



Aral Sea Basin Transboundary Water Early Warning Bulletin

August - September 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 fourth Bulletin contains the actual information on the Syr Darya and Amu Darya River Basins for August 2023 and the forecast for September. 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.

As part of the Project, an Internet platform [Early Warning Bulletin Project – Telegraph](#) has been developed. The platform contains all Bulletins issued since 2014 in both Russian and English.

Digest of CA news for August

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

Tajikistan suffers from mudflow and rock fall. Consequences of natural disasters - [IA-CENTR](#)

A roundtable on implementation of the Aarhus Convention in Tajikistan held in Dushanbe – Tajikistan News - [Avesta.tj](#)

Zheenbek Kulubaev met the Head of the UN Regional Centre for Preventive Diplomacy for CA ([kabar.kg](#))

Kyrgyzstan considers the possibility of importing electricity from Belarus ([trend.az](#))

Representatives of Kazakhstan, Uzbekistan and Kyrgyzstan discuss water-energy cooperation | News of 15:49, 27 August 2023 on [zakon.kz](#)

Tajikistan passes chairmanship in the International Fund for saving the Aral Sea to Kazakhstan | NIAT "Khovar" ([khovar.tj](#))

Summit on climate ambitions | United Nations ([un.org](#))

Emergency situation announced due to water shortage and heat in six areas of Zhambyl province in Kazakhstan | CentrAsia ([centrasia.org](#))

Drought embraced Central Asia ([water.gov.kg](#))

Meeting with the Head of the UN Development Coordination Office for Europe and Central Asia at MFA ([yuz.uz](#))

Representative of Tajikistan to UN met with the Head of the UN Regional Centre for Preventive Diplomacy for CA – Tajikistan News - [Avesta.tj](#)

Leader Emomali Rahmon inspects the construction of the main dam of Roghun Hydropower Project | NIAT "Khovar" ([khovar.tj](#))

How many emergencies happened in Tajikistan in 2023 ([sputniknews.ru](#))

Inflow to the Toktogul reservoir exceeds the values recorded in the last two years — [Tazabek](#)

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 August and Forecast for September

The natural, non-regulated river flow was estimated at 10,197 million m³ in August. The flow of the Amu Darya at Kelif section (upstream of intake to Garagumdarya) regulated by the Nurek reservoir amounted to 8,518 million m³ (119% of forecast). It is expected that in September, as compared to August, the river flow at Kelif section will be reduced by a factor of two to 4,198 million m³.

Inflow to the Nurek reservoir was 3,657 million m³ (by 15% more than forecast) in August. Water releases from the reservoir amounted to 3,379 million m³ (by 25% higher than the plan). The water releases were increased since the reservoir was filled almost to the maximum and most of the inflow was bypassed downstream as transit, forming sterile spills at HEPS and consequent power losses (see "HEPS"). The water volume in the reservoir was recorded at 10,226 million m³ at the beginning of month and 10,540 million m³ at the end of month. The reservoir was filled by 314 million m³ in August. The unrecorded inflow to the reservoir estimated by the balance method was 37 million m³ or about 1% of inflow to the reservoir. It is expected that in September 2,048 million m³ of water will flow into the Nurek reservoir (1.8 times lower than in August), the water volume will be 10,756 million m³, and water releases from the reservoir will be 1,832 million m³.

Inflow to Tuyamuyun waterworks facility (TMWF) was 3,482 million m³ (93% of expected inflow) in August. The reservoirs of TMWF (Ruslovoye, Kaparas, Sultansanjar, and Koshbulak) accumulated 3,457 million m³ by the beginning of month and the volume of water increased slightly to 3,651 million m³ by the end of month. Water releases from TMWF amounted to 2,483 million m³ (83% of the plan), while water diversion from TMWF into canals was 758 million m³ (69% of the plan). Inflow to TMWF is expected in the amount of 1,985 million m³ in September. Because of reduced inflow, TMWF reservoirs will not accumulate water, and their water volume is to decrease to 3,295 million m³ by the end of month. Water releases from TMWF into the river will be also reduced to 1,642 million m³. Water diversion will be reduced to 700 million m³.

Nurek HEPS generated 721 million kWh of electrical energy in August. The average flow through turbines was 859 m³/s, while the average head at HEPS was 265 m. Substantial sterile spills were recorded in the amount of 417 m³/s on average a month. Energy losses through the sterile spills amounted to 696 million kWh, that is almost 97% of electricity generation by HEPS.

In August, HEPS of Tuyamuyun waterworks facility generated 50 million kWh. The head at HEPS was 20 m.

In August, water along the Amu Darya River was distributed unevenly. Inflow to the first reach (Kelif g/s – Darganata g/s) was 8,518 million m³ (119% of forecast), while outflow from the reach (inflow to TMWF) was 3,482 million m³ (93% of expected inflow). Water withdrawal into canals amounted to 3,030 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 2,483 million m³ (83% of planned water releases from TMWF) in August. In this reach, water availability for diversion reached 79%, i.e. 21% of water shortage. Flow at Samanbay gauging station was 101 million m³.

In September, inflow is expected to halve and water withdrawal will drop 1.5 times in the first reach. Inflow to and water withdrawal in the second reach are to decrease 1.5 times. The river flow at Samanbay g/s is expected in the amount of 130 million m³ in September.

Inflow to the South Aral region is estimated by BWO Amu Darya by summing up the flow from the Amu Darya River, the flow from collecting drains, and the discharge from canals. In August 2023, inflow to the South Aral region was estimated at 278 km³, including 101 km³ from the river.

Additionally, the Main South Karakalpak Collector (MSKC) is considered separately. Its annual flow has varied within 0.4...0.8 km³ since 2010. Flow in MSKC was estimated approximately at 0.05 km³ in August 2023. This collector forms a 10-km² wetland at its tail section.

At the end of August, the total open water surface area of wetlands in the South Aral region was 58.8 km², including: Sudochie lake – 25 km²; Mezhdurechie reservoir – 15 km²; Dzhyltirbas wetland – 20 km². Since the beginning of the year, the total water surface area of wetlands decreased by 300 km².

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 August, inflow to the South Aral region (Amu Darya delta) from the Amu Darya River (Samanbay section) and collecting drains was recorded at 278 million m³, and about 50 million m³ flowed from MSKC, i.e. the total inflow was about 0.3 km³. However, no water surface in this part of the Aral Sea was recorded from monitoring of water surfaces in the Eastern basin of the Large Aral Sea (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). Thus, one may say that all water flowing to the Aral Sea region is used by wetlands and does not cross the boundary of Eastern Basin. In September, the total inflow to the South Aral region is expected to be the same as in August.

Surface water does not reach Western basin of the Large Aral Sea. Water losses through evaporation are partially compensated by inflow from aquifers. In August-September, the water surface area (F) is estimated by satellite images at 2...1.9 thousand km² on average in the Western basin. The water volume (V) derived from V(F) relationship is about 28 km³ in this water body. The water level derived from H(V) relationship is 20...19.8 m. Based on the data from the Aktumsuk weather station, the water level is 19.3 m.

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

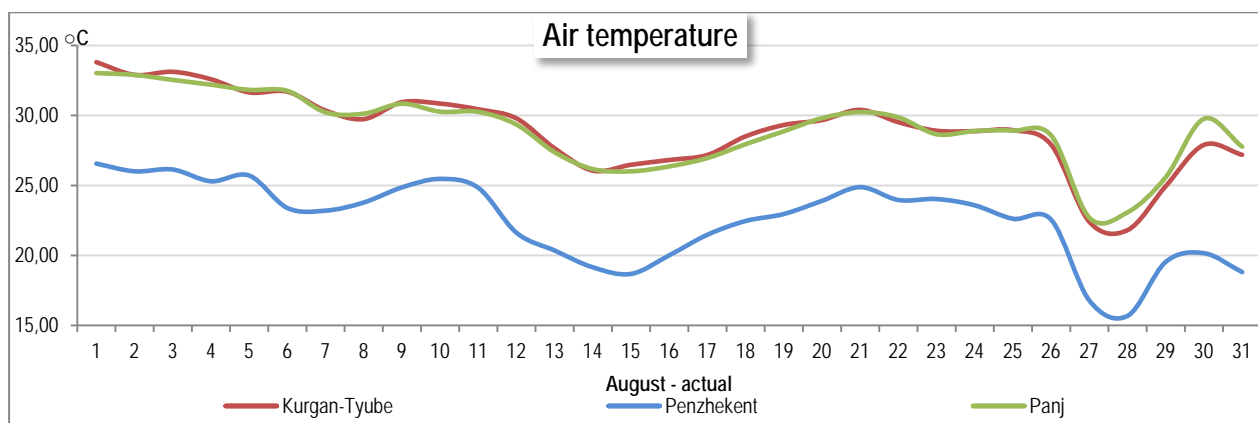


Climate

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	August			September			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Panj	T, °C	Forecast	34.0	29.0	28.0	28.0	27.0	25.0
		Actual	32.0	28.0	27.64			
Kurgan-Tyube	T, °C	Forecast	33.0	29.0	27.0	26.0	25.0	25.0
		Actual	32.0	28.0	27.17			
Penzhekent	T, °C	Forecast	25.0	22.0	22.0	21.0	20.0	19.0
		Actual	25.0	22.0	21.14			



