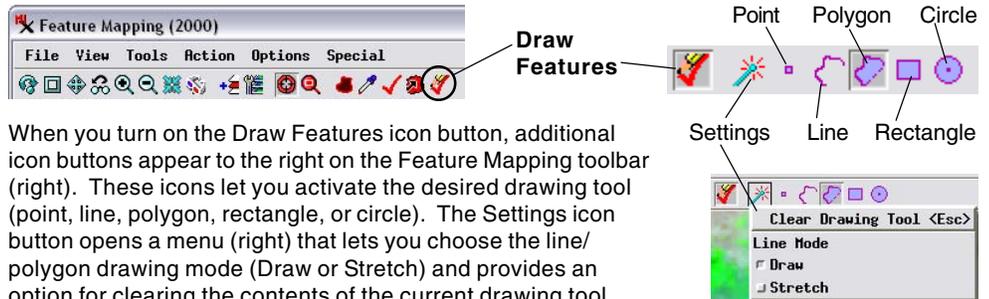


# Draw Features, Prototypes and Protected Areas



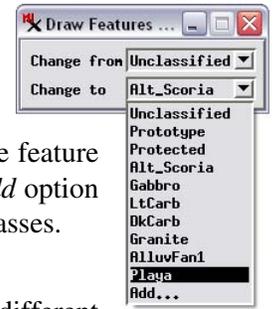
In addition to automated tools for classifying multispectral images, the Feature Mapping process in TNTmips provides drawing tools that let you manually modify the set of features you are creating. Using the *Draw Features* tool set (icon illustrated to the left) you can draw and add individual features, draw prototypes for later assignment to features, change all or part of an existing feature to another feature type (or unclassified), and define protected areas to be left unclassified by the automated classification procedures (*Define Samples* and *Grow and Mark Features*). You can switch between classification tools at any time.

When you turn on the Draw Features tool set using its icon button on the Feature Mapping toolbar, additional icon buttons appear to the right on the Feature Mapping toolbar (point, line, polygon, rectangle, or circle). The Settings icon button opens a menu (right) that lets you choose the line/polygon drawing mode (Draw or Stretch) and provides an option for clearing the contents of the current drawing tool.



When you turn on the Draw Features icon button, additional icon buttons appear to the right on the Feature Mapping toolbar (right). These icons let you activate the desired drawing tool (point, line, polygon, rectangle, or circle). The Settings icon button opens a menu (right) that lets you choose the line/polygon drawing mode (Draw or Stretch) and provides an option for clearing the contents of the current drawing tool.

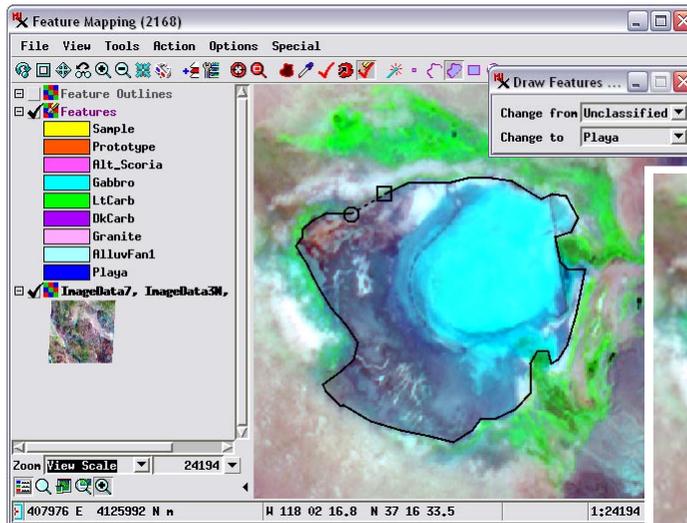
The icon buttons allow you to choose a specific drawing tool: point, line, polygon, rectangle, or circle. A Settings button provides a menu that lets you clear the drawing tool and change between standard modes for drawing lines or polygons (Draw or Stretch). The Draw Features window (illustrated to the right) provides two menus, each of which allows you to choose an established feature class, Unclassified, Prototype, or Protected. The *Change from* menu sets the feature class or other area type to operate on, and the *Change to* menu sets the output assignment. The *Add* option at the bottom of the menu opens a dialog that allows you to define one or more additional feature classes.



