



Water Resources: what part of natural flow do they represent?

Vazken Andréassian, J. Margat, Guillaume Thirel, Pascale Hubert, Charles Perrin

► To cite this version:

Vazken Andréassian, J. Margat, Guillaume Thirel, Pascale Hubert, Charles Perrin. Water Resources: what part of natural flow do they represent?. 11th Kovacs Colloquium, Jun 2014, Paris, France. pp.19, 2014. hal-02600761

HAL Id: hal-02600761

<https://hal.inrae.fr/hal-02600761>

Submitted on 16 May 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Water Resources: what part of natural flow do they represent?

Vazken Andréassian, Jean Margat, Guillaume Thirel,
Pierre Hubert, Charles Perrin

1



What are water resources?

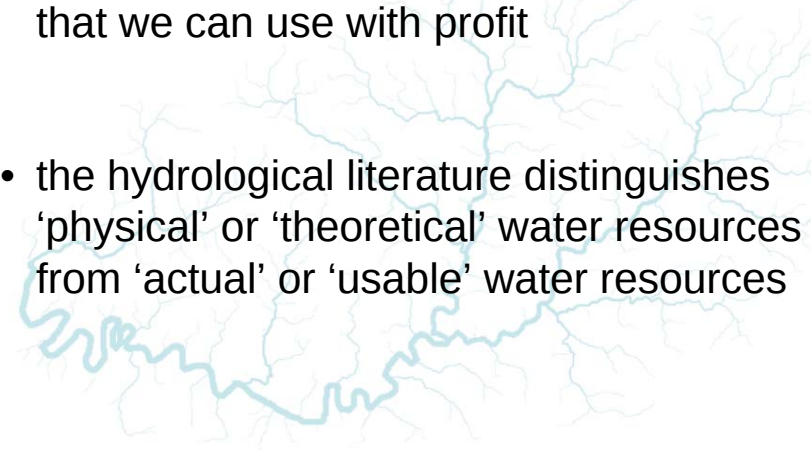
- In modern hydrological *newspeak*, water flow and water resource are synonyms
- Example : national water resources accounts (FAO's Aquastat figures...)
- Is this right?
- What part of the hydrological cycle can really be transformed into a resource?

2

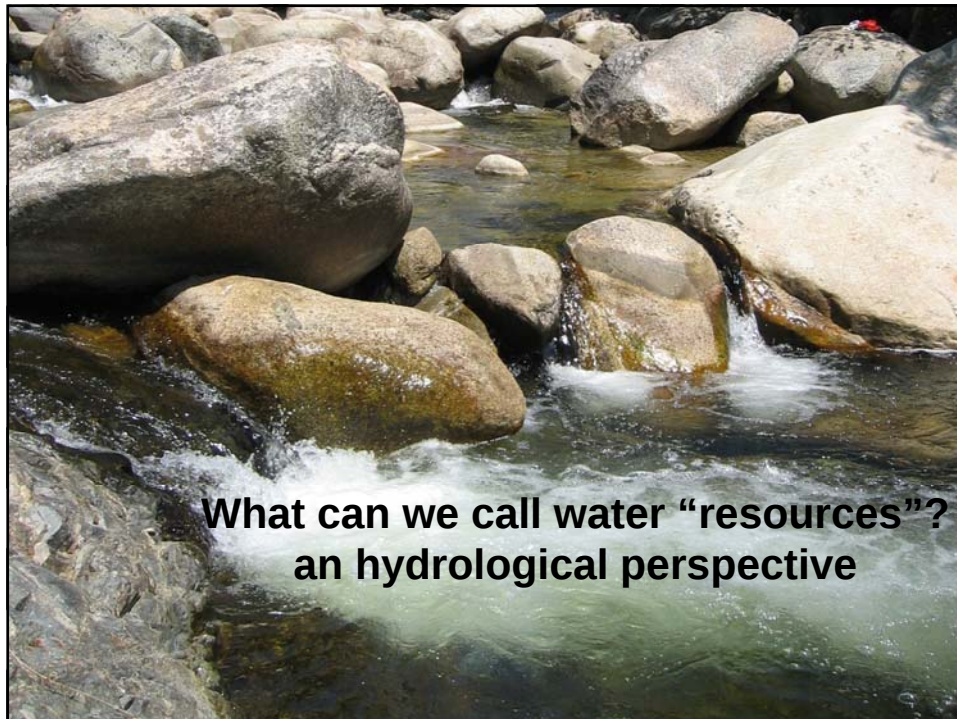


What can we call water “resources”?

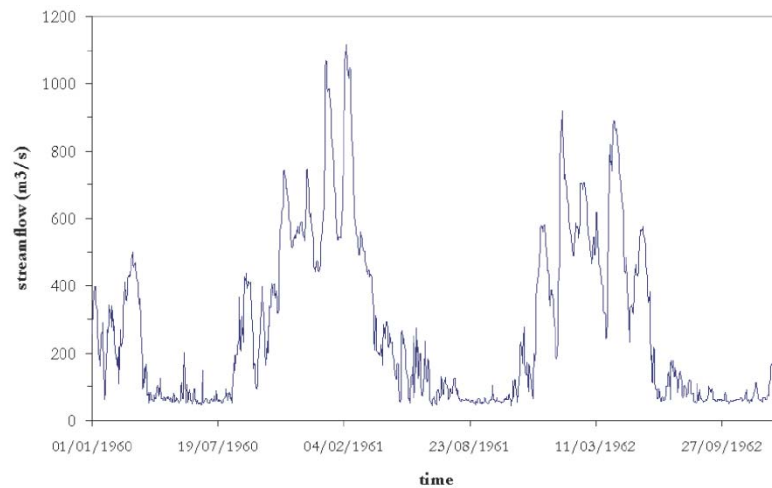
- resource = the part of the water cycle that we can use with profit
- the hydrological literature distinguishes ‘physical’ or ‘theoretical’ water resources from ‘actual’ or ‘usable’ water resources



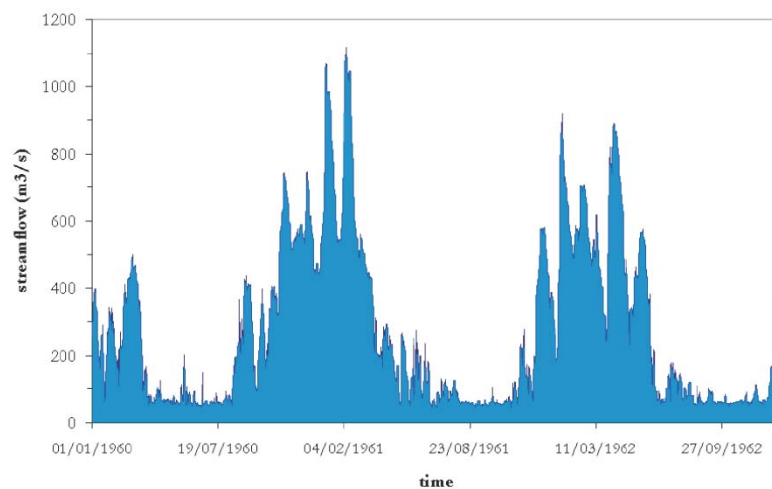
3



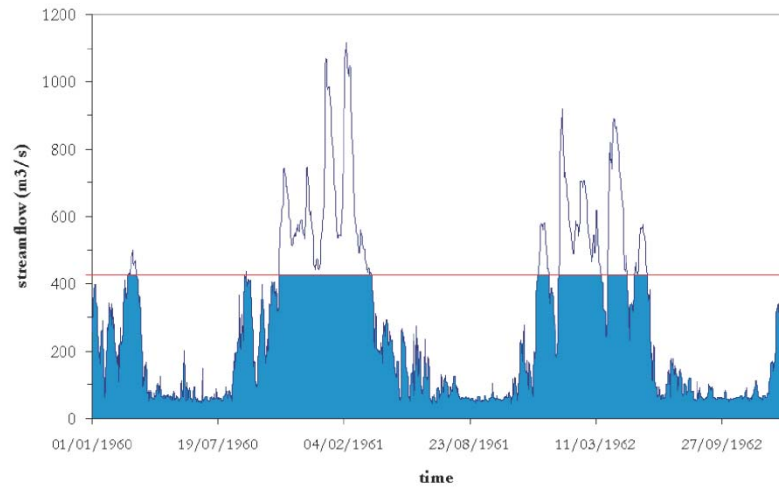
What can we call water “resources”? a surface hydrologist’s perspective



