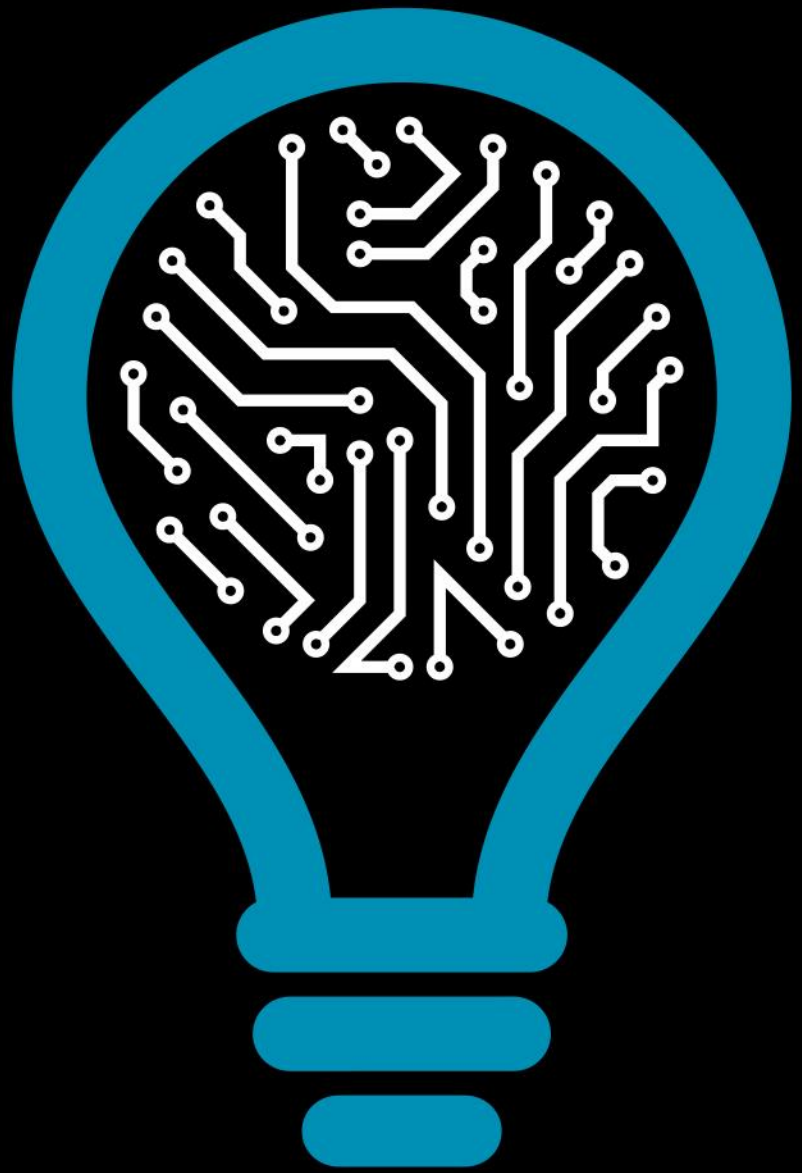
INFRAVINI – Thematic Spatial Data Infrastructure for Vineyard Climate Change Management

Lino Oliveira

Geospatial World Forum 2021, SDG & Circular Economy

20-22 October 2021 | Amsterdam, The Netherlands



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INSTITUTE FOR SYSTEMS AND COMPUTER ENGINEERING, TECHNOLOGY AND SCIENCE

- **RATIONALE**
  - Problem, Motivation, Opportunity
- **SPATIAL DATA INFRASTRUCTURE**
  - Thematic SDI for Vineyard Climate Change Management
- **CASE STUDY**
  - Douro Valley
- **FINAL NOTES**

Rationale

Rationale

Problem

- **Adapting to climate change is one of the biggest challenges for the wine sector.**
  - **Temporally**, adaptation strategies and policies must deal with potential impacts, both short and long term;
  - **Location-based**, and context-specific adaptations are essential in decision making.

Rationale

Motivation

- **Develop an instrument capable of supporting winegrowers to become more resilient to climate change.**
  - Each wine region has unique contexts (terroirs);
  - Essential to identify and prioritize climate change adaptation initiatives;
    - Knowledge and understanding of contextual factors, and their interaction with the regional climate.
  - The quality and updating of the information available is a major factor in decision making.

Rationale

Opportunity

- **The creation of a Thematic Spatial Data Infrastructure (SDI) for Supporting Vineyard Climate Change Management.**
  - Allow to gather and make available relevant geospatial data on climate change;
  - Include climatic and agronomic indicators, allowing the analysis and normalization of local sensory and forecast climate information;
  - Provide an observatory that monitors both the impact of meteorological variability and the impact of climate change.

