

Test Document

Introduction

This document describes the testing of the OpenEarth application Detran. Because this application is both a toolbox controlled from the Matlab command line and a standalone application with a Graphical User Interface (GUI), two types of tests have been carried out. First, automatic code testing was done using the TeamCity server. This is only possible for that part of the code that can be does not require user interaction, such as engines or the command line tools. Next, the GUI has been extensively tested, by trying out all buttons and options.

Application	Detran
Revision	2851
Test date	16-07-2010
Release version	v1.00.2851
Matlab version GUI testing	7.9.0 (R2009b)

Code testing

For the majority of the routines of Detran, a test routine has been written. Only for those routines which communicate with the user via the graphical user interface (which are dependent on user input i.e. a press on a button in the GUI) such tests are not possible.

Gui testing

The GUI objects in the Detran GUI are categorized in groups. Below, per group a table is presented which presents the test method and results for the various objects in the specific group. Two additional tables are added for the two menu-groups ('File' and 'Help').

Tabel 1: GUI group “Data input/output”

				tested with MATLAB	tested with EXE
BUTTON Load data					
Method: Loaded a saved mat-file with Detran-results (obtained by using the save-option). Also tested pressing the cancel-button.					
Test				✓	✓
BUTTON Import data					
Method: All types of input have been tested using results from the testmodel. For multi and mm, the testmodel results have been copied to two maps (run01 and run02) and weight-file (for mm: a mm-file in the correct format) was created in which both conditions were assigned with a weight of 50%. The test was successful if the loading of data succeeded without warnings/errors and if the computed transport rates through the transects as defined in transects.pol (in the testmodel dir) were as expected (see Appendix A). Besides, cancel-buttons in dialogues which popup during the data import process have been tested also (Pressing a cancel button should bring you back to the main screen without warnings/errors).					
Test	trim	single	mean	✓	✓
			instant	✓	✓
		multi	mean	✓	✓
			instant	✓	✓
		mm	mean	✓	✓
			instant	✓	✓
	trih	single	mean	✓	✓
			instant	✓	✓
		multi	mean	✓	✓
			instant	✓	✓
		mm	mean	✓	✓
			instant	✓	✓
BUTTON Save data					
Method: Saved Detran data (from an import action) to a mat-file. The saved mat-file was loaded to check if it was saved in the right format. Also tested pressing the cancel-button.					
Test				✓	✓
BUTTON Export to lintfile					
Method: Saved Detran data (from an import action) to a int-file. The saved int-file was opened in Muppet to check if it contains the right transport rates. Also tested pressing the cancel-button. Results in Appendix B.					
Test				✓	✓

Table 2: GUI group “Transport settings”

	tested with MATLAB	tested with EXE
POPUPMENU Transport type		
Method: Loaded Detran-data for the testmodel (obtained by using the import data option) and the transects file. Selected all transport types and checked (on transports through transects) whether the bedload + suspended = total transport.		
Test	✓	✓
POPUPMENU Time settings		
Method: Loaded Detran-data for the testmodel (obtained by using the import data option) and the transects file. Selected all time-settings and checked if this resulted in correct answers (i.e. if daily transport rates are 24 times the hourly transport rates). User-defines time settings has also been checked.		
Test	✓	✓
POPUPMENU Fraction selection		
Method: Loaded Detran-data for the testmodel (obtained by using the import data option) and the transects file. Selected the two fractions and checked (on transports through transects) whether the sum of the fractions were computed correctly.		
Test	✓	✓
CHECKBOX Pore Volume		
Method: Loaded Detran-data for the testmodel (obtained by using the import data option) and the transects file. Enabled the checkbox with default settings of 40% pore volume to check whether the transport rates (through transects) increased with 40%. Also tested it with a different pore volume of 50%.		
Test	✓	✓

Table 3: GUI group “Transect options”

	tested with MATLAB	tested with EXE
BUTTON Load transects		
Method: First, Detran-data were loaded from the testmodel (obtained by using the import data option). Then, it was tested if a transects file (polygon file ‘transects.pol’) could be loaded correctly and if the transport rates through the loaded transects could be plotted.		
Test	✓	✓
BUTTON Save transects		
Method: Saved the loaded transects from ‘transects.pol’ to a new file after adding a new transect and checked whether this new file contained the same coordinates as ‘transects.pol’ plus the extra coordinates of the added transect.		
Test	✓	✓
BUTTON Adjust transect		
Method: Adjusted one of the loaded transects from ‘transects.pol’ and checked if the computed transport rate changed.		
Test	✓	✓
BUTTON Add transect		
Method: Added one transect after loading the transects from ‘transects.pol’ and checked if a transport rate was computed through the newly added transect.		
Test	✓	✓

Table 4: GUI group “Map plot settings”

