

**EFFECTIVE ACCURACY OF SATELLITE-DERIVED  
GLOBAL, DIRECT AND DIFFUSE IRRADIANCE  
IN THE CENTRAL US**

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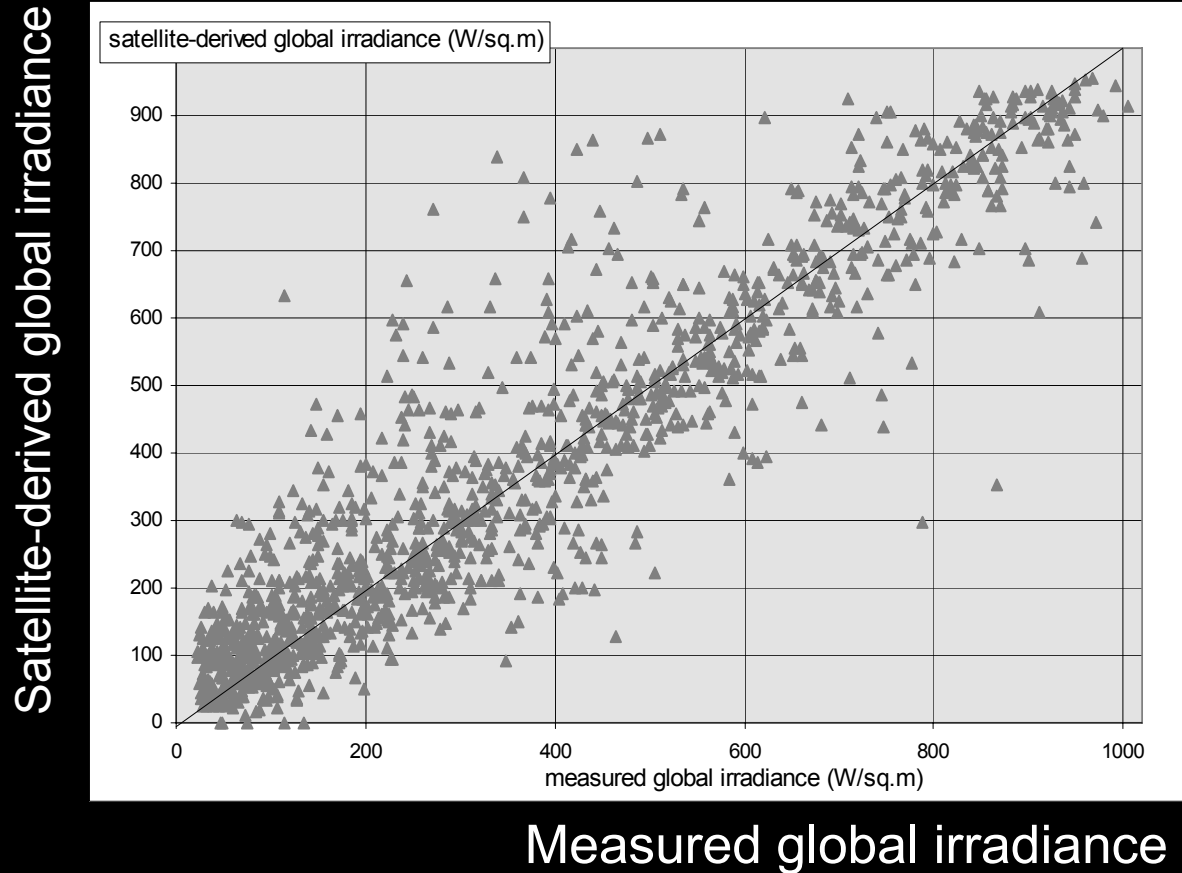
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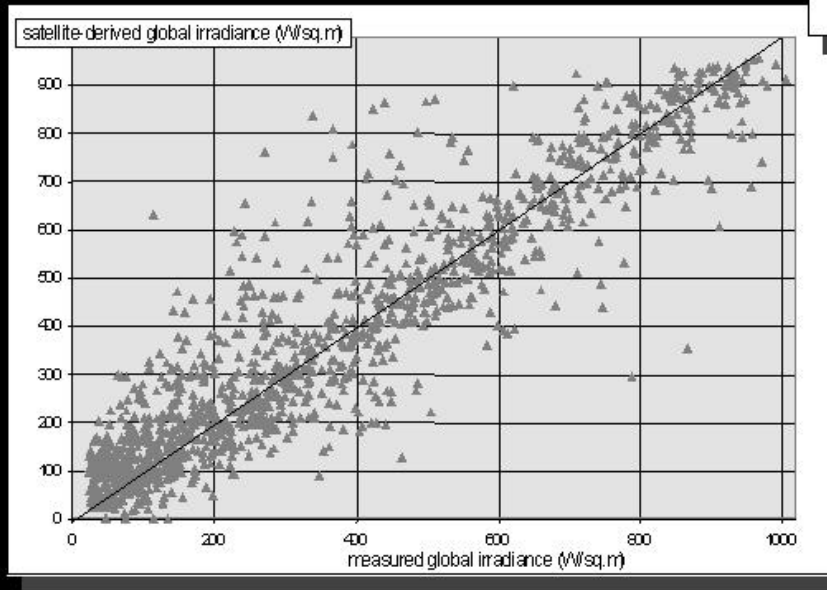
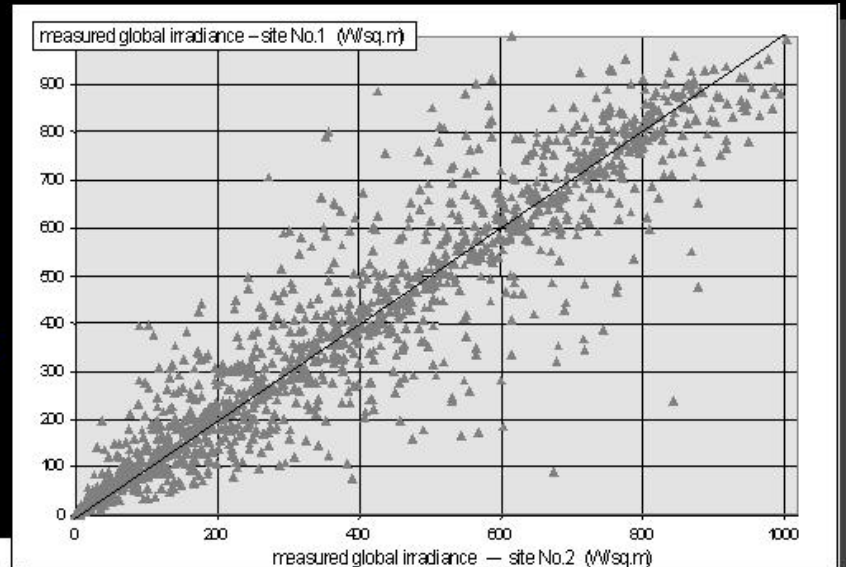
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# Short term Effective Accuracy



