

Hyper Hydro at AGU 2014

- A short business meeting!
- Thursday 18 Dec 2014
- 12:20 – 13:00
- Room: 3022 Moscone West

- Preliminary agenda:
 - 12:20: Opening (Marc Bierkens)
 - 12:25: WG1 Test beds (J.T. Reager)
 - 12:35: WG2 Framework (Rolf Hut)
 - 12:45: WG3 Parameters & concepts (Stefan Kollet)
 - 12:55: Any other business or interesting info to be shared.

HYDROLOGICAL PROCESSES

Hydrol. Process. (2014)

Published online in Wiley Online Library (wileyonlinelibrary.com). DOI: 10.1002/hyp.10391

INVITED COMMENTARY

HP
TODAY

Hyper-resolution global hydrological modelling: what is next? “Everywhere and locally relevant”

Marc F. P. Bierkens,^{1,17*}

Victoria A. Bell,²

Peter Burek,³

Nathaniel Chaney,⁴

Laura E. Condon,⁵

Cédric H. David,^{6,7}

Ad de Roo,³ Petra Döll,⁸

Niels Drost,⁹

James S. Famiglietti,^{6,7}

Martina Flörke,¹⁰

David J. Gochis,¹¹

Paul Houser,¹²

Rolf Hut,¹³

Jessica Keune,¹⁴

Stefan Kollet,^{14,18}

Reed M. Maxwell,⁵

John T. Reager,^{6,7}

Luis Samaniego,¹⁵

Edward Sudicky,¹⁶

Edwin H. Sutanudjaja,¹

Nick van de Giesen,¹³

Hessel Winsemius,^{13,17}

and Eric F. Wood⁴

¹ Utrecht University, Utrecht, The Netherlands

² Centre for Ecology and Hydrology, Wallingford, UK

³ Joint Research Centre, Ispra, Italy

⁴ Princeton University, Princeton, NJ, USA

⁵ Integrated Ground Water Modeling Center, Colorado School of Mines, Golden, CO, USA

⁶ University of California Center for Hydrologic Modeling, Irvine, CA, USA

⁷ Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

⁸ Goethe University of Frankfurt, Frankfurt, Germany

⁹ Netherlands eScience Center, Amsterdam, The Netherlands

¹⁰ University of Kassel, Kassel, Germany

¹¹ NCAR HR Regional Modelling, Boulder, CO, USA

¹² George Mason University, Fairfax, VA, USA

¹³ Delft University of Technology, Delft, The Netherlands

¹⁴ Agrosphere (IBG-3), Forschungszentrum Jülich GmbH, Jülich, Germany

¹⁵ UFZ Helmholtz Centre for Environmental Research, Leipzig, Germany

¹⁶ University of Waterloo, Waterloo, Canada

¹⁷ Deltares, Delft, The Netherlands

¹⁸ Centre for High-Performance Scientific Computing in Terrestrial Systems, Geoverbund ABC/J, Germany

*Correspondence to:

Marc F. P. Bierkens, Utrecht University, Utrecht, The Netherlands.

E-mail: m.f.p.bierkens@uu.nl

Background

Between 15 and 17 March 2010, a workshop was held at Princeton University entitled ‘Meeting a Grand Challenge to Hydrology: The Global Monitoring of Earth’s Terrestrial Water’. The goal of this workshop was to assess the need for developing hyper-resolution (0.1–1 km) global hydrology and land surface models and to make an inventory on what obstacles need to be overcome to make hyper-resolution models a reality. The primary output from this workshop was a position paper formulating a number of science questions that would benefit from hyper-resolution modelling and key challenges to overcome to make this possible (see Wood *et al.*, 2011).

Since the Princeton workshop and the paper, several groups have been working on making high-resolution ‘Locally Relevant Hydrological Models Everywhere’ a reality. For instance, WaterGAP (Döll *et al.*, 2003) now runs at 5 min globally (Flörke *et al.*, 2013) as does PRC-GLOBWB (Van Beek *et al.*, 2011), whereas LISFLOOD (De Roo *et al.*, 2000); Van Der Knijff *et al.*, 2010) runs at 6 min globally. Using a modular python-based framework, NOAA-MP (Niu *et al.*, 2011) is being coupled to Dynamic TOPMODEL (Beven and Freer, 2001) for 30-m continental simulations. At the same time, the Land Information System software has been developed to support high-performance land surface modelling and