

Horikawa Sen-nin Chosatai 2010 Summary meeting for the 15th stage



The secretariat of Horikawa Sen-nin Chosatai 2010

Sep.27th.2014

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

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 transmissiion 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 Transmission
Volume :Oct .5th-Nov.2nd 2010



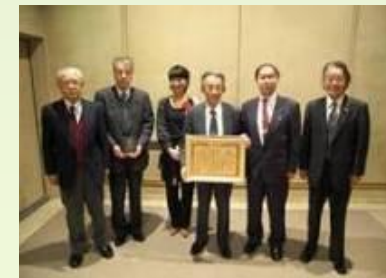
The formation of HSC (April 22nd 2007)

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 clrification 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 will make a improvement plan and take
action against the pollution.

After that, citizens and public
administration will do what is possible to
clean the river.

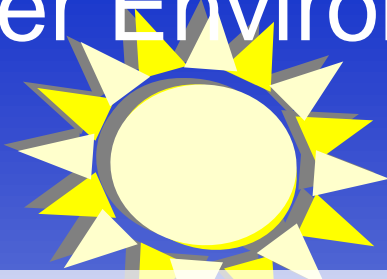
② There are many things that citizens can
do. We will expand the circle of partners
who love Horikawa River and hope TRWKR.



We will deepen exchanges with people
living in the basin of Kiso, Nagara, and Ibi
River.

We will check the effects of pollution
removal from domestic wastewater and
implement it in each house.

Water Environment of Horikawa River



Area of basin : 51.9km²
Length : 16.2km

The water source we use is Kiso River



Shonai River

Provisional raw water transmission : 0.3m³/s

Motoiri Sluiceway



Shimizu wakuwaku-sui

Ground water etc

Wastewater Treatment Plant

Sanage Bridge

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

Wastewater is discharged after treatment in wastewater treatment plant.

When heavy rain, wastewater is discharged without treatment.

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

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

Tide Gate

Horikawa

▼high tide

▼ebb tide

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

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

Nagoya Port

Ise bay

rising

Sludge rises and floats.

floating sludge

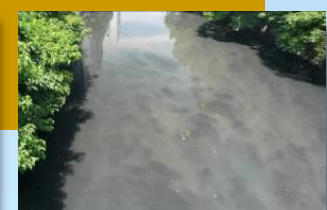
raised sludge



red tide



blue tide



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

Inxestigation spots

Number of Participants of Horikawa Sen-nin Chosatai 2010

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



	Start 22 nd Apr.2007	Now 27 th Sep.2014
Fixed Point Observation Groups	55 groups 497persons	95 groups 980persons
Free Survey Groups	22groups 234persons	40 groups 650persons
Horikawa Cheering Groups	88groups 1,531persons	2,514 groups 49,938persons
Total	165groups 2,262persons	2,652 groups 51,568persons

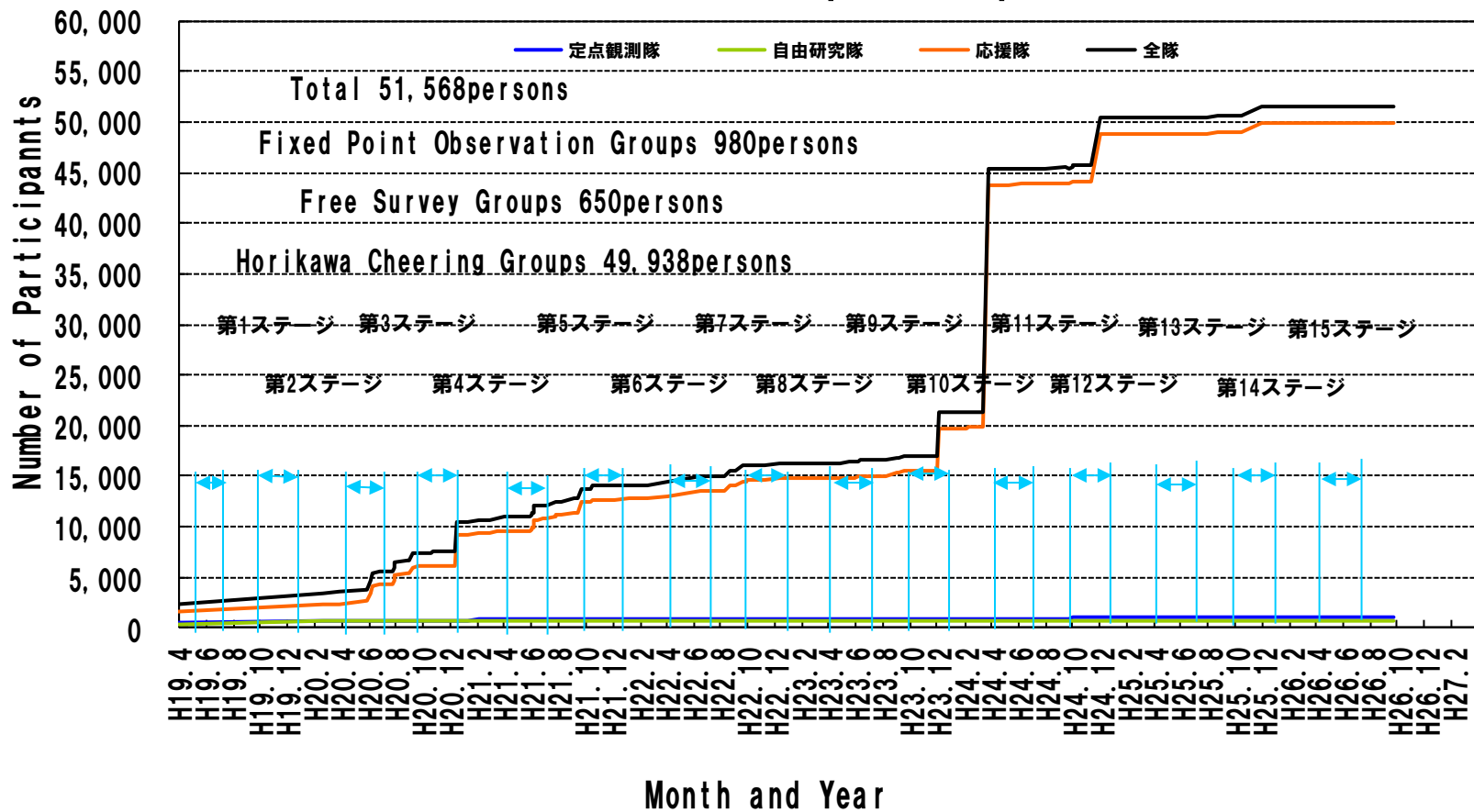




Number of Participants of Horikawa Sen-nin Chosatai



Growth of participants



**Transparency
Meter
100 cm**

Photo: Shinko Survey Group



It is an oxygen consumption required for oxidation of organic matters dissolved in ample water. The higher COD, the more it is contaminated.

堀川1000人調査隊2010 記録表

What is your Impression of cleanliness?

COD調査有無 ☐ COD _____ mg/L

①調査地名	平成 ____年 ____月 ____日(調査開始)	午()時 ____分	橋付
②調査日時	平	成	年
③調査地点	下流→上流	流れ無し	下流→上流
④天候	前日	当日	風速
⑤川の流れの方向(○で囲んでください)	風の方向(○で囲んでください)	気づいた点、感じた点などがありましたら、潮の流れなどの状況も踏まえてコメント欄に記入してください。	

⑥堀川の様子について、各項目の該当する番号(○)を付け、気づいた点、感じた点などがありましたら、潮の流れなどの状況も踏まえてコメント欄に記入してください。

- 水の汚れ
(1) 水の汚れに対する印象を5段階で評価してください。
 ①きらい ②ややきらい ③どちらともいえない ④ややきれい ⑤きれい
- 水の汚れの印象を評価した主な項目を1つ選んで○をつけてください。
 (1) ①色 ②透明感 ③におい ④生き物の様子 ⑤その他()
 コメント
- 水の色
似ている水の色に○をつけてください。また、その色の印象を5段階で評価してください。
 (1) 似ている水の色に○をつけてください。

①無色	②乳白色	③黄色	④黄緑色	⑤緑色	⑥灰色	⑦黄灰色	⑧濃灰色	⑨淡黄灰色	⑩濃黄灰色
⑪淡灰青	⑫緑色	⑬灰黄緑色	⑭灰緑色						

参考：水環境計画推進市民モニターリング調査マニュアル

- (2X1)で答えられた色目の印象を5段階で評価し、該当不快 やや不快 どちらともいえない ① ② ③
- 水の臭い
(1) 水の臭いの強さと印象を5段階で評価して、臭いの(1)水辺に立ったときの臭いですか。汲んだ水を直接(1)水辺に立った時の臭い ②汲んだ水を直接嗅いだ(2)水の臭いの強さを5段階で評価して、該当する項目ほどにおう ややひどくにおう ① ② ③
- (3X2)で答えられた臭いの印象を5段階で評価し、該当不快 やや不快 どちらともいえない ① ② ③
- (4)のような臭いですか。(1)で臭う(①～④)と答え(1)どろ臭い ②ベドロ臭い ③餅の腐った臭い ④ハルパの臭い ⑤磯の臭い ⑥その他()
 コメント

Yurinkai Survey Group



photo:Goyosui-ato-gaien-aigokai
Survey Group

Photo: Goyosui-ato-gaien-aigokai Survey Group

Survey Period and Number of Reports

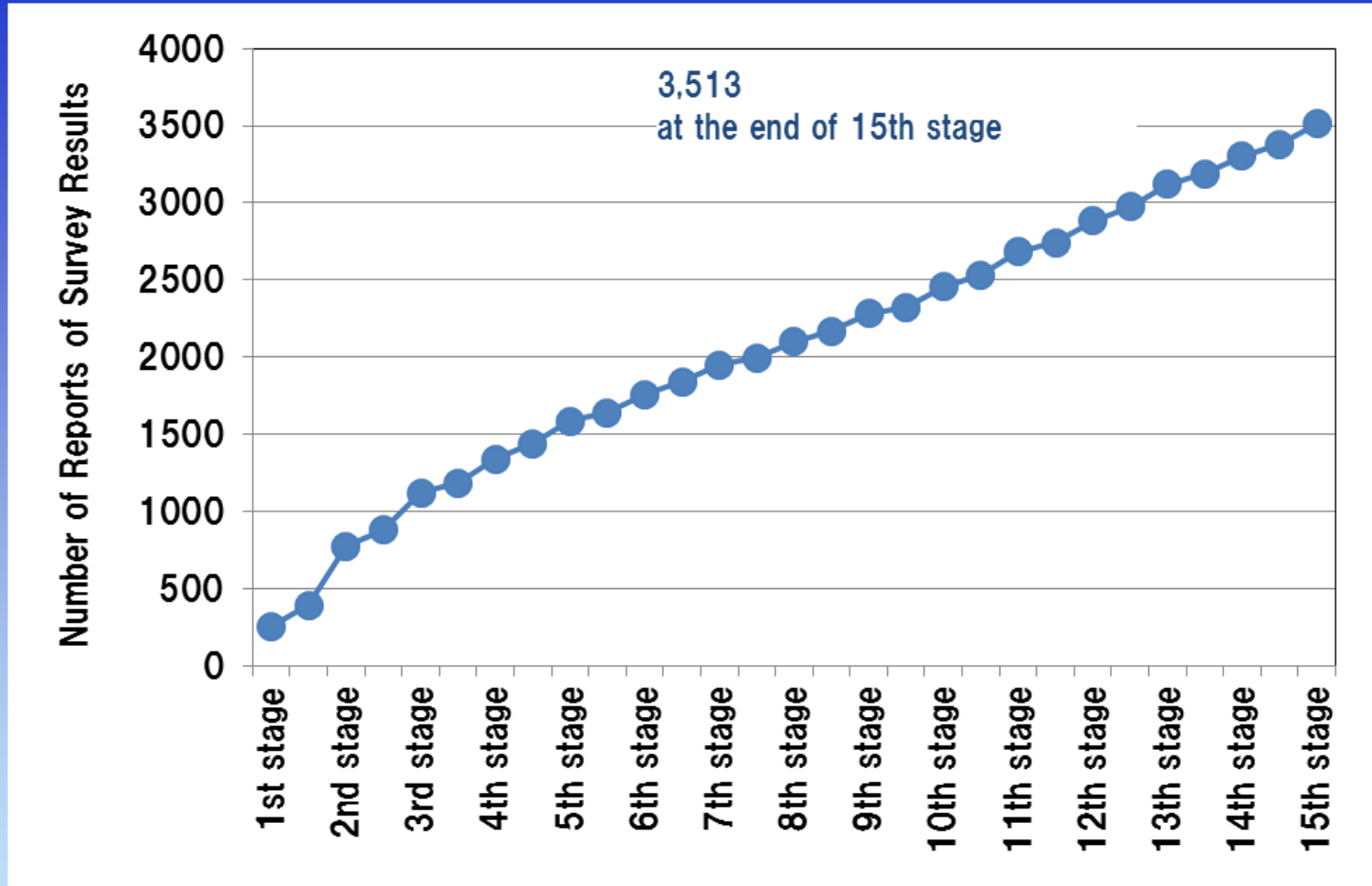


Survey Period			Number of Reports
With TRWKR	1st stage	Spring - Early Summer/Apr. 22nd - Jun. 30th.2007	258
	interval	Jul.1st - Sep. 7th. 2007	134
	2nd stage	Autumn - Early Winter/Sep. 8th - Dec. 16th.2007	383
	interval	Dec.17 2007 - Mar. 31st. 2008	103
	3rd stage	Spring - Early Summer/Apr. 1st - Jun. 30th.2008	245
	interval	Jul.1st - Sep. 27th.2008	64
	4th stage	Autumn - Early Winter/Sep. 28th - Dec. 16th.2008	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
Introduction of advanced water treatment at the Meijo Water Treatment Center	7th stage	Spring - Early Summer/Apr. 1st - Jun. 30th.2010	111
	interval	Jul.1st - Sep. 11th.2010	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. 22nd - 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
Utilization of reclaimed wastewater from Morioka Water Treatment Center from Apr. to Oct.	interval	Dec.18th 2013 - Mar. 31st.2014	79
	15th stage	Spring - Early Summer/Apr. 1st - Jun. 30th.2014	133
			3,513

Utilization of reclaimed wastewater from Morioka Water Treatment Center stopped in 15th stage due to construction for the improvement. (from April to October 2014)



Number of Reports



The total number of reports about survey results is 3,513 at the end of the 15th stage.
On average, the number of surveys is 400 every year.
A lot of citizens survey the true state of water environment of Horikawa River continually from a view point and sense of citizens.

Weather Condition

Japan Meteorological Agency, weather statistics
information at Nagoya Local Meteorological Agency
<http://www.jma.go.jp/jma/menu/report.html>

From April to June of the 15th stage, it was higher-temperature, less precipitation, and long hours of sunshine than normal. The temperature in June was especially high, and the precipitation in June was very little.

■ Temperature

- The average temperature of the 15th stage was about 1°C higher than normal. That of each month was higher than normal, too. Especially in June, it was about 1.7°C higher than normal.

■ Precipitation

- The average precipitation of the 15th stage was about 50mm less than normal. Especially, that in June was 72mm, it was 35% of normal.

■ Hours of sunlight

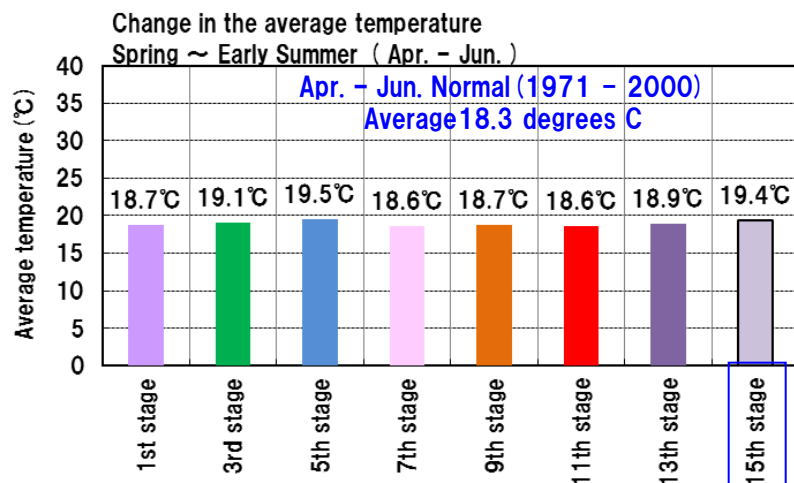
- The hours of sunlight of the 15th stage were about 50 hours longer than normal. That of each month was longer than normal, too. Especially in May, it was 137% of normal.



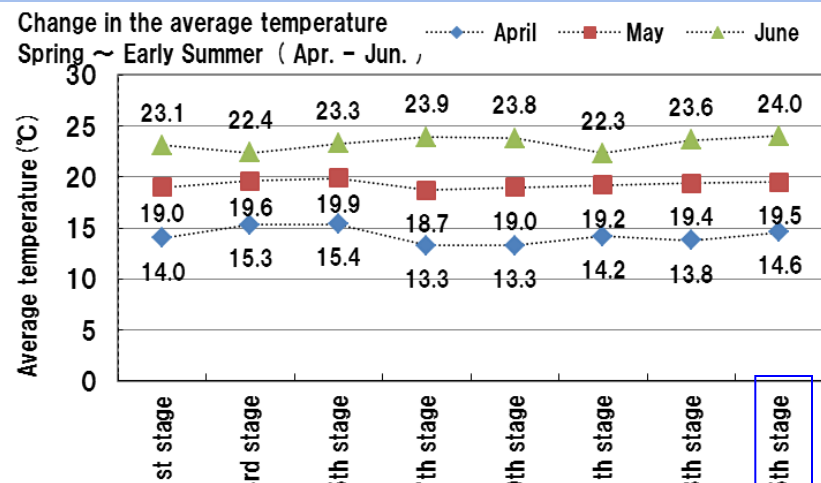
Nagoya Local Meteorological Agency: average value

Section	total rainfall (mm)	temperature (°C)			total hours of sunlight
		average	max	minimum	
Statistics data period	1981 ~ 2010	1981 ~ 2010	1981 ~ 2010	1981 ~ 2010	1981 ~ 2010
Years of data	30	30	30	30	30
April	143.3	14.1	19.5	9.2	188.4
May	155.7	18.5	23.7	14.0	199.6
June	201.5	22.3	26.7	18.7	145.2
average	166.8	18.3	23.3	14.0	177.7
September	234.4	24.1	28.6	20.7	151.0
October	128.3	18.1	22.8	14.1	169.0
November	79.7	12.2	17.0	8.1	162.7
December	45.0	7.0	11.6	3.1	172.2
average	121.9	15.4	20.0	11.5	163.7

temperature



1°C higher than normal

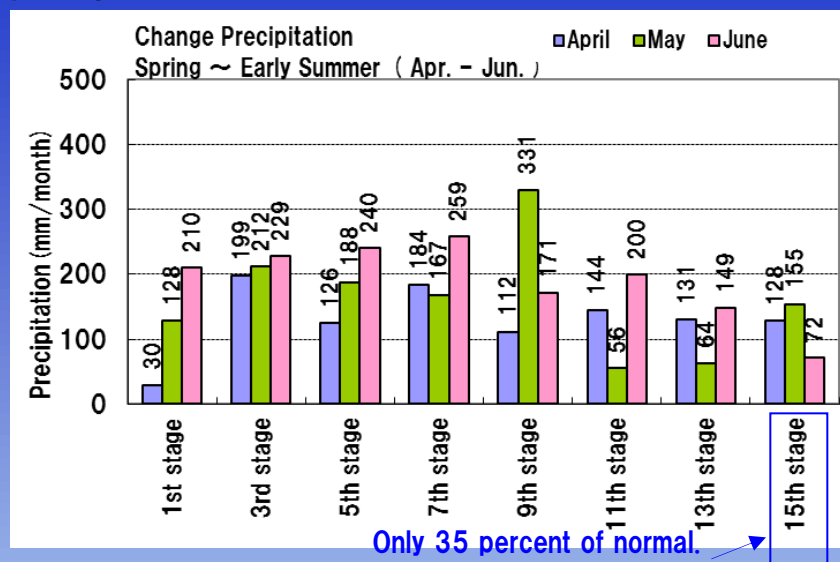
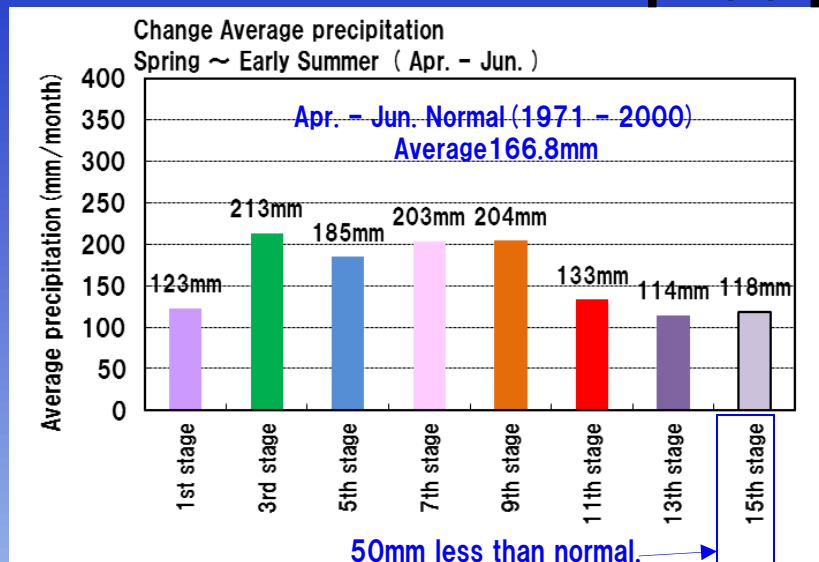


The average temperature of each month was higher than normal, too. Especially in June, it was 1.7°C higher than normal.

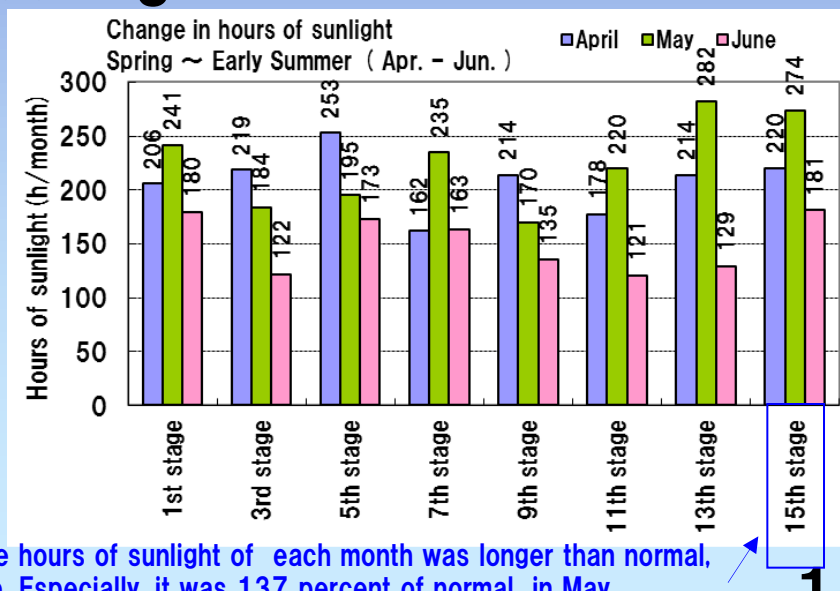
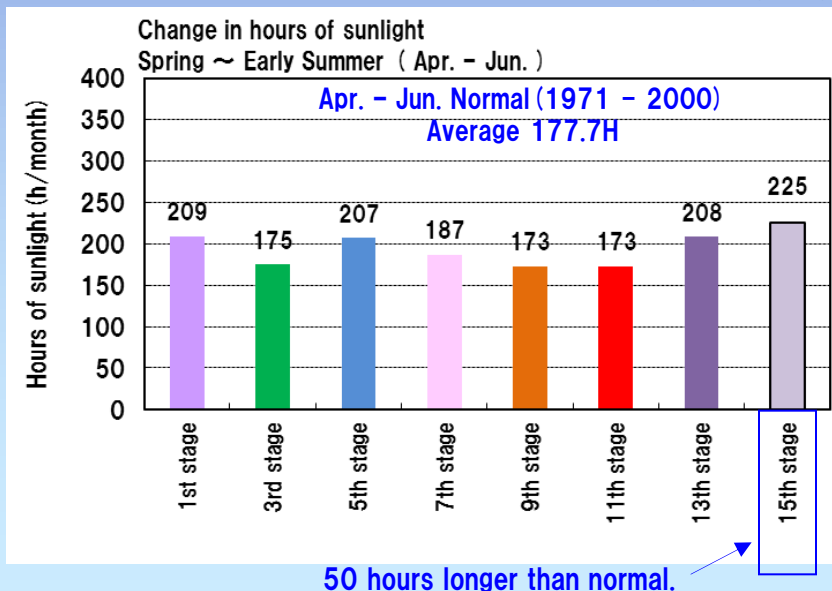
Weather Condition

precipitation

Japan Meteorological Agency, weather statistics
information at Nagoya Local Meteorological Agency
<http://www.jma.go.jp/jma/menu/report.html>



hours of sunlight



Main Measures for Water Quality Improvement

Measures	平成19年度			平成20年度			平成21年度			平成22年度			平成23年度			平成24年度			平成25年度			平成26年度		
	1st.			3st.			5st.			7st.			9st.			11st.			13st.			15st.		
		2st.			4st.			6st.			8st.			10st.			12st.			14st.				
With TRWKR(0.4m3/s)																								
Increase of raw water transmission from the Shonai River (+0.4m3/s)																								
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 from the Moriyama Water Treatment Center (0.046m3/s)																								

Utilization of reclaimed wastewater at Moriyama Water Treatment Center was stopped during the 15th stage because of construction work for the improvement (from April to October, 2014).

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)

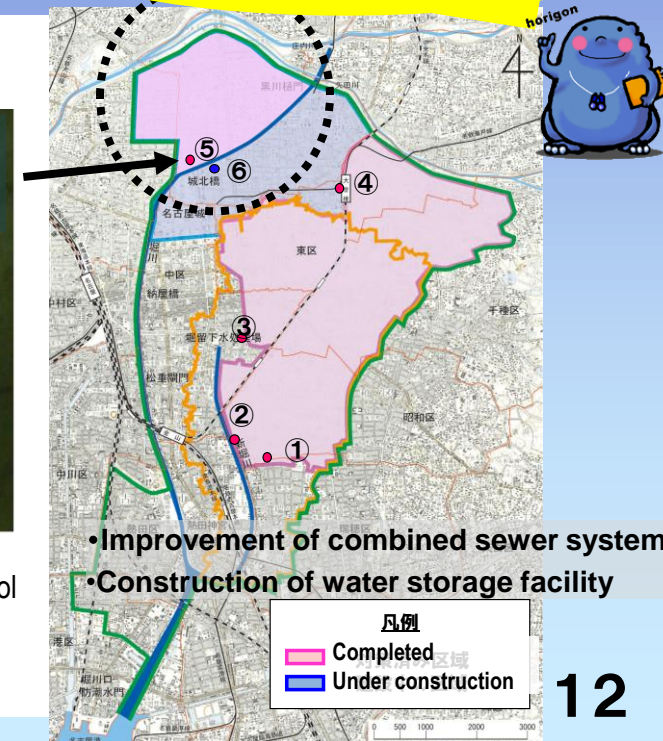


Advanced water treatment
at Meijo Water Treatment Center
Solution : conventional activated sludge
process and rapid filtration
Launch : May. 2010

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



Newly launched facilities after the stop of TRWKR

Securement of Additional Water Resource

Utilization of Reclaimed Wastewater

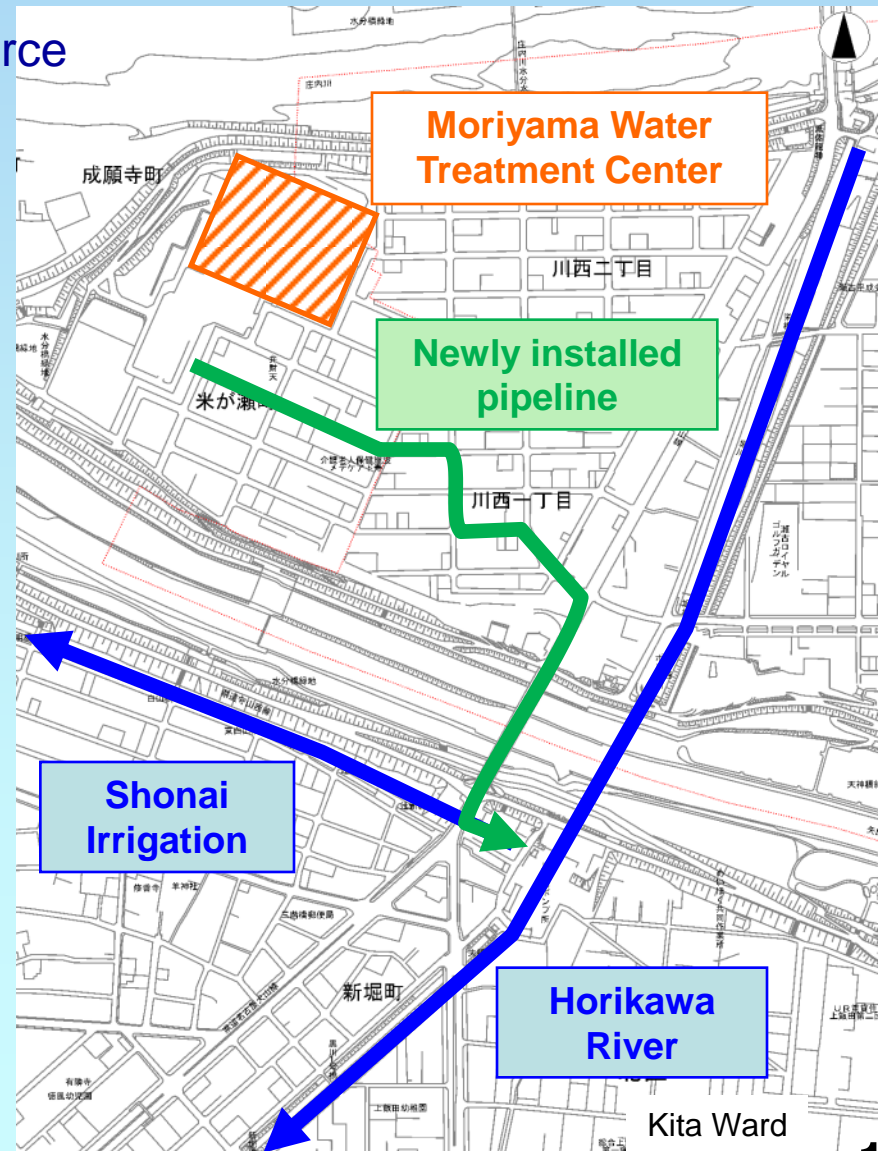
Conducting reclaimed wastewater treated by membrane filtration at the Moriyama Water Treatment Center (up to 4000m³/day) is discharged into Horikawa River.

Start to conduct in Aug. 2011



Conducting point into Horikawa River

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



Column

“To clarify and restore the Horikawa River”

Horikawa Sen-nin Chosatai 2010 made a start as a place for citizens' activities to clarify and restore Horikawa River on April 22nd, 2007.

There are 95 Fixed Point Observation Groups, which are continuously investigating actual condition of water quality, and cause of pollution. And there are also 40 Free Survey Groups and 2,517 Horikawa Cheering Groups. There are 51,568 persons on the list as of Sep 27, 2014.

The fixed point observations had been carried out 3,513 times by the end of the 15th stage. They turned out what makes citizens' impression about water quality of the Horikawa River.

Pilot project for clarification of the Horikawa River (from April 2007 and March 2012)

The pilot project of TRWKR (Transmission of Raw Water from the Kiso River) showed the water quality improvement between Sanage Bridge and Matsushige Bridge.

After TRWKR stopped, advanced water treatment at the Meijo Water Treatment Center was introduced and the Horikawa Ugan Rain-water Reservoir was launched.

Moreover, reclaimed wastewater treated by membrane filtration at the Moriyama Water Treatment Center was discharged into the Horikawa River.



Feature of the 15th stage (April - June, 2014)

Higher temperature and less precipitation through 15th stage presented in water color of the Horikawa River notably.

“Water colored greenish-brown and brown” was reported by Shirotori Taifu Goryo Bridge survey group, Kojo-Horikawa-to-Seikatsu-wo-Kangaeru-kai survey group and Kawasemi survey group in April. It is thought to be the influence of red tide.

Whiten or grayish colored waters were often reported in the other period. These clouds are thought to have been caused by particles of sulfur in the water, generated from sulfate-reducing bacteria activities in the condition of poor oxygen.

Furthermore, Kojo-Horikawa-to-Seikatsu-wo-Kangaeru-kai survey group reported “water near Nayabashi Bridge was colored deep black”, middle in May. It is thought to be the influence of winding up of sludge from the bottom of water by tidal effect.

In the 15th stage, Fixed Point Observation Groups investigated various conditions, and they could be able to distinguish the regular fluctuations and irregular fluctuations, so it's generating mechanism of these phenomena would be made clear.

It gradually become almost clear about the mechanism of these phenomena by distinguishing the regular fluctuations and irregular fluctuations because Fixed Point Observation Groups investigated various conditions in the 15th stage.

1. Impression of Water Clearness

The ratio of “Clean”, “Slightly clean” and “Ordinary”

Note) Not enough data.

Upstream Area

The 1st–6th stage : With TRWKR
No rain on the day and the previous day
The 7th–15th stage: No TRWKR
No rain on the day and the previous day

(Between Sakae Brdg. and Sanage Brdg. _ Average)

With TRWKR

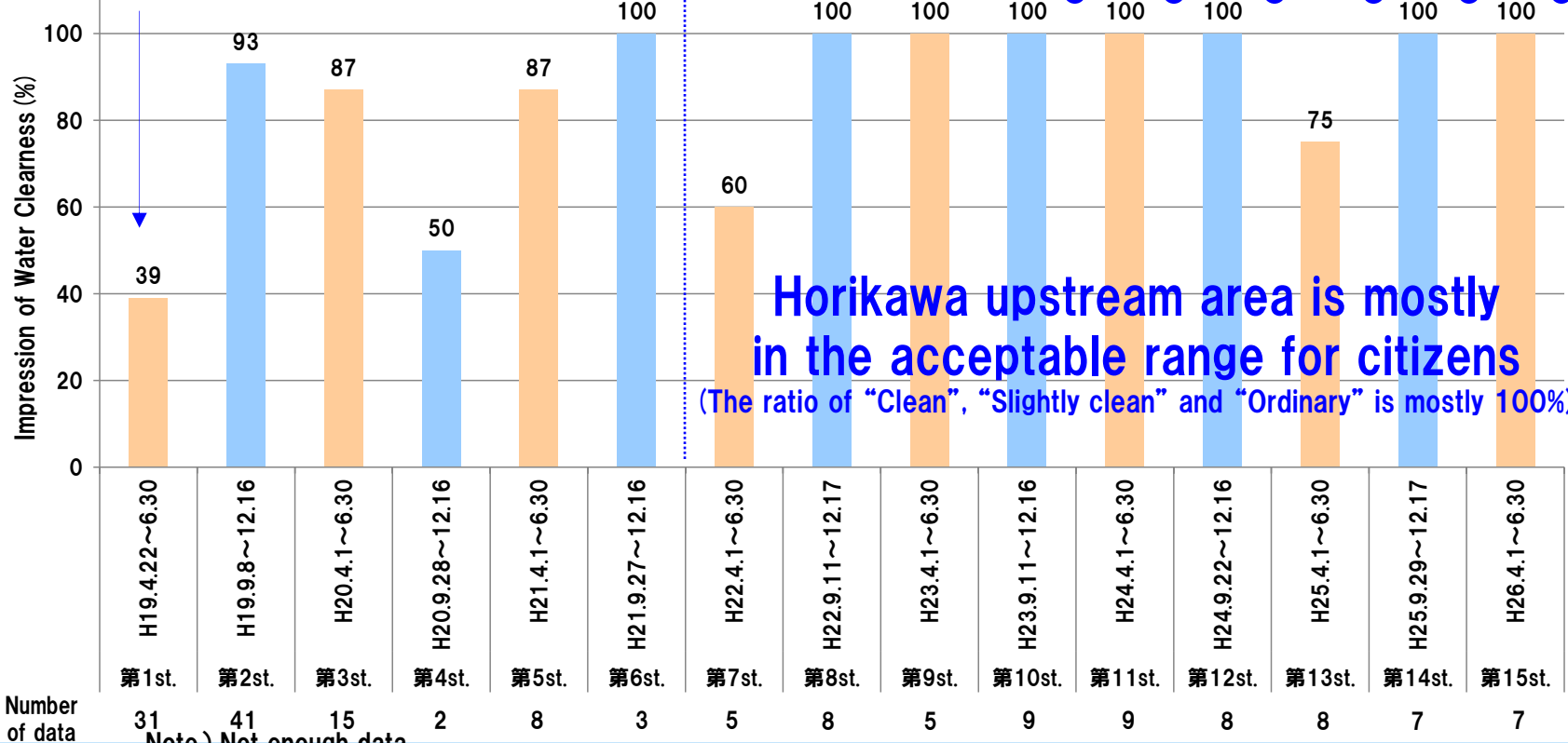
Introduction of advanced water treatment at Meijo Water Treatment Center

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

Utilization of reclaimed wastewater at Moriyama Water Treatment Center

25 out of 31 times surveys were carried out on June 27th (at Kizune Bridge), and “Slightly dirty” was seen a lot.

