mfLab
http://code.google.com/p/mflab

TUDelft

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Why ?

- GUI's are expensive and not flexible enough
- GUI's make make development by students generally impossible
- Students learn nothing from them
- Need for powerful modeling environment
- Making use of any available modelling package
- TU-Delft has Matlab site license for all students and staff
- Connect Matlab with available free groundwater modeling software and everything is possible

Objectives of *mfLab*

- Easy and advanced groundwater modeling
- No artificial limitations
- Maximum flexibility and adaptability
- Development environment
- Reproducible modeling
- Parameterization of models
- Free for students and others
- No redundancy (prescribe how the model is made and you can do away of all model input and output files)

For whom?

- My MSc and PhD students
- Myself
- My employer
- Everybody for whom it may be useful and hopefully likes to add functionality to help letting mflab grow

What is mfLab?

- a set of Matlab functions and scripts that allow building groundwater models of the MODFLOW family, to generate input files for them, to read the results and to analyze and visualize these results
- mfLab also has functions to read an existing model into the Matlab workspace.
- mfLab further comes with examples for MODFLOW, MT3DMS, SEAWAT and the SWI package to demonstrate how it works and it is used and how to start building your own models
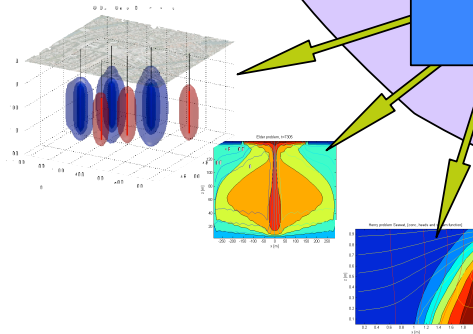
What is mfLab?

- mfLab consists of its backbone mf_setup, the model building script mf_adapt, the analysis script mf_analyze.
- mf_adapt, the excel workbook and mf_analyze reside in the local model directory
- mfLab is launched by typing mf_setup in the workspace of Matlab
- mf_setup executes mf_adapt
- mf_setup reads the excel workbook to lookup the required parameters
- mf_setup generates the input files for the target models
- mf_setup launches the model executables

mfLab: Matlab+Excel+models

user launches mf_setup by typing its name in the Matlab workspace

mf_setup

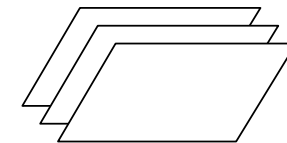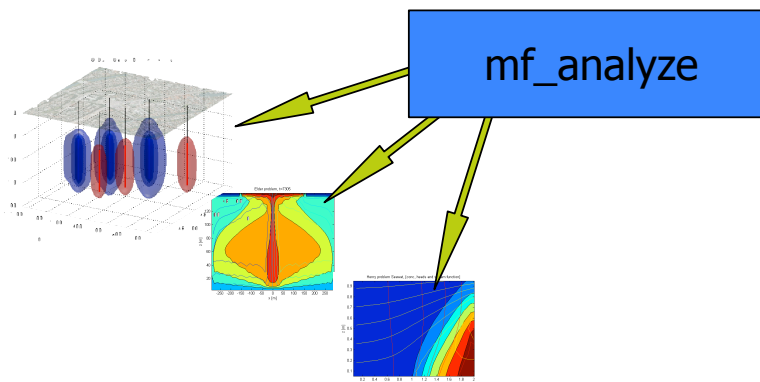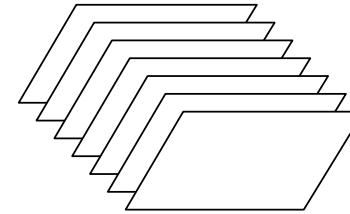mf_adapt

Excel_file

User launches mf_analyze

mf_analyze

Modflow

mfLab

Files in the local model directory after the simulation
1 mf_adapt.m
2 Excel workbook
3 mf_analyze.m
4 input files for models
5 output files from models
6 perhaps results from analysis

