

County Spatial Review - Introduction

NASS also produces acreage estimates at the county level for major crops. This section reviews the quality of the CDL across counties for spring wheat, the largest crop in acreage and value in North Dakota. Error matrices and derived statistics were generated for each county of the North Dakota CDL. To display county boundaries on a map an ArcGIS shapefile was restructured into a polygon data format compatible with the PolygonPlot class. This is used purely as an annotation layer and not linked to the statistics table. The county crop statistics table includes the coordinates of the centroid of each county in the same map projection as the county boundaries to align with the county boundary annotation layer.

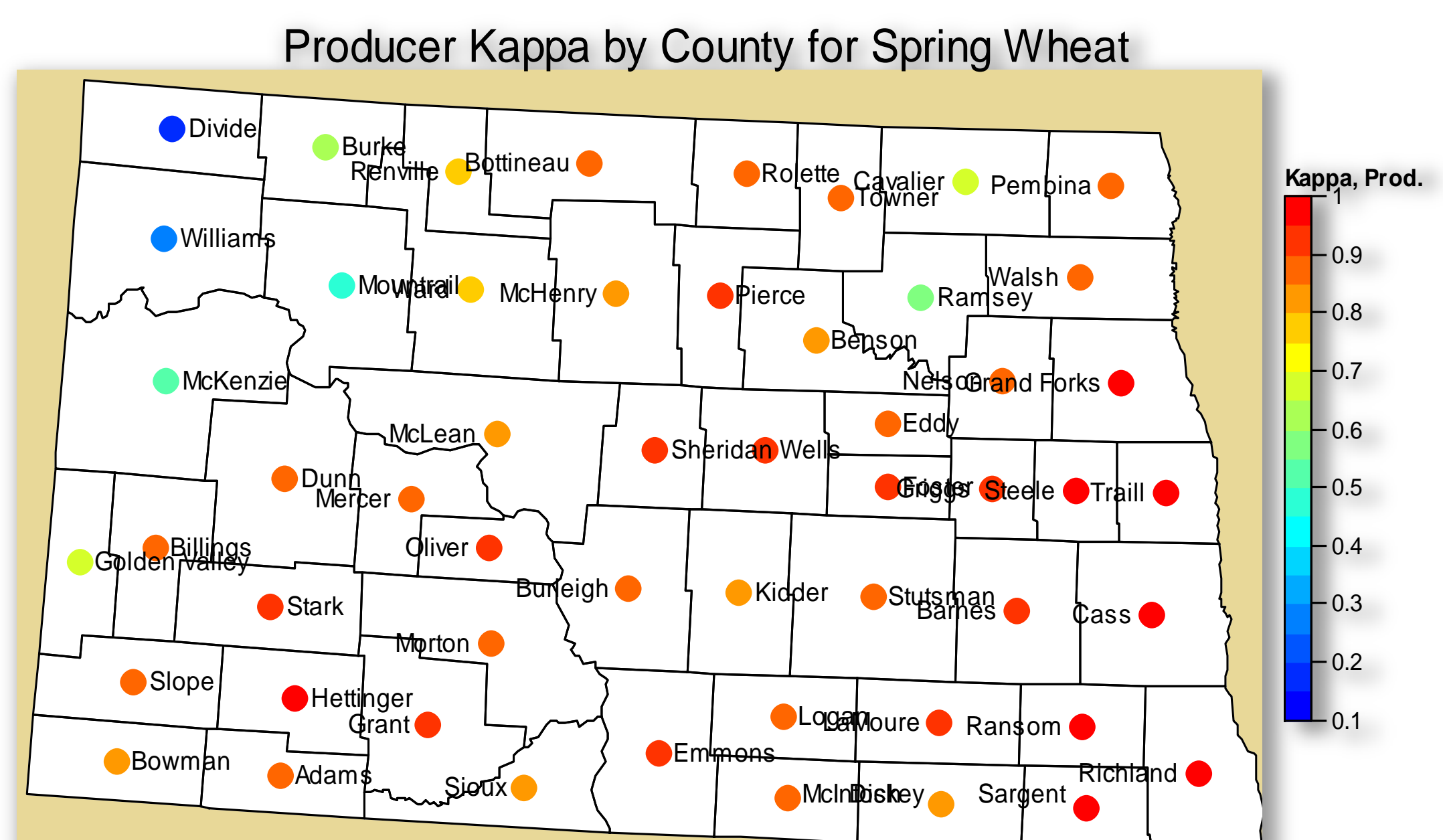
County Spatial Review – Kappa by County

The spatial distribution shown in this map was created with the ScatterPlot class and then underlain with the county boundaries using the SAS supplied DrawPolygonsByGroups module. Colors were defined in the data table and are the same and linked to the points of other graphics derived from the data table.

```
/* color code observations by values of KapProd */
objCtyCrp.GetVarData("KapProd", z );
SubDiv    = DO(0.1,1.0,.05); /* determines colors and values */
numColors = NCOL(SubDiv)-1;
Colors    = BLUE // CYAN // YELLOW // RED ;
ColorMap  = BlendColors( IntToRGB(Colors), numColors );
c         = RGBToInt( ColorMap );
DO i = 1 TO NCOL (SubDiv)-1;
  idx = LOC( z >= SubDiv[i] & z < SubDiv[i+1] );
  IF TYPE(idx)='U' THEN
    objCtyCrp.SetMarkerColor( idx, c[i, ] );
END;
```

The legend for this map was created in a drawing block so that it could be removed, tweaked and replaced. The DrawContinuousLegend module is provided by SAS and is new in IMLStudio 9.2:

```
pScatCty1.DrawRemoveCommands("Legend");
pScatCty1.DrawBeginBlock("Legend");
  Ticks      = DO(0.1,1.0,0.1);
  TickPos    = (Ticks-0.1)/0.9;
  LegendSizeFrac = {0.08, 0.6};
  run DrawContinuousLegend( pScatCty1, Ticks
    ,TickPos, "Kappa, Prod.", 8, ColorMap
    ,LegendSizeFrac, "OR" );
pScatCty1.DrawEndBlock();
```

