



# Unlock the Power of ArcGIS Configurable Apps with HTML, CSS, and Arcade

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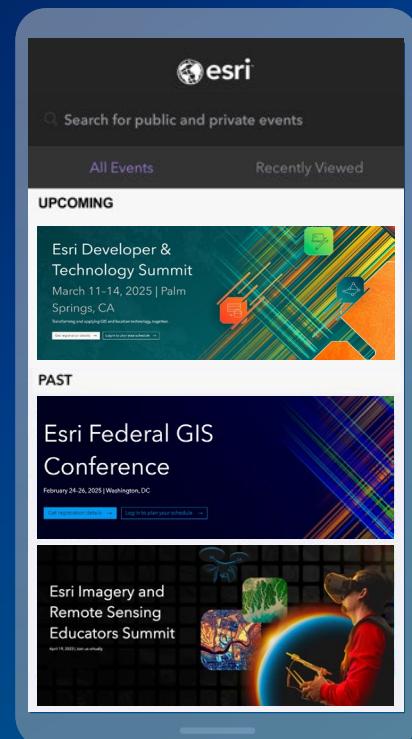
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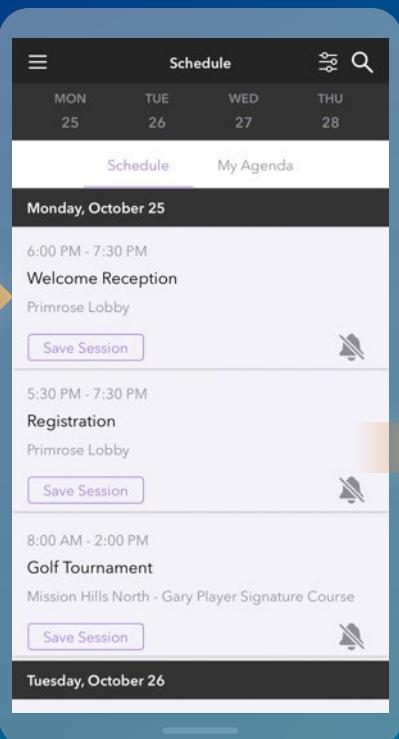
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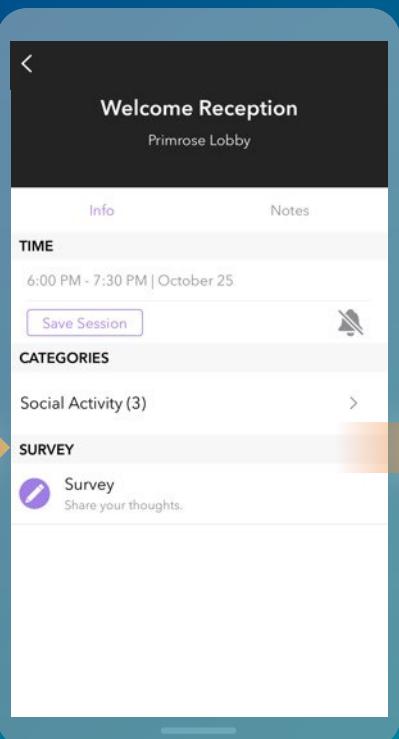
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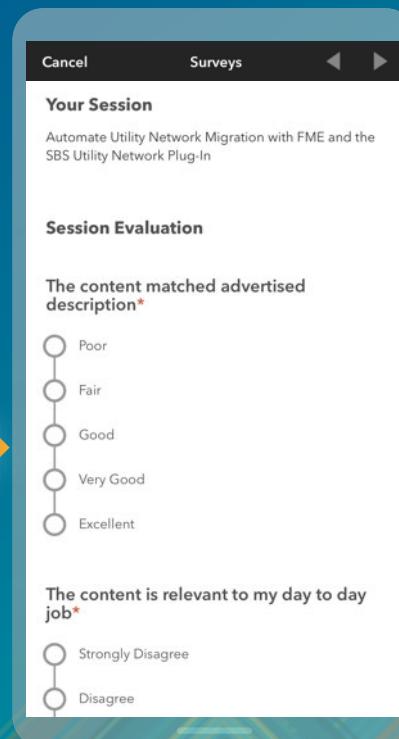
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# Agenda

- Introduction: Config-Custom Spectrum
- Technical Background
- Demos:
  - Web Map Popups
  - Dashboards
  - Hub
- Questions



*Code and slides from this session*

# “Config Custom”

“Config **vs** Custom”  
oversimplifies and undervalues ArcGIS!

