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

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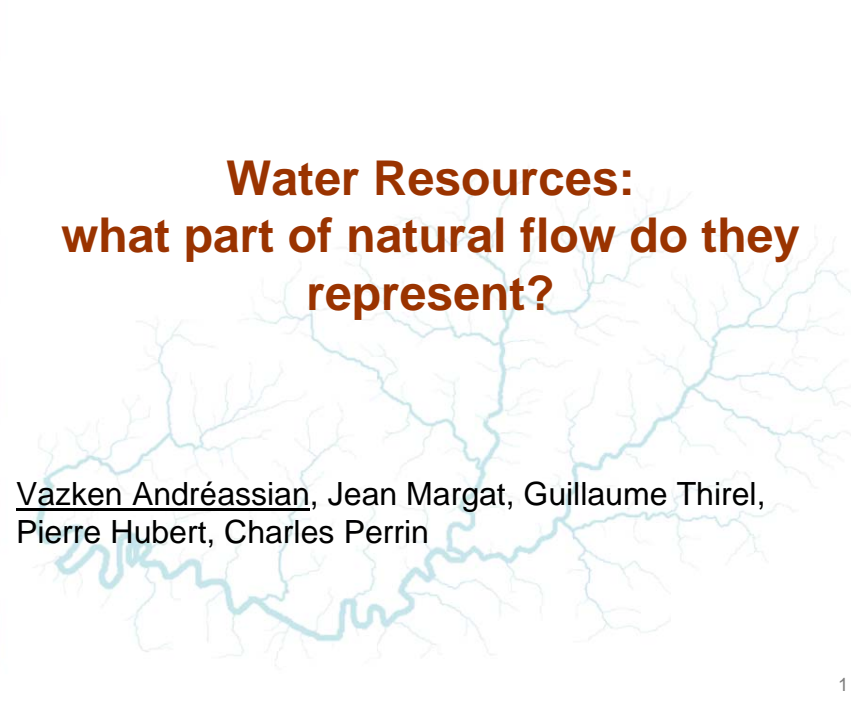
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Water Resources: what part of natural flow do they represent?

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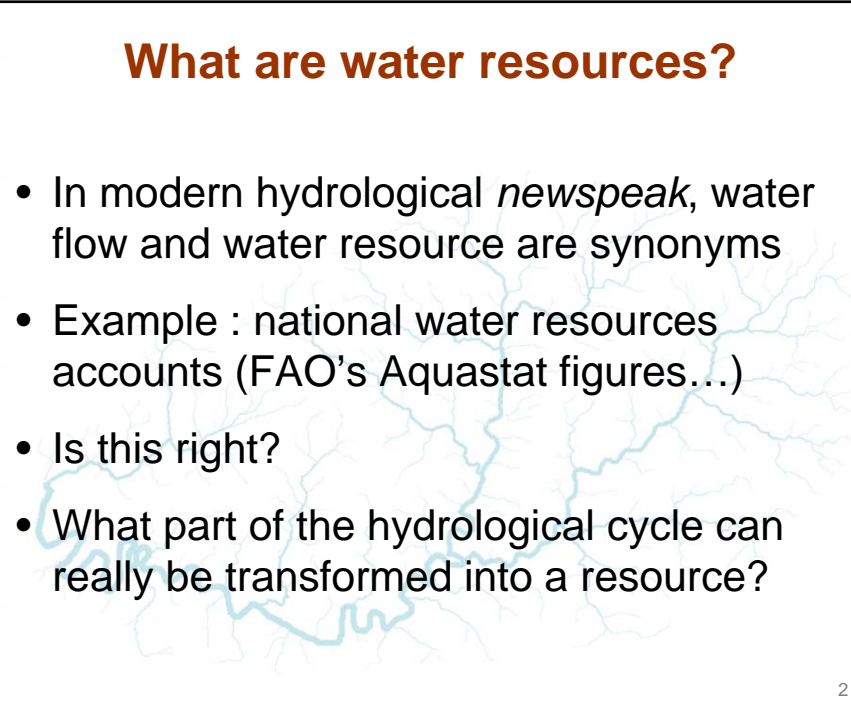


1




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?

