

Merging LiK communities with climate data using geographical markers

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30 October, 2020



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Generating Climate Data for LiK

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

2

Steps to generate CRU climate data

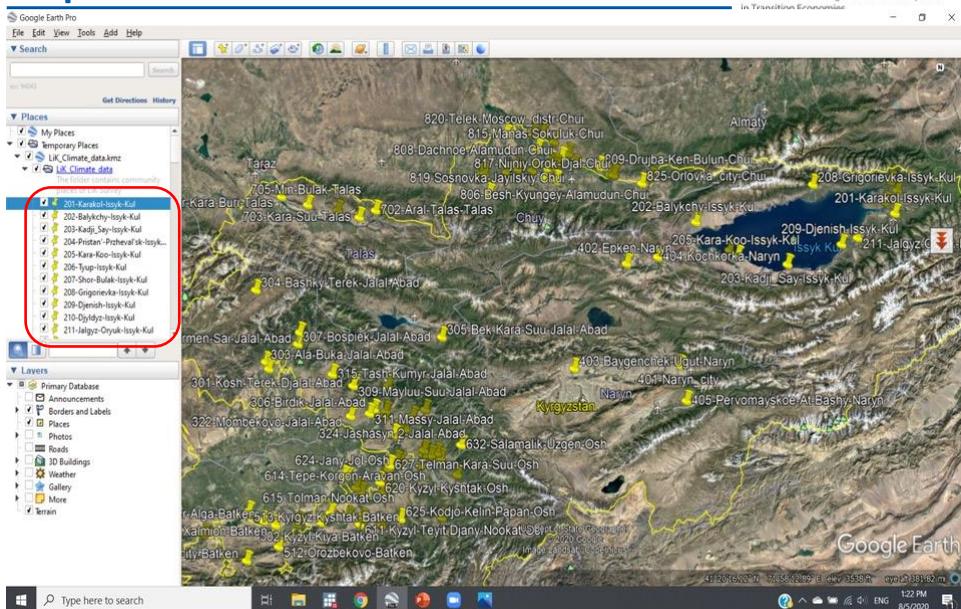
- Install Google Earth
- Add placemarks (clusters) on map of Kyrgyzstan
- Download **cruts_4.04_gridboxes.KML** file at <https://crudata.uea.ac.uk/cru/data/hrg/> and open it on Google Earth software
- Copy temperature and precipitation data for each LiK cluster
- Paste long-to-wide data to Stata .dta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

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Google Earth with LiK cluster placemarks



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CRU Climate data



High-resolution gridded datasets (and derived products)

NEW CRU TS v4 Paper: [click here for announcement](#)

NEW CRU TS & CRU CY BLOG (more)

- **Current Datasets and Static Climatologies**
 - 6 June 2020 [C9Julatory>Welcome to the Blog post](#)
 - 6 June 2020 [Blog report: affecting multiple variables - minor](#)
 - 8 June 2020 [Blog report: affecting VAP - minor](#)
 - 8 April 2020 [NEW CRU TS v4 Paper](#)
- **Legacy Datasets**
- **Superseded Datasets**
- **General Information**

Current Datasets and Static Climatologies

The CRU TS dataset was developed and has been subsequently updated, improved and maintained with support from a number of funders, principally the UK's Natural Environment Research Council (NERC) and the US Department of Energy. Long term support is currently provided by the UK National Centre for Atmospheric Science (NCAS), a NERC collaborative centre.

CRU gratefully acknowledges the support of all these funding agencies.

