Aral Sea Basin Transboundary Water Early Warning Bulletin

June - July 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 third bulletin contains the actual information on the Syr Darya and Amu Darya basins for June 2021 and the forecast for July.

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 June

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

World Bank appoints new regional director for Central Asia, en.trend.az

IRENA enhances dialogue on energy transition in the Central Asian countries, orient.tm

The Central Asian countries agree upon an agricultural export strategy, nuz.uz

Pollution and drying out of rivers discussed by Nur Otan in Kazakhstan, inform.kz

Khivaabad-Kaka gravity conduit improves living conditions in Turkmenistan, turkmenportal.com

Uzbek Foreign Minister and 75th UNGA President Volkan Bozkir discuss the Aral Sea problem, uz.sputniknews.ru

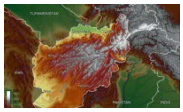
Tajikistan continues exporting electricity to Afghanistan, asiaplustj.info

Tajik section of CASA-1000 will be completed before the end of this year, asiaplustj.info

UNDP launches US$2.7-million project to boost climate change resilience in Tajikistan, asiaplustj.info

USAID launches regional water and environment program in Turkmenistan, orient.tm

UN finalizes new climate report, news.un.org



World Bank Contributes $57.5 million to Afghanistan's Emergency Agriculture & Food Supply Project, wadsam.com

Modernized Lake Sarez early warning system expected to be introduced into operation next month, asiaplustj.info

About 10% of Tajik electricity is exported, asiaplustj.info

The Head of Turkmenistan approves team of joint Turkmen-Uzbek Commission for Water, turkmenportal.com

Amu Darya River Basin

Actual Situation in June and Forecast for July

In June, the available usable river water resources estimated as natural, non-regulated river flow plus lateral inflow into the river and minus losses amounted to 9,568 Mm^3. The regulated flow of the Amu Darya at the Atamyrat (Kerki) section was 6,013 Mm^3.

In July, the available usable river water resources are expected to be 10,275 million m^3, i.e. will increase by 7% as compared to June.

Inflow to the Nurek reservoir from the Vakhsh River was 2,913 million m^3 in June. Water releases from the reservoir amounted to 1,860 million m^3 (8% less than planned). In June, the reservoir was filled with water by 649 million m^3 and reached the volume of 8,529 million m^3 by the end of month (8% more than planned). Water losses in the reservoir estimated as water balance discrepancy were zero, and unrecorded inflow was detected in the amount of 171 million m^3 (2% of water volume in the reservoir). It is expected that in July 3,498 million m^3 of water will flow into the Nurek reservoir. The water volume will increase to 9,953 million m^3, and water releases from the reservoir will increase to 2,074 million m^3.

Inflow to Tuyamuyun waterworks facility (TMWF) was 4,363 million m^3 in June (96% of the forecast volume). Water releases from TMWF into the Amu Darya River amounted to 2,100 million m^3 (82%), while water diversion from the reservoir into canals was 698 million m^3 (83% of planned one). In June, the water volume in the reservoirs of TMWF decreased from 2,702 million m^3 at the beginning of month to 2,453 million m^3 at the end of month (only 68% of the expected accumulation). Reservoir water balance discrepancy is estimated at 1,053 million m^3; this is about 35% of inflow to the waterworks facility. The discrepancy is negative and indicates to substantial water losses and, probably, to overestimated inflow to the facility. In July, inflow to TMWF will change slightly – 4,313 million m^3. TMWF reservoirs will accumulate water and their volume will be about 3,977 million m^3 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 1,849 million m^3. Water diversion will decrease to 681 million m^3.

Nurek HEPS generated 939 million kWh of electricity in June. The discharge through turbines was 717 m^3/s, while the average head was 230 m. Sterile spills at HEPS were not observed.

In June, TMWF HEPS generated 19 million kWh or 2 million kWh more than in May. The head at HEPS was 20 m.

In June, 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) the water shortage was 161 million m^3 (6% of the plan), and in the lower reaches at Tuyamuyun g/s – Samanbay g/s the water shortage was 272 million m^3 (20% of the plan).

In June, open-channel balance in the reaches showed negative discrepancies that can be attributed to water losses: 625 million m^3 (8% of river flow at Kelif g/s) in the middle reaches and 600 million m^3 (29% of Amu Darya river flow downstream of TMWF - Tuyamuyun g/s) in the lower reaches.

In June, flow of the Amu Darya River changed as follows by key gauging station: Kelif g/s –7,551 million m^3 (94% of the forecast), Birata g/s (inflow to TMWF) – 4,363 million m^3 (96% of the forecast), Tuyamuyun g/s (downstream of TMWF) – 2,100 million m^3 (82%), and Samanbay g/s - 77 million m^3 only (60% of planned supply).

In July, water withdrawal will be increased to 2,897 million m^3 in the first reach and to 1,468 million m^3 in the second reach. As expected, flow along the Amu Darya River will be transformed as follows: Kelif g/s – 8,232 million m^3, Birata g/s – 4,313 million m^3, Tuyamuyun g/s – 1,849 million m^3, and Samanbay g/s - 58 million m^3.

In June, inflow to the Large Aral Sea from the Amu Darya River and collecting drains (collectors) amounted to 217 million m^3 and no water was discharged from the Northern Aral Sea. The water level in the eastern part of the Large Aral Sea averaged 26.4 m, the water surface area was 1.1 thousand km^2, and the water volume was 0.9 km^3. In the western part, the water level varied within 22.1…22.4 m, the water surface area was 2.3...2.4 thousand km^2, and the water volume was 33.6…34.8 km^3.

It is expected that the inflow to the Large Aral Sea will decrease and will be 144 million m^3 in July. By the end of July, due to the decrease in inflow and an increase of evaporation from the water surface in the eastern part of the Large Aral Sea, the water level will decrease 26.2 m, the water surface area will shrink to 0.8 thousand km^2, and the water volume – to 0.7 km^3. In the western part of the Large Aral Sea the water level will be 22.4 m, the water surface area will be 2.4 thousand km^2, and the water volume will be 34.5 km^3.

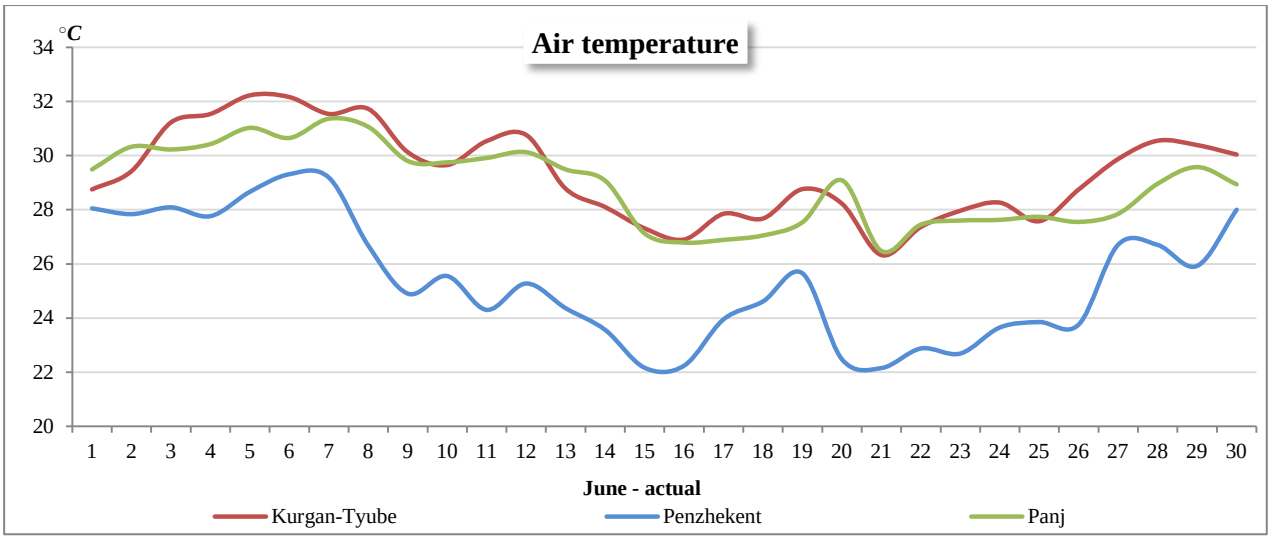
The sections below show daily and ten-day data on climate and water management (reservoirs, HEPS, water distribution).

Climate

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

Air temperature (**T**)

Station	Parameter		June			July		
			I ten-day	*II ten-day*	*III ten-day*	*I ten-day*	*II ten-day*	*III ten-day*
Panj	*T*, °*C*	*Forecast*	27.0	28.0	30.0	29.0	30.0	32.0
		Actual	30.4	28.3	27.9			
Kurgan-Tyube	*T*, °*C*	*Forecast*	27.0	28.0	30.0	30.0	31.0	31.0
		Actual	30.8	28.5	28.7			
Penzhekent	*T*, °*C*	*Forecast*	24.0	25.0	27.0	27.0	27.0	29.0
		Actual	27.6	23.9	24.6			

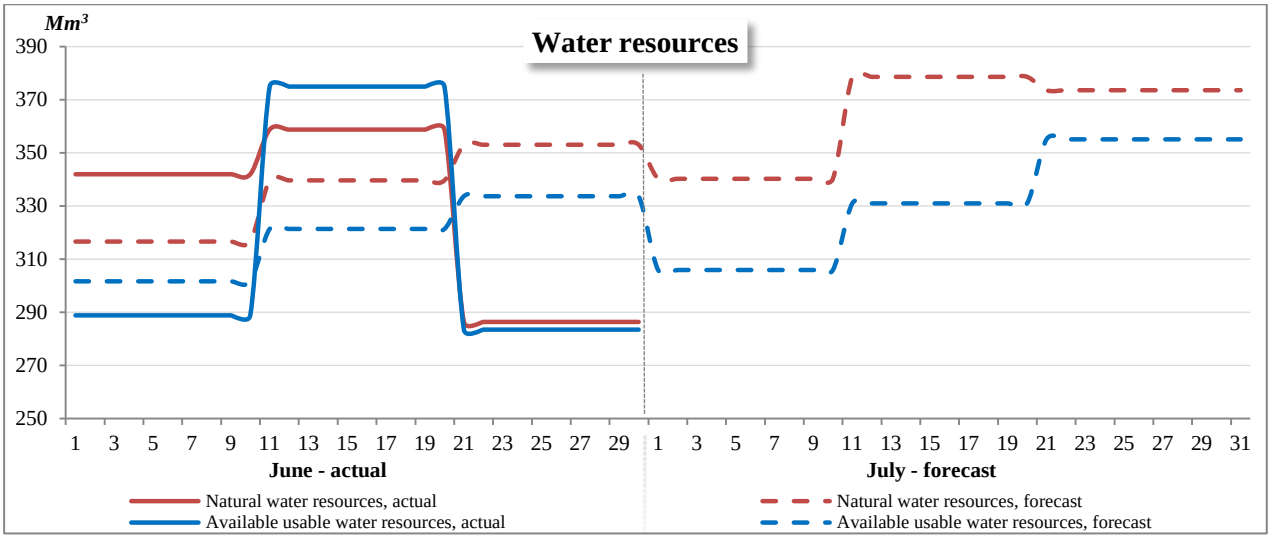


Water resources

Object
Amu Darya
Nurek reservoir
Atamyrat gauging station

Water volume (**W**)