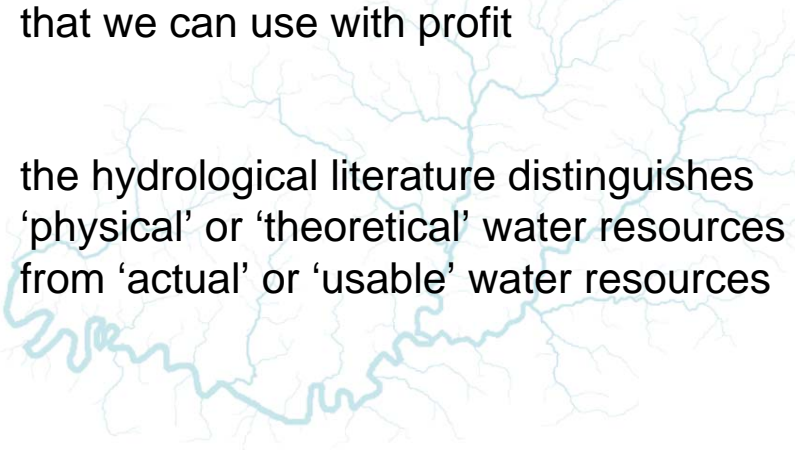


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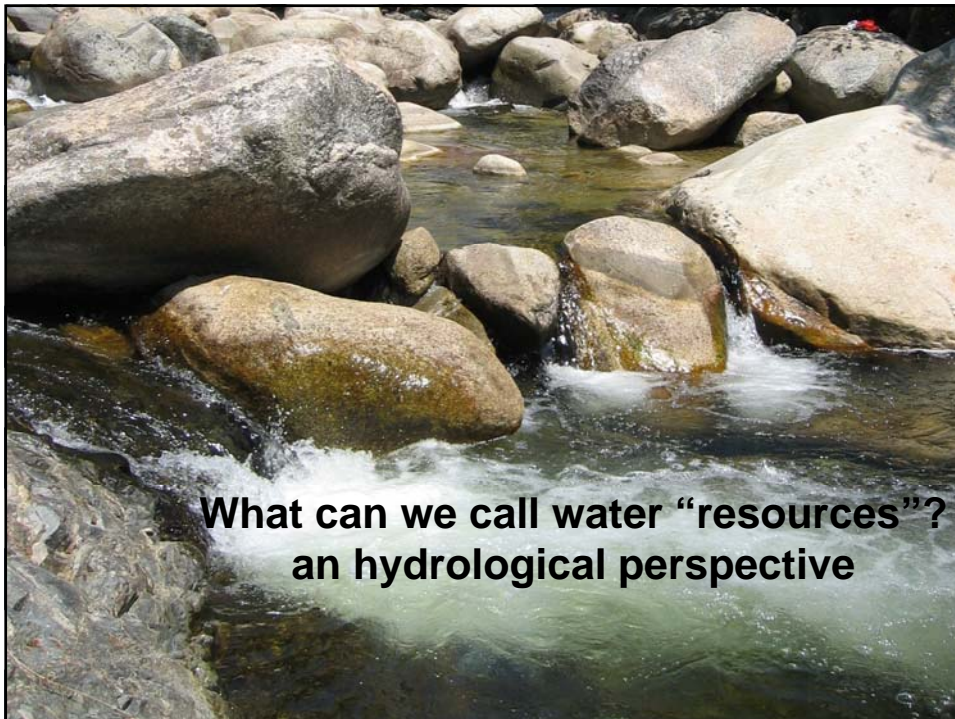


