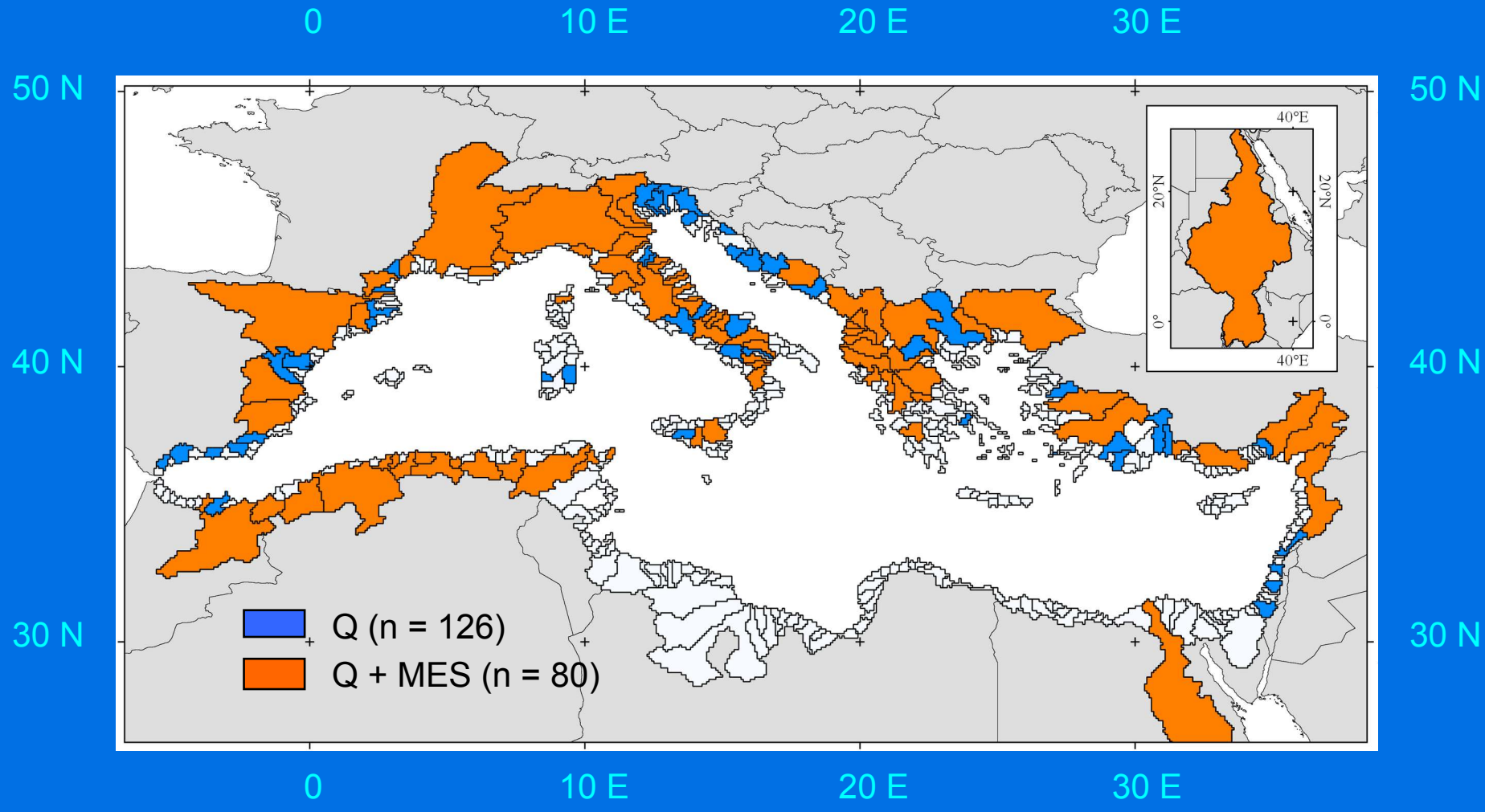
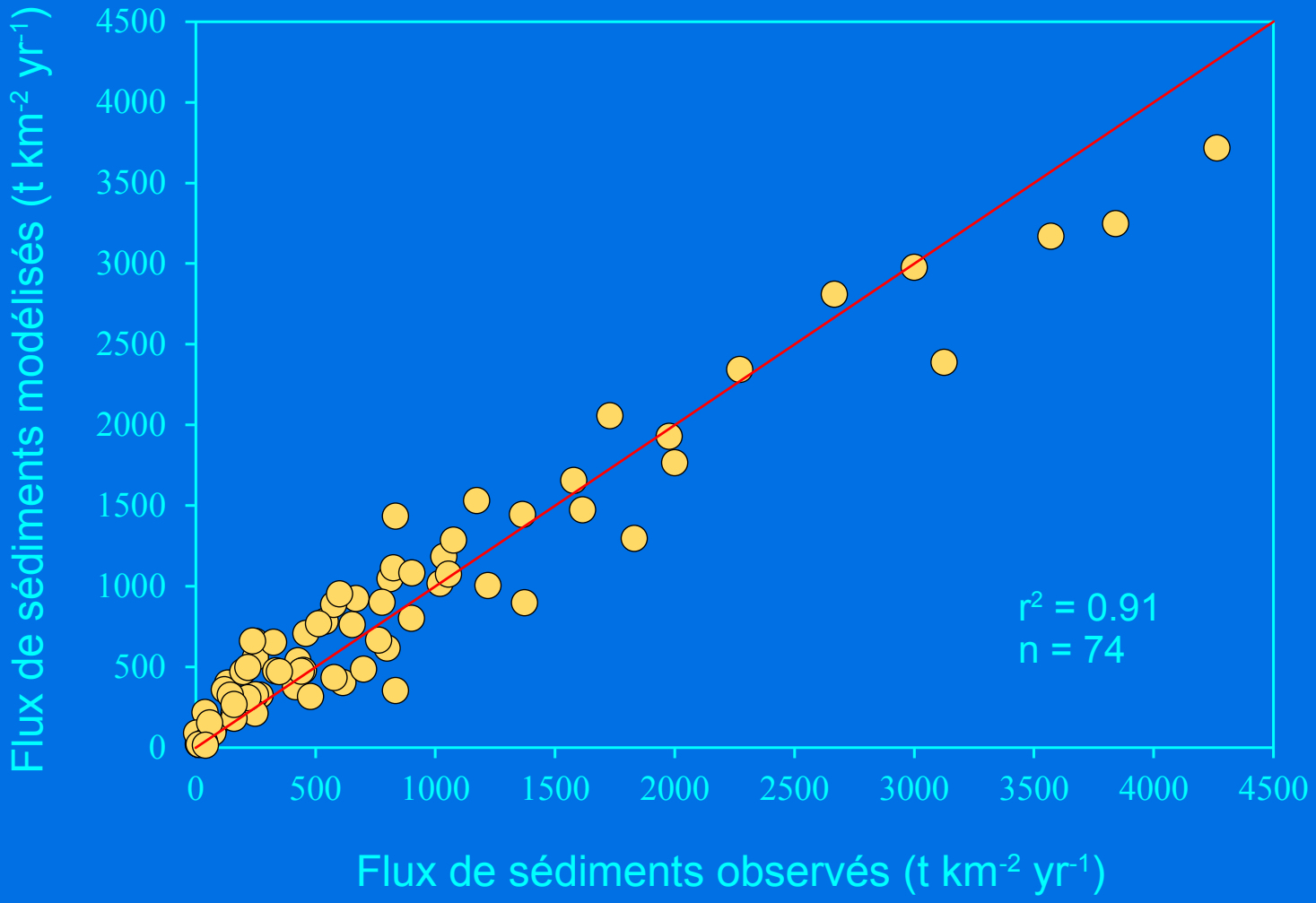
L'importance des fleuves côtiers en Méditerranée : exemple des flux de MES

Les bassins versants de la Méditerranée pour lesquels il existe des estimations sur l'érosion des sols (flux de MES: matières en suspension)



