

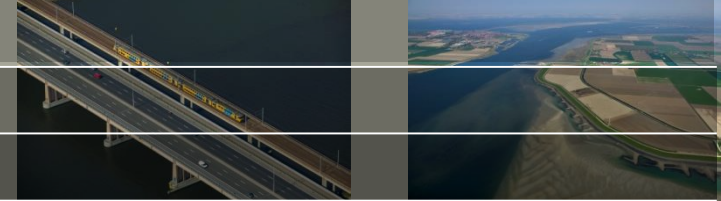


TKI D-HYDRO voor Waterschappen

Voortgangsoverleg 15 november

Tiel

agenda



1. Toelichting status softwareontwikkeling (Deltares)
2. Status Pilots (bureaus)
3. Onderzoeksvragen Pilots (gezamenlijke discussie)
4. Planning en beoogde einddatum project

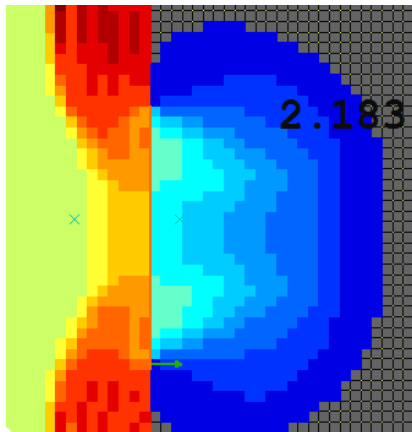


TKI Voortgang - november 2018

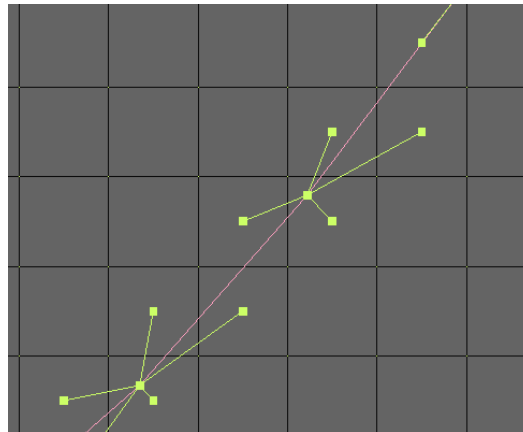
Arthur van Dam

Voortgang rekenhart op drie onderdelen

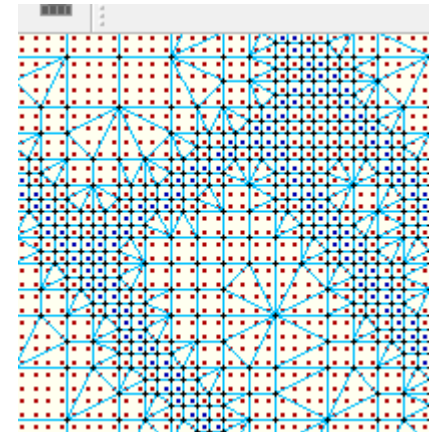
Bresgroei
Functies & validatie



1D2D generatie



automatische
gridverfijning

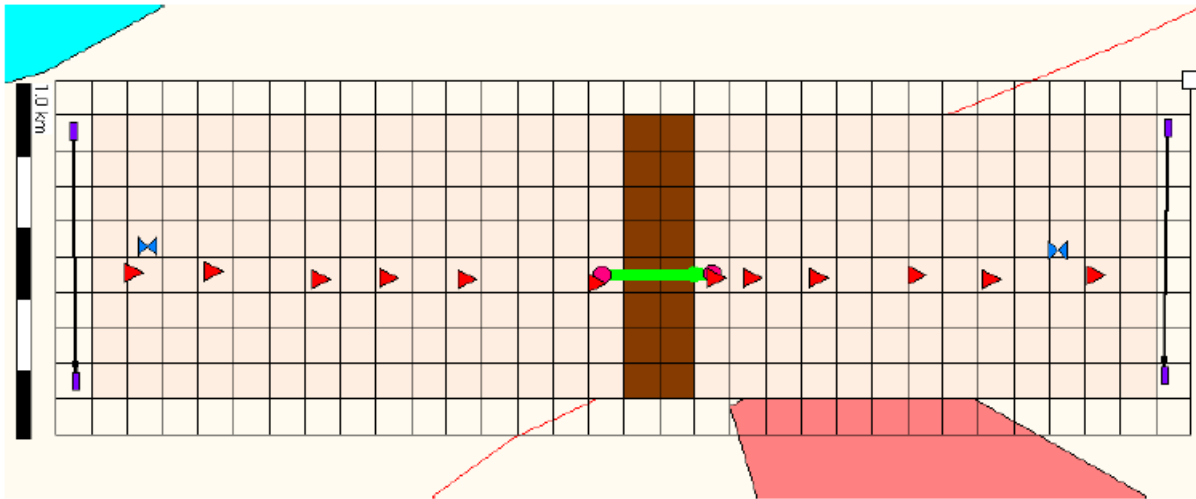
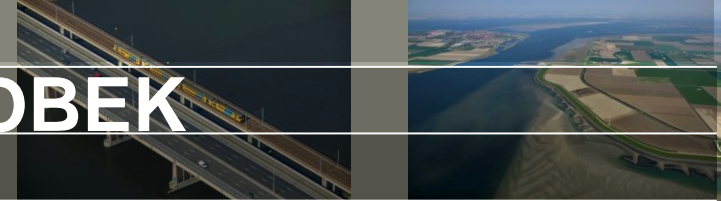




