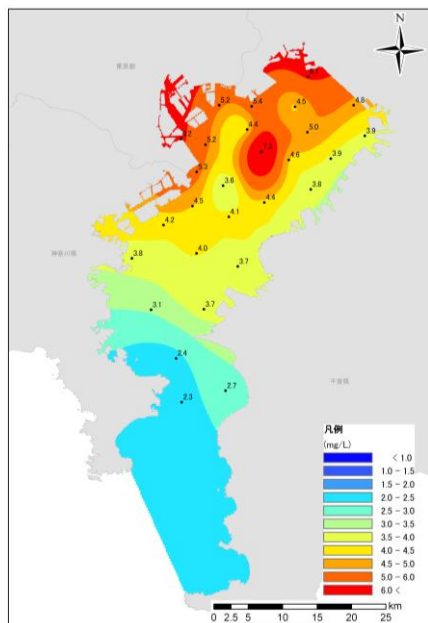
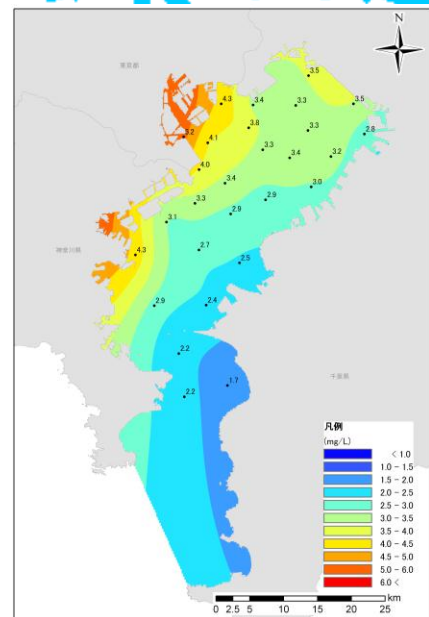


Guidance for Introducing Total Pollutant Load Control System “TPLCS”

~ Summary ~



1982~1984 av.



2006~2008 av.

Example : Transition of COD_{Mn} in Tokyo Bay

Purpose of this Guidance

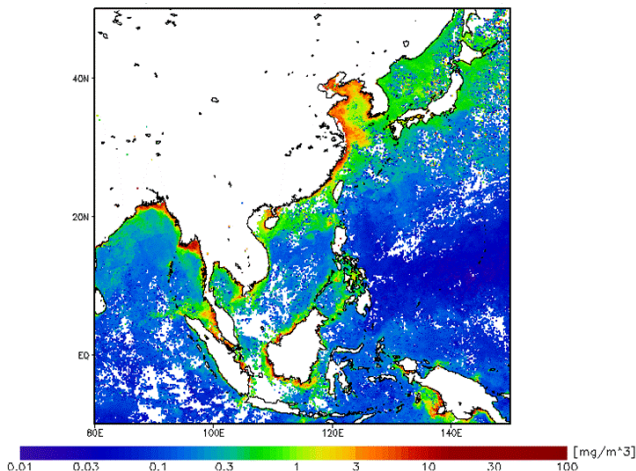
Water pollution is caused by the increase of pollutant load from population growth, industrial development and economic growth.

The Total Pollutant Load Control System (TPLCS), which has been implemented since 1979, is one of the important systems for water quality improvement in Japan.

The TPLCS is now regarded as a key for improving and preserving water quality in enclosed water area.



*Tokyo Bay in 1970's : fish boat in soap bubble
(©Tokyo Metropolitan Government)*



*Chlorophyll a in East Asia (2004. 1)
(©JAXA)*

Rapid economic growth in the East Asia has raised concerns on the deterioration of water quality, especially in enclosed water areas.

The TPLCS is an effective tool for conserving water quality in such regions.

Between 2009 and 2010, ministry of the environment Japan (MOE) conducted a joint research on the TPLCS with China.

We have exchanged the experiences in the TPLCS, and discussed the way of implementing the TPLCS more effectively.

In March 2011, MOE developed a "Guidance for Introducing TPLCS" with the aim of promoting understanding on the TPLCS among the parties involved, including officials engaged in the administration, as well as researchers and engineers.

We are willing to share its experience in the TPLCS and hope developing cooperative relationship such as joint study.



