Lake-catchment system and hydro-climatological fluctuations printed in lacustrine sediments

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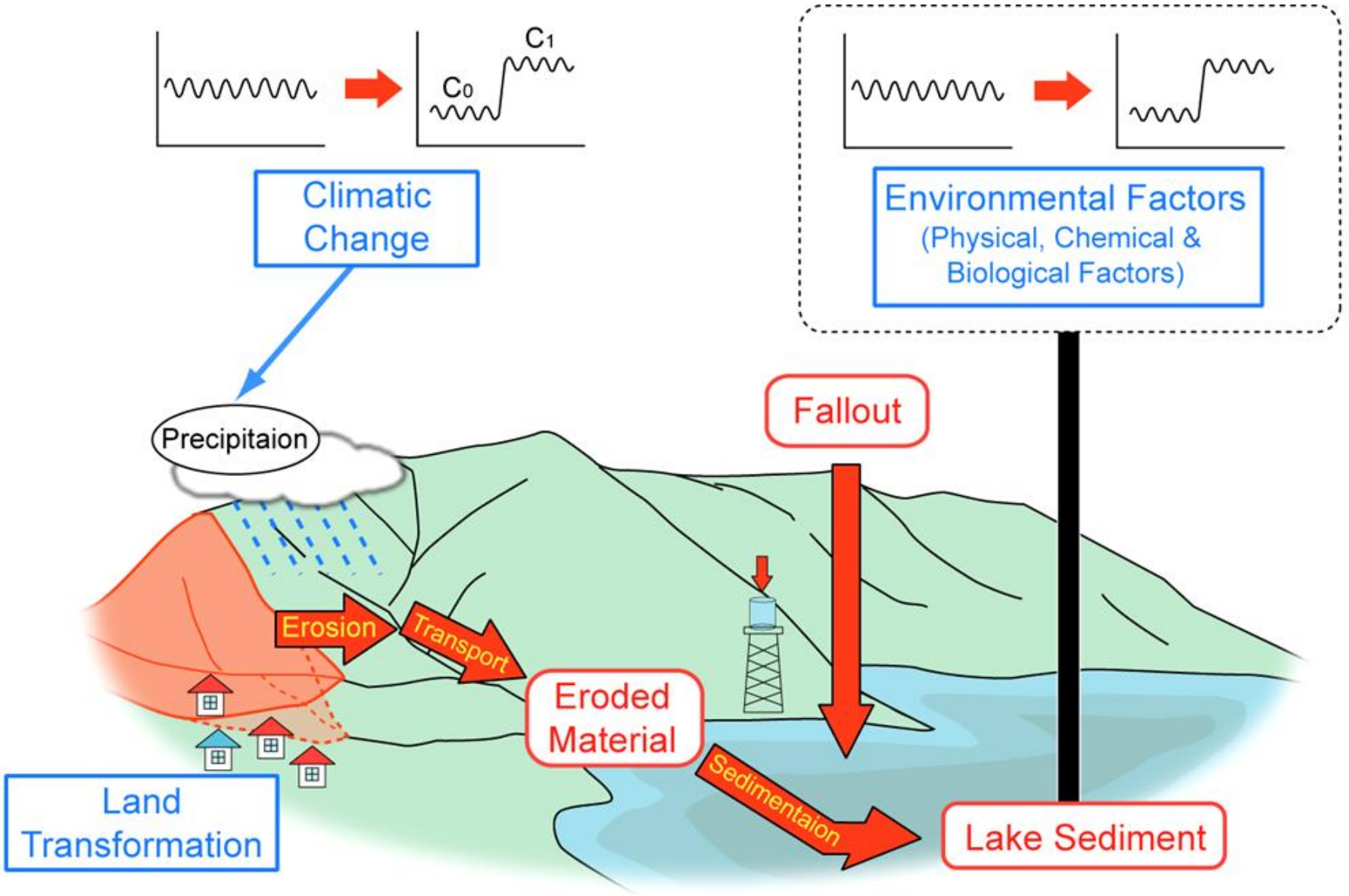
C1
C0
Climatic Change
Environmental Factors
(Physical, Chemical & Biological Factors)
Precipitaion
Fallout
Erosion
Transport
Eroded Material
Sedimentaion
Land Transformation
Lake Sediment

Monitoring for lake-catchment systems

Present monitoring:

1) Instrumental observation with sedimentary records in the present period.

Past monitoring:

2) Reconstruction of past environment with sedimentary information and documents based on understanding processes in the historical period.

3) Clarification of environmental changes with cosmic-solar and orbital fluctuations and sedimentary memory in the pre-historical period.

Future monitoring:

Simulation with models based on present and past data.

1. Outline of observation sites: Japan, China, Korea, etc.
2. On-going observation
3. Recent monitoring with sediments and observational records
4. Historical monitoring with sediments and documents


