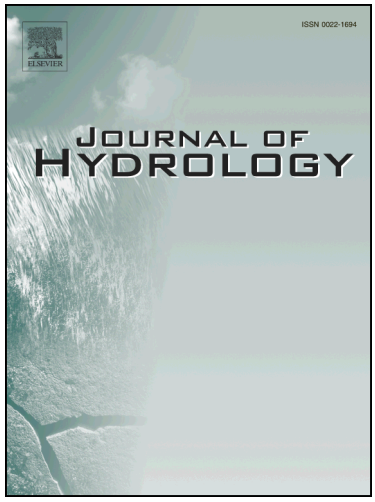
Accepted Manuscript



Research papers

Predicting Water Allocation Trade Prices Using a Hybrid Artificial Neural Network-Bayesian Modelling Approach

Tai Nguyen-ky, Shahbaz Mushtaq, Adam Loch, Kate Reardon-Smith, Duc-Anh An-Vo, Duc Ngo-Cong, Thanh Tran-Cong

PII: S0022-1694(17)30814-4
DOI: https://doi.org/10.1016/j.jhydrol.2017.11.049
Reference: HYDROL 22407

To appear in: *Journal of Hydrology*

Received Date: 11 September 2017
Revised Date: 25 November 2017
Accepted Date: 27 November 2017

Please cite this article as: Nguyen-ky, T., Mushtaq, S., Loch, A., Reardon-Smith, K., An-Vo, D-A., Ngo-Cong, D., Tran-Cong, T., Predicting Water Allocation Trade Prices Using a Hybrid Artificial Neural Network-Bayesian Modelling Approach, *Journal of Hydrology* (2017), doi: https://doi.org/10.1016/j.jhydrol.2017.11.049

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

PREDICTING WATER ALLOCATION TRADE PRICES USING A HYBRID ARTIFICIAL NEURAL NETWORK-BAYESIAN MODELLING APPROACH

TAI NGUYEN-KY[1*], SHAHBAZ MUSHTAQ[2], ADAM LOCH[3], KATE REARDON-SMITH[2], DUC-ANH AN-VO[1], DUC NGO-CONG[1] AND THANH TRAN-CONG[1]

[1]Computational Engineering and Science Research Centre (CESRC), University of Southern Queensland, Toowoomba, Qld 4350, Australia
[2]International Centre for Applied Climate Sciences (ICACS), University of Southern Queensland, Toowoomba, Qld 4350, Australia
[3]Centre for Global Food and Resources, University of Adelaide, South Australia 5005 Australia

Key Points

- Artificial Neural Network (ANN) approaches were used to model and predict water trading prices in the Murry Irrigation area, Australia.
- Prices forecast using hybrid ANN-Bayesian modelling showed greater agreement with actual water prices.
- Water security allocations, cereal and meat prices were significant determinants of future water trading prices.

Abstract: This paper proposes an integrated (hybrid) Artificial Neural Network-Bayesian (ANN-B) modelling approach to improve the accuracy of predicting seasonal water allocation prices in Australia's Murry Irrigation Area, which is part of one of the world's largest interconnected water markets. Three models (basic, intermediate and full), accommodating different levels of data availability, were considered. Data were analyzed using both ANN and hybrid ANN-B approaches. Using the ANN-B modelling approach, which can simulate complex and non-linear processes, water allocation prices were predicted with a high degree of accuracy (R_{BASIC} = 0.93, $R_{INTER.}$= 0.96 and R_{FULL} = 0.99); this was a higher level of accuracy than realized using ANN. This approach can potentially be integrated with online data systems to predict water allocation prices, enable better water allocation trade decisions, and improve the productivity and profitability of irrigated agriculture.

Keywords: Water allocation prices, Artificial Neural Network model, hybrid Artificial Neural Network-Bayesian model, water trade, price prediction.

* Corresponding author. Tel. +61 7 4631 1908

Email address: nguyentk@usq.edu.au (T. Nguyen-Ky)

دریافت فوری ← متن کامل مقاله

ISIArticles
مرجع مقالات تخصصی ایران

✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
✓ امکان دانلود نسخه ترجمه شده مقالات
✓ پذیرش سفارش ترجمه تخصصی
✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
✓ دانلود فوری مقاله پس از پرداخت آنلاین
✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات