ArcGIS Online: Accessibility Best Practices for Web Apps

Ana Rodriguez, Sean Gill

Session Agenda

ArcGIS Online: Accessibility Best Practices for Web Apps

- Esri Accessibility Program
- Accessibility and Disability Background
- Accessibility Testing Principles
- Building Maps for Accessibility
- Configuring Web Apps
- Esri Accessibility Resources
- Open Discussion

Esri Accessibility Program

What does Accessibility mean to Esri?

Support and Inclusion for people of all abilities

Promote product accessibility across Global Standards

Compliance for government accessibility requirements

Deploy cross-platform strategy to

- drive **accessibility innovation** in our product development
- **make a difference** in our global culture
- support our users in **successful implementation of GIS** with robust and accessible software.

Introduction to Accessibility

Why is accessibility important?

1 billion

people worldwide are living with a disability

2030

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

25+

countries currently have web accessibility laws and policies

20%

of web traffic could come from a person with a disability

Accessibility Standards & Guidelines

US Section 508

US standards for ICT accessibility for federal agencies

ADA

Civil rights law for businesses in private or public sector

WCAG

Web
Content
Accessibility
Guidelines

Internationally recognized accessibility standards; 2.1 AA is industry standard

European Union
Japan
Canada
Australia, New Zealand
United Kingdom

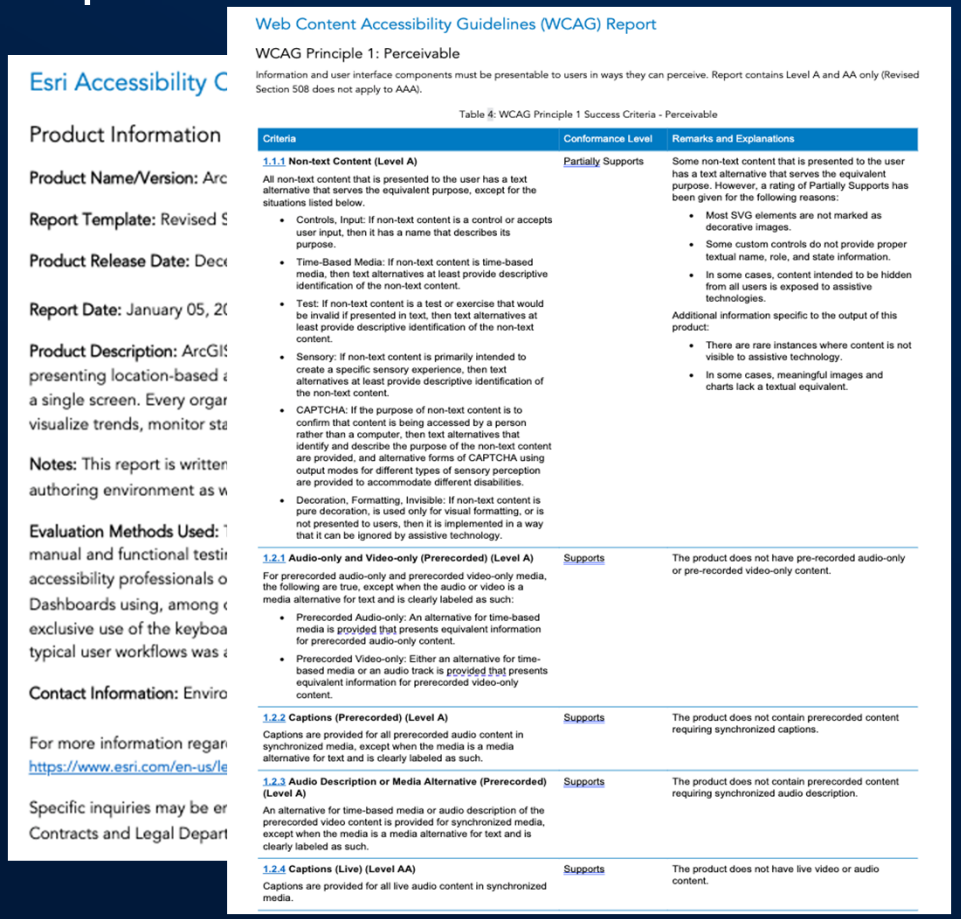
ArcGIS Accessibility Conformance Reports

VPAT

Voluntary Product Accessibility Template;
Commonly used template

ACR

Accessibility Conformance Report;
Documentation for product accessibility details;
May use VPAT template as part of ACR report



Esri Accessibility C

Product Information

Product Name/Version: Arc

Report Template: Revised S

Product Release Date: Dec

Report Date: January 05, 2(

Product Description: ArcGI
presenting location-based a
a single screen. Every orgar
visualize trends, monitor sta

Notes: This report is writter
authoring environment as w

Evaluation Methods Used:
manual and functional testi
accessibility professionals o
Dashboards using, among
exclusive use of the keyboa
typical user workflows was a

Contact Information: Enviro

For more information regar
https://www.esri.com/en-us/le

Specific inquiries may be er
Contracts and Legal Depart

Web Content Accessibility Guidelines (WCAG) Report

WCAG Principle 1: Perceivable

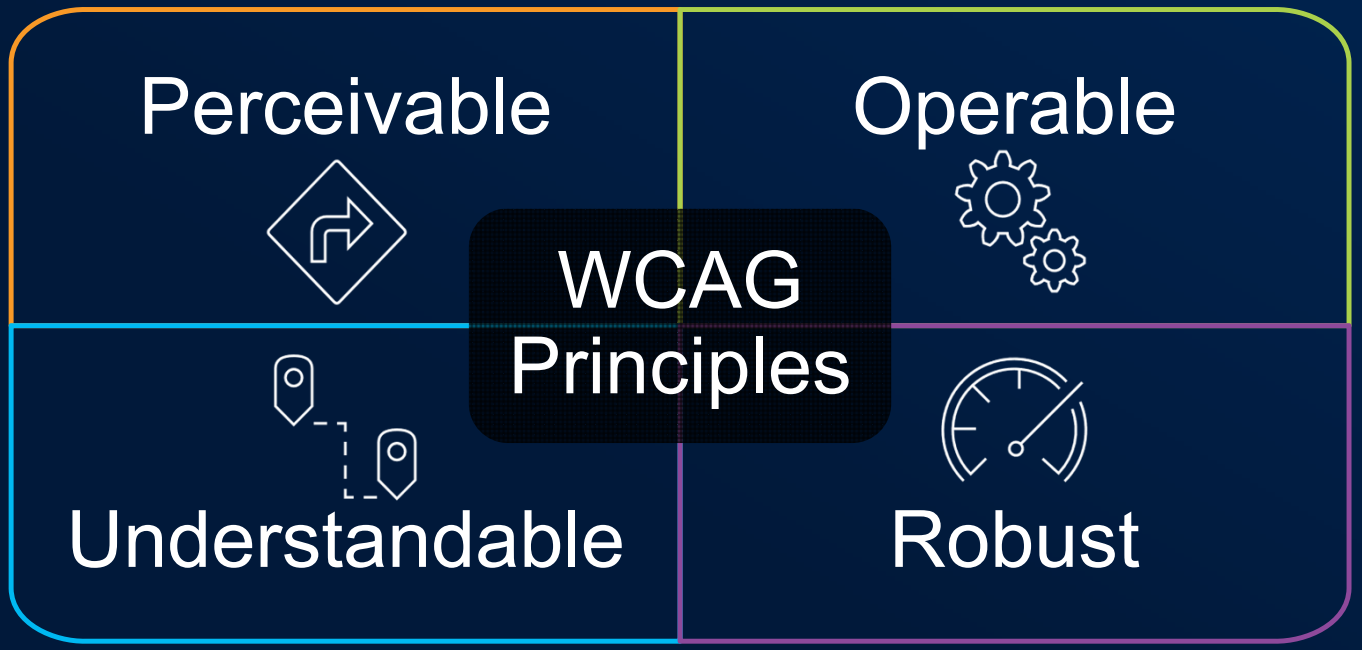
Information and user interface components must be presentable to users in ways they can perceive. Report contains Level A and AA only (Revised Section 508 does not apply to AAA).

