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THE AMUR RIVER RESEARCH IN 2007

Khabarovsk
2008

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Introduction

The research was carried out in the frame of the Implementation Agreement on the Joint Research of the Amur River, its Estuary and the Sea of Okhotsk between the Institute of Water and Ecology Problems FEB RAS (Russia) and the Research Institute of Humanity and Nature (Japan), signed on April 19, 2005 and based on the Agreement on Cooperation between the Far Eastern Branch of the Russian Academy of Sciences and the Research Institute of Humanity and Nature, signed on March 4, 2004.

Joint expeditions in the Lower Amur, the Amur Liman and the Sakhalin Bay south have been undertaken since 2005 under the annual contracts between IWEP FEB RAS and RIHN.

In 2007 the expedition was carried out August 6 – 15 in the Lower Amur from Khabarovsk to Nickolaevsk-on-Amur. Also water sampling continued near Khabarovsk and Bogorodskoe. In addition water sampling began in the Amur estuary near Nickolaevsk-on-Amur.

Totally 116 water and 116 particle-on-filters samples, 2 bottom sediment samples and 10 soil samples were collected. Chemical analyses were performed in the Interregional Center for Ecological Monitoring of Hydrologic Facilities (№ ROCC RU 0001.515988) and Physical and Chemical Analytical Center of the Institute of Tectonics and Geophysics FEB RAS.

The research results include new materials on spatial and seasonal characteristics of water in the Lower Amur, significantly expanding the knowledge on the subject and data previously received under the Project. Joint analysis of Amur water content data and water chemical composition will allow clarifying the volume of annual discharge of chemical substances and their seasonal distribution.

1. Research Methods

Field works included soil, water and bottom sediment sampling at the selected stations following the previously used methods. Sampling and water velocity measurements were carried out from the LADOGA research vessel and a speed boat. During the expedition 42 water samples, 2 bottom sediment samples and 10 soil samples were collected. Water in the Amur was sampled with a bathometer and with an electric vacuum pump at big river depths. For bottom sediment sampling a bottom-grab sampler, designed and made in IWEP was used. It is in the form of a metal cylinder with a shifted gravity center. Expedition participants identified soil sampling sites and collected soil samples there.

Immediately after the samples were collected they were treated respectively. They were filtered in the filtration unit, fixed as needed and stored in the refrigerator and freezer.

Expedition works were carried out by IWEP senior researchers Vladimir I. Kim and Vladimir P. Shesterkin and a leading engineer Dmitry Ryzhov. Japanese participants were Dr. Seiya Nagao, Osamu Seki and Masayuki Kawahigashi.

The samples were transported to Khabarovsk to be analyzed in the IWEP and the Institute of Tectonics and Geophysics FEB RAS.

Water sampling at Khabarovsk and Bogorodskoe was performed by the staff of Khabarovsk Center of Hydrometeorology and Environmental Monitoring of ROSHYDROMET and in Nickolaevsk-on-Amur the samples were collected by the staff of the Nickolaevsk Environment Conservation Center under the guidance of Dr. Valentin B. Kozlovsky.

List of Samples and Sampling Stations are presented in Figure 1 and Table 1.1.

The following measurements were performed at the water sampling station: water temperature, pH, electroconductivity, dissolved oxygen concentration with the Hand-held Water Quality Meter WQC-24 and water turbidity with the turbidimeter HI93703.

Fig. 1. Stations of Water, Bottom Sediments and Soils Sampling and Discharge Measurements (Blue – water, yellow – sediments, black – soils, red – discharge measurements)

Table 1.1. Description of Samples and Sampling Stations.

№	Date	Sampling station	Water velocity	Water samples	Bottom sediment samples	Soil samples
1.	06.08	Kalistratova sub-channel – 500 м from the entrance	In 3 points at 2 depths (near-surface and near-bottom)	3 samples at the near-surface layer (left bank, middle, right bank), 1 sample at the bottom layer (river middle)	1 sample middle	1 sample (left bank)
2.	07.08	Amur – mainstream lower Sikachi-Alyan village	In 5 points at 2 depths (near-surface and near-bottom)	3 samples at the near-surface layer (left bank, middle, right bank), 1 sample at the near-bottom layer (river middle)	1 sample middle	1 sample (right bank)
3.	07.08	Amur – opposite Mayak village	-	2 samples (near-surface and near-bottom layers) (river middle)	-	2 samples (left, right banks)
4.	07.08	Anui mouth	-	1 sample at the near-surface layer (river middle)	-	1 sample (left bank)
5.	07.08	Amur – mainstream opposite Anui mouth	-	2 samples (near-surface and near-bottom layers) (river middle)	-	1 sample (left bank)
6.	08.08	Chenka sub-channel, 5 km lower Lidoga	-	1 sample at the near-surface layer (river middle)	-	2 samples (left, right banks)
7.	08.08	Amur – mainstream opposite Chenka entrance	-	2 samples (near-surface and near-bottom layers) (river middle)	-	-
8.	08.08	Amur – mainstream opposite Malmyzh village	In 5 points at 2 depths (near-surface and near-bottom)	3 samples at the near-surface layer (left bank, middle, right bank), 1 sample at the near-bottom layer (river middle)	-	2 samples (left, right banks)
9.	09.08	Gur mouth	-	1 sample at the near-surface layer (river middle)	-	-
10.	09.08	Amur – mainstream opposite Gur mouth	-	2 samples (near-surface and near-bottom layers) (river middle)	-	-
11.	10.08	Gorin mouth	-	1 sample at the near-surface layer (river middle)	-	-
12.	10.08	Amur – mainstream	-	2 samples (near-surface and near-bottom layers) (river		-

		opposite Gorin mouth		middle)		
14.	10.08	Amur – mainstream, lower Khavanda lake	In 5 points at 2 depths (near-surface and near-bottom)	3 samples at the near-surface layer (left bank, middle, right bank), 1 sample at the near-bottom layer (river middle)	-	-
15.	11.08	Sarkidanka sub-channel – 3 km from the entrance	-	1 sample at the near-surface layer (river middle)	-	-
16.	11.08	Old Amur sub-channel – lower Sarkidanka	-	2 samples (near-surface and near-bottom layers) (river middle)	-	-
17.	13.08	Amur – mainstream at Savinskoe village	-	3 samples at the near-surface layer (left bank, middle, right bank), 1 sample at the near-bottom layer (river middle)	-	-
18.	13.08	Amgun mouth	In 3 points at 2 depths (near-surface and near-bottom)	1 sample at the near-surface layer (river middle)	-	-
19.	14.08	Amur – mainstream opposite Amgun mouth	-	2 samples (near-surface and near-bottom layers) (river middle)	-	-
20.	14.08	Amur – mainstream opposite Takhta vil.	-	1 sample at the near-surface layer (river middle)	-	-
21.	14.08	Amur – mainstream opposite Mago vil.	-	1 sample at the near-surface layer (river middle)	-	-

Water discharge was measured following the Handbook for Hydrometeorological Stations and Check-Posts [Handbook…, 1975, 1978] with the ‘velocity – area’ method, when a mean velocity in the stream section was determined and the area of stream section was estimated with river depth measurements. Water velocity was measured in two points at the velocity vertical (0.2 and 0.8 of depth) with the hydrometric rotating device GR-21 M.

River depth was measured with the echo-depth sounder Humminbird Matrix 67. The distance between velocity verticals was measured with the GPS-Navigator Etrex Vista. The distance from the bank velocity verticals to the water line was determined with the Bushnell laser distance meter.

2. Hydrologic Characteristics of the Studied Area

In 2007 the Amur water content was relatively not high. After winter low water (-170 cm above ‘0’ of the graph of the Khabarovsk water measuring station) during a not high spring flood that followed the water level rose up to 220 cm at the end of May. Then the water level decrease was observed, which is typical for summer low water. Minimal water levels were registered from 19 to 22 of July (-47 cm above ‘0’ of the graph of the Khabarovsk water measuring station). Summer and autumn rain-caused floods were not high and revealed practically equal high peaks (174 cm – August 3-4 and 172 cm – September 5 above ‘0’ of the graph of the Khabarovsk water measuring station). Then water level gradually decreased and reached its minimum before the river freezing (-105 cm).

The expedition was carried out in the period of the summer flood peak.

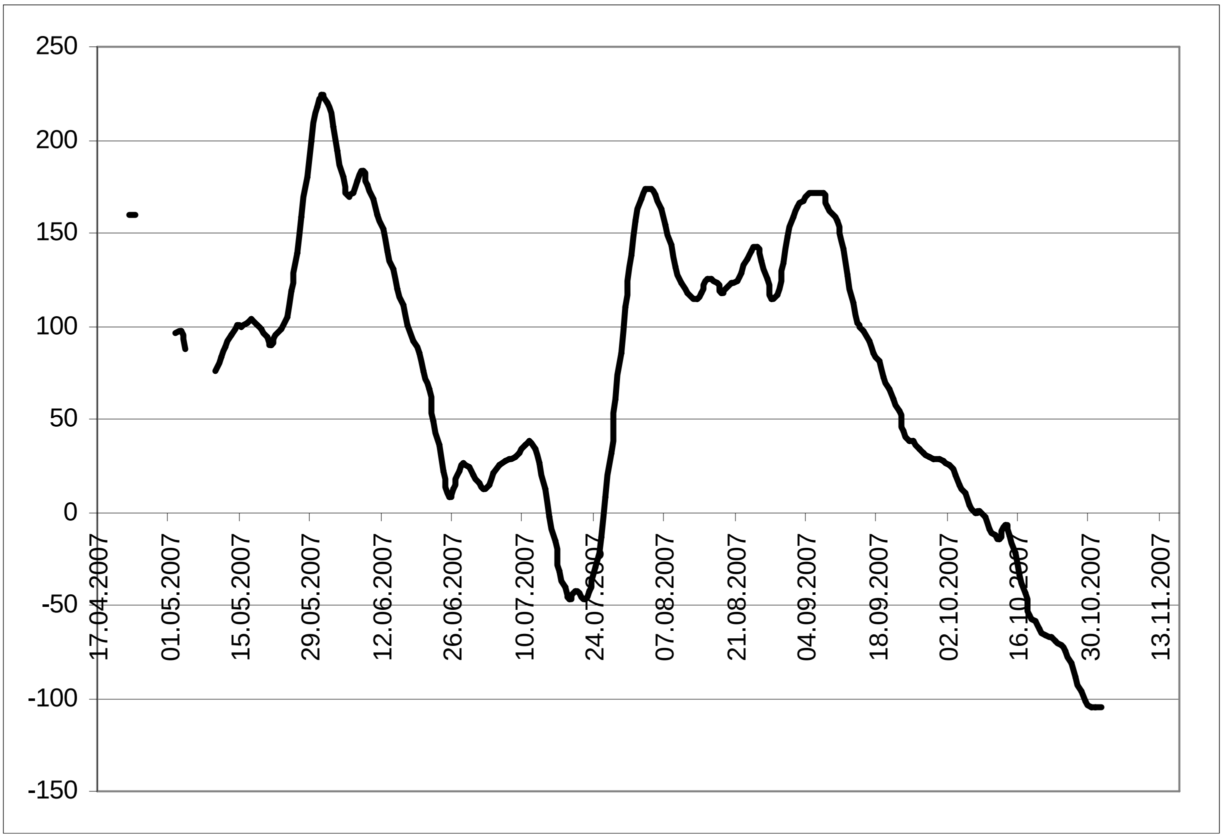

Fig. 2. Graph of the Water Level Fluctuations in the Amur at Khabarovsk (2007)

Water discharge was measured in the Middle-Amur Lowland at Sikachi-Alyan village in the Amur mainstream and in the Kalistratova sub-channel and near Malmyzh village. In the area of the Komsomolskoe-Kiselevskoe Narrowing water discharge was measured near the Khavanda Lake (15 km upper Kiselevka village). Water discharge was also measured in the Amgun mouth (Table 2.1.).

