



# Rainwater Basin Joint Venture Nebraska Landcover Dataset and National Wetland Inventory Dataset Index Guide

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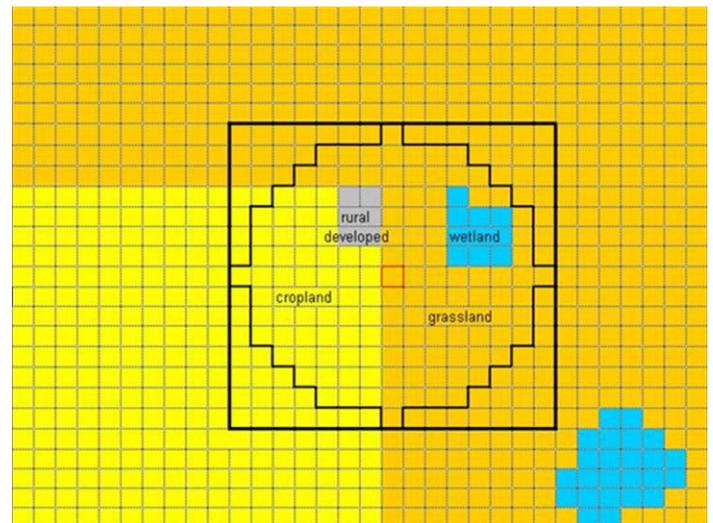
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## Overview:

Identifying the type, amount, and distribution of habitat throughout the landscape is a fundamental component in landscape ecology. In the conservation sciences, quantifying the availability and distribution of habitat within the habitat matrix provides insight on how to advance conservation success through targeted management strategies. Therefore an effective and efficient method of quantifying habitat over vast landscapes is necessary to provide adequate tools for conservation practitioners.

A moving window analysis, or focal statistics, is a means of quantifying habitat within a defined area through the use of a landcover dataset or an alternative raster representing a specific habitat classification. Regardless of the data source, the area of various habitat types within a specified distance is summarized in identical manners. Here we describe a moving window analysis using two alternative dataset types, the Rainwater Basin Joint Venture Landcover dataset and the National Wetland Inventory dataset (NWI). In the case of NWI, the vector data are first converted to a raster format for summary. A moving window analysis is conducted by summing (or averaging) all of the pixel values in the surrounding landscape (defined by the user) and recording the output value to the centroid (center raster cell) of the landscape (Figure 1). The process is repeated one cell over until the entire grid has been analyzed. To set the radius of the moving window (landscape dimensions), the number of pixels either left, right, up or down from the center pixel is multiplied by the cell size. The moving window radius in the example is approximately 200 m (7 pixels x 30m = 210 ≈ 200m; Fig. 1). The moving window adds up the number of pixels within the circular window that belong to a specific habitat class, usually classified in binary form (1s = habitat, 0 = otherwise). In the example, the center pixel is assigned a value of 6 for rural development in the output layer; for wetlands the center pixel has an assigned value of 10, and for cropland the center pixel has a value of 54. Then, the window shifts to the right and summarizes the surrounding area around the next pixel. The whole process continues until every pixel in the raster layer has been summarized. In the case of raster containing a 30 m pixel resolution, area is calculated by multiplying the number of pixels by 900 square meters (30m x 30m). The raster output can be assigned to a vector area, such as wetland outlines or farm tracts, by assigning the majority or average pixel value that occurs within the polygon. Another option is to evaluate the output as a percentage of the landscape so that the values are consistent regardless of the size of the moving window. The output pixels are divided by the total pixels within the circular window to obtain the percentages of the surrounding landscape classes at each defined spatial scale.

Again assuming the pixel size in Figure 1 is 30m, the radius is 210 meters and the total number of pixels within the circular window is 149, or 134,100 m<sup>2</sup> (149x900). We have cover class “cropland”, which is distributed throughout 54 raster cells within the circular window. To determine the percent of area within 210 meters of the center pixel that is classified as “rural developed”, the moving window analysis adds up the total number of cells for each cover class (in this case 54) and divides them by the total number of cells possible (149 cells). The output is multiplied by 100 and assigned to the centroid raster cell within the circular (or alternate shape) window and the entire process is repeated in the adjacent raster cell until every cell has been summarized. In this case, 36% of the window area is classified as cropland.



**Fig. 1.** An example of a focal summary moving window application on a theoretical landcover dataset

Moving window analysis can also be utilized to determine the number of features within a specific radius. During raster conversion, all wetlands or wetlands of different types are assigned unique values. When the moving window summarizes data, instead of recording the total number of pixels, the output summarizes the number of unique values within a radius of the central pixel. The output includes the feature itself; to isolate only the surrounding features, one is subtracted from the final output. Depending on how the data are set up, this method can be used to determine the number of different wetland types within the defined landscape, in which case each unique number represents a different wetland type (*i.e.*, semi-permanent = 1; seasonal = 2; temporary = 3; etc.), or alternatively, the values can represent individual wetlands within certain classes. For instance, where the landscape contains 6,000 semi-permanent wetlands, raster values will range from 1 to 6,000.