



FREEWAT

Free and Open Source Software Tools for Water Resource Management
EU HORIZON 2020 Project



 **ict4water.eu**

Open Workshop 1st FREEWAT User and Developers International Workshop

September 21st 2017

IDAEA. CID - CSIC

16 Jordi Girona. 08034 Barcelona

Selisoo Case Study - UTARTU

EIP Water Online Market Place
Matchmaking for water Innovation

**MAR Solutions - Managed Aquifer
Recharge Strategies and Actions
(AG128)**

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CID CELEBRAR
INNOVAR
DEBATRE
CENTRE D'INVESTIGACIÓ I DESENVOLUPAMENT 1967-2017

Taken from: <http://travessa-pirineus.blogspot.com.es/2014/08/dia-15-de-lospitalet-al-refugi-de-juclar.html>

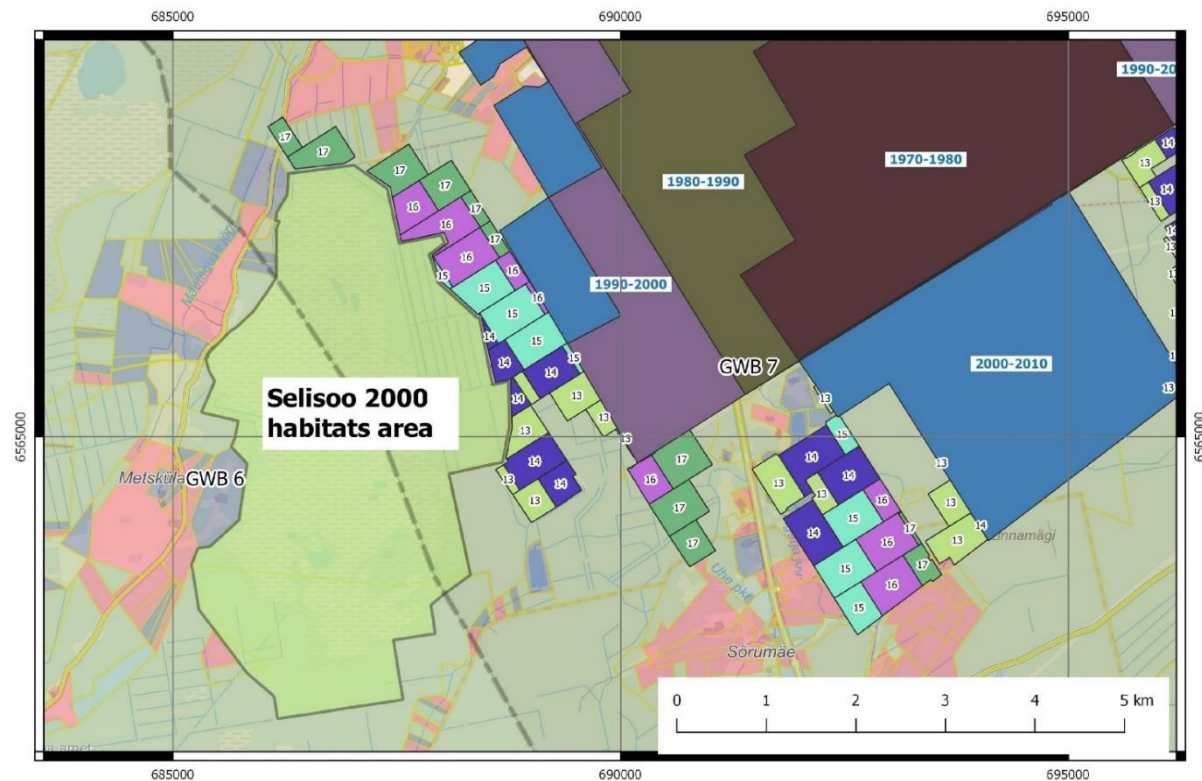
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Problem statement

- Underground mining takes place beside/under the Selisoo wetland (Natura 2000 area)
- The aim of the modelling is to assess the effect of mining to a wetland water balance

Case study represents:

- Groundwater management issue
- Groundwater and GDTE relationship



WFD (Directive 2000/60/EC)

Habitats Directive 92/43/EEC

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Water uses & WRM

- GWB of East-Viru Oil-Shale Mining Area (No 7)
- GWB has bad status
- Restoration is not feasible by 2021
- GWB bad status is defined by GRW quality (SO_4^{2-}) and quantitative (large depression cones, decreasing trend of GRW level)
- No classification tests are done for GDEs
- Selisoo is Natura 2000 protection area