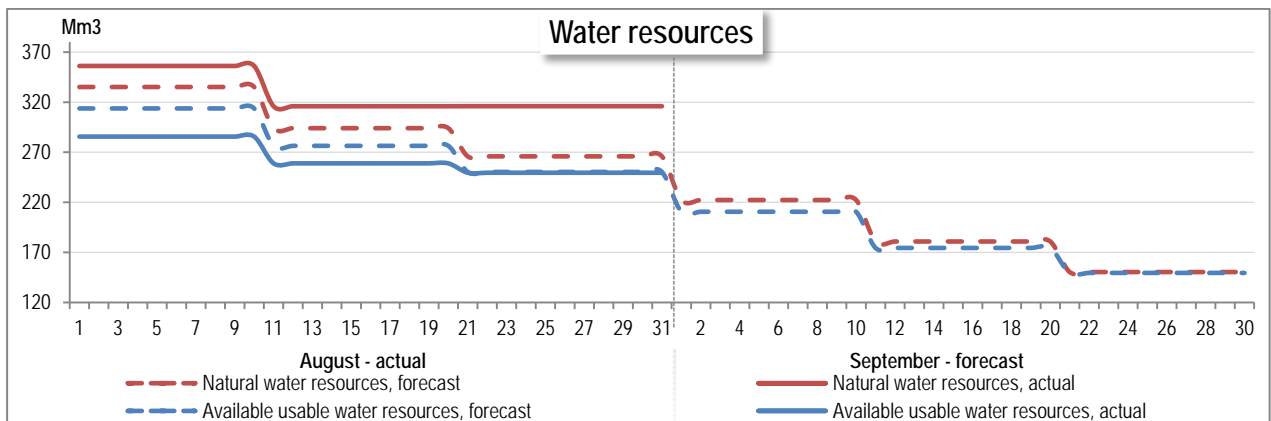


Water resources

Object
Amu Darya
Nurek reservoir
Atamyrat gauging station

Water volume (W)

Object	Parameter	August			September			
		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	1987.2	1641.6	1615.7	1123.0	950.0	691.0
		Actual	2197	2037	2399			
Water withdrawal: upstream of Atamyrat g/s	W, Mm ³	Forecast	1192	1126	1157	962.0	832.0	760.0
		Actual	1106	1084	1097			
Nurek reservoir /filling (+) or draw down (-)	W, Mm ³	Forecast	173	173	152	138.0	26.0	51.0
		Actual	259	38	-20			
Natural water resources at Atamyrat g/s	W, Mm ³	Forecast	3352	2940	2925	2223.0	1809.0	1503.0
		Actual	3562	3159	3476			
Lateral inflow: downstream of Atamyrat g/s	W, Mm ³	Forecast	50	50	54	49.0	48.0	47.0
		Actual	50	50	54			
River water losses: downstream of Atamyrat g/s	W, Mm ³	Forecast	265	226	226	166.0	113.0	56.0
		Actual	756	620	785			
Available usable water resources	W, Mm ³	Forecast	3138	2764	2754	2106.0	1744.0	1495.0
		Actual	2856	2589	2745			



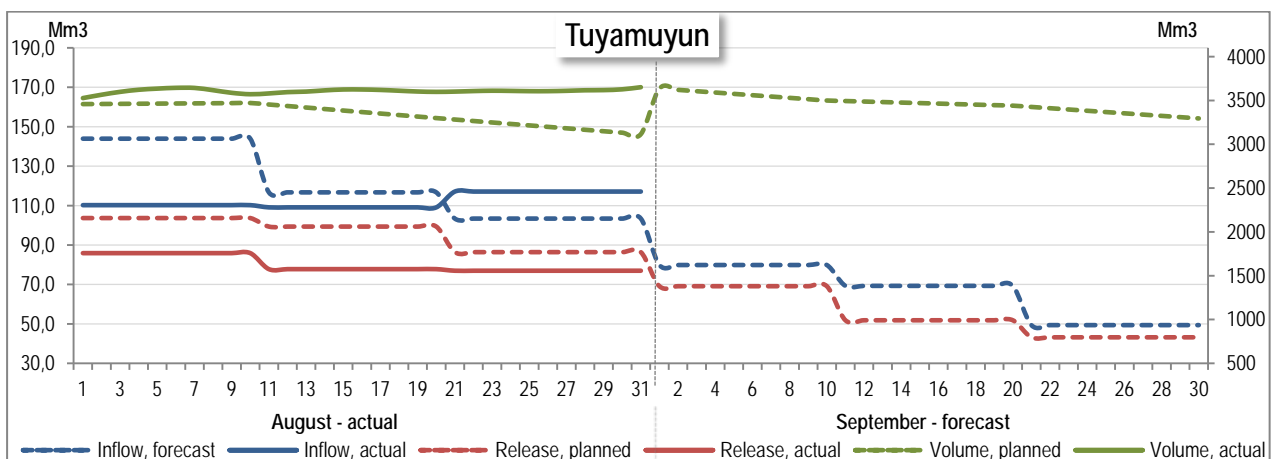
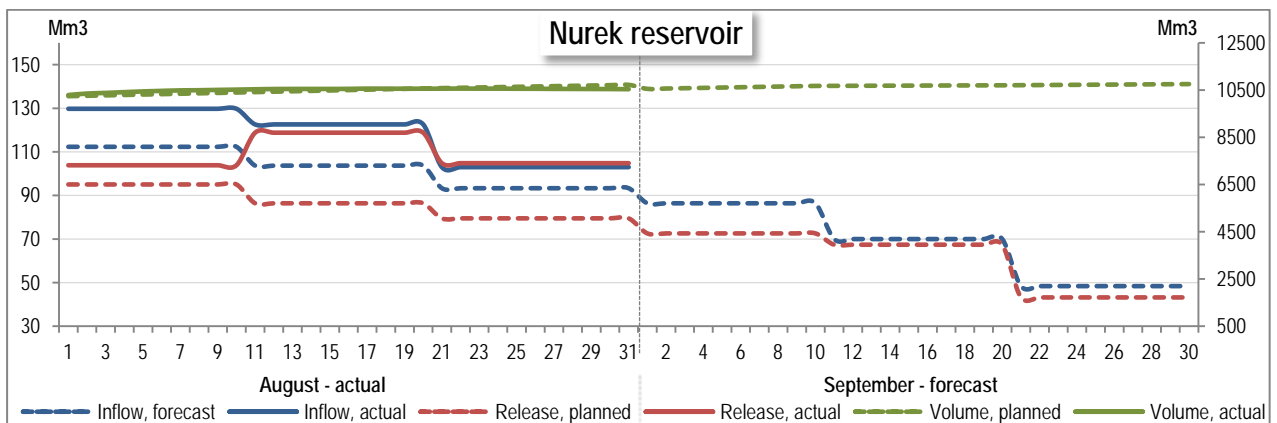


Reservoirs and HEPS

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

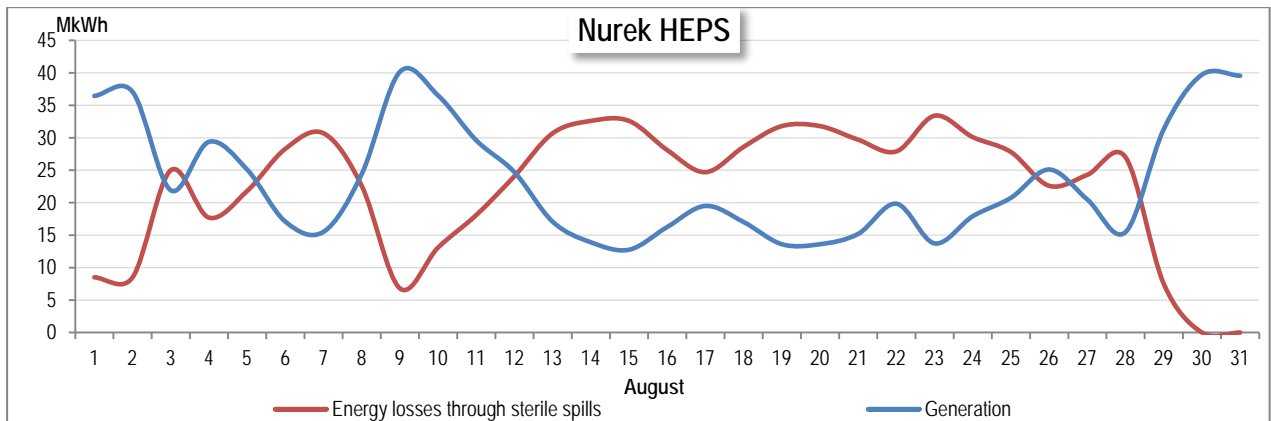
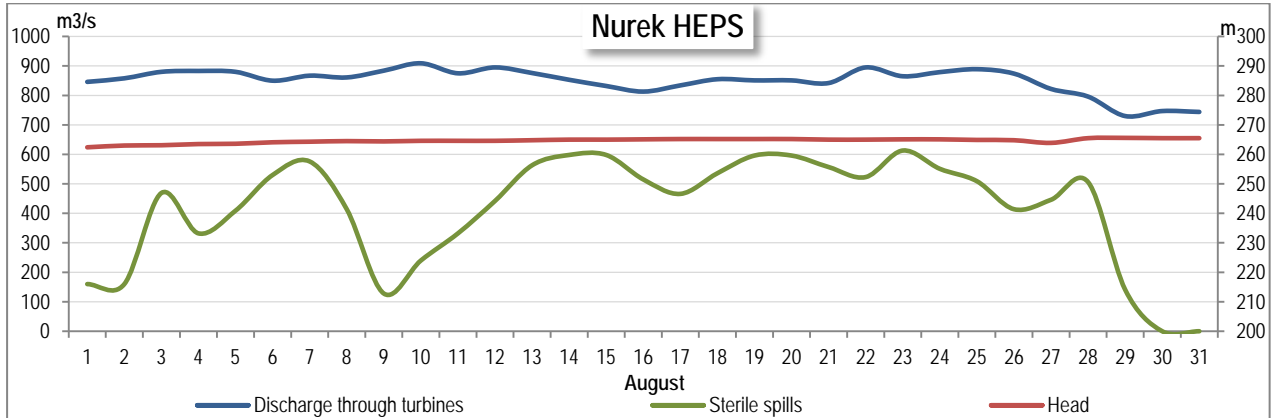
Inflow (I), Water releases (R), Volume (W)