Table 4: WCAG Principle 1 Success Criteria - Perceivable

Criteria	Conformance Level	Remarks and Explanations
1.1.1 **Non-text Content (Level A)** All non-text content that is presented to the user has a text alternative that serves the equivalent purpose, except for the situations listed below. • Controls, Input: If non-text content is a control or accepts user input, then it has a name that describes its purpose. • Time-Based Media: If non-text content is time-based media, then text alternatives at least provide descriptive identification of the non-text content. • Test: If non-text content is a test or exercise that would be invalid if presented in text, then text alternatives at least provide descriptive identification of the non-text content. • Sensory: If non-text content is primarily intended to create a specific sensory experience, then text alternatives at least provide descriptive identification of the non-text content. • CAPTCHA: If the purpose of non-text content is to confirm that content is being accessed by a person rather than a computer, then text alternatives that identify and describe the purpose of the non-text content are provided, and alternative forms of CAPTCHA using output modes for different types of sensory perception are provided to accommodate different disabilities. • Decoration, Formatting, Invisible: If non-text content is pure decoration, is used only for visual formatting, or is not presented to users, then it is implemented in a way that it can be ignored by assistive technology.	Partially Supports	Some non-text content that is presented to the user has a text alternative that serves the equivalent purpose. However, a rating of Partially Supports has been given for the following reasons: • Most SVG elements are not marked as decorative images. • Some custom controls do not provide proper textual name, role, and state information. • In some cases, content intended to be hidden from all users is exposed to assistive technologies. Additional information specific to the output of this product: • There are rare instances where content is not visible to assistive technology. • In some cases, meaningful images and charts lack a textual equivalent.
1.2.1 **Audio-only and Video-only (Prerecorded) (Level A)** For prerecorded audio-only and prerecorded video-only media, the following are true, except when the audio or video is a media alternative for text and is clearly labeled as such: • Prerecorded Audio-only: An alternative for time-based media is provided that presents equivalent information for prerecorded audio-only content. • Prerecorded Video-only: Either an alternative for time-based media or an audio track is provided that presents equivalent information for prerecorded video-only content.	Supports	The product does not have pre-recorded audio-only or pre-recorded video-only content.
1.2.2 **Captions (Prerecorded) (Level A)** Captions are provided for all prerecorded audio content in synchronized media, except when the media is a media alternative for text and is clearly labeled as such.	Supports	The product does not contain prerecorded content requiring synchronized captions.
1.2.3 **Audio Description or Media Alternative (Prerecorded) (Level A)** An alternative for time-based media or audio description of the prerecorded video content is provided for synchronized media, except when the media is a media alternative for text and is clearly labeled as such.	Supports	The product does not contain prerecorded content requiring synchronized audio description.
1.2.4 **Captions (Live) (Level AA)** Captions are provided for all live audio content in synchronized media.	Supports	The product does not have live video or audio content.

Testing for Web Accessibility

Web Content Accessibility Guidelines

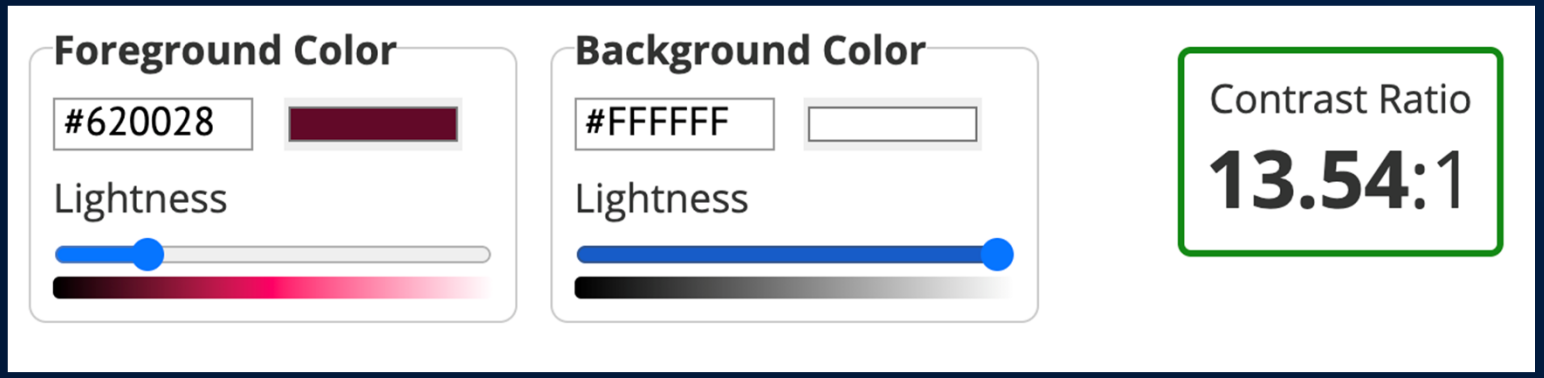


Testing for accessibility

Color and Contrast

- Elements in the foreground (especially text) need to stand out clearly and be legible against the background

- Can test with WebAIM Contrast Checker (should be 4.5:1 or greater for maximum accessibility)



Testing for accessibility

Color and Contrast

- As many as 1 in 20 people worldwide have some form of Color Vision Deficiency (CVD)
  - Deuteranopia (green-blind)
  - Protanopia (red-blind)
  - Tritanopia (blue-blind)

- Test your content's color palette to check for forms of CVD

Full-color vision

Deuteranopia (red-green CVD)

Protoanopia (red-green CVD)

Tritanopia (yellow-blue CVD)

Testing for accessibility

Keyboard Navigation

Who does this impact?

- Individuals using keyboards may have mobility disabilities

- Many consumers of online content use the keyboard (or any other text entry devices) rather than a mouse to navigate through web pages, apps, etc.

- Consider the Permanent, Temporary, and Situational conditions that could impact ability to use a keyboard

Testing for accessibility

Keyboard Navigation

Why is testing for keyboard navigation important?

- Keyboard navigation maps to other types of navigation interfaces (e.g. voice recognition software, switch controllers, pedals, etc)
- Optimizing for keyboard support takes you a long way in optimizing for other assistive technologies
- Relatively easy to test and confirm navigability of your technology

Testing for accessibility

Keyboard Navigation

Tab	move forward through interactive elements (e.g. link, button, form)
Shift + Tab	move backward through interactive elements
Arrow keys	move between parts of composite UI elements
Enter	activate the current selection (e.g. links, buttons)
Space	check/uncheck, and activate the current selection
Escape	close the current selection and return focus to the element that opened it
Shift + Arrows	expand/close dialog divider
Shift + F10	open a context menu (pop-up menu)
Alt + Down Arrow	opens a combo box

Testing for accessibility

Screen Readers

Who does this impact?

