# iPhone 3D modelling process & experiences

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Nordic Workshop 3D Cave Modelling

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# Background

- I had some background in surveying with DistoX, survex, etc.
- But no experience on 3D printing, modelling, lidar, et
- Earlier this year I was able to get one of the newest ip
- Trying to use it in caves seemed like a fun thing to try
- 7 months later even more excited about possibilities
- But I also realize we have some ways to go
- And how there are many topics

# Process

- Scanning a cave – practicalities, apps, tooling
- Exporting the results
- Post-processing – corrections, merging, image generation
- Sharing results – web viewers, cave db integration
- Going beyond 3D – map and slice generation

# Scanning

- I almost always have to break caves to parts to make sure iPhone or software doesn't crash or reach a limit
  - 50 meters or so

- I have only used Polycam app

(with mixed experiences)

- Lesson learned from Þórir:

Using a selfie-stick

(Ram Mounts X-Grip +

Benro MMA28C monopod)

# Exporting the results

- On the Polycam app, one has to do the initial processing in the phone

- This is tricky and buggy process, currently -- fails for large models
  - Including causing texture data loss!

- Polycam offers some options, use either default "space" or adjust yourself to reduce detail level

- Plenty of export options (all require paid version): mesh,  point cloud,  …
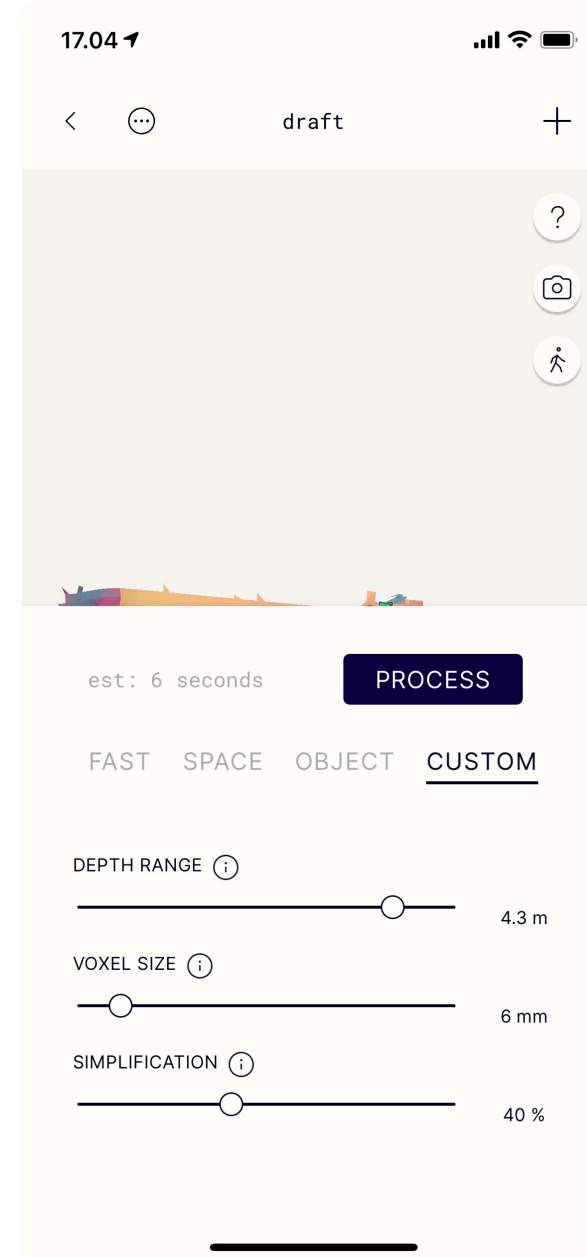
# Post-processing