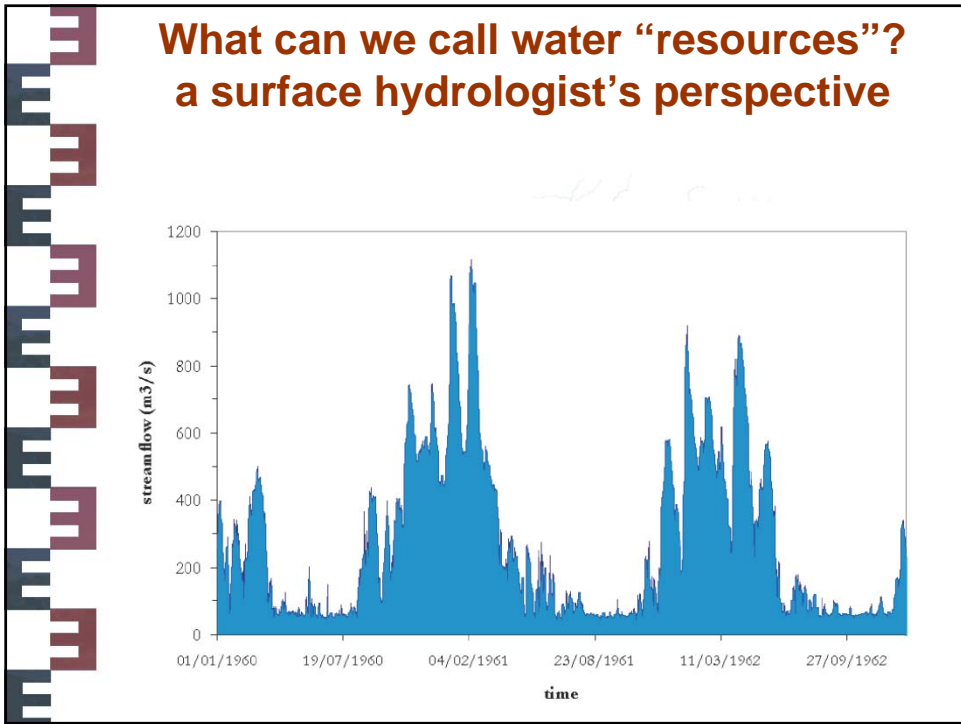
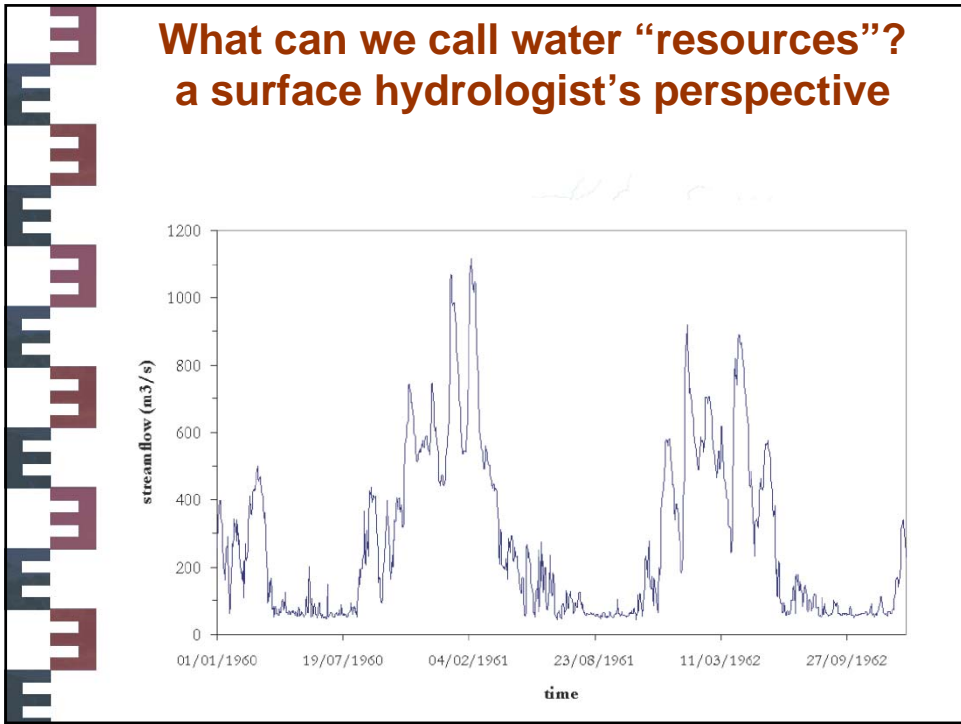
What can we call water “resources”?

