Curriculum Vitae for Prof. Yonghui Yang

1. BACKGROUND: Male, Born in October, 1965

2. EDUCATION

Beijing Forestry University, B.Sc. Agriculture (1987)

Chiba University, Japan, Ph. D of Sciences (2002)

3. PROFESSIONAL EXPERIENCE

2005.4-present	Professor, Center for Agricultural Resources Research (CARR) of IGDB
2002.3—2005.4	NIES Fellow, in National Institute for Environmental Studies (NIES), Japan.
2000.3—2002.3	STA (Japan Science and Technology Agency) Fellow in NIES, Japan
1999.10--- 2000.3	Professor and Head, Division of natural Resources, Shijiazhuang Institute of Agricultural Modernization (SIAM) in Chinese Academy of Sciences.
1996.10—1999.10	Associate Professor in SIAM
	Head, Division of Natural Resources
1993.2-1994.3	Visiting scientist in Center for Ecology and Hydrology, England.
1992.7—1996.10	Assistant Professor, SIAM
1987.7—1992.7	Research Assistant, Shijiazhuang Institute of Agricultural Modernization (SIAM), CAS

4. HONORS AND ACADEMIC AWARDS

Vice Director, Center for Agricultural Resources Research, IGDB

Head, Key Laboratory of Agricultural Water Resources, CAS

Vice Director, Center for Water Resources, CAS

Deputy Director, Provincial Key Laboratory of Agricultural Water-Saving

2010.6 One of the Excellent Professors at the final assessment for “Hundred Talent Programe Professors”.

5. MAJOR RESEARCH INTERESTS, PROJECTS AND ACHIEVEMENT

5.1 MAJOR RESEARCH INTERESTS

- Hydrological cycle and sustainable water resources management;
- Effect of air pollution on solar radiation and hydrological cycle

5.2 RESEARCH PROJECTS AND FUNDINGS

1) Project leader, National Cooperation Project with Japan funded by Ministry of Science and Technology (MOST) "Adaptability of agriculture and agricultural water use in Arid Region of China under the Effect of Climate Change", 950,000 RMB Yuan. (2013-2015)
2) Project Leader, Funded by CAS, "Water suitability for increasing food production in Areas surrounding Bohai Sea", 500,000 RMB Yuan. (2014-2015)
3) Project leader, National 973 Project by MOST, "Effect of Climate Change on Water Cycle in Agricultural Oasis in the Arid Region of China", 1,200,000 RMB Yuan. (2011-2014)
4) Project leader, Project for International Collaboration from MOST "Water resources management in Haihe Catchment, water receiving region of the South-to-North-Water-Transfer-Project", 1,350,000 RMB Yuan. (2009.7-2012.6)
5) Project leader, National Nature Science Foundation Committee "Effect of Different Land Use on Water Cycle in Mountainous region of the North China", 470,000 RMB Yuan. (2009-2011).
6) Project leader, Spatial and temporal changes of agricultural water use and their driving forces in Haihe Catchment, 600,000 RMB Yuan. (2008-2010)
7) Project Leader, Support for Hundred Talent Program of CAS, "Analysis on Agricultural Water Supply in Haihe Catchment", 1,730,000 RMB Yuan. (2006-2010)
8) Project Leader, National Supporting Programme for Science and Technology from Ministry of Science and Technology, "Assessment on suitability of forest cover in site conditions with different water availability", 700,000 RMB Yuan. (2006-2010)
9) Project leader, Priority Project of Scientific Innovation in CAS "Supply and Demand Analysis of Agricultural Water Resources in the Piedmont Region of the Taihang Mountains Based on Field Monitoring and Model Simulation", funding: 1,500,000 RMB Yuan. (2006-2010)

5.3 MAJOR RESEARCH ACHIEVEMENTS

SUMMARY

From 2009, 28 papers were published in international journals such as *Journal of Geophysical Research-Atmosphere, Water resources Research, Environmental Research Letter, Journal of Hydrology, Hydrological Processes, Agricultural Water Management*, and so on and over 9 papers in Chinese Journals.

It is worth mentioning that at the final assessment for 84 professors invited by "Hundred Talent Program", I was nominated as one of most excellent professors (about 20%).

As the head of Key Laboratory of Agricultural Water Resources in Chinese Academy of Sciences, in 2010, after very challenging competition, our Laboratory was listed as 17th position among 34 laboratories in biology in CAS.