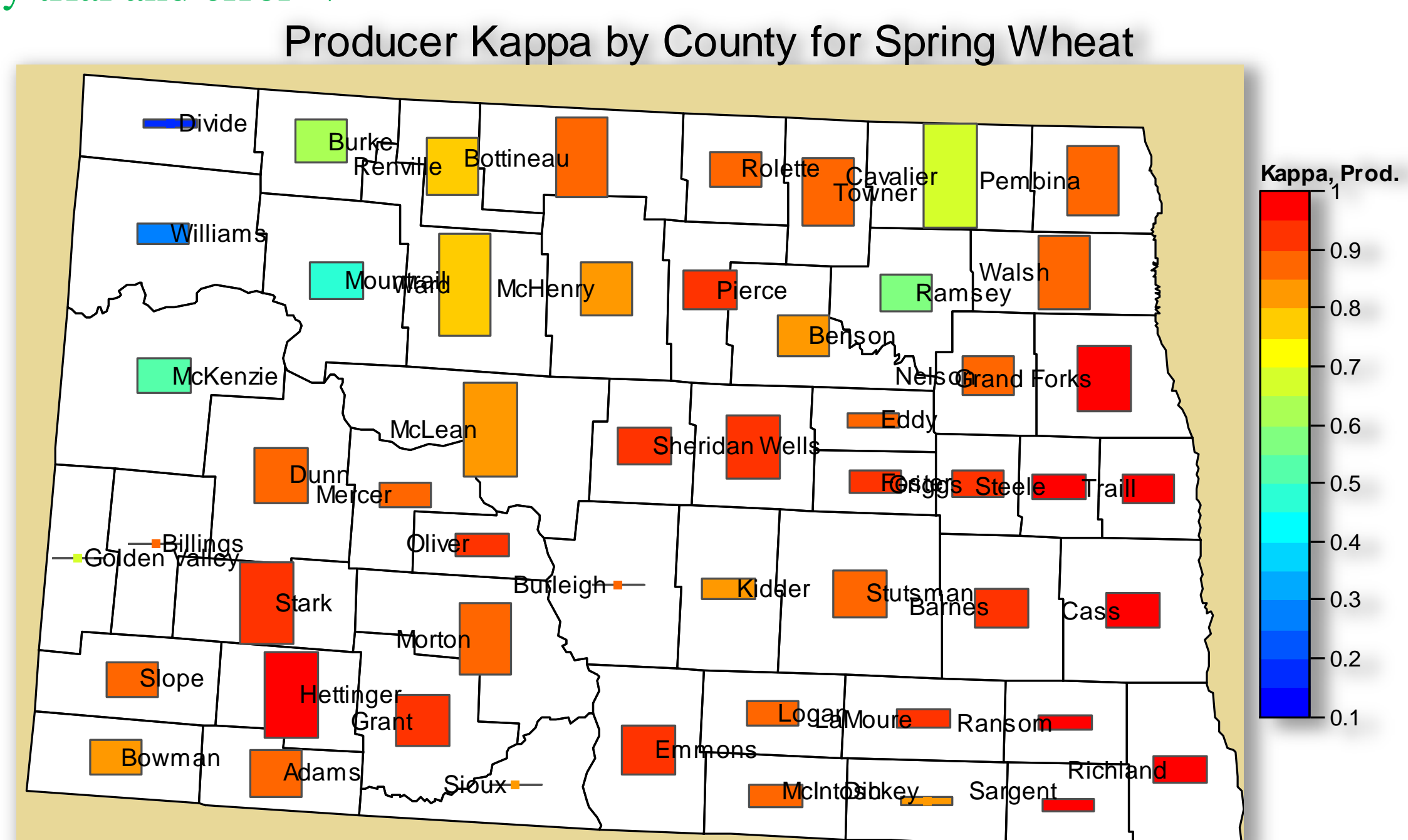


County Spatial Review – Adding Relative Importance

Clearly there is a pattern with the lowest kappas across the northwest and two counties in the northeast. An analyst with limited time may not be concerned if a county's crop classification has a low kappa if the acreage is low relative to other counties. This map puts these kappas in perspective by plotting a rectangle that approximates the actual acreage of spring wheat in each county, again bringing across the color coding of the previous map. Rectangles of fixed width across counties were chosen over squares to improve the visual comparison of the relative acreages between counties. Counties with only circles are not published by NASS for this crop. While the rectangles themselves are not selectable and not linked to the data table, the county centroids underneath are linked and can be selected.

```
/* Base is width in meters of the rectangles, arrived at by trial and error */
```

```
Base = 25000;
pScatCty1.DrawRemoveCommands("Squares");
/* Begin drawing block to create rectangles */
pScatCty1.DrawBeginBlock("Squares");
pScatCty1.DrawPushState();
pScatCty1.DrawResetState();
pScatCty1.DrawSetRegion( PLOTBACKGROUND );
pScatCty1.DrawSetPenColor( CHARCOAL );
pScatCty1.DrawUseDataCoordinates();
