Martin Scherpinski

15.11.2022

Utilizing Arcade

in the ArcGIS API for JavaScript

con·terra
locate the future

Martin Scherpinski

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con terra Technologies | Product development

map.
apps

Web mapping framework

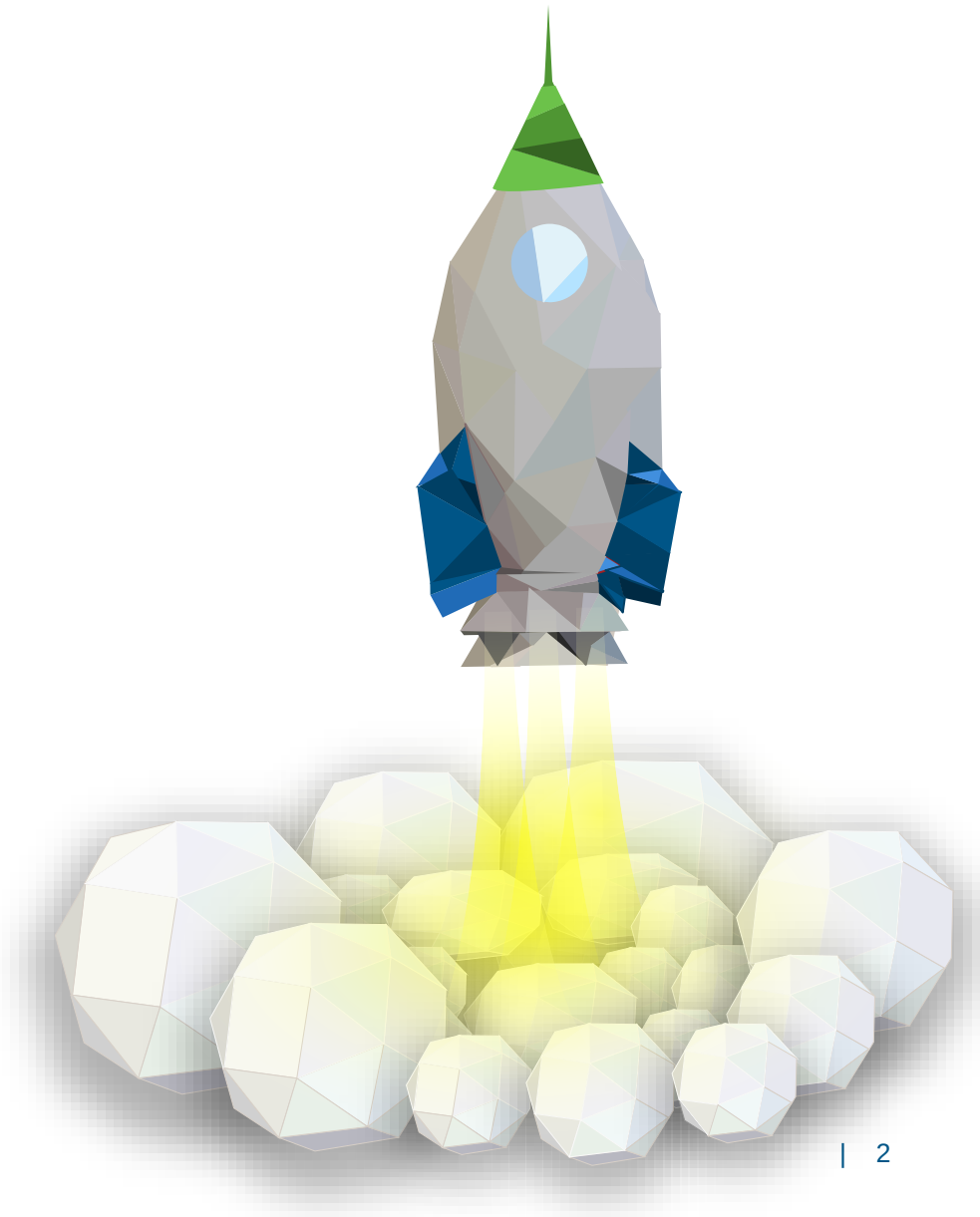
ArcGIS API for JavaScript

security.
manager

Access control

ArcGIS Enterprise

Server Object Interceptor



What is Arcade?