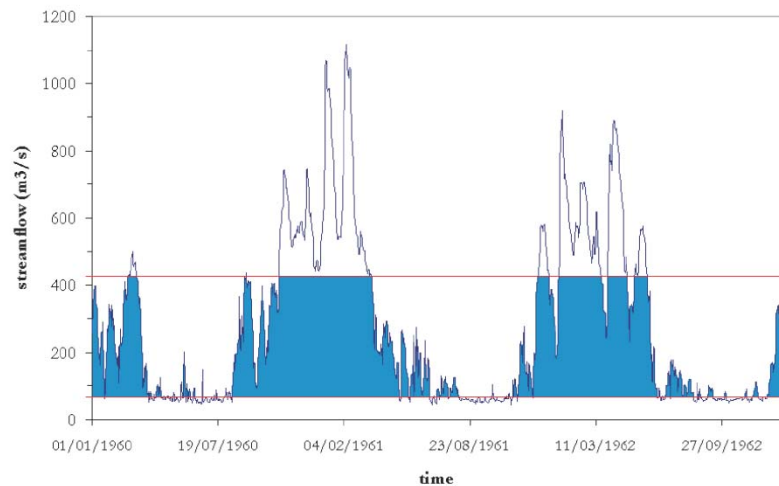
What can we call water “resources”? a surface hydrologist’s perspective

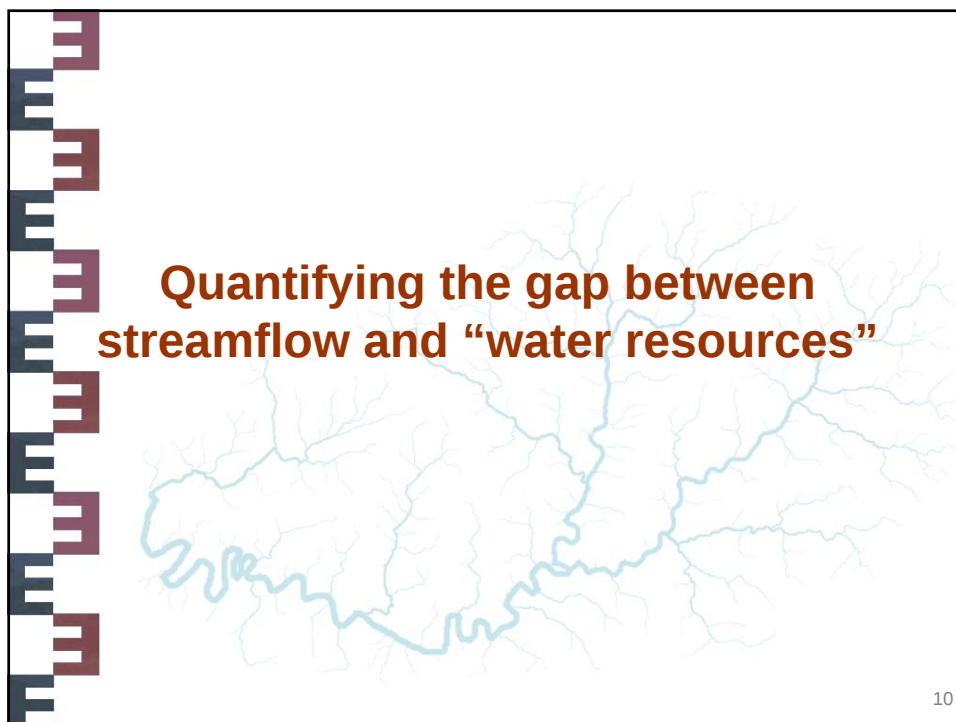
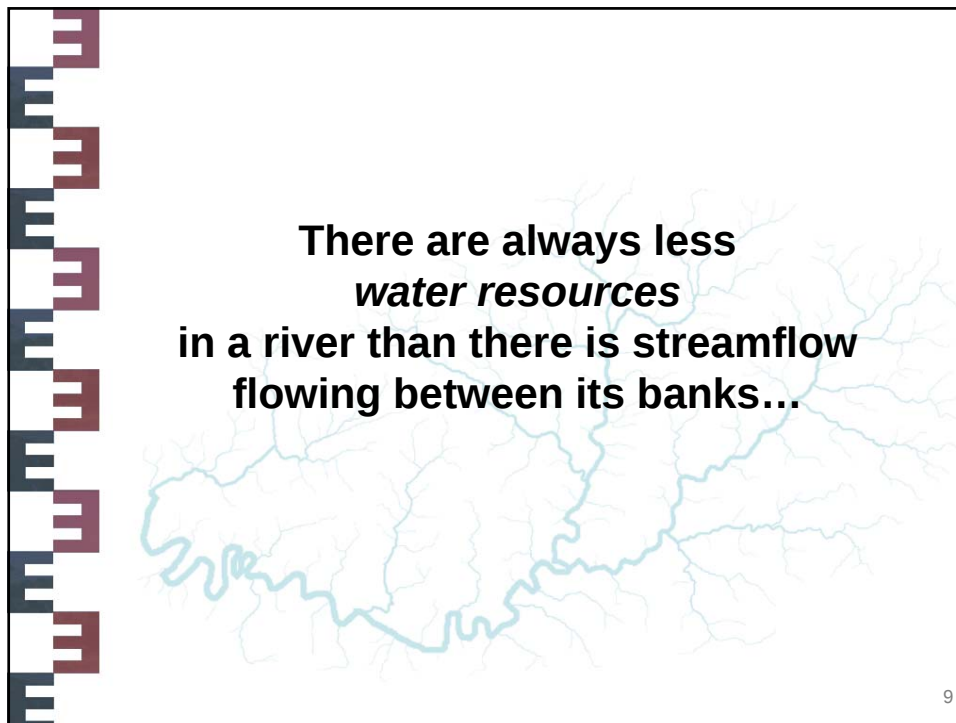