Sadaoui et al., 2017

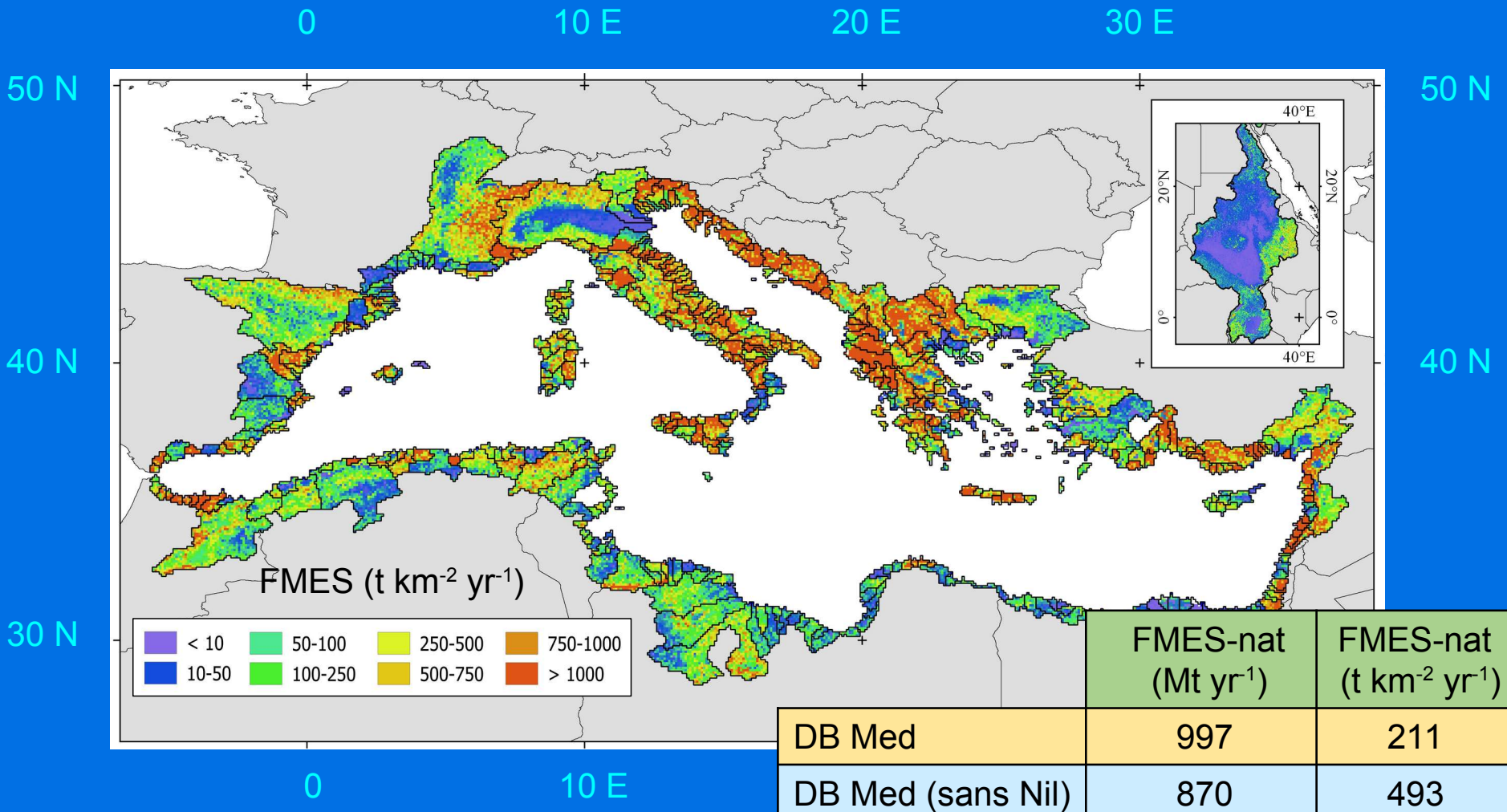


% de prairies, buissons et de surfaces agricoles

$$FMES = -3668.51 + 0.12\,Q + 270.79\,Pentes + 33.67\,SRe + 19.14\,Er$$

% roches sédimentaires en altitude (>600 m)

Variabilité spatiale des flux de sédiments naturels

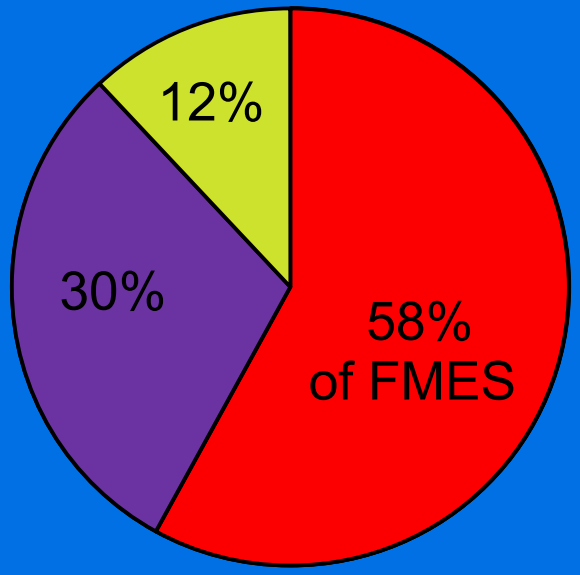


	FMES-nat (Mt yr^{-1})	FMES-nat (t km^{-2} yr^{-1})
DB Med	997	211
DB Med (sans Nil)	870	493

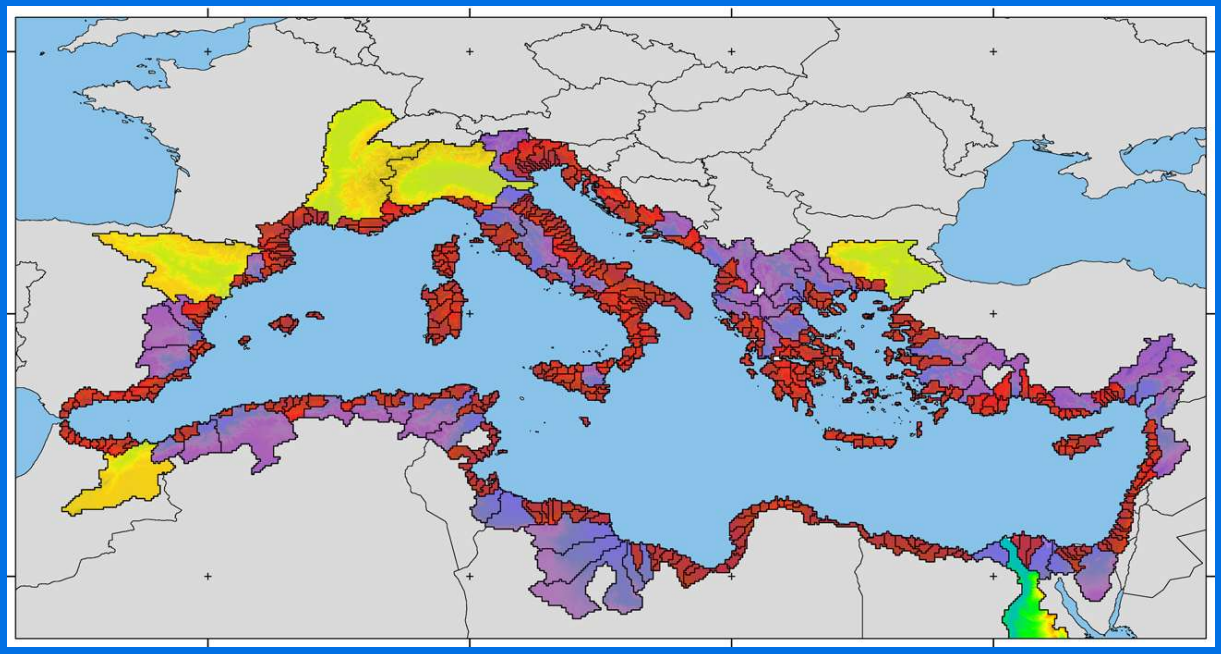
Sadaoui et al., 2017

Rôle des « fleuves côtiers » dans les bilans sédimentaires

Grands fleuves : > 50 * 10^3 km^2
24 % de la surface*



Fleuves intermédiaires
38 % de la surface*



Fleuves côtiers : < 5 * 10^3 km^2
38 % de la surface*
(*sans Nil)