Also during such period, as the vice director for Center of Water Resources Research of CAS, a Center to link water related researches in 19 institutes in the CAS, I involved in a lot activities including organizing workshops and conference of frontier science for water, giving suggestions of water issues (drought, flooding disaster, and long-term water management) to different levels, and making plans for water research in CAS. Through such activities, we jointly published the book "Roadmap for the development of water science and technology to 2050 in China", a guide book for China's water science planning, and "China water vision: impact of climate change on China's water resources".

4.3.1 RESEARCH FOCUS 1: Water sustainability

Over the last half Century, China's water system has been heavily influenced by human activities, land use change, and climatic change. Our Center is located in Shijiazhuang in the North China Plain and in the Haihe Catchment (Fig. 1). Haihe Catchment is a region most seriously influenced by water shortage indicated by quick depletion of groundwater and drying up of river water flow and lakes. Understanding the driving mechanisms of water system changes are the key for water resources management in the short-term and long-term.

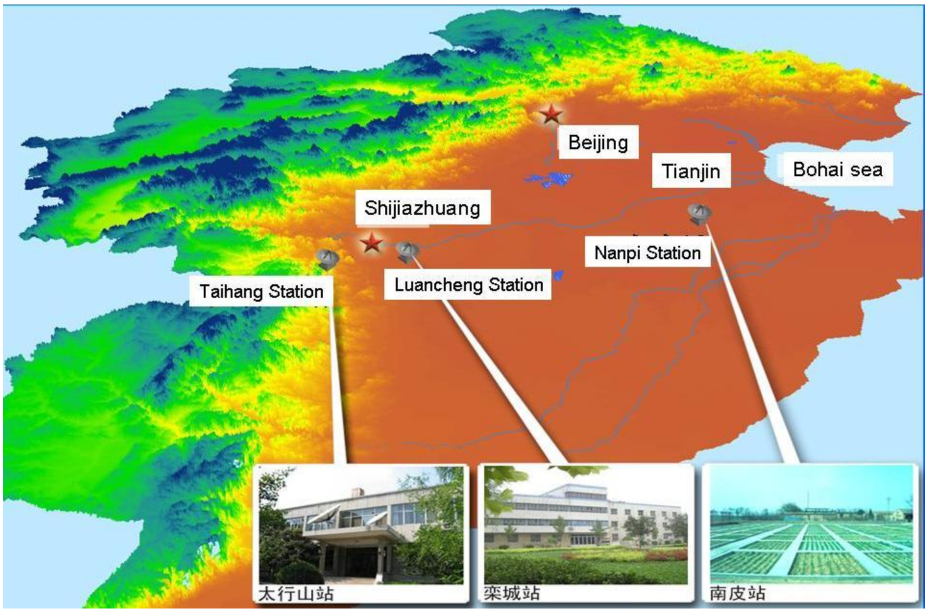

Fig. 1 Topography map of Haihe Catchment and field observation stations

Thus, our research mainly aimed to understand the long-term sustainability of water resources in Haihe Catchment and in the North China Plain, an important agricultural area of China food production. In the region, there are 2 critical issues influencing water sustainability in the long term:

- Decreasing river flows from the upstream mountainous regions;
- Future influence of the South-to-north water transfer project, which will soon start to deliver 9.5 billion m3 of surface water from Yangtze River to the region.

Our research in the past 5 years, therefore, focuses on 2 aspects:

- Mechanisms of runoff decrease in the mountainous region;
- Impact of agricultural water use on groundwater recharge.

Mechanisms of runoff decrease in mountainous regions

In Haihe Catchment, most subcatchments are experiencing quick decline of runoff since 1970s. It is generally understood that runoff decrease were caused by human activity and climate change. But it is so far not sure which factor has the most dominating influence on runoff decline, since there are so many human forces such as land use change, reservoir construction, small dams for runoff control in small valleys, and etc.

Our study (Yang & Tian 2009) on Journal of Hydrology understood:

- Runoff decrease mainly started in 1978-1984 period, the starting period of China's agricultural reform;
- Among eight catchments, catchments with over 25% of agricultural cover all have significant decline of runoff. It is showed that the higher the percentage of agricultural cover is, the stronger the runoff decline is.

Both findings suggested that agriculture water use could be a major driving force of runoff decline.

However, such conclusion is suspected, since 1978-1984 is also the period when precipitation decreased obviously, in comparison with the period of 1960-1976. In our next research, Hutuo River was taken as an example. Fan et al (2010, in Water science and technology), through the application of SWAT (Soil and Water Assessment Tool) model, testified that the dramatic decline of runoff is heavily caused human activities rather than climate change or precipitation decrease. Precipitation decline only resulted in 24% of runoff decrease, while human forces resulted in 76% of the runoff decrease. It is thus inferred that runoff decline is driven by human activities, especially agriculture.