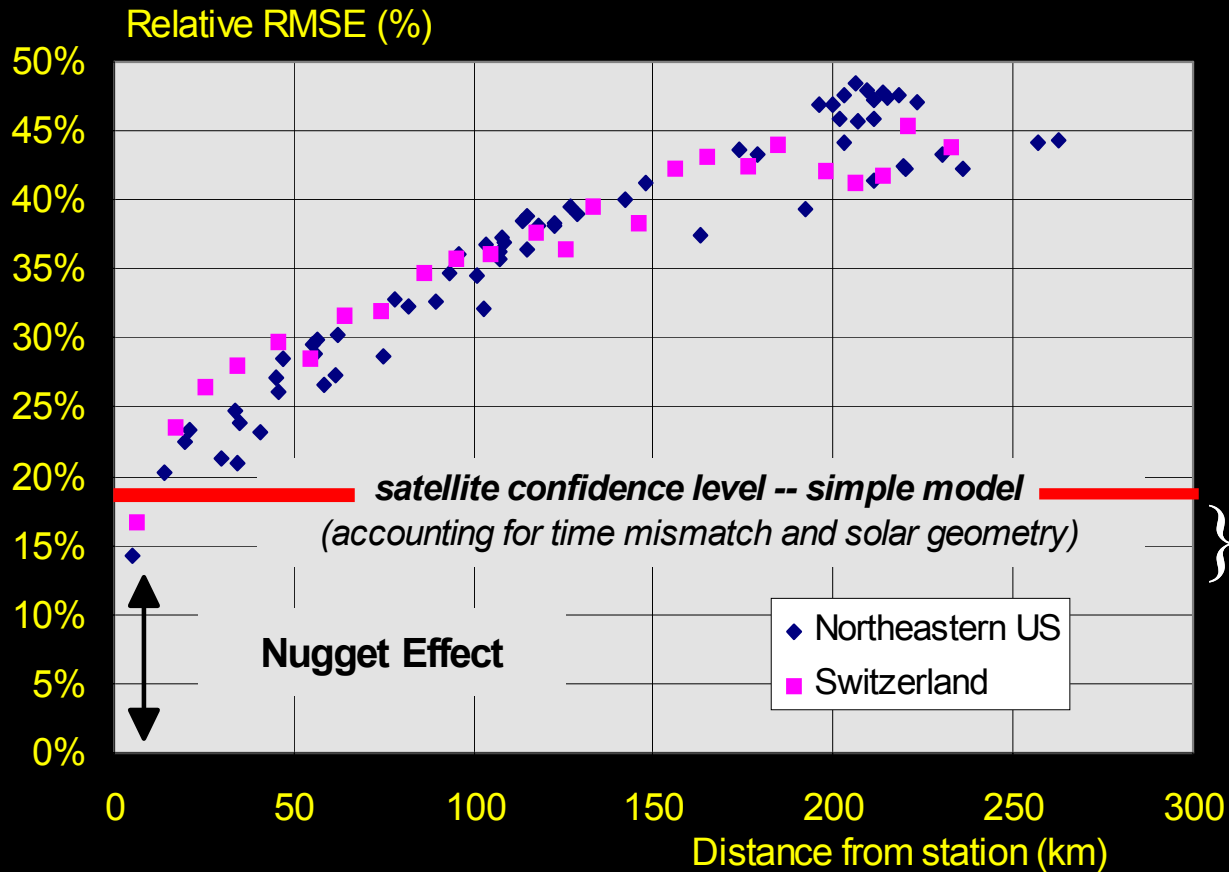
time/site specific data

*Perez et al., ASRC*



# Hourly RMS Error as a function of station distance

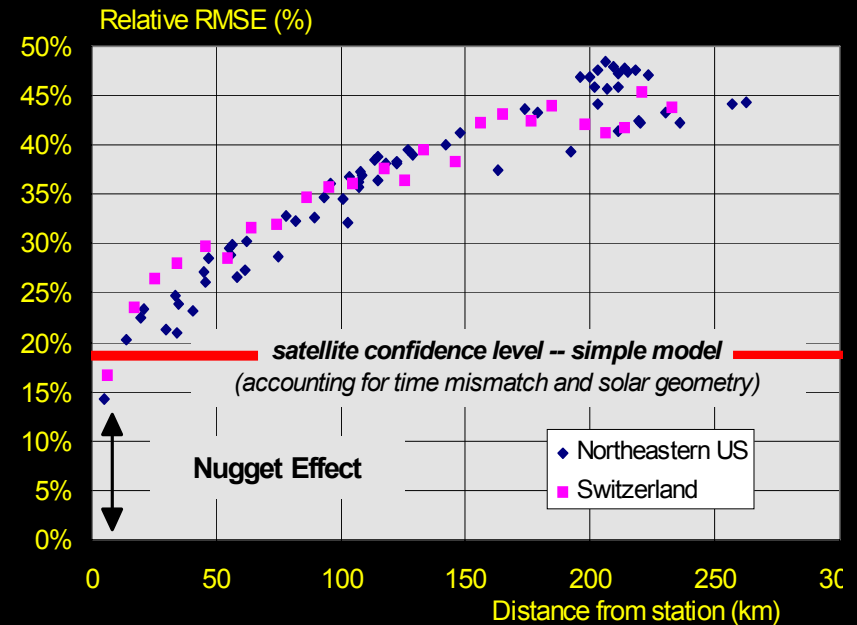
*satellite becomes more accurate beyond 20 km*



