

YYT-C3001 Management of environmental data and information

Lecture 3: Data sets in Finland



Aalto University
School of Engineering

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16.9.2020

Contents of this lecture

Overview of spatial data sets created and maintained in Finland

National Land Survey

Some examples of other public sector data providers in Finland

Some examples of private data providers in Finland

We'll return to this topic at the end of the course

Learning goals for this lecture

Know where you can go and try to find large collections of Finnish spatial data sets

Remember some services that provide spatial data in Finland

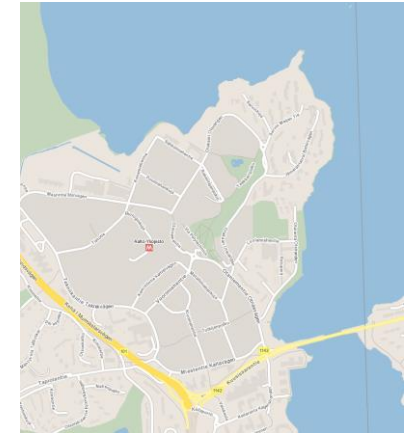
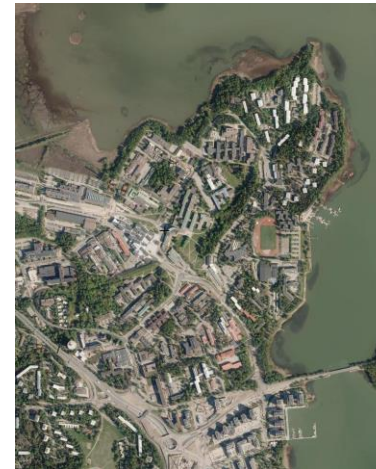
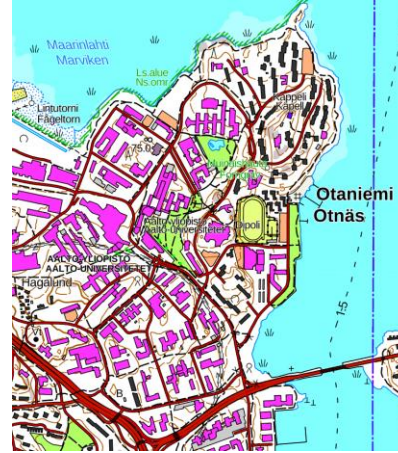
Remember some important public sector players that provider spatial data in Finland



Spatial data sets in Finland

What sort of spatial data is created in Finland?

- **Public sector data sets**
 - NLS
 - FMI, SYKE, other government institutions
 - Municipalities
- **EU data**
- **Data sets by Finnish companies**
- **Data sets by international companies**
- **Volunteered geographic information (VGI) and crowdsourcing**



Data gathered and data available

- Not all data gathered is available
 - Some of the data sets are available freely (without a cost or limitations)
 - Some require registration, or have some other limitations
 - Some are available for money
 - Some are available only for specific uses



ERITTÄIN SALAINEN Suojaustaso I Julkl (621/1999) 24.1 §:n ____ k Lain (____/____/____) §:n ____ k	SALAINEN Suojaustaso II Julkl (621/1999) 24.1 §:n ____ k Lain (____/____/____) §:n ____ k
LUOTTAMUKSELLINEN Suojaustaso III Julkl (621/1999) 24.1 §:n ____ k Lain (____/____/____) §:n ____ k	KÄYTTÖ RAJOITETTU Suojaustaso IV Julkl (621/1999) 24.1 §:n ____ k Lain (____/____/____) §:n ____ k

SeutuRuutu-käyttöoikeus voidaan myöntää pääkaupunkiseudun kuntien tai kuntayhtymien työntekijöille työ- ja virkatehtäviin ilman erillistä veloitusta. SeutuRuutu-käyttöoikeutta haettaessa tulee täyttää sekä käyttöoikeushakemus että -sitoumus. Käyttöluvan hakija on käyttöoikeuden saajan esimies, joka täyttää hakemuksen ja allekirjoittaa sen. Sitoumuslomakkeen allekirjoittaa käyttöluvan saaja. Allekirjoitettu hakemus ja sitoumus toimitetaan hakemuksessa olevien ohjeiden mukaisesti HSY:lle.

Request 7-day free trial of Spatineo Monitor now!

Try Spatineo Monitor full featured for free for 7-days and ensure the quality of your spatial web services.

Request Free Trial now!