Overview of the TPLCS

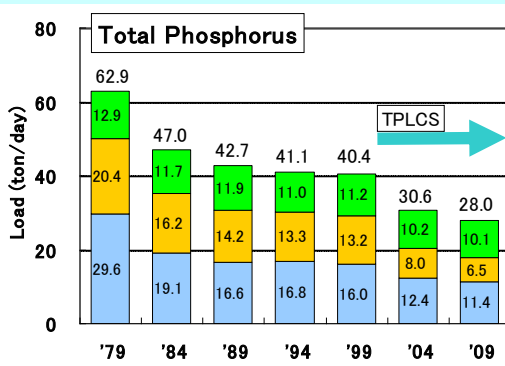
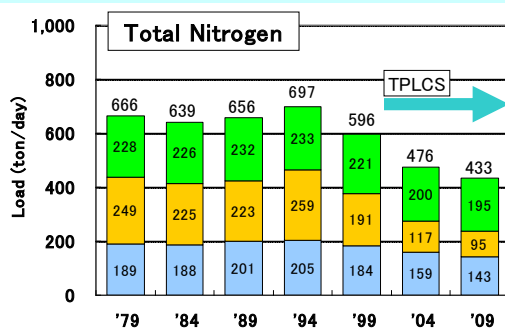
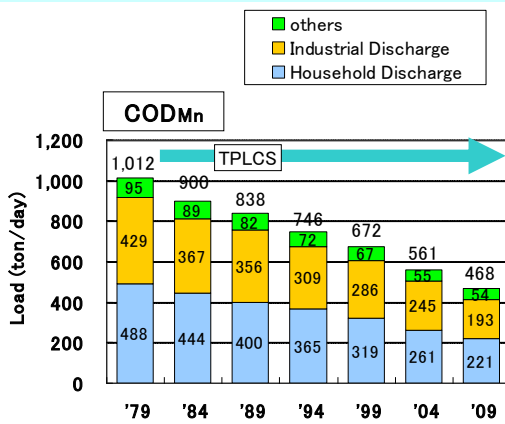
—Necessity and Effect—

Pollutant load is likely to be accumulated in enclosed seas. The excessive accumulation of pollutant load causes red tide and dysoxic environment and it debilitates and eventually kill fish and aquatic organisms.

Thus, in the case where water pollution has occurred or likely to occur, the total pollutant load flowing into the closed water area must be decreased.

The pollutant load sources include not only industrial effluent, but also household discharge, agricultural waste water and so on. The TPLCS involves comprehensively examining the required measures against the pollutant load sources, studying the feasibility of the measures, optimizing the combination of the measures.

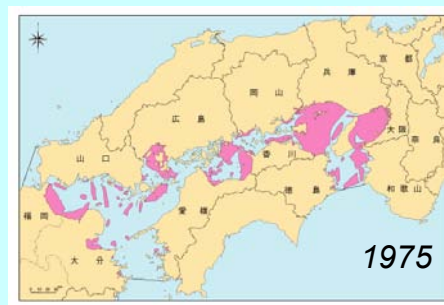
In Japan, pollutant load has steadily declined since the introduction of the TPLCS. According to this experience, introducing and appropriately managing the TPLCS are important in preserving the water quality of the countries under the period of higher economic growth.



Chattonella ovata(plankton)



Red Tide(left) and Mass mortality of Yellow-tail by Red Tide(right) (Seto Inland Sea)



1975

Reduced pollutant load has seen fewer occurrences of red tide, with its occurrence area significantly smaller



2005

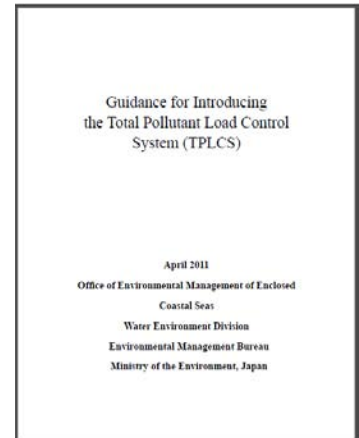
Transition of pollutant load in Seto Inland Sea

Transition of the area of red-tide occurrence in the Seto Inland Sea

Outline of this Guidance

The "Guidance for Introducing TPLCS" summarizes the concept of the TPLCS, describing the implementation procedure and remarks, from the aspects of government and administrative officials who are engaged in the preservation and improvement of water environment.

Also included is the implementation procedure and methods taken in the Japanese TPLCS.