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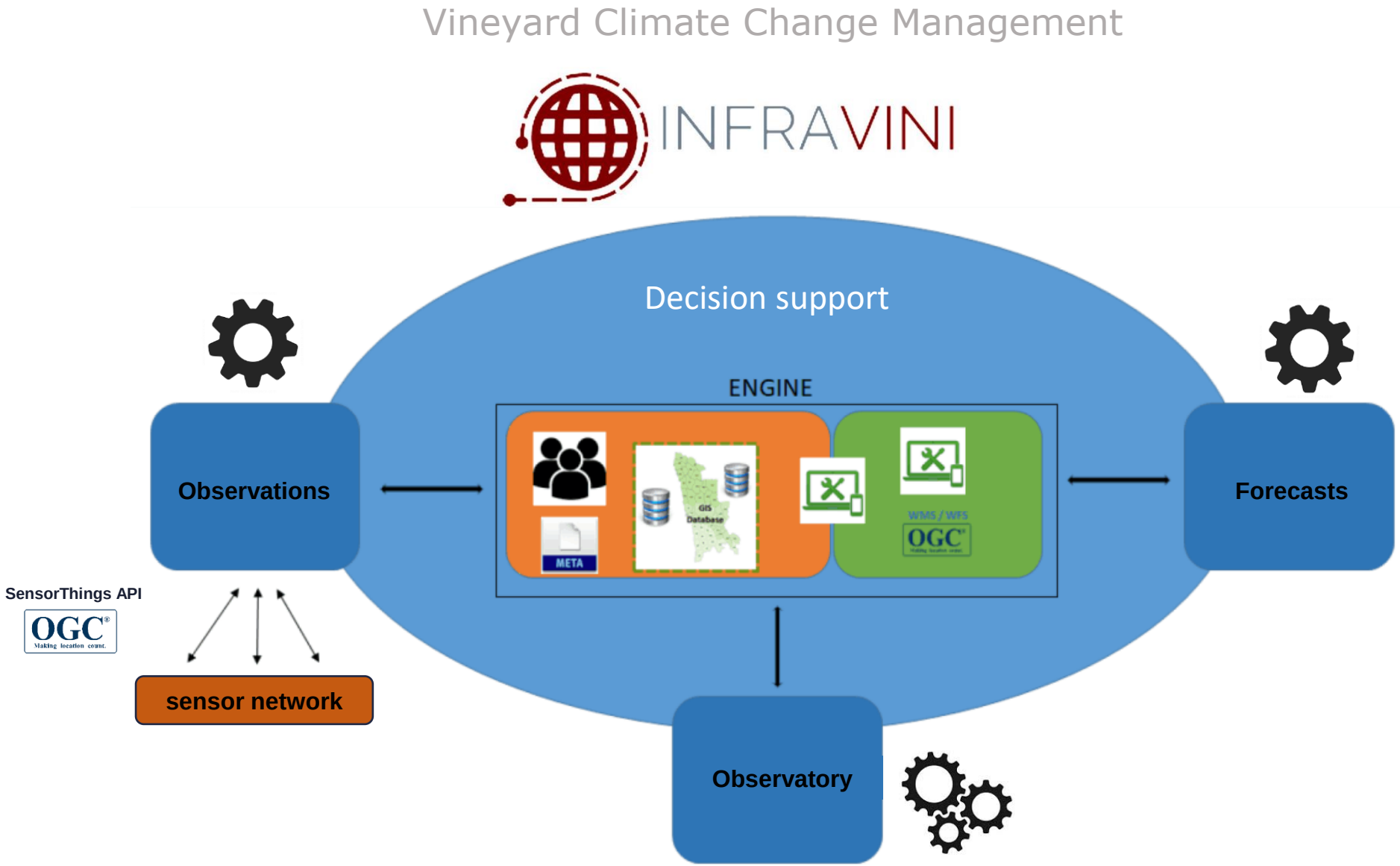
Spatial Data Infrastructure

Spatial Data Infrastructure (SDI)



Monitor both the impact of meteorological variability and the impact of climate change

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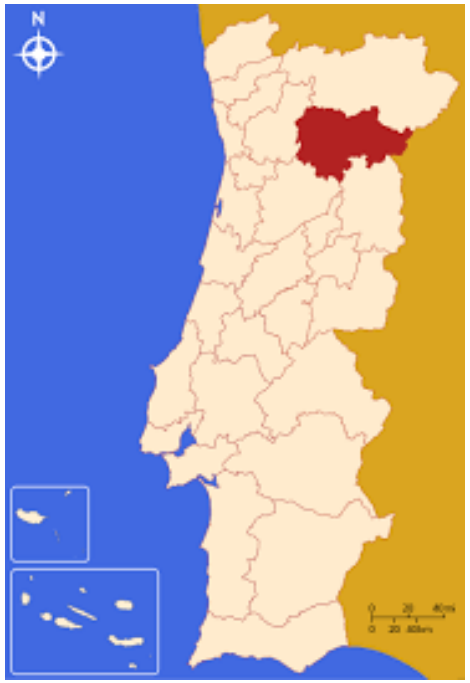
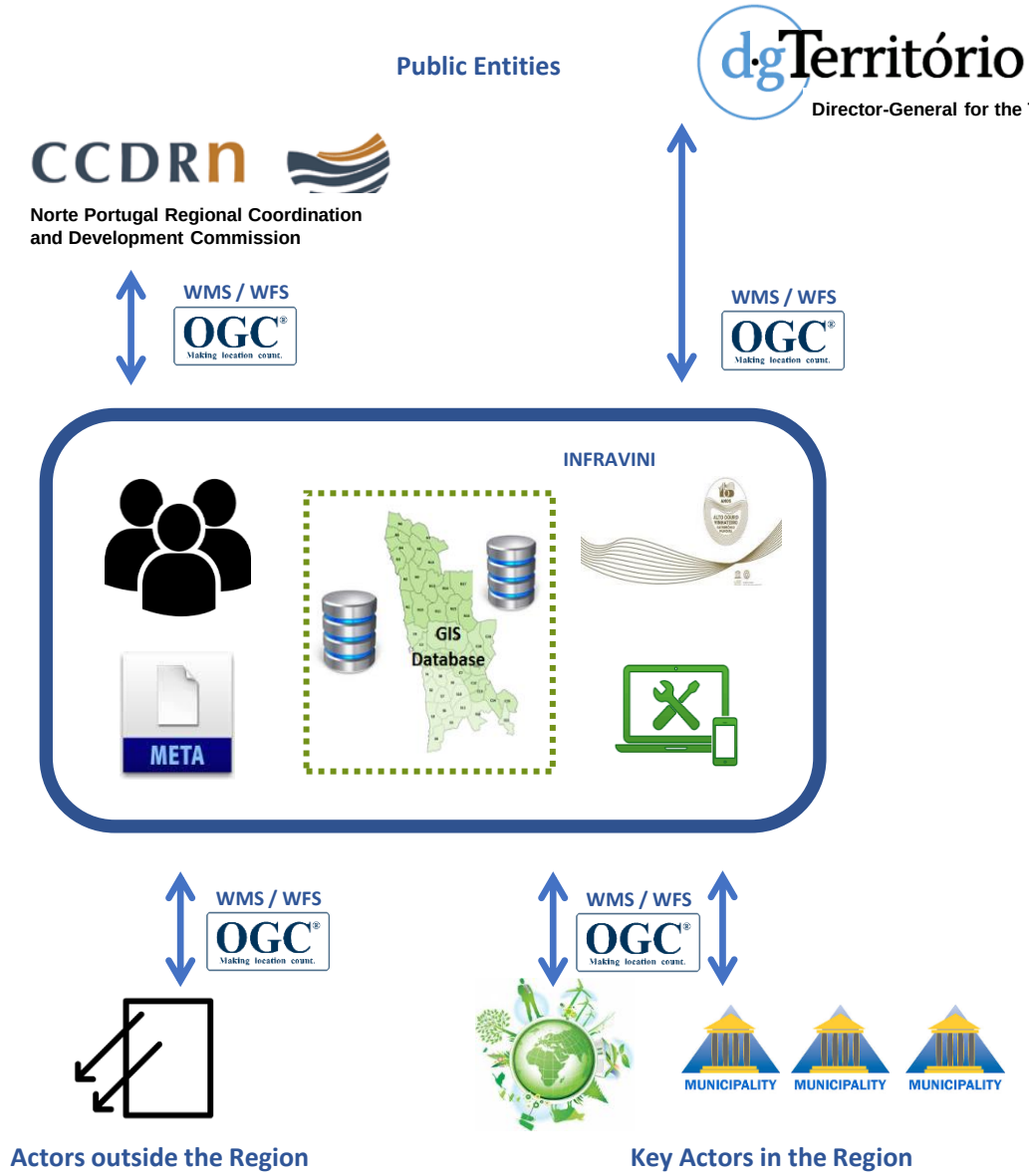
Case Study

