



**ORIENTEERING**  
**ONTARIO**

# Map Like a Pro (or not!)

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Matt Barrett and Jeff Teutsch

# Who are we?

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## Matt – the amateur mapper

- Started orienteering in 2019
- Learned how to make (quick and low quality) maps spring/summer 2020 to convince my neighbour to go running together
- Took Jeff's course last year
- Member of Toronto Orienteering Club and Orienteering Ontario Boards



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# Who are we?

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## Jeff – Navigation Sports

- Started orienteering as a kid
- Competed at World Champs and World Unis
- Started mapping, coaching, and organizing events as a volunteer then paid for small jobs
- Started Navigation Sports in Dec 2018
  - High Performance Director for Orienteering Canada
  - Mapper for 2024 North American Orienteering Championships



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# Topics

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## Matt

1. Fast park map creation with [Open Orienteering Map](#)
2. Fast forest map creation with [Ontario – Make a Topographic Map](#)

## Jeff

3. Hiring a mapper, what to expect
4. Custom maps – different levels
5. What goes into making a custom orienteering map



# Fast Maps

## Open Orienteering Map – city park

- Incredibly easy to make a starting map
- Open Street Map as data source
- Trails and terrain in parks are fairly accurate
- Contours are hit-and-miss
- Not editable
- Can also create courses – easily integrated with MapRun



# Fast Maps

## Open Orienteering Map – city park

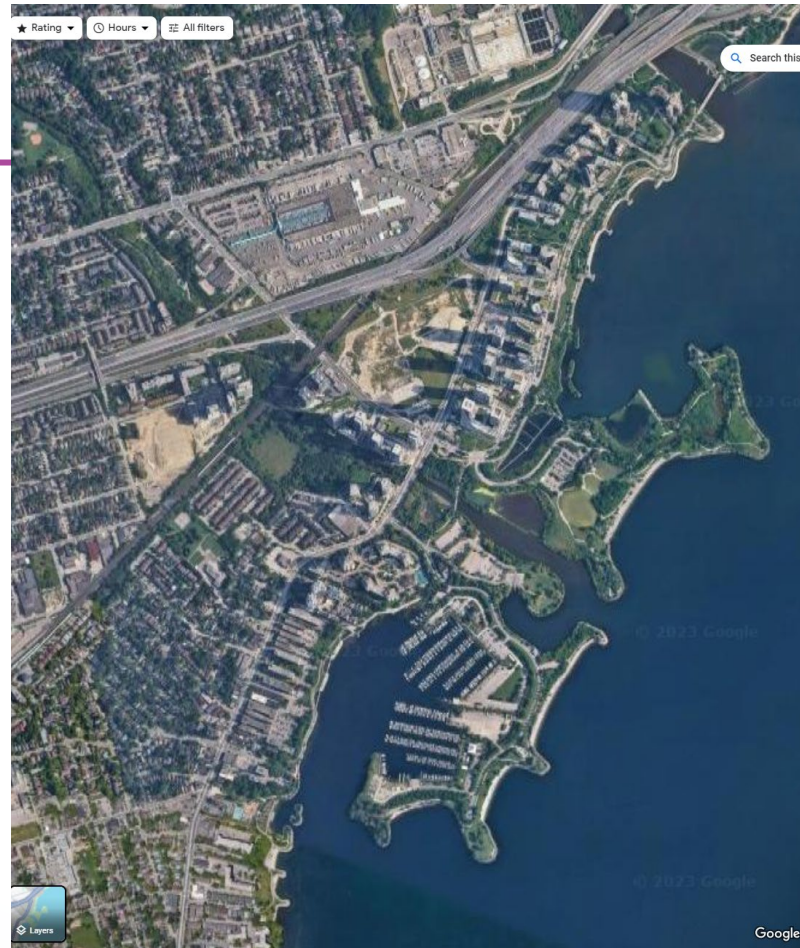
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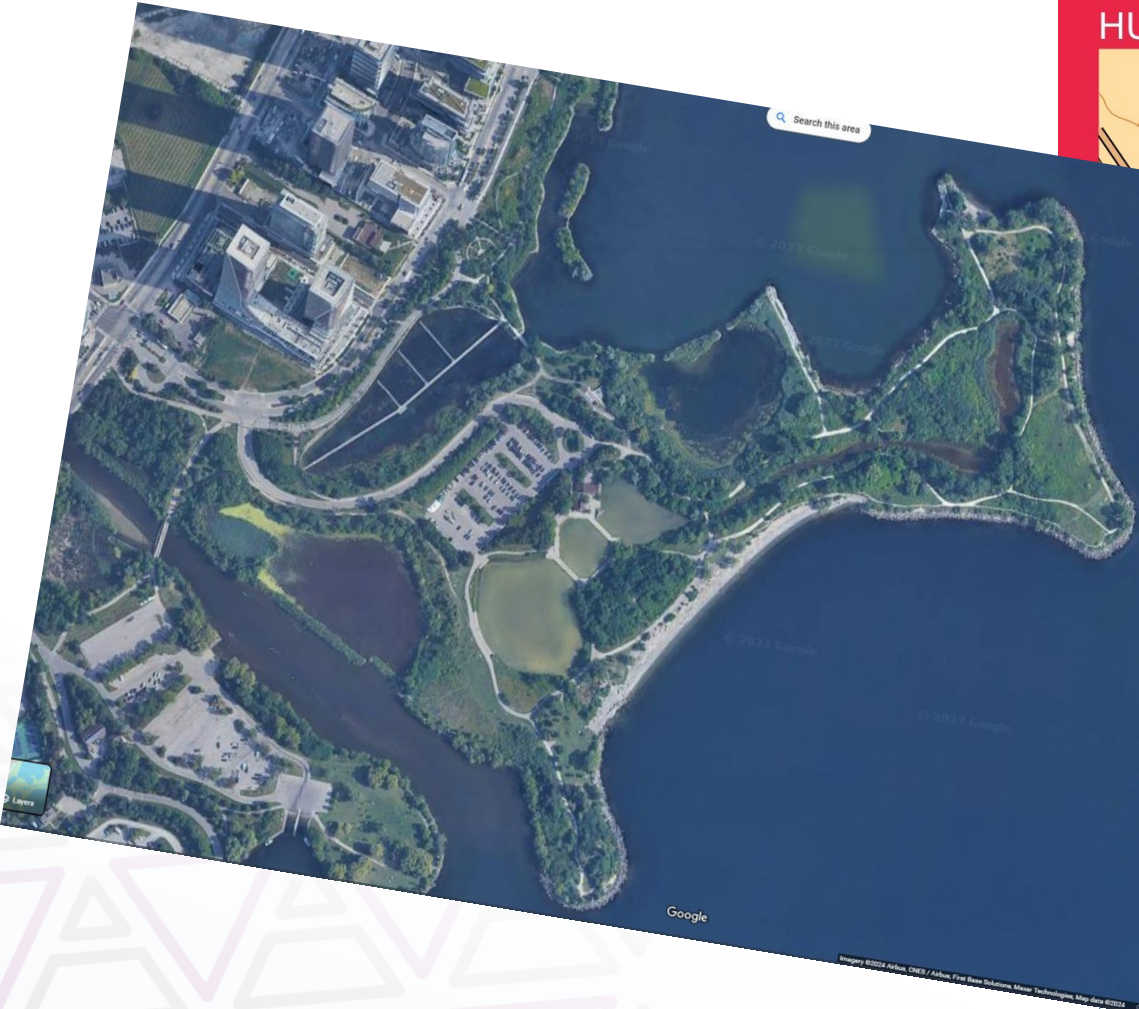
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# HUMBER RIVER

scale 1:5000, contours 5m  
200m



OpenStreetMap contributors; Open Database Licence.  
TM, NASA, gsis, DOI number: 10-50669/FR17171  
by Oliver O'Brien. Make your own: <https://oomap.dna-software.co.uk/>

