




Testing Your Apps for Accessibility: The ArcGIS Online Approach

Krista McPherson and Sarah McDonald

2021 ESRI
DEVELOPER SUMMIT

Presentation Overview

- **Introduction to Accessibility**
 - **Vision Impairment Testing**
 - **Keyboard Navigation Testing**
 - **Screen Reader Testing**
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The background features a vibrant, abstract graphic design. It consists of various overlapping shapes, including curved lines, geometric patterns, and clusters of small dots. The color palette is primarily blue, with accents of red, yellow, and white. The overall effect is dynamic and modern.

Introduction to Accessibility

Krista McPherson

What is Web Accessibility?



Developing solutions that remove barriers to access

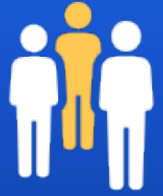


Creating perceivable, understandable, interactive experiences



Giving all people an opportunity to contribute

Why Test for Accessibility?



1 billion

people living with a disability worldwide



2030

2 billion people will need at least 1 assistive product by this year



25+

countries have web accessibility laws and policies



20%

of web traffic could come from a person with a disability



Vision Impairment Testing

Krista McPherson

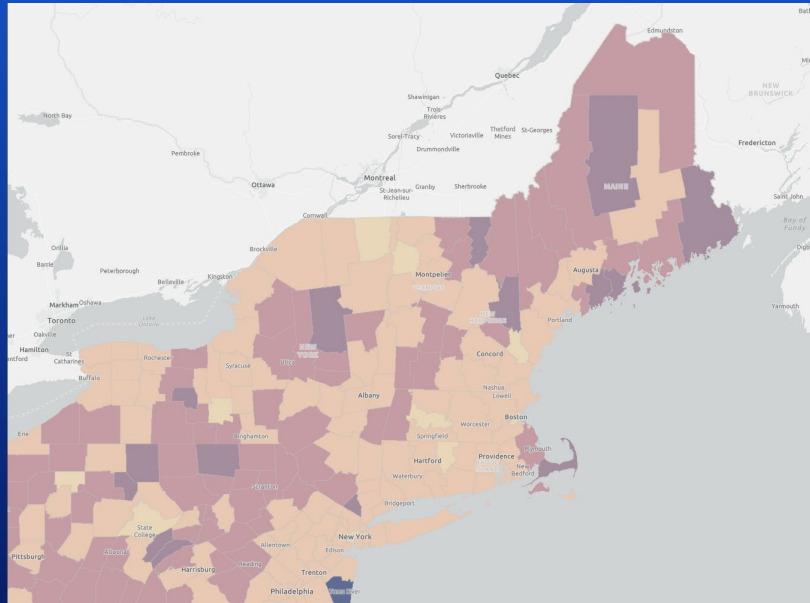
Getting Started with Vision Impairment Testing

Tools Needed

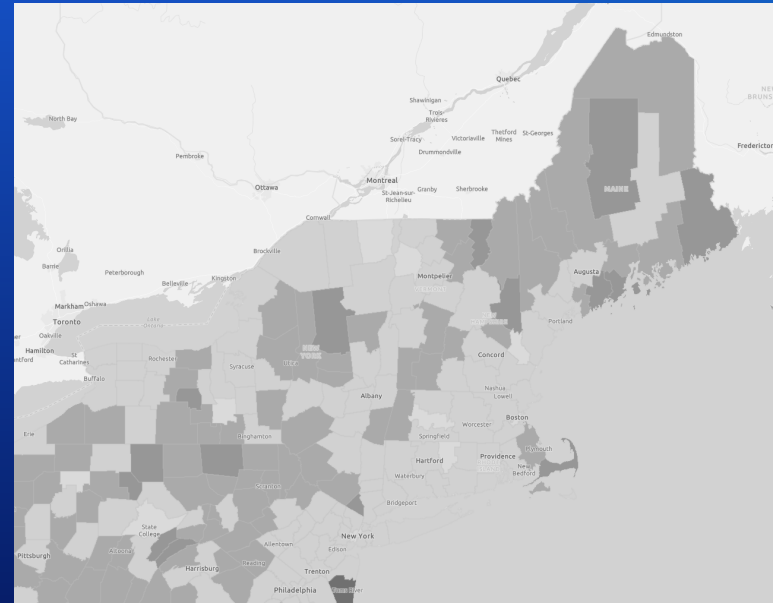
- **Low Vision + Colorblindness Simulator**
 - Visualize the impact of low vision and colorblindness in your app
 - NoCoffee – Extension for Chrome browser
- **Contrast Analyzing Tool**
 - Determine if contrast is sufficient for individuals with color deficiency
 - Color Contrast Analyzer – Application for Mac OSX
- **Browser and OS Zoom Tools**
 - Test usability for individuals with low vision with zoom settings in browser and OS
 - Zoom tools native to Google Chrome and MacOSX

