Karst flash floods characterization and tools for warning system management (KRHU project)

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> ## KRHU project

- Difficulties of understanding and warning
- Karst flash floods functionning
- Dificulties of anticipating
- Proposal for new methodology

> ## Methodology developped

- Karst basin
- Mixed basin
- Karst Indicator developped

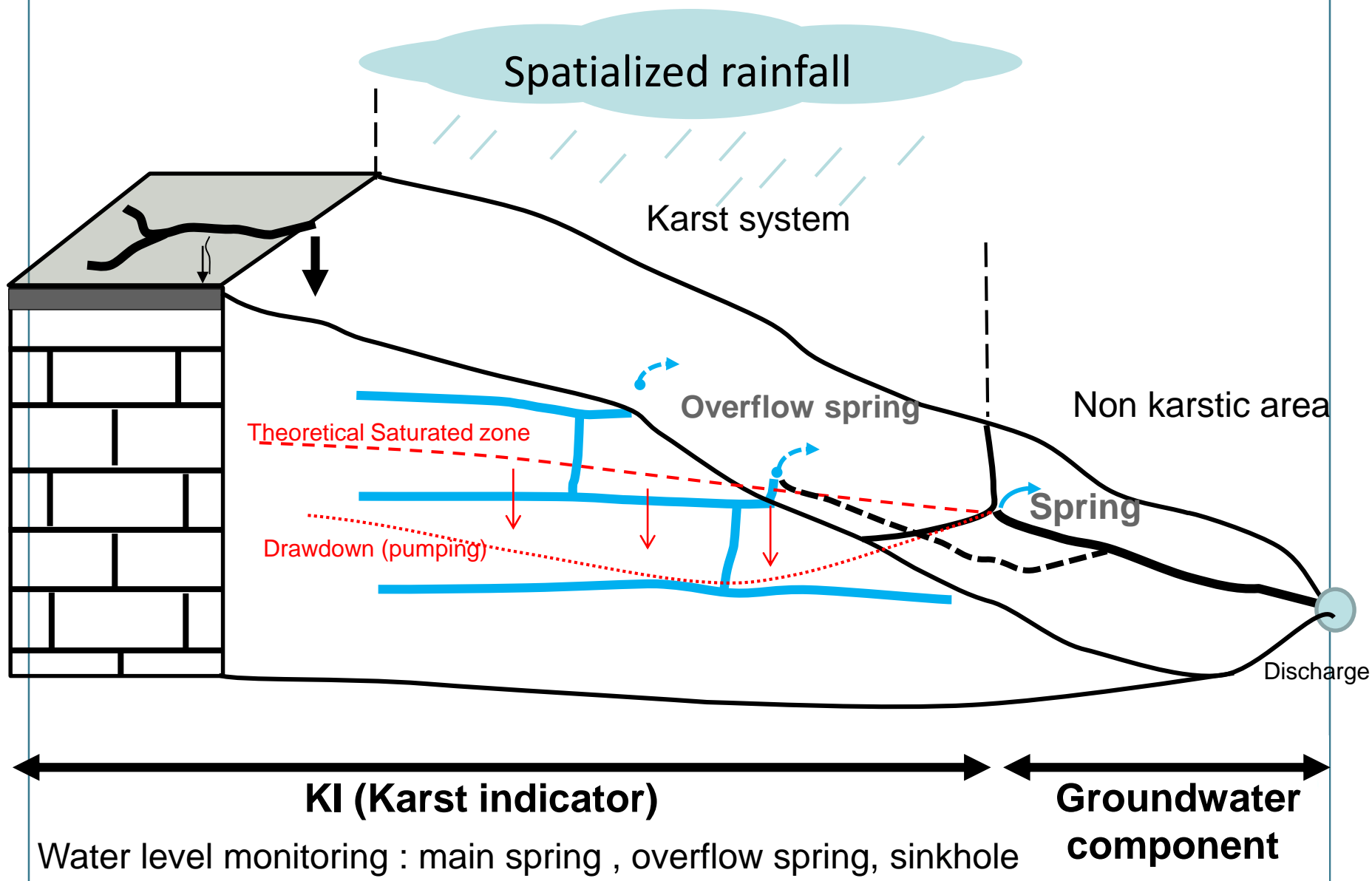> ## Tools developped

- Nartuby exemple

KRHU project

> **Karst flash floods functionning**

- South of France : important rainfall events
- Karst aquifer : important reservoir, presents duality of functionning
  => low water level : storage
  => High water level : runoff and incrising flood
- Difficulties for forecasters working

