MAPML IMPLEMENTATIONS IN MAPSERVER, GDAL AND OGR
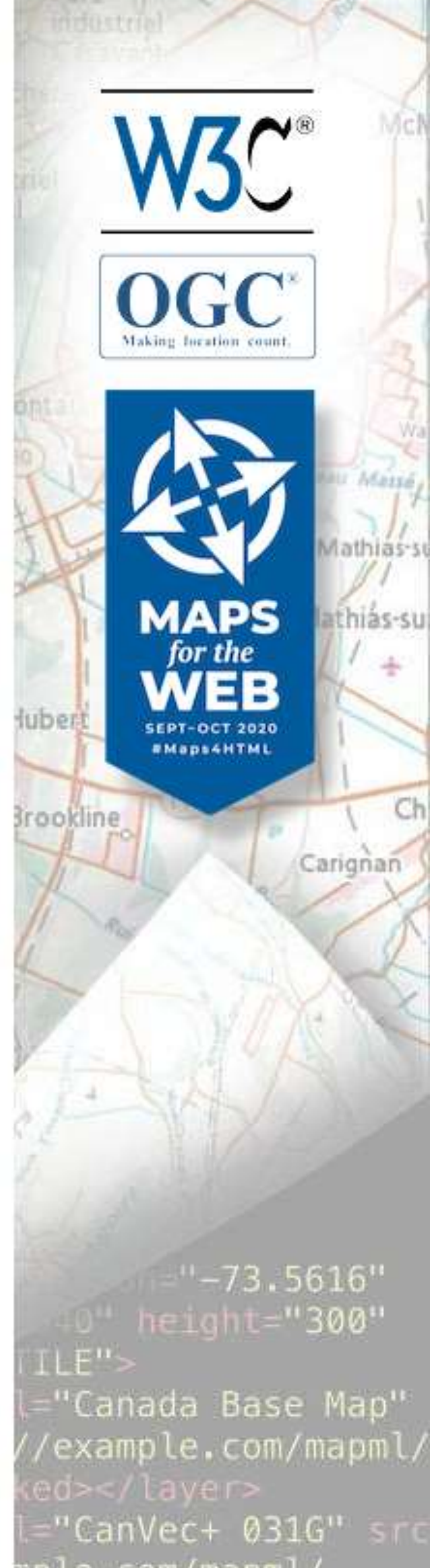
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W3C/OGC Joint Workshop Series on Maps for the Web
w3.org/2020/maps/