Color for Communicating Information

Color should not be the only means of communicating information



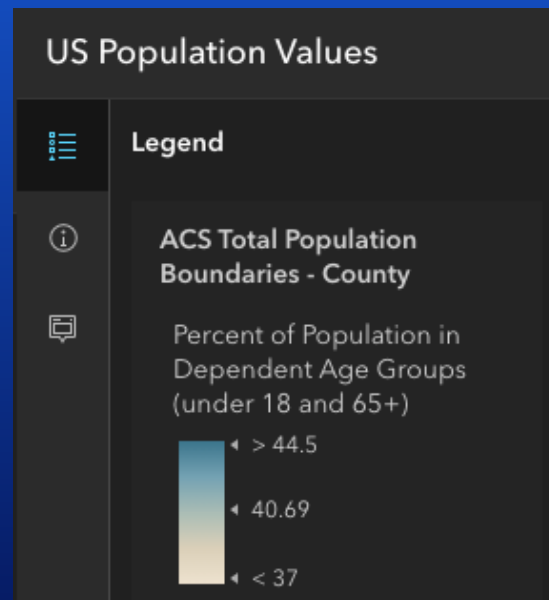
Color only map with normal vision



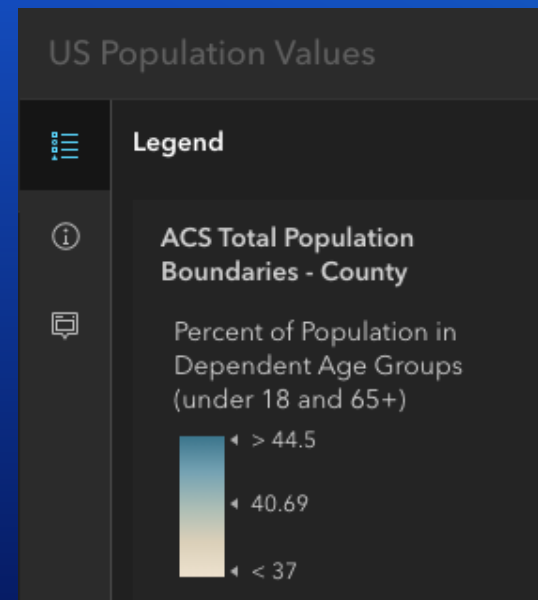
Color only map with no color vision

Color Contrast Ratios

Minimum color contrast ratio - 4.5:1 for regular text, 3:1 for large text