- Seems always necessary for my scans!
- I've used Blender – open source, very powerful + <u>big learning curve</u>
- Merging – bring parts to Blender, <u>align</u>, adjust/remove extra
- Corrections – removing outside the cave parts, fixes
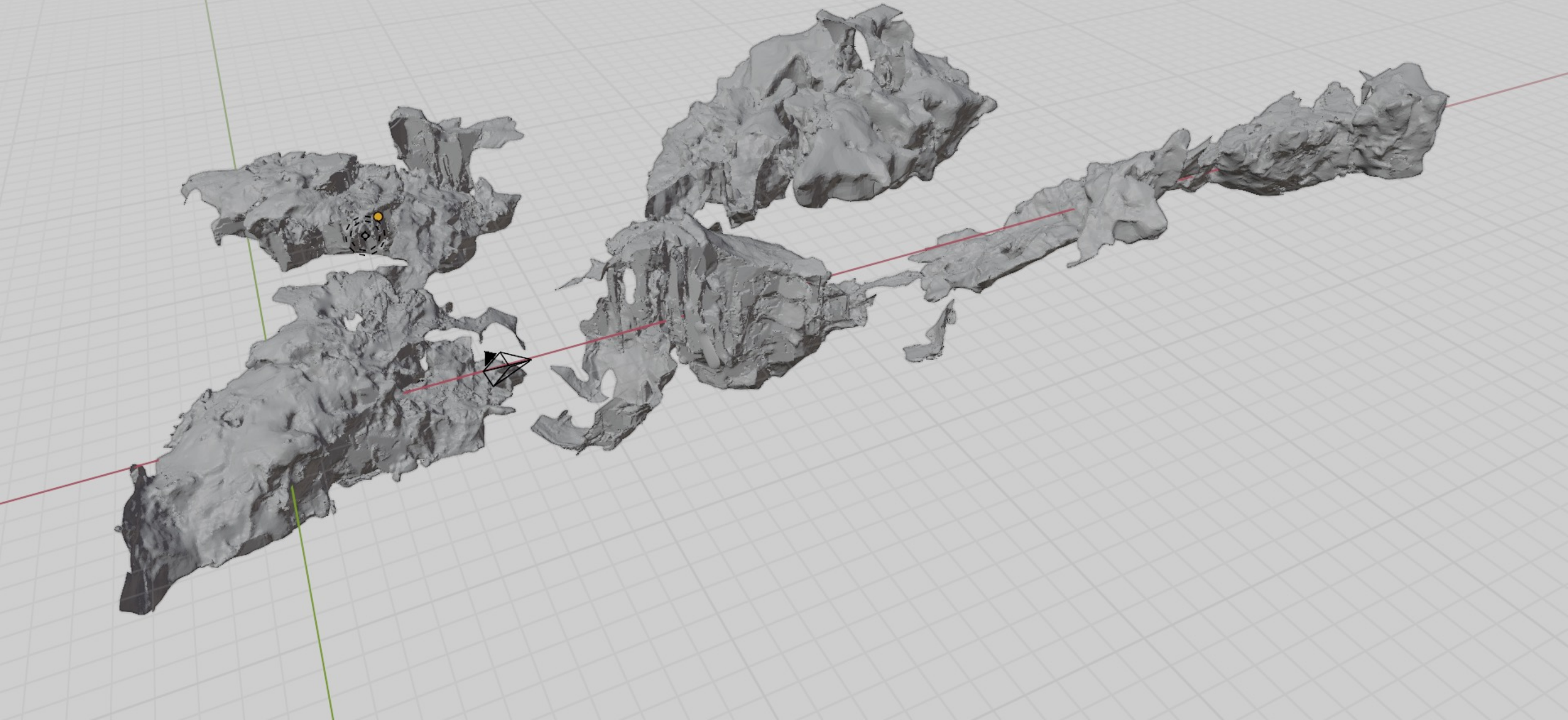- Images and movie generation

