Horikawa Sen-nin Chosatai 2010

Summary meeting for the 18th stage

Photos：Goyousui-ato-gaien-aigokai Survey Group
KawasemiSurvey Group

The secretariat of Horikawa Sen-nin Chosatai 2010

Feb.6th.2016

Horikawa Sen-nin Chosatai 2010

～Transmission of Raw Water from Kiso River～

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 transmisission 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 3years
(from Apr.22nd 2007 to Mar.22nd 2010)

■Increase of Transmisson Volume from the Shonai River (additional pilot project)
(1) Water Source Shonai River
(2) Transmission Usual 0.4m3/sec (maxium 0.7m3/sec)
(3) Experiment Period : 1st Oct-31St 2010
(4) 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 view point and a sence of citizens
＊Clearness ＊Transparency ＊Color ＊Smell
＊Garbage ＊ Living things ,etc

The first Nagoya City Environmental practice Prize February.2012
Branch of contribution for Regional Environment Development
Award for excellence

Transmission of Raw Water from Kiso River

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

To verify the clarification effects of TRWKR
Surveys during TRWKR period :
April 2007 ～ March 2010
Surveys after the stop of TRWKR

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 Cheering Groups
Cheering clarification of Horikawa

The survey from a view point and a sence of citizens

To verify the 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 the survey group
(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.

② There 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 house.

Water Environment of Horikawa River

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

Kiso River is our water source.

Change in temperature, precipitation and length of sunlight

Cause of breeding of phytoplankton, nitorogen and phosphorus are included in wastewater from houses, factories and stores.

The primary cause of water pollution is wastwater from houses,factiories and stores.

Wastwater is discharged after treatment in wastwater treatment plant.

When heavy rain, wastewater is discharged without treatment.

Shonai River
Provisional raw water transmission :0.3m^3/s

Wastewater Treatment Plant

Sanage Bridge

Motoiri Sluiceway

Tide Gate

▼high tide

Horikawa

▼ebb tide

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

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

Nagoya Port

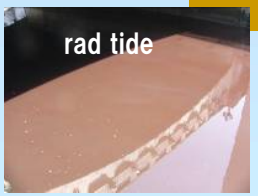
rising

Ise bay

Ground water etc

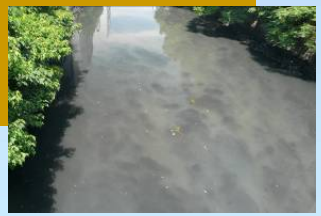
It has looked like red tide or blue tide.
In Nagoya Port and downstream of Horikawa, it is said that phytoplankton does over breeding and extinction, so water basin is polluted

Sludge rises and floats.


rad tide


blue tide


floating sludge


raised sludge


Shimizu wakuwaku-sui

Method of fixed-point observation

Measurement of COD

Chemical Oxygen Demand. This is an index of water contamination used for sea, lakes and marshes. It is an oxygen consumption required for oxidation of organic matters dissolved in ample water. The higher COD, the more it is contaminated.

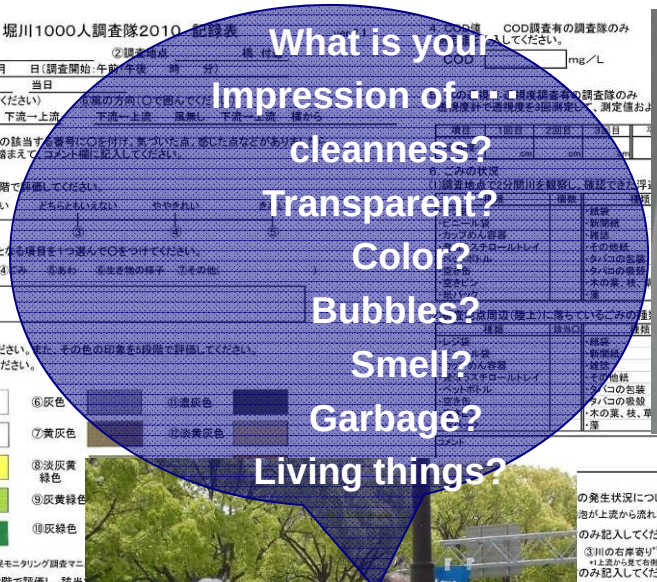


photo:Goyosui-ato-gaien-aigokai Survey Group

Photo: Goyosui-ato-gaien-aigokai Survey Group

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

Number of Participants of Horikawa Sen-nin Chosatai 2010

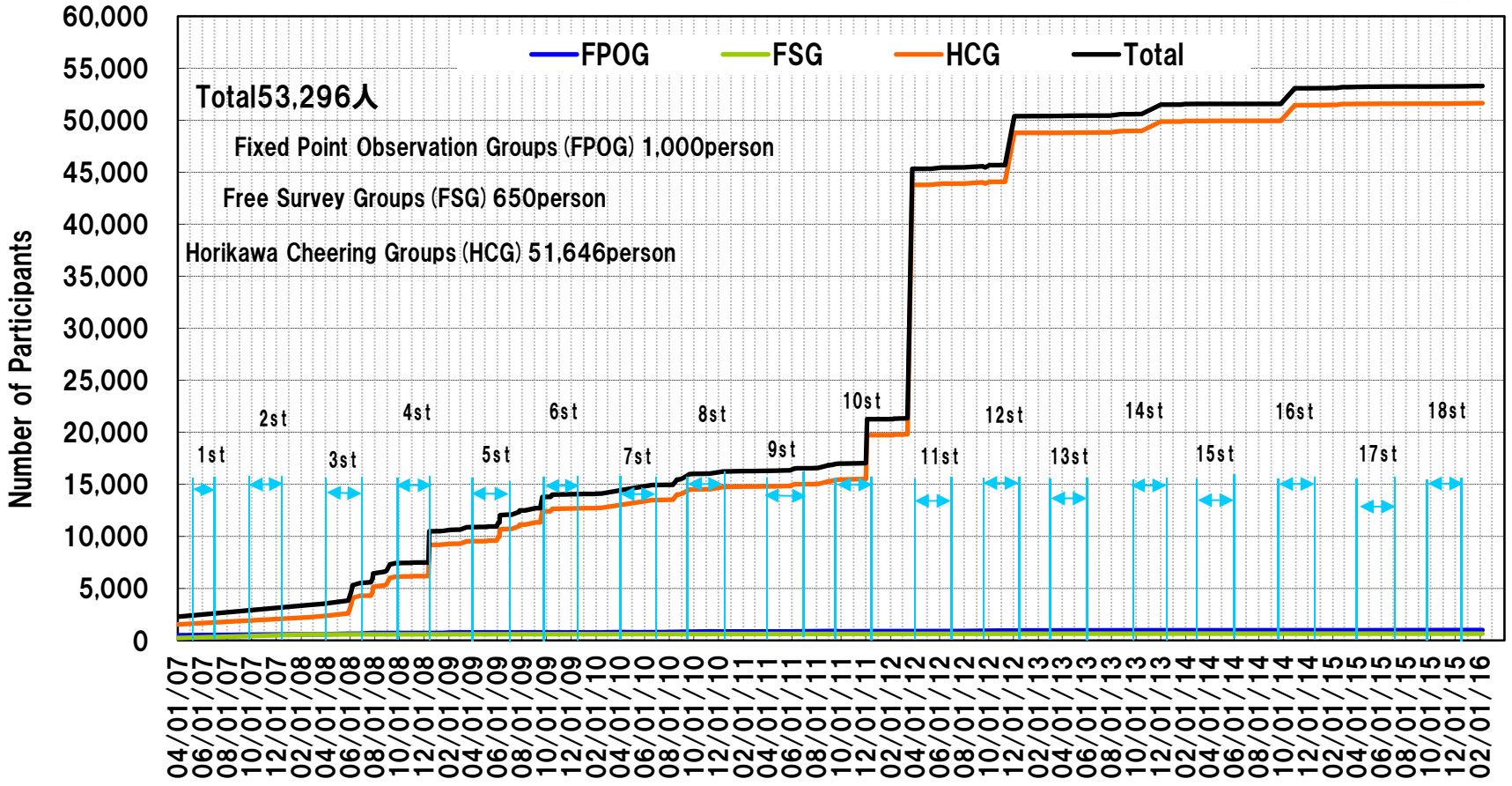
(Horikawa Sen-nin Chosatai started accepting participation on 26th Mar .2007)

	Start 22nd Apr.2007	Now 6th Feb.2016
Fixed Point Observation Groups	55 groups 497persons	97 groups 1000persons
Free Survey Groups	22groups 234persons	40 groups 650persons
Horikawa Cheering Groups	88groups 1,531persons	2,572 groups 51,646persons
Total	165groups 2,262persons	2,709 groups 53,296persons

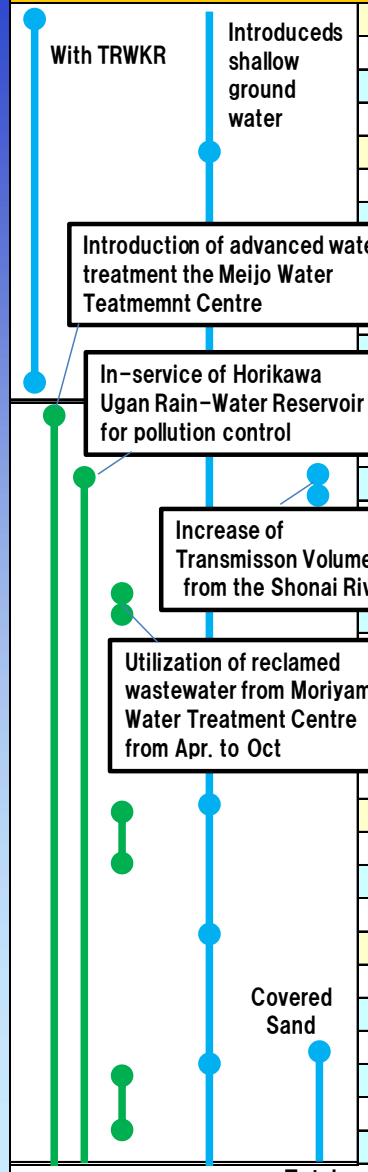
Investigation spots

Number of Participants of Horikawa Sen-nin Chosatai

Growth of participants

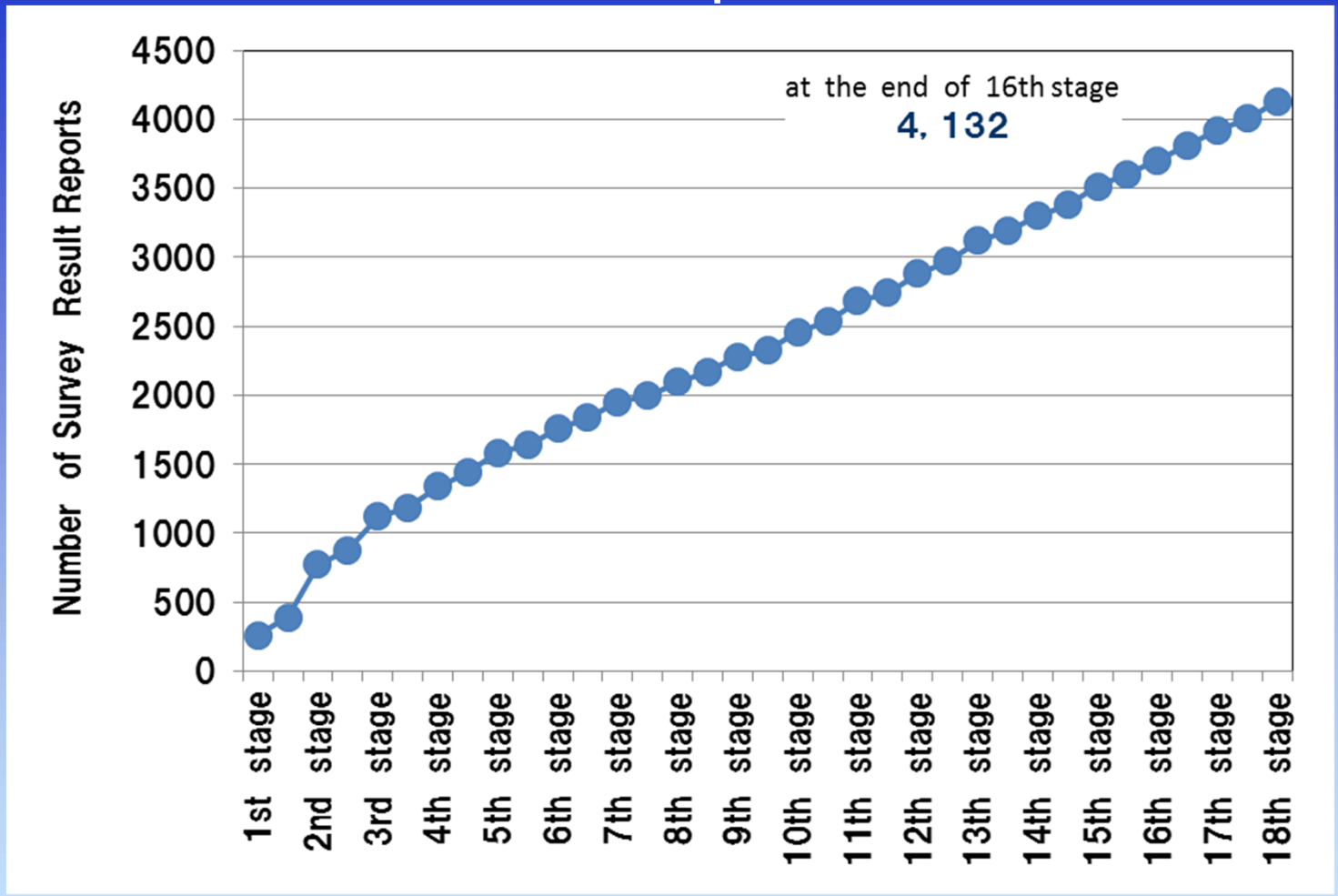


Survey Period and Number of Reports



Survey Period			reports
1st stage	Spring - Early Summer / Apr. 22nd - Jun. 30th. 2007		258
interval	Jul. 1st - Sep. 7th. 2007		134
2nd stage	Autumn - Early Winter / Sep. 8th -Dec. 16th. 2007		383
interval	Dec. 17th - Mar. 31st. 2008		103
3rd stage	Spring - Early Summer / Apr. 1st - Jun. 30th. 2008		245
interval	Jul. 1st - Sep. 27th. 2008		64
4th stage	Autumn - Early Winter / Sep. 28th -Dec. 16th. 2009		152
interval	Dec. 17th. 2008 - Mar. 31st. 2009		100
5th stage	Spring - Early Summer / Apr. 1st - Jun. 30th. 2009		145
interval	Jul. 1st - Sep. 26th. 2009		54
6th stage	Autumn - Early Winter / Sep. 27th -Dec. 16th. 2009		120
interval	Dec. 17th. 2009 - Mar. 31st. 2010		81
7th stage	Spring - Early Summer / Apr. 1st - Jun. 30th. 2010		111
interval	Jul. 1st - Sep. 11th. 2007		44
8th stage	Autumn - Early Winter / Sep. 12th -Dec. 17th. 2010		104
interval	Dec. 18th. 2010 - Mar. 31st. 2011		72
9th stage	Spring - Early Summer / Apr. 1st - Jun. 30th. 2011		112
interval	Jul. 1st - Sep. 10th. 2011		42
10th stage	Autumn - Early Winter / Sep. 11th -Dec. 16th. 2011		133
interval	Dec. 17th. 2011 - Mar. 31st. 2012		77
11th stage	Spring - Early Summer / Apr. 1st - Jun. 30th. 2012		148
interval	Jul. 1st - Sep. 21th. 2012		60
12th stage	Autumn - Early Winter / Sep. 22th -Dec. 16th. 2012		139
interval	Dec. 17th. 2012 - Mar. 31st. 2013		92
13th stage	Spring - Early Summer / Apr. 1st - Jun. 30th. 2013		145
interval	Jul. 1st - Sep. 28th. 2013		70
14th stage	Autumn - Early Winter / Sep. 29th -Dec. 17th. 2013		113
interval	Dec. 18th - Mar. 31st. 2014		79
15th stage	Spring - Early Summer / Apr. 1st - Jun. 30th. 2014		133
interval	Jul. 1st - Sep. 7th. 2014		91
16th stage	Autumn - Early Winter / Sep. 28th -Dec. 16th. 2014		99
interval	Dec. 17th. 2014 - Mar. 31st. 2015		107
17th stage	Spring - Early Summer / Apr. 1st - Jun. 30th. 2015		113
interval	Jul. 1st - Sep. 19th. 2015		81
18th stage	Autumn - Early Winter / Sep. 20th -Dec. 16th. 2015		128
Total			4,132

Number of Reports



The total number of survey reports is 4,132 by the end of the18th stage. On average, it is 400 reports every year.

A lot of citizens survey the real state of water environment of Horikawa River continually from a viewpoint and a sense of citizens.

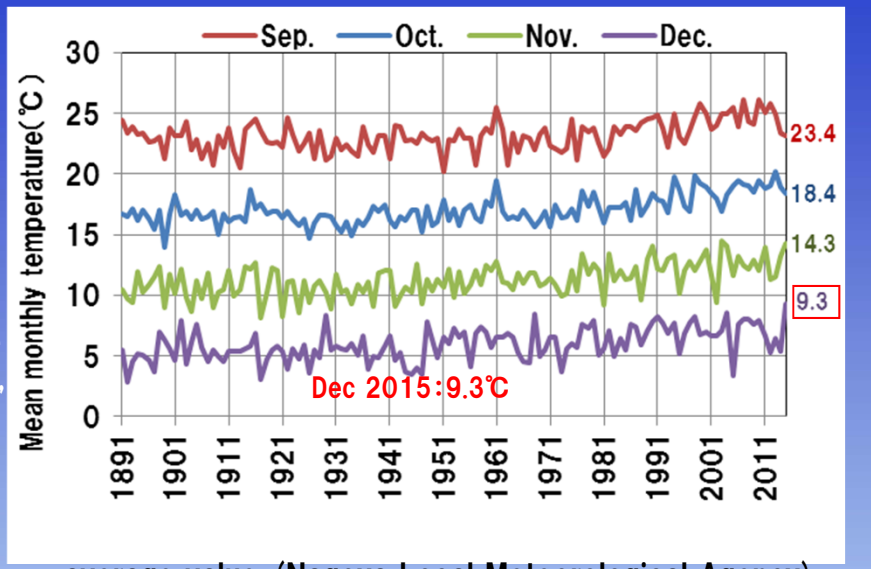
4. Weather Condition

There were many sunny days in the end of Sep.. However, it was raining hard from 24th to 26th as it was influenced by an atmospheric depression with an autumn rain front moving eastward on the southern sea.
The temperature had been low in the first half of Oct. due to an inflow of cold air mass from China. In the latter half of Oct. the temperature had been high because the warm air mass overlay Nagoya. In Oct. there were many sunny days covered, little rain and a lot of hours of sunlight by high atmospheric pressure.
Because low and high atmospheric pressure passed alternately, the weather changed every few days in Nov. There were a few of sunny days and a large amount of rainfall with a lot of rainy and cloudy days under the influence of a low atmospheric pressure and an autumn rain front. Besides, an influence of the cold air mass was weak, hot weather continued.
In Dec. An influence of the cold air mass from North was weak, an mean monthly temperature was 9.3℃.

18th Stage (from Sep. to Dec. 2015) Weather condition

■Temperature
A mean temperature was 16.3℃ which is above average (15.4℃)
■Precipitation
In Sep. we had a lot of rain due to an atmospheric depression with an autumn front. In contrast, There were little rain in Oct, and Dec. The mean precipitation is 137mm/month which is higher than the average (121.9mm/month)
■Sunlight hours
There were many sunny days and a lot of hours of sunlight in Oct. Therefore, monthly mean sunlight hours is 177, which is more than average.

Mean monthly temperature
(Nagoya Local Meteorological Agency)



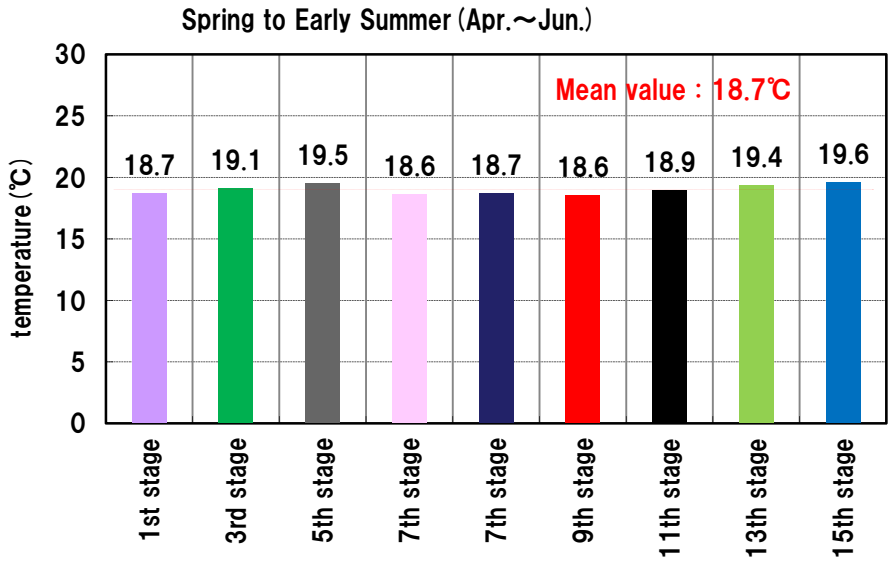
average value (Nagoya Local Meteorological Agency)

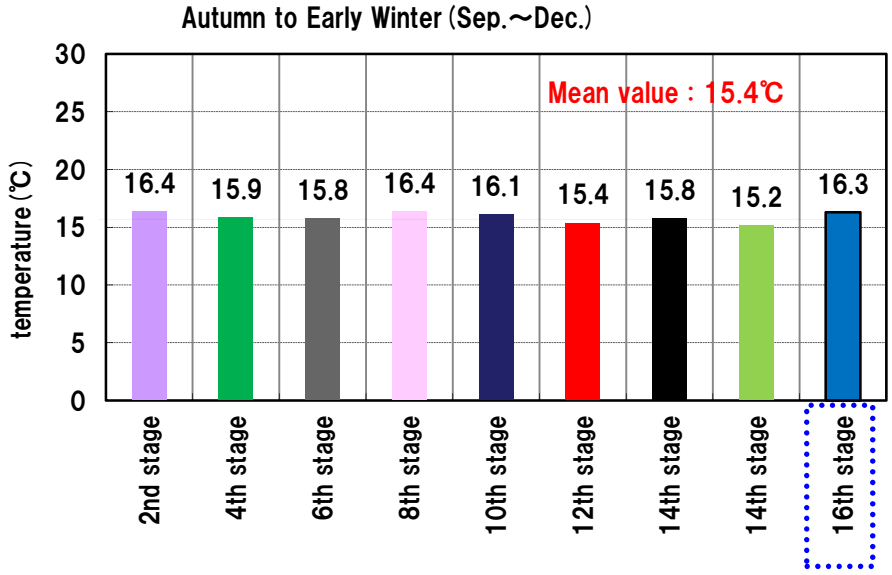
section	precipitation (mm) total	temperature (℃) average	temperature (℃) high	temperature (℃) low	sunlight (hours) total
period	1981 ~2010	1981 ~2010	1981 ~2010	1981 ~2010	1981 ~2010
year	30	30	30	30	30
Apr.	124.8	14.4	19.9	9.6	196.6
May	156.5	18.9	24.1	14.5	197.5
Jun.	201.0	22.7	27.2	19.0	149.9
Average	160.8	18.7	23.7	14.4	181.3
Sep.	234.4	24.1	28.6	20.7	151.0
Oct.	128.3	18.1	22.8	14.1	169.0
Nov.	79.7	12.2	17.0	8.1	162.7
Dec.	45.0	7.0	11.6	3.1	172.2
Average	121.9	15.4	20.0	11.5	163.7

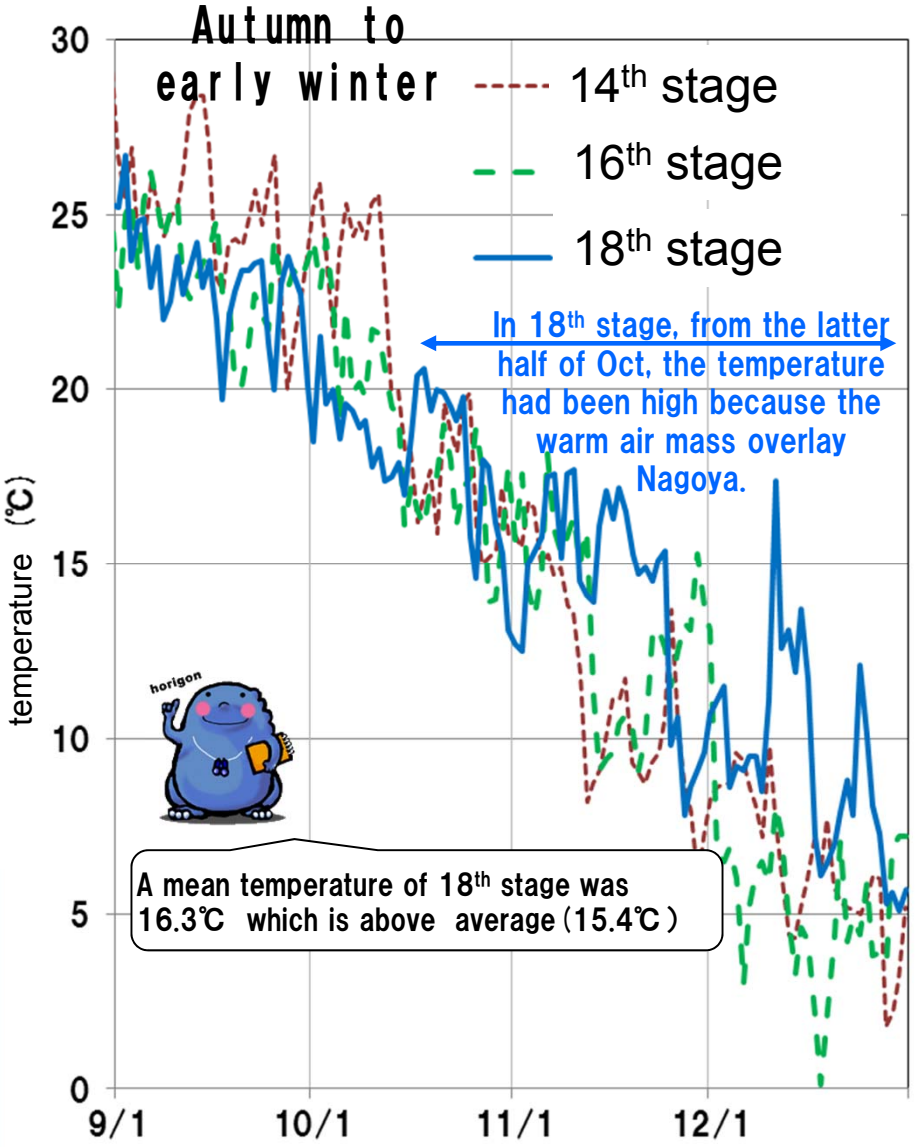
Nagoya Local Meteorological Agency
http://www.jma.go.jp/jma/menu/report.html

Change of Temperature

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

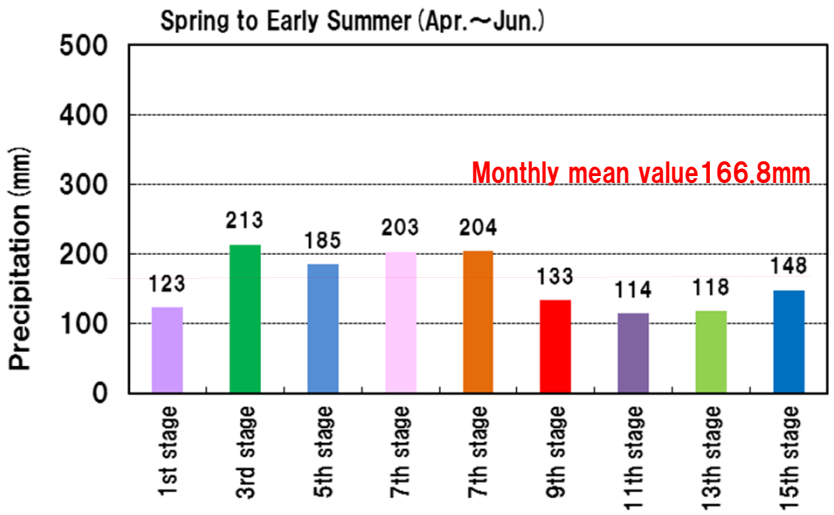


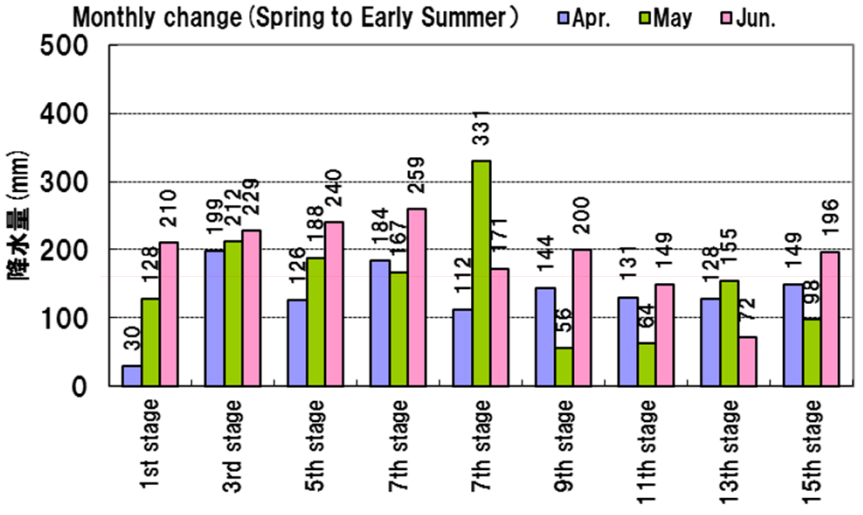


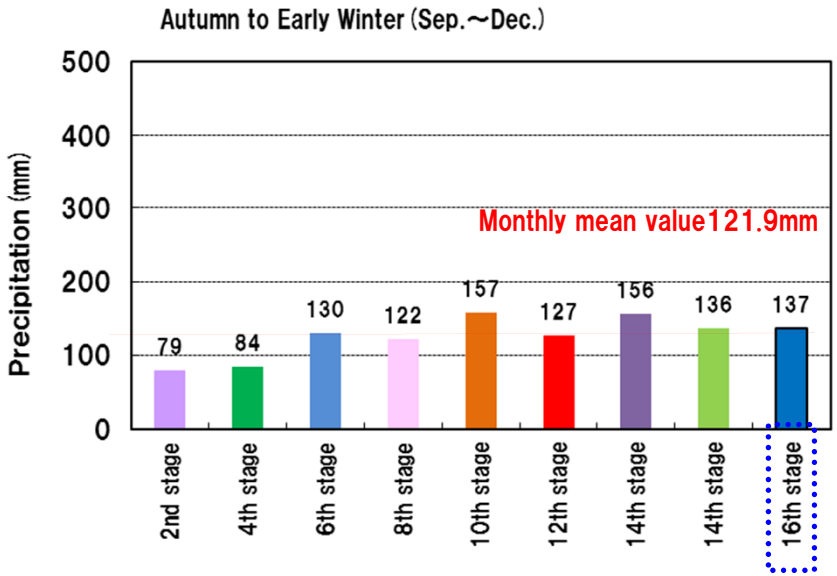


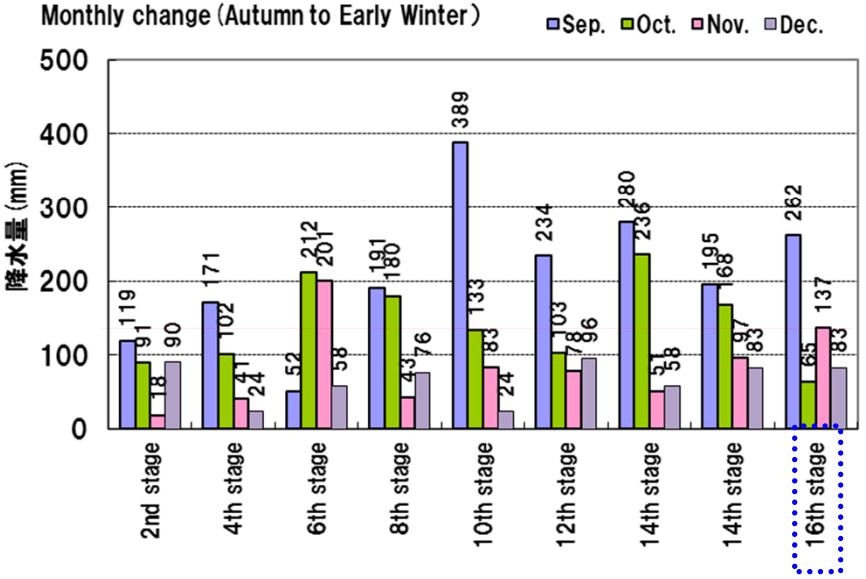
Chagne of precipitation

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





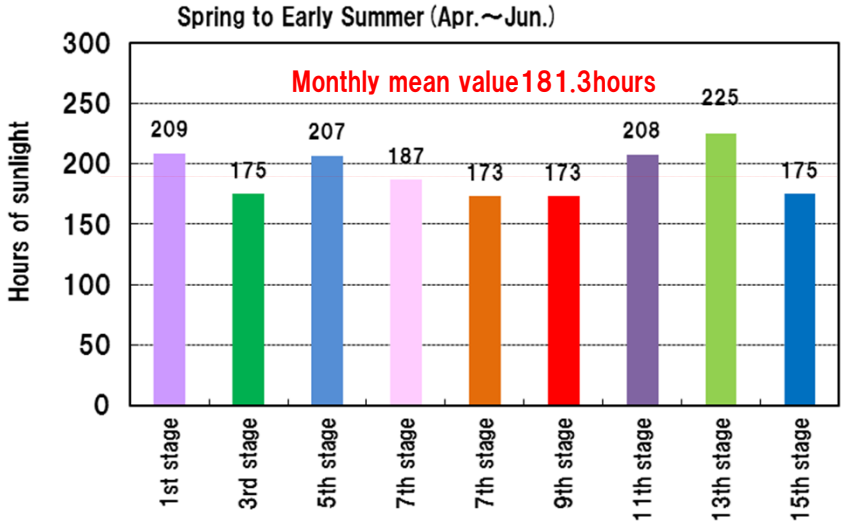


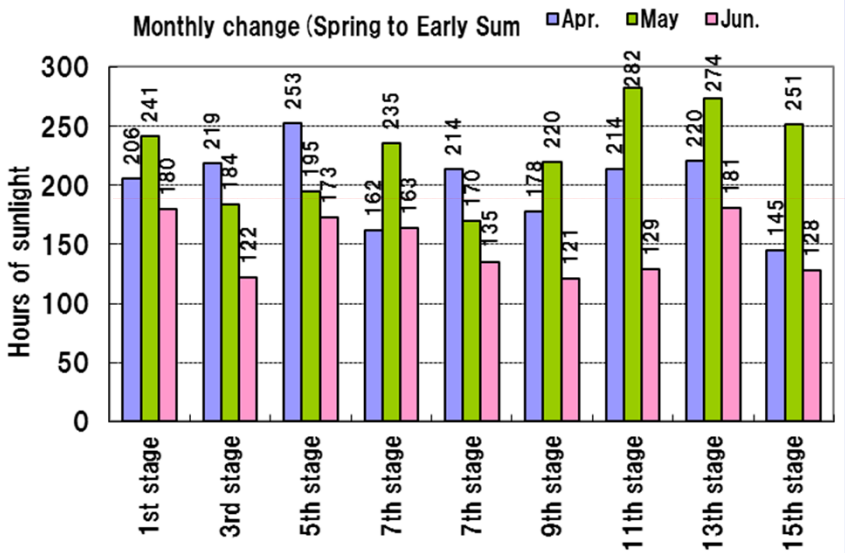


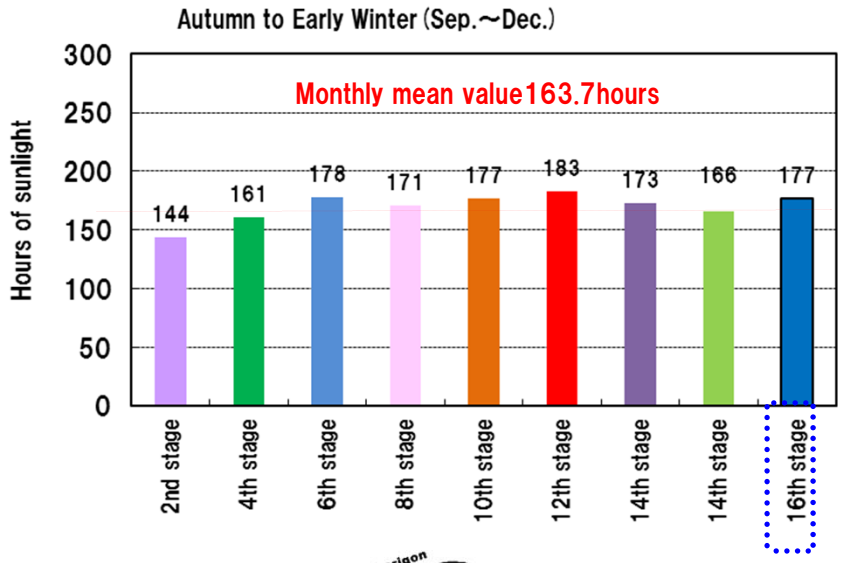
In Sep. we had a lot of rain due to an atmospheric depression with an autumn front. In contrast, There were little rain in Oct, and Dec. The mean precipitation is 137mm/month which is higher than the average (121.9mm/month)

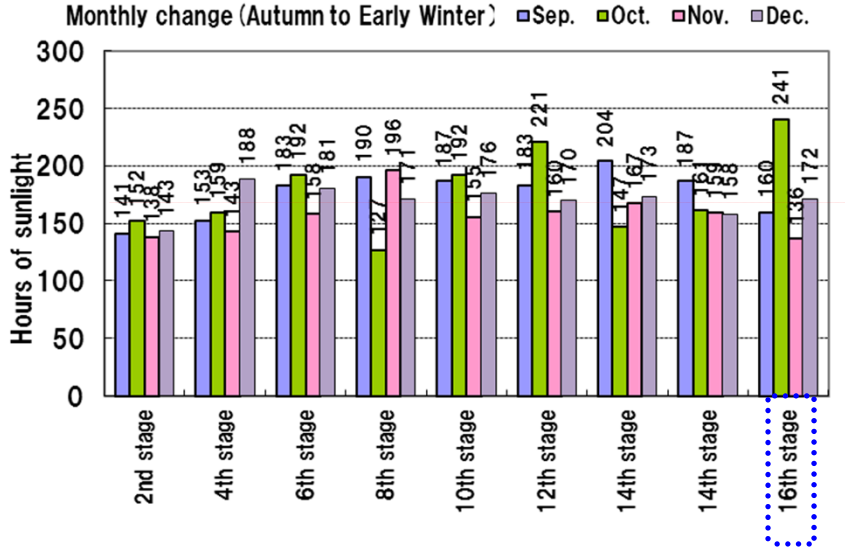
Change of hours of sunlight

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









There were many sunny days and a lot of hours of sunlight in Oct. Therefore, monthly mean sunlight hours is 177, which is more than average.

5. Main Measures for Water Quality Improvement

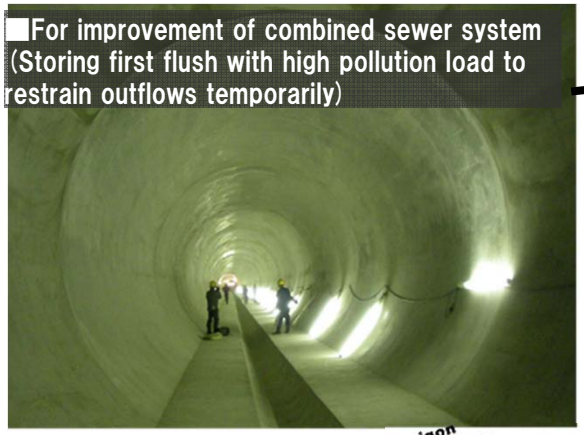
Measures	fy. 2007		fy. 2008		fy. 2009		fy. 2010		fy. 2011		fy. 2012		fy. 2013		fy. 2014		fy. 2015	
	1st.	2st.	3st.	4st.	5st.	6st.	7st.	8st.	9st.	10st.	11st.	12st.	13st.	14st	15st.	16st.	17st.	18st.
With TRWKR (0.4m3/s)	●					●												
Build a deep and shallow zone (Improvement of self-purification function and water enironment)							●				●		●					
Increase of raw water transmission from the Shonai River (+0.4m3/s)								●										
Utilization of shallow ground water (0.0405m3/s)		●										●		●		●		
Experiment of covering sand for water purification Gojo Brdg.-Naka Brdg.(water's edge along both banks)																●		
Introduction of Advanced water treatment at the Meijo Water Treatment Center							●											
In-service of the Horikawa Ugan Rain-water Reservoir for pollution control								●										
Utilization of reclaimed wastewater at Moriyama Water Treatment Center (0.046m3/s)									●	●	●		●				●	

Newly launched facilities after the stop of TRWKR

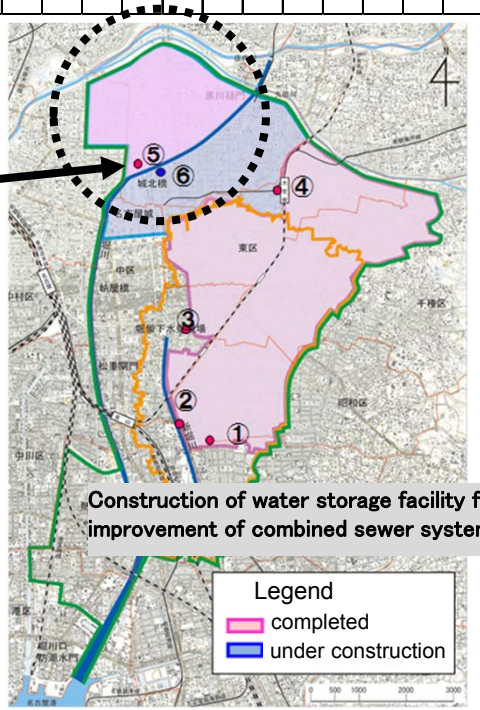
■For improvement of quality of treated water (Additional filtration of treated water at the Meijo Water Treatment Center can improve quality of water discharging into Horikawa River)

Advanced water treatment
at Meijo Water Treatment Center
Solution : conventional activated sludge process and rapid filtration
Launch : May. 2010

■For improvement of combined sewer system (Storing first flush with high pollution load to restrain outflows temporarily)



The Horikawa Ugan Rain-water Reservoir for pollution control
Volume : 13,000m³
Coverage Area : 633ha
Launch : Sep. 2010



Construction of water storage facility for improvement of combined sewer system

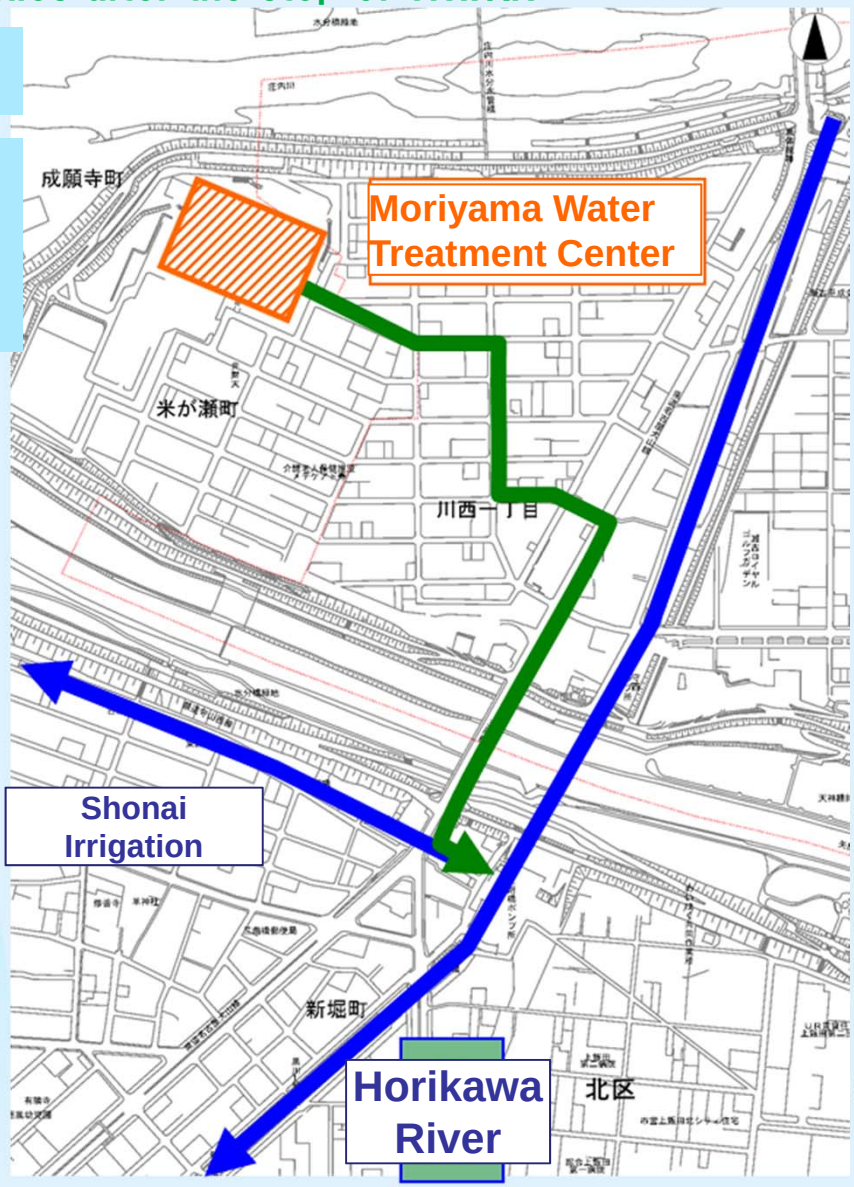
Newly launched facilities after the stop of TRWKR

■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

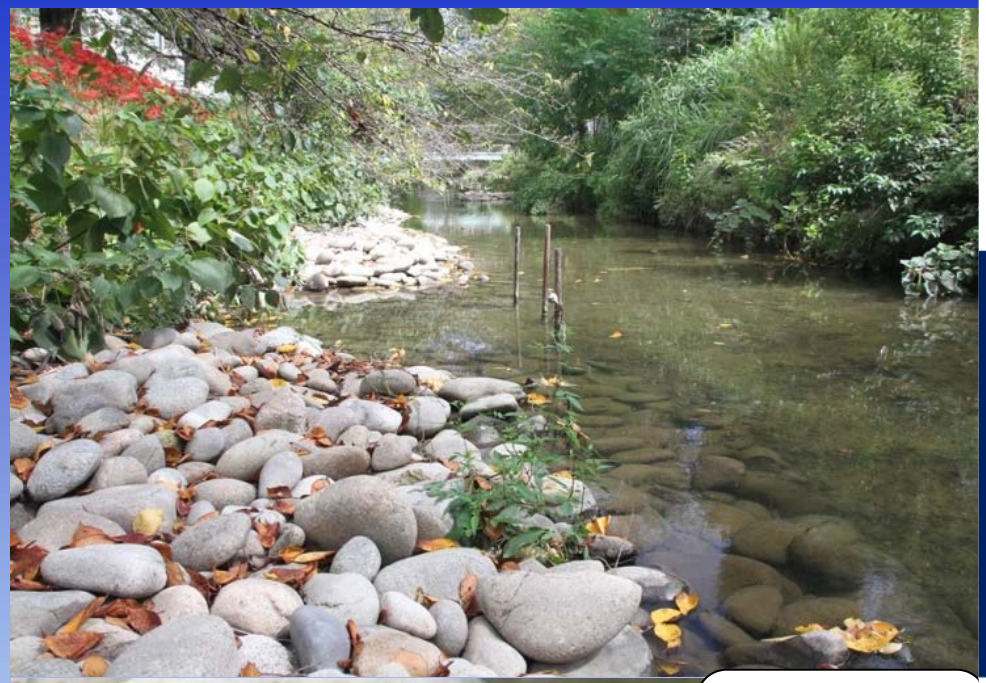
Reclaimed wastewater is conducted during irrigation season (Apr - Oct)



Reference: 17th Horikawa Sennin Chosatai conference

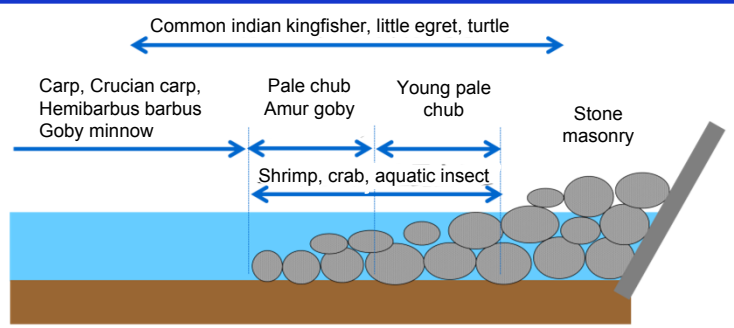
■Form of shallow and deep spot

Downstream from Kurokawa No.2 Bridge Sep.2013



Various living things come to this place for growing and breeding.

