

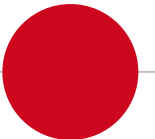
OpenVet Map

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Istituto Zooprofilattico Sperimentale delle Venezie – Italy

EuroSDR Workshop – Crowdsourcing in National Mapping – Building a VGI Map of Europe2020

Leuven 16th January 2020



● Istituto Zooprofilattico Sperimentale delle Venezie

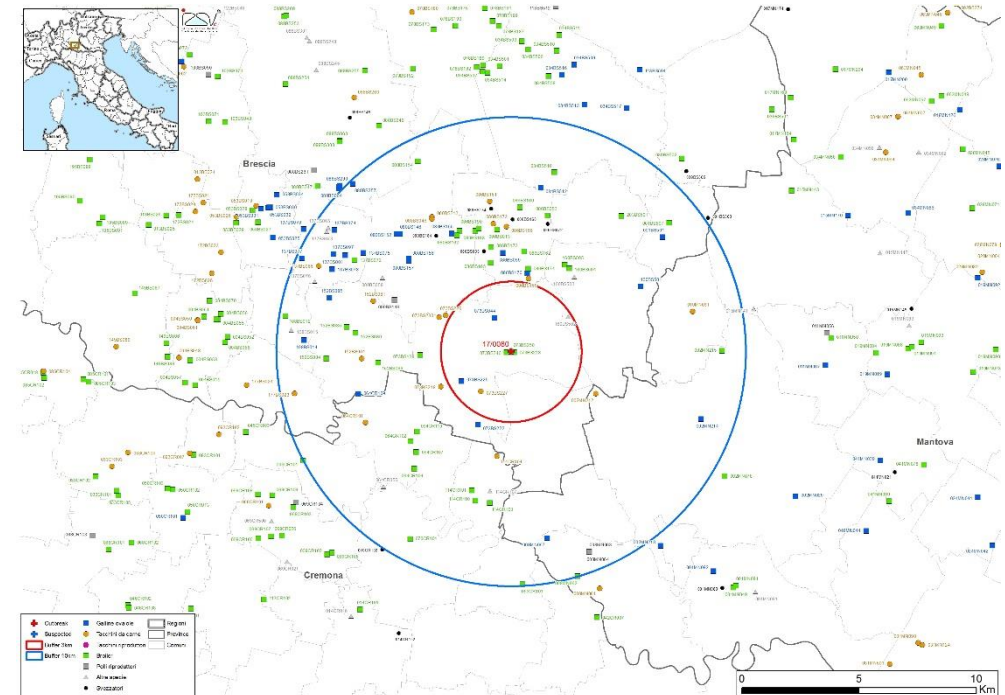


The Istituto Zooprofilattico Sperimentale delle Venezie (IZSve) is an Italian public health authority. It conducts prevention, control, research and services in the fields of animal health and food safety.



Introduction

- GIS is useful to support actions to control animal diseases, epidemiological surveillance and scientific research
- Veterinarians of Local Health Units are the main providers of spatial information in the veterinary field with the assistance of the Veterinary Institutes of their referring areas
- The **purpose** of OpenVetMap project is to increase the veterinarian information providers using volunteers and existing open information systems, such as OpenStreetMap database (OSM)





Why?

- There are countries or geographical areas without complete list of farms in their territory, and the census of all farms could be quite expensive
- Compare and improve the accuracy of information and share it between different users
- Improvement of OSM database is useful also in agronomic, zootechnical and other fields
- It is possible to extract different type of information, spatial or not spatial from OSM (e.g.: farms polygons or farms information)

● OpenVetMap PROJECT

- Will consist in a web application that will simplify the addition and the update of useful information in the veterinary and epidemiological fields in OSM
- The main goal is to increase the information available, with particular reference to farms
- The project will consist in two parts:

Application



Update information about farms in OSM

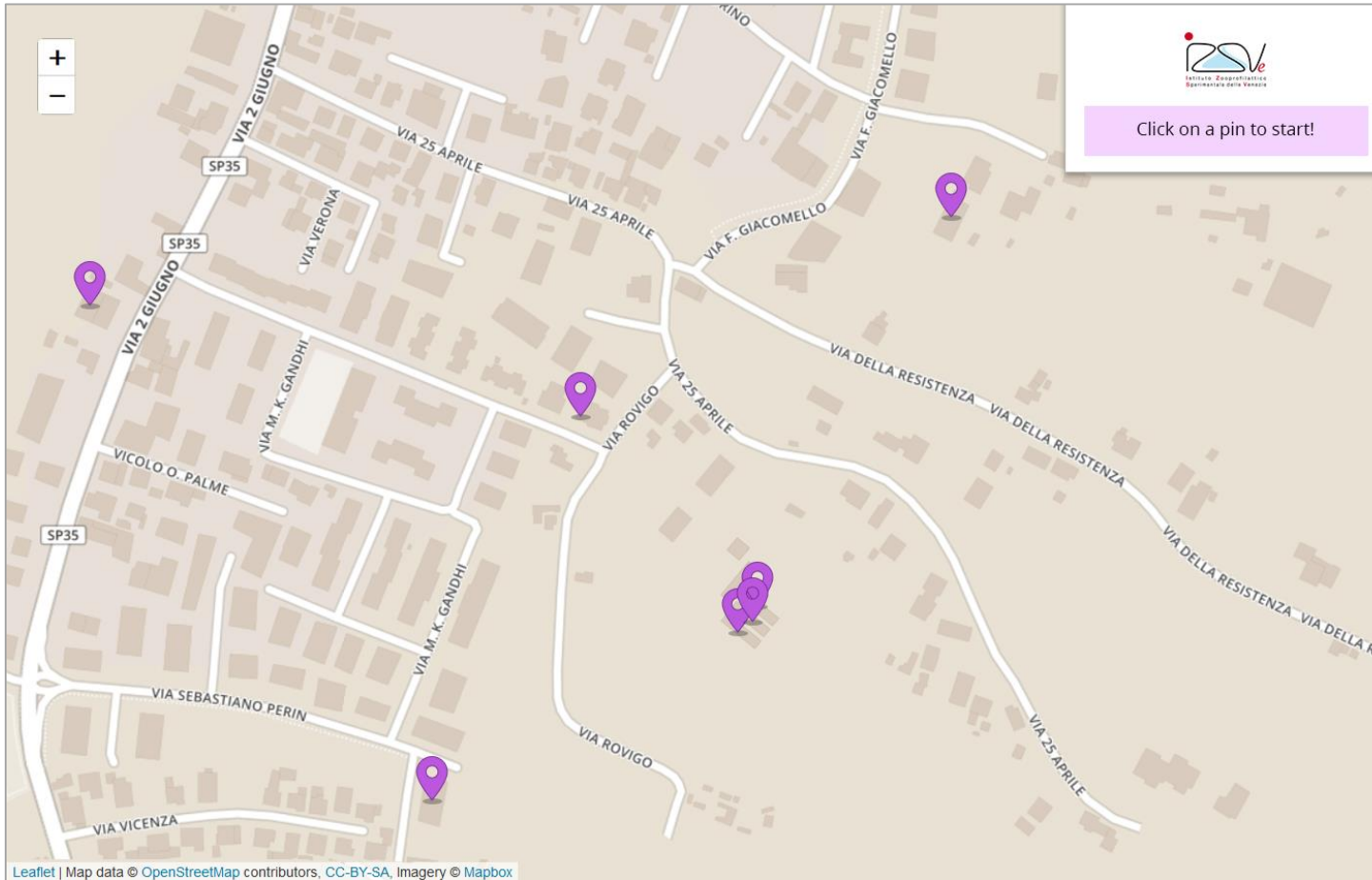
Integration and synchronization



Integration with IZSve Data warehouse (DWH)



