
Building an ArcGIS Web App, Part 2: Creating a simplified layer switcher

Overview

This document describes how to create a layer switcher for the [ArcGIS Web AppBuilder](#) that allows users to switch between groups of one or more layers, without allowing the user to turn the layers within each group on or off, and without allowing the user to turn on a custom selection of layers. This can be useful in cases where multiple layers are being used to present the same theme of data (e.g., a feature layer and a tile layer), since the user will not need to turn these on and off individually. Compared to a regular Layer List widget, this can reduce the complexity of your user interface and allow you to create something more similar to how your users think about the themes of data you are presenting.

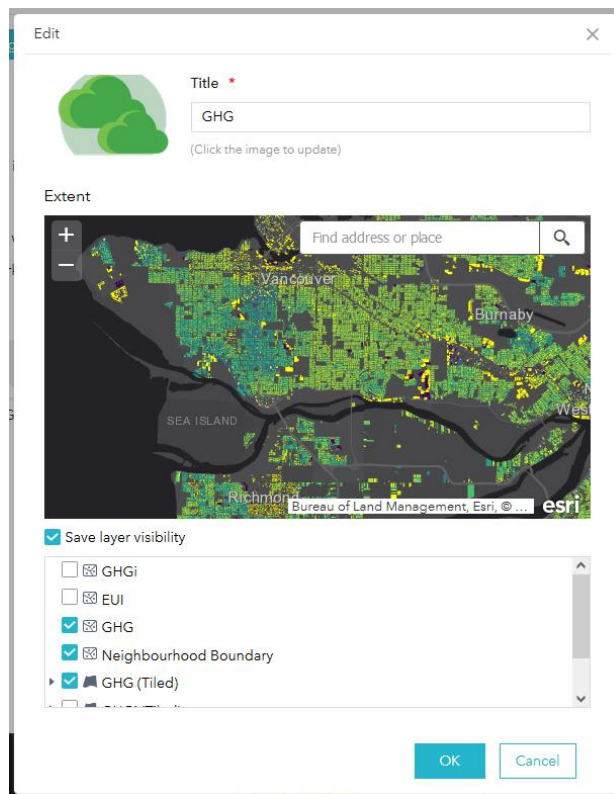
To create this simplified layer switcher, you can use the Web AppBuilder's [Bookmark](#) widget, which is normally used to provide a selection of pre-defined map extents that the user can view. However, the Web AppBuilder's Bookmark widget also allows you to specify which layers are enabled or disabled for each bookmark. After setting up the bookmarks, you can edit the [JSON](#) for the bookmarks to disable the map extents, so that clicking one of the bookmarks changes the layer selection but not the map extent.

This document is a companion to the blog post at <https://resources.esri.ca/education-and-research/building-an-arcgis-web-app-part-2>, which describes more about the user-interface design challenge that this document addresses. This blog post was the second part of a two-part series – the first blog post, <https://resources.esri.ca/education-and-research/building-an-arcgis-web-app-part-1>, describes more about the larger app-development project for which this solution was developed.

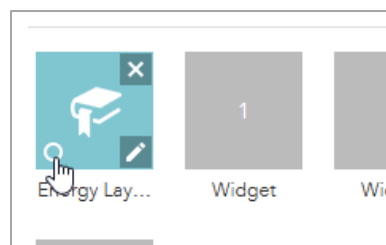
Part 1: Set up your bookmarks

1. In the Web AppBuilder, add the **Bookmark** widget to your app layout, and give it a name (in our case, "Energy Layers"). You can also upload a custom icon for the widget.
2. In the widget options, make sure the "Display custom bookmarks" option is checked.
3. Turn off the "Allow to add bookmarks in the widget" option. When it is on, this option allows users to create their own bookmarks, but this is unnecessary since this widget isn't going to be used as a normal bookmark widget. If you want to give users the ability to create their own bookmarks, you can create a separate bookmark widget afterwards.
4. Click the **Create** button to start creating bookmarks for each of the layers (or sets of layers) that you want users to be able to switch between. In the custom bookmark window, click the "Save layer visibility" checkbox and select which layer(s) should be displayed. Don't worry about setting the map extent, since you'll be configuring your app to ignore it. You can also upload a thumbnail image for the bookmark.
5. When you're finished, click **OK** to save the bookmark. Click the **Create** button again to create as many bookmarks as needed. Close the setup window for the Bookmark widget when you're finished adding bookmarks.

Here's an example for a bookmark that will turn on the two Greenhouse Gases (GHG) layers described in the blog post:



6. If switching between layers is a core part of your app's functionality, in the Web AppBuilder's Widgets panel, click the circle icon in the bottom-left corner of the widget's icon to make it appear by default when the app is opened. This helps to make the functionality more [discoverable](#) for users.



