



Aral Sea Basin Transboundary Water Early Warning Bulletin

July - August 2021



UNRCCA



A need for production and periodic and timely issue of the Bulletin as an information product for timely collection and dissemination of information on water-related, environmental, and climatic situation in the Aral Sea basin with the purpose to prevent problems or disputes arising was addressed during a seminar on “Early Warning on Potential Transboundary Water Problem Situations in Central Asia”, which was held in the city of Almaty on 26th of September 2011. The states in the Aral Sea basin have expressed their support for such initiative in discussions with the UN Regional Centre for Preventive Diplomacy for Central Asia. The Central Asian states have repeatedly shown their interest in enhancing the regional capacities for early warning and preparedness to potential hazards. Moreover, this was reflected in the Aral Sea Basin Programs (ASBP-3 and ASBP-4).

The Bulletin is a resource, which provides all the Central Asian states and their international partners with improved capacity to monitor regularly the status of transboundary rivers and warn early of potential issues that require attention.

Four early warning bulletins are to be issued as part of the Project in 2021. The format and content of the bulletins have been agreed with the client and with all organizations that provided source information. The fourth bulletin contains the actual information on the Syr Darya and Amu Darya basins for July 2021 and the forecast for August.

Information sources include:

- BWO Amu Darya and BWO Syr Darya – data on water resources, their distribution in time (day) and by river reach, operation regimes of reservoirs, inflow (planned versus actual) to the Aral Sea,
- CDC “Energy” – data on operation regimes of hydroelectric power stations (HEPS), electricity generation (planned, actual),
- Aral-Syrdarya BWA – data on lower reaches of the Syr Darya River (components of the water balance from the tail-water of the Shardara reservoir to the Northern Aral Sea),
- Open Internet sources - climatic information.

Digest of CA news for July

Source: <http://cawater-info.net/news/index.htm>



Tajikistan will provide Kazakhstan with additional water, dknews.kz



Kazakhstan leads in attracting financing in WEC in Central Asia, eenergy.media



KazMunaiGas and Eni agree on alternative energy cooperation, trend.az



Mudflow triggered by high temperature and glacier melting blocks Surkhob River in eastern Tajikistan, asiaplus.tj.info



Turkmenistan took part in an online meeting on CA wetlands, turkmenportal.com



Power stations to be built in Khorezm and Surkhandarya provinces, norma.uz



Green Uzbekistan: Huawei contributes to sustainable development and environmental protection, gazeta.uz



Uzbekistan offers Kyrgyzstan to rejoin efforts for saving the Aral Sea, uz.sputniknews.ru



Central Asian countries discuss in Dushanbe the issues of climate change, khovar.tj



Another one reservoir became shallow due to drought in Turkmenistan, hronikatm.com



Production of geomembranes to be launched for the water sector in Turkmenistan, orient.tm

ОБЗОРЫ РЕЗУЛЬТАТИВНОСТИ
ЭКОЛОГИЧЕСКОЙ ДЕЯТЕЛЬНОСТИ

УЗБЕКИСТАН
Третий обзор

Environmental Performance Review of the Republic of Uzbekistan officially launched in Tashkent on the 15th of July, aral.uz



Uzbek scientists study transport of dust, salt and sand from the dried bed of the Aral Sea, centralasia.media



Joint statement upon completion of the Consultative meeting of the Heads of Central Asian States, inform.kz



Kyrgyzstan may lose \$50 million of investments — Digital CASA Project at risk of failure, stanradar.com



EBRD will allocate more than 81 million Euros to Uzbekistan for energy development, centralasia.media

Amu Darya River Basin

Actual Situation in July and Forecast for August

In July, the available usable river water resources estimated as natural, non-regulated river flow plus lateral inflow into the river and minus losses amounted to 9,574 million m³. The regulated flow of the Amu Darya at the Atamyrat (Kerki) section was 5,660 million m³ (92% of expected flow). In August, the available usable river water resources are expected to be 8,312 million m³, i.e. will decrease by 13% as compared to July.

Inflow to the Nurek reservoir from the Vakhsh River was 3,781 million m³ in July (108% of the forecast). Water releases from the reservoir amounted to 2,311 million m³ (by 11% higher than planned). In July, the reservoir was filled with water by 1,109 million m³ and reached the volume of 10,193 million m³ by the end of month (2% more than planned). Water losses in the reservoir estimated as water balance discrepancy were zero, and unrecorded inflow to the reservoir was detected in the amount of 195 million m³ (2% of water volume in the reservoir). It is expected that in August 3,180 million m³ of water will flow into the Nurek reservoir. The water volume will reach 10,491 million m³, while water releases from the reservoir will increase to 2,881 million m³.

Inflow to Tuyamuyun waterworks facility (TMWF) was 3,695 million m³ in July (96% of the forecast volume). Water releases from TMWF into the Amu Darya River amounted to 1,875 million m³ (101%), while water diversion from the reservoir into canals was 576 million m³ (84% of planned one).

In July, the water volume in the reservoirs of TMWF decreased from 2,549 million m³ at the beginning of month to 2,411 million m³ at the end of month (less than 60% of the expected accumulation). Reservoir water balance discrepancy is estimated at 1,290 million m³; this is about 35% of inflow to the waterworks facility. The discrepancy is negative and indicates to substantial water losses and, probably, to overestimated forecast of inflow to the facility.

In August, inflow to TMWF will not change much – 3,695 million m³. TMWF reservoirs will accumulate water and their volume will be 3,541 million m³ by the end of month. Water will be accumulated through the reduction of water releases from TMWF, the latter being planned in the amount of 1,741 million m³.

Nurek HEPS generated 1,056 million kWh of electricity in July. The discharge through turbines was 780 m³/s, while the average head was 230 m. Sterile spills at HEPS were observed in the amount of 646 m³/s on average in the last four days of July. Losses through sterile spills amounted to 134 million kWh. In July, TMWF HEPS generated only 11 million kWh.

In July, water along the Amu Darya River was distributed unevenly: in the middle reaches at Kelif g/s (section upstream of intake to Garagumdarya) – Birata g/s (inflow to TMWF) there was no water shortage (7% of overwithdrawal of water was observed compared to water withdrawal limit), and in the lower reaches at Tuyamuyun g/s – Samanbay g/s the water shortage was 185 million m³ (13% of the limit).

In July, open-channel balance in the reaches showed negative discrepancies that can be attributed to water losses: 983 million m³ (12% of river flow at Kelif g/s) in the middle reaches and 537 million m³ (28% of Amu Darya river flow downstream of TMWF - Tuyamuyun g/s) in the lower reaches.

In July, flow of the Amu Darya River changed as follows by key gauging station: Kelif g/s – 7,651 million m³ (93% of the forecast), Birata g/s (inflow to TMWF) – 3,695 million m³ (96% of the forecast), Tuyamuyun g/s (downstream of TMWF) – 1,875 million m³ (101%), and Samanbay g/s - 55 million m³ (95% of planned supply).

In August, water withdrawal will be decreased to 2,856 million m³ in the first reach and will be 1,313 million m³ in the second reach. As expected, flow along the Amu Darya River will be transformed as follows: Kelif g/s – 7,204 million m³, Birata g/s – 3,602 million m³, Tuyamuyun g/s – 1,741 million m³, and Samanbay g/s - 80 million m³.

In July, inflow to the Large Aral Sea from the Amu Darya River and collecting drains (collectors) amounted to 103 million m³ and no water was discharged from the Northern Aral Sea. The water level in the eastern part of the Large Aral Sea averaged 26.2 m, the water surface area was 0.8 thousand km², and the water volume was 0.82 km³. In the western part, the water level averaged 22.4 m, the water surface area was 2.4 thousand km², and the water volume was 34.7 km³.

It is expected that the inflow to the Large Aral Sea will decrease and will be 87 million m³ in August. By the end of August, due to the decrease in inflow, the water level will decrease 26.1 m, the water surface area will shrink to 0.6 thousand km², and the water volume – to 0.7 km³ in the eastern part of the Large Aral Sea. In the western part of the Large Aral Sea the water level will be 22.4 m, the water surface area - 2.4 thousand km², and the water volume - 34.5 km³.

The sections below show daily and ten-day data on climate and water management (reservoirs, HEPS, water distribution).

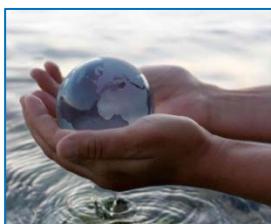
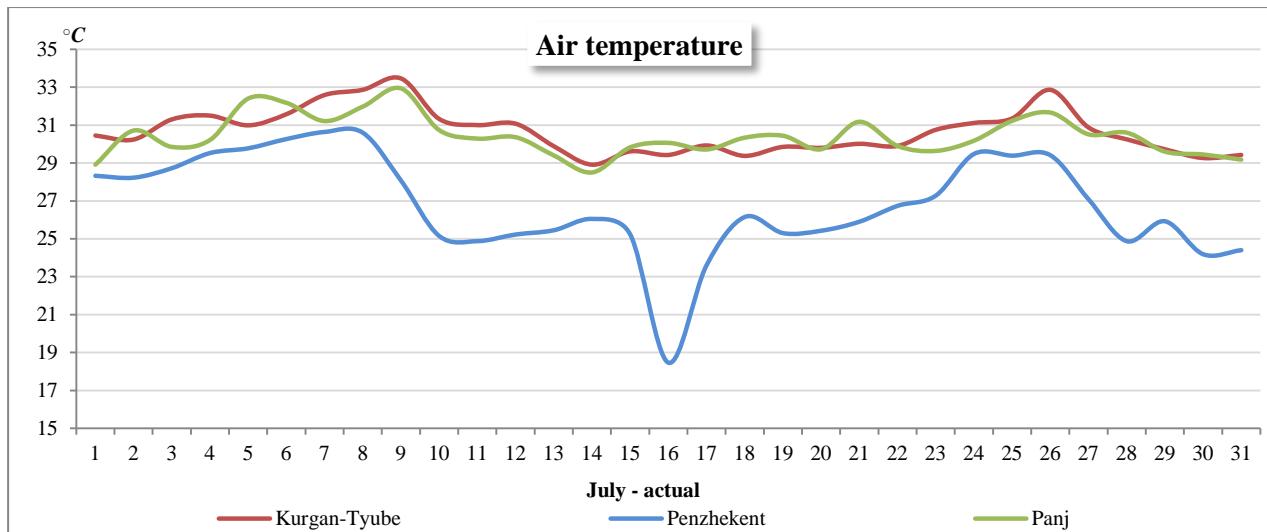


Climate

Weather station Riverhead	Location		
	Latitude	Longitude	Altitude above sea level, m
Kurgan-Tyube	37.82	68.78	429
Penzhikent	39.48	67.63	1015
Panj	37.23	69.08	363

Air temperature (T)

Station	Parameter	July			August			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Panj	$T, {}^{\circ}\text{C}$	Forecast	29.0	30.0	32.0	31.0	31.0	30.0
		Actual	31.0	30.0	30.3			
Kurgan-Tyube	$T, {}^{\circ}\text{C}$	Forecast	30.0	31.0	31.0	30.0	30.0	29.0
		Actual	32.0	30.0	30.5			
Penzhikent	$T, {}^{\circ}\text{C}$	Forecast	27.0	27.0	29.0	28.0	28.0	27.0
		Actual	28.9	24.6	26.8			

