Hungary-Croatia
Cross-border Co-operation Programme

Interreg
European Regional Development Fund

Prekogranični sustav monitoringa podzemnih voda i WEB GIS

Ivan Pilaš

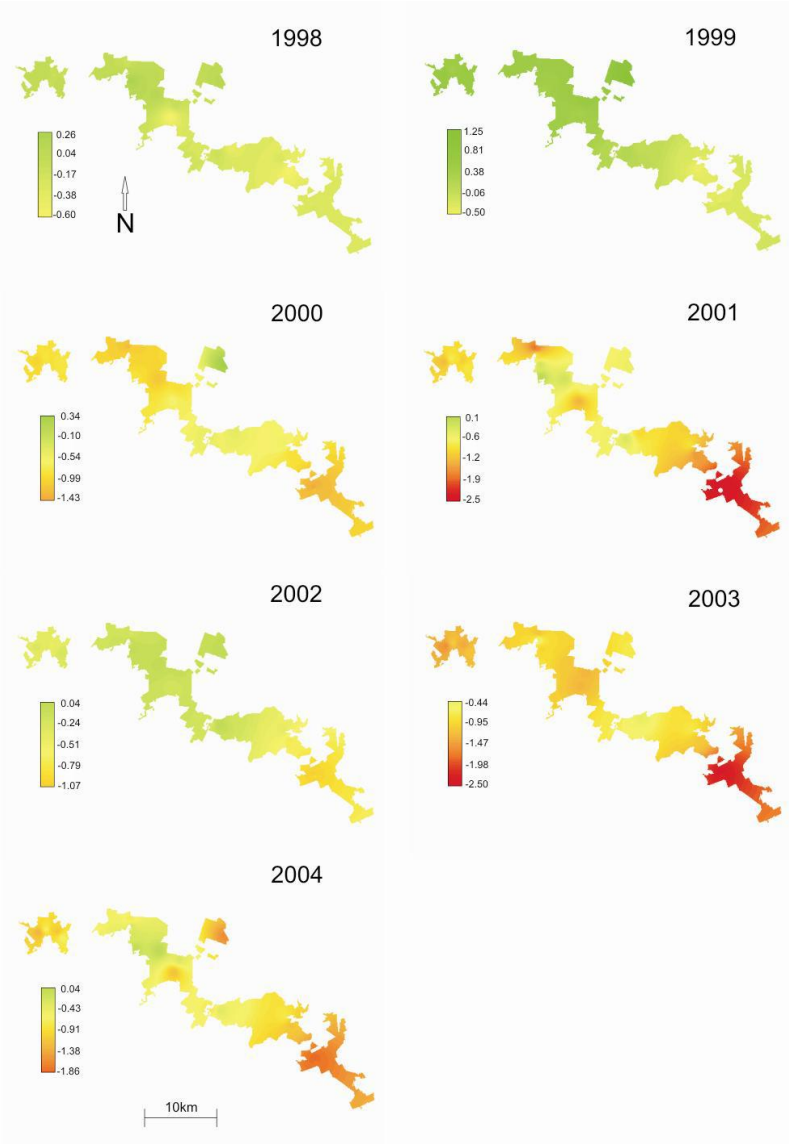
Hrvatski šumarski institut, Jastrebarsko

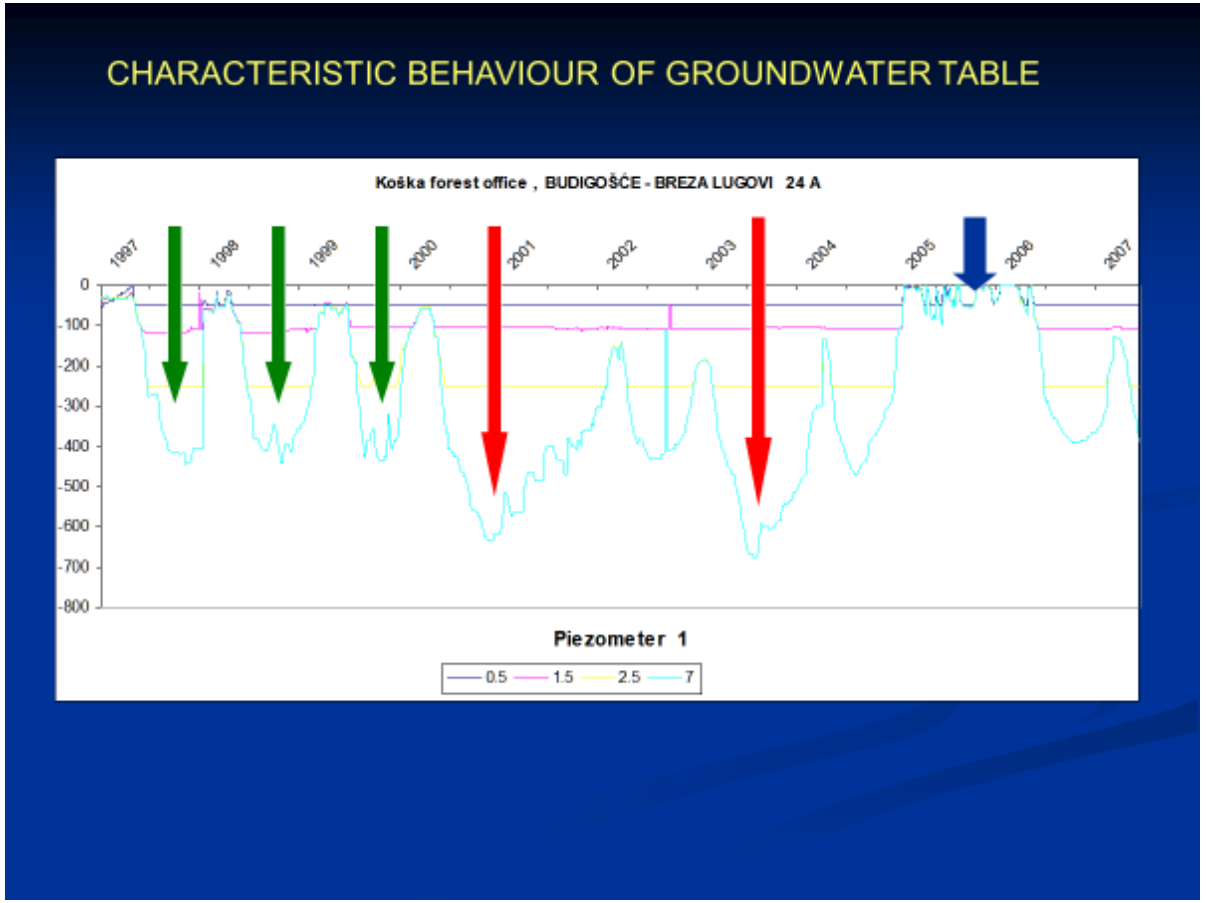
HRVATSKE ŠUME

Oak Protection

MECSEKERDŐ
természetes úton

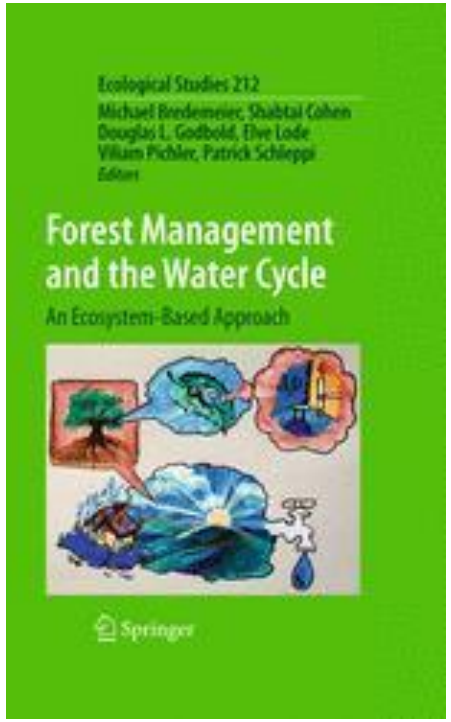
Motiv projekta – Klimatske promjene u Slavoniji i Baranji, naglo sniženje podzemnih voda nakon ekstremno vrućih i suhih godina 2000 i 2003, ekstremno visoki vodostaji 2005. i 2006., opći trend opadanja vodostaja (Prvi put opažano na podacima piezometara UŠP Našice)