Config to Custom Spectrum

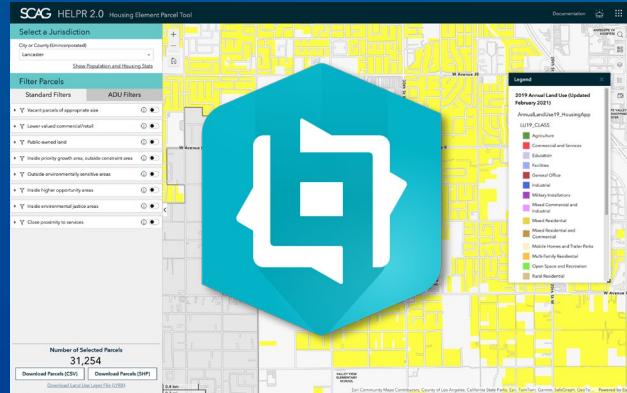
CONFIG ←→ CUSTOM

# Config to Custom Spectrum

# CONFIG

# CUSTOM

# Config to Custom Spectrum



No Code

Low Code

Full Code

# About Us

*Configuration Expert*



Jakob Drozd  
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**vs.**

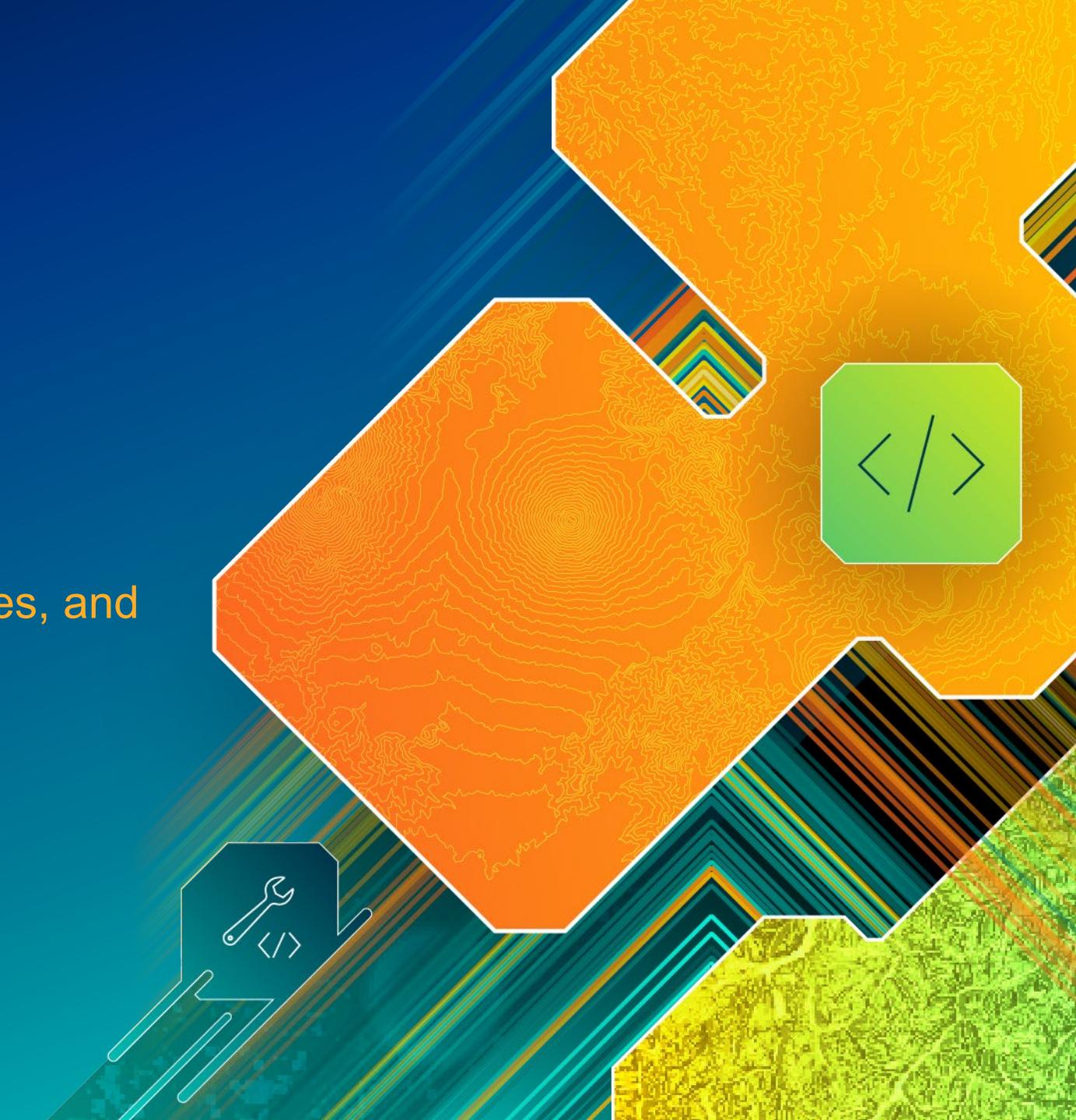


Lillie Bahrami  
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*Frontend Web Developer*

# Good to Know

Overview of Relevant Tools, Languages, and Software



# Languages: HTML

“HyperText Markup Language”

- Basic building blocks of all websites, the ‘skeleton’
- Useful Vocabulary:
  - Element/Tag
  - Attribute

```
<Opening Tag    (Optional: Attributes go here) >  
      (Inner Content, for example the text you want  
       to see on the screen, goes here)  
</Closing Tag>
```

- Read more: [Mozilla Web Docs](#)

# Languages: CSS

“Cascading StyleSheets”

- Provides all styles to our HTML: positioning, layouts, size and shape, color, font, etc.
- Useful Vocabulary:
  - Selector
  - Property
- Read More: [Mozilla Web Docs](#)

```
selector {  
    property: value;  
    property: value;  
}
```

# Stylesheet CSS

*Hub, Instant Apps*

```
<style>
  .my-class {
    width: 200px;
    font-weight: bold;
  }
</style>
```

```
<Opening Tag
  class="my-class"
>
  (Inner Content goes here)
</Closing Tag>
```

