Physics and Chemistry of the Earth 89–90 (2015) 1–2

Contents lists available at ScienceDirect

Physics and Chemistry of the Earth

journal homepage: www.elsevier.com/locate/pce

Editorial

Water use efficiency and integrated water resource management for river basin

Water use efficiency and management have attracted increasing attention as water has become scare to challenge the world's sustainable development. Water use efficiency is correlated to the land use and cover changes (LUCC), population distribution, industrial structure, economic development, climate changes, and environmental governance. These factors significantly alter water productivity for water balance through the changes in natural environment and socio-economic system (Wang et al., 2015b). Consequently, dynamics of water inefficiency lower the social welfare of water allocation (Wang et al., 2015b), and induce water management alternation interactively and financially (Wang et al., 2015a). This triggers on actual water price changes through both natural resource and socioeconomic system (Zhou et al., 2015). Therefore, it is very important to figure out a mechanism of water allocation in the course of LUCC (Jin et al., 2015) at a global perspective (Zhao et al., 2015), climate and economic changes of ecosystem service at various spatial and temporal scales (Li et al., 2015).

Among the 18 accepted papers in this special issue, several advances have been achieved. Firstly, advanced analysis has been applied. Based on input–output analysis, water use efficiency in each county of Heihe River Basin are quantitatively depicted for further understanding water allocation through diverse industries (Wang et al., 2015b). Particularly, irrigated agricultural water use efficiency in Oasis is estimated to illustrate economic transformation has significant impacts on oasis expansion, and a trend of labor force emigration (Song and Zhang, 2015). Furthermore, by employing recursive cross-entropy downscaling model, future crop land use changes are predicted to be increased, so that reginal water scarcity will become severely until 2050 (Zhang et al., 2015). A multi-regional model of Computable General Equilibrium also is applied for testing water use efficiency of hydrological power allocation (Ma et al., 2015). Due to close relationships between hydrological power and regional geo-risk, uncertain consequences of decision-making-based land development are tested by an application of model that is designed for estimating geo-risk zones (Yang et al., 2015).

Secondly, an improved methodology of theoretical model for studying on environmental dispersion is developed in terms of the two-scale perturbation analysis (Chen et al., 2015). Application of glacier changes with reference to Heihe River Basin is used for estimation of discharge in Central Aisa (Xu et al., 2015). Particularly, emission of CO_2 determines regional climatic changes through geophysical and chemical process (Singh et al., 2015). That illustrates human activities having huge impacts on environmental pollution and calls for research on environmental capacity with regards to urbanization (Ding et al., 2015). Urban expansion and water pollution have already endangered regional ecosystem health. Particular pollutant such as phosphorus flow down to the downstream of large rivers in China (Gao et al., 2015). This leads to regional environmental capacity and quality of life being challenged unprecedentedly. Interbrain water transfer has been applied in many countries which suffer from severely uneven distribution of water. Water use efficiency of that kinds of projects are improved, however, the regional environmental capacity is altered by huge changes in ecosystem services (Kibiiy and Ndambuki, 2015). Thus, research on regional eco-hydro-soico-economic impact in urban–rural rural are vital important to learn interactive impacts of changes between environmental capacity and efficiency gains (Yang and Ke, 2015). For instance, that mining under specific geophysical condition results in uncertain geo-risks induces land and water management to become more complicated. That kind of policy-oriented development calls for integrated scientific-based research to be referred by decision makers (Sun et al., 2015).

This special issue of the journal of *Physics and Chemistry of the earth* intends to advance our understanding of soil earth, geodesy, hydrology, oceans, atmosphere, solar-terrestrial and planetary science. The published papers on this journal will provide useful references for future study.

References

Chen, B., Zhang, L., Hayat, T., Alsaedi, A., Ahmad, B., 2015. Two-scale analysis for environmental dispersion in a two-layer wetland. Phys. Chem. Earth 89–90, 91–95.

Ding, L., Chen, K.-l., Chenga, S.-g., Wang, X., 2015. Water ecological carrying capacity of urban lakes in the context of rapid urbanization: a case study of East Lake in Wuhan. Phys. Chem. Earth 89–90, 104–113.

