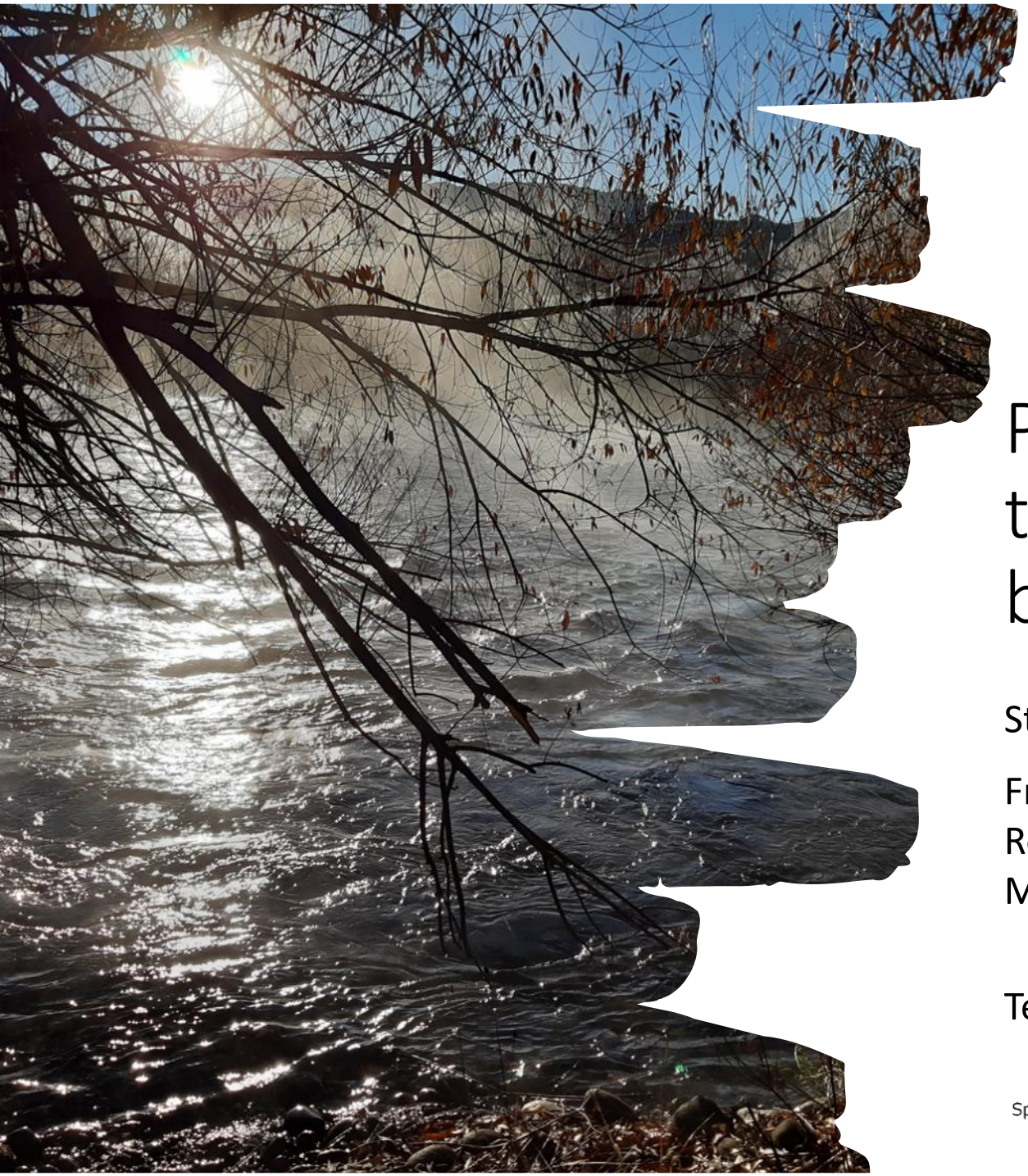

Preliminary characterization of the vegetation cover of the banks of the Chimehuín River

Students:

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Teacher: Ana Prieto

Sponsored by: NASA Supported by: NSF NOAA Implemented by: UCAR

Research Question

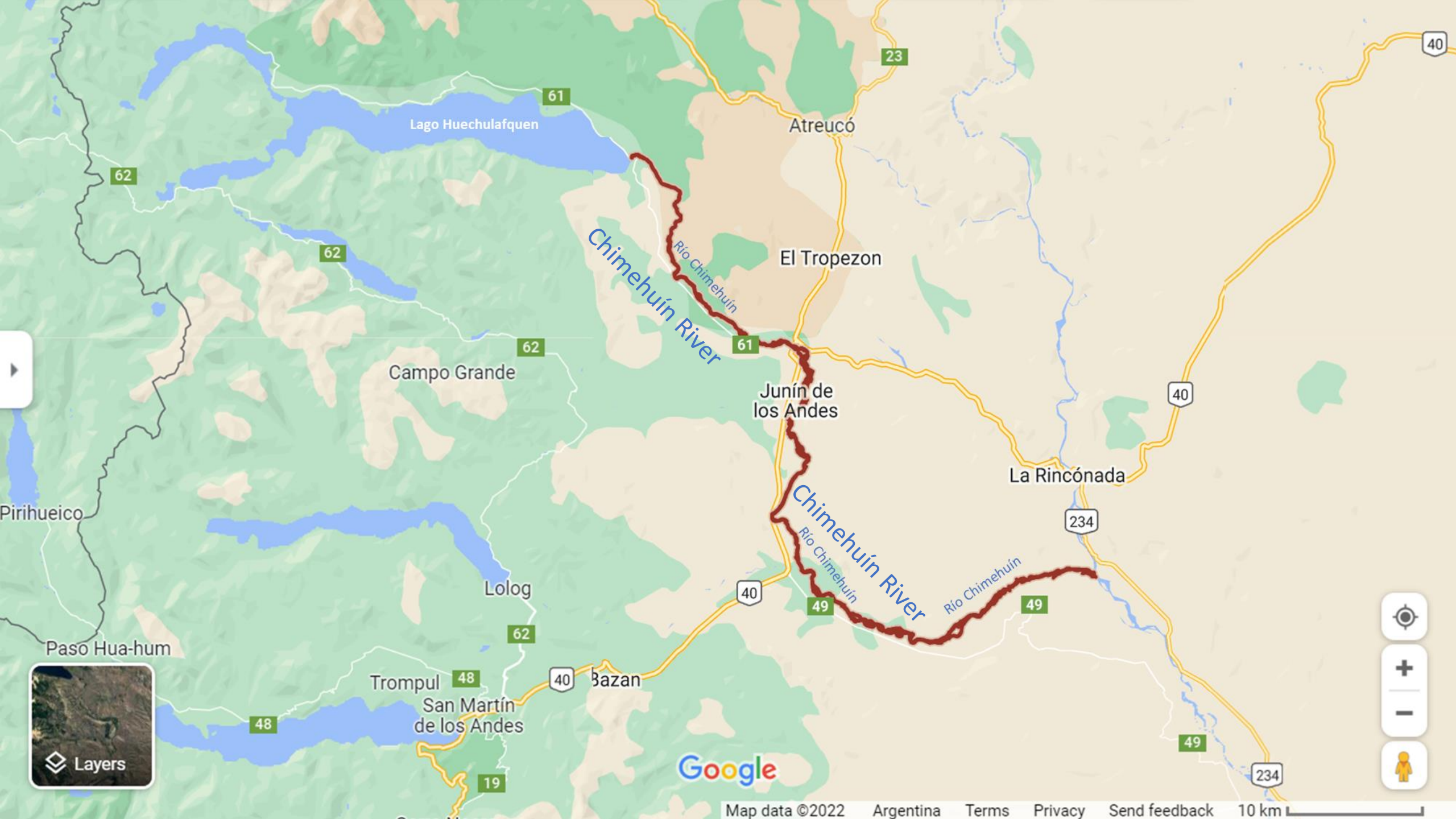
1. What type of vegetation cover predominates along the banks of the Chimehuín River?
2. Are there differences in riparian vegetation cover and tree heights in urban and rural areas?
3. What are the heights of the riparian trees in different sectors of the Chimehuín River?

Hypothesis

H_1: The predominant vegetation cover in the riverbank is herbaceous.

H_2: Riverbanks in urban areas have less vegetation and tree cover than in rural areas.

H_3: The trees on the riverbank are between 5 and 8 m high.


Lago Huechulafquen
Atreucó
El Tropezon
Río Chimehuín
Chimehuín River
Campo Grande
Junín de los Andes
La Rincónada
Río Chimehuín
Chimehuín River
Río Chimehuín
Pirihueico
Lolog
Paso Hua-hum
Trompul
San Martín de los Andes
Bazan
Layers
Google
Map data ©2022
Argentina
Terms
Privacy
Send feedback
10 km

Land Cover

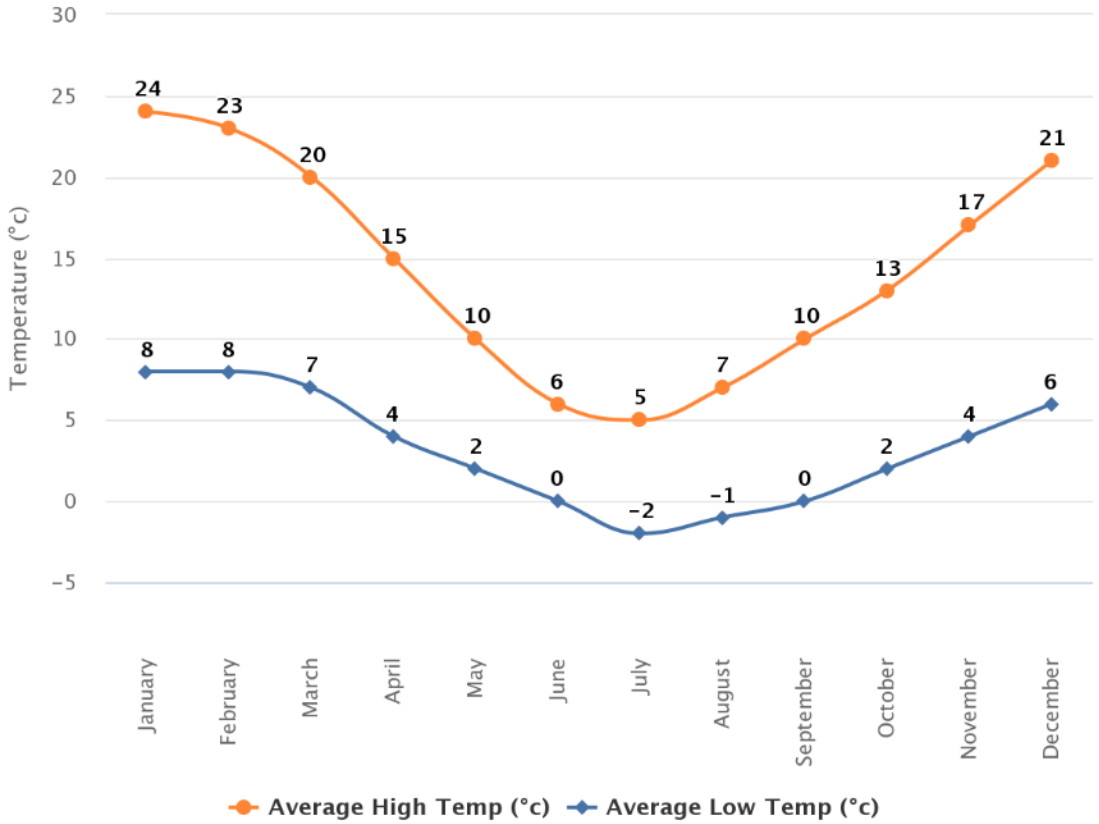

Lago Huechulafquen
Chimehuín River
Junín de los Andes
Chimehuín River
Chimehuín River
Tree cover
Shrubland
Grassland
Cropland
Built-up
Bare / sparse vegetation
Snow and ice
Permanent water bodies
Herbaceous wetland
Mangroves
Moss and lichen
-70.7938, -39.9997
10 km
esa
© ESA WorldCover project 2021
© Mapbox © OpenStreetMap

