

climate change initiative

# RIVER DISCHARGE

# ECV Assessment for use in climate tasks



river  
discharge  
cci



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User Workshop

Météo-France, Toulouse

03-04 June 2024



## Basic check

- 1. Resolution** (temporal sampling)
- 2. Dataset completeness**
  - Evaluation of missing/exceeding flow in monthly and annual fluxes

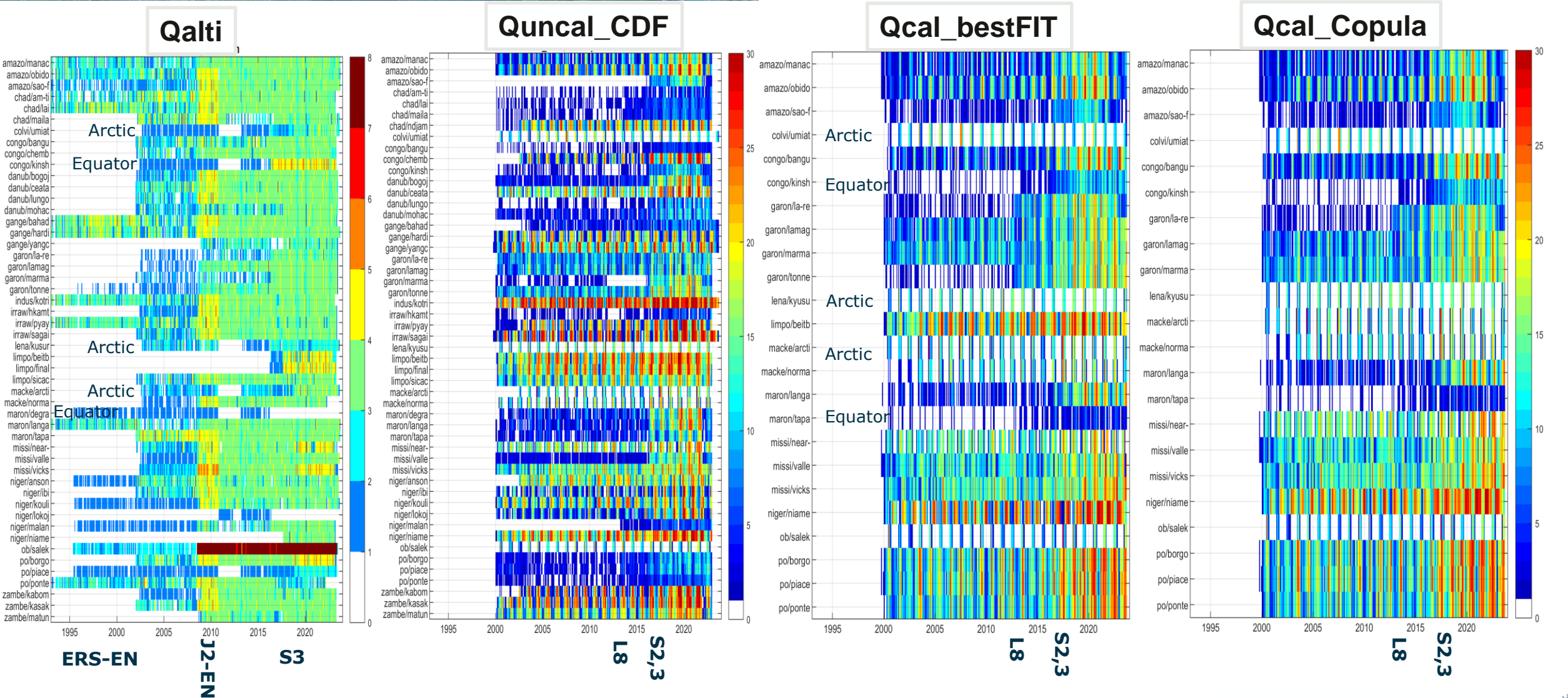
## Fitness4Purpose

1. Use cases
- 2. Means and variability**
  - $\text{mean}(Q_{yy})$ ,  $Cv(Q_{yy})$ ,  $Cs(Q_{yy})$
  - VS-GS seasonal cycling
- 3. Trends**
4. Products cross-comparison
5. Extreme events



