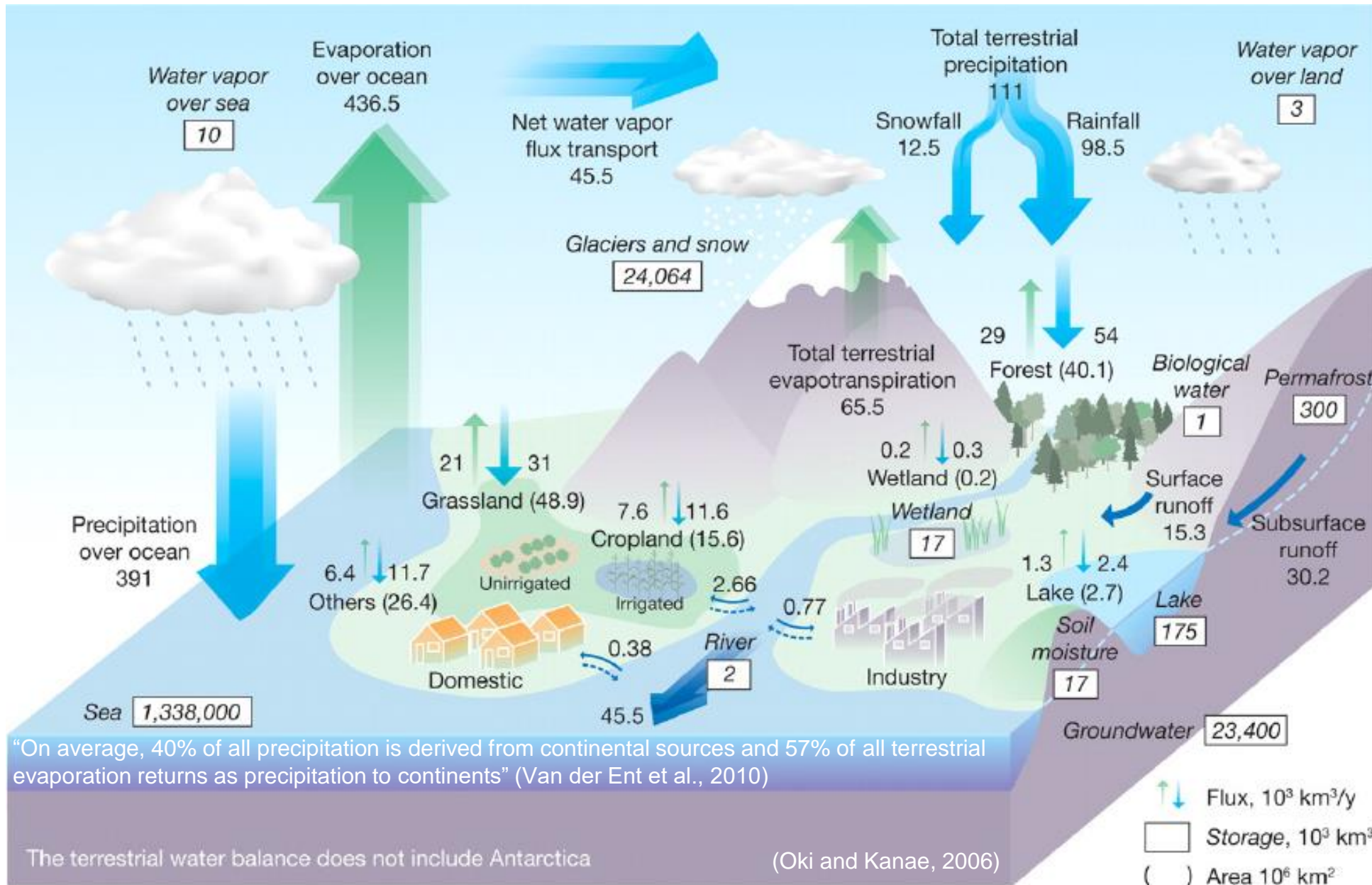


# Opportunities in hydrometeorology

Remko Uijlenhoet

