Esri Inc.

Exercise 2 – Working with Data and Creating Assessment Layers

GeoPlanner℠ for ArcGIS®

Esri Inc.
4-8-2016

Contents

Exercise 2 – Working with Data and Creating Assessment Layers

Introduction

Each planning project is unique and, as such, the data layers needed for decision making and analysis differ from project to project. GeoPlanner℠ for ArcGIS® allows you to tap into the vast amount of data and layers available in ArcGIS Online. The layers available in ArcGIS Online include a broad spectrum of types such as landscape layers, demographic layers, imagery layers, and more. In addition to the data layers already provided in ArcGIS Online, you can also make use of any local datasets you might have on hand by simply publishing and registering them with ArcGIS Online for use in GeoPlanner.

In this exercise, you will examine the Explore segment of GeoPlanner. First, you will search ArcGIS Online to find and add a variety of layers that are relevant to your specific planning project. Once you have those layers available within the app, you will use them to perform some simple analysis that will allow you to quickly assess the suitability of three potential sites for your redevelopment activity.

Adding layers to your map

GeoPlanner works with virtually any type of layer supported by ArcGIS Online. Map layers, image layers, and feature layers can all be added to your GeoPlanner project. Once added, any of these layers can be used within the application for simple visualization or even as inputs to analysis processes. Let's take a look at how we can find and use a number of different layers from ArcGIS Online to support our current planning project goals.

Add Potential Redevelopment Sites Layer

If you recall from our project goals that were specified in the previous tutorial, your first task is to determine which of three potential sites will be chosen to generate a couple of alternative plans for redevelopment in Lakeside, California. To get started with this task, you first need to add a layer to your project that contains the boundaries for the three potential redevelopment locations. Follow these steps to search ArcGIS Online for the layer containing the potential site locations and then add it as a layer in your project.

1. Activate the Explore segment. Notice that the segment-specific tools display underneath the Application Toolbar.
2. Toggle the Contents window to be visible by clicking on the Contents tool in the left side of the Application Toolbar. Notice that your project currently only contains four layers: a basemap called "Topographic" and three different "Active Scenario" layers (one for points, one for lines, and one for polygons).
3. Click the "Add Data" tool to bring up the dialog for finding and adding layers from ArcGIS Online. Notice that you have a variety of ways in which you can search, filter, and sort the layers available to be added to your project.
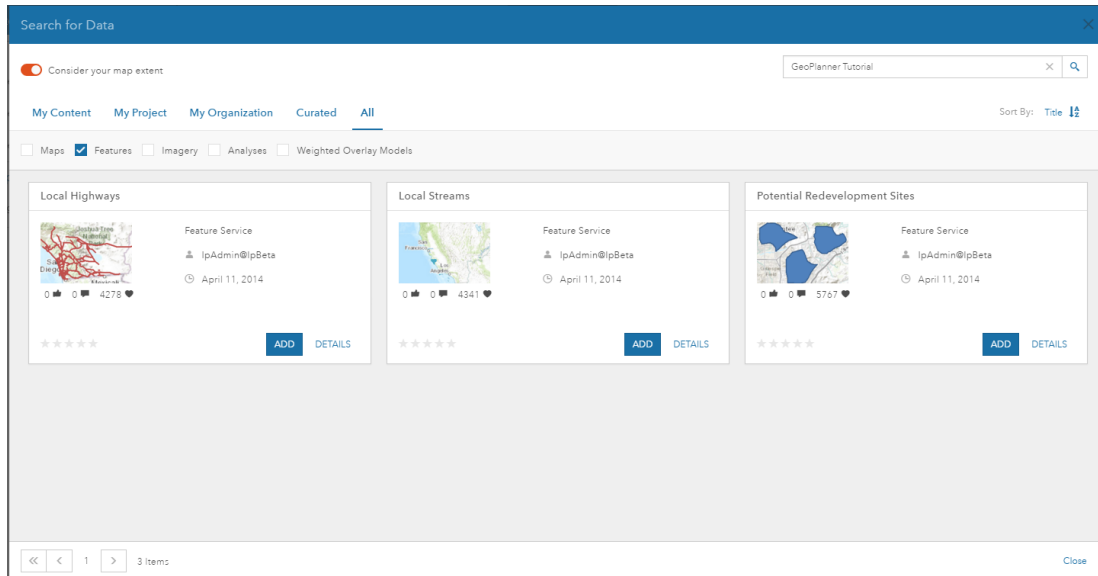
a. Click the "All" tab to ensure you are searching all publicly available layers in ArcGIS Online.

b. Click the "Features" check box to filter the results displayed to show only feature layers.

c. Type "GeoPlanner Tutorial" in the search box and hit the Enter key to further refine and filter the search results. You should now see a small set of layers from which to choose.

d. Find the layer named "Potential Redevelopment Sites" and click the "ADD" button to add it as a layer in your project.

e. You will notice that the "Potential Redevelopment Sites" layer has been added to your Contents window and the three features are drawn on top of your basemap.

