

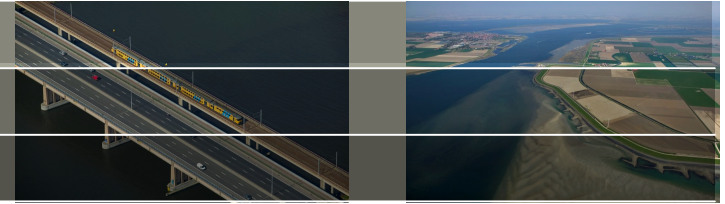


# How to compile Delft3D Open Source on Windows

**Webinar, February 8, 2012**  
**Adri Mourits**



# Webinar overview



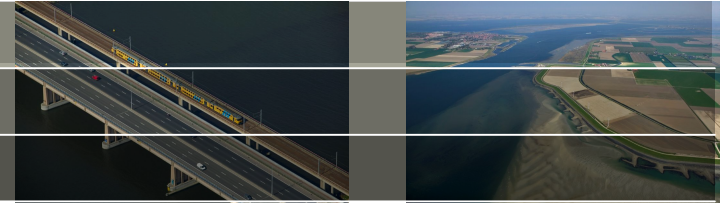
- Introduction
- Prerequisites
- Downloading the Delft3D open source code using TortoiseSVN
- Compiling the source code using VisualStudio
- Debugging in VisualStudio
- Version 5.00 versus 4.00
- Questions & answers

An aerial photograph of a coastal delta region. A large body of water, likely a river or estuary, flows from the top left towards the bottom right. On the left bank, a town with red-roofed buildings is visible. The right bank is dominated by a patchwork of agricultural fields in various shades of green and brown. A prominent green dike or levee runs along the water's edge, with several concrete structures (possibly locks or weirs) visible. The sky is a clear, pale blue.

# Introduction

**Deltares**

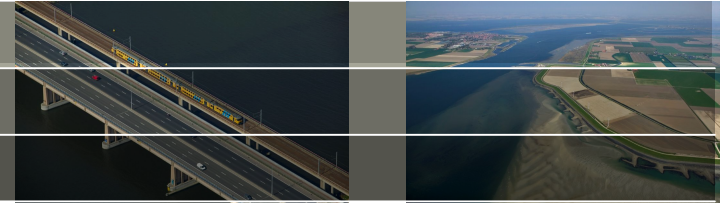
# Introduction



Assumed knowledge to follow this webinar

- Just some general knowledge about (what is):
  - Downloading
  - Source code
  - Compiling
  - Binaries (executable, dlls)
  - Run a simulation
- Advised:
  - What is Delft3D?
  - What is Delft3D-FLOW used for?
  - What is Subversion?

# Introduction



January webinar:  
Compiling on Linux

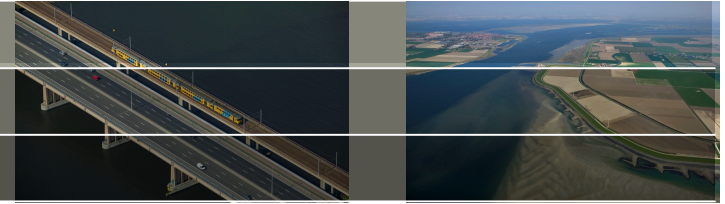
This webinar:  
Compiling on Windows

Currently open source:

- Delft3D-FLOW (and tools)
- Delft3D-WAVE
- QuickPlot (not handled in this webinar)

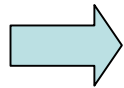


# Introduction



About this webinar:

Presenter: Adri Mourits  
Organization: Roderik Hoekstra  
Cooperators: Bert Jagers  
Edward Melger  
Frank Platzek



Use the webinar chat option for questions

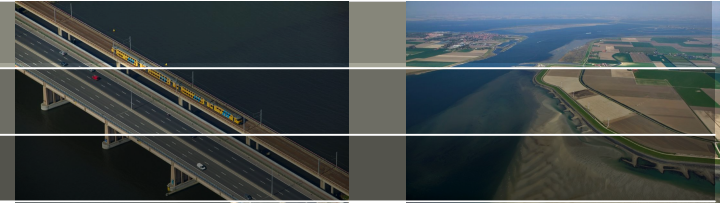


An aerial photograph of a coastal delta region. A large body of water, likely a bay or estuary, is on the left. A city with red-roofed buildings is visible on the left side. The right side is dominated by a large, flat area of agricultural fields, some green and some brown, separated by a network of ditches and roads. A prominent feature is a long, narrow strip of land or a dike that runs along the water's edge, with several small structures or buildings along its length. The overall scene depicts a complex landscape of water, urban development, and agriculture.