Always read the relevant documentation and publications

<p>CRU TS v. 4.04</p> <p>The current version of CRU TS, using a revised interpolation function, and superseding v4.03 and v3.26.</p> <p>Primary access is at CEDA, here.</p> <p>If CEDA access is unavailable, there is a Local Copy</p> <p>NEW Google Earth Interface to TMP, PRE, DTR and VAP</p>	<p>A gridded time-series dataset</p> <p>This version, released 24 April 2020, covers the period 1901-2019</p> <p><i>Dataset DOI will appear here when granted.</i></p> <p><i>Coverage: All land areas (excluding Antarctica) at 0.5° resolution</i></p> <p><i>Variables: pre, tmp, tmm, dtm, vap, cld, wet, #a, psc</i></p> <p><i>NEW Reference: Harris et al., 2020 (doi:10.1016/j.glores.2020.04.003) (click to access)</i></p>
<p>CRU CY v. 4.04</p> <p>The current version of CRU CY, which supersedes v4.03 and v3.26.</p> <p>This version uses the updated set of country definitions: Read Me, CRU TS v4.04 with feedback questions, Definitions</p>	<p>A dataset of country means derived from CRU TS</p> <p>This version, released 24 April 2020, covers the period 1901-2019</p> <p><i>Dataset DOI will appear here when granted.</i></p> <p><i>Coverage: Countries included 2017</i></p>

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CRU Climate data (2)



CRU TS Version 4.04 Google Earth Interface

A Google Earth-based interface to the CRU TS dataset.

The interface allows individual half-degree cells to be examined, and for nearby observations to also be found. The data included are drawn directly from the CRU TS 4.03 dataset and related observation files. Temperature (TMP), Precipitation (PRE), Diurnal Temperature Range (DTR) and Vapour Pressure (VAP) are available. In order to use this interface, you will need to have [installed Google Earth](#). You can then open this file in Google Earth: [crts_4.04_gridboxes.html](#)

News

DTR and VAP have been added, so four variables are available. VAP, as a secondary variable, has both observed and synthetic station support. The interface has been redesigned accordingly, with new station markers and a proper legend. Station names are hidden (to reduce clutter) until you mouse over them. Synthetic station counts have been added to the VAP cell data. The smoothed curves have been removed from the annual station plots - they were too intermittent. Note that the two bugs found in June can be seen 'in action' in this release; for the clustering of synthetic VAP stations, please see the [2 June report](#), and for the clustering of stations around the 70.99°W meridian please see the [6 June report](#). Finally, the colour scheme has been altered to one that is theoretically 'colour-safe' - I welcome feedback on this. (June 2020)

Where cells had no stations in range, the annual mean plot was a straight line (from the climatology), this has been replaced with a sample year from the climatology. Where the (PRE) climatology is zero throughout the year, a note is printed instead (September 2019)

The feature by which 'live' stations had a brighter colour is available for this version. (September 2017)

The error by which, if you were on a Mac, running 10.10.0 or later, choosing to view a 'larger' plot crashed Google Earth when you tried to return to the map, has only been resolved for Google Earth; it is reportedly still an issue on Google Earth Pro. (September 2017)

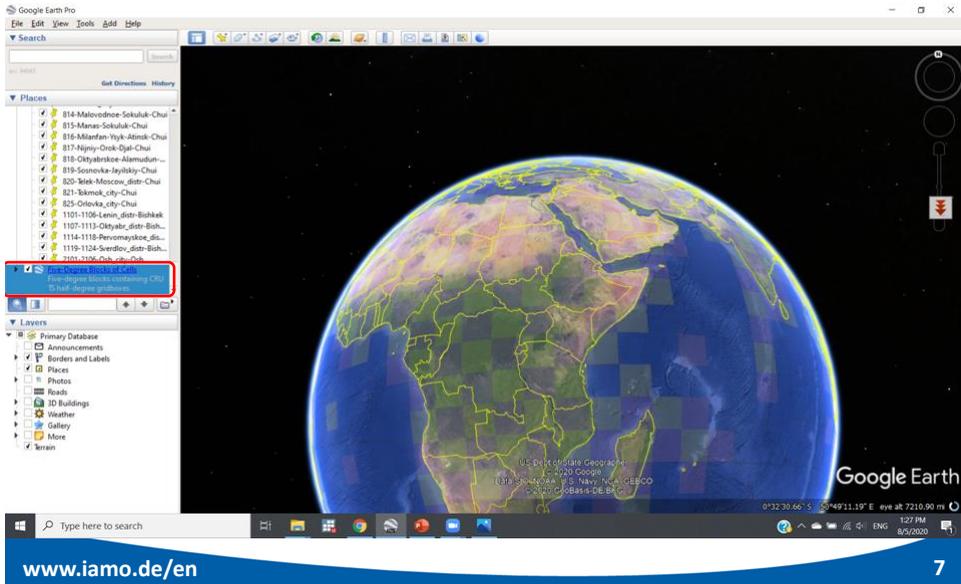
The feature by which 'live' stations had a brighter colour is not available for this version (all stations are bright). However, as a rule of thumb, if the station data end year is 2016, it is very likely to be receiving current updates. (January 2017)

