

Southeastern Asia – Oceania Regional Flash Flood Guidance System: FFGS Products and Data Needs



Hydrologic Research Center

SAOFFG Planning Meeting
3 February 2016
Jakarta, Indonesia

CAFFG - Central America Flash Flood Guidance System

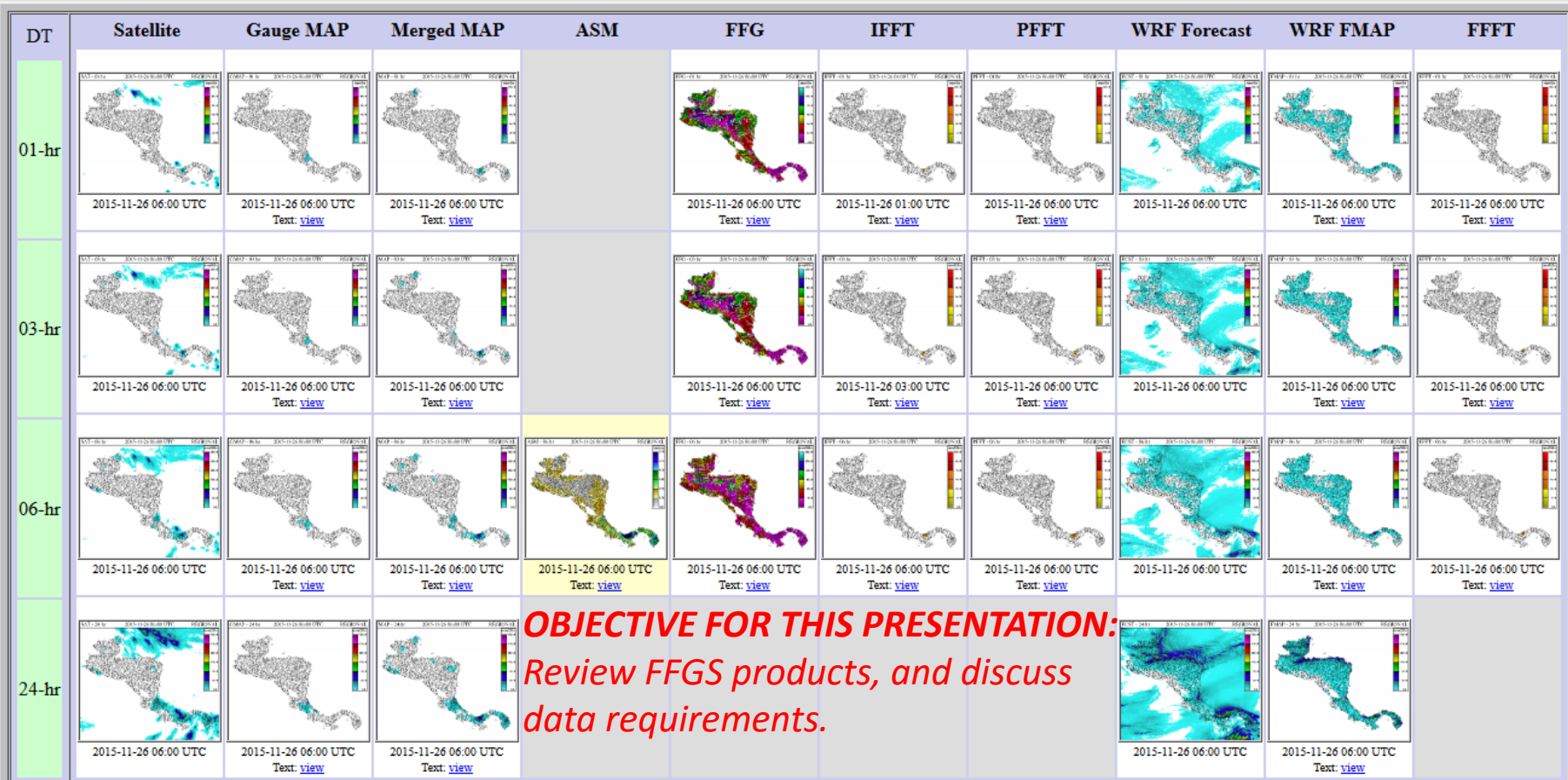
Current Date: 2016-02-01 06:12 UTC

Nav Date: 2015-11-26 06:00 UTC

Year: 2015 Month: 11 Day: 26 Hour: 06 REGION: REGIONAL OPTION: MEDIAN Submit

-1 Month -1 Day -6 Hours -1 Hour +1 Hour +6 Hours +1 Day +1 Month

Prev 6-hr Interval (00 UTC) Reset to Current Next 6-hr Interval (12 UTC)



OBJECTIVE FOR THIS PRESENTATION:
 Review FFGs products, and discuss data requirements.