- Expression Language
  - “… to create custom content in ArcGIS applications …”
  - In my own words: calculations based on „real“ data

- since 2017
  - current Version: 1.20
  - depends on the embedding product

Arcade	ArcGIS Pro	ArcGIS Enterprise server	ArcGIS Enterprise portal	ArcGIS API for JavaScript	ArcGIS Runtime
1.20	3.1	11.1	11.1	4.25 | 3.42	n/a
1.19	3.1	11.1	11.1	4.25 | 3.42	100.15
1.18	3.0	11.1	11.1	4.23 | 3.40	100.14
1.17	2.9	11.0	11.0	4.23 | 3.40	100.14
1.16	2.9	11.0	11.0	4.22 | 3.39	100.13
1.15	2.9	10.9.1	11.0	4.21 | 3.38	100.13

- spread across the whole ArcGIS platform
  - ArcGIS Pro, ArcGIS Online, ArcGIS API for JavaScript, ArcGIS Runtime, …

What can you do with it?

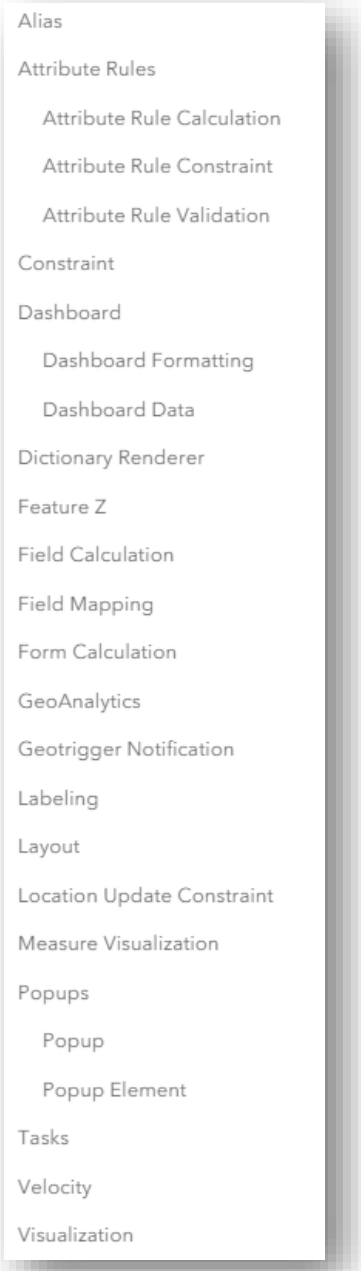
- mathematical calculations
- text manipulation
- logical expressions
- variables
- flow control
- feature and geometry data types
- …
- https://developers.arcgis.com/arcade/function-reference/