MAPS	ROUTES	PLACES
Static Maps Display maps as images	FREE FOR MOBILE	\$2 PER 1000 REQUESTS
Dynamic Maps Display interactive, customizable maps	FREE FOR MOBILE	\$7 PER 1000 REQUESTS
Local Context Map (Beta) Provide detailed information on nearby places directly on your maps - including user ratings, reviews, photos, pricing, ETA and walking directions	FREE DURING BETA	Requires enabling Dynamic Maps - \$7 CPM
Static Street View Display a non-interactive Google Street View 360 panoramic or thumbnail image		\$7 PER 1000 REQUESTS
Dynamic Street View Display an interactive Google Street View 360 panoramic or thumbnail image		\$14 PER 1000 REQUESTS

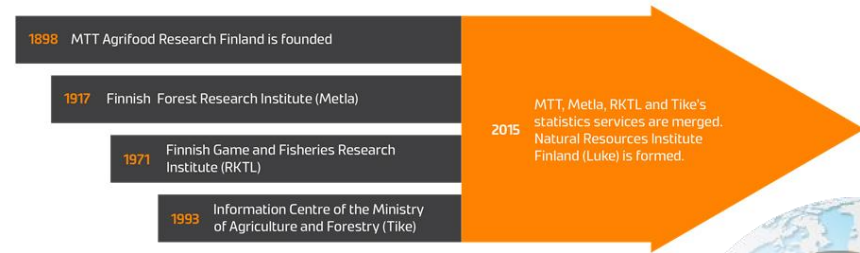
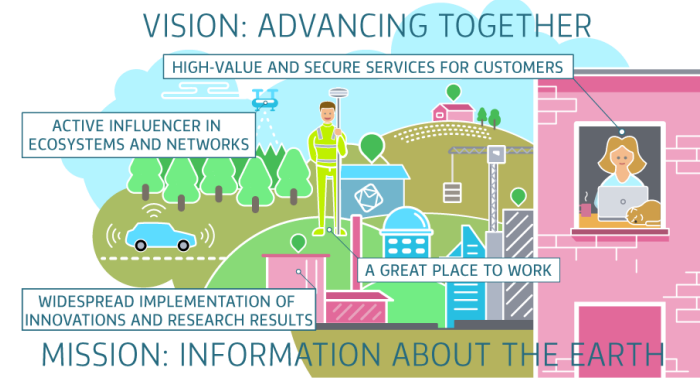
Public sector data sets

- **Public sector: government and municipalities**
- **Public sector data is mostly funded by tax money**
 - Significant parts of it are available as **open data**
- **Responsibility for data sets spread among several institutions**
 - Providing it to consumers as a single service has proven to be challenging
- **National Land Survey** is the most important public sector actor in the field



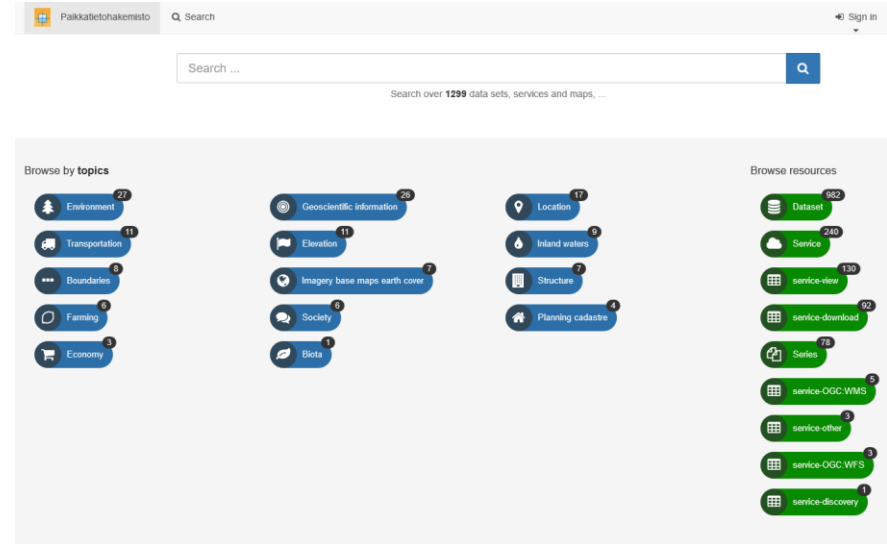
Public sector data sets continued

- What is the purpose of public sector data?
- Knowledge about the environment
 - The physical environment
 - The natural environment
 - The built environment
- Information for governance
- Public good



Where to get public sector data?

