

Supplementary Table 1: Overview of discharge (Q), total suspended solid (TSS), particulate organic carbon (POC), dissolved organic carbon (DOC), POC% (POC/TSS%) and Chl-a for the different sampling sites of the Yellow River mainstream during 2003, 2006, 2007 and 2009 investigations. *Italics stand for reservoirs.*

Date	Distance to the river mouth	Sampling station	Q (m <sup>3</sup> /s)	TSS (mg/L)	POC (mg/L)	DOC (mg/L)	POC%	DOC/POC	Chl-a (ug/L)
<b>OCT. 2003</b>									
	3400	Xingcheng	824	1237	9.58	1.59	0.77	0.17	1.21
	3345	Baishiqiao	823	1613	9.62	1.89	0.60	0.20	1.12
	1150	Tongguan	2315	2470	18.17	3.09	0.74	0.17	0.81
	1025	<i>Sanmengxia</i>		175	1.65	3.19	0.94	1.93	0.66
	883	<i>Xiaolangdi</i>		21	1.48	3.12	7.01	2.11	2.44
	786	Huayuankou	588	4213	17.52	2.75	0.42	0.16	1.36
	104	Lijin	1824	8400	27.38	3.09	0.33	0.11	2.45
<b>NOV. 2006</b>									
	3400	Xingcheng	802	191	0.84	1.57	0.44	1.87	2.84
	3345	Baishiqiao	802	707	1.67	1.69	0.24	1.01	2.86
	2900	Yinchuan	636	664	4.24	1.87	0.64	0.44	2.98
	2200	Baotou	433	565	4.04	1.96	0.72	0.48	3.56
	1150	Tongguan	500	1308	6.07	2.62	0.46	0.43	0.81
	1025	<i>Sanmengxia</i>		31	1.23	2.74	3.93	2.22	2.43
	883	<i>Xiaolangdi</i>		4	0.27	2.76	7.12	10.26	2.81
	786	Huayuankou	440	505	2.48	2.19	0.49	0.88	2.80
	104	Lijin	328	549	3.62	2.59	0.66	0.71	2.77
<b>JUL. 2007</b>									
	4300	Lajia		328	2.11	2.38	0.64	1.13	2.36
	3722	Guide	562	137	0.65	1.58	0.48	2.43	1.99

Supplementary Table 1(continued): Overview of discharge (Q), total suspended solid (TSS), particulate organic carbon (POC), dissolved organic carbon (DOC), POC% (POC/TSS%) and Chl-a for the different sampling sites of the Yellow River mainstream during 2003, 2006, 2007 and 2009 investigations. *Italics stand for reservoirs.*

Distance to the river mouth	Sampling station	Q (m <sup>3</sup> /s)	TSS (mg/L)	POC (mg/L)	DOC (mg/L)	POC%	DOC/POC	Chl-a (ug/L)
3345	Lanzhou	1040	360	1.57	2.06	0.44	1.32	3.72
2900	Yinchuan	830	8188	20.64	2.21	0.25	0.11	9.31
1150	Tongguan	130	6578	25.00	3.75	0.38	0.15	21.50
786	Huayuankou	525	413	2.26	2.83	0.55	1.25	22
104	Lijin		207	1.30	2.88	0.63	2.22	
<b>JUL. 2009</b>								
4850	Dari	298	91	2.01	2.93	2.20	1.46	0.53
4300	Lajia	500	144	2.61	2.97	1.82	1.14	0.82
3722	Guide	468	489	3.77	3.29	0.77	0.87	0.46
3500	<i>Liujiaxia</i>		5	0.31	3.67	5.80	11.99	5.93
3345	Lanzhou	1080	250	2.12	2.59	0.85	1.22	0.85
2900	Yinchuan	855	1494	8.59	3.27	0.57	0.38	1.24
2200	Baotou	310	395	2.60	2.47	0.66	0.95	7.40
1150	Tongguan	183	576	6.14	3.43	1.07	0.56	122.41
883	<i>Xiaolangdi</i>		6	1.38	4.04	24.87	2.94	0.68
786	Huayuankou	800	453	3.08	2.86	0.68	0.93	11.10
104	Lijin	210	221	1.42	1.89	0.64	1.33	12.48