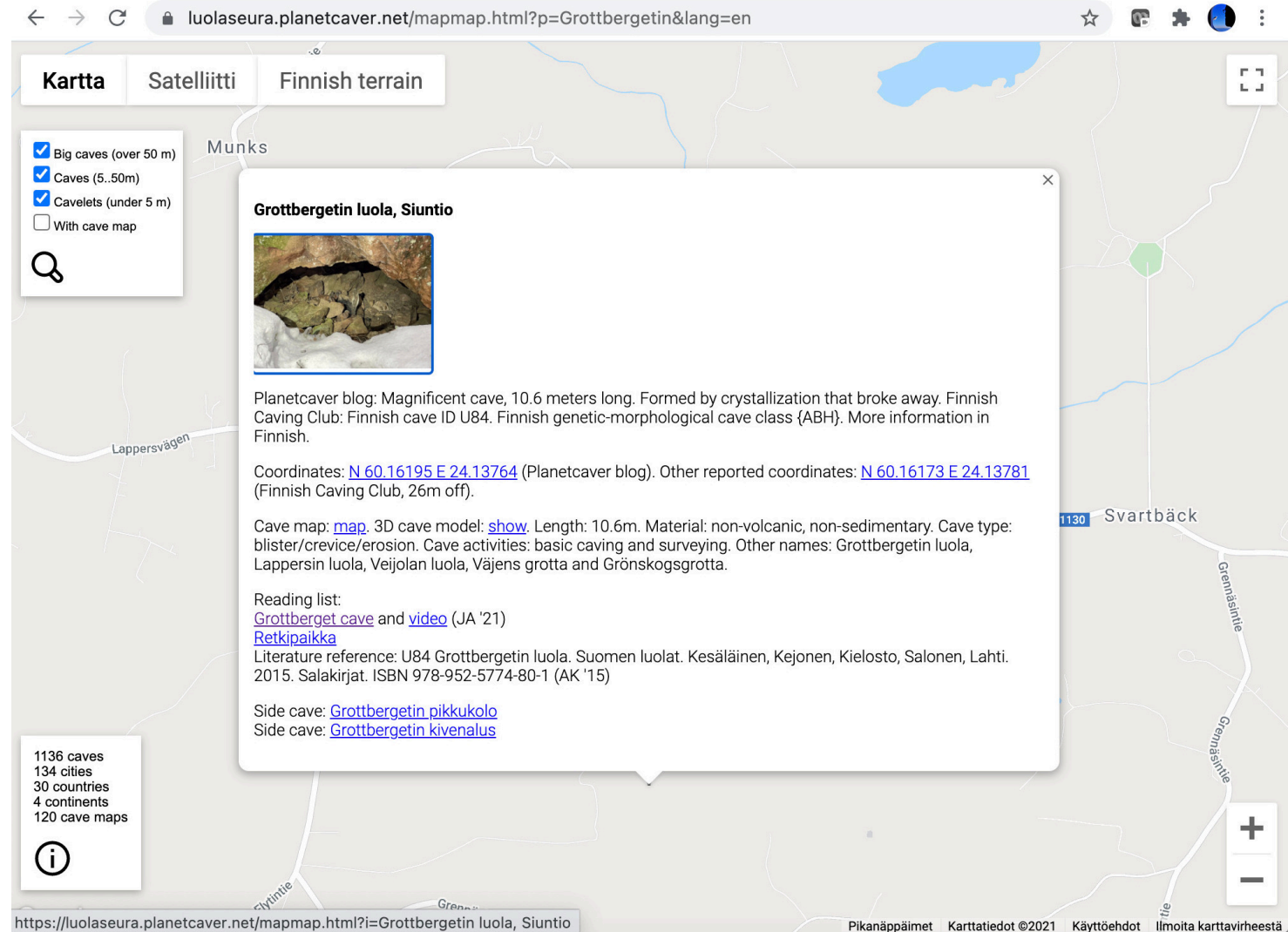# Torhola, Lohja, Finland
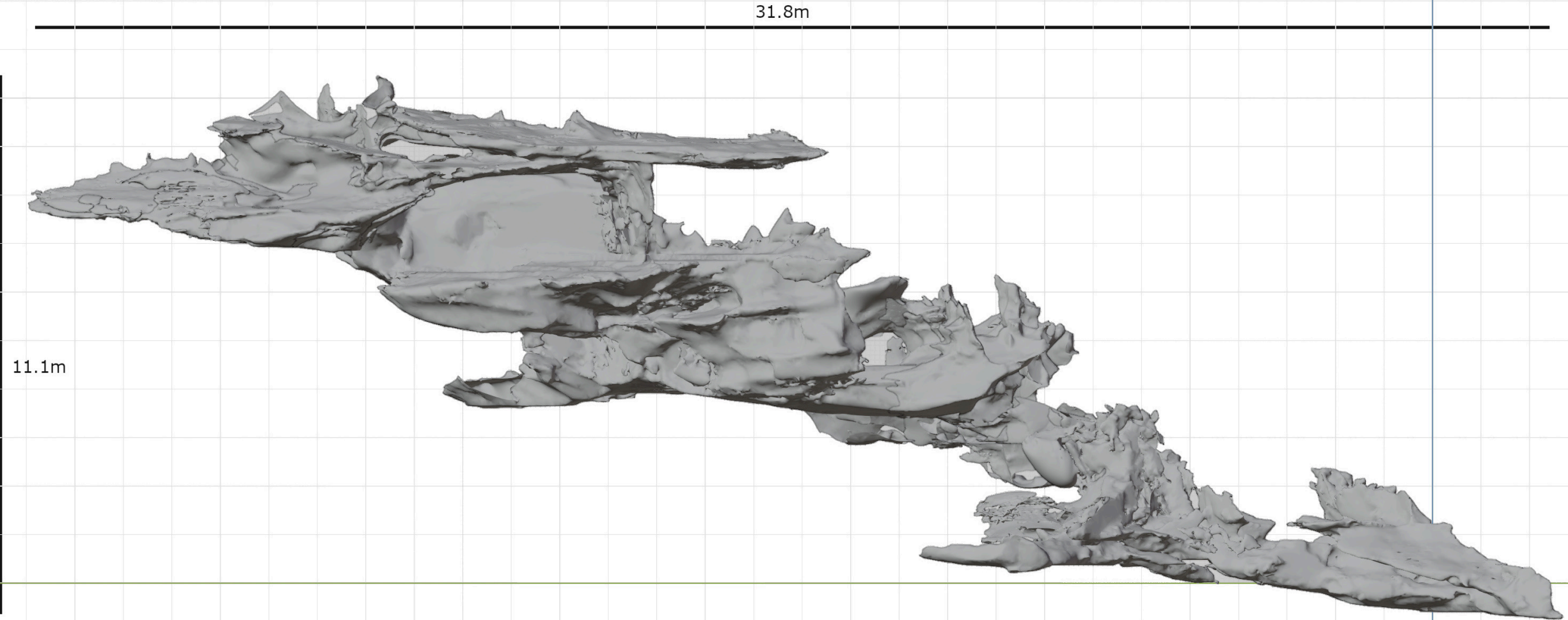
Lummelunda, Sweden
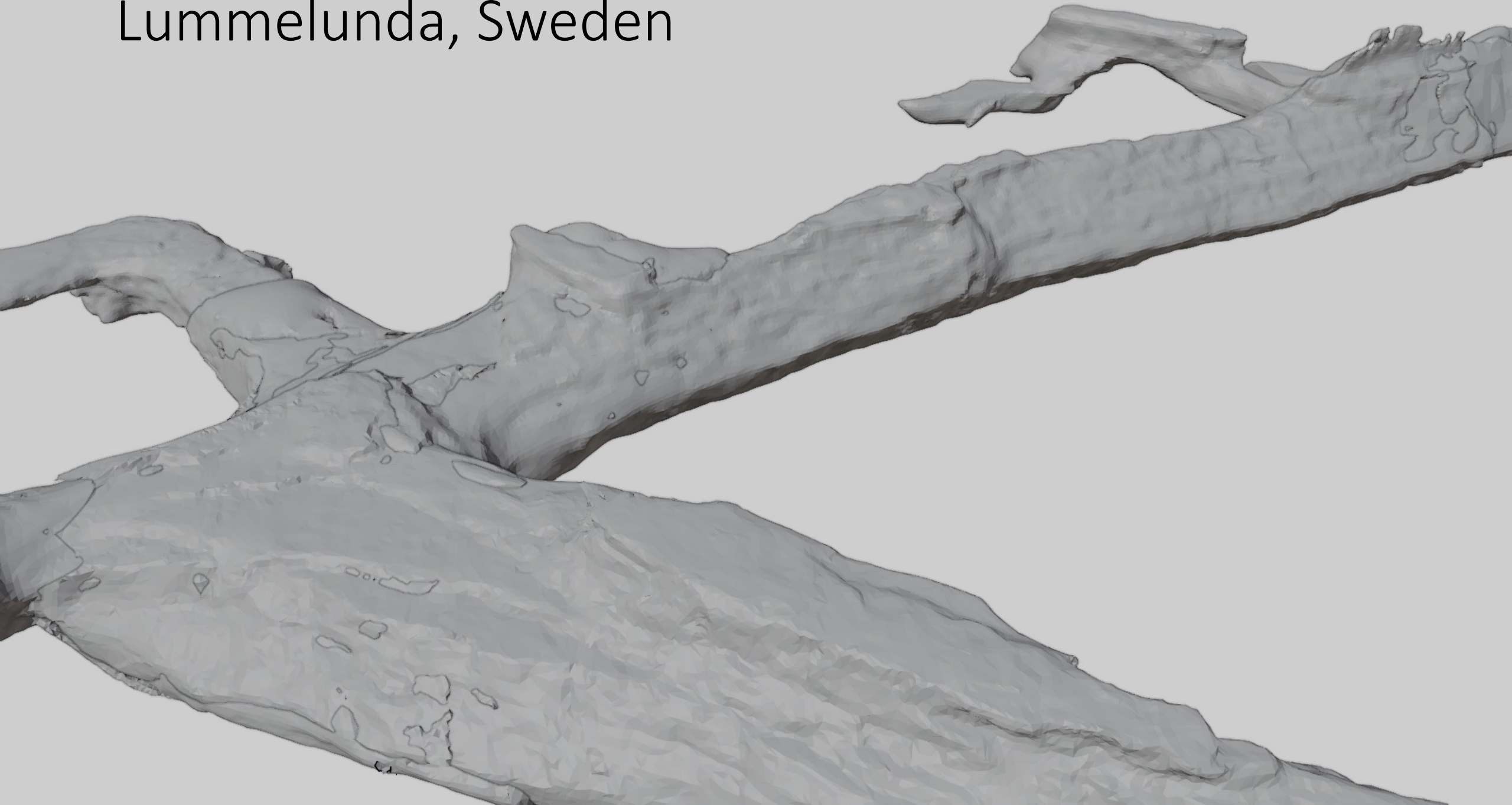
Lummelunda, Sweden

Kraljičina spilja (Queen's Cave), Croatia

# Sharing results

- We've experimented with one web viewer.
(https://model-viewer.dev)

- We've also implemented integration to our cave database front end user interface
(https://luolaseura.fi/luolakanta/kartta.html?lang=en)

- Jari's all cave models are also openly available at
https://planetcaver.net/modellist.html

# Going beyond 3D

- I thought that we'd be done once there's a model
- But… models are not easy to deal with in all situations
  - For many situations I'd prefer a simpler plan view
  - I thought I can just do intersection in my 3D tools… not so
- Wrote software to take slices or plan views of 3D models
  - https://github.com/jariarkko/cave-outliner (under construction)