> **KRHU project a response**

- FUI project (2012-2015) mixing french public establishment (EMA + BRGM) and private company (CENEAU + SYNAPSE + PREDICT).
- Aim project : understand karst functionning to developped tool for warning (internet real time warning system)
- 4 aquifers studied in project
- Characterise functioning : karst recharge, karst water level evolution and overflow
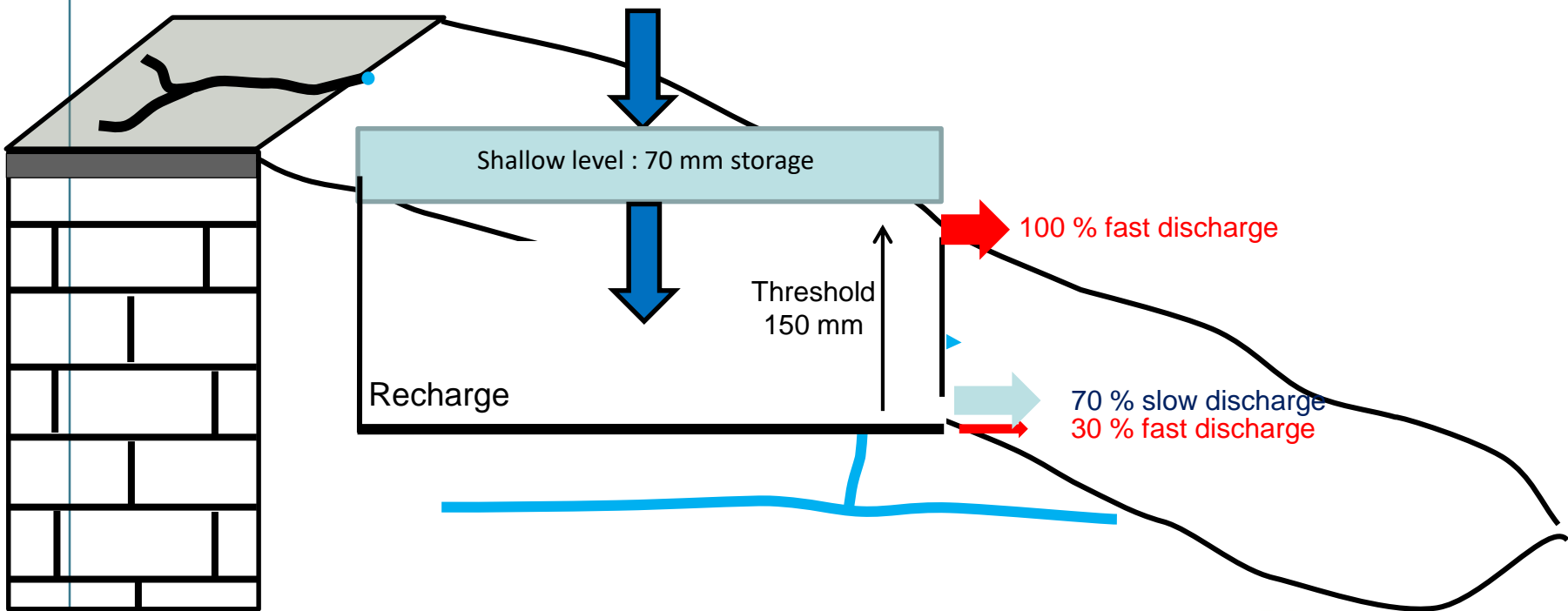- Using an Indicator for the forcasting : Karst Indicator water level or KI

> **Methodology developped**

Spatialized rainfall

Karst system

Non karstic area

Overflow spring

Theoretical Saturated zone

Drawdown (pumping)

Spring

Discharge

KI (Karst indicator)