# 1. Datasets Resolution (Nobs /month)

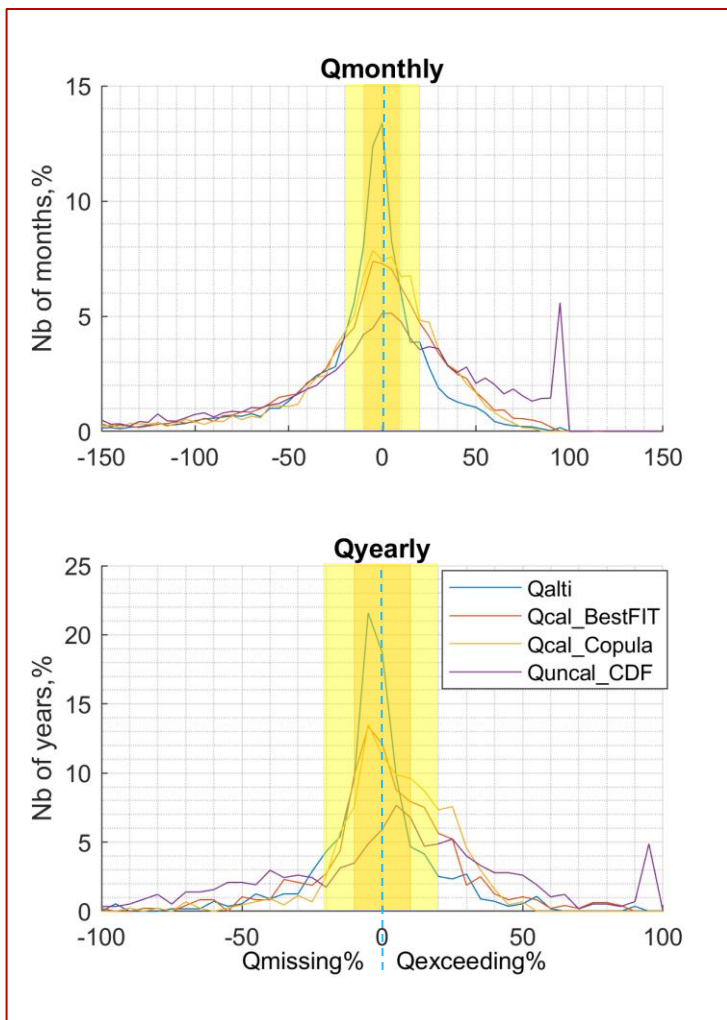
## Q. How good our products for estimation of freshwater fluxes and seasonal cycle





