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University of Stavanger

QGIS in Continuing Education

QGIS User Meeting, Trondheim, October 26, 2023

WHAT IS CONTINUING EDUCATION?

University obligation to provide courses for society that are relevant

Especially aimed at working life and increasing competence

May be offered online, physically, or a combination

Courses are outside normal university programs – fee-based courses

BEGINNINGS

Pandemic effects

Special need to offer courses for (re)education

NAV had an incentive program for recipients to take courses

WHY GIS?

Need for a course to exist for professionals

Personal willingness and interest

Expertise

WHY QGIS?

- Freely available
- Open source
- Compatible with OS, PC, Linux
- No license issues
- Certification possibilities

QGIS CERTIFICATION PROCESS

Certificate of Completion

University of Stavanger

[redacted]

Has attended and completed the course:

E-GEO260 Introduction to Geographic Information Systems

With a trained competence in:

Fundamentals of GIS using QGIS

From 7 March 2022 to 15 June 2022 (300 hours of instruction)

Convened by Associate Professor Lisa Watson, PhD at UiS Etter- og videreutdanning

Marco Bernasocchi
Project Representative

Associate Professor Lisa Watson, PhD
Course Convener

ID: [redacted]

You can verify this certificate by visiting http://[redacted]

After creating the course, applied for certification

Timely process – all course materials are reviewed by QGIS

Each successful participant receives a certificate of completion registered with QGIS

Organization	Creation Date	Update Date
3Liz	21/07/2020	03/02/2021
ASOCIACIÓN GEOINNOVA	03/10/2019	05/10/2023
Australian Water School	16/12/2022	16/08/2023
BIGDYX CIVIL ENGINEERING SERVICES	25/10/2023	25/10/2023
BNHR	03/10/2019	20/01/2023
Bird's Eye View	03/10/2019	12/12/2020
Camptocamp SA	03/10/2019	04/11/2021
Chartis Technology	03/10/2019	03/10/2019
Cracow University of Technology	03/10/2019	03/10/2019
EnviroSolutions	03/10/2019	24/10/2023
Faunalia	03/10/2019	01/03/2023
GIS Support	03/10/2019	07/09/2023
GISTRA	03/10/2019	03/10/2019
Geo Academie (part of B3Partners)	03/10/2019	26/09/2023
Geographic Innovations for Development Solutions, Inc. (GRIDS)	03/10/2019	09/06/2021
Geoideal S.A.S.	23/05/2023	01/06/2023
Geosaber	04/01/2020	30/07/2020
Geospatial Training Solutions	03/10/2019	29/06/2023
Gispo	09/06/2020	24/10/2023
Gter srl	03/10/2019	15/05/2023
HAS green academy	31/05/2023	19/07/2023
IHE Delft Institute for Water Education	03/10/2019	19/10/2023
ITC (Faculty of Geo-Information Science and Earth Observation, University of Twente)	17/03/2021	22/06/2023
Imasgal Técnica S.L.	22/03/2021	09/05/2023
ItOpen	13/05/2020	10/06/2020
Kartoza (Pty) Ltd	03/10/2019	18/08/2023
Københavns Universitet - Institut for Geovidenskab og Naturforvaltning, Skovskolen	03/10/2019	03/10/2019
LandGoed B.V.	03/10/2019	16/12/2019
Logisch Inzicht B.V.	08/12/2021	09/12/2021
Lutra Consulting Ltd	03/10/2019	07/03/2022
MIERUNE Inc.	18/11/2020	23/10/2023
Mammoth Geospatial	25/10/2021	25/06/2023
MapTech Solutions	14/07/2021	28/03/2022
MappingGIS	03/10/2019	16/10/2023
NT - systemy komputerowe	03/10/2019	03/10/2019
Natural GIS, LDA	03/10/2019	28/07/2023
North River Geographic Systems, Inc	03/10/2019	24/05/2022
North Road Consulting Pty Ltd	03/10/2019	03/10/2019
OPENGIS.ch	18/02/2021	17/09/2021
OPENGIS.ch GmbH	03/10/2019	11/05/2023
OpenGeoLabs s.r.o.	03/10/2019	12/10/2019
Oslandia	03/10/2019	06/10/2020
QGIS Colombia	11/07/2020	02/04/2021
QTIBIA Engineering	03/10/2019	02/10/2023
QWAST-GIS	07/05/2022	01/06/2023
Septima	16/07/2020	11/10/2023
Soluciones en Tecnologías de Información Geográfica S.A. (SOLTIG)	03/10/2019	19/10/2022
Spatial Thoughts	03/12/2019	20/10/2023
SunGIS	03/10/2019	25/10/2023
Terglobo	15/10/2021	02/11/2022
Territorio SIG	03/03/2021	11/10/2023
University of Stavanger	18/01/2021	08/08/2023