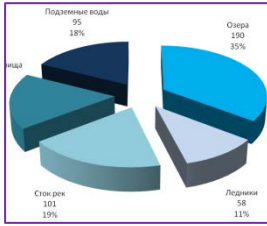
Reservoir	Parameter	August			September			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Nurek reservoir	I, Mm ³	Forecast	1123	1037	1026	864.0	700.0	484.0
		Actual	1298	1226	1133			
	R, Mm ³	Planned	950	864	874	726.0	674.0	432.0
		Actual	1039	1188	1153			
	W, Mm ³	Planned	10399	10572	10724	10678.0	10704.0	10756.0
		Actual	10521	10561	10540			
Reservoirs of Tuyamuyun waterworks facility	I, Mm ³	Forecast	1439	1167	1138	799.0	693.0	494.0
		Actual	1102	1091	1288			
	R, Mm ³	Planned	1037	994	950	691.0	518.0	432.0
		Actual	859	778	847			
	W, Mm ³	Planned	3471	3299	3115	3499.0	3440.0	3295.0
		Actual	3571	3598	3651			



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

HEPS	Parameter		August		
			I ten-day	II ten-day	III ten-day
Nurek	G, M kWh	Actual	283.6	178.0	259.1
	L, M kWh	Actual	183.0	283.1	230.3
	Q, m ³ /s	Actual	871.8	853.5	825.7
	R, m ³ /s	Actual	341.8	524.2	387.0
	H, m	Actual	263.8	265.0	265.1



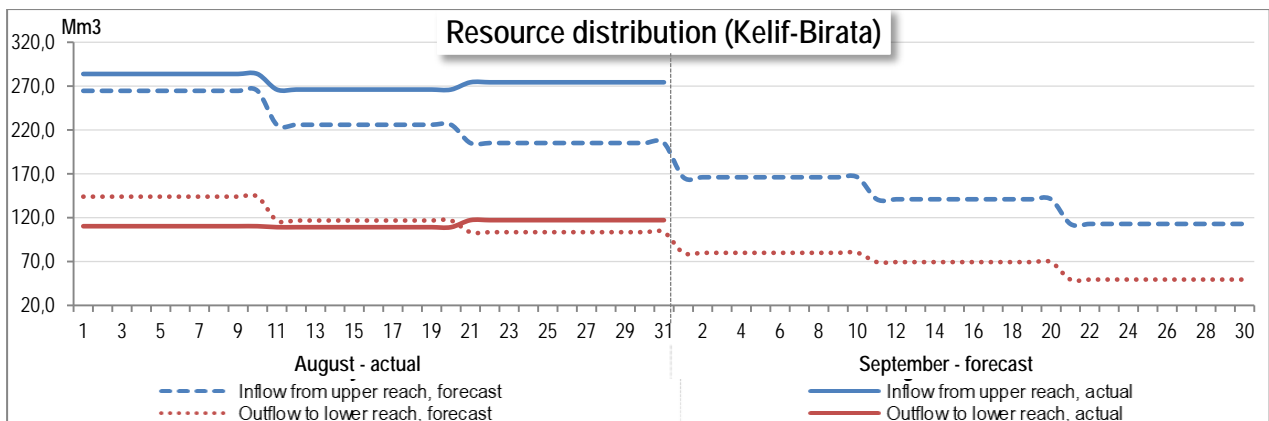


Water distribution

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)

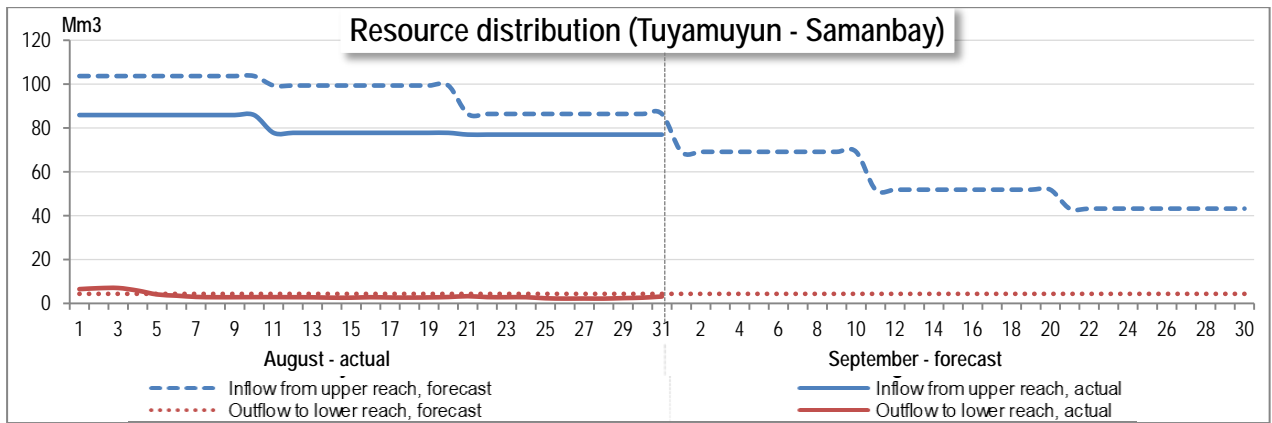
Kelif - Birata	Parameter	August			September			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Inflow from upper reach	W, Mm³	Forecast	2646	2259	2256	1661.0	1410.0	1128.0
		Actual	2839	2661	3018			
Lateral inflow	W, Mm³	Forecast	50	50	54	49.0	48.0	48.0
		Actual	50	50	54			
Water withdrawal	W, Mm³	Planned	993	916	948	745.0	652.0	626.0
		Actual	1030.9	999.7	998.9			
Losses	W, Mm³	Forecast	265	226	226	166.0	113.0	56.0
		Actual	756	620	785			
Outflow to lower reach	W, Mm³	Forecast	1439	1167	1137	799.0	693.0	494.0
		Actual	1102	1091	1288			



Water volume (W)

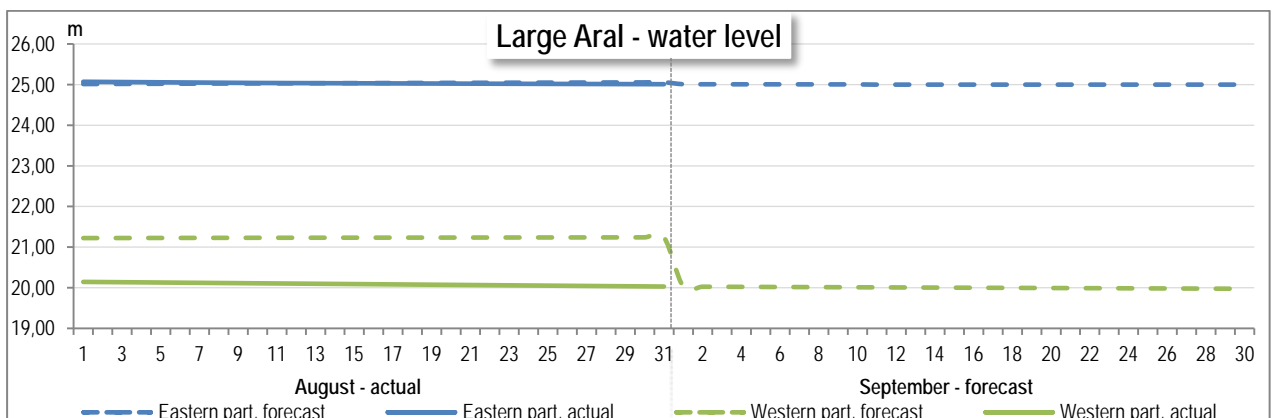
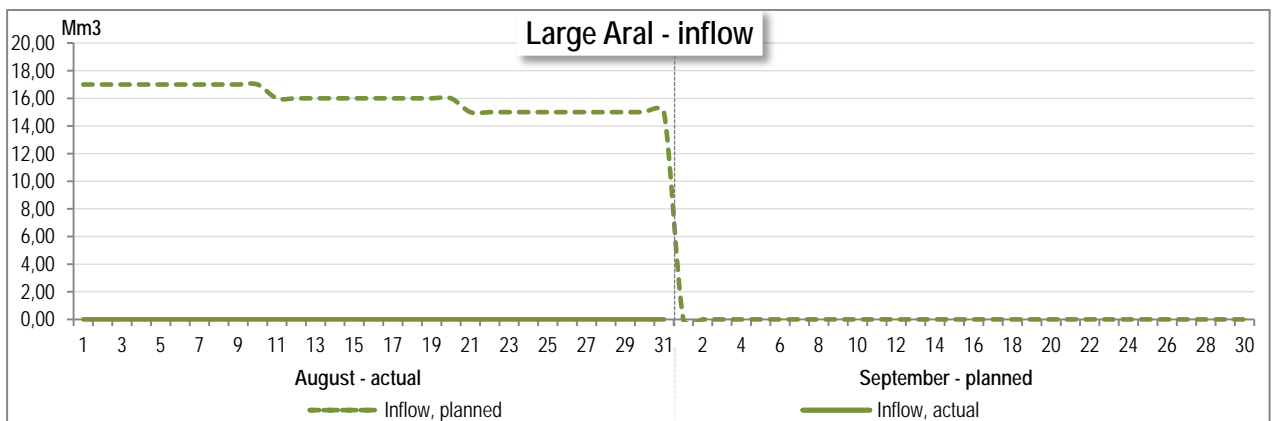
Tuyamuyun - Samanbay	Parameter	August			September			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Inflow from upper reach	W, Mm³	Forecast	1037	994	950	691.0	518.0	432.0
		Actual	859	778	847			
Lateral inflow	W, Mm³	Forecast	0	0	0	0.0	0.0	0.0
		Actual	0	0	0			
Water withdrawal ¹	W, Mm³	Planned	734	700	665	484.0	346.0	281.0
		Actual	585	493	583			
Losses	W, Mm³	Forecast	259	251	238	164.0	130.0	108.0
		Actual	229	258	236			
Outflow to lower reach	W, Mm³	Forecast	43	43	48	43.0	43.0	43.0
		Actual	45	27	28			