# 2. Completeness : evaluation of missing/exceeding flow in monthly and yearly fluxes

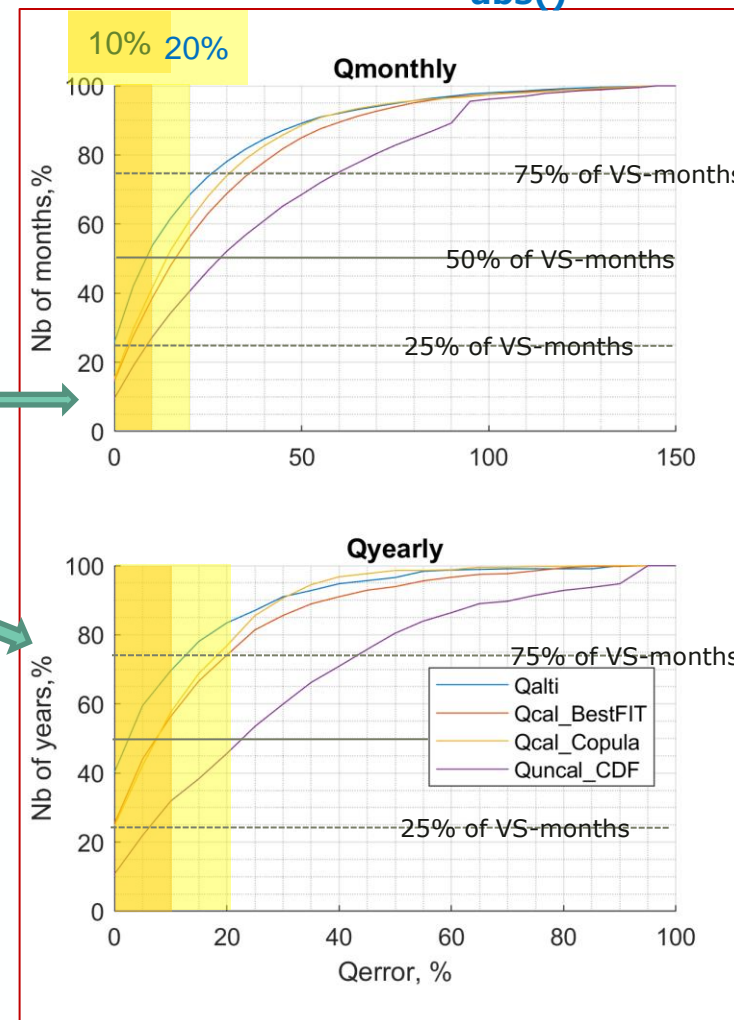
### PDF



$$Q_{err} = (Q_{gs} - Q_{vs}) / Q_{gs}$$

1. Due to sampling resolution and errors we can underestimate or overestimate  $Q_{mm}$  and  $Q_{yy}$
2.  $Q_{err} < 10\%$  observed in 50% of Qalti **months** and 40% of Qcop
3.  $Q_{err} < 10\%$  observed in 70% of Qalti **years** and 55% of Qcop/QbestFit