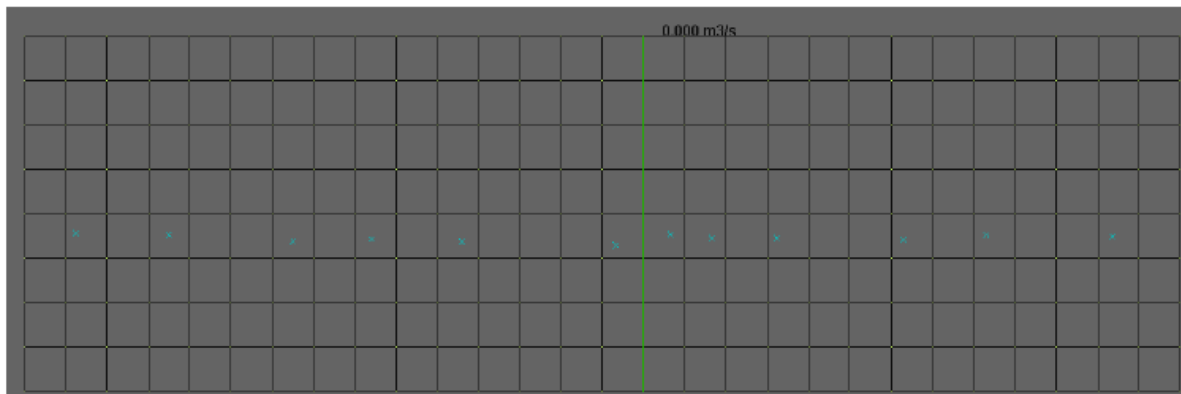
Bresgroei

- Validatie
- Extra: custom waterstandspunten

Dambreak vergelijking met SOBEK

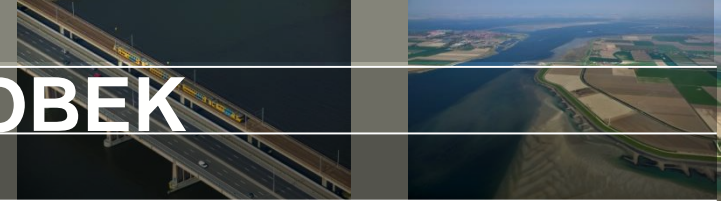


Sobek

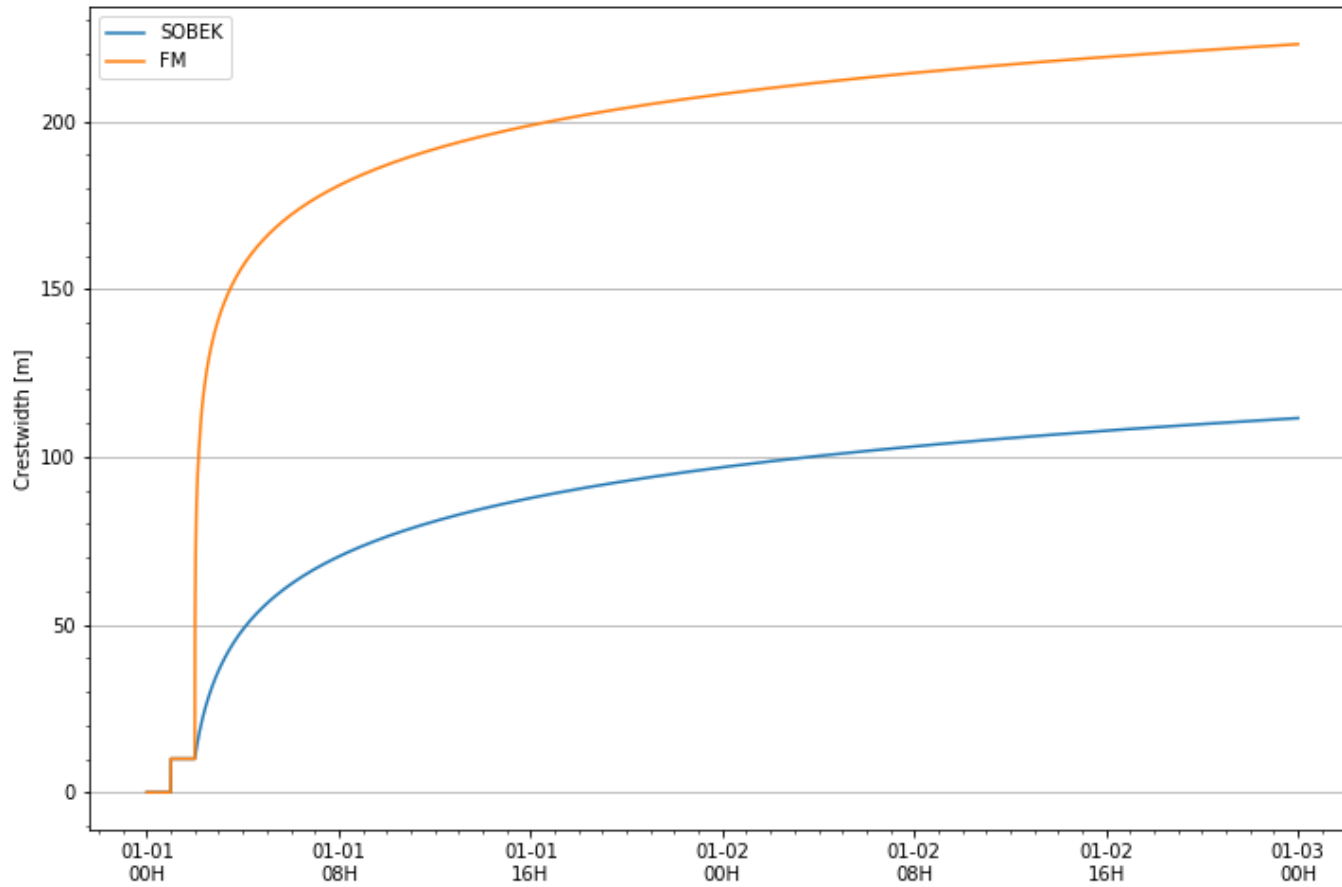


D-Flow FM

Dambreak vergelijking met SOBEK

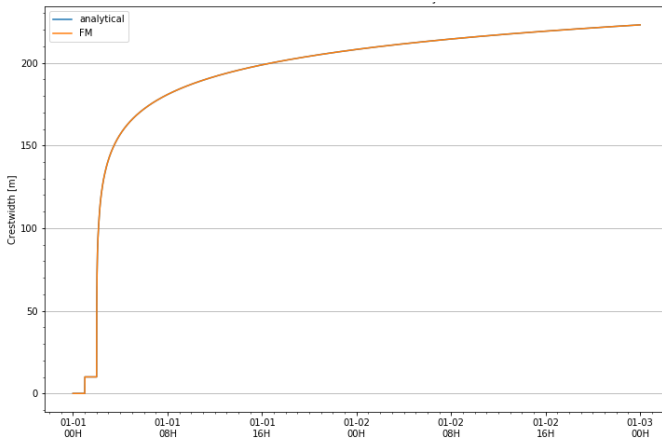


Breedte van bres over tijd voor SOBEK & D-Flow FM

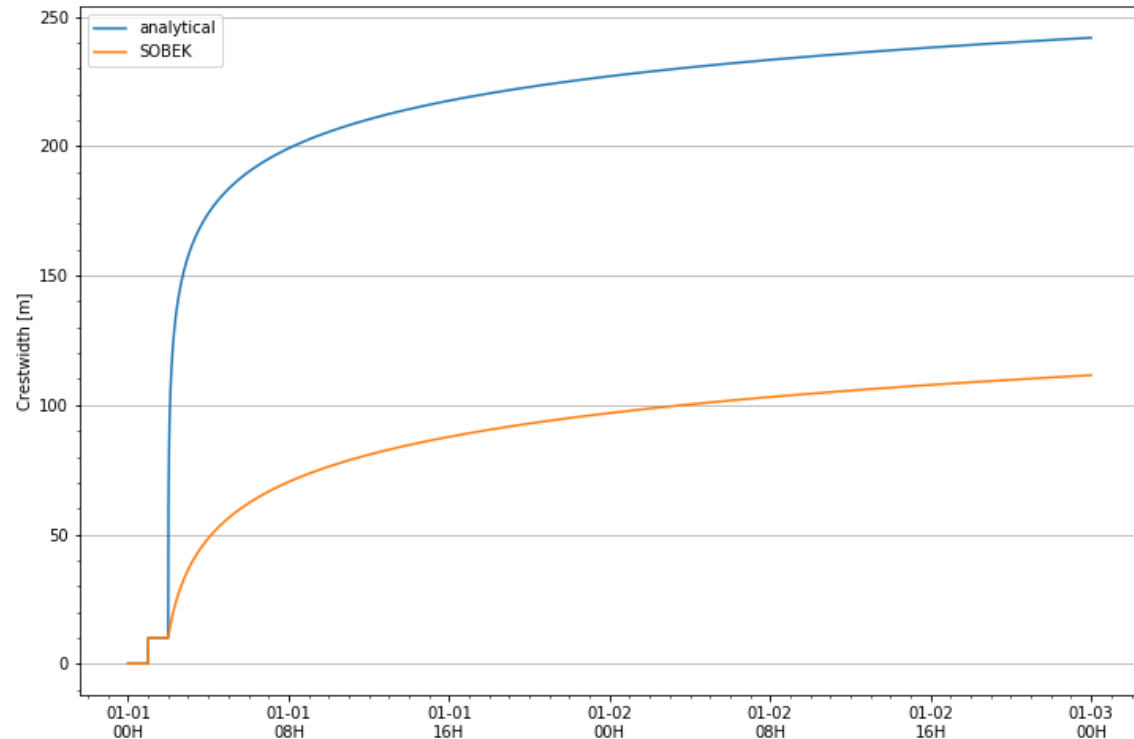


Dambreak vergelijking met SOBEK

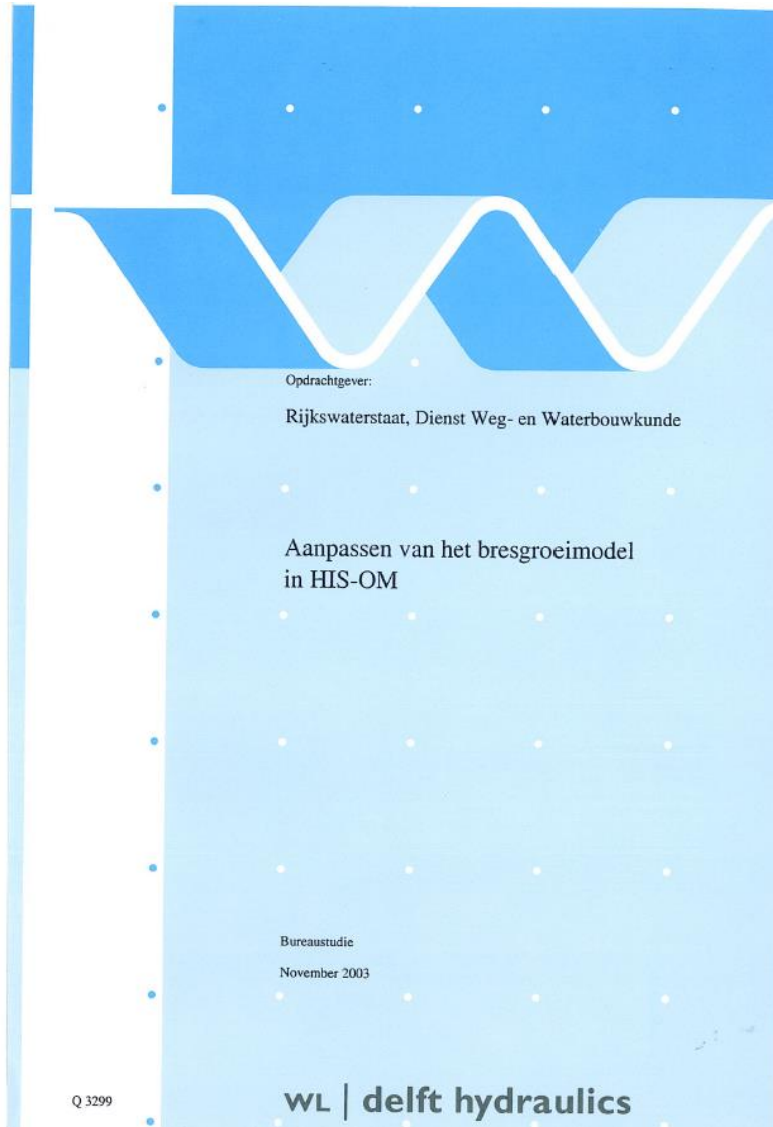
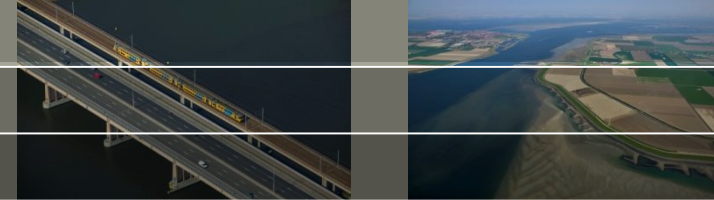
Breedte van bres over tijd voor D-Flow FM & quasi-analytische oplossing



Breedte van bres over tijd voor SOBEK & quasi-analytische oplossing



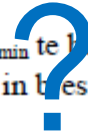
De tijd vliegt



$$\text{met } \left(\frac{\partial}{\partial t}\right)_{t_i} = \frac{1}{\ln 10} \frac{1}{u_c^2} \frac{1}{1 + \frac{f_2 g}{u_c} (t_i - t_0)} \quad (28)$$

waarin:

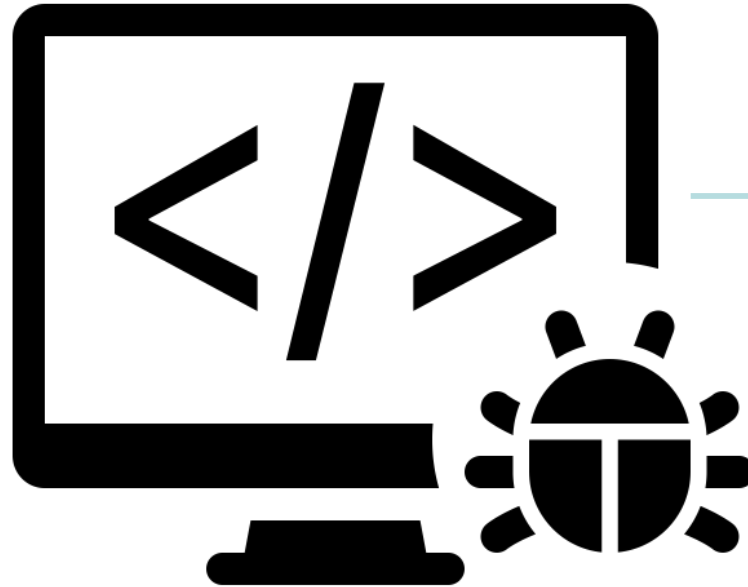
- f_1 = coëfficiënt (-)
- f_2 = coëfficiënt (-)
- h_{up} = bovenstroomse waterstand (m)
- h_{down} = benedenstroomse waterstand (m)
- t_i = tijdstip i (s)
- t_0 = tijdsduur om z_{min} te bereiken (s)
- z_{min} = laagste niveau in bres (m)



Dambreak vergelijking met SOBEK

Fix in Dambreak

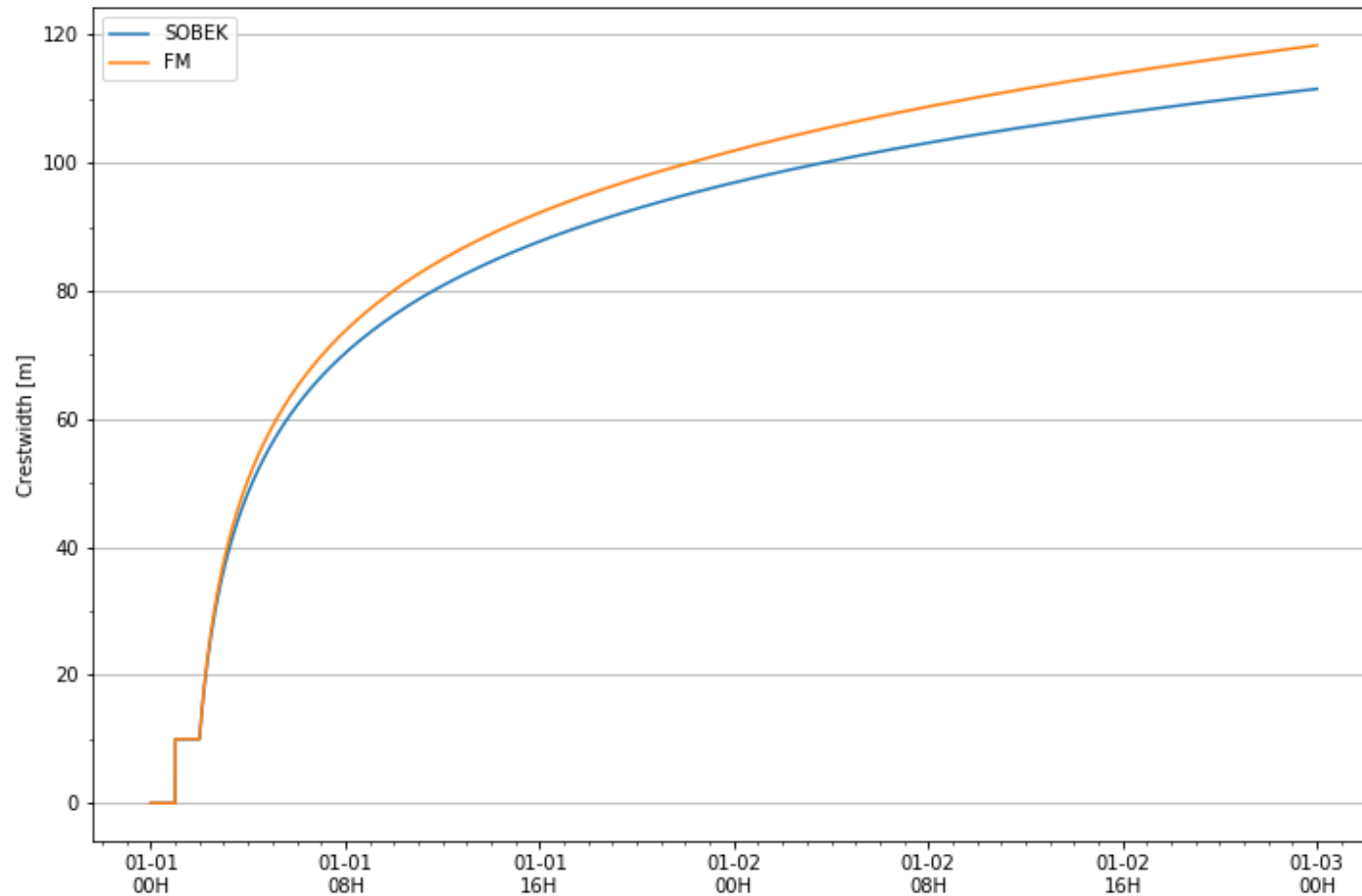
Tijd variabelen in
secondes



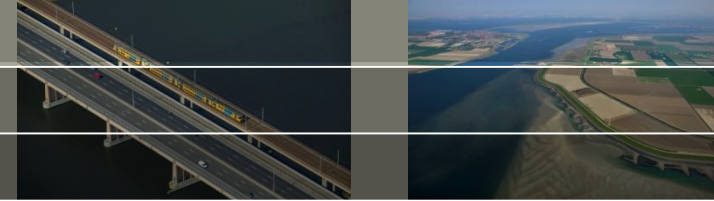
Tijd variabelen in
uren

Dambreak vergelijking met SOBEK na fix

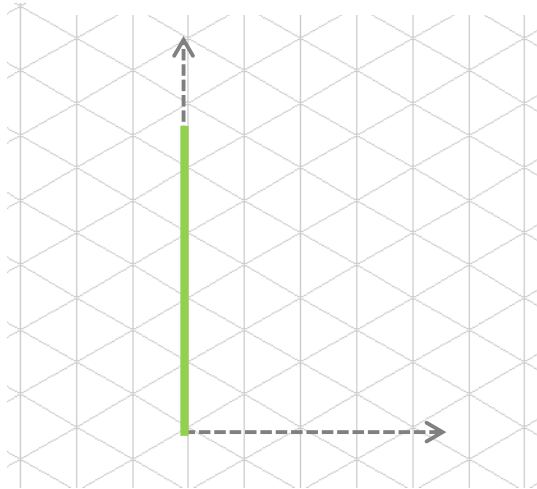
Breedte van bres over tijd voor SOBEK & D-Flow FM na fix