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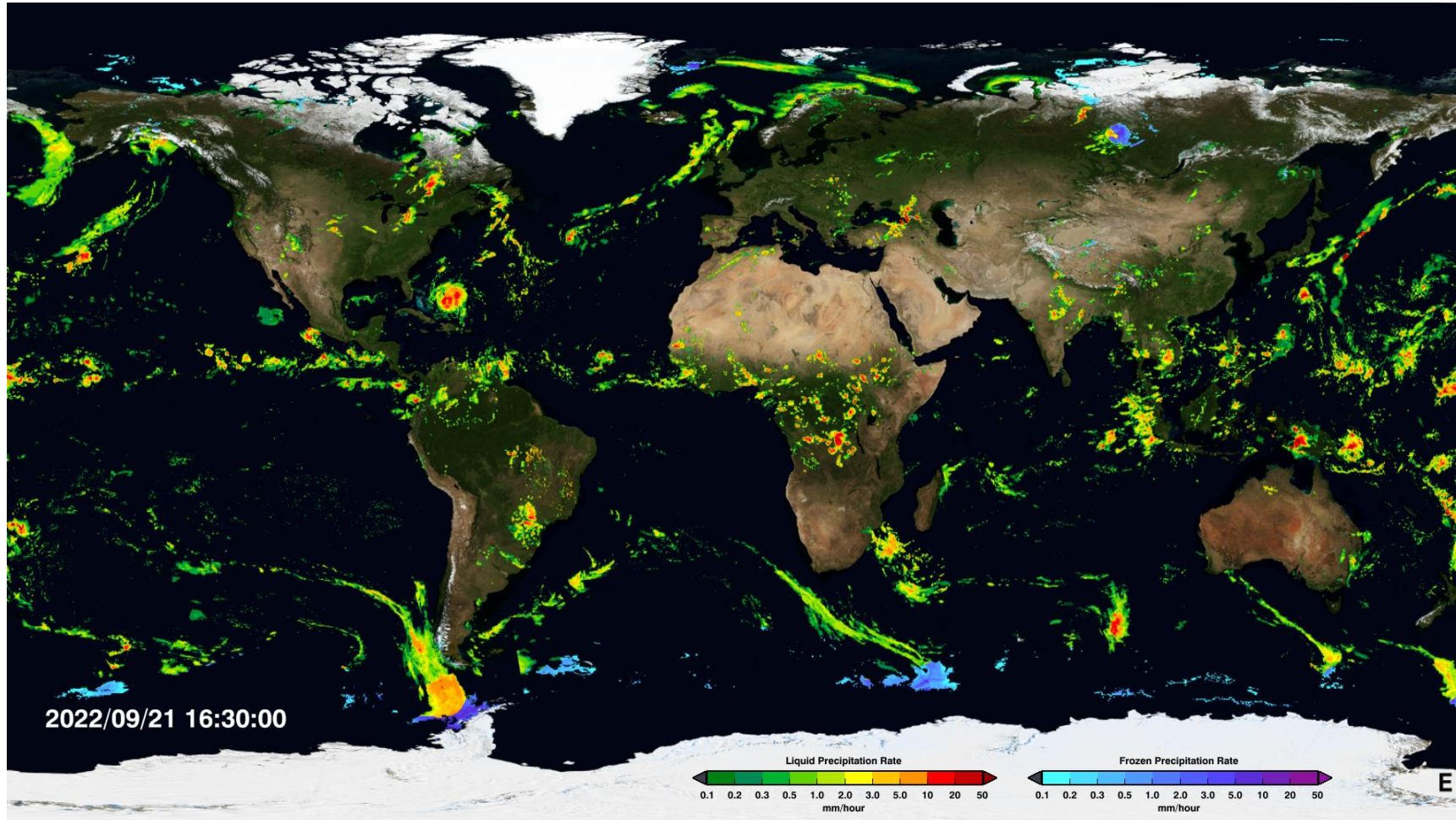


# Data revolution



(McCabe et al., 2017)