**Prerequisites**

**Deltares**

# Prerequisites



... for working with the Delft3D-FLOW/-WAVE open source code:

[www.oss.deltares.nl](http://www.oss.deltares.nl) -> Delft3D -> Download -> Source code ->

## 1. Prerequisites

- TortoiseSVN ([www.tortoisesvn.net](http://www.tortoisesvn.net)) (this webinar: 1.7)
- [Microsoft VisualStudio 2008/2010](#) (this webinar: 2010)
- [Intel Fortran compiler 11.0 or higher](#) (this webinar: 12.0)

Also used in this webinar: Total Commander ([www.ghisler.com](http://www.ghisler.com))  
(for exploring files/directories)

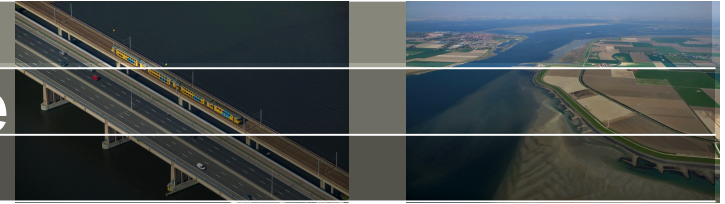


An aerial photograph of a coastal region. On the left, a large body of water, likely a bay or estuary, is visible. A town with red-roofed buildings is situated on a peninsula. To the right, there are extensive agricultural fields in various shades of green and brown, separated by a network of ditches and roads. A prominent green dike or levee runs along the water's edge, with a road on top. The sky is clear and blue.

**Downloading the source code**

**Deltares**

# Downloading the source code



First: register on [www.oss.deltares.nl](http://www.oss.deltares.nl) -> Delft3D -> Getting started

Then: follow [www.oss.deltares.nl](http://www.oss.deltares.nl) -> Delft3D -> Download

-> Source code -> 3. Download the source code

SVN repository:

- Trunk, main line:
  - Fixing bugs, new developments being merged in, being tested  
=> Possibly not stable
- Tags: 

Always start with a tagged version!

  - Copies of stable, fully tested Trunk-revisions
- Branches:
  - Separate develop versions
  - “Your own private version”

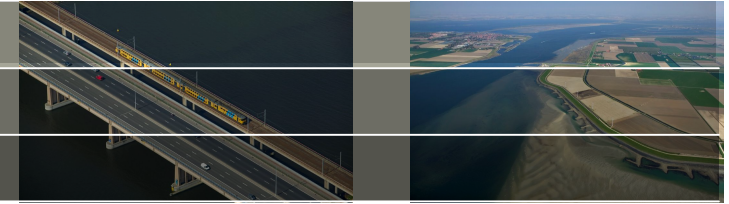
An aerial photograph of a coastal region. On the left, a large body of water, likely a bay or estuary, is visible. A town with red-roofed buildings is situated on the left bank. The right side of the image shows a patchwork of agricultural fields in various shades of green and brown, separated by roads and ditches. A prominent green dike or levee runs along the water's edge, with a road on top. In the foreground, a large, light-colored area, possibly a sandbar or a dry riverbed, is visible. The sky is clear and blue.

# Compiling the source code

**Deltares**



# Compiling the source code



[www.oss.deltares.nl](http://www.oss.deltares.nl) -> Delft3D -> Download -> Source code

-> 4. Compile the source code

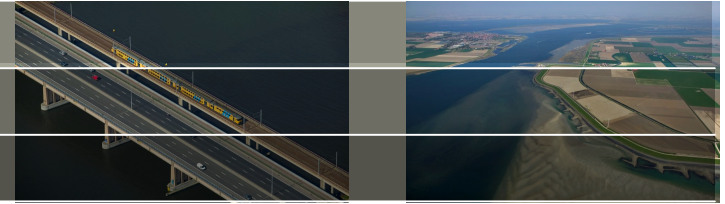
1. Open "src\d\_hydro\_open\_source.sln" in VS2008 or "src\d\_hydro\_open\_source\_vs2010.sln" in VS2010
2. Select the "solution configuration" you want: Debug or Release
3. <Ctrl><Shift>B
4. The binaries are installed in directory "bin\win32" (release) or in the subdirectory of the executable, e.g. "src\engines\_gpl\d\_hydro\bin\Debug" (debug)

INTERMEZZO: [www.oss.deltares.nl](http://www.oss.deltares.nl) -> Delft3D -> Download

-> Release notes -> Release notes Delft3D-FLOW

-> "Introduction of Delft3D-FLOW version 5.00.00"

# Compiling the source code



Using created binaries:

- First check: run examples
- To use them in an existing Delft3D setup:
  - Execute “convert\_win32\_to\_old\_directory\_structure\_w32.bat”
  - Copy “w32” to your Delft3D installation, overwriting existing files