Slope

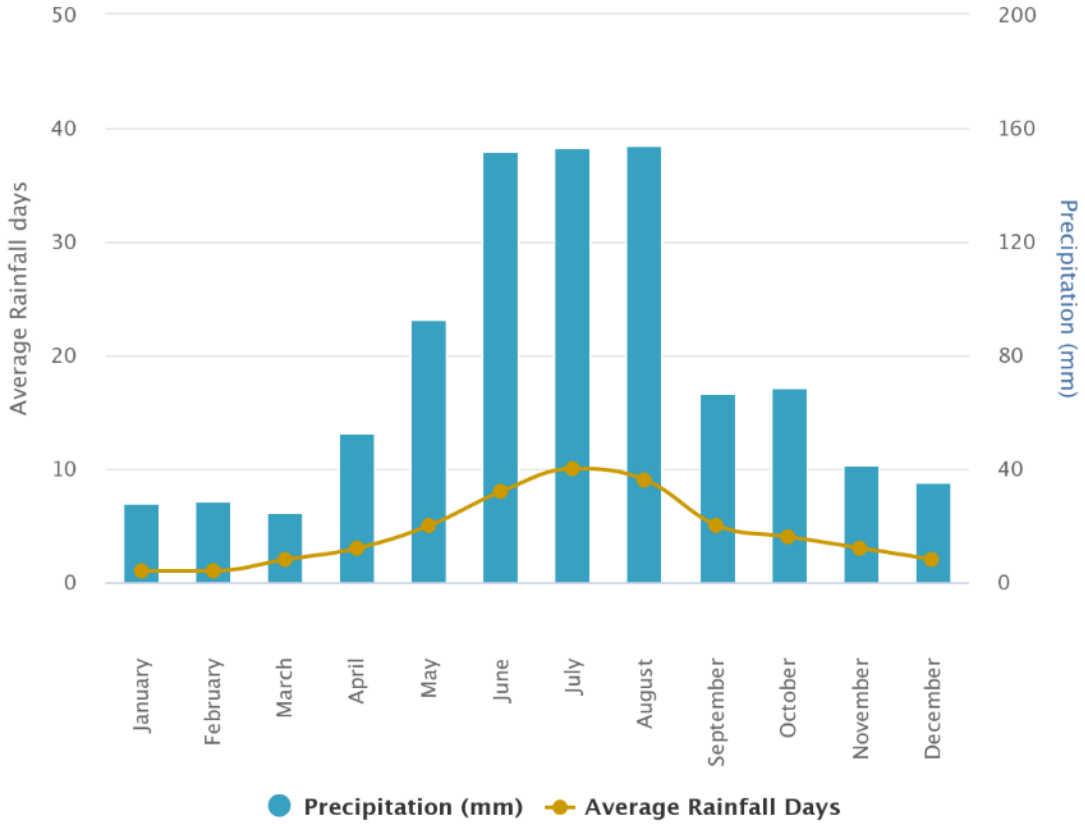

El Tropezon
La Rincónada
776 m
30.7 km -1.8%
Junín de los Andes
Image © 2022 CNES / Airbus
Image © 2022 Maxar Technologies
Image Landsat / Copernicus
9.77 km
Google Earth
Fechas de imágenes: 12/4/2020 39°58'03.02" S 71°04'29.84" O elevación 776 m alt. ojo 40.04 km


Gráfico: Mín., Prom., Máx. Elevación: 642, 761, 903 m
Totales del rango: Distancia: 70.8 km | Ganancia/Pérd. de elev.: 282 m, -537 m | Inclinación máx.: 3.3%, -4.1% | Inclinación prom.: 0.6%, -0.7%
903 m
825 m
750 m
675 m
642 m
776 m
-1.8%
7.5 km
15 km
22.5 km
30.7 km
37.5 km
45 km
52.5 km
60 km
70.8 km

Average Temperature (°c) Graph for Junin De Los Andes



Average Rainfall (mm Graph for Junin De Los Andes)

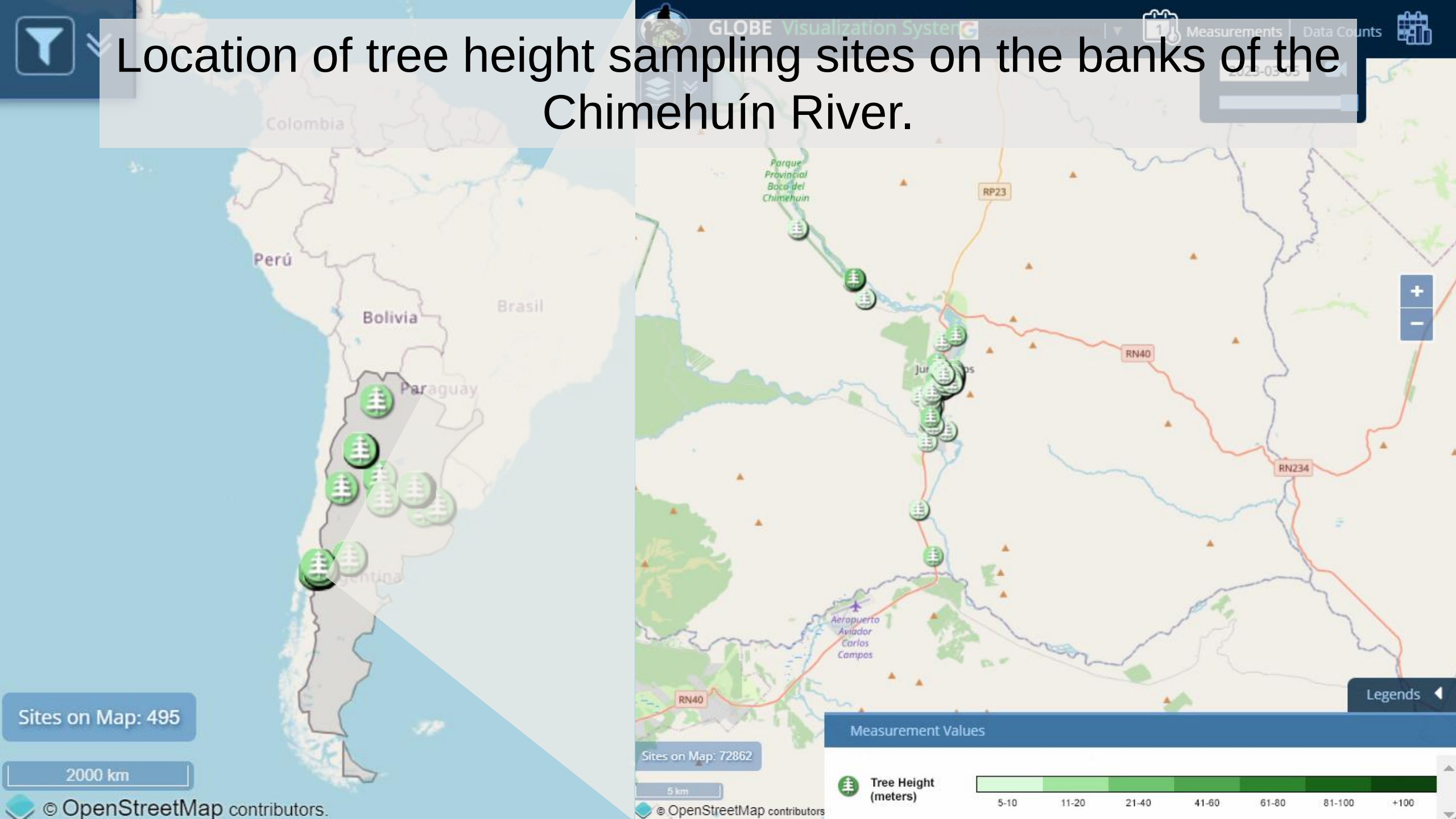


www.worldweatheronline.com

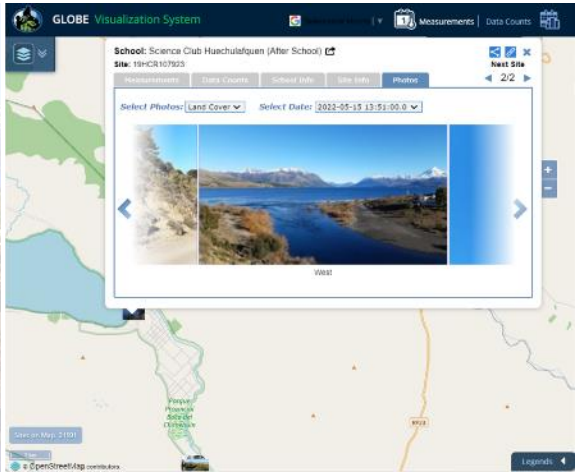

METHODOLOGY

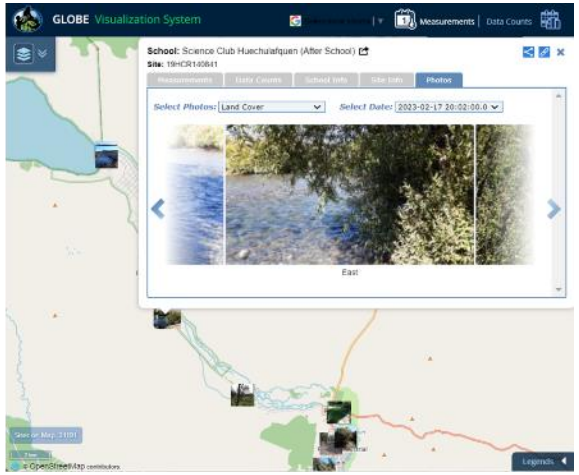
Location of land cover sampling sites on the banks of the Chimehuín River

