



# DIY Accessibility

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# What is accessibility?

- Make content usable by as many people as possible
- About 15% of world population lives with some form of disability: **1 billion** people
- In the US, 1 in 5 adults has a disability
- Disabilities could be temporary or situational

# Why is accessibility important?

- People with disabilities deserve equal rights
- The ADA and Section 508
- Accessible interface is about good design and coding practice
- Good accessibility is good user experience

# What are we doing?

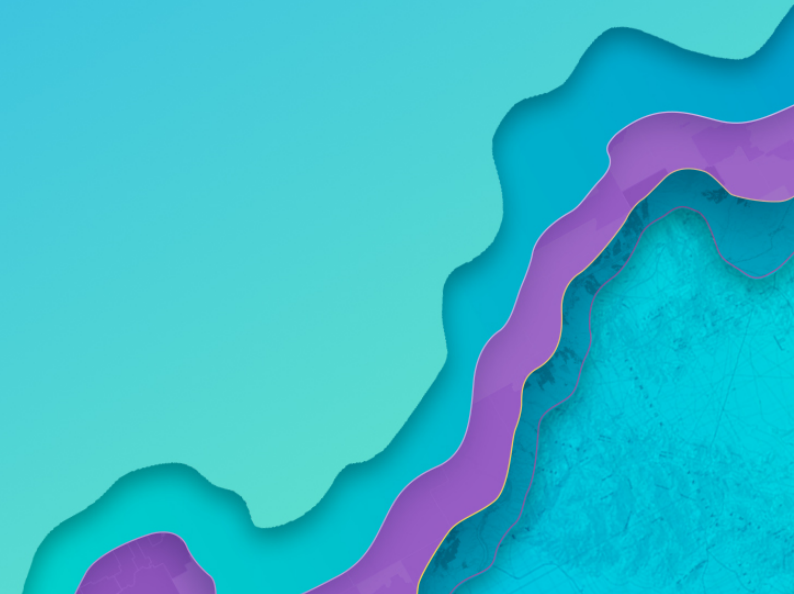
- Better knowledge sharing
- Review products internally for compliance
- Working accessibility into new features

The screenshot shows the Esri GeoNet website. At the top, there is a navigation bar with the Esri logo and links for ArcGIS, Industries, About, and Support. Below this is the 'GeoNet The Esri Community' header. A secondary navigation bar includes Home, News, Communities, All Content, ArcGIS Ideas, GeoNet Help, and Log in. The main content area is titled 'All Places > Accessibility' and includes a sub-navigation bar with Overview, Activity, Content, People, and Calendar. A message prompts users to 'Log in to follow, share, and participate in this socialgroup.' Below this, there is a 'Welcome to Accessibility' section with a description: 'This is place to discuss, ask questions and share ideas about accessibility.' To the right of this section are three buttons: 'Browse Content', 'Start Discussion', and 'Share File'. Further right is an 'ASK ACCESSIBILITY' section with a search bar and an 'Ask my question' button. Below these are sections for 'GROUP ADMINS' (listing khutchins-esristaff and TZhang-esristaff), 'LATEST BLOG POSTS' (featuring a post titled 'Welcome to the Accessibility group - Let's get started!'), and 'LATEST DISCUSSIONS'.

The screenshot shows the Esri ArcGIS Blog website. At the top, there is a navigation bar with the Esri logo and links for ArcGIS, Industries, About, and Support. Below this is a header with a satellite map background and the text 'ARCGIS BLOG'. A search bar is located on the right side of the header. The main content area features a post titled 'New accessibility features in Story Map Journal' by Owen Evans on December 7, 2017. The post includes social sharing buttons for Facebook, Twitter, and LinkedIn. The text of the post states: 'Accessibility is an important goal at Esri, and in the last two ArcGIS Online updates (September and December 2017), the Story Map Journal app received significant enhancements related to accessibility. Read on to learn more about these new features and how they work to help you create accessible stories.' Below the text is a section titled 'What is accessibility?' which explains that accessibility means people with disabilities can use it, and provides examples like an entrance ramp and web content. Another section titled 'Alternative Text' explains that alternative text provides a textual alternative to web content such as images, maps, videos, charts, and other visual media. The post concludes by stating that users can now use the Map Journal builder to attach alt text to media in the main stage and side panel of their stories.

