



# Document details

< Back to results | 1 of 2 Next >

Export Download Print E-mail Save to PDF Add to List More... >

Full Text

View at Publisher

IOP Conference Series: Earth and Environmental Science  
Volume 437, Issue 1, 11 February 2020, Article number 012008  
3rd International Conference of Water Resources Development and Environmental Protection,  
ICWRDEP 2019; Universitas BrawijayaMalang; Indonesia; 12 October 2019 through 13 October  
2019; Code 157604

## Flow structures in dividing open channels: A review (Conference Paper)

(Open Access)

Ibrahim, I.<sup>a</sup> ✉, Legori Ibrahim, S.<sup>a</sup>, Khan, S.<sup>b</sup>

<sup>a</sup>Department of Civil Engineering, International Islamic University Malaysia, Gombak, Selangor, 53100, Malaysia

<sup>b</sup>Department of Electrical and Computer Engineering, International Islamic University Malaysia, Gombak, Selangor, 53100, Malaysia

### Abstract

View references (18)

The supply of water for human consumption starts with the abstraction of 'raw' water from various sources. Most of these facilities convey raw water by pumping it directly from rivers via lateral channels to nearby water treatment plants, but this is badly affected by debris and sediment clogging at the intake structures. Lateral intakes are actually special cases of river bifurcations, where the channel naturally divides into two different branches, each carrying part of the flow and sediment. Many researchers have completed studies on bifurcations/diversions to understand the behaviour of water flow and sediment transport. However, a complete understanding of the phenomenon, especially in relation to secondary flows and vortices, is lacking up to this day. In fact, if this can be overcome, it will greatly contribute to the fundamental study of hydrodynamics at asymmetric fluvial bifurcations as well as in optimal design of diversions. Thus, the distribution of water flow in both main and lateral channels requires further detailed investigation. A review of the current state of research is discussed in this paper, with the objective of identifying the grey areas and gaps specifically in the investigation of complex turbulent behaviour of flow structures in open channels with lateral diversions. © Published under licence by IOP Publishing Ltd.

### SciVal Topic Prominence ⓘ

Topic: Confluence | Channel | Discharge ratio

Prominence percentile: 87.252 ⓘ

### Author keywords

bifurcations diversions hydrodynamics lateral intakes Open - channels turbulence

### Indexed keywords

Engineering  
controlled terms:

Bifurcation (mathematics) Environmental protection Flow of water Flow structure  
Hydraulics Hydrodynamics Sediment transport Turbulence Water resources exploration

Metrics ⓘ View all metrics >



PlumX Metrics

Usage, Captures, Mentions,  
Social Media and Citations  
beyond Scopus.

Cited by 0 documents

Inform me when this document  
is cited in Scopus:

Set citation alert >

Set citation feed >

### Related documents

Three-dimensional numerical  
modeling of the Bulle effect: the  
nonlinear distribution of near-  
bed sediment at fluvial diversions

Dutta, S. , Wang, D. , Tassi, P.  
(2017) *Earth Surface Processes  
and Landforms*

Nonlinear distribution of  
sediment at river diversions: Brief  
history of the bulle effect and its  
implications

Dutta, S. , Garcia, M.H.  
(2018) *Journal of Hydraulic  
Engineering*

Impact of topographic obstacles  
on the discharge distribution in  
open-channel bifurcations

Mignot, E. , Zeng, C. ,  
Dominguez, G.  
(2013) *Journal of Hydrology*

View all related documents based  
on references

Find more related documents in  
Scopus based on:

Authors > Keywords >

ISSN: 17551307

Source Type: Conference Proceeding

Original language: English




DOI: 10.1088/1755-1315/437/1/012008

Document Type: Conference Paper

Publisher: Institute of Physics Publishing

## References (18)

[View in search results format >](#)

All [Export](#)  [Print](#)  [E-mail](#)  [Save to PDF](#) [Create bibliography](#)

- 
- 1 Dutta, S.  
(2017) *Bulle-effect and Its Implications for Morphodynamics of River Diversions PhD Dissertation*. Cited 4 times.
- 
- 2 Neary, V.S., Sotiropoulos, F., Odgaard, A.J.  
**Three-dimensional numerical model of lateral-intake inflows**  
(1999) *Journal of Hydraulic Engineering*, 125 (2), pp. 126-140. Cited 87 times.  
doi: 10.1061/(ASCE)0733-9429(1999)125:2(126)  
[View at Publisher](#)
- 
- 3 Mignot, E., Bonakdari, H., Knothe, P., Lipeme Kouyi, G., Bessette, A., Rivière, N., Bertrand-Krajewski, J.-L.  
**Experiments and 3D simulations of flow structures in junctions and their influence on location of flowmeters**  
(2012) *Water Science and Technology*, 66 (6), pp. 1325-1332. Cited 24 times.  
<http://www.iwaponline.com/wst/06606/1325/066061325.pdf>  
doi: 10.2166/wst.2012.319  
[View at Publisher](#)
- 
- 4 Mignot, E., Vinkovic, I., Doppler, D., Riviere, N.  
**Mixing layer in open-channel junction flows**  
(2014) *Environmental Fluid Mechanics*, 14 (5), pp. 1027-1041. Cited 15 times.  
<http://www.wkap.nl>  
doi: 10.1007/s10652-013-9310-7  
[View at Publisher](#)
- 
- 5 Mignot, E., Cai, W., Launay, G., Riviere, N., Escarriaza, C.  
**Coherent turbulent structures at the mixing-interface of a square open-channel lateral cavity**  
(2016) *Physics of Fluids*, 28 (4), art. no. 045104. Cited 14 times.  
<http://scitation.aip.org/content/aip/journal/pof2>  
doi: 10.1063/1.4945264  
[View at Publisher](#)
-