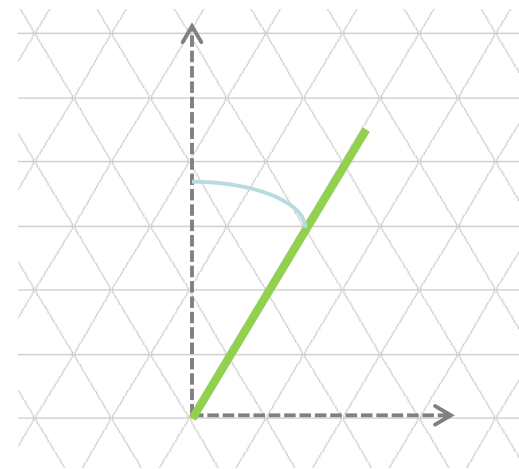
Hellende dambreak tests



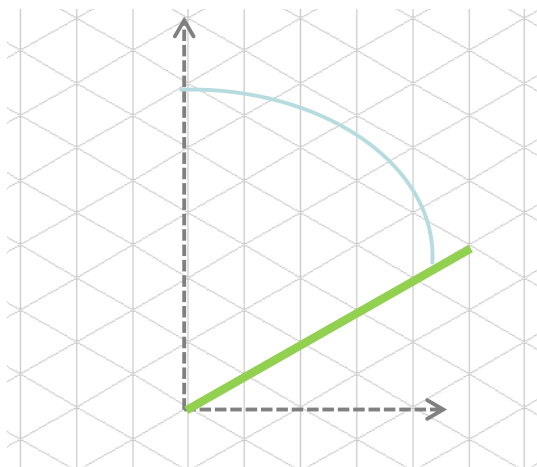
Verticale dambreak



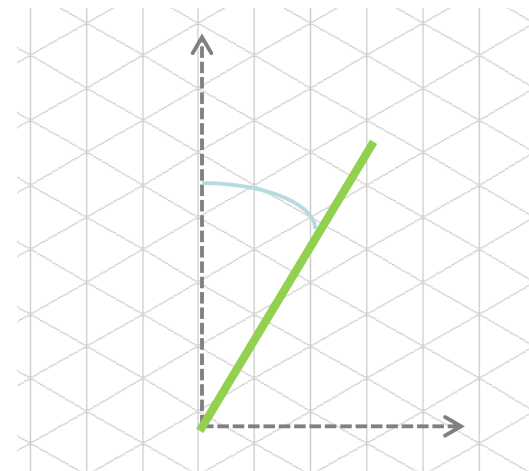
30 graden dambreak



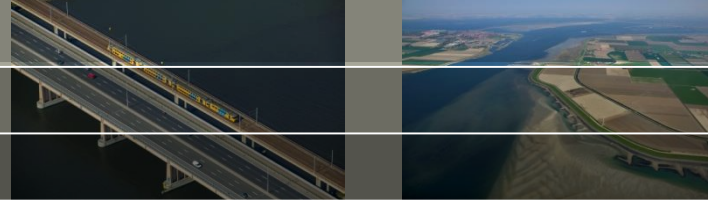
60 graden dambreak



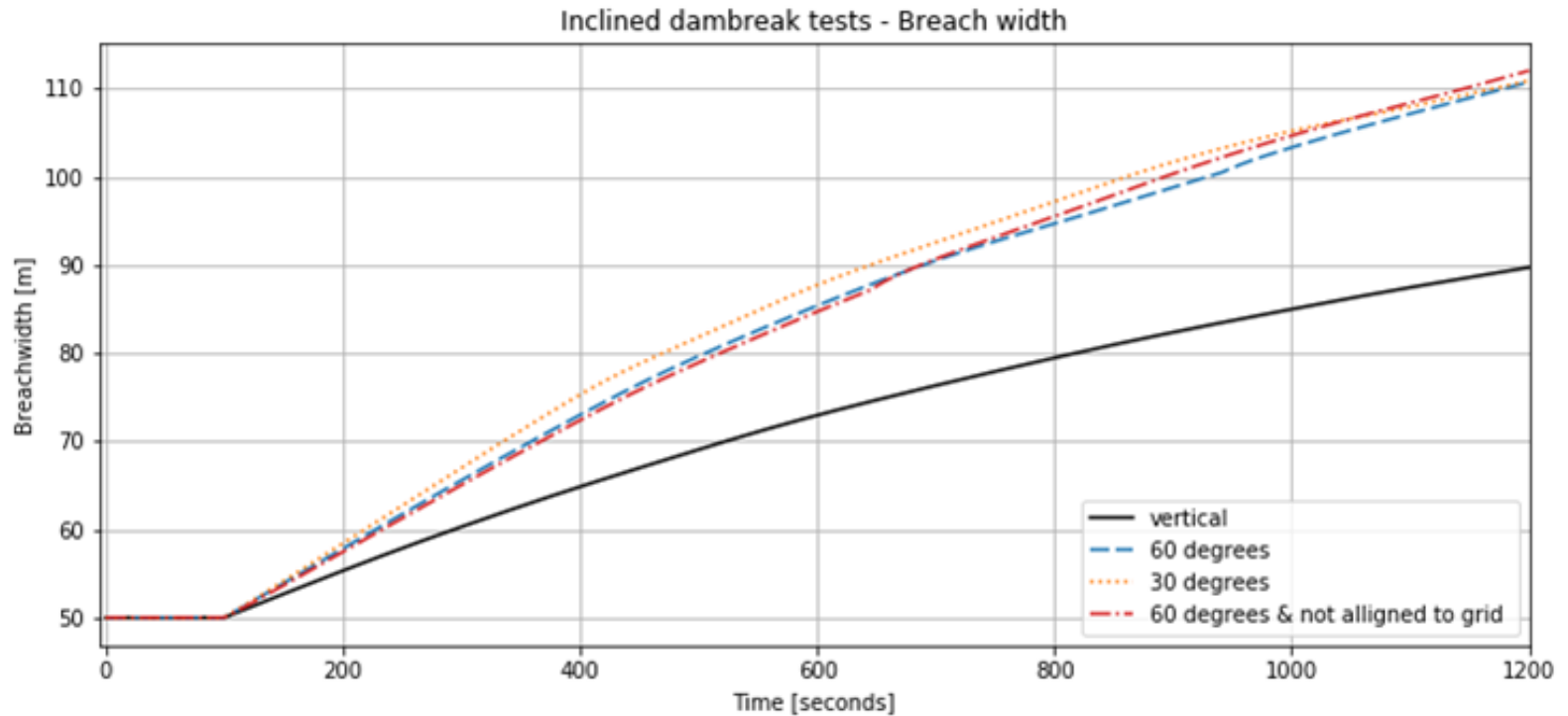
30 graden dambreak & niet parallel aan grid



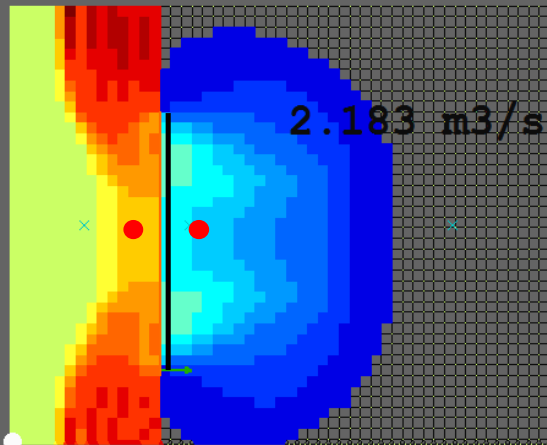
Hellende dambreak tests



Breedte van bres over tijd

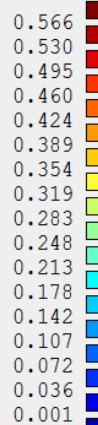


Dambreak with user defined water level locations



$$\left(\frac{\partial B}{\partial t}\right)_{t_i} \propto (g(h_{up} - \max(h_{down}, h_{min})))^{\frac{3}{2}}$$

Waterlevel
(m)



```
[structure]
type = dambreak
id = secondDambreak
polylinefile = secondDambreak.pli
startLocationX = 6.5
startLocationY = 4.0
algorithm = 2 # 1 VdKnaap ,2 Verheij-vdKnaap
crestLevelIni = 1.0
breachwidthini = 1
crestlevelmin = 0.2
timetobreachtomaximumdepth = 0.01 #in seconds
dischargecoeff = 1
f1 = 1
f2 = 1
ucrit = 0.001
waterLevelUpstreamLocationX = 4.73
waterLevelUpstreamLocationY = 2.81
waterLevelDownstreamLocationX = 5.37
waterLevelDownstreamLocationY = 2.87
t0 = 1.0 # make it a boolean
dambreakLevelsAndWidths = dambreak.tim #used only in algorithm 1
materialtype = 1 #1 clay 2 sand, used only in algorithm 1
```

User can specify:

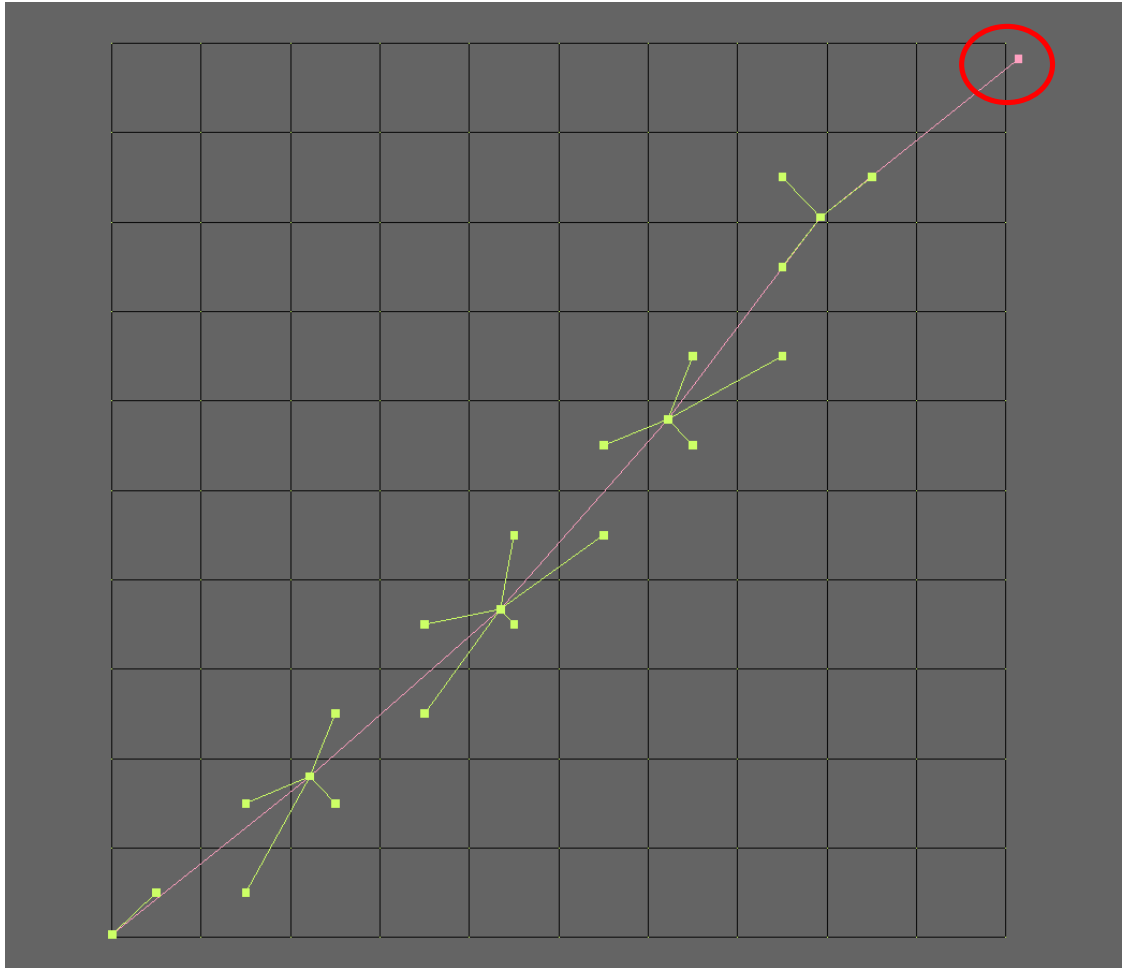
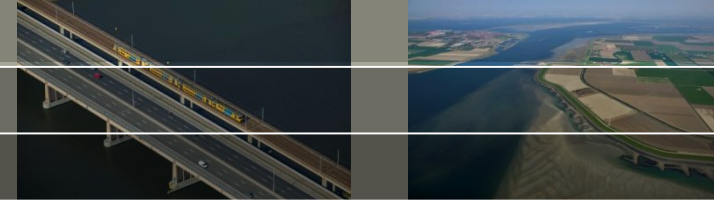
1. No water level locations: Water levels are computed by averaging the values on the left and right of the dambreak polyline in the open links (black line).
2. One or both water level locations (red dots): for the specified locations the computed water levels in the cell are used. Allows the user to use “far field” water levels.



1D2D link generatie

- Inbedding in DeltaShell GUI
- Verbetering: 1-op-veel koppelingen

Embedded 1d2d links



How does it work?

