Panta Rhei – Everything Flows
Change in Hydrology and Society
IAHS Scientific Decade 2013-2022
www.iahs.info/pantarhei

Details of the Proposal

Title of the Working Group

Modeling Hydrological Processes and Changes

Abstract of the proposed research activity

Hydrological processes both in catchment and urban area have been changing due to the dual impacts of climate changes and human activities, and modeling the hydrological processes and changes has long been the goal of the global hydrological communities. Challenges still exist, such as lacking effective models and in-situ observation data. This working group will address the challenges in modeling hydrological processes and changes. The working group will split into 3 sub-working groups to address three integrated issues.

- Sub-working group A: In-situ and remote sensing observation
  To observe hydrological processes, including evaportranspiration, soil moisture, runoff, groundwater, floods, drought, landslides and mudflows, data fusion and assimilation. Long established experiment catchments and urban test beds will be sought and databases for public assess will be set up. There are already many archived databases in the world, and they shall be utilized, collaborations with international bodies will be sought.

- Sub-working group B: Hydrological models and tools
  New hydrological models and tools that could be used to simulate/predict hydrological processes and changes will be proposed, and simulation systems based on high performance computers will be developed for public use, cutting-edge techniques and data supporting the modeling will be explored, and the uncertainties associated and its controlling methods will be studied.

- Sub-working group C: Changes of hydrological regimes
  Observe and simulate hydrological processes changes including but not limited to evaportranspiration, soil moisture, runoff, groundwater, floods, drought, landslides and mudflows. Worldwide case studies in large rivers and urbanized areas will be sought.

Panta Rhei Research Themes, Targets and Science Questions addressed by the Working Group

Targets:

1. Understanding
2. Estimation and prediction
3. Science in practice

Science Questions

2. How do changes in hydrological systems interact with and feedback on natural and social systems driven by hydrological processes?
4. How can we use improved knowledge of coupled hydrological-social systems to improve model predictions, including estimation of predictive uncertainty and assessment of predictability?
5. How can we advance our monitoring and data analysis capabilities to predict and manage hydrologic change?
6. How can we support societies to adapt to changing conditions by considering the uncertainties and feedbacks between natural and human-induced hydrologic changes?

Societal impact of the Working Group activity

Hydrological changes has a great impact on the societies, such as the enhanced flooding will increase the vulnerability of the society to the natural disasters, the more frequent drought will intensify the shortage of water supply and the deterioration of ecological system. This WG's activities will increase the capabilities of the societies' understanding and prediction to the hydrological processes changes, thus improving the abilities the societies to adapte to the hydrological changes.

List of Participants(more to be added**)**

Name of Participant	Affiliation	Role in Working Group (Chair or Member)	Country
Yangbo Chen	Sun Yat-sen University E-mail:eescyb@mail.sysu.edu.cn	Chairman	China
Chris Hopkinson	University of Lethbridge c.hopkinson@uleth.ca	Member	Canada
Guohe Huang	North China Electric Power University E-mail: guohe.huang3@gmail.com	Member	Canada
Frédérique Seyler	Institut de Recherches pour le Développement E-mail: frederique.seyler@ird.fr	Member	France
Z. (Bob) Su	University of Twente E-mail: z.su@utwente.nl	Member	Netherlands
Ian Cluckie	Swansea University E-mail: i.d.cluckie@swansea.ac.uk	Member	UK
Dawei Han	University of Bristol E-mail: d.han@bristol.ac.uk	Member	UK
Yunqing Xuan	Swansea University E-mail: y.xuan@swansea.ac.uk	Member	UK

