



3D GIS Web Scenes

Web-based 3D visualization has become increasingly important for communicating geographic data to diverse audiences. This module explores how to create and publish 3D scenes on the web, how to configure layer properties and pop-ups, and how to build engaging web applications around your 3D data. We'll cover Instant Apps for quick application creation, Experience Builder for custom multi-page websites, and other tools and frameworks for advanced 3D web visualization. Understanding web-based 3D visualization is essential for modern geospatial communication.

Note that our *Client-Side Web GIS* course covers web GIS in more detail.



Module Topics



1. Web layer types review
2. 3D tiles
3. Web scene configuration
4. Publishing 3D layers from ArcGIS Pro
5. Slides
6. Instant Apps
7. ArcGIS Experience Builder
8. Cesium
9. Potree

These are the topics covered in this module.



Layer Types



❖ ESRI Environment

- Publish as a hosted 3D layer from a **scene layer package (SLPK)**
- 3D tiles package as **.3tz**

<https://www.esri.com/arcgis-blog/products/arcgis-online/3d-gis/3d-object-layer-a-comprehensive-overview>

<https://doc.arcgis.com/en/arcgis-online/reference/scene-layers.htm>



3D layers for use in web scenes can be published from ArcGIS Pro or created in ArcGIS Online. You can publish data as a hosted 3D layer from a scene layer package (SLPK) file or as a 3D tiles package in .3tz format. Different layer types have different capabilities and support different publication methods and data sources.



Layer Types



- ❖ **3D Object** = similar to a multipatch feature class
- ❖ **3D Point** = large set of point features with automatic thinning
- ❖ **Building** = complex digital building models
- ❖ **Gaussian Splat Layers** = realistic visualization of 3D geometry
- ❖ **Mesh** = integrated meshes on the web
- ❖ **Point Cloud** = point clouds
- ❖ **Voxel** = raster-based

3D layer type	Supports associated feature layer (editable)	Supports SLPK (read only)	Supports 3tz (read only)
3D object	Yes	Yes	Yes
3D point	Yes	Yes	No
Building	Yes	Yes	No
Gaussian splat	No	No	Yes
Mesh	No	Yes	Yes
Point cloud	No	Yes	No
Voxel	No	Yes	No



<https://www.esri.com/arcgis-blog/products/arcgis-online/3d-gis/3d-object-layer-a-comprehensive-overview>

<https://doc.arcgis.com/en/arcgis-online/reference/scene-layers.htm>

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Several 3D layer types are available for web scenes. 3D Object layers are similar to multipatch feature classes and support associated editable feature layers, SLPK, and 3tz formats. 3D Point layers represent large sets of point features with automatic thinning for performance. Building layers contain complex digital building models. Gaussian Splat layers provide realistic visualization of 3D geometry using gaussian splatting. Mesh layers represent integrated meshes on the web. Point Cloud layers display point cloud data. Voxel layers represent raster-based 3D data. Each layer type has different capabilities for editing, storage, and representation.



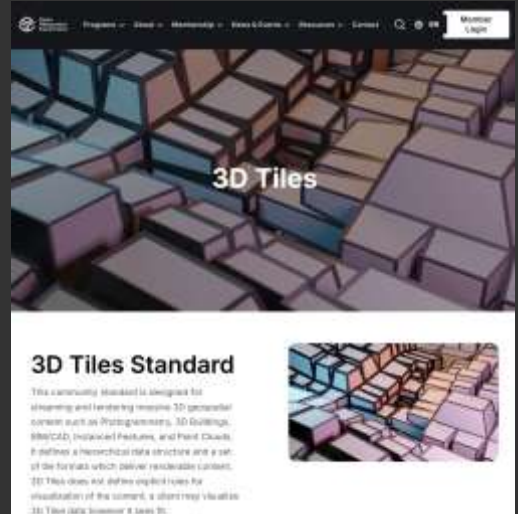
3D Tiles

<https://docs.ogc.org/cs/22-025r4/22-025r4.html>

<https://www.ogc.org/standards/3dtiles/>



Open
Geospatial
Consortium



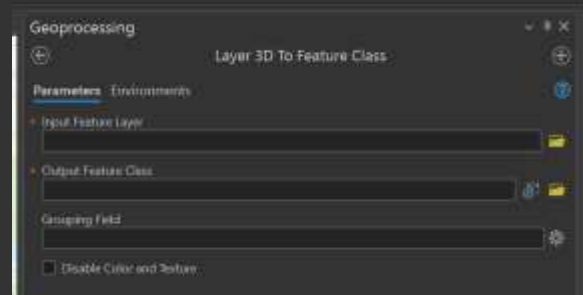
3D Tiles is an open standard developed by the OGC (Open Geospatial Consortium). This standard is increasingly important for web-based 3D visualization and is supported by many tools and platforms. Understanding 3D Tiles is essential for working with modern 3D geospatial data.



Layer 3D to Feature Class



- ❖ 2D vector → 3D symbology → Multipatch
- ❖ Layer 3D To Feature Class Tool



The Layer 3D to Feature Class tool allows converting 2D layers displayed with 3D symbology in ArcGIS Pro to feature classes. You can convert 2D vector data with 3D symbology to multipatch feature classes that maintain the 3D appearance.

Web Scenes

Web scenes are 3D scenes published to or created with ArcGIS Online that can be viewed in a web browser. Web scenes allow sharing 3D visualizations with anyone with a web browser, making 3D geographic data accessible to broad audiences. Web scenes, generally, preserve the appearance, symbology, and interactivity defined in ArcGIS Pro.



Types



❖ Can make **Local** or **Global** Scenes



Web scenes can be either local or global. Local scenes are projected and centered on a specific geographic area. Global scenes use geographic coordinates and represent the entire Earth using a digital globe. The choice between local and global scenes depends on the geographic extent and nature of your data.

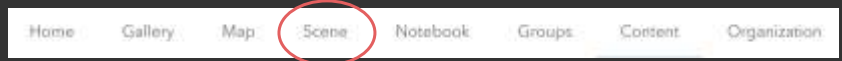


Create a Scene



❖ Log into [ArcGIS Online](https://www.arcgis.com/index.html) (<https://www.arcgis.com/index.html>)

❖ Click on Scene



❖ Click Save and Open Icon

❖ Save as 

❖ Provide title, save location, tags, and summary

❖ Click Save

You can generate web scenes using ArcGIS Online. Scenes are viewed and created under the Scene tab. They are saved as items to your ArcGIS Online content.



Tour of Scene Viewer



- ➕ Add data to **Scene**
 - 🗨️ List of **Layers**
 - 📄 Access or capture **Slides**
 - ⚙️ Change **Scene** properties
 - 💾 Save
 - 📱 Create an app
- 🔍 Search
 - 🗨️ **Layer List** and **Legend**
 - 🗨️ **Basemap**
 - ☀️ Illumination and weather
 - 📊 Analyze/Measurement
 - 🔗 Share
 - ⚙️ Graphic settings



*Tools on right are for data layers

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Scene are viewed in the Scene Viewer as opposed to the Map Viewer. The tools available for scenes are different from those for Maps.