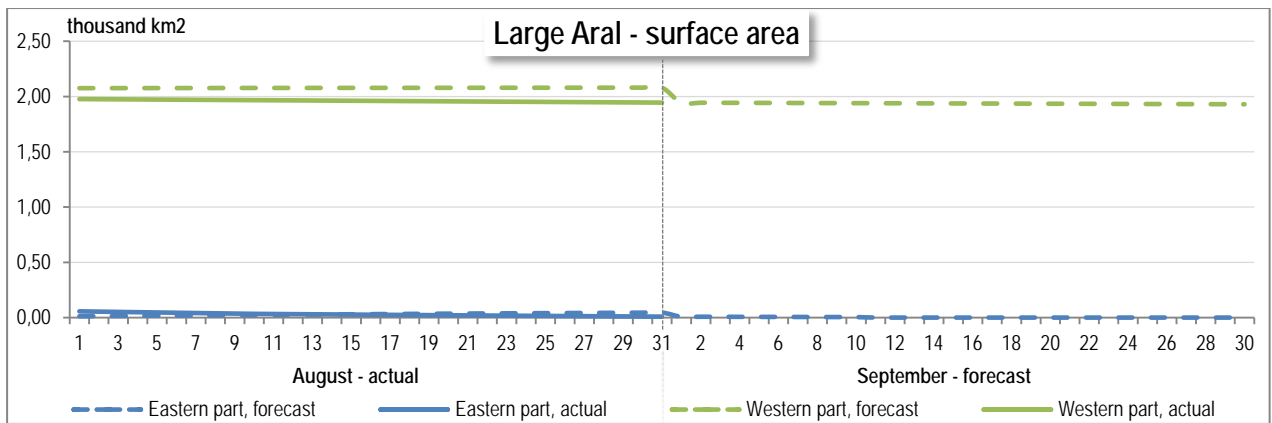
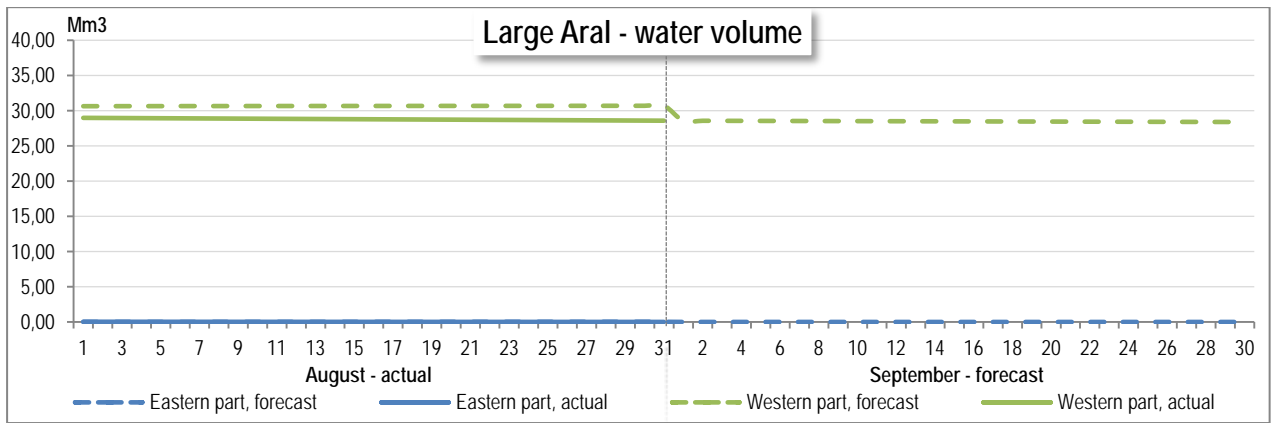
¹ Note: Including supply to the system of lakes and environmental water releases into canals



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

Large Aral Sea	Parameter	August			September			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Inflow	W, Mm ³	Planned	170.00	160.00	165.00	0.0	0.0	0.0
		Actual	0.00	0.00	0.00			
Eastern part, water volume	W, Mm ³	Forecast	0.01	0.02	0.02	0.0	0.0	0.0
		Actual	0.02	0.01	0.01			
Eastern part, level	H, m	Forecast	25.02	25.04	25.05	25.0	25.0	25.0
		Actual	25.06	25.03	25.02			
Eastern part, area	S, th.km ²	Forecast	0.02	0.03	0.04	0.0	0.0	0.0
		Actual	0.05	0.03	0.01			
Western part, water volume	W, Mm ³	Forecast	30.65	30.68	30.69	28.0	28.0	28.0
		Actual	28.93	28.79	28.65			
Western part, level	H, m	Forecast	21.23	21.23	21.24	20.0	20.0	19.0
		Actual	20.13	20.09	20.05			
Western part, area	S, th.km ²	Forecast	2.08	2.08	2.08	1.0	1.0	1.0
		Actual	1.97	1.96	1.95			





Syr Darya River Basin

Actual Situation in August and Forecast for September

In August, the available usable water resources in the Syr Darya River basin estimated as the sum of flows based on inflow to Toktogul, Andizhan, and Charvak reservoirs plus lateral inflow to basin's rivers and minus losses amounted to 2,583 million m³, of which the inflow to the three upper reservoirs was 1,897 million m³ (82% of forecast). Proceeding from inflow to the three upper reservoirs, water resources in the basin are expected to decrease to 1,339 million m³, i.e. will account for 70% of inflow in September.

In August, inflow to the Toktogul reservoir was as small as 1,314 million m³ only (84% of forecast), and 964 million m³ of water was discharged from the reservoir (94% of the plan). The water volume in the Toktogul reservoir increased from 10,950 million m³ to 11,293 million m³ (98% of water accumulation plan) in August. Water losses (derived from water balance discrepancy) were small – 0.2% of water volume in the reservoir. It is expected that in September the Toktogul reservoir will accumulate water and its water volume will augment to 11,607 million m³ by the end of month; inflow to the reservoir is expected in the amount of 881 million m³, and water releases are to be reduced largely to 568 million m³ (59% of those in August).

Inflow to the Andizhan reservoir amounted to 170 million m³ only (85% of forecast), and 338 million m³ of water (58% of planned discharge) was discharged from the reservoir in August. The water volume was as small as 974 million m³ at the beginning and dropped further to 739 million m³ at the end of month. In September, inflow to the Andizhan reservoir is expected at 134 million m³. Water releases are planned at 181 million m³, thus requiring draw downing of the reservoir. As a result, the reservoir's water volume will decrease to 691 million m³ by the end of month.

In August, inflow to the Charvak reservoir was 413 million m³ (74% of expected inflow), and 704 million m³ was discharged (97% of the plan) from the reservoir. By the beginning of month, the reservoir accumulated water in the amount of 1,905 million m³, and the volume decreased to 1,627 million m³ (93% of planned accumulation) at the end of month. In September, inflow to the Charvak reservoir is expected to decrease to 324 million m³, and water releases will be also reduced to 454 million m³. The water volume will go down to 1,497 million m³.

In August, the Bakhri Tojik reservoir was drawn down from 2,190 million m³ to 1,580 million m³, and the plan of water accumulation was 91% fulfilled by the end of month. Inflow to the reservoir was 725 million m³ (90% of forecast), while water releases from the reservoir were 1,431 million m³ (88% of the plan). The reduced water releases led to low water availability for diversion downstream the reservoir (see "Water distribution"). In September, inflow to the Bakhri Tojik reservoir is expected to decline to 699 million m³, while water releases will be reduced even more to 596 million m³ and the water volume in reservoir will be increased to 1,628 million m³.

Inflow to the Shardara reservoir was 311 million m³ in August (only 54% of expected inflow), and the plan of water releases from the reservoir into the Syr Darya River was 60% fulfilled. Water was not discharged into Arnasai. The reservoir was drawn down from 1,403 million m³ to 810 million m³ (73% of expected accumulation). Water withdrawal from the reservoir was 76 million m³ (57% of established water withdrawal limit). In September, inflow to the Shardara reservoir is expected to increase to 548 million m³ but water releases from the reservoir will be reduced to greater value and will be 467 million m³. It is planned to increase water volume to 866 million m³ in the reservoir by the end of month. Water discharge into Arnasai is not planned for September.

