

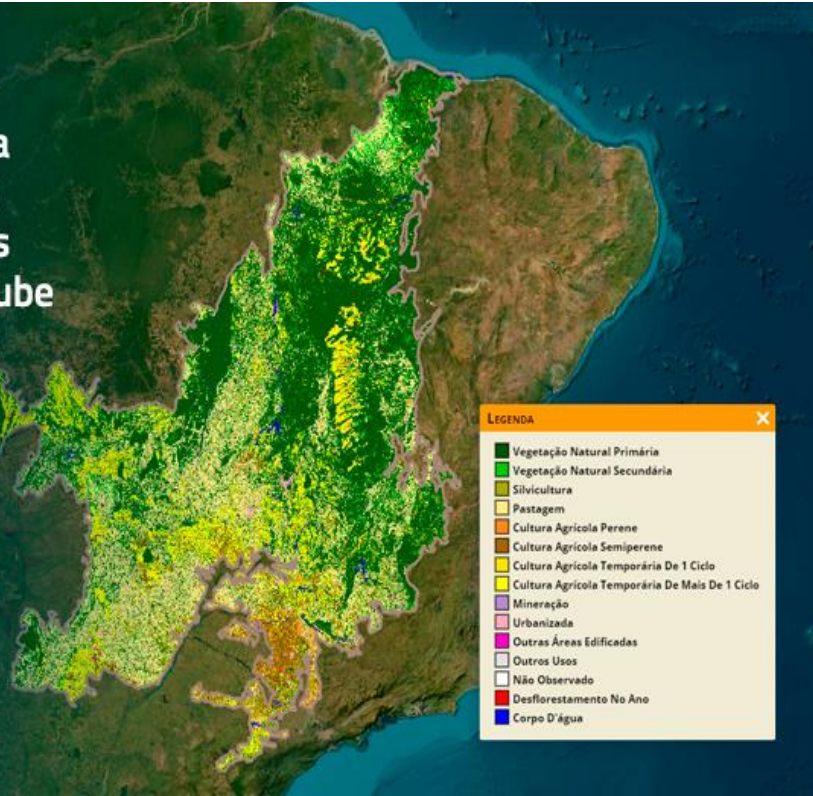


**BRAZIL
DATA CUBE**

Karine Ferreira, Gilberto Queiroz, Gilberto Câmara
INPE (Brazil)

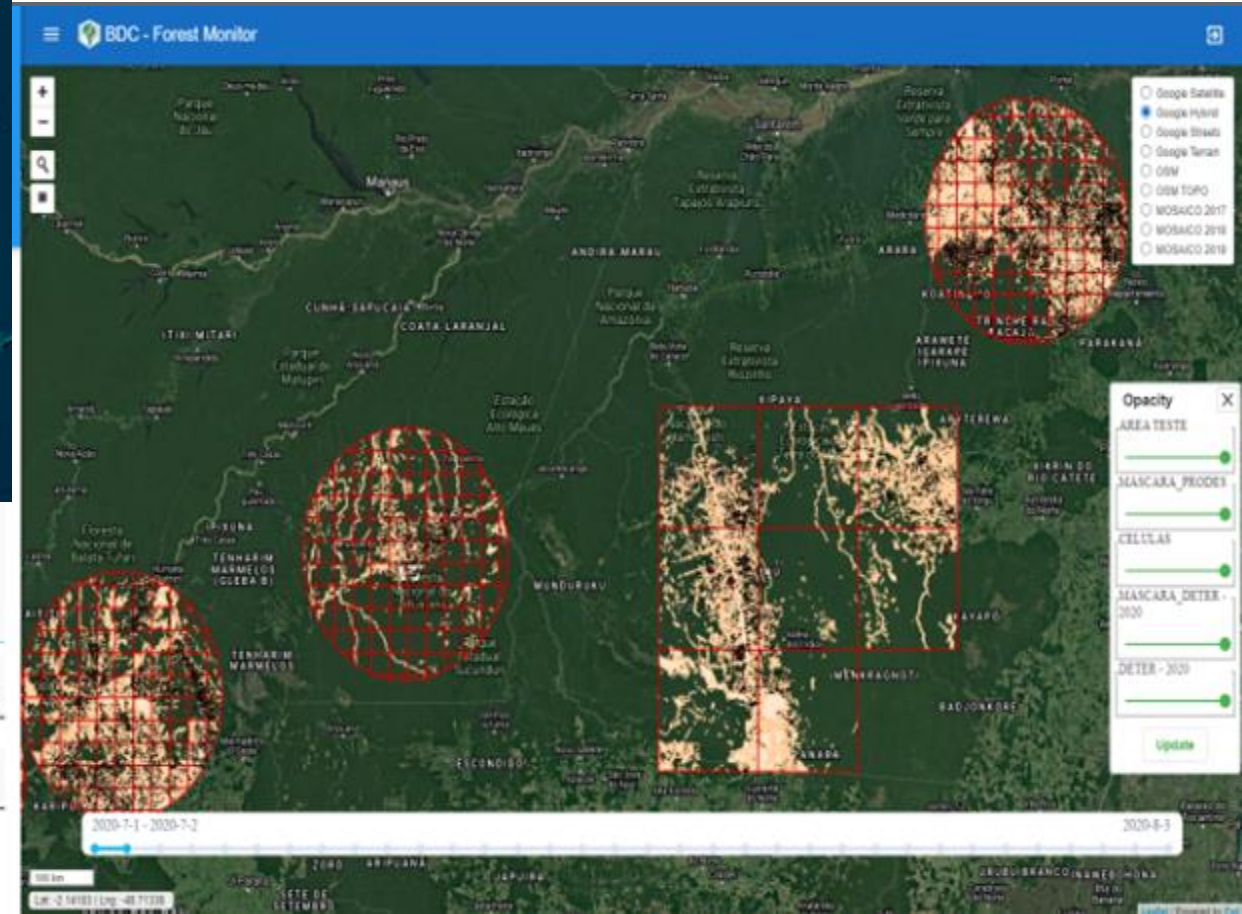
Big data analytics for environmental policy in Brazil

TerraClass Cerrado lança mapeamento produzido com tecnologias e dados do projeto Brazil Data Cube



LUCC mapping

Real-time monitoring



What is an ARD image collection?