The icons on the left-side allow for adding data to the scene, viewing the layer list and accessing layers, accessing or capturing slides, changing the Scene properties, saving the Scene, and creating an App from the Scene. Slides serve a similar purpose as Bookmarks in a 2D map. They store a camera position and view of the scene from a specific vantage point and scale.

Tools on the right-side allow for searching, viewing, and manipulating the Layer List and Legend; changing the base map; changing the simulated illumination and weather conditions; performing analyses and measurements; and changing the share and graphics settings.



Publish 3D Layers from ArcGIS Pro



- ❖ Can publish **scene** + **data** or just **data**
- ❖ Provide a summary and **tags**
- ❖ Set **share** settings
- ❖ Can configure **symbolology** and **pop-ups** in ArcGIS Pro
- ❖ 3D data published as **hosted 3D object**

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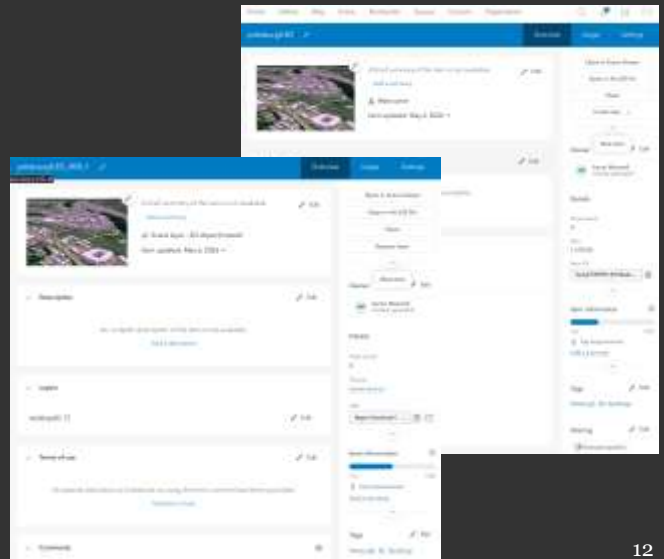
Publishing 3D layers or scenes from ArcGIS Pro allows sharing your work with broad audiences. You can publish a scene plus associated data, or just the data without the scene. You can provide a summary and tags to describe your content, set sharing settings to control who can access your data, and configure symbology and pop-ups before publishing. 3D data are published as a hosted 3D object layer in ArcGIS Online.



3D Scene Item



- ❖ Drop pages created for **scene** and **data**
- ❖ Can update **sharing** from these pages

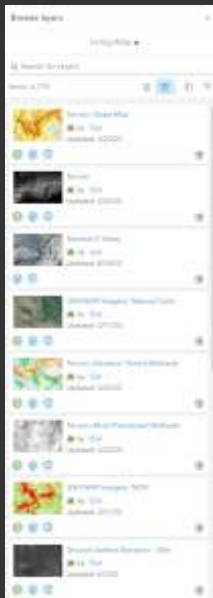


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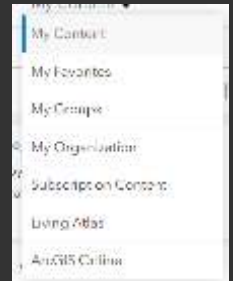
When you publish a scene, a 3D scene item is created in ArcGIS Online with associated drop pages showing the scene and data. These pages can be used to preview your content and update sharing settings.



Connecting to Other Layers



- ❖ My Content = your ArcGIS Online content
- ❖ My Favorites = often or recently used layers
- ❖ My Groups = from group in which you are a member
- ❖ My Organization = shared within your organization
- ❖ Subscription Content (not free)
- ❖ Living Atlas = ESRI Living Atlas
- ❖ ArcGIS Online = shared publicly by others via ArcGIS Online



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When connecting to other layers in ArcGIS Online, you can access content from various sources. My Content shows your own ArcGIS Online content. My Favorites shows frequently or recently used content or layers. My Groups provides layers from groups you're a member of. My Organization provides content shared within your organization. Living Atlas provides ESRI's Living Atlas content. ArcGIS Online provides publicly shared content. Subscription content provides additional premium data.



Layer Symbology

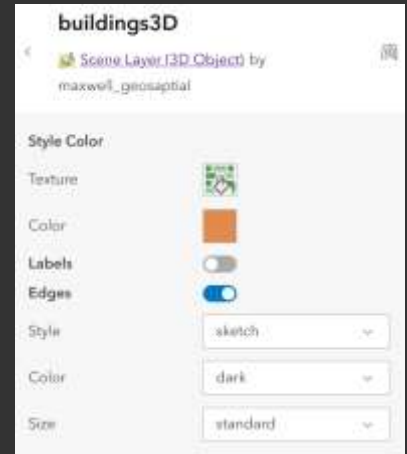


❖ Change color

❖ Add labels

❖ Show edges

- Style
- Color
- Size



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Layer symbology can be customized in web scenes. You can change colors, add labels, show edges, and further style the symbology. These adjustments are made in the Scene Viewer interface and affect how the layer appears.



Layer Properties



- ❖ Transparency
- ❖ Show legend
- ❖ Configure pop-up
- ❖ Elevation
- ❖ Visibility range
- ❖ Filters

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Additional layer properties can be configured to control visibility and behavior. You can adjust transparency, show legends, configure pop-ups, set elevation, specify visibility ranges, and apply filters. These properties control how and when the layer is displayed.



Pop-Up Recommendations



- ❖ Disable **pop-ups** when unnecessary (such as for reference layers)
- ❖ You can edit **pop-ups** in both **ArcGIS Online** and **ArcGIS Pro** (I prefer ArcGIS Pro)
- ❖ **Pop-up** edits made in **ArcGIS Pro** should carry over to **ArcGIS Online** when the layer is published
- ❖ Only show fields, graphics/images, and/or charts that are meaningful
- ❖ Try to avoid using poorly formatted field names (use **alias/display names** or provide a better name)
- ❖ Take some time to format text and numbers
- ❖ If you want to include different links for each feature, include the links in an attribute table column
- ❖ If you want to include different graphics/images for each feature, include links in an attribute column
- ❖ If the same link for graphic will be used for all **pop-ups**, you do not need to include this link in the attribute table
- ❖ **ArcGIS Arcade** and **HTML** code can be used to further customize pop-ups

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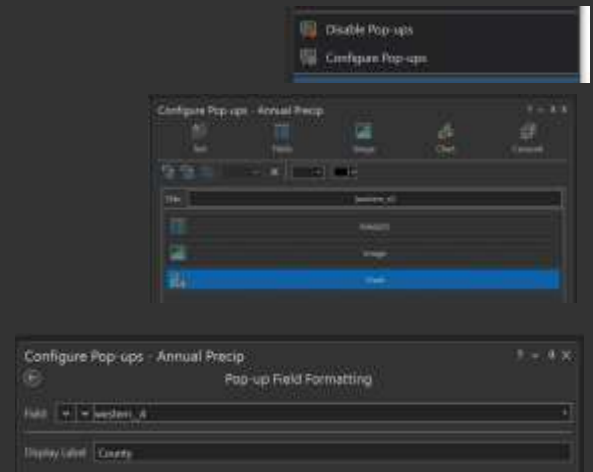
Pop-ups should be configured thoughtfully to provide useful information without overwhelming viewers. Disable pop-ups for reference layers where they're not needed. Pop-ups can be edited in both ArcGIS Online and ArcGIS Pro, though ArcGIS Pro provides more comprehensive editing tools. Only show meaningful fields, graphics, and charts. Use field aliases and display names instead of poorly formatted field names. Format text and numbers professionally. Include links in attribute columns for different links per feature. Include image/graphic links in attribute columns when they vary by feature. If using the same graphics link for all features, you don't need to include it in the table. ArcGIS Arcade and HTML code provide advanced customization.