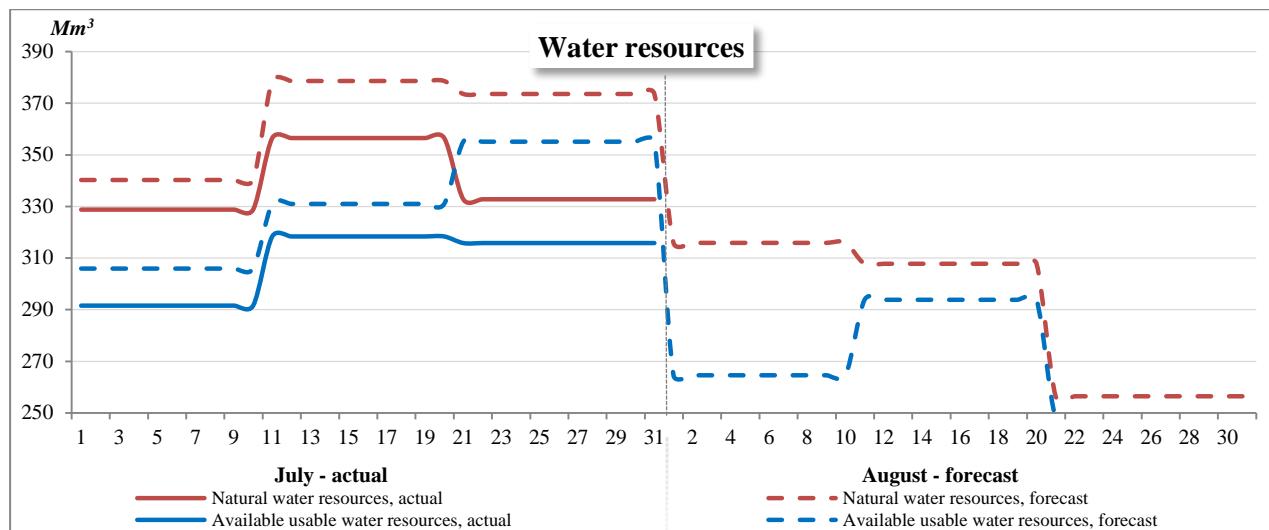


Water resources

Object
Amu Darya
Nurek reservoir
Atamyrat gauging station

Water volume (W)

Object	Parameter	July			August			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
River runoff: Atamyrat g/s	W, Mm^3	Forecast	1728.0	2160.0	2281.0	1857.6	1814.4	1615.7
		Actual	1696	1986	1978			
Water withdrawal: upstream of Atamyrat g/s	W, Mm^3	Forecast	1191	1194	1320	1189	1125	1158
		Actual	1095	1100	1189			
Nurek reservoir /filling (+) or draw down (-)	W, Mm^3	Forecast	484	432	508	112	138	48
		Actual	496.54	478.66	494			
Natural water resources at Atamyrat g/s	W, Mm^3	Forecast	3402.5	3786.0	4109	3159	3078	2821
		Actual	3287.8	3565.0	3661			
Lateral inflow: downstream of Atamyrat g/s	W, Mm^3	Forecast	81	82	94	97	96	106
		Actual	56	47	48			
Open channel losses: downstream of Atamyrat g/s	W, Mm^3	Forecast	425	558	297	610	236	200
		Actual	427.46	428.11	234			
Available usable water resources	W, Mm^3	Forecast	3059	3310	3906	2646	2939	2728
		Actual	2916	3184	3474			

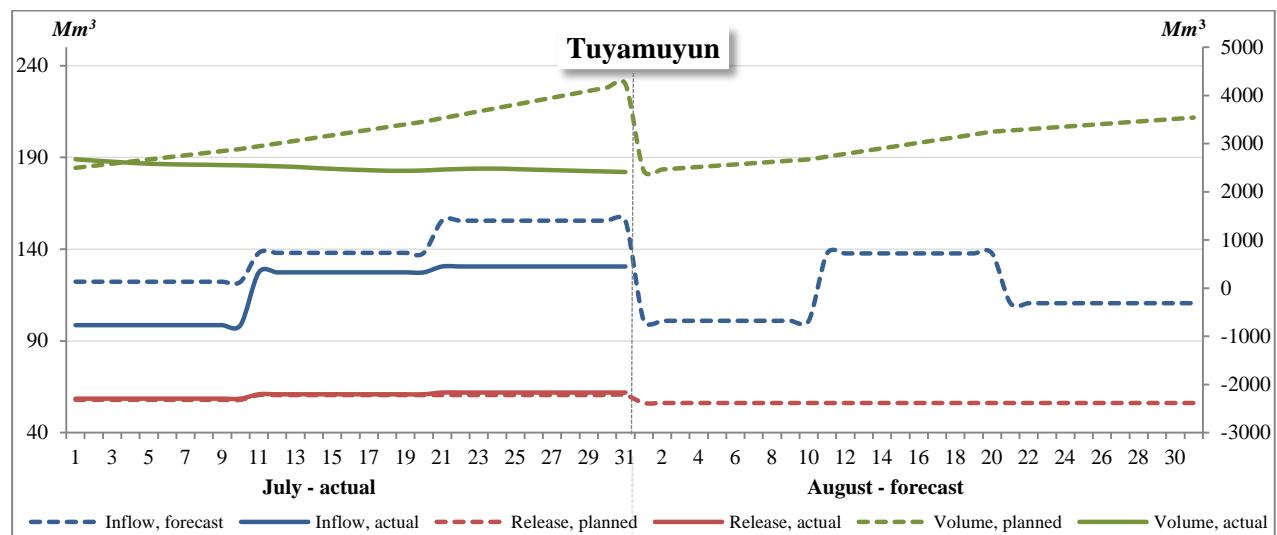
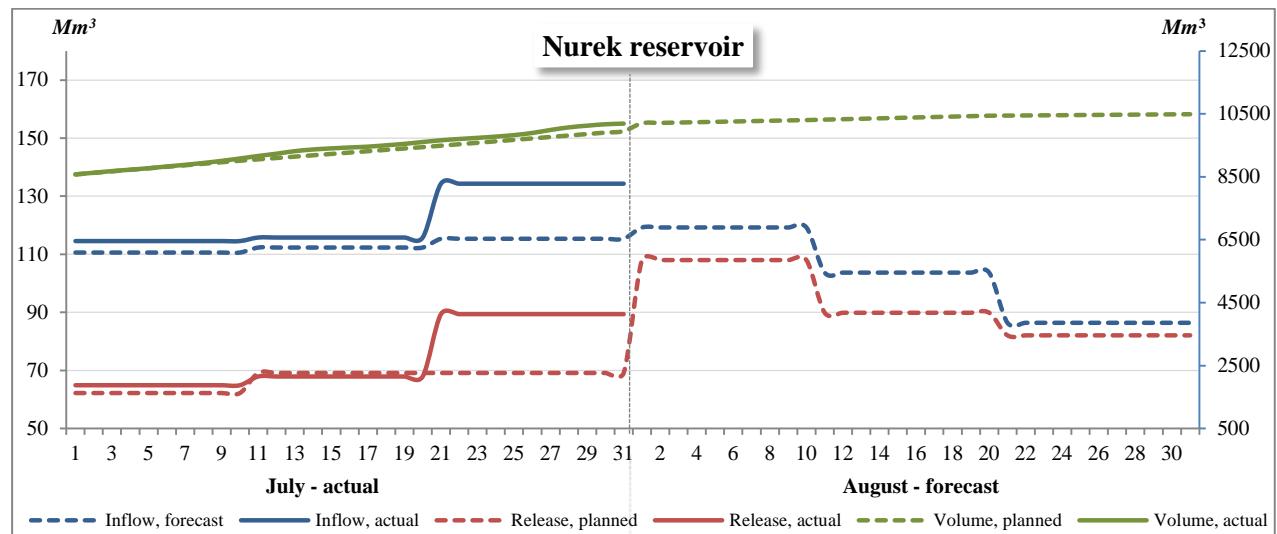


Reservoirs and HEPS

Reservoir	Location			Characteristics				
	Latitude	Longitude	Altitude above sea level, m	Length, km	Width, km	Water-surface area, km^2	Full volume, km^3	Full reservoir level, m
Nurek	38.40	69.47	864	70	1	98	10.50	910
Tuyamuyun	41.03	61.73	130	55	20	670	6.86	130

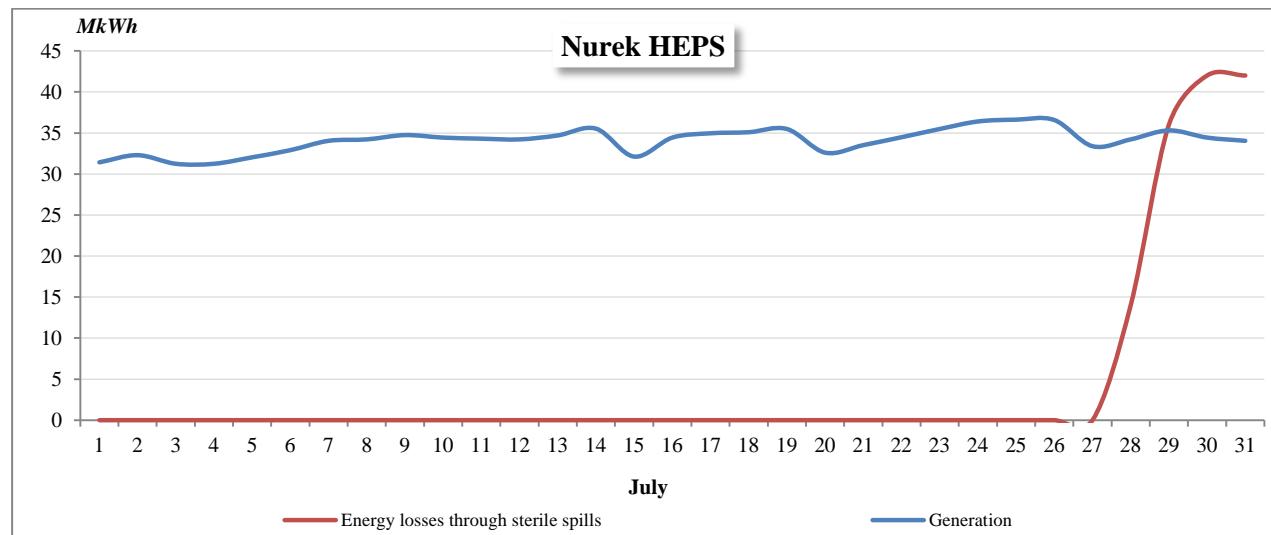
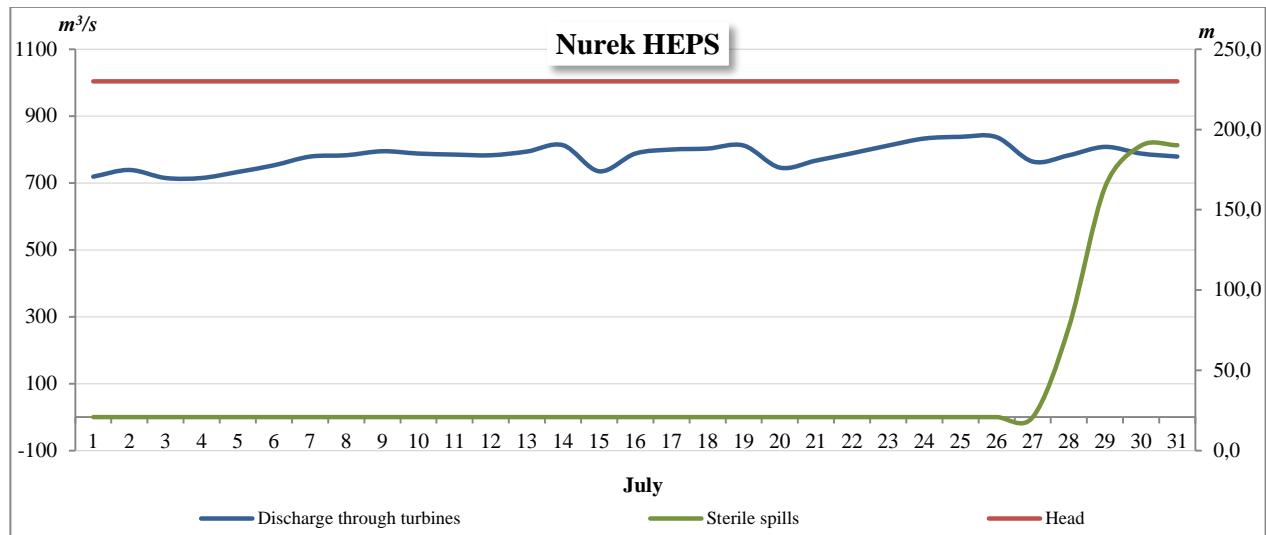
Inflow (I), Releases (R), Volume (W)