# Global precipitation map



(Near Real-time IMERG, NASA, 2022/09/21, 16:00–16:30 EST)

# Winter Spring Summer Autumn

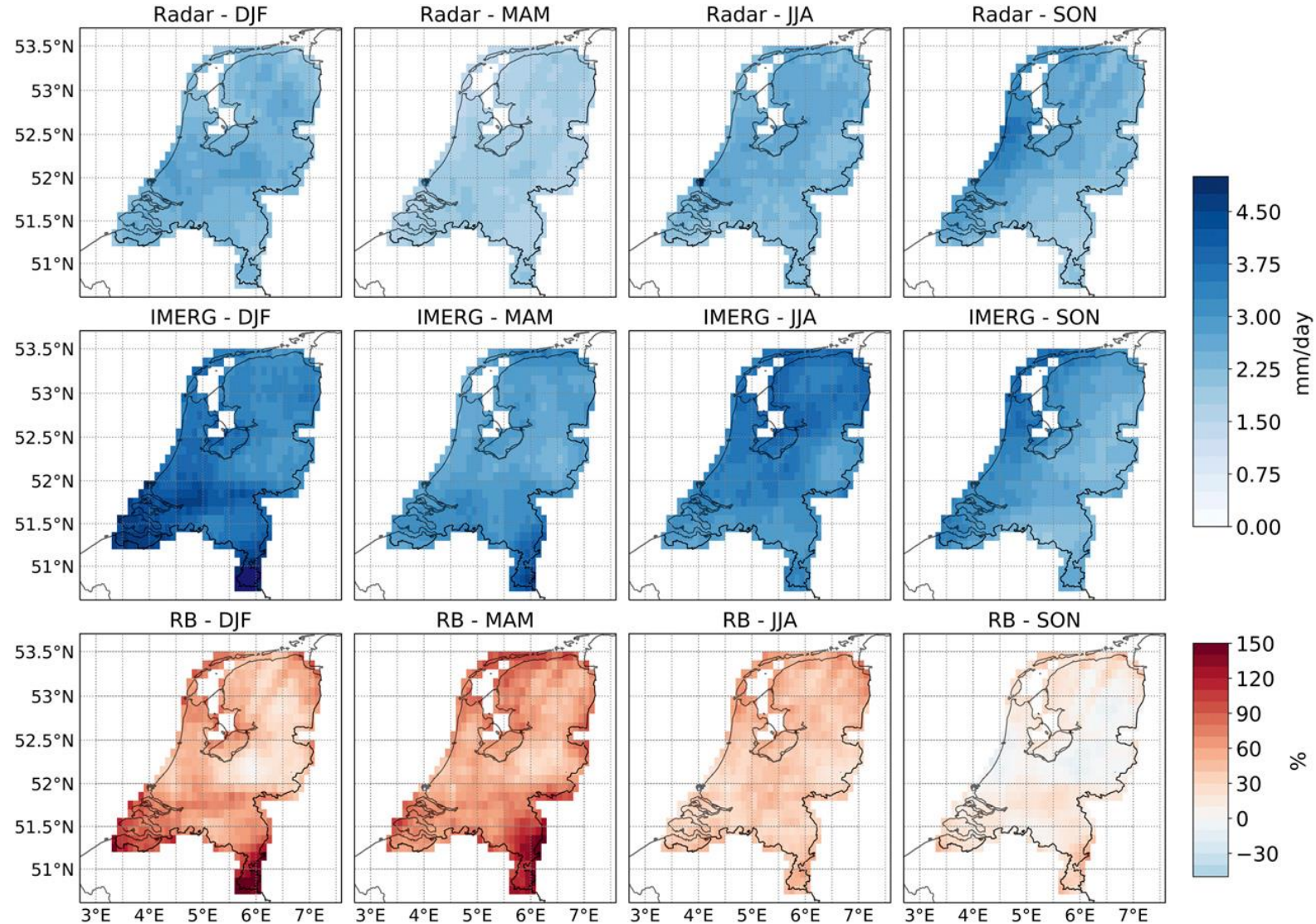
## Radar



## Satellite

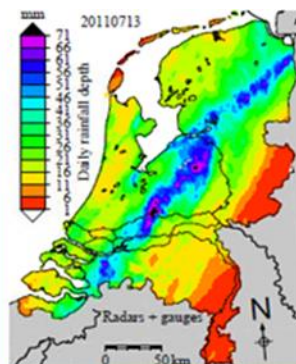


## Difference



(Bogerd et al., 2021)