There were no inflow to and discharge from the Koksarai reservoir in August. The available storage capacity of the reservoir was zero. The reservoir's water surface area is estimated at 6 thousand ha by satellite images at the end of August. Accumulation of water is not planned for September.

In August, the cascade of Naryn HEPS' (Kyrgyzstan) generated 835 million kWh (89% of the plan), of which 828 million kWh generated under energy mode (99% of the total generation). Toktogul HEPS

generated 342 million kWh in August. The average discharge through turbines of the Toktogul HEPS was 359 m³/s, and the average monthly head at HEPS was 142 m. No sterile spills were recorded.

In August, the total generation at large HEPS' of Uzbekistan amounted to 325 million kWh (by 22% lower than in July), of which: 244 million kWh at Charvak HEPS, 54 million kWh at Andizhan HEPS, and 27 million kWh at Farkhad HEPS. The average monthly discharge at Charvak HEPS was 264 m³/s, and the head was 145 m. The discharge at Andizhan HEPS was 111 m³/s, and the head was 95 m. For Farkhad HEPS, the discharge was 137 m³/s, and the head was 31 m.

Energy generation by HEPS of the Bakhri Tojik reservoir (Tajikistan) amounted to 35 million kWh in August. Shardara HEPS (Kazakhstan) generated 21 million kWh. The average monthly water discharge at HEPS of Bakhri Tojik was 399 m³/s, while the head was 17 m. Discharge through turbines of Shardara HEPS was 191 m³/s, and the head was 14 m.

In August, the water shortage was estimated at 130 million m³ or 17% 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 16 million m³ or the same 17% of the limit. In the Akjar section the water volume was 725 million m³ or by 10% lower of the amount envisaged in the water distribution plan.

In the middle reaches, from the Bakhri Tojik reservoir (Kyzylkishlak section) to Shardara reservoir, the actual water withdrawal was by 18% lower than planned one. Only 361 million m³ flowed to the Shardara reservoir from the Syr Darya River; this is by 46% lower of the expected inflow.

In the lower reaches of the Syr Darya River the river flow downstream of the Shardara reservoir was 499 million m³. This corresponds to 60% of the planned discharge from reservoir into the river. Water shortage was estimated at about 50% of planned water withdrawal in the lower reaches. Inflow to the North Aral Sea amounted to only 35 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 - 3% of the Syr Darya River flow; losses in the Bakhri Tojik reservoir - Shardara reservoir reach - 2%. In September, it is expected that discharge from the Toktogul waterworks facility will decrease by 40% as compared to water volume in August, while that from the Uchkurgan waterworks facility will decrease by as high as 50%. Inflow at Akjar section is expected by 4% lower than in August. Although water releases will be reduced twofold from the Bakhri Tojik reservoir, inflow to the Shardara reservoir will increase approximately 1.5 times (through lateral inflow to the river in this reach). Discharge from the Shardara reservoir will decrease slightly – approximately by 7%, and only about 12 million m³ will reach the North Aral Sea.

In August, inflow to the North Aral Sea from the Syr Darya River was about 36 million m³. In September, 12 million m³ is expected to reach the sea. The water volume in this water body decreased from 22.3 km³ to 22.12 km³ in August. The water surface area shrank from 2.88 thousand km² to 2.86 thousand km², while the water level dropped from 41.25 m to 41.02 m. In September, it is expected that the water volume will decline to 22 km³, the water surface area, to 2.85 thousand km², and the water level, to 40.9 m (lower the level of 41 m).

There was no discharge from the North Aral into the Large Aral in August, and water discharge is not planned in September too.

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

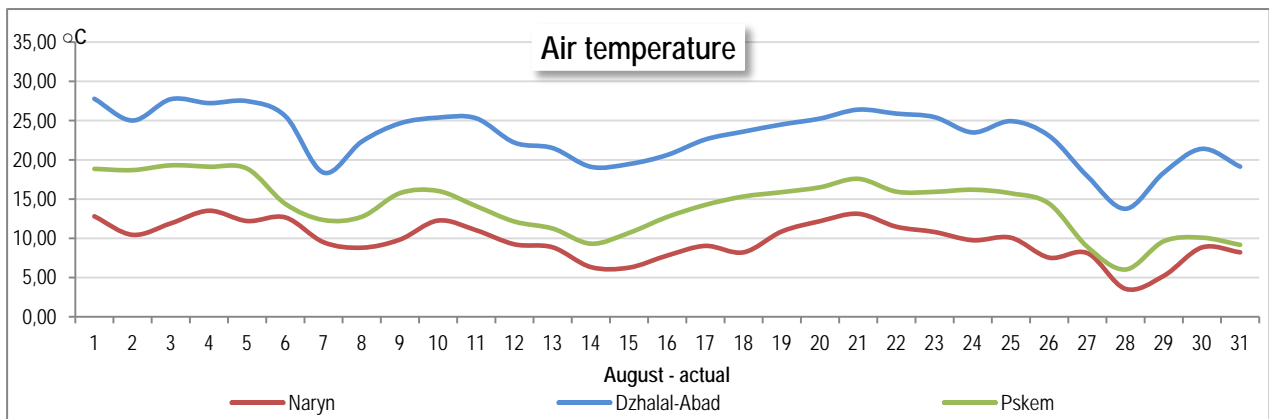


Climate

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	August			September		
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day
Naryn	Forecast	11.0	9.0	9.0	8.0	7.0	5.0
	Actual	11.0	9.0	8.79			
Dzhalal-Abad	Forecast	25.0	22.0	22.0	21.0	20.0	19.0
	Actual	25.0	22.0	21.8			
Pskem	Forecast	7.0	13.0	13.0	12.0	11.0	10.0
	Actual	17.0	13.0	12.69			



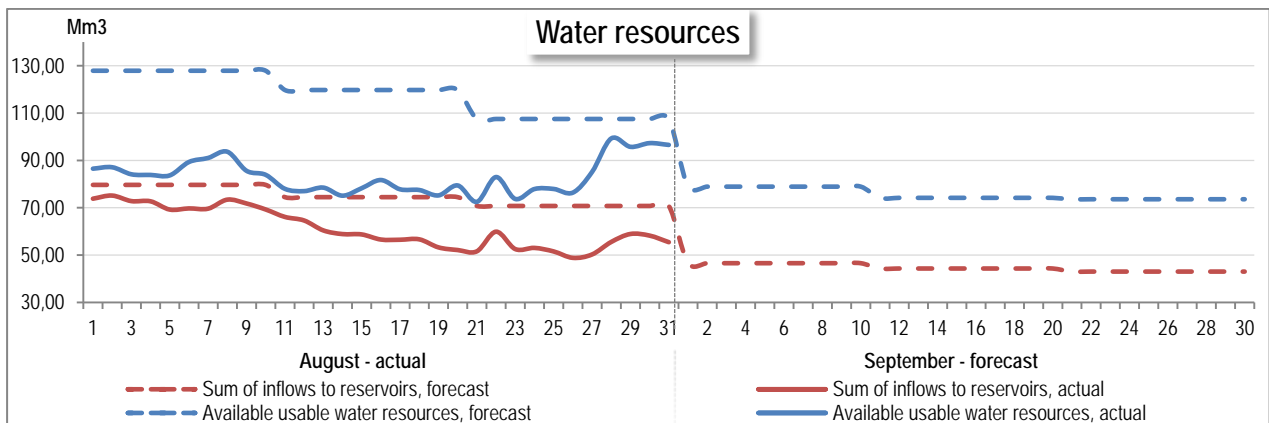


Water resources

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	August			September			
		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	503	503	553.1	294.0	294.0	293.0
		Actual	497	398	419.4			
Inflow to Andizhan reservoir	W, Mm ³	Forecast	78	60	61.8	48.0	43.0	43.0
		Actual	65	58	46.1			
Inflow to Charvak reservoir	W, Mm ³	Forecast	216	181	163.5	124.0	106.0	93.0
		Actual	156	127	130.4			
Sum of inflows to reservoirs	W, Mm ³	Forecast	797	745	778.3	466.0	443.0	430.0
		Actual	718	584	595.8			
Lateral inflow up to Shardara	W, Mm ³	Forecast	561	531	482.9	385.0	360.0	367.0
		Actual	230	273	418.2			
Losses	W, Mm ³	Forecast	79	79	78.7	62.0	62.0	61.0
		Actual	79	79	78.7			
Available usable water resources	W, Mm ³	Forecast	1279	1197	1182.6	789.0	742.0	735.0
		Actual	869	779	935.4			



