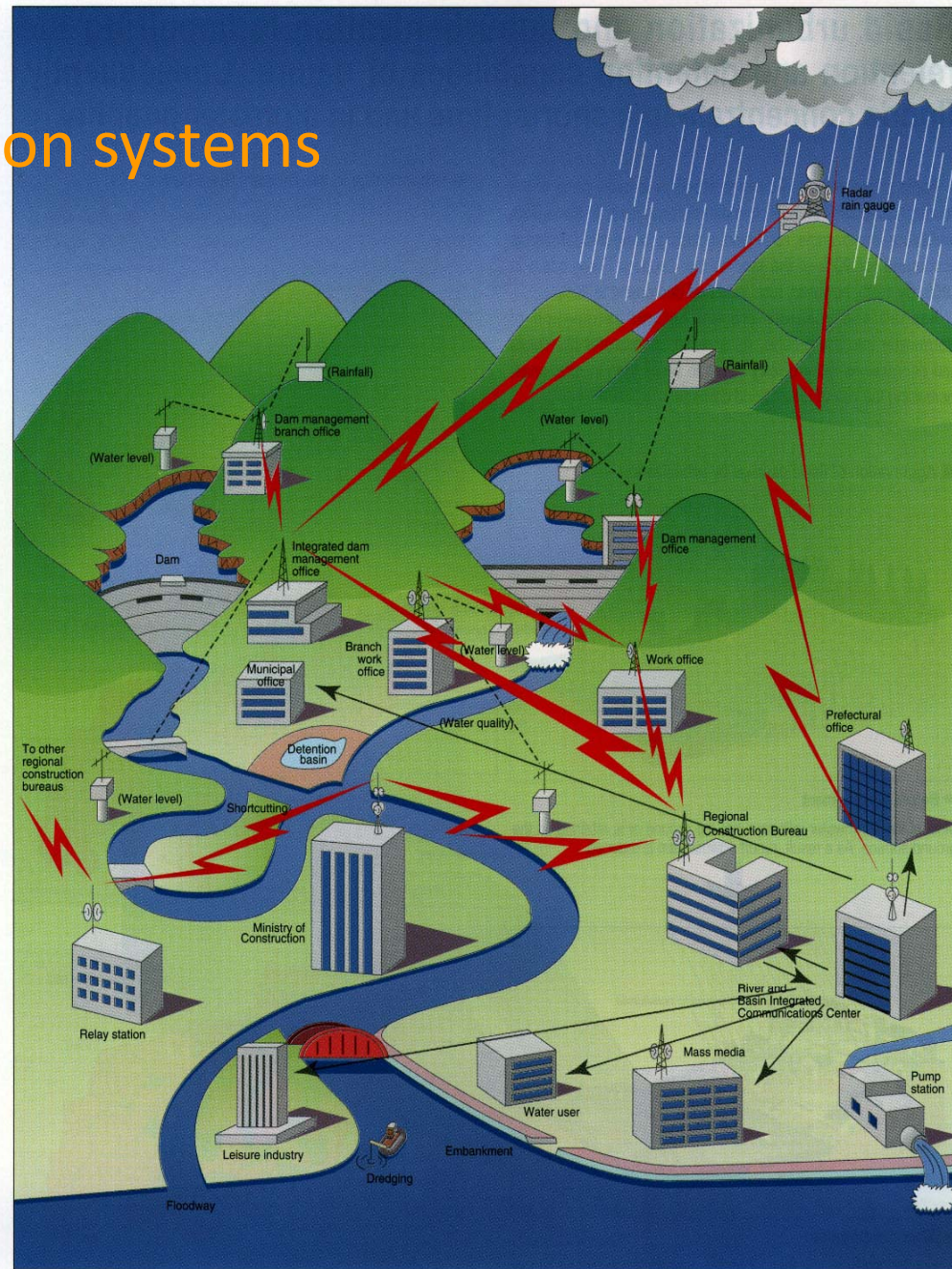


# River Information System

Slides are from:

Foundation of River and Basin Integrated  
Communication (FRICS)

# River information systems



Dr. Nakao FRICS

# Sources of Data

As of March 31, 2010

	River Bureau	Highway Bureau	Met. Agency	Local Government	Water Corporation, etc.	Total
Radars	26		20			46
TM Rain	2,348	1,182	1,275	4,557	243	9,605
Water Stage	2,132			4,042	88	6,262
Others	1,560	188	87	400	337	2,572
Total	6,066	1,370	1,382	8,999	668	18,485

