



# Hydrodynamics in Rivers and Channels

Rivers and channels are necessary for e.g. shipping, irrigation, drainage and production of drinking water. Fluctuation of discharges can cause flooding or water shortage. With SOBEK-Rural 1DFLOW you can evaluate and forecast hydraulic functioning of rivers and channels under different conditions. Furthermore you can optimize measures in rivers and channels to prevent flooding and water shortage. During the one day course you will work with SOBEK-Rural 1DFLOW. Aim of this course is to provide you theoretical background, improve your modelling skills and to get more out of SOBEK-Rural 1DFLOW.

## Course background:

The course focuses on SOBEK-Rural 1DFLOW. You can use SOBEK-Rural 1DFLOW for 1D hydrodynamic modelling and simulation of rivers, estuarine systems, irrigation and drainage systems. It is based upon the complete de Saint Venant Equations and includes different sub-sections within a cross-section. It has an automatic drying and flooding procedure, easily handles complex 1D networks of any size, includes a huge library of hydraulic structures, controllers and triggers, and takes into account the effects of wind.

## Subjects:

The course consists of short presentations and practical exercises. Participants will work on subjects like:

- Refreshment of open channel hydraulics;
- Explanation on 1D flow functionalities (cross-sections, structures etc), including some theoretical background;
- Aspects of importance in constructing a good 1D flow model (validation of bathymetry and hydraulic data, choice of proper time-step and space-step; avoiding discontinuities reducing computational performance and/or invoking instabilities);
- Calibration and validation of a river model (including an exercise);
- Exercises with 1D flow models, including pinpointing model errors;
- Overview of pre- and postprocessing options in SOBEK.



**Participants:**

The course is aimed at river engineers and modellers from consultancy and engineering companies, provinces, water boards, municipalities and universities. You are expected to have some experience with SOBEK, or to have gone through the SOBEK tutorial "Hydrodynamics in open water". Experience with open channel hydraulics is recommended.

**Aim of the course:**

In this course participants learn:

- The hydraulic background of channel hydraulics to improve your insight;
- How to check your data and schematization to improve your model performance;
- How to calibrate and validate your model to improve the reliability of your advice;
- How to visualize your results to communicate your findings;
- Tips and tricks to save time.

**Program:**

The program of Hydrodynamics in Rivers and Channels (1D) (in brief):

- Introduction to the course;
- Presentation: Theory on the SOBEK-Rural 1DFLOW module;
- Exercise: Extending an existing schematization and model calibration;
- Presentation: Tips and tricks;

**Course leader:**

M.C.M.L van Mierlo, Deltares.

**Fee:**

The costs for this 1 day course, from 9:30 to 17:00 hrs, is € 565,- excluding VAT.

50% discount for lecturers at centres of education.

**Certificate:**

We provide a certificate of participation.

**Course date:**

Monday, 19 April 2010.  
Monday, 27 September 2010.

**Location:**

Deltares, Stieltjesweg 2, 2628 CK Delft,  
The Netherlands.

# Deltares

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**Registration:**

Please use the electronic form for registration at [www.deltaressystem.com](http://www.deltaressystem.com) and choose 'Agenda'.

**Transportation:**

From Schiphol Airport a train is leaving for Leiden Central Station every 20 minutes. Here you have to change trains to Delft Central Station (total travelling time approximately 45 minutes).

**More information:**

All presentations and discussions will be in English. For more information, please visit our website [www.deltaressystem.com](http://www.deltaressystem.com) or contact the course coordinators, Carla van den Kieboom, Wendy Boerhave or Nancy Dijkhuizen, telephone +31 88 3357909 or e-mail: [sales@deltaressystem.com](mailto:sales@deltaressystem.com).

Deltares Academy is a training facility of Deltares.