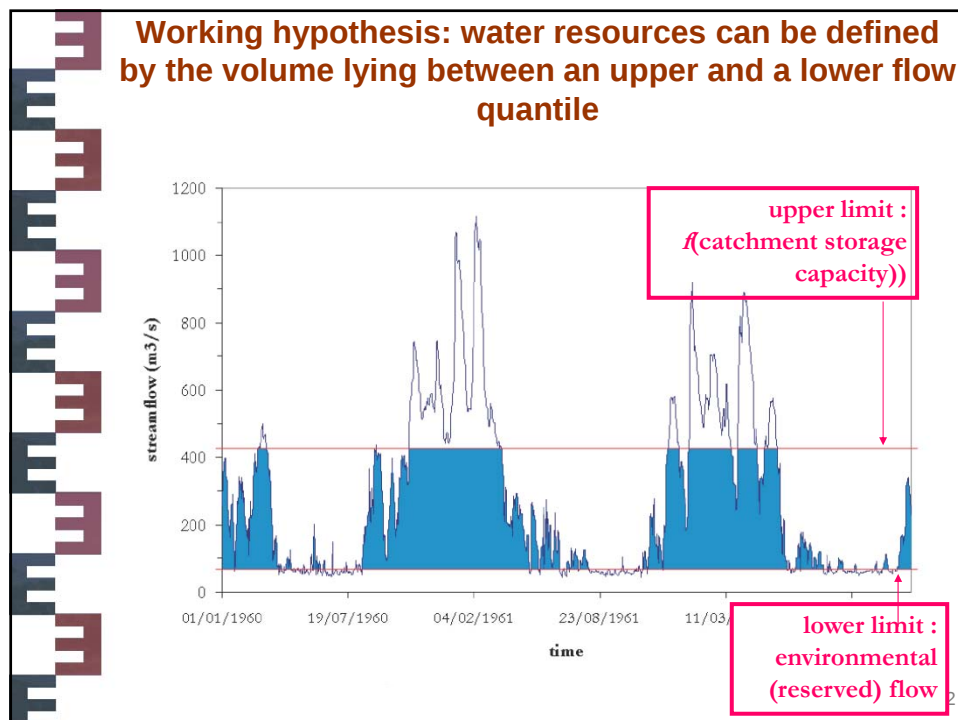
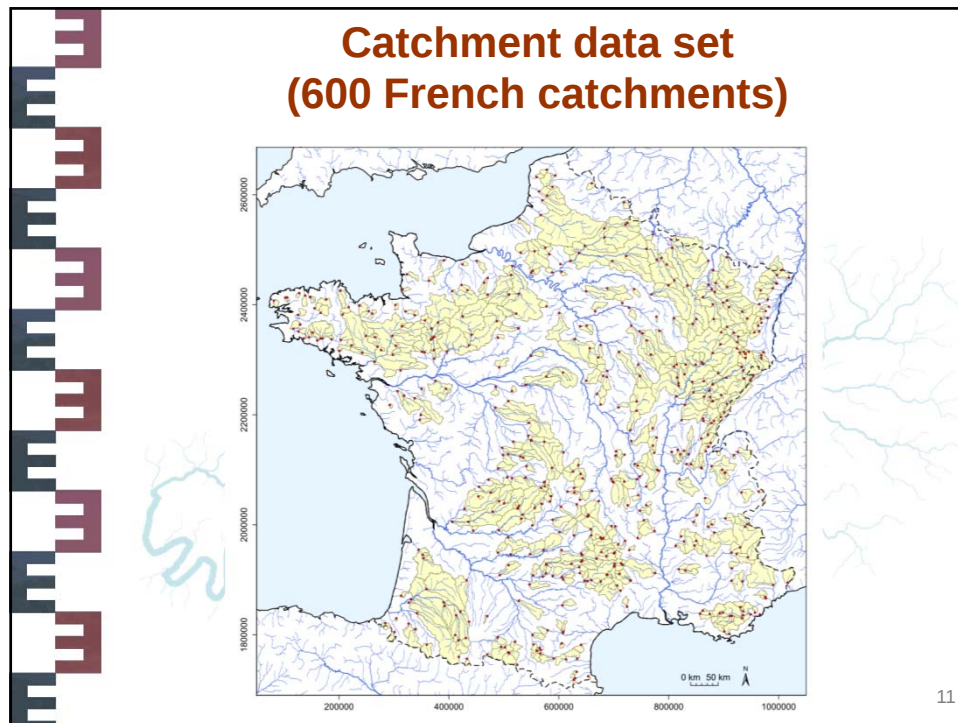
What can we call water “resources”? a surface hydrologist’s perspective

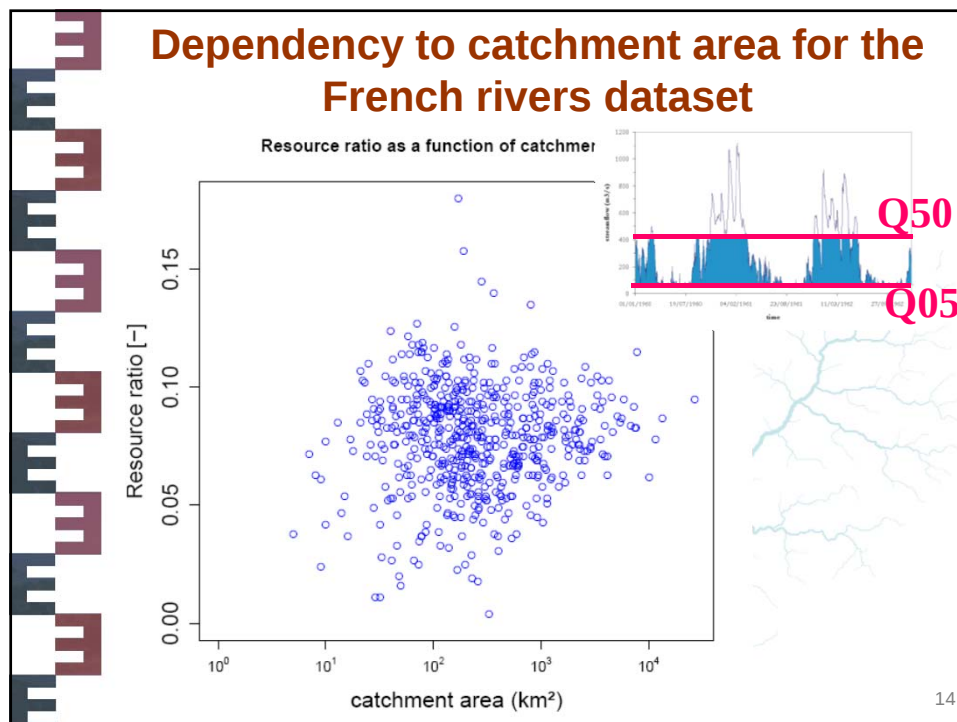
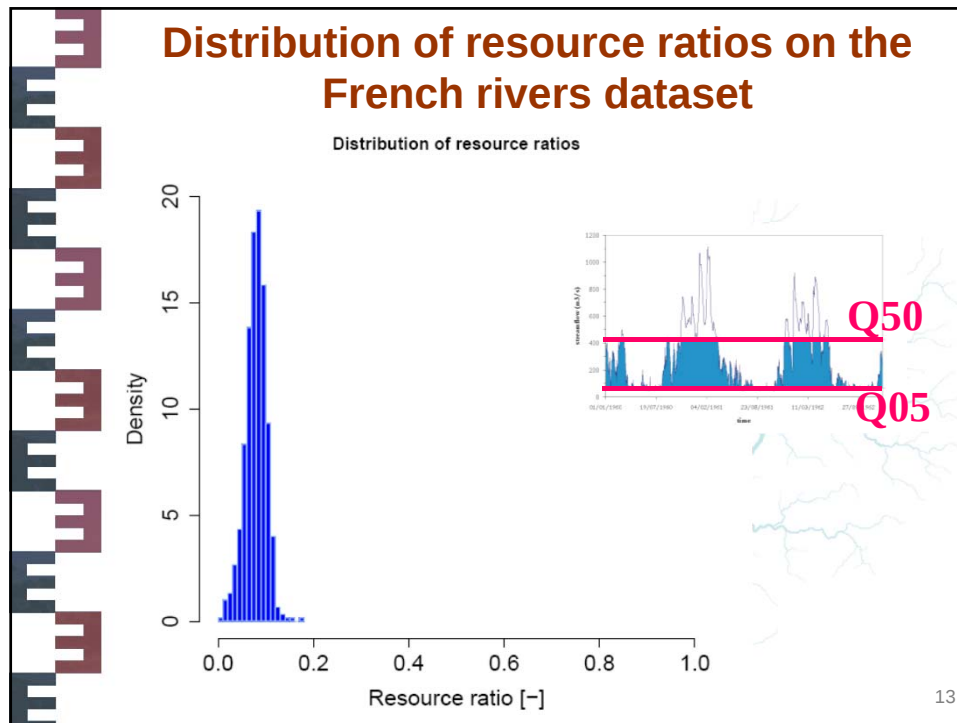