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Ulaanbaatar
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Kanazawa
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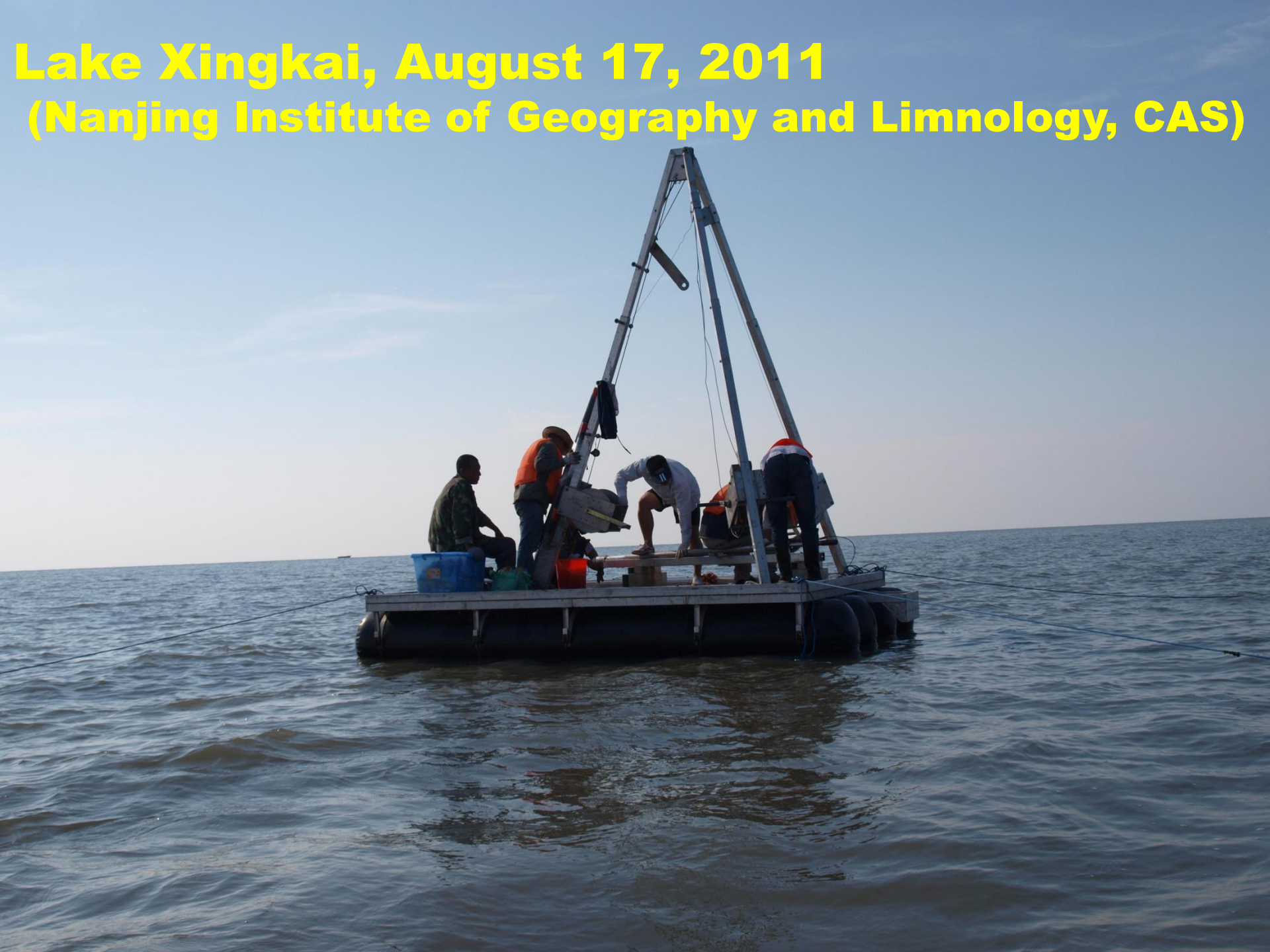
上空 3928.92 km
Short-term Cooperative Field
Taiwan


Lake Xingkai, August 17, 2011
(Nanjing Institute of Geography and Limnology, CAS)

Euirim-Je, Korea

Korea Institute of Geoscience and Mineral Resources

Instrumental observation for present lake-catchment systems

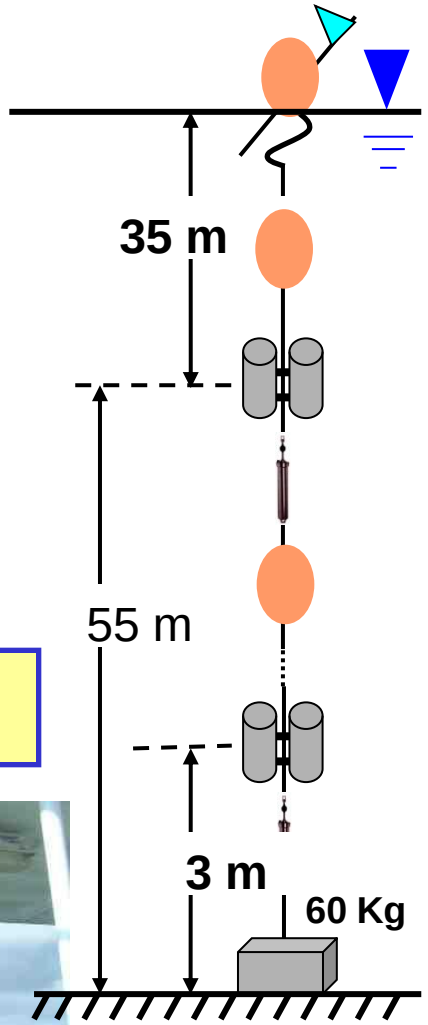
Takidani-ike (Kanazawa, Japan)

Kawauso-ike (Kobe, Japan)

Sediment-trap fishing (1or 2 /month)

