# 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



#### **Objectives of Day 06**

Date: 23.11

Presentation: EO\_SDG

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

#### **Objectives:**

- Wrap up of yesterday
  - - Climate Services Information System GeoSpatialData Infrastructure
- Applications with EO
- EO Indices



# **Various Applications**











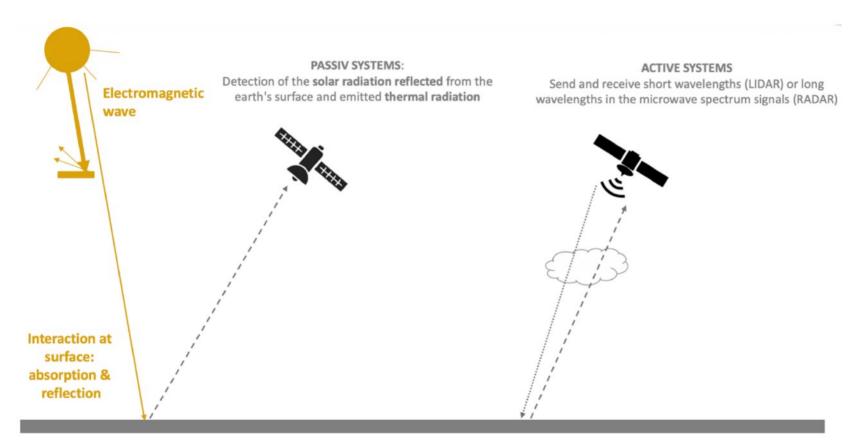
... and many more



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

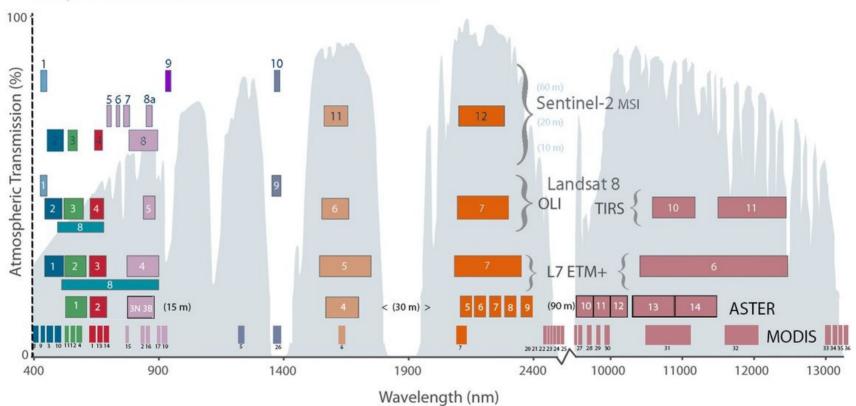
## **Principes**





#### **Bands**

Comparison of Landsat 7 and 8 bands with Sentinel-2



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



#### **COPERNICUS AND ITS SENTINELS**

European Earth Observation Programme Copernicus: observing our planet for a safer world



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



#### **Band Indices**

Many many more:

https://www.indexdatabase.de/

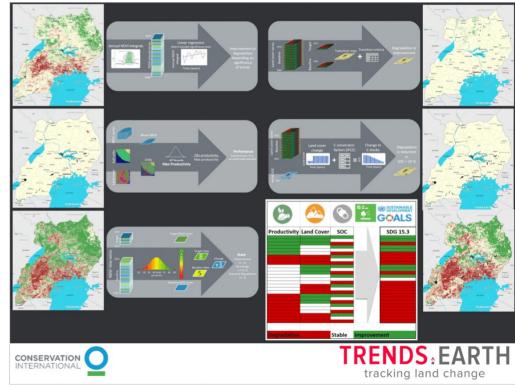
109	normalized green red difference index, Visible Atmospherically Resistant Indices Green (Vlgreen)	NGRDI	GREEN-RED GREEN+RED
110	Normalized Difference MIR/NIR Normalized Difference Vegetation Index (in case of strong atmospheric disturbances)	NDVI	MIR-NIR MIR+NIR
111	Normalized Difference NIR/Blue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