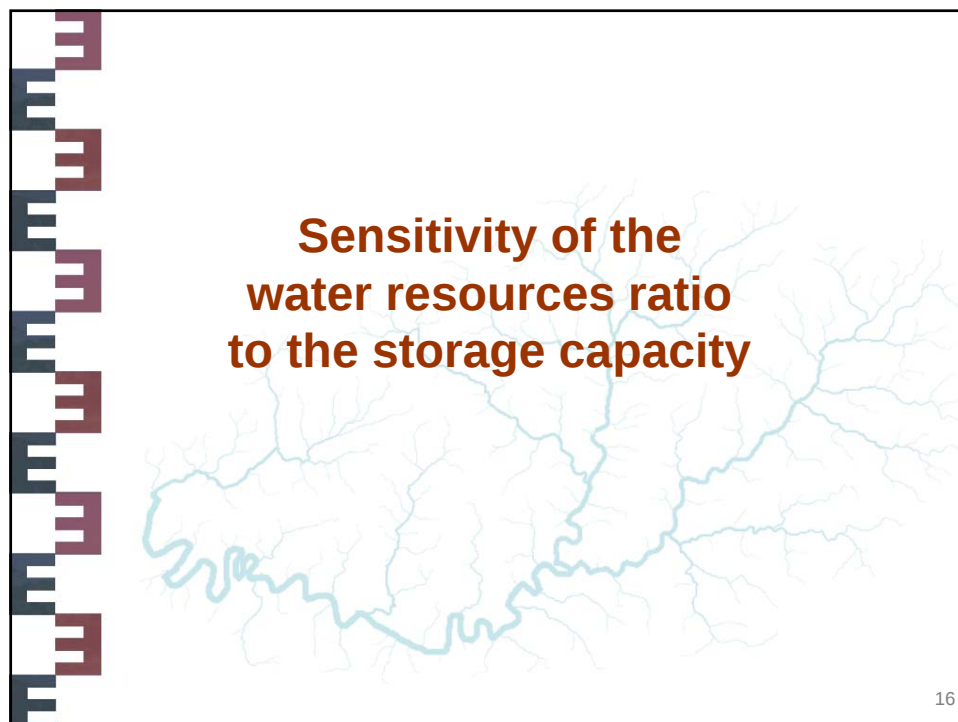
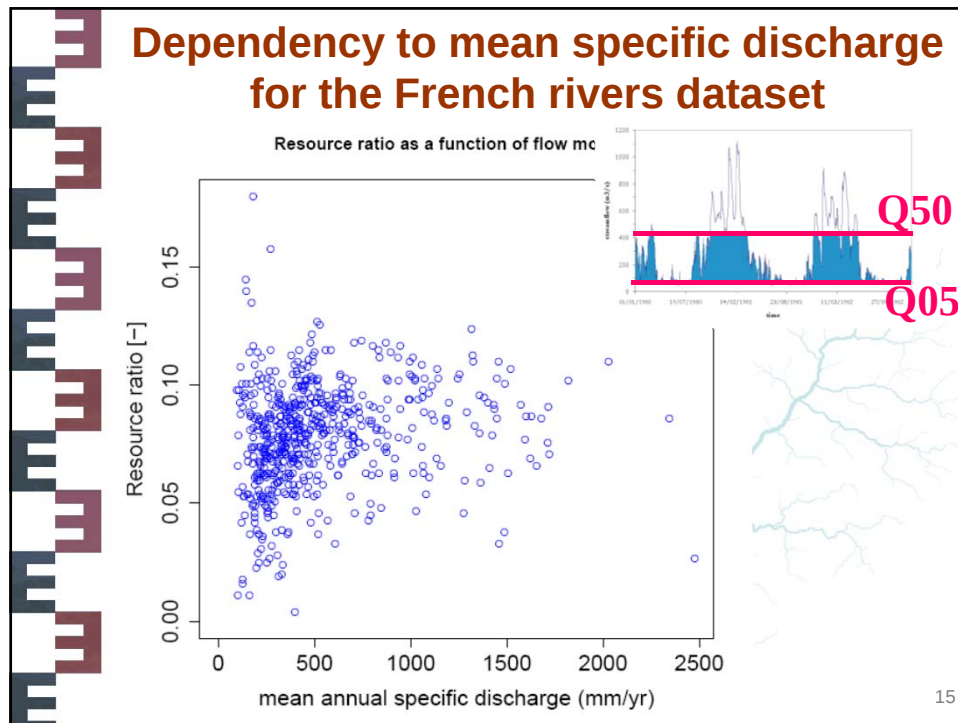
What can we call water “resources”? a surface hydrologist’s perspective

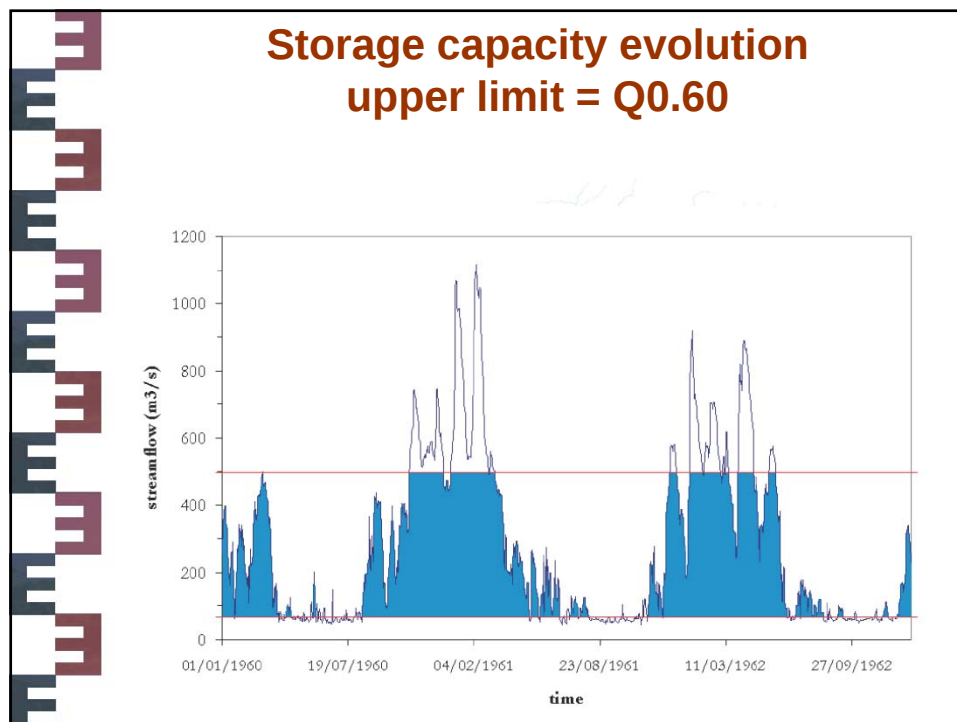
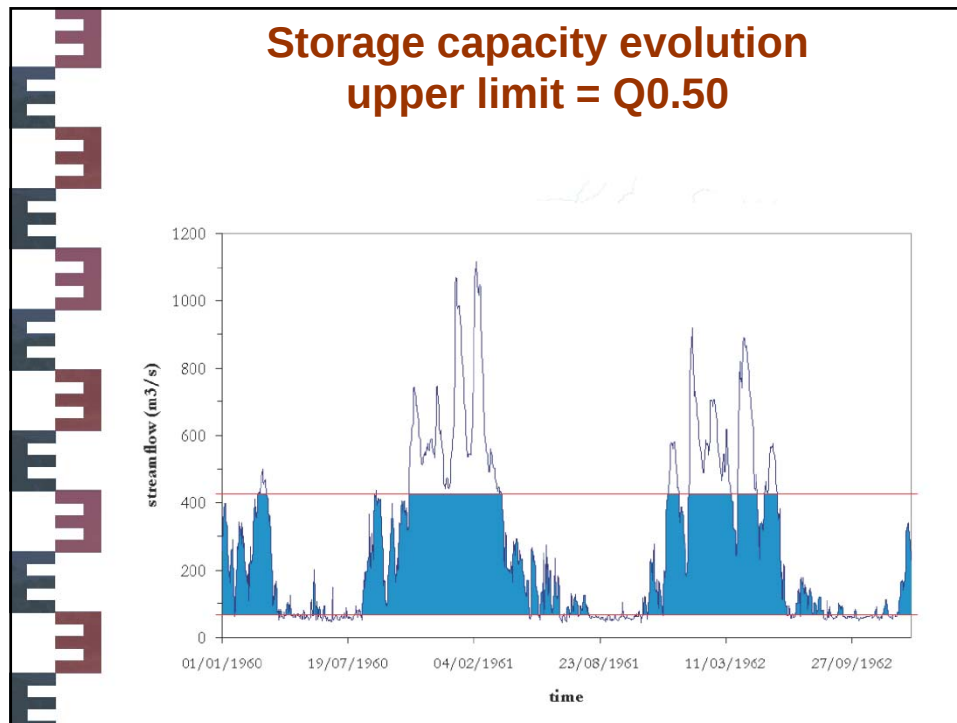


