

ÚKOLY

- 1) Zkonstruuje linii GMWL $\Delta D = 8 \cdot \Delta 18O + 10$
- 2) Zkonstruuje lokální linie MWL pro stanice Vienna, Athens, Wulumuqui a Shinejinst
- 3) Popište rozdíly mezi lokálními liniemi a interpretujte jejich příčiny
- 4) Určete hodnoty D-excess pro tyto stanice a jejich sezónní variace a interpretujte příčiny variací
- 5) Najděte body ovlivněné evaporací na lokalitě Shinejinst
- 6) Určete měsíční hodnoty $d18O$ a dH ze srážek na základě vážených průměrů pro stanici VIENNA

Deuterium excess - explanation:

<http://www-naweb.iaea.org/napc/ih/documents/userupdate/description/Precip6.html>

<https://www.mdpi.com/2076-3263/8/7/257/htm>

riací

√NA (období 1993-1999)

Date	d18O	d2H	3H	Precipitation (mm/month)
I-60				50
II-60				10
III-60				41
IV-60				25
V-60				54
VI-60				79
VII-60				87
VIII-60				70
IX-60				50
X-60				60
XI-60				20
XII-60				27
I-61			79	9
II-61	-9.9	-67	39.2	68
III-61	-6.2	-45.9	43.2	36
IV-61	-7.2	-57.6	123	60
V-61	-1.2	-16.8	174.5	84
VI-61	-7.1	-55.8	125.5	48
VII-61	-4.1	-29.2	140.5	83
VIII-61	-6.6	-53.3	104	28
IX-61	-4.5	-34.1	61.8	22
X-61	-13.8	-91.6	56	59
XI-61	-7.3	-59.5	101	61
XII-61	-11.6	-82.4	136	52
I-62			487	15
II-62	-16.4	-118.1	1232	39
III-62	-15.3	-118.1	1078	54
IV-62	-12.2	-83.6	1032	64
V-62	-6.3	-57.6	1210	48
VI-62	-5	-50.2	990	25
VII-62	-4.9	-47.1	1228	52
VIII-62	-4.5	-33.5	877	26
IX-62	-6.1	-45.9	550	25
X-62	-11.8	-83.6	521	49
XI-62	-14.5	-98.4	647	101
XII-62	-15.6	-112.1	648	42
I-63	-18.2	-124.9	1265	40
II-63	-21.6	-156.4	1900	22
III-63	-13.6	-97.8	2900	47
IV-63	-5.4	-43.4	3035	28
V-63	-7.2	-50.2	5930	70
VI-63	-7.2	-51.4	4960	53
VII-63	-6.6	-53.3	5950	11
VIII-63	-9.2	-68.8	3010	85
IX-63	-8	-59.5	2200	49
X-63	-7.6	-61.3	1558	24
XI-63	-8.6	-58.3	788	30

XII-63	-12.2	-93.5	1334	13
I-64	-11.4	-82.4	1664	7
II-64	-9.7	-69.4	1171	29
III-64	-17.2	-120	2745	72
IV-64			2973	61
V-64	-7.1	-53.9	2686	68
VI-64	-6.6	-51.4	2365	42
VII-64	-2.3	-31.6	2610	37
VIII-64	-4.9	-46.5	1783	52
IX-64	-6.6	-57	1073	20
X-64	-12.9	-87.9	649	132
XI-64	-6.2	-47.7	384	26
XII-64	-14.4	-97.8	432	49
I-65	-15.2	-112.7	475	42
II-65	-15.1	-106.4	719	47
III-65	-11.6	-80.6	582	44
IV-65	-10.7	-76.9	1003	131
V-65	-8.2	-54.5	1080	131
VI-65	-7.3	-52.7	1173	193
VII-65	-3.7	-25.5	1575	84
VIII-65	-5.9	-36.6	941	57
IX-65	-7.3	-49.6	578	48
X-65				
XI-65	-10.4	-77.5	275	29
XII-65	-11.5	-87.3	213	68
I-66	-18.7	-134.2	322	34
II-66	-11.3	-77.5	368	53
III-66	-10.1	-69.4	432	22
IV-66	-8	-67	578	39
V-66	-7.6	-65.1	780	69
VI-66	-5.7	-45.2	835	84
VII-66	-5.7	-48.3	792	123
VIII-66	-7.7	-53.9	703	133
IX-66	-7.1	-45.2	373	19
X-66	-16.2	-106.4	235	54
XI-66	-13.3	-89.2	229	84
XII-66	-12.9	-91	134.3	67
I-67	-13.65	-95.9	189	36
II-67	-9.05	-60.1	236.8	31
III-67	-6.98	-51.4	241	44
IV-67	-7.26	-45.9	323	32
V-67	-9.7	-66.4	475	91
VI-67	-7.36	-55.1	423	26
VII-67	-7.66	-53.3	359	70
VIII-67	-4.45	-42.2	299	44
IX-67	-6.57	-42.8	252	97
X-67	-8.5	-52.1	280.2	15
XI-67	-12.43	-82.4	138.9	22

XII-67	-13.52	-97.5	161.8	61
I-68	-13.11	-93.3	65.3	64
II-68	-9.63	-73.5	237.1	7
III-68	-7.89	-68.8	266.3	25
IV-68	-8.04	-56.7	301.7	20
V-68	-1.84	-7.8	277.1	45
VI-68	-7.53	-56	348.6	35
VII-68	-5.55	-31.9	301.5	60
VIII-68	-6.18	-48.1	299	68
IX-68	-8.12	-62	164.4	39
X-68			288.8	60
XI-68			152.5	31
XII-68			150	42
I-69	-15.56		122.6	50
II-69	-14.26		140.1	55
III-69	-12.76	-94.7	211.2	57
IV-69	-6.23	-49.7	213.1	18
V-69	-3.42	-40.9	270	30
VI-69	-8.67	-60.6	315.4	156
VII-69	-5.46	-48.5	341.8	42
VIII-69	-6.74	-47.3	266.9	67
IX-69	-9.3	-50.5	169.2	30
X-69	-6.71	-52.8	239.6	8
XI-69	-10.9	-74.1	105.4	67
XII-69	-24.41	-183.6	119	64
I-70	-18.14	-124.7	119.6	12
II-70	-12.98	-95.3	101.2	109
III-70	-14.65	-105.4	175.6	45
IV-70	-7.13	-56.6	172.2	48
V-70	-7.61	-56.4	309.6	20
VI-70	-7.19	-55.4	332.6	55
VII-70	-8.63	-64.5	319.3	121
VIII-70	-6.2	-39.5	266.2	53
IX-70	-6.27	-43.3	191.4	24
X-70	-9.53	-63.4	114.2	86
XI-70	-11.25	-78.3	105.8	105
XII-70	-15.39	-108.6	124.1	29
I-71	-13.56	-101.1	146.8	17
II-71	-15.61	-100.3	84.3	34
III-71	-11.13	-85.7	550.9	72
IV-71	-10.46	-71.1	292.1	22
V-71	-3.23	-37.3	390.1	34
VI-71	-7.83	-62.4	333.3	109
VII-71			216.1	19
VIII-71			127.3	62
IX-71	-9.5	-73.7	146.3	51
X-71	-10.52	-72.6	133.8	19
XI-71	-15.93	-109.7	66.7	64

XII-71			64.2	28
I-72	-17.35	-112.8	91.8	31
II-72				54
III-72	-11.43	-80	126.1	31
IV-72	-9.43	-66	130.8	86
V-72	-7.08	-54.6	165.9	131
VI-72	-6.85	-54.3	217.4	22
VII-72	-6.03	-54	205.6	114
VIII-72	-5.84	-45	149.2	67
IX-72	-7.23	-62.4	93.7	30
X-72	-13.23	-91.8	45.8	34
XI-72	-12.45	-94.9	48.6	32
XII-72				3
I-73	-16.23	-120.2	54.7	47
II-73	-8.64	-70.4	146.4	38
III-73	-14.4	-104.7	116.6	112
IV-73	-15.48	-110.1	125.3	129
V-73	-4.77	-32	190.4	17
VI-73	-6.69	-44.5	170.7	101
VII-73	-7.12	-48.9	124	31
VIII-73	-5.4	-36.5	144	43
IX-73	-8.98	-61.6	57.1	57
X-73	-11.3	-84.2	99.2	34
XI-73	-12	-85.8	53.9	43
XII-73	-13.32	-93.4	80	37
I-74	-11.29	-79.5	45.3	78
II-74	-9.11	-66.4	58.2	17
III-74	-7.25	-48.1	93.4	10
IV-74	-5.83	-40.8	138	11
V-74	-7.57	-58.9	267.9	47
VI-74	-7.02	-53.5	379	85
VII-74	-6.3	-38	226	56
VIII-74			166	19
IX-74	-6.83	-50	83.3	14
X-74	-17.43	-129.5	82.8	111
XI-74	-13.75	-99.7	103	47
XII-74	-11.51	-86.2	76.4	94
I-75	-12.05	-91.7	80.2	33
II-75	-9.31	-68	215	4
III-75	-11.11	-76.4	159	48
IV-75	-9.12	-65.5	208	46
V-75	-5.65	-37.1	148	70
VI-75	-8.36	-57.3	174	154
VII-75	-7.71	-45.7	150	121
VIII-75	-7.49	-54.5	117.9	52
IX-75	-6.06	-42	256.1	13
X-75	-9.05	-58.9	77	51
XI-75	-13.07	-95.7	53.7	30

