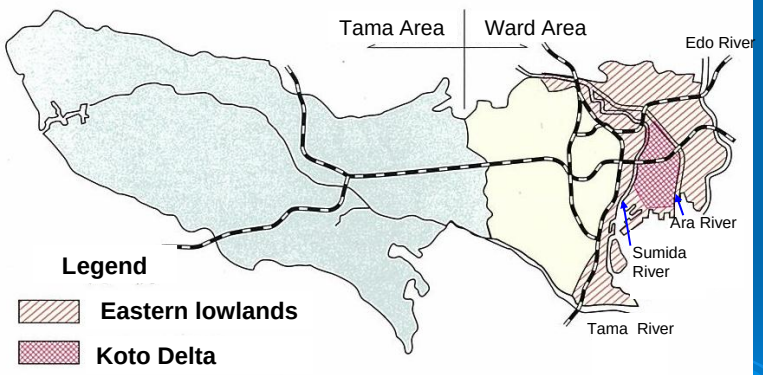
About Lowland Rivers in Tokyo

→ Rivers in eastern lowlands of Tokyo

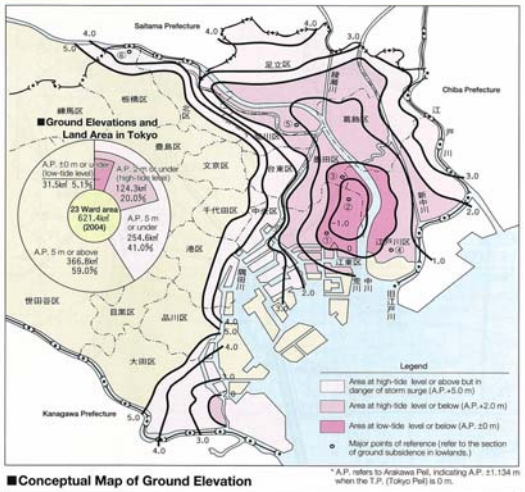
■ Map of Eastern lowlands



※ "Eastern Lowland Districts" are defined as land area portions within the eastern land area portion of Tokyo that are, roughly, less than A.P. + 5.1 m (land area portions where there is fear of submersion at times of high tidewater).

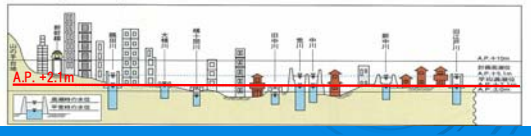
Ground Elevations in the Lowlands in Tokyo

Planimetric map of ground elevations in the lowlands



■Conceptual Map of Ground Elevation

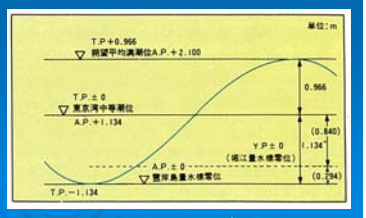
* A.P. refers to Arakawa Peil, indicating A.P. ±1.134 m when the T.P. (Tokyo Peil) is 0 m.



Most of the area is located below High tide level (A.P. +2.1m)

Ground subsidence due to water raising, etc., of underground water in Japan's era of rapid economic growth.

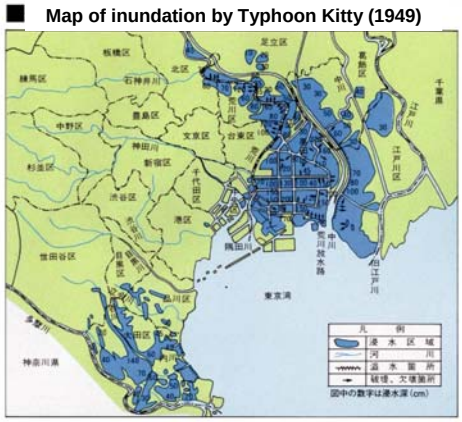
Lots of Water damage in past years



High-tide level A.P.＋2.1m
Low-tide level A.P.±0.0m

Past Major Storm Surge in Tokyo

■ **Map of inundation by Typhoon Kitty (1949)**



Water damage by Typhoon Kitty

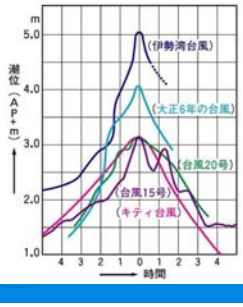
キティ台風は、昭和24年8月31日、伊豆半島の東岸から秩父山地を通過し、大正6年に次ぐ高潮（A.P.+3.15m）を発生させ、江東地区を中心に激甚な被害をもたらしました。
平成13年9月12日の台風15号では、キティ台風に匹敵するA.P.+3.15mの高潮を亀島川水門で記録しましたが、防潮堤・水門の整備により、高潮による水害は発生しませんでした。