Supplementary Table 2: Overview of discharge (Q), total suspended solid (TSS), particulate organic carbon (POC), dissolved organic carbon (DOC), POC%(POC/TSS%) and Chl-a for the annual investigation at the Huayuankou station during 2005.11 and 2006.11. *Italics stand for the water and sediment regulation (WSR) period.*

<b>y/m/d</b>	<b>Q (m<sup>3</sup>/s)</b>	<b>TSS (mg/L)</b>	<b>POC (mg/L)</b>	<b>DOC (mg/L)</b>	<b>POC%</b>	<b>Chl-a (ug/L)</b>	<b>DOC/POC</b>
2005/11/26	725	502	1.37	3.36	0.27	5.28	2.46
2005/12/2	638	184	1.07	3.49	0.58	5.20	3.27
2005/12/9	622	239	1.10	3.03	0.46	6.73	2.77
2005/12/16	492	209	1.07	2.73	0.51	6.38	2.54
2005/12/23	590	284	1.16	2.68	0.41	6.22	2.32
2005/12/30	347	361	1.25	2.51	0.35	4.18	2.01
2006/1/5	440	206	1.08	2.69	0.52	6.46	2.50
2006/1/9	460	271	1.89	2.61	0.70	5.04	1.38
2006/1/15	297	169	1.51	3.16	0.89	2.76	2.09
2006/1/24	325	54	1.21	2.74	2.25	1.35	2.26
2006/2/1	316	59	1.46	3.08	2.49	4.89	2.11
2006/2/7	290	79	1.82	3.40	2.29	2.06	1.87
2006/2/13	265	204	2.30	3.53	1.13	4.02	1.53
2006/2/20	570	253	2.47	3.70	0.98	7.09	1.50
2006/2/27	735	87	1.71	3.34	1.97	5.83	1.96
2006/3/6	1190	354	3.02	3.19	0.85	1.82	1.06
2006/3/16	1150	675	3.38	3.72	0.50	4.42	1.10
2006/3/20	1150	373	3.74	3.29	1	2.53	0.88
2006/3/24	1120	522	3.10	3.35	0.59	4.02	1.08
2006/3/27	1060	213	2.24	2.66	1.05	0.83	1.19
2006/4/3	1040	329	3.71	2.66	1.13	1.35	0.72

Supplementary Table 2 (continued): Overview of discharge (Q), total suspended solid (TSS), particulate organic carbon (POC), dissolved organic carbon (DOC), POC%(POC/TSS%) and Chl-a for the annual investigation at the Huayuankou station during 2005.11 and 2006.11. *Italics stand for the water and sediment regulation (WSR) period.*

y/m/d	Q (m <sup>3</sup> /s)	TSS (mg/L)	POC (mg/L)	DOC (mg/L)	POC%	Chl-a (ug/L)	DOC/POC
2006/4/10	895	443	2.52	2.46	0.57	1.33	0.98
2006/4/14	880	372	3.91	2.55	1.05	0.70	0.65
2006/4/19	1250	654	2.96	2.35	0.45	1.61	0.79
2006/4/25	1030	692	2.99	2.31	0.43	1.17	0.77
2006/5/9	1080	577	3.62	2.28	0.63	1.02	0.63
2006/5/16	1070	502	2.65	2.56	0.53	1.46	0.97
2006/5/17	890	582	2.78	2.52	0.48	1.90	0.91
2006/5/18	880	241	2.78	2.60	1.15	1.17	0.93
2006/5/23	945	481	2.55	2.71	0.53	0.76	1.06
2006/5/26	1150	468	1.70	2.86	0.36	0.64	1.68
2006/5/30	1230	198	2.97	2.95	1.50	0.86	0.99
2006/6/2	1130	479	1.69	2.83	0.35	1.17	1.68
2006/6/7	1400	338	3.07	2.96	0.91	2.41	0.96
2006/6/13	2700	1830	3.73	3.12	0.20	1.87	0.84
2006/6/16	3300	1660	3.42	3.60	0.21	2.19	1.05
2006/6/23	3720	1740	3.57	3.76	0.21	0.96	1.06
2006/6/28	3630	2576	3.90	3.69	0.15	2.51	0.95
2006/7/2	1120	1844	3.76	3.64	0.20		0.97
2006/7/5	1120	706	4.78	3.54	0.68	2.56	0.74
2006/7/14	532	627	3.43	3.40	0.55	3.19	0.99
2006/7/18	505	574	1.49	3.60	0.26	1.86	2.42

