



Aral Sea Basin Transboundary Water Early Warning Bulletin

July - August 2023



UNRCCA



A need for drafting and issuing given periodical Bulletin as a product for timely dissemination of information on the state-of-affairs in water, environment, and climate in the Aral Sea basin was raised during a seminar on “Early Warning on Potential Transboundary Water Problem Situations in Central Asia” (Almaty, 26 September 2011). The idea behind was to prevent problems or disputes arising. In the course of discussions with the UN Regional Centre for Preventive Diplomacy for Central Asia the riparian states in the Aral Sea basin have expressed their support for such an initiative as they repeatedly showed their interest in enhanced regional capacities for early warning and preparedness to potential hazards. This was reflected in the Aral Sea Basin Programs (ASBP-3 and ASBP-4). Past Bulletins issued in 2014-2022 have met expectations of the countries regarding such information.

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 2023. The format and content of the bulletins have been agreed with the client and with all organizations that provided source information. Given third Bulletin contains the actual information on the Syr Darya and Amu Darya basins for July 2023 and the forecast for August. The Bulletin also contains the information on the status of aquatic ecosystems in the South Aral Region that was not published before.

The following data sources were used in the Bulletin:

- BWO Amu Darya and BWO Syr Darya – data on water resources, their distribution in time (daily) 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.

Additionally, an Internet platform on telegra.ph is to be developed in September 2023 as part of the Project. The platform will contain all Bulletins issued since 2014 in both Russian and English.

Digest of CA news for July

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

Energy ministries of Kazakhstan, Kyrgyzstan and Uzbekistan discussed electricity supply, irrigation water provision and Kamarata-1 Project in Tashkent — [Tazabek](#)

New environmental security concept developed in Kyrgyzstan - | [24.KG](#)

Water Industry Day in Kazakhstan / 9 July 2023 ([anydaylife.com](#))

UN announces 2023-2025 Strategic Framework for Afghanistan | [TOLONews](#)

Turkmenistan and UNESCAP discuss sustainable transport, energy mobility and implementation of a resolution on the UN Special Programme for the Aral Sea Basin - News Central Asia ([nCa](#))

Heads of UN organizations discuss projects and issues related to efficient water use in the Aral Sea region ([uzdaily.uz](#))

Tajikistan sold electricity to its neighbors for \$44 million over half a year | Tajikistan News ASIA-Plus ([asiaplustj.info](#))

The Head of Turkmenistan split the Ministry of Agriculture | Krestyanskiye vedomosti ([kvedomosti.ru](#))

11 HEPS' to be put into operation in Kyrgyzstan in 2024 – Ministry of Energy ([kabar.kg](#))

First summit between the Central Asian states and the members of the Cooperation Council for the Arab States of the Gulf ([kommersant.ru](#))

3rd International Conference on Water and Climate | [World Water Council](#)

Task force on climate adaptation in CA established ([ekois.net](#))

Work started for cleaning the bottom of the Shardara reservoir – News — [Forbes Kazakhstan](#)

The Regional statement of Central Asian countries for the 28th UN Conference on climate change discussed in Almaty ([uzdaily.uz](#))

An event on green economy as a way to achieve economic security in Tajikistan held in Dushanbe | NIAT "Hovar" ([khovar.tj](#))

The above materials are taken from news media or websites and therefore SIC ICWC shall not bear any responsibility for the content of these materials.

Amu Darya River Basin

Actual Situation in July and Forecast for August

The available usable river water resources estimated as natural, non-regulated river flow plus lateral inflow to the river and minus losses amounted to 10,819 million m³ in July. The flow of the Amu Darya at Kelif section (upstream of intake to Garagumdarya) regulated by the Nurek reservoir was estimated at 9,877 million m³ (102% of the forecast). It is expected for August that the available usable water resources will decrease to 8,655 million m³, and the river flow at Kelif section will decrease to 7,162 million m³.

Inflow to the Nurek reservoir was 4,286 million m³ (by 7% more than the forecast) in July. Water releases from the reservoir amounted to 3,081 million m³ (by 4% higher than the plan). The water volume in the reservoir was recorded at 8,854 million m³ at the beginning of month and 10,226 million m³ at the end of month. Through the significant inflow the reservoir was filled by as high as 3.6 billion m³ of water in June and July! As a result of early accumulation of water in the reservoir, sterile spills at HEPS and consequent power losses were recorded in the second half of July (see "HEPS"). The unrecorded inflow to the reservoir estimated by the balance method was 167 million m³ or about 4% of inflow to the reservoir. It is expected that in August 3,186 million m³ of water will flow into the Nurek reservoir (1.3 times lower than in July). The water volume will increase to 10,724 million m³, and water releases from the reservoir will be 2,629 million m³.

Inflow to Tuyamuyun waterworks facility (TMWF) was 4,949 million m³ (only 87% of expected inflow) in July. The reservoirs of TMWF (Ruslovoye, Kaparas, Sultansanjar, and Koshbulak) accumulated 3,085 million m³ by the beginning of month and the volume of water increased to 3,457 million m³ by the end of month. However, this is by 18% lower than the plan of water accumulation. Water releases from TMWF amounted to 2,890 million m³, while water diversion from TMWF into canals was 890 million m³ (74% of the plan). Inflow to TMWF is expected in the amount of 3,744 million m³ in August. Because of reduced inflow, TMWF reservoirs will not accumulate water, and their water volume is to decrease to 3,115 million m³ by the end of month. Water releases from TMWF into the river are to be increased slightly to 2,981 to million m³. Water diversion will be increased to 1,105 million m³.

Nurek HEPS generated 1,238 million kWh of electrical energy in July. The average flow through turbines was 780 m³/s, while the average head at HEPS was 256 m. As expected, in the second half of July, sterile spills were recorded in the amount of 371 m³/s on average a month. Energy losses through the sterile spills amounted to 605 million kWh, i.e. almost 50% of electricity generation by HEPS.

In July, HEPS of Tuyamuyun waterworks facility generated 54 million kWh (1.7 million kWh a day). The head at HEPS was 20 m.

In July, water along the Amu Darya River was distributed unevenly. Inflow to the first reach (Kelif g/s – Birata g/s) was 9,877 million m³ (102% of forecast), while outflow from the reach (inflow to TMWF) was 4,949 million m³ (87% of expected inflow). Water withdrawal into canals amounted to 3,196 million m³ in the first reach, and no water shortage was observed in this reach. At the head of the second reach (Tuyamuyun g/s- Samanbay g/s) the flow of the Amu Darya River was 2,890 million m³ (87% of planned water releases from TMWF). Water availability for diversion was 76%, i.e. there was 24% of water shortage. Flow at Samanbay gauging station was 109 million m³. In August, inflow is expected to decrease approximately by 30% and water withdrawal will drop by 10% in the first reach. Inflow to the second reach is to increase to 3,309 million m³, and water withdrawal will be 2,100 million m³. The river flow at Samanbay g/s is expected in the amount of 130 million m³.

In mid-July, the total open water surface area of wetlands in the South Aral region was 58.8 km², including: Sudochie lake – 31 km²; Mezhdurechie reservoir – 11 km²; Dzhyltirbas wetland – 9 km². As compared to June, the total water surface area of wetlands in the South Aral region decreased 1.7 times, including 4 times in Dzhyltirbas wetland.

Source: data of the Regional Information-Analytical Center of SIC ICWC based on RS monitoring of the South Aral region, using Landsat 8-9 images and NDVI.

In July, inflow to the Large Aral Sea (eastern basin) from the Amu Darya River (Samanbay section) and collecting drains was recorded at 310 million m³. This is 1.8 times lower than expected inflow. In August, inflow to the Large Aral Sea is expected at about 500 Mm³.

Processing of images for the eastern basin of the Large Aral Sea showed that in July the water surface area of this basin shrank to 5 thousand km². The water volume is estimated (from balance calculations) at 0.03 km³, part of which is in aquifers. By the end of August, the water volume in eastern basin of the Large Aral Sea is expected to decrease to 0.02 km³. The level of the remained water surface is estimated at 25 m.

Surface water does not flow to Western basin of the Large Aral Sea. Water losses through evaporation are partially compensated by inflow from aquifer. In July-August, in this water body the water volume will remain within 30.8 – 30.7 km³, the water surface area will be 2.09 – 2.08 thousand km². Evaporation from 1 km² of water surface of the Large Aral Sea was 0.32 million m³ in July.