MapML in MapServer, GDAL and OGR

mapserver.org

gdal.org
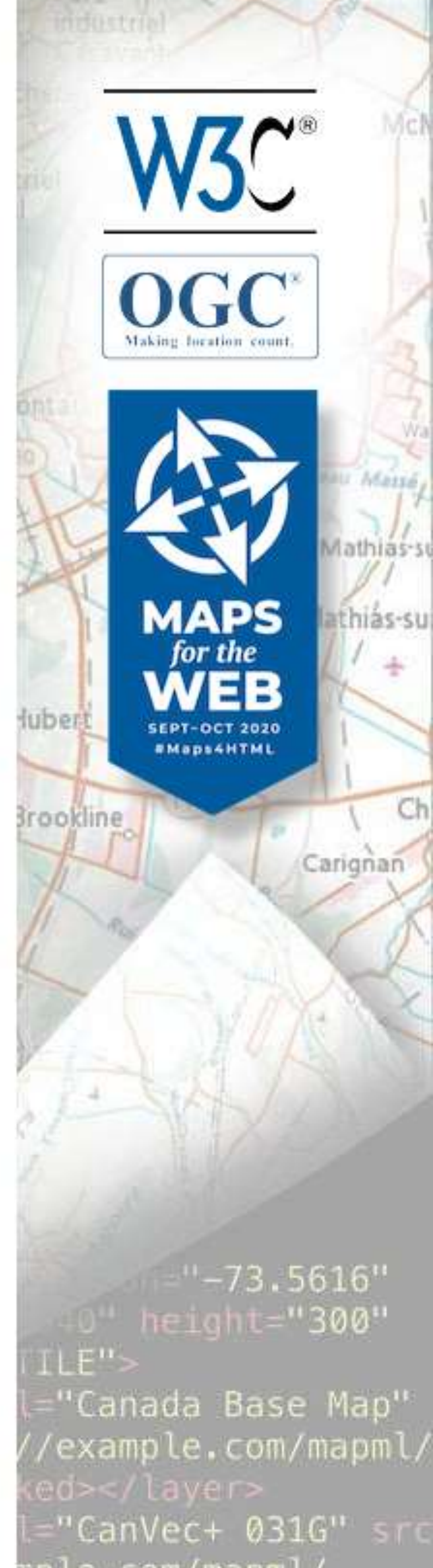
osgeo.org

MapML in MapServer

- MapServer RFC-123:
https://www.mapserver.org/development/rfc/ms-rfc-123.html

- Planned for inclusion in MapServer 8.0 release

- Github source fork:
https://github.com/dmorissette/mapserver/tree/rfc123-mapml

MapML in MapServer

- Requires a WMS-enabled mapfile

- Entry point = vendor-specific WMS GetMapML request

- The rest is automagically handled by MapServer and the polyfill viewer

```
http://example.com/cgi-bin/mapserv?map=...
    &service=WMS&request=GetMapML
    &layer=<wms_layer_name>
    &projection=<mapml_projection_code>
```
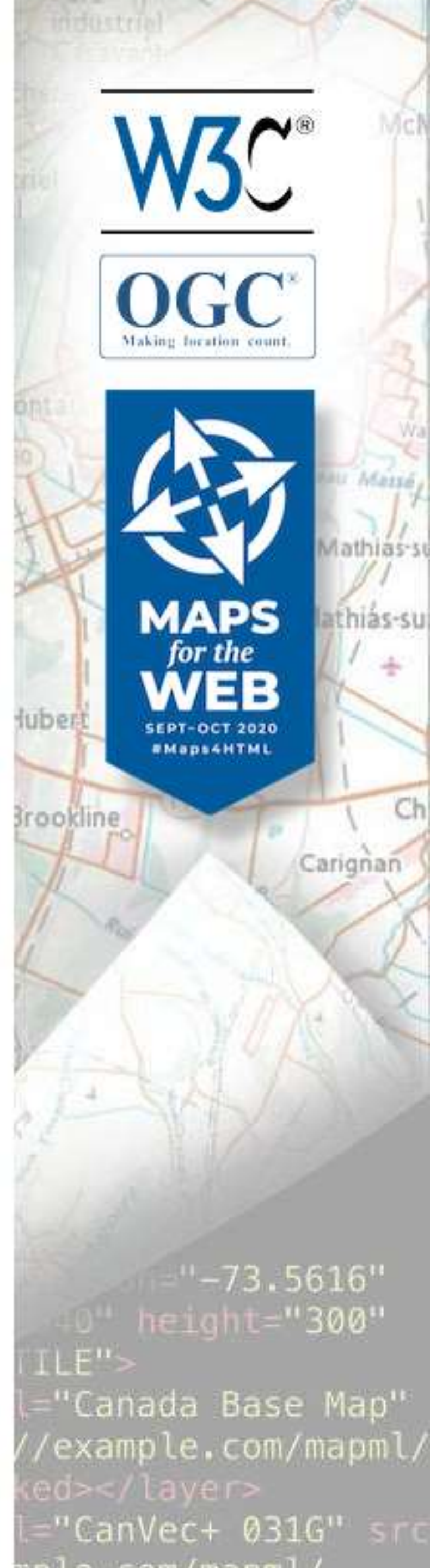
MapML in MapServer

