

mflab

<http://code.google.com/p/mflab>



The screenshot shows a web browser window titled "mflab - Project Hosting on Google Code". The address bar displays "http://code.google.com/p/mflab/". The browser's search bar contains "MathType: Eq...Editor Tips Login Waternet Apple Yahoo! Google Maps YouTube Wikipedia News". The page content includes a logo for "mflab" (a green 'S' on a computer monitor) and the text "Environment for MODFLOW suite groundwater modeling". Below this is a navigation bar with links: "Project Home", "Downloads", "Wiki", "Issues", "Source", and "Administer". A secondary bar contains "Summary", "Updates", and "People". A green tip box states: "Tip: Project owners, see our [Getting Started](#) guide for steps to configure your project". The main text describes "mflab" as an environment for efficient and flexible groundwater modeling using the MODFLOW suite (MT3DMS, SEAWAT, etc.), including feature extending packages. It notes that these packages are open-source and free of charge. A blue box on the right contains the "Code license: [GNU General Public License v3](#)" and "Labels: [mflab](#), [MODFLOW](#), [groundwater](#), [SEAWAT](#), [MT3DMS](#)". The bottom of the page mentions that the modeling workflow is scripted and reproducible, exploiting the interactive environment of Octave or Scilab.

mflab - Project Hosting on Google Code

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mflab - Project Hosting on Google Code

mflab
Environment for MODFLOW suite groundwater modeling

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Summary | Updates | People

Tip: Project owners, see our [Getting Started](#) guide for steps to configure your project

mflab (which stands for *MODFLOW-laboratory*) is an environment designed for efficient and flexible groundwater modeling using members of the *MODFLOW suite*, i.e. *MT3DMS*, *SEAWAT* etc. and including feature extending packages for them. These packages are numerous, each designed to model a specific groundwater flow process or boundary condition type (see <http://water.usgs.gov/nrp/gwsoftware/modflow.html>). Perhaps best of all, these programs and packages are open-source and free of charge, and used every day worldwide.

In **mflab**, the modeling workflow is scripted and, therefore, it is reproducible with a graphical user interface (GUI). **mflab** exploits the interactive environment of *Octave* or *Scilab* to: 1) create models, 2) to write their input files, and 3) an *Excel* file is used as a multi-page container for simulation parameters. The power of this modeling environment is believed to be unmatched by any other. Matlab's scripting ability makes modeling reproducible, which is an essential feature which is generally impossible with GUI's. The environment *Matlab/Octave/Scilab* provides, allows time by time

Code license: [GNU General Public License v3](#)

Labels: [mflab](#), [MODFLOW](#), [groundwater](#), [SEAWAT](#), [MT3DMS](#)

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Why ?

- GUI's are expensive and not flexible enough
- GUI's 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 mLab?

- 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
- mLab also has functions to read an existing model into the Matlab workspace.
- mLab 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

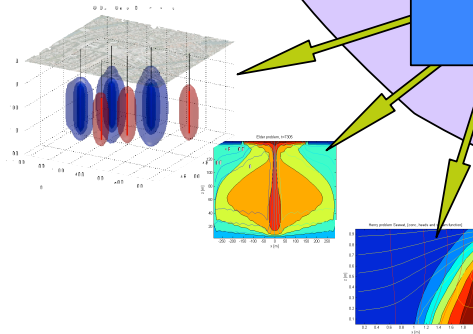
What is mfLab?

- 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

User launches mf_analyze



mf_setup

mf_adapt

Excel_file

mf_analyze

Modflow

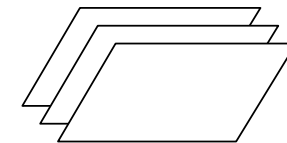
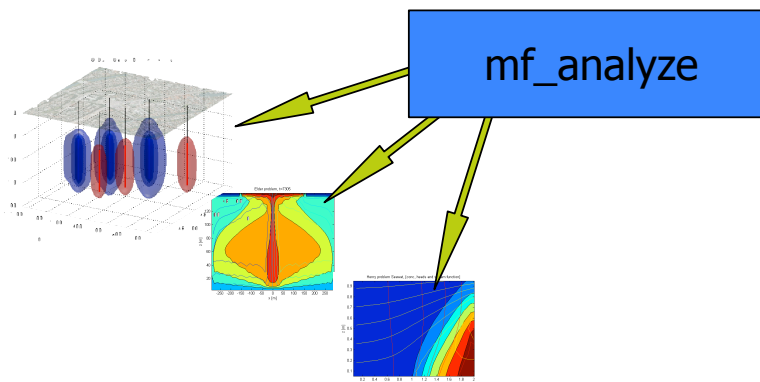
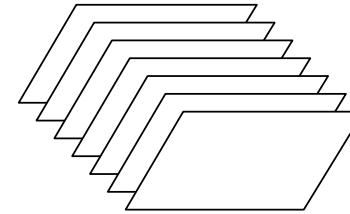
mfLab

