

Urban water supply vulnerability: sealing the failure paths

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Abstract. Water supplies for people and businesses in cities around the world are mainly delivered through local utilities. When their local urban water supply systems fail, the results are felt in social and economic impacts throughout urban areas. The typical arrangement for well-organized systems comprises three parts: source of supply, treatment and distribution, and failure can occur in any of these. Thus, urban water supply utilities face a range of technical, social and financial challenges to identify and mitigate the possible failures. Hydrologic failures, including those due to climate change and extreme events, comprise one class of failure, but utilities must consider others as well, such as infrastructure and human-caused failures. To anticipate and confront the range of challenges facing them, some water supply utilities are undertaking vulnerability studies. The paper will address the process for these studies and how their results can be used in integrated planning. It will begin with a conceptual risk model of threats to water supply utilities as they would be considered in vulnerability studies. Then it will present an archetype for a comprehensive vulnerability study. The paper will include a discussion of the vulnerability study currently being planned by the Fort Collins Water Utility. The conclusions of the paper will offer a model process to study vulnerability in local water supply utilities.