# Weather radar – opportunities and challenges



31  
10 min

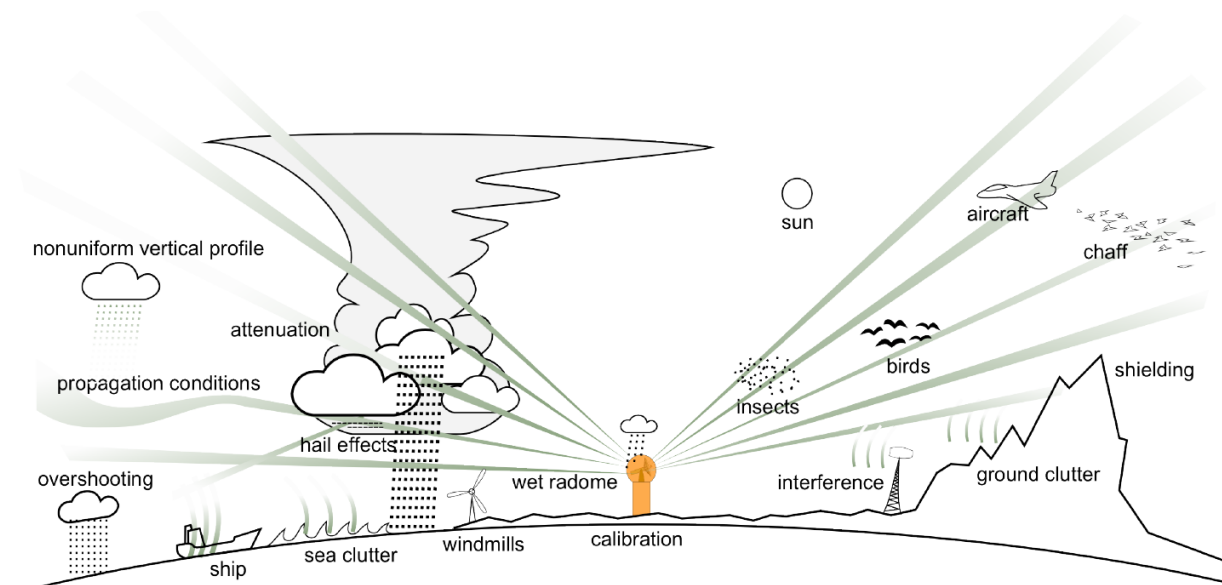


325  
1 day



38000  
5 min

(source: Aart Overeem)