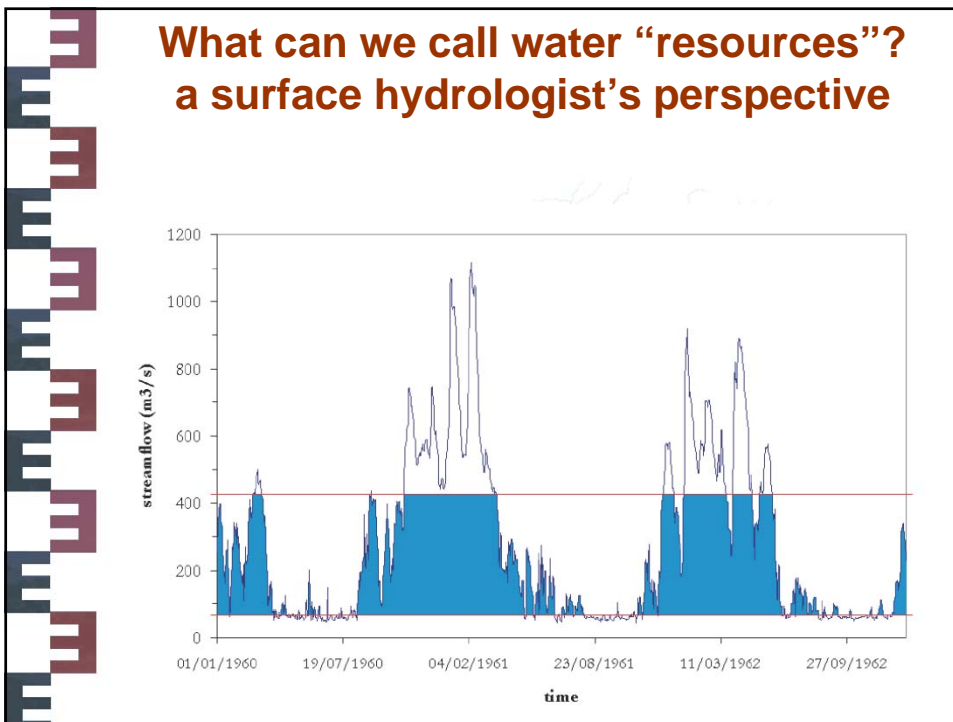
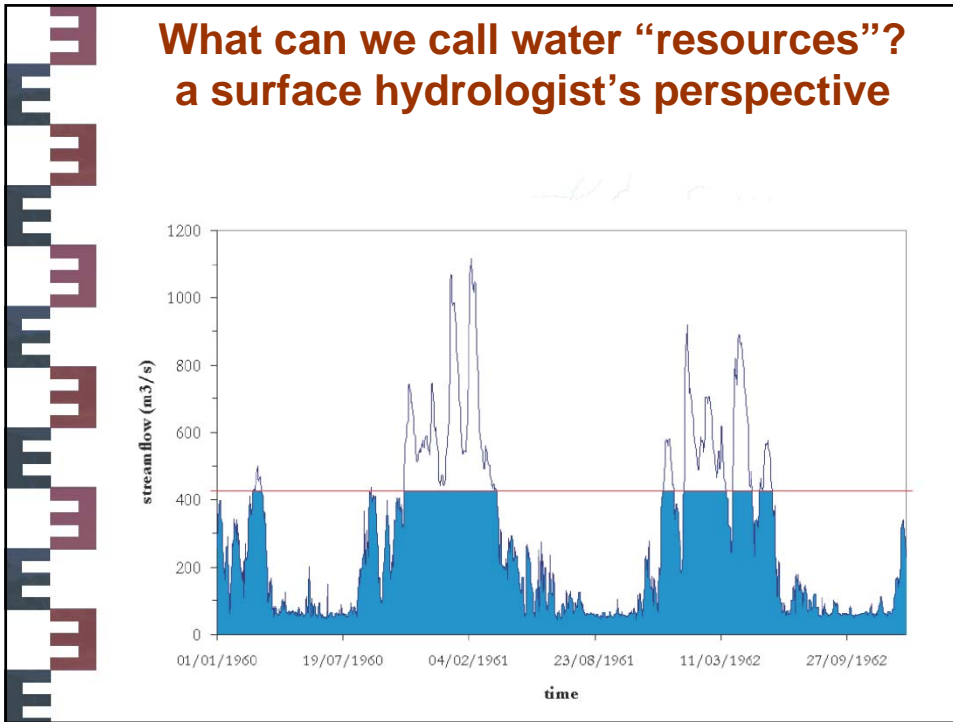
- resource = the part of the water cycle that we can use with profit
