Leibniz Institute of Agricultural Development in Transition Economies

Merging LiK communities with climate data using geographical markers

Sanaev G.

30 October, 2020

Leibniz Association

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Generating Climate Data for LiK

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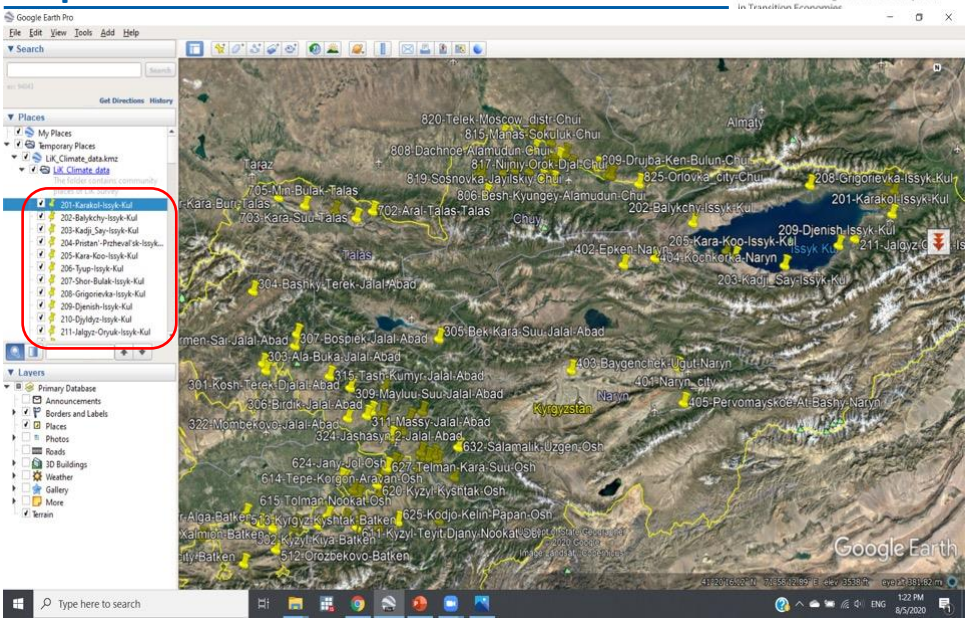
- Steps to generate CRU climate data
- Steps to generate MERRA2 climate data

2

Steps to generate CRU climate data

- Install Google Earth
- Add placemarks (clusters) on map of Kyrgyzstan
- Download **cruts_4.04_gridboxes.KML** file at https://crudata.uea.ac.uk/cru/data/hrg/ and open it on Google Earth software
- Copy temperature and precipitation data for each LiK cluster
- Paste long-to-wide data to Stata .dta file

Google Earth with LiK cluster placemarks



CRU Climate data

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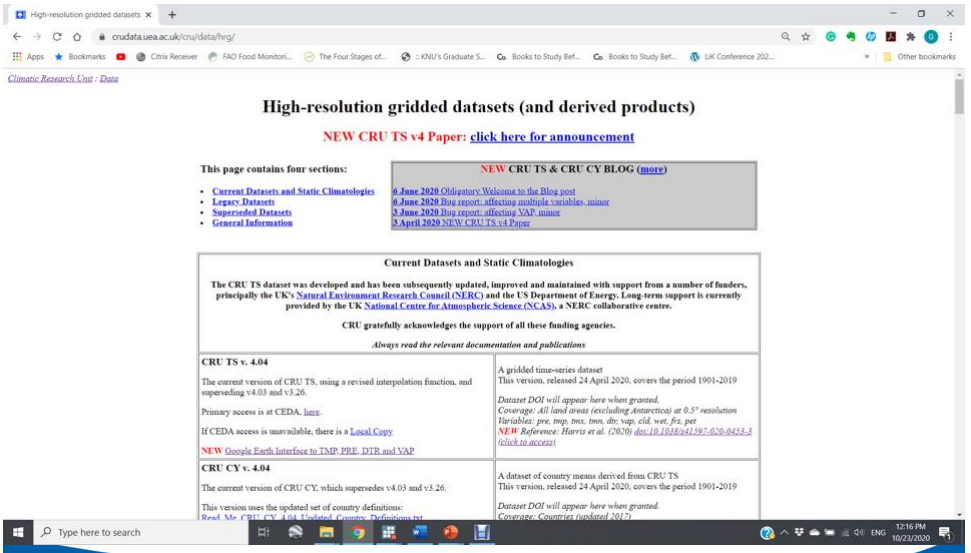

5

CRU Climate data (2)