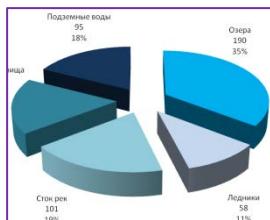
Reservoir	Parameter	July			August			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Nurek reservoir	I, Mm^3	Forecast	1106	1123	1269	1192	1037	950
		Actual	1145	1158	1477			
	R, Mm^3	Planned	622	691	760	1080	899	903
		Actual	649	679	983			
Reservoirs of Tuyamuyun waterworks facility	W, Mm^3	Planned	9013	9445	9953	10305	10444	10491
		Actual	9084	9608	10193			
	I, Mm^3	Forecast	1222	1380	1711	1009	1377	1216
		Actual	986	1274	1436			
	R, Mm^3	Planned	579	605	665	562	562	618
		Actual	585	609	680			
	W, Mm^3	Planned	2889	3457	4236	2673	3246	3541
		Actual	2549	2443	2411			



Generation (**G**), Energy losses through sterile spills (**L**), Discharge through turbines (**Q**), Sterile spills (**R**), Head (**H**)

HEPS	Parameter	July			
		I ten-day	II ten-day	III ten-day	
Nurek	<i>G, MkWh</i>	Actual	328.58	343.44	384.47
	<i>L, MkWh</i>	Actual	0	0	134.0
	<i>Q, m³/s</i>	Actual	751.9	785.9	799.8
	<i>R, m³/s</i>	Actual	0	0	235
	<i>H, m</i>	Actual	230	230	230



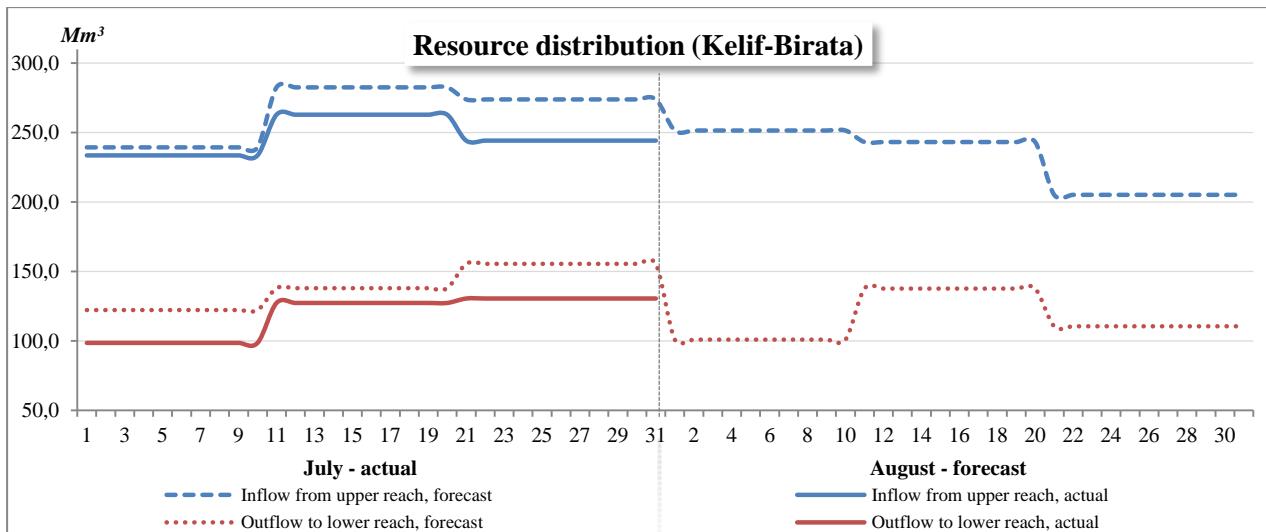


Water distribution

River reach						
Kelif gauging station (upstream of intake to Garagumdyra) – Birata gauging station (Darganata)						
Tuyamuyun gauging station (tail water of Tuyamuyun waterworks facility) – Samanbay settlement						
Large Aral Sea						

Water volume (W)

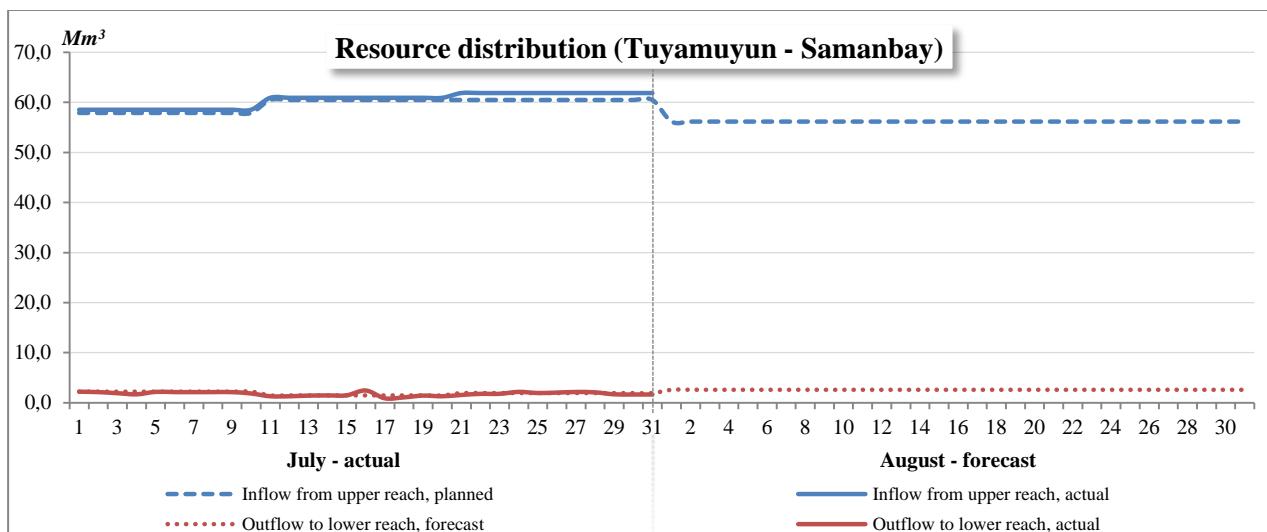
Kelif - Birata	Parameter	July			August		
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day
Inflow from upper reach	W, Mm ³	Forecast	2394	2826	3013	2515	2432
		Actual	2336	2629	2687		
Lateral inflow	W, Mm ³	Forecast	81	82	94	97	96
		Actual	56	47	48		
Water withdrawal	W, Mm ³	Planned	828	970	1099	993	916
		Actual	1004.1	1009.4	1110.2		
Losses	W, Mm ³	Forecast	425	558	297	610	236
		Actual	402	393	188		
Outflow to lower reach	W, Mm ³	Forecast	1222	1380	1711	1009	1377
		Actual	986	1274	1436		



Water volume (W)

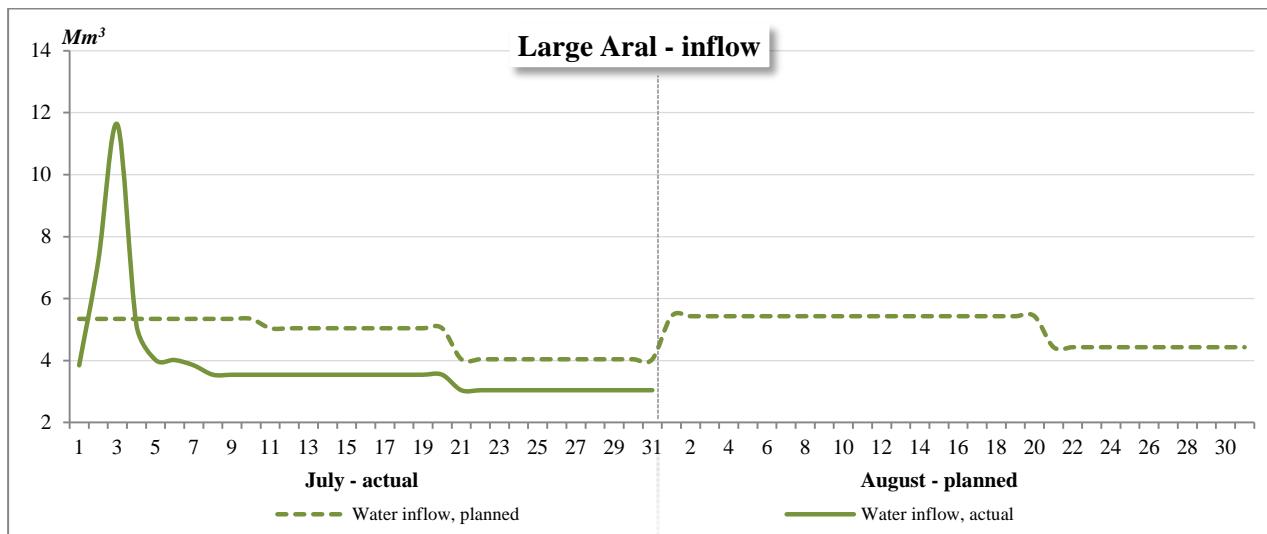
Tuyamuyun - Samanbay	Parameter	July			August		
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day
Inflow from upper reach	W, Mm ³	Forecast	578.9	605	665	562	562
		Actual	585	609	680		
Lateral inflow	W, Mm ³	Forecast	0	0	0	0	0
		Actual	0	0	0		
Water withdrawal ¹	W, Mm ³	Planned	405	570	494	406	432
		Actual	419	412	452		
Losses	W, Mm ³	Forecast	152	20	150	130	104
		Actual	146	183	208		
Outflow to lower reach	W, Mm ³	Forecast	22	15	21	26	26
		Actual	20	14	20		