Prawn and Japanese mitten crab migrate between river and sea.



the self-cleansing action by food chain

Pollution(organic substance・Nitrogen・phosphorus, etc)

↓

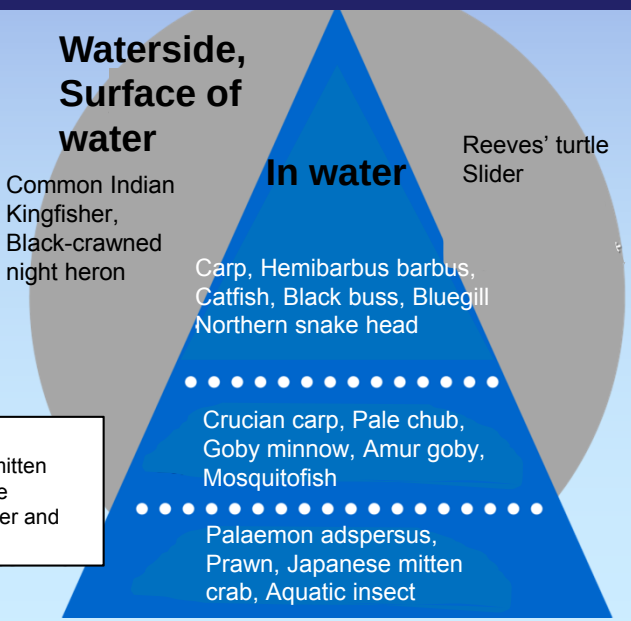
Algae and microbes are spread by pollution

↓

Fish, shrimp, insects eat algae, microbes

↓

Big fish and birds eat small fish and insects



Reference: 10th Horikawa Sennin Chosatai conference

■ Purification experiment by sand cover
started in June 2015

■Utilization of shallow ground water
A well at an upstream of Shiga Bridge
operated in Mar.2015

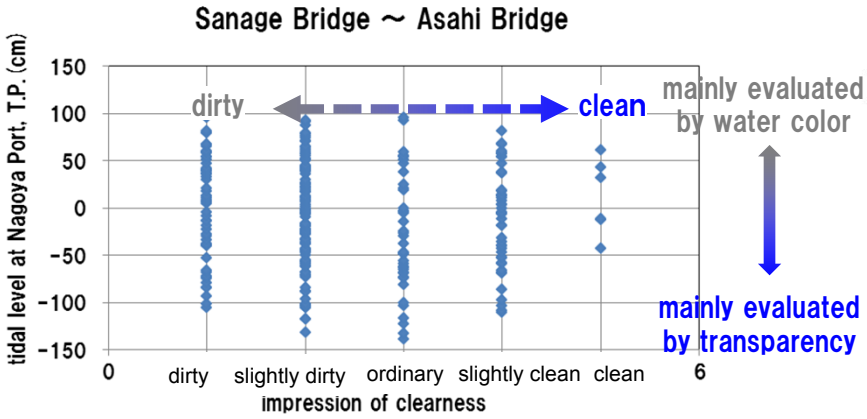
Photo:
http://horimachi.blog.fc2.com/

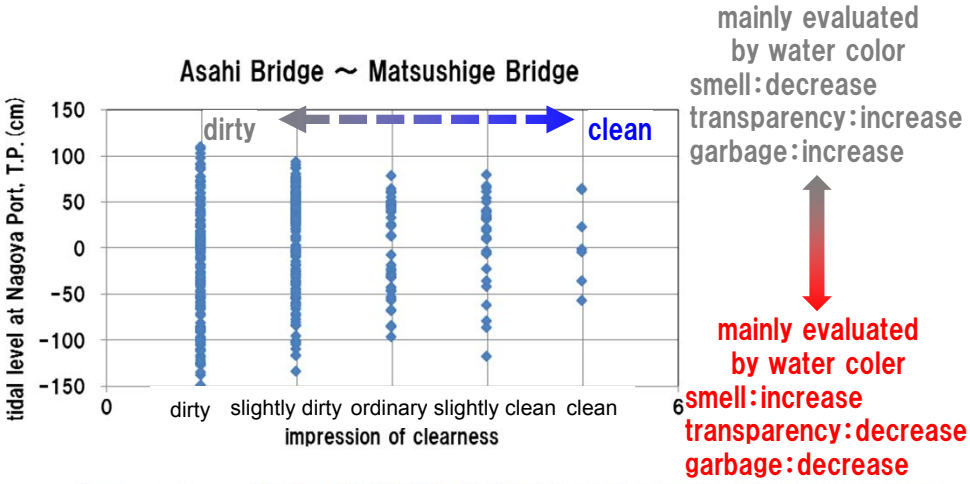
5. Relation between tidal level and water quality

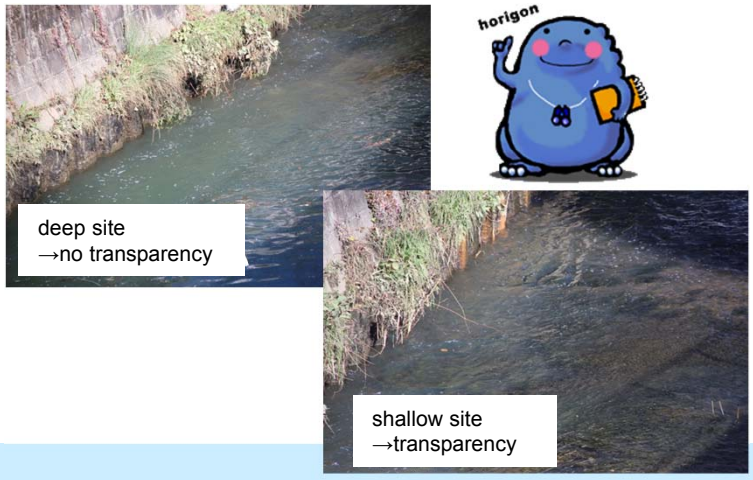
The survey we made before shows that the sludge is exposed and rolled up in a tidal section, between the mouth of Horikawa and Sanage Bridge, when the tidal level drops. And those movements of sludge affect impression of water clearness. In the 18th stage, we analyzed the relation between the tidal level in the Nagoya Port and the water quality of Horikawa in detail.

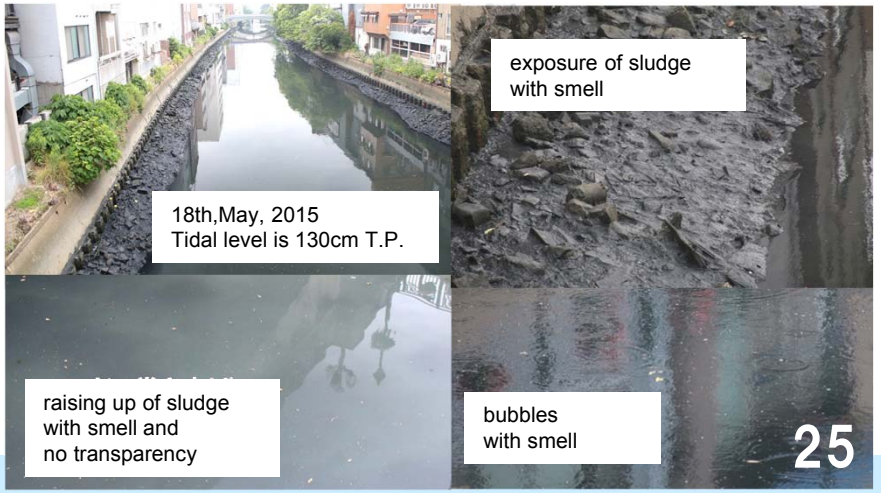
The result shows different tendency about "Impression of clearness" between Sanage Bridge ～ Asahi Bridge section and Asahi Bridge ～ Matsushige Bridge section. Specifically impression of clearness is better when the tidal level is low than when it's high between Sanage Bridge and Asahi Bridge. And Impression is evaluated by transparency when the tidal level is low. On the other hand, impression of clearness is a little worse when the tidal level is low than when it's high between Asahi Bridge and Matsushige Bridge. The impression is mainly evaluated by water color, and as the tidal level become lower and lower, evaluation by smell is more and more but evaluation by transparency is less and less. We guess those relations are affected by an exposure and rolling up of sludge.

Relation between the tidal level and the water quality is important to improve the impression of clearness at each section.









6. Purification experiment by sand cover (started in February, 2015)

It has been almost a year since the purification experiment by sand cover started between Naka Bridge and Gojo Bridge as a new measure for purification.

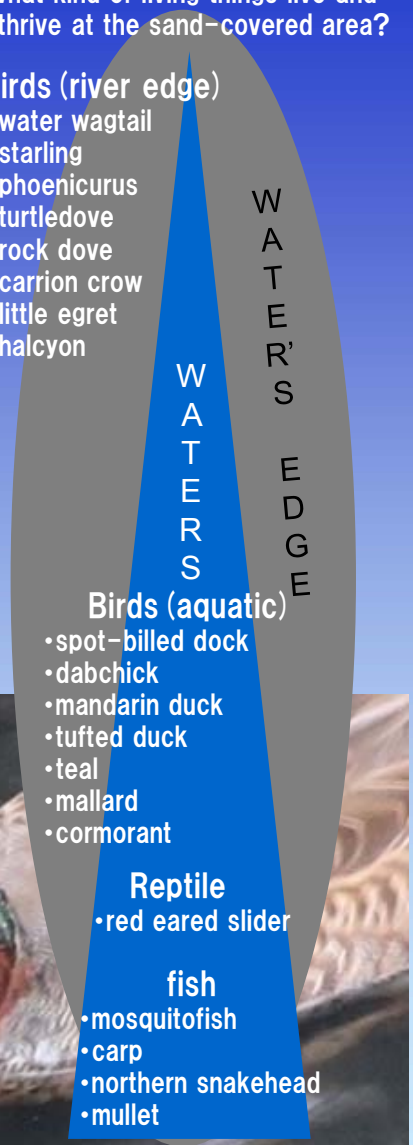
We suspected that "covering sand and purification materials will be flowed away" or " they will be covered with black sludge" when Nagoya City authority told they start that experiment at the 14th meeting. Therefore we started periodical observation to confirm the experiment process as soon as the experiment started.

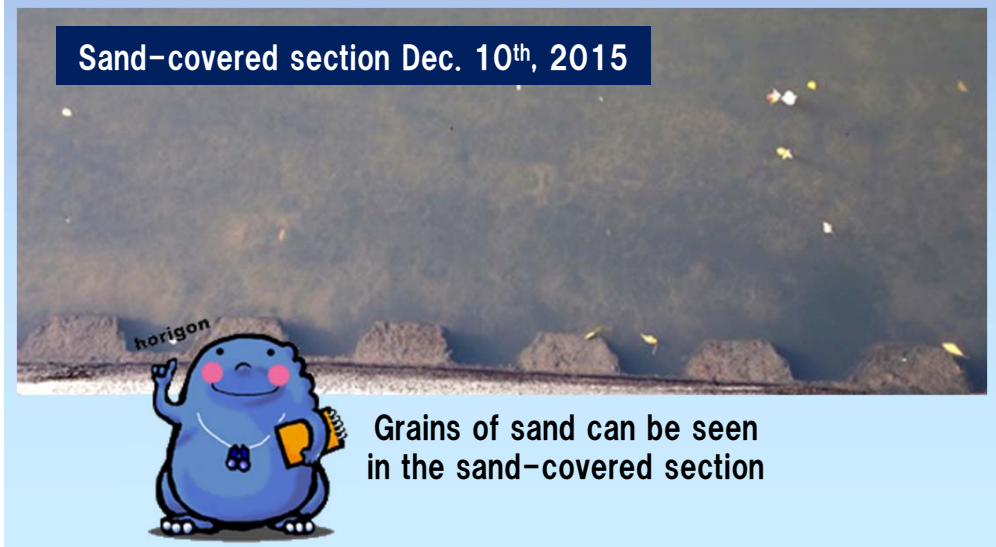
We can find cover sand and purification materials on the bridge today, a year passed since the experiment started. In particular, we can find even grains of white sand at the section covered with sand.

In addition, a large variety of animal has been found in the experiment section. For example, kinds of duck stayed, looked for foods and took something like an alga in their mouth in the 18th stage. We can't tell what they eat actually, but we can find ducks which is looking for foods more at the site covered with purification materials (coal ash) than the site covered with sand. We don't know the reason yet.

Improvement of natural purification by food chain is expected.

What kind of living things live and thrive at the sand-covered area?





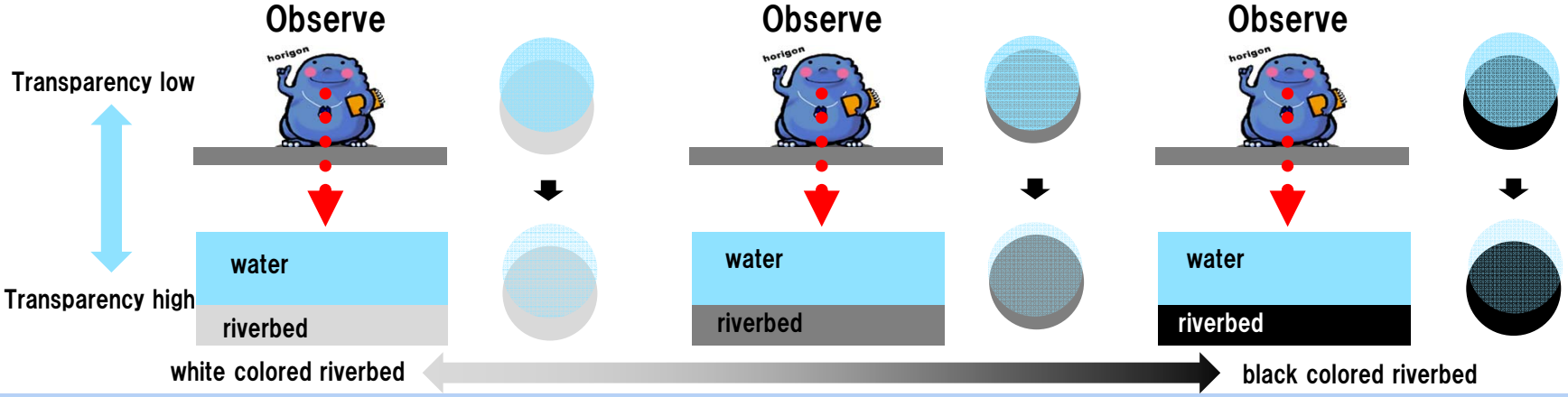
Grains of sand can be seen in the sand-covered section

6.2. Impression of water clearness

■ Which is your impression of Today's Horikawa?
Dirty？ Slightly dirty？ Ordinary？
Slightly clean？ Clean？
■ By which are you impressed?
Color？ Smell？ Transparency? Litters？
Bubbles? Living Things?

Source: 14th HSC report, p.15(revised and edited partly)

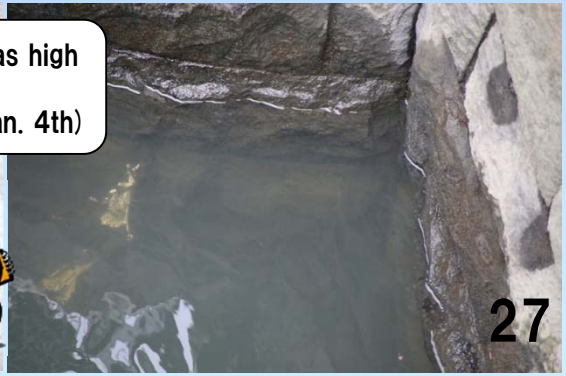
Transparency improve→see riverbed→impression become better？



Report：Horikawa Cheering Group (Sato Family)
2016.Jan.1 Nakatsuchido Bridge

Report：Secretariat
2016.Jan.4 Naya Bridge

Report：Secretaiiat
2016. Jan.12 Naya Bridge



Impression of Water Clearness (average in each section)

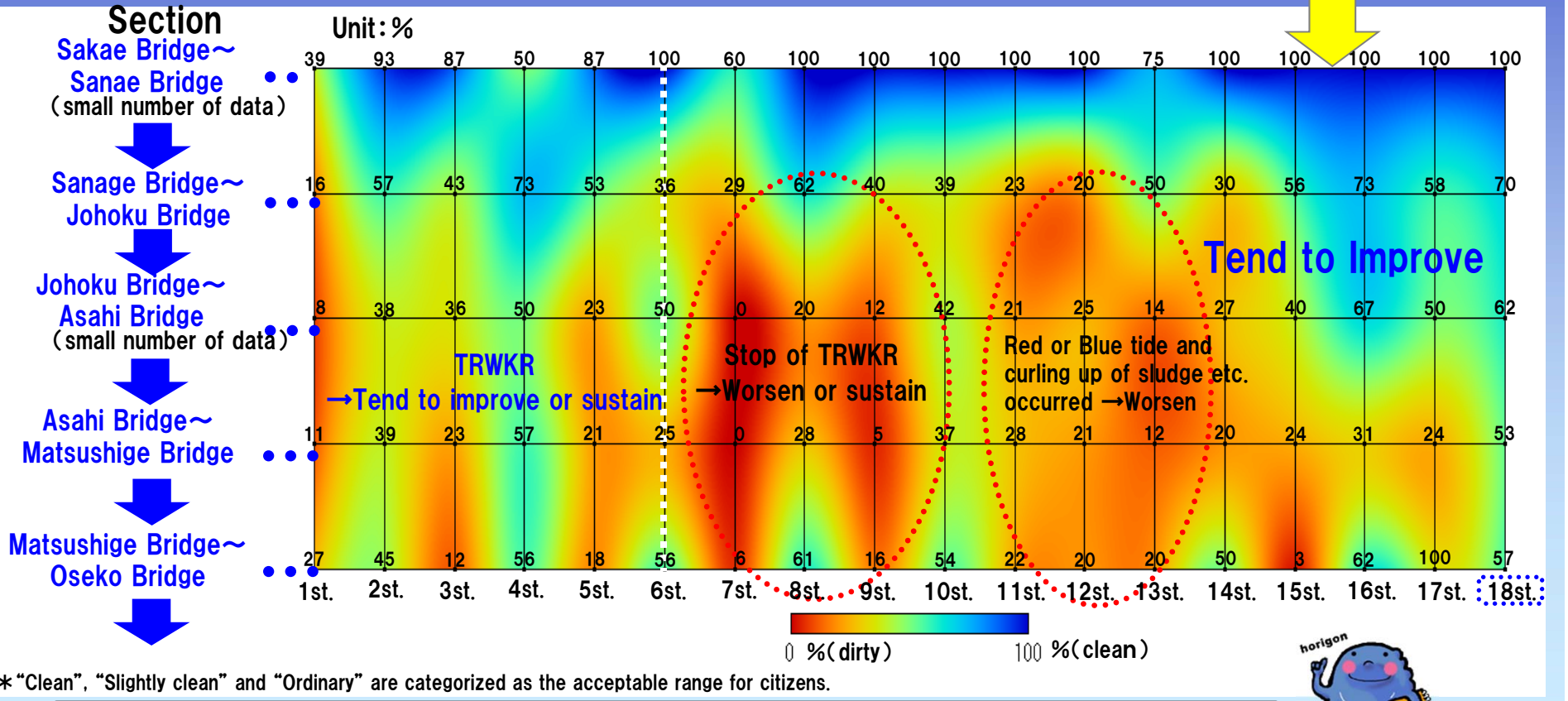
Ratio of "Clean"～"Ordinary"*

* except the data between Oseko Bridge and Minatoshin Bridge for not enough data

1st～6th stage : With TRWKR
No rain on the day and the previous day
7th～18th stage:No TRWKR
No rain on the day and the previous day

TRWKR

Form of pool and shoal
Utilization of shallow groundwater
Increasing of transmission from Shonai River
Covering sand etc.
Introduction of advanced water treatment at Meijo Water Treatment Center
In-service of Horikawa Ugan Rain-water Reservoir for pollution controll
Utilization of reclaimed wastewater at Moriyama Water Treatment Center



*"Clean", "Slightly clean" and "Ordinary" are categorized as the acceptable range for citizens.

Impression of water clearness, especially between Sanage and Asahi Bridge, is considered to tend to improve little by little by the effect of newly conduted water quality improvement measures as well as the change of citizen's awareness.

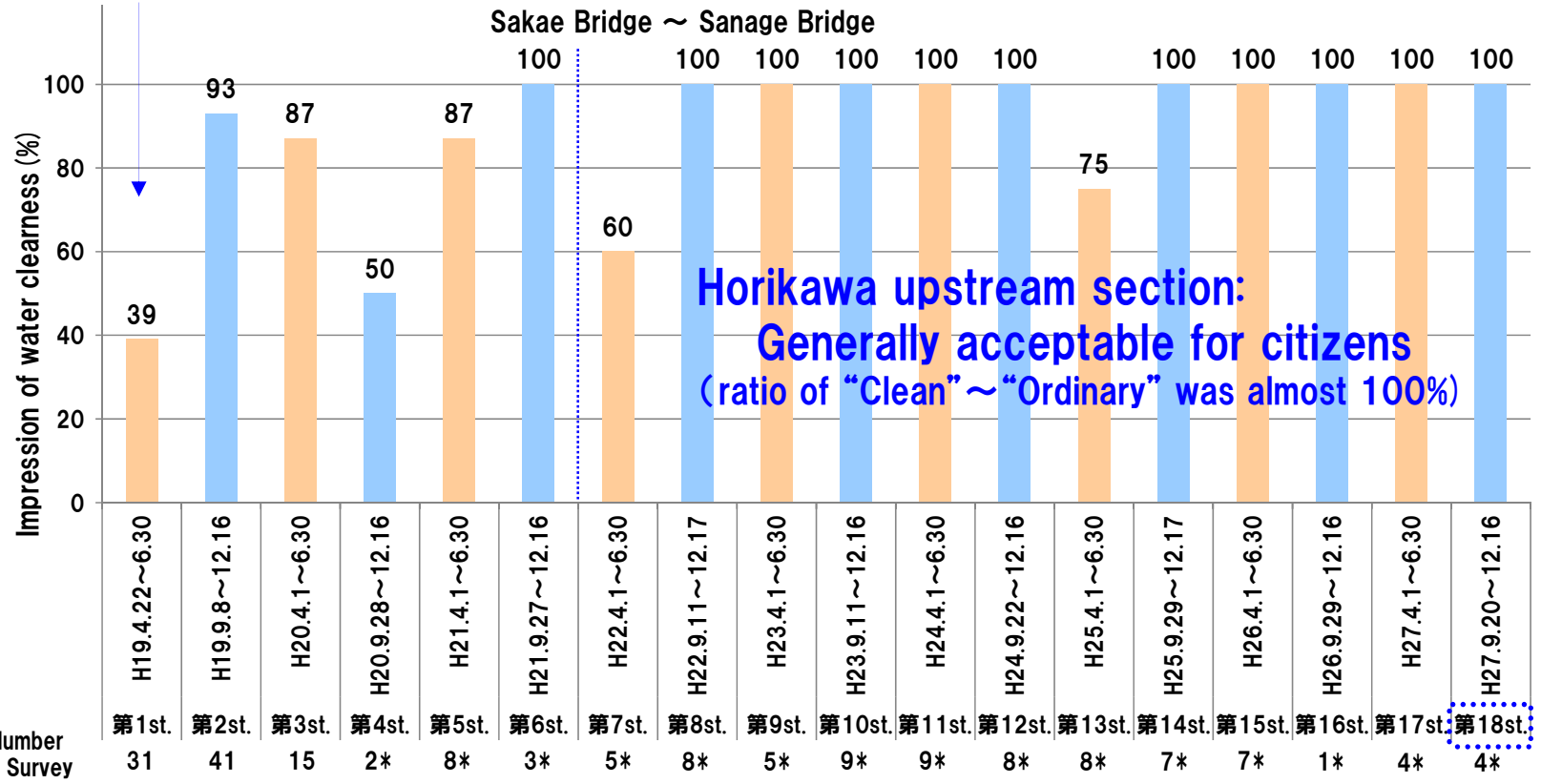
Upstream section

Impression of water clearness
Ratio of "Clean"～"Ordinary"*
(Sakae～Sanage Bridge_Ave.)

1st～6th stage : With TRWKR
No rain on the day and the previous day
7th～18th stage:No TRWKR
No rain on the day and the previous day

TRWKR
Form of pool and shoal
Utilization of shallow groundwater
Increasing of transmission from Shonai River
Covering Sand etc.
Introduction of advanced water treatment at Meijo Water Treatment Center
In-service of Horikawa Ugan Rain-water Reservoir for pollution controll
Utilization of reclaimed wastewater at Moriyama Water Treatment Center

25 of the 31 surveys were done at Kizune Bridge on Jun. 27th, many of them were "slightly dirty".



*small number of data

■ How did impression of water clearness change in the upstream section (between Sakae Bridge and Sanage Bridge)? Although number of data was small, ratio of "clean"～"ordinary" was almost 100%. Impression of water clearness changes **mostly in the acceptable range for citizens.**

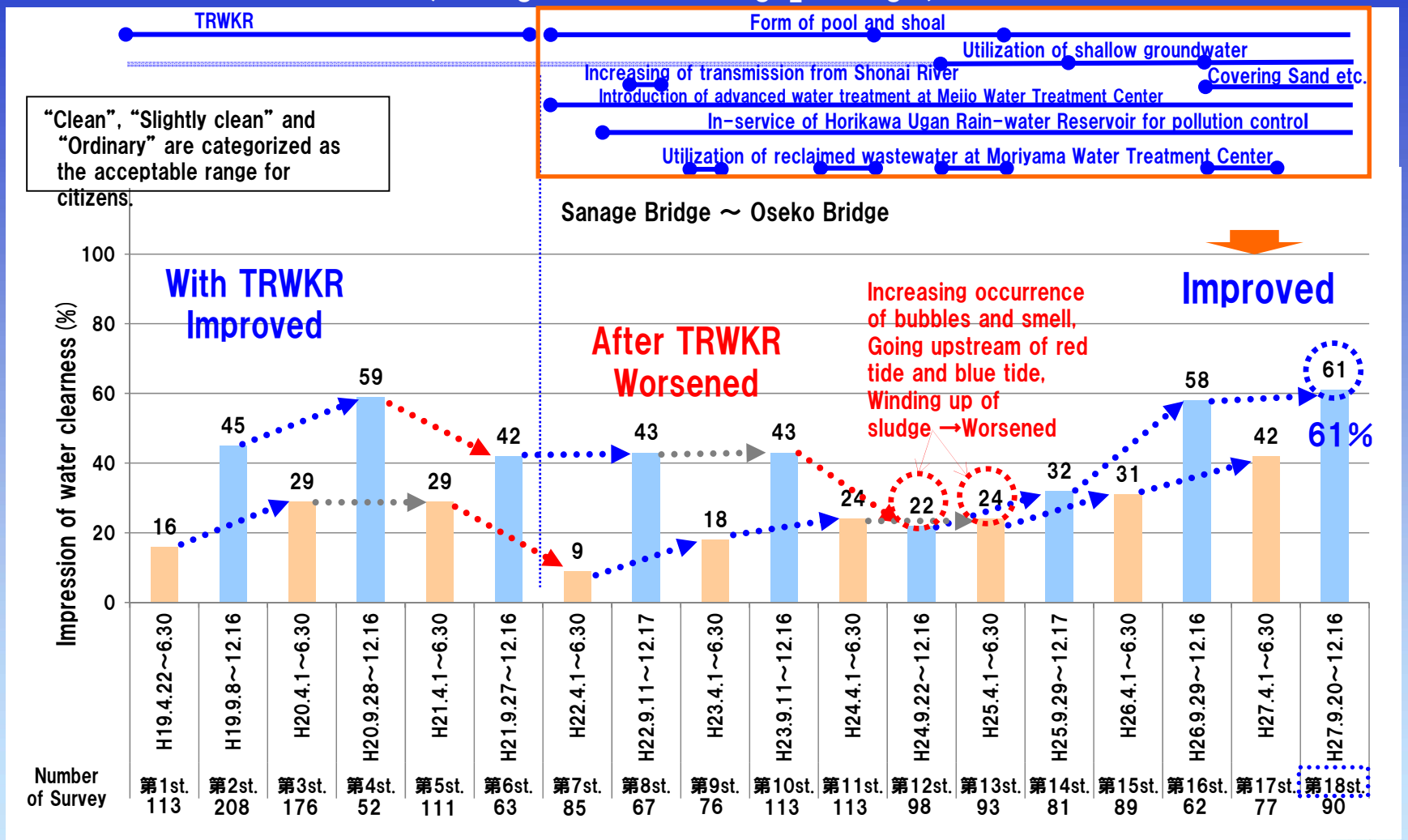
*"Clean", "Slightly clean" and "Ordinary" are categorized as the acceptable range for citizens.

Impression of water clearness
Ratio of “Clean”～“Ordinary”*

* except the data between Oseko Bridge and Minatoshin Bridge for not enough data

1st～6th stage : With TRWKR
No rain on the day and the previous day
7th～18th stage:No TRWKR
No rain on the day and the previous day

Mid・Downstream section （Sanage～Oseko Bridge_average）



■ How did the impression of water clearness change in the middle and downstream of Horikawa River (between Sanage Brdg. and Oseko Brdg.)? →Improving trend was seen (the ratio of “Clean”, “Slightly clean” and “Ordinary” was increased) during TRWKR. In the 7th stage after the stop of TRWKR, impression of water clearness was worsened. Moreover, in the 12th and 13th stage, it was worsened by increasing occurrence of bubbles and smell, going upstream of red tide and blue tide, and winding up of sludge. However, impression of water clearness was improved after that. It is considered that these trends are made by the effect of new water quality improvement measures. The ratio of “Clean”, “Slightly clean” and “Ordinary” was 61% in the 18th stage.

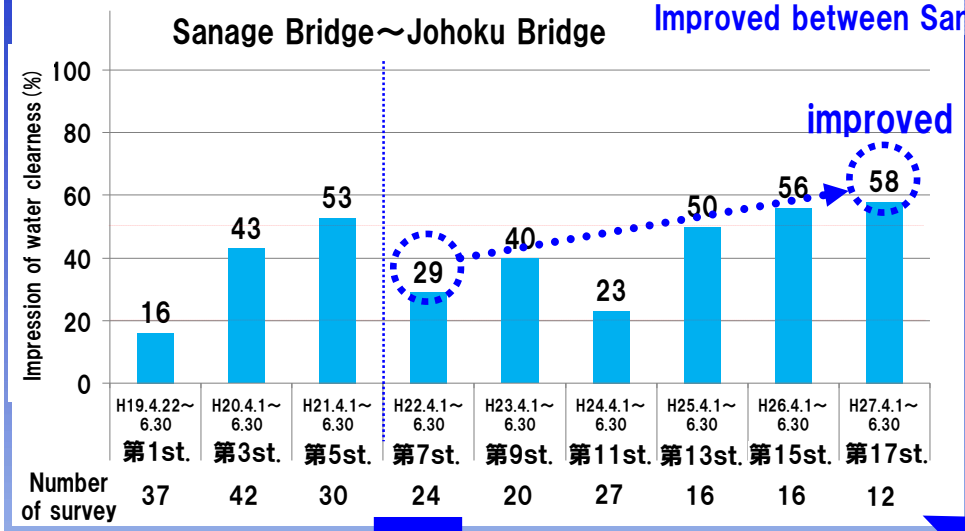
Impression of water clearness(Average)・・・Spring～Early Summer

Ratio of “Clean”～“Ordinary”

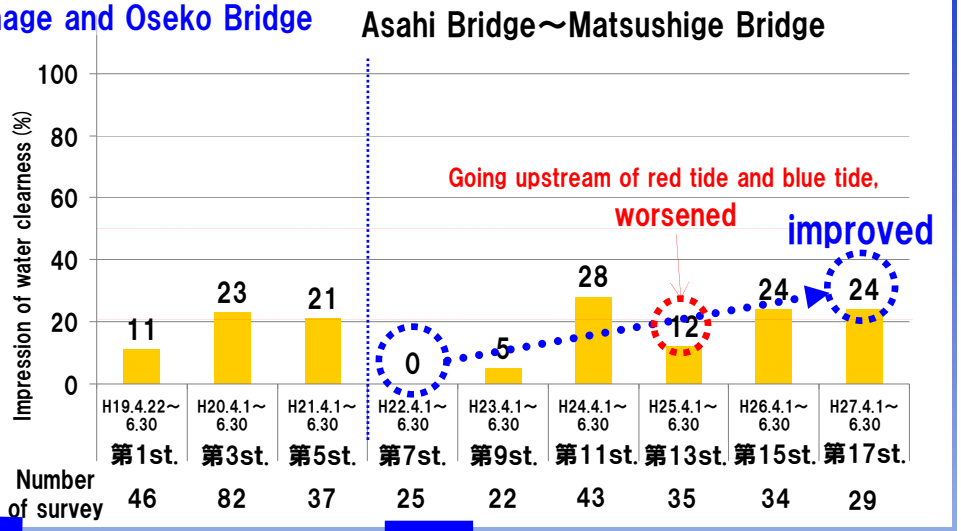
1st, 3rd, 5th stage : With TRWKR
No rain on the day and the previous day
7th, 9th, 11th, 13th, 15th, 17th stage:No TRWKR
No rain on the day and the previous day

Sanage Bridge～Johoku Bridge

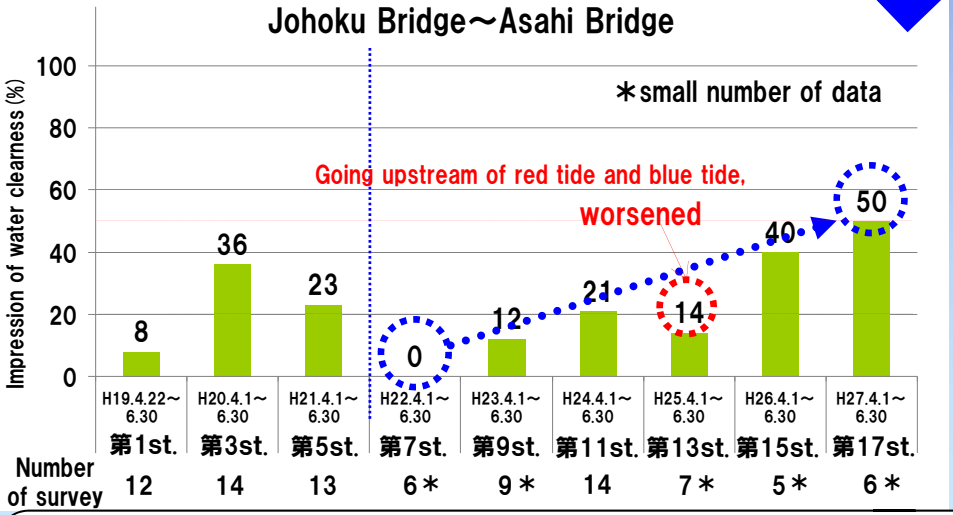
Improved between Sanage and Oseko Bridge



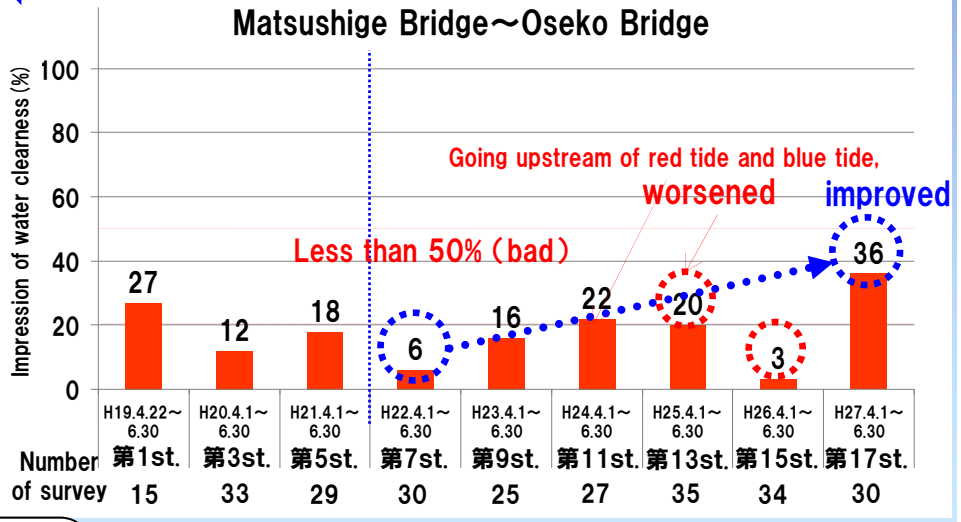
Asahi Bridge～Matsushige Bridge



Johoku Bridge～Asahi Bridge



Matsushige Bridge～Oseko Bridge

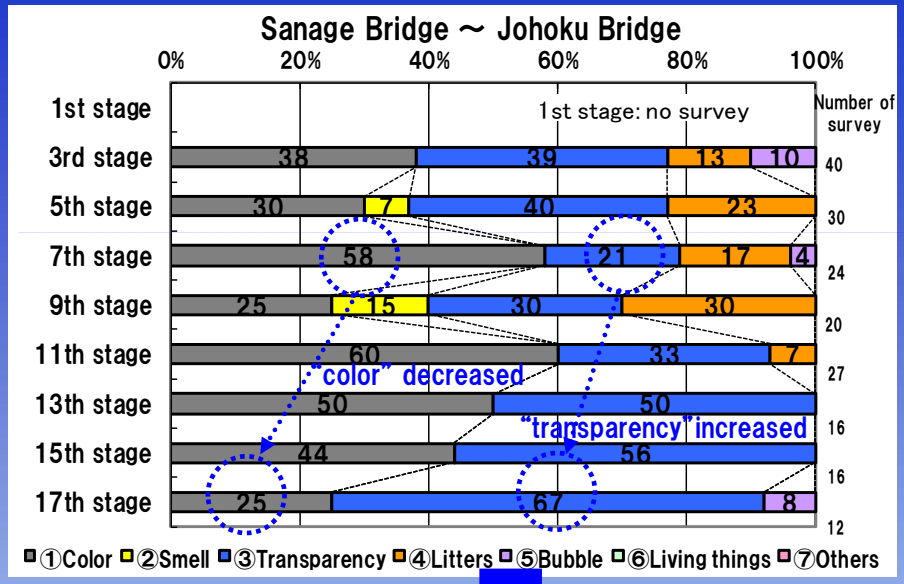


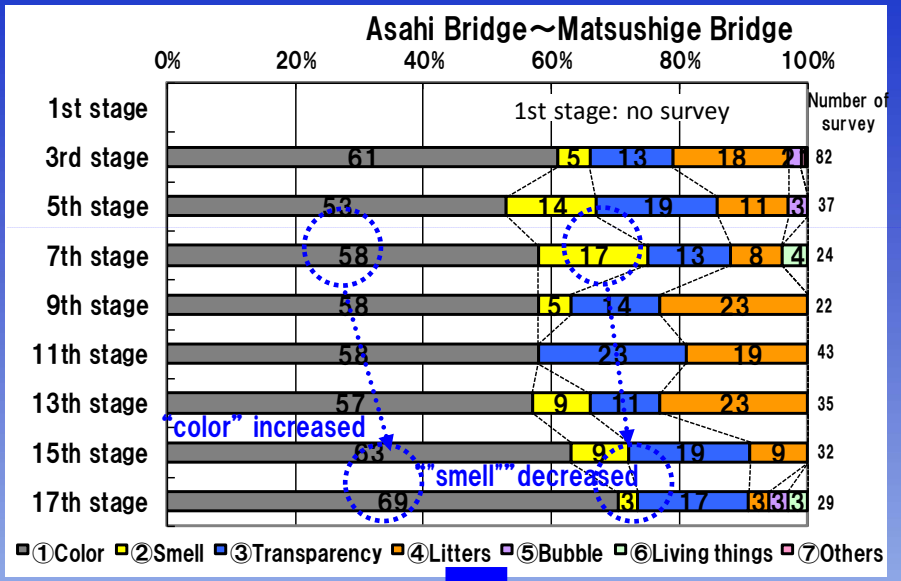
■ How did the impression of water clearness change in each section (spring to early summer)?
Impression of water clearness (Sanage Bridge～Oseko Bridge) was improved after the stop of TRWKR. The ratio of “Clean”, “Slightly clean” and “Ordinary” (Sanage Bridge ～Asahi Bridge) was improved to more than 50%. However, it was under 50% (bad) between Asahi Bridge to Oseko Bridge, need to be improved.

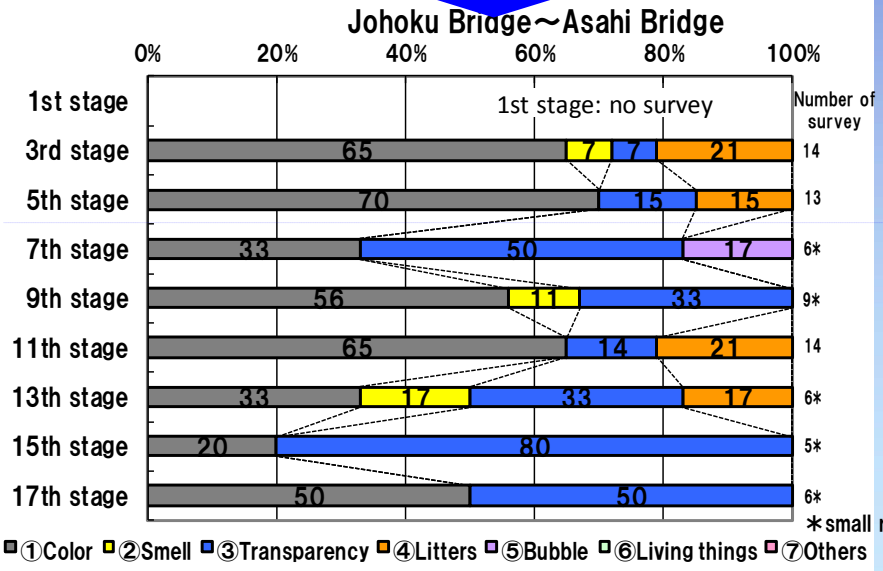
“Clean”, “Slightly clean” and “Ordinary” are categorized as the acceptable range for citizens.
Less than 50% ratio of “Clean”, “Slightly clean” and “Ordinary” is categorized as “bad” , and less than 20% as “especially bad”.