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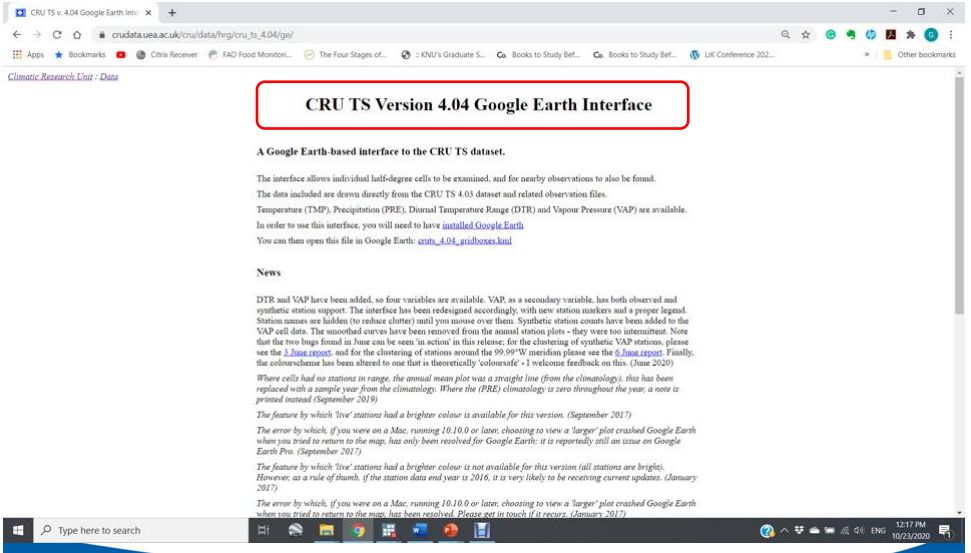

6

Open cruts_4.04_gridboxes.kml on Google Earth software

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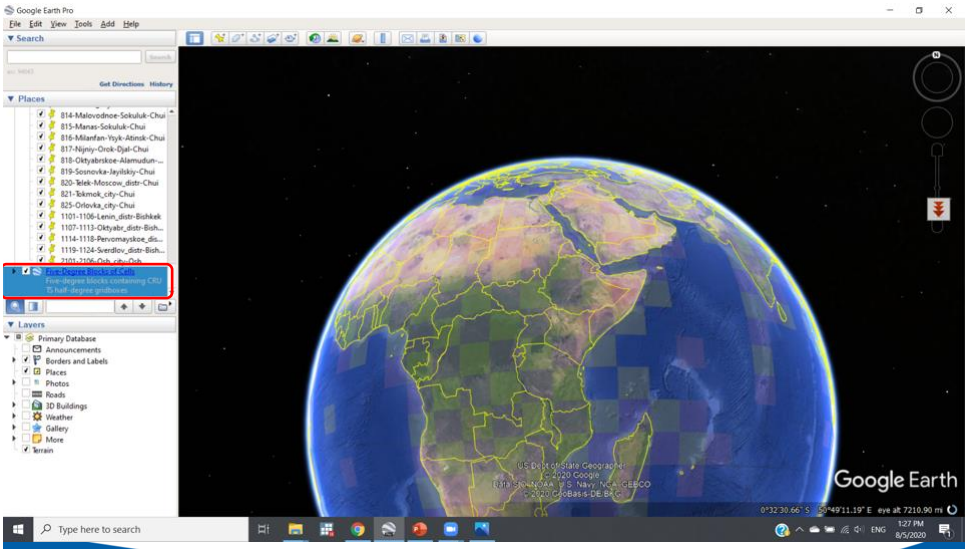

7

Example: 201-Karakol-Issyk-Kul data

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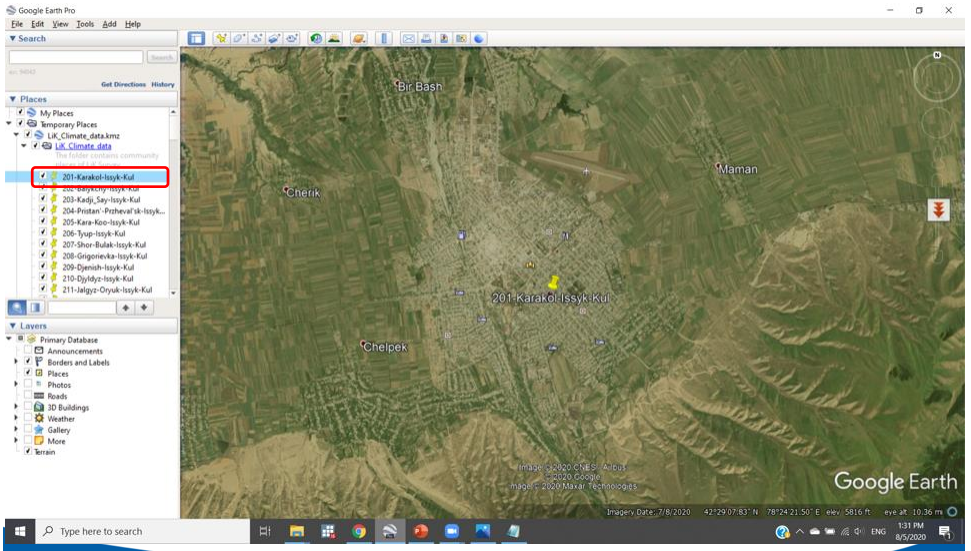

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Example: 201-Karakol-Issyk-Kul data (2)

