

# DRAFT WORKSHOP REPORT

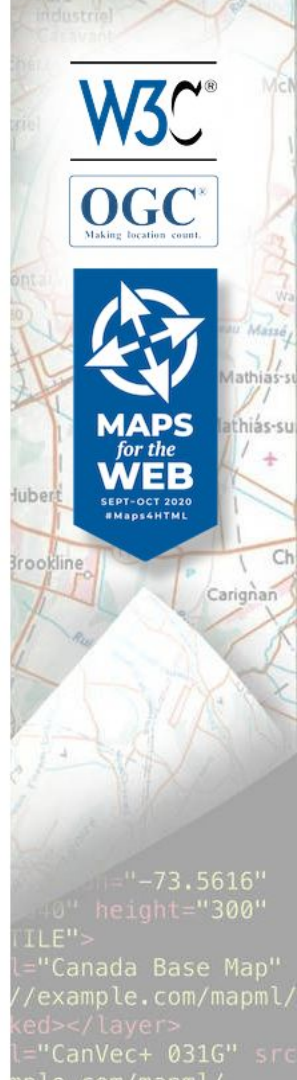
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*Workshop Program  
Committee*

TPAC Breakout 2020-10-26/30

Report on W3C/OGC Joint Workshop Series on Maps for the  
Web

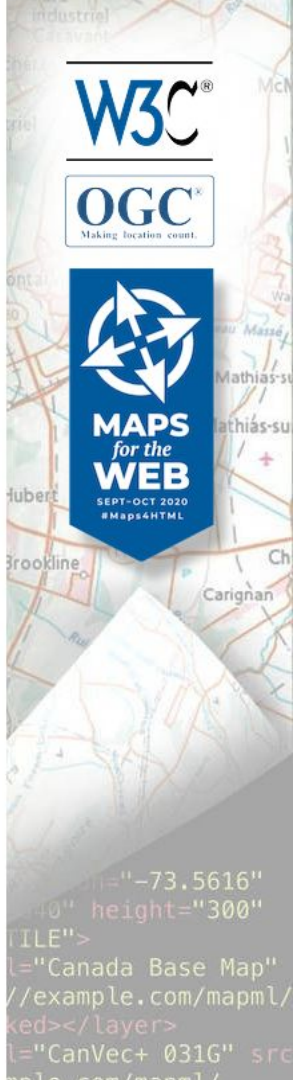
[w3.org/2020/maps/](https://w3.org/2020/maps/)



# Maps for HTML Community Group

## Focus areas:

- Standardize client-side standards for representing and controlling maps in browsers
- Normalize client-server protocols for GIS operations
- Open standard for maps as native content type in browsers
  - MapML specification, ARIA roles, controls and client-side API
- Open source prototype
- Not reinventing the wheel
  - Applying traditional GIS models and best practices to Web
- Documenting use cases and requirements (UCRs)
  - Legal requirements, i.e. accessibility
  - Opportunities
- Testing for interoperability and fulfilment of UCRs



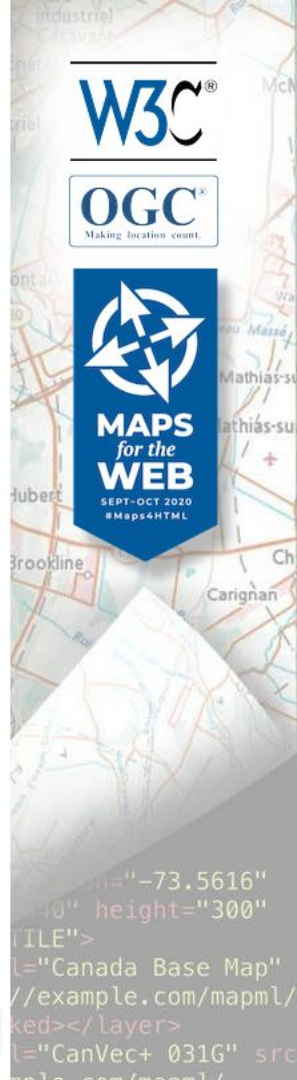
# Complementary to GIS standards

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- Most GIS standards are oriented to server-side technologies
  - Our work is primarily client-side
- Actively seeking collaboration:
  - GIS standards bodies
  - existing implementers
- Need coordination for client-server protocols and APIS