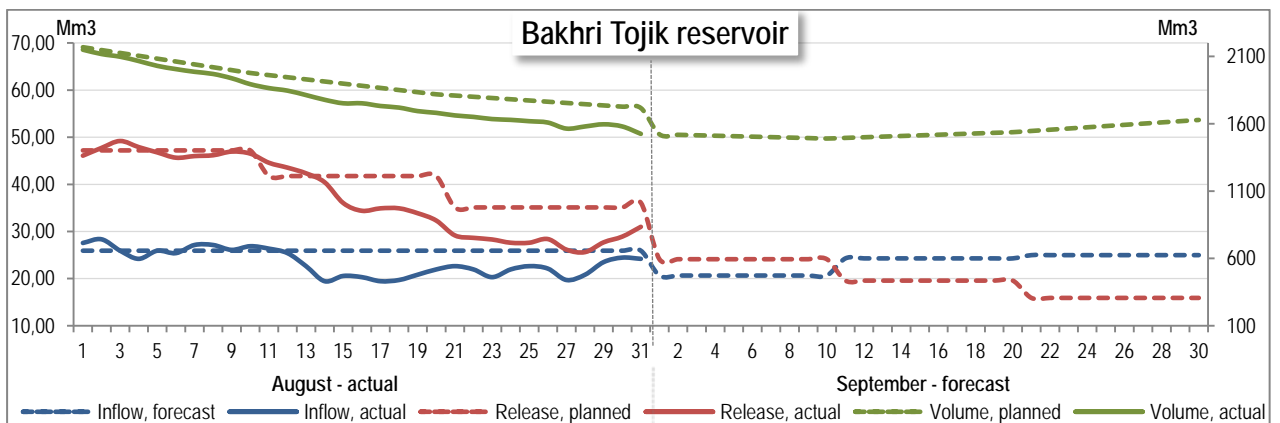
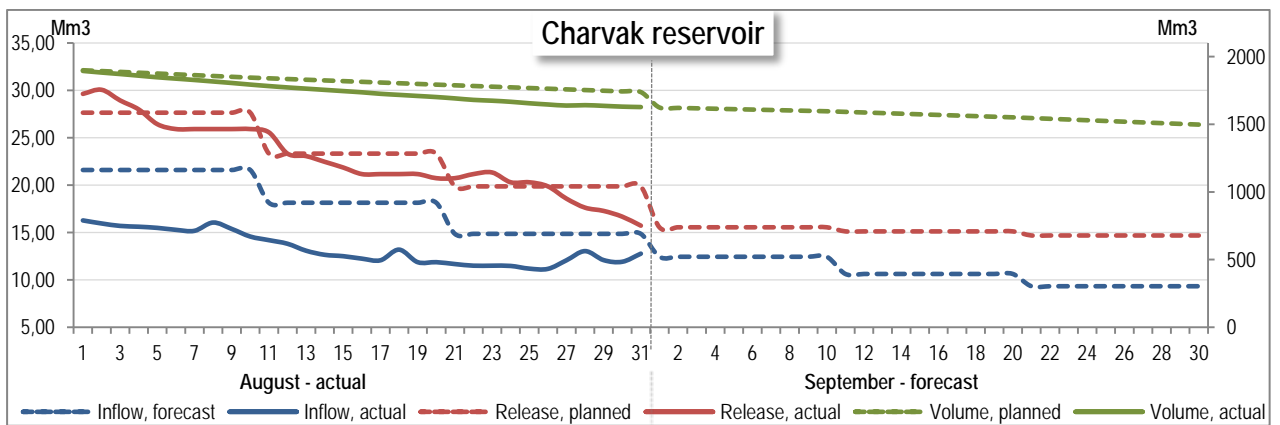
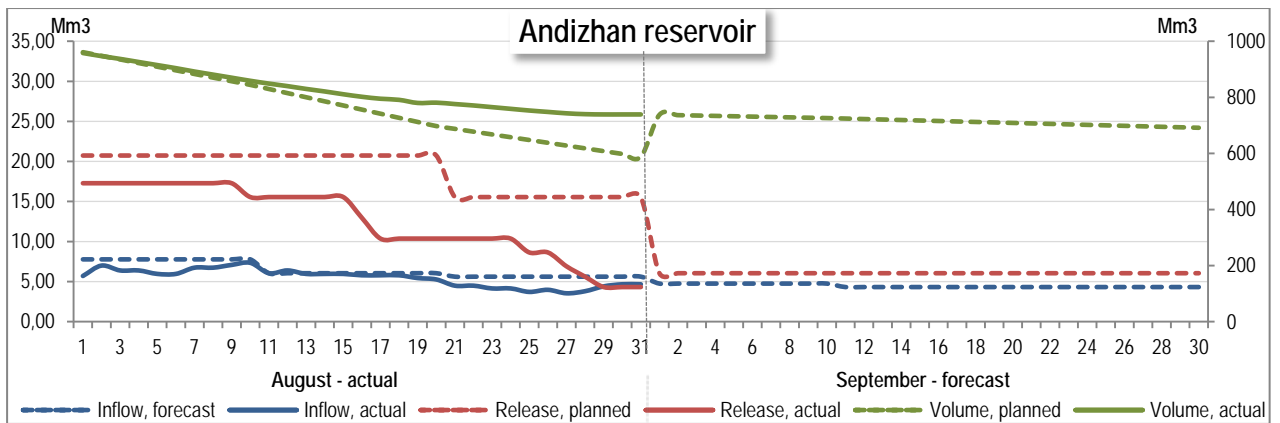
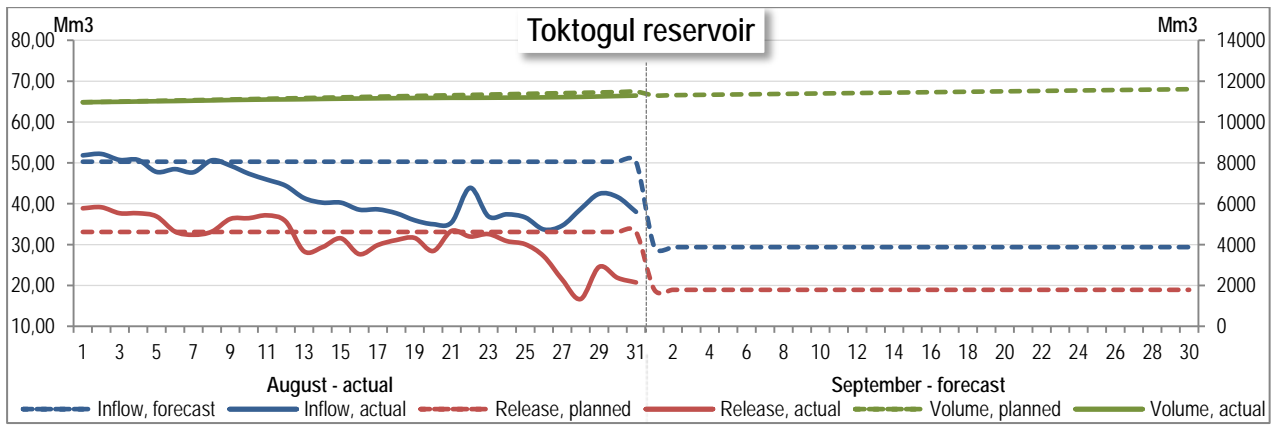


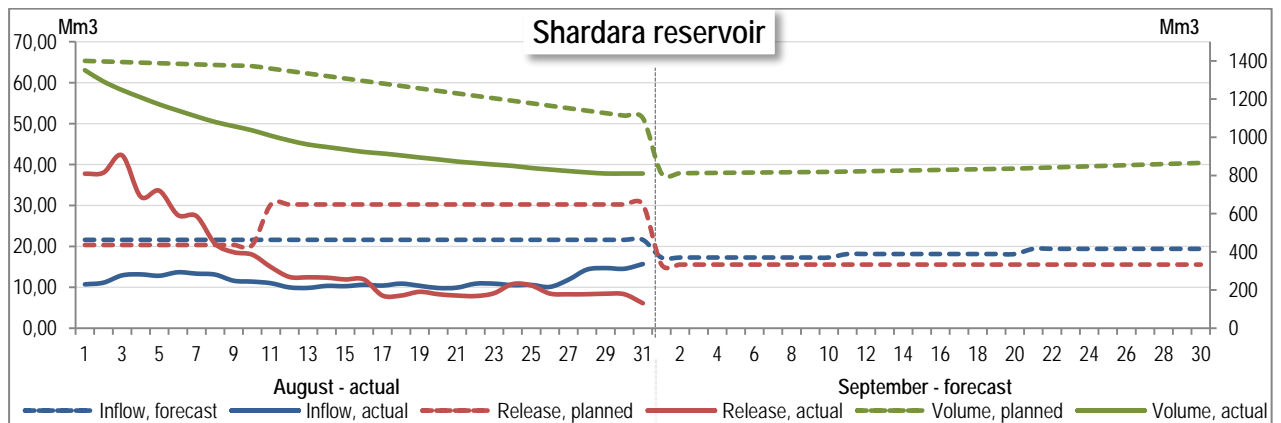
Reservoirs and HEPS

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)