### CDF<sub>abs()</sub>

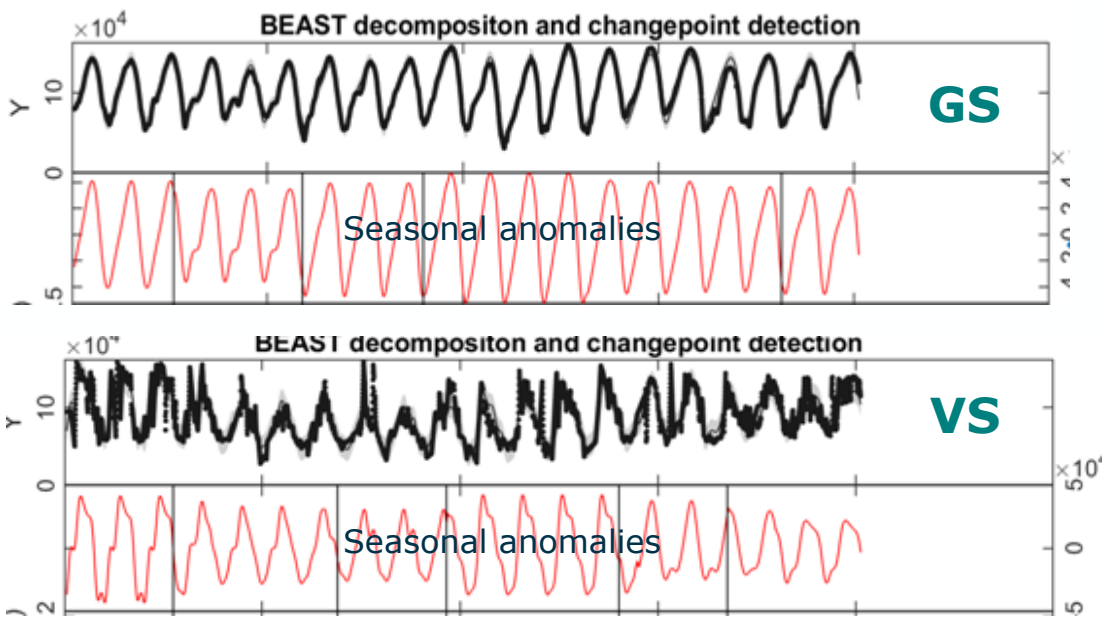




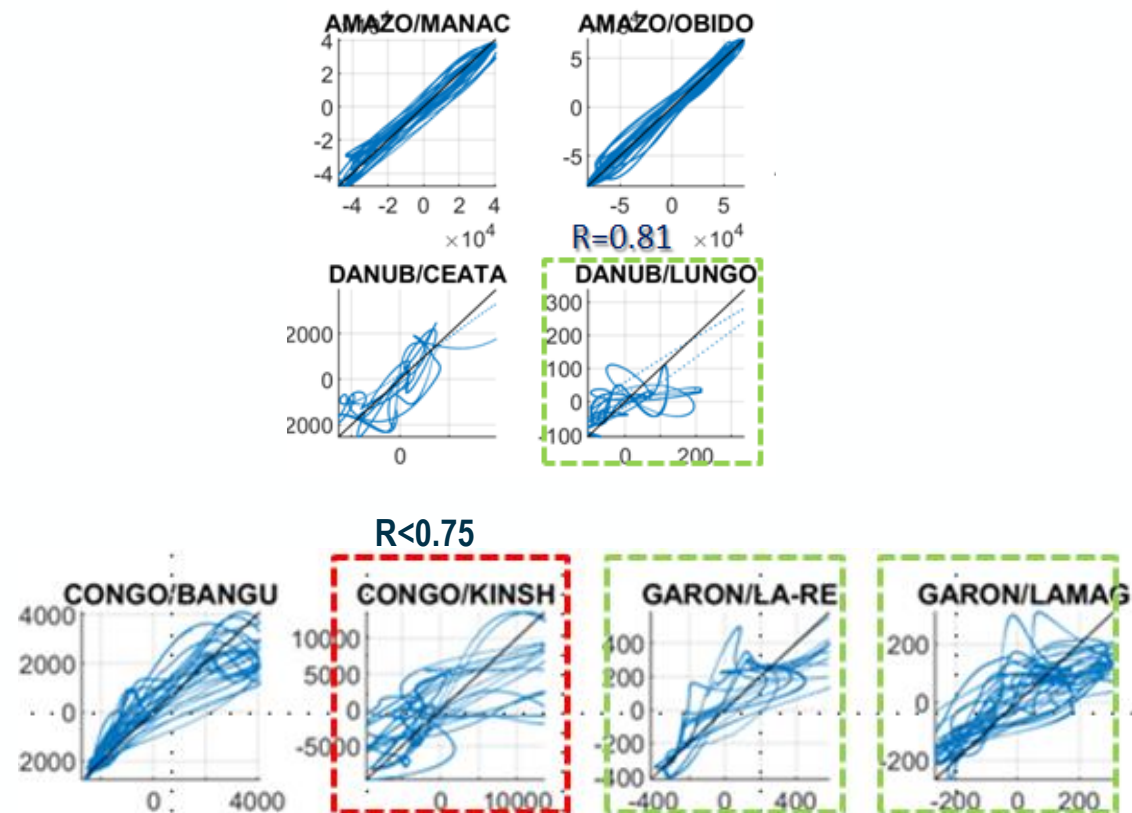
# 2. Completeness: How good our products for representation of seasonal freshwater fluxes



