ArcGIS API for JavaScript: Using Arcade with your apps

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Session Goals

- Overview of Arcade
- Using Arcade in the ArcGIS JS API
- Generate Arcade expressions using JavaScript

Arcade Purpose

Arcade is NOT intended to be a full programming / scripting language
Arcade is NOT JavaScript

- Goal – lightweight and simple
- Equivalent to a spreadsheet cell calculation
- Designed for web maps and web scenes (ArcGIS Pro/JS API/Runtime)

Not a replacement for Python for geoprocessing and automation

Arcade Goals

Portable

- Write an expression in Pro, have it run in a browser, or on a device

Secure

- Ensure that expressions or scripting do not compromise security

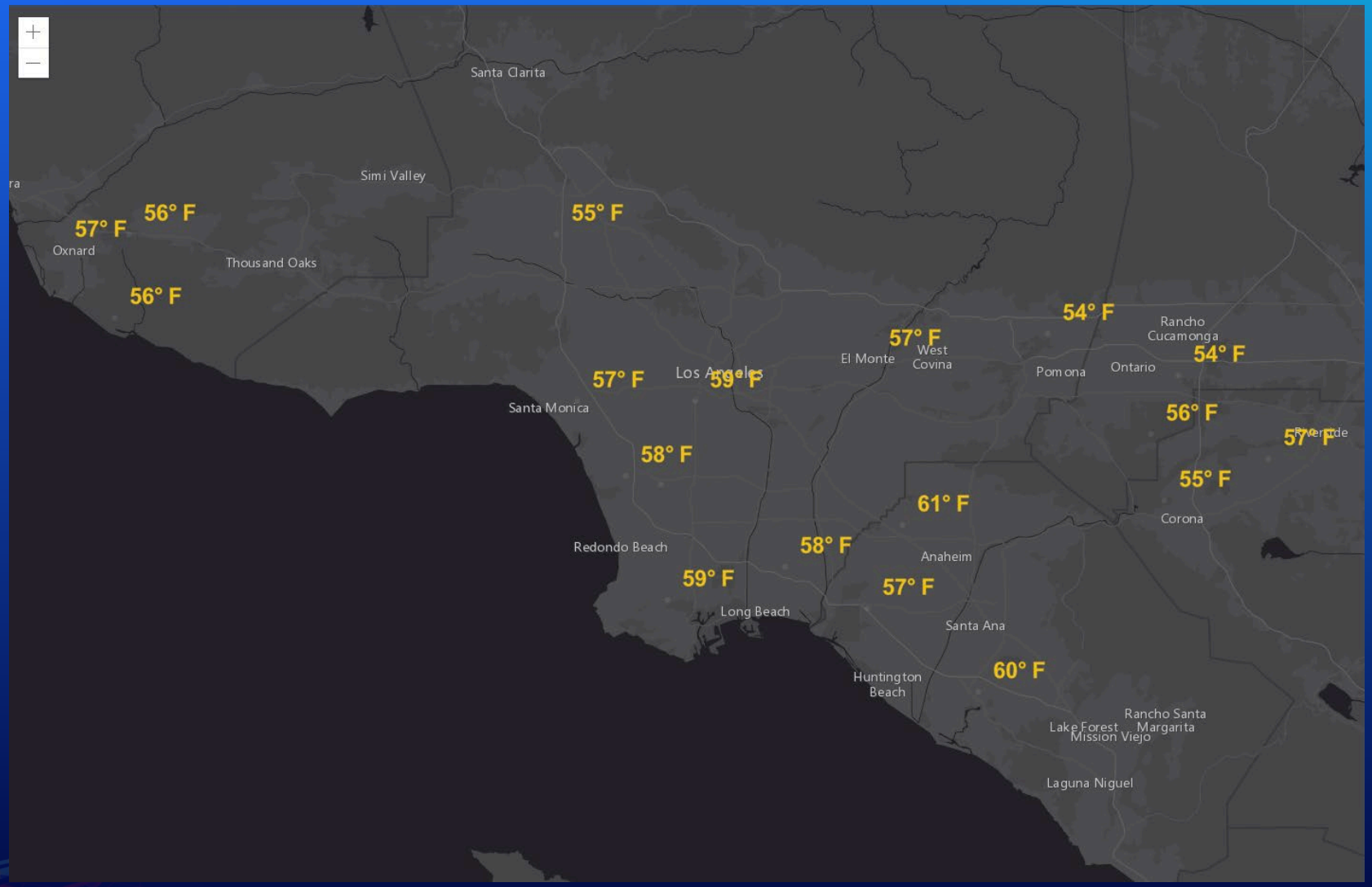
Lightweight

- Most requirements for scripts and expressions are lightweight. The language should be small, and fast

Geospatial

- Scripts should treat geospatial as first class Members

Unit Conversion



Language Overview

Arcade: Language Features

Designed for simple expressions

- Single line - implicit returns
- Case insensitive language
- Dictionary syntax for field access

Has language features to support more complex scripts

- Type system
- Implicit and explicit type casting
- Flow control statements: IF, FOR
- Variable declaration and assignments
- User defined functions

Arcade Scripts run and return a value. They are self contained and cannot alter their environment.

New features

Since last DevSummit…

4 releases!

Added support for Template literals

return `This is the ${feature.ADJ} feature
for embedded expressions!`

4 new profiles

- Dashboard
- Dictionary Renderer
- Layout
- Velocity

41 new functions

Array functions (push, pop, splice, etc.)
ISO Date functions

Additional geometry functions
Subtype and Domain
… and more!

Profiles

Profiles in the ArcGIS JS API

	Visualization	Popup	Labeling	Feature Z	Constraint	Field Calculate