Pop-Ups in ArcGIS Pro



- ❖ Right-Click Layer in Contents Pane → **Disable/Enable Pop-ups**
- ❖ Right-Click Layer in Content Pane → **Configure Pop-Ups**
- ❖ When referencing fields, field names are provided in {}
- ❖ Can add:
 - ❖ Title
 - ❖ Text
 - ❖ Fields
 - ❖ Image
 - ❖ Chart
 - ❖ Carousel
- ❖ Can edit text font, font size, and color
- ❖ Can change field names using field options: Display label



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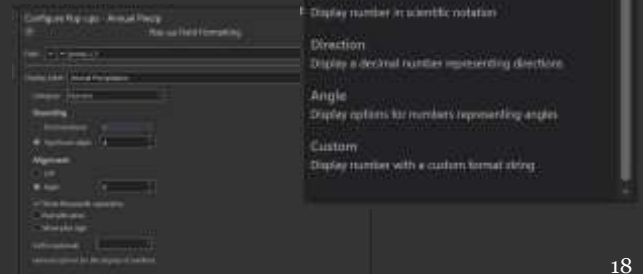
In ArcGIS Pro, configure pop-ups by right-clicking a layer in the Contents Pane and selecting **Disable/Enable Pop-ups** or **Configure Pop-Ups**. Field names are provided in curly brackets {}. You can add a title, text, fields, images, charts, and carousels. Text formatting is available including font, bold, italic, underline, strikethrough, color, alignment, character spacing, and line spacing.



Pop-Ups in ArcGIS Pro



- ❖ Can edit numeric attributes to round off values, apply alignment, show thousands separator, pad with zeros, or add a suffix (e.g., units)
- ❖ Can apply additional number formatting by changing the Category



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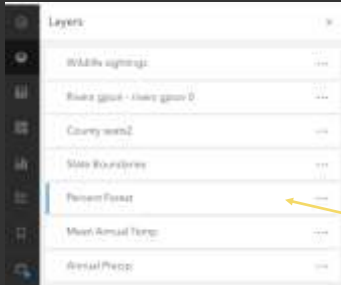
Numeric attributes can be formatted to round values, apply alignment, show thousands separators, pad with zeros, or add suffixes like units. Additional number formatting categories provide even more control.



Pop-Ups in ArcGIS Online



- ❖ Make sure layer of interest is selected under Layers
- ❖ Click on **Pop-ups** button



Make sure layer
of interest is
selected

<https://www.esri.com/en-us/arcgis/products/mapping/smart-mapping>

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In ArcGIS Online, make sure the layer of interest is selected in the Layers panel. Click the Pop-ups button to configure. The interface is similar to ArcGIS Pro but with fewer options.



Pop-Ups in ArcGIS Pro



- ❖ Can enable or disable **pop-ups**
- ❖ I recommend configuring table alias names and numeric formatting in **ArcGIS Pro** before publishing to **ArcGIS Online**
- ❖ When referencing fields, field names are provided in {}
- ❖ Can add alternative text when referencing graphics/images to aid in accessibility
- ❖ Pop-ups authored in **Map Viewer** are not compatible with all **apps**

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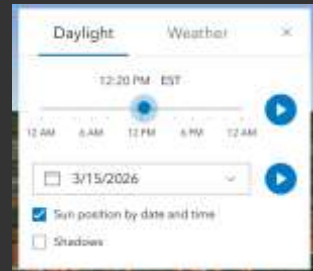
Pop-ups can be enabled or disabled in ArcGIS Online. I recommend configuring table alias names and numeric formatting in ArcGIS Pro before publishing to ensure consistent appearance. When referencing fields, use field names in curly brackets {}. Add alternative text for graphics and images to improve accessibility. Note that pop-ups authored in the Map Viewer may not be compatible with all apps.



Scene Properties



- ❖ Basemap
- ❖ Ground Transparency
- ❖ Daylight simulation
- ❖ Weather simulation (global scenes)



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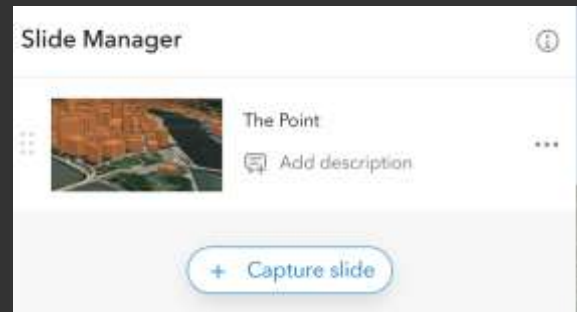
Scene properties control the overall appearance and behavior of web scenes. You can change the basemap, adjust ground transparency, simulate daylight with time controls, and simulate weather conditions in global scenes.



Slides



❖ Similar to Bookmarks



Slides in web scenes are similar to bookmarks, capturing specific viewpoints and configurations that can be saved and shared with other users.

Web Apps

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Web apps allow sharing interactive maps and scenes with specific purposes and audiences. Web apps can be configured to facilitate specific workflows or analyses. Several methods exist for creating web apps in ArcGIS Online.

Instant Apps



General Steps for Making a Web App using ArcGIS Online



1. Find, prepare, publish, and/or create required layers/data
2. Configure layer(s) for editing if necessary
3. Create a web map or scene
4. Configure web map or scene
5. Add layers to map or scene
6. Edit layer symbology and/or visibility
7. Configure or disable pop-ups
8. Choose an app generation method
9. Configure and save app
10. Test app
11. Edit/update as needed

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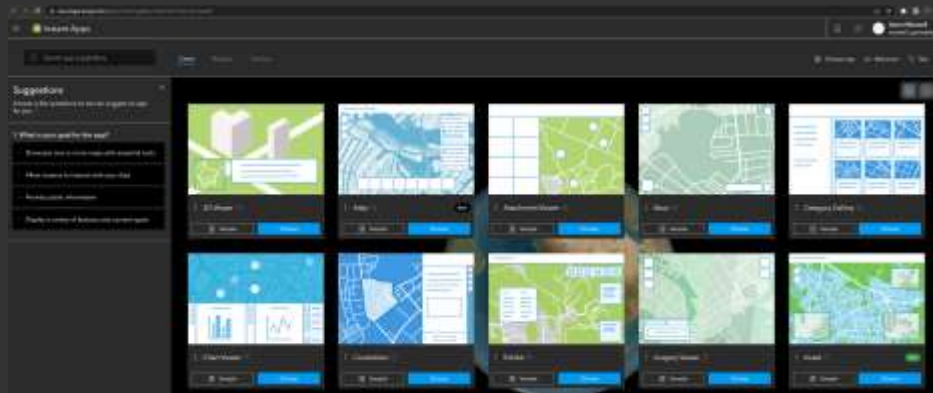
The general workflow for creating web apps involves several steps. First, find, prepare, publish, and/or create required layers and data. Configure layers for editing if necessary. Create a web map or scene. Add layers to the map or scene. Edit layer symbology and visibility. Configure or disable pop-ups. Choose an app generation method. Configure and save the app. Test the app thoroughly before deployment.