XII-75	-16.18	-122.5	41.3	37
I-76	-7.52	-52.4	120	99
II-76	-13.67	-98.6	82.4	21
III-76	-9.31	-76	193	9
IV-76	-8.5	-58.1	95.2	36
V-76	-8.86	-63.1	172	93
VI-76	-9.3	-69	105	55
VII-76	-6.58	-41.5	115	34
VIII-76	-8.98	-61	112	44
IX-76	-10.92	-74.6	71.9	79
X-76	-10.29	-68.2	44.5	49
XI-76	-13.37	-91.3	32.3	69
XII-76	-18.41	-139.9	32.8	35
I-77	-12.6	-83	38.6	59
II-77	-14.18	-103.2	34.3	60
III-77	-11.25	-81.9	63.5	60
IV-77	-10.14	-69.3	93.4	50
V-77	-4.92	-37.6	116	21
VI-77	-7.9	-53.8	147	41
VII-77	-6.37	-39.6	149	89
VIII-77	-7.81	-50.8	123	98
IX-77	-6.22	-41.5	107	44
X-77	-4.57	-19.7	70.5	13
XI-77	-9.32	-65.4	49.5	21
XII-77	-10.23	-65	42	25
I-78	-14.45	-93.8	53.6	26
II-78	-18.51	-130.7	99.2	30
III-78	-12.43	-90.7	84.6	39
IV-78	-9.5	-59.5	118	30
V-78	-9.69	-60.7	117	98
VI-78	-9.47	-62.4	155	46
VII-78	-8.69	-58.2	100	36
VIII-78	-7.09	-46	95.2	28
IX-78	-6.94	-42.6	47.1	44
X-78	-8.33	-43.4	47.9	21
XI-78	-18.75	-124.1	39.8	32
XII-78	-8.16	-53.8	50.7	20
I-79	-19.18	-140.6	41.8	40
II-79	-12.42	-87.5	34.8	55
III-79	-15.96	-117.2	65.9	112
IV-79	-14.76	-108	53.8	72
V-79			51.3	10
VI-79			76.5	159
VII-79	-5	-28.8	68.7	64
VIII-79	-7.93		56.8	35
IX-79	-9.53	-55.3	50.6	33
X-79	-8.61	-65.4	38.3	15
XI-79	-11.9	-87	31.6	107

XII-79	-10.01	-76.9	38.1	45
I-80	-14.02	-104.2	31	25
II-80	-12.26	-95.4	31.9	38
III-80	-11.45	-84.3	34.6	39
IV-80	-12.21	-89.9	44.2	125
V-80	-8.93	-66.7	74.8	18
VI-80	-6.56	-53.2	60.4	53
VII-80	-9.08	-68.9	60.3	73
VIII-80	-3.93	-30.3	50.3	40
IX-80	-7.98	-60.4	38.1	40
X-80			19.8	73
XI-80	-16.19	-114.4	24	75
XII-80	-15.07	-110	26.8	25
I-81	-12.69	-93.8	25.3	23
II-81	-9.6	-70.1	42.1	19
III-81	-8.41	-64	47.6	21
IV-81	-9.49	-72.8	63.5	21
V-81	-12.3	-93.2	73.8	43
VI-81	-7.13	-48	73.2	48
VII-81	-7.55	-48.6	61.5	83
VIII-81	-6.94	-51.4	50.8	38
IX-81	-8.81	-56.7	34.7	99
X-81	-9.76	-61.9	24.5	44
XI-81	-11.86	-78.4	24.2	57
XII-81	-18.16	-130	15.8	70
I-82	-15	-113		57
II-82	-15.36	-113.8	27.2	14
III-82	-10.68	-75.1	30.2	22
IV-82	-7.15	-45.6	32.8	18
V-82	-8.67	-61.7	37	62
VI-82	-7.13	-51.2	34.1	60
VII-82	-6.99	-45.6	48.3	72
VIII-82	-5.45	-39.8	42.7	20
IX-82	-7.71	-55.6	21.3	30
X-82	-7.75	-64	27.7	57
XI-82			16.8	8
XII-82	-12.83	-95.5	13.8	52
I-83	-11.23	-81.4	15.6	58
II-83	-16.44	-120.1	13	48
III-83	-9.22	-66.7	31.5	8
IV-83	-7.51	-64	25.6	67
V-83	-7.73	-53	32.3	69
VI-83	-7.75	-58.1	40.8	108
VII-83	-3.13	-29.6		6
VIII-83	-6.35	-47.5	38.6	29
IX-83	-7.34	-50.2		52
X-83	-7.53	-50.6	36.5	27
XI-83	-8.75	-70.7	21.5	18

XII-83	-13.27	-107.5	16	19
I-84	-12.39	-93	16.3	29
II-84	-13.88	-103.3	16.7	57
III-84	-13.84	-105.7	22.2	45
IV-84	-9.46	-68.7	28.6	52
V-84	-8.8	-66.5		56
VI-84	-6.88	-54.1		39
VII-84	-6.53	-45.9		72
VIII-84	-6.07	-41.8		45
IX-84	-8.02	-57.9		69
X-84	-10.43	-74.5	17.2	47
XI-84	-14.1	-105.8	12.8	36
XII-84	-17.68	-134.1	18.1	35
I-85	-16.31	-125.9	16.3	40
II-85	-11.47	-86	18.8	25
III-85	-15.1	-112.2	20.1	49
IV-85	-7.21	-57.8	19.1	16
V-85	-7.82	-55.2	27.4	73
VI-85	-7.58	-56.1	28.5	67
VII-85	-6.11	-43.5	27.7	39
VIII-85	-9.25	-63.9	21.3	130
IX-85	-6.01	-43.7	24.9	29
X-85	-5.36	-24.5	16.4	16
XI-85	-14.45	-101.6	14.8	107
XII-85	-12.11	-88.8	18.7	66
I-86	-13.37	-101.3	13.5	49
II-86	-18.19	-133.7	17.3	44
III-86	-8.44	-62.2	15.9	15
IV-86	-10.96	-84.5	23.9	14
V-86	-8.31	-62.6	25.3	52
VI-86	-10.44	-78.2	32.4	55
VII-86	-6.18	-43.2	28.8	35
VIII-86	-6.07	-39.6	24.4	142
IX-86	-7.22	-44	22.9	35
X-86	-9.17	-64.2	11	33
XI-86	-9.41	-68.3	19.2	47
XII-86	-14.75	-108.7	13.6	57
I-87	-18.18		10.3	82
II-87	-11.11		14.8	74
III-87	-14.92	-108.9	17.3	52
IV-87	-8.56	-65.5	21.1	15
V-87	-11.56	-86.5	23.6	106
VI-87	-10.84	-83	22.7	118
VII-87	-7.61	-52.6	28.6	80
VIII-87	-5.82	-38.5	25.5	44
IX-87	-7.52	-50.6	20.8	37
X-87	-5.79	-32.9	16.4	28
XI-87	-7.14	-50.4	15.9	31

XII-87	-11.87	-85.9	11.2	64
I-88	-13.49	-103.1	15.3	20
II-88	-17.46	-127.4	17.9	62
III-88	-13.16	-100.1	17.6	64
IV-88	-7.7	-50.4	21.7	27
V-88	-8.21	-62.2	31.3	42
VI-88	-6.86	-47.6	25	34
VII-88	-6.39	-46.4	23.9	56
VIII-88	-5.49	-39.1	21.2	64
IX-88	-11.08	-81.4	14.6	120
X-88	-6.64	-48.9	6.5	11
XI-88	-13.15	-96.5	11	50
XII-88	-11.69	-85.9	10.1	68
I-89	-13.91	-104.7	13	16
II-89	-8.91	-63	14.3	27
III-89	-5.74	-43.8	19.9	23
IV-89	-9.19	-62.3	24.3	88
V-89	-6.22	-41.6	23.9	89
VI-89	-8.69	-57.6	28.9	81
VII-89	-3.96	-27.6	31.5	50
VIII-89	-7.83	-52.3	34	144
IX-89	-8.37	-56.6	25.5	56
X-89	-7.44	-51.2	13	25
XI-89	-9.75	-64.4	10	24
XII-89	-9.11	-76.2		5
I-90				3
II-90	-13.17	-100.4	9.8	69
III-90	-7.1	-48.6	17.2	33
IV-90	-11.56	-81.1	17.3	88
V-90	-4.83	-30.7	25.9	43
VI-90	-6.37	-44	22.1	69
VII-90	-4.06	-29.7	25.4	53
VIII-90	-5.91	-46.8	20.3	15
IX-90	-7.95	-56.7	17.3	69
X-90	-9.81	-72	12.9	37
XI-90	-9.46	-65.7	9.7	52
XII-90	-13.93	-99	10.4	43
I-91	-8.98	-68.9	11.1	5
II-91	-17.53	-125.2	10.6	17
III-91	-11.41	-84.8	10.2	28
IV-91	-10.2	-90.9	17.9	28
V-91	-12.37	-90	17.5	179
VI-91	-6.24	-48	23.1	49
VII-91	-7.69	-54.4	23.8	80
VIII-91	-6.04	-38.7	29.3	59
IX-91	-4.55	-33.1	18.6	15
X-91	-7.36	-47	15.1	30
XI-91	-13.97	-101.2	7.2	75