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

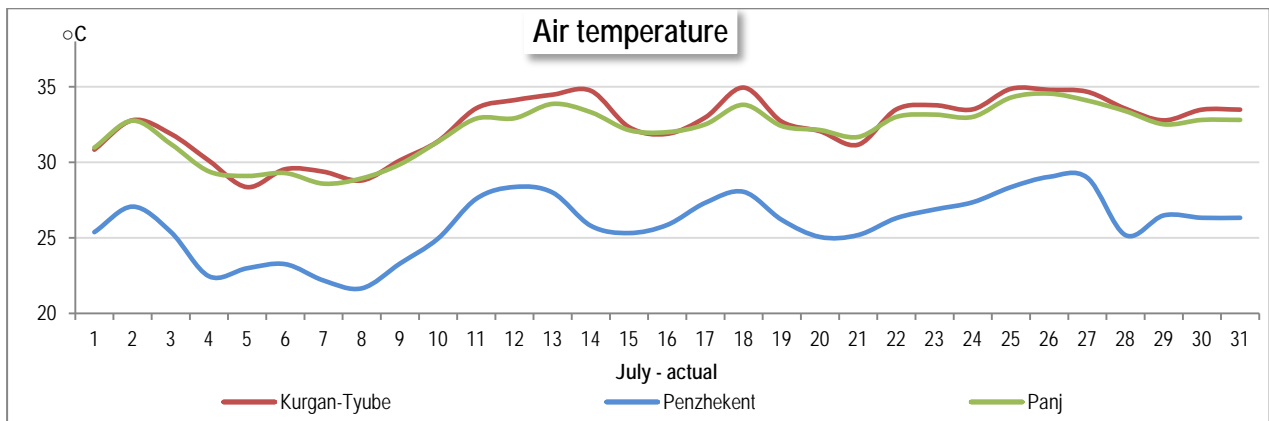


Climate

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	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	31.0	33.0	34.0	34.0	29.0	28.0
		Actual	30.0	33.0	33.21			
Kurgan-Tyube	$T, ^\circ\text{C}$	Forecast	31.0	33.0	34.0	33.0	29.0	27.0
		Actual	30.0	33.0	33.6			
Penzhekent	$T, ^\circ\text{C}$	Forecast	24.0	27.0	27.0	25.0	22.0	22.0
		Actual	23.87	26.76	26.95			



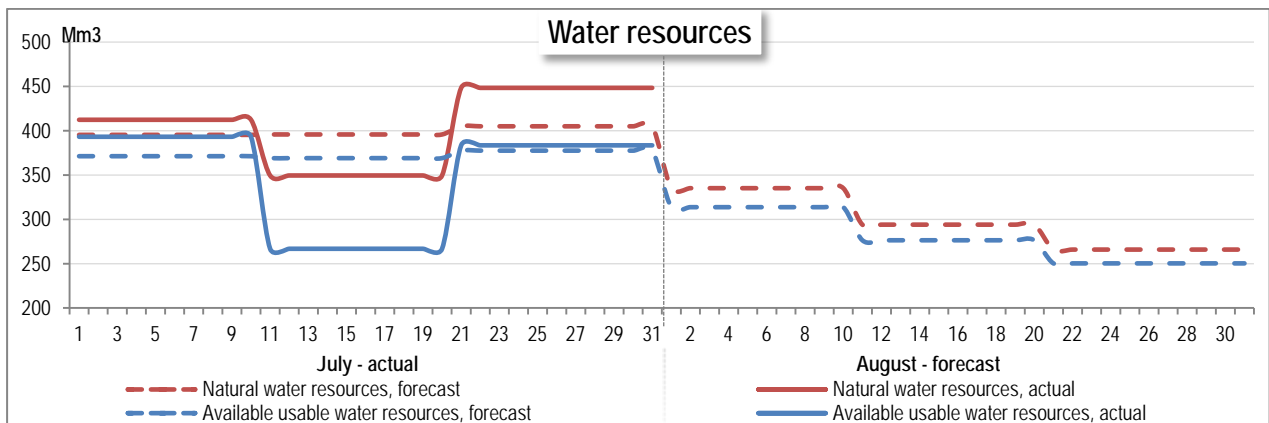


Water resources

Object
Amu Darya
Nurek reservoir
Atamurat 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: Atamurat g/s	W, Mm ³	Forecast	2246.4	2505.6	2851.2	1987.0	1641.0	1615.0
		Actual	2491	2004	3377			
Water withdrawal: upstream of Atamurat g/s	W, Mm ³	Forecast	1189	1193	1319	1192.0	1126.0	1157.0
		Actual	1130	1117	1228			
Nurek reservoir /filling (+) or draw down (-)	W, Mm ³	Forecast	518	259	285	173.0	173.0	152.0
		Actual	503.19	374.11	328			
Natural water resources at Atamurat g/s	W, Mm ³	Forecast	3953.8	3958.0	4455	3352.0	2940.0	2925.0
		Actual	4123.8	3495.2	4932			
Lateral inflow: downstream of Atamurat g/s	W, Mm ³	Forecast	50	50	56	50.0	50.0	54.0
		Actual	50	50	56			
River water losses: downstream of Atamurat g/s	W, Mm ³	Forecast	291	317	358	265.0	226.0	226.0
		Actual	241.92	877.13	770			
Available usable water resources	W, Mm ³	Forecast	3713	3691	4153	3138.0	2764.0	2754.0
		Actual	3932	2668	4219			



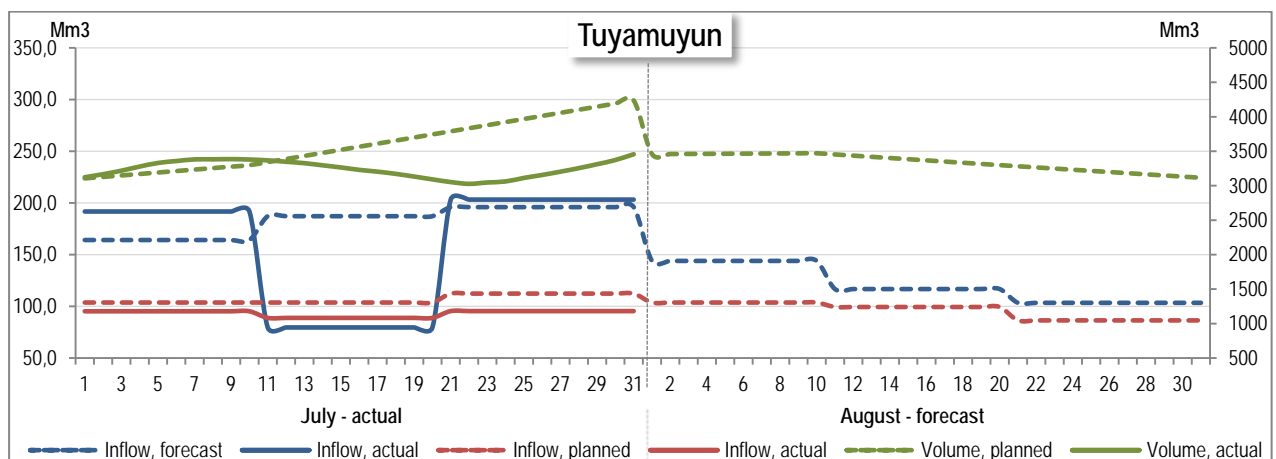
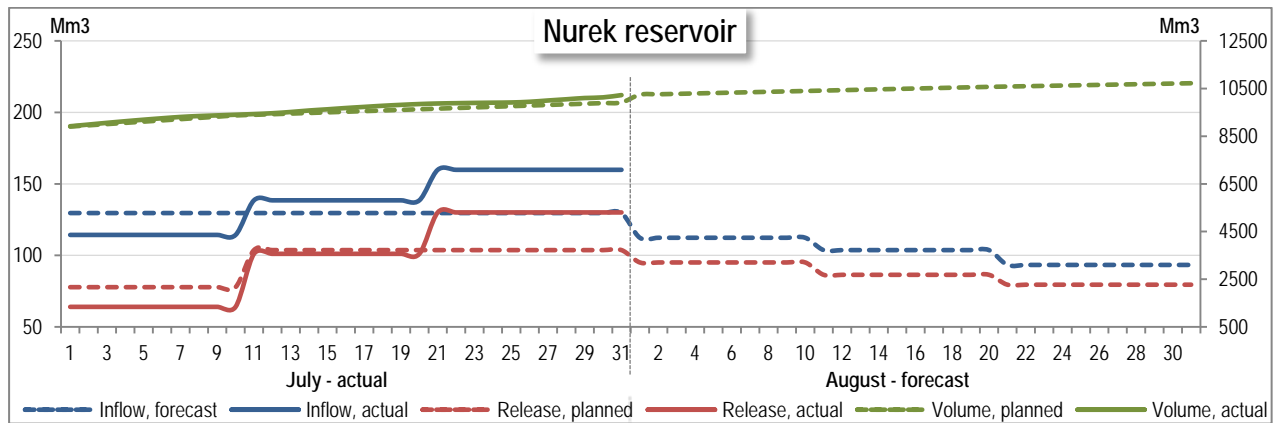


Reservoirs and HEPS

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

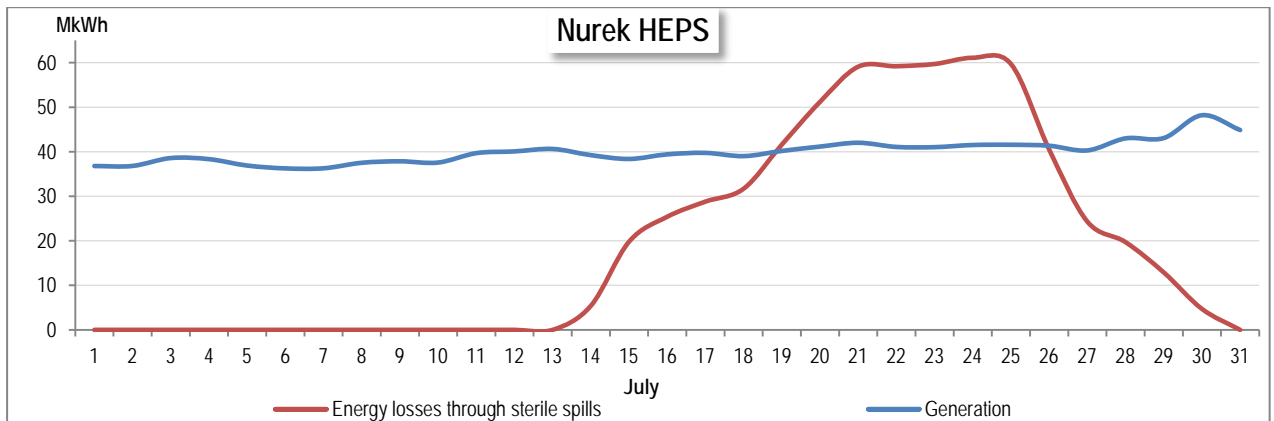
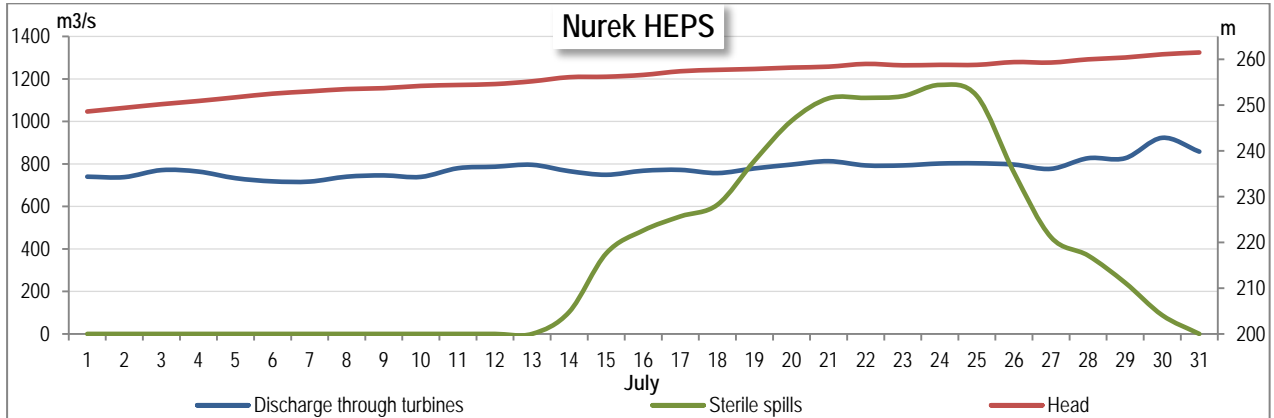
Приток (I), Попуск (R), Объем (W)