There is a floodplain expansion near Sikachi-Alyan village. It is 20 km wide and 50 km long. The left part of the floodplain is more developed and is characterized with a great number of small sub-channels and floodplain lakes. Practically all Amur flow passes through the main riverbed. The most important sub-channels are the Khokhlatskaya and the Kalistratova. The Amur mainstream here has several islands. The main Amur tributaries here are the Tunguska and the Obor rivers. The Petropavlovskoe Lake also situates in this area.

The other floodplain expansion is situated between the Anui mouth and Malmyzh village, which is over 70 km long and over 30 km wide. It is composed of lots of floodplain islands and massifs, cut with numerous sun-channels, inlets and lakes. The main river flow is distributed among the three channels: the Emoron sub-channel, which separates the main massif from the left part of the Amur; the Kafa sub-channel, which separates the Selimonkho Island from the Bandaren Island; the Amur mainstream, which is bending round the floodplain in the south-east.

The biggest islands here are the Selimonkho and Bandaren Islands. The flow distribution in the expansion is uneven and much depends of the water regime phase.

The Komspomolskoe-Kiselevskoe Narrowing ends in the Khavanda Lake area. This narrowing is nearly 200km long. The Amur flows as a single stream here. The riverbed has a box-like form and is 13-15 m deep throughout the whole passage.

The river passage near the Amgun mouth is not very wide (200-250 m) and is very deep up to 17 m. That is why water velocity is not high here (mean velocity is 0.35 m/sec).

Table 2.1. Measured Hydrologic Characteristics

№	Date	River - Station	Q, m^3/sec	F, m^2	V, m/sec	Q_{sm}, kg/sec	Turbidity, g/ m^3
1.	07.08.2007	Amur – Sikachi-Alyan village	15900	14900	1.07	838	52.7
2.	08.08.2007	Amur – Malmyzh village	14700	15700	0.94	746	50.7
3.	10.08.2007	Amur – Khavanda lake	12100	13900	0.87	600	49.6
4.	13.08.2007	Amgun - mouth	762	2180	0.35	7.97	10.5

Water discharge was measured in the period of low flood and the discharge values are not high. The decrease of the measured discharge values is explained with the fact that measurements were performed a little earlier than flood wave came.

The flood was mostly formed in the Zeya Basin. That is why suspended matter (SM) content in water was low. Mean water turbidity did not exceed 60 g/m^3 (Table 2.2.).

The Amur reveals a tendency of turbidity decrease downstream. In August 2007 suspended matter content decrease down the Amur was also observed from 52.7 g/m^3 at Sikachi-Alyan village to 40.1 g/m^3 near Mago village. That is why suspended matter discharge also decreased, from 838 to 600 kg/sec in particular. Turbidity changes across the river in some river passages are associated with tributary water inputs.

Table 2.2. Suspended Matter Content in Water (g/m^3)

№	Date	Sampling station	Point in the hydrologic section	Surface	Bottom
1.	06.08	Kalistratova sub-channel –500 м from the entrance	Left bank Middle Right bank	58 50.4 49.9	- 53.3 -
2.	07.08	Amur – mainstream lower Sikachi-Alyan village	Left bank Middle Right bank	58.5 51.5 48.2	- 56.3 -
3.	07.08	Amur – opposite Mayak village	Middle	40.1	44.9
4.	07.08	Anui mouth	Middle	5.0	-
5.	07.08	Amur – mainstream opposite Anui mouth	Middle	34.4	67.3
6.	08.08	Chenka sub-channel, 5 km lower Lidoga	Middle	48	
7.	08.08	Amur – mainstream opposite Chenka entrance	Middle	59.3	61.3
8.	08.08	Amur – mainstream opposite Malmyzh village	Left bank Middle Right bank	37.0 54.7 66.7	- 57.0 -
9.	09.08	Gur mouth	Middle	7.1	-

10.	09.08	Amur – mainstream opposite Gur mouth	Middle	53	54.3
11.	10.08	Gorin mouth	Middle	27.1	-
12.	10.08	Amur – mainstream opposite Gorin mouth	Middle	52.0	62.0
14.	10.08	Amur – mainstream, lower Khavanda lake	Left bank Middle Right bank	72.0 50.0 57.6	- 65.3
15.	11.08	Sarkidanka sub-channel – 3 km from the entrance	Middle	50.0	-
16.	11.08	Old Amur sub-channel – lower Sarkidanka	Middle	63.0	86.7
17.	13.08	Amur – mainstream at Savinskoe village	Left bank Middle Right bank	80.7 56.3 50.3	- 59 -
18.	13.08	Amgun mouth	Middle	10.0	-
19.	14.08	Amur – mainstream opposite Amgun mouth	Middle	42.9	93.0
20.	14.08	Amur – mainstream opposite Takhta village	Middle	43.4	-
21.	14.08	Amur – mainstream opposite Mago village	Middle	40.1	-

3. Water Chemical Composition Specifics in the Amur in 2007

Water chemical composition in the Amur lower Khabarovsk much depends on Amur water mixing with water from different tributaries, the biggest of them being the Zeya, Bureya, Sungari and Ussuri rivers. Water chemical composition in these rivers is very different, especially as Bureya and Zeya have hydropower dams in their lower reaches. That is why the Amur water chemical composition changes greatly. In 2006, for example, the Sungari had the most impact on the Amur water, whereas in 2007 the Russian tributaries played the main role. The mean daily water input into the Zeya on 19.07.07 was the highest (15 200 м^3/sec) in all the period of observations (1901 – 2007). High water colority in August 2007, which lower the Anui constantly exceeded 100^0, and even reached 170^0, is another evidence of the Zeya and Bureya significant impact on the Amur runoff.

<u>Main Ions</u>

Maximal concentration levels of main ions in Amur water at Khabarovsk are observed at the begging of the freezing period. It happens due to the big water input from the Sungari and Middle-Amur tributaries with mineralization over 150 mg/dm^3 in this period. During winter the share of these tributaries in the Amur runoff gradually decreases, whereas the share of the Zeya and Bureya waters with mineralization lower 50 mg/dm^3 increases. These Amur hydrologic regime specifics cause gradual decrease of main ion concentrations in Amur water towards the end of the freezing period. Due to the increase of the Zeya and Bureya impact on the Amur in recent years concentrations of main ions of natural genesis have been decreasing. For examples, maximal calcium ion concentrations in December 2000 in Amur water at Khabarovsk was 19.2 mg/dm^3, in December 2006 it was 15.2 mg/dm^3 and in December 2007 it decreased to 13.4 mg/dm^3. Main ion concentration dynamics at Bogorodskoe is different. As the distance from Khabarovsk and Bogorodskoe is rather big and flow velocity is low maximal ion concentrations are registered at Bogorodskoe much later, i.e. in January or February (Table 3.1.). Owing to the Ussuri and other tributaries down the Amur, maximal dissolved matter (DM) concentrations are lower at Bogorodskoe than at Khabarovsk (Fig. 3).

Main ion distribution across the Amur at Khabarovsk and Bogorodskoe also differs. At Bogorodskoe ion concentrations are distributed across the Amur more or less evenly. Upper Khabarovsk maximal ion concentrations are registered at the right bank. This uneven distribution pattern is caused by Sungari input of water with higher ion concentrations than in the Amur water at the junction of two rivers [1]. Most evident this difference is observed in winter low water.

In spring melting snow water inflow causes noticeable changes in main ion concentrations (Fig. 3). Usually in Amur water concentrations of most dissolved substances decrease at this time of the year. In 2007 this situation was observed at Bogorodskoe (Fig. 3), whereas at Khabarovsk, where the water level was over 100 cm, such situation was not revealed. In spring 2006 at Khabarovsk the distribution of chemical elements in Amur water was noticeably uneven. Sulfate ion concentration was three times less at this time.

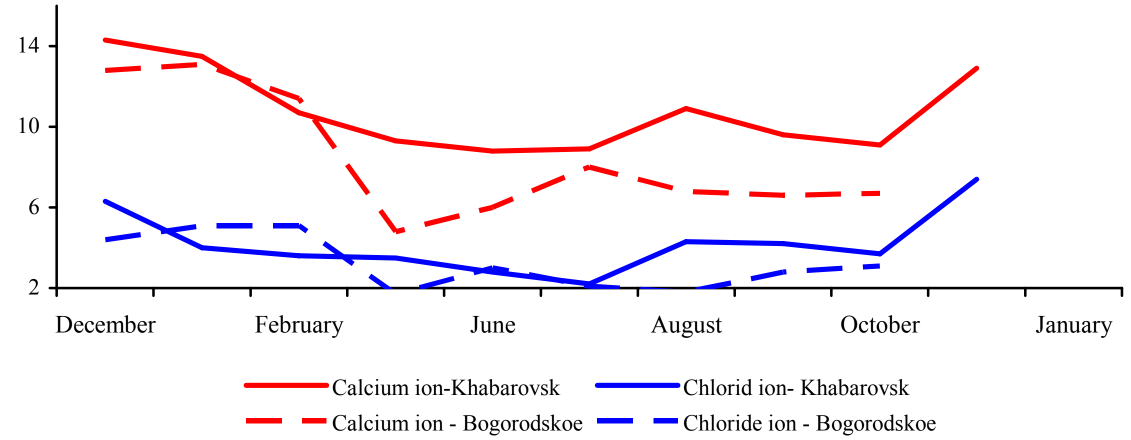

Fig. 3. Main Ion Concentration Dynamics (mg /dm^3) in Amur Water at Khabarovsk and Bogorodskoe in 2006 – 2007.