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



mfLab -- zero redundancy

Files necessary for reconstructing entire model

- 1 mf_adapt.m
- 2 Excel workbook
- 3 mf_analyze.m

mf_adapt

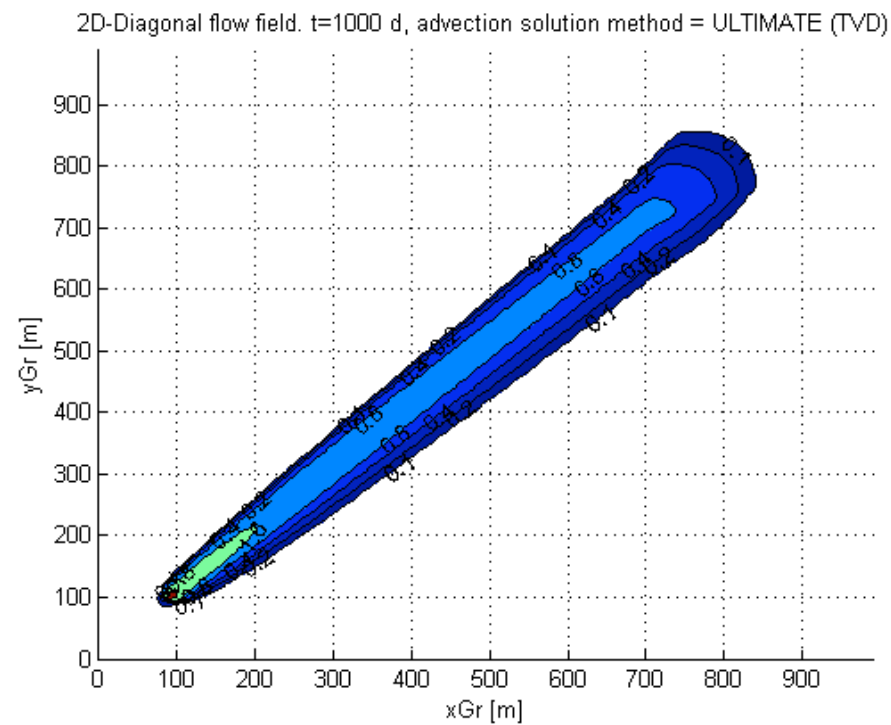
Excel_file

mf_analyze

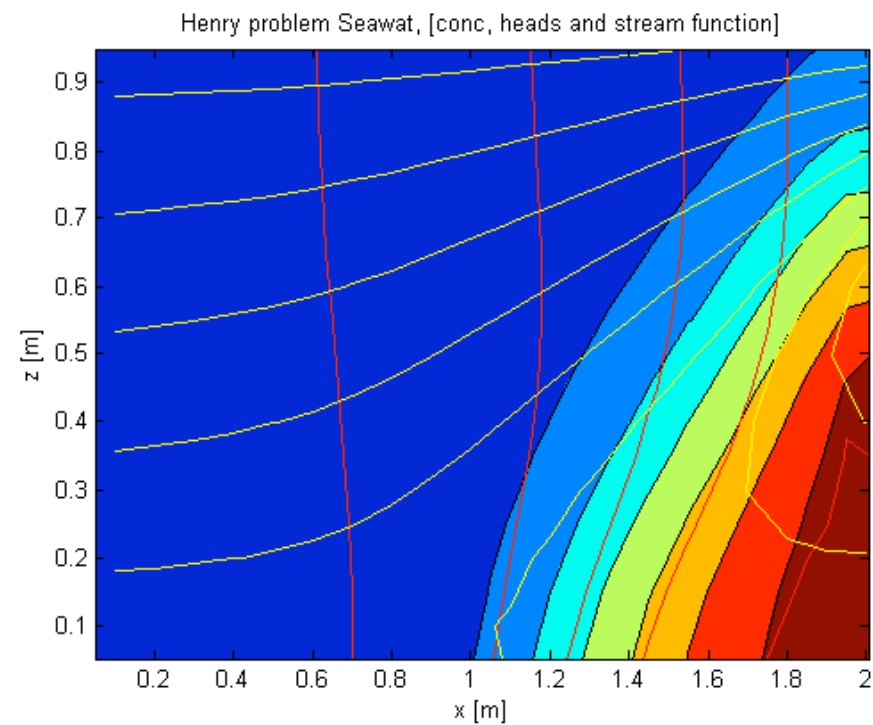
Applications so far ?