- www.paikkatietohakemisto.fi
 - Catalogue of **spatial data** sets
 - Does not contain spatial data, just **metadata** and **links** to providers
- www.avoindata.fi
 - Catalogue of **open data** sets
 - Not just spatial data
 - Mostly **metadata** and **links**
- **These are only two examples!**

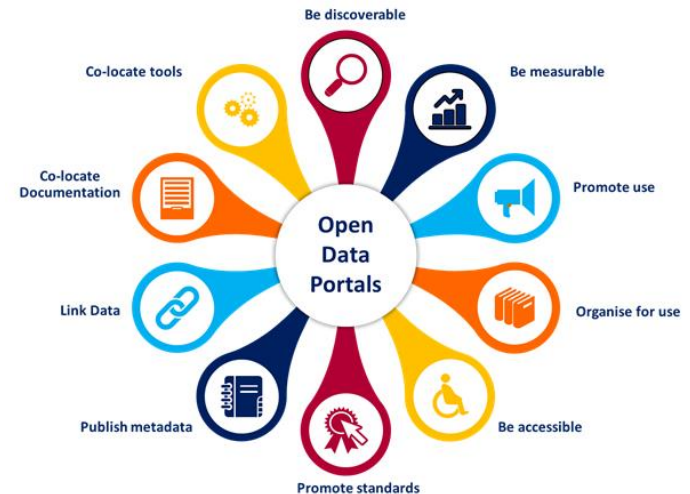


Metadata? Open data?

- **Metadata is data about data**
 - It describes what a data set is about, how to interpret the data in it, how the data is arranged, etc.
 - Covered in detail later on the course
- **Open data is data that is provided to users without a cost or usage restrictions**
 - Open data does not provide (direct) income for the data provider
 - Increased use of data has indirect benefits



<https://gisgeography.com/gis-metadata/>



Lecture exercise: Open data

I will put you into breakout rooms in Zoom.

In groups discuss the following: What is the importance of open data? Do you use any services that you think are based on open data? If you do, what open data sets they contain? Where is this data produced?

You have 15 minutes

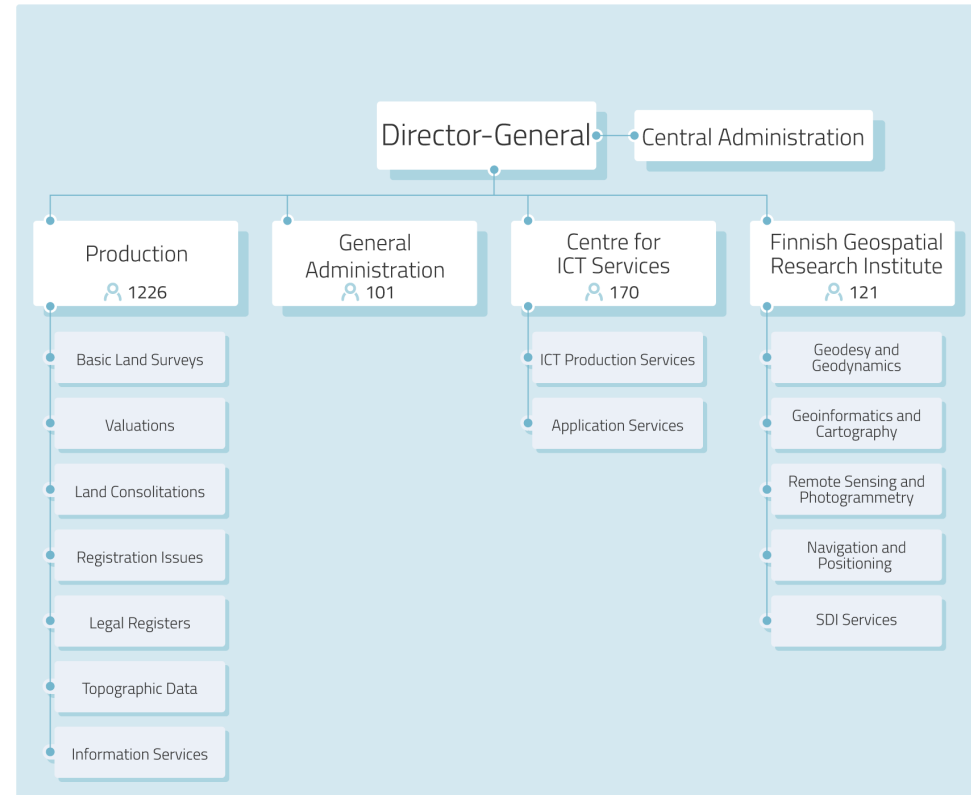
https://jamboard.google.com/d/1NZ2yVqWY3VcVdZxrh4vykaPPFsc0UrmwYt_ZsTRWKF0/edit?usp=sharing