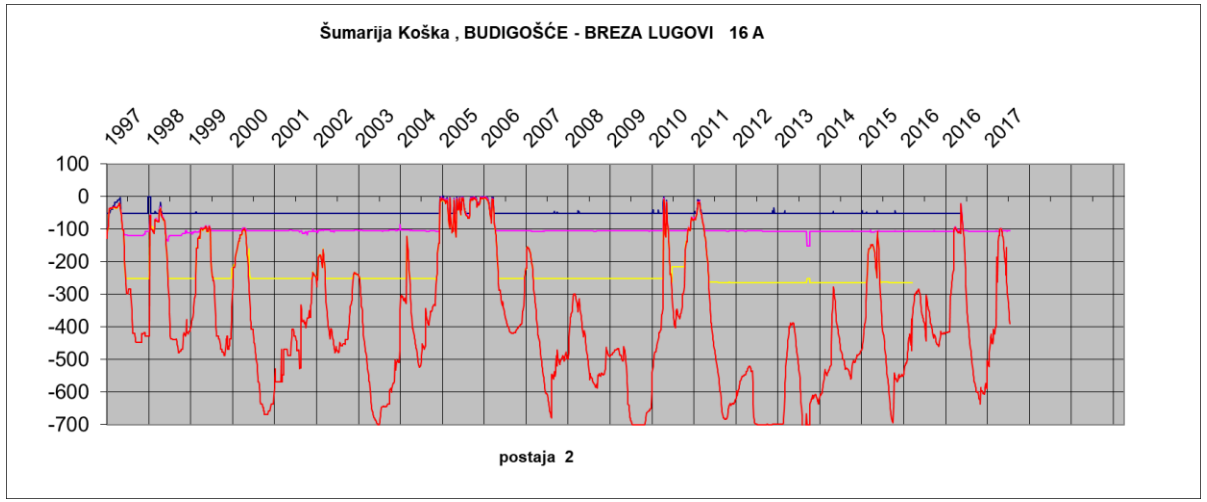


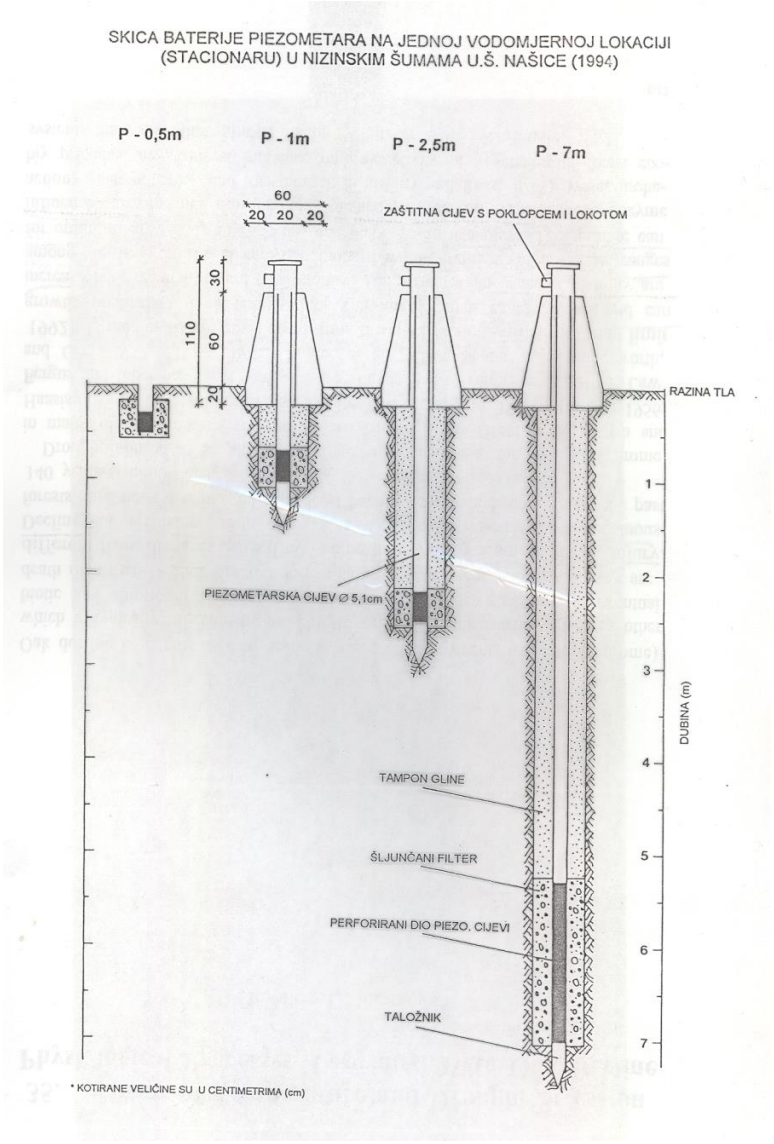
Opažanja prezentirana na IUFRO konferenciji u Pekingu, 2007. god.:

- International forest eco-hydrological Workshop on Water Management through Forest Management CAF (Chinese Academy of Forestry), Beijing - IUFRO Division 8.01.04 – Water supply and quality and jointly organized by CAF and the Forest Ecosytems Research Center of Goettingen University, Germany. Pilaš. I. TRENDS AND SEASONALITY OF GROUNDWATER TABLES IN LOWLAND HARDWOOD FORESTS IN CROATIA



„Stari” sustav praćenja podzemnih voda (fućka, vrpca i motritelj, dva puta na tjedan)





Ideja i preduvjeti za novi sustav praćenja – „Oak protection” Uprava šuma Podružnica Našice i Mecsekerdő Zrt. Pécs

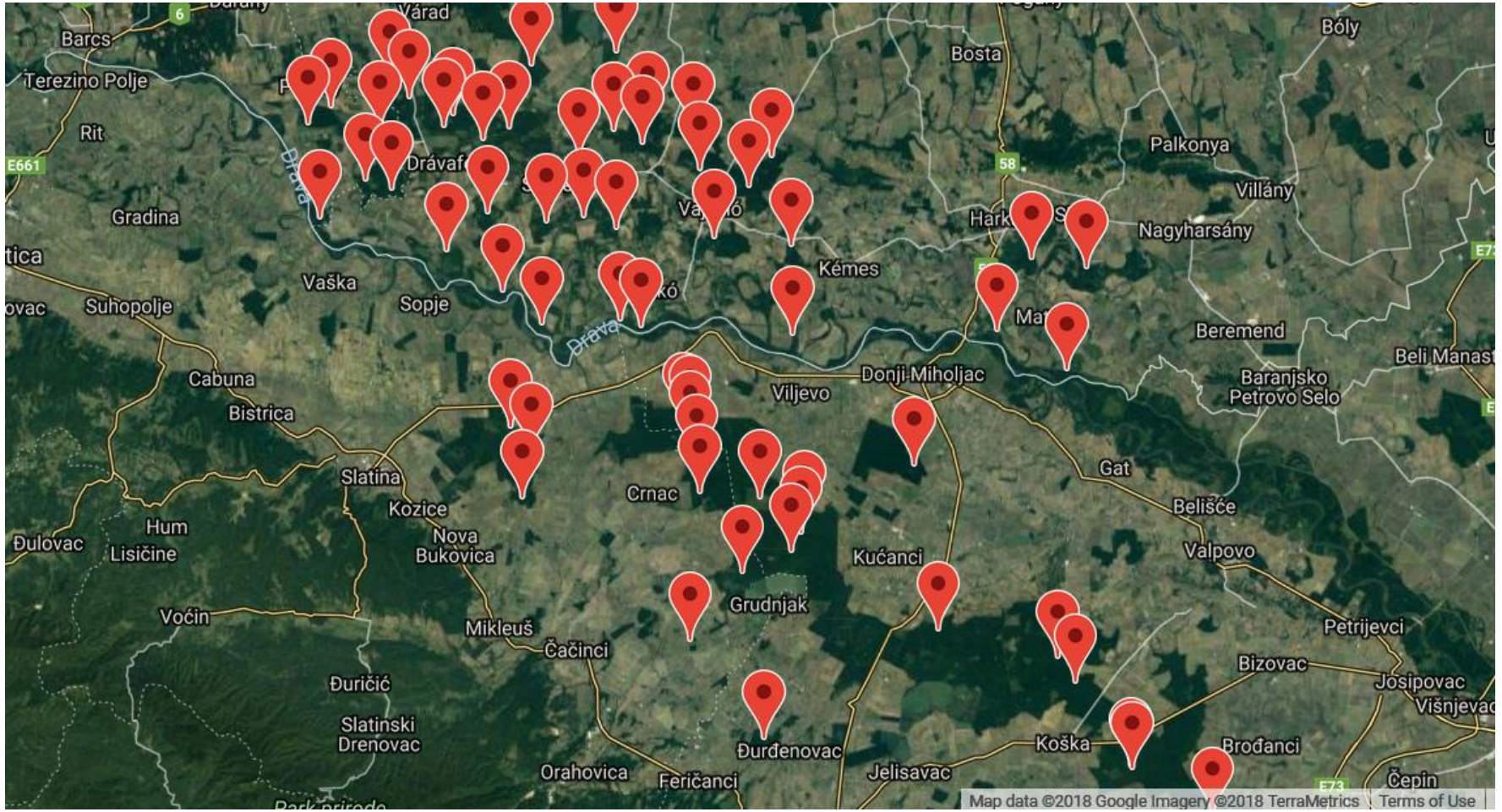
- automatizirani sustav praćenja, smanjenje terenskih obilazaka (redukcija troškova), povećanje pouzdanosti i višegodišnja održivost sustava

- dinamični prikaz podataka tijekom sezone (upozorenje na sušu i pojačano sušenje šuma…), nadopuna s klimatskim podacima s meteo postaja

- priprema za uspostavu aktivnih vodno-retencijskih adaptivnih mjera za umanjenje učinka klimatskih promjena

Ostvareni ciljevi INTERREG Oak protection projekta:

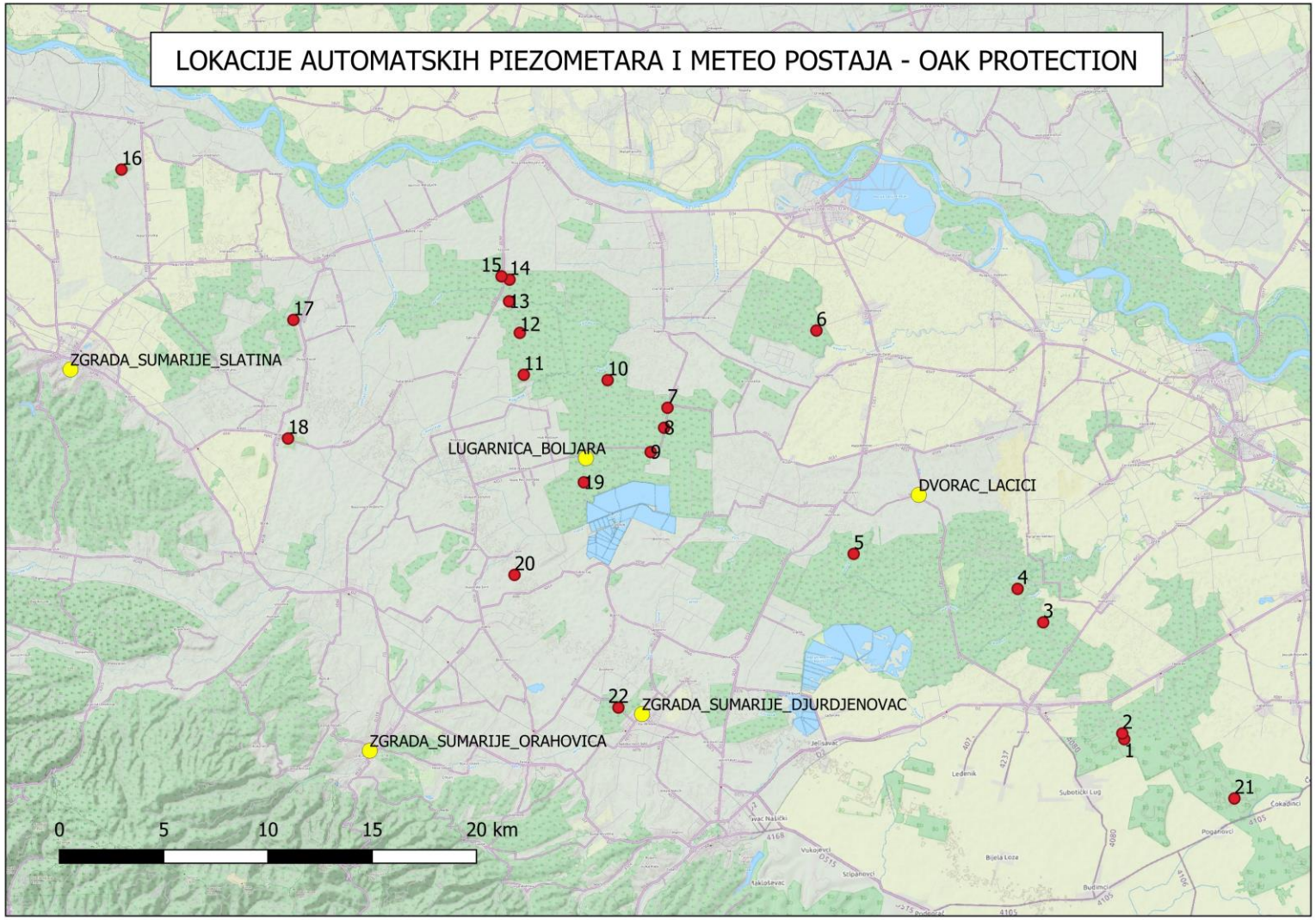
I) Uspostava prekograničnog automatiziranog sustava praćenja podzemnih voda (Uspostavljeno 60 postaja, 38 u Mađarskoj, 22 u Hrvatskoj)