XII-91	-13.04	-96.6	10.5	77
I-92	-9.87	-71.5	10.6	29
II-92	-12.17	-87.7	8.9	30
III-92	-11.91	-88	22.2	96
IV-92	-7.58	-55.5	17.4	34
V-92	-6.32	-43.5	17	17
VI-92	-8.46	-55.4	19.2	74
VII-92	-10.36	-75.9	28.6	48
VIII-92	-6.03	-43.4	14.1	19
IX-92	-9.59	-70.2	12	46
X-92	-9.49	-65.5	11.3	71
XI-92				82
XII-92	-15.46	-116.1	8.9	39
I-93	-11.62	-80.2	9	42
II-93	-19.54	-142.5	14.5	39
III-93	-12.81	-95.5	17.5	44
IV-93	-9.5	-72.2	17.1	19
V-93	-4.83	-32.8	24.7	22
VI-93	-6.87	-48	32.3	61
VII-93	-6.78	-50.5	18.1	81
VIII-93	-5.98	-37.7	15.1	111
IX-93	-5.95	-38.2	15.7	38
X-93	-9.14	-62	14	66
XI-93	-18.55	-127.2	16.7	45
XII-93	-12.82	-93.8	13.1	52
I-94	-11.44	-94	11.3	31
II-94	-8.94	-77.6	20.8	8
III-94	-8	-65.3	19.4	48
IV-94	-11.65	-82.3	13.5	100
V-94	-7.98	-60.2	18.5	59
VI-94	-7.97	-59.9	15	41
VII-94	-6.2	-38.2	24.7	76
VIII-94	-4.24	-27	18.7	79
IX-94	-5.9	-41.8	14	22
X-94	-14.17	-101.3	12.1	40
XI-94	-8.35	-55.8	10.1	67
XII-94	-11.88	-88.9	11.7	38
I-95	-13.99	-105.9	13	27
II-95	-12.25	-99	11.5	34
III-95	-12.37	-92.9	13.8	66
IV-95	-11.33	-85.9	15.59	79
V-95	-7.69	-58.2	20.21	58
VI-95	-8	-60.3	18.88	117
VII-95	-4.63	-33.8	22.26	24
VIII-95	-9.66	-69	19.19	75
IX-95	-9.32	-65.3	12.71	128
X-95	-5.1	-31	16.48	11
XI-95	-12.02	-86.1	13.16	74

XII-95	-20.74	-156.3	8.92	79
I-96	-18.7	-140.1	8.8	48
II-96	-12.54	-91.5	14.45	38
III-96	-13.87	-101	18.27	33
IV-96	-12.28	-91	15.79	111
V-96	-6.48	-45.7	15.85	84
VI-96	-6.39	-46.1	19.62	71
VII-96	-7.49	-61.9	15.59	26
VIII-96	-7.72	-56.5	17.94	67
IX-96	-10.19	-70.9	17.64	136
X-96	-8.84	-61.2	10.41	53
XI-96	-12.44	-97.2	8.27	21
XII-96	-17.6	-136	7.99	24
I-97	-12.46	-98.2	6.02	14
II-97	-6.9	-61.1	11.38	22
III-97	-7.84	-56.4	10.86	91
IV-97	-8.15	-60.3	17.53	63
V-97	-7.95	-62.3	14.3	71
VI-97	-7.45	-58.7	15.05	45
VII-97	-8.24	-61.8	20.4	245
VIII-97	-8.33	-64.4	20.41	33
IX-97	-3.93	-27.5	18.34	21
X-97	-5.41	-35.1	11.54	27
XI-97	-16.96	-125.3	13.61	72
XII-97	-12.93	-97.6	11.15	49
I-98	-13.48	-109.3	12.25	30
II-98	-2.69	-39	12.67	4
III-98	-9.99	-73.2	10.24	63
IV-98	-12.39	-97	15.59	30
V-98	-8.45	-64.2	17.63	43
VI-98	-8.66	-64.6	16.01	58
VII-98	-7.81	-54.7	18.91	136
VIII-98	-5.81	-43.3	19.49	39
IX-98	-10.16	-70.8	11.64	120
X-98	-8.01	-54.2	7.89	93
XI-98	-8.82	-58.6	9.66	34
XII-98	-11.19	-79.6	8.22	34
I-99	-13.88	-106.6		17
II-99	-12.94	-96.9	10.94	113
III-99	-13.42	-98.8	9.61	32
IV-99	-10.84	-81.7	13.47	48
V-99	-5.74	-34.35	13.64	91
VI-99	-7.89	-54.95	17.32	62
VII-99	-6.86	-47.75	17.13	81
VIII-99	-6.32	-43.95	12.9	73
IX-99	-6.3	-41.5	10.69	59
X-99	-6.97	-46.9	9.63	15
XI-99	-14.65	-106.7	10.55	52

XII-99	-17.57	-139.05	7.98	64
I-00	-12.85	-101.8	8.71	46
II-00	-10.59	-81.95	9.47	36
III-00	-8.94	-66.7	9.85	81
IV-00	-8.23	-60.85	10.6	12
V-00	-6.58	-45.05	14.67	51
VI-00	-5.5	-45.05	11.85	23
VII-00	-7.16	-52.25	11.62	66
VIII-00	-4.45	-26.15	12.11	53
IX-00	-7.96	-53.5	11.9	46
X-00	-8.29	-53.75	9.58	56
XI-00				33
XII-00	-12.98	-94.4	6.57	42
I-01	-12.99	-98.4	8.79	19
II-01	-12.62	-96.7	10.92	20
III-01	-9.29	-68.9	8.92	11
IV-01	-13.33	-105.3	9.51	31
V-01	-6.55	-48.6	12.68	29
VI-01	-8.4	-62.7	11.51	47
VII-01	-5.52	-36.3	11.18	78
VIII-01	-4.67	-33.4	11.94	44
IX-01	-8.46	-60.3	10.93	99
X-01	-5.96	-39	12.82	9
XI-01	-11.29	-79.6	9.08	56
XII-01	-13.24	-101.5	9.09	54
I-02	-7.81	-67.4	7.06	13
II-02	-6.78	-56	7.65	37
III-02	-10.18	-78.8	7.73	65
IV-02	-7.93	-57.3	14.44	57
V-02	-8.14	-55.7	11.88	47
VI-02	-4.5	-31.7	12.2	69
VII-02	-6.02	-45.6	14.3	52
VIII-02	-7.9	-55.7	13.49	210
IX-02	-9.49	-67.2	11.64	44
X-02	-10.95	-76.3	7.75	92
XI-02	-11.21	-81.9	6.07	67
XII-02	-12.75	-100.4	8.73	66
I-03	-10.65	-89.9	9.26	64
II-03				1
III-03	-2.05	-38.6		15
IV-03	-8.25	-56.9	12.07	27
V-03	-6.19	-40	12.55	112
VI-03	-4.23	-28.2	13.53	30
VII-03				36
VIII-03	-3.59	-27.1	13.85	20
IX-03	-7.49	-53.2	10.89	44
X-03	-14.82	-110.5	8.39	36
XI-03	-12.09	-85.6	7.2	25

XII-03	-11.97	-87.2	6.01	36
I-04	-14.68	-108.6	9.24	71
II-04	-10.05	-71.2	6.87	89
III-04	-13.01	-98.8	10.06	92
IV-04	-8.9	-67.4	10.4	22
V-04	-9.25	-66.6	16.09	55
VI-04	-7.91	-57.16	14.23	125
VII-04	-4.26	-24.3	17.79	47
VIII-04	-6.17	-46.3	17.4	25
IX-04	-6.92	-45	8.77	40
X-04	-8.87	-57	7.32	39
XI-04	-14.77	-109.9		48
XII-04	-11.84	-85.2	9.9	15
I-05	-12.56	-96.25		59
II-05	-19.34	-152.7		77
III-05	-11.64	-88.9	10.05	19
IV-05	-10.47	-78.4	8.6	29
V-05	-6.75	-46.35	11.38	49
VI-05	-7.11	-50.72	13.48	44
VII-05	-8.37	-58.91	13.37	64
VIII-05	-8.37	-56.97	12.64	105
IX-05	-7.92	-56.04	9.63	44
X-05	-5.29	-36.54	10.82	3
XI-05	-14	-94.59	8.44	25
XII-05	-16.93	-128.26	7.04	86
I-06	-16.23	-121.55	7.39	48
II-06	-14.65	-124.14	10.19	35
III-06	-13.57	-104.49	6.88	79
IV-06	-8.11	-58.74	12.18	72
V-06	-7.58	-58.98	9.31	76
VI-06	-8.03	-59.41	14.48	66
VII-06	-5.38	-38.17	15.01	38
VIII-06	-9.12	-67.25	13.69	212
IX-06	-6.96	-51.03	10.67	17
X-06				11
XI-06	-7.55	-52.75	8.76	32
XII-06	-9	-65.67	8.62	17
I-07	-5.98	-49.04	7.06	54
II-07	-13.8	-106.2	8.19	72
III-07	-13.78	-105.37	9.82	90
IV-07	-8.21	-71.81	8.48	1
V-07	-7.66	-56.68	9.31	89
VI-07	-5.2	-38.38	14.87	66
VII-07	-7.92	-60.15	9.93	55
VIII-07	-4.56	-30.76	10.13	60
IX-07	-9.03	-59.24	9.8	195
X-07	-12.84	-87.93	8.27	69
XI-07	-10.04	-70.41	7.04	55