52 ORGANIZATIONS WORLDWIDE

SUCCESSFUL STUDENTS RECEIVE

Official QGIS certificate

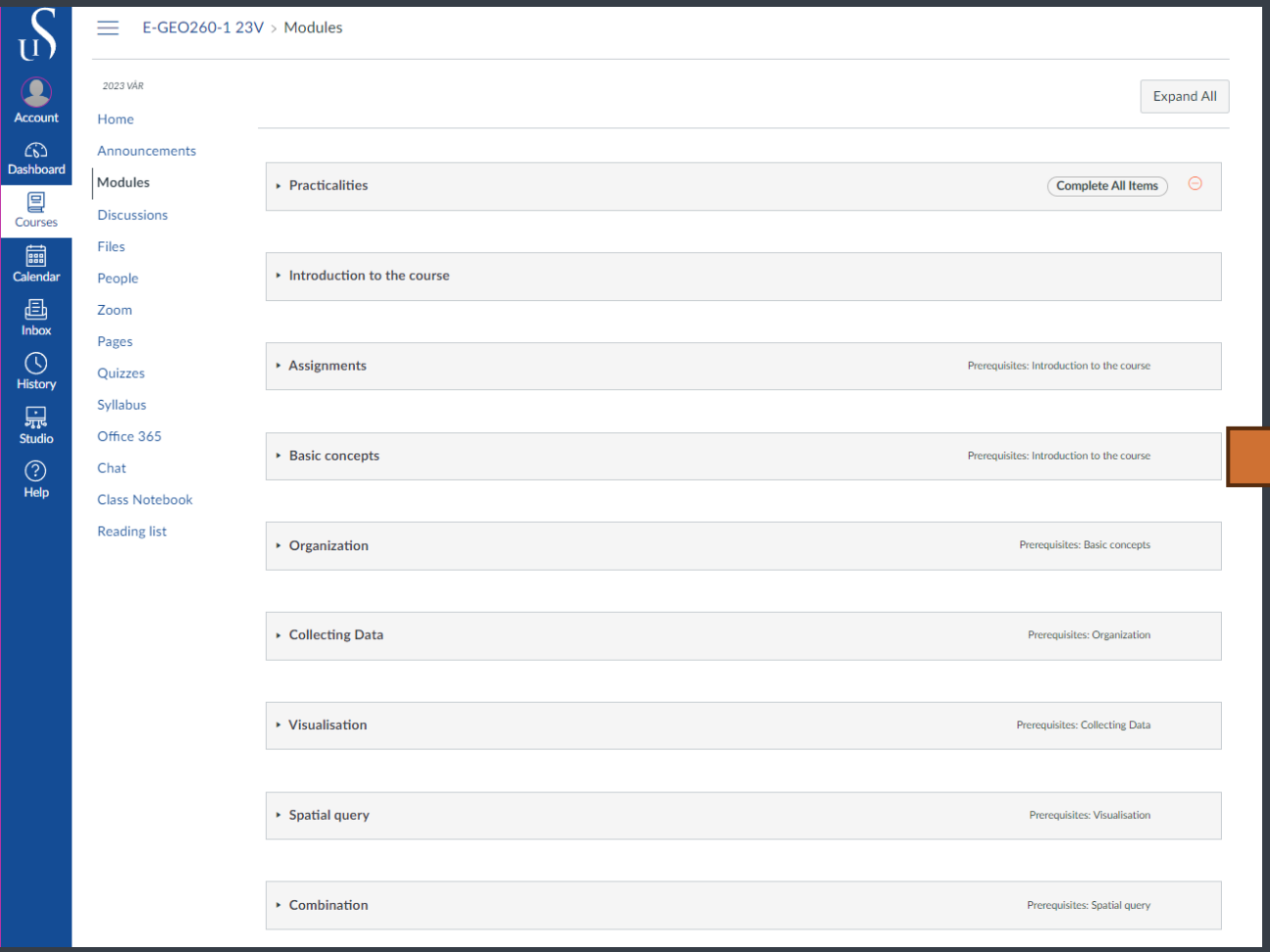
10 study points (course credits) at BSc level from UiS

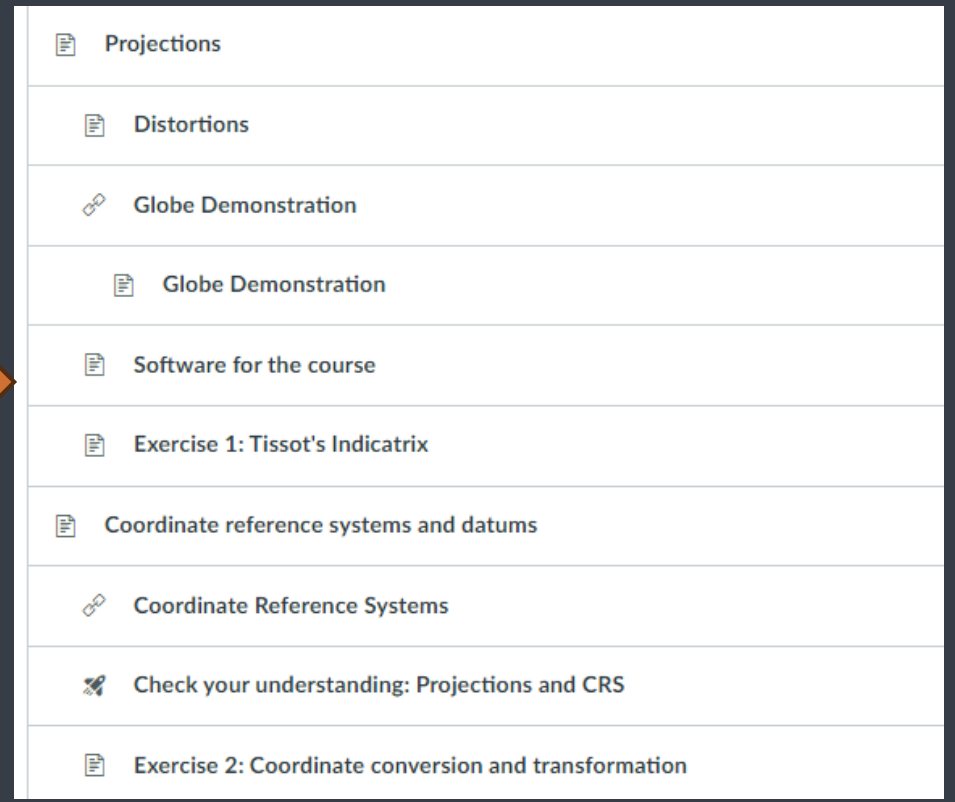
WHAT DO STUDENTS LEARN?