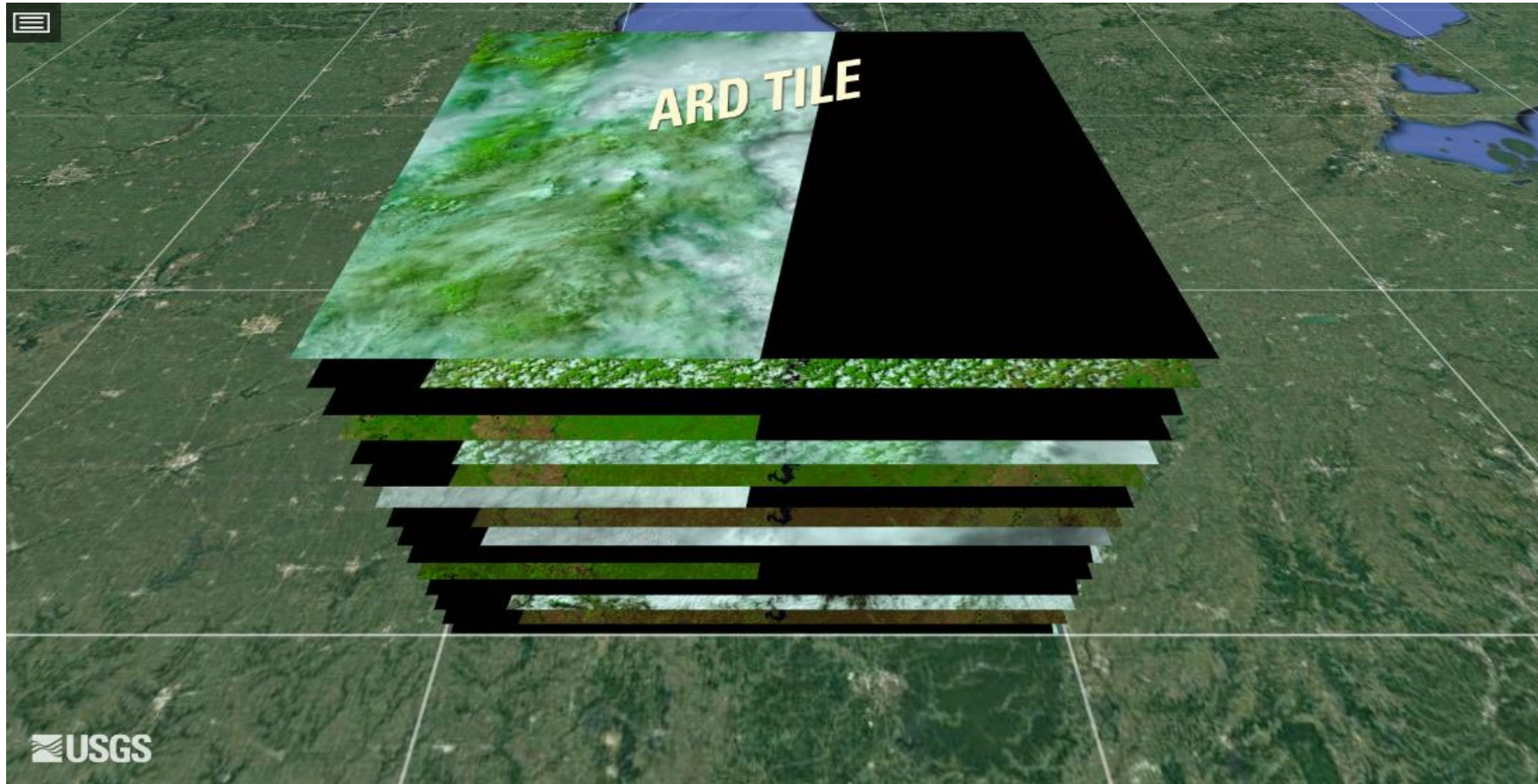
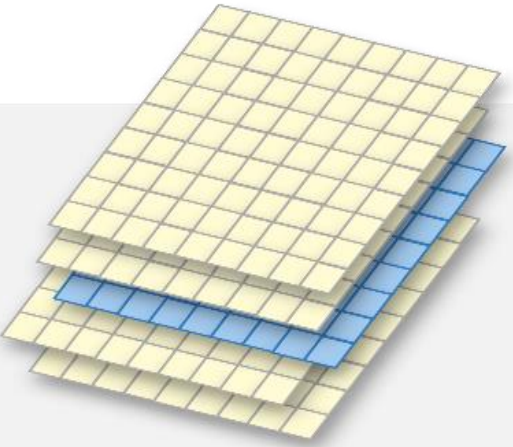


Image collections are not regular in space and time.
Bands may have different resolutions.
Temporal intervals may be irregular.

