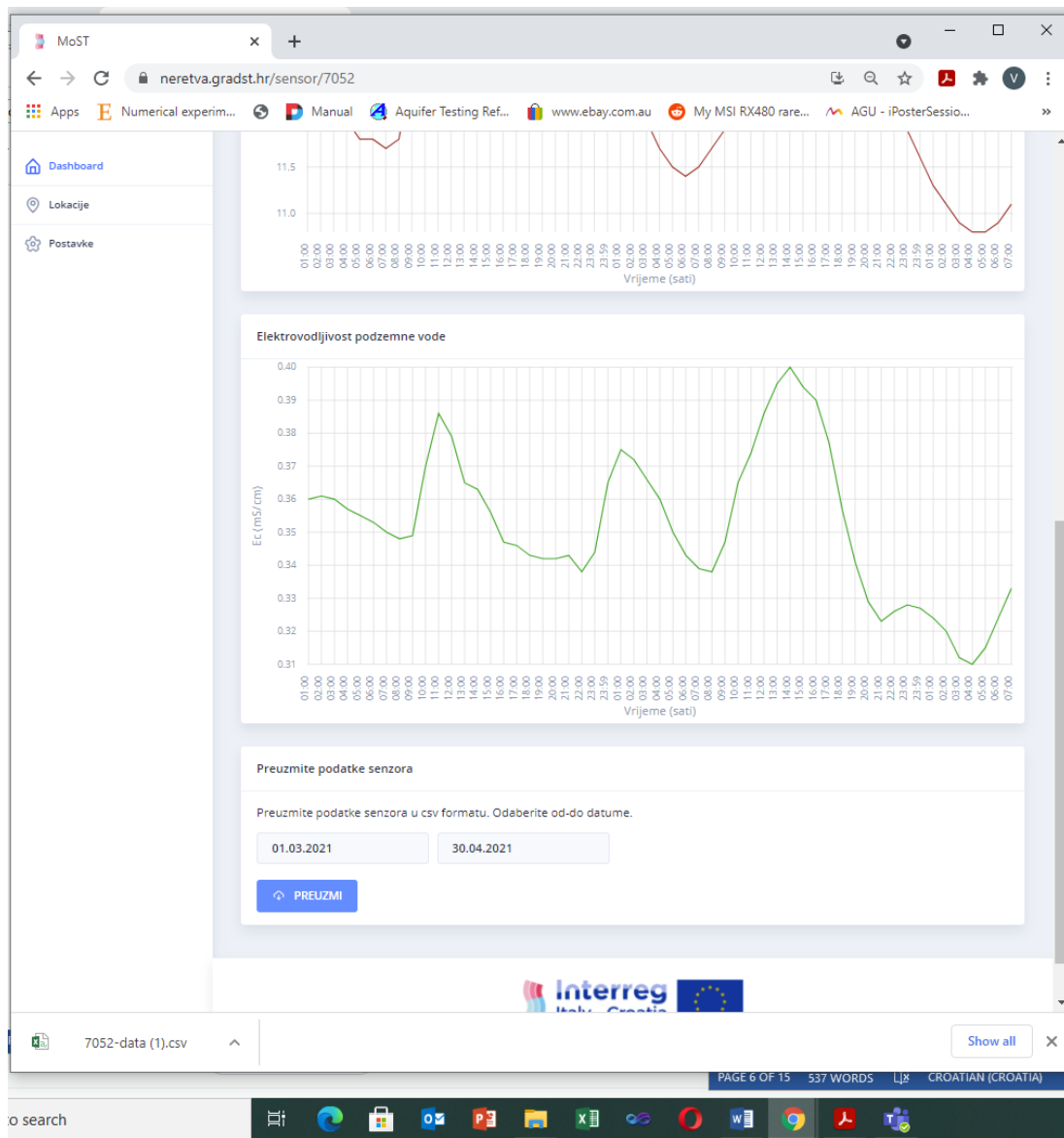
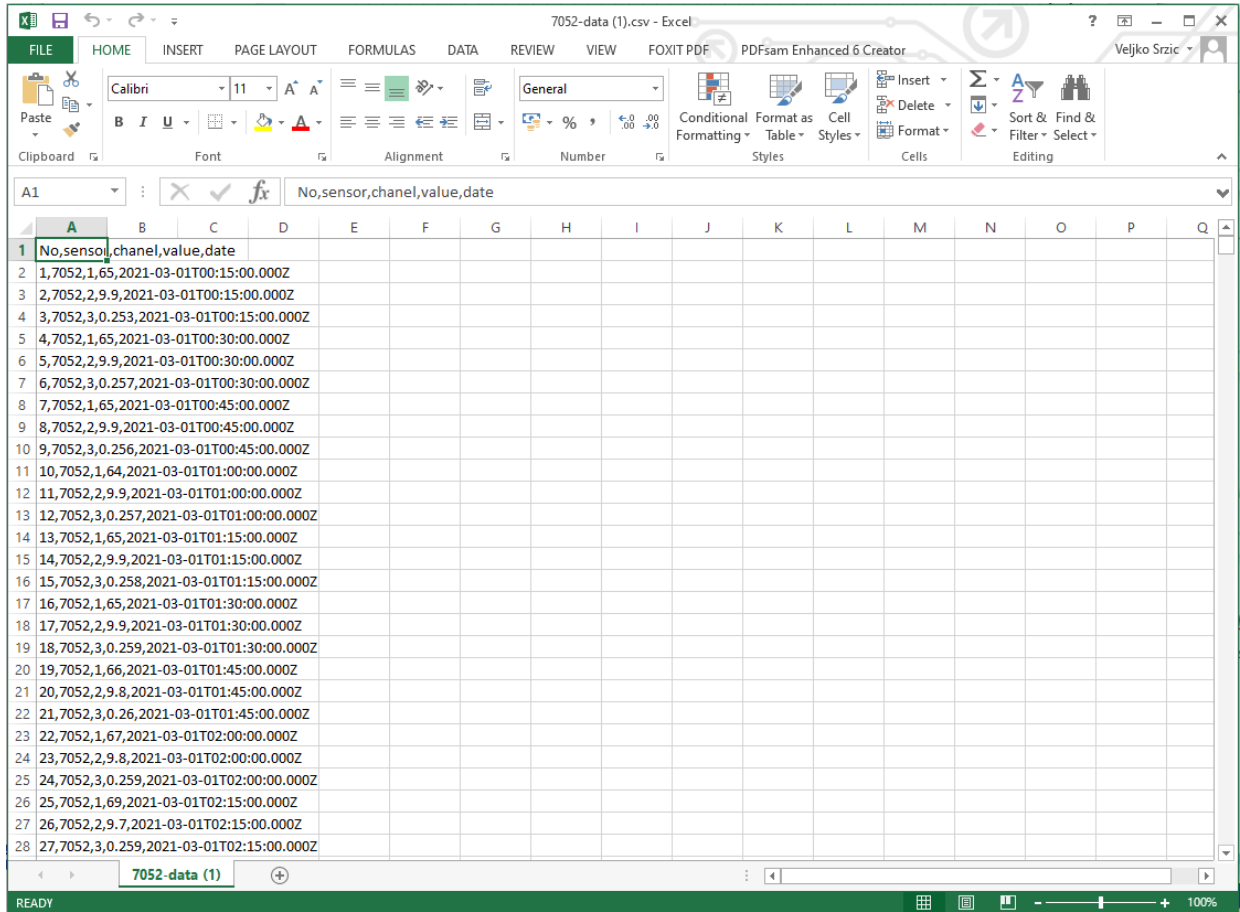