Simple WMS Map Layer Example:

```
<body>
<map is="web-map" projection="OSMTILE" zoom="5" lat="45" lon="-80" controls>
  <layer- label="My WMS" src="http://example.com/cgi-
bin/mapserv?map=...&service=WMS&request=GetMapML&layer=...&projection=OSMTILE"
checked></layer->
</map>
</body>
```


http://msdev.mapgears.com/mapml/demos/mapserver-canvec-osmtile.html

MapML in MapServer

```
1  <!DOCTYPE html>
2  <html>
3  <head>
4  <title>MapServer MapML Demo1 - CanVec WMS</title>
5  <meta charset='utf-8'>
6  <script src="/mapml/viewer/bower_components/webcomponentsjs/webcomponents-lite.min.js"></script>
7  <link rel="import" href="/mapml/viewer/bower_components/web-map/web-map.html">
8  <style>
9  * {margin: 0;padding: 0;}
10 map { display: flexbox; height: 100vh;}
11 </style></head>
12 <body>
13 <map is="web-map" projection="OSMTILE" zoom="5" lat="45" lon="-80" controls>
14 <layer- label="MapServer Guelph WMS" src="http://msdev.mapgears.com/cgi-bin/mapserv-mapml?map=/opt/
15 </map>
16 </body>
17 </html>
18
```
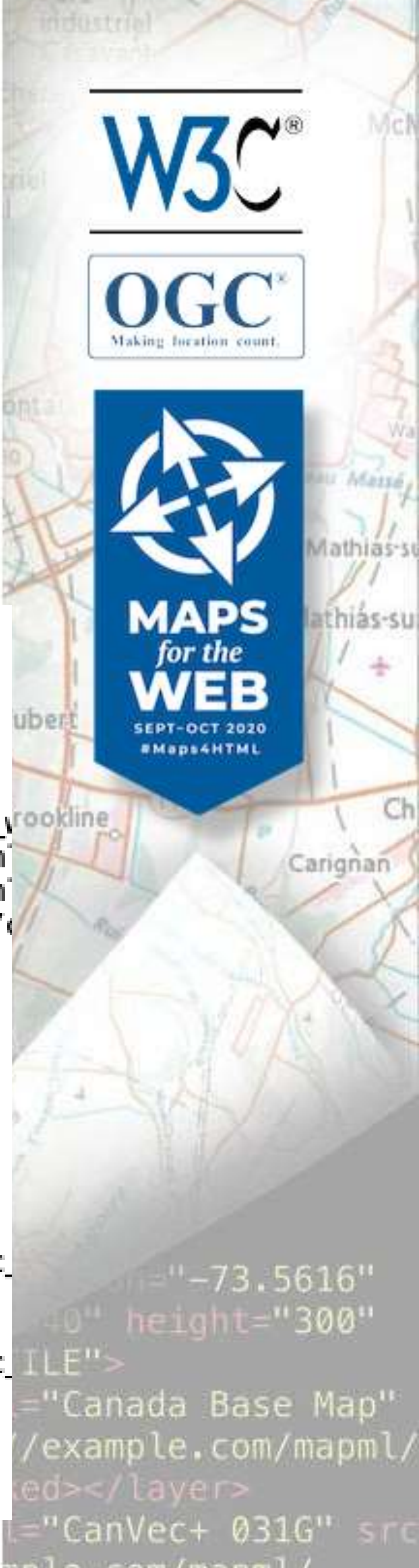
MapML in MapServer