- Basics of cartographic theory
- Basics of GI systems and science
- How to collect data via app
- How to create databases
- How to create a usable map project for specific purposes
- How to create a map for use

HOW DO THEY LEARN?

Online learning





HOW DO THEY LEARN?

Series of short text and video with hands on exercises

HOW DO THEY LEARN?

Series of short text and video with hands on exercises

Projections

A projection is a mathematical equation to transfer a region, of whatever size, of the round Earth onto a flat surface (Figure 15). Projections are used because distance and surface area calculations are more difficult on a sphere. A flat map can show greater detail than a sphere and is more transportable. Imagine how large a globe you would need to sufficiently show the streets in your neighborhood! We need projections to transform our 3D ellipsoidal Earth onto a flat map. Projections may be based on the authalic sphere, ellipsoid, or geoid.

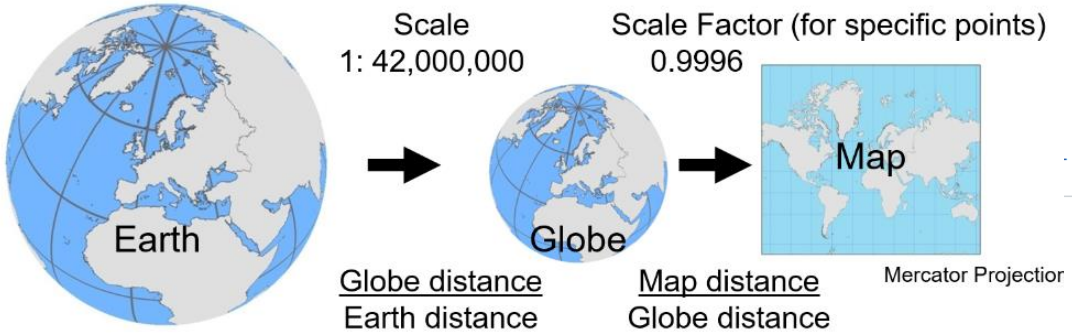


Figure 15. Transforming location from the Earth to a flat surface.

Before proceeding, take a moment to look over an informational pictographic by the U.S. Geological Survey describing different types of projection.

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. 23V › Pages › Distortions

Immersive Reader

View All Pages

Distortions

All projections have distortions that vary by projection type (i.e. transverse Mercator vs. Miller cylindrical – see pictograph mentioned in previous section). Selecting a projection depends on discipline (e.g. oil industry vs cadastre), size of area, orientation of area, regional standards, map purpose, and map scale. There are many resources for determining which projection you should use. Large-scale mapping uses conformal projection because angles measured on the ground are the same as those in the map (Iliffe and Lott, 2008). Four types of distortion are: area, shape, direction, and distance. The Tissot's Indicatrix is a graphic device to show the distortion at a point (Robinson et al., 1995). We will investigate this phenomenon in the upcoming exercise.

There are innumerable projections. In time, you will become acquainted with many more and become more familiar with the projection you need for your mapping project. In the meantime, you can refer to online guides for assistance, such as the guides by Snyder (1987) or United States Geological Survey (1993).

Note: Projection is not the same as coordinate reference system although software treats them the same.