Object	Parameter		June			July		
			I ten-day	*II ten-day*	*III ten-day*	*I ten-day*	*II ten-day*	*III ten-day*
River runoff: Atamyrat g/s	*W, Mm³*	*Forecast*	1814.4	2039.0	2160	1728.0	2160.0	2281.0
		Actual	2001	2280	1424			
Water withdrawal: upstream of Atamyrat g/s	*W, Mm³*	*Forecast*	1153	1167	1181	1191	1194	1320
		Actual	939	1064	1110			
Nurek reservoir /filling (+) or draw down (-)	*W, Mm³*	*Forecast*	198.7	190.1	190	484	432	508
		Actual	479.1	243.6	330			
Natural water resources at Atamyrat g/s	*W, Mm³*	*Forecast*	3166	3397	3531	3402.5	3786.0	4109
		Actual	3420	3588	2864			
Lateral inflow: downstream of Atamyrat g/s	*W, Mm³*	*Forecast*	92	81	82	81	82	94
		Actual	86.8	87.2	60			
Open channel losses: downstream of Atamyrat g/s	*W, Mm³*	*Forecast*	241	264	276	425	558	297
		Actual	617.8	-74.6	89			
Available usable water resources	*W, Mm³*	*Forecast*	3017	3214	3337	3059	3310	3906
		Actual	2889	3749	2835			

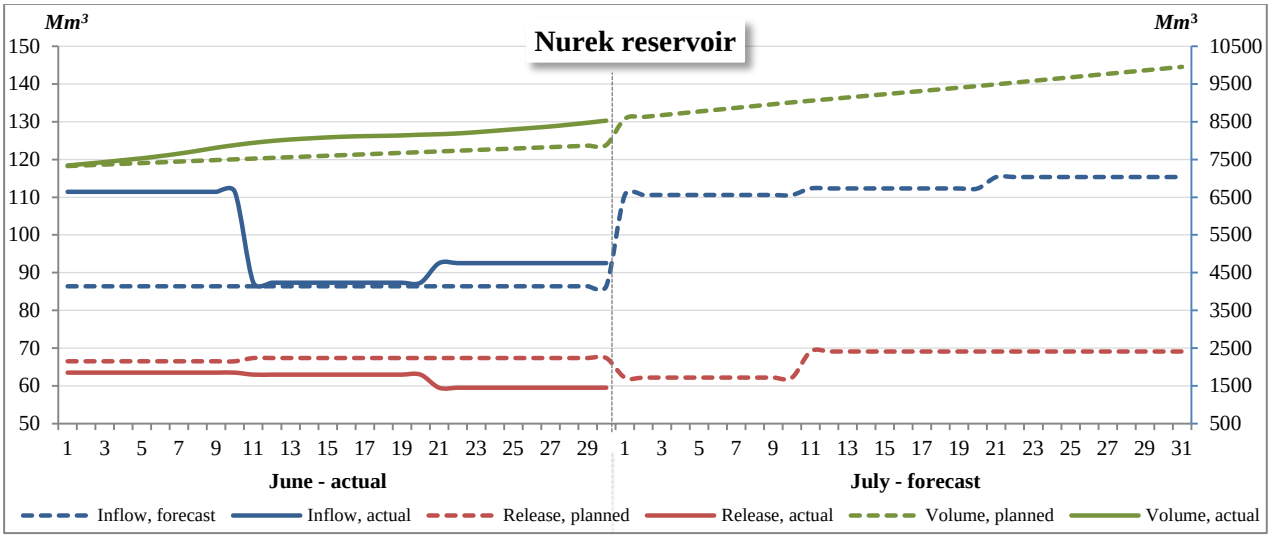


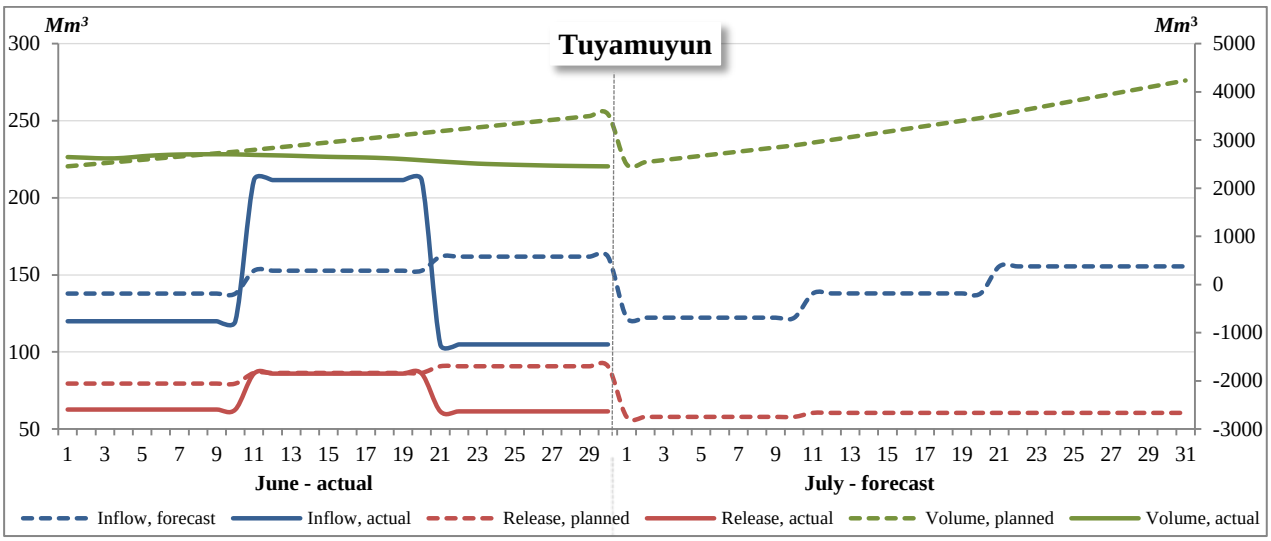
Reservoirs and HEPS

Reservoir	Location			Characteristics				
	Latitude	Longitude	Altitude above sea level, m	Length, km	Width, km	Water-surface area, km²	Full volume, km³	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**)

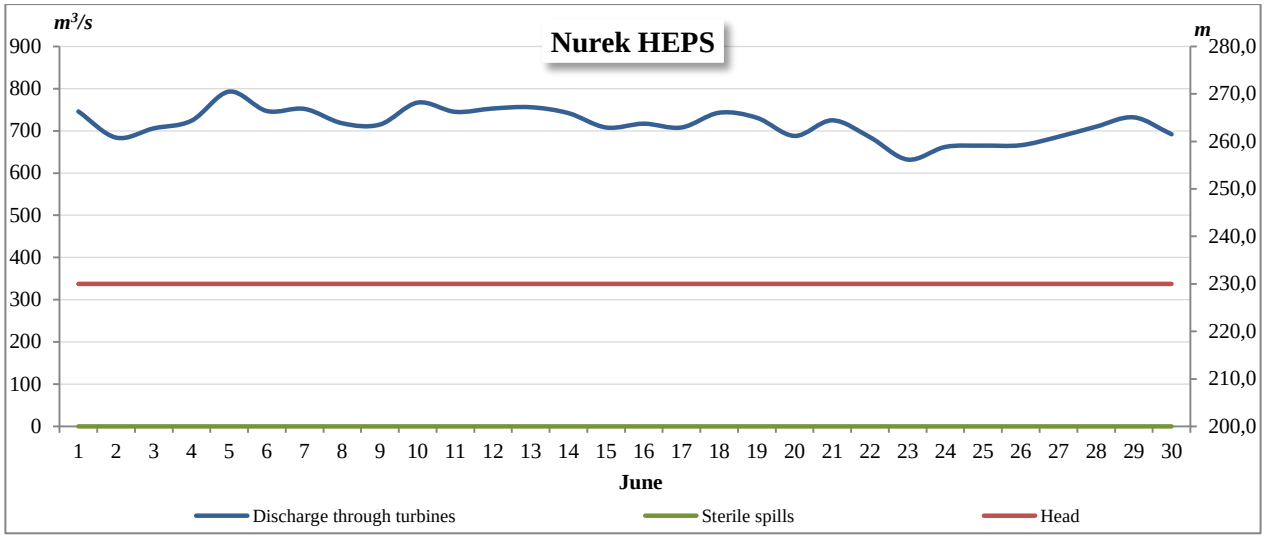
Reservoir	Parameter		June			July		
			I ten-day	*II ten-day*	*III ten-day*	*I ten-day*	*II ten-day*	*III ten-day*
Nurek reservoir	*I, Mm³*	*Forecast*	864.0	864.0	864	1106	1123	1269
		Actual	1114.3	873.5	925			
	R, Mm³	*Planned*	665.3	673.9	674	622	691	760
		Actual	635.2	629.9	595			
	W, Mm³	*Planned*	7503.7	7693.8	7884	9013	9444.8	9953.3
		Actual	7880	8156	8529			
Reservoirs of Tuyamuyun waterworks facility	*I, Mm³*	*Forecast*	1378.8	1527	1618	1222	1380	1711
		Actual	1199.2	2115.1	1049			
	R, Mm³	*Planned*	794.9	864.0	907	579	605	665
		Actual	626.5	859.5	614			
	W, Mm³	*Planned*	2758	3144	3536	2889	3457	4236
		Actual	2702	2580	2453			

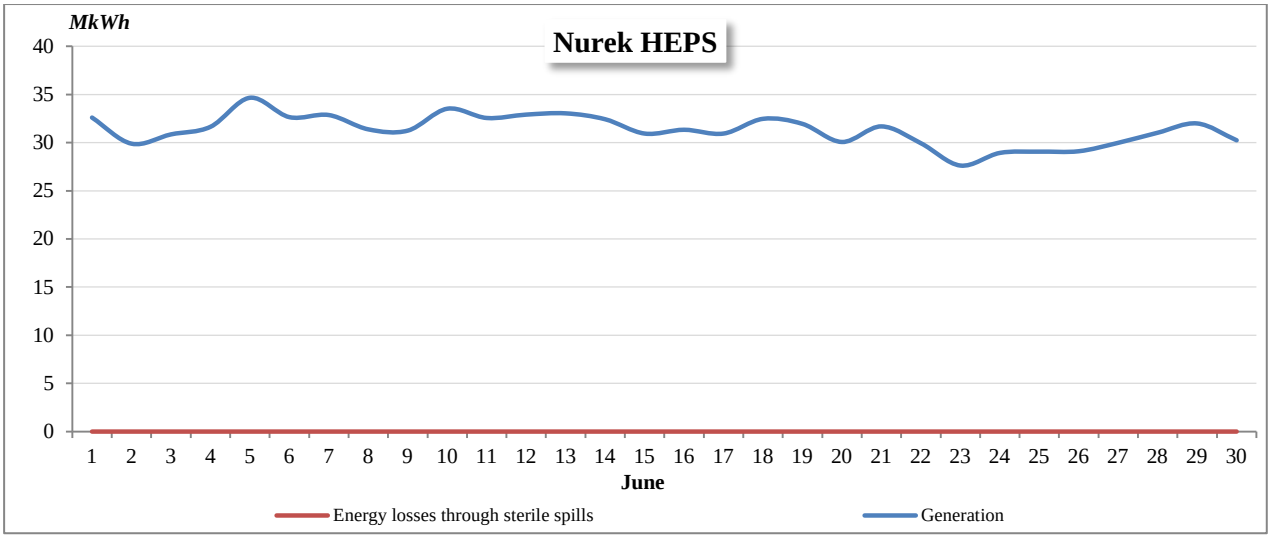


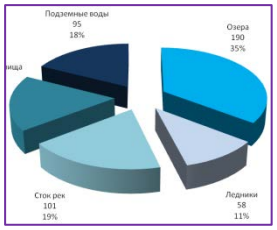


Generation (**G**), Energy losses through sterile spills (**L**), Discharge through turbines (**Q**), Sterile spills (**R**), Head (**H**)