GetMapML Response = <mapml> document with WMS URL references
(<link rel=image ... >)

```
<mapml>
  <head>
    <title>CanVec Demo WMS</title>
    <meta charset="UTF-8"/>
    <meta http-equiv="Content-Type" content="text/mapml;projection=OSMTILE"/>
    <link rel="license" href="http://msdev.mapgears.com/mapml/" title="MapServer MapML Attribution Here"/>
    <link rel="legend" href="http://msdev.mapgears.com/cgi-bin/mapserv-mapml?map=/opt/scribeui/workspaces/dm_mapml/canvec_wms/map/canvec_
    <link rel="alternate" projection="CBMTILE" href="http://msdev.mapgears.com/cgi-bin/mapserv-mapml?map=/opt/scribeui/workspaces/dm_mapml
    <link rel="alternate" projection="APSTILE" href="http://msdev.mapgears.com/cgi-bin/mapserv-mapml?map=/opt/scribeui/workspaces/dm_mapml
    <link rel="alternate" projection="WGS84" href="http://msdev.mapgears.com/cgi-bin/mapserv-mapml?map=/opt/scribeui/workspaces/dm_mapml/
  </head>
  <body>
    <extent units="OSMTILE">
      <input name="w" type="width"/>
      <input name="h" type="height"/>
      <input name="xmin" type="location" units="pcrs" position="top-left" axis="easting" min="-9.50126e+06" max="-7.57178e+06"/>
      <input name="ymin" type="location" units="pcrs" position="bottom-left" axis="northing" min="5.00048e+06" max="6.17829e+06"/>
      <input name="xmax" type="location" units="pcrs" position="top-right" axis="easting" min="-9.50126e+06" max="-7.57178e+06"/>
      <input name="ymax" type="location" units="pcrs" position="top-left" axis="northing" min="5.00048e+06" max="6.17829e+06"/>
      <link rel="image" tref="http://msdev.mapgears.com/cgi-bin/mapserv-mapml?map=/opt/scribeui/workspaces/dm_mapml/canvec_wms/map/canvec_
      <input name="i" type="location" axis="i" units="map" min="0" max="0"/>
      <input name="j" type="location" axis="j" units="map" min="0" max="0"/>
      <link rel="query" tref="http://msdev.mapgears.com/cgi-bin/mapserv-mapml?map=/opt/scribeui/workspaces/dm_mapml/canvec_wms/map/canvec_
    </extent>
  </body>
</mapml>
```

MapML in MapServer
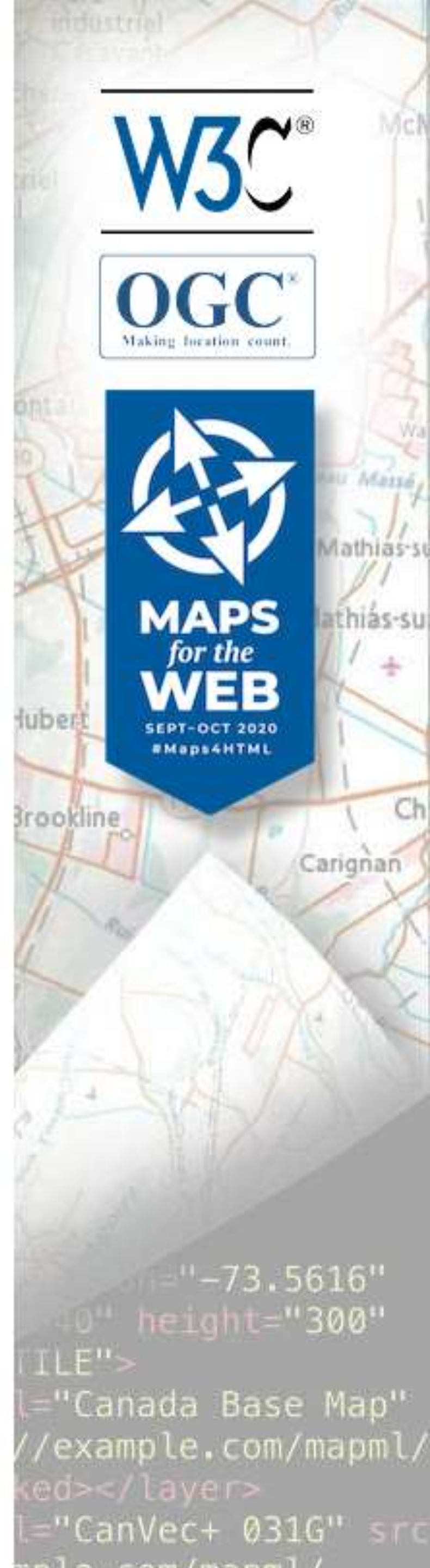
Multiple MapML <link rel=... > modes

Map Draws:
- <link rel=image ... > pointing to full page WMS requests
- <link rel=tile ... > pointing to tiled WMS requests
- <link rel=tile ... > pointing to mode=tile mapserv CGI requests
- <link rel=features ... > pointing to WFS GetFeature (future)