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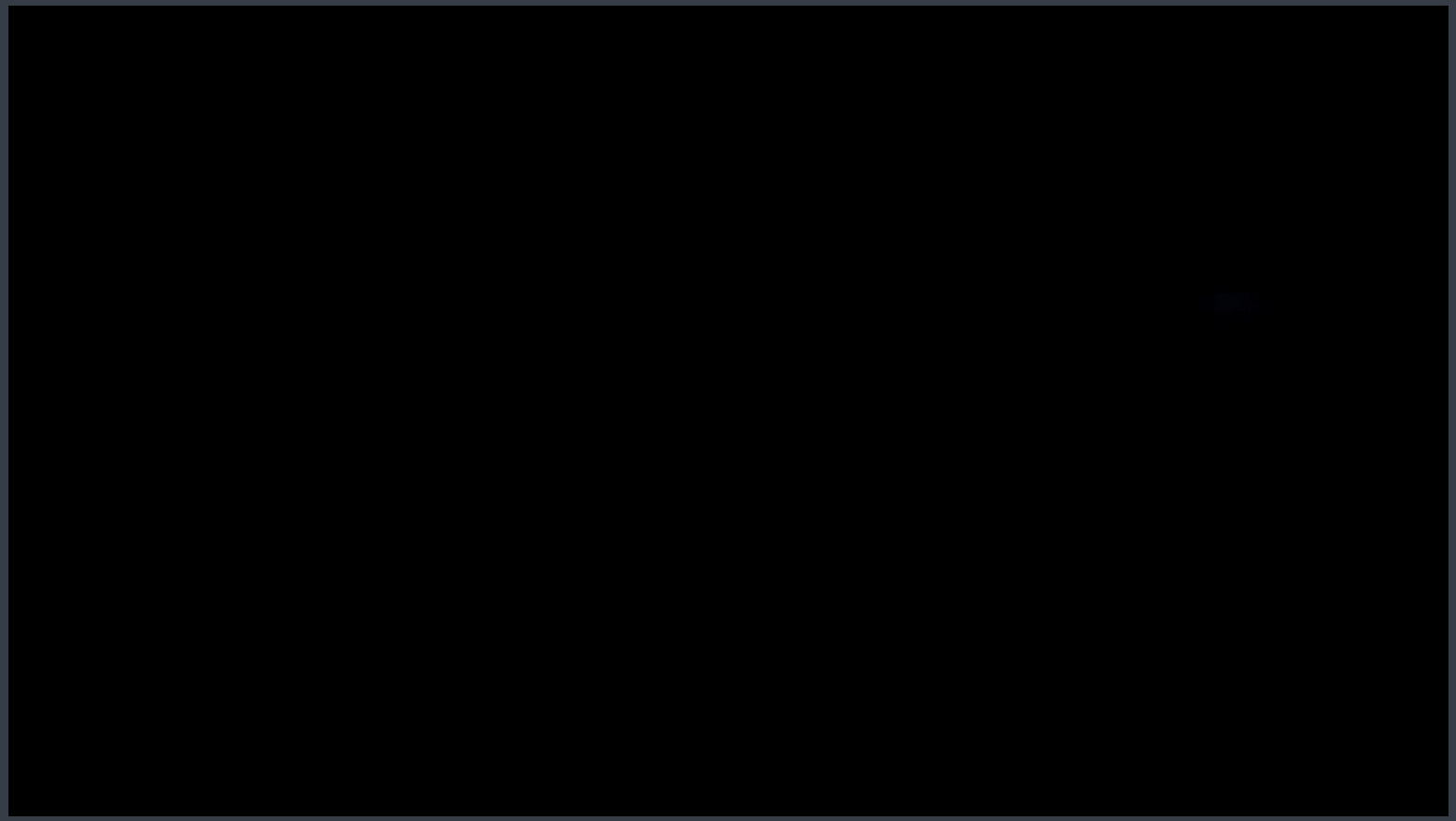
Next ▸

HOW DO THEY LEARN?

Series of short text and video with hands on exercises



HOW DO THEY LEARN?

Series of short text and video with hands on exercises

Exercise 1: Tissot's Indicatrix

This exercise will introduce you to QGIS and to understanding distortions in projections.

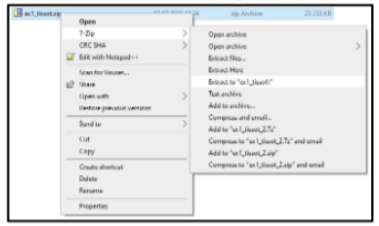
Open the pdf

Minimize File Preview

Page 1 of 5 ZOOM

This exercise will introduce you to QGIS and to understanding distortions in projections.

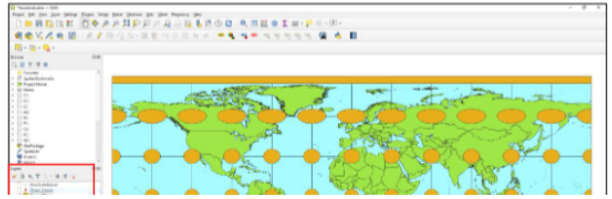
1. Download "ex1_tissot.zip" from Canvas.
2. Right-click on the zip file.
3. Select 7-zip and select "extract to ex1_tissot\".