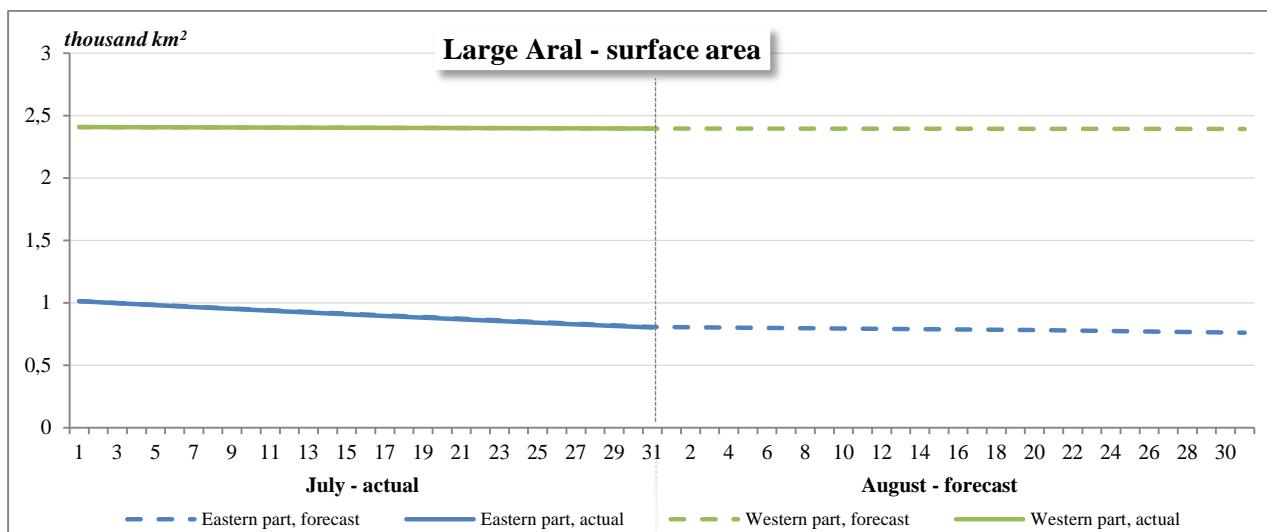
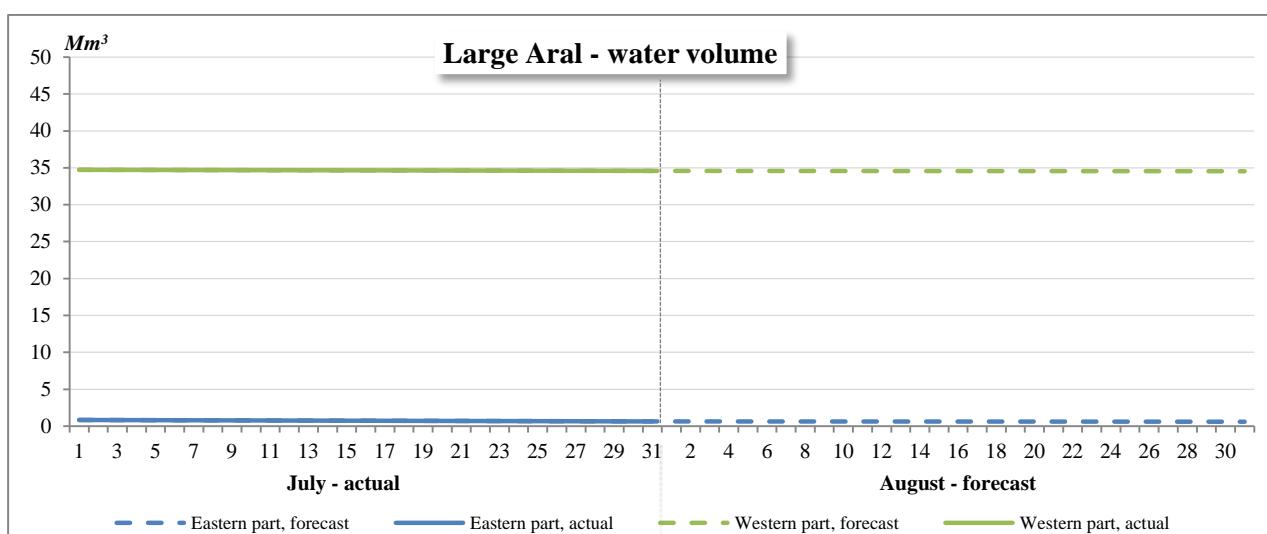
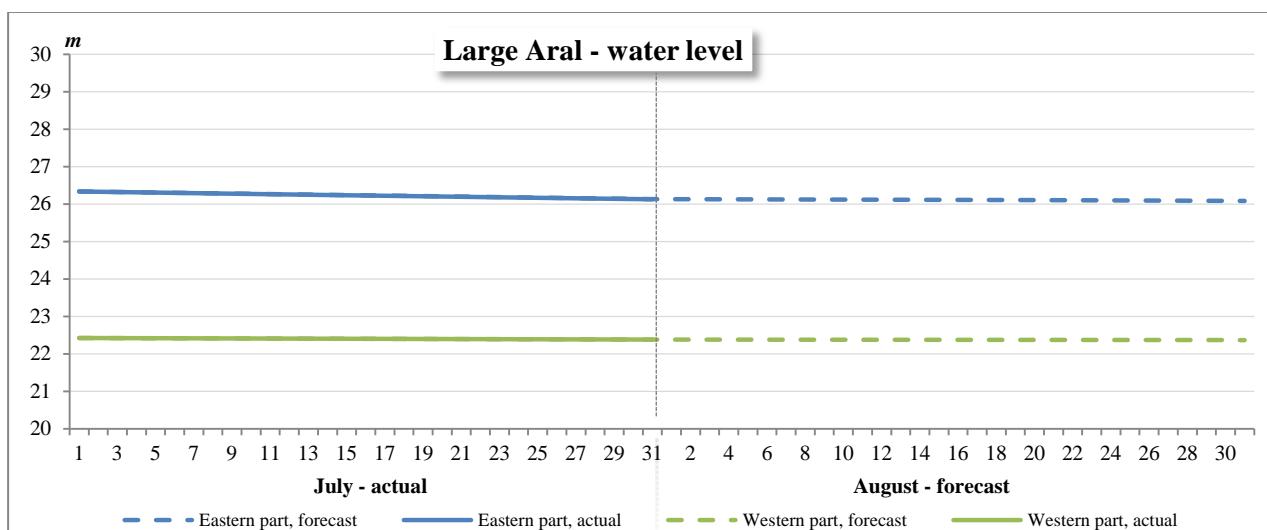
¹ Note: Including supply to the system of lakes and environmental water releases into canals



Water volume (W), Level (H), Surface area (S)

Large Aral Sea	Parameter	July			August			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Inflow	W, Mm^3	Planned	50.00	50.00	44.00	50.00	50.00	44.00
		Actual	35.00	35.00	33.00			
Eastern part, water volume	W, Mm^3	Forecast	0.81	0.75	0.68	0.64	0.63	0.61
		Actual	0.81	0.74	0.67			
Eastern part, level	H, m	Forecast	26.31	26.24	26.17	26.13	26.11	26.09
		Actual	26.30	26.23	26.16			
Eastern part, area	$S, th.km^2$	Forecast	0.98	0.91	0.84	0.80	0.79	0.77
		Actual	0.98	0.91	0.83			
Western part, water volume	W, Mm^3	Forecast	34.71	34.66	34.61	34.58	34.56	34.55
		Actual	34.71	34.66	34.61			
Western part, level	H, m	Forecast	22.42	22.40	22.39	22.38	22.37	22.37
		Actual	22.42	22.40	22.39			
Western part, area	$S, th.km^2$	Forecast	2.41	2.40	2.40	2.40	2.39	2.39
		Actual	2.41	2.40	2.40			





Syr Darya River Basin

Actual Situation in July and Forecast for August

In July, the available usable water resources in the Syr Darya River that were estimated as the sum of flows of the Naryn, the Karadarya and the Chichik rivers based on inflow to Toktogul, Andizhan, and Charvak reservoirs plus lateral inflow to the rivers and minus losses amounted to 3,365 million m³. The cumulative inflow to the three reservoirs was 2,520 million m³ (82% of the forecast). In August, the available usable water resources are expected in the amount of 2,982 million m³, including 1,995 million m³ of inflow to the three reservoirs.

In July, inflow to the Toktogul reservoir was 1,812 million m³ (96% of expected flow), and water releases from the reservoir amounted to 1,124 million m³. The water volume in the Toktogul reservoir was 11,091 million m³ by the beginning of month and increased to 11,751 million m³ (99% of accumulation plan) by the end of month. The reservoir water balance showed a negative discrepancy of 28 million m³, indicating to water losses in the reservoir. It is expected that in August the Toktogul reservoir will accumulate water and by the end of month the water volume will be 12,057 million m³; inflow to the reservoir is expected in the amount of 1,317 million m³, while water releases are planned at 996 million m³.

In July, inflow to the Andizhan reservoir was 142 million m³, and water releases from the reservoir were 569 million m³ (by 18% more than planned). The reservoir's water volume decreased from 1,130 million m³ at the beginning of month to 715 million m³ at the end of month (76% of planned one). The unrecorded inflow in the amount of 13 million m³ was detected. In August, inflow to the Andizhan reservoir is expected to be 169 million m³ and water releases will be 283 million m³. The reservoir will be drawn down to 603 million m³.

In July, inflow to the Bakhri Tojik reservoir was 856 million m³ (115% of the forecast), including through water releases from the Andizhan reservoir above planned ones. Water releases from the Bakhri Tojik reservoir were 1,523 million m³ (103% of the plan). The water volume decreased from 3,090 million m³ at the beginning of month to 2,326 million m³ (98% of the plan) by the end of month. Water losses in the reservoir were detected by the balance method in the amount of 97 million m³. In August, inflow to the Bakhri Tojik reservoir is expected to decrease to 705 million m³, and water releases will diminish to 1,495 million m³. The reservoir will be drawn down to 1,879 million m³.

In July, the Charvak reservoir was drawn down from 1,870 million m³ to 1,670 million m³ (87% of the plan). Inflow to the reservoir was 566 million m³ (63% of the forecast), and water releases were 786 million m³ (92%). The unrecorded inflow in the amount of 20 million m³ was detected by the balance method in the reservoir. In August, the Charvak reservoir will continue discharging water and its volume will decrease to 1,438 million m³ by the end of month. Inflow to the reservoir is expected in the amount of 509 million m³, while 745 million m³ of water is to be released.

Inflow to the Shardara reservoir was 178 million m³ only (37% of the forecast) and water releases from the reservoir amounted to 1,339 million m³ (100% of the plan) in July. Small inflow to the reservoir led to substantial drawdown - from 3,285 million m³ to 1,532 million m³ (70% of the plan), and water was not discharged into Arnasai. Water diversion from the reservoir amounted to 232 million m³. Balance discrepancy (indicating to flow losses) was 360 million m³. In August, inflow to the Shardara reservoir is expected to increase to 375 million m³, and water releases will decrease to 1,205 million m³. This will lead to further lowering of reservoir's water volume to 599 million m³ by the end of month. Water discharge into Arnasai is not planned in August.

The Koksarai reservoir did not accumulate water in July. Water discharge from the reservoir into the Syr Darya River amounted to 61 million m³. The water volume in the reservoir decreased from 88 million m³ to 25 million m³. Water losses in the reservoir were estimated at 2 million m³ by the balance method. In August, accumulation and discharge of water in the Koksarai reservoir are not planned.

In July, energy generation by the cascade of Naryn HEPS amounted to 981 million kWh against planned 958 million kWh, i.e. by 2% more than the plan, including 780 million kWh under energy-generation regime. The Toktogul HEPS generated 392 million kWh in July. The average discharge through turbines of Toktogul HEPS was 419 m³/s, and the average head at HEPS was 145 m. No sterile spills were observed. The plan of energy generation for August for the cascade of Naryn HEPS is set at 890 million kWh, including 357 million kWh for Toktogul HEPS.