Map Query:
- <link rel=query ... > pointing to WMS GetFeatureInfo, returns <mapml> features
- Leverages the OGR MapML vector feature driver...
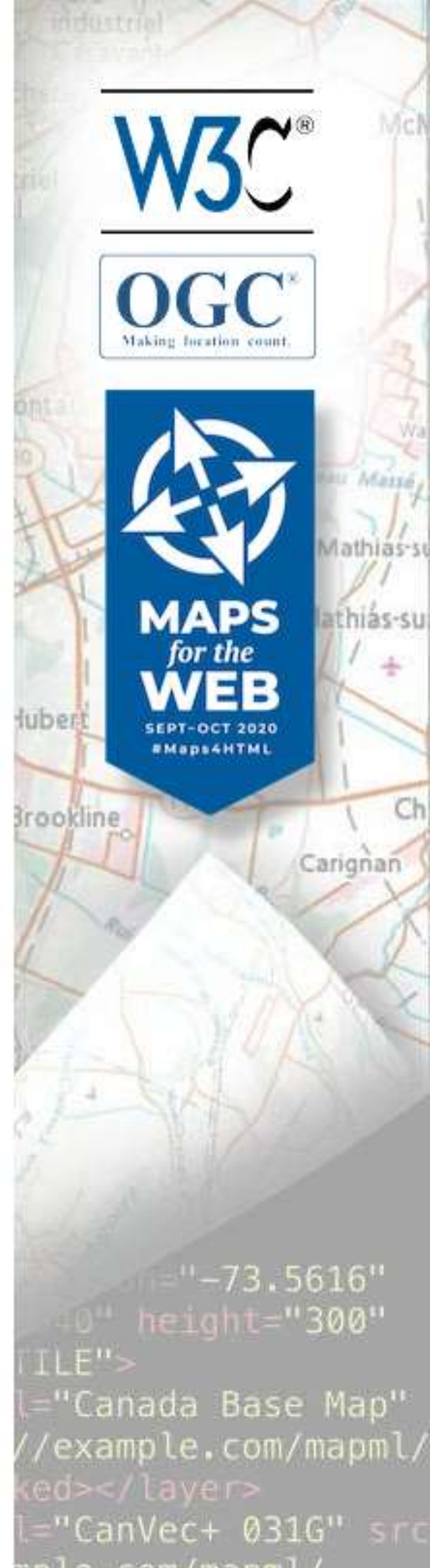
MapML in GDAL/OGR