In order to further clarify our hypothesis, in Tian 2010 (Water Science and Technology), we compared runoff decrease in the Ye River Catchment, where Dazhai is located, and Hutuo River Basin. Our study further showed that agriculture effect on runoff is dominate, since runoff decrease started in 1968 in Ye River catchment where agricultural activities is the strongest in China, the central part of "Dazhai movement". Dazhai Movement is a most famous movement in China for agriculture. The movement started in 1964. A lot terrace was developed to catch water to increase agricultural production. Runoff in Ye River Catchment, where the strongest activities were carried out, started to decline significantly from 1968, soon after the start of the Movement. And in the nearby catchment, significant runoff decline started after China's agricultural reform. Thus, it is again suggested that agriculture is the major factor of runoff decrease.

One may still doubt our conclusion. The strong negative argument is that reservoirs must have played an important role in stopping river water flow. We believe that is also true. However, it is generally recognized that agricultural water use in Haihe River Catchment (which harbors major cities like Beijing, Tianjin and Shijiazhuang) is 70-80%. Hebei Department of Water Resources (1984) documents that agricultural water use in most of the mountain counties was higher than 90% in the early 1980s, because of the lowly developed economy. In these regions, farmers often collect runoff in terraces in order to enhance crop yield. With farmers' increasing ability in irrigation for instance with increasing supply of electricity, much water can then be taken from reservoirs to farmland for irrigation after reform policy.

Above studies basically clarified that runoff decline in Haihe Catchment is caused by human activities, especially agricultural water use. This is important owing to the fact that farmers in the mountainous are still working hard to pump out base flows in large rivers and small valleys by digging more shallow wells. Such activities should lead to further shrinking of water supply to the plain area in the long-term.

Right now, our studies are: 1) looking at the effect of land use on evapotranspiration (ET), through remotely sensed ET data (derived from SEBAL model), and 2) aiming to obtain a much accurate spatial precipitation data through the application of Radar data in combination with the recently available rainfall observation network..

Assessment of agricultural water use for wise use of groundwater

1) Agricultural water use estimation

Agriculture used over 60% of water resources in China. However, the present method in estimating agricultural water use is less reliable. People from each county bureau go to the field and investigate how many times irrigation is applied for different crops. Then, irrigation quota (how much water in each irrigation) is estimated to calculate how much water is used for each crop. And next crop area and irrigation amount are used to get agricultural water use. Above method obviously have many shortages for instance lack of enough sampling plots, less accuracy of quota, and so on.

In order to increase water use estimation, DSSAT (wheat and maize crops) (Yang et al 2006a, 2006b) and COTTON2K (Yang YM, et al 2008) models were calibrated by using data from field experiment. For wheat, plant growth rate and soil water use are validated to correctly simulate wheat growth in different seasons. Similarly, pruning and topping, two most commonly used practice, were added into COTTON2K model to reflect China's cotton growth more properly.

Then, Yang YM et al 2010 (in Agricultural Water Management) estimated agricultural water use in spatial level through the application of three crop models in combination with Kc coefficiency method for vegetables and fruit trees. Spatial and temporal variations in our estimated irrigation water requirement are higher than those published by the governmental agency in statistical data (Figure 2). According such estimation, wheat, corn, fruite tree, cotton and vegetables respectively accounts for 60%, 15%, 14%, 7%, and 5% of total agricultural water use. And the highest irrigation pumping are taking place in April and May, 1.63 and 2.39 billion m^3 respectively. Our results also showed a much higher annual variations, which is considered to be more reflective to the really conditions (e.g. precipitation, cropping pattern, irrigated land area, etc.). This, therefore, indicates a substantive improvement (in our study) over the average statistical data. Based on our simulation results, viable surface water reallocation strategies following the completion of the South-to-North Water Transfer (SNWT) project are discussed. It is showed that water supply under the support of SNWT project is optimistic in the piedmont, while in the coast region near the Bohai Sea, future water supply is still in shortage.