4. Click the gear icon next to the "Potential Redevelopment Sites" layer in your Contents window to reveal the layer context menu. Notice that you can invoke a number of functions against the layer from this location including controlling its draw order, setting its transparency, removing it from the project entirely, and more. For now, click the "Zoom To" option to ensure your map display is zoomed tightly around the 3 potential redevelopment sites.
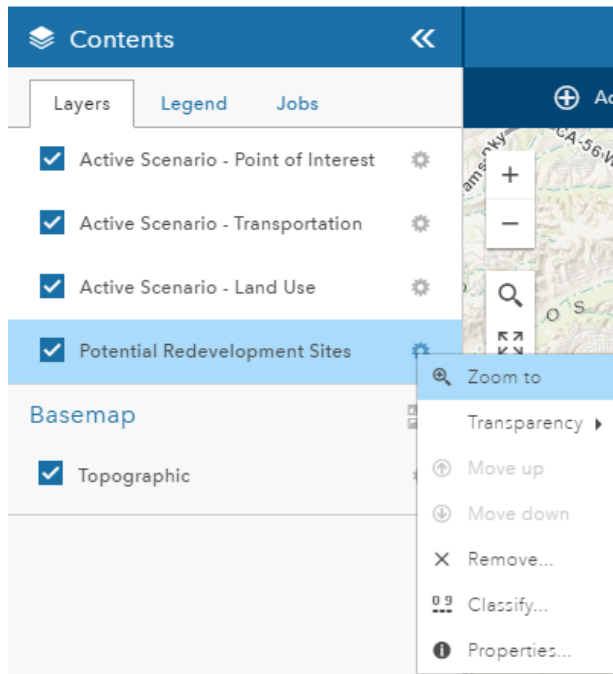
5. Now that you have a better defined area for the project activities going forward, let's update the project extent so that any other project team members can easily zoom to it.
    a. Click the "Extent" icon in the Common Tools section, select "Save Project Extent".
    b. Click the "SAVE" button in the dialog to update the project extent to what is currently displayed.

Add Local Rivers and Local Highways Layers

Our other criteria for determining the site for detailed redevelopment planning activities has to do with proximity to local rivers and highways. Let's search for some data that can be used in our project that includes local streams and local highways in order to support assessing the best proposed site for our planning activities.

1. Click the "Add Data" tool to bring up the dialog for finding and adding layers from ArcGIS Online. Notice that your previous search settings have been retained.
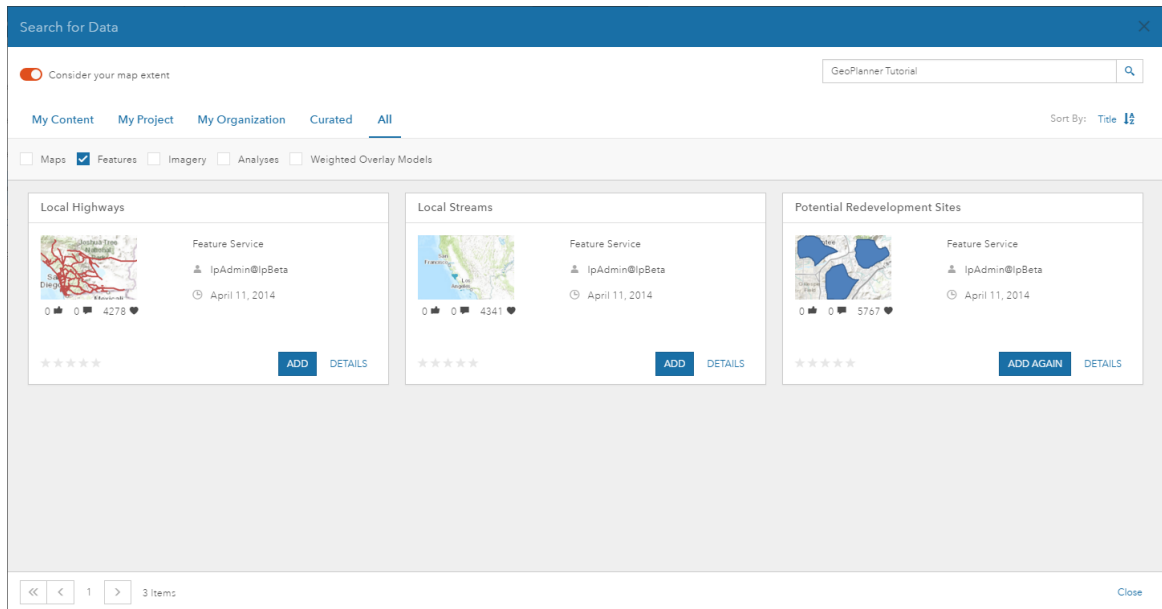
2. If not already there, in the search box, enter "GeoPlanner Tutorial" and press the Enter key.
3. Find the layer named "Local Streams" and click the Add button to add it as a layer in your project.
4. Next, click the "Add Data" tool again and use the dialog to find the layer named "Local Highways". Click the Add button to add it as a layer in your project.
5. You should now see that two new layers have been added to your Contents window and the new features are drawn on your map.

