

United Nations/Austria

World Space Forum

13 - 15 December 2022




Unlocking the benefits of Earth observation by making it accessible to everyone

Prof. Krištof Oštir
University of Ljubljana, Slovenia

ORGANIZED JOINTLY BY:

 Federal Ministry
Republic of Austria
Climate Action, Environment,
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Innovation and Technology

 UNITED NATIONS
Office for Outer Space Affairs

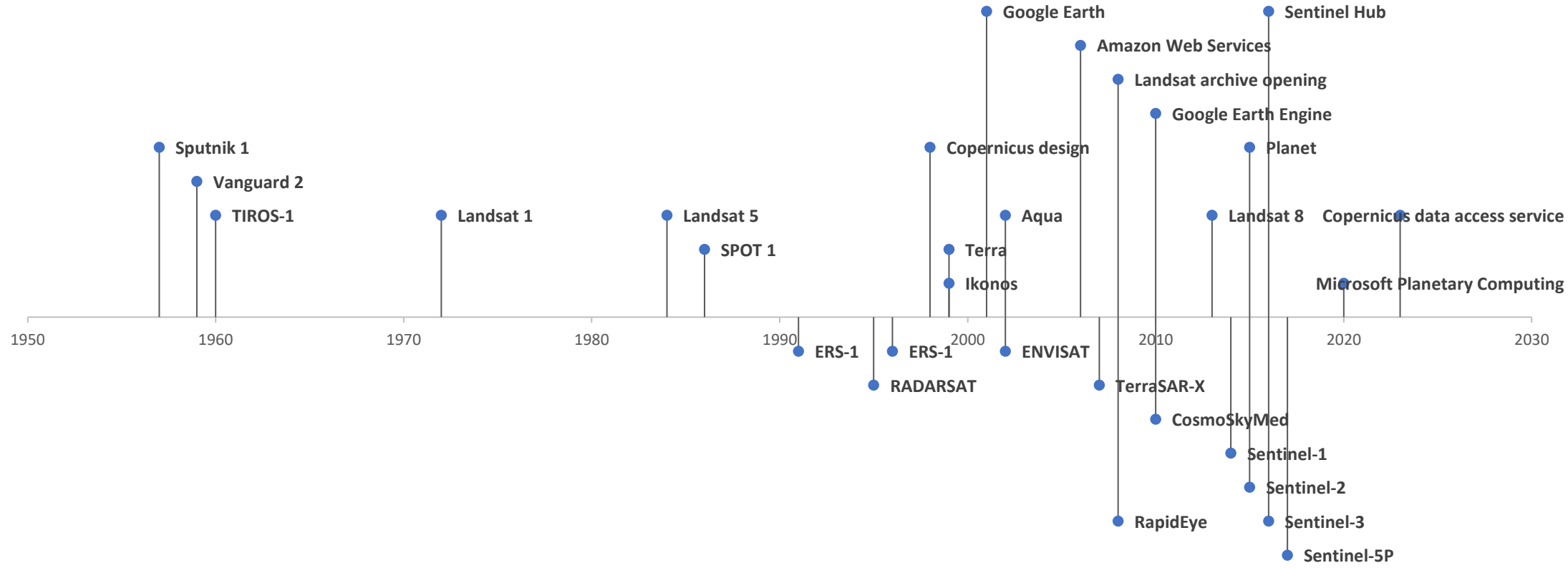
 Federal Ministry
Republic of Austria
European and International
Affairs

SUSTAINABLE DEVELOPMENT GOALS

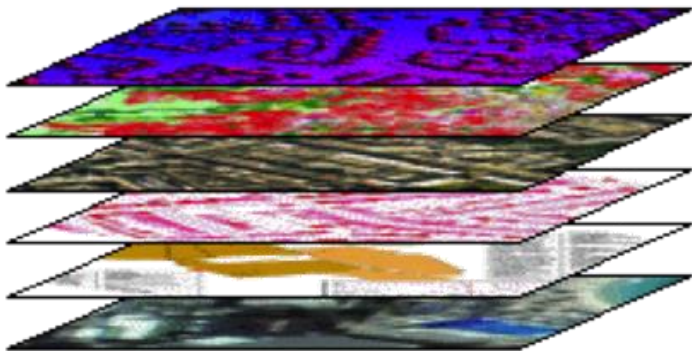


[Space4SDGs: How space can be used in support of the 2030 Agenda for Sustainable Development \(unoosa.org\)](https://www.unoosa.org)

Major milestones



Open EO data - Sentinel-1, Sentinel-2, Landsat, etc.

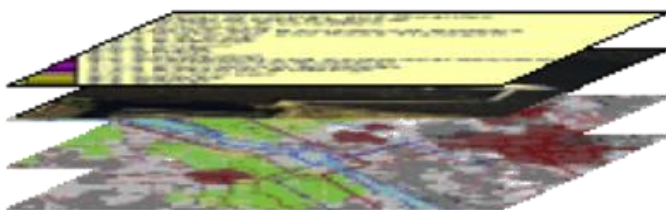


SENTINEL Hub

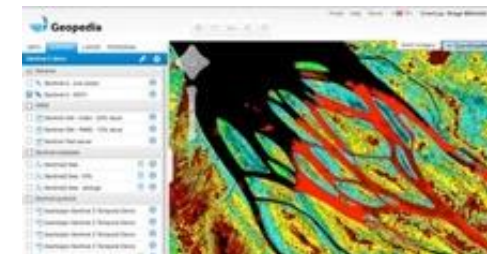
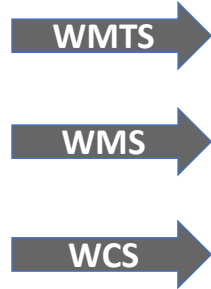
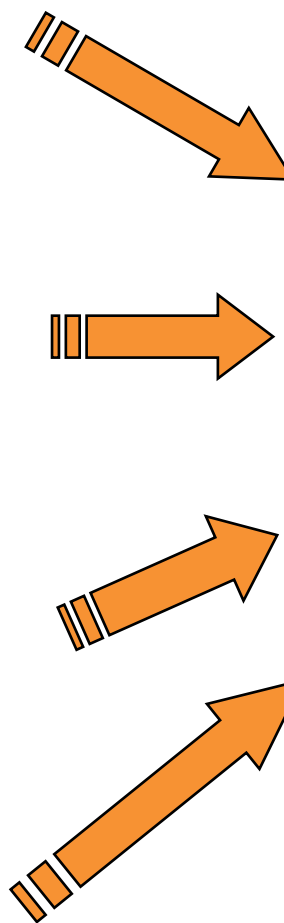
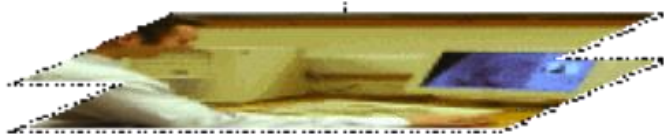
Commercial EO data – WorldWind, GeoEye,...