Application part



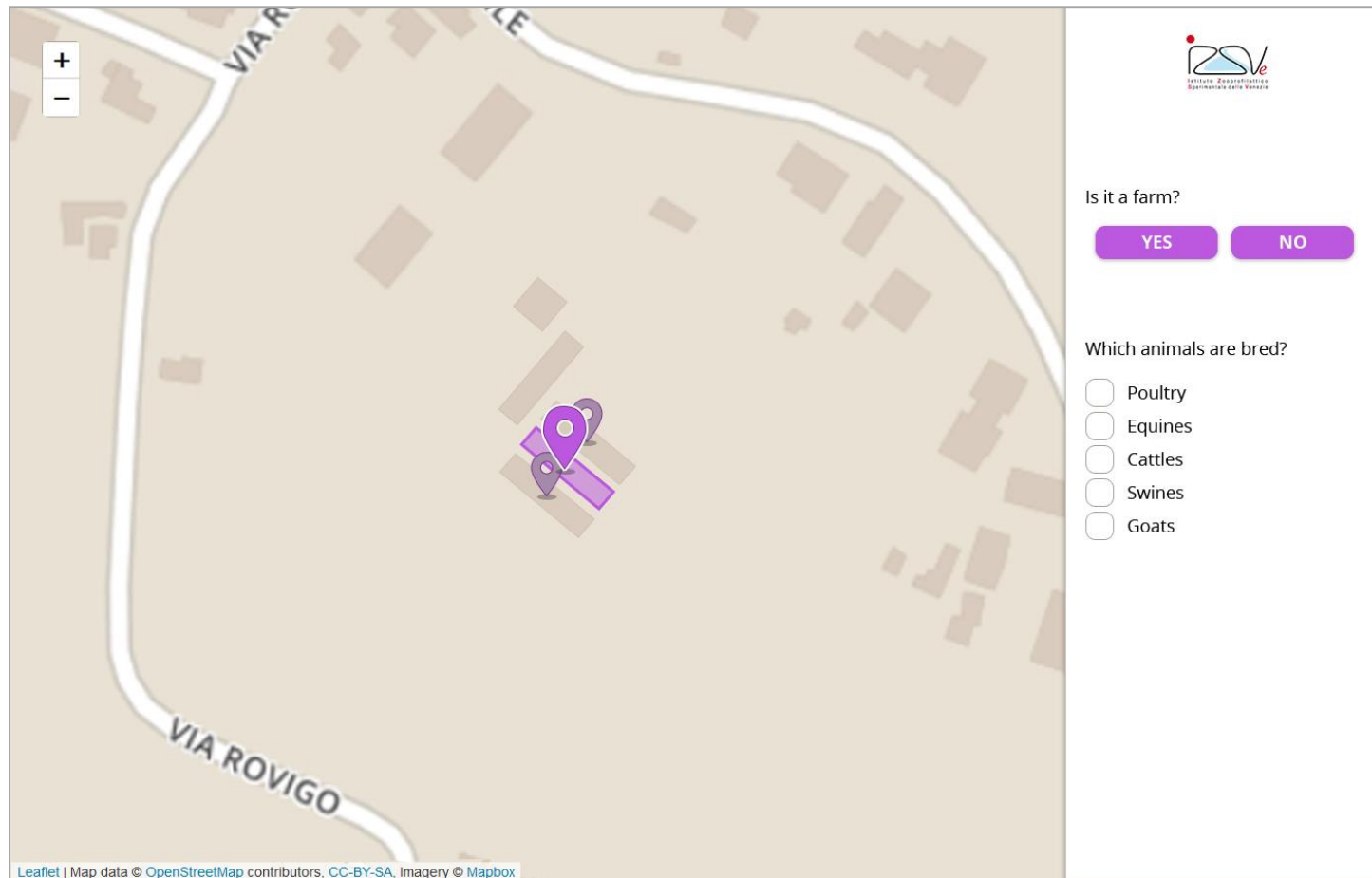
Pins will be generated on:

- OSM elements with informative gaps
- Elements not been updated for a long time
- IZSve DWH farm position.

The spatial information (position) will not be managed by the web app but by OSM tools:

- OSM id
- JOSM

Application part



IZSVe
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Is it a farm?

YES NO

Which animals are bred?

☐ Poultry
☐ Equines
☐ Cattles
☐ Swines
☐ Goats

Leaflet | Map data © OpenStreetMap contributors, CC-BY-SA, Imagery © Mapbox

Users will be guided to fill in information

Type of production:

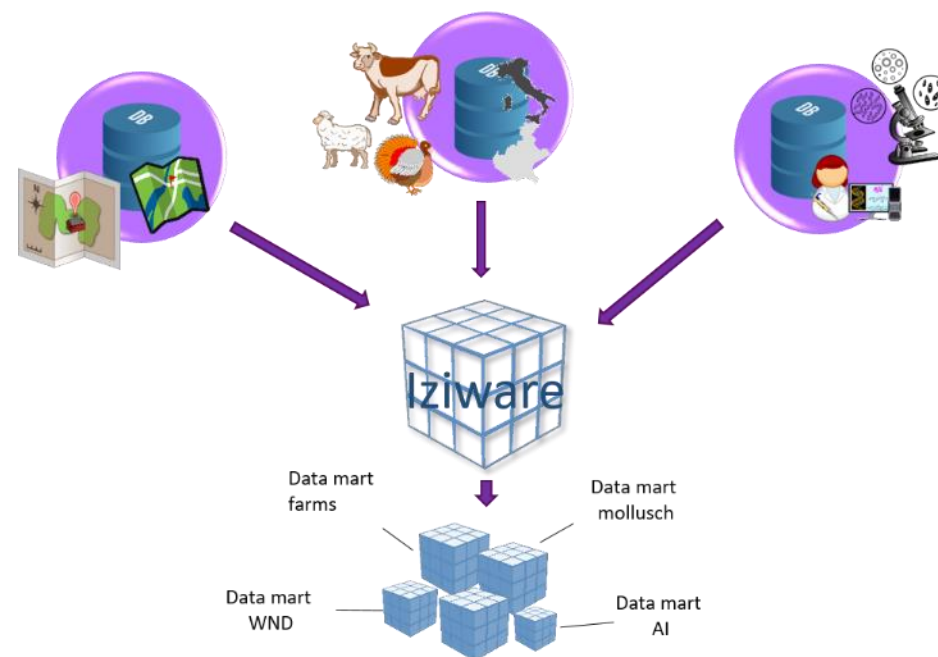
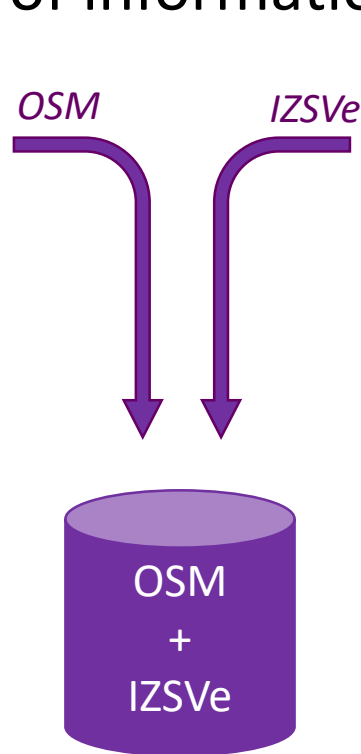
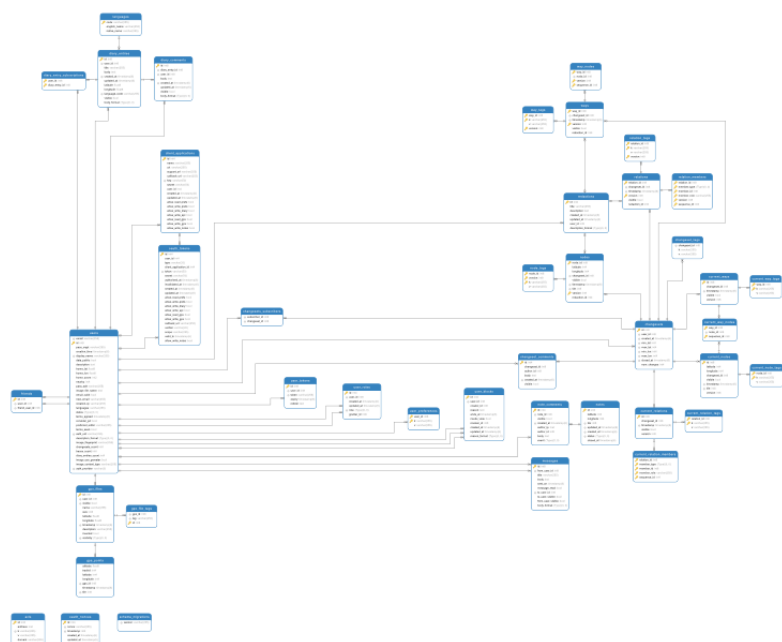
- ☐ Meat
- ☐ Eggs
- ☐ Grower