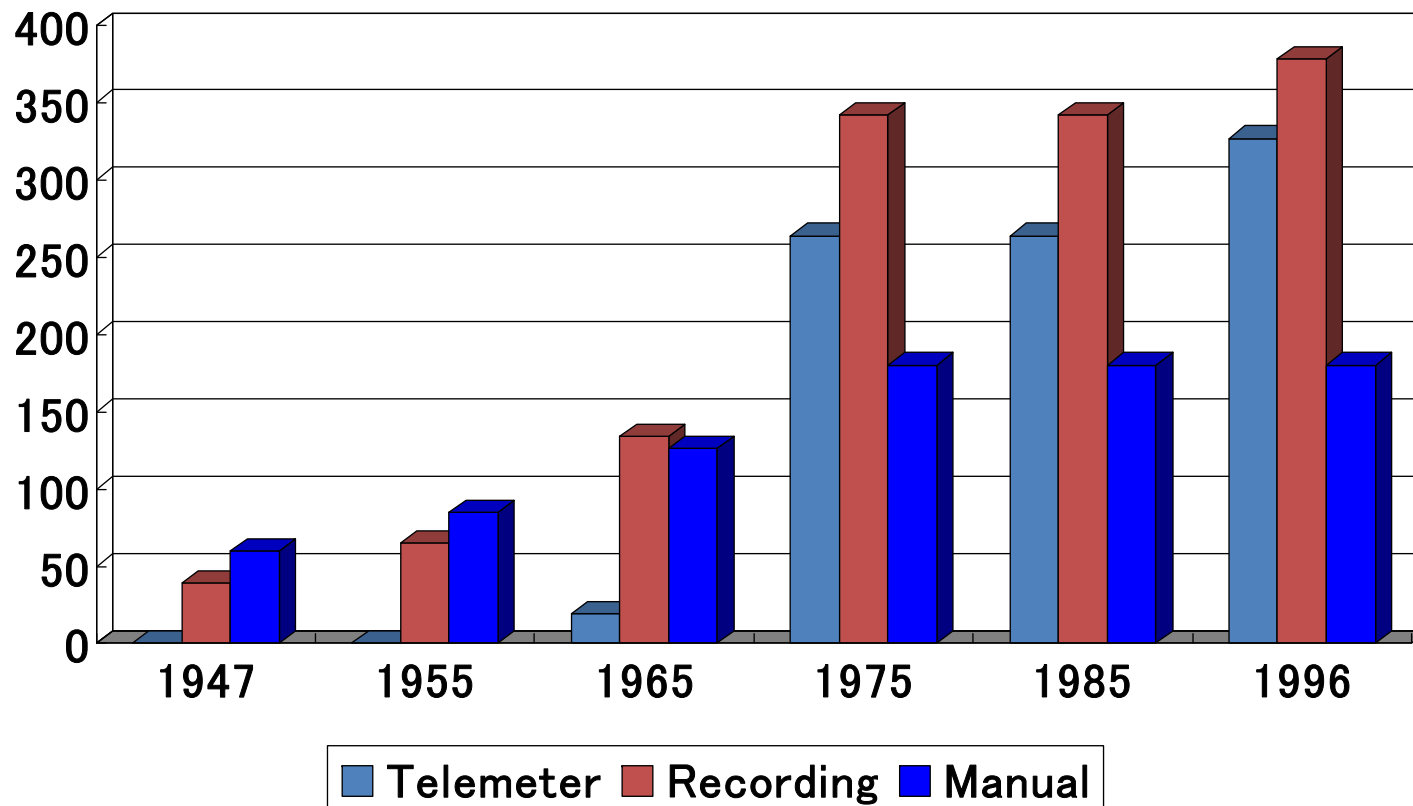
Most data are updated every 5(radar) or 10(telemeter) minutes. © FRICS

# Development of Flood Forecasting Facilities

Dr. Nakao FRICS

Year	Item
ca.1948	Manual Reading. Reporting by Telephone and Telegraph. Manual Analysis based on Personal Experience.
1950	Introduction of Short Wave Wireless Telephone (only for Emergency Use)
1951	Introduction of VHF Telephone (Daily Use was permitted)
1952	First Telemeter Data Transmission (Using Telephone Line)
1956	Introduction of Multiplex Data Transmission Network
1970	Introduction of a Digital Computer for Flood Forecasting
1972	Installation of a Digital Computer at the Bureau Headquarter
1976	Branch Offices were connected to the HQ on-line for Flood Forecasting
1976	Installation of on-line Data Exchange Network for Tone River
1977	Installation of the First Radar Rainfall System on Mt. Akagi
1986	FRICS started Information provision to Municipalities .