# Inline CSS

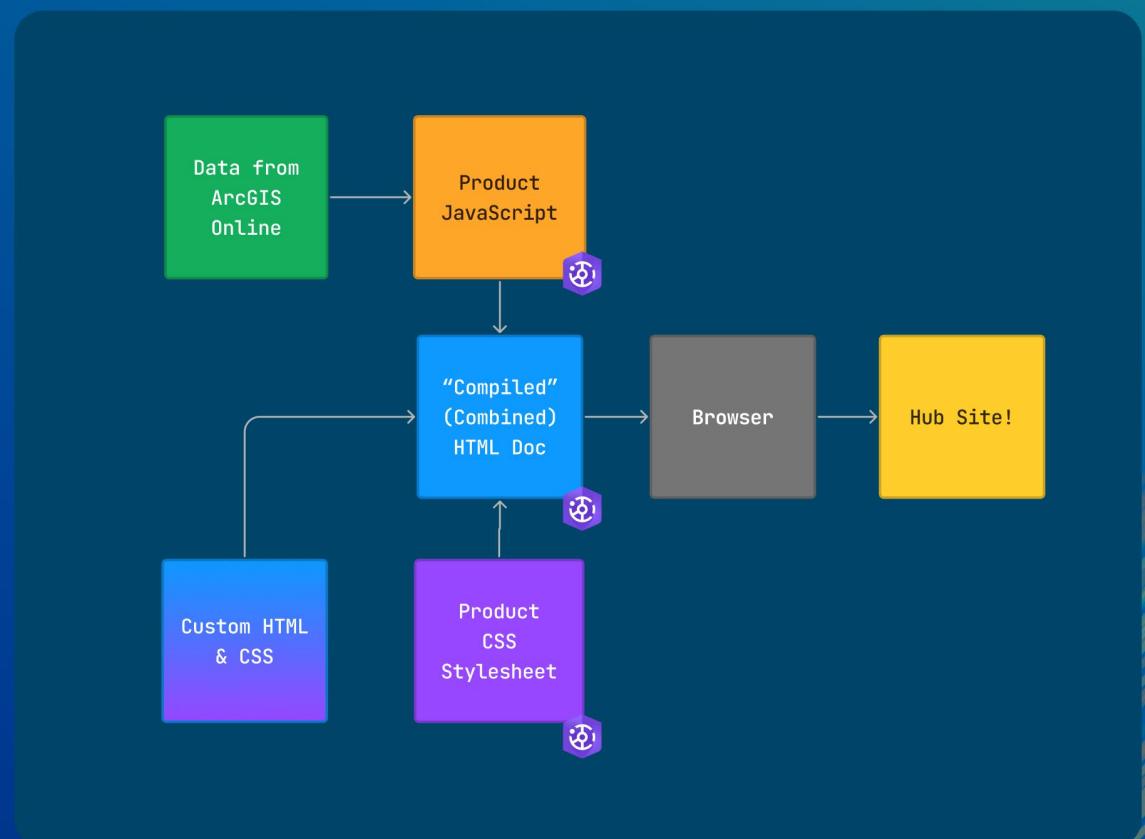
*Survey123, Dashboards*

VS.

```
<Opening Tag
  style="width: 200px; font-weight:
  bold"
>
  (Inner Content goes here)
</Closing Tag>
```

# Languages: JavaScript [not customizable]

- The ‘muscles’ of a website: interactive changes to content, importing/exporting data, logical evaluations, etc.
- Not customizable in most ArcGIS web apps





# Languages: Arcade

Portable, lightweight, and secure expression language used to create custom content in ArcGIS apps

- Provides us with logical programming abilities inside our configurable applications
- Effectively combined with CSS to achieve conditional styles

```
var status = $feature.incident_status  
var tag-color = When(status = "Open", "fcf703", //yellow  
status = "Under Review", "#03f3db", //teal  
status = "Monitor", "#b57edc", //purple  
status = "Closed", "#6fbf73", //green  
"#dddddd" //gray)
```

incident_id	incident_status
1	Open
2	Under Review
3	Monitor
4	Closed
5	



- Read more: [Esri Developer | Arcade](#)

# Tools: ArcGIS Configurable Web Apps

App	HTML	Inline-CSS	Stylesheet*	Arcade	Notes
Experience Builder	Yes	Yes	No	Not yet...	Can only include HTML in the Embed widget as Code. Note there is a character limit.
Hub / Sites	Yes	Yes	Yes	No	Able to integrate HTML and CSS in the header, footer, and text cards.
Dashboards	Yes	Yes	No	Yes	HTML and inline CSS can be added to all element's titles and descriptions, list elements, table elements, and rich text elements.
Survey123	Yes	Yes	No	No	HTML and inline CSS can be added to the survey' description and submission page. HTML can also be rendered onscreen through question label and hint.  Note that HTML and CSS can render differently in the web form compared to the field application.
Field Maps	Yes	Yes	No	Yes	Honors the HTML and CSS configured within the underlying web map.
Instant Apps	Yes	Yes	Yes	No	Many instant apps include a <i>Custom CSS</i> section where class can be styled.
Web Maps	Yes	Yes	No	Yes	HTML and in-line CSS can be added into pop-ups within the title, description, fields list, text, and arcade content.  Note that HTML and CSS viewed in a web map can render differently when opened through Field Maps, Dashboards, Experience Builder, etc.
Workflow Manager	No	No	No	Yes	
QuickCapture	No	No	No	Yes	
Workforce	No	No	No	No	
StoryMaps	No	No	No	No	

\*Stylesheet is implemented in COTS as a <style> tag.