Groundwater component

Water level monitoring : main spring , overflow spring, sinkhole

> **Results on Nartuby karst system : a full karst system**

Avène:
RA 57km²

Esquielle
RA 11km²
Karst pumped

Lez
RA 208km²
Karst pumped

Nartuby
RA 230km²

Shallow level : 70 mm storage

Threshold
150 mm

Recharge

100 % fast discharge

70 % slow discharge
30 % fast discharge
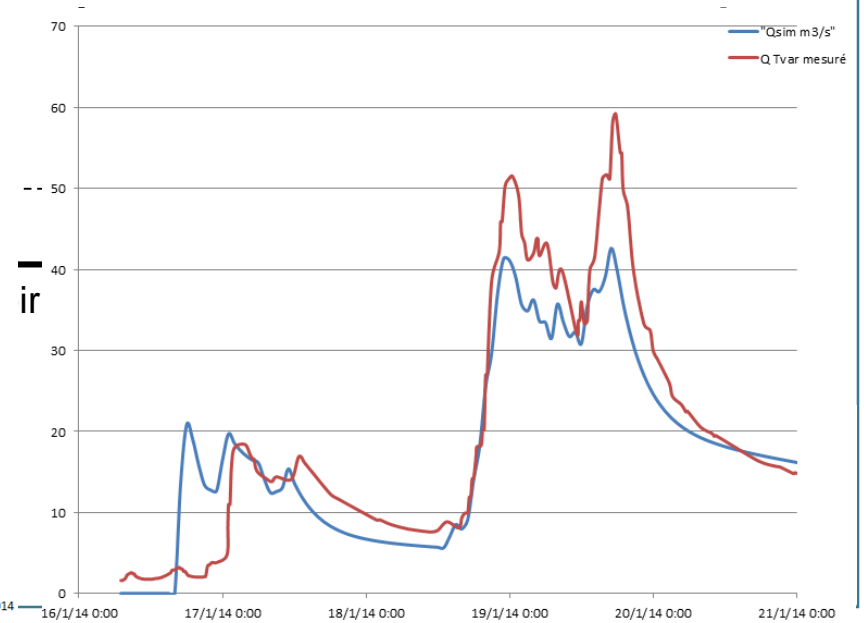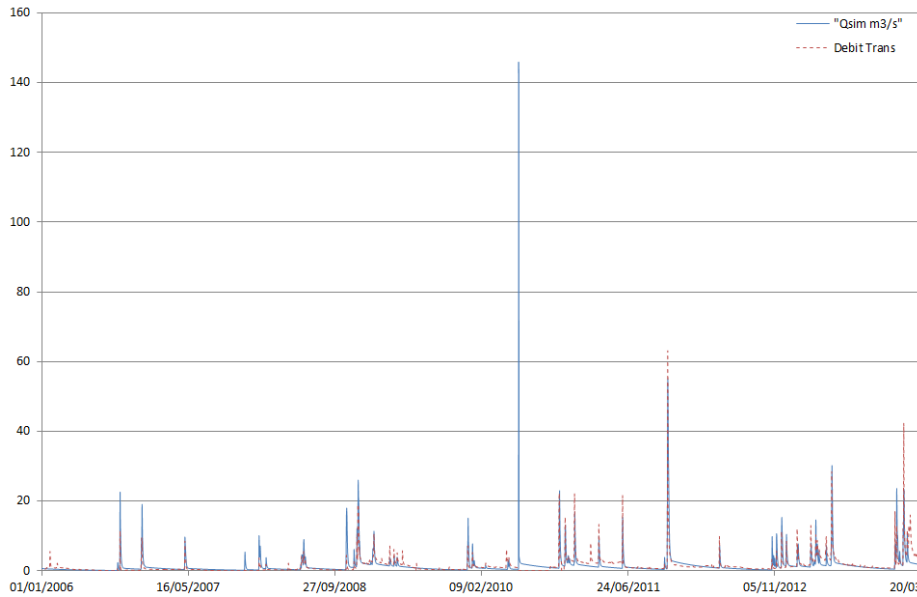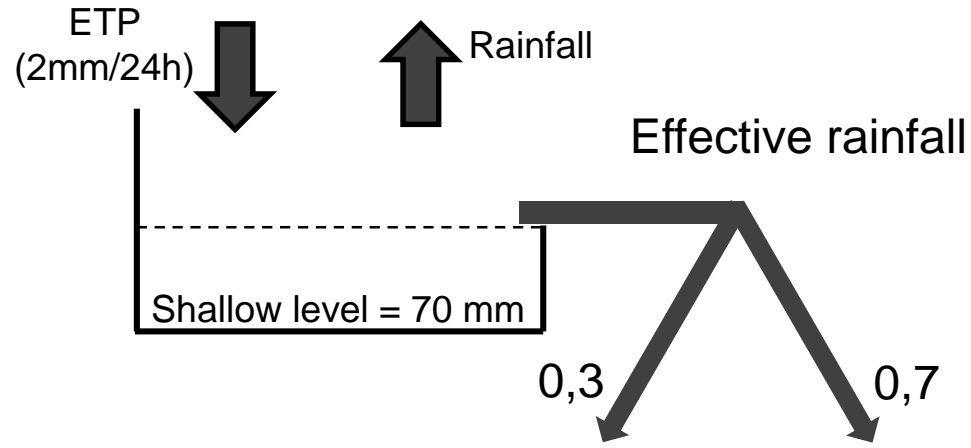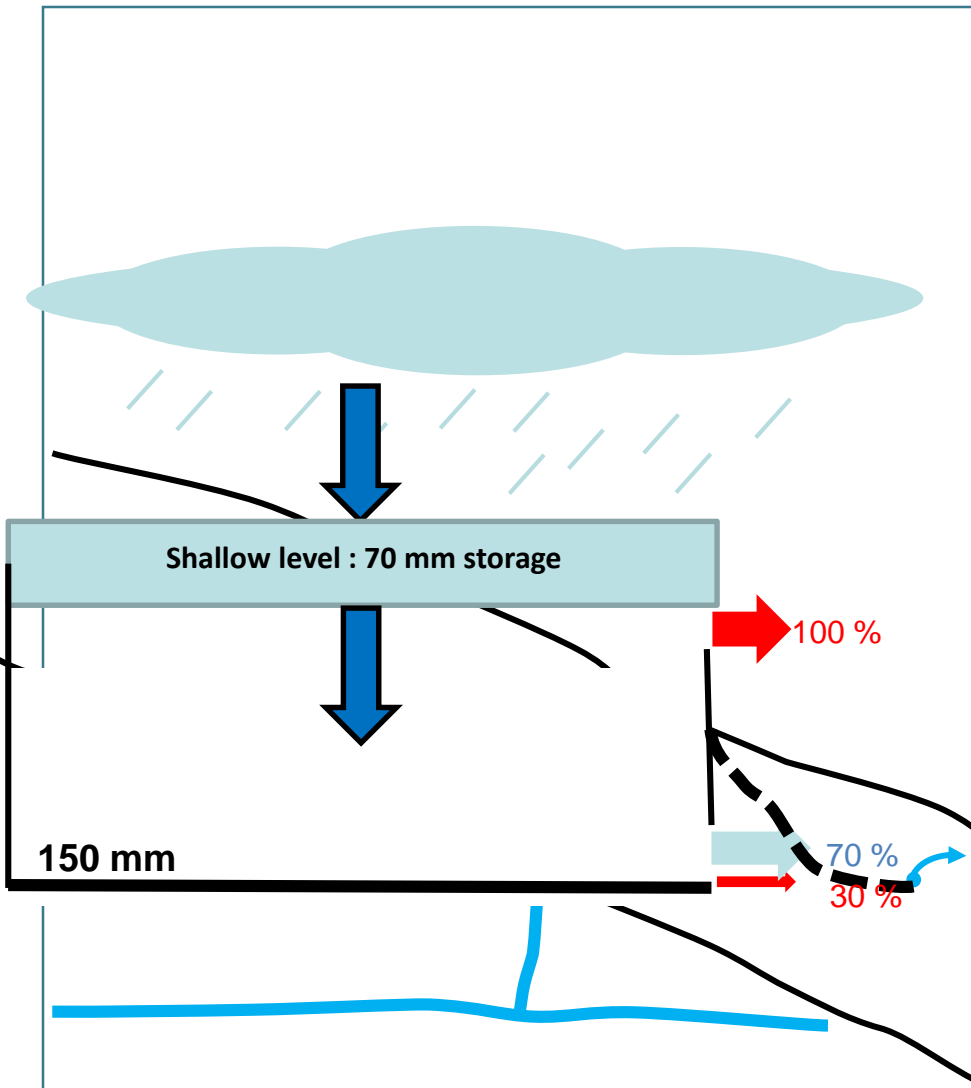
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Reservoir model

ETP
(2mm/24h)

Rainfall

Effective rainfall

Shallow level = 70 mm

0,3   0,7

Shallow level : 70 mm storage

100 %

150 mm

70 %

30 %

Piézo Mouret (m)

Vidange lente | Vidange rapide

200 m³/s

Overflow Mouret sinkhole = 55 m

100 m³/s

50

40 m³/s

0

0   50   100   150   200   250 Pluie (mm)

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