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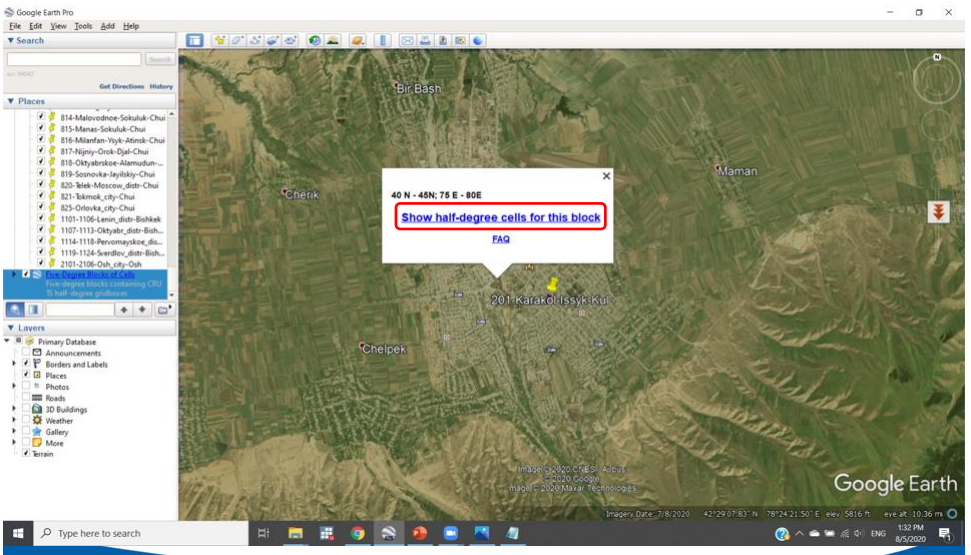

9

Example: 201-Karakol-Issyk-Kul data (3)

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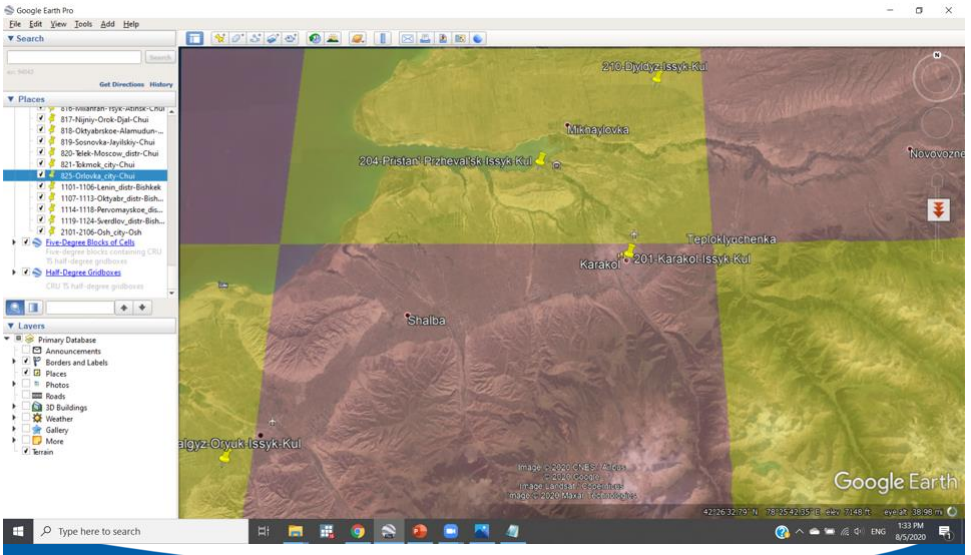

10

Example: 201-Karakol-Issyk-Kul data (4)

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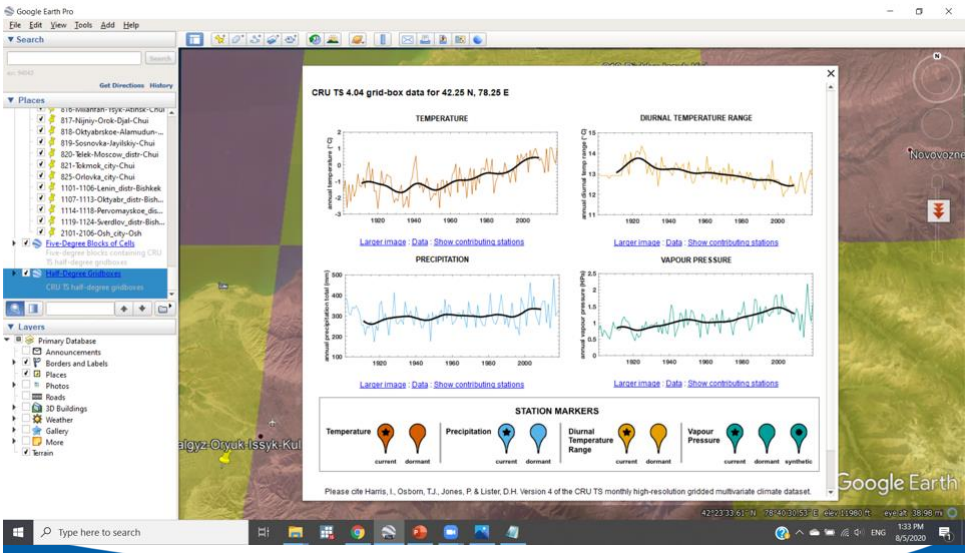