Type of landuse:

- ☐ Farmyard
- ☐ Farmland
- ☐ Meadow

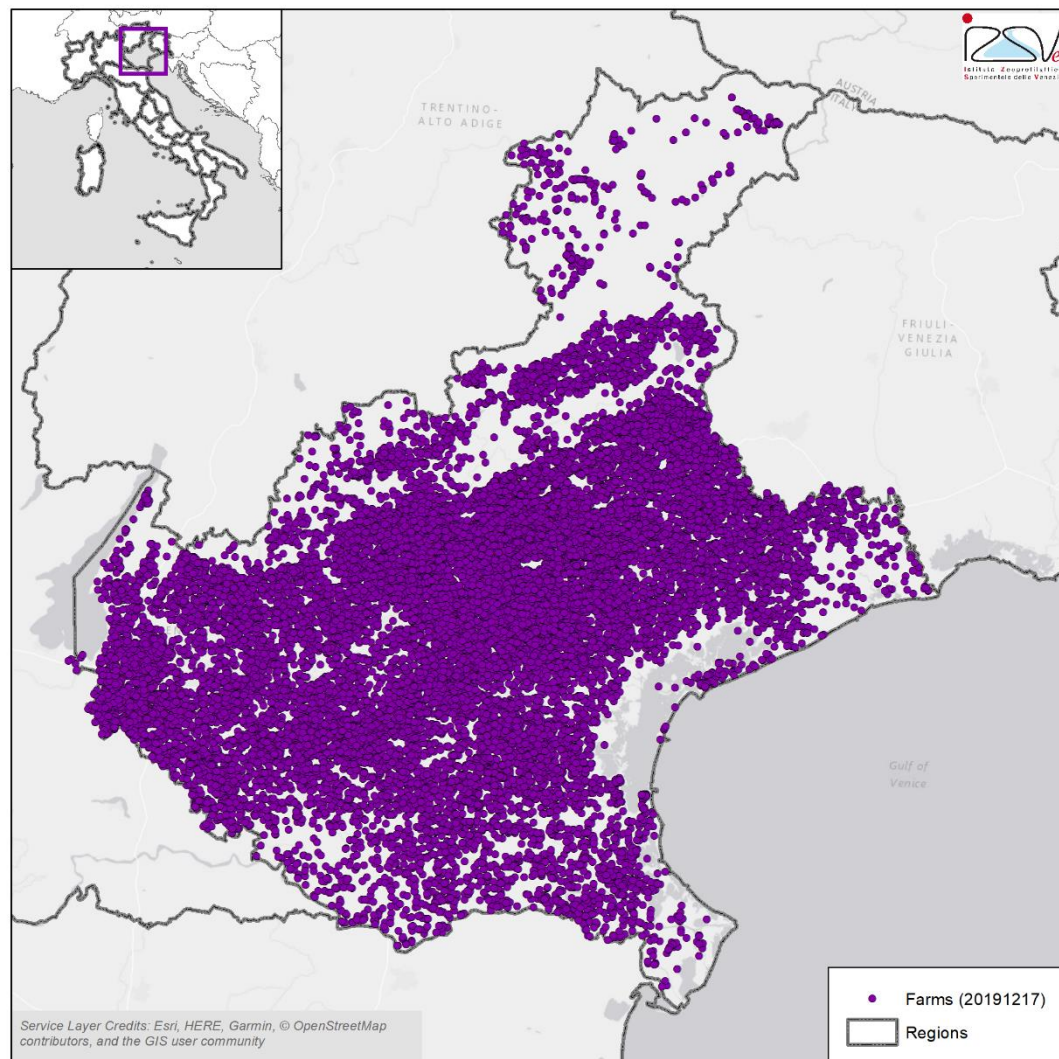
Integration and Synchronization part

- The integration and synchronization part will combine the information of OSM with IZSVe DWH farms to create a local database where data will be daily updated
- OSM allows a limited number of queries to its database and each query may request a limited number of information

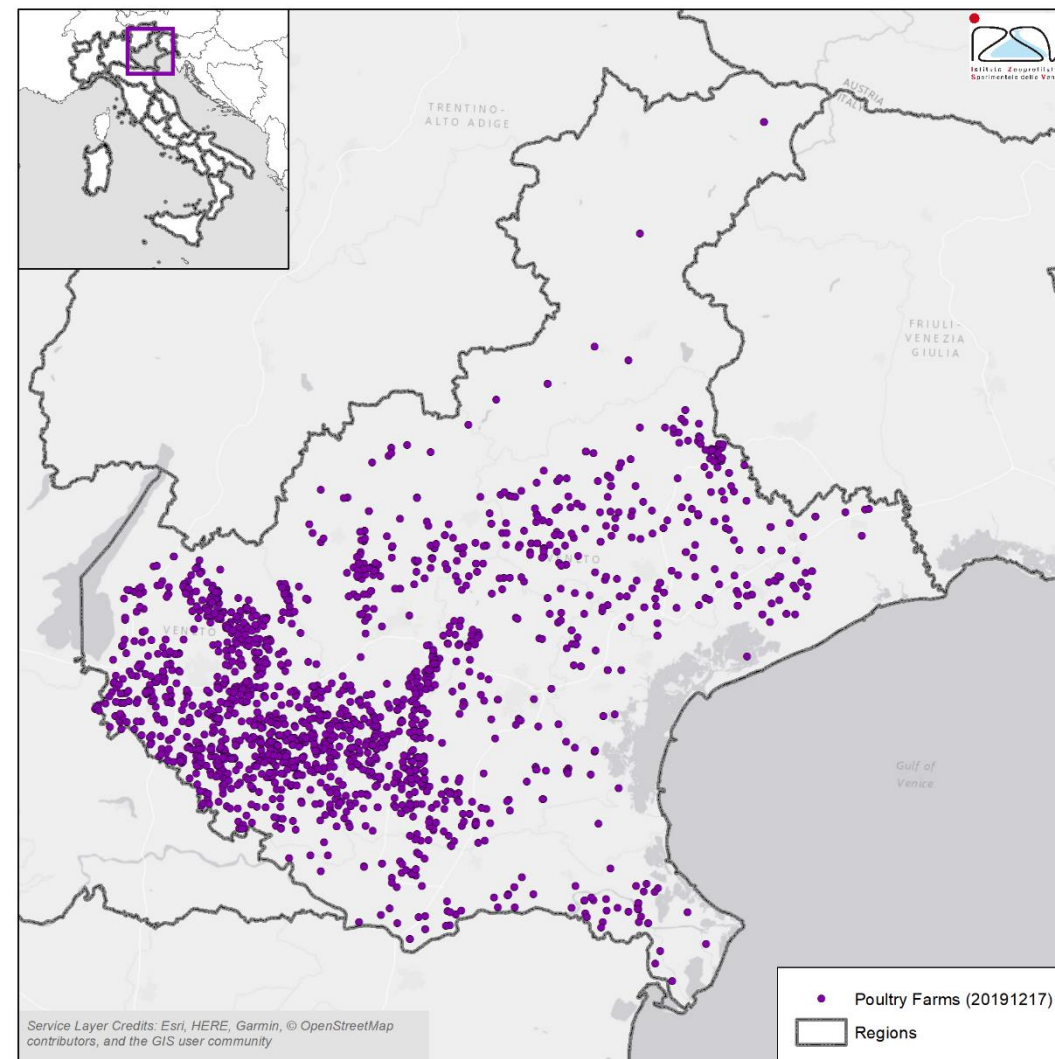




IZSve farm data



Active georeferenced farms in the national database (BDN) for Veneto region.



