eWaterCycle

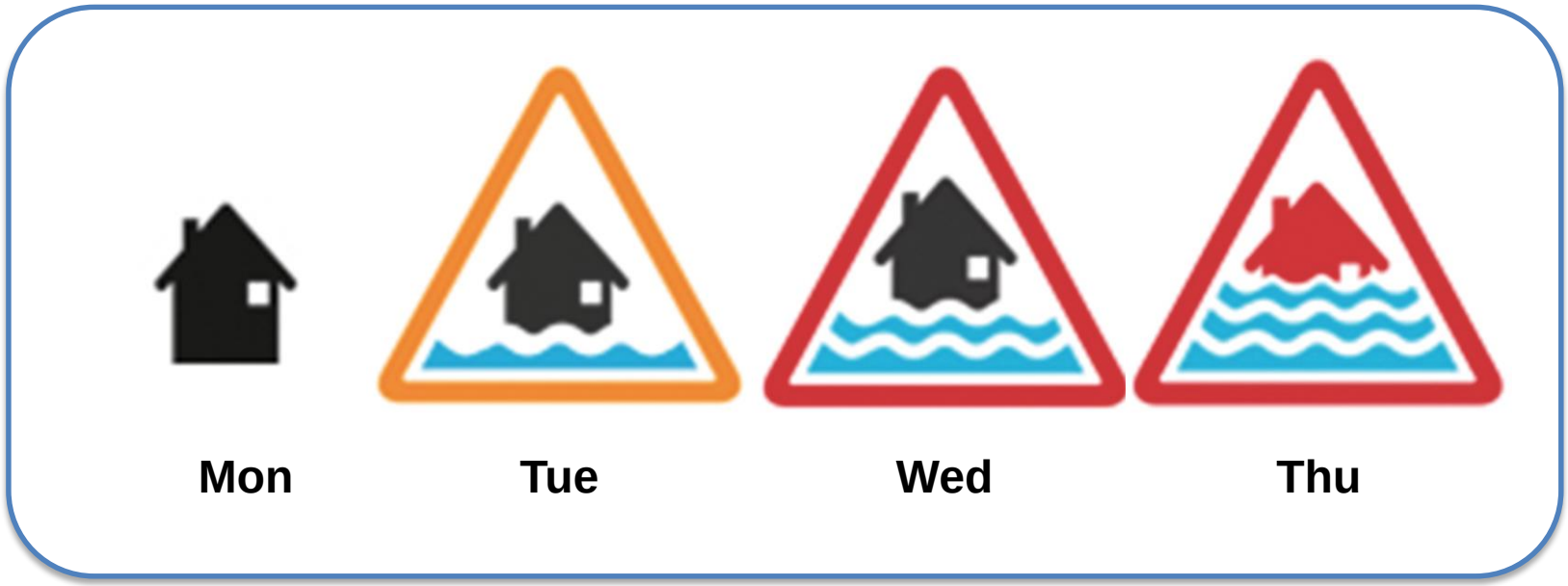
Building an operational global Hydrological forecasting system based on standards and open source software

Niels Drost, Marc Bierkens, Gennadii Donchyts, Nick van de Giesen, Stef Hummel, Rolf Hut, Arno Kockx, Maarten van Meersbergen, Edwin Sutanudjaja, Martin Verlaan, Albrecht Weerts, Hessel Winsemius

netherlands eScience center
by SURF & NWO

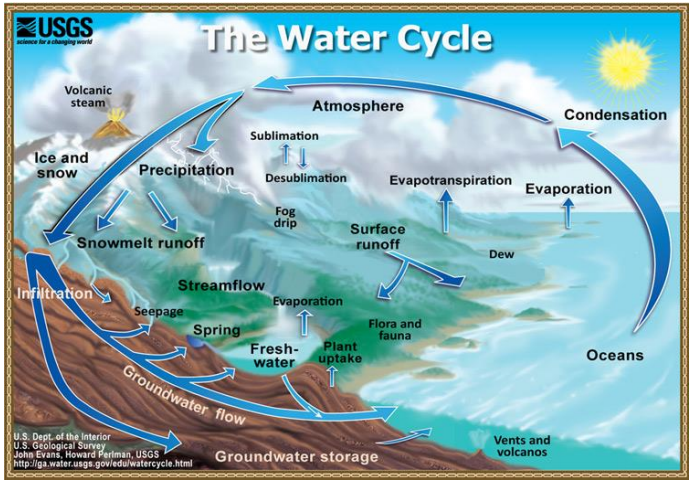
Universiteit Utrecht
TU Delft
WaterCycle