- Upwards of 2.2 billion people have vision impairment (as of 2022)
- More than 12 million people in the US (over 40) have vision impairment (as of 2021)
- Screen reader users are often blind, but also include users with low vision, cognitive or learning disabilities, and those who prefer voice assistants
- Consider the Permanent, Temporary, and Situational conditions that could impact a human's sight

https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment

Testing for accessibility

Screen Readers

SCREEN READER	BROWSER	OS
NVDA	**Firefox**, Chrome	Windows
JAWS	**Chrome, IE**	Windows
Narrator	**Edge**, Chrome	Installed in WIN 10
VoiceOver	**Safari**, Chrome	MacOS, iOS
TalkBack	**Chrome**	Android mobile

Data from WebAIM 2019 Survey on Screen Reader Preference

Testing for accessibility

Automated testing tools – Web Scanners

Accessibility Insights

Optimized for various environments:

- Web browser extensions
- Windows OS version
- Android apps (run on desktop)
- Created by Microsoft

Axe Dev Tools

Optimized for web and desktop:

- Web browser extensions (free and upgraded modes of operation)
- Axe-core API for testing (open source)
- Created by Deque

Building Maps for Accessibility

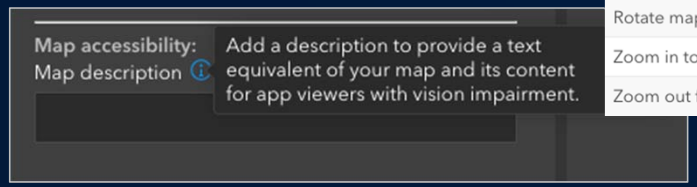
Building Maps for Accessibility

Combined Approach

Enahnced Contrast Basemaps in basemap gallery

Map navigation keyboard shortcuts in Map Viewer

Map description in ArcGIS Instant Apps

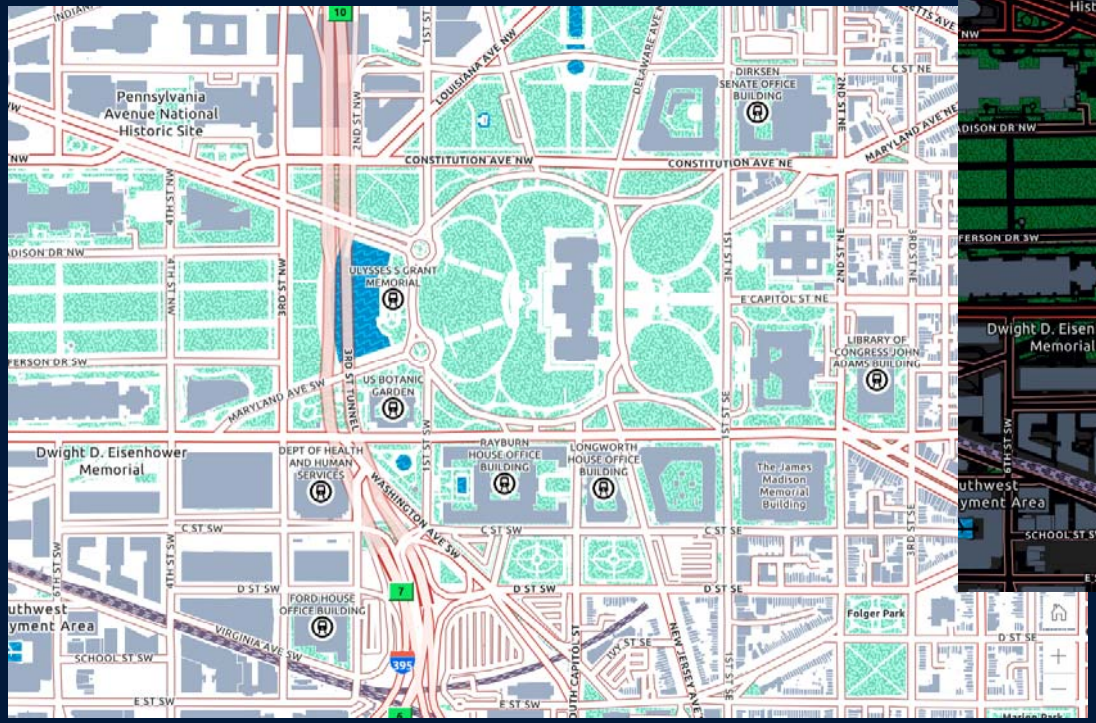


When map view is in focus	
Nudge the view to left, right, up, or down	Arrow keys
Adjust view to point north	N
Rotate map counterclockwise	A
Rotate map clockwise	D
Zoom in to center of the map	+
Zoom out from center of the map	-