# What we will cover today

- Background
- Automated test
- Keyboard test
- Screen reader test
- Color accessibility



# Why accessibility testing?

- Accessibility is about the *experience* of all users.
- Testing is the only way to ensure the experience is accessible.

# Functional test

<b>Specification</b>	WCAG 2.0 Success Criteria
<b>Goal</b>	Verify how well web content functions as WCAG 2.0 specified

Less subjective compared to usability testing

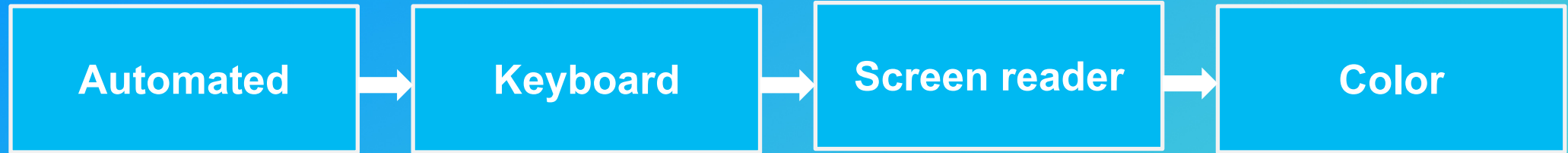
Anyone can do the test!

# Overview of WCAG 2.0

Principles	Success Criteria	Level A	Level AA	Level AAA
1. Perceivable	1.1 Text Alternatives	1.1.1		
	1.2 Time-based Media	1.2.1 – 1.2.3	1.2.4 – 1.2.5	1.2.6 – 1.2.9
	1.3 Adaptable	1.3.1 – 1.3.3		
	1.4 Distinguishable	1.4.1 – 1.4.2	1.4.3 – 1.4.5	1.4.6 – 1.4.9
2. Operable	2.1 Keyboard Accessible	2.1.1 – 2.1.2		2.1.3
	2.2 Enough Time	2.2.1 – 2.2.2		2.2.3 – 2.2.5
	2.3 Seizures	2.3.1		2.3.2
	2.4 Navigable	2.4.1 – 2.4.4	2.4.5 – 2.4.7	2.4.8 – 2.4.10
3. Understandable	3.1 Readable	3.1.1	3.1.2	3.1.3 – 3.1.6
	3.2 Predictable	3.2.1 – 3.2.2	3.2.3 – 3.2.4	3.2.5
	3.3 Input Assistance	3.3.1 – 3.3.2	3.3.3 – 3.3.4	3.3.5 – 3.3.6
4. Robust	4.1 Compatible	4.1.1 – 4.1.2		



# Test process



# Automated test

The background features a gradient from dark blue at the top to light teal at the bottom. On the right side, there are faint, white, concentric wavy lines. At the bottom, there are large, overlapping, wavy shapes in shades of teal and purple, resembling a stylized landscape or abstract pattern.

The screenshot shows the aXe accessibility testing tool interface. The top navigation bar includes tabs for Elements, Console, Sources, Network, Performance, Memory, Application, Security, Audits, aXe-Coconut, and aXe. The aXe tab is active, showing 11 violations. The main panel displays a violation titled "Page must have means to bypass repeated blocks" with an impact of "serious". The issue description states: "Ensures each page has at least one mechanism for a user to bypass navigation and jump straight to the content". The element location is "html". The element source is shown as: `<html lang="en" class="dj_edge dj_gecko dj_ff1 dj_contentbox">`. The "To solve this violation, you need to:" section lists three issues: "No valid skip link found", "Page does not have a header", and "Page does not have a landmark region". The bottom of the interface shows issue tags: "category: keyboard wcag2a wcag241 section508 section508.22.o".