DO i = 1 TO NROW(RectINColor);
/* Acreage data is converted to meters and diagonal
corners of rectangle calculated */
DiagDist=RectINColor[i,3]*4046.86/Base/2;
x1 = RectINColor[i,1]-Base/2;
y1 = RectINColor[i,2]-DiagDist;
x2 = RectINColor[i,1]+Base/2;
y2 = RectINColor[i,2]+DiagDist;
/* Color for this rectangle set */
pScatCty1.DrawSetBrushColor(RectINColor[i,4]);
/* Draw rectangle for this county */
pScatCty1.DrawRectangle(x1, y1, x2, y2, TRUE);
END;
pScatCty1.DrawPopState();
pScatCty1.DrawEndBlock();
```



Conclusion

Error matrix analysis has been around for some time but the SAS/IML and IMLPlus tools available through IML Studio aid in the calculation and display of the data, especially the large matrix of up to 256 categories from the cropland data layer. The mosaic plot summarizes the error matrix into one picture with interactive shortcuts to subset the classes of interest and manipulate the display. Accuracies and kappa values can be calculated with SAS/IML matrix functions and merged back to the data table and scatter plots created which are linked to other charts. County data may be mapped to show spatial trends and custom created layers such as the color coded acreage rectangles added to improve interpretation. IML Studio is the ideal environment for exploring this type of data.