Evaluating the Water and Energy Supply and Consumption Data Standard

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INTRODUCTION

Given increasing pressures from population growth and land use change, Australian researchers from academia and government require access to high value water and energy (WE) consumption data for planning and policy-making purposes. While recent data initiatives from the federal government have sought to unlock data, further work is needed to harmonise and prepare these datasets for seamless integration, comparison and analyses over space-time. Towards this goal AURIN and CSIRO Land and Water collaborated in 2015 to develop a protocol for improving access and use of WE data that led to the creation of the WE Supply and Consumption (WESC) model [1], which is now publicly available on GitHub. Early success of this model was demonstrated in a data harmonisation proof-of-concept called the AURIN-CSIRO WESC hub, which streamed (now historical) data from 9 utilities across Australia via the AURIN Workbench to support eResearch.

Recently, the EUDM/NEAR projects [2] extended the WESC model to handle new classes and proposed new elements. While this work incorporated new developments into the model from a utility perspective, a formal investigation was needed to evaluate the extended WESC model by applying it to existing government/industry data and applications; inviting feedback from key stakeholders; and using the results to enhance and update the existing WESC hub. Specifically, this project investigated the following project questions: (1) What is researcher feedback on the value of the data supplied via the extended WESC model? (2) Does the model need to be further extended to handle other/new kinds of WE data? (3) What is needed to update the existing AURIN-CSIRO WESC hub with new data and make it FAIR [3]? (4) How can WE utilities be incentivised to participate for sustainability of the AURIN-CSIRO WESC hub?

METHODOLOGY

A scoping study was performed to investigate the project questions and evaluate the value of extending WESC and updating the AURIN-CSIRO WESC data hub. The proposed approach followed user-centred design processes and comprised four stages: data collection (users and utilities), analysis (data requirements and usability), forum (users, utilities and other stakeholders for FAIR data [3]) and report (describing the model and presenting recommendations). Researchers and data sources were identified for consultation during the desktop review and data collection stages through AURIN's personal/professional networks (~10,000 contacts). The AURIN Outreach team spread the survey and workshop opportunities to both communities and collate results. Both AURIN and CSIRO were well positioned to handle the evaluation process. The scoping study team consisted of three key roles: (1) AURIN project manager with proven expertise in data management, relationships and advocacy, who delivered the four stages, (2) CSIRO Senior data scientist

with specific knowledge of WE data and the WESC model, (3) AURIN Data officer who reconnected AURIN to the WESC data store and modified it be more FAIR.

OUTCOMES

The scoping study's primary outcome was delivery of a final report summarising the extended WESC model and the evaluation performed. This included a description of researcher challenges within various user communities and the value of the extended WESC model to meet the WE data needs of researchers, planners and policy makers. The report also summarized the nature/availability of WE datasets in each State/Territory, the interests of data sources including licensing, and how the existing WESC hub could be updated to be more FAIR. The alignment of the WE data collection with Commonwealth Government research priorities such as the United Nations Sustainable Development Goals and 'big ticket' national decadal challenges, must remain a key ongoing focus to satisfy researcher data requirements. A summary of the report's findings will be presented at the conference.

REFERENCES

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3. Wilkinson, M. D., Dumontier, M., Aalbersberg, I. J., Appleton, G., Axton, M., Baak, A., ... & Bouwman, J. (2016). The FAIR guiding principles for scientific data management and stewardship. *Scientific Data*, 3(160018).