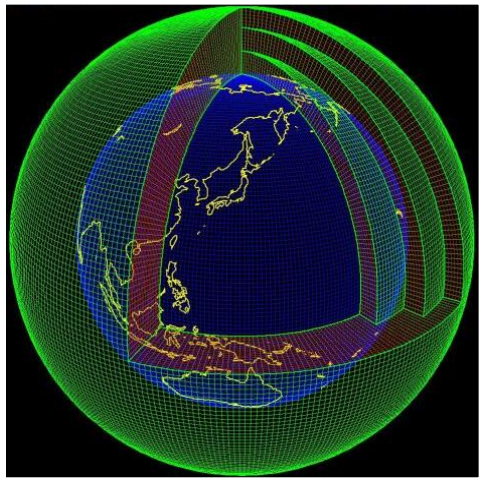
Tonight Sep 4		23°C 16°C Observed High 5:45 pm	Partly Cloudy	CHANCE OF RAIN: 0%	WIND: ENE at 8 km/h **Details**
Fri Sep 5		23° 16°	Partly Cloudy	CHANCE OF RAIN: 10%	WIND: ENE at 10 km/h **Details**
Sat Sep 6		19° 14°	Mostly Cloudy	CHANCE OF RAIN: 20%	WIND: NW at 16 km/h **Details**
Sun Sep 7		18° 12°	AM Showers	CHANCE OF RAIN: 30%	WIND: NNW at 11 km/h **Details**
Mon Sep 8		18° 13°	Partly Cloudy	CHANCE OF RAIN: 20%	WIND: WNW at 23 km/h **Details**

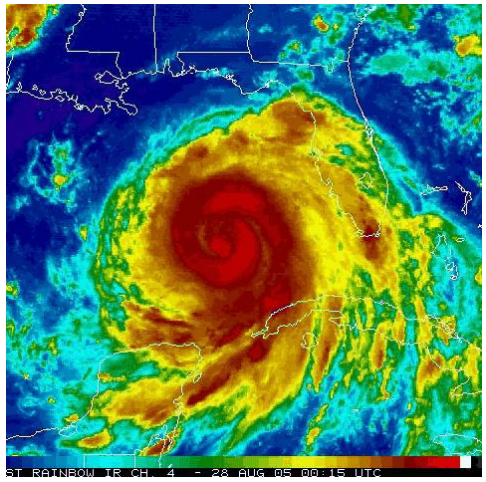

Mon
Tue
Wed
Thu

eWaterCycle: Global Hydrological Forecast System

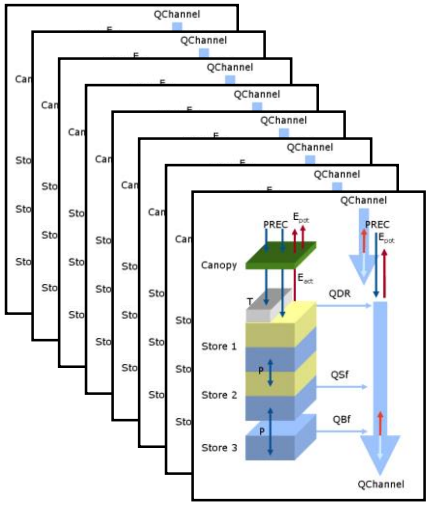
- **Global @ 10Km resolution (for now)**
- **GFS Ensemble Forcing**
- **H-SAF Soil moisture observations**