Between Sakae Brdg. and Sanage Brdg.



Note) Not enough data.

Horikawa upstream area is mostly in the acceptable range for citizens
(The ratio of “Clean”, “Slightly clean” and “Ordinary” is mostly 100%)

■ How did the impression of water clearness change in Horikawa upstream area (between Sakae Brdg. and Sanage Brdg.) ?

→ Although we don't have enough data, the ratio of water clearness impression changes mostly in the acceptable range for citizens.

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



Middle and Downstream Area

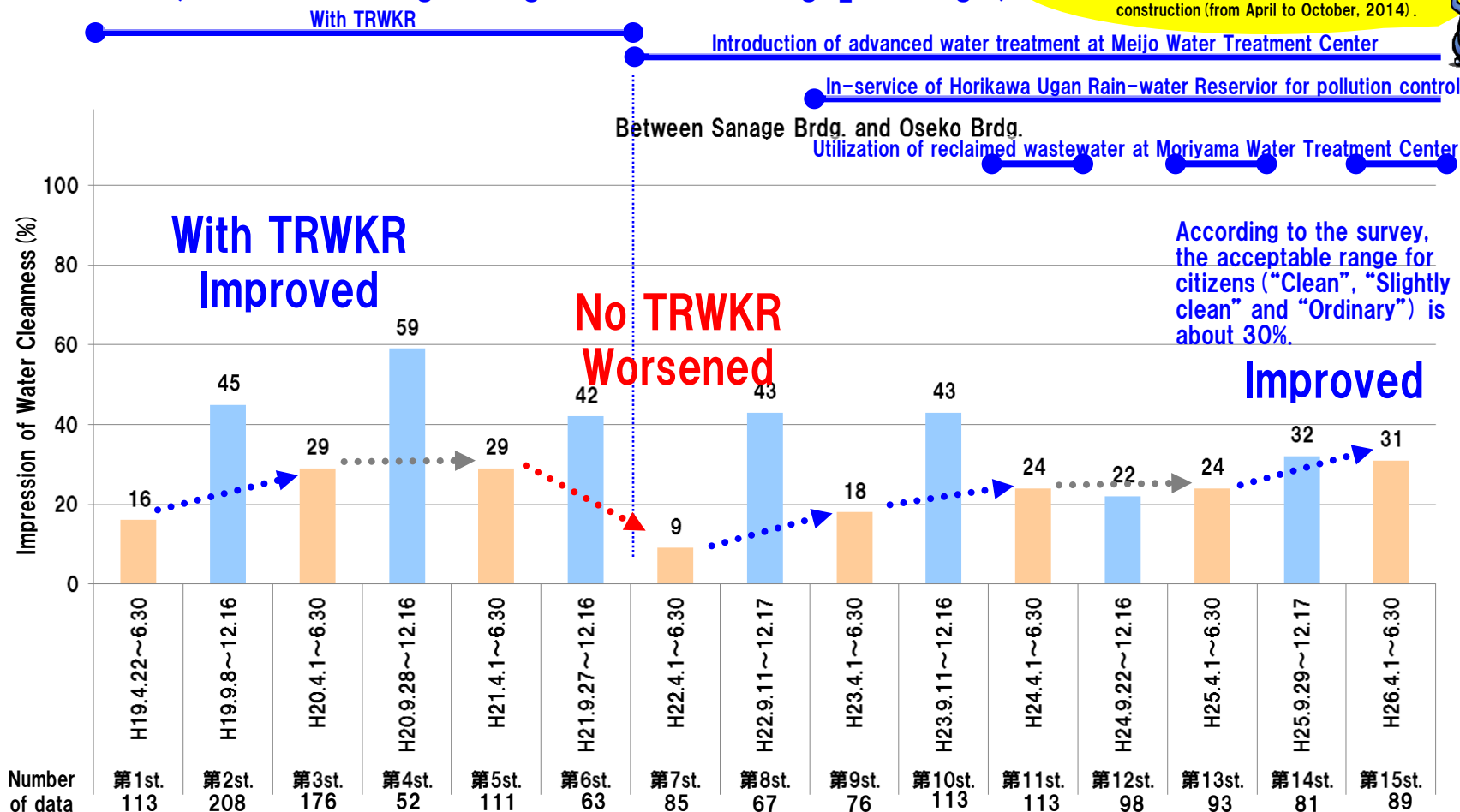
Impression of Water Clearness

The ratio of “Clean”, “Slightly clean” and “Ordinary”*

Note) Except the data between Oseko Brdg. and Minatoshin Brdg. for not enough data

The 1st–6th stage : With TRWKR
No rain on the day and the previous day
The 7th–15th stage: No TRWKR
No rain on the day and the previous day

(Between Sanage Brdg. and Oseko Brdg. _ Average)



■ How did the impression of water clearness (from spring to early summer) 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 decreased) during transmission. In the 7th stage after the stop of TRWKR, impression of water clearness was worsened. 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 about 30% in the 15th stage.

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



Impression of Water Clearness(Area Average)

The ratio of “Clean”, “Slightly clean” and “Ordinary”

Note) Except the data between Minatoshin Bldg. and Oseko Bldg.
for not enough data

The 1st-6th stage : With TRWKR
No rain on the day and the previous day
The 7th-15th stage: No TRWKR
No rain on the day and the previous day

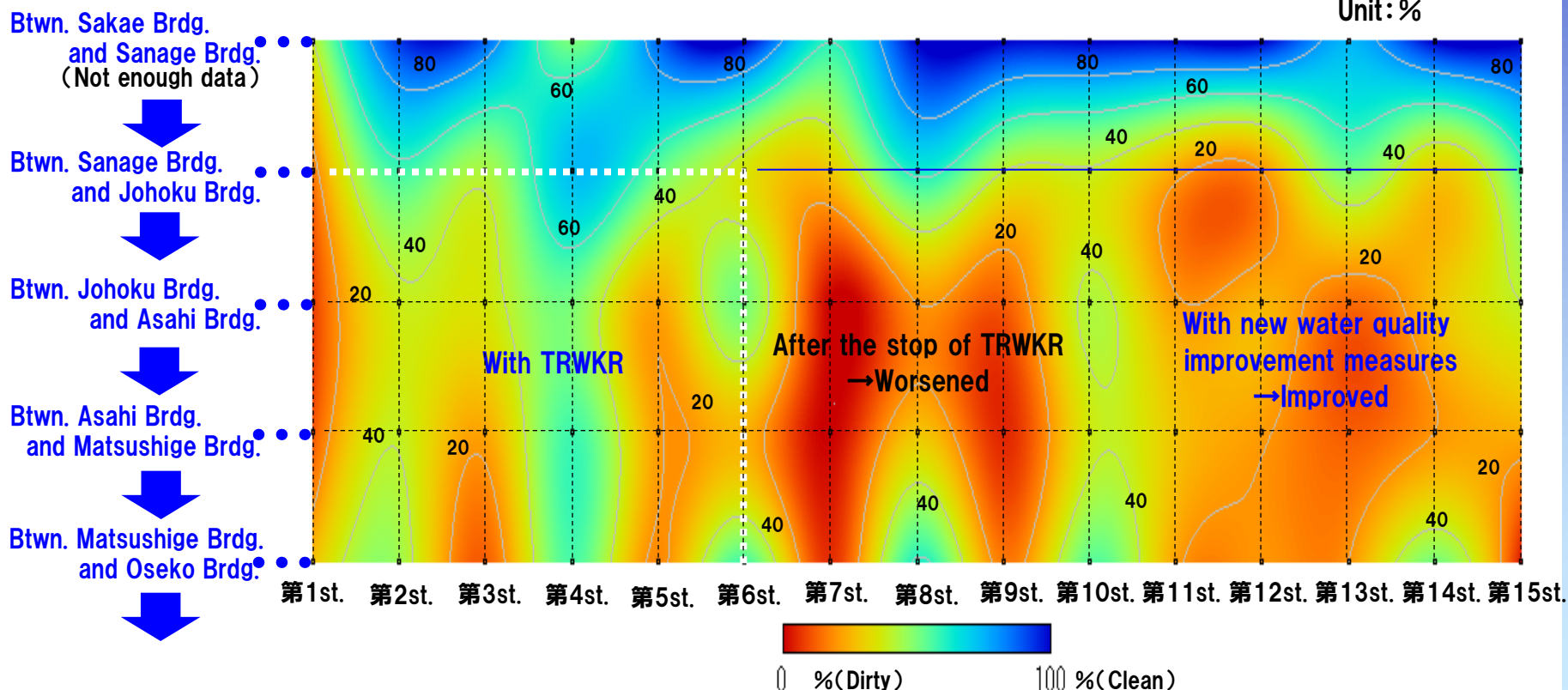
Utilization of reclaimed wastewater at Moriama Water Treatment Center was stopped during the 15th stage because of its improvement construction (from April to October, 2014).



Utilization of reclaimed wastewater at Moriama Water Treatment Center

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

(Evaluation Area) ● With TRWKR Introduction of advanced water treatment at Meijo Water Treatment Center



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

Impression of Water Cleanness (Area Average)

From Spring to Early Summer

The ratio of “Clean”, “Slightly Clean” and “Ordinary”*

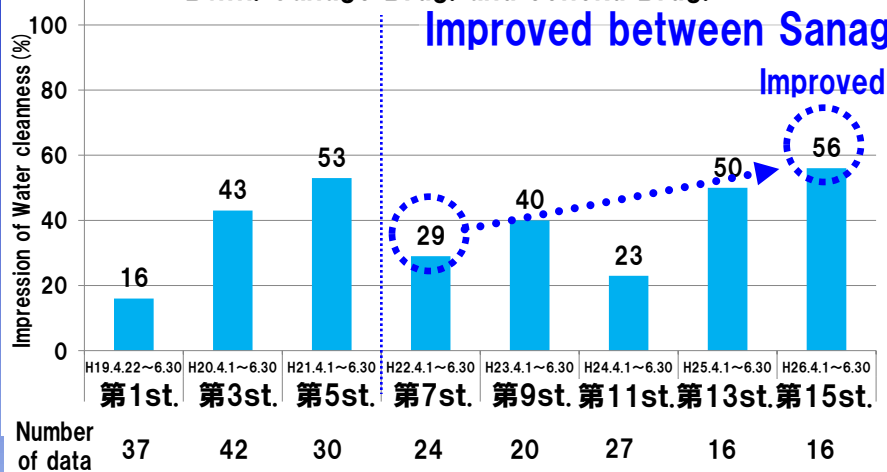
The 1st・3rd・5th stage : With TRWKR

No rain on the day and the previous day

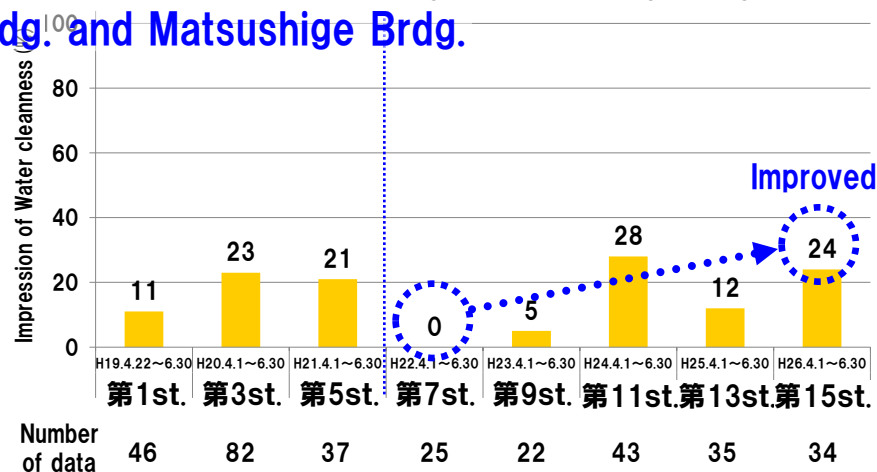
The 7th・9th・11th・13th・15th stage : No TRWKR

No rain on the day and the previous day

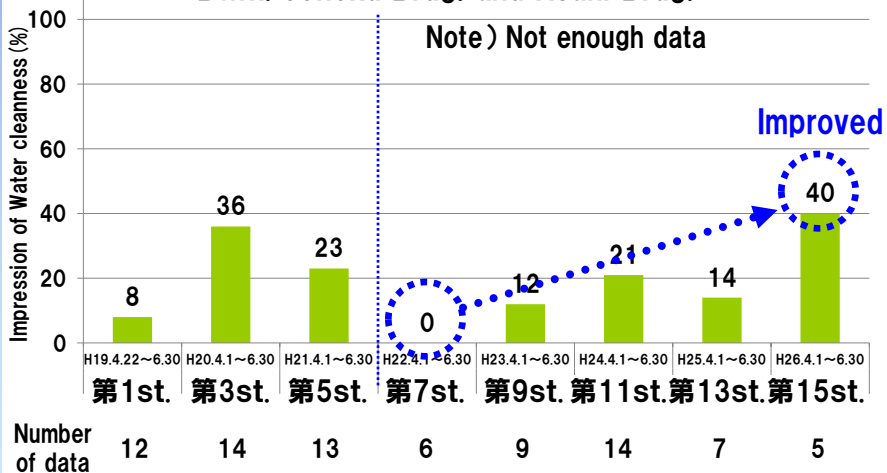
Btwn. Sanage Brdg. and Johoku Brdg.



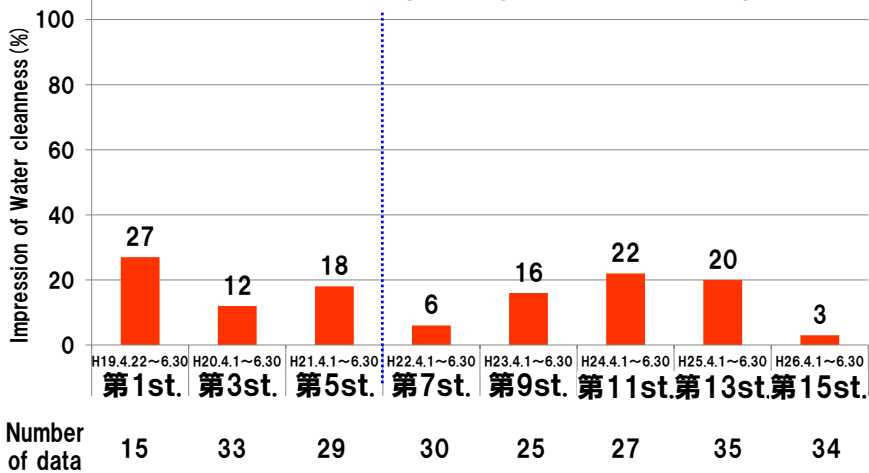
Btwn. Asahi Brdg. and Matsushige Brdg.



Btwn. Johoku Brdg. and Asahi Brdg.



Btwn. Matsushige Brdg. and Oseko Brdg.



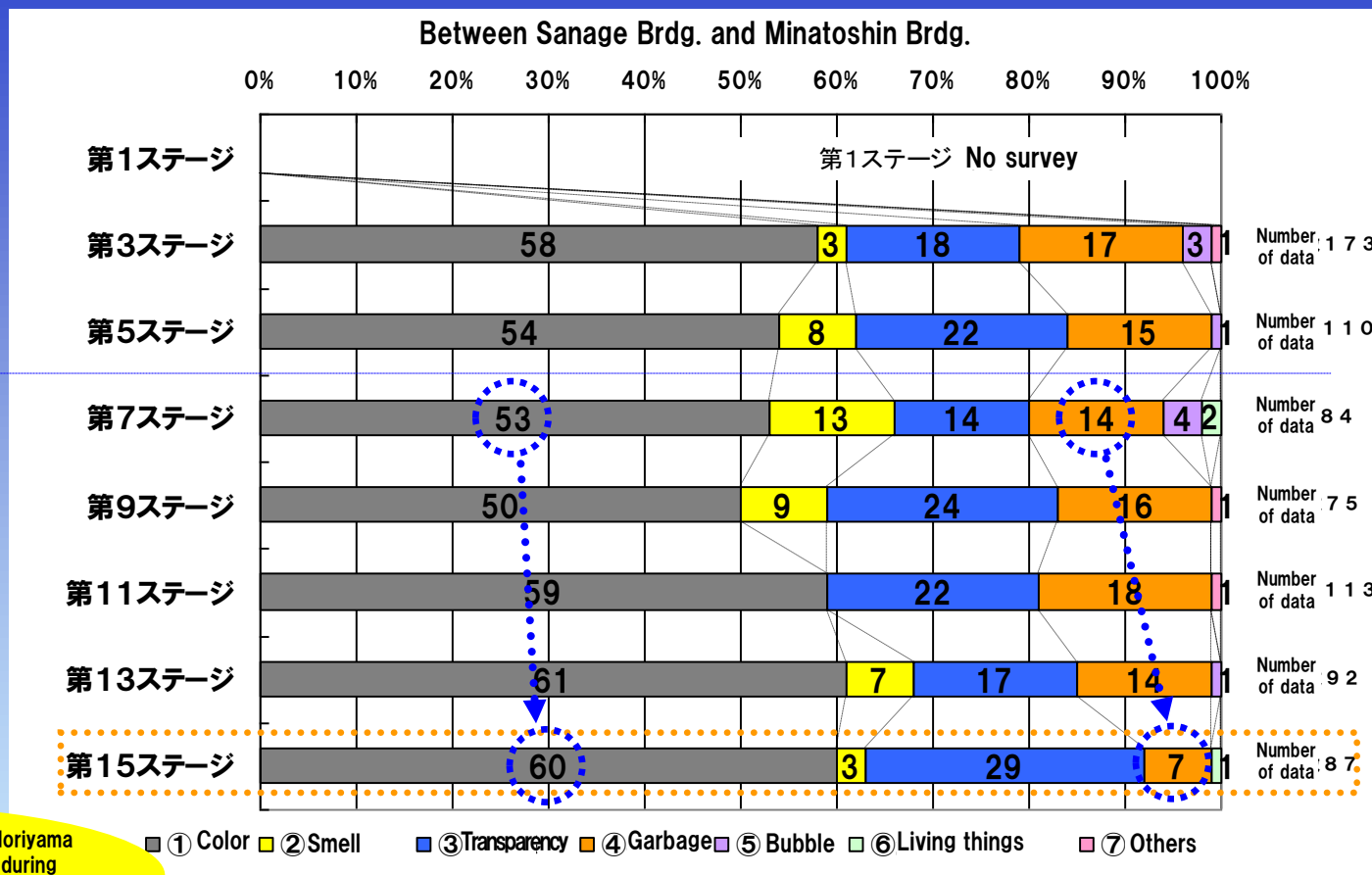
The impression of water cleanness in the 15th stage has improved between Sanage Brdg. and Matsushige Brdg. compared with just after the stop of TRWKR (the 7th stage).

The ratio of “Clean”, “Slightly clean” and “Ordinary” was higher in the upstream area. The ratio between Sanage Brdg. and Johoku Brdg. was over 50%. On the other hand, the ratio between Matsushige Brdg. and Oseko Brdg. was less than 10%.



Evaluation of Water Clearness Impression From Spring to Early Summer

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



Note) 0% items are not displayed.

Utilization of reclaimed wastewater at Moriyama Water Treatment Center was stopped during the 15th stage because of its construction for the improvement (from April to October, 2014).

How did the evaluation of water clearness impression change?

→ High ratio items of the water clearness evaluation were “Color”, “Transparency” and “Garbage”.

The ratio of “Color” has increased and that of “Garbage” has decreased after the stop of TRWKR.



Evaluation of Water Clearness Impression

From Spring to Early Summer Between Sanage Brdg. and Minatoshin Brdg.

With TRWKR

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 Moriama Water Treatment Center

The 1st・3rd・5th stage :

With TRWKR

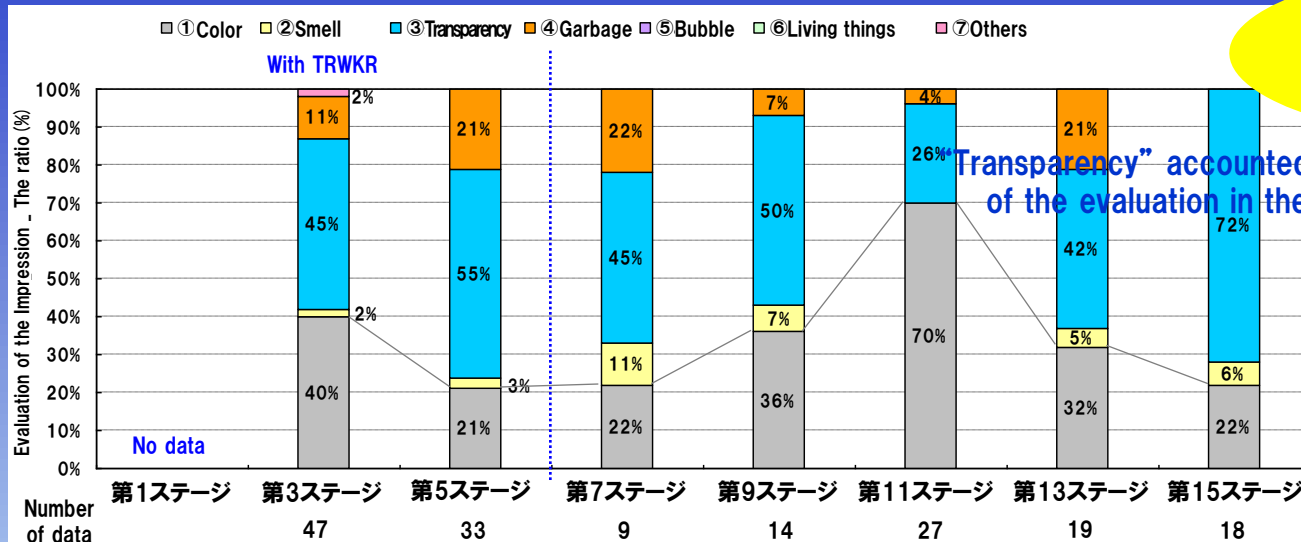
No rain on the day and the previous day

The 7th・9th・11th・13th・15th stage :

No TRWKR

No rain on the day and the previous day

The criterion for evaluation when people answered “Clean”, “Slightly clean” and “Ordinary”.



“Transparency” accounted for about 70% of the evaluation in the 15th stage.

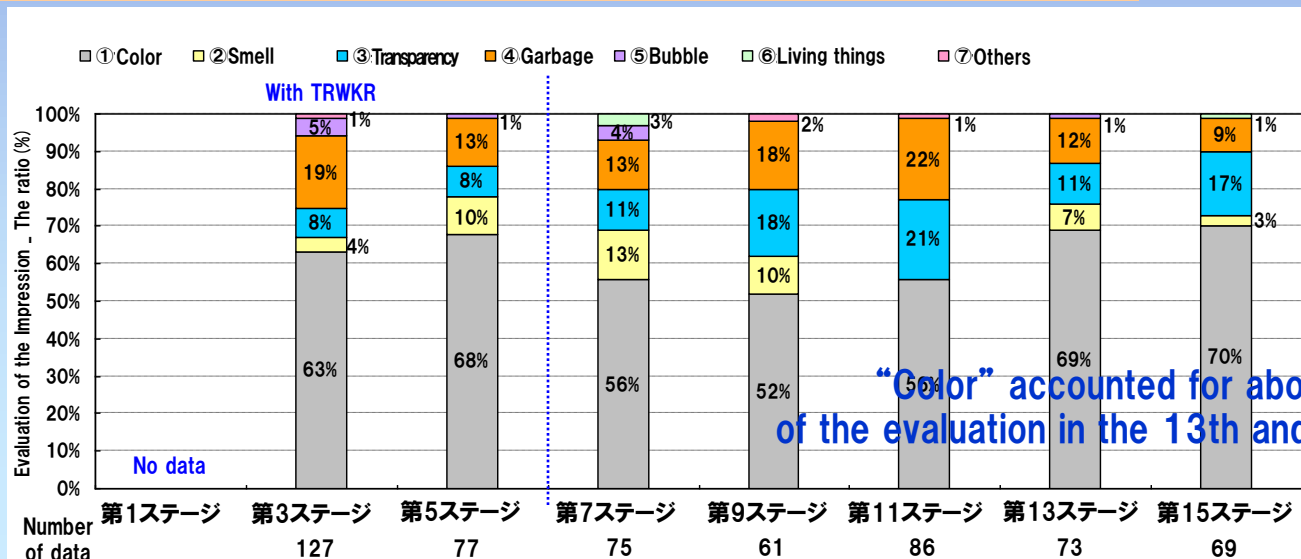
Utilization of reclaimed wastewater at Moriama Water Treatment Center was stopped during the 15th stage because of its construction for the improvement (from April to October, 2014).



What is the item to evaluate “Clean”, “Slightly clean” and “Ordinary”?

→ “Transparency” accounted for about 70% in the 15th stage.

“The criterion for evaluation when people answered “Slightly dirty” and “Dirty”.



“Color” accounted for about 70% of the evaluation in the 13th and 15th stages.

What is the item to evaluate “Slightly dirty” and “Dirty”?

→ “Color” accounted for about 70% in the 13th and 15th stages.



Note) 0% items are not displayed.

2. Change in Transparency

Measuring transparency



Photo: Shinko Survey Group

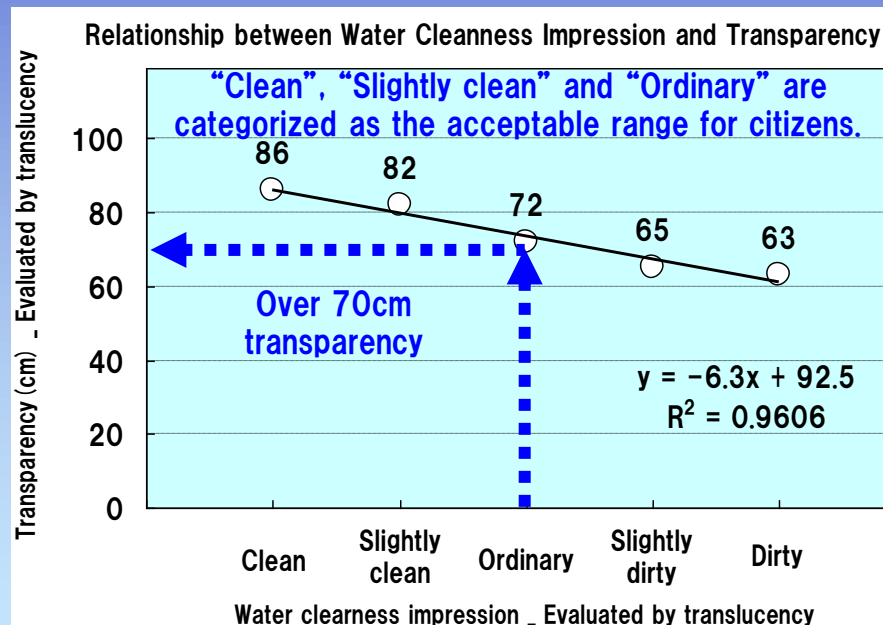


Photo: Goyousui-ato-gaien-aigokai
Survey Group



(For reference) The 9th survey meeting
Relationship between the Impression of Water Cleanness
and the Average of Transparency

The 2nd-9th stage (No rain) : Including out-of period data
Water cleanness impression evaluated by translucency
All sections (including upstream area)



Acceptable range for citizens: Over 70cm transparency

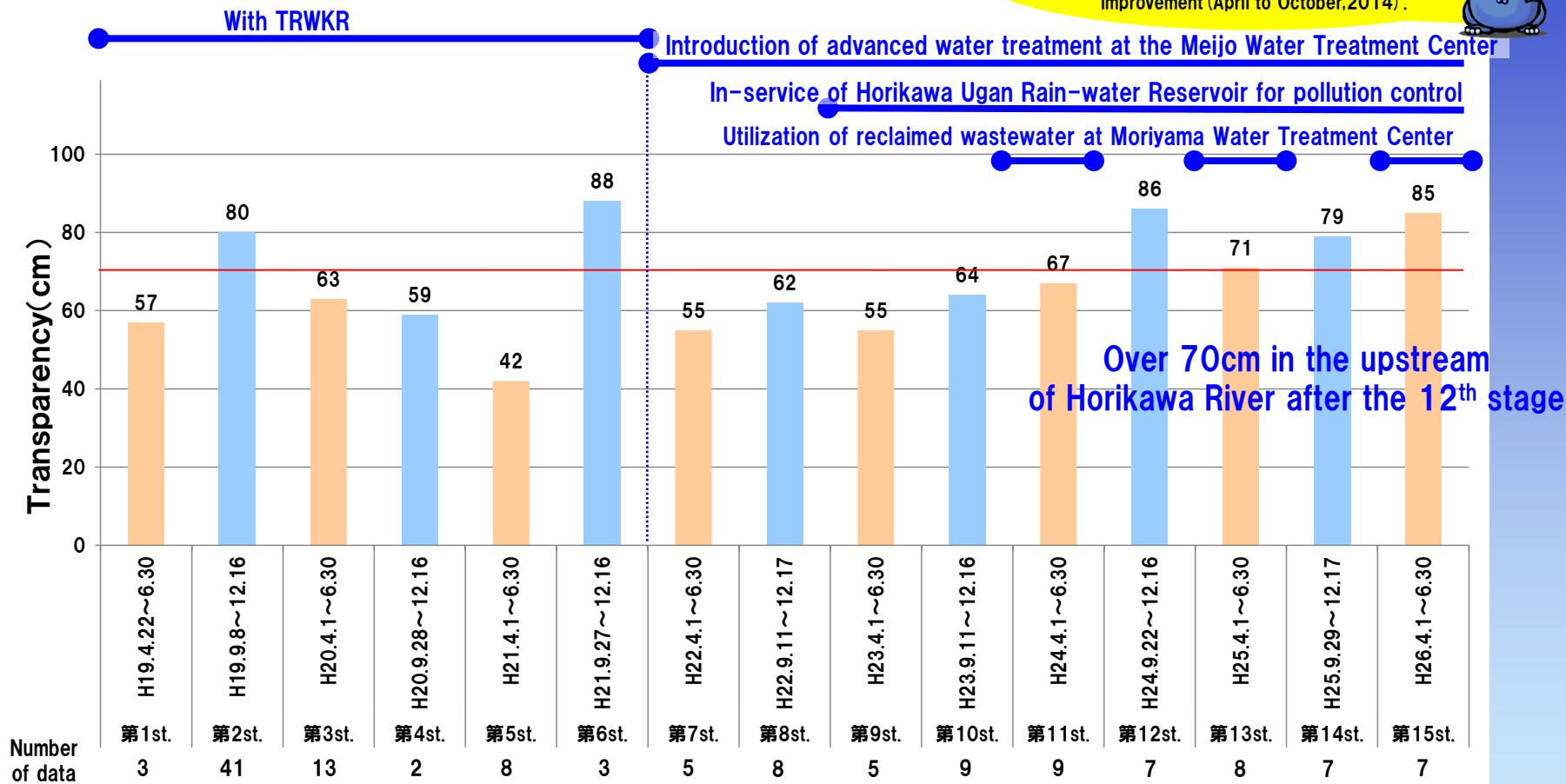
Upstream Area

Change in Transparency

The 1st~6th stage: with TRWKR
 No rain on the day and the previous day
 The 7th~15th stage: No TRWKR
 No rain on the day and the previous day

Average (from Sakae Bridge to Sanage Bridge)

Utilization of reclaimed wastewater at Moriyma Water Treatment Center was stopped in the 15th stage because of the construction work for the improvement (April to October, 2014).



Note) Not enough data

■ How did the transparency in the upstream of Horikawa River (Sakae bridge~Sanage bridge) change?
 →There are not enough data, but transparency after the 12th stage have been over 70cm (civil acceptable value).

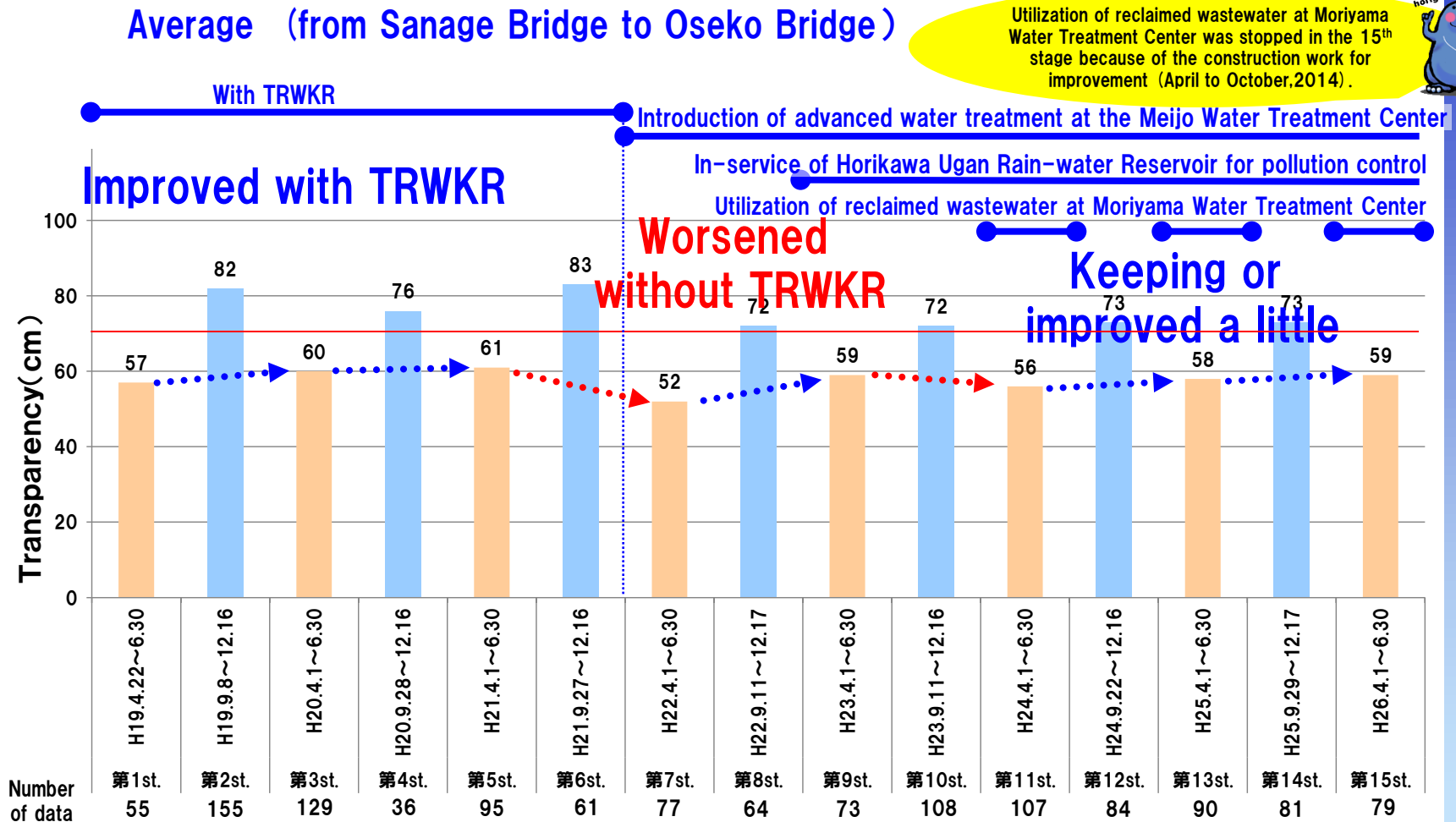


Middle and Downstream Area

Change in Transparency

The 1st~6th stage: with TRWKR
No rain on the day and the previous day
The 7th~15th stage: No TRWKR
No rain on the day and the previous day

Utilization of reclaimed wastewater at Moriama Water Treatment Center was stopped in the 15th stage because of the construction work for improvement (April to October, 2014).



