HyperHydro meeting: EGU splinter meeting 1 May 2014

Participants:
- Marc Bierkens   Utrecht University
- Eric Wood   Princeton University
- Martyn Clark   NCAR
- Dave Gochis   NCAR
- Gonzalo Miguez-Macho   Universidade de Santiago de Compostela
- Nick van de Giesen   TU Delft / eWaterCycle
- Laura Condon   Colorado School of Mines
- Hannes Müller Schmied   Goethe-Universität Frankfurt am Main
- Edwin Sutanudjaja   Utrecht University
- Ad de Roo   EU JRC
- Luis Samaniego   UFZ Leipzig
- Stephanie Eisner   University of Kassel
- Stefan Kollet   University of Bonn
- Rolf Hut   TU Delft
- Niels Drost   eScience Center Amsterdam
- Rohini Kumar   UFZ Leipzig
- Olda Rakovec   UFZ Leipzig

Presentation from Marc Bierkens:
- Progress on the website www.hyperhydro.org and paper draft.
- Paper draft is almost ready and will be circulated to all co-authors, around end of May.
- The paper will be submitted to HP today.
- Marc also encouraged people to join working groups:
  - WG1: Testbeds, coordinator: JT Reager
  - WG2: Common framework, coordinator: Rolf W. Hut
  - WG3: Parameters and concepts, coordinator: Stefan Kollet

Presentation from Stefan Kollet (coordinator of WG3: parameters and concepts):
- The main task of this working group is to deliver the information (parameters, forcing and concepts) needed to achieve hyper-resolution (< 1 km) globally.
- There are three main issues that should be discussed. The structure for this discussion is as follows:
  - Parameters:
    - Land surface (vegetation, radiation, snow, topography, ...)
    - Sub-surface (soil texture, hydraulic conductivity, ...)
  - Forcing:
    - Atmospheric variables
      - Note that some models calculate atmospheric variables internally (see below).
      - ... and others
  - Concepts:
    - Up-/down-scaling techniques (forcing, parameters, …)
    - Modeling (coupling, including physics and complexity, …)
    - Computations (parallelism, performance, ...)
- Stefan is going to initiate the writing of a review paper with the following setup:
  - Create an inventory of what's already out there in terms of concepts and parameters
  - The paper will point to the current deficiencies and perspectives about how we should tackle them
- Other issues:
  - Stefan: Some models couple atmospheric and land surface processes internally. When we are aiming for continental and global extent, we should extend our networks (e.g. we need oceanographers).
  - Marc: Paul Houser can provide high resolution forcing data.

- Visualization and big data issues:
  - These issues will also be discussed in the review paper. We still have limited experience for handling, storing, visualizing, and analyzing big data (terra-byte, even peta-byte/higher scales in the future).

Presentation from Edwin Sutanudjaja (on behalf of JT Reager, coordinator of WG1: testbeds)
- See the powerpoint file "WG1_testbeds.pdf" for more details.
- Objective: Setting up testbeds for comparing different large-scale models at different resolutions
- Three goal domain:
  - Long term vision: global at 5 minutes (long term goals: global at 1 km)
  - Medium term goals: continental scale: CONUS United States, CORDEX Europe at 1 km
  - **Initial test cases** (focus at this moment): California + Illinois + Rhine (up to 100 m)
- Test bed framework
  - Using common datasets that are provided at the finest resolution possible
  - Run the various model at increasing resolution (e.g. from 0.5 arc degree to 100 m)
  - Run it with local and globally available information
  - Include LIS scaling tools
- Storage space: We are very grateful that UCCHM can provide the storage (for the input data).
- Volunteers to manage/upload the data for each test case (Rhine, Illinois, California)
  - UCCHM can do California.
  - Edwin and Jessica will upload the data for Rhine.
  - Eric Wood said that Nate Chaney (Princeton) may be able to help for Illinois.
- Simulation period: At least 1 year. We still have to define which year (2008?).
- Range of resolutions to simulate:
  - Which steps between 0.5 deg and 100 m? Not decided yet
  - We have to consider the resolutions of (future) CORDEX: Stefan will mail these to Edwin & JT Reager.
- To what extent should simulations include management or other human activities (e.g. irrigation)?
  - Up to each group. We let every group to include (or not to include it).
    - Are there any local datasets (about human impacts) available in test-case areas?
- Other issues:
  - Dave Gochis: Dave proposed some test areas (like MOPEX) than can be used in further test cases (medium term).
- Comparison framework: avoid passing terabytes of data over the net □ this is a task/discussion for the WG1 members!
- Timing: presenting first test runs at AGU splinter meeting and discuss draft paper there!

Presentation from Rolf Hut (coordinator of WG2: common framework):
- See the powerpoint file "WG2_framework.pdf" for more details.
- There are only 4 people in the group. Please join them.
- Rolf: We should avoid making a new our own "framework" or "standard".
- Discussion for using BMI interfaces for model coupling.
  - Stefan: Problems and issues with parallelization strategies while implementing BMI interfaces and developing component based models.
- Using Netcdf CF convention
  - Dave Gochis: The hydrology community should be more active and involved in any discussions or networks related to CF convention.
- General plan of WG2:
  - Literature review of existing standards
  - Survey of support in community
  - It may also result a review paper that points to the deficiencies of existing standards (and some perspectives about how we should tackle them)
- Others:
  - Dave Gochis: There is a white paper (led by Gochis, DeLuca, Peckham) for the NSF EarthCube which reviews several Earth System model coupling architectures.

Next meeting: AGU (December 2014)
- AGU Splinter meeting? Who will organize: Marc will request this.

AGU (2014) session about high-resolution process based modeling
- Conveners: Dave Gochis, Marc Bierkens, …
- This session can be a good place for presenting our results.
- Dave Gochis: We will try to get a lot of oral slots for this AGU session (still waiting for approval). Our goal is to get enough slots in order to carve out some dedicated time for additional discussion or a panel-type presentation and discussion during the oral. Thus, I hope folks from the hyper hydro group will want to submit. We'll certainly send out invites to many in the group.

Funding:
- An attempt to secure the money from EU was failed.
- Nick van de Giesen: We need money/funding. Also, we have to start introducing this hyperhydro community to other external communities (e.g. computer science people): Nick will look into EU-based funding oppertunities and email these around.
- Dave Gochis: Try to follow up this funding issue with a US NSF program manager on joint NSF-EU funding opportunities.

This short report is sent to all people in the Hyper Hydro mailing list.