## Manacapuru

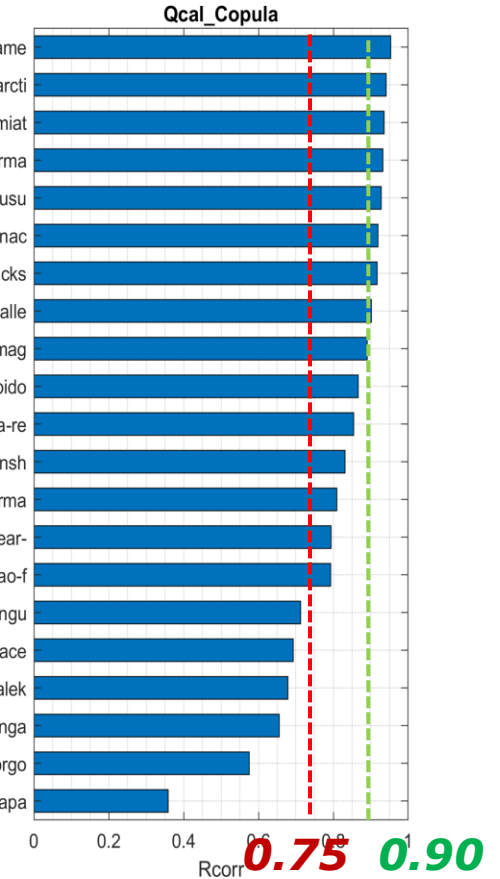
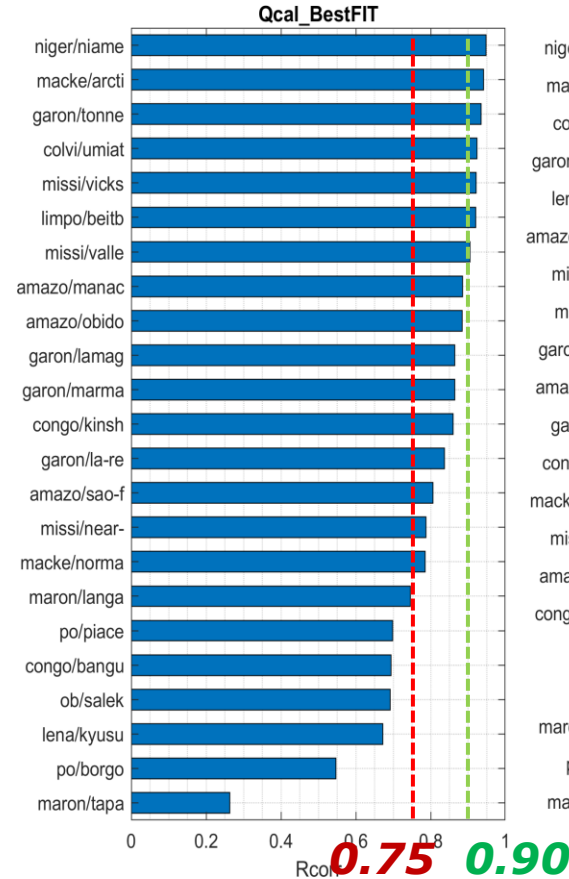
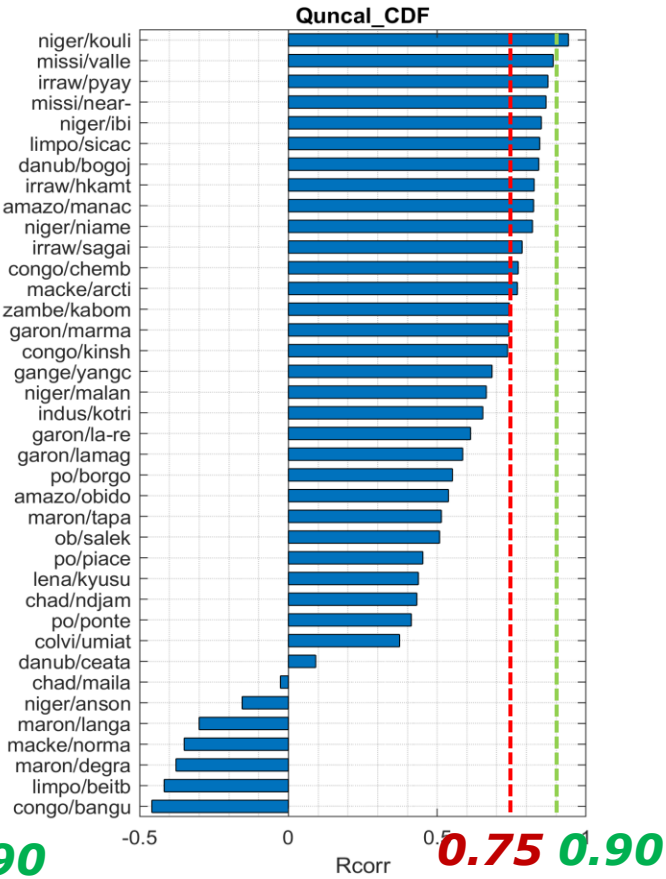
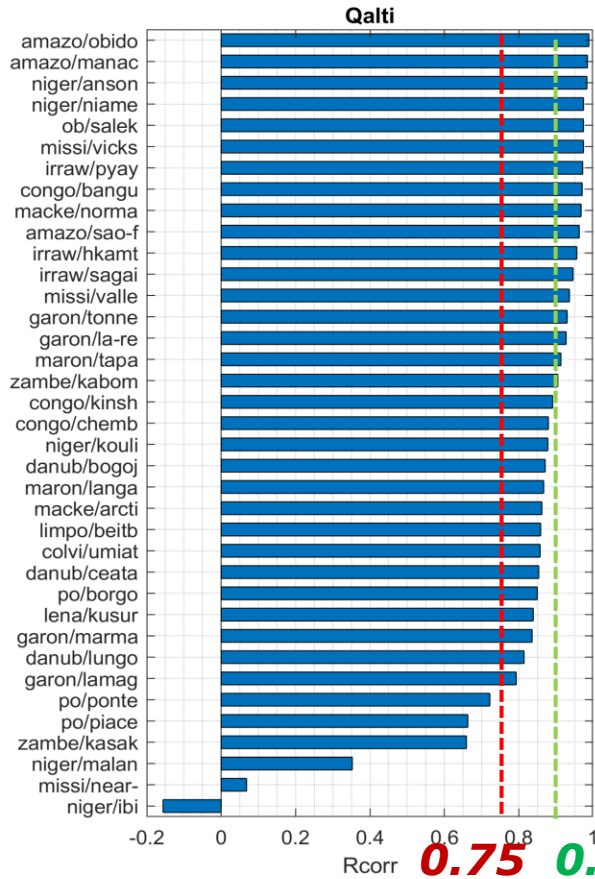