■ How did the transparency in the downstream of Horikawa River (Sanage bridge~Oseko bridge) change? →We monitored improving trend with TRWKR and worsening trend in the 7th stage without TRWKR. However, we monitored slightly improving trend again after the 11th stage. . It is considered that these trends are made by the effect of the new water quality improvement measures. Transparency from autumn to early winter is over 70cm which is civil acceptable value. On the other hand, that from spring to early summer is under 70cm.



Change in Transparency

Average

Note) Area from Minatoshin Bridge to Oseko Bridge is omitted because of not enough data



Utilization of reclaimed wastewater at Moriyama Water Treatment Center was stopped in the 15th stage because of the improvement work (April to October, 2014).

The 1st~6th stage: with TRWKR
No rain on the day and the previous
The 7th~15th stage: No TRWKR
No rain on the day and the previous

Utilization of reclaimed wastewater at Moriyama Water Treatment Center

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

Introduction of advanced water treatment at the Meijo Water Treatment Center

Area

With TRWKR

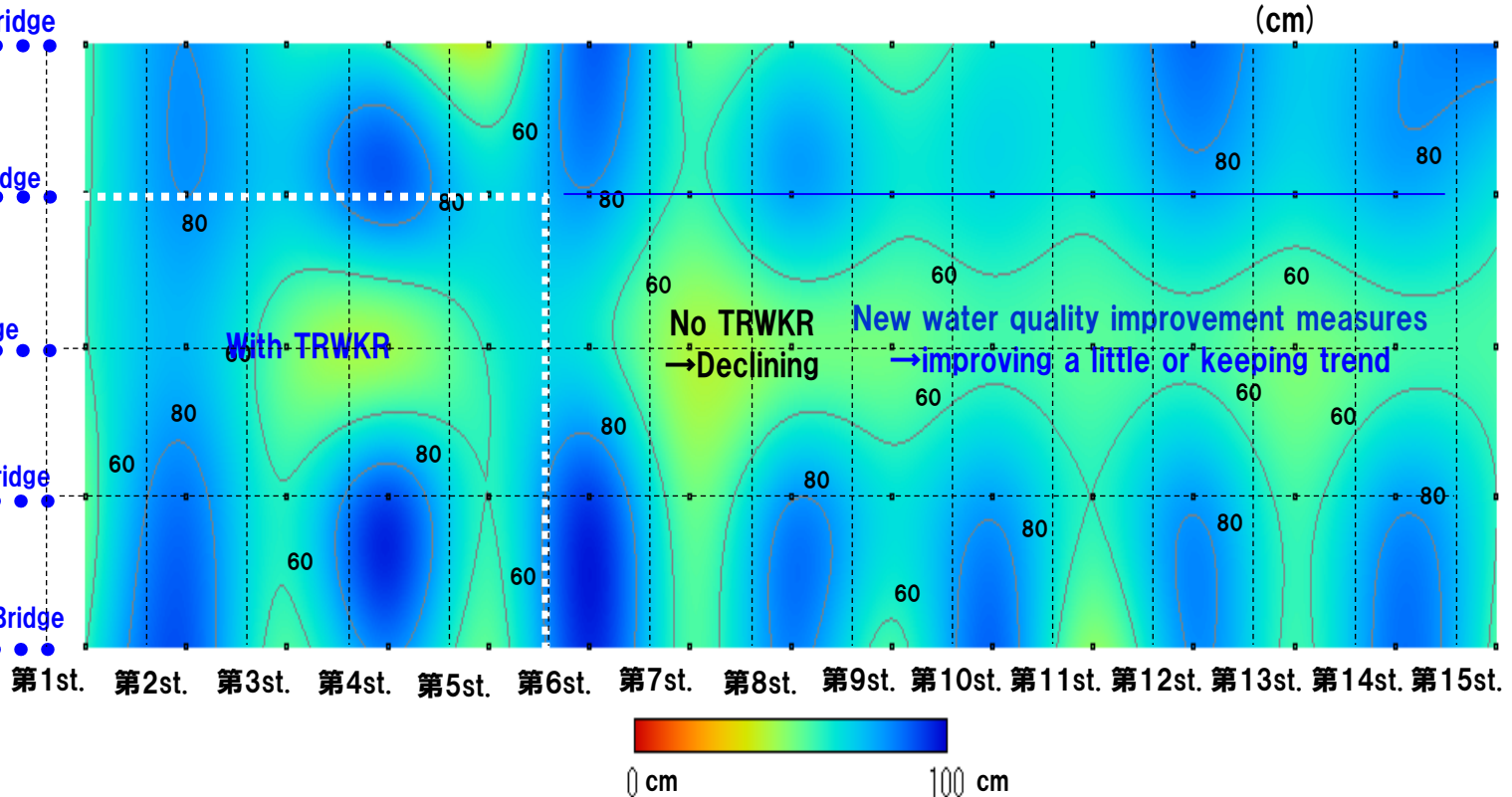
Sakae Bridge to Sanage Bridge
(not enough data)

Sanage Bridge to Johoku Bridge

Johoku Bridge to Asahi Bridge

Asahi Bridge to Matsushige Bridge

Matsushige Bridge to Oseko Bridge

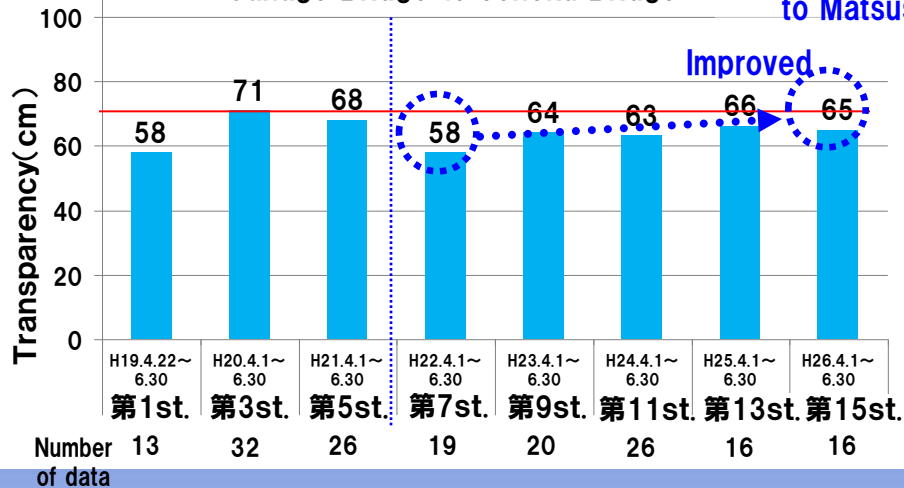


Change in Transparency

Average (from spring to early summer)

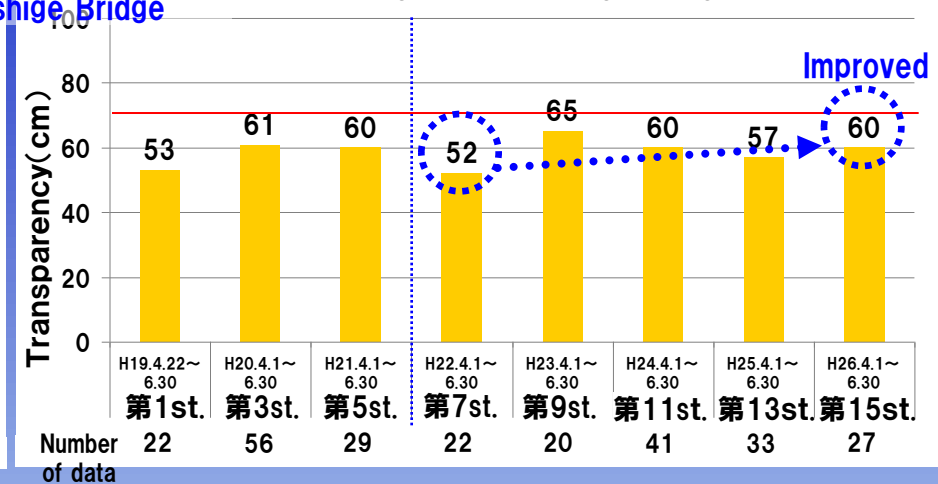
The 1st, 3rd, 5th stage: with TRWKR
No rain on the day and the previous day
The 7th, 9th, 11th, 13th, 15th stage: No TRWKR
No rain on the day and the previous day

Sanage Bridge to Johoku Bridge

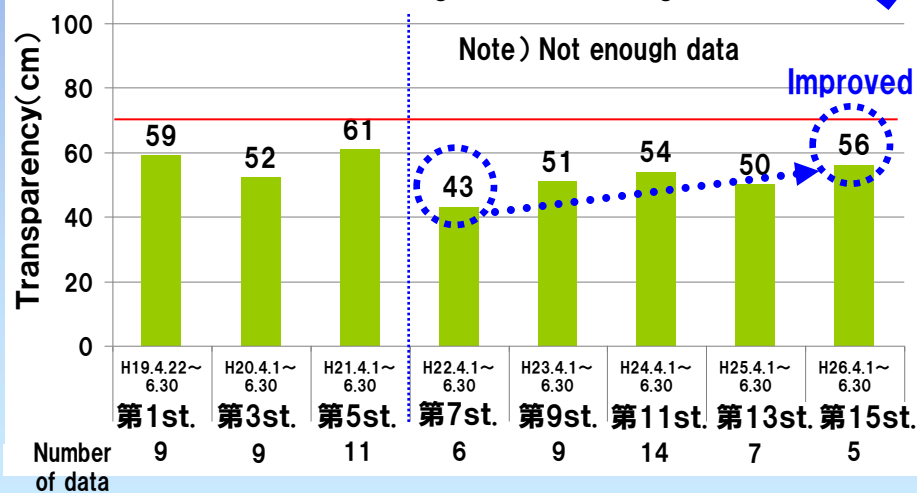


Improved from Sanage Bridge to Matsushige Bridge

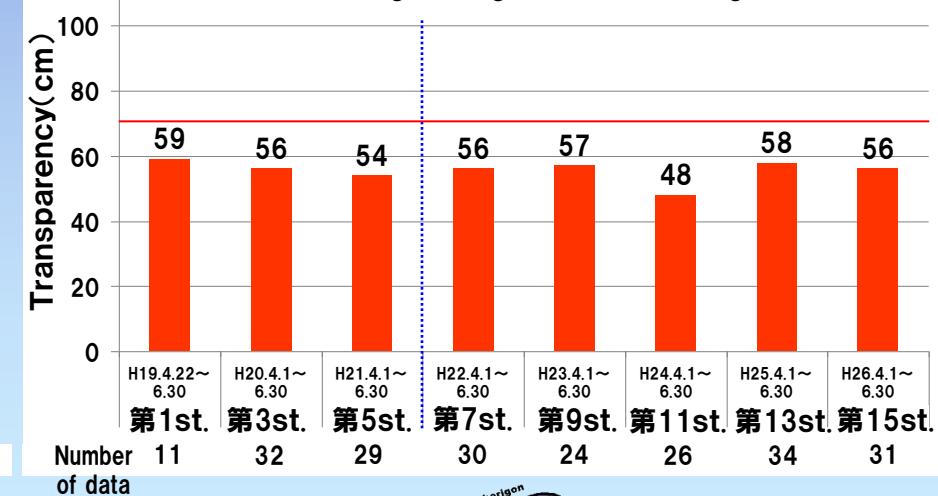
Asahi Bridge to Matsushige Bridge



Johoku Bridge to Asahi Bridge



Matsushige Bridge to Oseko Bridge



Transparency from Sanage bridge to Matsushige bridge in the 15th stage got better than that in the 7th stage. Transparency from spring to early summer is less than 70cm which is civil acceptable value.



3. COD

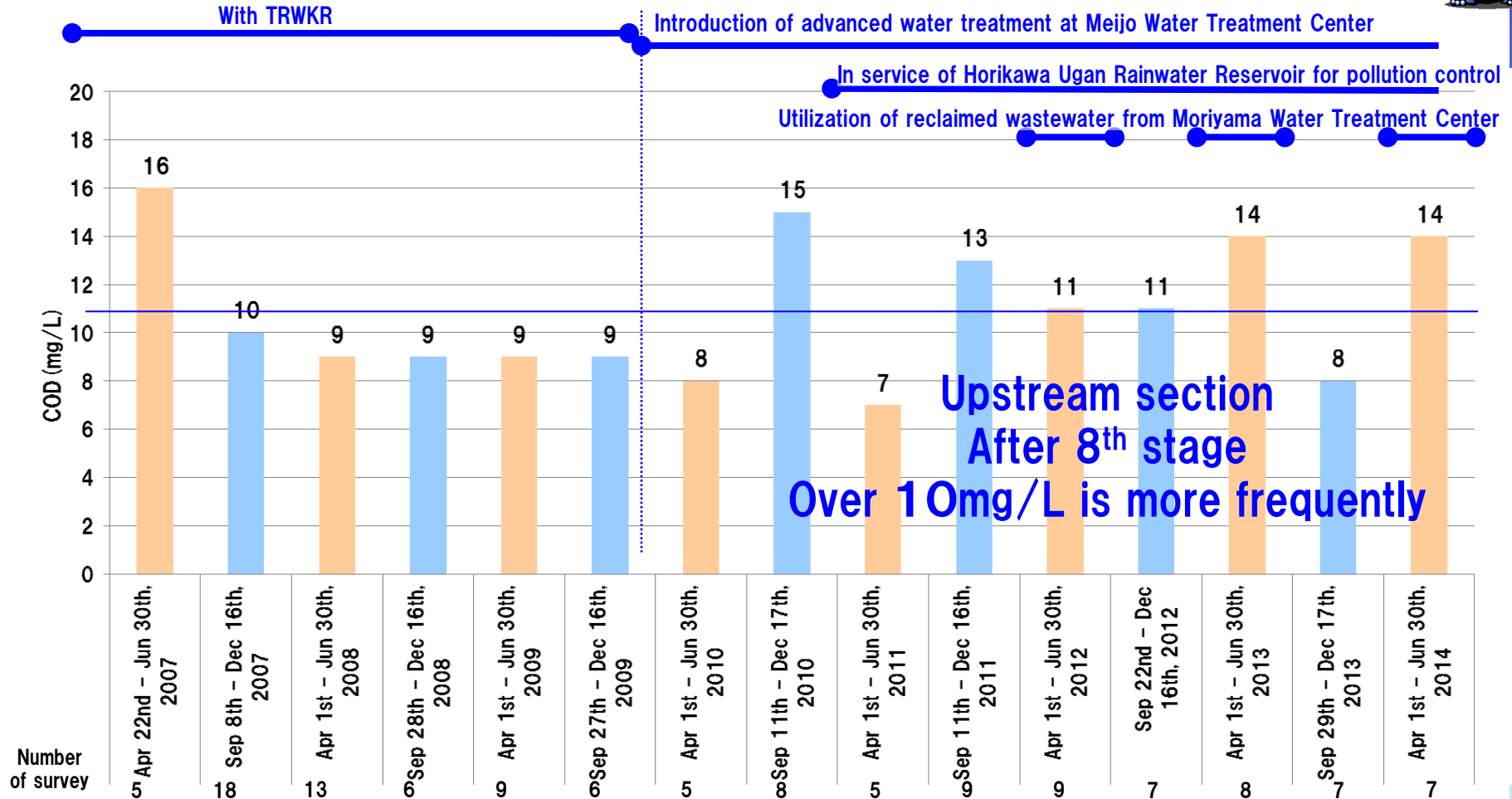
1st – 6th stage : With TRWKR
 No rain on the day and the previous day
 7th – 15th stage : No TRWKR
 No rain on the day and the previous day

Change of COD

Utilization of reclaimed wastewater from Moriyama Water Treatment Center was stopped during 15th stage because of construction for improvement.



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



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



Change of COD

1st – 6th stage : With TRWKR
No rain on the day and the previous day
7th – 15th stage : No TRWKR
No rain on the day and the previous day

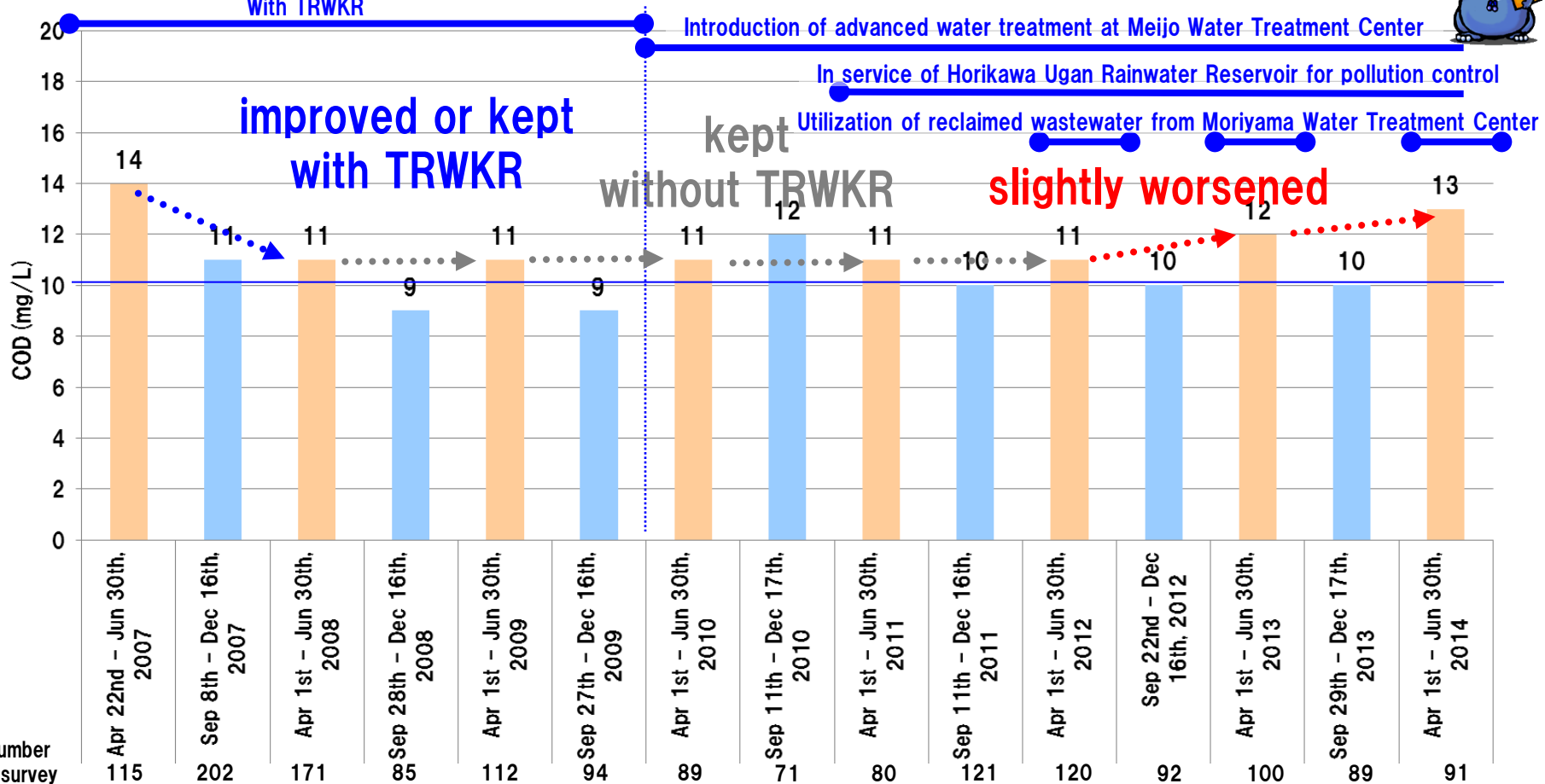
Middle and downstream section (between Sanage Bridge and Oseko Bridge, average)

With TRWKR

Introduction of advanced water treatment at Meijo Water Treatment Center

In service of Horikawa Ugan Rainwater Reservoir for pollution control

Utilization of reclaimed wastewater from Moriyama Water Treatment Center



How did COD change in the middle and downstream section (between Sanage Bridge and Oseko Bridge)?

→ It seems that COD was improved and kept during TRWKR, and after the stop of TRWKR it was remained at the same level until 11th stage. But after that it was slightly worsened.



Change of COD(average in some sections)

between Minatoshin Bridge and Oseko Bridge is excepted.



1st – 6th stage : With TRWKR
No rain on the day and the previous day
7th – 15th stage : No TRWKR
No rain on the day and the previous day

Utilization of reclaimed wastewater from Moriyama Water Treatment Center was stopped during 15th stage because of construction for improvement.

Utilization of reclaimed wastewater from Moriyama Water Treatment Center

In service of Horikawa Ugan Rainwater Reservoir for pollution control

Introduction of advanced water treatment at Meijo Water Treatment Center

(section)

With TRWKR

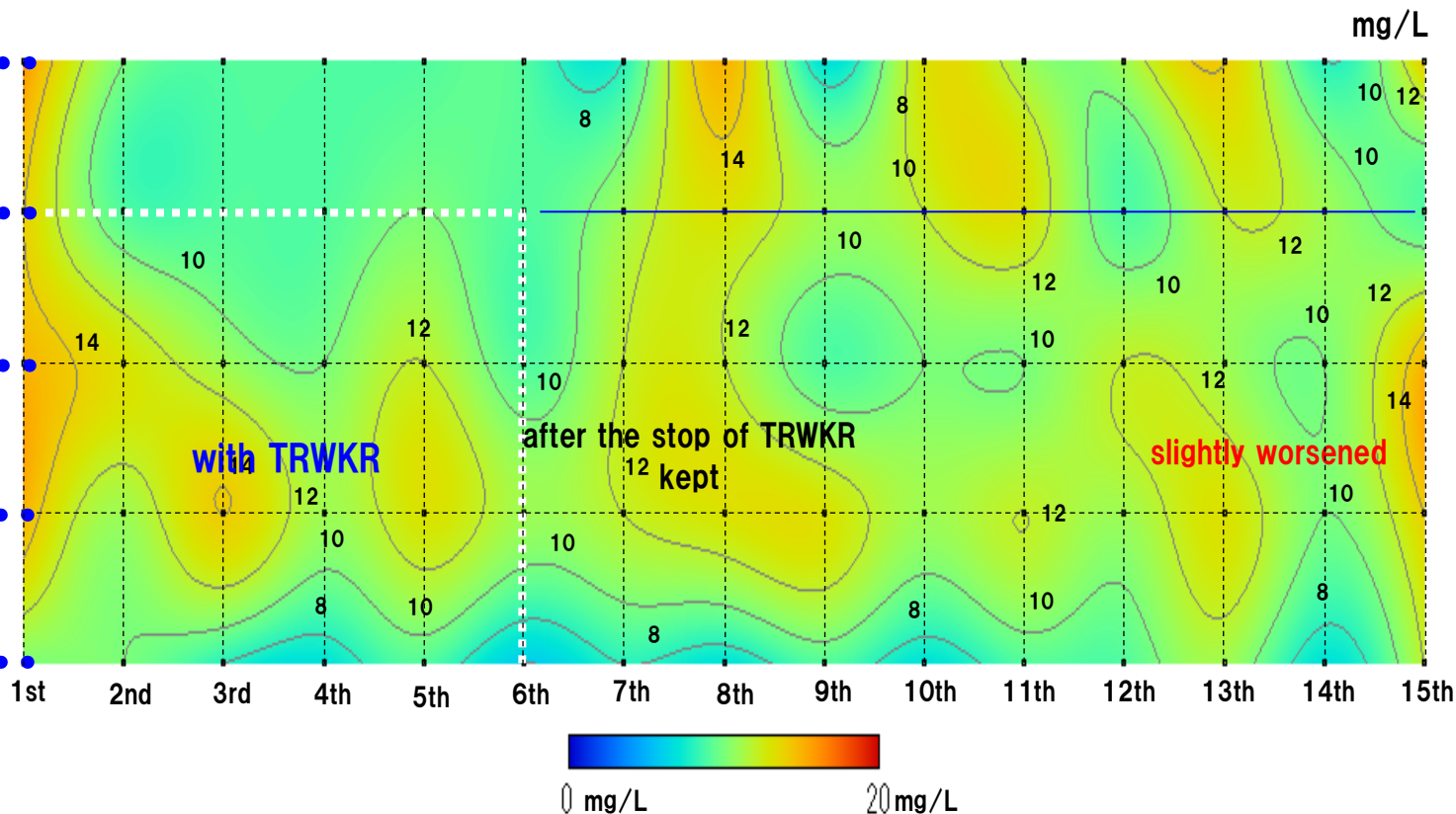
Sakae Bridge –
Sanage Bridge
(not enough data)

Sanage Bridge –
Johoku Bridge

Johoku Bridge –
Asahi Bridge

Asahi Bridge –
Matsushige Bridge

Matsushige Bridge –
Oseko Bridge



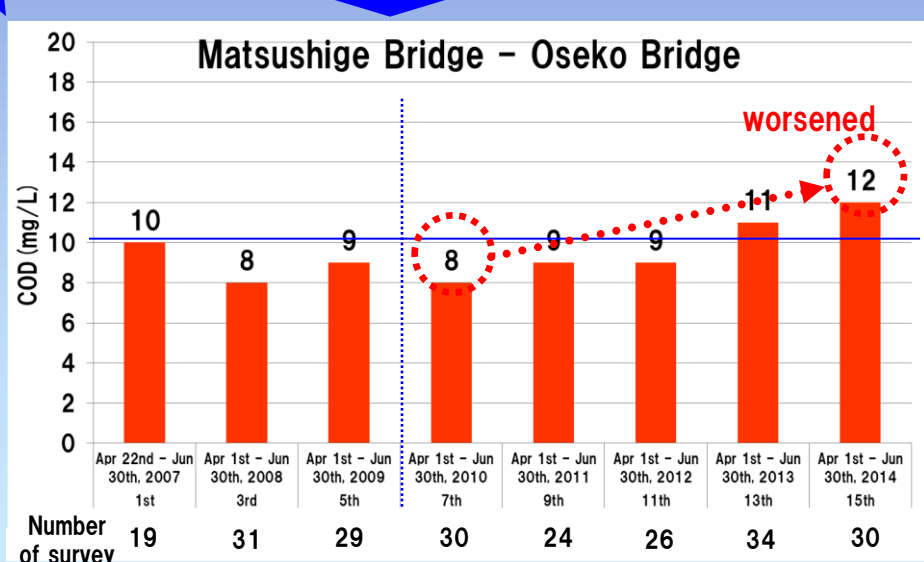
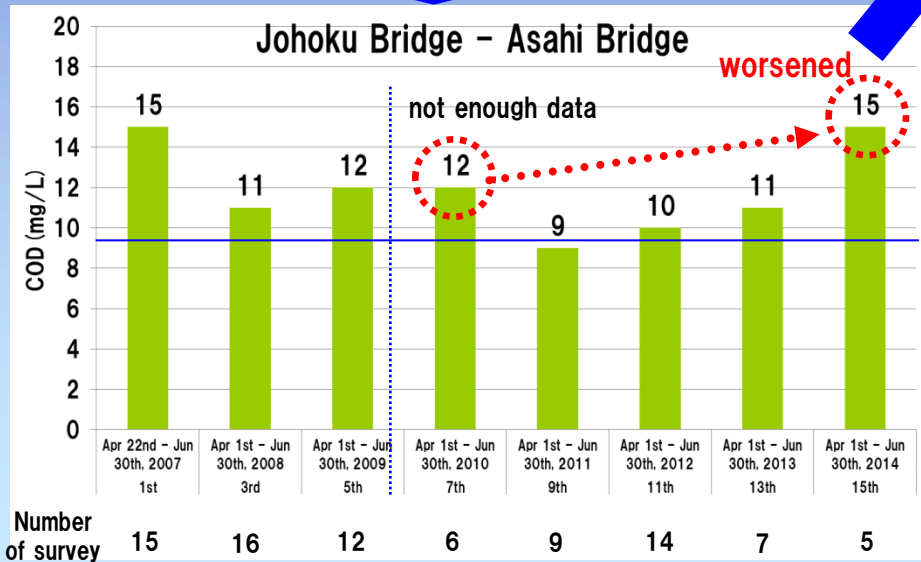
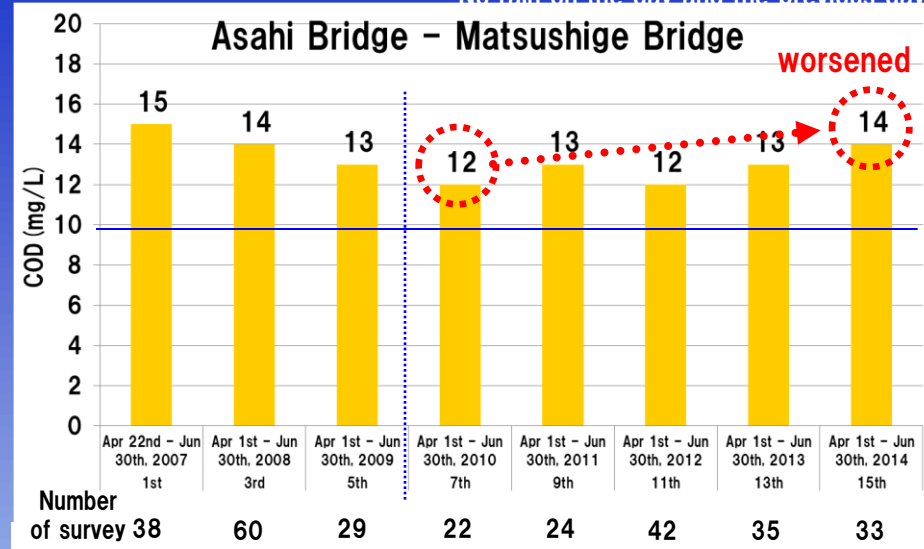
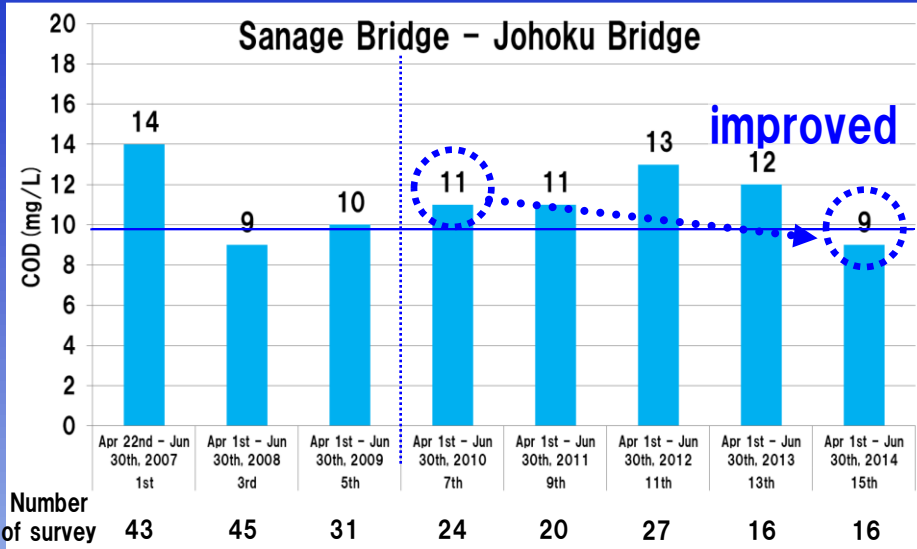
Change of COD spring – early summer

1st,3rd,5th stage : With TRWKR

No rain on the day and the previous day

7th,9th,11th,13th,15th stage : No TRWKR

No rain on the day and the previous day



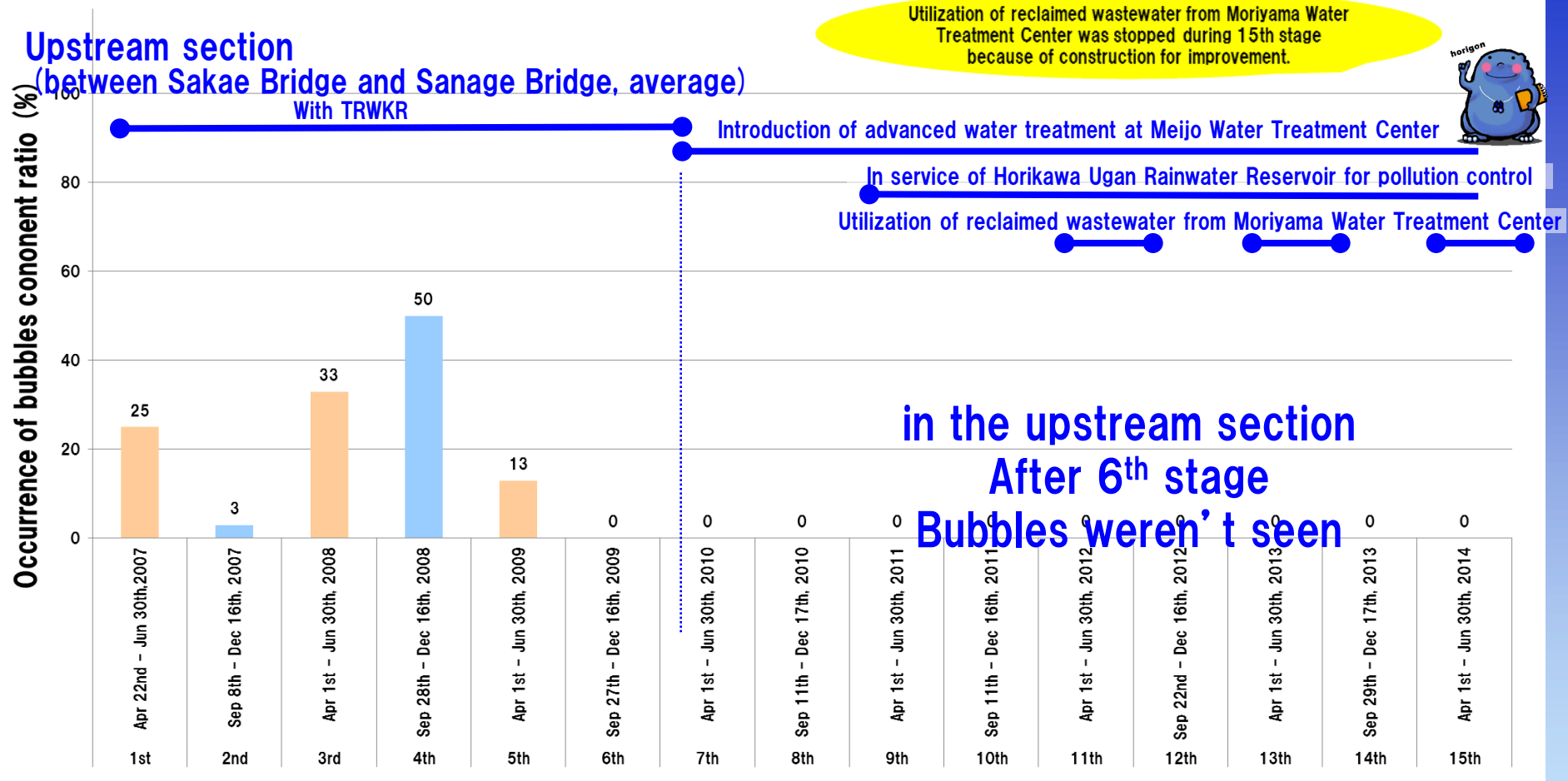
COD in the 15th stage was improved between Sanage Bridge and Johoku Bridge but worsened between Johoku Bridge and Oseko Bridge in comparison with in the 7th stage just after the stop of TRWKR.