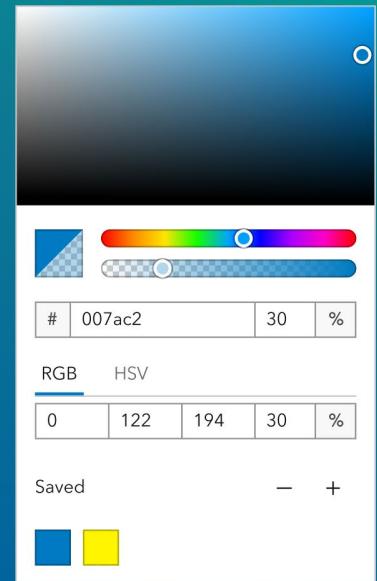
Split Button

Button

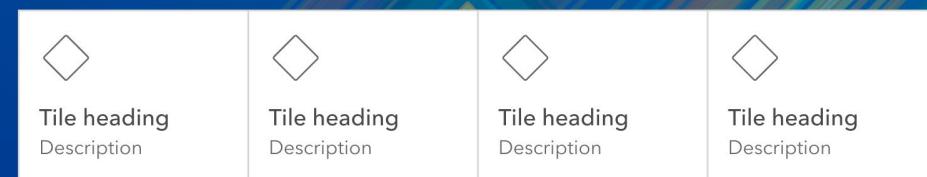
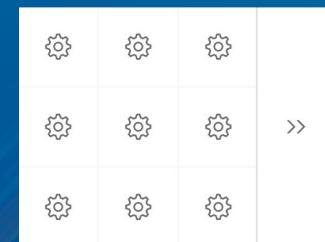
Button

# Tools: Calcite Components

- Calcite Design System-adherent web components
- Most components are available for custom code in Hub
- Read more: [Calcite Design System](#)



Control item   Control item   Control item





## Tip for Web Developers

Take advantage of read-only CSS variables built into our configurable web apps to save time on theming!

### Dashboards

```
:root :: {  
    --box-shadow: 0px 3px 15px rgba(0, 0, 0, 0.2);  
    --ck-color-image-caption-background: hsl(0, 0%, 97%);  
    --ck-color-image-caption-text: hsl(0, 0%, 20%);  
    --ck-color-mention-background: hsla(341, 100%, 30%, 0.1);  
    --ck-color-mention-text: hsl(341, 100%, 30%);  
    --ck-color-selector-caption-background: hsl(0, 0%, 97%);  
    --ck-color-selector-caption-text: hsl(0, 0%, 20%);  
    --ck-highlight-marker-blue: hsl(201, 97%, 72%);  
    --ck-highlight-marker-green: hsl(120, 93%, 68%);  
    --ck-highlight-marker-pink: hsl(345, 96%, 73%);  
    --ck-highlight-marker-yellow: hsl(60, 97%, 73%);  
    --ck-highlight-pen-green: hsl(112, 100%, 27%);  
    --ck-highlight-pen-red: hsl(0, 85%, 49%);  
    --ck-image-style-spacing: 1.5em;  
    --ck-inline-image-style-spacing: calc(var(--ck-image-style-spacing) / 2);  
    --ck-todo-list-checkmark-size: 16px;  
}
```

```
body[data-theme="theme-custom"] :: {  
    --survey123-header-backgroundColor: #4000be;  
    --survey123-header-textColor: #ffffff;  
    --survey123-form-backgroundColor: #ffffff;  
    --survey123-form-backgroundOpacity: 1;  
    --survey123-form-textColor: #505050;  
    --survey123-form-primaryColor: #4000be;
```

Survey123

### Hub

```
element :: {  
    ✓ --headerBackground: #fff;  
    ✓ --headerText: #000000;  
    ✓ --headerTextTransparent: hsla(0, 0%, 0%, 0);  
    ✓ --headerSecondTierBackground: #e0e0e0;  
    ✓ --bodyBackground: #fff;  
    ✓ --bodyText: #4c4c4c;  
    ✓ --bodyLink: #0079c1;  
    ✓ --bodyLinkHoverColor: #00598e;  
    ✓ --bodyTextAlpha08: hsla(0, 0%, 30%, 0.08);  
    ✓ --bodyTextAlpha15: hsla(0, 0%, 30%, 0.15);  
    ✓ --bodyTextAlpha20: hsla(0, 0%, 30%, 0.2);
```

HTML

Cancel

Apply

```
1 <style>
2   #.description {
3     --calcite-color-status-danger-press: #7c1d13;
4     --calcite-color-status-danger-hover: #a82b1e;
5     --calcite-color-status-danger: #d83020;
6     --calcite-color-status-warning-press: #bfa200;
7     --calcite-color-status-warning-hover: #d9bc00;
8     --calcite-color-status-warning: #edd317;
9     --calcite-color-status-success-press: #1a6324;
10    --calcite-color-status-success-hover: #288835;
11    --calcite-color-status-success: #35ac46;
12    --calcite-color-status-info-press: #00304d;
13    --calcite-color-status-info-hover: #004874;
14    --calcite-color-status-info: #00619b;
15  }
16 </style>
```

VS.

```
1 <style>
2   #.description {
3     --calcite-color-status-danger-press: #7c1d13;
4     --calcite-color-status-danger-hover: #a82b1e;
5     --calcite-color-status-danger: #d83020;
6     --calcite-color-status-warning-press: #bfa200;
7     --calcite-color-status-warning-hover: #d9bc00;
8     --calcite-color-status-warning: #edd317;
9     --calcite-color-status-success-press: #1a6324;
10    --calcite-color-status-success-hover: #288835;
11    --calcite-color-status-success: #35ac46;
12    --calcite-color-status-info-press: #00304d;
13    --calcite-color-status-info-hover: #004874;
14    --calcite-color-status-info: #00619b;
15  }
16 </style>
17
```



## Tip for Configuration Specialists

Write your code in an IDE instead of the built-in editor! You'll see helpful syntax highlighting, can quickly format your code, and won't have to worry about saving your work.