Core Sampling

Lake Biwa,
Central Japan

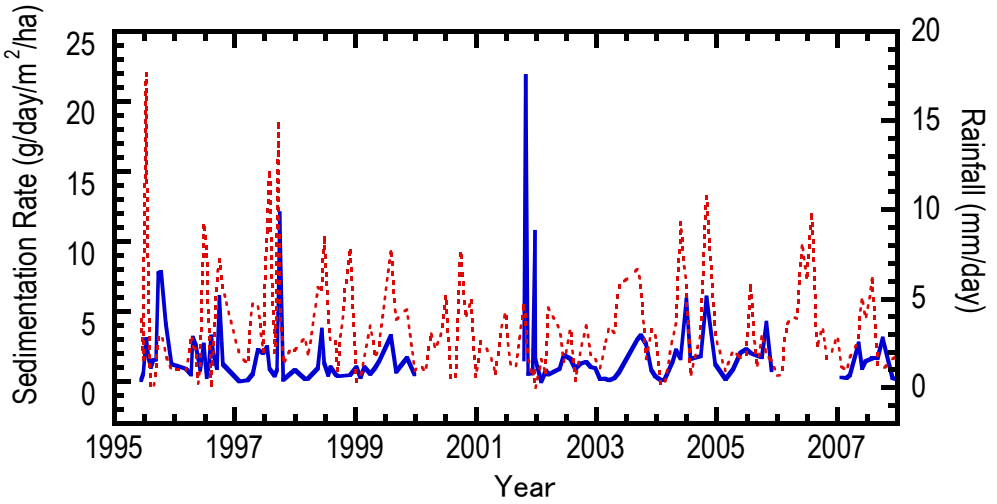


Sediment Trap

Monthly sedimentation rate and rainfall

Sedimentation rate

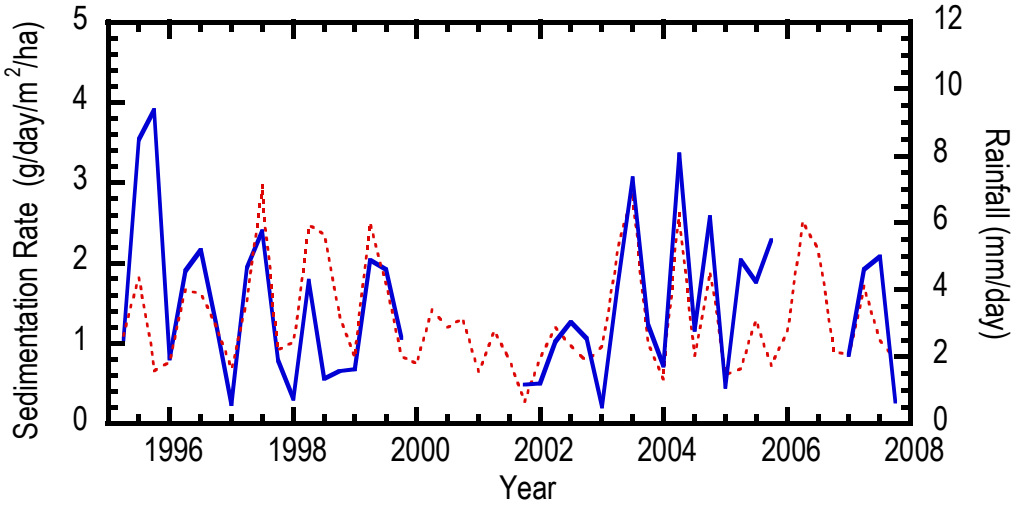
Rainfall



Seasonal sedimentation rate and rainfall

Sedimentation rate

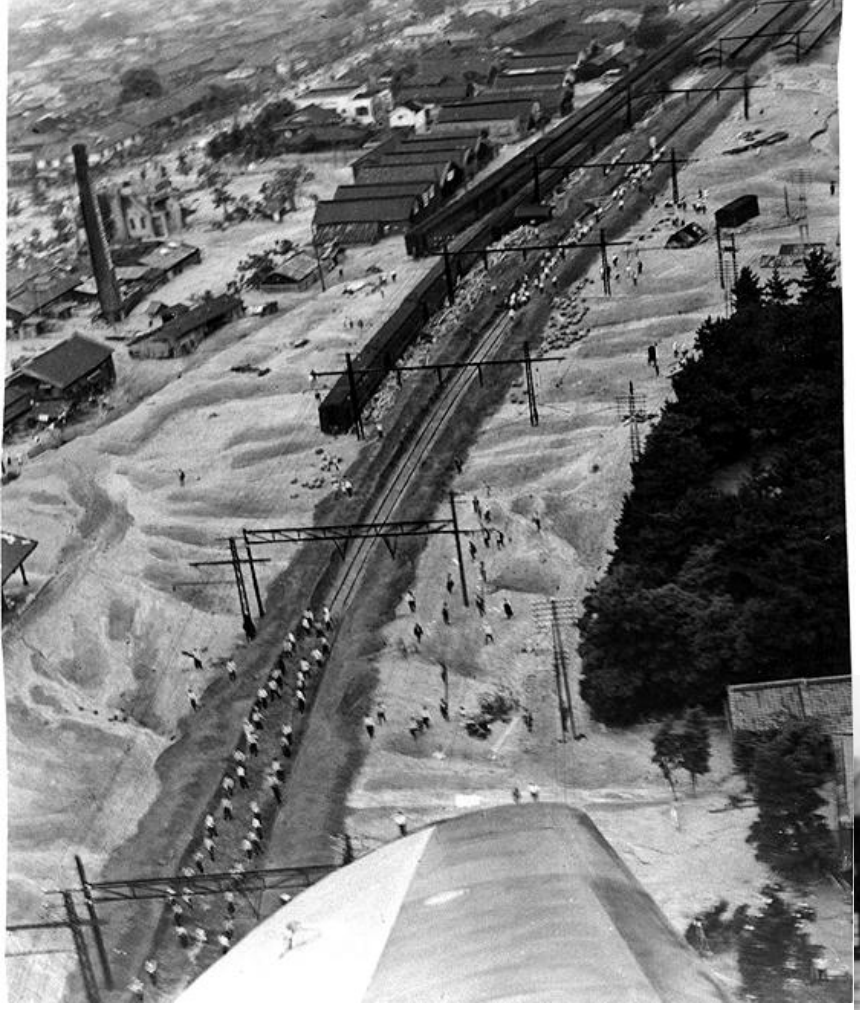
Rainfall



Kawauso-ike
Kobe

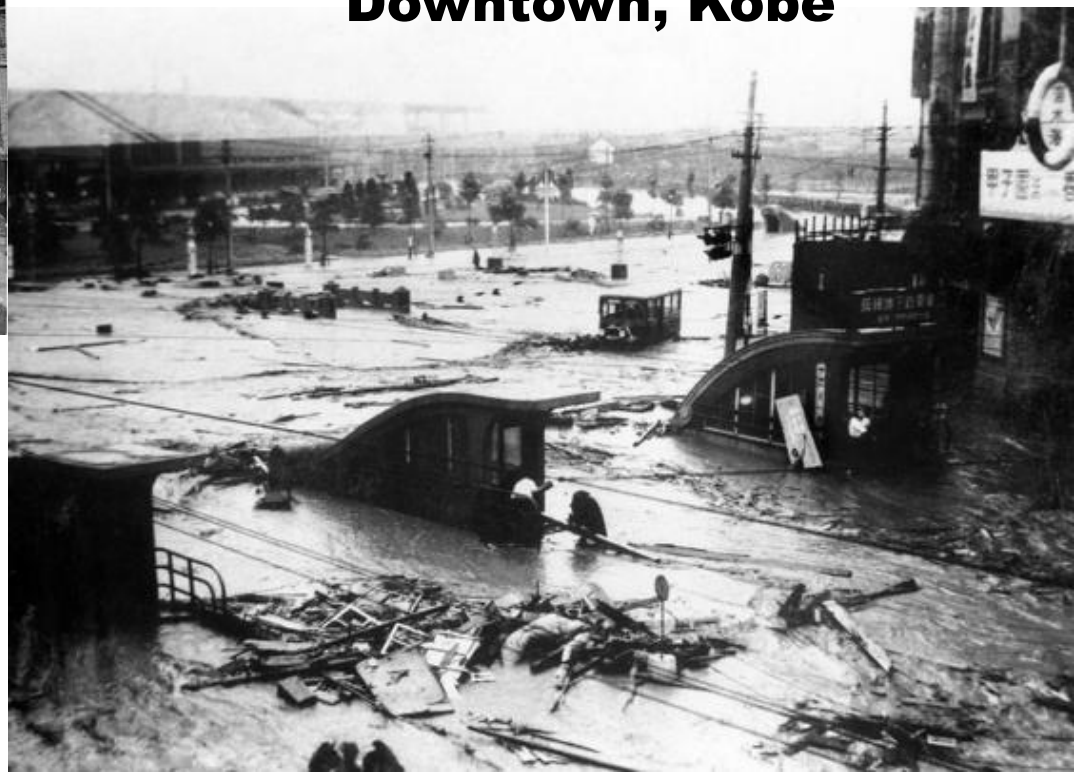
Heavy Rainstorm
(July, 1938)

Debris flows, landslides, floods, etc.