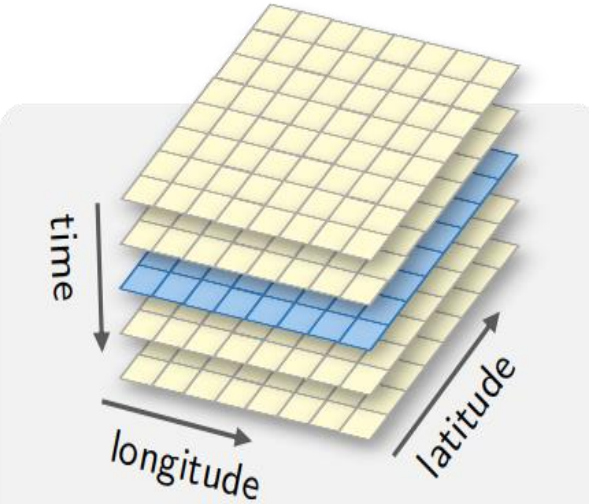


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DATA CUBE

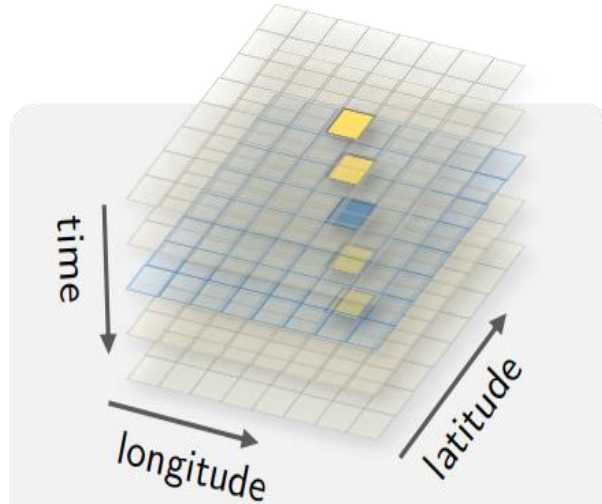
What is an EO data cube?



