A variable fuzzy-sets assessment model and its application to regional water resources assessment

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Abstract Regional water resources assessments aim at estimating the current status and trends of water resources, providing a scientific basis for the development, utilization and protection of water resources, and optimizing a sustainable utilization plan. Therefore, it is essential to conduct a holistic water resources assessment. Most of the current assessment models for regional water resources only focus on water quantity and water quality. The assessment of hydroenergy resources is usually ignored. Furthermore, the assessment result is only compared with that of other models without analysing the stability itself. To target these issues, a variable fuzzy-sets model for regional water resources assessment was developed. Water quantity, water quality, and hydroenergy are considered in this model, and its stability is also analysed with varying parameters. The given case study focusing on water quality shows that the variable fuzzy-sets model is useful to guide regional water resources assessment.

Key words hydroenergy; variable fuzzy-sets assessment model; water quality; water quantity; water resources