ISLSCP II River Routing Data (STN-30p)

Revision date: April 6, 2011

Summary:

The Simulated Topological Network (STN-30p) data set provides the large-scale hydrological modeling community an accurate representation of the global river system at 0.5 degree and 1.0 degree spatial resolutions. STN-30p represents the potential connectivity of the continental land mass by assigning one of eight (E, SE, S, SW, W, NW, N, NE) possible flow directions to each continental grid cell (Jenson 1988, Band 1993). The potentiality of STN-30p reflects the fact that flow direction is assigned to every land cell regardless of the existence of actively flowing rivers. STN-30p can be viewed as a river network which would exist if sufficient surface runoff was available to form river channels everywhere. There are two data files with this data set.

Additional Documentation:

This data set is one of the products of the **International Satellite Land-Surface Climatology Project, Initiative II (ISLSCP II)** data collection which contains 50 global time series data sets for the ten-year period 1986 to 1995. A complete description of the data, it's derivation, acknowledgements, and references provided by the ISLSCP II Data Management Staff is included with this data set as a companion file named **1_river_routing_doc.pdf**

ISLSCP II is a consistent collection of data sets that were compiled from existing data sources and algorithms, and were designed to satisfy the needs of modelers and investigators of the global carbon, water and energy cycle. The data were acquired from a number of U.S. and international agencies, universities, and institutions. The data and documentation have undergone two peer reviews.

ISLSCP is one of several projects of Global Energy and Water Cycle Experiment (GEWEX) [http://www.gewex.org/] and has the lead role in addressing land-atmosphere interactions -- process modeling, data retrieval algorithms, field experiment design and execution, and the development of global data sets.

Related Data Sets:

- Additional ISLSCP II data sets are available from the Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC).

Data Citation:

Cite this data set as follows:

Vorosmarty, C.J., and B. Fekete. 2011. ISLSCP II River Routing Data (STN-30p). In Hall, Forrest G., G. Collatz, B. Meeson, S. Los, E. Brown de Colstoun, and D. Landis (eds.). ISLSCP Initiative II Collection. Data set. Available on-line [http://daac.ornl.gov/] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. doi:10.3334/ORNLDAAC/1005

File Information:

The archived data sets for ISLSCP II have been organized by categories. This data set is in the Hydrology, Soils, and Topography category---- a collection of hydroclimatology and surface elevation data sets.

Data Set Spatial Extent: Global gridded

Westernmost Longitude: -180 W

Easternmost Longitude: 180 E

Northernmost Latitude: 90 N

Southernmost Latitude: -90 S

Projection: Geographic

Data Set Spatial Resolution: 1.0 degree and 0.5 degree in both latitude and longitude

Data Set Temporal Extent: 1986 through 1995

Data File Format

All of the data files in each data set within the ISLSCP Initiative II data collection are in ASCII GRID format. The file format consists of numerical fields of varying length, which are delimited by a single space and arranged in columns and rows. This data set has 2 files at spatial resolutions of 0.5 and 1.0 degree in both latitude and longitude, denoted as hd and 1d, respectively, in each file name:

river_routing_stn_1deg.zip, and **river_routing_stn_hdeg.zip**.

When expanded, each data file contains a number of global, gridded data layers and two associated attribute tables named as follows:

File Name	Description
stn_basin_id_XX.asc	Basin grid, which assigns unique identifiers to groups of grid-cells forming individual river basins. XX can be hd or 1d, depending on the spatial resolution of the data set.
stn_basin_attribute_XX.dat (table)	Basin attribute table contains attribute information such as basin name, catchment area, mainstem length, etc. for each individual basin. See below for table descriptions.
stn_cell_attribute_XX.dat (table)	Cell attribute table contains attribute information for each land cell.
stn_flow_accum_XX.asc	Flow accumulation grid or upstream area grid (km^2), which provides the catchment area estimate for each grid cell according to the STN-30p network.
stn_flow_direction_XX.asc	Flow direction grid, which represents the horizontal connectivity of the continental land mass.
stn_dist2mouth_XX.asc	Distance [km] to the outlet of river basins.

stn_mainstem_length_XXasc	Mainstem length [km] grid.
stn_stream_order_XX.asc	Strahler stream order grid.
stn_elevation_hd.asc	Adjusted elevation (m) grid, which combines HYDRO1k aggregated elevation at 30-minute resolution with STN-30p, where the inconsistencies between the elevation and the flow direction data sets (i.e. increasing elevation along downstream flow path) were eliminated. Available only in 0.5 degree resolution.
stn_slope_hd.asc	Slope (degree) along the STN-30p grid, provides slope information for each grid cell along the cell's flow direction. Available only in 0.5 degree resolution.

Please refer to **1_river_routing_doc.pdf** and **0_river_routing_readme.txt** for a more complete description of the data files and naming conventions.

References:

Band, L. E.: Extraction of channel networks and topographic parameters from digital elevation data, in Channel Network Hydrology (Editor: Beven K.), John Wiley & Sons, New York, NY, USA.

Jenson, S. K. and Dominque, J. O.: Extracting Topographic Structure from Digital Elevation Data for Geographic Information System Analysis, Photogrammetric Engineering and Remote Sensing, Vol: 54, pp: 1593-1600, 1988.

Vorosmarty C. J., B. M. Fekete, M. Meybeck and R.B. Lammers: Global Systems of Rivers: Its role in organizing continental land mass and defining land-to-ocean linkages, Global Biochemical Cycles, 14(2): 599-621, 2000. doi:10.1029/1999GB900092

Data Access:

These data are available through the Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC) **[http://daac.ornl.gov].**

Data Archive Contact Information:

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