Sadaoui et al., 2017

L'importance des fleuves côtiers dans le GdL : variabilités temporelles

MOOSE
Mediterranean Ocean Observing System for the Environment

Rhone

Coastal rivers

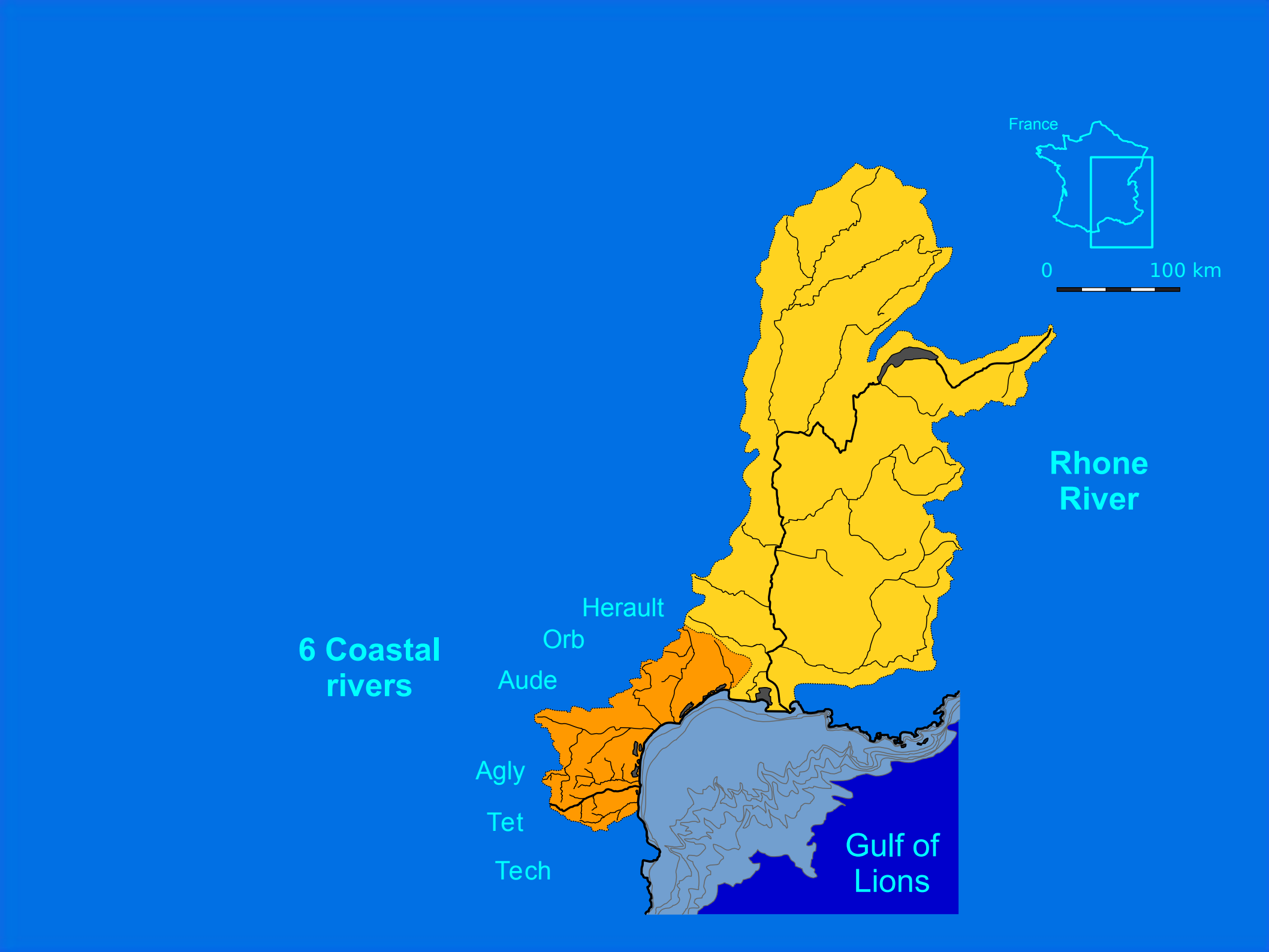
Arles

Tet at Villelongue

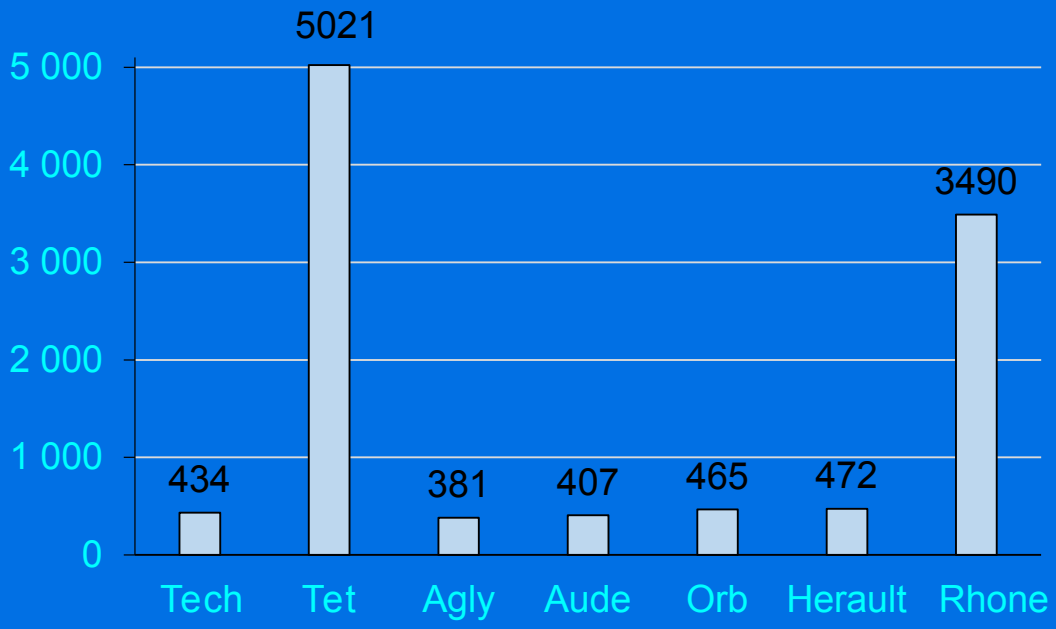
Gulf of Lions

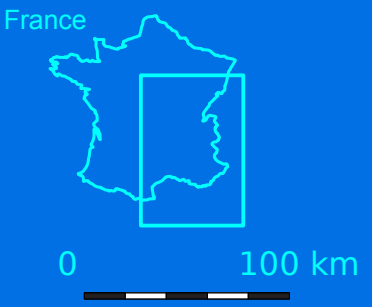
France

0 100 km


France
0
100 km
Rhone River
6 Coastal rivers
Herault
Orb
Aude
Agly
Tet
Tech
Gulf of Lions

