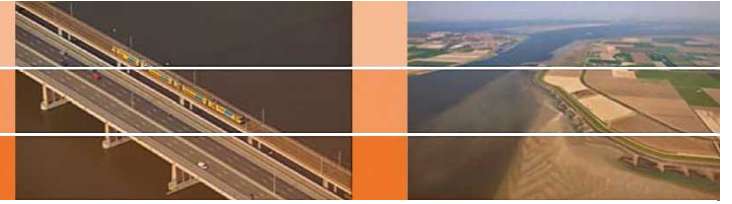




Werken met D-Geo Flow

Esther Rosenbrand
Vera van Beek

Inhoud



- Inleiding
- Wat kan wel, wat kan niet?
- Aandachtspunten en gevoeligheden
 - Meshing
 - MPicard
- Oefening
- Known issues

D-Geo Flow



- D-Geo Flow is een gezamenlijke ontwikkeling van RWS en Deltares
- D-Geo Flow wordt gereleased als een eerste versie (v1.0) en is een startpunt voor doorontwikkeling.
- D-Geo Flow wordt kosteloos verstrekt aan geïnteresseerde partijen na tekenen van het contract, wat recht geeft op:
 - Versie 1.0
 - Eerste lijn support
 - Eenmalige registratie per bedrijf, met meerdere installaties.
- Verdere verbeteringen via actieve gebruikers community en pilotprojecten
- Uiterlijk in 2019 zal D-Geo Flow worden opgenomen in de ontwikkellijn van RWS/I&M

Inleiding



Project1 - D-Geo Flow

File Home View

Clipboard New Model Import New Folder Run All Run Current Run Script Run Find Feedback Show Log About Help

Project Start Page

Groundwater flow and piping calculation module

D-GEO FLOW

Deltares systems

Photo by: Waterschap Rivierland

User Manuals:
D-Geo flow

Deltares
Enabling Delta Life

Undo / Redo

Chart Operations Toolbox Undo / Redo

Properties Project

General	
Name	Project1
Project	
Created	
Changed	
Task count	0
Size	0

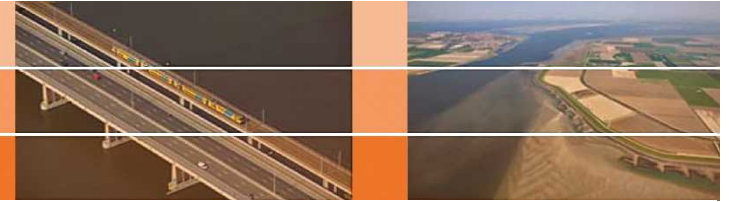
Messages

- Adding welcome page ... 9/27/2017 9:57:26 AM
- Main window created. 9/27/2017 9:57:25 AM
- Hiding splash screen ... 9/27/2017 9:57:25 AM
- Started in 7.92 sec 9/27/2017 9:57:25 AM
- Project Project1 saved 9/27/2017 9:57:25 AM
- Creating database session ... 9/27/2017 9:57:23 AM
- Creating database schema ... 9/27/2017 9:57:23 AM
- Creating database ... 9/27/2017 9:57:23 AM
- Creation of configuration took 1207 ms 9/27/2017 9:57:23 AM
- Creating new database configuration ... 9/27/2017 9:57:22 AM
- Waiting until new project is initialized ... 9/27/2017 9:57:22 AM
- Menus and toolbars are ready. 9/27/2017 9:57:22 AM
- Setting up menus and toolbars ... 9/27/2017 9:57:22 AM
- Initializing gui plugin Delta Shell Toolbox Plugin (UI) ... 9/27/2017 9:57:22 AM
- Initializing gui plugin SharpMap GIS Plugin (UI) ... 9/27/2017 9:57:21 AM

Messages Time Navigator

Name
Name of the project shown to the user.

Inleiding



The screenshot displays the D-Geo Flow software interface. The main window shows a title bar "Project1 - D-Geo Flow" and a menu bar with "File", "Home", and "View". The "File" menu is open, showing options like "Add", "Import...", "Export...", "Cut", "Copy", "Paste", "Rename", "Run All Models", "Stop All Models", "Clear All Models Output", "Expand All...", "Collapse All...", and "Properties". The main content area features a blue header with the text "Groundwater flow and piping calculation module" and "D-Geo FLOW". Below this is a large image of a delta landscape with the text "Deltares systems" and "User Manuals: D-Geo flow". The Deltares logo is visible in the bottom right corner.

The "Messages" window at the bottom left shows a log of system events:

Icon	Message	Time
Info	Project Project1 saved	9/27/2017 10:42:18 AM
Info	Creating database session ...	9/27/2017 10:42:17 AM
Info	Creating database schema ...	9/27/2017 10:42:17 AM
Info	Creating database ...	9/27/2017 10:42:17 AM
Info	Creation of configuration took 72 ms	9/27/2017 10:42:17 AM
Info	Creating new database configuration ...	9/27/2017 10:42:17 AM
Info	Saving project Project1 as C:\Users\rosenbra\AppData\Local\Temp\tmpEE0D.tmp	9/27/2017 10:42:17 AM
Info	Project closed	9/27/2017 10:42:17 AM
Info	Closing current project ...	9/27/2017 10:42:17 AM
Info	Project Project1 saved	9/27/2017 10:41:59 AM
Info	Creating database session ...	9/27/2017 10:41:59 AM
Info	Creating database schema ...	9/27/2017 10:41:59 AM
Info	Creating database ...	9/27/2017 10:41:59 AM
Info	Creation of configuration took 58 ms	9/27/2017 10:41:59 AM
Info	Creating new database configuration ...	9/27/2017 10:41:59 AM

The "Properties" window on the right shows the "General" tab for the project "Project1".

Property	Value
Name	Project1
Description	
Created	
Changed	
Task count	0
Size	0

Inleiding



DgFlow_tutorial_river_dike* - D-Geo Flow

File Home View Map

North Arrow Legend Scale Bar Decorations

Zoom Previous Zoom Next Query Time Series

Map Coordinate Export As Image

Project Start Page Dg

DgFlow_tutorial_river_dike

- DgFlow Model
 - Input
 - Materials
 - Boreholes
 - Boundary Condition
 - Pipes
 - Grid
 - Output
 - Pipe Results

Map

- Map
 - DgFlow Model
 - Origin point
 - Results
 - Pipe
 - Boreholes
 - Boundary conditions
 - Unstructured Grid
 - CrossSection

Messages

- Project N:\Projec
- Project DgFlow_s
- Saving project D
- Project Project1
- Creating databas
- Creating databas
- Creating databas
- Creation of confi
- Creating new da
- Saving project Ph
- Project closed
- Closing current project ... 9/27/2017 10:42:17 AM
- Project Project1 saved 9/27/2017 10:41:59 AM
- Creating database session ... 9/27/2017 10:41:59 AM
- Creating database schema ... 9/27/2017 10:41:59 AM

Chart Operations Toolbox Undo / Redo

Properties

DgFlow model properties

Output properties

Output Step Interval 1

Output time step 00:05:00

Settings

NDim 2

Analysis flow

MPicard 1000

Gravity 9.81

ErrLin 1E-12

ErrNonLin 1E-06

Working Directory C:\Users\rosenbra\AppData\Local\Temp\

File Name DgTestXXX

Advanced Mode

Advanced Mode False

2017-09-27 00:00:00

2017-09-28 00:00:00

288

00:05:00

1

00:05:00

2

flow

500

9.81

1E-12

1E-06

Gravity

ErrLin

ErrNonLin

Time Steps

Number of Time Steps

Inleiding



DgFlow_tutorial_river_dike* - D-Geo Flow

Project

- DgFlow_tutorial_river_dike
 - DgFlow Model
 - Input
 - Add new soil
 - Clay
 - Loam
 - Peat
 - New Soil
 - Water
 - Boreholes
 - Boundary Condition
 - Pipes
 - Grid
 - Output
 - Pipe Results

Map

- Map
 - DgFlow Model
 - Results
 - Pipe
 - Boreholes
 - Boundary conditions
 - Unstructured Grid
 - CrossSection