App with Instant Apps



❖ **Instant Apps** = pre-made applications that you can load your layers into

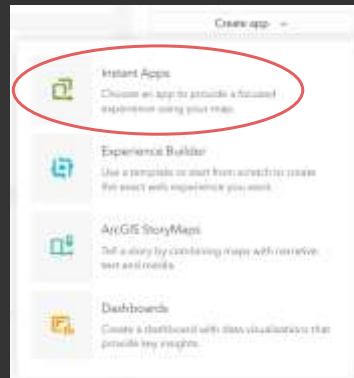
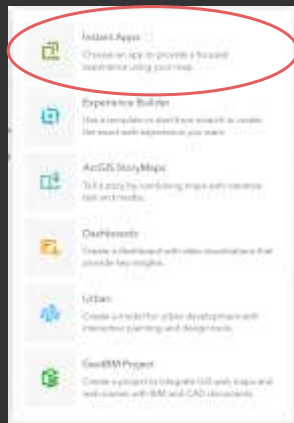


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Instant Apps are pre-made applications that you load your layers into. With Instant Apps, you choose from available templates and configure settings without coding. Apps are created quickly and can be customized for your specific data.



Initialize App



- ❖ Content → Create App
- ❖ From Map View Or Scene View → Create App
- ❖ Map or Scene Drop Page → Create Web App

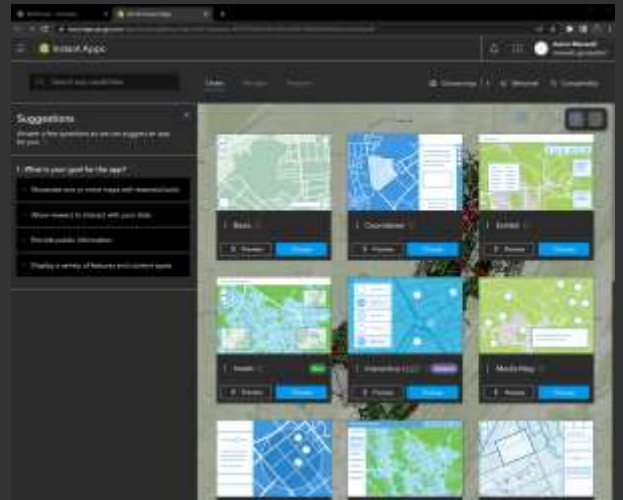
To initialize an app, access the Create App option from Map View or Scene View. You can create apps directly from the map or scene drop page.



Select a Template



- ❖ Different templates/apps for different purposes
- ❖ Make sure data meet the requirements of the template
- ❖ Make sure the template aligns to the goals of the **app**
- ❖ Some templates note the data requirements



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When selecting a template, consider the purpose and ensure your data meets template requirements. Different templates serve different purposes. Some templates document their data requirements. Choose a template that aligns with your app goals.



Configure App



- ❖ Select template
- ❖ Name **app**
- ❖ Provide tags
- ❖ Save to **Content**

Create app - Basic

Give your app a title

MonForest

Add tags

mon forest workshop web gis Add tags

Save in folder

workshopExamples

Close Create app

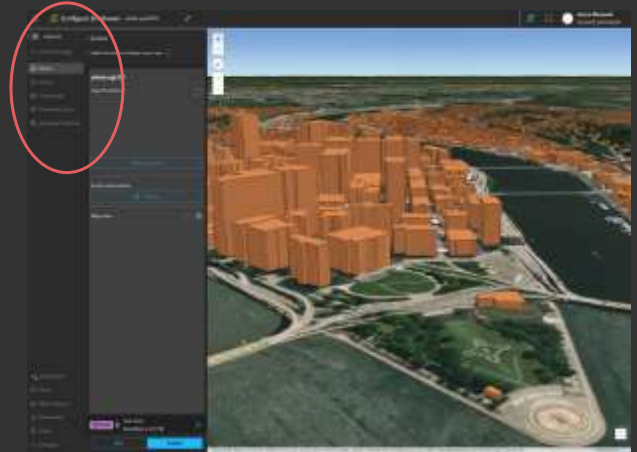
Configure the app by selecting a template, naming the app, providing tags, and choosing a save location. These settings establish the basic app configuration.



Configure App



- ❖ Available option/configurations vary by template
- ❖ Express mode = provide access to most important options only
- ❖ Common options
 - Source **Scene**
 - Include certain components or widgets such as
 - Header, legend, layer list, basemap gallery, etc.
 - Available interactivity
 - Themes, colors, and fonts
 - Position of apps, widgets, and tools

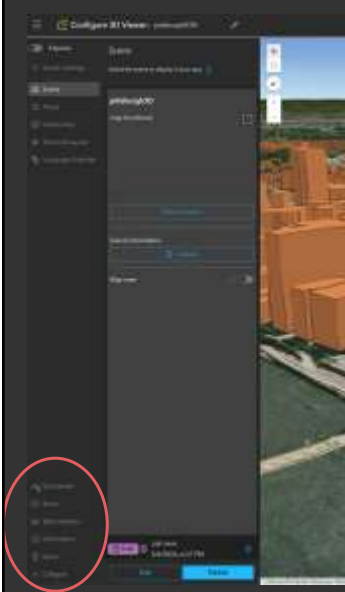


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Available options vary by template. Express mode provides access to important options only. Common configuration options include selecting the source scene; including specific components like header, legend, layer list, or basemap gallery; setting available interactivity; choosing themes and colors; and positioning app components.



Configure App



- ❖ Share settings
- ❖ Web analytics
- ❖ Assess on different screen sizes

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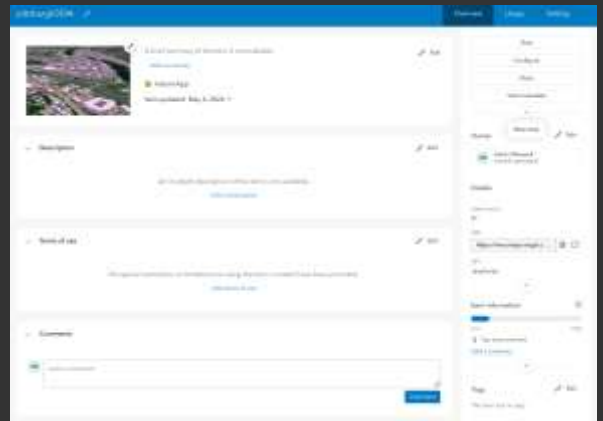
Additional configuration includes sharing settings and web analytics. Test the app on different screen sizes to ensure responsive design works properly.