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

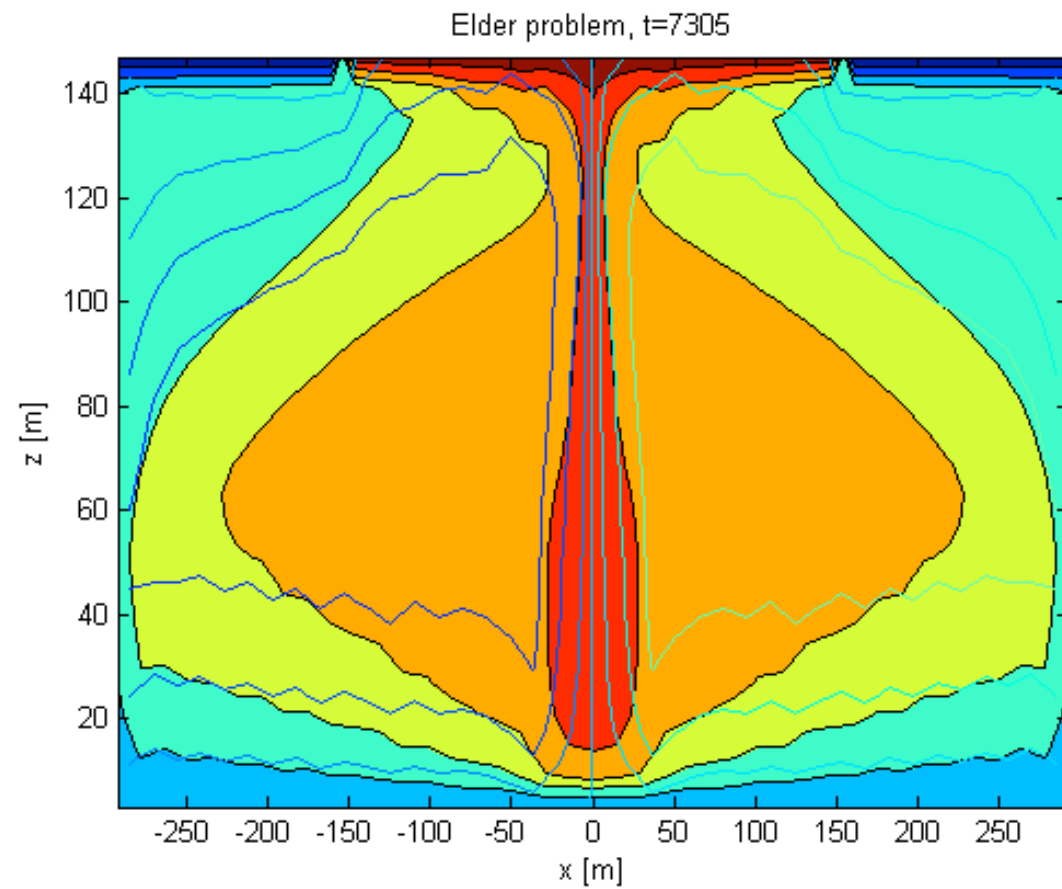
Transport (see examples)



