

Theme No. 3

Drainage Policy for Water Resources Protection and Agricultural Landuse

(Case Study on the RISWC Prague-Zbraslav Experimental Field)

Jakub Stibinger , Pavel Kovar

Czech University of Life Science Prague

Faculty of Environmental Sciences



► **PROJECT**

is focused on water resources protection and agriculture landuse, it means to manage water regime for mitigation of negative impacts in flood and dry seasons and protect the agricultural land.

► **PURPOSE**

is to elaborate a clear methodology for drainage hydrology of water regimes necessary for arable land, permanent grassland, forest and water resources.

► **AIM**

is to apply a drainage policy for biotechnical measures to optimise water regime, growing crops and to protect water resources. Case study: The RISWC Prague-Zbraslav Exp. Field.

Drainage policy in agricultural landscape

Norwegian Funds: 2. Environment
c. Aquaculture and Water Resources Protection.
Water Interaction with Particular Focus
in Agricultural Landuse



Water regime protection of wetland by subsurface pipe
drainage system,
forestry landscape next to Mariánské Lázně,
Czech Republic



Construction of landfill base drainage system, Osecna Landfill, Czech Republic (water regime and soil protection)



Wooden trench system in Tereza Valley, Nove Hradky, Czech Republic



Case study: RISWC Prague-Zbraslav drainage experimental field in agricultural arable land

Model of subsurface total drainage quantity in non-steady state drainage flow

Differences between cumulative and calculated daily values of the subsurface total drainage quantity from the RISWC Prague-Zbraslav experimental field.