# Trend of Measurement Facilities



In Tone River Basin ( $A=16,840 \text{ km}^2$ ), including Rainfall and Stage Stations

# Sources of Data

As of March 31, 2010

	River Bureau	Highwa y Bureau	Met. Agency	Local Govern- ment	Water Corpora tion, etc.	Total
Radars	26		20			46
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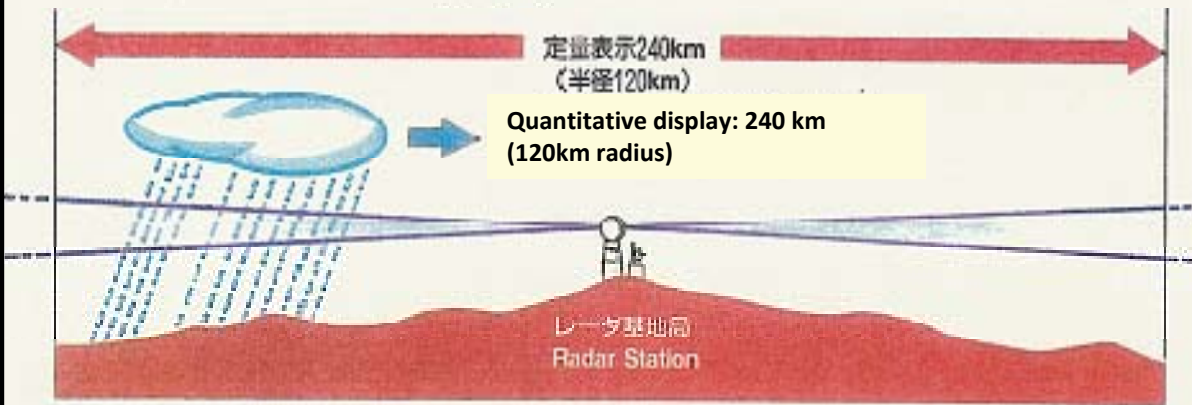
# Radar Rain Gage



Dr. Nakao FRICS

# Radar Rain Gauge System

レーダ雨量計システム Radar Rain gauge System

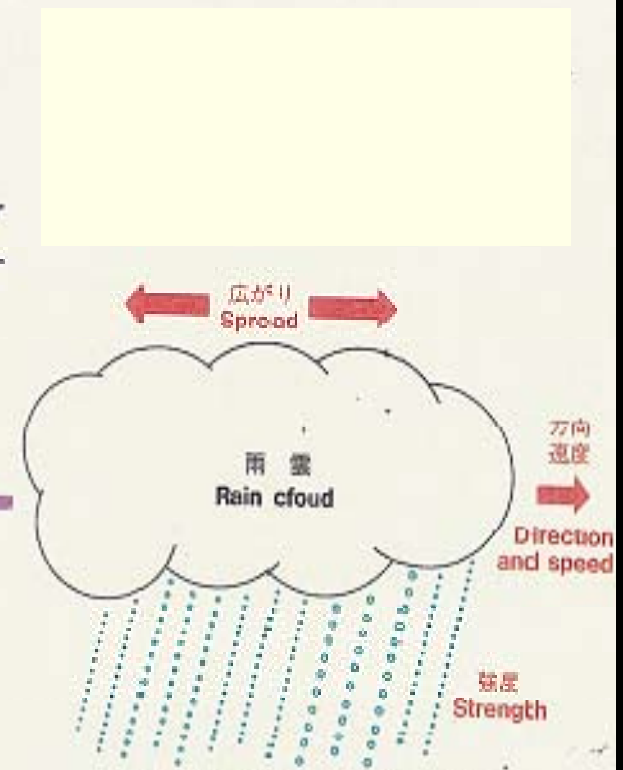


面積雨量がわかります。  
The state of rainfall can be viewed over the wide area.