Building Maps for Accessibility

Enhanced Contrast Basemaps

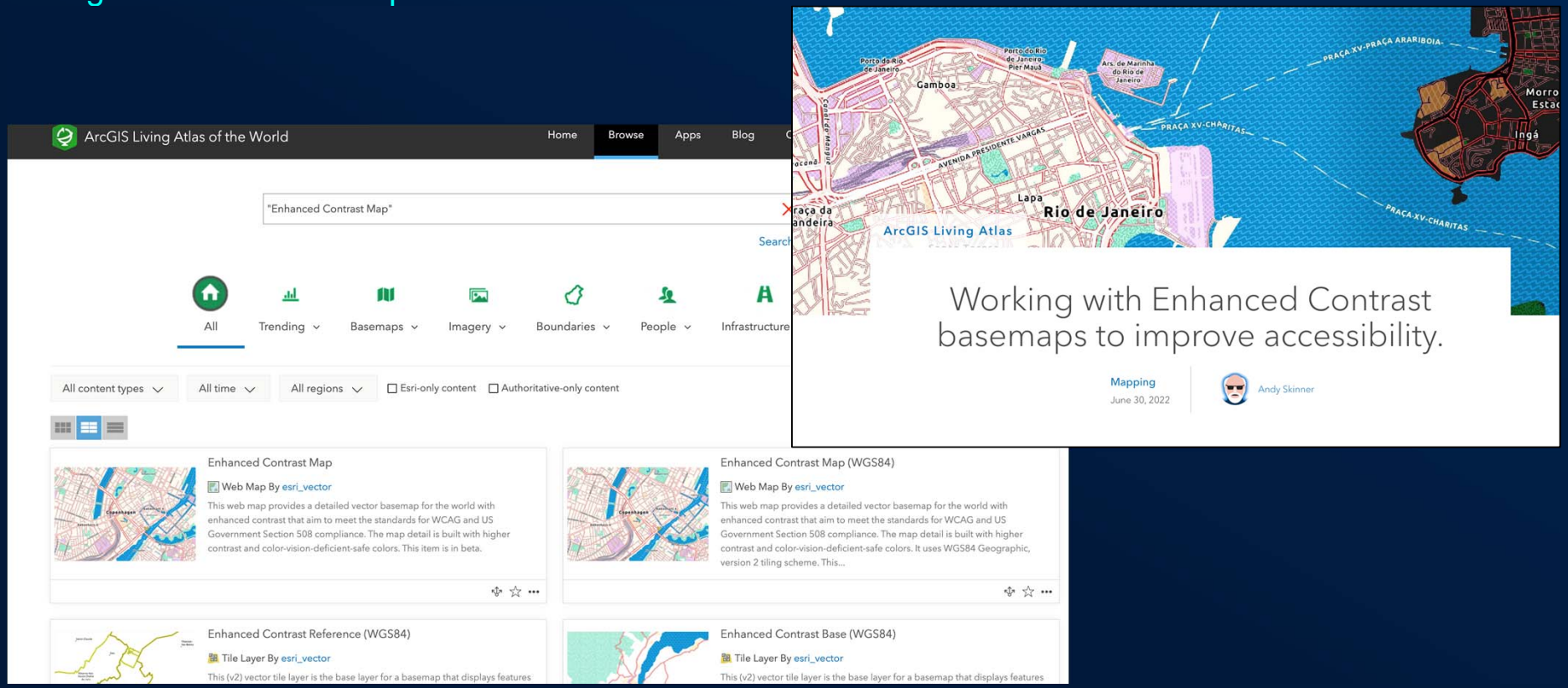
Enhanced Contrast Map



Enhanced Contrast Dark Map

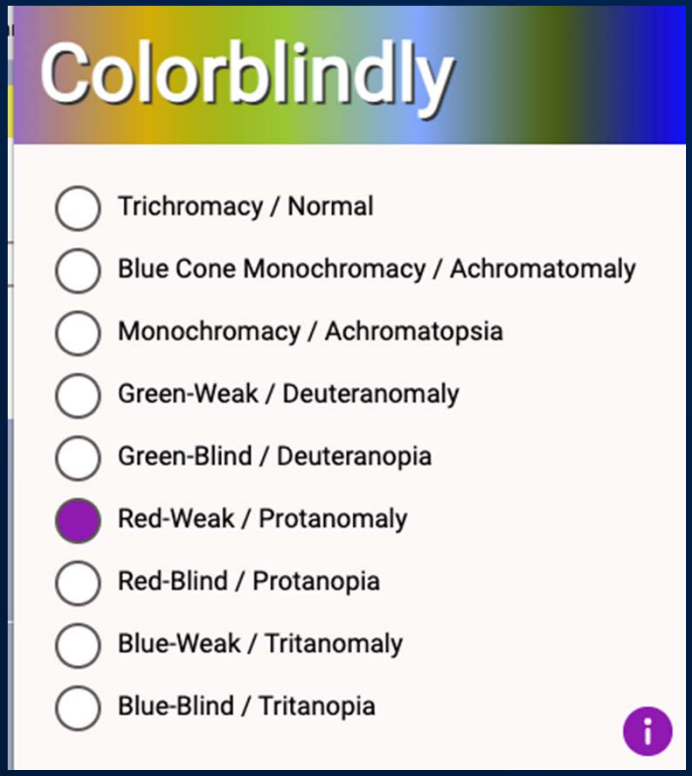
Building Maps for Accessibility

High Contrast Basemaps



Color Ramps for Color Vision Deficiency

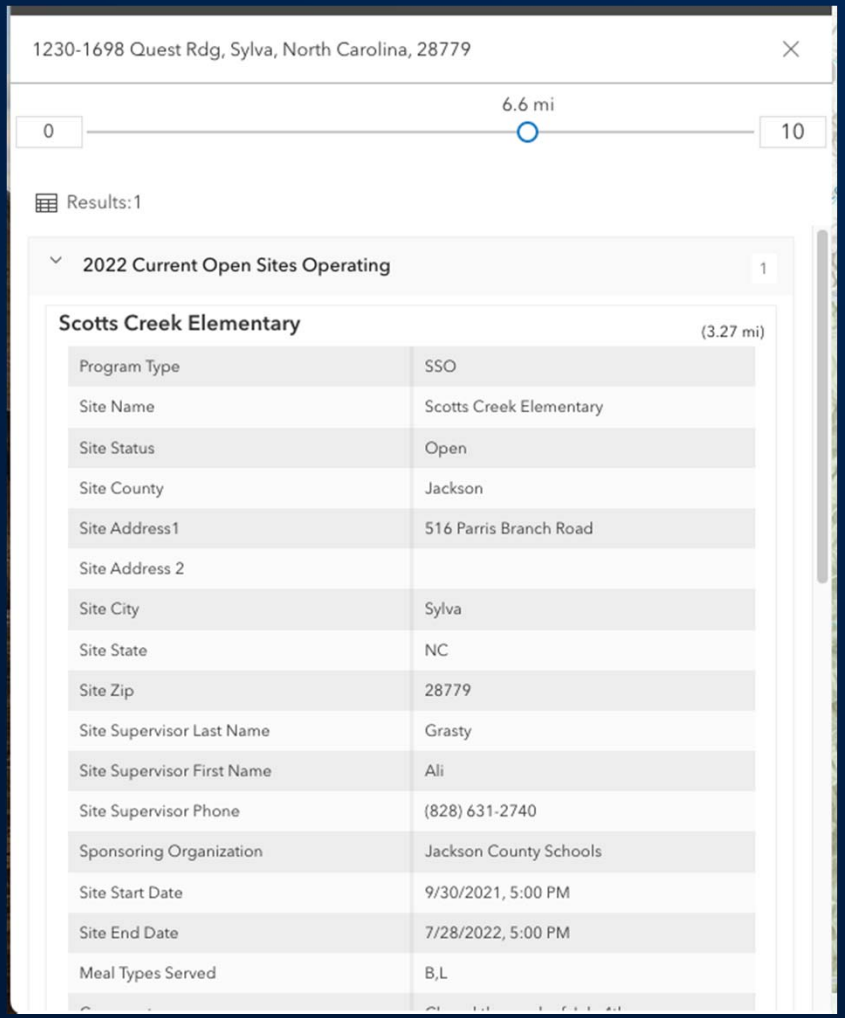
- Esri color ramps
- Designing Apps with Color Blind Users in Mind
- https://colorbrewer2.org
- Testing tools
  - Colorblindly
  - Color Oracle



Data and Information

- Avoid information overload
- Clear concise language
- Avoid visual clutter

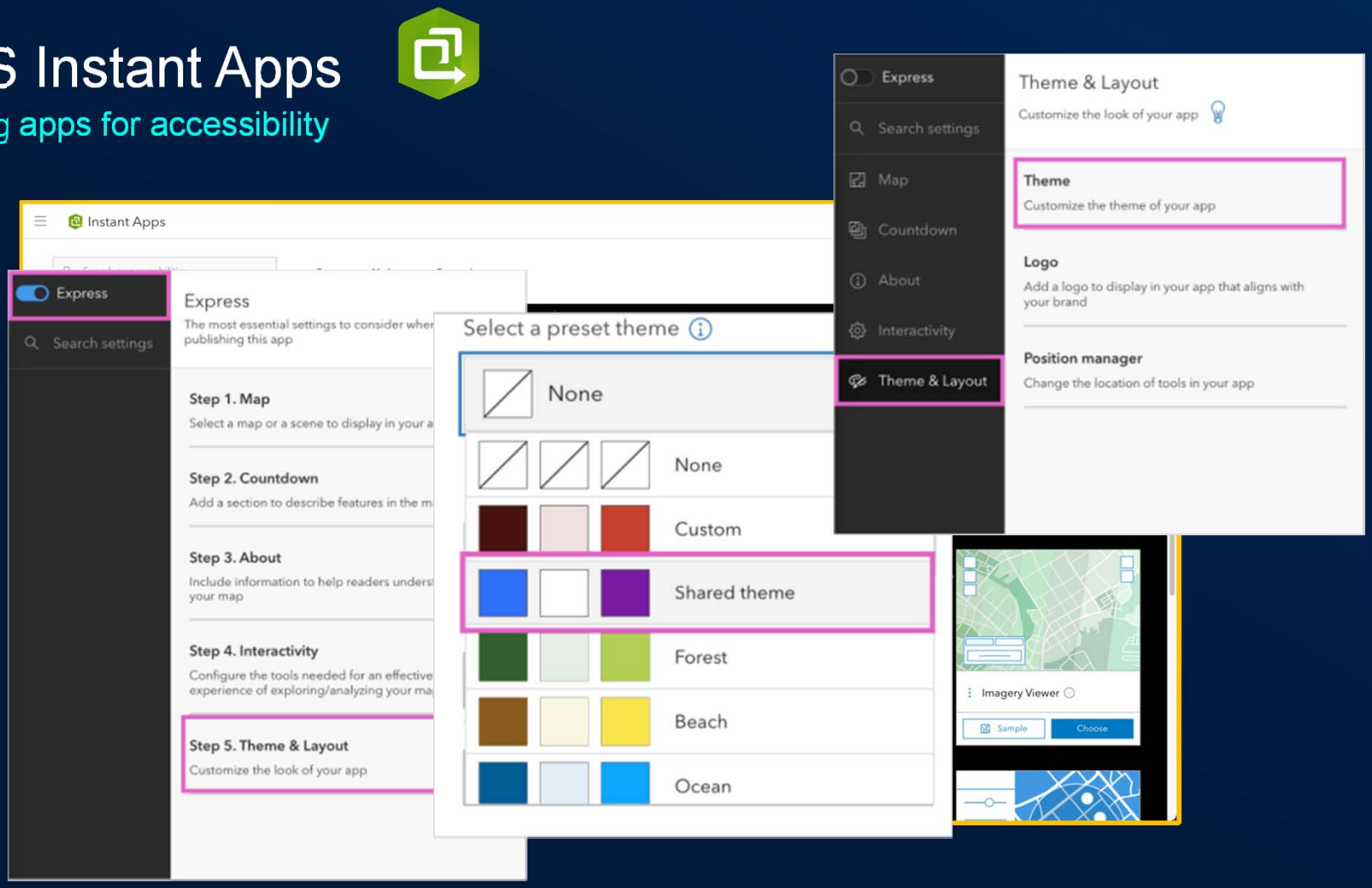
- Tips from the W3C
- Writing for Web Accessibility