XII-07	-13.29	-98.96	8.34	60
I-08	-6.22	-42.94	7.58	8
II-08	-7.34	-58.82	9.09	10
III-08	-8.26	-66.65	6.76	57
IV-08	-9.8	-71.28	10.73	61
V-08	-8.43	-58.82	12.37	57
VI-08	-4.21	-28.09	14.33	115
VII-08	-6.13	-41.36	12.1	96
VIII-08	-5.6	-36.65	8.53	43
IX-08	-11.96	-83.8	12.69	62
X-08	-7.73	-50.31	10.34	24
XI-08	-10.13	-72.07	6.93	60
XII-08	-14.67	-110.34		39
I-09	-13.99	-108.41	8.5	35
II-09	-12.74	-98.76	8.24	72
III-09	-12.81	-98.83	10.25	145
IV-09	-5.73	-44.56		5
V-09	-7.26	-49.73	12.73	85
VI-09	-6.41	-43.08	13.61	142
VII-09	-6.01	-39.56	13.42	149
VIII-09	-4.9	-31.84	14.69	85
IX-09	-5.42	-36.7	12.25	20
X-09	-9.78	-70.58	9.18	43
XI-09	-14.12	-103.96	7.82	77
XII-09	-9.52	-70.54	8.22	52
I-10	-12.81	-91.54	9.26	56
II-10	-15.92	-125.66	9.43	20
III-10	-13.28	-105.07	8.61	18
IV-10	-9.11	-69.55	14.24	91
V-10	-7.94	-58.78	16.75	169
VI-10	-7.82	-54.66	14.13	120
VII-10	-6.73	-43.86	14.82	88
VIII-10	-8.17	-60.47	14.19	123
IX-10	-9.14	-63.06	9.45	65
X-10	-9.15	-63.46	8.9	23
XI-10	-14.77	-106.29	6.47	36
XII-10	-18.91	-141.77	7.78	42
I-11	-12.02	-99.48	5.41	31.5
II-11	-6.36	-50.74	8.17	10
III-11	-10.55	-75.53	11.86	35.1
IV-11	-5.94	-42.98	12.51	43
V-11	-8.22	-55.62	16.01	
VI-11	-6.98	-48.09	13.77	113
VII-11	-7.93	-56.89	14.23	84
VIII-11	-5.61	-37.96	10.42	28
IX-11	-7.78	-51.19	8.73	21
X-11	-9.62	-68.51	8.06	73
XI-11				

XII-11	-10.62	-79.27	7.71	18
I-12	-10.94	-81.4	6.13	91
II-12	-11.8	-93.32	9.39	27
III-12	-6.98	-52.66	7.69	30
IV-12	-10.88	-81.9	13.5	26
V-12	-4.04	-30.76	14.22	38
VI-12	-6.24	-47.97	12.1	69
VII-12	-3.88	-29.45	12.71	130
VIII-12	-7.78	-58.19	9.63	41
IX-12	-11.93	-89.68	9.27	45
X-12	-11.94	-87.31	7.05	45
XI-12	-13.75	-104	5.05	21
XII-12	-13.63	-104.39	6.05	52
I-13	-11.95	-89.93		105
II-13	-16.66	-126.32		56
III-13	-16.69	-129.4		40
IV-13	-16.03	-126.83		14
V-13	-8.62	-61.29		130
VI-13	-8.77	-62.5		145
VII-13	-8.9	-63.61		11
VIII-13	-5.02	-35.45		60
IX-13	-13.74	-102.49		92
X-13	-7.86	-53.7		27
XI-13	-12.12	-90.52		42
XII-13	-8.27	-60.45		18
I-14				8
II-14	-14.55	-113.7		21
III-14	-12.81	-99.1		12
IV-14	-6.62	-45.6		66
V-14	-6.83	-49.9		189
VI-14	-10.75	-85.5		33
VII-14	-5.8	-39.1		91
VIII-14	-5.76	-33.4		110
IX-14	-10.15	-74		109
X-14	-7.53	-50.2		37
XI-14	-9.67	-64.9		34
XII-14	-11.01	-79.8		43

Avg Month Air Temperature

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1995	-13.99
1996	-18.7
1997	-12.46
1998	-13.48
1999	-13.88
Celkový součet	-95.57

suma P*180

vážený průměr 180

$$\bar{\delta X} = \frac{\sum_{i=1}^n P_i \cdot \delta_i}{\sum_{i=1}^n P_i}$$

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20.5
13.6
9.1
3.8

0.7
3.4
4.4
6.4
10.9
16.2
20.4
20.4
20.1
14.5
10.6
7.2
2.6
-1.5
1.2
5.7
14.3
16.3
18.2
21.4
21
17.2
9.8
6.8
1.4
-1.9
0.8
6
10.8
14.6
19.2
22.3
19.4
14.2
7.8
7.5
-2.3
1.2
0.7
6.7
13
16
19.8
19.2
21.1
17.7
10
3.4

3.8
2.6
-2.1
8.5
11
17
20.5
21.5
21.6
16.7
10.2
6.9
0.8
0.6
1.3
2.9
11.7
15
18.6
22.9
21.3
15.1
11
6.4
3.2
2.2
4.1
9.2
12.6
14.9
19.6
21.9
19
15.9
12.2
8.1
3.9

leden	
H2	Precipitation
-80.2	42
-94	31
-105.9	27
-140.1	48
-98.2	14
-109.3	30
-106.6	17
-734.3	209

suma P*H2 suma P

vážený průměr H2

únor		
O18	H2	Precipitation
-19.54	-142.5	39
-8.94	-77.6	8
-12.25	-99	34
-12.54	-91.5	38
-6.9	-61.1	22
-2.69	-39	4
-12.94	-96.9	113
-75.8	-607.6	258

suma P*180 suma P*H2 suma P

vážený průměr 180 vážený průměr H2

i

březen		
O18	H2	Precipitation
-12.81	-95.5	44
-8	-65.3	48
-12.37	-92.9	66
-13.87	-101	33
-7.84	-56.4	91
-9.99	-73.2	63
-13.42	-98.8	32
-78.3	-583.1	377

suma P*180 suma P*H2 suma P

vážený průměr 180 vážený průměr H2

duben	
O18	H2
-9.5	-72.2
-11.65	-82.3
-11.33	-85.9
-12.28	-91
-8.15	-60.3
-12.39	-97
-10.84	-81.7
-76.14	-570.4

suma P*180 suma P*H2

vážený průměr 180 vážený průměr H2

Precipitation
19
100
79
111
63
30
48
450

květen		
O18	H2	Precipitation
-4.83	-32.8	22
-7.98	-60.2	59
-7.69	-58.2	58
-6.48	-45.7	84
-7.95	-62.3	71
-8.45	-64.2	43
-5.74	-34.35	91
-49.12	-357.75	428

O18
-6.87
-7.97
-8
-6.39
-7.45
-8.66
-7.89
-53.23

suma P

suma P*180 suma P*H2 suma P

suma P*180

vážený průměr 180 vážený průměr H2

vážený průměr 180

červen	
H2	Precipitation
-48	61
-59.9	41
-60.3	117
-46.1	71
-58.7	45
-64.6	58
-54.95	62
-392.55	455

suma P*H2 suma P

vážený průměr H2

červenec		
O18	H2	Precipitation
-6.78	-50.5	81
-6.2	-38.2	76
-4.63	-33.8	24
-7.49	-61.9	26
-8.24	-61.8	245
-7.81	-54.7	136
-6.86	-47.75	81
-48.01	-348.65	669

suma P*180 suma P*H2 suma P

vážený průměr 180 vážený průměr H2

srpen		
O18	H2	Precipitation
-5.98	-37.7	111
-4.24	-27	79
-9.66	-69	75
-7.72	-56.5	67
-8.33	-64.4	33
-5.81	-43.3	39
-6.32	-43.95	73
-48.06	-341.85	477

suma P*180 suma P*H2 suma P

vážený průměr 180 vážený průměr H2

O18
-5.95
-5.9
-9.32
-10.19
-3.93
-10.16
-6.3
-51.75

suma P*180

vážený průměr 180

září	
H2	Precipitation
-38.2	38
-41.8	22
-65.3	128
-70.9	136
-27.5	21
-70.8	120
-41.5	59
-356	524

suma P*H2 suma P

vážený průměr H2

říjen		
O18	H2	Precipitation
-9.14	-62	66
-14.17	-101.3	40
-5.1	-31	11
-8.84	-61.2	53
-5.41	-35.1	27
-8.01	-54.2	93
-6.97	-46.9	15
-57.64	-391.7	305

suma P*180 suma P*H2 suma P

vážený průměr 180 vážený průměr H2

listopad		
O18	H2	Precipitation
-18.55	-127.2	45
-8.35	-55.8	67
-12.02	-86.1	74
-12.44	-97.2	21
-16.96	-125.3	72
-8.82	-58.6	34
-14.65	-106.7	52
-91.79	-656.9	365

suma P*180	suma P*H2	suma P
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vážený průměr 180 vážený průměr H2