Add Conservation Lands Layer

Our final factor for consideration when deciding which of the three areas we will select for redevelopment planning has to do with minimizing impacts related to existing conservation lands. Let's search for some data that can be used to support this assessment like we have for the others:

1. Click the "Add Data" tool to bring up the dialog for finding and adding layers from ArcGIS Online. Notice that your previous search settings have been retained.
2. In the search box, clear out "GeoPlanner Tutorial" and press the Enter key.
3. For the type of layer to search for, uncheck the box next to "Features" and then check the box next to "Maps".
4. Type "San Diego Conserved Lands" in the search box and press the Enter key.
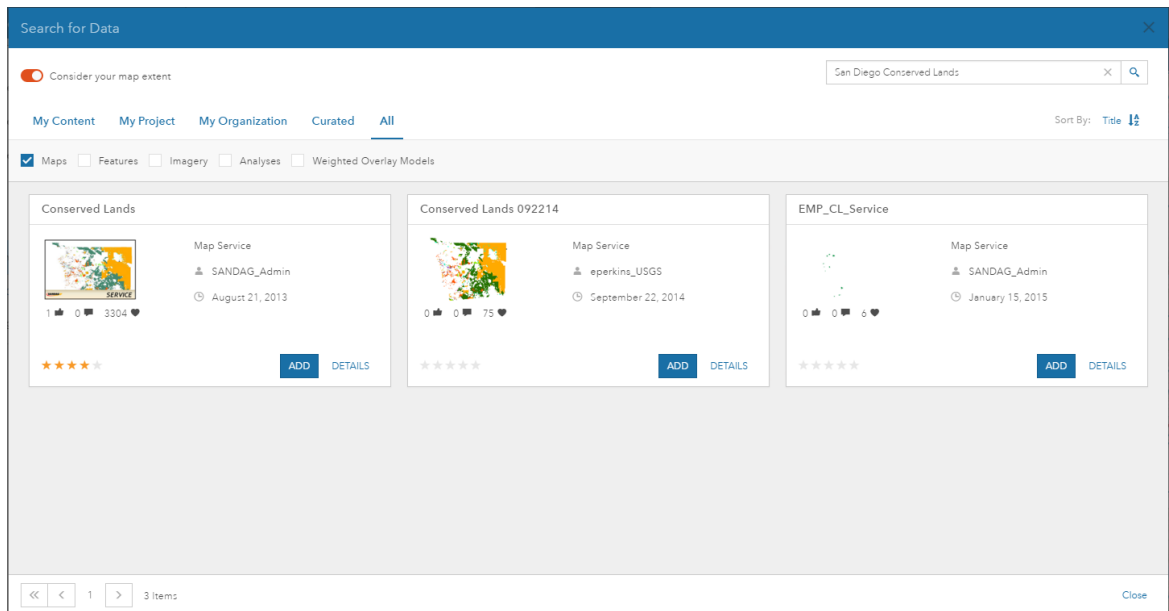
5. Find the layer named "Conserved Lands". This is a good example of a dataset that has been compiled and published by another organization to ArcGIS Online and then shared for public use. If you click the "Details" button, you can see more information about this particular layer, including that it was provided by "SANDAG Regional Information Services – GIS".
6. Once you have looked at the item details to verify the lineage of this data source, click the "ADD" button to add it to your project.
7. Click the "Open Menu" button ☰ to open the Project Backstage, select the "Save" option, then click the "SAVE" button to save your project map with all of the newly added data layers.