Chapter 1 Need for the TPLCS

- 1.1 Overview
- 1.2 Structure
- 1.3 Experiences and lessons of Japan
- 1.4 Necessity to introduce the TPLCS
- 1.5 Basic principles

⇒How does the TPLCS work ?
⇒What is the basic principle for making the TPLCS function effectively ?

Chapter 2 Execution procedures for the TPLCS

- 2.1 Definition of pollutant discharge load
- 2.2 Overview of the execution procedures
- 2.3 The implementation procedures of TPLCS
- 2.4 Introduction of the system adapted to local needs and situations

⇒How to calculate the pollutant load
⇒What kind of variations are there in the implementation of the TPLCS ?

Chapter 3 Development of institutions and frameworks for effective operation of the TPLCS

- 3.1 Measurement of water quality
- 3.2 Cooperation with agencies and other concerned organizations
- 3.3 Institutions and frameworks for administrative supervision over factories and business establishments
- 3.4 Promotion of efforts by factories and business establishments to reduce discharge loads
- 3.5 Implementing measures against domestic effluents
- 3.6 Other related matters

⇒What kinds of things should be kept in mind for effectively implementing the TPLCS ?
⇒What kind of preparation is necessary for implementing the TPLCS ?
⇒How Japan cope with the issues ?

Reference Materials

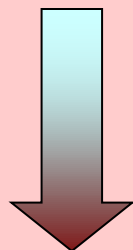
- 1 Japan's experience in water pollution and countermeasures
- 2 Calculating method of pollutant discharge load
- 3 Overview of Japan's Total Pollutant Load Control Standards and examples of the method for establishing the standard values
- 4 Measurement method for the water quality of water areas in Japan

Experience of Japan

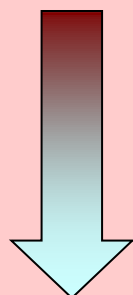
In Japan, the economic growth rate from 1956 to 1973 reached an average of 9.1% per year, and the industrial production value increased approximately threefold against the value from 1960 to 1975. But in that process, Environment administration could not deal with the significant increase in the pollutant load. As a result, severe water pollution took place.

It has been controlled further deterioration of water quality by the implementation of the TPLCS and it has been observed some improvements.

Mid-1950s :High economic growth started



Escalation of water pollution



Water pollution ceased with some improvement

1957 Outbreak of red-tide in Tokuyama-bay in Seto Inland sea
⇒Red tide extended across the Seto Inland sea

1958 Extensive damage to the fishing industry around Tokyo Bay caused by paper mill wastewater

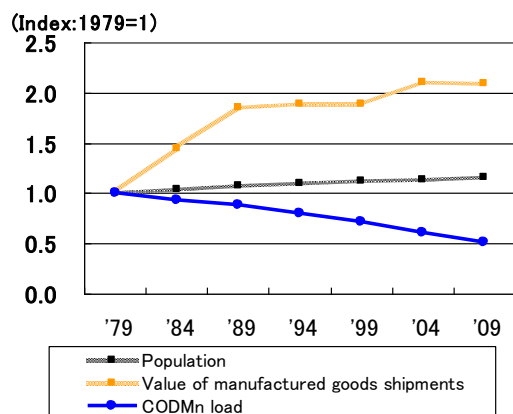
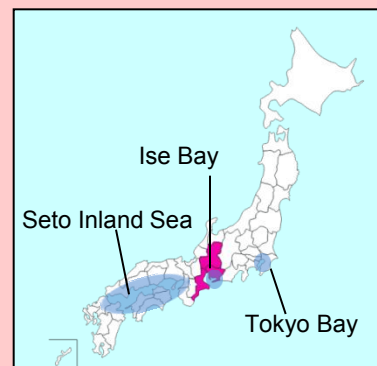
1970 The Water Pollution Control Law was enacted
⇒Effluent standard adopted all over the country
Water Environmental standard was established