Aerial imagery (drone, plane)



Other raster data



Cloud GIS



Web / Mobile apps



Desktop (QGIS, ArcGIS...)

```
#!/usr/bin/env python
# -*- coding: utf-8 -*-
"""
    This script is used to generate a map of the world using the
    Sentinel-2 data. It uses the GDAL library to read the data and
    the PyQGIS library to generate the map.
"""
import sys
import os
import glob
import re
import math
import numpy as np
import gdal
import qgis

# Get the path to the Sentinel-2 data
path = sys.argv[1]

# Get the path to the output file
output = sys.argv[2]

# Get the path to the map file
map_file = sys.argv[3]

# Get the path to the style file
style_file = sys.argv[4]

# Get the path to the legend file
legend_file = sys.argv[5]

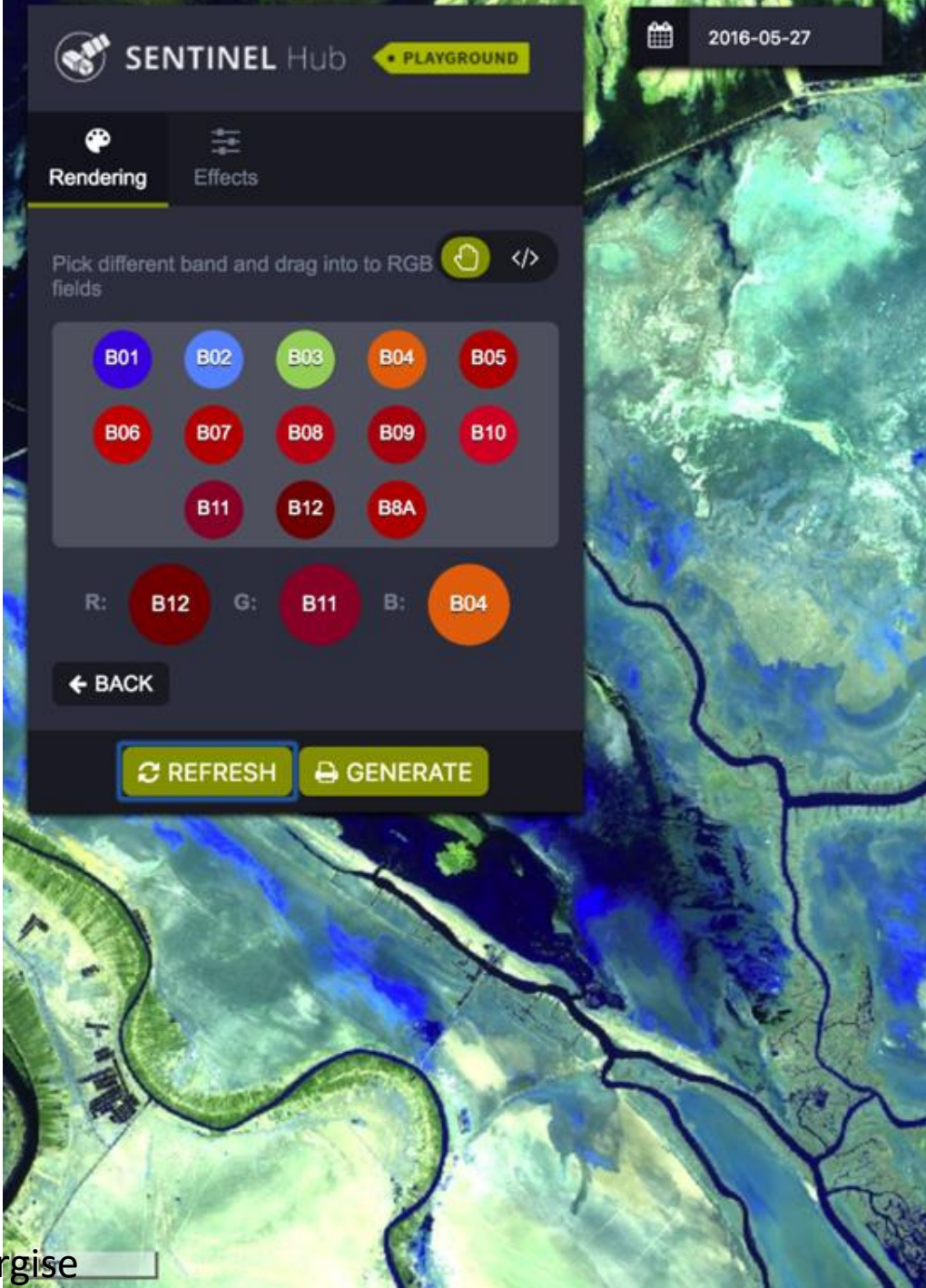
# Get the path to the map file
map_file = sys.argv[3]

# Get the path to the style file
style_file = sys.argv[4]

# Get the path to the legend file
legend_file = sys.argv[5]
```

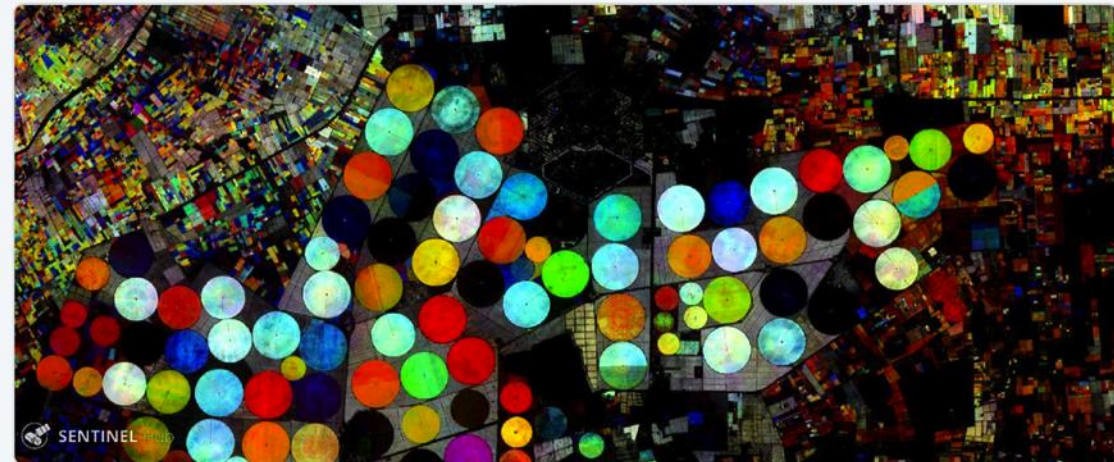
Scripting (Python, R, ENVI...)

Sinergise



HD @HarelDan · 24 Oct 2017

Tip: Blue field growing, Green fields maturing, Yellow Fields ripe, Red fields reaped/drying. Same place, 3 days ago apps.sentinel-hub.com/sentinel-playg...