## Examples of correlation between GS-VS seasonal cycles





# 2. Completeness: How good our products for representation of seasonal freshwater fluxes



**<0.75 - <0.9 - >0.9**  
**16% - 38% - 46%**

**<0.75 - <0.9 - >0.9**  
**65% - 32% - 3%**

**<0.75 - <0.9 - >0.9**  
**31% - 39% - 30%**

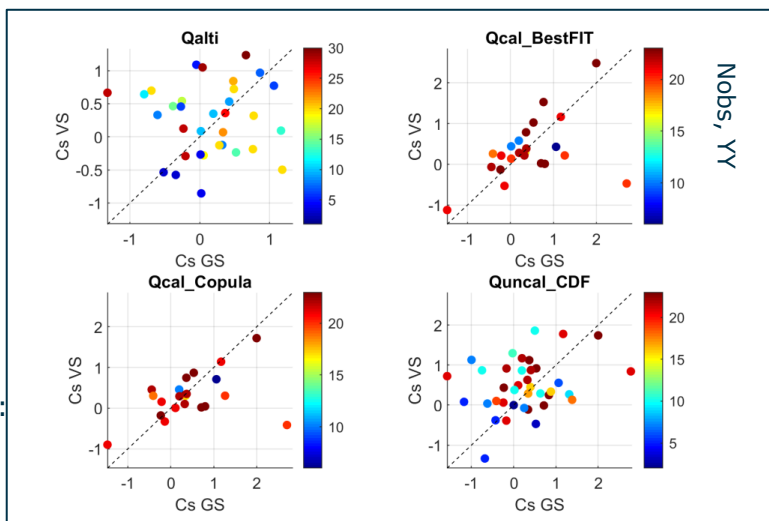
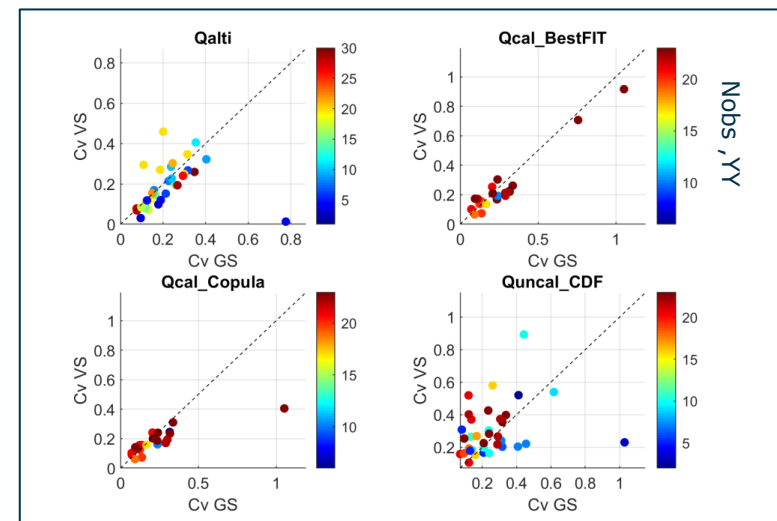
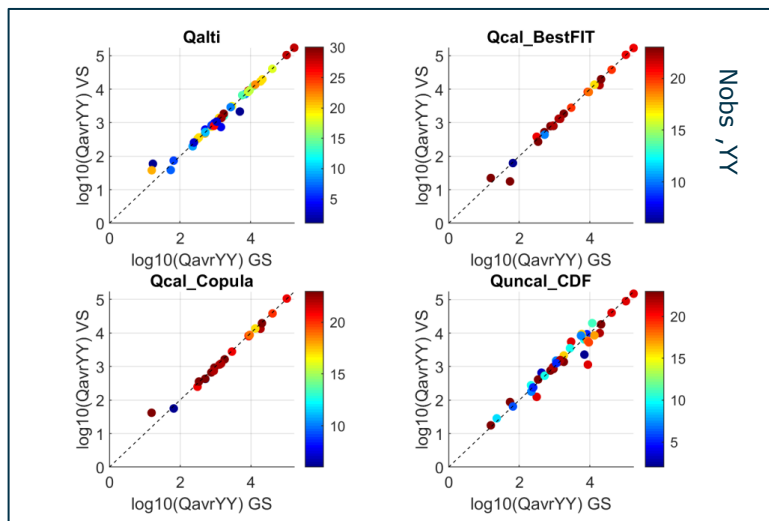
**<0.75 - <0.9 - >0.9**  
**29% - 38% - 33%**