4. Bubbles

Occurrence of bubbles from the bottom

1st – 6th stage : With TRWKR
No rain on the day and the previous day
7th – 15th stage : No TRWKR
No rain on the day and the previous day



Number of survey	24	38	15	2	8	3	5	8	5	9	9	8	7	7	7
	not enough data														

■ How did bubbles change in the upstream section (between Sakae Bridge and Sanage Bridge) ?
→Bubbles weren't seen after 6th stage.

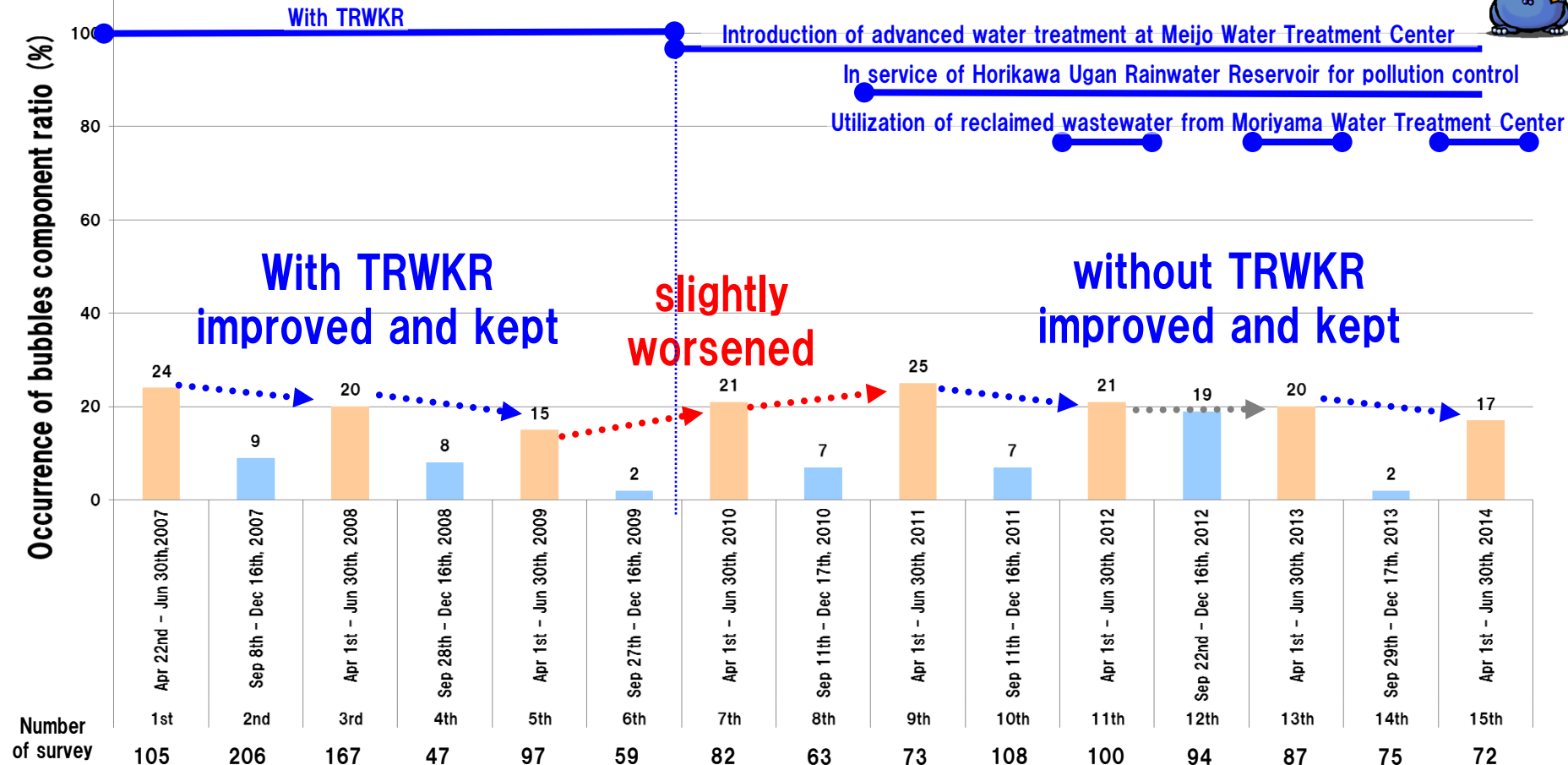


Occurrence of bubbles from the bottom

1st – 6th stage : With TRWKR
No rain on the day and the previous day
7th – 15th stage : No TRWKR
No rain on the day and the previous day

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

Utilization of reclaimed wastewater from Moriyama Water Treatment Center was stopped during 15th stage because of construction for improvement.



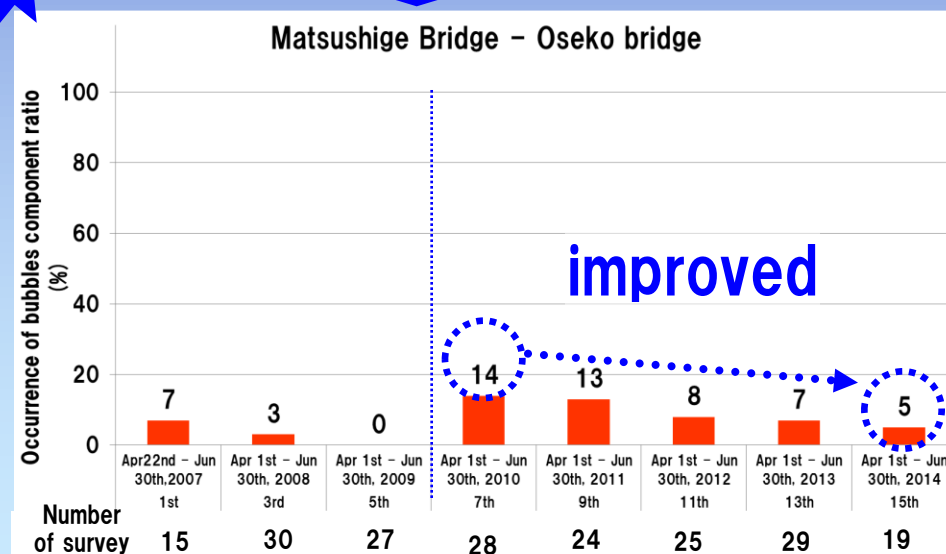
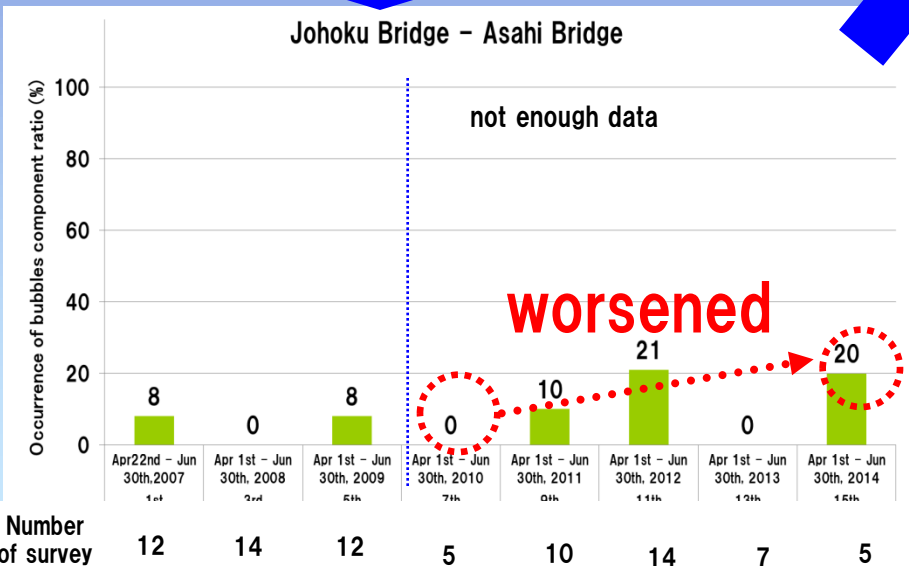
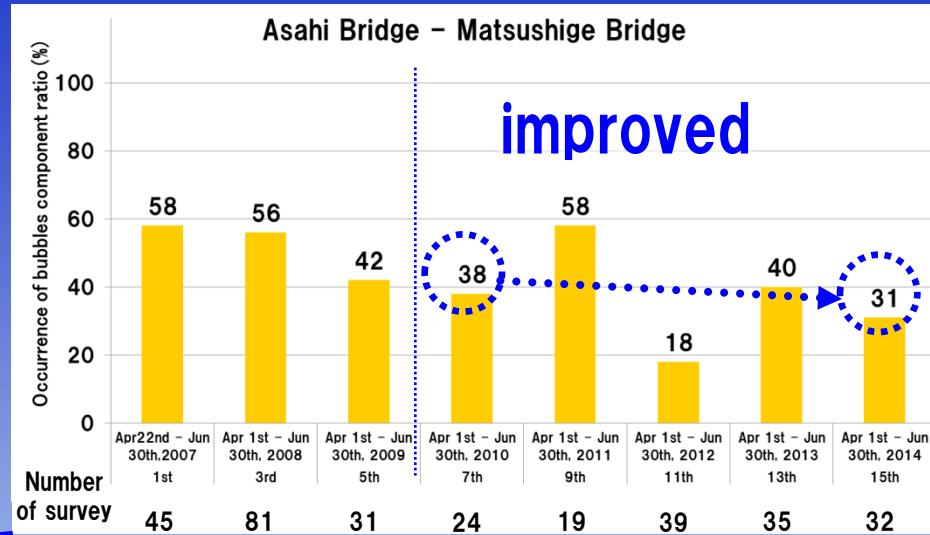
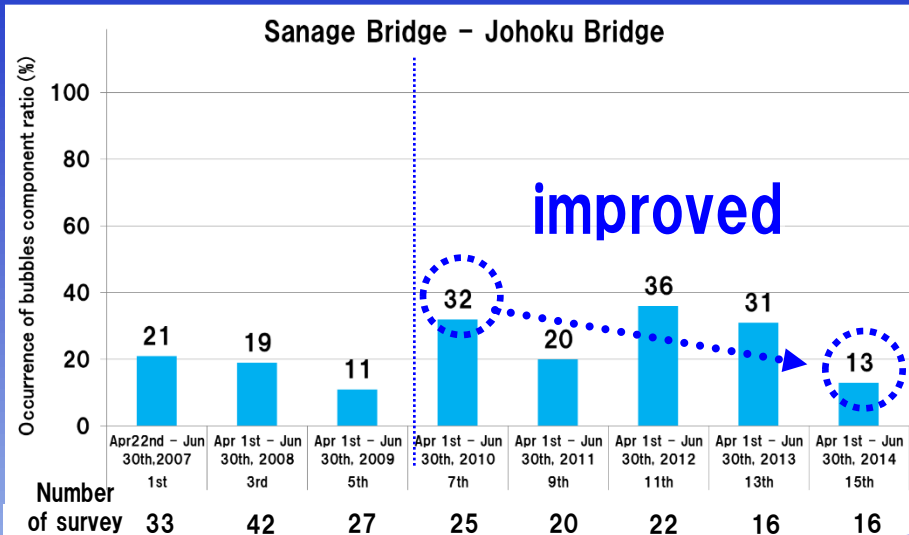
■ How did bubbles occur in the middle and downstream section (between Sanage Bridge and Oseko Bridge)?

→ It seemed that the bubbles were improved and kept during TRWKR and then it was slightly worsened in the 7th and 9th stage. After that it was improved a bit again as a result of the water quality treatment.



Occurrence of bubbles from the bottom spring – early summer

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



Bubbles were improved between Sanage Bridge and Johoku Bridge and also between Asahi Bridge and Oseko Bridge in the 15th stage in comparison with in the 7th stage just after the stop of TRWKR



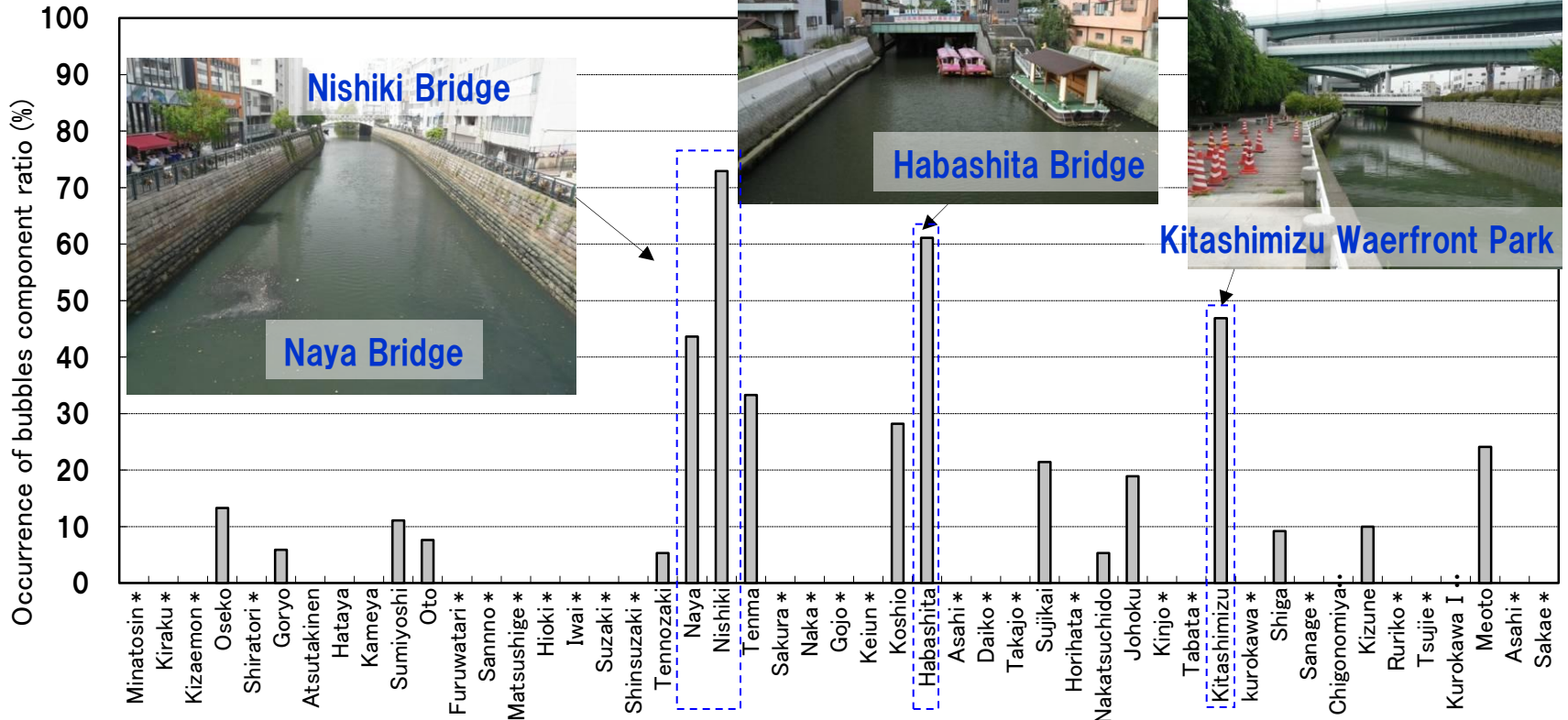
Change of bubbles from the bottom

At each bridge

In the 1st,3rd,5th,7th,9th,11th,13th and 15th stage (spring – early summer)

No rain

Both with TRWKR and without TRWKR



* : under 10 samples

Occurrence of bubbles component ratio (%)

= Days when bubbles rise from the bottom / All survey days × 100

Bubbles are frequently observed from spring to early summer between Naya Bridge and Tenma Bridge, at Habashita Bridge and Kitashimizu Bridge.



5. Smell

Occurrence of Smell

Upstream section

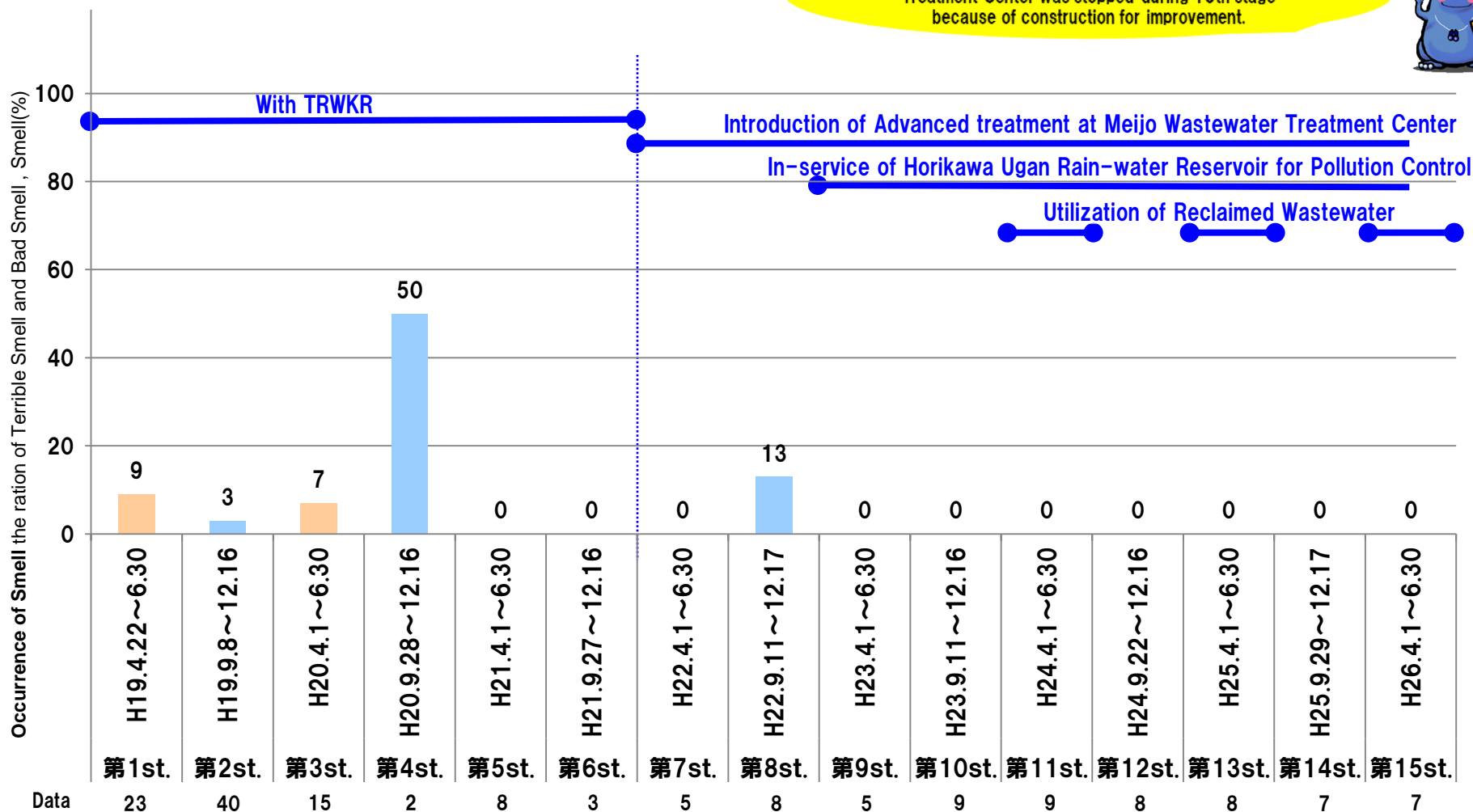
1st–6th stage : With TRWKR

No rain on the day and the previous day

7th–13th stage : No TRWKR

No rain on the day and the previous day

Utilization of reclaimed wastewater from Moriyama Water Treatment Center was stopped during 15th stage because of construction for improvement.



■ Change of Smell

→ There was no reports of smell after 9th stage.

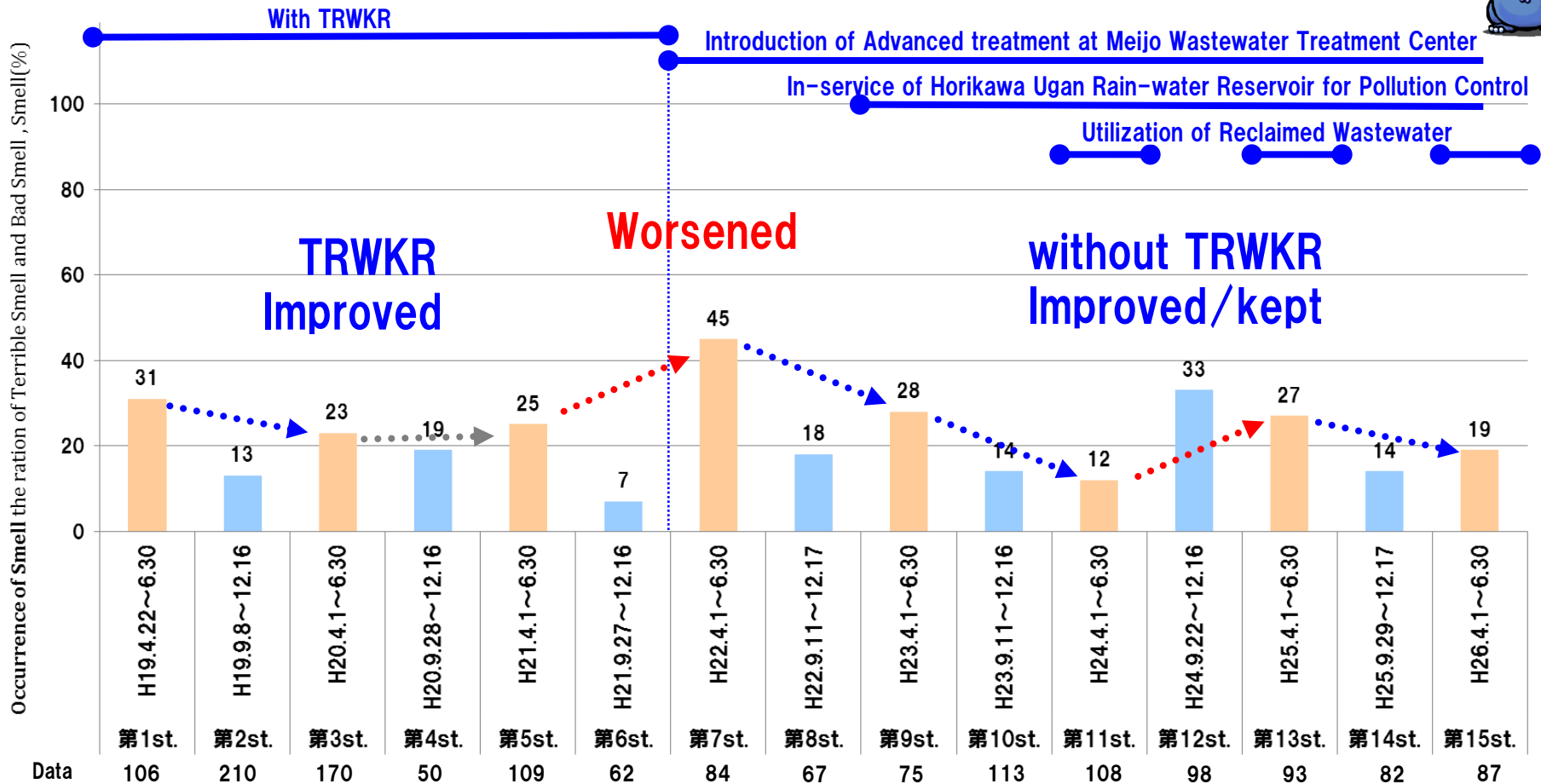


Occurrence of Smell

Middle stream, Downstream section

1st–6th stage : With TRWKR
No rain on the day and the previous day
7th–13th stage : No TRWKR
No rain on the day and the previous day

Utilization of reclaimed wastewater from Moriama Water Treatment Center was stopped during 15th stage because of construction for improvement.



Change of smell

→ After the stop of TRWKR, smell was worsened at 7th stage and then smell was improved as a result of the water quality improvement.



Kind of smell (Spring – Early summer)

• With TRWKR

• Introduction of Advanced treatment at Meijo Wastewater Treatment Center

• In-service of Horikawa Ugan Rain-water Reservoir for Pollution Control

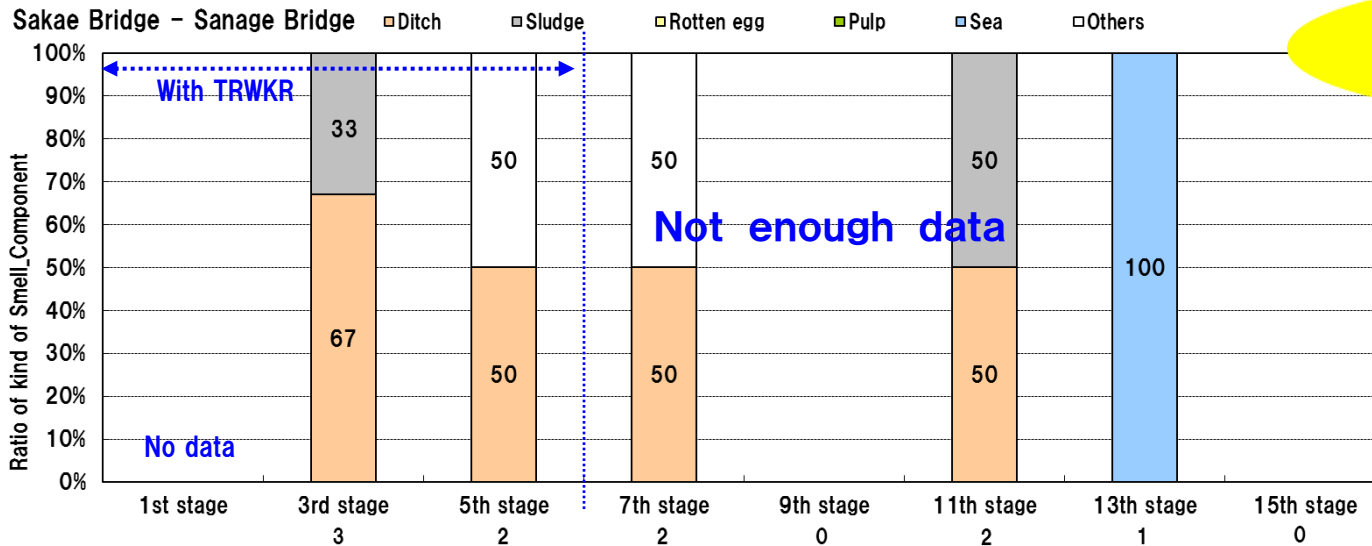
Utilization of Reclaimed Wastewater

1st–6th stage : With TRWKR

No rain on the day and the previous day

7th–13th stage : No TRWKR

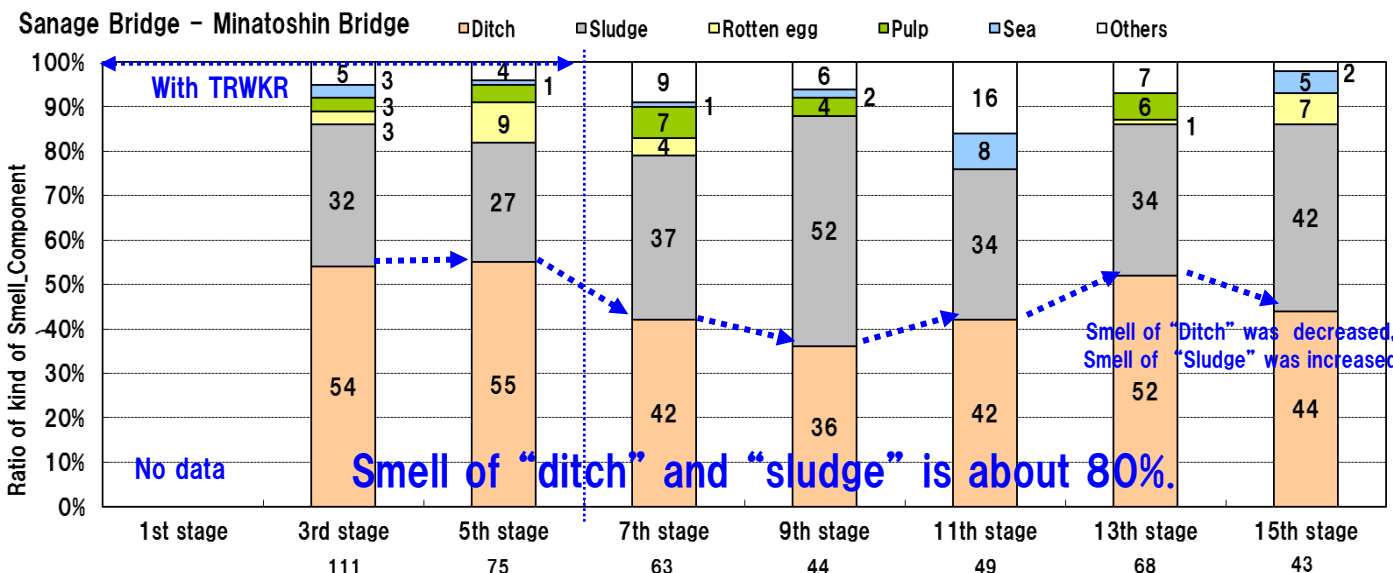
No rain on the day and the previous day



Utilization of reclaimed wastewater from Moriyama Water Treatment Center was stopped during 15th stage because of construction for improvement.



■ Occurrence of smell
Smell of “ditch” and “sludge” is about 80%.

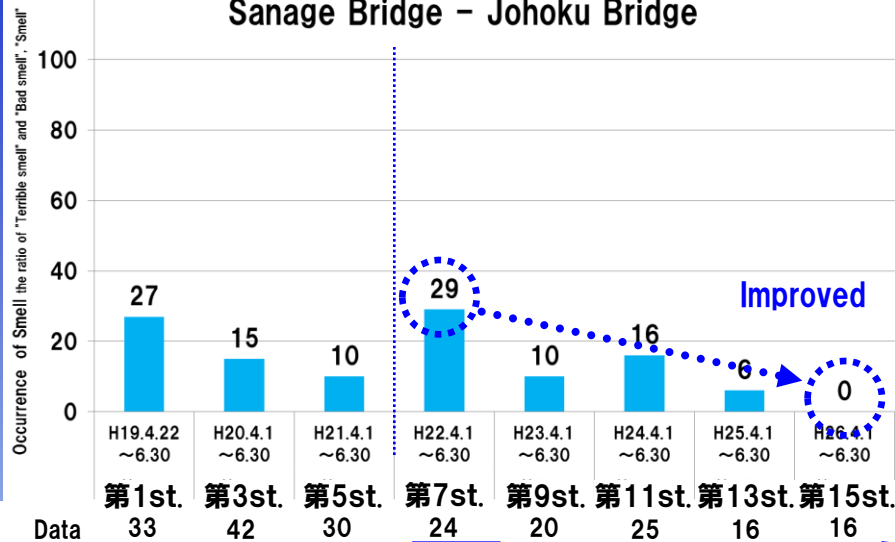


■ Change of the kind of smell
At 15th stage, smell of “ditch” and “sludge” is about 40% each.