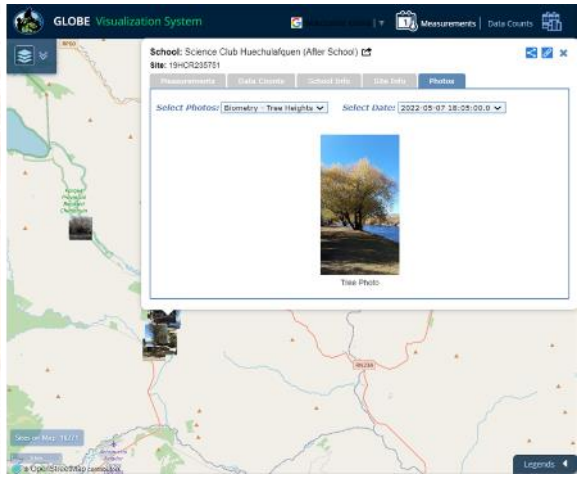
Location of tree height sampling sites on the banks of the Chimehuín River.



Data logging with GLOBE Observer: Land Cover and Trees





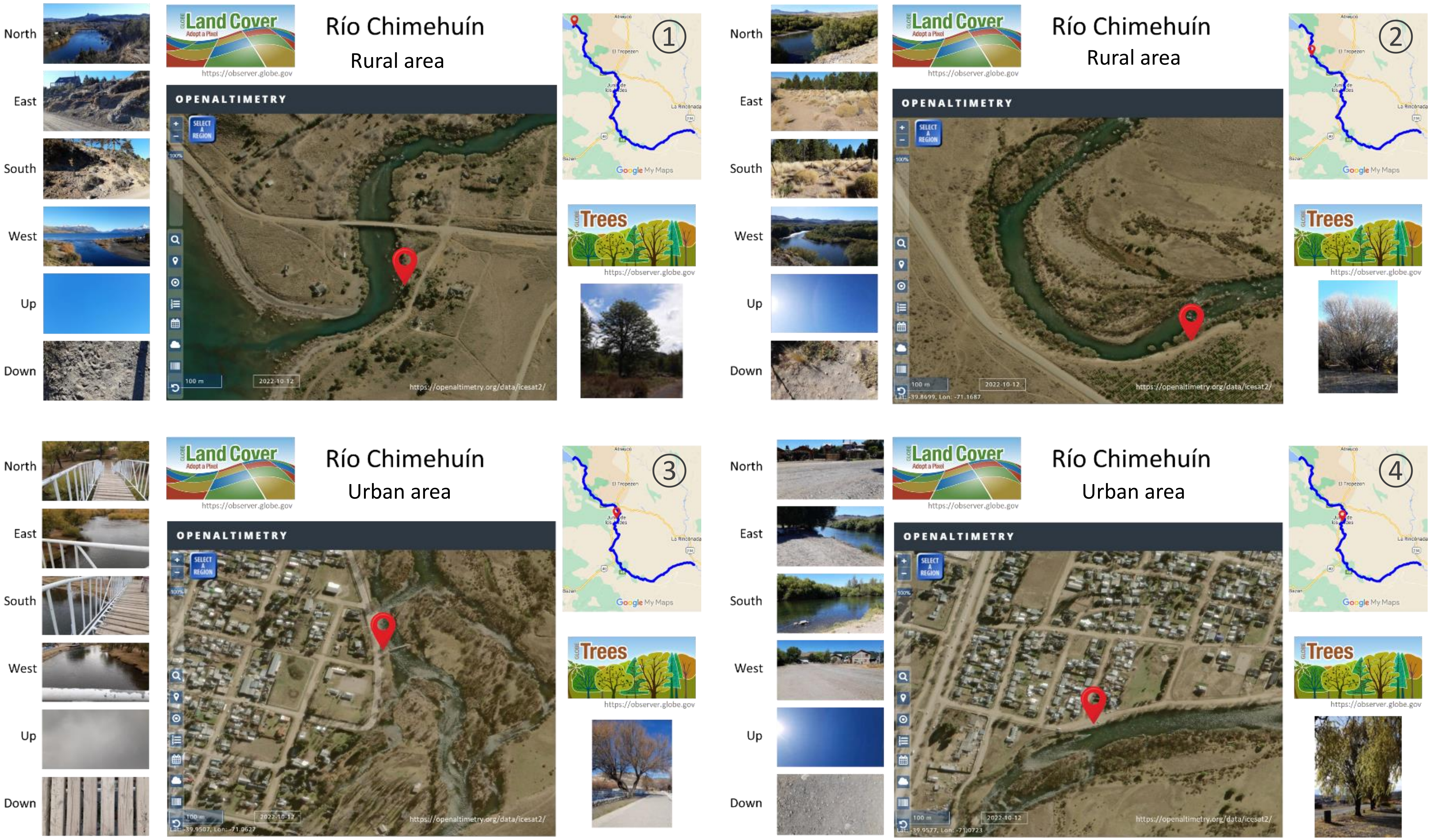


Field measurements with GLOBE Observer App:

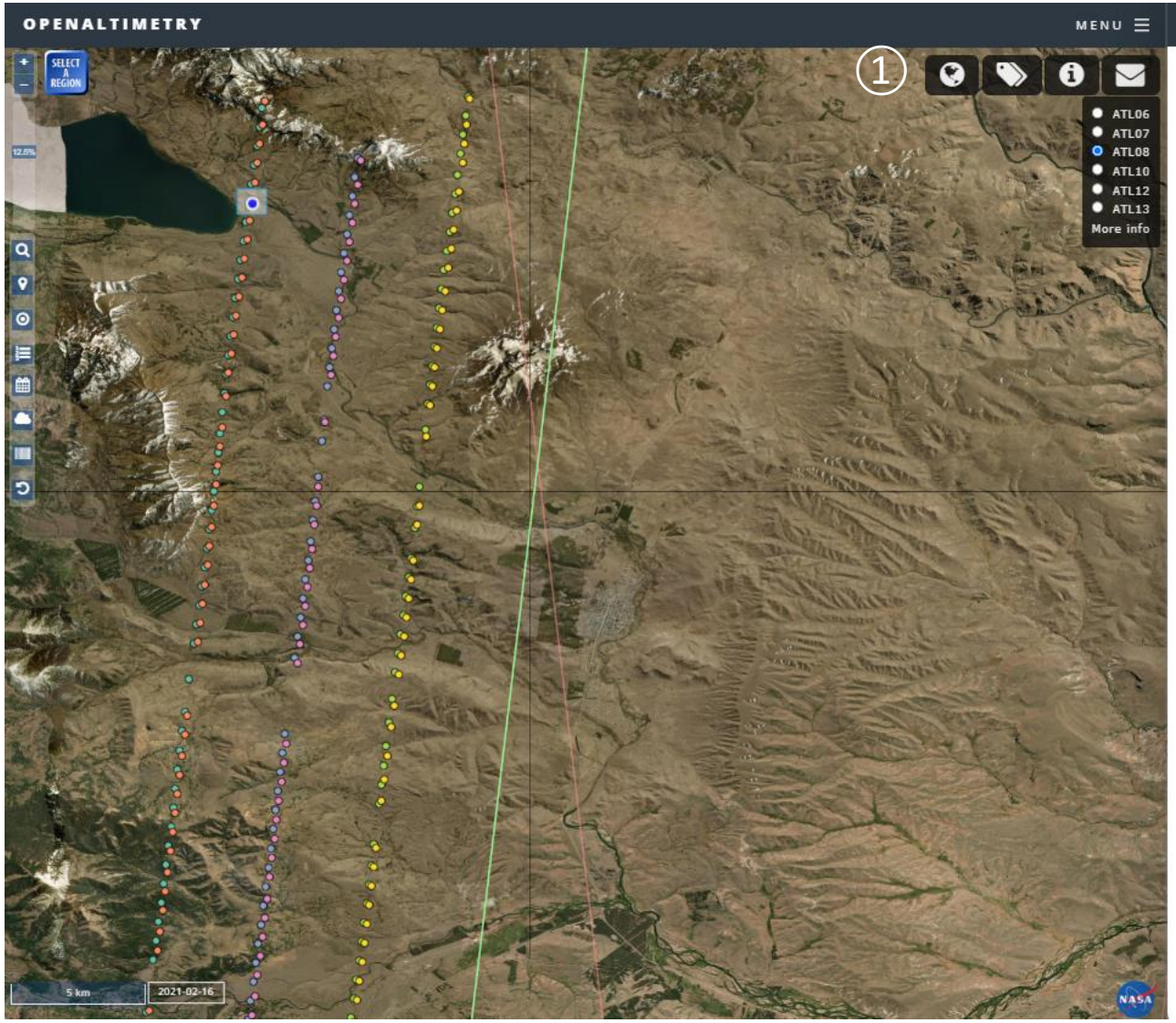
① Land coverage at the headwaters of the Chimehuín River (rural area)

② Land coverage in a rural area

③ Height of tree in an urban area


Río Chimehuín
Rural area
1
North
East
South
West
Up
Down
Land Cover
Adopt a Pixel
https://observer.globe.gov
OPENALTIMETRY
SELECT A REGION
100 m
2022-10-12
https://openaltimetry.org/data/icesat2/
Google My Maps
Trees
https://observer.globe.gov
Río Chimehuín
Rural area
2
Lat: -39.8699, Lon: -71.1687
Río Chimehuín
Urban area
3
Lat: -39.9507, Lon: -71.0627
Río Chimehuín
Urban area
4
Lat: -39.9577, Lon: -71.0723

