QA/QC for GIS Data: Visual Inspection and Quality Control

Transcript

Welcome to our ESRI Instructional Series podcast: Visual Inspection and Quality Control for GIS Data.

I'm Keith Mann from Educational Services at ESRI in Redlands, California. Today, I will provide a few tips and tricks you can use when performing visual inspection of your GIS data. This discussion is tailored to GIS managers and coordinators and GIS data producers.

Visual assessment or inspection of GIS data is probably the most common method of quality control. And yet, it's the most time-consuming and expensive process of QA/QC. Today I am going to focus on several strategies that I hope will make your visual inspection of GIS data more efficient. I will briefly cover three topic areas: (1) managing the inspection space, (2) employing a visual inspection tracking layer, and, (3) using the Overview and Magnifier windows during quality control. Keep in mind that these methods are quality control techniques. The issues for deciding which feature classes to assess, how many features to inspect, and how those features will be evaluated for quality, should be described completely in the quality assurance plan for the project.

During QA/QC, visual inspection of the data should be a methodical and consistent effort. Even if you're only planning on spot-checking a dataset, you want to adopt a systematic approach. Here are some strategies for managing the inspection space.

When you view data layers and maps in ArcMap, you do so through a data frame. You can set certain properties of the data frame to control what you see in the display window. If you right-click the data frame in the table of contents, you'll access the Data Frame Properties dialog box. In the dialog box, click the Data Frame tab and you'll see several options. If you check the Use Fixed Scale radio button and enter a scale value, say 1-500, you can ensure that the data will be inspected at that specified scale.

If instead, you check the Fixed Extent radio button, you can enter a geographic extent that will limit the view in the data window to that specified extent. Be aware that there is an Advanced button with a Fixed Extent option. Clicking it provides you with further options, such as choosing the existing extent of a polygon feature class in the data frame, or you can choose to use different coordinate system values to express the extent like decimal degrees, or, my personal favorite, you can choose the extent of a selected graphic. To apply the extent of a selected graphic, you must

first use a Drawing tool on the Draw toolbar and draw a graphic shape, like a rectangle, which describes the area in the map where you want to limit the inspection. Make sure to give the graphic a hollow fill color, and make sure it's selected. Then, on the Data Frame tab of the Data Frame Properties dialog box, check the Fixed Extent radio button, click the Advanced button, and then check the Outline of Selected Graphics radio button and click OK.

If you want to completely hide features outside of the inspection area, check the box for Enable, in the Clip to Shape panel on the Data Frame tab. With this option, you can also use the outline of a polygon layer in the data frame, the outline of a selected graphic, or a custom extent. Whichever extent you choose, features outside the extent will not be drawn in the map.

Another strategy that will help you with your visual inspection efforts is to create a layer for tracking the review process. As you move methodically through your visual inspection, it's a good idea to keep track of where you've been. Ideally, in QA/QC, you would use something like a quality control grid, which in this context, is a polygon feature class composed of equally-sized polygons arranged in rows and columns. A quality control grid should have a spatial extent slightly larger than the data layer being inspected. You can create a grid like this programmatically.

Instead of a quality control grid, you can create a quality control tracking feature class by borrowing polygon features from another feature class. For example, you can use administrative boundaries, like zoning polygons, or even natural boundaries, like watershed polygons. Just make sure the feature class covers your study area and is composed of contiguous polygons. In ArcCatalog, simply copy the feature class and paste it into your QA/QC geodatabase, rename it, and then delete all of the non-required fields.

Next, create a domain in the QA/QC geodatabase. Name it something like INSPECTION_STATUS and compose several domain values for it that indicate the inspection status. For example, "not started," "in progress," and "complete." In the quality control grid, or quality control tracking feature class, add a text field named QC_STATUS and assign the inspection status domain to it. Add the quality control grid or tracking feature class to ArcMap, and change the symbolization for the layer so that it represents the three inspection status categories. Use the layer to guide your visual inspection progress. For example, once you've

finished inspecting the features inside the quality control polygon, change the QC status attribute value from *not started*, or *in progress*, to *complete*.

A third strategy that will improve your visual inspection efficiency is to use the Overview and Magnifier windows. Continually zooming in and out of the map during visual inspection can have a disorienting effect causing you to get lost in the data or confused about which features you've inspected. There are two standard tools that can help you keep your focus. First, there's the Magnifier window, which allows you to interactively see more detail without changing the display scale. From the Windows menu, on the Main Menu toolbar, click Magnifier. This window behaves like a magnifying glass that you can move and drop any place on your map. You can resize the Magnifier window and you can change the magnification factor by right-clicking on the title bar and clicking Properties.

For example, you can change the zoom percentage from 400 percent to 800 percent. You can also interactively select features in the Magnifier window with the Select Features tool, or identify features with the Identity tool, and you can edit features inside the Magnifier window. Next there's the Overview window, which is launched by clicking Overview on the Windows menu. The Overview menu shows the full extent of one of the layers in the map, or any feature class you choose. This layer is called the reference layer. A box in the Overview window represents the currently displayed area on the map. In the Overview window, you can move this box to pan the map, or you can reshape the box, which causes the map display to zoom in and out. You can change the reference layer and the Display Extent box symbolization by right-clicking on the title bar of the Overview window and clicking Properties.

Let me review the topics covered in this broadcast. During QA/QC, visual inspection of the data is time-consuming and expensive, but you can make the process more efficient by employing a few techniques. First, you can manage the inspection space. One method for doing this is to reconfigure the Data Frame Extent options in the Data Frame Properties dialog box. Second, you can employ a visual inspection tracking layer to help you keep track of the status of the inspection progress. A quick way to make this type of layer is to borrow polygons from an existing feature class. Third, try using the Magnifier and Overview windows during visual inspection.

For more resources, please check out our instructor-led training courses at www.esri.com/training. This discussion touched on topics that are covered in our two-day instructor-led course *QA/QC for GIS Data*.

Thank you for tuning into this session of our ESRI Instructional Series podcast. Stay tuned for future broadcasts.