OOM v4 developed by David Dixon  
Map ID: 659f584f3edae



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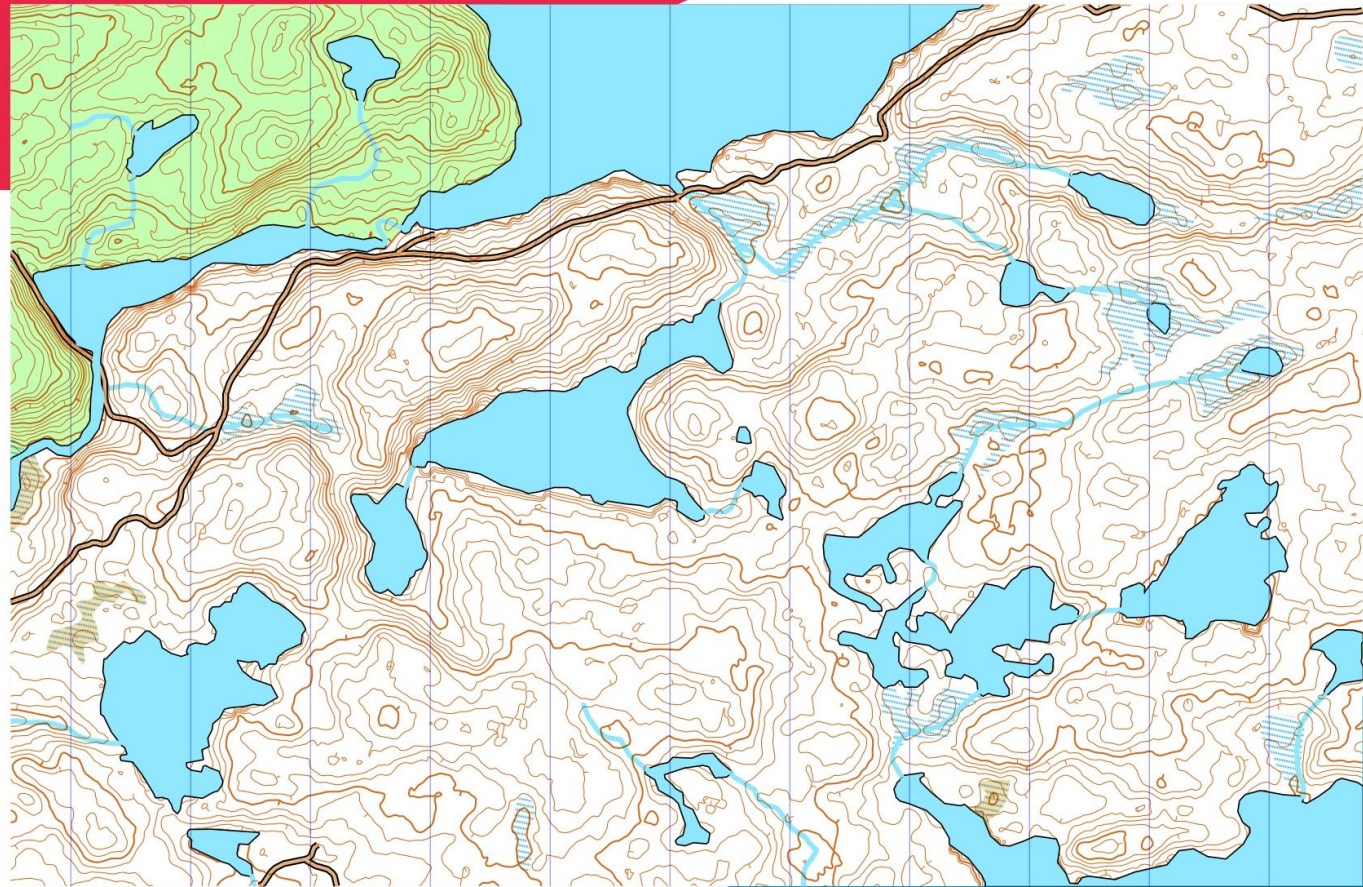
# Fast Maps

## Open Orienteering Map – forest

- Decent
  - Contours
  - Water features
  - Roads
- Missing
  - Trails
  - Vegetation density/runnability
  - Point features (boulders, distinct trees, etc.)

SHABOMEKA LAKE

scale 1:20000, contours 5m  
500m



Map data: © OpenStreetMap contributors, Open Database Licence.  
Contours: SRTM, NASA data, DOI number: /10.5066/7PR71FT  
OOM created by Oliver O'Brien. Make your own: <https://oomap.dna-software.co.uk/>

OOM v4 developed by David Dixon  
Map ID: 659b6aef1f96



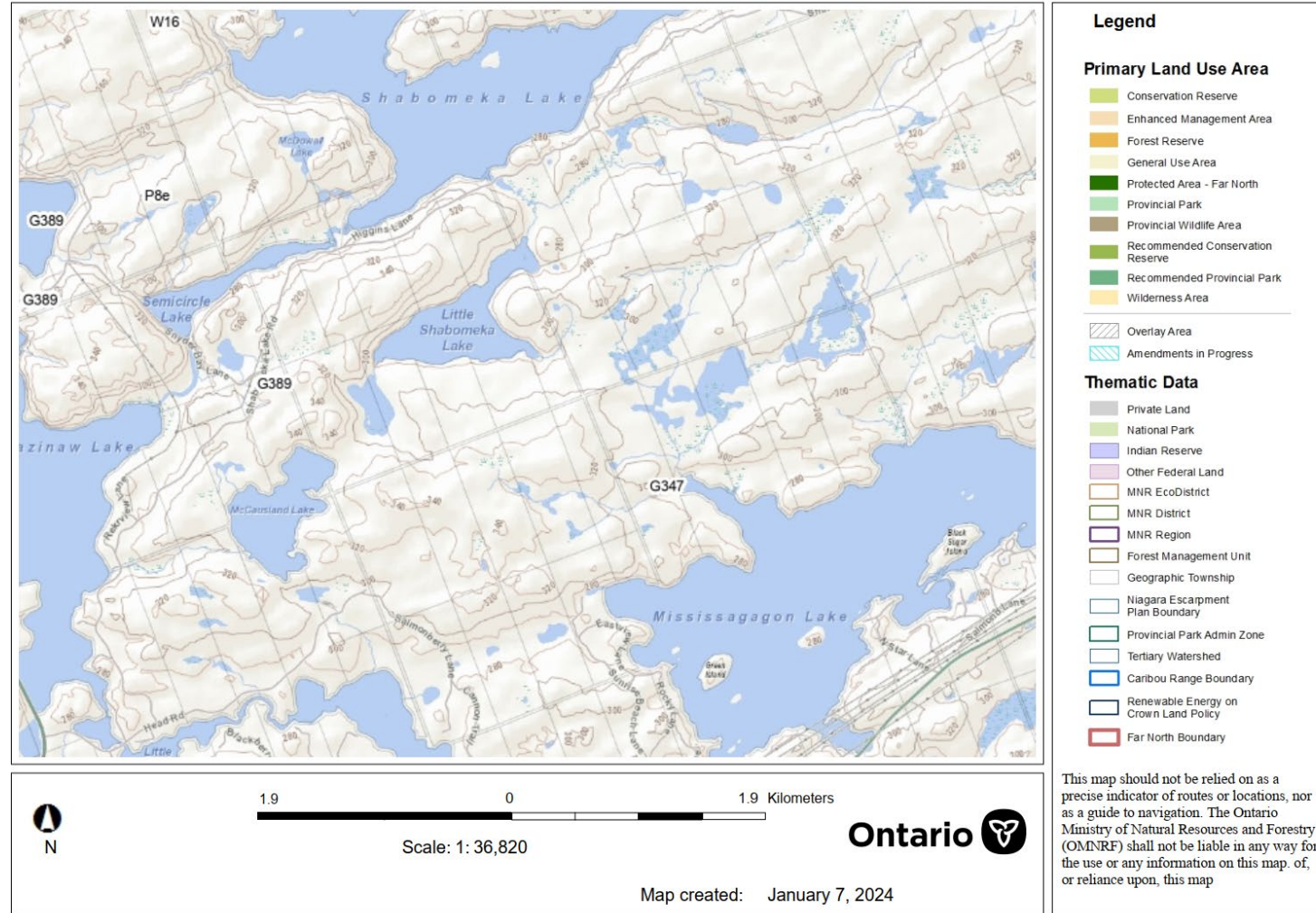
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# Fast Maps

## Ontario – Make a Topographic Map

- Easy to make a quick topographic map
- Elevation and location are labelled
- Can extend to huge area
- Very strange scale options
- No magnetic declination correction
- Combine with Ontario Crown Land Atlas to find private vs public use land

Shabomeka Lake



# Don't forget!

1. Possessing (or creating) a map does not imply permission to access that location
2. Off-trail activity is often a sensitive topic. Be aware of local rules
3. Tell somebody where you're going and when you'll be back

# Costs

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- Up to \$3000+/ $\text{km}^2$  for championship maps
- Large maps can cost \$20,000-\$30,000
- Smaller maps may be more like \$1500-2000

Price is based on:

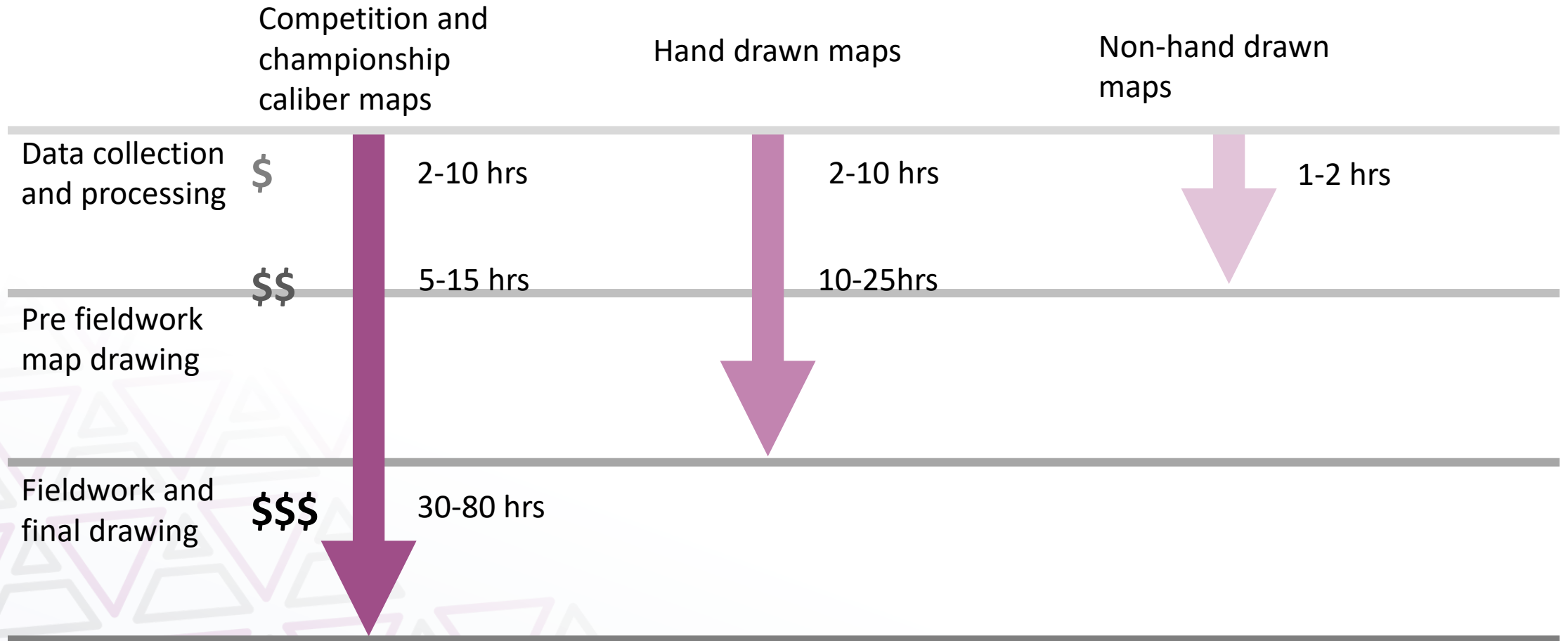
- Size of area
- Complexity of terrain
- Physicality of terrain

