Horikawa Sen-nin Chosatai 2010 (HSC)
Summary meeting for the 27th stage

Place:
WILL AICHI
Big Conference room

The secretariat of Horikawa Sen-nin Chosatai 2010
Oct. 10th. 2020

1. Horikawa Sen-nin Chosatai 2010

～Transmission of Raw Water from Kiso River (TRWKR)～

1.Purpose

To verify the clarification effects of TRWKR with citizens

(1) Develop to new clarifying measures
(2) Asses the influence on an ecosystem
(3) Sustain and enhance citizens' activities
(4) Develop citizens' awareness in the entire Horikawa River basin

2.Water source and Volume of transmission of raw water

(1) Water Source : Kiso River
(2) Volume of transmission of raw water : Maximum 0.4 m3/s

3.Pilot project period

(1) Evaluation and Survey term : About 5 years
(from Apr.2007 to Mar.2012)
(Including the term of follow-up survey and evaluation after the stop of TRWKR)
(2) TRWKR period : about 3 years
(from Apr.22nd.2007 to Mar.22nd.2010)

■Increase of Transmisson Volume from the Shonai River (additional pilot project)

1.Water source and Volume of transmission of raw water

(1) Water Source : Shonai River
(2) Transmission Usual 0.4m3/sec (maxium 0.7m3/sec)

2.Period of Increase

(1) Experiment Period : Oct.1st - Dec.31st.2010
(2) Period of Increased Transmision Volume : Oct.5th - Nov.2nd.2010

The formation of HSC (April.22nd.2007)
With a viewpoint and a sence of citizens, the survey of the clarification effect of TRWKR started

■ The survey from a viewpoint and a sence of citizens'
＊Clearness ＊Transparency ＊Color ＊Bubble ＊Smell
＊Garbage ＊Living things, etc

The first Nagoya City Environmental Practice Prize, Feb.2012
Branch of contribution for Regional Environment Development Award for Excellence

Water Resource Contributor Awards
Minister of Land, infrastructure and Transportation) Aug.2016

Transmission of Raw Water from Kiso River (TRWKR)

3 years from April.22nd.2007(Stopped on March.22nd.2010)

Surveys during TRWKR period :
April.2007 ～ March.2010
Surveys after the stop of TRWKR period :
April.2010 ～ March.2012

Horikawa Sen-nin Chosatai
April.2007 ～ March.2012

- ■ Fixed Point Observation Groups
  Surveying effects of TRWKR
- ■ Free Survey Groups Researching
  Horikawa River by free themes
- ■ Horikawa Support Groups Supporting
  clarification of Horikawa

The survey from a viewpoint and sense of citizens

Results of pilot project (Clarification effects of TRWKR)

- ■ It was confirmed that the water quality tended to improve during TRWKR between Sanage Bridge and Matsushige Bridge.
- ■ Network of citizens who wish for clarification and restoration of Horikawa River expanded.
- ■ Citizens' awareness of cleaning of the river was developed.

■ Role of Horikawa Sen-nin Chosatai
(Conclusions of Summary Meeting for the 10th Stage)

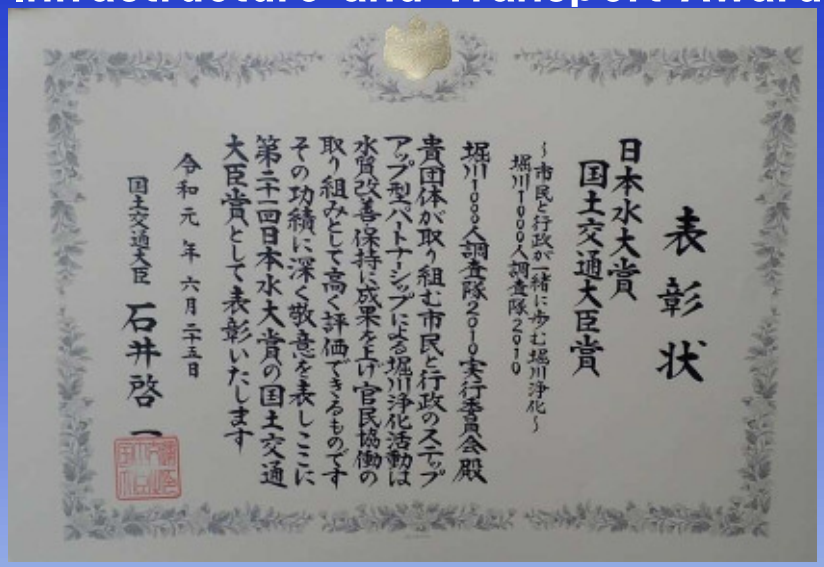
① More surveys should be implemented.

- •Continuity of investigation, clarification of the situation of the river, identification of cause of pollution in the river, are needed.
- •We improve our plan and take action against the pollution.
- •After that, citizens and public administration do what is possible to clean the river.

②There are many things that citizens can do.

- •We expand our partners who love Horikawa River and hope TRWKR again.
- •We deepen exchanges with people living in the basin of Kiso, Nagara, and Ibi River.
- •We check the effects of pollution removal from domestic wastewater and implement it in each residence.

Won the21st Japan Water Award Minister of Land, Infrastructure and Transport Award June 2019


表彰状

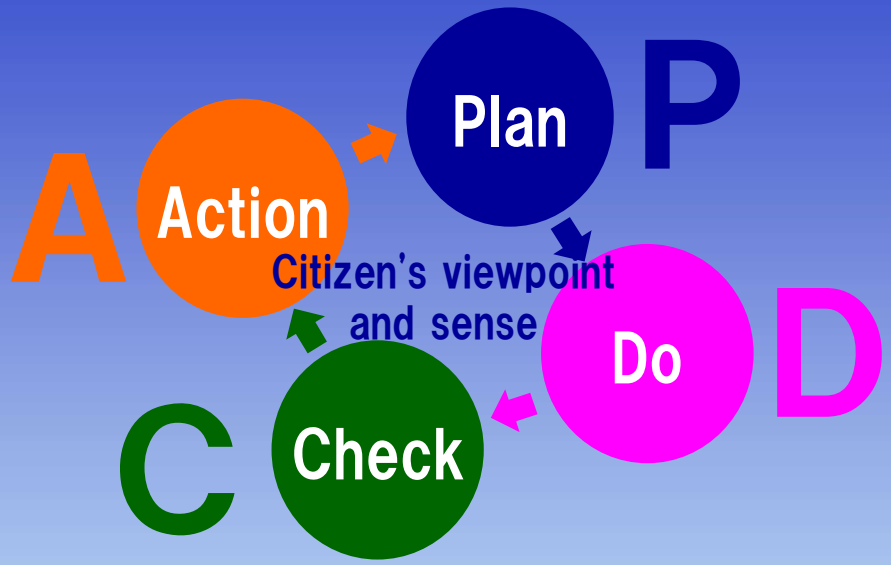
日本水大賞
国土交通大臣賞

～市民と行政が一緒に歩む堀川浄化～
堀川1000人調査隊2010

堀川1000人調査隊2010実行委員会殿
貴団体が取り組む市民と行政のステップアップ型パートナーシップによる堀川浄化活動は水質改善保持に成果を上げ官民協働の取り組みとして高く評価できるものです
その功績に深く敬意を表しここに第二十四回日本水大賞の国土交通大臣賞として表彰いたします

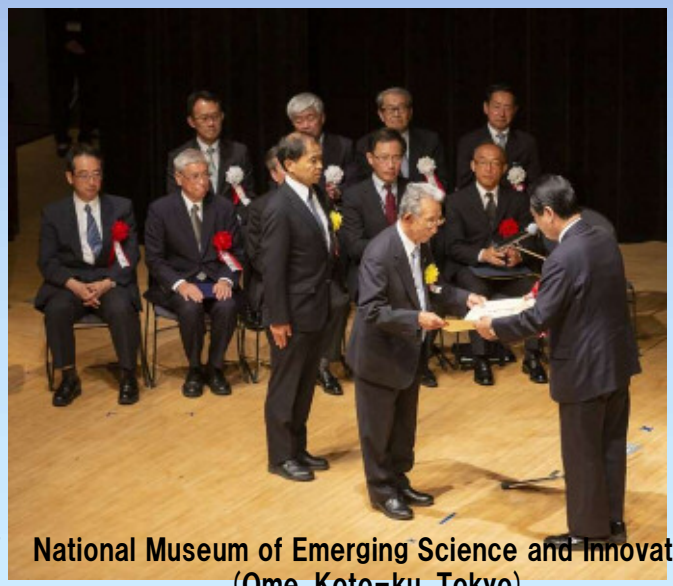
令和元年六月二十五日
国土交通大臣 石井啓一

Public-private academic collaboration step-up partnership



Horikawa Sen-nin Chosatai Executive Committee visited Mayor Kawamura to report getting a prize on the Japan Water Award and Minister of Land, Infrastructure, Transport and Tourism award.

On June 25, 2019, the award ceremony for the 21st Japan Water Awards was held in the presence of Crown Prince Akishino. Horikawa Sen-nin Chosatai Executive Committee received the Minister of Land, Infrastructure, Transport and Tourism Award.



National Museum of Emerging Science and Innovation (Ome, Koto-ku, Tokyo)

Water Environment of Horikawa River

Area of basin: 51.9km^2
Length: 16.2km

Change in temperature, precipitation and hours of sunshine

Kiso River is our water source.

Cause of breeding of phytoplankton, nitrogen and Phosphorus are included in wastewater from houses, factories and stores.

The primary cause of water pollution is wastewater from houses, factories, and stores.

Wastewater is discharged after treatment in wastewater treatment plant.

After heavy rain, wastewater is discharged without treatment.

Shonai River
Privisional raw water transmission: 0.3m3/s

Wastewater Treatment Plant

Sanage Bridge

Motoiri Sluiceway

Tide Gate

▼High Tide

Horikawa River

Difference of water level is more than 2m between high tide and ebb tide.

▼Ebb Tide

Water level, direction of current and velocity are changed, by tide.

Shimizu wakuwaku-sui

Nagoya Port

Rising

Groundwater, etc

Ise Bay

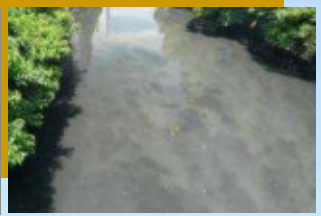
It has looked like red tide or blue tide.
In Nagoya Port and downstream of Horikawa, it is said that phytoplankton does over breeding and extinction, so water basin is polluted

Sludge rises and floats.


Red Tide


Blue Tide


Floating Sludge


Raised Sludge

2. Number of Participants of Horikawa Sen-nin Chosatai

(Horikawa Sen-nin Chosatai started accepting participation on 26th Mar.2007)

Network of citizens who wish for clarification and restoration of Horikawa River is growing.

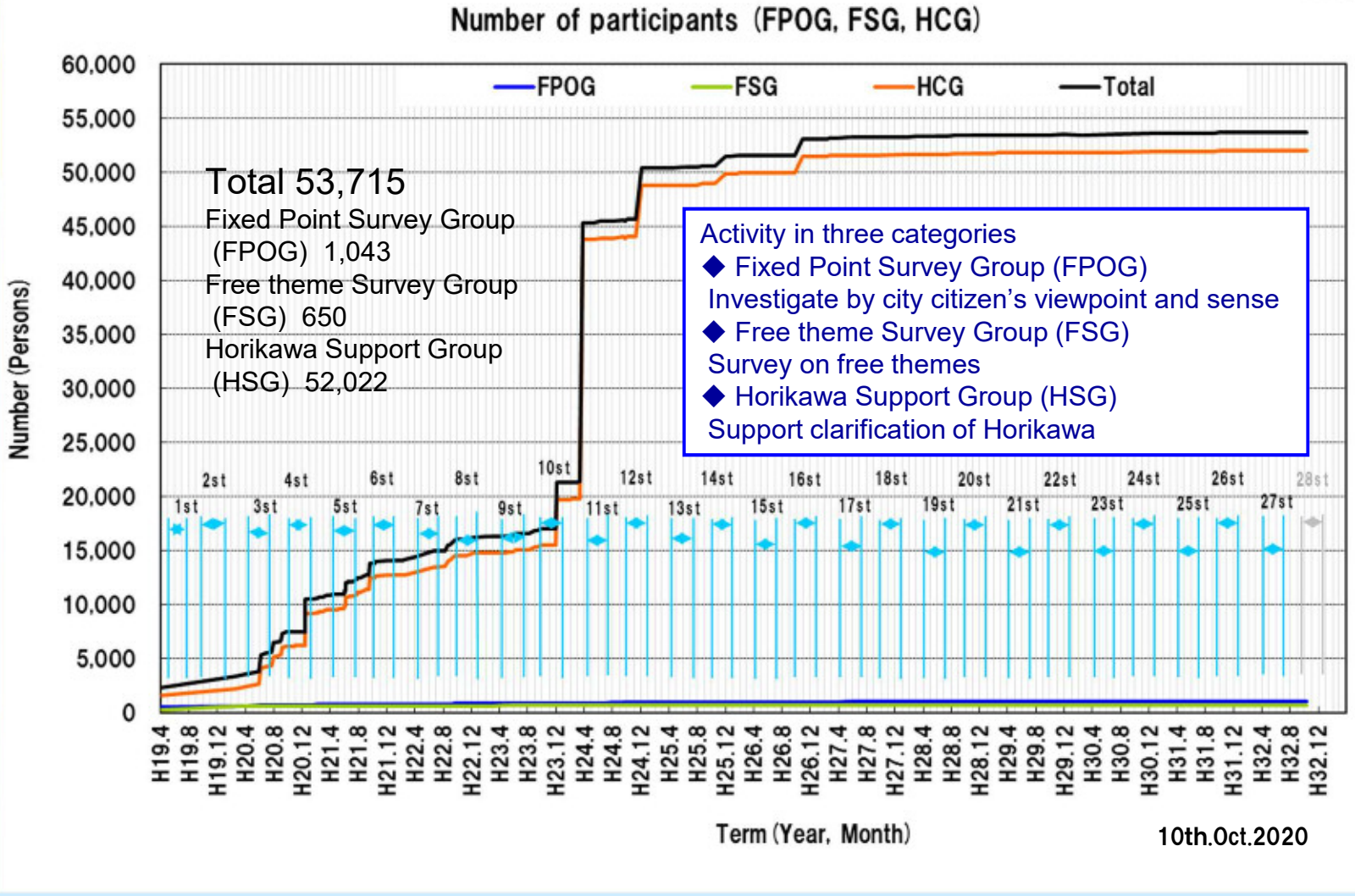
More than 50 thousand citizens' network

Horikawa, the Mother River of Nagoya, was polluted in rapid economic growth.
The citizens have rised to get the past back.

