

HENRY

Hydraulic Engineering Repository

Ein Service der Bundesanstalt für Wasserbau

Conference Paper, Published Version

Jodeau, Magali

2D and 3D Modelling of sediment dynamics in a large reservoir, Chambon reservoir France

Zur Verfügung gestellt in Kooperation mit/Provided in Cooperation with:
TELEMAC-MASCARET Core Group

Verfügbar unter/Available at: <https://hdl.handle.net/20.500.11970/104249>

Vorgeschlagene Zitierweise/Suggested citation:

Jodeau, Magali (2014): 2D and 3D Modelling of sediment dynamics in a large reservoir, Chambon reservoir France. In: Bertrand, Olivier; Coulet, Christophe (Hg.): Proceedings of the 21st TELEMAC-MASCARET User Conference 2014, 15th-17th October 2014, Grenoble – France. Echirrolles: ARTELIA Eau & Environnement. S. 59-59.

Standardnutzungsbedingungen/Terms of Use:

Die Dokumente in HENRY stehen unter der Creative Commons Lizenz CC BY 4.0, sofern keine abweichenden Nutzungsbedingungen getroffen wurden. Damit ist sowohl die kommerzielle Nutzung als auch das Teilen, die Weiterbearbeitung und Speicherung erlaubt. Das Verwenden und das Bearbeiten stehen unter der Bedingung der Namensnennung. Im Einzelfall kann eine restriktivere Lizenz gelten; dann gelten abweichend von den obigen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Documents in HENRY are made available under the Creative Commons License CC BY 4.0, if no other license is applicable. Under CC BY 4.0 commercial use and sharing, remixing, transforming, and building upon the material of the work is permitted. In some cases a different, more restrictive license may apply; if applicable the terms of the restrictive license will be binding.



2D and 3D Modelling of sediment dynamics in a large reservoir, Chambon reservoir France

Magali Jodeau¹,

¹ EDF R&D LNHE 6 quai Watier 78400 CHATOU FRANCE
magali.jodeau@edf.fr

Abstract:

This paper focuses on siltation processes in an Alpine reservoir, the Chambon Reservoir on the Romanche River. In order to help identifying a sustainable sediment management strategy, a modelling of sediment dynamics in this reservoir was built. Numerical simulations were performed according to a comprehensive understanding of sediment transport in this lake based on a large set of in situ data.

Suspended sediment concentration monitoring upstream the dam leads to the identification of the main contributing hydrological events. Downstream monitoring demonstrates that specific operating conditions (reservoir level, discharge) allow sediment routing throughout the reservoir. In order to elaborate a clear comprehension of sediment processes, field surveys have also been performed in the reservoir. Bathymetry, Velocity field, sediment concentration were monitored. An innovative device has been built in order to identify sediment and flow dynamics inside the reservoir.

Preliminary numerical simulations of sediment dynamics in the reservoir using TELEMAC2D and SISYPHE show encouraging results. Then calculations using TELEMAC3D allow to well reproduce the three dimensional patterns of suspended sediment transport in this large reservoir. Some sensitivity analyses are performed in order to better assess the validity of the simulations.

Actually modelling could be a useful tool to evaluate sediment management strategy. The main processes involved in suspended sediment transport were identified and their understanding will help to define strategies to reduce sedimentation in Chambon reservoir.

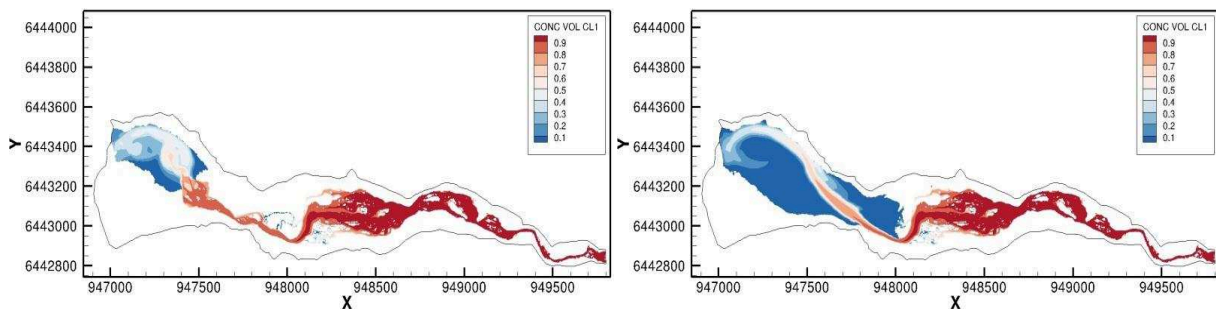


Figure 1. Numerical results of settling calculations (TELEMAC2D SISYPHE) : Qupstream=20 m³/s et Zdam=985-980 m : sediment concentration.