The error by which, if you were on a Mac, running 10.10.0 or later, choosing to view a 'larger' plot crashed Google Earth when you tried to return to the map, has been resolved. Please get in touch if it recurs. (January 2017)

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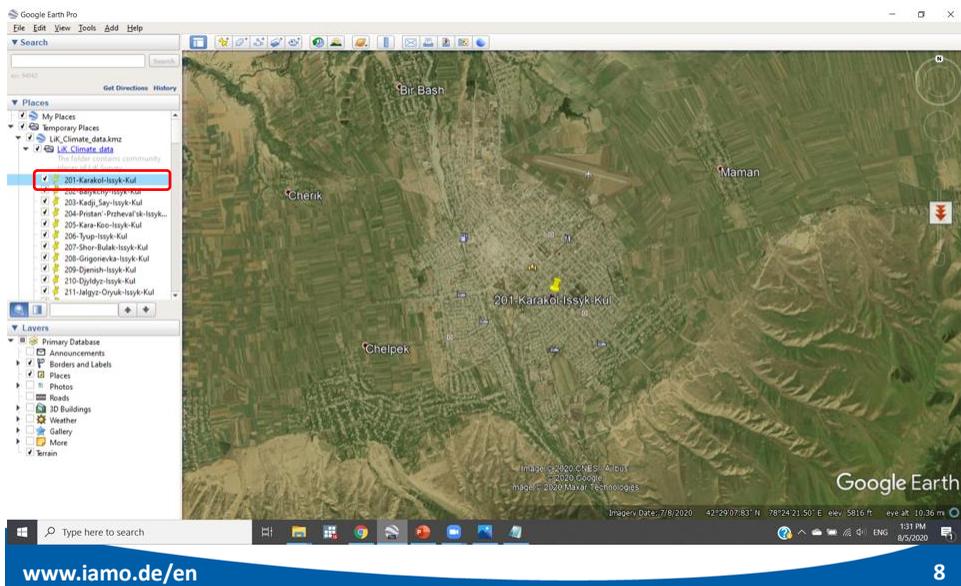
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Open cruts_4.04_gridboxes.kml on Google Earth software



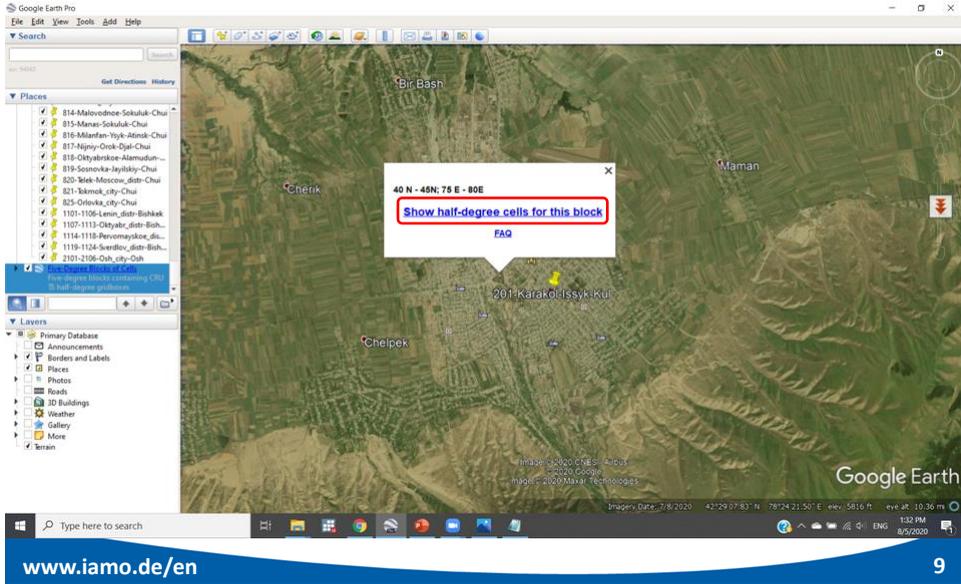
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Example: 201-Karakol-Issyk-Kul data