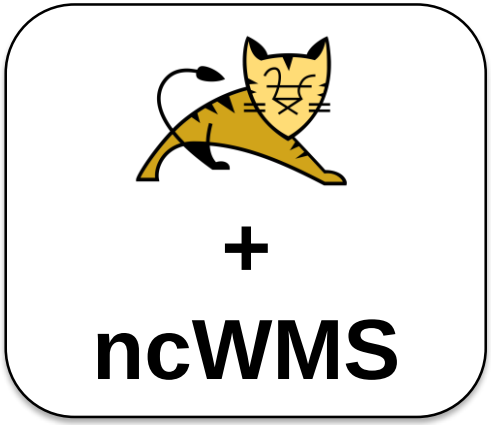


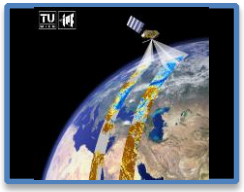




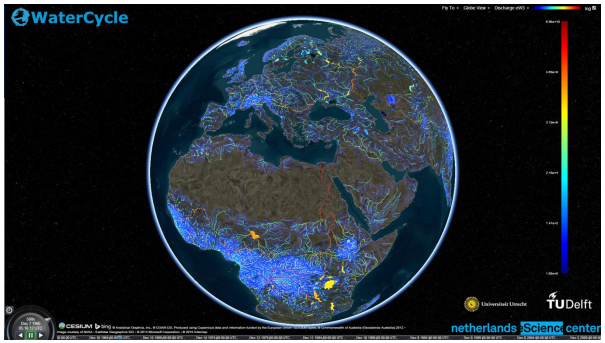
GFS
Global Forecast System


QChannel
PREC
Canopy
Store 1
Store 2
Store 3
QDR
QSf
QBf

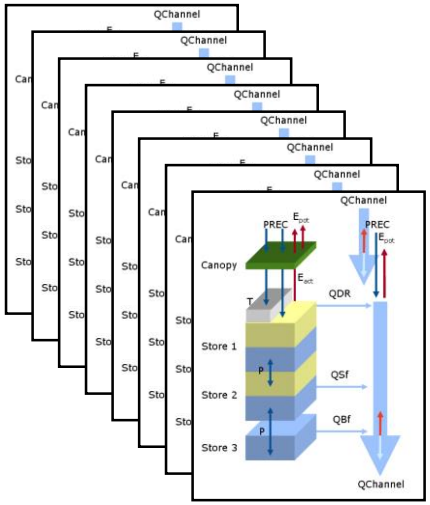

+
ncWMS



OpenDA


WaterCycle
TUDelft
netherlands eScience center

NetCDF



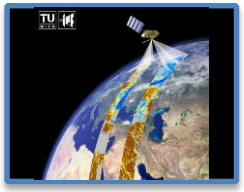
NetCDF

\+

ncWMS

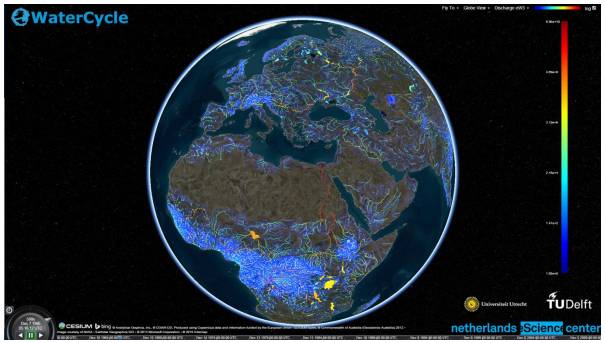