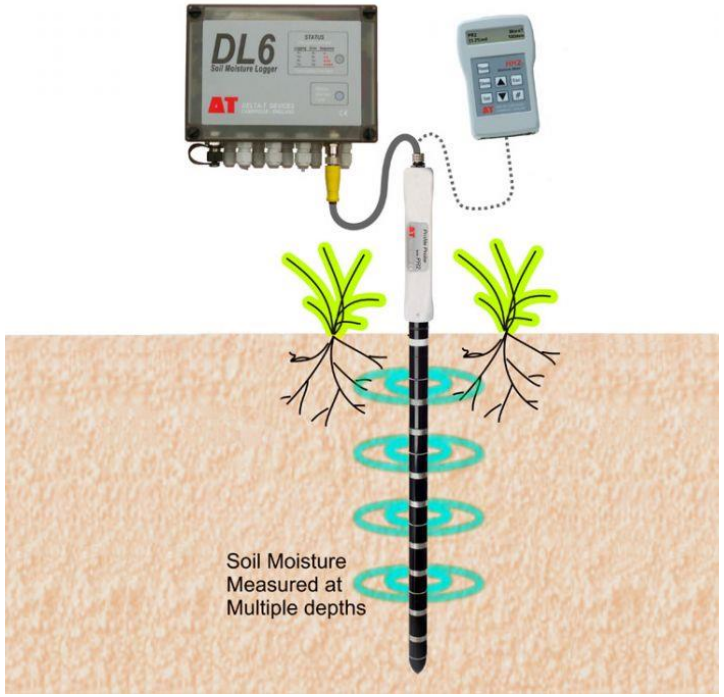
Eijkelkamp
Soil & Water

II) Uspostava 5 automatskih meteo postaja u Hrvatskoj, 2 u Mađarskoj

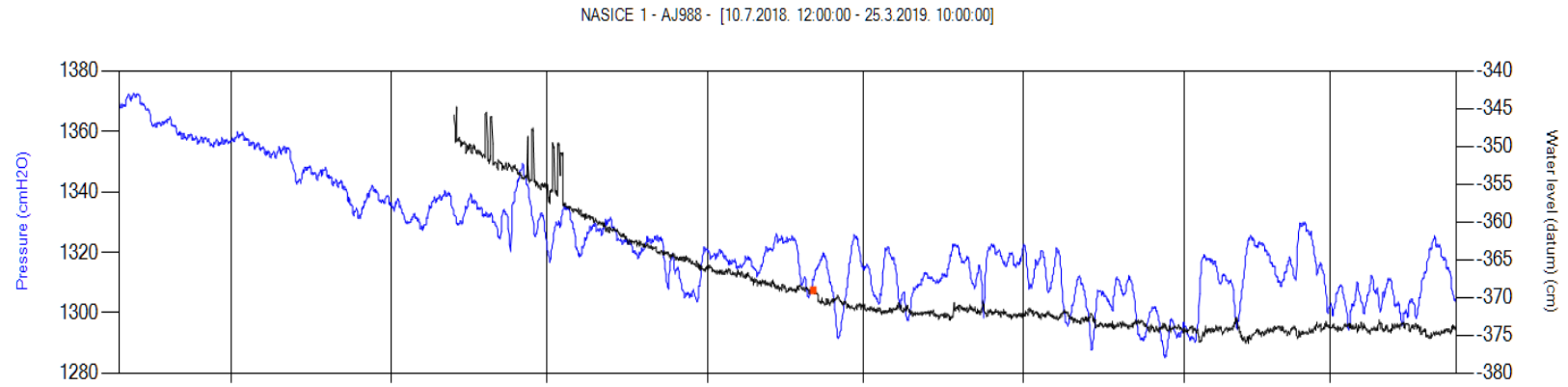
CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

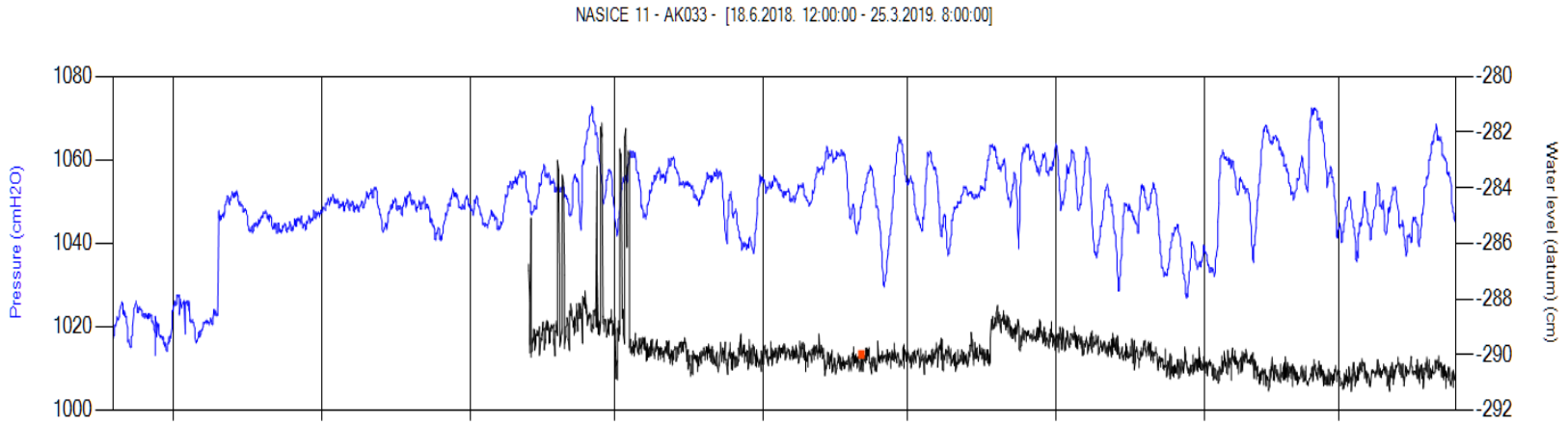


III) Uređaj za analizu kvalitete vode na terenu i sonda za praćenje vlažnosti tla