7. Once finished, save the app!

If you try out the bookmarks in your app right now, you'll notice that they change the layers successfully, but they also change the map extent. You'll need to edit the JSON to disable that. To accomplish this, follow the steps described below in Parts 2 and 3.

Part 2: Open the JSON for your app

NOTE: The ArcGIS Assistant tool used below is not an officially supported Esri application, and manually editing JSON files in the ArcGIS Assistant is not an officially supported workflow. Errors in the JSON files

will break your app. If you choose to follow the steps below, you do so at your own risk. There are some steps below that will show you how to back up the JSON first.

If you're using the version of the Web AppBuilder in ArcGIS Online or ArcGIS Enterprise:

1. Go to the ArcGIS Assistant at <https://assistant.esri-ps.com/> and sign in to your ArcGIS Online or ArcGIS Enterprise account.
2. In the list of contents, click the Web AppBuilder app you want to modify (tip: use the item type filters to show only Web AppBuilder apps to be sure that you select the right item). Click **View Item JSON**.
3. By default, this will show the JSON for the app's metadata (e.g., the title, description, and tags). Switch to the JSON for the app itself by clicking the **Data** tab.
4. Before you make any changes, take this opportunity to back up your JSON in case anything goes wrong! You can copy and paste the JSON into a code editor such as Visual Studio Code, and save the file as "<apptitle>_data.json" on your computer.
5. Click the **Edit JSON** button on the right of the code editor in the ArcGIS Assistant to start editing.

Or, if you're using the Developer Edition of the Web AppBuilder:

1. In the Web AppBuilder folder on your computer, go to the folder for your app (e.g., "ArcGISWebAppBuilder\server\apps[number]").
2. Create a backup of the app's "config.json" file, and then open the original file in a code editor such as Visual Studio Code.

Part 3: Modify the app's JSON

1. **Find the code for the Bookmark widget.** In the code editor, press Ctrl+F on your keyboard to open a search box. (If you are using the ArcGIS Assistant, click inside the code editor, first, to ensure that you open the editor's search box rather than the browser's.) Search for the term "bookmark" to find the section for the Bookmark widget in the JSON. It should be the first search result, and will include the lines `"name": "Bookmark"` and `"uri": "widgets/Bookmark/Widget"`.

```

{
  "position": {
    "left": 55,
    "top": 45,
    "relativeTo": "map"
  },
  "placeholderIndex": 1,
  "id": "_5",
  "name": "Bookmark",
  "version": "2.22",
  "closeable": true,
  "uri": "widgets/Bookmark/Widget",
  "config": {
    "bookmarks2D": [
      {

```

Scroll down in the code to see the sections for each of the bookmarks you added. For example, the image below is the JSON for the GHG bookmark you saw in an earlier screenshot:

```

"displayName": "GHG",
"name": "GHG",
"extent": {
  "xmin": -13724111.842085032,
  "ymin": 6300943.9488276625,
  "xmax": -13682835.846811092,
  "ymax": 6323875.057313184,
  "spatialReference": {
    "wkid": 102100
  },
},
"cache": {
  "_parts": [
    {
      "extent": {
        "xmin": -13724111.842085032,
        "ymin": 6300943.9488276625,
        "xmax": -13682835.846811092,
        "ymax": 6323875.057313184,
        "spatialReference": {
          "wkid": 102100
        }
      },
      "frameIds": [
        0
      ]
    }
  ]
},
},
"isInWebmap": false,
"isSaveLayers": true,
"layerOptions": {
  "96959643cbf6498f924b6db048458eaf": {
    "selected": false
  },
  "b87926491f8c4425b0185bc6f008e656": {
    "selected": false
  },
  "GHG_3693": {
    "selected": true
  },
  "AdminBoundary_Clip_4864": {
    "selected": true
  },
  "GHG_Tiled_6970": {

```

Notice that in the first half of the code block, there are coordinates for the bookmark extent (`"extent": {...}`), and in the second half of the code block, it is specified which layers will be turned on and off when the bookmark is clicked (`"layerOptions": {...}`).

2. **Edit the JSON for each bookmark to disable the extent.** The exact steps for this will vary a bit depending on what sort of JSON the Web AppBuilder added earlier.

Scroll down past the `layerOptions` section for the current bookmark, and you will see a line starting with `_uID`. Below this line, you may see a line starting with `isSaveExtent`, as shown in the screenshot on the next page. This line is most likely to appear if you did change the extent for one of the bookmarks earlier.

```

    },
    "8bf3e6ec907d4af18a47c3e49062bed3": {
      "selected": false
    }
  },
  "_uID": 6,
  "isSaveExtent": true,
  "thumbnail": "https://edu.maps.arcgis.com/
},
{
  "displayName": "GHGi",
  "name": "GHGi"
}