Project is coordinated by Natural Resources Canada

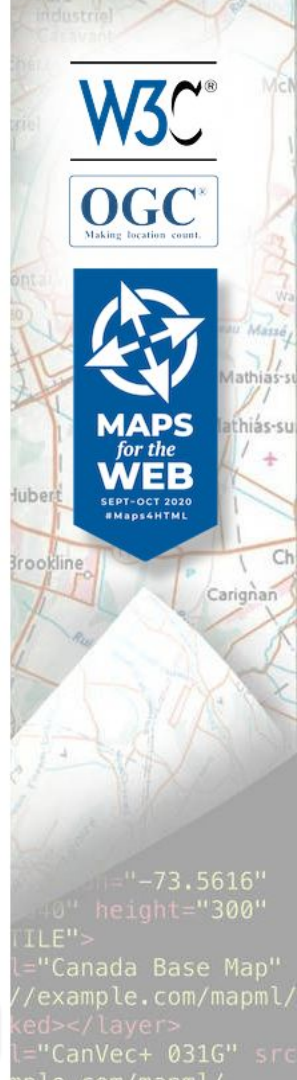
- Active participant in many GIS organizations and projects
- Long history of traditional and digital map making
- Seeking contributions from other governments



# High-level requirements

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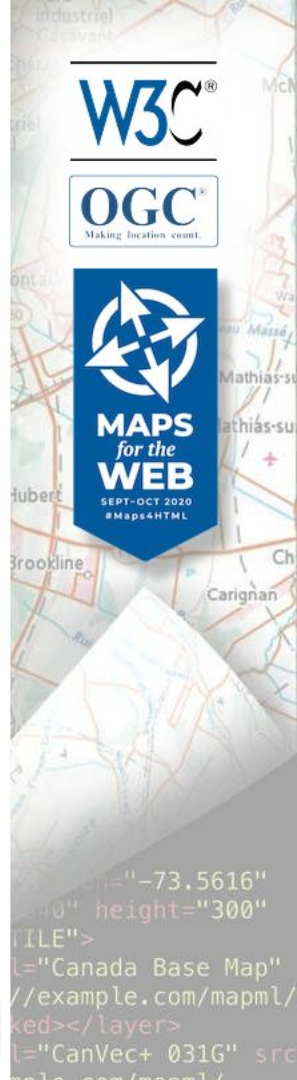
- Integrate common GIS standards
- Build on popular web map frameworks
- Intersect with Web standards



# Integrate common GIS standards 1/2

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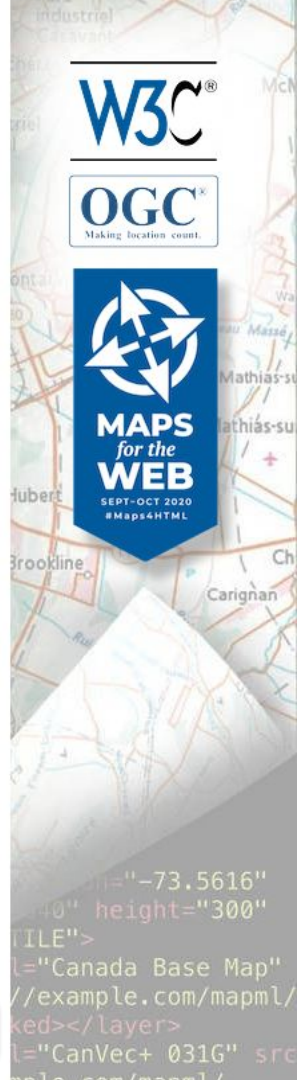
- Layers
  - Layer is a common, flexible map abstraction
  - All maps have layers, especially GIS systems
- Coordinate Reference Systems / Projections:
  - Provide fit-for-purpose depiction of (Earth)'s surface
  - Supported by limited registered domain of values+definitions, similar to approach used for link rel="relation-to-this" values.
  - Web Mercator, WGS 84, Lambert Conformal Conic, Polar Stereographic
- Scale / zoom
  - Map scale is the dimensionless ratio of a single map unit to real-world units. Zoom is an integer proxy for scale.
  - Zoom is used to create server caches, e.g. Google Maps
  - Pre-defined (standard) sets of zoom levels are a de facto Web map industry standard