Active georeferenced poultry farms in national database (BDN) for Veneto region.

● OSM Query to extract farms data

Landuse

landuse=farmyard

amenity=animal_breeding

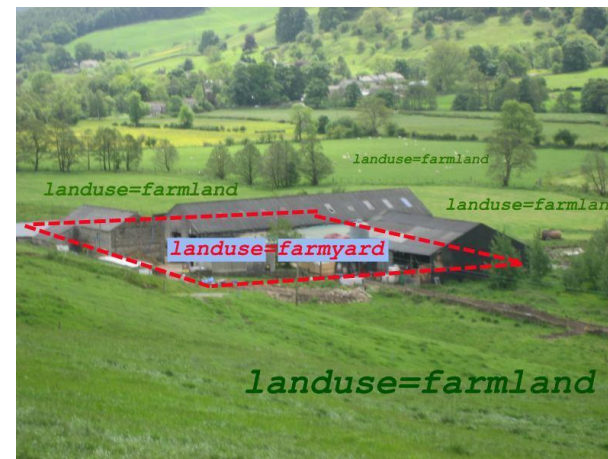
animal_breeding=chicken;goose

produce=meat

Building

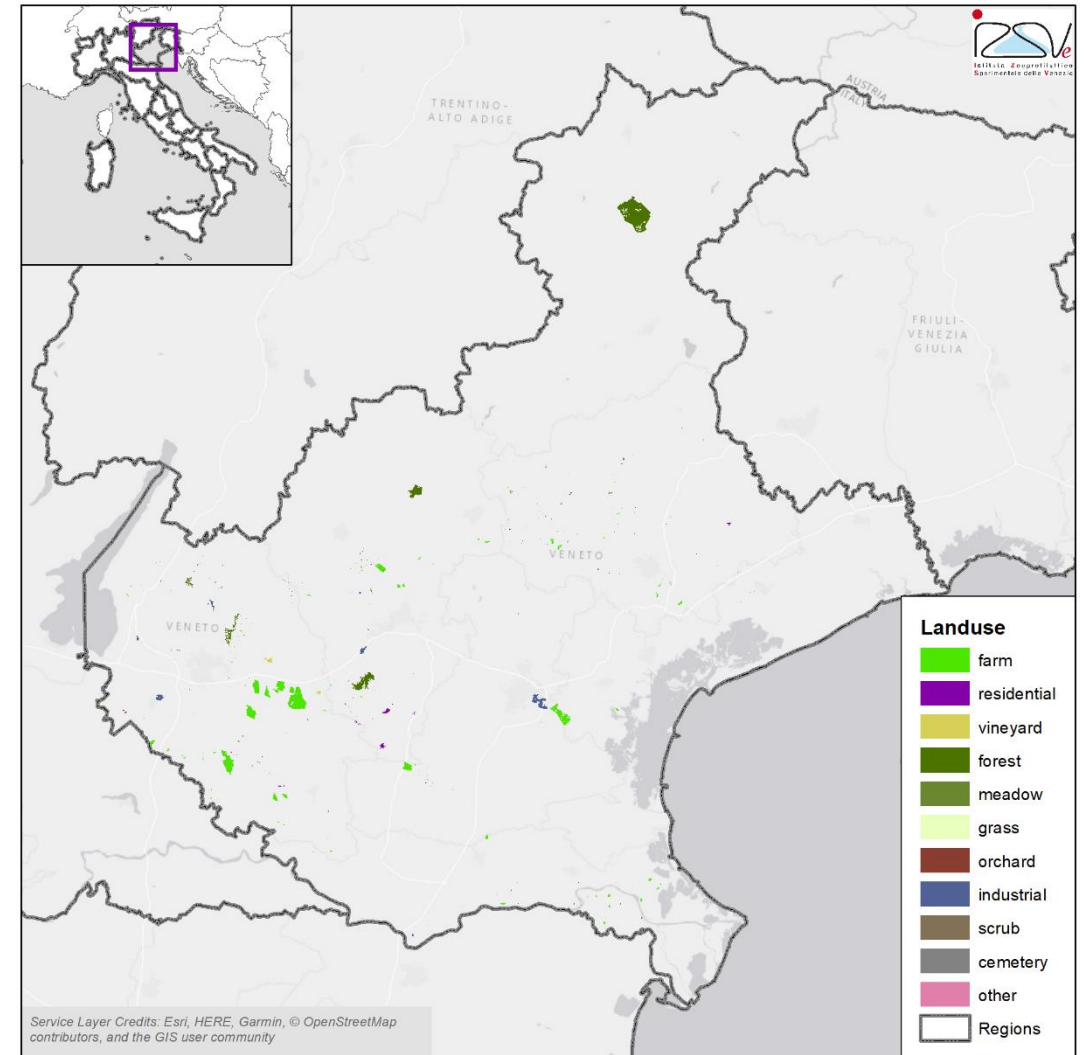
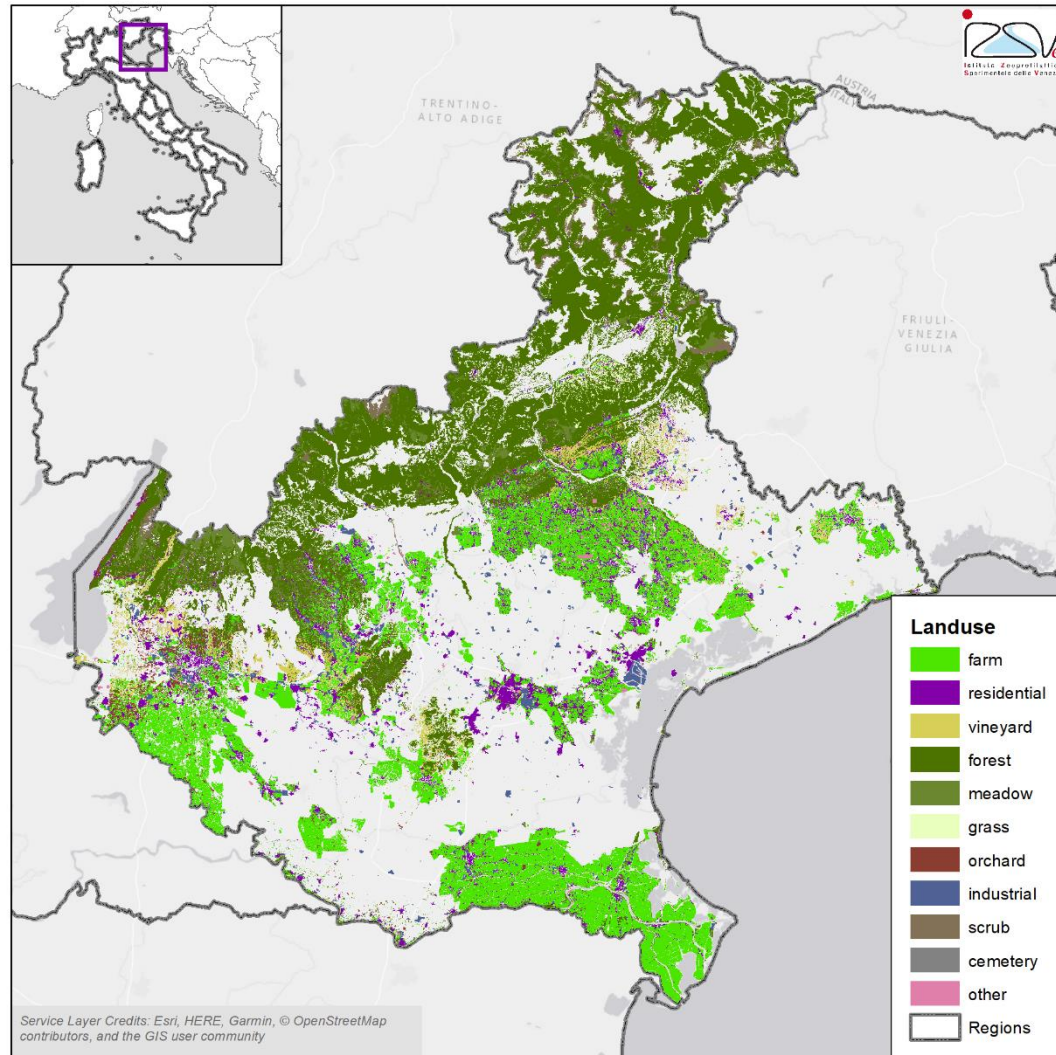
building=poultry_house