Messages

Message	Time
Project N:\Projects\11200500\11200575\B. Measurements and calculations\028 D-Geo Flow\DgFlow_tutorial_river_dike.dsprj saved	9/27/2017 10:44:39 AM
Project DgFlow_tutorial_river_dike saved	9/27/2017 10:44:39 AM
Saving project DgFlow_tutorial_river_dike as N:\Projects\11200500\11200575\B. Measurements and calculations\028 D-Geo Flow\DgFlow_tutorial_river_dike.dsprj	9/27/2017 10:44:39 AM
Project Project1 saved	9/27/2017 10:42:18 AM
Creating database session ...	9/27/2017 10:42:17 AM
Creating database schema ...	9/27/2017 10:42:17 AM
Creating database ...	9/27/2017 10:42:17 AM
Creation of configuration took 72 ms	9/27/2017 10:42:17 AM
Creating new database configuration ...	9/27/2017 10:42:17 AM
Saving project Project1 as C:\Users\rosenbra\AppData\Local\Temp\tmpE0D.tmp	9/27/2017 10:42:17 AM
Project closed	9/27/2017 10:42:17 AM
Closing current project ...	9/27/2017 10:42:17 AM
Project Project1 saved	9/27/2017 10:41:59 AM
Creating database session ...	9/27/2017 10:41:59 AM
Creating database schema ...	9/27/2017 10:41:59 AM

Inleiding



The screenshot shows the 'Properties' window for 'Soil Properties' in the D-Geo Flow software. The window is divided into sections: 'General', 'Other', and 'Permeability'. The 'General' section includes 'Name' (New Soil), 'Color' (248; 216; 51), and 'Other' properties like Porosity, Compressibility, Grain Particle Density, Particle diameter, White's constant, and Bedding angle. The 'Permeability' section includes Hydraulic Conductivity (Kx, Ky) and Intrinsic permeability (kx, ky).

Property	Value
Name	New Soil
Color	248; 216; 51
Porosity, n [-]	0.36
Compressibility, α [m^2/N]	1E-07
Grain Particle Density, ρ^s [kg/m^3]	2650
Particle diameter, D_{70} [m]	0.0002
White's constant, η [-]	0.25
Bedding angle, θ [deg]	37
Hydraulic Conductivity, K_x [m/day]	7.5434976
Intrinsic permeability, k_x [m^2]	1.15700E-011
Hydraulic Conductivity, K_y [m/day]	7.5434976
Intrinsic permeability, k_y [m^2]	1.15700E-011

Inleiding



Groundwater flow and piping calculation module

D-Geo Flow

Deltares systems

User Manuals:
D-Geo flow

Deltares
Enabling Delta Life

Messages

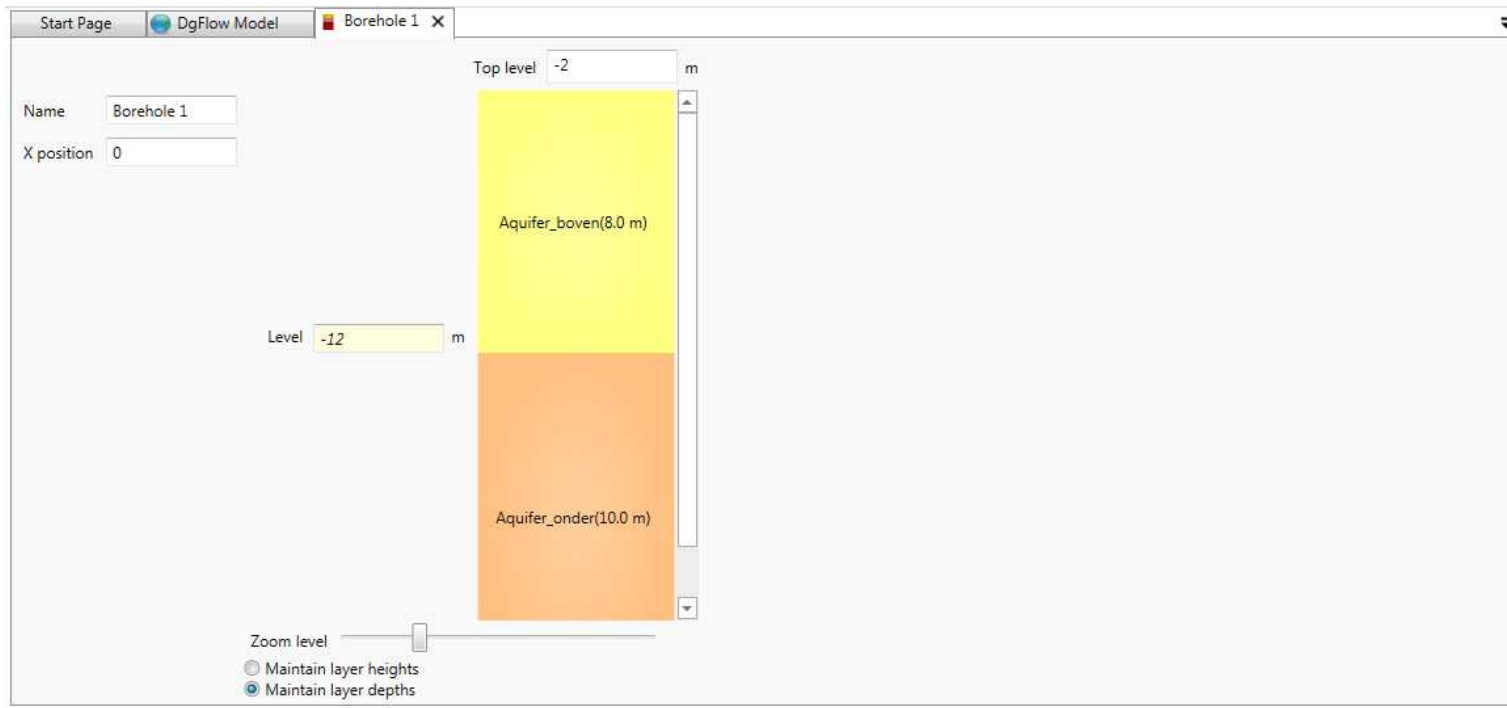
- Aquifer_onder (Compressibility is too low adjusting to 1.0E-10(m²/N))
- Aquifer_boven (Density of grains (ρ_g) is too low adjusting to 2.40E3(kg/m³))
- Aquifer_boven (Compressibility is too low adjusting to 1.0E-10(m²/N))
- Dijk (Density of grains (ρ_g) is too low adjusting to 2.40E3(kg/m³))
- Dijk (Compressibility is too low adjusting to 1.0E-10(m²/N))
- Project DgFlow_tutorial_river_dike saved
- Saving project DgFlow_tutorial_river_dike as N:\Projects\11200500\11200575\B. Measurements and calculations\028 D-Geo Flow\DgFlow_tutorial_river_dike.dsproj
- Achterland (Compressibility is too low adjusting to 1.0E-10(m²/N))
- Voorland (Particle Diameter (D₉₀) is too low adjusting to 1.0E-4(m))
- Voorland (Density of grains (ρ_g) is too low adjusting to 2.40E3(kg/m³))
- Voorland (Density of grains (ρ_g) is too low adjusting to 2.40E3(kg/m³))
- Voorland (Compressibility is too low adjusting to 1.0E-10(m²/N))
- Voorland (Compressibility is too low adjusting to 1.0E-10(m²/N))

Water Properties

Name	Water
Compressibility β [m ² /N]	0
State seepage	Steady
Density ρ [kg/m ³]	1000
Viscosity μ [Ns/m ²]	0.0013

Eerdere versie

Inleiding



Inleiding



The screenshot displays the DgFlow software interface for a borehole model. The main window shows a vertical cross-section of a borehole with two aquifer layers: 'Aquifer_boven(10.0 m)' in yellow and 'Aquifer_onder(8.0 m)' in orange. The top level is set to -2 m and the level is -12 m. The borehole name is 'Borehole 1' and its X position is 0. A context menu is open over the borehole, showing options: 'Create copy of Borehole 1' and 'Delete Borehole 1'. The left sidebar shows a tree view with categories: Input, Materials, Boreholes, Boundaries, Pipes, Grid, and Output. The bottom panel contains a 'Messages' log with the following entries:

- Aquifer_onder (Compressibility is too low adjusting to 1.0E-10(m³/N))
- Aquifer_boven (Density of grains (ρ_f) is too low adjusting to 2.40E3(kg/m³))
- Aquifer_boven (Compressibility is too low adjusting to 1.0E-10(m³/N))
- Dijk (Density of grains (ρ_f) is too low adjusting to 2.40E3(kg/m³))
- Dijk (Compressibility is too low adjusting to 1.0E-10(m³/N))
- Project DgFlow_tutorial_river_dike saved
- Saving project DgFlow_tutorial_river_dike as N:\Project\11200500\11200575\B. Measurements and calculations\028 D-Geo Flow\DgFlow_tutorial_river_dike.dsproj
- Achterland (Compressibility is too low adjusting to 1.0E-10(m³/N))
- Voorland (Particle Diameter (D_{10}) is too low adjusting to 1.0E-4(m))
- Voorland (Density of grains (ρ_f) is too low adjusting to 2.40E3(kg/m³))
- Voorland (Density of grains (ρ_f) is too low adjusting to 2.40E3(kg/m³))
- Voorland (Compressibility is too low adjusting to 1.0E-10(m³/N))
- Voorland (Compressibility is too low adjusting to 1.0E-10(m³/N))
- Voorland (Density of grains (ρ_f) is too low adjusting to 2.40E3(kg/m³))
- Voorland (Compressibility is too low adjusting to 1.0E-10(m³/N))

The right sidebar shows the 'Properties' panel for 'DgFlowBoreholeProperties_DisplayName' with the following values:

General	
Name	Borehole 1
X	0
TopLevel	-2
Number of layers	1

Inleiding

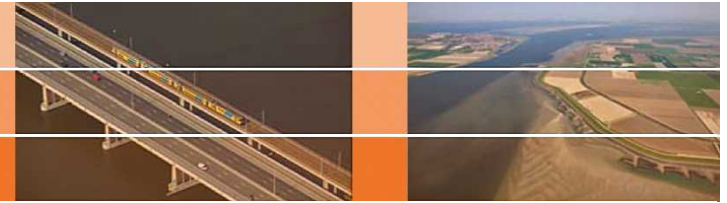


The screenshot displays the DgFlow software interface for a project named "DgFlow_tutorial_river_dike - D-Geo Flow". The main window shows a cross-section of a dike with a red top layer, a green layer, a yellow layer, and an orange base layer. A scale bar at the bottom indicates 0, 5, 10, 15, and 20 meters. The left sidebar contains a "Project" tree with "DgFlow Model" and "Input" folders, and a "Map" tree with "DgFlow Model" and "Results" folders. The "Messages" window at the bottom lists several error messages related to cross-section generation and material properties.

Messages:

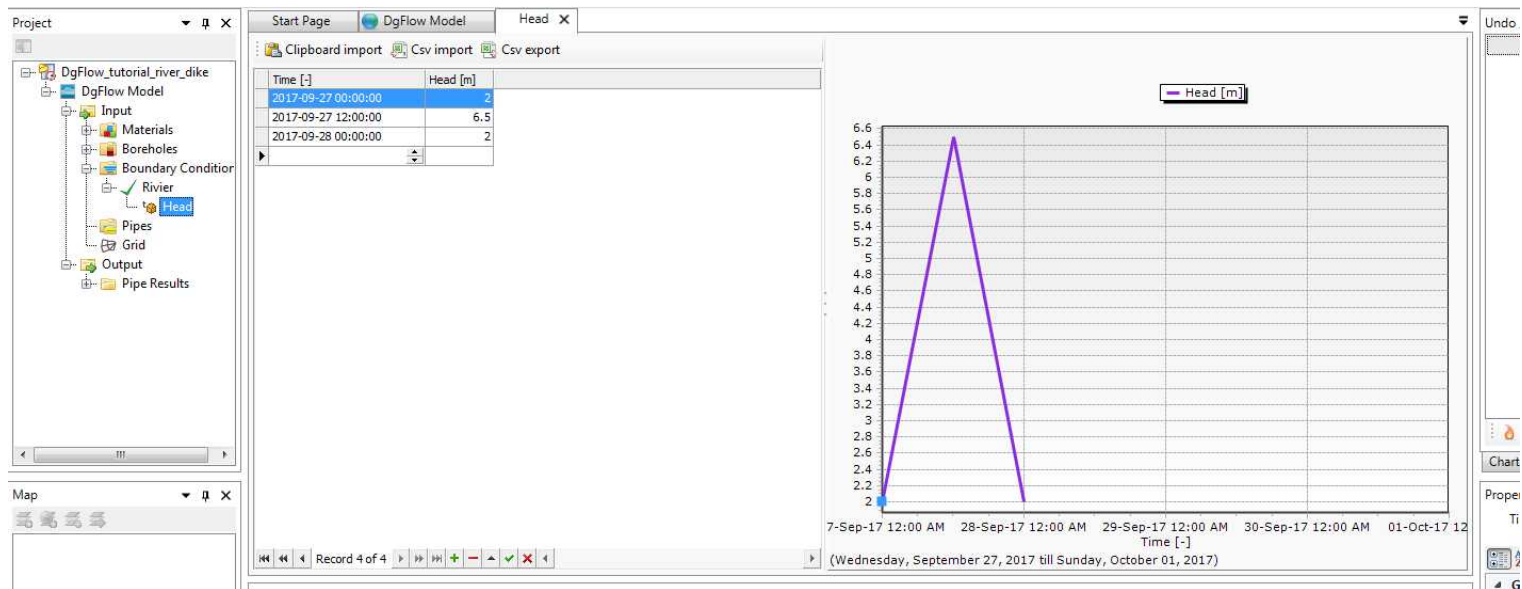
- Project DgFlow_tutorial_river_dike saved (9/27/2017 12:05:54 PM)
- Saving project DgFlow_tutorial_river_dike as N:\Projects\11200500\11200575\B. Measurements and calculations\028 D-Geo Flow\DgFlow_tutorial_river_dike.dsproj (9/27/2017 12:05:54 PM)
- Cross Section Generation Errors: Borehole 5 has repeated zone layer with Borehole 1 (Aquifer_boven). Correct Boreholes. (9/27/2017 12:04:02 PM)
- Cross Section Generation Errors: Borehole 5 has repeated zone layer with Borehole 1 (Aquifer_boven). Correct Boreholes. (9/27/2017 12:03:26 PM)
- Aquifer_ouder (Compressibility is too low adjusting to 1.0E-10[m²/N]) (9/27/2017 11:38:41 AM)
- Aquifer_boven (Density of grains (ρ^g) is too low adjusting to 2.40E3[kg/m³]) (9/27/2017 11:37:16 AM)
- Aquifer_boven (Compressibility is too low adjusting to 1.0E-10[m²/N]) (9/27/2017 11:37:09 AM)
- Dijk (Density of grains (ρ^g) is too low adjusting to 2.40E3[kg/m³]) (9/27/2017 11:36:41 AM)
- Dijk (Compressibility is too low adjusting to 1.0E-10[m²/N]) (9/27/2017 11:36:38 AM)
- Project DgFlow_tutorial_river_dike saved (9/27/2017 11:35:35 AM)
- Saving project DgFlow_tutorial_river_dike as N:\Projects\11200500\11200575\B. Measurements and calculations\028 D-Geo Flow\DgFlow_tutorial_river_dike.dsproj (9/27/2017 11:35:34 AM)
- Achterland (Compressibility is too low adjusting to 1.0E-10[m²/N]) (9/27/2017 11:35:02 AM)
- Voorland (Particle Diameter (D_{50}) is too low adjusting to 1.0E-4[m]) (9/27/2017 11:32:14 AM)

Inleiding



A screenshot of the DgFlow software interface. The main window displays a 3D model of a river dike with a cross-section showing layers of red, green, yellow, and orange. An 'Open With...' dialog box is open in the center, with the text 'Choose view to open:' and two options: 'Table and Chart (multiple functions)' (highlighted in blue) and 'Table and Chart (single function)'. The dialog has 'OK' and 'Cancel' buttons at the bottom. In the background, the software's 'Project' and 'Map' panes are visible, along with a 'Messages' pane on the right. A scale bar with markings for 5 and 10 is also present.

