Information Server for the Global Soil Wetness Project Phase II

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One of the Goals of the GSWP2

- Produce the “best” global data sets of soil moisture, surface fluxes, and related hydrologic quantities (including runoff) for 1986-1995 with 1x1 degree grid spacing considering the uncertainties associated with:
  - Land surface models: more than 20 LSMs
  - Model parameters: 2 kinds of vegetation etc.
  - Forcing data: 3 kinds of reanalysis data, corrected precipitation, etc.
  - Temporal and spatial scales to run LSMs
Net radiation to Precipitation ratio (Rn/IP)
Evapotranspiration to precipitation ratio (E/P)
Climatic Zones delineated by Budyko’s Aridity Index (BAI)
Mean Annual Precipitation

Mean Water Balance (1986–1995)

- Rain
- Snow

- Arid
- Semi-Arid
- Semi-Humid
- Humid
- Tropical Humid
- Very Humid
- Ice cover

- (mm/year)
Mean Water Balance (mm/y)

Water Flux from Land Surface (1986–1995)

Arid
Semi Arid
Semi Humid
Humid
Tropical Humid
Cold Humid
Ice
Global

Rainfall: Rsub
Surface: Rsurf
Evapotranspiration: ET
GSWP2-ICC: Data viewer & data distributor

- Work with your internet browser
  
  http://gswp2.tkl.iis.u-tokyo.ac.jp/gswp2/

- Developed by Drs. E. Ikoma and M. Yasukawa

- Three interfaces
  
  1. Data visualization on scratch pad
     - Simple, high response, and easy-to-use viewer
  
  2. Time sequential comparison
     - For time series comparison at a grid point
  
  3. Model inter-comparison workbench
     - Matrix type viewer for model inter-comparison

- Prototype is introduced for B0 run outputs
Global Soil Wetness Project 2 – Data InterComparison Center

Demonstration Site

- Data Visualization on Scratch Pad
  - Time Sequential Comparison
  - Model Intercomparison Workbench

This Project is supported by JST-CREST and Oki-Kanae Lab.

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http://gswp2.tkl.iis.u-tokyo.ac.jp/gswp2/

Approximately 0.7 PB of Data Archiver

SGI ONYX4 UltimateVision

GSWP2-ICC/DDC Toppage

http://gswp2.tkl.iis.u-tokyo.ac.jp/gswp2/
1. Data visualization on scratch pad

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- Data Visualization on Scratch Pad
- Time Sequential Comparison
- Model Intercomparison Workbench

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Select “data visualization on scratch pad”
Data visualization on scratch pad

Select variable, model, period and location
Data visualization on scratch pad

Selected data appears on the screen as a contour map.
- Time step:
  - Daily
  - Monthly mean
  - Annual mean
- Color bar:
  - Automatic
  - User specified max. and min.
- 4 figure sizes
- Unit conversion from kg/m²/s to mm/day

You can display several figures at once
⇔ you can compare between variables/models
You can download the selected data, as well. (big or little endian, compressed binary file)
2. Time sequential comparison

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- Data Visualization on Scratch Pad
- Time Sequential Comparison
- Model Intercomparison Workbench

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Select “Time sequential comparison”
Time sequential comparison

Select variable, model, period and location (Common interface)
Time sequential comparison

Time series (one year) appear on screen
Time sequential comparison

You can overlay several models
Time sequential comparison

You can have a closer look
Time Sequential Comparison

- Spatial images of weekly time series around the specific grid point are displayed.
  - Color bar can be modified.
  - Mpeg animation of temporal sequences
  - Frame by frame display by pointing images by mouse
Time sequential comparison

You can download the time series data.
3. Model inter-comparison workbench

Select variable, model, period and location (Common interface)
3. Model inter-comparison workbench

- All the figures for comparing every pair of models are displayed at once.
- Color bar setting.
- Expansion and erase with a click

Show difference between models on screen
The GSWP2-ICC is scale independent! If you have a big screen, you can display many figures at once and enjoy the modern map discussion!
ICC workflow

- Public
- Participants
- DVD, DAT, FTP
- ICC Data Viewer & Data Distributor
- Dr. E. Ikoma
- Dr. M. Yasukawa
- Primary analysis
- N. Hanasaki
- Data upload
- Kitsuregawa Lab
- Oki Lab
- IIS/UT
- Public
- Participants
- DVD, DAT, FTP
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http://gswp2.tkl.iis.u-tokyo.ac.jp/gswp2/
Prototype of GSWP2-Data Download Center

Specify year and month or 10 year mean

Monthly/daily

All on/off vertically

Region by Lon./Lat.

Select Experiment or Model

All on/off laterally

Automatic estimation of total volume

http://gswp2.tkl.iis.u-tokyo.ac.jp/gswp2/
Data Download Center

User

Request

HTTP

Interface Program

GSWP2 server <haneda>

Stored data (Plain Binary)
No Meta-data

netCDF generate Program

Send-Email Program

Distribution data (netCDF)

With Meta-data (Self-Describing)
GrADS supported

Retrieve data

E-mail

FTP or HTTP
File size limit: 300MB (Global, 3-hourly, for 1 year)

http://gswp2.tkl.iis.u-tokyo.ac.jp/gswp2/
You can check your downloaded file immediately via GrADS!!

- netCDF file
  - Lon/Lat coordinate
    (GSWP2 original one is “dehydrated”-1D)
  - COARDS convention
- Flexible cutout
  - Area: rectangular
  - Period: any month
    (annually, monthly, daily, 3-hourly(1995))
  - Model/Run
# GSWP-2 Modeling Status

<table>
<thead>
<tr>
<th>MODEL</th>
<th>Institute</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLM-TOP</td>
<td>University of Texas at Austin</td>
</tr>
<tr>
<td>COLA-SSiB</td>
<td>COLA</td>
</tr>
<tr>
<td>ISBA</td>
<td>Météo France/CNRM</td>
</tr>
<tr>
<td>LaD</td>
<td>USGS &amp; NOAA/GFDL</td>
</tr>
<tr>
<td>MOSES-2</td>
<td>Met Office. UK</td>
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<tr>
<td>NOAA</td>
<td>NOAA NCEP/EMC</td>
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<tr>
<td>SiBUC</td>
<td>Kyoto University</td>
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<tr>
<td>SWAP</td>
<td>Institute of Water Problems, Russian Academy of Sciences</td>
</tr>
<tr>
<td>VISA</td>
<td>University of Texas at Austin</td>
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<tr>
<td>BUCKET*</td>
<td>University of Tokyo</td>
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<tr>
<td>Mosaic</td>
<td>NASA GSFC/HSB</td>
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<tr>
<td>NSIPP-catchment</td>
<td>NASA GSFC/NSIPP (GMAO)</td>
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<td>ORCHIDEE</td>
<td>IPSL. France</td>
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<td>CLM</td>
<td>NASA GSFC/HSB</td>
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<td>HY-SSiB</td>
<td>NASA GSFC/HSB</td>
</tr>
<tr>
<td>VIC</td>
<td>NASA GSFC/HSB</td>
</tr>
</tbody>
</table>

**Multi-model Analysis**

- Included
- Ready to be included
- Not ready to be included

* May be dropped
Validation of GSWP-2 1m Column Soil Moisture (IL, GSMDB)

Total Field (1m, 1986-1995)

Anomaly (1m, 1986-1995)
Notice

• DDC is now under TEST-OPERATION
  – Now access is protected by password
  – If you find any trouble, please contact us.

• Your request to ICC/DDC is welcome
  – If you find any shortage in function, please let us know. We will try our best to support your request.

• BAMS Article on GSWP2 will appear soon.