livestock=chicken





OSM Landuse

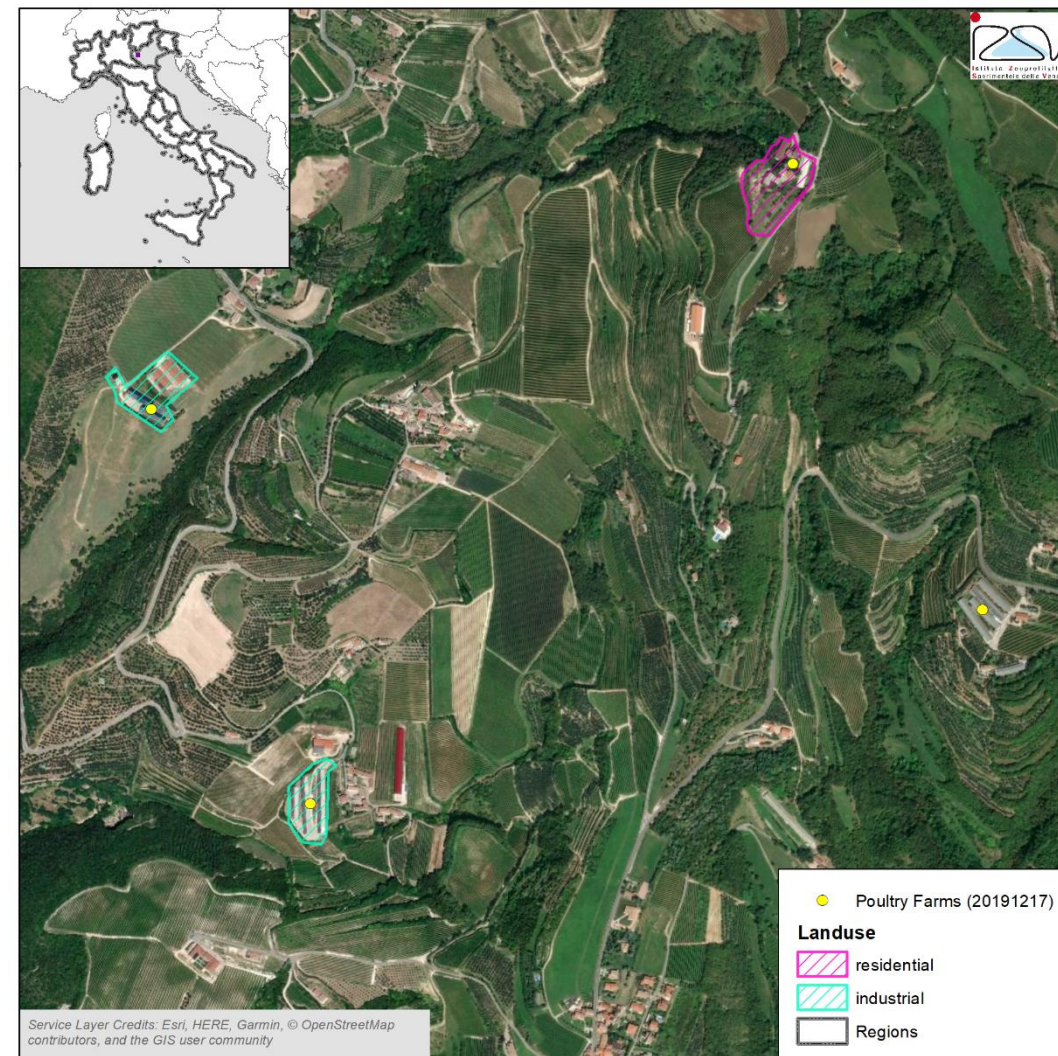


OSM Landuse: compare OSM information with IZSVe DWH

Poultry farms within or not in a landuse polygon OSM

Province	Out of	Within	Count
Belluno	88%	13%	8
Padova	91%	9%	231
Rovigo	40%	60%	78
Treviso	48%	52%	191
Venezia	84%	16%	56
Vicenza	69%	31%	258
Verona	76%	24%	872
Count			1694

27 % of poultry farms fall inside a landuse polygon

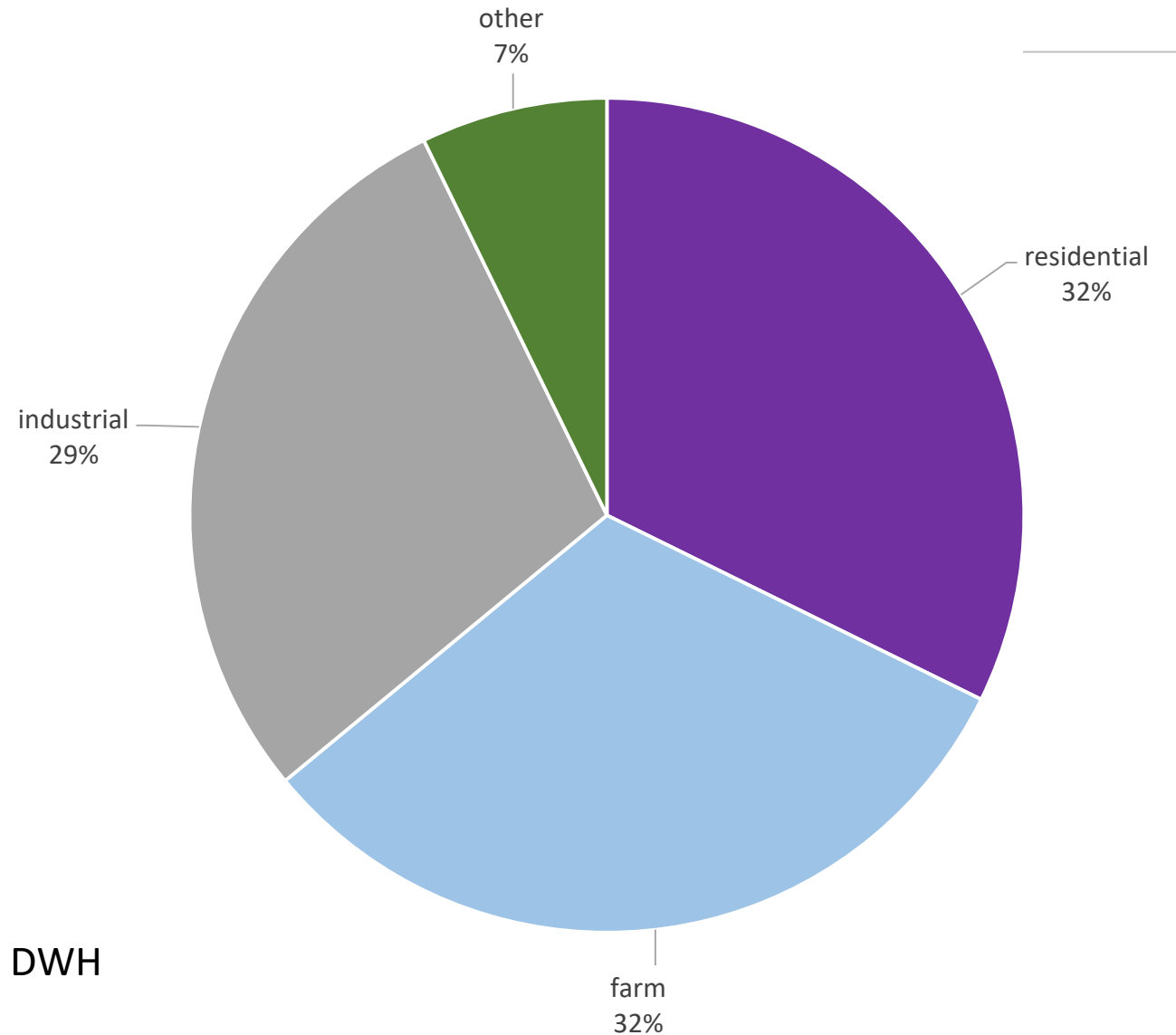


Satellite image with OSM landuse polygons.