Inleiding



Inleiding



The screenshot displays the DgFlow software interface. The main window shows a cross-section of a dike structure. The dike is represented by a red trapezoidal shape on top of a yellow soil layer, which sits on an orange subsoil layer. Several vertical lines represent boreholes or pipes extending through the layers. The interface includes a 'Project' tree on the left, a 'Map' panel below it, and a 'Messages' window at the bottom. A yellow arrow points from the 'Map' panel to the 'CrossSection' item in the project tree.

Project Tree:

- DgFlow_tutorial_river_dike
 - DgFlow Model
 - Input
 - Materials
 - Boreholes
 - Boundary Condition
 - Rivier
 - Polder
 - Seepage Bounde
 - Pipes
 - Grid
 - Output
 - Pipe Results

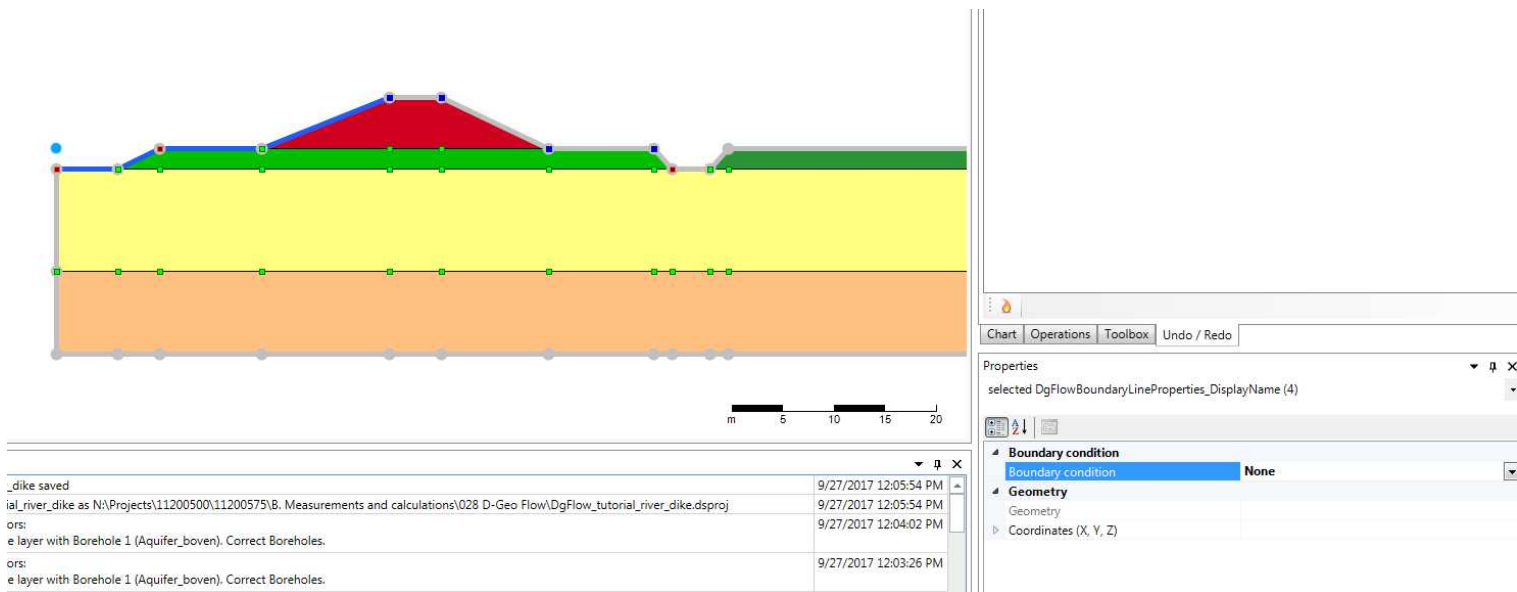
Map Panel:

- Map
 - DgFlow Model
 - Origin point
 - Results
 - Pipe
 - Boreholes
 - Boundary conditions
 - Unstructured Grid
 - CrossSection

Messages Window:

Icon	Message	Time
Info	Project DgFlow_tutorial_river_dike saved	9/27/2017 12:05:54 PM
Info	Saving project DgFlow_tutorial_river_dike as N:\Projects\11200500\11200575\B. Measurements and calculations\028 D-Geo Flow\DgFlow_tutorial_river_dike.dsproj	9/27/2017 12:05:54 PM
Error	Cross Section Generation Errors: Borehole 5 has repeated zone layer with Borehole 1 (Aquifer_boven). Correct Boreholes.	9/27/2017 12:04:02 PM
Error	Cross Section Generation Errors: Borehole 5 has repeated zone layer with Borehole 1 (Aquifer_boven). Correct Boreholes.	9/27/2017 12:03:26 PM
Warning	Aquifer_order (Compressibility is too low adjusting to 1.0E-10[m ² /N])	9/27/2017 11:38:41 AM
Warning	Aquifer_boven (Density of grains (ρ _s) is too low adjusting to 2.40E3[kn/m ³])	9/27/2017 11:37:16 AM

Inleiding



Inleiding



The screenshot displays the DgFlow software interface for a project named "DgFlow_tutorial_river_dike". The main window shows a cross-section model with a red trapezoidal dike on top, a green layer representing the dike body, a yellow layer for the riverbed, and an orange layer for the ground below. A context menu is open over the model, listing several boundary condition options: "Add Head boundary condition", "Add Flux boundary condition", "Add Seepage boundary condition", "Add Submerging boundary condition", "Add No-Flow boundary condition", and "Assign default (no flow) boundary conditions". A tooltip below the menu states "All boundaries are assigned." The interface includes a Project tree on the left with folders for Input, Materials, Boreholes, Boundary Conditions, Pipes, Grid, and Output. The Boundary Conditions folder is expanded, showing checked items for Rivier, Polder, Seepage Bot, and No Flow Bot. The Map view at the bottom left shows the model's location in a geographic context. A scale bar at the bottom right indicates distances in meters (0, 5, 10, 15, 20).

Inleiding



The screenshot displays the DgFlow software interface for a project named "DgFlow_tutorial_river_dike". The main window shows a cross-section of a river and dike. The dike is represented by a red trapezoidal shape on top of a yellow rectangular area. Below the yellow area is an orange rectangular area representing the riverbed. The river is shown as a blue area on the left. A context menu is open over the dike, listing several boundary condition options: "Add Head boundary condition", "Add Flux boundary condition", "Add Seepage boundary condition", "Add Submerging boundary condition", "Add No-Flow boundary condition", and "Assign default (no flow) boundary conditions". A tooltip below the menu states "All boundaries are assigned." The interface includes a Project tree on the left with folders for Input, Materials, Boreholes, Boundary Conditions, Pipes, Grid, and Output. The Boundary Conditions folder is expanded, showing checked items for Rivier, Polder, Seepage Bot, and No Flow Bot. The Map view at the bottom left shows the "DgFlow Model" and "Origin point" layers. A scale bar at the bottom right indicates distances in meters (0, 5, 10, 15, 20).

Inleiding



The screenshot displays the DgFlow software interface for a project named "DgFlow_tutorial_river_dike". The main window shows a cross-section of a dike with a red top layer, a yellow middle layer, and an orange bottom layer. The left sidebar contains a tree view with categories like "Input", "Materials", "Boundary Condition", "Pipes", and "Output". The bottom panel shows a "Messages" window with several error and warning messages.