# Integrate common GIS standards 2/2

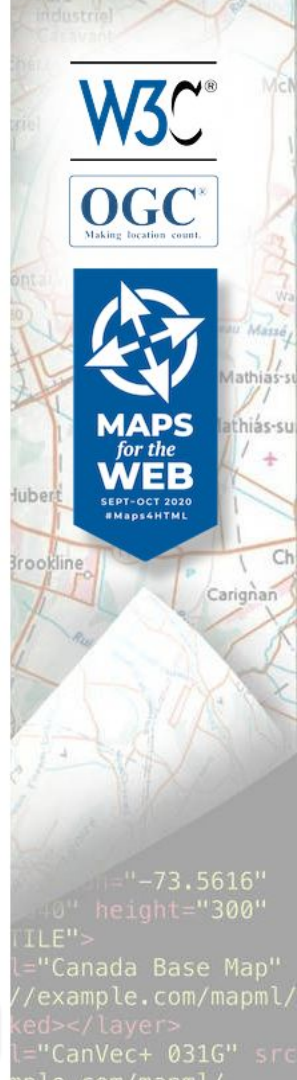
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- Images:
  - A Web map may be represented by a single resource that composes requested layers into a single image at request time. Implemented by server APIs, and standardized as
  - OGC Web Map Service
- Tiles
  - Tiles are a common Web map abstraction, widely represented in de facto and de jure standards, such as
  - OGC Web Map Tile Service
- Simple Features:
  - Simple Features is an abstract model of geographic objects common across the GIS domain in standards and formats:
  - KML, GML, GeoJSON, MVT, etc.



# Integrate common GIS standards 3/2

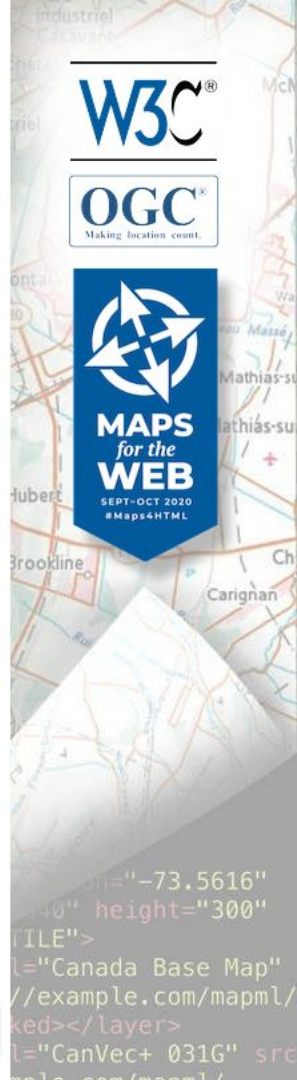
- Spatial Data on the Web Best Practices
  - High-level geospatial concepts e.g. serve feature geometry data appropriate to the desired use
  - Incorporated where feasible
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# Build on popular web map frameworks

