

How to compile Delft3D under Linux

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1 Getting Delft3D

2 Prerequisites

3 Compiling

4 Contributing

Subscribe

The screenshot shows the Delft3D website with the following sections:

- Log In / Register** (top right)
- Navigation Bar:** Delft3D, XBeach, OpenMI, OpenDA
- Open Source Initiatives:**
 - COSMOS: Delft Dashboard, Delft3D
 - OpenDA: OpenEarth, OpenMI
 - SWAN: SWASH, XBEACH
- Instructions Open Source Software Portal:** A grid of four thumbnail images showing software interfaces.
- Announcements:**
 - 9 December 2011: [Delft3D Live interactive Web Seminar](#) - How to perform realistic morphodynamic simulations with acceptable run times.
 - 7 December 2011: [Delft Software Demo 2011](#) - Join us and download our software; presentations available for download.
 - 7 November 2011: [Delft3D Live interactive Web Seminar \(Webinar\)](#) - Process Based Long Term Morphological Modelling.
 - 21 October 2011: [New Delft3D Advanced Courses](#).
 - 19 September 2011: [Delft Software Demo 2011](#) - 29-10 until 4-11.
 - 18 September 2011: [Delft3D, OpenDA, OpenEarth, SWAN and XBEACH users and developers workshop](#) - Pre-announcement: International Delft3D users.
 - 22 July 2011: [Delft3D 2011](#) - during the first International Water Week (IWW).
 - 7 July 2011: [Pre-compiled Delft3D GUI version 4.06](#) is now available (Windows only).
 - 16 June 2011: [Delft Software Australia and Delftware](#) are providing Workshop "Support Advances in Modelling" at IWW2011.
 - 27 May 2011: [All Delft3D meeting documents available for download](#) on [ftp.delft3d.nl](#).
 - 18 May 2011: [Interactive Delft3D technical presentation](#) available: the way to train using Delft3D tool.
 - 28 April 2011: [Delftware is hosting a Delft3D \(web\)event](#) during Coastal Sediments 2011.
 - 26 April 2011: [Delft3D open source on COSMOS](#): Community Surface Dynamics Modelling System, [http://delft3d.org/cosmos/](#)
 - 21 April 2011: [Workshop release of the Delft3D open source website](#) [http://www.delft3d.nl](#)
 - 15 April 2011: [Pre- and Post-processing tools group created](#) on [http://www.delft3d.nl](#)
 - 23 March 2011: [New Delft3D open source community website available for beta testing](#) by more than 200 Delft3D advanced step users.
 - 2 March 2011: [XBEACH Networking Group on LinkedIn created](#).
 - 14 January 2011: [OpenEarth Professional Group on LinkedIn created](#).
 - 14 January 2011: [Delft3D Professional Group on LinkedIn created](#).
 - 3 January 2011: [Abstract copy of the computational codes of Delft3D flow morphology and waves available as GPL open source software](#) from 1 January 2011 Delft3D flow, morphology and waves modules are open source.
 - 22 December 2010: [waves](#).
- Top influencers this week:**
 - Bert Jagers** - Technical Coordinator Software Development at Delftware
 - Arjen Luijckx** - Senior Coastal Engineer at Delftware
 - Dirken de Boer** - member of Marine Observation and Data Expert Group (MODDG) at European Commission
 - Egon Ravekin** - Professor of coastal engineering at UNESCO-IHE, Delftware
 - Edward Meljar** - Product Manager at Delftware
- End-User License Agreement and Terms & Conditions of Use (EULA)** (bottom)

Subversion

Use subversion to get the source.

Delft3D can be found here.

<https://svn.oss.deltares.nl/repos/delft3d/trunk>

Get it using subversion software, which can be found here:

<http://subversion.apache.org/>

SUBVERSION REPOSITORIES DELFT3D

Rev 1164 | Last modification | Compare with Previous | View Log | SVN | RSS feed

(root)/trunk/src/ - Rev 1164

Rev 1164 | 10:10 13:35:18

Author: baart_f

Log message:
update autogen.sh to check for libtool
+2

Path	Last modification	Log	SVN	RSS
branches/	1161 10:04 mountains	Log	SVN	RSS
tags/	998 642:05h mountains	Log	SVN	RSS
trunk/	1164 3h 18m baart_f	Log	SVN	RSS
examples/	1130 17:0 21h mountains	Log	SVN	RSS
src/	1164 3h 18m baart_f	Log	SVN	RSS
engines_gst/	1105 28:0 00h mountains	Log	SVN	RSS
me/	968 09:2 23h mountains	Log	SVN	RSS
plugins_lgl/	1140 4:0 00h baart_f	Log	SVN	RSS
scripts_lgl/	1157 4:0 23h baart_f	Log	SVN	RSS
third_party_open/	1158 4:0 18h baart_f	Log	SVN	RSS
tools_lgl/	1163 6h 21m jagers	Log	SVN	RSS
utils_lgl/	1121 22:0 06h mountains	Log	SVN	RSS
AUTHORS	4 38:0 01h mountains	Log	SVN	RSS
autogen.sh	1164 3h 18m baart_f	Log	SVN	RSS
build.cmd	4 38:0 01h mountains	Log	SVN	RSS
build.sh	1131 17:0 21h mountains	Log	SVN	RSS

How do I download the Delft3D source code?

```
1  svn co https://svn.oss.deltares.nl/repos/delft3d/trunk delft3trunk
3
5  # > The program 'svn' is currently not installed. You can install it by typing:
6  # > sudo apt-get install subversion
7
7  # Install subversion
8  sudo apt-get install subversion
9  # Retry to get the sourcecode
10  svn co https://svn.oss.deltares.nl/repos/delft3d/trunk delft3trunk
11  # A      delft3dprepared/src/tools_gpl/mormerge/packages/mormerge_version_number/
12  #       mormerge_version_number.vcproj
13  # ...
13  # Checked out revision 1163.
14
15  # Tagged versions are more stable (we'll use the trunk today)
16  svn co https://svn.oss.deltares.nl/repos/delft3d/tags/4.00.02.0423 delft3drelease
```

Branches

- The main developments are happening in the trunk
- New developments are done in branches/research
- Old releases are maintained at branches/release

How do I keep up to date with the latest developments?

```
2 # Go to the directory where delft3d was downloaded  
cd delft3dtrunk  
# Use the subversion update command to get over the  
latest changes  
4 svn up
```

How do I keep up to date with the latest developments?

```
ls
2 # examples  gpl-3.0.txt  lgpl-2.1.txt  src  tsvn-auto-
   props
cd src
4 ls
# AUTHORS      common.am                      engines_gpl
   plugins_lgpl      tools_lgpl
```


What do I need installed to build Delft3D?

- Linux (official supported: CentOS 5, today we use ubuntu)
- Build tools (autoconf, automake, libtool, make)
- Compilers (gcc, g++, gfortran (≥ 4.5), g77?, official supported ifort)
- Compiler-compiler (bison/flex)
- Scripting (tclsh, probably temporary)
- Subversion (svnversion)
- Libraries (expat, pthread)
- MPI (mpifgo, build with same compiler as fortran compiler, only mpich2 supported)

What do I need to know?

- Basics (system maintainer available): bash, less
- Intermediate (maintaining own system): editor (emacs/vim), package manager (apt, yum, port, emerge)
- Advanced (debugging, contributing): gdb, gprof, valgrind, nm, ldd, strace

Statistics of the Delft3D sourcecode (sloccount)

Totals grouped by language (dominant language first):

f90: 187893 (56.87%)

ansic: 87491 (26.48%)

cpp: 24480 (7.41%)

sh: 12983 (3.93%)

fortran: 12973 (3.93%)

tcl: 1953 (0.59%)

...

Total Physical Source Lines of Code (SLOC) = 330,382

(46968 in third party)

How do I configure the Delft3D source?

Typical issues

In the next examples I assume you did not install any of the prerequisites. The goal is to show some common errors.

Steps in building linux software

Prepare → Configure → Build → Install

How do I prepare the Delft3D source?

```
1 ./autogen.sh
# Preparing the Delft3D build system...please wait
3
# ERROR: Unable to locate GNU Autoconf.
5
# ERROR: To prepare the Delft3D build system from
      scratch ,
7 #           at least version 2.52 of GNU Autoconf must be
      installed.
sudo apt-get install autoconf
```

How do I prepare the Delft3D source?

```
./autogen.sh
2 # Preparing the Delft3D build system...please wait
4 # Found GNU Autoconf version 2.68
# Found GNU Automake version 1.11.1
6 # ...
# ERROR: Unable to locate GNU Libtool.
8
# ERROR: To prepare the Delft3D build system from
scratch,
10 # at least version 2.0.0 of GNU Libtool must be
installed.
12 sudo apt-get install libtool
```

How do I prepare the Delft3D source?

```
./autogen.sh
2 # Automatically preparing build ... done
4 # The Delft3D build system is now prepared. To build
  here, run:
# ./configure
6 # make
```