1972 Mass mortality of yellow-tail by Red tide in Seto Inland Sea
⇒ 710 million yen damage

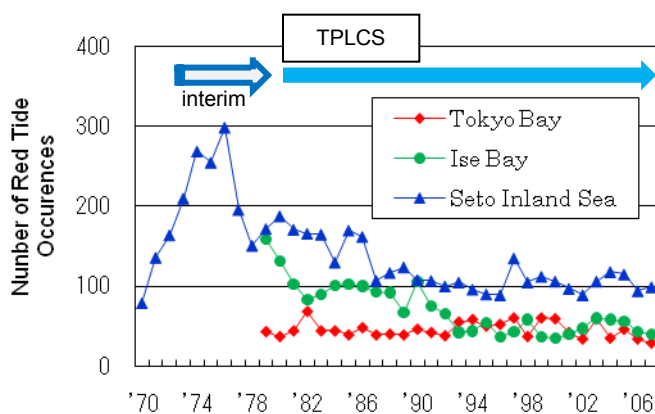
1973 Interim measures for 50% reduction of the total COD load from industrial discharge started in Seto Inland Sea

1980 TPLCS put into practice in Tokyo-Bay, Ise-Bay, Seto Inland

2001 Total nitrogen and total phosphorus added to the scope of target for the total reduction



Transition of population, industry and pollutant load after starting the TPLCS (Ise Bay)



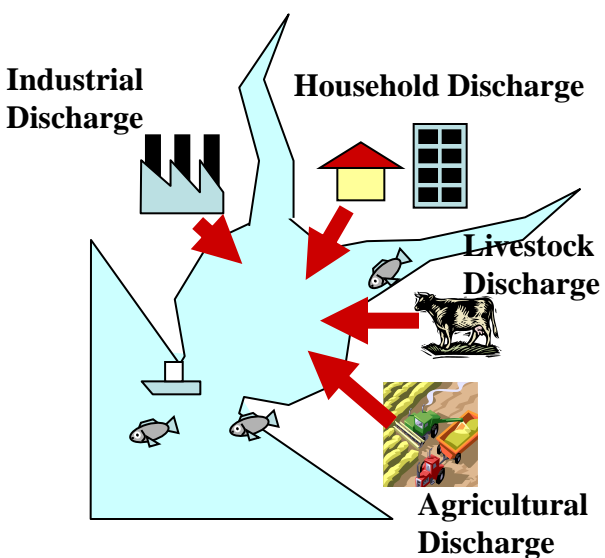
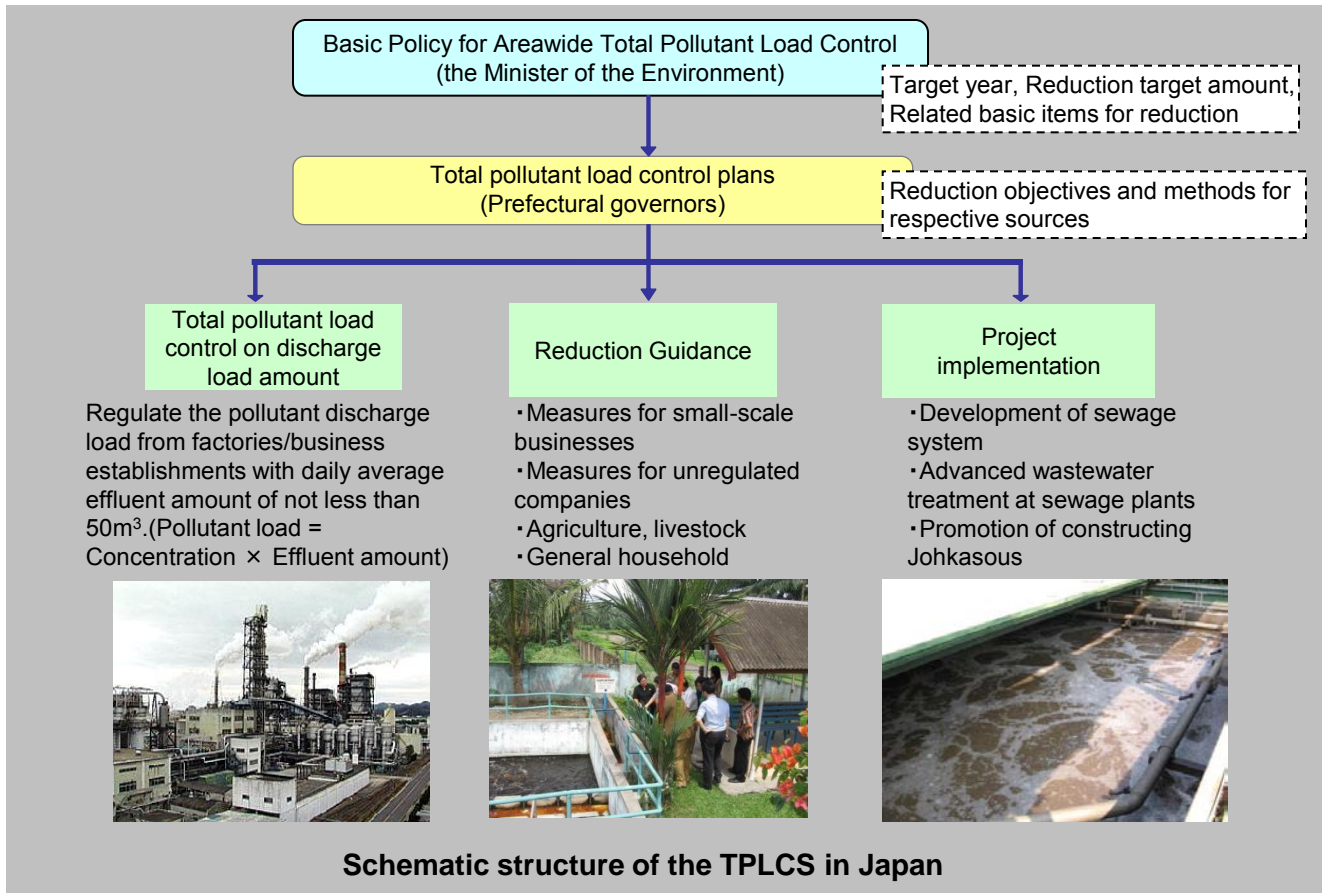
Transition of the number of red tide occurrences