EO image collection



EO data cube



Time series selection

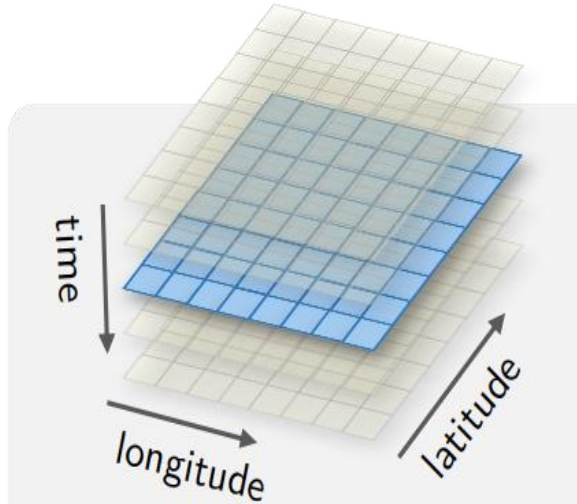


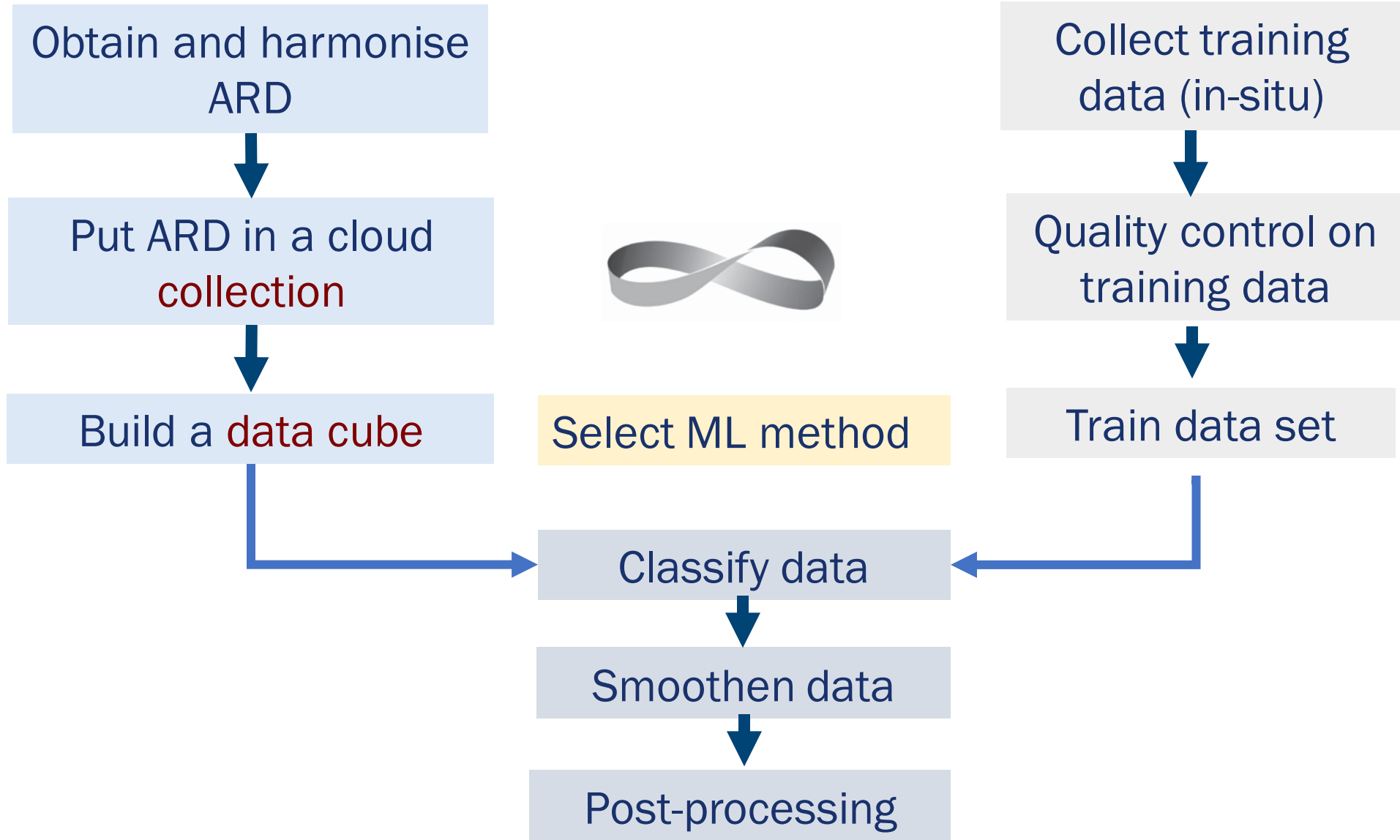
Image selection

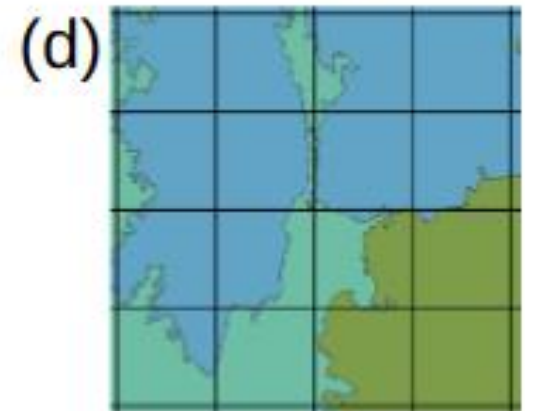
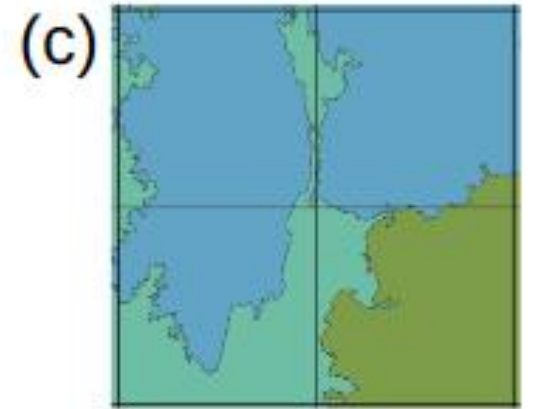
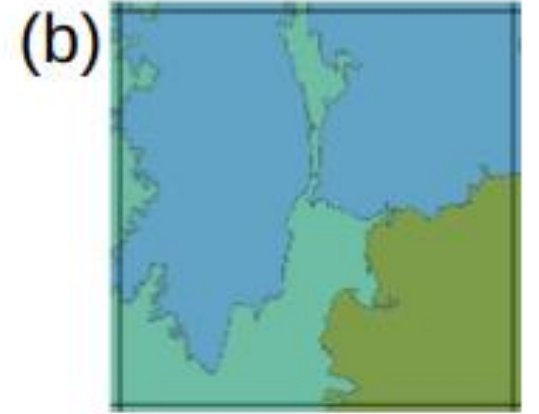
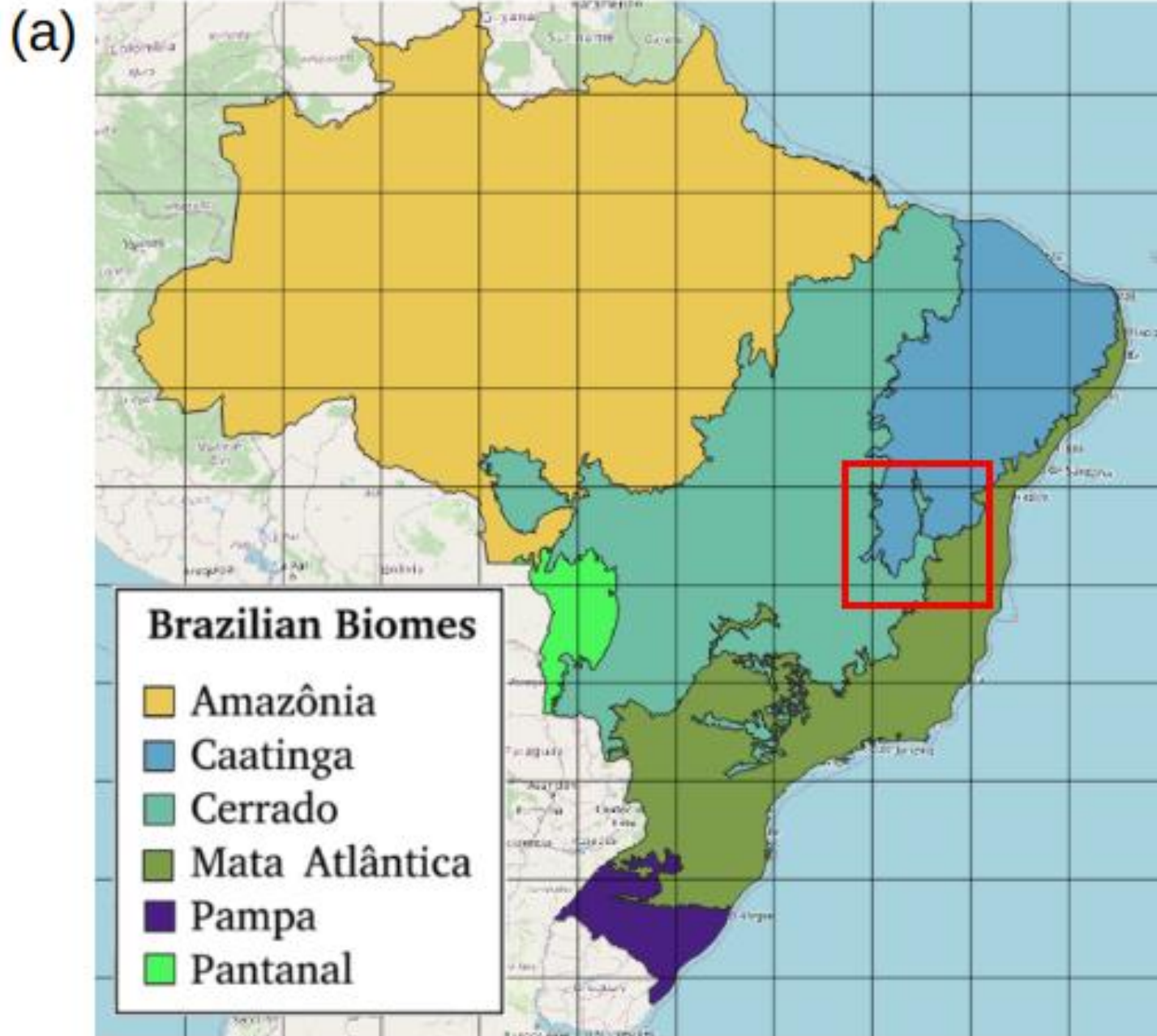
Data cube = regular partitions of space and time