Note: The "Conservation Lands" layer is one that was published to ArcGIS Online and made publicly accessible by another organization. ArcGIS Online is full of public datasets like this that can add value to planning activities, and GeoPlanner allows you to include these data layers in your planning project in the same easy way as working with your own online content.

Performing analysis to assess potential sites

Now that you have the initial data layers required for your project, let's get started with assessing each of the three potential redevelopment sites. Your initial assessment is focused on proximity to a number of other land-based features (local streams, highways, and conservation lands). GeoPlanner will allow you to leverage the analysis services provided by ArcGIS Online to generate additional derived layers in your project that allow you to easily visualize each of the three potential sites relative to our selection criteria.

Proximity Assessment

Two of the location criteria that you want to assess for your potential sites include their proximity to local streams and highways. In both cases, you want to focus your redevelopment planning efforts on areas that are a half-mile or further away from these things. A simple buffer analysis against the Local

Streams and Local Highways layers that you've added to your project will allow you to visually assess your sites relative to this selection criteria.

To generate Local Stream and Local Highway proximity assessment layers, follow these steps:

1. Activate the Explore segment. Notice that the segment-specific tools display underneath the Application Toolbar.
2. Click the Analysis drop-down and select Use Proximity, then choose "Create Buffers" from the list to display the Create Buffers control.

a. Select "Local Streams" for the feature layer to be buffered.
b. Choose to buffer by "Distance", and enter a value of 0.5 miles.
c. Expand the Options section and set your Buffer type to "Dissolve".
d. Enter "Local Streams Proximity (0.5 Miles)" for the Result layer Name.
e. Ensure the box is checked next to "Use current map extent" so you are only buffering the features in the current view that are relevant to your current project extent.
f. Click the "Run Analysis" button to begin executing the buffer operation.
3. Click on the "Jobs" tab in the Contents control so that you can monitor the progress of your analysis processes. Analysis processes like this buffer operation against the Local Streams layer are executed asynchronously as background jobs handled by ArcGIS Online. You can continue to

use the application while the jobs are running and you may have multiple background jobs running simultaneously.
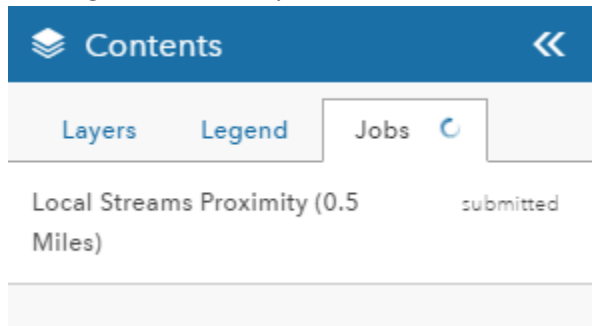
4. When the job is executing, the status in the Jobs tab will change to from "submitted" to "running". When the job completes executing, the output analysis layer will be added to your project. The status of the entry in the Jobs tab will also be updated from "running" to "processing" to "completed".
5. Repeat the above process to generate a half-mile buffer analysis layer around the Local Highways layer. Name your output layer "Local Highway Proximity (0.5 Miles)".

Overlay Assessment

In addition to the Buffer analysis shown above, GeoPlanner includes Overlay analysis capability and many other analysis tools. Using this tool, you can overlay any two layers in your project to produce a new output layer that has the combined information from both layers. By repeating this process multiple times with multiple layers, you can essentially create a "map sandwich" where a single layer in your project contains information consolidated from many different individual layers. This can be useful when you want to perform assessments based on multiple variables/factors that are dependent on one another.

For your purposes in this tutorial, however, a simple visual overlay assessment of the layers will suffice:

1. Open the Contents window, click the "Layers" tab, then turn off all layers (by unchecking them) except the "Potential Redevelopment Sites" layer and your basemap.
   a. In the Contents window, click the gear icon next to the Potential Redevelopment Sites layer then choose the Transparency option and set the transparency of the layer to 50%.
   b. Next, ensure this layer is moved above the Local Streams Proximity, Local Highway Proximity, and Conserved Lands layers. Again, click the gear icon next to the layer and use the "Move up" and "Move down" options to position the layers accordingly.
2. Turn on the "Local Highway Proximity" layer to see if any of the areas are within the half-mile distance you are trying to avoid when siting your project activities. All 3 sites appear to be viable based on highway proximity.
3. Next, turn on the "Local Streams Proximity" layer to see if any of the areas are within the half-mile distance we are trying to avoid. Now you can start to see some impacts. All potential sites appear to have some amount of overlap with local streams, but the northwestern-most potential site appears to exist in an area with a high concentration of local streams and should probably be dropped from consideration at this point. So, now you are down to two potential sites and you have one more factor to assess: existing conservation lands.