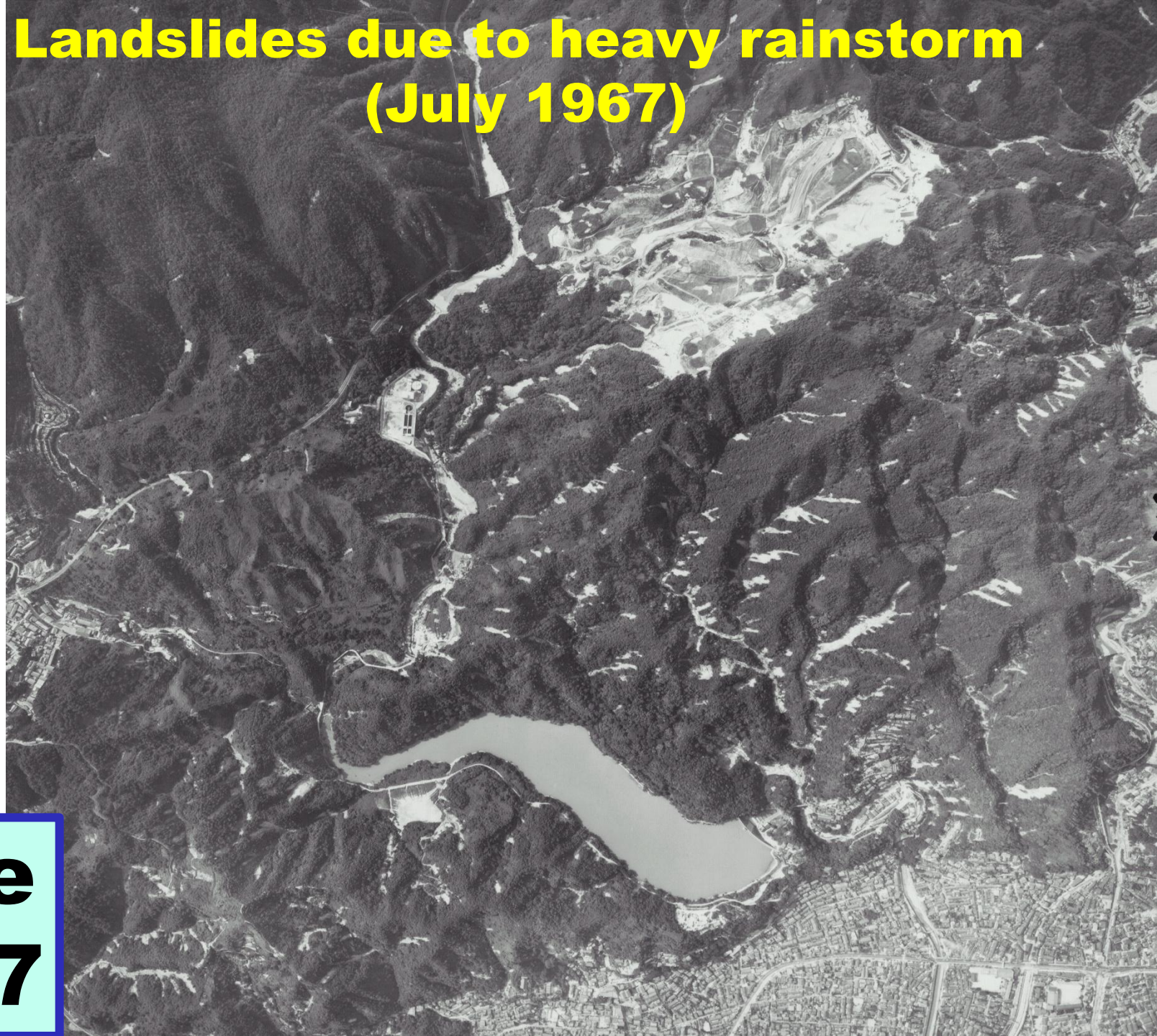


Sumiyoshi Station, Kobe

Downtown, Kobe

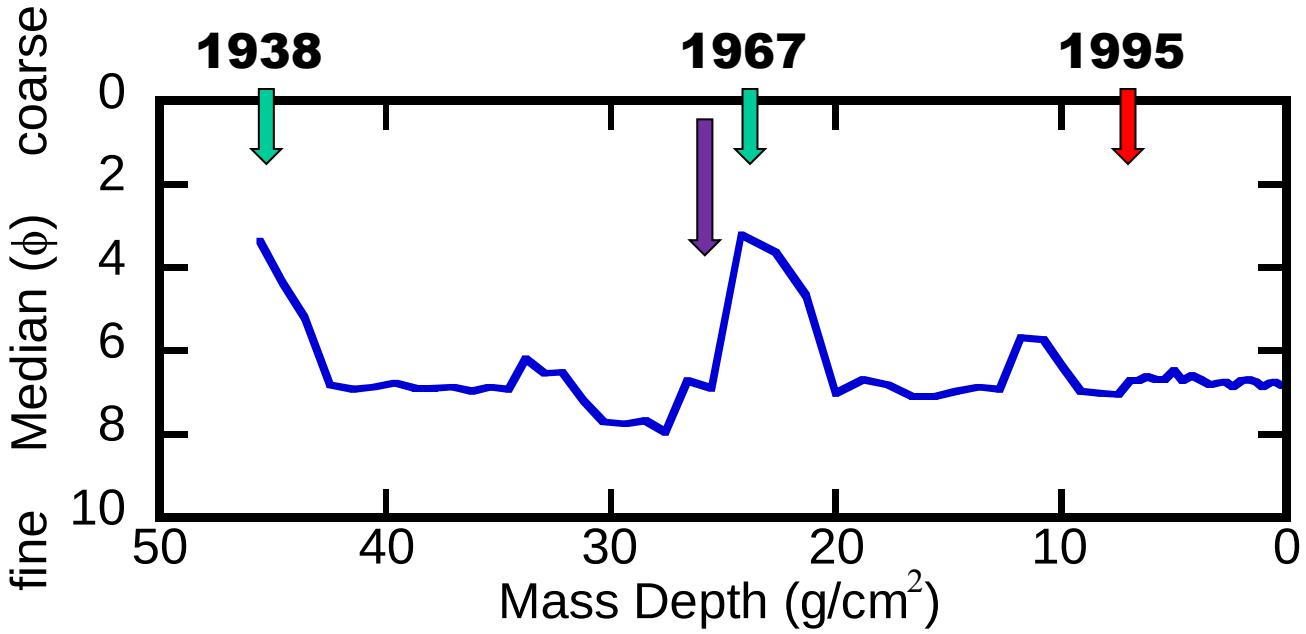


Kobe 1938

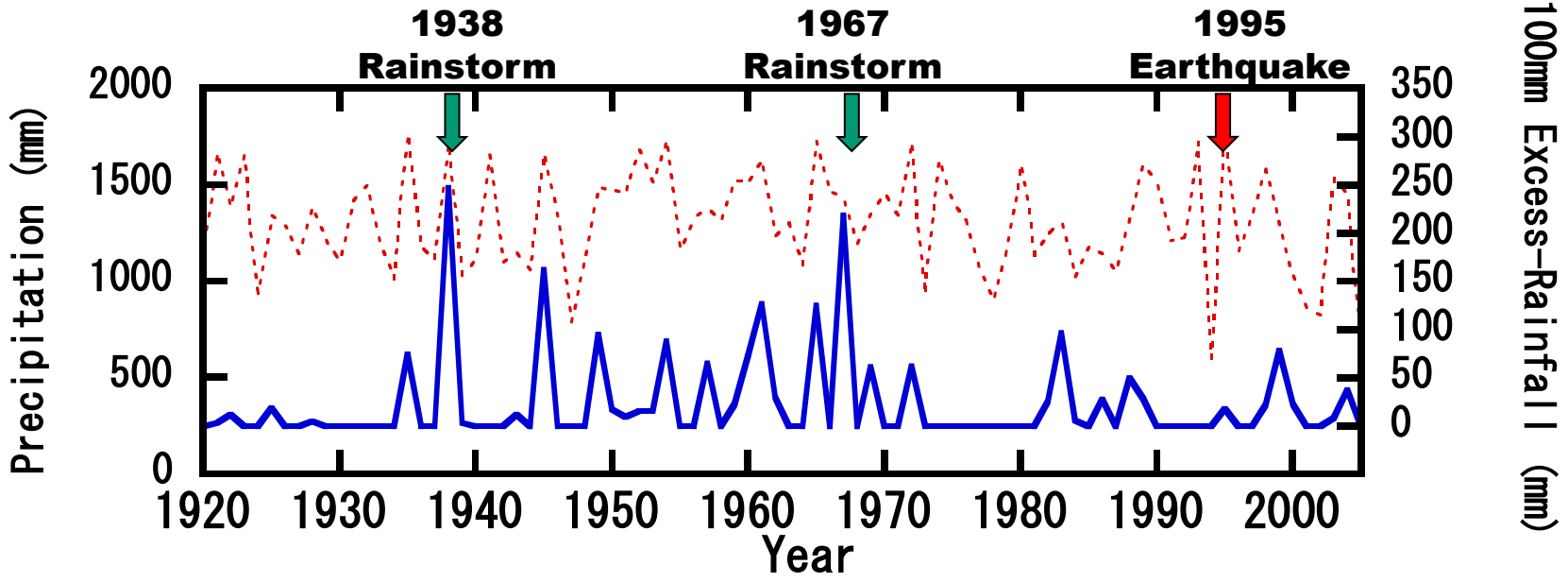