Messages

Icon	Message	Time
Info	Project DgFlow_tutorial_river_dike saved	9/27/2017 1:42:05 PM
Info	Saving project DgFlow_tutorial_river_dike as N:\Projects\11200500\11200575\B. Measurements and calculations\028 D-Geo Flow\DgFlow_tutorial_river_dike.dsproj	9/27/2017 1:42:04 PM
Info	Project DgFlow_tutorial_river_dike saved	9/27/2017 12:05:54 PM
Info	Saving project DgFlow_tutorial_river_dike as N:\Projects\11200500\11200575\B. Measurements and calculations\028 D-Geo Flow\DgFlow_tutorial_river_dike.dsproj	9/27/2017 12:05:54 PM
Error	Cross Section Generation Errors: Borehole 5 has repeated zone layer with Borehole 1 (Aquifer_boven). Correct Boreholes.	9/27/2017 12:04:02 PM
Error	Cross Section Generation Errors: Borehole 5 has repeated zone layer with Borehole 1 (Aquifer_boven). Correct Boreholes.	9/27/2017 12:03:26 PM
Warning	Aquifer_onder (Compressibility is too low adjusting to 1.0E-10[m ² /N])	9/27/2017 11:38:41 AM
Warning	Aquifer_boven (Density of grains (ρ_s) is too low adjusting to 2.40E3[kg/m ³])	9/27/2017 11:37:16 AM
Warning	Aquifer_boven (Compressibility is too low adjusting to 1.0E-10[m ² /N])	9/27/2017 11:37:09 AM
Warning	Dijk (Density of grains (ρ_s) is too low adjusting to 2.40E3[kg/m ³])	9/27/2017 11:36:41 AM
Warning	Dijk (Compressibility is too low adjusting to 1.0E-10[m ² /N])	9/27/2017 11:36:38 AM
Info	Project DgFlow_tutorial_river_dike saved	9/27/2017 11:35:35 AM

Inleiding



Chart Operations Toolbox Undo / Redo

Properties
DgFlowProjectTreeItemProperties

20

Mesh Data

Default Mesh Coarseness [m]	2.5
Pipe Coarseness [-]	6

Mesh Parameters

Cell Count	0
Min Angle [deg]	0.00
Max Angle [deg]	0.00

'M
'M
'M
'M
'M
'M
PM
PM
PM

Inleiding



Project: DgFlow_tutorial_river_dike

- DgFlow Model
 - Input
 - Materials
 - Soils
 - Water
 - Boreholes
 - Boundary Condition
 - Rivier
 - Polder
 - Seepage Bounde
 - No Flow Bounde
 - Pipes
 - Grid
 - Output
 - Pipe Results

Map: DgFlow Model

- Origin point
- Results
 - Pipe
 - Head
 - Pressure
 - Velocity
 - Permeability_X
 - Permeability_Y
 - Water
- Pipe
- Boreholes
- Boundary conditions
- Unstructured Grid
- CrossSection

Legend

- DgFlow Model
 - CrossSection (Name)
 - Aquifer_boven
 - Aquifer_onder
 - Voorland
 - Dijk
 - Achterland

Messages

Icon	Message	Time
Info	Project DgFlow_tutorial_river_dike saved	9/27/2017 2:12:07 PM
Info	Saving project DgFlow_tutorial_river_dike as N:\Projects\11200500\11200575\B. Measurements and calculations\028 D-Geo Flow\DgFlow_tutorial_river_dike.dsproj	9/27/2017 2:09:50 PM
Info	Wall clock "DgFlow Model": Start time: 27-Sep-2017 14:03:04.	9/27/2017 2:06:50 PM
Info	Model "DgFlow Model" has finished in 1 steps.	9/27/2017 2:06:50 PM
Error	Initialization of DgFlow Model has failed.	9/27/2017 2:02:46 PM
Error	Validation of this model failed. Please fix the errors in the validation report.	9/27/2017 2:02:46 PM
Warning	Adjust Water Compressibility, β , to Steady State default, 0.0 m ³ /N	9/27/2017 2:01:49 PM
Info	Project DgFlow_tutorial_river_dike saved	9/27/2017 2:01:02 PM
Info	Saving project DgFlow_tutorial_river_dike as N:\Projects\11200500\11200575\B. Measurements and calculations\028 D-Geo Flow\DgFlow_tutorial_river_dike.dsproj	9/27/2017 2:01:00 PM
Info	A grid has been generated for model 'DgFlow Model'.	9/27/2017 2:00:39 PM
Info	Project DgFlow_tutorial_river_dike saved	9/27/2017 1:58:28 PM
Info	Saving project DgFlow_tutorial_river_dike as N:\Projects\11200500\11200575\B. Measurements and calculations\028 D-Geo Flow\DgFlow_tutorial_river_dike.dsproj	9/27/2017 1:58:27 PM
Info	Project DgFlow_tutorial_river_dike saved	9/27/2017 1:57:32 PM
Info	Saving project DgFlow_tutorial_river_dike as N:\Projects\11200500\11200575\B. Measurements and calculations\028 D-Geo Flow\DgFlow_tutorial_river_dike.dsproj	9/27/2017 1:57:23 PM

Inleiding



The screenshot shows the DgFlow Model software interface. The main window displays a cross-section model of a dike and surrounding areas. A legend on the left identifies the layers: Aquifer_boven (yellow), Aquifer_onder (orange), Voorland (green), Dijk (red), and Achterland (dark green). A dialog box titled "Select Time Dependent Spatial Data" is open, showing a table of available items:

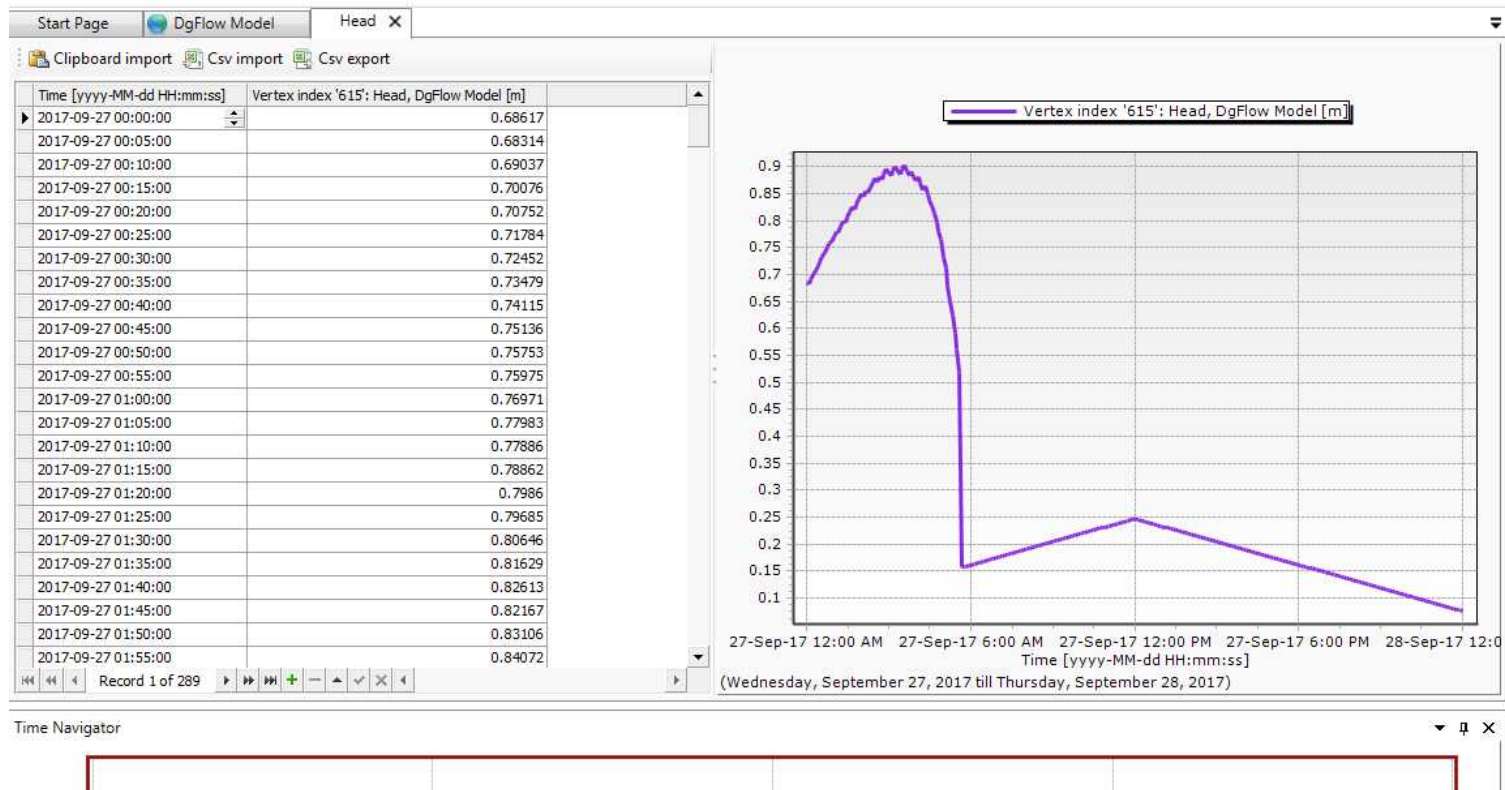
Owner	SpatialData
DgFlow Model	Pressure
DgFlow Model	Head