Composite Product... [text](#) [DBF](#)

SFTP data transfer (requires SFTP Client): [EXPORTS/REGIONAL/2015/11/26](#)

Surfnet Gauge Observations at 2015-11-26 06:00 UTC

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| 0500072A | EL BOQUETE | No Report | No Report | NICARAGUA | 11.982222222 | -86.394722222 | Disabled | Disabled |
| 0500145C | EL ROSARIO | 0.00 | No Report | NICARAGUA | 11.846111111 | -86.166666667 | Enabled | Disabled |
| 050071BA | ALTAMIRA (ARROCERA) | No Report | No Report | NICARAGUA | 12.133055556 | -85.713611111 | Enabled | Disabled |
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| 0500E4D8 | SIUNA | 0.00 | No Report | NICARAGUA | 13.716111111 | -84.775 | Enabled | Disabled |
| 050146DA | SAN DIONISIO | No Report | No Report | NICARAGUA | 12.756388889 | -85.845833333 | Enabled | Disabled |

Spatial Analysis for Basin Delineation

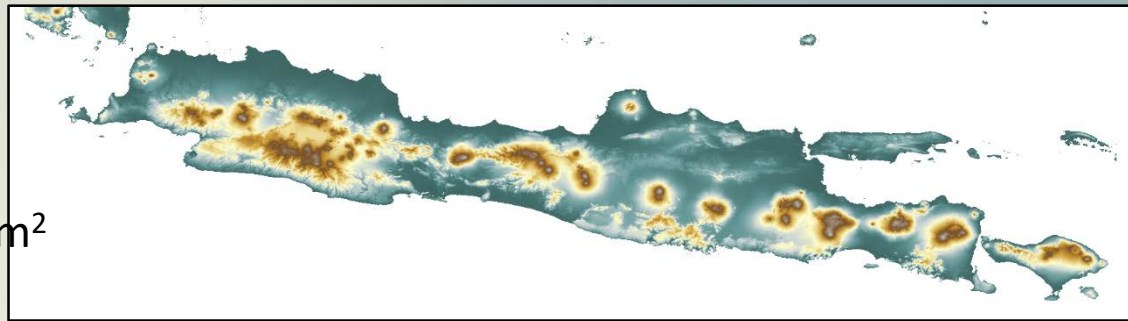
OBJECTIVE:

- ❑ Define flash flood-scale watershed boundaries
- ❑ Provide spatial representation for model parameterization
- ❑ Determine geometric properties of flash flood basins for model computations.