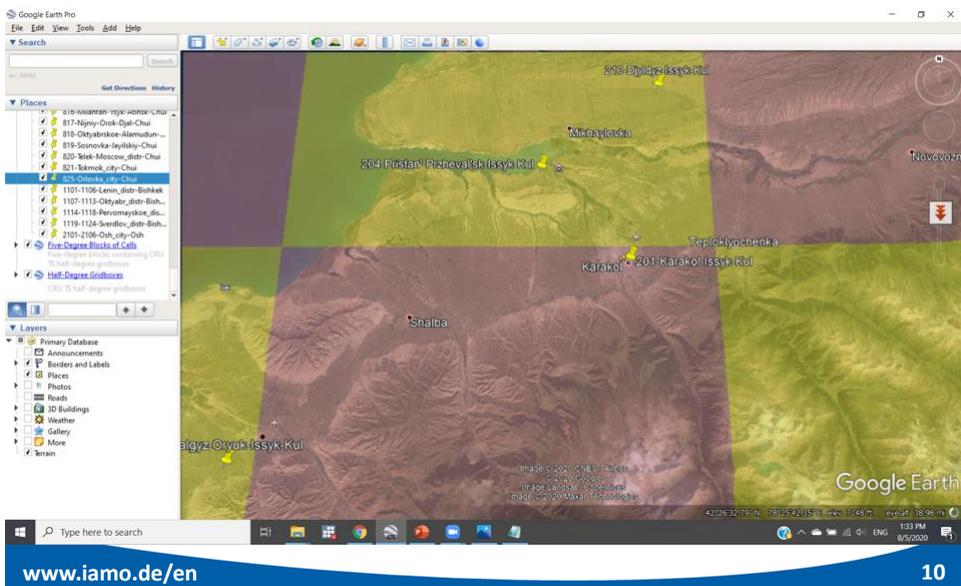
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Example: 201-Karakol-Issyk-Kul data (2)



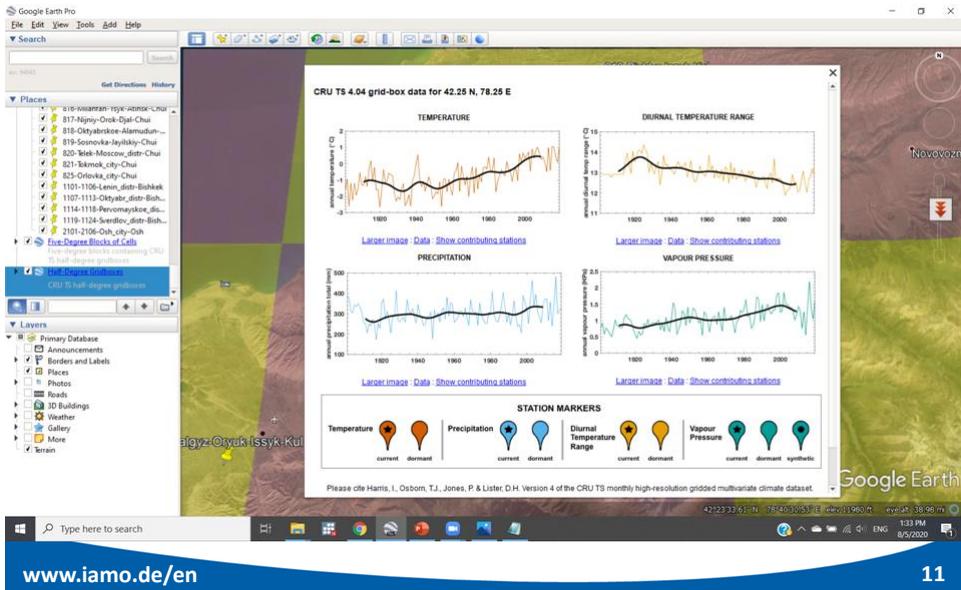
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Example: 201-Karakol-Issyk-Kul data (3)