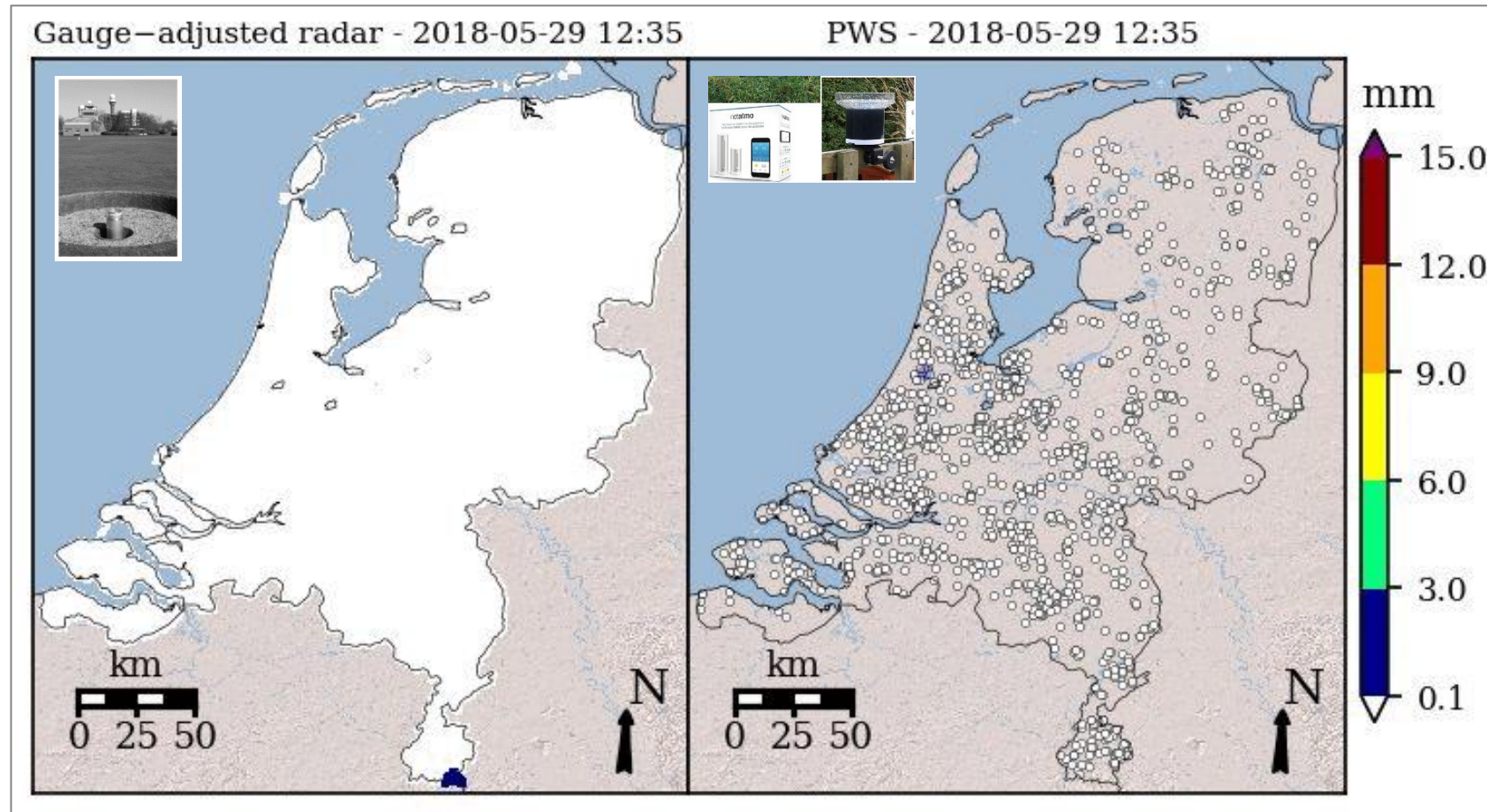


(source: Markus Peura, FMI)

# Global weather radar coverage



# Citizen science: personal weather stations



(De Vos et al., 2019)