} *Satellite's Effective Accuracy*

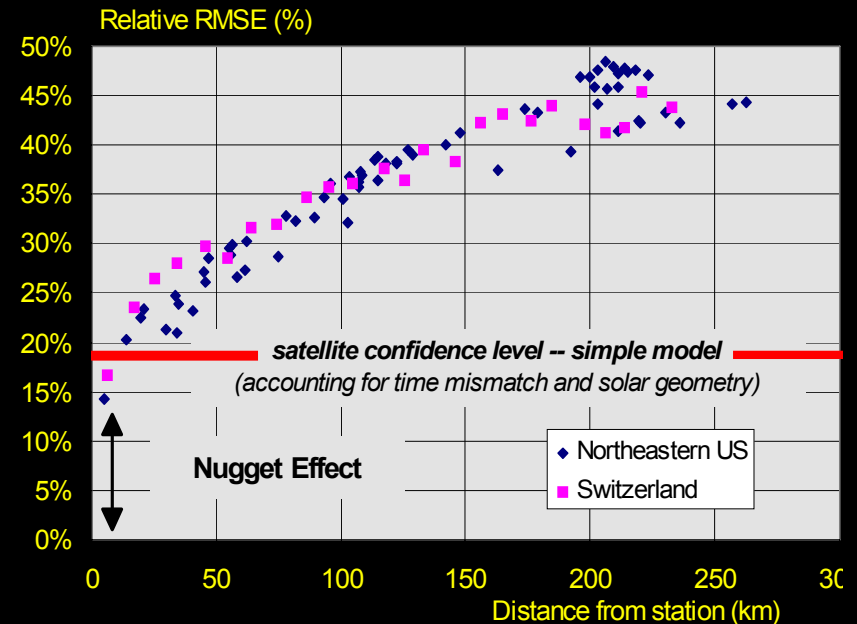
# NE-US / Switzerland Study

- Ground measurement networks not designed for research
- Hourly data only
- Global irradiance only
- Humid / temperate climates
- Marked orographic features