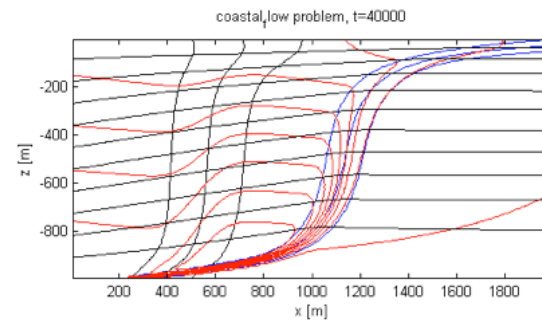
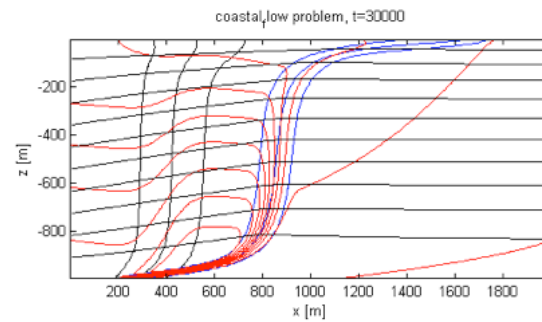
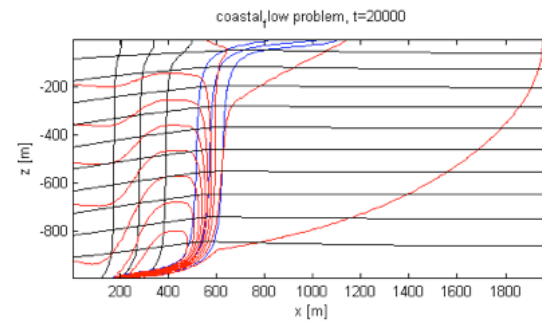
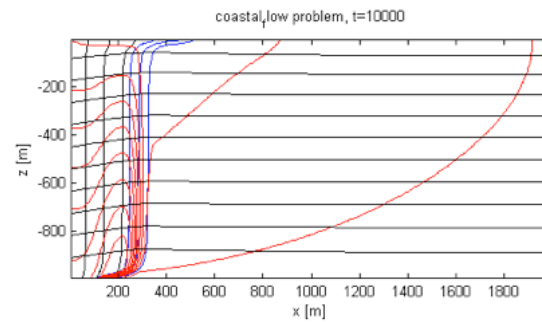
Henry, density (see examples)