11

Example: 201-Karakol-Issyk-Kul data (5)

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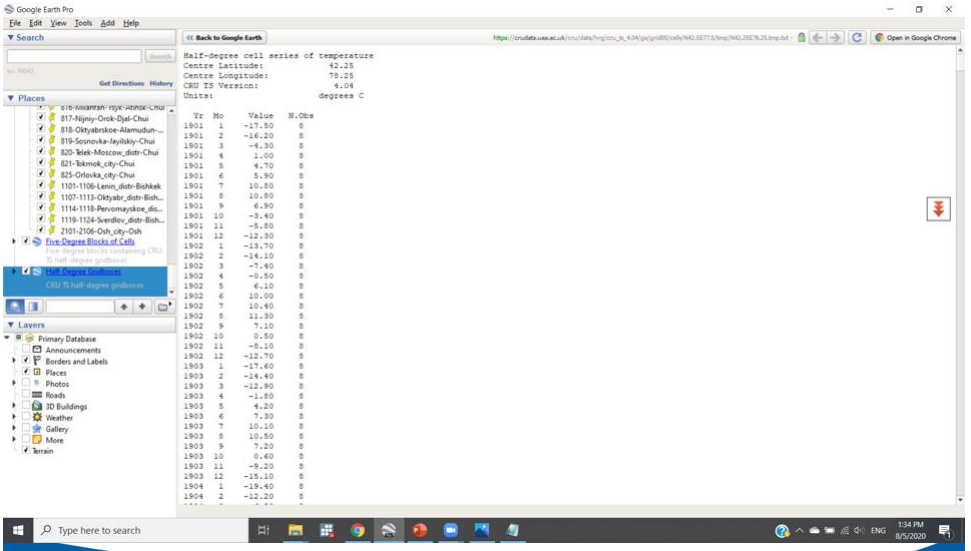

12

Copy temperature and precipitation data for each LiK cluster

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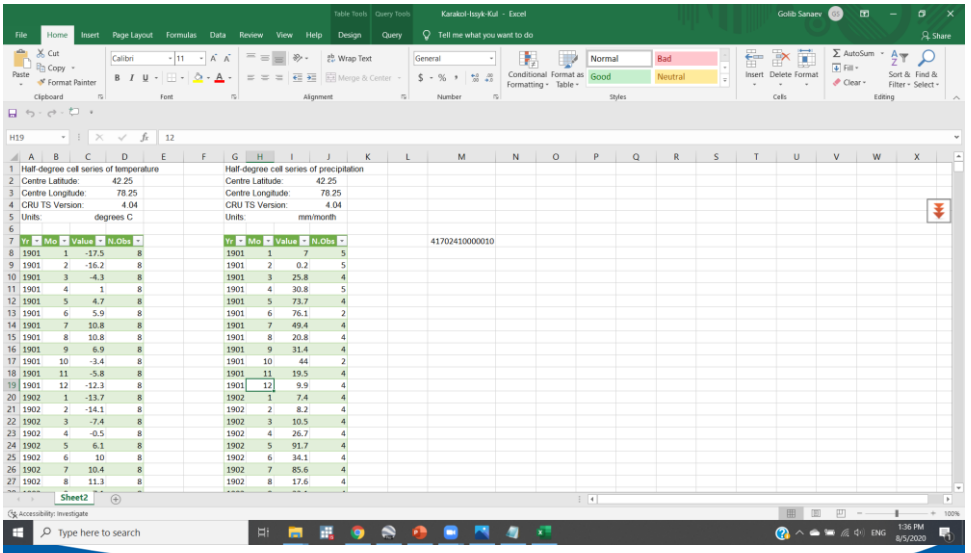