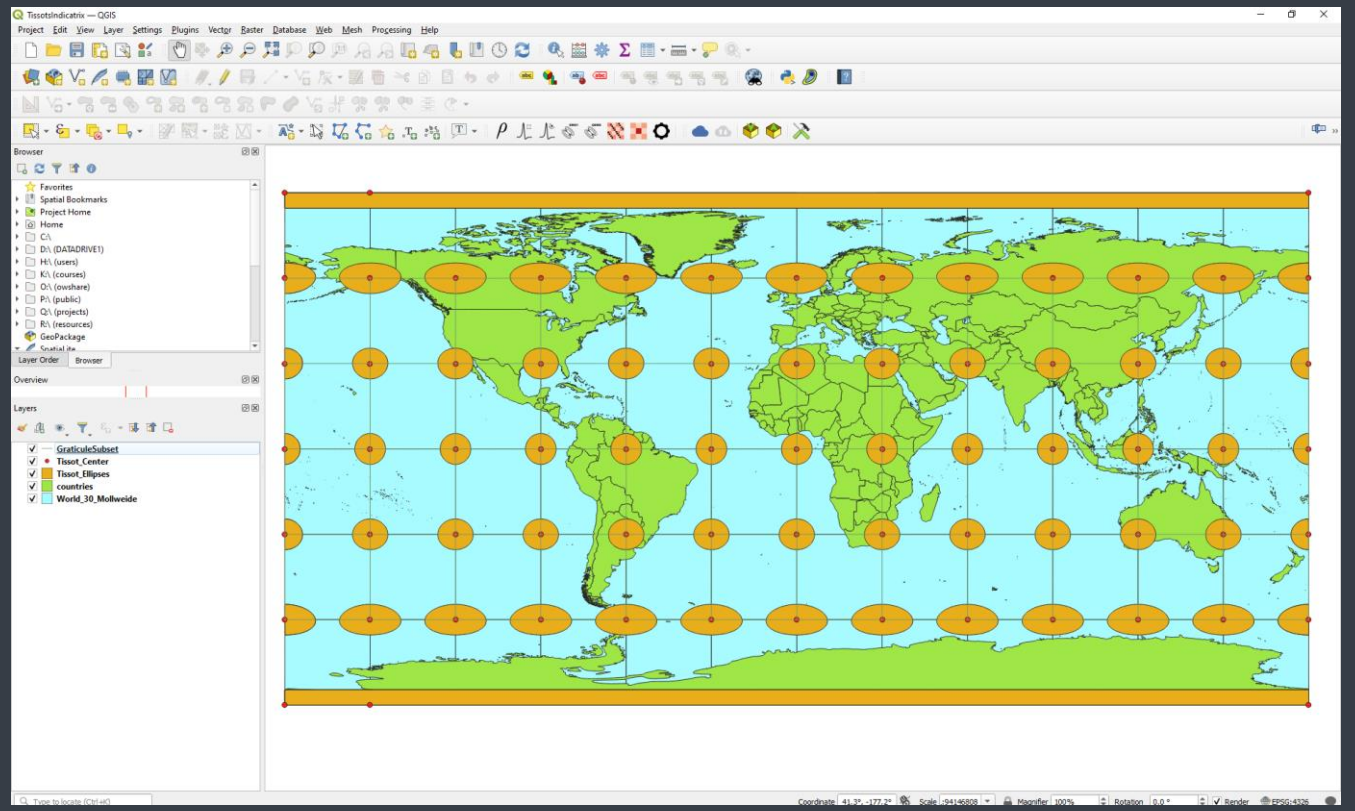


4. Open the directory "ex1_tissot".
5. There are two files.

TissotsIndicatrix.qgz is the QGIS map document. The other file ending in .gdb is a geodatabase. We will discuss what this means in a later section. For now, it is where all of the map document data is stored. Double-click on TissotsIndicatrix.qgz.

6. The QGIS map document will open and look similar to the image below.





HOW DO THEY LEARN?

Online learning

Series of short text and video with hands on exercises

Live online Q&A sessions

MAP PROJECT EXAMPLES

TURSTIER BÅSMOFJELLET (& BOSSMO GRUBER)

TEKNISK SPESIFIKASJON

Målestokk 1:7 500
Ekvidistanse 20 m

Målestokk Gruvekart 1:6 000
Misvisning Gruvekart ca. 3,4 grader

Kartgrunnlag
Kartdata : Kartverket (Geodata)
Gruvekart : Rana Kommune (Papirkopi)
Turdata : Ole Morten Wie (GPS-Track)
Kullmiler : Rana Museum (Kulturminner i Rana)
Båsmofork. : UIT - Jordskjelv i Nord-Norge

Tegnforklaring Turkart
- Kullmile
- Høydekurve
- Elv/Bekk
- Vei
- Sti
- Åpent Område
- Skog
- Bebyggelse
- Myr
- Vann
- Idrettsanlegg
- Dyrket Mark

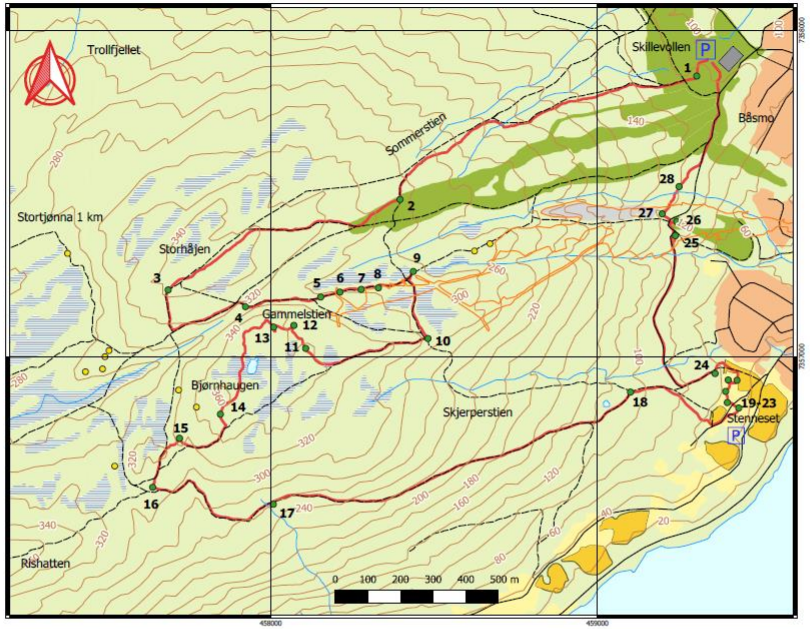
"En rundtur på Båsmofjellet"
- Turforslag 8,5 km
- Veipunkter