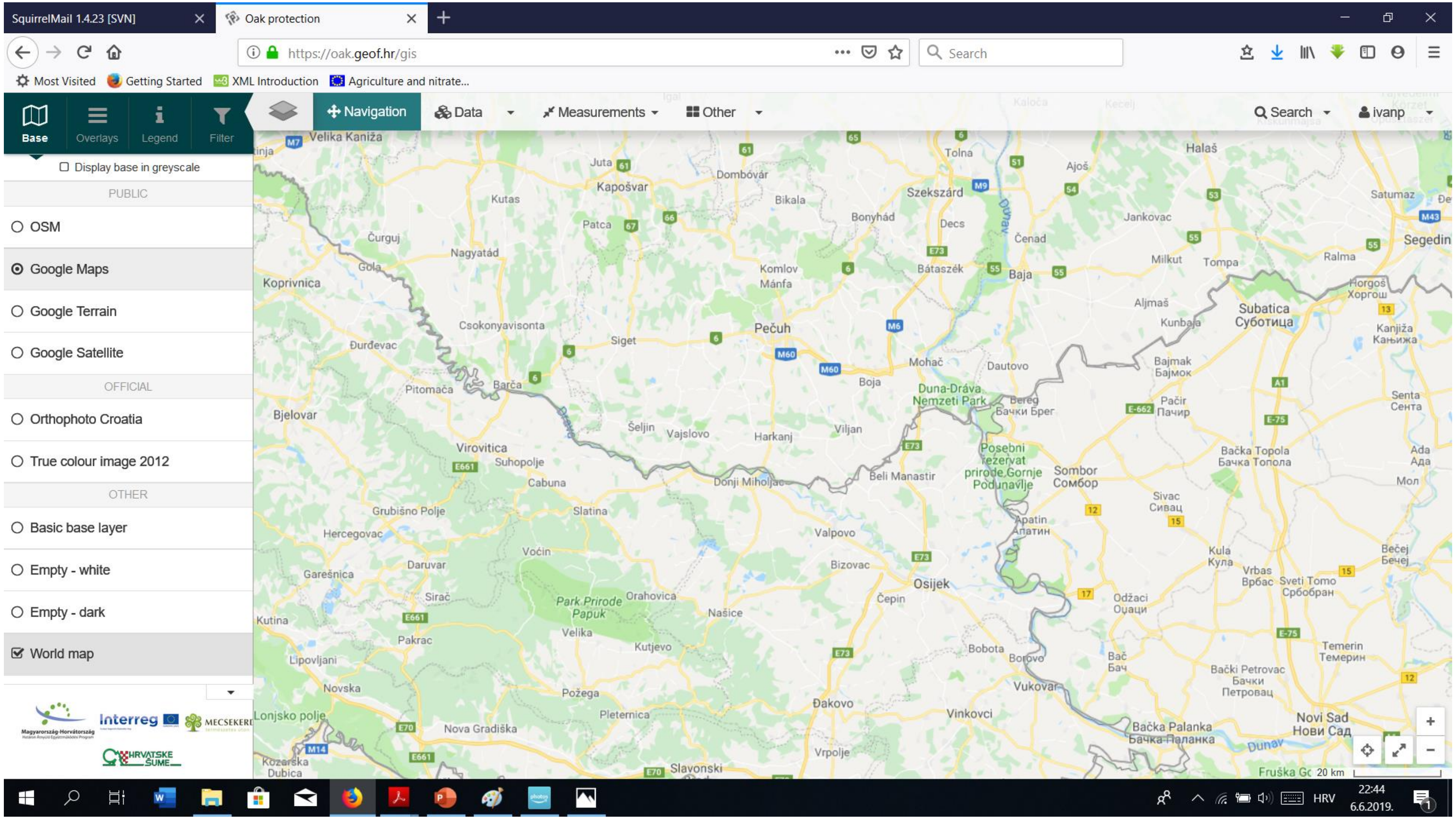


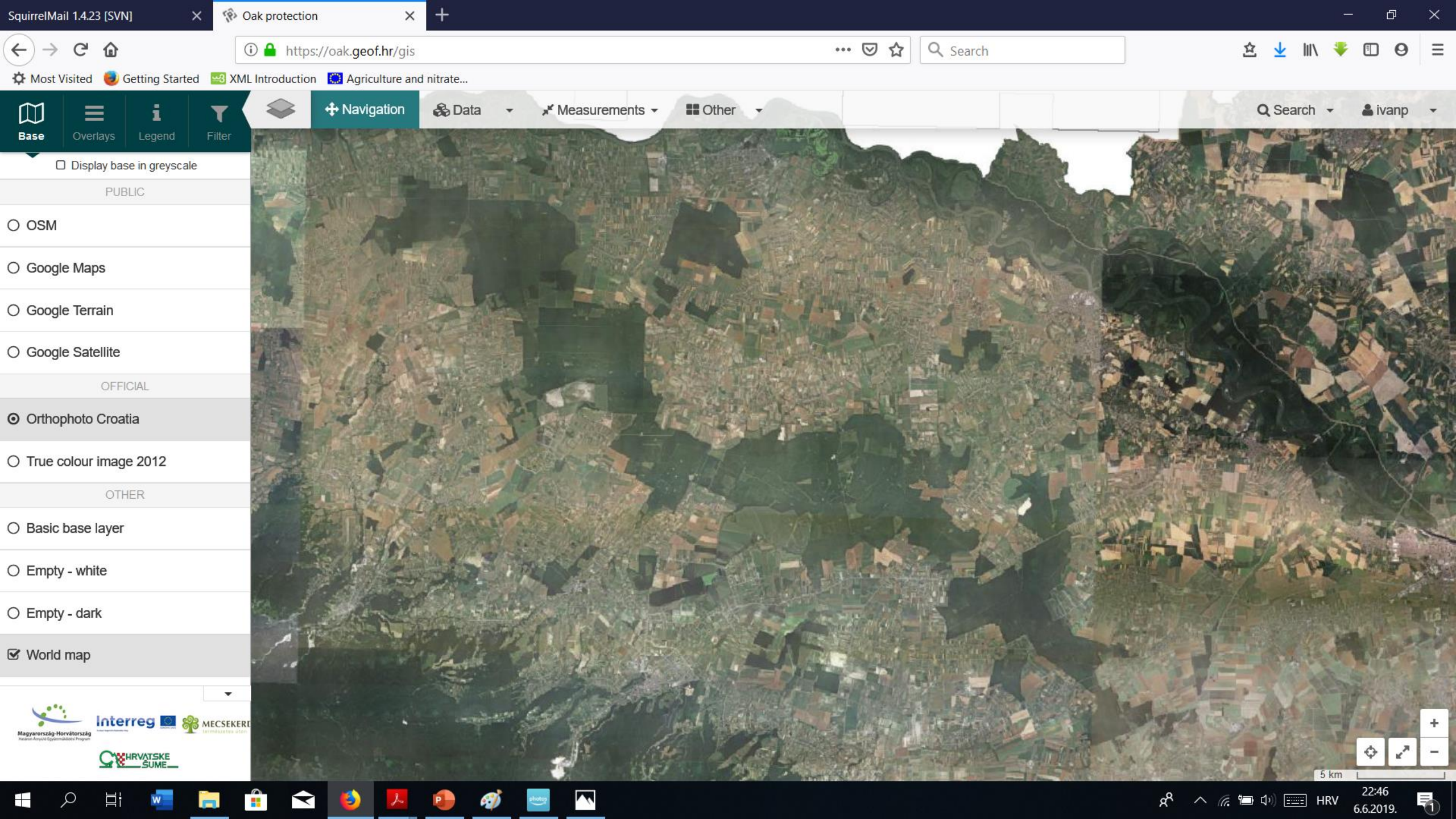
Prvi rezultati automatiziranog sustava praćenja podzemnih voda !!!





WEB – GIS „Oak Protection” https://oak.geof.hr/gis

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https://oak.geof.hr/gis
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Display base in greyscale
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OSM
Google Maps
Google Terrain
Google Satellite
OFFICIAL
Orthophoto Croatia
True colour image 2012
OTHER
Basic base layer
Empty - white
Empty - dark
World map
Interreg
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HRVATSKE ŠUME
5 km
HRV
22:46
6.6.2019.

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https://oak.geof.hr/gis

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Display base in greyscale

PUBLIC

- OSM
- Google Maps
- Google Terrain
- Google Satellite

OFFICIAL

- Orthophoto Croatia
- True colour image 2012

OTHER

- Basic base layer
- Empty - white
- Empty - dark
- World map

Magyarország-Horvátország | Interreg | MECSEKERDŐ | HRVATSKE ŠUME

2 km

HRV 22:51 6.6.2019.

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Display base in greyscale

PUBLIC

- OSM
- Google Maps
- Google Terrain
- Google Satellite

OFFICIAL

- Orthophoto Croatia
- True colour image 2012

OTHER

- Basic base layer
- Empty - white
- Empty - dark
- World map

31A

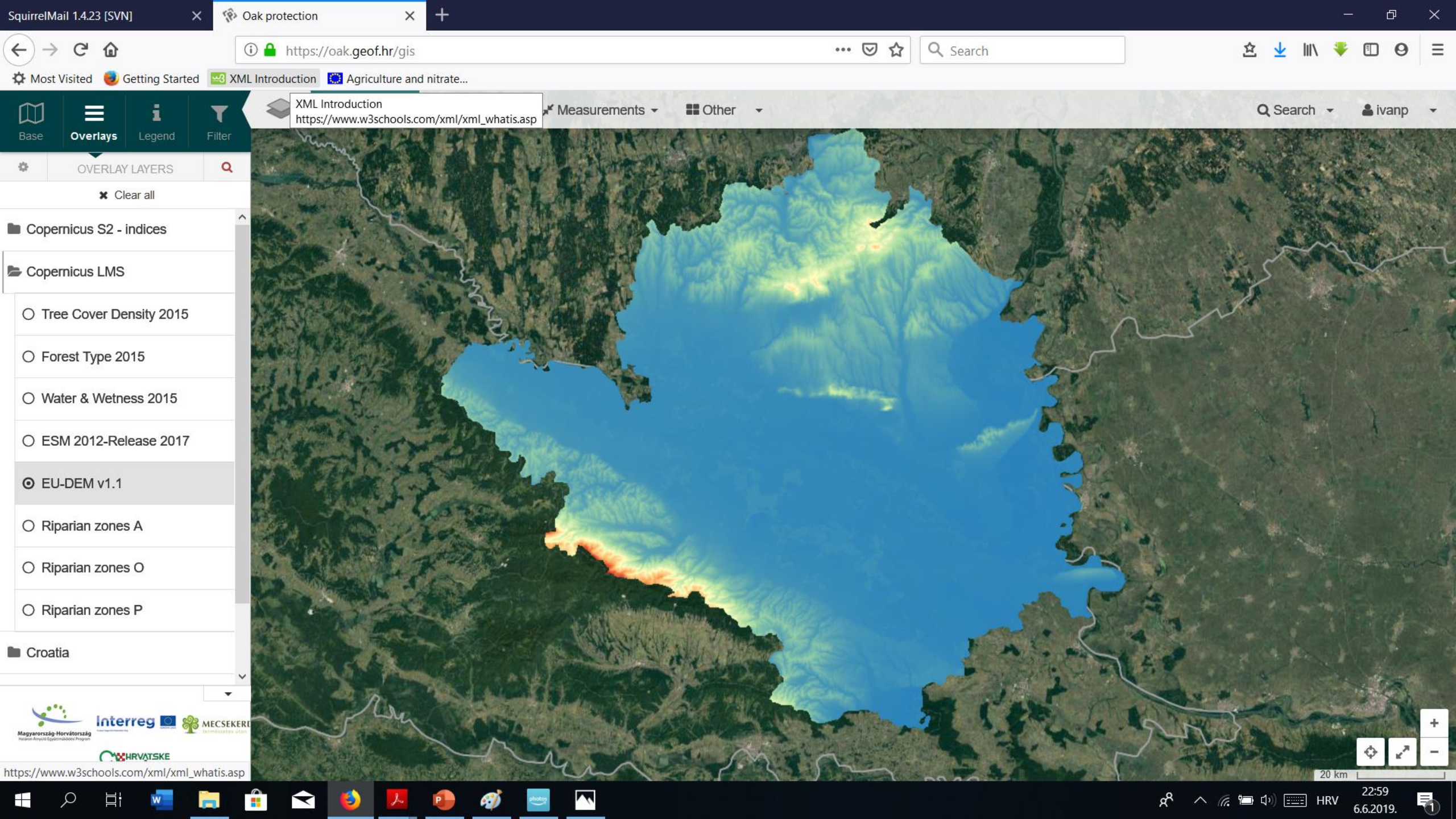
31B

36PR

36A

50 m

HRV 22:56 6.6.2019.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https://www.w3schools.com/xml/xml_whatis.asp
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Copernicus S2 - indices
Copernicus LMS
Tree Cover Density 2015
Forest Type 2015
Water & Wetness 2015
ESM 2012-Release 2017
EU-DEM v1.1
Riparian zones A
Riparian zones O
Riparian zones P
Croatia
Interreg
MECSEKERDŐ
HRVATSKE
https://www.w3schools.com/xml/xml_whatis.asp
20 km
HRV
22:59
6.6.2019.

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MAP LEGEND

Tree Cover Density 2015

0

25

50

75

Magyarország-Horvátország | Interreg | MECSEKERDŐ | HRVATSKE ŠUME

20 km

HRV 23:01 6.6.2019.

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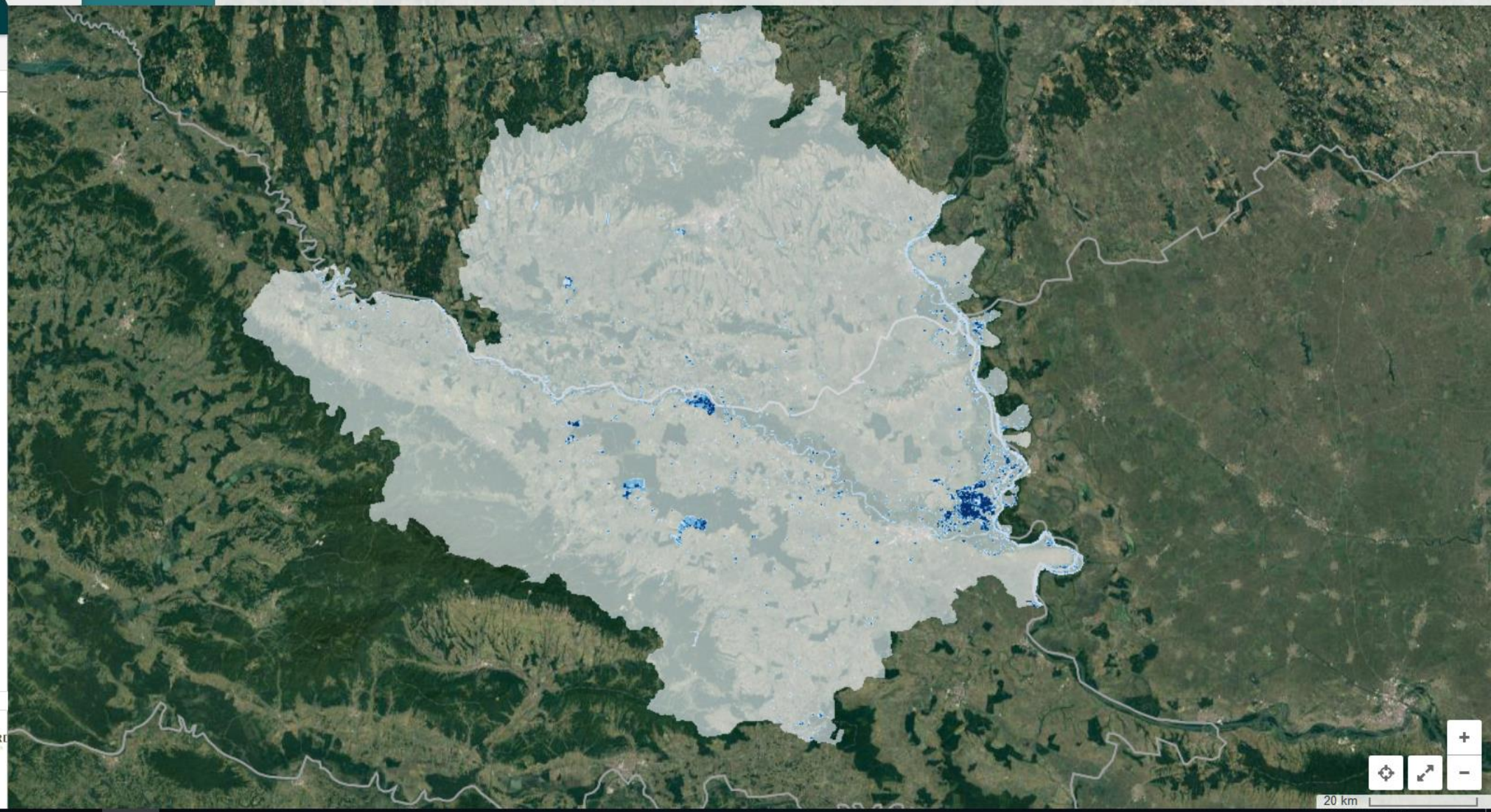
MAP LEGEND

Water & Wetness 2015

- No water/no wet area
- Permanent water
- Temporary water
- Permanently wet area (wetness)



Magyarország-Horvátország | Interreg | MECSEKERDŐ | HRVATSKE ŠUME

HRV 23:01 6.6.2019.

