

## China Land Data Assimilation System (CLDAS) Research and Operation

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In recent years, frequent drought events have caused enormous losses. High quality space-time soil moisture products are urgent to support CMA in China drought monitoring services. Soil moisture retrieved from satellite observation or simulated from land surface models or from in-situ observations has different advantages and deflections. Merging all the soil moisture information together may have the ability to obtain high quality soil moisture continuously. Therefore, China Land Data Assimilation System (CLDAS) is proposed to meet the demand of drought monitoring and other meteorological, agricultural and hydrological requirements over China.

CLDAS consists of three stages. The first stage aims to realize STMAS operation for producing forcing data; to realize operational running of CLM; to evaluate forcing and CLM output; and to publish the operational products for users. The second stage aims to build retrospective forcing data set since 1995 over China; to develop multi-LSMs operational system; and to develop multi-satellite merged soil moisture product. The third stage aims to assimilate multi-satellite merged soil moisture; to assimilate satellite radiance or brightness temperature.

The first stage of CLDAS (V1.0) will be operated in national meteorological information center of CMA by the end of Jun 2013. The product coverage is 70-150E, 0-60N and the spatial resolution is 1/16 (0.0625) degree. Hourly gridded forcing data, including air temperature, pressure, humidity, wind speed, downward shortwave radiation and precipitation, are used to drive CLM in CLDAS. STMAS (Space-Time Multi-scale Analysis System) (Xie, Y., 2011) are used to combining NCEP/GFS data with regional automatic surface observation temperature (more than 30000) over China, and the result are validated using national automatic observation (more than 2400). The result shows that the combined temperature product is closer to surface observations than GFS product. Air pressure, relative humidity and wind speed are processed similar as temperature. The Downward shortwave radiation (DSR) is retrieved from FY-2(C-F) series geostationary meteorological satellites, operated by CMA. The DISORT method for radiation transfer calculations with the climatic data sets from the ISCCP C2 is used in the retrieval. The DSR is evaluated against ground-based observations (OBS) from 94 stations over mainland China (Jia, B., 2013). Grid precipitation is produced by merging more than 30000 rain gauge data and CMORPH product.

CMA began to establish automatic soil moisture observation network since 2009. More than 2000 stations are put into operation till now. The automatic observation network will gradually replace the human observation network which has more than 700 stations since 1981. After quality control, soil moisture observations are used to evaluate CLDAS soil moisture product.

### References

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