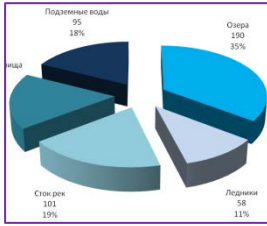
Reservoir	Parameter	July			August			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Nurek reservoir	I, Mm ³	Forecast	1296	1296	1426	1123.0	1037.0	1026.0
		Actual	1143	1385	1758			
	R, Mm ³	Planned	778	1037	1140	950.0	864.0	874.0
		Actual	640	1011	1430			
	W, Mm ³	Planned	9372	9631.6	9916.7	10399.0	10572.0	10724.0
		Actual	9402	9851	10226			
Reservoirs of Tuyamuyun waterworks facility	I, Mm ³	Forecast	1641	1872	2156	1439.0	1167.0	1138.0
		Actual	1917	796	2236			
	R, Mm ³	Planned	1037	1037	1236	1037.0	994.0	950.0
		Actual	952	888	1049			
	W, Mm ³	Planned	3298	3744	4237	3471.0	3299.0	3115.0
		Actual	3380	3092	3457			



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	G, M kWh	Actual	372.9	397.5	468.0
	L, M kWh	Actual	0.0	203.9	400.9
	Q, m ³ /s	Actual	740.6	775.1	819.3
	R, m ³ /s	Actual	0.0	394.8	686.0
	H, m	Actual	251.8	256.4	259.6





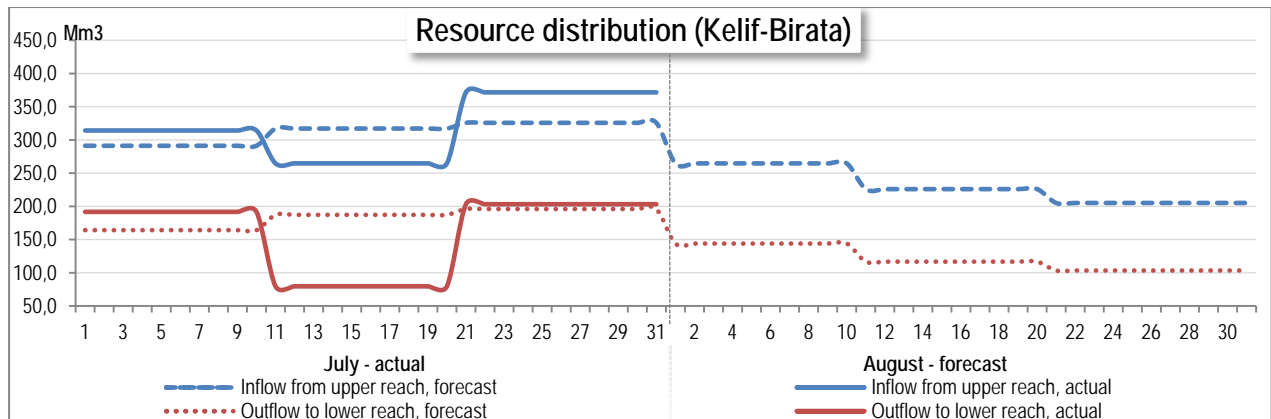
Water distribution

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)

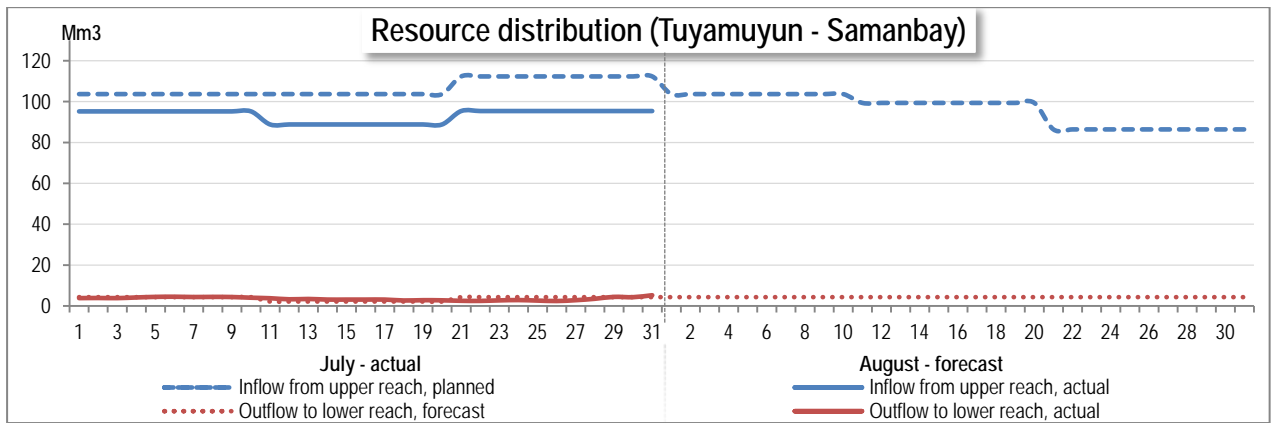
Kelif - Birata	Parameter	July			August			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Inflow from upper reach	W, Mm ³	Forecast	2912	3171	3583	2646.0	2259.0	2256.0
		Actual	3142	2647	4088			
Lateral inflow	W, Mm ³	Forecast	50	50	56	50.0	50.0	54.0
		Actual	50	50	56			
Water withdrawal	W, Mm ³	Planned	1030	1032	1125	993.0	916.0	948.0
		Actual	1033.3	1024.1	1138.6			
Losses	W, Mm ³	Forecast	291	317	358	265.0	226.0	226.0
		Actual	242	877	770			
Outflow to lower reach	W, Mm ³	Forecast	1641	1872	2156	1439.0	1167.0	1137.0
		Actual	1917	796	2236			



Water volume (W)

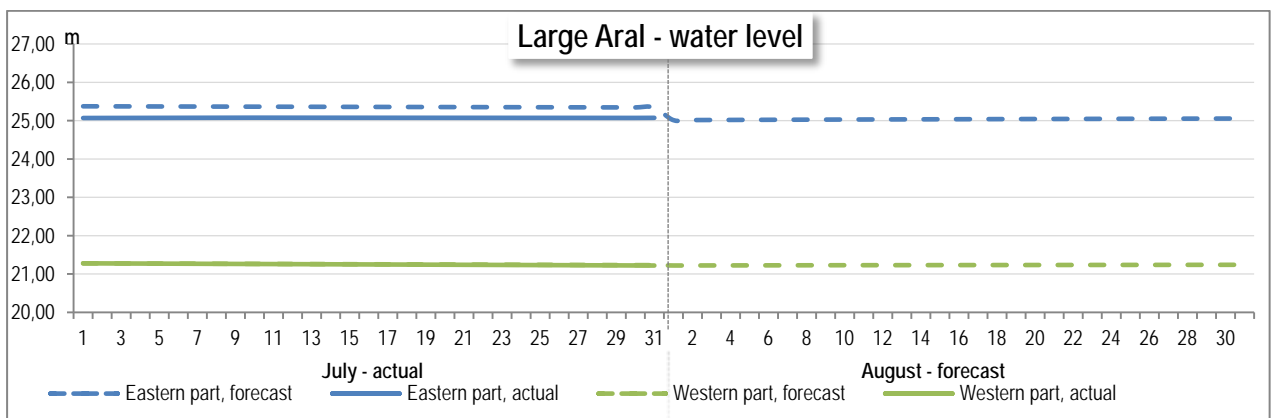
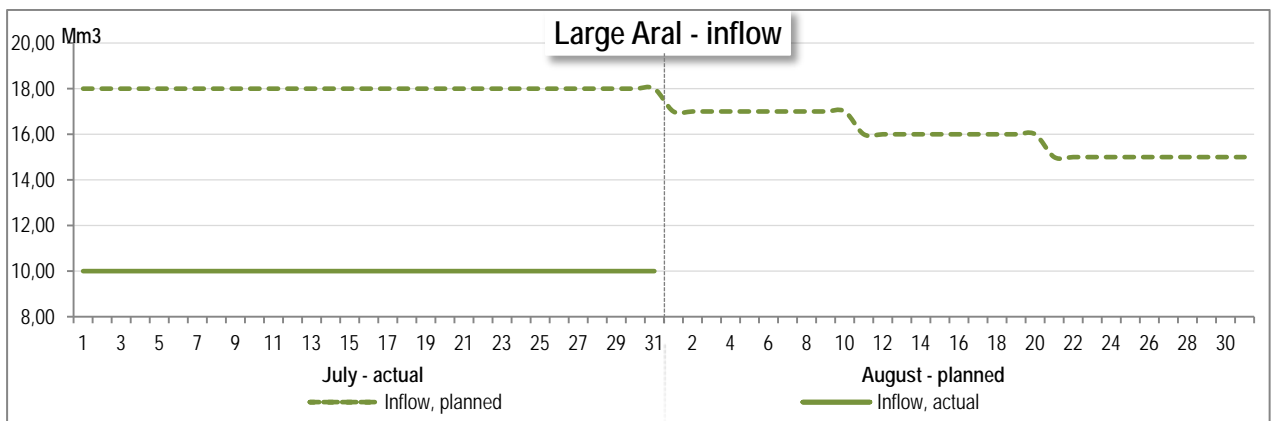
Tuyamuyun - Samanbay	Parameter	July			August			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Inflow from upper reach	W, Mm ³	Forecast	1036.8	1037	1236	1037.0	994.0	950.0
		Actual	952	888	1049			
Lateral inflow	W, Mm ³	Forecast	0	0	0	0.0	0.0	0.0
		Actual	0	0	0			
Water withdrawal ¹	W, Mm ³	Planned	734	799	879	734.0	700.0	665.0
		Actual	601	599	635			
Losses	W, Mm ³	Forecast	259	216	309	259.0	251.0	238.0
		Actual	309	258	379			
Outflow to lower reach	W, Mm ³	Forecast	43	22	48	43.0	43.0	48.0
		Actual	42	31	36			