App title using high contrast







App title using low contrast

Color Contrast Ratios

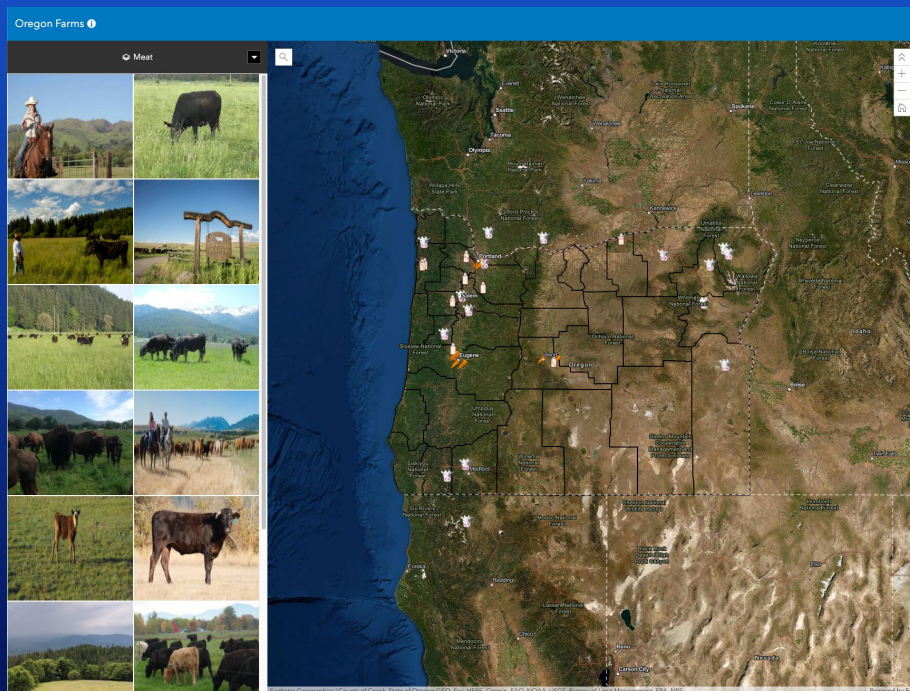
Shared theme settings in ArcGIS Online

Shared theme colors

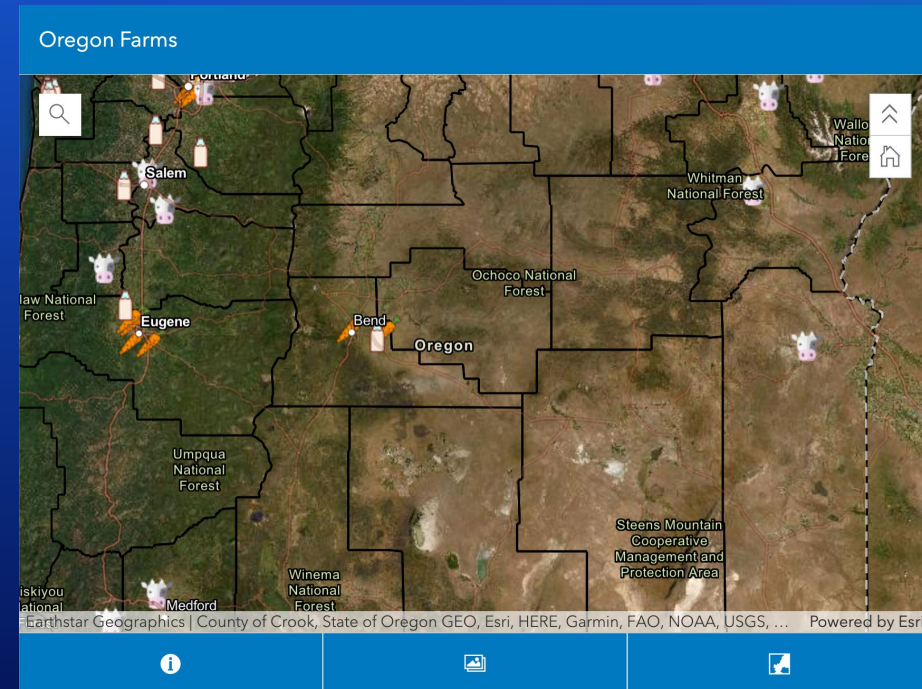
		Contrast ratio ⓘ
Header		
	Header background #A80084	
	Header text #FFFFFF	✓ 7.0
Button		
	Button background #A80084	
	Button text #FFFFFF	✓ 7.0