Figure 7 User interface of the MoST Web tool – after definition of interval of interest and data sets download in csv format (bottom left corner)



The screenshot shows an Excel spreadsheet titled "7052-data (1).csv". The spreadsheet has four columns: A (Sensor ID), B (Channel), C (Value), and D (Date). The data is as follows:

A	B	C	D
1	No,sensor,	chanel,	value,date
2	1,7052,1,65,	2021-03-01T00:15:00.000Z	
3	2,7052,2,9.9,	2021-03-01T00:15:00.000Z	
4	3,7052,3,0.253,	2021-03-01T00:15:00.000Z	
5	4,7052,1,65,	2021-03-01T00:30:00.000Z	
6	5,7052,2,9.9,	2021-03-01T00:30:00.000Z	
7	6,7052,3,0.257,	2021-03-01T00:30:00.000Z	
8	7,7052,1,65,	2021-03-01T00:45:00.000Z	
9	8,7052,2,9.9,	2021-03-01T00:45:00.000Z	
10	9,7052,3,0.256,	2021-03-01T00:45:00.000Z	
11	10,7052,1,64,	2021-03-01T01:00:00.000Z	
12	11,7052,2,9.9,	2021-03-01T01:00:00.000Z	
13	12,7052,3,0.257,	2021-03-01T01:00:00.000Z	
14	13,7052,1,65,	2021-03-01T01:15:00.000Z	
15	14,7052,2,9.9,	2021-03-01T01:15:00.000Z	
16	15,7052,3,0.258,	2021-03-01T01:15:00.000Z	
17	16,7052,1,65,	2021-03-01T01:30:00.000Z	
18	17,7052,2,9.9,	2021-03-01T01:30:00.000Z	
19	18,7052,3,0.259,	2021-03-01T01:30:00.000Z	
20	19,7052,1,66,	2021-03-01T01:45:00.000Z	
21	20,7052,2,9.8,	2021-03-01T01:45:00.000Z	
22	21,7052,3,0.26,	2021-03-01T01:45:00.000Z	
23	22,7052,1,67,	2021-03-01T02:00:00.000Z	
24	23,7052,2,9.8,	2021-03-01T02:00:00.000Z	
25	24,7052,3,0.259,	2021-03-01T02:00:00.000Z	
26	25,7052,1,69,	2021-03-01T02:15:00.000Z	
27	26,7052,2,9.7,	2021-03-01T02:15:00.000Z	
28	27,7052,3,0.259,	2021-03-01T02:15:00.000Z	

Figure 8 User interface of the MoST Web tool – structure of the csv file generated by the MoST Web tool for data storing and querying

Web App – English version

Same procedure as previously done for Croatian operative mode is demonstrated within this chapter, with exception for English operative mode. Below, in Figure 9 to Figure 12 Web app is shown with its front end and interface for end users in English language. First step in reaching in situ observed data via Web tool is to select appropriate location and probe as shown in Figure 9 and Figure 10.