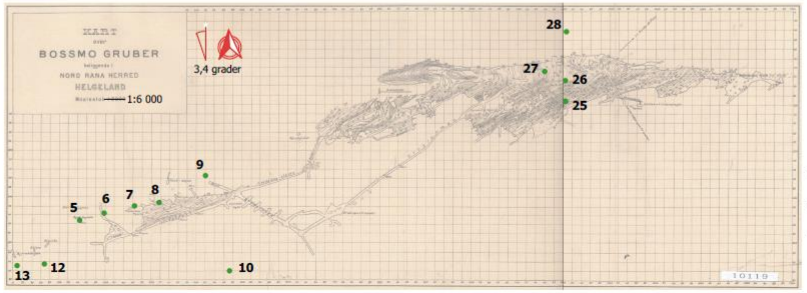
Symboler tilknyttet Bossmo Gruber
- Hovedskjerpet. Inngjerdet område!
- Omriss av gruvene
  Se Gruvekart Bossmo Gruber

Oversiktskart (og Båsmoforkastningen)

Båsmoforkastningen strekker seg fra Sjona i vest til Plurdalen i øst. Forkastningen kjennetegnes av bratte lier og djupe daler. Den går rett gjennom Båsmofjellet og kan tydeligst observeres ved punkt 4 rett nord for Bjørnhaugen.

Karttegning og Design
Ole Morten Wie
Jessica Marlen Treutler-Onarheim





Gruvekartet fra ca. 1920 viser hvordan gruvegangene går inne i Båsmofjellet. Det er gjengitt et omriss av gruvegangene i kartet og markert punkter som kan finnes igjen i begge kartene.

EN RUNDTTUR PÅ BÅSMOFJELLET

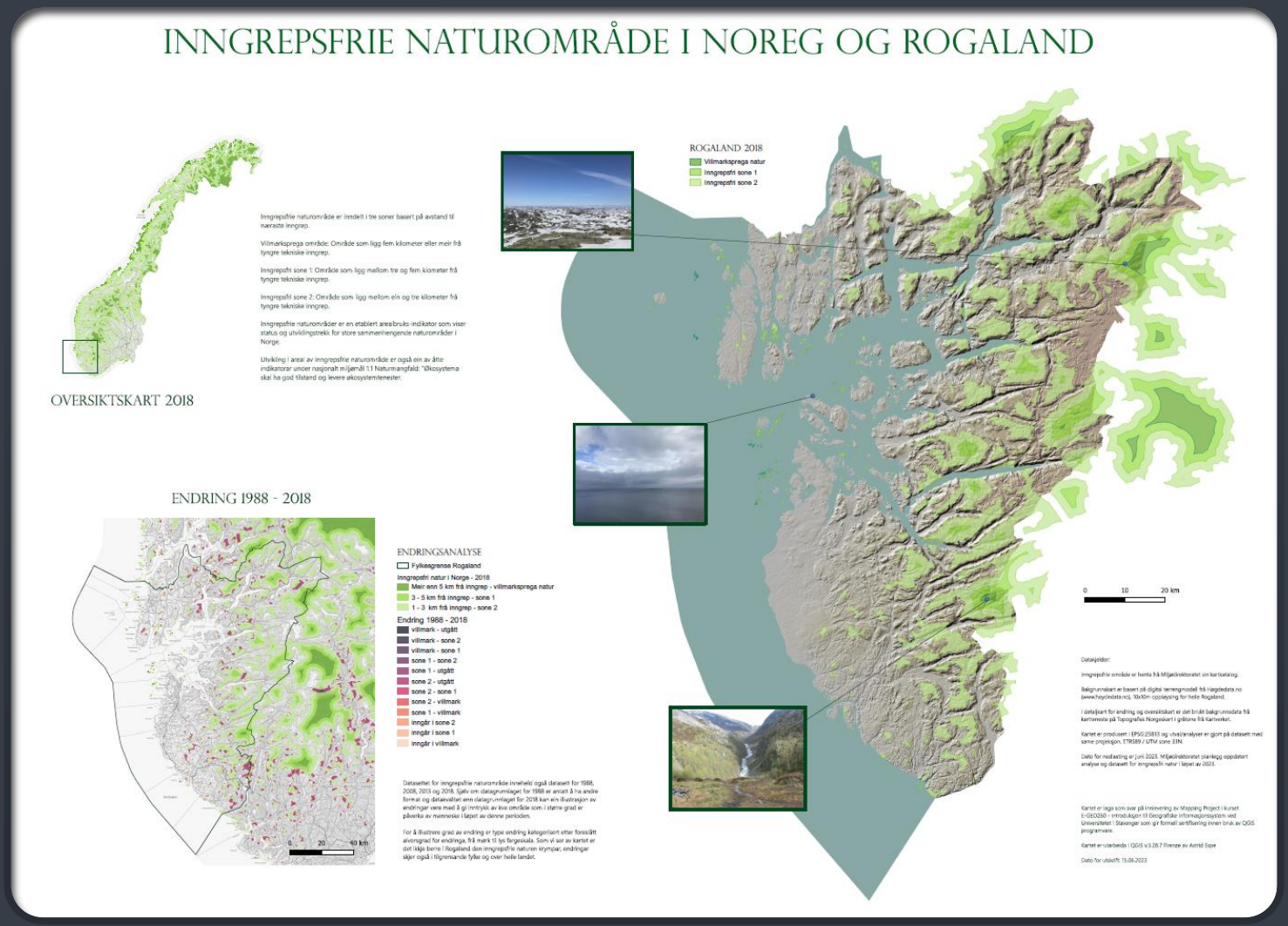
1-2. Skillevollen idrettsanlegg
3. Storhåjen - Turpunkt
4. Båsmoforkastningen
5-9. Skjerp og tydelige spor etter gruvedriften på fjellet
10. Rogerbua - Turpunkt
11-12. Prøvedrift og Riotinto
13. Bjørnhaugen skjerp