Tree height with OpenAltimetry

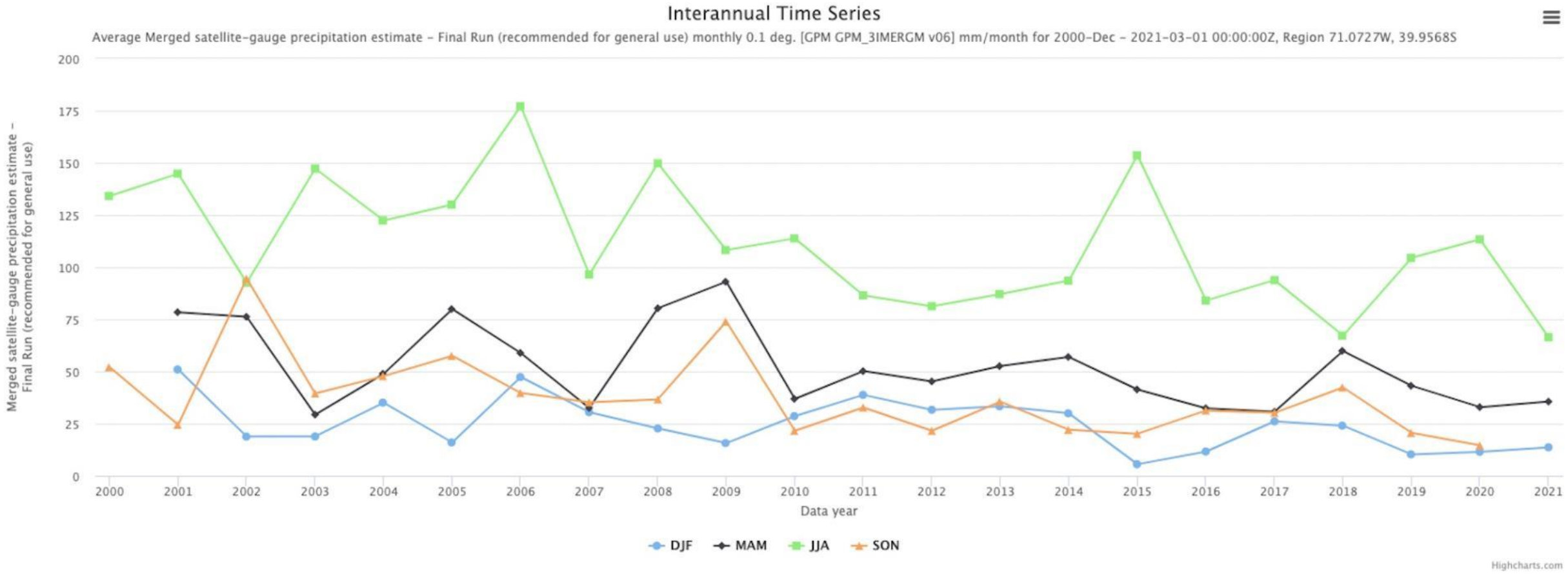


https://openaltimetry.org/data/icesat2/

PRELIMINARY RESULTS

Seasonal variation of rainfall. Period 2000 to 2021

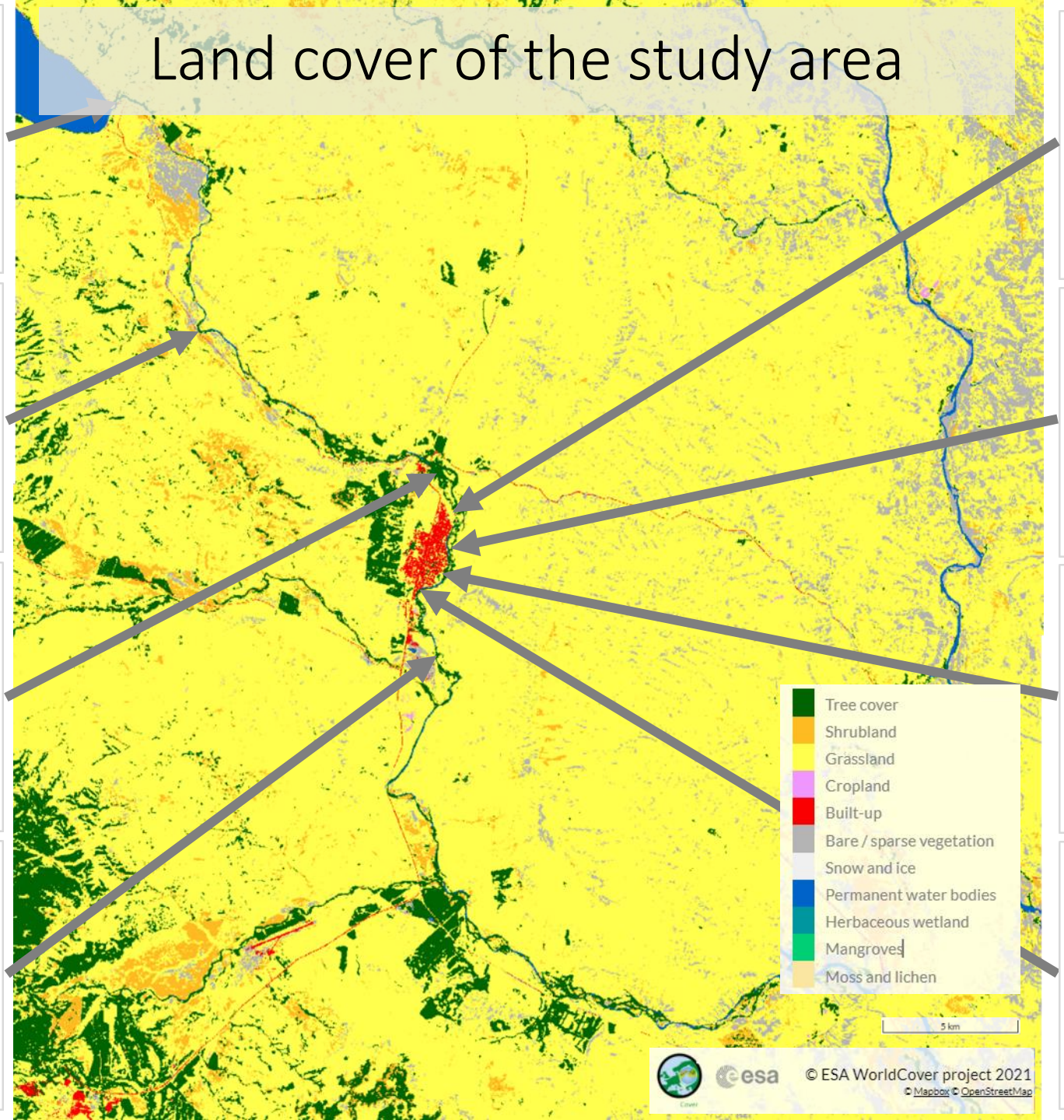
Giovanni https://giovanni.gsfc.nasa.gov/giovanni/



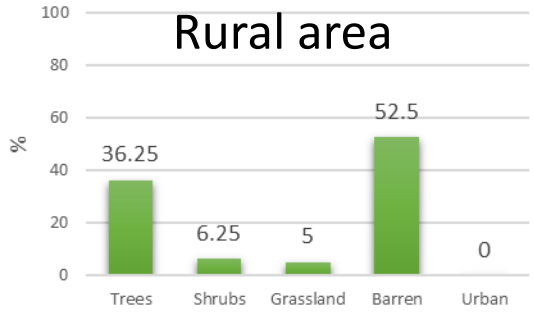
Land cover on the banks of the Chimehuín River recorded with GLOBE Observer

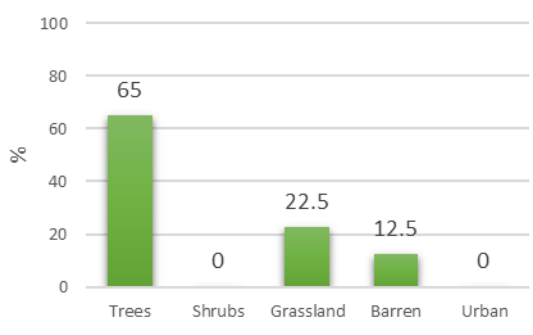
	% land cover on the banks of the Chimehuín river					
	Latitude	**Trees**	**Shrubs**	**Grassland**	**Barren**	**Urban**
Rural area	-39.79654	36.3	6.3	5.0	52.5	0.0
	-39.87234	65.0	0.0	22.5	12.5	0.0
	-39.92119	100.0	0.0	0.0	0.0	0.0
Urban area	-39.94750	20.0	0.0	35.0	20.0	25.0
	-39.95016	42.5	0.0	35.0	2.5	20.0
	-39.95168	5.0	12.5	57.5	0.0	25.0
	-39.95632	32.5	17.5	37.5	12.5	0.0
	-39.95659	18.8	0.0	26.3	55.0	0.0
	-39.95826	28.8	10.0	5.0	50.0	6.3
	-39.95861	35.0	0.0	0.0	55.0	10.0
Rural area	-39.95984	100.0	0.0	0.0	0.0	0.0
	-39.98226	82.5	0.0	11.3	6.3	0.0

