Climate data processing for climate resilience

Tajikistan and Kyrgyzstan

Data access, processing and methodological concepts

Webinar
17. - 27. 11.2020

DAY 06
EO and Climate Change

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Objectives of Day 03

Date: 22.11
Presentation: Day05_BigData

https://github.com/nilshempelmann/climdatatutorial/blob/master/presentations

Objectives:

- Wrap up of yesterday
-

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Various Applications

… and many more

Sourse: ESA CC BY –SA 3.0 IGO, Sentinel-2, bearbeitet durch MapTailor Geospatial Consulting

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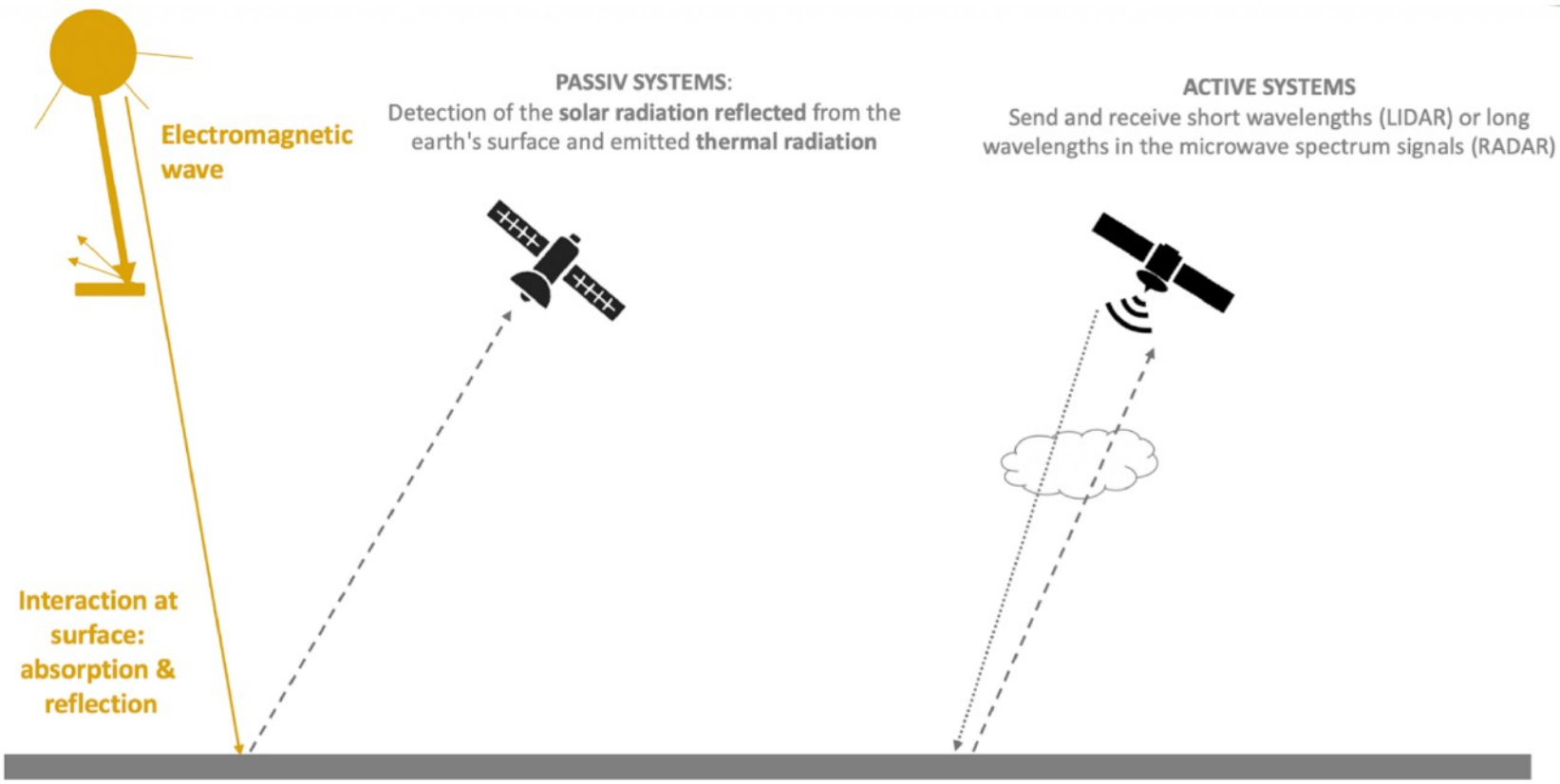
Principes