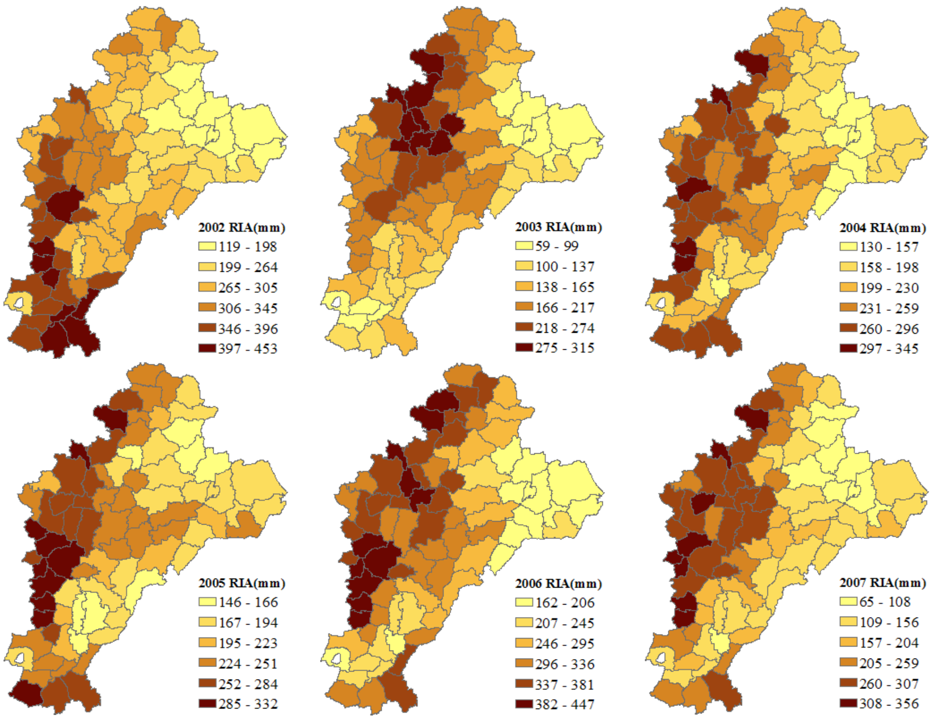

Fig. 2. Spatial and temporal variation of irrigation water requirement in the North part of the North China Plain

The recent development of energy-based evapotranspiration estimation model such as SEBAL and its derivatives has made it possible to calculate spatial and temporal ET. In order to further test our irrigation water assessment, ET-Watch, a model developed from SEBAL by Prof. Wu and his group in Institute of Applied Remote Sensing, was applied to estimate variation of ET from MODIS (Moderate Resolution Imaging Spectroradiometer) data. And then, a sub-model of soil water balance was added into the model system to calculate soil water status along with changes in precipitation and evapotranspiration. Based on soil water balance, irrigation water calculation was applied into the model to estimate the spatial and temporal irrigation water requirement (it is different from irrigation, since irrigation can cause water leaching). Irrigation water requirement to the north of Yellow River in the North China Plain for the period of 2002-2009 was calculated based on such estimations (Fig. 3).

Spatial and temporal variation of irrigation shows that irrigation is heavily driven by precipitation, wheat cultivation, and vegetable plantation (Ma et al. 2011, Chinese Journal of Remote Sensing). Precipitation is negatively related to the irrigation requirement. The higher irrigation water requirement takes place in the counties with higher percentage of wheat and vegetables. On other hand, regions with higher percentage of cultivation of cotton and soybean have lower irrigation requirement.