Supplementary Table 2 (continued): Overview of discharge (Q), total suspended solid (TSS), particulate organic carbon (POC), dissolved organic carbon (DOC), POC% (POC/TSS%) and Chl-a for the annual investigation at the Huayuankou station during 2005.11 and 2006.11. *Italics stand for the water and sediment regulation (WSR) period.*

<b>y/m/d</b>	<b>Q (m<sup>3</sup>/s)</b>	<b>TSS (mg/L)</b>	<b>POC (mg/L)</b>	<b>DOC (mg/L)</b>	<b>POC%</b>	<b>Chl-a (ug/L)</b>	<b>DOC/POC</b>
2006/7/25	1200	457	1.72	3.50	0.38	1.82	2.03
2006/7/27	1470	202	1.61	3.10	0.79	2.38	1.93
2006/8/1	1320	319	1.79	3	0.56	1.66	1.68
2006/8/8	1000	860	4.51	3.05	0.52	4.30	0.68
2006/8/15	830	160	1.46	3.15	0.91	2.41	2.15
2006/8/22	680	105	1.19	3.54	1.13	3.90	2.98
2006/8/29	620	72	0.95	3.26	1.32	3.04	3.42
2006/9/5	1200	830	4.86	3.02	0.59	1.19	0.62
2006/9/12	600	263	1.74	3.30	0.66	3.44	1.90
2006/9/16	610	289	1.91	3.58	0.66	1.41	1.87
2006/9/19	460	121	1.41	3.70	1.16	1.56	2.63
2006/9/26	1370	828	3.56	2.94	0.43	3.20	0.83
2006/10/4	600	141	1.38	3.19	0.98	2.20	2.31
2006/10/9	720	98	1.51	3.52	1.55	2.46	2.33
2006/10/17	525	112	1.73	3.34	1.54	1.47	1.93
2006/10/23	550	120	1.27	3.57	1.06	0.89	2.80
2006/10/31	420	97	1.04	3.67	1.07	3.11	3.54
2006/11/7	446	101	1.16	3.57	1.15	2.52	3.07

Supplementary Table 3: Overview of discharge (Q), total suspended solid (TSS), particulate organic carbon (POC), dissolved organic carbon (DOC), POC% (POC/TSS%) and Chl-a during the 2008 water and sediment regulation (WSR) period at the Lijin station.

m/d	Q (m <sup>3</sup> /s)	TSS(mg/L)	POC(mg/L)	DOC(mg/L)	POC%	chl-a (ug/L)	DOC/POC
<b>Before water and sediment regulation period</b>							
6-16	378	340	4.66	2.84	1.37	8.76	0.61
6-17	374	352	4.36	2.69	1.24	2.78	0.62
6-18	358	386	2.31	2.86	0.6	7.26	1.24
6-19	302	345	4.19	2.66	1.22	2.75	0.63
6-20	289	321	4.06	2.74	1.27	2.57	0.67
6-21	270	395	4.3	2.68	1.09	2.96	0.62
6-22	263	506	4.56	2.61	0.9	2.67	0.57
<b>Water and sediment regulation period</b>							
6-23	1330	1476	5.21	2.53	0.35	2.4	0.49
6-24	2740	1986	12.42	2.83	0.63	5.72	0.23
6-25	3080	3176	11.74	2.59	0.37	1.71	0.22
6-26	3120	2554	11.44	2.5	0.45	2.7	0.22
6-27	3180	2452	14.86	2.7	0.61	1.33	0.18
6-28	3730	2758	12.65	2.59	0.46	1.27	0.2
6-29	4040	3194	14.16	2.41	0.44	2.64	0.17
6-30	4110	2574	12.35	2.51	0.48	2.74	0.2
7-1	4030	2214	10.64	2.5	0.48	1.55	0.23
7-2	3880	2024	9.93	2.8	0.49	2.37	0.28
7-3	3760	1473	9.6	2.78	0.65	2.3	0.29
7-4	2920	6242	29.95	2.63	0.48	1.18	0.09
7-5	2790	18460	107.44	2.85	0.58	8.5	0.03