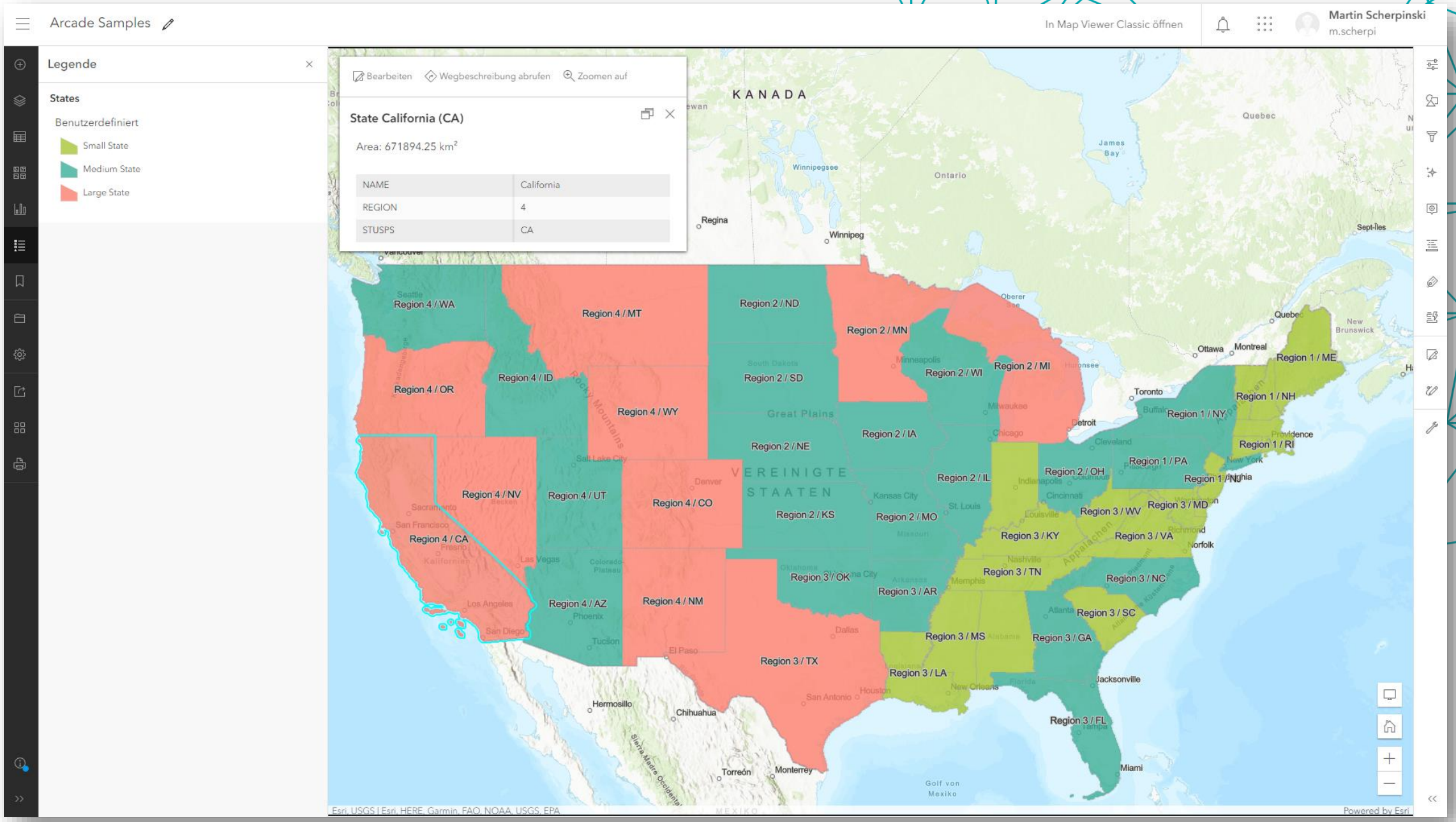
- **Profile**: context that controls, what is available for calculations (In/Out)

What can you do with it?

- common „use cases“ / profiles
  - Popups
  - Labeling
  - Styling / Visualization
  - Geometrical operations
  - …

  - DEMO (AGOL)
  - DEMO (JS API)




Arcade Samples
In Map Viewer Classic öffnen
Martin Scherpinski
m.scherpi
Legende
States
Benutzerdefiniert
Small State
Medium State
Large State
Bearbeiten
Wegbeschreibung abrufen
Zoomen auf
State California (CA)
Area: 671894.25 km²
NAME California
REGION 4
STUSPS CA
KANADA
Region 4 / WA
Region 4 / MT
Region 2 / ND
Region 2 / MN
Region 4 / OR
Region 4 / ID
Region 2 / SD
Region 2 / WI
Region 2 / MI
Region 4 / WY
Region 2 / IA
Region 2 / NE
Region 1 / ME
Region 1 / NH
Region 1 / NY
Region 1 / RI
Region 1 / PA
Region 4 / NV
Region 4 / UT
Region 4 / CO
Region 2 / IL
Region 2 / OH
Region 2 / KS
Region 2 / MO
Region 3 / WV
Region 3 / MD
Region 4 / CA
Region 3 / KY
Region 3 / VA
Region 3 / TN
Region 3 / NC
Region 3 / OK
Region 3 / AR
Region 4 / AZ
Region 4 / NM
Region 3 / SC
Region 3 / MS
Region 3 / GA
Region 3 / TX
Region 3 / LA
Region 3 / FL
Esri, USGS | Esri, HERE, Garmin, FAO, NOAA, USGS, EPA
Powered by Esri

Expressions

- Popups
  - Title:

```
State {NAME} ({STUSPS})
```

  - Content:

```
return {
   type : 'text',
   text : "Area: " + Round(Area(Geometry($feature),
           'square-kilometers'), 2) + " km²"
}
```

Expressions

- Style:

```
var area = Round(Area(Geometry($feature), 'square-kilometers'), 2);

When(
        area < 200000, 'Small State‘,
        area >= 200000 && area < 450000, 'Medium State‘,
        area >= 450000, 'Large State', 'n/a‘
);
```

- Label:

```
"Region "+ $feature.REGION + " / "+ $feature["STUSPS"]
```

And beyond?