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OVERLAY LAYERS

Clear all

- Croatia
  - Forest stand border
    - Subcompartment border
  - Hydrology-groundwater
    - Monthly average layers
      - Water AVG (2.5m) Jan
      - Water AVG (10m) Jan
      - Water AVG (2.5m) Feb
      - Water AVG (10m) Feb
      - Water AVG (2.5m) Mar
      - Water AVG (10m) Mar

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5 km

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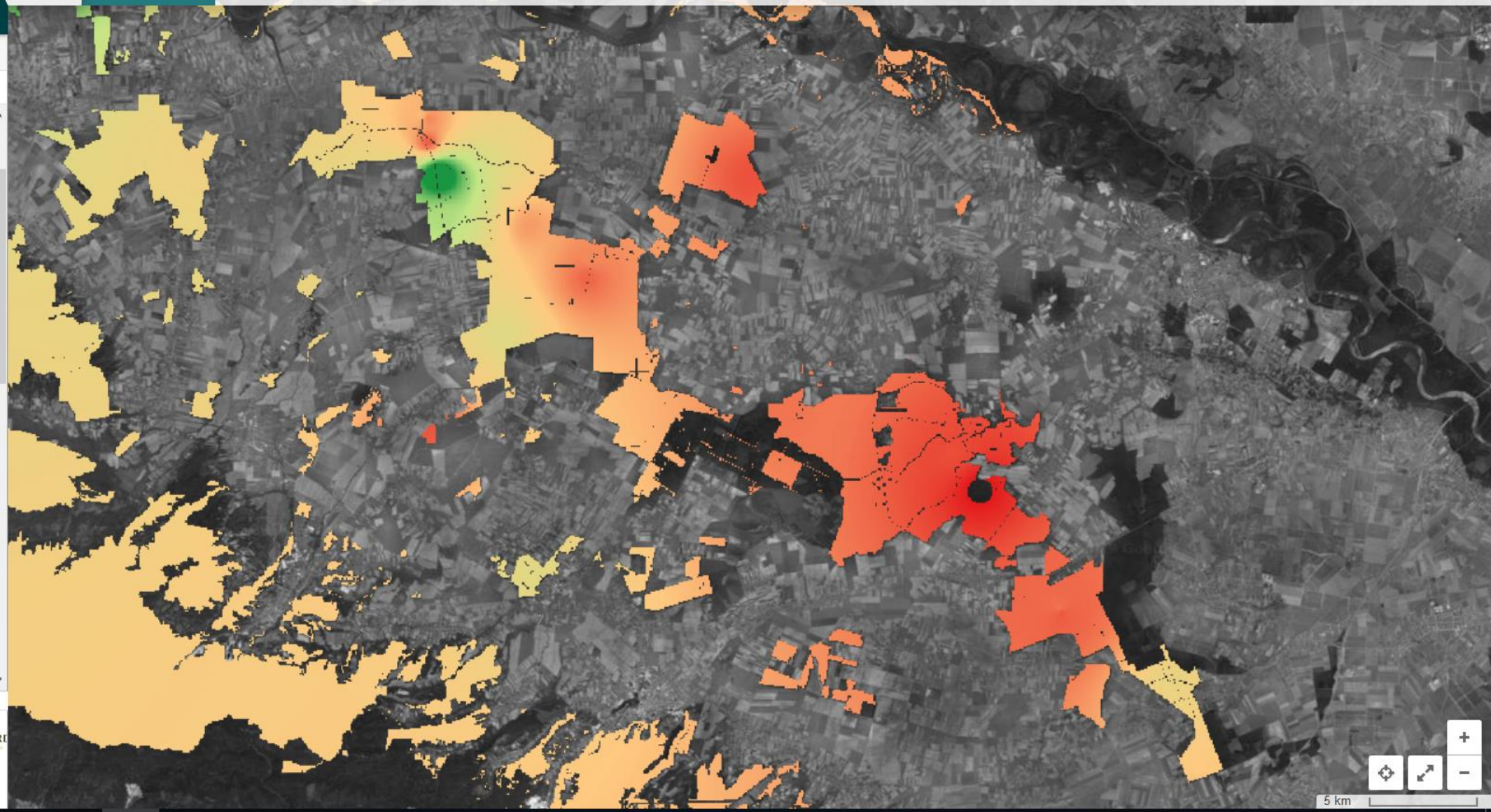
OVERLAY LAYERS

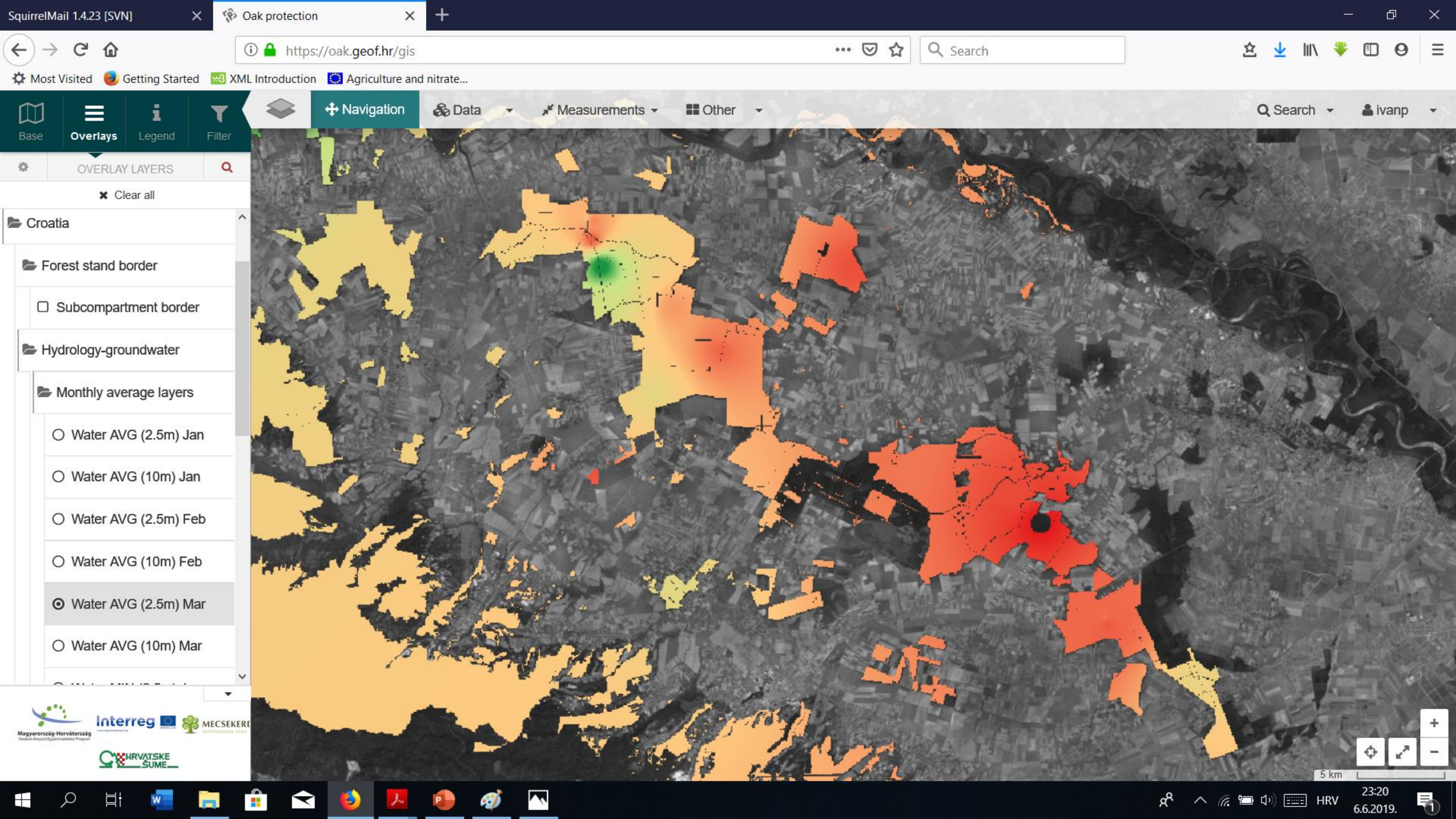
Clear all

- Croatia
  - Forest stand border
    - Subcompartment border
  - Hydrology-groundwater
    - Monthly average layers
      - Water AVG (2.5m) Jan
      - Water AVG (10m) Jan
      - Water AVG (2.5m) Feb
      - Water AVG (10m) Feb
      - Water AVG (2.5m) Mar
      - Water AVG (10m) Mar