In July, the total generation at large HEPS of Uzbekistan amounted to 385 million kWh, of which: 268 million kWh at Charvak HEPS, 30 million kWh at Farkhad HEPS, and 87 million kWh at Andizhan HEPS. The discharge at Charvak HEPS was 290 m³/s, and the head was 142 m. The discharge at Farkhad HEPS was 154 m³/s, and the head was 31 m. For Andizhan HEPS, the discharge was 165 m³/s, and the head was 95 m.

Energy generation by HEPS of the Bakhri Tojik reservoir amounted to 54 million kWh and that by Shardara HEPS was 61 million kWh in July. Water discharge at HEPS of Bakhri Tojik was 530 m³/s, while the head was 20 m. Discharge at Shardara HEPS was 480 m³/s, and the head was 16 m only.

In July, the flow was distributed unevenly along the Naryn River and the Syr Darya River. In the reach of Toktogul HEPS – Uchkurgan waterworks facility (tail-water) the water shortage was 36% of planned water withdrawal. The balance discrepancy that can be attributed to open channel losses was 65 million m³ (6% of river flow at the head of the reach). In the reach of Uchkurgan waterworks facility (tail-water) – Akjar g/s (inflow to the Bakhri Tojik reservoir) water shortage was 23%, and the balance discrepancy was 4% of the flow at the head of the reach. In the reach of Bakhri Tojik reservoir – Shardara reservoir water shortage accounted for 21%, and the open-channel balance discrepancy (losses) was 179 million m³ (13%). In the lower reaches of the Syr Darya River (downstream of Shardara reservoir) the open-channel balance discrepancy (losses) was recorded at 262 million m³ - 19% of river flow at the head of the reach (downstream of spillway from the Koksarai reservoir into the river); there was no water shortage.

In July, the flow along the Naryn – Syr Darya rivers changed as follows: discharge from the Toktogul reservoir – 1,124 million m³; Akjar g/s (inflow to the Bakhri Tojik reservoir) – 856 million m³ (115% of the forecast); inflow to the Shardara reservoir – only 178 million m³ (37% of the forecast); Syr Darya – tail-water of the Shardara reservoir – 1,339 million m³; and, inflow to the Northern Aral Sea - 16 million m³.

In July, inflow to the Northern Aral Sea was 16 million m³. No water was discharged from the Northern Aral Sea into the Large Aral Sea (Amu Darya Basin). The water level varied within 41.9...41.7 m. The water surface area was 3.11...3.06 thousand km² and the water volume was 24.9...24.3 km³. It is expected that in August inflow to the Northern Aral Sea will decrease to 13 million m³, and no discharge into the Large Aral Sea will be made. The water level is expected to be 41.6 m, the water surface area - 3.0 thousand km², and the water volume - 24.0 km³ by the end of month.

The sections below show daily and ten-day data on climate and water management (reservoirs, HEPS, water distribution).

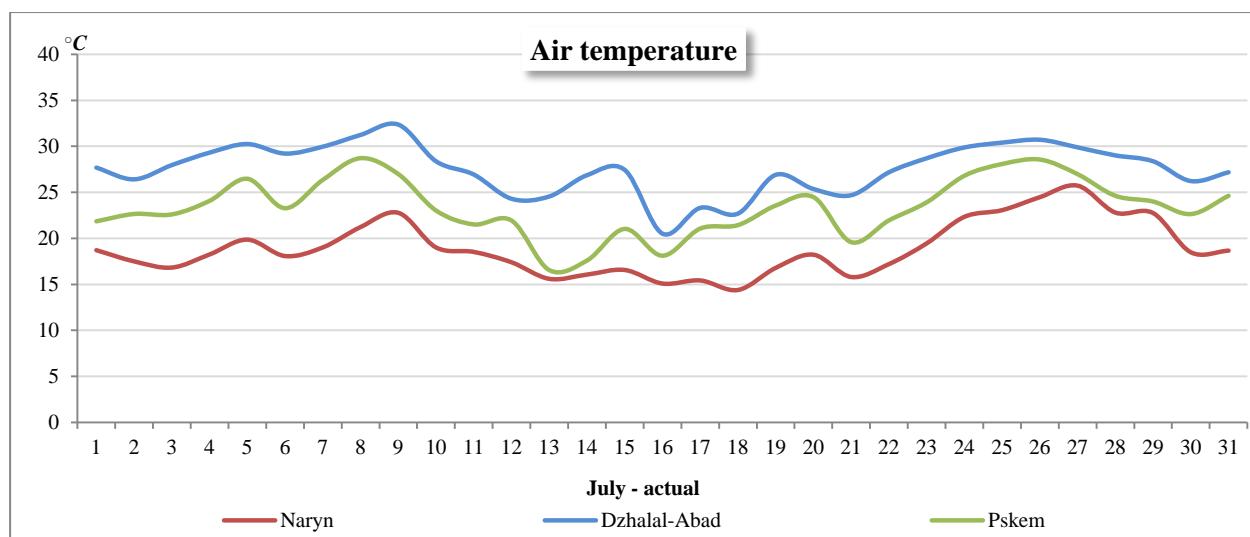


Climate

Weather station Riverhead	Location		
	Latitude	Longitude	Altitude above sea level, m
Naryn	41.43	76.00	2041
Dzhalal-Abad	40.92	72.95	765
Pskem	41.90	70.37	1258

Air temperature (T)

Station	Parameter	July			August		
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day
Naryn	T. °C	Forecast	19.0	20.0	21.0	22.0	21.0
		Actual	19.0	16.0	21.0		
Dzhalal-Abad	T. °C	Forecast	31.0	31.0	32.0	31.0	30.0
		Actual	29.0	25.0	28.4		
Pskem	T. °C	Forecast	24.0	25.0	25.0	26.0	25.0
		Actual	25.0	21.0	24.7		

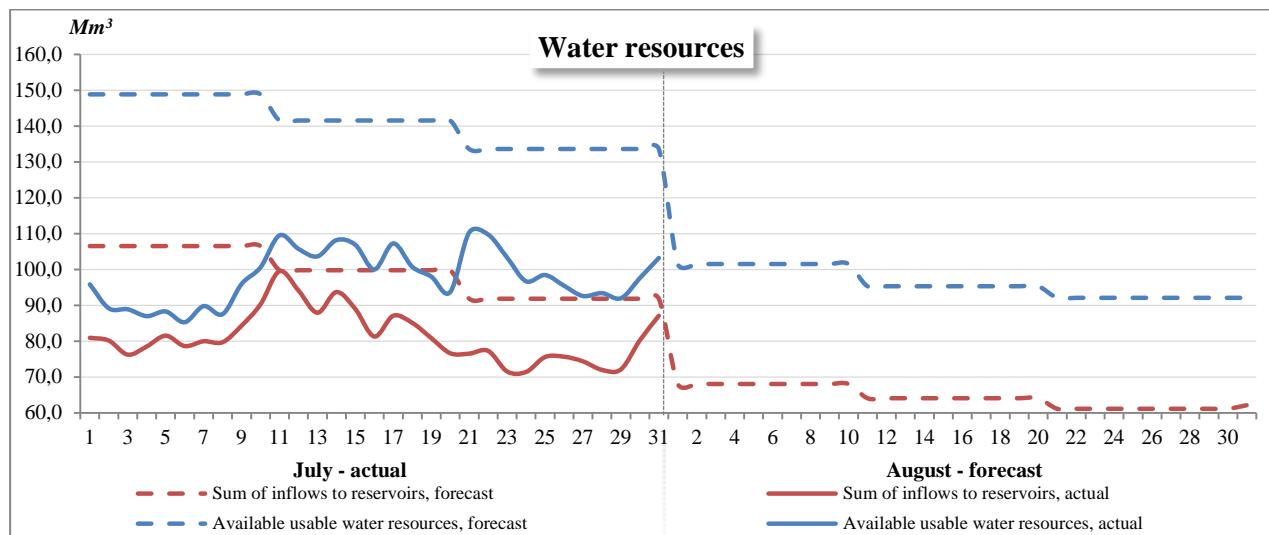


Water resources

Object
Naryn River (inflow to Toktogul)
Karadarya River (inflow to Andizhan)
Chirchik River (inflow to Charvak)
Syr Darya River (up to Shardara)

Water volume (W)

Object	Parameter	July			August		
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day
Inflow to Toktogul reservoir	W, Mm^3	Forecast	612	612	673.0	425	425
		Actual	538	658	616.3		
Inflow to Andizhan reservoir	W, Mm^3	Forecast	104	95	76.0	60	52
		Actual	58	40	43.3		
Inflow to Charvak reservoir	W, Mm^3	Forecast	350	291	261.4	195	164
		Actual	214	177	174.4		
Sum of inflows to reservoirs	W, Mm^3	Forecast	1065	998	1010.3	681	641
		Actual	810	875	834.0		
Lateral inflow up to Shardara	W, Mm^3	Forecast	511	505	555.6	418	396
		Actual	185	246	355.0		
Losses	W, Mm^3	Forecast	87	87	96.1	84	84
		Actual	87	87	96.1		
Available usable water resources	W, Mm^3	Forecast	1489	1416	1469.9	1015	953
		Actual	908	1034	1092.9		