National Land Survey and NLS data sets

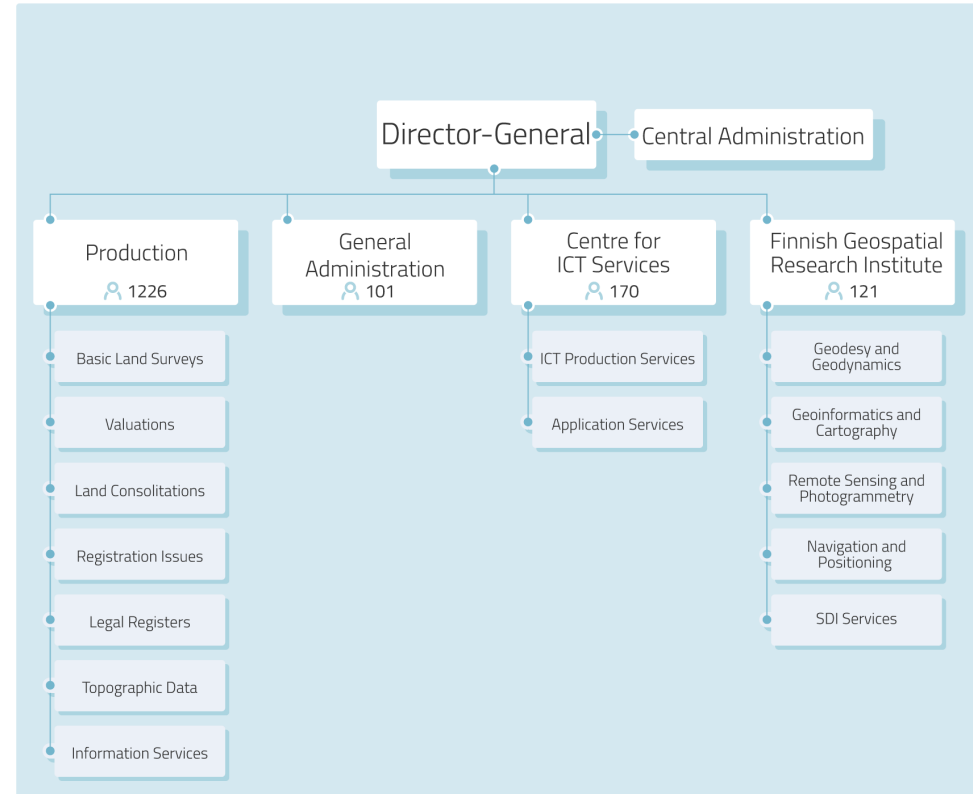
National Land Survey (NLS)

- **NLS is one of the most prominent public sector providers of spatial data**
 - History of NLS goes back to 17th century
- **Background maps, cadastral index map, elevation maps, laser scanning results, topographic database, etc.**



Overview of NLS

- **FGI is a research-oriented organization within NLS**
 - Used to be the independent Finnish Geodetic Institute until 2015
- **The importance of ICT services is constantly increasing**
- **Production contains the traditional core of NLS work**
 - Maps, cadastral registry, etc.



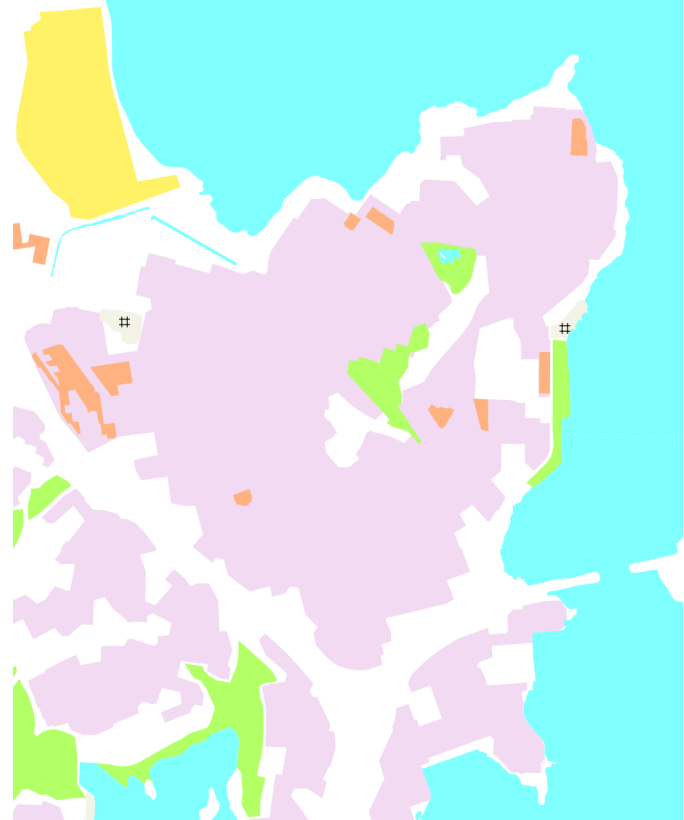
NLS data sets: paikkatietoalusta (spatial data platform)