Supplementary Table 3 (continued): Overview of discharge (Q), total suspended solid (TSS), particulate organic carbon (POC), dissolved organic carbon (DOC), POC% (POC/TSS%) and Chl-a during the 2008 water and sediment regulation (WSR) period at the Lijin station.

m/d	Q (m <sup>3</sup> /s)	TSS(mg/L)	POC(mg/L)	DOC(mg/L)	POC%	chl-a (ug/L)	DOC/POC
7-6	2010	27106	188.28	2.94	0.69	8.55	0.02
7-7	1240	19392	126.36	2.67	0.65	11.35	0.02
7-8	1080	25234	175.48	2.85	0.7	15.22	0.02
7-9	600	19686	123.56	2.79	0.63	14.98	0.02
7-10	465	11214	72.05	2.61	0.64	9.13	0.04
<b>After water and sediment regulation period</b>							
7-11	375	4909	20.87	2.99	0.43	5.17	0.14
7-12	295	4868	19.58	2.83	0.4	6.12	0.14

Supplementary Table 4: Overview of Return flow, actual discharge and water consumption of each reach along the Yellow River during 2001-2010.

Parameter	Distance to the river mouth (km)	Sampling station	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Return flow (km<sup>3</sup>/a)</b>													
	3345	Lanzhou	0.77	0.90	0.73	0.69	0.66	0.64	0.43	0.41	0.44	0.50	0.66
	2002	Toudaoguai	5.86	5.59	5.81	3.47	4.53	4.67	5.35	4.84	4.90	5.04	5.25
	1267	Longmen	0.01	0.02	0.01	0.11	0.11	0.15	0.14	0.15	0.17	0.15	0.14
	1025	Sanmengxia	0.39	0.38	0.51	0.68	0.71	0.70	0.74	0.78	0.79	0.82	0.99
	786	Huayuankou	0.19	0.19	0.14	0.16	0.16	0.13	0.23	0.22	0.26	0.27	0.31
	104	Lijin	0.16	0.18	0.15	0.11	0.12	0.11	0.12	0.12	0.12	0.13	0.17
<b>Actual discharge (km<sup>3</sup>/a)</b>													
	3345	Lanzhou	25.97	23.56	23.58	21.97	23.85	29.11	29.89	30.70	28.51	30.47	31.40
	2002	Toudaoguai	14.02	11.33	12.28	11.56	12.76	15.02	17.49	18.93	16.41	16.96	19.12
	1267	Longmen	15.72	13.94	15.66	16.23	15.85	16.92	19.96	20.59	17.76	17.83	20.73
	1025	Sanmengxia	16.31	14.26	15.21	23.61	16.87	21.14	21.20	24.27	21.08	21.97	25.01
	786	Huayuankou	16.53	16.55	19.56	27.27	24.05	25.70	28.11	26.97	23.61	23.22	27.63
	104	Lijin	4.86	4.65	4.19	19.26	19.88	20.68	19.17	20.40	14.56	13.29	19.30
<b>Water consumption (km<sup>3</sup>/a)</b>													
	3345	Lanzhou						41.09	27.61	34.63	29.52	37.84	30.69
	2002	Toudaoguai						38.17	25.80	33.10	27.85	35.12	28.76
	1267	Longmen						40.72	29.39	35.51	30	36.81	31.05
	1025	Sanmengxia						48.35	34.50	43.48	37.19	45.20	39.80
	786	Huayuankou						55.55	40.04	49.01	40.04	47.99	45.77
	104	Lijin						58.02	40.81	50.92	40.11	48.37	48.22