# Level 1: Web Maps



## EATON Incident

2025-CALAC-009087

IRWINID: {72660ADC-B5EF-4D96-A33F-B4EA3740A4E3}

Type: WF - Wildfire

Discovered at 1/7/2025, 9:18 PM

The reported cause is Undetermined

Calculated size: 14,021 ac

The estimated total cost was \$100,000,000

Incident was reported Out on 2/17/2025, 10:00 PM

The perimeter geometry comes from 2025 NIFS and was last updated on 1/20/2025, 7:18 PM

The perimeter attribution comes from IRWIN and was last updated on 3/5/2025, 12:44 PM

VS.

```
// State
var state = When($datapoint.attr_P00State == "US-TX", "Texas",
    $datapoint.attr_P00State == "US-WI", "Wisconsin",
    $datapoint.attr_P00State == "US-CA", "California",
    $datapoint.attr_P00State == "US-MO", "Missouri",
    $datapoint.attr_P00State == "US-FL", "Florida",
    "Undefined")

// Formatting of cost, final acres
var cost_text = Text($feature.attr_EstimatedFinalCost, "$" + "###,###")
var disc_text = Text($feature.attr_DiscoveryAcres, "###,###.###")
var size_text = Text($feature.attr_IncidentSize, "###,###.###")

// Display of acres, size, cause, cost
var disc_disp = IIf(IsEmpty($feature.attr_DiscoveryAcres), "none", "")
var size_disp = IIf(IsEmpty($feature.attr_IncidentSize), "none", "")
var cause_disp = IIf(IsEmpty($feature.attr_FireCause), "none", "")
var cost_disp = IIf(IsEmpty($feature.attr_EstimatedFinalCost), "none", "")
```

## Eaton Incident

Wildfire

Los Angeles County, California

0.01

Discovery Acres

14,021

Total Acres

Undetermined

Cause

\$100,000,000

Final Cost

Discovered: Jan 7th, 2025 at 9:18 PM

## Butram Rx Incident

Prescribed

Ozark County, Missouri

1,850

Discovery Acres

2,258

Total Acres

Undetermined

Cause

Discovered: Jan 28th, 2025 at 7:14 AM

```
return {
  type : 'text',
  text : `<div style="background-color: #FCFAF0; border-radius: 2px; border: 2px solid #171717">
<div style="display: flex; justify-content: space-between; margin-bottom: 10px; font-weight: bold; font-size: 16px; color: #f0f0f0; padding: 4px; border-radius: 4px; border: 1px solid #171717; background-color: #fff; width: 100%; height: 40px; position: relative; z-index: 1; transition: all 0.3s ease; border: none; outline: none; font-family: sans-serif; font-weight: bold; letter-spacing: .1rem">
  ${incident_proper} Incident
  ${type}
</div>
<hr width=80%; color="#171717">
<p style="font-weight: 400; margin: 16px 0; font-size: 16px;">${$feature.attr_P00County} County, ${state}</p>
<div style="padding: 8px 0; font-size: 18px; display: grid; grid-template-columns: 10ch 8ch; justify-content: space-around; border-top: 1px solid #171717; margin-top: 10px; position: relative; z-index: 2; transition: all 0.3s ease; border: none; outline: none; font-family: sans-serif; font-weight: bold; letter-spacing: .1rem">
  <p style="display: ${disc_disp};><span style="font-weight: 600; font-size: 20px; border: 1px solid #171717; padding: 2px; border-radius: 50%; width: 18px; height: 18px; display: flex; align-items: center; justify-content: center; margin-right: 5px; transition: all 0.3s ease; border: none; outline: none; font-family: sans-serif; font-weight: bold; letter-spacing: .1rem">${disc_text}</span> Discovery Acres</p>
  <p style="display: ${size_disp};><span style="font-weight: 600; font-size: 20px; border: 1px solid #171717; padding: 2px; border-radius: 50%; width: 18px; height: 18px; display: flex; align-items: center; justify-content: center; margin-right: 5px; transition: all 0.3s ease; border: none; outline: none; font-family: sans-serif; font-weight: bold; letter-spacing: .1rem">${size_text}</span> Total Acres</p>
  <p style="display: ${cause_disp};><span style="font-weight: 600; font-size: 20px; border: 1px solid #171717; padding: 2px; border-radius: 50%; width: 18px; height: 18px; display: flex; align-items: center; justify-content: center; margin-right: 5px; transition: all 0.3s ease; border: none; outline: none; font-family: sans-serif; font-weight: bold; letter-spacing: .1rem">${$feature.attr_FireCause}</span> Cause</p>
  <p style="display: ${cost_disp};><span style="font-weight: 600; font-size: 20px; border: 1px solid #171717; padding: 2px; border-radius: 50%; width: 18px; height: 18px; display: flex; align-items: center; justify-content: center; margin-right: 5px; transition: all 0.3s ease; border: none; outline: none; font-family: sans-serif; font-weight: bold; letter-spacing: .1rem">${cost_text}</span> Final Cost</p>
</div>
<p style="margin: 0; font-style: italic; font-weight: 400; font-size: 12px; font-family: sans-serif; font-weight: bold; letter-spacing: .1rem">Discovered: ${discovery_date}</p>
</div>`}
```

```
// State
var state = When($datapoint.attr_POOState == "US-TX", "Texas",
    $datapoint.attr_POOState == "US-WI", "Wisconsin",
    $datapoint.attr_POOState == "US-CA", "California",
    $datapoint.attr_POOState == "US-MO", "Missouri",
    $datapoint.attr_POOState == "US-FL", "Florida",
    "Undefined")

// Formatting of cost, final acres
var cost_text = Text($feature.attr_EstimatedFinalCost, "$" + "###,###")
var disc_text = Text($feature.attr_DiscoveryAcres, "###,###.###")
var size_text = Text($feature.attr_IncidentSize, "###,###.###")

// Display of acres, size, cause, cost
var disc_disp = IIf(IsEmpty($feature.attr_DiscoveryAcres), "none", "")
var size_disp = IIf(IsEmpty($feature.attr_IncidentSize), "none", "")
var cause_disp = IIf(IsEmpty($feature.attr_FireCause), "none", "")
var cost_disp = IIf(IsEmpty($feature.attr_EstimatedFinalCost), "none", "")
```

```
<div style="padding: 8px 8px 0px; font-size: 18px; display:grid; grid-template-columns: 10ch 8ch; justify-content: space-around;">
    <p style="display: ${disc_disp};"><span style="font-weight:600; font-size:20px">${disc_text}</span> Discovery Acres</p>
    <p style="display: ${size_disp};"><span style="font-weight:600; font-size:20px">${size_text}</span> Total Acres</p>
    <p style="display: ${cause_disp}"><span style="font-weight:600; font-size:20px">${$feature.attr_FireCause}</span> Cause</p>
    <p style="display: ${cost_disp}"><span style="font-weight:600; font-size:18px">${cost_text}</span> Final Cost</p>
</div>
```

