FINNISH METEOROLOGICAL INSTITUTE

FMI Open Data

Roope Tervo | Finnish Meteorological Institute

FMI Open Source Software

Finnish Meteorological Institute opened its data

2013

FMI starts to open it's software

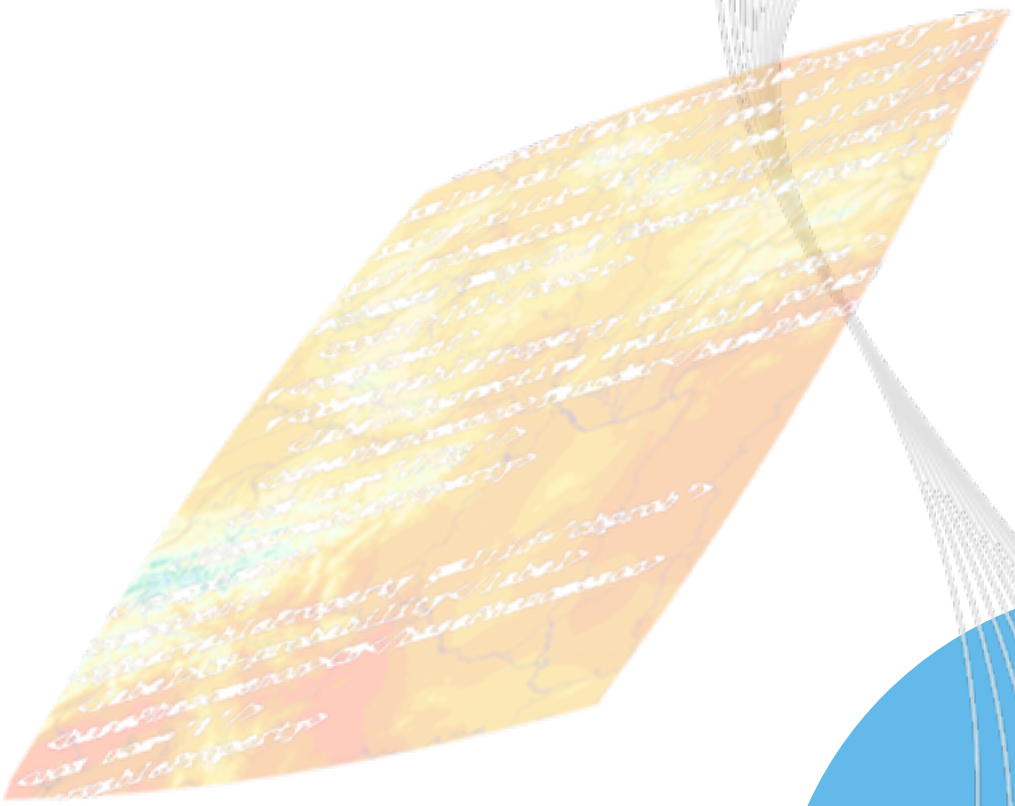
2016

FMI OPEN DATA

https://en.ilmatieteenlaitos.fi/open-data

FMI Open Data

- Finnish Meteorological Institute opened its data in 2013.
- Basically everything that FMI has property rights was opened.
  - Both (near) real-time and historical and climatological data.
- Data is provided in freely in machine readable format.



https://en.ilmatieteenlaitos.fi/open-data

Example of Data Sets

Data set	Description	Time Interval	Estimated publish date
Weather Observations	Temperature, Wind, Humidity, Ground Temperature…	10 min	Open, older data to be added
Sun Radiation	UV, Short and Long Term Radiation…	1 min	Open
Marine Observations	Waves, Sea Temperature, Sea Level…	1 h	Open
Weather Radars	Precipitation Rate, Precipitation Amount…	5 min	Open, older data to be added
Lightning	Thunder Strikes in Finland	5 min	Open

