

# Niigata-Fukushima Torrential Rain in July 2004



Inundation in Sanjo-City

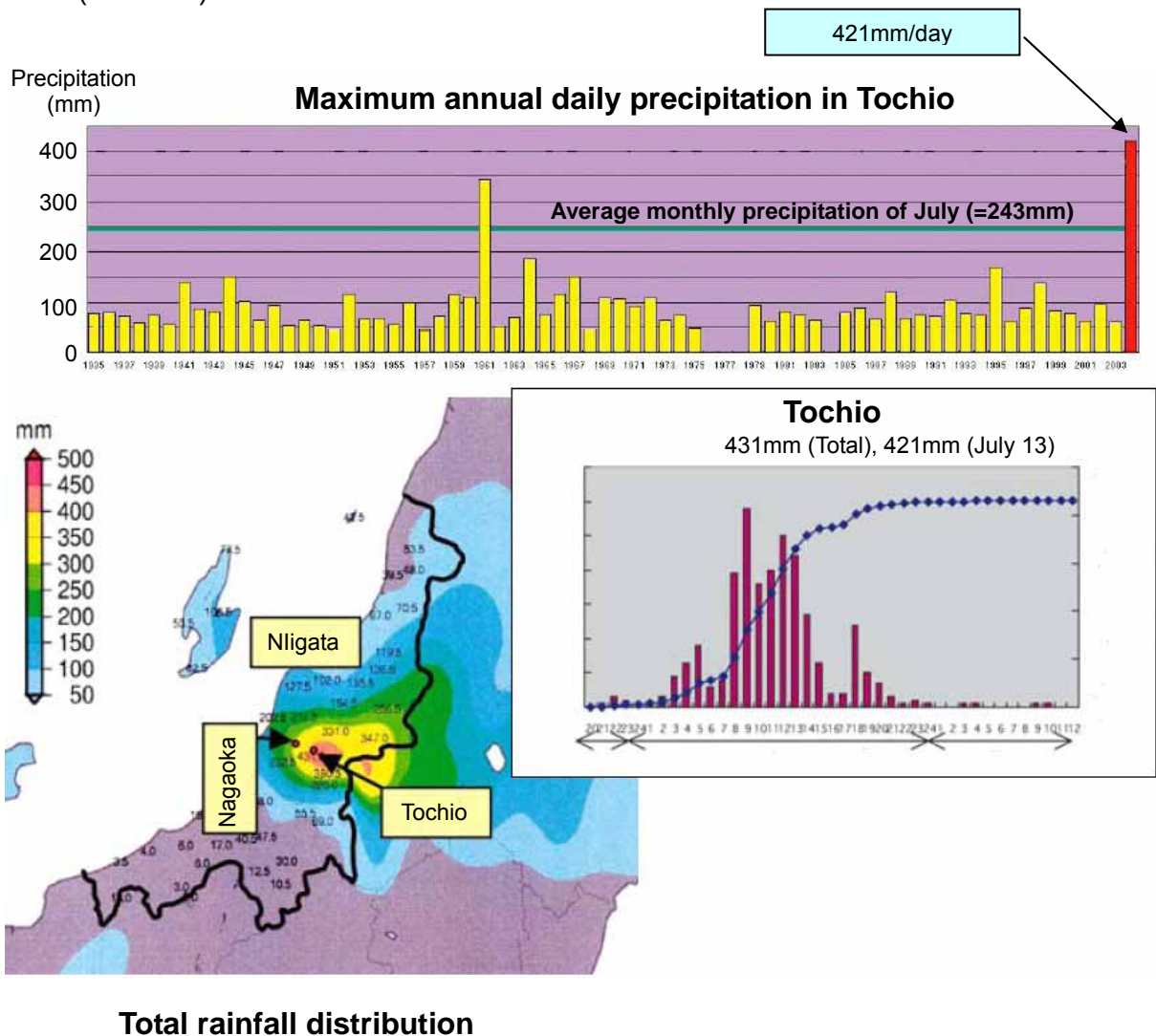
**Source:**

- Hokuriku Regional Development Bureau, Ministry of Land, Infrastructure and Transport and Niigata Prefecture: *Niigata Fukushima Torrential Rain in July 2004 (Second Report)*
- Tamai Nobuyuki: *Report on flood damage from torrential rain in Hokuriku Region in July, 2004, Civil Engineering, JSCE, Vol. 89 October 2004*

# 1. Meteorological phenomena and precipitation

A Baiu-front<sup>1</sup> from the Japan Sea to the Niigata area was activated by warm and moist air blowing from the South.