- A service infrastructure for promoting spatial data use
- Primary focus on expert use, but data is (mostly) open
- Goal is to improve the **interoperability** of (mostly public sector) spatial data
- Currently in beta testing phase



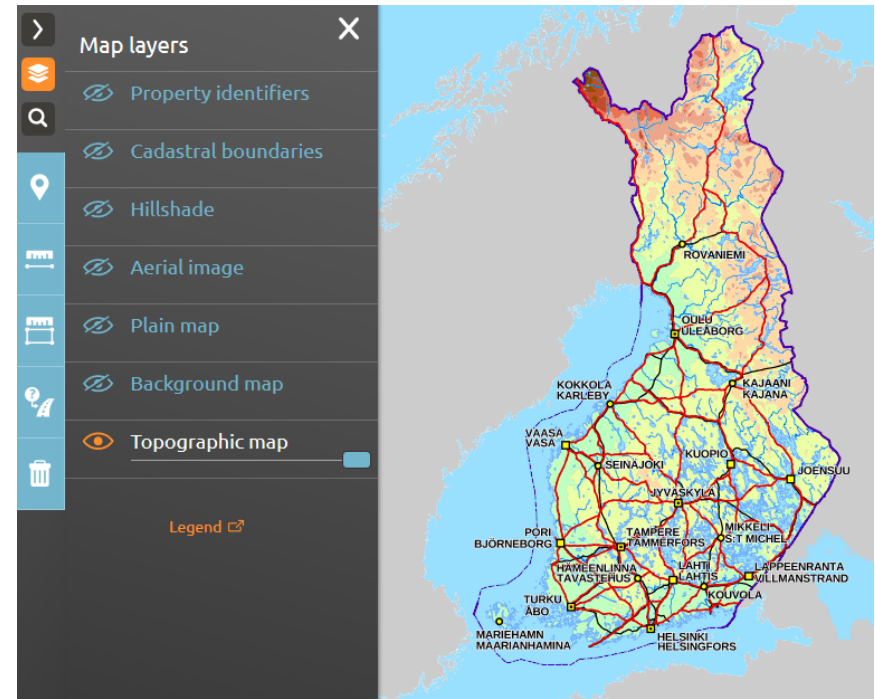
NLS data sets: Topographic database (maastotietokanta)

- An important source data set for significant number of different spatial data products
- Road network, buildings, administrative borders, land use, waterways, elevation
- Available as open data
 - Full dataset is over 70 GB as a GeoPackage database



NLS data sets: MapSite (karttapaikka)

- Service for accessing selected NLS spatial datasets via browser
- Aimed at consumers
- No data download
 - Data available for download from other NLS services
- Can be used to order printed maps (for €)



Other Finnish spatial data producers

FMI data

- The Finnish Meteorological Institute is responsible for weather and climate data gathering and modeling
- FMI provides a lot of data and services, both as **open data**, and paid products
- Aimed at expert users (user has to know what they need)

The Finnish Meteorological Institute's open data

The Finnish Meteorological Institute has made its data sets freely available for public use. The data sets are available in machine-readable, digital format. There are also some computer programs developed at the Institute that have released as open-source code.



Through the Open Data services of the Finnish Meteorological Institute it is possible to search for, browse and download the Institute's data sets in machine-readable format free of charge.

SYKE data

- **Finnish Environment Institute produces spatial data about both the natural and built environment**
- **They are responsible for the CORINE land cover in Finland**
- **Natural disaster risk areas, city plan areas, inhabited areas, conservation areas, etc.**



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Spatial datasets

SYKE's open spatial datasets can be downloaded or browsed using map services. Information about the properties of the datasets and services is described in metadata. Spatial datasets are available only in Finnish, but most metadata descriptions are available also in English.

Download services under the INSPIRE directive provide SYKE's INSPIRE content mainly through Atom feeds as GML files. Some of the materials have also been published through the WFS direct access. Additionally, the site has an "as is" Atom feed for downloading shape files that are not in conformity to the INSPIRE data specifications.

SYKE applies [Creative Commons BY 4.0 International license](#) for open datasets.



Download Service [LAPIO](#) is a map application, which makes it possible to download SYKE's spatial datasets by clipping data layers with the boundaries of municipalities, provinces or self-defined rectangles.