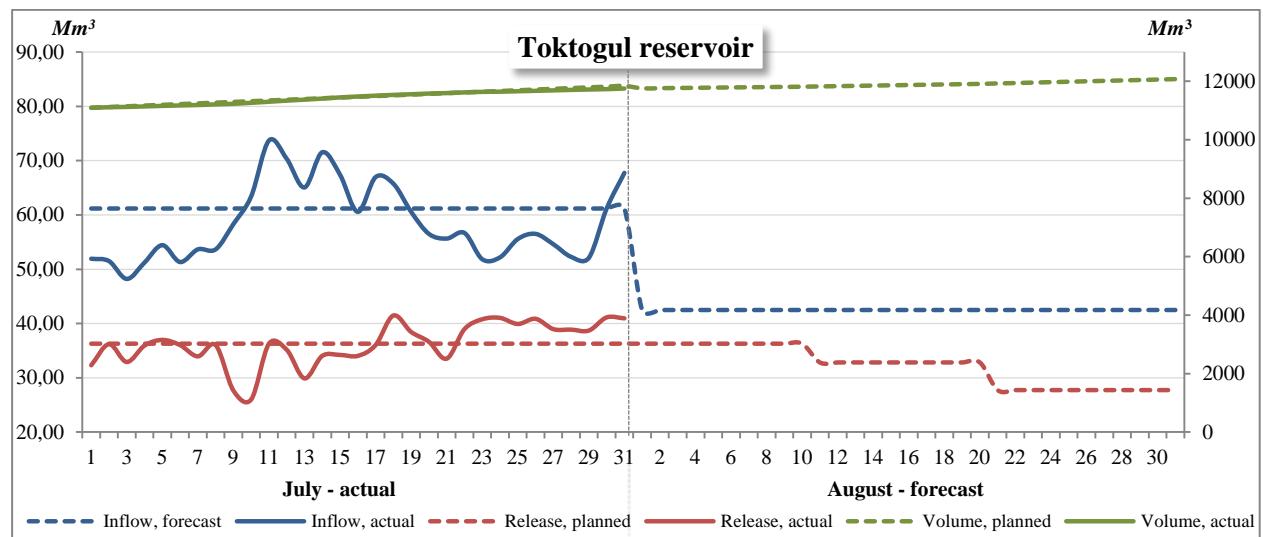


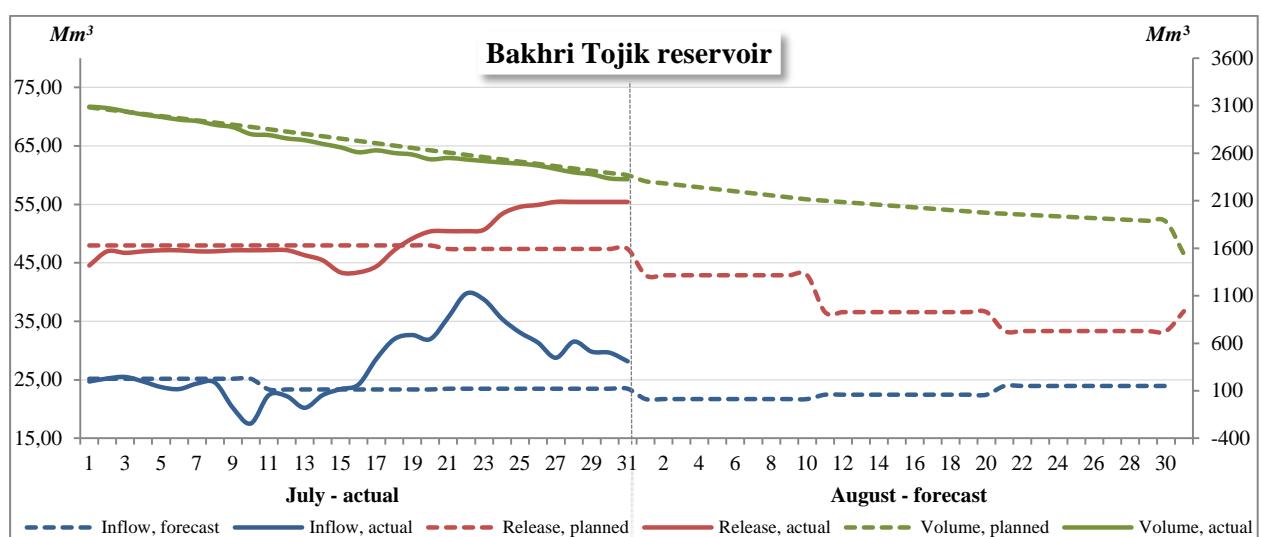
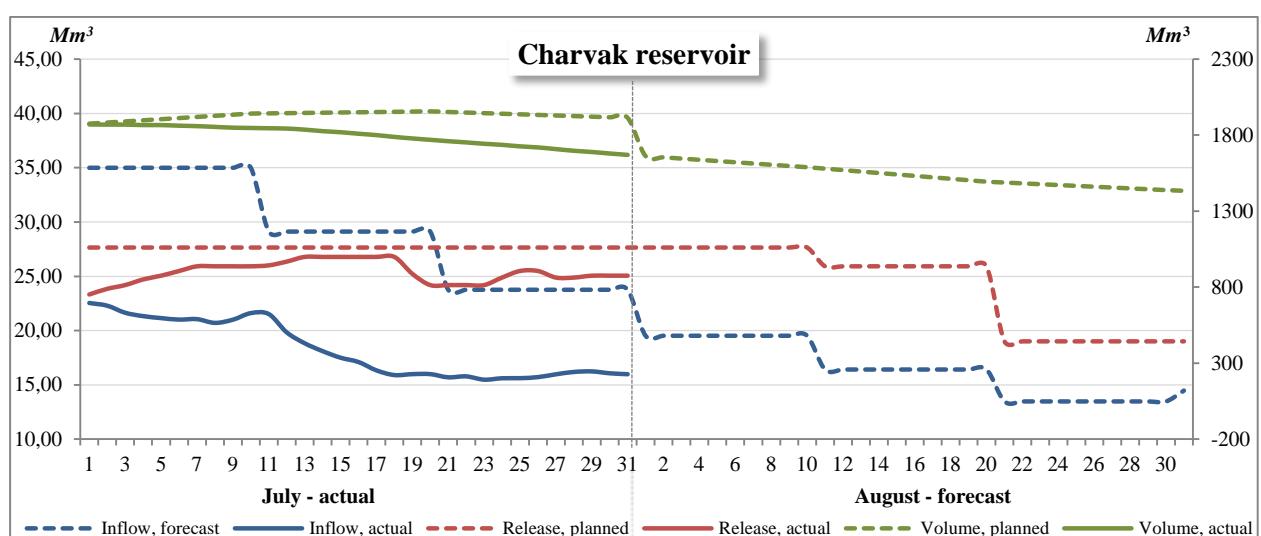
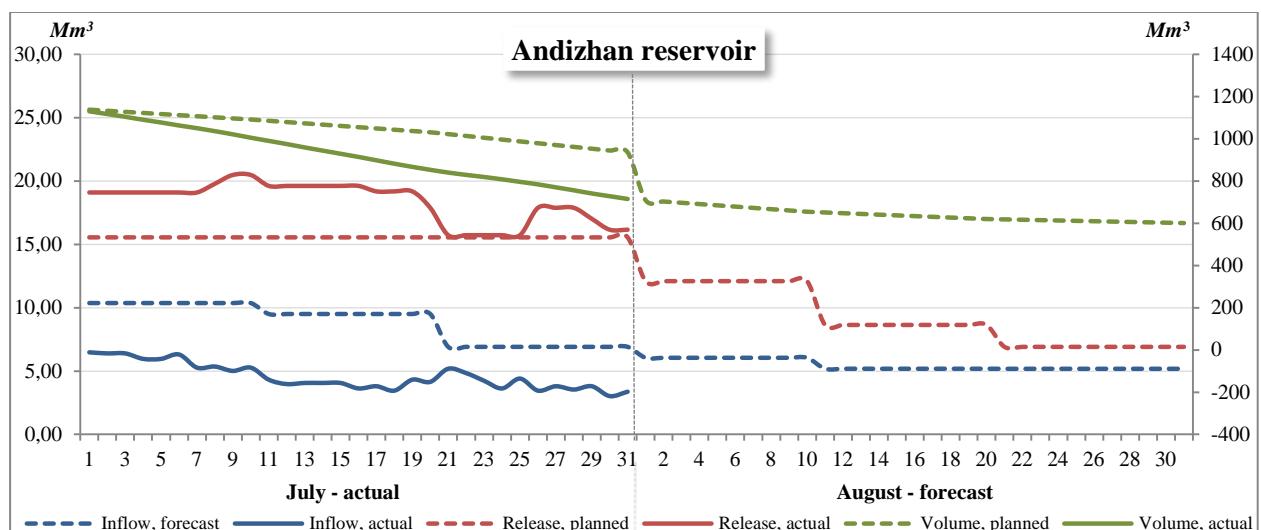
Reservoirs and HEPS

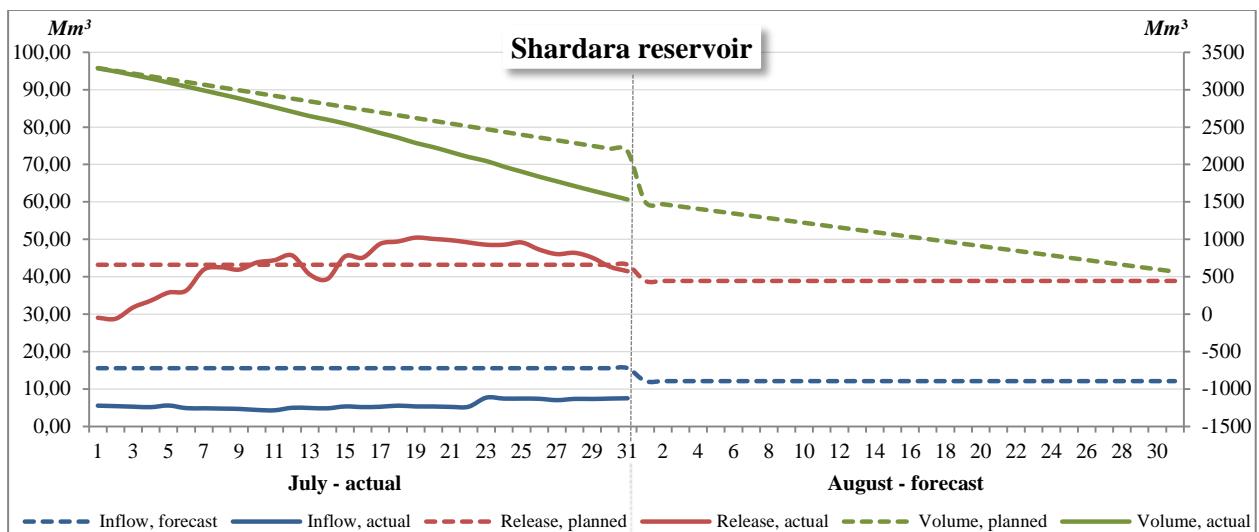
Reservoir	Location			Characteristics			
	Latitude	Longitude	Altitude above sea level, m	Length, km	Width, km	Water-surface area, km^2	Full volume, km^3
Toktogul	41.80	72.87	880	65	12	284	19.50
Andizhan	40.77	73.11	900	36	1.5-12	56	0.19
Bakhri Tojik	40.29	70.07	344	75	20	520	4.16
Charvak	41.63	70.03	869	15	3	37	1.90
Shardara	41.20	67.99	250	80	25	783	5.70

Inflow (I), Releases (R), Volume (W)

Reservoir	Parameter	July			August			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Toktogul reservoir	I, Mm^3	Forecast	611.78	611.78	672.96	424.89	424.89	467.39
		Actual	537.67	658.37	616.29			0.00
	R, Mm^3	Planned	362.88	362.88	399.17	362.88	328.32	305.14
		Actual	334.02	356.23	433.73			
Andizhan reservoir	W, Mm^3	Planned	11318	11567	11841	11813	11910	12072
		Actual	11262	11579	11751			
	I, Mm^3	Forecast	103.68	95.04	76.02	60.48	51.84	56.98
		Actual	58.41	39.83	43.29			0.00
Charvak reservoir	R, Mm^3	Planned	155.52	155.52	171.05	120.96	86.40	76.02
		Actual	194.40	193.10	181.61			0.00
	W, Mm^3	Planned	1091	1031	936	655	620	601
		Actual	1005	853	715			
Bakhri Tojik reservoir	I, Mm^3	Forecast	349.92	291.17	261.36	195.26	164.16	149.26
		Actual	214.35	177.15	174.38			
	R, Mm^3	Planned	276.48	276.48	304.13	276.48	259.20	209.11
		Actual	250.30	262.48	273.37			
Shardara reservoir	W, Mm^3	Planned	1941	1956	1913	1589	1494	1434
		Actual	1847	1769	1670			
	I, Mm^3	Forecast	251.82	233.52	258.26	217.10	224.58	263.46
		Actual	233.97	259.98	361.93			
Volume	R, Mm^3	Planned	479.78	479.84	521.18	428.83	365.76	370.14
		Actual	467.74	463.96	591.50			
	W, Mm^3	Planned	2877	2631	2368	2114	1973	1536
		Actual	2801	2536	2326			
Shardara reservoir	I, Mm^3	Forecast	155.52	155.52	171.07	120.96	120.96	133.06
		Actual	50.44	50.91	77.00			
	R, Mm^3	Planned	432.00	432.00	475.20	388.80	388.80	427.68
		Actual	365.39	459.48	514.17			
Volume	W, Mm^3	Planned	2955	2584	2175	1221	910	568
		Actual	2824	2232	1532			