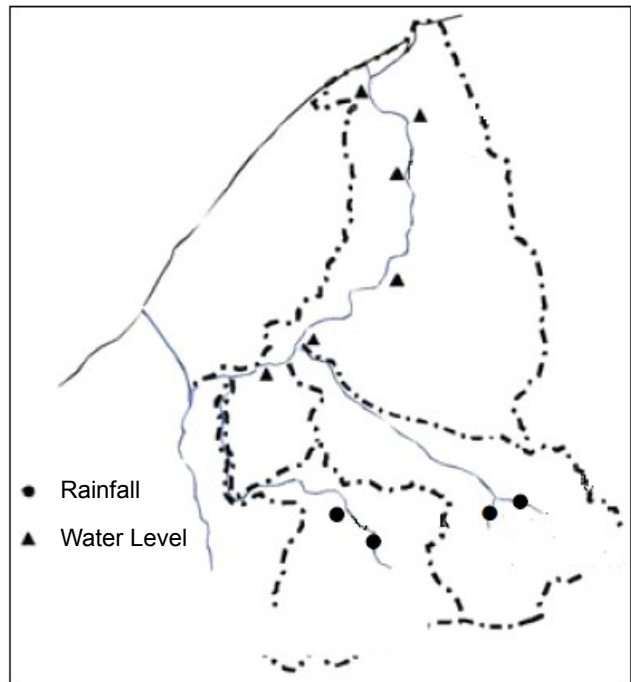
Torrential rain pounded Nagaoka and Sanjo areas in Niigata Prefecture from the night of 12 July to the evening of 13 July. The daily precipitation of 13 July reached 421 mm in Tochio City, nearly twice the average monthly precipitation of July in Tochio (243 mm).



<sup>1</sup> Baiu-front: Stationary front from May until July, there is a high-pressure mass of cold air above the Sea of Okhotsk to the north of Japan, while over the Pacific Ocean there develops a high-pressure mass of warm, moist air. Along the line where these cold and warm air masses meet, known as the baiu-zensen, causes prolonged periods of continuous rainfall.

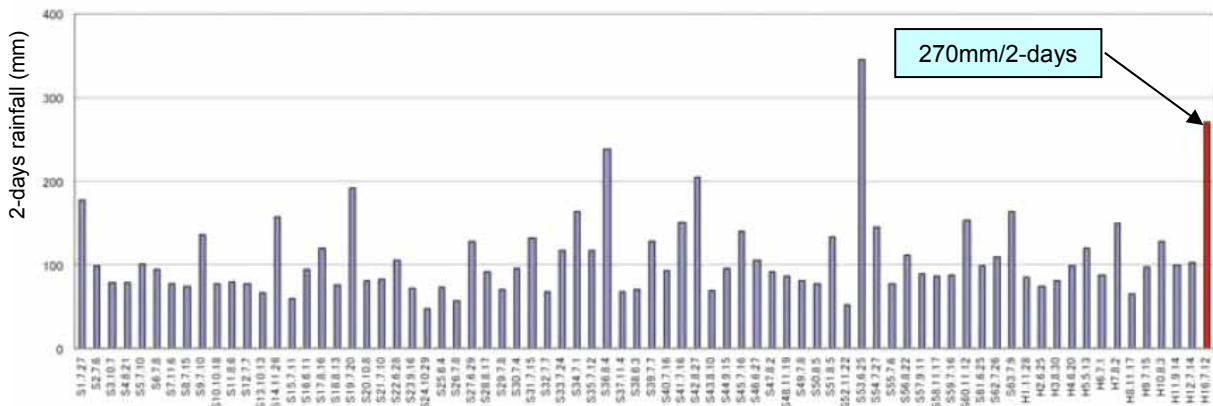
The basins average 2-day rainfall over upper stream area from Teisekibashi reached around 270 mm. This was the second largest rainfall after World War II following 335 mm in two days, recorded in June 1978 and nearly equals to a 150-year rainfall in this basin.