13

Paste long-to-wide data to Stata .dta file

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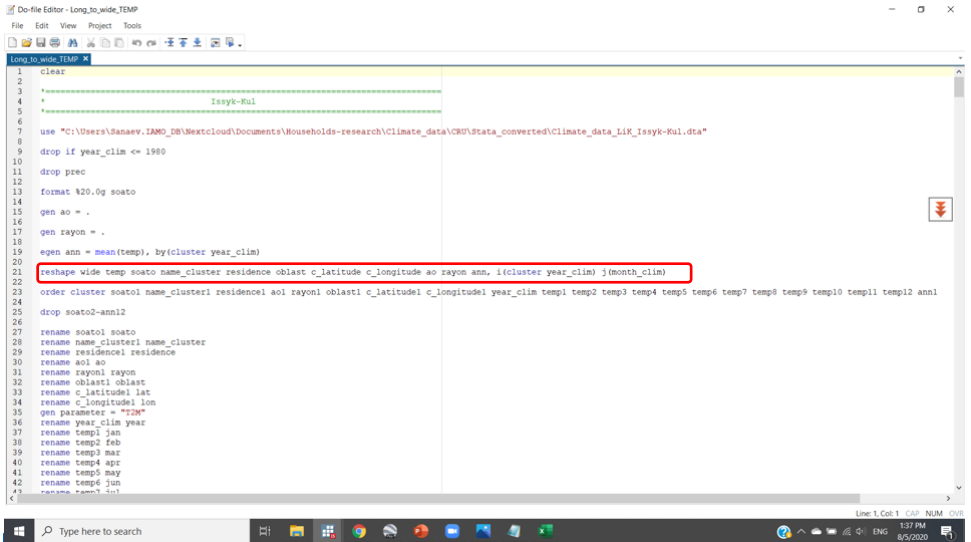
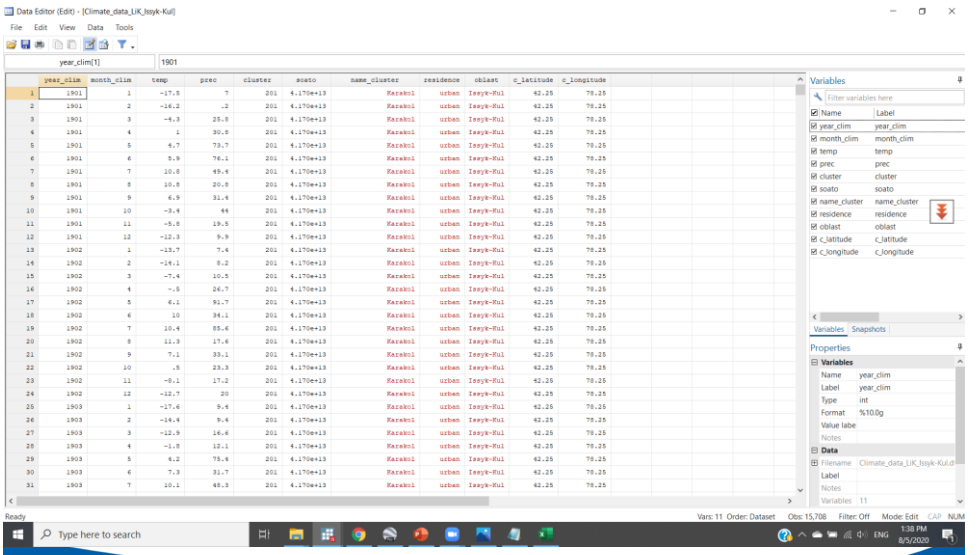


14

Paste long-to-wide data to Stata .dta file (2)



Steps to generate MERRA2 climate data

- Extract .xlsx data from Google Earth with coordinates
- Use https://power.larc.nasa.gov/data-access-viewer/ to download temp & precipitation data for each LiK cluster
- Paste wide data to Stata .dta file

Extract .xlsx data from Google Earth with coordinates

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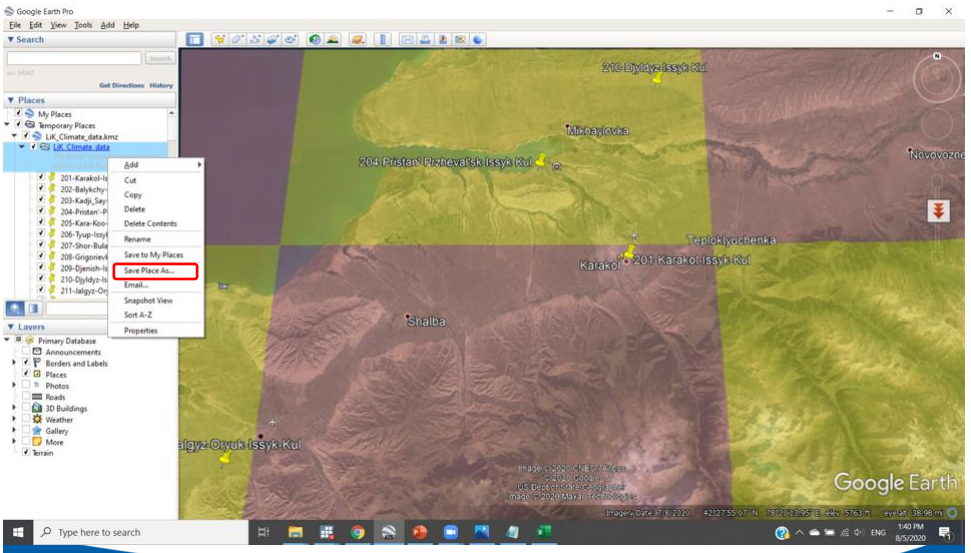
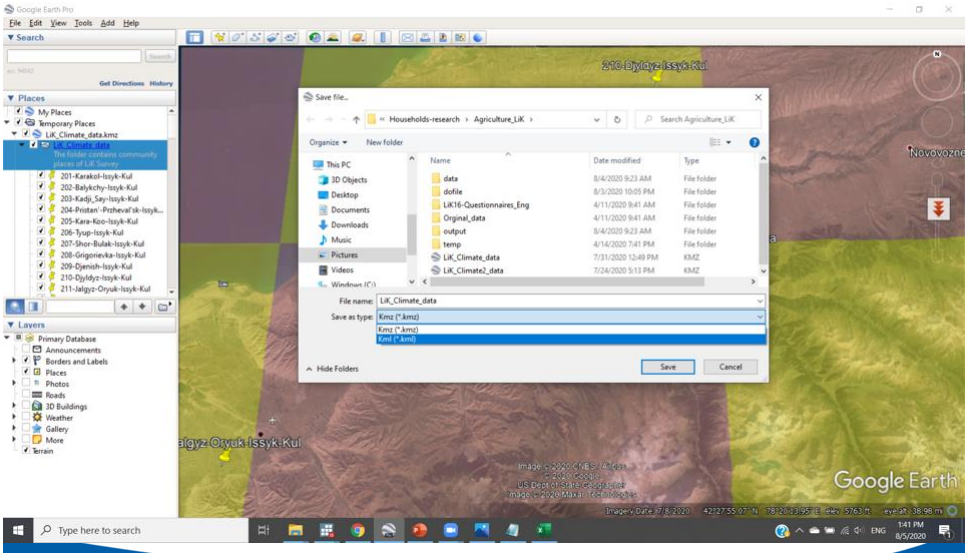