4 5 20



Stef Lhermitte

@StefLhermitte

Following

Replying to @HarelDan @sentinel_hub and 4 others

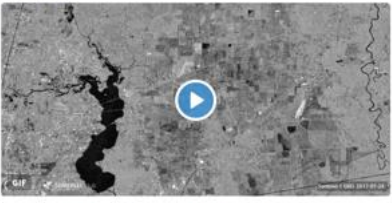
Wow! The moment even my mom can classify petabytes in seconds on her very old computer is getting closer. Just need to teach her Javascript

8:14 AM - 25 Oct 2017

1 Retweet 9 Likes



Simon Gascoin @sgascoin · Aug 30
Flooded areas near Highway 90 and Dayton TX (July 24 vs. Aug 29) #Sentinel1 #HarveyFlood



Zack Labe @ZLabe · Sep 7
Break in the satellite imagery for something a bit less intimidating than Hurricane Irma --> phytoplankton! (Barents Sea 9/5/17, Sentinel-2)



You, Copernicus EU, Copernicus Marine and 2 others

Toño Fdez-Cañadas @TFCanadas · Aug 25
Terrorífica e impresionante la imagen 3D del 23-08-2017 del incendio de Losadilla #sentinel2 obtenida de sentinel-hub.com



Denis Oštr @kricac · Aug 22
Great images of #Croatia fires from @CopernicusEMS #Sentinel imagery, Hvar and Obrovac.



Latest relatively cloud free #sentinel2 L1C NDVI imagery shows extents of Landslides in #Inishowen #sentinel_hub @doregacouncil



You, Copernicus EU and 5 others

Zack Labe @ZLabe · Sep 16
How can you not find Earth science fascinating? Eddies, sediment, sand, etc from Hurricane Irma in the Florida Keys [Sentinel-2, 13 Sep '17]



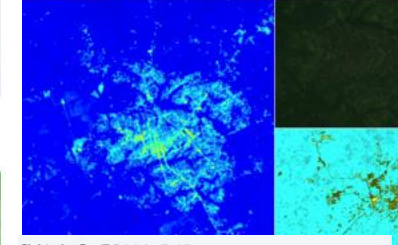
GIS and Beers @GIS_and_Beers · Sep 4
Ataque al corazón!! Heart attack in #Tokio using #sentinel_hub #Infrared #copernicus #sentinel



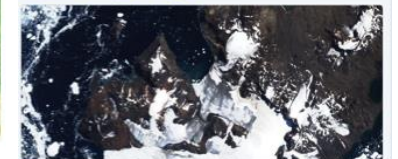
Tim Wallace @wallacetim · Jul 12
This browser for Sentinel and Landsat constellations is kinda incredible. On the fly band combos and math. apps.sentinel-hub.com/eco-browser/#la...



Seen having a play around with #sentinel_hub playground, and it's brilliant. I'm in #Kakata, #Liberia, where I'm spending the next 10 wks!



Christopher Darvill @chrisdarvill · 14h
James Ross Island, Antarctic Peninsula Island -63.9182, -58.1166 goo.gl/8TJ1jm #DailyGlacier #sinergise #sentinel_hub



Simon Gascoin @sgascoin · Sep 12
Flood in #Luzon #Sentinel2 on Sep 04 and Sep 11



Toño Fdez-Cañadas @TFCanadas · Sep 4
Replying to @svilalba @Divulgaméteo @JostMaffeo
Isi se ve el embalse desde #Sentinel2. A finales de agosto de este año y del año pasado #sentinel_hub



Pierre Markuse @Pierre_Markuse · Sep 18
Greece Turkey 9-months temporal mosaic using #sentinel_hub #EOBrowser and some PS #Sentinel #Copernicus Big pic.k/p/yBQkS2



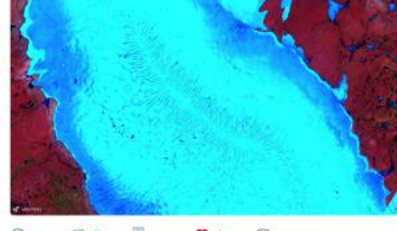
Christopher Darvill @chrisdarvill · Sep 18
Isman Glacier, New Zealand -43.6616, 170.1890 goo.gl/5373qb #DailyGlacier #sinergise #sentinel_hub



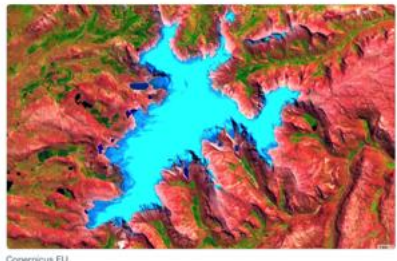
ICU browser #copernicus #sentinel_hub mad-science.org/2017/09/11/hea...



BABA Mohamed Wassim @MatarNissan · Aug 22
A better view with NIR-SWIR-Blue



Simon Gascoin @sgascoin · Sep 10
Quelccaya ice cap. Largest glacier in the tropics. Home of white-winged diuca finch, aka the glacier bird #Sentinel2 on Aug 13 #amazon



Clear view of the #WeddellPolynya (Antarctic) today by Sentinel-3 satellite. For more information about this feature twitter.com/seaice_de/stat...



Simon Gascoin @sgascoin · 6:20 AM · 26 Sep 2017
18 Retweets 41 Likes

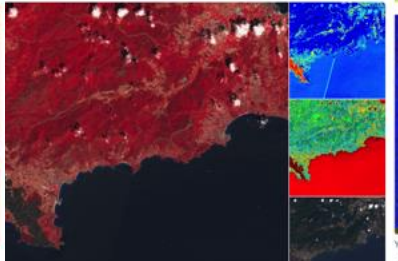
#LarsenC : The Movie
Made with 1 year of extra-wide swath single HH Sentinel-1 data available @sentinel_hub @ESA_EO @CopernicusEU



Greenland's rare wildfire is 'biggest-ever'
AT Solutions @D2AT_Solutions · Jul 31
James-Les-Mimosas at La Bastide après #incendie vu par le satellite #sentinel2 #CopernicusEU #sinergise (NIR, Tur, Moisture Index, NDVI)



Replying to @svilalba @Divulgaméteo @JostMaffeo
Isi se ve el embalse desde #Sentinel2. A finales de agosto de este año y del año pasado #sentinel_hub



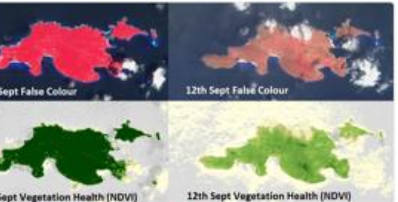
ely fluvial geomorphology revealed using the #sentinel_hub playground. eck out those braided channels!