Case Study

- **Douro wine region in the northern Portugal, classified as UNESCO world heritage site.**

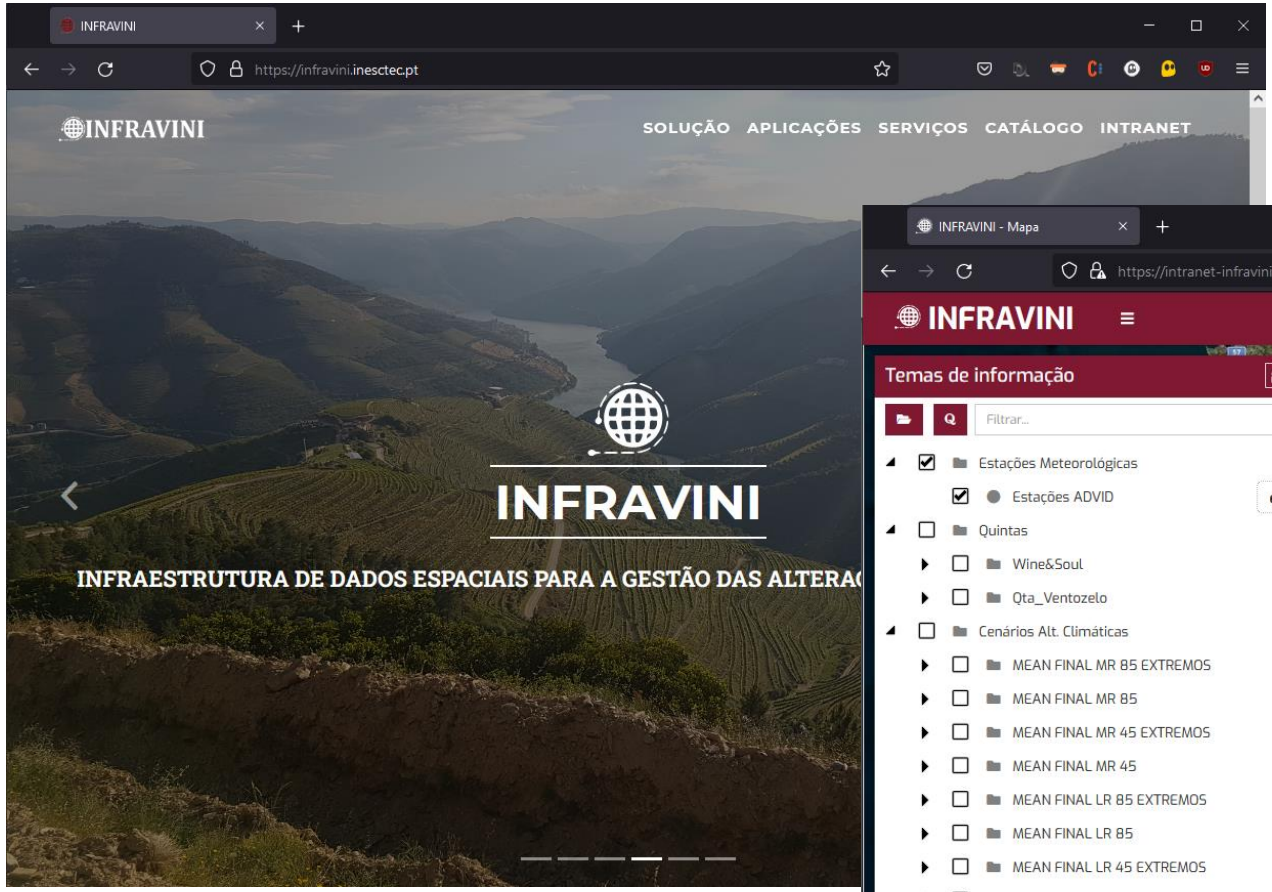


Case Study



- It uses and provides interoperable thematic information from different sources.

Case Study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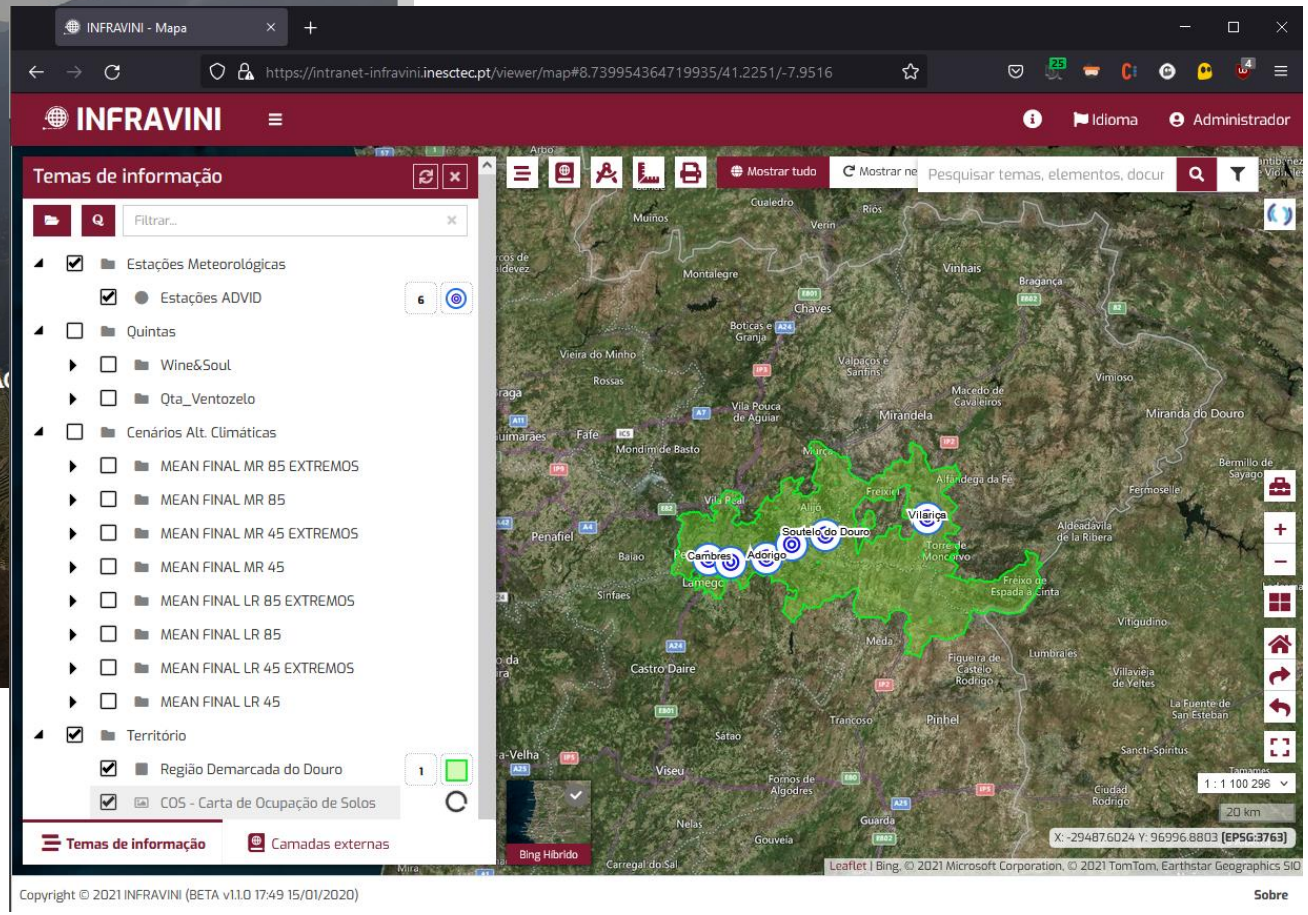
https://infravini.inesctec.pt
INFRAVINI
SOLUÇÃO APLICAÇÕES SERVIÇOS CATÁLOGO INTRANET
INFRAVINI
INFRAESTRUTURA DE DADOS ESPACIAIS PARA A GESTÃO DAS ALTERA