- Tests rendered browser DOM
- Aims at no false positives
- Accessible
- Helpful documentation

Practice aXe

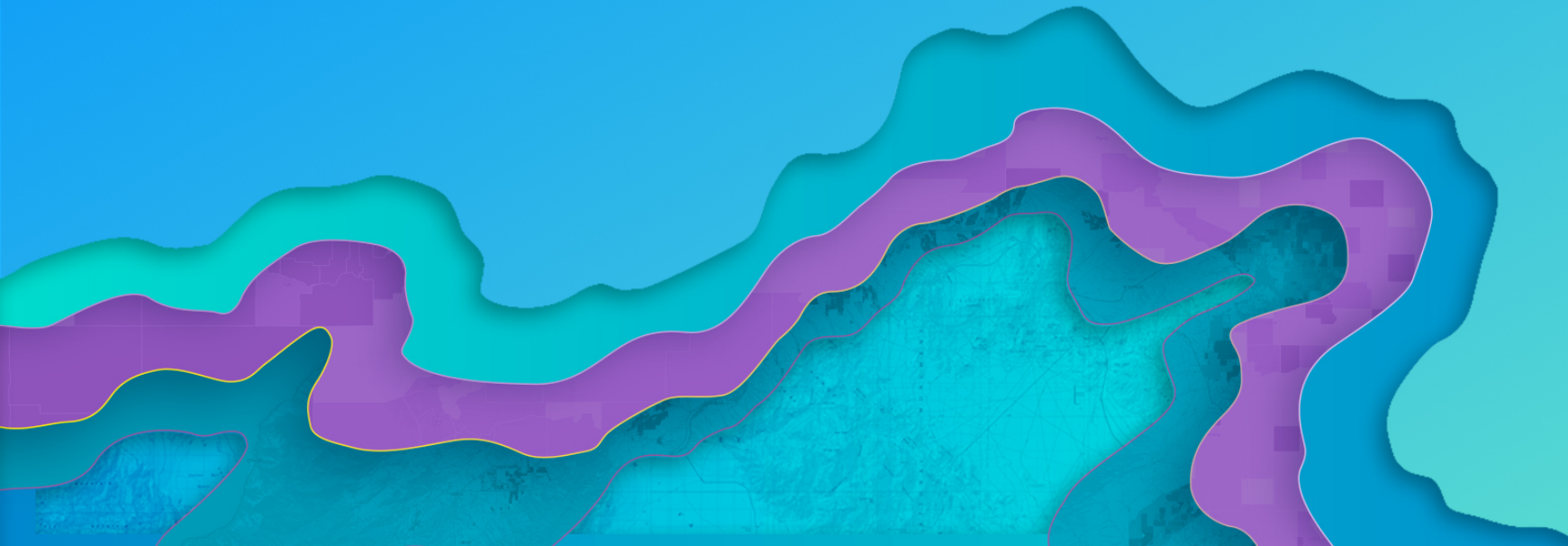
Park Locator

<http://arcg.is/05DzDX>

# Automated test

- No automated test tools can definitely prove conformance with any given WCAG Success Criterion.
- Automated test is good starting point but cannot detect all accessibility issues.
- Run automated test of each page state.

# Keyboard test



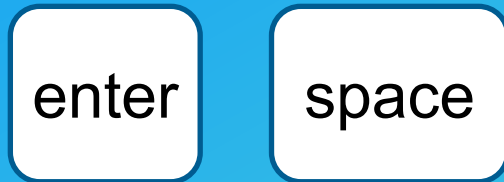
# Keyboard navigation



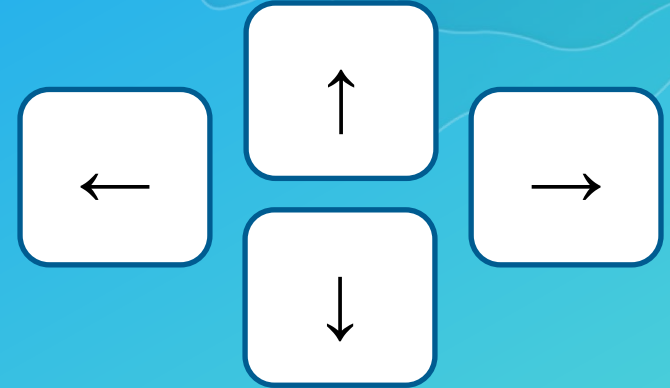
Move keyboard focus



Click links



Click buttons



Menus and some form controls

# Expected outcomes

- 2.1.1: Interact with all controls, links, and menus using only keyboard.
- 2.4.7: See what item has focus at all times.
- 2.4.3: Visual focus order matches intended interaction order.
- 2.1.2: No keyboard trap.
- Off-screen content (e.g., responsive navigation) should not receive focus when invisible.