In summer low water (minimum at Khabarovsk was -40 cm) main ion concentrations increase. The marked increase was registered at Bogorodskoe. In the Amur lower reaches near Nickolaevsk-on-Amur this increase was not very sharp (Table 3.2.). No much difference in ion concentrations (except for sulfate ions) was observed between Bogorodskoe and Nickolaevsk-on-Amur.

Significant changes of Amur water chemical composition occur in time of floods on the river. Main ion concentrations in water at this period depend much on where the flood is formed [2]. For example, in 2007 the peak of the flood, which was formed in the Zeya and Bureya basins, was observed at Khabarovsk at the beginning of August, at Bogorodskoe – at the end of August and a little later it reached Nickolaevsk. So the joint expedition works were performed in conditions of increased water levels (maximal water level was 168 cm). A relatively even distribution of ion concentrations across and along the river was observed. The registered ion concentrations were lower than those recorded by 2005 expedition. For example, 2007-year concentrations of Ca^{2+} and SO_4^{2-} in Amur water at Malmyzh village were 1.6 and 1.5 times low that those of 2005 respectively.

In autumn Amur water content decreases, but main ion concentrations at Khabarovsk did not change much. The situation at Bogorodskoe and Nickolaevsk-on-Amur is different. After the floods chloride, sulfate and magnesium ion concentrations there gradually increased.

Biogenic Substances

Biogenic substance dynamics in the Amur water differs much from the dynamics of main ion concentrations. In winter low water maximal concentrations of iron and ammonium and nitrite nitrogen, as well as increased concentrations of nitrate nitrogen and phosphates are registered. As in the previous years upper Khabarovsk concentrations of these substances were much higher in the right-bank part of the Amur. Near Bogorodskoe, similar to the last year, noticeable difference in biogenic substance distribution across the Amur was not registered. Iron and silicon concentrations also showed no marked difference between the 2006 and 2007 years.

Total nitrogen content did not drop lower 1.65 mg/dm^3 and compared to 2006 it increased 1.5 times. Mineral form of nitrogen at this time prevailed over its suspended form. Only at the beginning of the river freezing nitrogen suspended form prevailed over its dissolved form.

In spring snow melting causes nitrogen compound content decrease in river water. Its distribution across the river becomes more even. The correlation between nitrogen forms is changing and the share of nitrogen, bound with organic and suspended matter starts to increase. Such situation was clearly observed at Bogorodskoe in spring 2007. Near Khabarovsk such dynamics was not registered. Much higher concentrations for winter low water of phosphate ions and abnormal for this year-period concentrations of nitrate nitrogen were revealed in water. The unevenness of distribution of these element concentrations across the Amur was not registered.

In June 2007, when the flood decreased (maximal flood level was over 180 cm), the concentrations of mineral forms iron and silicon in Amur water at Khabarovsk were minimal. Such nitrogen compound concentrations due to hydrobionts consumption were registered in 2006, which is proved with a higher nitrogen concentration in suspended matter compared to dissolved matter. Similar concentrations of these substances but much later in time (at the end of July) were registered in Amur water at Bogorodskoe (Fig. 4).

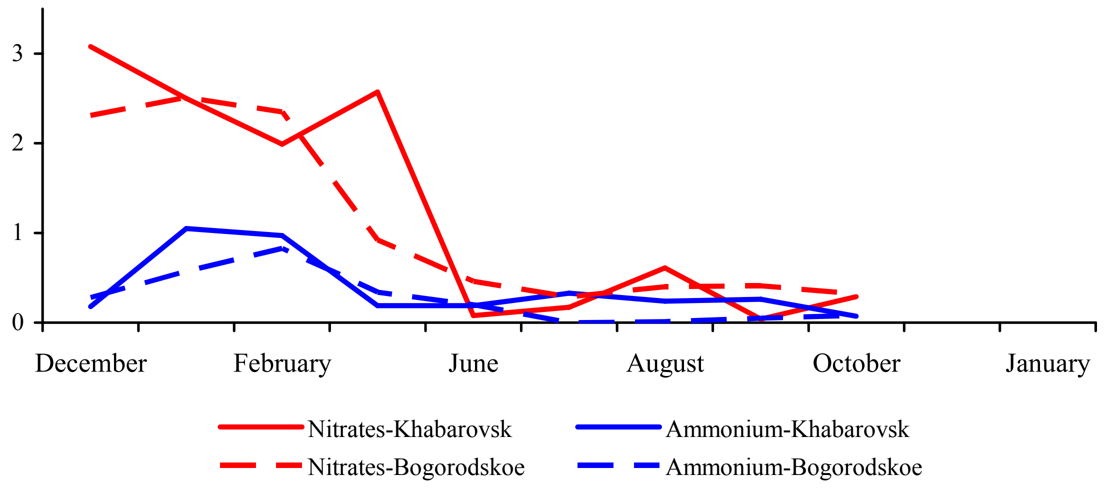

Fig. 4. Nitrate and Ammonium Ion Concentration Dynamics in Amur Water at Telegino and Bogorodskoe Villages in 2007.

In the flood time biogenic substance and main ion concentrations in Amur water change. August floods caused at Khabarovsk a slight increase in the concentrations of nitrate nitrogen, phosphates and iron and a little decrease of silicon. Similar trends (except silicon) were registered at Bogorodskoe. Quite different biogenic substance dynamics was observed in the Amur estuary. Nitrite and nitrate nitrogen concentrations there revealed the lowest concentrations values in the whole period of observations (Table 3.2.).

The Amur expedition in 2007 also revealed low concentrations of NO_3^- and NO_2^-. Ammonium nitrogen concentrations across and along the Amur were distributed evenly and did not exceed 0.45 mg/dm^3, but in the Amur tributaries this substance was absent.

In autumn the flood decrease causes ammonium nitrogen decrease and nitrate nitrogen increase in Amur water. Similar situation was observed at Bogorodskoe and Nickolaevsk-on-Amur. This is associated with significant nitrification processes and photosynthetic activity of phytoplankton in water. At this time as well as in winter low water the mineral form of nitrogen becomes dominating among the dissolved nitrogen forms.

Thus, a deep summer low water level and floods, formed in the Russian part of the Amur Basin, influenced the Amur water chemical composition in 2007.

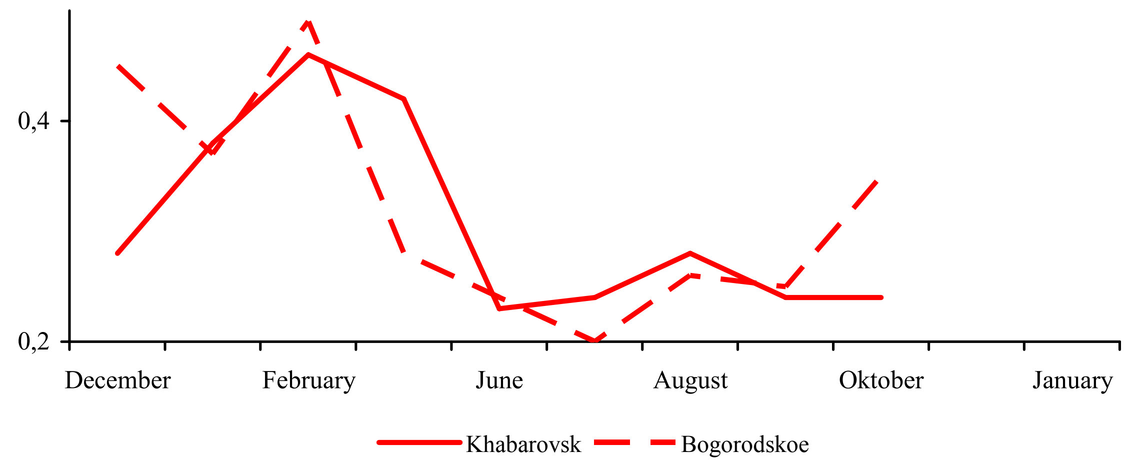

Fig. 5. Seasonal Dynamics of Iron Concentration (mg dm^{-3}) in Amur Water at Khabarovsk and Bogorodskoe.

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Table 3.1. Water Chemical Composition at Khabarovsk, mg/dm^3

Date	Sampling point	Na^+	K^+	Ca^{2+}	Mg^{2+}	Cl^-	SO_4^{2-}	NH_4^+	NO_2^-	NO_3^-	N_{total}	$N_{susp.}$	HPO_4^{2-}	Fe_{total}	Si	Turbidity*
27.12.06	Left bank	8.9	1.9	13.6	6.9	6.4	14.5	0.15	0.010	2.76	1.70	1.58	0.023	0.28	4.0	
	Middle	8.9	1.9	14.0	4.9	6.1	14.9	0.14	0.010	3.01	1.72	1.61	0.015	0.31	5.3	
	Right bank	9.6	2.1	15.2	6.0	6.4	18.0	0.24	0.008	3.41	1.80	2.61	0.023	0.26	5.8	
29.01.07	Left bank	7.3	1.7	13.4	2.9	4.0	10.1	0.93	0.013	2.38	1.51	0.09	0.045	0.39	4.5	
	Middle	7.3	1.7	13.0	3.2	4.0	11.0	1.04	0.016	2.40	1.36	0.47	0.077	0.36	3.9	
	Right bank	8.1	1.9	14.2	3.6	4.1	13.8	1.19	0.018	2.72	1.56	0.65	0.085	0.40	4.6	
20.02.07	Left bank	6.3	1.4	10.1	3.6	3.7	8.3	0.91	0.29	1.59	1.60	0.19	0.046	0.54	3.3	
	Middle	6.3	1.4	10.1	3.4	3.4	8.3	0.95	0.026	1.66	1.40	0.28	0.054	0.43	4,1	
	Right bank	7.1	1.7	11.8	3.4	3.8	10.1	1.04	0.031	1.78	1.31	0.09	0.085	0.42	4.1	
26.05.07	Left bank	5,8	1.8	9.6	4.4	3.4	14.0	0.18	0.010	2.52	0.94	0.75	0.105	0.47	3.3	2.3
	Middle	6.0	1.6	9.6	4.4	3.4	14.6	0.22	0.011	2.62	0.86	1.68	0.082	0.39	3.1	7.7
	Right bank	6.0	1.7	8.8	3.9	3.8	16.2	0.18	0.019	2.58	1.02	0.37	0.082	0.39	2.8	2.4
27.06.07	Left bank	6.1	1.5	8.8	3.9	3.1	14.2	0.18	0.003	0.16	0.40	0.56	0.018	0.24	1.2	6.2
	Middle	5.5	1.5	8.8	4.1	2.7	13.0	0.18	0.000	0.05	0.31	0.84	0.025	0.20	1.2	6.0
	Right bank	6.2	1.5	8.8	3.9	2.7	14.2	0.20	0.000	0.04	0.20	0.75	0.044	0.26	1.2	6.3
31.07.07	Left bank	4.8	0.8	8.4	2.2	2,1	6.0	0.33	0.005	0.22	0.40	0.65	0.016	0.23	1.8	1.2
	Middle	4.8	0.8	8.8	2.2	2.3	5.6	0.45	0.006	0.17	0.43	0.37	0.023	0.32	1.6	4.2
	Right bank	6.1	1.0	9.6	2.4	2.3	8.5	0.21	0.007	0.13	0.32	0.74	0.031	0.28	1.8	13.4