BRAZIL
DATA CUBE

Big EO data analysis in practice





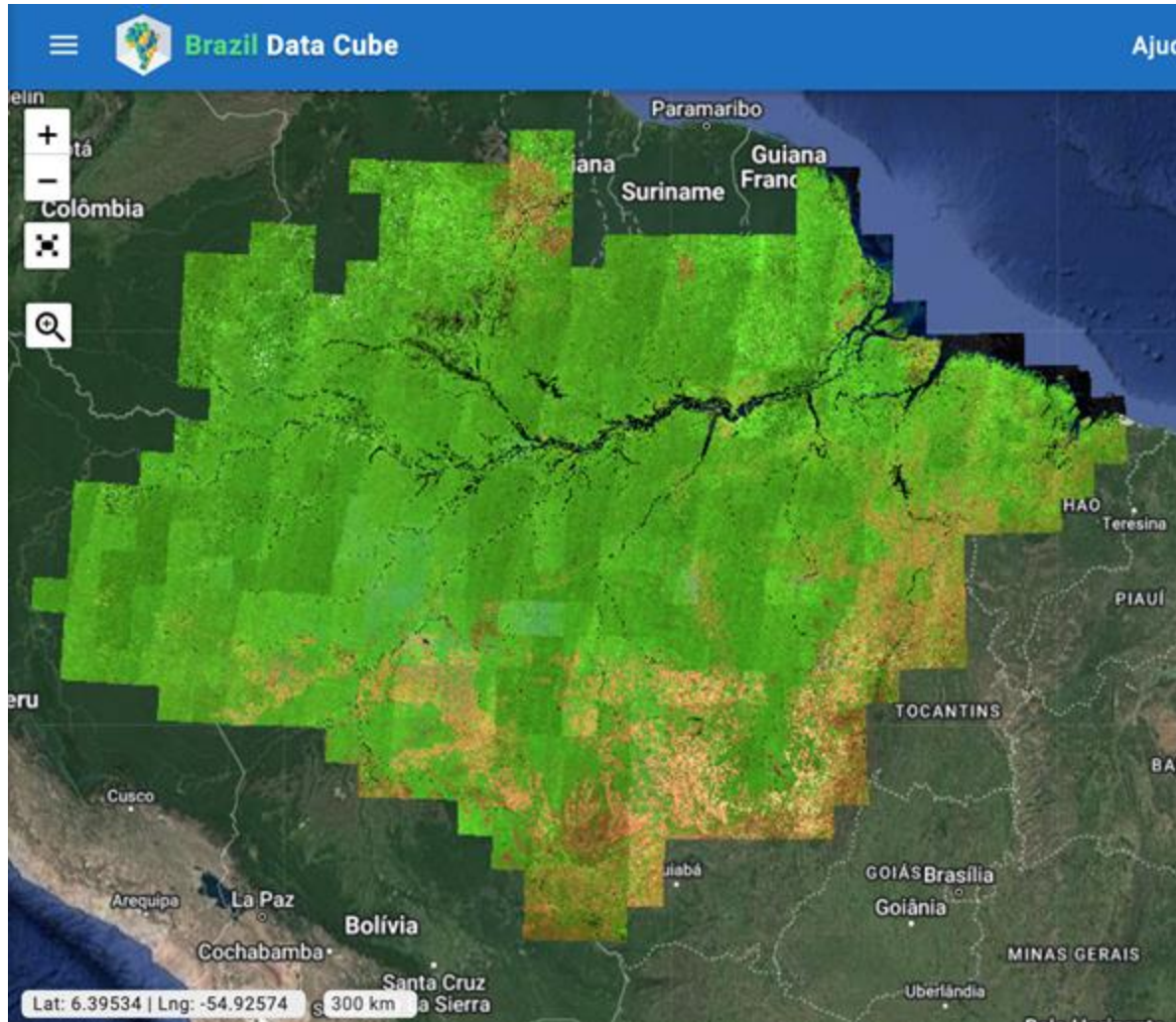
Landsat-8 - OLI - Brazil



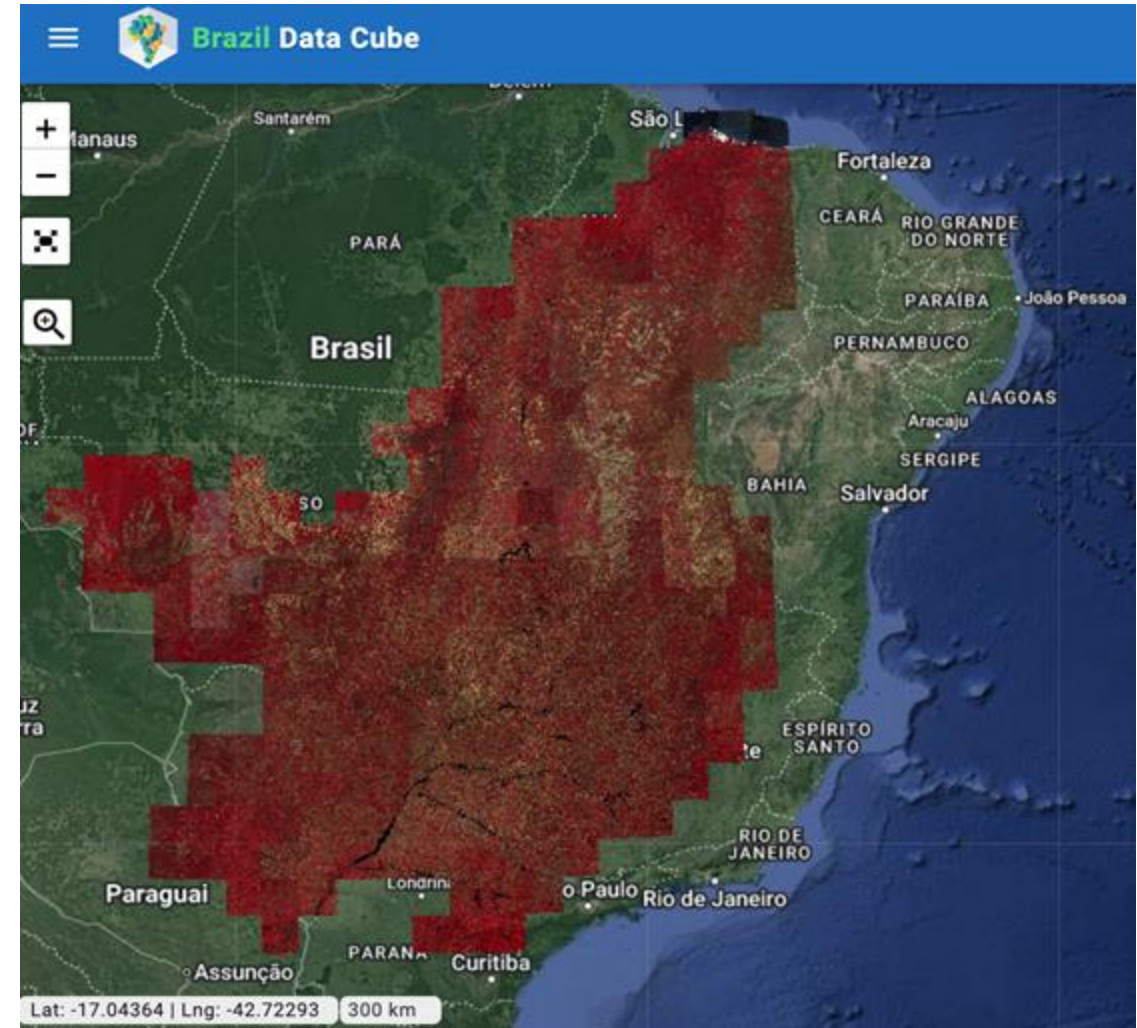
CBERS-4 WFI - Brazil