It was the regional heavy rainfall that has ever been experienced, as total precipitation from 12 to 14 July at Kasabori-dam and Kariyatagawa-dam were 489 mm and 433 mm respectively.

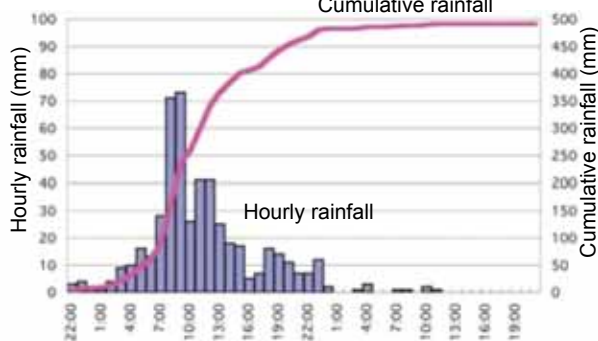


Observation station  
in the lower stream of Shinano river

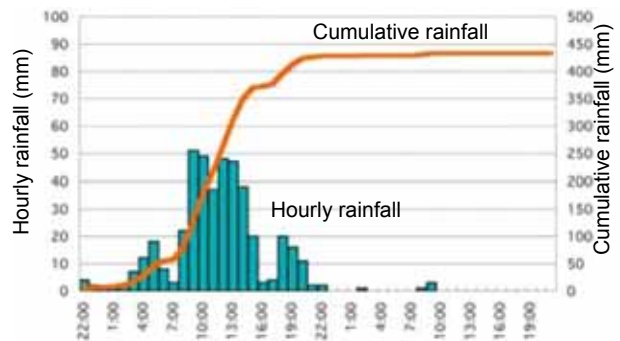
Maximum annual precipitation for two days at the average precipitation  
in the lower stream of Shinano river basin



**Kasabori Dam** Total precipitation: 489mm  
Cumulative rainfall



**Kariyatagawa Dam** Total precipitation: 433mm  
Cumulative rainfall



## 2. Flooding Situation

- Discharge

At Teisekibashi, planning point for flood control in the Lower Shinano River Basin, the maximum discharge reached 2,270m<sup>3</sup>/s breaking the largest flood record of 2,250m<sup>3</sup>/s recorded during the flood in July 1978.

- Water level

Water level along the main stream of the Lower Shinano River rose considerably. At both the Aramachi water gauge station (in Sanjo-City) and the Homyoshinden water gauge station (in Tagami-Town), the water levels exceeded the dangerous water levels<sup>2</sup>, while at the other water gauge stations, water levels rose above the warning water levels<sup>3</sup>. Inundation was prevented by piling sand bags along dykes at 4 points. Furthermore, in many other water gauge stations, the elevation of the water surface exceeded the recorded highest water level (after completion of Sekiya flood control channel). At Homeisinden water gauge station, peak water level was reached 8.2m which was higher than 0.75m as compared with 7.45m flood in June, 1978.