# Level 2: Web Apps





VS.

```
// PERCENT CONTAINED GAGE
// Find percent contained attribute and define filled color and background gage color
var contained = $datapoint.attr_PercentContained
var filledcolor = '#d9534f'
var gaugecolor = '#D6D6D6'

// Create gradient effect
var filled = Concatenate(filledcolor, ' ', (contained - 4))
var gauge = Concatenate(gaugecolor, ' ', contained)

// If no PercentContained attribute, hide the gage
var gauge_disp = IIf(IsEmpty(contained), 'none', 'flex')

// Create gauge chart
var chart = Concatenate('<div style="background:linear-gradient(to right,' + filled +
'%, ' + gauge + '%); display:' + gauge_disp +
'; justify-content:center; border-radius:4px;margin: 0px 16px 16px"><p
style="padding: 5px;color:#f0f0f0; font-size:20px; letter-spacing: .2rem"><strong>' + contained +
'% Contained</strong></p></div>')
```

```
return {
  textColor: '',
  backgroundColor: backgroundColor,
  separatorColor: '',
  selectionColor: '',
  selectionTextColor: '',
  attributes: {
    card_color: card_color,
    incident_proper: incident_proper,
    state: state,
    discovery_date: discovery_date,
    type_color: type_color,
    type: type,
    chart: chart
  }
}
```

```
<p>
  {expression/chart}
</p>
```

**Eaton Incident** Wildfire

Los Angeles County, California

**100% Contained**

*Discovered: Jan 7th, 2025 at 9:18 PM*

**Donup Incident** Wildfire

Mason County, Texas

**100% Contained**

*Discovered: Jan 20th, 2025 at 3:43 PM*

**Two Barrel Incident** Wildfire

Liberty County, Florida

**80% Contained**

*Discovered: Feb 26th, 2025 at 12:50 PM*

**Butram Rx Incident** Prescribed

Ozark County, Missouri

*Discovered: Jan 28th, 2025 at 7:14 AM*

```
// PERCENT CONTAINED GAGE
// Find percent contained attribute and define filled color and background gage color
var contained = $datapoint.attr_PercentContained
var filledcolor = '#d9534f'
var gaugecolor = '#D6D6D6'

// Create gradient effect
var filled = Concatenate(filledcolor, ' ', (contained - 4))
var gauge = Concatenate(gaugecolor, ' ', contained)

// If no PercentContained attribute, hide the gage
var gauge_disp = IIf(IsEmpty(contained), 'none', 'flex')

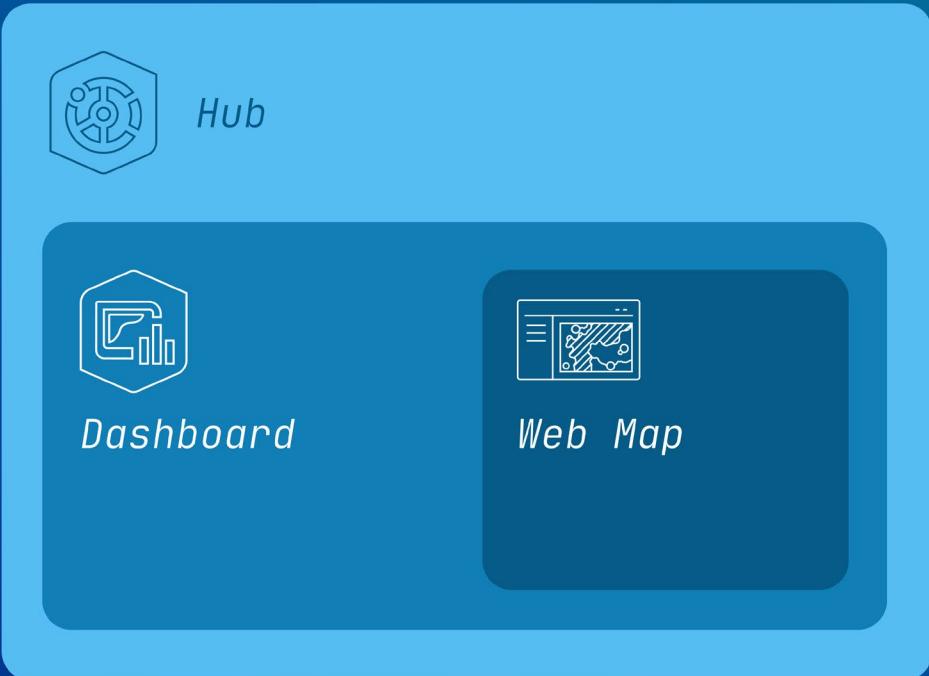
// Create gauge chart
var chart = Concatenate('<div style="background:linear-gradient(to right,' + filled +
'%,' + gauge + '%); display:' + gauge_disp +
'; justify-content:center; border-radius:4px;margin: 0px 16px 16px"><p
style="padding: 5px;color:#f0f0f0; font-size:20px; letter-spacing: .
2rem"><strong>' + contained +
'% Contained</strong></p></div>')
```

```
return {
  textColor: '',
  backgroundColor: backgroundColor,
  separatorColor:'',
  selectionColor: '',
  selectionTextColor: '',
  attributes: {
    card_color: card_color,
    incident_proper: incident_proper,
    state: state,
    discovery_date: discovery_date,
    type_color: type_color,
    type: type,
    chart: chart
  }
}
```

```
<p>
  {expression/chart}
</p>
```