# **Land degradation Neutrality**

UNCCD policy frame
National strategy, implementation and reporting



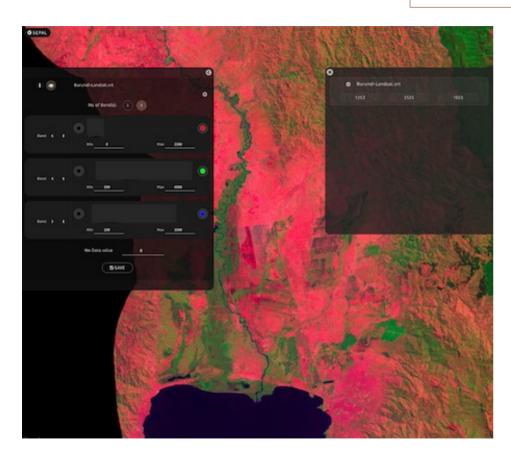


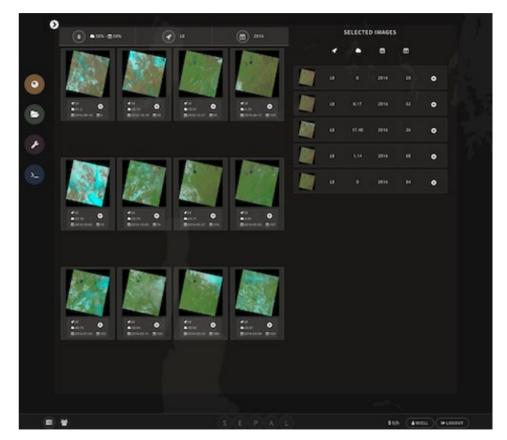


15 LIFE ON LAND



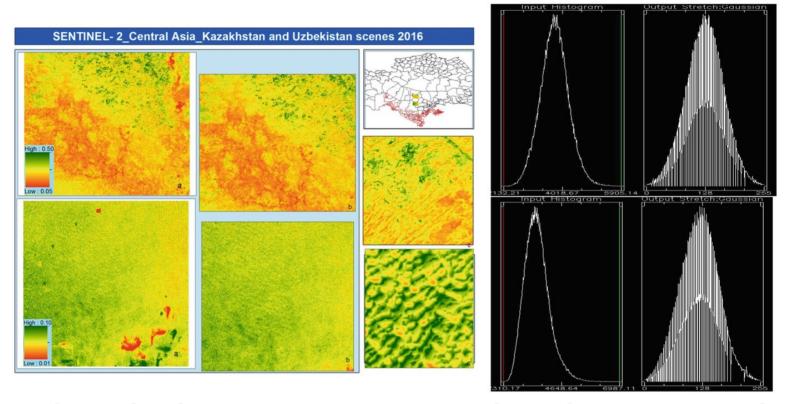
#### REDD+ CBD policy frame National strategy, implementation and reporting







## **Monitoring**

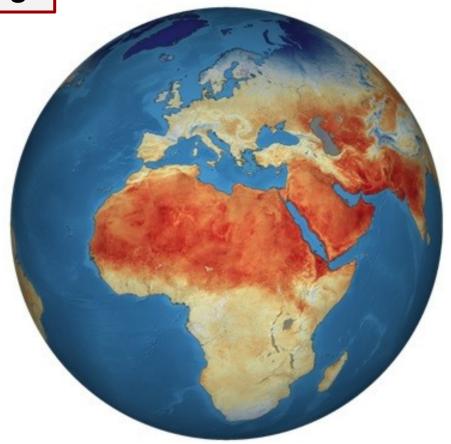


NDVI-Based Monitoring Long-Term Vegetation Change Dynamics in the Drylands of Central Asia Source: Dildora Aralova et at 2018 https://link.springer.com/chapter/10.1007/978-3-319-99728-5\_3



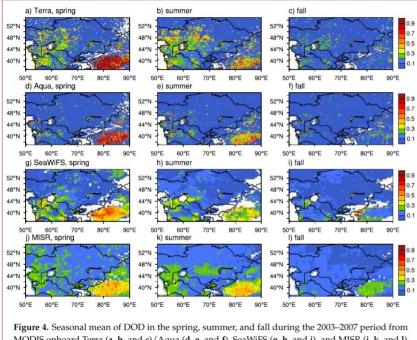
**Climate Change monitoring** 

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





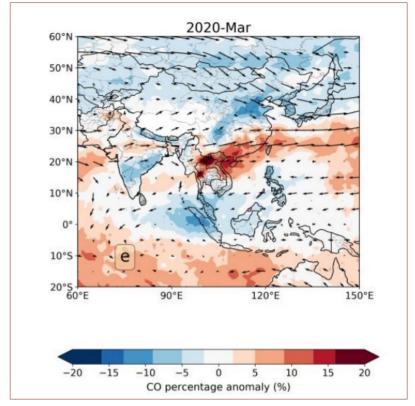
# Air quality / emissions → NDC – strategy



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



#### **EO** for SDG

Source:
Digital Earth Africa
digitalearthafrica.org/

	Target Contribute to progress on the Target, not necessarily the Indicator								Goal Indicator  Goal Direct measure or indirect support to the Indicator							
							1.4	1.5	1	No poverty	1.4.2					
						2.3	2.4	2.c		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		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				



#### **Hands ON:**

**Qgis exercise NDVI calculation** 