HEPS	Parameter		June		
			I ten-day	*II ten-day*	*III ten-day*
Nurek	*G, MkWh*	*Actual*	34.65	33.04	31.99
	L, MkWh	*Actual*	0	0	0
	Q, m^3/s	*Actual*	735.2	729.1	685.5
	R, m^3/s	*Actual*	0	0	0
	H, m	*Actual*	230	230	230





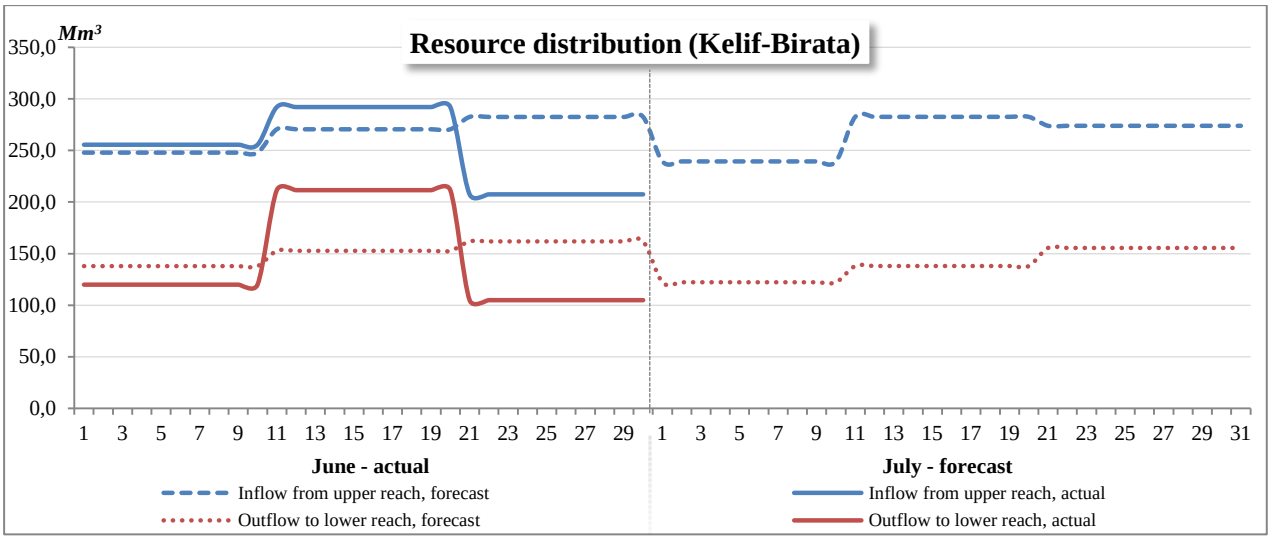


Water distribution

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

Water volume (W)

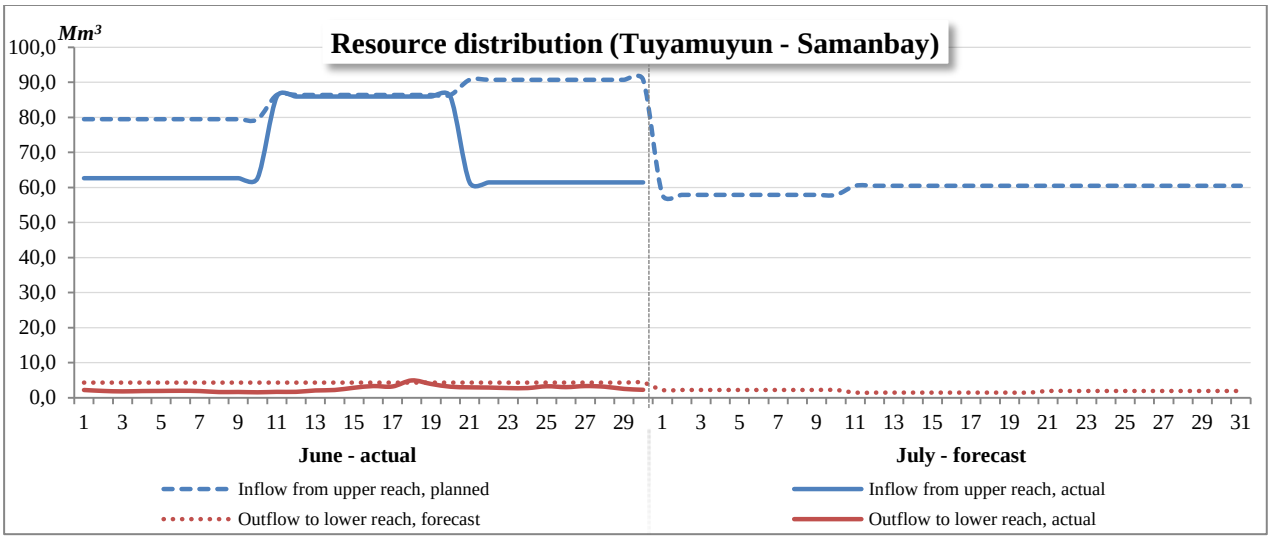
Kelif - Birata	Parameter		June			July		
			I ten-day	*II ten-day*	*III ten-day*	*I ten-day*	*II ten-day*	*III ten-day*
Inflow from upper reach	*W, Mm³*	*Forecast*	2479	2705	2825	2394	2826	3013
		Actual	2556	2921	2074			
Lateral inflow	*W, Mm³*	*Forecast*	92	81	82	81	82	94
		Actual	86.8	87.2	60			
Water withdrawal	*W, Mm³*	*Planned*	950	995	1013	828	970	1099
		Actual	828	970	999			
Losses	*W, Mm³*	*Forecast*	241	264	276	425	558	297
		Actual	615	-77	87			
Outflow to lower reach	*W, Mm³*	*Forecast*	1378.8	1527	1618	1222	1380	1711
		Actual	1199.2	2115.1	1049			



Water volume (W)

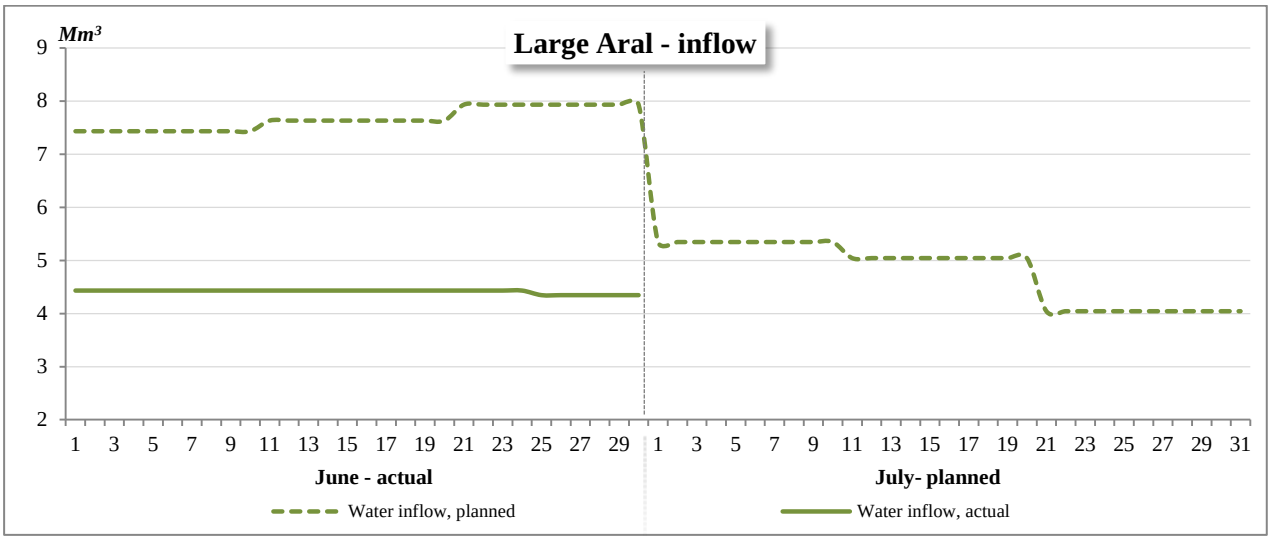
Tuyamuyun - Samanbay	Parameter		June			July		
			I ten-day	*II ten-day*	*III ten-day*	*I ten-day*	*II ten-day*	*III ten-day*
Inflow from upper reach	*W, Mm³*	*Forecast*	794.9	864	907	578.9	605	665
		Actual	626.5	859.5	614			
Lateral inflow	*W, Mm³*	*Forecast*	0.0	0	0	0	0	0
		Actual	0.0	0.0	0			
Water withdrawal [1]	*W, Mm³*	*Planned*	553.0	605	638	405	570	494
		Actual	405	570	449			
Losses	*W, Mm³*	*Forecast*	198.7	216	226	152	20	150
		Actual	203.2	260	137			
Outflow to lower reach	*W, Mm³*	*Forecast*	43.2	43	43	22	15	21
		Actual	19	29	29			

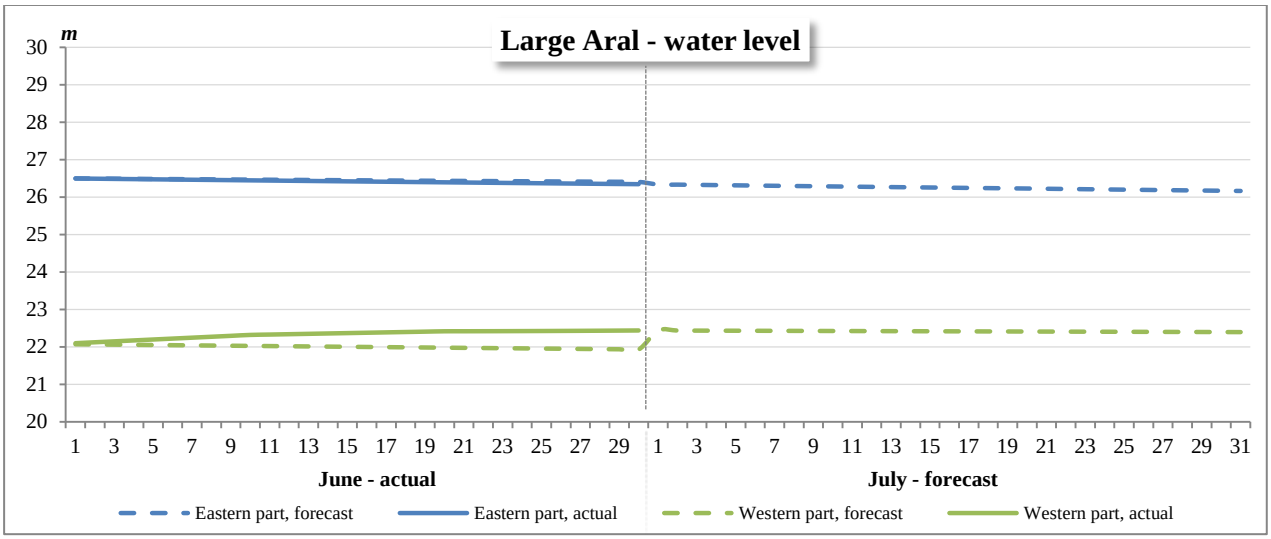
[1] *Note: Including supply to the system of lakes and environmental water releases into canals*