# Level 3: Nested Web Apps





**HTML**  
**CSS**



Fire Hub

## Our Organization's Mission

adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna

VS.



```
.hero-banner {  
  display: flex;  
  justify-content: flex-start;  
  align-items: center;  
  backdrop-filter: blur(10px);  
  border-radius: 4px;  
  padding: 8px;  
  margin: 64px 32px;  
  gap: 16px
```

```
.hero-bar {  
  height: 160px;  
  width: 16px;  
  margin: 4px 0px 4px 4px;  
  border-radius: 2px;  
  background-color: □#dadada;  
}  
  
.hero-text {  
  font-size: 62px;  
  letter-spacing: 1px;  
  color: □#dadada
```

```
<div class="hero-banner">  
  <div class="hero-bar"></div>  
  <p class="hero-text">Interagency <br /> Fire Hub</p>  
</div>
```

## Our Mission

Lorem ipsum dolor sit amet, consectetur adipiscing elit,  
minim veniam, quis nostrud exercitation ullamco laboris

```
.mission-container {  
  display: flex;  
  padding: 8px;  
  margin: 16px 32px 0px 32px;  
  gap: 16px  
}  
  
.mission-bar {  
  height: 24px;  
  width: 8px;  
  margin: 4px 0px 4px 4px;  
  border-radius: 2px;  
  background-color: □#0e0e0e;
```

```
.mission-text {  
  font-size: 24px;  
  line-height: 2ch;  
}  
  
.mission-container + p {  
  font-size: 16px;  
  padding: 8px;  
  margin: 0px 32px 32px;  
  color: □#0e0e0e;
```

```
<div class="mission-container">  
  <div class="mission-bar"></div>  
  <div class="mission-text">Our Mission</div>  
</div>  
<p>Lorem ipsum dolor sit amet, consectetur adipiscing
```

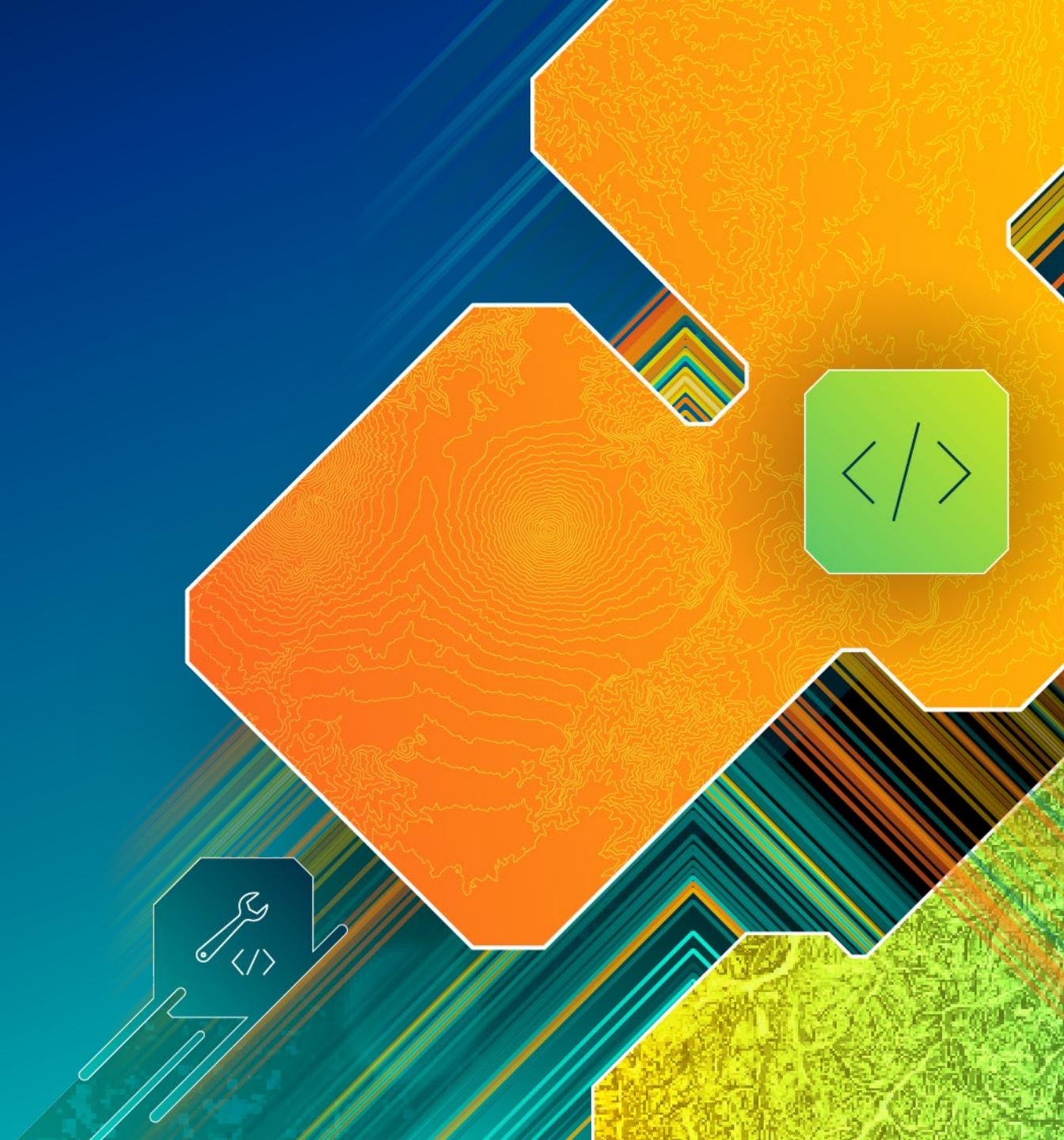
Launch Fire Explorer Application ➔

```
<calcite-button alignment="center" appearance="outline-fill" icon-end="arrow-up-right" kind="neutral" scale="l"  
width="half" href="https://prof-services.maps.arcgis.com/apps/dashboards/b69b819020874d10a3ff5e30ceecf8d3"  
target="_blank">Launch Fire Explorer Application</calcite-button>
```