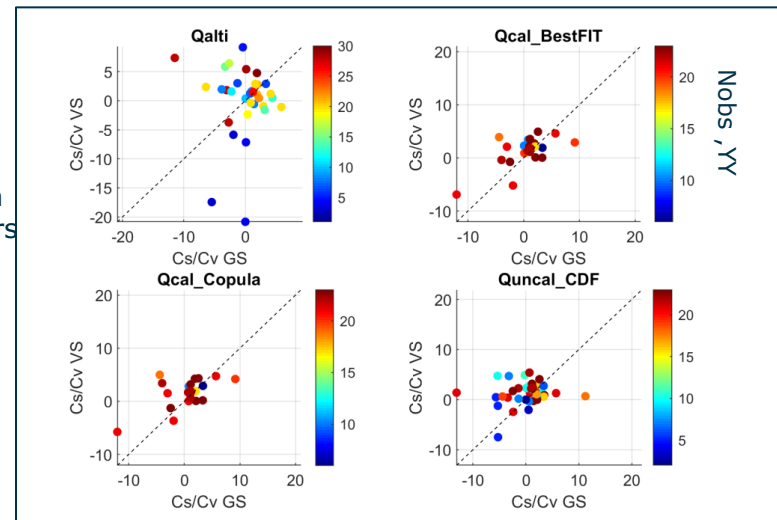
# 3. Evaluation of means and variability: mean(Qyy), Cv(Qyy), Cs(Qyy)



1. All Qcci products are very good for climate means;
2. 3 Qcci products are very good for climate variability assessment (good Cv correlation)
3. 2 Qcci products are correct for regional climate change assessment (acceptable Cs correlation)
4. Certain VSs of Multisat Qcci can be used for regional flow reconstructions (Cs/Cv)



Cs & Cs/Cv:  
We should reject VS with Nobs < 15 years



Cv - Variability of Q around the average (depends on climate, water sources, regulation, land use)

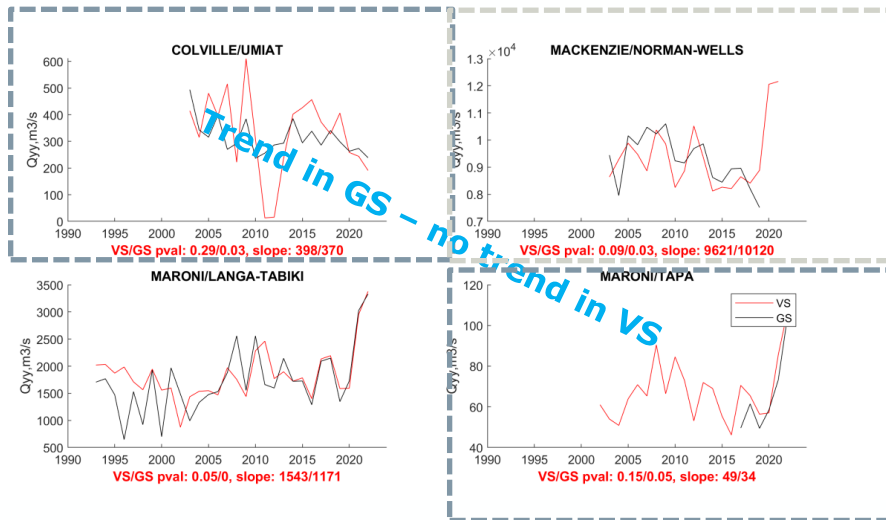
Cs - Asymmetry of the Q distribution (Skewness):  
negative - dominating wet years,  
positive - dominating dry years