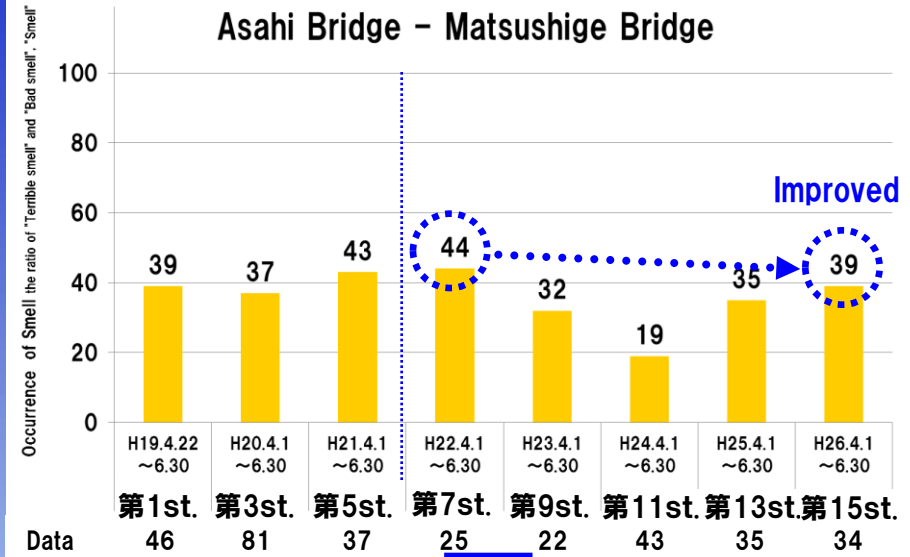
Kind of smell (Spring – Early summer)

1st–6th stage : With TRWKR
No rain on the day and the previous day
7th–13th stage : No TRWKR
No rain on the day and the previous day

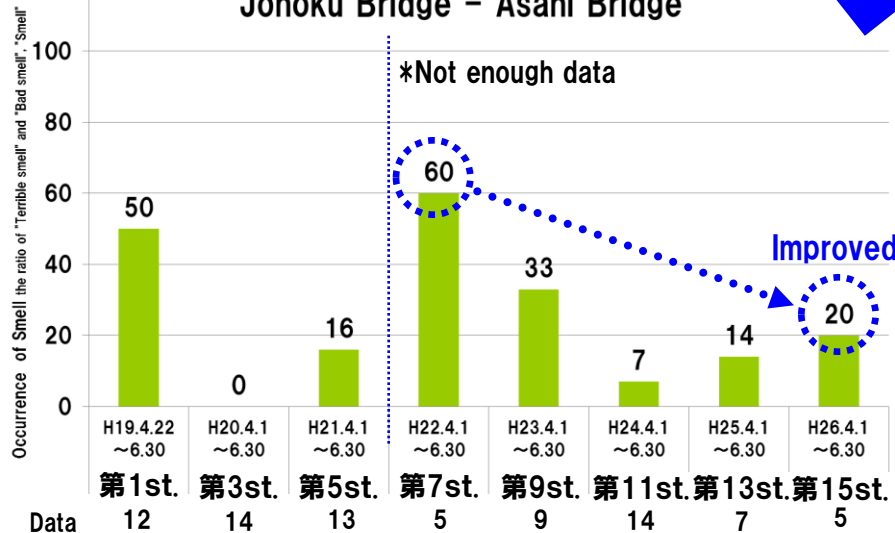
Sanage Bridge – Johoku Bridge



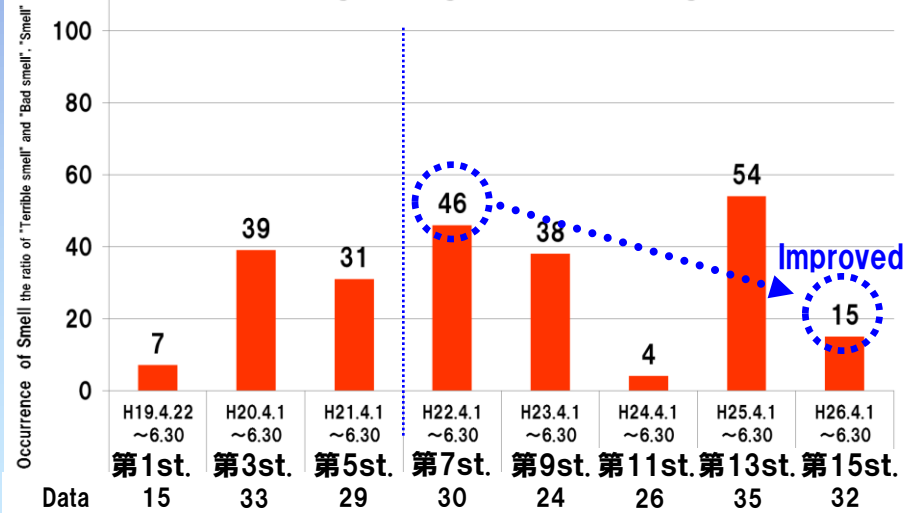
Asahi Bridge – Matsushige Bridge



Johoku Bridge – Asahi Bridge



Matsushige Bridge – Oseko Bridge



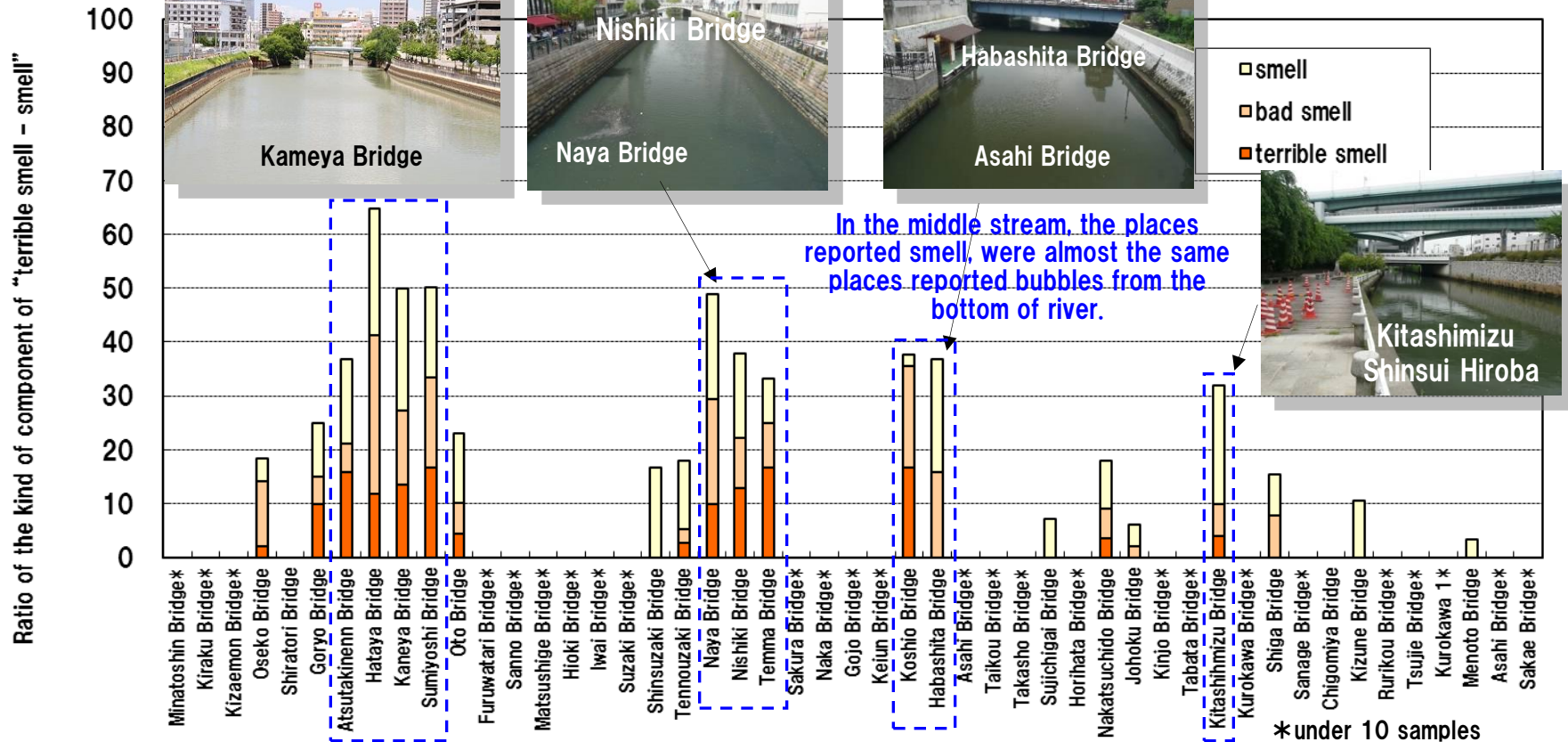
In the 15th stage, occurrence of smell had been improved from 7th stage (after TRWKR).



Change of the smell along the river Spring–Early summer

Ratio of the kind of component “terrible smell – smell”(%)
 = the number of day of “terrible smell – smell” / all survey days × 100

1st 3rd 5th 7th 9th 11th 13th 15th stage no rain, both with TRWKR and without TRWKR



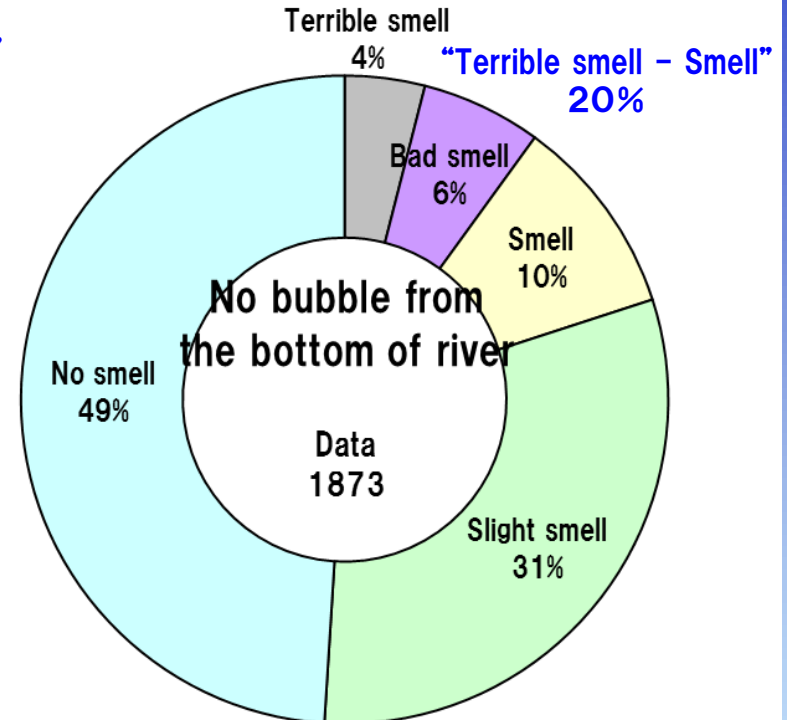
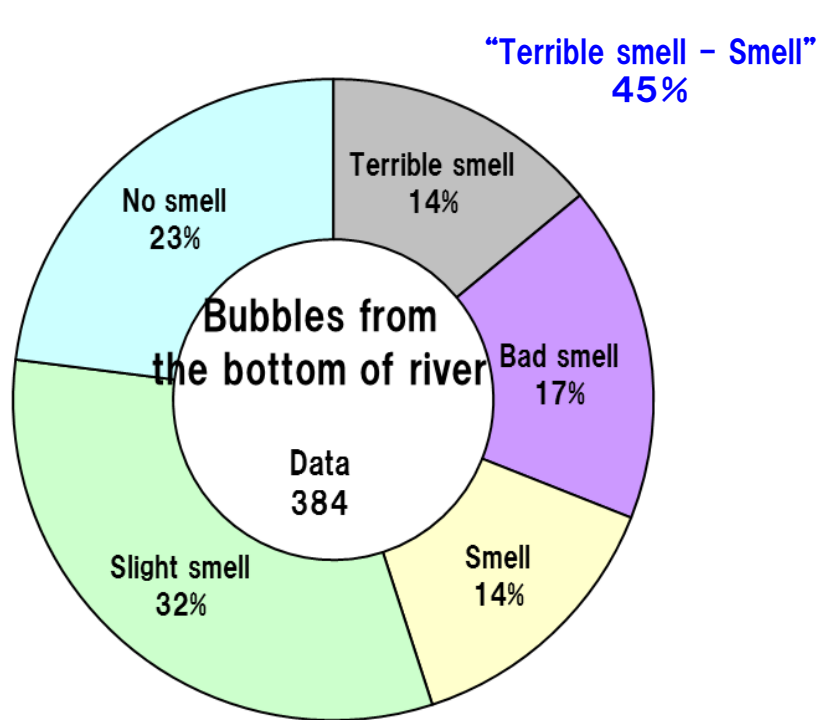
Smelly places were “Atsutakinenn Bridge – Sumiyoshi Bridge” and “Naya Bridge – Temma Bridge”, “Koshio Bridge – Habashita Bridge”, “Kitashimizu Bridge”. (Spring – early summer)



Relation between bubbles and smell

Sanage Bridge – Minatoshin Bridge

Both with TRWKR and no TRWKR, include out of research period, No rain on the day and the previous day



When the bubbles occurred from the river, “terrible smell– smell” is about 45%, but without the bubbles it is 20%. Horikawa River smelled more frequently when bubbles were seen.



It was reported that bubbles form the bottom were seen frequently when water level was down.

6. Color

① Colorless



⑥ Gray



⑪ Dark gray



② Milk white



⑦ Yellow gray



⑫ Light yellow green



③ Yellow



⑧ Light gray yellow green



⑬ Yellow brown



④ Yellow green



⑨ Gray yellow green



⑭ Brown



⑤ Green



⑩ Gray green



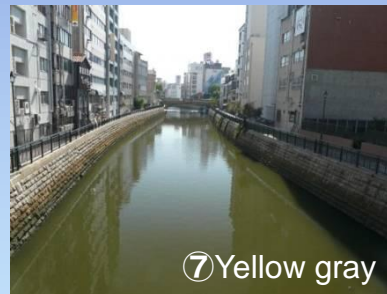
⑮ Green brown



Photo
at Nishiki Bridge



⑤ Green



⑦ Yellow gray



⑧ Light gray yellow green



⑨ Gray yellow green



⑩ Gray green



⑪ Dark gray

There were some reports at the time of “⑧ light gray yellow green”, “the river was smelled like “rotten Egg”, “fish was gasped painfully” and so on.

Component ratio of colors

Sanage Bridge – Minatoshin Bridge

1st–6th stage : With TRWKR

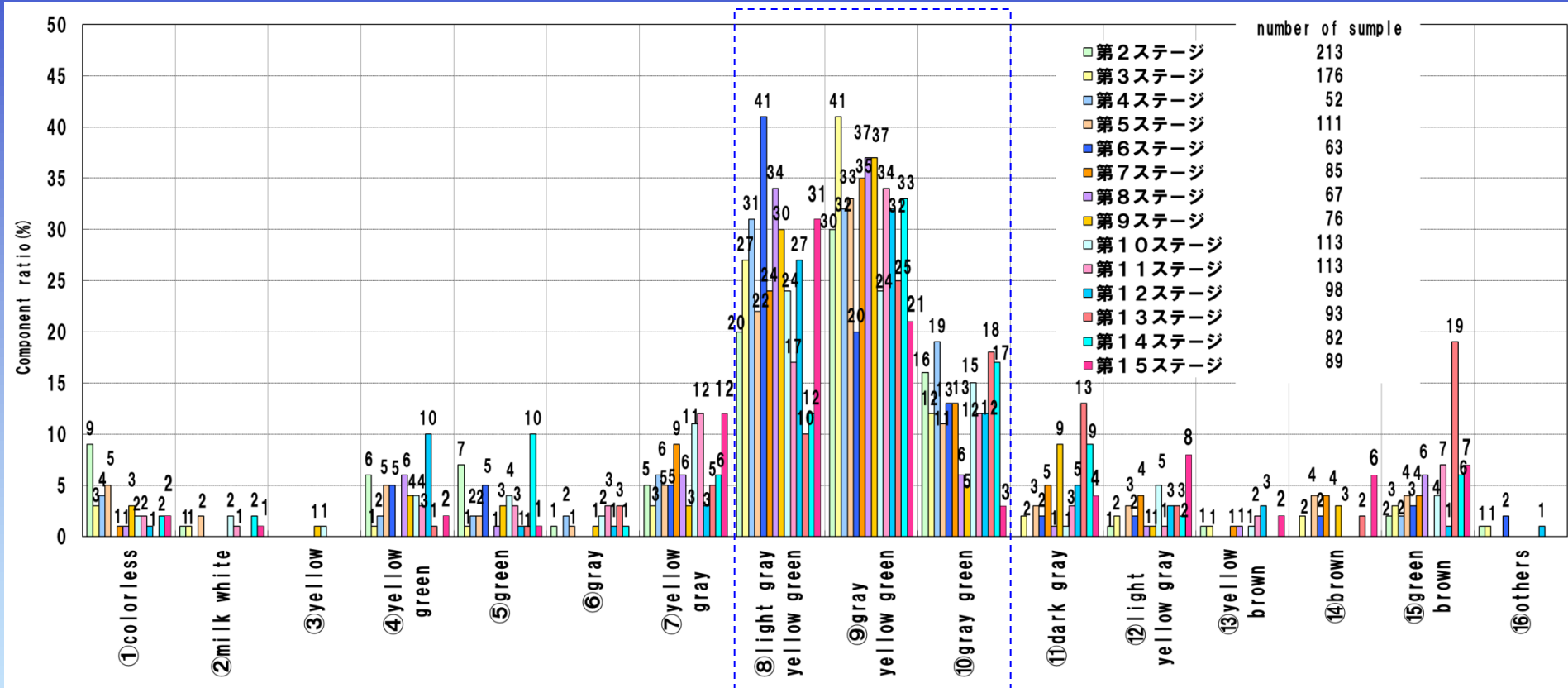
No rain on the day and the previous day

7th–13th stage : No TRWKR

No rain on the day and the previous day

Colors has added on the survey list since the 2nd stage

“⑧light gray yellow green, ⑨gray yellow green, ⑩gray green” was seen high frequency.



■ High frequency Colors

⑧light gray yellow green, ⑨gray yellow green, ⑩gray green

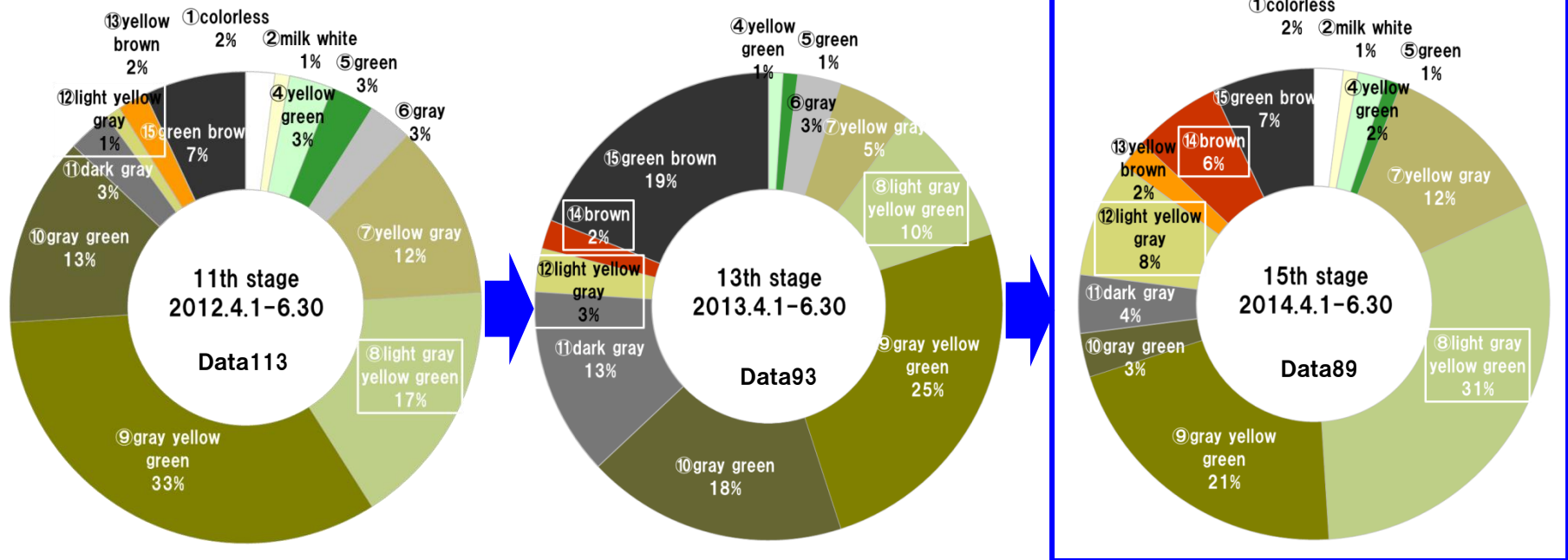


What colors were mainly seen

No rain on the day and the previous day

Component ratio of colors (Sanage Bridge – Minatoshin Bridge)

Compared with 11th and 13th, 15th stage



Increased mainly ⑧light gray yellow green, ⑫light yellow gray and ⑭brown

■ What colors were mainly seen when impression of cleanness was “slightly dirty” or “dirty” ?
(Comparison among 11th stage, 13th stage and 15th stage)

In the 15th stage ⑧light gray yellow green ⑫light yellow and ⑭brown was increased.



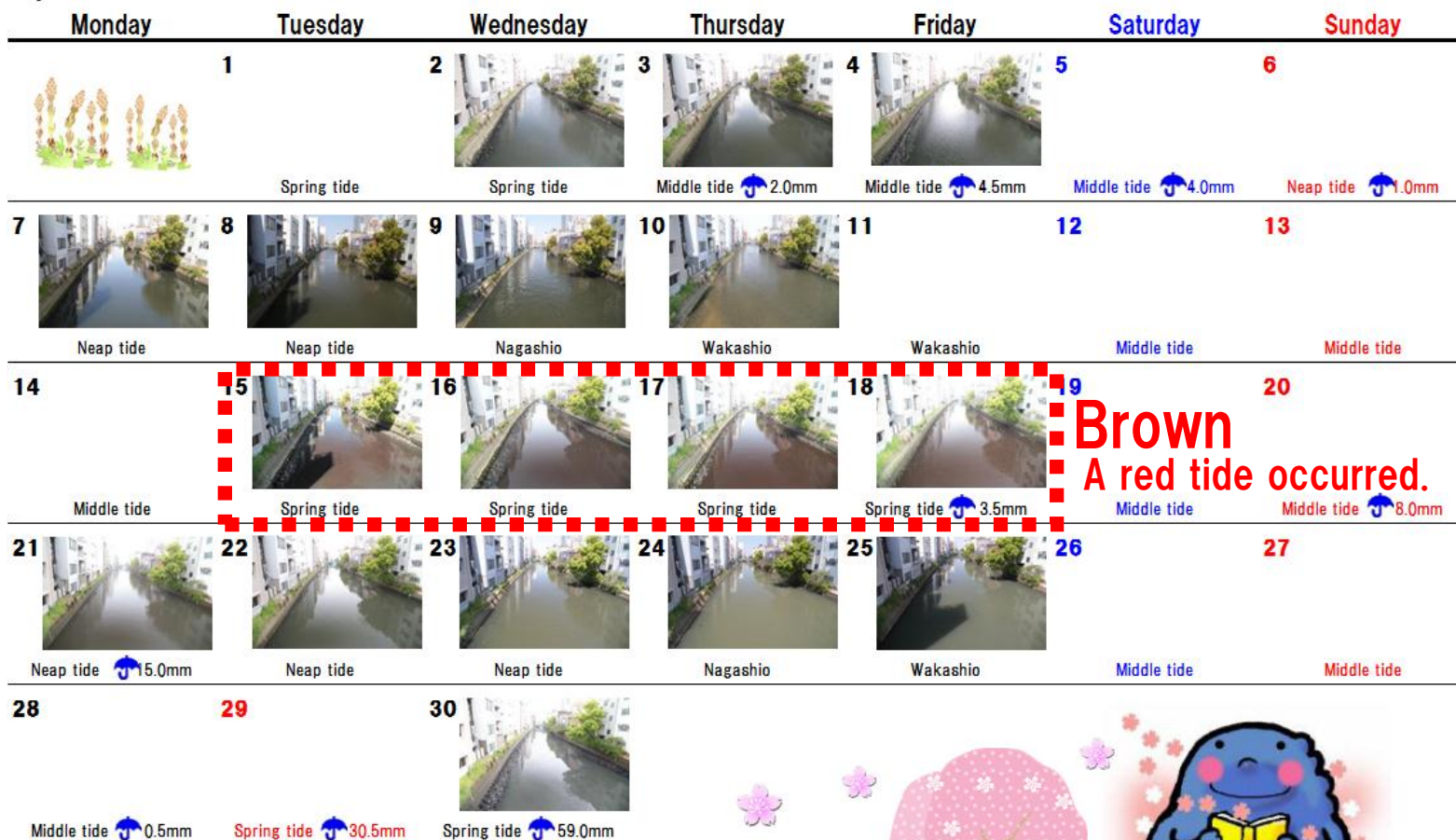
(Reference) Change of color of Horikawa Part1

A red tide occurred in the middle of April this year. After those days the light color was frequently seen from the end of April to May.

Apr. 2014

TRWKR

Nagoya Local Meteorological Office



Brown
A red tide occurred.

Nagashio means the tide on the day on which the difference between spring and neap is least.

Wakashio means the tide on the day after the day of Nagashio, transitional tide between spring and neap tide.

(Reference) Change of color of Horikawa Part2

There are a lot of days with the light color.

May. 2014

TRWKR



Nagoya Local Meteorological Office



(Reference) Change of color of Horikawa Part3

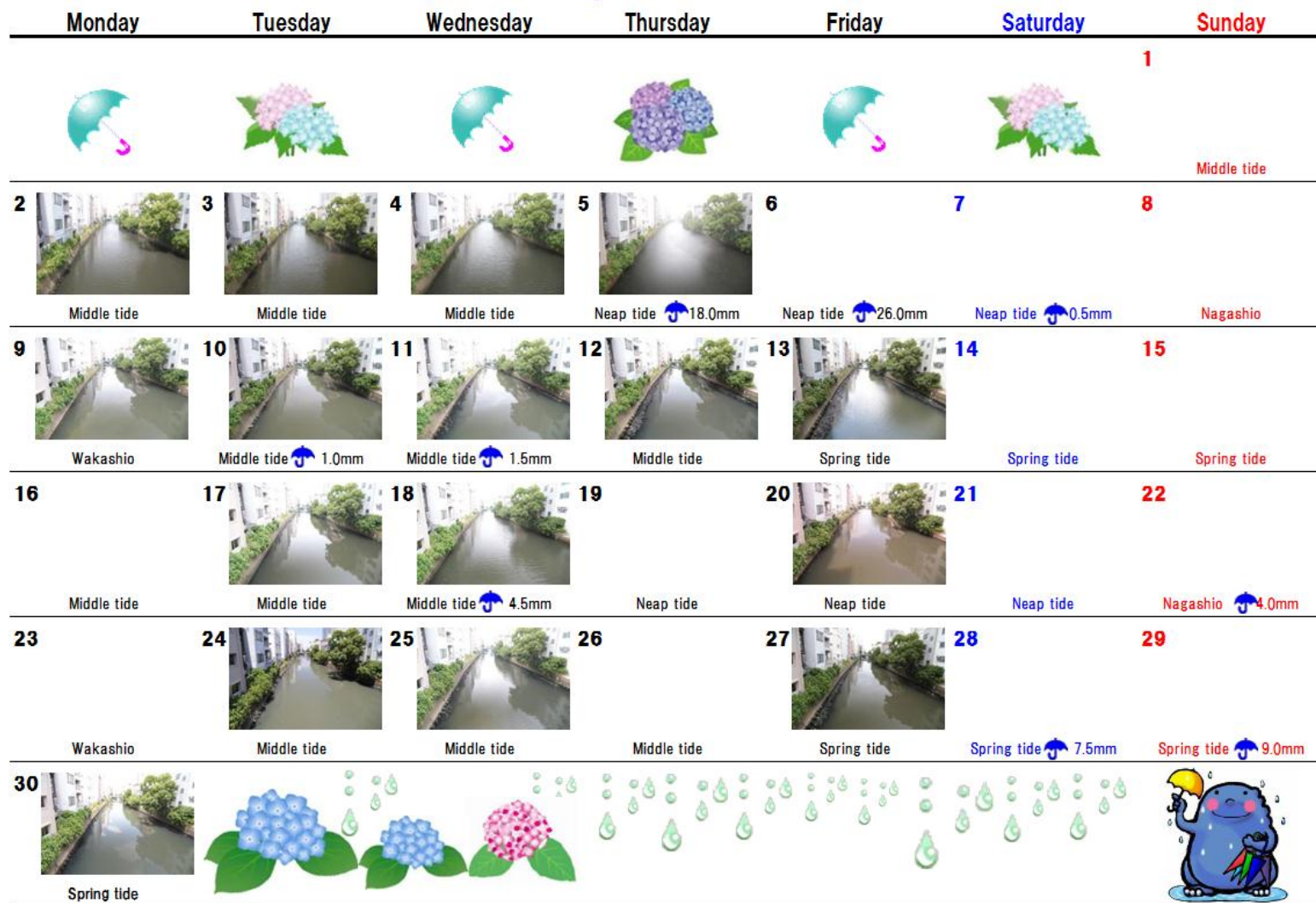
There are a lot of days with the light color.

June 2014

● TRWKR



Nagoya Local Meteorological Office

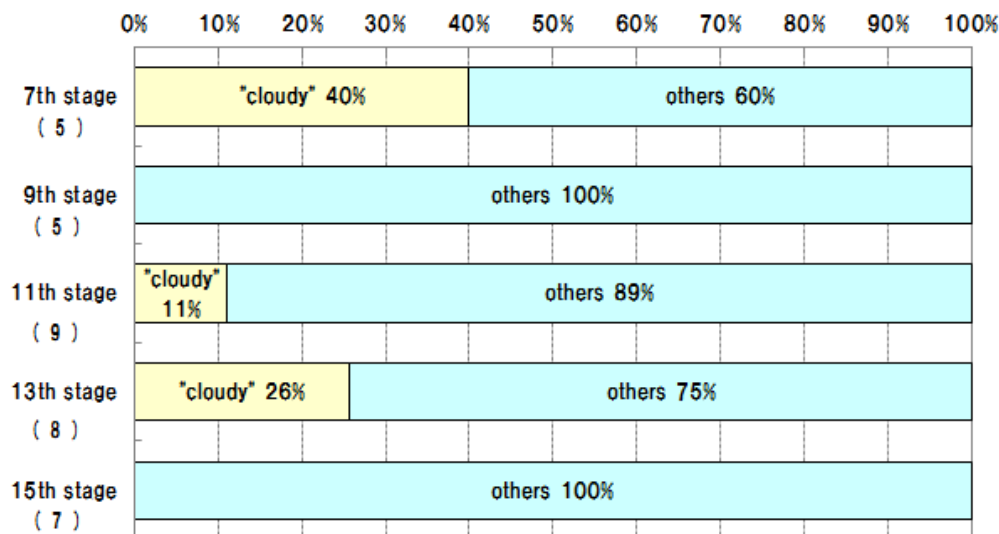


Change of color (spring ~ early summer)

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

Sakae Bridge~Sanage Bridge

Not enough data



(graph legend)

"cloudy"

②milk white

⑧light gray yellow green

⑫light yellow gray

"red tide"

⑬yellow brown

⑭brown

⑮green brown

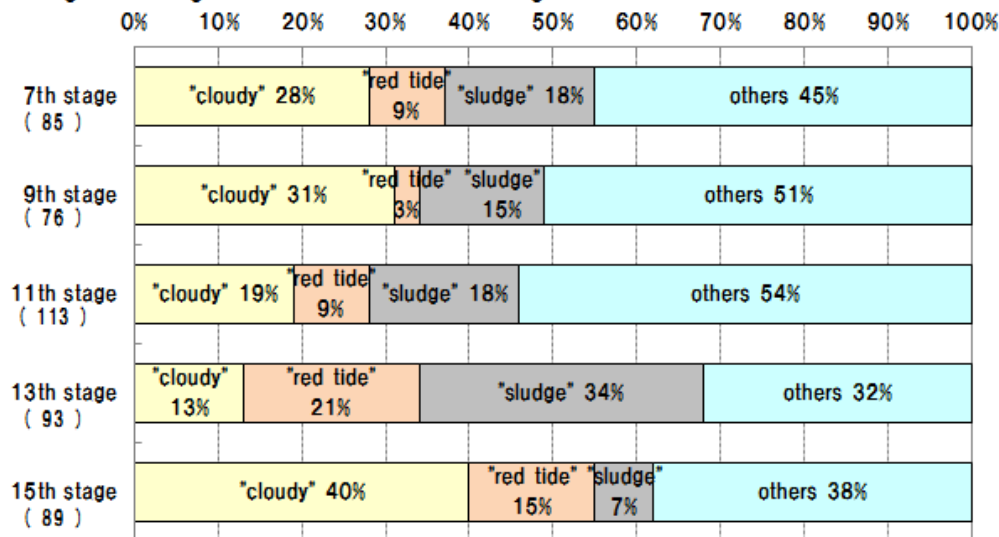
"sludge"

⑥gray

⑩gray green

⑪dark gray

Sanage Bridge~Minatoshin Bridge



Upper: Stage
Lower: Number of investigation

■ Change of component of colors
→The ratio of "red tide" and "sludge" increased in the 13th stage in comparison with in the 11th stage, and "cloudy" decreased.

In the 15th stage, "red tide" and "cloudy" were high, and "sludge" was low.

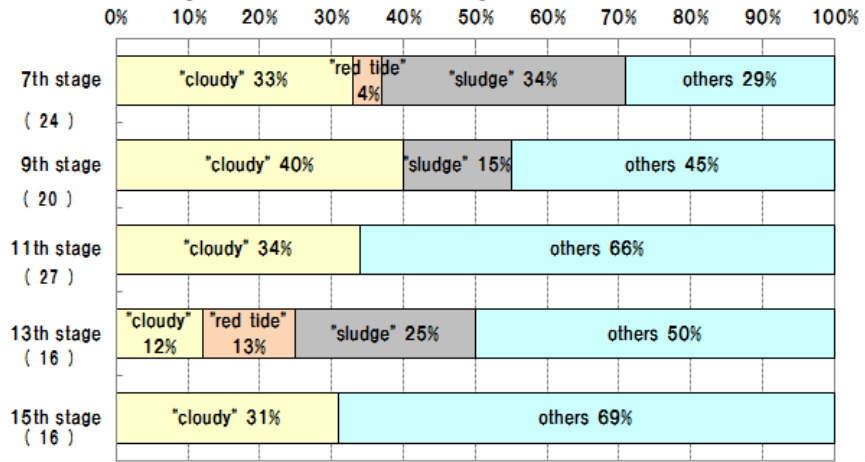
We guess that plankton easily multiplied at surface of water because of less amount of rainfall, higher temperature and longer sunshine time than usual, therefore the bottom layer became bin oxygen and it caused blue tide state ("cloudy").



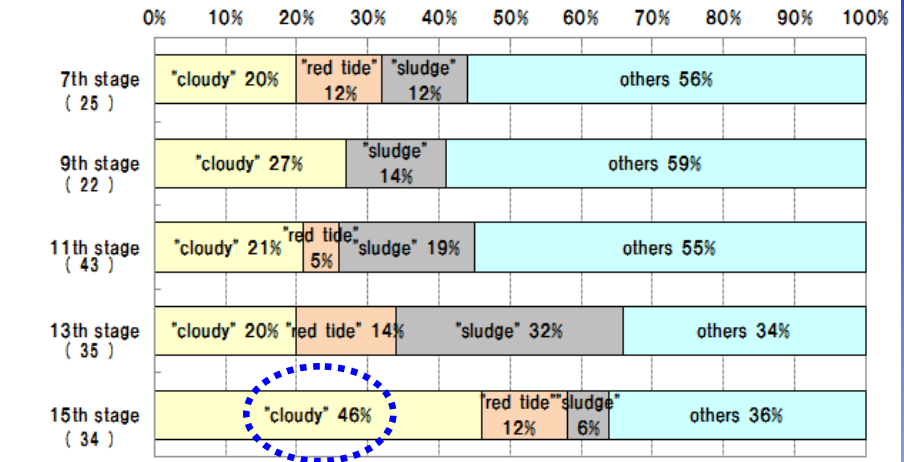
Component ratio of colors which is mainly seen

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

Johoku Bridge ~ Minatoshin Bridge



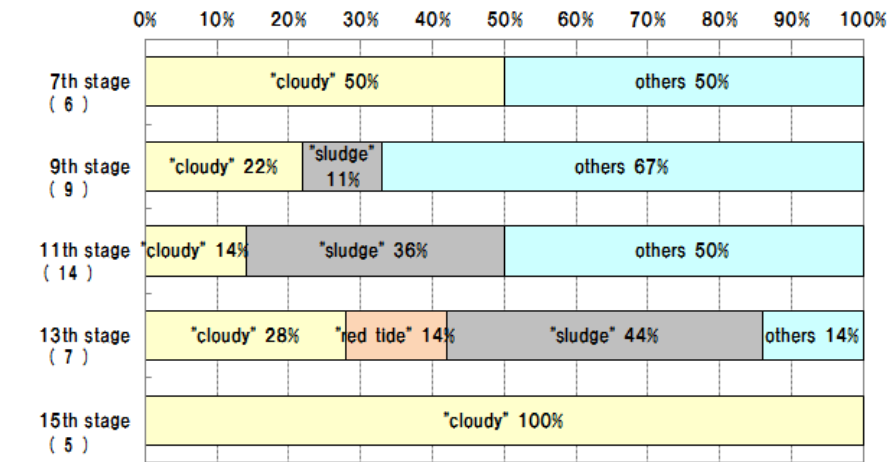
Asahi Bridge ~ Mastushige Bridge



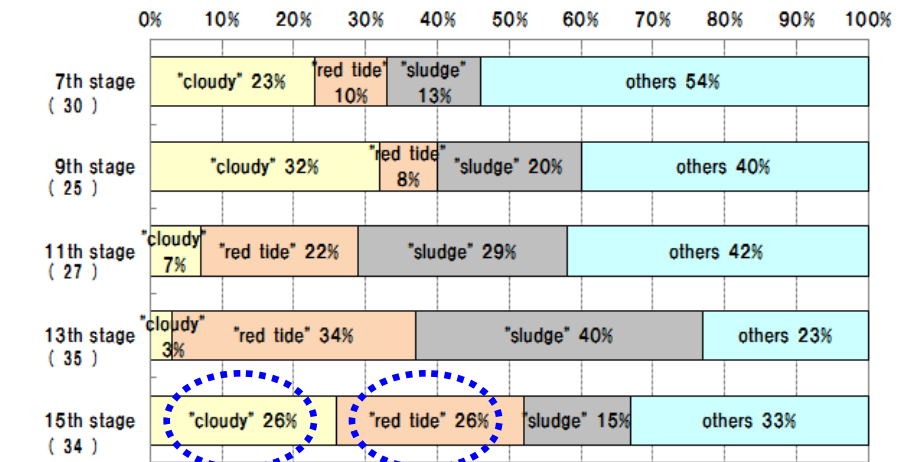
The ratio of "cloudy" was high between Asahi Bridge and Matsushige Bridge.