	Start 22nd Apr.2007	Now 10th Oct.2020
Fixed Point Observation Groups	55 groups 497 persons	107 groups 1,043persons
Free Survey Groups	22 groups 234 persons	40 groups 650 persons
Horikawa Support Groups	88 groups 1,531 persons	2,605 groups 52,022persons
Total	165 groups 2,262 persons	2,752 groups 53,715persons

Number of Participants

Horikawa Sen-nin Chosatai was established to clean *Horikawa* River and to check the effective of experiment for it by city citizen's viewpoint.
This activities are not only to surveys, but also spread to the clarification, cleanup, enlightenment activities and exchanges between regions.



3. Survey Periods and Number of Reports

Content		Fiscal year	Survey Period			Reports	Horikawa River	Shin-Horikawa River
Horikawa River Purification Social Experiment	With TRWKR 0.4 m^3/s	2007	1st stage	Spring - Early summer	4/22 - 6/30	258	258	-
				Interval	7/1 - 9/7	134	134	-
			2nd stage	Autumn - Early winter	9/8 - 12/16	383	383	-
				Interval	12/17 - 3/31	103	103	-
		2008	3rd stage	Spring - Early summer	4/1 - 6/30	245	245	-
				Interval	7/1 - 9/27	64	64	-
			4th stage	Autumn - Early winter	9/28 - 12/16	152	152	-
				Interval	12/17 - 3/31	100	100	-
		2009	5th stage	Spring - Early summer	4/1 - 6/30	145	145	-
				Interval	7/1 - 9/26	54	54	-
			6th stage	Autumn - Early winter	9/27 - 12/16	120	120	-
				Interval	12/17 - 3/31	81	81	-
		2010	7th stage	Spring - Early summer	4/1 - 6/30	111	111	-
				Interval	7/1 - 9/11	44	44	-
			8th stage	Autumn - Early winter	9/12 - 12/17	104	104	-
				Interval	12/18 - 3/31	72	72	-
		2011	9th stage	Spring - Early summer	4/1 - 6/30	112	112	-
				Interval	7/1 - 9/10	42	42	-
			10th stage	Autumn - Early winter	9/11 - 12/16	133	133	-
				Interval	12/17 - 3/31	77	77	-
Public-private academic collaboration step-up partnership		2012	11th stage	Spring - Early summer	4/1 - 6/30	148	148	-
				Interval	7/1 - 9/21	60	59	1
			12th stage	Autumn - Early winter	9/22 - 12/16	139	135	4
				Interval	12/17 - 3/31	92	78	14
		2013	13th stage	Spring - Early summer	4/1 - 6/30	145	129	16
				Interval	7/1 - 9/28	70	55	15
			14th stage	Autumn - Early winter	9/29 - 12/17	113	99	14
				Interval	12/18 - 3/31	79	68	11
		2014	15th stage	Spring - Early summer	4/1 - 6/30	133	117	16
				Interval	7/1 - 9/28	91	78	13
			16th stage	Autumn - Early winter	9/29 - 12/16	99	90	9
				Interval	12/17 - 3/31	107	89	18
		2015	17th stage	Spring - Early summer	4/1 - 6/30	113	100	13
				Interval	7/1 - 9/19	81	69	12
			18th stage	Autumn - Early winter	9/20 - 12/16	126	109	17
				Interval	12/17 - 3/31	91	79	12
		2016	19th stage	Spring - Early summer	4/1 - 6/30	127	116	11
				Interval	7/1 - 9/19	62	54	8
			20th stage	Autumn - Early winter	9/20 - 12/16	130	107	23
				Interval	12/17 - 3/31	104	84	20

Content	Fiscal year	Survey Period			Reports	Horikawa River	Shin-Horikawa River
Public-private academic collaboration step-up partnership	2017	21st stage	Spring - Early summer	4/1 - 6/30	129	100	29
			Interval	7/1 - 9/18	58	48	10
		22nd stage	Autumn - Early winter	9/19 - 12/20	121	93	28
			Interval	12/21 - 3/31	80	67	13
	2018	23rd stage	Spring - Early summer	4/1 - 6/30	180	107	73
			Interval	7/1 - 9/19	76	44	32
		24th stage	Autumn - Early winter	9/20 - 12/16	184	106	78
			Interval	12/17 - 3/31	108	67	41
	2019	25th stage	Spring - Early summer	4/1 - 6/30	193	127	66
			Interval	7/1 - 9/19	101	43	58
		26th stage	Autumn - Early winter	9/20 - 12/16	214	105	109
			Interval		123	67	56
	2020	27th stage	Spring - Early summer	4/1 - 6/30	333	168	165
			Interval				
		28th stage	Autumn - Early winter	9/20 - 12/16 (plan)			
			Interval				
Total					6,544	5,539	1,005

Background about COVID-19

2020

1/16 It was confirmed infected person in Japan.

2/27 Prime Minister requested temporary closure of school.

4/7 A state of emergency was announced in 7 prefectures.

4/10 A state of emergency was announced in Aichi Prefectures.

4/16 A state of emergency was announced nationwide.
13 prefectures were determined under special precautions.

5/31 A state of emergency was lifted.

6/19 Self-restraint of move across prefectures was relaxed.

8/16 Prefectural emergency was announced in Aichi Pref.

8/24 Prefectural emergency was lifted.

To date, 6,544 reports have been reported. Of these, the number of reports for Shin-Horikawa River was 1,005.

In the 27th stage, there were 333 reports. Of these, 168 were reported for Horikawa River and 165 were reported for Shin-Horikawa River.

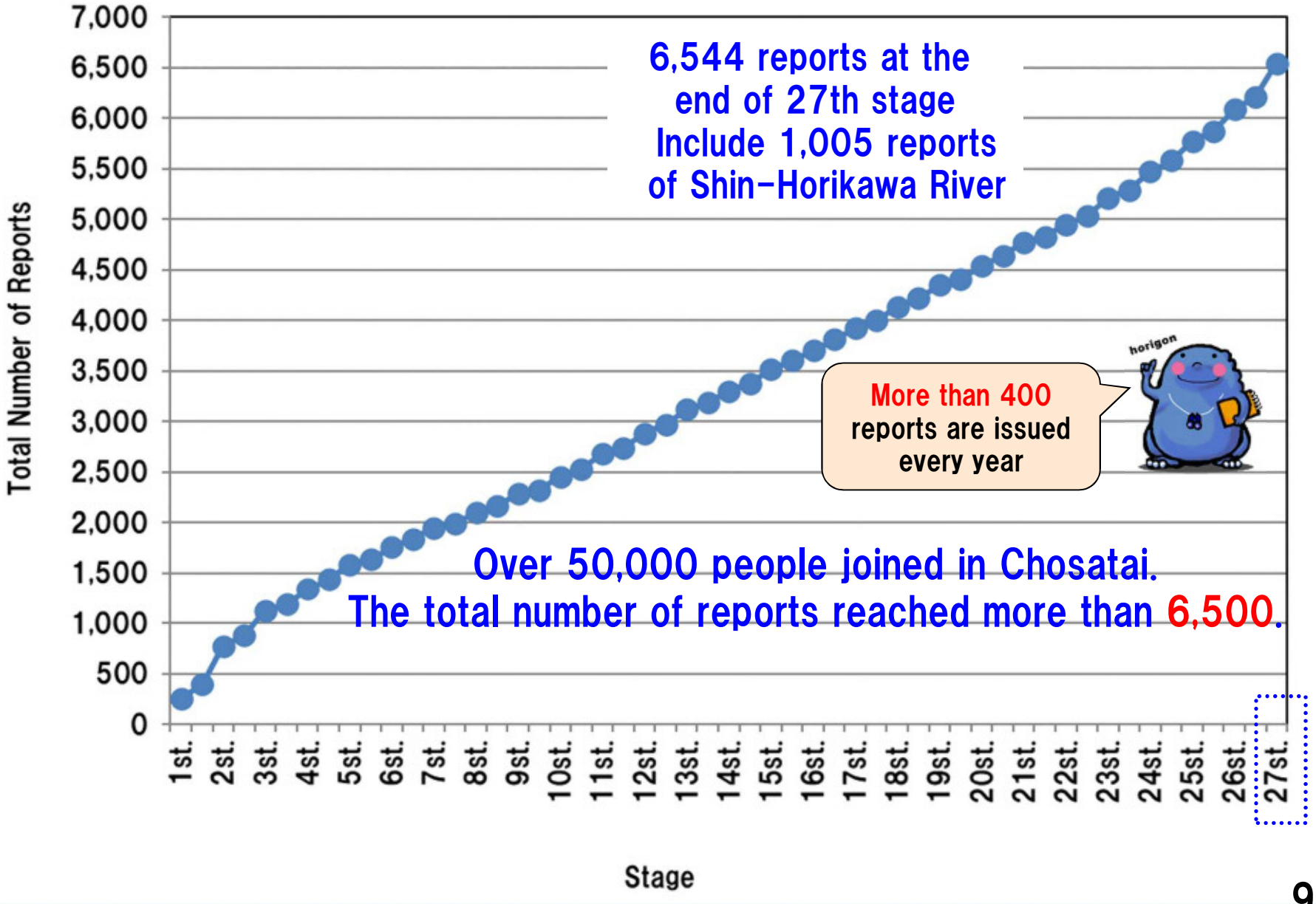
On average, more than 400 surveys are conducted every year in Horikawa River and Shin-Horikawa River.

Many citizens are continuously examining the actual water environment of Horikawa River and Shin-Horikawa River on a daily basis from the perspective and sense of the citizens.

In the 27th stage, a state of emergency was announced for prevention of spread of COVID-19.So survey groups stopped or worked avoid "3Cs"(※), their active was restricted.

※"3Cs" : Close space, crowded places, close-contact

Total Number of Reports



4. State of the weather

Overview

In the 27th stage, the temperature was high in May and June, especially the temperature in June was the highest on record since they started record in 1891. The rainfall was as same level as typical year. The rainy season started on June 10th, as same as typical year.

■temperature

The average is 19.5℃, which was a little higher than typical year (18.7℃). It was low in March and high in May and June. Especially in June it was 1.9 ℃ higher than typical year, and it was the highest on record since they started record in 1891.

■rainfall

The Average rainfall was 159mm, as same level as typical year (160.8mm). It was lower than typical year in April and May but higher in June. The rainy season started on June 10th.

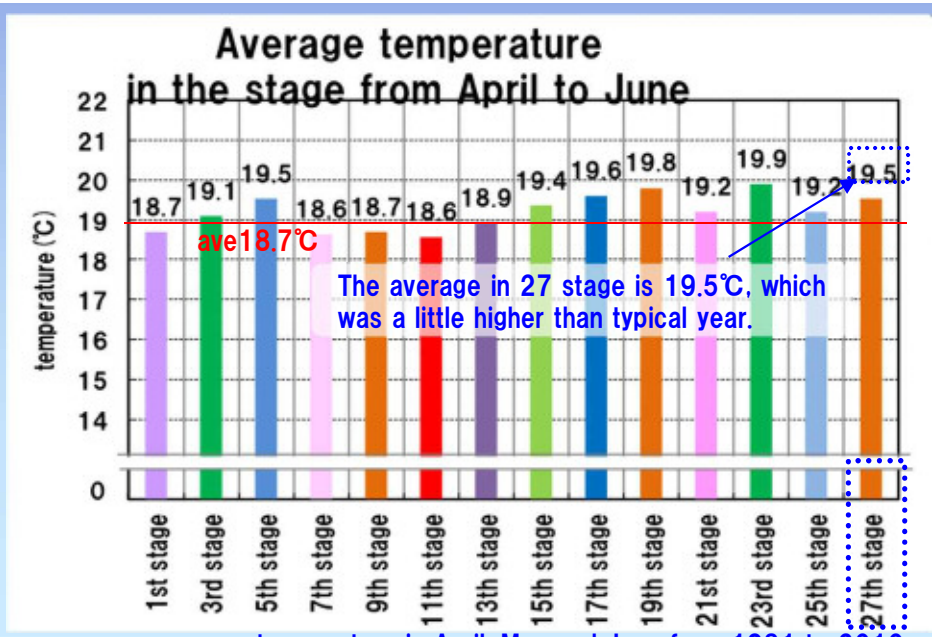
■daylight hours

The average daylight hours was 211 hours, which was about 30 hours longer than typical year (181.3 hours). It was longer than typical year in every month in the 27th stage.