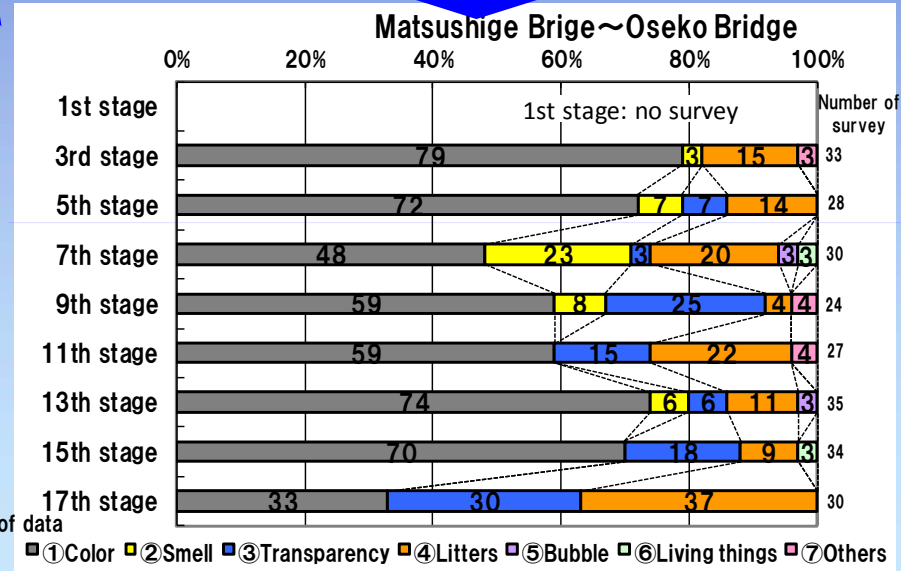
Evaluation of Impression of water clearness ・・・Spring～Early Summer

With TRWKR
No rain on the day and the previous day









Note: 0% item isn't displayed

■ How did the evaluation of impression water clearness (spring ～ early summer) in each sections change?
→Between Sanage Brdige and Johoku Bridge, "Color" decreased and "Transparency" increased after the stop of TRWKR. On the other hand, between Asahi Bridge and Matsushige Bridge, "Color" increased and "Smell" decreased.
Transparency was improved between Sanage Bridge and Johoku Bridge because of improved transparency.

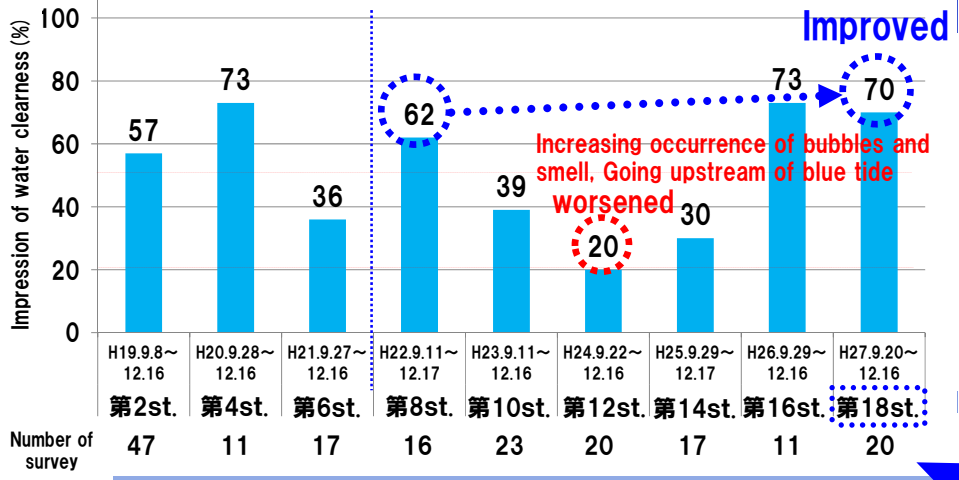
Impression of water clearness(Average)・・・Autumn～Early Winter

Ratio of “Clean”～“Ordinary”

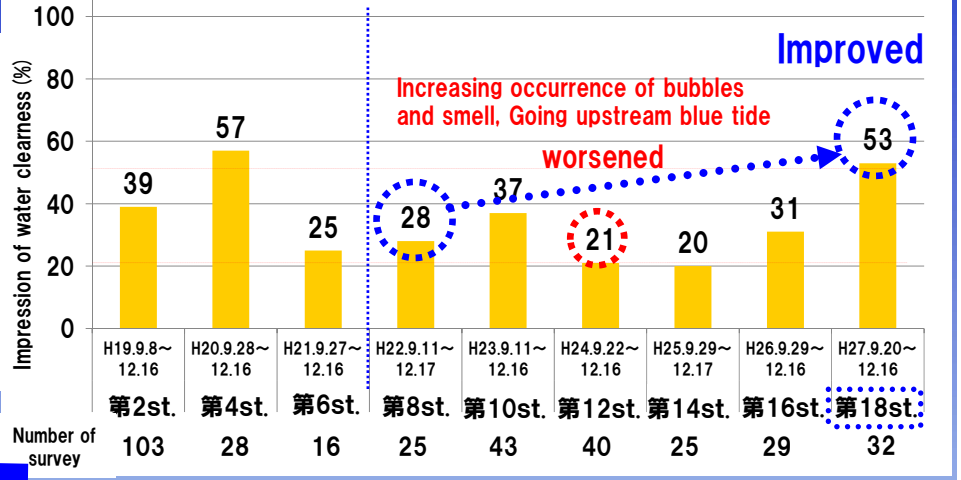
2nd, 4th, 6th stage : With TRWKR
No rain on the day and the previous day
8th, 10th, 12th, 14th, 16th, 18th stage:No TRWKR
No rain on the day and the previous day

Sanage Bridge～Johoku Bridge

Improved between Sanage and Matsushige Bridge

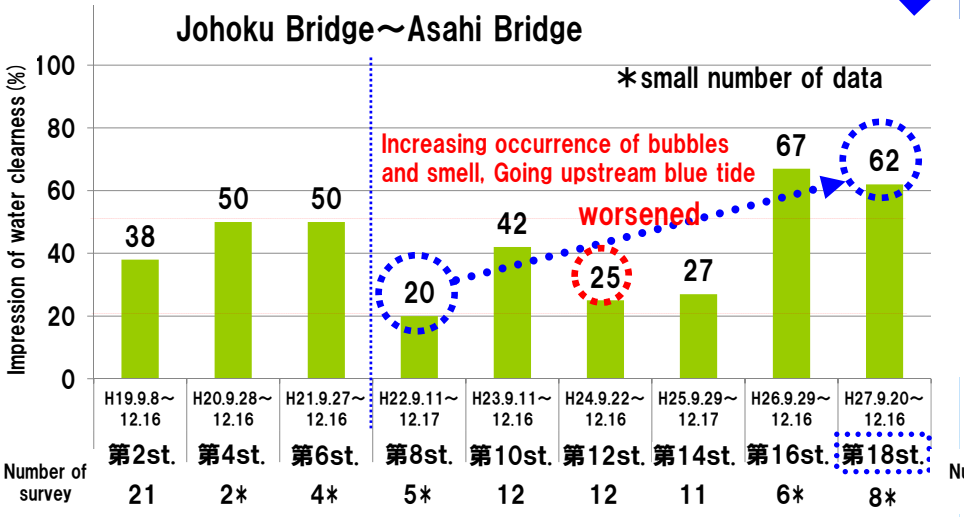


Asahi Bridge～Matsushige Bridge



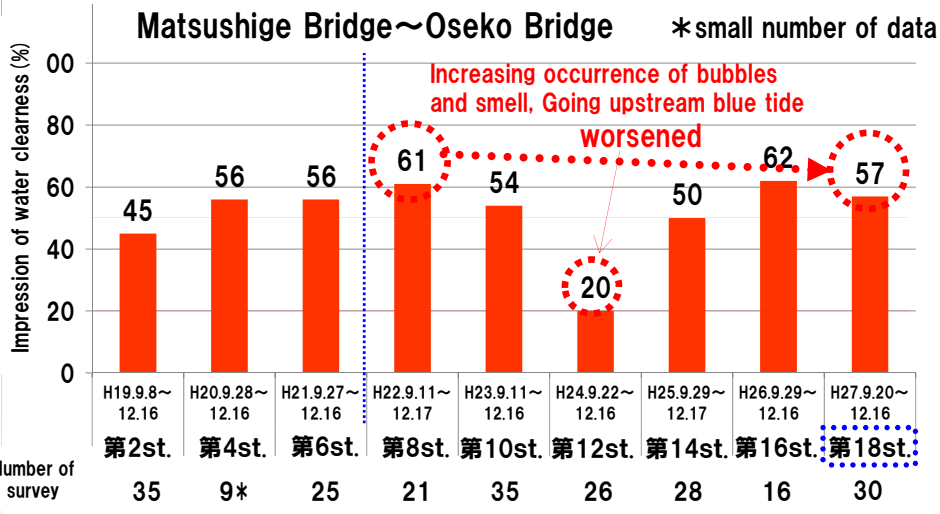
Johoku Bridge～Asahi Bridge

＊small number of data



Matsushige Bridge～Oseko Bridge

＊small number of data

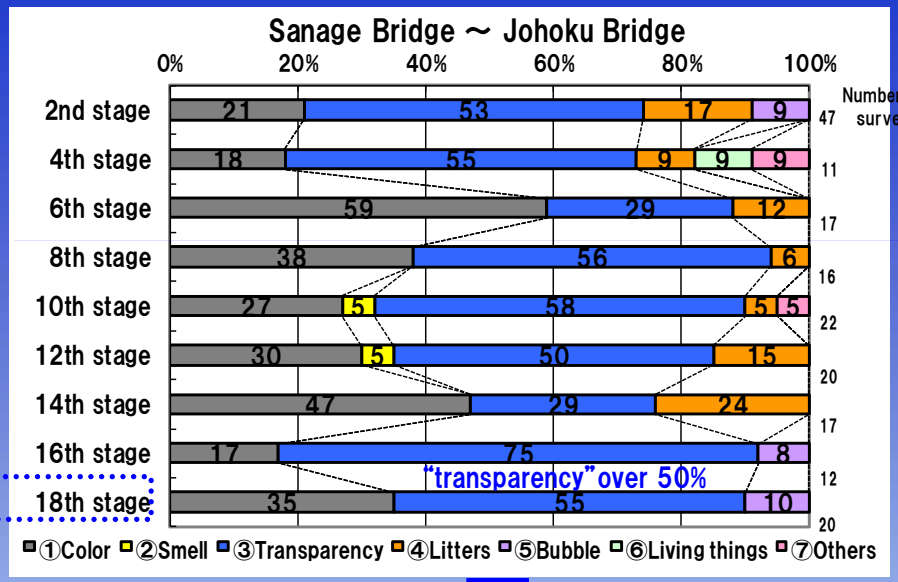


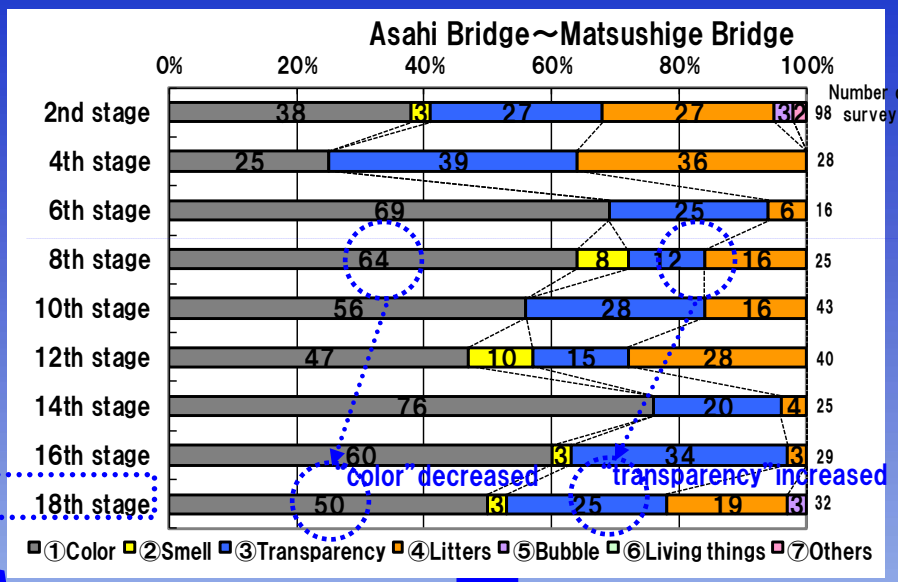
■ How did the impression of water clearness change in each section (autumn to early winter)?
Impression of water clearness between Sanage Bridge and Matsushige Bridge was improved after the stop of TRWKR. The ratio of all sections were over 50% at the 18th stage.

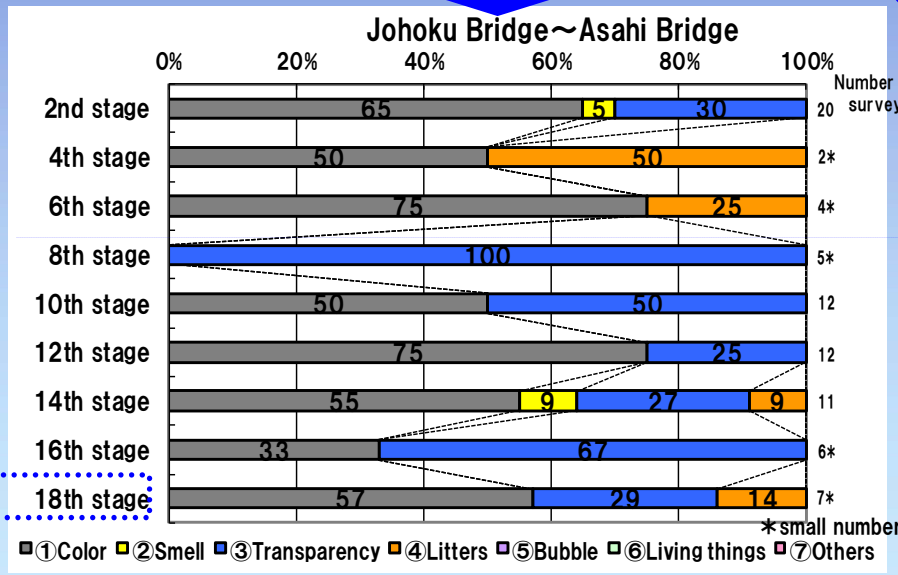
“Clean”, “Slightly clean” and “Ordinary” are categorized as the acceptable range for citizens.
Less than 50% ratio of “Clean”, “Slightly clean” and “Ordinary” is categorized as “bad” , and less than 20% as “especially bad”.

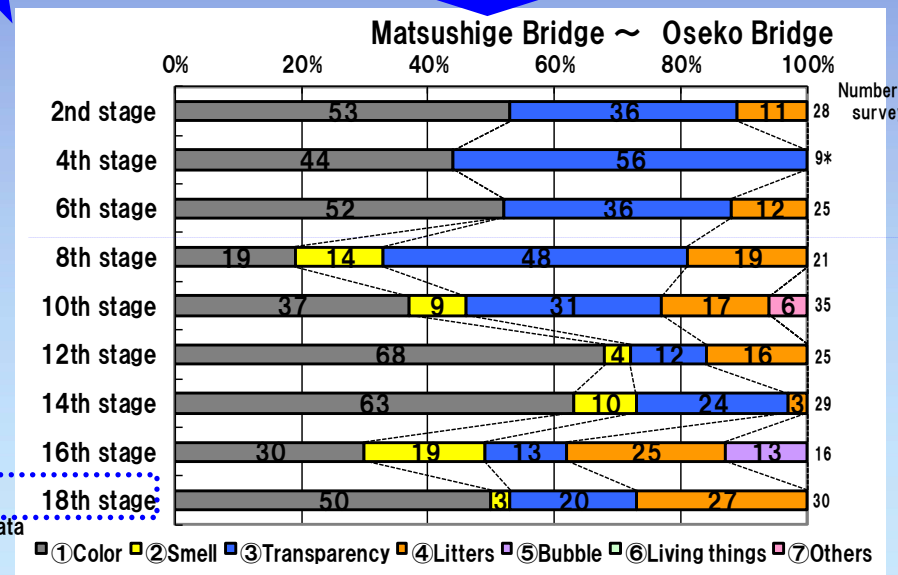
Evaluation of Impression of water clearness ・・・Autumn～Early Winter

With TRWKR
No rain on the day and the previous day









Note: 0% item isn't displayed

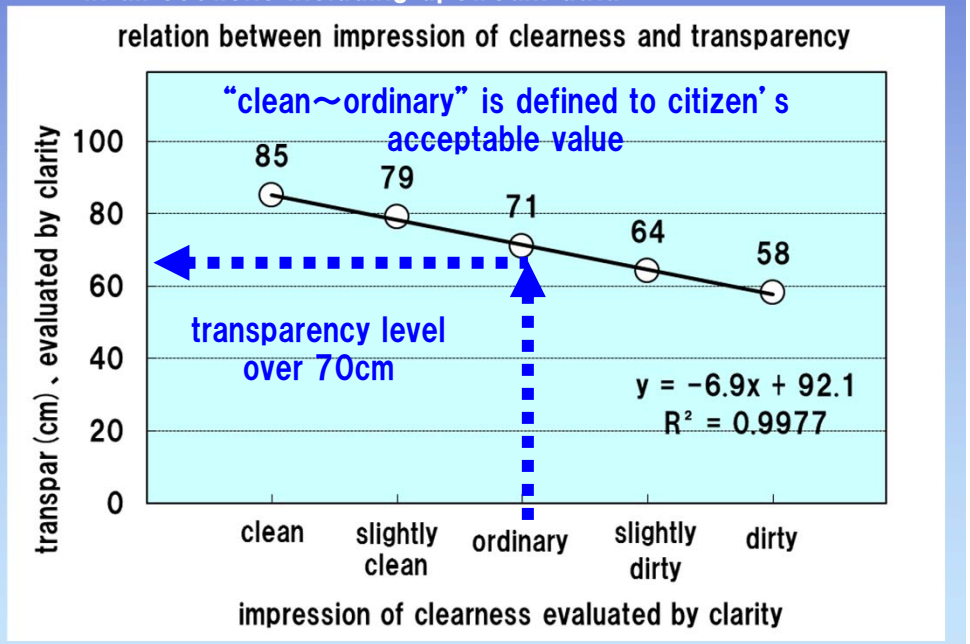
■ How did the evaluation of impression water clearness (autumn～early winter) in each sections change?
→Ratio of "transparency" (Sanage Bridge～Johoku Bridge) was almost more than 50% after the stop of TRWKR.
"Color" was decreased and "Transparency" was increased between Asahi Bridge and Matsushige Bridge.

6.3 Transparency


photo:Goyosuiato Gaien Aigo Chosatai

Relation between impression of clearness and transparency

- 2nd stage ～ 18th stage, No rain, including data outside the specified period
- evaluated by clarity
- in all sections including upstream data



citizen's acceptable value of transparency level is over 70cm

Change of transparency (section average)

Except the data between Oseko Bridge and Minatoshin Bridge for not enough data

1st ～ 6th stage : With TRWKR
No rain on the day and the previous day

7th ～ 18th stage : No TRWKR
No rain on the day and the previous day

With TRWKR

Creation of deep water and rapids

Utilization of shallow groundwater

Increasing volume of transmission water from Shonai River

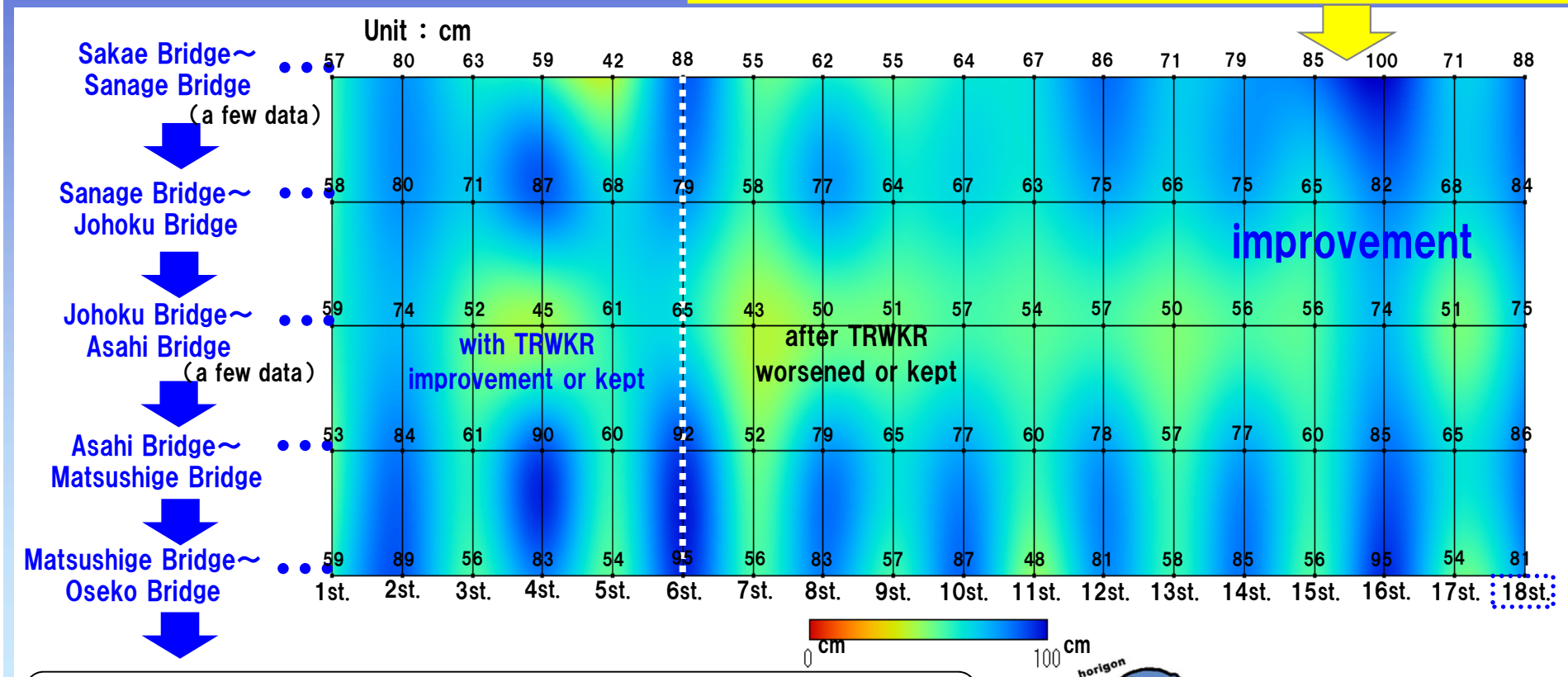
Covering sand

Introduction of advanced water treatment at Meijo Water treatment Center

In- service of Horikawa Ugan Rain-water reservoir for pollution control

Utilization of reclaimed wastewater at Moriyama Water Treatment Center

(Survey section)



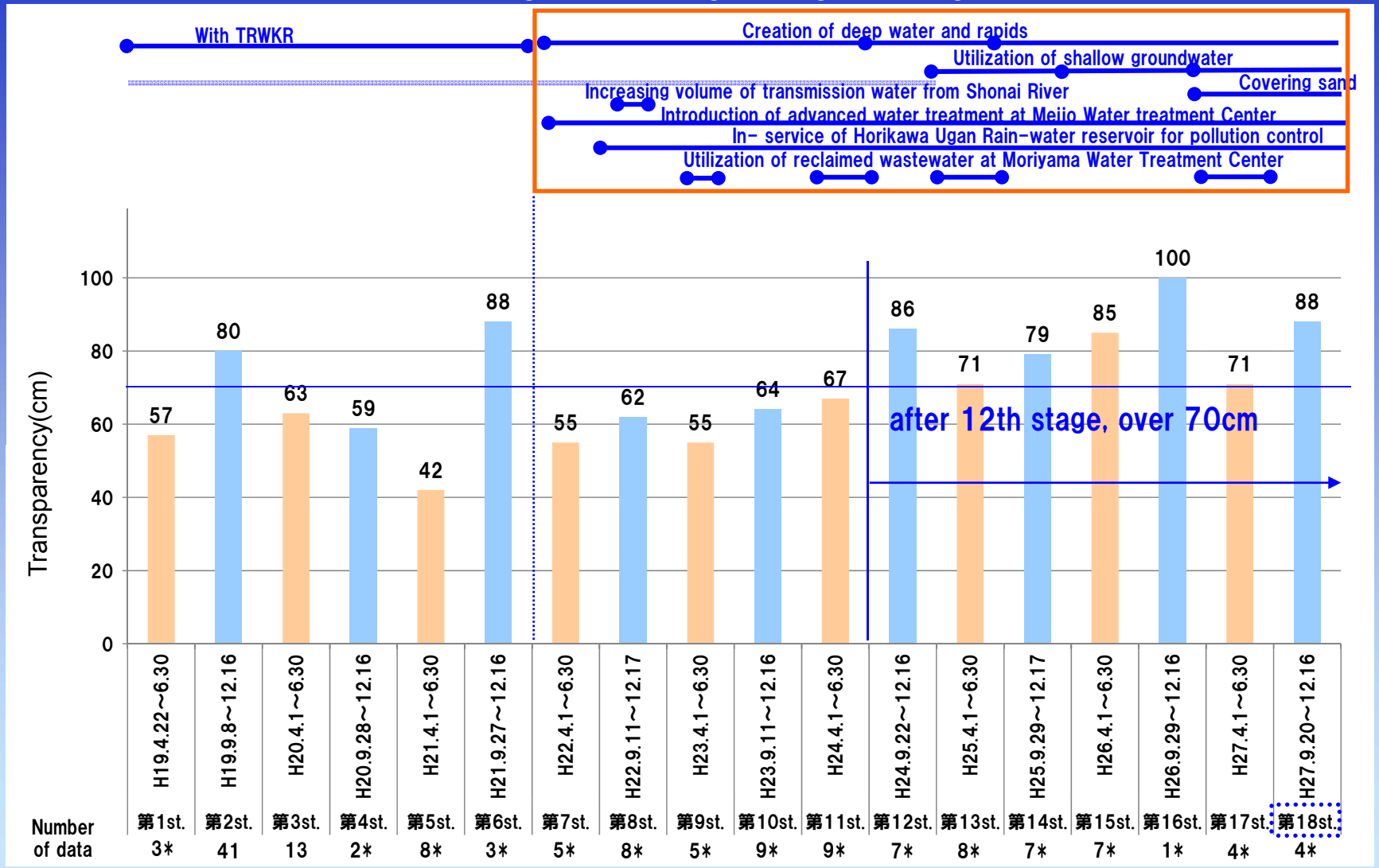
Transparency has a tendency to be improved Between Sanage Bridge and Asahi Bridge mainly in the stage from autumn to early winter. We think it's an effect of the New measures for water quality improvement after TRWKR.

citizen's acceptable value of transparency level is over 70cm

Change of transparency

Upstream section (between Sakae Bridge and Sanage Bridge, average)

1st ～ 6th stage : With TRWKR
No rain on the day and the previous day
7th ～ 18th stage : No TRWKR
No rain on the day and the previous day



* not enough data

citizen's acceptable value of transparency level is over 70cm

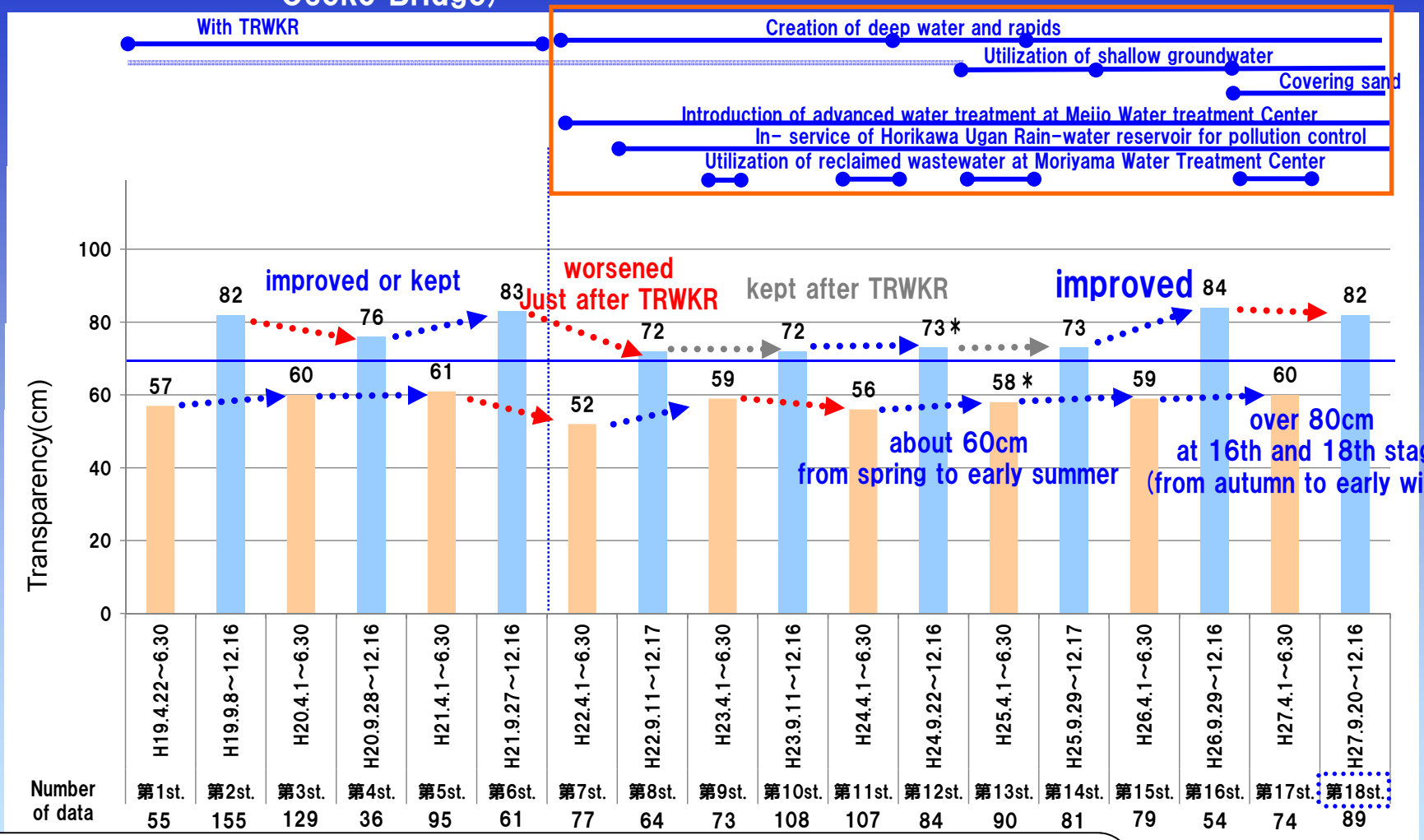
■Change of transparency in the upstream section, between Sakae Bridge and Sanage Bridge, There are not enough data, but transparency level in 12th stage was over 70cm.

Change of transparency

Middle and downstream section (between Sanage Bridge and Oseko Bridge)

1st ～ 6th stage : With TRWKR
No rain on the day and the previous day

7th ～ 18th stage : No TRWKR
No rain on the day and the previous day

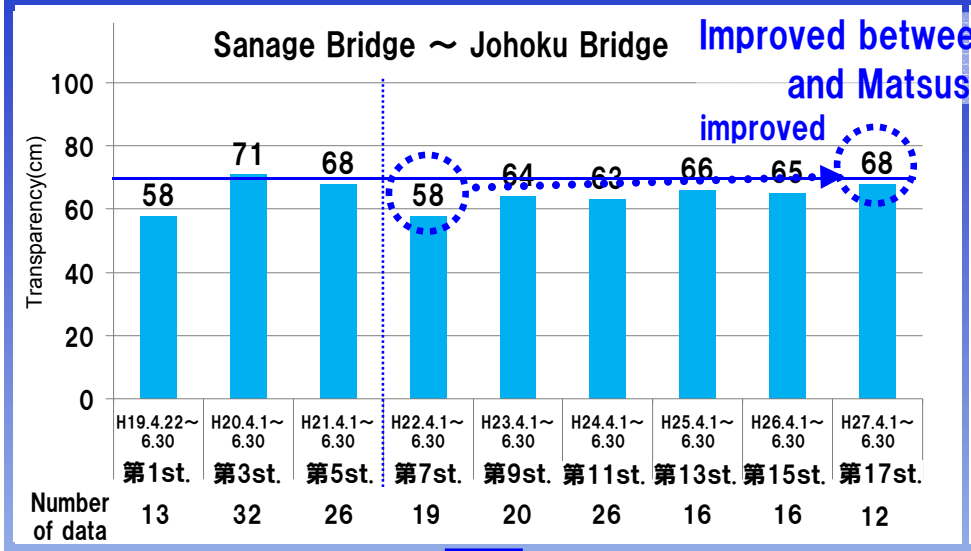


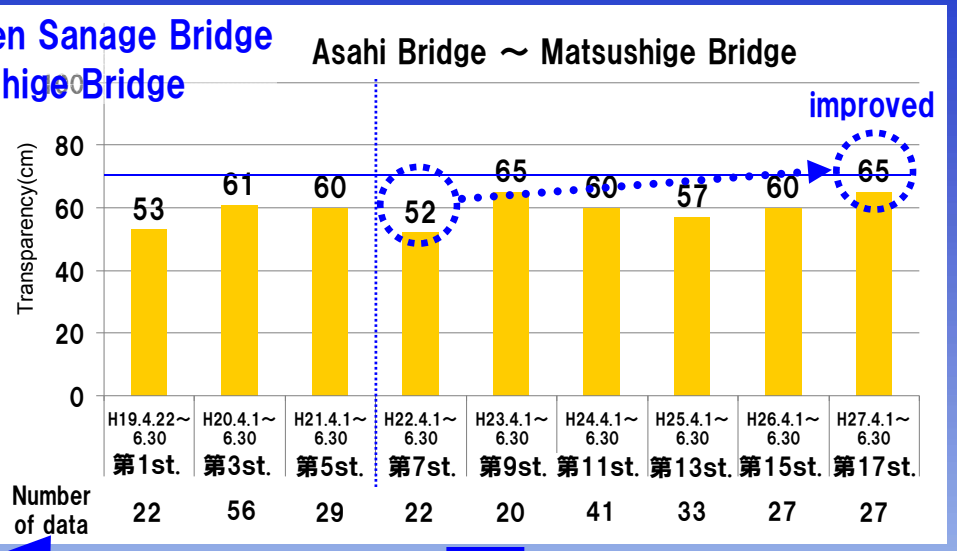
■How did the transparency change in the middle and downstream section (Sanage Bridge ～ Oseko Bridge)?
It was tend to be improved with TRWKR and worsened after TRWKR.
It was kept at about 60cm from Spring to early Summer and over 70cm from Autumn to early Summer after TRWKR, and improved to over 80cm after the 16th stage.
＊The blue tide, red tide and raising up of sludge were found in the12th and 13th stage but they don't affect very much. We think it's because we sampled surface fresh water.

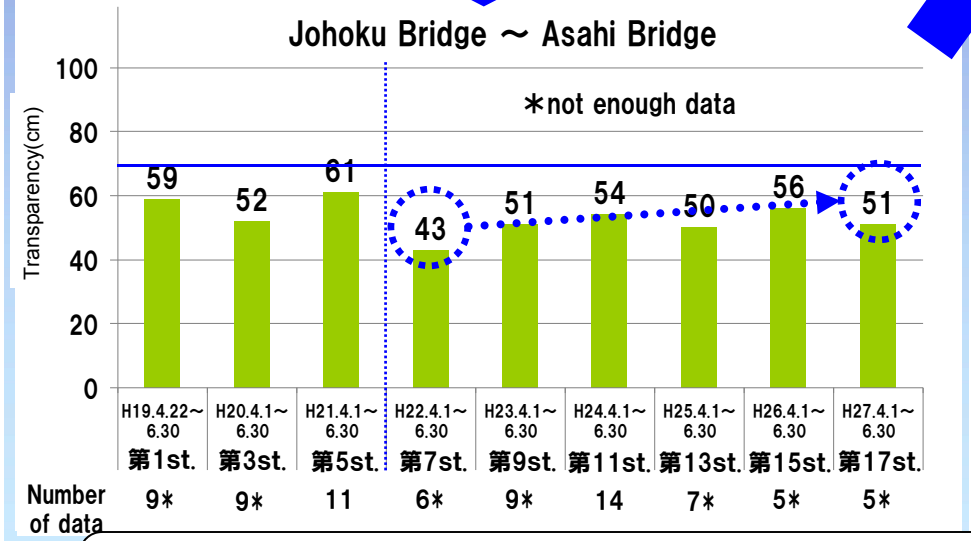
"citizen's acceptable value of transparency level is over 70cm

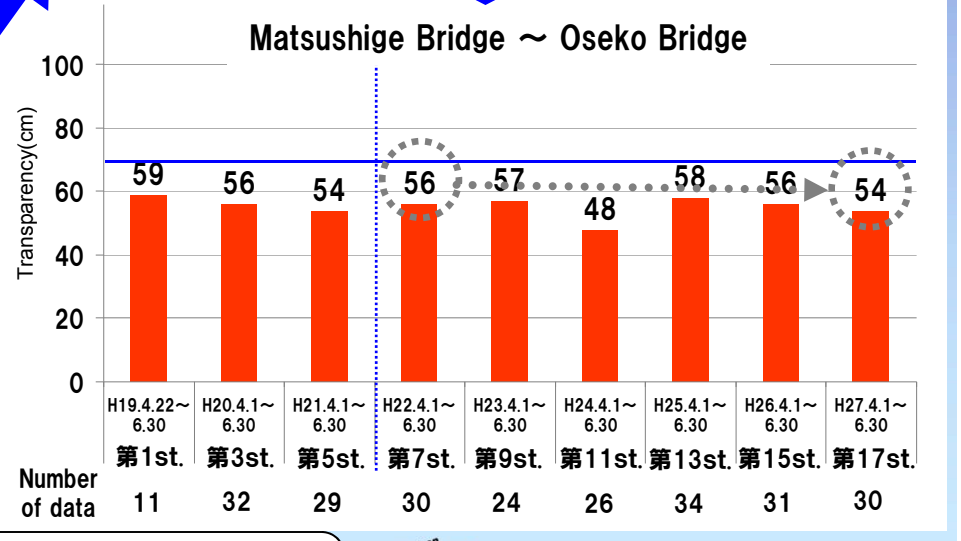
Change of transparency section average, from Spring to early Summer

1st, 3rd, 5th stage : With TRWKR
No rain on the day and the previous day
7th, 9th, 11th, 13th, 15th, 17th stage : No TRWKR
No rain on the day and the previous day









The transparency from spring to early summer is tend to be improved between Sanage Bridge and Matsushige Bridge but that level is under 70cm. It is 68cm between Sanage Bridge and Johoku Bridge, only 2cm below citizen's acceptable level.

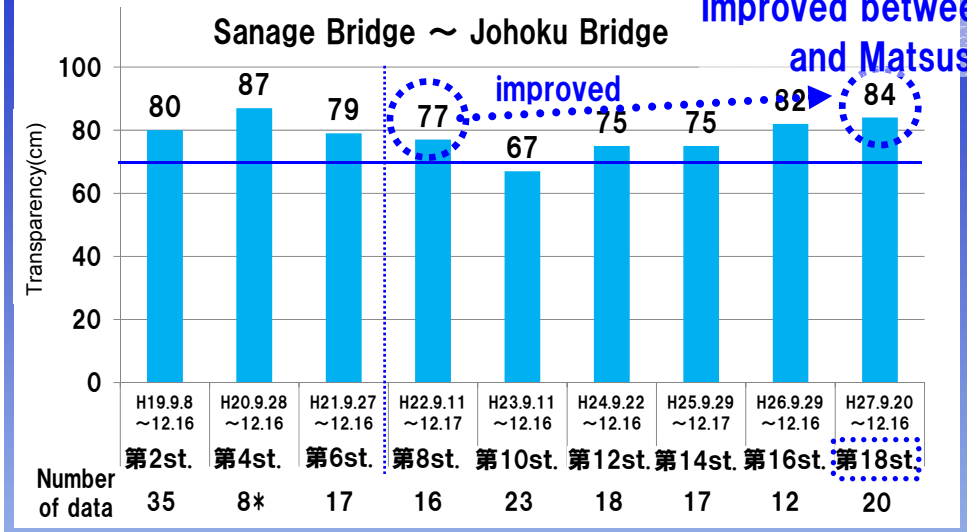
citizen's acceptable value of transparency level is over 70cm

Change of transparency section average, from Autumn to early Winter

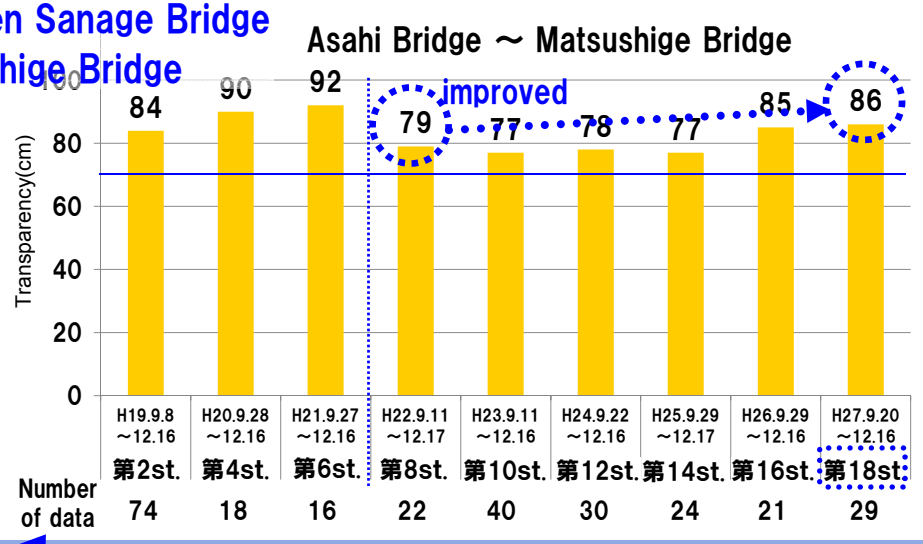
2nd, 4th, 6th stage : With TRWKR
No rain on the day and the previous day
8th, 10th, 12th, 14th, 16th, 18th stage : No TRWKR
No rain on the day and the previous day

Improved between Sanage Bridge and Matsushige Bridge

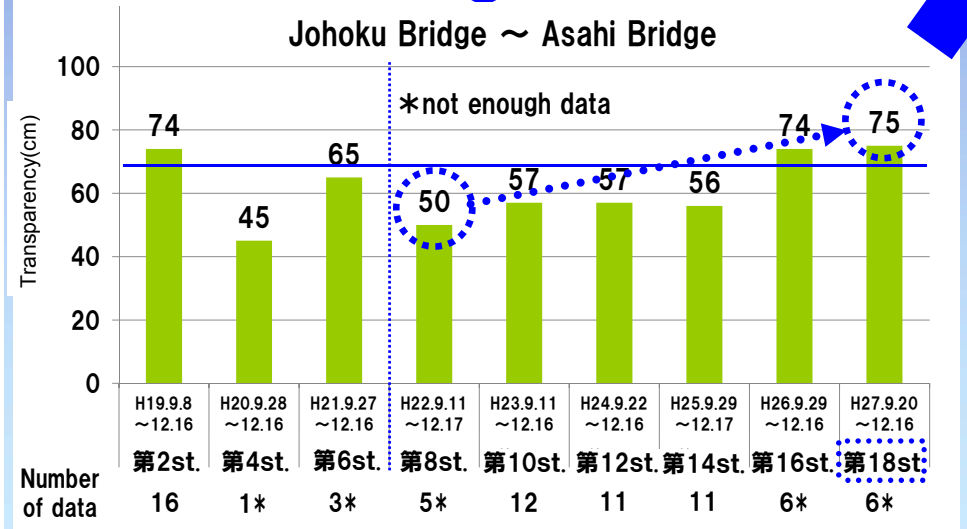
Sanage Bridge ～ Johoku Bridge



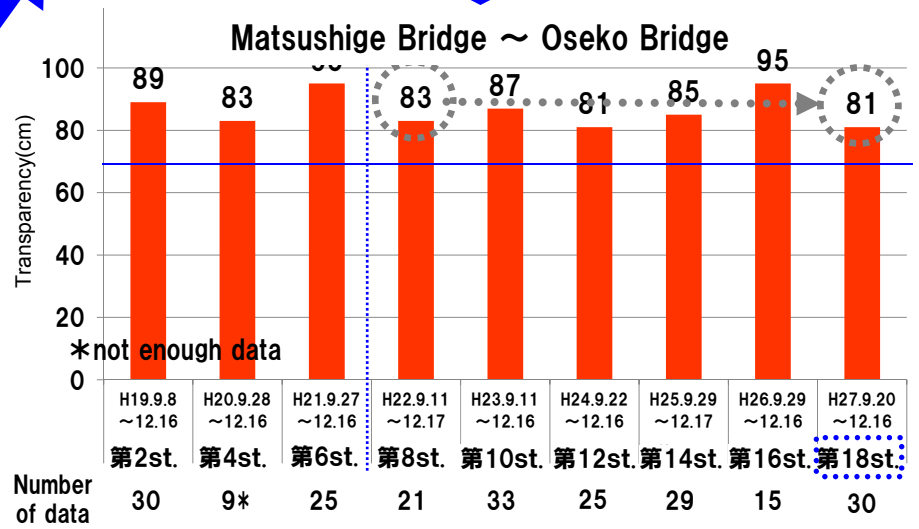
Asahi Bridge ～ Matsushige Bridge



Johoku Bridge ～ Asahi Bridge



Matsushige Bridge ～ Oseko Bridge



The transparency is tend to be improved and that level is over 70cm between Sanage Bridge and Matsushige Bridge from autumn to early winter.

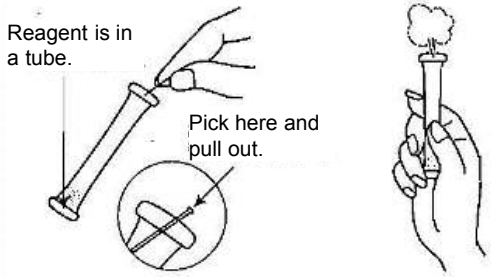
citizen's acceptable value of transparency level is over 70cm

6.4. COD

Chemical Oxygen Demand. It means degree of water pollution by organic substance in the sea, lakes and marshes mainly. It is volume of oxygen which react on organic substance in water.