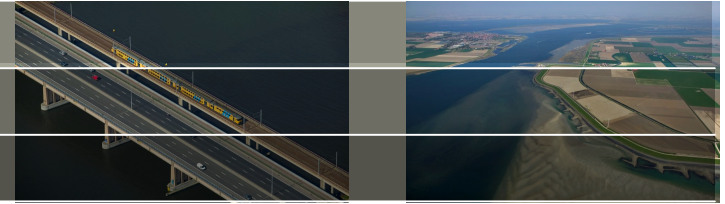


An aerial photograph of a coastal region. On the left, a large body of water, likely a bay or estuary, is visible. A town with red-roofed buildings is situated on a peninsula. To the right, there are extensive agricultural fields in various shades of green and brown, separated by roads and ditches. A prominent green dike or levee runs along the water's edge, with a road on top. The sky is clear and blue.

# Debugging in Visual Studio

**Deltares**

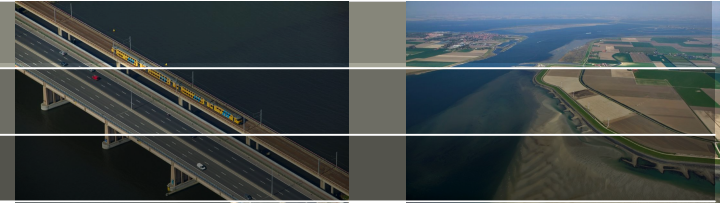
# Debugging in Visual Studio



Not parallel:

- Compile the debug version
- Produce the input file for “d\_hydro.exe”:  
deltares\_hydro.exe <config.ini> **-keepXML**
- Add a breakpoint
- “d\_hydro” project -> properties -> debugging:
  - Set working directory
  - Set command argument (<config.xml>)
- “d\_hydro” project -> debug -> new instance

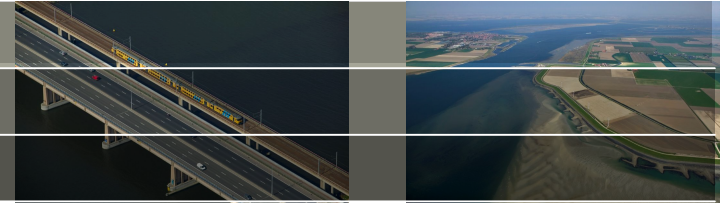
# Debugging in Visual Studio



## Parallel:

- Compile the debug version
- Produce the input file for “d\_hydro.exe”:  
deltares\_hydro.exe <config.ini> -keepXML
- Add a breakpoint
- Edit <config.xml>  
See example on next slide
- Edit batch file to start the simulation:  
See example on next slide
- Run the batch file:  
Waiting for file "debug.txt" to appear...
- Debug -> Attach to process(es) “d\_hydro.exe”
- Add file “debug.txt”

# Debugging in Visual Studio



Parallel:

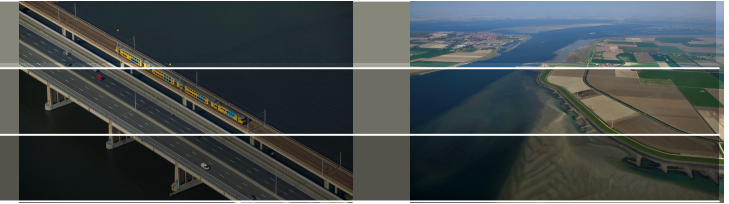
File "TMP\_config\_flow2d3d\_8280.xml":

```
<DeltaresHydro start="flow2d3d">
  <flow2d3d
    library          = 'flow2d3d'
    MDFFile          = 'f34'
    waitFile        = 'debug.txt'
    description      = 'Delft3D-FLOW single domain calculation'
  >
</flow2d3d>
</DeltaresHydro>
```

File "run\_flow2d3d\_parallel.bat":

```
set argfile=TMP_config_flow2d3d_8280.xml
set D3D_HOME=d:\sources\webinar\live\src\engines_gpl\d_hydro\bin\Debug
set exedir=%D3D_HOME%
set PATH=%exedir%;%PATH%
mpiexec -n 2 -localonly %exedir%\d_hydro.exe %argfile%
```

# Debugging in Visual Studio



Switch on NaN checking:

In trisim.F90, activate 4 lines:

1. 46: use ifcore
2. 75: INTEGER\*4 OLD\_FPE\_FLAGS, NEW\_FPE\_FLAGS
3. 84: NEW\_FPE\_FLAGS = FPE\_M\_TRAP\_OVF  
+ FPE\_M\_TRAP\_DIV0 + FPE\_M\_TRAP\_INV
4. 85: OLD\_FPE\_FLAGS = FOR\_SET\_FPE (NEW\_FPE\_FLAGS)