# Stages of Mapping

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1. Finding an interesting area
  2. Acquiring permissions
  3. Acquiring base material (data)
  4. Preparing base material
  5. Drawing contours and other info from base material
  6. Fieldwork
  7. Drafting fieldwork
  8. Course setting
  9. Map layout
  10. Printing
- } Data collection and processing
- } Pre fieldwork map drawing
- } Fieldwork and final drawing

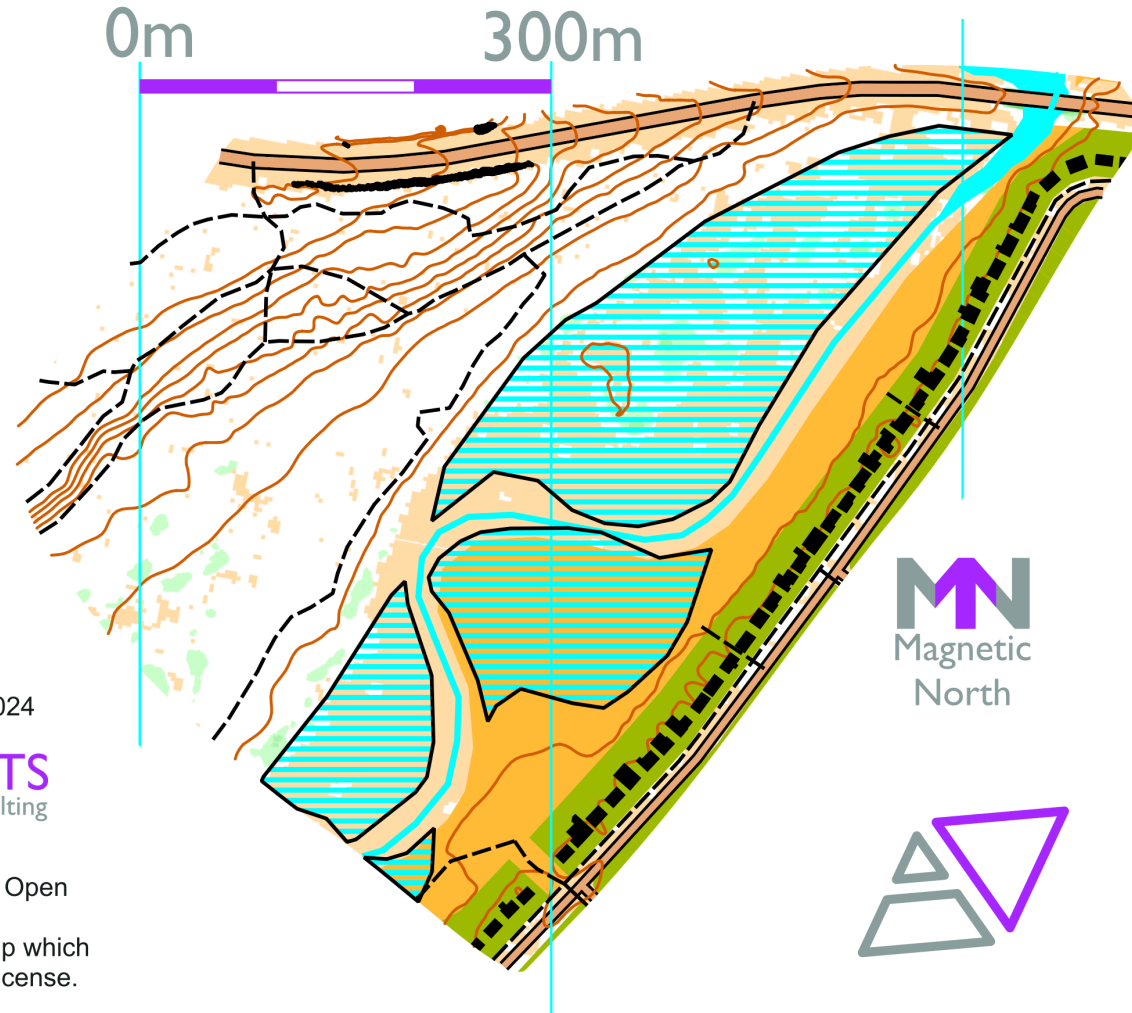
# Stages of Mapping





# Moss Mountain Creek Trails

2.5m contours



Map created by Jeff Teutsch, January 2024

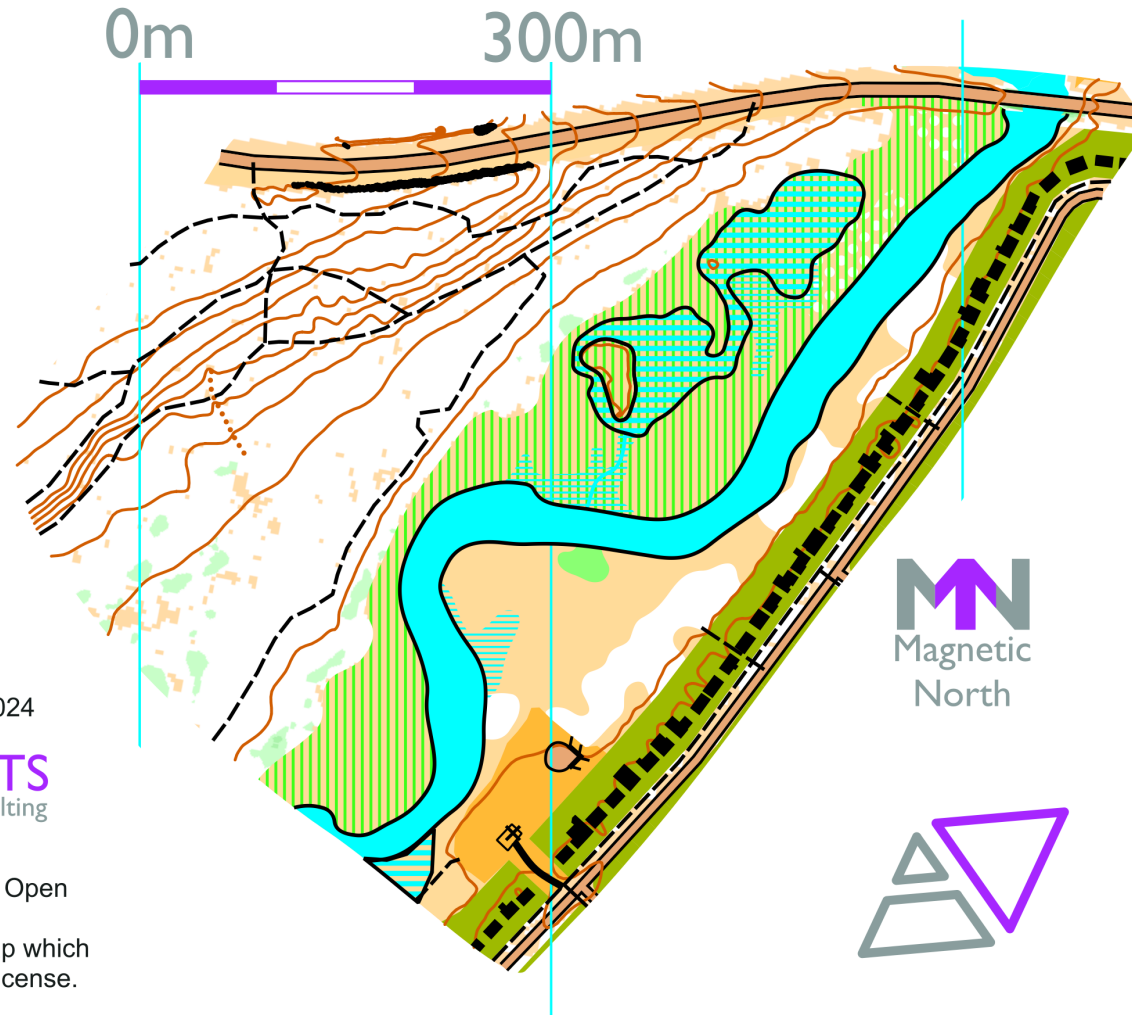
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Coaching | Cartography | Consulting

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Also contains data from Open Street Map which is available under the Open Database License.