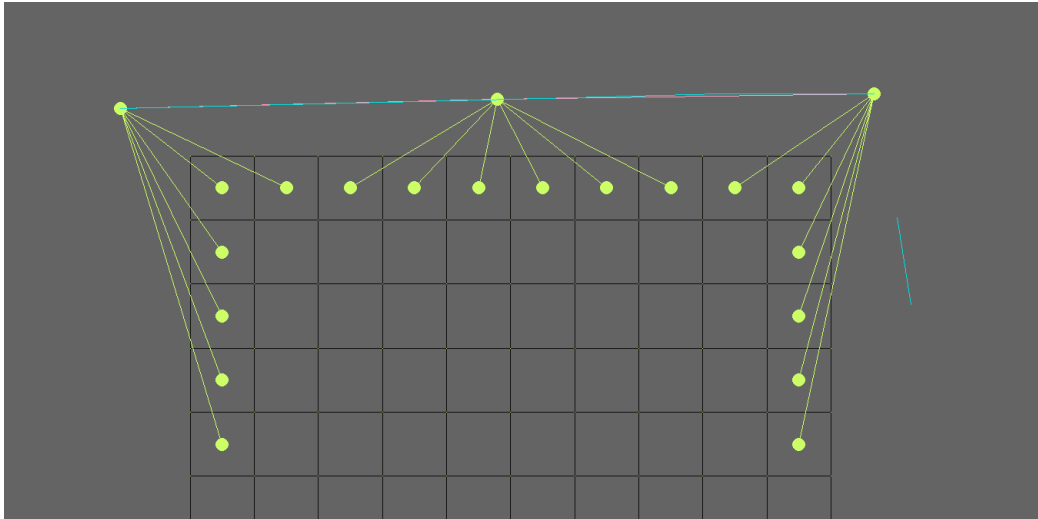
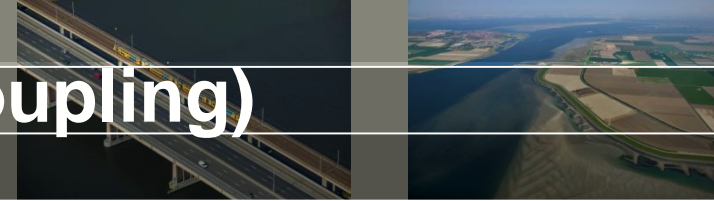
The 2d cells intersected by 1d mesh links are connected to the closest 1d mesh points.

As a result, a 1d mesh point can be connected to multiple 2d cells -> improves on the existing algorithm for flooding simulations

1d mesh points outside the 2d mesh are not connected

Needs some improvements when internal dry areas are present.

Lateral links (e.g. for 1D river coupling)



How does it work?

The 2d boundary cells within a search radius are connected to the closest 1d mesh point outside the 2d mesh.

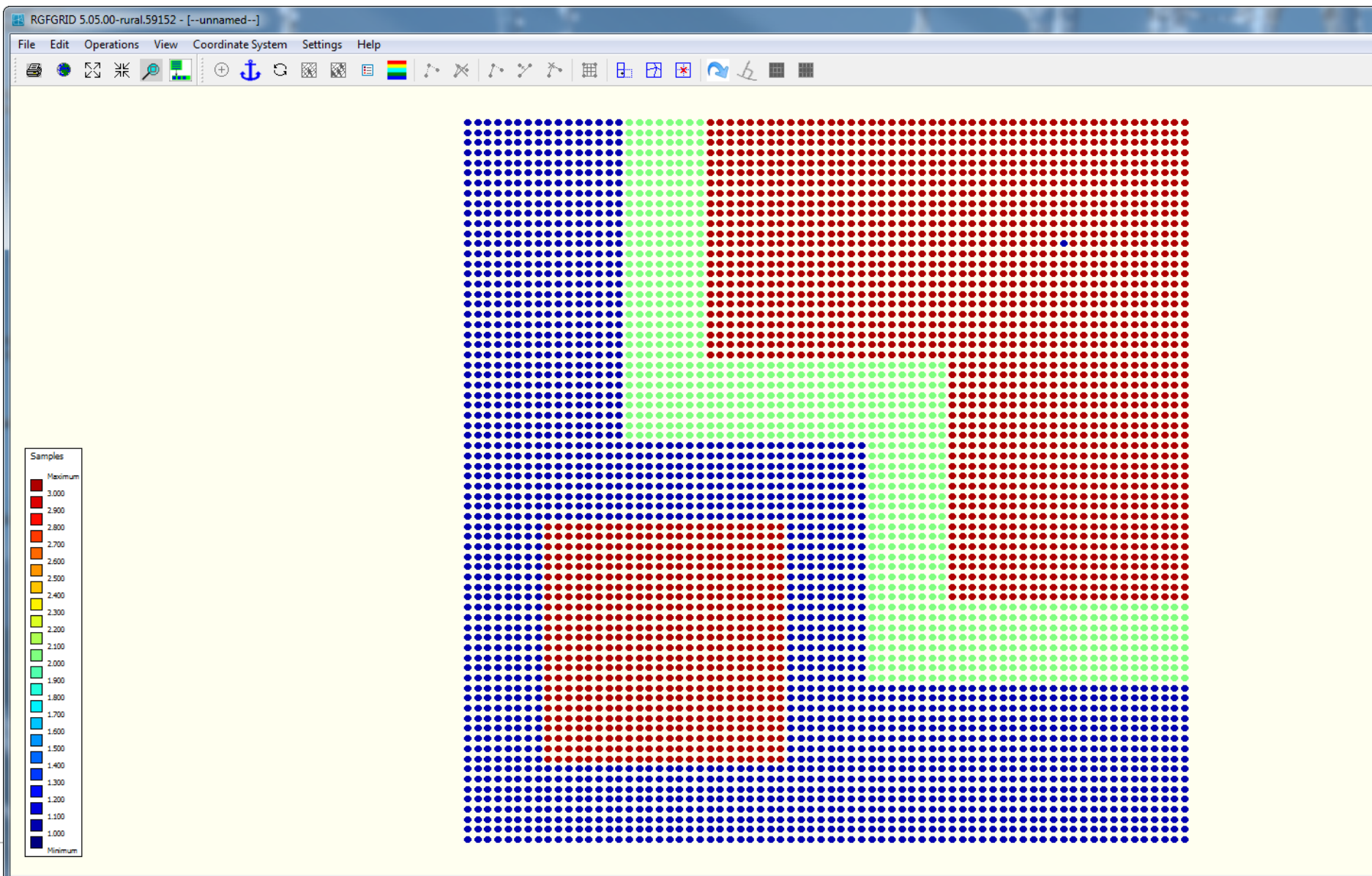
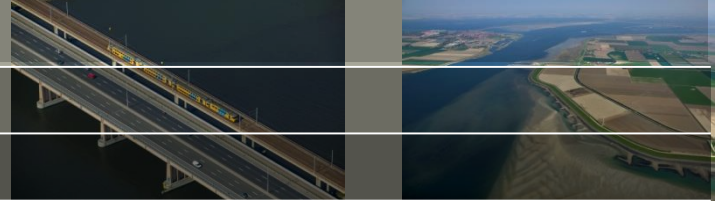
When the search radius is 0, the search radius is calculated internally ($\max(\text{lengthLinkRight}, \text{lengthLinkLeft})$).



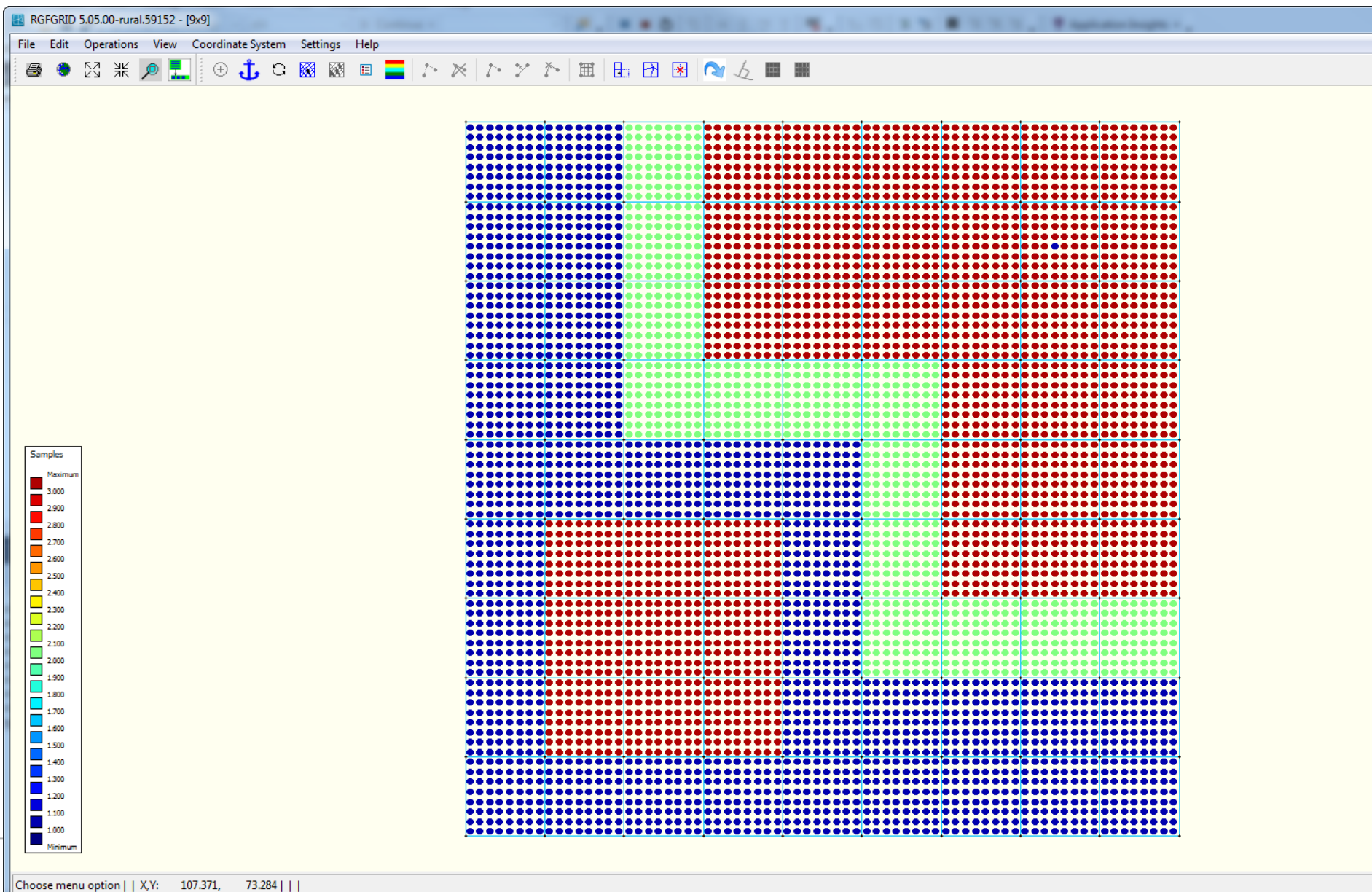
Automatische gridgeneratie

- Raster-support in RGFGRID
- Automatisch basisgrid + verfijning
- Intuïtieve verfijningsklassen