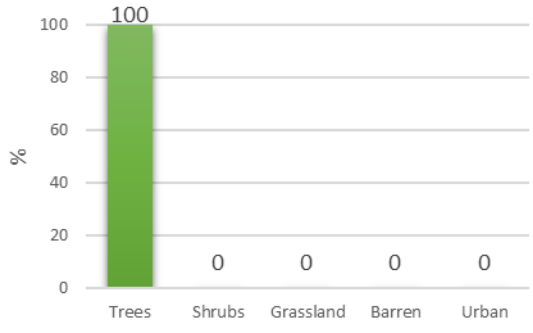
Land cover of the study area

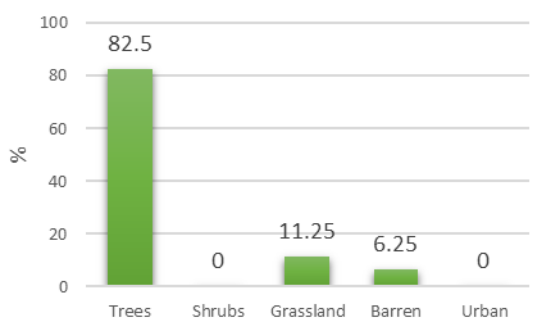


Rural area

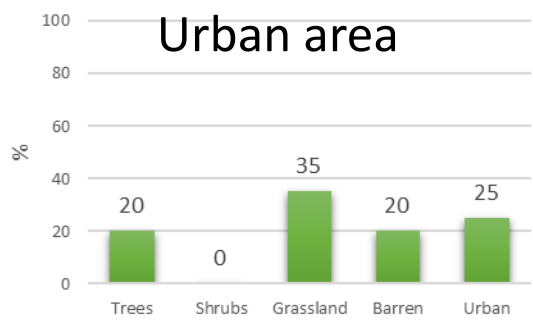


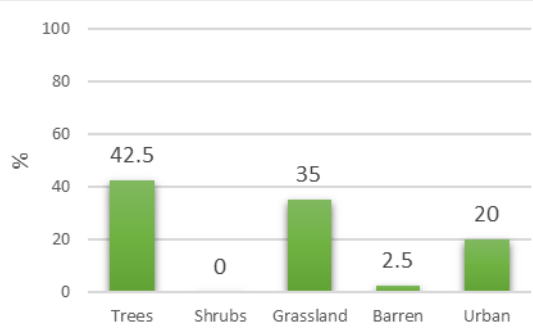


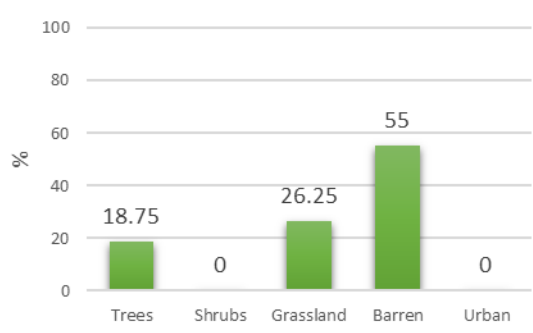


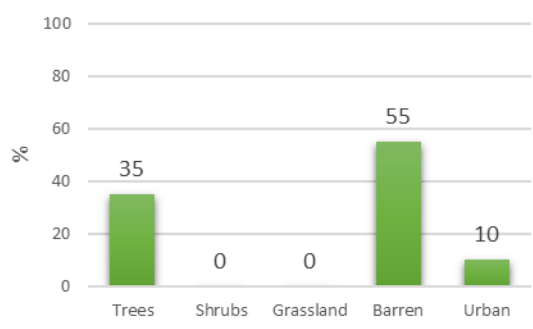


Urban area





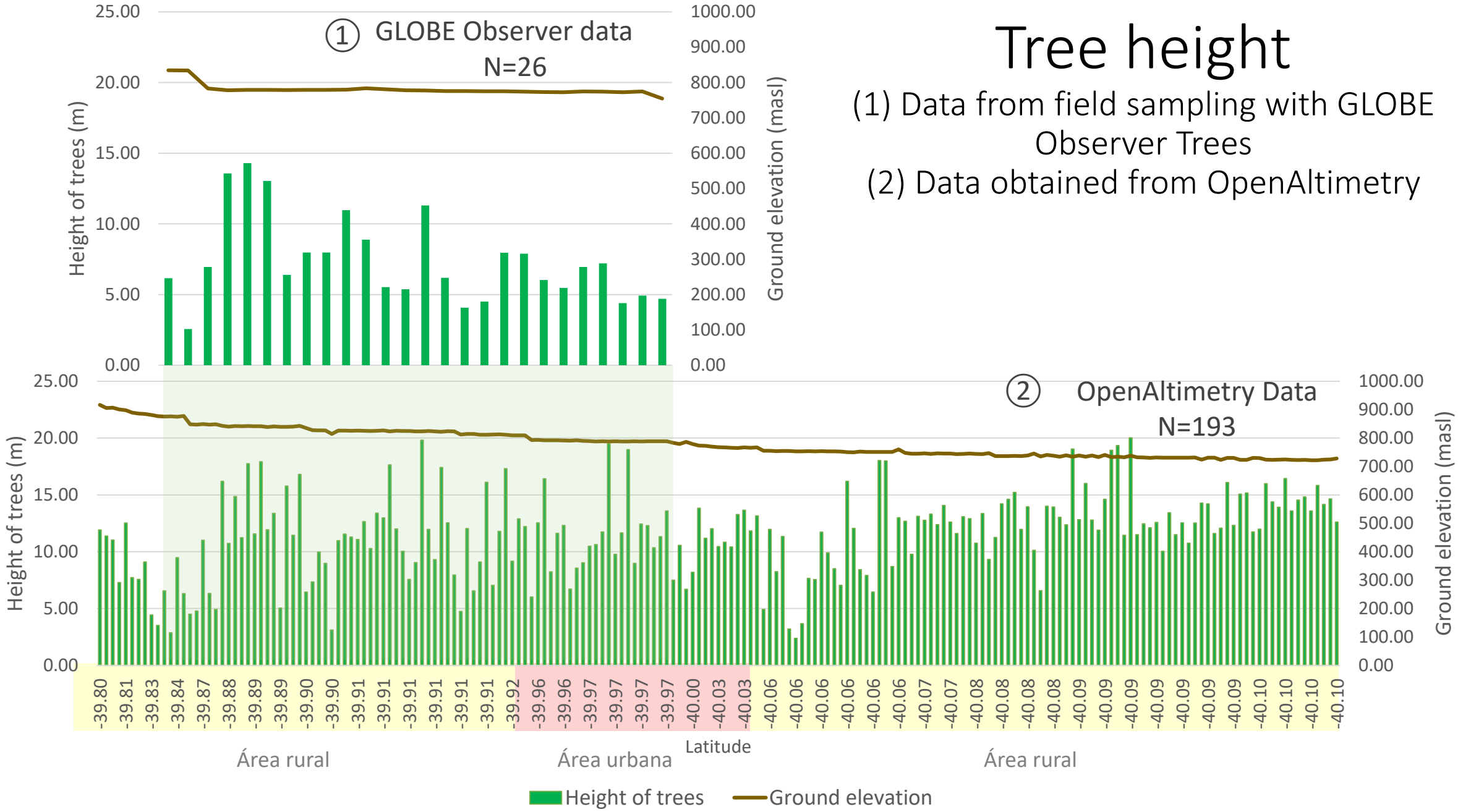




Tree height

(1) Data from field sampling with GLOBE Observer Trees

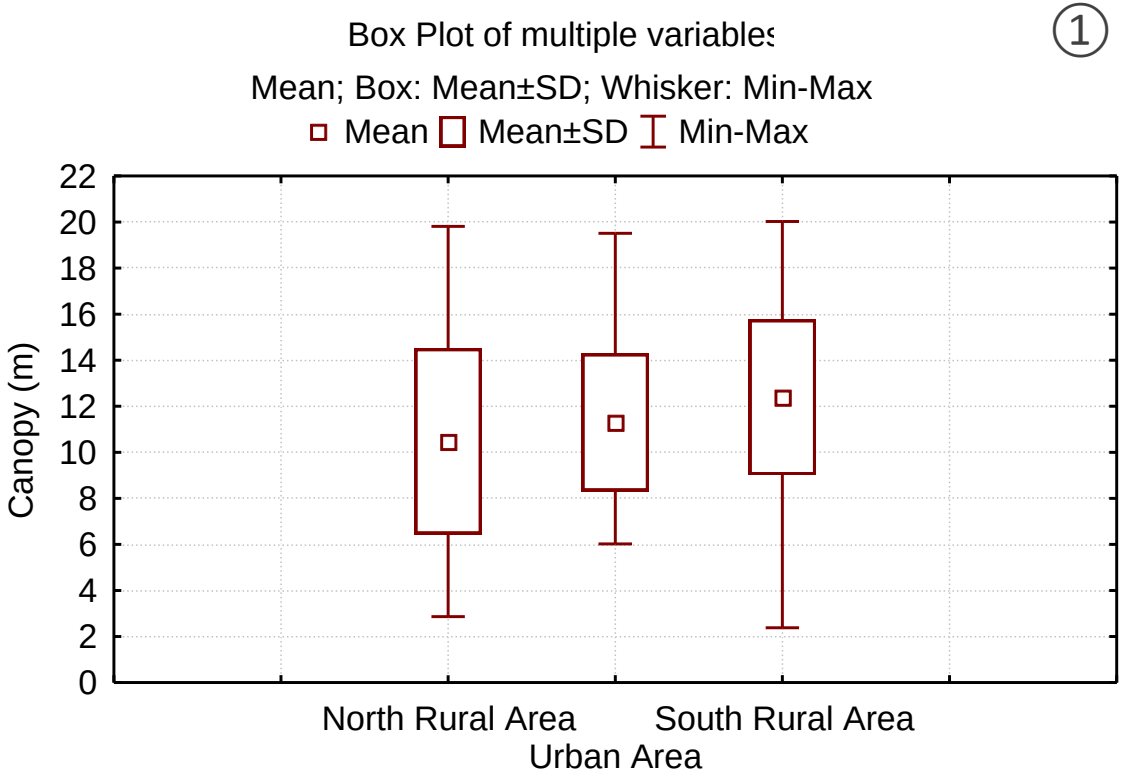
(2) Data obtained from OpenAltimetry



Height of trees on the banks of the Chimehuín River.

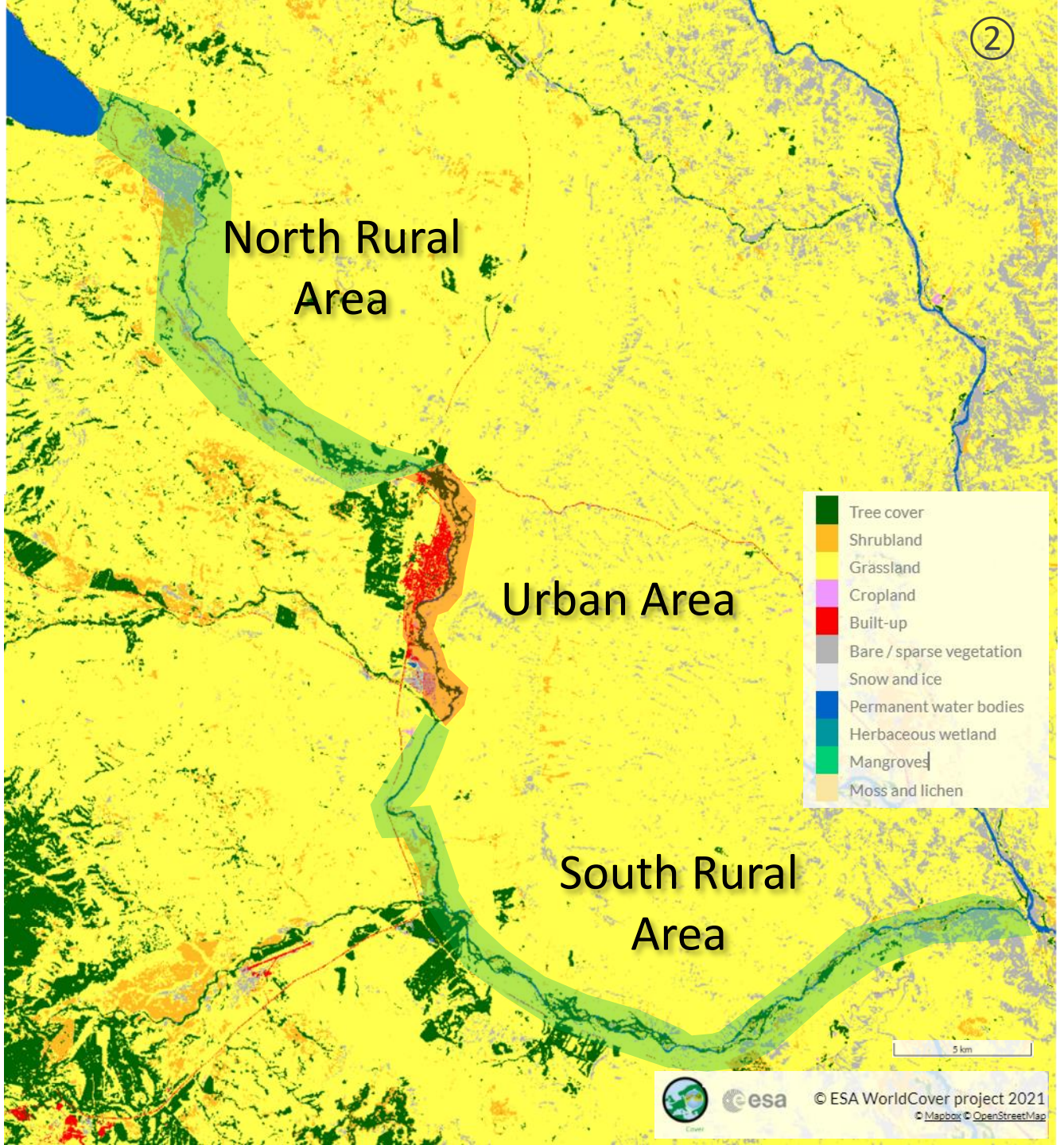
Data obtained from OpenAltimetry

①



	N	Mean	Minimum	Maximum	Std. Dev.
North Rural Area	67	10.48084	2.863953	19.81073	4.033927
Urban Area	36	11.30136	6.023682	19.51184	2.983339
South Rural Area	90	12.39258	2.378113	20.02179	3.375529

②




CONCLUSIONS

- Current and historical weather information shows great variability in precipitation with several extreme events.
- Climate change predicts more frequent and intense droughts that could negatively influence the vegetation cover of the riverbanks and increase the risk of fires.
- The predominant vegetation cover on the riverbank is trees, followed by grasslands.
- In rural areas the predominant vegetation cover is trees, while in urban areas grasslands predominate.
- In the field measurements, a high percentage of bare soil is detected on the banks, especially in urban areas, which allows dust and other particles to enter the river through runoff after the rains.

- Most of the trees on the riverbank have a height between 8 and 15 m with some specimens reaching 20 m. There is a small variation between the heights of trees in the different sectors.
- Riparian trees in urban areas reach heights similar to those in rural areas.
- It is recommended to continue with satellite monitoring and increase the sampling area in the field to better characterize the height of the trees due to their importance as regulators of various fluvial processes.
    - For example, they regulate the force of floods, stabilizing the banks of the river and reducing its erosion. (Naiman, et al, 1998, Kutschker, et al, 2020) and also for its impact on water quality and macroinvertebrate communities.

Thanks!

Joaquín Melo

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Ailén Tallarico

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GLOBE LAC

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