

Progress of Sub-Project

Application of Space Rainfall for Hydrological Analysis

Thai-leader: Dr. Sarintip Tantanee,
Naresuan University

Japanese expert: Prof. Dr. Takehiko Satomura
Kyoto University

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Overall Activities

2011 2012 2013

Data collection:

•TRMM rainfall	✓	✓	
•Ground based (GB) radar rainfall		✓	
•Ground rainfall from gauge stations	✓	✓	✓

GIS development:

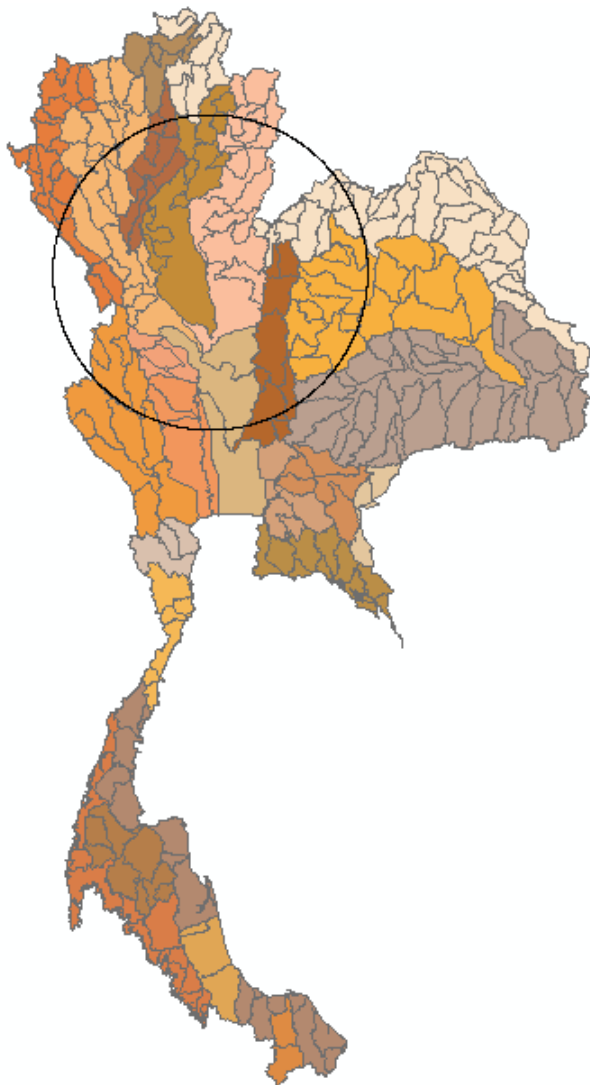
•GIS based of obtained TRMM, radar and gauge rainfall	✓	✓	✓
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Analysis process:

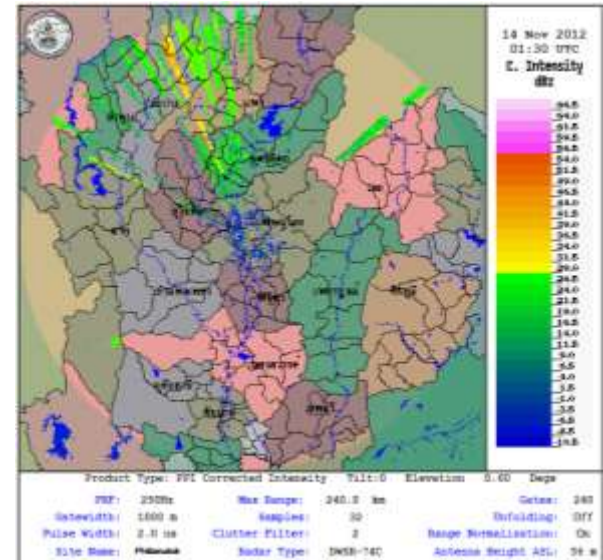
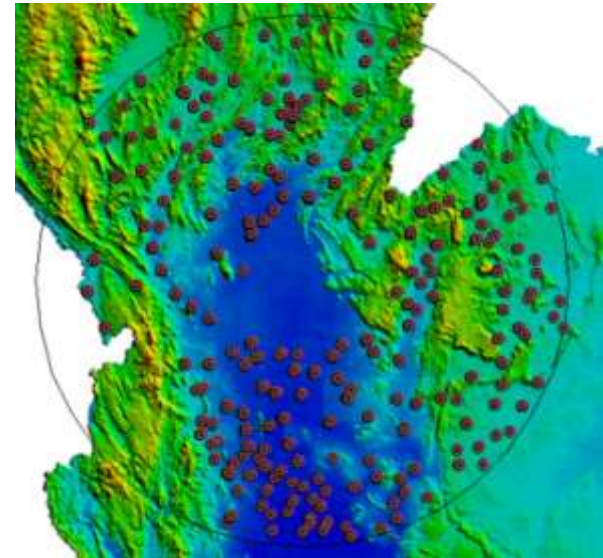
• Determine the blackout area (radar data loss area) over the studied area.		✓	
• Generate set of radar rainfall for the blackout area.			✓
• Comparing RADAR rainfall with ground observed data.		✓	✓
• Comparing TRMM rainfall with ground observed data.	✓	✓	
• Statistical study for GB radar and TRMM rainfall to detect interannual variation of rainfall.	✓	✓	✓
• Application of GB radar & TRMM rainfall for hydrological (rainfall-runoff) model for a selected watershed located in the studied area.			✓

Verification process

1. Activities area of Phitsanulok radar station

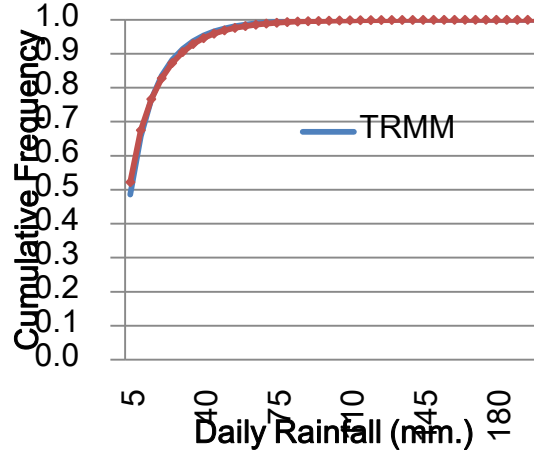
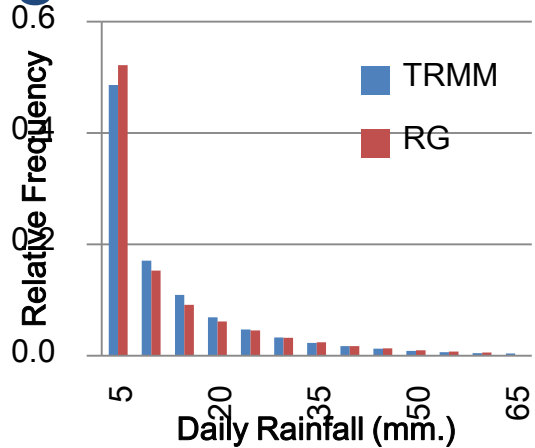