OSM Landuse: type

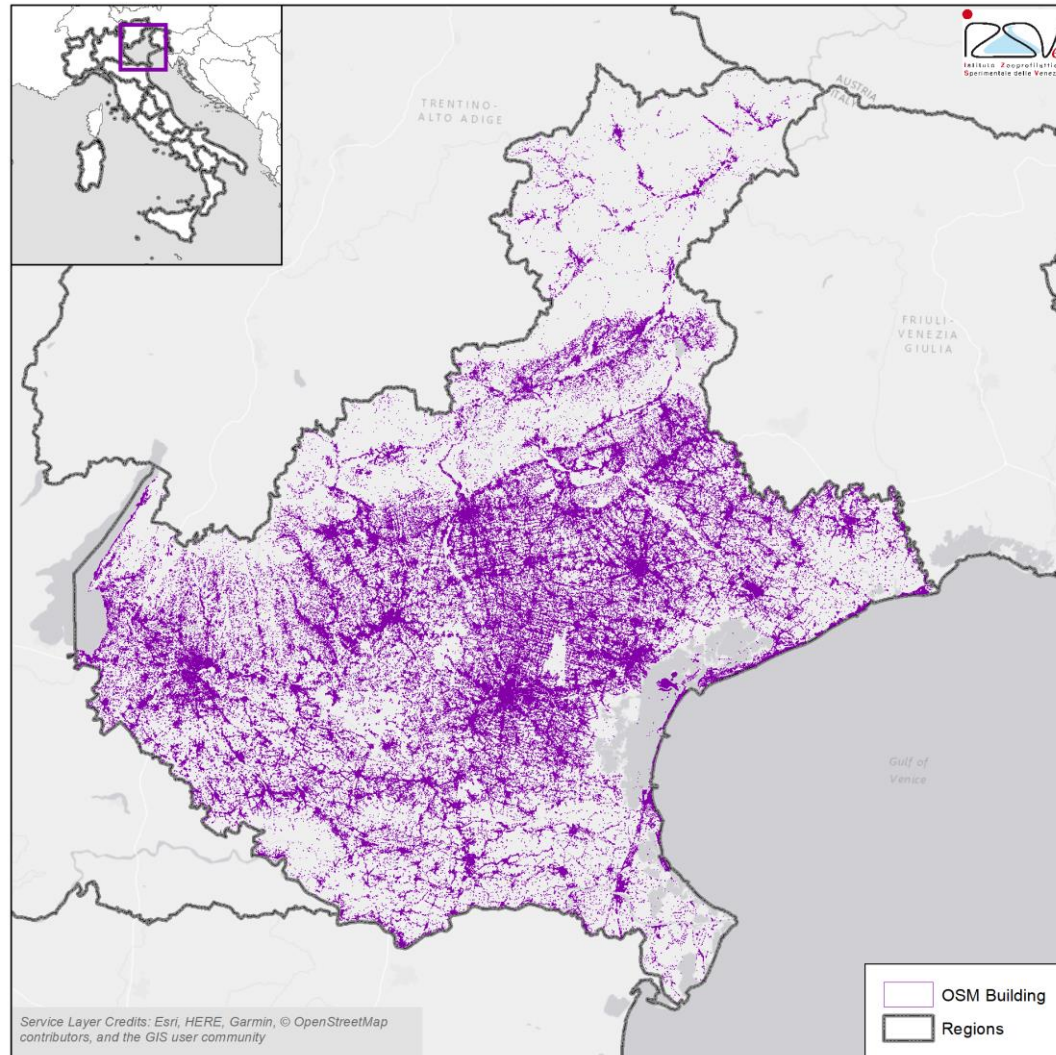
Landuse type	Count
residential	183
farm	180
industrial	163
meadow	11
orchard	9
vineyard	8
forest	8
grass	4
quarry	1
Count	567



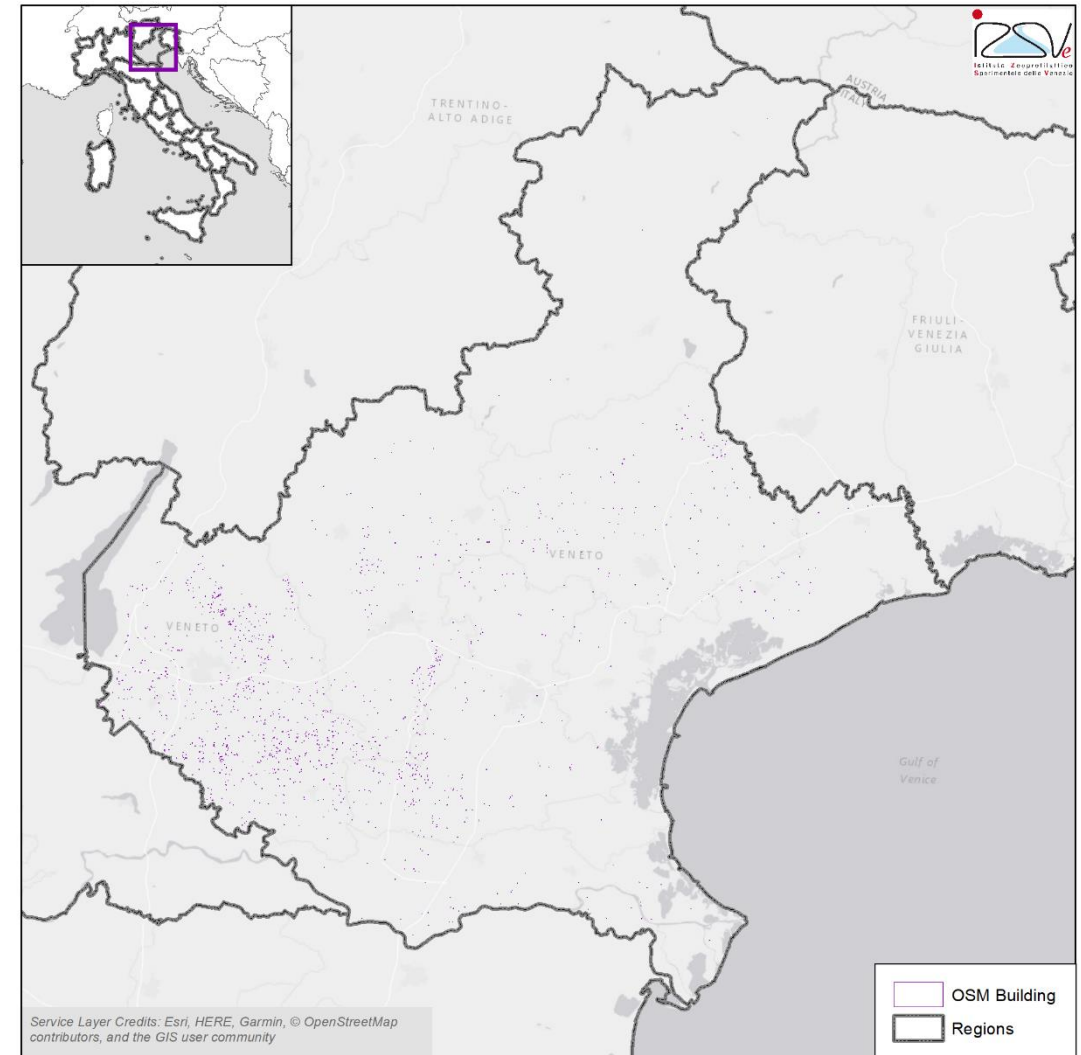
Only 9 % of OSM data are compliant with IZSve DWH



