

## RESEARCH ON THE VULNERABILITY OF SOMEȘ MIC MEADOW IN TERMS OF HYDROGEOLOGICAL

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**Abstract.** The area between Cluj-Napoca and Apahida consists of miocene and quaternary deposits. Miocene (tortonian) is affected by salty diapirism manifested by salt water, which influences the water chemistry of quaternary deposits. Characteristic in terms of hydrogeological is that in Someș Mic River valley, the drillings made by OCPGA Cluj revealed the quaternary deposits, hosted in the aquifer.

**Keywords:** vulnerabilty, meadow, hydrogeological, groundwater

### INTRODUCTION

On the surface (as topsoil) met powder clay or sandy shores and rarely clay. This complex, low permeable, was found in depths of typically 1.00 to 2.00 m from ground level and sometimes to a depth of 5.00 m. Often this complex was not met at all.

Under complex low permeability or directly below the topsoil layer is made of high permeability sandy gravel, cobble gravel and sand, and sometimes at the top, muddy or silty sands. The permeable layer typically occurs to a depth of 3.00 to 5.00 m from the surface, and some places even up to 8.00 to 10.00 m in depth. As mentioned previously permeable complex, drilling entered the base layer formed on the entire surface of the toortonian marls.

### MATERIAL AND METHOD

Periodic level measurements might perform in some rural wells in the area over a longer period would provide more complete information on the temporal variation of groundwater level in correlation with rainfall and river levels.

Aquifer is related to surface water from the river Someș Mic.

General direction of groundwater flow is along the floodplain and skewed towards the river. Groundwater flow gradients have different values, ranging from 1-4%.

The mapping performed by ISPIFGA indicated a number of sources (some captured) which had a rate generally lower than 0.5 l / s An exception is the source of the commune Dezmir whose flow was about 2 l / s on mapping.

### RESULTS AND DISCUSSION

These springs are located at the base of the slope and slope are shown on the site plan. They continually feeds the aquifer, helping to maintain the high level of groundwater.

The presence of ponding water is indicated by the fact that along the slope in some areas (both on the left and on the right) are water collection channels. In some areas of land depressions where channels have a slope drain enough water is the surface, forming puddles, almost permanent character.

The formation of these accumulations of water (puddles) frequently encountered within the perimeter, is partly explained by the existence of low permeability layer dusty sand from the surface.

Table 1

Centralizing piezometric levels (cm) in drilling Jucu F1 (2011)

Day	Month											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
3	174	170	161	141	144	171	191	207	219	239	242	246
6	175	169	160	141	145	173	191	209	222	239	242	247
9	175	167	158	140	147	177	192	209	226	240	243	246
12	176	166	156	140	149	180	193	211	228	241	244	245
15	177	165	153	139	151	180	194	212	232	241	244	244
18	176	164	152	138	152	181	196	213	235	242	243	243
21	175	164	149	139	155	183	197	213	237	242	244	243
24	174	163	146	140	159	186	199	216	238	243	244	242
27	174	163	144	141	162	188	201	217	239	243	245	242
30	172	162	143	142	166	189	203	219	240	244	246	241
Max	172	162	143	138	144	171	191	207	219	239	242	241
Med	175	165	152	140	153	181	196	213	232	241	244	244
Min	177	170	161	142	166	189	203	219	240	244	246	247
Annual maximum	138											
Annual average	195											
Annual minimum	247											

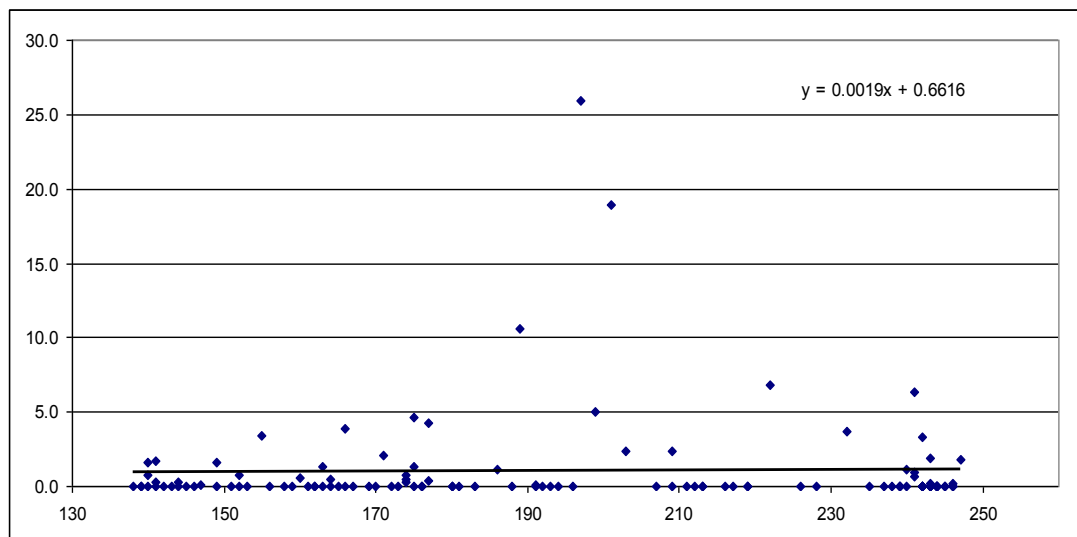


Fig. 1. Correlation between the piezometric level (cm) at drill Jucu F1 and precipitation (mm) recorded in 2011