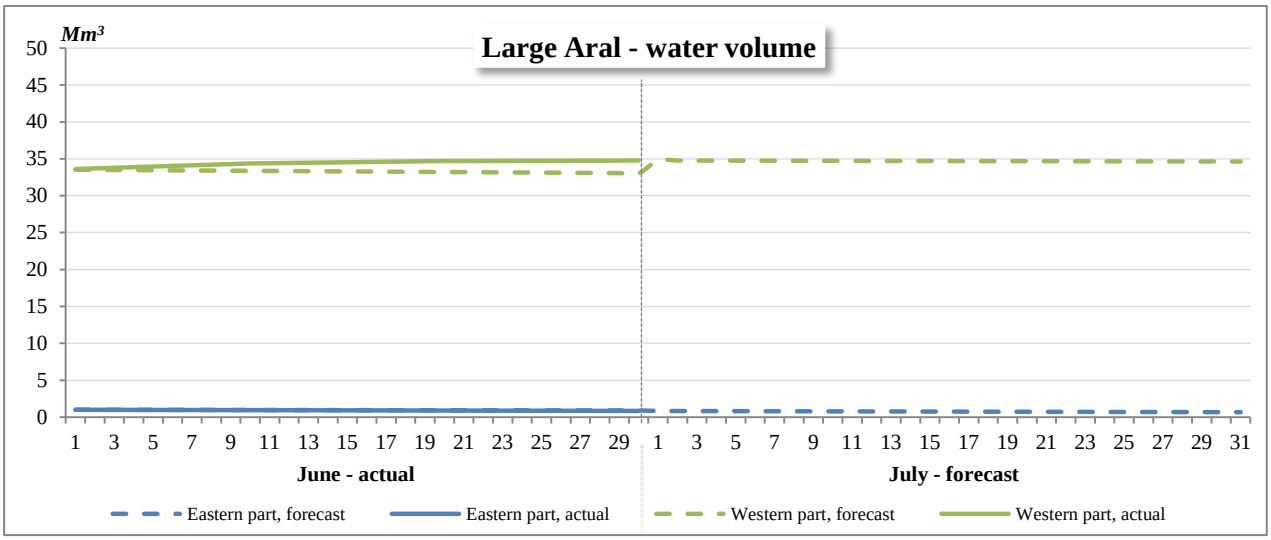


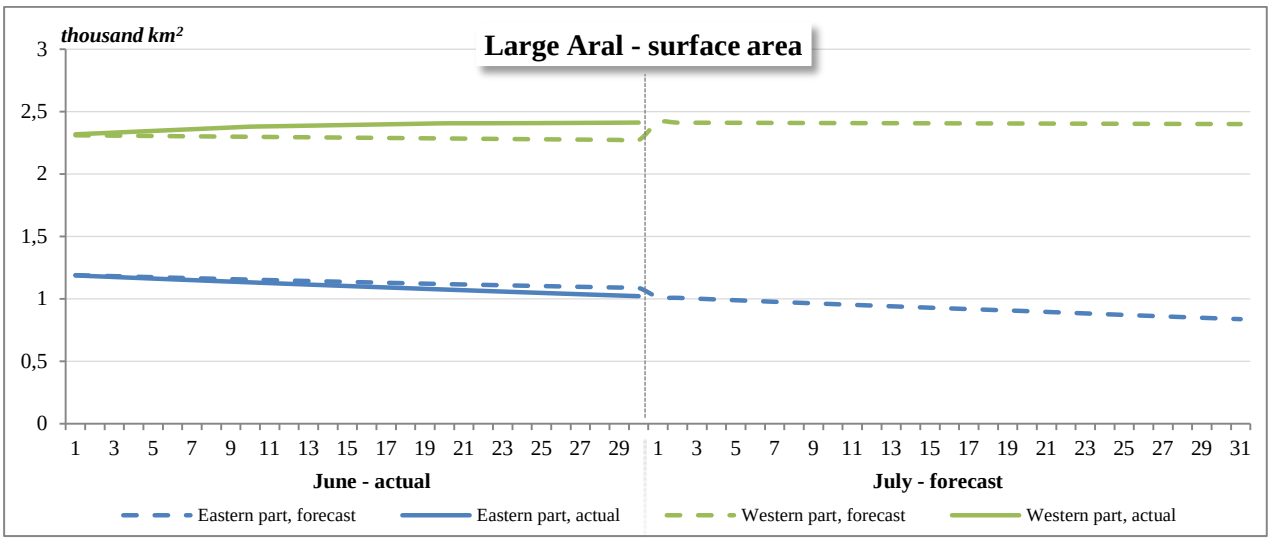
Water volume (**W**), Level (**H**), Surface area (**S**)

Large Aral Sea	Parameter		June			July		
			I ten-day	*II ten-day*	*III ten-day*	*I ten-day*	*II ten-day*	*III ten-day*
Inflow	*W, Mm³*	*Planned*	70.00	72.00	75.00	50.00	50.00	44.00
		Actual	40.00	40.00	40.00			
Eastern part, water volume	*W, Mm³*	*Forecast*	0.99	0.96	0.92	0.82	0.76	0.70
		Actual	0.98	0.92	0.87			
Eastern part, level	*H, m*	*Forecast*	26.48	26.45	26.42	26.31	26.25	26.19
		Actual	26.47	26.42	26.37			
Eastern part, area	*S, th.km²*	*Forecast*	1.17	1.13	1.10	0.99	0.93	0.87
		Actual	1.16	1.10	1.04			
Western part, water volume	*W, Mm³*	*Forecast*	33.45	33.29	33.12	34.75	34.70	34.65
		Actual	34.00	34.55	34.73			
Western part, level	*H, m*	*Forecast*	22.05	22.00	21.95	22.43	22.42	22.40
		Actual	22.21	22.37	22.43			
Western part, area	*S, th.km²*	*Forecast*	2.30	2.29	2.28	2.41	2.41	2.40
		Actual	2.35	2.39	2.41			




Large Aral - water level
m
30
29
28
27
26
25
24
23
22
21
20
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
June - actual
July - forecast
Eastern part, forecast
Eastern part, actual
Western part, forecast
Western part, actual


Large Aral - water volume
Mm³
50
45
40
35
30
25
20
15
10
5
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
June - actual
July - forecast
Eastern part, forecast
Eastern part, actual
Western part, forecast
Western part, actual


Large Aral - surface area
thousand km²
3
2,5
2
1,5
1
0,5
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
June - actual
July - forecast
Eastern part, forecast
Eastern part, actual
Western part, forecast
Western part, actual

Syr Darya River Basin

Actual Situation in June and Forecast for July

In June, 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 3,878 million m^3. The cumulative inflow to the three reservoirs was 3,298 million m^3 (89% of the forecast). In July, the available usable water resources are expected in the amount of 5,235 million m^3, including 4,374 million m^3 of inflow to the three reservoirs.

In June, inflow to the Toktogul reservoir was 1,939 million m^3 (85% of flow in May), and water releases from the reservoir amounted to 1,046 million m^3. The water volume in the Toktogul reservoir was 10,230 million m^3 by the beginning of month and in the course of June increased by 839 million m^3, reaching 11,069 million m^3 (98% of accumulation plan) by the end of month. The reservoir water balance showed a negative discrepancy of 54 million m^3, indicating to water losses in the reservoir. It is expected that in July the Toktogul reservoir will accumulate water and by the end of month the water volume will be 11,841 million m^3; inflow to the reservoir is expected in the amount of 1,897 million m^3, while water releases are planned at 1,125 million m^3.

In June, inflow to the Andizhan reservoir was 395 million m^3, and water releases from the reservoir were 450 million m^3. The reservoir's water volume decreased from 1,187 million m^3 at the beginning of month to 1,143 million m^3 at the end of month (94% of planned one). The unrecorded inflow in the amount of 11 million m^3 was detected. In July, inflow to the Andizhan reservoir is expected to be 275 million m^3 and water releases will be 482 million m^3. The reservoir will be drawn down to 936 million m^3.

Inflow to the Bakhri Tojik reservoir was 847 million m^3 (106% of the forecast), while water releases from the reservoir were 1,130 million m^3 (89% of the plan) in June. The water volume decreased from 3,472 million m^3 at the beginning of month to 3,105 million m^3 (103% of the plan) by the end of month. Water losses in the reservoir were detected by the balance method in the amount of 84 million m^3. In July, inflow to the Bakhri Tojik reservoir is expected to decrease to 744 million m^3, but water releases from the reservoir will increase to 1,481 million m^3. The reservoir will be drawn down to 2,378 million m^3.

In June, the Charvak reservoir was filled with water from 1,543 million m^3 to 1,868 million m^3 (89% of the plan). Inflow to the reservoir was 964 million m^3 (81% of the forecast), and water releases were 751 million m^3. The unrecorded inflow in the amount of 112 million m^3 was detected by the balance method in the reservoir. In July, the Charvak reservoir will accumulate water and its volume will increase to 1,913 million m^3 by the end of month. Inflow to the reservoir is expected in the amount of 902 million m^3, while 857 million m^3 of water is to be released.

Inflow to the Shardara reservoir was 183 million m^3 only (35% of the forecast) and water releases from the reservoir amounted to 611 million m^3 (45% of the plan) in June. The reservoir was drawn down from 4,120 million m^3 to 3,327 million m^3, and water was not discharged into Arnasai. Water diversion from the reservoir amounted to 104 million m^3. Balance discrepancy (indicating to flow losses) was 260 million m^3. In July, inflow to the Shardara reservoir is expected to increase to 482 million m^3, and water releases will also increase to 1,339 million m^3. This will lead to lowering of reservoir's water volume to 2,175 million m^3 by the end of month. Water discharge into Arnasai is not planned in July.

The Koksarai reservoir did not accumulate water in June. Water discharge from the reservoir into the Syr Darya River amounted to 805 million m^3, i.e. exceeded the plan by 14%. The water

volume in the reservoir decreased from 908 million m^3 to 105 million m^3. Water losses in the reservoir were estimated at 2 million m^3 by the balance method. In July, accumulation of water in the Koksarai reservoir is not planned. Discharge of water from the reservoir into the river will be 64 million m^3. The reservoir will be drawn down almost fully to 64 million m^3.

In June, energy generation by the cascade of Naryn HEPS amounted to 920 million kWh against planned 855 million kWh, i.e. by 8% more than the plan, including 791 million kWh under energy-generation regime. The Toktogul HEPS generated 358 million kWh (8% more than the plan) in June. The average discharge through turbines of Toktogul HEPS was 405 m^3/s, and the average head at HEPS was 141 m. No sterile spills were observed. The plan of energy generation for July for the cascade of Naryn HEPS is set at 958 million kWh, including 372 million kWh for Toktogul HEPS.

In June, the total generation at large HEPS of Uzbekistan amounted to 318 million kWh, of which: 236 million kWh at Charvak HEPS, 17 million kWh at Farkhad HEPS, and 65 million kWh at Andizhan HEPS. The discharge at Charvak HEPS was 267 m^3/s, and the head was 142 m. The discharge at Farkhad HEPS was 88 m^3/s, and the head was 31 m. For Andizhan HEPS, the discharge was 115 m^3/s, and the head was 95 m.