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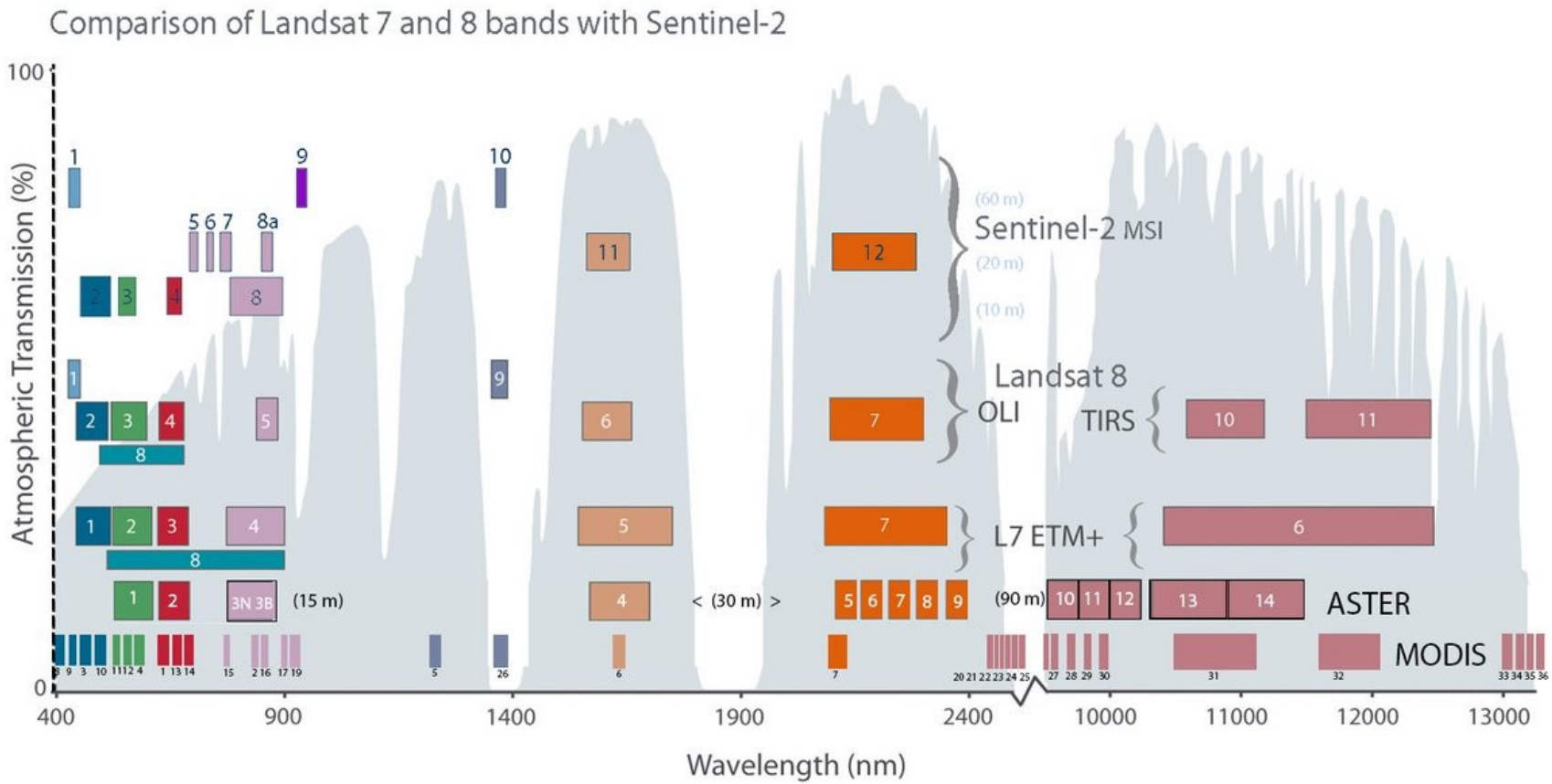
Bands



Source: https://gis.stackexchange.com/questions/276871/convertion-of-spectral-indices-formulas-from-landsat-to-sentinel