17

Extract .xlsx data from Google Earth with coordinates (2)

Leibniz Institute of Agricultural Development in Transition Economies



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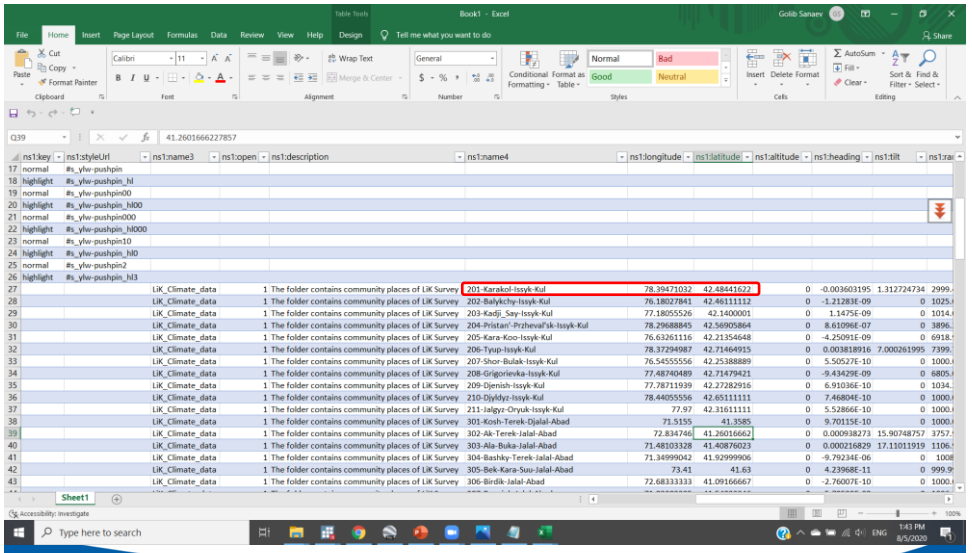
Extract .xlsx data from Google Earth with coordinates (3)

Leibniz Institute of Agricultural Development in Transition Economies



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normal	#s_ylw-pushpin									
highlight	#s_ylw-pushpin_hl									
normal	#s_ylw-pushpin00									
highlight	#s_ylw-pushpin_hl00									
normal	#s_ylw-pushpin000									
highlight	#s_ylw-pushpin_hl000									
normal	#s_ylw-pushpin10									
highlight	#s_ylw-pushpin_hl0									
normal	#s_ylw-pushpin2									
highlight	#s_ylw-pushpin_hl3									
		LiK_Climate_data	1	The folder contains community places of LiK Survey	201-Karakol-Issyk-Kul	78.39471032	42.48441622	0	-0.003603195	1.312724734
		LiK_Climate_data	1	The folder contains community places of LiK Survey	202-Balykchy-Issyk-Kul	76.18027841	42.46111112	0	-1.212838-09	0
		LiK_Climate_data	1	The folder contains community places of LiK Survey	203-Kadji_Say-Issyk-Kul	77.18055526	42.1400001	0	1.1475E-09	0
		LiK_Climate_data	1	The folder contains community places of LiK Survey	204-Pristan'-Przheval'sk-Issyk-Kul	78.29688845	42.56905864	0	8.61096E-07	0
		LiK_Climate_data	1	The folder contains community places of LiK Survey	205-Kara-Koo-Issyk-Kul	76.63261116	42.21354648	0	-4.25091E-09	0
		LiK_Climate_data	1	The folder contains community places of LiK Survey	206-Tyup-Issyk-Kul	78.37294987	42.71464915	0	0.003818916	7.000261995
		LiK_Climate_data	1	The folder contains community places of LiK Survey	207-Shor-Bulak-Issyk-Kul	76.54555556	42.25388889	0	5.50527E-10	0
		LiK_Climate_data	1	The folder contains community places of LiK Survey	208-Grigorievka-Issyk-Kul	77.48740489	42.71479421	0	-9.43429E-09	0
		LiK_Climate_data	1	The folder contains community places of LiK Survey	209-Djenish-Issyk-Kul	77.78711939	42.27282916	0	6.91036E-10	0
		LiK_Climate_data	1	The folder contains community places of LiK Survey	210-Djyldyz-Issyk-Kul	78.44055556	42.65111111	0	7.46804E-10	0
		LiK_Climate_data	1	The folder contains community places of LiK Survey	211-Jalgyz-Oryuk-Issyk-Kul	77.97	42.31611111	0	5.52866E-10	0
		LiK_Climate_data	1	The folder contains community places of LiK Survey	301-Kosh-Terek-Djalal-Abad	71.5155	41.3585	0	9.70115E-10	0
		LiK_Climate_data	1	The folder contains community places of LiK Survey	302-Ak-Terek-Jalal-Abad	72.834746	41.26016662	0	0.000938273	15.90748757
		LiK_Climate_data	1	The folder contains community places of LiK Survey	303-Ala-Buka-Jalal-Abad	71.48103328	41.40876023	0	0.000216829	17.11011919
		LiK_Climate_data	1	The folder contains community places of LiK Survey	304-Bashky-Terek-Jalal-Abad	71.34999042	41.92999906	0	-9.79234E-06	0
		LiK_Climate_data	1	The folder contains community places of LiK Survey	305-Bek-Kara-Suu-Jalal-Abad	73.41	41.63	0	4.23968E-11	0
		LiK_Climate_data	1	The folder contains community places of LiK Survey	306-Birdik-Jalal-Abad	72.68333333	41.09166667	0	-2.76007E-10	0