# Practice keyboard test

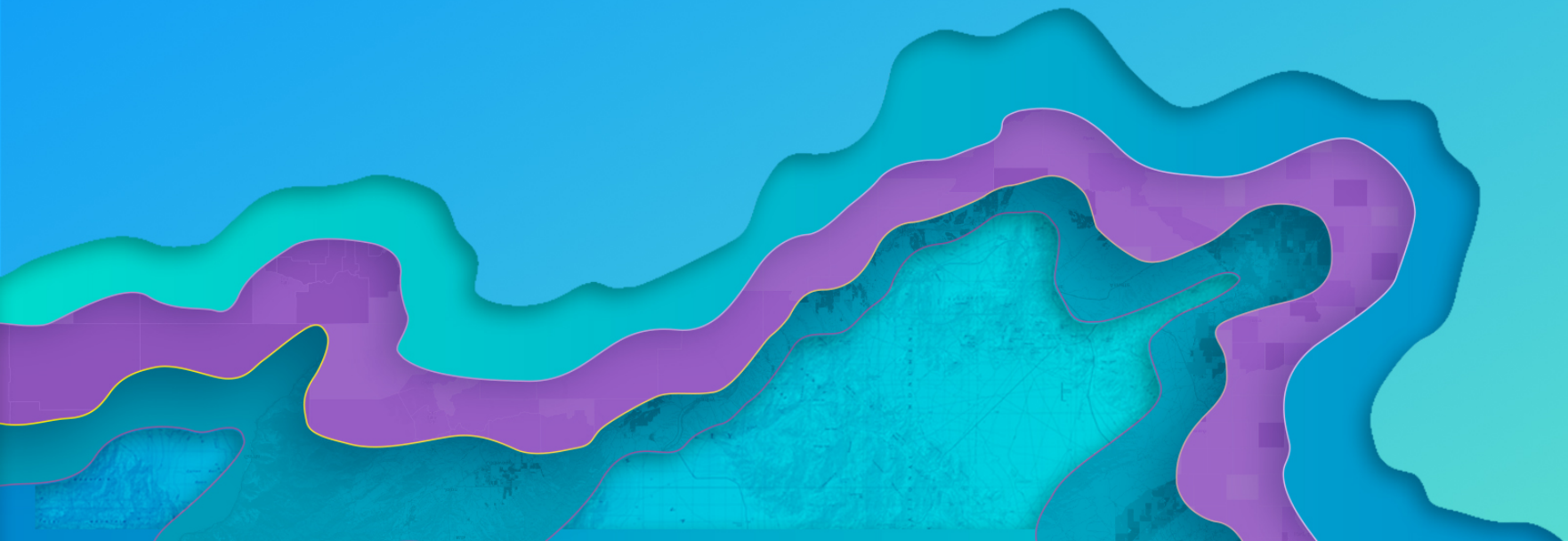
## Test cases

- [Park Locator](#)
- [UK Government Digital Service – Test cases](https://arcg.is/1OLC8K) (https://arcg.is/1OLC8K)
- [Accessible University](http://arcg.is/1O45jz) (http://arcg.is/1O45jz)

## Tools

- [Enhanced focus](http://arcg.is/19muKy) (http://arcg.is/19muKy)
- `document.activeElement`

# Screen reader test



# Screen reader

Recommended combinations:

OS	Screen reader	Browser
MacOS	<u>VoiceOver</u>	Safari
Windows	<u>NVDA</u>	Firefox
Windows	<u>JAWS</u>	IE/Edge

# Screen reader

	Turn on	Stop	Modifier key
<b>VoiceOver</b>	Command + F5	Command + F5	Control + Option
<b>NVDA</b>	Control + Alt + N	NVDA + Q	Numpad Insert
<b>JAWS</b>	Control + Alt + J	Insert + F4	Numpad Insert

Modifier key: Enter screen reader commands by pressing modifier key and one or more other keys