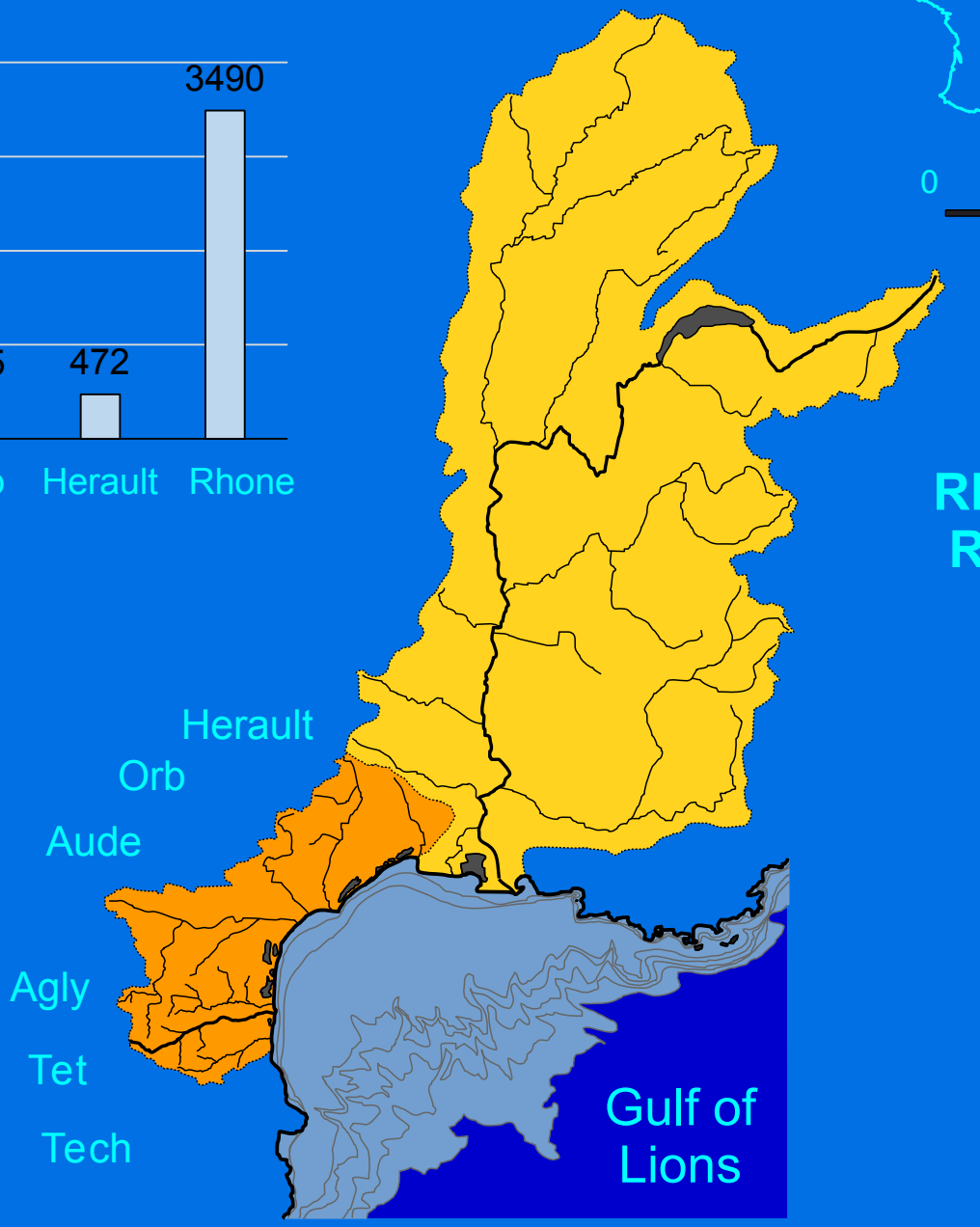
Number of Q - TSS data pairs



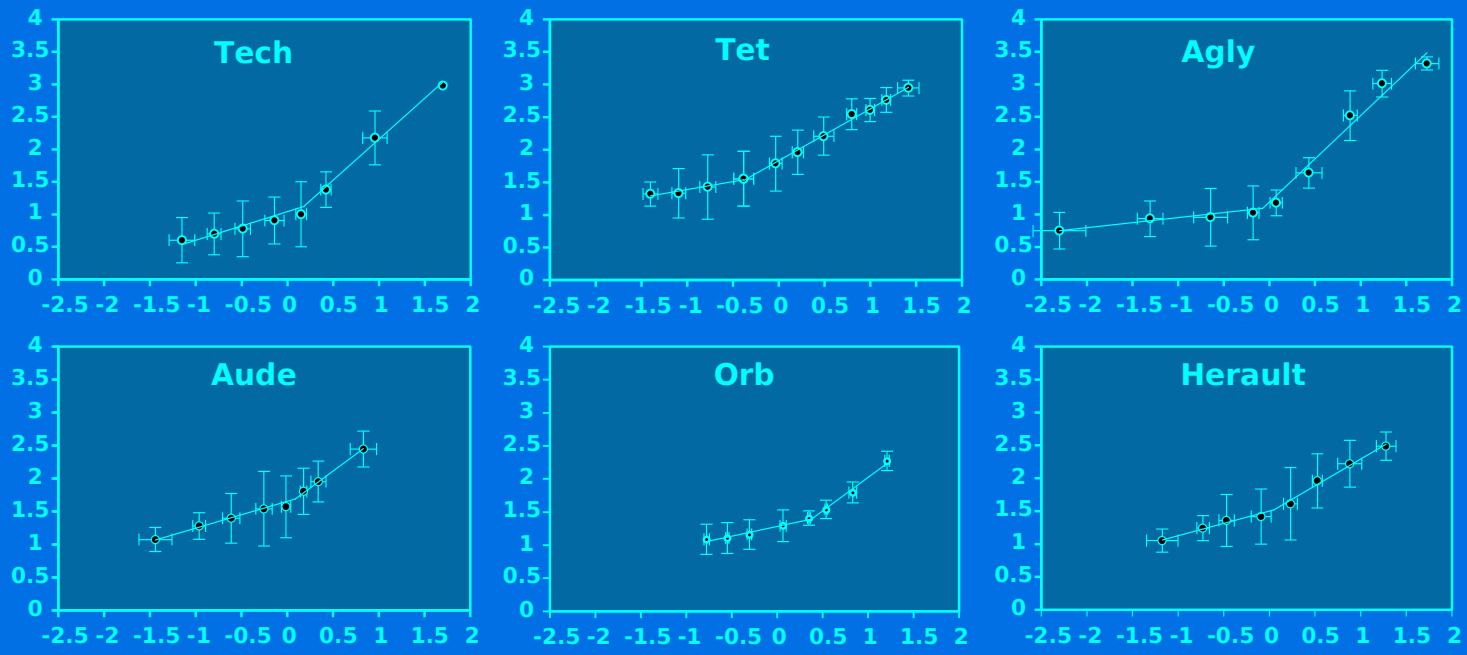


Rhone River

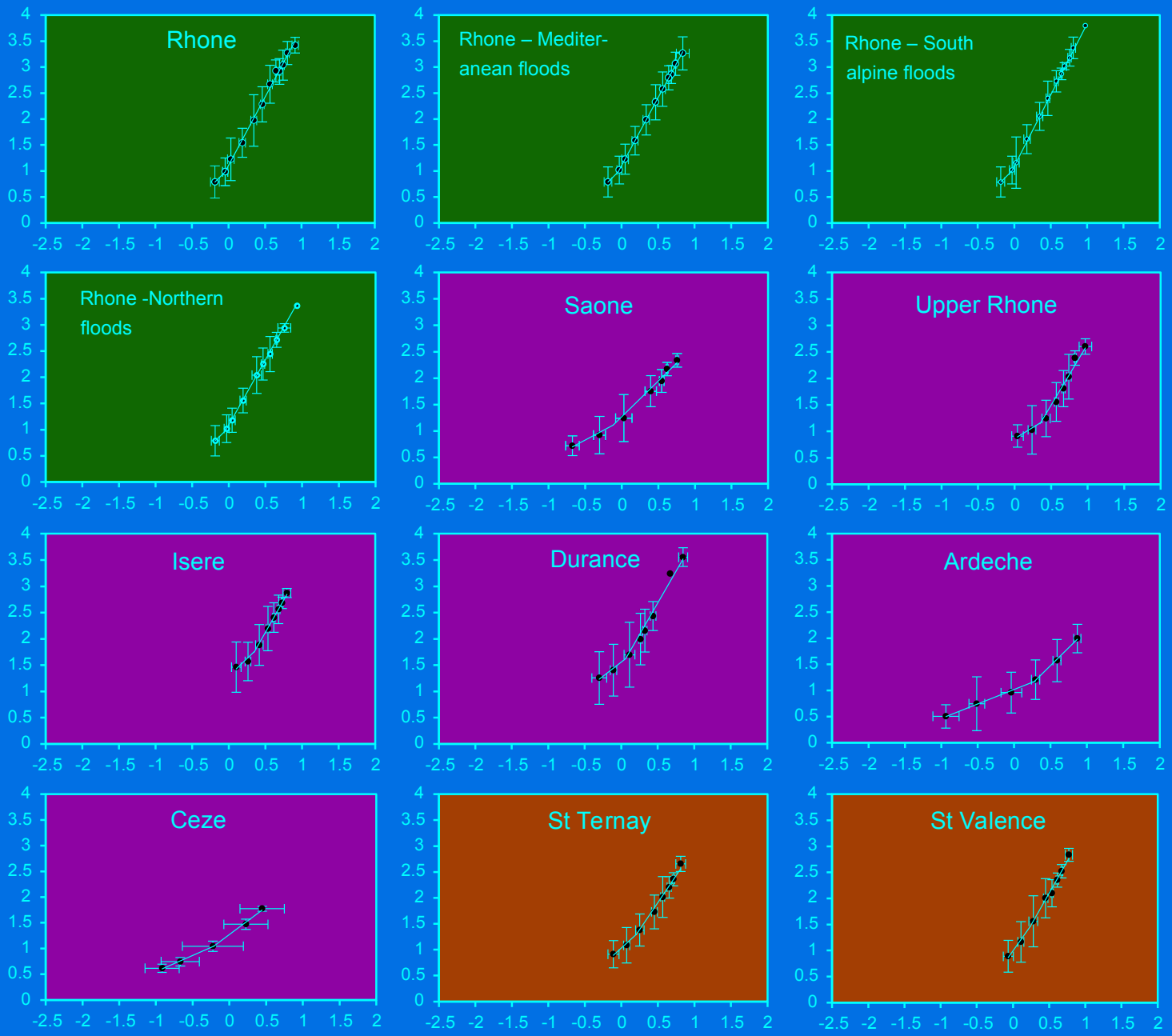
6 Coastal rivers



TSS – Q rating curves for FTSS calculations

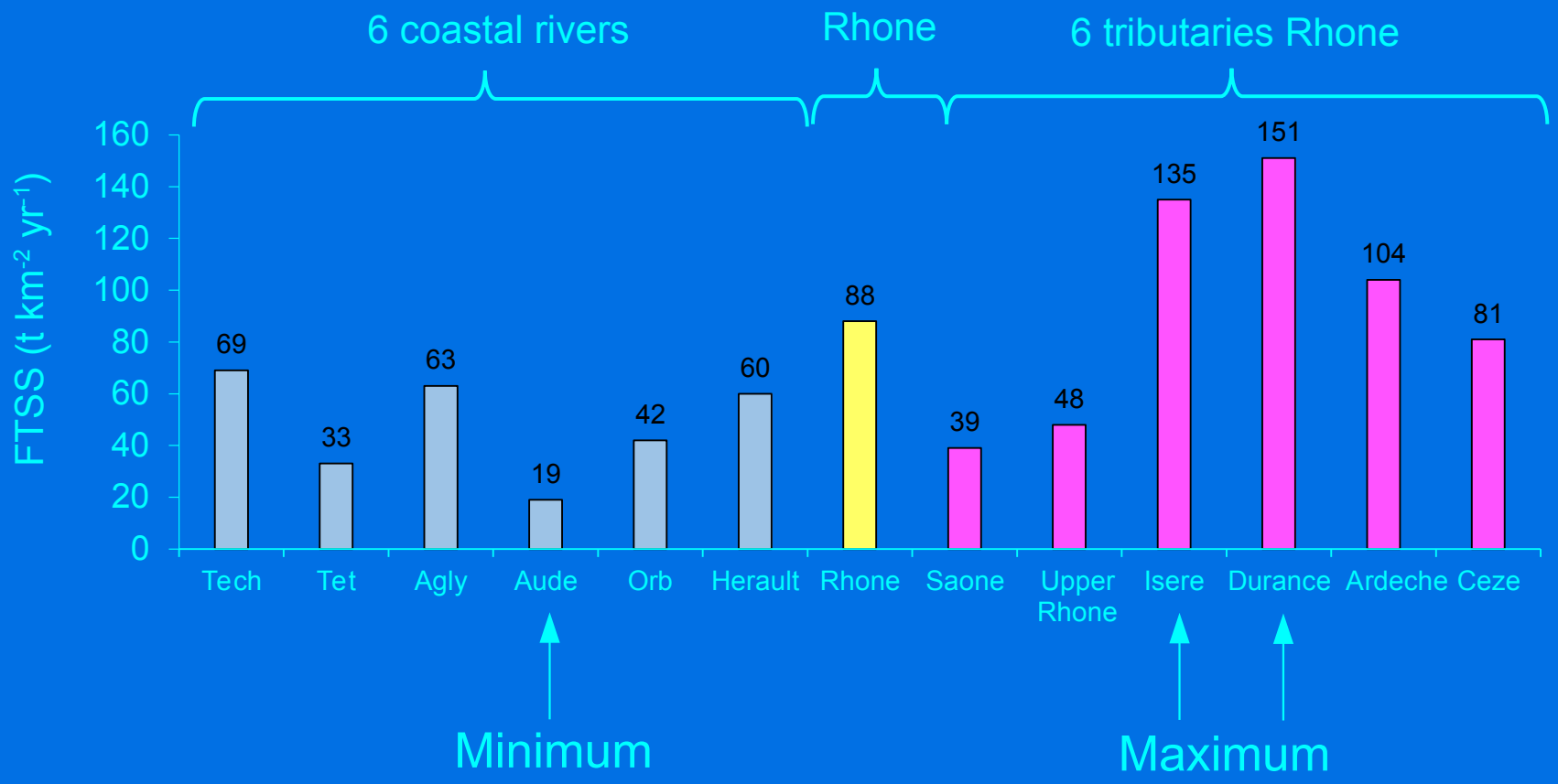


Sadaoui et al., 2016

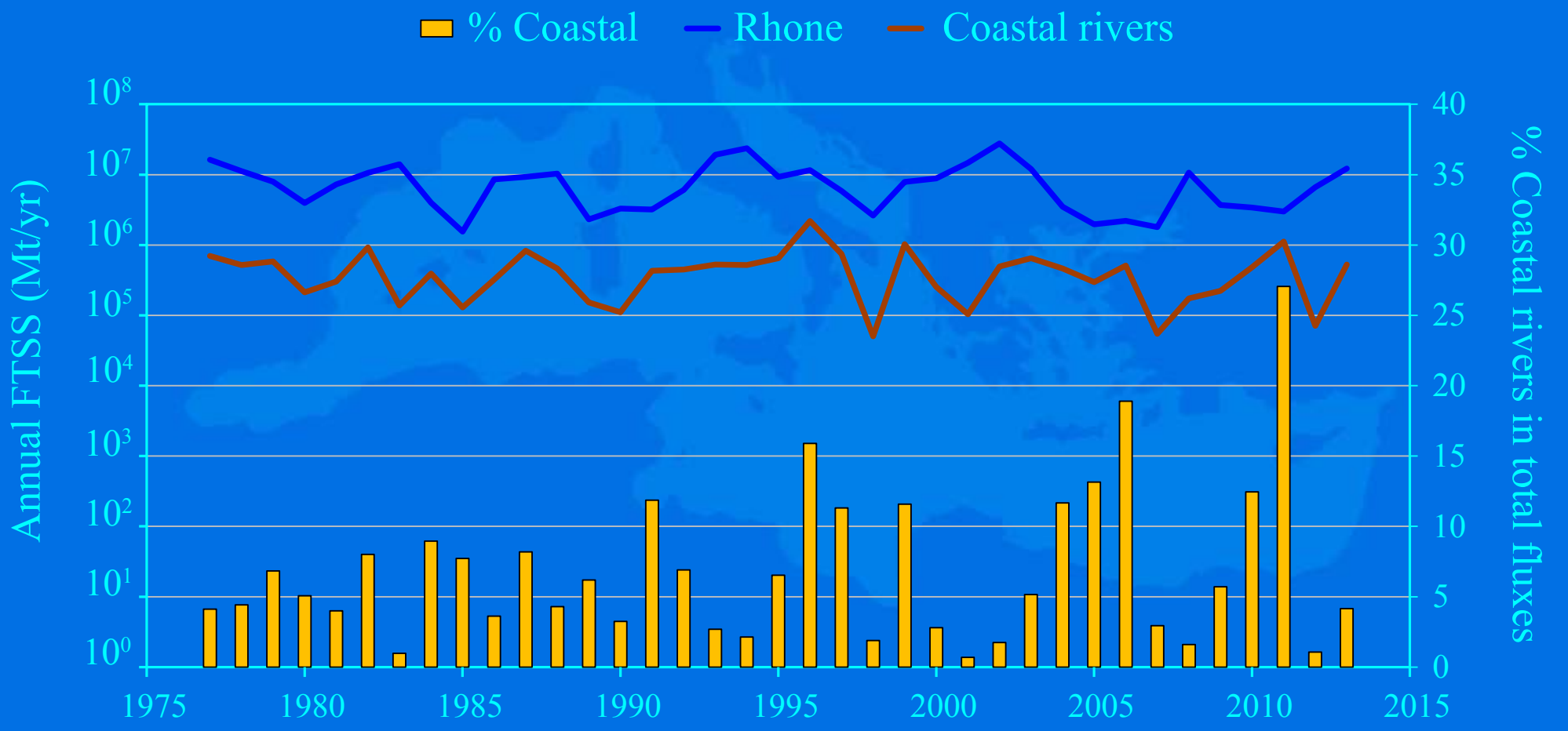


Sadaoui et al., 2016

Spatial variability of river sediment yields in the Gulf of Lions drainage basin