Magyarország-Horvátország | Interreg | MECSEKERDŐ | HRVATSKE ŠUME



HRV 23:19 6.6.2019.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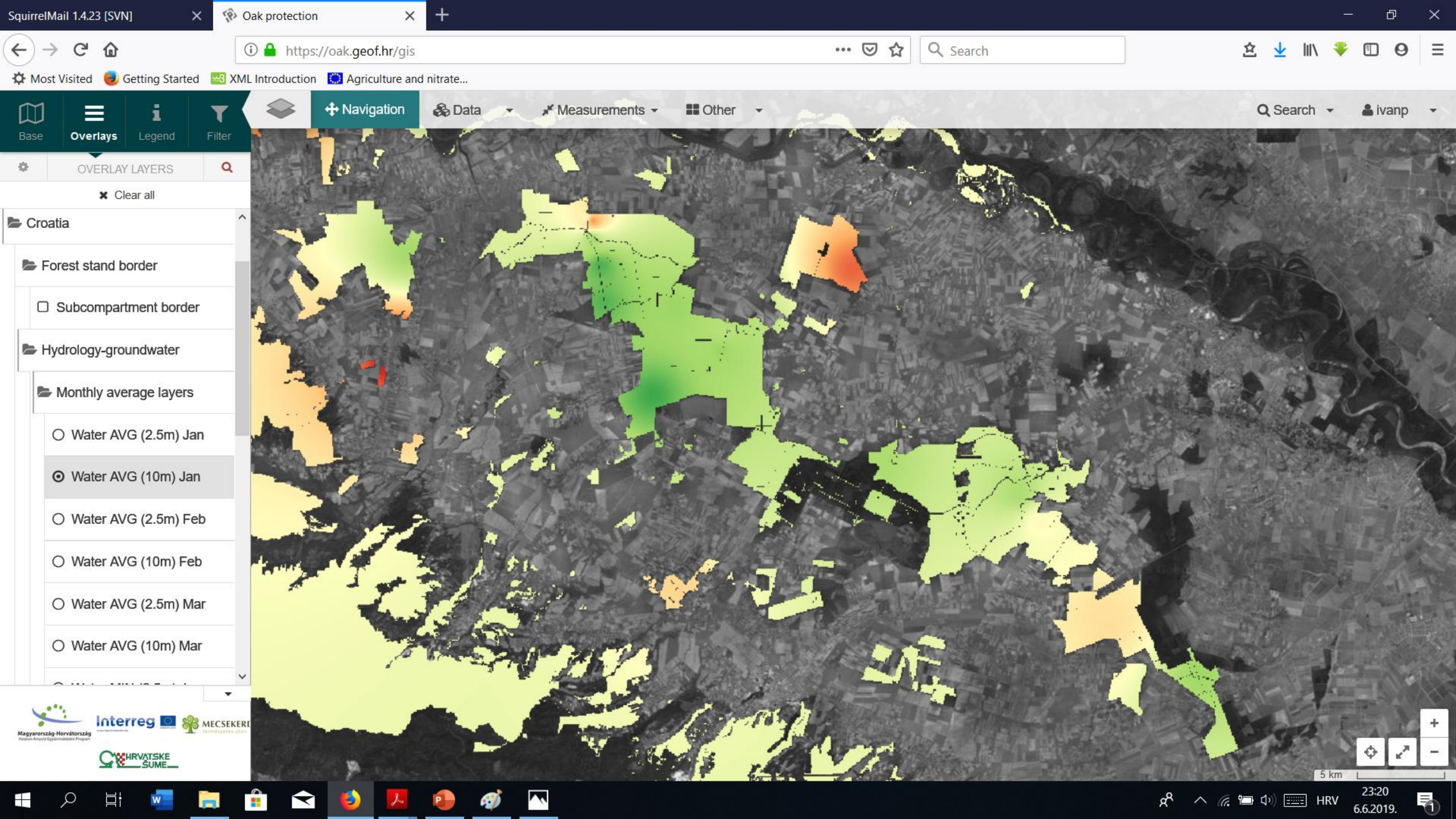
Croatia
Forest stand border
Subcompartment border
Hydrology-groundwater
Monthly average layers
Water AVG (2.5m) Jan
Water AVG (10m) Jan
Water AVG (2.5m) Feb
Water AVG (10m) Feb
Water AVG (2.5m) Mar
Water AVG (10m) Mar
5 km
HRV
23:20
6.6.2019.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Water AVG (2.5m) Jan
Water AVG (10m) Jan
Water AVG (2.5m) Feb
Water AVG (10m) Feb
Water AVG (2.5m) Mar
Water AVG (10m) Mar
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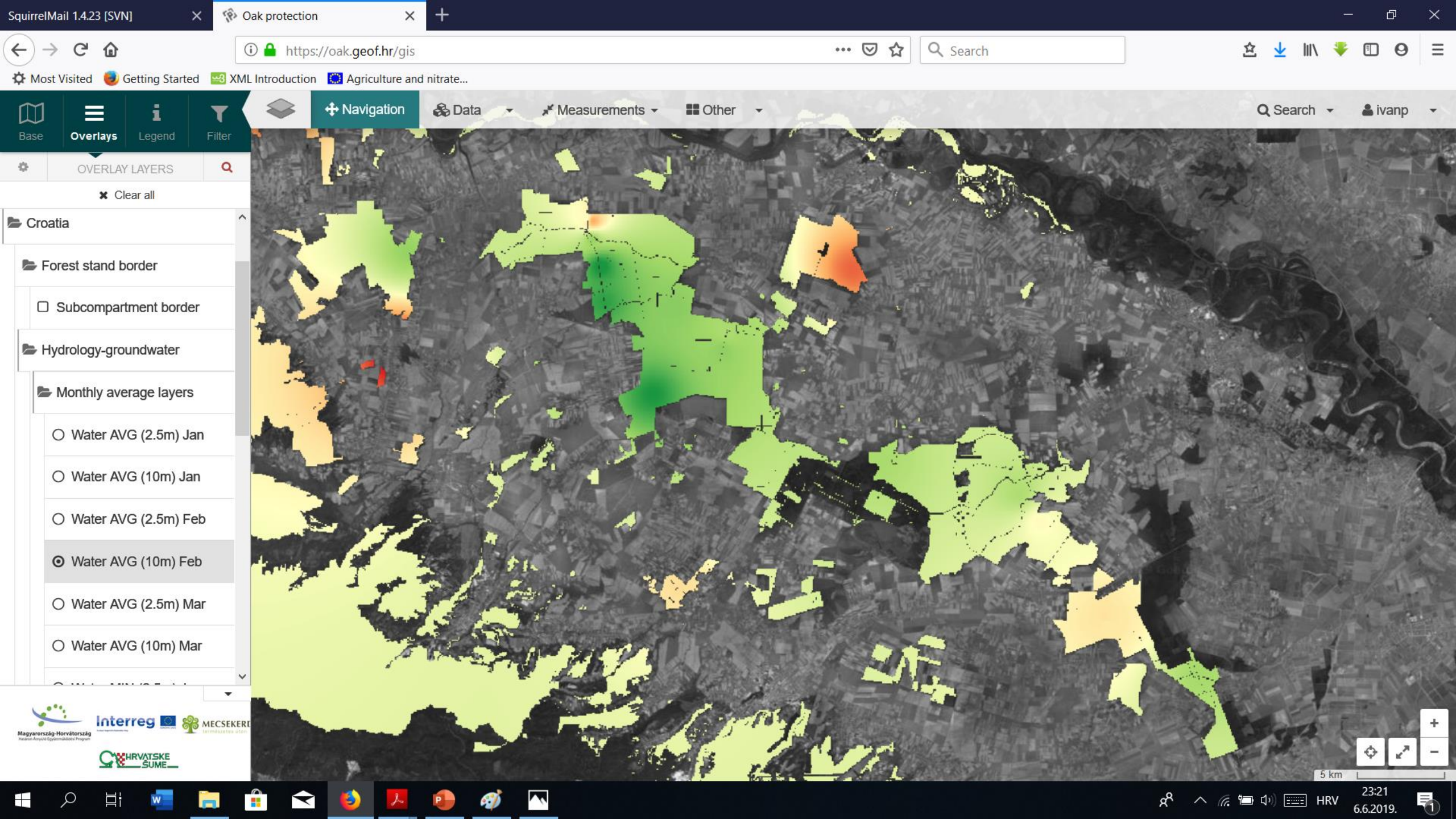
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Water AVG (2.5m) Jan
Water AVG (10m) Jan
Water AVG (2.5m) Feb
Water AVG (10m) Feb
Water AVG (2.5m) Mar
Water AVG (10m) Mar
Interreg
MECSEKERDŐ
HRVATSKE ŠUME
5 km
HRV
23:21
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OVERLAY LAYERS

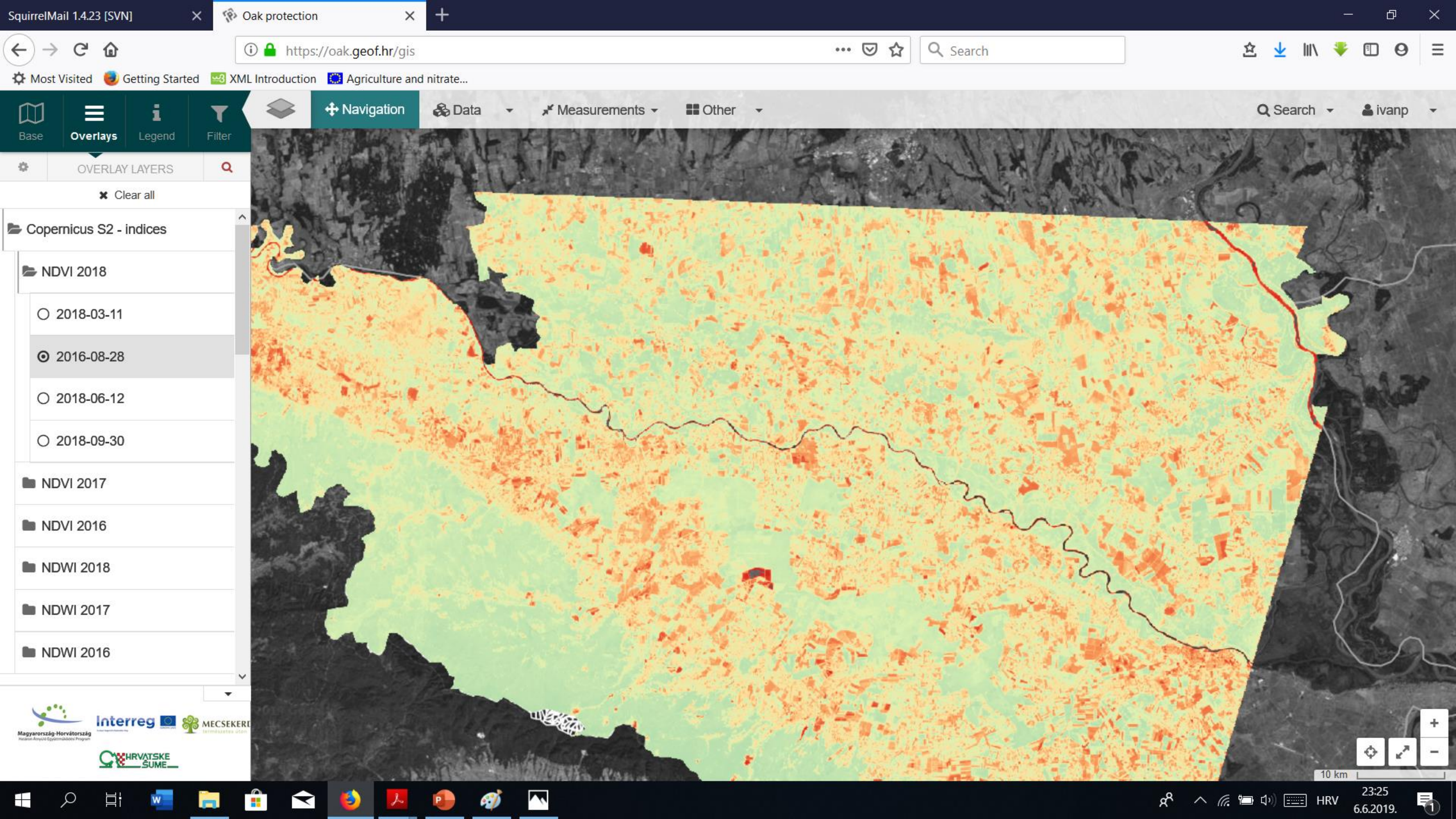
Clear all

- Croatia
  - Forest stand border
    - Subcompartment border
  - Hydrology-groundwater
    - Monthly average layers
      - Water AVG (2.5m) Jan
      - Water AVG (10m) Jan
      - Water AVG (2.5m) Feb
      - Water AVG (10m) Feb
      - Water AVG (2.5m) Mar
      - Water AVG (10m) Mar

