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MOSAICO, a Fortran 90 Free Open Source library for raster based hydrological applications

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In recent years, many distributed hydrologic models were proposed, varying in nature and complexity including advanced methodologies and computational methods that improved significantly models' performances. On the other hand, proliferation of distributed hydrological models gave birth to a myriad of different file formats used for storing results. Most of the models produce files that are digitally encoded in the ASCII format. There are also models that produce files in binary format, making the data less accessible. This has been a significant obstacle to data sharing and comparison across user communities. Moreover, the complexity of natural phenomena involved in hydrological processes often requires model coupling rising concerns on models interoperability.
Unlike other scientific communities, meteorologists being an example, hydrological researchers have never agreed a standard format for storing and sharing data and model results. Recently some initiatives addressing data interoperability for the simplification of the linking of hydrologic models claimed the need of standard format to be used in hydrological applications.
An emerging standard for data exchange in the scientific research community is the NetCDF (network Common Data Form), a set of software libraries and machine-independent data formats that support the creation, access, and sharing of array-oriented scientific data. This data format is now used by numerous earth science studies institutions and is supported by several commercial analysis and data manipulation and visualization packages.
This work presents MOSAICO, a set of Fortran 90 Modules for facilitating development of raster based hydrological applications and stimulating adoption of netCDF as a common format for sharing and comparing data among hydrological community. MOSAICO include routines for high level operations for input output and manipulation of gridded dataset. A test program is presented in order to show basic MOSAICO capabilities.