Example of Data Sets

Data set	Description	Time Interval	Estimated publish date
Real Time Observations	Real Time Observations from specific location(s)	AWS 2010 – Soundings 1959 – Flashes 1998 – Sea Level 1971 – Waves 2005 –	Open *older data will be added*
Climatological Observations	Dayly and monthly temperature mean and extreme values from weather stations	1959 -	Open
Climatological Observations	Monthly temperature and precipitation rate mean values interpolated to grid	1961 -	Open
Climatological Reference	Climatological Reference. Temperature, humidity, pressure, precipitation amount and snow depth.	Reference seasons: 1971-2000 1981-2010	Open

Example of Data Sets

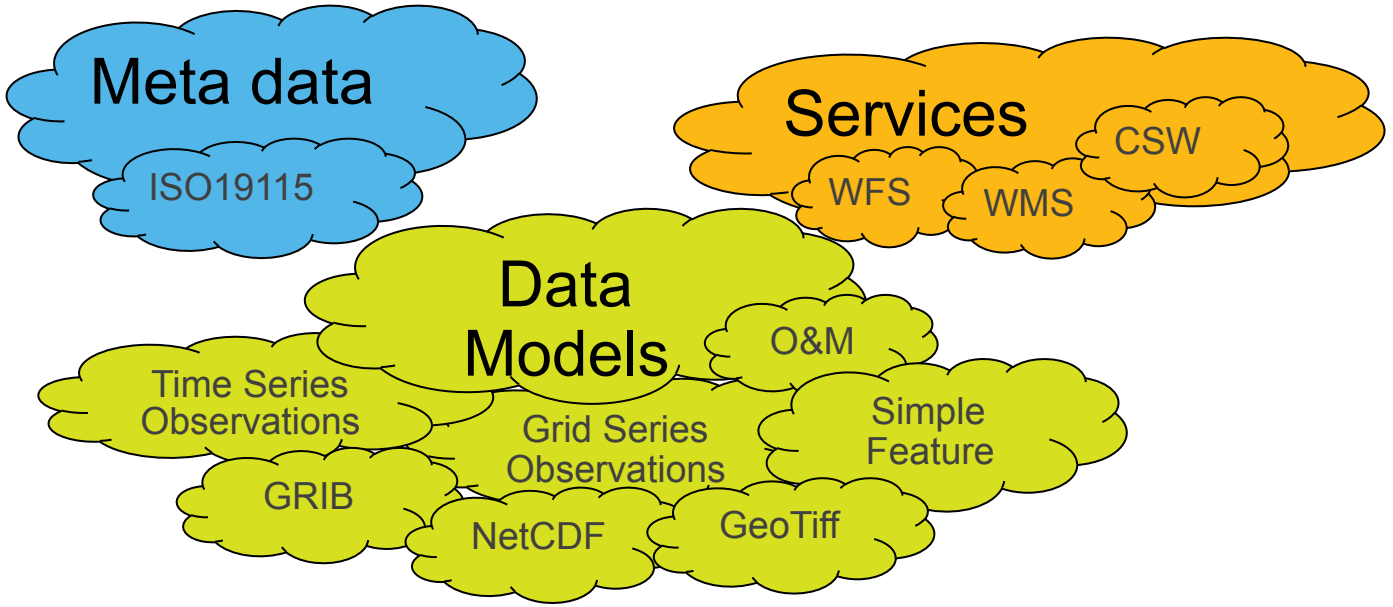
Data set	Description	Time Interval	Estimated publish date
Weather forecast model HIRLAM RCR	Point forecasts and grid data from surface and pressure levels	Latest model run (4 times a day) 0… 54 h	Open
Weather forecast model Harmonie	Point forecasts and grid data from surface, pressure and model levels	Latest model run (4 times a day) 0… 54 h	Open
Sea forecast models	Sea level point forecasts, Wave (WAM) and current (HBM) as grid data, Ice model HELMI	Latest model run (4 times a day) 0...54 h	Open
Environmental Monitoring Facilities	Weather observation stations, radars…		2016-2017

Example of Data Sets

Data set	Description	Time Interval	Estimated publish date
Aviation Observations	METAR	30 min	Open
Mast observations	Special observations from masts		Open
Air Quality Observations	Air Quality Observations	1h	Open
Silam Model	Dispersion Model for Air Quality, Forest Fire and Pollen	Latest model run (once a day) 0…96h	2017
Soundings	Temperature, Humidity, Pressure, Wind from ground to 25 km height	2 times a day	2017
Road Weather Observations (LIVI)	Road Weather Observations	10 min	Open

FMI Open Data Portal

FMI Open Data Portal follows INSPIRE requirements.