Magyarország-Horvátország | Interreg | MECSEKERDŐ | HRVATSKE ŠUME

5 km

HRV 23:21 6.6.2019.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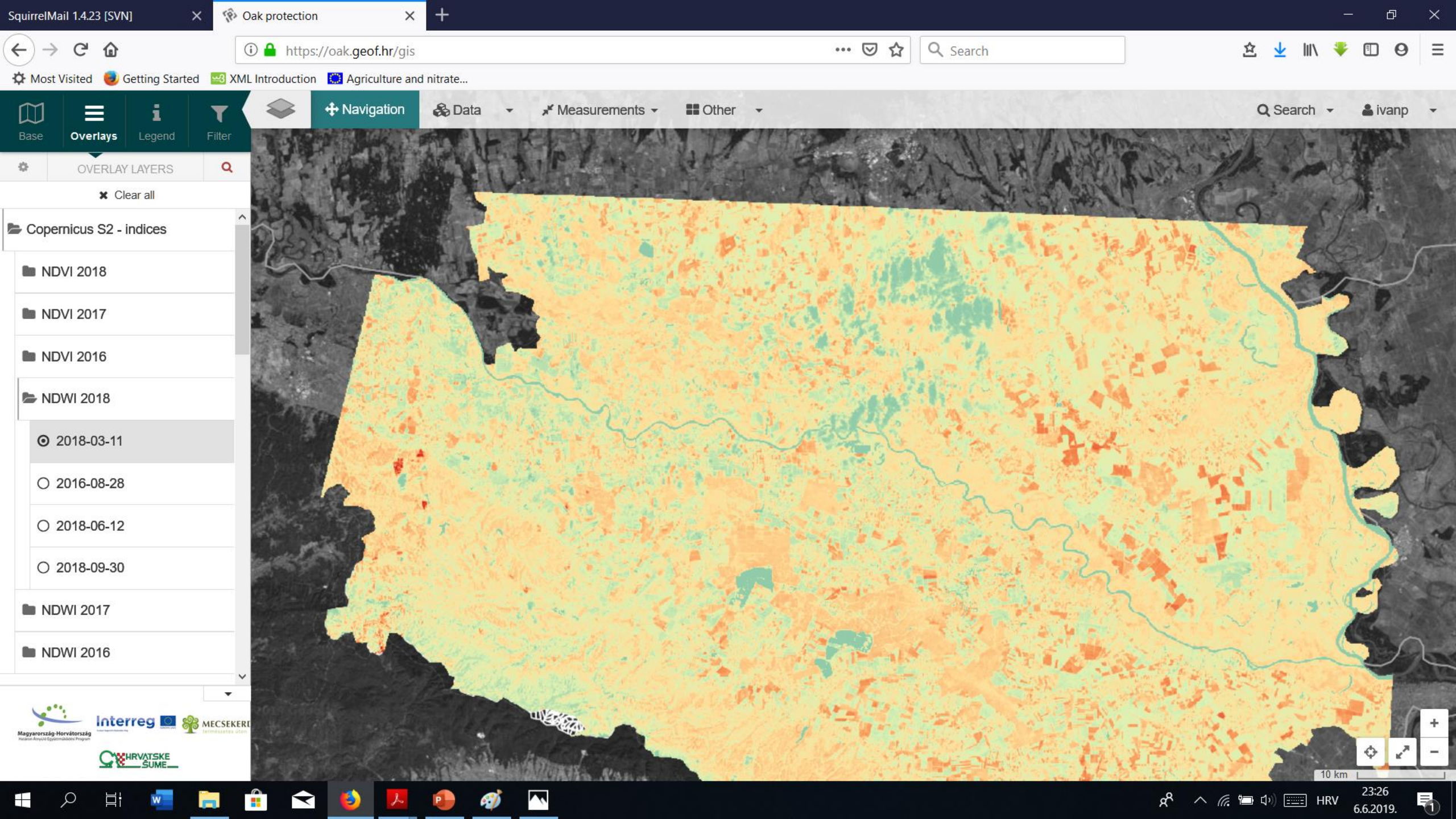
NDVI 2018
2018-03-11
2016-08-28
2018-06-12
2018-09-30
NDVI 2017
NDVI 2016
NDWI 2018
NDWI 2017
NDWI 2016
Interreg
MECSEKERDŐ
HRVATSKE ŠUME
10 km
HRV
23:25
6.6.2019.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Clear all
Copernicus S2 - indices
NDVI 2018
NDVI 2017
NDVI 2016
NDWI 2018
2018-03-11
2016-08-28
2018-06-12
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NDWI 2017
NDWI 2016
Interreg
MECSEKERDŐ
HRVATSKE ŠUME
10 km
HRV
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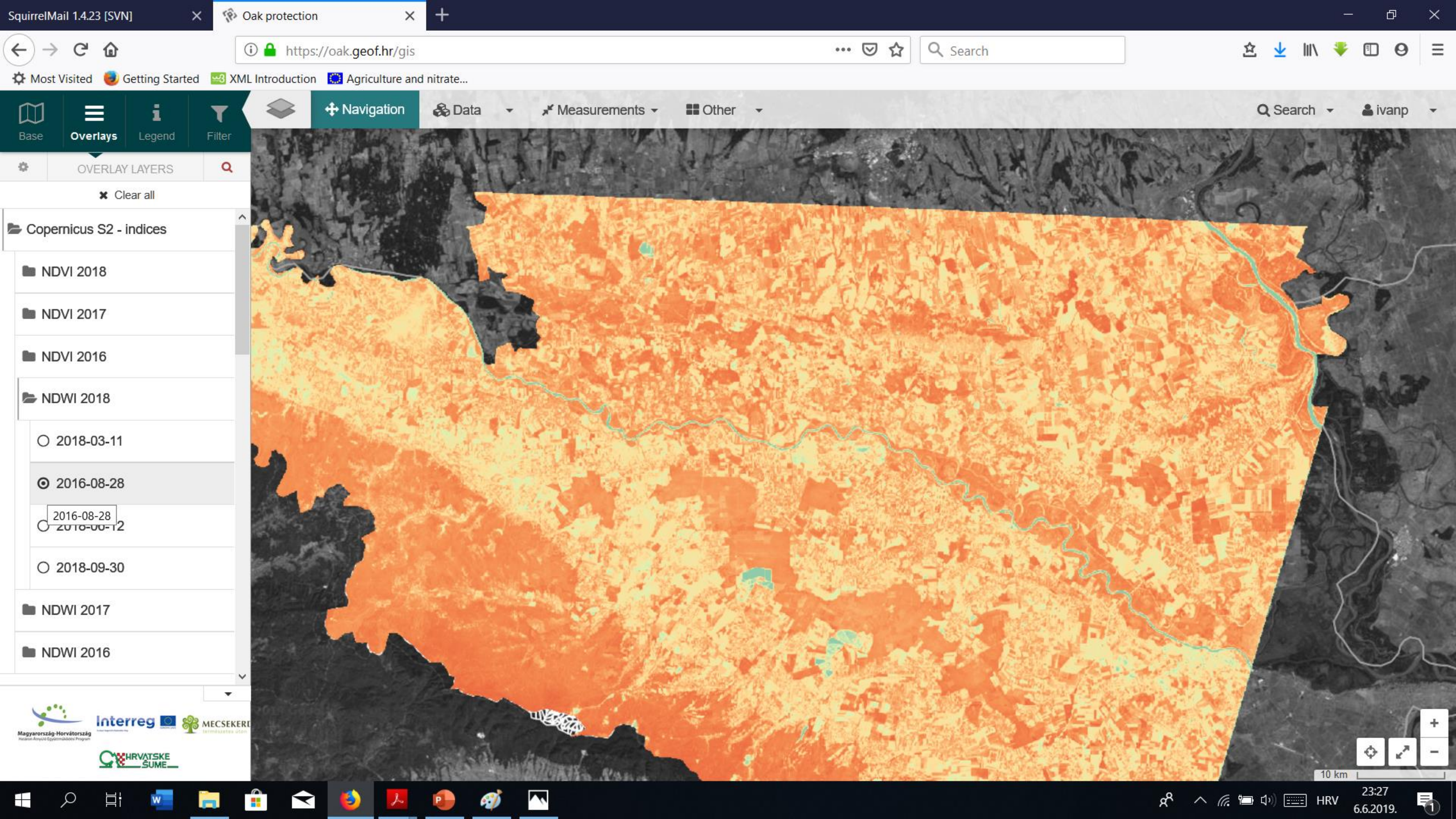
6.6.2019.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Copernicus S2 - indices
NDVI 2018
NDVI 2017
NDVI 2016
NDWI 2018
2018-03-11
2016-08-28
2016-08-28
2018-09-30
NDWI 2017
NDWI 2016
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HRVATSKE ŠUME
10 km
HRV
23:27
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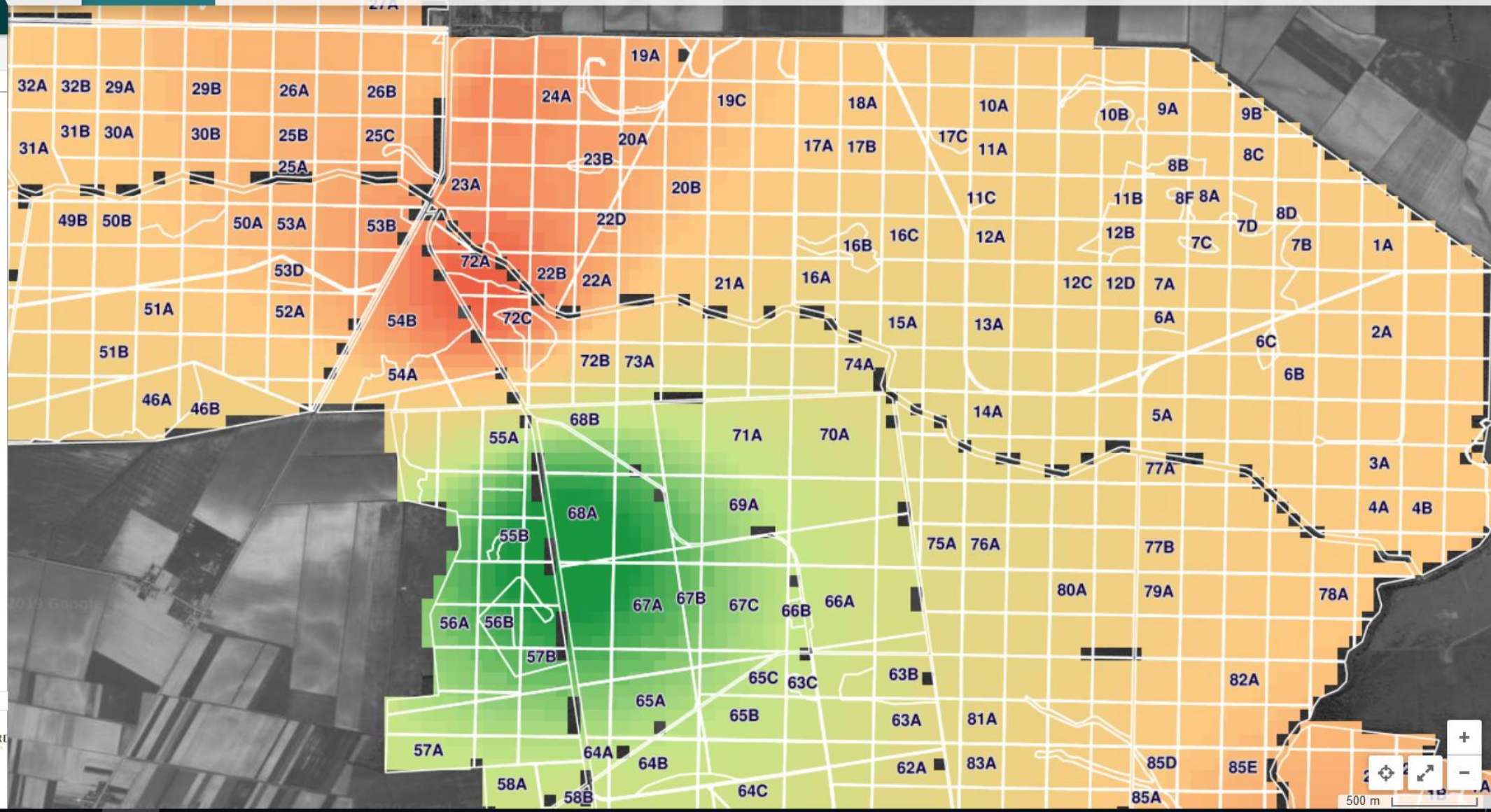
MAP LEGEND

Water AVG (2.5m) Mar

-326
-258
-189
-121



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HRV 23:29 6.6.2019.

