PUMa – modelling the groundwater flow in Baltic Sedimentary Basin

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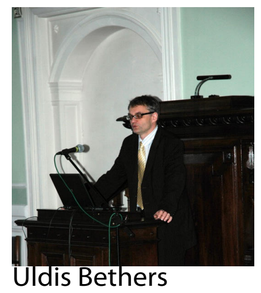

Uldis Bethers
Project head

ESF project
"Establishment of interdisciplinary scientist group and modelling system for groundwater research"

In 2009-2012 at University of Latvia and Latvia University of Agriculture project „Establishment of interdisciplinary scientist group and modelling system for groundwater research" is implemented financed by the European Social Fund. The aim of the project is to develop groundwater research in Latvia by establishing interdisciplinary research group and modelling system covering groundwater flow in the Baltic Sedimentary Basin. Researchers from fields like geology, chemistry, mathematical modelling, physics and environmental engineering are involved in the project.

The modelling system is used as a platform for addressing scientific problems such as: (1) large-scale groundwater flow in Baltic Sedimentary Basin and impact of human activities on it; (2) the evolution of groundwater flow since the last glaciation and subglacial groundwater recharge; (3) the effects of climate changes on shallow groundwater and interaction of hydrographical network and groundwater; (4) new programming approaches for groundwater modelling.

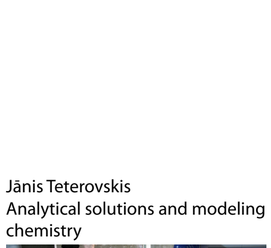
Within the frame of the project most accessible geological information such as description of geological wells, geological maps and results of seismic profiling in Latvia as well as Estonia and Lithuania are collected and integrated into modelling system. For example data form more then 40 thousands wells are directly used to automatically generate the geological structure of the model.

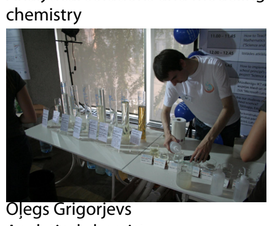
Additionally a groundwater sampling campaign is undertaken. Contents of CFC, stabile isotopes of O and H and radiocarbon are the most significant parameters of groundwater that are established in unprecedented scale for Latvia.

The most important modelling results will be published in web as a data set.

Project number: 2009/0212/1DP/1.1.1.2.0/09/APIA/VIAA/060; web-site: - www.puma.lu.lv