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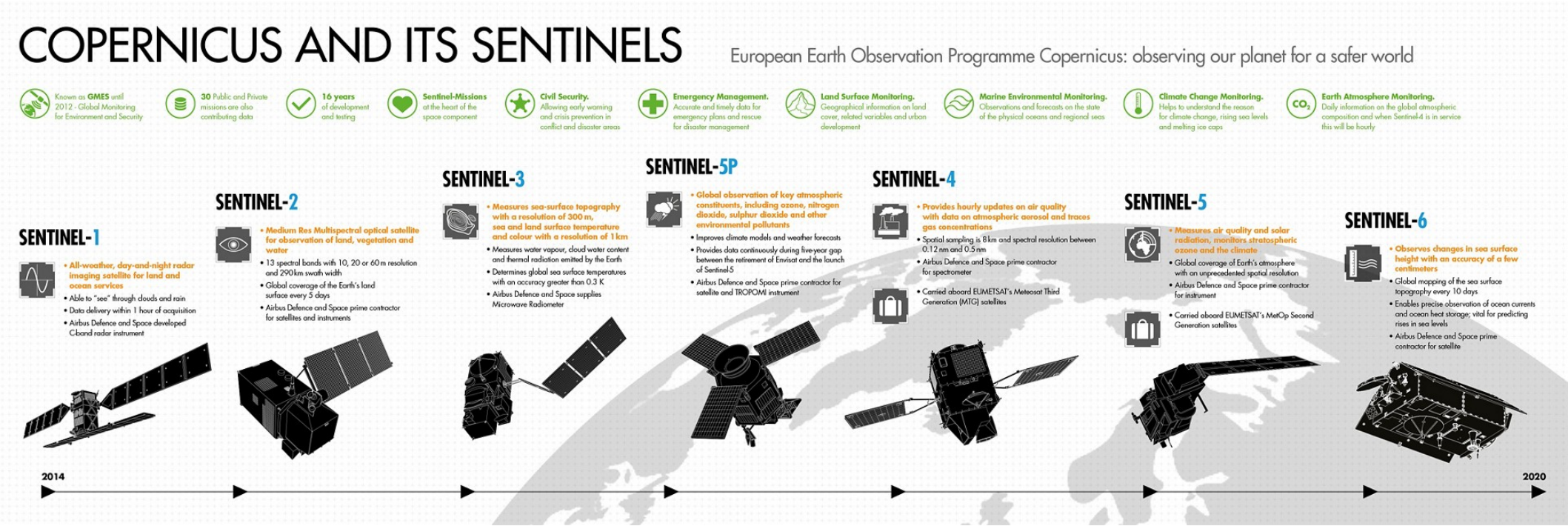
Sentinel Family

https://www.sentinel-hub.com/



Source: https://www.airbus.com/public-affairs/berlin/en/our-topics/space.html

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Band Indices

Many many more:

https://www.indexdatabase.de/

109	Normalized green red difference index, Visible Atmospherically Resistant Indices Green (VIgreen)	NGRDI	$\frac{GREEN-RED}{GREEN+RED}$
110	Normalized Difference MIR/NIR Normalized Difference Vegetation Index (in case of strong atmospheric disturbances)	NDVI	$\frac{MIR-NIR}{MIR+NIR}$
111	Normalized Difference NIR/Blue Blue-normalized difference vegetation index	BNDVI	$\frac{NIR-BLUE}{NIR+BLUE}$
112	Normalized Difference NIR/Green Green NDVI	GNDVI	$\frac{NIR-GREEN}{NIR+GREEN}$
113	Normalized Difference NIR/MIR Modified Normalized Difference Vegetation	MNDVI	$\frac{NIR-MIR}{NIR+MIR}$