mf_adapt

Excel_file

mf_analyze

mfLab -- zero redundancy

Files necessary for reconstructing entire model
1 mf_adapt.m
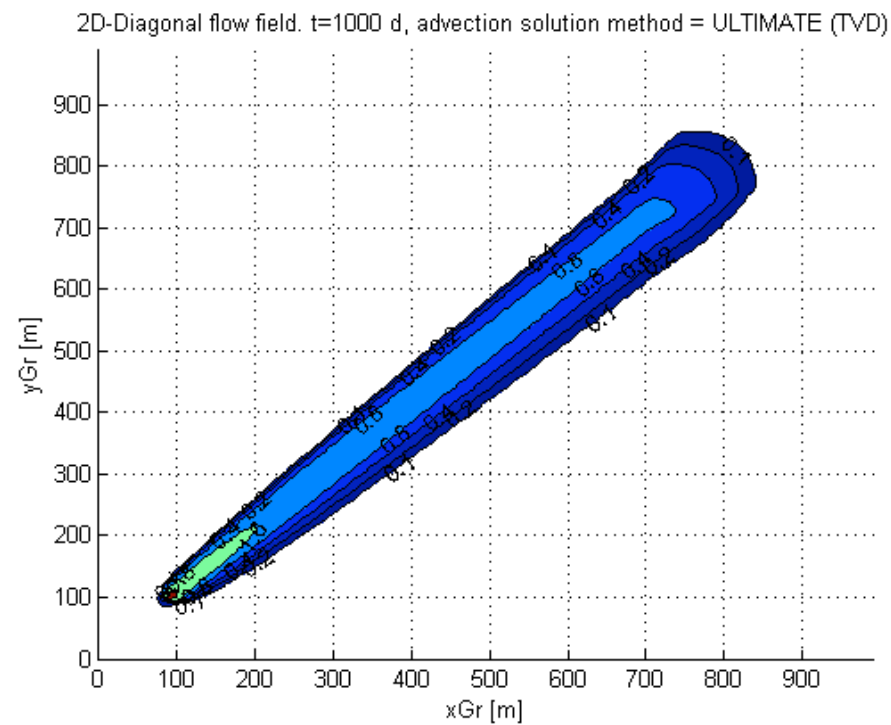2 Excel workbook
3 mf_analyze.m
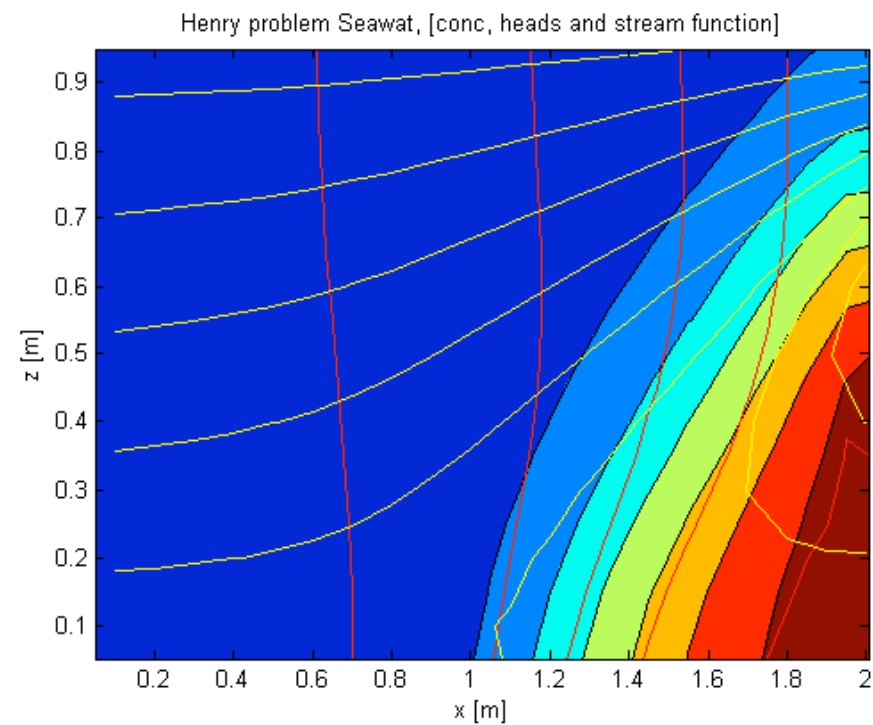
mf_adapt

Excel_file

mf_analyze

Applications so far ?