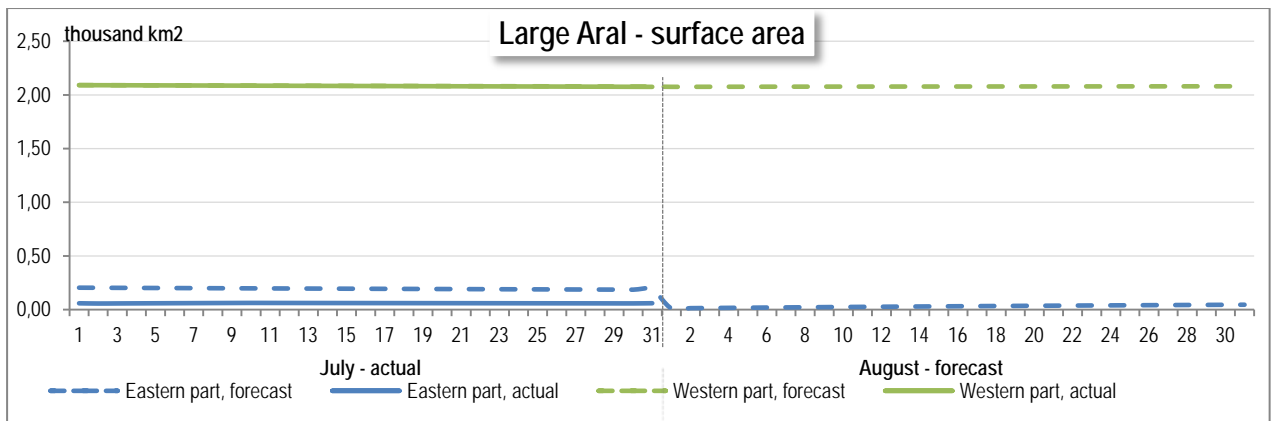
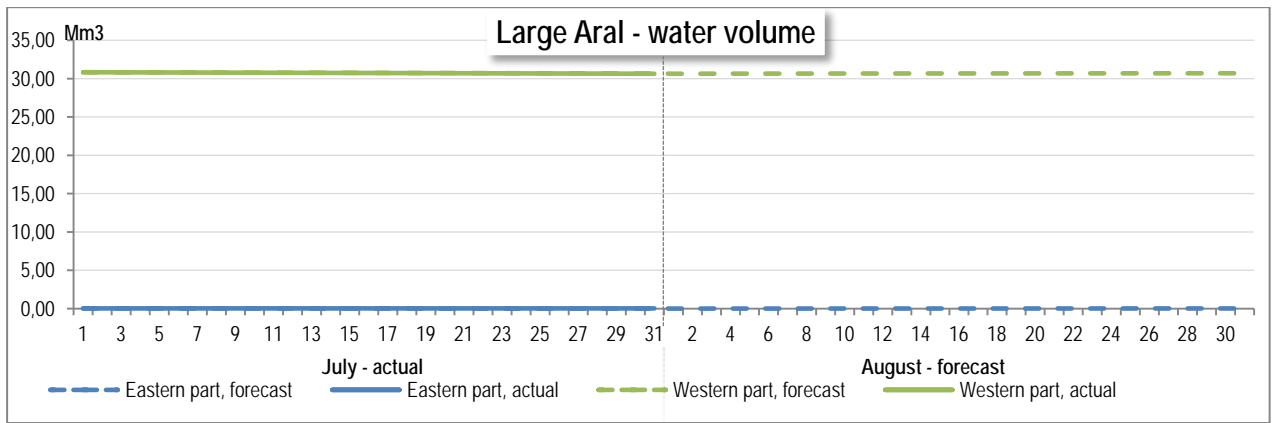
¹ Note: Including supply to the system of lakes and environmental water releases into canals



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	180.00	180.00	198.00	170.0	160.0	165.0
		Actual	100.00	100.00	110.00			
Eastern part, water volume	W, Mm ³	Forecast	0.02	0.02	0.01	0.0	0.0	0.0
		Actual	0.03	0.03	0.03			
Eastern part, level	H, m	Forecast	25.37	25.36	25.35	25.0	25.0	25.0
		Actual	25.07	25.08	25.07			
Eastern part, area	S, th.km ²	Forecast	0.20	0.19	0.19	0.0	0.0	0.0
		Actual	0.06	0.06	0.06			
Western part, water volume	W, Mm ³	Forecast	30.81	30.75	30.70	30.0	30.0	30.0
		Actual	30.80	30.74	30.67			
Western part, level	H, m	Forecast	21.27	21.26	21.24	21.0	21.0	21.0
		Actual	21.27	21.25	21.23			
Western part, area	S, th.km ²	Forecast	2.09	2.08	2.08	2.0	2.0	2.0
		Actual	2.09	2.08	2.08			





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 rivers' flow based on inflow to Toktogul, Andizhan, and Charvak reservoirs plus lateral inflow to the rivers and minus losses amounted to 3,641 million m³, of which the inflow to the three reservoirs was 2,783 million m³ (only 73% of forecast). Proceeding from inflow to the three reservoirs, the available usable water resources in the basin are expected to decrease to 2,320 million m³ in August.

In July, inflow to the Toktogul reservoir was as small as 1,869 million m³ (82% of forecast), and 1,185 million m³ of water was discharged from the reservoir (96% of the plan). The water volume in the Toktogul reservoir increased from 10,251 million m³ to 10,950 million m³ in the course of July. However, the plan of water accumulation has not been fulfilled (97% of the plan). It is expected that in August the Toktogul reservoir will accumulate water and its water volume will increase to 11,466 million m³ by the end of month; inflow to the reservoir is expected in the amount of 1,559 million m³, and water releases are planned at 1,026 million m³.

Inflow to the Andizhan reservoir amounted to 245 million m³ only (about 50 % of forecast), and 629 million m³ of water was discharged from the reservoir in July. Despite the small inflow, discharge from the reservoir into the Karadarya River amounted to 639 million m³ (95% of the plan) through storage decrease. The water volume was 1,256 million m³ at the beginning and only 974 million m³ at the end of July. In August, inflow to the Andizhan reservoir is expected to decrease even more, to 200 million m³. Water releases are planned at 586 million m³. As a result, the reservoir's water volume will decrease to 598 million m³ by the end of month.

In July, inflow to the Charvak reservoir was 673 million m³ (68% of expected inflow), and 813 million m³ was discharged (86% of the plan) from the reservoir. By the beginning of month, the reservoir accumulated water in the amount of 1,991 million m³, and the volume decreased to 1,905 million m³ at the end of month. In August, inflow to the Charvak reservoir is expected to decrease to 561 million m³, and water releases will also decrease to 728 million m³. The water volume will further go down – to 1,743 million m³ by the end of month.

In July, the Bakhri Tojik reservoir was drawn down from 3,100 million m³ to 2,190 million m³, and the plan of water accumulation was 96% fulfilled by the end of month. Inflow to the reservoir was 753 million m³ (94% of forecast), while water releases from the reservoir were 1,491 million m³ (92% of the plan). The discrepancy derived from water balance that can be attributed to water losses was 7% of reservoir's water volume. In August, inflow to the Bakhri Tojik reservoir is expected to increase to 804 million m³, while water releases will increase to 1,627 million m³. The reservoir will be drawn down to 1,727 million m³.

Inflow to the Shardara reservoir was only 321 million m³ in July (82% of expected inflow) but the plan of water releases from the reservoir into the river was fulfilled and amounted to 1,330 million m³. Water was not discharged into Arnasai. The reservoir was drawn down from 3,084 million m³ to 1,403 million m³ (76% of expected accumulation). Water withdrawal from the reservoir amounted to 327 million m³ (that is by 10% more than planned one). In August, inflow to the Shardara reservoir will be 670 million m³, and water releases from the reservoir are to be 838 million m³. The reservoir's water volume will be 1,113 million m³ by the end of month. Water discharge into Arnasai is not planned for August.