	tested with MATLAB	tested with EXE
CHECKBOX Plot map transport field		
Method: Loaded Detran-data for the testmodel (obtained by using the import data option). Enabled the checkbox to verify the plotting of the map transport field. Also verified whether disabling this checkbox results in hiding the map transport field plot.		
Test	✓	✓
CHECKBOX Plot landboundary		
Method: After loading a landboundary file (with the ‘load landboundary’ button), the landboundary plotting was verified using this checkbox.		
Test	✓	✓
BUTTON Load landboundary		
Method: Pressed the button and opened a landboundary file. Afterwards, the landboundary was plotted (using ‘Plot landboundary’ checkbox) to verify the correct loading of the landboundary file.		
Test	✓	✓
EDIT Color scale		
Method: First, a transport field has been plotted. Varied the color scale and observed the behavior of the colored map plot. Also tried erroneous options like ‘1 1’, ‘10 0’ and ‘a b’ (values must be increasing and non-NaN.). In the latter case, the color scale must be corrected by Detran.		
Test	✓	✓
CHECKBOX Plot colorbar		
Method: First, a transport field has been plotted. Checked the plotting of a color bar by enabling this checkbox. Also verified whether changing the color scale had effect on the colorbar.		
Test	✓	✓
EDIT Map vector spacing		
Method: First, a transport field has been plotted. Tested various options of the map vector spacing for both ‘uniform’ and ‘distance’ spacing mode. Also tried erroneous options like ‘1 1’ and ‘b’. In the latter case, the map vector spacing must be corrected by Detran		
Test	✓	✓
POPUPMENU Spacing mode		
Method: First, a transport field has been plotted. Tested various options of the map vector spacing in combination with both options of spacing mode.		
Test	✓	✓
EDIT Map vector scaling		
Method: First, a transport field has been plotted. Tested various options of the map vector scaling. Also tried erroneous options like ‘1 1’ and ‘b’. In the latter case, the map vector scaling must be corrected by Detran		
Test	✓	✓

Table 5: GUI group “Transect vector plot settings”

	tested with MATLAB	tested with EXE
CHECKBOX Plot transport through transects		
Method: Loaded Detran-data for the testmodel (obtained by using the import data option) and the transects file. Tested the checkbox by verifying the plotting and hiding of the transport rates through the transects.		
Test	✓	✓
CHECKBOX Plot gross transports		
Method: After plotting transport through transport rates (with data from trim-file) checked this option. It has also been verified whether the sum of the gross transports equals the nett transport rate. Disabling the checkbox must result in deleting the gross transport rates from the figure.		
Test	✓	✓
EDIT Transect vector scaling		
Method: First, transport vectors have been plotted. Tested various options of the transect vector scaling. Also tried erroneous options like ‘1 1’ and ‘b’. In the latter case, the map vector scaling must be corrected by Detran.		
Test	✓	✓
EDIT Multiply transport labels by		
Method: First, a transport field has been plotted. Tested various options of this option. Also tried erroneous options like ‘1 1’ and ‘b’. In the latter case, the map vector spacing must be corrected by Detran.		
Test	✓	✓

Table 6: Menu “File”

	tested with MATLAB	tested with EXE
Load data		
Method: As described at “BUTTON Load data”.		
Test	✓	✓
Save data		
Method: As described at “BUTTON Save data”.		
Test	✓	✓
Import data		
Method: As described at “BUTTON Import data”.		
Test	✓	✓
Export data to lintfile		
Method: As described at “BUTTON Export to lintfile”.		
Test	✓	✓
Exit		
Method: Verified if the program quits correctly after pressing this ‘Exit’.		
Test	✓	✓

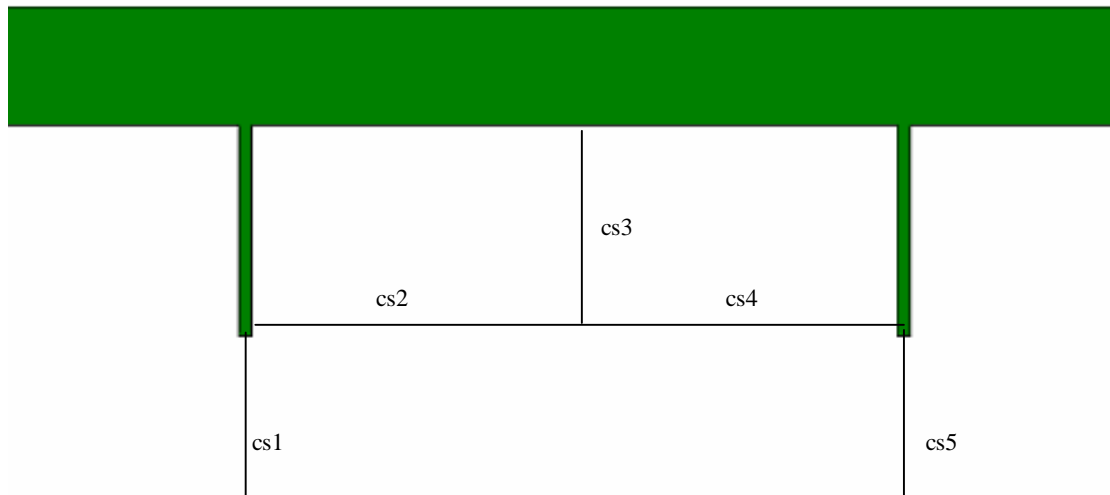
Table 7: Menu “Help”

	tested with MATLAB	tested with EXE
Online help		
Method: Verified if pressing this option resulted in opening the Detran section at the OpenEarth product suite web page.		
Test	✓	✓
About		
Method: Checked if this opens correctly the about message box with the right information, like version and revision number.		
Test	✓	✓

Appendix A

Hourly transport rates [m³] of total transport and for sum of fractions excluding pore volume. NB: for instant transports, the last time step was chosen.

		Trim-file			Trih-file		
		single	multi	mm	single	multi	mm
cs1	mean	6109	6109	6109	6112	6112	6112
	instant	11959	11959	11959	11963	11963	11963
cs2	mean	467	467	467	429	429	429
	instant	620	620	620	563	563	563
cs3	mean	48	48	48	48	48	48
	instant	54	54	54	55	55	55
cs4	mean	508	508	508	480	480	480
	instant	1100	1100	1100	1056	1056	1056
cs5	mean	6388	6388	6388	6402	6402	6402
	instant	12349	12349	12349	12369	12369	12369



Appendix B

Results of Muppet with exported lintfile.