Configuring Web Apps for Accessibility

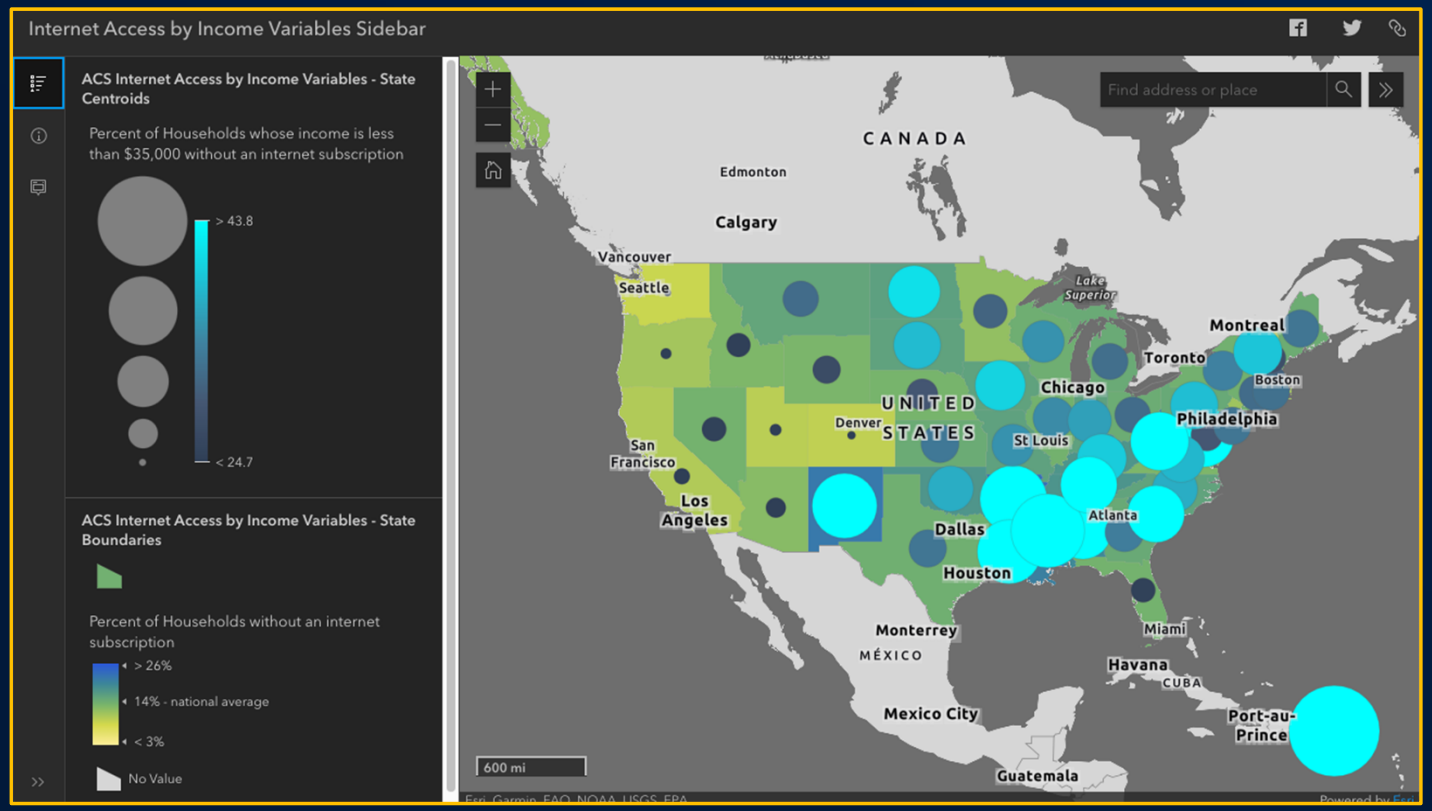
ArcGIS Instant Apps

Configuring apps for accessibility



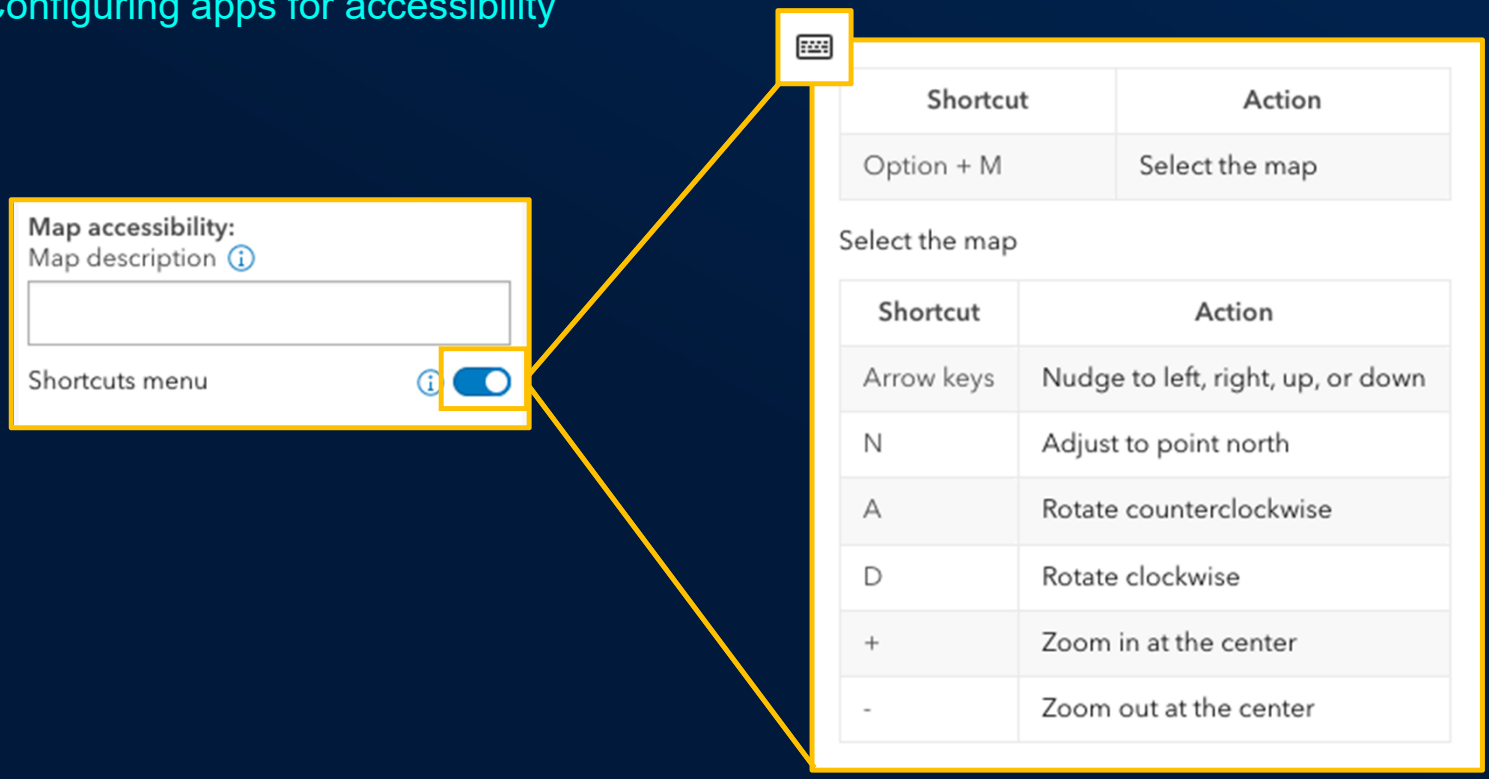
ArcGIS Instant Apps

Configuring apps for accessibility



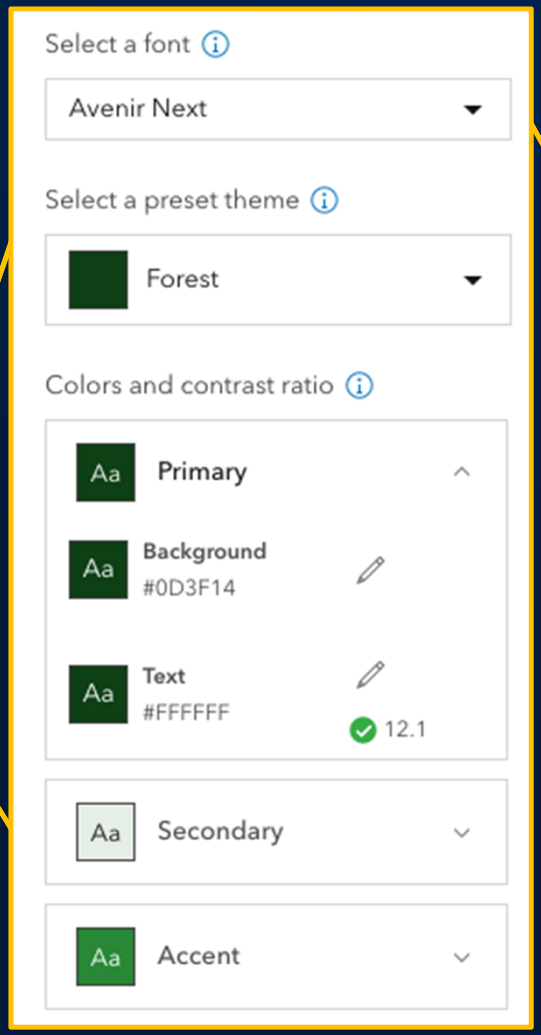
ArcGIS Instant Apps

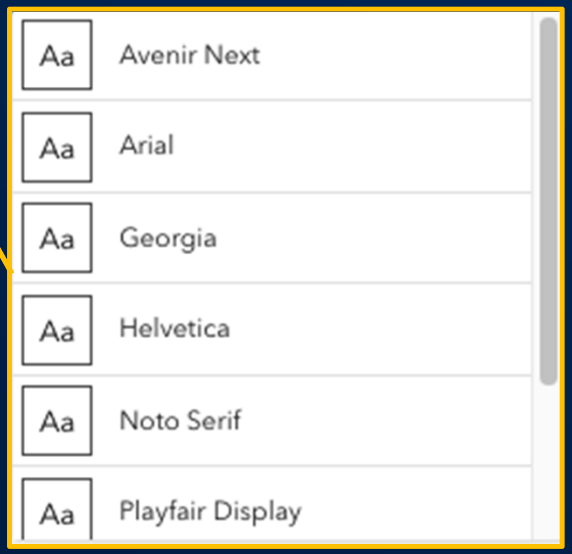
Configuring apps for accessibility



ArcGIS Instant Apps

Configuring apps for accessibility





ArcGIS StoryMaps

Configuring apps for accessibility

ArcGIS StoryMaps

Configuring apps for accessibility

ArcGIS StoryMaps has been evaluated for conformance with WCAG 2.0 AA, WCAG 2.1 AA, and Section 508 standards. This evaluation, the Voluntary Product Accessibility Template (VPAT), can be found here.