Publish



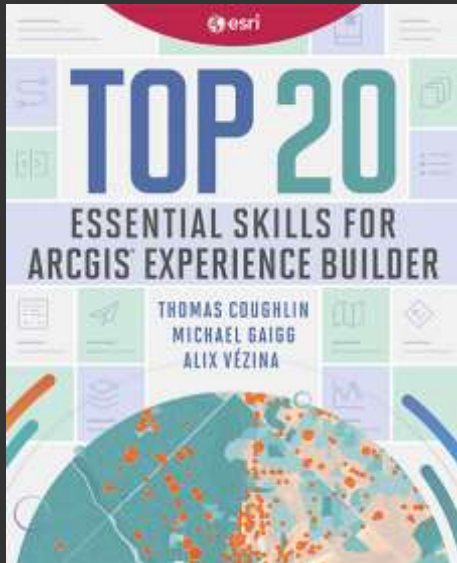
- ❖ Click **Publish**
- ❖ **Launch**
- ❖ Will save to your **ArcGIS Online** Content
- ❖ Can View, Configure, or change **Share** settings from drop page
- ❖ App will get assigned a URL



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Click Publish to finalize and launch your app. The app will be saved to your ArcGIS Online Content. The app will be assigned a URL for sharing. You can access the drop page to view, configure, or change sharing settings.

Experience Builder



Top 20 Essential Skills for ArcGIS Experience Builder

By Thomas Coughlin, Michael Gaigg, and Alix Vézina

- ❖ Design and create visually stunning and highly functional map apps with *Top 20 Essential Skills for ArcGIS Experience Builder*.

If you are interested in a book focused on Experience Builder, I recommend the text referenced on this slide and published by ESRI Press.



App with Experience Builder



❖ **ArcGIS Experience Builder** = web-based tool for generating multi-page websites that do not need to be centered around a map



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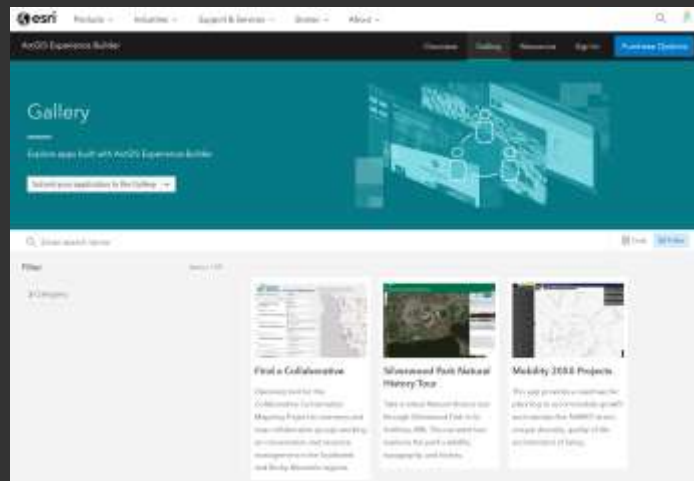
ArcGIS Experience Builder is a web-based tool for generating multi-page websites that don't need to be centered around a map. Experience Builder provides more flexibility than Instant Apps for creating custom web experiences.



What can you build?



- ❖ Map apps
- ❖ Data dashboards
- ❖ Single web pages
- ❖ Full websites



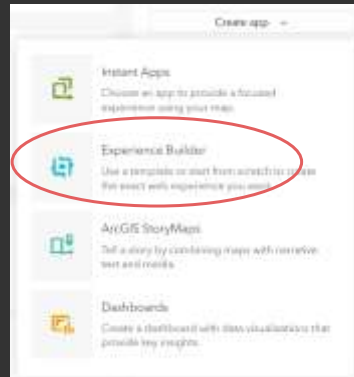
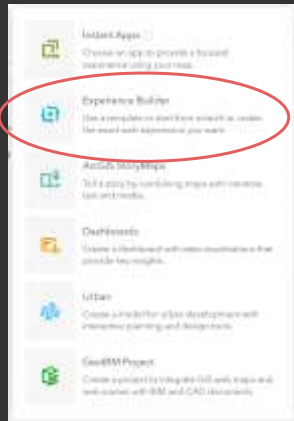
<https://doc.arcgis.com/en/experience-builder/gallery/>

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With Experience Builder, you can build map apps, data dashboards, single web pages, and full websites. The capabilities are very broad, allowing creation of sophisticated web experiences.



Initialize App



- ❖ Content → Create App
- ❖ From Map View Or Scene View → Create App
- ❖ Map or Scene Drop Page → Create Web App



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To initialize an Experience Builder app, access Create App from Map View or Scene View, or create from the drop page of a web scene object.



Page Types



- ❖ **Fullscreen fixed** = full page, non-scrolling
- ❖ **Fullscreen grid** = full page made up of responsive panels
- ❖ **Scrolling** = a scrolling page
- ❖ **Multipage** = website with multiple linked pages
- ❖ Can make your own templates
- ❖ Others make their templates available
- ❖ Can start from a blank page or use a pre-defined template.
- ❖ ESRI continues to add templates.



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Experience Builder offers multiple page types. Fullscreen fixed creates a full page without scrolling. Fullscreen grid creates responsive panels. Scrolling creates a scrollable page. Multipage creates a website with multiple linked pages. You can use pre-defined templates or create custom templates. ESRI continues adding new templates.



Canvas



- ❖ Center pane
- ❖ Where the page is designed



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The center pan, or Canvas, is where you design the page. This is your primary workspace for adding and configuring elements.



Header



- ❖ Set title
- ❖ Save
- ❖ Publish
- ❖ Change Screen Size
- ❖ Lock layout
- ❖ Live Preview

Can toggle in and out of live preview mode while building your app or site.

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The header provides access to page-level controls. You can set the title, save your work, publish the app, change screen size preview, lock or unlock the layout, and toggle live preview mode. Live preview mode allows seeing how the app functions while building.



Left Panel



Insert = define elements/widgets that can be added to the page



Page/Window = outline for page content/add new page or window



Data = links to page assets



Utility Services = links to background services used for apps



Themes = set and configure page themes



Settings = app settings (icon, thumbnail, summary, tags, time zone, etc.)

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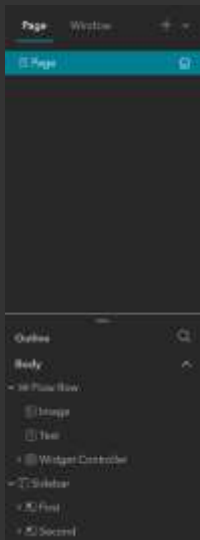
The left panel provides access to various tools and settings. Insert allows defining elements and widgets. Page/Window provides the page structure. Data links to page assets. Utility Services links background services. Themes sets page appearance. Settings configures app-level settings.



Page/Window



- ❖ Add pages or windows
- ❖ Navigate
- ❖ Select page components/widgets
- ❖ **Page** = main views constituting app
- ❖ **Windows** = panels that appear on top of the page



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Pages are main views constituting the app. Windows are panels appearing on top of the page. You can add pages or windows, navigate between them, and select page components.



Right Panel



❖ Depends on what is active

❖ For **Page**:

- Add opening window
- Set background color
- Add/configure a Header
- Add/configure a Footer

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The right panel functionality depends on what is active. For a page, you can add opening windows, set the background color, add/configure headers, or add/configure footers.