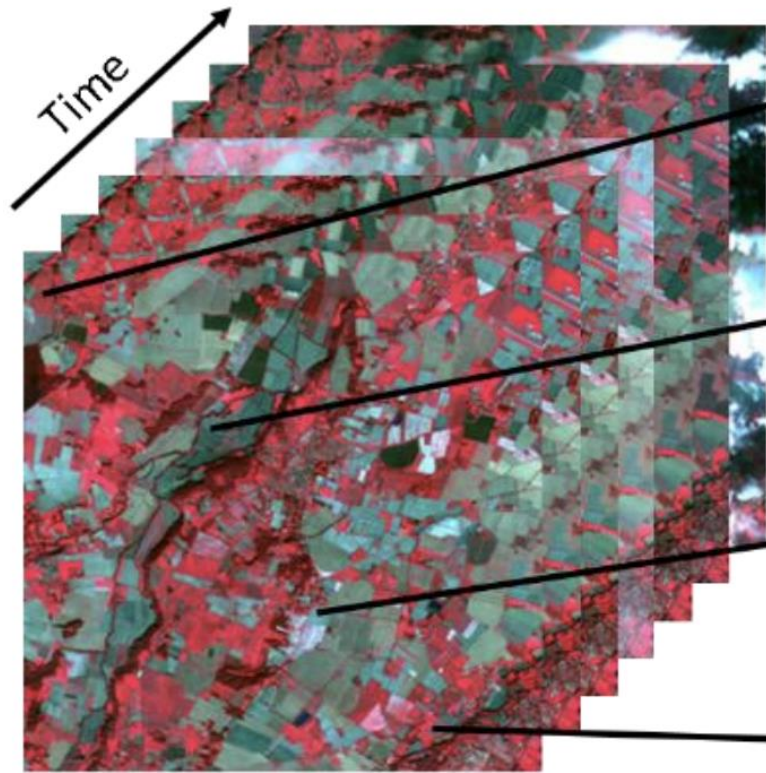
Sentinel-2 - MSI - Amazonia



Sentinel-2 - MSI - Cerrado



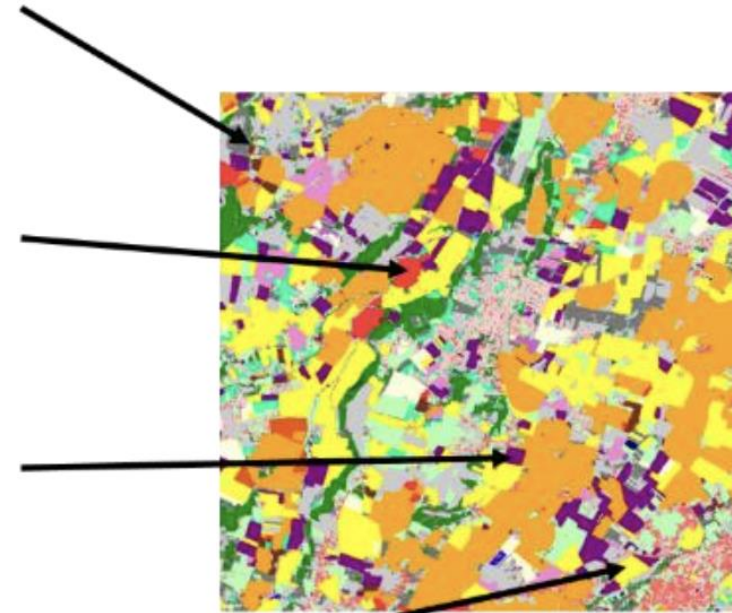
Land classification with image time series