Context	ClassBreaksRenderer UniqueValueRenderer Visual Variables	Popup Template	LabelClass	ElevationInfo In 3D Scenes	FeatureForm widget FieldConfig	3.x only!
Globals	$feature $view.scale	$feature $layer $map $datastore	$feature	$feature	$feature	$feature $datastore
Return Type	Text Number	Text Number	Text	Number	Boolean	Text Number Date
Banned functions	FeatureSet functions	N/A	FeatureSet functions	FeatureSet functions	FeatureSet functions	N/A

Profiles define the purpose, rules, and context for executing Arcade Expressions

Generate Arcade for your users

Generate Arcade for your users

```
function generateArcade(fields: string[], normalizationField?: string): string {
  const value = fields.map( field => `$feature.${field}` ).reduce( (a,c) => `${a} + ${c}`);
  const percentValue = normalizationField ?
    `( ( ${value} ) / $feature.${normalizationField} ) * 100` : value;
  return `Round( ${percentValue} )`;
}
```

```
generateArcade([ "EDUC10_CY", "EDUC12_CY", "EDUC13_CY", "EDUC14_CY", "EDUC15_CY" ])

// returns the following expression

Round( ( (
  $feature.EDUC10_CY + $feature.EDUC12_CY +
  $feature.EDUC13_CY + $feature.EDUC14_CY +
  $feature.EDUC15_CY
) / $feature.EDUCA_BASE ) * 100 )
```

Future

Adding functions, profiles, and new syntax

Identifying common operations and use cases

- Let us know what you need!
- New profiles?
- New functions?
- New globals?

In the works

- Aggregated features
- New arcade editor
- Internationalization

Research projects

- Import
- Web request
- Projection
- Expanded popup profile (returning dictionaries and lists)

Arcade resources

Resources

For Arcade Documentation
https://developers.arcgis.com/arcade

Playground
https://developers.arcgis.com/arcade/playground/

Using Arcade with JS API

https://developers.arcgis.com/javascript/latest/guide/arcade/index.html

Blogs
https://www.esri.com/arcgis-blog/?s=#&tag=arcade-expressions

Arcade Expression sharing repo

https://github.com/Esri/arcade-expressions/

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