## NE-US / Switzerland Study

- Ground measurement networks not designed for research
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## SOUTHERN GREAT PLAINS STUDY

- Ground measurement network designed for research (ARM)
- One minute, hourly and daily data
- Global, direct and diffuse irradiances
- Continental climate
- Limited orographic features



<http://www.arm.gov/>

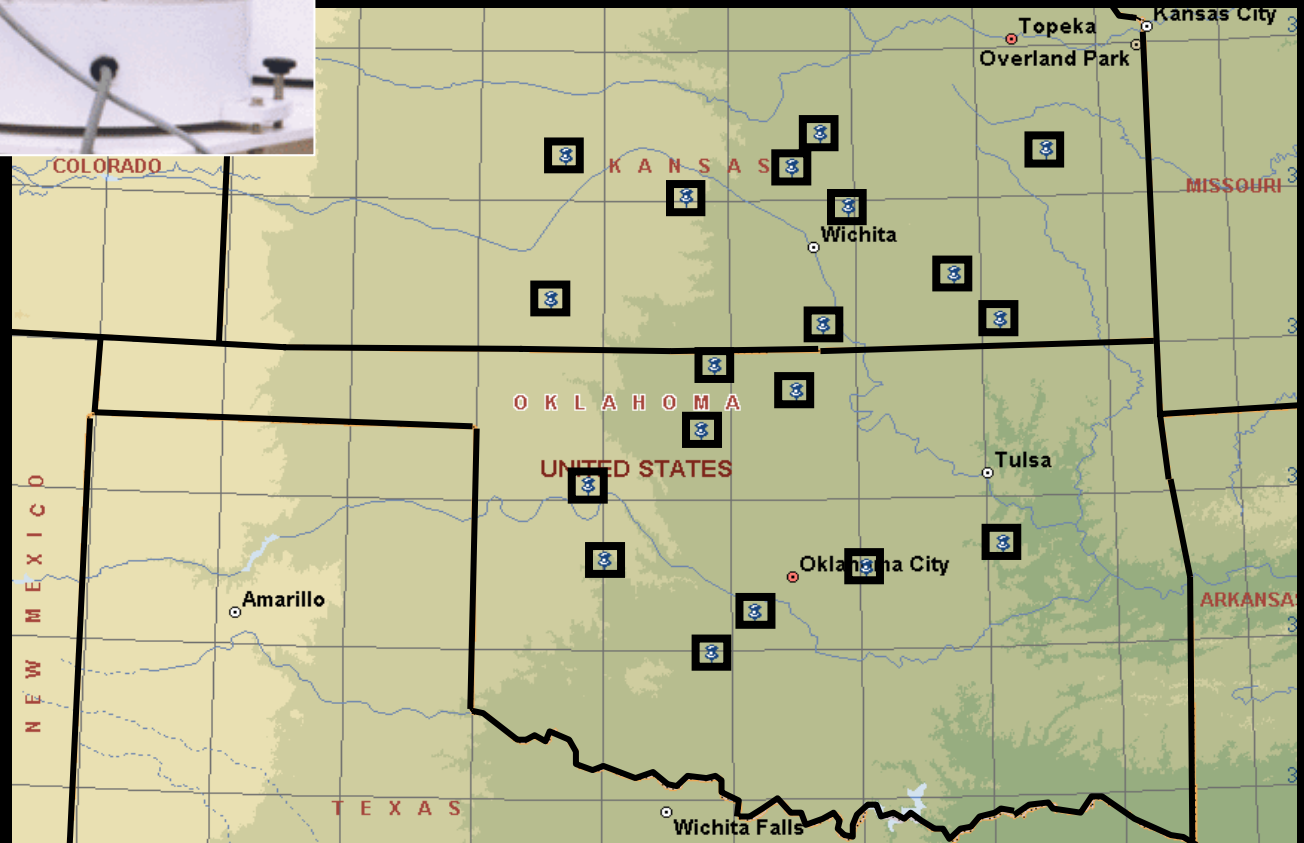




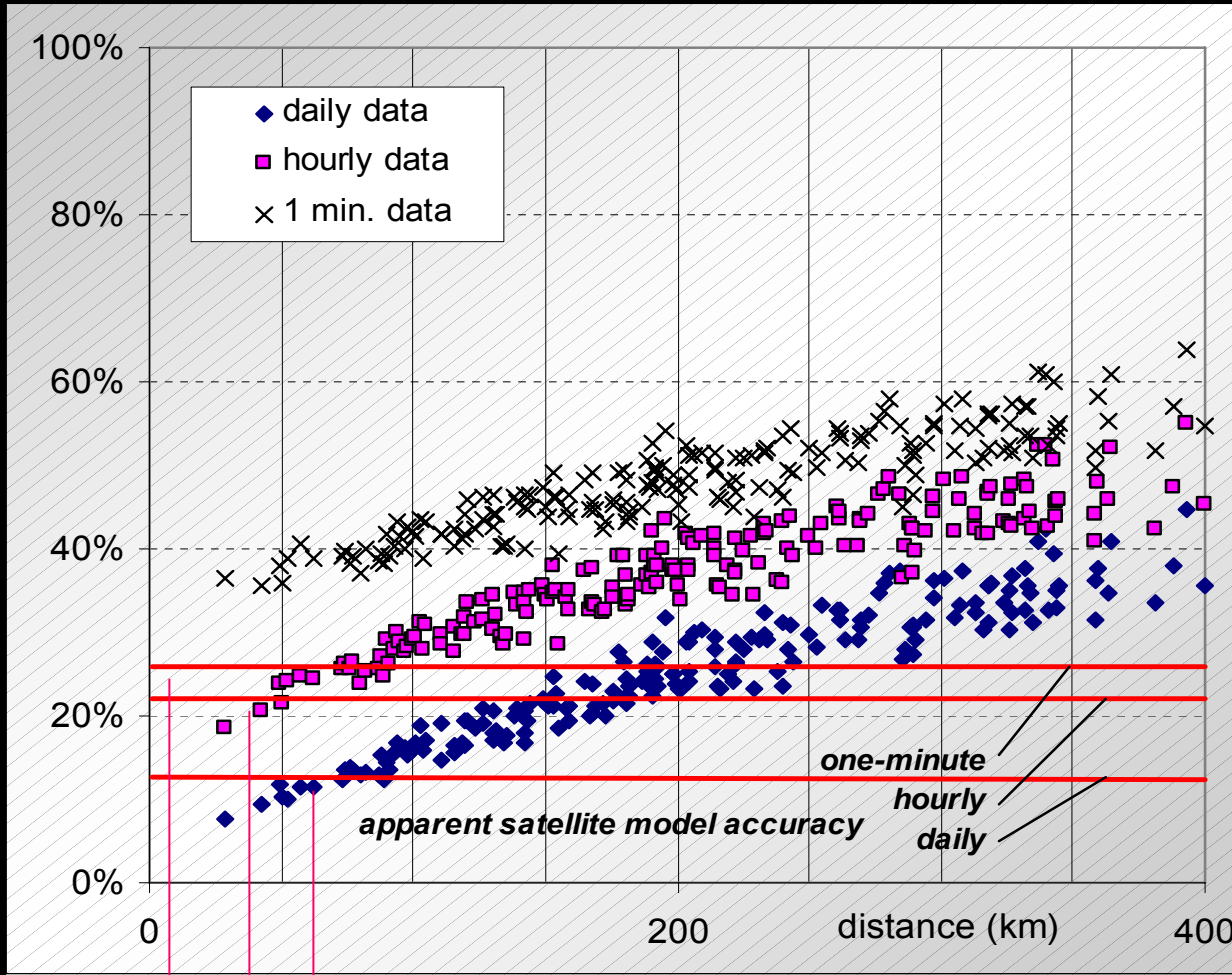


## ARM Extended Facility

- WMO class I global, direct, diffuse