Energy generation by HEPS of the Bakhri Tojik reservoir and by Shardara HEPS amounted to 79 million kWh in June. Water discharge at HEPS of Bakhri Tojik was 399 m^3/s, while the head was 20 m. Discharge at Shardara HEPS was 229 m^3/s, and the head was 20 m only.

In June, water 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 14% of planned water withdrawal. The balance discrepancy that can be attributed to open channel losses was 121 million m^3 (12% 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 1% only, and the balance discrepancy that can be attributed to unrecorded inflow was 4% of the flow at the head of the reach. In the reach of Bakhri Tojik reservoir – Shardara reservoir water shortage accounted for 61%, and the open-channel balance discrepancy (losses) was 191 million m^3 (19%). In the lower reaches of the Syr Darya River (downstream of Shardara reservoir) the open-channel balance discrepancy (losses) was recorded at 285 million m^3 - 20% of river flow at the head of the reach (downstream of spillway from the Koksarai reservoir into the river); water shortage was 4%.

In June, the flow along the Naryn – Syr Darya rivers changed as follows: discharge from the Toktogul reservoir –1,046 million m^3 (105% of BWO SyrDarya's schedule), Akjar g/s (inflow to the Bakhri Tojik reservoir) – 847 million m^3 (106% of the forecast), inflow to the Shardara reservoir – only 183 million m^3 (35% of the forecast), Syr Darya – tail-water of the Shardara reservoir – 611 million m^3 (45% of BWO SyrDarya's schedule), and, inflow to the Northern Aral Sea - 12 million m^3 (90% of the forecast).

In June, inflow to the Northern Aral Sea was 12 million m^3 only. No water was discharged from the Northern Aral Sea into the Large Aral Sea (Amu Darya Basin). The water level varied within 41.9…42 m. The water surface area was 3.11…3.13 thousand km^2 and the water volume was 24.9…25.2 km^3.

It is expected that in July inflow to the Northern Aral Sea will decrease to 5 million m^3, and no discharge into the Large Aral Sea will be made. The water level will be 41.9 m, the water surface area will be 3.1 thousand km^2, and the water volume will be 24.7 km^3 by the end of month.

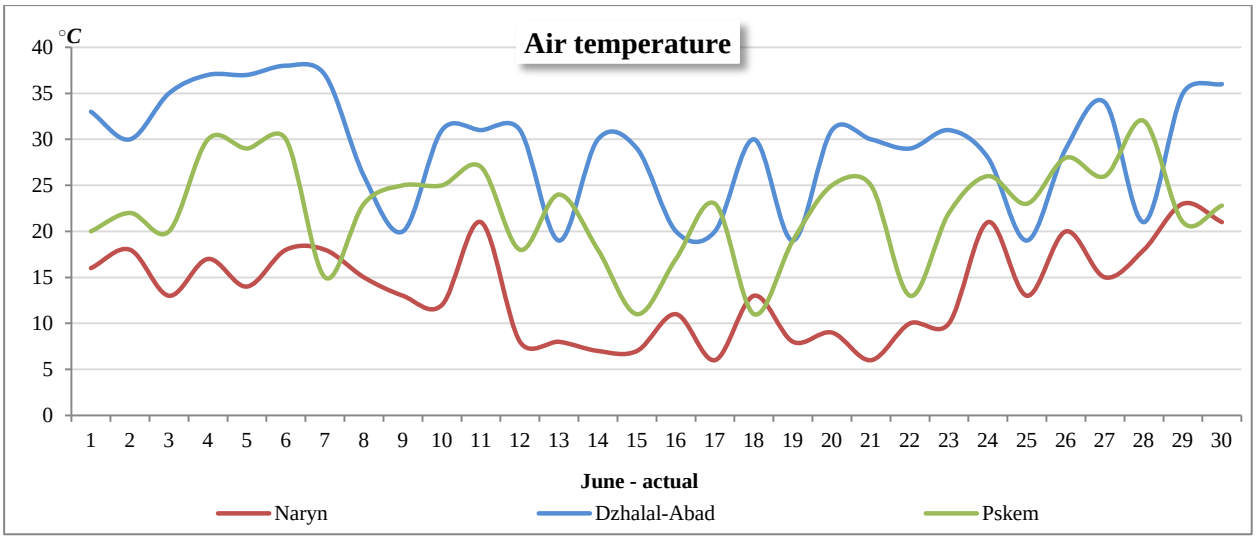
The sections below show daily and ten-day data on climate and water management (reservoirs, HEPS, water distribution).

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		June			July		
			I ten-day	*II ten-day*	*III ten-day*	*I ten-day*	*II ten-day*	*III ten-day*
Naryn	*T*. °C	*Forecast*	16.0	17.0	19.0	19.0	20.0	21.0
		Actual	15.4	9.8	15.7			
Dzhalal-Abad	*T*. °C	*Forecast*	28.0	30.0	32.0	31.0	31.0	32.0
		Actual	32.4	26.0	29.2			
Pskem	*T*. °C	*Forecast*	22.0	23.0	24.0	24.0	25.0	25.0
		Actual	23.9	19.3	23.9			

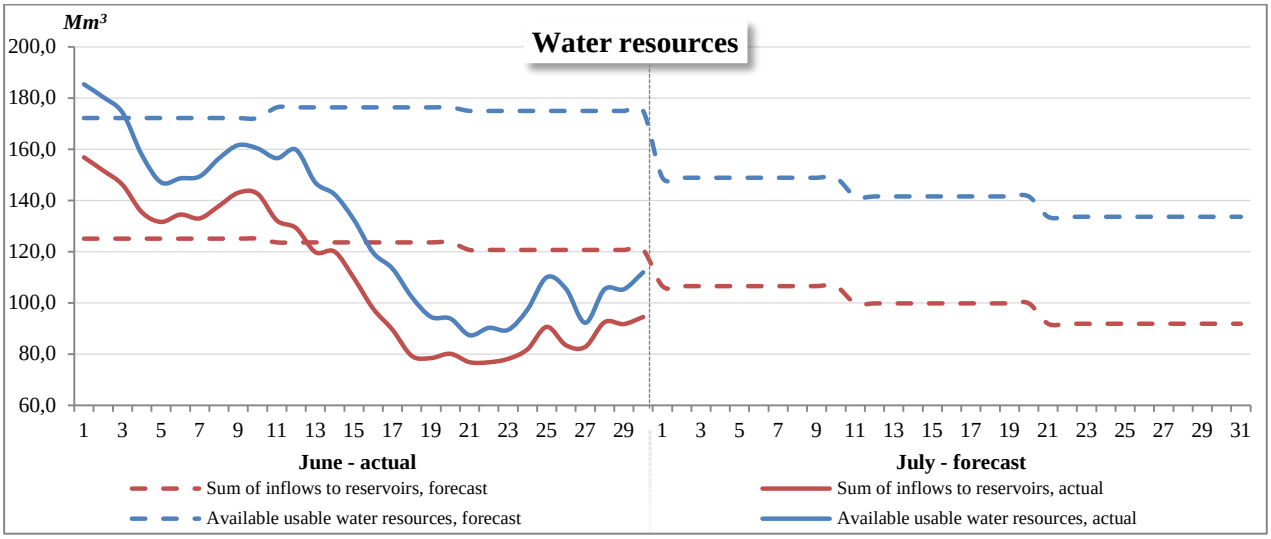


Water resources

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		June			July		
			I ten-day	*II ten-day*	*III ten-day*	*I ten-day*	*II ten-day*	*III ten-day*
Inflow to Toktogul reservoir	*W, Mm³*	*Forecast*	711	711	710.8	612	612	673.0
		Actual	823	594	522.3			
Inflow to Andizhan reservoir	*W, Mm³*	*Forecast*	143	121	103.7	104	95	76.0
		Actual	160	147	87.4			
Inflow to Charvak reservoir	*W, Mm³*	*Forecast*	397	404	392.3	350	291	261.4
		Actual	430	295	239.4			
Sum of inflows to reservoirs	*W, Mm³*	*Forecast*	1251	1236	1206.8	1065	998	1010.3
		Actual	1413	1036	849.2			
Lateral inflow up to Shardara	*W, Mm³*	*Forecast*	532	588	603.3	511	505	555.6
		Actual	269	286	205.9			
Losses	*W, Mm³*	*Forecast*	60	60	60.4	87	87	96.1
		Actual	60	60	60.4			
Available usable water resources	*W, Mm³*	*Forecast*	1722	1764	1749.6	1489	1416	1469.9
		Actual	1621	1262	994.7			