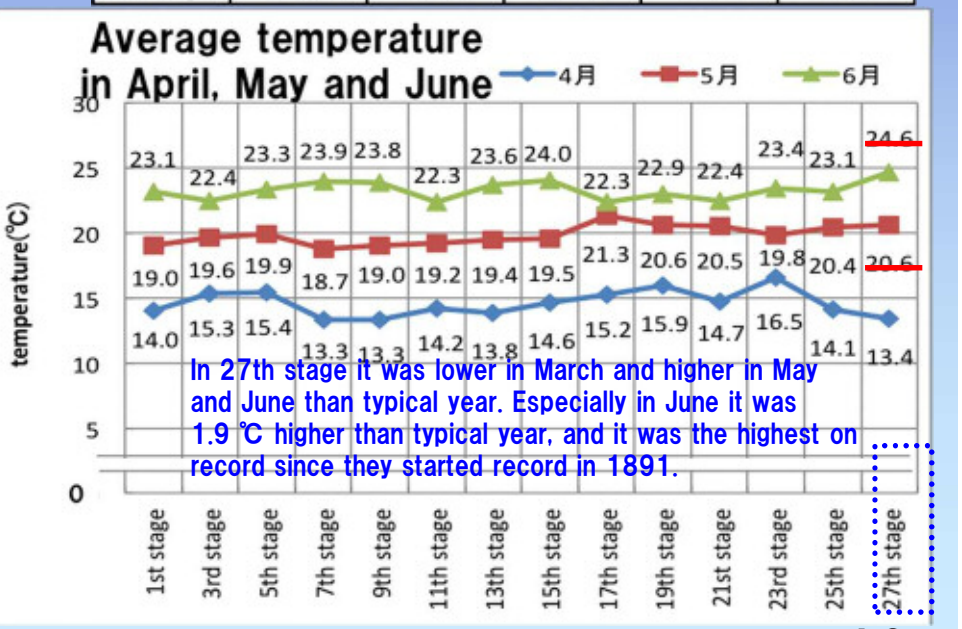
Nagoya Local Meteorological Observatory
http://www.jma.go.jp/jma/menu/report.html

value in typical year
by Nagoya Local Meteorological Observatory

category	rainfall (mm) total	temerature (℃) average	temerature (℃) highest/day	temerature (℃) lowest/day	daylight (hour) total
reord period	1981 ~2010	1981 ~2010	1981 ~2010	1981 ~2010	1981 ~2010
record years	30	30	30	30	30
year	1535	15.8	20.7	11.9	2092
April	124.8	14.4	19.9	9.6	196.6
May	156.5	18.9	24.1	14.5	197.5
Jun	201.0	22.7	27.2	19.0	149.9
average	160.8	18.7	23.7	14.4	181.3
September	234.4	24.1	28.6	20.7	151.0
October	128.3	18.1	22.8	14.1	169.0
November	79.7	12.2	17.0	8.1	162.7
December	45.0	7.0	11.6	3.1	172.2
average	121.9	15.4	20.0	11.5	163.7

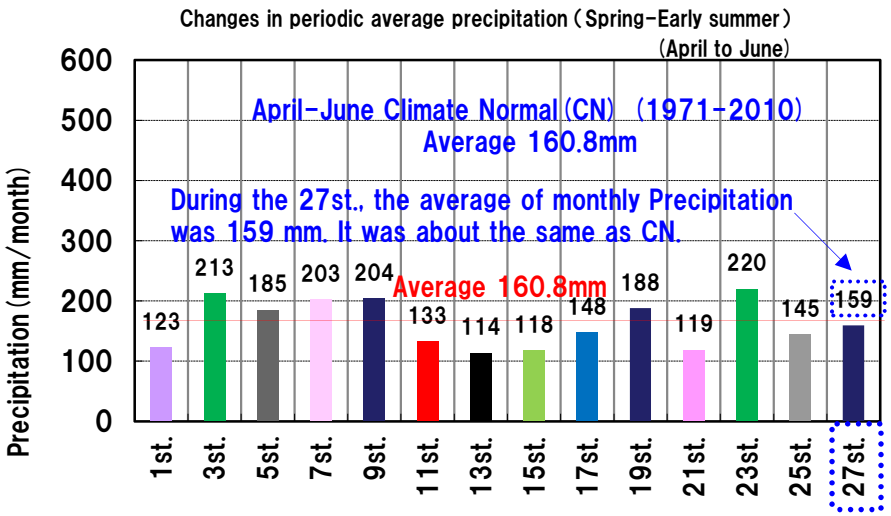


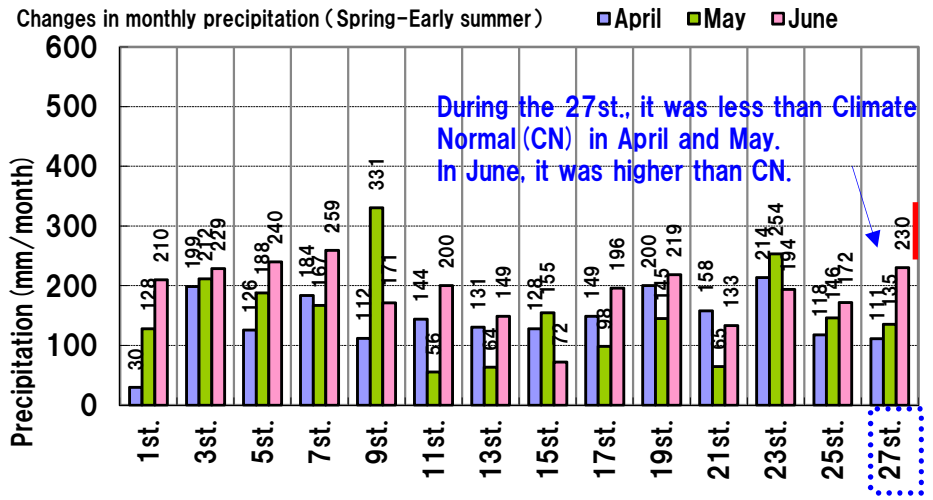
average temperature in April, May and June from 1981 to 2010
average 18.7℃



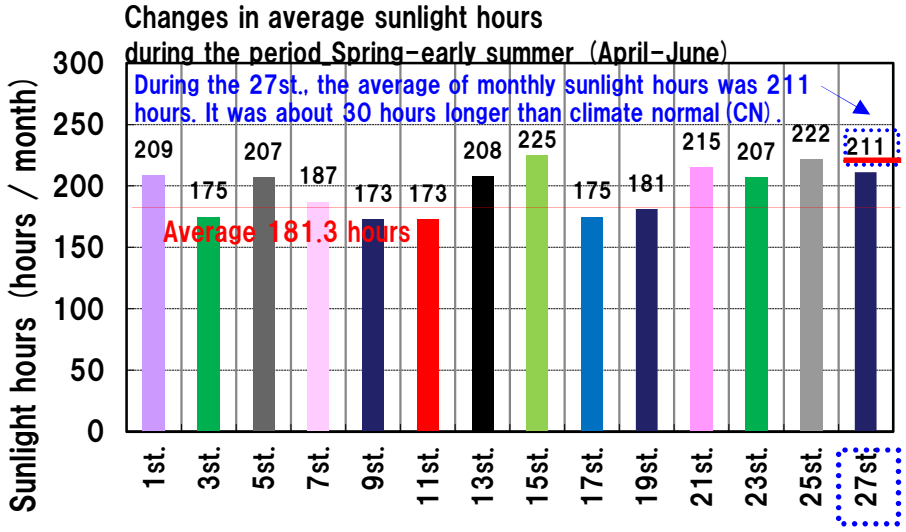
Weather conditions

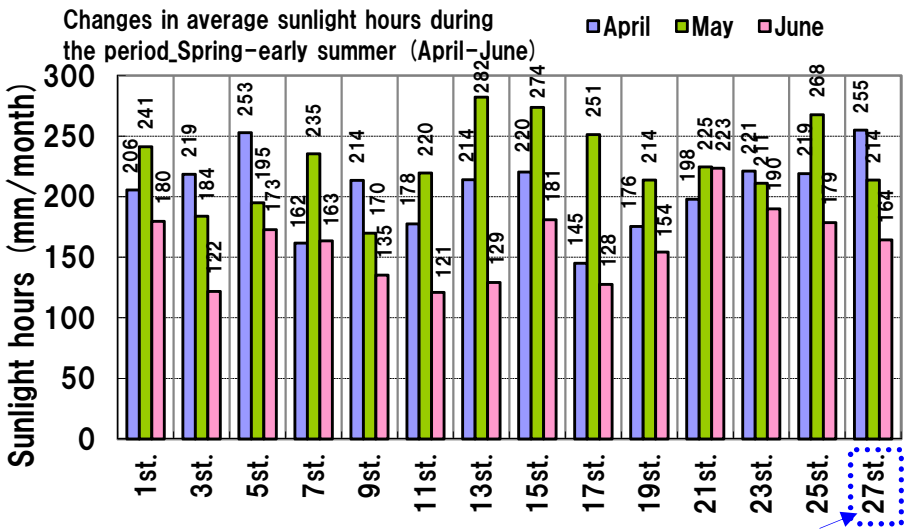
Meteorological Agency _ Meteorological Statistics, Nagoya Local Meteorological Observatory
http://www.jma.go.jp/jma/menu/report.html





