

Appendix B. A description of all basin characteristics considered as potential explanatory variables in the various regressions conducted as part of the Southeast Model Comparison.

[Gages-II can be found in Falcone and others (2009) and in Falcone (2011). cm, centimeter; m, meter]

Variable Name	Source	Class	Description	FDC Regressions	Moment Regressions
ASPECT_DEGREES	Gages-II	Topo	Mean watershed aspect, degrees (degrees or the compass, 0-360). Derived from 100-m resolution National Elevation Data. 0 and 360 point to north. Because of the national Albers projection, actual aspect may vary.	X	
AWCAVE	Gages-II	Soils	Average value for the range of available water capacity for the soil layer or horizon (inches of water per inches of soil depth).	X	
BAS_COMPACTNESS	Gages-II	Bas_Morph	Watershed compactness ratio, 100 times the area divided by the squared perimeter; higher values represent a more compact shape.	X	
BDAVE	Gages-II	Soils	Average value of bulk density (grams per cubic centimeter).	X	X
CDL_CORN	Gages-II	LC_Crops	Percent of the watershed classified as corn cropland. Class 1 of the 2009 USDA NASS Cropland Data Layer.	X	X
CDL_OTHER_HAYS	Gages-II	LC_Crops	Percent of the watershed classified as other hays cropland. Class 37 of the 2009 USDA NASS Cropland Data Layer.	X	
CDL_PASTURE_GRASS	Gages-II	LC_Crops	Percent of the watershed classified as pasture/grass cropland. Class 62 of the 2009 USDA NASS Cropland Data Layer.	X	
CDL_SOYBEAN	Gages-II	LC_Crops	Percent of the watershed classified as soybeans cropland. Class 5 of the 2009 USDA NASS Cropland Data Layer.	X	X
CLAYAVE	Gages-II	Soils	Average value of clay content (percentage).	X	X
CONTACT	Gages-II	Hydro	Subsurface flow contact time index. The subsurface contact time index estimates the number of days that infiltrated water resides in the saturated subsurface zone of the basin before discharging into the stream.	X	X
CORNSOYBEAN_index	Derived (Gages-II)	LC06_Basin	Summation of CDL_CORN and CDL_SOYBEANS.	X	X

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Variable Name	Source	Class	Description	FDC Regressions	Moment Regressions
CROPSNLCD06	Gages-II	LC06_Basin	Percentage of the watershed classified as cultivated crops (class 82).	X	
DECIDNLCD06	Gages-II	LC06_Basin	Percentage of the watershed classified as deciduous forest (class 41).	X	X
DRAIN_SQKM	Gages-II	BasinID	Watershed drainage area, sq km, as delineated in our basin boundary.	X	X
ELEV_MAX_M	Gages-II	Topo	Maximum watershed elevation (meters) from 100-m National Elevation Dataset.		X
ELEV_MEAN_M_BASIN	Gages-II	Topo	Mean watershed elevation (meters) from 100-m National Elevation Dataset.	X	X
ELEV_MEDIAN_M_BASIN	Gages-II	Topo	Median watershed elevation (meters) from 100-m National Elevation Dataset.	X	X
ELEV_MIN_M	Gages-II	Topo	Minimum watershed elevation (meters) from 100-m National Elevation Dataset (may include sinks).		X
EVERGRNLCD06	Gages-II	LC06_Basin	Percentage of the watershed classified as evergreen forest (class 42).	X	
FORESTNLCD06	Gages-II	LC06_Basin	Percentage of the watershed classified as forested. (Sum of classes 41, 42, and 43.)	X	
FracP	Derived (Gages-II)	Climate	Monthly precipitation (12 values) as a fraction of annual total precipitation.		X
FROST_index	Derived (Gages-II)	Climate	Number of days between first frost (FST32F_BASIN) and last frost (LST32F_BASIN).	X	X
FST32F_BASIN	Gages-II	Climate	Watershed average of mean day of the year of first freeze, derived from 30 years of record (1961-1990), 2-km PRISM. For example, value of 300 is the 300th day of the year (Oct 27th).	X	X
GRASSNLCD06	Gages-II	LC06_Basin	Percentage of the watershed classified as herbaceous (grassland) (class 71).	X	
JAN_TMP7100_DEGC	Gages-II	Climate	Average January (1971-2000) air temperature for the watershed, degrees C; derived from 800-m PRISM data.	X	