BMI

WMS



NetCDF

OpenDA

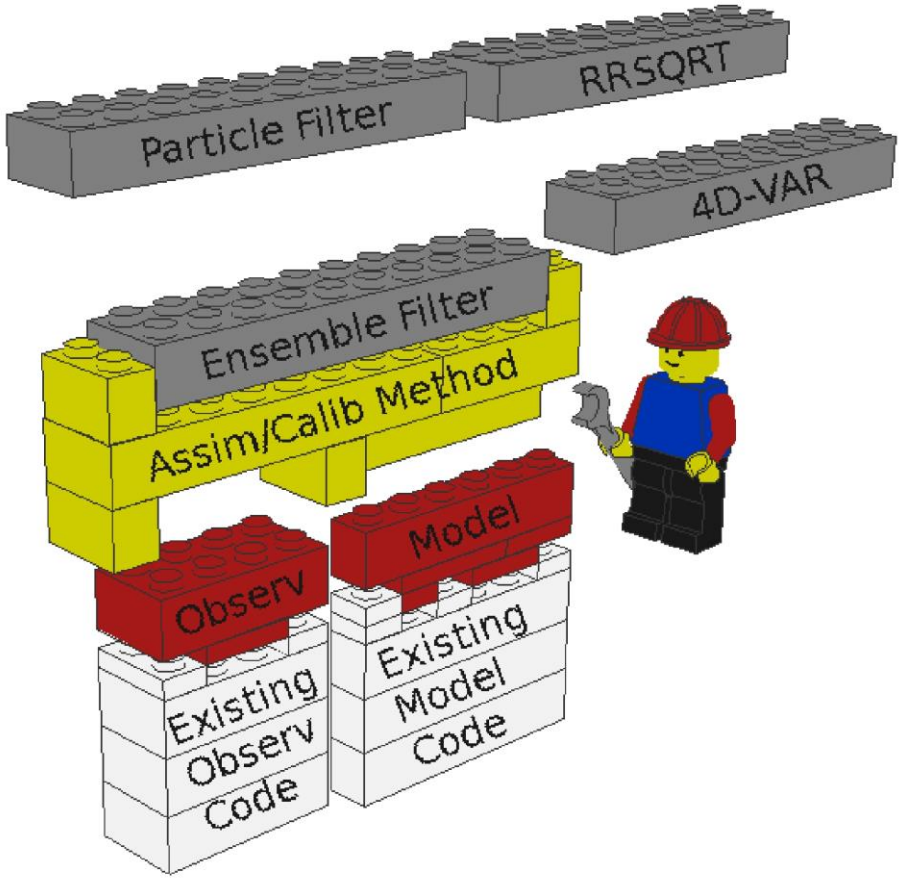


PCRGlob-WB

- PCRaster GLobal Water Balance 2.0
- global hydrology & water resources model
- 5 arc-min (~10 km) (and increasing)
- Implemented in Python using PCRaster(GPL)
- More info: HS2.4.2 Large scale hydrology poster session (Wed)

OpenDA

- **Open Source data-assimilation toolbox**
- **LGPL, Java**



http://www.openda.org

Basic Model Interface (BMI)