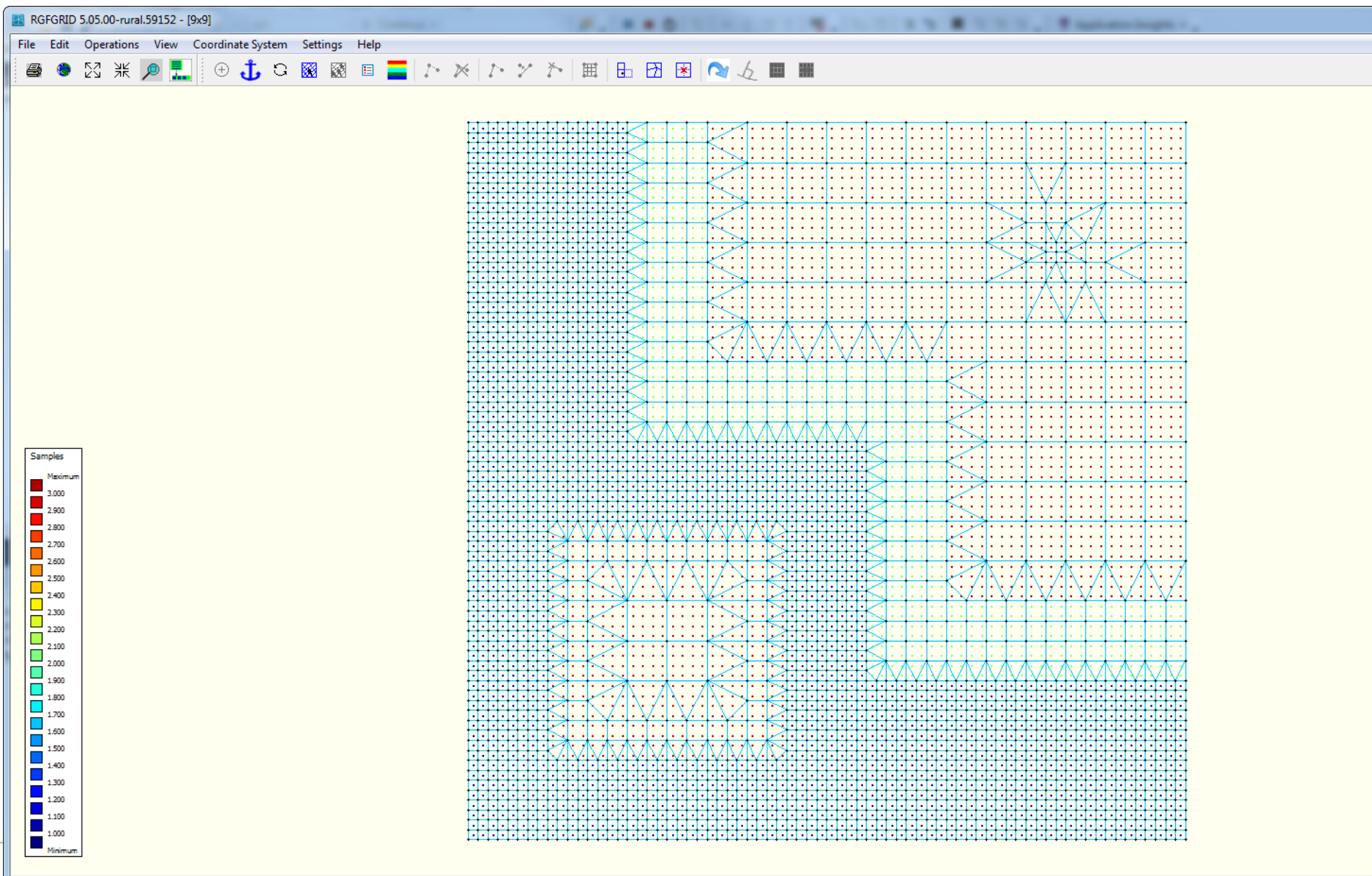
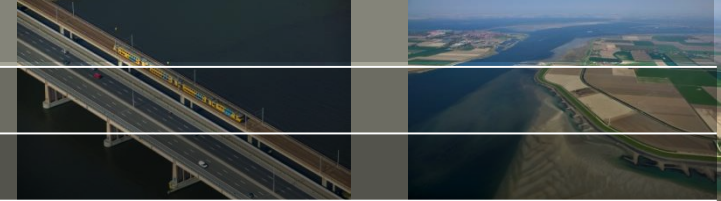
Raster-support in RGFGRID



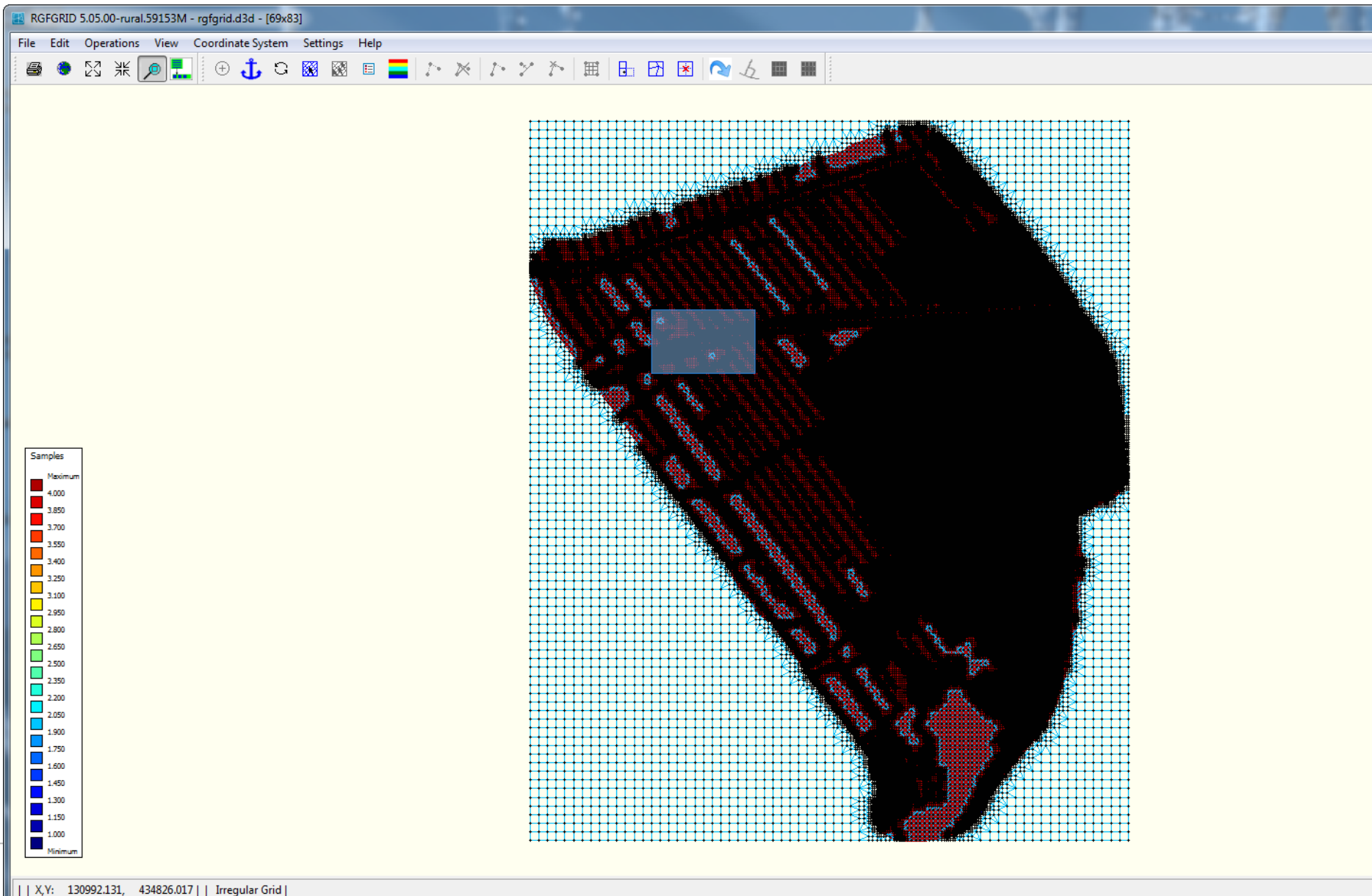
Automatisch basisgrid o.b.v. rasterkaart