194 Rain gauge
(2009 - 2011)

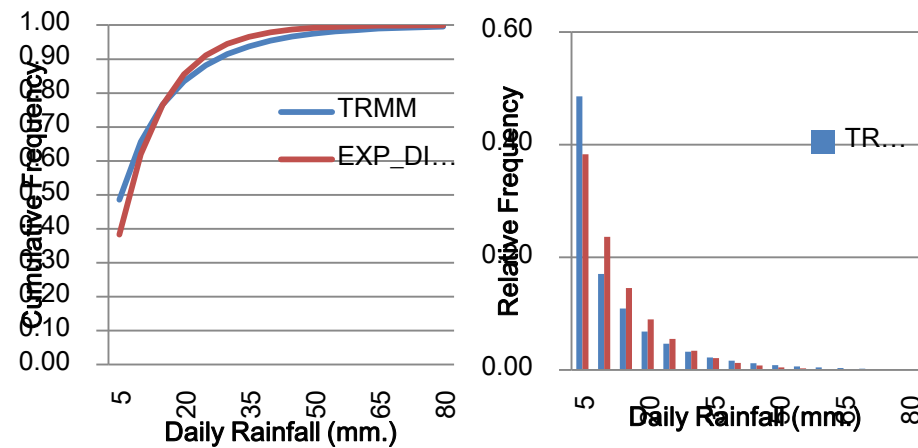


240 km. Radar radian

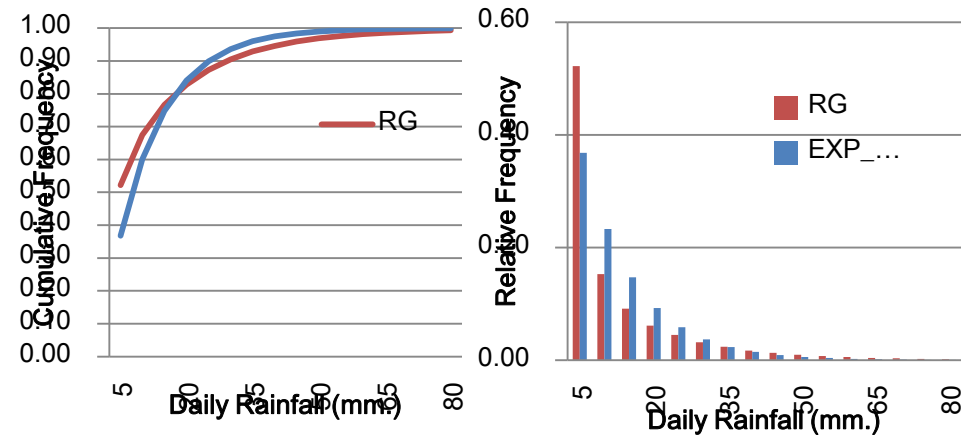
2. Statistical parameter of TRMM Daily rainfall and ground observed data.



Parameter	TRMM	RG
Mean	10.36	10.89
Standard Deviation	14.01	15.42
Skewness	2.51	3.08
Minimum	0.06	0.50
Maximum	168.12	347.50
Number of Data	59,343	59,343