```

Case 1: If the `isSaveExtent` line already exists, it will be set to **true** by default. Change it to **false**, as seen in the screenshot below. This will prevent the Web AppBuilder from changing the extent when this bookmark is clicked. If there is a comma at the end of the line, make sure not to delete the comma!

```

    "selected": false
  }
},
  "_uID": 6,
  "isSaveExtent": false,
  "thumbnail": "https://edu.maps
},
{
  "displayName": "GHGi"
}

```

Case 2: If the `isSaveExtent` line does not exist already, you can add this manually. A good place to add this is at the end of the JSON block for the current bookmark. Not too far below the `_uID` line, you should see a line with a closing curly brace ("`}"`), as seen in the screenshots below. This curly brace may be immediately after the `_uID` line, or two lines after it if you added a thumbnail to the bookmark.

```

    },
    "8bf3e6ec907d4af18a47c3e49062bed3": {
      "selected": true
    }
  },
  "_uID": 19
},

```

```

    "8bf3e6ec907d4af18a47c3e49062bed3": {
      "selected": true
    }
  },
  "_uID": 18,
  "thumbnail": "https://edu.maps.arcgis.com/s
},

```

To add the line of code to disable the bookmark extent:

1. In the final line before the closing curly brace (e.g., `_uID` or `thumbnail`), add a comma at the end of the line.
2. Add a new line after this, and enter the following line:

```
"isSaveExtent": false
```

When finished, this section of the code block should look something like the example on the next page (with or without the "thumbnail" line).

```

80f3e0ec907d4af18a47c3e49002be03 : {
  "selected": true
},
{
  "_uID": 18,
  "thumbnail": "https://edu.maps.arcgis.com/sh
  "isSaveExtent": true
},

```

3. **Repeat for your other bookmarks.** Scroll to each of the other bookmarks you created in the widget, and repeat the steps above to disable the map extent for each one.
4. **Change the size of the Bookmark widget (optional).** With some Web AppBuilder layouts, such as the default "Foldable" layout, you can also make the Bookmark widget smaller to avoid having a large amount of empty space at the bottom of the widget. In the case of the Foldable layout, the default height is 410 pixels, but the minimum height that can be used (without causing a scrollbar to appear) is 190 pixels.

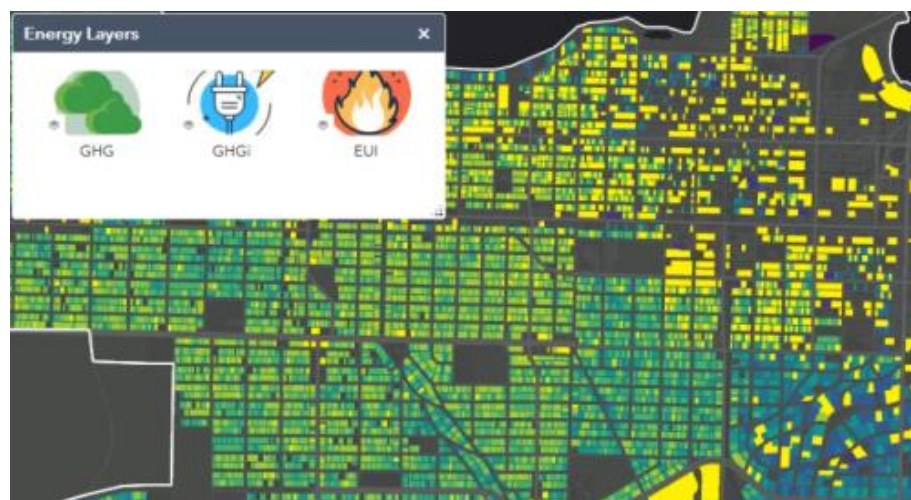
Scroll back to the start of the Bookmark widget code. If there is a `position` section towards the top, add a `height` property inside of this (see example below). Make sure to include a comma at the end of the line!

```

{
  "position": {
    "left": 55,
    "top": 45,
    "height": 190,
    "relativeTo": "map"
  },
  "placeholderIndex": 1,
  "id": "_5",
  "name": "Bookmark",
  "version": "2.0"
}

```

5. Once finished, save your changes (if you're using the ArcGIS Assistant, click the **Save** button at the top-right corner). Return to the Web AppBuilder editor and launch your app. The finished widget should appear similarly to the screenshot below, and clicking one of the bookmarks will change the selection of layers on the map without also changing the map extent.



Summary

In this tutorial, you learned how to create a simplified layer switcher using the ArcGIS Web AppBuilder's Bookmark widget. You used the Bookmark widget to create a bookmark for each set of layers, and you disabled the map extent for each bookmark so that clicking the bookmark would change only the layer selection and not the map extent.

There are some additional, important considerations for when to use this sort of layer switcher compared to a regular Layer List widget, as well as for how to improve the bookmark thumbnails to make the selection of layers clearer to the user. To learn more, please refer to the blog post at <https://resources.esri.ca/education-and-research/building-an-arcgis-web-app-part-2>.

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