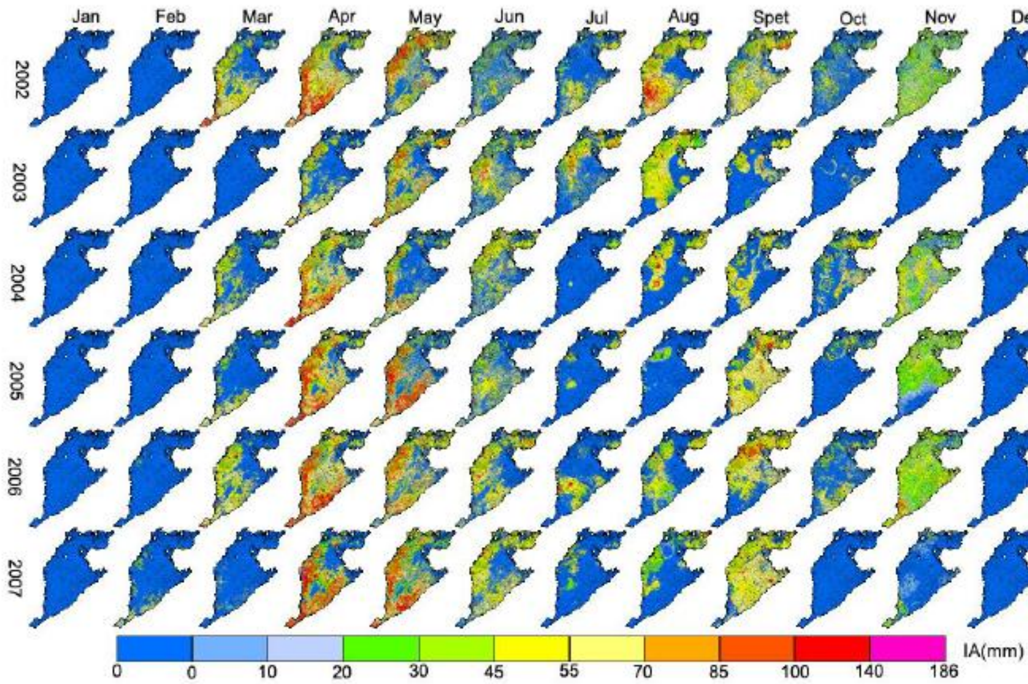

Fig. 3 Spatial and temporal irrigation water requirement estimated from remotely sensed data.

2) Influence of agricultural water use on groundwater

Above results increased our estimation on how much water has been purely used for crop growth and how much water will be recharged back to groundwater through infiltration processes. Hu et al (2010, in Journal of Hydrology) used spatially and temporally estimated crop water use data from crop models in combination with Modflow model to simulate the effect of irrigation water pumping on groundwater. The method is successfully tested for the 4,763 km^2 Shijiazhuang Irrigation District in the piedmont region of the Mount Taihang. Results show that 29.2% or 135.7 mm reduction in irrigation (equivalent to 5.6 X 10^8 m^3 of water) could stop the present groundwater drawdown. Considering the fact that South to North Water Transfer project will deliver around 7 X 10^8 m^3 of water to the region, it is believed that the transferred surface water could replace the present available reservoir water to be used in cities and reservoir water will be used to recharge the aquifer via either irrigation return-flow or any other artificial means. Under such condition, groundwater recovery in the piedmont region is optimistic.

Recently development of GRACE (Gravity Recovery and Climate Environment) satellite makes it possible to estimate groundwater storage change by considering water storage in soil moisture, fresh water body, groundwater, and unsaturated zone over a large region. The quick depletion of groundwater and the large groundwater depletion zone make it possible to estimate groundwater depletion rate in the region. A study on water loss from GRACE data (Moiwo et al., 2010, in Water SA) shows that water loss in the whole Haihe Plain varies from 12.7 to 23.8 mm/yr (around 4.05 – 7.59 billion m3) – a phenomenon that has been detected in the range of previous studies. Based on such estimation, validation of RS-Based ET and soil moisture storage change have also been testified for the Haihe Catchment (Moiwo et al., 2011 in Hydrological Science Journal, and Moiwo et al., 2011 in Hydrological Processes).

Such study constructed the scientific base for future adjustment of water use facing the increasingly demand of water requirement by domestic and industrial sectors. In addition, as limitation on groundwater extraction has been listed as one of basic governmental policies, one of the group's future objectives is to find out the best combinations of crop patterns for different regions with different groundwater availability under the SNWT scenarios. This will be very crucial for regional sustainable water resources management and food production.

4.3.2 RESEARCH FOCUS 2: Air pollution and hydrological cycle

As the primary energy source of the earth system, solar radiation governs a wide range of physical, biological, and chemical processes on our planet, including climate systems, hydrological cycle, plant growth, etc. Aerosol load increase caused by air pollution could induce stronger reflection of incoming solar radiation and decline in the amount of solar radiation absorbed by the surface. This phenomenon, popularly known as "global dimming", was observed at widespread locations across the world.

In China, there is growing evidence that surface solar radiation and sunshine hours have undergone decadal fluctuations during the 1960s–2010s. How does air pollution or aerosol affect sunshine hours and how does sunshine hour decline affect the accuracy of solar radiation calculation, since in most meteorological stations, sunshine hours are measured rather than solar radiation. There is a need of carefully study in order to secure the accuracy of energy balance calculation for crop models, ecosystem models, and hydrological models.

Our studies over the past 5 years can basically be summarized as the following 3 findings:

(1) Quantifying the effect of air pollution on sunshine duration, and proving the value of API (Air Pollution Index) as a separate indicator in studying aerosol effects on global dimming and brightening.