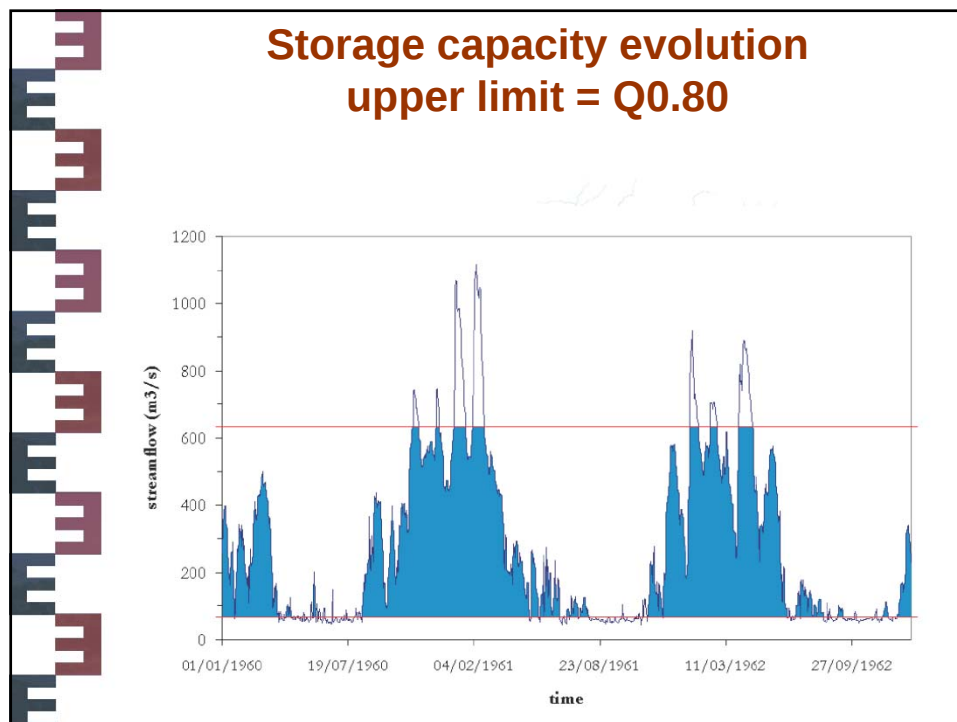
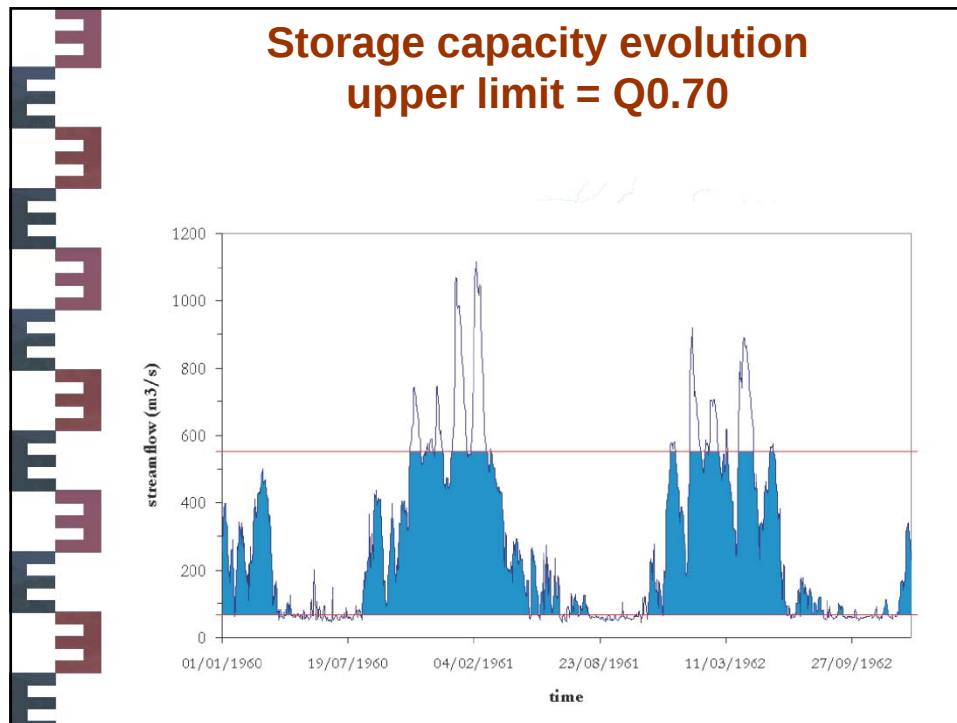


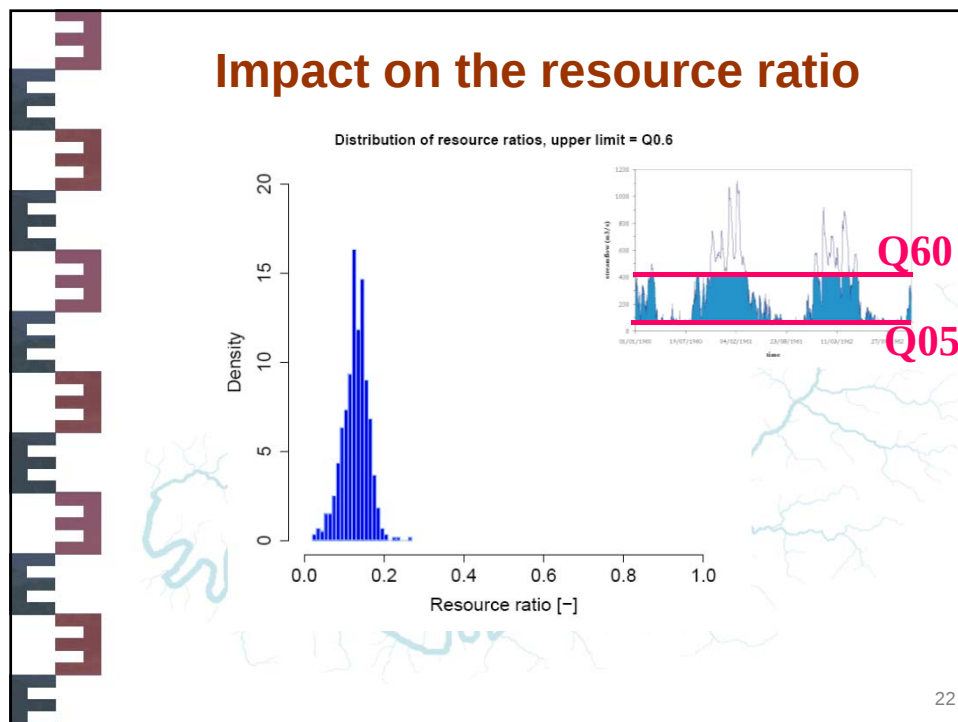
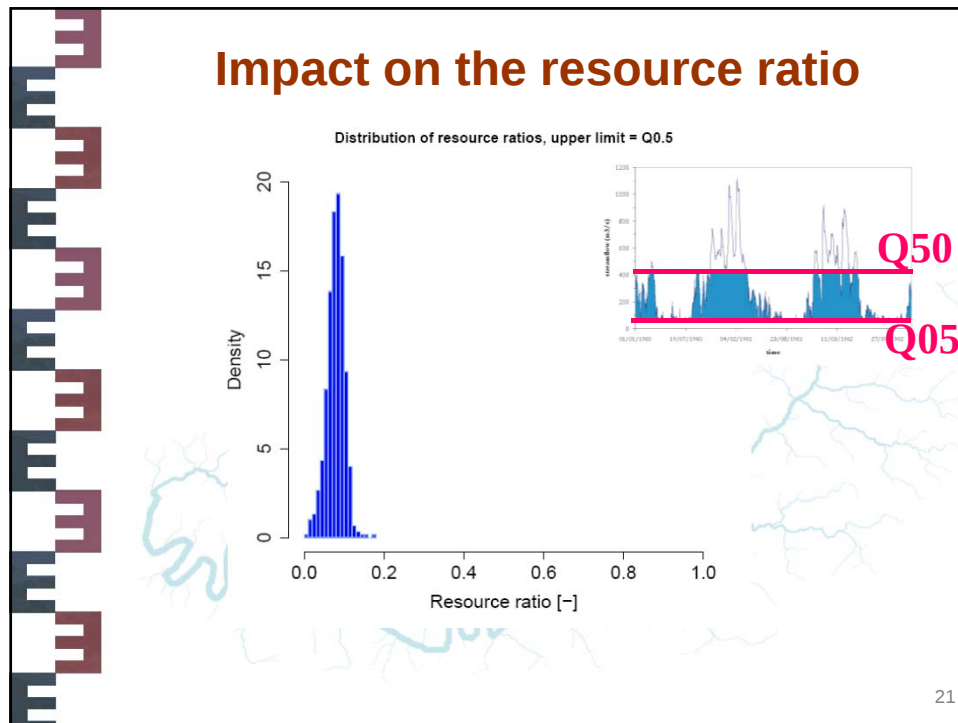