Themes



❖ Color

- Primary
- Secondary
- Info
- Success
- Warning
- Error
- Neutral
- Surface
- Interactive Elements

❖ Typography

- Heading
- Body
- Font Size

❖ More

- Border radius
- Components
- Links

Themes control the overall visual appearance of your app. You can customize colors including primary, secondary, info, success, warning, error, neutral, and surface colors. Interactive elements, typography, heading and body styles, font sizes, borders, and component appearance can all be configured.



Assets Types



- ❖ Maps
- ❖ Scenes
- ❖ Layers
- ❖ URLs
- ❖ Arcade



Add data

Web Map

Web Scene

Layers

URL

Arcade

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Asset types you can add to your app include maps, scenes, layers, URLs, and Arcade expressions. These assets provide the data and functionality needed to created the experience.



Asset Sources



The screenshot displays the 'Asset Sources' interface. On the left, a sidebar shows a 'Data' section with an 'Add data' button and a list of maps including 'Web Map', 'chuckfish-map', 'FantasyMap/ADM', 'FantasyMap/ADM2', and 'PointType Map'. The main area lists five asset sources: My Content, My Groups, My Organization, ArcGIS Online, and Living Atlas. At the bottom, a navigation bar contains tabs for 'My content', 'My groups', 'My organization', 'ArcGIS Online', and 'Living Atlas', with 'My content' selected.

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Asset sources include My Content, My Groups, My Organization, publicly shared ArcGIS Online content, and the Living Atlas.



Text



- ❖ Header 1-6
- ❖ Paragraph
- ❖ Ordered or unordered list
- ❖ Can configure:
 - Font
 - Bold, Italic, Underline, Strikethrough
 - Color
 - Alignment
 - Character spacing
 - Line spacing
 - Character effects
 - Alignment and justification
 - Size and position
 - Background
 - Border
 - Box shadow



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Text elements can be formatted extensively. You can create headers at multiple levels, paragraphs, or ordered or unordered lists. Font, bold, italic, underline, strikethrough, color, alignment, character spacing, line spacing, and character effects can all be configured.



Images



- ❖ Connect via URL
- ❖ Upload an image
- ❖ Link to URL or page element
- ❖ Link to data
- ❖ Alt text
- ❖ Can configure:
 - Alignment and justification
 - Shape and position
 - Background
 - Border
 - Box Shadow

48

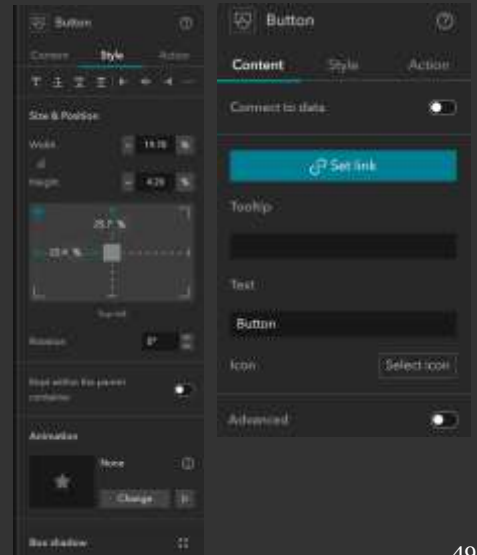
Images can be connected via URL or uploaded. You can link images to other URLs or page elements. Alternative text can be added for accessibility. Alignment, shape, position, background, borders, and shadows can be configured.



Buttons



- ❖ Assign a link
- ❖ Assign an action/trigger
- ❖ Change associated text
- ❖ Can configure:
 - Alignment and justification
 - Size and position
 - Box shadow



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Buttons can assign links and actions/triggers. Associated text can be changed. Buttons can be sized, positioned, and styled with shadows and hover effects.



Cards



- ❖ Multiple templates are available
- ❖ Can include different components: images, text, buttons, links, share
- ❖ Can set link
- ❖ Can configure:
 - Background
 - Border
 - Box shadow
 - Hover effects
 - Box shadow
 - Alignment and justification
 - Size and position



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Cards provide multiple templates for displaying information. Cards can include different components such as images, text, buttons, and links. Links and styling can be configured.



Embed



- ❖ Embed other web content (iframe)
- ❖ Link via URL
- ❖ Add HTML code
- ❖ Link to data
- ❖ Can configure:
 - ❖ Alignment and justification
 - ❖ Size and position
 - ❖ Border
 - ❖ Box shadow



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Embed elements allow embedding other web content via iframe or linking via URLs. HTML code can be added for advanced customization.



Divider



- ❖ Page/content divider
- ❖ Multiple divider options
- ❖ Can edit color, stroke pattern, and stroke width
- ❖ Can add start and end point
- ❖ Can configure:
 - ❖ Alignment and justification
 - ❖ Size and position
 - ❖ Background
 - ❖ Border
 - ❖ Box Shadow

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Divider elements separate page sections. Multiple divider styles are available. Color, stroke pattern, and stroke width can be customized. Start and end points can be configured.



Add Scenes



- ❖ Add **scene** to Assets
- ❖ Add a **Map element**
- ❖ Link to **scene**
- ❖ Can add widgets that interact with **scene**
- ❖ Other page elements can impact the **scene**
- ❖ The **map** can impact other page elements



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To add scenes to your Experience Builder app, first add the scene to your assets. Then add a Map element and link it to your scene. Widgets can be added that interact with the scene. Other page elements can impact the scene and vice versa.

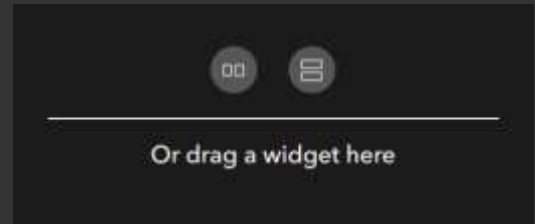


❖ Blocks

- Sections of a scrolling page
- Vertical organization of content (used for scrolling pages)
- Scroll down through blocks

❖ Screen Group

- Main stage and scrolling panels
- Story- or presentation-like



Can be helpful to find a template that has a page layout close to what you desire.

There are different means to organize page content within your app.

Blocks define rows of the page or sections of a scrolling page. As the user scrolls down, they will move through the different blocks on the page. The content within the blocks are responsive to different screen sizes. The block is divided into 12 spans or columns, and content within the block can take up different numbers of these spans.

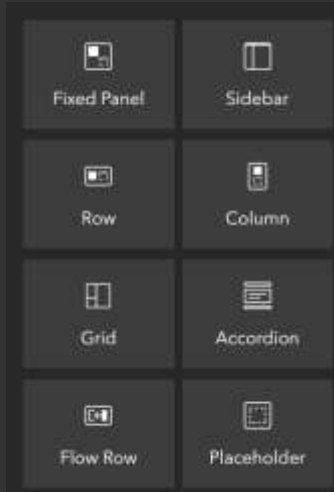
In contrast to blocks, screen groups are used for story- or presentation-like layouts, as is common with StoryMaps, where content scrolls over top of prior content.