地上雨量計システム Conventional Rain gauge System

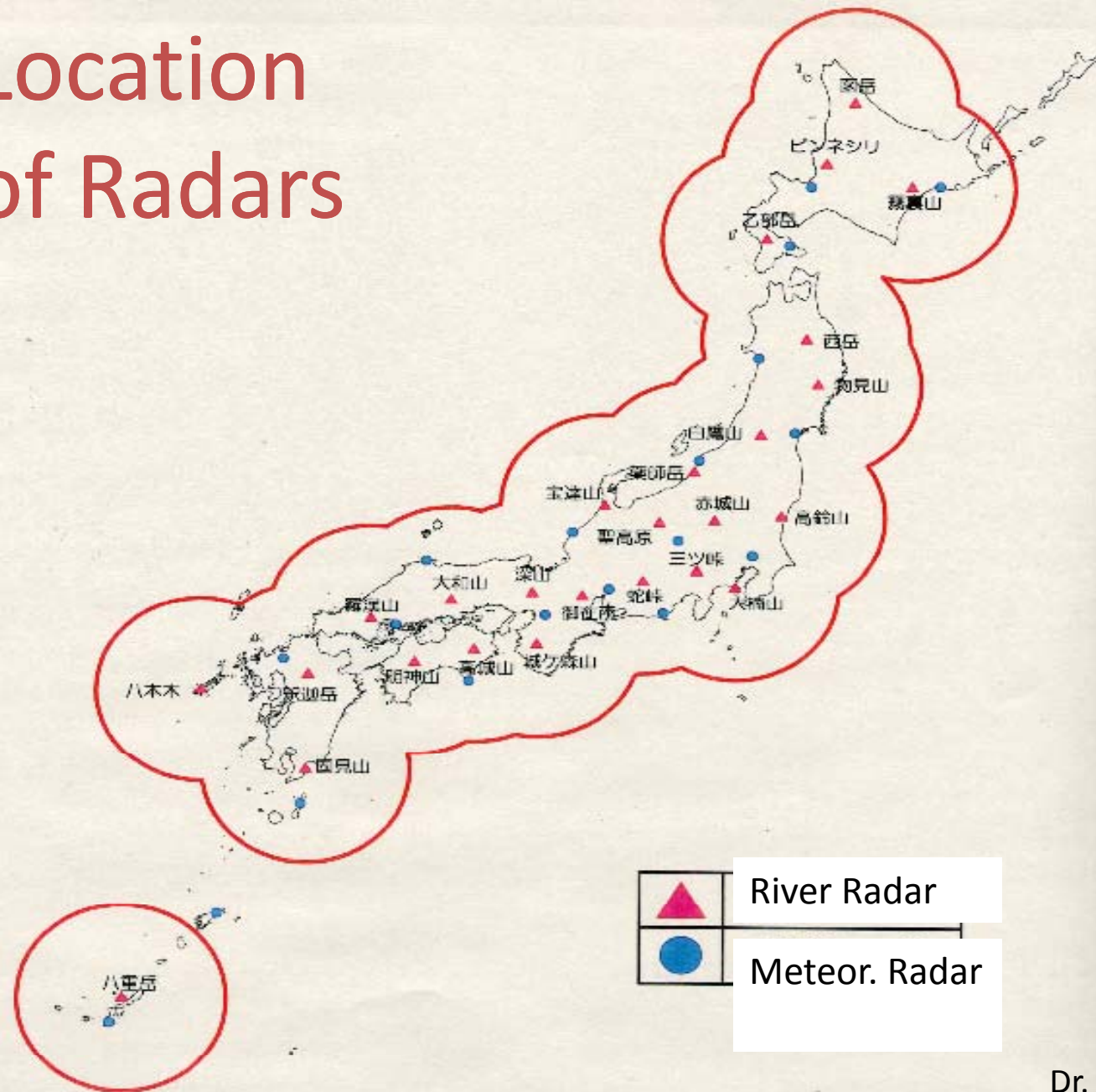


地点雨量しかわかりません。  
The state of rainfall can be viewed only spot area.