Gao, Z., Bai, J., Jia, J., Wen, X., Zhang, G., Zhao, Q., 2015. Spatial and temporal changes of phosphorus in coastal wetland soils as affected by a tidal creek in the Yellow River Estuary, China. Phys. Chem. Earth 89–90, 114–120.

Jin, G., Wang, P., Zhao, T., Bai, Y., Zhao, C., Chen, D., 2015. Reviews on land use change induced effects on regional hydrological ecosystem services for integrated water resources management. Phys. Chem. Earth 89–90, 33–39.

Kibiiy, J., Ndambuki, J., 2015. New criteria to assess interbasin water transfers and a case for Nzoia-Suam/Turkwel in Kenya. Phys. Chem. Earth 89–90, 121–126.

Li, H., Li, Z., Li, Z., Jing, Y., Liu, B., 2015. Evaluation of ecosystem services: a case study in the middle reach of the Heihe River Basin, Northwest China. Phys. Chem. Earth 89–90, 40–45.

Ma, J., Liu, Y., Wang, H., Yan, D.H., Lv, Y.K., Yang, Z., 2015. Socioeconomic impacts of hydropower development on the Yibin-Chongqing section, upper reaches of the Yangtze River. Phys. Chem. Earth 89–90, 73–78.

Singh, R.B., Janmaijaya, M., Dhaka, S.K., Kumar, V., 2015. Study on the association of green house gas (CO_2) with monsoon rainfall using AIRS and TRMM satellite observations. Phys. Chem. Earth 89–90, 65–72.

Song, Wei, Zhang, Ying, 2015. Expansion of agricultural oasis in the Heihe River Basin of China: patterns, reasons and policy implications. Phys. Chem. Earth 89–90, 46–55.

http://dx.doi.org/10.1016/j.pce.2015.11.004
1474-7065/© 2015 Published by Elsevier Ltd.

Sun, W., Qiang, W., Liu, H., Jiao, J., 2015. Prediction and assessment of the disturbances of the coal mining in Kailuan to karst groundwater system. Phys. Chem. Earth 89–90, 136–144.
Wang, G., Chen, J., Wu, F., Li, Z., 2015a. An integrated analysis of agricultural water-use efficiency: a case study in the Heihe River Basin in Northwest China. Phys. Chem. Earth 89–90, 3–9.
Wang, Z., Deng, X., Chen, J., 2015b. Impacts of sparing use of water on farmer income of China. Phys. Chem. Earth 89–90, 18–24.
Xu, B., Lu, Z., Liu, S., Li, J., Xie, J., Long, A., Yin, Z., Zou, S., 2015. Glacier changes and their impacts on the discharge in the past half-century in Tekes watershed, Central Asia. Phys. Chem. Earth 89–90, 96–103.
Yang, B., Ke, X., 2015. Analysis on urban lake change during rapid urbanization using a synergistic approach: a case study of Wuhan, China. Phys. Chem. Earth 89–90, 127–135.
Yang, L., Wang, Z., Jin, G., Chen, D., Wang, Z., 2015. Geological risk assessment for the rapid development area of the Erhai Basin. Phys. Chem. Earth 89–90, 79–90.
Zhang, X., Ermolieva, T., Balkovic, J., Mosnier, A., Kraxner, F., Liu, J., 2015. Recursive cross-entropy downscaling model for spatially explicit future land uses: a case study of the Heihe River Basin. Phys. Chem. Earth 89–90, 56–64.
Zhao, C., Wang, P., Zhang, G., 2015. A comparison of integrated river basin management strategies: a global perspective. Phys. Chem. Earth 89–90, 10–17.
Zhou, Q., Wu, F., Zhang, Q., 2015. Is irrigation water price an effective leverage for water management? An empirical study in the Middle reaches of the Heihe River Basin. Phys. Chem. Earth 89–90, 25–32.

Xiangzheng Deng
R.B. Singh
Junguo Liu
Burak Güneralp