

A Stream Classification System for the Conterminous United States

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Suggested Citation:

McManamay, R.A., C.R. DeRolph (2018) A stream classification system for the conterminous United States. Scientific Data (in press).

Dataset Overview:

The US Stream Classification System classifies over 2.6 million stream reaches of the NHDPlus V2 stream network into different types of habitat. The classification is constructed using six habitat layers: 1) size, 2) gradient, 3) hydrology, 4) temperature, 5) bifurcation network, and 6) valley confinement. Multiple alternative classification approaches are used, where possible, for a given layer. Files are organized into six folders representing different habitat layers. Data are provided as a series of .csv files, each pertaining to one of four regions of the US split by major basins (East, UM (Upper Mississippi), LM (Lower Mississippi), and West). There are two hydrology-related .csv files for each region. The first dataset, ([region]_hydrology_classes.csv) provides predominant hydrologic classes and their probabilities. The second dataset provides probabilities of all classes. All datasets include the Common Identifier (COMID) to uniquely identify stream reaches and to cross-reference the NHDPlus V2 dataset.

Variable Descriptions

Size & Gradient

Variable	Description
COMID	Common Identifier for NHDPlus V2 stream reaches
Flow_cfs	Mean annual flow in cubic feet per second
StreamOrde	Stream Order
SizeClass	Size Class determined using breaks in discharge values
slope	Slope (rise/run of stream flow line)
GradientClass	Gradient class dervied from slope values

Hydrology

Hydrologic classes

Variable	Description
COMID	Common Identifier for NHDPlus V2 stream reaches
exp	Gaussian mixture model hydrologic class
prop.e	Proportion of votes (probability) for the predominant "exp" class
g2	Ward's agglomerative hydrologic classes (two clusters)
prop.g2	Proportion of votes (probability) for the predominant "g2" class
g4	Ward's agglomerative hydrologic classes (four clusters)
prop.g4	Proportion of votes (probability) for the predominant "g4" class
g8	Ward's agglomerative hydrologic classes (eight clusters)
prop.g8	Proportion of votes (probability) for the predominant "g8" class
g14	Ward's agglomerative hydrologic classes (fourteen clusters)
prop.g14	Proportion of votes (probability) for the predominant "g14" class
g30	Ward's agglomerative hydrologic classes (thirty clusters)
prop.g30	Proportion of votes (probability) for the predominant "g30" class

Hydrologic probabilities

Variable	Description
COMID	Common Identifier for NHDPlus V2 stream reaches
exp	Gaussian mixture model hydrologic class
exp_1, exp_2, ... exp_15	Proportion of votes (probability) for each "exp" class (1 through 15)
g2	Ward's agglomerative hydrologic classes (two clusters)
g2_1, g2_2	Proportion of votes (probability) for each "g2" class (1 and 2)
g4	Ward's agglomerative hydrologic classes (four clusters)
g4_1, g4_2,g4_4	Proportion of votes (probability) for each "g4" class (1 through 4)
g8	Ward's agglomerative hydrologic classes (eight clusters)
g8_1, g8_2, ...g8_8	Proportion of votes (probability) for each "g8" class (1 through 8)
g14	Ward's agglomerative hydrologic classes (fourteen clusters)
g14_1, g14_2,g14_14	Proportion of votes (probability) for each "g14" class (1 through 14)
g30	Ward's agglomerative hydrologic classes (thirty clusters)
g30_1, g30_2, ...g30_29	Proportion of votes (probability) for each "g30" class (1 through 30)

Temperature

Variable	Description
COMID	Common Identifier for NHDPlus V2 stream reaches
Maheu_class	Maheu et al. thermal regime class
hivar_cool	Proportion of votes for "hivar_cool" class
sta_cold	Proportion of votes for "sta_cold" class
sta_cool	Proportion of votes for "sta_cool" class
var_cold	Proportion of votes for "var_cold" class
var_cool	Proportion of votes for "var_cool" class
var_warm	Proportion of votes for "var_warm" class
JulyAug_tempC	Predicted July-August temperature (°C)
JulAug_Class	July-Aug temperature class

Bifurcation Network

Variable	Description
COMID	Common Identifier for NHDPlus V2 stream reaches
ecoid	Ecological Unit Identifier (Wieferich et al. 2014) for reaches with unmeaningful junctions (i.e., quadrangle boundaries)
flag	Reaches flagged as partitioned by unmeaningful junctions (i.e., quadrangle boundaries)
countUp	Number of contributing reaches forming junction immediately upstream of reach
countDown	Number of reaches branching at downstream end of each reach
orderup1	The predominant order forming junction immediately upstream of reach
orderup2	The secondary order forming junction immediately upstream of reach
orderup3	The tertiary order forming junction immediately upstream of reach
Divergence	Indicative of whether reach is a divergence (i.e., braid). D1 = divergence main channel, D2=divergence secondary channel (From NHDPlus V2)
Div_up	Indicative of whether a divergence forms junction at the immediate upstream end of a reach
Bif_Class	Network bifurcation class
Div_Class	Divergence class - combination of "Divergence" and "Div_up" variables

Valley Confinement

Variable	Description
COMID	Common Identifier for NHDPlus V2 stream reaches
RL	Reach length in km
VBA	Valley Bottom area in m2
RWA	River width area in m2
CatArea	Area of NHDPlus Catchment in m2
VBL	Valley Bottom length along stream reach
VBL_RL_R	Ratio of valley bottom length to reach length
VBA_RWA_R	Ratio of valley bottom area to river width area
inWtrbdy	Binary indication of intersection of reach with waterbody (1=yes)
inIndund	Binary indication of intersection of reach with an inundated area (1=yes)
Confinement	Confinement Class