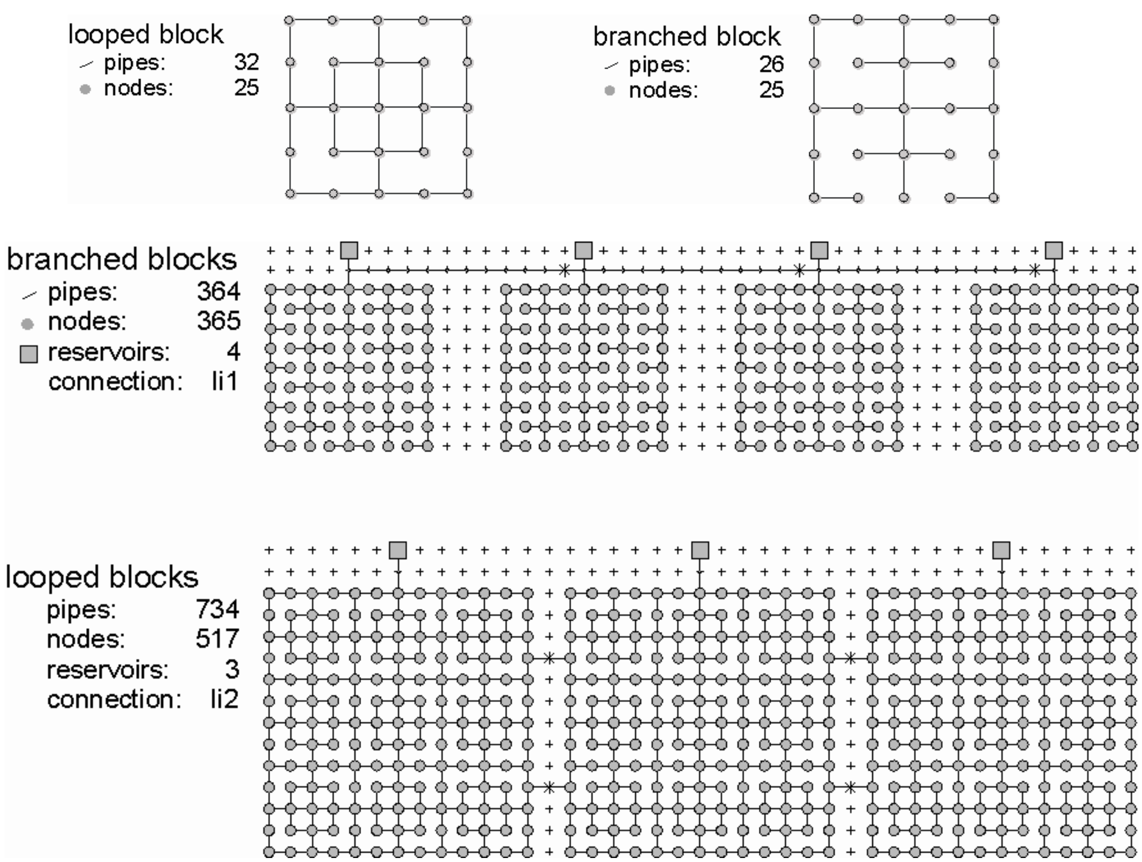
SYSTEM ID: WSS_set_2280

NARRATIVE DESCRIPTION

In Möderl *et al.*, 2007 the Modular Design System (MDS) is presented. With the MDS, a framework for systematic investigations of network structures is presented. Network structures like energy supply network, district heating networks or water distribution networks can be organized, administrated and represented by means of graph theory. An application of the MDS approach for water distribution systems was presented in Möderl *et al.*, 2007.
In the MDS, the layout graph of a network structure is represented by a graph matrix. Parts of water distribution systems (blocks or modules) of different sizes and characteristics can easily be connected to entire water distribution systems. Reservoirs can be added with the MDS, and with an interface to the hydraulic solver Epanet2 and simple pipe sizing algorithms, entire water distribution systems can be generated. Also the generation algorithms can be downloaded and users can create their own models (http://www.hydro-it.com/extern/IUT/mds_app/)

NETWORK SCHEMATIC (examples):