Reflow for Zoom Tools

Ensure reflow without loss of content when zoom is enabled



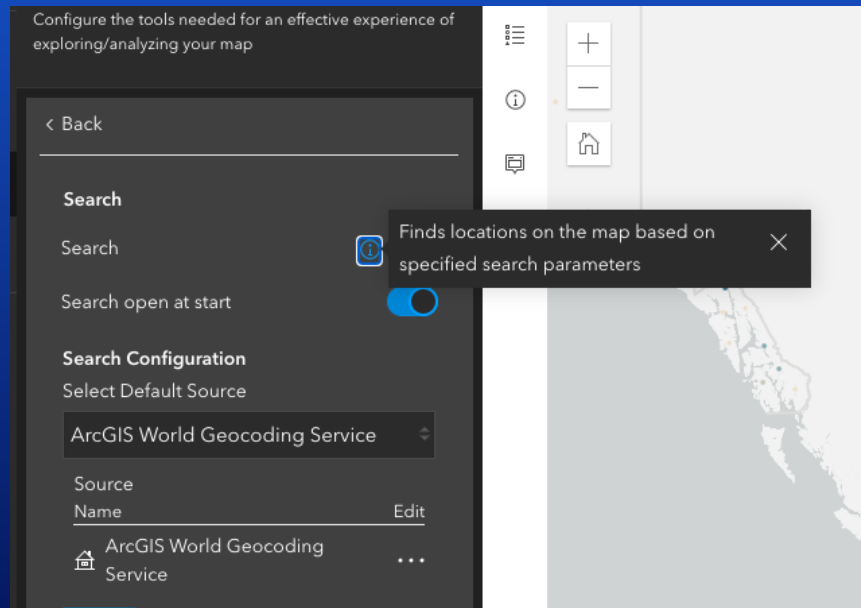
App viewed at 100% zoom



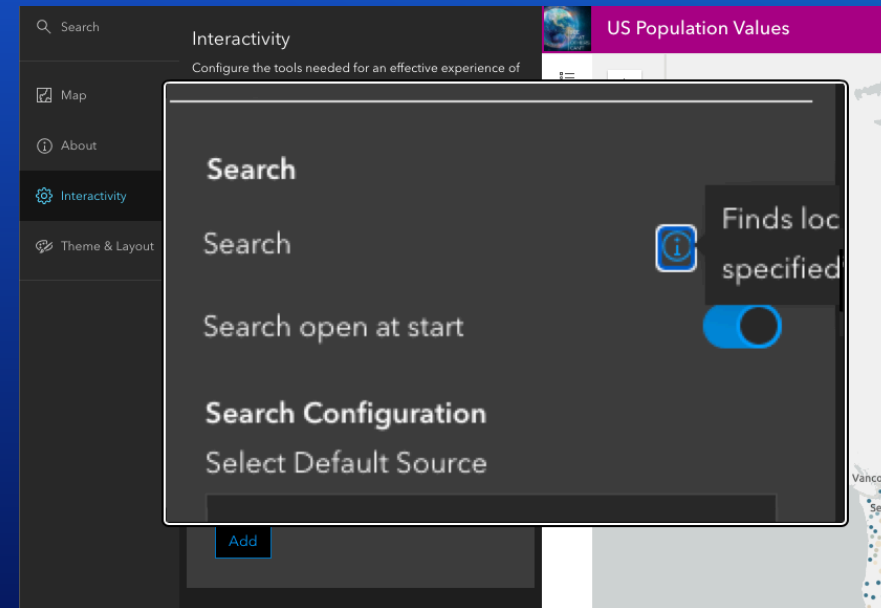
App viewed at 250% zoom

Hover Content with Zoom Tools

Content that appears on hover must be dismissible with keyboard



Tooltip view with zoom tools disabled



Tooltip view with zoom tools enabled

Vision Impairment Testing

Krista McPherson



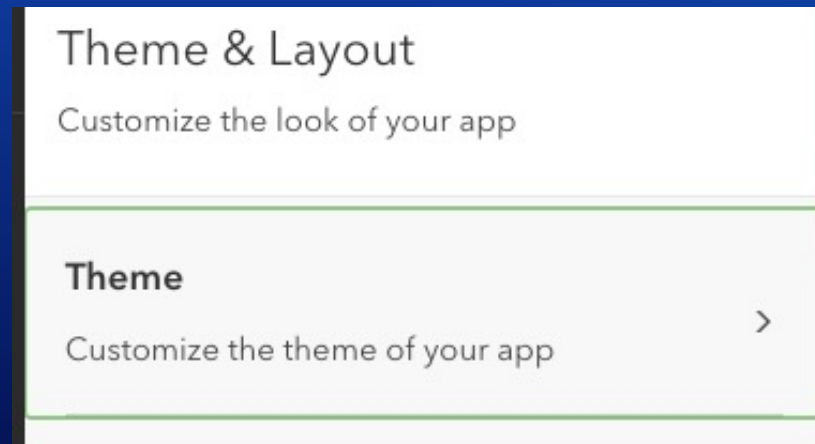
