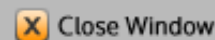




Print



Close Window

Proof



Print

**CONTROL ID:** 1474217**TITLE:** Impact of river–lake–groundwater interaction on boundless carbon cycle in continental basin

**ABSTRACT BODY:** In the Changjiang River in south China, deforestation and land reclamation have induced serious soil erosion and increased floods. Although the Three Gorges Dam (TGD) will provide flood control, the aquatic environment might be changed by discharge control and pollutant loads caused by the deposition of large amounts of sediment in the upper dam (Yang et al., 2006). Some research implies that seepage of groundwater along the lower regions plays important role in maintaining stream flow and after TGD impounding by using natural radionuclides (Dai et al., 2010). It is effective to clarify complicated river–lake–groundwater interaction (Eltahir and Yeh, 1999; Dai et al., 2010), and to evaluate optimum amount of transferred water and environmental consequences in the basin. The authors have so far developed the process-based National Integrated Catchment-based Eco-hydrology (NICE) model (Nakayama, 2008a, 2008b, 2010, 2011a-b, 2012a-c; Nakayama and Fujita, 2010; Nakayama and Hashimoto, 2011; Nakayama and Watanabe, 2004, 2006, 2008a, 2008b; Nakayama et al., 2006, 2007, 2010, 2012), which includes complex interactions between the forest canopy, surface water, the unsaturated zone, aquifers, lakes, and rivers. The objective of this research is to estimate the impact of river–lake–groundwater interaction on hydrologic cycle and to predict the impact of TGD on the hydrologic change in the downstream Dongting and Poyang Lakes region by using a process-based model. Analysis of power spectra in river discharge also helps to understand its complex mechanism. This integrated system also throws some light on the improvement in boundless biogeochemical cycle along terrestrial-aquatic continuum (Cole et al., 2007).

References;

- Cole, J.J. et al., *Ecosystems*, doi:10.1007/s10021-006-9013-8, 2007.
- Dai, Z. et al., *Hydrogeol. J.*, 18, 359-369, 2010.
- Eltahir, E.A.B.& Yeh, P.J.-F., *Water Resour. Res.*, 35(4), 1199-1217, 1999.
- Nakayama, T., *Ecol. Model.*, doi:10.1016/j.ecolmodel.2008.02.017, 2008a.
- Nakayama, T., *Forest Ecol. Manag.*, doi:10.1016/j.foreco.2008.07.017, 2008b.
- Nakayama, T., *River Res. Applic.*, doi:10.1002/rra.1253, 2010.
- Nakayama, T., *Hydrol. Process.*, doi:10.1002/hyp.8009, 2011a.
- Nakayama, T., *Agr. Forest Meteorol.*, doi:10.1016/j.agrformet.2010.11.006, 2011b.
- Nakayama, T., *Water Sci. Technol.*, doi:10.2166/wst.2012.205, 2012a.
- Nakayama, T., *Hydrol. Process.*, doi:10.1002/hyp.9347, 2012b.
- Nakayama, T., *Proc. Environ. Sci.*, doi:10.1016/j.proenv.2012.01.008, 2012c.
- Nakayama, T. & Fujita, T., *Landscape Urban Plan.*, doi:10.1016/j.landurbplan.2010.02.003, 2010.
- Nakayama, T. & Hashimoto, S., *Environ. Pollut.*, doi:10.1016/j.envpol.2010.11.016, 2011.
- Nakayama, T. & Watanabe, M., *Water Resour. Res.*, doi:10.1029/2004WR003174, 2004.
- Nakayama, T. & Watanabe, M., *Hydrol. Earth Syst. Sci. Discuss.*, 3, 2101-2144, 2006.
- Nakayama, T. & Watanabe, M., *Hydrol. Process.*, doi:10.1002/hyp.6684, 2008a.
- Nakayama, T. & Watanabe, M., *Global Planet. Change*, doi:10.1016/j.gloplacha.2008.04.002, 2008b.
- Nakayama, T., et al., *Hydrol. Process.*, doi:10.1002/hyp.6142, 2006.
- Nakayama, T., et al., *Sci. Total Environ.*, doi:10.1016/j.scitotenv.2006.11.033, 2007.
- Nakayama, T., et al., *Global Planet. Change*, doi:10.1016/j.gloplacha.2010.06.001, 2010.
- Nakayama, T., et al., *Hydrol. Process.*, doi:10.1002/hyp.9290, 2012.
- Yang, Z. et al., *Water Resour. Res.*, doi:10.1029/2005WR003970, 2006.

**CURRENT SECTION/FOCUS GROUP:** Global Environmental Change

**CURRENT SESSION:** GC019. Environmental, Socio-economic and Climatic Change in Northern Eurasia and Their Feedbacks to the Global Earth System

**INDEX TERMS:** [1615] GLOBAL CHANGE / Biogeochemical cycles, processes, and modeling, [1655] GLOBAL CHANGE / Water cycles, [1830] HYDROLOGY / Groundwater/surface water interaction, [0414] BIOGEOSCIENCES / Biogeochemical cycles, processes, and modeling.

**AUTHORS/INSTITUTIONS:** T. Nakayama, Center for Global Environmental Research, National Institute for Environmental Studies (NIES), Tsukuba, Ibaraki Prefecture, JAPAN;  
D. Shankman, Department of Geography, University of Alabama, Tuscaloosa, AL;

**SPONSOR NAME:** Tadanobu Nakayama

**CONTACT (E-MAIL ONLY):** nakat@nies.go.jp

**TITLE OF TEAM:**

---

ScholarOne Abstracts® (patent #7,257,767 and #7,263,655). © [ScholarOne](#), Inc., 2012. All Rights Reserved.  
ScholarOne Abstracts and ScholarOne are registered trademarks of ScholarOne, Inc.



Follow ScholarOne on Twitter

[Terms and Conditions of Use](#)

Product version number 4.0.0 (Build 55)  
Build date Aug 03, 2012 13:50:09. Server tss1be0014