A significant dimming trend was noted in SD (Sunshine Duration) in Chinese cities for 1960−2011 at an average rate of −0.20 h d−1 decade−1. The prime driver has been proved to be city-based API as opposed to regional-based TCC (Total cloud cover). Comparing annual fluctuations of SD and TCC in cities with those in nearby counties for 1960−2011, a growing gap was noted in SD trends between cities and their nearby counties; by contrast, TCC trends remained very similar. Therefore, the influence of clouds on the dimming trend in Chinese cities could be excluded. On the other hand, API has been verified as the main driving force by the results from grey relational analyses. On average, the dimming rate of SD for 1960−2011 in cities with API > 75 is 0.06 h d−1 decade−1 higher than that in cities with API ≤ 75. Under polluted conditions, aerosol-driven extinction in solar radiation (by enhanced backscattering and absorption of incoming solar radiation) reduces SD by weakening direct solar radiation needed to activate the Campbell-Stokes Sunshine Recorder (120 W m^{-2}). This work has been published in *Journal of Geophysical Research-Atmospheres* and has been reported by various newspapers and websites, such as China Science Daily, Beijing Daily, sciencenet.cn, people.cn, cma.gov.cn, etc.

(2) Proposing a plausible mechanism of wind speed regulating solar radiation through interactions with aerosols.

Worsening air pollution has pushed wind speed into a non-negligible regulator of SSR (Surface Solar Radiation). There are two cut-off points of 2.5 m s−1 and 3.5 m s−1 wind speeds in the process of wind-aerosol interactions regulating SSR. Winds < 2.5 m s−1 noticeably disperse air pollutants and thereby enhance SSR. Above the 2.5 m s−1 threshold, air pollution and SSR become largely insensitive to changing wind speeds. Winds in excess of 3.5 m s^{-1} could enhance aerosol concentration probably by inducing dust-storms (especially in spring), which in turn attenuate SSR. This work has been published in *Environmental Research Letters*.

(3) Improving the accuracy of solar radiation estimation from sunshine duration under the influence of air pollution.

Radiation measurements on the ground are of key importance for the evaluation of the surface radiation budgets derived from remote sensing and from climate models. However, the spatial and temporal coverage with these measurements is not satisfactory for an adequate representation of these flux fields. SD (Sunshine Duration) with wider and longer observations has therefore been broadly used to estimate SSR (Surface Solar Radiation). SD is measured when direct solar radiation is of sufficient intensity (0.12 cal cm^{-2} min^{-1}) to activate the recorder. The periods after sunrise and before sunset are often not recorded in SD due to insufficient direct solar radiation. Pollution driven declines in radiation in these periods are ignored in estimating SSR from SD, which eventually results in an overestimation of SSR. We improved the Angström-Prescott (A-P) model by incorporating a pollution-related dependency, and realized an accurate estimation of SSR from SD under various pollution levels. The improved A-P model could be applied in climate, hydrological and crop models. This is important for understanding and analyzing the processes of climate change, water cycle and plant growth.

Our further research will aim to more accurately estimate solar radiation through combinational use of sunshine hour observation, point observed air pollution index and globally available aerosol depth from remote sensing.

6. LABORATORY PERSONNEL

Association Professor Yanmin Yang

Association Professor Shumin Han

Computer Technician: Shaojie Bi

Experimental Technician: Zhanyao Lv

Post Doctor: Xinyao Zhou

PhD student: Ms. Yawen Wang, Zhiping Ai, Weiwei Xiao

Master Student: Qiuli Hu, Dandan Ren, Kangkang He

7. PUBLICATIONS AND INVITED TALKS IN INTERNATIONAL CONFERENCE

7.1 PUBLICATIONS

1) Fei Tian, Guoyu Qiu, Yonghui Yang, Yihe Lu, Yujiu Xiong, 2013, Estimation of evapotranspiration and its partition based on an extended three-temperature model and MODIS products, *Journal of Hydrology*, 498: 210-220. Doi: 10.1016/j.jhydrol.2013.06.038

2) Weiwei Xiao, Zhigang Sun, Qinxue Wang, Yonghui Yang，2013，Evaluating MODIS phenology products for rotating croplands through ground observations， *Journal of Applied Remote Sensing*, 7(1), 073562, DOI: 10.1117/1.JRS.7. 073562.

3) Yawen Wang, <u>Yonghui Yang</u>*, Shumin Han, Qinxue Wang, Jiahua Zhang, 2013, Sunshine dimming and brightening in Chinese cities (1955−2011) was driven by air pollution rather than clouds, *Climate Research*, 56, 11-20, DOI: 10.3354/cr01139.

4) Xinyao Zhou, Yongqiang Zhang, <u>Yonghui Yang</u>, Yanmin Yang，Shumin Han， 2013，Evaluation of anomalies in GLDAS-1996 dataset，*Water Science and Technology*, 67(8), 1730-1739.