Precipitation



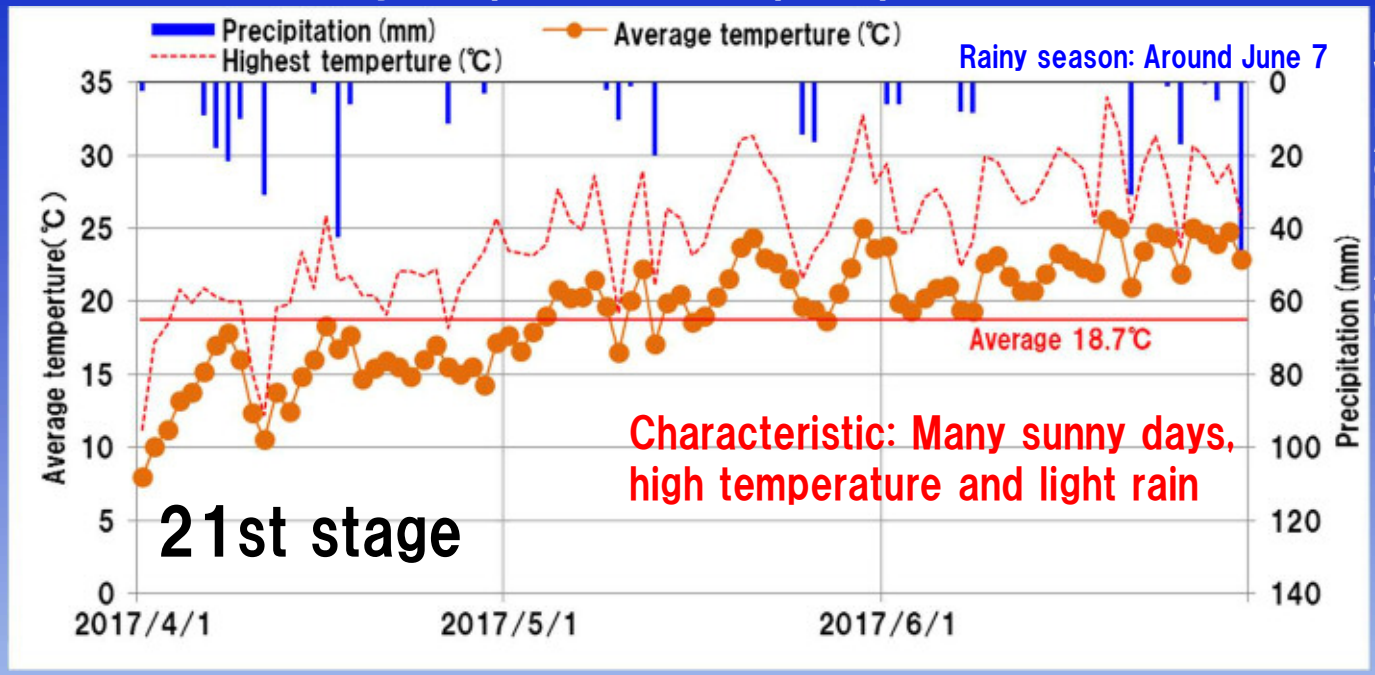


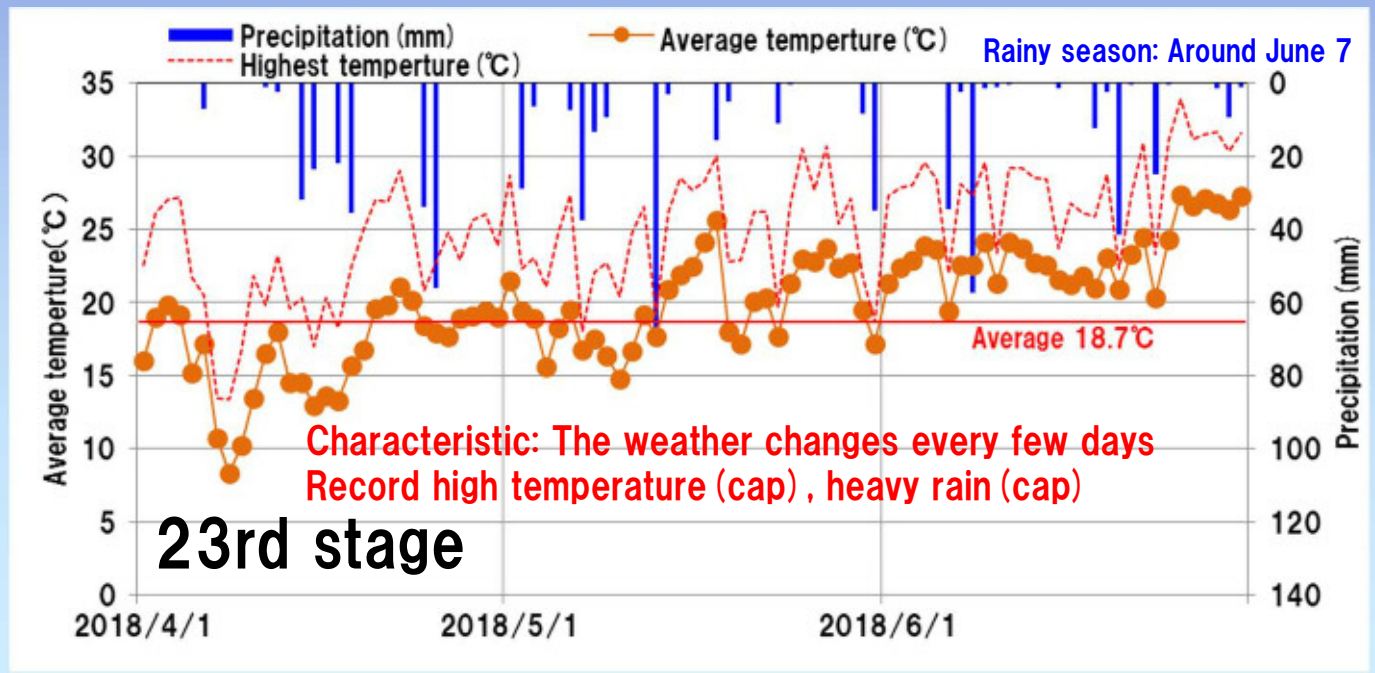
April-June climate normal (CN) (1971-2010)
Average 181.3 hours

Sunlight hours

During the 27st., it was longer than Climate Normal (CN) in all months of April, May and June. It was 58 hours longer than CN especially in April.

(Reference) Daily temperature and precipitation





Note) Arrangement of the characteristic of weather in the target period

■ Average temperature (℃)
Average temperature-Climate Normal (CN)
Over 0.5 ° C → high temperature
Under -0.5 ° C → low temperature

■ Average precipitation (mm / month)
Average precipitation-Climate Normal (CN)
Over 20 mm / day → heavy rain
Under -20 mm / day → light rain

5. Main Water Quality Improvement Measures

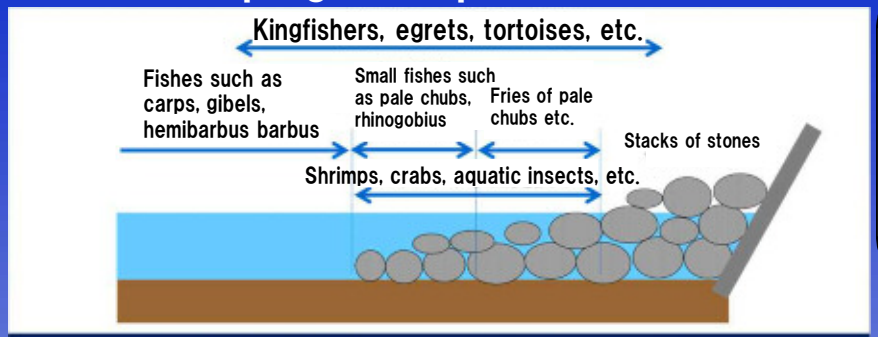
Measures	2007	2008	2009	2010	2011	2012	2013	2014
	1st. 2st.	3st. 4st.	5st. 6st.	7st. 8st.	9st. 10st.	11st. 12st.	13st. 14st.	15st. 16st.
TRWKR (0.4m³/s)	New Water Quality Improvement Measures							
Making shallow and deep (Improvement of self-purification function and water enviroment)				Kurokawa No.1 Bridge～Meoto Bridge		downstream Kurokawa No.2 Bridge	upstream Kurokawa No.2 Bridge	
Increase of Raw Water transmission from Shounai River (+0.4m³/s)	*provisional raw water transmission from Shonai River 2001.Jul～ Max0.3m³/s							
New water resource (from shallow ground water) (0.0805m³/s)	upstream Tsujie Bridge 0.01m³/s (2004) upstream Kizune Bridge 0.01m³/s (2005) Shimizu wakuwaku water 0.0005m³/s (2008)						upstream Seko Bridge 0.01m³/s	upstream Sanage Bridge 0.01m³/s
Experiment of sand covering for water purification Habashita Bridge～Sakura Bridge (water's edge along both banks)								Gojo Bridge～Naka Bridge
Remove bad smell at Shin-Horikawa River (dredging,sand cover)								
Reclaimed wastewater at the Moriyama Water Treatment Center (0.046m³/s)								
Advanced water treatment at the Meijo Water Treatment Center								
Rain-water Reservoir for pollution control					Horikawa Ugan			
Facility for advanced primary treatment								

Measures	2015	2016	2017	2018	2019	2020
	17st. 18st.	19st. 20st.	21st. 22st.	23st. 24st.	25st. 26st.	27st. 28st.
TRWKR (0.4m³/s)	New Water Quality Improvement Measures					
Making shallow and deep (Improvement of self-purification function and water enviroment)	downstream Rurikou Bridge	downstream Meoto Bridge	upstream Shinbori Bridge	upstream Kizune Bridge		
Increase of Raw Water transmission from Shounai River (+0.4m³/s)			(donated by Johoku Lions Club)			
New water resource (from shallow ground water) (0.0805m³/s)	upstream Shiga Bridge 0.01m³/s	upstream Nakatsuchido Bridge 0.01m³/s	upstream Kinjo Bridge 0.01m³/s			upstream Kurokawa No.1 Bridge 0.01m³/s
Experiment of sand covering for water purification Habashita Bridge～Sakura Bridge (water's edge along both banks)	Gojo Bridge～Naka Bridge		Habashita Bridge～Gojo Bridge	Naka bridge～Sakura Bridge		
Remove bad smell at Shin-Horikawa River (dredging,sand cover)			downstream area	upstream area		
Reclaimed wastewater at the Moriyama Water Treatment Center (0.046m³/s)						
Advanced water treatment at the Meijo Water Treatment Center						
Rain-water Reservoir for pollution control					Horikawa Sagan	
Facility for advanced primary treatment					Meijo Water Treatment Center	Horidome Water Treatment Center

※Advanced water treatment at the Tsuyuhashi Water Treatment Center

Last year 9th well was dug at upstream of Kurokawa No.1 Bridge for using shallow grand water to Horikawa River (0.01m³/s). Horikawa Sagan Rain-water Reservoir for pollution control and Facility for advanced primary treatment at Meijo Water Treatment Center was put into service for improvement of combined sewer system.

Shaping of Rapids and Pool



Rise of self-purification by food chain

Dirt of water (organic substance, nitrogen, phosphorus)

↓

Algaes and microbes stick on stones with the dirt as nutrition.

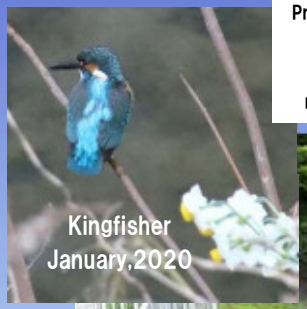
↓

Small fishes, shrimps, aquatic insects feed the algaes and the microbes.

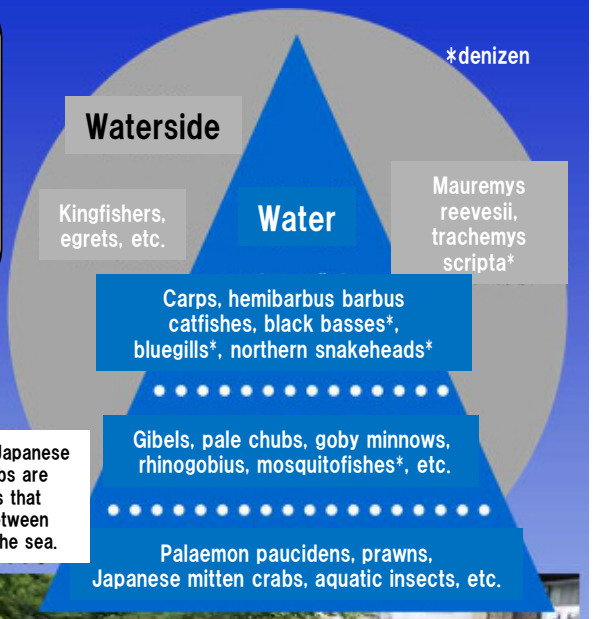
↓

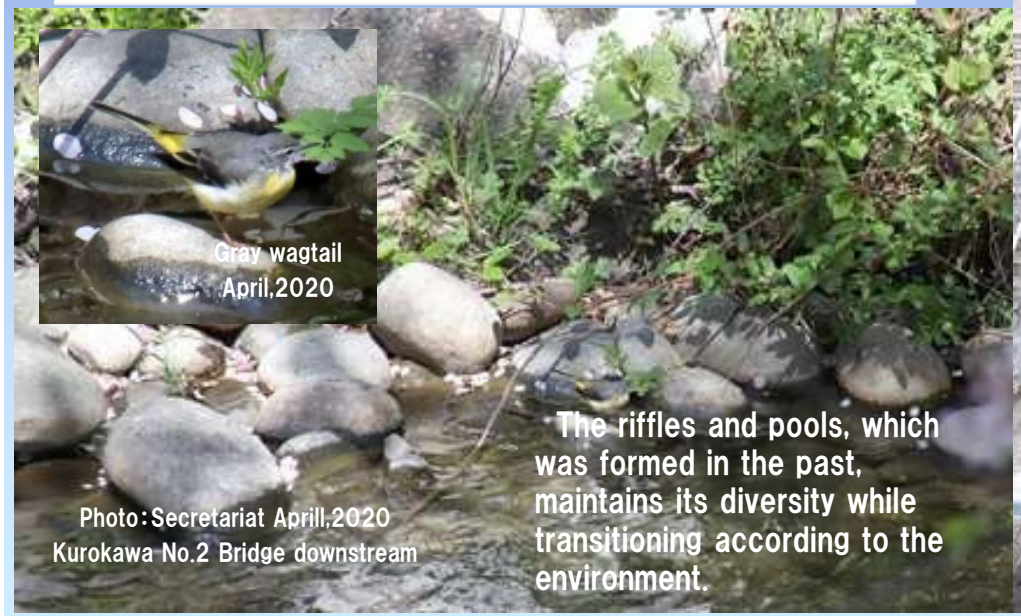
Big fishes and birds prey the small fishes and aquatic insects.

It was identified that various organisms breed and grow when rapids and pools were shaped. This place has been a habitat of organisms that like cobble stones.
In winter, some ducks are waiting for spring here.



Prawns and Japanese mitten crabs are organisms that migrate between rivers and the sea.