Johoku Bridge ~ Asahi Bridge

Not enough data



Mastushige Bridge ~ Oseko Bridge



The ratio of "cloudy" and "red tide" were high between Matsushige Bridge and Oseko Bridge.

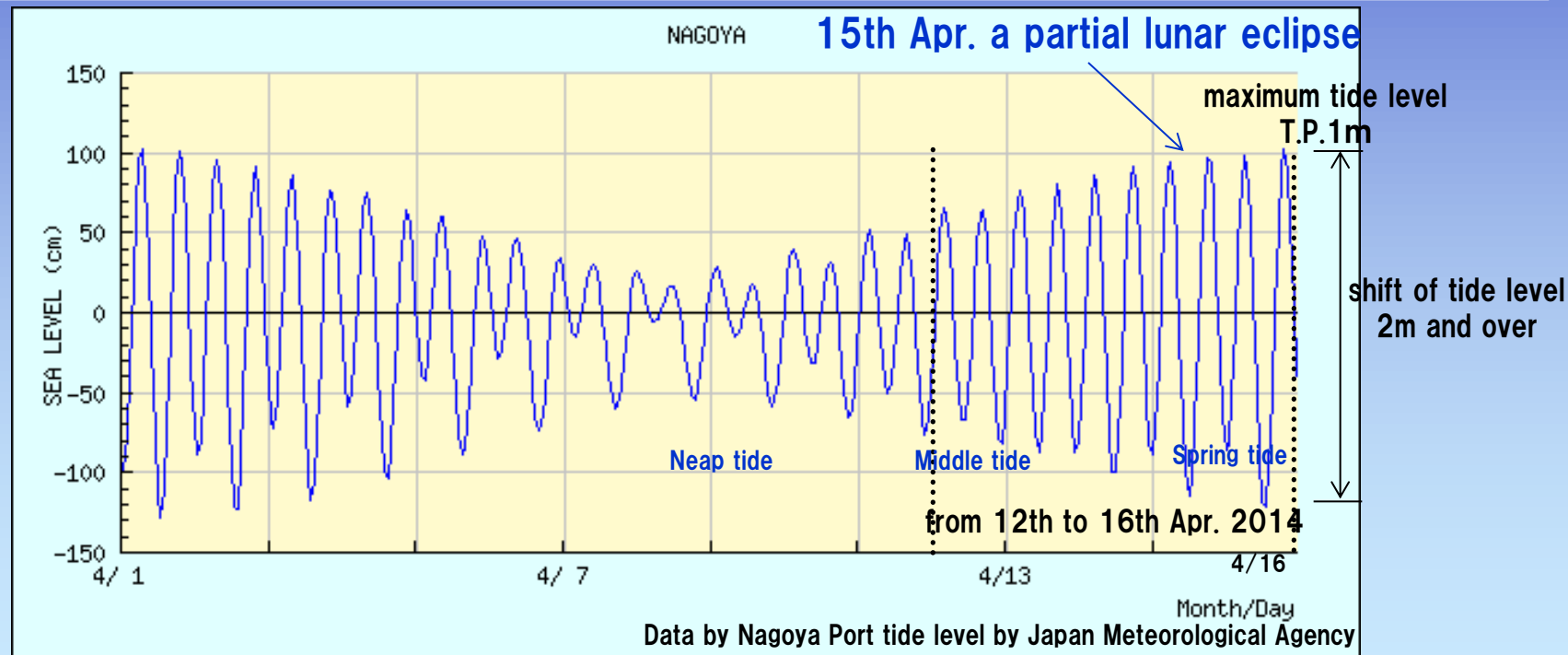


■ Change in component ratio of colors
In the 15th stage, the ratio of "cloudy" was high between Asahi Bridge and Matsushige Bridge, "cloudy" and "red tide" were high between Matsushige Bridge and Oseko Bridge.

REPORT1 Red tide occurred and water color became green brown or brown.

From 12th to 16th Apr. 2014

Survey groups which observed in fixed points, ShiratoriTayu Goryobashi Chosatai, Kojo Horikawa-to-Seikatsu-wo-Kangaerukai Chosatai and Kawasemi Chosatai, reported that water color had been green brown or brown on the points from downstream to midstream in Horikawa. Judging from reports of survey groups from 12th to 15th Apr. and the secretariat's seeing in the spot on 16th Apr. , it seems that red tide occurred from outside Horikawaguchi Tide Gate, the sea to Gojo Bridge.



- Shift of tidal level is 2m and over.
- Maximum tide level climbed T.P.1m.

⇒ Seawater was pushed up strongly in this period

■ The secretariat's eye

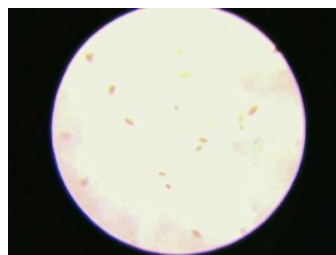
Date, time and spot

- Date from 9am to 1pm on 16th Apr.
the ebb tide on spring tide day
- Spot outside Horikawaguchi Tidal Gate, the sea
from Hataya Bridge to Gojo Bridge

Result

1. The water color was brown from outside Horikawaguchi Tidal Gate (the sea) to midstream of Horikawa.
2. Much whirling phytoplankton was seen.

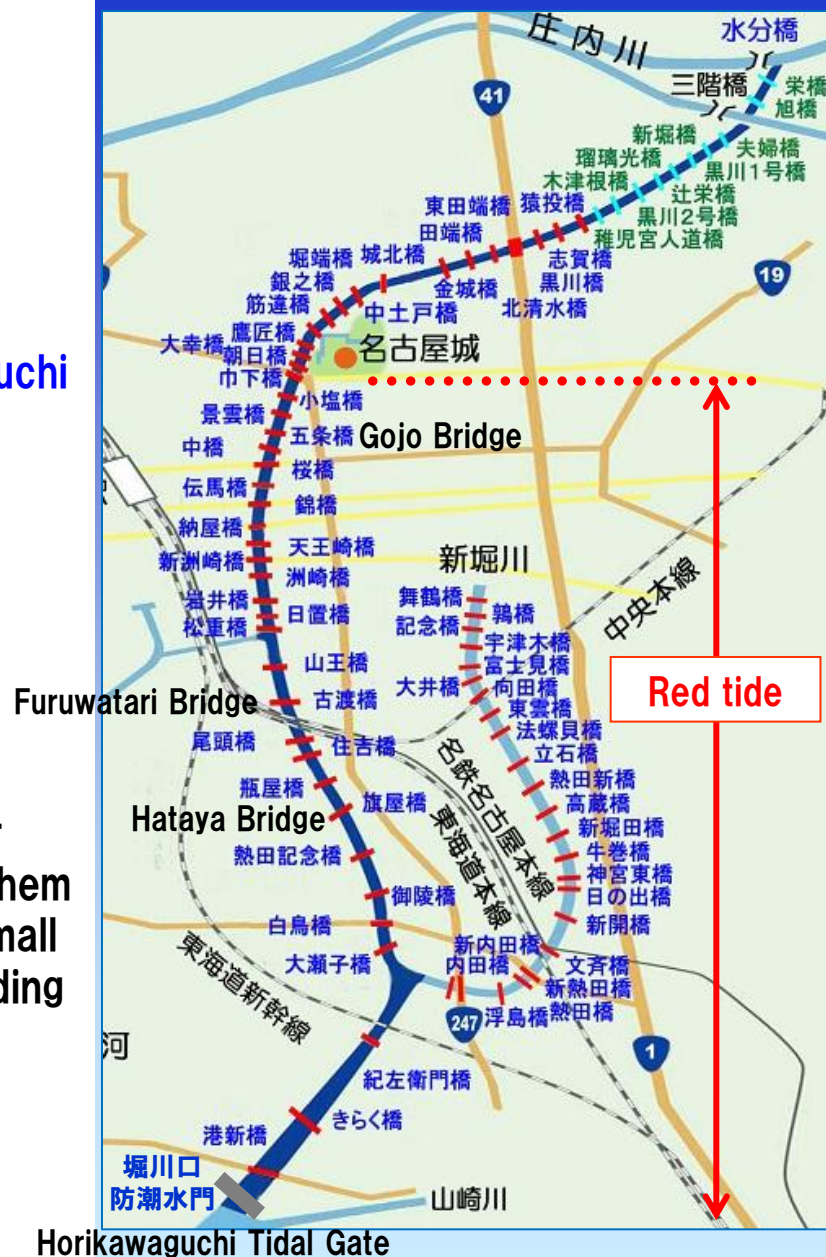
a kind of phytoplankton



3. Climbing dotted gizzard shads were seen.

A school of dotted gizzard shads was seen under Furuwatari Bridge. About 50 of cormorants capturing them were also seen. Dotted gizzard shads eat plankton, small shellfishes and diatoms. Possibly they climbed for feeding but relationship to red tide isn't clear.

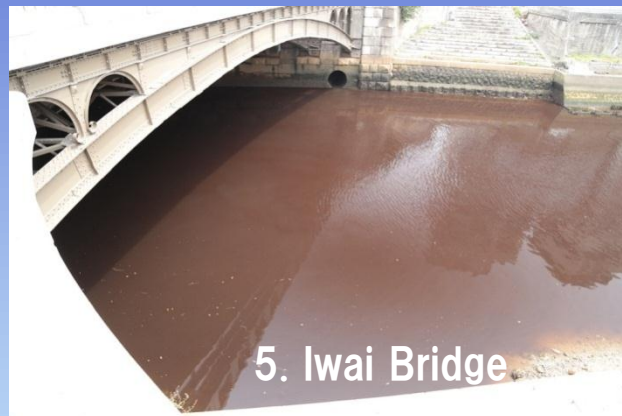
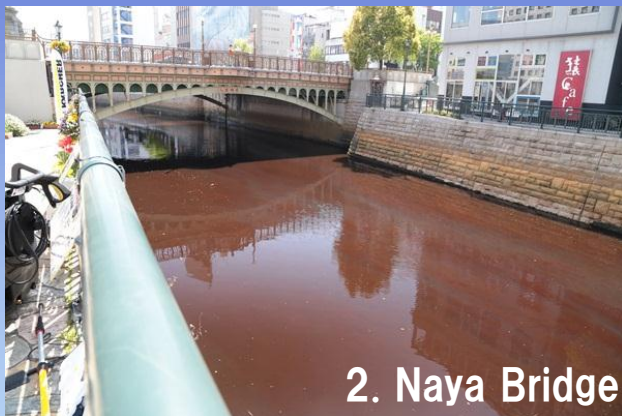
Under Furuwatari Bridge
11:05



Horikawaguchi Tidal Gate

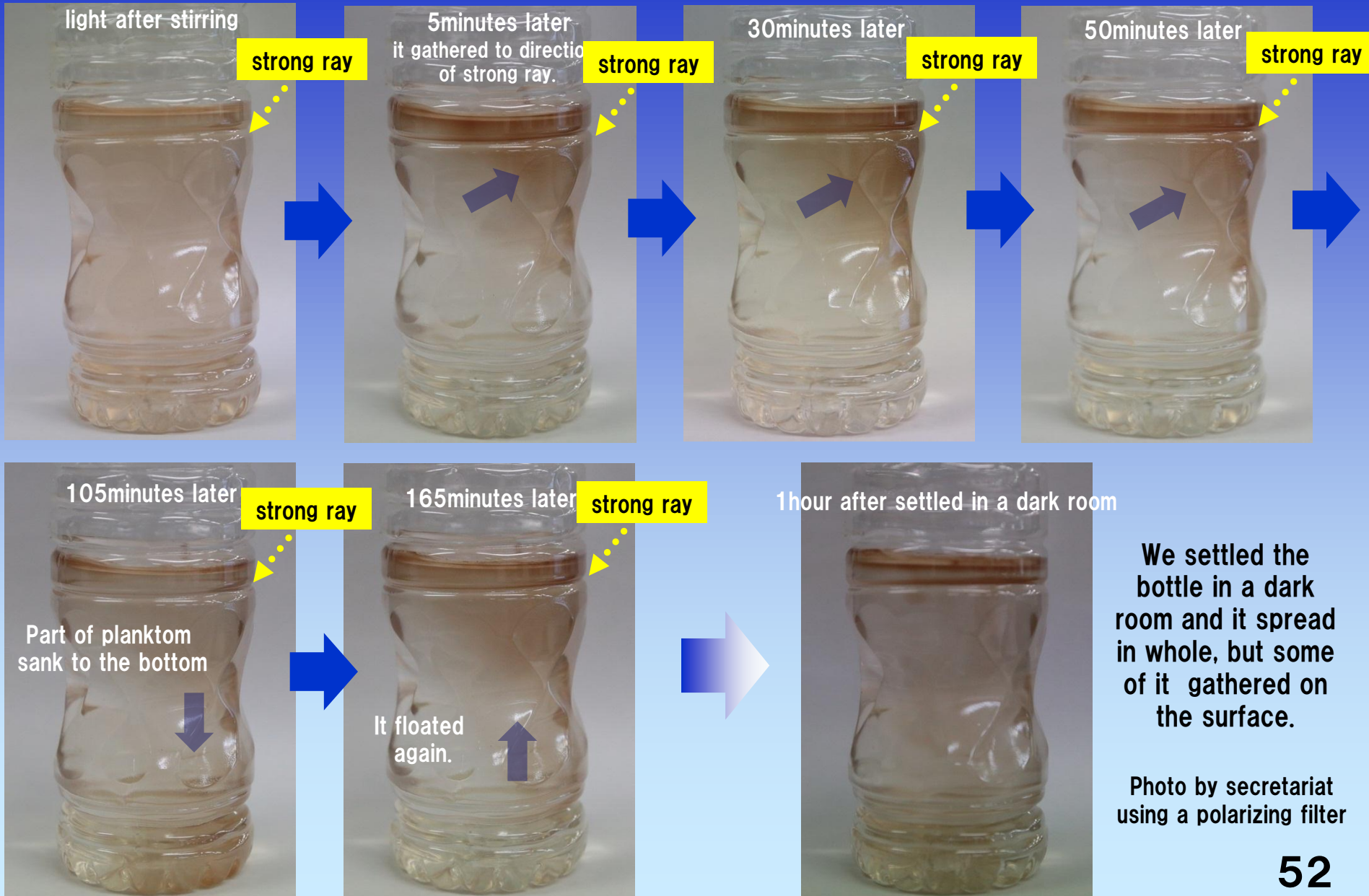
States of red tide 16th Apr. 2014

Photo by secretariat

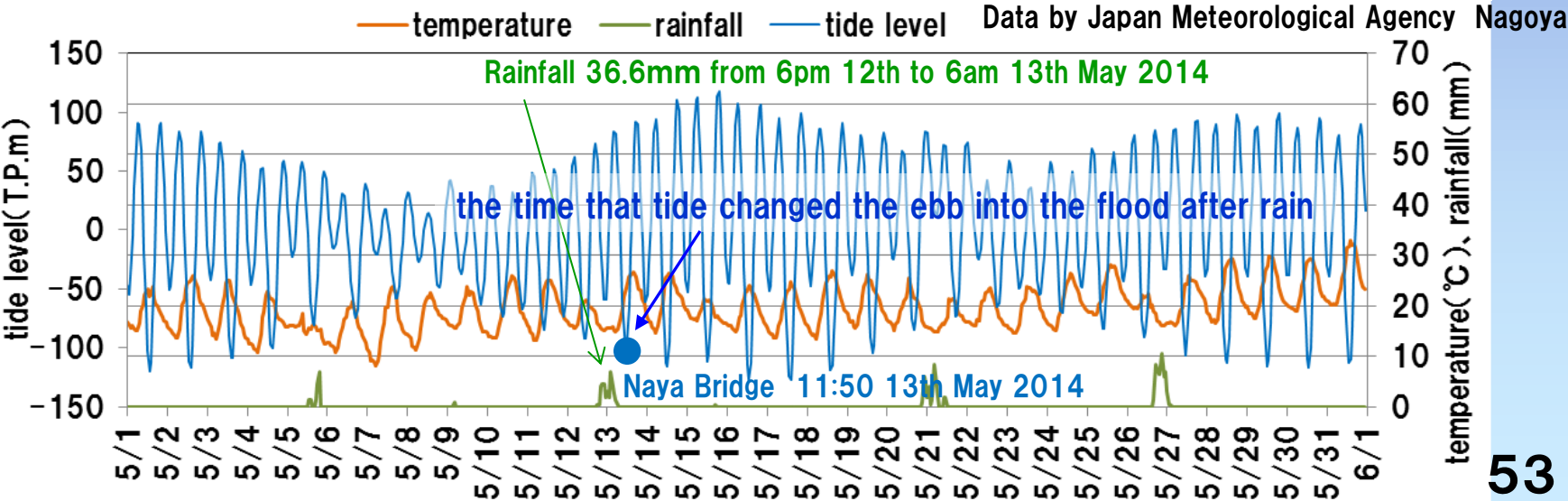


Moving of plankton In the water

Water settled after stirred. Plankton moved to surface. 5minutes later it gathered to direction of strong ray.



REPORT As we cleaned around Naya Bridge today, some of members said that water of Horikawa looked too black. So I will report with a photo, about 11:50 13th May 2014. Because of rain at last night, sludge might have been stirred? It smelt like rotten egg peculiar to Horikawa.



■ The secretariat's eye

Date, time and spot

- Date from 11am to 5pm 14th May 2014, from the ebb to the flood on spring tide
- Spot from Nishiki Bridge to Hataya Bridge, outside Horikawaguchi Tidal Gate, Nagoya



Result

1. From Nishiki Bridge to Hataya Bridge ... gray green, light gray yellow green
2. From Nishiki Bridge to Tennozaki Bridge ... rising sludge, outcrop of waterside sludge
3. Outside Horikawaguchi Tidal Gate (the sea side) and Nagoya Port ... gray green brown
affected by red tide

Water color around Naya Bridge from 12th to 14th May gray green→light gray yellow green

The day before the rainy day
Nishiki Bridge 12:15 12th May



The rainy day (survey group reported)
Nishiki Bridge 12:15 13th May

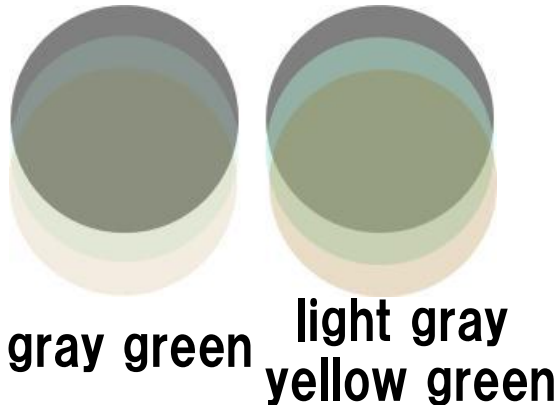


The day after the rainy day
(secretariat observed)
Nishiki Bridge 11:30 14th May

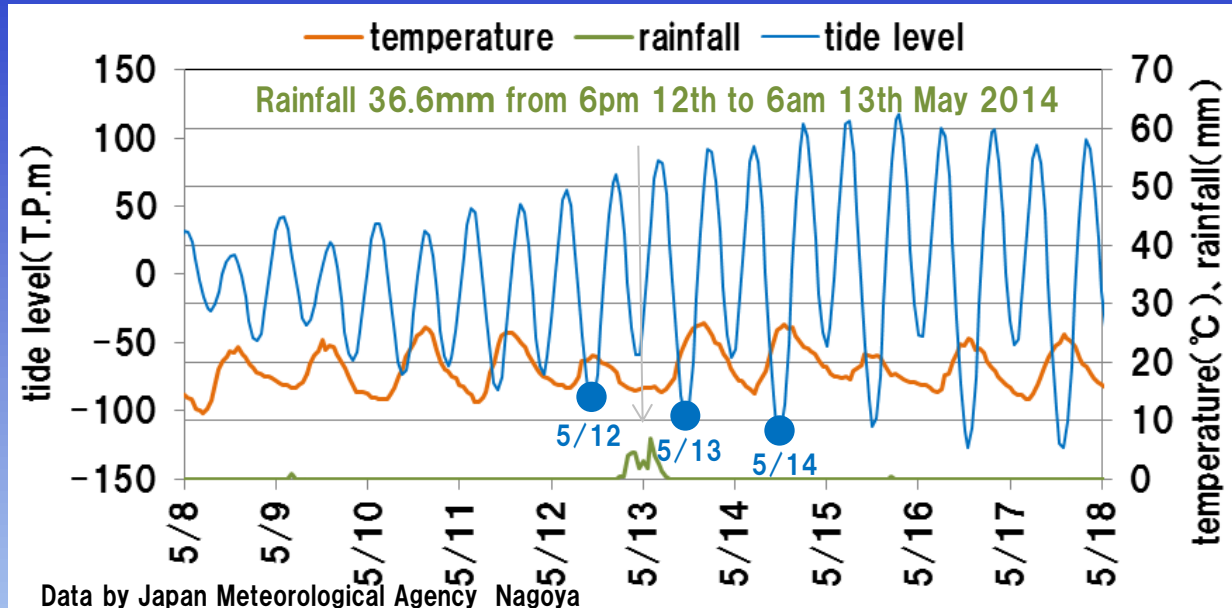




3 colors are mixed
in different transmittance

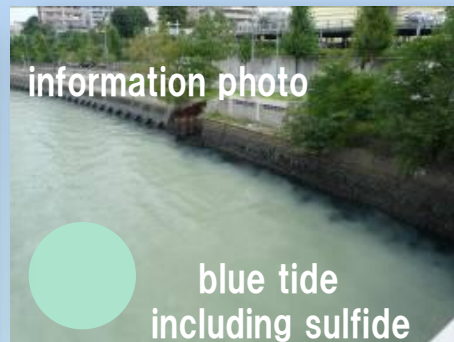


We guess that water color looked too black on 13th May because it was strongly affected by rising sludge, although relationship to rain isn't clear.



Color mixed
3 colors

- Rising sludge, gray float sludge and black sludge
- Blue milky color including sulfide
- Red tide in Nagoya Port, color of phytoplankton



(Reference) Why does Horikawa become lack of oxygen and milky

Influx of organic substance → Anoxia of bottom mud, water → Sulfide (H_2S , HS^- etc)

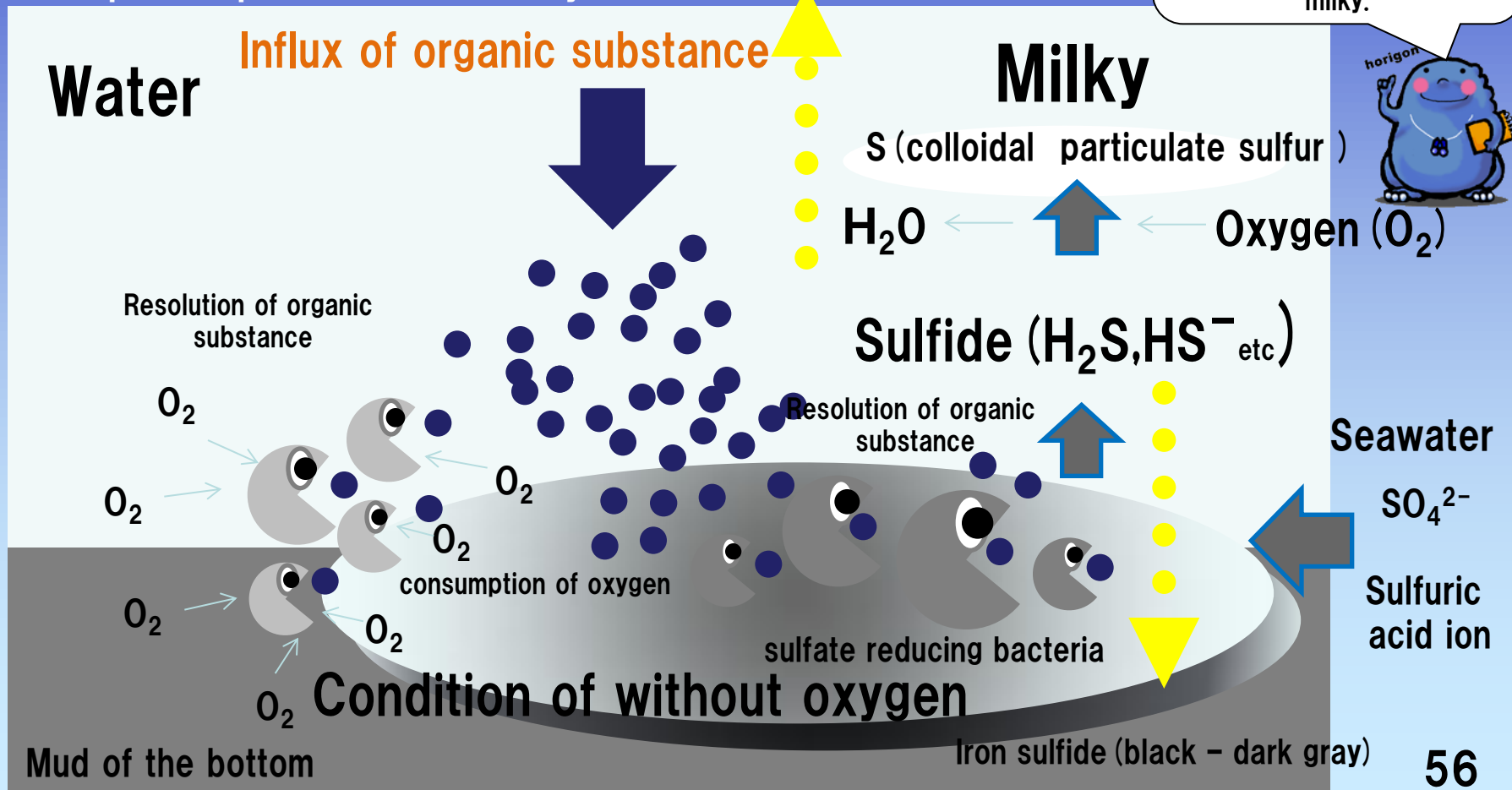
↓ ← Oxygen (O_2)

Be generated particulate sulfur (milky)

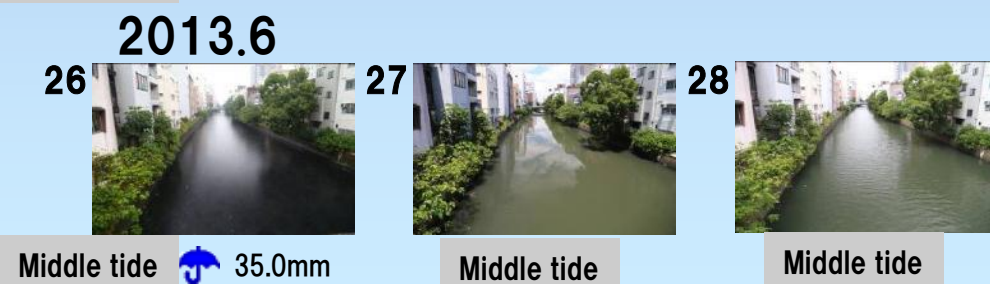
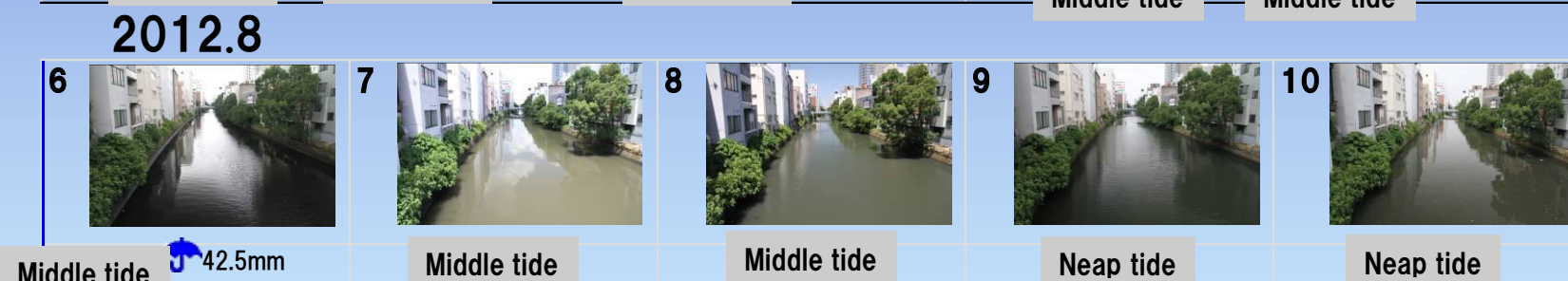
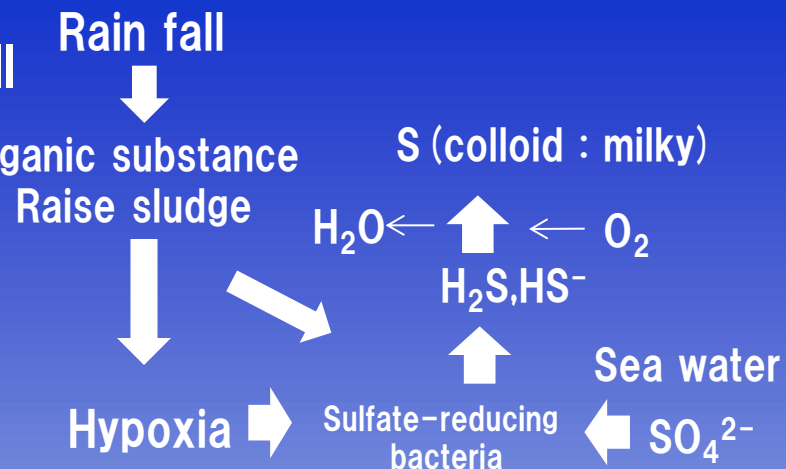
The example of process to be milky

Smell of hydrogen sulfide (H_2S)

Sulfide (H_2S , HS^- etc) combined with Oxygen (O_2), become particulate sulfur. Sometimes water become milky.



(Reference) Change of the color after rainfall

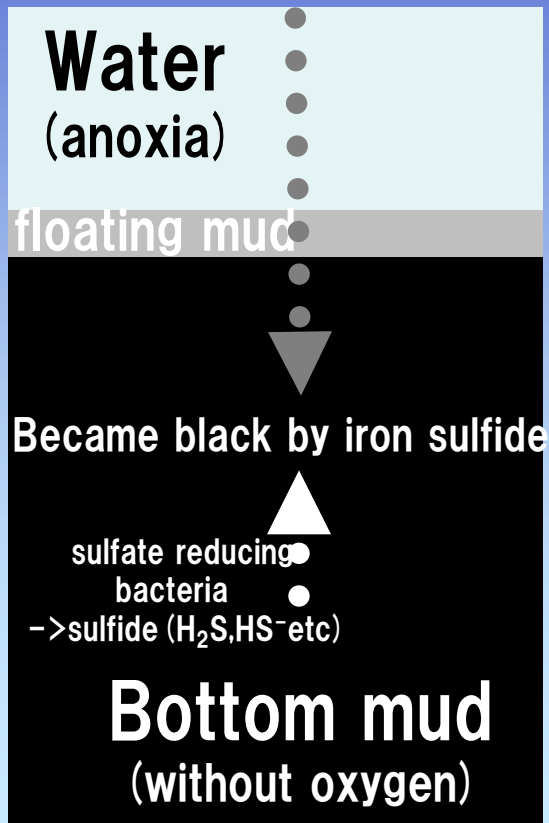


Information : Horikawa Sen-nin Chosatai (HSC)
http://www.horikawa1000nin.jp/nishiki/nishiki_photo.htm

(Reference) Why does bottom mud become black?

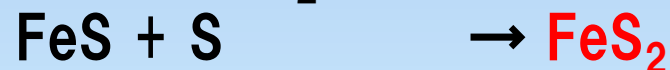
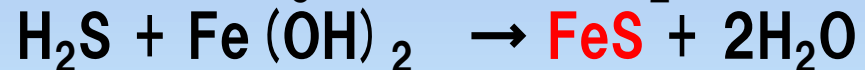
Hydrogen sulfide react with Iron sulfide (black – dark gray) to form iron content.

Iron in the water without oxygen
iron hydroxide ($\text{Fe}(\text{OH})_2, 2\text{Fe}(\text{OH})_3$)



■ Bottom mud(without oxygen)

Hydrogen sulfide react with **Iron sulfide** (**FeS, FeS_2 : Black**) to form iron content.



Under the condition without oxygen, Hydrogen sulfide reacts with **Iron sulfide** (**FeS, FeS_2**) to form iron content. This Iron sulfide is black. So bottom mud become black.

On the other hand, Hydrogen sulfide ($\text{H}_2\text{S}, \text{HS}^-$ etc) and Iron are combined. Hydrogen sulfide decreases. Causal substance of smell of hydrogen sulfide and milky also decreases.



(Report3) Bucket of water is yellow and gray and includes some brown particles.



Kameya Bridge



Goryou Bridge



Nishiki Bridge

report / photo : Chikyu Club Chosatai

Photo : secretariat



Tenno Bridge – Naya Bridge

Photo : secretariat

Some beings
Photo : secretariat



Kinds of goby



Grapsoidea crab



Young eel



Young perch



Kinds of shrimp

Because of the 60mm rainfall from May 26th to May 27th, water became anoxic. Hydrogen sulfide and also particulate sulfur generated. Water became yellow and gray. And these days are in spring tide, so red tide went upstream easily from Nagoya port. We thought brown particle was related to red tide.