Dataset packages covering the whole country



INSPIRE download services



INSPIRE WMS and WFS



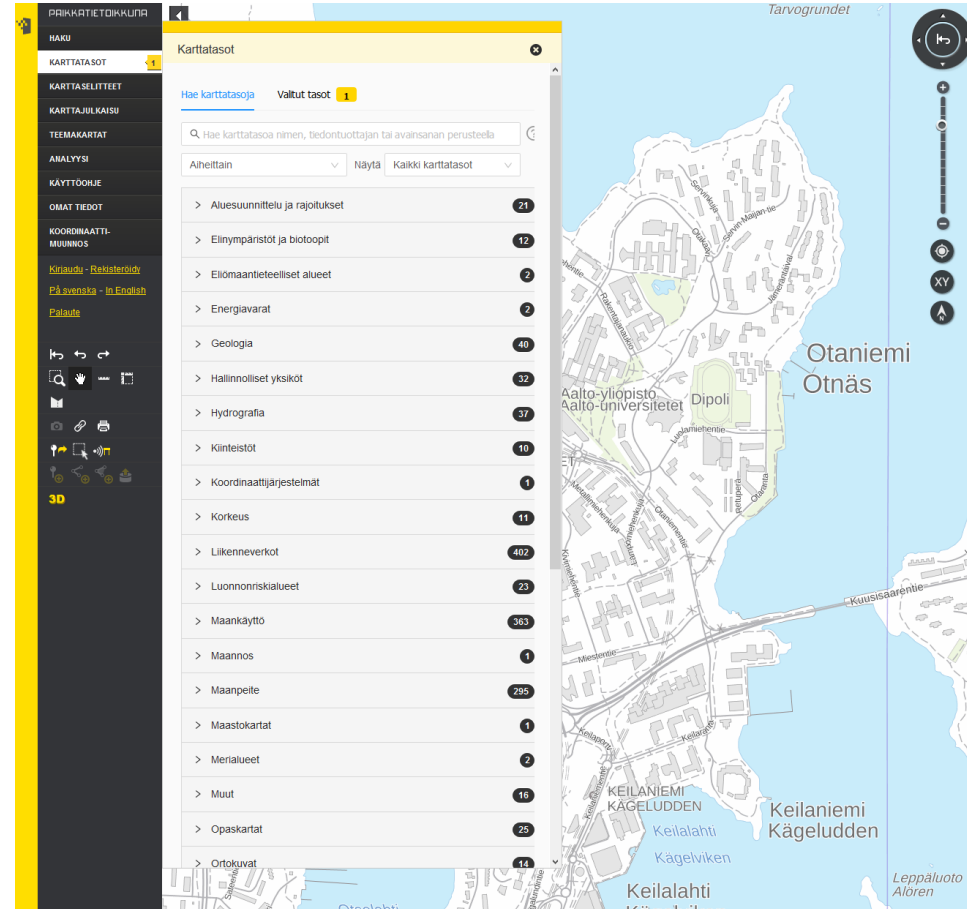
National web map services

Other public sector data producers

- **Natural Resources Institute Finland**
 - Exploitable natural resources, esp. cultivated area and forests
- **Geological Survey of Finland**
 - Geological resources, minerals etc.
- **Other government institutes**
- **Municipalities**
 - Especially large cities have both resources and need for spatial data
 - All municipalities require cadastral registries (kiinteistörekisteri)
 - NLS helps with this

Paikkatietoikkuna – a service for public sector spatial data

- www.paikkatietoikkuna.fi/
- A service for showcasing Finnish INSPIRE datasets and services
 - I would assume it is either VERY thorough, or contains more than is needed for compliance with INSPIRE
- Also includes some analysis tools
- Used with web browser



Paituli – open data directory for academic use

- Spatial data **download service**
 - Data available as files and via WFS/WMS
- Primarily **aimed at academia**
- Most of the data is **open data**
- Contains data from public sector institutes

Paituli spatial data service

Paituli service provides spatial datasets that are important for research and education.

[Go to dataset metadata](#)[Go to application](#)[Go to interface](#)[Go to downloads](#)[Go to source code repository](#)

Paituli is spatial data download service. Paituli's primary users are students and personnel of Finnish universities and polytechnics, but most of the datasets are open to anyone. The service provides datasets that are important for research and education. Compared to other spatial data services Paituli includes also historical versions of datasets. For many datasets the first version is from 2005, when Paituli started. At the moment datasets from following data providers are available: Finnish Meteorological Institute, National Land Survey, Traffic Agency, Agency for rural affairs, Statistics Finland and Finnish Environment Institute (SYKE).