In July, there were no inflow to and discharge of water from the Koksarai reservoir. The reservoir was at its dead volume (about 20 million m³). Accumulation of water is not planned for August.

In July, the cascade of Naryn HEPS' (Kyrgyzstan) generated 1,001 million kWh (94% of the plan), of which 969 million kWh generated under energy mode. The plan of energy generation for August for the

cascade of Naryn HEPS' is set at 936 million kWh. Toktogul HEPS generated 414 million kWh in July. The average discharge through turbines of the Toktogul HEPS was 442 m³/s, the average monthly head at HEPS was 140 m. No sterile spills were recorded. The plan of energy generation for August for the Toktogul HEPS is set at 375 million kWh (91% of generation in July).

In July, the total generation at large HEPS' of Uzbekistan amounted to 417 million kWh, of which: 283 million kWh at Charvak HEPS, 98 million kWh at Andizhan HEPS, and 36 million kWh at Farkhad HEPS. The average monthly discharge at Charvak HEPS was 297 m³/s, and the head was 147 m. The discharge at Andizhan HEPS was 176 m³/s, and the head was 95 m. For Farkhad HEPS, the discharge was 189 m³/s, and the head was 31 m.

Energy generation by HEPS of the Bakhri Tojik reservoir (Tajikistan) amounted to 51 million kWh in July. Shardara HEPS (Kazakhstan) generated 57 million kWh. The average monthly water discharge at HEPS of Bakhri Tojik was 521 m³/s, while the head was 18 m. Discharge through turbines of Shardara HEPS was 500 m³/s, and the head was 16 m.

In July, the water shortage was estimated at 25% of the set limit in upper reaches in the Naryn River reach from Toktogul HEPS to Uchkurgan waterworks facility (tail-water). Further downstream, in the reach from Uchkurgan waterworks facility (tail-water) to Akjar g/s (inflow to the Bakhri Tojik reservoir) the water shortage was higher - 30 % of the limit. In the Akjar section the water volume was 753 million m³ or by 6% lower of the amount envisaged in the water distribution plan.

In the middle reaches, from the Bakhri Tojik reservoir (Kyzylkislak section) to Shardara reservoir, the actual water withdrawal was by 23% lower than planned one. 321 million m³ flowed to the Shardara reservoir from the Syr Darya River; this is by 17% lower of the expected inflow.

In the lower reaches of the Syr Darya River the river flow downstream of the Shardara reservoir was 1,330 million m³. This corresponds to the expected discharge from reservoir into the river. Water shortage is estimated at 7% in the lower reaches. Inflow to the North Aral Sea amounted to only 20 million m³ (see the section on the Aral Sea).

River water balance discrepancies that can be attributed to water losses were estimated through balance method as follows: Toktogul HEPS-Uchkurgan waterworks facility – 5% of the Naryn River flow; Uchkurgan waterworks facility-Akjar - 6% of the Syr Darya River flow; losses in the Bakhri Tojik reservoir - Shardara reservoir reach were virtually absent; and, lower reaches – about 15%. In August, it is expected that discharge from the Toktogul waterworks facility will decrease by 13% as compared to water volume in July, while that from the Uchkurgan waterworks facility will decrease by 30%. Inflow at Akjar section is expected by 7% higher than in July. Although water releases will be reduced 1.2 times from the Bakhri Tojik reservoir, inflow to the Shardara reservoir will increase approximately twofold. Discharge from the Shardara reservoir will decrease 1.6 times, and only about 10 million m³ will flow to the North Aral Sea.

In July, inflow to the North Aral Sea from the Syr Darya River was only 20 million m³. In August, approximately 10 million m³ will flow to the sea. The water volume in this water body decreased from 23 km³ to 22.3 km³ in July. The water surface area shrank from 3 thousand km² to 2.9 thousand km², while the water level dropped from 41.25 m to 41.02 m. In August, the downward trend will remain in the North Aral Sea, with the water volume decreasing to 19.25 km³, the water surface area, to 2.61 thousand km², and the water level, to 40.0 m. There was no discharge from the North Aral into the Large Aral in July, and water discharge is not planned in August too.

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

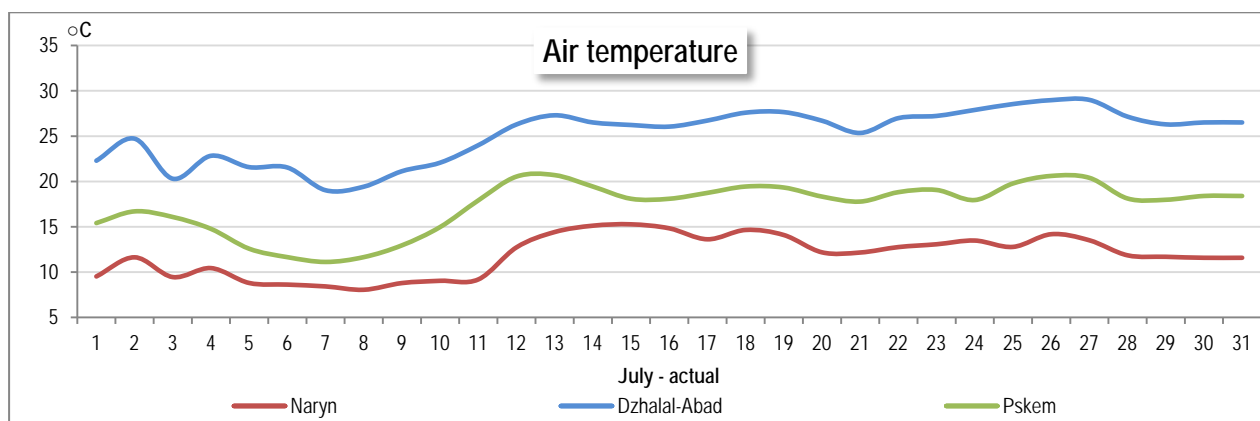


Climate

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	Forecast	10.0	15.0	13.0	11.0	9.0	9.0
	Actual	9.0	14.0	12.6			
Dzhalal-Abad	Forecast	22.0	27.0	27.0	25.0	22.0	22.0
	Actual	21.0	27.0	27.3			
Pskem	Forecast	15.0	20.0	19.0	7.0	13.0	13.0
	Actual	14.0	19.0	18.8			



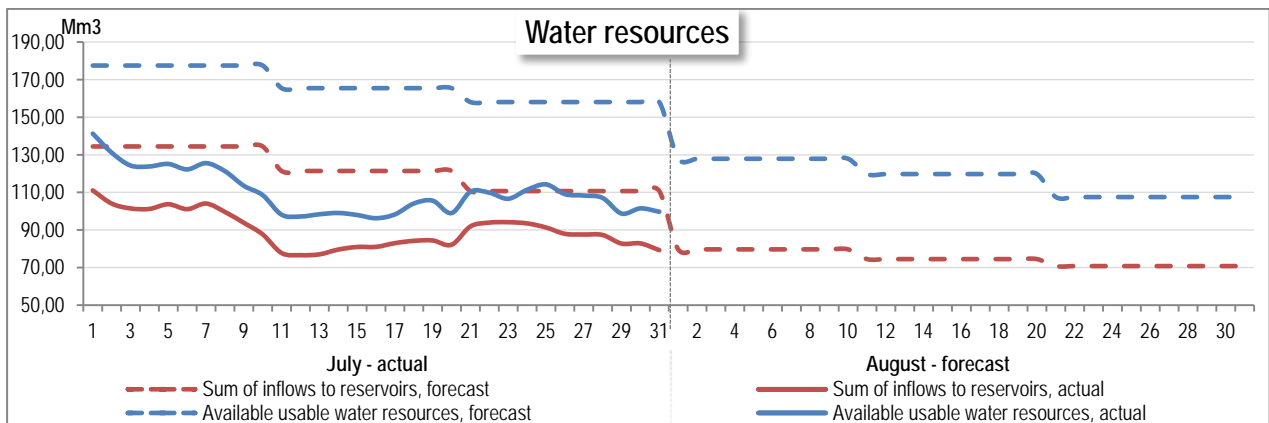


Water resources

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	737	737	810.7	503.0	503.0	553.0
		Actual	610	575	684.5			
Inflow to Andizhan reservoir	W, Mm ³	Forecast	216	156	123.5	78.0	60.0	61.0
		Actual	148	13	82.9			
Inflow to Charvak reservoir	W, Mm ³	Forecast	391	321	283.3	216.0	181.0	163.0
		Actual	250	218	204.8			
Sum of inflows to reservoirs	W, Mm ³	Forecast	1344	1214	1217.5	797.0	745.0	778.0
		Actual	1007	806	972.3			
Lateral inflow up to Shardara	W, Mm ³	Forecast	486	496	576.5	561.0	531.0	482.0
		Actual	284	243	259.7			
Losses	W, Mm ³	Forecast	55	55	55.2	79.0	79.0	78.0
		Actual	55	55	55.2			
Available usable water resources	W, Mm ³	Forecast	1775	1655	1738.8	1279.0	1197.0	1182.0
		Actual	1237	994	1176.7			