The "Head" item is selected. The Messages panel at the bottom shows the following log entries:

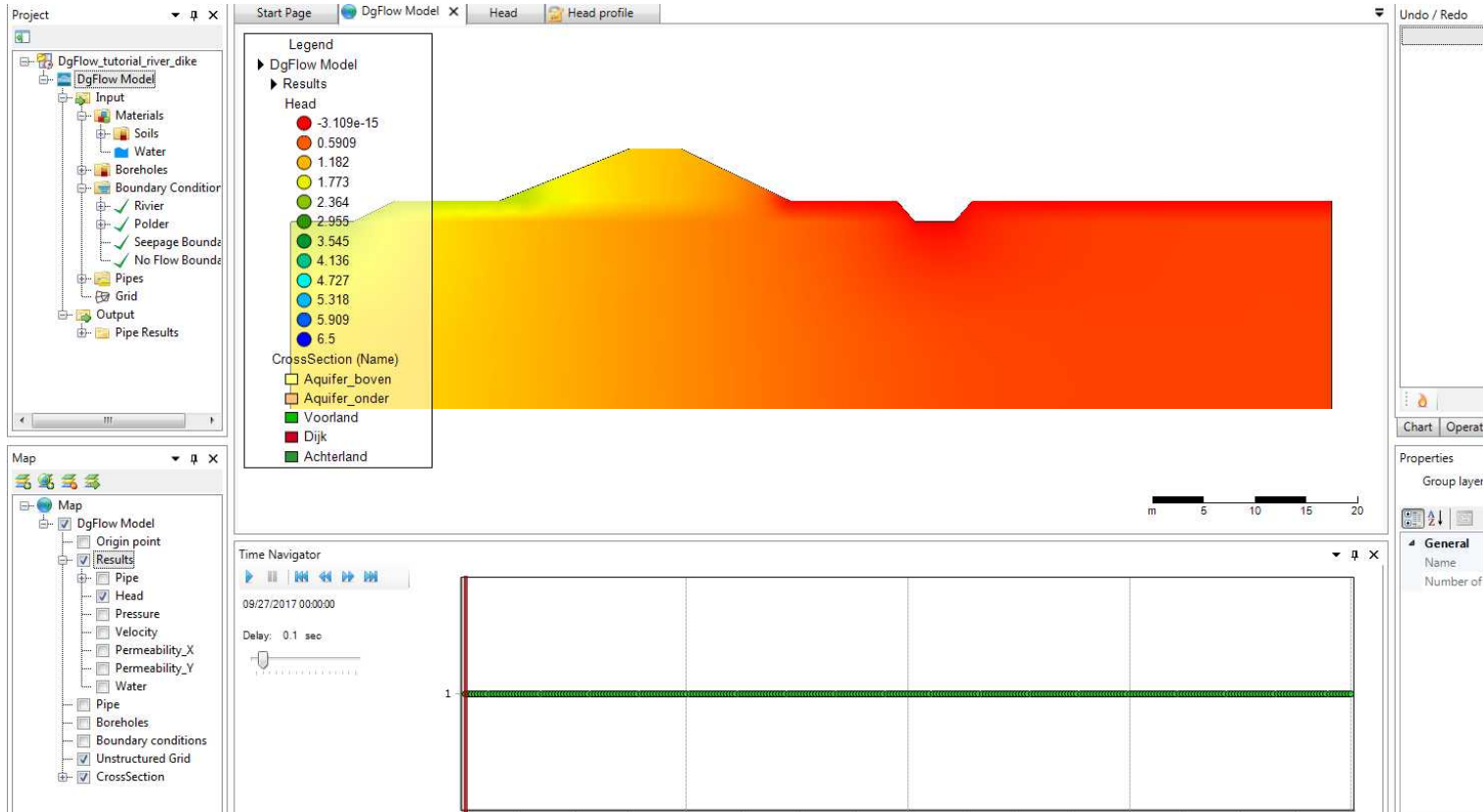
- Project DgFlow_tutorial_river_dike saved
- Saving project DgFlow_tutorial_river_dike as N:\Projects\11200500\11200575\B. Measurements and calculati
- Wall clock "DgFlow Model":
- Start time: 27-Sep-2017 14:03:04.
- Model "DgFlow Model" has finished in 1 steps.

Timestamps for the last two messages are 9/27/2017 2:06:50 PM.