alimazzara.forestry.es/2017/08/incend...
Translate from Spanish



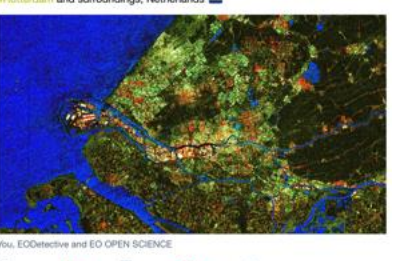
Amir Farhand @AmirFarhand · Sep 13
Damage to vegetation after #irma on #jostvandyke #BV Before & After satellite imagery #sentinel_hub @BBCAms @SCFGallagher @richardbranson



Pierre Markuse @Pierre_Markuse · Aug 21
Playing with the new temporal mosaicking abilities of #sinergise #SentinelHub (Beta coming soon) - Nice so far! Lake Edward DRC #Uganda



You, EODetective and Copernicus EU



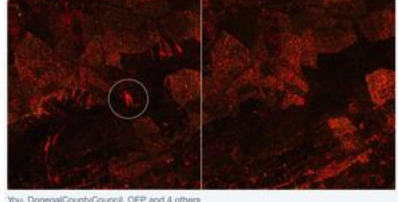
You, EODetective and EO OPEN SCIENCE

Veeteede Amet
February 13 at 4:35pm · E

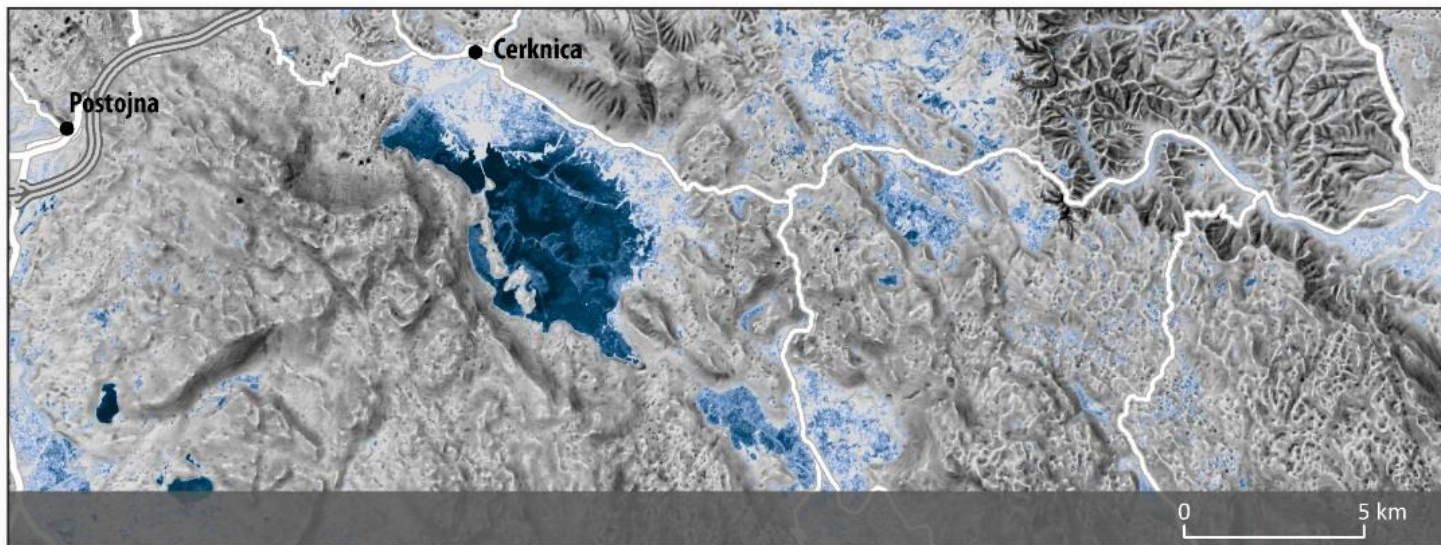
Selline piit avaneb siis Eesti merealast ja jääoludest 600 km kõrguseilt, otse Sentinel-2 pardalt. Siit on ka hästi näha, kus jää juba paksem ja kus see veel õrnem on. Surfa ise ka sateliitpildel siit: http://sentinel-pds.s3-website.eu-central-1.amazonaws.com/.../ Aga täna teatas Maanteeamet melle, et nad on alustanud ettevalmistusi jäätee rajamiseks Vormsile. Niisil otsustasimegi meie peatada seal alates 20. veebruarist laevaliiklus. Laevaliiklus pannakse seega seisma kavan... See More See Translation