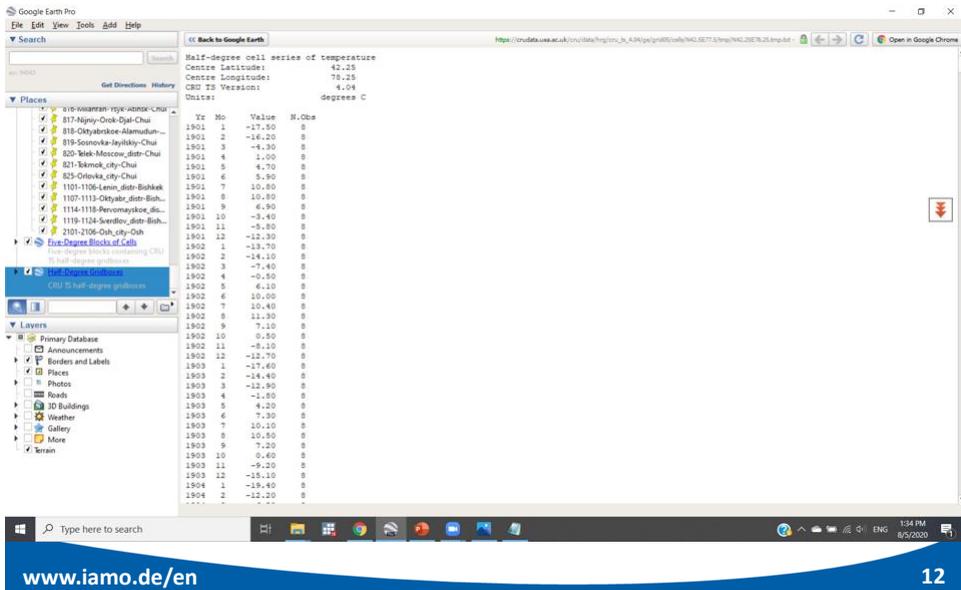
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Example: 201-Karakol-Issyk-Kul data (4)



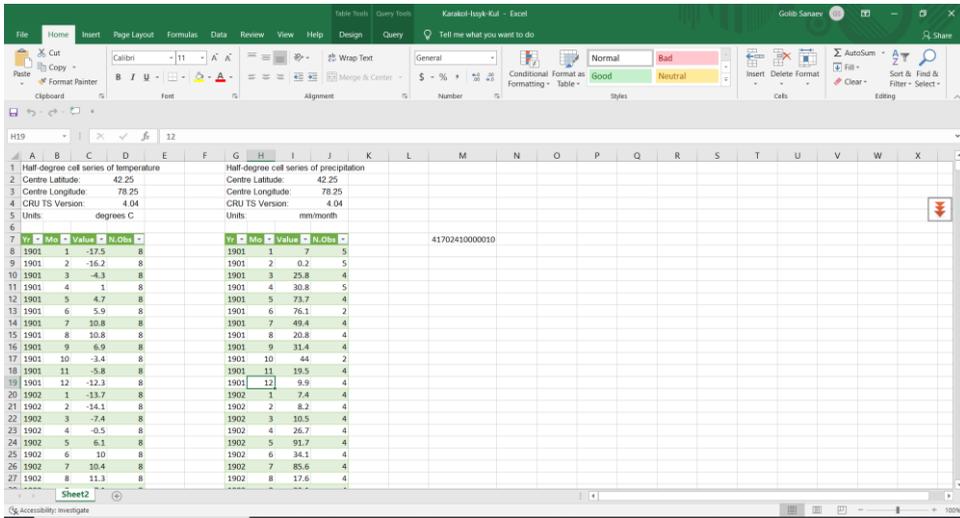
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Example: 201-Karakol-Issyk-Kul data (5)