INFRAVINI - Mapa
https://intranet-infravini.inesctec.pt/viewer/map#8.739954364719935/41.2251/-7.9516
INFRAVINI
Idioma
Administrador
Temas de informação
Filtrar...
Estações Meteorológicas
Estações ADVID
Quintas
Wine&Soul
Qta_Ventozelo
Cenários Alt. Climáticas
MEAN FINAL MR 85 EXTREMOS
MEAN FINAL MR 85
MEAN FINAL MR 45 EXTREMOS
MEAN FINAL MR 45
MEAN FINAL LR 85 EXTREMOS
MEAN FINAL LR 85
MEAN FINAL LR 45 EXTREMOS
MEAN FINAL LR 45
Território
Região Demarcada do Douro
COS - Carta de Ocupação de Solos
Temas de informação
Camadas externas
Mostrar tudo
Pesquisar temas, elementos, docur
Bing Híbrido
Leaflet | Bing, © 2021 Microsoft Corporation, © 2021 TomTom, Earthstar Geographics SIO
Copyright © 2021 INFRAVINI (BETA v1.1.0 17:49 15/01/2020)
Sobre


CCDRn
DGTerritório
OGC
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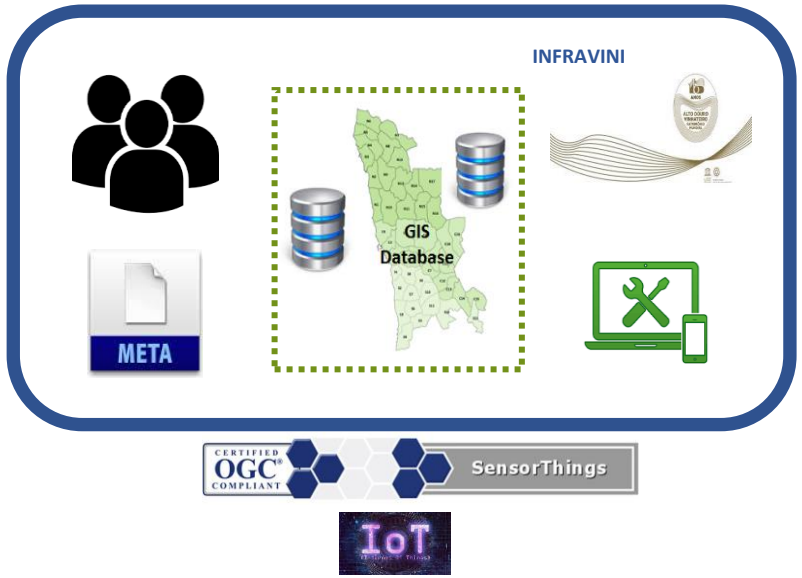
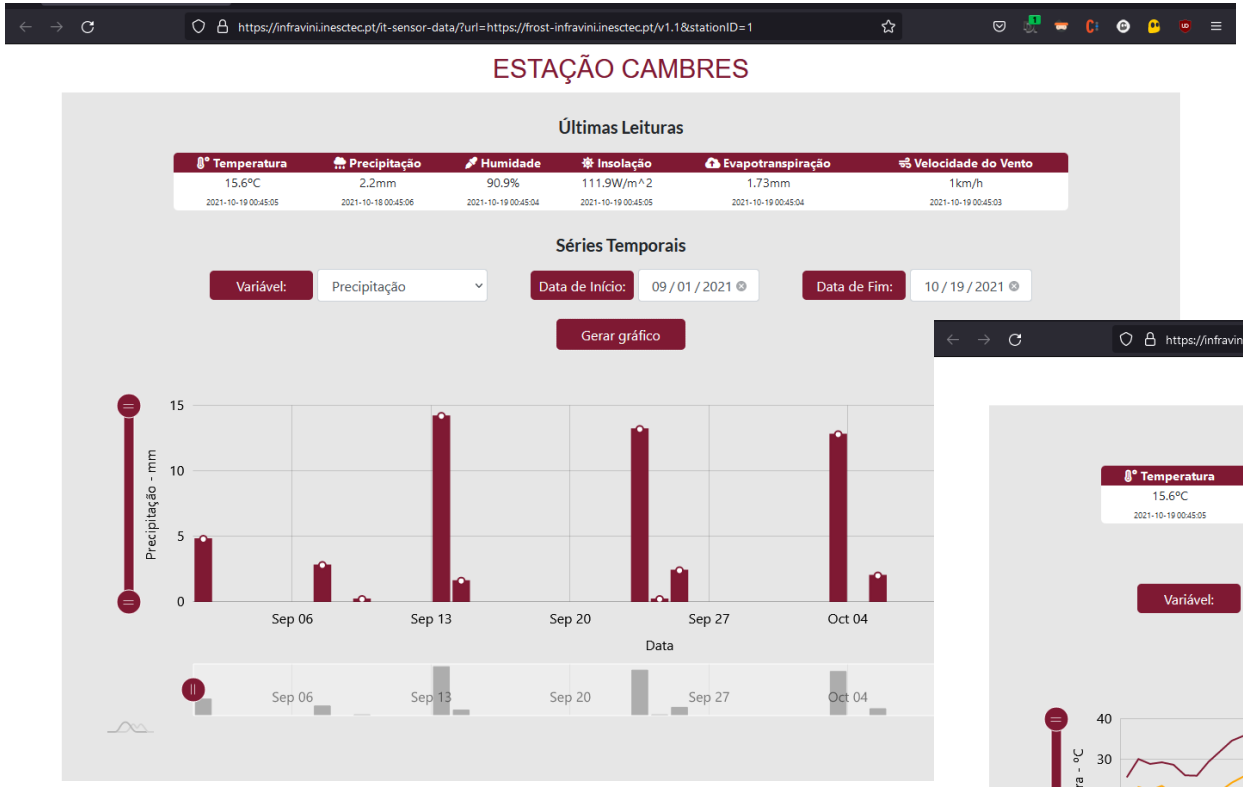
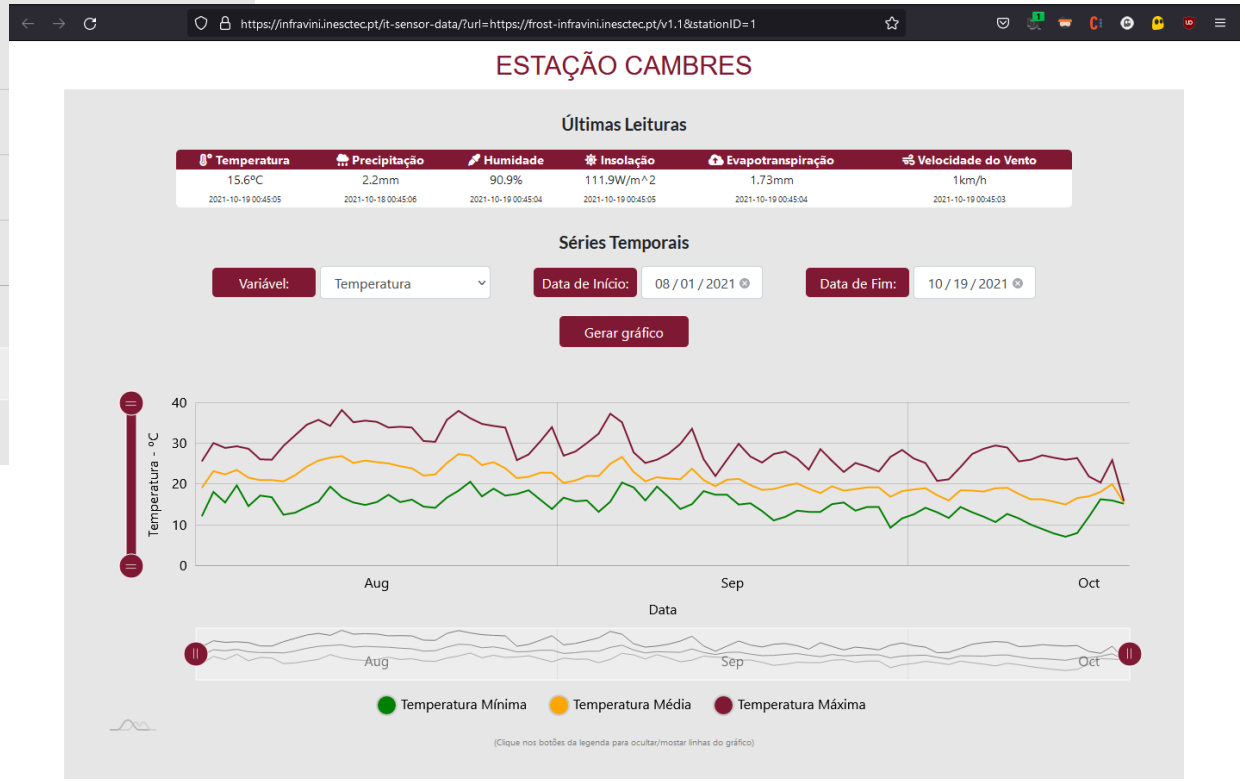
Case Study



- Information collected continuously from the wine-growing area.