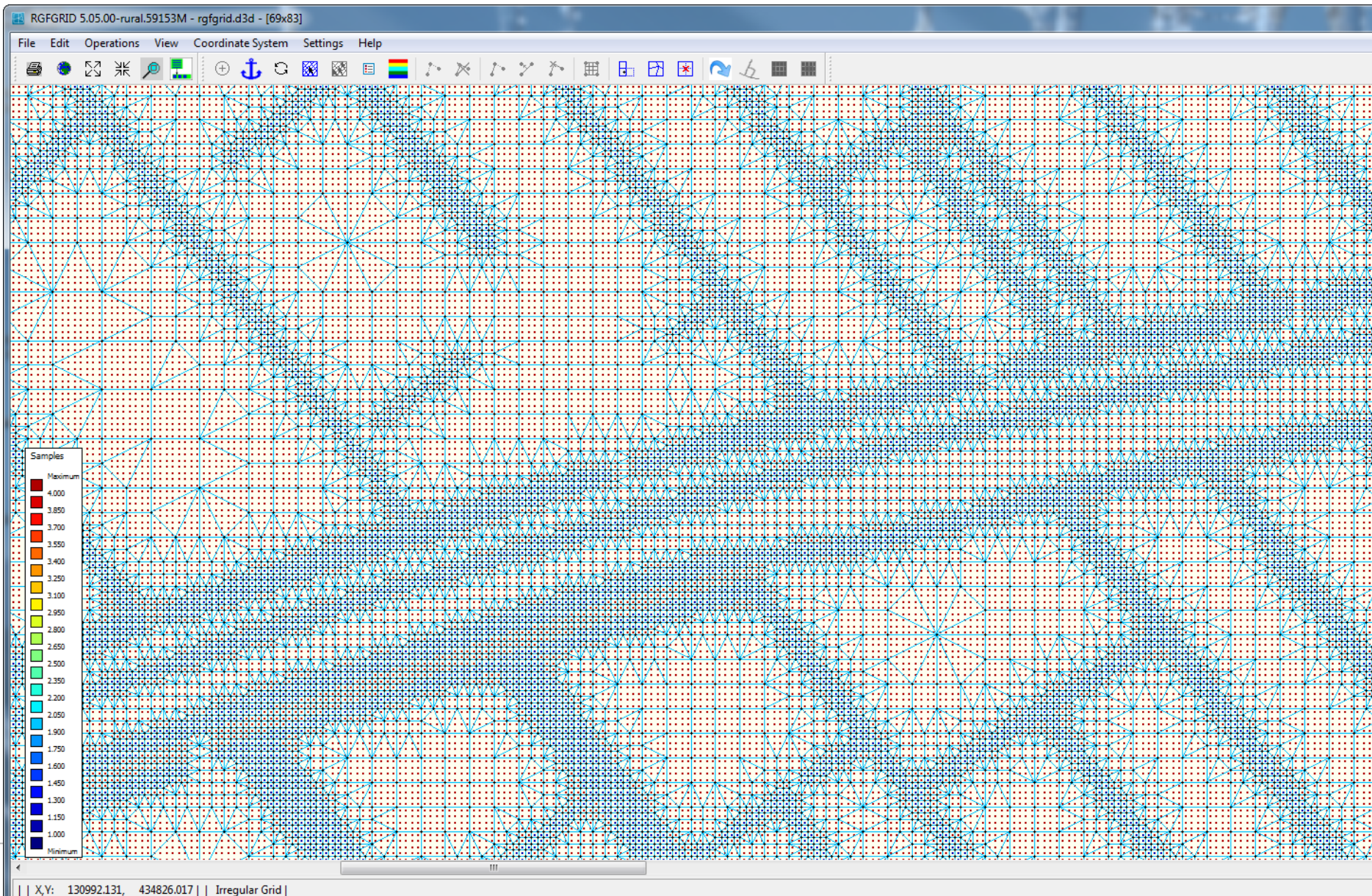
Automatische gridverfijning

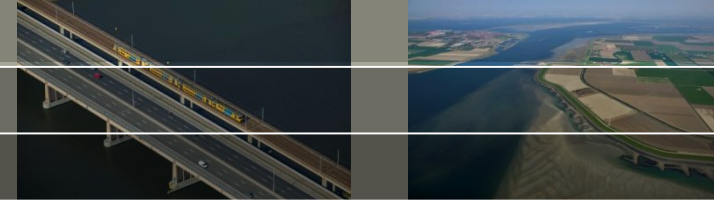


Automatische gridverfijning (Leerdam-West)



Automatische gridverfijning (Leerdam-West)





- Modelling support pilots
- Samenwerkdagen met Hydrologic (Annemarleen van Kersbergen & Bram Schnitzler), tweewekelijks
- Modelleerkickoff met HKV (Guus Rongen)

Release D-HYDRO 1D2D (prototype)

November 2018: TKI functionaliteiten ontsloten in Delta Shell User interface

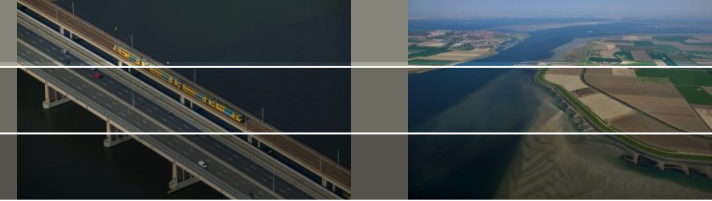
The screenshot displays the Delta Shell User interface for the D-HYDRO 1D2D (prototype) software. The main window is titled "Project1 - Delft3D Flexible Mesh Suite 1D2D (prototype)". The interface is divided into several panels:

- Top Panel:** Contains the menu bar (File, Home, View, Tools, Map) and a toolbar with various GIS and simulation tools such as "Generate links", "Add link", "Merge operations", "North Arrow", "Legend", "Scale Bar", "Zoom Previous", "Zoom Next", "Map Coordinate System", "Export As Image", "Query Features", "Query Time Series", "Show Profile", "Grid Profile", "Network", "Area", "Coverage", "Computational 1D Grid", "Network Coverage", and "An...".
- Left Panel:** The "Project" tree shows the following structure:
 - Project1
 - FlowFM
 - General
 - Network
 - Area
 - Computational 1D Grid
 - Grid
 - 1D2D Links
 - Bed Level
 - Time Frame
 - 1D Roughness
 - Processes
 - Initial Conditions
 - Boundary Conditions
 - Physical Parameters
 - Sources and Sinks
 - Numerical Parameters
 - Output Parameters
 - Output

- Right Panel:** The "Region" tree shows:
- Network
 - Routes
 - Shared Cross Section Definitions
 - Sections (roughness)
 - Channel1
 - Channel2
 - Channel3
 - Channel4
 - Channel5
 - CompositeBranchStructure1: 13
 - Weir1
- Bottom Panel:** The "Time Navigator" shows a play button, a stop button, and a time value of "01/01/0001 00:00:00". Below it, the "Delay" is set to "0.1 sec". The "Messages" panel is currently empty.

Current map coordinates (WGS 84 / Pseudo-Mercator) : 553290.350633531, 6842887.55547079

1D2D embedded koppeling



Project1 - D-HYDRO Suite 1D2D (Prototype)

Map

File Home View Tools

Generate links
Add link
Embedded

FM Region

Project

Embedded

Lateral
Roof-sewer
Inhabitants

Properties

Group layer

General

Name Computational 1D Grid
Number of layer: 1

Name
Name of the layer group.

Time Navigator

01/01/0001 00:00:00

Delay: 0.1 sec

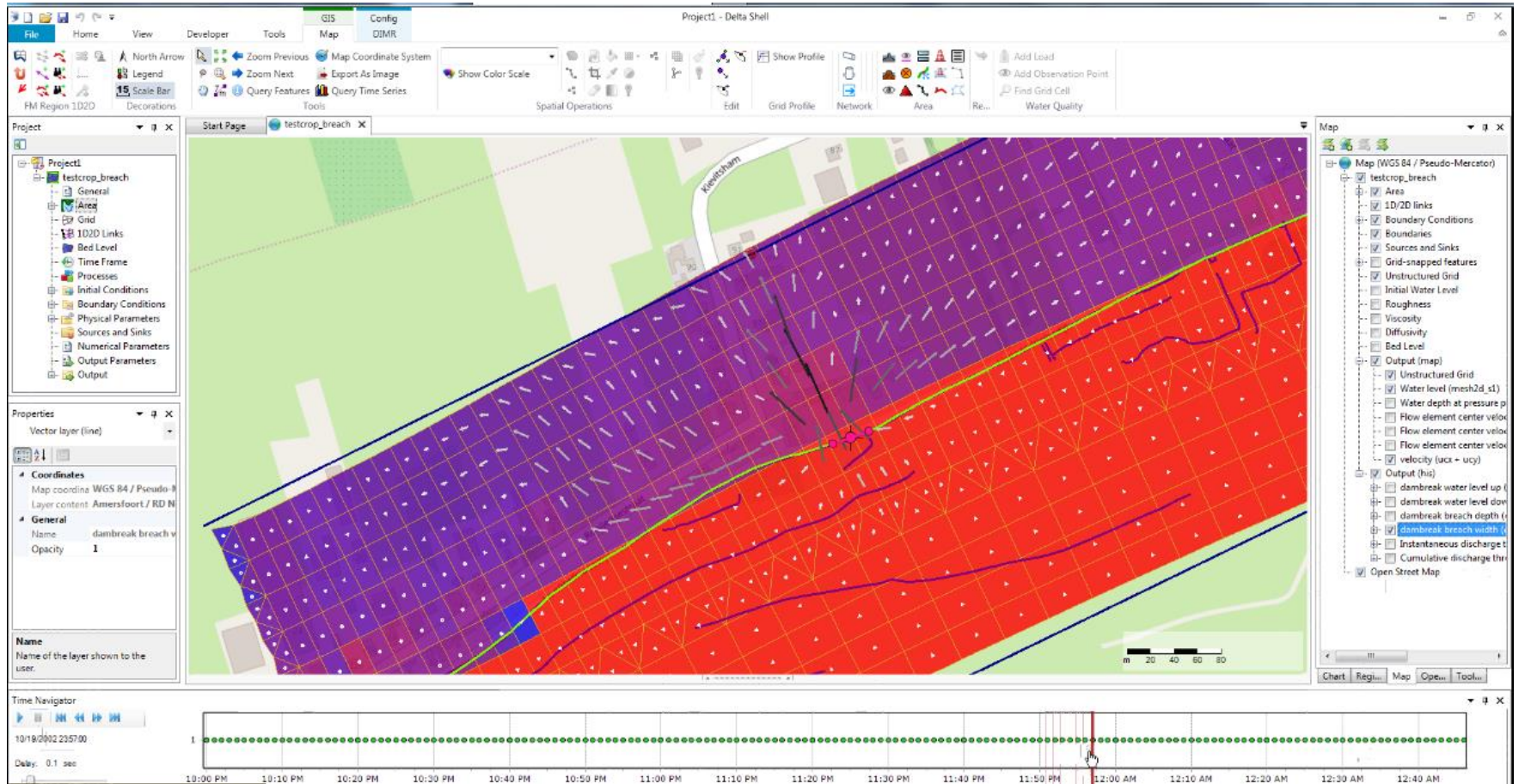
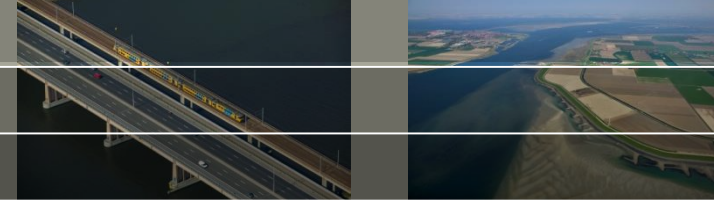
Messages Time Navigator