- the hydrological literature distinguishes ‘physical’ or ‘theoretical’ water resources from ‘actual’ or ‘usable’ water resources




3

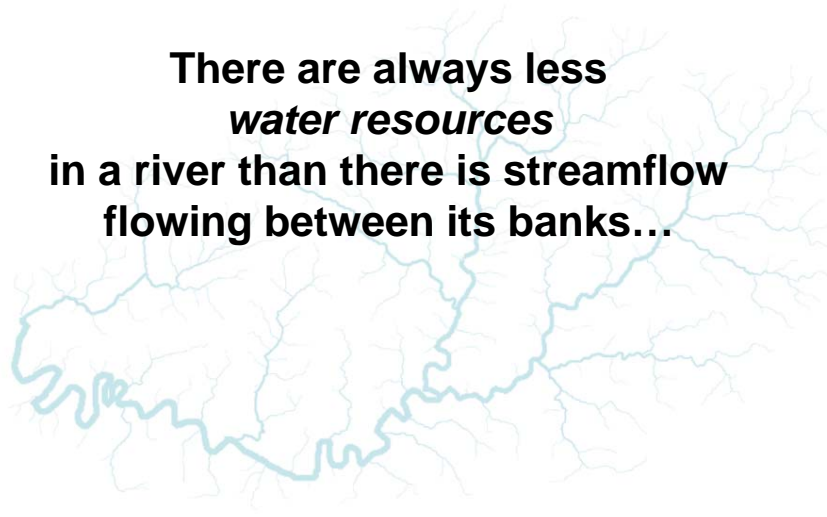









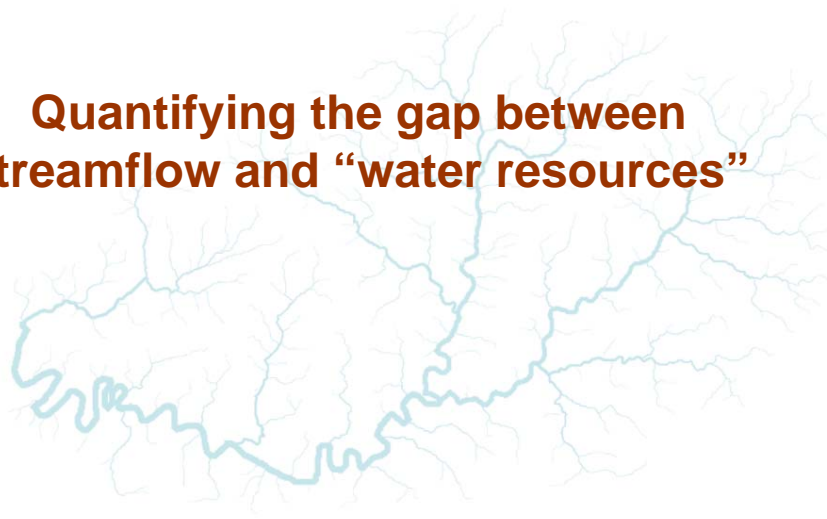
**There are always less
water resources
in a river than there is streamflow