Page Layout



❖ Insert → Layout



Type	Use
Fixed panel	Less ridged than a row
Sidebar	Collapsible side navigation container
Row	Horizontal layout
Column	Vertical layout
Grid	Structured row + column layout
Accordion	Collapsible sections
Flow Row	Responsive row that wraps items
Placeholder	Empty slot reserved for content

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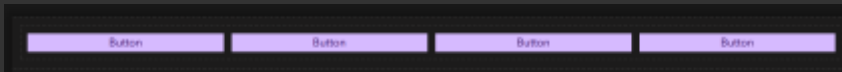
The following slides explain the different layout options available and elaborate on the descriptions provided in the table included on this slide.



Row



- ❖ Arrange widgets side-by-side
- ❖ Broken into 12 columns
- ❖ Can configure:
 - Gap
 - Padding
 - Height
 - Alignment and justification
 - Size and position
 - Background color
 - Border style
 - Box shadow



<https://doc.arcgis.com/en/experience-builder/latest/configure-widgets/row-widget.htm>

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Rows are important for block-style layouts. They are made up of 12 spans. Content within the row can take up different numbers of spans and will be responsive to changing screen sizes.

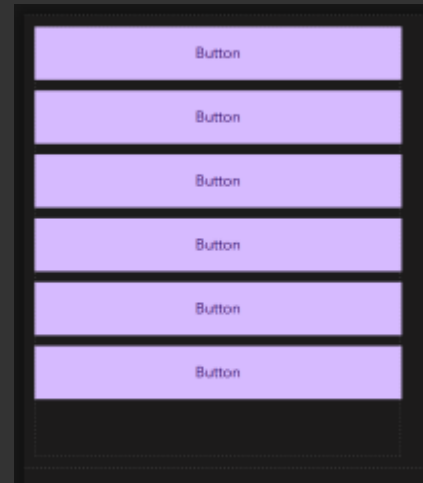
Rows are generally used to organized content horizontally.



Column



- ❖ Stack widgets vertically
- ❖ Can configure:
 - Vertical alignment
 - Gap
 - Padding
 - Alignment and justification
 - Size and Position
 - Background color
 - Border style
 - Box shadow



<https://doc.arcgis.com/en/experience-builder/latest/configure-widgets/column-widget.htm>

57

In contrast to rows, columns are used to organize content vertically.



Fixed Panel



- ❖ Less ridged than a row
- ❖ Elements do not need to align
- ❖ Can configure
 - Alignment and justification
 - Size and Position
 - Background color or image
 - Border color, style, size, and rounding
 - Box shadow

The images below are in a fixed panel.



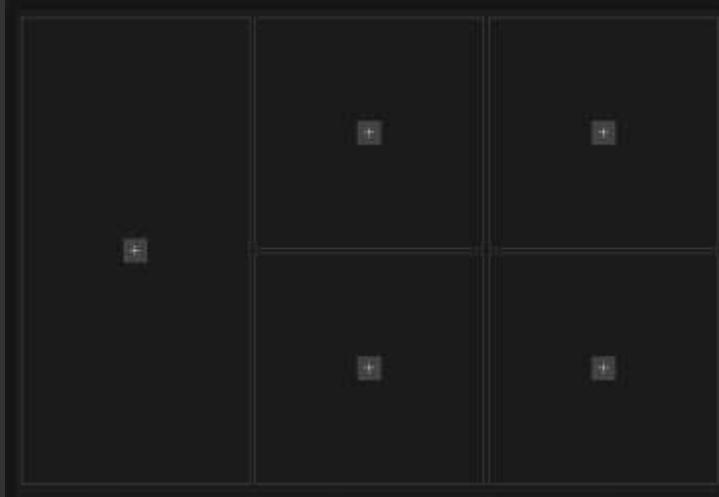
<https://doc.arcgis.com/en/experience-builder/latest/configure-widgets/fixed-panel-widget.htm>

58

A fixed panel is different from a row because the content within it does not need to align and will not respond dynamically to changes in the screen size.



Grid



- ❖ Space divided into rows and columns
- ❖ Can configure:
 - Gap
 - Padding
 - Alignment and justification
 - Size and position
 - Background color
 - Border style
 - Box shadow

<https://doc.arcgis.com/en/experience-builder/latest/configure-widgets/grid-widget.htm>

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A grid can be used to organize the page using combinations of rows and columns. Individual objects will be assigned to the different cells defined by the grid. You can think of grids as a combination of rows and columns.



Flow Row



- ❖ Responsive row
- ❖ Content wraps as page size changes
- ❖ Not divided into 12 discrete columns (continuous)
- ❖ Horizontal alignment
- ❖ If something is removed, other widgets adjust positioning/size
- ❖ Even spacing horizontally
- ❖ Can configure:
 - Horizontal alignment
 - Gap
 - Padding
 - Alignment and justification
 - Size and position
 - Background color
 - Border style



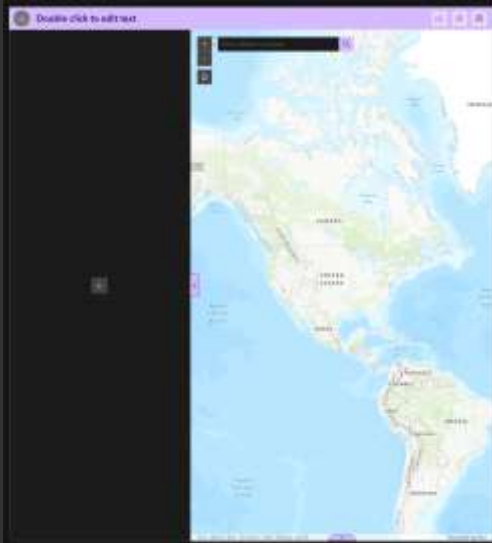
<https://doc.arcgis.com/en/experience-builder/latest/configure-widgets/flow-row-widget.htm>

60

A flow row is a responsive row that allows content to wrap as the page size changes. It does not make use of a fixed set of 12 spans. If an object is removed from within the flow row, other objects within it can adjust to make use of the freed-up space.



Sidebar



- ❖ Pane that can be collapsed or expanded over other content
- ❖ Can be configured to push content as it expands or contracts
- ❖ Check out **JewelryBox** template
- ❖ Can configure:
 - Dock side
 - Size
 - Overlay
 - Resizable
 - Default state
 - Button
 - Border
 - Divider
 - Alignment and justification
 - Size and position
 - Background Color
 - Box shadow

<https://doc.arcgis.com/en/experience-builder/latest/configure-widgets/sidebar-widget.htm>

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Sidebars allow for a collapsible panel that can hold other content. When the sidebar is collapsed, the other content on the page can expand to make use of the freed-up space.

The JewelryBox template is a good example of a template that uses a sidebar-style layout.



Accordion



- ❖ Store multiple collapsible panes
- ❖ Can be used for grouping
- ❖ Save space
- ❖ Can configure:
 - Alignment and justification
 - Size and position
 - Background
 - Border
 - Box shadow

<https://doc.arcgis.com/en/experience-builder/latest/configure-widgets/accordion-widget.htm>

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Accordions are used to store collapsible content to save screen space.