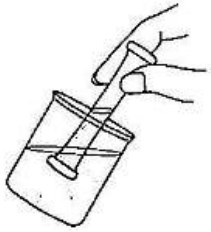
COD pack test

How to test

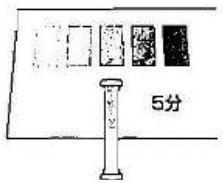


1. Pull plug out.

2. Put air out.



3. Absorb water from intake hole.



4. Compare the color with check sheet, after 5 minutes .

Change of COD (average in some sections)

Section between the Minatoshin Bridge and the Oseko Bridge is excepted

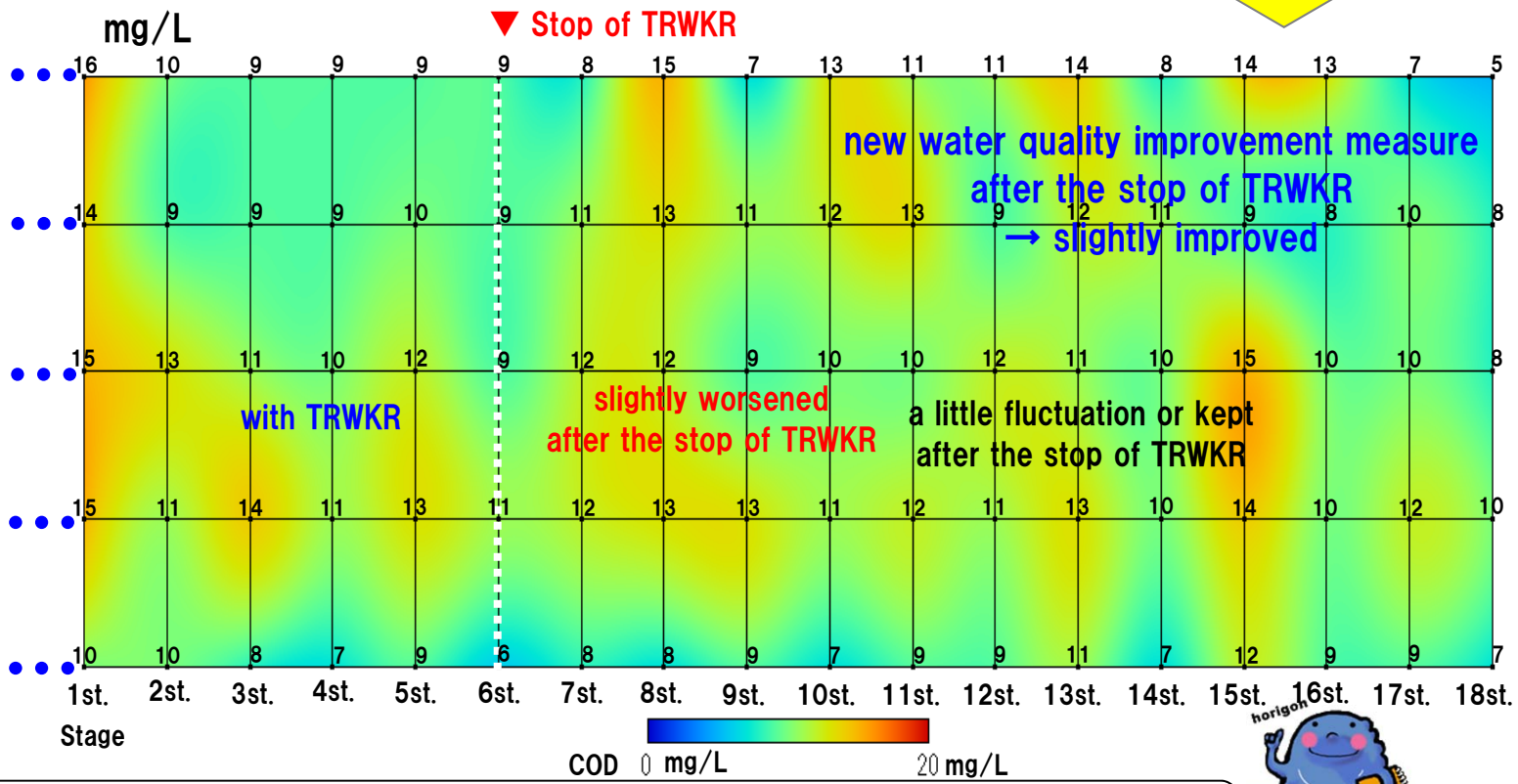
1st – 6th stage : With TRWKR
No rain on the day and the previous day
7th – 18th stage : No TRWKR
No rain on the day and the previous day
(not enough data)

New water quality improvement measure by Nagoya City

- With TRWKR
- Making of diversionary flow
- Utilization of groundwater
- Raw Water Transmission from the Shonai River
- Coverage the sludge with clarification materials
- Introduction of advanced water treatment at Meijo Water Treatment Center
- Service of Horikawa Ugan Rainwater Reservoir for pollution control
- Utilization of reclaimed wastewater from Moriyama Water Treatment Center

《Section》

- Sakae Bridge–Sanage Bridge (not enough data)
- Sanage Bridge – Johoku Bridge
- Johoku Bridge – Asahi Bridge (not enough data)
- Asahi Bridge – Matsushige Bridge
- Matsushige Bridge – Oseko Bridge

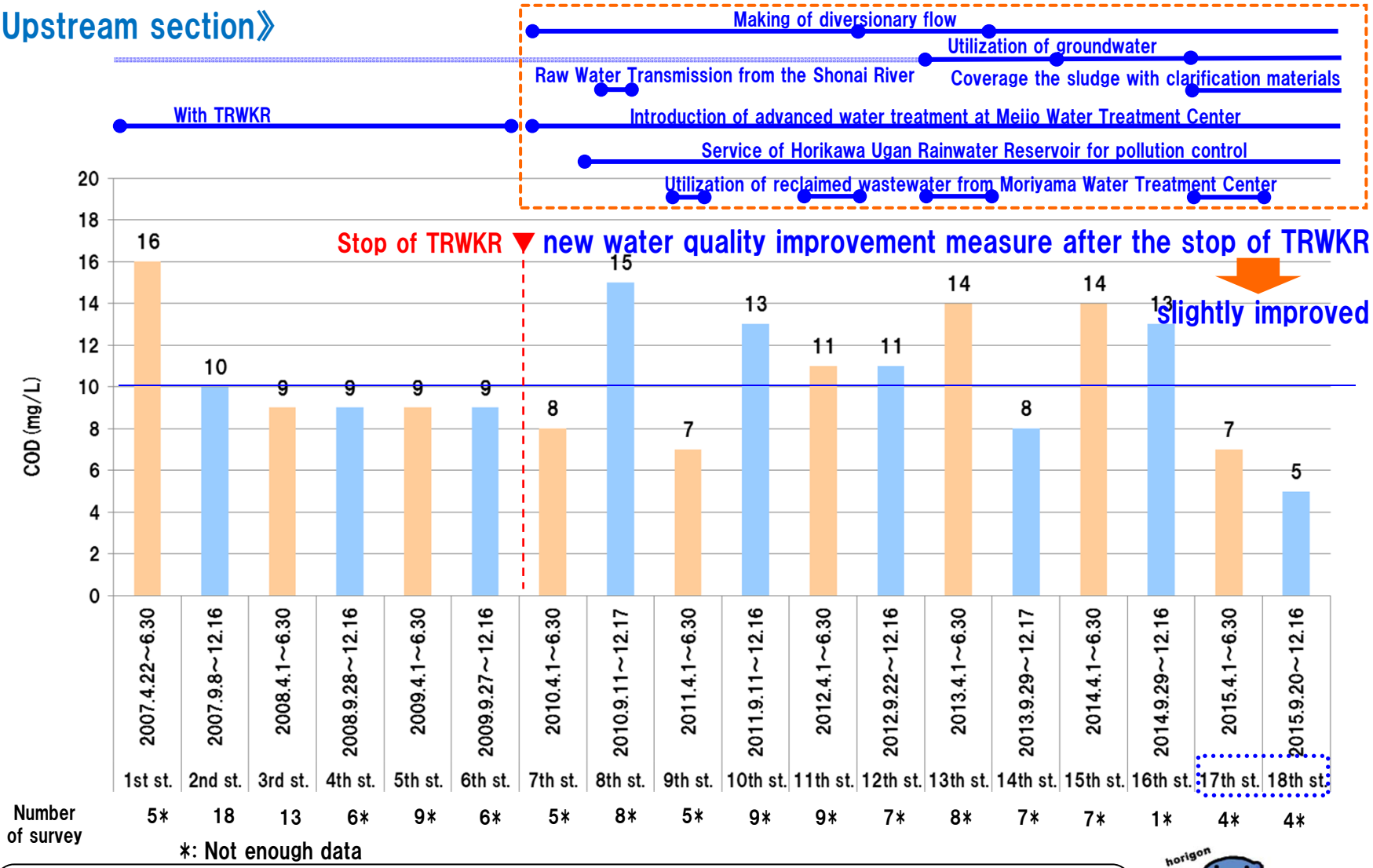


We think that the COD readings have been better between the Sanage Bridge and the Asahi Bridge mainly because of effect by new water quality improvement measure after the stop of TRWKR.

Change of COD
(average between the Sakae Bridge and the Sanage Bridge)

1st – 6th stage : With TRWKR
No rain on the day and the previous day
7th – 18th stage : No TRWKR
Change of COD No rain on the day and the previous day

《Upstream section》

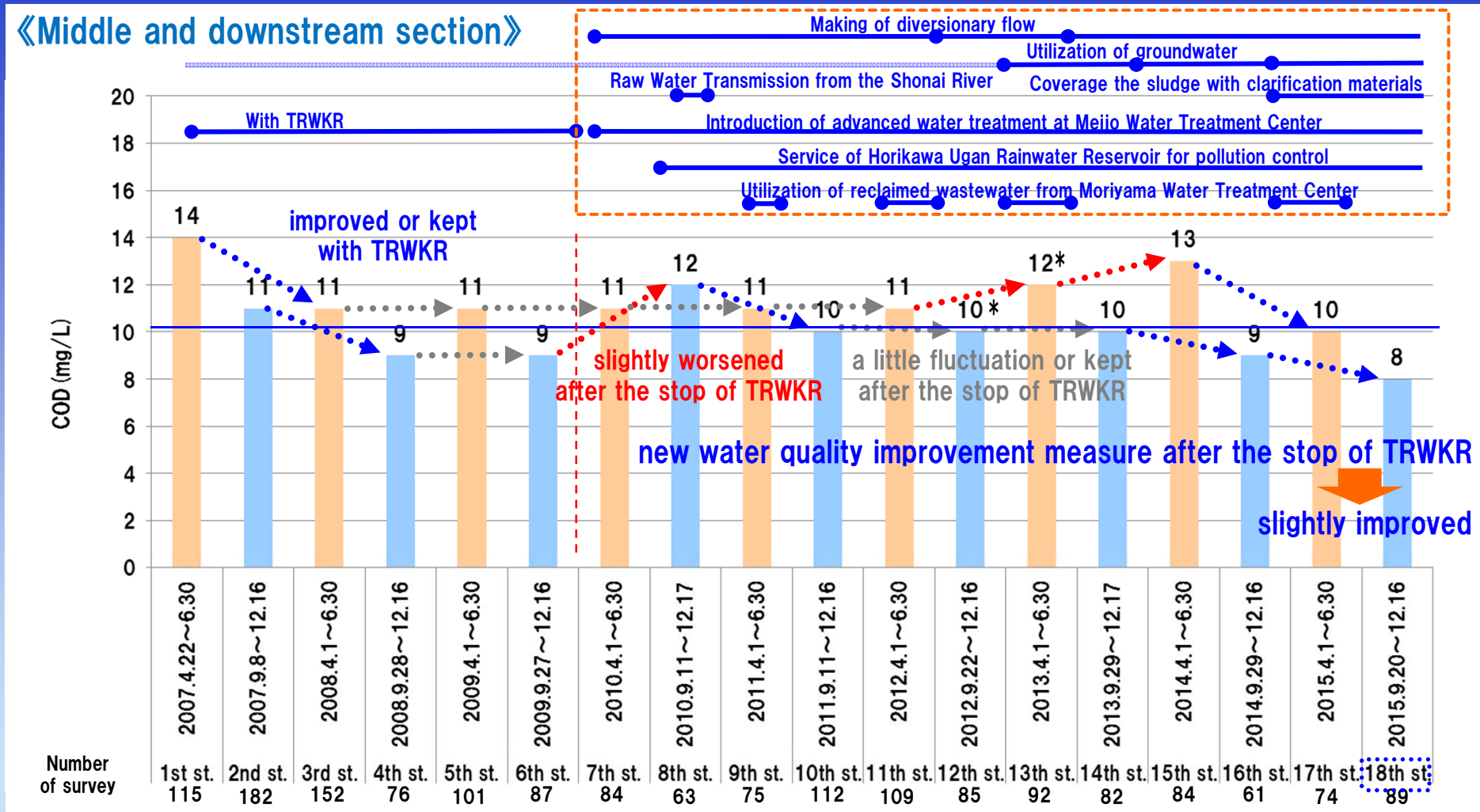


*: Not enough data

■ How did COD change in the upstream section (between the Sakae Bridge and the Sanage Bridge)
→ COD is over 10mg/L more frequently after 8th stage. It was below 10mg/L in the 17th and 18th stage.

Change of COD
(average between the Sanage Bridge and the Oseko Bridge)

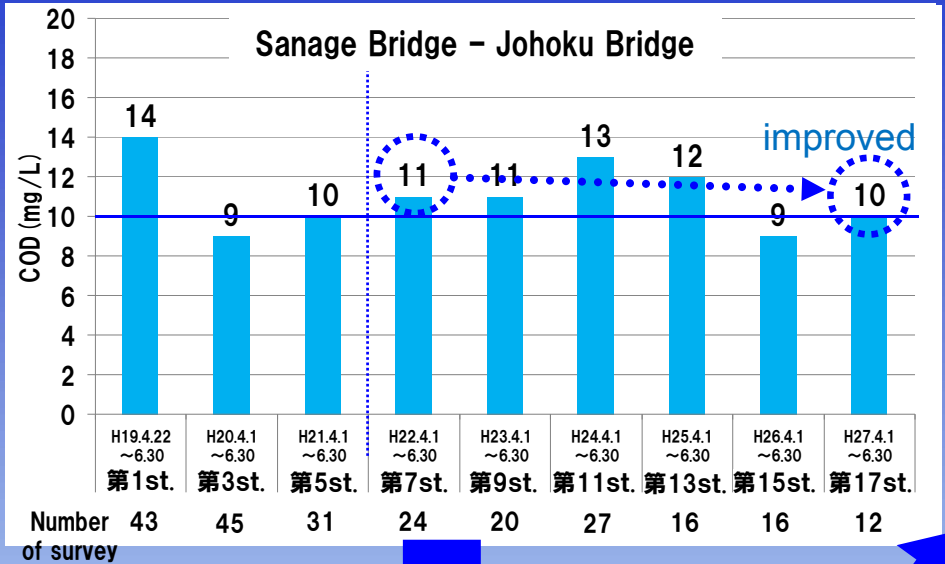
1st – 6th stage : With TRWKR
No rain on the day and the previous day
7th – 18th stage : No TRWKR
Change of COD No rain on the day and the previous day

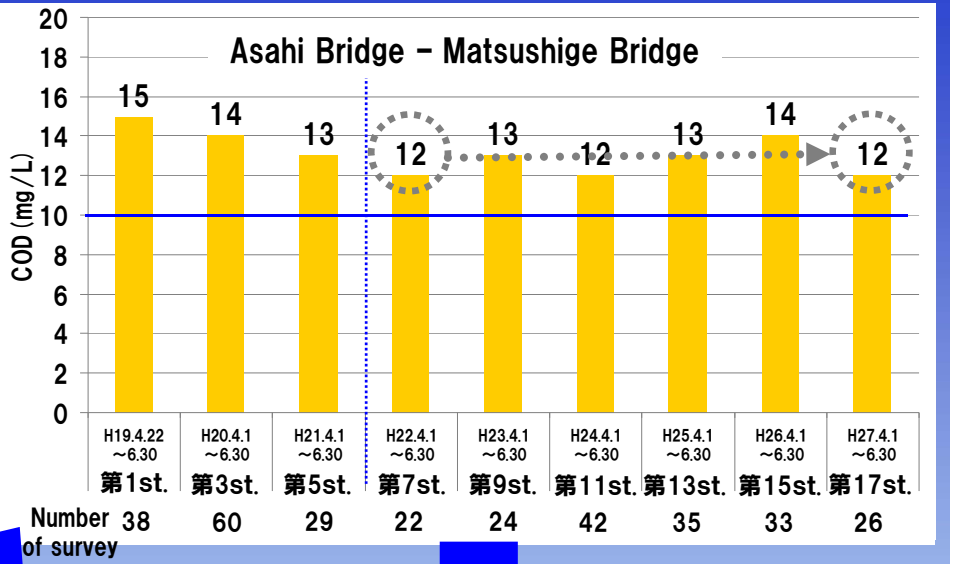


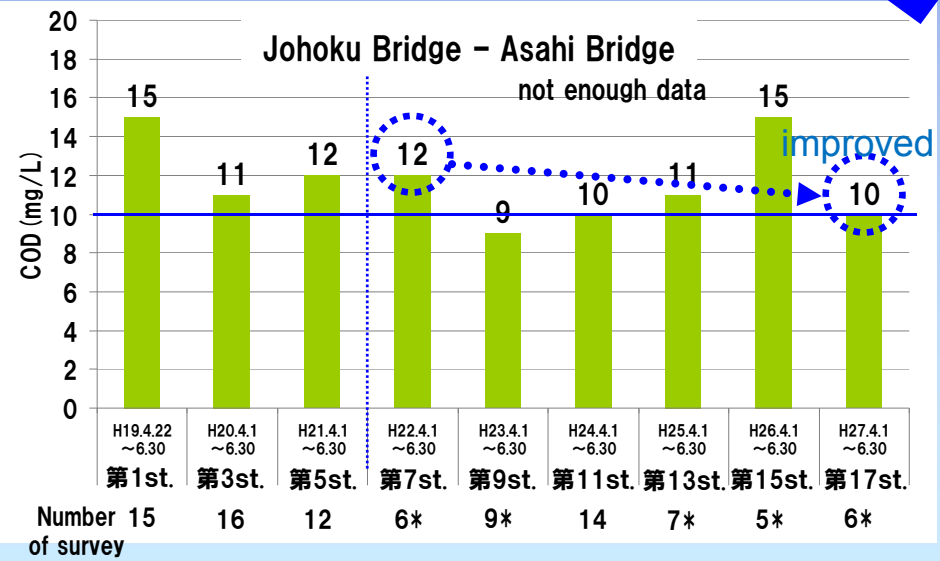
■How did COD change in the middle and downstream section (between the Sanage Bridge and the Oseko Bridge)?
→ It seems that COD was improved and kept during TRWKR, slightly worsened after the stop of TRWKR. It was fluctuated or kept around 10mg/L in the 13th and 15th stage, and was improved after the 16th stage.
In the 12th and 13th stage, going up of blue tide or red tide and rising of sludge was reported, but the effect of those didn't appear clearly because it supposed that we observed fresh water of a surface.

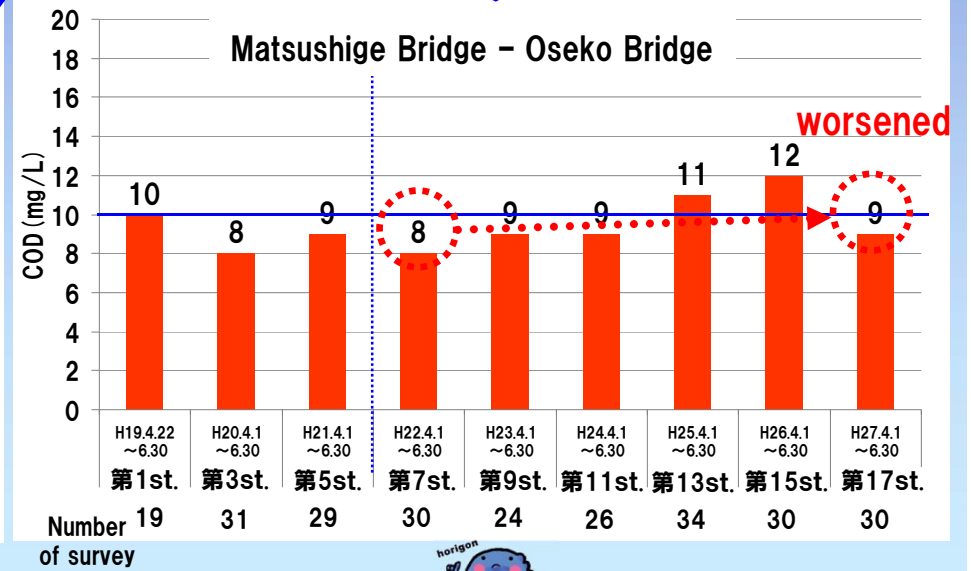
Change of COD (spring - early summer)

1st,3rd,5th stage : With TRWKR
No rain on the day and the previous day
7th,9th,11th,13th,15th ,17th stage : No TRWKR
No rain on the day and the previous day





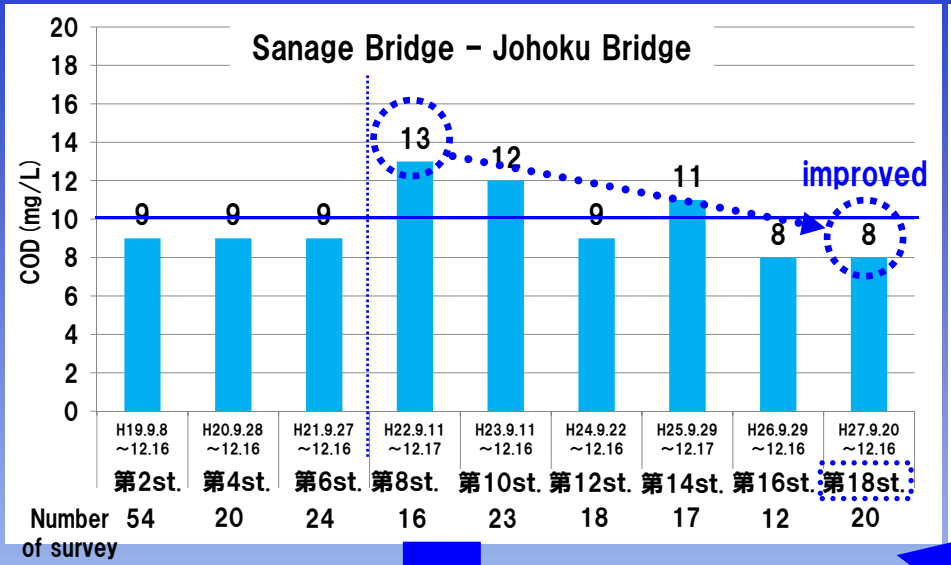


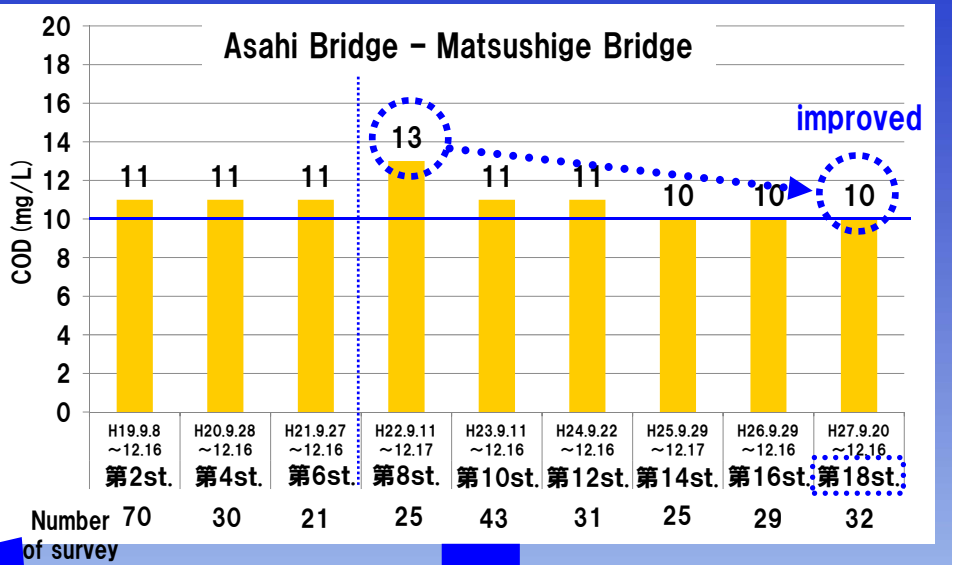


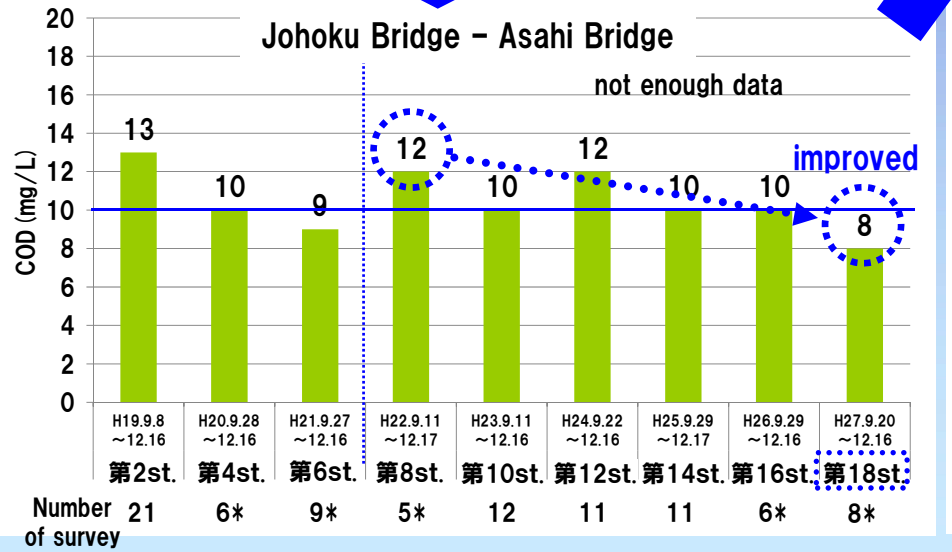
COD from spring to early summer was likely to keep the same status or be improved slightly.

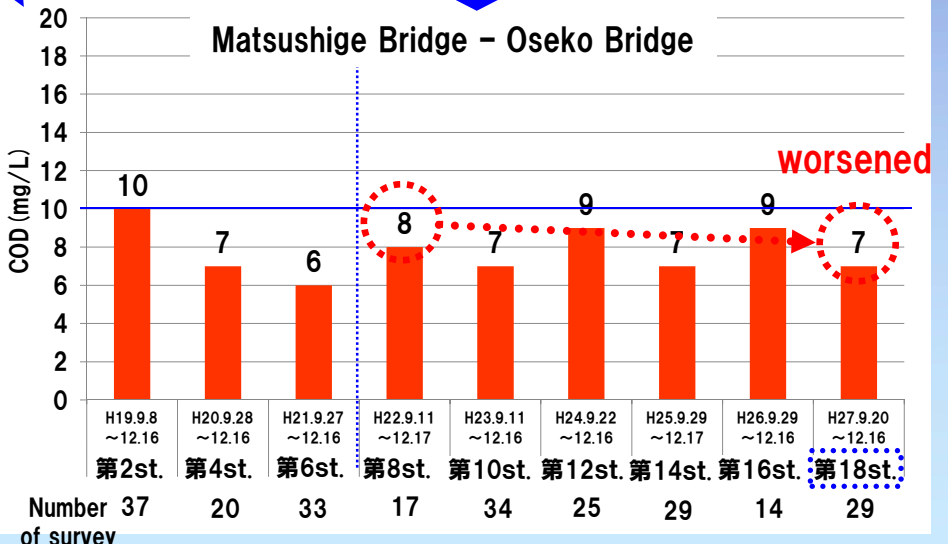
Change of COD (autumn – early winter)

2nd,4th,6th stage : With TRWKR
No rain on the day and the previous day
8th,10th,12th,14th,16th,18th stage : No TRWKR
No rain on the day and the previous day



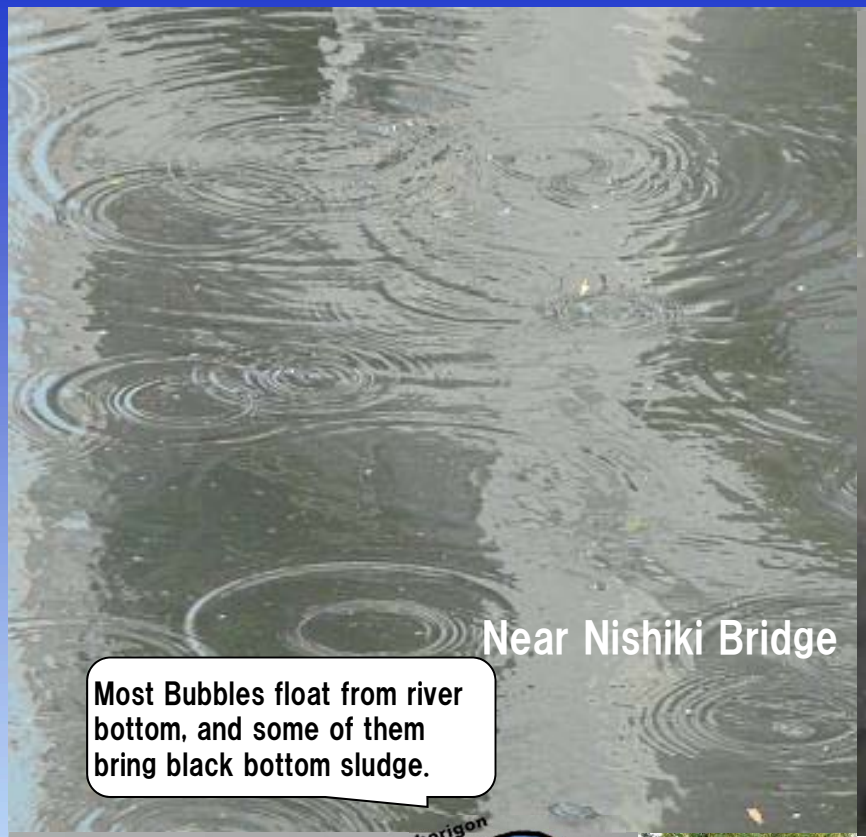






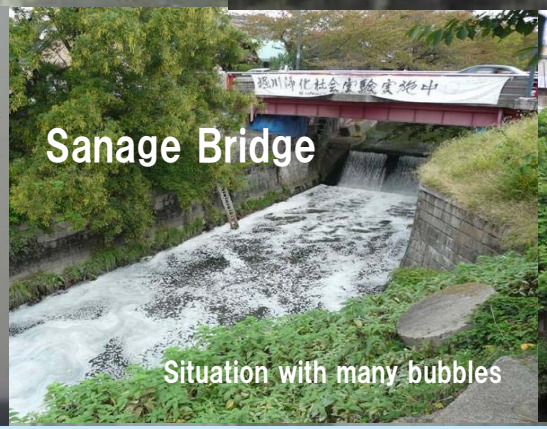
COD from autumn to early winter was improved between the Sanage Bridge and the Matsushige Bridge. It was improved to 8mg/L especially between the Sanage Bridge and the Johoku Bridge.

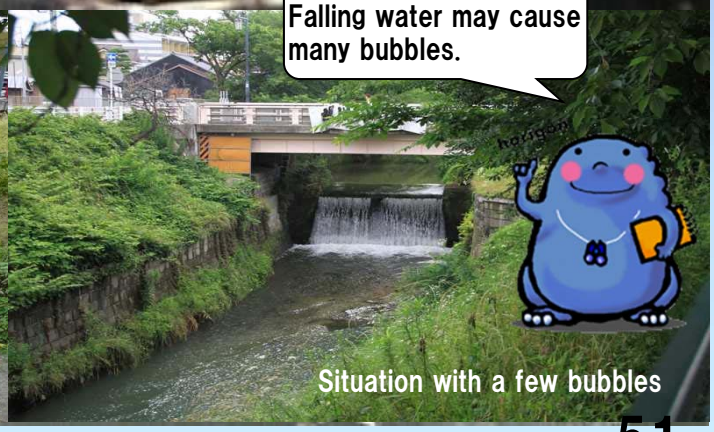
6.5.Bubbles


Near Nishiki Bridge
Most Bubbles float from river bottom, and some of them bring black bottom sludge.


Bubbles from river bottom in movie “This is bottom of Horikawa River” recorded in 2008.05.01-05


horigon


Sanage Bridge
Situation with many bubbles


Falling water may cause many bubbles.
horigon
Situation with a few bubbles

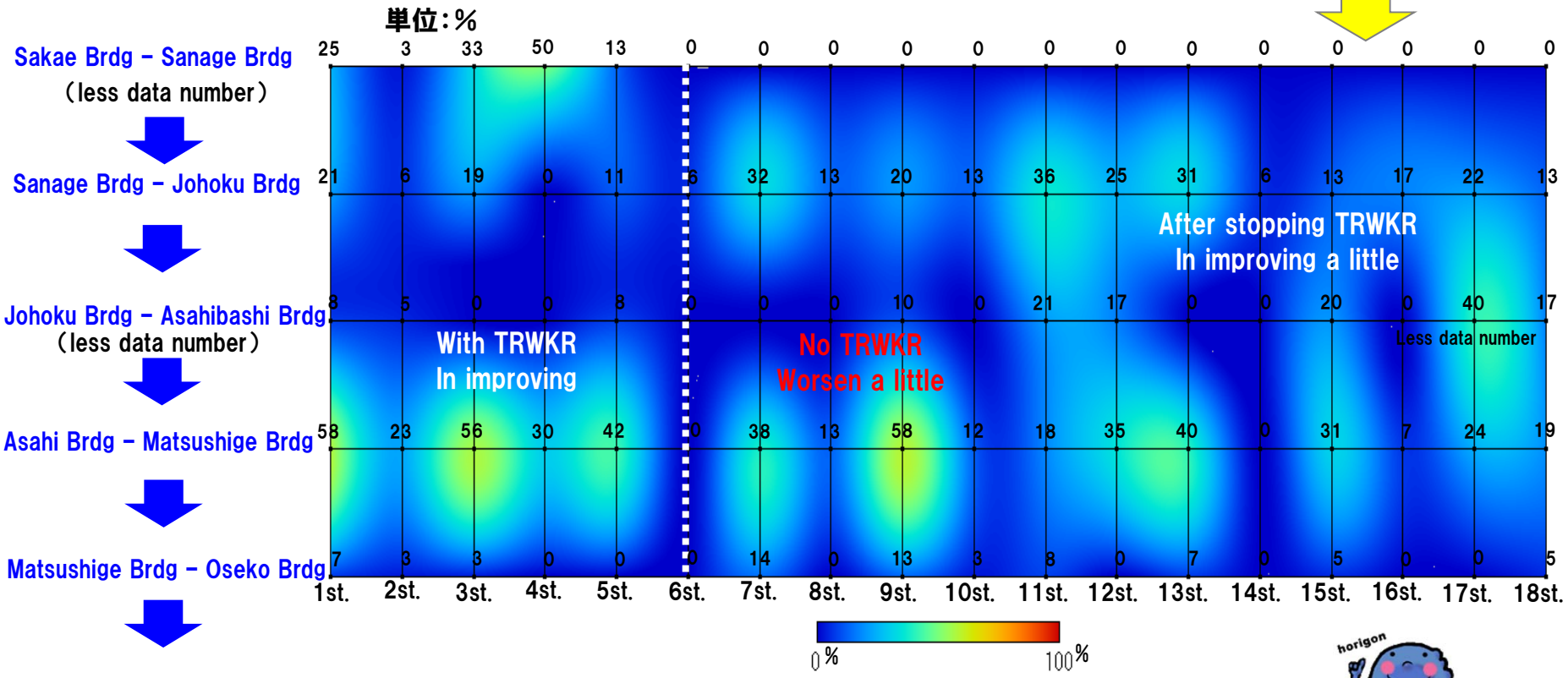
Change of Bubbles from River Bottom

*except data from Minato-shin bridge to Oseko bridge

1st -6th stage : With TRWKR
No rain on the day and the previous day
7th -17th stage : No TRWKR
No rain on the day and the previous day

With TRWKR
Form of pool and shoal
Utilization of groundwater
Increase of raw water transmission from Shonai River
Bottom sediment covering
Introduction of advanced water treatment at Meijo Water Treatment Center
In-service of Horikawa Ugan Rain-water Reservoir for pollution control
Utilization of reclaimed wastewater at Moriyama Water Treatment Center

(estimating period)

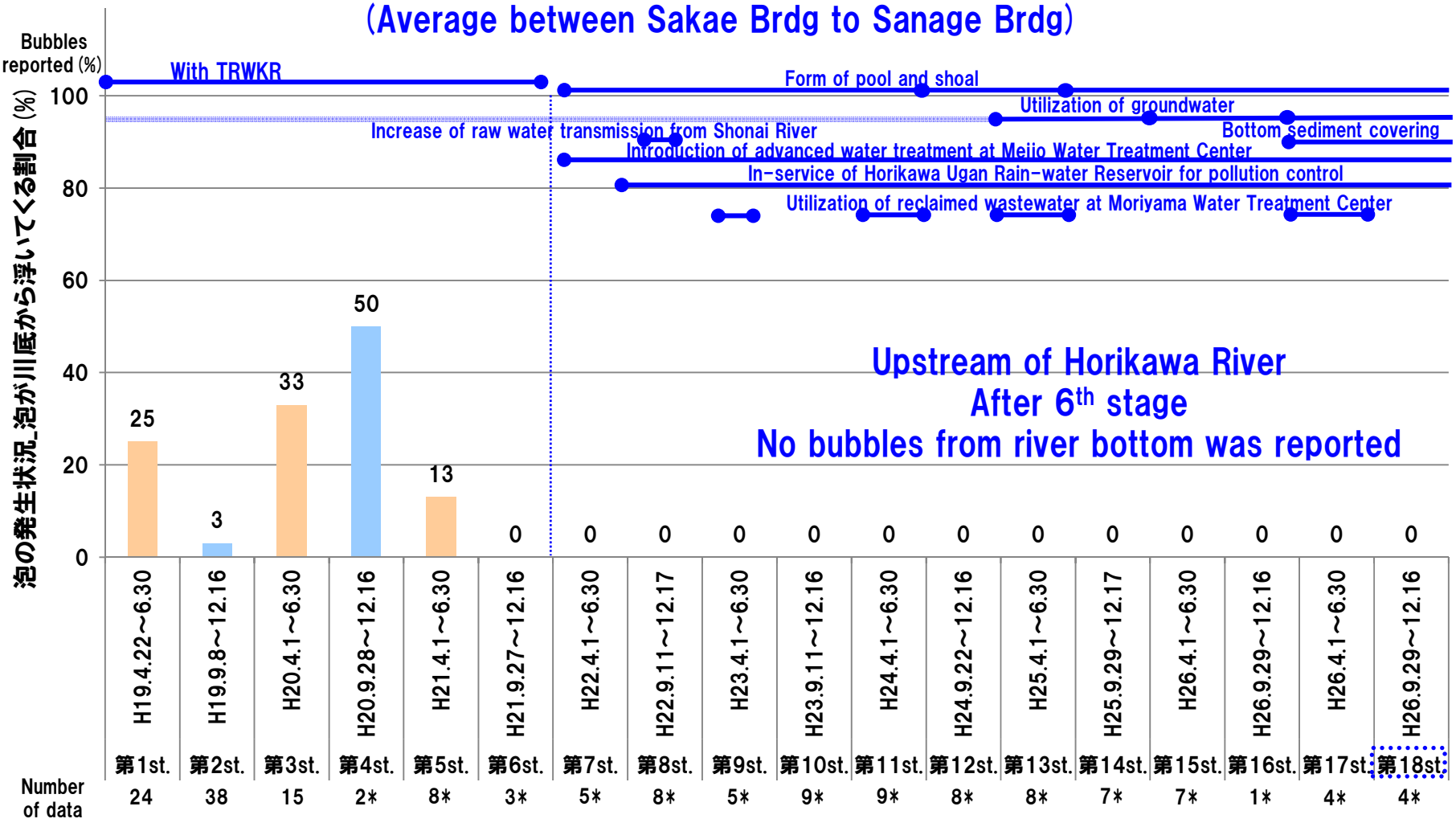


Bubbles from river bottom tend to improve a little in spite of stopping TRWKR. We guess recent measures for water quality improvement work.

Upstream

Bubbles from River Bottom

1st -6th stage : With TRWKR
No rain on the day and the previous day
7th -17th stage : No TRWKR
No rain on the day and the previous day



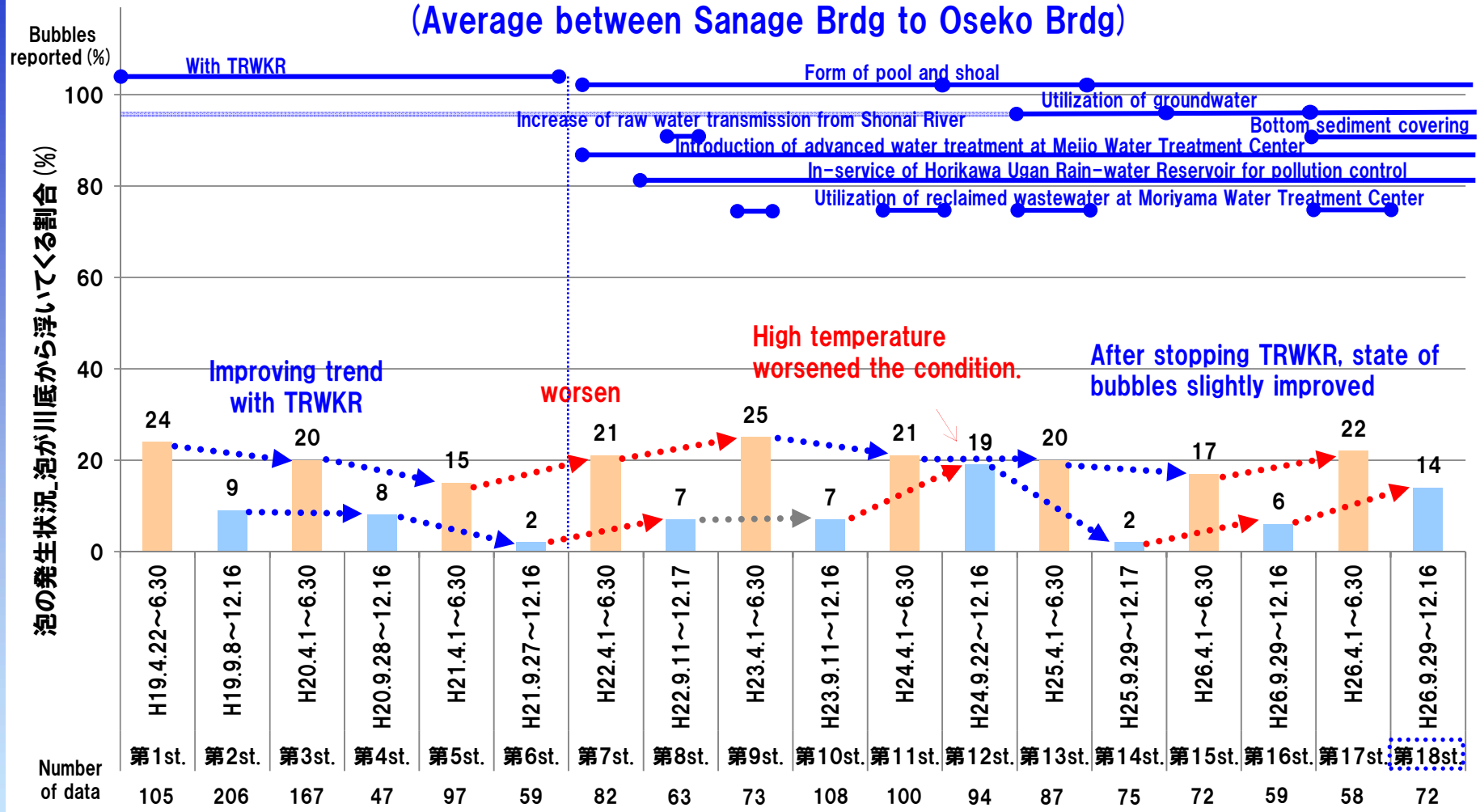
*less data number

How did bubbles from river bottom change in upstream of Horikawa river?
Though number of data is not enough, no bubbles was reported after 6th stage.