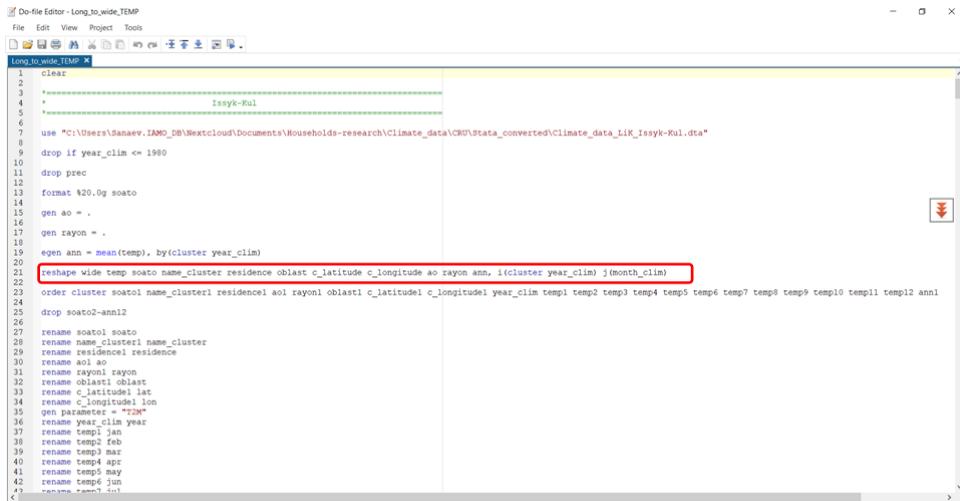
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Copy temperature and precipitation data for each LiK cluster



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



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

The screenshot displays the Stata Data Editor interface. The main window shows a dataset with the following columns: year_clim, month_clim, temp, prec, cluster, soato, name_cluster, residence, oblast, c_latitude, and c_longitude. The data is organized into rows for each year from 1901 to 1909, with 12 months per year. The Variables window on the right shows the following structure:

Variable Name	Label
year_clim	year_clim
month_clim	month_clim
temp	temp
prec	prec
cluster	cluster
soato	soato
name_cluster	name_cluster
residence	residence
oblast	oblast
c_latitude	c_latitude
c_longitude	c_longitude

The Properties window shows the following details for the 'year_clim' variable:

Property	Value
Name	year_clim
Label	year_clim
Type	int
Format	%10.0g
Value label	
Notes	

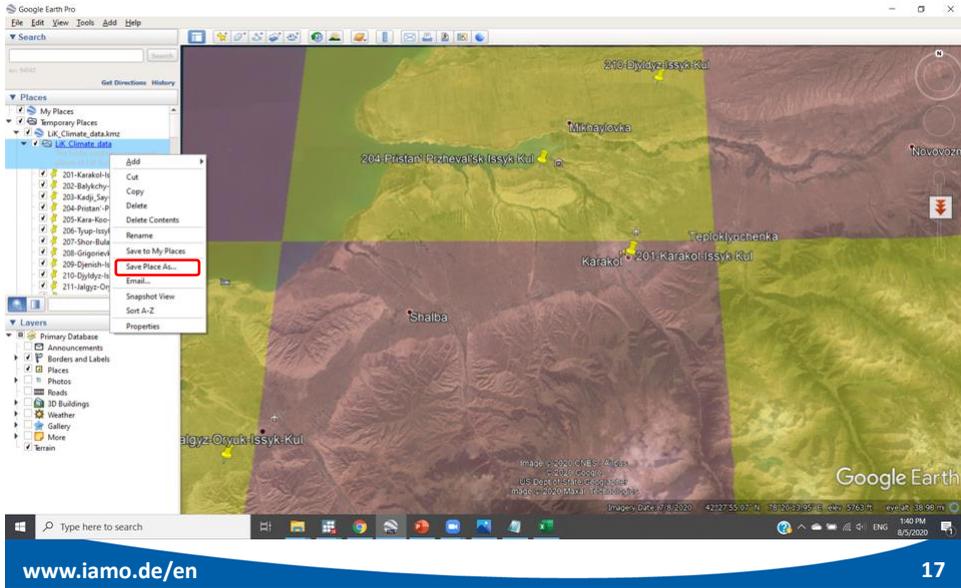
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Steps to generate MERRA2 climate data