Qingyun Duan	Beijing Normal University qyduan@bnu.edu.cn	Member	USA
Qizhong (George) Guo	Rutgers University E-mail: Qguo@rutgers.edu	Member	USA
Yang Hong	University of Oklahoma E-mail: yanghong@ou.edu	Member	USA
Kuolin Hsu	University of California, Irvine E-mail: kuolinh@uci.edu	Member	USA
Ramesh Teegavarapu	Hydrosystems Research Laboratory E-mail: rteegava@fau.edu ramesh.teegavarapu@gmail.com	Member	USA
Xixi Wang	Old Dominion University E-mail: xxqqwang@gmail.com	Member	USA
Xiaojun Yang	Florida State University Email: xyang@fsu.edu	Member	USA
Zhongbo Yu	Hohai University E-mail: zyu@hhu.edu.cn	Member	USA
Yongqin David Chen	The Chinese University of Hong Kong Email: ydavidchen@cuhk.edu.hk	Member	Hong Kong, China
Qiuwen Chen	Nanjing Hydraulics Research Institute E-mail: qwchen@nhri.cn	Member	China
Xi Chen	Chinese Academy of Sciences E-mail: chenxi@ms.xjb.ac.cn	Member	China
Yaning Chen	Chinese Academy of Sciences E-mail: chenyn@ms.xjb.ac.cn	Member	China
Yuanfang Chen	Hohai University E-mail:chenyuanfang@hhu.edu.cn	Member	China
Yanfen Geng	Southeast University E-mail: yfgeng@seu.edu.cn	Member	China
Caihong Hu	Zhengzhou University E-mail: whuhch@163.com	Member	China
Guoru Huang	E-mail: huanggr@scut.edu.cn	Member	China
Tong Jiang	National Climate Center E-mail: jiangtong@cma.gov.cn	Member	China
Juliang Jin	Hefei University of Technology E-mail: jinjl66@126.com	Member	China
Chuan Liang	Sichuan University E-mail: lchester@sohu.com	Member	China
Kairong Lin	Sun Yat-sen University E-mail: linkr@mail.sysu.edu.cn	Member	China
Pan Liu	Wuhan University E-mail: liupan@whu.edu.cn	Member	China
Tiegang Liu	Sichuan University E-mail: liutiegang79@163.com	Member	China
Guangheng Ni	Tsinghua University E-mail:a6henry@gmail.com	Member	China
Dingzhi Peng	Beijing Normal University E-mail: dzpeng@bnu.edu.cn	Member	China
Guanghua Qin	Sichuan University E-mail:ghqin2000@163.com	Member	China
Songbai Song	Northwest A&F University ssb6533@nwsuaf.edu.cn	Member	China
Wenchao Sun	Beijing Normal University E-mail: sunny@bnu.edu.cn	Member	China
Xiangjun Tian	Chinese Academy of Sciences, E-mail: tianxj@mail.iap.ac.cn	Member	China
Dong Wang	Nanjing University	Member	China

	E-mail: wangdong@nju.edu.cn wangdongm1@gmail.com		
Guoqiang Wang	Beijing Normal University Email: wanggq@bnu.edu.cn	Member	China
Guoqing Wang	Nanjing Hydraulic Research Institude E-mail:guoqing_wang@163.com gqwang@nhri.cn	Member	China
Xianwei Wang	Sun Yat-sen University E-mail: xianweiw@vip.qq.com	Member	China
Zhenghui Xie	Chinese Academy of Sciences E-mail: zxie@lasg.iap.ac.cn	Member	China
Lihua Xiong	Wuhan University E-mail: xionglh@whu.edu.cn	Member	China
Yueping Xu	Zhejiang University Email: yuepingxu@zju.edu.cn	Member	China
Zongxue Xu	Beijing Normal University E-mail: zxxu@bnu.edu.cn	Member	China
Jingjie Yu	Chinese Academy of Sciences E-mail: yujj@igsnrr.ac.cn	Member	China
Tao Yang	Hohai University E-mail: enigama2000@hhu.edu.cn	Member	China
Xingnan Zhang	Hohai University E-mail: zxn@hhu.edu.cn	Member	China
Jianzhong Zhou	Huazhong University of Science & Technology E-mail: jz.zhou@mail.hust.edu.cn	Member	China
Maichun Zhou	South China Agricultural University E-mail: mczhou@scau.edu.cn mczhou@aliyun.com	Member	China
Nianqing Zhou	Tongji University nq.zhou@tongji.edu.cn	Member	China
Qiting Zuo	Zhengzhou University E-mail: zuoqt@zzu.edu.cn zuoqiting@163.com.	Member	China