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Relevant stakeholders, end users etc

Estonian Energy company (mining activity);

Mäeküla vallavalitsus (local authority);

Ministry of Environment, management of:

RBMBs;

Mineral resources;

Nature conservation areas;

ELF - NGO, nature protection

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The Activities

1. Implement Selisoo in Freewat software – test software
2. Freewat training
3. Sensitivity and calibration studies of Selisoo model
4. Selisoo case study stakeholder meeting to implement Freewat platform (early participation strategy)

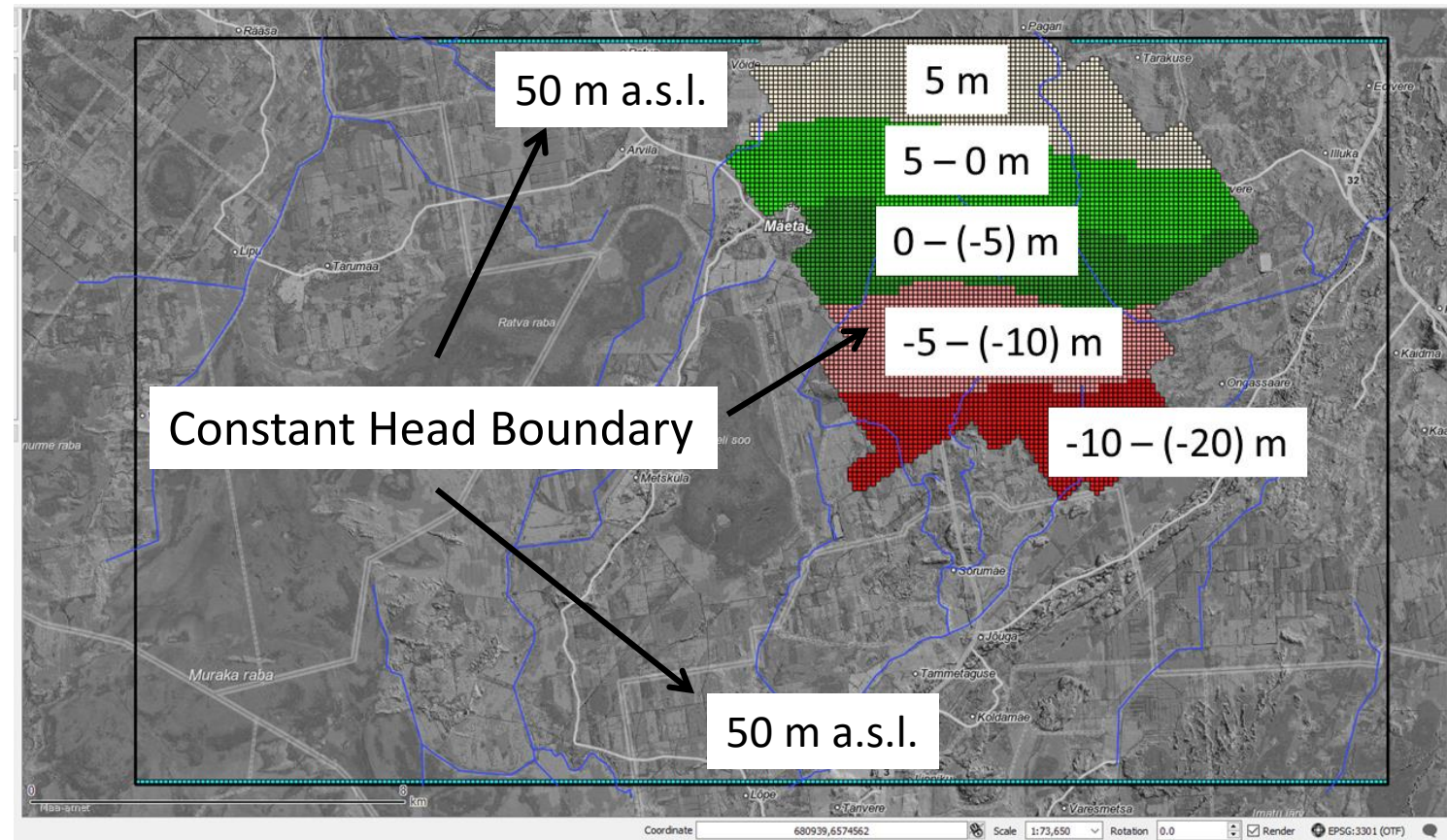
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The Activities

