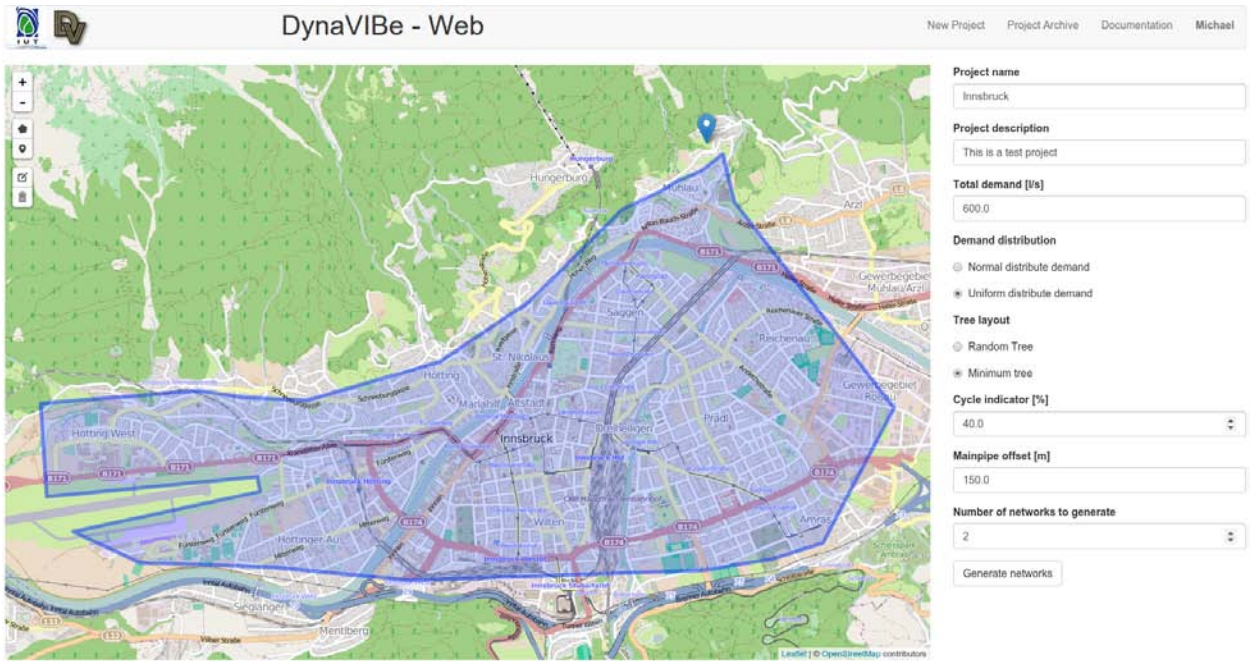
SYSTEM ID: DynaVIBe-Web

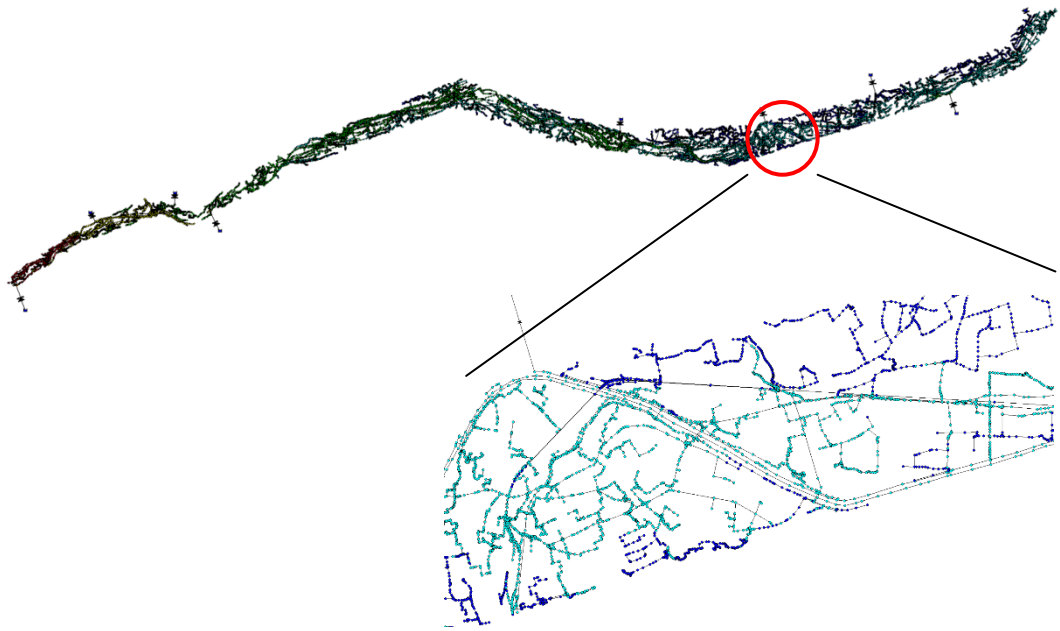
NARRATIVE DESCRIPTION

DynaVIBe-Web, is a free available and online accessible web frontend application for generating water infrastructure networks for any place on earth. The needed data is a digital elevation map, service area, the total demand and position of water sources. Using the strong correlation between street and water distribution network, an arbitrary sized set of technical feasible water distribution models with different characteristics can be generated and used for benchmarking and other scientific applications. The easy accessible platform also includes an archive to share all model sets of different case studies with the whole scientific community. The generator is available at http://web01-c815.uibk.ac.at/.



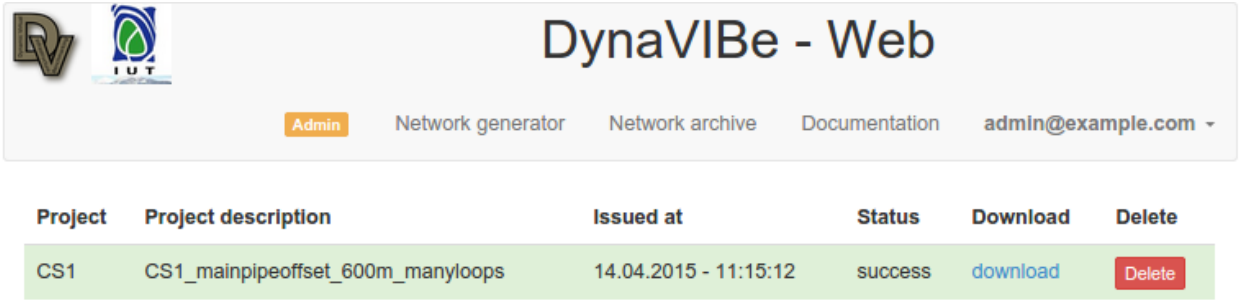
NETWORK SCHEMATIC:

The current generator is able to generate gravity driven water distribution system models (EPANET2 inp files) with variations of the network size (number of junctions and pipes), different looping degrees, nodal demand distribution. The generator will be developed further, with focus on implementing currently missing system components (e.g. pumps and valves).



HISTORY OF THE NETWORK FILE

The web platform includes an archive to share all generated network with the whole scientific community.



USER INPUT

Total demand [l/s]:	Total amount of water supply in the defined service area polygon in liter per second.
Demand distribution:	The total demand is distributed on demand points which are automatically generate within the server area. You can choose the type of the point distribution. If you have a high urbanized area with a high population density in the center, you may choose "Normal distribute

	demand".
Tree layout:	The minimal operating water supply network layout is automatically generated based on a "Random" or "Minimum" spanning tree using OpenStreetMap data as input.
Cycle indicator [%]:	Defines the condition when adding an additional flow path between two water supply system nodes. E.g. 50% Means only additional flow paths (water supply pipes) are added if the alternative path length between two nodes is smaller than 50% of the flow path length in the spanning tree.
Mainpipe offset [m]:	Places pipes with a wider diameter next to a defined polygon. This polygon is calculated by creating an offset polygon of the area of interest.
Number of networks to generate:	Number of virtual water supply network models to generate (EPANET2 input files).