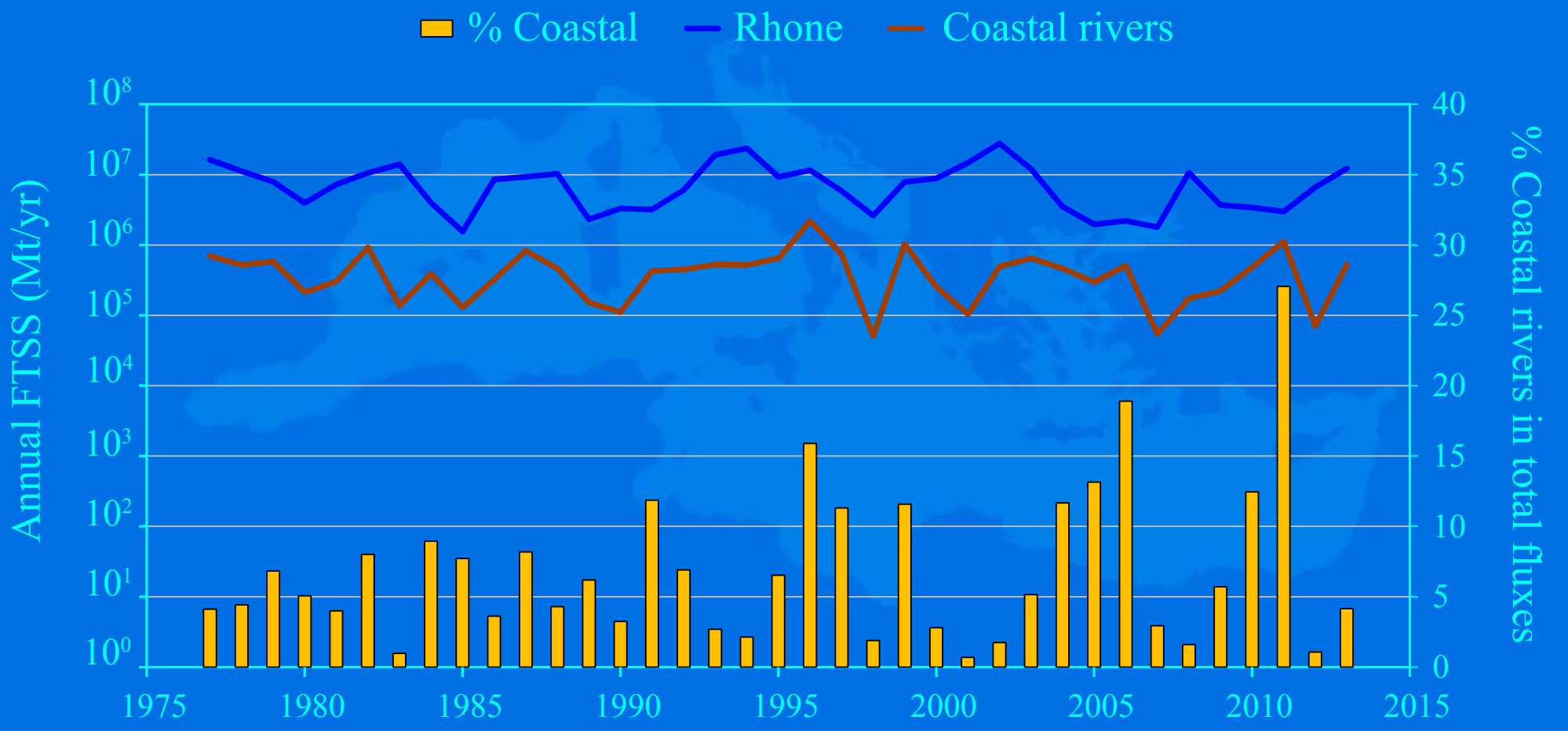


Temporal variability of river sediment fluxes to the Gulf of Lions



Sadaoui et al., 2016

Temporal variability of river sediment fluxes to the Gulf of Lions

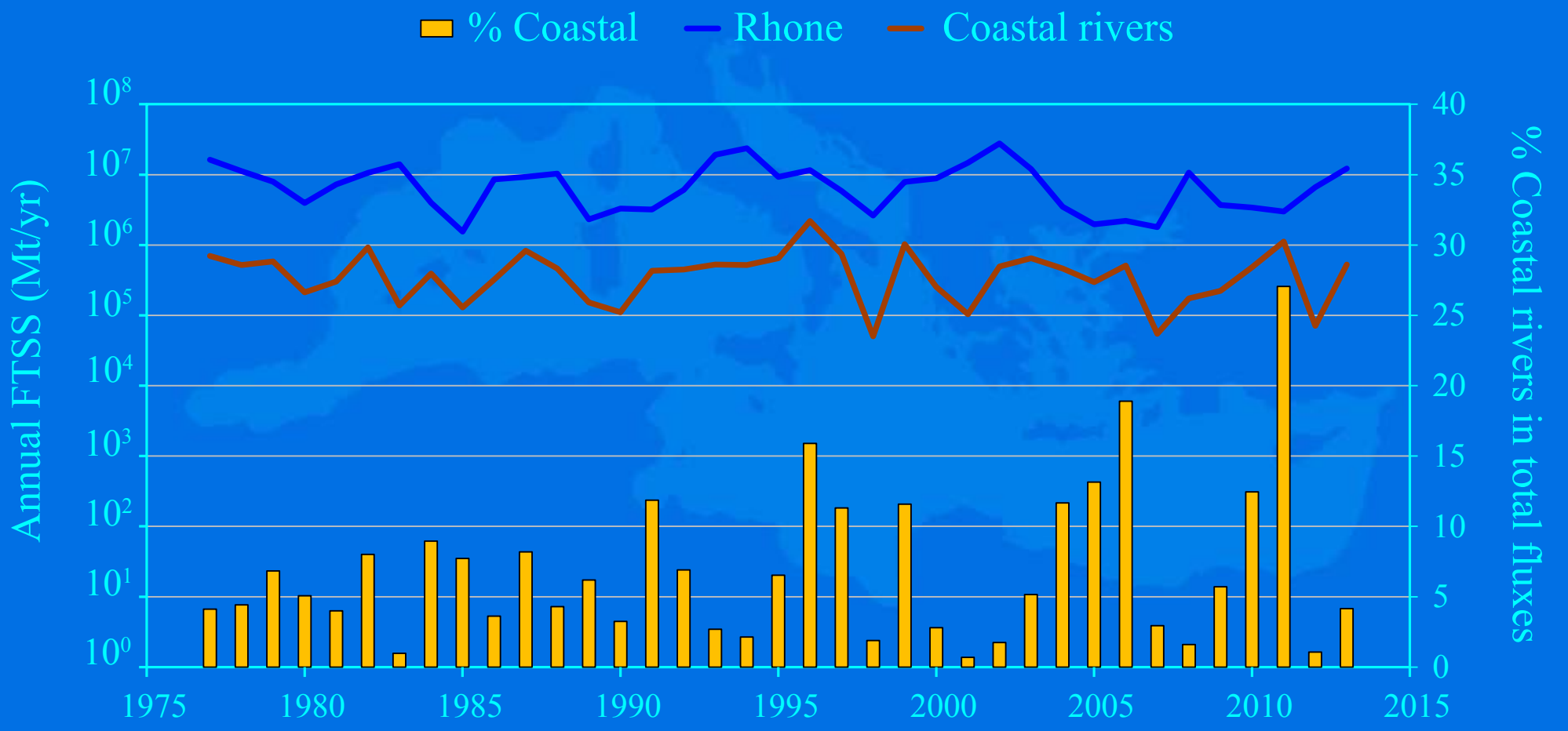


Coastal rivers vs the Rhone river

On average, 5 % of total inputs
For individual years : up to 27 %
For individual month : > 90 %