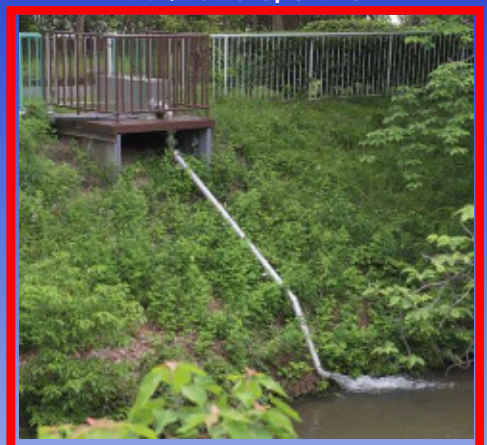
The components of dirt in water are taken up by living things in the food chain and consumed for growth and reproduction.
<u>As the riffles and pools is formed and a diverse and affluent ecosystem is built, more dirt components are consumed in a chain and removed from the water, cleaning the water.</u>
The purifying effect of the river will increase.(=Increased self-cleaning effect)

Photo:Secretariat May,2020
Meoto Bridge downstream

Coverd sand construction
Btwn.SakuraBrdg. and HabashitaBrdg.
Jan.-Feb.2015,Dec.2017-Jan.2018

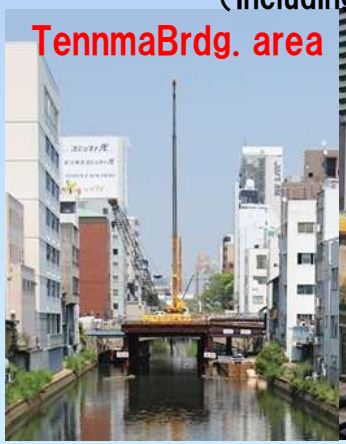
Measure against foul odors in the Shin-Horikawa river
(Sludge dredged・Coverd sand)
Section:Downstream
Period:Nov.2017—May.2018

Secured water source
(Use of shallow ground water)
Upstream well in Kurokawa No.1 Brdg.
Mar.2020 operation



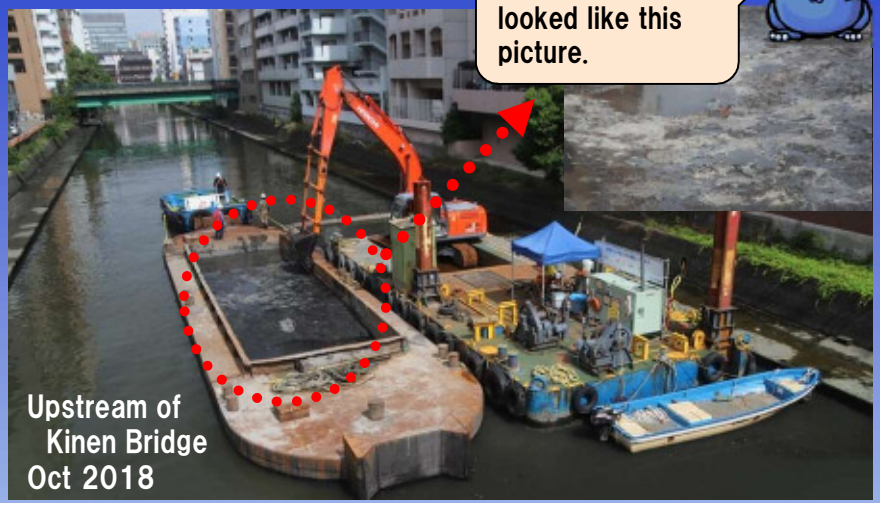
State of middle stream moving on seawall construction
(Including sludge dredged)

Photo：secretariat May.2020



Countermeasures against bad odor of Shin-Hori River : Sludge Dredging

Section : Tateishi Bridge - Upstream End
Period : Sep 2018 - Feb 2019



Newly launched facilities after the stop of TRWKR

■Securement of Additional Water Resource

Utilization of Reclaimed wastewater
Conducting reclaimed wastewater treated by membrane filtration at the Moriyama Water Treatment Center (up to 4000m3/day) is discharged

Start to conduct in Aug. 2011

Reclaimed wastewater is conducted during irrigation season (Apr - Oct)

Summary of the HSC's survey : 18th meeting

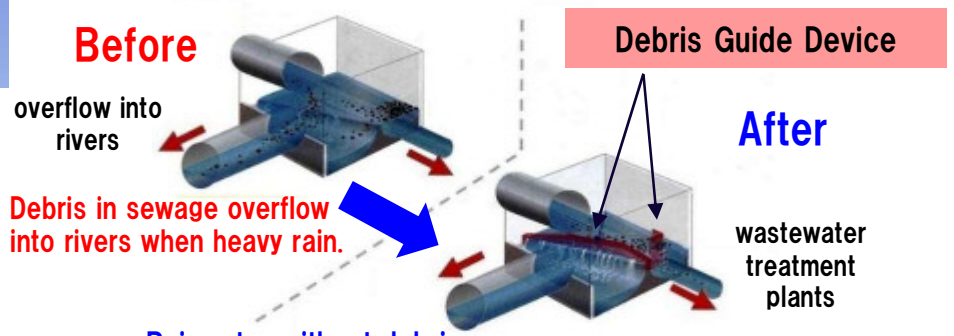
Installed Devices after TRWKR

■Improvement of Treatedwater Quality

Meijo Wastewater Treatment Plant installed filtration devices and improved quality of treated water.

Meijo Wastewater Treatment Plant
- Installed Device : Mechanical Filter
- Operated since : May 2010

■Preventing the outflow of debris into rivers



■Installation of Narrower Slit Screens

- Shirotoribashi Punp Station
- Nakajima Pump Station
- Chitose Wastewater Treatment Plant

◆Interval of Slits
40mm → 25mm

Facilities which started operation after the stop of TRWKR

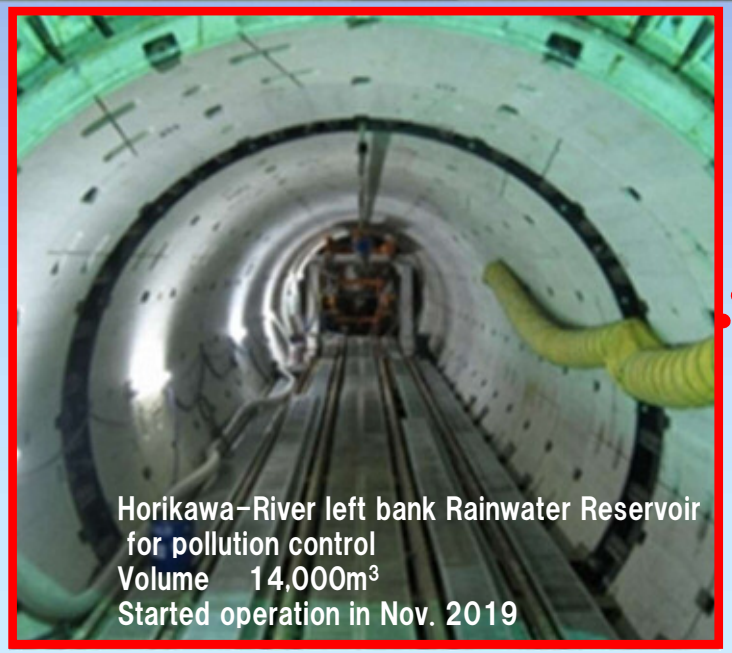
■Control of combined sewer overflow

Reduce volume and frequency of overflow from sewer outlets in rainy weather condition by temporarily store first flush of which pollution load is high

Horikawa-River right bank Rainwater Reservoir for pollution control

Volume 13,000m³

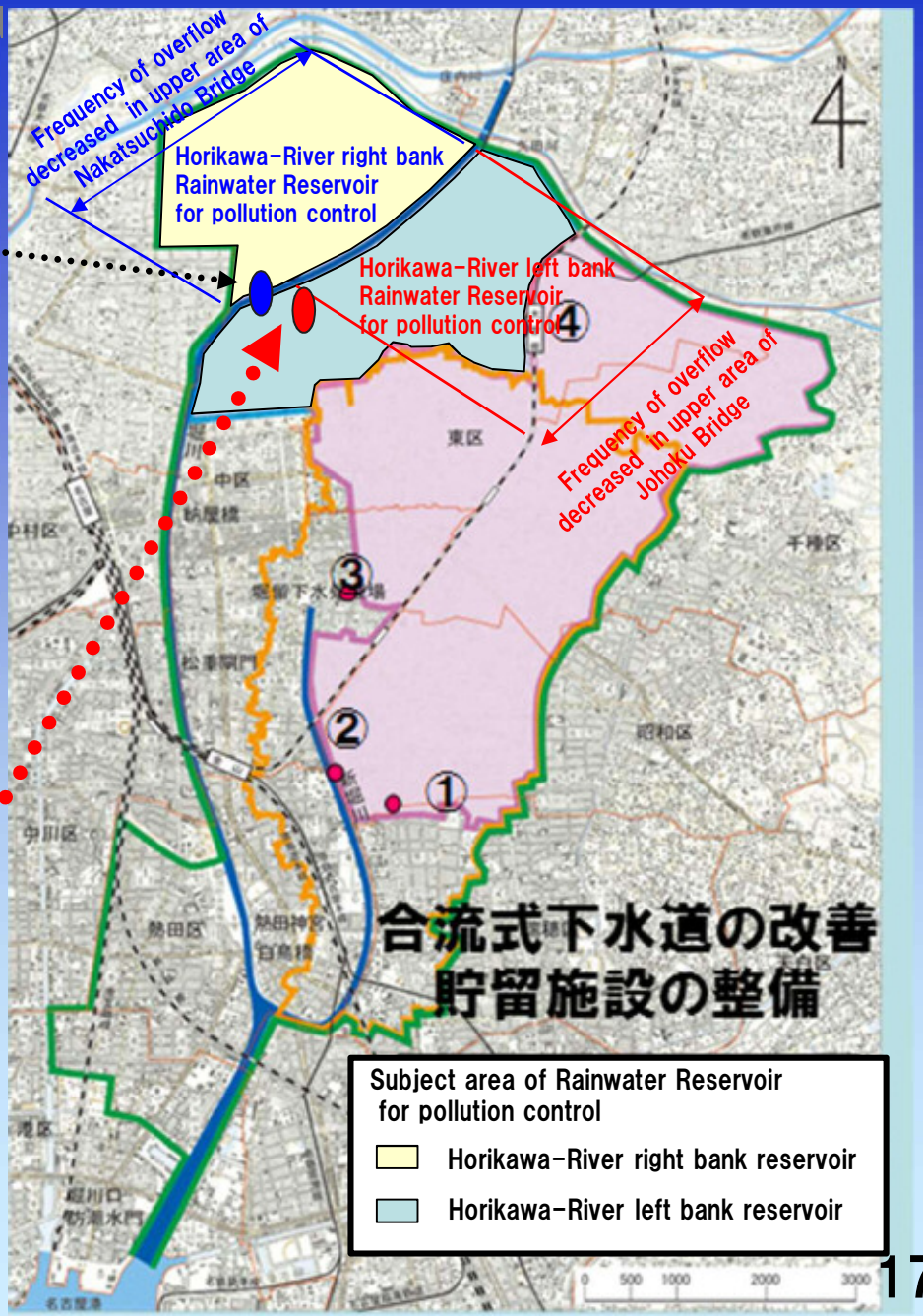
Started operation in Sep. 2010



Horikawa-River left bank Rainwater Reservoir for pollution control

Volume 14,000m³

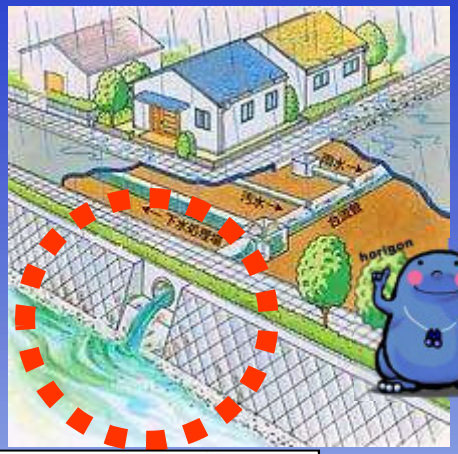
Started operation in Nov. 2019



Advanced Facility for simple treatment in Horidome Water Treatment Center

Started in Mar. 2019

Combined Sewer System in rainy day



Less than certain amount of rainwater is treated with wastewater in water treatment center, but more amount is directly discharged into the river.

Rain-water Reservoir for pollution control is the facility temporally storing the initial rainwater (="first flush" which is particularly dirty).
Accumulated rainwater in the reservoir is delivered to the water treatment center for treatment after rain stops.

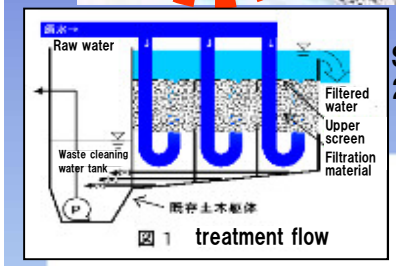
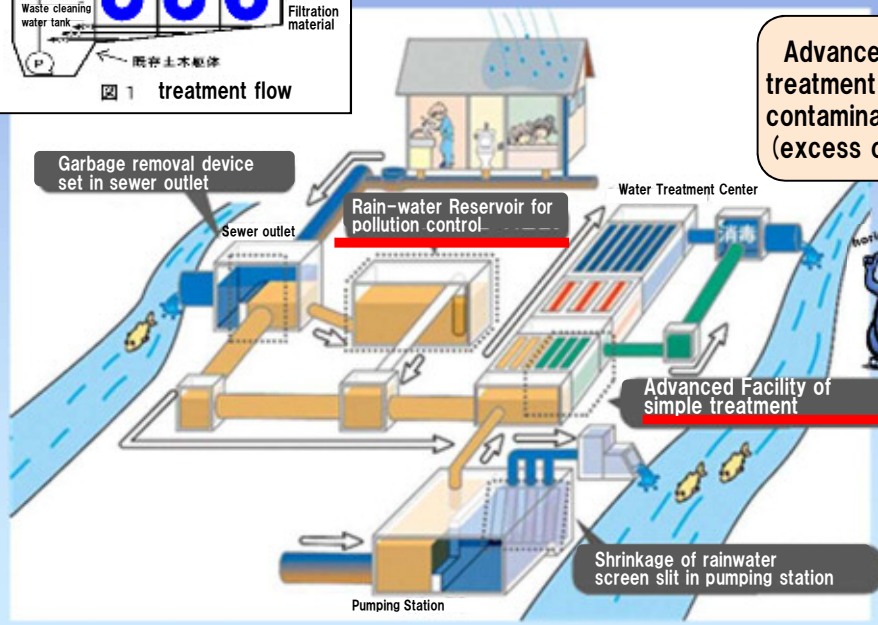


図 1 treatment flow

Source:
25th HSC Conference
(Report by Nagoya City)



Advanced Facility of simple treatment * can remove more contaminants from rainwater (excess of normal treatment).

*By replacing sedimentation tank to filtration facility, water quality improves substantially compared with conventional simple treatment.

