Wisconsin River Floodplain Project: Overview and Plot Metadata

CLASS I. DATA SET DESCRIPTORS

Data set identity: Plot-level variable information for Wisconsin River Floodplain Project. Relevant for following Wisconsin River Floodplain data sets: canopy trees, shrubs, tree seedlings, birds, soils and denitrification. (Italicized data sets not yet linked for download are in preparation, please check back again).

Data set identification code: WIRF_plotinfo.csv

Data set description: Data set includes Wisconsin River Floodplain project plot variables including plot identification information, geographic coordinates, forest patch area and perimeters, landcover classification for the 1930's, 1960's and 1990's, and distance from plot to each of the following: roads, the Wisconsin River, anthropgenic edge, and unforested edge.

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http://landscape.zoology.wisc.edu/index.html

CLASS II. RESEARCH ORIGIN DESCRIPTORS

Overall project description:

Originator: Monica G. Turner and Emily Stanley

Period of Study: 1999-2001

Project description: The Wisconsin River Floodplain Project aimed to identify landscape indicators that are well correlated with specific aspects of ecological function is a crucial research need requiring an integrated approach that combines landscape monitoring with field studies. Large river-floodplain systems are among the most diverse and dynamic landscapes in the US, providing many important societal values, but relatively little effort has been devoted to development and testing of landscape indicators for these systems.

We developed and tested ecological indicators for large river-floodplain landscapes along reaches of the Wisconsin River to determine which landscape metrics are most useful for monitoring population, community and ecosystem processes in large river-floodplain landscapes. Spatially extensive field sampling was combined with landscape analysis in nine reaches of the Wisconsin River sampling to quantify the ability of landscape indicators to predict ecological variables over broad scales. Landscape indicators were evaluated by their utility for detecting changes in the structure and function of the Wisconsin River floodplain landscape that were related to modification of the natural flow regime, historical land use, and current land-use patterns. Our field studies were concentrated in floodplain forest in nine 12 to 20-km reaches along the lower 400 km of the Wisconsin River.

For more information about this project, including key findings, please visit Dr. Turner's Wisconsin River Floodplain Project page (.

Sources of funding: Environmental Protection Agency STAR program (Ecological Indicators, Grant No. R826600)

2. Specific subproject description

Site description: Spatial extent of the 100-year floods (based on U.S. FEMA maps) on the lower 370 km of the Wisconsin River in Wisconsin, U.S.A. Data were collected from nine reaches, each 10-15 km in length and extending laterally to the edge of the 100-year floodplain. WIRF site locations in Wisconsin

Geography: Three geographic provinces: Northern Highland, Central Plain and Western Upland

Habitat: Floodplain (riparian) forest

Geology: Geologically, the Northern Highland province is characterized by multiple glacial moraines from the most recent Pleistocene glaciation (12 000 - 16 000 yr B.P.), and soils are dominated by glacial tills. The Central Plain province is composed of Cambrian (500 million years BP) sandstone lowlands and includes the lake bed of Glacial Lake Wisconsin. Dominant soils include sandy outwash plains and lacustrine flats. The final 150 km to the Mississippi River are dam-free, include large amounts of protected lands, and traverse the unglaciated Western Upland province

characterized by soft sandstones and limestone (Durbin 1997) and more coarse-textured soils.

Watersheds/hydrology: The Wisconsin River flows ca. 700 km from its source in northern Wisconsin to its confluence with the Mississippi River, dropping 328 m in elevation and draining 31 800 km2. The floodplain varies from wide and flat to narrow and steep. Dams on the Wisconsin River have reduced flow variability; summer and fall low flows (summer-fall) are augmented, and floods (winter-spring) are reduced Setback levees (earthen levees built on the floodplain but away from the river) were constructed in the early 1900s in the Wisconsin Dells reach.

Site history:

View following publications for more information on site history:

Burgi, M. and M. G. Turner. 2002. Factors and processes shaping land cover and land cover changes along the Wisconsin River, USA. Ecosystems 5:184-201.

Curtis, J.T., 1971. The Vegetation of Wisconsin. University of Wisconsin Press, Madison.

Freeman, R. E., E. H. Stanley and M. G. Turner. 2003. Analysis and conservation implications of landscape change in the Wisconsin River floodplain, USA. Ecological Applications 13:416-431.

Turner, M. G., E. H. Stanley, M. Bürgi and D. J. Mladenoff. 2007. Changes in the Wisconsin River and its floodplain. In: D. M. Waller and T. P. Rooney, editors. The vanishing present: ecological change in Wisconsin. University of Chicago Press (In press).

Climate: Average temperature in January is 14.3 ºF. Average temperature in July is 70.0 ºF. Average total annual precipitation is 33.1inches. (Data from Wisconsin Dells weather station (station ID#: 479319) from years 1971-2000 and accessed from Midwest Regional Climate Center: http://mcc.sws.uiuc.edu)

GIS-based calculations: The GIS-based calculations were done using data interpreted from aerial photographs and reported in: Freeman, R. E., E. H. Stanley and M. G. Turner. 2003. Analysis and

conservation implications of landscape change in the Wisconsin River floodplain, USA. Ecological Applications 13:416-431. This applies to calculations of distances, edge, patch size, and land-cover history data.

Sampling protocols: Please see individual data set metadata for this information.

CLASS III. DATA SET STATUS AND ACCESSIBILITY

For internal use only

CLASS IV. DATA STRUCTURAL DESCRIPTORS

Data Set File

Identity: WIRF_plotinfo.csv

Size: 40kb

Format and storage mode: ASCII text, comma delimited. No compression scheme was used.

Header information: See variable names in Section B.

Alphanumeric attributes: Upper and lower case

Missing value codes: "."

Authentication procedures: Column sums provided (for some variables) in table in Section B.

Variable information (N/A = not applicable)

Variable Name	Variable definition	Units	Storage Type	Range for Numeric Values
Reach	Name of Wisconsin River reach	NA	character	
Transect	Transect identifier	NA	Integer	
Plot	Plot identifier	NA	character	

Plotcode	Unique number for each plot	NA	integer	
X_coord	UTM easting (zone 16N)	meters	Floating point	
Y_coord	UTM northing (zone 16N)	meters	Floating point	
Elev	Elevation of plot	feet	integer	648-1123
Dist_ed	Distance from point to nearest unforested edge not including roads	meters	Floating point	0.488-483.177
Dist_an	Distance from point to nearest anthropogenic edge (agriculture, urban, orchard) not including roads)	meters	Floating point	11.624-4434
Rd_dist	Distance from point to nearest road	meters	Floating point	33-1471
Dist_riv	Distance from point to Wisconsin River	meters	Floating point	.448-1855.9
P_area	Patch area	ha	Floating point	1.1155-761.741
P_perim	Patch perimeter	meters	Floating point	
LC_30	Type of landcover in which the point was located in the 1930's landcover codes: 1 = Deciduous forest 2 = Coniferous forest 3 = Agriculture 4 = Grassland 5 = Waterway 6 = Open Wetlands 7 = Sand/barren 8 = Urban 9 = Orchard 11 = Cranberry bog	NA	Floating point	
LC_60	Type of landcover in which the point was located in the 1960's, (code definitions same as 1930's)	NA	Floating point	
LC_90	Type of landcover in which the point was located in the 1990's, (code definitions same as 1930's)	NA	Floating point	