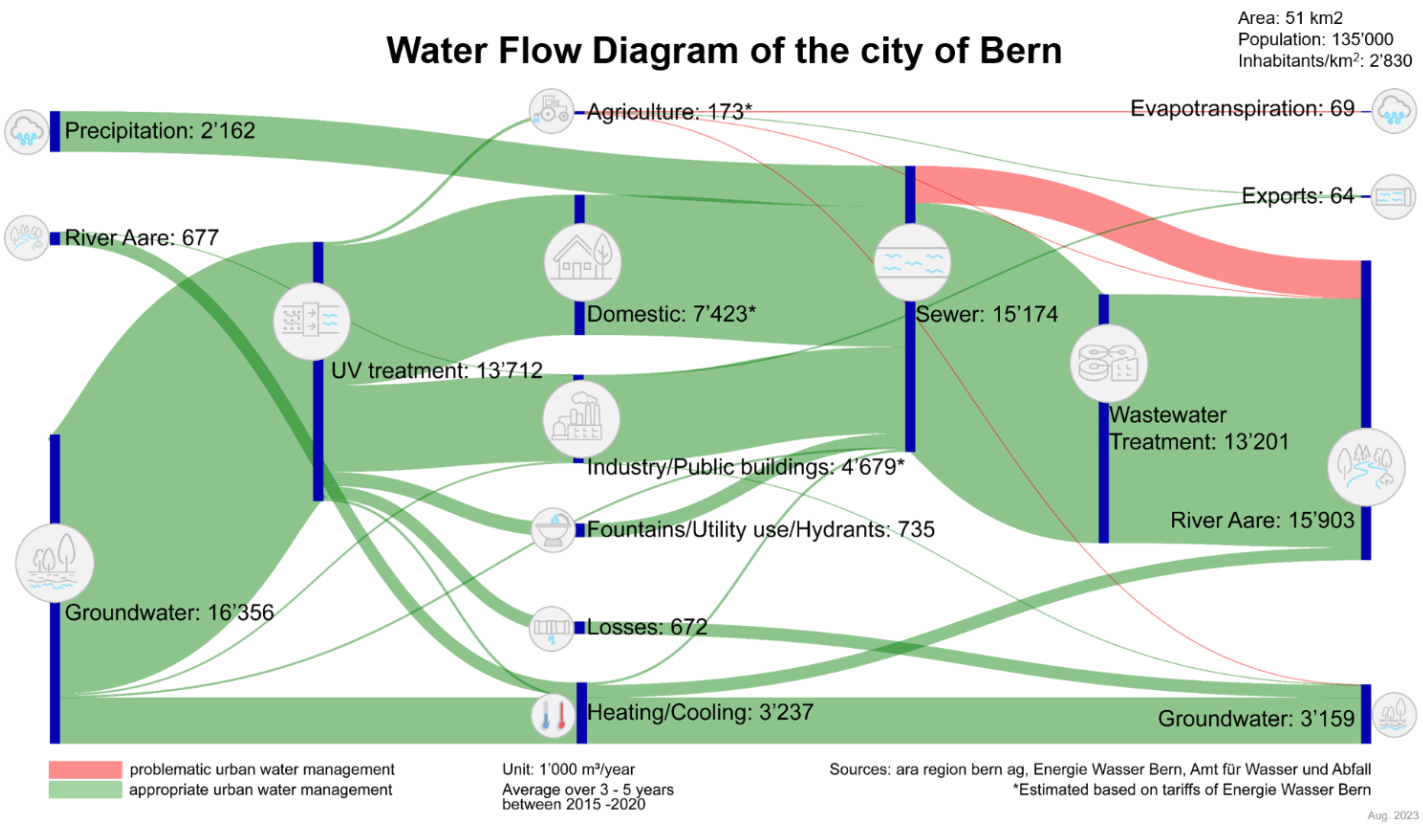

Partners	Blue Community Bern, City of Bern
Data sources	Wastewater utility (ara region bern), water utility (energie wasser bern), cantonal water office (Amt für Waser und Abfall)
System boundaries	Political borders of the city of Bern (51 km^2) in Switzerland
Context and motivation	The Swiss capital Bern served as a blue print of the Water Flow Diagram and was the first Water Flow Diagram. It was chosen because the necessary data was readily available. Bern is a relatively small city with a well-developed urban water management (UWM).
Interpretation and main learnings	Almost all flows were green and represent an appropriate UWM. Abstracted groundwater was treated with ultraviolet light and distributed to private households, industry, public buildings, fountains or hydrants. The industries used some negligible volumes of untreated water for their processes. Approximately 5% of treated water was lost during the distribution in the piped network, which was below the threshold of 10% for problematic UWM defined in the WFD user guide[1]. All buildings are connected to a sewer system. Most wastewater was appropriately treated in an advanced wastewater treatment plant before being discharged into the river Aare. Groundwater and river water were abstracted, used for heating and cooling and discharged again to the water bodies without quality change. An estimated 173'000 m^3 of piped water per year was used in agriculture (in addition to rain-fed water supply to the fields). This water sometimes polluted the groundwater and surface water. Small volumes of water were exported by industry (concrete factory) and agriculture. The most interesting finding of the WFD was that approximately 15% of the total wastewater in the sewer system was discharged to the river Aare without treatment. The discharge happened during heavy rainfall events only, when sewer and plant capacities were exceeded. The diagram identified that improvements of the combined sewer overflow should be implemented. Potential measures for improvement consist of infrastructure adaptions or the installation of blue-green infrastructure to reduce immediate run-off after heavy rainfalls.
Actions triggered	The diagram served as a blue print and motivated other case studies to evolve. It also triggered the further development of the WFD in the Swiss context.