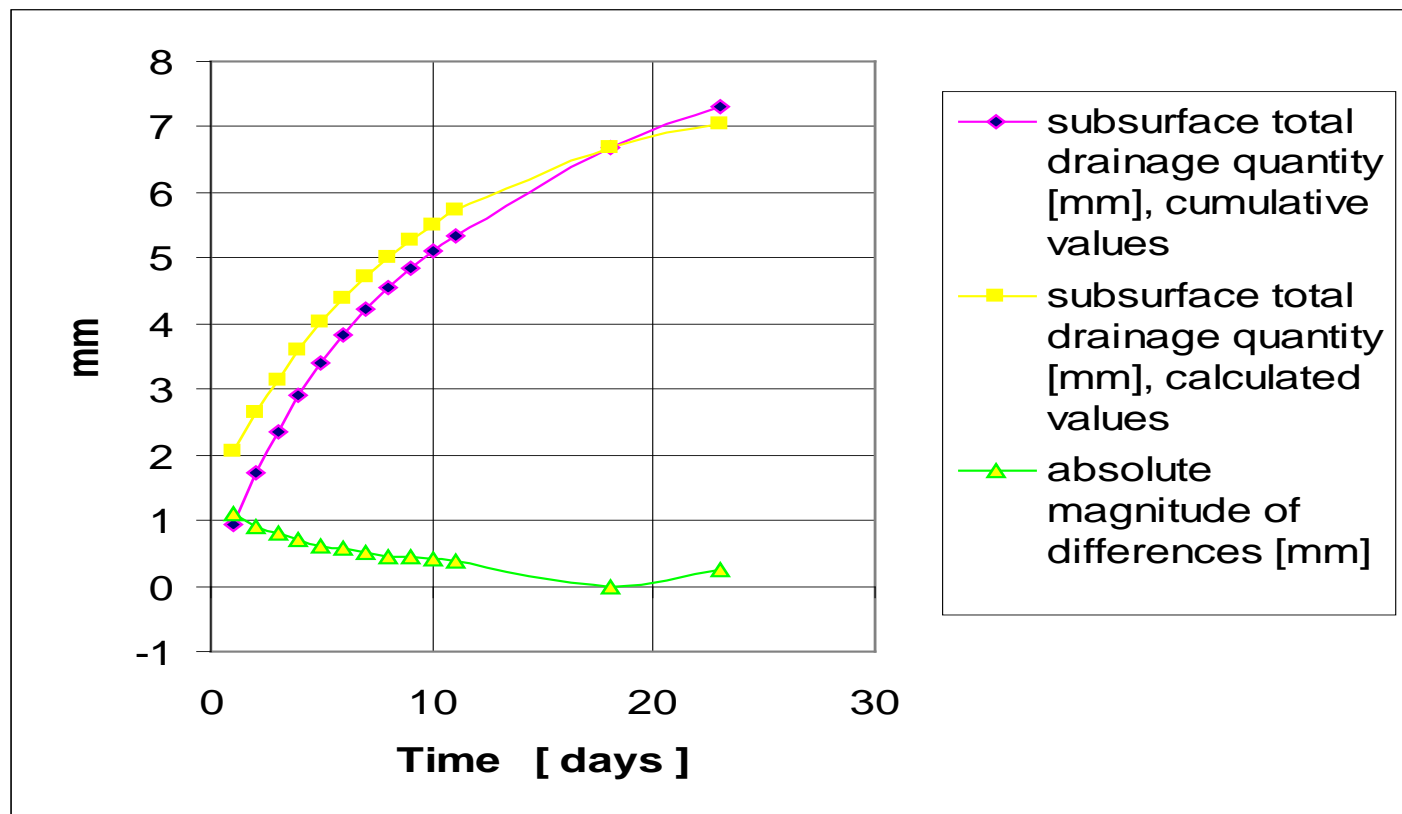


Days	Subsurface total drainage quantity [mm], cumulative values	Subsurface total drainage quantity [mm], calculated values	Differences [mm] absolute magnitude	Differences [%]
1	0.95	2.06	1.11	15.23
2	1.73	2.63	0.90	12.44
3	2.36	3.15	0.79	10.86
4	2.90	3.61	0.71	9.77
5	3.40	4.02	0.62	8.57
6	3.82	4.39	0.57	7.85
7	4.21	4.72	0.51	7.02
8	4.56	5.01	0.45	6.26
9	4.85	5.28	0.43	5.89
10	5.11	5.51	0.40	5.55
11	5.35	5.72	0.37	5.14
18	6.68	6.68	0.00	0.00
23	7.30	7.03	0.26	3.59



Case study: RISWC Prague-Zbraslav drainage experimental field in agricultural arable land

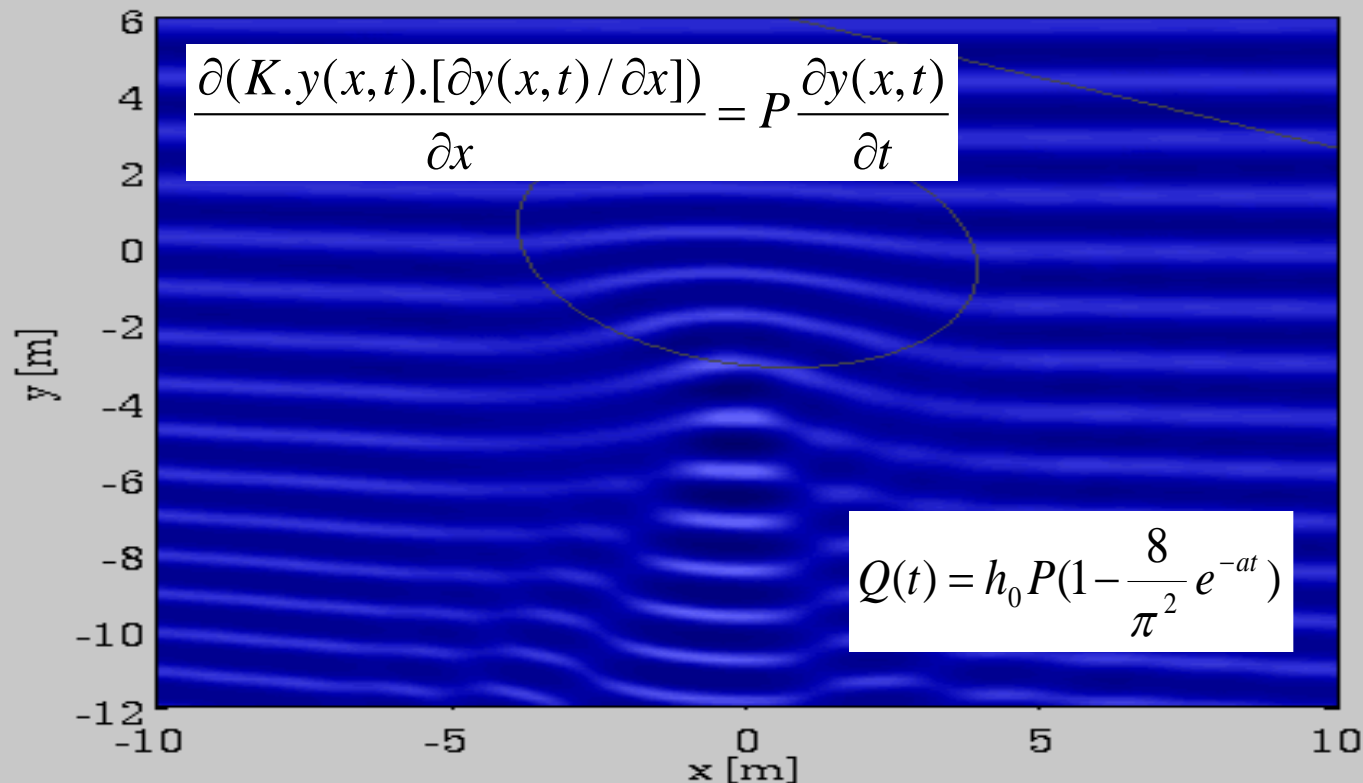
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Model of subsurface total drainage quantity in non-steady state drainage flow

Boussinesq's Equation and derived final formula



Conclusions:

- ▶ The biggest daily difference (approximately 0.71 mm) will be at the beginning of the validity of equation 6 (approximately at time t (day)=4) at the 4th day. Other differences will be smaller.
- ▶ The linearization of Boussinesq's Equation is relevant for relatively deep barriers. This approximation (even as H was substituted by $l' + h_0/4$), introduces errors in the estimations of the drain flow rates.
- ▶ The next observation and drainage hydrology calculations are needed to provide better conditions for agriculture, water resources and for greenhouse gas emission and nitrogen runoff control.
- ▶ According to these conditions the system of wise drainage measures should mitigate the negative impact of hydrological extremes, increase retention capacity and protect the water regime.