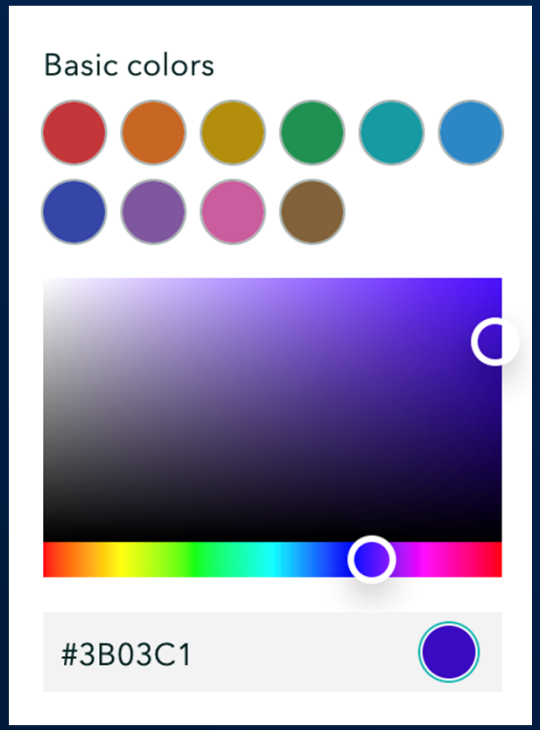
The StoryMaps team has also put a lot of effort into giving authors the ability to produce maximally accessible stories through a variety of features.

ArcGIS StoryMaps

Story Theming

Theme Builder — Gives authors a lot of control over the aesthetic look and feel of their story

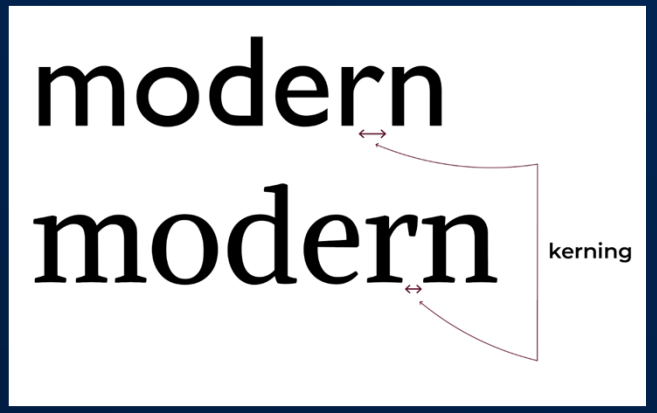
- Color
  - Theme builder's color picker lets users input any hex code (or drag selector to desired spot on color ramp)
    - Can control the story's background color, primary and secondary accent colors, text colors, and colors of other elements such as separators and button links
  - As mentioned earlier, check for accessible contrast ratio and compatibility with CVDs!