- Modflow
- Transport - MT3MDS
- Density - SEAWAT - SWI
- Temperature
  - Seawat (density + viscosity)
- Thermal Energy Storage
  - Amsterdam (MSc student + Waternet)
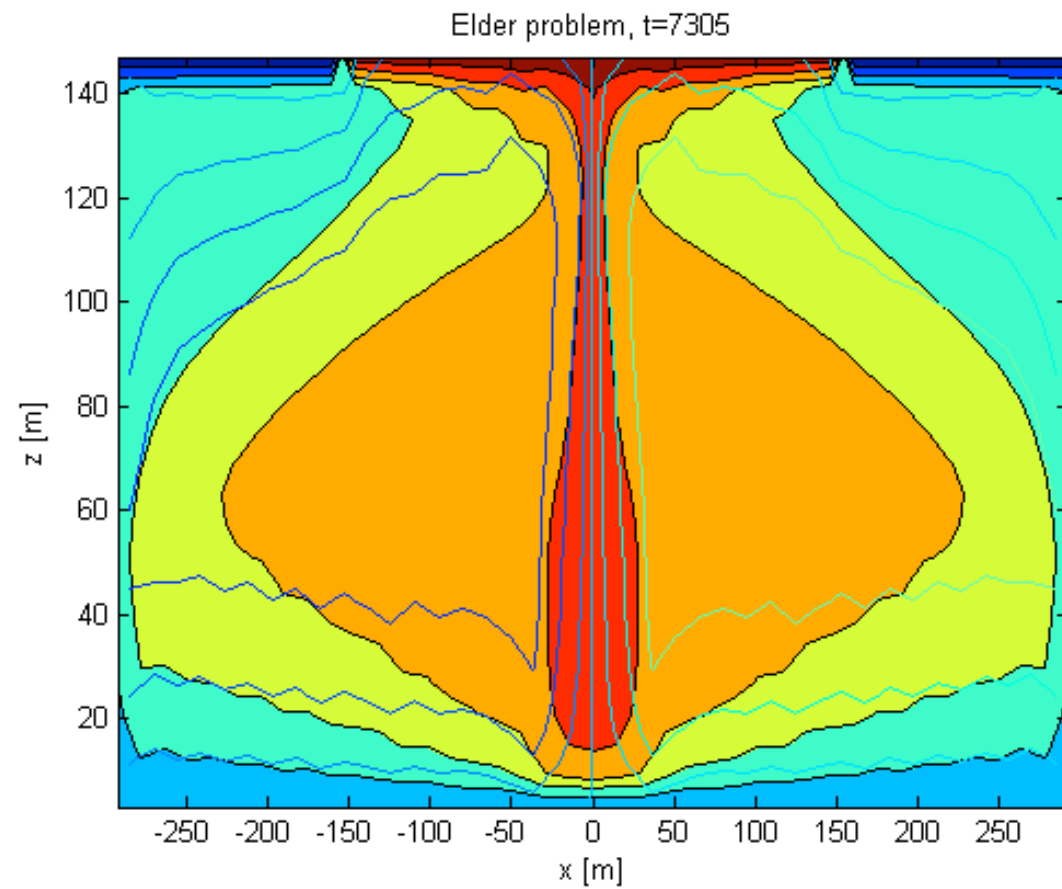 - Wageningen University (students)

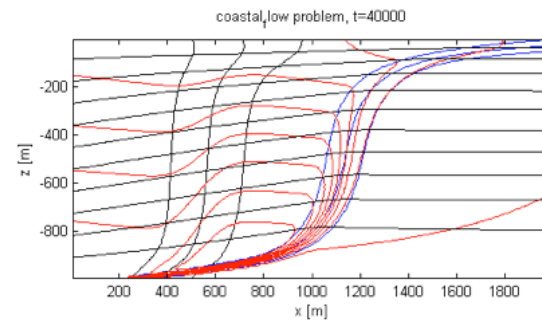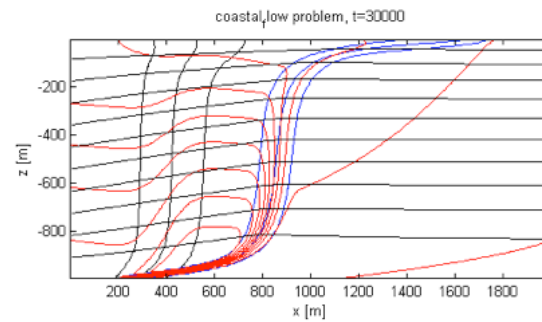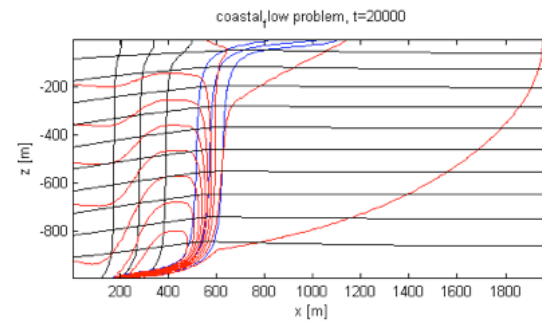# Transport (see examples)