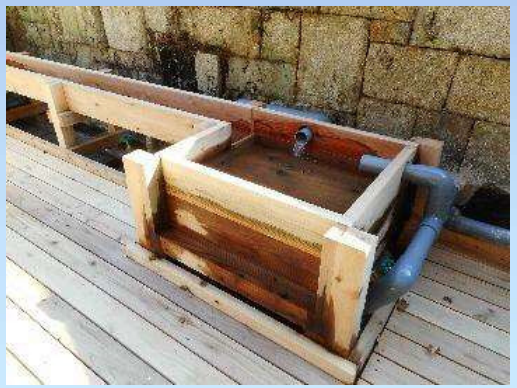
(Source) Website of Nagoya City Waterworks and Sewerage Bureau
https://www.water.city.nagoya.jp/category/mizukankyoukoujou/2096.html

Examination of using ground water for Shin-Horikawa River

- Summarize information of groundwater capable to use for Shin-Horikawa
- Review model cases of using ground water for river clarification

(reference) Well Water of Tsuruma Library

There are many water springs in basement floor of Tsuruma Library. One of springs is abundant (more than 100 litters/min. (fluctuated)) and water quality is good.



(Source) Website of Nagoya City Environment Bureau
http://www.city.nagoya.jp/kankyo/page/0000089008.html

5. 26th stage survey report

～Column～ For the clean-up and regeneration of Horikawa River

Horikawa Sen-nin Chosatai (HSC) was established on April 22nd, 2007 for clean-up and regeneration of Horikawa River, as a place for citizens' activities (Fixed Point Observation Group, Free Survey Group and Support group).
Fixed Point Observation Group examines Horikawa River to confirm the clean-up effect by the water quality improvement measure and to make clear the condition of water quality and cause of pollution, from a viewpoint and a sense of citizen.
Free Survey Group studies Horikawa River from various view points.
Support Group supports clean-up and regeneration of Horikawa River in various-free ways. These three groups wish for clean-up and regeneration of Horikawa River, and work together in a large network.
Currently (as of Oct.10.2020), there are 2,752 groups and 53,715 people in HSC.
(107 groups in Fixed Point Observation Groups, 40 groups in Free Survey Group and 2,605 groups in Support Group) At the time of launch of HSC, there were 165 groups and 2,262 people.
We can see that the network of citizens who wish to purify and regenerate Horikawa-River has expanded significantly.
(Reference. Survey group registration status p.7～8)

We will explain the status of activities of Fixed Point Observation Groups. The Fixed Point Observation Groups carried out 6,544 observations. It has become clear from the surveys so far that the state of the water area changes from moment to moment due to the ebb and flow of the tide at the downstream section (tidal section) from the Sanage Bridge in Horikawa River. Since Fixed Point Observation Groups made many observations from the perspective and sense of the citizens (Observation in various places, tide conditions, and time zones), we are able to grasp the average condition of the water quality of the Horikawa, and trends in that change become clear. (Reference: 3. Survey period / number of reports of survey results_p.9-10)

-Pilot project of Horikawa River clean-up "from Apr. 2007 to Mar. 2012 confirmed the effect of TRWKR"-

In 5 years pilot project of Horikawa River clean-up, it was confirmed that the range of improved water quality due to TRWKR "0.4㎥/sec" was about between Sanage Bridge and Matsushige Bridge. And in this period, it was confirmed that the amount of waste "artificial waste : plastic waste" was reduced. This is probably because the public awareness has changed due to increased cleaning activities.

【Summary of 5 years pilot project】

■Confirmed the effect of clean-up between Sanage Bridge and Matsushige Bridge due to TRWKR
■The network of citizens who wish to clean and revives the Horikawa River has been expanded
■Citizens' awareness of clean-up improved as cleaning activities became active

The weather of the 27th Stage (2020: in April (Apr.) ～ June (Jun.)) ⇒ In order to prevent the spread of the new coronavirus, Aichi Prefecture issued its own "Aichi Prefecture Declaration of state of emergency" on April 10, and then the national government declared official "state of emergency " between April 16 and May 31. The activities of the HSC team were forced to cancelled, or carried out with prevention of confined space, dense state, close contact. So its activities were limited.
In addition, we think that evaluation of this survey is not enough at this time, for example such as study of impact for decline in social and economic activities due to new coronavirus. According to further investigations, we think that it is necessary to reorganize as necessary.

(1) State of the weather (Ref: 4. Weather condition etc._p.11-16)

In the 27th stage (from April to June), the temperature was high in May and especially June, the highest temperature since the start of statistics in 1891 was recorded in June. Precipitation amount was almost usual. And rainy season was started on June 10th. It is also same as normal.

(Feature of the 27th stage weather, etc.) • The average temperature is slightly higher than normal.
• Highest temperature was recorded from start of statistics • Precipitation amount was almost usual.

(2) Implementation of new water quality improvement measures

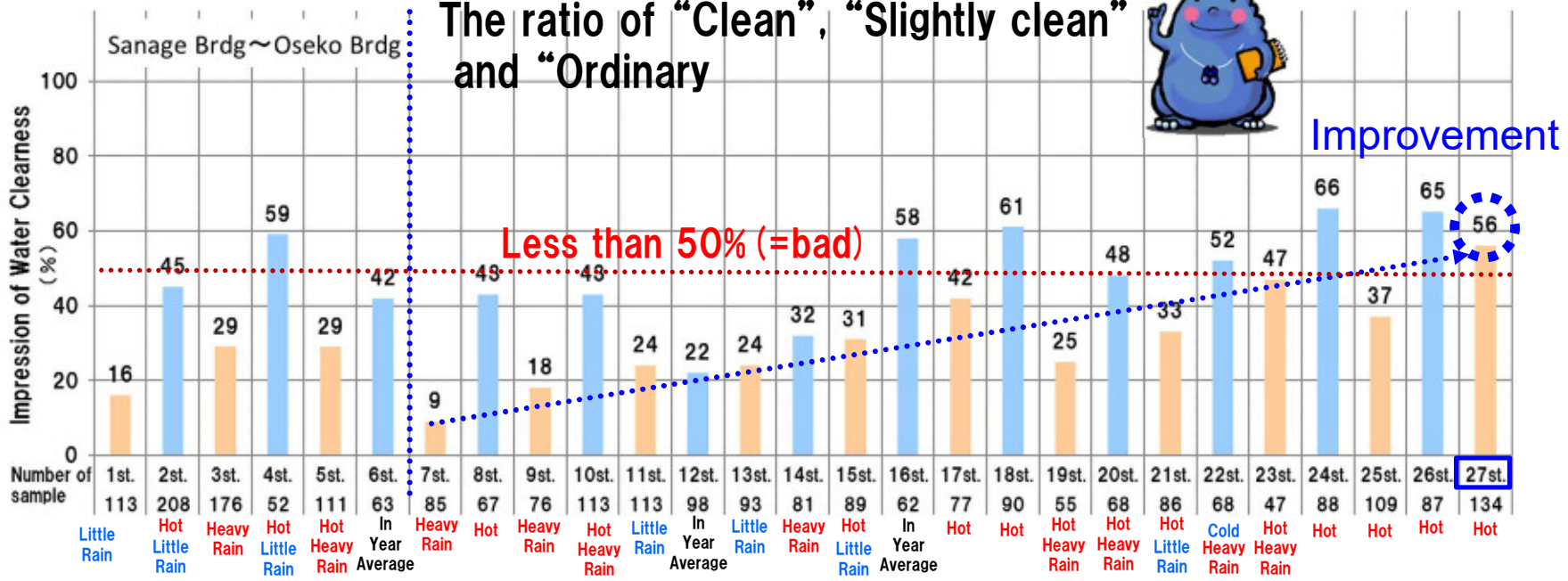
(Ref: 5. Implementation status of main water quality improvement measures_p.15-20)

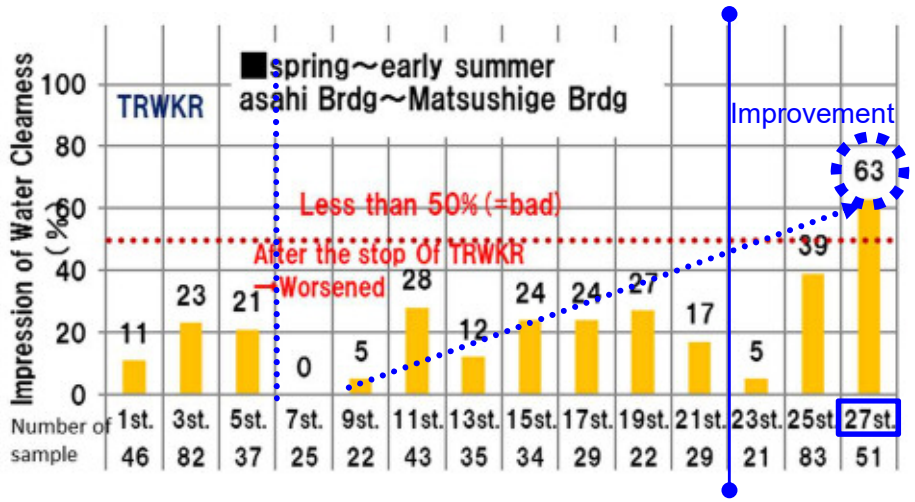
After the TRWKR was stopped "Mar. 2010", new measures were implemented to improve the water quality.
Last year (Reiwa 1, 2019), ninth well (0.01 m3 / s) was dug upstream of Kurokawa No. 1 Bridge of Horikawa River to use shallow groundwater, and water conveyance to Horikawa River started.
In addition, left side bank rainwater retention pond and the simple treatment advanced facility of the Meijo Water Treatment Center have started operation to improve the combined sewerage system.
Regarding to the Shinhorikawa River, dredging and sand covering of the river channel were carried out near the confluence in 2017 as a countermeasure against bad odors, and similarly, dredging of the river channel was carried out as countermeasure against bad odors in the upstream section in 2018.
And then, In March 2019, the Horidome Water Treatment Center started the operation of simple treatment advanced facility.

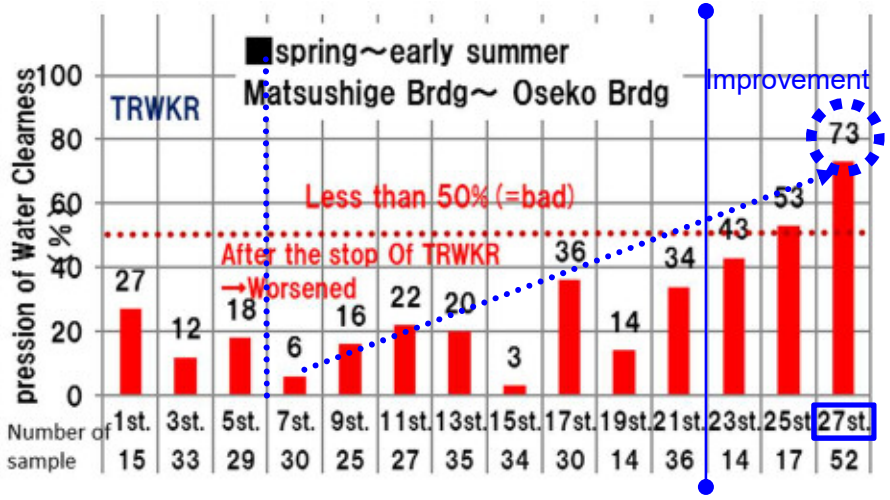
(3) Change in water quality of Horikawa River

The water quality of the Horikawa deteriorated after the suspension of TRWKR. However, there is a general gradual improvement trend from the upstream, except temporal deterioration due to weather conditions, etc.
At 27 stages, there was a marked improvement tendency especially in "impression of water stains", "smell" and "bubbles from the river bed". Regarding to improvement of "impression of water stains", between Asahi Bridge and Oseko Bridge was remarkable. Especially between Matsushige Bridge and Oseko Bridge, the ratio of "good" or "neither" was totally 73%.
Also, between Sanage Bridge and Oseko Bridge, odors and sludge odors decreased, along with the decrease of "bubbles from the riverbed" and the ratio of odorlessness increased to 84%.
As we mentioned above, in the 27th stage, some clauses checked by human senses such as "smell",were improved along with the improvement of the condition of the riverbed in the middle and lower stream of Horikawa River.
We believe that this is effect of changes in public awareness aimed at clean-up and regeneration of Horikawa River, and the implementation of new water quality improvement measures after the suspension of TRWKR.