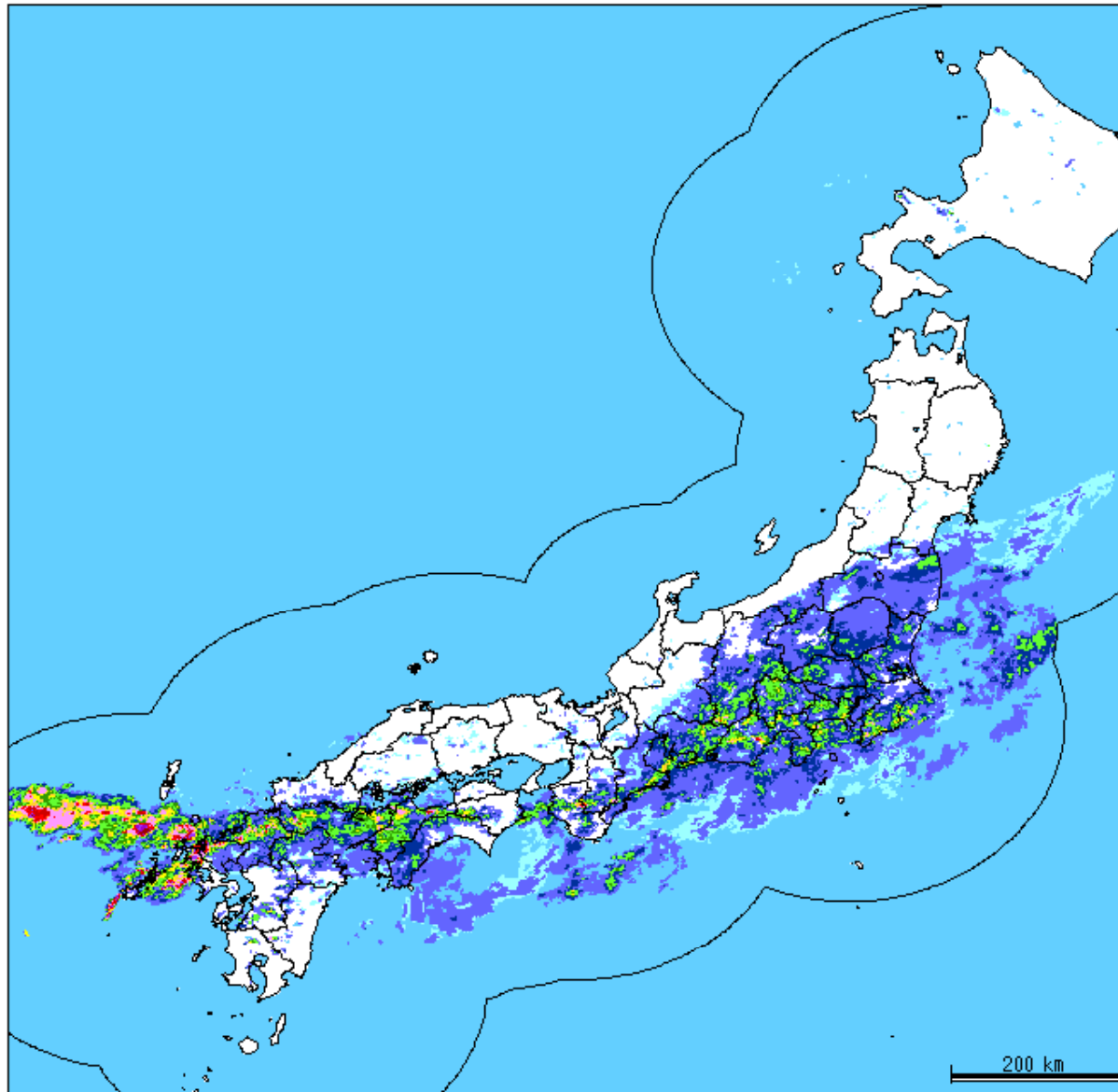
# Location of Radars



Dr. Nakao FRICS

# Rainfall Map (July, 2006)

MLIT



最新時刻 表示 移動刻み 1時間

< 2006年 7月 19日 10時 00分 >

<< >>

全国

河川名・流域界  標高  
 行政名称  
 道路・鉄道

雨量レーダ  点滅表示  
 降雨強度

気象庁レーダ  
 統合プロダクト

時刻 Time 2006/07/19 10:00

レーダ雨量

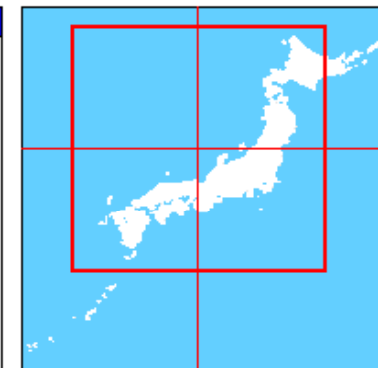
降雨強度 Rader rainfall 0mm/h  
rain strength

メッシュ Mesh

メッシュサイズ Mesh size 1km メッシュ  
メッシュコード Mesh code

Rainfall Legend

雨量凡例	
■	200mm/h~
■	~200mm/h
■	~150mm/h
■	~100mm/h
■	~80mm/h
■	~50mm/h
■	~40mm/h
■	~30mm/h
■	~20mm/h
■	~10mm/h
■	~5mm/h
■	~1mm/h
□	0mm/h
□	Data missing