14. Grensestein med korsmerke
15. Kullmile
16. Idavollen - Turpunkt
17. Løkberglia - Utsiktspunkt
18. Skjerperstien
19-24. Stenneset friluftsmuseum - Helgeland Museum

25. Inngang til gruve (Consulen). Avstengt med gitter!
26. Munklia hoppanlegg
27. Bossmo Gruber - Hovedskjerpet
28. Kullmile

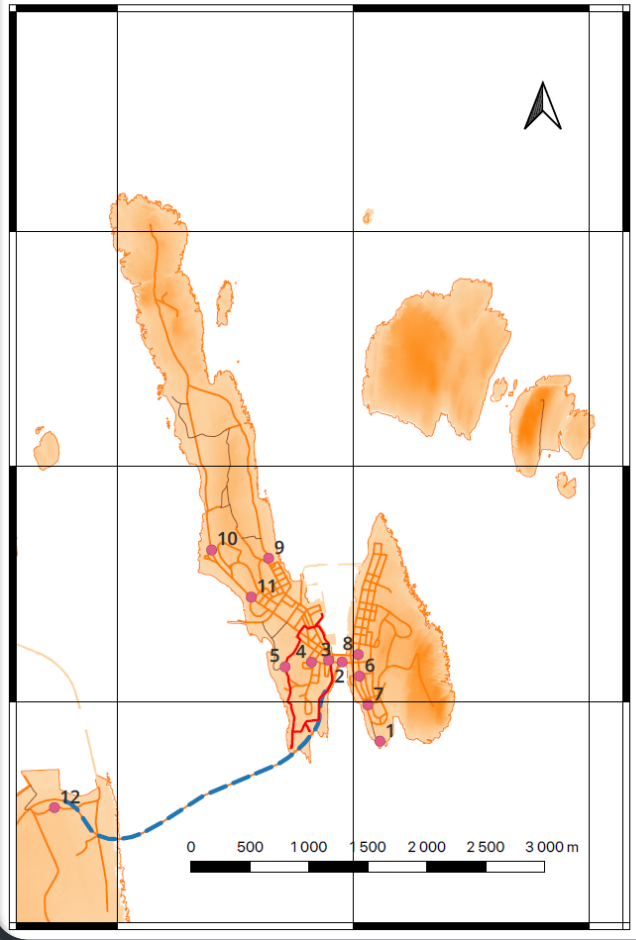
Turprofil (8,5 km - ca. 3 timer)

MAP PROJECT EXAMPLES

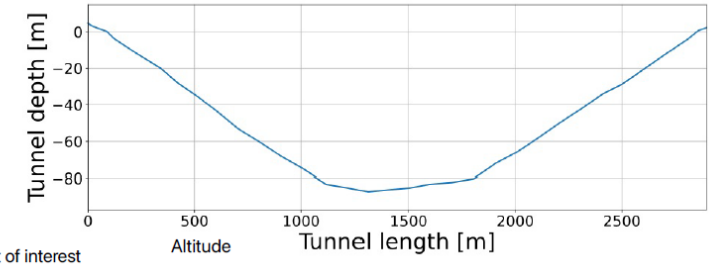


MAP PROJECT EXAMPLES

Points of interest in Vardø



The Vardø Tunnel is the first undersea tunnel built in Norway. Construction completed in 1982, it runs 2982 meters long and has a deepest point at 88 meters below sea level.



Legend

- Point of interest
- Tusenårsstien
- Vardø Tunnel
- Path
- Road

1 Østervågen Southern Tip
2 Vardø Town Hall
3 Grand Hotel
4 Vardø Radio
5 Steilneset Memorial Site
6 Old Vardø Cinema
7 Tiny House
8 Colored Houses
9 Rødsjåen
10 Krutthuset
11 Lushaugen Quarantine Station
12 Vardø tunnel

Altitude

Mainland side of the tunnel

Location of Vardø in Northern Norway

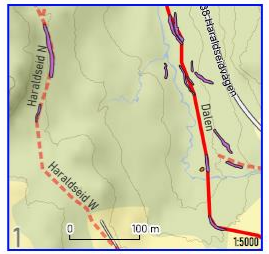
Map created by Nils Holmebukt, 2023. It shows some of the buildings in Vardø I personally find interesting in some way or another.
Projection: ETRS89 / UTM zone 35N
Grid: UTM zone 35N

MAP PROJECT EXAMPLES

Haraldseid — Harold's Portage

The old Norse word *eið* occurs in many Scandinavian place names. The term denotes a passage over land between two trafficable waters, i.e. an isthmus which could be used as a portage for transporting boats, people and cargo. As such, the eið place names provide important evidence for sites which may have been central communication routes in pre-modern times. Haraldseid in SW Norway is among the prominent examples of such sites and was a significant waypoint for the transportation of goods and people along the Norwegian coast. The personal name *Haraldr* has been associated in local legends with the Viking king Haraldr Fairhair, who resided nearby at Avaldsnes.