2D-Diagonal flow field. t=1000 d, advection solution method = ULTIMATE (TVD)

Henry, density (see examples)

Henry problem Seawat, [conc, heads and stream function]

]

Elder problem, t=7305

$\tilde{T}U$Delft
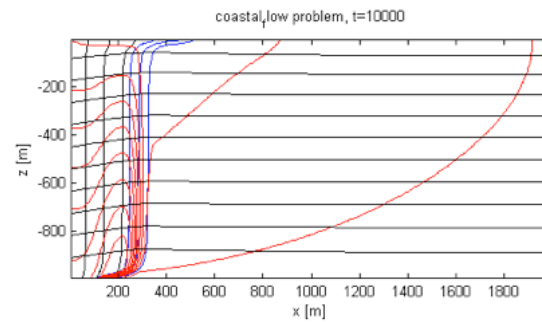
Coastal flow, density + viscosity (see examples)

SWI-package, multiple interfaces (see examples)

SWI example 2, rotation of brackish zone, ISTRAT=1
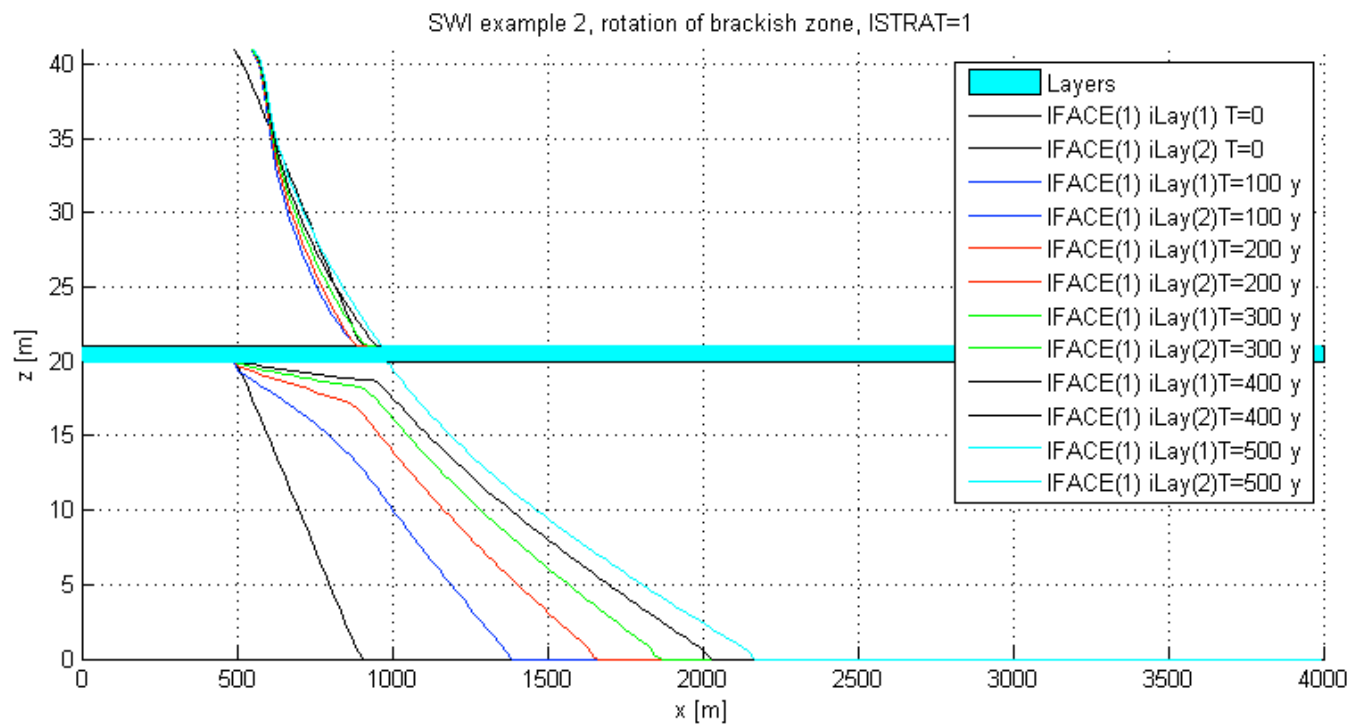
Thermal Energy Storage below centre of Amsterdam