Rebuild

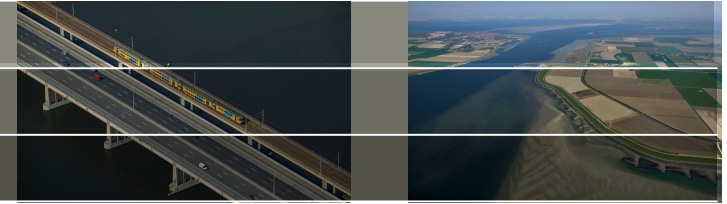




**Version 5.00 versus 4.00**

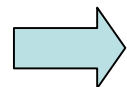
**Deltares**

# Version 5.00 versus 4.00



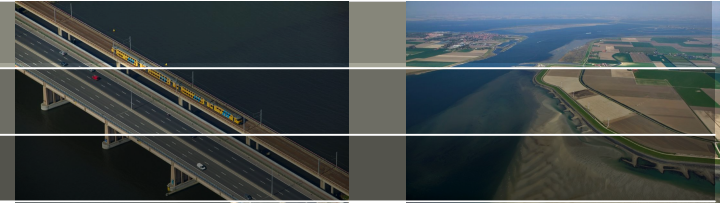
Why all these changes?

- Prepare for 64-bit AND 32-bit binaries, which both need correct dynamic libraries
- Minimize Fortran <-> C interfaces in top routines
- FLOW-, WAVE-, WAQ-dynamic libs started by:
  - Small executable(s)
  - OpenMI
  - OpenDA
  - DeltaShell
- One configuration file in common file format (XML)



Ready for the future!

# Version 5.00 versus 4.00



See Delft3D-FLOW release notes:

[www.oss.deltares.nl](http://www.oss.deltares.nl) -> Delft3D -> Download -> Release notes

-> Release notes Delft3D-FLOW

-> “Introduction of Delft3D-FLOW version 5.00.00”

- Main binaries
- Directory structure
- Compiling on Linux
- Running a calculation

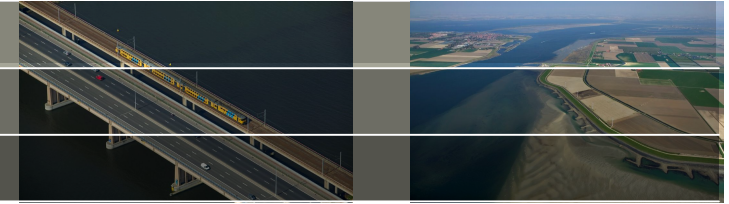


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# Questions & answers

**Deltares**

# Questions & answers



**Q: Can I get pre-built tested executables?**

A: Yes, via service packages:

[www.oss.deltares.nl](http://www.oss.deltares.nl) -> Delft3D -> Services

**Q: How can I get help on compiling?**

A: 1) Info: [www.oss.deltares.nl](http://www.oss.deltares.nl) -> Delft3D -> Download

-> Source code

2) FAQ: [www.oss.deltares.nl](http://www.oss.deltares.nl) -> Delft3D -> FAQ

3) Forum: [www.oss.deltares.nl](http://www.oss.deltares.nl) -> Delft3D -> Discussion Groups

-> General

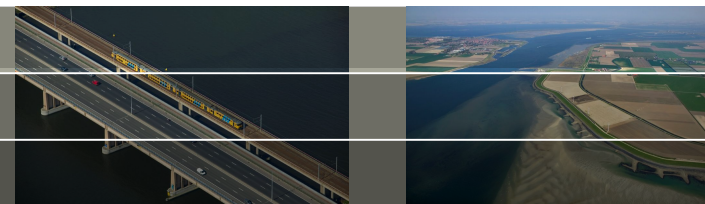
**Q: How can I get help on modelling?**

A: 1) Training courses: [www.oss.deltares.nl](http://www.oss.deltares.nl) -> Delft3D -> Services

2) Forum: [www.oss.deltares.nl](http://www.oss.deltares.nl) -> Delft3D -> Discussion Groups



# Questions & answers



**Q: How can I contribute my own source code?**

A: Bugfixes/minor improvements: put on the forum

(optional: TortoiseSVN -> create patch)

Get your own branch to work in: mail to [oss-webmaster@deltares.nl](mailto:oss-webmaster@deltares.nl)

**Q: Will this webinar be placed on the oss-site?**

A: Yes, together with this presentation:

[www.oss.deltares.nl](http://www.oss.deltares.nl) -> Delft3D -> Webinars

**Q: What is the next webinar about?**

A: About “Unibest”

Presenter: Bas Huisman

Wednesday 14 March 2012, at 17:00 CET

See [www.oss.deltares.nl](http://www.oss.deltares.nl) -> Delft3D -> Webinars