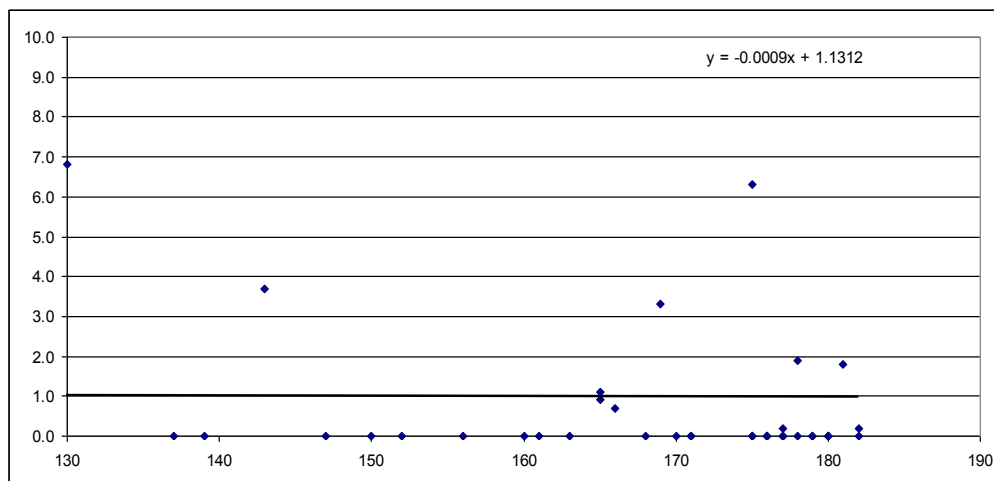


Fig. 2. Correlation between the piezometric level (cm) at drill Jucu F2 and precipitation (mm) recorded in 2011

In table 2 piezometric levels are given (cm) in F2 Jucu drilling for the year 2011 on the groundwater level variation. In 2011, drilling F2 Jucu, it is estimated that the spread of oscillation of the water level can be between 0,5 m - 1,82 m.

Table 2

Centralizing piezometric levels (cm) in drilling Jucu F2 (2011)

Day	Month											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
3	86	75	68	53	55	76	90	112	126	161	175	182
6	85	74	66	53	57	79	92	114	130	163	176	181
9	84	74	65	52	60	81	94	115	137	165	175	180
12	84	73	63	51	61	83	96	115	139	165	176	180
15	83	73	60	50	63	84	98	116	143	166	177	179
18	83	72	58	50	65	84	99	116	147	168	177	178
21	81	72	57	51	66	85	102	116	150	169	178	177
24	80	71	56	51	68	86	104	117	152	170	179	177
27	78	71	55	52	71	86	107	117	156	171	180	176
30	77	70	54	52	73	87	109	120	160	171	182	175
Max	77	70	54	50	55	76	90	112	126	161	175	175
Med	82	73	60	52	64	83	99	116	144	167	178	179
Min	86	75	68	53	73	87	109	120	160	171	182	182
Annual maximum	50											
Annual average	108											
Annual minimum	182											

It also indicates the presence of puddles around Someșeni, which has a very high mineralization being fueled by information from a mineral spring, now polluted by waste. High water level in irrigated areas is due to irrigation canals dug by permeable layer of

sand, gravel and cobble. This layer is therefore supplied with water from irrigation, resulting in an increase in hydrostatic the area.

On the variation of groundwater level data are presented piezometric levels (cm) in drilling F1 Jucu in table 1 for the year 2011. In 2011, drilling F1 Jucu, it is estimated that the spread of oscillation of the water level can be between 1,38 m - 2,47 m. In figure 1 and in figure 2, are presented correlations between piezometric levels in the two drilling from Jucu and precipitation on days in which measurements were made.

### CONCLUSIONS

On the measurements made in the drills from Jucu and Iclod using the Gis technique, we made a thematic map (figure 3) representing the medium annual piezometric levels for drills Jucu and Iclod.

### Medium annual piezometric levels for drills Jucu and Iclod

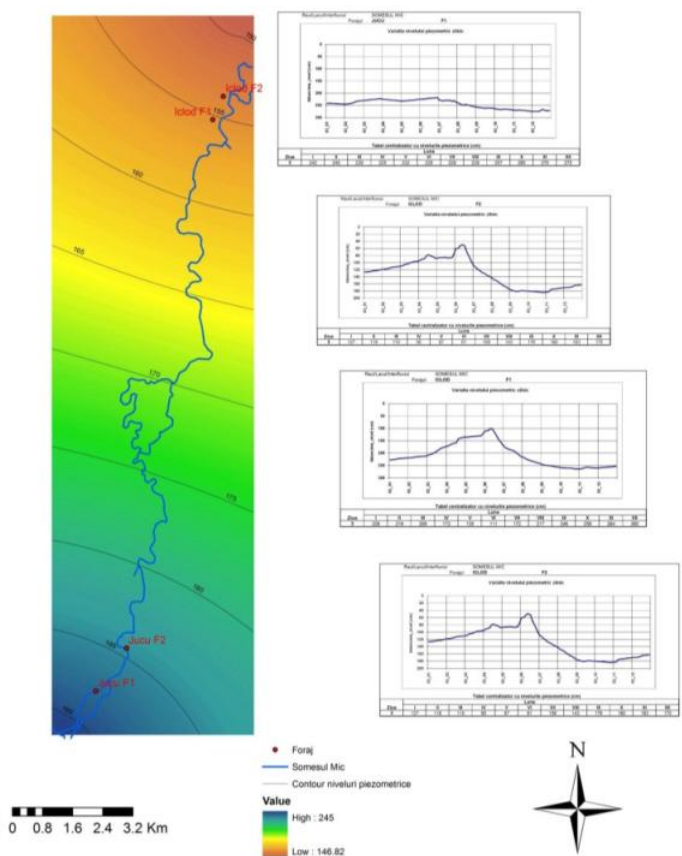


Fig. 3. Medium annual piezometric levels for drills Jucu and Iclod

### REFERENCES

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