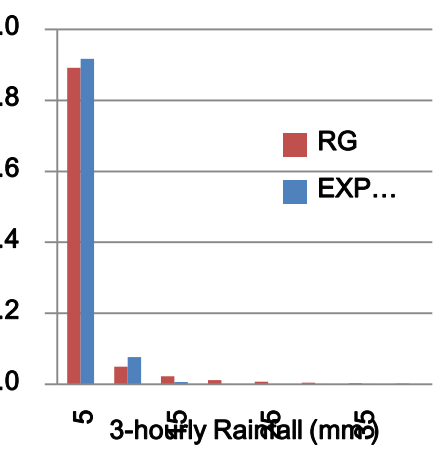
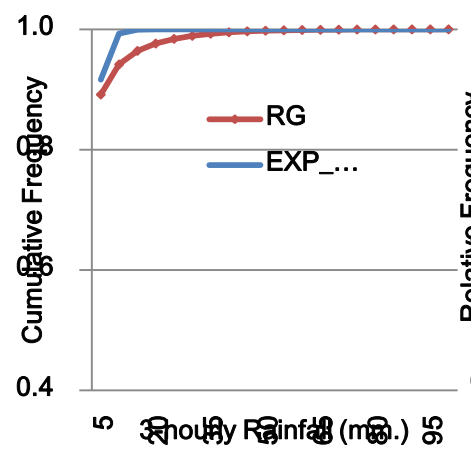
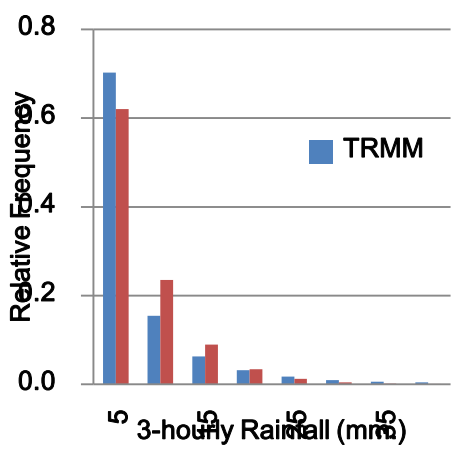
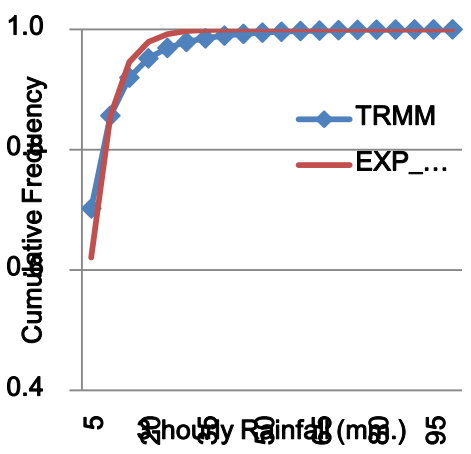
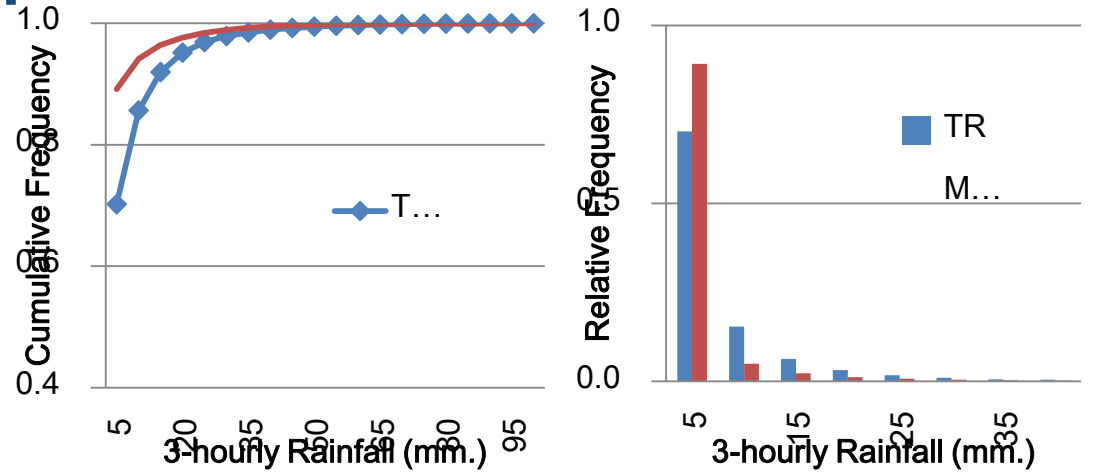
Daily TRMM
Rainfall (mm.)



Daily Gauge
Rainfall (mm.)