- 19 out of 26 stations used for analysis

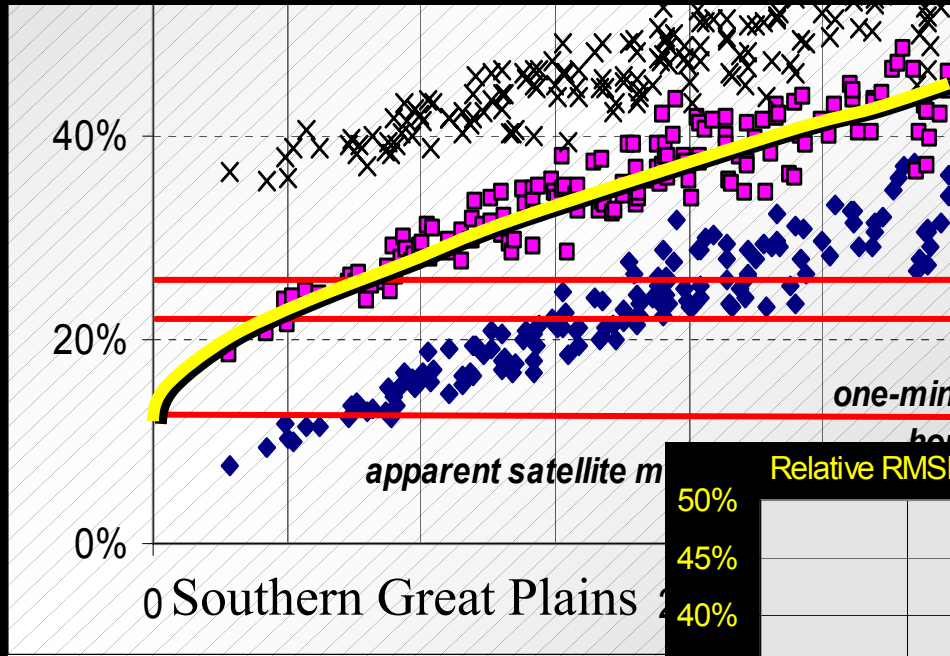


# GLOBAL

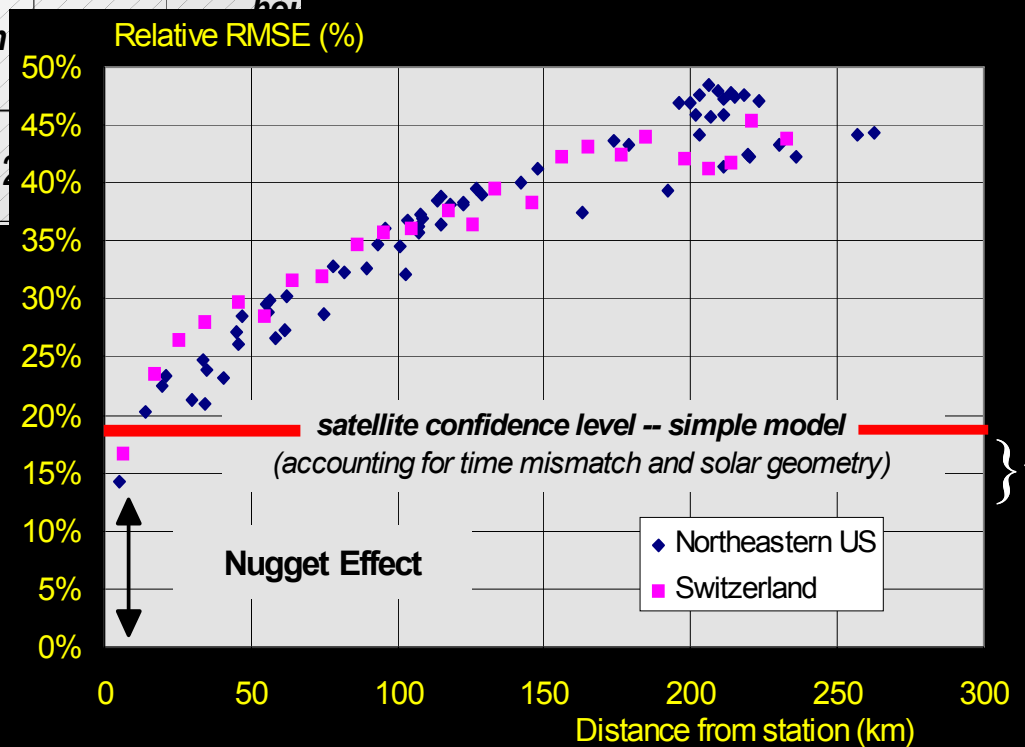


Daily breakeven distance ~ 60 km  
Hourly breakeven distance ~ 35 km  
1-minute breakeven distance ~ < 5 km