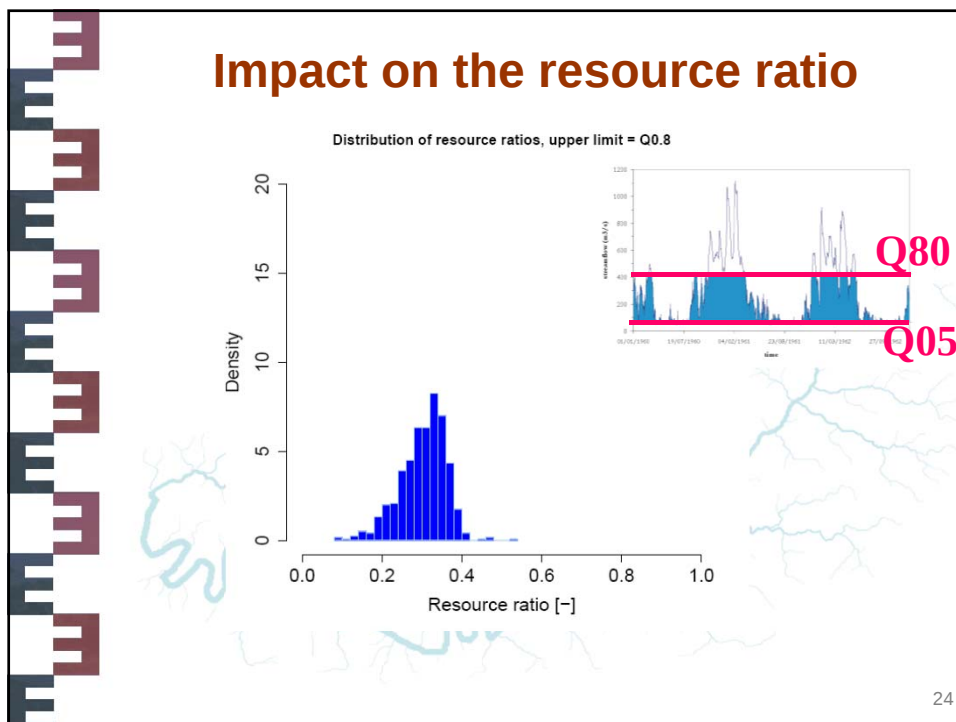
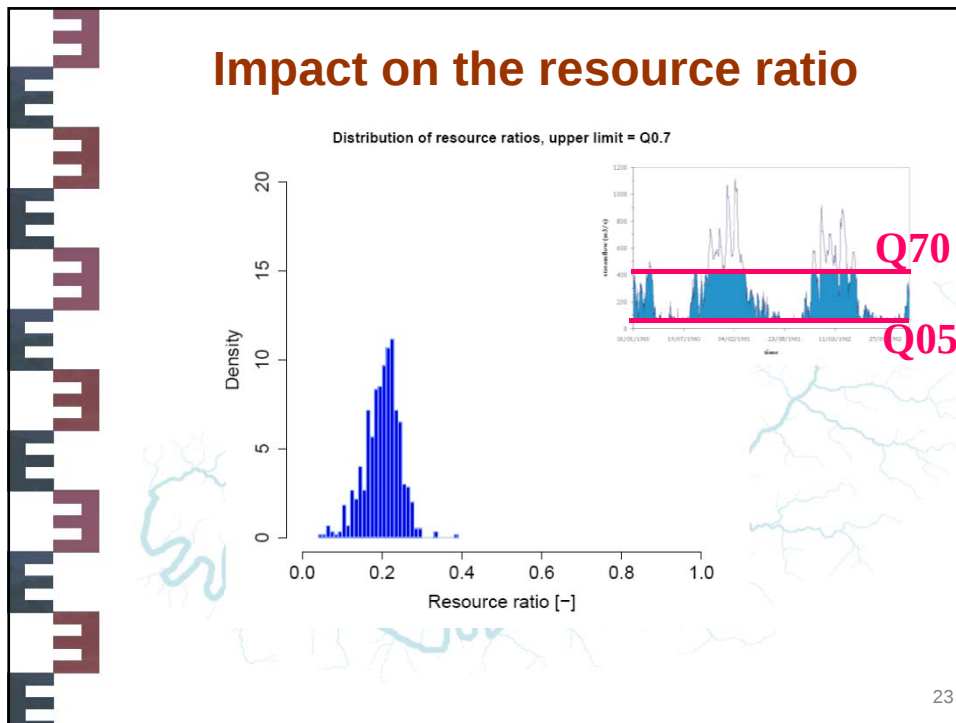


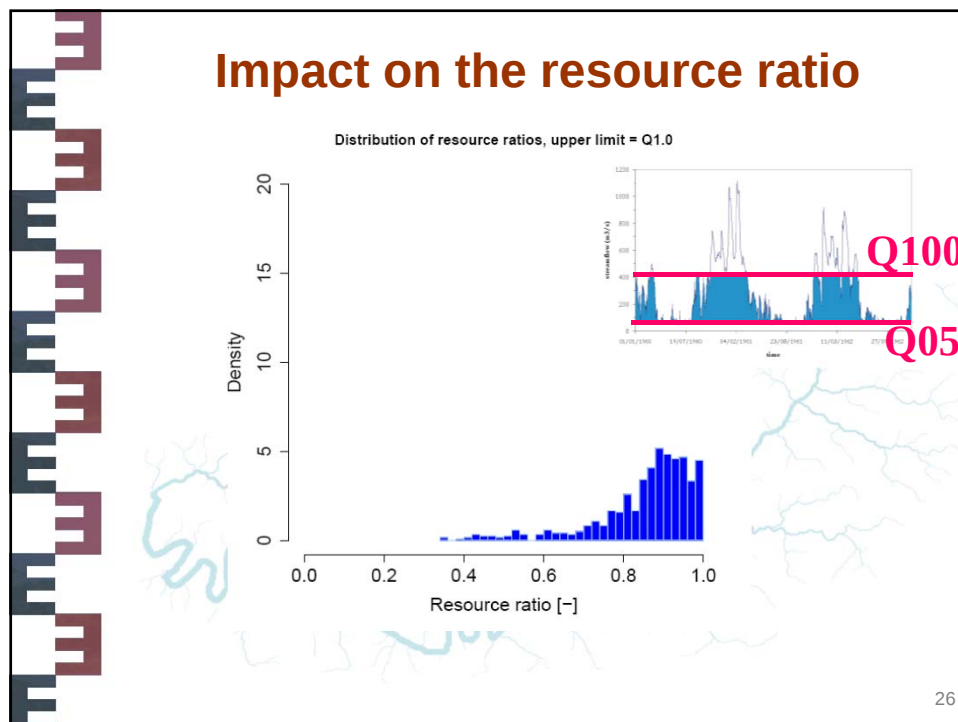
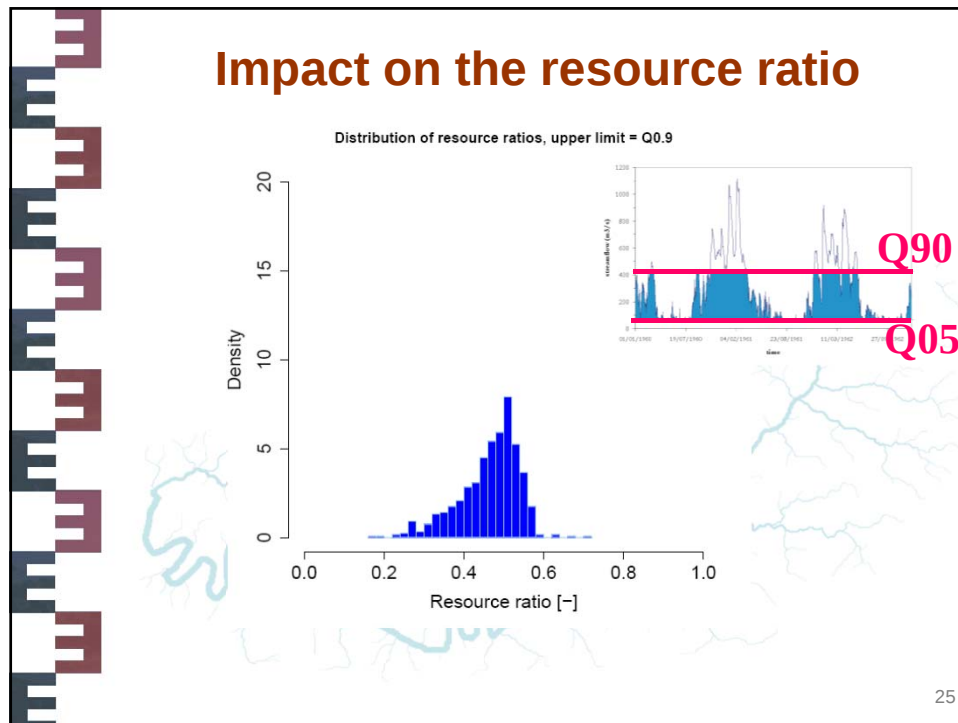