3. Statistical parameter of TRMM 3-hourly rainfall and ground observed data.

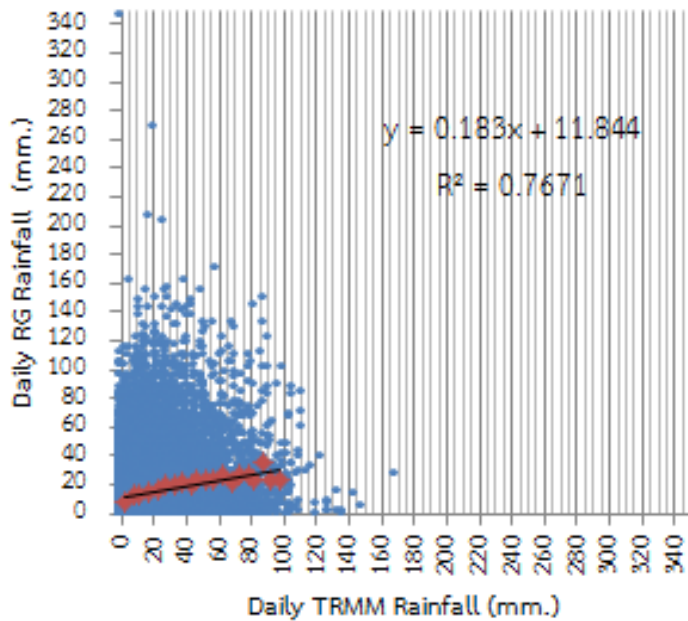
Parameter	TRMM	RG
Mean	5.16	2.01
Standard Deviation	8.13	6.01
Skewness	4.00	6.19
Minimum	0.03	0.50
Maximum	138.15	281.00
Number of Data	273607	273607



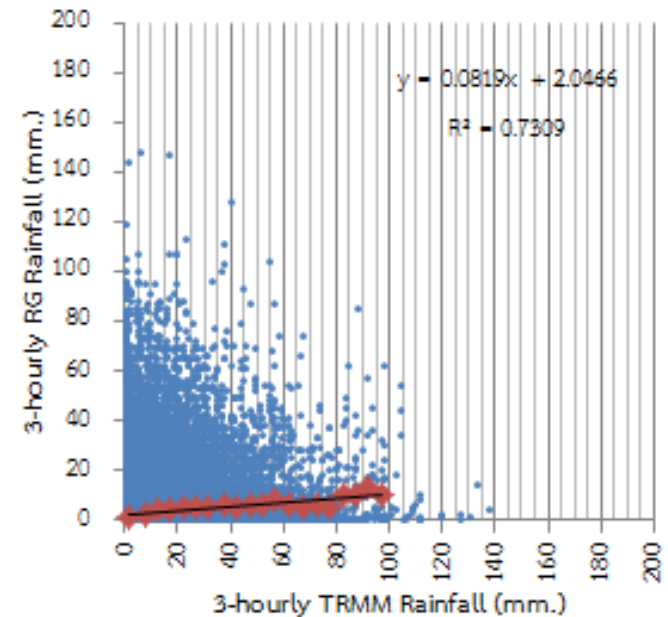
3-hourly TRMM Rainfall (mm.)

3-hourly Gauge Rainfall (mm.)