Sadaoui et al., 2016

Temporal variability of river sediment fluxes to the Gulf of Lions



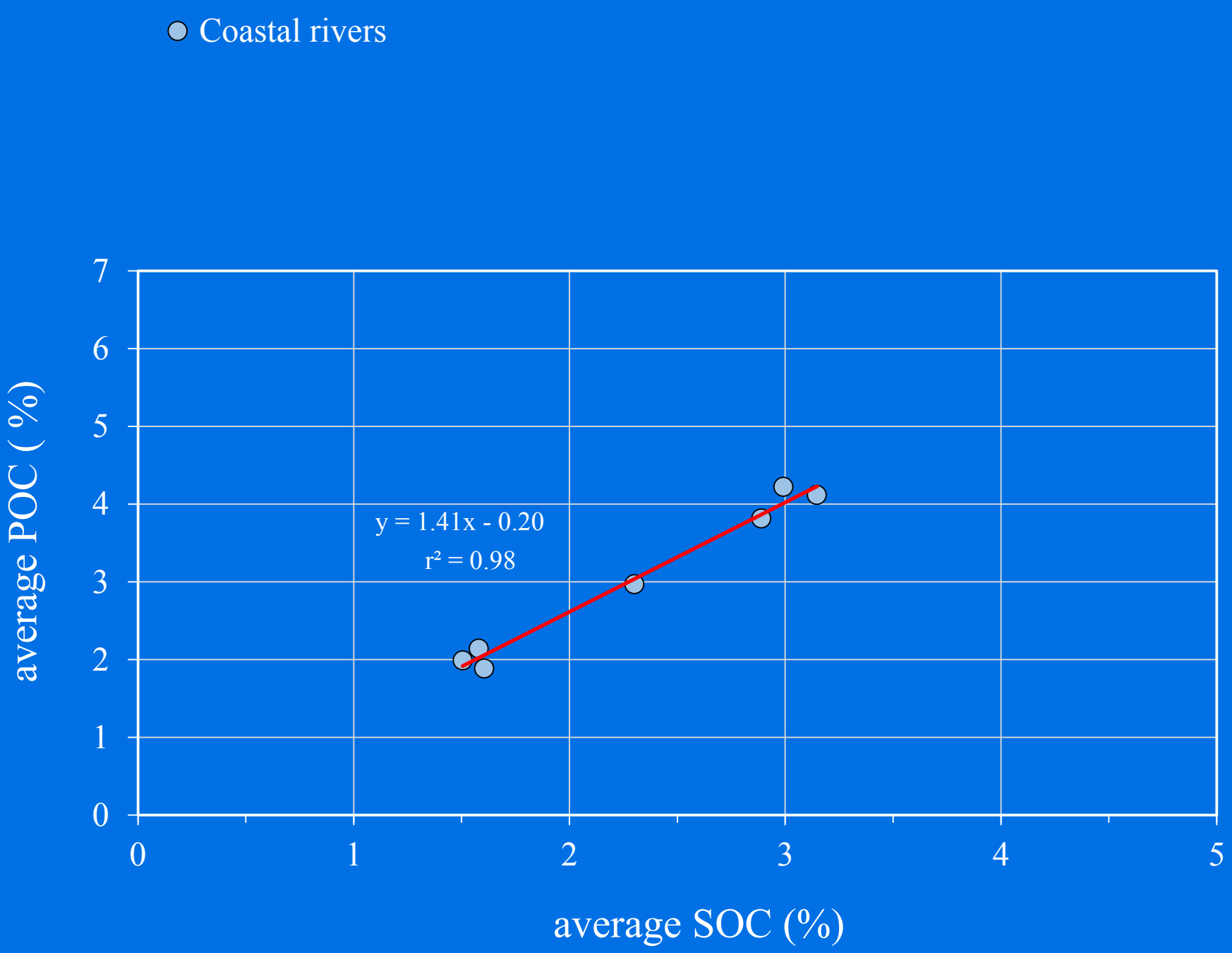
Coastal rivers vs the Rhone river

On average, 5 % of total inputs
For individual years : up to 27 %
For individual month : > 90 %

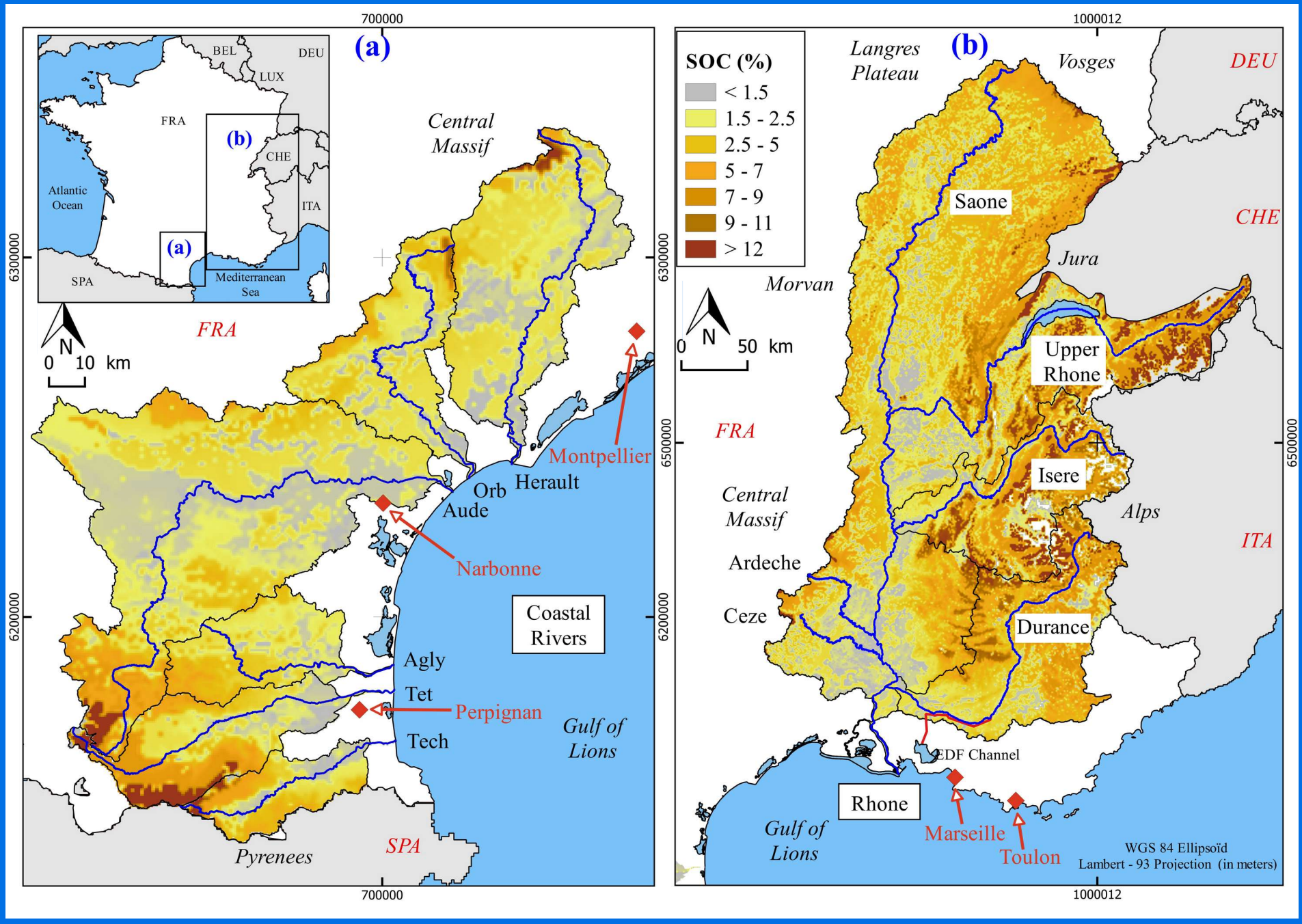
Flood contributions (% of total)