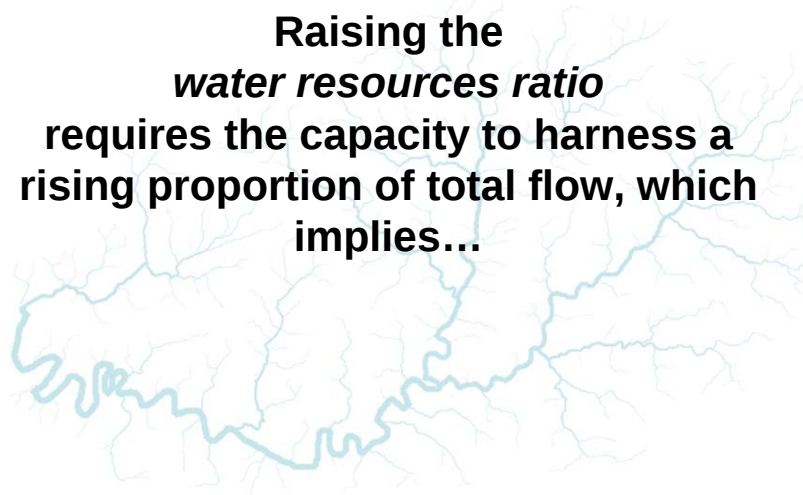








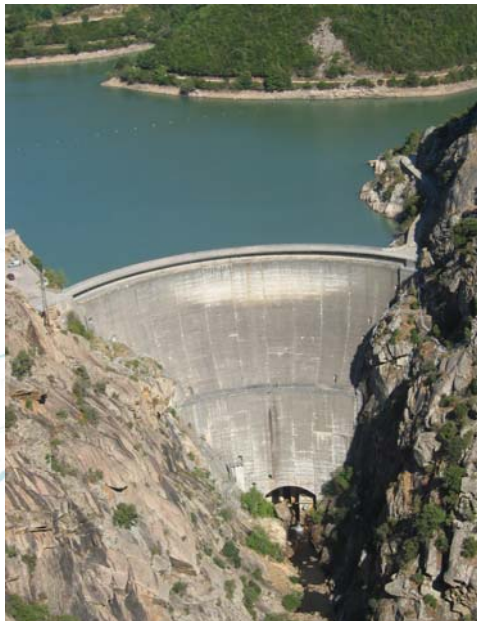
**Raising the
water resources ratio
requires the capacity to harness a
rising proportion of total flow, which
implies...**



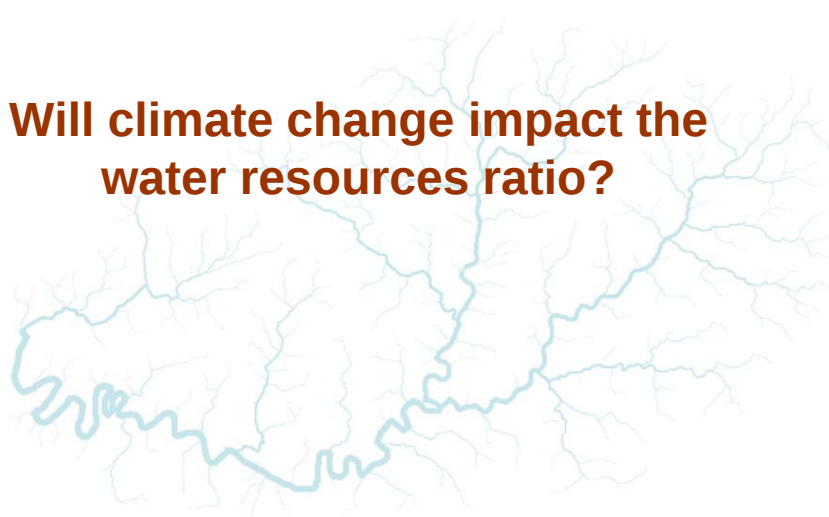
27



... storage capacity

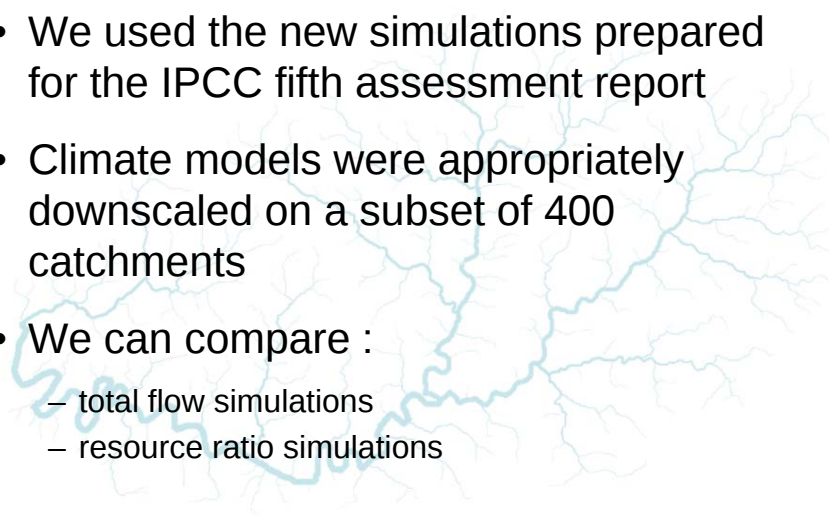


28



Will climate change impact the water resources ratio?