How do I configure the Delft3D source?

```
1 ./configure
2 # checking for lex... no
3 # configure: error: Can't find lex, please install or
4   set the LEX variable
5 sudo apt-get install flex
```


How do I configure the Delft3D source?

```
./configure
2 # checking for mpif90... no
# configure: error: cannot compile a simple Fortran
  program
4 # See 'config.log' for more details
sudo apt-get install gfortran mpich2
```

How do I configure the Delft3D source?

```
1 ./configure
# checking for mpifgo... yes
3 #configure: error: Compiler can't find libstdc++
sudo apt-get install g++
```

How do I configure the Delft3D source?

```
2 ./configure  
# configure: error: Compiler can't find <expat.h>  
sudo apt-get install libexpat1 libexpat1-dev
```

How do I configure the Delft3D source?

```
1 ./configure
# 240x config.status: */Makefile
3 # config.status: creating config.h
make
```

How do I compile the Delft3D source?

```
make
2 # This generates a lot of .o, .a, .la, .so, .exe files.
# .....
4 # make[1]: Leaving directory 'delft3trunk/src'
```

What now?

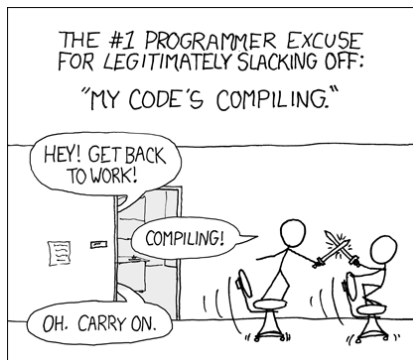


Figure: Things to do while Delft3D compiles (src:xkcd.com)

Installing the Delft3D libraries and executables?

```
1 # This installs the executables in /usr/local/lib and /  
2   usr/local/bin  
3 make install  
4  
5 # This is the install method that is used to build a  
6   release  
7 # It installs all the executables in ../bin, only works  
8   if you did ./configure --prefix=$(pwd)  
9 # It also groups the executables  
10 make ds-install
```

Running an example

```
1 ./configure --prefix=$(pwd)/build
  make install
3 ls build/bin
  cd ../examples/o1_standard
5 deltares_hydro.tcl # will be called .exe
  # deltares_hydro.tcl: command not found
7 export PATH=$buildpath/bin:$PATH
```


Running an example

```
1 deltares_hydro.tcl # will be called .exe  
# Executing "build/bin/d_hydro.exe  
  TMP_config_flow2d3d_7257.xml" ...  
3 # d_hydro ABORT: Cannot load component library "  
  libflow2d3d.so": libflow2d3d.so: cannot open shared  
  object file: No such file or directory  
export LD_LIBRARY_PATH=$buildpath/lib:$LD_LIBRARY_PATH
```

Running an example

```
2  deltares_hydro.tcl # will be called .exe again
   # ERROR: Start "deltares_hydro.exe" with 1 or 2
   #   arguments.
   # Usage:
4  # deltares_hydro.exe <config.ini> [-keepXML]
   deltares_hydro.tcl config_flow2d3d.ini
6  # ...
   #
   -----
8  #   FINISHED      Delft3D-FLOW
   #                 runid       : f34
10 #                 date, time  : 2012-01-10, 14:28:26
   #                 o errors and o warnings
12 # returning to main program from domain f34
   #
   -----
```



How do customize the compilation process?

```
1 # install in a custom directory
2 ./configure --prefix=$(pwd)/build
3 export LD_LIBRARY_PATH=$(pwd)/build/lib:
4     $LD_LIBRARY_PATH
5 export PATH=$(pwd)/build/bin:$PATH
6
7 # switch comilers
8 make clean
9 FC=ifort ./configure
10 # this assumes ifort was also used to build mpi
11
12 # Pass extra options , this can be needed for some
13     AMD 64bit systems
14 FCFLAGS=-fPIC ./configure
15
16 # Customize the MPI compiler
17 MPIFC=openmpifgo ./configure
```

How can I get help?

Service packages

Get pre-built tested executables from the service packages.

<http://www.deltaressystem.com/hydro/service-packages>

Community support

Through the forums:

<http://oss.deltares.nl>

How do I report bugs?

`delft3d.support@deltares.nl`

How can I contribute my own sourcecode?

Getting write access

If you want to contribute sourcecode, please ask for write access. You will get access to a branch.

`oss-webmaster@deltares.nl`