Mid-Downstream

Bubbles from River Bottom

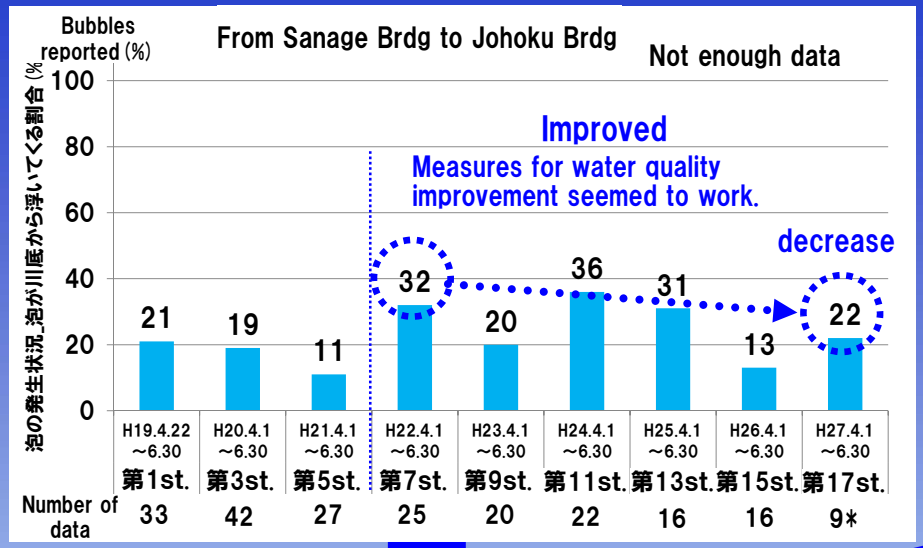
1st -6th stage : With TRWKR
No rain on the day and the previous day
7th -17th stage : No TRWKR
No rain on the day and the previous day

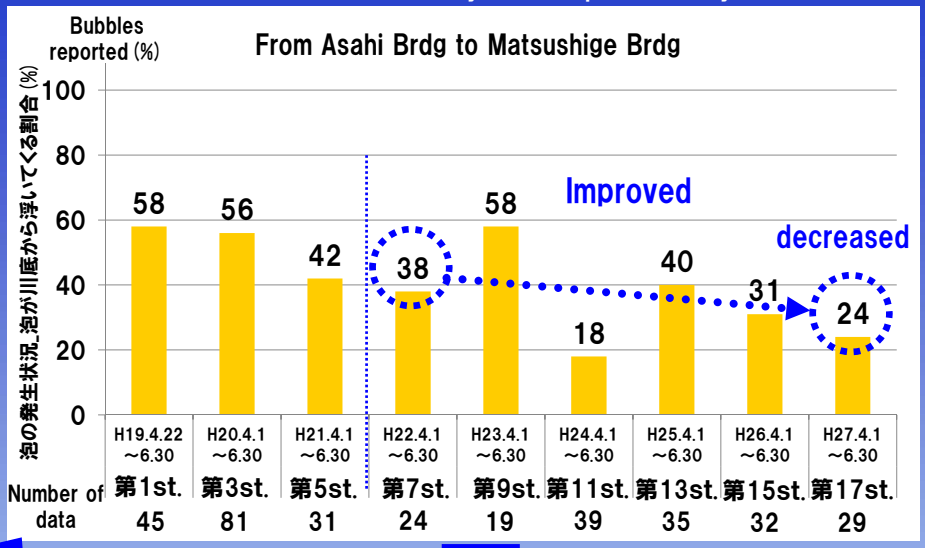


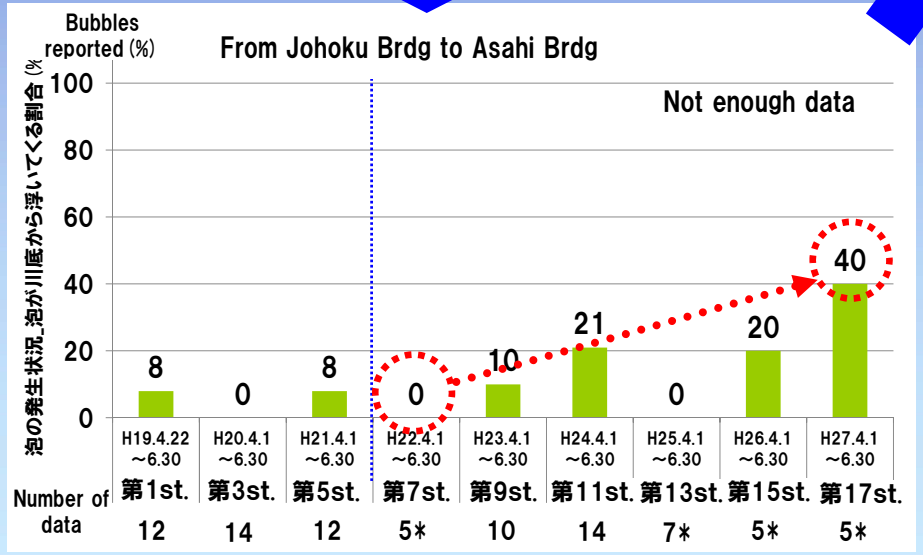
How bubbles from river bottom change in mid-downstream of Horikawa river?
After stopping TRWKR, stat of bubbles got slightly improved throughout effects of recent measures for water quality improvement.

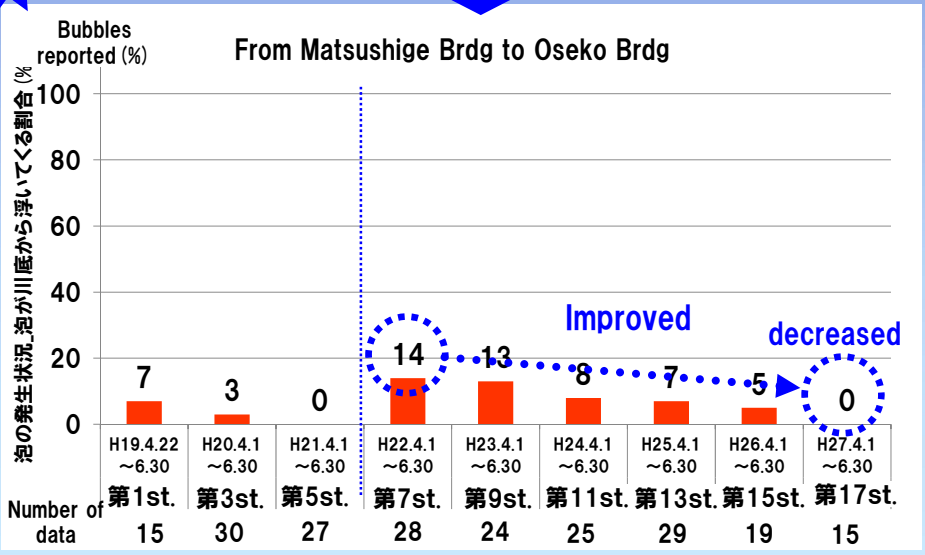
Bubbles from River Bottom from spring to early summer

1st -6th stage : With TRWKR
No rain on the day and the previous day
7th -17th stage : No TRWKR
No rain on the day and the previous day





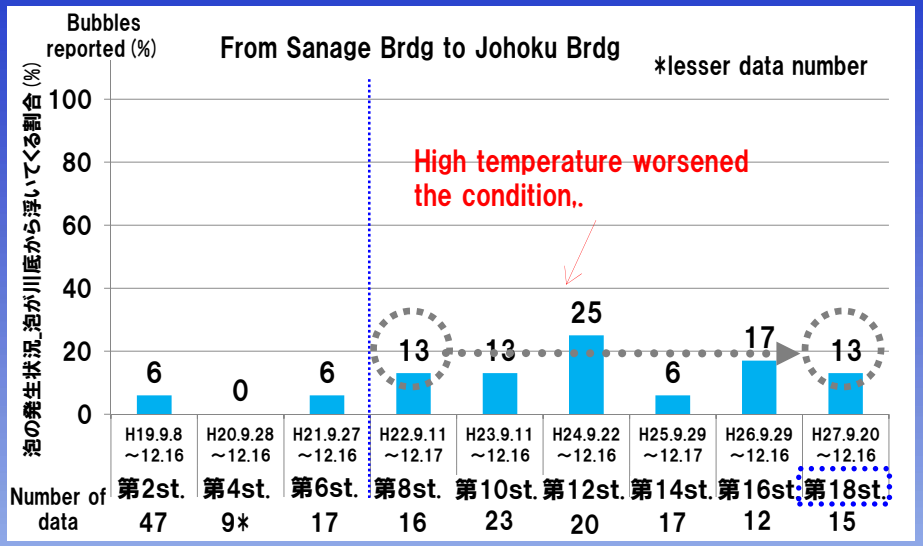


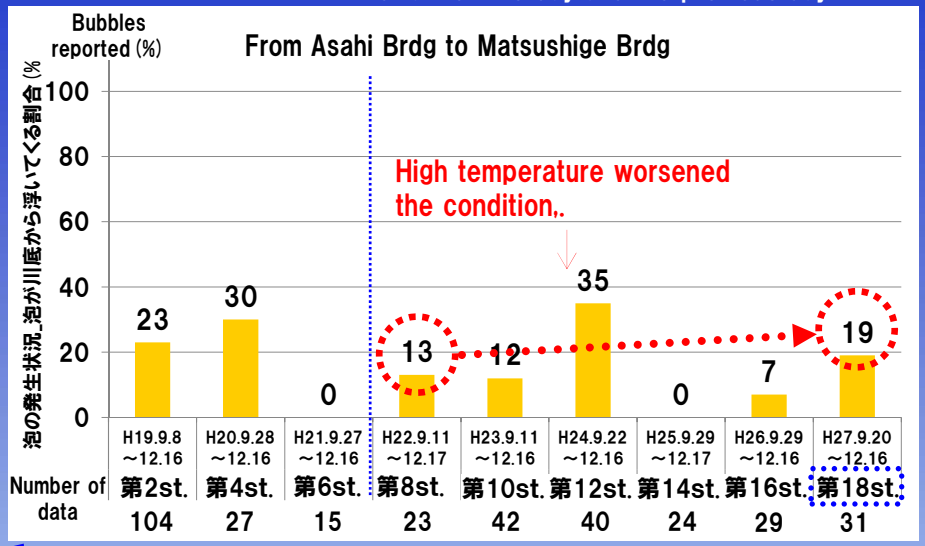


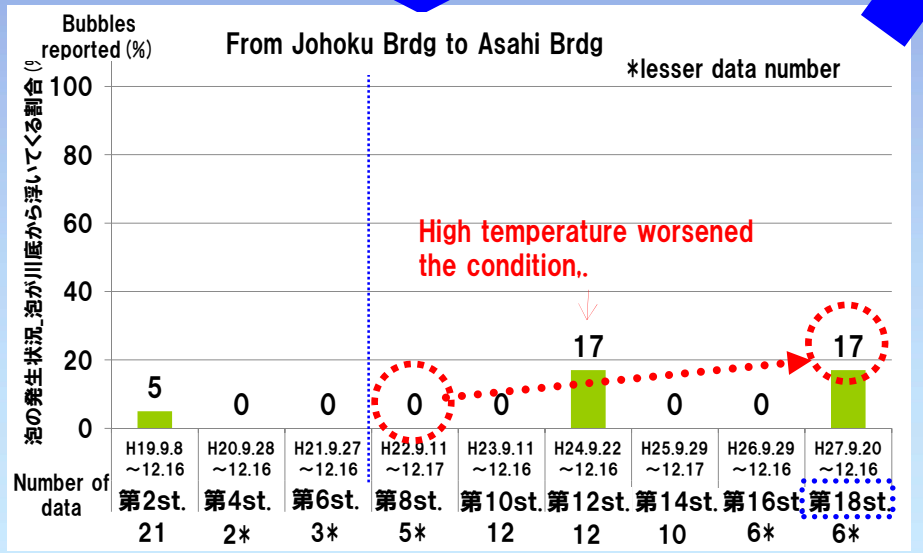
Bubbles from River Bottom from spring to early summer improved from Sanage Brdg to Johoku Brdg and from Asahi Brdg to Ohseko Brdg. State of river bottom bubbles may easily be effected by temperature or tide, but recent measures for water quality improvement worked. We need to continue the survey to make it clear.

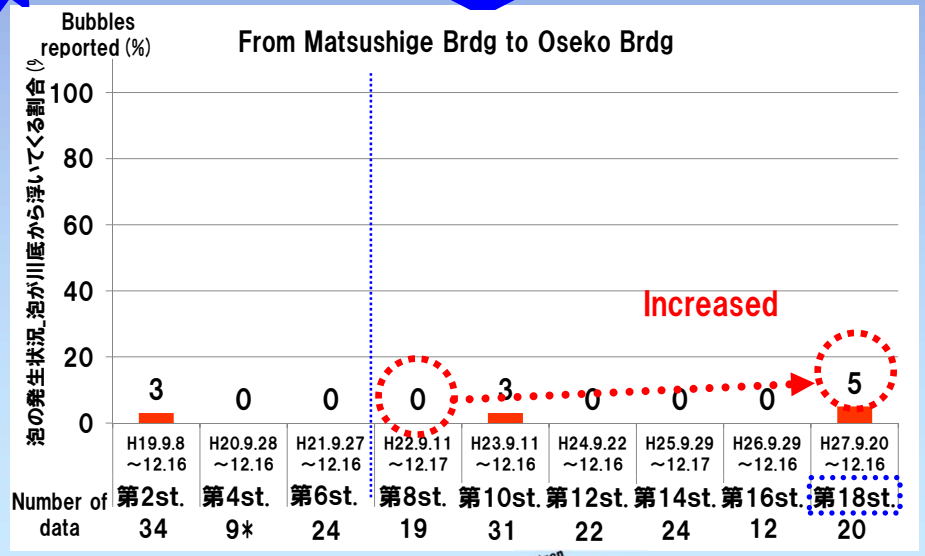
Bubbles from River Bottom from Autumn to early Winter

1st -6th stage : With TRWKR
No rain on the day and the previous day
7th -17th stage : No TRWKR
No rain on the day and the previous day





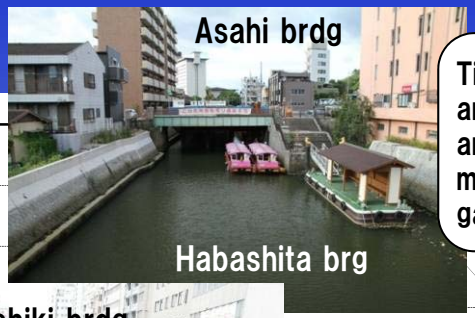




State of bubbles got worse compared 8th stage to 18th stage between Johoku brdg and Oseko brdg. High temperature appears to cause it.

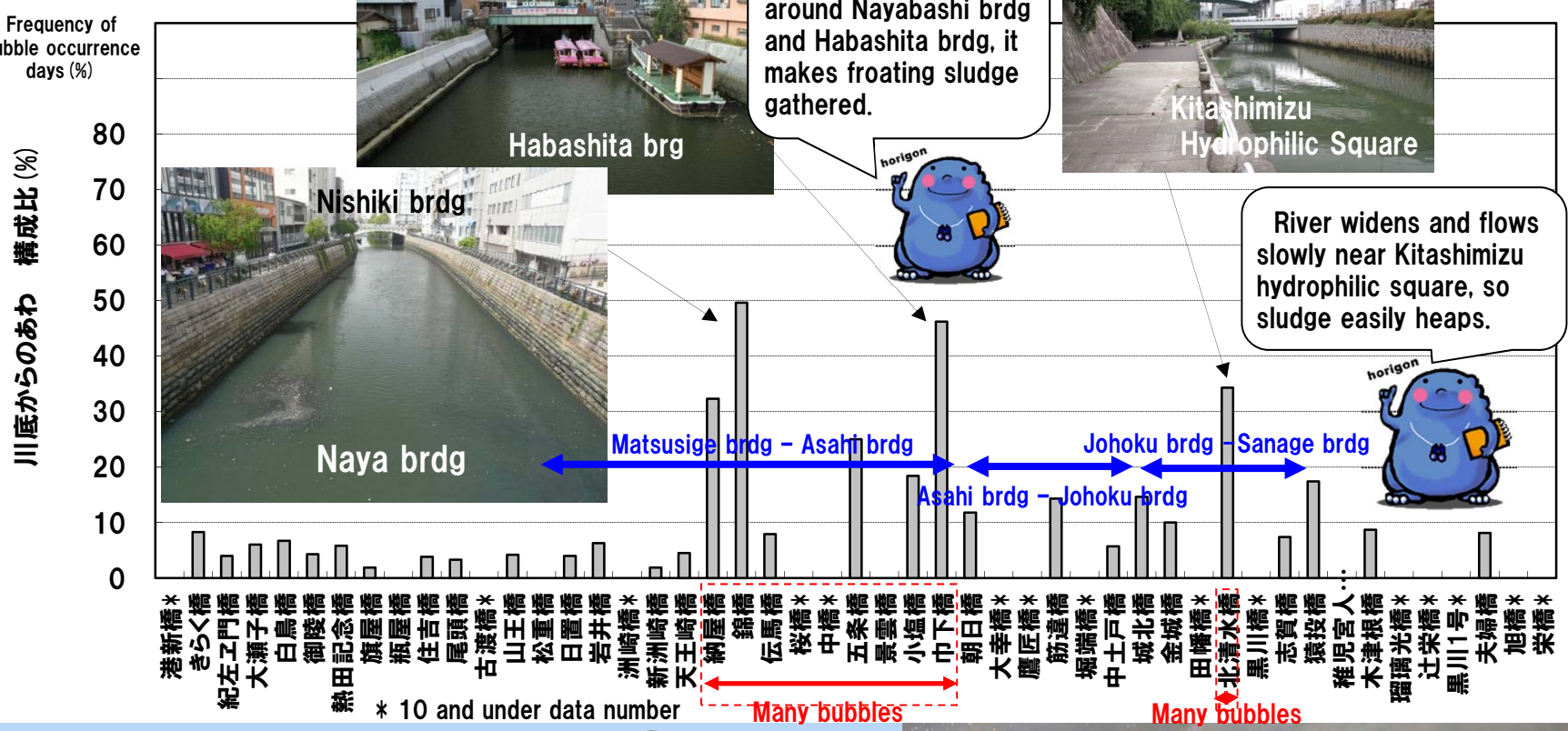
State of Bubbles in all sections

1st -18th stage ;
including all condition



Tidal flow reaches around Nayabashi brdg and Habashita brdg, it makes froating sludge gathered.

River widens and flows slowly near Kitashimizu hydrophilic square, so sludge easily heaps.



At survey of river bottom near Kitashimizu brdg On December 26th, the bottom could be seen Cleary (not so dark) from top of bridge, and bubbles were not seen.

Secretariat thinks that measures for water quality improvement worked, and bubbles from river bottom decreased.

River bottom under Kitashimizu bridge
photo by secretariat: 12/26/2015

6.6. Smell

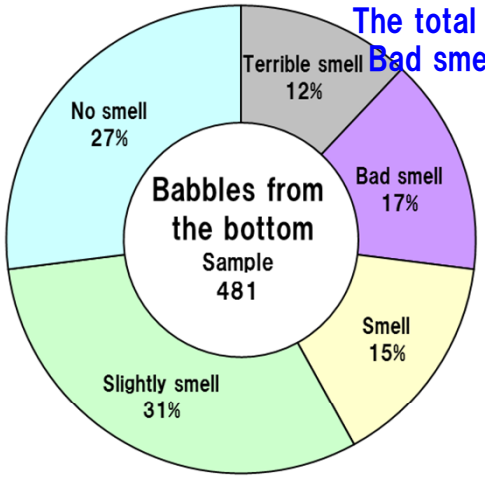
The ratio of “Terrible smell – smell ” was 44%, when “bubbles from the bottom”. On the other hand, That was 19 %, when “no bubbles from the bottom”.
Smell often worsened, when “bubble from the bottom” appeared.
This tendency is clear between Asahi Bridge and Matsushige Bridge compared to other areas in 15th stage.

The difference in the occurrence of smell between “bubbles from the bottom” and “no bubbles from the bottom”.

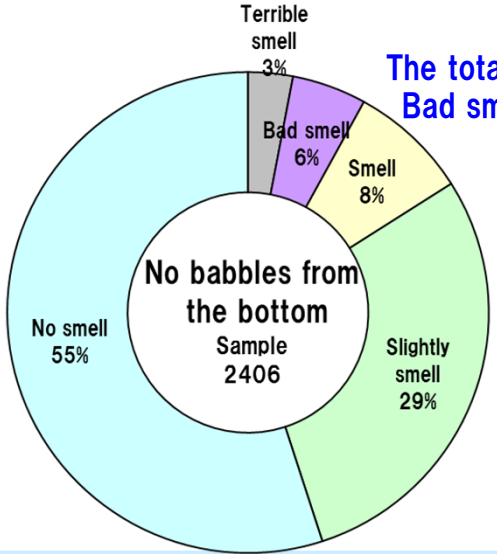
All stage, with TRWKR and No TRWKR including all surveys
No rain on the day and the previous day

Sanage Bridge～Minatoshin Bridge

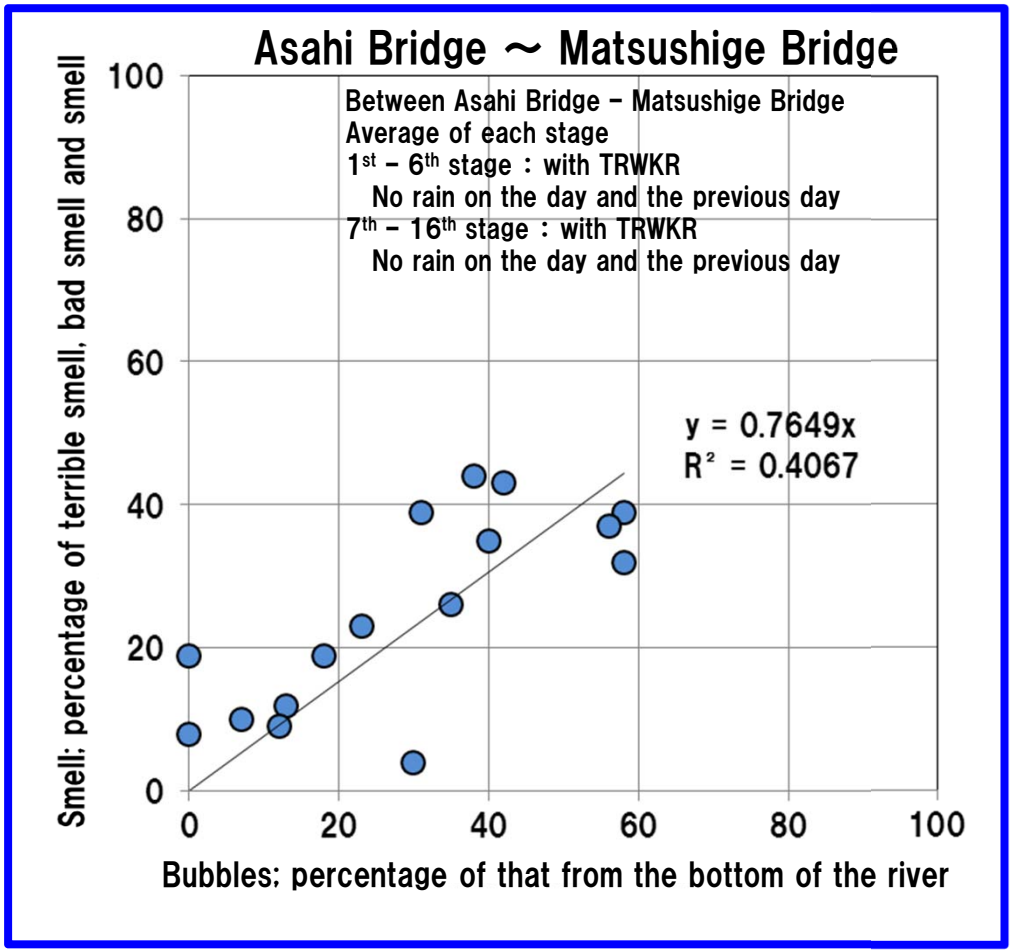
The total rate of terrible smell. Bad smell and smell is 44%



The total rate of terrible smell. Bad smell and smell is 17%



Relation between “bubbles” and “smell”



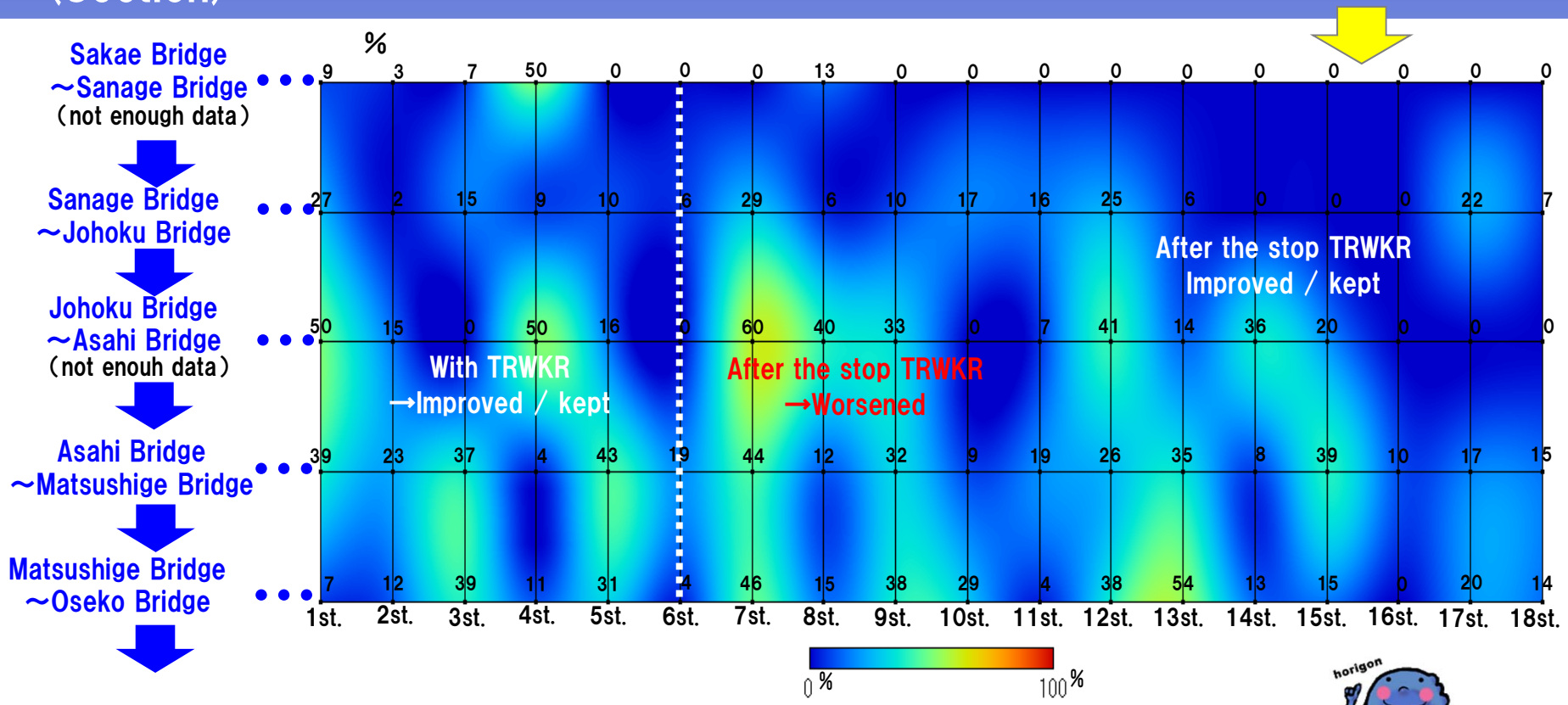
Change in occurrence of smell (Average in some section)

＊ Except the data between Minatoshin Bridge and Oseko Bridge.

1st – 6th stage : With TRWKR
No rain on the day and the previous day
7th – 18th stage : With TRWKR
No rain on the day and the previous day

With TRWKR
Form of pool and shoal
Utilization of groundwater
Increase of raw water transmission from Shonai River
Covered sand
Introduction of advanced water treatment at Meijo Water Treatment Center
In-service of Horikawa Ugan Rain-water Reservoir for pollution control
Utilization of reclaimed wastewater at Moriyama Water Treatment Center

(Section)

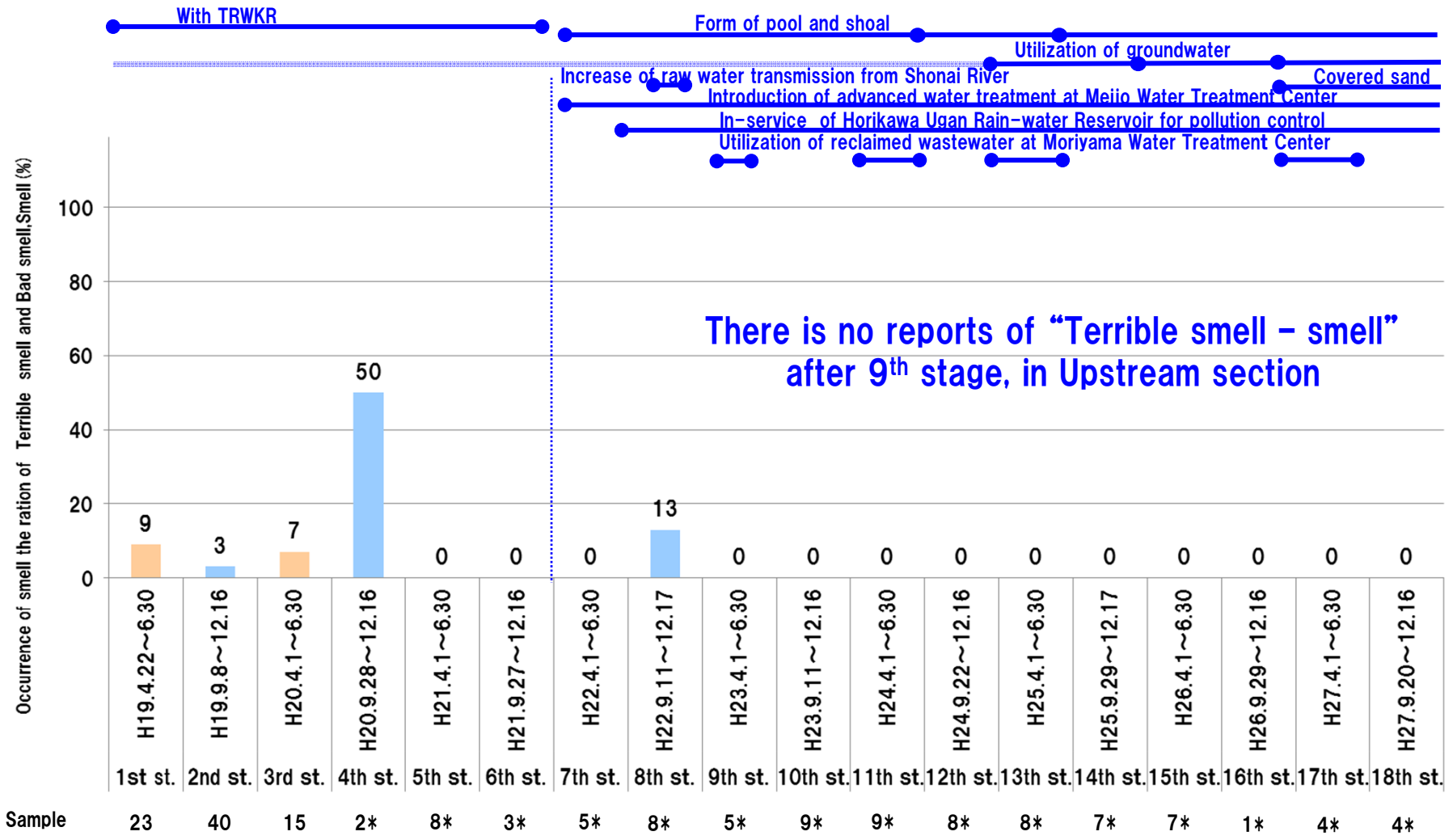


"Occurrence of smell" improved and kept after the stop TRWKR. It is considered that measures for water quality improvement seemed to work .

Upstream Section

Occurrence of Smell
(Average from Sakae Bridge to Sanage Bridge)

1st – 6th stage : With TRWKR
No rain on the day and the previous day
7th – 18th stage : With TRWKR
No rain on the day and the previous day



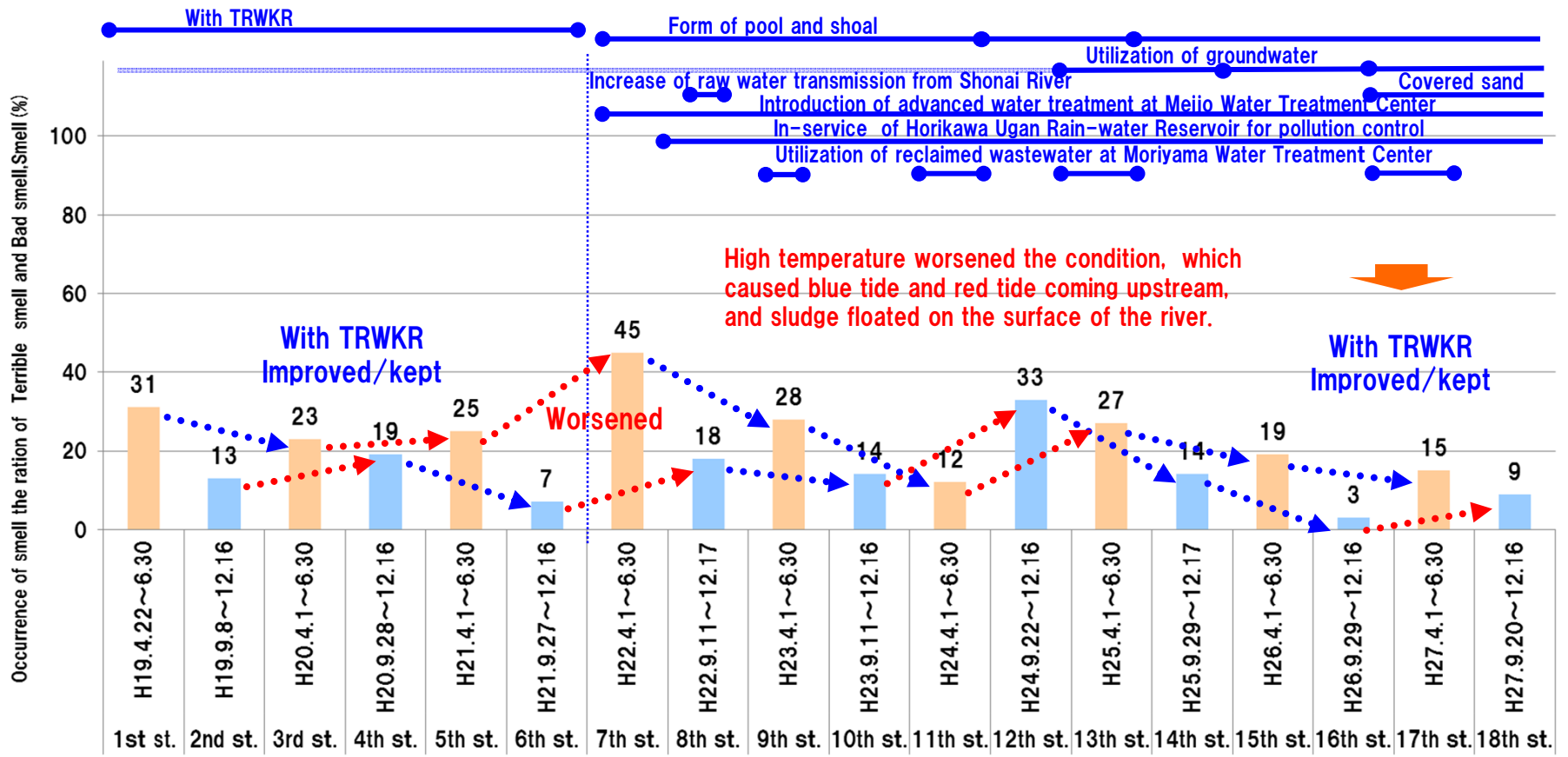
*Few data

■ Change of smell in upstream section
→ There is no reports of "terrible smell – smell" , after 9th stage, although few data.

Middle and Downstream Section

Occurrence of Smell
(Average from Sanage Bridge to Oseko Bridge)

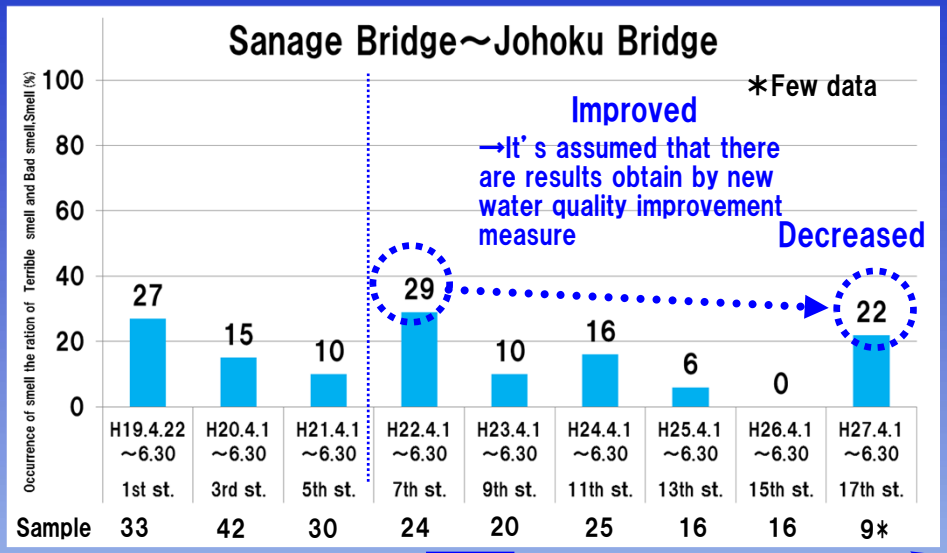
1st – 6th stage : With TRWKR
No rain on the day and the previous day
7th – 18th stage : With TRWKR
No rain on the day and the previous day

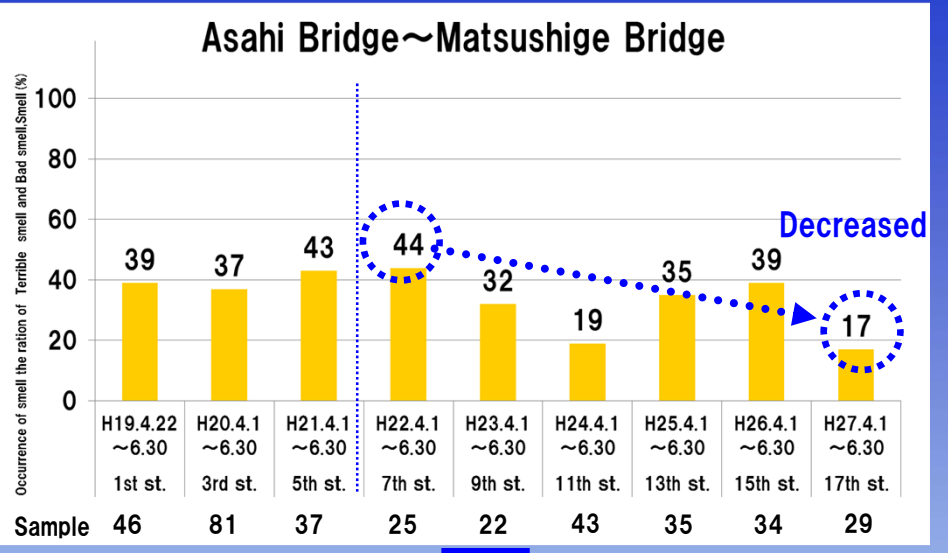


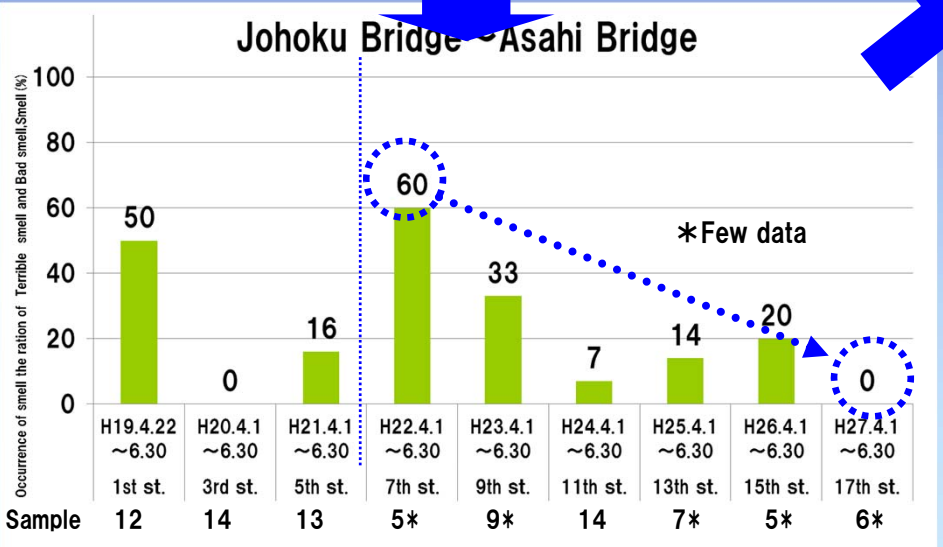
■ Change of smell in middle stream and downstream section
After the TRWKR, the smell was worsened. After that, at 12th and 13th stage, the smell worsened, but in other stages, it improved.

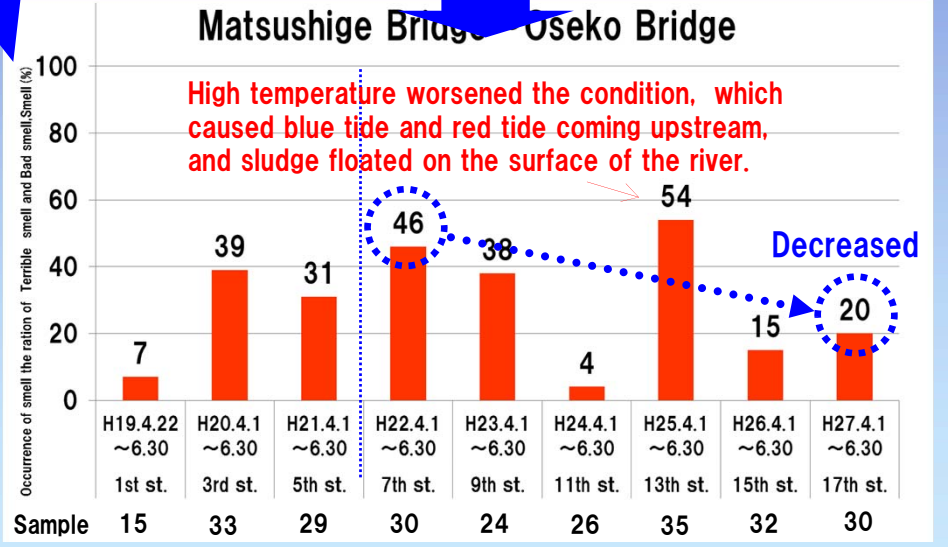
Occurrence of smell
Spring～Early summer

1st, 3rd, 5th stage :With TRWKR
No rain on the day and the previous day
7th, 9th, 11th, 13th, 15th, 17th stage:No TRWKR
No rain on the day and the previous day







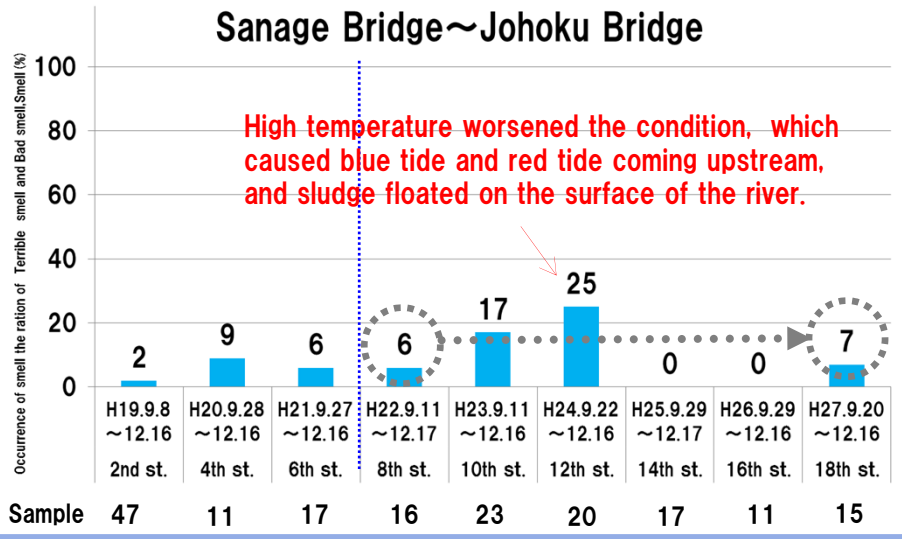


Occurrence of smell from spring to early summer was improved between Sanage Bridge and Oseko Bridge After the stop TRWKR. Because Occurrence of smell is easily affected by temperature and observed time tidal, some points can not be confirmed. Although it's assumed that there are results of new water quality measure. We need to continue the survey to make it clear.