Table 3.1. continued

Date	Sampling point	Na^+	K^+	Ca^{2+}	Mg^{2+}	Cl^-	SO_4^{2-}	NH_4^+	NO_2^-	NO_3^-	N_{total}	$N_{susp.}$	HPO_4^{2-}	Fe_{total}	Si	Turbidity
28.08.07	Left bank	5.7	0.9	9.2	2.7	4.3	7.7	0.27	0.006	0.61	0.45	0.09	0.023	0.28	0.7	10.1
	Middle	5.7	0.9	8.8	2.7	4.3	7.3	0.21	0.006	0.59	0.55	0.09	0.031	0.30	1.2	4.9
	Right bank	5.5	0.9	8.8	2.7	4.3	8.5	0.25	0.005	0.63	0.56	0.28	0.031	0.26	0.9	8.9
28.09.07	Left bank	5.8	0.9	9.6	2.4	4.3	7.7	0.27	0.004	0.04	0.44	0.37	0.023	0.22	2.4	5.1
	Middle	5.3	0.8	9.6	2.4	4.0	6.9	0.30	0.004	0.04	0.35	0.37	0.010	0.23	2.2	5.6
	Right bank	5.8	0.9	9.6	2.4	4.3	8.1	0.20	0.004	0.04	0.33	0.37	0.023	0.27	2.2	6.5
25.10.07	Left bank	5.1	0.8	9.4	2.6	4.4	9.5	0.06	0.011	0.32	0.47	0.18	0.000	0.26	2.1	2.0
	Middle	5.1	1.0	9.0	2.6	3.4	9.6	0.12	0.006	0.31	0.27	0.37	0.014	0.26	1.9	1.8
	Right bank	5.3	1.1	9.0	3.0	3.4	10.2	0.03	0.013	0.24	0.45	0.28	0.022	0.30	2.5	8.2
26.12.07	Left bank	8.3	1.9	12.6	4.7	7.8	11.6	0.10	0.027	2.12	0.73	0.18	0.018	0.34	3.2	14.0
	Middle	7.9	1.8	12.6	4.2	6.9	12.2	0.03	0.026	2.43	0.63	<0.05	0.029	0.34	3.4	3.6
	Right bank	8.3	1.9	13.4	4.7	7.4	12.8	0.07	0.027	2.39	0.58	<0.05	0.010	0.31	3.2	14.1
31.01.08	Left bank	6.3	1.6	10.1	2.9	4.3	11.9	0.34	0.005	1.23	1.23	<0.05	0.022	0.36	2.5	3.4
	Middle	6.6	1.6	9.7	3.4	5.6	11.7	0.34	0.006	1.74	1.35	0.18	0.014	0.36	2.6	1.4
	Right bank	6.7	1.7	10.5	3.2	5.6	12.6	0.36	0.008	1.23	1.26	0.37	0,025	0.62	3.4	3.2

Note * Turbidity units as formazine

Table 3.1. continued. Water Chemical Composition at Bogorodskoe, mg/dm^3

Date	Sampling point	Na^+	K^+	Ca^{2+}	Mg^{2+}	Cl^-	SO_4^{2-}	NH_4^+	NO_2^-	NO_3^-	N_{total}	$N_{susp.}$	HPO_4^{2-}	Fe_{total}	Si	Turbidity
28.10.06	Left bank	6.4	1,2	8.8	5.6	1.7	9.4	0.43	0,006	0.14	0.41	0.47	0.069	0.44	3.8	
	Middle	6.4	1.2	9.2	4.6	1.7	10.1	0.27	<0,005	0.11	0.34	0,47	0.046	0.35	3.7	
	Right bank	6.4	1.2	9.6	3.4	1.9	12.7	0.05	0.006	0.09	0.23	0.37	0.038	0.35	3.8	
27.12.06	Left bank	8.9	1.9	12.5	4.9	4.7	6.6	0.36	0.006	2.36	1.12	2.24	0.000	0.50	6.3	
	Middle	8.9	1.9	12.9	5.4	4.4	10.1	0,28	0.006	2.31	1.02	2.24	0.012	0.44	7.3	
	Right bank	9.6	2.1	12.9	5.6	4.3	9.2	0.20	0.005	2.27	1.02	1.87	0.012	0.40	6.6	
25.01.07	Left bank	6.9	1.6	13.0	4.2	7.7	10.5	0.67	0.002	1.65	1.20	0.37	0.031	0.39	5.4	
	Middle	7.0	1.6	13.4	4.1	3.8	12.3	0.44	0.004	2.90	1.16	<0.05	0.035	0.36	3.1	
	Right bank	7.4	2.0	13.0	4.6	3.9	11.0	0.59	0.005	2.99	1.23	0.65	0.062	0.37	7.9	
22.02.07	Left bank	6.4	1.6	11.4	3.9	3.5	9.6	0.82	0.008	2.31	1.86	0.19	0.073	0.51	6.6	
	Middle	6.6	1.6	11.4	3.9	7.0	10.3	0.82	0.007	2.29	1.16	<0.05	0.073	0.47	5.7	
	Right bank	7.4	1.7	11.4	3.9	4.7	9.4	0.85	0.007	2.46	1,43	0.19	0.046	0.48	6.3	
28.05.07	Left bank	3.8	1.0	4.8	2.9	1.7	9.5	0.50	0.000	0.87	0,60	0.37	0.044	0.30	3.4	3,7
	Middle	4.0	1.2	4.8	2.9	1.7	10.8	0,25	0.003	0.94	0.70	0.09	0.041	0.24	3.0	4.7
	Right bank	3,9	1.1	4,8	2.9	1.7	8.9	0.26	0.00	0.95	0.73	0.18	0.037	0.30	3.4	1.2
23.06.07	Left bank	4.3	1.1	5.6	2.9	1.7	10.2	0,26	0.00	0.47	0.38	0.18	0.044	0.23	2.7	6.8

	Middle	4.5	1.1	6.8	2.7	2.0	9.8	0.20	0.00	0.54	0.53	0.09	0.044	0.23	2.7	7.1
	Right bank	4.1	1.1	5.6	2.9	5.2	10.2	0.14	0.00	0.36	0.60	0.09	0.037	0.26	2.8	1.3
30.07.07	Left bank	4.6	0.8	7.6	2.9	2.1	6.6	0.00	0.009	0.03	0.18	0.18	0.007	0.22	1.2	5.0
	Middle	4.6	0.8	8.4	2.7	2.1	6.9	0.00	0.007	0.05	0.45	0.28	0.029	0.22	1.6	13.4
	Right bank	4.6	0.8	8.0	2.7	2.1	3.6	0.00	0.000	0.03	0.25	0.09	0.018	0.15	1.6	4.3
29.08.07	Left bank	3.4	0.7	6.8	1.4	1.8	4.4	0.03	0.008	0.30	0.42	0.28	0.022	0.27	3.3	5.5
	Middle	3.4	0.6	6.8	1.4	5.7	4.4	0.00	0.004	0.28	0.50	0.28	0.041	0.26	1.2	2.6
	Right bank	3.6	0.7	6.8	1.4	1.8	4.4	0.00	0.006	0.26	0.28	0.28	0.044	0.24	2.2	3.2
25.09.07	Left bank	3.1	0.7	6.3	2.2	2.9	5.9	0.03	0.003	0.01	0.36	0.55	0.044	0.30	0.4	2.8
	Middle	3.1	0.9	6.7	2.7	2.6	7.5	0.03	0.006	0.00	0.52	0.37	0.022	0.22	2.8	1.9
	Right bank	3.3	0.9	6.7	1.9	3.0	8.3	0.08	0.004	0.00	0.35	0.37	0.029	0.24	2.8	1.9
25.10.07	Left bank	2.9	0.8	6.7	2.7	2.9	6.1	0.14	0.007	0.20	0.39	0.37	0.029	0.44	1.0	9.3
	Middle	3.7	0.9	7.1	2.7	2.7	9.5	0.03	0.010	0.24	0.54	0.64	0.018	0.31	2.2	2.7
	Right bank	2.6	0.8	6.3	2.2	3.6	7.5	0.06	0.006	0.22	0.43	0.55	0.022	0.30	0.7	7.9
27.12.07	Left bank	6.2	1.4	11.3	3.8	3.4	7.9	<0.03	<0.005	0.61	0.88	1.10	0.014	0.67	3.6	3.0
	Middle	6.5	1.6	11.3	3.8	5.0	8.9	<0.03	0.005	0.54	0.82	0.37	<0.006	0.50	3.6	2.9
	Right bank	5.0	1.7	10.9	4.0	5.0	9.3	<0.03	0.005	0.79	1.05	0.46	0.010	0.51	3.7	3.6
27.01.08	Left bank	6.7	1.7	12.1	3.0	5.7	10.9	<0.03	<0.005	1.74	0.96	0.46	0.018	0.47	2.6	1.8
	Middle	6.6	1.6	11.3	3.3	5.9	11.9	<0.03	<0.005	1.17	0.52	0.46	<0.006	0.36	3.1	3.7
	Right bank	6.8	1.1	11.7	3.3	5.9	11.1	<0.03	0.005	1.74	1.30	0.37	0.010	0.46	3.3	2.8