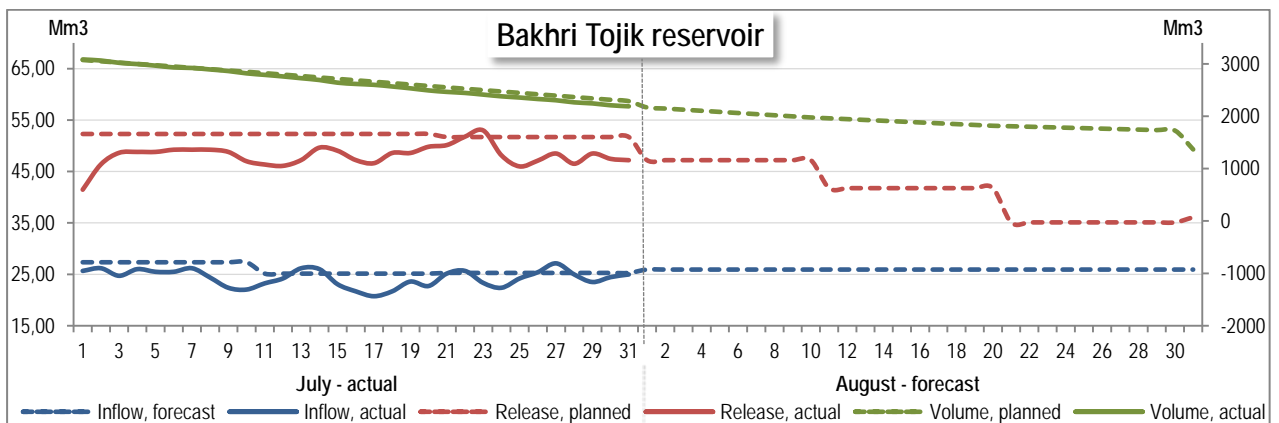
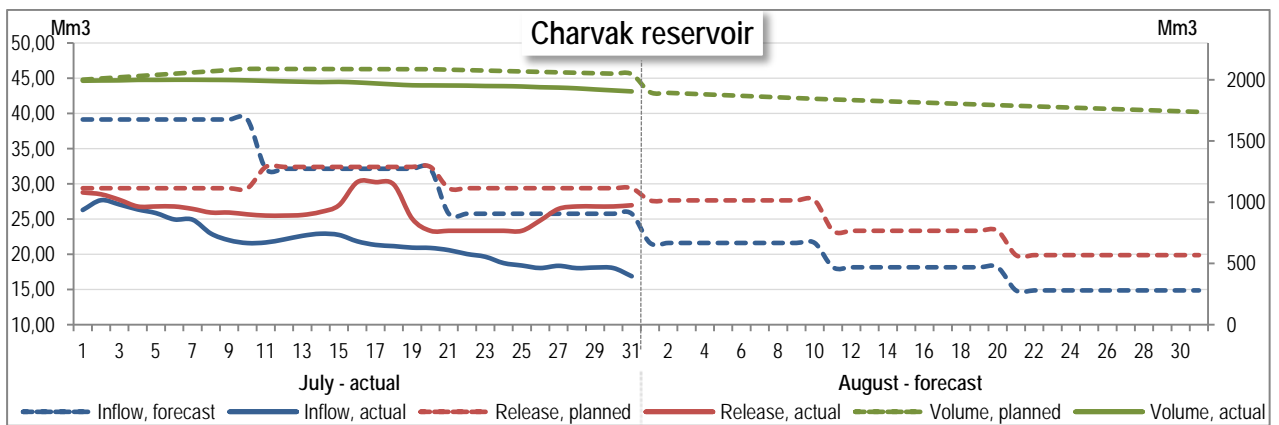
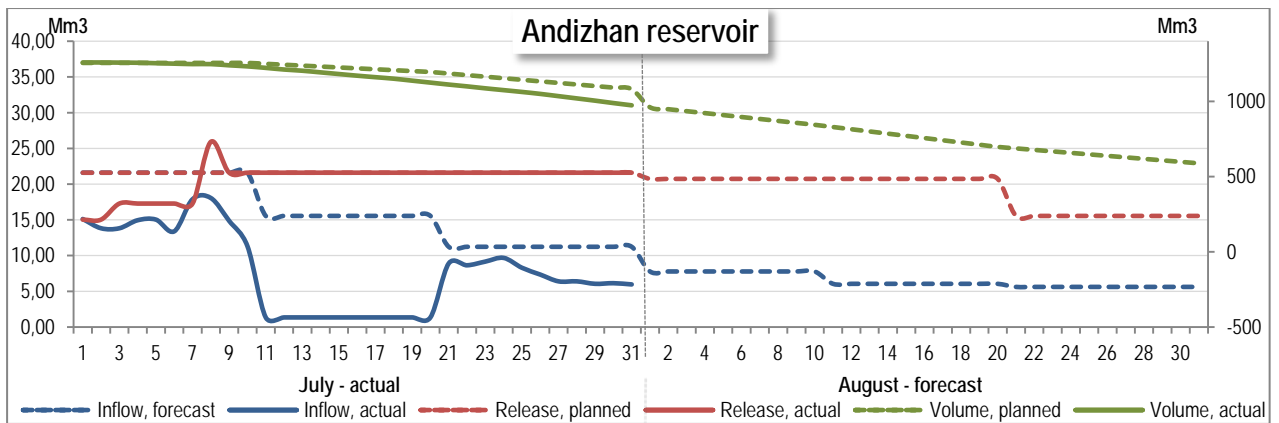
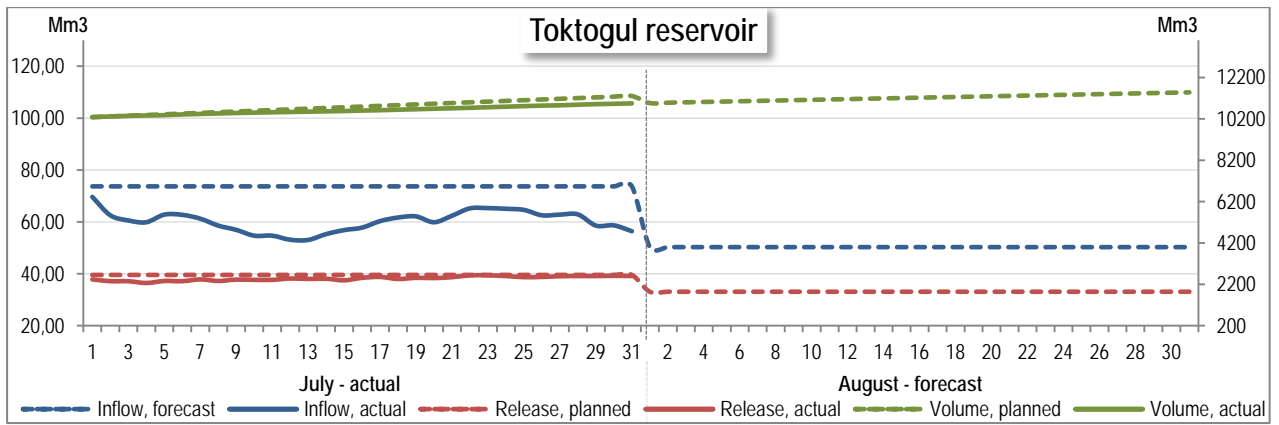


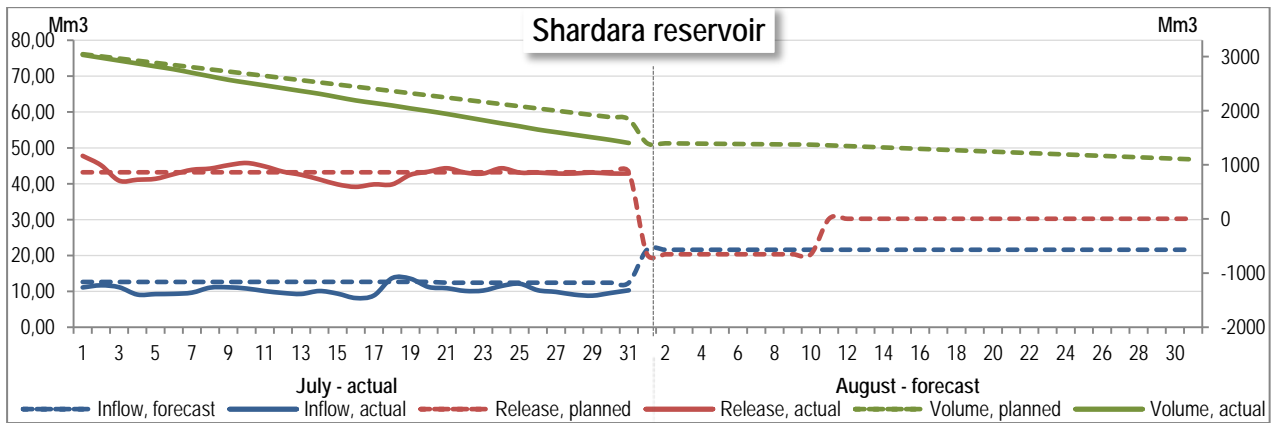
Reservoirs and HEPS

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
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	