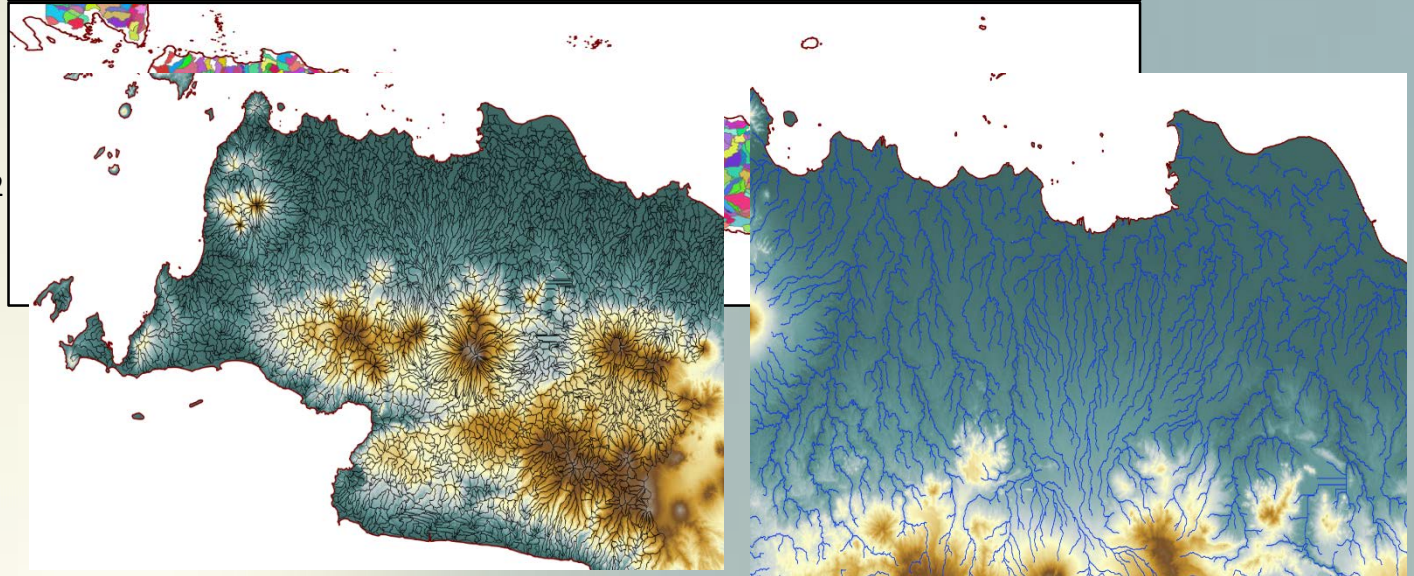
*initial delineation results

Basin Size: $\sim 100 \text{ km}^2$

Coastal Basins: $\sim 50 \text{ km}^2$



Jakarta Basins: $\sim 5 \text{ km}^2$



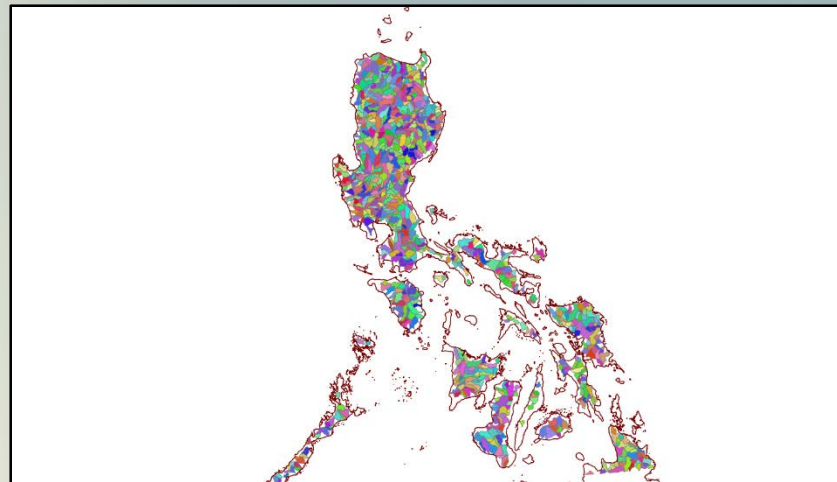
Spatial Analysis for Basin Delineation

DEVELOPMENT INPUT DATA:

- ❑ Digital Elevation Model (DEM) data
 - The preliminary delineation shown was based on SRTM 30m and 90m resolution data

VALIDATION DATA:

- ❑ Digital stream network data (Digital Chart of the World database)
- ❑ Comparison with satellite visible imagery (e.g., GoogleEarth)
- ❑ Country-provided *digital* stream and/or basin GIS files
- ❑ *Country-representative review and comments*



*initial delineation results

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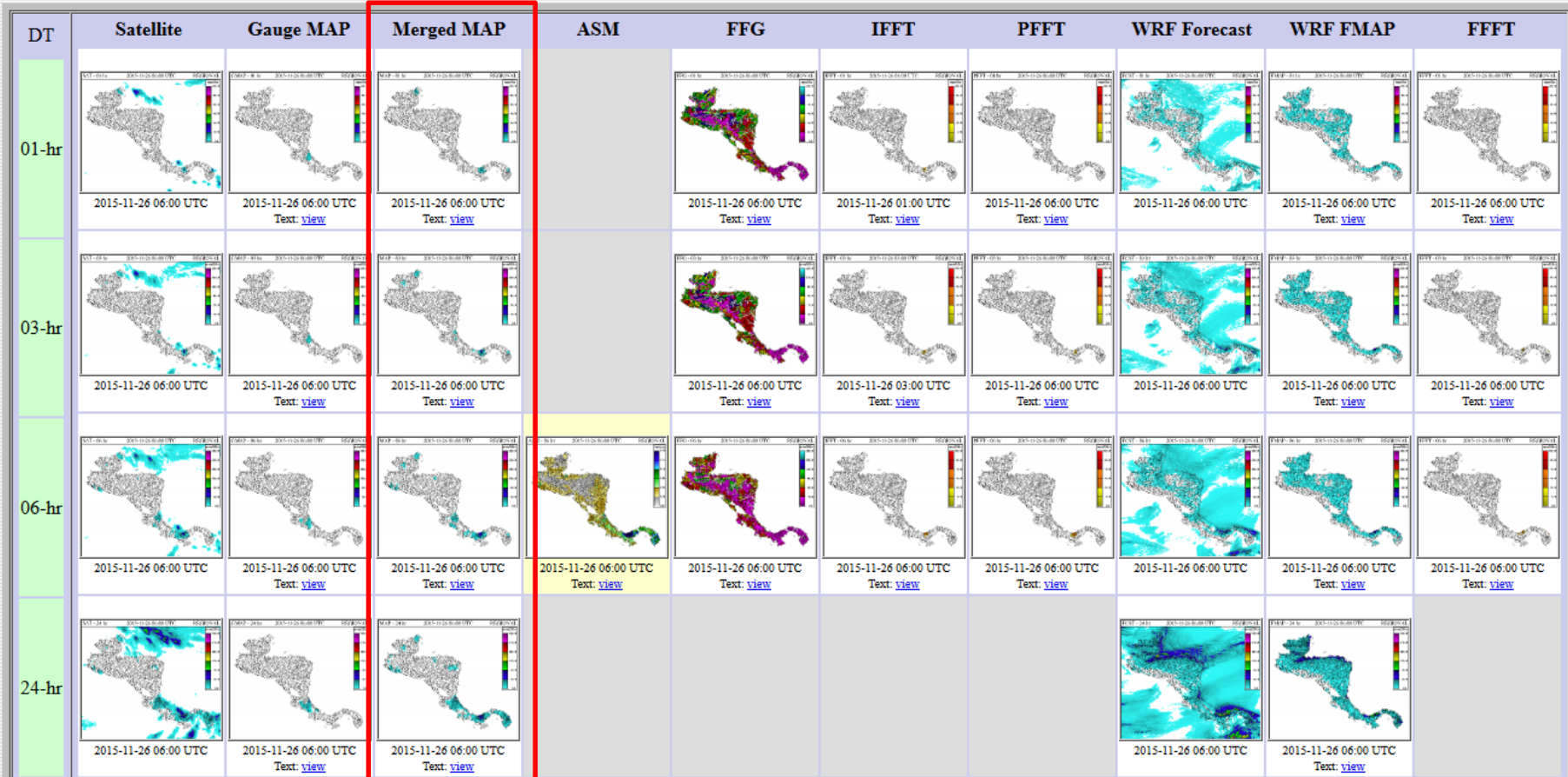
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Real-Time Rainfall Processing and Merged MAP