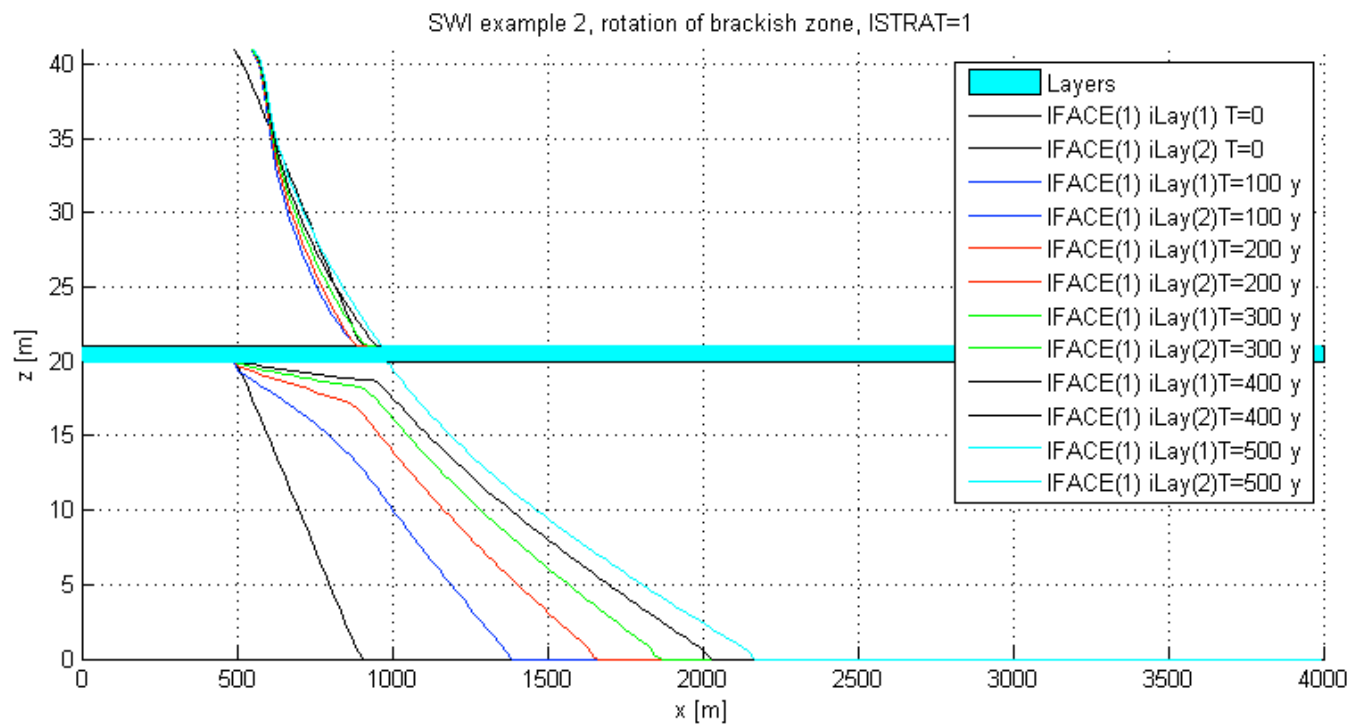
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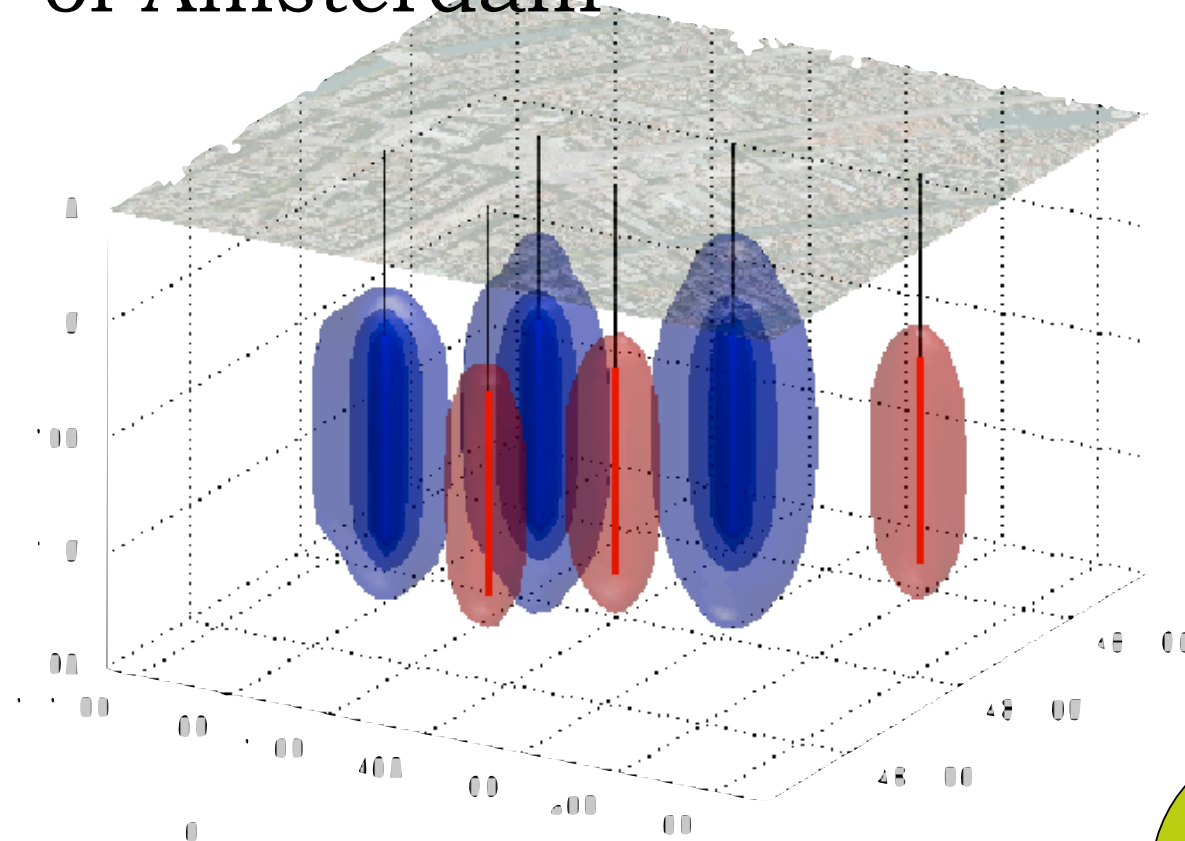
Coastal flow, density + viscosity (see examples)



SWI-package, multiple interfaces (see examples)




Thermal Energy Storage below centre of Amsterdam



Movie
via VLC

To download use Subversion (svn)

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

**mflab**
Environment for MODFLOW suite groundwater modeling

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Use_SVN_to_get_your_working_copy

#You should have svn installed to get your working copy of mflab

Introduction

There are no download packages on this site, on purpose. It's really much much better to get your copy t comes preinstalled on every Mac and Window users can download Torquoise SVN, which is free, and is : treasure by itself which you can use to track versions and updates of any of your own projects as well.

Once you have svn do the "checkout" as shown by google on the source page.

Download using svn checkout



mflab

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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
```