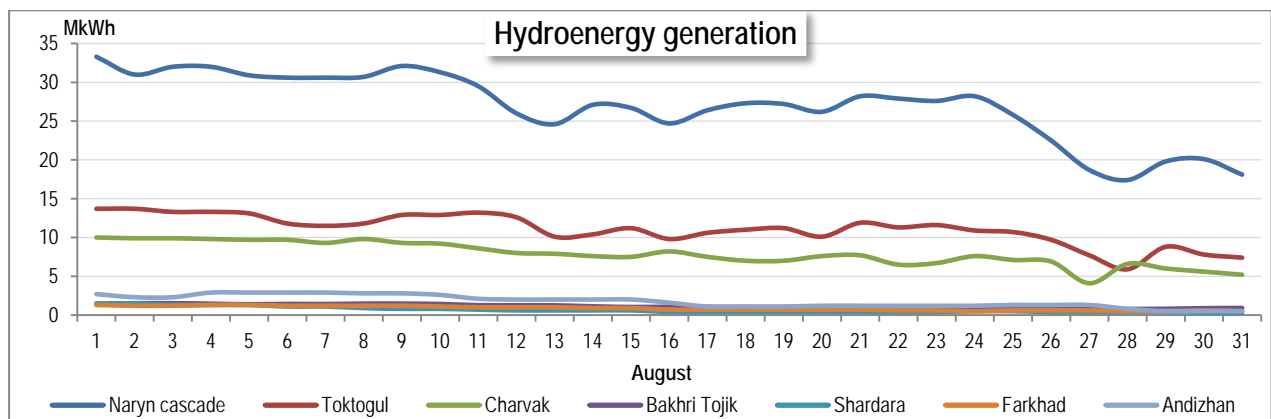
Reservoir	Parameter	August			September			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Toktogul reservoir	I, Mm ³	Forecast	502.85	502.85	553.08	293.0	293.0	293.0
		Actual	496.71	397.96	419.39			
	R, Mm ³	Planned	330.91	330.91	363.99	189.0	189.0	189.0
		Actual	361.76	310.78	291.17			
	W, Mm ³	Planned	11122	11294	11483	11398.0	11502.0	11607.0
		Actual	11089	11178	11293			
Andizhan reservoir	I, Mm ³	Forecast	77.76	60.48	61.78	47.0	43.0	43.0
		Actual	65.32	58.41	46.05			
	R, Mm ³	Planned	207.36	207.36	171.05	60.0	60.0	60.0
		Actual	171.07	132.19	84.24			
	W, Mm ³	Planned	844	698	588	726.0	709.0	691.0
		Actual	859	781	739			
Charvak reservoir	I, Mm ³	Forecast	216.00	181.44	163.46	124.0	106.0	93.0
		Actual	155.51	127.49	130.38			
	R, Mm ³	Planned	276.48	233.28	218.57	155.0	151.0	146.0
		Actual	272.68	221.70	209.61			
	W, Mm ³	Planned	1845	1793	1738	1596.0	1551.0	1497.0
		Actual	1793	1701	1627			
Bakhri Tojik reservoir	I, Mm ³	Forecast	259.20	259.20	285.12	206.0	242.0	249.0
		Actual	264.56	216.60	244.25			
	R, Mm ³	Planned	472.03	417.60	387.10	241.0	195.0	158.0
		Actual	468.99	377.32	309.06			
	W, Mm ³	Planned	1977	1819	1367	1490.0	1537.0	1628.0
		Actual	1894	1681	1525			
Shardara reservoir	I, Mm ³	Forecast	216.00	216.00	237.60	172.0	181.0	193.0
		Actual	123.87	103.58	134.00			
	R, Mm ³	Planned	203.40	302.40	332.64	155.0	155.0	155.0
		Actual	296.01	109.30	93.58			
	W, Mm ³	Planned	1372	1243	1100	819.0	836.0	866.0
		Actual	1036	884	810			

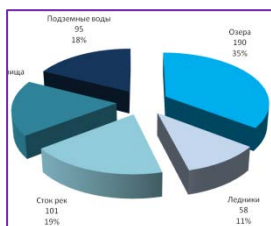




Generation (G), Energy losses through sterile spills (L), Discharge through turbines (Q), Sterile spills (R), Head (H)

HEPS	Parameter		August		
			I ten-day	II ten-day	III ten-day
Naryn cascade	G, M kWh	Actual	282.5	265.7	254.3
	Q, m ³ /s	Actual	419.0	359.1	305.1
Toktogul	G, M kWh	Actual	128.0	110.2	103.7
	H, m	Actual	142.0	142.0	142.4
Andizhan	G, M kWh	Actual	27.1	16.2	11.0
	Q, m ³ /s	Actual	183.0	97.6	56.3
Bakhri Tojik	G, M kWh	Actual	95.0	95.0	95.0
	Q, m ³ /s	Actual	14.6	11.2	9.4
Farkhad	G, M kWh	Actual	504.5	396.8	304.2
	H, m	Actual	17.0	16.6	16.4
Charvak	G, M kWh	Actual	12.2	7.6	6.3
	Q, m ³ /s	Actual	193.4	134.3	89.2
Shardara	G, M kWh	Actual	30.6	30.6	30.6
	H, m	Actual	96.6	76.9	70.0
Andizhan	G, M kWh	Actual	321.5	257.1	217.8
	H, m	Actual	143.0	140.6	138.8
Farkhad	G, M kWh	Actual	11.6	5.1	4.4
	Q, m ³ /s	Actual	354.0	125.0	102.2
Shardara	G, M kWh	Actual	14.0	14.32	14.2
	H, m	Actual			



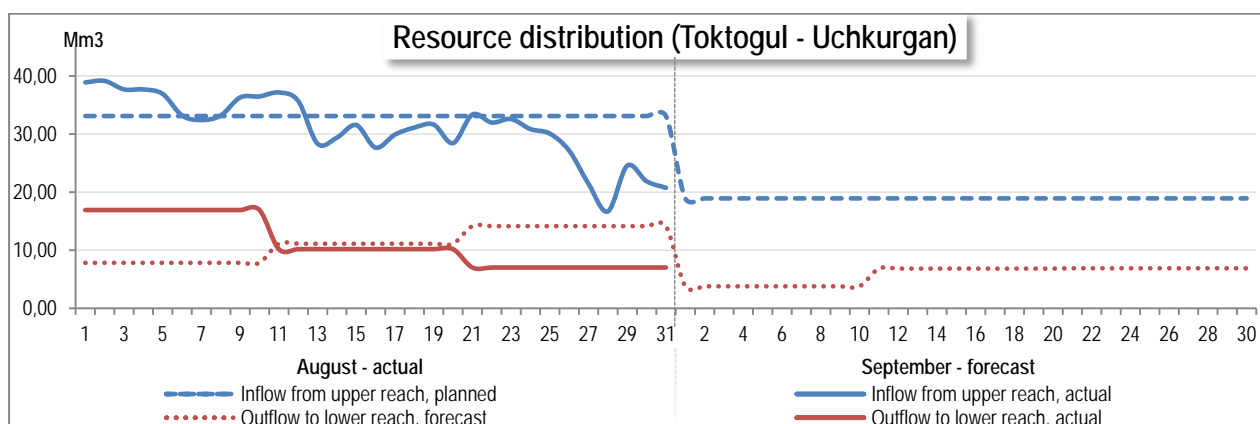


Water distribution

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	August			September			
		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	330.91	330.91	363.99	189.0	189.0	189.0
		Actual	361.76	310.78	291.17			
Lateral inflow ²	W, Mm ³	Forecast	37.54	37.54	41.25	30.0	30.0	30.0
		Actual	21.60	17.28	23.76			
Water withdrawals	W, Mm ³	Planned	272.85	240.02	230.67	156.0	125.0	125.0
		Actual	198.98	199.23	215.71			
Losses	W, Mm ³	Forecast	17.28	17.28	19.03	25.0	25.0	25.0
		Actual	15.21	27.05	22.00			
Outflow to lower reach ³	W, Mm ³	Forecast	78.32	111.15	155.54	37.0	68.0	68.0
		Actual	169.17	101.78	77.22			



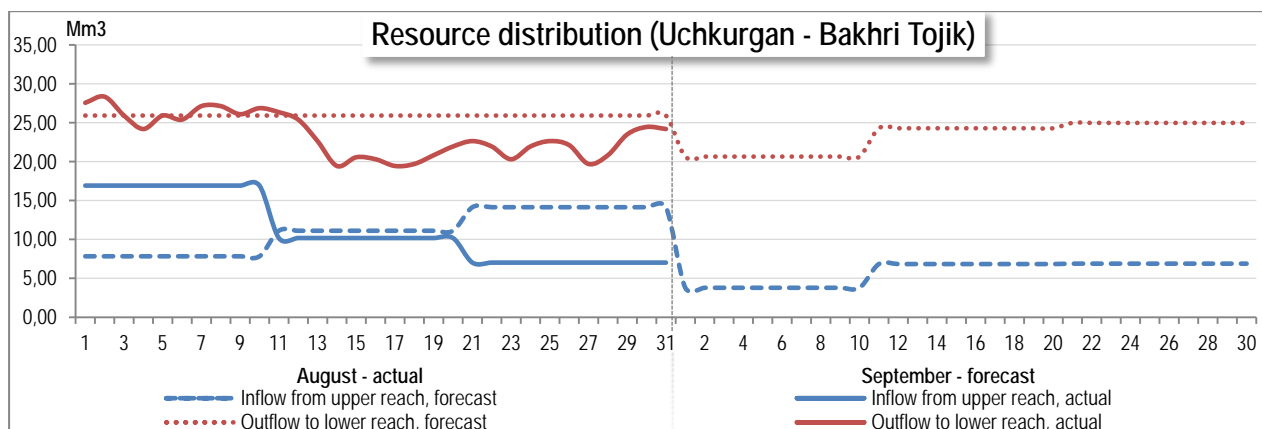
Water volume (W)

Uchkurgan – Bakhri Tojik	Parameter	August			September			
		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	78.32	111.15	155.54	37.0	68.0	68.0
		Actual	169.17	101.78	77.22			
Lateral inflow	W, Mm ³	Forecast	248.78	207.57	186.89	201.0	205.0	206.0
		Actual	148.21	137.87	209.00			
Water withdrawals	W, Mm ³	Planned	37.90	29.52	24.31	16.0	15.0	10.0
		Actual	24.65	24.49	27.27			
Losses	W, Mm ³	Forecast	30.00	30.00	33.00	16.0	15.0	14.0
		Actual	28.17	-1.44	14.70			
Outflow to lower reach ⁴	W, Mm ³	Forecast	259.20	259.20	285.12	206.0	242.0	249.0
		Actual	264.56	216.60	244.25			