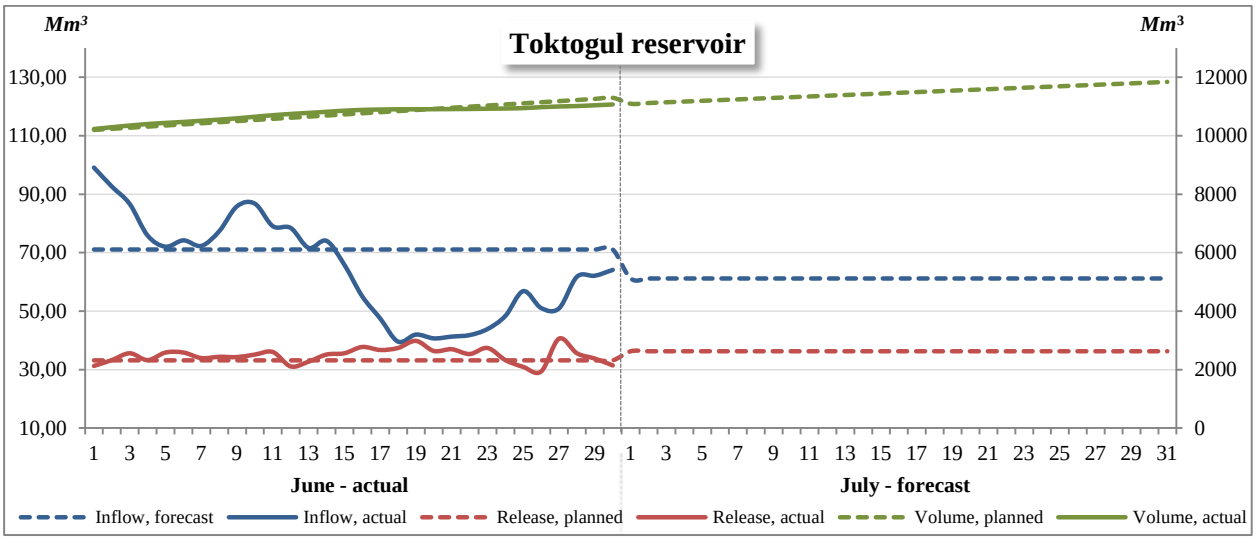


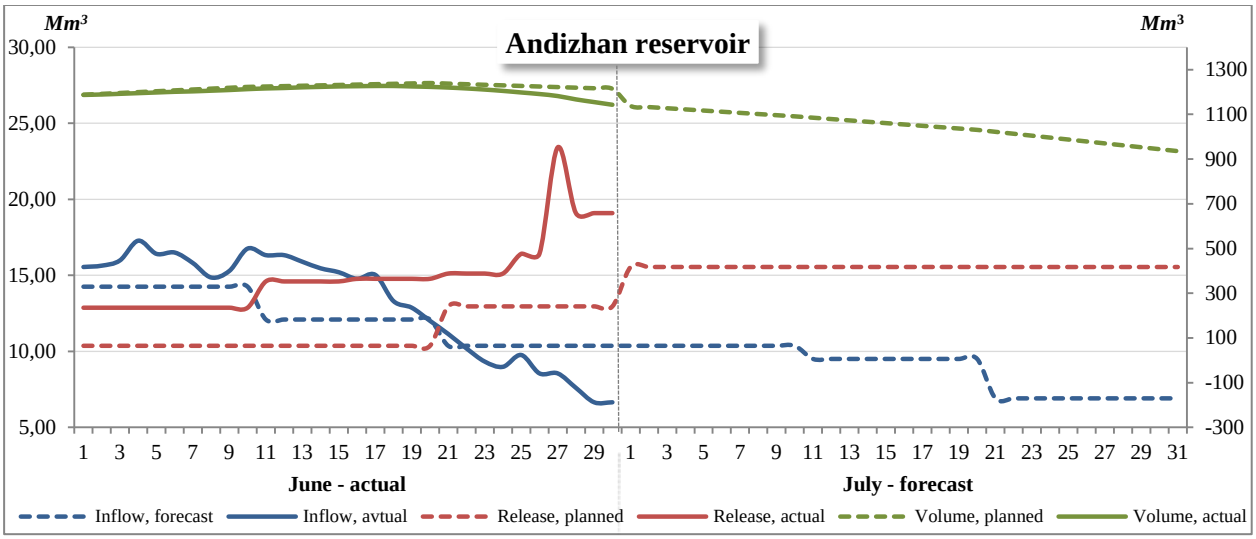
Reservoirs and HEPS

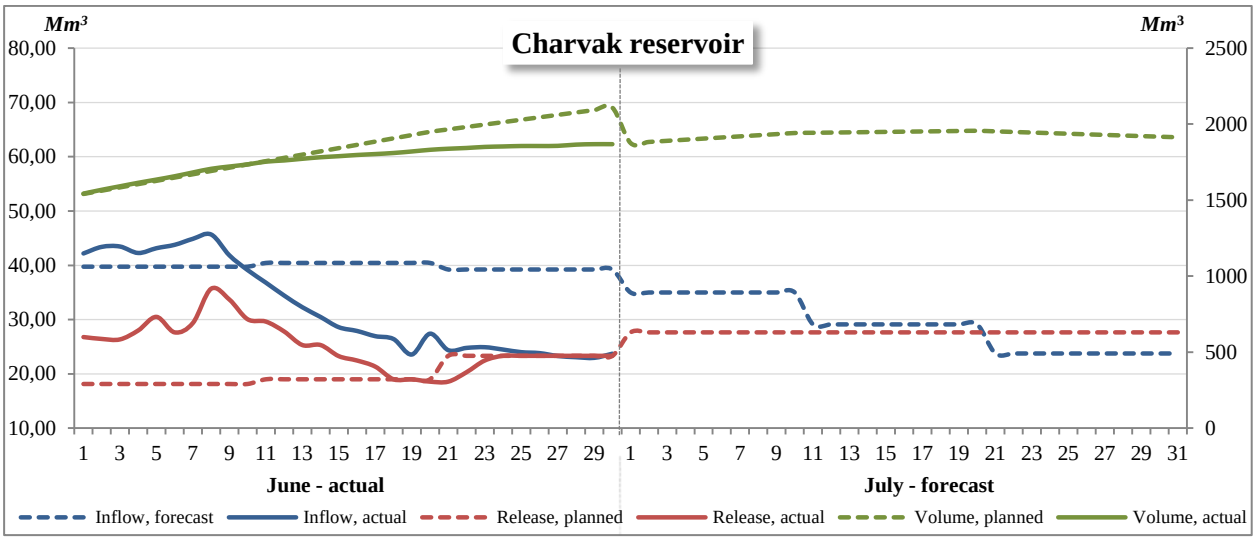
Reservoir	Location			Characteristics				
	Latitude	Longitude	Altitude above sea level, m	Length, km	Width, km	Water-surface area, km²	Full volume, km³	Full reservoir level, m
Toktogul	41.80	72.87	880	65	12	284	19.50	215
Andizhan	40.77	73.11	900	36	1.5-12	56	0.19	905
Bakhri Tojik	40.29	70.07	344	75	20	520	4.16	348
Charvak	41.63	70.03	869	15	3	37	1.90	906
Shardara	41.20	67.99	250	80	25	783	5.70	252

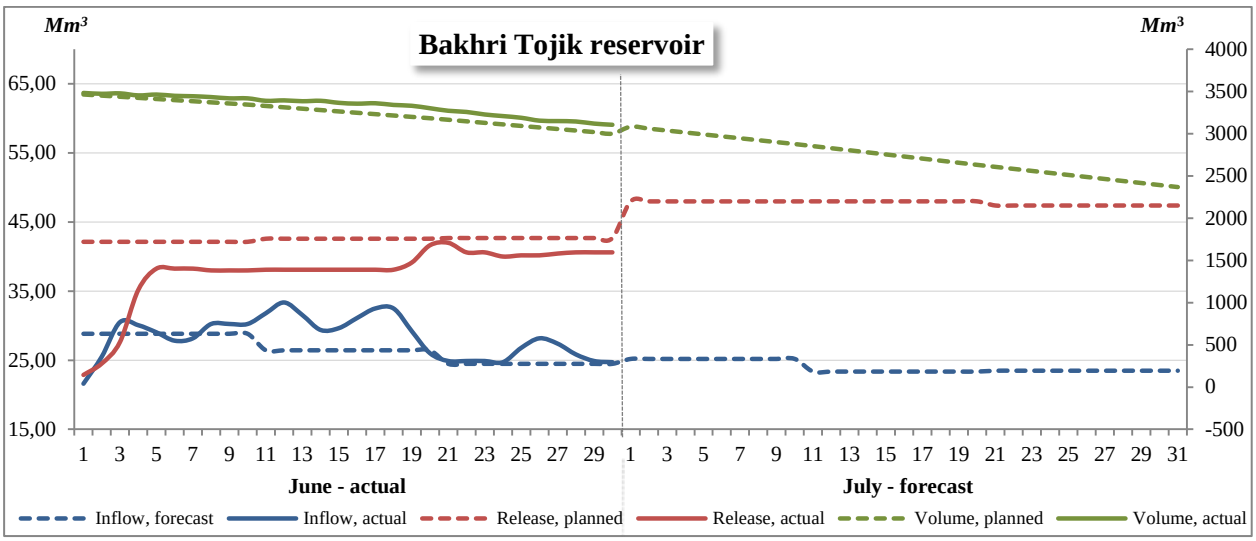
Inflow (**I**), Releases (**R**), Volume (**W**)

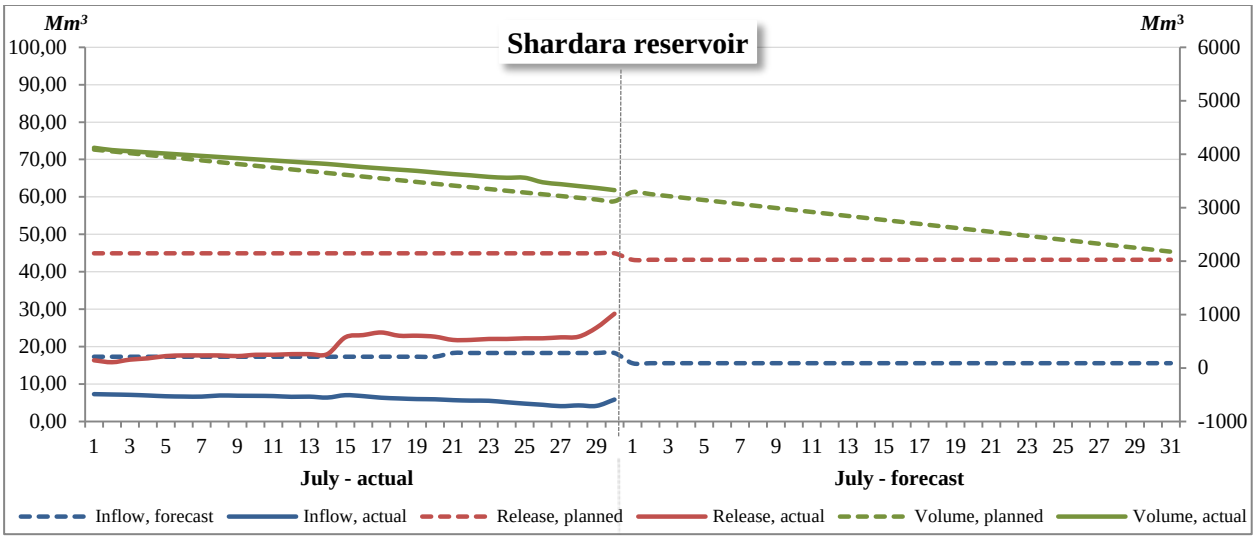
Reservoir	Parameter		June			July		
			I ten-day	*II ten-day*	*III ten-day*	*I ten-day*	*II ten-day*	*III ten-day*
Toktogul reservoir	*I, Mm³*	*Forecast*	710.81	710.81	710.81	611.78	611.78	672.96
		Actual	822.79	593.83	522.29			
	R, Mm³	*Planned*	331.78	331.78	331.78	362.88	362.88	399.17
		Actual	342.92	358.73	344.74			
	W, Mm³	*Planned*	10539	10918	11297	11318	11567	11841
		Actual	10650	10907	11069			
Andizhan reservoir	*I, Mm³*	*Forecast*	142.56	120.96	103.68	103.68	95.04	76.02
		Actual	160.10	147.23	87.44			
	R, Mm³	*Planned*	103.68	103.68	129.60	155.52	155.52	171.05
		Actual	128.74	146.88	174.01			
	W, Mm³	*Planned*	1223	1240	1214	1091	1031	936
		Actual	1213	1223	1143			
Charvak reservoir	*I, Mm³*	*Forecast*	397.44	404.35	392.26	349.92	291.17	261.36
		Actual	429.72	294.86	239.45			
	R, Mm³	*Planned*	181.44	190.08	233.28	276.48	276.48	304.13
		Actual	294.54	231.75	224.64			
	W, Mm³	*Planned*	1735	1949	2108	1941	1956	1913
		Actual	1735	1831	1868			
Bakhri Tojik reservoir	*I, Mm³*	*Forecast*	288.22	264.33	244.75	251.82	233.52	258.26
		Actual	283.39	306.98	257.13			
	R, Mm³	*Planned*	421.29	425.76	426.74	479.78	479.84	521.18
		Actual	338.85	385.48	405.76			
	W, Mm³	*Planned*	3344	3183	3001	2877	2631	2368
		Actual	3418	3301	3105			
Shardara reservoir	*I, Mm³*	*Forecast*	172.80	172.80	182.80	155.52	155.52	171.07
		Actual	69.04	64.37	49.33			
	R, Mm³	*Planned*	449.28	449.28	449.28	432.00	432.00	475.20
		Actual	171.07	209.43	230.95			
	W, Mm³	*Planned*	3783	3446	3119	2955	2584	2175
		Actual	3903	3657	3327			




Andizhan reservoir
Mm³
Mm³
30,00
25,00
20,00
15,00
10,00
5,00
1300
1100
900
700
500
300
100
-100
-300
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
June - actual
July - forecast
Inflow, forecast
Inflow, avtual
Release, planned
Release, actual
Volume, planned
Volume, actual