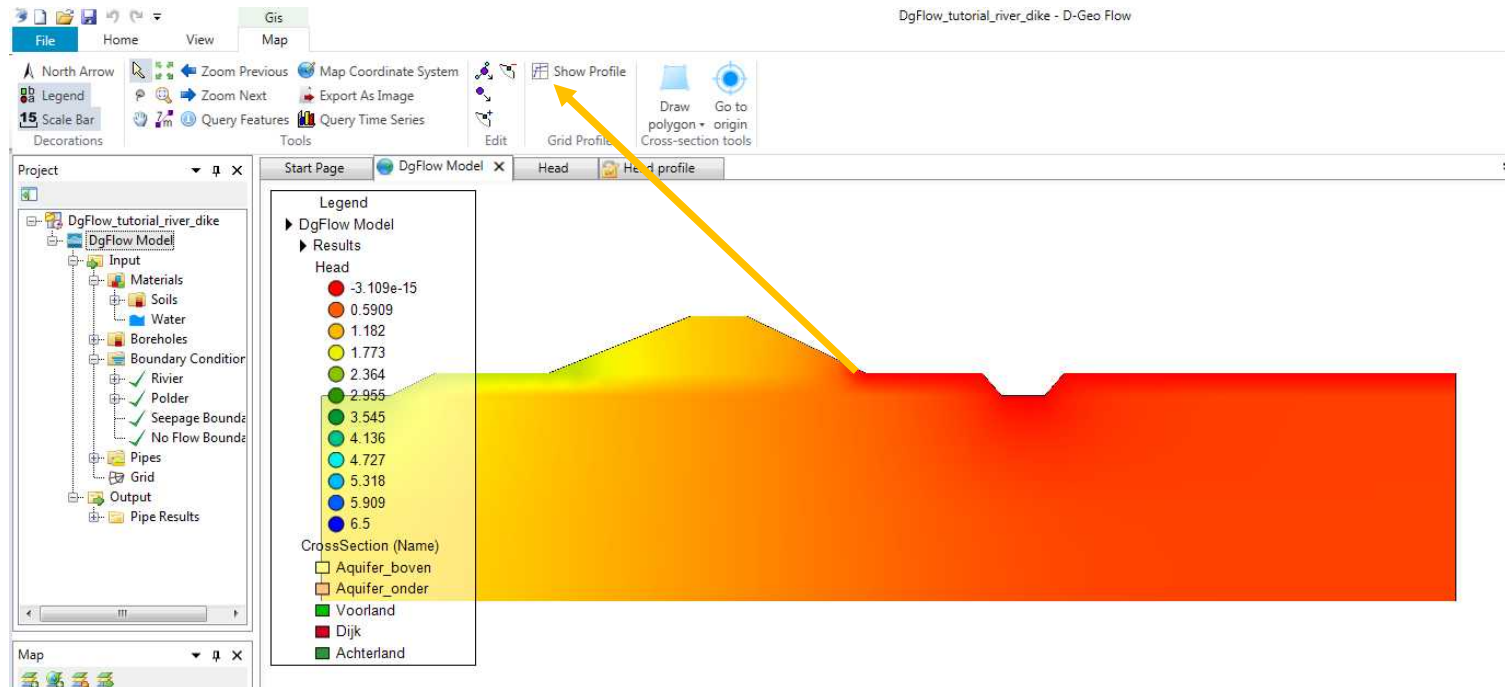
Inleiding



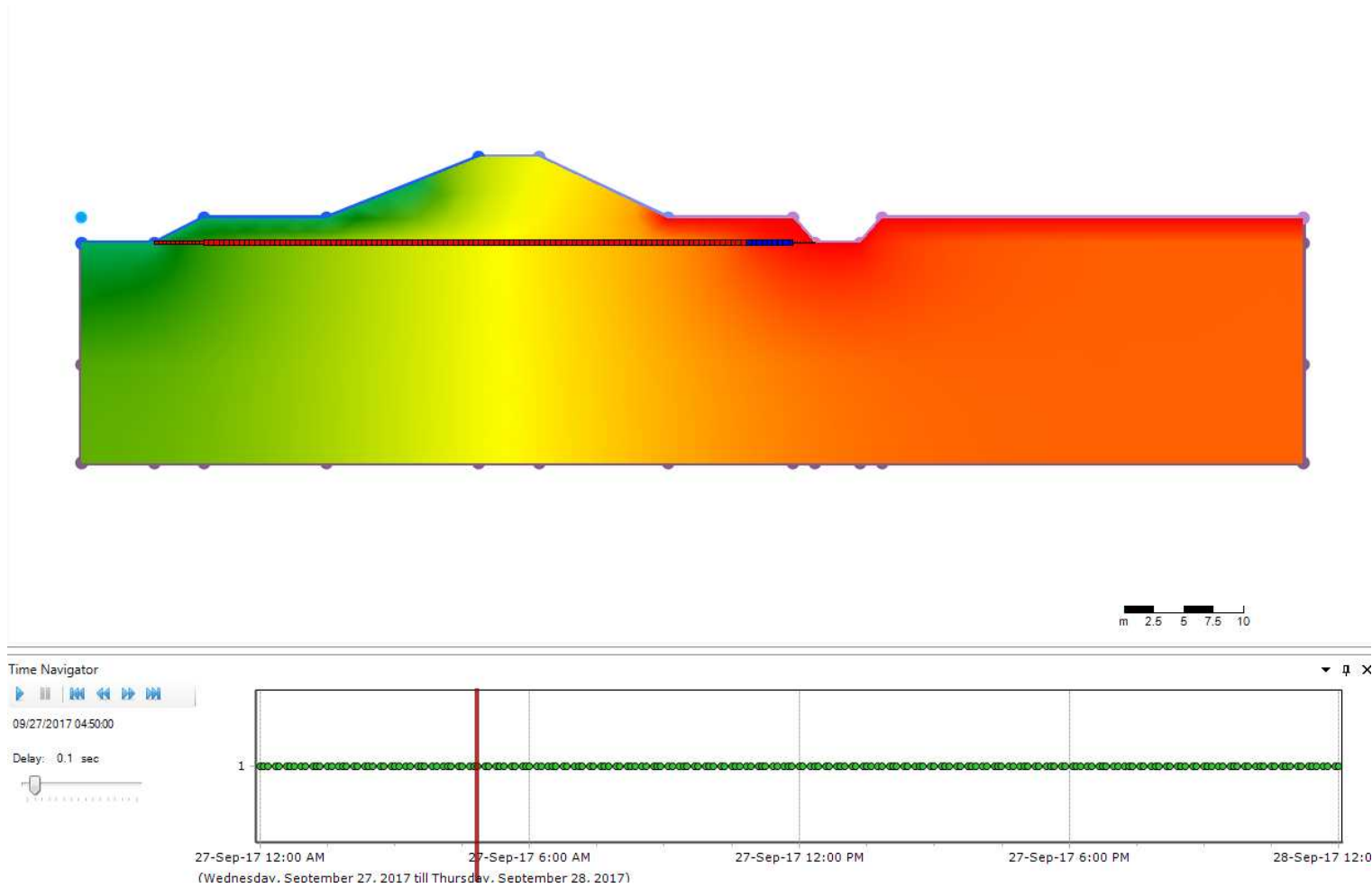
Inleiding



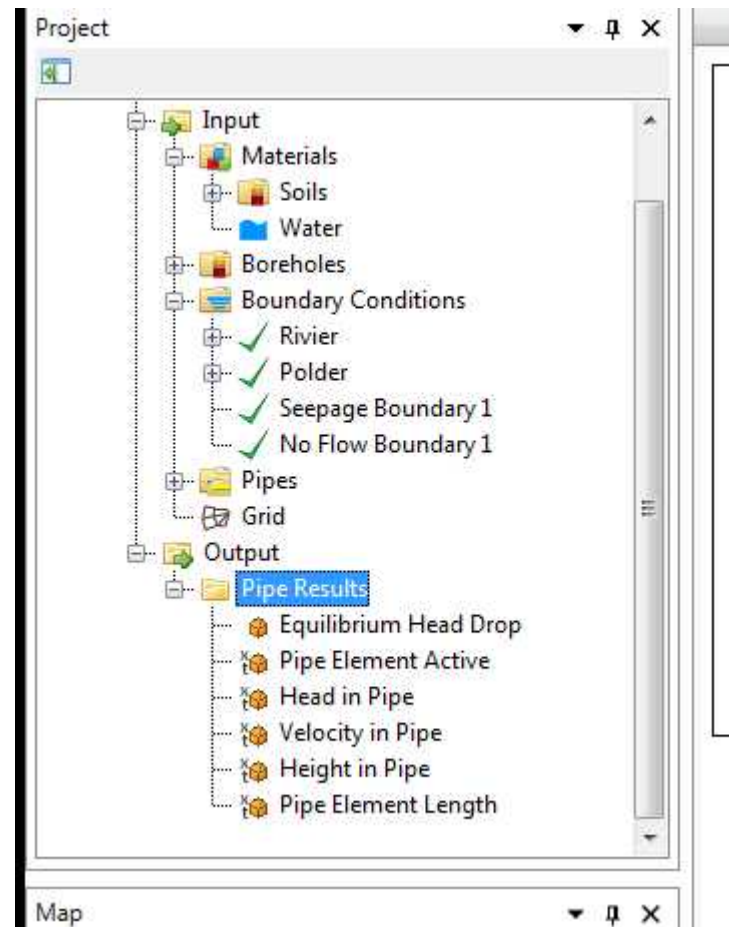
Inleiding



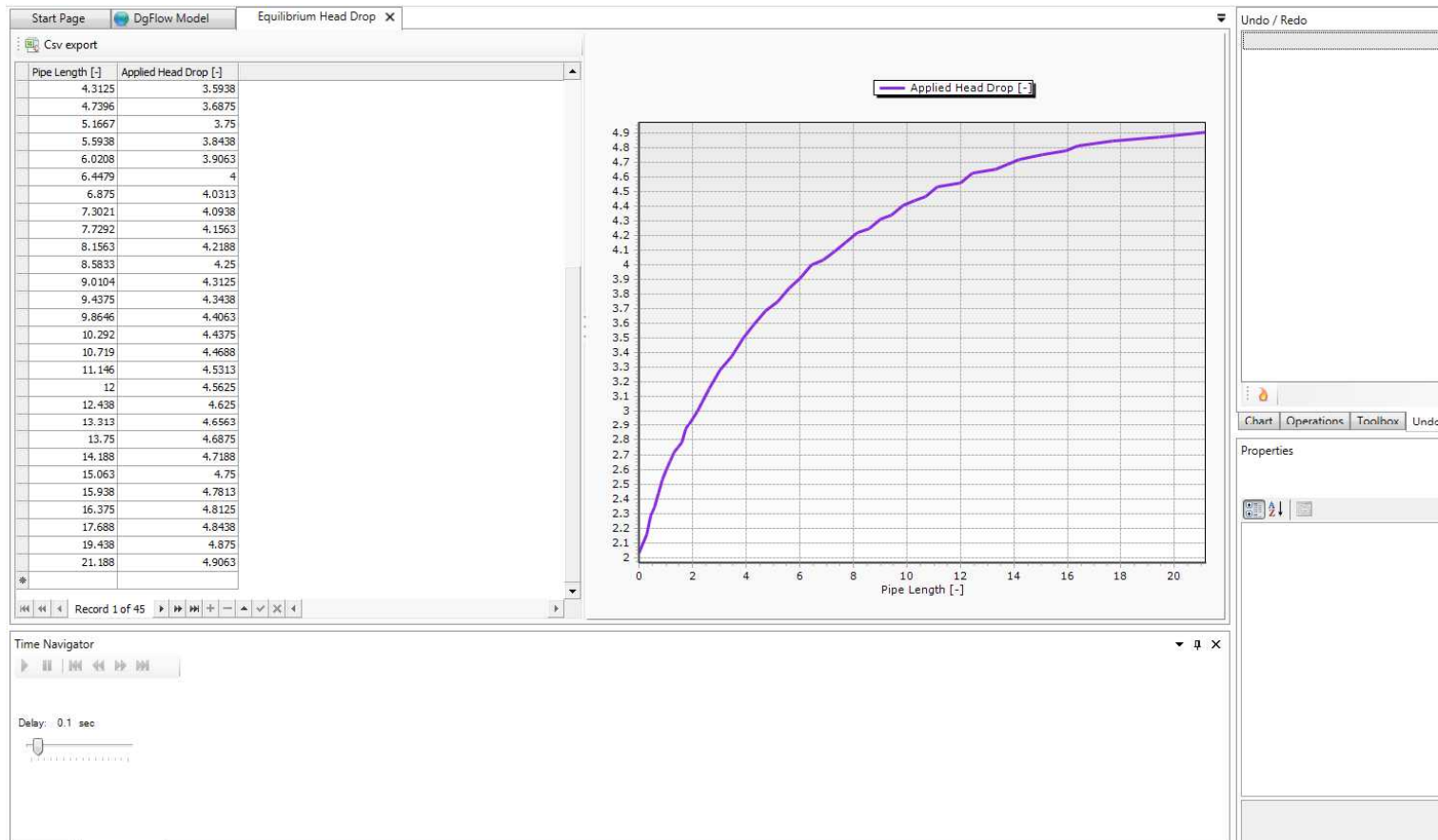
Inleiding



Inleiding



Inleiding



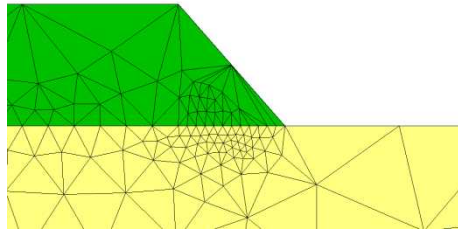
Aandachtspunten en gevoeligheden

- **Dit is een eerste versie**
- Invoer met gebruik van de punt, niet komma voor decimalen
 - 0.02 *niet* 0,03
- Als er meerdere projecten open staan wordt alleen het actieve project opgeslagen door de save functie
- Bij het selecteren van lijnen voor randvoorwaarden zijn nodes niet automatisch mee geselecteerd, die moet je dus apart nog een randvoorwaarde geven.

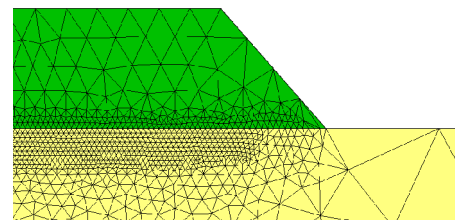
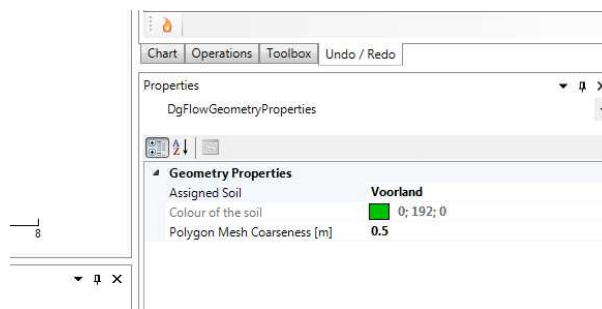
Aandachtspunten en gevoeligheden

- **Mesh**

- Resultaten zijn afhankelijk van de meshverfijning
- Bij grote verfijning om pipe krijg je slecht gevormde elementen.



- Blokken kunnen ook lokaal verfijnd worden; lange rekentijden



Aandachtspunten en gevoeligheden

- **MPicard**
- Pipe hoogte wordt bepaald met een nauwkeurigheid van

$$\Delta a_{pipe} = \frac{100 * D70}{MPicard}$$

Dus een hogere MPicard leidt tot een hogere nauwkeurigheid maar ook langere rekentijden.

Bij een onnauwkeurigere pipe hoogte wordt het criterium overschat wat leidt tot een lager kritiek verval. Dit is onnodig conservatief.

Wat kan wel, wat kan niet



- Range waarin rekenregel geldig is van 63-500 mu; dat geldt ook voor D-Geo Flow.
- Grondopbouw door boreholes, niet polygons
- Dezelfde grondlaag mag niet op twee diepten voorkomen, dus zandlaag die gescheiden wordt door kleilaag moet boven en onder klei verschillende namen hebben.

Transiente berekening



- **Aandachtspunten tijdsafhankelijk rekenen**