# Moss Mountain Creek Trails

2.5m contours



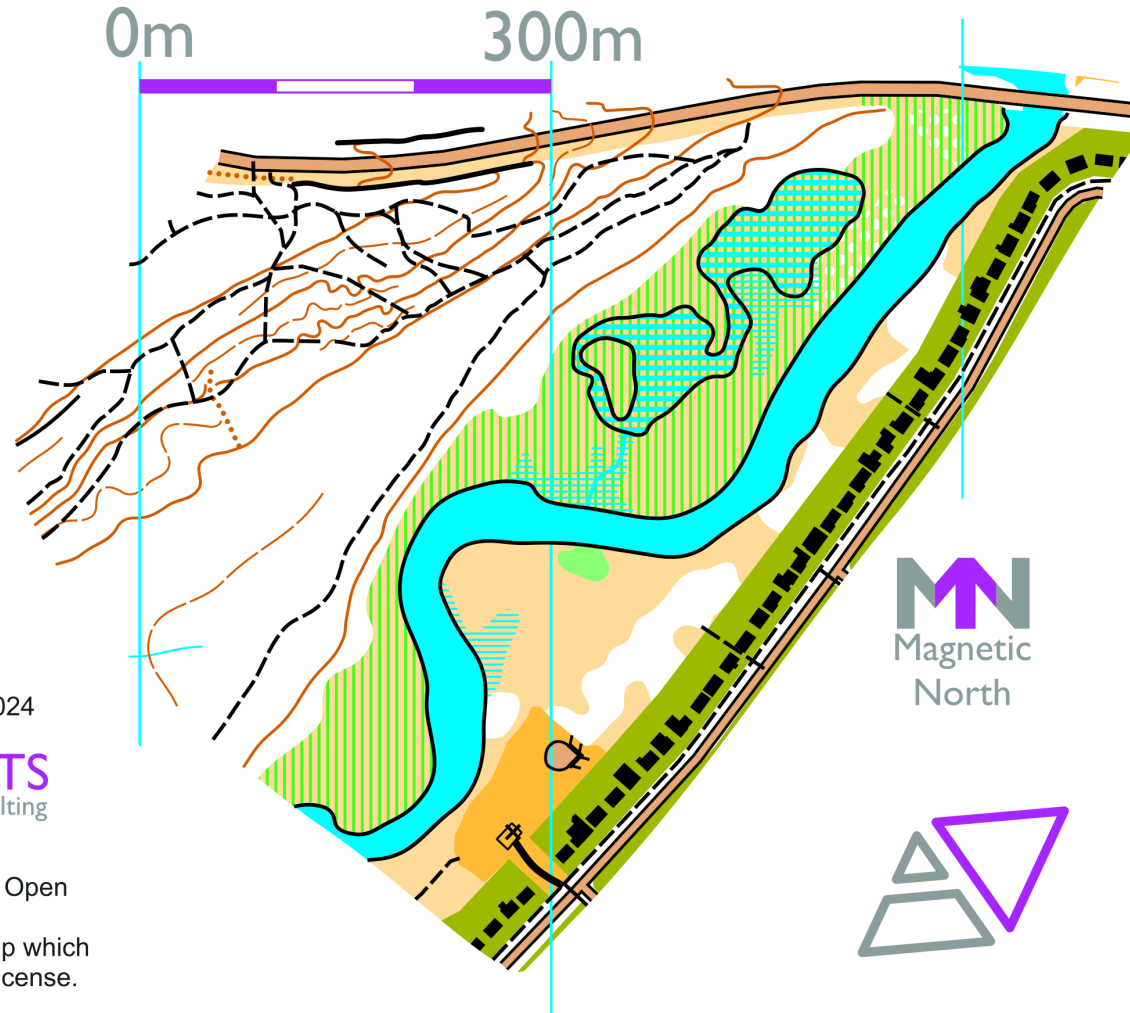
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# Moss Mountain Creek Trails

5m contours



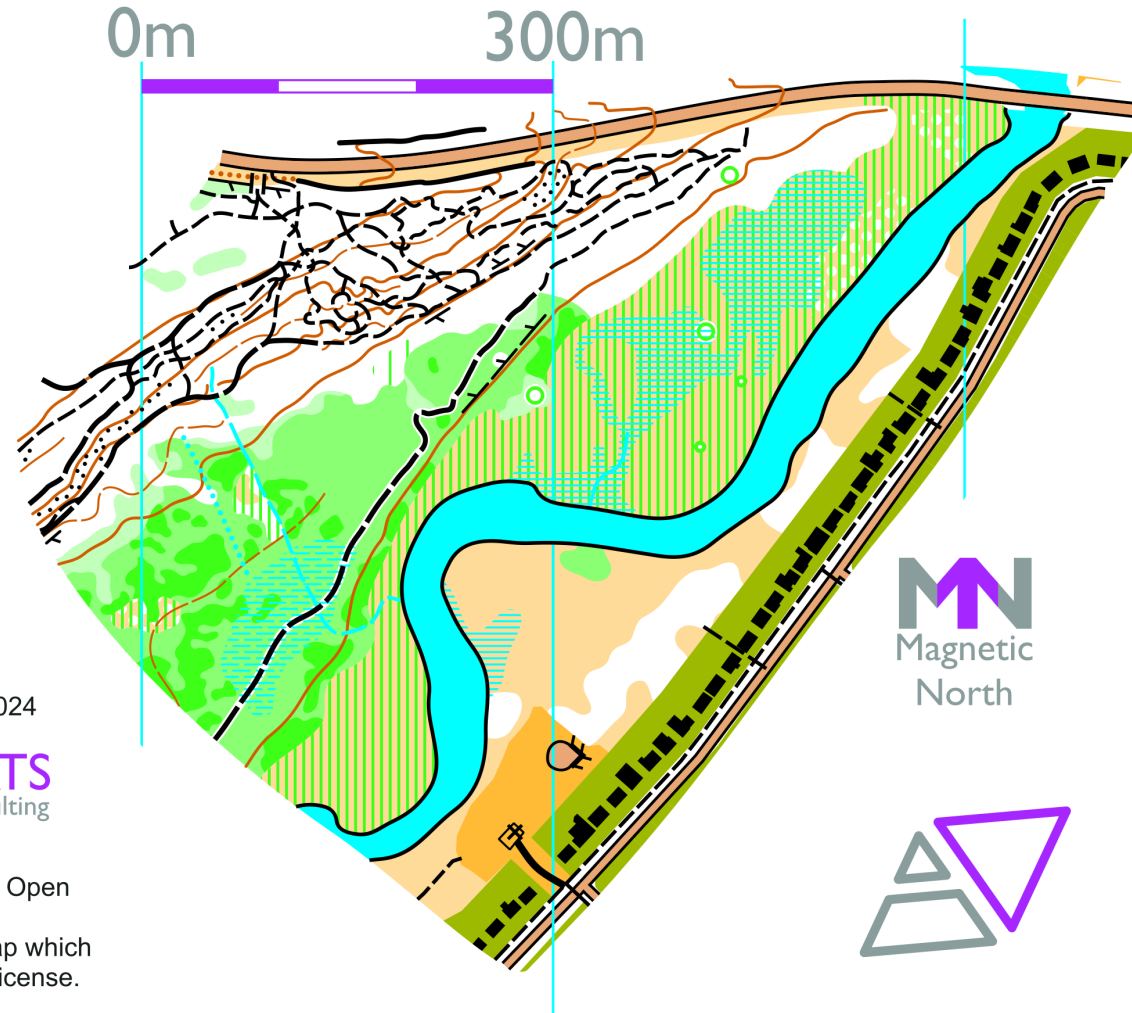
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# Data Collection and Processing

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## Steps

- Finding data
- Processing data
- Collating data

## Knowledge and skills

- Knowing where to look for data
  - Open data
  - Shape files
  - Aerial imagery
- Understanding georeferencing, declination, etc.
- Experience with tools to process and collate data
  - OCAD, OOM, QGIS

# Pre-fieldwork Map Drawing

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## Steps

- Draw major features from lidar and aerial imagery
- Draw contours from lidar
- Draw other details from lidar