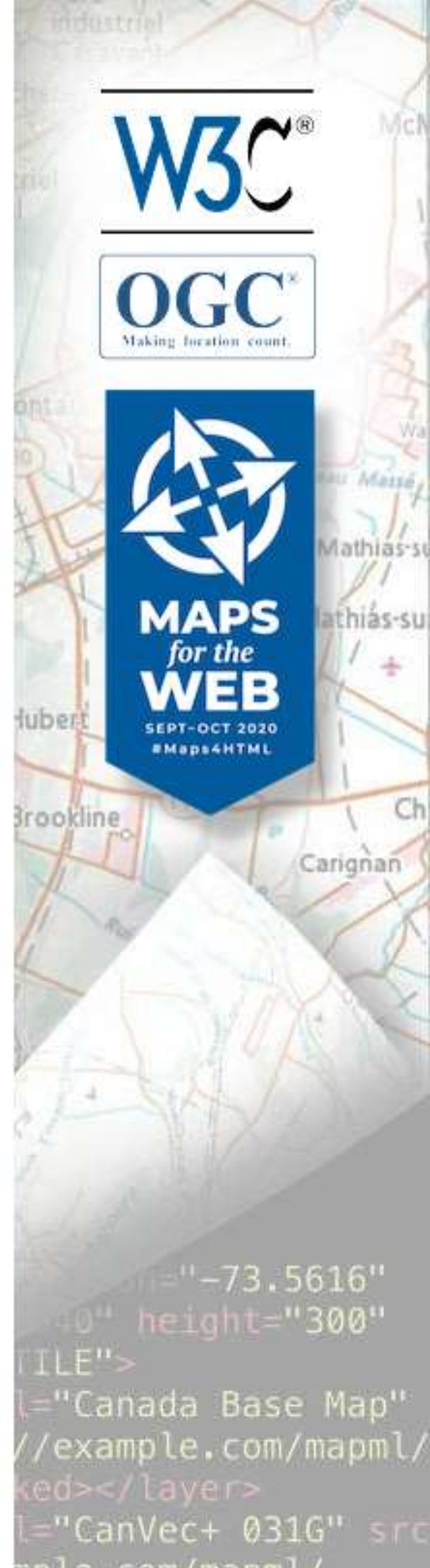GDAL
Raster tiles / imagery

OGR
Vector features

MapML driver in OGR

- Available in GDAL/OGR v3.1+

- https://gdal.org/drivers/vector/mapml.html

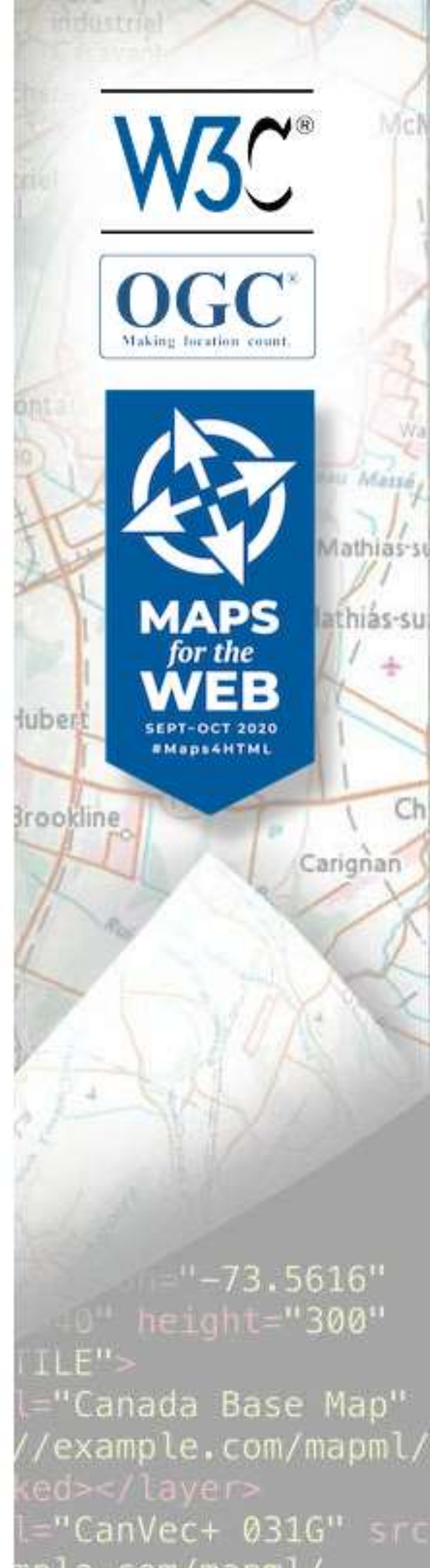- Reads and Writes <mapml> vector feature sets

MapML driver in OGR

- Usage example:

```
ogr2ogr -f "MapML" places.mapml place_0.shp
-sql "select pname_en, pop_estim, capital_en
      from place_0 where pop_estim > 100000"
-dsco "HEAD=<title>Populated Places</title> »
```

- Or export to MapML from your OGR-enabled GIS software

MapML in gdal2tiles.py

- Available in GDAL/OGR v3.1.3+

- Adds MapML output support to gdal2tile:
  https://gdal.org/programs/gdal2tiles.html#mapml-options

- Takes a raster file as input and generates a directory with a tile pyramid and <mapml> file