Supplementary Table 5: Overview of Discharges (Q) and precipitation (P) of every month at the Huayankou station during 2005.11 and 2006.11

	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Agu	Sep	Oct	Nov
<b>Q (km<sup>3</sup>)</b>	2.16	1.45	1.01	1.09	2.97	2.50	2.84	6.79	2.28	2.39	2.15	1.56	1.20
<b>P (mm)</b>	4.90	2.30	25.80	17.80	5.40	37	65.50	82.90	181.90	162.10	50	0	58.70

Supplementary Table 6: Overview of the discharges of each hydrological station at each month of 2003 (km<sup>3</sup>). *Italic font means sampling month.*

Distance to the river mouth	station	Month											
		1	2	3	4	5	6	7	8	9	10	11	12
3911	Tangnaihai	0.23	0.24	0.39	0.57	0.98	1.32	2.13	3.16	3.81	<i>2.67</i>	1.10	0.54
3345	Lanzhou	0.95	0.80	0.77	1.10	2	1.98	1.99	2.42	2.85	3.38	2.25	1.50
2002	Toudaoguai	0.57	0.87	1.57	0.60	0.42	0.20	0.42	0.97	2.33	<i>1.50</i>	1.34	0.78
1267	longmen	0.65	1.05	1.70	1.11	0.54	0.69	0.81	1.72	2.85	<i>2.31</i>	1.72	1.09
1150	Tongguan	0.71	1.02	1.62	1.28	0.67	0.63	0.96	2.79	5.88	<i>6.03</i>	2.72	1.83
1025	Sanmengxia	0.51	0.95	1.32	1.05	0.62	0.73	0.86	2.52	5.83	<i>5.46</i>	2.28	1.48
883	Xiaolangdi	0.37	0.37	1.44	1.18	1.20	1.55	0.87	0.63	3.34	<i>3.96</i>	3.73	2.17
786	Huayankou	0.45	0.39	1.48	1.26	1.16	1.56	1.22	1.10	5.47	<i>6.16</i>	4.41	2.62
104	Lijin	0.08	0.08	0.10	0.08	0.10	0.15	0.34	0.56	4.85	<i>6.59</i>	4.17	2.17

Supplementary Table 7: Overview of the discharges of each hydrological station at each month of 2006 (km<sup>3</sup>). *Italic font means sampling month.*

Distance to the river mouth	station	Month											
		1	2	3	4	5	6	7	8	9	10	11	12
3911	Tangnaihai	0.59	0.52	0.61	0.75	0.98	1.61	2.20	1.56	2.01	1.88	<i>0.92</i>	0.50
3345	Lanzhou	1.49	1.26	1.72	3.08	3.40	3.45	3.24	2.84	2.88	2.73	2.20	1.62
2002	Toudaoguai	1.04	1.14	2.44	2.50	1.06	0.93	1.71	1.92	2.22	0.77	<i>0.94</i>	0.83
1267	longmen	1.10	1.38	2.84	2.30	1.24	1.31	1.74	2.33	2.70	1.18	<i>0.96</i>	0.89
1150	Tongguan	1.06	1.61	2.92	2.44	1.82	1.40	1.89	2.45	3.50	1.75	<i>1.33</i>	1.16
1025	Sanmengxia	0.96	1.42	2.89	1.96	1.51	1.60	1.73	2.18	3.47	1.37	<i>1.10</i>	0.99
883	Xiaolangdi	0.80	1.12	2.64	2.52	2.66	6.71	1.89	2.10	1.88	1.30	<i>1.03</i>	1.11
786	Huayuankou	1.01	1.09	2.97	2.50	2.84	6.79	2.28	2.39	2.15	1.56	<i>1.20</i>	1.33
104	Lijin	0.86	0.43	0.51	0.85	2	5.73	2.21	2.45	2.01	0.95	<i>0.73</i>	0.45