Public sector data with limited availability

- Not all public sector data is open
- Data can be costly to provide
 - Paper maps cost to produce
 - Extracting data from a digital data set also has labor costs involved
- Some data is confidential
 - Privacy concerns
 - National security concerns

Maastokartta 1:20 000 / Peruskartta 1:25 000 / Maastokartta 1:50 000

Tuote	Hinta € (ilman alv.)	Hinta € (sis. alv.)
Maastokartta 1:20 000	5,04	6,25
Peruskartta 1:25 000	12,50	15,50
Maastokartta 1:50 000	12,50	15,50

Kertatilauksella ostetuista kartoista myönnetään alennusta seuraavasti:

Kappalemäärä	Alennusprosentti
vähintään 5 kpl	10 %
vähintään 20 kpl	20 %
vähintään 50 kpl	30 %
vähintään 100 kpl	40 %

Tietosuojalainsäädännön puitteissa SeutuCD:llä olevia tietoja ei saa julkaista henkilötietojen osalta tunnistettavassa muodossa. Rakennustasoista väestöaineistoa voi julkaista esimerkiksi teemakartoissa tai raporteissa summattuna alueisiin (kuten ruudut 250 x 250). Julkaistaessa väestötietoja tulee huolehtia, että väestörakennetta ei julkaista niiltä alueilta, joilla asuu 0-99 asukasta. Alue, jossa on vain 0-4 asukasta, tulee poistaa kokonaan julkaistavasta kartasta tai esityksestä.

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SALAINEN
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KÄYTTÖ RAJOITETTU
Suojaustaso IV
JulKL (621/1999) 24.1 §:n _____ k
Lain (____/____) _____ §:n _____ k

Commercial data

Lecture exercise: service comparison

I will divide you into breakout rooms in Zoom

In groups compare the car routes provided by the following services: Fonecta.fi/kartat, Maps.google.fi, Opas.matka.fi

Use routes the services give between two Finnish cities that are at least 100 km apart as an example. Do the services give identical routes? If there are differences, what and how big are they?

You have 10 minutes

https://jamboard.google.com/d/1KHh4_XA6lqlbllI--lttrtEajPWeA6sTCKh219bTHsQ/edit?usp=sharing



Commercial data sets

- **Data sets for consumers**
 - E.g. maps, route finding, etc
 - What's the monetization schema?
- **Data sets for experts**
 - Additional value to somebody's business
- **Open data for somebody**
 - Again, what's the monetization schema?



<https://www.youtube.com/watch?v=PIJGVcJP1T8>

Commercial data and services

The City of Helsinki assessed its maturity in the utilisation of spatial data with Spatineo Roadmap

[Frontpage](#) > [News & Blog](#) > [The City of Helsinki assessed its m...](#)



The maturity assessment in the utilisation of spatial data was executed in the **City of Helsinki** by using Spatineo Roadmap in November 2014. A development program on spatial data has been going on in the City of Helsinki in 2011–2014 and it will be finished at the end of this year. “The maturity assessment helped us to see the results of the progress of the development program.”, tells Outi Hermans, the special Planner at the City of Helsinki. The maturity assessment in the utilisation of spatial data was executed in the city also at the beginning of the development program in January 2011. Thus, the development of the maturity from the year 2011 to 2014 indicates well the effects of the actions carried out during the program. Hermans also states that with the help of the results of the maturity assessment, the new objectives for managing and utilising spatial data will be set.

Commercial data and services

GLOBE BUILDER — BECAUSE THE WORLD IS NOT FLAT

My colleague Topi crafted a beautiful map for the [#30DayMapChallenge](#) showing the ecoregions of the world in a globe-like map with round halo. I was amazed when he told me that he had done it using nothing but QGIS. This made me wonder what if this could be scripted and even make it as a plugin? I decided to practice my PyQGIS skills and try to develop my first QGIS 3 Plugin.



Ecoregions of the world, made by Topi Tjukanov for the #30DayMapChallenge.