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Variable Name	Source	Class	Description	FDC Regressions	Moment Regressions
JUL_TMP7100_DEGC	Gages-II	Climate	Average July (1971-2000) air temperature for the watershed, degrees C; derived from 800-m PRISM data.	X	
KFACT_UP	Gages-II	Soils	Average K-factor value for the uppermost soil horizon in each soil component. K-factor is an erodibility factor that quantifies the susceptibility of soil particles to detachment and movement by water. The K-factor is used in the Universal Soil Loss Equation (USLE) to estimate soil loss by water. Higher values of K-factor indicate greater potential for erosion.	X	X
LAND_index	Derived (Gages-II)	LC06_Basin	Summation of WOODYWETNLCD06 and EVERGRNLCD06.	X	
LST32F_BASIN	Gages-II	Climate	Watershed average of mean day of the year of last freeze, derived from 30 years of record (1961-1990), 2-km PRISM. For example, value of 100 is the 100th day of the year (April 10th).	X	X
MAR_PPT7100_CM	Gages-II	Climate	Average March (1971-2000) precipitation (cm) for the watershed; derived from 800-m PRISM data.	X	
MonP	Derived (Gages-II)	Climate	Average precipitation (cm) for the watershed for each month (12 values); derived from 800-m PRISM data.		X
MonT	Derived (Gages-II)	Climate	Average air temperature (1971-2000) for the watershed for each month (12 values), degrees C; derived from 800-m PRISM data.		X
OCT_PPT7100_CM	Gages-II	Climate	Average October (1971-2000) precipitation (cm) for the watershed; derived from 800-m PRISM data.	X	
OMAVE	Gages-II	Soils	Average value of organic matter content (percent by weight).	X	X
PASTURENLCD06	Gages-II	LC06_Basin	Percentage of the watershed classified as pasture or hay (class 81).	X	X

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Variable Name	Source	Class	Description	FDC Regressions	Moment Regressions
GEOPERM	Gleeson et al. (2011)	Geology	Geological permeability.	X	X
PERMAVE	Gages-II	Soils	Average permeability (inches/hour).	X	X
PET	Gages-II	Climate	Mean-annual potential evapotranspiration (PET), estimated using the Hamon (1961) equation.	X	X
PLANTNLCD06	Gages-II	LC06_Basin	Percentage of the watershed classified as planted or cultivated (agriculture). (Sum of classes 81 and 82.)	X	X
PPT_index	Derived (Gages-II)	Climate	Difference between March and October precipitation as a fraction of the average precipitation.	X	X
PPTAVG_BASIN	Gages-II	Climate	Mean annual precip (cm; 1971-2000) for the watershed, from 800-m PRISM data.	X	X
PRECIP_SEAS_IND	Gages-II	Climate	Precipitation seasonality index. Index of how much annual precipitation falls seasonally (high values) or spread out over the year (low values). Based on monthly precipitation values from 30-year (1971-2000) PRISM. Range is 0 (precipitation is spread out exactly evenly in each month) to 1 (all precipitation falls in a single month).	X	
RELIEFFT	Derived (Gages-II)	Topo	Basin relief. (Maximum elevation minus minimum elevation.)	X	X
RFACT	Gages-II	Soils	Average annual (1971-2000) rainfall and runoff factor ("R factor" of USLE).	X	X
RH_BASIN	Gages-II	Climate	Watershed average (1971-2000) relative humidity (percent), from 2-km PRISM.	X	X
ROCKDEPAVE	Gages-II	Soils	Average value of total soil thickness examined (inches).	X	X
RRMEAN	Gages-II	Topo	Dimensionless elevation relief ratio, calculated as the difference between mean and minimum elevation divided by the full range of elevations.	X	X

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Variable Name	Source	Class	Description	FDC Regressions	Moment Regressions
RRMEDIAN	Gages-II	Topo	Dimensionless elevation relief ratio, calculated as the difference between median and minimum elevation divided by the full range of elevations.	X	X
SANDAVE	Gages-II	Soils	Average sand content of soils (percentage).	X	X
SHRUBNLCD06	Gages-II	LC06_Basin	Percentage of the watershed classified as shrubland (class 52).	X	
SILTAVE	Gages-II	Soils	Average silt content of soils (percentage).	X	X
SLOPE_PCT	Gages-II	Topo	Mean watershed slope, percent; derived from 100-m resolution National Elevation Dataset.	X	X
SNOW_PCT_PRECIP	Gages-II	Climate	Estimated snow as a percent of total precipitation, mean for period 1901-2000 on a 1-km grid.	X	
StanP	Derived (Gages-II)	Climate	Monthly precipitation, standardized by mean and standard deviation of monthly precipitation.		X
StanT	Derived (Gages-II)	Climate	Monthly average temperature standardized by mean and standard deviation of monthly average temperature.		X
T_AVG_BASIN	Gages-II	Climate	Average annual air temperature (1971-2000) for the watershed, degrees C; derived from 2-km PRISM data.	X	X
T_index	Derived (Gages-II)	Climate	Difference between the average July temperature and January temperature, less the basin average temperature.	X	X
T_MAX_BASIN	Gages-II	Climate	Watershed average of maximum monthly air temperature (degrees C, 1971-2000) from 800-m PRISM data.	X	X
T_MIN_BASIN	Gages-II	Climate	Watershed average of minimum monthly air temperature (degrees C, 1971-2000) from 800-m PRISM data.	X	X

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Variable Name	Source	Class	Description	FDC Regressions	Moment Regressions
TOPWET	Gages-II	Hydro	Topographic wetness index. Calculated as $\ln(a/S)$, where "ln" is the natural log, "a" is the upslope area per unit contour length and "S" is the slope at that point. See http://ks.water.usgs.gov/Kansas/pubs/reports/wrir.99-4242.html for more detail.	X	X
WATERNLCD06	Gages-II	LC06_Basin	Percentage of the watershed classified as open water (class 11).	X	X
WOODYWETNLCD06	Gages-II	LC06_Basin	Percentage of the watershed classified as woody wetlands (class 90).	X	X
WTDEPAVE	Gages-II	Soils	Average value of depth to seasonally high water table (feet).	X	X