# Trans-African Hydrometeorological Observatory (TAHMO)



### Population coverage by type of mobile network and area, 2021\*



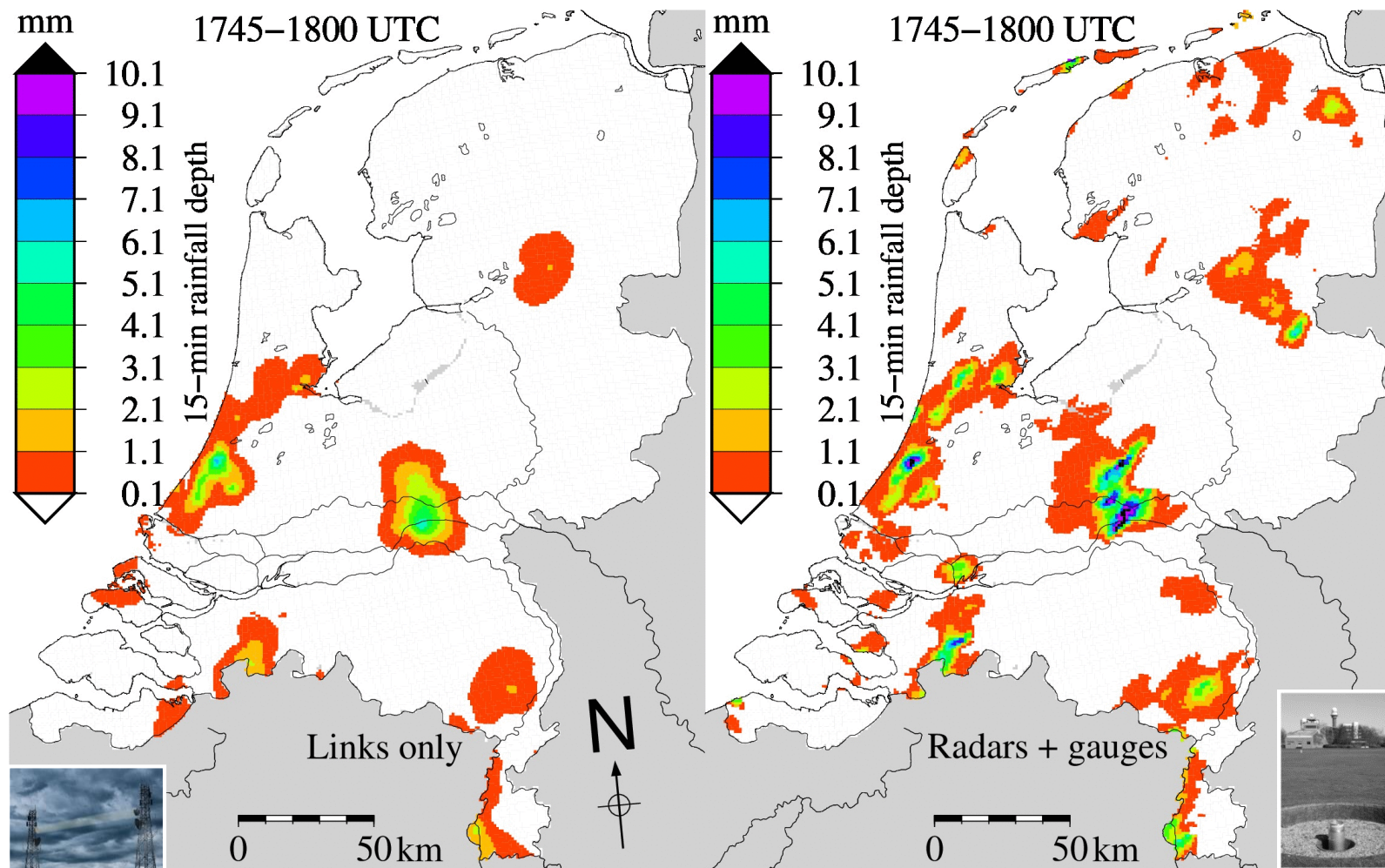
In almost half of the countries for which data are available for the 2018-2020 time-frame, more than 90 per cent of the population own a mobile phone.

For another 10 countries, that figure lay between 80 and 90 per cent.

In only 3 countries was the share below one-half of the population, the lowest at 45 per cent.