# Screen reader commands

- VoiceOver
- NVDA
- JAWS
- Basic commands for accessibility testing

# VoiceOver commands

**VO + right/left arrow**

Read next/previous item

**Control**

Stop reading

**VO + space**

Click link, button, form controls

**VO + u**

Open rotor

# Screen reader testing coverage

## Navigation

Headings

Links

Landmarks

Menus

## Content

Alt text

Tables

Charts

## Interaction

Forms

Dialogs

Messages

**Widgets**

# WAI-ARIA Authoring Practices

## TABLE OF CONTENTS

- 1. **Introduction**
- 2. **Read Me First**
  - 2.1 No ARIA is better than Bad ARIA
  - 2.2 Browser and Assistive Technology Support
  - 2.3 Mobile and Touch Support
- 3. **Design Patterns and Widgets**
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  - 3.2 Alert
  - 3.3 Alert and Message Dialogs
  - 3.4 Breadcrumb
  - 3.5 Button
  - 3.6 Checkbox
  - 3.7 Combo Box
  - 3.8 Dialog (Modal)
  - 3.9 Disclosure (Show/Hide)
  - 3.10 Feed
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  - 3.12 Link
  - 3.13 Listbox
  - 3.14 Menu or Menu bar
  - 3.15 Menu Button
  - 3.16 Radio Group

## WAI-ARIA Authoring Practices 1.1

W3C Working Group Note 14 December 2017



### This version:

<https://www.w3.org/TR/2017/NOTE-wai-aria-practices-1.1-20171214/>

### Latest published version:

<https://www.w3.org/TR/wai-aria-practices-1.1/>

### Latest editor's draft:

<https://w3c.github.io/aria-practices/>

### Previous version:

<https://www.w3.org/TR/2017/WD-wai-aria-practices-1.1-20170628/>

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## Abstract

This document provides readers with an understanding of how to use [WAI-ARIA 1.1](#) [[wai-aria-1.1](#)] to create accessible rich internet applications. It describes considerations that might not be evident to most authors from the [WAI-ARIA](#) specification alone and recommends approaches to make widgets, navigation, and behaviors accessible using [WAI-ARIA](#) roles, states, and properties. This document is directed primarily to Web application developers, but the guidance is also useful for user agent and assistive technology developers.

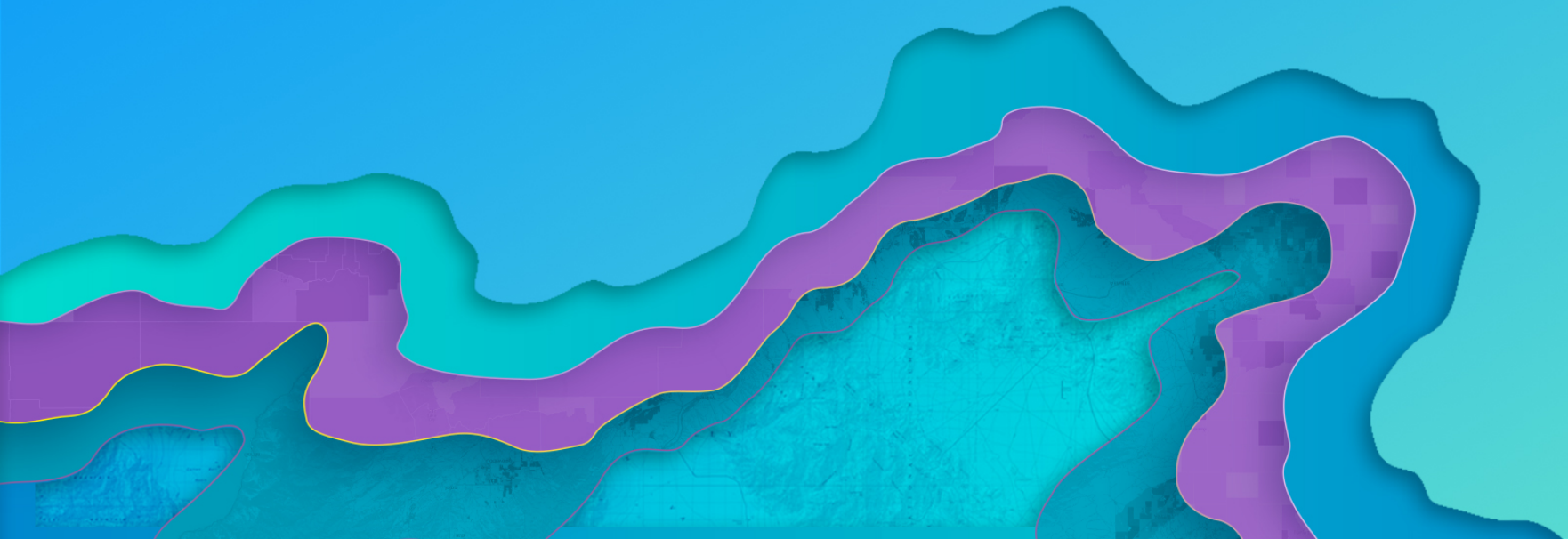


Practice screen reader

Park Locator

<http://arcg.is/05DzDX>

# Color test



# Expected outcomes

- 1.4.1: Not use presentation that relies solely on color.
- 1.4.3: Color contrast ratio is at least 4.5:1.