O18
-12.82
-11.88
-20.74
-17.6
-12.93
-11.19
-17.57
-120.19

suma P*180

vážený průměr 180

prosinec	
H2	Precipitation
-93.8	52
-88.9	38
-156.3	79
-136	24
-97.6	49
-79.6	34
-139.05	64
-907.35	379

suma P*H2

suma P

vážený průměr H2

Date	d18O	d2H	Precipitation(mm/month)	Avg MonthAir Temperature
01-00				
02-00				
03-00				
04-00				
05-00				
06-00				
07-00				
08-00				
09-00				
10-00	-7.25	-42.95	8.2	19
11-00			71.1	16
12-00			23.1	12.5
01-01	-4.4	-22.2	56.1	11.6
02-01	-6.6	-40.1	45.2	11.5
03-01	-1.2	-2.7	7.5	16.4
04-01	-4.51	-26.49	58.3	13.3
05-01				21.4
06-01	-2.61	-26.7	0.7	26.3
07-01	-6.99	-47.4	13.1	27.5
08-01				30
09-01				25.6
10-01	-2.01	0.1	0.4	21.1
11-01	-7.25	-40.31	91.9	12.8
12-01	-8.2	-48.1	95.5	8.2
01-02	-6.5	-33.9	33.3	8.6
02-02	-3.6	-17.9	10.4	12.8
03-02	-5.7	-37.7	47.2	13.8
04-02	-5.6	-36.2	44.4	15.7
05-02	-2.3	-12.3	8.8	21.7
06-02	-2.34	-12.3		27.1
07-02	-6.5	-44.5	91.2	29.7
08-02	-8	-49.4	52.1	27.6
09-02	-5.4	-31.5	218	23.1
10-02	-5.3	-28.4	69	19.8
11-02	-6.41	-32.9	174.7	16.2
12-02	-6.94	-38	235.8	10.7
01-03	-5.98	-33.5	76.7	12.4
02-03	-10.21	-66.4	73.7	6
03-03	-7.29	-45.9	22.7	10.2
04-03	-5.97	-37.2	38.8	14.1
05-03	-4.72	-26.6	17.6	23.4
06-03				28.3
07-03				29.5
08-03	-4.54	-36.5	3.4	30
09-03	-3.57	-15.6	20.2	23.9
10-03	-4.69	-21.6	38.8	21
11-03	-4.09	-20.8	82.9	15.7
12-03	-10.25	-51.9	155.5	10.9
01-04	-9.79	-62.9	138.4	8.7

02-04	-6.83	-41.5	16.2	10.1
03-04	-1.31	-0.1	6.9	12.7
04-04	-2.83	-17.7	14	16
05-04	-6.13	-30.4	8.8	20.1
06-04			0.4	26.2
07-04				29.1
08-04				28.3
09-04				24.3
10-04	-4.37	-19.6	44.4	21.1
11-04	-5.64	-26.8	61.3	15.2
12-04	-7.53	-26.8	126	12.3
01-05		-39.6	68	10
02-05	-7.51	-40.7	45.6	8.8
03-05	-4.46	-18.4	22.8	12.8
04-05	-6.26	-45.5	3.7	15.9
05-05	-5.61	-37.72	27.3	21.6
06-05	-4.1	-33.97	4.7	25.7
07-05	-7.65	-49.78	26.2	29.2
08-05	-4.48	-31.06	5.9	29.1
09-05		-45.63	57.3	24.4
10-05	-4.15	-15.37	3.5	18.2
11-05	-6.7	-36.49	167.4	13.7
12-05	-3.96	-19.02	14	11.9
01-06	-7.05	-41.79	61.3	7.5
02-06	-4.78	-25.53	50.5	9.9
03-06	-8.72	-59.44	56.3	12.9
04-06	-3.95	-26.87	15.8	17.1
05-06				21.8
06-06	-3.79	-24.15	8	26.1
07-06	0.12	0.77	7	28.1
08-06				30.2
09-06	-7.82	-48.49	68.5	23.9
10-06	-8.15	-54.5	89	19.2
11-06	-7.26	-44.75	18.5	14
12-06	-7.66	-50.03	13.6	11
01-07			0.9	11.9
02-07	-7.96	-55.04	38.5	10.5
03-07	-6.1	-33.5	73.6	13.1
04-07	-1.8	-1.22	6.6	16.5
05-07	-6.72	-42.45	85.7	21.5
06-07	-2.3	-12.97	10.9	27.3
07-07				30.6
08-07				29.2
09-07				23.9
10-07	-5.05	-23.58	81.6	19.6
11-07	-4.87	-21.23	34.9	14.3
12-07	-5.87	-33.61	33.8	9.9
01-08	-7.13	-39.77	27.5	9.2
02-08	-3.87	-15.19	9.6	9.4
03-08	-3.63	-26.64	36.2	14.6

04-08	-8.85	-57.04	71.7	16.8
05-08	1.78	-1.86	1.9	21.3
06-08	-4.66	-33.66	6.8	27
07-08				29.1
08-08	-1.93	-14.13	2.5	29.4
09-08	-8.29	-48	41.8	23.8
10-08	-4.76	-25.78	30.3	19.3
11-08	-7.24	-40.02	33.4	16
12-08	-6.05	-30.04	63.2	11.7
01-09	-5.7	-33.71	80.3	11.3
02-09	-5.04	-21.85	44.6	9.7
03-09	-5.87	-29.91	90.4	12.2
04-09	-5.77	-39.43	32.4	16.2
05-09	3.01	21.48	3.5	21.9
06-09	3.05	21.59	0.7	26.4
07-09	-1.09	-7.06	1.9	29.3
08-09			0.3	28.1
09-09	-6.03	-38.89	80.1	22.8
10-09	-4.11	-19.08	73.6	19.5
11-09			46.1	15.5
12-09	-10.73	-70.34	111.9	13.6
01-10	-8.06	-49.65	27.9	10.5
02-10	-8.09	-55.21	50.4	12.3
03-10	-4.35	-21.64	9.6	13.6
04-10			0.2	17.4
05-10	-3.23	-15.6	9.1	22
06-10	-3.14	-25.27	12.2	25.7
07-10			0.3	29.2
08-10				30.4
09-10	-4.95	-24.43	37.7	24.5
10-10	-5.53	-31.84	89.5	18.4
11-10	-3.15	-16.6	24	17.9
12-10	-6.54	-34.3	25.5	13.1
01-11	-7.61	-44.1	83.5	10.2
02-11	-10.34	-68.9	94.6	10.4
03-11	-4.53	-21.2	27.2	11.5
04-11	-3.69	-18.32	49.5	14.9
05-11	-4.41	-24.97	45.6	19.9
06-11	-4.81	-30.13	31.5	25.1
07-11				29.4
08-11			0.4	28.5
09-11	1.02	5.82	3.8	26.2
10-11	-7.51	-38.21	42.1	17
11-11			1	11.6
12-11	-7.23	-40.18	88.9	11.6
01-12	-7.47	-46.41	29.6	7.3
02-12	-5.39	-25.02	94.9	8.8
03-12	-6.14	-36.58	11.9	12.6
04-12	-5.61	-35.98	32.2	17.3
05-12	-4.45	-27.8	15.3	21.5

06-12				28
07-12				31
08-12			0.4	30.1
09-12	-2.26	-8.71	8.3	25.5
10-12	-4.57	-27.37	7.7	22.1
11-12	-6.12	-33.3	91.5	16.5
12-12	-8	-51.52	125.1	11.1
01-13	-6.49	-36.61	80.5	10.6
02-13	-6.12	-35.73	190.1	11.7
03-13	-5.22	-32.76	12.3	13.8
04-13			2	17.8
05-13			5.6	22.9
06-13			9.4	25.5
07-13				28.3
08-13				28.7
09-13				24.6
10-13	-5.76	-39.94	22.8	19
11-13	-4.67	-24.7	120.8	15.9
12-13	-5.63	-34.46	61.8	10.3
01-14	-8.05	-50.2	112.8	12.3
02-14	-4.79	-24.8	21.6	12.3
03-14	-6.46	-40.3	53.6	13.4
04-14	-3.08	-15.5	32.2	16.3
05-14			5.2	20.6
06-14			19.6	25.4
07-14			25.6	27.8
08-14			2.4	28.7
09-14			12.6	24
10-14			35.6	18.9
11-14			35.6	14.9
12-14			159.4	12.7