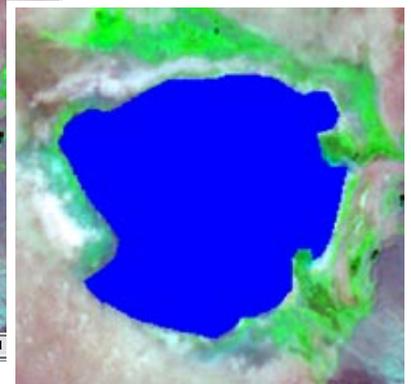
## Draw Feature or Prototype

In some cases you may wish to assign an area to a single feature class despite the fact that it includes different surface materials exhibiting varied spectral signatures (producing different colors in your reference RGB band combination). The example in the illustration below at left is a dry lake bed in an arid region, shown in an ASTER satellite image using a false-color band combination.

The lower portion of the lake bed is covered by precipitated salt (shown in the cyan color in the reference image), while higher areas are covered by dark mud (dark gray color). Mapping this composite feature using the automated classification tools (*Define Samples* or *Grow and Mark Features*) would be cumbersome, so it may be easier to simply draw the feature using the Polygon tool provided by the Draw Features mode as shown.



Using the Polygon tool to outline a previously unclassified area (left) and assign it to a feature class. The mapped feature (blue) is shown below.

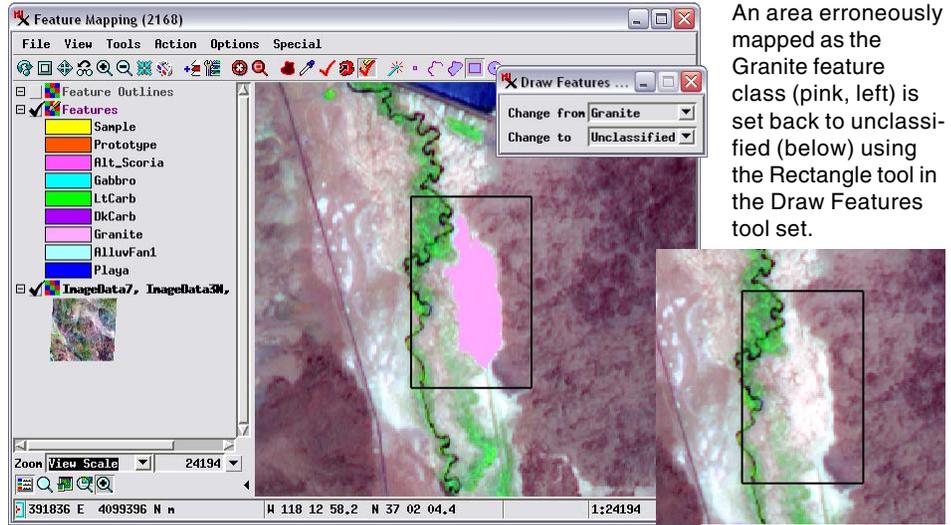


To draw a new feature in a previously unclassified area, choose Unclassified from the *Change from* menu, then choose the desired output feature class from the *Change to* menu. Use any of the provided drawing tools to draw or outline the feature, then right-click to assign the area to the feature class. Instead of drawing features directly, you can draw areas as *prototypes*, groups of cells that are indicated by a special color in the Feature Mapping window but have not yet been assigned to a feature class. To do so, choose Prototype from the *Change to* menu instead of a feature class. Once you have drawn one or more prototypes, you can use the Mark Features tool to choose which ones to assign to particular classes (see the Technical Guide entitled *Feature Mapping: Define Samples and Mark Features*).

(over)

## Reassign Feature Areas

You can also use the Draw Features tool set to assign a previously-classified feature or group of features to a different feature class or to mark those cells as unclassified. In the Draw Features window, use the *Change from* menu to choose the feature class of the feature(s) you want to change, and the *Change to* menu to select the output feature class (or Unclassified). Use the Polygon, Rectangle, or Circle tool to enclose all of the features you want to reclassify, then right-click to make the assignment. In the example illustrated here, an area incorrectly assigned to the Granite feature class (pink color) is changed to Unclassified using the Rectangle tool in the Draw Features tool set.