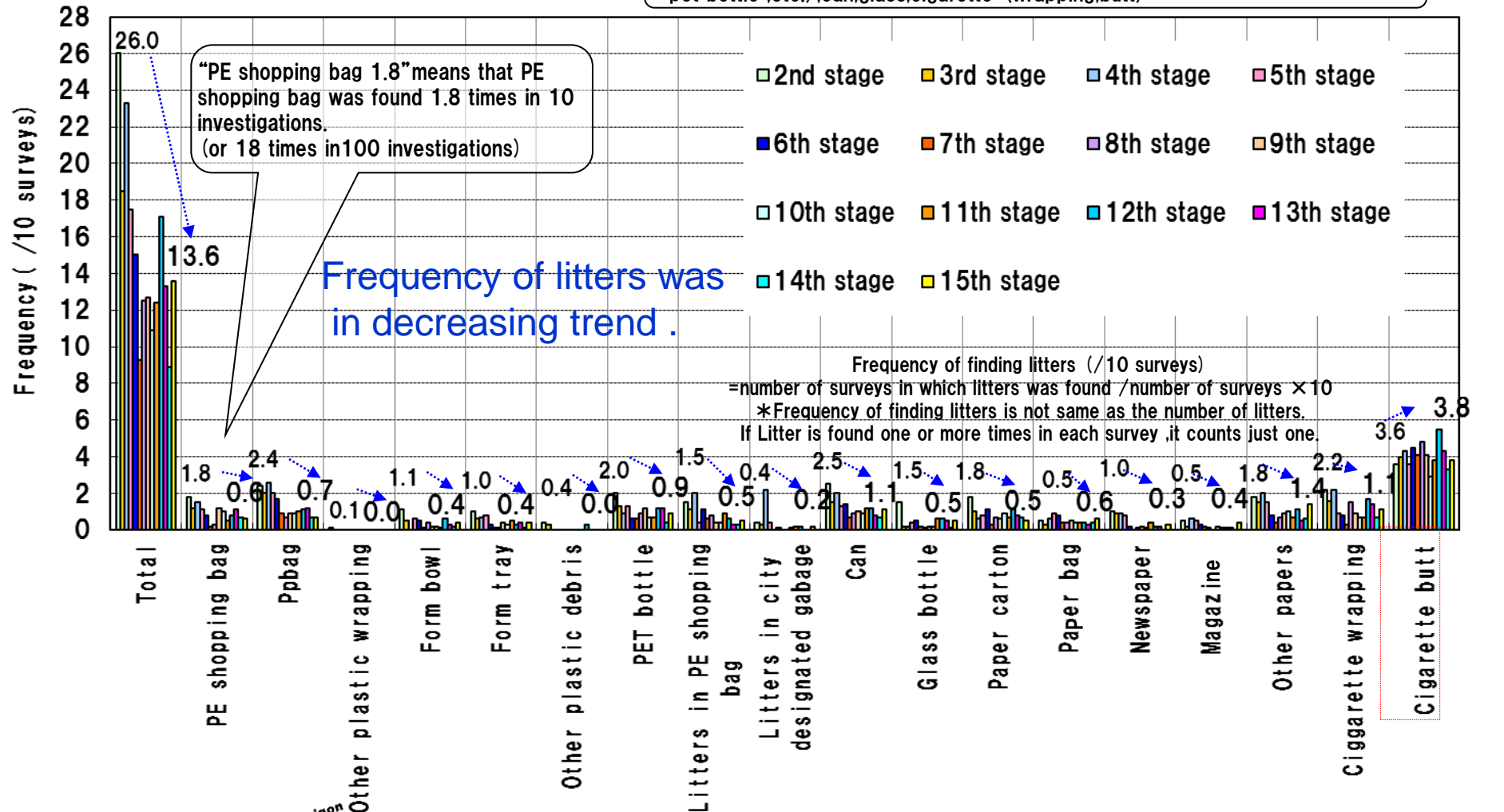


Frequency of finding Litters (From 2nd~15th stage, all section)

7. Litters

From 2nd to 6th stage :
With TRWKR No rain on the day and the previous day
From 7th to 15th stage :
Without 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)

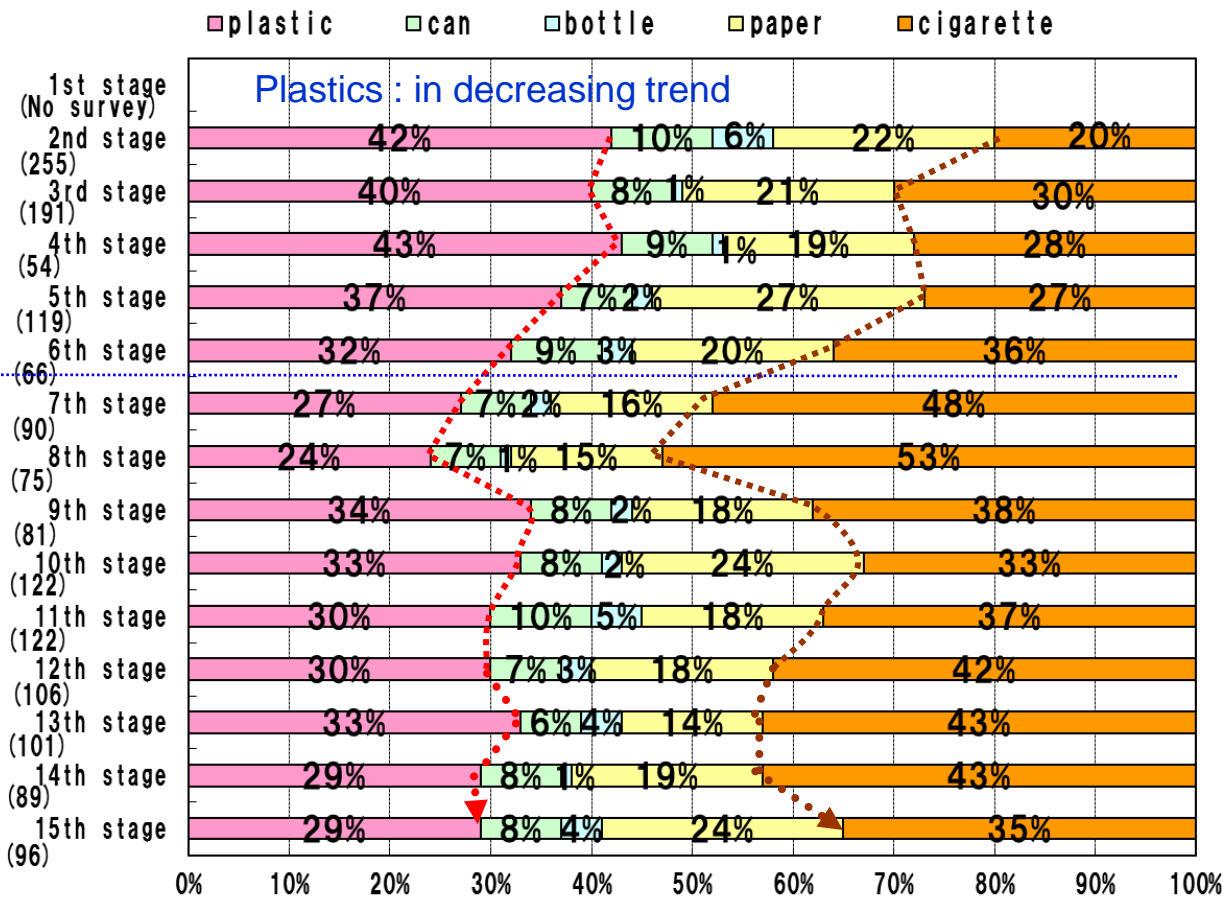


■What kind of litters was found more frequency?
Cigarette butt was the most frequent.
The other litters was on decreasing trend .

Litters on Riverside Ways (From 2nd~15th stage, each section)

From 2nd to 6th stage :
With TRWKR No rain on the day and the previous day
From 7th to 15th stage :
Without TRWKR No rain on the day and the previous day

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



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.

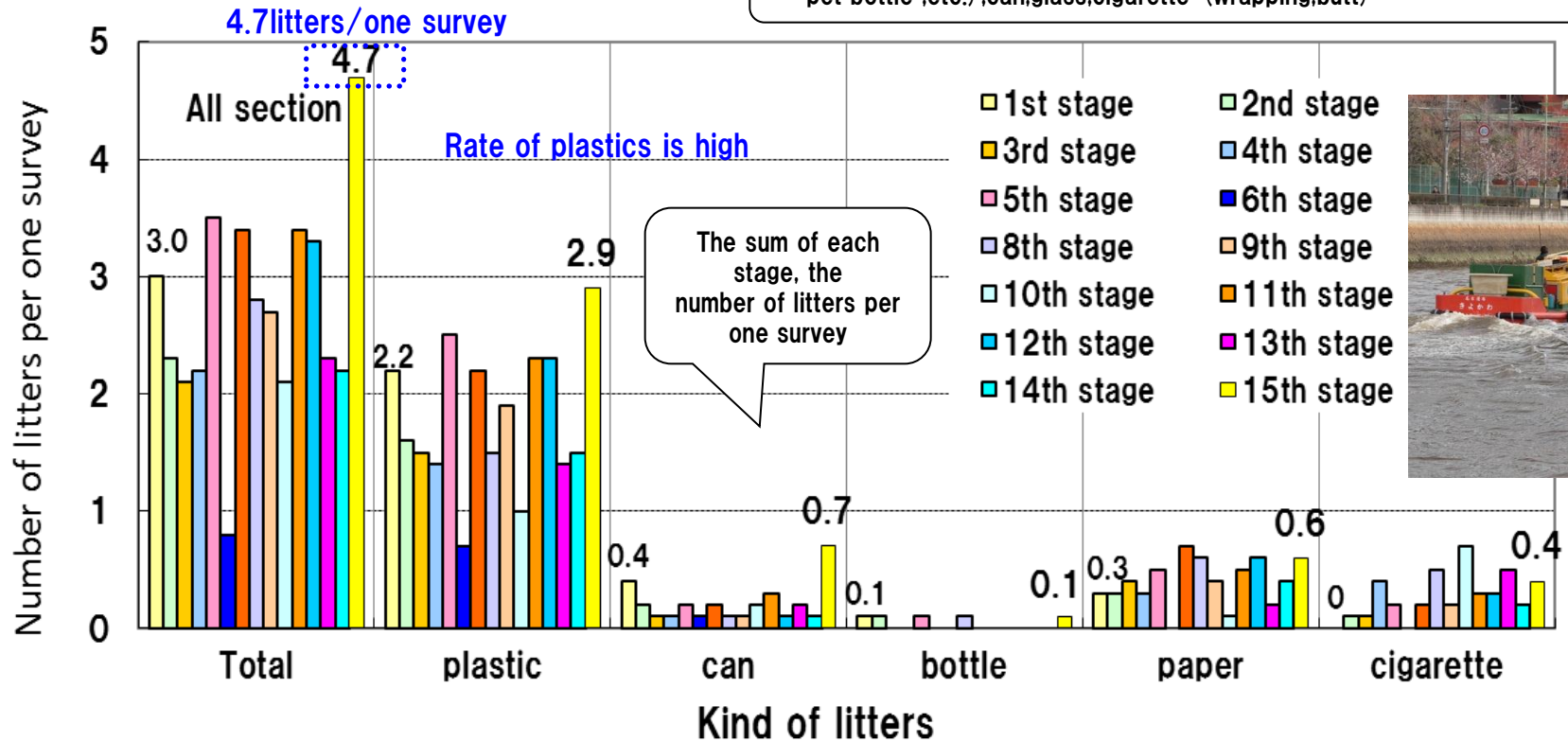


Change in Floating Litters

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

From 7th to 15th stage : Without 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)



Note: the number of litters per one survey = the number of each litters found in all surveys/the number of surveys

*the number of litters is the number of litters found through all surveys

"If some kind of litters was found "countless (=***) "in some survey, it counts "10", the maximum number in one survey substituted for the number of "countless"

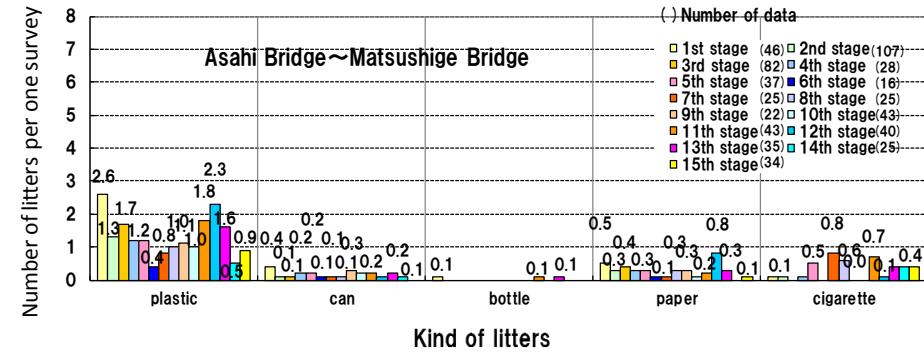
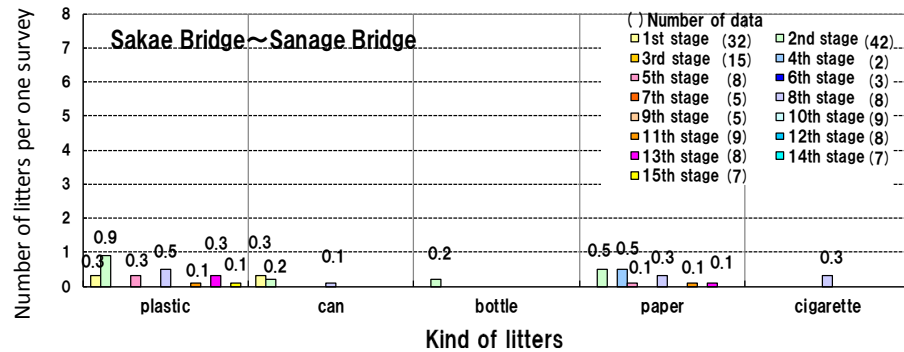
■ What trend the floating litters goes?

→ There most frequent floating litters were found in 15th stage.

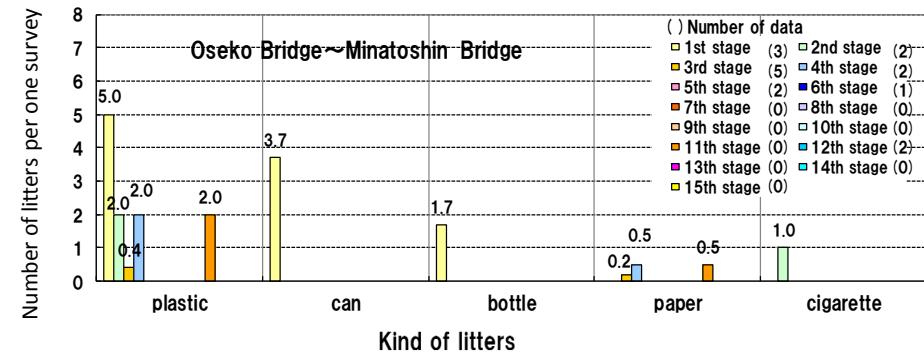
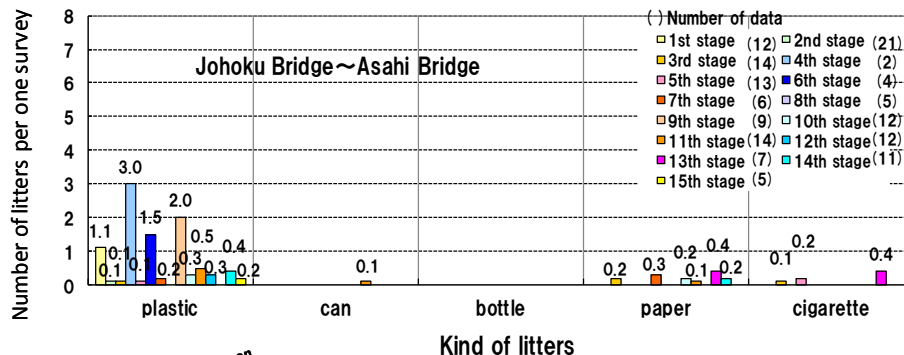
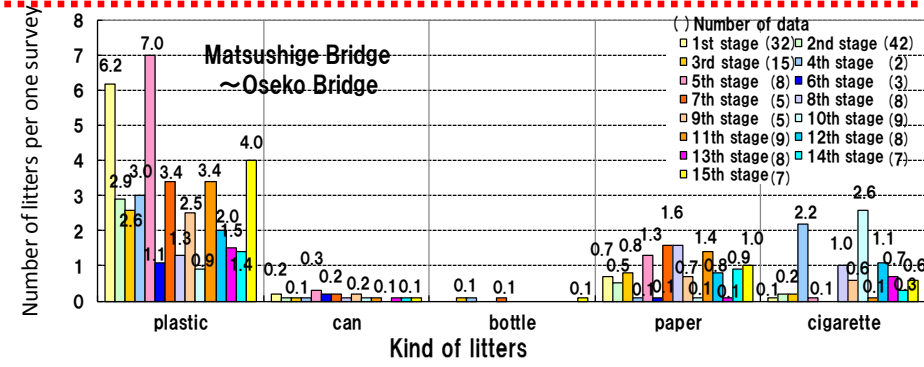
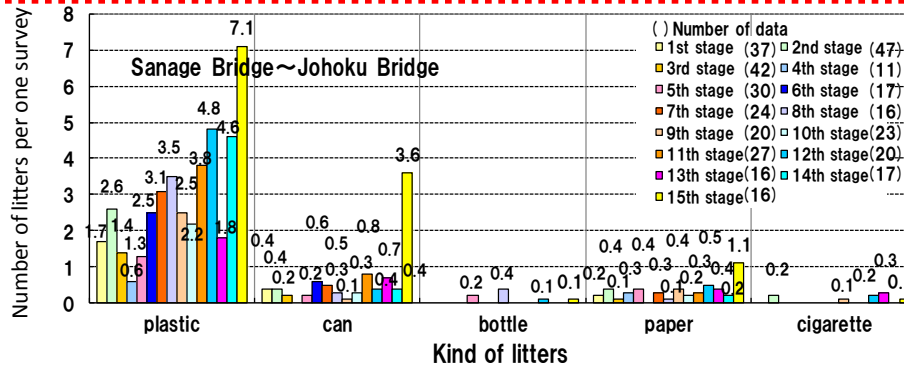


Change of the number of Floating Litters

From 1st to 6th stage :
With TRWKR No rain on the day and the previous day
From 7th to 15th stage :
Without TRWKR No rain on the day and the previous day



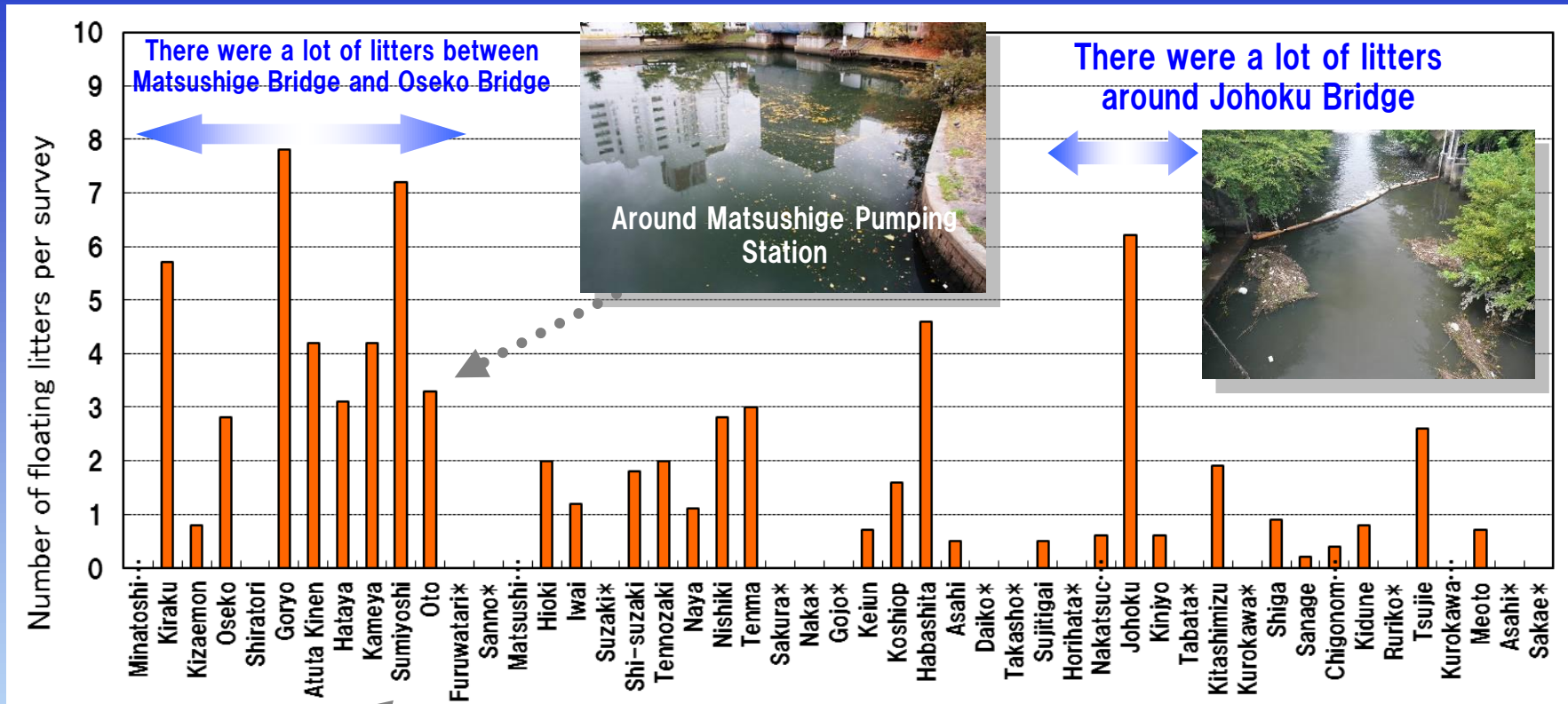
There were many floating litters In "Sanage Bridge ~ Johoku Bridge" section and "Matsushige Bridge ~ Oseko Bridge" section.



■ In which section did a lot of litters float ?
→ In "Sanage Bridge ~ Johoku Bridge" section and "Matsushige Bridge ~ Oseko Bridge" section.

Change in Floating Litters along the Horikawa River

The 1st-15th stage: include both with TRWKR and without TRWKR out of research period ,No rain on the day and the previous day

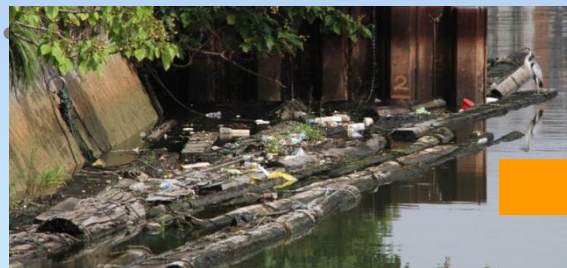


*:Under 10 samples

Note: the number of litters per one survey
= the number of each litters found in all surveys
/ the number of surveys

*the number of was found through all surveys

"If some kind of garbage was found "countless
(=***) "in some survey,it counts "10", the
maximum number in one survey substituted for
the number of "countless"



Kameya Bridge~Sumiyoshi Bridge

Photo: secretariat

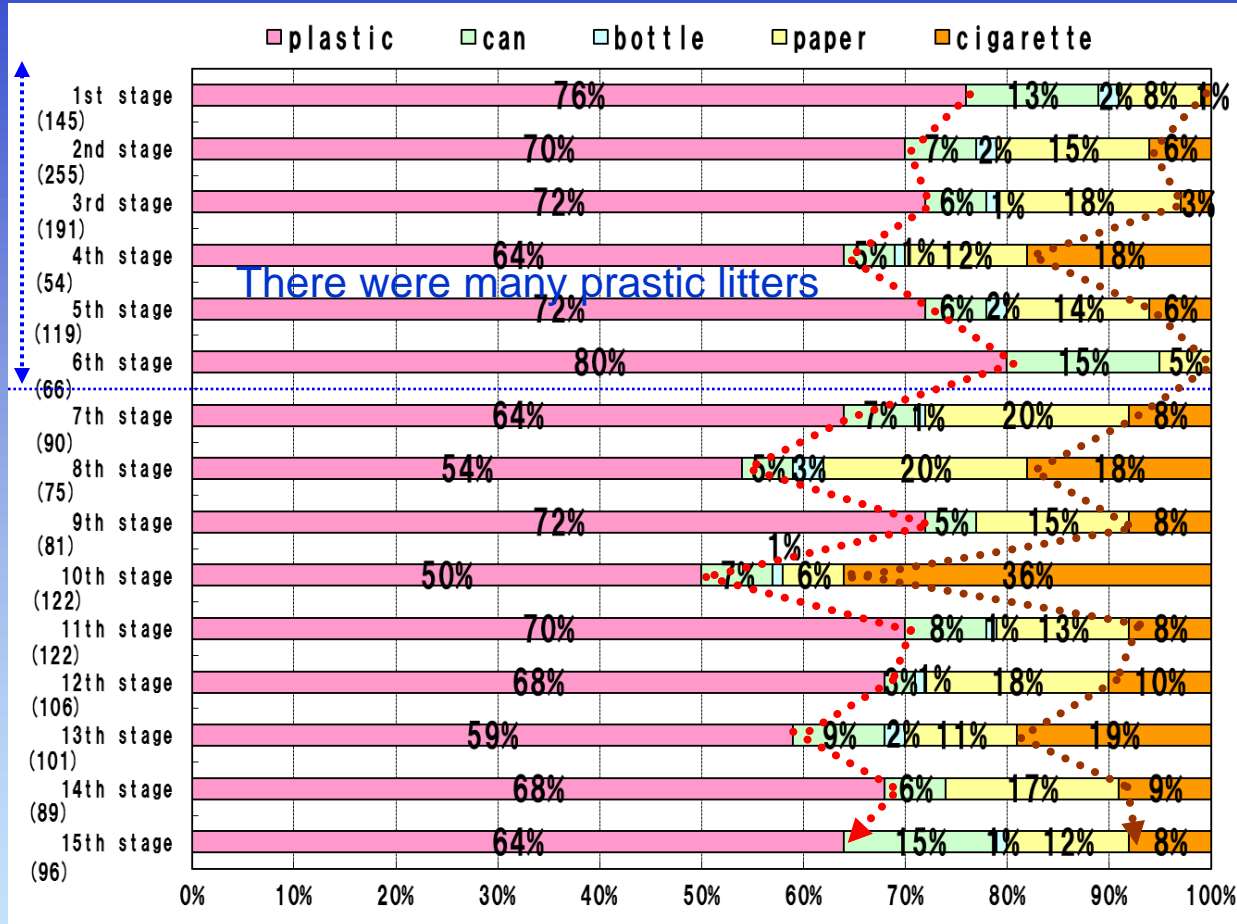


Kind of floating Litters (component ratio)

From 1st to 6th stage :
With TRWKR No rain on the day and the previous day
From 7th to 15th stage :
Without 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



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 survey substituted for the number of "countless"

■ What kind of floating litters were found frequently?

→ The rate of plastics is high, 60% (15th stage)



8. Wind

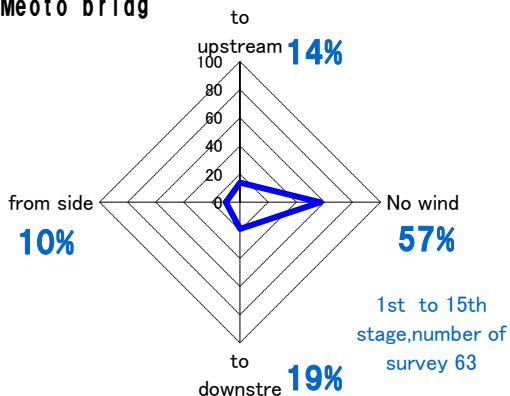
Direction of wind

Wind blows frequently along the Horikawa River

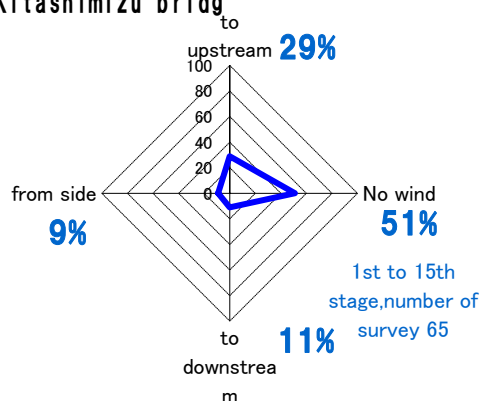
Wind to upstream

Wind from side

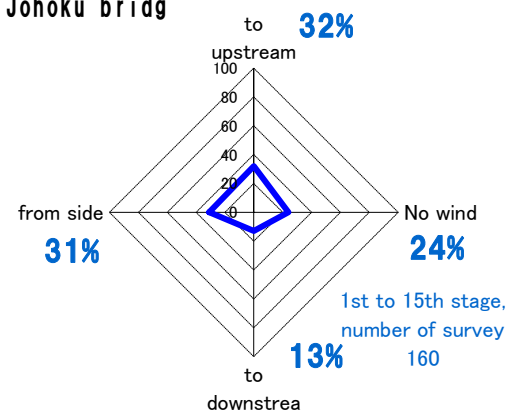
Meoto bridg



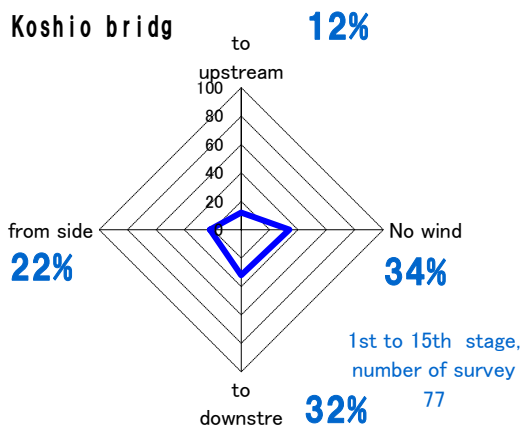
Kitashimizu bridg



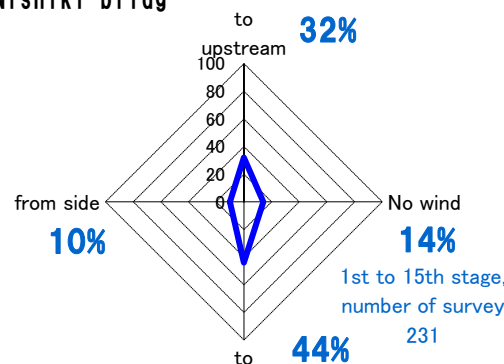
Johoku bridg



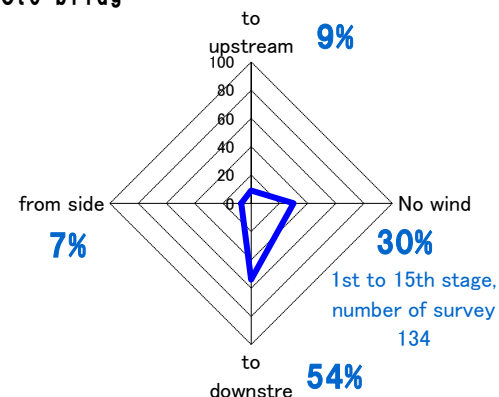
Koshio bridg



Nishiki bridg



Oto bridg



Wind to downstream



Which direction?

We organized the data through all surveys. The wind, blowing along the river, were more frequent than that from side. At the Nishiki bridge, the rate of winds blowing along the river was about 80%.



9. Living things

Egg laying of carp May 4th, 2014
Reported by the Gyousuiato-gaien-aigokai

Laying of turtles May 31th, 2014
Reported by the Goyousuiato-gaien-aigokai



Child & Cormorant
April 2nd, 2014
Reported by the
Goyousui-gaien-aigokai



Crab, prawn, mosquitofish, gambusia
Near the Tsujie bridge
May 25th, 2014



Brown soft-shell turtle, June 5th, 2014



Reported by the Goyousui-gaien-aigokai



Fishing of mango fish, by the Matsushige lock gate
June 21st, 2014, reported by the surdin survey group



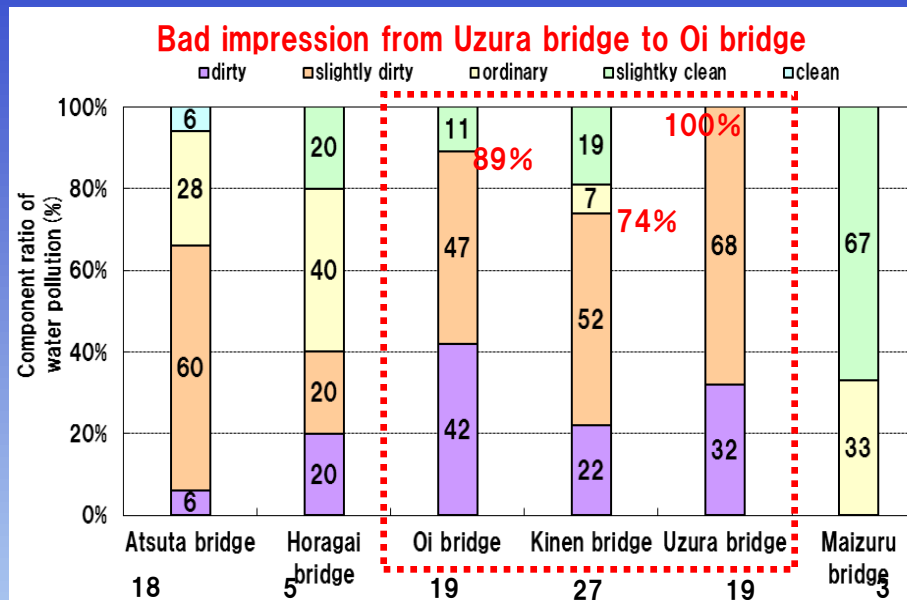
Parent-child of brown eared bulbul,
at the Naya bridge, July 15th, 2014



10. Result of survey of Shin-Horikawa River

Shin-horikawa river

Impression of the water pollution



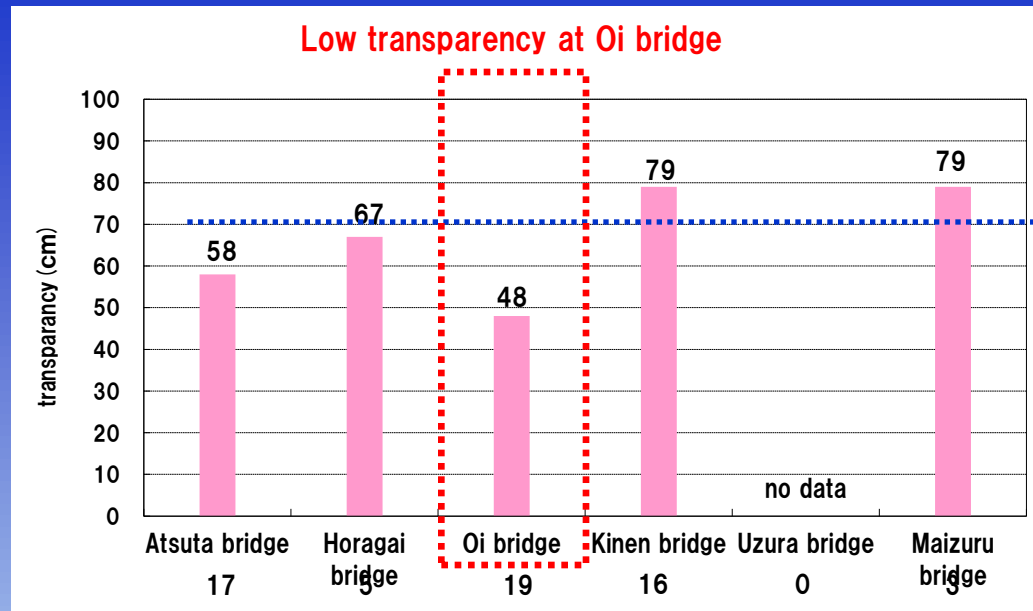
■ Impression of the water pollution

In upstream of Shin-horikawa river, from Uzura bridge to Oi bridge, ratio of “dirty” & “slightly dirty” was more than 70%. Especially, around Uzura bridge, all reports was evaluated “dirty” or “slightly dirty”.

Around Atsuta bridge in downstream, almost all results were evaluated “slightly dirty” or “slightly clean”. The impression of water pollution was worse in upstream than in downstream.



Shin-horikawa river, Transparency



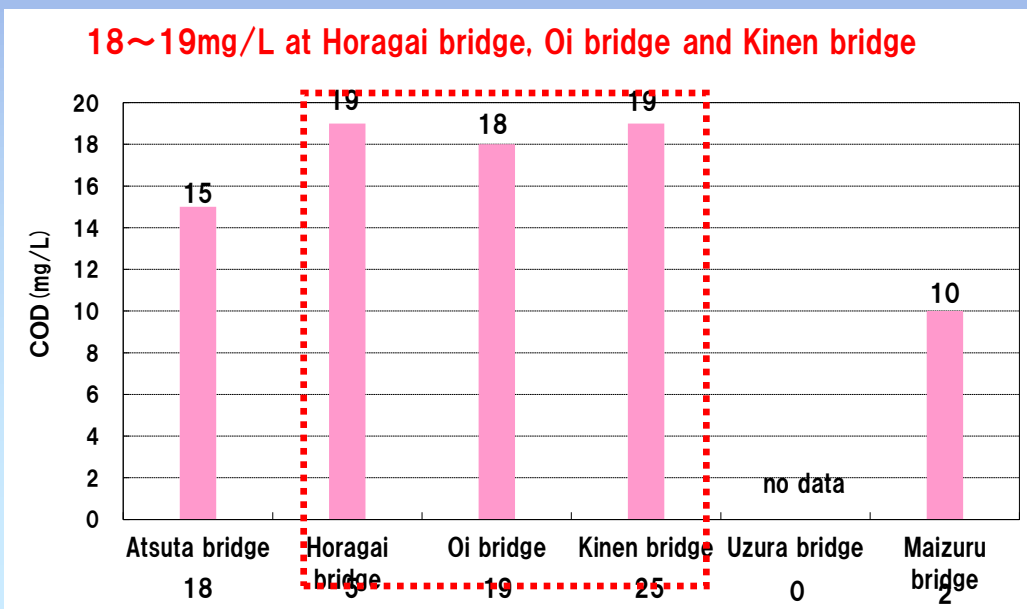
■ Transparency

The transparency in upstream of Shi-horikawa river, from Maizuru bridge to Kinen bridge, was more than 70cm. It was acceptable range of citizen. However it was only 48cm at Oi bridge.