Satellite Image Series



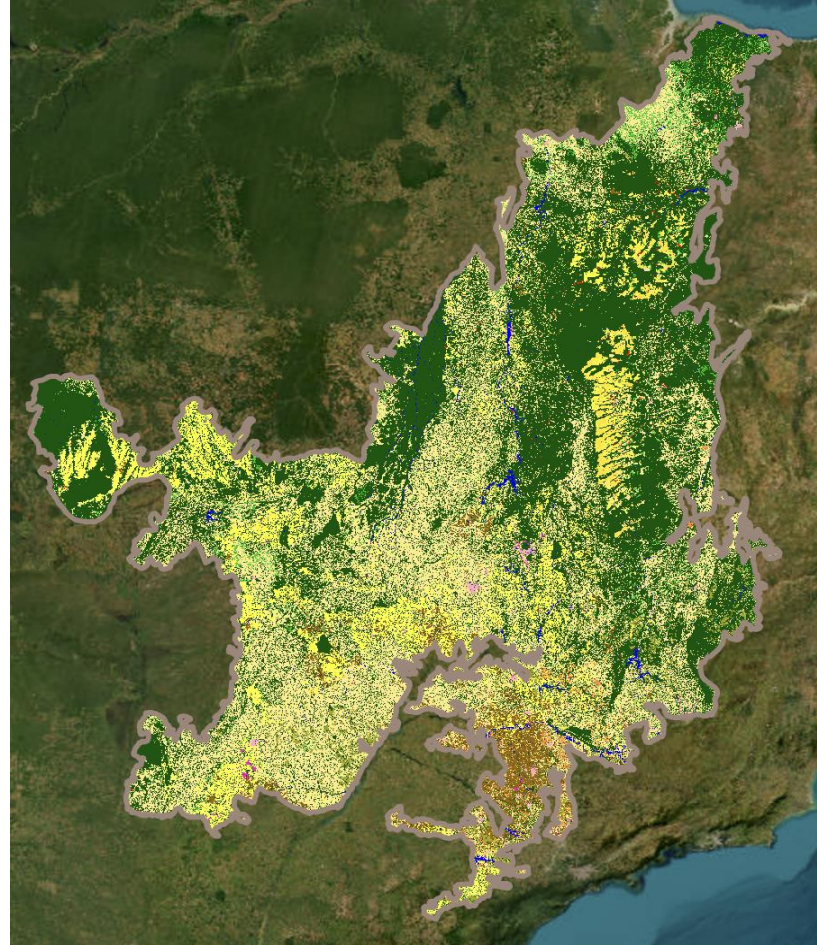
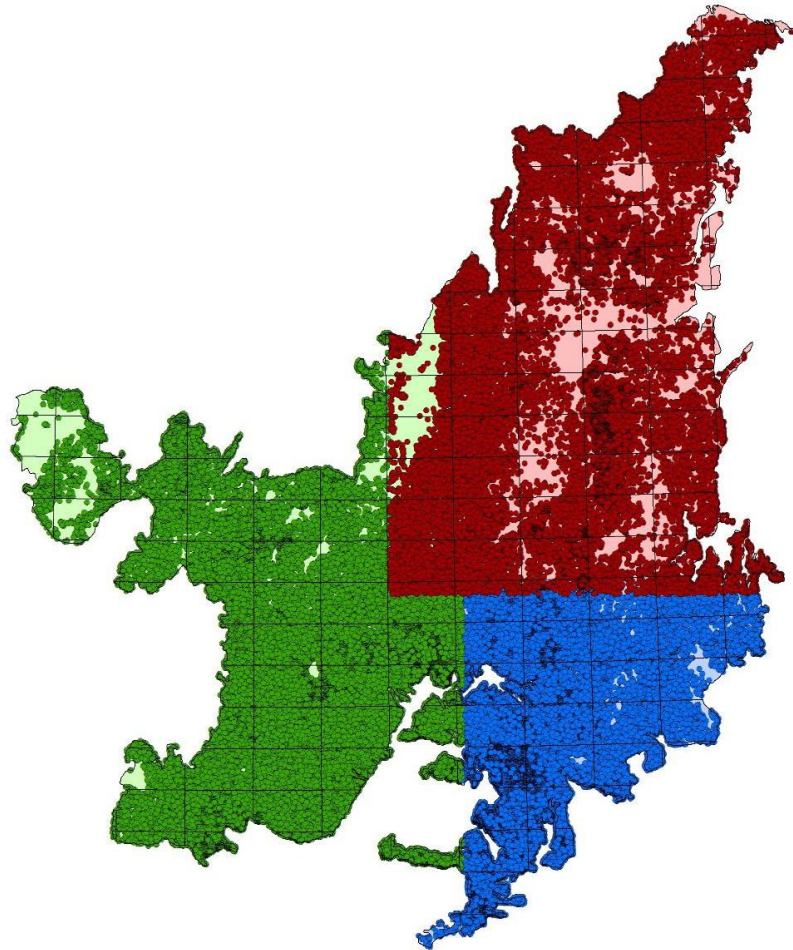
Time Series



Land Cover Map (Classes)