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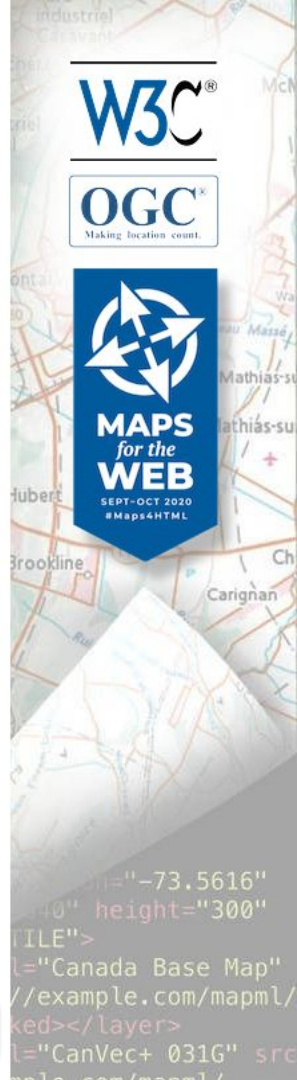
- Client side Web map patterns and best practices
  - OpenLayers - <https://openlayers.org/>
    - Object-oriented full-featured/mature Web map framework
  - Leaflet - <https://leafletjs.com/>
    - Plugin architecture - leaflet.js core, plugin ecosystem
  - OpenStreetMap - <https://www.openstreetmap.org/>
    - “Slippy tiles” public, user-generated global tile cache
  - Proprietary but standard behaviour: Google Maps, Apple Maps, MapBox, Bing Maps, etc.





# Intersect with Web standards

- HTML
  - Custom/native geo-map element for maps and floorplans
  - New controls and APIs
- SVG
  - Vector tiles, metadata
- ARIA
  - New map roles and properties
- CSS
  - Generic styling options that work well for maps
- XR: AR/VR
  - New shared primitives: zoom, pan, tiles
- REST
  - URL variables



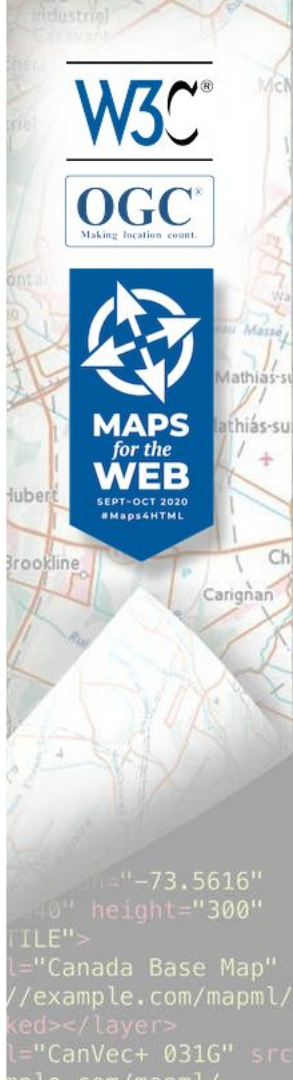
# Workshop Report

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- Work in progress
  - November 2020: Expected publication of first draft
    - Seeking feedback and other contributions
  - December 2020: Expected publication of final draft
- Persistent URL on [workshop site](#)

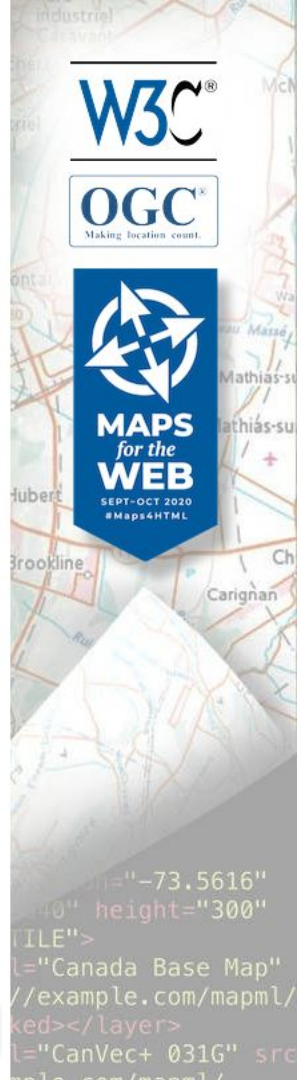
Report will summarize main topics of workshop:

- Current State of Web Maps
- A Web Platform-Native Map Viewer
- Government Data Providers Viewpoint
- Map Accessibility