  - Soil moisture probes, sensors, weather stations.

Case Study


https://infravini.inesctec.pt/it-sensor-data/?url=https://frost-infravini.inesctec.pt/v1.1&stationID=1
ESTAÇÃO CAMBRES
Últimas Leituras
Temperatura
Precipitação
Humidade
Insolação
Evapotranspiração
Velocidade do Vento
15.6°C
2.2mm
90.9%
111.9W/m^2
1.73mm
1km/h
Séries Temporais
Variável:
Precipitação
Data de Início:
09 / 01 / 2021
Data de Fim:
10 / 19 / 2021
Gerar gráfico
Precipitação - mm
Sep 06
Sep 13
Sep 20
Sep 27
Oct 04
Data


https://infravini.inesctec.pt/it-sensor-data/?url=https://frost-infravini.inesctec.pt/v1.1&stationID=1
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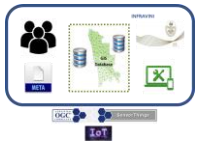
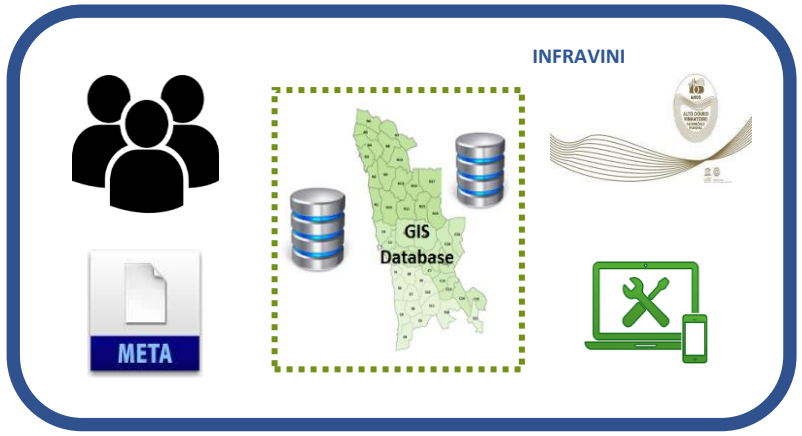
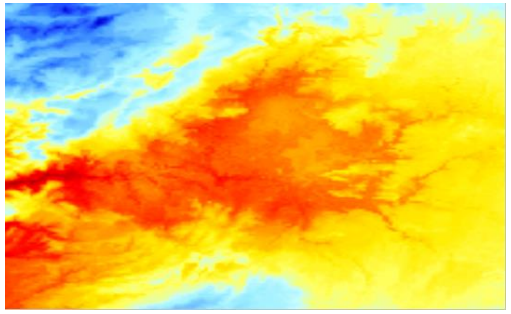
1km/h
Séries Temporais
Variável:
Temperatura
Data de Início:
08 / 01 / 2021
Data de Fim:
10 / 19 / 2021
Gerar gráfico
Temperatura - °C
Aug
Sep
Oct
Data
Temperatura Mínima
Temperatura Média
Temperatura Máxima
(Clique nos botões da legenda para ocultar/mostar linhas do gráfico)