■ **Major record of tide level**

潮位等 ＼ 台風	大正6年の台風	キティ台風	20号台風	15号台風	伊勢湾台風
生起年・月・日	大正6年10月1日	昭和24年8月31日	昭和54年10月19日	平成13年9月12日	昭和34年9月26日
最高潮位（A.P.+m）	(1) 4.21 (2) 4.09	(3) 3.15 (4) 3.25	(3) 3.55 (5) 3.16	(3) 3.15 (3) 2.77	(6) 5.02 (5) 4.88
最大偏差（m）	2.1	1.04	1.16	1.27	3.45

注1．最高潮位の(1)は「東京市史稿港湾篇第1」、(2)は建設省資料、(3)は東京都建設局調（亀島川水門付近）、(4)は建設省霞岸島記録、(5)は気象庁記録、(6)は愛知県土木部資料
注2．最大偏差は気象庁資料による。

■Tide Level Changes Graphic



Main Four Projects of Lowland Rivers

- Improvement of Storm surge Defense Facilities
- Improvement of Koto Inner Rivers
- Improvement of Super Levees
- Earthquake Measures of River Facilities (antiseismic reinforcement of existing facilities)

Storm surge Control facility improvement Project

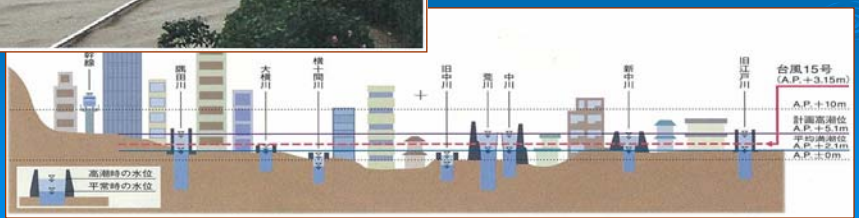
River Tidal Defense

Sluice gate

Storm surge measures are almost completed

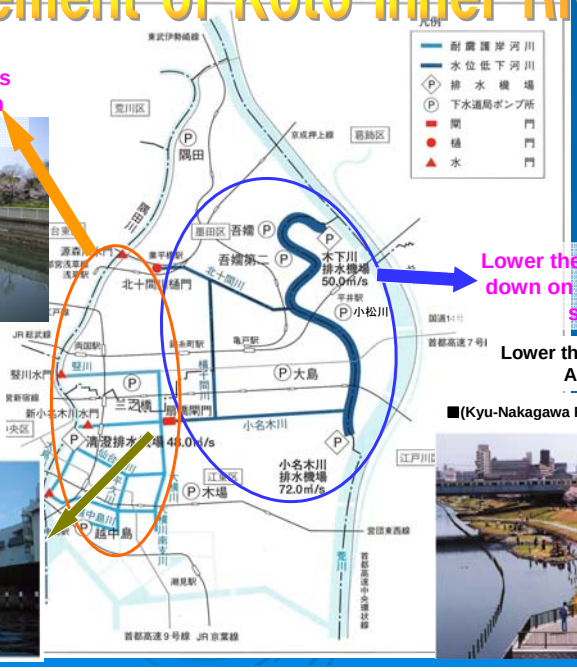
Effect of Storm surge Control facility improvement

On September 11, 2001, Typhoon No. 15—the largest class typhoon of the postwar era—comes ashore at Tokyo. The tide level at that time was A.P. + 3.15 m, roughly the same tide level as experienced in the August 1949 Kitty Typhoon, when 122 persons died or were injured.
However, in Typhoon No. 15, due to the near completion of tide embankments, etc., along main rivers, there was no damage resulting from the high tidewaters of rivers.