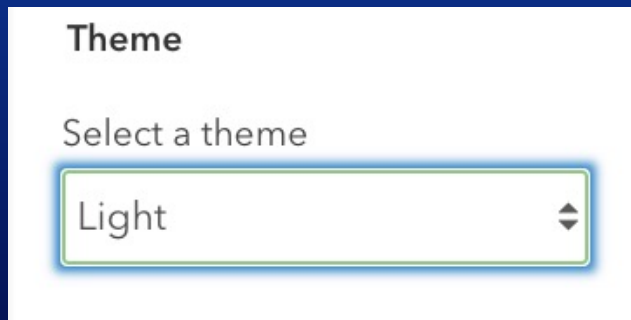
The background features a vibrant, abstract digital graphic. It consists of various geometric shapes, including circles, lines, and polygons, in shades of blue, red, and yellow. The shapes are layered and overlapping, creating a sense of depth and movement. The overall aesthetic is modern and tech-oriented.

Keyboard Navigation Testing

Sarah McDonald

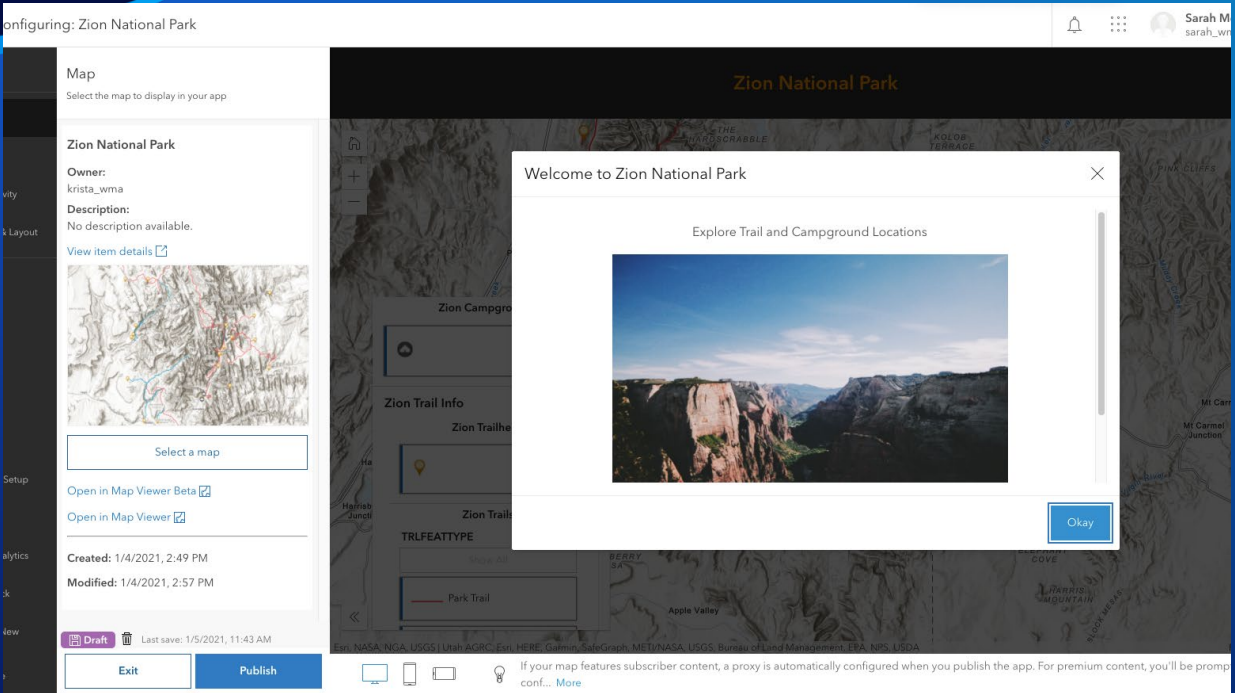
Getting Started with Keyboard Navigation