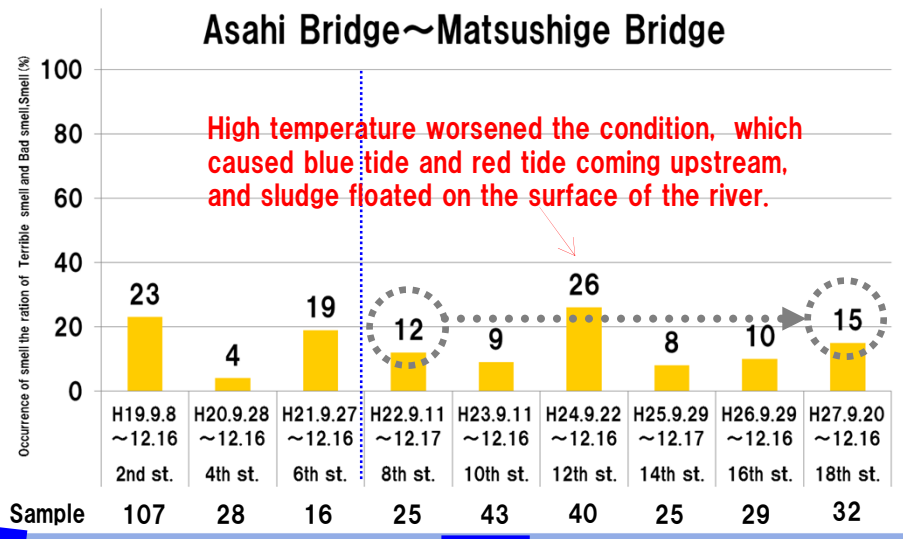
Occurrence of smell
Autumn～Early winter

2nd, 4th, 6th stage: With TRWKR
No rain on the day and the previous day
8th ,10th ,12th ,14th ,16th , 18th stage : No TRWKR
No rain on the day and the previous day

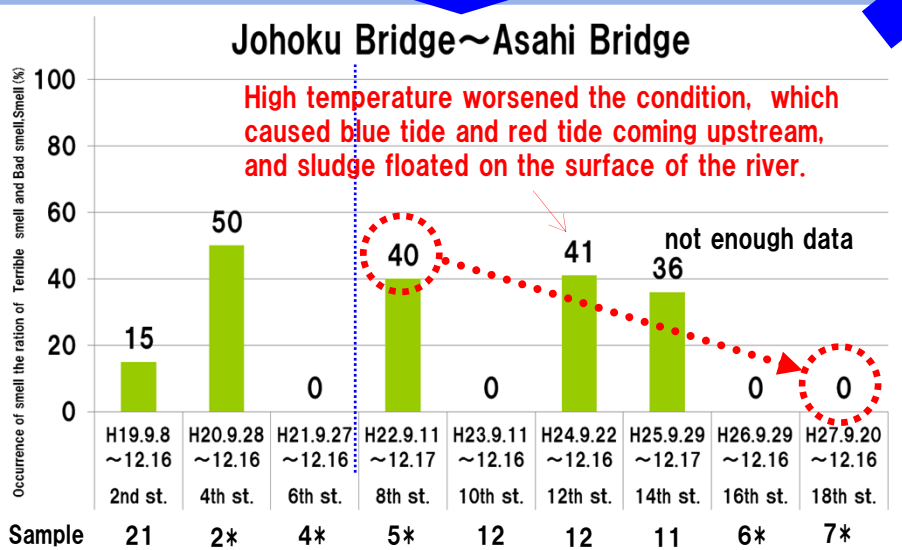
Sanage Bridge～Johoku Bridge



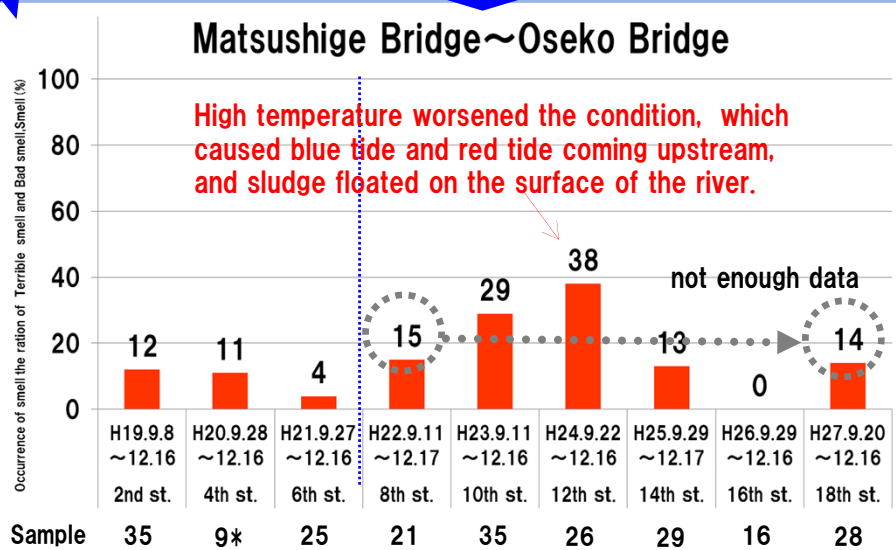
Asahi Bridge～Matsushige Bridge



Johoku Bridge～Asahi Bridge

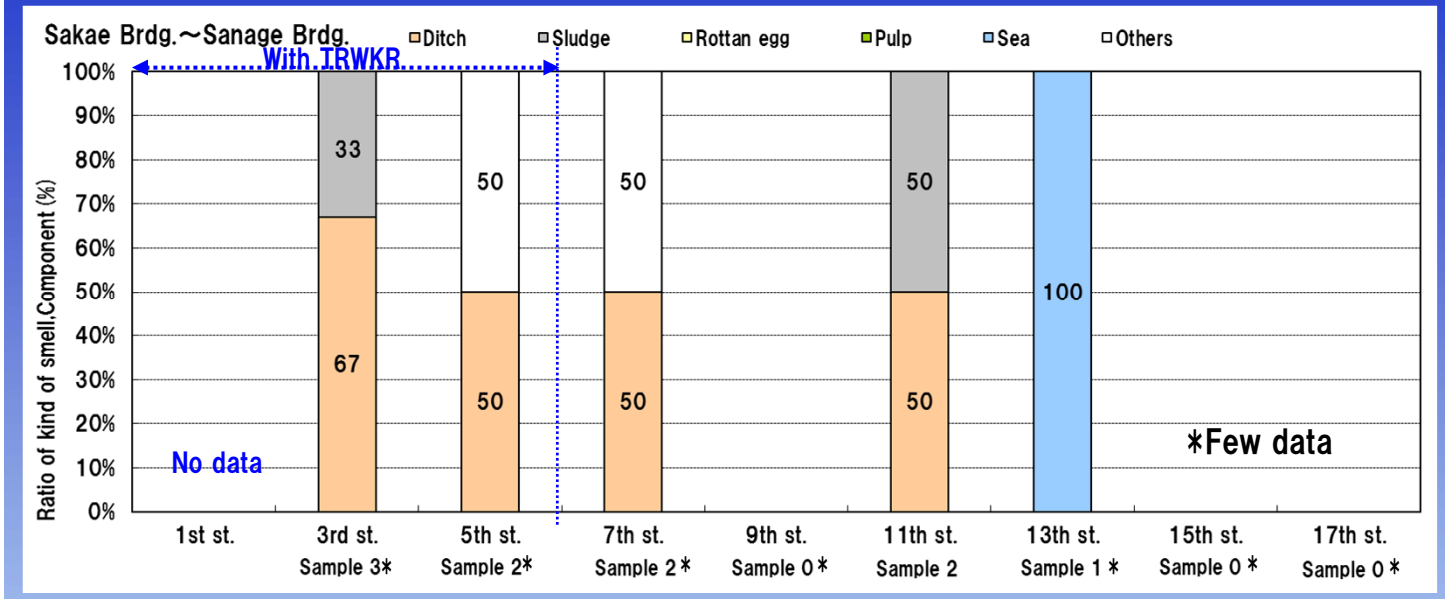


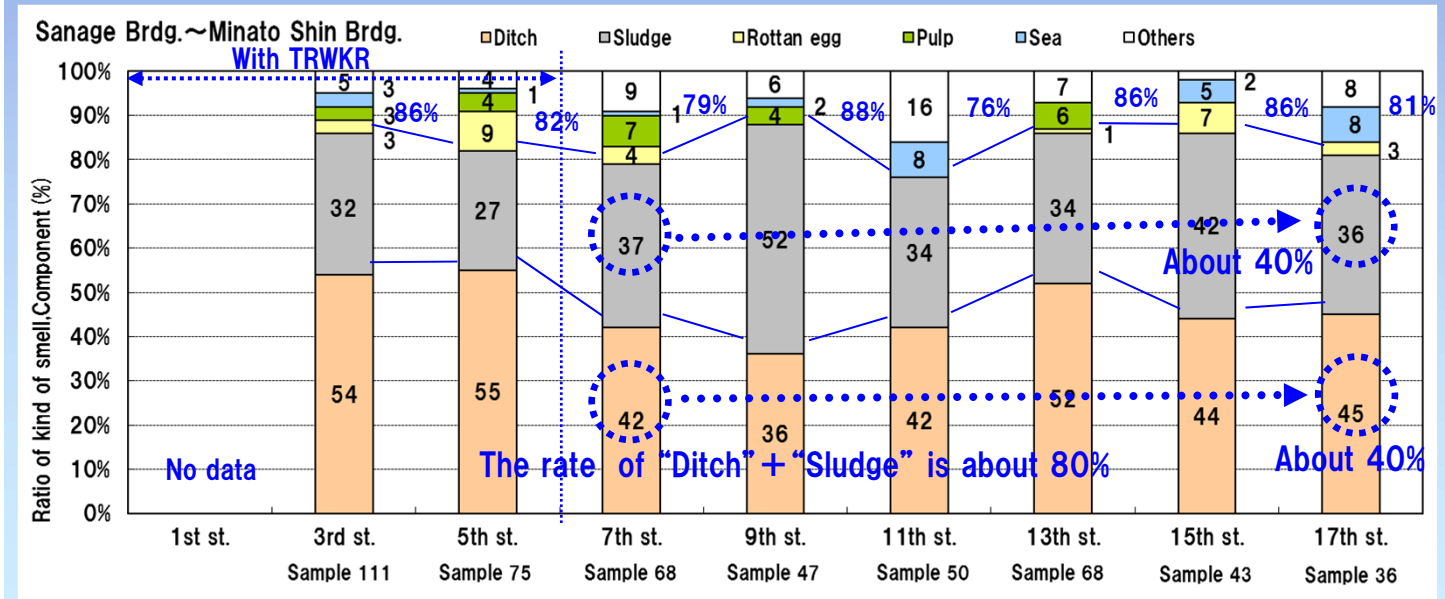
Matsushige Bridge～Oseko Bridge



Occurrence of smell at 18th stage was almost the same as that at 17th stage after the stop TRWKR.

Kind of smell(each division)・・・spring～early summer





1st ,3rd ,5th stage
With TRWKR
No rain on the day and the previous day

7th, 9th, 11th, 13th, 15th, 17th stage
No TRWKR
No rain on the day and the previous day

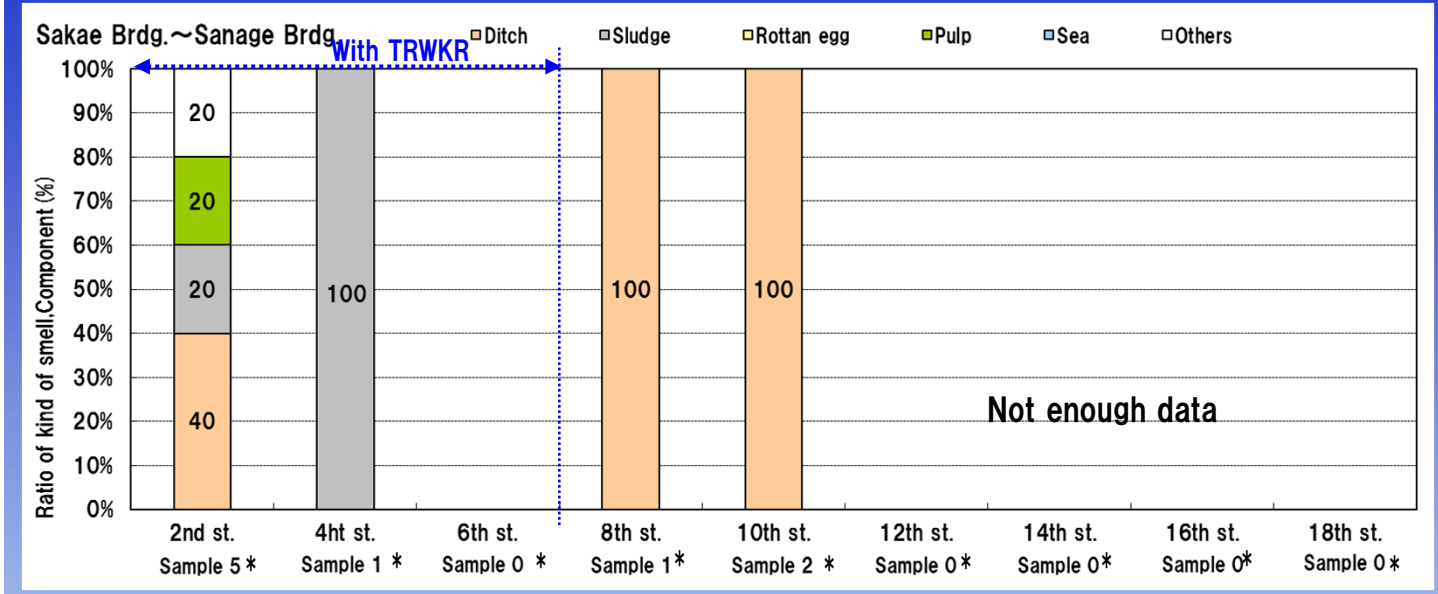
■ Change of the smell, from spring to early summer, between Sanage bridge to Minatoshin Bridge
→The ratio of "Ditch" and "Sludge" was about 80%. Each was about 40%.
There is no significant change in 7th stage and 17th stage

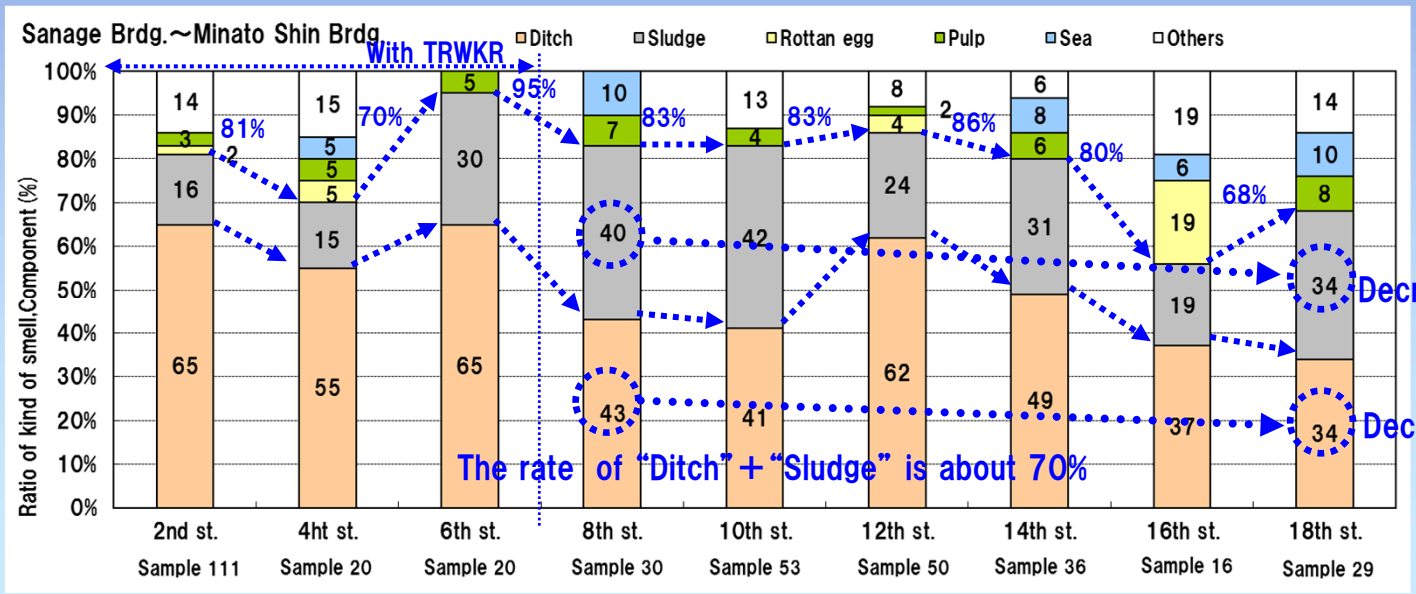
* 0% item isn't displayed.

Kind of smell(each division)・・・autumn～early winter

2nd, 4th, 6th stage
With TRWKR
No rain on the day and the previous day

8th ,10th ,12th ,14th ,16th , 18th stage
No TRWKR
No rain on the day and the previous day





■ Change of the smell, from autumn to early winter, between Sanage bridge to Minatoshin Bridge
→The ratio of "Ditch" and "sludge" was about 70%.
In 18th stage, it was especially reduced the smell of "Ditch" and "Sludge" than in 8th stage.

Decreased

Decreased

＊ 0% item isn't displayed

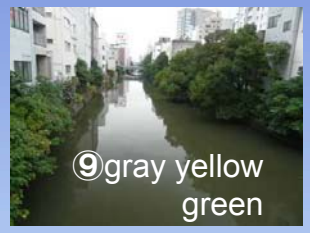
6.7. Colors

①colorless	⑥gray	⑪dark gray
②milky white	⑦yellow gray	⑫pale gray yellow
③yellow	⑧pale gray yellow green	⑬yellow brown
④yellow green	⑨gray yellow green	⑭brown
⑤greeen	⑩gray green	⑮green brown

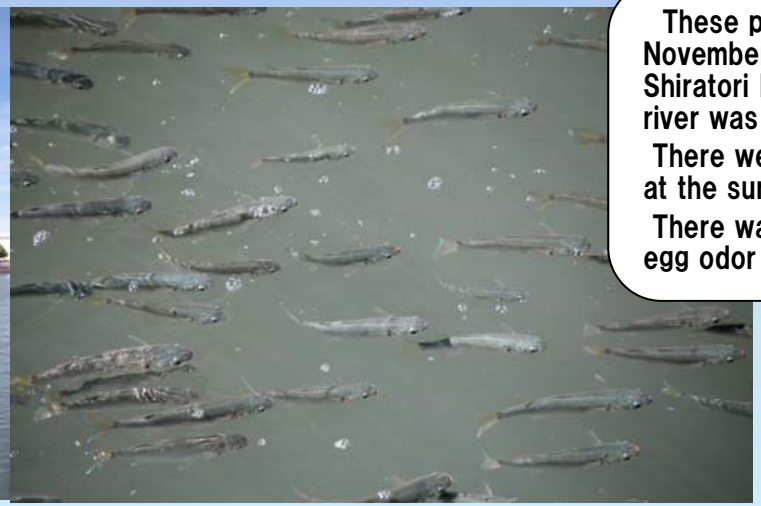
Legend
- milky
- ②milky white
- ⑧pale gray
- yellow green
- ⑫pale yellow gray
- red tide
- ⑬yellow brown
- ⑭brown
- ⑮green brown

- sludge
- ⑥gray
- ⑩gray green
- ⑪dark gray

We classify the colors into three groups, milky, red tide, sludge on the basis of the data of the Fixed Point Observation.



＊photos
Shiratori Bridge…pale gray yellow
photos: secretariat , November 11 2015



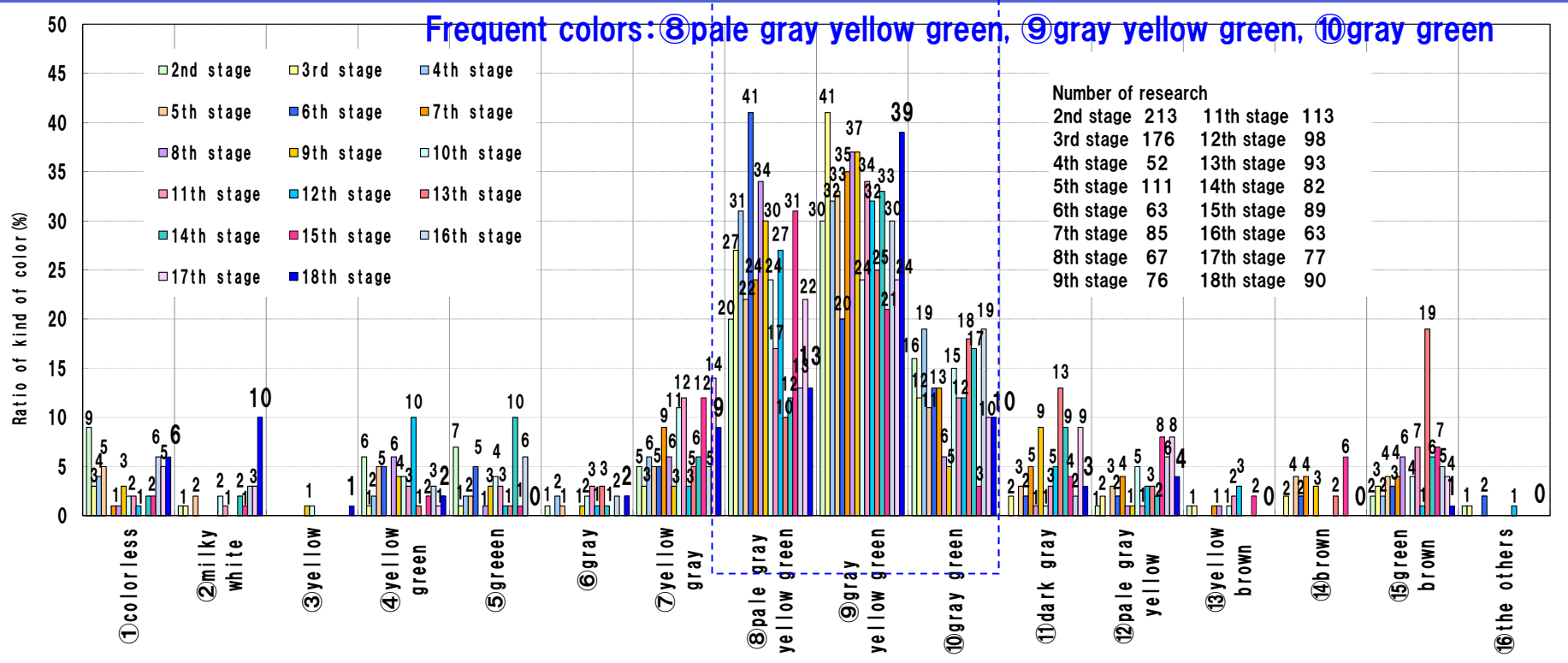
These photos were taken on November 11, 2015 around Shiratori Bridge. The color of the river was pale gray yellow.
There were many labored mullets at the surface of the river.
There was a smell of the rotten egg odor (hydrogen sulfide) .

Ratio of color

Sanege Bridge ～ Minatoshin Bridge

2nd-6th stage : With TRWKR
No rain on the day and the previous day

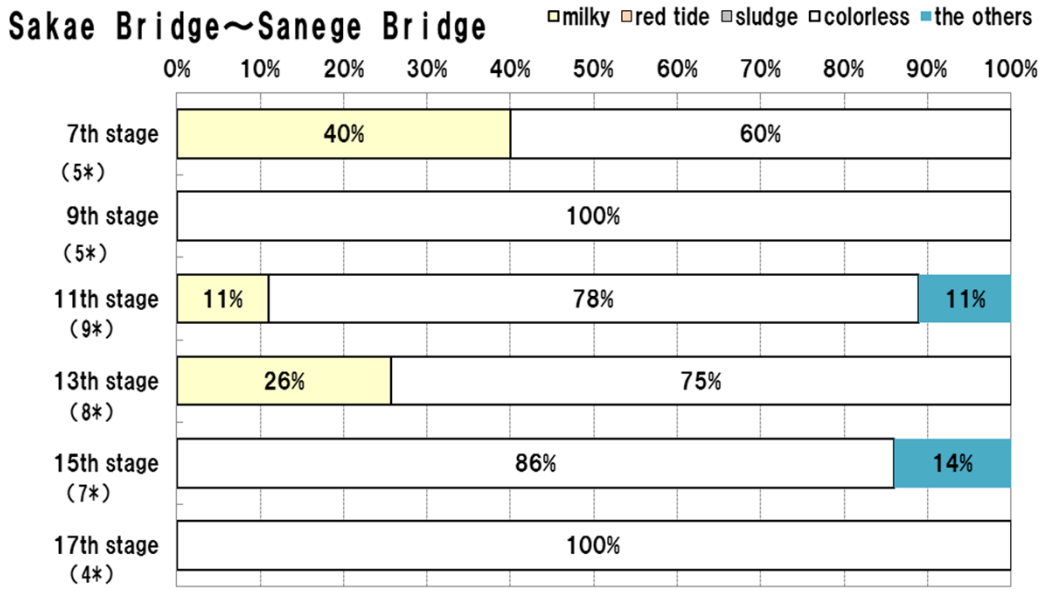
7th-18th stage : No TRWKR No rain on the day and the previous day



■Frequent colors?
⑧pale gray yellow green,
⑨gray yellow green,
⑩gray green

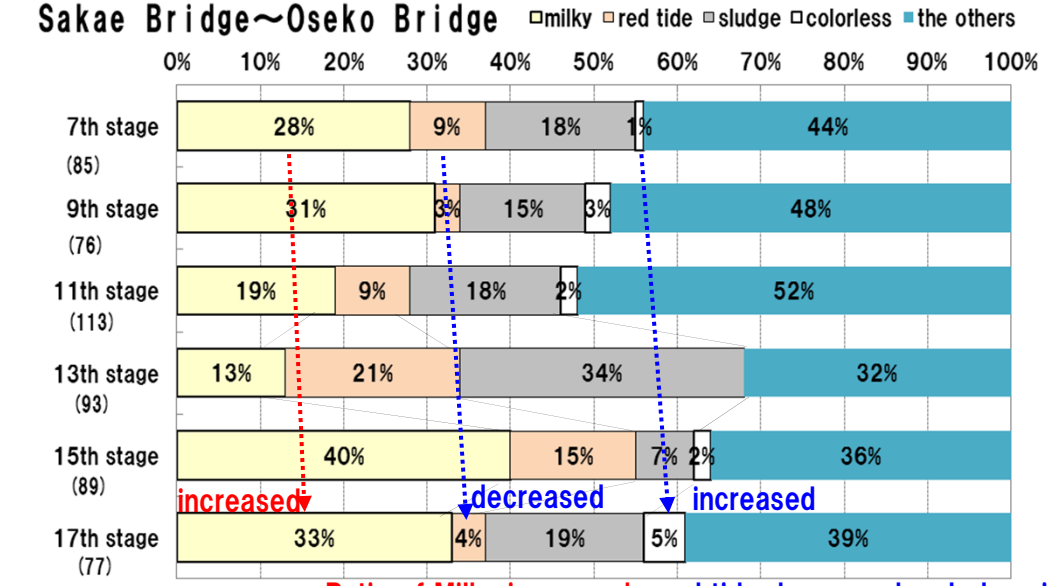
Change of colors (spring ～ early summer)

The 7th, 9th, 11th, 13th, 15th 17th stage:
No TRWKR ,No rain on the day and the previous day



( ) the number of survey

Note: ※ few data



Ratio of Milky increased→red tide decreased, colorless increased

Legend

- milky
- ②milky white
- ⑧pale gray yellow green
- ⑫pale yellow gray
- red tide
- ⑬yellow brown
- ⑭brown
- ⑮green brown
- sludge
- ⑥gray
- ⑩gray green
- ⑪dark gray

■ Change of colors after the stop of TRWKR

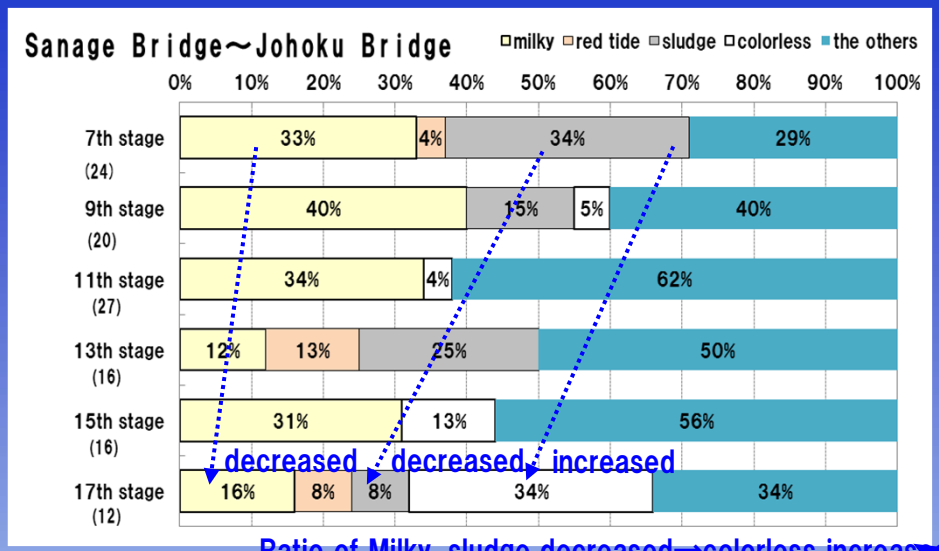
→The ratio of Milky increased, red tide decreased, colorless increased compared with 7th stage.

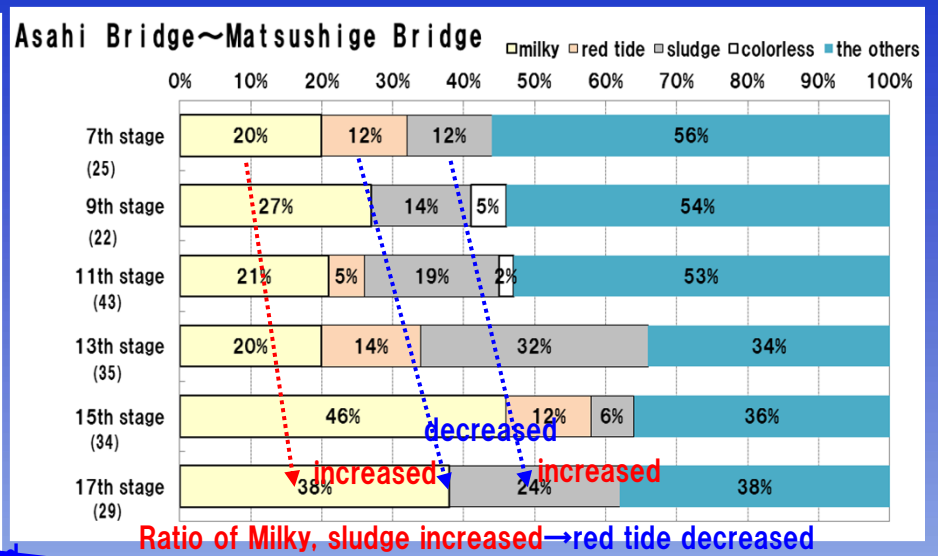
In the 17th stage, compared to the 15th , the ratio of milky and sludge increased, the ratio of red tide decreased.

We think that the water quality has get better by the new measures for water quality improvement. We need to ascertain the facts by continuous survey.

Ratio of color (spring ～ early summer)

The 7th, 9th, 11th, 13th, 15th 17th stage:
No TRWKR ,No rain on the day and the previous day



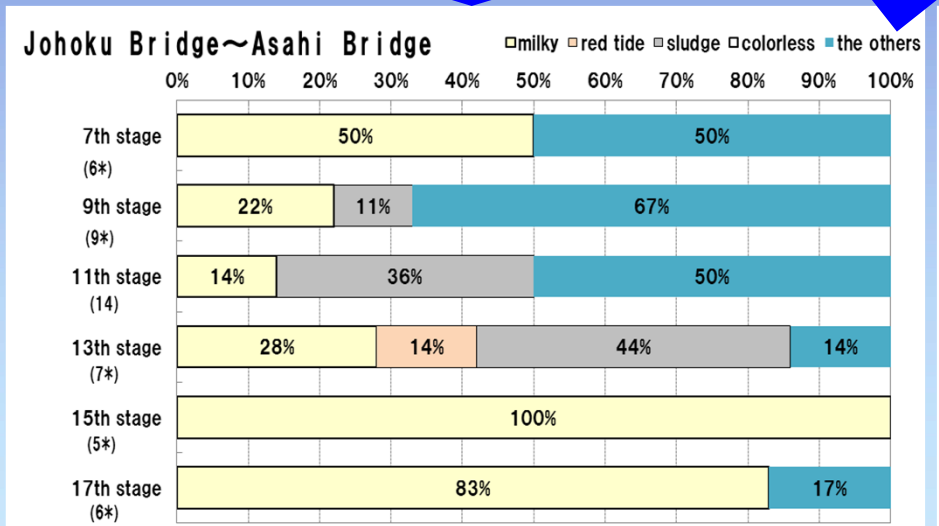


Ratio of Milky, sludge decreased→colorless increased

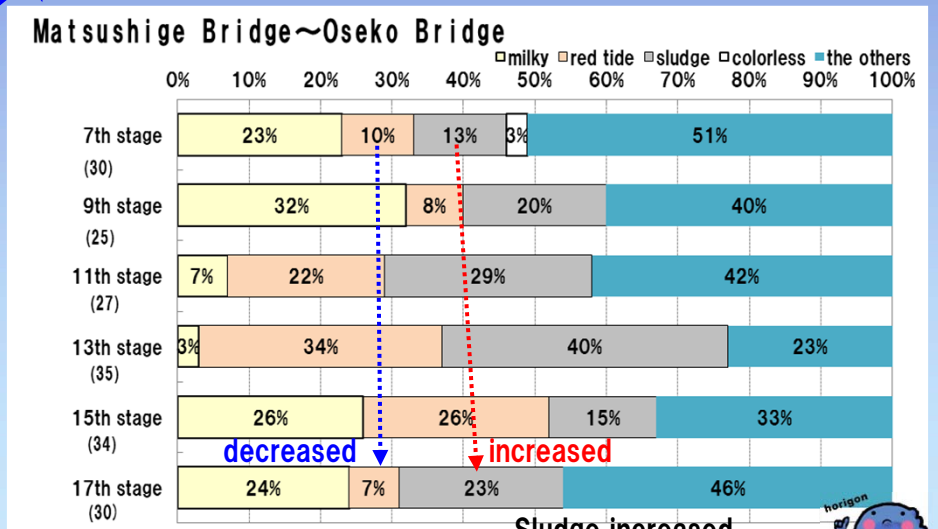
( ) the number of survey

Ratio of Milky, sludge increased→red tide decreased

( ) the number of survey



Note: ※ few data



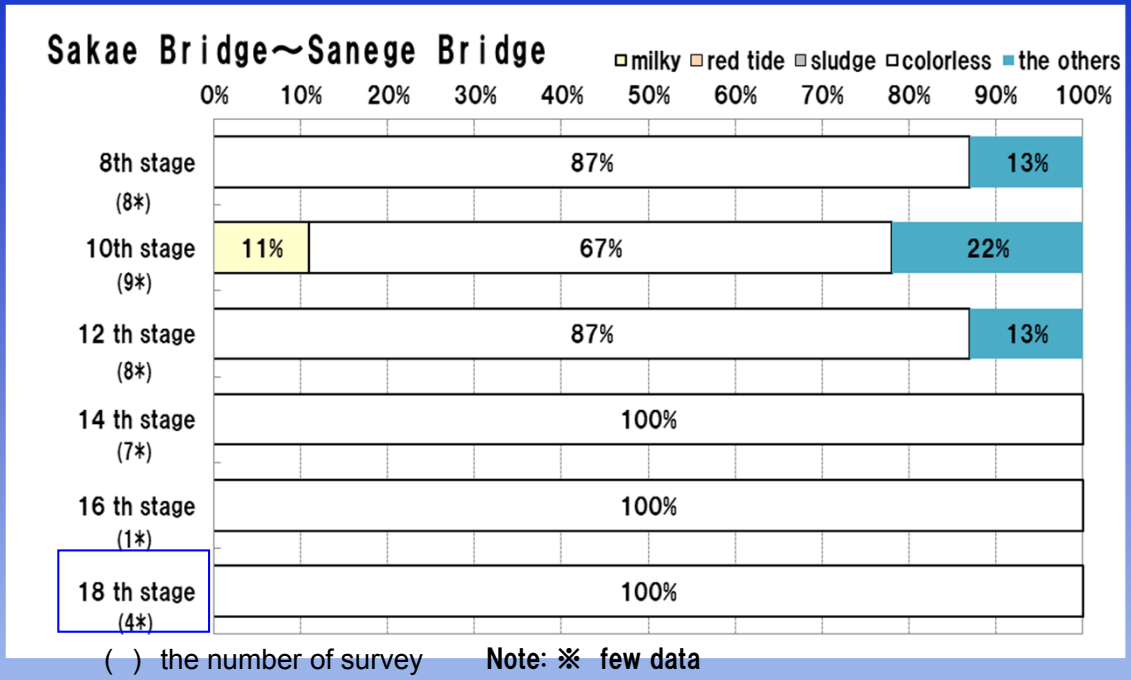
Sludge increased

■ Change of colors after the stop of TRWKR

Ratio of Milky, sludge decreased, and colorless increased after the stop of TRWKR at 17th stage around Sanage Bridge～Johoku Bridge. Ratio of Milky, sludge increased, red tide decreased around Asahi Bridge ～ Oseko Bridge. We think that colorless increased Sanage Bridge ～Johoku Bridge by the new measures for water quality improvement. We need to ascertain the facts by continuous survey.

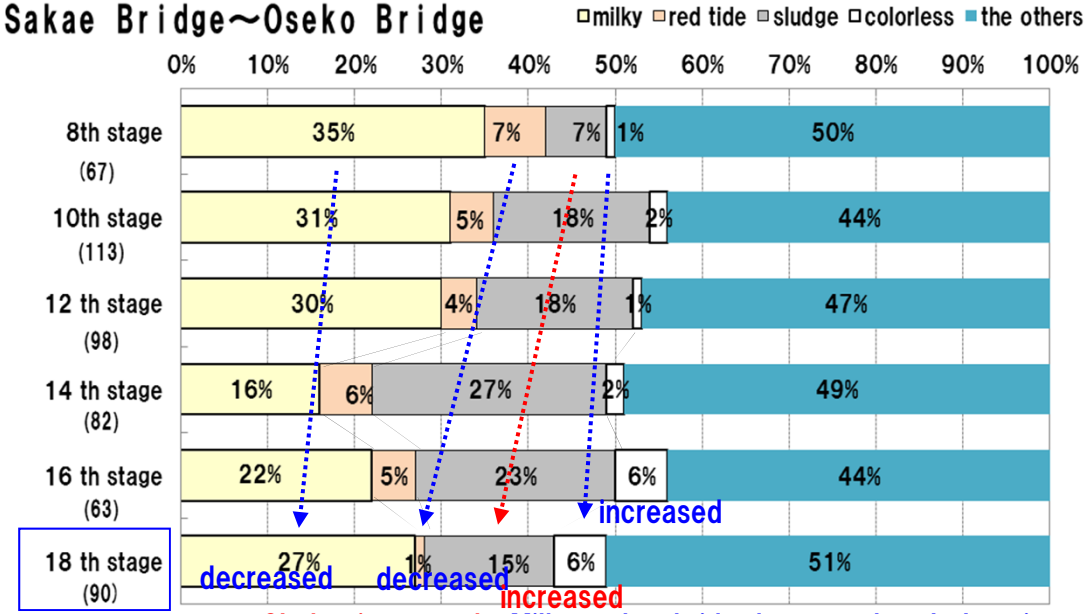
Change of colors (Autumn ～ Early Winter)

The 8th, 10th, 12th, 14th, 16th 18th stage:
No TRWKR ,No rain on the day and the previous day



( ) the number of survey Note: ※ few data

Legend
- milky
- red tide
- ②milky white
- ⑬yellow brown
- ⑧pale gray
- ⑭brown
- yellow green
- ⑮green brown
- ⑫pale yellow gray
- sludge
- ⑥gray
- ⑩gray green
- ⑪dark gray

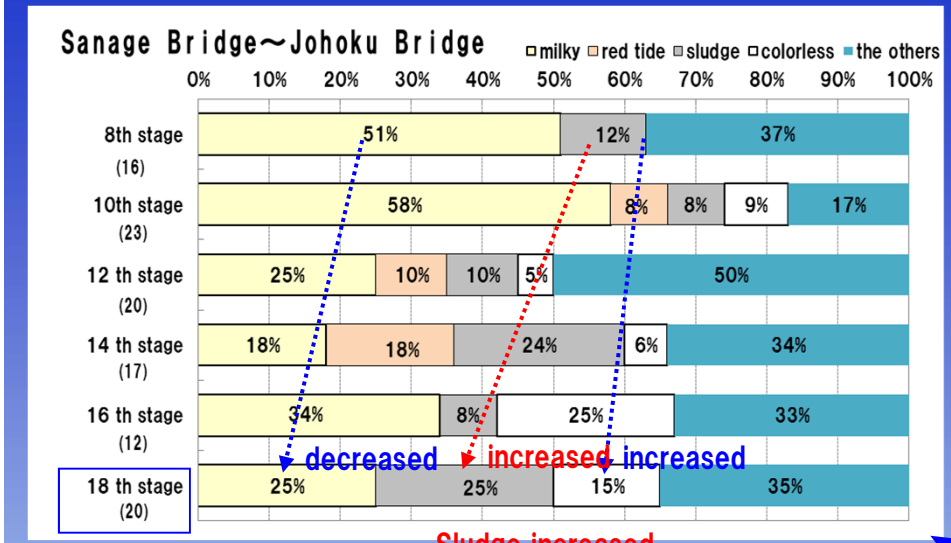


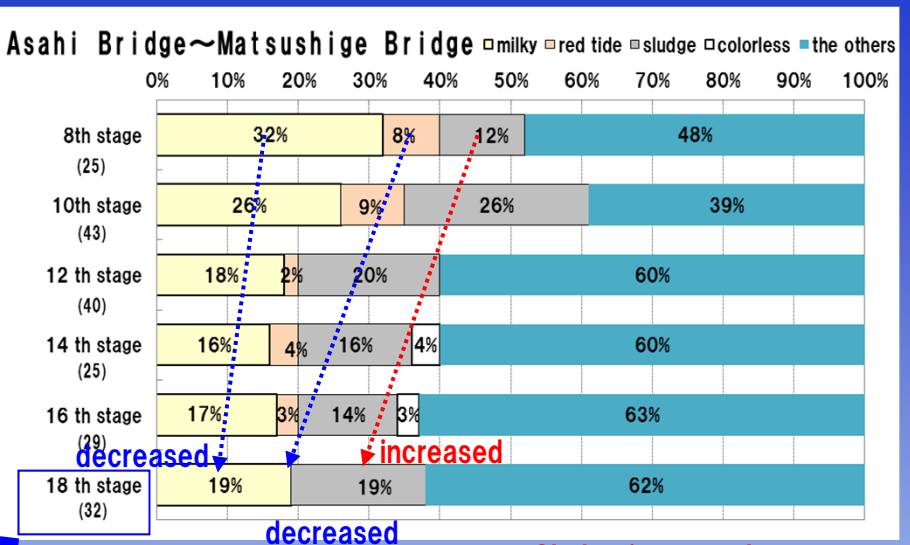
Sludge increased→Milky and red tide decreased、colorless increased

■ Change of colors after the stop of TRWKR
→Sludge increased, Milky and red tide decreased, colorless increased compared with 7th stage.
We think that colorless increased at 16th and 18th stage by the new measures for water quality improvement. We need to ascertain the facts by continuous survey.

Ratio of color (Autumn ～ Early Winter)

The 8th, 10th, 12th, 14th, 16th 18th stage:
No TRWKR ,No rain on the day and the previous day



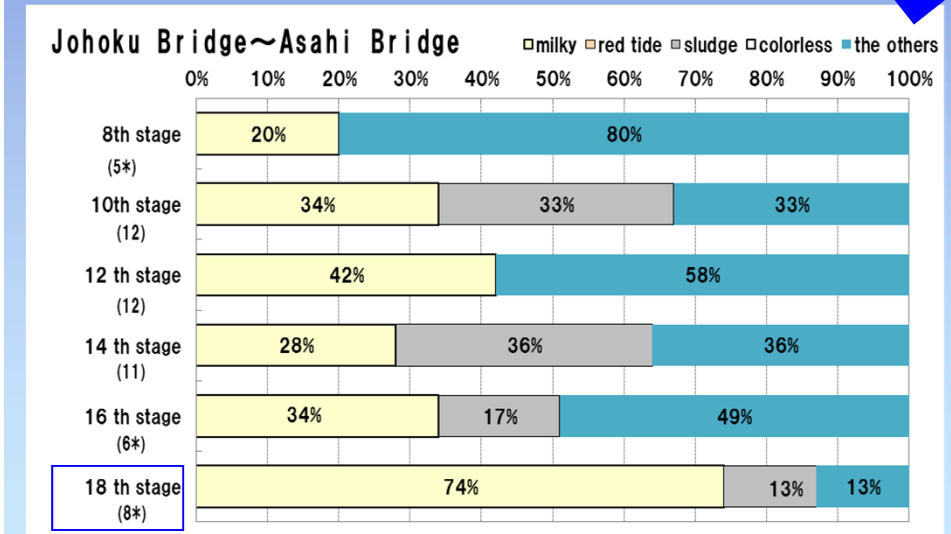


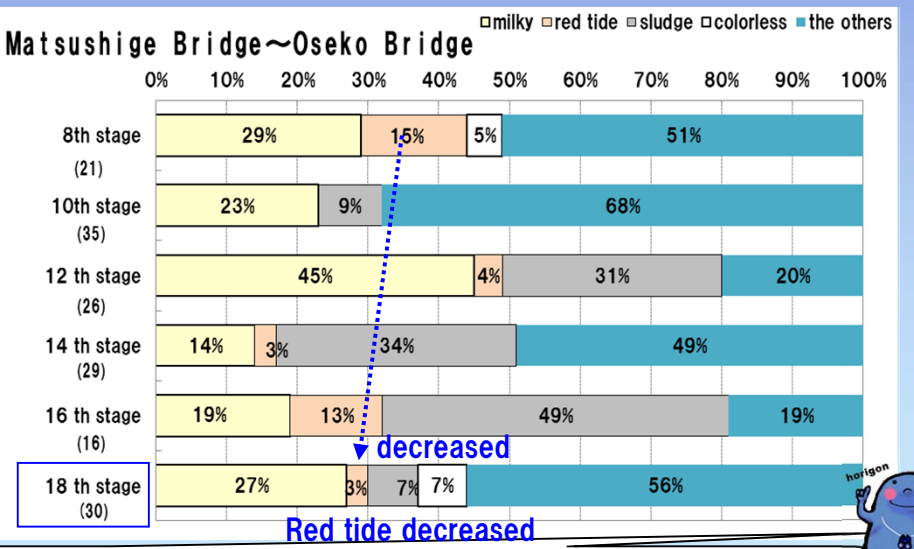
( ) the number of survey
Note: ※ few data

Sludge increased
→Milky decreased、colorless increased

( ) the number of survey

Sludge increased
→Milky and red tide decreased





■ Change of colors after the stop of TRWKR

Sludge increased, and milky decreased、colorless increased at 17th stage around Sanage Bridge～Johoku Bridge compared with the stage after the stop of TRWKR. Milky and red tide decreased around Asahi bridge and Oseko bridge. We think that colorless increased at 16th and 18th stage around Sanage Bridge～Johoku Bridge by the new measures for water quality improvement. We need to ascertain the facts by continuous survey.