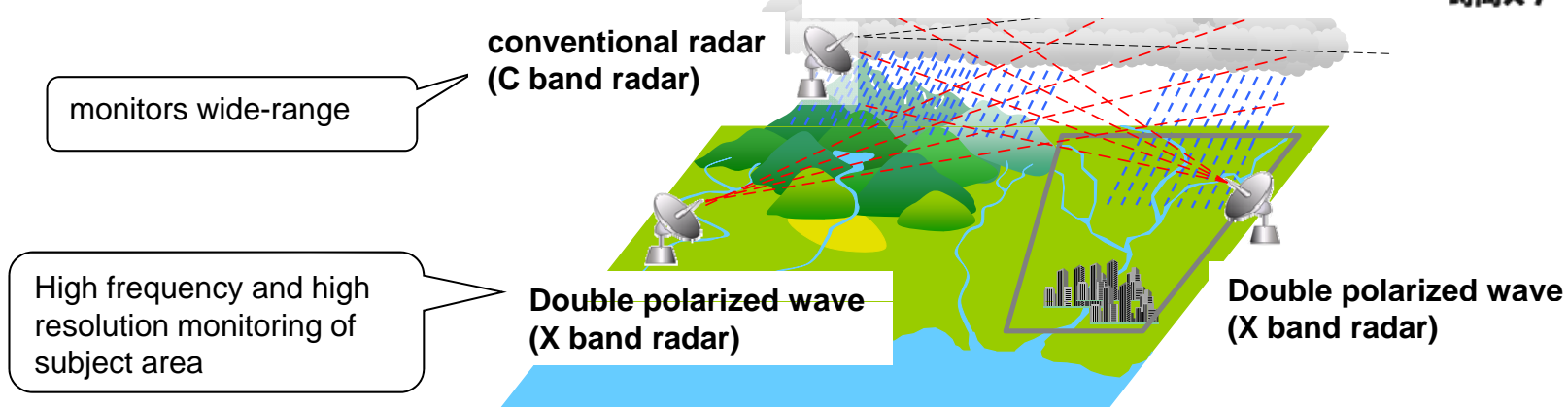
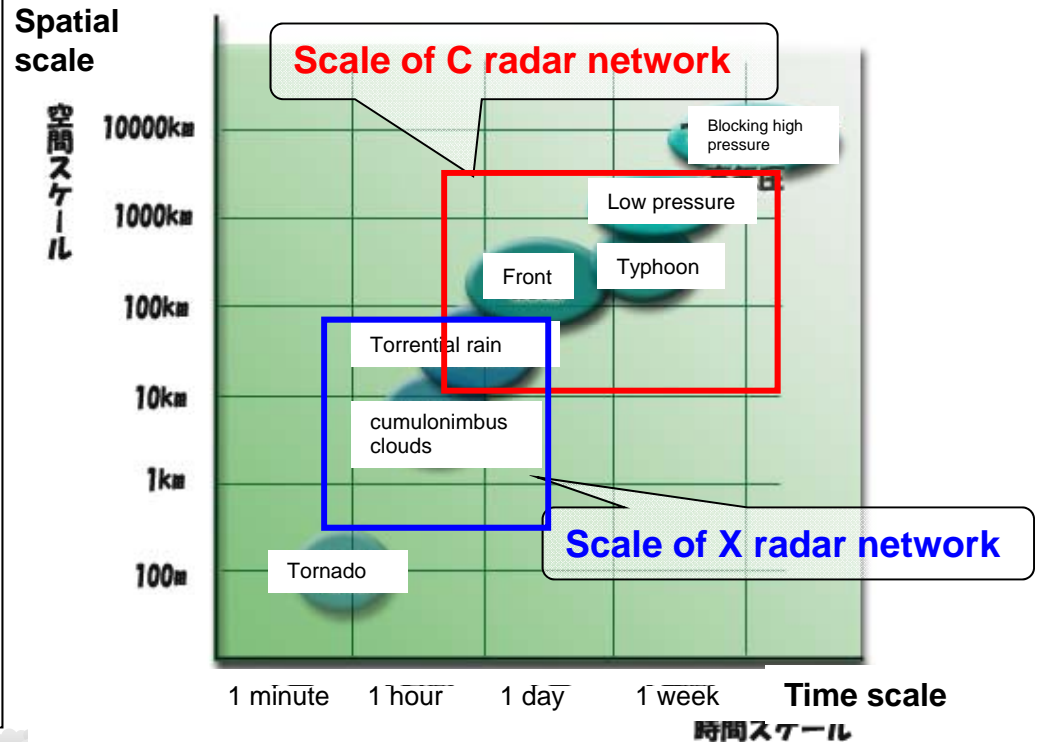
# X Band Radar

## Intensive use of X band radar

- High frequency (every 1 minute) and high resolution (250m mesh) rainfall distribution.
- Development of airy winds and clouds obtained from the volume scan.
- Linkage with wide-area rainfall distribution obtained from the C band radar and numerical forecasting etc.



**Forecasting of local heavy rain and torrential rainfall in 10-60 minutes.**



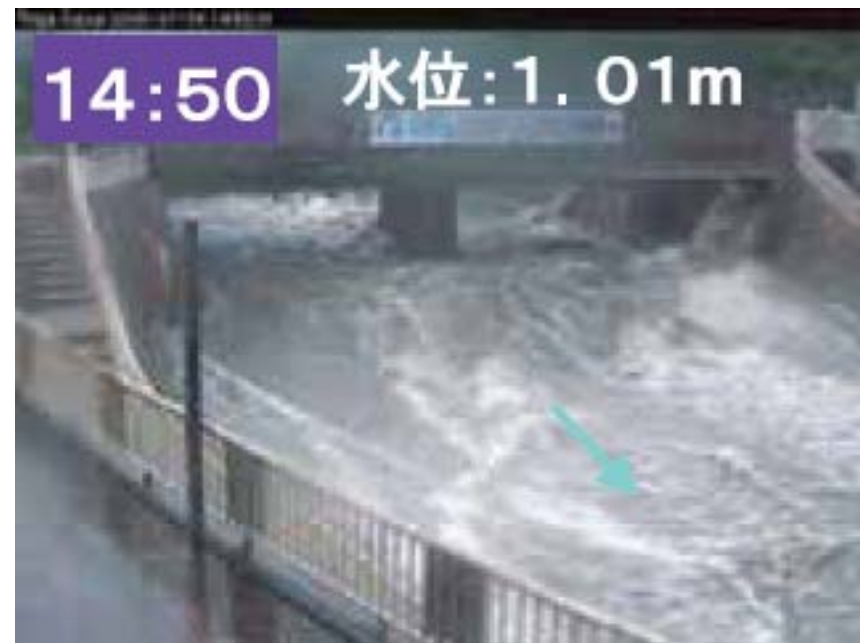
Rainfall observation bridging the spatial and temporal gap of conventional radar.