OSM Building

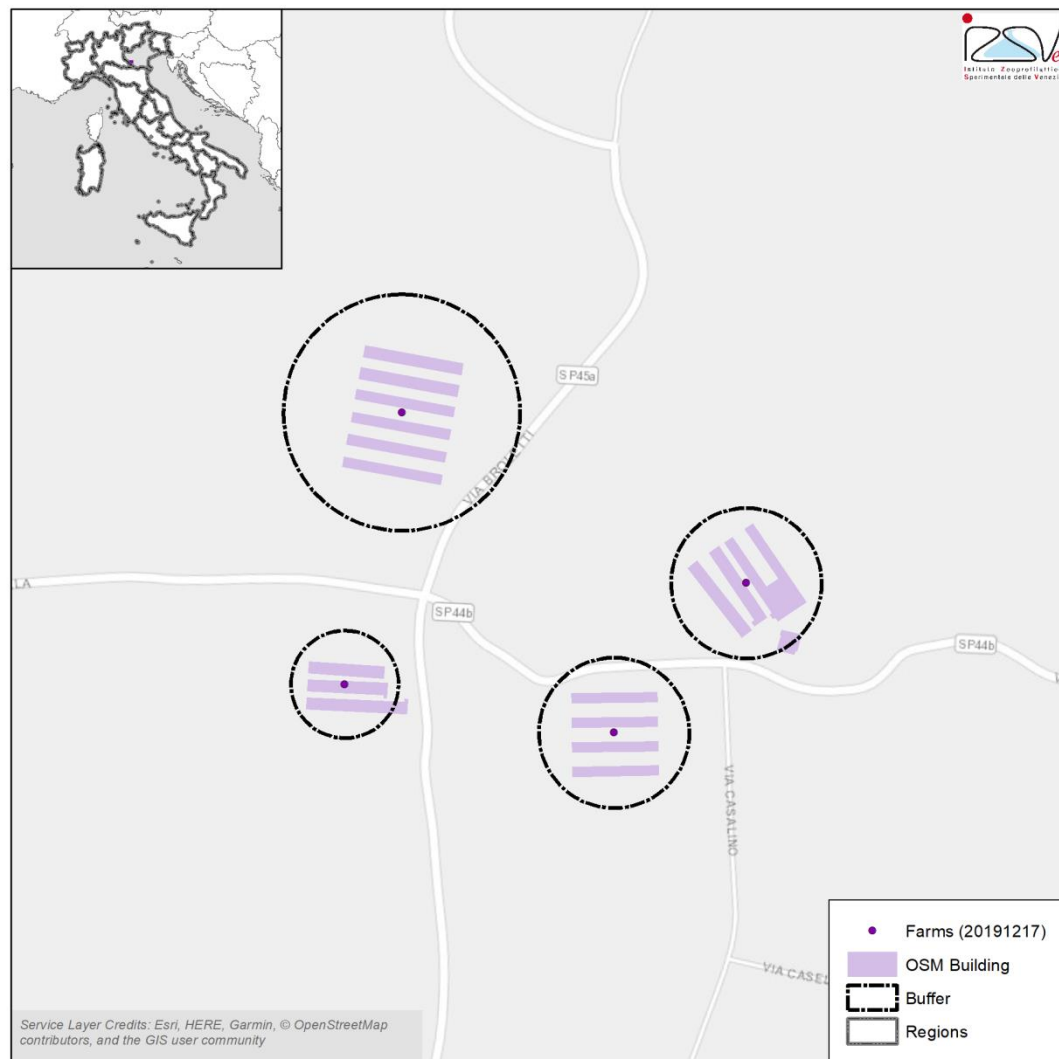


OSM building of Veneto region.



OSM building polygons that intersect poultry farms buffer.

OSM Building: compare OSM information with IZSVe registry



Zoom to OSM building that intersect poultry farms buffer.



Satellite background and OSM building that intersect poultry farms buffer.

OSM Building: compare OSM information with IZSVe DWH

Poultry farms with or without at least 1 building in OSM

Province	Without	With	Count
Belluno	63%	38%	8
Padova	17%	83%	231
Rovigo	28%	72%	78
Treviso	28%	72%	191
Venezia	23%	77%	56
Vicenza	33%	67%	258
Verona	7%	93%	872

83% of poultry farms have at least 1 building in OSM

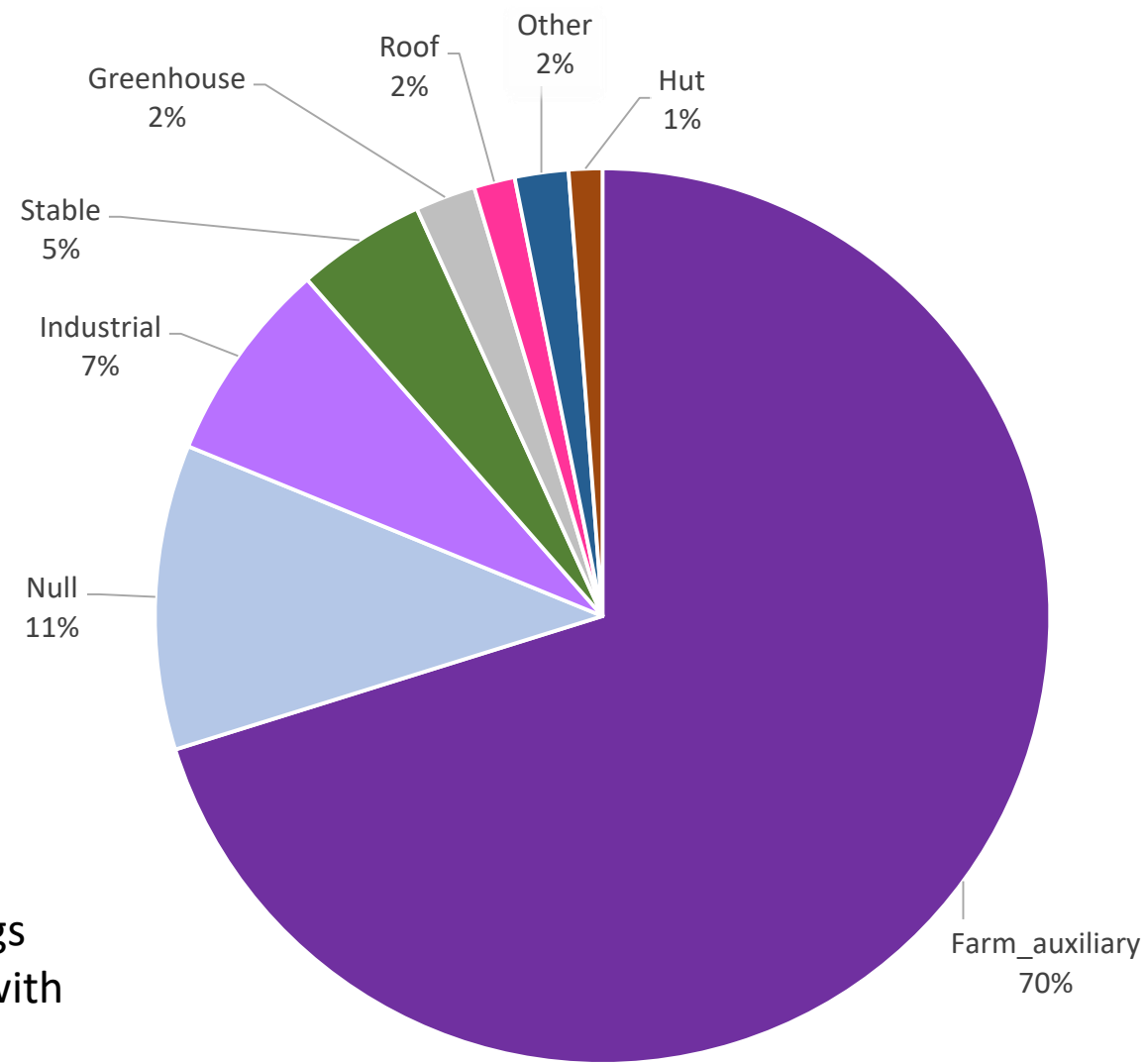


Area without OSM buildings of poultry farms.