The TPLCS has successfully prevented the increase in total discharge of pollutant. As a result, the deterioration of water quality has been brought under control, with some evidence of water quality improvement, such as the reduced number of occurrences of red tide.

Implementation of TPLCS in Japan

In Japan, the Prefectural Governors formulate the pollutant load control plans. Prior to the formulation of the plans, the Minister of the Environment prepares Basic Policy for Areawide Total Pollutant Load Control, which provides the basis to formulate the pollutant load control plans.

The pollutant load control plans clarifies the goal for the total pollutant load control and describes the measures for achieving the goal such that the relevant administrative bodies can cooperatively implement the plan.



source	main reduction measures
Industrial	<ul style="list-style-type: none"> ○ Regulation (concentration × amount) ○ Implementation of wastewater treatment ○ Economical support etc.
Household	<ul style="list-style-type: none"> ○ Implementation and reinforcement of sewage systems ○ Treatment of feces and urine ○ Collecting the garbage etc.
Livestock	<ul style="list-style-type: none"> ○ Treatment of livestock manure etc.
Agriculture	<ul style="list-style-type: none"> ○ Appropriate application of fertilizer etc.

These reduction measures are considered to formulate the pollutant load control plans in terms of their effects and costs and so on.

Typical procedure of TPLCS

The TPLCS must be matched to the particular circumstances of each country, including the existing system, the administrative organization and the condition of water quality environment.

The following shows a typical procedure for the implementation of the TPLCS.

(1) Determination of the water area to be subject of the TPLCS

(2) Decision of the water quality targets in accordance with the purpose of the water utilization

(3) Collecting water environment data ,effluent quality ,and other related data

(4) Calculation of discharge load

(5) Modeling and simulation of the relational between the pollutant load and water quality

(6) Establishment of the total reduction objective of discharge load and the target date

(7) Deliberation on the reduction measures of discharge load

(8) Establishment of the “Total pollutant load control plan”

(9) Execution of the plans

(10) Monitoring the water quality of the area and calculating the discharge load for the targeted period

(11) Evaluating the result of the step (10) to review the pollutant load control plan and to devise a renewed plan

Please refer to the “Guidance (full version)” for the explanations on the procedure in detail, the points to be noted during the implementation and the useful examples in Japan.

The “Guidance (full version)” is available from the web site of Ministry of the Environment, Japan.

Tokyo Bay (1972)



Bubble of a synthetic detergent drift with the current

(©Tokyo Metropolitan Government)

Tokyo Bay (present)



Sea and seaside are the pleasant place for people again
(©Tokyo port terminal Corporation)

*To get the full version of this Guidance,
<http://www.env.go.jp/en/water/>*

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Management of Enclosed Coastal Seas, <http://www.env.go.jp/en/>



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