Wulumuqui

Begin of Period	End of Period	Precipitation	Air Temperature	d18O	d2H
2/1/1986	2/28/1986	4	-11.6	-18.99	-129.6
3/1/1986	3/31/1986	27	-0.9	-18.82	-145.2
4/1/1986	4/30/1986	24	8.5	-10.47	-74.9
5/1/1986	5/31/1986	37	17.5	-6.97	-42.5
6/1/1986	6/30/1986	38	20	-6.42	-38
7/1/1986	7/31/1986	8	24.9	-5.71	-39.9
8/1/1986	8/31/1986	5	22.4	-0.89	-8.9
9/1/1986	9/30/1986	46	17.5	-12.81	-84.1
10/1/1986	10/31/1986	19	6.7	-10.98	-79.3
11/1/1986	11/30/1986	9	-3.8	-11.58	-86.5
12/1/1986	12/31/1986	30	-10.2	-24.3	-195.8
1/1/1987	1/31/1987	11	-11.4	-17.88	-146.4
2/1/1987	2/28/1987	17	-6.7	-16.94	-120.2
3/1/1987	3/31/1987	15	-3.2	-19.04	-133.9
4/1/1987	4/30/1987	59	9	-12.59	-84.2
5/1/1987	5/31/1987	27	16.3	-6.4	-33.4
6/1/1987	6/30/1987	67	18	-8.04	-53.6
7/1/1987	7/31/1987	58	24.5	-7.27	-51.2
8/1/1987	8/31/1987	2	23.6	-7.63	-52.3
9/1/1987	9/30/1987	29	16.4	-7.23	-44.9
10/1/1987	10/31/1987	47	1.2	-15.15	-92
12/1/1987	12/31/1987	15	-7.7	-12.35	-94.3
1/1/1988	1/31/1988	14	-12	-8.28	-60.6
5/1/1988	5/31/1988	77	13.1	-8.74	-54.6
6/1/1988	6/30/1988	55	21	-4.88	-30
7/1/1988	7/31/1988	37	23.5	-5.08	-35.2
8/1/1988	8/31/1988	60	21.3	-3.94	-29.5
9/1/1988	9/30/1988	39	18.1	-8.89	-49.9
10/1/1988	10/31/1988	27	7.2	-12.19	-83.5
11/1/1988	11/30/1988	10	-1.1	-11.89	-75.6
12/1/1988	12/31/1988	9	-6.2	-20.14	-142.3
1/1/1989	1/31/1989	12	-12.3	-24.59	-175.4
2/1/1989	2/28/1989	12	-11.9	-22.95	-173.3
3/1/1989	3/31/1989	7	-1.8	-16	-111.6
4/1/1989	4/30/1989	27	8.8	-11.6	-95.8
6/1/1989	6/30/1989	57	21.1	-6.5	-48.2
7/1/1989	7/31/1989	11	23.8	-3.47	-30.4
8/1/1989	8/31/1989	25	22	-6.13	-40.2
9/1/1989	9/30/1989	62	15.8	-7.89	-56.8
10/1/1989	10/31/1989	33	9.1	-13.82	-90
11/1/1989	11/30/1989	9	-3.1	-13.98	-94.6
12/1/1989	12/31/1989	8	-3.1	-26.1	-183.9
1/1/1990	1/31/1990	26	-12.5	-22.47	-152.5
2/1/1990	2/28/1990	8	-10	-24.67	-181.7
3/1/1990	3/31/1990	43	-0.3	-16.72	-125.7
4/1/1990	4/30/1990	46	9.3	-13.1	-92.9
5/1/1990	5/31/1990	9	17.2	-2.34	-13.3
6/1/1990	6/30/1990	21	23.6	-9.33	-62.8

7/1/1990	7/31/1990	54	23.1	-6.81	-37.8
8/1/1990	8/31/1990	4	22.6	-5.81	-48.5
10/1/1990	10/31/1990	16	9.6	-15.68	-100.4
11/1/1990	11/30/1990	43	-1.8	-16.31	-109.7
12/1/1990	12/31/1990	7	-7.2	-25.12	-177.9
1/1/1991	1/31/1991	5	-11.2	-27.97	-204.5
2/1/1991	2/28/1991	7	-10.3	-24.81	-177.7
3/1/1991	3/31/1991	18	-2.9	-18.61	-138.6
5/1/1991	5/31/1991	9	18.3	-10.95	-90.4
6/1/1991	6/30/1991	20	22.2	-9.04	-70.6
7/1/1991	7/31/1991	21	24.6	-4.57	-39.2
8/1/1991	8/31/1991	59	21.9	-4.99	-23.4
9/1/1991	9/30/1991	9	18.1	-5.13	-40.1
10/1/1991	10/31/1991	9	9.8	-13.14	-80
11/1/1991	11/30/1991	4	-0.9	-12.61	-86.7
12/1/1991	12/31/1991	16	-8.5	-19.61	-119.6
1/1/1992	1/31/1992			-20.78	-125.9
2/1/1992	2/29/1992			-13.5	-97.8
3/1/1992	3/31/1992			-18.02	-112
4/1/1992	4/30/1992			-13.06	-83
5/1/1992	5/31/1992			-11.07	-72.1
6/1/1992	6/30/1992			-5.65	-46.8
7/1/1992	7/31/1992			-8.98	-67.7
8/1/1992	8/31/1992			-4.24	-30.8
12/1/1995	12/31/1995	11	-9.8	-27.06	-191
1/1/1996	1/31/1996	14	-15.8	-23.08	-184.9
2/1/1996	2/29/1996	2	-10.9	-21.69	-164.9
3/1/1996	3/31/1996	14	-1.6	-15.29	-131.8
4/1/1996	4/30/1996	89	8	-11.8	-75.2
5/1/1996	5/31/1996	52	17.4	-8.35	-53.9
6/1/1996	6/30/1996	11	24	-4.32	-25.3
7/1/1996	7/31/1996	85	26.8	-8.1	-54.3
8/1/1996	8/31/1996	37	25.2	-3.93	-25.3
9/1/1996	9/30/1996	19	18.1	-9	-60.1
10/1/1996	10/31/1996	33	7.3	-13.56	-87.6
12/1/1996	12/31/1996	9	-9.6	-17.12	-120.8
1/1/1997	1/31/1997	9	-11.9	-20.19	-145.3
2/1/1997	2/28/1997	3	-9.7	-14.94	-113.6
3/1/1997	3/31/1997	13	3.4	-7.63	-36.4
5/1/1997	5/31/1997	45	22.8	-11.76	-73.8
6/1/1997	6/30/1997	11	28.2	-8.23	-62.2
7/1/1997	7/31/1997	20	29.8	-1.56	-25.3
8/1/1997	8/31/1997	21	26.9	-8.91	-69.1
11/1/1997	11/30/1997	27	-6.1	-17.26	-132.7
12/1/1997	12/31/1997	7	-13.8	-19.76	-147.6
1/1/1998	1/31/1998	6	-15.7	-22.52	-153.7
2/1/1998	2/28/1998	10	-6.6	-20.82	-146.4
3/1/1998	3/31/1998	18	-0.8	-14.61	-110.1
4/1/1998	4/30/1998	56	11.3	-10.01	-77.1
5/1/1998	5/31/1998	126	15.1	-14.07	-121.5

7/1/1998	7/31/1998	74	23.5	-6.1	-21
8/1/1998	8/31/1998	56	23.6	-7.3	-27

Zhangye

Begin of Period	End of Period	Precipitati	Air Temper	d18O	d2H
7/1/1986	7/31/1986	29	22.2	-5.71	-45.8
8/1/1986	8/31/1986	32	19.8	-4.67	-26.3
9/1/1986	9/30/1986	1	13.3	-1.28	-15.9
10/1/1986	10/31/1986	21	6.3	-12.14	-97
4/1/1987	4/30/1987	27	10.9	-14.49	-90.5
5/1/1987	5/31/1987	8	14.7	-7.97	-55.6
6/1/1987	6/30/1987	61	18.4	-5.21	-23.9
7/1/1987	7/31/1987	22	21.8	-2.96	-16.1
8/1/1987	8/31/1987	14	19.5	-4.18	-36.3
10/1/1987	10/31/1987	2	6.2	-11.28	-74.9
12/1/1987	12/31/1987	3	-5.5	-14.47	-91.1
1/1/1988	1/31/1988	3	-8.6	-17.67	-122.3
2/1/1988	2/29/1988	7	-6.9	-19.54	-133.2
3/1/1988	3/31/1988	8		-14.35	-96
4/1/1988	4/30/1988	3	9.9	-7.78	-47.1
5/1/1988	5/31/1988	21	14.8	-8.14	-47.7
6/1/1988	6/30/1988	53	18.9	-4.08	-25.8
7/1/1988	7/31/1988	4	21.8	0.07	-4.3
8/1/1988	8/31/1988	35	20.4	-6.47	-37.8
11/1/1988	11/30/1988	9		-9.64	-67.6
12/1/1988	12/31/1988	2	-5.6	-19.93	-138.4
1/1/1989	1/31/1989	6	-11.5	-20.61	-149.8
4/1/1989	4/30/1989	9	10.3	-5.09	-48.4
6/1/1989	6/30/1989	11	19.6	-3.03	-34.7
7/1/1989	7/31/1989	42	20.8	-3.72	-21.3
8/1/1989	8/31/1989	13	20.6	-6.92	-42.9
9/1/1989	9/30/1989	20	14.7	-5.83	-39.3
12/1/1989	12/31/1989	1	-4.6	-23.44	-191.4
1/1/1990	1/31/1990	2	-6.9	-23.34	-164.8
2/1/1990	2/28/1990	1	-4.5	-9.47	-63.3
3/1/1990	3/31/1990	9	3.8	-7.65	-58
5/1/1990	5/31/1990	9	15.7	-6.03	-30.5
6/1/1990	6/30/1990	10	20	-3.83	-28.3
7/1/1990	7/31/1990	60	21.1	-2.95	-15.7
8/1/1990	8/31/1990	20	20.1	-1.57	-5.9
9/1/1990	9/30/1990	14	14.9	-3.97	-14.2
10/1/1990	10/31/1990	12	7.6	-9.35	-58.8
11/1/1990	11/30/1990	1	0.5	-17.62	-122.6
3/1/1991	3/31/1991	4	2.9	-24.74	-174.6
4/1/1991	4/30/1991	5	9.6	-6.71	-45.3
5/1/1991	5/31/1991	9	15.4	-3.64	-26.9
6/1/1991	6/30/1991	21	20.5	-4.18	-42.3
7/1/1991	7/31/1991	7	23.2	-1.58	-14.8
8/1/1991	8/31/1991	25	19.9	-9.2	-67.6
10/1/1991	10/31/1991	10	6.4	-4.49	-29.7
1/1/1992	1/31/1992			-16.94	-134.9
2/1/1992	2/29/1992			-22.18	-166.8
3/1/1992	3/31/1992			-16.28	-143.2