OSM Building: type

Type	Count
Farm_auxiliary	2608
Null	409
Industrial	273
Stable	173
Greenhouse	81
Roof	55
Hut	45
House	21
Cowshed	20
Agriculture	11
Shed	8
Barn	4
Residential	3
Warehouse	2
Collapsed	2
Construction	1
Count	3716



56% of OSM buildings data are compliant with IZSVe DWH



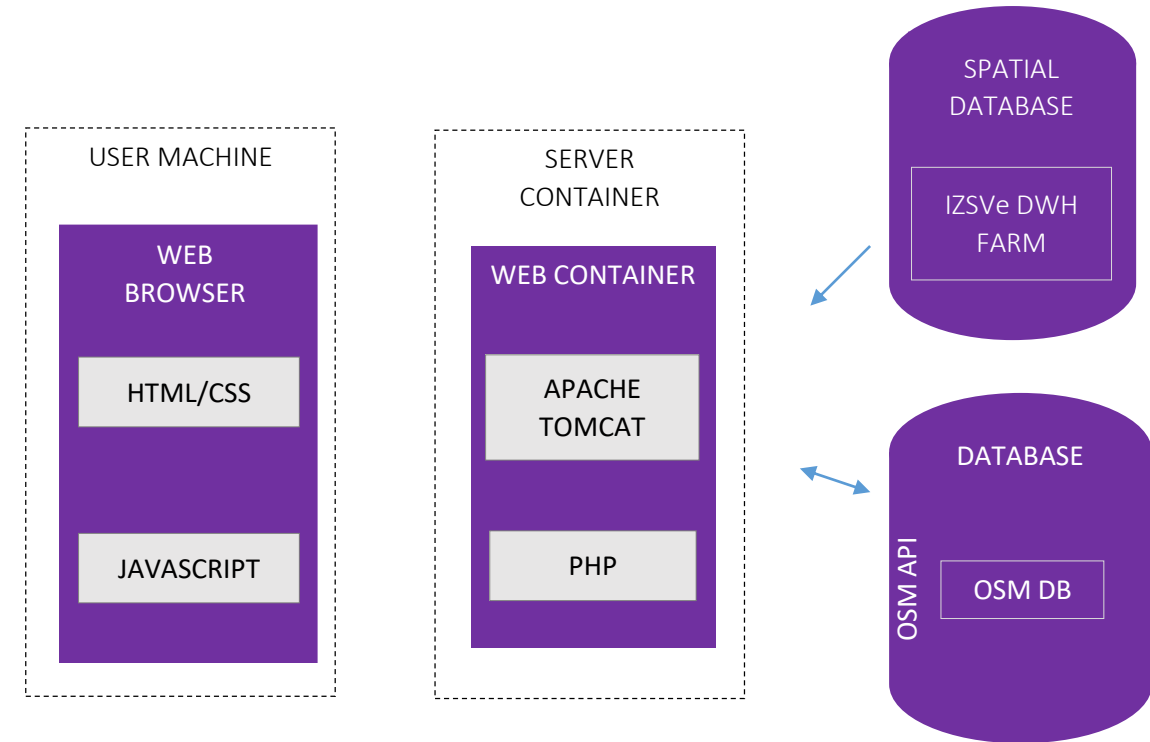
Observation

- Buildings: have a good starting point because the geometries are already present in OSM and we will focus more on improving the description
- Landuse: will require a greater effort → 73% of the geographical component is missing

Architecture

Web Application

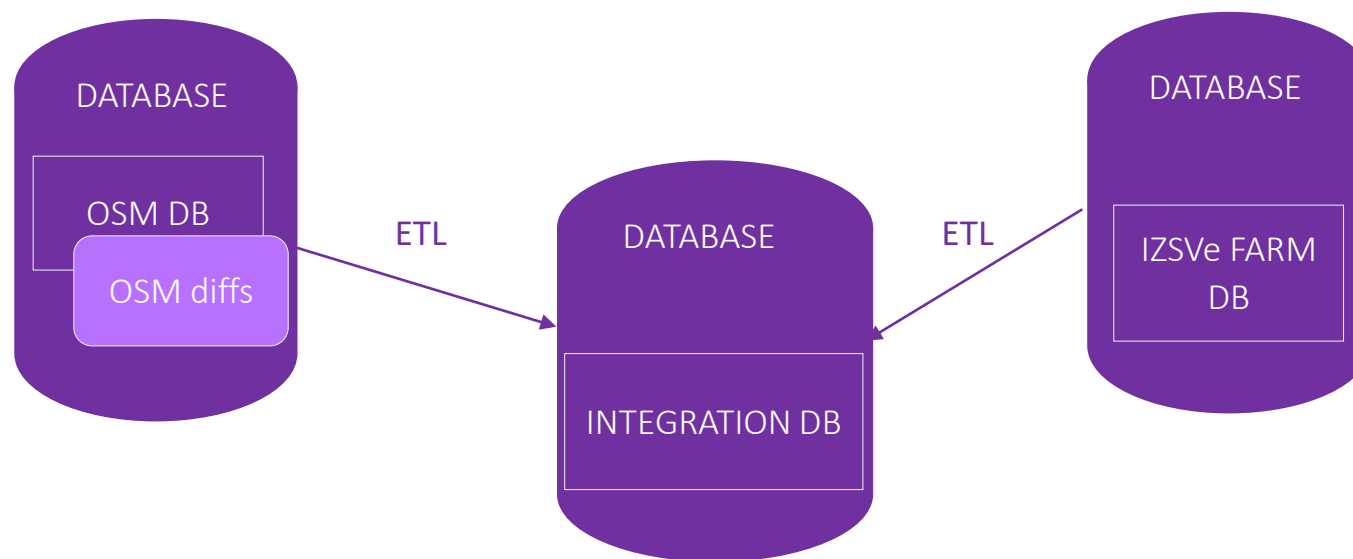
- The front-end web application:
 - developed in HTML, CSS and Javascript
- the server side:
 - developed in PHP
- the databases:
 - IZSve DWH spatial database
 - OSM database (PostgreSQL database) with specific API to read and edit data (API v.06, OverpassAPI).



Architecture

Integration and synchronization

- New database that combines OSM farms data and IZSve DWH farms
 - PostgreSQL + PostGIS
 - OSM diff



Conclusion

- The project:
 - will improve our farm data
 - will share a common database
 - will allow to extend the procedure to other fields (e.g. wetlands for avian influenza disease)

● Final remarks

- Gather suggestions, advise on how to develop the project:

OSM

How best to interface
with the OSM
community?
How share data
massively?

Tools

Already exist similar
tools?

Partnership

Join the project



Thank you

pbonato@izsvenezie.it

Acknowledgments

This work is funded by National Research:

- Studio del ruolo di volatili selvatici non acquatici come potenziale specie ponte nella trasmissione di malattie virali alle popolazioni domestiche (IZS VE 11/19 RC)
- Metodiche non invasive per la valutazione della risposta allo stress da trasporto in cavalli sportivi e da carne (IZS VE 06/16 RC)

Credits

Poultry farm picture: Id: 796784500 – Shutterstock

OpenStreetMap database schema : https://wiki.openstreetmap.org/w/images/thumb/5/58/OSM_DB_Schema_2016-12-13.svg/733px-OSM_DB_Schema_2016-12-13.svg.png

Landuse picture: <https://wiki.openstreetmap.org/wiki/File:Landuse%3Dfarmland.jpg>