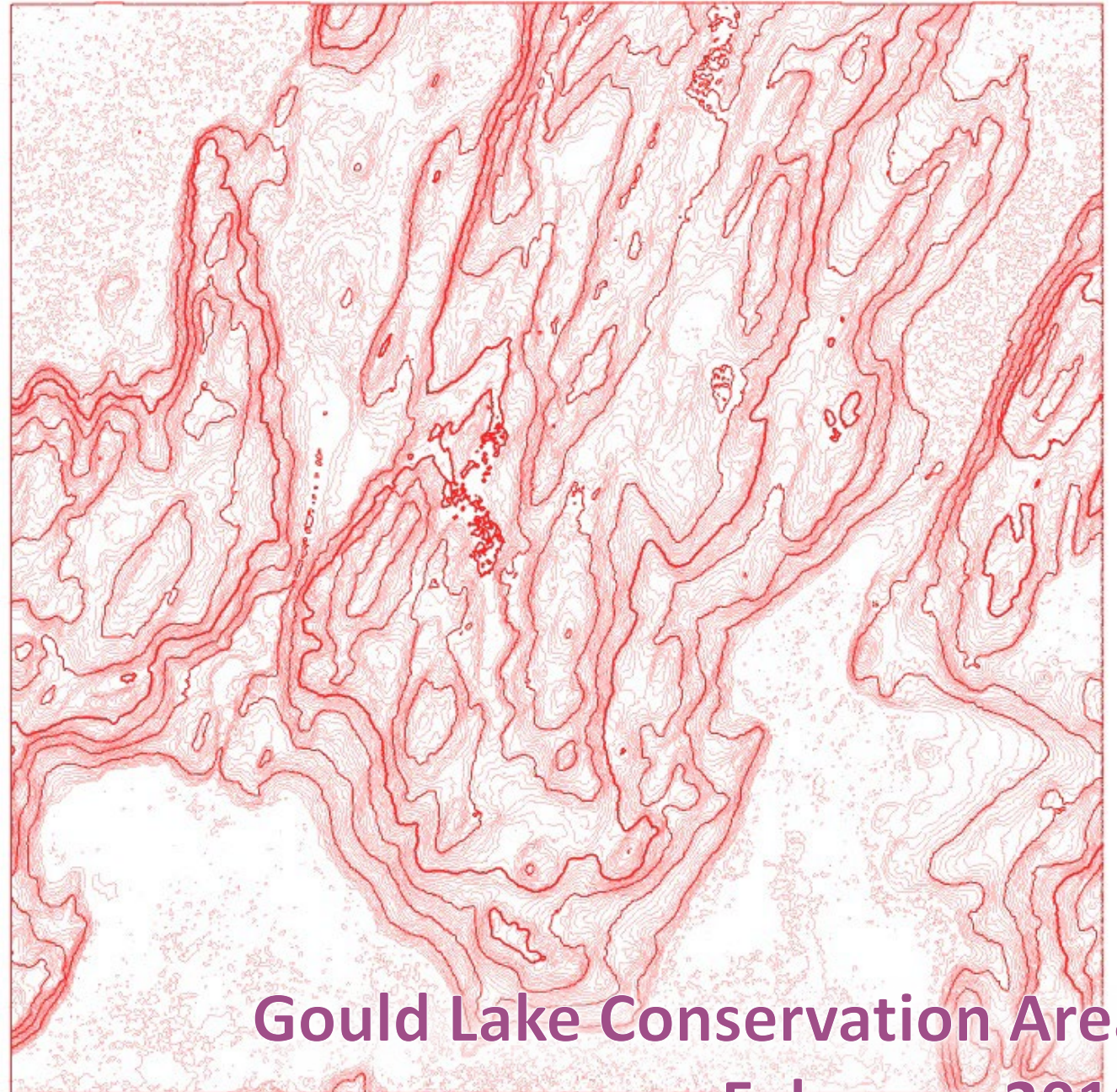
## Knowledge and skills

- Interpreting lidar data
  - Experience with hill shades, slope gradients, intensity images
- Experience drawing
  - Drawing with Bezier curves
  - Using mapping software
- Knowledge of IOF specifications

# Lidar generated contours

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- Custom interval
- Different smoothing options
- Positive and negative contours

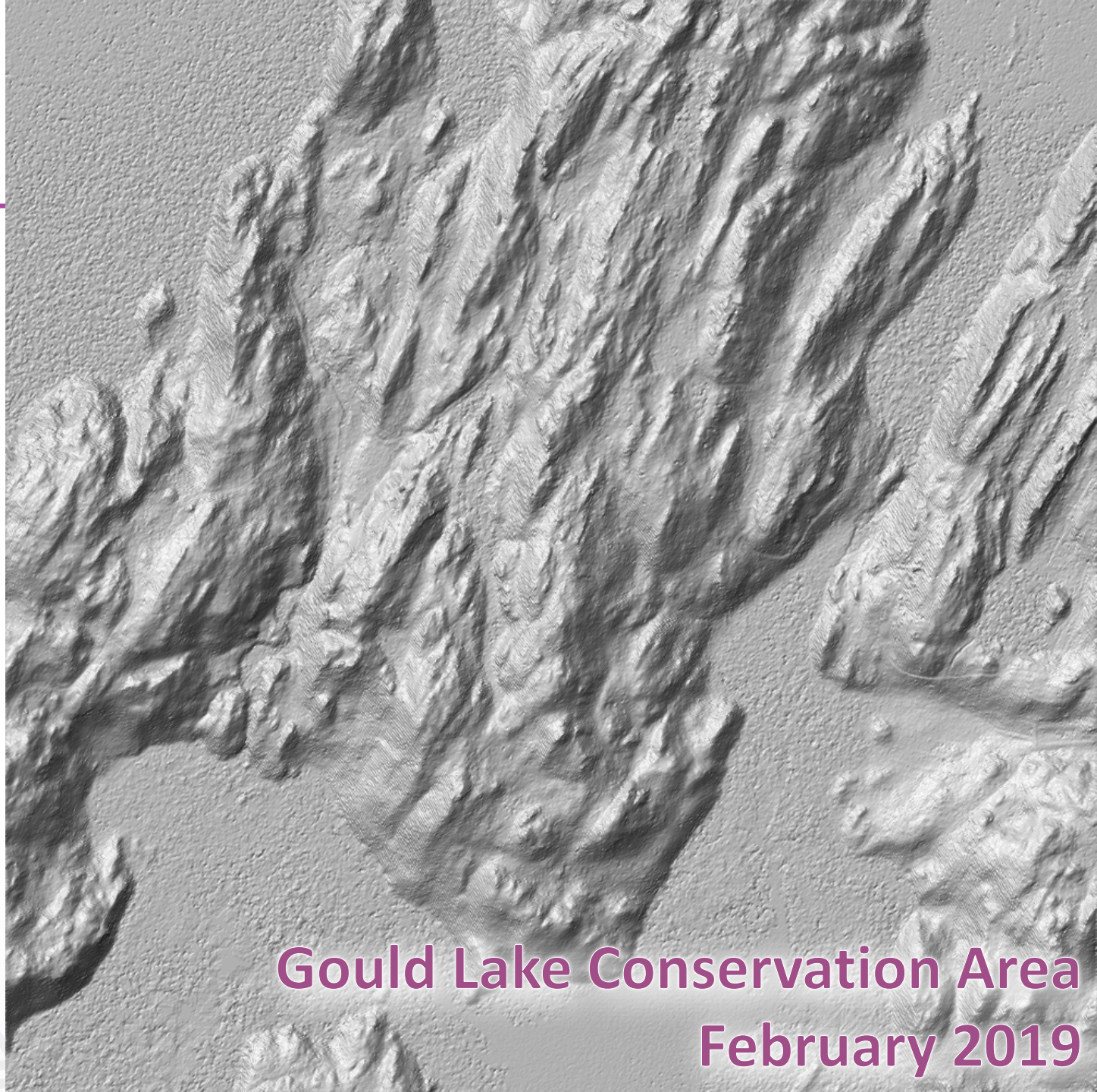


**Gould Lake Conservation Area**  
**February 2019**

# Hill Shade

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- Knolls
- Pits
- Streams
- Trails
  