OBJECTIVE:

- ❑ Provide “best estimate” of mean areal precipitation over each watersheds input to soil water and FFG models.

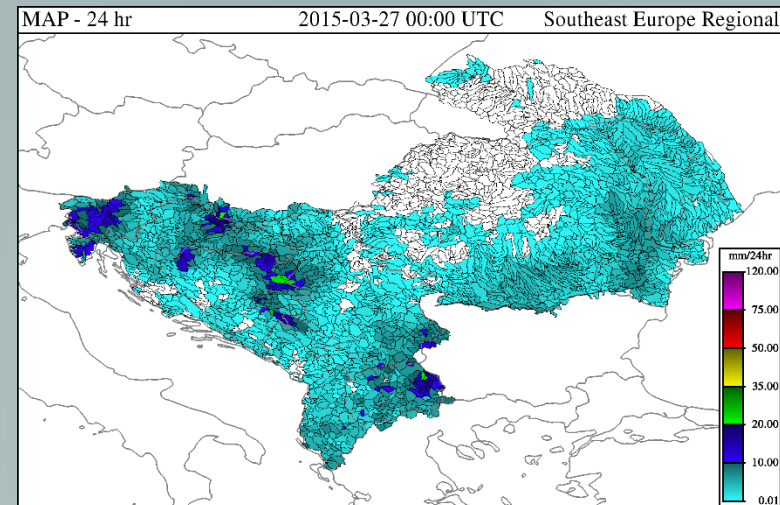
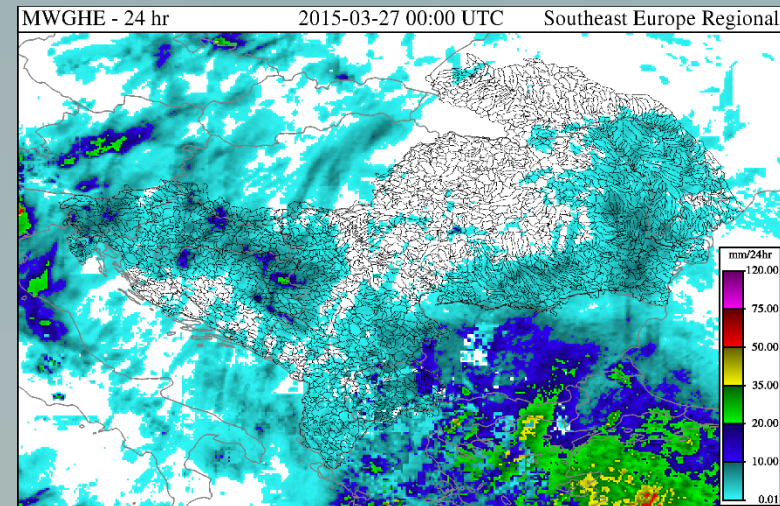
DEVELOPMENT INPUT DATA:

- ❑ Historical satellite precipitation data (HRC)
- ❑ Historical rain gauge precipitation data (6-hourly or daily)
- ❑ Analysis of climatological bias of satellite precipitation

REAL-TIME INPUT DATA:

- ❑ Satellite precipitation (GHE, MWGHE)
- ❑ Climatological adjustment factors
- ❑ Real-time rain gauge precipitation for dynamic (real-time) precipitation bias adjustment

Examples from SEFFGS



Flash Flood Guidance



FFG product is computed through the hydrologic modeling components:

- Threshold Runoff Modeling
- Soil Water Modeling

Threshold Runoff Model Component

Threshold Runoff is a foundational parameter of FFG, defined as the amount of *effective* rainfall of a given duration over a watershed that produces bankfull flow at the watershed outlet.