# TOGA River in Kobe

Sudden Flood in 28 July 2008 14:32-16:40

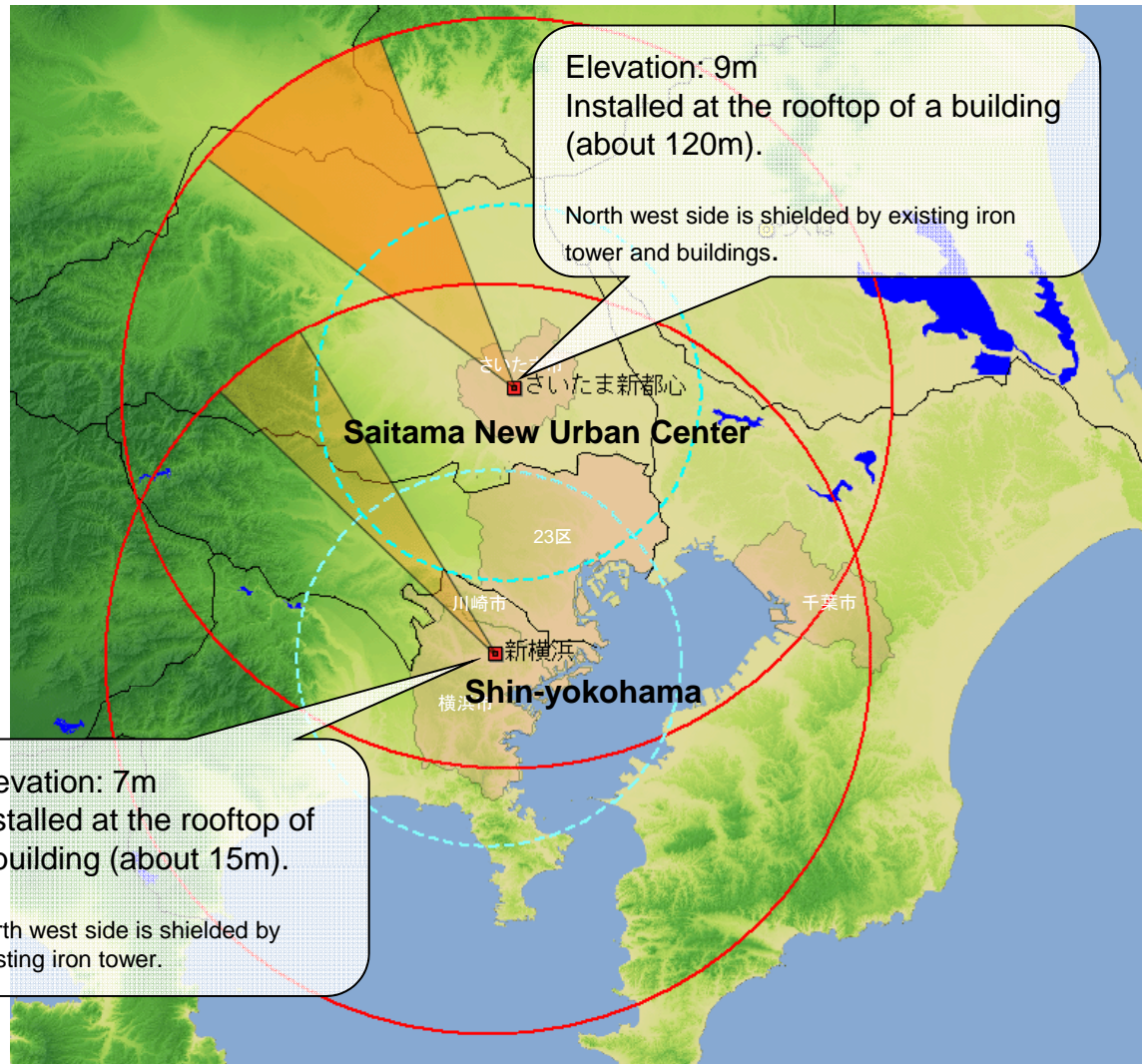


KOBE City <http://www17.plala.or.jp/kcamera/movie/demo.html>



[http://www.youtube.com/watch?v=4QWVzKoL-J8&feature=player\\_detailpage](http://www.youtube.com/watch?v=4QWVzKoL-J8&feature=player_detailpage)

# Installation Position (Kanto region)



## Shin-yokohama,

## Saitama New Urban Center

=>to conduct actual monitoring of the prioritized observation area.