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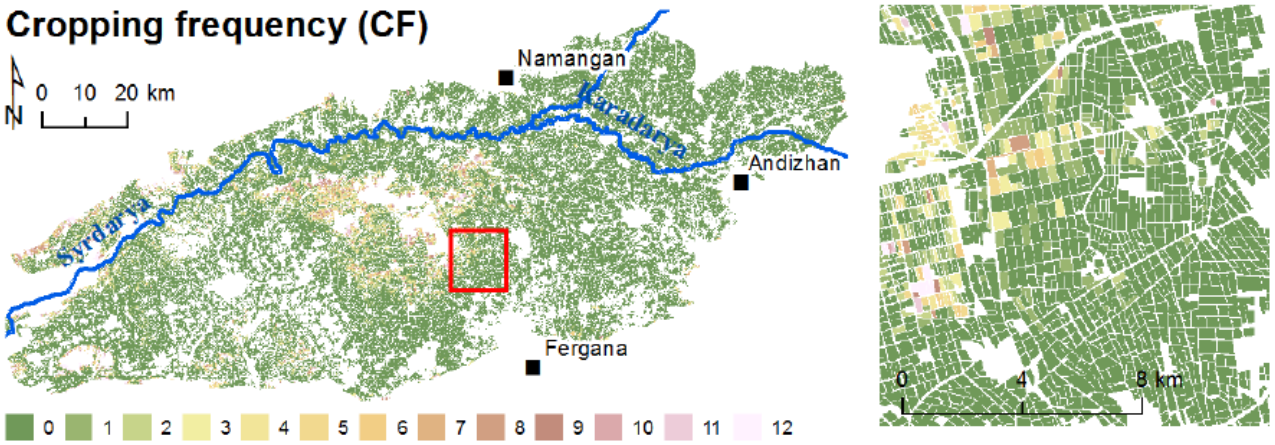
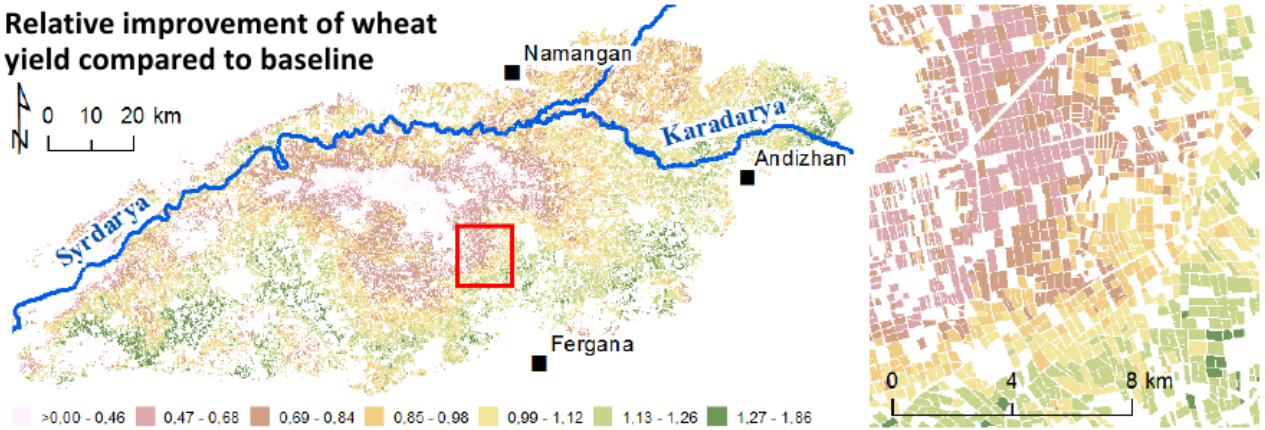
Agriculture monitoring

Source: Löw, F., Biradar, et al. 2017. Int. J. Appl. Earth Obs. Geoinf. 59, 118–134.