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

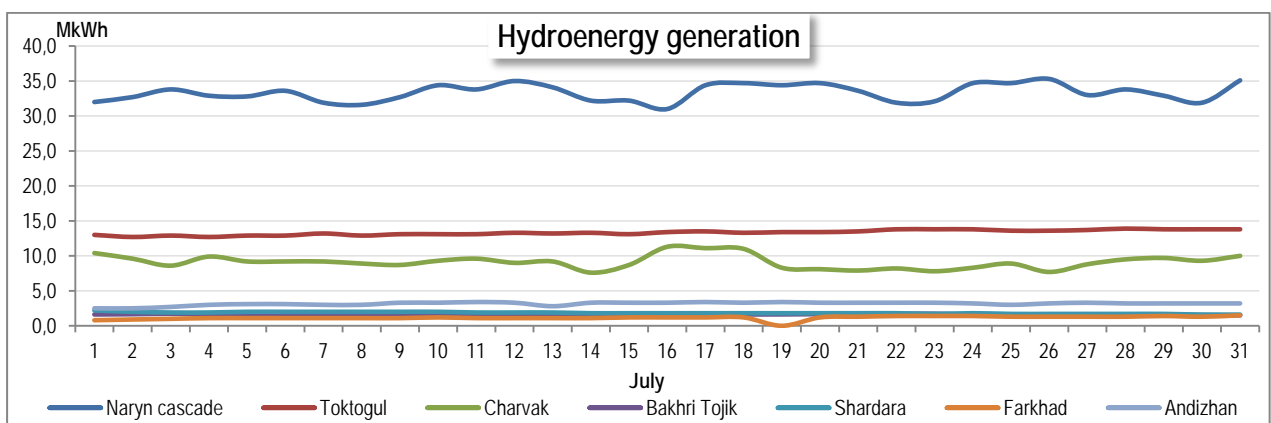
Reservoir	Parameter	July			August			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Toktogul reservoir	I, Mm ³	Forecast	736.99	736.99	810.70	502.0	502.0	553.0
		Actual	609.64	574.82	684.55			
	R, Mm ³	Planned	395.71	395.71	435.27	330.0	330.0	363.0
		Actual	373.51	381.54	429.84			
	W, Mm ³	Planned	10592	10934	11309	11122.0	11294.0	11483.0
		Actual	10502	10691	10950			
Andizhan reservoir	I, Mm ³	Forecast	216.00	155.52	123.53	77.0	60.0	61.0
		Actual	148.26	13.44	82.94			
	R, Mm ³	Planned	216.00	216.00	237.60	207.0	207.0	171.0
		Actual	185.59	216.00	237.60			
	W, Mm ³	Planned	1256	1196	1081	844.0	698.0	588.0
		Actual	1233	1125	974			
Charvak reservoir	I, Mm ³	Forecast	391.39	321.41	283.25	216.0	181.0	163.0
		Actual	249.59	218.17	204.81			
	R, Mm ³	Planned	293.76	324.00	323.18	276.0	233.0	218.0
		Actual	269.31	268.27	275.18			
	W, Mm ³	Planned	2089	2086	2046	1845.0	1793.0	1738.0
		Actual	1995	1954	1905			
Bakhri Tojik reservoir	I, Mm ³	Forecast	273.42	251.33	277.97	259.0	259.0	285.0
		Actual	248.49	233.11	271.12			
	R, Mm ³	Planned	522.98	523.04	568.70	472.0	417.0	387.0
		Actual	477.62	479.20	534.30			
	W, Mm ³	Planned	2850	2579	2288	1977.0	1819.0	1367.0
		Actual	2820	2494	2190			
Shardara reservoir	I, Mm ³	Forecast	126.23	126.44	136.51	216.0	216.0	237.0
		Actual	104.17	103.79	112.71			
	R, Mm ³	Planned	432.00	432.00	475.20	203.0	302.0	332.0
		Actual	438.13	416.45	475.37			
	W, Mm ³	Planned	2683	2283	1839	1372.0	1243.0	1100.0
		Actual	2518	1993	1403			

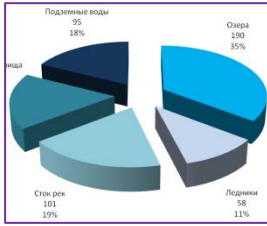




Generation (G), Energy losses through sterile spills (L), Discharge through turbines (Q), Sterile spills (R), Head (H)

HEPS	Parameter		July		
			I ten-day	II ten-day	III ten-day
Naryn cascade	G, M kWh	Actual	328.4	336.5	369.0
	G, M kWh	Actual	129.4	133.0	151.1
Toktogul	Q, m³/s	Actual	432.0	441.6	452.3
	H, m	Actual	139.1	140.4	141.5
	G, M kWh	Actual	29.5	32.8	35.4
Andizhan	Q, m³/s	Actual	157.2	185.0	185.0
	H, m	Actual	95.0	95.0	95.0
	G, M kWh	Actual	16.8	16.4	17.3
Bakhri Tojik	Q, m³/s	Actual	516.2	522.3	523.8
	H, m	Actual	19.2	18.4	17.7
	G, M kWh	Actual	10.5	10.4	14.9
Farkhad	Q, m³/s	Actual	165.5	186.0	213.0
	H, m	Actual	30.6	30.6	30.6
	G, M kWh	Actual	93.0	93.9	96.1
Charvak	Q, m³/s	Actual	300.8	304.3	285.8
	H, m	Actual	147.4	146.6	145.9
	G, M kWh	Actual	20.0	18.3	18.8
Shardara	Q, m³/s	Actual	502.0	500.0	499.1
	G, M kWh	Actual	17.1	16.1	14.7



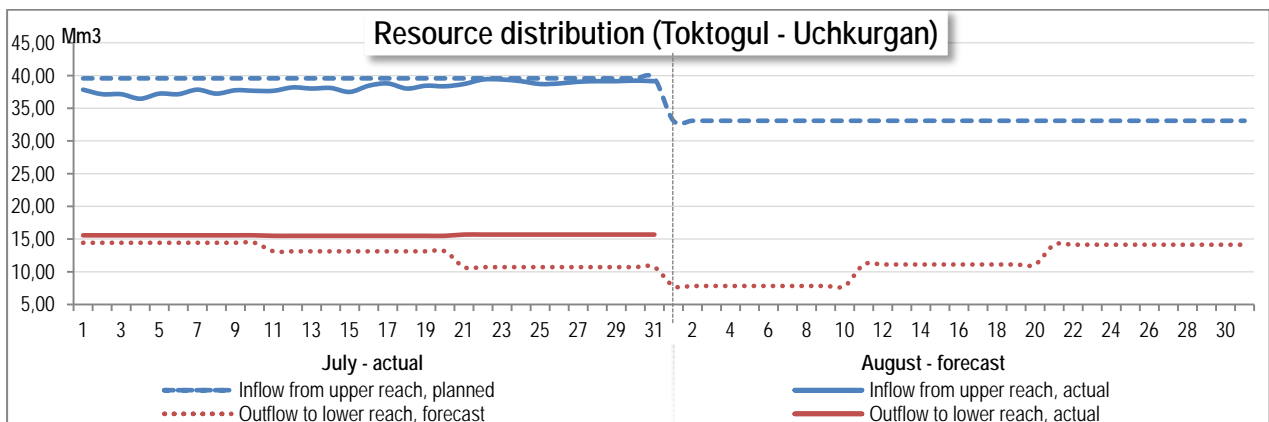


Water distribution

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 North Aral Sea (Karateren settlement)
North 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, Mm³	Planned	395.71	395.71	435.27	330.0	330.0	363.0
		Actual	373.51	381.54	429.84			
Lateral inflow ²	W, Mm³	Forecast	62.28	62.28	68.42	37.0	37.0	41.0
		Actual	25.49	26.52	23.76			
Water withdrawals	W, Mm³	Planned	287.71	300.76	359.92	272.0	240.0	230.0
		Actual	219.73	236.66	255.86			
Losses	W, Mm³	Forecast	25.92	25.92	25.92	17.0	17.0	19.0
		Actual	23.49	16.40	25.15			
Outflow to lower reach ³	W, Mm³	Forecast	144.36	131.31	117.85	78.0	111.0	155.0
		Actual	155.78	155.00	172.59			



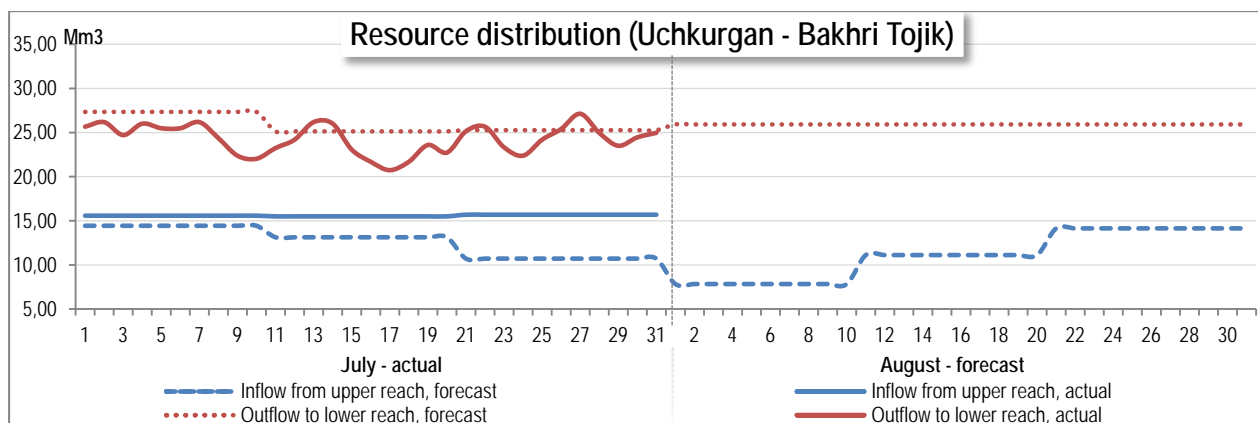
Water volume (W)

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, Mm³	Forecast	144.36	131.31	117.85	78.0	111.0	155.0
		Actual	155.78	155.00	172.59			
Lateral inflow	W, Mm³	Forecast	198.03	193.42	240.75	248.0	207.0	186.0
		Actual	123.65	135.14	150.70			
Water withdrawals	W, Mm³	Planned	38.97	43.40	47.63	37.0	29.0	24.0
		Actual	29.53	29.98	32.02			
Losses	W, Mm³	Forecast	30.00	30.00	33.00	30.0	30.0	33.0
		Actual	1.41	27.05	20.15			
Outflow to lower reach ⁴	W, Mm³	Forecast	273.42	251.33	277.97	259.0	259.0	285.0
		Actual	248.49	233.11	271.12			