OBJECTIVE:

- ❑ Estimate *Threshold Runoff* for all flash flood-scale watersheds in region.



DEVELOPMENT INPUT DATA:

- ❑ Geometric properties of watersheds as determined via spatial analysis;
- ❑ Stream surveys or estimates of cross-sectional properties at channel bankfull for developing regional relationships;
- ❑ Return period discharge information for flash flood prone streams to develop regional relationships.

Soil Water Model Component

OBJECTIVE:

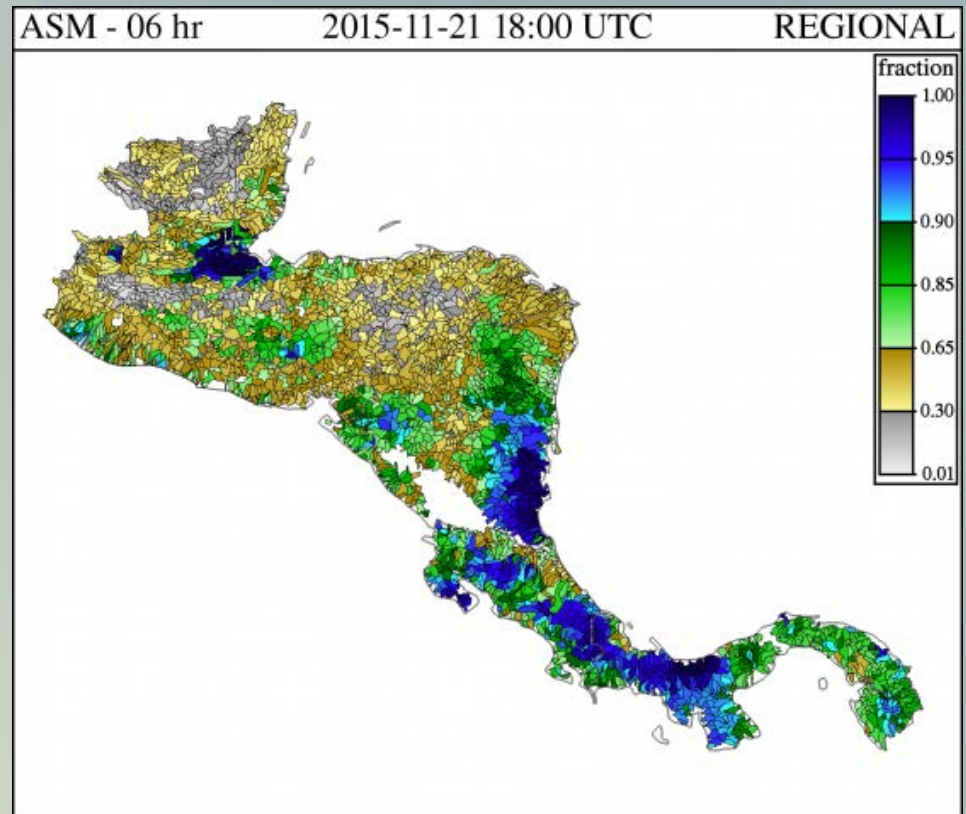
- Estimate soil water conditions within basins in real-time
- Account for land surface processing in transformation of rainfall to runoff

REAL-TIME INPUT DATA:

- Small watershed mean areal precipitation

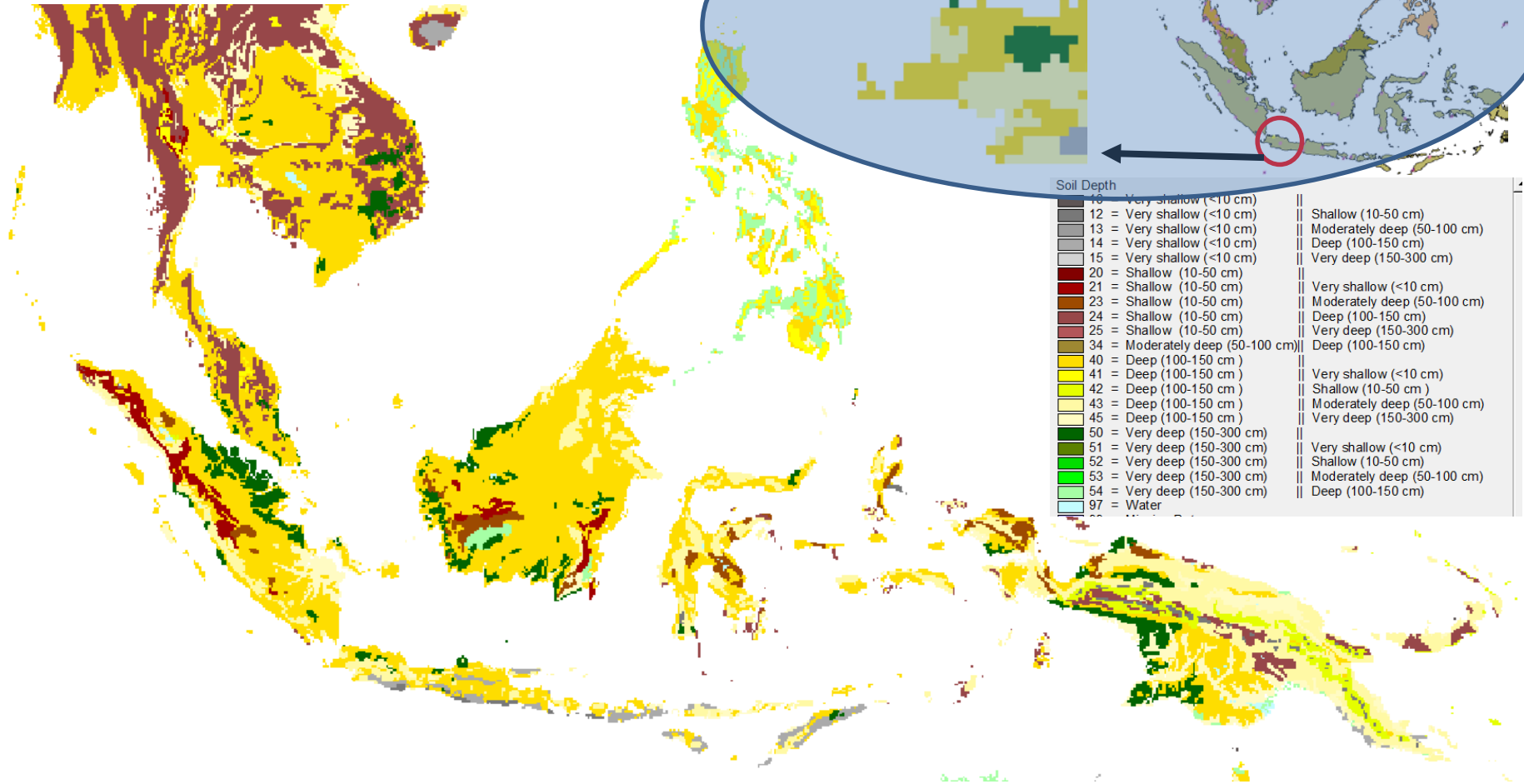
DEVELOPMENT INPUT DATA:

- Soils Properties
- Spatial Land Cover Data
- Historical temperature and evaporation data
- Stream discharge data