Kobe
1967

Grain Size Fluctuation in Core Sediments, Kobe



Peak in Cs-137 concentration; 1963



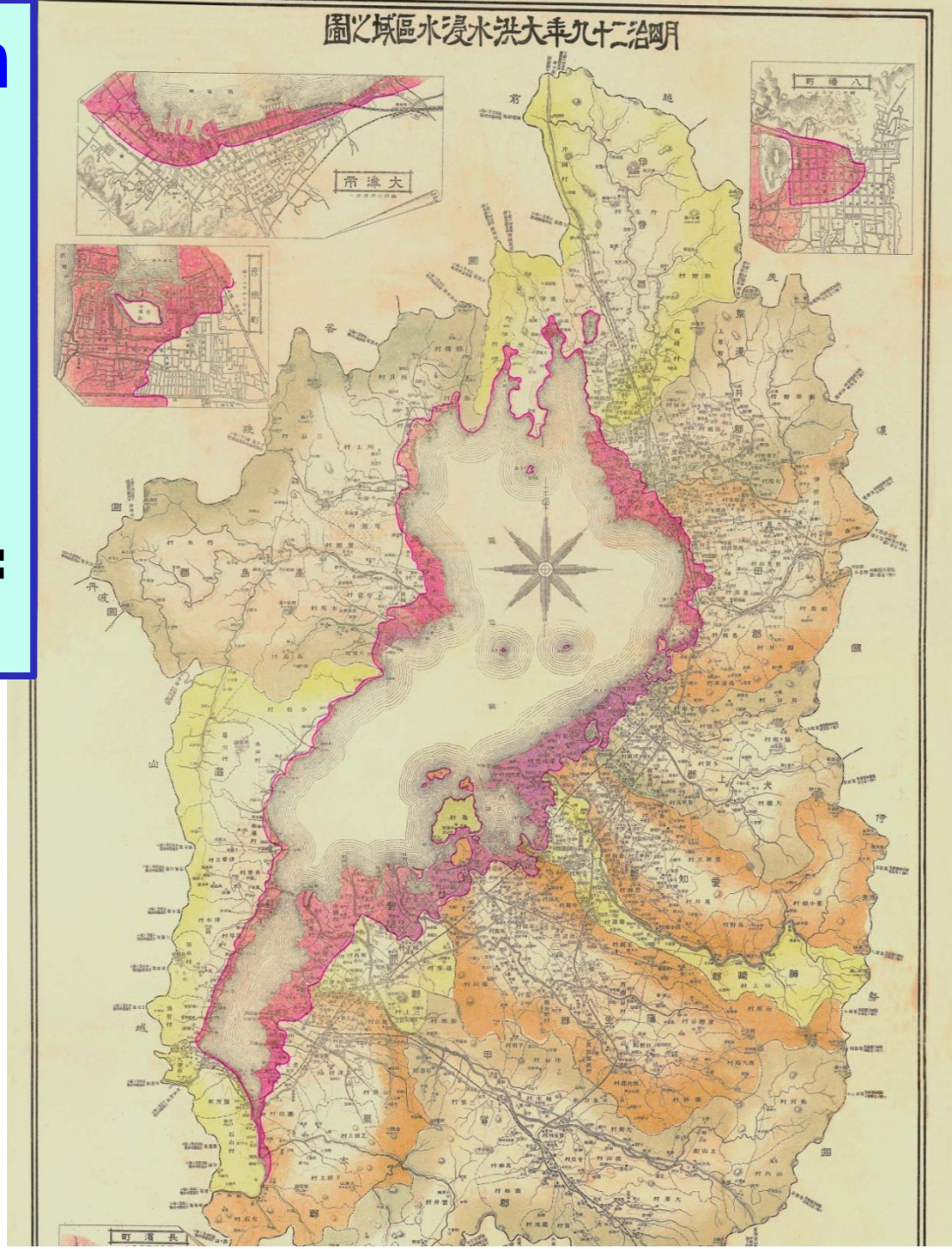
Meiji Rainstorm

(September, 1896)