- Helps with generated contours

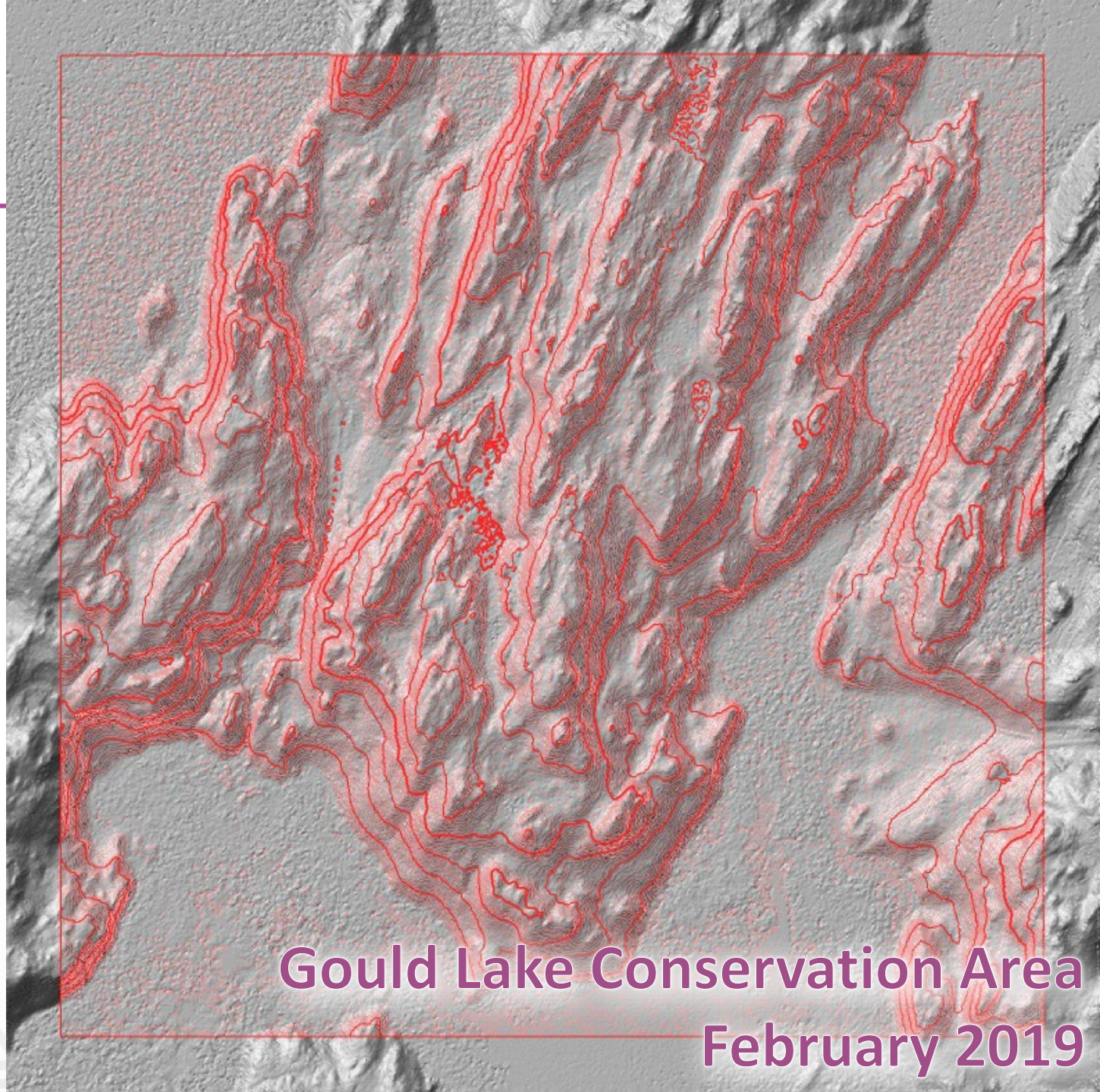


Gould Lake Conservation Area  
February 2019

# Hill Shade + Contours

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- Use for drawing contours

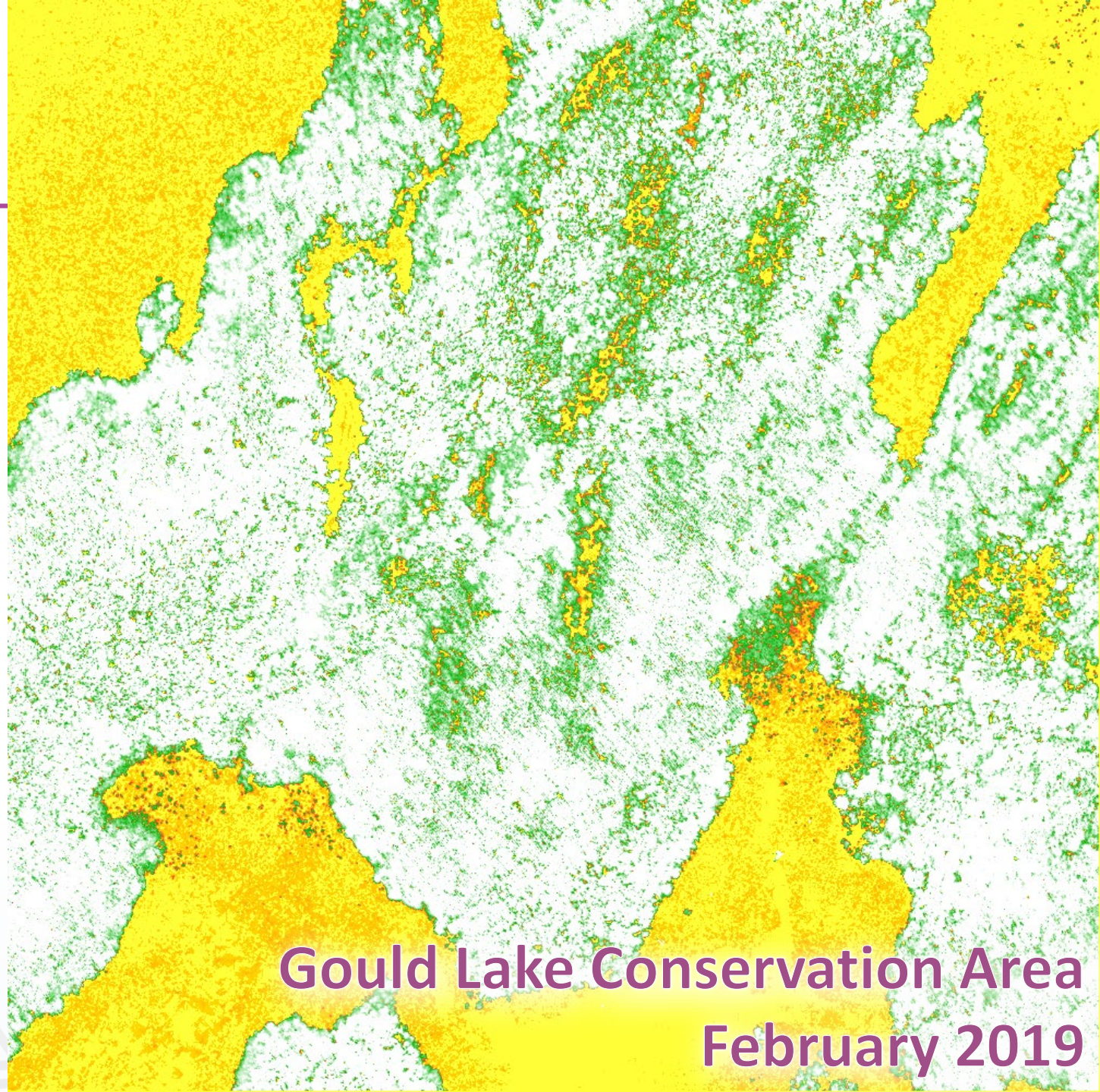


Gould Lake Conservation Area  
February 2019



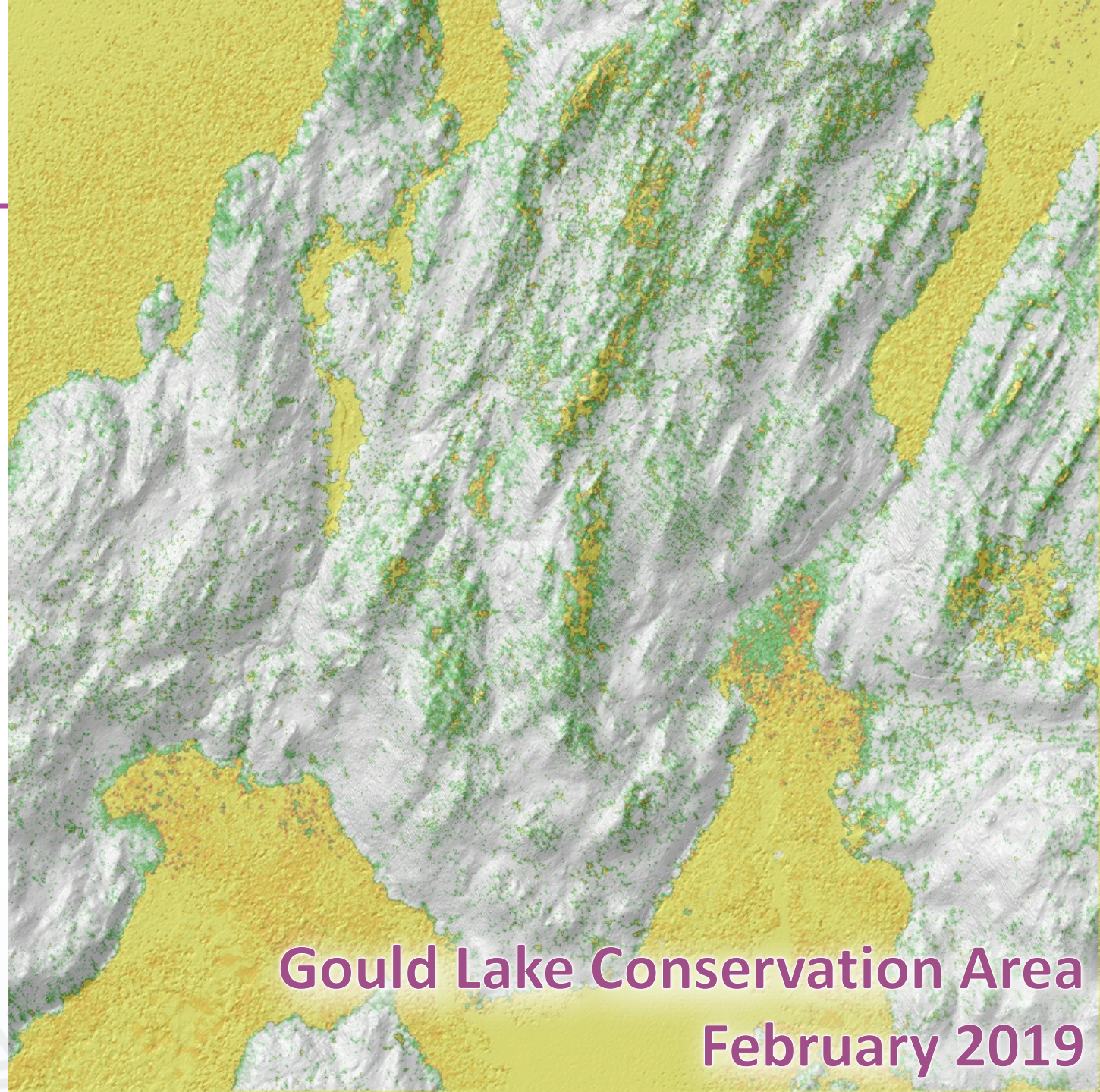
# Vegetation Height

- Clearings
- Marshes
- Rough open / Juniper bushes
- Lone trees
  
- Vegetation density boundaries (in some terrain)