IoT

Case Study

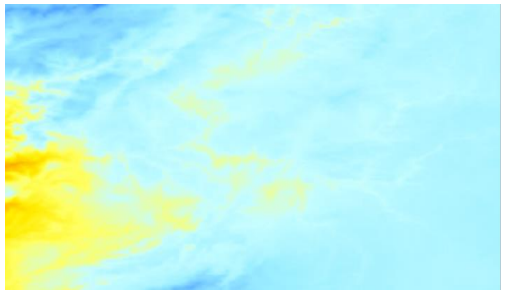


- Spatial-based climate information (factual and forecast).



Historical Climate

(1950-2015)

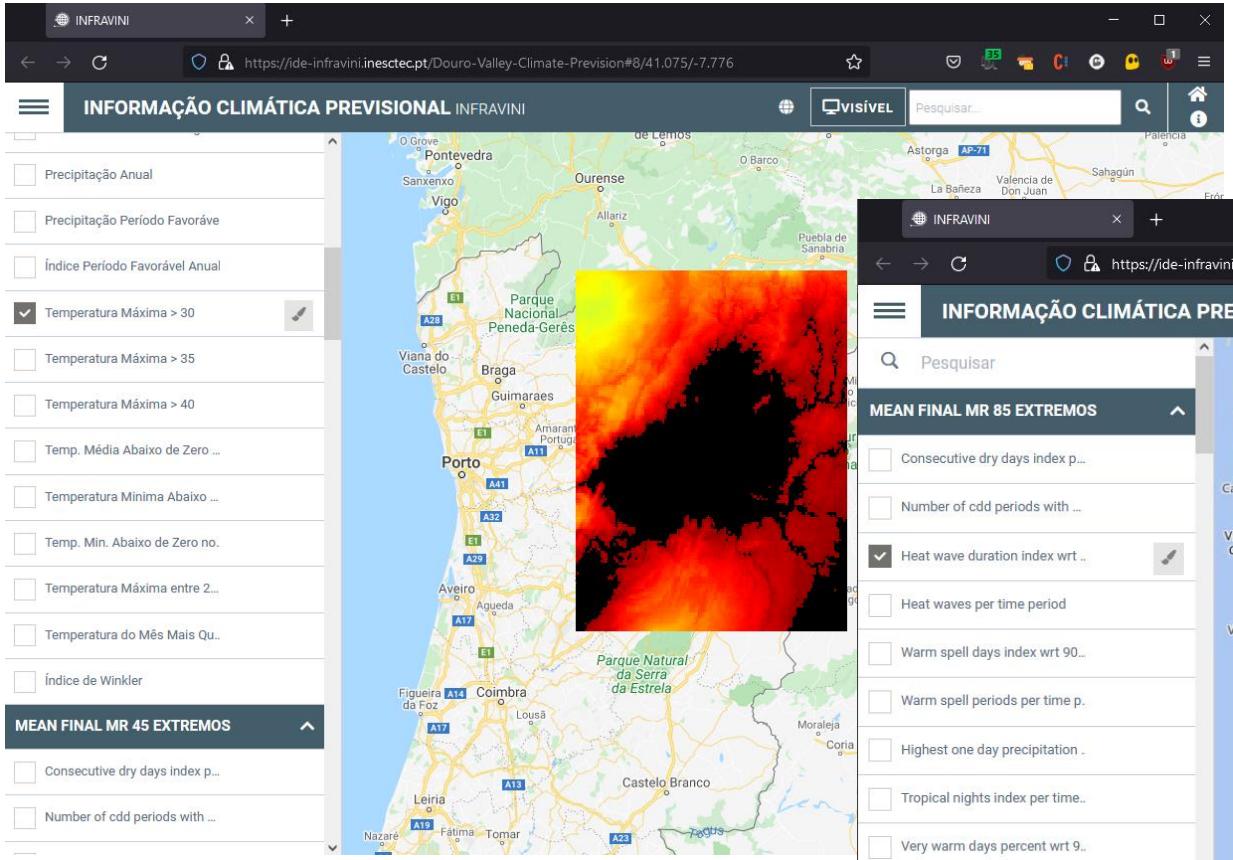


Future Climate

(2051-2080)