Total rainfall:
Sep.7- Sep.10
947 mm

Max. daily rainfall:
684 mm

Increase in water level:
3.26 m



Flood area in the 1896 rainstorm

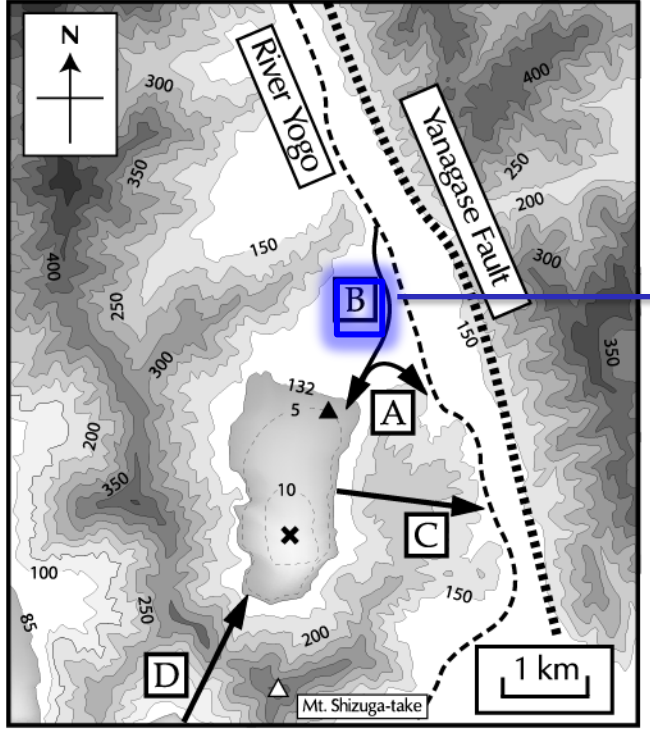
Lake Biwa 1896

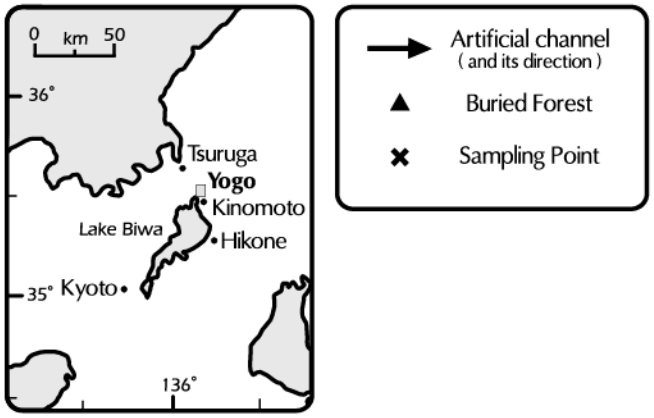
Isewan Taiphoon

1959

Floods in the catchment of Lake Biwa (Ane-gawa)

Lake Biwa 1959





(Shimada et al., 2002)

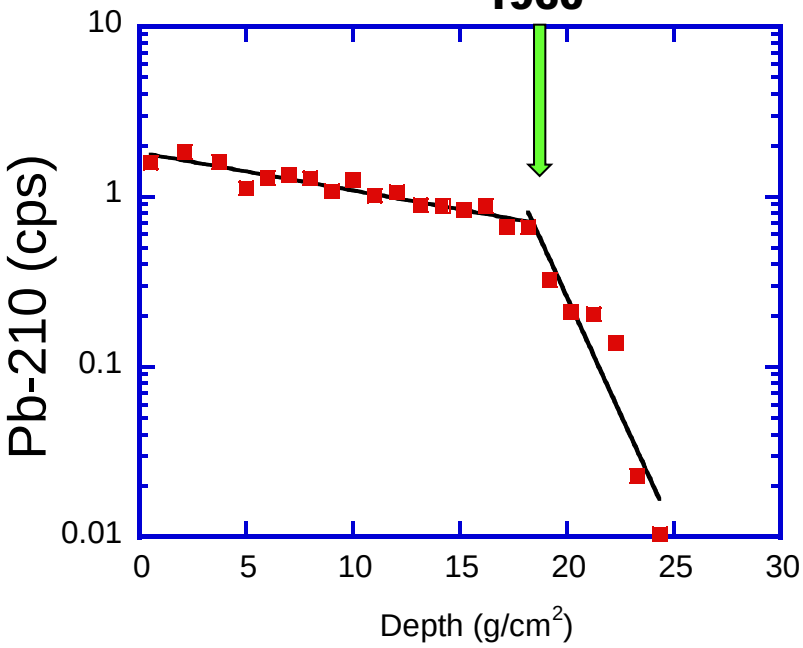
Lake Yogo and its surrounding area. Contour interval: — 50 m (land area); ... 5 m (lake area)