4/1/1992	4/30/1992			-9.51	-66.4
5/1/1992	5/31/1992			-4.84	-28.8
6/1/1992	6/30/1992			-4.57	-26.2
7/1/1992	7/31/1992			-1.85	-5.9
11/1/1995	11/30/1995	1	-0.4	-15.71	-106.2
12/1/1995	12/31/1995	1	-8.4	-18.5	-131.5
1/1/1996	1/31/1996	1	-9.5	-17.03	-145.9
2/1/1996	2/29/1996	1	-5.7	-13.24	-123.2
3/1/1996	3/31/1996	2	2	-16.89	-129.8
4/1/1996	4/30/1996	7	9.8	-18.21	-137.3
6/1/1996	6/30/1996	18	26.5	-8.68	-56.9
7/1/1996	7/31/1996	53	28.4	-7.42	-50.8
8/1/1996	8/31/1996	46	23.7	-2.16	-9.3
11/1/1996	11/30/1996	1	-0.3	-16.31	-110.7
12/1/1996	12/31/1996	1	-7.7	-20.85	-146
6/1/2001	6/30/2001	1.2	22	0.03	-25.1
7/1/2001	7/31/2001	22.2	23.5	0.87	-17.8
8/1/2001	8/31/2001	19.6	21.6	-2.32	-28.3
9/1/2001	9/30/2001	51.5	15.3	-4.51	-37.8
10/1/2001	10/31/2001	10.8	8	-7.24	-58
12/1/2001	12/31/2001	3.2	-9.6	-4.36	-37.7
4/1/2002	4/30/2002	3.8	9.6	-8.99	-68
5/1/2002	5/31/2002	36.1	15.7	-6.34	-74
6/1/2002	6/30/2002	19.4	21.2	-0.75	-23.6
8/1/2002	8/31/2002	21.1	22.2	-4.92	-29
9/1/2002	9/30/2002	11	14	-4	-37.2
12/1/2002	12/31/2002	4.3	-9.3	-28.5	-149
1/1/2003	1/31/2003	1.5	-8.8	-12.6	-77
2/1/2003	2/28/2003	3.4	-3.1	-17.4	-106
3/1/2003	3/31/2003	2.2	3.2	-8.8	-70
4/1/2003	4/30/2003	8.3	9.7	-12.1	-80
5/1/2003	5/31/2003	4.6	16.3	-7.4	-53
6/1/2003	6/30/2003	11.9	21.4	-0.6	-24
7/1/2003	7/31/2003	16.1	22.2	0.7	-8
8/1/2003	8/31/2003	27.4	20.8	-1.8	-29
9/1/2003	9/30/2003	33.8	15.6	-5.6	-38
10/1/2003	10/31/2003	9.7	7.3	-9.1	-57
11/1/2003	11/30/2003	8.8	-0.2	-18.4	-140

Ulaanbaatar

Begin of Period	End of Period	Precipitation	Air Temperature	d18O	d2H
6/1/1990	6/30/1990	58		-9.17	-76.1
1/1/1991	1/31/1991	1	-23.1	-7.36	-57
6/1/1991	6/30/1991	22	15.4	-9.03	-76.1
7/1/1991	7/31/1991	60	16.5	-10.07	-81.4
8/1/1991	8/31/1991	38	18.1	-1.64	-22.4
12/1/1991	12/31/1991	1	-19.1	-22.29	-187.6
4/1/1992	4/30/1992	8	4.6	-16.3	-124.4
6/1/1994	6/30/1994	55	16.8	-7.25	-61.4
8/1/1994	8/31/1994	163	15.2	-9.29	-70
6/1/1996	6/30/1996	28	12.9	-3.62	-16.6
7/1/1996	7/31/1996	84	17.8	-11.52	-88.5
8/1/1996	8/31/1996	62	16.1	-9	-58.6
6/1/1997	6/30/1997	33	16.6	-9.04	-76.9
7/1/1997	7/31/1997	114	18.3	-6.94	-61.95
8/1/1997	8/31/1997	34	16.1	-11.24	-79.3
10/1/1997	10/31/1997	2	-3.8	-11.93	-90.2
7/1/1998	7/31/1998	55	19.4	-11.83	-86.1
8/1/1998	8/31/1998	66	15.9	-13.4	-101.5
9/1/1998	9/30/1998	49	10.8	-9.02	-61
10/1/1998	10/31/1998	19	1.6	-12.62	-80.9
11/1/1998	11/30/1998	11	-11.4	-21.2	-158.4
2/1/1999	2/28/1999	3	-14.5	-27.44	-216.5
3/1/1999	3/31/1999	8	-13	-25.97	-199.85
4/1/1999	4/30/1999	9	3.1	-11.1	-86.45
5/1/1999	5/31/1999	15	11.8	-12.2	-84.85
6/1/1999	6/30/1999	79	15.9	-8.74	-58.5
7/1/1999	7/31/1999	36	16.3	-10.35	-79.75
8/1/1999	8/31/1999	48	16.5	-8.59	-59.65
9/1/1999	9/30/1999	61	8.8	-9.76	-64.15
10/1/1999	10/31/1999	7	-0.5	-16.32	-119.45
11/1/1999	11/30/1999	3	-8.8	-24.06	-177.6
12/1/1999	12/31/1999	2	-17.8	-23.75	-186.8
2/1/2000	2/29/2000	3	-17.9	-30.14	-234.6
3/1/2000	3/31/2000	4	-5.4	-15.8	-125.1
7/1/2000	7/31/2000	60	19.1	-8.53	-61.35
8/1/2000	8/31/2000	138	17.1	-10.36	-73.55
10/1/2000	10/31/2000	8	-2.8	-17.78	-132.95
11/1/2000	11/30/2000	12	-17.5	-28.86	-221
12/1/2000	12/31/2000	5	-21.8	-30.48	-236.5
1/1/2001	1/31/2001	6	-31.9	-13.46	-154.2
2/1/2001	2/28/2001		-29.8	-27.04	-214.8
3/1/2001	3/31/2001	6	-14.1	-26.94	-209

PV Shinejinst

pramen na zlomu pod dunama
 pramen v karbonském kaňonu
 vrt
 vrt
 vrt
 vrt
 vrt
 vrt
 vrt
 vrt
 vrt
 vrt
 pramen na jihozápadě až dole
 vrt
 vrt
 vrt
 vrt
 vrt
 vrt
 vrt
 vrt
 vrt
 pramen u GC10
 pramen
 pramen

	d18O	d2H
039V	-5.36	-58.50
023V	-5.03	-68.98
001G	-8.96	-85.85
GC-01	-7.38	-77.60
GC-02	-9.96	-89.02
GC-03	-12.42	-97.74
GC-07	-11.76	-96.14
GC-08	-6.96	-76.56
GC-09	-8.32	-80.17
GC-10	-10.67	-90.65
GC-11	-11.26	-94.03
GC-12	-6.99	-78.60
012-G	-9.91	-78.27
GC-13	-8.30	-81.71
GC-15	-10.57	-90.11
GC-16	-12.59	-100.97
GC-17	-10.94	-89.57
GC-18	-8.57	-80.74
GC-19	-7.16	-80.42
GC-21	-6.33	-75.99
GC-22	-8.44	-69.11
GC-23	-11.50	-94.07
026G	-7.89	-76.43
036V	0.29	-49.04
082V	-10.36	-89.77