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OVERLAY LAYERS

Clear all

- Copernicus S2 - indices
- Copernicus LMS
  - Tree Cover Density 2015
  - Forest Type 2015
  - Water & Wetness 2015
  - ESM 2012-Release 2017
  - EU-DEM v1.1
  - Riparian zones A
  - Riparian zones O
  - Riparian zones P
- Croatia

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500 m

HRV 23:31 6.6.2019.

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OVERLAY LAYERS

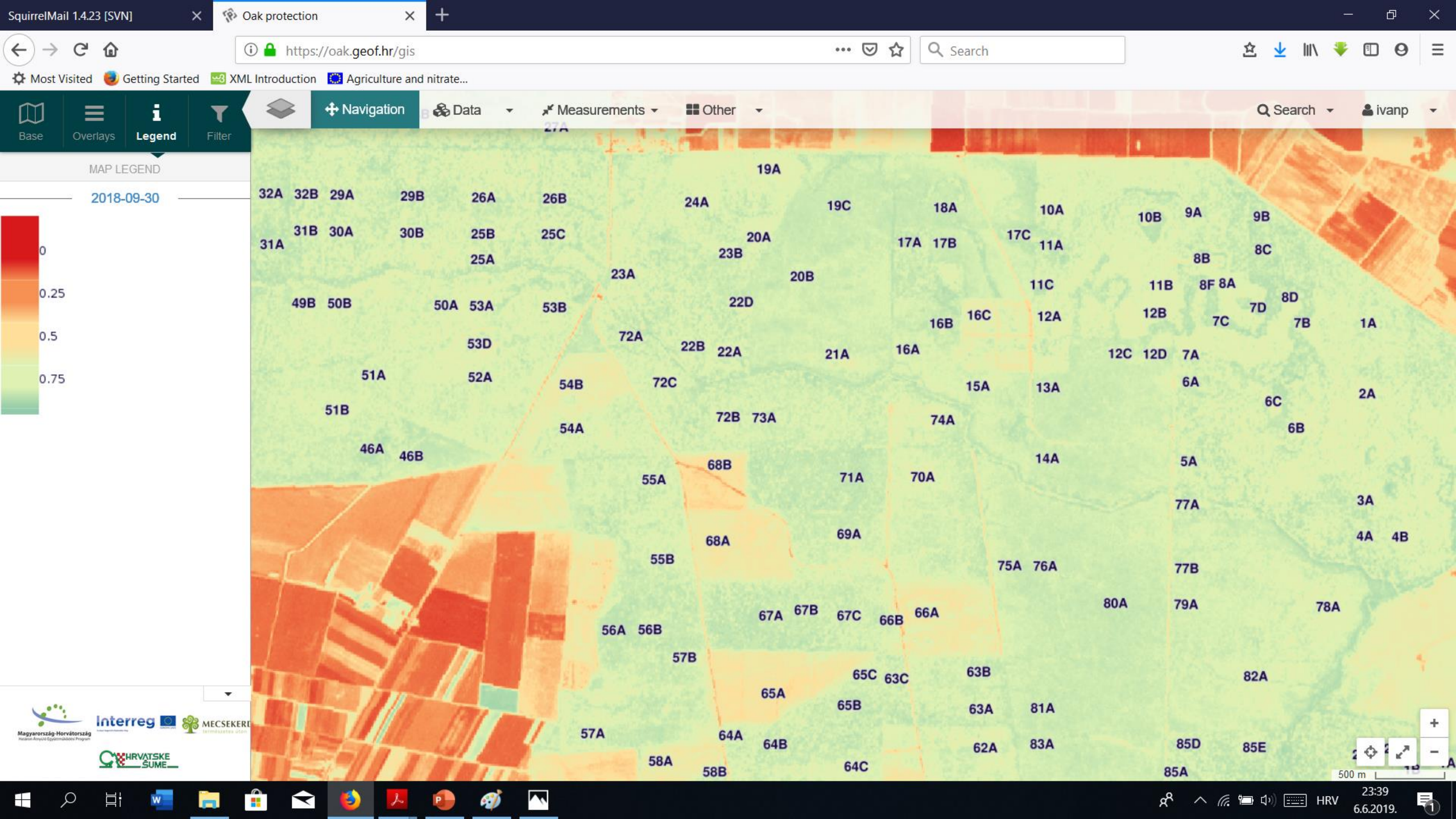
Clear all

- ESM 2012-Release 2017
- EU-DEM v1.1
- Riparian zones A
- Riparian zones O
- Riparian zones P
- Croatia
  - Forest stand border
    - Subcompartment border
  - Hydrology-groundwater
    - Monthly average layers
      - Water AVG (2.5m) Jan

Magyarország-Horvátország | Interreg | MECSEKERDŐ | HRVATSKE ŠUME

500 m

HRV 23:36 6.6.2019.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Other
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ivanp
MAP LEGEND
2018-09-30
0
0.25
0.5
0.75
Interreg
MECSEKERDŐ
HRVATSKE ŠUME
500 m
HRV
23:39
6.6.2019.

SquirrelMail 1.4.23 [SVN] | Oak protection

https://oak.geof.hr/gis

Search

Most Visited | Getting Started | XML Introduction | Agriculture and nitrate...

Base | Overlays | Legend | Filter

Navigation | Data | Measurements | Other | Search | ivanp

OVERLAY LAYERS

Clear all

- ESM 2012-Release 2017
- EU-DEM v1.1
- Riparian zones A
- Riparian zones O
- Riparian zones P
- Croatia
  - Forest stand border
    - Subcompartment border
  - Hydrology-groundwater
    - Monthly average layers
      - Water AVG (2.5m) Jan
      - Water AVG (10m) Jan

Magyarország-Horvátország | Interreg | MECSEKERDŐ | HRVATSKE ŠUME

5 km

HRV 23:41 6.6.2019.

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Oak protection

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Display base in greyscale

PUBLIC

- OSM
- Google Maps
- Google Terrain
- Google Satellite

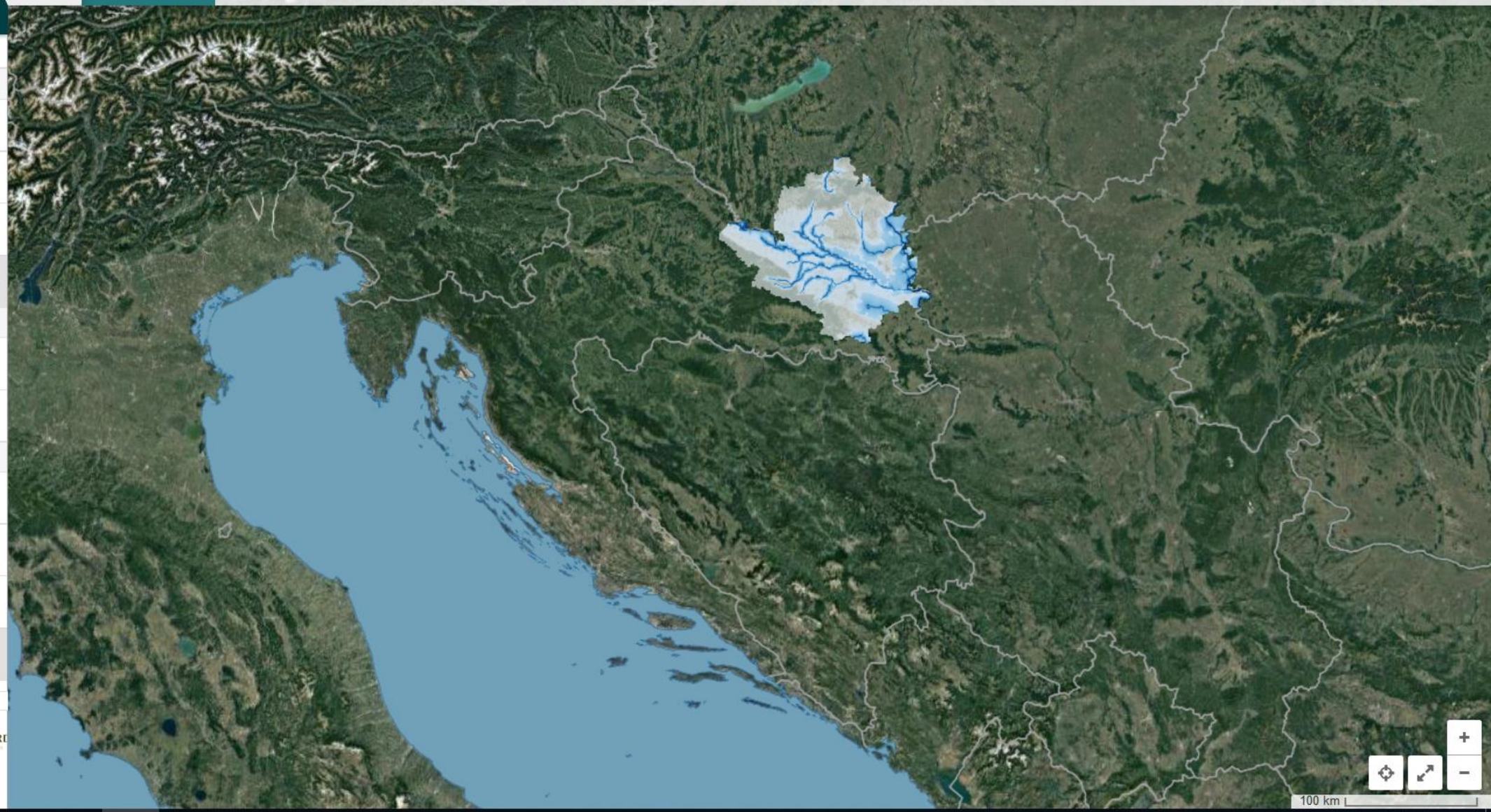
OFFICIAL

- Orthophoto Croatia
- True colour image 2012

OTHER

- Basic base layer
- Empty - white
- Empty - dark
- World map

Magyarország-Horvátország | Interreg | MECSEKERDŐ | HRVATSKE ŠUME



HRV 23:44 6.6.2019.

Hvala na pažnji!