6.8. Litters

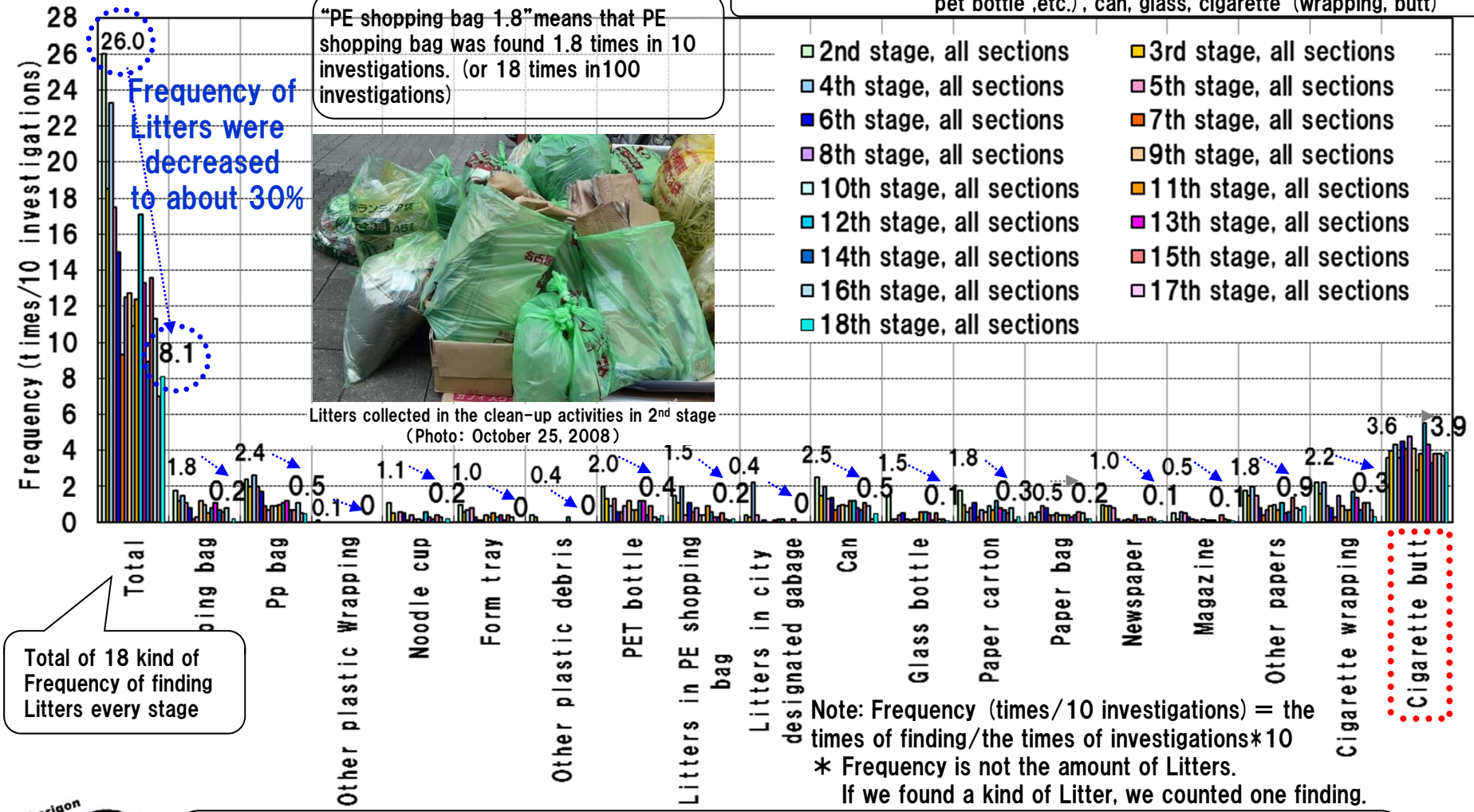
Litters
Change in Frequency of finding Litters on Riverside Ways
(From 2nd to 18th stage, all section)

From 2nd to 6th stage :
With TRWKR No rain on the day and the previous day
From 7th to 18th stage :
No TRWKR No rain on the day and the previous day

■Litters component:Plastic wastes (PE, plastic bag, noodle cup, foam tray, pet bottle ,etc.), can, glass, cigarette (wrapping, butt)

"PE shopping bag 1.8"means that PE shopping bag was found 1.8 times in 10 investigations. (or 18 times in100 investigations)

Litters collected in the clean-up activities in 2nd stage (Photo: October 25, 2008)



Total of 18 kind of Frequency of finding Litters every stage

Note: Frequency (times/10 investigations) = the times of finding/the times of investigations*10
* Frequency is not the amount of Litters.
If we found a kind of Litter, we counted one finding.

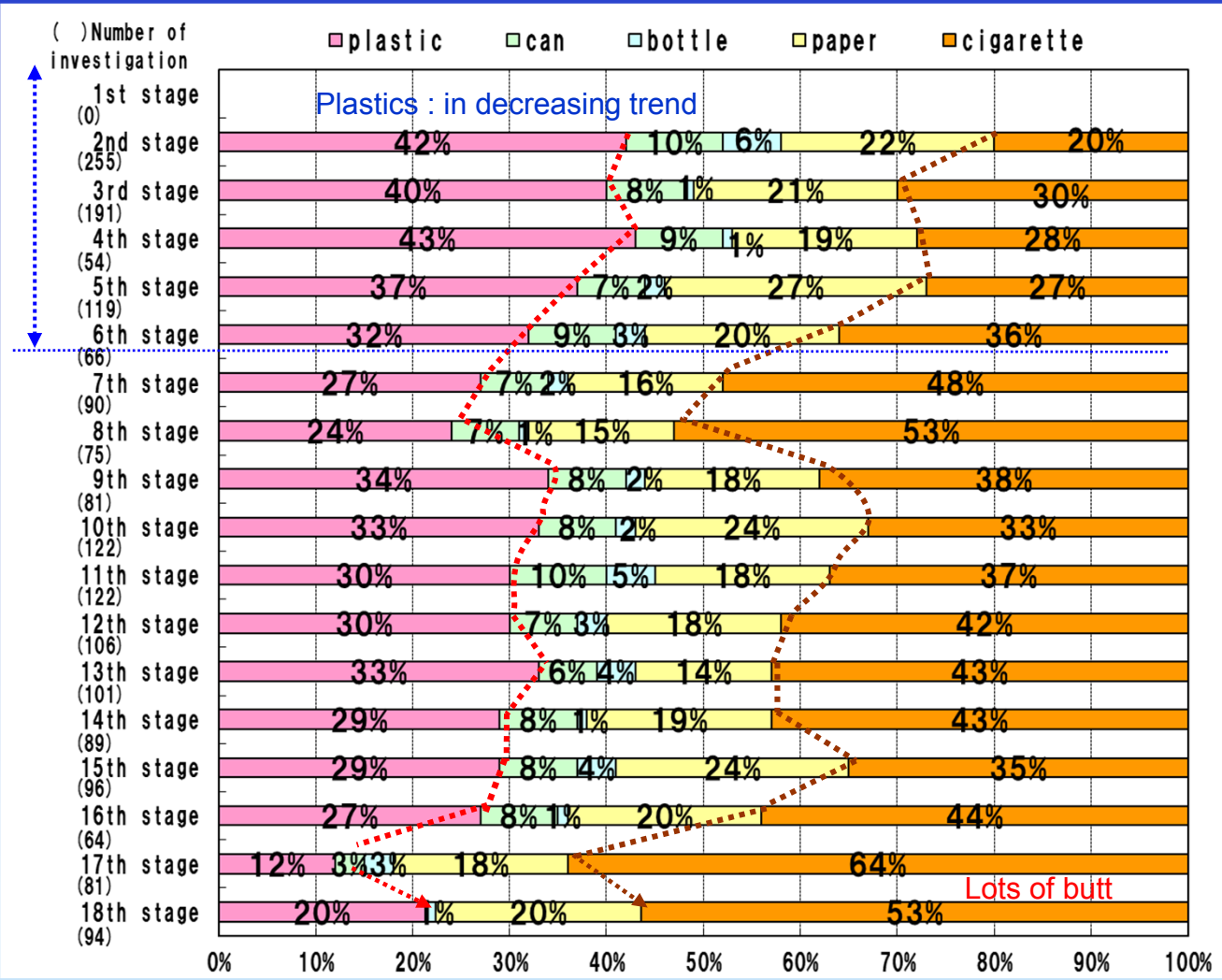
■Frequency of finding Litters on Riverside Ways?
Frequency of Litters in 18th stage were decreased to about 30% (8.1/26.0*100=31%) as compared to 2nd stage starting investigations. This is the result that we can feel a change in the consciousness of citizens have appeared by spreading the relation of citizen loving Horikawa rever, and increasing the organizations and the companies cleaning Horikawa rever. Cigarette butt was the most frequency Litters.

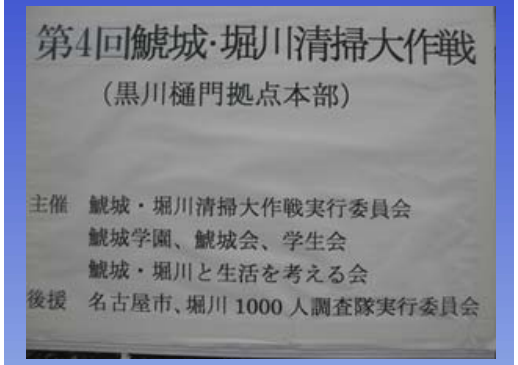
Litters on Riverside Ways
（From 2nd to 18th stage, each section）

From 2nd to 6th stage :
With TRWKR No rain on the day and the previous day
From 7th to 18th stage :
No TRWKR No rain on the day and the previous day

■Litters component:
Plastic wastes (PE, plastic bag, noodle cup, foam tray, pet bottle ,etc.) , can, glass, cigarette (wrapping, butt)

With TRWKR





Note: Component ratio (%) ＝the number of sighting each kind of litter／the number of sighting all kind of litter ×100　Litter does not include leaves, branches and grass.
＊The number of sighting is not the number of litters.
We count one, even if at least one litter is sighted in the survey.

■What kind of litters was found on the riverside ways more frequently?
→ The rate of cigarette was high. Plastics are in decreasing trend.

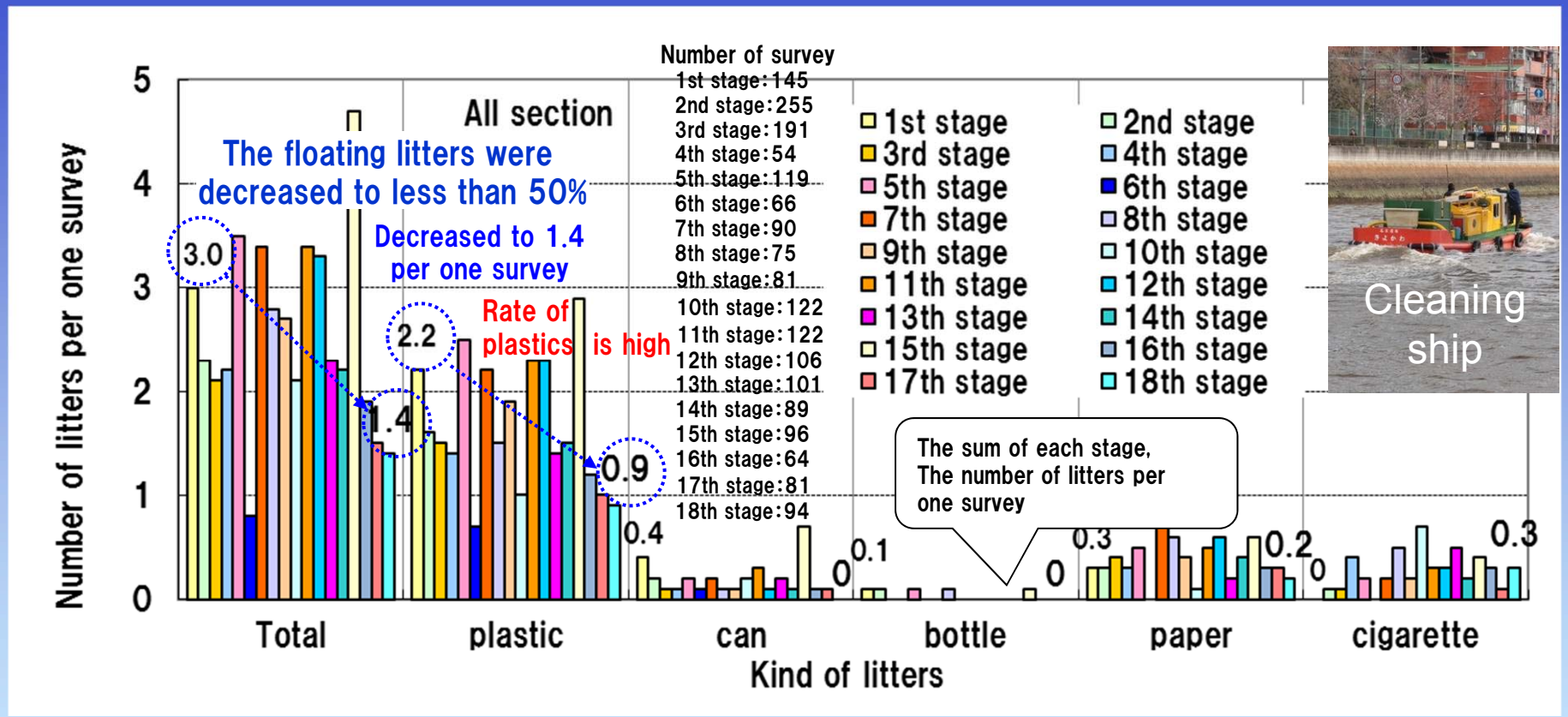
Conspicuous littering of cigarette butts.

Change in Floating Litters

From 2nd to 6th stage :
With TRWKR No rain on the day and the previous day

From 7th to 18th stage :
No TRWKR No rain on the day and the previous day

■Litters component:Plastic wastes (PE, plastic bag, noodle cup, foam tray, pet bottle ,etc.) ,can, glass, cigarette (wrapping, butt)

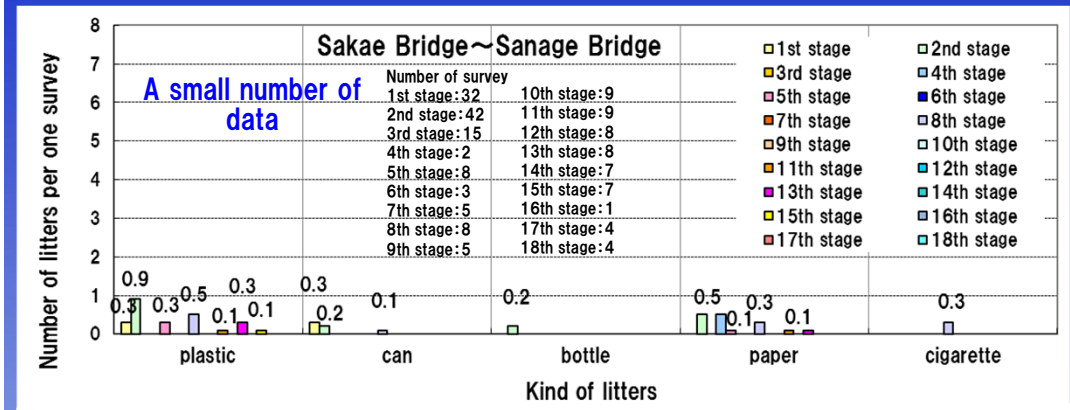


■What trend the floating litters go?→The number of floating litters at 18th stage was 1.4litters/one survey. The floating litters were decreased to less than 50% as compared to 1st stage.
Rate of plastics was high, and the number of plastic was 0.9 per one survey.

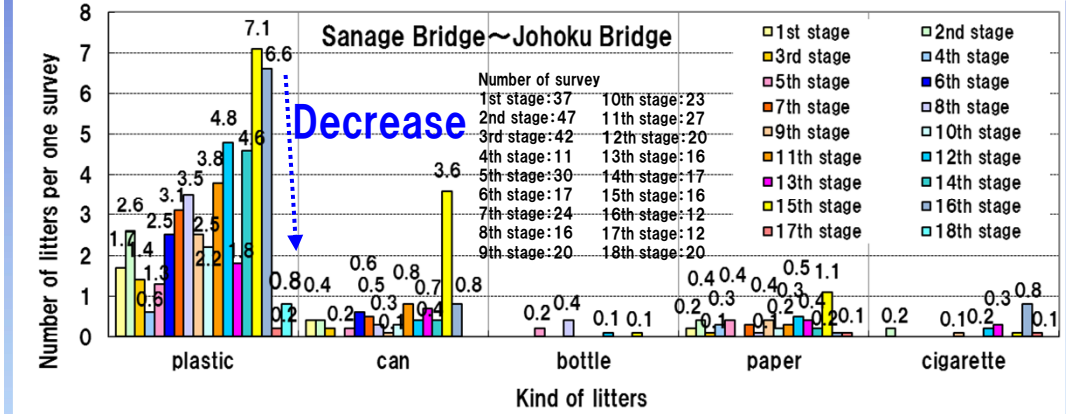
Note: the number of litters per one survey = the number of each litters found in all survey / the number of surveys
＊the number of litters is the number of litters found in all survey
If the number of litters was reported “countless(=＊＊＊)”in some survey, it count ”10”, the maximum number of other reports.

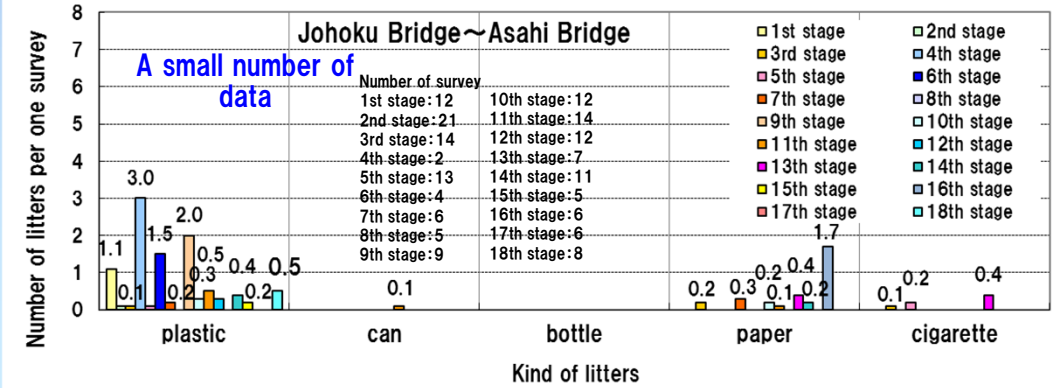
Change of the number of Floating Litters

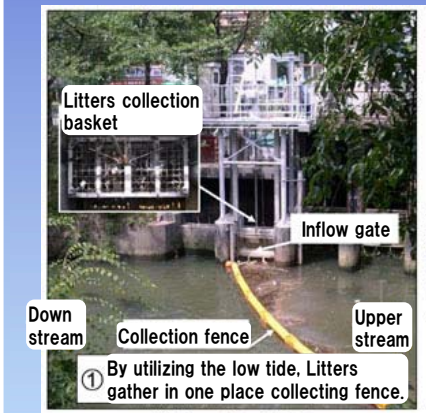
From 2nd to 6th stage :
With TRWKR No rain on the day and the previous day
From 7th to 18th stage :
No TRWKR No rain on the day and the previous day



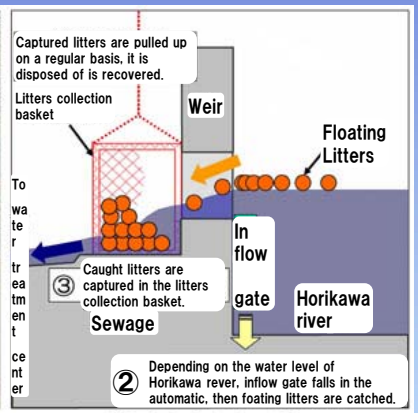
Floating litters in "Sanage Bridge ～ Johoku Bridge" section decreased in 17th and 18th stage.







Installation condition of the facility



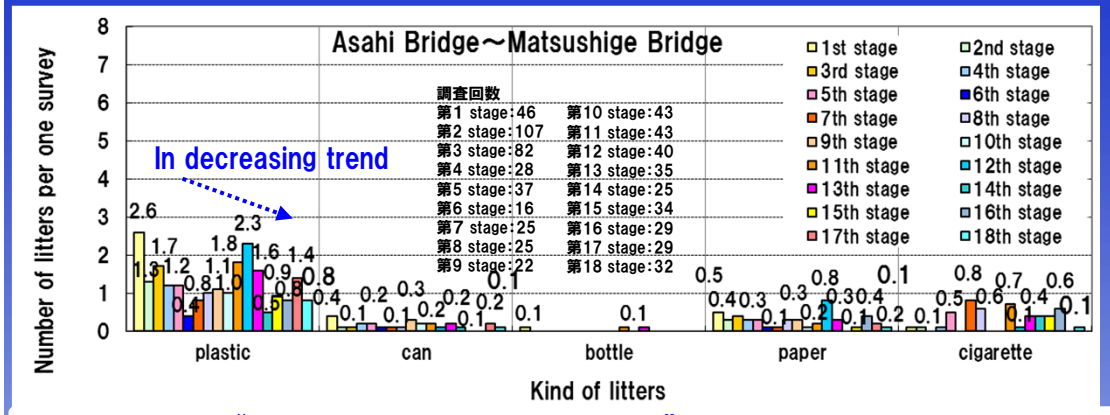
Sectional view (image)

Document: Website of Nagoya city
http://www.city.nagoya.jp/ryokuseidoboku/page/0000009101.html

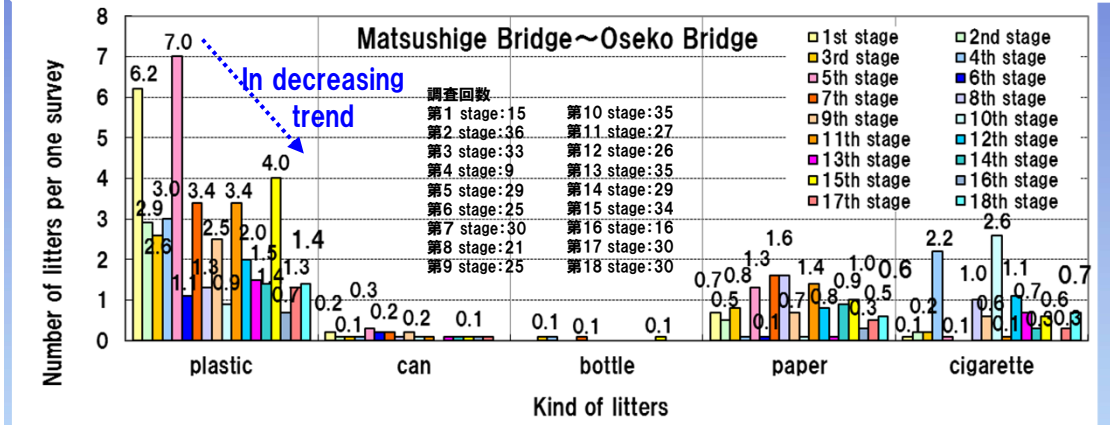
■What trend floating litters in Sakae Bridge ～ Asahi Bridge go?
→Floating litters in "Sanage Bridge ～ Johoku Bridge" section decreased significantly in 17th and 18th stage.
As a factor, it is considered that of the two.
①Litters to fall on the river like the wind decreased, because litters on riverside way decreased by a change in the consciousness of citizens.
②Floating litters are effectively removed, so litters catcher established in downstream of Johoku Bridge is operated well.

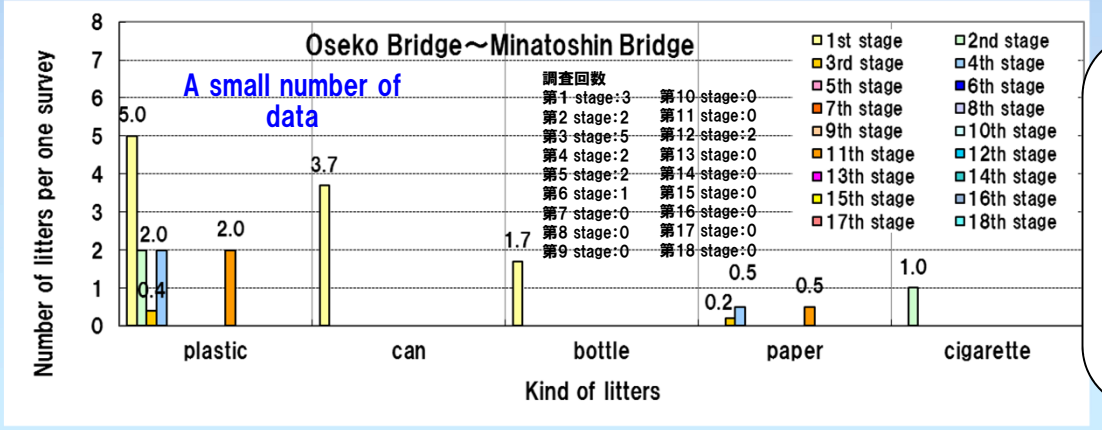
Change of the number of Floating Litters

From 2nd to 6th stage :
With TRWKR No rain on the day and the previous day
From 7th to 18th stage :
No TRWKR No rain on the day and the previous day



Floating litters in “Sanage Bridge ～ Johoku Bridge” section decreased mostly plastic.





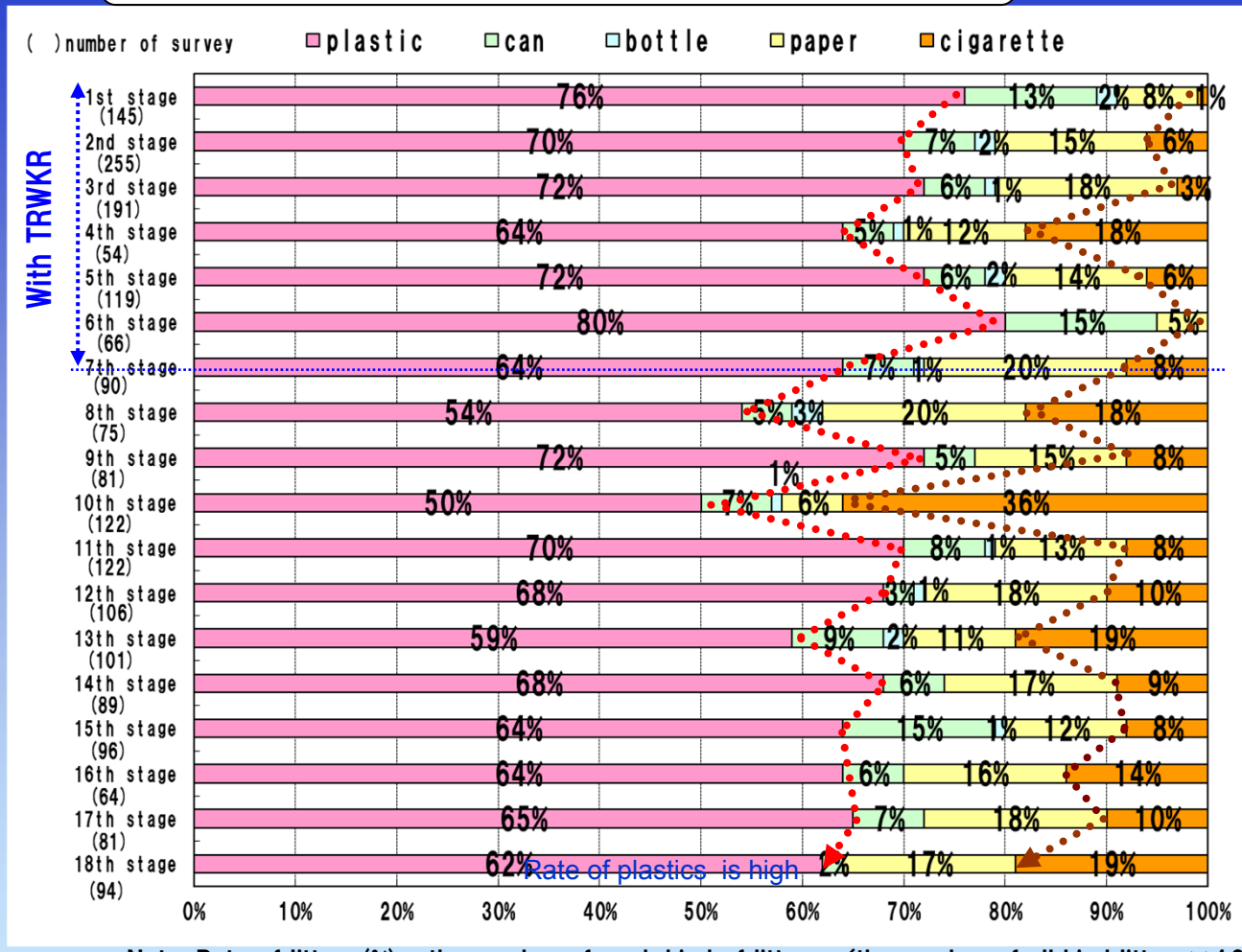
Kameya Bridge～Sumiyoshi Bridge
By having been removed the raft in the water’s edge, it decreased the frequency to see the litters.

■What trend floating litters in Asahi Bridge ～ Minatoshin Bridge go?
→Floating litters in “Sanage Bridge ～ Johoku Bridge” section decreased mostly plastic.
As a factor, it is considered that of the two.
①Litters to fall on the river like the wind decreased, because litters on riverside way decreased.
②By having been removed the raft in the water’s edge in Kameya Bridge～Sumiyoshi Bridge, litters are no longer stagnant.

Kind of floating Litters(component ratio)

■Litters component：Plastic wastes (PE, plastic bag, noodle cup, foam tray, pet bottle ,etc.) , can, glass, cigarette (wrapping, butt)

From 2nd to 6th stage :
With TRWKR No rain on the day and the previous day
From 7th to 18th stage :
No TRWKR No rain on the day and the previous day



Note: Rate of litters (%) ＝the number of each kind of litters ／the number of all kind litters×100
the number does not include leaves branches and grass
＊the number of litters was found through all surveys
"if some kind of litters were found "countless (=＊＊＊)"in some survey, it counts "10",
the maximum number in one ubstituted for the number of "countless".

■What kind of floating litters were found frequently?
→The rate of plastics is high, about 60% (18th stage) , in decreasing trend.

6.9. Living things

Horikawa was polluted in rapid-economic growth period, so called “dead river”. But now, various living things can be seen, for example Kingfisher, although the river flow through the center of Nagoya city.

Sep.18 2015 (Fri.)　Report・Photo: Kawasemi-chosatai


カワセミ


イソヒヨドリ


ハクセキレイ


スッポン


ミシシッピアカミミガメ
（外来種）


ギンヤンマ
（産卵中）

白鳥付近　たくさんのボラが水面付近で苦しそうにしている様子
モクズガニも水面付近に避難
Nov. 11 2015(Wed.)　Report・Photo:Kawasemi-Chosatai

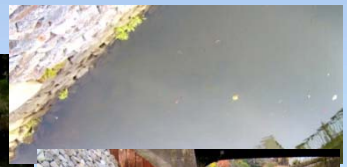
熱田記念橋　カラスの大軍と鴨の群れ
Dec. 25 2015(Fri.)　Report・Photo:Chikyukurabu-Chosatai

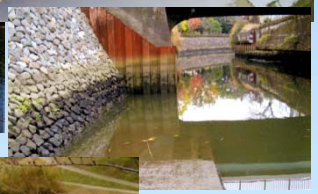
Nakatsuchido Bridge Living things Observation Diary

Report・Photo:Sato family Chosatai

私どもは、川魚が定着すれば、先ず生きた川に発展すると考えました。そのために中土戸橋周辺の川が何を望んでいるかを、歩いて知ろうと考えました。特別テーマは別にして、間口を大きくしないためにも1日をA4で纏めることにしました。そして1年200回を目標としています。

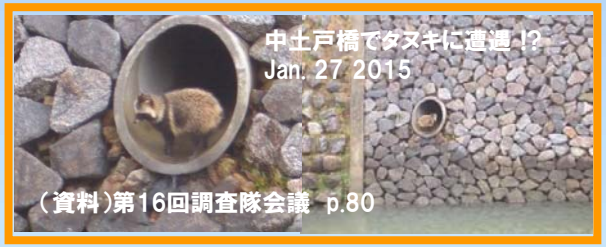
Sep.15 2015(Tue.)
カメが甲羅干し
カルガモ8羽上流へ。
対岸の葦に小さなアオサギ。





Oct. 9 2015(Fri.)
鵜が小魚をくわえて出る。
カワセミが葦の根本近くにとまる。
タヌキの糞見当たらず。

Nov. 29 2015(Sun.)
水鳥の数が増える。星羽白の数が多い。
カルガモ、カワウ、セキレイ、白鷺、鵜。小鴨が約100羽。
中土戸橋下流に金黒羽白約60羽、筋違橋に約20羽。
お堀に星羽白と金黒羽白の場所にユリカモメが約40羽。



Dec. 10 2015(Thu.)
小鴨と星羽白50羽程。金黒羽白の姿はなく、星羽白の数が少ない。
小鴨が6,7羽コンクリートの水垢を啄んでいる。カイツブリの姿は見えない。
下流に金黒羽白の二つのグループは健在で、お堀には
金黒羽白と星羽白が戻っていた。ユリカモメは20羽以下に減少し、
鵜の姿は見えず。狸の糞、認められず。

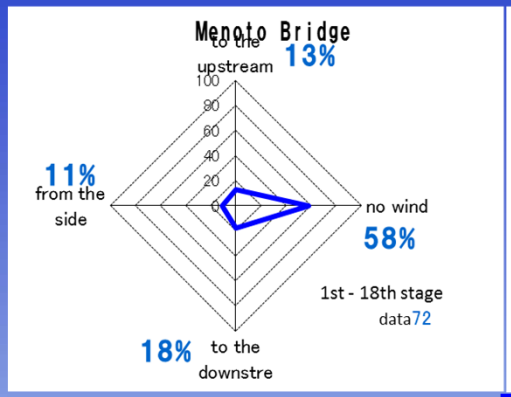
6.10. Wind

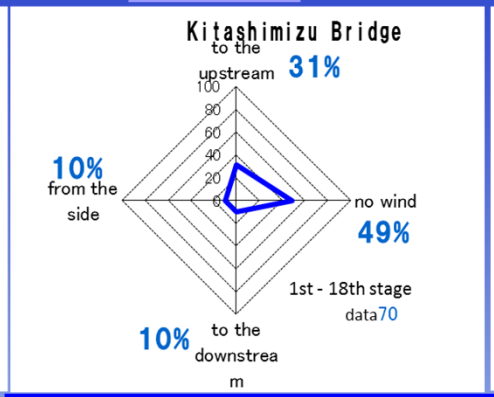
Direction of wind

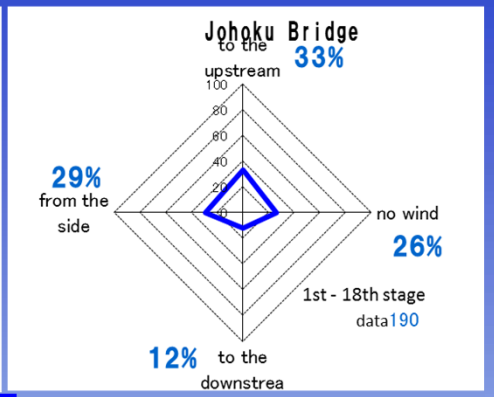
Wind to the upstream

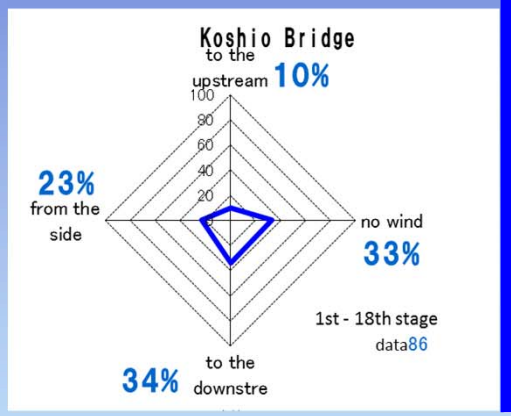
The wind often blows along the Horikawa river

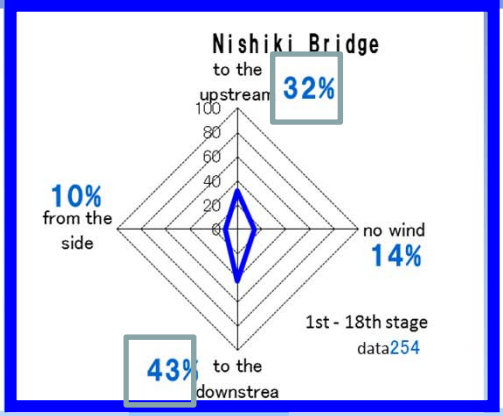
Wind from the side

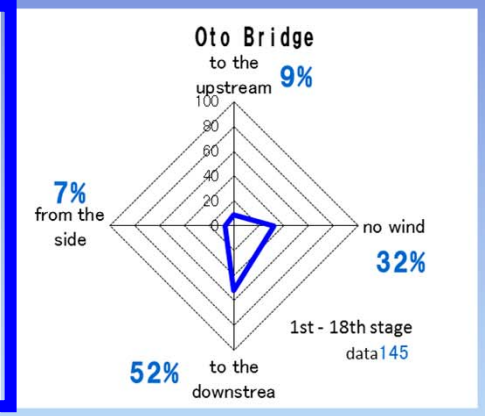












Wind to the downstream

■Direction of wind

Data: all data of 1st stage to 18th stage

The wind often blows along the Horikawa river than from the side.

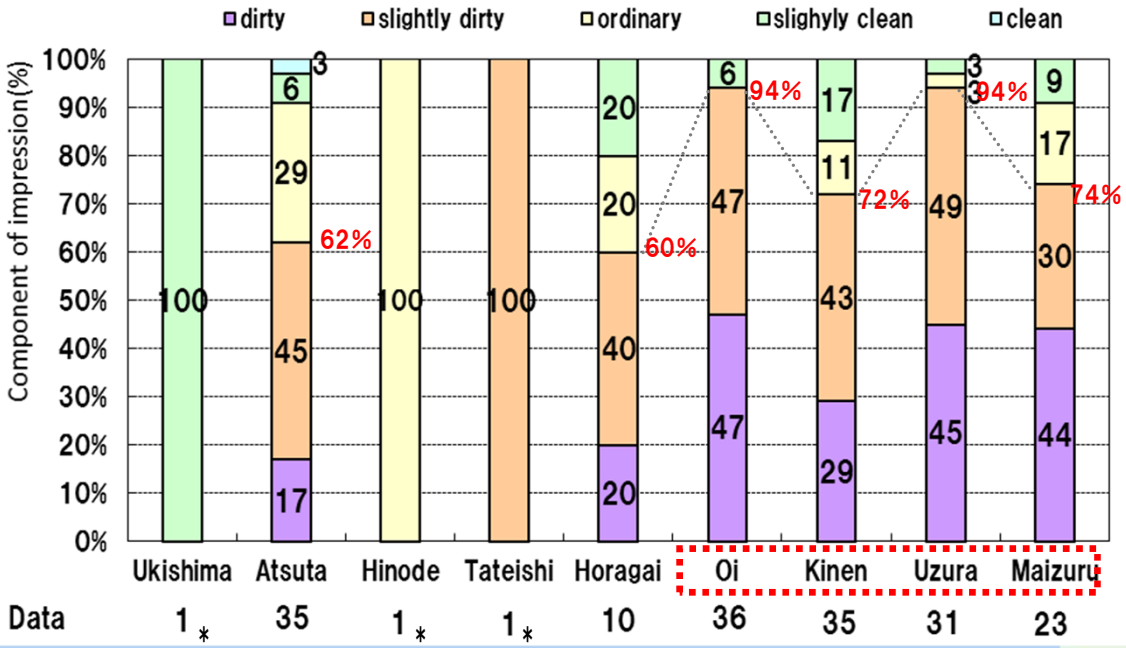
At Nishiki Bridge, the wind blowed along the river about 80%.

6.11. State of Shin-Horikawa River

Impression of water pollution

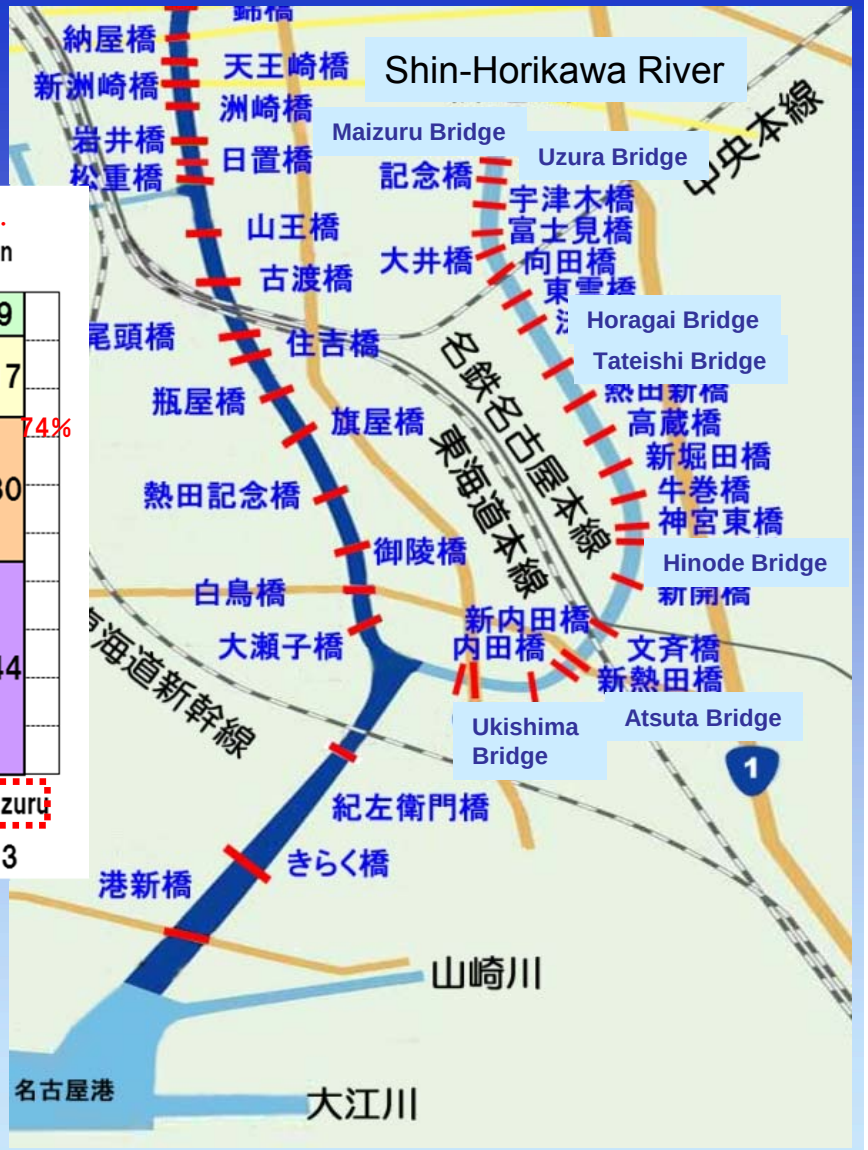
All data included

Impression of water pollution was worth between Maizuru Bridge and Oi Bridge.

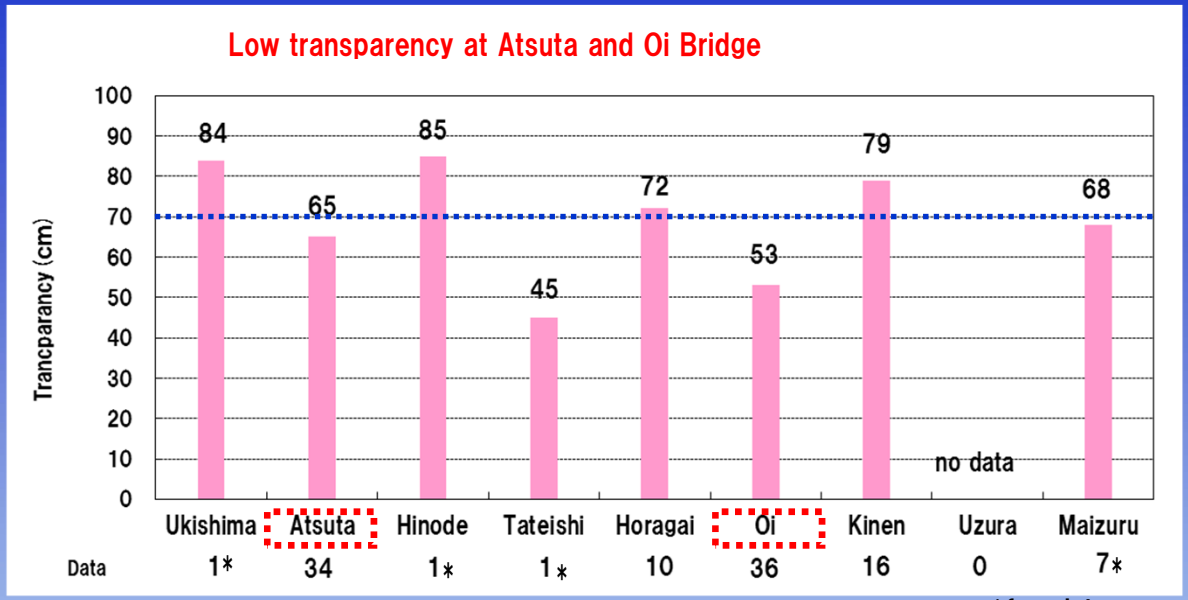


* Few data

■ Impression of water pollution
At upstream of Shin-Horikawa river, between Maizuru Bridge and Oi Bridge, the rate of “dirty” or “slightly dirty” was over 70%.
At downstream, the rate was 62%.
Impression of water pollution is especially bad between Maizuru Bridge and Oi Bridge.



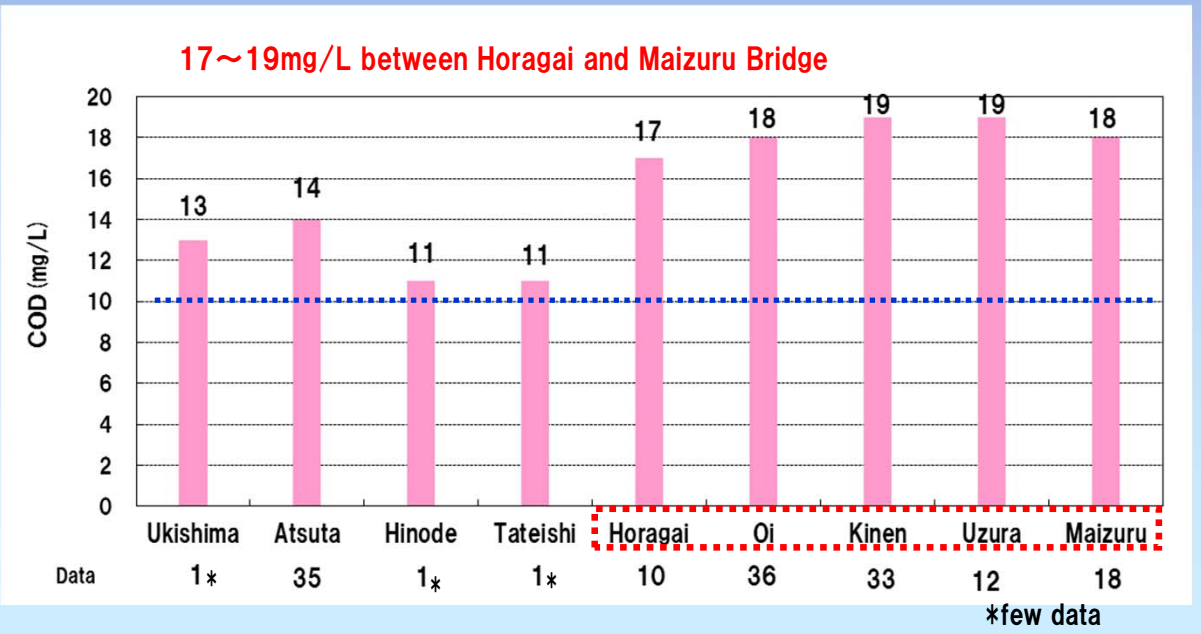
Transparency of Shin-Horikawa River



Transparency of Oi bridge in upstream of Shin-Horikawa river, was 53cm, that was shorter than 70cm.
That of Atsuta Bridge in downstream, was 65cm,that was shorter than 70cm.
Both were acceptable range for citizen.