- 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

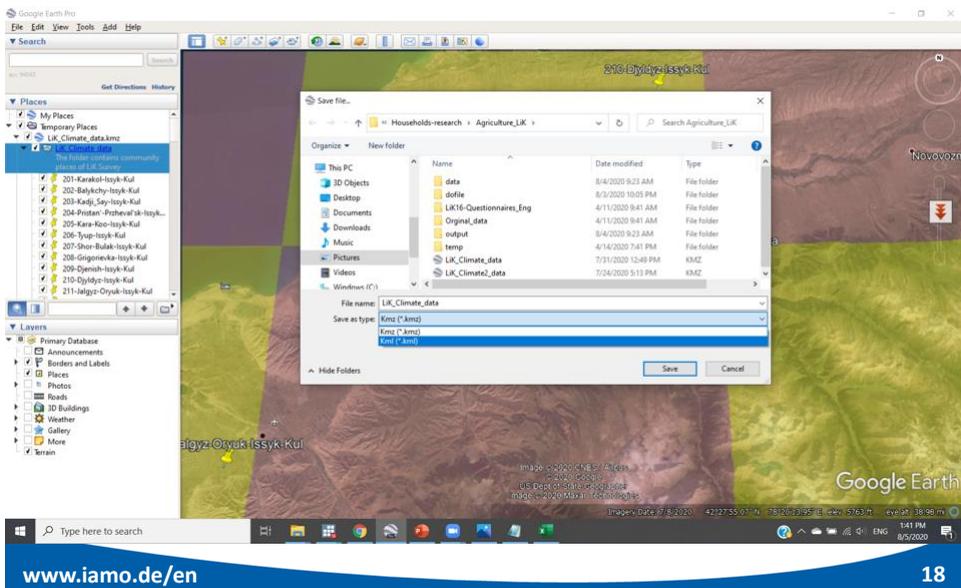
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Extract .xlsx data from Google Earth with coordinates



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



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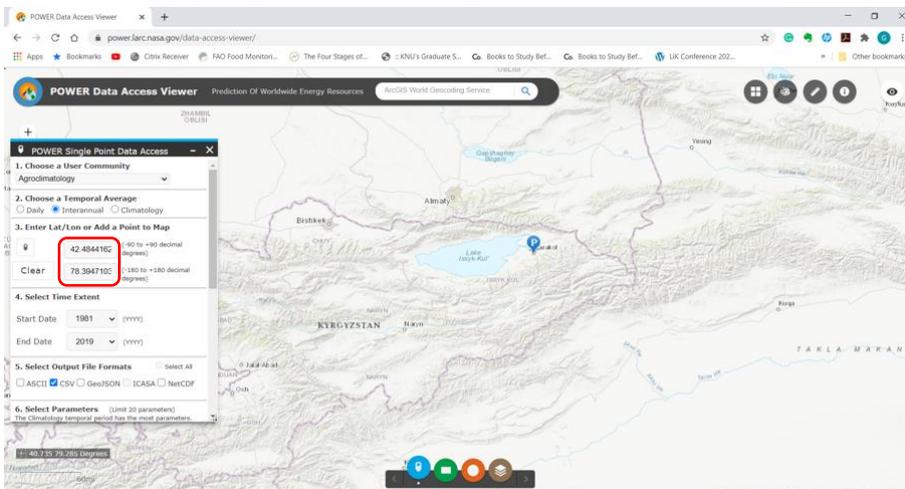
Extract .xlsx data from Google Earth with coordinates (3)