# Combined Hill Shade + Veg Height

- Good for general field work especially when combined with generated contours

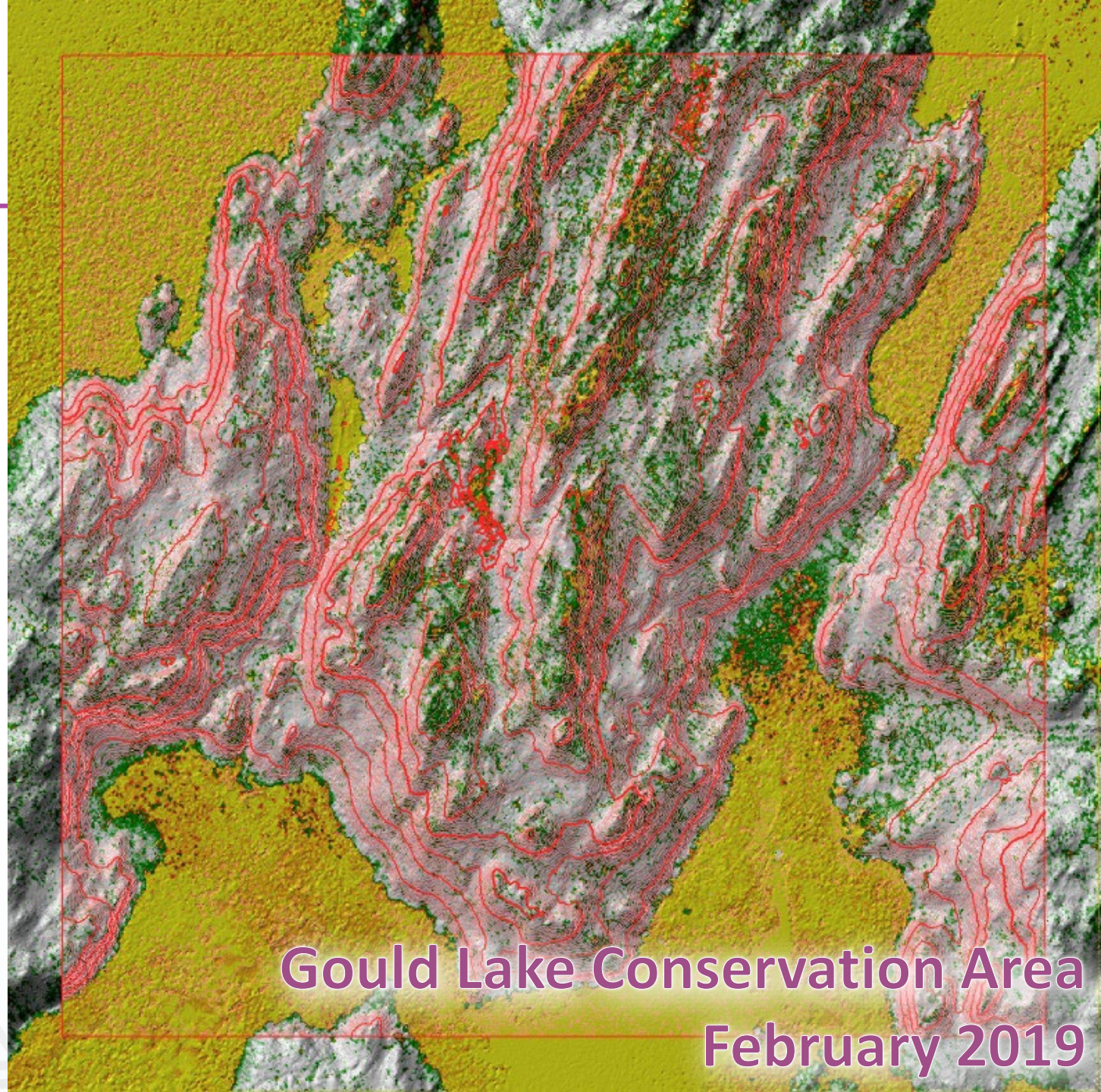


Gould Lake Conservation Area  
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# Combined Contours, Hill Shade + Veg Height

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- Good for general field work especially when combined with generated contours

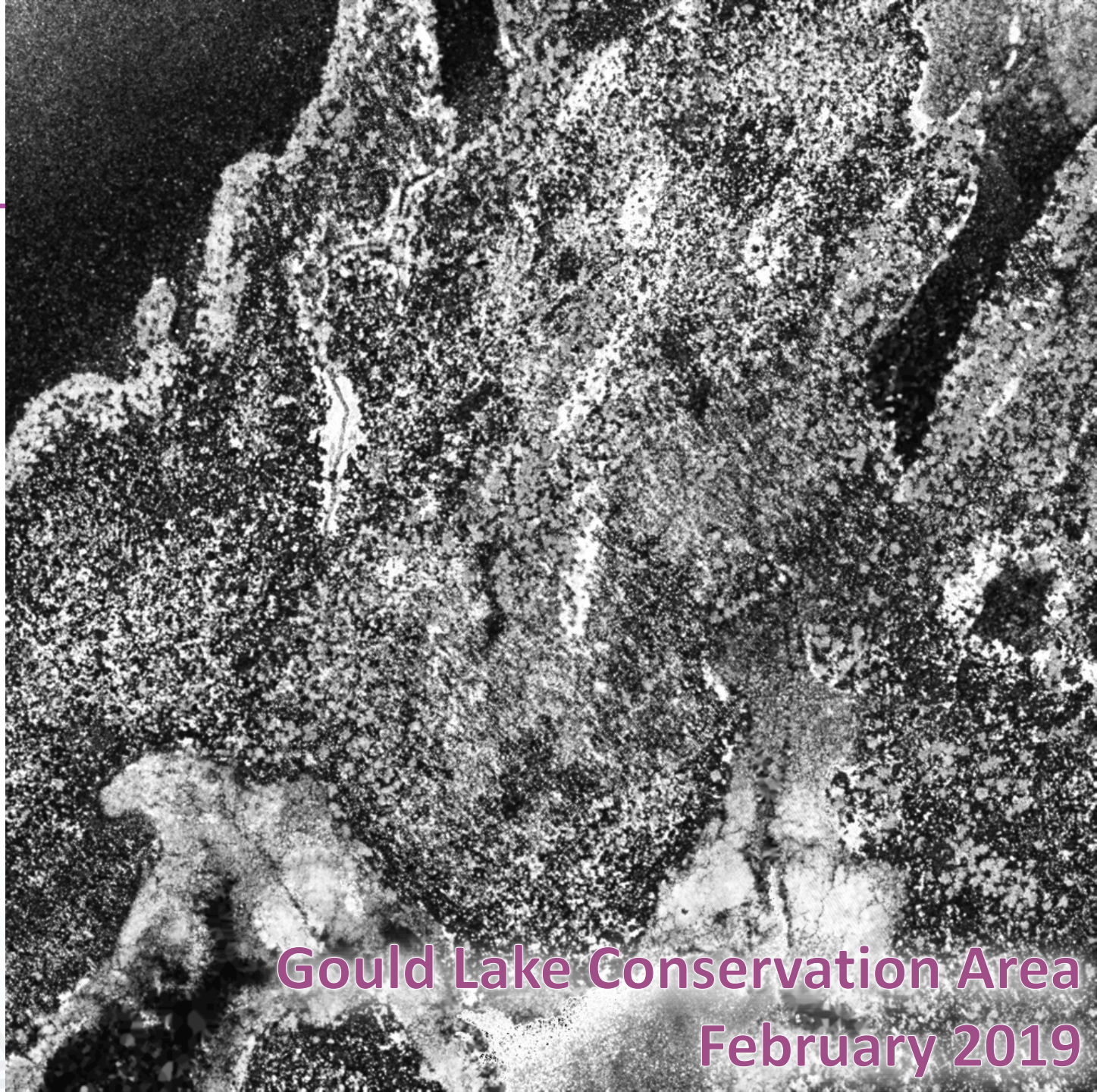


Gould Lake Conservation Area  
February 2019

# Intensity

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- Open water (vs marsh)
- Pavement
- Buildings
- Really useful in urban areas



Gould Lake Conservation Area  
February 2019

# Fieldwork and Final Drawing

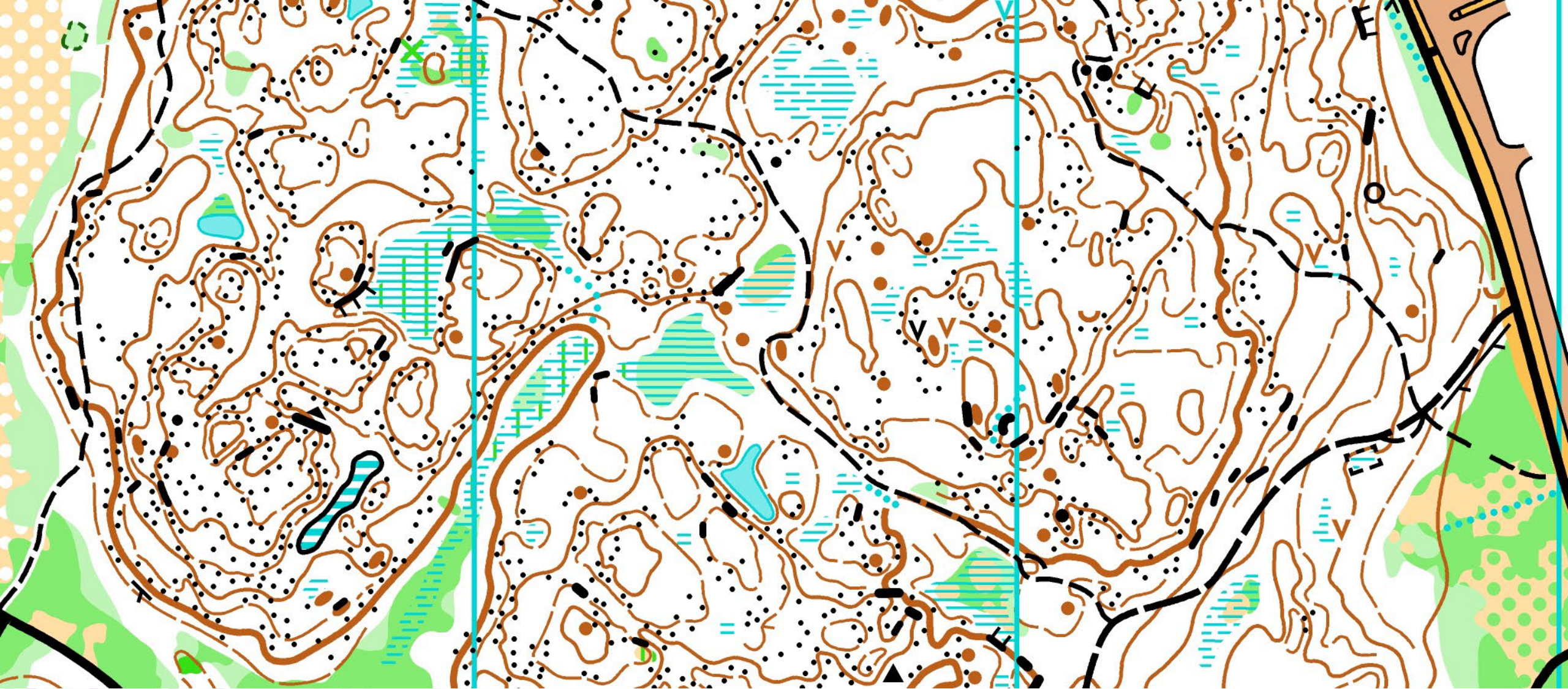
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## Steps