Table 3.2. Water Chemical Composition at Nickolaevsk-on-Amur, mg/dm^3

Date	Sampling station	Na^+	K^+	Ca^{2+}	Mg^{2+}	Cl^-	SO_4^{2-}	NH_4^+	NO_2^-	NO_3^-	HPO_4^{2-}	Fe_{total}	Si	Turbidity
28.10.06	ST.1, surface	3.7	1.1	7.2	2.2	3.4	7.1	0.95	0.014	0.73	0.056	0.20	3.7	1.5
	ST.1, bottom	3.7	1.1	6.4	2.9	3.4	5.1	1.16	0.017	0.75	0.056	0.20	3.6	1.4
	ST.2, surface	3.4	1.1	6.4	2.4	3.4	4.3	0.48	0.018	0.86	0.063	0.20	3.9	1.5
	ST.2, bottom	3.8	1.1	6.4	2.4	4.2	3.9	0.48	0.014	0.76	0.044	0.21	4.0	2.6
21.07.07	ST.1, surface	3.6	1.1	6.8	2.7	1.9	2.8	0.29	0.005	0.08	0.042	0.03	2.4	7.8
	ST.1, bottom	3.5	0.8	6.4	2.4	1.9	3.2	0.21	0.003	0.07	0.042	0.03	1.5	15.1
	ST.3, surface	3.8	1.0	6.8	2.7	2.0	4.4	0.19	0.005	0.11	0.061	0.05	2.5	6.4
	ST.3, bottom	3.8	1.0	7.2	2.4	2.0	4.0	0.27	0.005	0.09	0.057	0.05	2.4	8.8
17.08.07	ST.1, surface	3.4	0.8	6.4	1.9	3.2	6.0	0.17	0.002	0.10	0.035	0.22	3.2	8.8
	ST.1, bottom	3.5	0.8	6.4	1.4	3.3	5.2	0.29	0.002	0.09	0.004	0.18	3.2	9.7
	ST.3, surface	3.4	0.9	6.4	1.9	2.8	6.0	0.29	0.002	0.12	0.012	0,.20	3.4	8.8
	ST.3, bottom	3.4	0.8	6.4	1.9	2.8	6.4	0.24	0.008	0.11	0.020	0.18	3.2	9.1
17.09.07	ST.1, surface	3.0	0.6	5.6	1.5	3.1	6.2	0.13	<0.005	0.08	0.037	0.27	3.6	17.1
	ST.1, bottom	3.0	0.6	5.2	1.9	2.7	3.6	0.10	<0.005	0.06	0.029	0.27	3.4	17.2
	ST.3, surface	3.2	0.6	5.6	1.5	3.5	5.2	0.24	<0.005	0.05	0.044	0.27	3.5	20.8
	ST.3, bottom	3.0	0.6	5.6	1.5	2.6	5.2	0.13	<0.005	0.04	0.044	0.30	3.5	22.6
18.10.07	ST.1, surface	3.6	0.6	6.4	2.9	3.4	9.1	0.17	<0.005	0.04	0.044	0.28	4.1	10.4
	ST.1, bottom	3.6	0.6	6.4	2.4	3.5	9.1	0.10	<0.005	0.04	0.000	0.30	4.1	7.3
	ST.3, surface	3.6	0.6	6.4	3.9	4.3	8.3	0.15	<0.005	0.04	0.029	0.26	4.1	3.7
	ST.3, bottom	3.8	0.6	6.4	2.9	3.4	8.7	0.10	<0.005	0.04	0.014	0.30	4.0	7.4

Table 3.3. Water Chemical Composition in the Amur and its Tributaries at the Time of the Russian-Japanese Expedition in August 2007

Station	Na^+	K^+	Ca^{2+}	Mg^{2+}	Cl^-	SO_4^{2-}	NH_4^+	NO_2^-	NO_3^-	HPO_4^{2-}	Si	Fe
St. 1A, right surface	2.3	0.6	5.6	1.9	1.6	4.7	0.38	0.005	0.23	0.035	4.1	0.20
St. 1A, central surface	2.9	0.8	6.8	2.7	1.8	7.3	0.29	0.004	0.12	0.035	4.2	0.12
St.1A, central bottom	2.9	0.8	6.8	2.2	1.8	6.7	0.15	0.003	0.19	0.035	3.1	0.07
St. 1A, left surface	3.3	0.9	7.2	1.9	1.9	7.5	0.15	0.004	0.15	0.042	4.2	0.05
St. 1B, right surface	2.5	0.6	5.6	1.9	2.0	5.6	0.19	0.002	0.15	0.012	4.2	0.08
St. 1B, central surface	2.1	0.6	5.6	1.9	1.1	6.7	0.38	0.000	0.21	0.012	3.6	0.08
St.1B, central bottom	2.0	0.6	5.6	1.9	1.1	5.1	0.38	0.000	0.16	0.012	4.1	0.07
St. 1B, left surface	2.2	0.6	5.6	1.9	1.1	7.1	0.42	0.003	0.21	0.027	4.4	0.07
St. A, central surface	1.8	0.7	5.6	1.9	2,1	5.1	0.42	0.002	0.19	0.020	4.4	0.07
St. A, central bottom	2.0	0.7	5.6	1.9	2.2	7.5	0.33	0.002	0.18	0.027	3.9	0.07
St. 2, central surface	2.4	0.8	5.8	2.2	2.4	6.9	0.33	0.001	0.13	0.031	3.6	0.08
St.2, central bottom	2.1	0.7	6.4	2.2	1.7	7.1	0.22	0.004	0.15	0.035	3.5	0.12
Anui River	1.6	0.5	6.4	2.2	0.8	6.3	0.00	0.003	0.66	0.012	3.8	0.04
St. 3, central surface	3.0	0.8	6.4	2.2	1.7	7.9	0.29	0.003	0.15	0.053	3.9	0.26
St.3, central bottom	3.0	0.8	6.4	2,2	1.7	5.5	0.25	0.005	0.16	0.027	3.9	0.20
Lidoga	2.9	0.8	6.4	2.2	2.2	6.9	0.08	0.007	0.08	0.046	3.9	0.05
St. 4, right surface	2,2	0.7	6.0	2.2	1.1	4.9	0.38	0.006	0.08	0.023	3.9	0.13
St. 4, central surface	2.8	0.8	6.4	2.2	2.1	7.1	0.27	0.006	0.16	0.038	3.7	0.13
St.4, central bottom	2,8	0.8	6.0	2.2	2.5	5.9	0.19	0.006	0.16	0.038	3.8	0.08
St. 4, left surface	2.3	0.9	6.8	2.7	1.8	6.7	0.17	0.005	0.02	0.038	3.6	0.05
St. 5, central surface	3.3	0.8	6.4	2.4	1.7	6.9	0.00	0.005	0.01	0.038	3.6	0.09
St. 5, central bottom	3.2	0.8	6.4	2.4	1.7	6.5	0.12	0.008	0.02	0.031	3.7	0.05
Gur River	2.1	0.5	5.6	1.9	1.7	4.7	0.00	0.005	0.02	0.016	5.5	0.03

Table 3.3. continued

Station	Na^+	K^+	Ca^{2+}	Mg^{2+}	Cl^-	SO_4^{2-}	NH_4^+	NO_2^-	NO_3^-	HPO_4^{2-}	Si	Fe
St. 6, central surface	2.5	0.7	5.6	2.4	1.1	6.7	0.30	0.006	0.06	0.050	4.2	0.09
St. 6, central bottom	2.5	0.5	6.0	2.2	1.6	5.1	0.23	0.008	0.05	0.038	3.9	0.05
Gorin River	2.7	0.4	6.0	2.2	1.1	4.9	0.08	0.003	0.02	0.061	5.5	0.11
St. 7, right surface	2.7	0.5	6.0	2.2	1.4	5.5	0.45	0.002	0.06	0.053	3.9	0.09
St. 7, central surface	2.7	0.8	6.0	2.2	1.4	6.3	0.23	0.002	0.08	0.053	3.8	0.07
St.7, central bottom	2.8	0.8	6.0	2.2	2.3	4.9	0.27	0.002	0.06	0.038	3.9	0.12
St. 7, left surface	3.1	0.8	6.4	2.2	1.8	5.9	0.36	0.002	0.06	0.053	3.6	0.05
St. 8, central surface	2.8	0.8	6.0	2.2	1.5	5.9	0.43	0.002	0.13	0.046	3.5	0.07
St. 8, central bottom	2.8	0.8	6.0	2.2	1.5	6.3	0.29	0.004	0.12	0.053	3.6	0.07
Sofiisk	3.4	1.2	6.0	2.2	1.5	6.7	0.32	0.000	0.01	0.031	2.2	0.11
St. 9, right surface	2.8	0.8	6.0	2.2	1.6	5.9	0.21	0.005	0.14	0.061	3.6	0.08
St. 9, central surface	2.8	0.7	6.0	2.2	1.5	4.9	0.19	0.006	0.12	0.061	3.3	0.11
St.9, central bottom	2.8	0.8	6.0	2.2	1.5	6.5	0.29	0.009	0.10	0.068	2.9	0.08
St. 9, left surface	2.7	0.8	6.4	2.4	1.5	5.5	0.23	0.003	0.07	0.046	3.3	0.16
St. 10, central surface	2.8	0.8	6.0	2.2	1.4	7.1	0.34	0.005	0.10	0.061	3.3	0.11
St.10, central bottom	2.9	0.8	6.4	1.9	1.4	5.5	0.30	0.003	0.10	0.038	3.0	0.09
Amgun River	1.8	0.4	4.8	1.0	0.6	3.7	0.00	0.006	0.13	0.020	4.8	0.08
St.11, Tahta, surface	2.8	0.8	6.4	1.9	1.4	4.3	0.23	0.005	0.11	0.068	3.0	0.08
St. 12. Mago, surface	2.2	0.8	6.8	2.2	1.5	6.3	0.25	0.005	0.12	0.068	3.0	0.12

Table 3.4. Chemical Composition of Soils and Bottom Sediments (metals in mg/kg, N in %)

Station	Al	Mn	Fe	Co	Ni	Cu	N_{total}	TOC
Bottom Sediments								
St. 1 A center	2 418.21	163.85	3 110.50	2.72	3.93	1.99	0.006	10.4
St. 2 A center	2 471.785	138.95	2995.17	2.56	5.10	2.61	0.005	1.7
Soils								
St. 1 A Soil	S	439.70	17145.38	11.44	20.44	10.86	0.18	3.0
St. A Left	S	300.58	17 601.90	10.82	22.01	12.22	0.23	4.2
St. A. Right	17 988.807	422.54	11 684.34	8.11	13.07	5.86	0.06	25.2
St.1 B Soil	9 403.2755	119.99	6 750.79	4.88	8.79	3.08	0.02	3.2
St. 2. Anui Soil	S	350.43	16 474.38	10.02	24.62	12.00	0.14	13.5
St.2. Amur Soil	S	475.97	14 691.82	11.20	17.89	11.67	0.20	20.1
St. 3. Lidoga 1	S	440.05	14 696.66	9.99	17.87	10.73	0.20	18.1
St.3. Lidoga 2	22 600.191	320.46	13 618.53	9.53	18.84	8.55	0.11	8.3
St. 4 Right	23 418.792	354.03	13 037.64	9.43	14.59	7.87	0.17	14.5
St.4 Left	14 744.81	237.62	8 025. 46	5.57	11.24	6.45	0.20	18.9

Note: “S” means range over 30 000 mg/kg

Table 3.5. Heavy Metal Content on Filters (mg/kg)