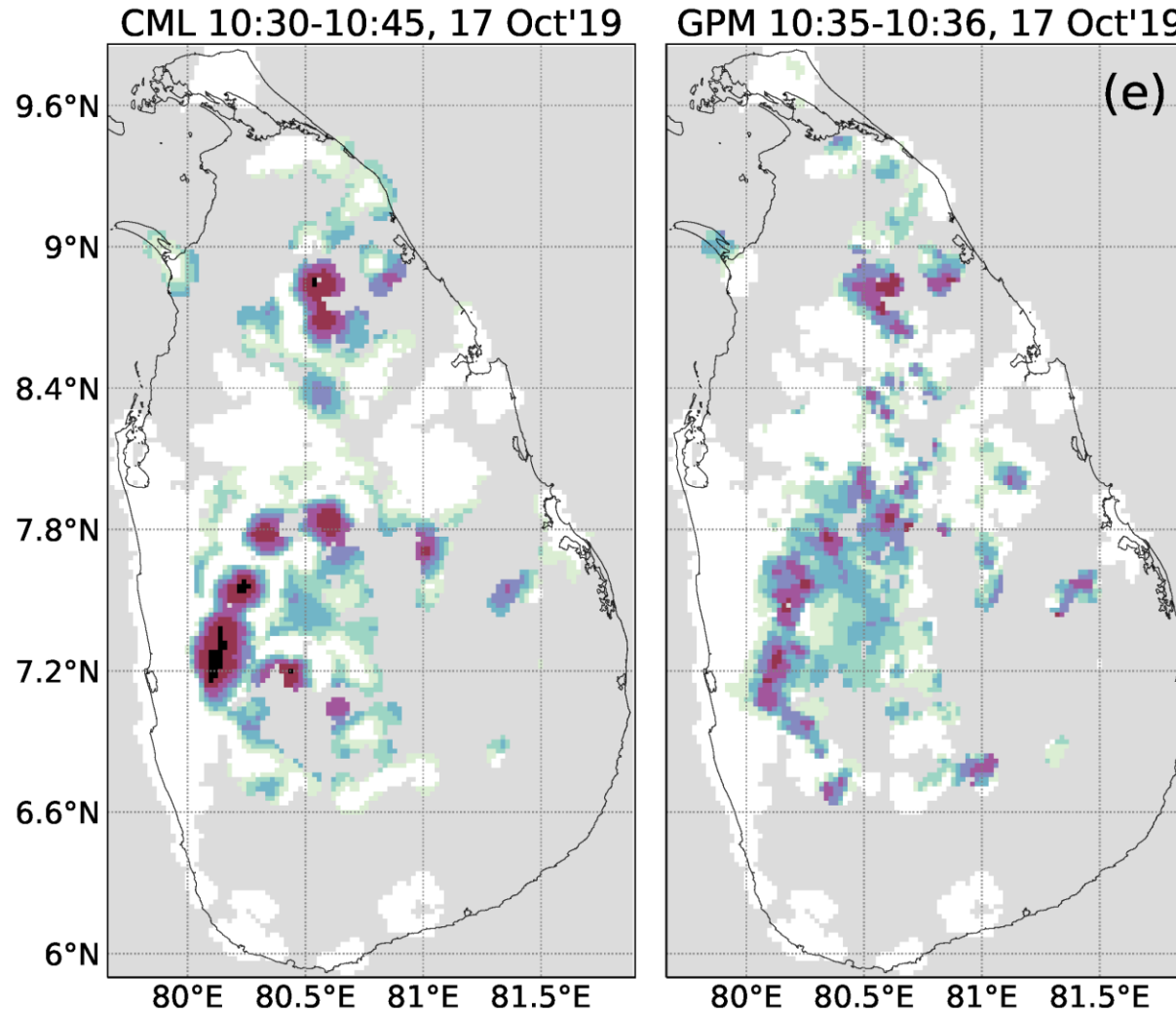
(International Telecommunication Union, 2021)