The very same data portal works as Open Data and INSPIRE portal.

Registration

- Registration is required to use View and Download Services
  - Working email address is the only mandatory information
- After registration the user gets an API key which have to be added into all requests
  - GET parameter *fmi-apikey=…&*
  - Header *fmi-apikey; …*
  - Part of url http://*wms.fmi.fi/fmi-apikey/…/wms?*
- One can create several API keys with one email

Usage Limits

With one API key it's allowed to

- do at most **20 000** requests **per day** to Download Service
- do at most **10 000** requests **per day** to View Service
- do at most **600** requests **per 5 minutes** to both services

- If all observations from one time step is calculated to as one, little over **17 000** new data sets are published daily
  - So, with one API key it's allowed load everything once
- View service can be used for testing but can not be used as a back end for popular clients

FMI OpenData on AWS

- FMI OpenData is also distributed on Amazon Web Services (AWS) Cloud platform
- 2-years pilot
  - Hirlam surface and pressure levels in the first stage
- The objective is to
  - support public-private-partnership
  - increase the utility and effective use of weather and climate data.
- Specially convenient for users who need the whole model data
    - i.e for post-processing or generating map visualizations

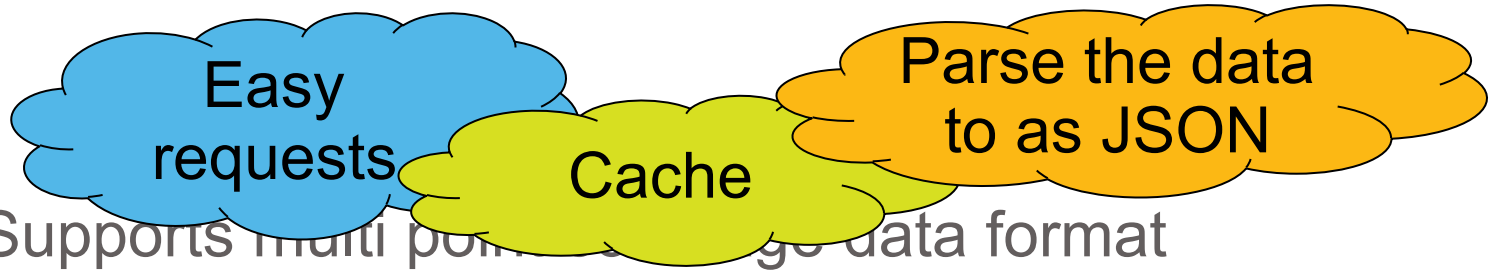
Data Models

- Observations and point forecasts as GML
  - The same data is published in:
    - GridSeriesObservations/ MeasurementTimeSeries/ SimpleFeature
- Gridded data is provided in appropriate binary format (GRIB, NetCDF, GeoTiff…)
  - WFS members contains the metadata ‘envelope’ with a link to a actual data
- Radar images in GeoTiff format via WMS

MetoLib

Please contribute!
https://github.com/fmidev/

- Open source JavaScript library produced by Finnish Meteorological Institute
- Helps users to load and use the data