Color	Class
[Orange]	corn
[Light Orange]	corn for silage
[Yellow-Orange]	corn-irrigated corn
[Yellow]	wheat
[Light Green]	sunflower
[Green]	sorghum
[Dark Green]	sorghum II
[Light Blue]	soybean
[Blue]	barley
[Purple]	pea
[Dark Purple]	rape
[Light Green]	broad-leaved tree
[Green]	conifer
[Dark Green]	poplar tree
[Blue-Gray]	eucalyptus
[Light Blue]	water
[Blue]	lake
[Dark Blue]	gravel pit
[Light Green]	meadow
[Light Green]	temporary meadow
[Light Green]	fallow land
[Light Green]	wild land
[Light Green]	high density housing surface
[Light Green]	specific urban surface
[Light Green]	low density housing surface
[Light Green]	mineral surface

TerraClass Cerrado 2022



Sentinel-2, 10bands, 10 meter, 16 days, TempCNN method with 87.500 samples,
Accuracy: more than 91% UA and PA for core classes.

Natural or man-made landscapes?

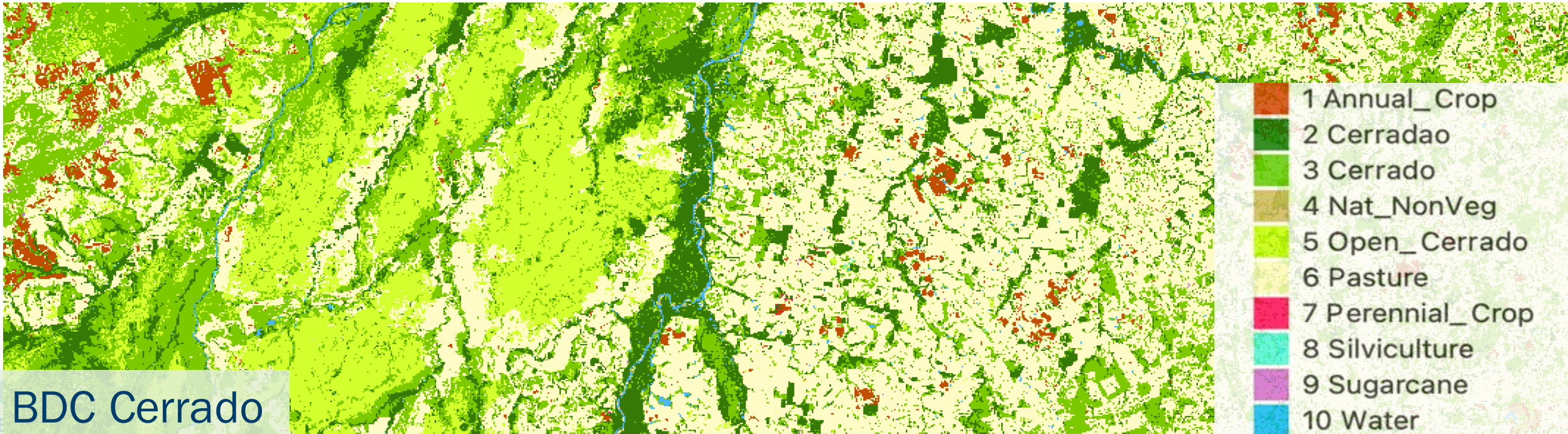
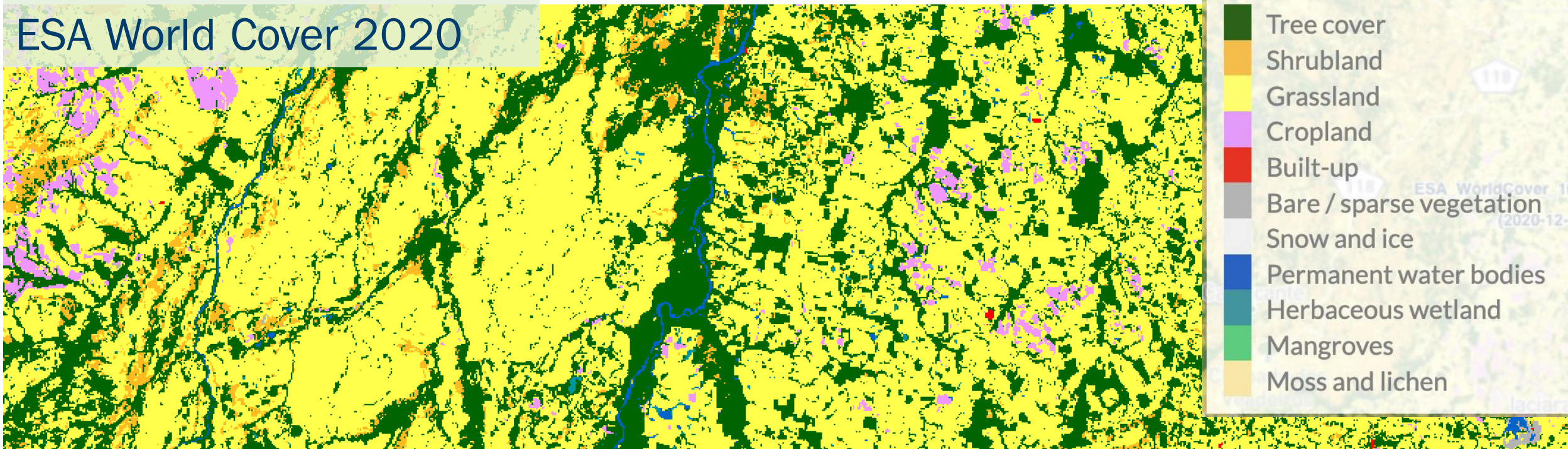


Natural savanna (Brazilian Cerrado)



Cattle in pasture (in the Cerrado)

ESA World Cover 2020



BDC Cerrado