² Incl. Karasu left and right

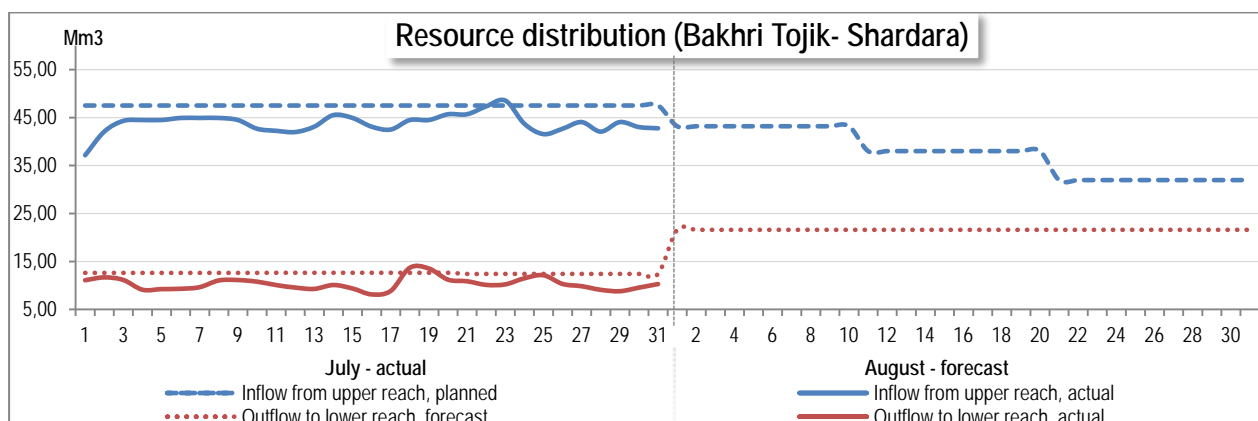
³ Uchkurgan waterworks facility

⁴ Akdzhar g/s



Water volume (W)

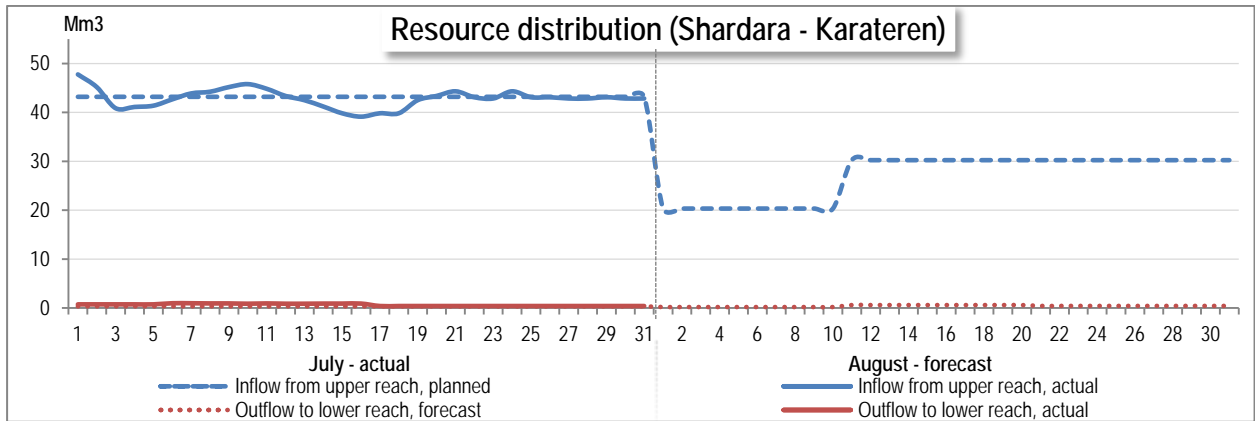
Bakhri Tojik - Shardara	Parameter	July			August			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Inflow from upper reach ⁵	W, Mm ³	Planned	475.20	475.20	522.72	432.0	380.0	351.0
		Actual	434.51	438.13	485.57			
Lateral inflow	W, Mm ³	Forecast	244.22	254.81	275.99	299.0	271.0	238.0
		Actual	115.05	113.05	135.30			
Water withdrawals	W, Mm ³	Planned	563.19	573.57	629.20	485.0	406.0	319.0
		Actual	449.64	442.20	473.33			
Losses	W, Mm ³	Forecast	30.00	30.00	33.00	30.0	30.0	33.0
		Actual	-4.26	5.19	34.83			
Outflow to lower reach	W, Mm ³	Forecast	126.23	126.44	136.51	216.0	216.0	237.0
		Actual	104.17	103.79	112.71			



Water volume (W)

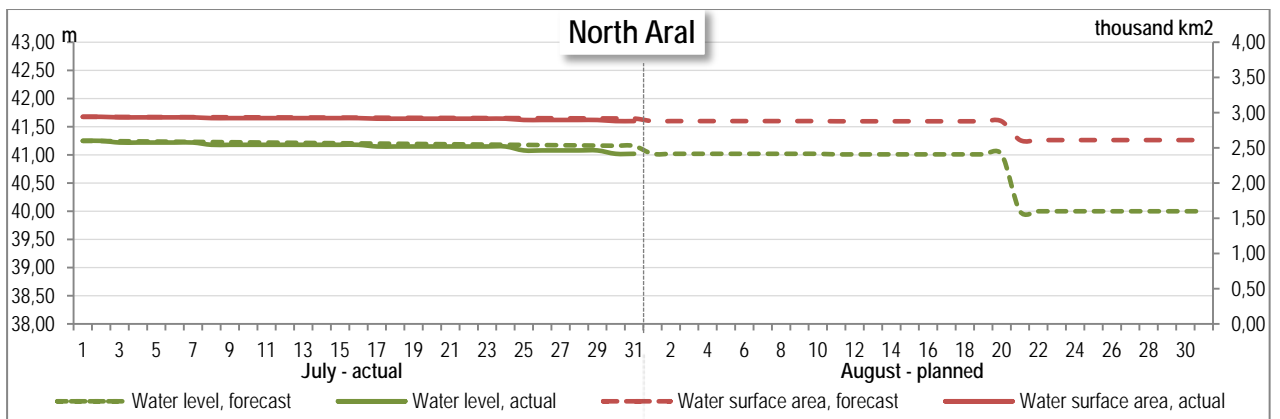
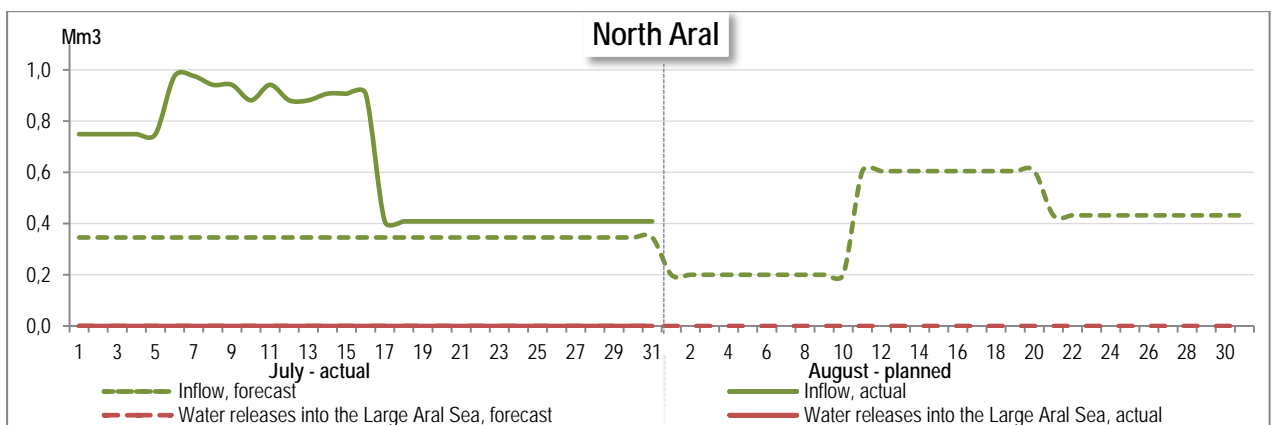
Shardara - Karateren	Parameter	July			August			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Inflow from upper reach	W, Mm ³	Planned	432.0	432.0	475.2	203.0	302.0	332.0
		Actual	438.1	416.4	475.4			
Lateral inflow	W, Mm ³	Forecast	8.528	5.936	5.38	8.0	0.0	10.0
		Actual	0.043	0.043	0.048			
Filling (+), draw down (-) of Koksarai reservoir	W, Mm ³	Planned	0.0	0.0	0.0	0.0	0.0	0.0
		Actual	0.0	0.0	0.0			
Water withdrawals	W, Mm ³	Planned	387	384.48	416	200.0	227.0	249.0
		Actual	372	366.49	367			
Losses	W, Mm ³	Forecast	50	50.00	61	10.0	70.0	88.0
		Actual	58	42.94	104			
Outflow to lower reach	W, Mm ³	Forecast	3.5	3.46	3.80	2.00	6.0	4.0
		Actual	8.5	7.06	4.50			

⁵ Kyzylkishlak g/s



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

North 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	3.5	3.5	3.80	2.0	6.0	5.0
		Actual	8	7	4.50			
Water volume	W, Mm ³	Forecast	22.95	22.9	22.8	22.0	22.0	19.0
		Actual	22.88	22.74	22.52			
Water level	H, m	Forecast	41.24	41.21	41.18	41.0	41.0	40.0
		Actual	41.21	41.17	41.09			
Water surface area	S, th.km ²	Forecast	2.94	2.93	2.92	2.0	2.0	2.0
		Actual	2.93	2.92	2.90			
Water releases into the Large Aral Sea	W, Mm ³	Forecast	0	0	0	0.0	0.0	0.0
		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