№	Station	Al	Mn	Fe	Co	Ni	Cu
1	St. 1A, right surface	51 206.9	5 752.0	13 772.3	34.96	819.99	93.29
2	St. 1A, central surface	48 218.5	903.2	27 461.1	12.02	25.29	16.23
3	St.1A, central bottom	62 136.2	1 880.5	47 216.6	21.09	45.47	45.87
4	St. 1A, left surface	54 645.7	1 638.0	43 037.6	18.16	37.35	21.00
5	St. 1B, right surface	65 530.6	2 129.2	100 496.9	25.94	91.41	43.28
6	St. 1B, central surface	80 227.8	1 977.5	50 471.0	23.82	57.72	15.01
7	St.1B, central bottom	69 888.1	1 511.1	43 711.7	19.51	37.39	37.52
8	St. 1B, left surface	67 723.2	1 564.4	44 081.1	19.35	36.84	<0.001
9	St. A, central surface	84 725.5	2 115.6	66 961.5	27.05	63.61	<0.001
10	St. A, central bottom	49 783.4	1 209.7	31 109.4	15.23	26.09	7.71
11	St. 2, central surface	514 361.3	15 201.1	365 251.5	153.62	308.39	<0.001
12	St.2, central bottom	69 777.5	1 513.9	43 305.4	19.72	39.97	23.06
13	Anui River	52 411.7	1 731.6	69 029.6	19.84	66.10	<0.001
14	St. 3, central surface	57 806.7	1 712.8	41 887.1	20.52	37.71	35.69
15	St.3, central bottom	61 469.5	1 656.1	39 968.5	19.82	34.69	<0.001
16	Lidoga	84 915.7	931.2	31 660.7	13.06	29.83	20.94
17	St. 4, right surface	87 766.3	1 311.5	40, 105.4	15.98	23.52	29.07
18.	St. 4, central surface	85 256.6	1 446.5	39 050.4	16.16	29.00	33.66
19	St.4, central bottom	91 157.5	1 390.5	38 238.1	15.83	25.57	3.86
20	St. 4, left surface	99 239.1	1 877.6	79 934.6	20.58	47.24	<0.001
21	St. 5, central surface	87 753.5	1 142.8	36 207.3	14.91	29.87	7.57
22	St. 5, central bottom	101 252.2	1 458.3	45 929.6	17.35	37.48	22.75
23	Gur River	8 719.0	241.1	8 663.2	2.06	3.16	3.00
24	St. 6, central surface	89 287.9	1 180.0	35 146.2	15.09	26.69	16.74
25	St. 6, central bottom	94 577.6	1 318.7	37 082.3	16.64	28.94	20.47
26	Gorin River	32 417.2	3 706.3	59 991.1	13.15	<0.001	55.24
27	St. 7, right surface	92 833.4	1 260.2	37 743.9	15.66	24.23	5.28
28	St. 7, central surface	103 601.3	1 835.7	56 922.8	20.08	34.57	38.62
29	St.7, central bottom	91 111.3	1 277.7	36 999.9	15.52	23.99	6.60
30	St. 7, left surface	116 267.6	3 243.0	94 556.6	26.35	46.26	39.86
31	St. 8, central surface	61 334.5	6 042.6	126 245.5	24.33	173.36	65.26
32	St. 8, central bottom	86 238.2	1 261.1	46 452.1	15.53	29.88	14.21
33	Sofiisk	87 244.9	1 467.9	52 083.3	17.16	31.71	11.04
34	St. 9, right surface	73 562.6	1 331.4	46 736.7	15.38	35.19	20.47
35	St. 9, central surface	76 053.0	1 761.9	72 279.8	17.08	37.07	10.03
36	St.9, central bottom	78 908.8	1 384.3	45 867.1	15.33	27.73	15.39
37	St. 9, left surface	77 223.8	1 573.9	49 119.2	15.71	28.99	8.07
38	St. 10, central surface	52 352.2	2 033.9	81 120.7	9.83	49.38	6.82
39	St.10, central bottom	77 003.5	2 167.4	80 565.8	18.84	40.61	<0.001
40	Amgun River	83 333.0	1 293.0	47 416.7	15.20	32.07	21.78
41	St.11, Takhta, surface	74 842.3	1 849.5	59 065.3	16.16	33.62	4.67
42	St. 12. Mago, surface	53 610.8	2 515.5	73 029.8	15.58	26.67	50.86

Table 3.6. Heavy Metal Content in Water (mcg/dm^3)

№	Station	Al	Mn	Fe	Co	Ni	Cu
1	St. 1A, right surface	25.587	1.555	56.623	0.014	< 0.001	< 0.001
2	St. 1A, central surface	67.121	6.084	142.144	0.047	< 0.001	< 0.001
3	St.1A, central bottom	36.405	3.148	84.475	0.019	< 0.001	< 0.001
4	St. 1A, left surface	32.657	2.546	75.271	0.015	< 0.001	< 0.001
5	St. 1B, right surface	40.961	3.408	89.921	0.015	< 0.001	< 0.001
6	St. 1B, central surface	50.347	4.655	183.228	0.036	< 0.001	5.381
7	St.1B, central bottom	48.160	3.483	105.572	0.023	0.160	< 0.001
8	St. 1B, left surface	41.321	3.451	101.688	0.016	< 0.001	0.342
9	St. A, central surface	45.115	3.109	100.024	0.017	< 0.001	< 0.001
10	St. A, central bottom	34.446	2.708	76.407	0.012	< 0.001	< 0.001
11	St. 2, central surface	37.734	7.433	88.590	0.022	< 0.001	< 0.001
12	St.2, central bottom	25.160	5.639	42.323	0.006	< 0.001	< 0.001
13	Anui River	44.374	23.776	273.026	0.135	6.158	6.448
14	St. 3, central surface	9.599	0.425	21.864	< 0.001	< 0.001	< 0.001
15	St.3, central bottom	44.166	4.148	158.132	0.070	1.776	132.015
16	Lidoga	60.181	5.211	163.243	0.040	< 0.001	0.597
17	St. 4, right surface	68.759	5.117	168.079	0.032	0.086	< 0.001
18.	St. 4, central surface	110.844	9.114	234.365	0.055	< 0.001	< 0.001
19	St.4, central bottom	78.299	7.087	192.337	0.039	0.489	< 0.001
20	St. 4, left surface	67.595	8.954	163.476	0.025	< 0.001	< 0.001
21	St. 5, central surface	64.290	4.926	149.741	0.024	0.616	< 0.001
22	St. 5, central bottom	57.663	5.517	155.904	0.024	0.216	< 0.001
23	Gur River	7.525	8.446	91.939	0.008	1.205	< 0.001
24	St. 6, central surface	60.256	4.886	175.621	0.021	< 0.001	0.017
25	St. 6, central bottom	73.955	5.437	185.047	0.025	< 0.001	0.392
26	Gorin River	28.770	15.337	249.551	0.049	< 0.001	< 0.001
27	St. 7, right surface	7.023	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
28	St. 7, central surface	85.295	6.708	215.407	0.040	2.330	0.562
29	St.7, central bottom	92.852	5.485	206.512	0.032	< 0.001	< 0.001
30	St. 7, left surface	100.055	8.476	212.663	0.041	< 0.001	0.823
31	St. 8, central surface	37.918	2.952	144.782	0.031	< 0.001	0.138
32	St. 8, central bottom	62.389	8.230	180.048	0.033	< 0.001	< 0.001
33	Sofiisk	52.512	6.898	150.878	0.028	< 0.001	< 0.001
34	St. 9, right surface	57.530	5.103	157.987	0.024	< 0.001	< 0.001
35	St. 9, central surface	65.767	5.872	173.779	0.027	< 0.001	< 0.001
36	St.9, central bottom	64.399	5.893	161.256	0.028	< 0.001	0.096
37	St. 9, left surface	63.617	6.026	174.891	0.035	1.840	< 0.001
38	St. 10, central surface	15.593	3.316	137.342	0.001	< 0.001	< 0.001
39	St.10, central bottom	70.704	6.351	180.466	0.031	< 0.001	0.524
40	Amgun River	61.882	5.907	166.779	0.025	< 0.001	< 0.001
41	St.11, Tahta, surface	60.201	5.030	167.240	0.025	< 0.001	< 0.001
42	St. 12. Mago, surface	72.269	5.000	187.499	0.030	0.096	< 0.001