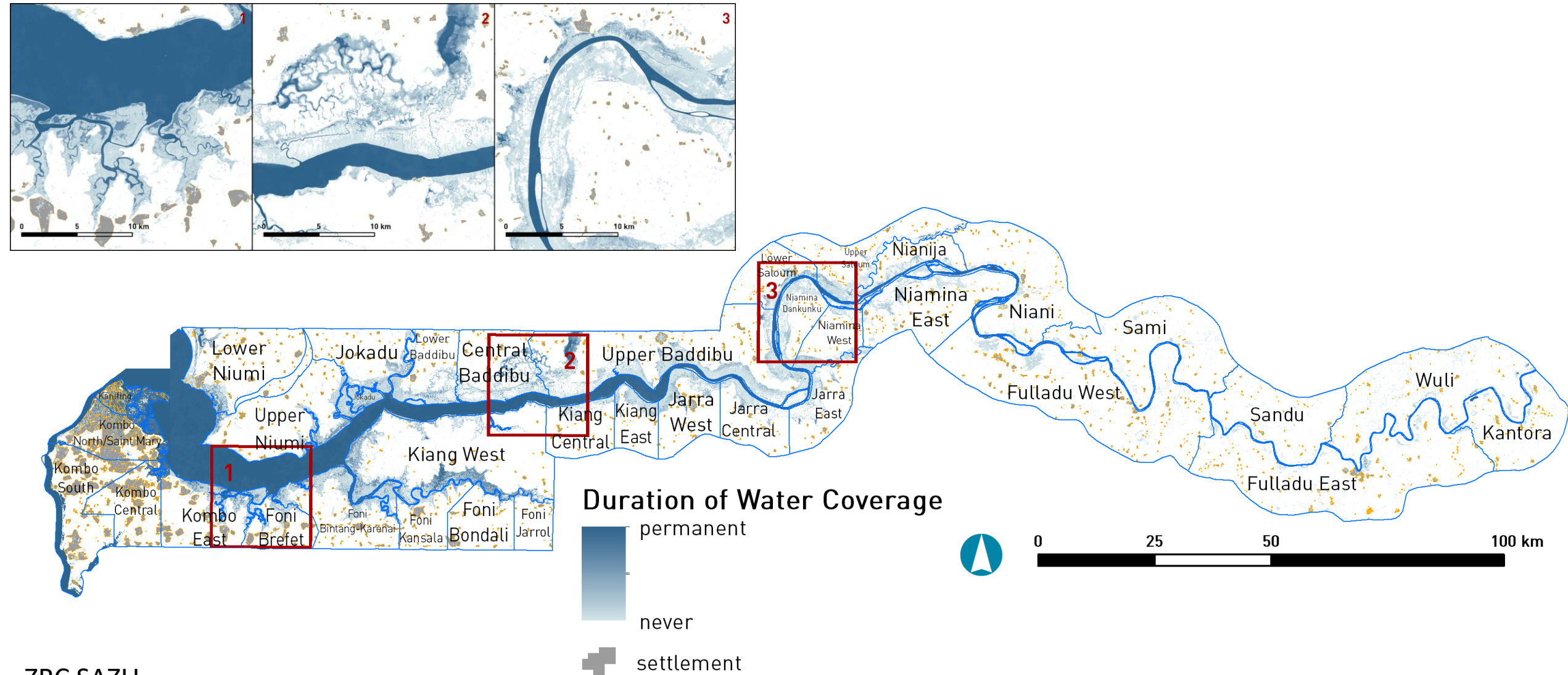
11 Comments 147 Shares



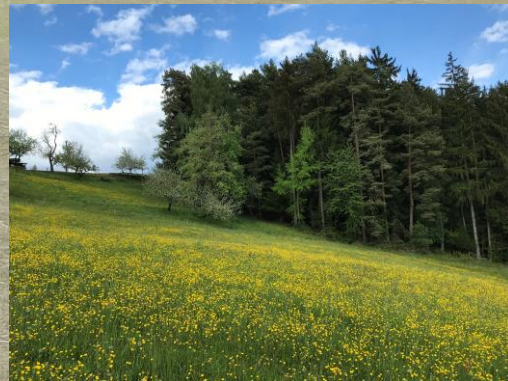
Monitoring surface water bodies

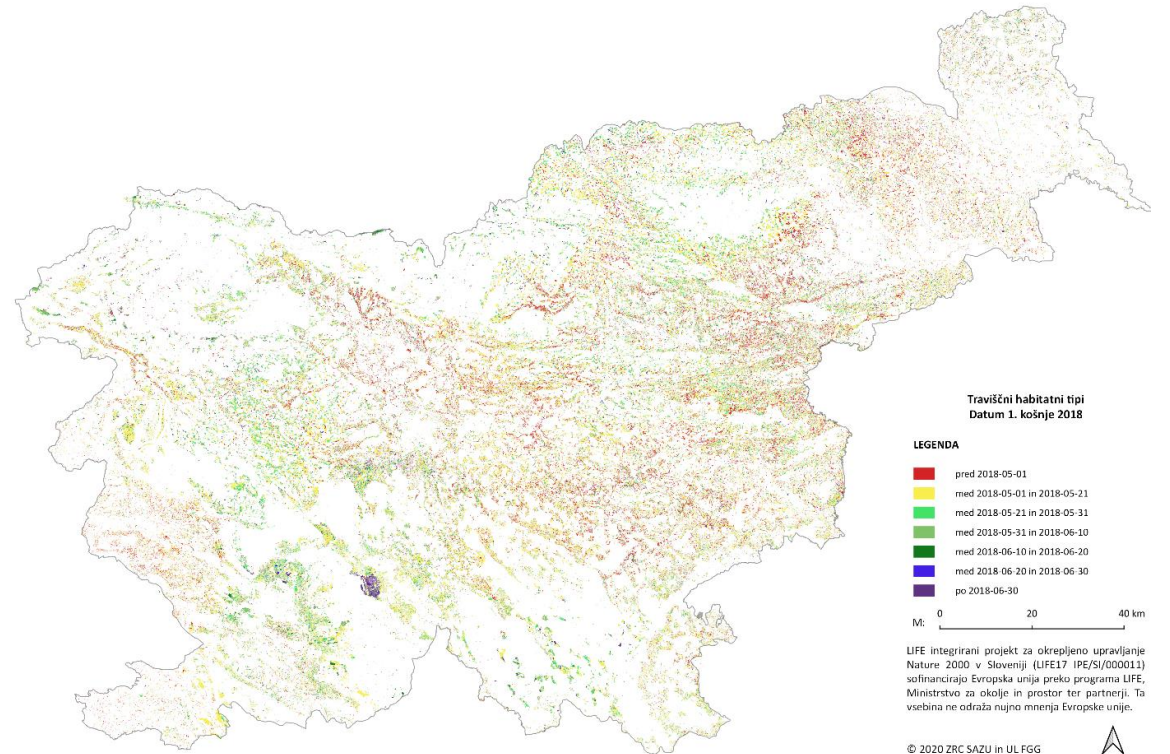
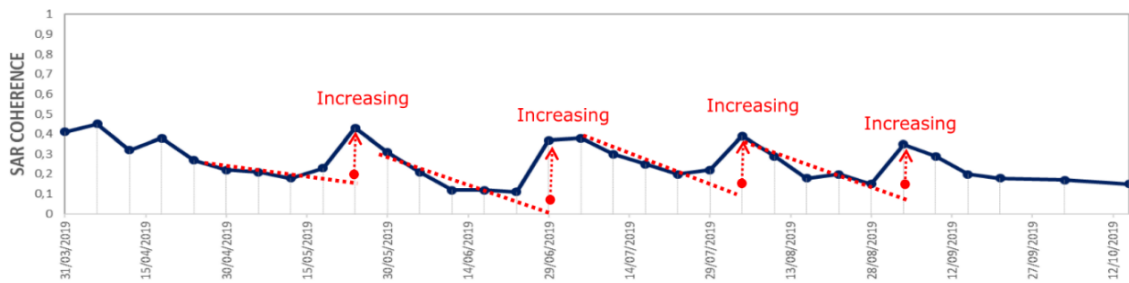
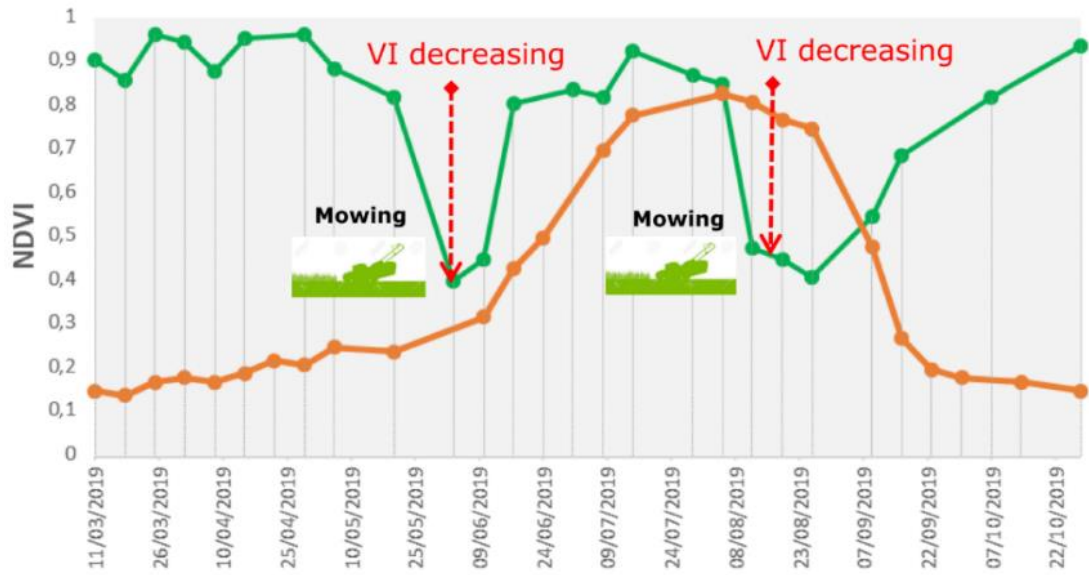