RCP 4.5

Case Study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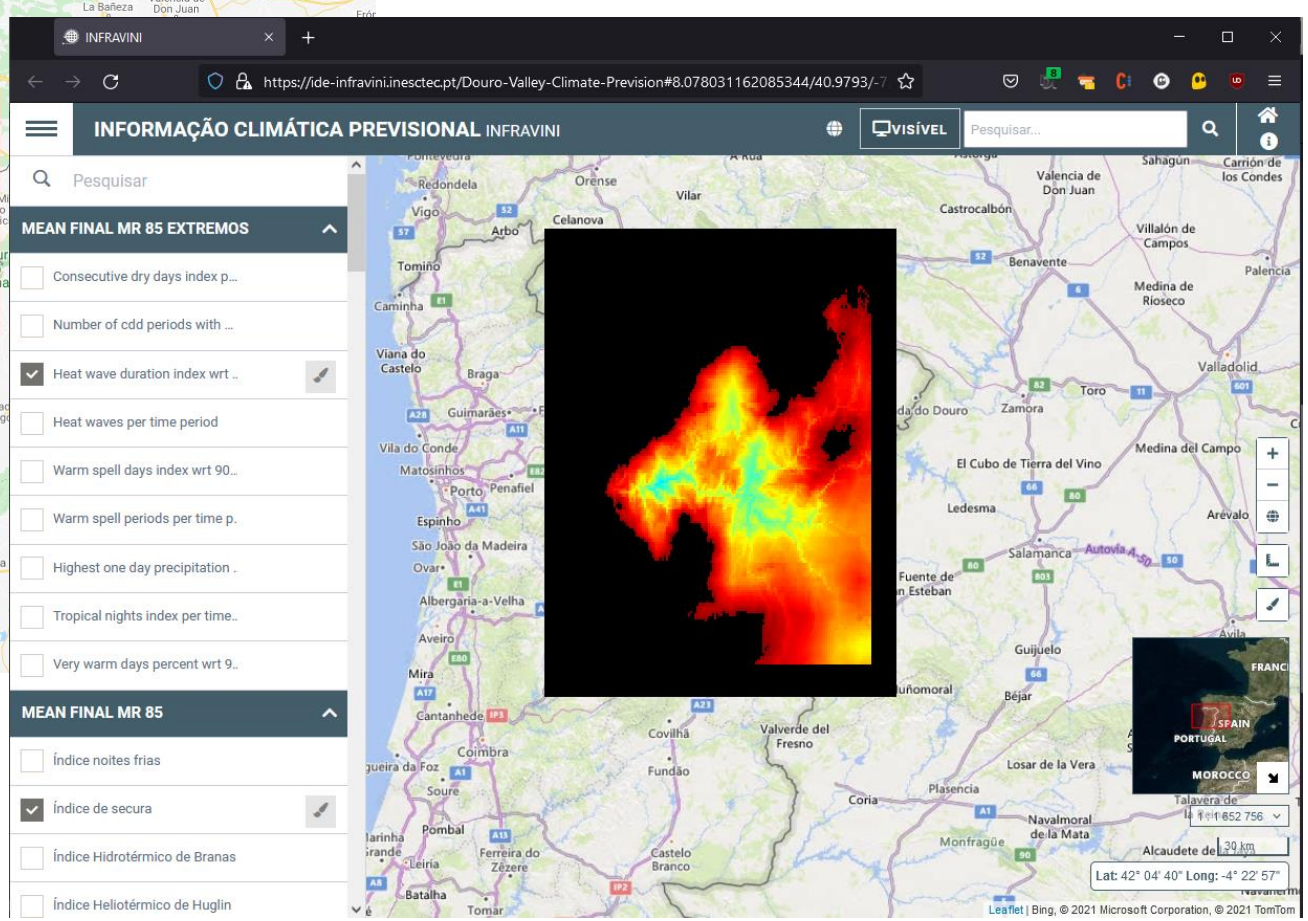
https://ide-infravini.inesctec.pt/Douro-Valley-Climate-Prevision#8/41.075/-7.776
INFORMAÇÃO CLIMÁTICA PREVISIONAL INFRAVINI
VISÍVEL
Pesquisar...
Precipitação Anual
Precipitação Período Favoráve
Índice Período Favorável Anual
Temperatura Máxima > 30
Temperatura Máxima > 35
Temperatura Máxima > 40
Temp. Média Abaixo de Zero ...
Temperatura Mínima Abaixo ...
Temp. Min. Abaixo de Zero no.
Temperatura Máxima entre 2...
Temperatura do Mês Mais Qu..
Índice de Winkler
MEAN FINAL MR 45 EXTREMOS
Consecutive dry days index p...
Number of cdd periods with ...


INFRAVINI
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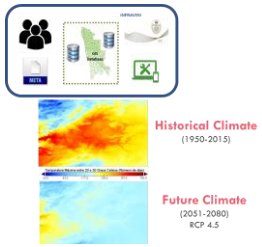
INFORMAÇÃO CLIMÁTICA PREVISIONAL INFRAVINI
VISÍVEL
Pesquisar...
Pesquisar
MEAN FINAL MR 85 EXTREMOS
Consecutive dry days index p...
Number of cdd periods with ...
Heat wave duration index wrt ..
Heat waves per time period
Warm spell days index wrt 90...
Warm spell periods per time p.
Highest one day precipitation .
Tropical nights index per time..
Very warm days percent wrt 9..
MEAN FINAL MR 85
Índice noites frias
Índice de secura
Índice Hidrotérmico de Branas
Índice Heliotérmico de Huglin
SPAIN
PORTUGAL
MOROCCO
Lat: 42° 04' 40" Long: -4° 22' 57"
Leaflet | Bing, © 2021 Microsoft Corporation, © 2021 TomTom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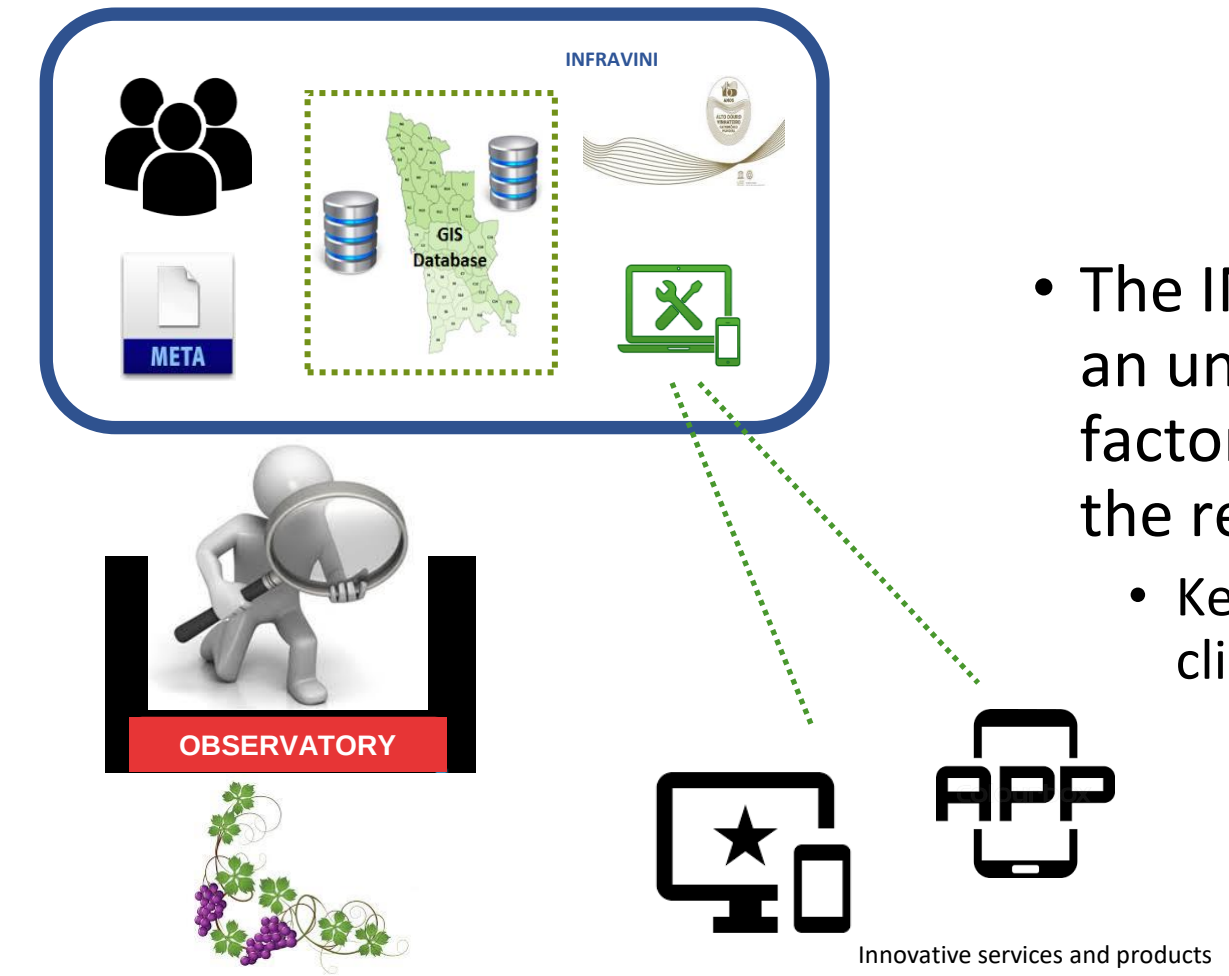
Case Study