Supplementary Table 8: Overview of the discharges of each hydrological station at each month of 2007 (km<sup>3</sup>). *Italic font means sampling month.*

Distance to the river mouth	station	Month											
		1	2	3	4	5	6	7	8	9	10	11	12
3911	Tangnaihai	0.37	0.32	0.58	0.76	0.80	3.24	<i>3.75</i>	2.38	2.75	2.18	1.18	0.60
3345	Lanzhou	1.37	1.17	1.34	2.20	3.13	3.06	<i>3.67</i>	3.38	3.50	3.67	2.53	1.66
2002	Toudaoguai	0.99	1.22	2.23	1.28	0.81	1.56	<i>1.43</i>	2	2.90	1.72	1.81	0.98
1267	longmen	0.93	1.34	2.51	1.50	0.87	1.61	<i>1.66</i>	2.03	2.90	2.13	1.92	1.18
1150	Tongguan	1.12	1.48	2.54	1.29	0.76	1.47	<i>2.58</i>	2.89	3.60	3.54	2.30	1.48
1025	Sanmengxia	1.02	1.39	2.42	1.17	0.69	1.79	<i>2.58</i>	2.81	3.60	3.21	2.29	1.31
883	Xiaolangdi	0.71	0.67	1.81	2.11	1.59	4.46	<i>2.81</i>	2.97	1.77	2.55	1.76	1.44
786	Huayuankou	0.80	0.65	2.04	2.20	1.51	4.15	<i>3.27</i>	4.21	2.18	2.81	1.84	1.32
104	Lijin	0.57	0.26	0.63	0.39	0.44	2.40	<i>3.59</i>	4.79	2.09	2.49	1.84	0.93

Supplementary Table 9: Overview of the discharges of each hydrological station at each month of 2009 (km<sup>3</sup>). *Italic font means sampling month.*

Distance to the river mouth	station	Month											
		1	2	3	4	5	6	7	8	9	10	11	12
3911	Tangnaihai	0.51	0.53	0.73	1.14	1.88	2.77	<i>4.50</i>	4.15	4.04	3.32	1.78	0.98
3345	Lanzhou	1.43	1.05	2.04	3.21	3.35	3.40	<i>2.76</i>	2.71	3.29	3.19	2.46	1.60
2002	Toudaoguai	0.78	0.97	2.50	2.64	0.80	0.95	<i>0.90</i>	1.30	2.75	1.44	0.85	1.11
1267	longmen	0.84	1.32	2.45	2.58	0.84	1.31	<i>1.06</i>	1.10	2.80	1.45	1.09	1
1150	Tongguan	0.87	1.43	2.45	2.38	1.19	1.28	<i>1.03</i>	1.71	3.84	1.91	1.41	1.14
1025	Sanmengxia	0.83	1.59	2.64	2.54	1.36	1.72	<i>1.05</i>	1.67	4.10	1.69	1.48	1.31
883	Xiaolangdi	1.13	1.99	1.58	1.84	1.24	4.48	<i>1.61</i>	1.04	1.87	2.15	1.39	1.19
786	Huayuankou	1.17	2.03	1.86	1.92	1.36	4.38	<i>1.93</i>	1.27	2.03	2.25	1.63	1.41
104	Lijin	0.53	0.28	0.47	0.40	0.58	2.55	<i>2.53</i>	1.02	1.32	1.53	1.21	0.88

Supplementary Table 10: Overview of the temperature variations during the one year observation during 11, 2005 and 11, 2006 at the Huayuankou station ( °C).

station	Month												
	11	12	1	2	3	4	5	6	7	8	9	10	11
Huayuankou	11.5	1.9	0.3	3.9	11.5	17.2	21.9	27.8	27.1	26.1	21.2	19.0	10.9