AVAILABLE INFORMATION

Physical attributes	**Y**
Schematic diagram	**N**
Network geometry data	**Y**
GIS data file	**Y**
Background map	**Y**
Elevation data	**Y**
Pipe data	**Y**
Pipe material	**N**
Pipe age	**N**
Pipe pressure class	**N**
Nominal or actual diameters	**Y**
Pump data	**N**
Useful horsepower	**N**
Pump operating curves	**N**
Tank data	**Y**
Elevation data	**N**
Stage storage curves	**N**
Water quality information	**N**
Valve data	**N**
PRV/FCV data	**N**
Isolation valve data	**N**
Hydrant data	**N**
Demand data	**Y**
Total system demand	**Y**
Nodal demand data	**Y**
Temporal data demands	**N**
System leakage	**N**
Hydraulic data	**Y**
Hydraulically calibrated model	**N**
Field hydraulic calibration data	**N**
Water quality data	**N**
Disinfection method	**N**
Chlorine residual data	**N**
Booster station data	**N**
Fluoride/Chloride field data	**N**
Water quality calibrated model	**N**
Operational data	**N**
SCADA datasets	**N**
Operational rules	**N**

REFERENCES:

Mair, M.; Sitzenfrei, R.; Möderl, M.; Rauch, W. (2012): Identifying multi utility network similarities. Proceedings of the World Environmental and Water Resources Congress 2012; Albuquerque, New Mexico, United States, May 20-24, 2012.

Mair, Michael; Rauch, Wolfgang; Sitzenfrei, Robert (2014a): Improving Incomplete Water Distribution System Data. *Procedia Engineering 70*, 1055 - 1062. DOI: 10.1016/j.proeng.2014.02.117

Mair M., Rauch W. and Sitzenfrei R. (2014b). Spanning tree based algorithm for generating water distribution network sets by using street network data sets. *World Environmental & Water Resources Congress EWRI*, June 1 - 5, 2014, Portland, Oregon, USA.

Mair, M.; Mikovits, C.; Sengthaler, M.; Schöpf, M.; Kinzel, H.; Urich, C.; Kleidorfer, M.; Sitzenfrei, R.; Rauch, W. (2014c): The application of Web-geographic information system for improving urban water cycle modelling. *Water Science and Technology* 70 (11), 1838 - 1846. DOI: 10.2166/wst.2014.327

DETAILED DATA SUMMARIES

PHYSICAL ASSETS:

Asset Type:	# of Assets
Master Meters	1
Tanks	User input
Pumps	Currently not possible
Pump Stations	Currently not possible
Water Treatment Plants	Currently not possible

NETWORK CHARACTERISTICS:

# Total Pipes:	Depending on area of interest
# Branch Pipes:	User input
Ratio (Branch Pipes / Total Pipes):	User input
# Nodes	Depending on area of interest
# Reservoirs	User input
# Tanks	User input
# Regulating Valves	Currently not possible
# Isolation Values	Currently not possible
# Hydrants	Currently not possible
Elevation Data	User input

PIPE DATA:

Diameter (in)	Length (mm)
10 - 1000	Automatic pipe sizing

PUMP DATA:

Pump Horsepower	NO
Pump Curves:	NO

CUSTOMERS AND USAGE:

Customer Type	Customer Count	Average Daily Demand (LPS)
Wholesale:		
Residential:		
Commercial:		
Institutional:		
Industrial:		
Other:		
Total Customers:		
Flushing, Maintenance & Fire Protection:		
Total Water Usage:		User input

DATA FILE ATTRIBUTES:

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