Monitoring water coverage – Gambia

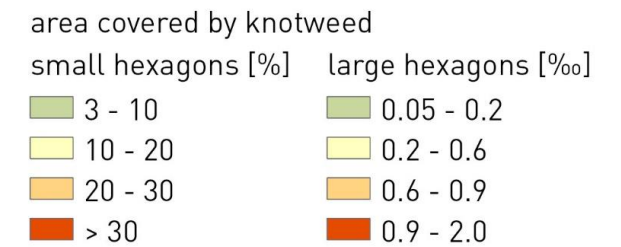
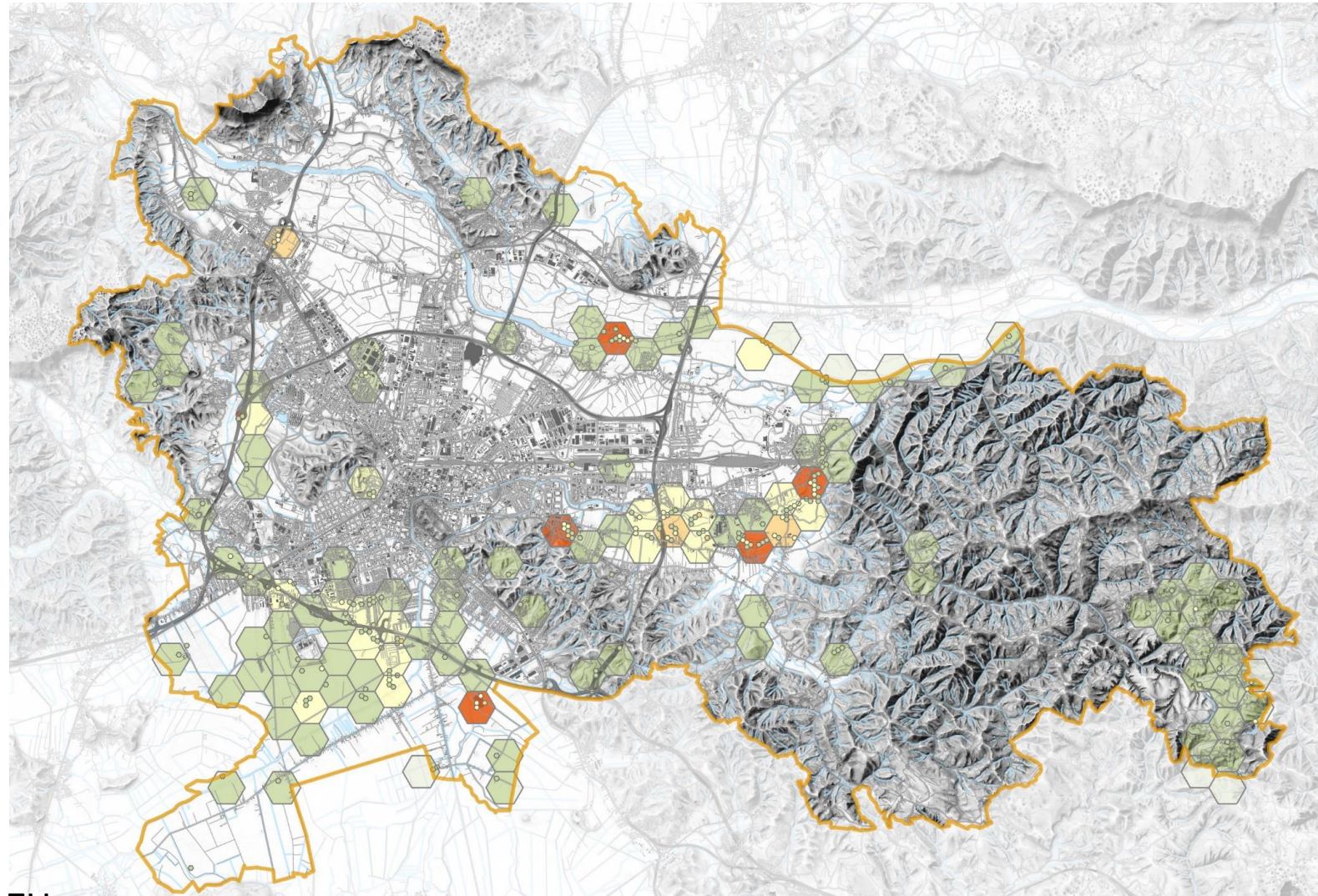