- **Keyboard Navigation: Ensuring that all content can be accessed with the keyboard alone**
- **Things to look for or "Focus" on:**
 - All interactive elements should be focusable and operable with keyboard
 - Visible indication of focus
 - Navigation order



Common Keys for Navigation

- **Tab/Shift + Tab:** interactive elements, radio buttons
- **Space:** checkboxes, buttons, scroll
- **Enter:** Links, buttons, autocomplete
- **Esc:** close
- **Up, Down, Right, Left arrows:** radio buttons, sliders, menus



Keyboard Navigation

Sarah McDonald

The background features a vibrant, abstract digital graphic. It consists of various geometric shapes, including circles, lines, and polygons, in shades of blue, red, yellow, and cyan. The shapes are layered and overlapping, creating a sense of depth and movement. The overall aesthetic is modern and tech-oriented, typical of a presentation slide for a digital or accessibility-related topic.

Screen Reader Testing

Sarah McDonald and Krista McPherson

Getting Started with Screen Readers

- **Define screen reader testing:** Screen readers convert strings into speech that is read aloud for users
 - **Common screen readers include: JAWS, VoiceOver(Mac), NonVisual Desktop Access(NVDA), Narrator(Microsoft)**
- **Things to listen for:**
 - **Regions, headings, and lists**
 - **Alt Text**
 - **Name, State, and Role**
 - **Aria-labels**
 - **Labels that can be added when a <label> can't be used**
 - **A screen reader would read aloud a <aria-label>**

Regions, Headings and Lists

- **Regions**

- Areas on a page that have a visual structure with a block of content
 - `<Header>`, `<nav>`, `<main>`, `<aside>`, and `<footer>`