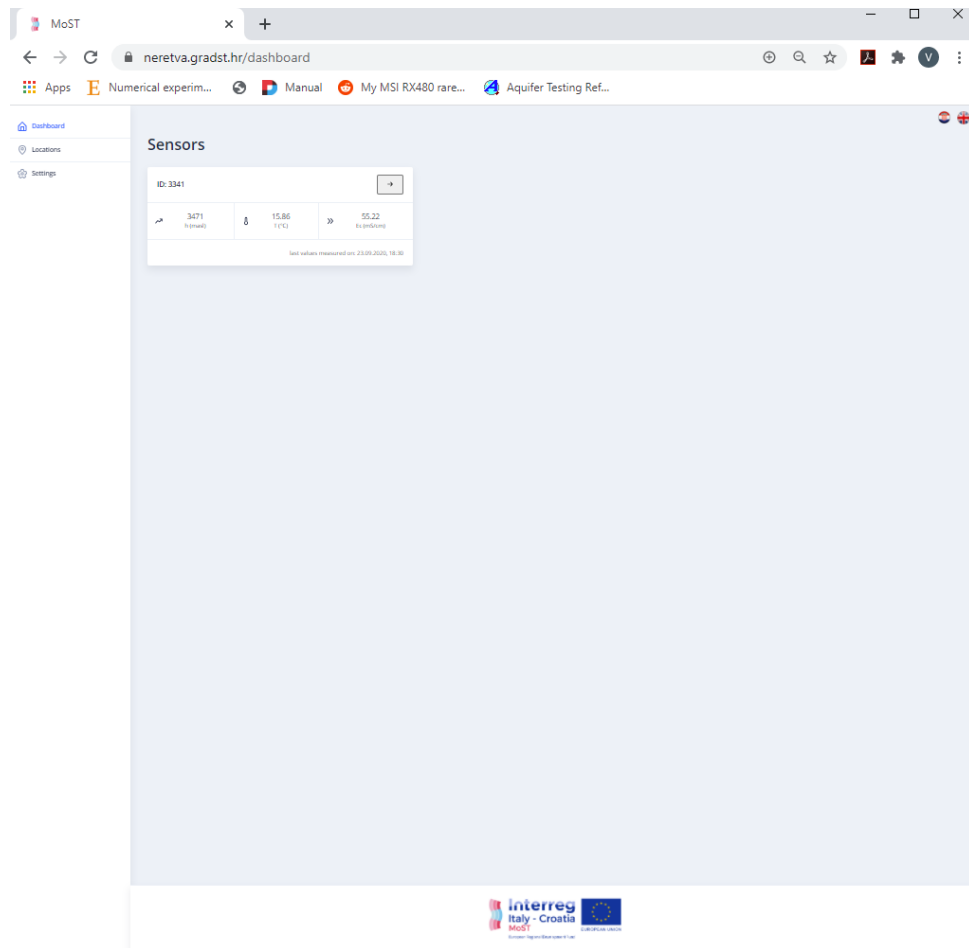


Figure 9 User interface of the MoST Web App

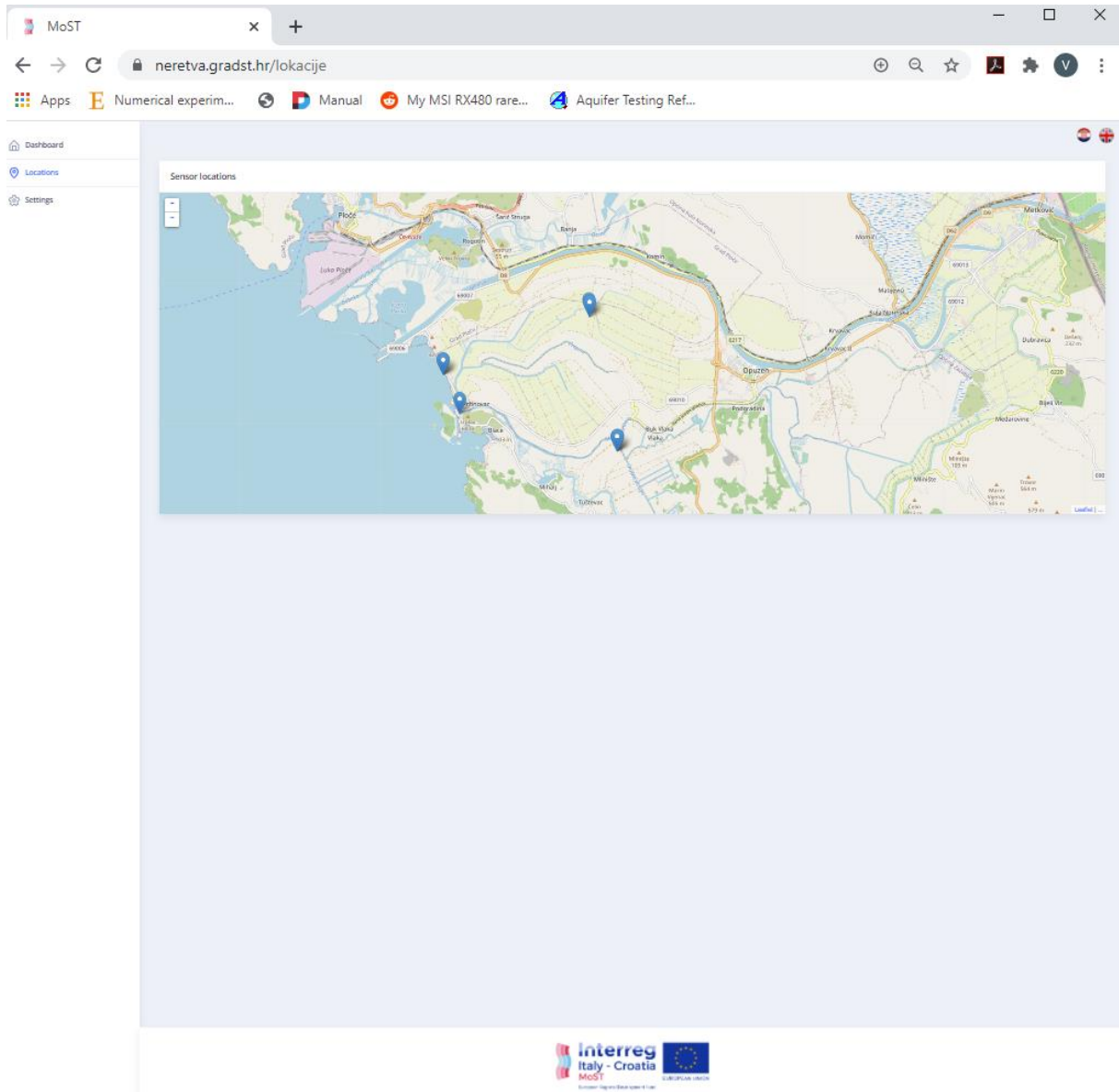


Figure 10 User interface of the MoST Web App – selection of the probes and sensor location/s

After selection of the probe of interest, the user can choose between two options: i) whether to get insight to real time piezometric head, temperature and electrical conductivity values (Figure 10) or ii) to use Web tool as a source of data sets observed during past period of defined length (Figure 12).