Mapping grassland – intensive/extensive





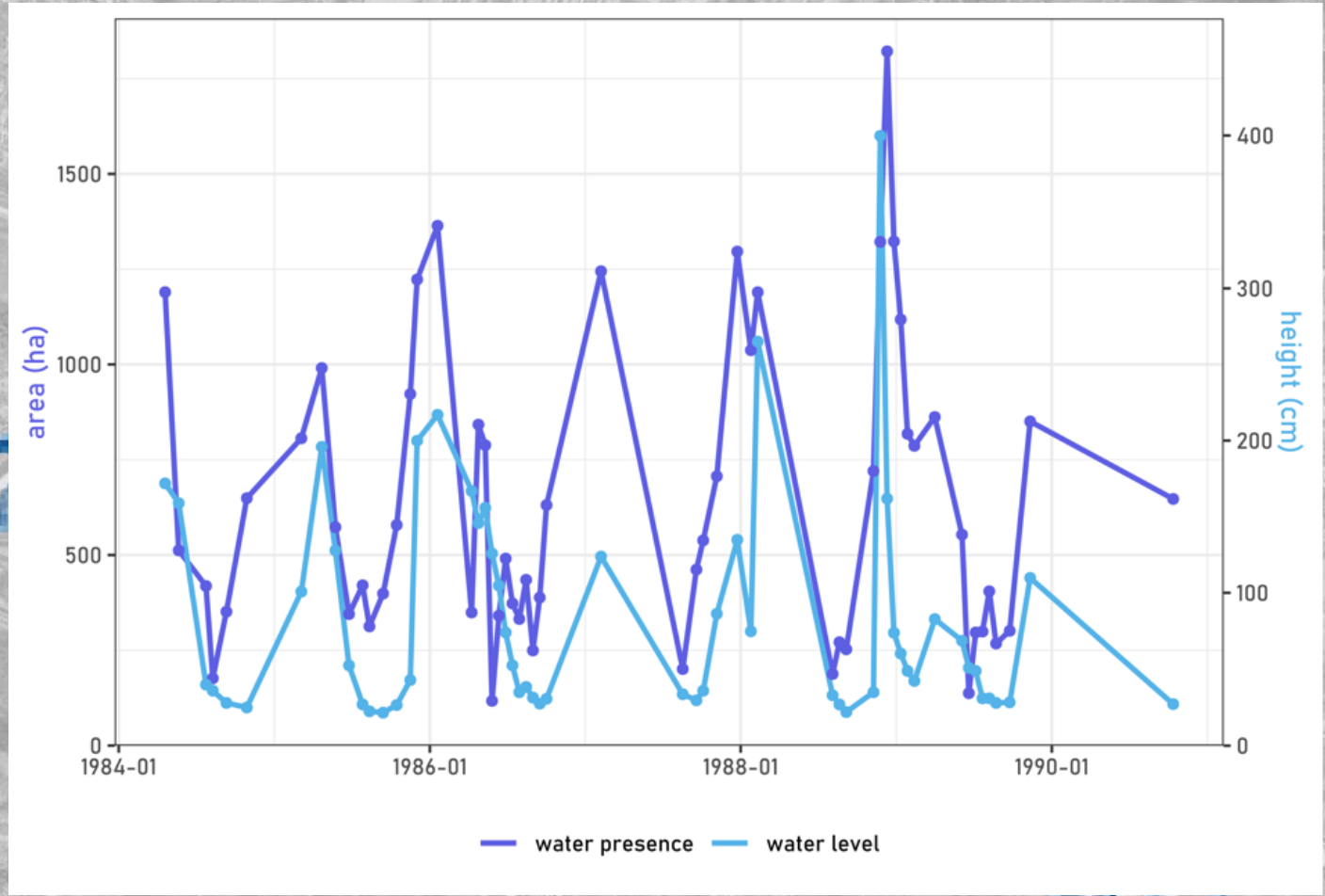
Monitoring invasive alien species



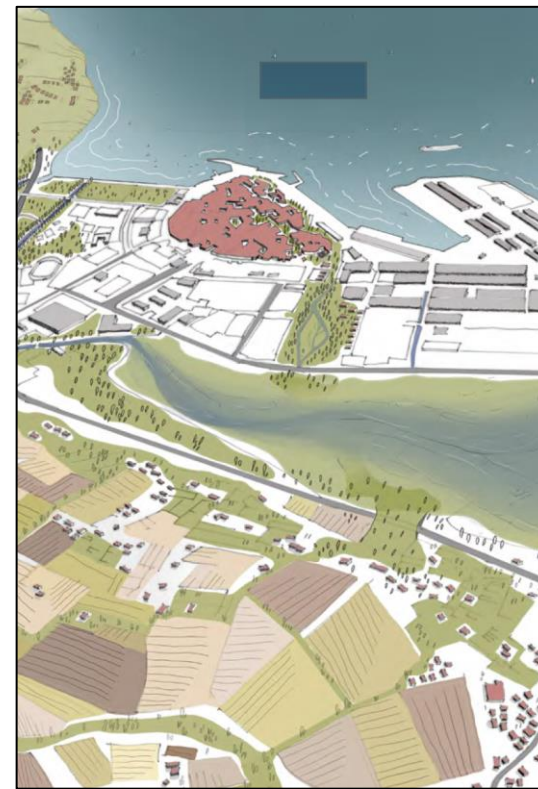
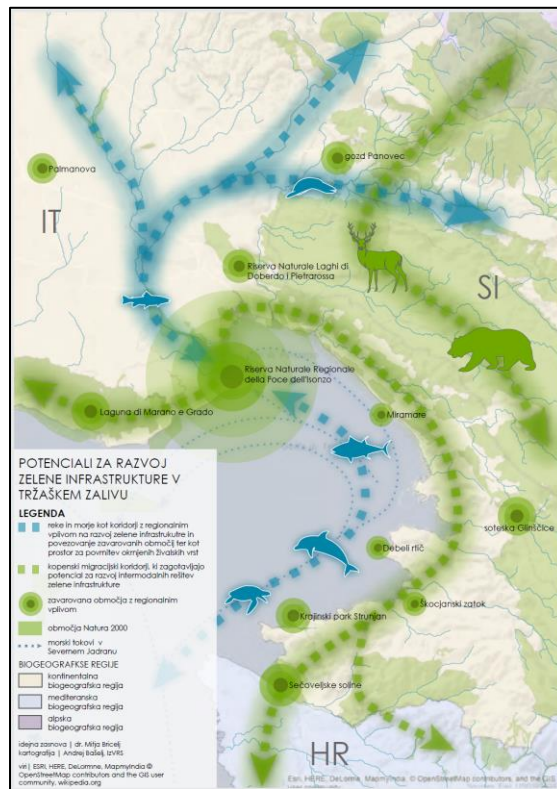
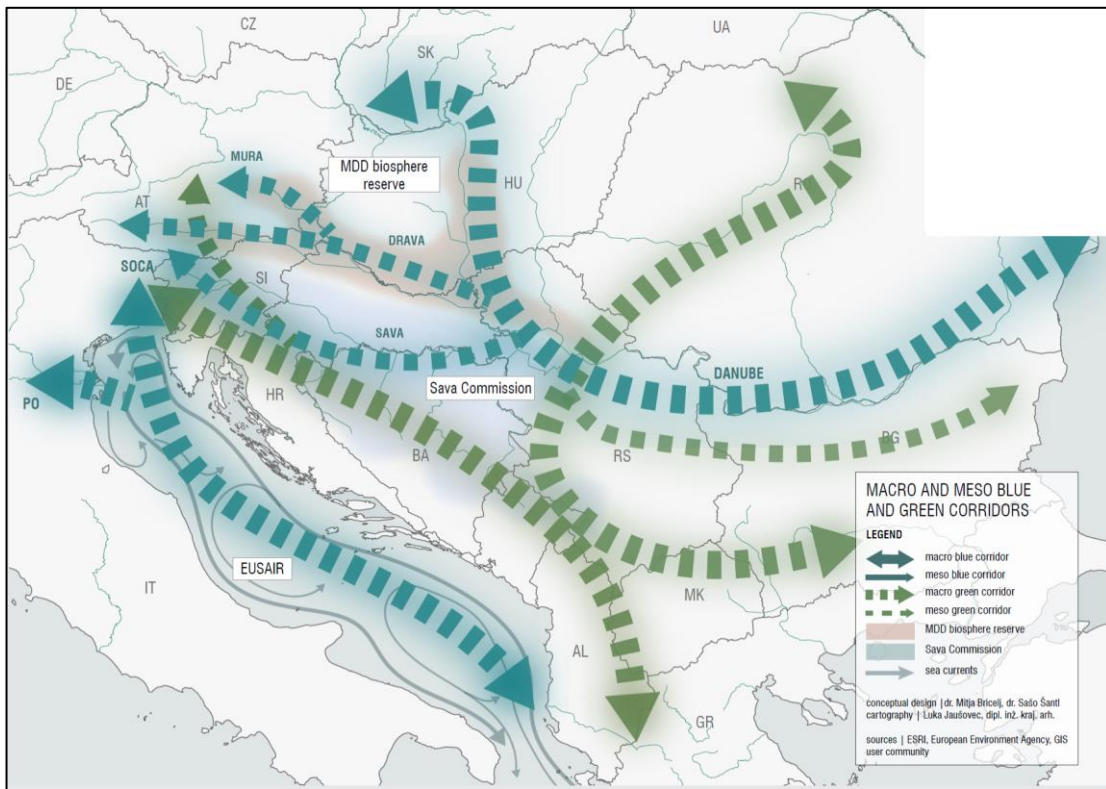
0