Use NASA website to download temp & precipitation data for each LiK cluster

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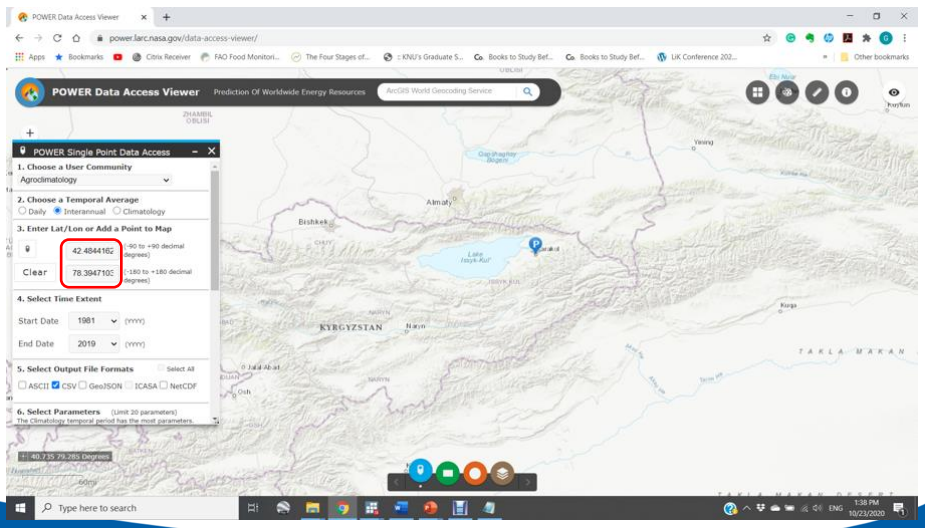
- Go to https://power.larc.nasa.gov/data-access-viewer/



Use NASA website to download temp & precipitation data for each LiK cluster (2)

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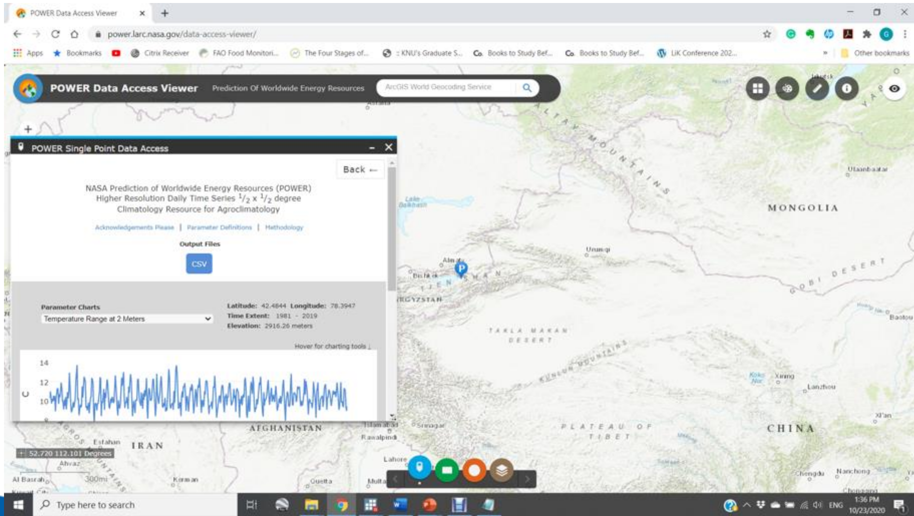
- Go to https://power.larc.nasa.gov/data-access-viewer/



