Geophysical Research Abstracts
Vol. 19, EGU2017-8005, 2017
EGU General Assembly 2017

User-centred development of hydrological data visualisations for non-scientific contexts in Lima (Peru).

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Effective communication is critical to enhance the understanding and application of hydrological information within non-scientific contexts. Visualisations are increasingly seen as powerful tools to engage users with unfamiliar and complex subject matter. Research suggests that the design of effective visualisation-based tools requires a highly iterative and collaborative approach towards the development of tailored visualisations. However, at present there are a lack of empirically-based methodologies to assist information providers. To help address this issue, a design study was conducted to elucidate the potential added value of adopting such a user-centred approach. Using the water supply system of the city of Lima (Peru) as a case study, we co-designed (with potential end users and a visualisation designer) three different static graphical displays intended to inform and engage different end users about a fixed and predetermined water-related topic. The end user groups were defined as non-hydrologist professional stakeholders in Lima, highland community water users and citizens with a general interest in the display content. By sharing visual iterations with potential end users throughout the design process we were able to observe a relationship between the responses to different types of visualisation and the three user groups targeted. Conducting a collaborative design approach helped to crystallise our ideas throughout the design process and ultimately create a product that was better tailored to specific user needs. We hope that these findings can contribute to the development of an empirically-driven methodology for designing effective visualisations at the interface between hydrological knowledge generation and non-scientific, societal application.