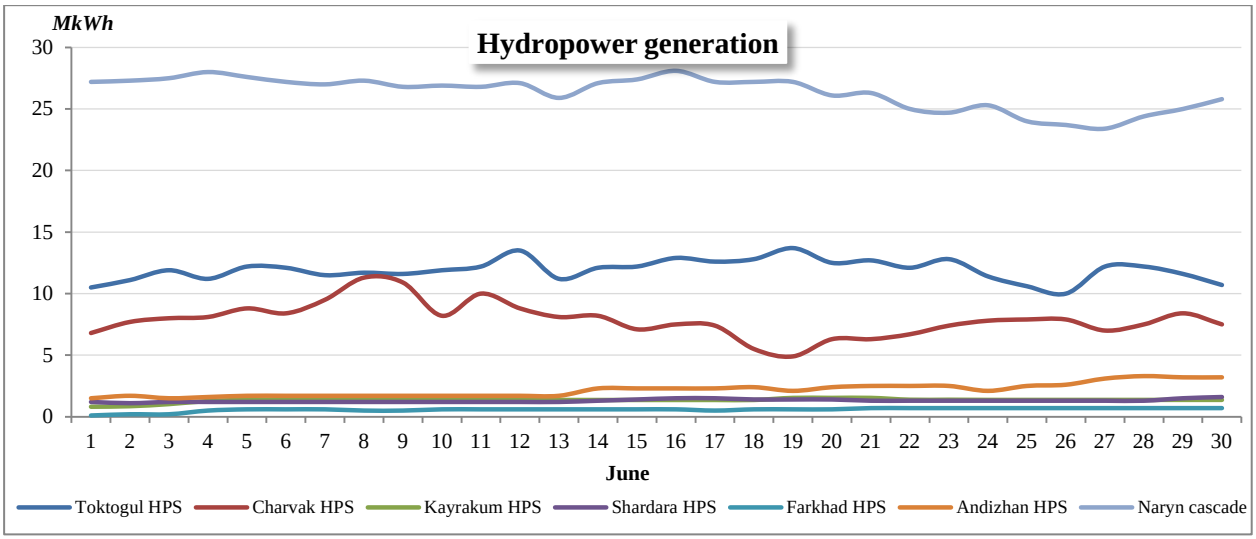

Charvak reservoir
Mm³
Mm³
80,00
70,00
60,00
50,00
40,00
30,00
20,00
10,00
2500
2000
1500
1000
500
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
June - actual
July - forecast
Inflow, forecast
Inflow, actual
Release, planned
Release, actual
Volume, planned
Volume, actual

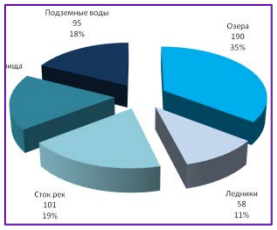

Bakhri Tojik reservoir
Mm³
Mm³
65,00
55,00
45,00
35,00
25,00
15,00
4000
3500
3000
2500
2000
1500
1000
500
0
-500
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
June - actual
July - forecast
Inflow, forecast
Inflow, actual
Release, planned
Release, actual
Volume, planned
Volume, actual



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

HEPS	Parameter		June		
			I ten-day	*II ten-day*	*III ten-day*
Naryn cascade	*G, M kWh*	*Actual*	288.4	329.8	302.0
Toktogul	*G, M kWh*	*Actual*	115.7	125.7	116.3
	Q, m^3/s	*Actual*	397	425.1	393
	H, m	*Actual*	140.2	141.8	141.8
Andizhan	*G, M kWh*	*Actual*	16.5	21.2	27.5
	Q, m^3/s	*Actual*	91.7	104.8	148.9
	H, m	*Actual*	95	95	95
Bakhri Tojik	*G, M kWh*	*Actual*	12.1	13.9	13.8
	Q, m^3/s	*Actual*	356	410	432
	H, m	*Actual*	20.1	20	18.9
Farkhad	*G, M kWh*	*Actual*	4.4	5.9	7
	Q, m^3/s	*Actual*	76.1	88.2	99.3
	H, m	*Actual*	30.6	30.6	30.6
Charvak	*G, M kWh*	*Actual*	87.7	73.8	74.4
	Q, m^3/s	*Actual*	304.7	248.5	247.2
	H, m	*Actual*	138.1	142.7	143.9
Shardara	*G, M kWh*	*Actual*	11.9	13.5	13.5
	Q, m^3/s	*Actual*	200	231	255
	G, M kWh	*Actual*	20.1	19.6	19



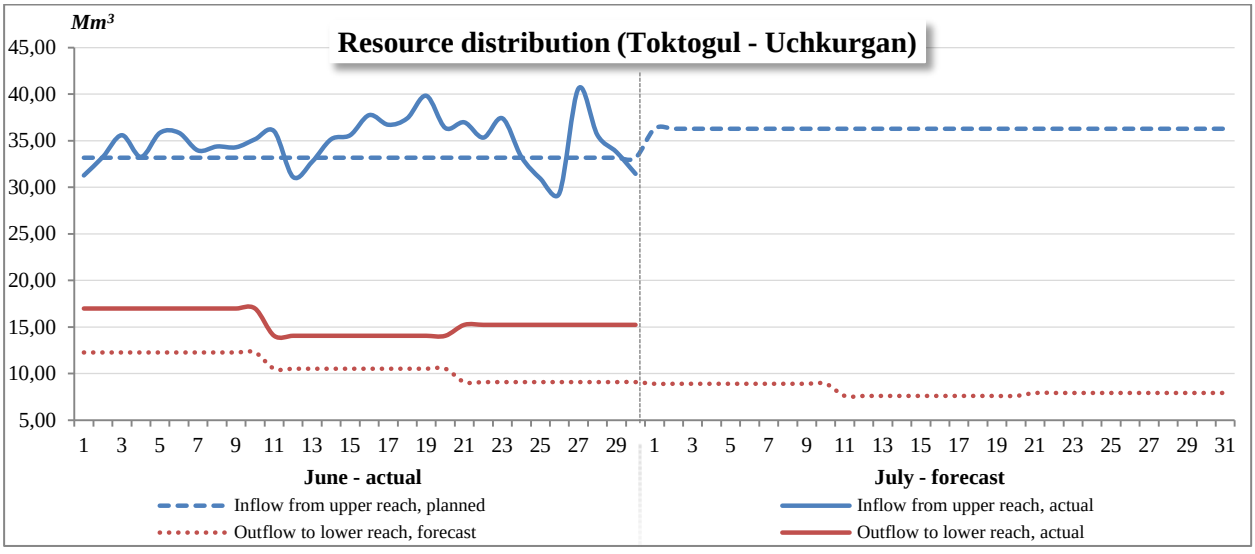


Water distribution

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**		**June**			**July**		
			I ten-day	*II ten-day*	*III ten-day*	*I ten-day*	*II ten-day*	*III ten-day*
Inflow from upper reach	*W, Mm³*	*Planned*	331.78	331.78	331.78	362.88	362.88	399.17
		Actual	342.92	358.73	344.74			
Lateral inflow[2]	*W, Mm³*	*Forecast*	83.93	83.93	83.93	56.04	56.04	61.61
		Actual	89.16	58.75	30.00			
Water withdrawals	*W, Mm³*	*Planned*	226.97	244.43	258.77	286.68	299.72	326.15
		Actual	215.96	230.71	193.62			
Losses	*W, Mm³*	*Forecast*	66.09	66.09	66.09	43.20	43.20	47.52
		Actual	46.26	46.20	28.80			
Outflow to lower reach[3]	*W, Mm³*	*Forecast*	122.65	105.19	90.85	89.04	76.00	87.11
		Actual	169.86	140.57	152.32			

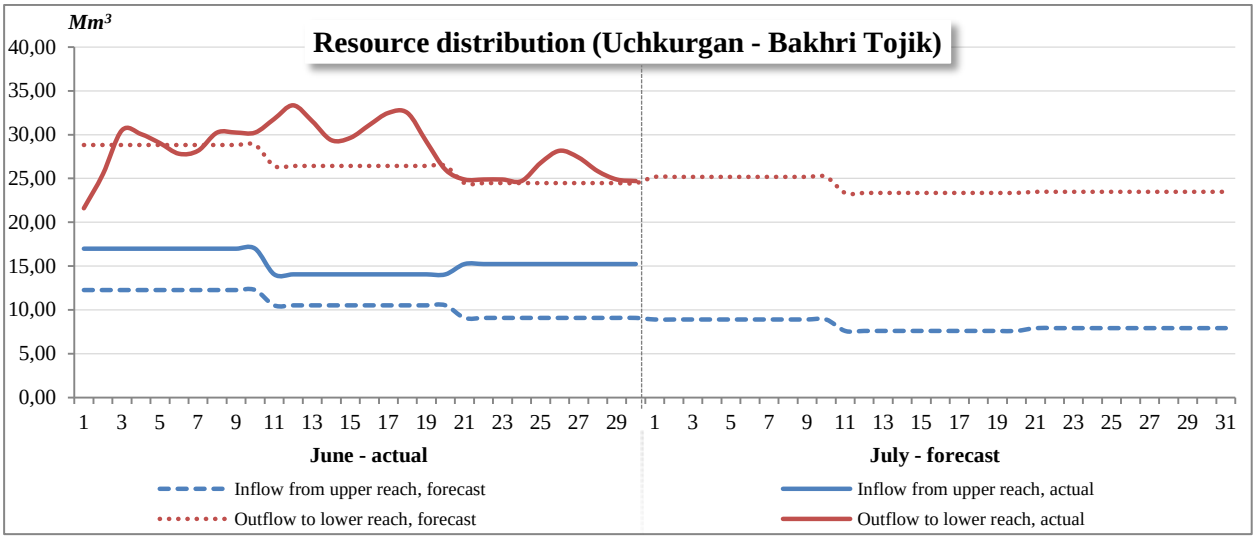


Water volume (**W**)

Uchkurgan – Bakhri Tojik	**Parameter**		**June**			**July**		
			I ten-day	*II ten-day*	*III ten-day*	*I ten-day*	*II ten-day*	*III ten-day*
Inflow from upper reach	*W, Mm³*	*Forecast*	122.65	105.19	90.85	89.04	76.00	87.11
		Actual	169.86	140.57	152.32			
Lateral inflow	*W, Mm³*	*Forecast*	220.97	217.15	213.61	231.75	230.92	251.89
		Actual	162.10	159.17	129.06			