Impression of Water Clearness

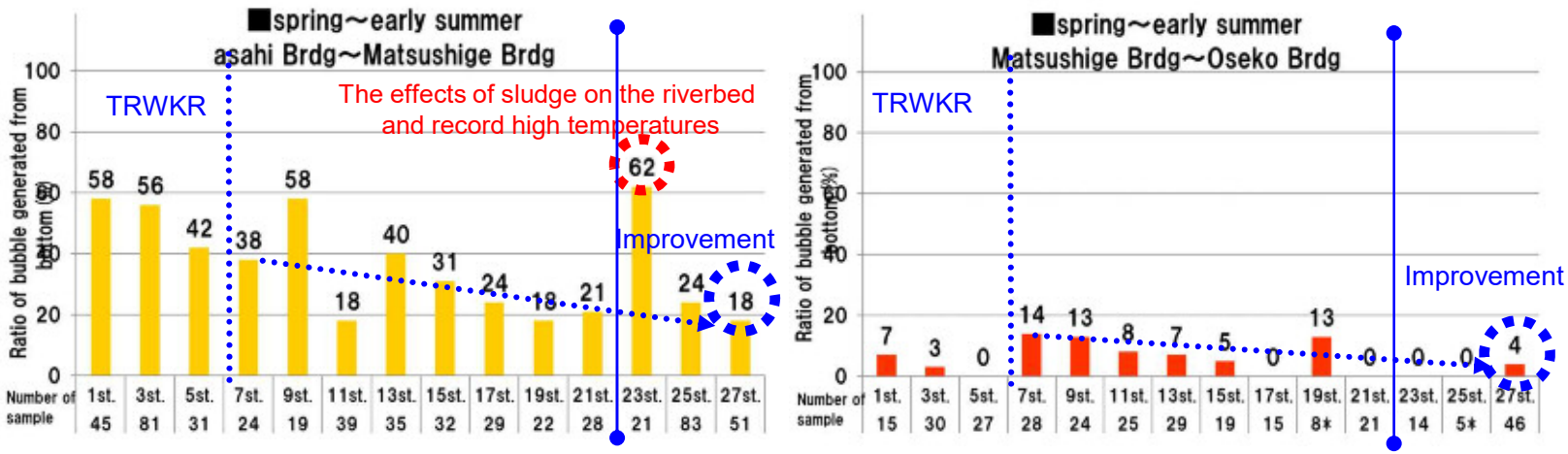




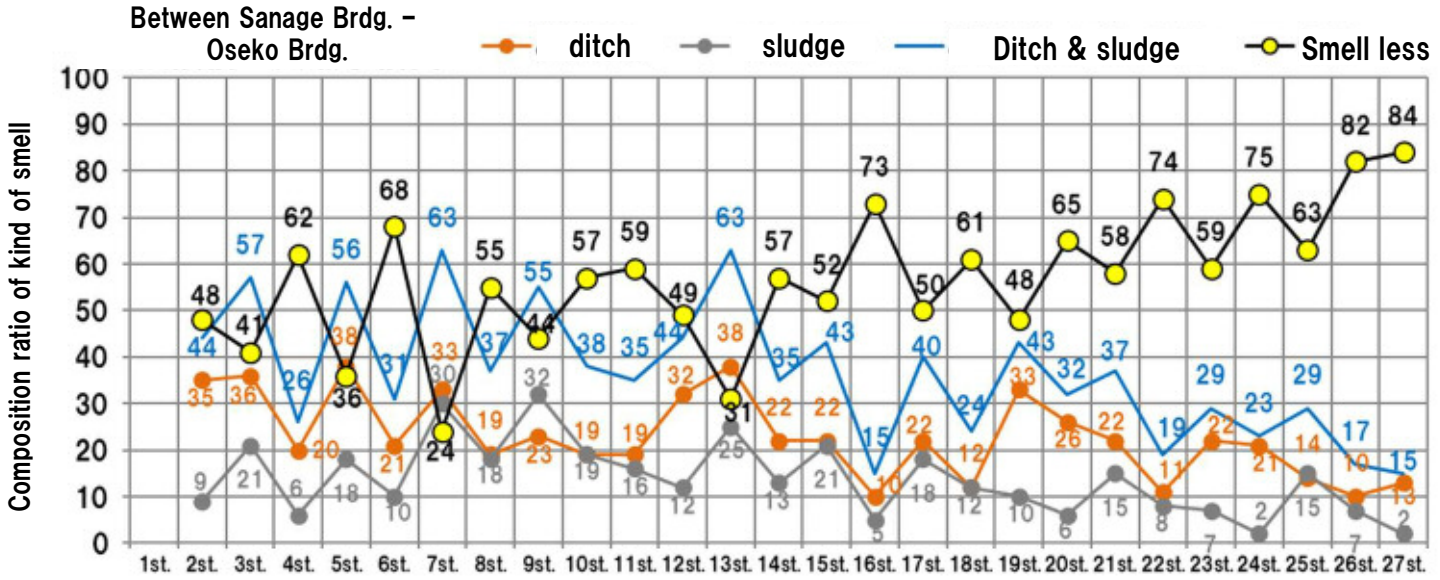


Bubble

Ratio of bubble generated from bottom



Ratio of Ditch, Sludge,Ditch & Sludge,Smell less



(4) About the longitudinal change in water quality of Horikawa River

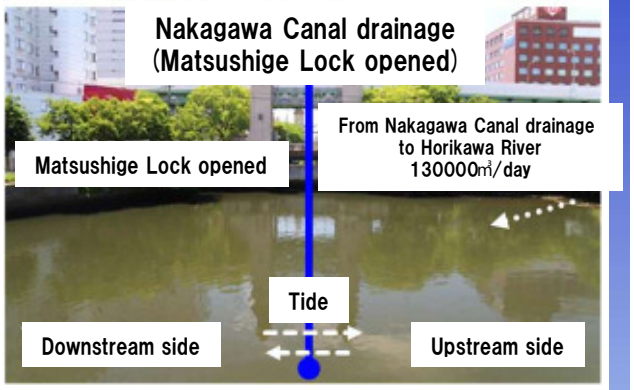
(Reference:6.2.10. 4 About the longitudinal change in water quality of Horikawa River_p.71～76)

We sorted out the longitudinal change in Horikawa River, the place where the impression of water stains is remarkably bad, and the points of interest for future research.

As a result, it was found that the areas around Kitashimizu Bridge, Tennozaki Bridge-Nakatsuchido Bridge, Oto Bridge-Shinsuzaki Bridge, and Goryo Bridge are bad.

■ Impression is remarkably bad place
■ For future research points of interest

■Near Kitashimizu Bridge…Focus on river width widens (flow velocity slows down and suspends things settle down), the environment of dirt easily accumulates on the riverbed.
■Near Tennozaki Bridge-Nakatsuchido Bridge… Focus on the tip of the tide and the riverbed the environment where dirt is easily accumulated. (Agglomerates and precipitates of pollutants)
■Near Oto Bridge-Shinsuzaki Bridge…Focus on impact of drainage from the Nakagawa Canal.
■Near Goryo Bridge…Focus on the influence of the Shin-Horikawa River.

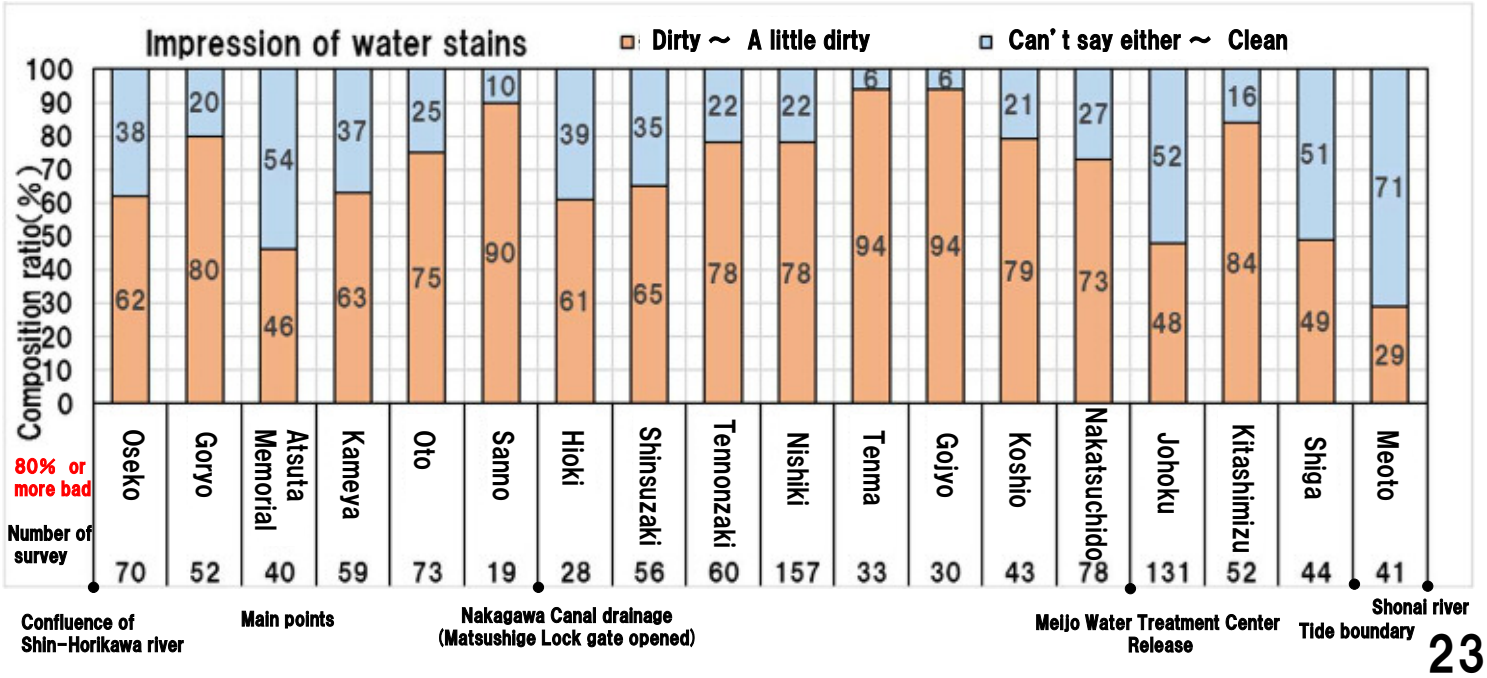


From the Kiso River after the water conveyance is stopped

11years

(Spring～early summer :average value)

7,9,11,13,15,17,19,21, 23,25,27stage (From the Kiso River after the water conveyance is stopped ,Spring～early summer: April～June) The day before fall with and without rain.
Number of survey:1066



(5) The effect of drainage from the Nakagawa Canal

(Ref. : 6.2.11. the effect of drainage from the Nakagawa Canal_p.77～82)

We compared the three years before and after the operation of the Tsuyuhashi water treatment center (The advanced water treatment facility: H29.10～)

As a result, it was found that "the impression of clearness" in Horikawa river improved after the operation of Tsuyuhashi water treatment center.We need to continue to investigate to clarify the mechanism by which the impression of clearness in Horikawa river has improved.

(Data) The stop of Tsuyuhashi C 17,19,21 stage
The operation of Tsuyuhashi advanced water treatment facility 23,25,27 stage
＊ Spring～early summer：April～July, With and without rainfall

We focused on the effect of drainage from the Nakagawa Canal from Oto Bridge to Shinsuzaki Bridge.

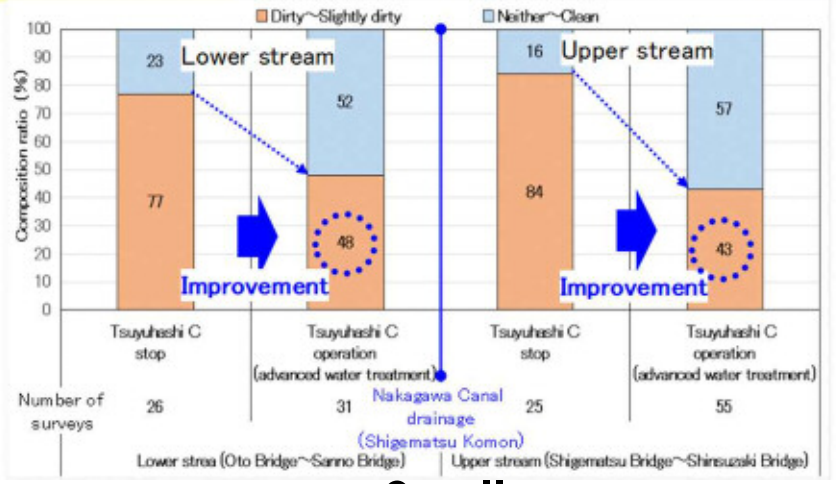
After the operation of Tsuyuhashi water treatment C The impression of clearness in Horikawa river was improved.