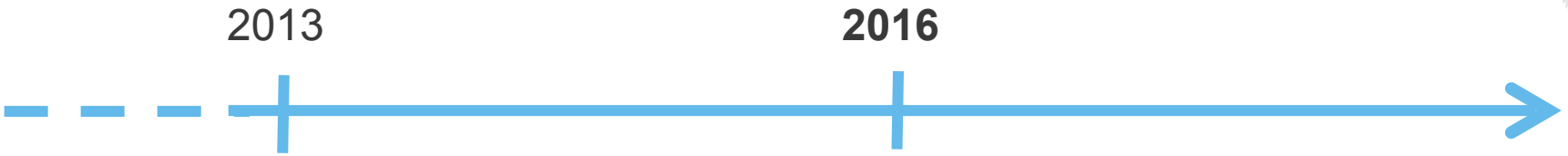
- Supports multi point [illegible] data format
- See also our python example: https://github.com/fmidev/opendata-resources/tree/master/examples/fmiopendata-client/python

Also python example available:
https://github.com/fmidev/opendata-resources/tree/master/examples/fmiopendata-client/python

FMI Open Source Software

Finnish Meteorological Institute opened its data

FMI starts to open it's software



FMI OPEN DATA

https://en.ilmatieteenlaitos.fi/open-data

License

- MIT license is recommended for all FMI OSS…
- …but every license is considered separately.
  - For example, other members of the project and/or used third party projects may require some specific license.

✓ Commercial Use

✓ Distribution

✓ Modification

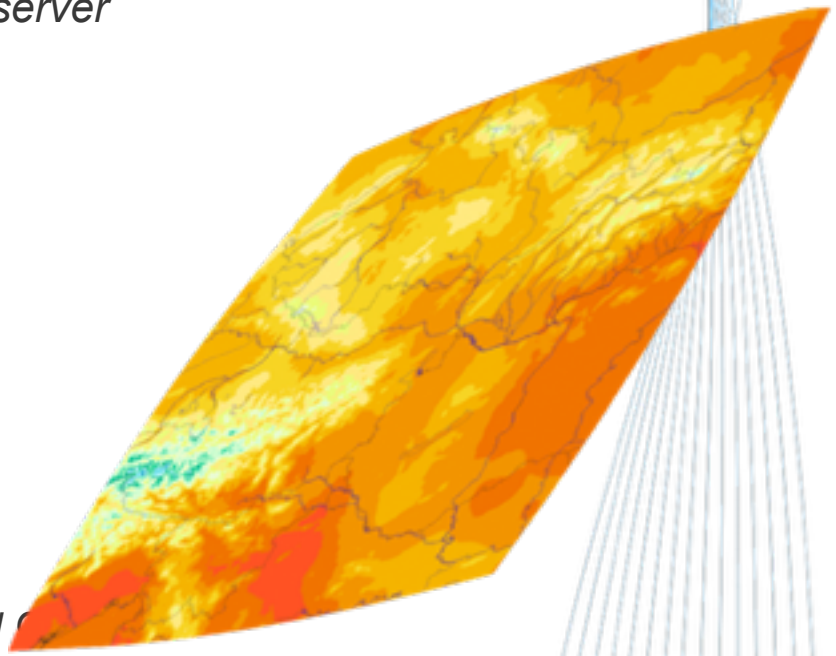
✓ Private Use

➢License and Copyright Notice required

What

Examples

- SmartMet Server (open)
  High-capacity and high-availability data and product server for MetOcean data.
- SmartMet Workstation (2018)
  Tool for visualizing and editing meteorological data
- SmartMet Alert (2019)
  Tool for creating and disseminating (supports CAP) weather warnings
- HIMAN (open)
  Post-processing suite for meteorological data
- PyTroll (open)
  Set of tools for the reading, interpretation, and writing o weather satellite data.
- SILAM (open)
  Airquality and dispersion model



Many Others

Some Open --- Some Under Investigation

- Data format conversion tools
- Product generation tools
- Observation network software and quality control
- TAC → IWXXM converters
- Radar composite and analyzing software
- …

Policies and Guidelines

- Source code and documentation in GitHub: https://github.com/fmidev

http://www.slideshare.net/tervo/
https://en.ilmatieteenlaitos.fi/open-data

FINNISH METEOROLOGICAL INSTITUTE

www.fmi.fi