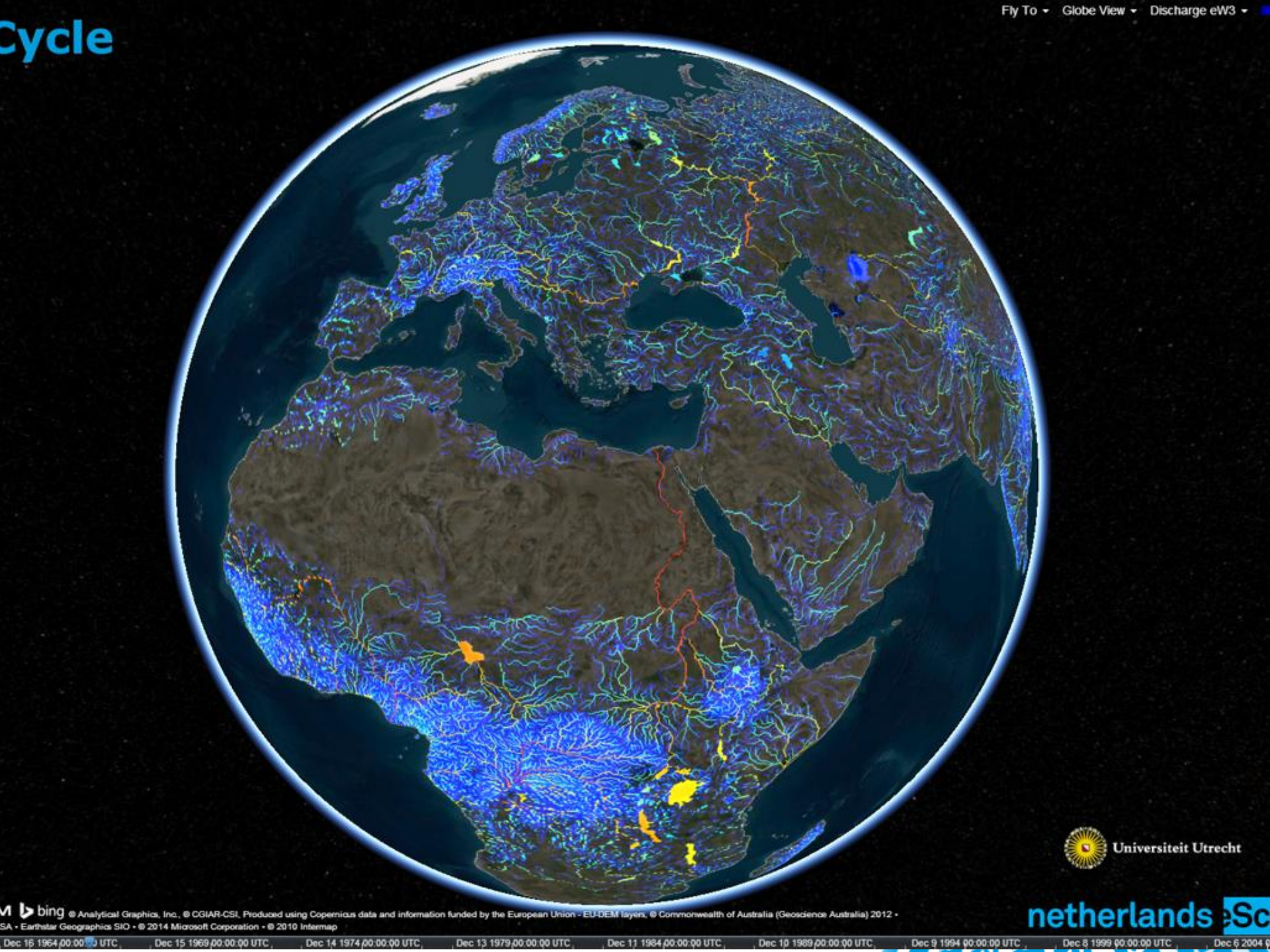
- **From CSDMS project, now on its way to being standardize**
- **void initialize (string config_file)**
  void update (double dt)
  void finalize ()
  get_value (string var_name)
  set_value (string var_name)

+grid + time + units info

+not much else

Source Code: https://github.com/csdms/bmi

Python, Fortran, C, Java, etc...


Cycle
Fly To
Globe View
Discharge eW3
Universiteit Utrecht
bing
© Analytical Graphics, Inc., © CGIAR-CSI, Produced using Copernicus data and information funded by the European Union - EU-DEM layers, © Commonwealth of Australia (Geoscience Australia) 2012 -
SA - Earthstar Geographics SIO - © 2014 Microsoft Corporation - © 2010 Intermap
netherlands eSc
Dec 16 1964 00:00:00 UTC
Dec 15 1969 00:00:00 UTC
Dec 14 1974 00:00:00 UTC
Dec 13 1979 00:00:00 UTC
Dec 11 1984 00:00:00 UTC
Dec 10 1989 00:00:00 UTC
Dec 9 1994 00:00:00 UTC
Dec 8 1999 00:00:00 UTC
Dec 6 2004

forecast.ewatercycle.org
www.escience center.nl

Visualization: ESSI 3.1 Posters (Wed)

Model: HS2.4.2 Posters (Wed)

eWaterCycle: HS4.6/NH1.2 Pico (Thu)

Universiteit Utrecht

TU Delft

WaterCycle