Commercial data and services

Koronavirus Suomessa ja globaalisti

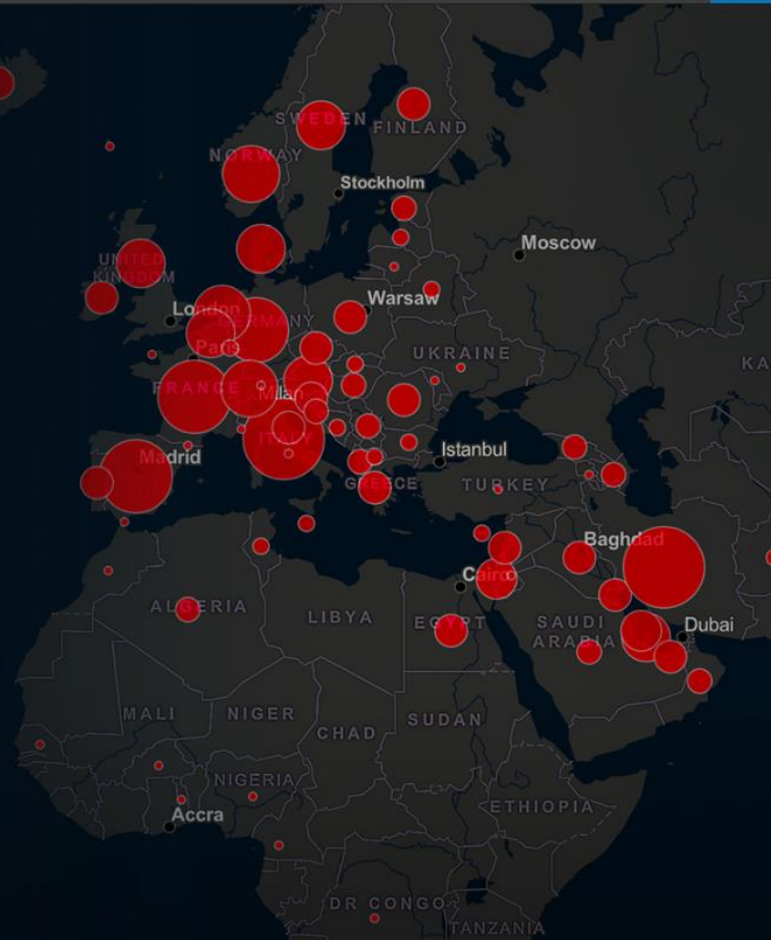
intro

ArcGIS auttaa
ehkäisemään
koronaviruksen
leviämistä

Paikkatietoanalytiikka ja kartat
auttavat ennaltaehkäisyssä ja
viestinnässä

Tutustu THL:n julkaisemaan karttasovellukseen varmistetuista
koronatapauksista Suomessa (COVID19).

THL:n karttasovellus →



A?

Commercial data and services



[Etusivu](#) / [Toimialat ja sovellusalueet](#) / **Maatalous**

PAIKANNUSPALVELUA CM-TARKKUUDELLA



**Trimnet
AgriVRS**

Paikannuspalvelua
cm-tarkkuudella



^ Trimnet AgriVRS -palvelu

Geotrimin Trimnet AgriVRS-palvelu mahdollistaa viljelijöille monipuoliset täsmäviljelyratkaisut. Geotrim ylläpitää Suomessa kattavaa tukiasemaverkkoa – yli 100 tukiasemaa – jonka tuottaman korjaustiedon ansiosta päästään cm-tarkkoihin (RTK) viljelytuloksiin.

Trimnet AgriVRS-palvelulla cm-tarkkuus viljelyyn

RTK GNSS -tarkkuusluokassa käytössä ovat kaikki paikannussatelliitit. Suosittelemme RTK GNSS -tarkkuusluokan AgriVRS-korjauspalvelua erityisesti silloin, kun ajo-opastin on varustettu Autopilot-automaattiohjauksella tai työlaiteautomaatiolla. Parhaiten RTK GNSS -tarkkuusluokan palvelu sopii GPS-paikannuksen kannalta haasteellisille alueille ja korkeuserojen mittausta vaativille sovelluksille.

Volunteered geographic information

- **Your phone – handy locator whenever turned on**
 - Google / Apple
 - Manufacturers
 - Telecoms
- **112 app**
- **What is your geodata used for?**

Note: does this actually use geodata? The app just maintains a list of contacts, not of locations

Näin Suomen koronasovellus toimii – tartuntatautilain väliaikainen muutos hyväksyttiin tänään

Vapaaehtoinen sovellus on tulossa ladattavaksi 31.8.

Mobiilitieteologia 26.6.2020 klo 14:54



Crowdsourced geodata in Finland

- Osoitehaavi
- SoftGIS
- Municipality planning in general
- Riistakolmiot
- International efforts
 - OSGeo
 - OpenStreetMap



QGIS-suomennosillat ja OSM-kartoitusillat järjestetään etänä

20.3.2020

OSGeo Suomen organisoimat kevään QGIS-suomennosillat ja OSM-kartoitusillat tullaan järjestämään sovitusti, mutta lähitapaamisen sijaan illat järjestetään etäyhteyden avulla. QGIS-suomennosillat 24.3.2020 klo 17.00-20.00 @ Google Hangouts Meet (liity kokoukseen tästä) 28.4.2020 klo 17.00-20.00 @ Google Hangouts Meet (liity kokoukseen tästä) 26.5.2020 klo 17.00-20.00 @ Google Hangouts Meet (liity kokoukseen tästä) OSM-kartoitusillat 14.4.2020 klo 17.00-20.00 @ Google Hangouts Meet (liity kokoukseen tästä) 12.5.2020 klo 17.00-20.00 @ Google Hangouts Meet (liity kokoukseen tästä) Seuraamme koronavirustilannetta jatkuvasti ja teemme muutoksia hallituksen esittämien linjausten ja THL:n suositusten mukaan.

For the next time...

Submit the first exercise ASAP, if you have not yet done so

Second exercise round has been published

Remember to continue writing the learning diary