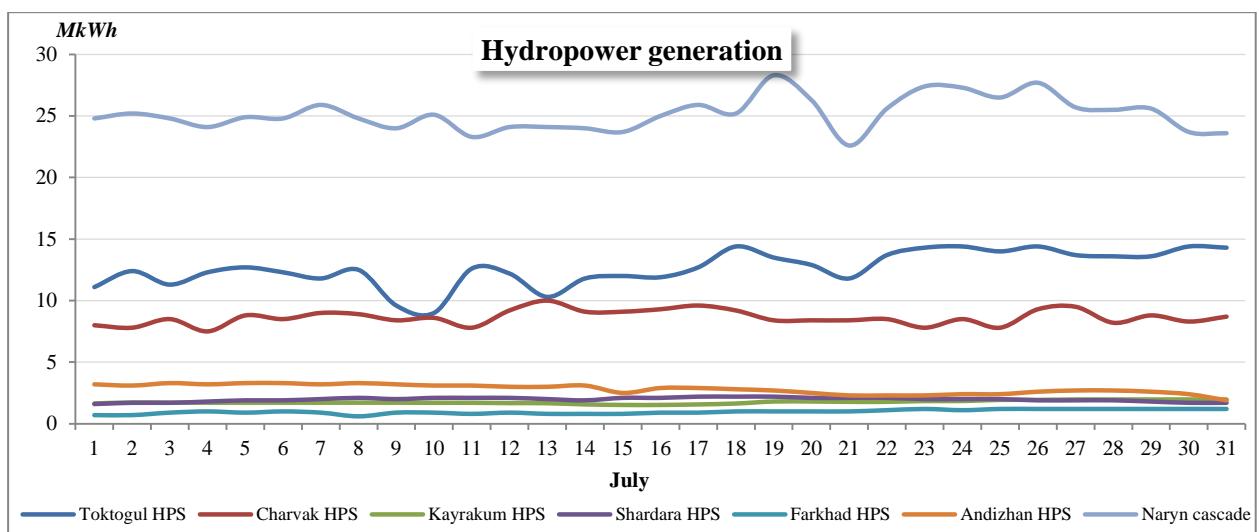


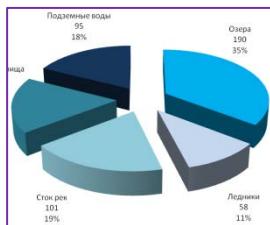




Generation (G), Energy losses through sterile spills (L), Discharge through turbines (Q), Sterile spills (R), Head (H)

HEPS	Parameter	July			
		I ten-day	II ten-day	III ten-day	
Naryn cascade	G, M kWh	Actual	273.7	324.7	382.3
	G, M kWh	Actual	115	124.3	152.2
Toktogul	Q, m³/s	Actual	386	411.4	456.4
	H, m	Actual	143.2	144.7	145.6
Andizhan	G, M kWh	Actual	32.2	28.5	26.6
	Q, m³/s	Actual	172	174.3	149.7
	H, m	Actual	95	95	95
Bakhri Tojik	G, M kWh	Actual	17	16.5	20.9
	Q, m³/s	Actual	497.7	496.9	590
	H, m	Actual	20.1	19.5	19
Farkhad	G, M kWh	Actual	8.5	8.9	12.8
	Q, m³/s	Actual	143.7	147.8	169.7
	H, m	Actual	30.6	30.6	30.6
Charvak	G, M kWh	Actual	84	90.1	93.8
	Q, m³/s	Actual	279.3	300.6	289
	H, m	Actual	143.9	142.7	140.1
Shardara	G, M kWh	Actual	18.8	21	21.1
	Q, m³/s	Actual	399	505.5	529
	G, M kWh	Actual	17.8	16.4	14.8



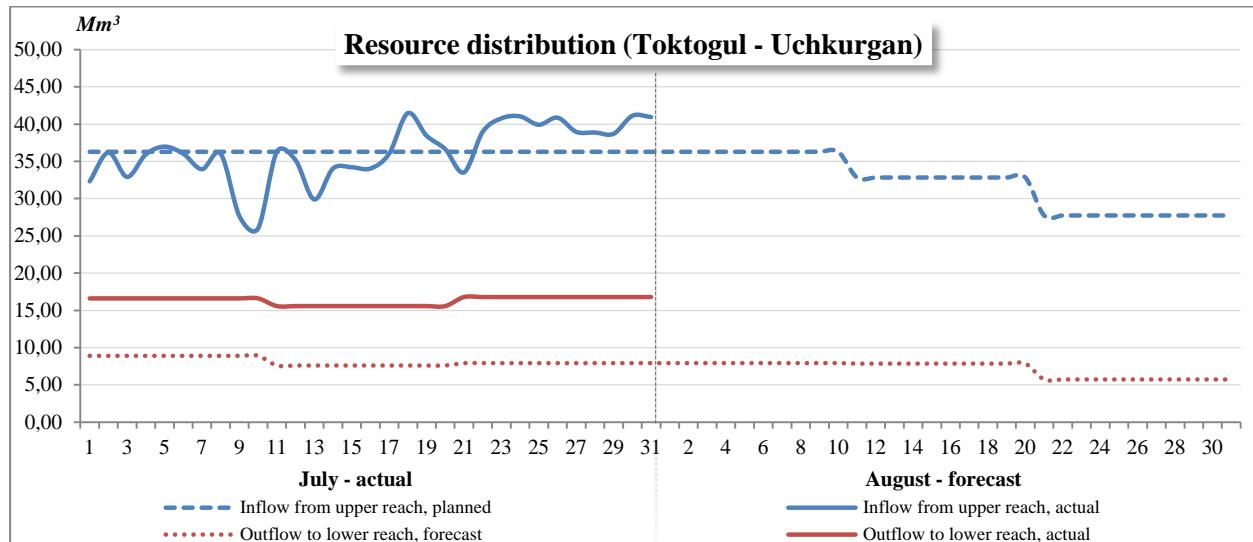


Water distribution

River reach						
Naryn River: tail water of Toktogul reservoir – Uchkurgan waterworks facility						
Naryn River: Uchkurgan waterworks facility - Syr Darya River: inflow to Bakhri Tojik reservoir						
Syr Darya River: tail water of Bakhri Tojik reservoir – inflow to Shardara reservoir						
Syr Darya River: tail water of Shardara reservoir – inflow to Northern Aral Sea (Karateren settlement)						
Northern Aral Sea						

Water volume (W)

Toktogul - Uchkurgan	Parameter	July			August			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Inflow from upper reach	W, Mm ³	Planned	362.88	362.88	399.17	362.88	328.32	305.14
		Actual	334.02	356.23	433.73			
Lateral inflow ²	W, Mm ³	Forecast	56.04	56.04	61.61	33.78	33.78	37.16
		Actual	48.04	37.76	31.27			
Water withdrawal	W, Mm ³	Planned	286.68	299.72	326.15	272.94	239.07	230.34
		Actual	189.13	219.31	261.03			
Losses	W, Mm ³	Forecast	43.20	43.20	47.52	44.49	44.49	48.94
		Actual	26.87	18.90	19.28			
Outflow to lower reach ³	W, Mm ³	Forecast	89.04	76.00	87.11	79.23	78.54	63.02
		Actual	166.06	155.78	184.69			



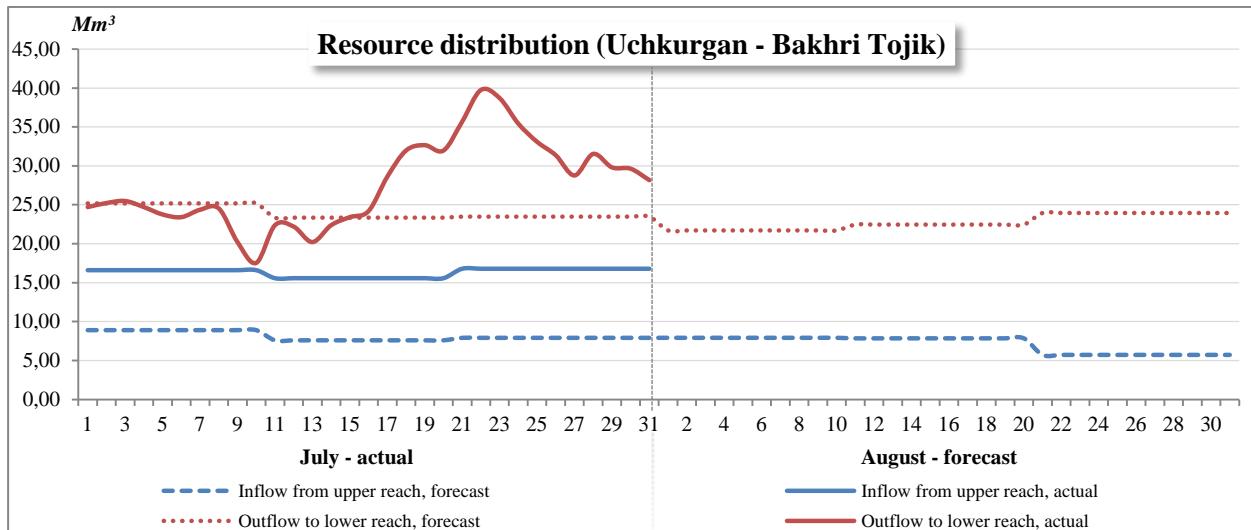
Water volume (W)

Uchkurgan – Bakhri Tojik	Parameter	July			August			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Inflow from upper reach	W, Mm ³	Forecast	89.04	76.00	87.11	79.23	78.54	63.02
		Actual	166.06	155.78	184.69			
Lateral inflow	W, Mm ³	Forecast	231.75	230.92	251.89	205.86	205.56	257.84
		Actual	113.96	153.97	167.20			

² Incl. Karasu left and right

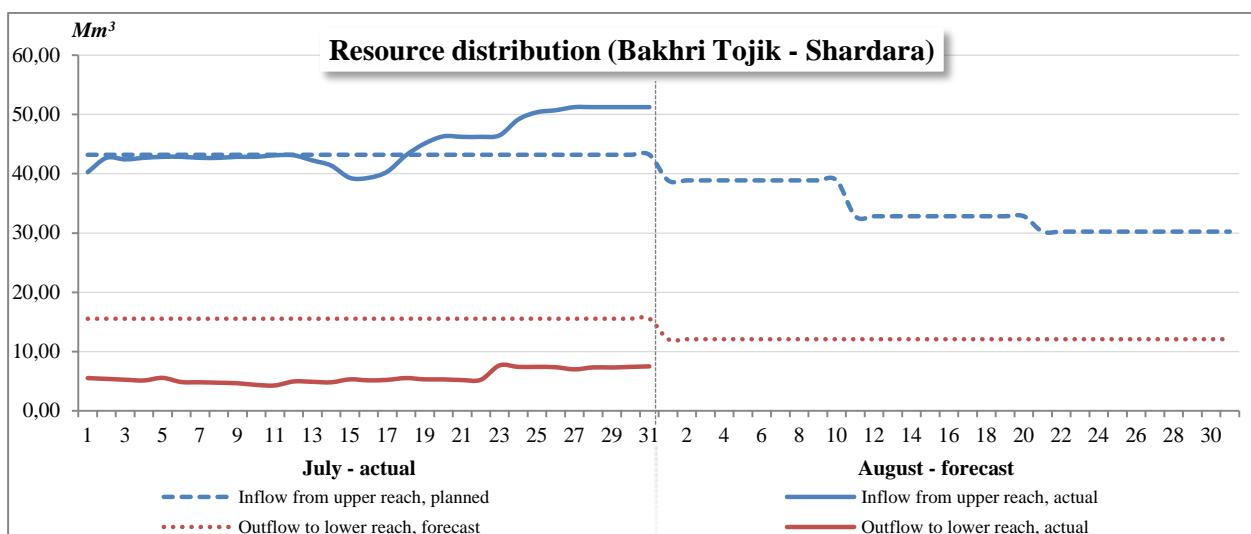
³ Uchkurgan waterworks facility

Water withdrawal	W, Mm^3	Planned	38.97	43.40	47.74	37.99	29.52	24.40
		Actual	32.17	33.43	41.91			
Losses	W, Mm^3	Forecast	30.00	30.00	33.00	30.00	30.00	33.00
		Actual	13.88	16.34	-51.95			
Outflow to lower reach ⁴	W, Mm^3	Forecast	251.82	233.52	258.26	217.10	224.58	263.46
		Actual	233.97	259.98	361.93			



