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Increasing the water temperature of a 2nd order stream reach: Hydraulic aspects of a whole-stream manipulative experiment

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What will happen when water temperatures of streams increases, due to climate changes or in connection with rapidly changing human systems? Trying to answer to this question a whole-stream manipulative experiment was undertaken, where an increase in water temperature was artificially induced on a 2nd order stream reach. The main objective of this poster is to describe this experiment focusing on the design of the hydraulic system. The system maintained a steady flow while allowing natural variation in abiotic factors and was successfully used to evaluate the effects of warming on a stream ecosystem at several levels of biological organization. A constant flow of stream water was controlled by a hydraulic setup ($\sim$22m long; $\sim$1.5m width) subdivided into two independent channels. One channel of the study reach received heated water ($\sim$3ºC above the other), while the other received water at stream ambient temperature. The warming system maintained a steady gravity controlled flow making use of weirs and valves.