Lake Yogo

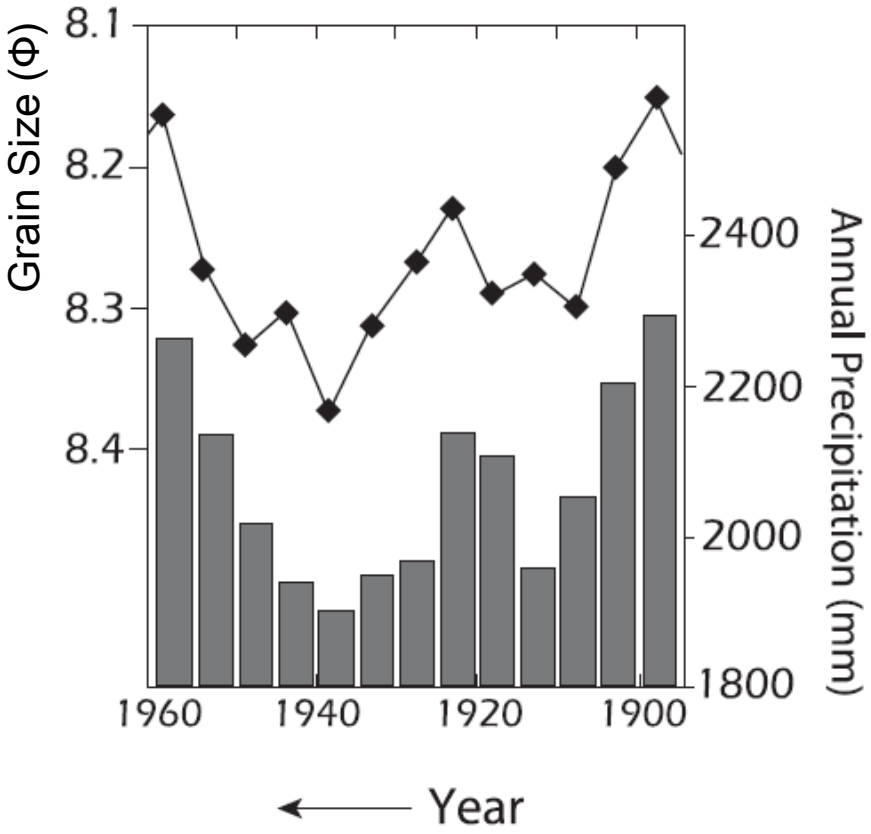
Piston Core Sampler

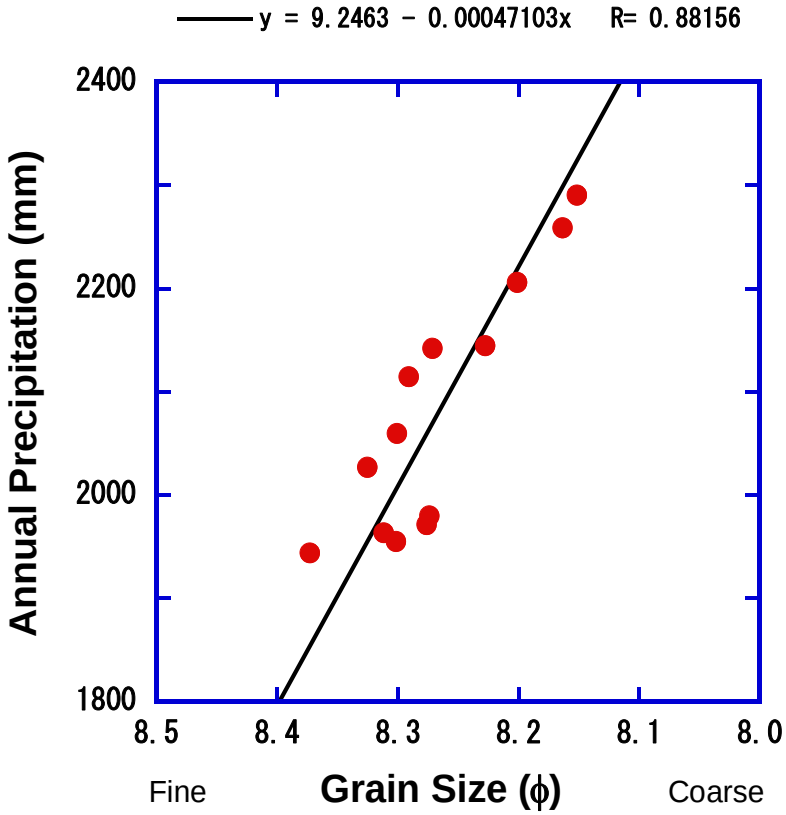
Core Sediment Information

Artificial channel construction: B 1960



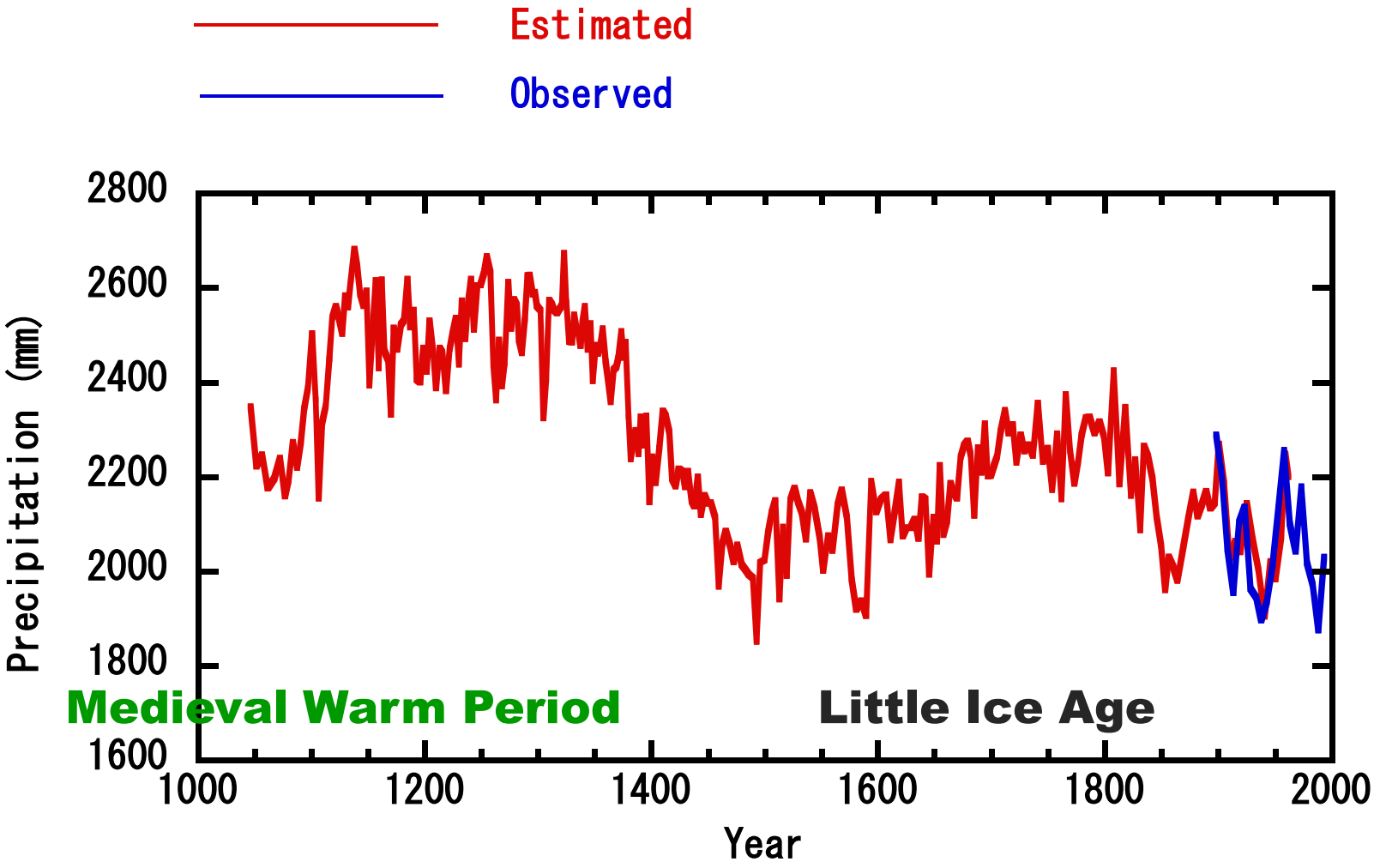
Annual Precipitation and Grain Size in Lake Yogo