- Field survey
- Field drawing
- Editing
- Resurveying as needed
- Final drawing/drafting

## Knowledge and skills

- Knowledge of IOF specifications
  - Basic symbol definitions
  - Minimum symbol sizes
  - Minimum gaps
- Experience with field survey
- Experience drawing
  - Prominence and prioritization



# Cité des Jeunes – version I



## Cité des Jeunes – final version

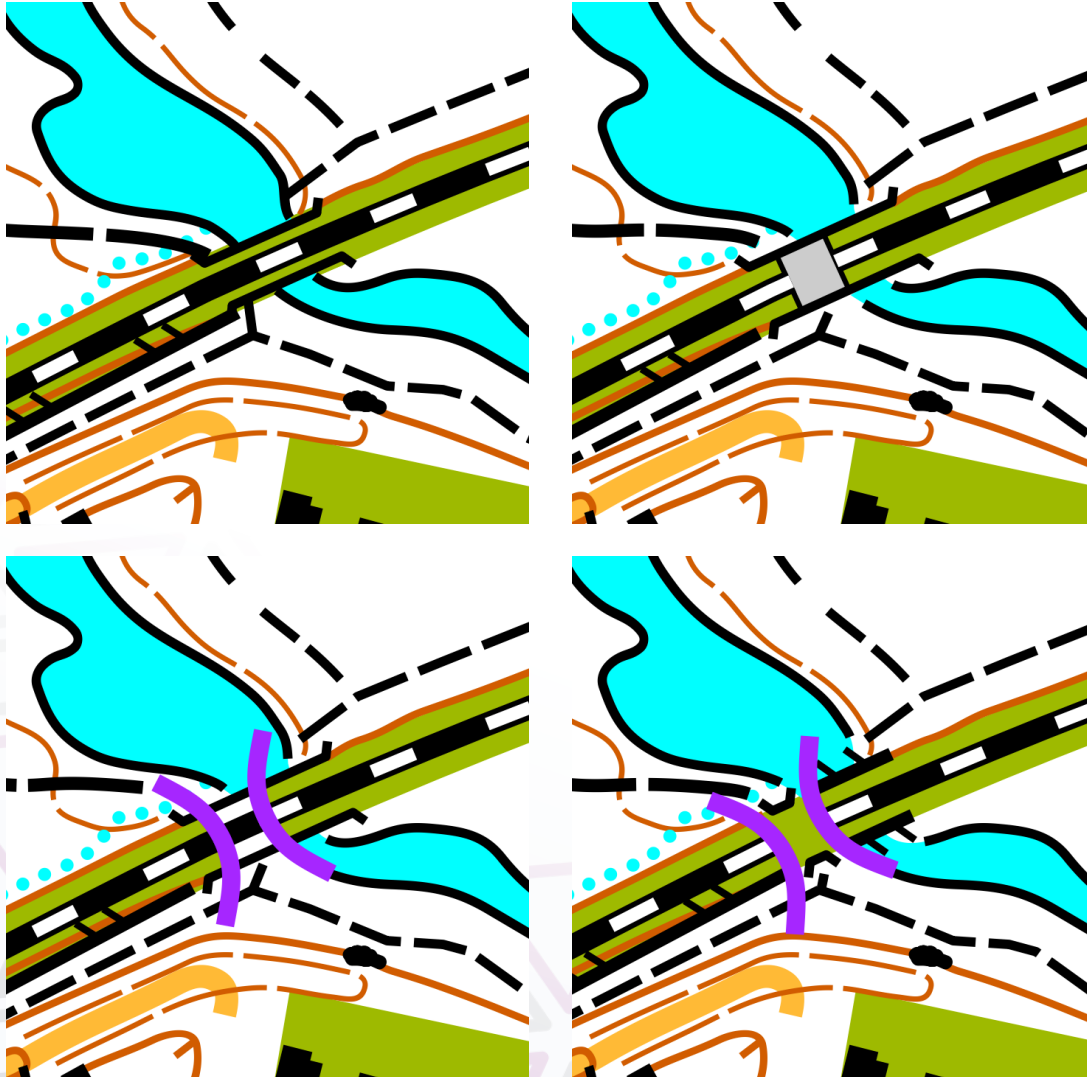


Cité des Jeunes – overlay image



# Careful drafting

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# Mapping Resources

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[Open Orienteering Map](#)

[Ontario – Make a Topographic Map](#)

[MapRun](#)

[Open Orienteering Mapper](#)

[OCAD](#)

[Ontario Lidar](#)

[Karttapullautin](#)

[Navigation Sports \(professional mapping\)](#)

[Gord Hunter's map making guides](#)

[IOF Mapping Specifications](#)

[Orienteering Ontario Maps](#)

[Orienteering Mappers Int. - Facebook](#)

# Upcoming Courses

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- Jan 24 – Starting a map project
- Jan 31 – Using Open Orienteering Mapper
- Feb 7 – Laying Out Your Map
  
- Feb 21, 28 – Intro to Lidar
- March 6, 13, 20, 27 – Contour Drawing

[navigationssports.ca/Courses](https://www.navigationssports.ca/Courses)

# Upcoming Events

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Jan 21 – Dontgetlost South Georgian Bay | The Blue Mountains | [Loree Forest Snowshoe Scramble](#)

Jan 28 – Orienteering Ottawa | Nakkertok Ski QC | [Ski-O Nakkertok](#)

Feb 3 – Don't Get Lost | Oro-Medonte ON | [Snowshoe Raid Adventure Run](#)

Feb 25 – Stars | Wasaga Beach ON | [Stars W.A.R. \(Winter Adventure Race\)](#)

Mar 10 – UKR/TOC | TBA | 2024 UKR O-Cup

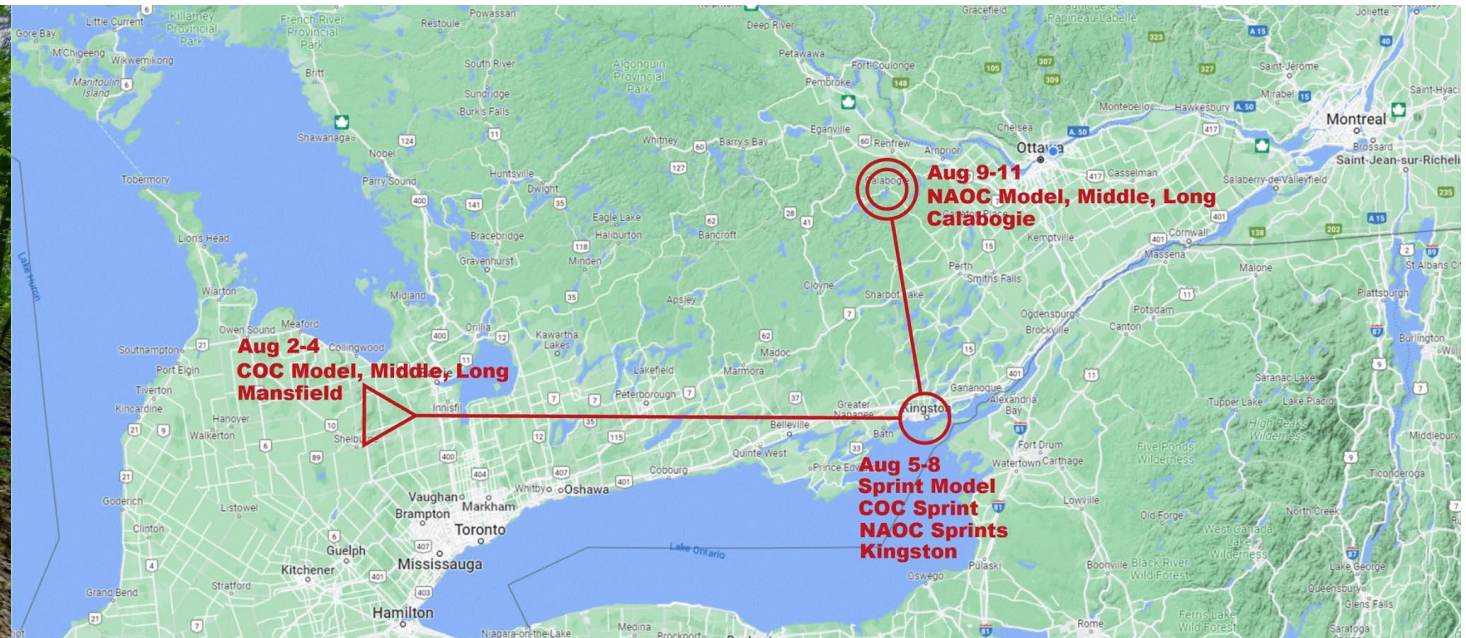
# Upcoming Events

Canadian Orienteering Championships  
North American Orienteering Championships  
COCNAOC2024.ca | August 2-11, 2024



**Registration is Open!**

- Full Festival Packages
- NAOC/COC Race Packages
- Single Race Sign Up
- SportIDEN Chip Rentals
- Souvenir Shirts
- Festival Banquet
- Training/Model Maps
- Camping Accommodations



# Questions