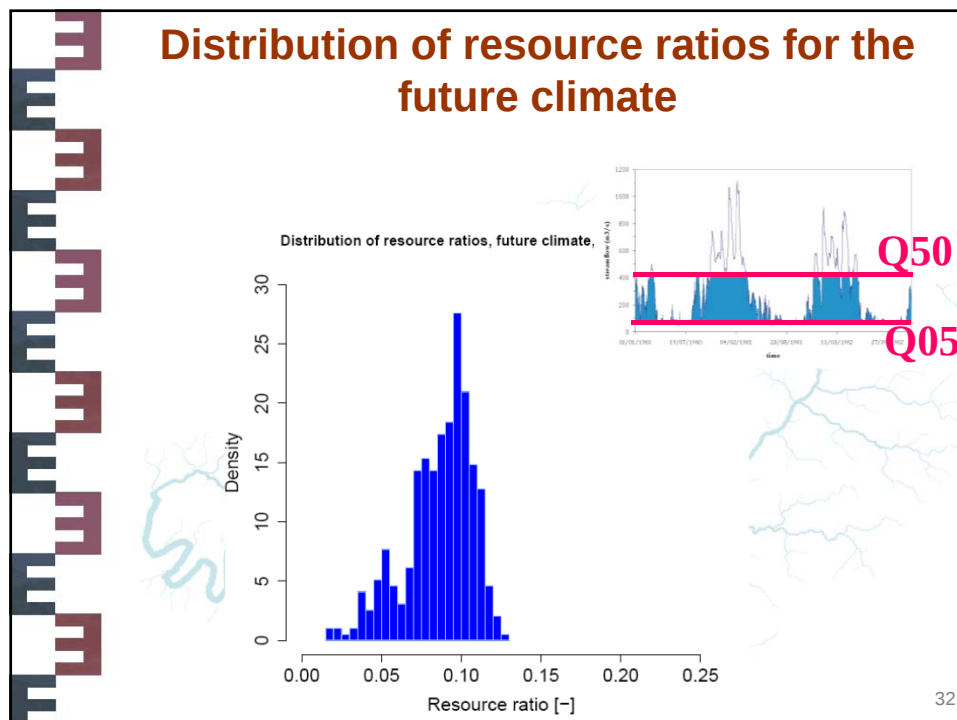
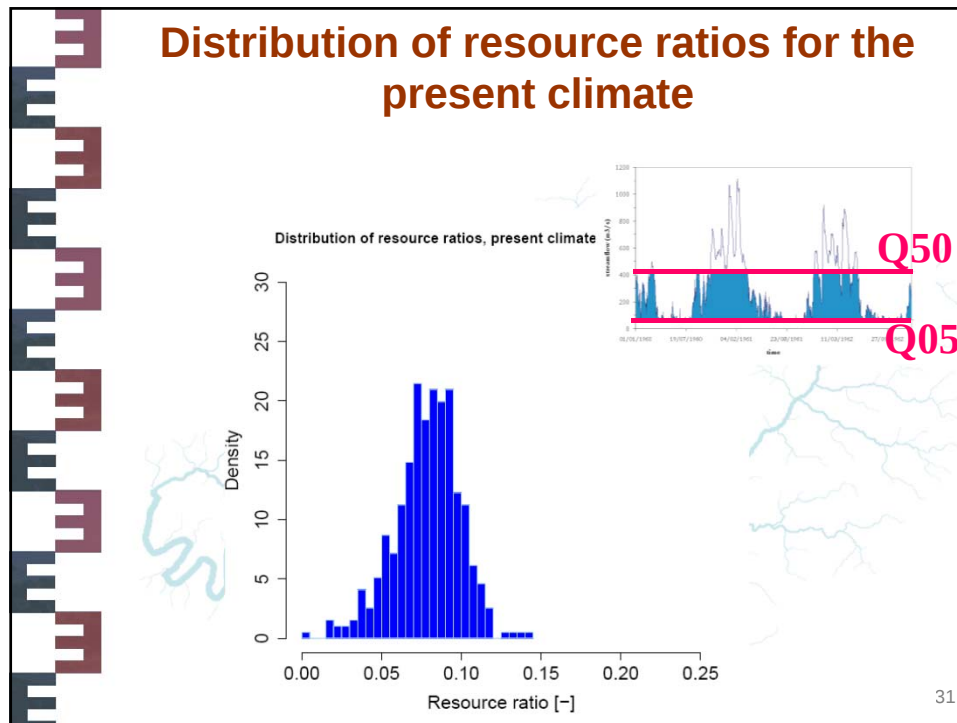
29

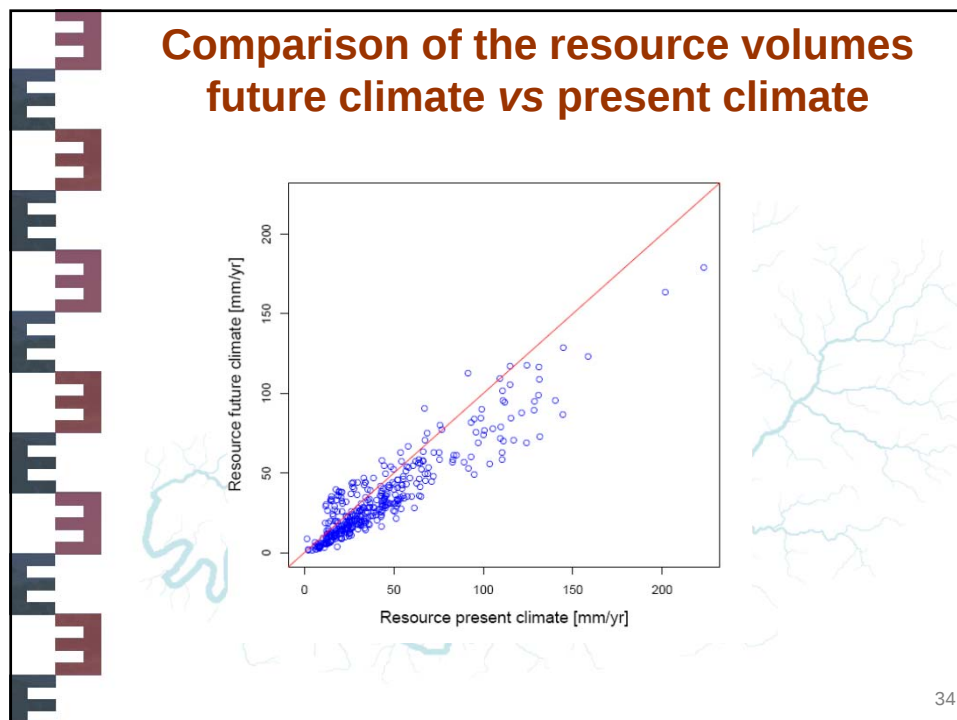
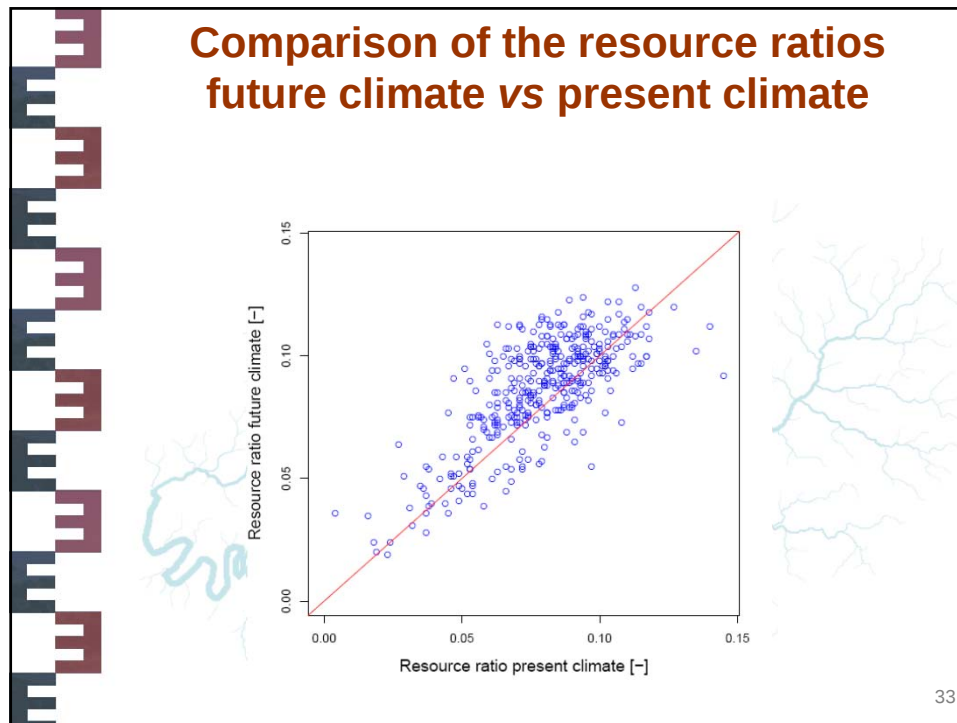


Using IPCC's simulations for 2070-2100

- We used the new simulations prepared for the IPCC fifth assessment report
- Climate models were appropriately downscaled on a subset of 400 catchments
- We can compare :
 - total flow simulations
 - resource ratio simulations

30





Conclusion (1)

- Producing resource figure from flow figures is far from straightforward
- We have only looked at water resources from the flow variability perspective. Other very important aspects would include:
- Transboundary rivers and aquifers issues
 - imply a reduction on exploitable water resources
- use-dependent relationships
 - each type of water use has its own streamflow-resource relationship
 - (in-stream uses vs withdrawals, etc.)

35

Conclusion (2)

- It would probably be easier to ban the expression 'water resources' from our vocabulary...

36