Table 3.7. Heavy Metal Concentrations on Filters, mcg/kg

№	Station	Al	Mn	Fe	Co	Ni	Cu
1	25.01.07-Amur-Bogorodskoe, left bank	-	-	-	-	-	-
2	-«-«-«- Middle	-	-	-	-	-	-
3	-«-«-«-«, Right bank	-	-	-	-	-	-
4	22.02.07-Amur-Bogorodskoe, left bank	32 377	848.99	79 218.75	6.29	131.28	1 028.12
5	-«-«-«- Middle	-	-	-	-	-	-
6	-«-«-«-«, Right bank	102 384	2 605.41	306513.0	15.07	475.96	743.96
7	28.05.07-Amur-Bogorodskoe, left bank	65 338	3 228.16	61146.75	21.97	155.37	1 735.38
8	-«-«-«- Middle	72 473	2 962.09	48980.25	19.80	157.56	752.1
9	-«-«-«-«, Right bank	38 641	1,826.71	123432.86	16.07	54.50	716.1
10	23.06.07-Amur-Bogorodskoe, left bank	31 878	2297.78	29017.25	16.08	40.11	377.2
11	-«-«-«- Middle	153 249	6 817.45	991240.00	49.40	351.51	2 469.4
12	-«-«-«-«, Right bank	62 523	3 055.08	95841.30	15.97	96.26	1 460.77
13	30.07.07-Amur-Bogorodskoe, left bank	76 395	1 806.75	70613.40	17.90	90.00	612.31
14	-«-«-«-Middle	204 722	2239.37	105074.44	24.11	192.18	998.7
15	-«-«-«-«, Right bank	133 889	6 899.65	107329.00	35.47	295.91	1057.25
16	29.08.07-Amur-Bogorodskoe, left bank	89 394	1 349.86	26541.35	12.95	22.04	151.51
17	-«-«-«-Middle	47 484	1 452.65	< 0.001	< 0.001	< 0.001	< 0.001
18	-«-«-«-«, Right bank	28 234	735.32	< 0.001	< 0.001	< 0.001	< 0.001
19	25.09.07-Amur-Bogorodskoe, left bank	18 806	1 414.34	< 0.001	< 0.001	< 0.001	< 0.001
20	-«-«-«-Middle	40 559	832.17	6 727.18	6.13	82.20	17.25
21	-«-«-«-«, Right bank	74 585	4 328.88	< 0.001	2.99	54.55	804.88
22	25.10.07-Amur-Bogorodskoe, left bank	36 948	1 021.84	11 201.21	4.69	< 0.001	114.95
23	-«-«-«-Middle	38 618	1 675.31	< 0.001	< 0.001	< 0.001	< 0.001
24	-«-«-«-«, Right bank	53 398	344.61	< 0.001	3.59	58.03	429.29
25	26.05.07.08-Amur-Khabarovsk, left bank.	66 877	1 028.23	15133.05	6.07	4.47	209.54
26	-«-«-«-Middle	20 217	374.78	< 0.001	< 0.001	60.70	58.62
27	-«-«-«-«, Right bank	65 563	915.86	15 832.50	6.19	96.34	< 0.001
28	27.06.07-Amur-Khabarovsk, left bank	16 066	815.34	< 0.001	< 0.001	< 0.001	< 0.001
29	-«-«-«-Middle	19 956	1 542.83	< 0.001	< 0.001	34.01	483.02
30	-«-«-«-«, Right bank	34 783	1 656.40	< 0.001	< 0.001	134.85	109.67
31	31.07.07-Amur-Khabarovsk, left bank	14 835	212.49	5 367.79	2.56	6.06	9.05
32	-«-«-«-Middle	2 316	66.83	55.60	0.30	1.01	4.34
33	-«-«-«-«, Right bank	1 776	61.81	< 0.001	0.19	0.46	2.28
34	28.08.07-Amur-Khabarovsk, left bank	4 558	63.77	1 358.05	0.52	3.19	5.08
35	-«-«-«-Middle	3 350	42.18	339.65	0.29	0.86	3.06
36	-«-«-«-«, Right bank	10 075	106.36	3 970.24	1.25	4.78	6.40
37	28.09.07-Amur-Khabarovsk, left bank	2 492	87.98	347.27	0.37	0.79	1.87
38	-«-«-«-Middle	2 624	73.66	140.18	0.33	0.45	2.30
39	-«-«-«-«, Right bank	4 545	124.27	1 646.24	0.76	1.20	3.88
40	25.10.07-Amur-Khabarovsk, left bank	1 222	71.83	< 0.001	0.15	1.70	3.96
41	-«-«-«-Middle	3 055	78.25	424.71	0.42	2.06	3.70
42	-«-«-«-«, Right bank	2 748	79.81	499.05	0.41	0.86	6.38
43	25.06.07-Amur-Nickolaevsk, ST. 1. surface	38	24.12	369.89	0.13	1.10	0.73
44	-«-«-«-bottom	915	14.97	370.60	0.16	0.80	0.63
45	-«-«-«-«, ST.3 surface	867	16.96	445.04	0.11	0.75	1.29
46	-«-«-«-bottom	772	9.14	381.24	0.09	0.26	0.20
47	21.07.07-Amur-Nickolaevsk, ST. 1. surface	864	4.29	115.91	0.03	0.20	< 0.001
48	-«-«-«-bottom	2 970	10.62	531.92	0.12	1.08	0.88
49	-«-«-«-«, ST.3 surface	462	8.33	252.42	0.06	0.15	< 0.001
50	-«-«-«-bottom	501	8.93	325.42	0.07	0.18	< 0.001
51	17.08.07-Amur-Nickolaevsk, ST. 1. surface	897	8.65	349.72	0.08	0.33	< 0.001
52	-«-«-«-bottom	1 838	13.35	724.88	0.18	1.16	0.30
53	-«-«-«-«, ST.3 surface	783	9.24	335.25	0.07	0.30	< 0.001
54	-«-«-«-bottom	782	8.44	363.74	0.08	0.26	< 0.001
55	17.09.07-Amur-Nickolaevsk, ST. 1. surface	843	10.25	363.82	0.11	0.26	0.43
56	-«-«-«-bottom	2 357	19.13	854.59	0.25	0.61	0.60
57	-«-«-«-«, ST. 3 surface	2 570	23.17	885.52	0.27	0.59	0.13
58	-«-«-«-bottom	2 841	25.40	1 080.78	0.30	0.64	1.27
59	18.10.07-Amur-Nickolaevsk, ST. 1. surface	774	9.38	416.81	0.07	0.21	0,17
60	-«-«-«-bottom	892	9.85	401.95	0.08	0.31	0.20
61	-«-«-«-«, ST.3 surface	565	6.73	254.30	0.05	0.17	0.21
62	-«-«-«-bottom	784	8.94	345.10	0.07	0.19	0.48

Note: “-“ the particle amount on filters was too small for element identification

Table 3.8. Heavy Metal Concentrations in Amur Water, mcg/dm^3

№	Station	Al	Mn	Co	Ni	Cu
1	29.05.07-Amur-Bogorodskoe, left bank	7.84	6.13	0.02	0.58	2.28
2	-«-«-«-Middle	27.75	5.49	0.03	0.52	2.48
3	-«-«-«-«, Right bank	32.35	10.36	0.05	0.70	2.91
4	23.06.07-Amur-Bogorodskoe, left bank	15.89	6.48	0.03	0.50	3.18
5	-«-«-«-Middle	31.19	1.76	0.03	0.51	3.46
6	-«-«-«-«, Right bank	34.93	10.39	0.05	0.55	2.47
7	30.07.07-Amur-Bogorodskoe, left bank	60.35	4.28	0.03	0.30	23.11
8	-«-«-«-Middle	46.02	3.65	0.02	0.23	1.62
9	-«-«-«-«, Right bank	37.87	4.31	0.02	0.31	0.78
10	29.08.07-Amur-Bogorodskoe, left bank	43.58	5.11	0.03	0.43	2.14
12	-«-«-«-Middle	63.84	6.22	0.04	0.45	1.47
13	-«-«-«-«, Right bank	89.92	10.89	0.06	0.96	3.68
14	25.09.07-Amur-Bogorodskoe, left bank	95.65	10.18	0.07	1.14	3.74
15	-«-«-«-Middle	43.76	13.29	0.07	1.05	5.48
16	-«-«-«-«, Right bank	85.45	14.48	0.07	1.12	3.38
17	25.10.07-Amur-Bogorodskoe, left bank	90.68	72.75	0.08	1.05	2.38
18	-«-«-«-Middle	78.50	193.17	0.08	1.11	3.00
19	-«-«-«-«, Right bank	103.20	9.20	0.05	0.62	1.61
20	26.05.07-Amur-Khabarovsk, left bank	33.70	2.06	0.04	0.92	3.19
21	-«-«-«-Middle	32.65	3.66	0.05	0.82	2.56
22	-«-«-«-«, Right bank	13.80	5.78	0.03	0.97	1.92
23	27.06.07-Amur-Khabarovsk, left bank	26.32	1.32	0.03	0.50	2.74
24	-«-«-«-Middle	57.15	3.96	0.07	0.70	3.39
25	-«-«-«-«, Right bank	34.86	2.47	0.06	0.64	1.87
20	31.07.07-Amur-Khabarovsk, left bank	90.40	4.39	0.05	0.81	3.80
21	-«-«-«-Middle	109.74	6.93	0.07	0.80	4.27
22	-«-«-«-«, Right bank	101.90	4.95	0.06	1.25	1.70
23	28.08.07-Amur-Khabarovsk, left bank	104.23	4.11	0.06	0.71	0.94
17	-«-«-«-Middle	142.72	6.17	0.08	0.64	0.78
18	-«-«-«-«, Right bank	107.82	4.26	0.05	0.65	2.86
19	28.09.07-Amur-Khabarovsk, left bank	32.47	10.98	0.10	1.31	7.84
20	-«-«-«-Middle	26.52	3.37	0.04	0.58	1.45
21	-«-«-«-«, Right bank	23.25	3.11	0.04	0.72	1.77
22	25.10.07-Amur-Khabarovsk, left bank	24.68	3.62	0.04	0.47	0.59
23	-«-«-«-Middle	11.87	3.49	0.05	0.72	0.99
24	-«-«-«-«, Right bank	22.42	3.73	0.04	0.74	1.88
25	25.06.07-Amur-Nickolaevsk, ST. 1. surface	34.43	1.63	0.03	0.89	2,99
26	-«-«-«-bottom	36.44	2.01	0.03	0.65	4.52
27	-«-«-«-«, ST.2 surface	70.94	4.48	0.04	1.32	2.75
28	-«-«-«-bottom	40.91	1.87	0.03	0.74	4.30
29	21.07.07-Amur-Nickolaevsk, ST. 1. surface	14.25	2.18	0.02	0.46	3.67
30	-«-«-«-bottom	9.79	5.26	0.03	0.47	2.61
31	-«-«-«-«, ST.2 surface	4.27	1.09	0.02	0.48	1.84
32	-«-«-«-bottom	13.18	1.52	0.02	0.46	3.34
33	17.08.07-Amur-Nickolaevsk, ST. 1. surface	14.90	1.59	<0.001	<0.001	1.86
34	-«-«-«-bottom	14.43	2.21	<0.001	<0.001	0.72
35	-«-«-«-«, ST.2 surface	16.31	1.42	<0.001	<0.001	0.15
36	-«-«-«-bottom	14.31	1.66	<0.001	<0.001	1.67
37	17.09.07-Amur-Nickolaevsk, ST. 1. surface	16.43	2.69	<0.001	<0.001	<0.001
38	-«-«-«-bottom	7.17	2.15	<0.001	<0.001	1.02
39	-«-«-«-«, ST.2 surface	18.36	2.08	<0.001	<0.001	<0.001
40	-«-«-«-bottom	24.08	2.66	<0.001	<0.001	<0.001
33	18.10.07-Amur-Nickolaevsk, ST. 1. surface	25.74	3.50	<0.001	<0.001	0.34
34	-«-«-«-bottom	25.10	4.03	<0.001	<0.001	0.67
35	-«-«-«-«, ST.2 surface	15.30	4.01	<0.001	<0.001	0.83
36	-«-«-«-bottom	51.71	6.66	<0.001	<0.001	7.73

4. Organic Matter Concentrations in Amur Water

The analysis data are given in Table 4.1. Landscape structure of the Amur Basin, dynamics and amount of precipitation, soil specifics as well as anthropogenic factors determine the regularities of organic matter geochemical migration.

Our studies revealed that the Kalistratova (St 1A) sub-channel water has high OM concentrations, where total organic carbon (TOC) in surface and bottom water layers at average was 11.19 and 11.10 mg C/dm^3 respectively. Dissolved organic carbon (DOC) concentrations were also high and in surface layer was 10.8 mg C/dm^3 at average. The amount of suspended organic carbon (SOC) was at average 7.5% (surface) and 11.0% (bottom) of TOC. Maximal DOC concentration of 12.0 mg C/dm^3 was registered at the right bank of the Kalistratova sub-channel. Minimal SOC of 0.31 mg C/dm^3 or 2.5% of TOC was also registered here, but its maximal value of 17.1% was observed in the middle (bottom water layer).