GMWL		Vienna		Athens		Wulumuqui		Mong
d180	d2H	d180	d2H	d180	d2H	d180	d2H	

olsko

PV Shinejinst
d180 d2H

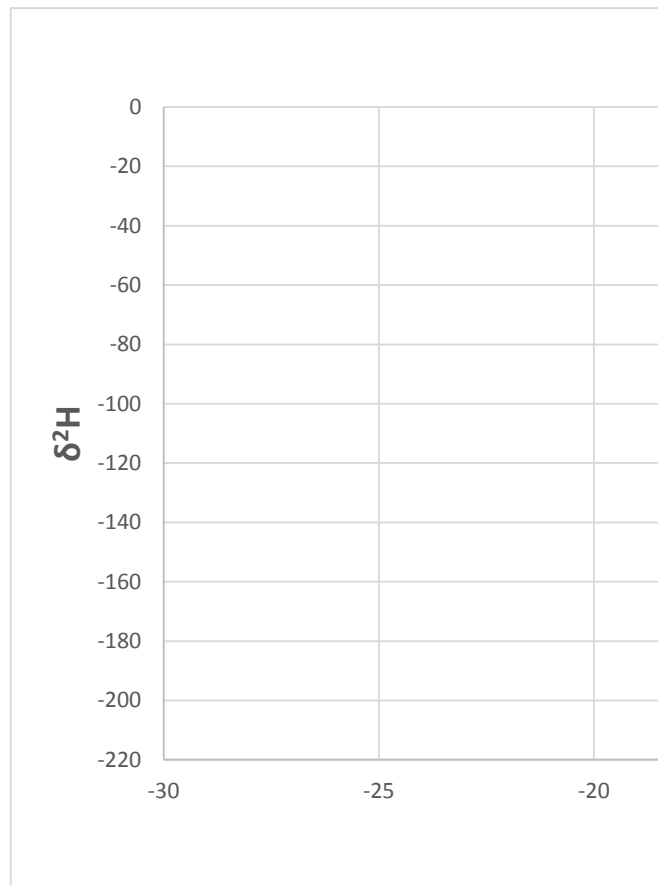
1) výpočet GMWL: $\delta^2H = 8 \cdot \delta^{18}O + 10$

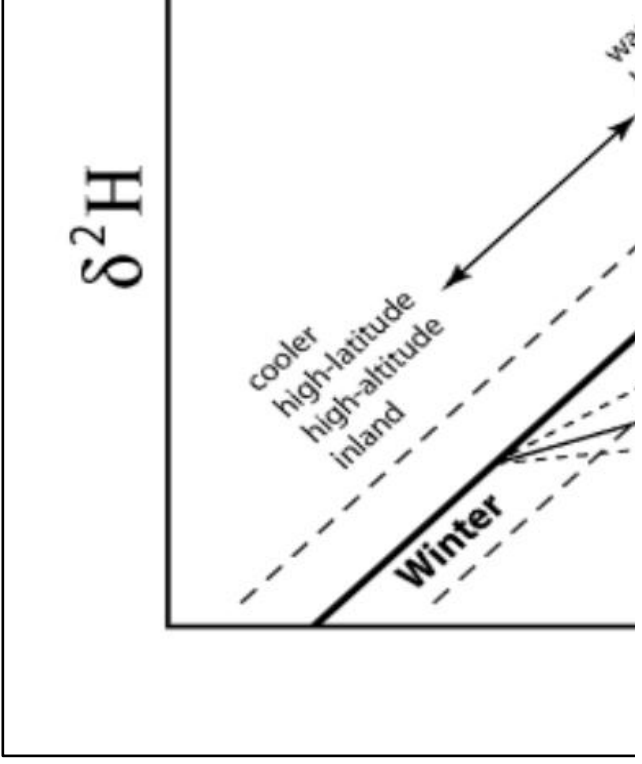
4) výpočet D-excess: $d = \delta^2H - 8 \cdot \delta^{18}O$

6) Výpočet měsíční hodnoty d18O a d2H ze srážek na zákl

$$\bar{\delta X} = \frac{\sum_{i=1}^n P_i \cdot \delta_i}{\sum_{i=1}^n P_i}$$

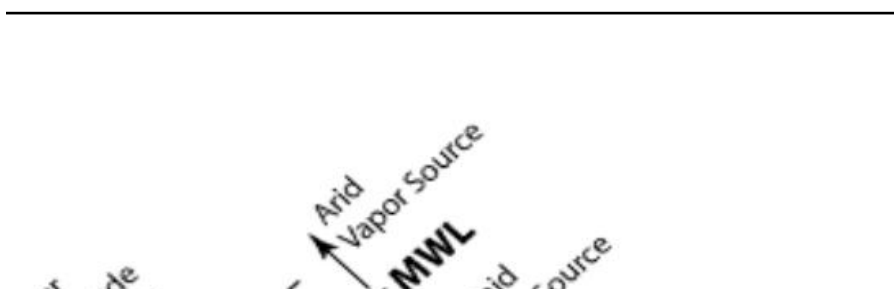
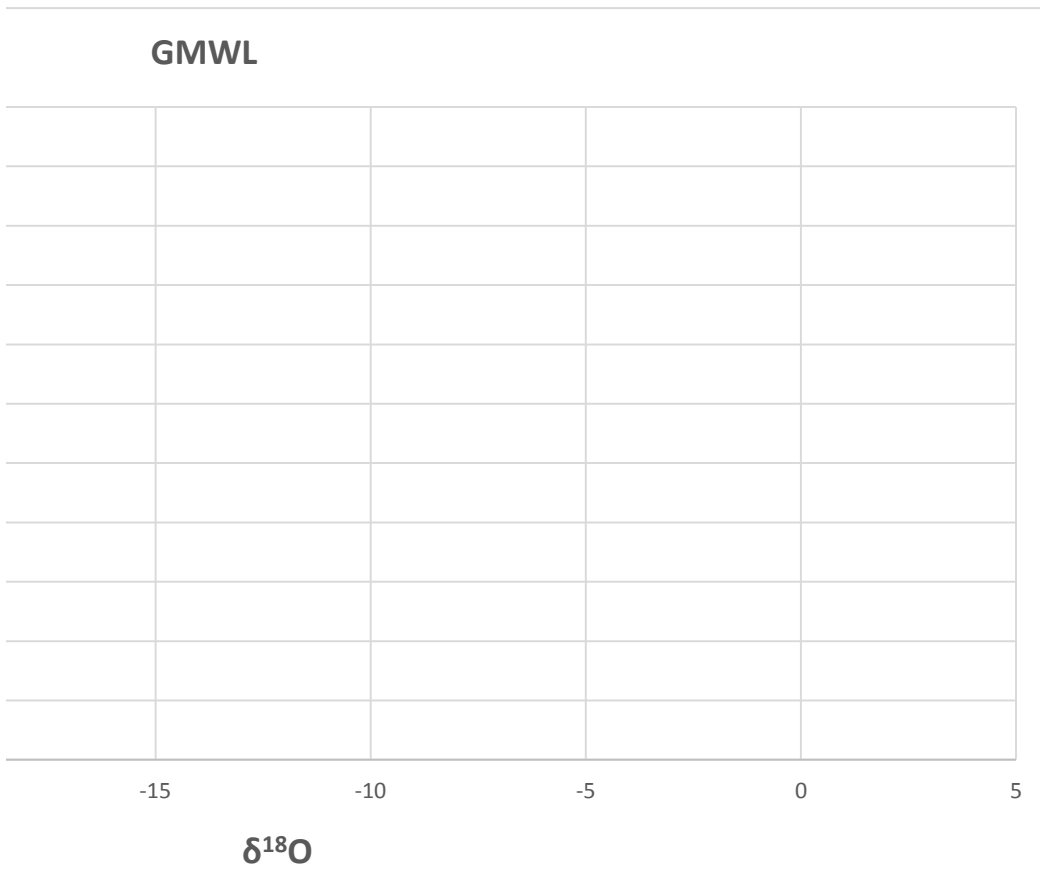
where P_i and δ_i are the monthly precipitation amount (i

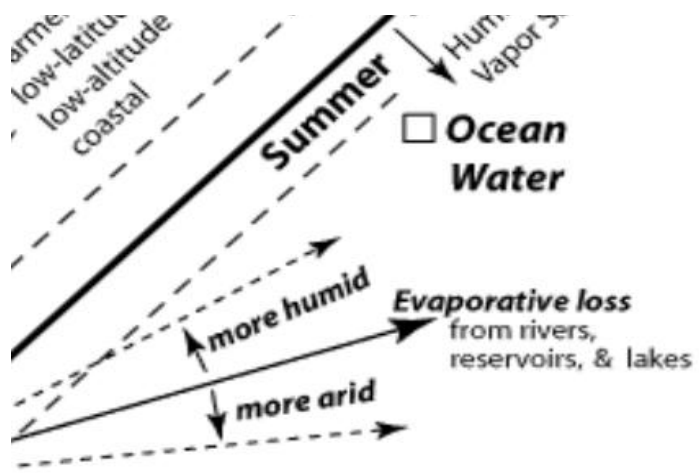




ladě vážených průměrů dle vzorce:

mm) and the isotopic composition (‰), respectively, and n is the number of months





$\delta^{18}\text{O}$