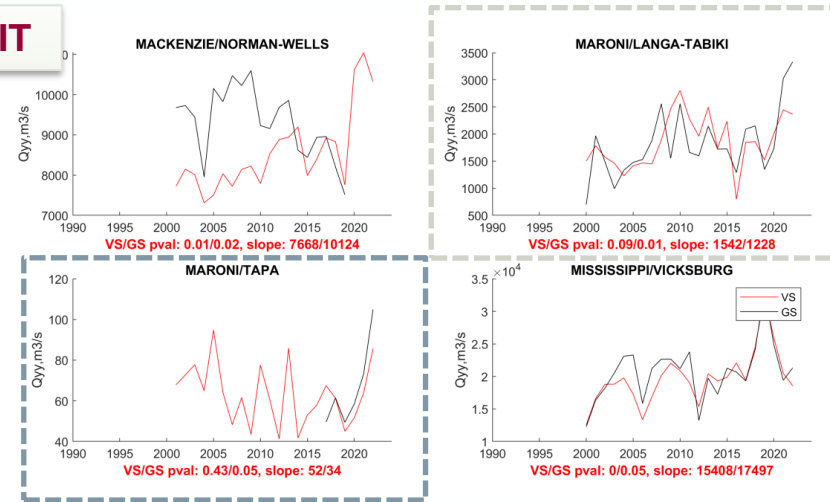
# 3. Evaluation of Linear trend in annual Q for common period of observations

Qalti



Qcal\_bestFIT

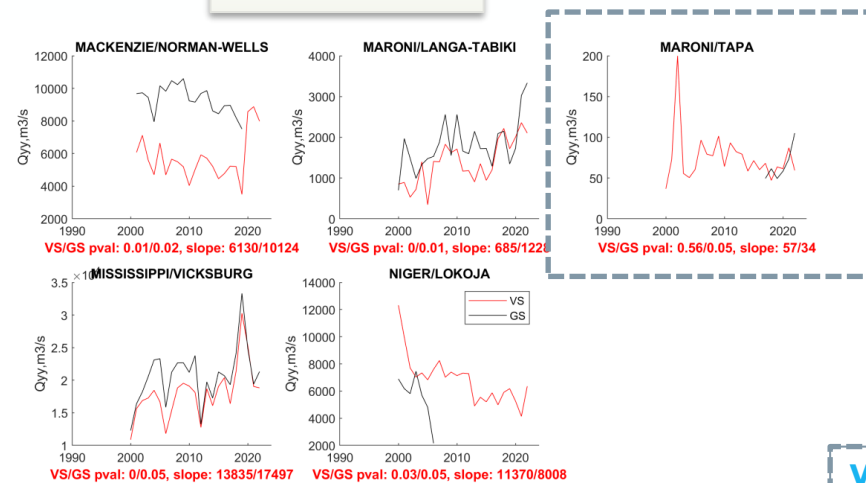
Only significant VS or GS trends for common periods of observations



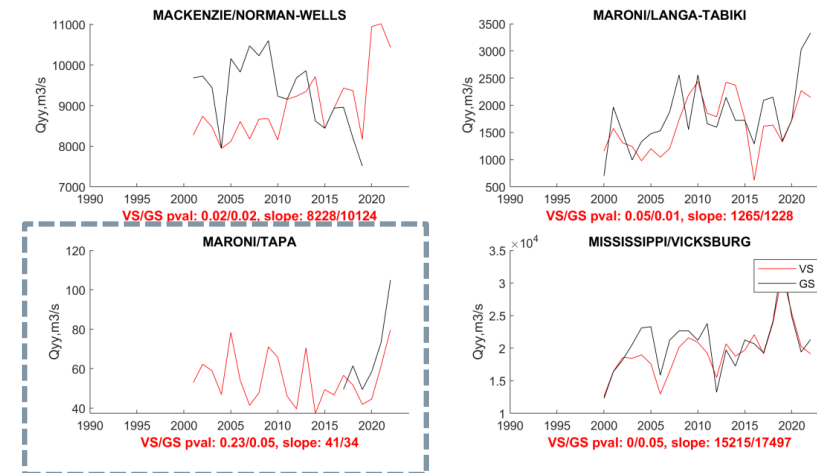
Quncal\_CDF

Other stations agree in the trend absence

Qcal\_Copula



VS-GS Disagreement







# river discharge cci

[climate.esa.int/projects/river-discharge](https://climate.esa.int/projects/river-discharge)