Movie via VLC

TU Delft
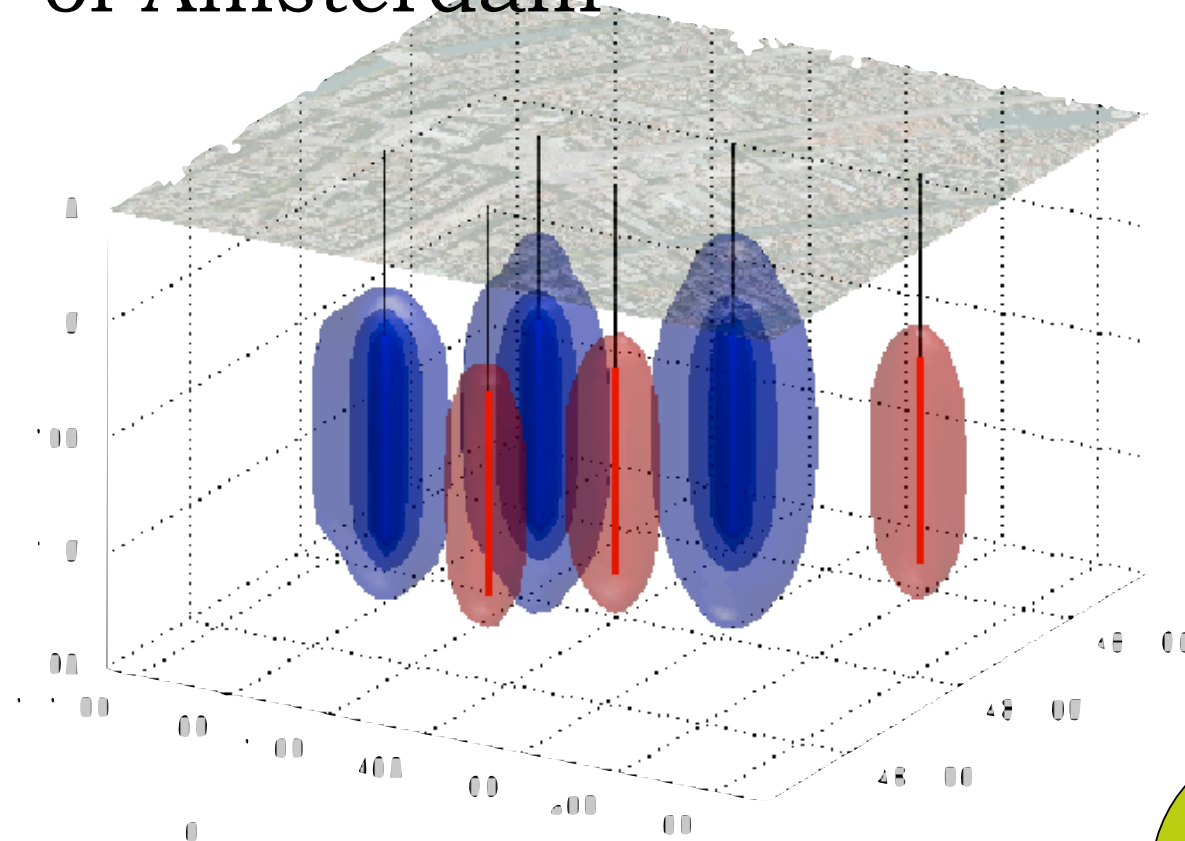
To download use Subversion (svn)

- get subversion from http://subversion.tigris.org/
- Windows svn interface: http://tortoisesvn.net/

Download using svn checkout

mflab
Environment for MODFLOW suite groundwater modeling

Project Home	Downloads	Wiki	Issues	Source	Administer

Checkout | Browse | Changes | [ ] (Search Trunk) | Request code review

How-to: Explore this project's source code by clicking the "Browse" and "Changes" links above.

Command-line access

If you plan to make changes, use this command to check out the code as yourself using HTTPS:

```
# Project members authenticate over HTTPS to allow committing changes.
svn checkout https://mflab.googlecode.com/svn/trunk/ mflab --username tolsthoorn@gmail.com
```

When prompted, enter your generated googlecode.com password.

Use this command to anonymously check out the latest project source code:

```
# Non-members may check out a read-only working copy anonymously over HTTP.
svn checkout http://mflab.googlecode.com/svn/trunk/ mflab-read-only
```