* acceptable range of citizen = transparency 70cm & over

Shin-HR, COD

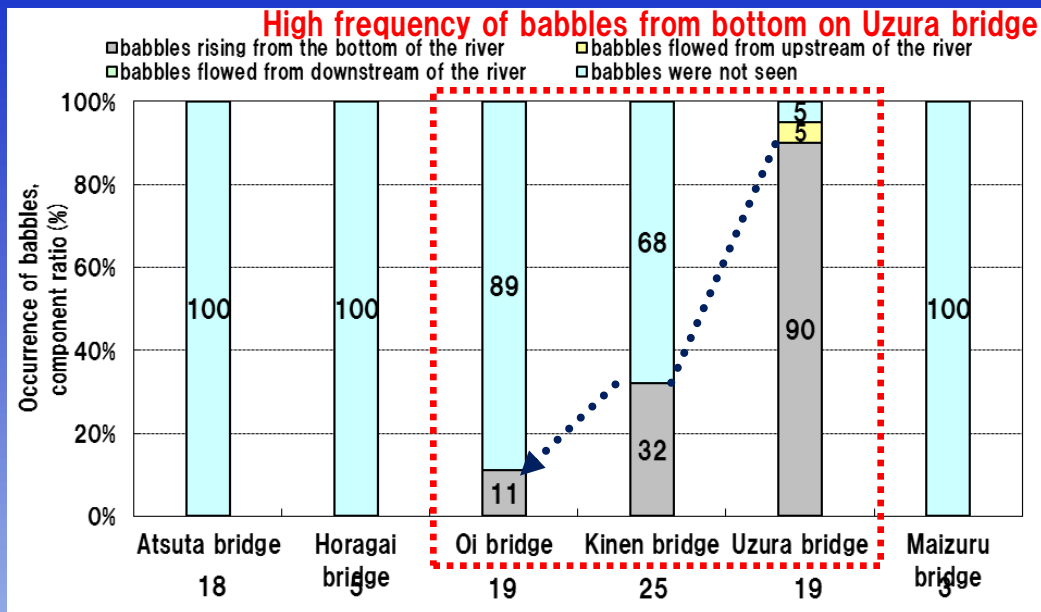


■ COD

The COD in upstream of shin-horikawa river, from Kinen bridge to Horagai bridge was high, 18 to 19mg/L. At Atsuta bridge in downstream, that was low, 15mg/L. The COD in upstream was higher than that in downstream.



Shin-horikawa river, Babbles

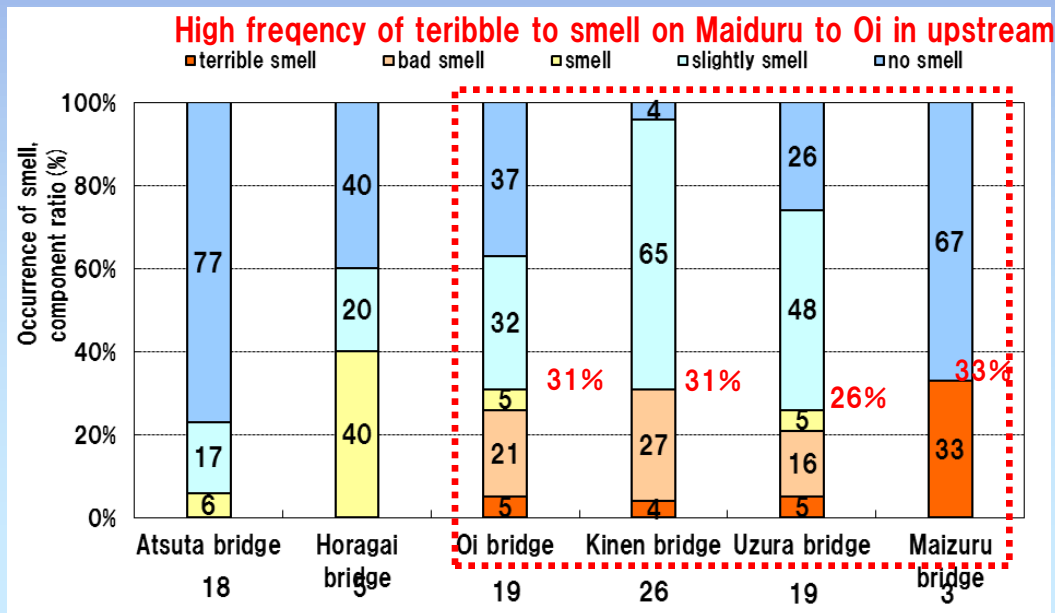


■ Occurrence of babbles?

Babbles were seen at Uzura bridge, Kinen bridge and Oi bridge in Shi-horikawa river. At Uzura bridge in upstream, the babbles rising from the bottom of river were seen 90%. The frequency of babbles rising from the bottom of river were higher than that flowed from downstream. At Maizuru bridge, Horagai bridge and Atsuta bridge, no babbles was seen.



Shin-horikawa river, Smell

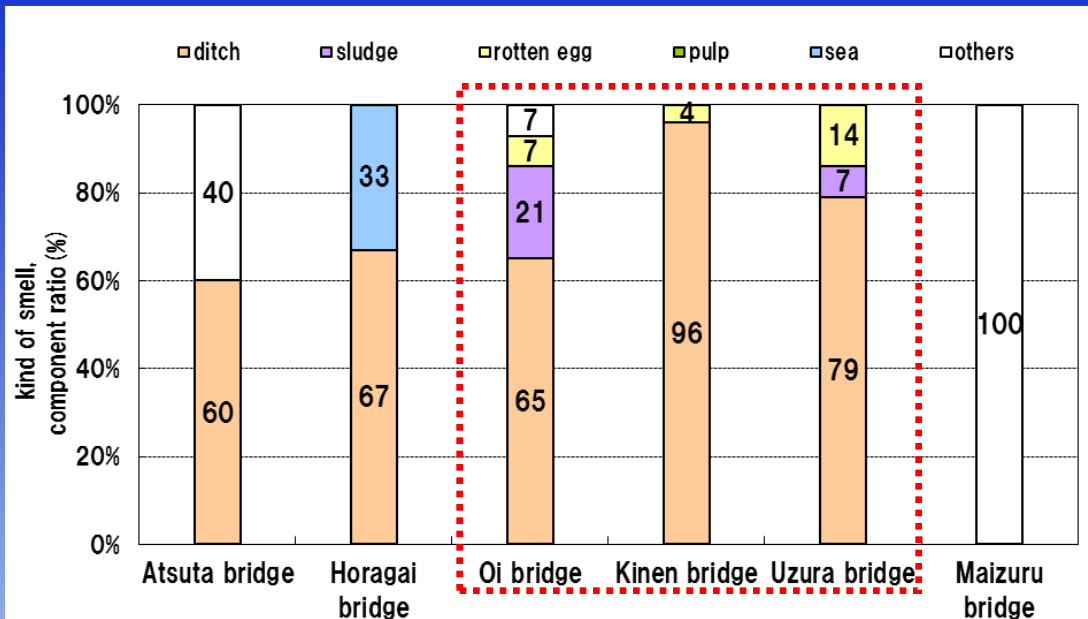


■ Occurrence of smell?

From Maizuru bridge to Oi bridge in upstream, the rate of “terrible smell” to “smell” was 26 to 31%. At Atsuta bridge in downstream, all of the data was “slightly smell” or “no smell”. The smell in upstream was worse than that in downstream.



Shin-horikawa river, Kind of smell

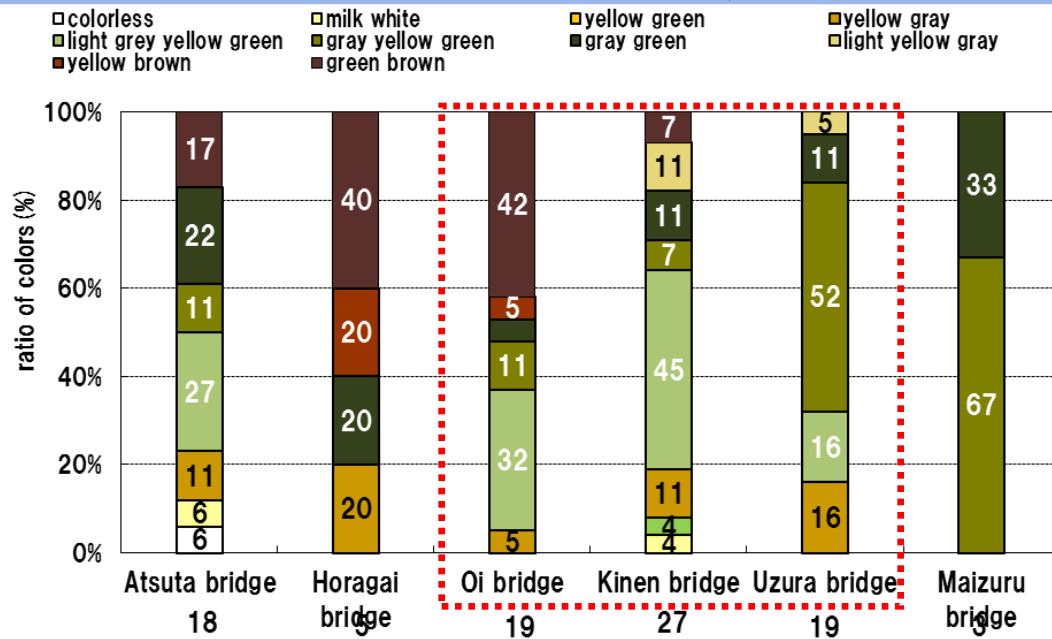


Occurrence of the kind of the smells

Upstream of river, "ditch", "sludge", and "rotten egg" was smelled.



Shin-horikawa river, Colors



Colors

Upstream of the river, green series were seen frequently. But milk white could be seen on Uzura bridge and Kinen bridge. It can be considered caused by granular sulfide.

Also, green brown could be seen on Kinen bridge, Oi bridge, and Atsuta bridge. it is considered that was caused by phytoplankton.



11. Progress of Citizen's Awareness Activities of studies



堀川1000人調査隊2010 第14回調査隊会議
平成26年2月15日(土) 報告:事務局

伊勢湾流域圏再生フォーラム

＝ 連携・交流の輪を広げよう ＝

＜日時＞平成26年3月1日(土)
13:30～(受付13:00)

＜会場＞名古屋文化短期大学 アセンブリホール

伊勢湾流域圏で環境活動に取り組む人たちの、連携・交流の場として活動発表、意見交換を行います。

▼活動報告「平成25年度活動報告」伊勢湾ネット事務局 三宅由佳

▼活動発表(発表者)

- ①「きれいな海を守る心を広げるプロジェクト」～海に焦点を置いた環境教育として～
建設ボランティアサークル亀の子隊 鈴木 吉春さん
- ②「つばきガメの育ち」
つばきガメネットワーク 柴川 雅希代さん
- ③「100年後の伊勢湾の漂着ごみゼロに」
22世紀世代の浜プロジェクト委員会 森 一知さん
- ④「堀川への思い110年を語る」
堀川・堀川と生活をつなぐ会 小林 秀明さん
- ⑤「本郷三川グリーンアップ大作戦」
NPO法人 本郷三川にの会 発表者諸君
- ⑥「矢作川流域における森林再生と水質保全」
NPO法人 農林付林塾 渡 博康さん
- ⑦「字ももたらがらみ」～東へ向かう道～
最新干潟クリーン大作戦実行委員長 鈴木 康平さん

▼情報提供

「企業の活力を活かす協働への取り組み」
NPO法人グラウンドワーク東岡 藤田 郁郎さん

「三河湾の環境再生に向けた取り組み」
愛知環境水地学館 谷口 亮さん

▼話題提供

活動への助言と話題提供 中部大学工学部長 松尾 直樹さん

伊勢湾流域圏再生フォーラム
平成26年3月1日(土)

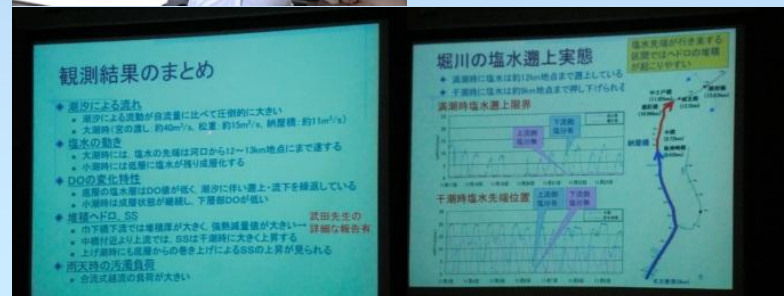


「全国 水都ネットワーク フォーラムin 松江」
平成26年2月7日(金)
公益財団法人なごや建設事業サービス財団



第3回堀川ラウンドテーブル開催
平成26年7月25日(金)
開催:堀川まちづくりの会
報告:堀川まちづくりの会・事務局

堀川再生フォーラム
平成26年3月26日



Progress of Citizen's Awareness Activities of studies



名北小学校3年生 堀川散策
平成26年4月9日(水)



大杉小学校2年生 堀川観察会
平成26年6月10日(火)



笹島小学校5年生 堀川水質調査
平成26年5月16日(金)



名北小学校3年生 堀川学習会
平成26年6月16日(月)



堀川上流部で水遊び
平成26年5月25日(日)



笹島小学校5年生 堀川観察会
平成26年6月24日(月)



飯田小学校3年生 堀川観察会
平成26年6月3日(火)



名北小学校3年生 堀川観察会
平成26年6月6日(金)



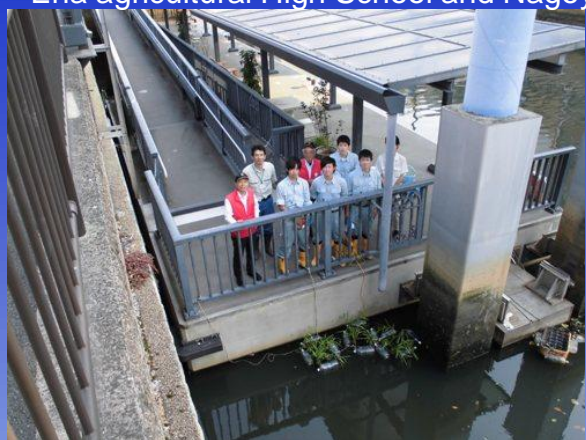
飯田小学校3年生80名の児童より
お礼の寄せ書きが届く
平成26年7月25日(月)



高年大学環境学科 堀川探索
平成26年6月11日(水)
報告:御用水跡街園愛護会調査隊

•Horikawa Clean Experiment of Chinese water spinach 2014/6/22~

•Ena agricultural High School and Nagoya Horikawa Lions Club experimented this year. Place : near the pier of Naya Bridge



恵那農業高校の森本先生からの報告
平成26年8月20日
浮島の新たな浮かべ方を研究
竹に紐を巻きつけ、
そこに切った茎を挟んだもの



Activities of "Free Survey Groups" & "Cheering Groups"



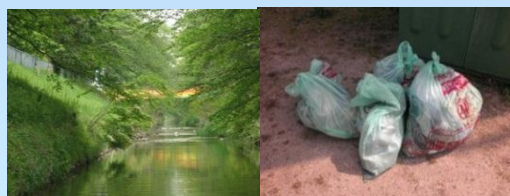
北区ウォーキング大会 主催: 北区役所
平成26年3月15日(土)



ホテルのエサになるカワニナを2000匹放流
ドリーム会会長梅本さん・高年大学の皆さん
平成26年4月2日(水)



季節のお花の移植 生活支援センターの皆さん
平成26年5月19日(月)



清掃活動・報告: 御用水跡街園愛護会調査隊

平成26年4月9日
堀川フラワーフェスティバル実行委員会

堀川フラワーフェスティバル2014

堀川護岸びかびか大作戦

～堀川に花と緑をのびにぎやかに 堀川から広がる、ひととまの笑顔が～

堀川フラワーフェスティバルは今年で6回目を迎え、お祭り期間の春の風物詩として定着しています。お祭り期間中、多くの市民や団体、企業の方と共に、手作りの花や緑で飾り、各種のイベントでにぎわいを演出します。

5月のフェスティバル開催に先立ち、「堀川」に対する関心や愛着を呼び起こし、堀川再生への更なる機運を高めるという実行委員会の思いを受け、実現しました。堀川の護岸を花や緑で飾り、びかびかに洗って、再生する「堀川護岸びかびか大作戦」を下記のように展開します。

ぜひ、イベントにお越しください。

期

開催期間 平成26年4月15日(火)～18日(金)
(予定日・4月28日(月))

開催場所 堀川 陸橋～桜井橋間の護岸

開催内容 清掃活動・花や緑の配布・花や緑の配布・花や緑の配布

イベント (会場: 桜井橋付近の広場)

① 名古屋の中心部を流すフェスティバルの美しさを伝える「堀川護岸びかびか大作戦・出陣式」
日時: 平成26年4月15日(火)午前9時15分～9時30分
当日の開催内容については、本報に掲載する「堀川」のページをご覧ください(予定)

内容: 名古屋の中心部を流すフェスティバルの美しさを伝える「堀川護岸びかびか大作戦」の開催を記念し、堀川再生への関心や愛着を呼び起こす。堀川再生への更なる機運を高めるという実行委員会の思いを受け、実現しました。堀川の護岸を花や緑で飾り、びかびかに洗って、再生する「堀川護岸びかびか大作戦」を下記のように展開します。

② ケルヒャーで「堀川護岸びかびか大作戦」
日時: 平成26年5月9日(土) 午後5時～7時(予定)
※フラワーフェスティバル2014開催中のみ開催
内容: 洗車デモンストラクションや花や緑の配布など(予定)

主催 堀川フラワーフェスティバル実行委員会

堀川護岸 汚れ落とす

びかびか大作戦 出陣式

名古屋の中心部を流すフェスティバルの美しさを伝える「堀川護岸びかびか大作戦」の出陣式が、堀川沿いの川岸で行われた。参加者は、高圧洗浄機や高圧洗浄機を用いて、堀川の護岸をきれいにし、花や緑をのびにぎやかにする計画だ。

初日は出陣式がある。五月に堀川沿いの川岸で行われる「堀川護岸びかびか大作戦」の出陣式が、堀川沿いの川岸で行われた。参加者は、高圧洗浄機や高圧洗浄機を用いて、堀川の護岸をきれいにし、花や緑をのびにぎやかにする計画だ。

堀川の護岸をきれいにし、花や緑をのびにぎやかにする計画だ。

清掃活動「堀川護岸・びかびか大作戦」
錦橋と納屋橋間 ケルヒャー ジャパン(株)
平成26年4月15日(火)～18日(金)



撮影: 御用水跡街園愛護会調査隊

堀川の護岸をきれいにし、花や緑をのびにぎやかにする計画だ。

中日新聞・朝刊
平成26年4月15日(火)



春の堀川一斉大そうじ
主催: クリーン堀川
平成26年4月19日(土)
報告: 御用水跡街園愛護会調査隊
事務局

第5回 春の堀川一斉大そうじ

-参加者大募集-

クリーン堀川は、2000年より「堀川一斉大そうじ」を年に2回開催し、春は3月、秋は9月に開催しています。美しい堀川、美しい堀川を再生させ、みんなで暮らす環境をきれいにしたい。堀川の未来は、私たち市民に委ねられています。

日時 平成26年4月19日(土)

集合場所 * 北区北清水親水広場 10:00～
* 熱田区宮の渡し公園 13:00～

参加方法 少雨決行です。参加は各自判断をお願いし、裏面連絡先または担当者までお申込みください。
(4月17日締切)

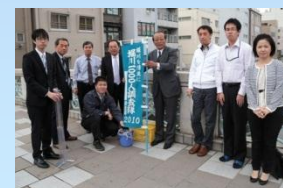
春の堀川一斉大そうじ 参加申込書

1. 参加場所	* 北区北清水親水広場	* 熱田区宮の渡し公園
2. 会社名(学校名)		
3. 名前		
4. 住所		
5. 電話番号		

* 複数で参加したい場合は、代表者の連絡先をご記入ください。



清掃活動
ぎふしんムーミン清水支部堀川応援隊
平成26年6月14日(土)



定点観測・清掃活動
中日本建設コンサルタント(株)
かわせみ調査隊

Activities of "Free Survey Groups" & "Cheering Groups"

堀川ギャラリーでパネル展示発表会
「堀川を清流に
10年間を観る 写真とデータ」
名古屋市高年大学環境学科27期
平成26年2月12日(水)
～3月2日(日)

堀川ギャラリー展示のご案内

「堀川を清流に！ 10年間を観る」写真とデータ

堀川水質調査結果の最大成長といえる名古屋市高年大学環境学科
環境学科27期生の1年間にわたる水質調査結果と、過去10年に及ぶ
データの展示ならぬ堀川水質写真展を開催します。堀川を清流にの
願いを込めて、一人でも多くの方に堀川の美観と堀川の奇麗さを
届けたいと思います。ぜひご覧ください。

日時 平成26年2月11日(水)～3月2日(日)

観覧時間 10時～16時

休 日 2月17日(月) 24日(月)

場所 「堀川ギャラリー」

堀川水質調査結果の最大成長といえる名古屋市高年大学環境学科

地下鉄丸の内線丸の内駅 丸の内線丸の内駅 丸の内線丸の内駅

電話 052-202-3401

入館料 無料



主催 名古屋市高年大学環境学科 環境学科 27期生
後援 名古屋市教育委員会
協賛 名古屋市環境土木局 河川部環境
名古屋市河川下水道局
堀川1000人調査会

平成二十五年年度
「鯉城・堀川と生活を考える会」
堀川浄化活動報告書
2013
二五年年度代表 佐野 昌司
二六年年度代表 佐野 昌司



堀川を清流に！ 10年間を観る 写真とデータ

「上流は下流を思い、下流は上流に感謝する」
下流交流・連携の一層発展を

堀川は清流に！ 10年間を観る 写真とデータ

堀川は清流に！ 10年間を観る 写真とデータ

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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 木曽川流域みんなの会

活動報告「上流は下流を思い、下流は上流に感謝する」
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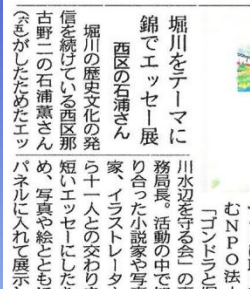
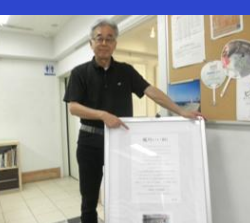
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堀川ギャラリー 個展「堀川いいね」 Gondolaと堀川水辺を守る会 事務局 石浦薫さん 平成26年7月15日(火)～8月3日(日) 報告:御用水跡街園愛護会調査隊

堀川ギャラリー 個展「堀川いいね」
Gondolaと堀川水辺を守る会
事務局 石浦薫さん
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平成26年7月15日(火)～8月3日(日)
報告:御用水跡街園愛護会調査隊

地下鉄丸の内線丸の内駅でパネル展示会
鯉城・堀川と生活を考える会が
平成26年3月3日(土)～3月14日(金)
主催:伊勢湾流域圏再生ネットワーク

活動報告:
環境ボランティアサークル「亀の子隊」

活動報告:
伊勢湾流域圏再生ネットワーク事務局

「堀川・歴史と文化の探索」を出版
堀川文化探索隊 伊藤氏、沢井氏

Activities of "Free Survey Groups" & "Cheering Groups"

明電舎錦調査隊

<http://www.horikawa1000nin.jp/katudou/2014-07-31-meidensha.htm>

堀川調査活動メモ

- 調査隊名: 明電舎錦調査隊 / 布施川・堀谷・萩須
- 調査地点: 堀谷(中央地下道前)
- 調査日時: 2014/4/9(水) 9:15頃
- 天気: 晴れ (前日に降雨:なし)
- 気温: 18℃
- 風速: 微風
- 流れ: 緩やか(上流→下流)
- 水位: やや低め(右岸階段:10段目)
- 水の色: 濁灰色
- 泡: なし
- 浮遊物: 桜の花びら、落ち葉

7. 水質測定結果(現場測定)

測定項目	測定値	測定方法	測定日時
水温	15.6	℃	2014/4/9(水) 9:15頃
導電率	2.24	mS/cm	2014/4/9(水) 9:15頃
水深下1m (プロープ1m浸透)			
水温	15.6	℃	2014/4/9(水) 9:20頃
導電率	4.00	mS/cm	2014/4/9(水) 9:20頃

*現場にて導電率を測定した。

2014/4/9(水) 名古屋港の潮位(気象庁webサイトより)

時刻	潮位	時刻	潮位
1:50	164	8:17	121
12:50	154		73

<http://www.data.kishou.go.jp/dh/tide/susan/index.php>

8. 所見

風も強く穏やか、桜は重荷となり山鏡が早咲き。



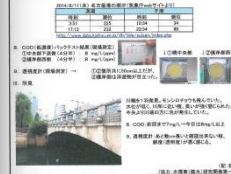
桜の花びらが流れ着いている。



(記:後藤)

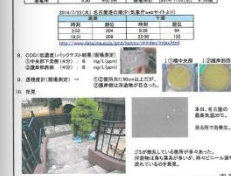
堀川調査活動メモ

測定項目	測定値	測定方法	測定日時
水温	15.6	℃	2014/4/9(水) 9:15頃
導電率	2.24	mS/cm	2014/4/9(水) 9:15頃
水深下1m (プロープ1m浸透)			
水温	15.6	℃	2014/4/9(水) 9:20頃
導電率	4.00	mS/cm	2014/4/9(水) 9:20頃



堀川調査活動メモ

測定項目	測定値	測定方法	測定日時
水温	15.6	℃	2014/4/9(水) 9:15頃
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導電率	4.00	mS/cm	2014/4/9(水) 9:20頃



(記:後藤)



平成の新堀川浄化実験開始

平成26年4月10日(木)～

参加:大同大学 大東憲二教授

写真:横井利明オフィシャルブログより

名城に「葵の御紋ベンチ」

長野県木曽町の高校生が25日、木曽ヒノキで作った特製ベンチ4脚を名古屋城に寄贈した。木曽川の上流と下流の交流事業の一環。ベンチには、徳川家の家紋である「三葉葵(みつばあおい)」が彫られ、座り心地にもこだわった。天守閣1階に設置された。

(沢田千秋)

木曽の高校生作製、寄贈

ろう木曽川流域みん・校舎アトリエの生徒らみんなの会。木曽青峰高は、地元木曽を使った製品作りの依頼を受け、一年以降、ベンチを製作し、名古屋城、名古屋科学館、名古屋博物館、名古屋科学館にそれぞれ1脚ずつ、名城は今回4脚の計4脚を寄贈した。

市長は高校生6人に感謝状を贈呈。ベンチは厚みと重さのバランスが良く、座り心地がよい。市民も喜び、地産地消の推進に貢献した。

制作者の一人、同校2年の浅川勝彦さん(18)は「葵の御紋を彫るの大変だった」と話した。また、「長く幅広い世代に受け継がれたい」と座ったときに腰に当たるようベンチに思いやりを込めた。

中日新聞 平成26年2月26日(水)朝刊



栄の子ども施設に
間伐材の玩具寄贈
木曽青峰高卒業生
長野県木曽町の木曽青峰高校インテリア科の卒業生が、栄にあるナディアパークの市子ども・子育て支援センターを訪れ、木曽川流域の間伐材で作った玩具を寄贈した。

「水源の里を守ろう」



木曽川流域みん・み玩具室内の施設に贈ら葉っぱのよに伸びるの台に、動物のパーツをのせて遊ぶ。柱の台座をわざと不安定にしてあり、五種ほどある動物のパーツをバラバラにのせて遊ぶ。いって倒れてしまう。

「飽きずに遊ぶようバラバラに組む要素を取り入れたパーツに子どもが好きな動物の絵を描いた」と細田さん。

玩具は同センターの子どもが自由に遊べるスペースに置かれた。古田さんは「たかさんの子どもに使ってもらえるとうれしい」と話した。

中日新聞 平成26年6月6日(金)朝刊

木曽川上流域の自治体の首長でつくる「木曽川流域みん」が七日、上流の森林保全や水資源の大切さを知ってもらおうと、木曽産木材の活用を求める要望書を河村たかし市長に提出した。

長野県木曽町の宮川正光町長と大桑村の貴舟豊村長が、木曽ヒノキの間伐材でできた小学校向けの机と椅子を持参。要望書を手渡した。

木材活用要望で市長関心



木曽川上流域の首長でつくる「木曽川流域みん」が七日、上流の森林保全や水資源の大切さを知ってもらおうと、木曽産木材の活用を求める要望書を河村たかし市長に提出した。

ただ、価格は「セツト四万二千円で、スチール製の四倍以上と知ると一導入できなかつた、ちよとまけてもえんか」と苦言。宮川町長は「大量注文があれば値段は下げられる」と応じた。

(沢田千秋)

中日新聞 平成26年4月8日



木曽村のアンテナショップ

桜山に再オープン

木曽川の流域にアンテナショップを開設し、地元産品の販売や観光客への情報提供を行う。木曽川流域みんは、木曽川上流の森林保全や水資源の大切さを知ってもらおうと、木曽産木材の活用を求める要望書を河村たかし市長に提出した。

木曽川流域みんは、木曽川上流の森林保全や水資源の大切さを知ってもらおうと、木曽産木材の活用を求める要望書を河村たかし市長に提出した。

Activities of "Free Survey Groups" & "Cheering Groups"

名古屋市に水道ができて、今年の9月1日で100年
堀川の浄化とも関連が深い名古屋市の上下水道事業について 中日新聞に連載記事が掲載

2014年(平成26年)8月19日(火曜日)

水と暮らす

① 源流



下流のため上流の献身

名古屋市に水道ができて今年9月1日で100年。その源流は、名古屋市東部の山間部にある。かつては、山間部の住民は、山の水を飲んで暮らしていた。しかし、戦後、人口が増え、水需要が増えた。そこで、市は、山間部の住民に、水を供給するよう求めた。住民は、水を供給する代わりに、山の水を飲む権利を放棄した。これが、下流のため上流の献身である。

山間部の住民は、山の水を飲んで暮らしていた。しかし、戦後、人口が増え、水需要が増えた。そこで、市は、山間部の住民に、水を供給するよう求めた。住民は、水を供給する代わりに、山の水を飲む権利を放棄した。これが、下流のため上流の献身である。

2014年(平成26年)8月20日(水曜日)

水と暮らす

② 味



おいしさの追求へ転換

水は、生きるために必要不可欠な資源である。しかし、水は、ただ飲むだけでなく、味も大切である。名古屋市は、水の味を追求し、おいしさを追求へ転換した。これは、市民の要望に応えるためである。

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2014年(平成26年)8月21日(木曜日)

水と暮らす

③ 浸水対策補う住民の絆



浸水対策補う住民の絆

名古屋市は、浸水対策を推進している。しかし、浸水対策は、住民の絆を補う必要がある。住民は、浸水対策を推進するために、協力している。これは、住民の絆を補うためである。

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2014年(平成26年)8月23日(土曜日)

水と暮らす

⑤ 浄化の願い



堀川に清流を「高い壁」

名古屋市は、堀川の浄化を推進している。しかし、浄化は、高い壁を乗り越える必要がある。名古屋市は、高い壁を乗り越えるために、努力している。これは、堀川の浄化を推進するためである。

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8月20日(水) 朝刊



horigon

8月21日(木) 朝刊

水と暮らす

④ 売れない水



売れない水

名古屋市は、水の需要が増えている。しかし、水の需要が増えているにもかかわらず、水は売れない。これは、水の需要が増えているにもかかわらず、水は売れないためである。

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8月22日(金) 朝刊

水と暮らす

④ 伸びぬ需要 活路を模索



伸びぬ需要 活路を模索

名古屋市は、水の需要が増えている。しかし、水の需要が増えているにもかかわらず、水は売れない。これは、水の需要が増えているにもかかわらず、水は売れないためである。

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中日新聞 平成26年8月19日(火) 朝刊



稚児宮人道橋の地下水汲み上げポンプが始動

平成26年8月29日(木) 報告:御用水跡街園愛護会調査隊

8月20日(水) 朝刊



horigon

8月21日(木) 朝刊

水と暮らす

④ 伸びぬ需要 活路を模索



伸びぬ需要 活路を模索

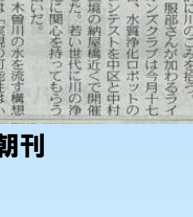
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8月23日(土) 朝刊

水と暮らす

⑤ 浄化の願い



堀川に清流を「高い壁」

名古屋市は、堀川の浄化を推進している。しかし、浄化は、高い壁を乗り越える必要がある。名古屋市は、高い壁を乗り越えるために、努力している。これは、堀川の浄化を推進するためである。

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参加：名古屋市高年大学環境学科28期調査隊
名古屋グランパス調査隊
名古屋堀川ライオンズクラブ調査隊



春の環境デーなごや2014 堀川体験乗船
「身近な自然体験会～船から発見！
私たちの堀川」平成26年6月7日(土)
主催：名古屋市環境局
協力：名古屋堀川ライオンズクラブ
報告：事務局

[illegible]

鍋屋上野浄水場 ポンプ所内部初公開

町の屋上貯浄水場を一般開放するイベント「なご水フェスタ」が一日有形文化財（旧第一ポンプ所）の内部初めて公開した。今年は水道給水見学に訪れた大勢の来場者が給水の歴史の一端に触れた。（梅田綾晴）

第10回「堀川エコロボットコンテスト2014」

平成26年8月17日(日)

主催:名古屋堀川ライオンズクラブ・名古屋工業大学
報告:事務局



「ごんぎつね」堀川清掃

エコロボット 28チーム競う

名古屋の中心に流れる
堀川の津に堀川を挟んで
もらて「堀川コロボ
ットコンステラ」(名古屋
工業大)名古屋ライオン
シネクラ 主催が、昨日、
中区泉の繁屋橋 葎で開か
れた。

コンステラは今回で10回
目。今年高校生を中心
に28チームが参加し、ホ
ットの性を競い合った。

興立で工業高校のチー
ムは、「はんじ車馬り」

の山車を出市出店の童謡
作家新美南吉に出たんだ
「ごんぎんぎ」をかたど
り、滑らかな動き、無
限な変化がきくなど、ハ
ジメがあったが、母で口
いいた。

ボットがいて、浮いた水
ミをすく取り、水を送
るをきまき取りに酸を注
り込んだ。

作成した3年の新美南人
さん17は、4月かけて
作った。堀川は名古屋のシン
ボルなのでできたとい
ったと話し、同、原田
マケルさん18は、いま
すく水を進むよう、作る
のが難しかったと振り返
った。

名古屋堀川ライオンシネ
クラの藤原真 さん17は
「10年続いてきて、堀川を
美しくしようと考えるとこれ
が人が増えた。今後とも
続けていきたい」と話して



2014

第10回 記念 堀川 エコロボットコンテスト



参加チーム
大募集!!







コンテスト開催日

平成26年8月17日(日)

会場

名古屋・堀川「納屋橋周辺」

主催 名古屋工業大学・名古屋堀川ライオンズクラブ