Tsuyuhashi Water Treatment C (the advanced water treatment) is in operation, and the circulation volume of the Nakagawa Canal is higher than when it is stopped.
70,000m3/d → 130,000m3/d

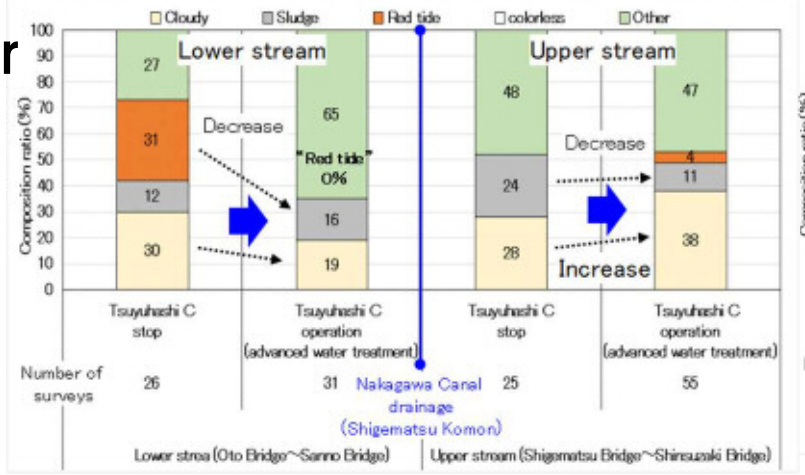
Changes due to increased drainage from the cleaned Nakagawa Canal ?
(Increased amount of advanced water)

Item		Lower stream (Oto Bridge～Sanno Bridge)		Upper stream (Shigematsu Bridge～Shinsuzaki Bridge)	
		Tsuyuhashi C stop 2015～2017 17, 19, 21st	Tsuyuhashi C operation (advanced water treatment) 2018～2020 23, 25, 27st	Tsuyuhashi C stop 2015～2017 17, 19, 21st	Tsuyuhashi C operation (advanced water treatment) 2018～2020 23, 25, 27st
Impression of clearness	Dirty～Slightly dirty	77% ⇒	Improved up to 48%	84% ⇒	Improved up to 43%
Color	Cloudy	30% ⇒	19%	28% ⇒	38%
	Sludge	12% ⇒	16%	24% ⇒	11%
	Red tide	31% ⇒	0%	0% ⇒	4%
Bubbles	Bubbles from the riverbed	4% ⇒	0%	4% ⇒	9%
Smell	Terrible smell ～Smell	12% ⇒	0%	20% ⇒	2%
	Smell less	69% ⇒	82%	52% ⇒	87%

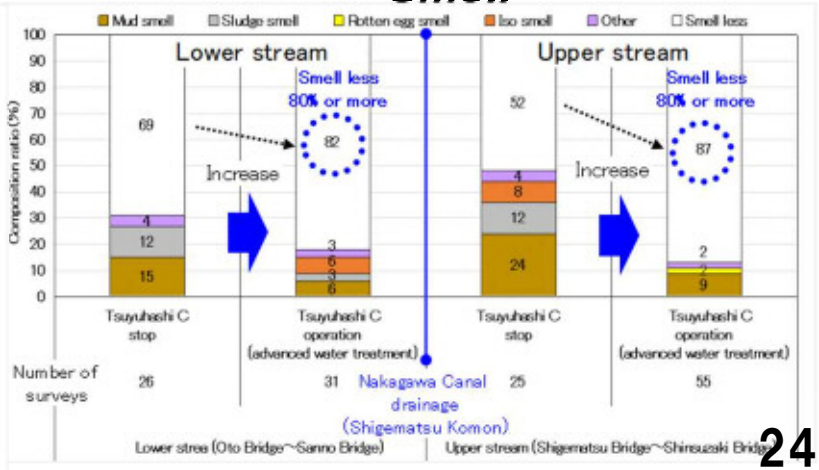
Impression of clearness



Color



Smell



(6) Changes two years after sludge dredging of Shin-Horikawa River

Sludge dredging was carried out as a measure against bad odors for Shin-Horikawa River in 2017 and 2018. We compared the result of before and after dredging in the upstream.

(Data)
Horagai Bridge - Maizuru Bridge
before dredging 23th stage
after dredging 25th&27th stage
both rain and no rain

Comparison before and after dredging

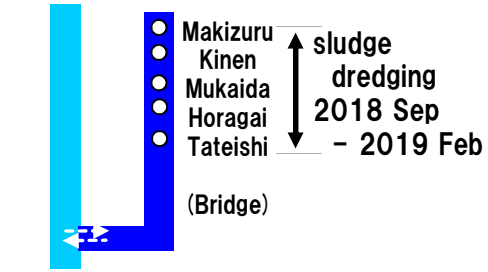
■No significant changes in the impression of clearness were observed

■The proportion of Bubbles from river bed, "terrible smell" and "smell" was increased at Maizuru Bridge and Kinen Bridge. We think that river bed remains unstable after sludge dredging.

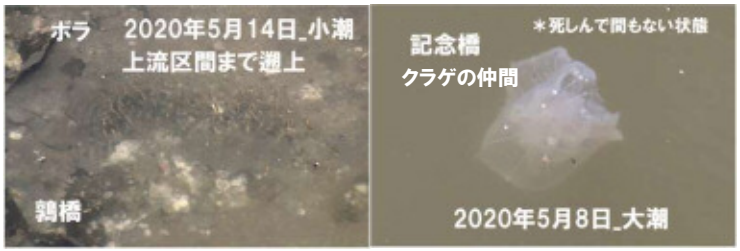
■"slightly smell" and "no smell" increased at Mukaida Bridge that is in the middle section. We believe that sludge dredging improved "Odor" and "Colour".

2 years after dredging (27th stage)

Sludge dredging improved "Odor" and "Color" around Mukaida Bridge.

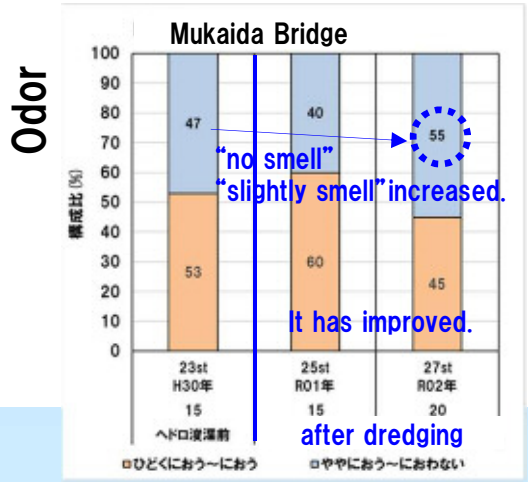


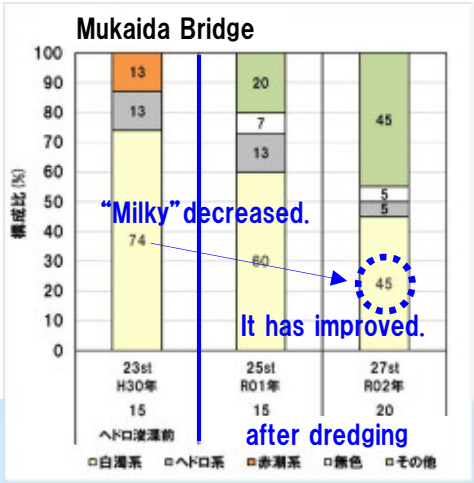
We found the flock of mullets, eels, and jellyfish in the upstream section in the 27th stage. We believe that the dredging of sludge on the riverbed has improved oxygen in the water.



Confirmation of the effect of sludge dredging requires continuous investigation and arrangement until the riverbed becomes stable.

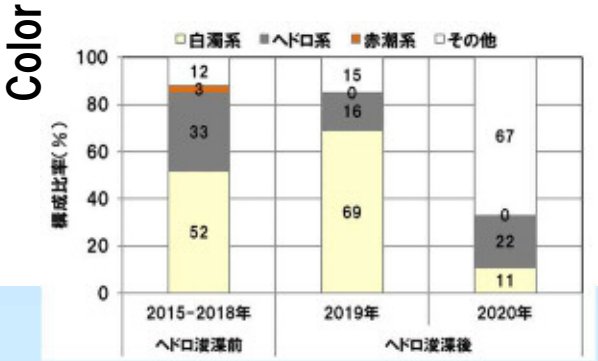
image diagram





ECOドコ応援隊

fixed point observation at Mukaida Bridge
:2014 Oct -2020 Jun
http://www.eco-doco.jp/meiko_line/html/01.html

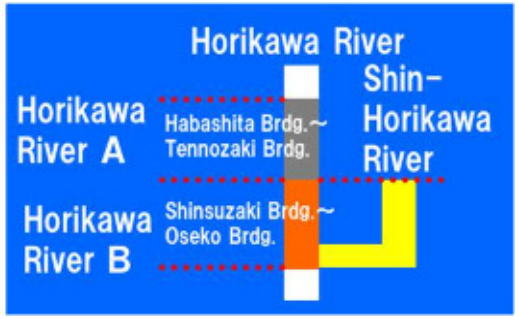


(7) Compare Horikawa River and Shin-Horikawa River

We have organized the issues regarding the differences and characteristics of the impression of water stains on the Horikawa River and Shin-Horikawa River.

(Data) 13,15,17,19,21,23,25,27stage,
No rainfall on the day before or on the day

Organize the impression of water stains (citizen's sense) and their characteristics



■Impression of water stains

Shin-Horikawa River is

not better than Horikawa River ★

(Characteristic)

・Horikawa River A (Habashita Brdg.~Tennozaki Brdg.)
…The existence of sludge and the hoisting of sludge

・Horikawa River B (Shinsuzaki Brdg.~Oseko Brdg.)
…Phenomenon derived from the existence of seawater

・Shin-Horikawa River …Presence of sludge (sludge scum) and generation of sulfide

Comparison of main items (Composition ratio)

			Horikawa River A Habashita Brdg.~ Tennozaki Brdg.	Horikawa River B Shinsuzaki Brdg.~ Oseko Brdg.	Shin-Horikawa River
Impression	Dirty~ A little dirty		74%	61%	★87%
	Evaluation	Color	66%	57%	63%
		Smell	8%	5%	13%
Bubbles	Bubbles from the bottom of the river		37%	3%	37%
Floating material (Sludge Scum)	Existence rate		5%	1%	54%
Color	Cloudy		34%	26%	58%
	Red tide-like		5%	13%	6%
	Sludge-like		24%	17%	8%
Smell	Bad smell ~smell		29%	17%	43%
	Types	Gutter odor	30%	16%	31%
		Sludge odor	20%	13%	6%
		Rotten egg odor	3%	1%	28%
		Odorless	44%	64%	31%

Issues

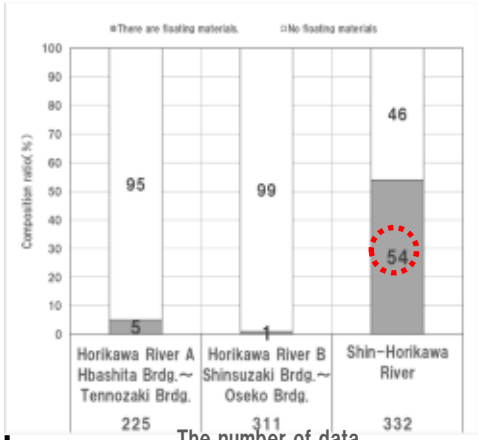
■Horikawa River

The impression of water pollution in Horikawa River may worsen depending on the weather conditions, but it is gradually improving with the implementation of new water quality improvement measures.
Horikawa River's issue is to improve the presence of sludge-like sludge that tends to accumulate on the riverbed near the tip of the tide and the situation in which it rolls up.
It is awaited to implement measures to reduce sludge redemption, such as removal of sludge due to revetment maintenance and improvement of combined sewerage systems.

■Shin-Horikawa River

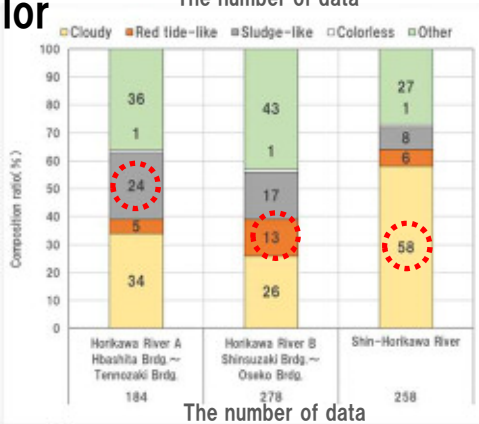
The impression of water stains on the Shin-Horikawa River is not as good as that on the Horikawa River. The daily deterioration of "color" and "smell" derived from sulfide generated at the bottom of the river seems to further worsen the impression of water stains. Further investigation data accumulation and organization is an issue in order to understand the mechanism of pollution of the Shin-Horikawa River and take effective measures. Then, for example, measures such as reducing the load in rainy weather, improving the water cycle, and operating regular vessels (stirring the water area) are awaited.

Floating material (sludge scum)



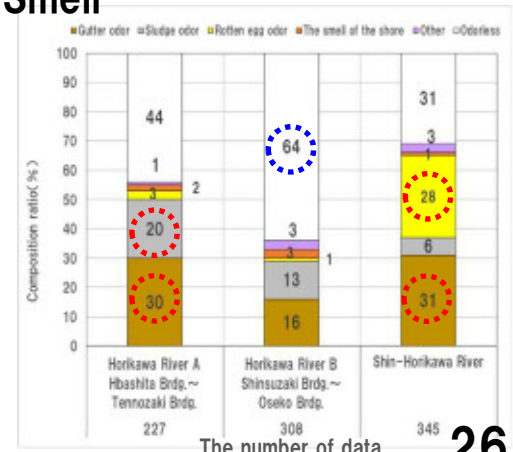
The number of data

Color



The number of data

Smell



The number of data

from secretariat

■ Every data you offer to us is valuable

Information about subtle change you find when you survey Horikawa river can be valuable data to understand the present situation of the river. We're looking forward to your data from now on.

■ Let us introduce your activity

Your activity, such as survey, think and cheer up Horikawa, is the motivation to increase the number of those who love Horikawa, Nagoya City and the Earth.

■ Let's hand down the past appearance of Horikawa as record

To know about the past Horikawa is very important to design the future Horikawa.

We refer Horikawa's pictyures taken in Taisho and Showa era to know forgotten past Horikawa. Do you keep photos which Horikawa was photographed in in your album? For example, photo of your family with Horikawa in the background of the picture is Okay.

(contact) secretariat

e-mail:2010@horikawa1000nin.jp

Please send comments and pictures (with date and place) from mobile phone or PC.

＊We think image quality of picture taken by mobile phone camera is enough.