# Practice color test

## Test cases

- Park Locator

## Tools

- Contrast ratio calculator  
(<http://arcg.is/1m44TW>)

# Summary

- Start with automated test, then do keyboard, screen reader, and color test.
- Need to understand [WCAG 2.0 Success Criteria](#).
- Get familiar with ARIA for widgets.

The ultimate decision-maker about whether or not something is accessible, is whether or not people can use it.

Want to learn more about accessibility?

**Accessible Web Mapping Apps: ARIA, WCAG and 508 Compliance**

Kelly Hutchins, Tao Zhang

8:30 – 9:30 am  
Friday, March 9

Smoketree A-E

# Schedule

## Hands-on Workshops

### Tuesday, March 6

**1:00 – 2:00 PM**

**Introducing UX to your GIS Org**  
Mesquite B

**4:00 – 5:00 PM**

**DIY Usability Testing**  
Mesquite C

### Thursday, March 8

**9:00 – 10:00 AM**

**DIY Accessibility**  
Mesquite B

**1:00 – 2:00 PM**

**ArcGIS Runtime: Building Great  
User Experience**  
Smoketree A-E

**2:30 – 3:30 PM**

**Collaborative Brainstorming**  
Mesquite G-H

**4:00 – 5:00 PM**

**Customizing the ArcGIS API for  
JavaScript Widgets**  
Primrose A

### Friday, March 9

**8:30 – 9:30 AM**

**Accessible Web Mapping Apps**

**10:00 – 11:00 AM**

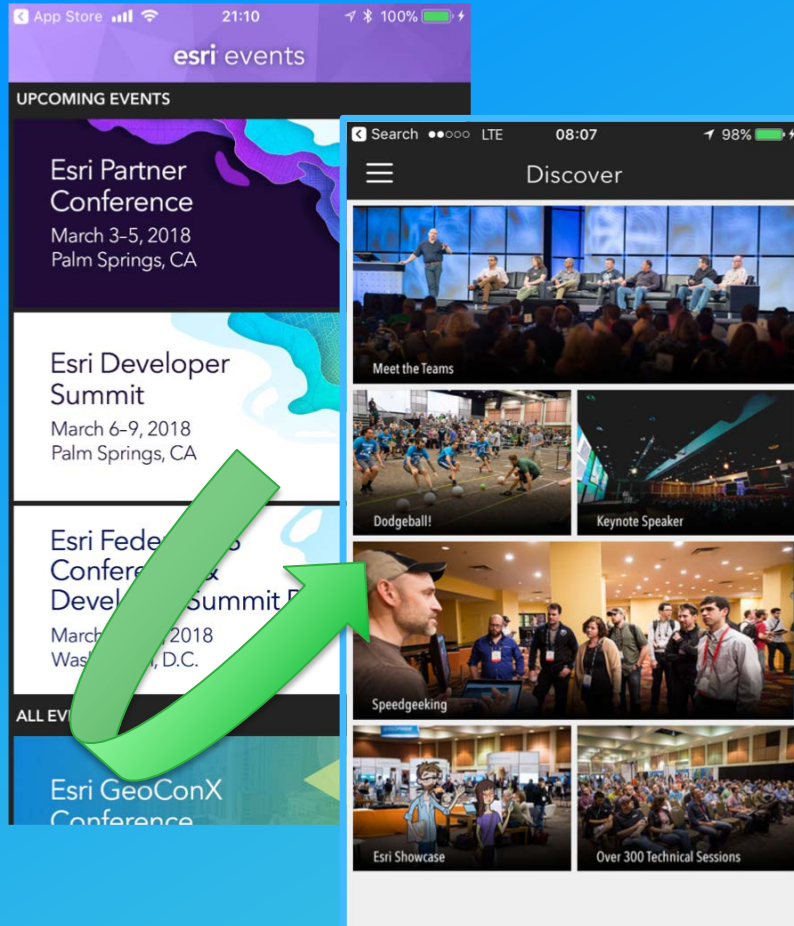
**DIY Usability Testing**  
Smoketree A-E



