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Preface

Carbon exchange research in ChinaFLUX

China has made rapid progress on many fronts over the last two decades, not least being the impressive investment in science and scientists engaged in understanding China's natural and man-made ecosystems in the context of climate variability and climate change. China has now in place a large number of flux stations, on a scale that matches the networks in both Europe and the USA, to monitor exchanges of energy, carbon and water between the land and atmosphere. The enormous diversity of ecosystems across China is reflected in the studies reported in this volume, which range from temperate broad and needle leafed forests in the north east, to tropical forests in the south, wheat crops in the North China Plain to steppe and shrub vegetation in Tibet. Early results from ChinaFLUX were presented at an International Workshop on Flux Observation Research in Asia held from 1 to 3 December 2003 in Beijing, and a selected subset of these papers are presented here. This special issue begins with an overview of ChinaFLUX and an evaluation of eddy covariance measurements at various sites (Yu et al., 2006). This is followed by papers showing seasonal variation and annual carbon balances in forest ecosystems in China (Guan et al., 2006; Zhang et al., 2006a), and several investigations of biotic and abiotic effects on ecosystem processes of carbon dioxide exchange (Wen et al., 2006; Zhang et al., 2006b; Shi et al., 2006; Fu et al., 2006). An exploratory study on the importance of low-frequency contributions to eddy fluxes is presented (Sun et al., 2006), while Wang et al. (2006) describe a canopy photosynthesis and transpiration coupled model. We would like to express our appreciation to the participants of the workshop for presenting their ideas and research results that ultimately lead to this special issue, and to the authors, reviewers and guest editors involved. It has been our pleasure to edit these papers, because of their high scientific standards and to provide an opportunity for Chinese scientists to showcase their work to an international audience.

Of course, much progress in flux observation research has been made in China over the two years since the workshop, with most results published in two special issues of *Science in China Series D: Earth Science* in 2005 and 2006. We hope these papers will provide a link between scientists of ChinaFLUX with the international community to quantify and improve the understanding of the controls on carbon balances in global terrestrial ecosystems.

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References

Fu, Y.L., Yu, G.R., Sun, X.M., Li, Y.N., Wen, X.F., Zhang, L.M., Li, Z.Q., Zhao, L., Hao, Y.B., 2006. Depression of net ecosystem CO_2 exchange in semi-arid Leymus chinensis steppe and alpine shrub. Agric. Forest Meteorol. 137, 234–244.

Guan, D.X., Wu, J.B., Zhao, X.S., Han, S.J., Yu, G.R., Sun, X.M., Jin, C.J., 2006. CO_2 fluxes over an old, temperate mixed forest in north-eastern China. Agric. Forest Meteorol. 137, 138–149.

Shi, P.L., Zhang, X.Z., Zhong, Z.M., Ouyang, H., 2006. Diurnal and seasonal variability of soil CO_2 efflux in a cropland ecosystem on the Tibetan Plateau. Agric. Forest Meteorol. 137, 220–233.

Sun, X.M., Zhu, Z.L., Wen, X.F., Yuan, G.F., Yu, G.R., 2006. The impact of averaging period on eddy fluxes observed at ChinaFLUX sites. Agric. Forest Meteorol. 137, 188–193.

Wang, J.W., Yu, Q., Li, J., Li, L.H., Li, X.G., Yu, G.R., Sun, X.M., 2006. Simulation of diurnal variations of CO_2, water and heat fluxes over winter wheat with a model coupled photosynthesis and transpiration. Agric. Forest Meteorol. 137, 194–219.

Wen, X.F., Yu, G.R., Sun, X.M., Li, Q.K., Lui, Y.F., Zhang, L.M., Ren, C.Y., Fu, Y.L., Li, Z.Q., 2006. Soil moisture effect on the temperature dependence of ecosystem respiration in a subtropical Pinus plantation of southeastern China. Agric. Forest Meteorol. 137, 166–175.

0168-1923/$ – see front matter
doi:10.1016/j.agrformet.2006.02.002

Yu, G.R., Wen, X.F., Tanner, B.D., Sun, X.M., Lee, X.H., Chen, J.Y., 2006. Overview of ChinaFLUX and evaluation of its eddy covariance measurement. Agric. Forest Meteorol. 137, 125–137.

Zhang, J.H., Han, S.J., Yu, G.R., 2006a. Seasonal variation in carbon dioxide exchange over a 200-year-old Chinese broad-leaved Korean pine mixed forest. Agric. Forest Meteorol. 137, 150–165.

Zhang, L.M., Yu, G.R., Sun, X.M., Wen, X.F., Ren, C.Y., Fu, Y.L., Li, Q.K., Li, Z.Q., Liu, Y.F., Guan, D.X., Yan, J.H., 2006b. Seasonal variations of ecosystem apparent quantum yield (α) and maximum photosynthesis rate (P_{max}) of different forest ecosystems in China. Agric. Forest Meteorol. 137, 176–187.

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