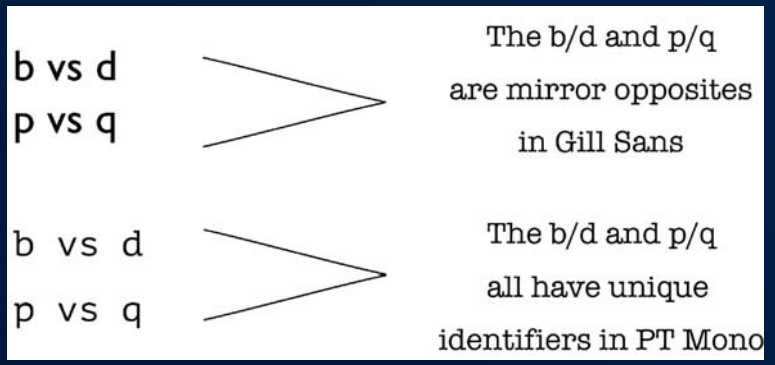


ArcGIS StoryMaps

Story Theming

- Typography
  - Theme builder allows authors to select from the entire library of Google Fonts (over 1,000 fonts). Many of these can be difficult to read for consumers with vision impairments or conditions such as dyslexia.
  - Some considerations when selecting an accessible font:
    - Sans serif fonts tend to be more legible in digital formats
    - Kerning (spacing between characters in a given typeface). If it's too tight, multiple characters can blend together and look like one letter (ex: "cool" can read as "cod")
    - Fonts with all unique characters are most accessible (tip: compare capital I (eye), lower-case l (ell), and number 1)
    - Use display fonts judiciously: they can be fun, but also not very accessible





ArcGIS StoryMaps

Media

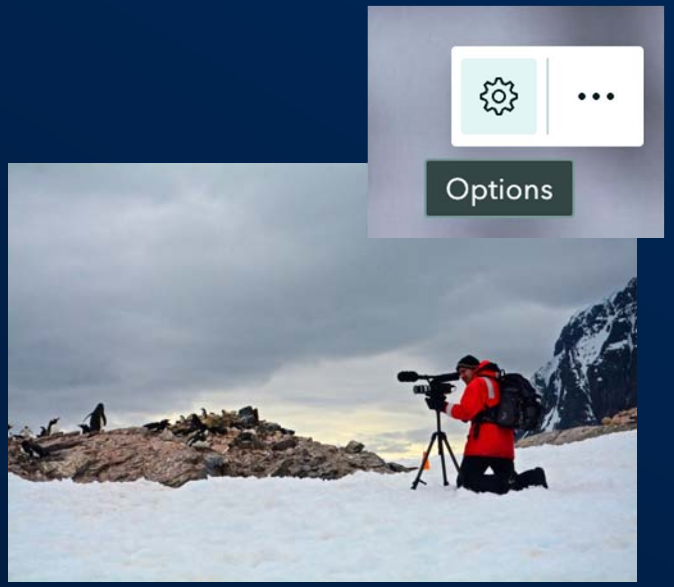
Media: photos, videos, audio, embedded content

- Videos or audio clips with speech should be captioned or have a transcript made available through a link

- Limit use of graphics that have text within them (especially if the text is important)
  - Screen readers won't pick up on words within graphics
  - Real text is more adaptable by consumer (can be enlarged, copy/pasted, available in reader modes, etc.)

ArcGIS StoryMaps

Media



- Alternative text
  - Describes media for screen readers or if the media doesn't load
  - ArcGIS StoryMaps allows adding alt text for all forms of media (videos, maps, audio clips as well as images)
  - Most effective alt text finds a balance between too much description and not enough

Too much	Not enough	Just right
A person in a neon red jacket and a hefty backpack kneels in the snow beneath a granite sky, peering through the telescopic lens of a tripod-mounted camera. Their target is cluster of penguins camping out on a rocky outcropping several yards away	Person in a red jacket in the snow	A person in a red jacket kneels in the snow, photographing some penguins on a nearby rock

ArcGIS StoryMaps

Story Structure/Language

- Use heading and subheading text types properly
  - Should be used to break story into logical sections and sub-sections, NOT for effect
  - Helps optimize the story for assistive technologies
- Try to avoid paragraphs that are too long or many short paragraphs in a row
  - Both a wall of text and a lot of line breaks can be disorienting
- Use descriptive language for hyperlinks and button links
  - e.g., “Learn more about rainforest conservation” rather than “Click here to learn more.”

ArcGIS StoryMaps

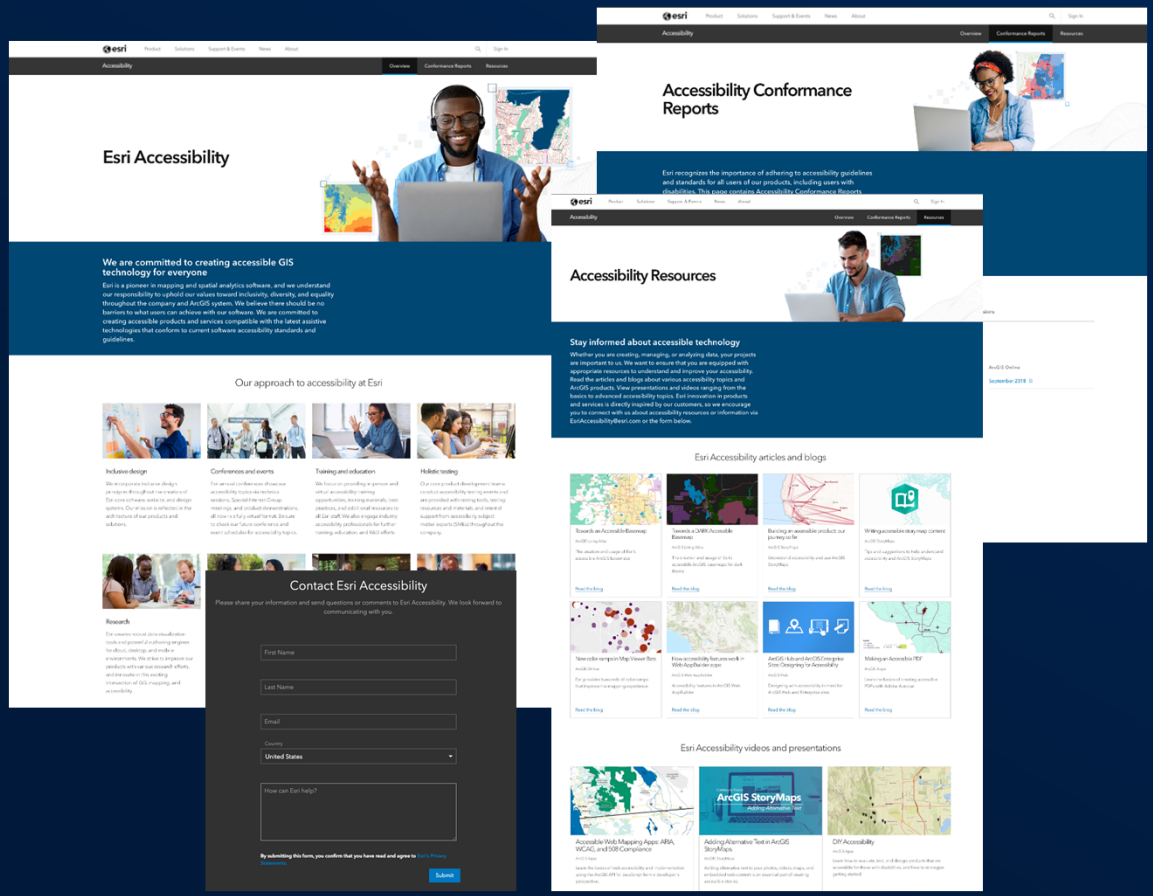
Story Structure/Language

- Be mindful of using **inclusive language**
  - Many commonplace words and phrases have roots in bias (ableism, racism, sexism, etc.) or violence
  - Here are some resources to learn more about inclusive language and substitute phrasing for less inclusive terms:
    - Linguistic Society of America's guidelines for inclusive language
    - American Psychological Association's style guide for bias-free language
    - National Center on Disability and Journalism's disability language style guide