## 3. Damages

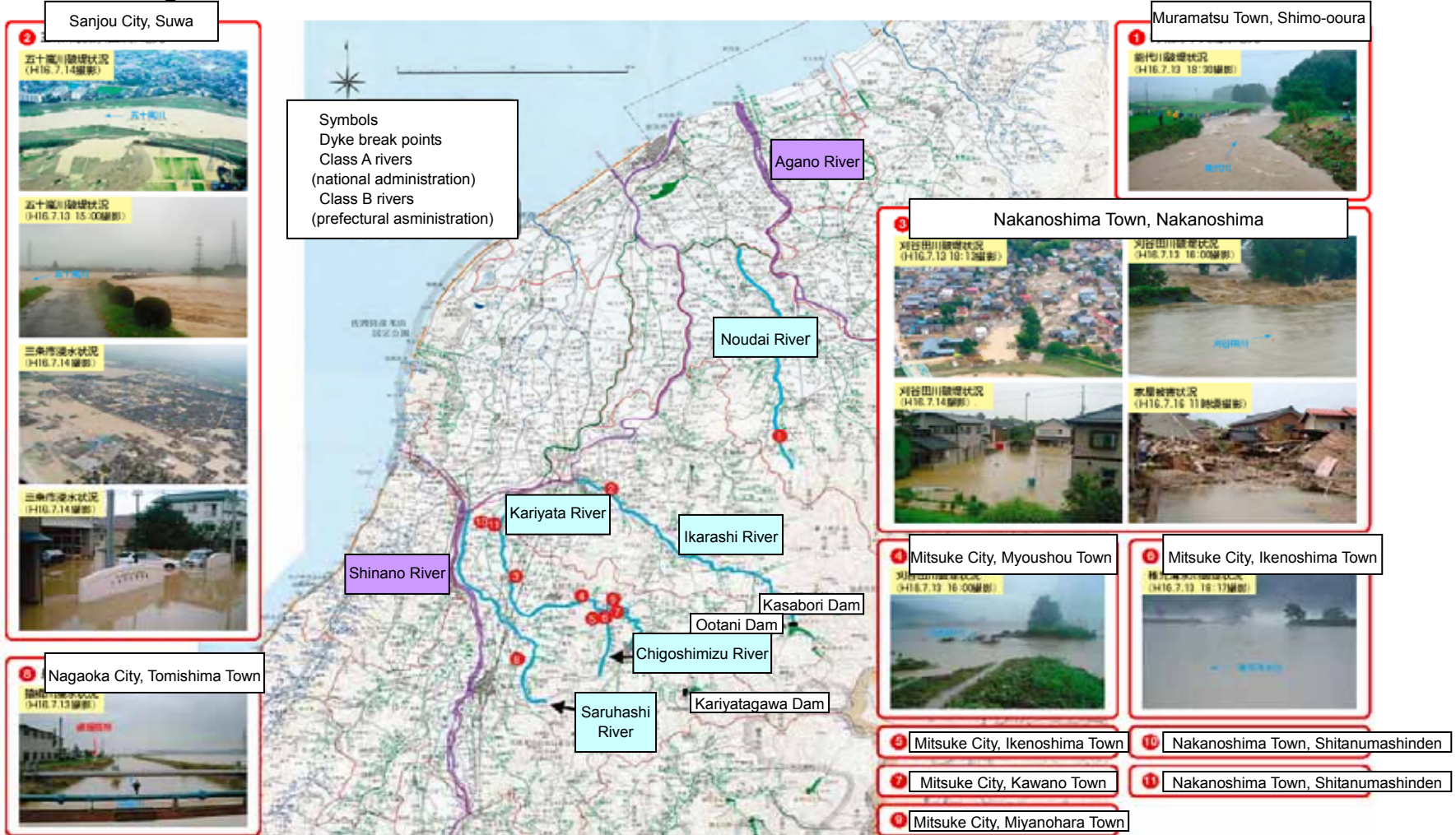
Most of the damages were caused by dyke breaks. The dykes at Suwa area in Sanjo-City along the Ikarashi River and at Nakanoshima area in Nakanoshima-Town along the Kariyata River were breached, and most of the deaths and the housing damage occurred in these areas.

<b>General damage</b>	Personal injury
	Deaths: 15
	Injured: 1
	Material Damage
	Destroyed houses: 22
	Half destroyed or damaged houses: 238
	Inundated houses (above and below floor level): 26,557
	(Source: Niigata Prefecture)

<sup>2</sup> Dangerous water level: When a water level exceeds a dangerous water level, there is the possibility that flood could occur around its area.

<sup>3</sup> Warning water level: When a water level exceeds a warning water level, precautions should be taken along the river. Flood fighting team would start their activity.