ns1key	ns1styleUrl	ns1name3	ns1open	ns1description	ns1name4	ns1longitude	ns1latitude	ns1altitude	ns1heading	ns1tilt	ns1...
17	normal	#_yvw-pushpin									
18	highlight	#_yvw-pushpin_I									
19	normal	#_yvw-pushpin00									
20	highlight	#_yvw-pushpin_H00									
21	normal	#_yvw-pushpin000									
22	highlight	#_yvw-pushpin_H000									
23	normal	#_yvw-pushpin10									
24	highlight	#_yvw-pushpin_H10									
25	normal	#_yvw-pushpin2									
26	highlight	#_yvw-pushpin_H2									
27	LIK_Climate_data	1	The folder contains community places of LIK Survey	201-Karabul-Isyky-Kul		78.39471032	42.48441623	0	-0.00360195	1.31272474	2999.
28	LIK_Climate_data	1	The folder contains community places of LIK Survey	202-Balykchy-Isyky-Kul		76.18027941	42.46111112	0	-1.2128E-09	0	1025.
29	LIK_Climate_data	1	The folder contains community places of LIK Survey	203-Kadji_Say-Isyky-Kul		77.18055526	42.14000001	0	1.1475E-09	0	1014.
30	LIK_Climate_data	1	The folder contains community places of LIK Survey	204-Pristan_Prhovaul'k-Isyky-Kul		78.29888845	42.56905864	0	8.61096E-07	0	3896.
31	LIK_Climate_data	1	The folder contains community places of LIK Survey	205-Kara-Koo-Isyky-Kul		76.61261116	42.21254648	0	-4.25091E-09	0	6918.
32	LIK_Climate_data	1	The folder contains community places of LIK Survey	206-Tapp-Isyky-Kul		78.37294987	42.71464915	0	0.003818016	1.000261995	7395.
33	LIK_Climate_data	1	The folder contains community places of LIK Survey	207-Shor-Bulak-Isyky-Kul		76.54555556	42.25388889	0	5.50527E-10	0	1000.
34	LIK_Climate_data	1	The folder contains community places of LIK Survey	208-Grigorievka-Isyky-Kul		77.48740489	42.71479421	0	-9.43429E-09	0	6805.
35	LIK_Climate_data	1	The folder contains community places of LIK Survey	209-Ujensky-Isyky-Kul		77.78719399	42.27282916	0	6.61036E-10	0	1034.
36	LIK_Climate_data	1	The folder contains community places of LIK Survey	210-Sydyky-Isyky-Kul		78.44025556	42.69111111	0	7.46804E-10	0	1000.
37	LIK_Climate_data	1	The folder contains community places of LIK Survey	211-Jalgyz-Oryuk-Isyky-Kul		77.97	42.31611111	0	5.52866E-10	0	1000.
38	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	1000.
39	LIK_Climate_data	1	The folder contains community places of LIK Survey	302-Ab-Terek-Jalal-Abad		72.834748	41.36016623	0	0.009938273	15.90748757	3757.
40	LIK_Climate_data	1	The folder contains community places of LIK Survey	303-Ab-Bulak-Jalal-Abad		71.48103328	41.40876023	0	0.000238429	17.11011919	1316.
41	LIK_Climate_data	1	The folder contains community places of LIK Survey	304-Bashy-Terek-Jalal-Abad		71.34999042	41.92999906	0	-9.79234E-06	0	1008.
42	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	999.9
43	LIK_Climate_data	1	The folder contains community places of LIK Survey	306-Birdik-Jalal-Abad		72.68133333	41.09166667	0	-2.76007E-10	0	1000.

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

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



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

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

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Extracting MERRA2 to .csv file

LAT	LON	PARAMET	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
42.48441	78.39471	T2M	1981	-12.13	-11.01	-5.59	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	-5.83	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	15.94	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	-4.11	-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

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Thank you!

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Thank you for your attention!

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