flowing between its banks...**



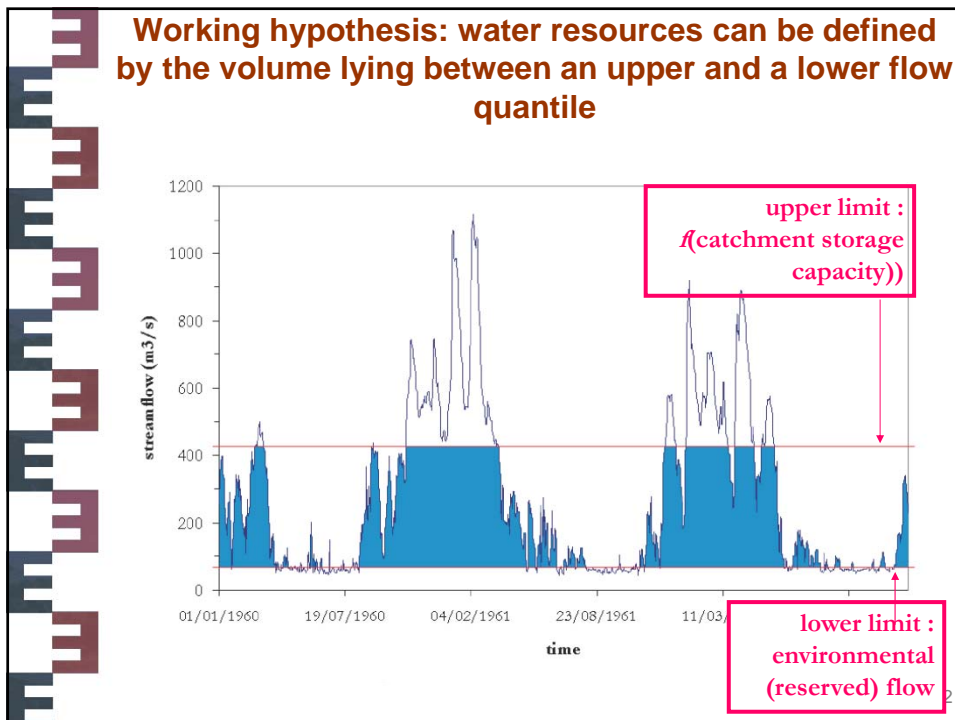
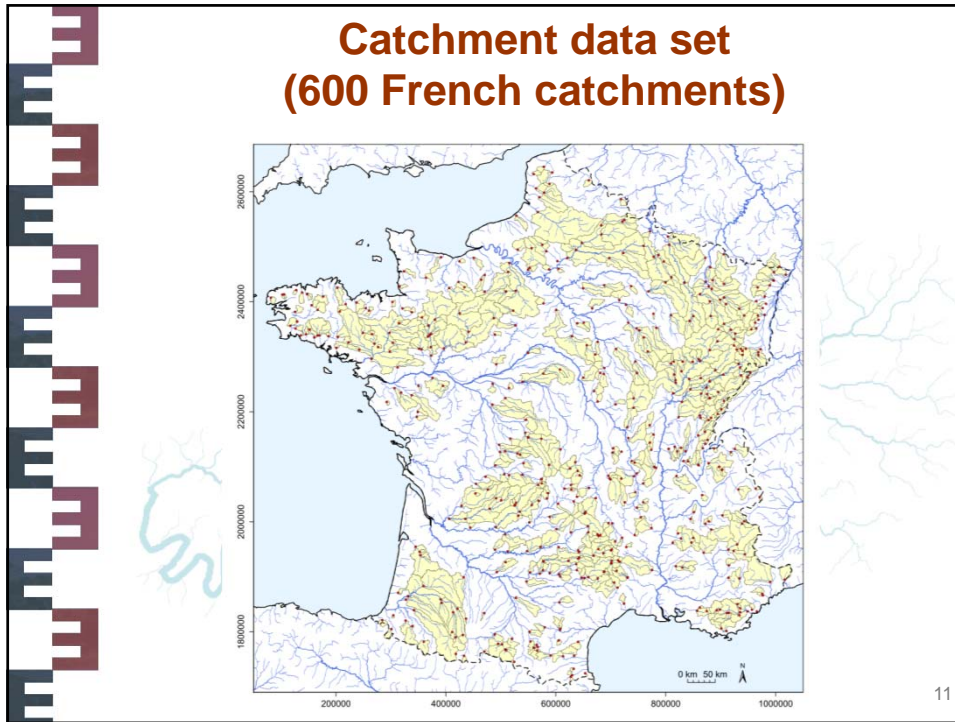
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