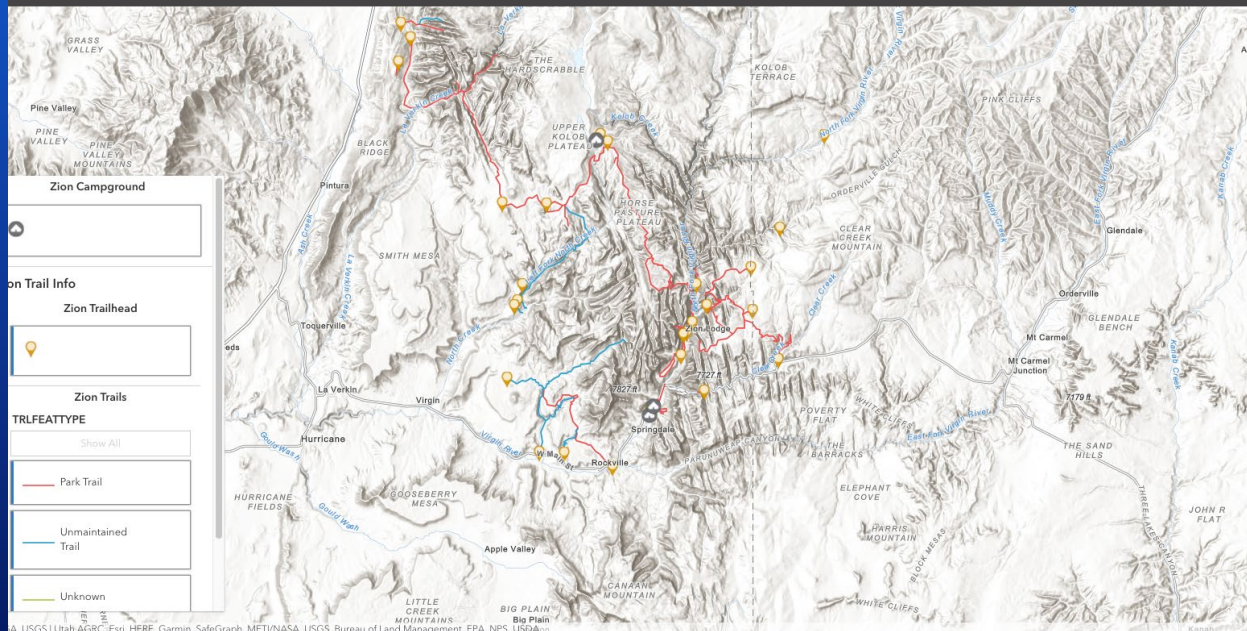
- **Headings**

- Heading can be used to outline and communicate the content on a page
 - A page should typically only have one `<h1>`

- **Lists**

- Lists can give insight to an arrangement of content
 - Unordered list (``), Ordered list (``), and Description lists (`<dl>`)

Zion National Park



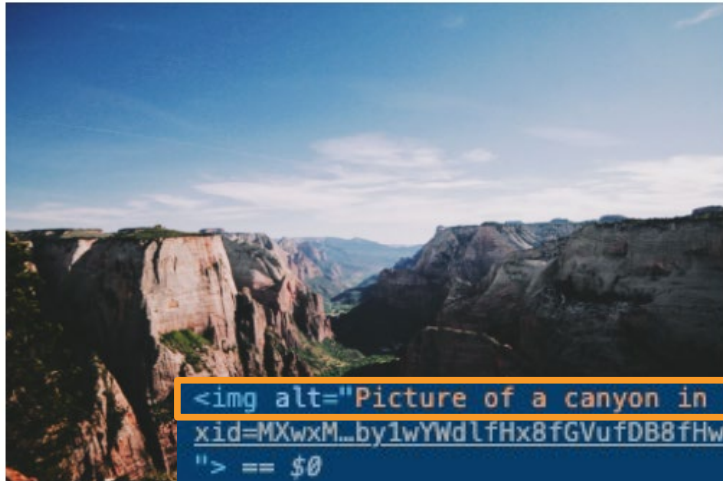
Headings and Screen Readers

Sarah McDonald

Alternative Text for Images

Non-text content should have a text alternative that serves an equivalent purpose

