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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Urban water sustainability: an integrative framework for regional water management" *by* P. Gonzales and N. K. Ajami

Anonymous Referee #2

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The author-stated goal for the work is to develop a regional integrative framework for the assessment of water resource sustainability under current management practices. In practice this is done using a series of simple urban water supply system indices that characterise supply, demands and water supply system adaptation potential (considering a utility's ability to conserve water, bring on new supplies, and its diversity of water uses). These factors are combined into an aggregate sustainability index. The approach is used to characterise and evaluate the 'sustainability' of water service providers in the San Francisco area which in part share a common large regional water source.

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General comments

Do the urban water supply indices introduced create new information that could lead to management or planning improvements? The reviewer is not sure of this. Rather than try and back calculate what the indices were quantifying and why, the reviewer found themselves referring repeatedly to the summary Fig 2 and 3 GIS plots of the raw data (before aggregation into metrics). The reviewer apparently preferred the maps with basic to the metrics because of their simplicity and their ability to communicated unprocessed information.

The authors seem to be operating under the general assumption that imported water supplies are negative. Are they in this case? Is the quantity or quality of San Francisco water supply threatened? Even if it were, could water not be obtained temporarily on California's water market? Do water local water agencies run a risk by using regional shared supplies? Surely this should be evaluated with an appropriately designed regional water supply study before assuming incoming water transfers are a negative characteristic. Perhaps imported supplies are of better quality and of lower or even much lower cost? Suppose local water managers sources more water locally, and it goes up in price and down in quality. Would the decreased dependence on imported supplies be considered a good thing in that case? It would be good to link future water provision strategies to impacts on system performance and service for a user, rather than on assumptions of what constitutes favourable sources of supply. The introduction speaks of 'over-reliance' in imported supplies, how should a water provider evaluate whether their supply is over reliant on imported water, what is the consequence of this? The paper does not answer this key initial question. This could be done with analysis and/or appropriate references.

The ambitious language used to describe the framework and its contribution are not commensurate with the simple descriptive aggregate supply-demand metrics which are being proposed for use. For example 'The objective of this work is to develop a regional integrative framework for the assessment of water resource sustainability un-

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der current management practices, as well as to identify opportunities for sustainability improvement in coupled socio-hydrologic systems.' Could this not more simply and accurately be stated as something along the lines of: "This work develops indices which characterize supply and demand information regarding subzones of a metropolitan water supply system. These indicators can serve to underline which parts of a regional or urban supply system have characteristics that set them apart from nearby areas and could point to an increased risk of water supply failures.' Similarly the conclusions have a tendency to oversell the contribution, its content and value: 'This work develops a generalized socio-hydrologic framework that can help bridge the science-policy gap for sustainable water management and enhanced collaboration.'

Too little is explained about the institutional context of the case study (management and governance of the urban water system). The paper focuses on evaluating 'agencies' which the reader gathers are the smallest management unit in a network of municipal public water supply entities? The term 'agency' needs to be described and defined to help reader not familiar with how the public water system is structured in the case-study area.

A related point is whether this analysis approach would be of value in other institutional contexts? Would privatized or concession-type water supply systems be appropriate for use of the proposed indicators? What specifically would be gained from their use? Can the proposed indicators be meaningfully ported to other contexts/countries. Some may have single or dominant supply sources – why is that a problem.

Some sentences would benefit from further clarification, for example the last sentence of the abstract states: 'Our analyses demonstrate that water agencies that share common water supplies are in a good position to establish integrative regional management partnerships in order to achieve individual and collective short-term and long-term benefits.' It's not clear what a 'integrative regional management partnership' is and how it can be used to improve urban water supply service. Also in the abstract, what is meant by 'making responsible use of supplies'? The value of the indices introduced is not suf-

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ficiently argued for in light of related indices currently in use. A literature review should include descriptions of other indices and how the proposed ones compare. It's not clear what specific benefits the proposed metrics have and what the provide in comparison with existing ones or simply making maps that show the related raw data.

In the Adaptation capacity section, the augmentation capacity index does not consider how hard or expensive it is to increase supplies. There's almost always a source of supply, but the point is that it may be economically or environmentally unjustified.

The regression and PCA sections used in the case-study - it's not clear how these methods are part of framework?

Specific comments

p 93 Line 14: 'Thus, the water sector has to rethink its water supply and demand priorities.' This appears to be a subjective/prescriptive statement which is not substantiated by clear evidence.

p. 93 Line 21: 'Innovative holistic approaches and enhanced collaboration are needed' Avoid use of jargon; what really is meant in simple terms?

p. 93, line 20: 'traditional water supply portfolios' – is there such a thing? Are you referring to tradition in California? If this is a general framework, case-study specific information should not appear so early in the manuscript.

p. 98: should section on socio-economic be removed from paper? It seems to mostly to serve reminding the reader that this area has not been covered. Discussion of socio-economic aspects should be removed entirely or strongly reduced as the paper does not address these topics.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 11291, 2015.