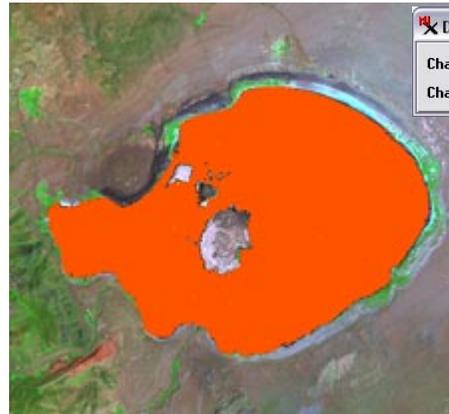
An area erroneously mapped as the Granite feature class (pink, left) is set back to unclassified (below) using the Rectangle tool in the Draw Features tool set.

## Draw Protected Areas

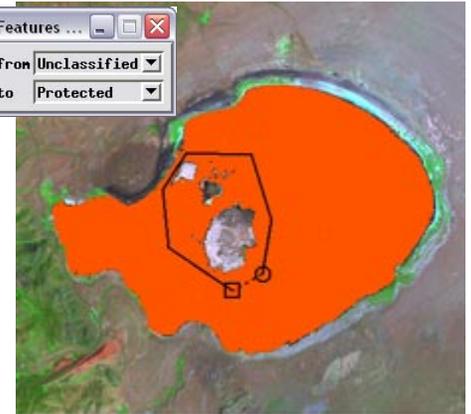
The Draw Features tool can be used to designate areas to be excluded from any manual or automated classification procedures in Feature Mapping. Such areas are designated as Protected. To create protected areas using the Draw Features tool set, choose Protected from the *Change to* menu in the Draw Features window before outlining the desired area. One application of protected areas, illustrated below, is to protect islands (real or virtual) within a prototype area from being assigned to the designated feature class along with the surrounding prototype by the optional hole-filling procedure (Options / Hole-Filling).



Lake with islands in Landsat Band 7-4-2 reference image.

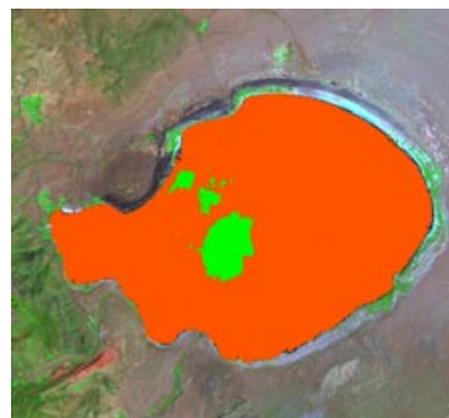


Prototype (orange) from Define Samples tool covering lake surface and surrounding the islands.

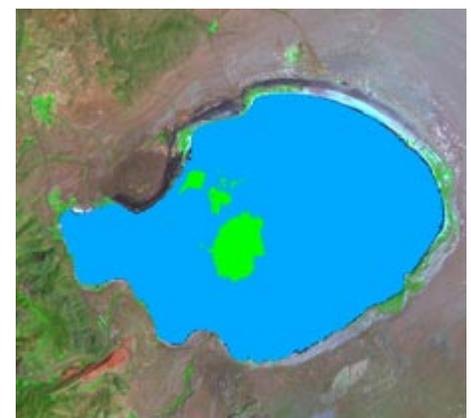


Drawing polygon around islands using Draw Features tool to change Unclassified cells to Protected.

When a prototype is *marked* (assigned to a feature class), holes of any size within the prototype are automatically filled when the hole-filling option is turned on (Options / Hole-Filling). When prototype features have been identified with the Define Samples tool, you can easily designate unclassified "holes" as Protected so that they will not become part of the feature when the prototype is marked. These illustrations show an example of actual islands within a lake. After a prototype is created for the lake surface using the Define Samples tool, the Draw Features polygon tool is used to protect the islands. Because only unclassified cells were set to be protected, there was no need to meticulously draw the exact outlines of the islands.



Islands now Protected (green), so the hole-filling procedure will not mark these areas as water along with the lake surface.



Lake surface prototype assigned to Water feature class (blue).