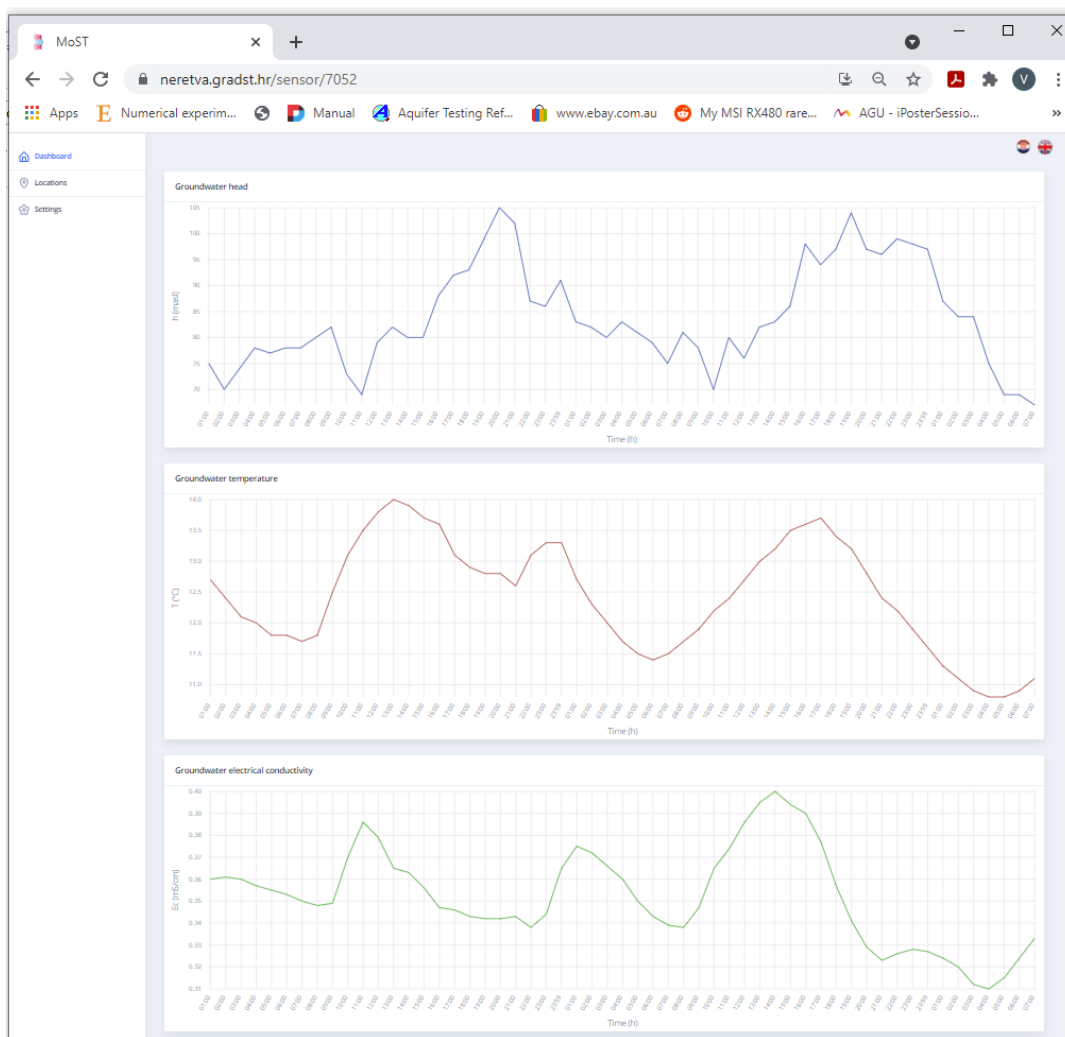


Figure 11 User interface of the MoST Web App – insight to real time values of piezometric head, temperature and electrical conductivity from selected sensor

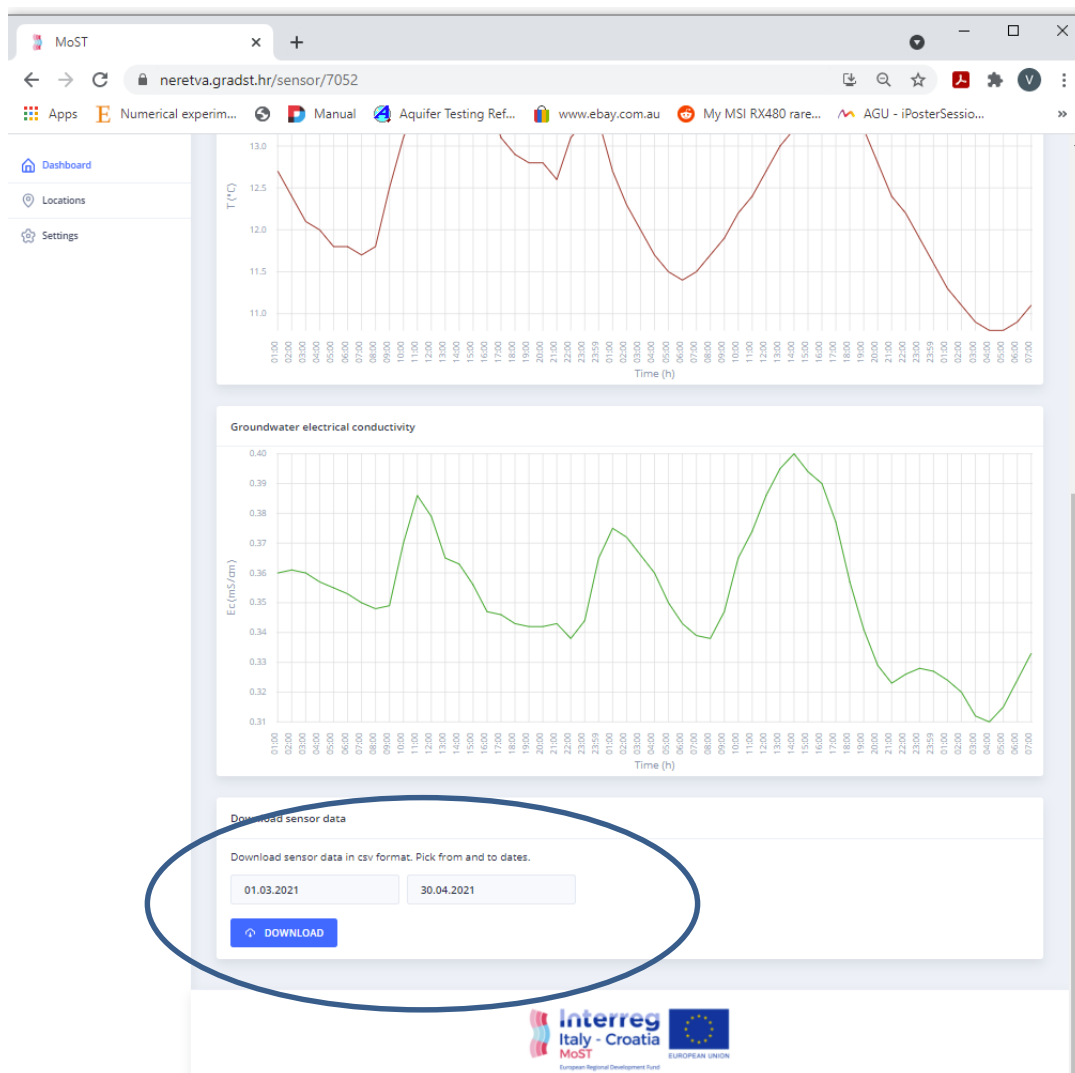


Figure 12 User interface of the MoST Web tool - location of the Web tool interface for data storing and querying

Web tool for data storing and querying screen is set up in bottom left corner of App interface (Figure 12). To access observed data, end user has to define the length of data series, by definition of starting and ending date as demonstrated in Figure 13. Ending point in accessing observed data series is shown in Figure 14. After selection of appropriate interval of interest,

Web tool offers a download option and csv format delivery to personal computer. Print screen of downloaded file (Figure 15) with clear structure of downloaded file and available data sets can be easily adapted to users need.