# “Config Custom”

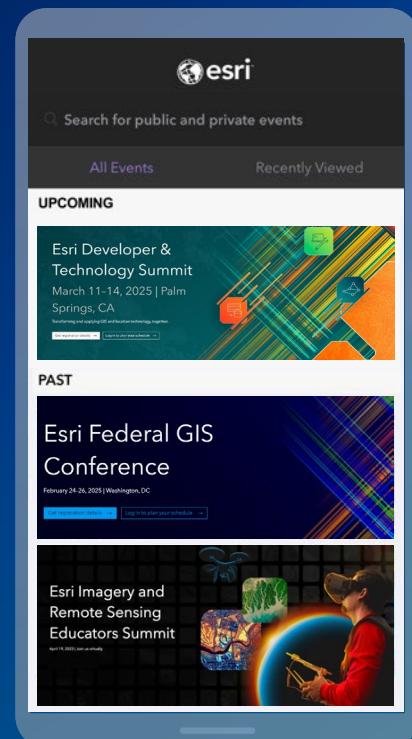
“Config **vs** Custom”  
oversimplifies and undervalues ArcGIS!

# Questions

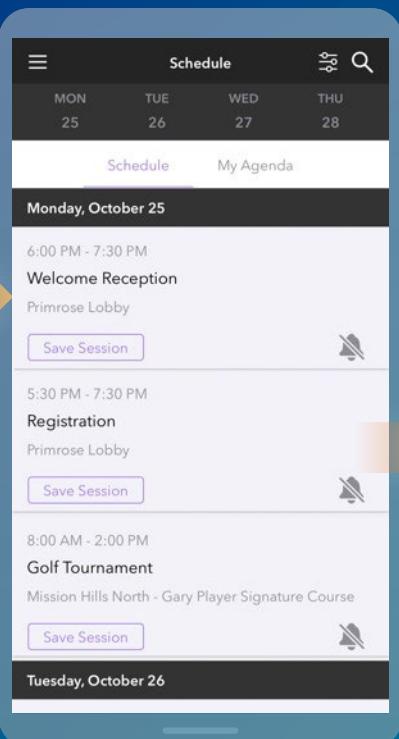


# Please share your feedback in the app

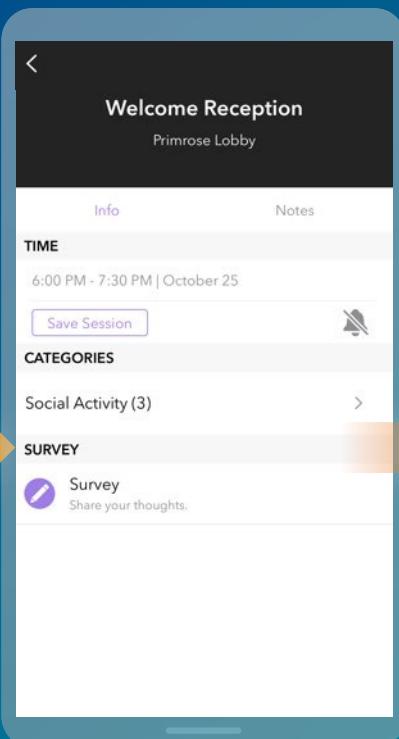
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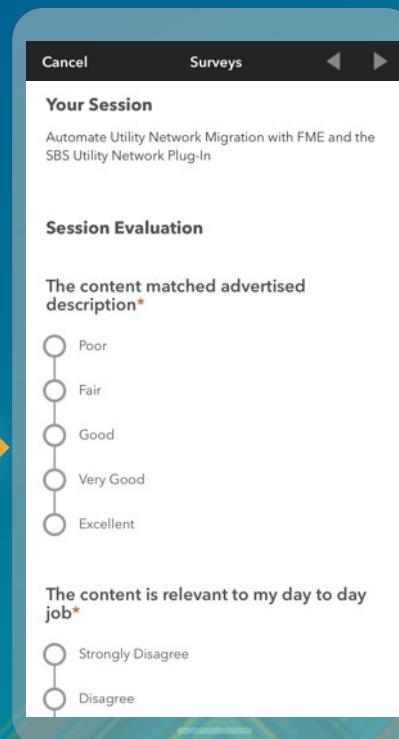
Select the session that you attended



Scroll down to "Survey"



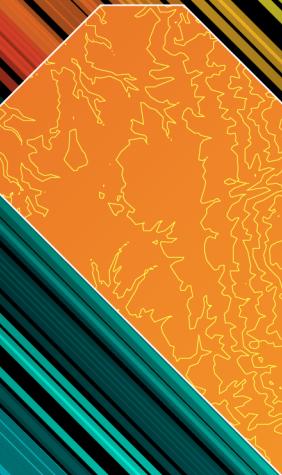
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