In Amur water at Sikhachi-Alyan (St 1B) organic matter values in the water section did not change much and average DOC in surface and bottom layers was 10.2 and 10.7 mg C/dm^3 respectively. SOC did not exceed 8.3% of TOC (~ 11.3 mg C/dm^3). In Amur water at Mayak (St. A) and lower the Anui River (St.2) TOC did not differ much from the value registered at the previous stations but SOC increased to 10% of TOC.

In Amur lower the Anui organic matter content was not high (DOC – 7.5 mg C/dm^3) and SOC was only 0.65 mg C/dm^3. In spite of the fact that soils in the Anui Basin have relatively high reserves of organic carbon, the migration of the water-soluble carbon into the soil solutions and ground water is much slowed down due to slow melting of the permafrost ground (especially in the Anui upper reaches). Thus DOC values in the Anui mouth are relatively not high. The Anui water impact is noticeably observed at the right Amur bank at Malmyzh village (St.4). DOC values in water changed from the left to the right river bank from 5.5 to 6.5 mg C/dm^{3}respectively. SOC revealed similar regularities, changing from 0.98 to 1.61 mg C/dm^3. Marked differences of OM concentrations in surface and bottom layers were not observed.

At St. 5 OM concentrations were a little higher than upstream and seemed to be due to the Gur impact. The Gur River is characterized with minimal TOC (4.7 mg C/dm^3). Near Nizhnie Khalby village (St. 6) TOC increased to 10.5 mg C/dm^3. Maximal SOC of 2.3 mg C/dm^3 is also registered here in the surface water layer. Gorin river water contained 25% of DOC less than Amur water at this river passage.

Downstream at the Khavanda lake (St. 7) both DOC ad SOC in water decreased as was observed previously. Further on down the Amur OM concentrations in the Amur (St. 8) increased a little (by 15%) compared to St. 7 and decreased again at Nizhnaya Gavan village (St. 9). At St. 9 DOC and SOC gradually increased in the surface layer from the right bank towards the left bank from 7.0 to 8.0 and from 0.90 to 1.64 mg C/dm^3 respectively. At this river passage maximal OM concentrations were registered in the bottom layer in the river middle, i.e. DOC – 8.3 mg C/dm^3 and SOC – 1.88 mg C/dm^3. At St. 10 TOC did not exceed the values of the previous station. The OM decrease is observed at St. 11, especially in SOC (2 times). Is seems to be associated with Amgun water, having OM concentrations twice less than in the Amur.

Table 4.1. Dissolved (DOC) and Suspended (SOC) Organic Carbon Concentrations in River Water Samples in 2007.

Sample №	Date	Station	DOC	SOC
			mg C/ dm^3	
1.	06.08	St.1A. Amur. Right (Kalistratova)	12.0	0.31
2.		St.1A. Amur. Center, surface	9.0	1.17
3.		St.1A. Amur. Center, bottom	9.2	1.90
4.		St.1A. Amur. Left	11.3	1.05
5.	07.08	St.1B. Amur. Right (Sikachi-Alyan)	10.3	0.96
6.		St.1 B. Amur. Center, surface	10.3	0.94
7.		St.1 B. Amur. Center, bottom	10.7	0.81
8.		St.1 B. Amur. Left	10.0	1.40
9.	07.08	St.A. Amur. Center, surface (Mayak)	9.0	2.00
10.		St.A. Amur. Center, bottom	10.5	1.77
11.		St.2. Amur. Center, surface (lower Anui)	10.0	1.20
12.		St.2. Amur. Center, bottom	9.5	1.80
13.		St.2. Anui…	7.5	0.65
14.	07.08	St.3. Amur. Center, surface (Lidoga)	-	2.00
15.		St.3. Amur. Center, bottom	12.0	1.90
16.	07.08	St.3. Lidoga (inlet)	-	1.60
17.	08.08	St.4. Amur. Right (Malmyzh)	5.3	0.98
18.		St.4. Amur. Center, surface	6.2	1.60
19.		St.4. Amur. Center, bottom	6.2	1.11
20.		St.4. Amur. Left	6.5	1.61
21.	09.08	St.5. Amur. Center, surface	5.7	1.84
22.		St.5. Amur. Center, bottom	6.0	1.71
23.		St.5. Gur	4.5	0.16
24.	09.08	St.6. Amur. Center, surface (N. Khalby)	8.5	2.30
25.		St.6. Amur. Center, bottom	8.2	1.90
26.		St.6. Gorin	6.0	1.95
27.	10.08	St.7. Amur. Right (Khavanda)	8.0	1.44
28.		St.7. Amur. Center, surface	7.5	1.29
29.		St.7. Amur. Center, bottom	7.9	1.43
30.		St.7. Amur. Left	7.2	1.54
31.	11.08	St.8. Amur. Center, surface (Daldzha)	8.5	1.92
32.		St.8. Amur. Center, bottom	9.0	1.61
33.		St.8. Sofiisk	8.2	1.20
34.	13.08	St.9. Amur. Right (N. Gavan)	7.0	0.90
35.		St.9. Amur. Center, surface	7.2	1.15
36.		St.9. Amur. Center, bottom	8.3	1.88
37.		St.9. Amur. Left	8.0	1.69
38.	13.08	St.10. Amur. Center, surface	7.2	1.59
39.		St.10. Amur. Center, bottom	7.0	1.54
40.		St.10. Amgun	4.5	0.33
41.	15.08	St.11. Amur. Takhta	6.7	0.77
42.		St.11. Amur. Mago	6.5	0.69

Note: Here and in other tables below (-) means that the sample bottle broke while kept in the freezer

DOC in Amur water near Khabarovsk changed at average from 5.4 to 10.2 mg C/dm^3 (Table 4.2.). Maximal value of 11.0 mg C/dm^3 was registered in the Amur middle in August 2007. SOC at Khabarovsk at this time changed from 0.24 to 2.20 mg C/dm^3 (Table 4.3.). Maximal SOC of 3.60 mg C/dm^3 was observed in July in the Amur middle and may be explained with the impact of Sungari water.

Table 4.2. Dissolved Organic Carbon Concentrations in Amur Water at Khabarovsk (2007), mg C/dm^3

Sampling point	Sampling date							
	26.05.07	27.06.07	31.07.07	28.08.07	29.09.07	26.10.07	26.12.07	31.01.08
Left bank	6.8	6.8	9.8	10.6	9.7	5.4	8.6	8.3
Middle	7.8	6.6	9.0	11.0	8.2	5.5	8.3	8.6
Right bank	7.6	6.8	10.5	9.00	9.0	5.4	8.3	9.9

Table 4.3. Suspended Organic Carbon Concentrations in Amur Water at Khabarovsk (2007), mg C/dm^3

Sampling point	Sampling date							
	26.05.07	27.06.07	31.07.07	28.08.07	28.09.07	26.10. 07	26.12.07	31.01. 08
Left bank	0.10	1.45	2.10	1.80	2.03	0.53	2.15	0.10
Middle	0.59	1.81	3.60	2.20	2.56	0.53	2.07	0.31
Right bank	0.31	0.75	1.68	1.34	2.00	0.31	1.61	0.31

In Amur water at Bogorodskoe DOC at average fluctuated between 5.4. – 7.5. mg C/dm^3 (Table 4.4.). Maximal value 7.6 mg C/dm^3 was registered in June and minimal 5.4 mg C/dm^3 in October. SOC content in water changed from 0.14 to 1.25 mg C/dm^3 (Table 4.5.). Maximal SOC was registered in June (1.60 mg C/dm^3) and minimal in October (0.10 mg C/dm^3).

Table 4.4. Dissolved Organic Carbon Concentrations in Amur Water at Bogorodskoe (2007), mg C/dm^3

Sapling point	Sampling date							
	28.05.07	23.06.07	30.07.07	29.08.07	25.09.07	25.10.0 7	27.12.0 7	27.01.08
Left bank	7.4	7.4	5.3	5.3	6.2	6.0	7.5	4.5
Middle	7.2	7.6	6.0	6.8	5.3	6.2	6.8	8.0
Right bank	6.8	7.6	4.9	–	4.9	5.0	7.0	6.0

Table 4.5. Suspended Organic Carbon Concentrations in Amur Water at Bogorodskoe (2007), mg C/dm^3

Sapling point	Sampling date							
	28.05.07	23.06.07	30.07.07	29.08.07	25.09.07	25.10.07	27.12.07	27.01.08
Left bank	0.59	0.52	1.26	1.00	0.24	0.10	1.20	1.30
Middle	0.39	0.90	1.60	1.10	0.20	0.23	0.38	0.10
Right bank	0.26	0.26	0.90	0.76	0.20	0.10	0.77	0.10

In general, SOC values in water in 2007 were lower than those in 2006. It may be explained with a low water content in 2007 and relatively smaller technogenic OM discharge in the Amur this year.

Closer to the estuary at Nickolaevsk-on-Amur in surface and bottom water layers DOC changed from 7.15 to 12.80 and from 5.25 до 9.4 mg C/dm^3 respectively. DOC content was 25% higher in the surface water layer and in June the opposite situation was observed. Still the water sample might be not filtrated (Table 4.6.).

Table 4.6. Dissolved Organic Carbon Concentrations in Amur Water at Nickolaevsk (2007), mg C/dm^3

№	Sampling point	Sampling date				
		23.06.07*	21.07.07	17.08.07	17.09.07	18.10.07
1	surface	12.1	8.3	10.6	7.5	11.3
	bottom	-	8.3	12.0	6.0	9.0
2	surface	8.4	8.6	8.9	6.8	14.3
	bottom	12.1	8.9	8.9	4.5	9.8

Note * - sample seemed to be not filtrated.

SOC in Amur water in vertical direction changed from 0.9 to 2.03 mg C/dm^3 (Table 4.7.). It seems preliminary to identify any regularity in vertical distribution of SOC, although the difference in concentrations is rather noticeable (up to 2 times). SOC concentrations at Nickolaevsk is nearly twice as much as at Bogorodskoe.

Table 4.7. Suspended Organic Carbon Concentrations in Amur Water at Nickolaevsk (2007), mg C/dm^3

№	Sampling point	Sampling date				
		23.06.07	21.07.07	17.08.07	17.09.07	18.10.07
1	surface	2.03	0.96	2.30	1.68	1.42
	bottom	0.99	1.42	1.15	0.80	1.00
2	surface	1.49	1.42	1.45	2.38	0.84
	bottom	0.80	1.15	1.11	2.45	0.86

References

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