# Current State of Web Maps

- **Standards: put maps in HTML!**: Peter Rushforth / W3C M4H CG
- **UCR - abstract map functions inventory**: Amelia Bellamy-Royds
- **GeoMoose: longstanding, OS standards-based project**: Dan Little
- **SVGMap**: Satoru Takagi
  - established JIS; Quad-Tree vector tiling
- **User Research on Maps in HTML**: Terence Eden



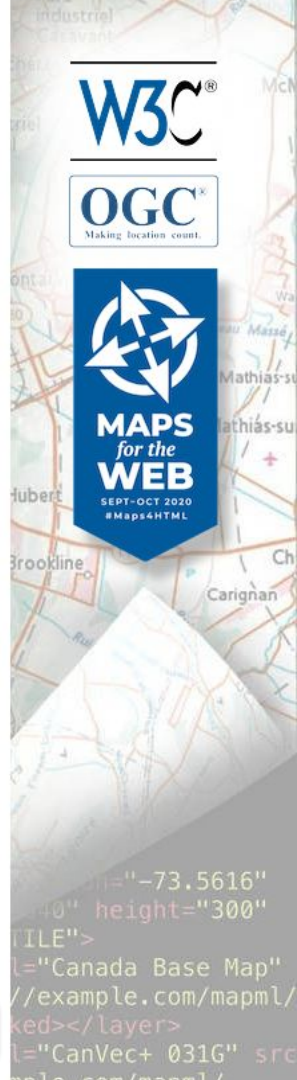
# Current State of Web Maps Takeaways

## Conflicting opinions of need for native features

- Web maps need to be standardized, easier to create and mash-up
- No need to ask browsers to support maps, they already do, via HTML/SVG+CSS+JS
- Users like declarative Web maps

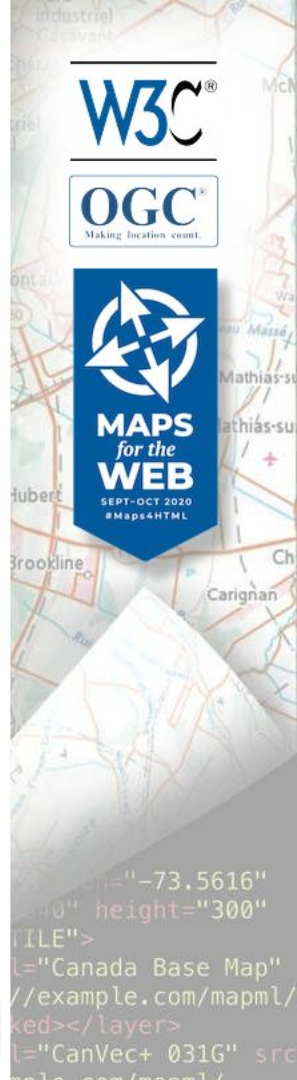
## Use cases and requirements:

- Need to survey developers' opinions, will result in better standards
- Security model of browsers could be updated to support CORS access of map layers
- A single map should be able to support multiple decoupled map sources and layers



# A Web Platform-Native Map Viewer

- **How we can build maps into HTML: MapML:** Peter Rushforth
  - A polyfill as custom elements
- **Bocoup's Review of the MapML Proposal:** Simon Pieters
  - UCR good, “MapML” not so much. How can we help?
- **Extending the Web: Maps, The Commons, & Pie:** Brian Kardell
  - Caution! Browser dev costly, risky, long term. Can we help?
- **Rendering performance:** Andreas Hocevar (OpenLayers)
  - Browser can help with rendering today. An HTML standard might be a good starting point for future map dev.
- **Multilingual text rendering:** Brandon Liu (Protomaps/OSM)
  - International text rendering is the domain of browser rendering engines. Maps in HTML: do it.
- **Map adventures in weird web standards:** Iván Sánchez Ortega
  - Google could corrupt a standard by making it work 'better' on their site; -1 on maps in Web Platform.