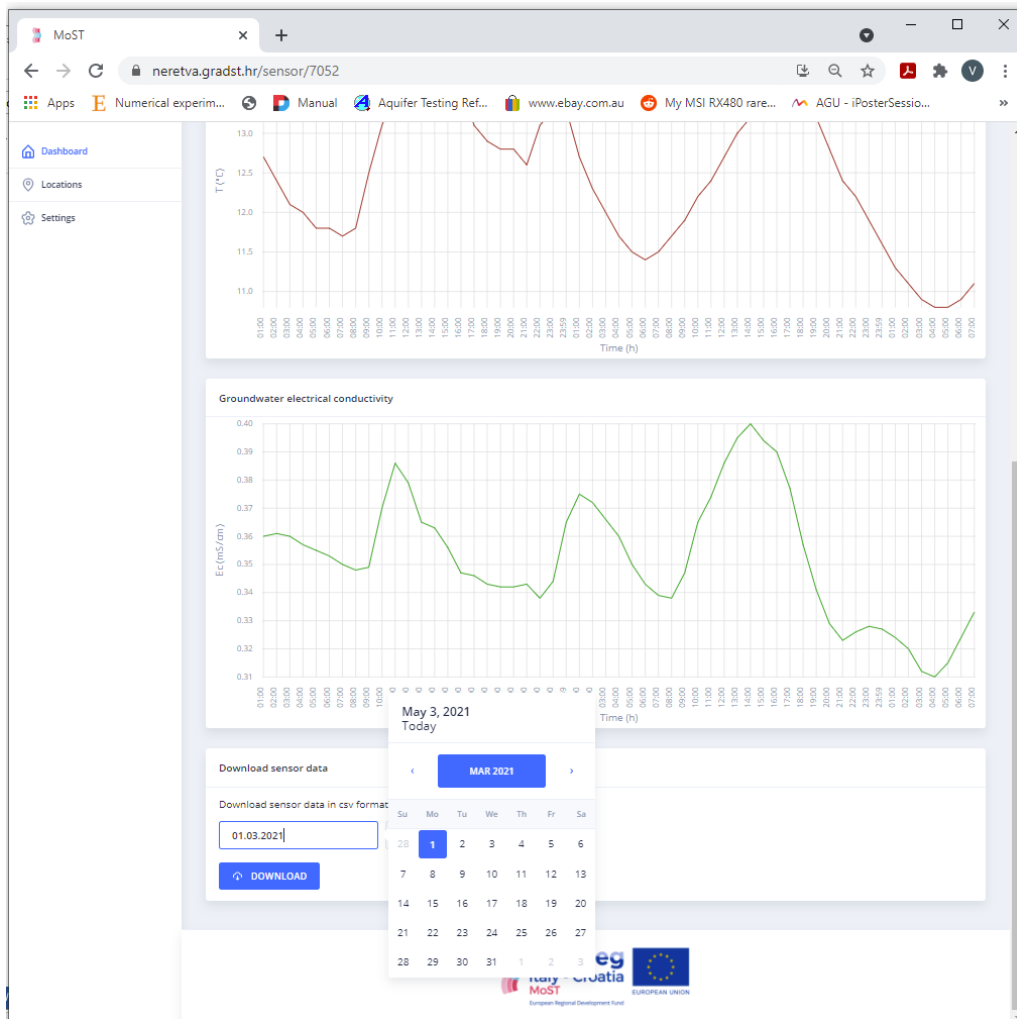


Figure 13 User interface of the MoST Web tool - location of the Web tool interface for data storing and querying with option to select interval of interest