² Incl. Karasu left and right

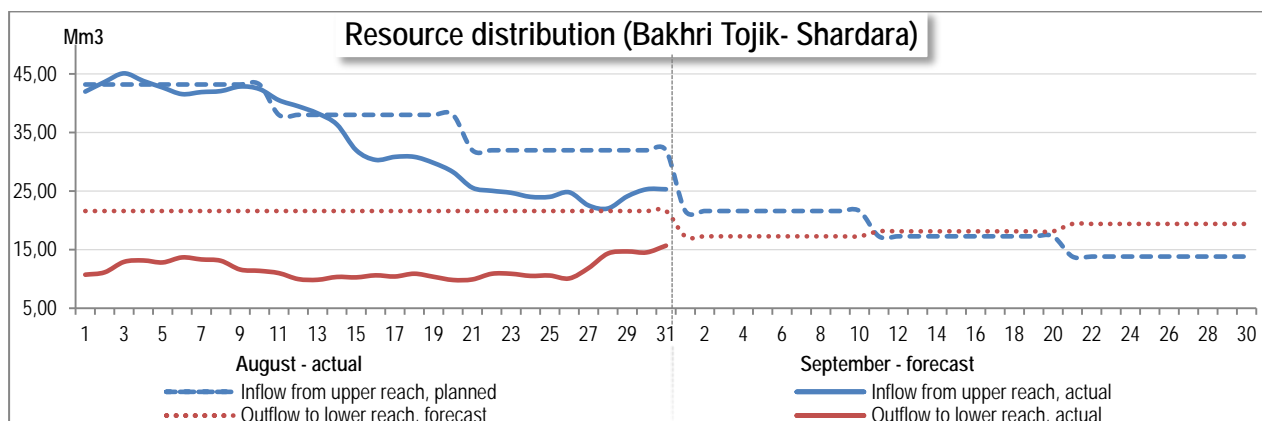
³ Uchkurgan waterworks facility

⁴ Akdzhar g/s



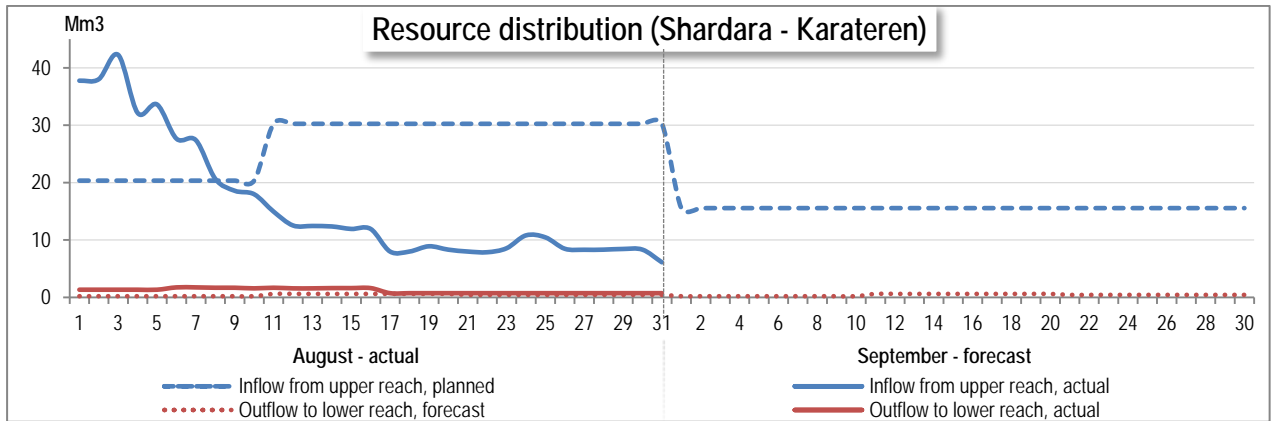
Water volume (W)

Bakhri Tojik - Shardara	Parameter	August			September			
		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	432.00	380.16	351.67	216.0	172.0	138.0
		Actual	428.03	336.70	267.49			
Lateral inflow	W, Mm ³	Forecast	299.00	271.84	238.04	148.0	145.0	160.0
		Actual	134.00	109.40	174.46			
Water withdrawals	W, Mm ³	Forecast	485.00	406.00	319.11	185.0	104.0	79.0
		Actual	374.80	320.80	298.10			
Losses	W, Mm ³	Forecast	30.00	30.00	33.00	6.0	31.0	25.0
		Actual	63.36	21.72	9.86			
Outflow to lower reach	W, Mm ³	Forecast	216.00	216.00	237.60	172.0	181.0	193.0
		Actual	123.87	103.58	134.00			



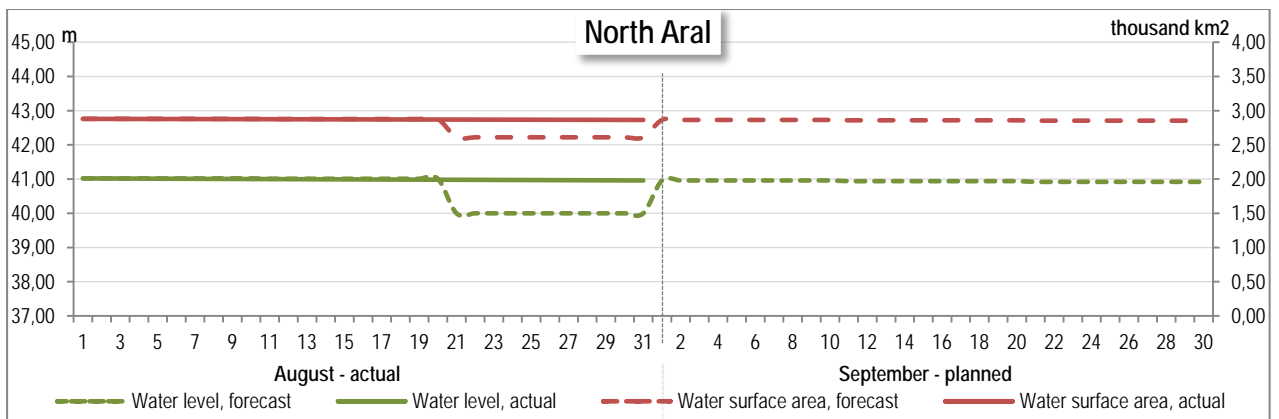
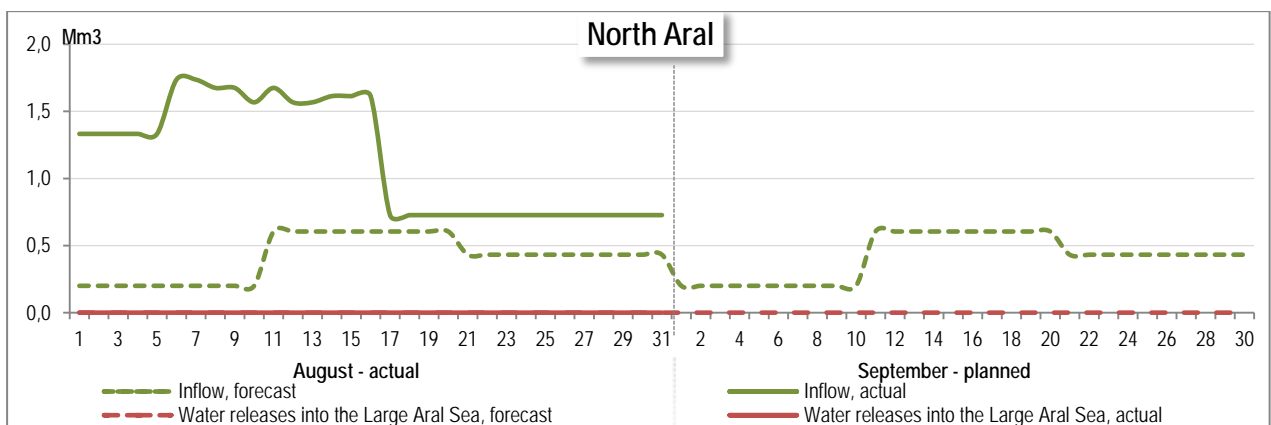
Water volume (W)

Shardara - Karateren	Parameter	August			September			
		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	203.4	302.4	332.6			
		Actual	296.01	109.30	93.6			
Lateral inflow	W, Mm ³	Forecast	8.6	0.8	10.0	5.0	5.0	5.0
		Actual	0.1	0.1	0.1			
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	200.0	227.2	249.9	131.0	132.0	141.0
		Actual	184.6	73.0	23.1			
Losses	W, Mm ³	Forecast	10.0	70.0	88.0	27.0	22.0	15
		Actual	96.5	23.9	62.6			
Outflow to lower reach	W, Mm ³	Forecast	2.00	6.05	4.8	2.0	6.0	4.0
		Actual	15.05	12.56	8.0			



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

North Aral	Parameter	August			September			
		I ten-day	II ten-day	III ten-day	I ten-day	II ten-day	III ten-day	
Inflow	W, Mm ³	Forecast	2.00	6.05	4.75	2.0	6.0	4.0
		Actual	15.05	12.56	8.00			
Water volume	W, Mm ³	Forecast	22.30	22.27	19.25	22.0	22.0	22.0
		Actual	22.27	22.21	22.15			
Water level	H, m	Forecast	41.02	41.01	40.00	40.0	40.0	40.0
		Actual	41.01	40.99	40.97			
Water surface area	S, th.km ²	Forecast	2.88	2.88	2.61	2.0	2.0	2.0
		Actual	2.88	2.87	2.87			
Water releases into the Large Aral Sea	W, Mm ³	Forecast	0.00	0.00	0.00	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