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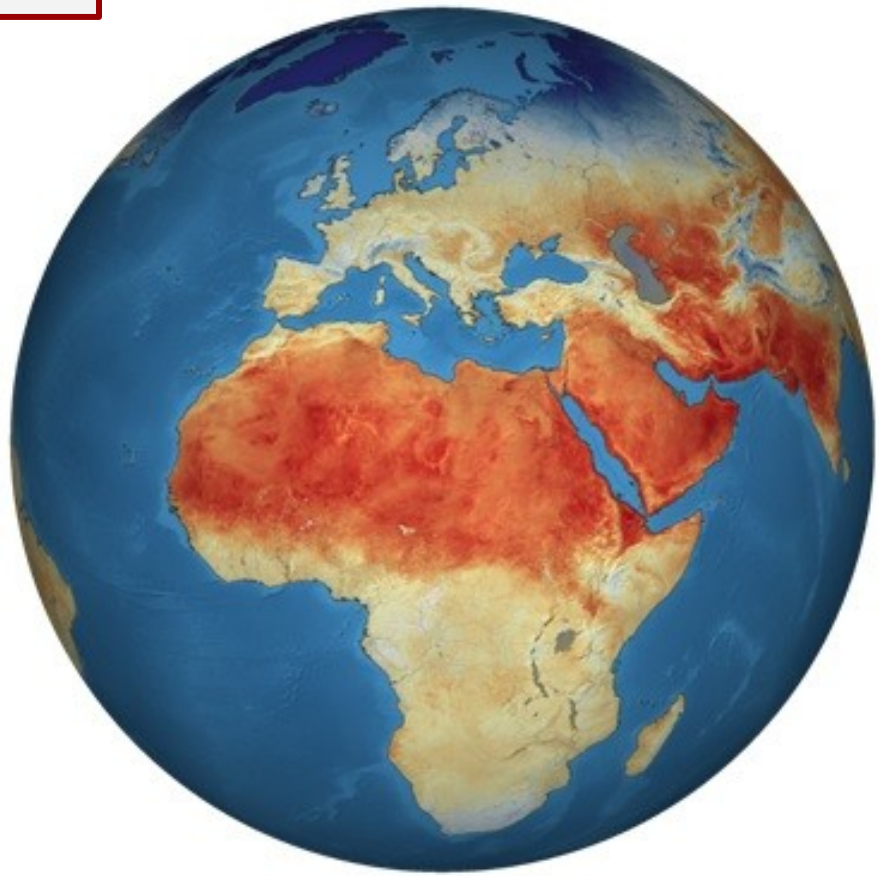
Climate Change monitoring

Global Land Surface Temperatures from Sentinel-3/SLSTR data (2018). (Credit: ESA)



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Air quality / emissions
→ NDC – strategy

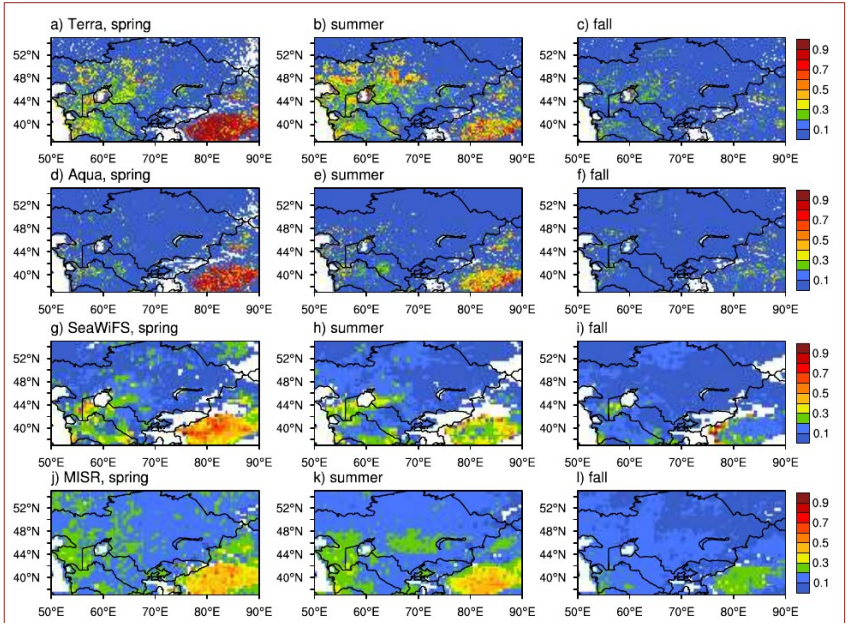
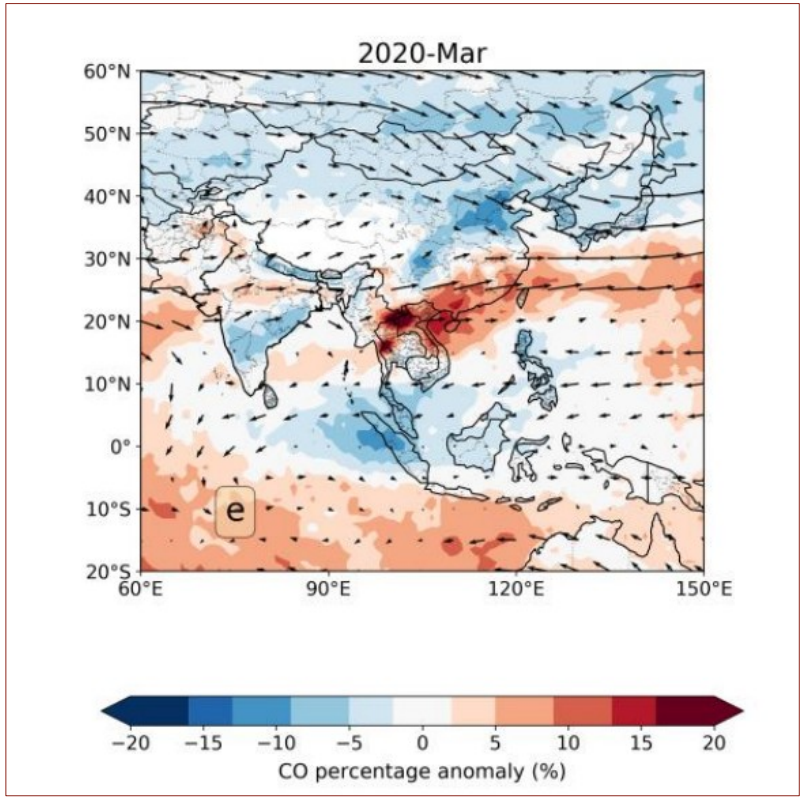