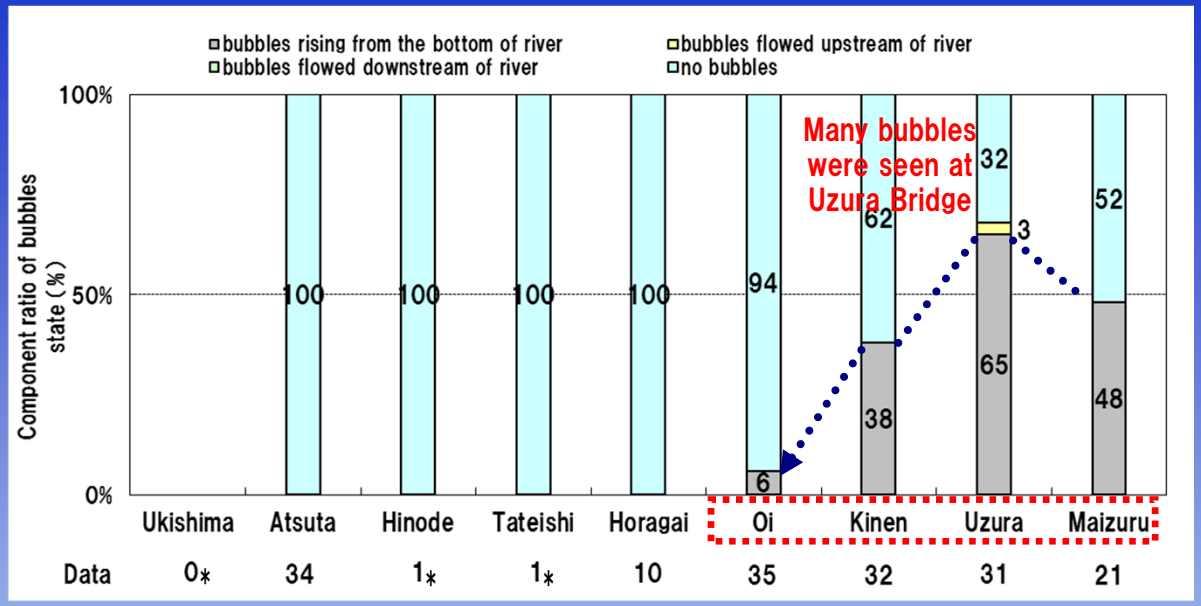
*acceptable range for citizen
: over 70cm transparancy

COD of Shin-Horikawa River



COD level between Maizuru and Horagai Bridge ,in upstream of Shin-Horikawa river, was 17-19mg/l, That of Atsuta Bridge, in downstream, was 14mg/l.
Upstream was more high level COD than downstream.

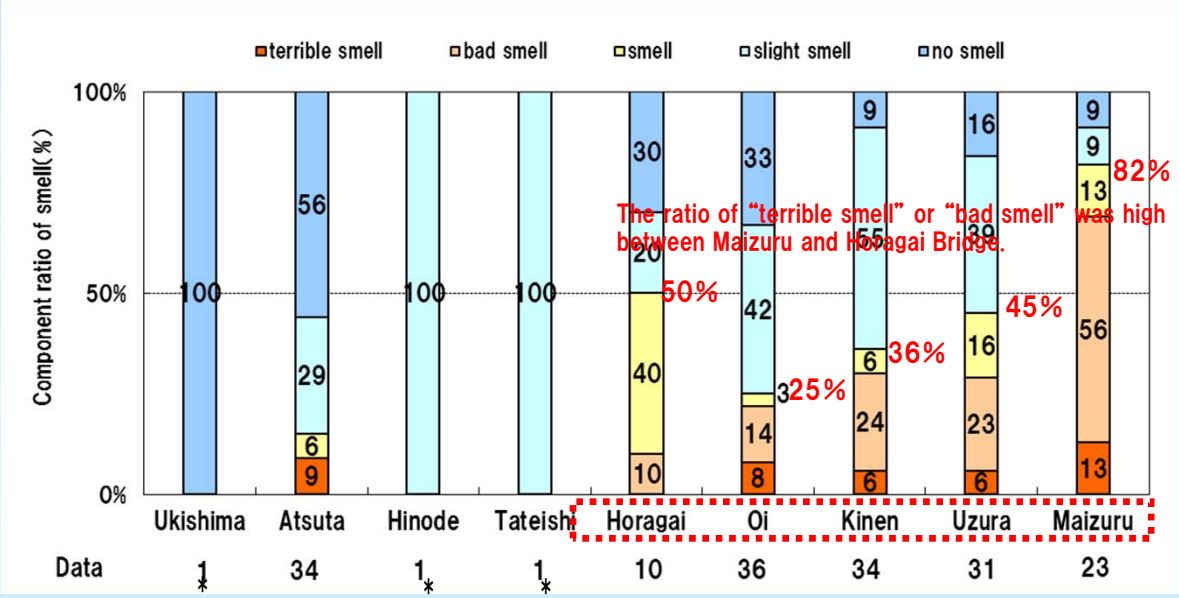
Bubbles of Shin-Horikawa River



*few data

"Bubbles rising from the bottom of river" were seen at Maizurum, Uzura, Kinen and Oi Bridge.
Especially, that were seen high ratio at Uzura Bridge 65%.
No bubbles were seen between Horagai and Atusta Bridge.

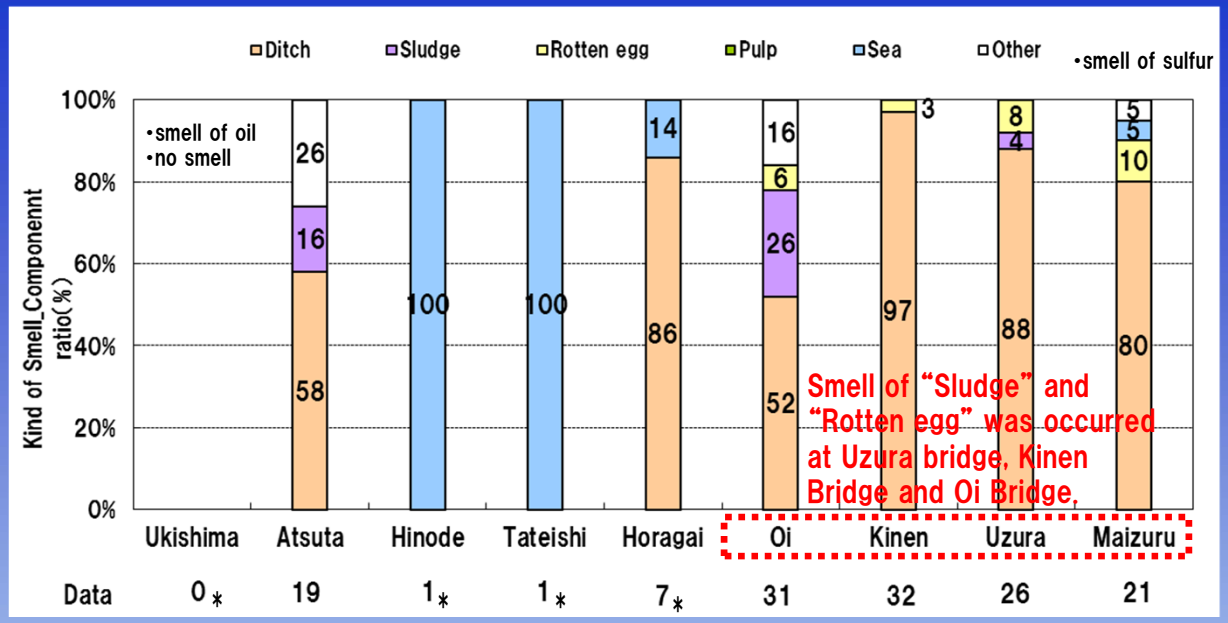
Smell of Shin-Horikawa River



*few data

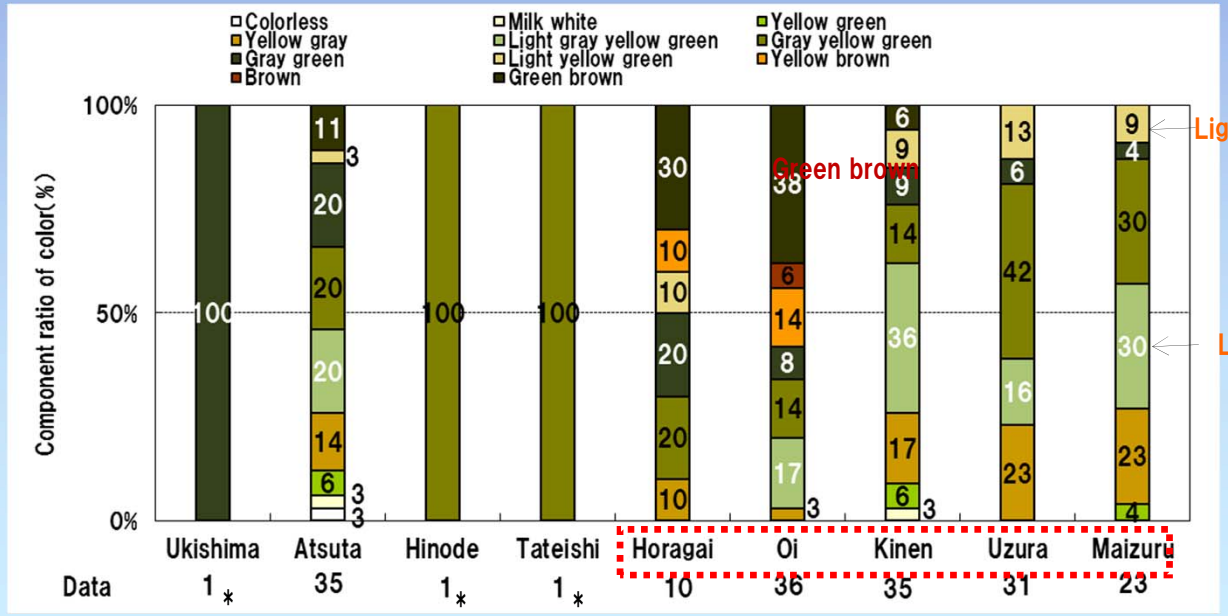
The ratio of terrible smell or bad smell, between Maizuru and Horagai Bridge, was 25-82%. That was high in upstream than in downstream.

Kind of Smell from Shin-Horikawa River



*few data

Colors of Shin-Horikawa River



*few data

■ Kind of smell

In Addition to smell of "Ditch", Smell of "Sludge" and "Rotten egg" was occurred at upstream of Uzura Bridge, Kinen bridge and Oi Bridge.

■ Colors

→Lighter colors were seen about 40% at Maizuru Bridge and Kinen Bridge. Colloidal particulate sulfur might cause these colors.
And darker green colors seen at Kinen Bridge and Oi Bridge, Horagai Bridge, Atsuta Bridge. The color were from phytoplankton.

Horikawa Clean Experiment with Chinese Water Spinach and SunPatiens

June 19th ～ October 7th, 2015

By Ena Agricultural High School, Nagoya Horikawa Lions Club
and EspecMic Corporation
Place：near the pier of Naya Bridge

The sand of withered sunpatiens was muddy and black as sludge.

Horikawa Clean Experiment with Chinese Water Spinach and SunPatiens

June 19th ～ October 7th, 2015

Place:near the pier of Naya Bridge

June 22th
（3days after experiment start）

June 29th（1st week）

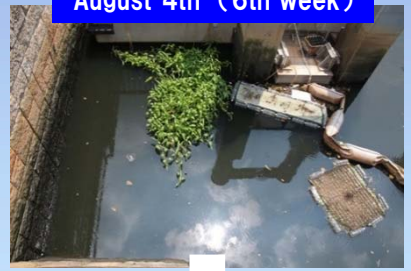
July 6th（2nd week）

July 13th（3rd week）

July 22th（4th week）

July 27th（5th week）

August 4th（6th week）



August 10th（7th week）

August 17th（8th week）

August 24th（9th week）

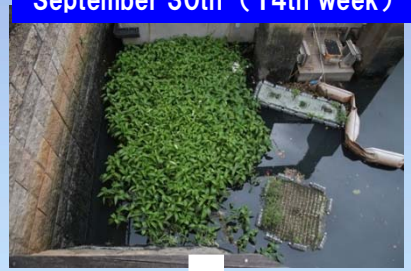
September 1st（10th week）

September 7th（11th week）

September 15th（12th week）

September 24th（13th week）

September 30th（14th week）



October 7th（15th week）

Horikawa Clean Experiment with Chinese Water Spinach and SunPatiens

June 19th ～ October 7th, 2015

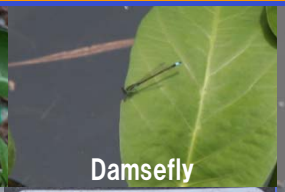
Place:near the pier of Naya Bridge

Harvest Working （October 7th）

Insects, Birds, and Crustaceans photos by Kawasemi survey group


Orthetrum albistlyum


Lycaenidae


Damsefly


Anax parthenope


Japanese mitten crab


Sesarmops intermedium


Speceis of Crabs and Shrimp


Black-backed wagtail


Blue rock-thrush


Grey heron

Two years ago, the root of chinese water spinach became black, but it became white this time.


October 16th ,2013


October 7th, 2015


（※1） Bestman island


（※2） Rebotex

November 26th , 2015

At two floating islands (※1,※2） introduced in June 2015, many kinds of plants sprout and grow up. These species are seen at a path between rice paddies. This result is considered valuable for examining what kind of plants can grow up at midstream of Horikawa.

Horikawa Clean Experiment with Chinese Water Spinach and SunPatiens（2015）

Term:June 19th ～ October 7th, 2015（15weeks）
① Chinese Water Spinach :Grow up smoothly
② SunPatiens:Withered （7th week）

Continuous observation of plant succession in two floating islands

Term:October 8th, 2015 ～（Ongoing）
Plants seen at a path between rice paddies occur naturally
ex.） Brassicaceae, Cyperaceae

～Impression about the plants that grow up in the floating islands～
From Mr.Morimoto of Ena Agricultural High School
December 23rd ,2015

1. Observing plant succession and change of its ecology

①Confirm plant succession by letting the floating islands lie
②Confirm the role of vegetation in this ecosystem by observing the floating islands with flourish plants and gathering insects and birds.

2. Proposed Horikawa Canola Field Project

① Cultivate and observe canola flower
② Confirm the possibility of canola field on water
③ Confirm the possibility for extracting and using canola-seed-oil

※canola Field project for reviving farmland that was damaged from salt by tsunami

They aim for reconstruction of the affected area of tsunami of Great East Japan Earthquake by cultivating Brassicaceae which is strong in damage from salt in the paddy fields.

■Sale of edible canola-flower and *Yukina*
→Regeneration of food production and farm management
■canola-seed-oil
→Invigorating local communities by renewable energy

The Graduate School of Agriculture, Tohoku Univ.
http://www.nanohana-tohoku.com/

6.15. Progress of Citizen's Awareness Activities of studies

堀川1000人調査隊2010　第17回調査隊会議
平成27年9月5日(土)　報告:事務局

堀川浄化 水鳥戻った
市の実験 市民団体が会議

市が今年二月に浄化実験を始めた堀川の五条橋―中橋間（いずれも中区）で、実験前にはほとんど見られなかったオシドリなど水辺を好む鳥類十四種が姿を現すようになった。環境調査や浄化に取り組む市民団体「堀川1000人調査隊」の会の観察では、二つの橋の間の約二百メートルの区間では透視度が改善傾向。色鮮やかな羽が美しいオシドリのほか、ムクドリ、ハクセキレイ、ジョウビタキ、カルガモ、カイツブリなどの姿が確認できた。

服部宏事務局長（56）は「砂のおかげでヘドロが水流で巻き上がることがなくなり、鳥が好む小さな水中の生き物の成育環境がよみがえったのでは」と話した。

調査隊は二〇〇七年四月、木曽川から堀川への試験導水に合わせ、市民目線で水質の変化を調べるために発足。現在は五万人超の隊員で透視度や臭い、化学的酸素要求量（COD）、生息する生き物などを定期的に調査している。（中野祐紀）

堀川に姿を現した鳥類が紹介された会議＝北区の名城水処理センターで

TJ35P

中日新聞
平成27年9月6日(日)
朝刊記事より

第5回
堀川ラウンドテーブル 開催
堀川まちづくりの会
平成27年7月31日(金)

主催・協力・報告：黒川ドリーム会
・御用水跡街園愛護会調査隊・ロマン黒川・北区役所

黒川親子水遊び
平成27年8月11日(火)

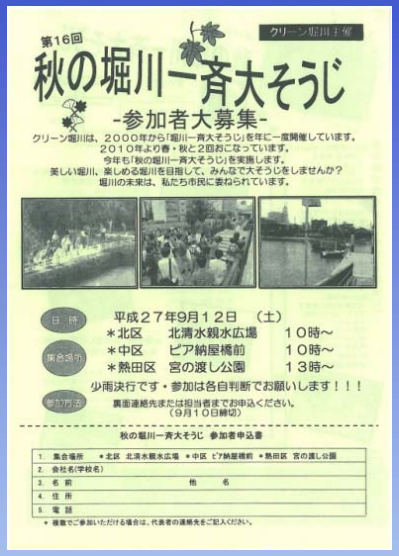
黒川親子体験教室
平成27年8月15日(土)

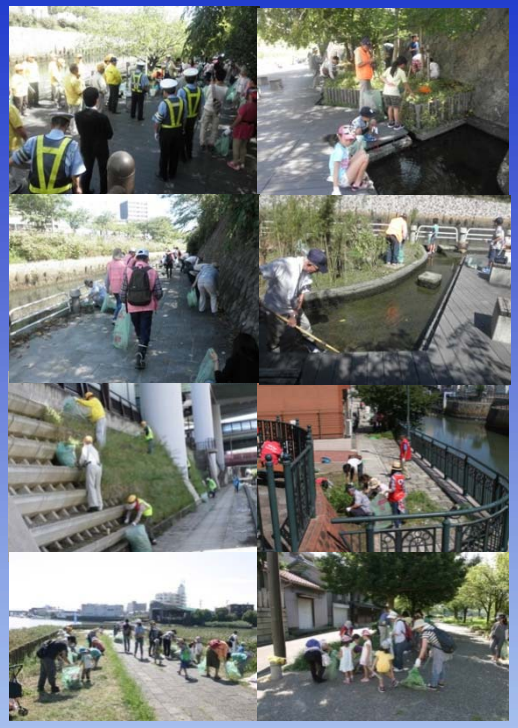
黒川川遊び
平成27年8月19日(水)

飯田小学校4年生　堀川水質調査勉強会
平成27年9月15日(火)

Activities of “Free Survey Groups” & “Cheering Groups”

第16回　秋の堀川一斉大そうじ
主催：クリーン堀川
平成27年9月12日（土）
報告：御用水跡街園愛護会調査隊
事務局

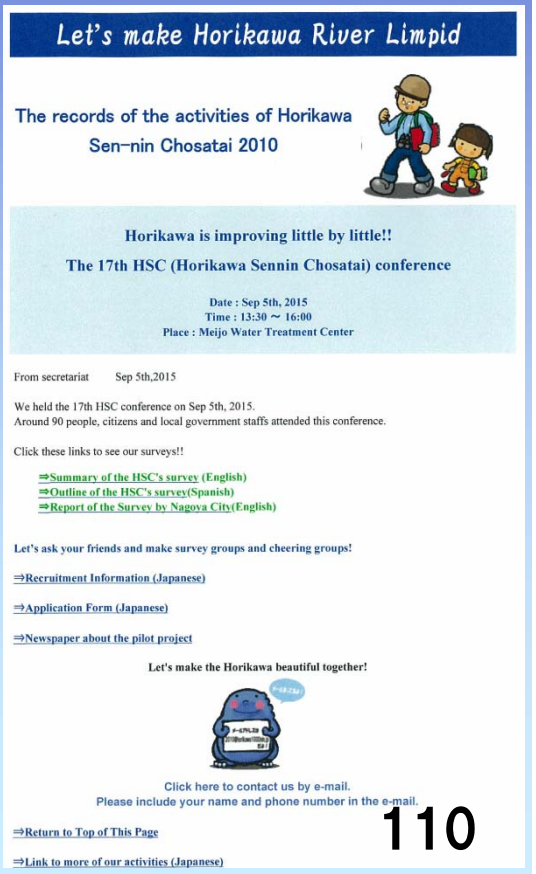




御用水跡街園の清掃活動
新堀町 空手道場の子供達
平成27年9月24日（木）
報告：御用水跡街園愛護会
調査隊

堀川まちづくりの会パネル展
平成27年10月8日（木）
報告：御用水跡街園愛護会調査隊

英文HPの第17弾、第18弾をアップ
WBP堀川応援隊


Let's make Horikawa River Limpid

The records of the activities of Horikawa
Sen-nin Chosatai 2010

Horikawa is improving little by little!!
The 17th HSC (Horikawa Sennin Chosatai) conference

Date : Sep 5th, 2015
Time : 13:30 ～ 16:00
Place : Meijo Water Treatment Center

From secretariat　Sep 5th,2015

We held the 17th HSC conference on Sep 5th, 2015.
Around 90 people, citizens and local government staffs attended this conference.

Click these links to see our surveys!!

⇒Summary of the HSC's survey (English)
⇒Outline of the HSC's survey(Spanish)
⇒Report of the Survey by Nagoya City(English)

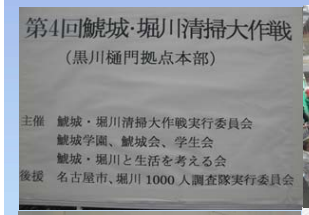
Let's ask your friends and make survey groups and cheering groups!

⇒Recruitment Information (Japanese)
⇒Application Form (Japanese)
⇒Newspaper about the pilot project

Let's make the Horikawa beautiful together!

Click here to contact us by e-mail.
Please include your name and phone number in the e-mail.

⇒Return to Top of This Page
⇒Link to more of our activities (Japanese)


第4回鯱城・堀川清掃大作戦
（黒川樋門拠点本部）
主催　鯱城・堀川清掃大作戦実行委員会
鯱城学園、鯱城会、学生会
鯱城・堀川と生活を考える会
後援　名古屋市、堀川1000人調査隊実行委員会

第4回　鯱城・堀川清掃大作戦
主催：鯱城学園
平成27年11月7日（土）
報告：御用水跡街園愛護会調査隊
事務局

読売新聞
平成27年
11月8日（日）
朝刊より

鯱城学園OBら
堀川清掃大作戦

水辺の環境をきれいにしようと、名古屋市高年大学「鯱城学園」環境学科のOBらが7日、「鯱城・堀川清掃大作戦」と銘打ち、市内を流れる堀川と新堀川で清掃活動を行った。同大OBらは2003年から月1回、中区の納屋橋周辺の川沿いなどで清掃を続け、12年に始まった「大作戦」は今年で4回目となる。

この日は、約950人が参加。緑や黄緑のベストを着て、堀川の上流から下流までの16㌔と新堀川の5㌔で、たばこの吸い殻や落ち葉などを拾い集めた。

同学科OBでつくる「鯱城・堀川と生活を考える会」の宇津昇代表（75）は「以前の堀川は非常に汚れていたが、清掃活動や下水処理施設の整備などできれいになってきた。力を合わせ、さらにきれいな堀川にしていきたい」と話していた。

中日新聞
平成27年
11月10日
（火）朝刊
より

水質浄化へ沿道清掃

市民950人が参加

堀川の沿道を清掃する「鯱城・堀川清掃大作戦」が七日あり、市民ボランティア九百五十人が参加した。一六・二㌔の川全体に十一カ所の拠点を設け、午前中の約一時間半、川に架かる橋や川沿いの歩道などに落ちた枯れ葉やポイ捨てごみを集めた。

堀川は高低差が少ないため流れがよどみやすく、歩道から川に落ちた葉やごみがヘドロ化して堆積している。市中心部の納屋橋付近では八日にもなり、水質悪化の要因になっている。

川の環境を向上させようと、市高年大学鯱城学園の在校生や「鯱城・堀川と生活を考える会」などでつくる実行委が主催し、四回目。考える会の鵜飼幹雄副代表（六七）＝名東区＝は「地道に清掃活動を続け、川の浄化につなげていきたい」と話した。（市川泰之）


堀川に架かる錦橋付近で歩道を清掃するボランティア＝中村区名駅5で

Activities of “Free Survey Groups” & “Cheering Groups”

名古屋市への寄付金制度に
「堀川再生の寄附金」が追加

新聞　2015年（平成27年）11月10日（火曜日）

堀川 商家の米運び再現

西区の市民団体 船で体験

市内を流れる堀川を使って米などを運んだ江戸時代の商家「伊藤家」（西区那古野）の往時の営みを体験しようと、港区の南陽地区で収穫された米を伊藤家住宅まで船で運ぶ試みが九日、堀川であった。十五日には、運んだ米でおにぎりを作って味わう催しが同住宅である。（室木泰彦）

伊藤家住宅がある西区まちづくり協議会が、江戸期の商家の魅力などを再確認するため開催。か つて、伊藤家と実際に米を取引していた南陽地区の藤高土地改良区に相談し、JAなごや南陽町支店が提供するなどした米を用したまちづくりに取り組む四間道（那古野界隈）。

米俵を船に運び込む参加者＝熱田区の宮の渡し公園で

協議会事務局の浅野健さん（四三）は「都合で船で運ぶ日が近日になってしまったが、江戸の商家の暮らしぶりの一端を体験する機会になれば」と話す。

伊藤家は、江戸時代に尾張藩の御用商人で、その住宅は本家と主屋、蔵、細工蔵などから構成される。堀川の水運を利用して家業を営んだ商家屋敷の典型例とされ、一九八七（昭和六十二）年に県指定文化財に指定された。

福谷正男代表ら協議会のメンバー九人がそろい の法被姿で集合し、熱田の宮の渡し公園の船着き場で渡し船に米を積み込み出発。約一時間かけて堀川を七㌔ほど上り、伊藤家住宅まで運んだ。

十五日は、地域の児童ら も加わった参加者数十人でまず住宅を掃除。おに ぎりを作り、当時の暮らしぶりに思いをはせつつ味わう。戦災で多くの歴史的建造物を失った名古屋で、当時の面影を残す貴重な住宅への理解を深める狙いもある。

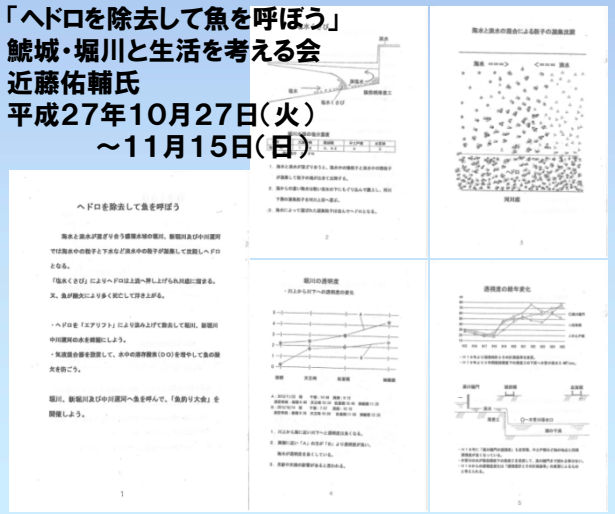
中日新聞
平成27年11月10日（火）
朝刊より

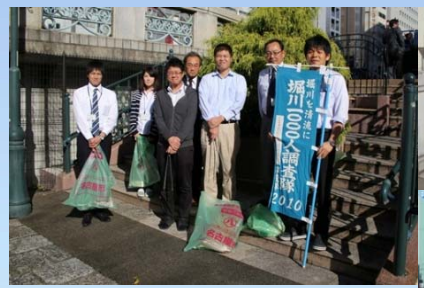
堀川まちづくりパネル展
地下鉄星が丘駅ロビーにて
平成27年11月11日（水）
報告：御用水跡街園愛護会調査隊

歴史散策 開催
平成27年11月14日（土）
主催：北区役所
報告：御用水跡街園愛護会調査隊

堀川まちづくり啓発運動
「遊んで堀川に親しんで」
平成27年11月15日（日）
イオンモール熱田店
報告：御用水跡街園愛護会調査隊

堀川ギャラリー
「ヘドロを除去して魚を呼ぼう」
鯱城・堀川と生活を考える会
近藤佑輔氏
平成27年10月27日（火）
～11月15日（日）





清掃活動・定点観測
中日本建設コンサルタント㈱
かわせみ調査隊
場所：錦橋～納屋橋間
平成27年11月19日（木）

堀川の歴史街歩き
高年大学鯱城学園26期地域学科生
平成27年11月19日（木）

Activities of “Free Survey Groups” & “Cheering Groups”

活動レポート：伊勢湾流域圏
再生ネットワーク事務局

活動レポート：環境ボランティア
サークル「亀の子隊」

堀川の変遷を演劇で

あすまで 中区で高年大学文化祭

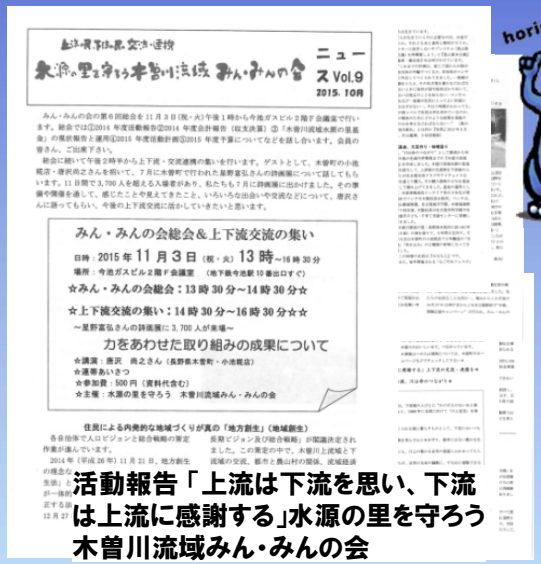
六十歳以上の市民が学ぶ市高年大学・鯱城学園の第二十回文化祭が、学園のある中区栄一の伏見ライフプラザで始まり、日ごろの学習とクラブ活動の成果を舞台や展示で発表している。二十一日まで。

ホール舞台では、専攻クラスごとに演劇やダンス、合唱などを披露。本年度入学した三十期目環境専攻の生徒約五十人は、演劇で江戸時代から現代までの堀川の変遷を紹介し、その重要性を訴えた。

堀川を水運で活用し、友禅流しや水遊びにも使った江戸時代、住民は感謝を込めて総出で大掃除をするなどしていた。だが昭和の高度成長期を経て、堀川はごみ捨て場と化し、同市の扱いで汚れている。舞台と展示は二十日が午前九時～午後四時、二十一日は午前十時～午後三時四十分。（室木泰彦）

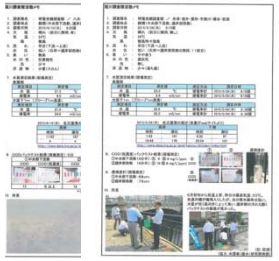
中日新聞
平成27年11月20日（金）
朝刊より

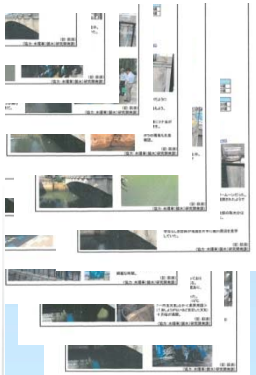
中日新聞
平成27年11月21日（土）
朝刊より



活動報告「上流は下流を思い、下流は上流に感謝する」水源の里を守ろう木曽川流域みん・みんの会

信濃毎日新聞
平成27年12月20日（日）
朝刊より





活動レポート：明電舎錦調査隊
平成27年4月～12月

西区・円頓寺商店街東側出口にあたる堀川・五条橋の橋詰に親水広場が完成
平成27年11月

Events

第11回堀川エコロボットコンテスト開催
平成27年8月23日(日)
主催:名古屋堀川ライオンズクラブ
協賛:名古屋工業大学

平成27年8月8日(土)
小学生向けロボット工作教室
を開催

中日新聞　平成27年8月24日(月)　朝刊より

エコロボ 堀川きれいに

中区で性能競うコンテスト

市中心部を流れる堀川の浄化に役立つロボットの性能などを競う「第十一回堀川エコロボットコンテスト」が二十三日、中区の納屋橋周辺であった。

初めてコンテストに参加した岩手三陸復興推進機構特任研究員の高木基樹さん(35)は「ロボットは改良し、製作した二十四台が集産業で役立てたい」と話した。コンテストは名古屋堀川ライオンズクラブが主催。

(天田優里)

ろ過装置を搭載したクジラ型の作品も参加した堀川エコロボットコンテスト=中区栄1で

読売新聞
平成27年8月24日(月)
朝刊より

エコロボット技術 競う

名古屋でコンテスト

名古屋市を流れる堀川の浄化に関心を持ってもらおうと、同市中区の納屋橋周辺で23日、「堀川エコロボットコンテスト2015」が開かれた。名古屋堀川ライオンズクラブ(LC)主催で、今年で11回目。高校生を中心に24チームが、ロボットの性能や個性豊かなアイデアを競い合った。

ロボット技術で三陸の復興に取り組む岩手大学三陸復興推進機構からは、ひれを使って移動する有線式の「ひれっち」と、水中で自在に姿勢を変えられるプロペラ式の「FAN」が出場。「ひれっち」は不具合に見舞われたが、「FAN」は潜水や回転などで見物者を楽しませた。「FAN」を操縦した大学院2年の森隼人さん(24)は「三陸でのワカメ養殖などに役立てば」と話していた。

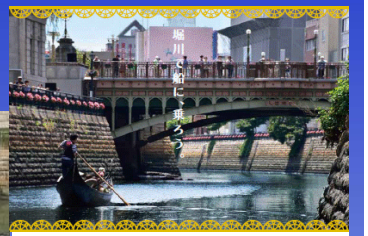
名古屋堀川LCの服部宏さん(60)は「ロボット作りを通じ、堀川に関心を持ってもらえればうれしい」と話した。

2台で出場した岩手大学三陸復興推進機構チーム。左は「FAN」を操縦した森さん

名古屋環境デー
平成27年9月19日(土)
報告:御用水跡街園愛護会調査隊
展示:堀川ライオンズクラブ
高年大学の皆さん

やっとかめ文化祭
堀川と御用水跡街園の歴史と文化を学ぶ
平成27年11月10日(火)
報告:御用水跡街園愛護会調査隊

「堀川ウォーターマジックフェスティバル」
平成27年10月10日(土)～
11月8日(日)開催
報告:御用水跡街園愛護会調査隊



ナヤマルシェの様子
平成27年10月10日(土)
報告:御用水跡街園愛護会調査隊

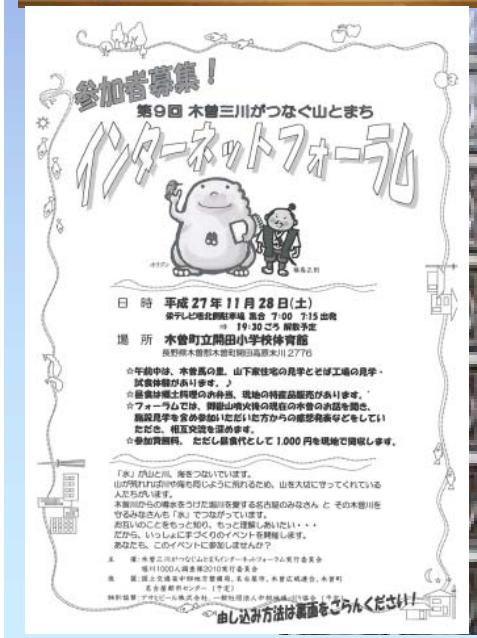
堀川河畔に生まれた
名古屋の近代医学の歩み
「衛生の道」を歩こう!
「衛生のみち」歴史ウォーク2015
主催:　NPO法人
市民まちづくり風の会

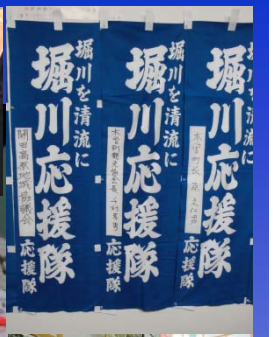
「つながろう木曽
応援ありがとうキャンペーン」

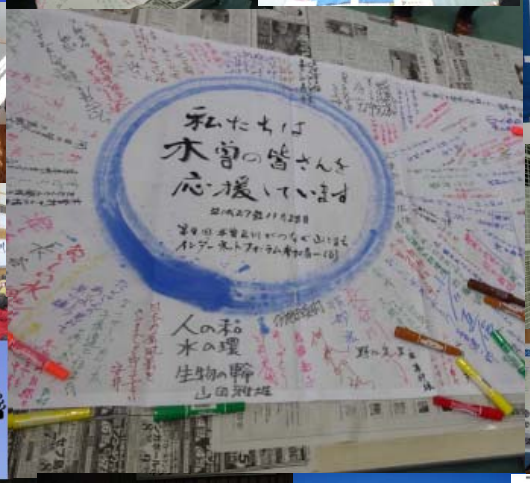
報告:事務局

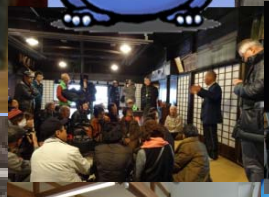
Events

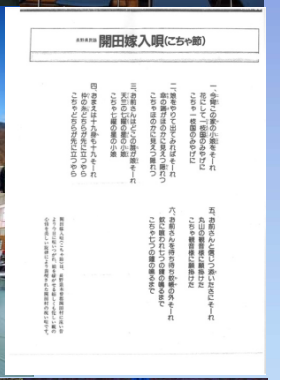
第9回 木曽三川がつなぐ山とまち　インターネットフォーラム開催
場所：長野県木曽町
企画・実施：木曽三川がつなぐ山とまちインターネットフォーラム実行委員会
掘川1000人調査隊2010実行委員会　共催
特別協賛：アサヒビール株式会社　一般社団法人、中部地域づくり協会
平成27年11月28日（土）　報告：事務局











木曽川がつなぐ人の縁

市民140人 長野・開田高原で交流

木曽地域に向けた感謝のメッセージを書き込む参加者ら＝長野県木曽町の開田小で

木曽川上下流の住民が親交を深める「木曽三川がつなぐ山とまち インターネットフォーラム」があり、名古屋市民ら百四十人が二十日に長野県木曽町の開田高原地区を訪れ、八日に開田小学校で、木曽町の住民三十人に堀川の清掃活動の様子などを紹介。縦一メートル、横二メートルほどの布に「おいしい水とおいしい空気をありがとう」「日本の原風景をいつまでも守って」といった感謝のメッセージを寄せ、原った後、町住民に市内での川の浄化活動を紹介したり、感謝のメッセージを寄せた布を贈ったりした。

名古屋市内を流れる堀川の浄化に取り組む市民団体などでつくる実行委が主催し九回目。当初はインターネット上で木曽地域の住民と交流していたが、三回目からは年ごとに木曽郡六町村を順に訪れている。

市民らは、木曽馬と触れ合ったり、雪で白く染まった御嶽山の姿も眺めたりした後、開田高原の歴史と文化を説明した。

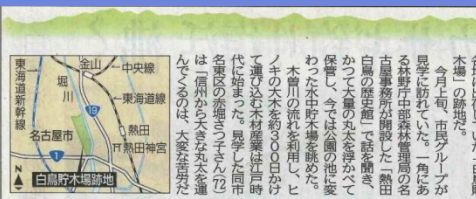
参加した瑞穂区の佐本順子さん(七)は「開田は寒いけど、山や川の自然がきれい。木曽川の上下流で一緒になって自然を守りたい」と笑顔で話し、実行委事務局で名古屋堀川ライオンズクラブの服部宏さん(六)は「互いの取り組みへの理解を深められた。今後も交流活動を続けたい」と話した。（前田寛季）

事務局：中日新聞名古屋市民版　平成27年12月1日（火）朝刊より

南信　中信

名古屋の信州

木曽ヒノキ ここから全国へ



名古屋市熱田区。市中心部を抜け伊勢湾に注ぐ堀川の下流沿いに、日本庭園や国際会議場などが整備された約16㌶の一帯がある。木曽ヒノキなど天然林の良材を集め、全国各地に出荷していた「白鳥貯木場」の跡地だ。

今月上旬、市民グループが見学に訪れていた。一角にある林野庁中部森林管理局の名古屋事務所が開設した「熱田白鳥の歴史館」で杭を抜き、かつて大量の丸太を浮かべて保管し、今では公園の池に変わった木貯木場を眺めた。

木曽川の流れを利用し、ヒノキの木材を約300日かけて運び込む木材産業は江戸時代に始まった。見学した岡市名東区の赤堀さつえさん(72)は「信州から大きな丸太を運んでくるのは、大変な苦労だったと思う」と話した。

◇

同事務所などによると、白鳥貯木場の起こりは江戸初期の1610年、名古屋城築城に必要な運河として堀川が開削された際、資材置き場として造られた。徳川家康が15年、屋敷普請となった九男の義直（尾張藩主となった九男の義直）に木曽地方の山林を贈ると、藩は白鳥御材木役所を置いた。木曽谷の奥地から丸太が集まるようになり、築城ブームも到来。良質な木曽ヒノキを扱う貯木場は木材流通の全国的な中心地に発展した。

「あらゆるインフラに使われた木材は江戸時代の基幹産業。白鳥には、幕府と結び付いて権勢を誇った材木商もいた。徳川林政史研究所（東京）の竹内誠所長は当時の状況を説明する。さらに、こう付け加えた。「二百年の人は、伐採しすぎてはいけないことも気付いていた。山林の保水力が失われると知っていた」

乱伐で木曽谷の景観が「尼山」（伐採し尽くした山）に変わりゆく状況を危ぶんだ尾張藩は1665年、伐採を厳しく制限する「留山」を導入する。その後、木曽の山林は長い保全の時代を迎えた。

伐採が再開されたのは明治から。管理主体は尾張藩から帝室林野局、林野庁などに変遷し、第2次大戦後は復興需要に応じて伐採量が急増する。伊勢湾台風の倒木処理が重なった1960年、白鳥貯木場を抱える熱田営林署の販売量はピークに達した。

◇

だが、安価な外材の輸入が本格化した60年代以降、国有林の採算は悪化。「留山」後に200～300年かけて育った木曽ヒノキは、その赤字を埋めるのように搬出が続いた。再び植樹が指摘され始めた。60年代後半から貯木場の取扱量は急減し、96年で販売を終了した。

国有林はその後、木材生産から環境保全に役割を変えた。貯木場の敷地は名古屋市や民間事業者に切り売りされ、現在、林野庁の保有は名古屋事務所がある400平方㍍だけに。同事務所は昨年、歴史を伝えようとホールだった場所で資料展示を始め、今春に歴史館を開設した。

木曽のヒノキ　長野県の木曽地方と、隣接する岐阜県の裏木曽と呼ばれる地域に分布する天然ヒノキ。津軽ヒバ、秋田スギと並ぶ「天然の日本三大美林」の一つとされ、すらりと伸びた形質や優れた耐久性と抗菌性を有し、古くから城郭や神社仏閣などの重要建築に使われてきた。自然に落ちた種子が数百年の歳月をかけて少しずつ大木に成長するため、木目が詰まった良材となる。伐採地に苗木を植え、間伐を繰り返して早い成長を促す人工林のヒノキと区別される。

事務局：信濃毎日新聞　平成27年12月20日（日）朝刊より

発行／平成28年1月4日
長野県木曽広域連合　第46号

きそネット

第９回インターネットフォーラムが開催されました。

11月28日㈯木曽町開田高原にて「第９回木曽三川がつなぐ山とまち インターネットフォーラム」が開催されました。

このフォーラムは、堀川浄化の社会実験（名古屋市の堀川に木曽川の水を流して浄化する実験）が行われた平成19年から、上流域である木曽と下流域の市民団体「堀川1000人調査隊」などの皆さんの交流として始まりました。当初はインターネットを介しての中継による交流でしたが、現在では下流域の皆さんが実際に木曽を訪れて、お互いの取り組みや歴史を見て知る文化交流へと発展しています。


（県宝：山下家住宅見学の様子）


（開田小学校１年生による合唱）

当日は、雪舞う前日の寒空から一転し、澄み切った晴天の下、下流域からは約140名、上流域からは約30名の皆さんが参加し、活気のある催しとなりました。

午前中は、下流域の皆さんは木曽馬の里・山下家住宅・そば工場を見学、上流域の皆さんはＤＶＤなどで堀川の歴史や調査隊の取り組みについて説明を受けました。


（新開副市長と原町長らによるエール交換）

昼食には地元の手作りのお弁当や、旬の名物「すんきそば」が振る舞われ、木曽の味を堪能していただきました。

開田小学校１年生による地元の民謡「開田嫁入唄」で始まった午後の意見交換会は、和やかな雰囲気の中、木曽の魅力などをテーマに話し合いが行われ、新開名古屋市副市長と原木曽町長がエールを交換し、今後も、それぞれの立場で水資源を守ることを確認しあいました。

木曽広域連合では、貴重な水資源である「木曽川」の上流域として水源環境の保全に努めるとともに、下流域の皆さんの活動を応援し、交流のさらなる発展を目指していきます。

目　次

木曽広域連合の最新情報は、ホームページでご確認できます。
http://www.kisoji.com/kisokoiki/