- Pipe groei met 1 element per tijdsstap
- Sterkere mesh afhankelijkheid
- Momenteel erg lange rekestijden en onbetrouwbare resultaten bij te lage mesh refinement en/of te grote tijdsstappen.

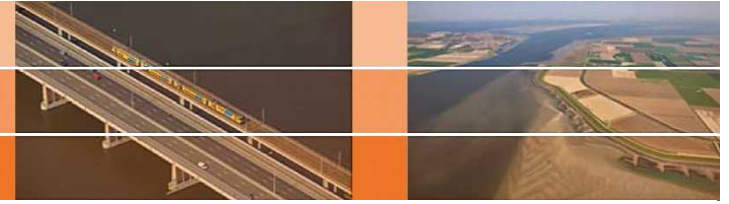
Oefening



Tutorial River dike in handleiding: Hoofdstuk 5

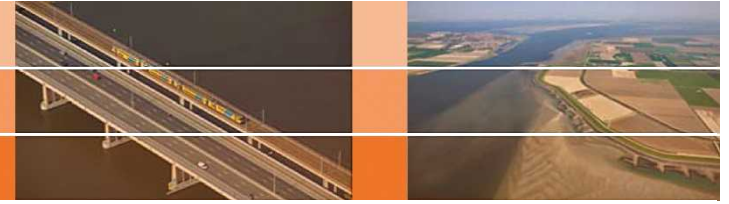
- Laat g op default, laat viscositeit water op default
- Eigenschappen van grond alleen nodig voor de laag waarin de pipe komt voor overige lagen kan men de default waarden laten staan:
 - Submerged particle density
 - D70
 - White's constante (η)
- Invullen van particle density dus 2650 niet submerged particle density 1650 zoals in tutorial staat.
- Randvoorwaarden opleggen, polderpeil met head 0, en benedenstroomse zijde dijk is seepage.
- Eventuele foutmelding bij creëren pipe negeren en coördinaten start en einde pipe invullen.
- Opslaan model duurt lang.

Known Issues



- **Changing names and saving documents**
 - Try to copy the data structure separately to a new name (i.e. “.dsproj” file and corresponding directory)
 - Don't change project name between saves
 - Only use the “save” option and not “save as”
 - To be fixed in version 2

Known Issues

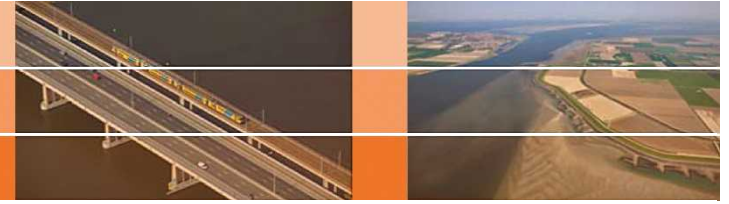


- **Crashes on Execution \ Save:**

Index was outside the bounds of the array

- Mesher is generating 4 noded elements
- Work around to set specific coarseness values for different polygons, particularly long and very thin polygons.

Known Issues



- **Default Mesh: Extremely fine mesh (long generation time)**
 - Mesher generates extremely fine mesh on default.
 - Due to very small polygon features defining the default value.
 - Work around to set specific global coarseness value.