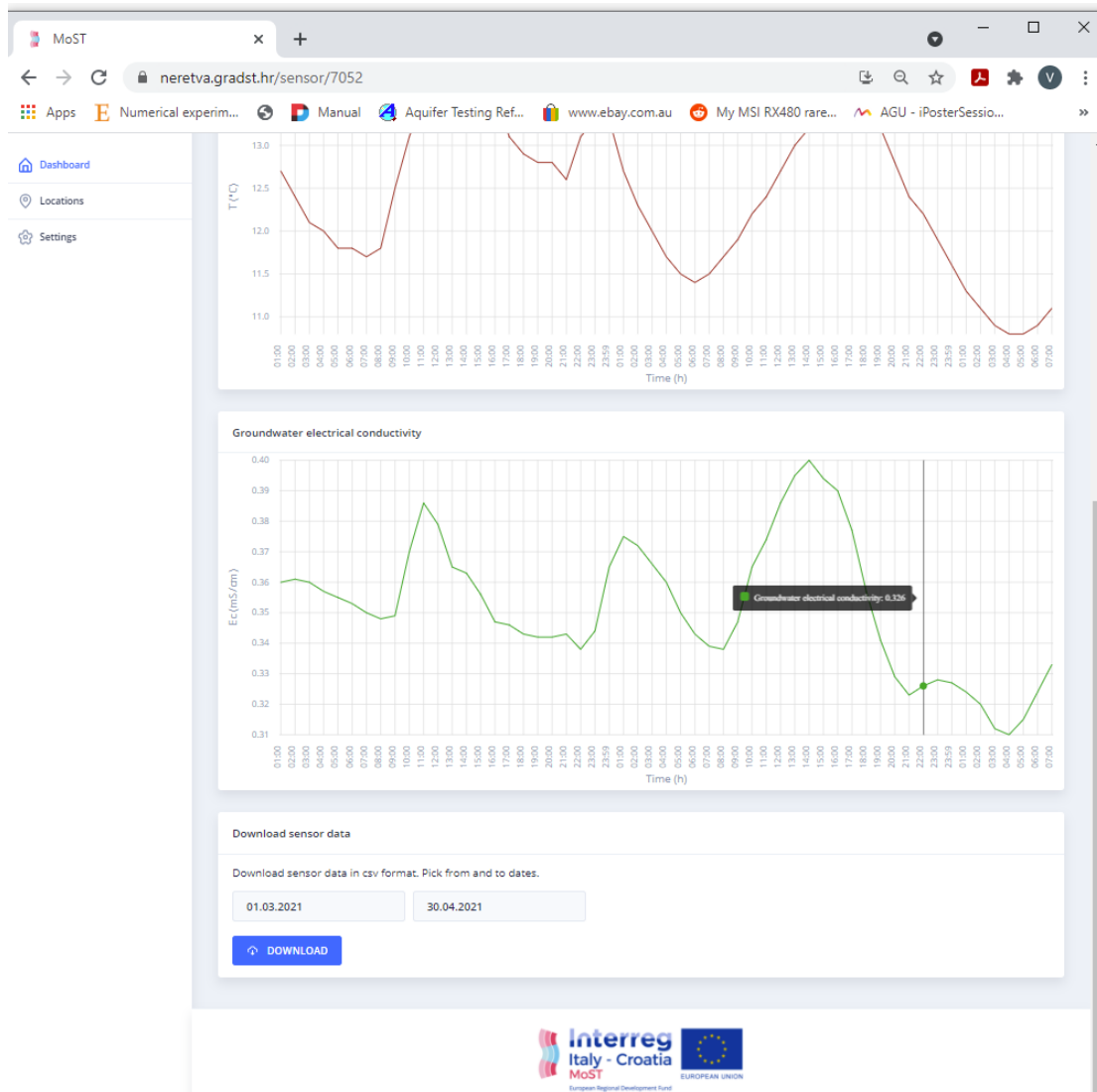
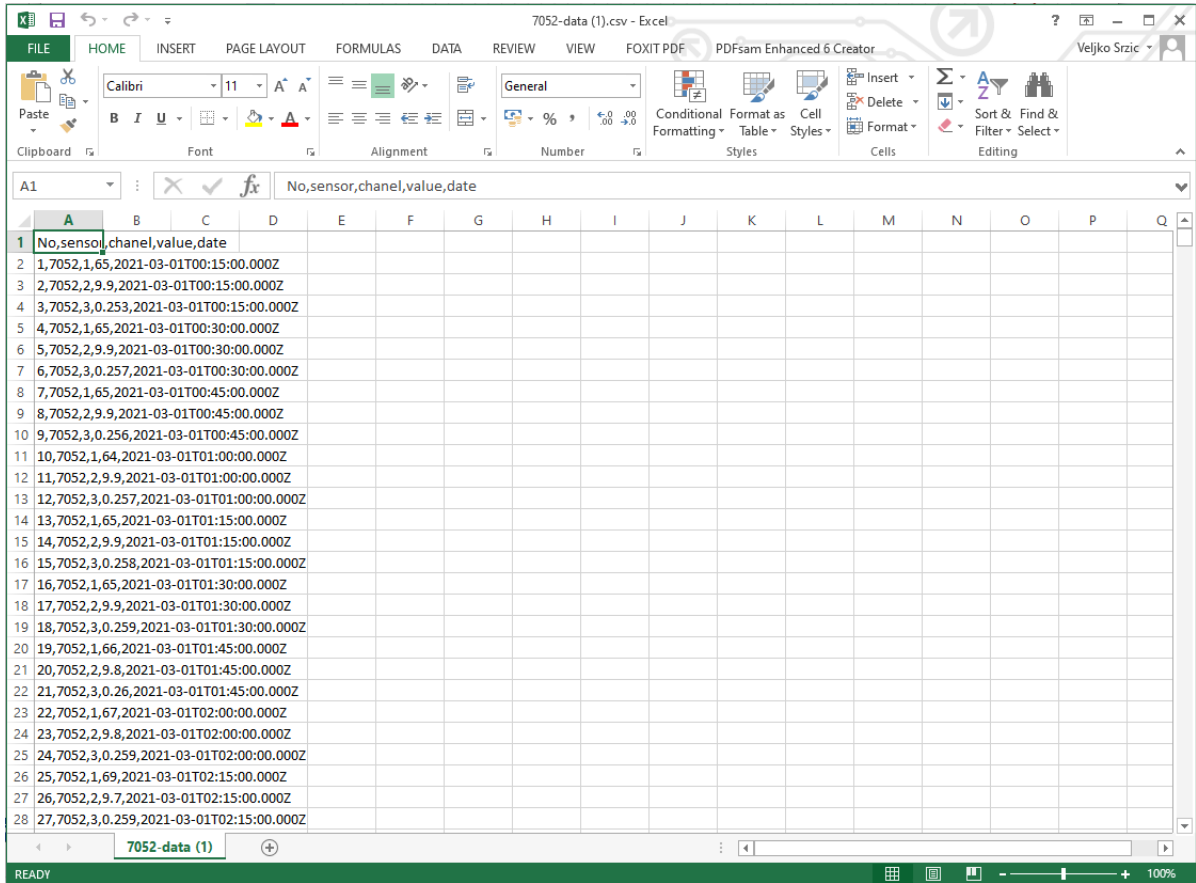