Inprovement of Koto Inner Rivers

"Anti-seismic revetment method" is being carried out on the western side



Lower the water level down on the eastern side

Lower the water level to A.P.-1.0m

Establish lock to allow boats to pass

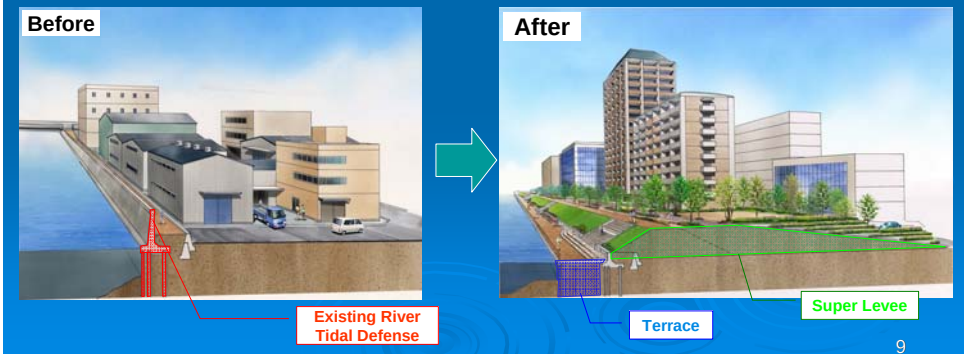
■(Kyu-Nakagawa River)

Improvement of Super Levees

○Two Aims

Earthquake Resistance and
Improvement of Water Accessibility

○Implemented in cooperation with local development along the riverside



Case Example of Improvement of Super Levee (Sumida River) (Hakozaki Area)

Before

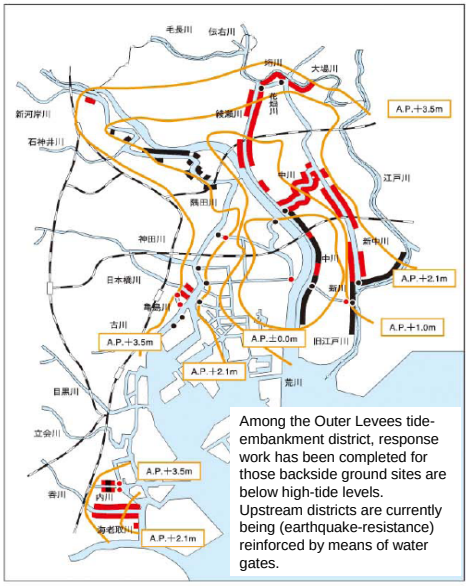
After

Earthquake-resistance measures for river facilities

■ Levee (photo: Nakagawa River)

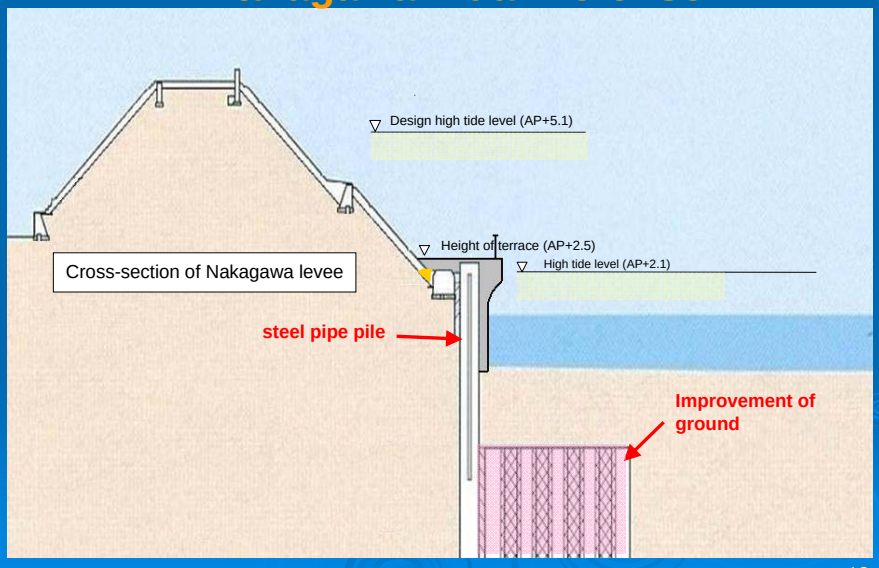
■ Sluice gate/ Drainage pumping station (photo: Imai sluice gate)

■ Map of Earthquake Measures Implemented in River Facilities



Among the Outer Levees tide-embankment district, response work has been completed for those backside ground sites are below high-tide levels. Upstream districts are currently being (earthquake-resistance) reinforced by means of water gates.

Case Example of Improvement of Nakagawa Tidal Defense



Case Example of Improvement of Nakagawa River (Before/ After)

Before

After