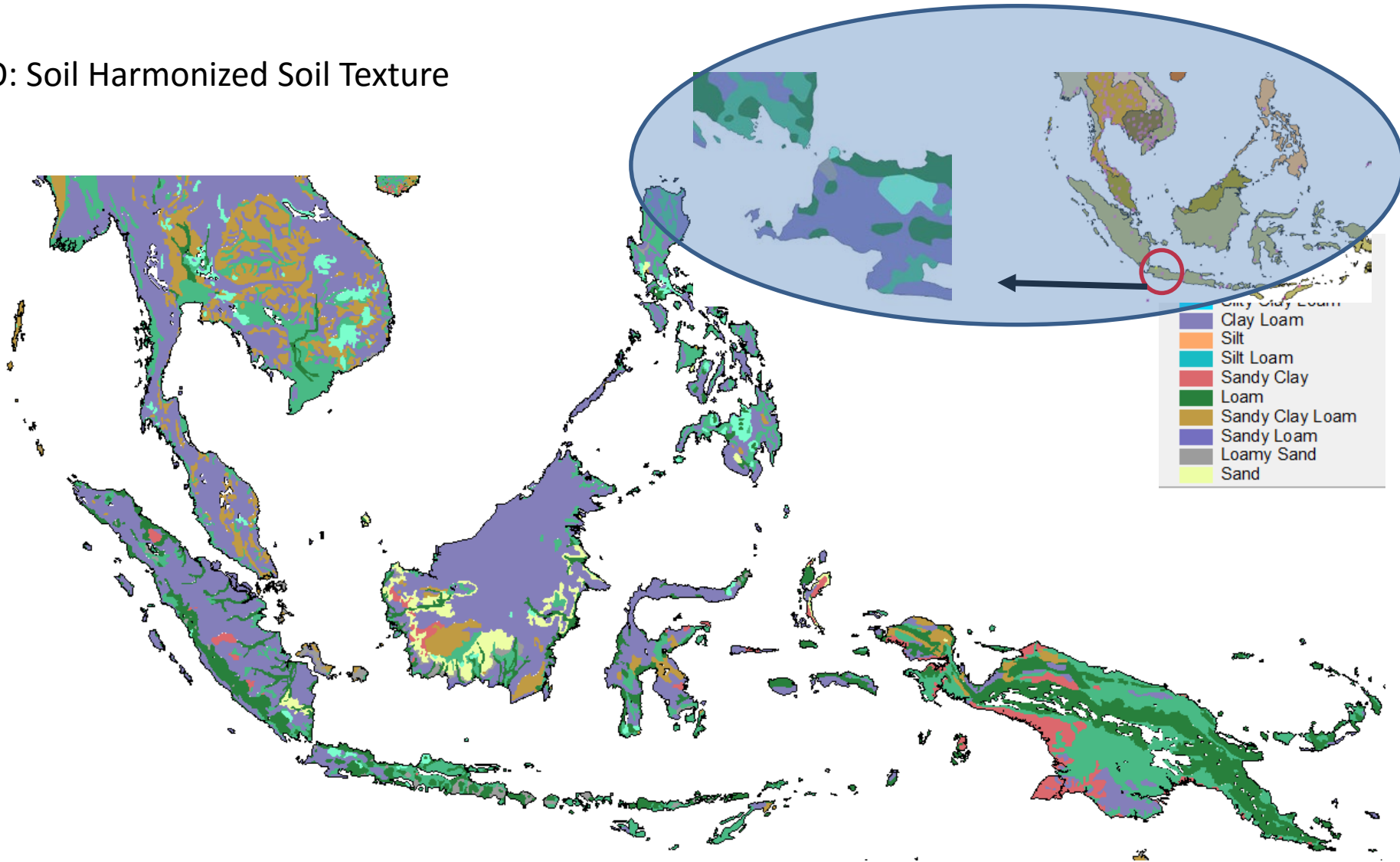
Soil Water Model Component

FAO: Soil Depth [Global]