4. Comparing TRMM rainfall with ground observed data.

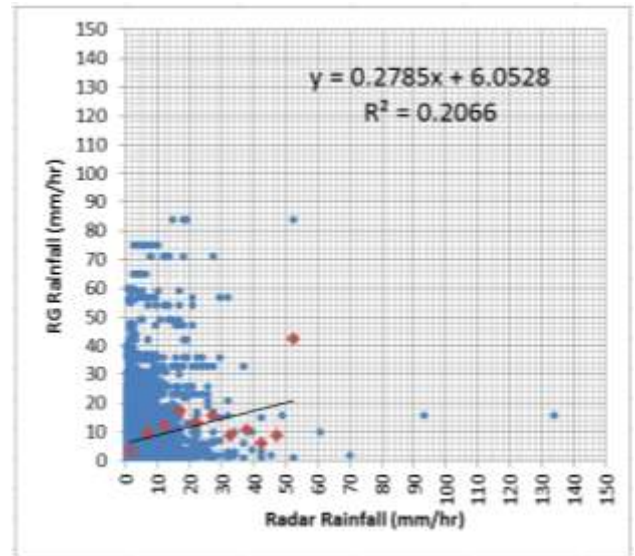
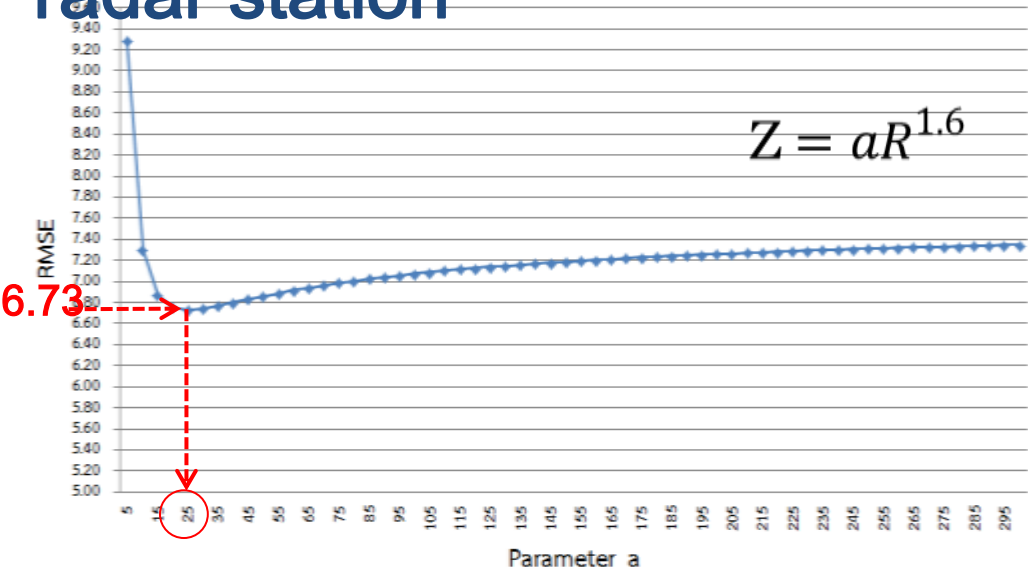


Daily Rainfall (mm.)



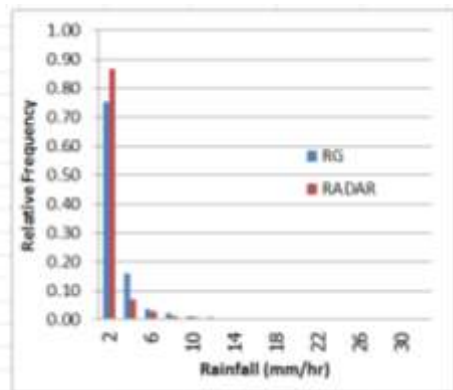
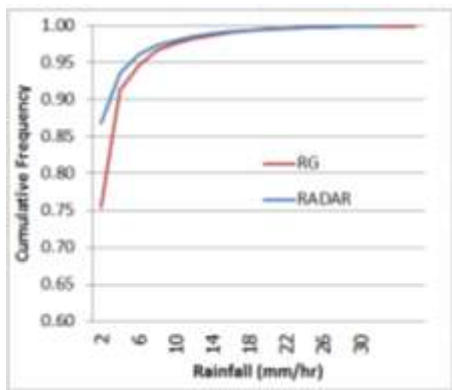
3-hourly Rainfall (mm.)