Figure 14 User interface of the MoST Web tool – after definition of interval of interest and data sets download in csv format (bottom left corner)



No	sensor	chanel	value	date
1	7052	1,65		2021-03-01T00:15:00.000Z
2	7052	2,9.9		2021-03-01T00:15:00.000Z
3	7052	3,0.253		2021-03-01T00:15:00.000Z
4	7052	1,65		2021-03-01T00:30:00.000Z
5	7052	2,9.9		2021-03-01T00:30:00.000Z
6	7052	3,0.257		2021-03-01T00:30:00.000Z
7	7052	1,65		2021-03-01T00:45:00.000Z
8	7052	2,9.9		2021-03-01T00:45:00.000Z
9	7052	3,0.256		2021-03-01T00:45:00.000Z
10	7052	1,64		2021-03-01T01:00:00.000Z
11	7052	2,9.9		2021-03-01T01:00:00.000Z
12	7052	3,0.257		2021-03-01T01:00:00.000Z
13	7052	1,65		2021-03-01T01:15:00.000Z
14	7052	2,9.9		2021-03-01T01:15:00.000Z
15	7052	3,0.258		2021-03-01T01:15:00.000Z
16	7052	1,65		2021-03-01T01:30:00.000Z
17	7052	2,9.9		2021-03-01T01:30:00.000Z
18	7052	3,0.259		2021-03-01T01:30:00.000Z
19	7052	1,66		2021-03-01T01:45:00.000Z
20	7052	2,9.8		2021-03-01T01:45:00.000Z
21	7052	3,0.26		2021-03-01T01:45:00.000Z
22	7052	1,67		2021-03-01T02:00:00.000Z
23	7052	2,9.8		2021-03-01T02:00:00.000Z
24	7052	3,0.259		2021-03-01T02:00:00.000Z
25	7052	1,69		2021-03-01T02:15:00.000Z
26	7052	2,9.7		2021-03-01T02:15:00.000Z
27	7052	3,0.259		2021-03-01T02:15:00.000Z

Figure 15 User interface of the MoST Web tool – structure of the csv file generated by the MoST Web tool for data storing and querying

List of figures

Figure 1 Web tool for data storing and acquisition on MoST Web App	3
Figure 2 User interface of the MoST Web App.....	5
Figure 3 User interface of the MoST Web App – selection of the probes and sensor location/s..	6
Figure 4 User interface of the MoST Web App – insight to real time values of piezometric head, temperature and electrical conductivity from selected sensor	7
Figure 5 User interface of the MoST Web tool - location of the Web tool interface for data storing and querying.....	8
Figure 6 User interface of the MoST Web tool - location of the Web tool interface for data storing and querying with option to select interval of interest	9
Figure 7 User interface of the MoST Web tool – after definition of interval of interest and data sets download in csv format (bottom left corner)	10
Figure 8 User interface of the MoST Web tool – structure of the csv file generated by the MoST Web tool for data storing and querying	11
Figure 9 User interface of the MoST Web App.....	12
Figure 10 User interface of the MoST Web App – selection of the probes and sensor location/s	13
Figure 11 User interface of the MoST Web App – insight to real time values of piezometric head, temperature and electrical conductivity from selected sensor	14
Figure 12 User interface of the MoST Web tool - location of the Web tool interface for data storing and querying.....	15
Figure 13 User interface of the MoST Web tool - location of the Web tool interface for data storing and querying with option to select interval of interest	16

Figure 14 User interface of the MoST Web tool – after definition of interval of interest and data sets download in csv format (bottom left corner) 17

Figure 15 User interface of the MoST Web tool – structure of the csv file generated by the MoST Web tool for data storing and querying 18