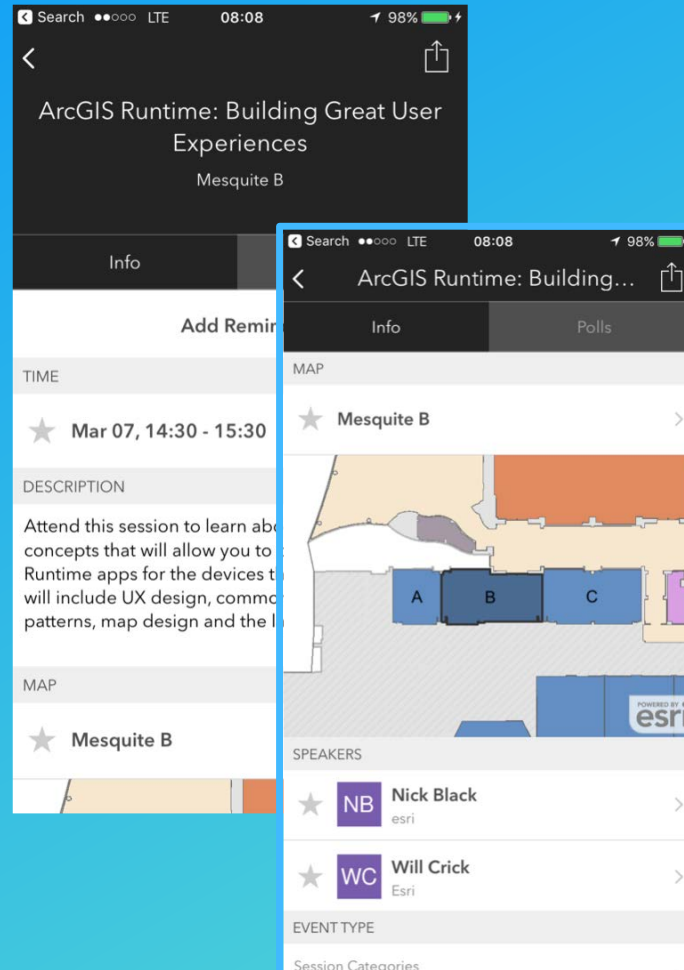


# Please Take Our Survey!

Download the Esri Events app  
and find your event

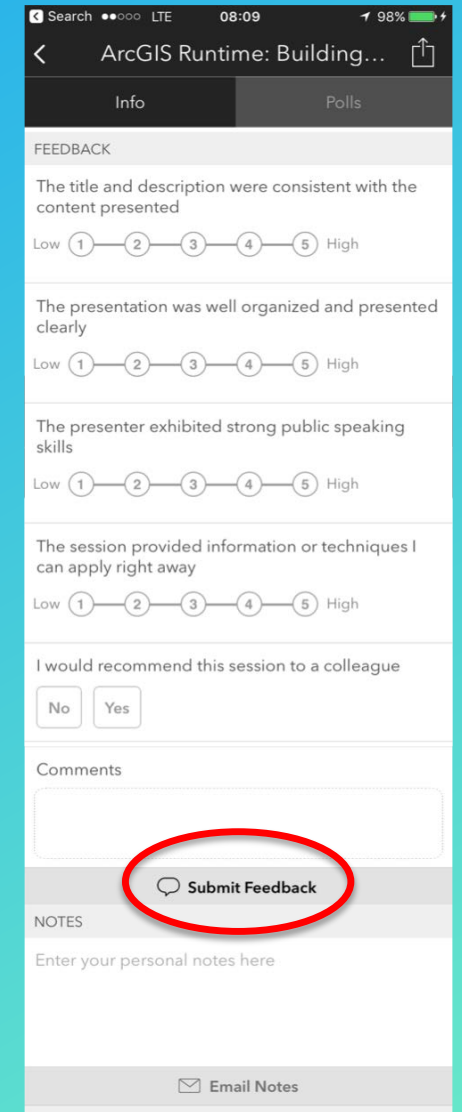


Select the session you  
attended



Scroll down to the  
“Feedback” section

Complete Answers,  
add a Comment,  
and Select “Submit”





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