5. Sensitivity Analysis Z-R Relationship of Phitsanulok radar station



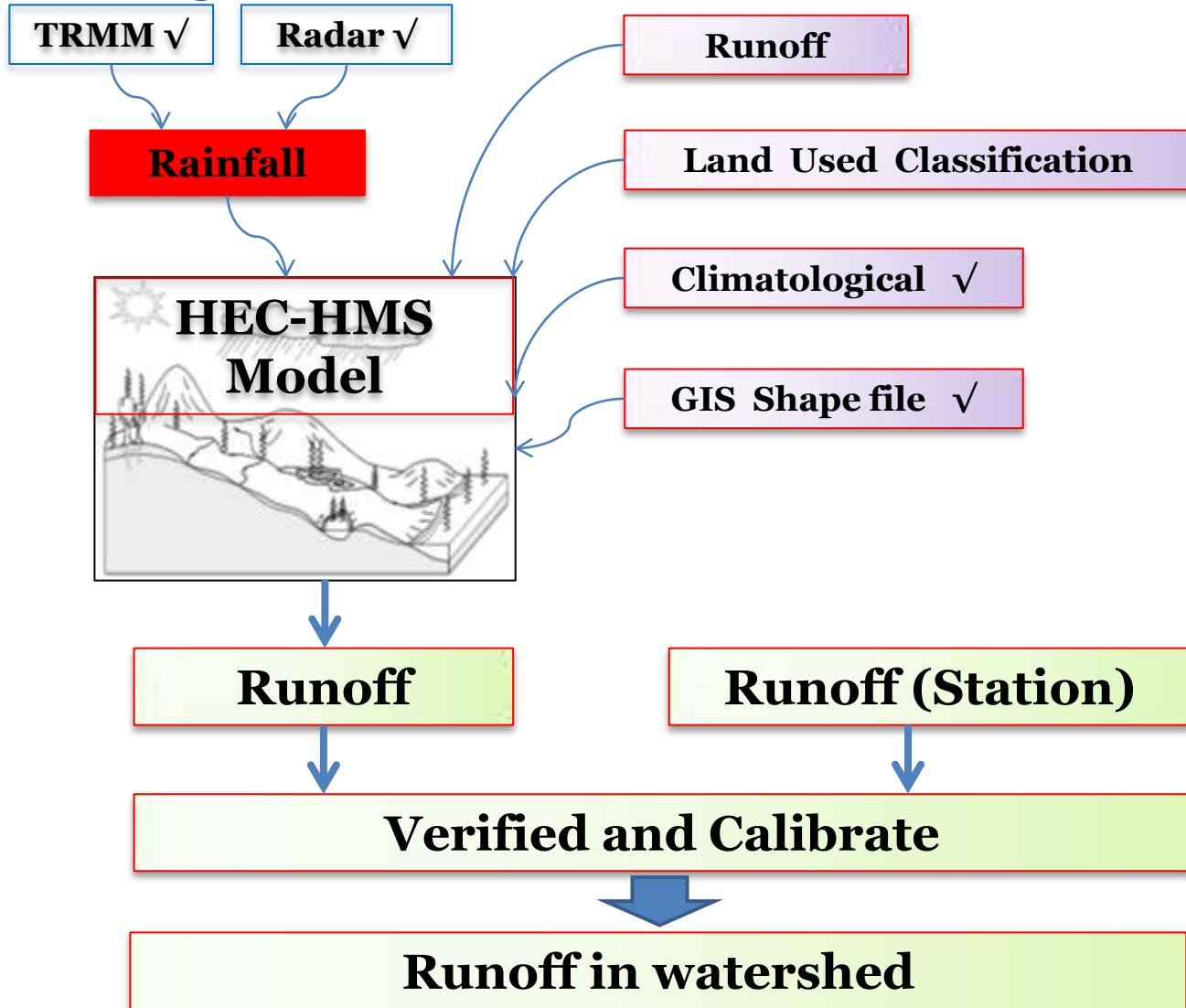
6. Statistical parameter of RADAR rainfall and ground observed data

Parameter	RG	RADAR
Mean	4.01	1.88
Standard Deviation	6.57	3.19
Skewness	4.81	9.81
Minimum	1.00	0.27
Maximum	84.00	133.75
Number of Data	20769	20769



Rainfall (mm/hr)

7. Application of Space Rainfall for Hydrological Model



Next step activities

2013

- ❑ Application of TRMM rainfall and GB radar rainfall for hydrological model (HEC-HMS).
- ❑ Verification process by comparing observed runoff with obtained results that space rainfall are applied to rainfall – runoff model.
- ❑ Providing training course for TMD staff concerning the process of radar rainfall calibration by using observed rainfall from gauges.



Thank you