Explore Trail and Campground Locations



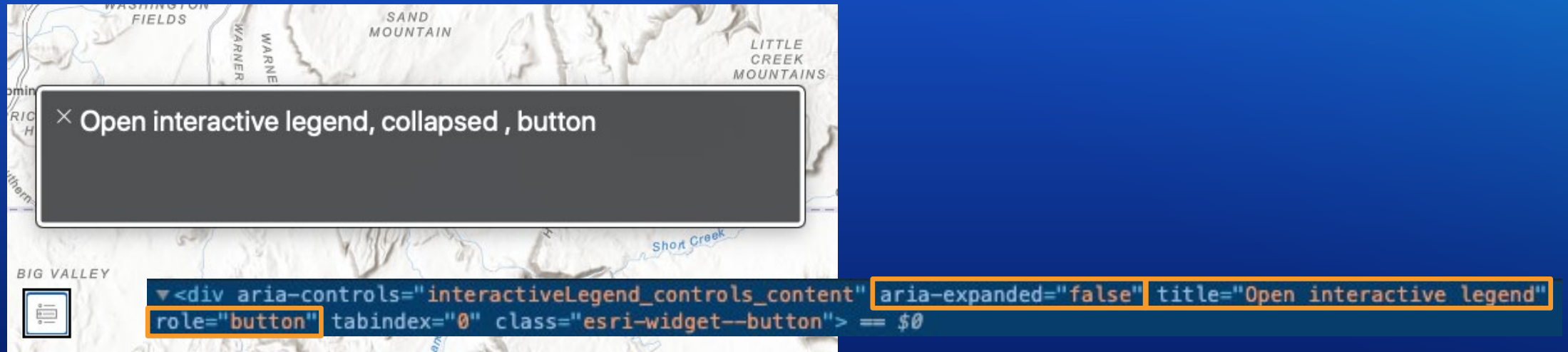
```
 == $0
```

<https://www.nps.gov/zion/index.htm>

Alternative text for image in introduction panel

Component Name, State, and Role

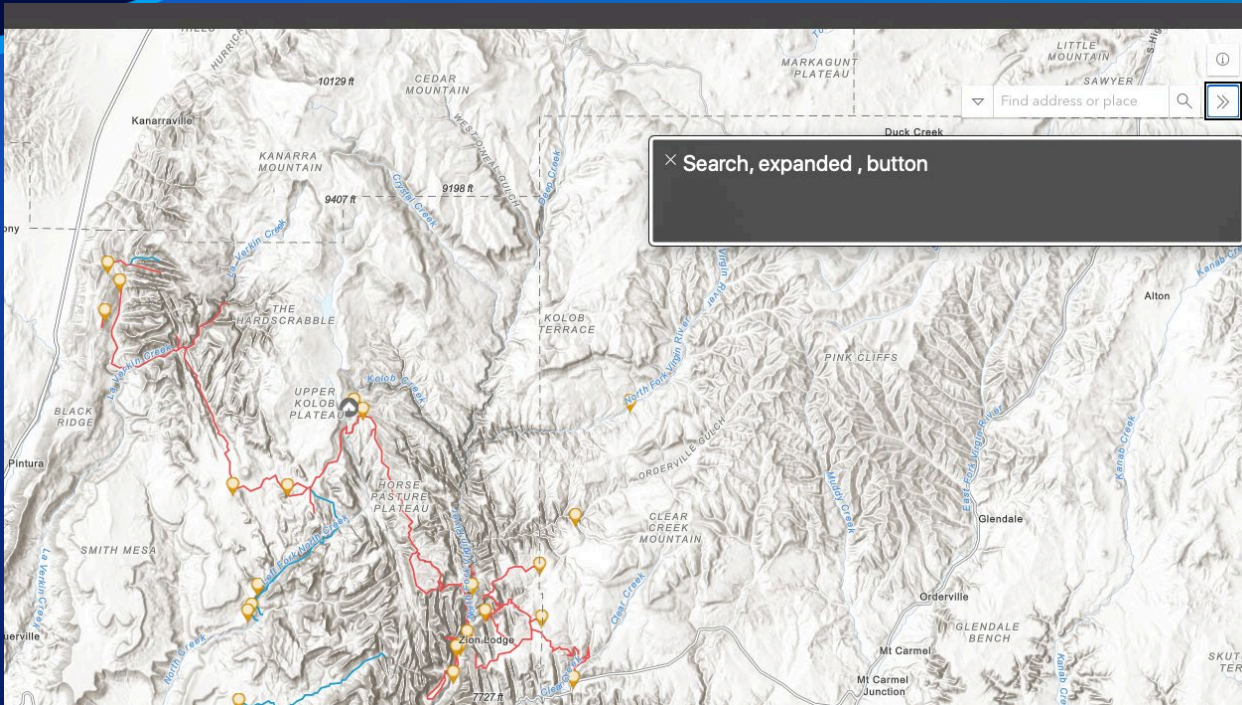
Interactive components should have a programmatically defined name, state, and role



× Open interactive legend, collapsed, button

```
▼ <div aria-controls="interactiveLegend_controls_content" aria-expanded="false" title="Open interactive legend" role="button" tabindex="0" class="esri-widget--button"> == $0
```

Code snippet for Interactive Legend button



Alt Text, Labels, Screen Readers

Krista McPherson

Key Takeaways



Awareness is the first step toward accessibility improvements



Web accessibility standards are constantly evolving



Opportunity to build an inclusive experience on the web

References and Additional Resources

Find references for this presentation and additional resources related to accessibility testing on the [2021 Dev Summit GitHub](#)



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