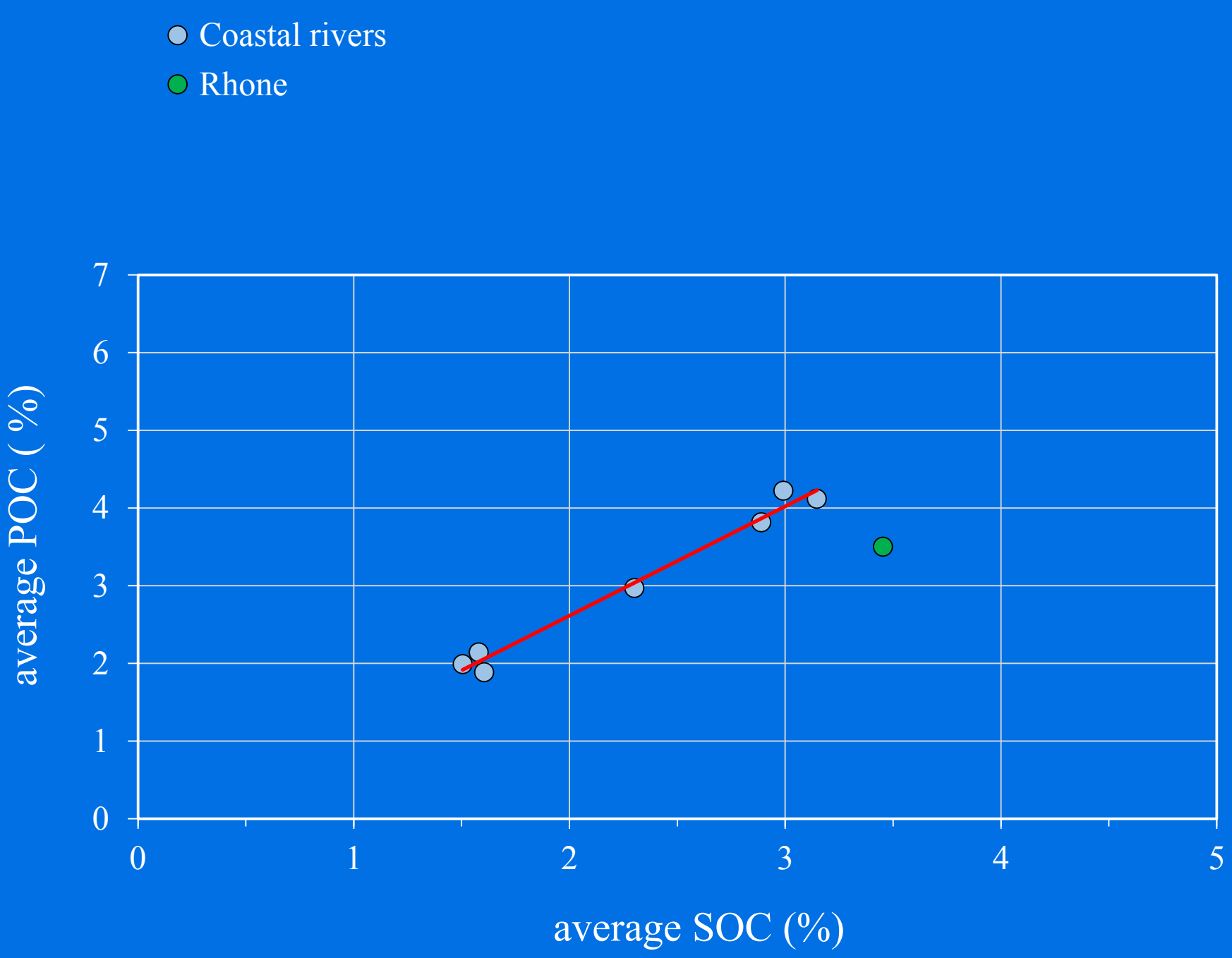
Coastal rivers 63 %
Rhone River : 40 %

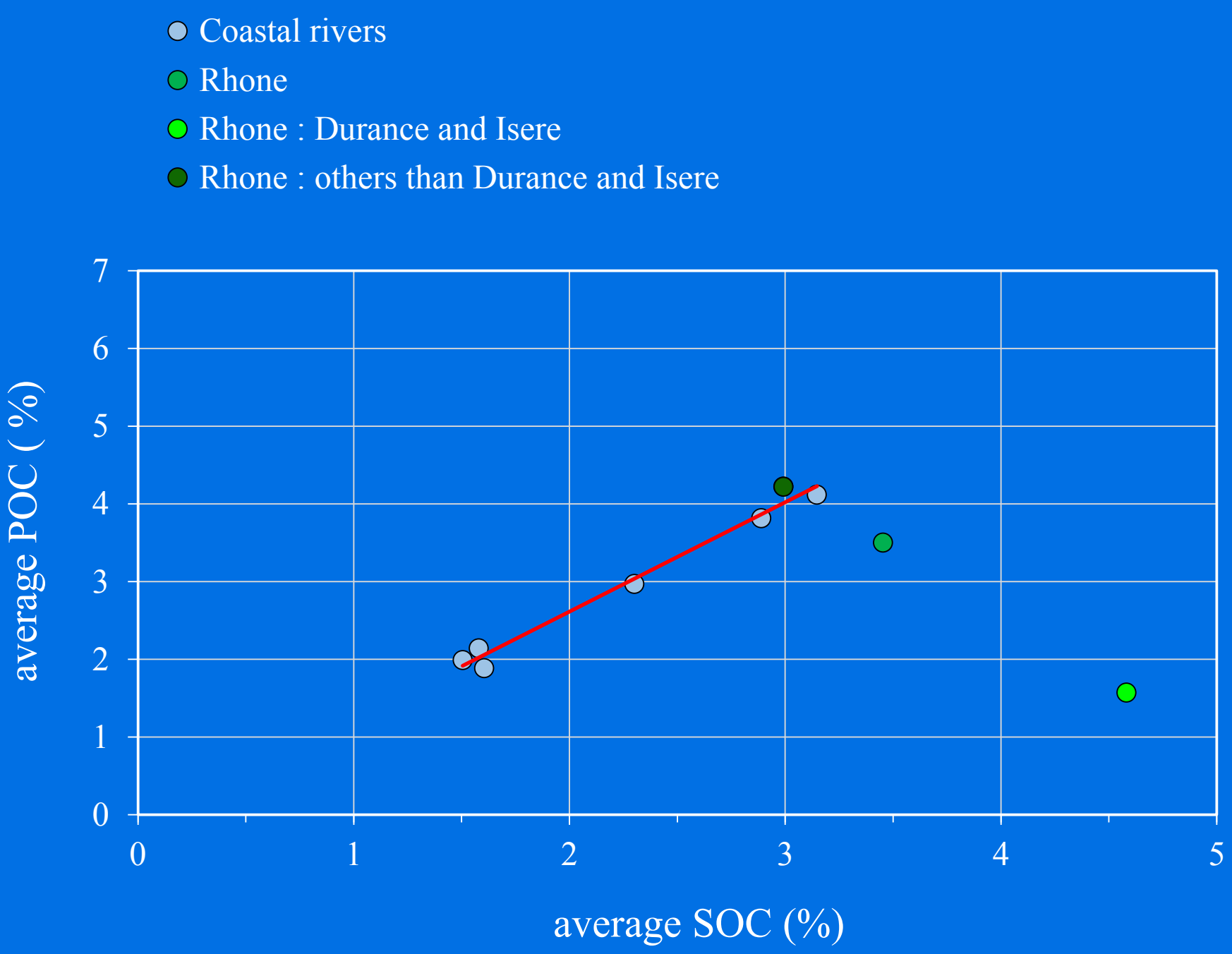
L'importance des fleuves côtiers dans le GdL : exemple du carbone organique particulaire

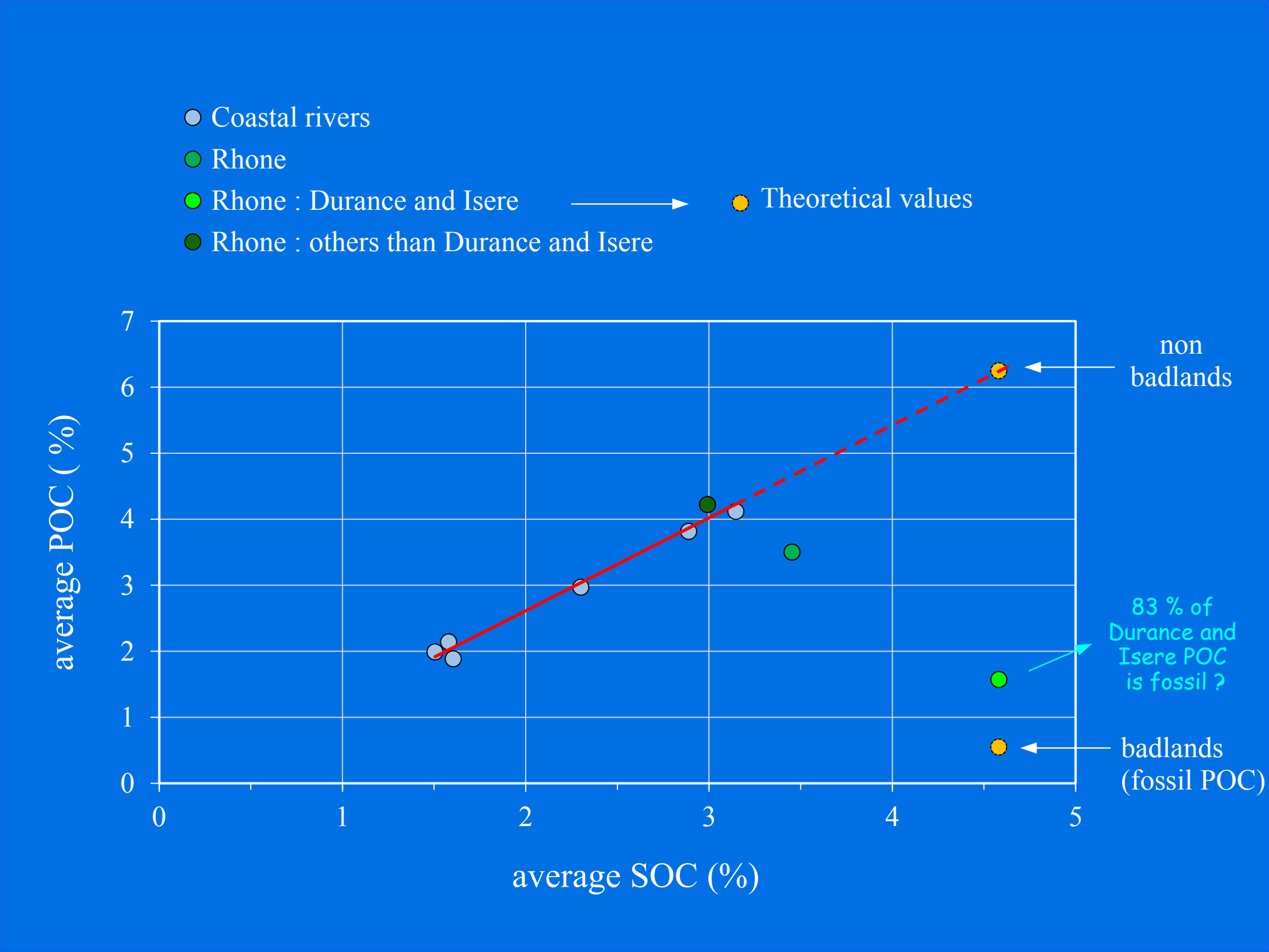

Coastal rivers
y = 1.41x - 0.20
r² = 0.98
average POC (%)
average SOC (%)
0
1
2
3
4
5
6
7