Exctracting MERRA2 to .csv file

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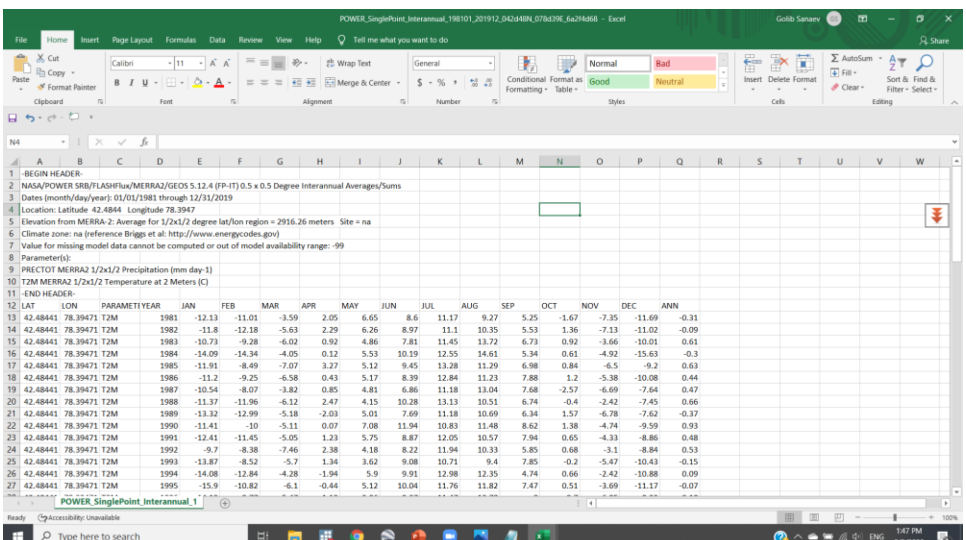

-BEGIN HEADER-
NASA/POWER SRB/FLASHFlux/MERRA2/GEOS 5.12.4 (FP-IT) 0.5 x 0.5 Degree Interannual Averages/Sums
Dates (month/day/year): 01/01/1981 through 12/31/2019
Location: Latitude 42.4844 Longitude 78.3947
Elevation from MERRA-2: Average for 1/2x1/2 degree lat/lon region = 2916.26 meters Site = na
Climate zone: na (reference Briggs et al: http://www.energycodes.gov)
Value for missing model data cannot be computed or out of model availability range: -99
Parameter(s):
PRECTOT MERRA2 1/2x1/2 Precipitation (mm day-1)
T2M MERRA2 1/2x1/2 Temperature at 2 Meters (C)
-END HEADER-

LAT	LON	PARAMETI	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
42.48441	78.39471	T2M	1981	-12.13	-11.01	-3.59	2.05	6.65	8.6	11.17	9.27	5.25	-1.67	-7.35	-11.69	-0.31
42.48441	78.39471	T2M	1982	-11.8	-12.18	-5.63	2.29	6.26	8.97	11.1	10.35	5.53	1.36	-7.13	-11.02	-0.09
42.48441	78.39471	T2M	1983	-10.73	-9.28	-6.02	0.92	4.86	7.81	11.45	13.72	6.73	0.92	-3.66	-10.01	0.61
42.48441	78.39471	T2M	1984	-14.09	-14.34	-4.05	0.12	5.53	10.19	12.55	14.61	5.34	0.61	-4.92	-15.63	-0.3
42.48441	78.39471	T2M	1985	-11.91	-8.49	-7.07	3.27	5.12	9.45	13.28	11.29	6.98	0.84	-6.5	-9.2	0.63
42.48441	78.39471	T2M	1986	-11.2	-9.25	-6.58	0.43	5.17	8.39	12.84	11.23	7.88	1.2	-5.38	-10.08	0.44
42.48441	78.39471	T2M	1987	-10.54	-8.07	-3.82	0.85	4.81	6.86	11.18	13.04	7.68	-2.57	-6.69	-7.64	0.47
42.48441	78.39471	T2M	1988	-11.37	-11.96	-6.12	2.47	4.15	10.28	13.13	10.51	6.74	-0.4	-2.42	-7.45	0.66
42.48441	78.39471	T2M	1989	-13.32	-12.99	-5.18	-2.03	5.01	7.69	11.18	10.69	6.34	1.57	-6.78	-7.62	-0.37
42.48441	78.39471	T2M	1990	-11.41	-10	-5.11	0.07	7.08	11.94	10.83	11.48	8.62	1.38	-4.74	-9.59	0.93
42.48441	78.39471	T2M	1991	-12.41	-11.45	-5.05	1.23	5.75	8.87	12.05	10.57	7.94	0.65	-4.33	-8.86	0.48
42.48441	78.39471	T2M	1992	-9.7	-8.38	-7.46	2.38	4.18	8.22	11.94	10.33	5.85	0.68	-3.1	-8.84	0.53
42.48441	78.39471	T2M	1993	-13.87	-8.52	-5.7	1.34	3.62	9.08	10.71	9.4	7.85	-0.2	-5.47	-10.43	-0.15
42.48441	78.39471	T2M	1994	-14.08	-12.84	-4.28	-1.94	5.9	9.91	12.98	12.35	4.74	0.66	-2.42	-10.88	0.09
42.48441	78.39471	T2M	1995	-15.9	-10.82	-6.1	-0.44	5.12	10.04	11.76	11.82	7.47	0.51	-3.69	-11.17	-0.07

Leibniz Institute of Agricultural Development in Transition Economies

Thank you!

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Germany

Leibniz Institute of Agricultural Development in Transition Economies

Thank you for your attention!

Leibniz Association

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