5) Yawen Wang, <u>Yonghui Yang</u>*, Na Zhao, Chen Liu, Qinxue Wang, 2012, The magnitude of the effect of air pollution on sunshine hours in China. *Journal of Geophysical Research*, 117, D00V14, DOI:10.1029/2011JD016753.

6) Xinyao Zhou, Yongqiang Zhang, Y.P. Wang，Huqiang Zhang，Jai Vaze, Lu Zhang，<u>Yonghui Yang</u>, Yanchun Zhou，2012，Benchmarking global land surface models against the observed mean annual runoff from 150 large basins, *Journal of Hydrology*. 470-471: 269-279. DOI: 10.1016/j.jhydrol.2012.09.002.

7) Shumin Han, <u>Yonghui Yang</u>*, Tong Fan, Dengpan xiao and Juana P. Moiwo, 2012, Precipitation-runoff processes in Shimen hillslope micro-catchment of Taihang Mountain, North China, *Hydrological Processes*, 26(9): 1332-1342. DOI: 10.1002/hyp.8233.

8) Fei Tian, Guoyu Qiu, <u>Yonghui Yang</u>, Yujiu Xiong, Pei Wang, 2012, Studies on the Relationships Between Land Surface Temperature and Environmental Factors in an Inland River Catchment Based on Geographically Weighted Regression and MODIS Data, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 5(3): 687-698, DOI: 10.1109/JSTARS.2012. 2190978.

9) Chen Liu, Qinxue Wang, Kelin Wang, <u>Yonghui Yang</u>, Zhu Ouyang, Yaoming Lin, Yan Li, Alin Lei. 2012. Recent Trends and Problems of Nitrogen Flow in Agro-Ecosystems of China, *Journal of the Science of Food and Agriculture*, 92： 1046-1053. DOI: 10.1002/jsfa.4725.

10) Shufen Wang, Huilong Li, <u>Yonghui Yang</u>, Huijun Wang, Yanmin Yang, Yongguo Jia, 2012, Using DSSAT Model to assess spring wheat and maize water use in the arid oasis of Northwest China, *Journal of Food Agrculture and Environment*, 10(1):911-918.

11) Moiwo JP, <u>Yonghui Yang*</u>, Fulu Tao, Wenxi Lu, Shumin Han，2011， Water storage change in the Himalayas from GRACE and an empirical climate model，*Water Resources Research*, Vol 47, W07521, doi:10.1029/2010WR010157.

12) Moiwo JP*, <u>Yonghui Yang</u>*, Shumin Han, Wenxi Lu, Nana Yan, Bingfang Wu, 2011, A method for estimating soil moisture storage in regions under water stress and storage depletion—a study of Haihe River Basin, North China, *Hydrological Processes*, 25(14): 2275-2287. DOI: 10.1002/hyp.7991.

13) Moiwo JP*, <u>Yonghui Yang*</u>, Nana Yan, Bingfang Wu, 2011, Comparison of Evapotranspiration estimated by ET-Watch with that derived from combined GRACE and measured precipitation data in Hai River Basin, North China. *Hydrological Science Journal*, 56(2): 249-267. DOI: 10.1080/02626667.2011. 553617.

14) Yukun Hu, Juana Paul Moiwo, <u>Yonghui Yang</u>*, Shumin Han, Yanmin Yang, 2010, Agricultural water-saving and sustainable groundwater management in Shijiazhuang Irrigation District, North China Plain, *Journal of Hydrology*, 393: 219-232. doi:10.1016/j.jhydrol.2010.08.017. 第一