Analytical chemistry


Jānis Teterovskis
Analytical solutions and modeling chemistry

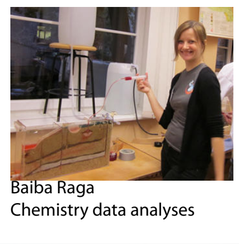

Oļegs Grigorjevs
Analytical chemistry


Konstantīns Viligurs
Analytical chemistry

Geology


Inga Retiķe
Microcomponent analyses


Āris Andersons
Geothermal modeling


Baiba Raga
Chemistry data analyses


Jānis Jātnieks
GIS solutions, clustering


Andis Kalvāns
Groundwater composition; author of the project proposal


Jānis Bikše
CFC data interpretation


Tomas Saks
Structural geology; Paleo subglacial hydrogeology


Konrāds Popovs
Model geometry

Alise Babre
Groundwater sampling; Isotopes


Aija Dēliņa
General hydrogeology


Eleonora Pērkone
Hydrogeological properties of rocks


Jānis Ukass
Model geometry


Andres Marandi
Estonia, isotopes

Mathematical modelling and physics


Tija Sīle
Climate data

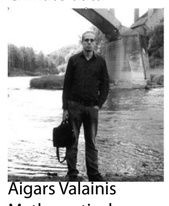

Jānis Virbulis
Leader of modeling group

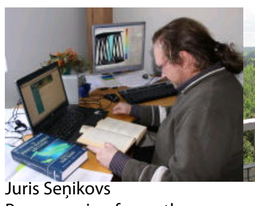

Ilze Klints
Mathematical modeling

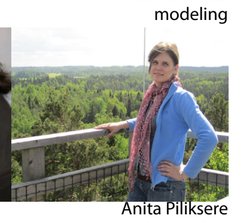

Daiga Cepite-Frišfelde
Climate data


Pēteris Bethers
Hydrological modeling


Andrejs Timuhins
Mathematical modeling


Aigars Valainis
Mathematical modelin


Juris Seņikovs
Programming for mathematical modeling

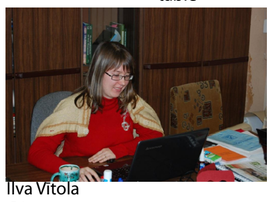

Anita Piliksere
Mathematical modeling

Environmental engineering


Agnese Gailuma
Data processing


Didzis Lauva
Seasonal fluctuation of groundwater table


Valdis Vircavs
Groundwater quality and influencing factors; Big boss

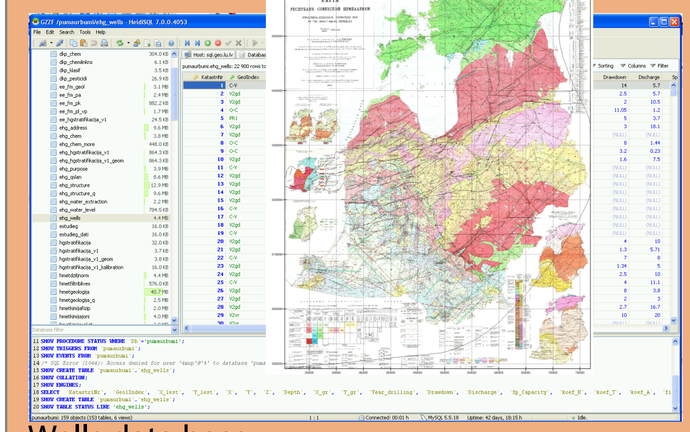

Ilva Vitola
Climate data


Zane Dimanta
Agricultural run-off

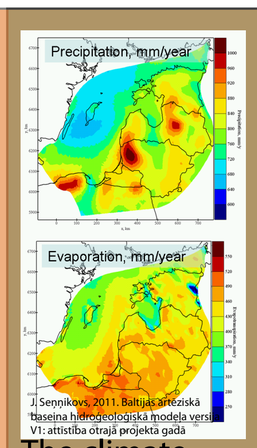

Artūrs Veinbergs
Groundwater table fluctuations

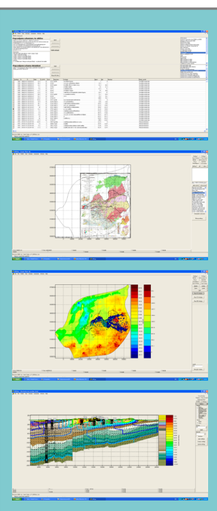

Kaspars Abramenko
Groundwater quality, modeling

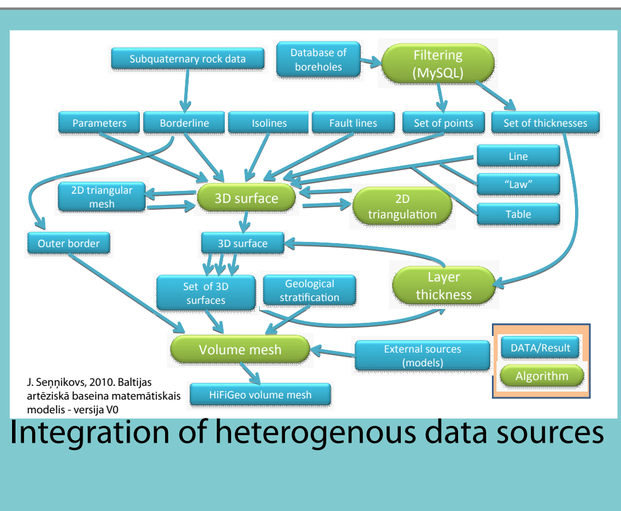
Data


Wells data base

Geological maps


The climate data

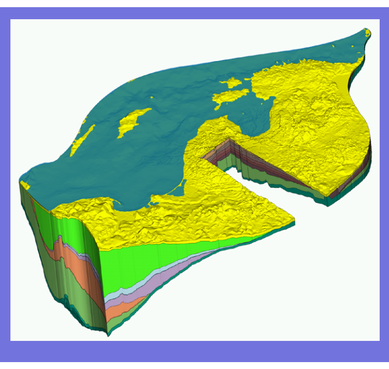

Custom made modeling and visualisation tools

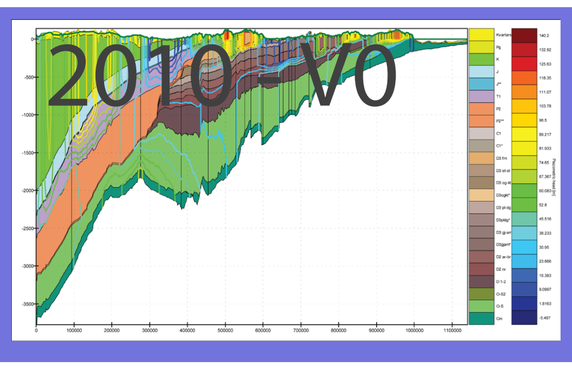

Integration of heterogenous data sources

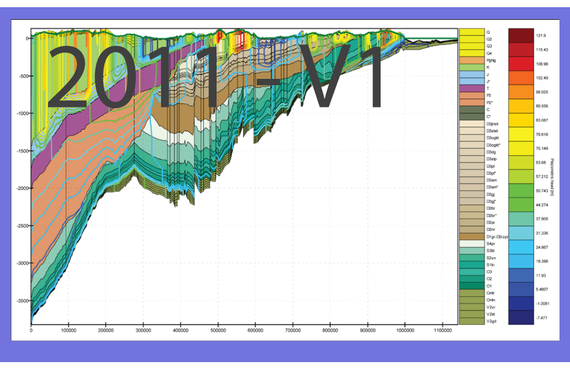
Tools


Scripted model generation

Results: model system







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