Red solid-line circle  
: 60km radius



Aqua blue dot-line circle:  
30km radius

Notice: Both sites have shielding by artifacts (orange colored area)

⇒ considered to take the shielded area away from prioritized observation area

Shielded area of Shin-Yokohama can be covered by Saitama New Urban Center (light orange colored area)

# Closed Circuit TV



Dr. Nakao FRICS

# Display in an Operation Room

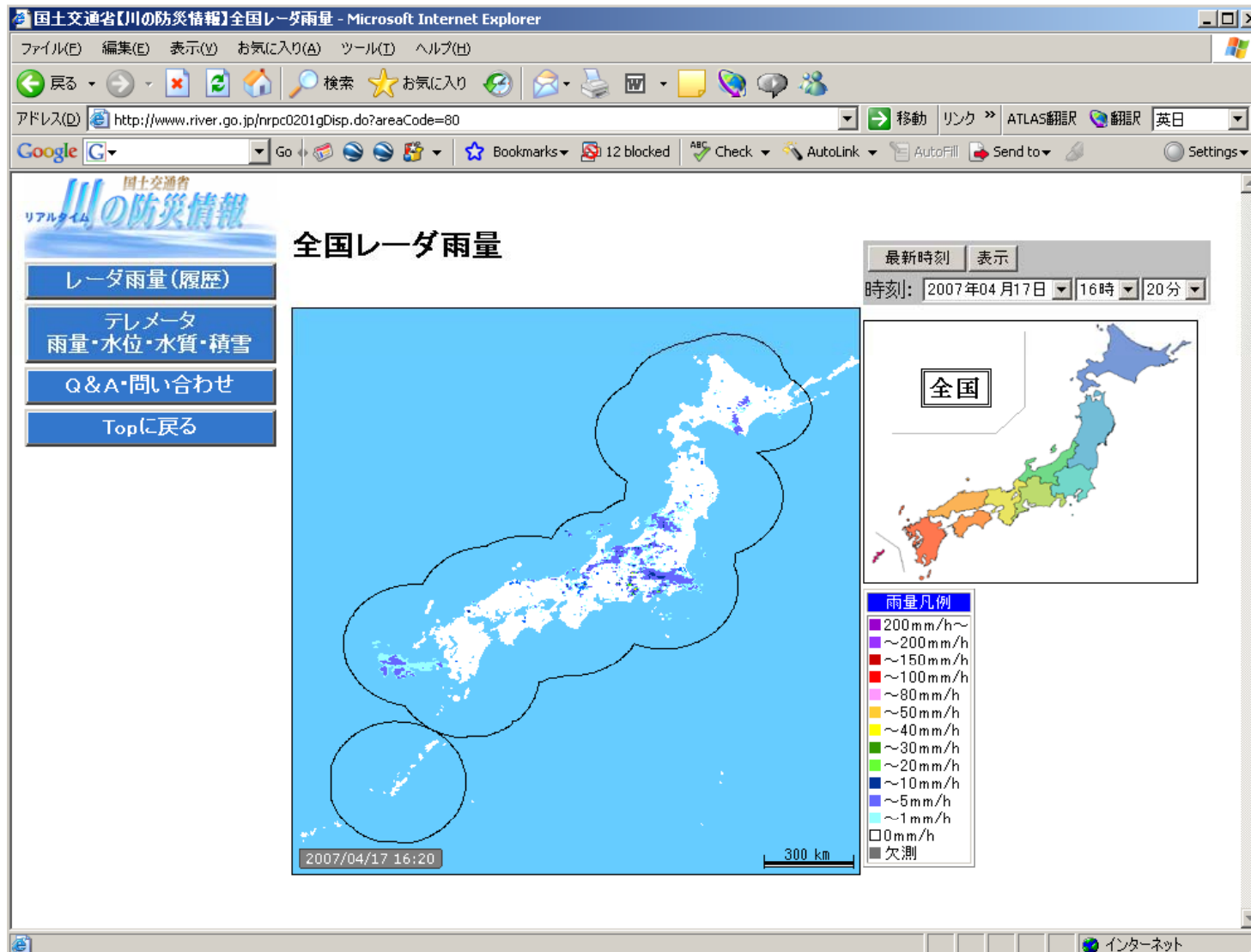




# Information through Internet for the Public

<http://www.river.go.jp/>

Dr. Nakao FRICS



# Information through Mobile Phone

<http://i.river.go.jp/>



Dr. Nakao FRICS

Thank you for your attention