### 3.1 Damage of rivers



### 3.2 Sediment-related disaster

July 10-15, 2004 Sediment Related Disasters



Teradomari-machi, Yamada



Izumosaki-chou, Nakayama



(H16.7.14(震動))



Mishima-machi, Sakasidani

(7.14(震動))

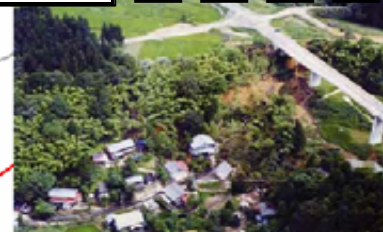
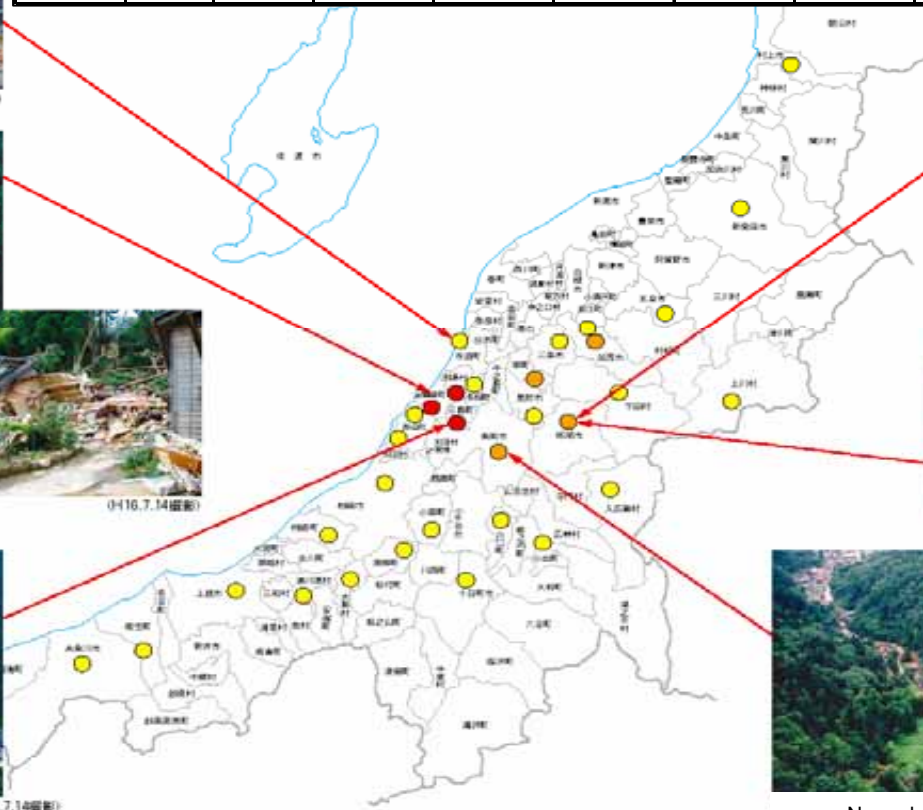


Nagaoka-shi, Urasema-chi

(H16.7.14(震動))

Disasters	Prefecture	Occurrence Number	Personal Damage			Material Damage		
			Dead	Lost	Injured	Total Collapse	Half Collapse	Partial Collapse
Land Slides	Niigata	61	1			1	3	1
Slope Failures	Niigata	278	1		1	3	1	16
Debris Flows	Niigata	8						5
Total		347	2	0	1	4	4	22

Total number of land slides, slope failures and debris flows in each prefecture.  
 ● (1-9 damages)  
 ● (10-29 damages)  
 ● (over 30 damages)



Tochio-shi, Hechi



Tochio-shi, Kitanigoro

## 4 Damage rehabilitation works

Ikarashi River

Broken point of the embankment



Restoration work from disaster



Kariyata River

Broken point of the embankment



Restoration work from disaster



Pumping drainage



Broken point of the embankment



Broken point of the embankment



Flood fighting activity