1. Implement Selisoo in Freewat software – test software
160 Rows, 299 Columns, 10 layers (16X29 km)

ModFlow packages:

- RECH
- CHB
- GHB
- RIV
- SFR
- HOB



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The Activities

2. Freewat training:

1. 2 basic trainings, 24th to 27th of January, Tallinn – 39 participants
2. Advanced training, 7th of March, Tallinn – 18 participants
3. Full training , 9th to 10th of March, Riga – 18 participants
4. Full training, 14th to 16th of March, Tartu – 15 participants

- Simple Selisoo model for training
- QGIS and Freewat Tutorials – English, Estonian
- All materials free for download:

http://freewat.ut.ee/sites/default/files/freewat/files/freewat_training_estonia.zip



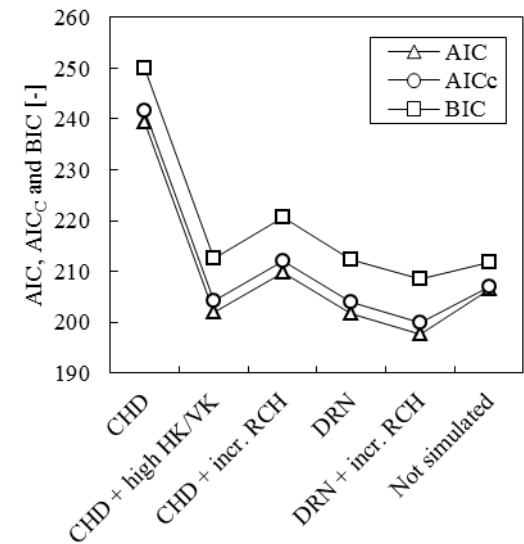
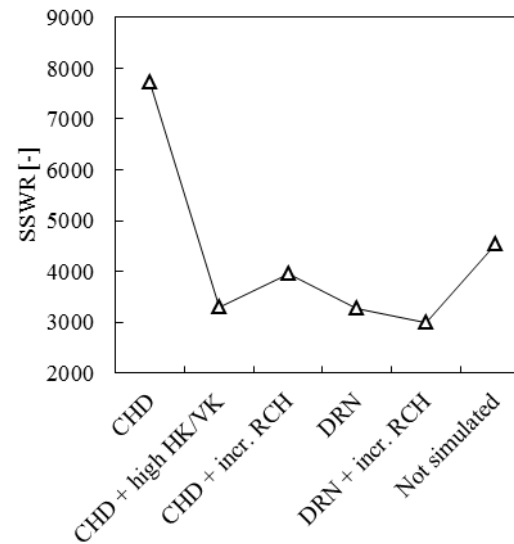
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The Activities

3. Sensitivity and calibration studies of Selisoo model

7 conceptual models:

- mine - CHD or DRN
- RCH distribution



Model type	Correlation Coefficient	Standard Deviation	AIC	AIC _c	BIC	SSWR
CHD	0.93	14.07	239	242	250	7725
CHD + high HK/VK	0.94	9.18	202	204	213	3287
CHD + incr. RCH	0.93	10.06	210	212	221	3946
DRN	0.96	9.17	202	204	212	3277
DRN + incr. RCH	0.95	8.76	198	200	208	2994
Not simulated	0.58	10.53	206	207	212	4543

Bayesian Information Criterion (BIC), Corrected Akaike Information Criterion (AICc) or the sum of squared weighted residuals (SSWR)

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The Activities

4. Selisoo case study stakeholder meeting to implement Freewat platform (early participation strategy)

The aim of 5 FG meetings:

- a) to introduce FREEWAT;
- b) to demonstrate the benefits of FREEWAT to a non-technical audience;
- c) to increase the numbers of FREEWAT users;
- d) to introduce early participation strategy.

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Follow up

In Estonia

- Early participation strategy is well taken and will be used in tendering descriptions in future MoE works;
- Freewat is already included into 1 Interreg and 1 Life project application;
- Estonian Geological Survey will Freewat party starting the 2018;

In EU

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In case of new ideas: **Andres Marandi**, andresmarandi@gmail.com