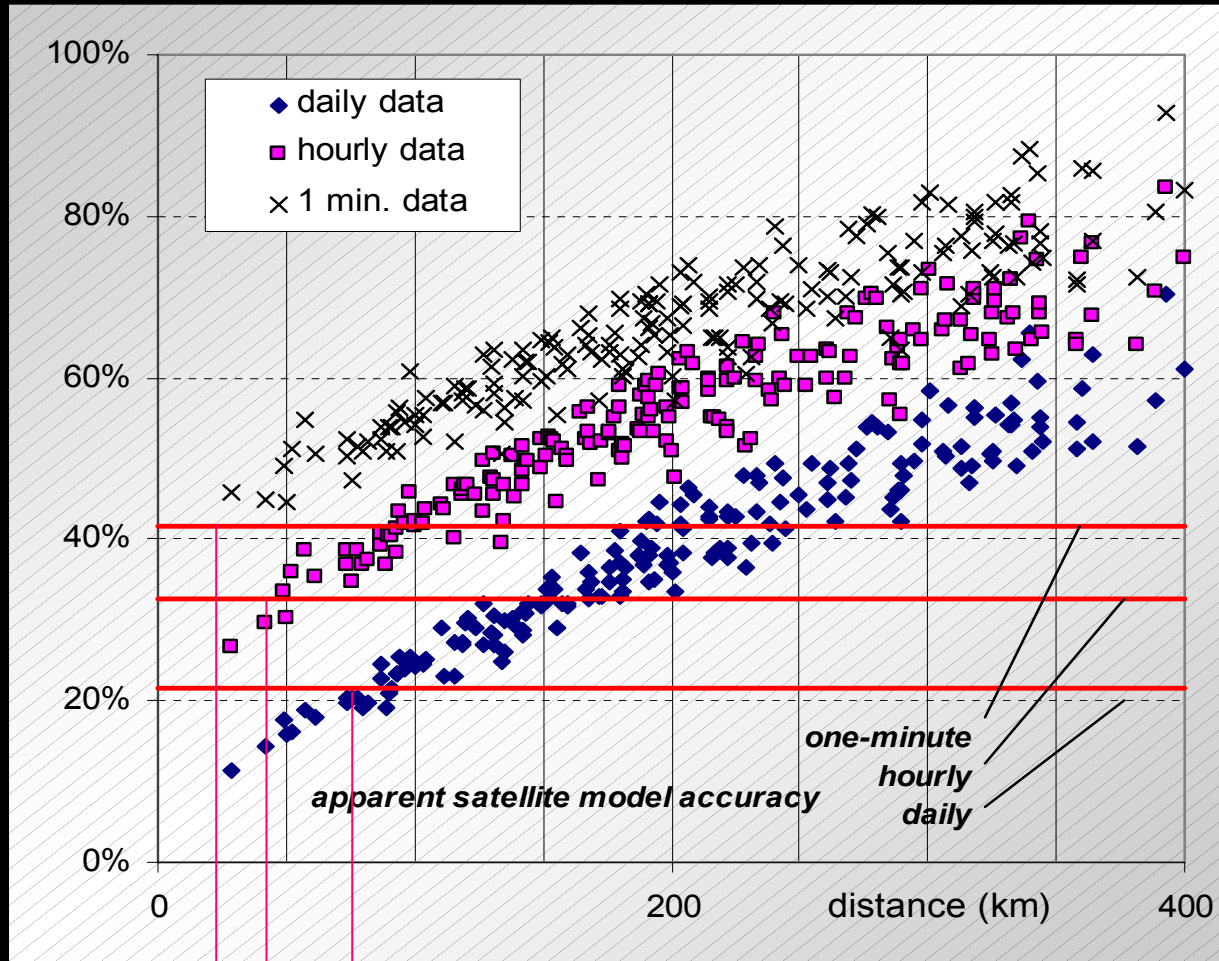
# GLOBAL



} — Effective accuracy

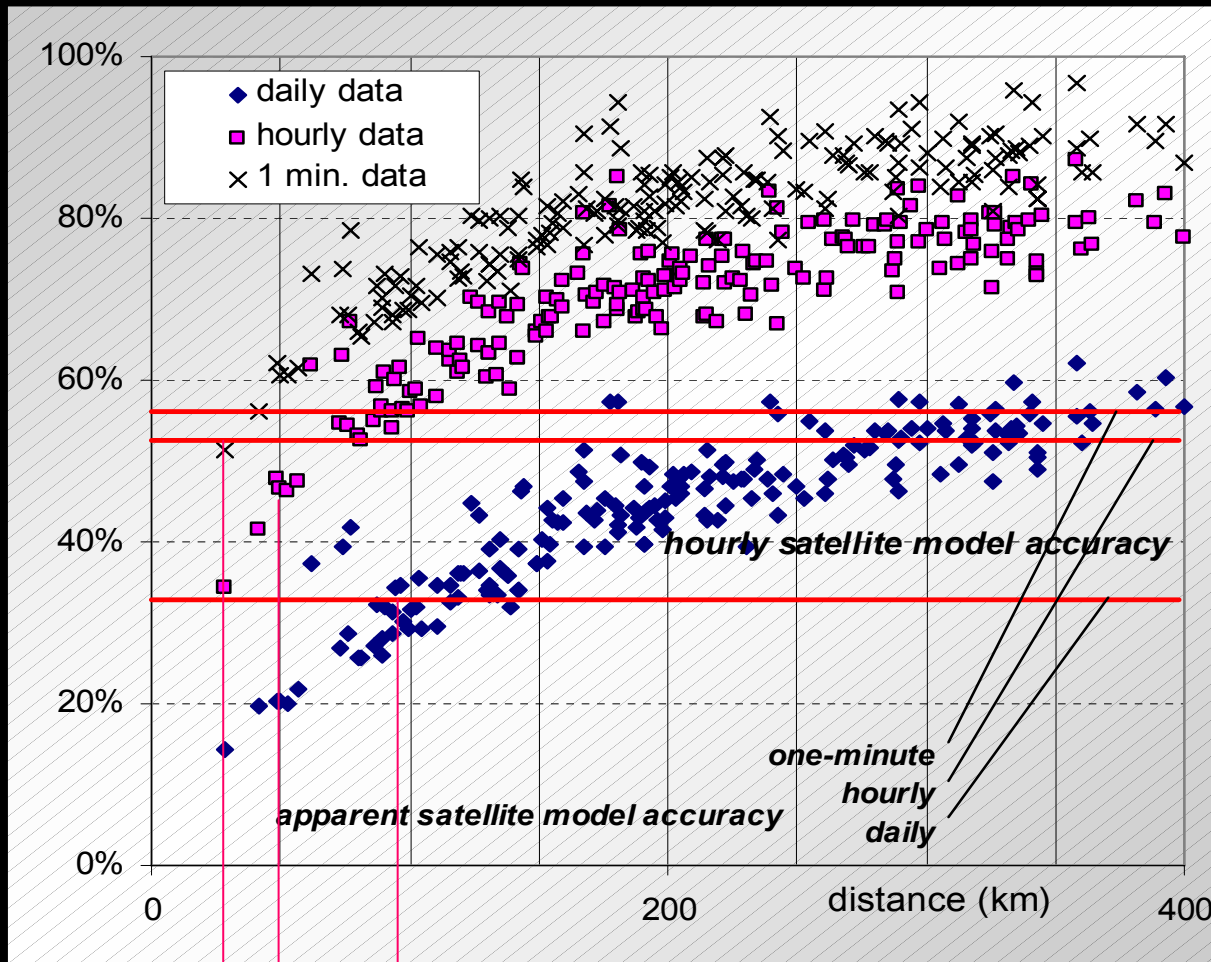


# DIRECT



Daily breakeven distance ~ 75 km  
Hourly breakeven distance ~ 45 km  
1-minute breakeven distance ~ 20 km

# DIFFUSE

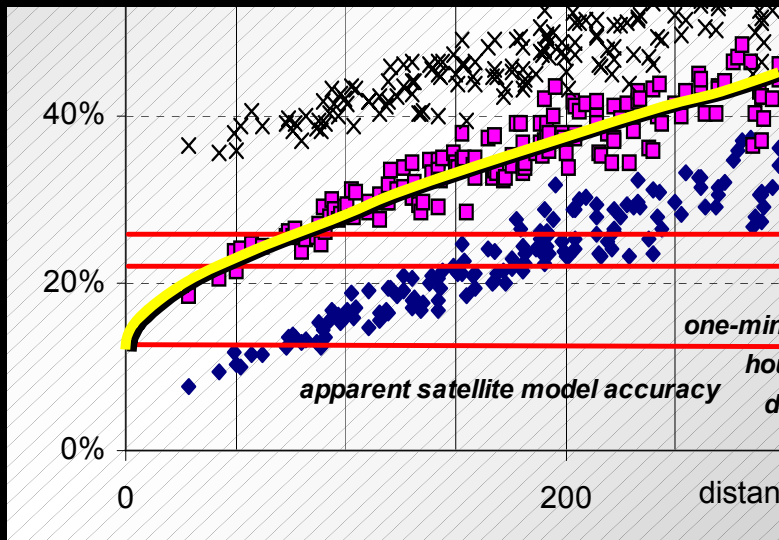


Daily breakeven distance ~ 100 km  
Hourly breakeven distance ~ 50 km  
1-minute breakeven distance ~ 25 km

# CONCLUDING REMARKS

Confirmation / extension of initial investigations

Hourly	Global effective accuracy	~ 15%
	Direct effective accuracy	~ 25%
	Diffuse effective accuracy	~ 35%



} — Effective accuracy

# CONCLUDING REMARKS

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Confirmation / extension of initial investigations

Hourly	Global effective accuracy	~ 15%
	Direct effective accuracy	~ 25%
	Diffuse effective accuracy	~ 35%

Need to expand study to arid and tropical/subtropical climates