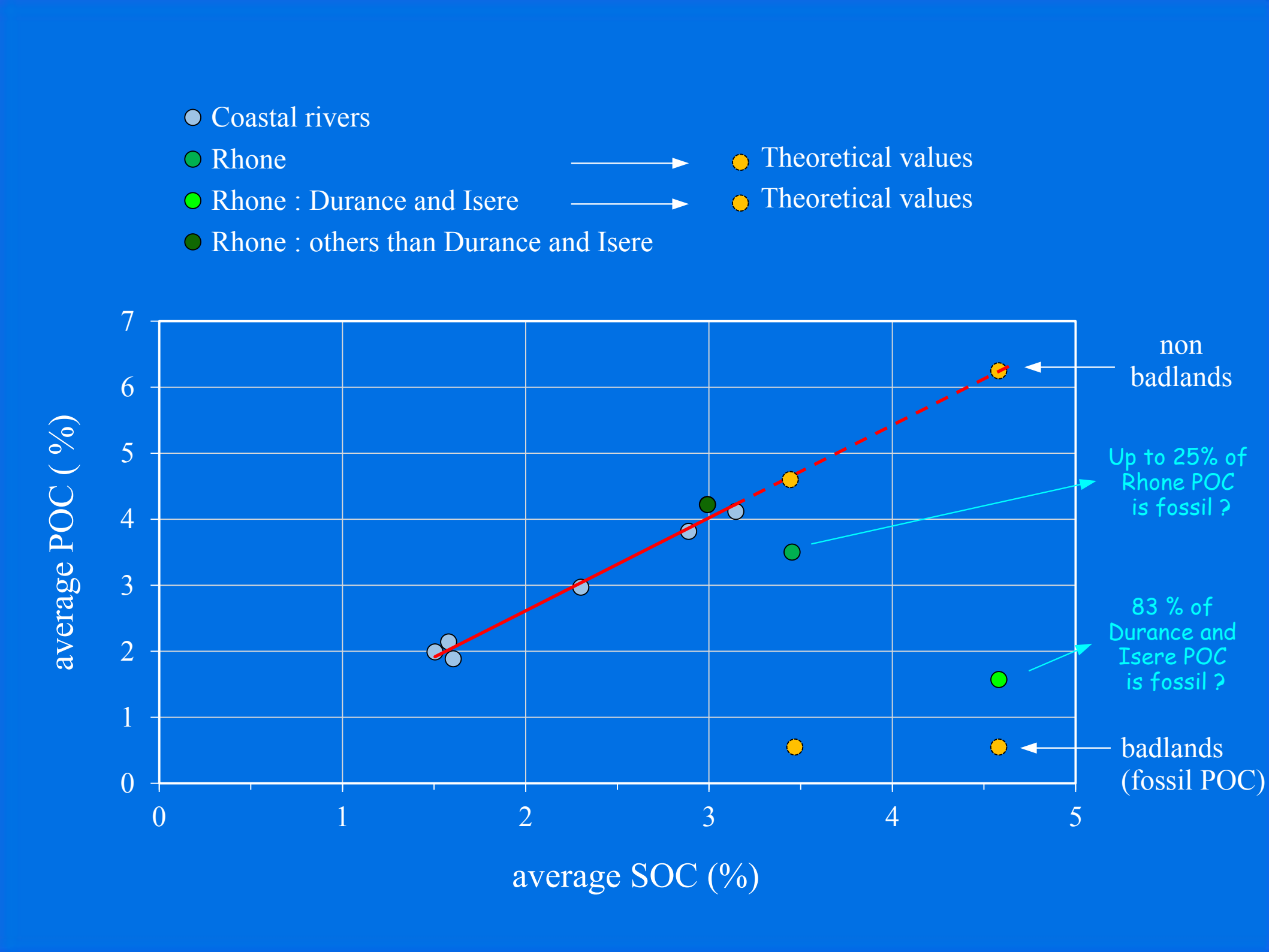
Soil organic carbon in the Gulf of Lions rivers

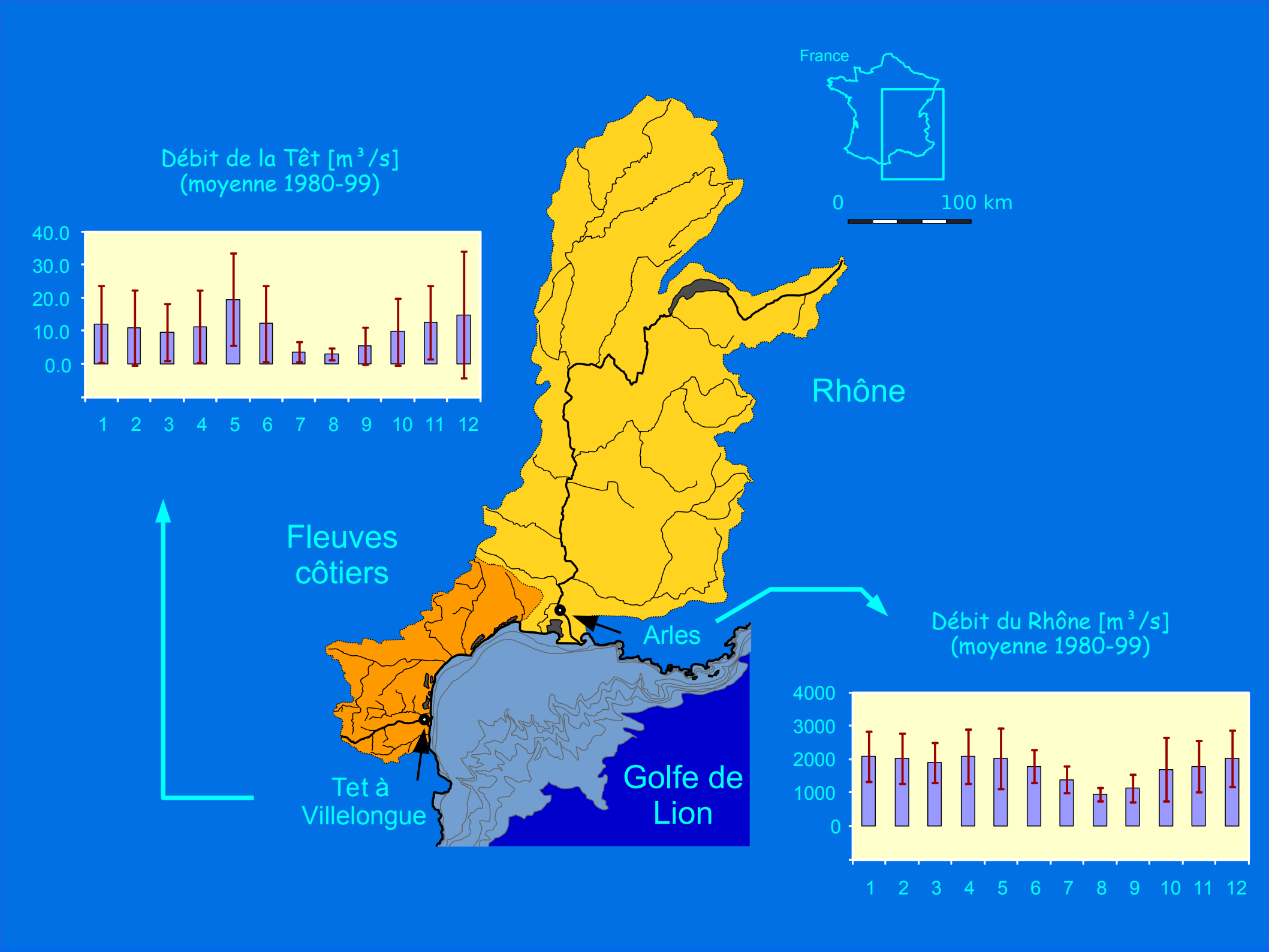



Coastal rivers
Rhone
average POC (%)
average SOC (%)
0
1
2
3
4
5
6
7
0
1
2
3
4
5


Coastal rivers
Rhone
Rhone : Durance and Isere
Rhone : others than Durance and Isere
average POC (%)
average SOC (%)
0
1
2
3
4
5
6
7


Coastal rivers
Rhone
Rhone : Durance and Isere
Rhone : others than Durance and Isere
Theoretical values
non badlands
83 % of Durance and Isere POC is fossil ?
badlands (fossil POC)
average POC (%)
average SOC (%)
0
1
2
3
4
5
6
7


Coastal rivers
Rhone
Rhone : Durance and Isere
Rhone : others than Durance and Isere
Theoretical values
Theoretical values
non badlands
Up to 25% of Rhone POC is fossil ?
83 % of Durance and Isere POC is fossil ?
badlands (fossil POC)
average POC (%)
average SOC (%)
0
1
2
3
4
5
6
7


Débit de la Têt [m³/s]
(moyenne 1980-99)
40.0
30.0
20.0
10.0
0.0
1 2 3 4 5 6 7 8 9 10 11 12
France
0
100 km
Rhône
Fleuves
côtiers
Arles
Tet à
Villelongue
Golfe de
Lion
Débit du Rhône [m³/s]
(moyenne 1980-99)
4000
3000
2000
1000
0
1 2 3 4 5 6 7 8 9 10 11 12

Flux spécifiques en nutriments dissous