- since ArcGIS API for JS **4.24** Arcade may be executed independent of the „use case“
- may be used in „normal“ code
- API Sample

- enables you to provide e.g. a playgroud / sandbox based on „actual“ data

- DEMO

```
/*
 * Copyright (C) con terra GmbH
 */

import arcade from "esri/arcade";

const profile = {
    variables: [{
        name: "$feature",
        type: "feature"
    } as SimpleVariable,
    {
        name: "$layer",
        type: "featureSet"
    } as SimpleVariable]
};
export class ArcadeExecutor {

    async evaluateExpressionForLayer(arcadeExpression: string, selectedLayer: FeatureLayer): Promise<string> {

        const executor = await arcade.createArcadeExecutor(arcadeExpression, profile);

        selectedLayer.outFields = executor.fieldsUsed;
        const { features } = await selectedLayer.queryFeatures();

        return executor.execute( {
            "$feature": features.at( index: 0),
            "$layer": selectedLayer
        });
    }
}
```


map.apps Days 2022
Arcade
con terra
locate the future
Developer Network
Scotland
Edinburgh
Newcastle upon Tyne
UNITED KINGDOM
Belfast
Douglas
Leeds
Liverpool
Dublin
IRELAND
Nottingham
Birmingham
Wales
Cardiff
London
English Channel
Celtic Sea
Kattegat
DENMARK
Copenhagen
Esbjerg
Baltic Sea
Hamburg
Bremen
NETHERLANDS
Amsterdam
Rotterdam
Hanover
Berlin
Bielefeld
Dortmund
Dusseldorf
Cologne
GERMANY
Leipzig
Dresden
Antwerp
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Poznan
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Vienna
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Budapest
SLOVAKIA
Kosice
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Minsk
Mahilyow
Vitsyebsk
Vilnius
LITHUANIA
BELARUS
Lutsk
Kyiv
Lviv
Ternopil
Vinnytsia
Ivano-Frankivsk
Chernivtsi
UKRAI
Debrecen
Oradea
HUNGARY
Cluj-Napoca
MOLDOVA
Chișinău
Odes
ROMANIA
Brasov
GDI-TH, Esri, HERE, Garmin, FAO, NOAA, USGS

Expressions

- Title:

```
$feature.bez + " " + $feature.gen
```

- Area 1:

```
„Area: " + Round(Area($feature, 'square-kilometers'), 2) + " km²"
```

- Area 2:

```
„Area: " + $feature.kfl + " km²"
```

- Density:

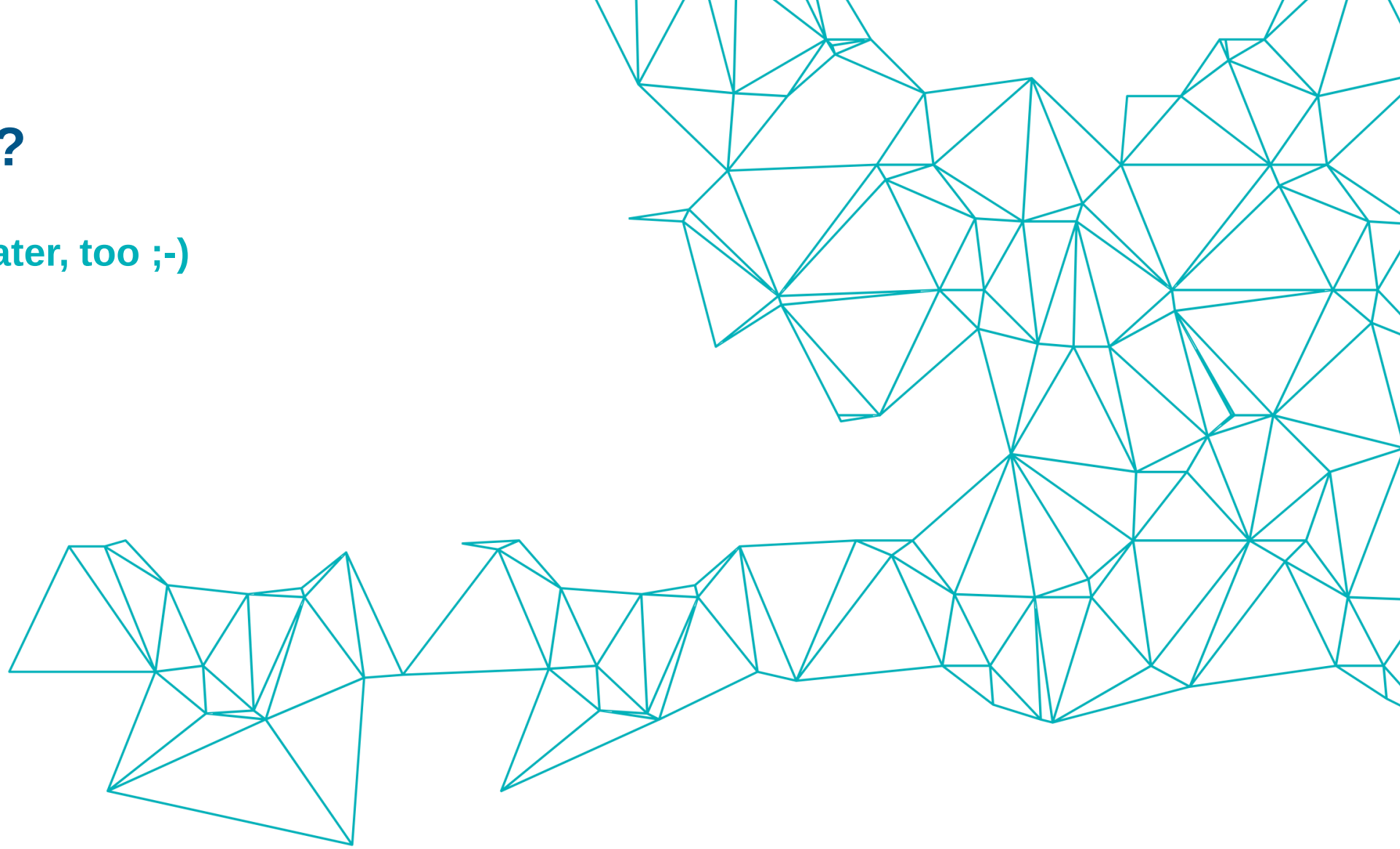
```
Round( $feature.ewz / $feature.kfl, 2) + " Ppl / km²"
```

- Title water level:

```
$feature.longname+ ": " +
Round($feature.currentMeasure_value, 0) + " " +
$feature.parameter_unit
```

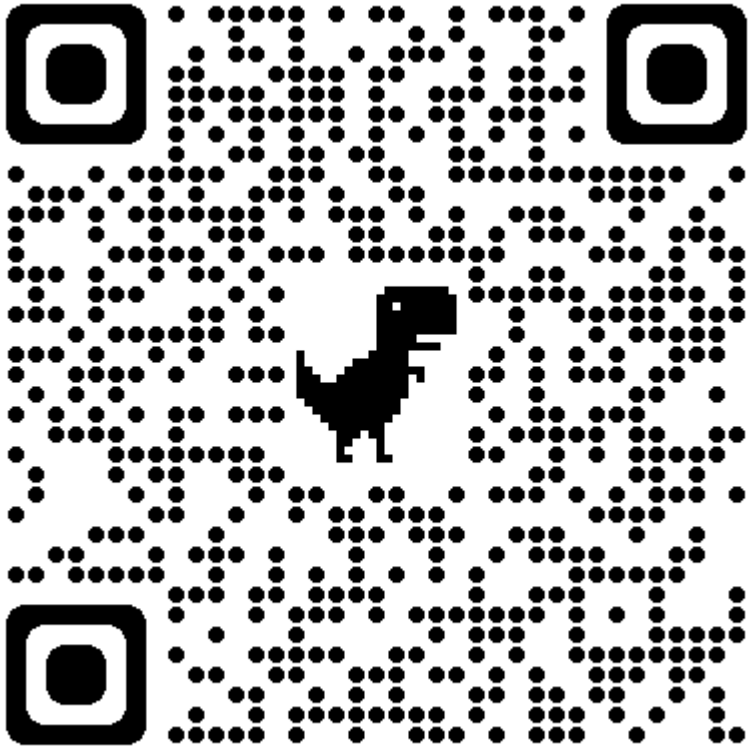
Any questions?

Feel free to ask me later, too ;-)



Links

https://github.com/m-scherpi/arcade-links



Thank You!

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