Map (WGS 84 / Pseudo-Mercator)

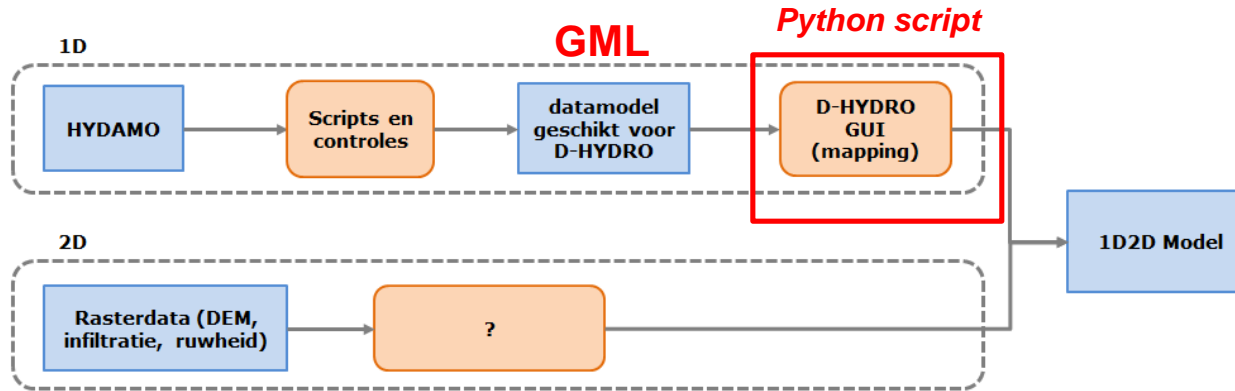
- FlowFM
- Network
- Area
- Computational 1D Grid
 - Locations
 - Unstructured Grid
 - 1D/2D links
 - Bed Level
 - Roughness
 - Boundary Conditions
 - Boundaries
 - Sources and Sinks
 - Estimated Grid-snapped featu...
 - Initial Water Level
 - Viscosity
 - Diffusivity
 - Open Street Map

Chart Regi... Map Ope... Tool...

dijkdoorbraak

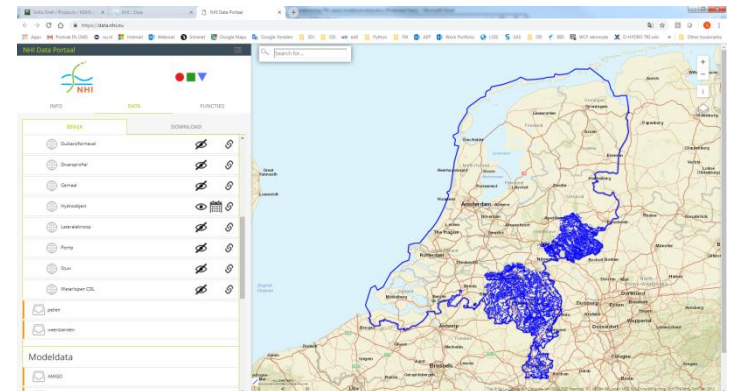
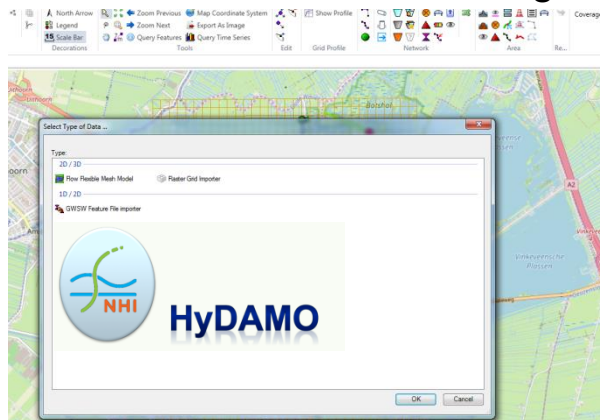


HyDAMO conversie

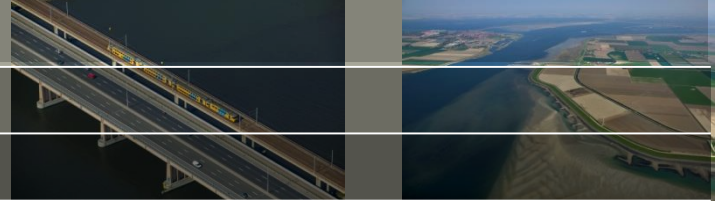


TKI-1: Ontwikkelen Python script om vanuit de HyDAMO GML's de invoerfiles te genereren voor het rekenhart in D-HYDRO. (af voor eind dit jaar)

TKI-2: doorontwikkelen ontsluiting in User interface

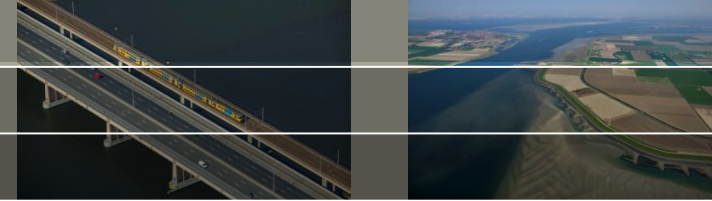


Pilots



- Stand van zaken
- Discussie onderzoeksvragen

Planning TKI

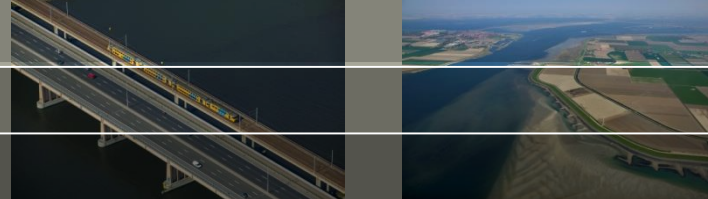


	2018					DSD 2018						2018					af bij DSD 2019	
	jan	feb	mrt	april	mei	juni	juli	aug	sept	okt	nov	dec	jan	feb	mrt	april	mei	juni
1D2D embedded koppeling																		
Bresgroei																		
2D gridgeneratie en verfijning																		
<i>PILOTS</i>																		

Geplande einddatum TKI-1 project: 1 juni 2019

Inplannen volgend overleg? (eind januari)

1. TKI-2: Hydrologie in D-HYDRO



UW WATERSCHAP



Onderwerpen

Hydrologie

1D basisfunctionaliteit (incl sturing)

Modelgeneratie

Visualisatie



The screenshot shows a web browser window displaying a Confluence Wiki page. The browser's address bar shows the URL: <https://publicwiki.deltares.nl/display/DHYDROUsers/D-HYDRO+Users+Home>. The browser's bookmark bar includes links for 'Apps', 'Postvak IN (340)', 'nu.nl', 'Hotmail', 'Webmail', 'Intranet', 'Google Maps', 'Google Vertalen', '3Di', 'GIS', 'edX', 'Python', 'FM', 'AEP', and 'Other bookmarks'. The page header features the 'Deltares' logo and navigation tabs for 'Dashboard', 'Topics', 'Communities', 'Projects', 'Others', and 'Archive'. A search bar is located on the right side of the header. The main content area is titled 'D-HYDRO Users' and includes a 'Create' button. Below the title, there is a 'Pages' section with a sub-item 'D-HYDRO Users Home'. A green notification box contains the text: 'Welcome to your new space! Confluence spaces are great for sharing content and news with your team. This is your home page. You can customize this page in any way you like... Which includes removing all of this text.' Below the notification, a section titled 'Log in and complete these tasks to get started' lists five tasks with checkboxes: 'Edit this home page', 'Create your first page', 'Set permissions', 'Brand your Space', and 'Check out our Help and Support space'. At the bottom, the 'Space Details' section shows the name 'D-HYDRO Users'.

D-HYDRO Users Home

Expand all Collapse all

- D-HYDRO Users Home

Pages

D-HYDRO Users Home

✓ **Welcome to your new space!**
Confluence spaces are great for sharing content and news with your team. This is your home page. You can customize this page in any way you like... Which includes removing all of this text.

Log in and complete these tasks to get started

- Edit this home page** - Click *Edit* in the top right of this screen to customize your Space home page
- Create your first page** - Click the *Create* button in the header to get started
- Set permissions** - Click the menu button and '*Permissions*' to update permissions and give others access
- Brand your Space** - Click the menu button and '*Space Logo*' to update your space logo, or click '*Overview*' to change your space details
- Check out our [Help and Support space](#)

Space Details

Name **D-HYDRO Users**