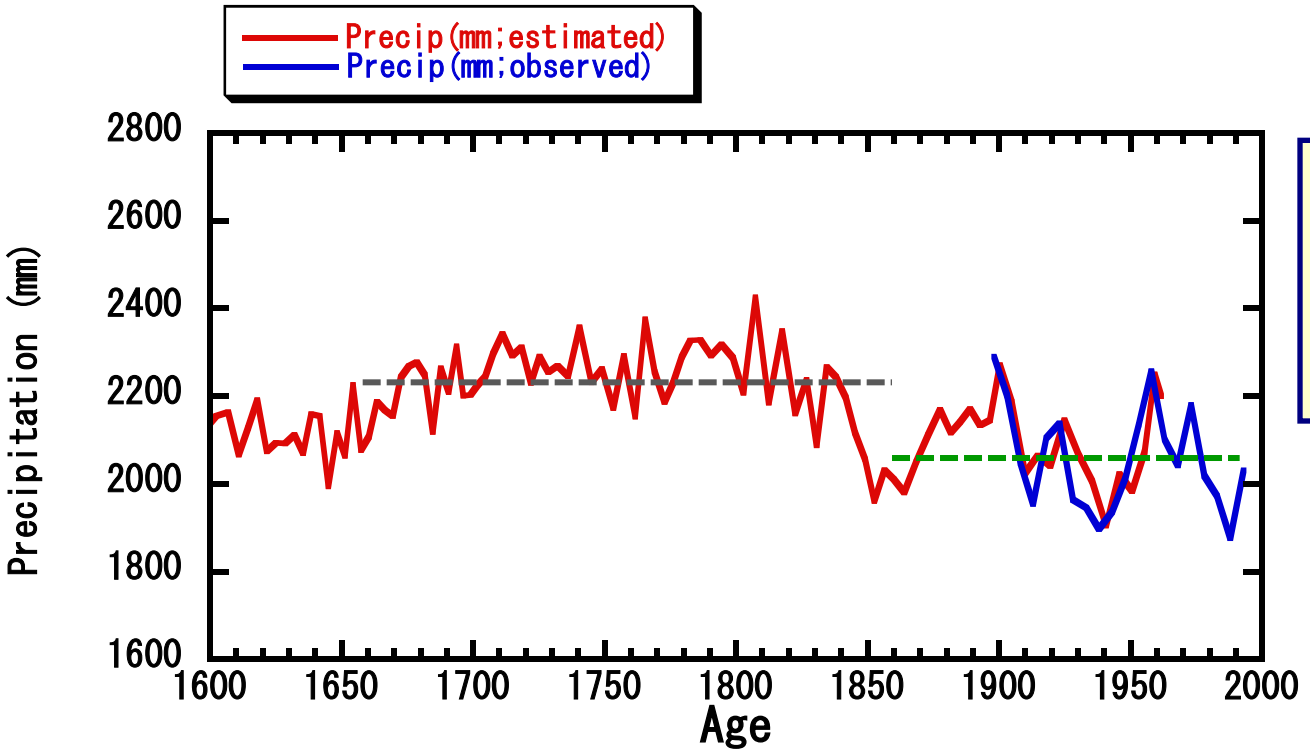


(Shimada et al., 2002)

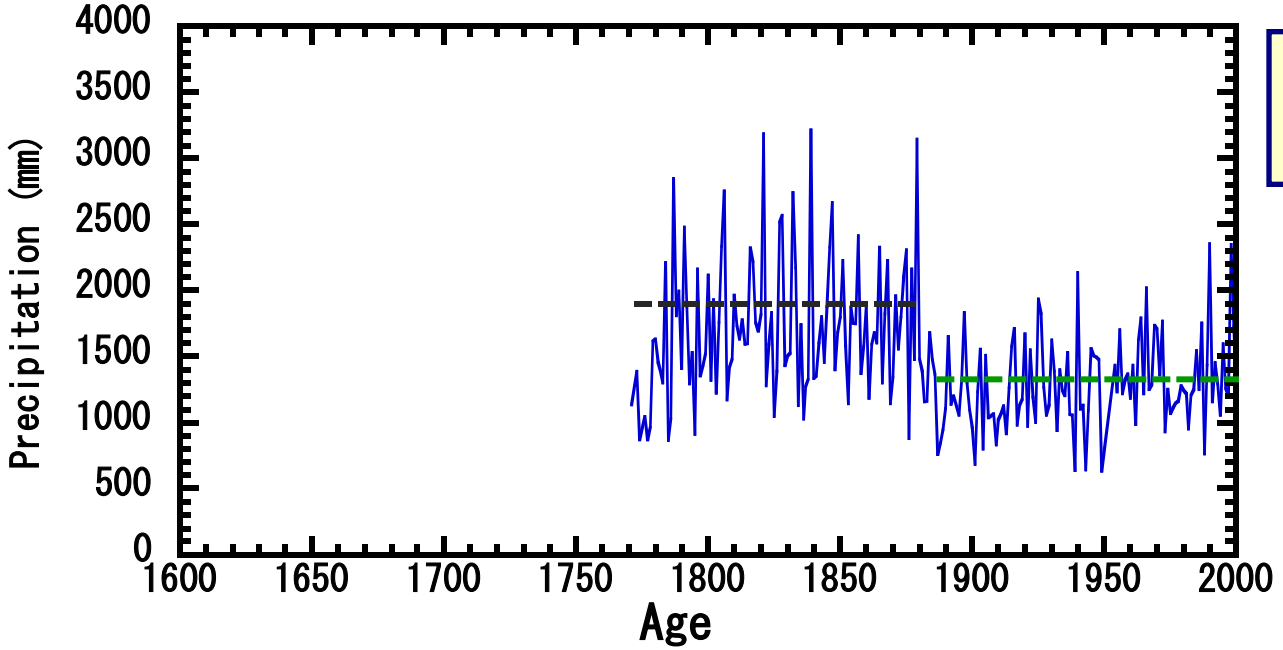
Precipitation during the past 1000 years estimated from sediments



Lake Yogo



Precipitation estimated from sediments
Lake Yogo
(Central Japan)



Precipitation observed
Seoul