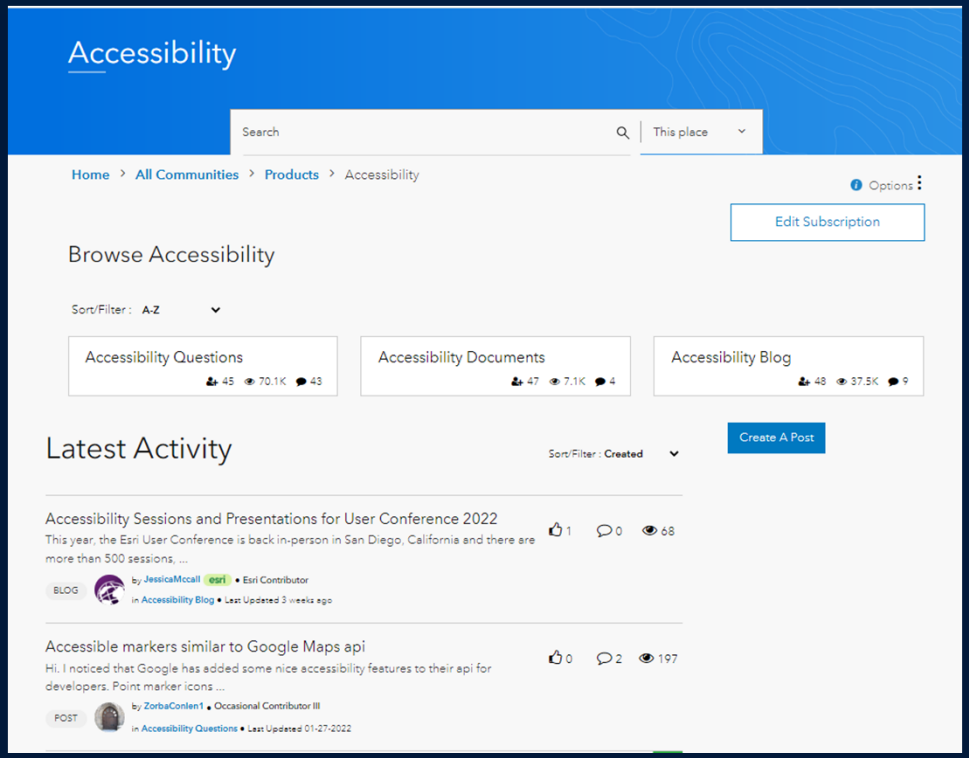
Accessibility Resources

Esri Accessibility Resources Site

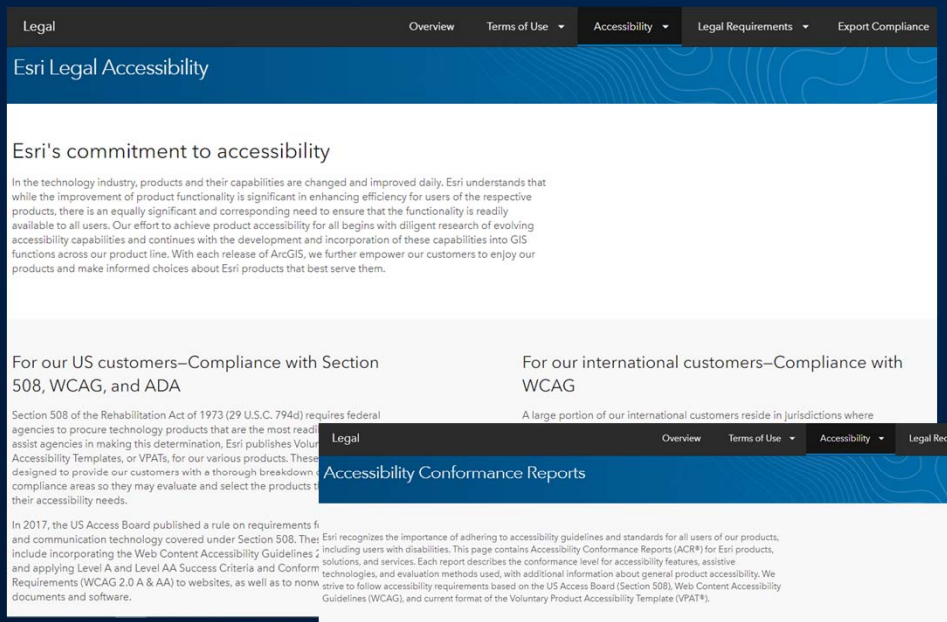
- Customer information and resource site dedicated to Accessibility at Esri
- Product accessibility best practices, articles, documentation, and general resources
- Contact Esri Accessibility Form

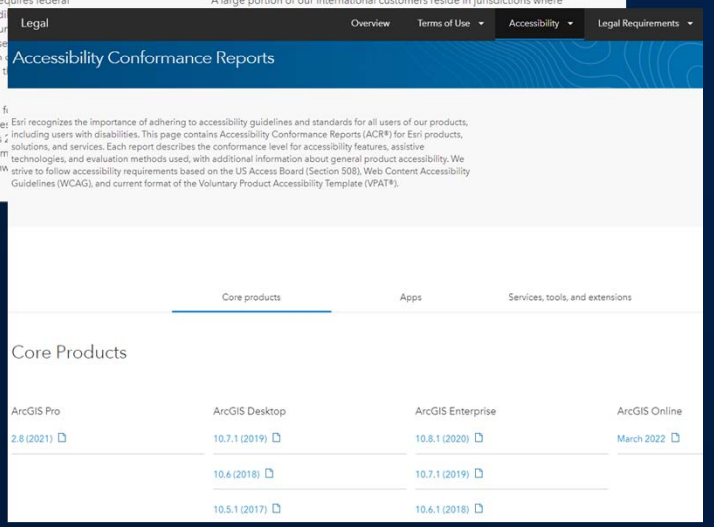


Accessibility Community



Esri Legal Accessibility





Esri Accessibility Resources

- Esri Accessibility Site
  - https://www.esri.com/en-us/accessibility/overview
- Esri Legal Accessibility
  - https://www.esri.com/en-us/legal/accessibility/conformance-reports
- Esri Accessibility Community
  - https://community.esri.com/t5/accessibility/ct-p/accessibility
- EsriAccessibility@Esri.com
  - Email alias for issues and request for assistance

Esri Accessibility Resources (cont)

- ArcGIS Instant Apps resources:
  - https://www.esri.com/en-us/arcgis/products/arcgis-instant-apps/resources

- ArcGIS StoryMaps resources:
  - https://storymaps.arcgis.com/stories/02670c9018f14cfbbaef7cba5c54d453

Questions and Discussion

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