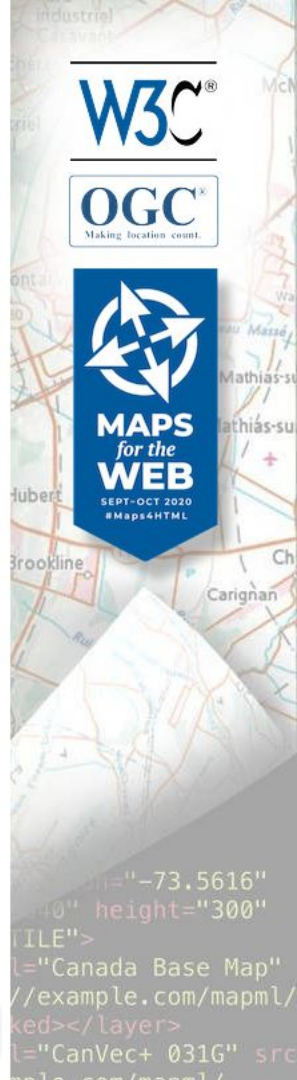
# Government Data Providers Viewpoint

## Presentations

- **Data-driven configuration of web maps:** Danielle Dupuy, USGS
- **Fuzzy Geolocation and privacy:** Thijs Brentjens, Geonovum
- **Web GIS application for Indian Prime Minister's Rural Road Programme:** Sajeevan G

## Panel:

- Sébastien Durand, Canadian Federal Geospatial Platform:
- Don Sullivan, NASA: standard maps on Web: brilliant idea. Do it!
- Cameron Wilson, Canadian Spatial Data Infrastructure: everything has location and time. Need to make geo a day-to-day commonality.
- Emilio López Romero, National Centre of Geographic Information (Spain): standards are crucial for us. Private sector not using our free resources enough.



# Map Accessibility

## Presentations:

- Location-based Accessibility
  - **Physical accessibility data in maps:** Sebastian Felix Zappe
  - **Indoor maps:** Claudia Loitsch, Julian Striegl
- Accessible map interfaces:
  - **UI patterns in web map widgets:** Nic Chan, Robert Linder
  - **Digital nonvisual and cross-sensory maps:** Brandon Biggs
  - **Map annotations:** Nicolò Carpignoli, Joshue O Connor

## Panels:

- **Web Maps for Cognitive Accessibility**
  - David Fazio, John Kirkwood, John Rochford
- **Creating accessible Web map widgets**
  - Brandon Biggs, Tony Stockman, Nicholas Giudice, Doug Schepers



# Map Accessibility Takeaways

## Location-based Accessibility

- We need generalized way to express structured data about **points of interest** (AKA “features”)
  - Is this location wheelchair accessible? Where is the accessible entrance? Is it guide-dog-friendly? Is the restroom accessible? Where is its dedicated accessible parking?
  - Many non-accessibility use cases: allergy info, business hours
- We need standard ways to describe **indoor maps** for navigation

## Accessible map interfaces:

- Current state of the art in UI needs much improvement
- Accessible map annotation could help with information retrieval, navigation, comparing, and monitoring info
- Many possible improvements for web through sonification, earcons, vibro-tactile audio maps
- Many cognitive challenges, not just mobility and sensory

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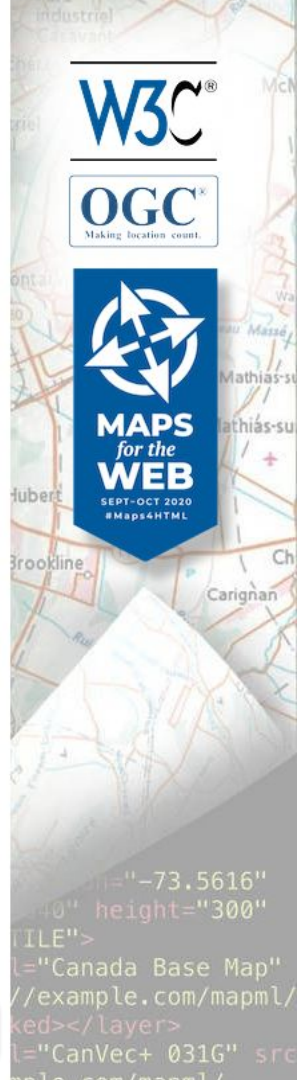
# Get Involved - You can help

