Telecommunication Networks
Internet of Things
Opportunities in Hydro-Meteorology?
The future of environment monitoring?
Getting rainfall data from the telephone network

Marielle Gosset IRD (GET) and collaborators
Radio transmission are used in some part of the mobile telecom network (backhaul).

Rain attenuates the signal between the antennas.

If we measure these fluctuations we can estimate the amount of rain fall over the given period.
Rain Cell Africa: Quantitative validation - Proof of Concept

Ouagadougou, Burkina Faso 2012-2014

Since 2016: Niger - Niamey

Quantitative evaluation done in Africa (versus gauge or weather radar):

Good results at daily and down to 15 minutes time step. Dense network in towns: high resolution.

Doumouni, Gosset et al, 2014, GRL


Niger – city of Niamey – May August 2016:

Gauge: 296 mm
Link: 280 mm (-5%)
Pluvio vs Lien: \( r^2 = 0.91 \)
Rain Cell App: Collecting data over the network to produce high resolution Rain Maps.

NIGER
Niamey

A dense network of antenna in Niamey, Niger’s capital city - Very prone to flooding.

Rainfall monitoring since April 2016

15 minutes time step
Rain Cell App : 2
NIAMEY interface web :

15 minutes
Time step evolution
Of rain maps over the city :

Case 21
August 2017

Courtesy
Matias Alcoba
Rain Cell Africa: urban flood risk alert demonstration

- Mobile network as entry to rainfall events monitoring system

- Flood risk
- Other rainfall related risk

- Several Pilot studies ongoing in Africa in collaboration with Orange

Rain Cell App: Démonstrateur IRD/Banque Mondiale – Ouagadougou/Bamako/Niamey/Yaounde

LOW COST
HIGH TECH
SMART!!