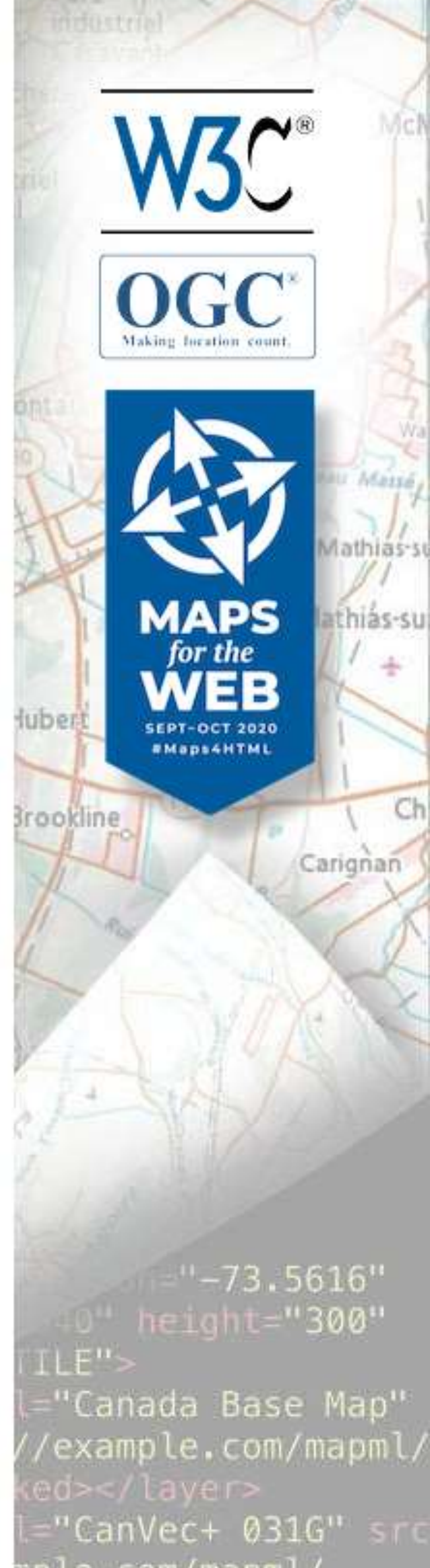# MapML in gdal2tiles

- Usage example:

```
gdal2tiles.py --zoom=16-18 -w mapml -p APSTILE
--url "https://example.com" input.tif output_folder
```
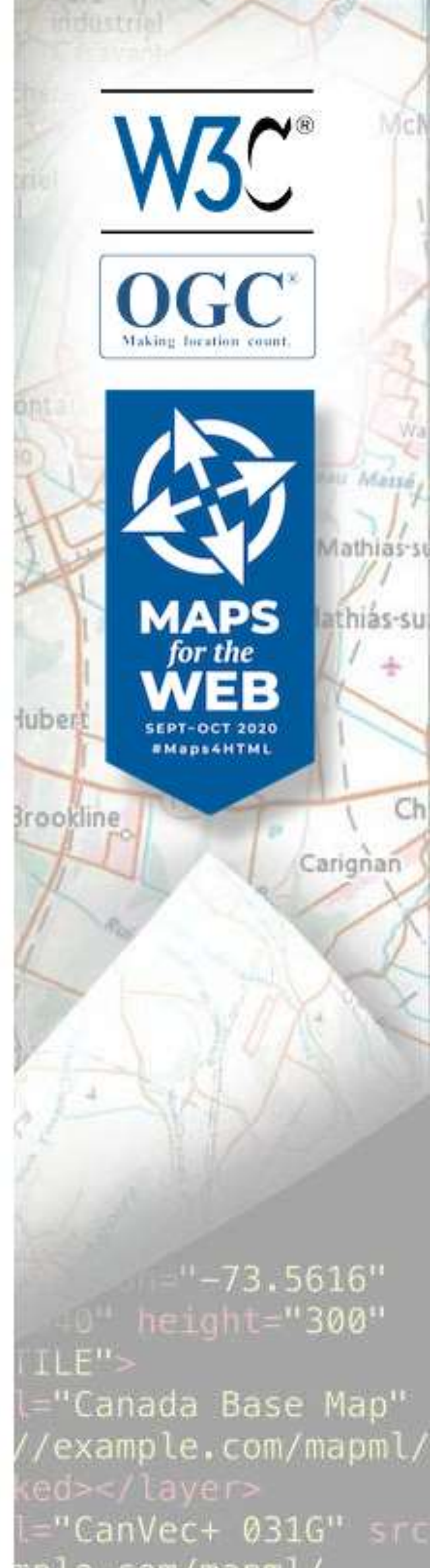
MapML in GDAL/OGR

Thanks to Even Rouault for the GDAL and OGR implementations

THANK YOU!

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