Figure 4. Seasonal mean of DOD in the spring, summer, and fall during the 2003–2007 period from MODIS onboard Terra (**a**, **b**, and **c**)/Aqua (**d**, **e**, and **f**), SeaWiFS (**g**, **h**, and **i**), and MISR (**j**, **k**, and **l**). White indicates no retrievals available.

Analysis of Dust Aerosol Retrievals Using Satellite Data in Central Asia

Source: Li et. al. 2018: https://doi.org/10.3390/atmos9080288



COVID-19 Lockdowns Improve Air Quality in the South-East Asian Regions, as Seen by the Remote Sensing Satellites

Source: Abirlal Metya(2020) in Special Issue on COVID-19 Aerosol Drivers, Impacts and Mitigation (IV)
https://doi.org/10.4209/aaqr.2020.05.0240

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EO for SDG

Source:
Digital Earth Africa
digitalearthafrica.org/

Target (Contribute to progress on the Target, not necessarily the Indicator)	Goal	Indicator (Direct measure or indirect support to the Indicator)
1.4, 1.5	1 No poverty	1.4.2
2.3, 2.4, 2.c	2 Zero hunger	2.4.1
3.3, 3.4, 3.9, 3.d	3 Good health and well-being	3.9.1
	4 Quality education	
5.a	5 Gender equality	5.a.1
6.1, 6.3, 6.4, 6.5, 6.6, 6.a, 6.b	6 Clean water and sanitation	6.3.1, 6.3.2, 6.4.2, 6.5.1, 6.6.1
7.2, 7.3, 7.a, 7.b	7 Affordable and clean energy	7.1.1
8.4	8 Decent work and economic growth	
9.1, 9.4, 9.5, 9.a	9 Industry, innovation and infrastructure	9.1.1, 9.4.1
10.6, 10.7, 10.a	10 Reduced inequalities	
11.1, 11.3, 11.4, 11.5, 11.6, 11.7, 11.b, 11.c	11 Sustainable cities and communities	11.1.1, 11.2.1, 11.3.1, 11.6.2, 11.7.1
12.2, 12.4, 12.8, 12.a, 12.b	12 Responsible consumption and production	12.a.1
13.1, 13.2, 13.3, 13.b	13 Climate action	13.1.1
14.1, 14.2, 14.3, 14.4, 14.6, 14.7, 14.a	14 Life below water	14.3.1, 14.4.1, 14.5.1
15.1, 15.2, 15.3, 15.4, 15.5, 15.7, 15.8, 15.9	15 Life on land	15.1.1, 15.2.1, 15.3.1, 15.4.1, 15.4.2
16.8	16 Peace, justice and strong institutions	
17.2, 17.3, 17.6, 17.7, 17.8, 17.9, 17.16, 17.17, 17.18	17 Partnerships for the goals	17.6.1, 17.18.1

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Hands ON:

Qgis exercise NDVI calculation

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