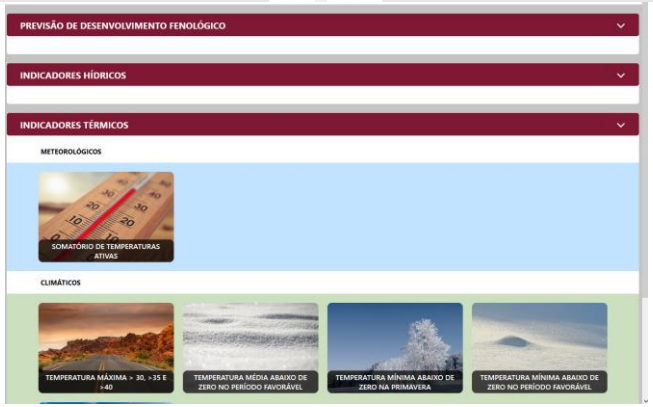


- The INFRAVINI platform provides an understanding of contextual factors, and their interaction with the regional climate.
  - Key to identifying and prioritizing climate change adaptation initiatives.

Case Study

Ano	> 0 ºC	> 7 ºC	> 10 ºC
2021	5234	3057	2124
2020	6079	3517	2419
2019	5817	3262	2167
2018	5823	3268	2173
2017	5968	3413	2318
2016	5829	3267	2169
2015	5869	3314	2219
2014	5726	3171	2076

Ano	Somatório (mm)
2021	507
2020	652
2019	901
2018	972
2017	470
2016	1072
2015	525
2014	1073



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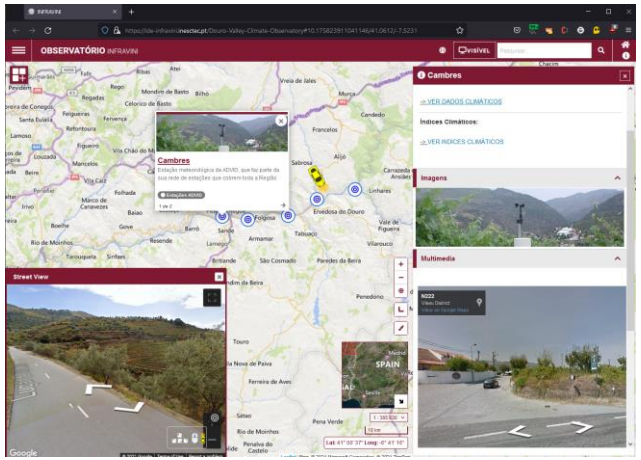
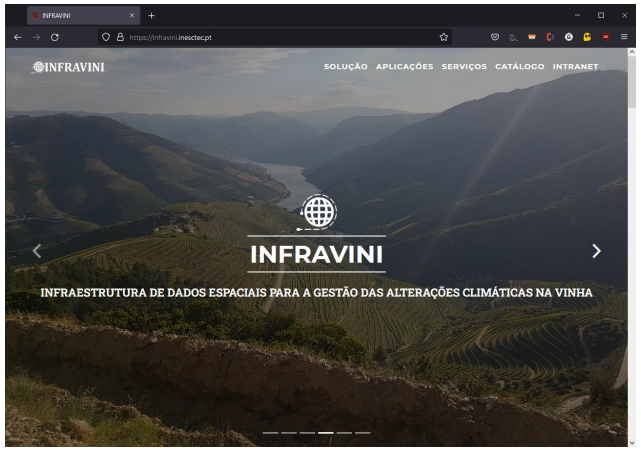
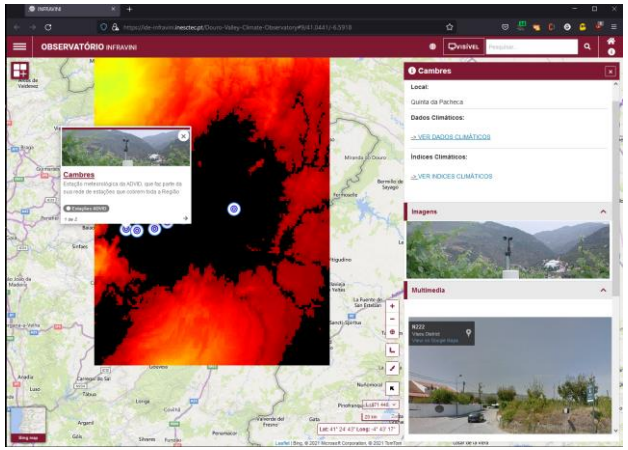
Final Notes

Final Notes

- INFRAVINI aims to contribute to making the European wine industries more resilient to climate change.
- Help minimizing costs and risks through improved management and monitoring of production (quality and quantity of the final product).







Final Notes

Lead Promoter

Spatial Data Infrastructure development

Co-Promoter

Scientific research in the field of climate change and their implication in viticulture

Co-Promoter

Scientific research and technological development in geospatial systems and standards

Co-Promoter

Assessment of the consequences of climate change on viticulture in the Douro Wine Region

Thank You!

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https:// INFRAVINI **.pt**

Co-Promotion R&D Project supported by:

NORTE 2020
PROGRAMA OPERACIONAL REGIONAL DO NORTE

PORTUGAL 2020

UNIÃO EUROPEIA
Fundos Europeus
Estruturais e de Investimento

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