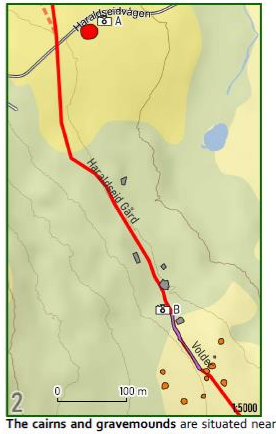
Excavations have shown that Haraldseid has been used as a landing site since the Mesolithic (9000—4000 BC), and it was used for the transportations of boats up to the 19th century. Radiocarbon dates identified an intensified use in the Roman period.



The sunken roads at Haraldseid are a product of erosion. Movement of goods, people and animals creates sunken lanes along the transport routes. The erosion of sunken lanes is especially prevalent at steep incline at the landing sites at Haraldseid, such ast the segments *Dalen-Haraldseid* and *Kalstveit-Båtavika*.
Seasonal changes in precipitation makes part of the main route impassable, creating the need for diversions. This is why the portage is not just one single lane, but more a network of roads creating passage over the isthmus.

The gravemound at Haraldseidvågen, from NE (photo: C. Kvæstad 2023)

To the left a farmstead ruin and to the right the sunken road. The burial cairns are bareley visible in the background, from NW (photo: C. Kvæstad 2021)

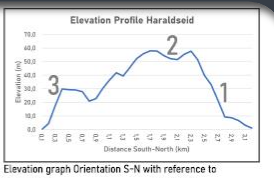


The cairns and gravemounds are situated near the main route of the portage. The building of the burial mound and cairns along the main passage route shows that there was status and power in controlling the passage. The ruins are remains of abandoned farmsteads that were established in the 17th century. These are consentrated at the highest point in the landscape, on the segments of *Haraldseid Gård* and *Volder*.

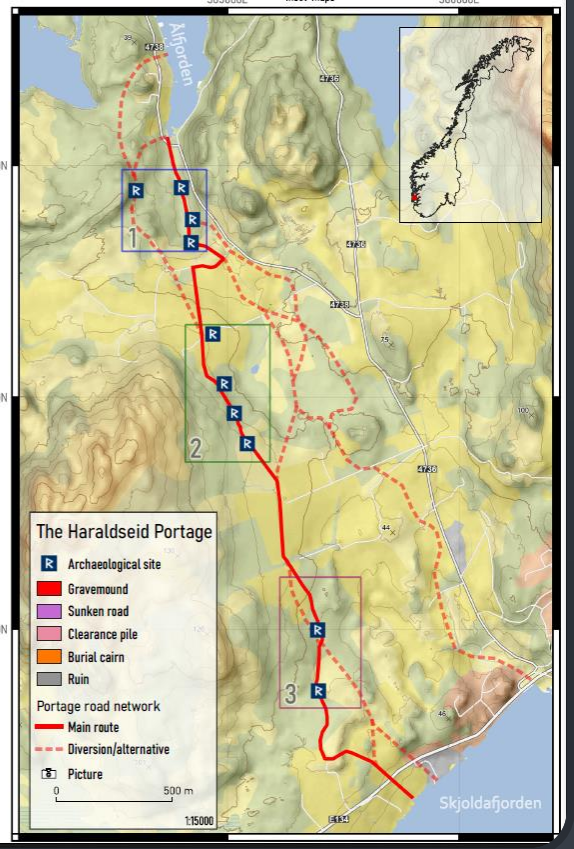
Road network: Main route GPS-Track in QField Android. Alternative routes based on DEM, historical sources and expance of bogs and wetlands.
Archaeology: Kulturminner - REST-API (Riksantikvaren/ geonorge.no)
Background map: Norges grunnkart (Kartverket/geonorge.no)
Coordinate reference system: WGS 84 / UTM zone 32N (EPSG:25832)

Author: Christopher F. Kvæstad, 2023

Source: Reiersen, H., & Kvæstad, C. (2023). The Iron Age and medieval portage at Haraldseid, SW Norway. Legends, place names and archaeology UBAS. Universitetet i Bergen Arkeologiske Skrifter (in press).



Elevation graph Orientation S-N with reference to inset-maps



STUDENT FEEDBACK AND IDEAS FOR FUTURE

Create advanced courses

Students choose analysis pathways in course modules

Focus on skills creation and knowledge transfer

Provide 5 study point course option

FOR MORE INFORMATION ABOUT THE COURSE

REGISTRATION OPEN FOR SPRING 2024