# Microwave links as opportunistic rain gauges



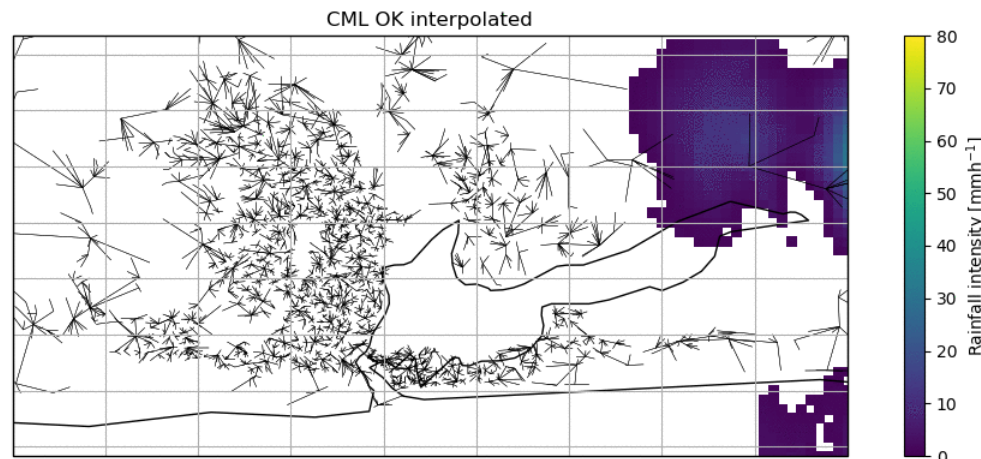
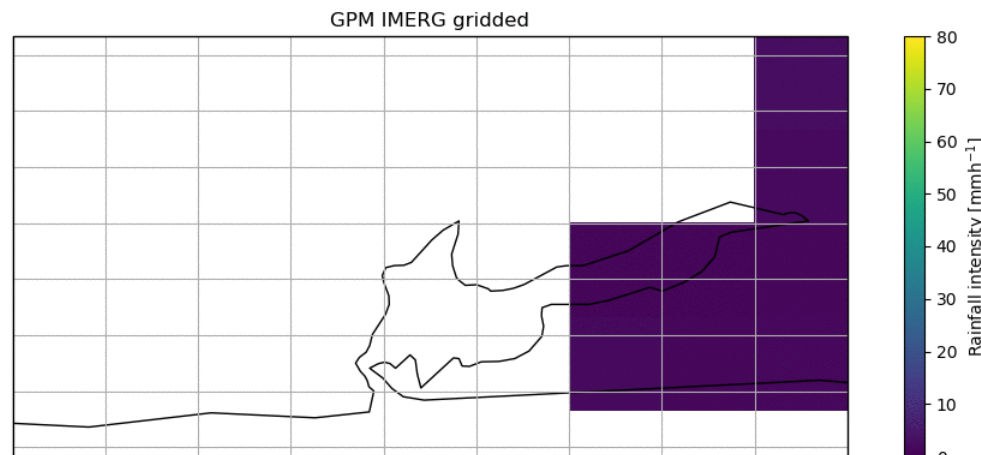
(Overeem et al., 2013, in collaboration with T-Mobile NL)

# Rainfall maps for Sri Lanka from links and satellite

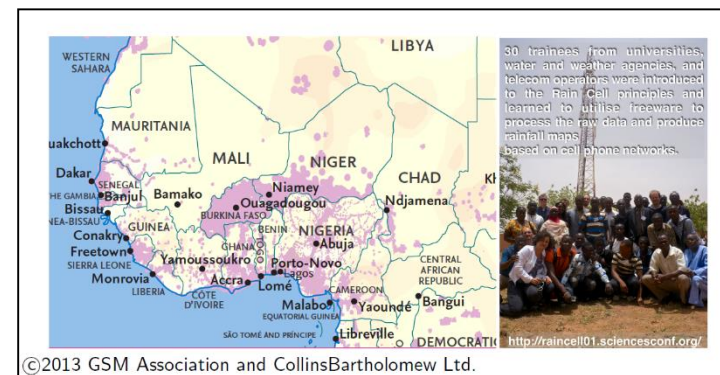


# Rainfall maps for Lagos (Nigeria) from links and satellite

Rainfall intensity 2019-03-06 10:45:00 UTC



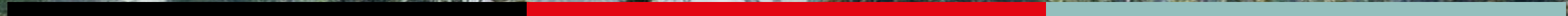
Raincell Africa Training School – Burkina Faso, 2015



(Gosset et al., 2016)



**Mobile data for climate resilient agriculture**  
**CML-based rainfall observations for digital service innovation**



# Opportunities in hydrometeorology

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