- Review the Use Cases and Requirements - open or contribute ideas to linked issues
- Test and potentially deploy and use the Web-Map-Custom-Element polyfill. Provide feedback via issues.
- If you represent an organization, there's probably someone there who deals with the maps. Let them know about this initiative, and get your organization's use cases and requirements represented
- Join the CG! Even if you don't want to spend time on this, if you support it, join. More numbers means more visibility, and there's no expectation that you have to contribute. By joining, you have contributed.

Fill out the MDN Developer Needs Assessment survey before Oct. 31.

Mention standards for Web

maps. <https://www.surveygizmo.com/s3/5897636/Bocoup>



# Coordination and Contact Info

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## 2020 W3C-OGC Maps for the Web workshop

- [Agenda, slides, and videos](#)

## Maps for HTML Community Group

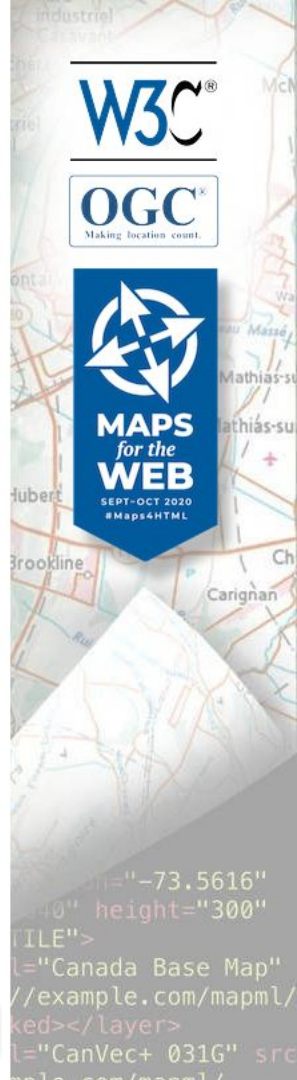
- Project website: <https://maps4html.org>
- [W3C Community Group homepage](#)
- Mailing list: [public-maps4html@w3.org](mailto:public-maps4html@w3.org) ([archive](#))

## MapML specification

- <https://maps4html.org/MapML/spec/>

## Web Map Custom Element (Web Component) prototype

- [Github repository](#)
- [Issue tracker](#)



# Open Source for Web Mapping

## Panel:

- Andreas Hocevar, OpenLayers
- Simon Pieters, Bocoup
- Will Mortenson, NGA
- Daniel Morissette, MapGears

## Topics

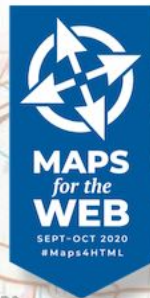
- How can FOSS4G developers help with standardization in the browser
- How can we increase OSGeo participation
- Future of relationship between browser capabilities and web mapping libraries



# Open Source for Web Mapping

## Takeaways

- Use cases, requirements
- Stakeholders and developers for browser geo-features needed early on
- Geo and web communities need to interact
- Look into ways map features in the browser can help out non-map capabilities (common use cases between different needs)
- Cross pollinating at code sprints
- If maps are implemented in the browser (i.e. rendering) Web mapping libraries will be able to focus on more interesting features

The logo for the World Wide Web Consortium (W3C), featuring the letters "W3C" in a stylized blue font with a registered trademark symbol.The logo for the Open Geospatial Consortium (OGC), featuring the letters "OGC" in a stylized blue font with a registered trademark symbol, and the tagline "Making location count." below it.

# What is W3C?

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## World Wide Web Consortium

- Standards organization of Web industry leaders
- Implementers, browser vendors, application developers, major content creators
- Primarily (but not exclusively) client-side technologies
- Voluntary, royalty-free standards
- Seeks interoperability between implementations

## Workshop goal:

- Find existing challenges and common solutions
- Determine which technologies are ready for standardization
- Potentially form working group to set standards

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