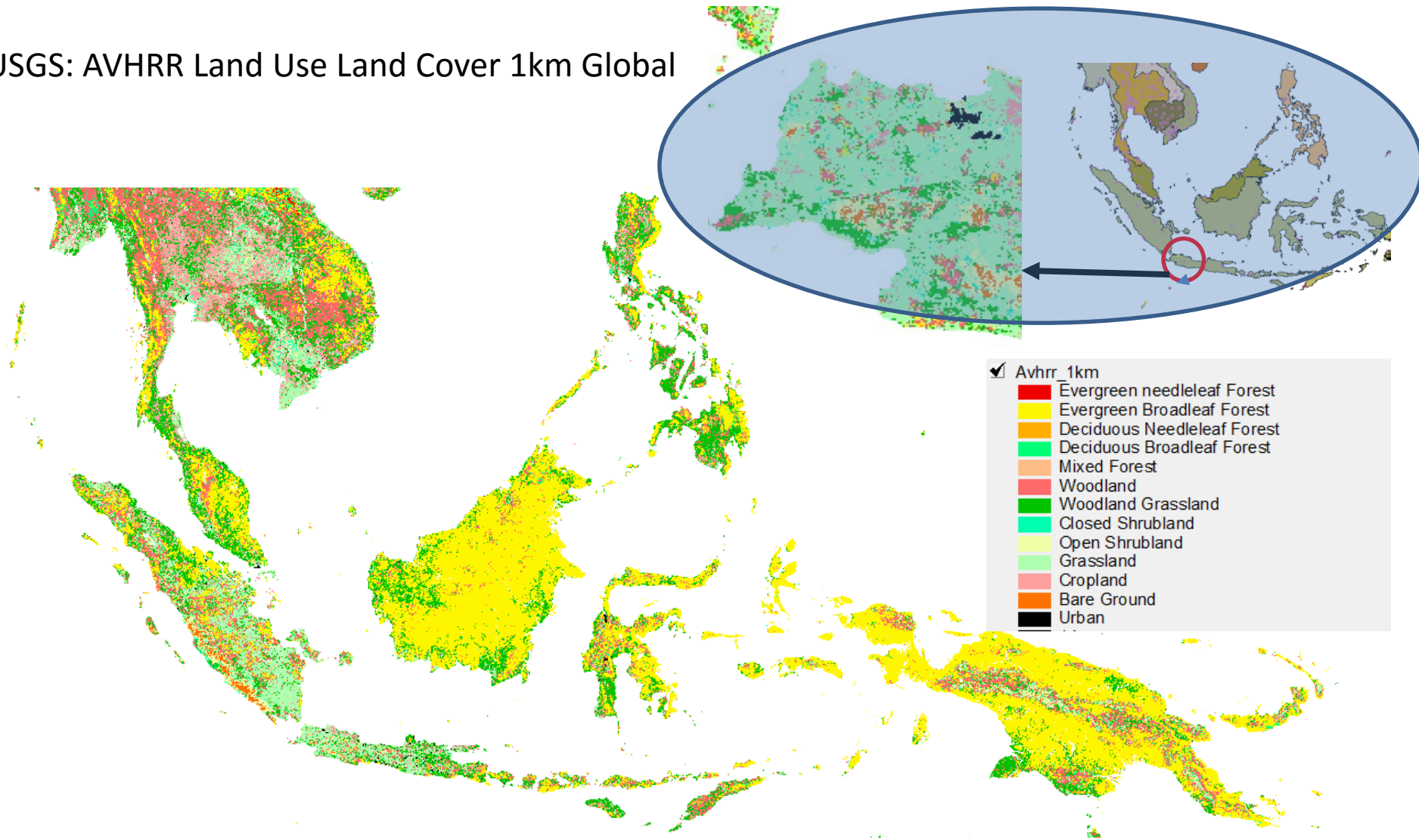
Soil Water Model Component

FAO: Soil Harmonized Soil Texture



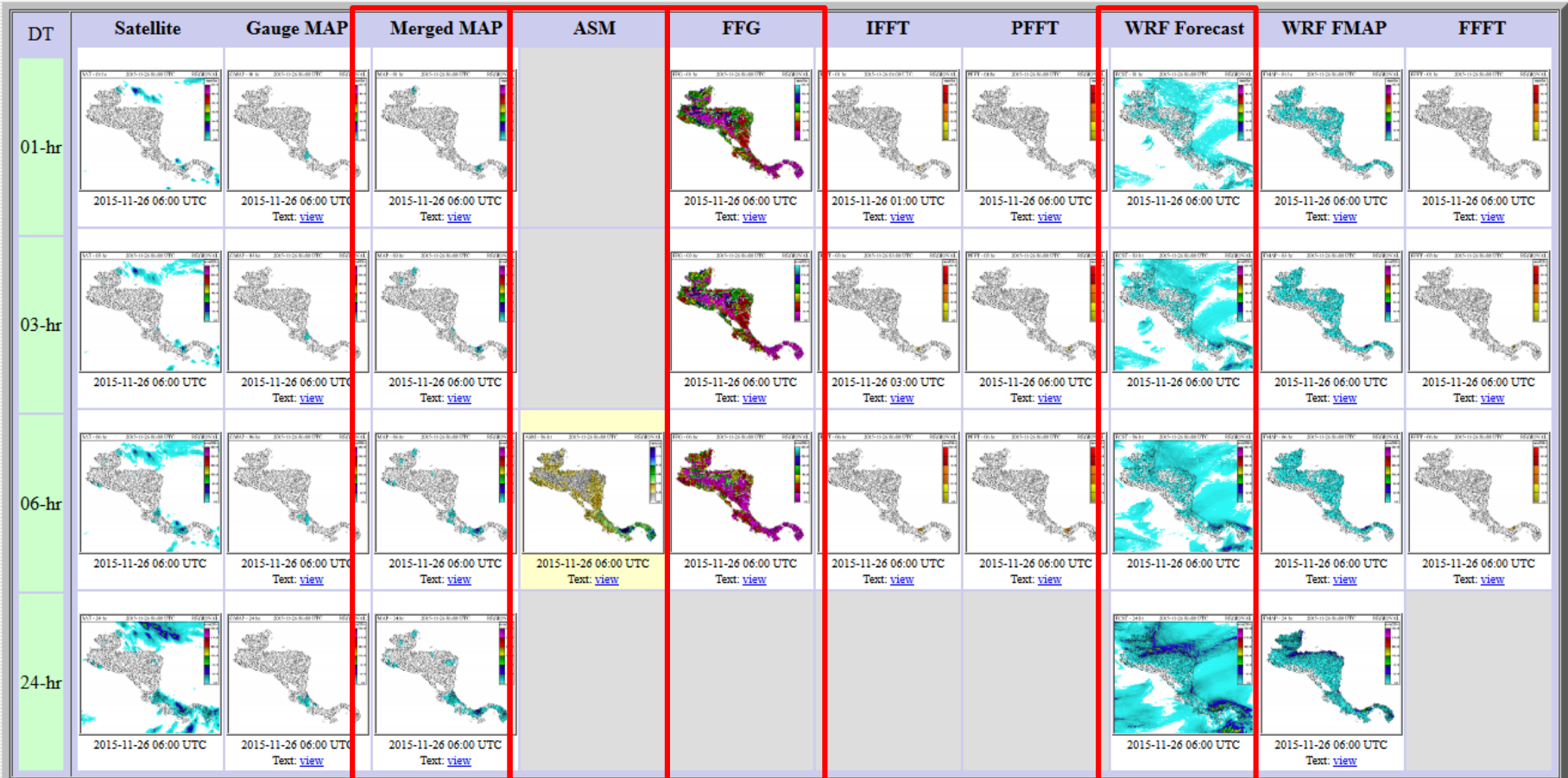
Soil Water Model Component

USGS: AVHRR Land Use Land Cover 1km Global



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