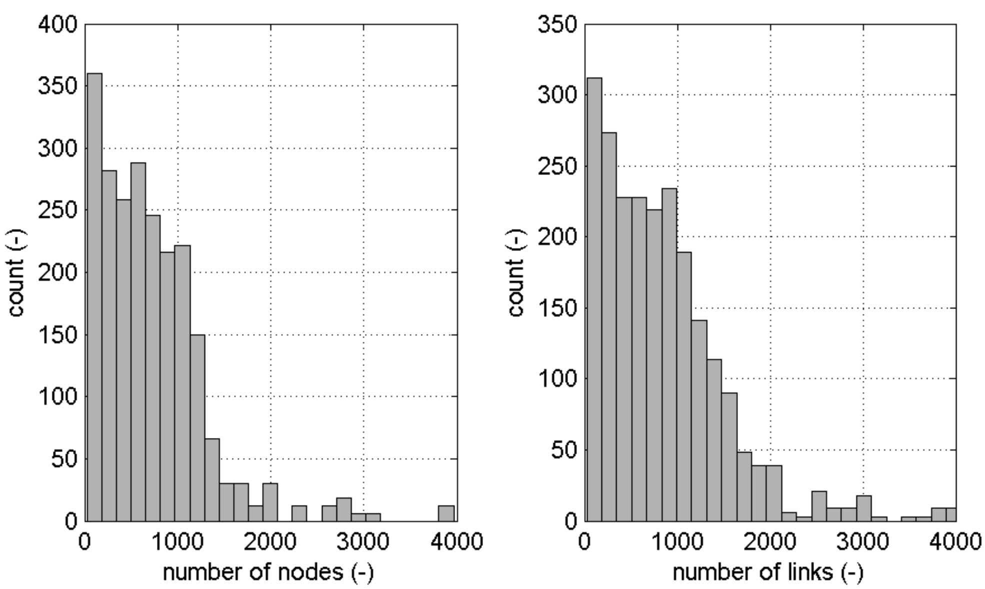
HISTORY OF THE NETWORK FILE

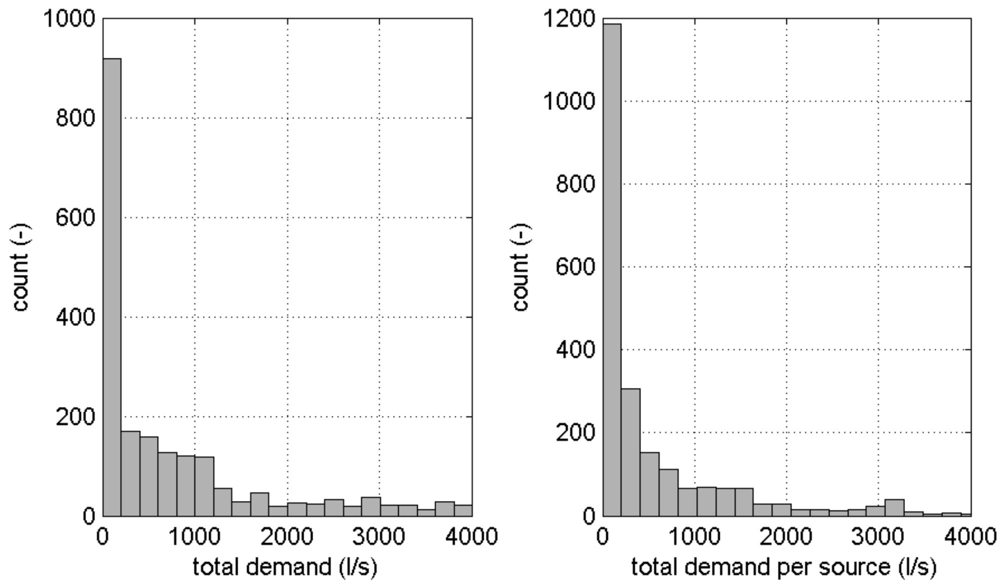
A stochastic performance evaluation of 2,280 water distribution systems was shown in Möderl *et al.*, 2007 and proved the proposed methodology. In Möderl *et al.*, 2011 an description how this set was created and an evaluation is shown. The MDS graph representation is the basis for more complex network generation algorithms like the WDS Designer (Sitzenfrei *et al.*, 2010a) or the VIBe approach (Sitzenfrei *et al.*, 2010b; Sitzenfrei *et al.*, 2010c) for generating entire virtual cities including water infrastructure.

AVAILABLE INFORMATION

Physical attributes	
Schematic diagram	
Network geometry data	
Elevation data	
Pipe data	
Nominal or actual diameters	
Elevation data	
Demand data	
Total system demand	
Nodal demand data	
Hydraulic data	

PIPE/LOOP HISTROGRAM OF THE SET





REFERENCES:

Möderl M., Fetz T. and Rauch W. (2007). Stochastic approach for performance evaluation regarding water distribution systems. *Water Science and Technology*, 56 (9), 29-36.

Möderl M., Sitzenfrei R., Fetz T., Fleischhacker E. and Rauch W. (2011). Systematic generation of virtual networks for water supply. *Water Resources Research*, 47

Sitzenfrei R., Möderl M. and Rauch W. (2010a). *WDS Designer—A Tool Algorithmic Generation of Water Distribution Systems based on GIS Data*. in World Environmental and Water Resources Congress 2010, (ed.), 2010a.

Sitzenfrei R., Möderl M. and Rauch W. (2010b). Graph-based approach for generating virtual water distribution systems in the software ViBe. *Water Science and Technology: Water Supply*, 10 (6), 923-932.

Sitzenfrei R., Fach S., Kinzel H. and Rauch W. (2010c). A multi-layer cellular automata approach for algorithmic generation of virtual case studies - VIBe. *Water Science and Technology*, 61 (1), 37 - 45.

DETAILED DATA SUMMARIES

PHYSICAL ASSETS:

Asset Type:	# of Assets
Reservoirs	1 – 6

NETWORK CHARACTERISTICS:

# Total Pipes:	26 - 6484
# Branch Pipes:	branched and looped systems
Ratio (Branch Pipes / Total Pipes):	branched and looped systems
# Nodes	25 - 4752
# Reservoirs	1 - 6
# Tanks	0
# Regulating Valves	Unknown
# Isolation Values	Unknown
# Hydrants	Unknown
Elevation Data	0 m (demand nodes) 100m reservoirs

PIPE DATA:

Diameter (mm)	Length (m)
80	
100	
125	
150	
200	
250	
300	
350	
400	
500	
600	

PUMP DATA:

Pump Horsepower	NO
Pump Curves:	NO

DEMAND STATISTICS:

Demographic Type	Population	Households
Total Serviceable:	1,600 – 14,000,000	

DATA FILE ATTRIBUTES:

ATTRIBUTE		UNITS
Pipe Length & Diameter	X	meters
Pipe Age		
Node Elevation	X	meters
Node Demand	X	LPS
Valves		
Hydrants		
Tank Levels		
Tank Volume		
PRVs		
WTP		
WTP Capacity		
Pump Data		