Sections



- ❖ Navigate between different views or content in the same window
- ❖ Can configure:
 - Number of views
 - Arrows
 - Dots
 - Autoplay
 - Alignment and justification
 - Size and position
 - Border
 - Box shadow



<https://doc.arcgis.com/en/experience-builder/latest/configure-widgets/section-widget.htm>

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Sections are used to allow for navigating or scrolling between different content that all take up the same space on the page. For example, this could be used to pivot between multiple maps using the same space in the view port or to scroll through a series of images (image carousel).



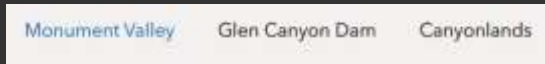
View Navigation



❖ Add navigation to accompany a sections widget

❖ Can configure:

- Section it is linked to
- Which views to include
- Direction
- Spacing
- Alignment
- Icons
- Text
- Position
- Border style
- Box shadow



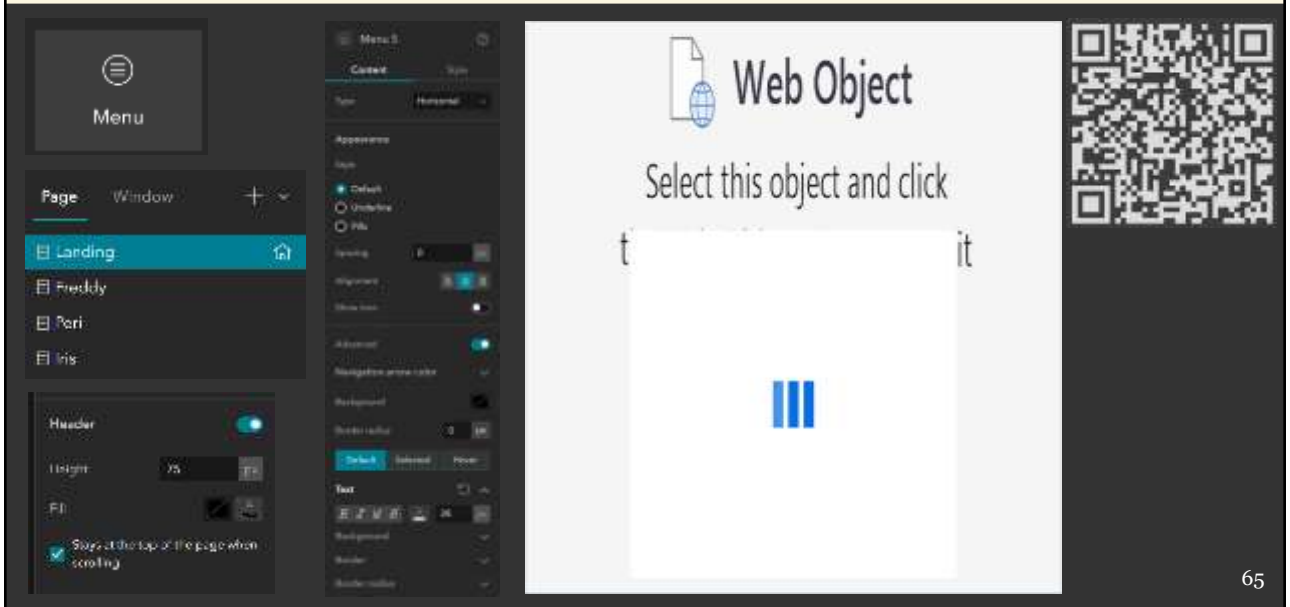
<https://doc.arcgis.com/en/experience-builder/latest/configure-widgets/view-navigation-widget.htm>

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View navigation is used to add controls for navigating between the different elements included within a section.



Multipage Website



When creating a multipage website, it makes sense to include a means to navigate between the separate pages. This is generally accomplished using a navigation, or nav, bar.

The Menu element can be used to create a nav bar. It can be included on every page and even configured so that it always stays at the top of the page even when scrolling.

The app on this page provides a very simple multipage website with navigation configured.

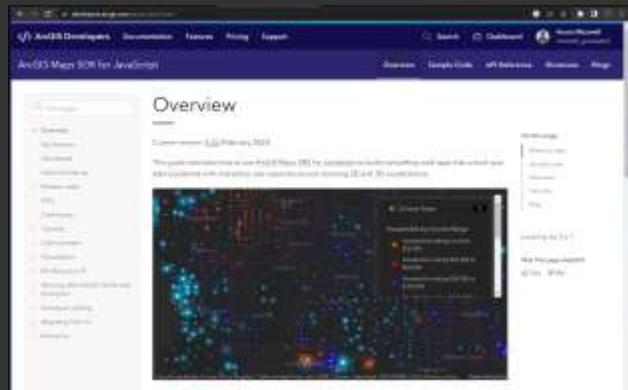
Other App Generation Tools



App with ArcGIS Maps SDK for JavaScript



❖ **ArcGIS Maps SDK for JavaScript** = offers fully customizable web maps and apps (requires coding)



<https://developers.arcgis.com/javascript/>

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The ArcGIS Maps SDK for JavaScript offers fully customizable web maps and apps but requires coding knowledge. This is the most flexible approach for developers who want complete control.



- ❖ **Cesium Ion**: store 3D tiles
- ❖ **Cesium for Unity**: integration with Unity engine
- ❖ **Cesium for Unreal**: integration with Unreal engine
- ❖ **CesiumJS**: JavaScript library for creating 3D web scenes



<https://cesium.com/>

CesiumJS is a JavaScript library for creating 3D web scenes. Cesium Ion provides cloud storage for 3D tiles. Cesium has integrations with Unity and Unreal for game engine applications.

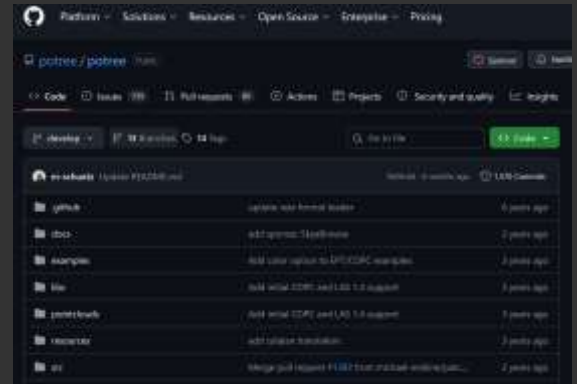
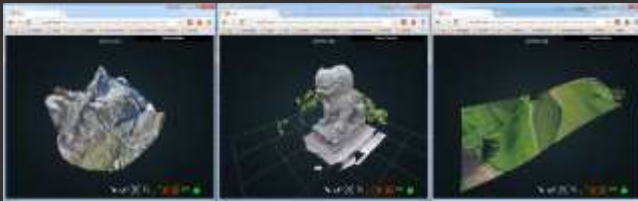


Point Cloud Viewing on the Web



❖ Potree

- ❖ Free and open-source WebGL-based point cloud renderer for large points clouds



<https://github.com/potree/potree>

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Potree is a free, open-source WebGL-based point cloud renderer excellent for visualizing large point cloud datasets on the web. Potree is particularly useful when you have massive point cloud data that needs to be viewable via a web browser.



This is the end of this lecture module.

Please return to the West Virginia View
Webpage for additional content.



Thanks! Hope you found this useful.