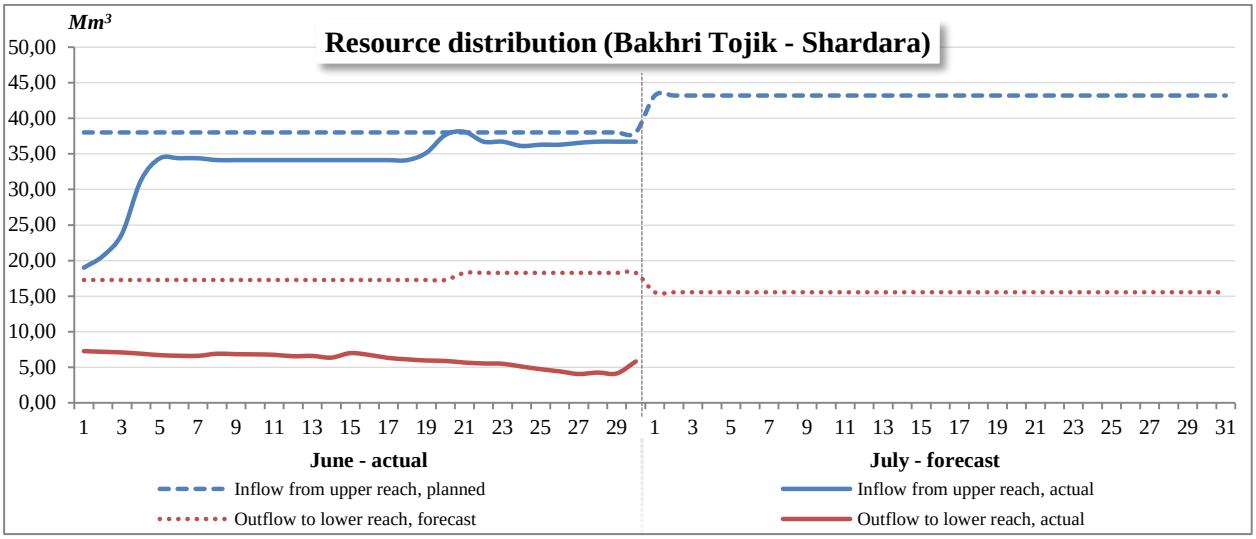
[2] *Incl. Karasu left and right*
[3] *Uchkurgan waterworks facility*

Water withdrawals	*W, Mm³*	*Planned*	25.40	28.01	29.71	38.97	43.40	47.74
		Actual	26.95	26.78	30.37			
Losses	*W, Mm³*	*Forecast*	30.00	30.00	30.00	30.00	30.00	33.00
		Actual	21.62	-34.02	-6.12			
Outflow to lower reach[4]	*W, Mm³*	*Forecast*	288.22	264.33	244.75	251.82	233.52	258.26
		Actual	283.39	306.98	257.13			



Water volume (**W**)

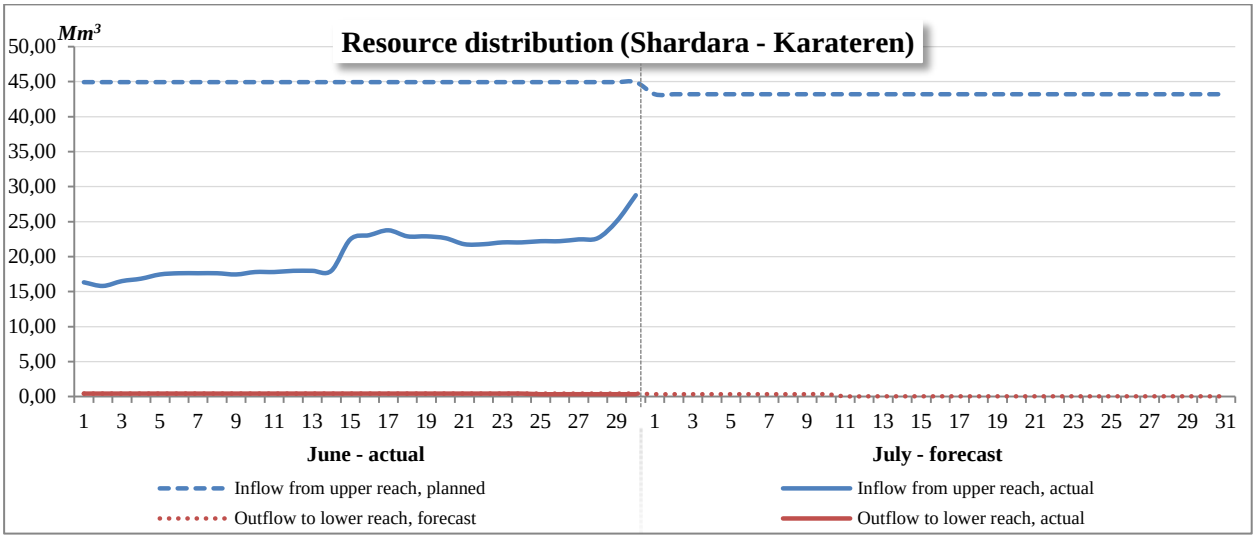
Bakhri Tojik - Shardara	Parameter		June			July		
			I ten-day	*II ten-day*	*III ten-day*	*I ten-day*	*II ten-day*	*III ten-day*
Inflow from upper reach[5]	*W, Mm³*	*Planned*	380.16	380.16	380.16	432.00	432.00	475.20
		Actual	300.24	345.86	366.94			
Lateral inflow	*W, Mm³*	*Forecast*	275.64	333.65	349.14	301.92	301.92	332.11
		Actual	91.67	101.14	85.20			
Water withdrawals	*W, Mm³*	*Planned*	453.00	511.01	516.50	518.40	518.40	570.24
		Actual	259.79	312.03	345.65			
Losses	*W, Mm³*	*Forecast*	30.00	30.00	30.00	60.00	60.00	66.00
		Actual	63.08	70.60	57.16			
Outflow to lower reach	*W, Mm³*	*Forecast*	172.80	172.80	182.80	155.52	155.52	171.07
		Actual	69.04	64.37	49.33			



[4] *Akdzhar g/s*
[5] *Kyzylkishlak g/s*

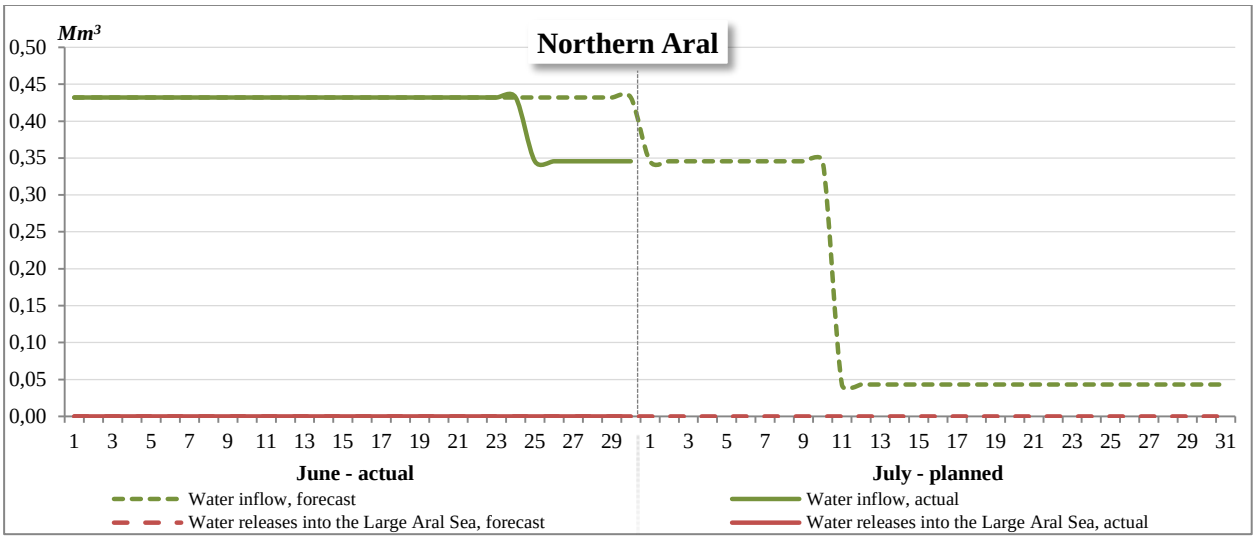
Water volume (**W**)

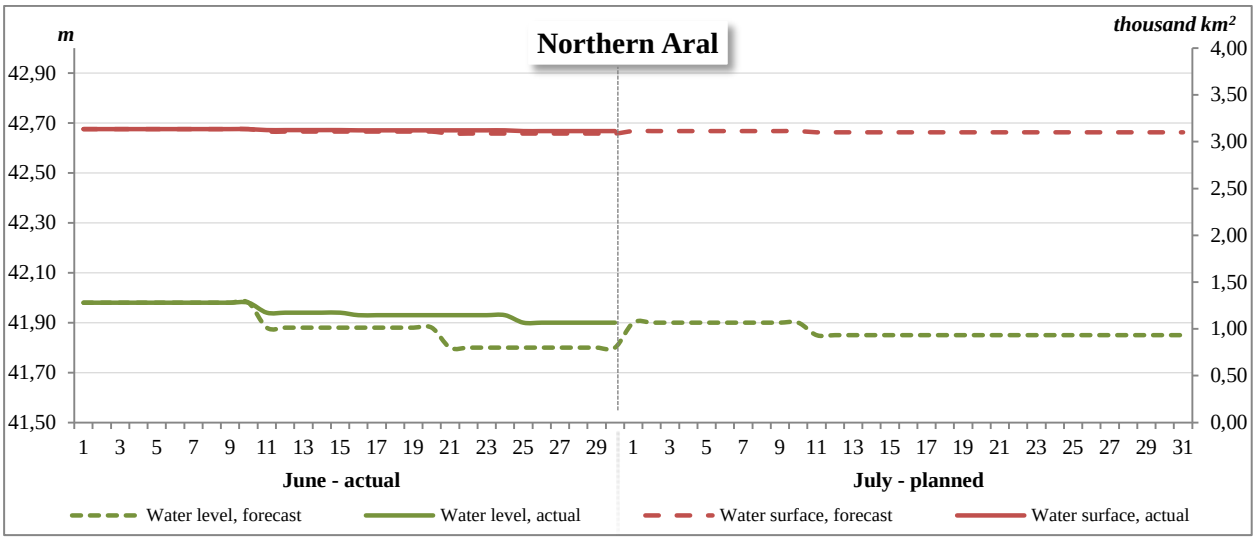
Shardara - Karateren	Parameter		June			July		
			I ten-day	*II ten-day*	*III ten-day*	*I ten-day*	*II ten-day*	*III ten-day*
Inflow from upper reach	*W, Mm³*	*Planned*	449.3	449.3	449.28	432.0	432.0	475.2
		Actual	171.1	209.4	230.95			
Lateral inflow	*W, Mm³*	*Forecast*	6.0	6.0	6.00	1	1.00	1
		Actual	0.043	0.043	0.04			
Filling (+), draw down (-) of Koksarai reservoir	*W, Mm³*	*Planned*	328.3	216.0	146.88	64	0.00	0
		Actual	317.1	272.2	216.00			
Water withdrawals	*W, Mm³*	*Planned*	374.6	356.0	347.31	354	346.61	362
		Actual	389.0	367.3	362.80			
Losses	*W, Mm³*	*Forecast*	404.7	310.9	250.53	140	85.96	114
		Actual	94.9	110.0	80.39			
Outflow to lower reach	*W, Mm³*	*Forecast*	4.3	4.3	4.32	3.5	0.43	0.48
		Actual	4.3	4.3	3.80			



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

Northern Aral	Parameter		June			July		
			I ten-day	*II ten-day*	*III ten-day*	*I ten-day*	*II ten-day*	*III ten-day*
Inflow	*W, Mm³*	*Forecast*	4.32	4.32	4.32	3.46	0.43	0.48
		Actual	4.32	4.32	3.80			
Water volume	*W, Mm³*	*Forecast*	25.17	24.87	24.63	24.93	24.78	24.78
		Actual	25.17	25.04	24.97			
Water level	*H, m*	*Forecast*	41.98	41.88	41.80	41.90	41.85	41.85
		Actual	41.98	41.94	41.91			
Water surface area	*S, th.km²*	*Forecast*	3.13	3.11	3.09	3.11	3.10	3.10
		Actual	3.13	3.12	3.12			
Water releases into the Large Aral Sea	*W, Mm³*	*Forecast*	0.00	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