4. Turn on the "Conserved Lands" layer in your Contents window to see how that factor impacts the potential sites. Again, you will notice that both of the remaining sites have some amount of conservation lands within their limits. The northeastern site clearly has a significantly larger amount and type of conservation lands to be considered, though, so you can safely say that the southern site is the one that best meets the criteria for redevelopment planning and start to focus your efforts on that area as you continue with your detailed plan development.
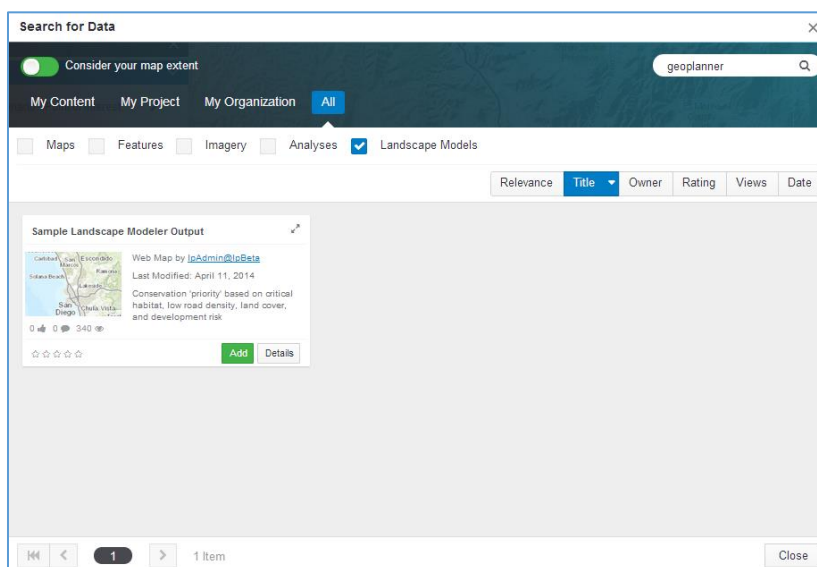
Weighted overlay modeling with GeoPlanner

Suitability analysis can be a time-consuming process with conventional desktop GIS tools. GeoPlanner supports suitability analysis through a Modeler widget. The Modeler performs weighted raster overlays to help you visualize information such as critical habitats, development risk, and fire potential, across the United States. This information can be used to research sites for urban development, housing developments, habitat locations, and other projects that require you to weigh several types of data against each other. Modeler helps you assess site conditions relative to your planning activities.

Modeler functionality is available in the "Explore" segment. You will see in subsequent tutorials how the weighted overlay model output can be used to help drive sketching of planned feature locations as well as how it can be used as a summary layer for analyzing proposed feature locations relative to the landscape suitability analysis.

Add a landscape model to your project

For this planning project, you can use an existing Modeler suitability analysis output. The following steps detail how to add this suitability analysis layer to your project.

1. Activate the Explore segment.
2. Click the "Add Data" button on the Application Toolbar to display the "Search for Data" dialog.

3. In the "Search for Data" dialog:
   a. Click the "All" tab to ensure you are searching all publicly available layers in ArcGIS Online.

b. Check the box next to "Weighted Overlay Models", and uncheck all other boxes if needed.
c. Type "GeoPlanner Tutorial" in the search box and press the Enter key.
d. Find the "Sample Landscape Modeler Output" layer and click the ADD button.
e. The "Sample Landscape Modeler Output" layer will be added to your Contents window.
f. Click the "Open Menu" button ≡ to open the Project Backstage, select the "Save" option, then click the "SAVE" button to save your project map.

Summary

In this tutorial, you were able to add a variety of data layers to your project to aid in meeting your planning goals. You found feature layers and map layers; some were published by Esri while others were published by other agencies that make their data layers publicly available within ArcGIS Online. Using these layers as input to analysis capabilities, also provided by ArcGIS Online, you were able to visually assess the three potential redevelopment sites against your project goals and criteria for redevelopment. Now that you have identified an area that meets your criteria for redevelopment, you will begin to create a series of alternative redevelopment planning scenarios that can be evaluated and compared against the remainder of your project goals.