Water volume (W)

Bakhri Tojik - Shardara	Parameter	July			August			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Inflow from upper reach ⁵	W, Mm^3	Planned	432.00	432.00	475.20	388.80	328.32	332.64
		Actual	424.83	423.36	545.36			
Lateral inflow	W, Mm^3	Forecast	301.92	301.92	332.11	277.16	258.64	249.22
		Actual	83.82	94.66	111.10			
Water withdrawal	W, Mm^3	Planned	518.40	518.40	570.24	485.00	406.00	382.80
		Actual	390.52	402.56	532.40			
Losses	W, Mm^3	Forecast	60.00	60.00	66.00	60.00	60.00	66.00
		Actual	67.69	64.55	47.06			
Outflow to lower reach	W, Mm^3	Forecast	155.52	155.52	171.07	120.96	120.96	133.06
		Actual	50.44	50.91	77.00			

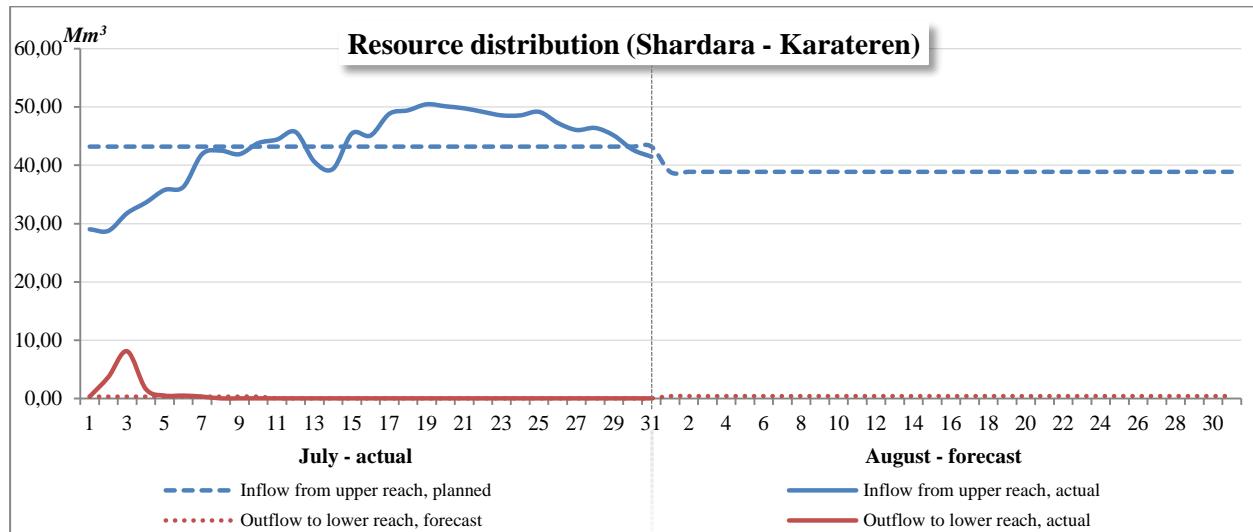


⁴ Akdzhар g/s

⁵ Kyzylkishlak g/s

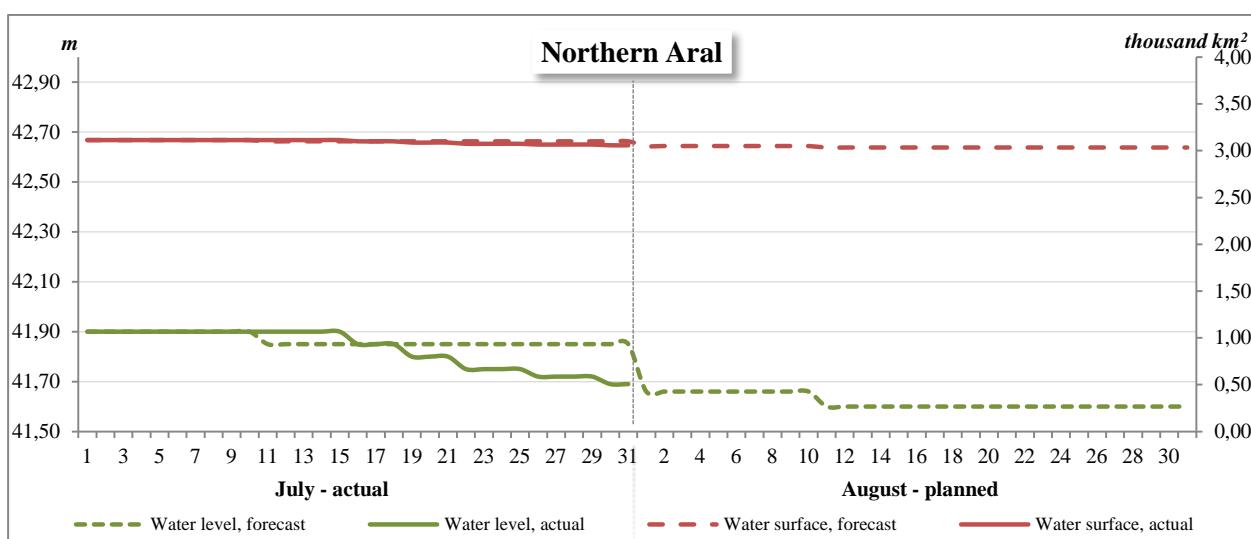
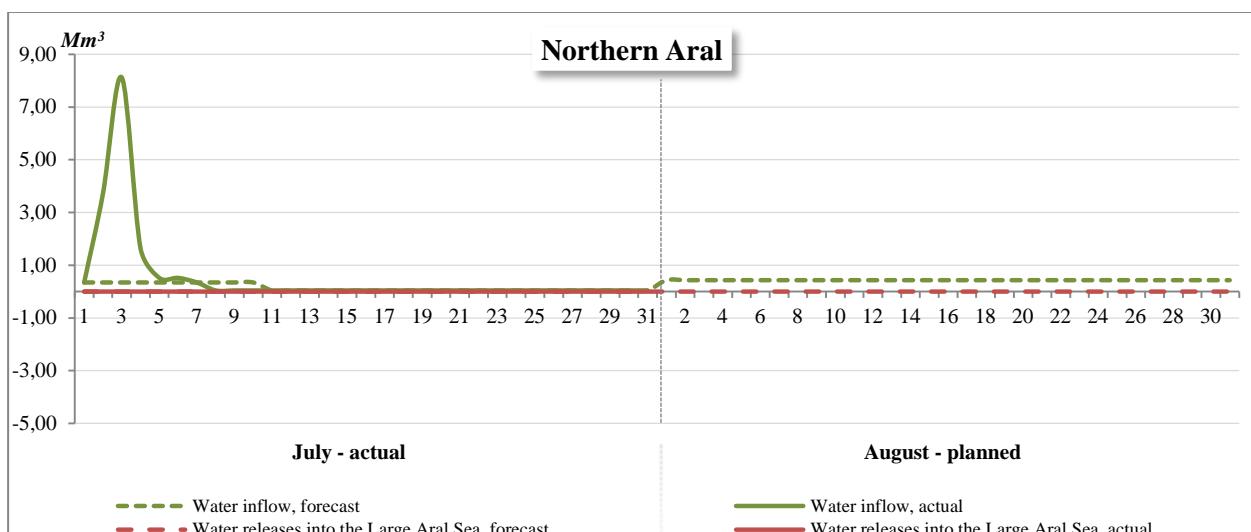
Water volume (W)

Shardara - Karateren	Parameter	July			August		
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day
Inflow from upper reach	W, Mm ³	Planned	432.0	432.0	388.80	388.80	388.80
		Actual	365.4	459.5	0.00		
Lateral inflow	W, Mm ³	Forecast	1	1.00	1.0	1.0	1.0
		Actual	0.043	0.043	0.0		
Filling (+), drawdown (-) of Koksarai reservoir	W, Mm ³	Planned	64	0.00	0.0	0.0	0.0
		Actual	61	0.00	0.0		
Water withdrawal	W, Mm ³	Planned	354	346.61	232.5	232.5	172.0
		Actual	361	361.61	0.0		
Losses	W, Mm ³	Forecast	140	85.96	153.0	153.0	213.5
		Actual	50	97.48	0.0		
Outflow to lower reach	W, Mm ³	Forecast	3.5	0.43	4.32	4.32	4.8
		Actual	15.3	0.43	0.00		



Water volume (W), Level (H), Surface area (S)

Northern Aral	Parameter	July			August		
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day
Inflow	W, Mm ³	Forecast	3.46	0.43	0.48	4.32	4.32
		Actual	15.34	0.43	0.48		
Water volume	W, Mm ³	Forecast	24.93	24.78	24.78	24.21	24.03
		Actual	24.93	24.83	24.43		
Water level	H, m	Forecast	41.90	41.85	41.85	41.66	41.60
		Actual	41.90	41.87	41.73		
Water surface area	S, th.km ²	Forecast	3.11	3.10	3.10	3.05	3.03
		Actual	3.11	3.10	3.07		
Water releases into the Large Aral Sea	W, Mm ³	Forecast	0.00	0.00	0.00	0.00	0.00
		Actual	0.00	0.00	0.00		



Information sources

Basin Water Organization “Amu Darya”

Basin Water Organization “Syr Darya”

Aral–Syrdarya Basin Water Authority Coordination Dispatch Center “Energy”

Website of the Center of Hydrometeorological Service (Uzbekistan) meteo.uz
Central Asia Water and Ecological Knowledge Portal cawater-info.net
Website “Weather and Climate” pogodaiklimat.ru

For detailed analysis of water-related situation by SIC ICWC, please, visit the CAWATER-info portal cawater-info.net/analysis/index.htm

On August 14, 2021, when the fourth issue of the Early Warning Bulletin was under preparation, Professor **Viktor Abramovich Dukhovniy** passed away at the age of 88.

We lost an Outstanding Leader, Mentor, Scholar, and, most importantly, a Person who was not indifferent! We loved **Viktor Dukhovniy** for his charisma, wisdom and concerns about others, we loved his good mood, his smile, his humor that made the sun shining in our hearts. He left a tremendous legacy and guidance to all of us to work for the well-being of the people in Central Asia and don't give up.

May his blessed memory live forever in the hearts of all who knew him as a talented and intelligent leader, a great scientist and a bright man.



On behalf of the great Water Family we convey our sincere condolences and feeling of deep sadness to his family, relatives and friends.