5 km

Long term gravel bar monitoring – Vjosa, Albania



Observing different scales



Blue & Green corridors

Sentinel satellites
Small satellites
Airplanes and drones
In situ sensors, IoT

Nemo-HD River Basin Scanning Challenge



With innovative co-creation and technologies from Industry 4.0 we are **changing the perception of tourism** and business sector around it.



Join us



digitalisation of cultural heritage



Smart Camper Stop



Tourism Impact Model



Articles, Papers & Guidelines



bringing R&D into tourism



Read our Newsletter



Tourist Flows

Tourism Impact Model



Using real data to create an objective picture of tourism impact in a destination



Digital twin of a tourist destination



Data driven strategic planning by modelling the impact using different scenarios

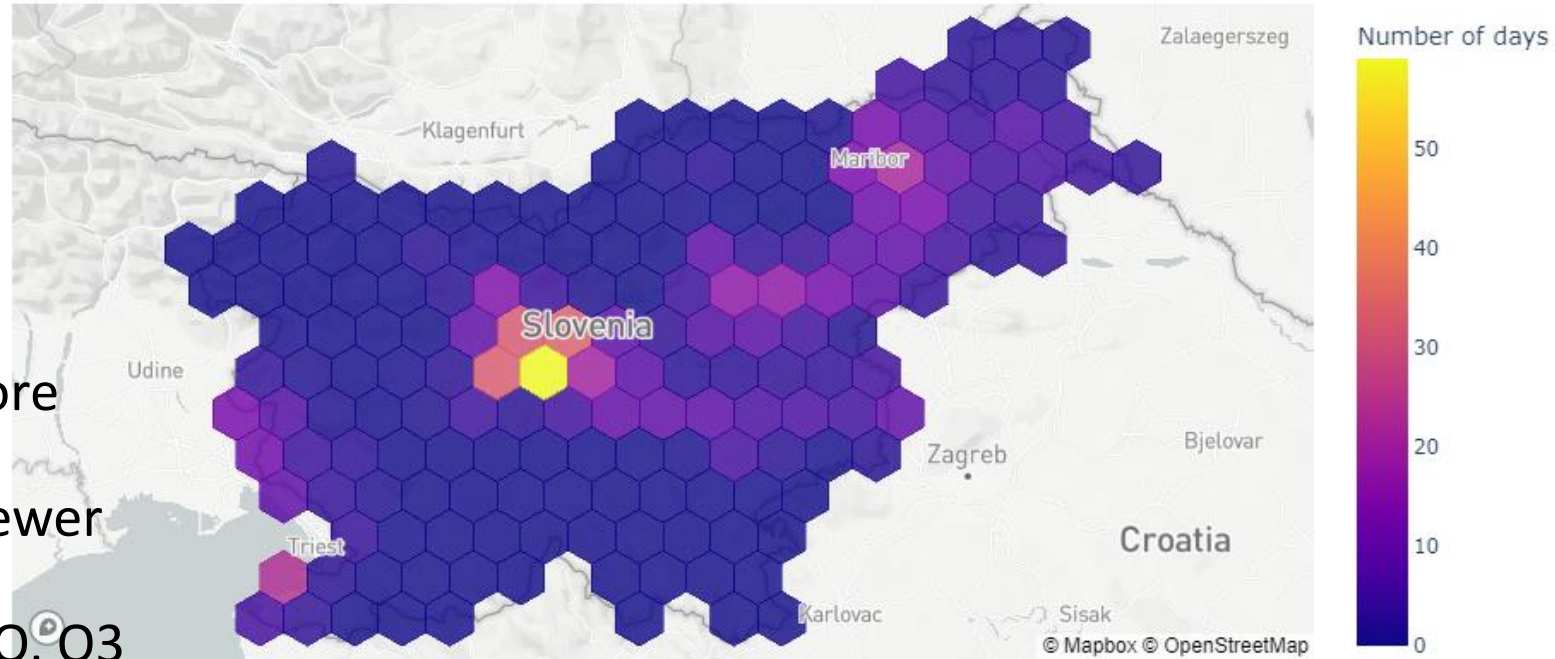
300+ indicators
positive and negative impact of tourism
different societal aspects



Earth observation data in tourism

- UV monitoring
- Algal bloom monitoring
- Landuse trends
- Air quality monitoring
 - More tourists can mean more pollution
 - More pollution can mean fewer tourists
 - PM10, PM2.5, SO2, NO2, CO, O3
 - Short- and long-term effects
 - Local population as well as tourists

Number of days where transport pollution exceeds WHO threshold in Slovenia in 2022



Conclusions



RESEARCH AND
DEVELOPMENT IS
THE DRIVING FORCE



EDUCATION IS
CRUCIAL



DIGITAL TWINS



DATA INTEGRATION,
CLOUD PROCESSING,
BIG DATA



ARTIFICIAL VS
HUMAN
INTELLIGENCE

Energy consumption of AI

Emissions Problem

Rob Toews Contributor

I write about the big picture of artificial intelligence.

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Jun 17, 2020, 11:54am EDT

 This article is more than 2 years old.



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FEATURE | ARTICLE 3 OF 4 | Part of: The environmental impact of AI

Energy consumption of AI poses environmental problems

Data centers and large AI models use massive amounts of energy and are harmful to the environment. Businesses can take action to lower their environmental impact.

By  Mark Labbe Published: 26 Aug 2021

   Training an advanced AI model takes time, money and high-quality data. It also takes energy -- a lot of it...

Part of: The environmental impact of AI 3 of 4

- AI and climate change: The mixed impact of machine learning**
AI can both help and hurt the environment. While companies use artificial intelligence to increase
- How AI can be used in agriculture: Applications and benefits**
The use of agricultural AI optimizes the farming industry by decreasing workloads, analyzing
- Energy consumption of AI poses environmental problems**
Data centers and large AI models use massive amounts of energy and are harmful to the
- AI carbon footprint: Helping and hurting the environment**
Companies can use AI to help the environment, including by using it to prevent forest fires and

Thank you!

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