15) Jing Fan, Fei Tian, Yonghui Yang*, Shumin Han, Guoyu Qiu, 2010, Quantifying the magnitude of the impact of climate change and human activity on runoff decline in Mian River Basin, China, *Water Science and Technology*, 62(4): 783-791. doi:10.2166/wst.2010.294.
16) Moiwo JP, Yonghui Yang*, Huilong Li, Shumin Han, Yanmin Yang, 2010, Impact of water resource exploitation on the hydrology and water storage in Baiyangdian Lake, *Hydrological Processes*, 3026-3039. DOI: 10.1002/hyp.7716.
17) Yanmin Yang, Yonghui Yang*, Juana Paul Moiwo, Yukun Hu, 2010, Estimation of irrigation requirement for sustainable water resources reallocation in North China, *Agricultural Water Management*, 97(11), 1711-1721.
18) Fei Tian, Yonghui Yang*, Shumin Han, Juana P. Moiwo, Guoyu Qiu, 2010, Determination of the period of major runoff decline and related driving factors in Ye River Basin, North China, *Journal of Water and Climate Change*, 1(2)：154-163.
19) Shaohua Zhao, Yonghui Yang, Guoyu Qiu, Qiming Qin, Yunjun Yao, Yujiu Xiong, 2010, Remote detection of bare soil moisture using a surface-temperature- based soil evaporation transfer coefficient, *International Journal of Applied Earth Observation and Geoinformation*, 12(5): 351-358. Doi:10.1016/j.jag.2010.04.007.
20) Zhao Na, Yonghui Yang*, Xinyao Zhou, 2010, Application of geographically weighted regression in estimating the effect of climate and site conditions on vegetation distribution in Haihe Catchment, *Plant Ecology*, 209：349-359. DOI: 10.1007/s11258-010-9769-y.
21) Moiwo JP, Wenxi Lu, Yongsheng Zhao, Yonghui Yang, Yanmin Yang, 2010, Impact of land use on distributed hydrological processes in the semi-arid wetland ecosystem of Western Jilin, *Hydrological Processes*, 24(4): 492-503. Doi: 10.1002/hyp.7503.
22) YonghuiYang, Fei Tian, 2009, Abrupt change of runoff and its major driving factors in Haihe River Catchment, China, *Journal of Hydrology*, 374: 373-383. Doi: 10.1016/j.jhydrol.2009.06.040.
23) Yonghui Yang, Na Zhao, Yukun Hu, Xinyao Zhou, 2009, Effect of wind speeds on sunshine hours in three cities in northern China, *Climate Research*. 39: 149-157. Doi: 10.3354/cr00820.
24) Yonghui Yang, Na Zhao, Xiaohua Hao, Chunqiang Li，2009，Decreasing trend in sunshine hours and related driving forces in North China，*Theoretical and Applied Climatology*，97: 91-98. DOI: 10.1007/s00704-008-0049-x
25) Fei Tian, Yonghui Yang*, Shumin Han, 2009. Using runoff slope-break to determine dominate factors of runoff decline in Hutuo River Basin, North China. *Water Science and Technology: Water Supply*. 60(8): 2135-2144.
26) Moiwo JP, Yonghui Yang*, Han SM, Hu YK, 2009, Comparison of GRACE with in situ hydrological measurement data shows storage depletion in Hai River basin, Northern China, *Water SA*, 35(5)， 663-670.
27) Chen Liu, Qinxue Wang, Alin Lei, Yonghui Yang, Zhu Ouyang, Yaoming Lin, Yan Li, Kelin Wang, 2009, Identification of anthropogenic parameters for a regional nitrogen balance model via field investigation of six ecosystems in China, *Biogeochemistry*, 94: 175-190. DOI 10.1007/s10533-009-9317-9.

28) Shaohua Zhao, Qiming Qin, Yonghui Yang, Guoyu Qiu, Xiong Yujun, 2009, Comparison of two split-window methods for retrieving land surface temperature from MODIS data, *Journal of Earth System Science*. 118(4): 345-353.

7.2 INVITED TALKS IN INTERNATIONAL CONFERENCE

Jan 22, 2011, Member of organizing Committee for China-US Forum, 2011 Chinese-American Kavli Frontiers of Science, Honolulu, Hawaii, USA, fully supported by American Academy of Science and Chinese Academy of Science.

Nov. 15, 2010, Improving water use efficiency for a sustainable food production in the North China Plain Presented to the 7th Annual Australia-China Symposium on food security and agriculture relating to health under climate change, Adelaide, Australia, fully supported by the Australian Governmental Department of Innovation, Industry, Science and Research and Chinese Academy of Science.

Sept. 27, 2010, Invited Speaker & fully supported by National Institute for Environmental Studies, Long-term sustainability of water resources in the receiving region of South-to-North Water Transfer, In 4th China-Japan Workshop on Management of Water Environment.

8. EDITORIAL DUTIES

- Board Editor, Chinese Journal of Eco-Agriculture
- Review of 56 papers in 2009-2013 period for international journals such as Water Resources Research, Journal of Hydrology, Hydrological Processes, Agricultural Water Management, and etc.

9. INTERNATIONAL CONFERENE ORGANIZATION

May, 2011, Organizer, China-Australia workshop on new approaches to agricultural water management in a changing climate, Fully funded by Chinese Academy of Science and Australian Government Department of Innovation, Industry, Science and Research.