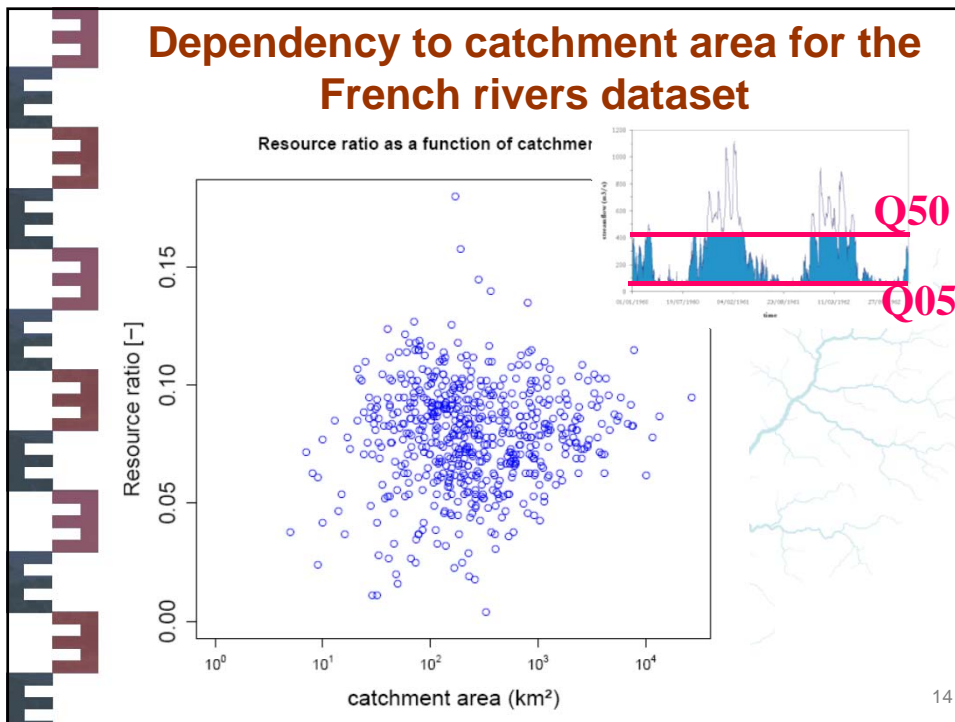
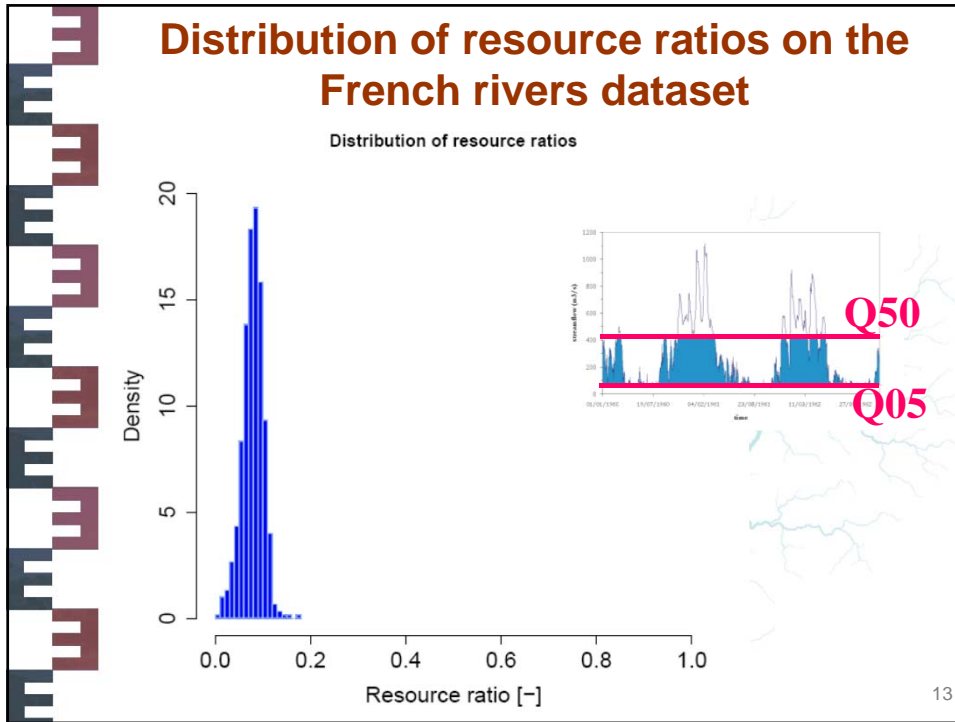


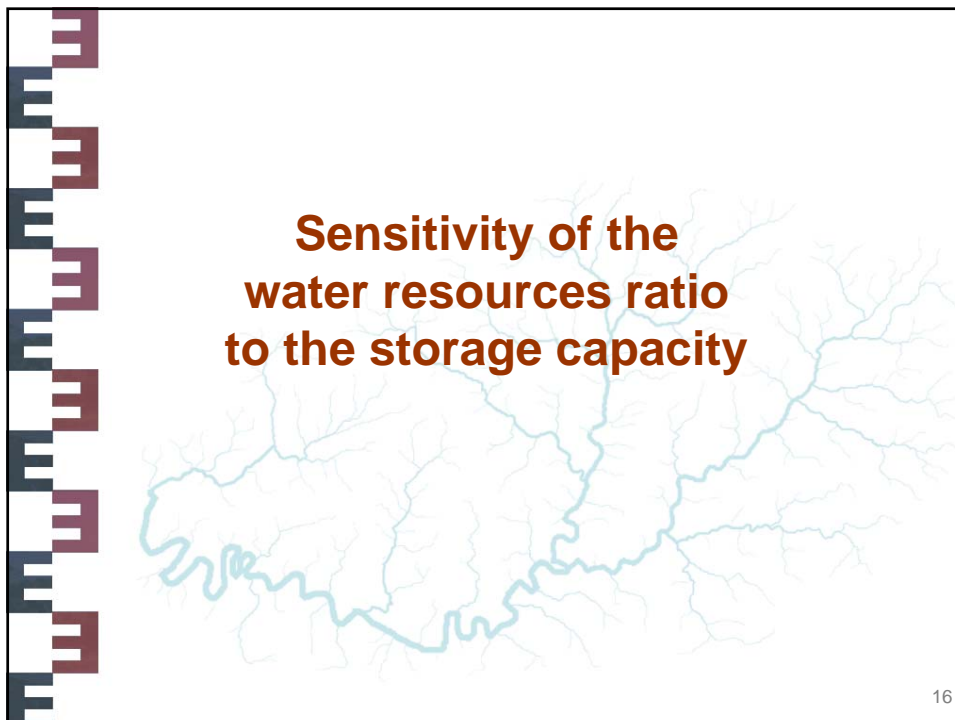
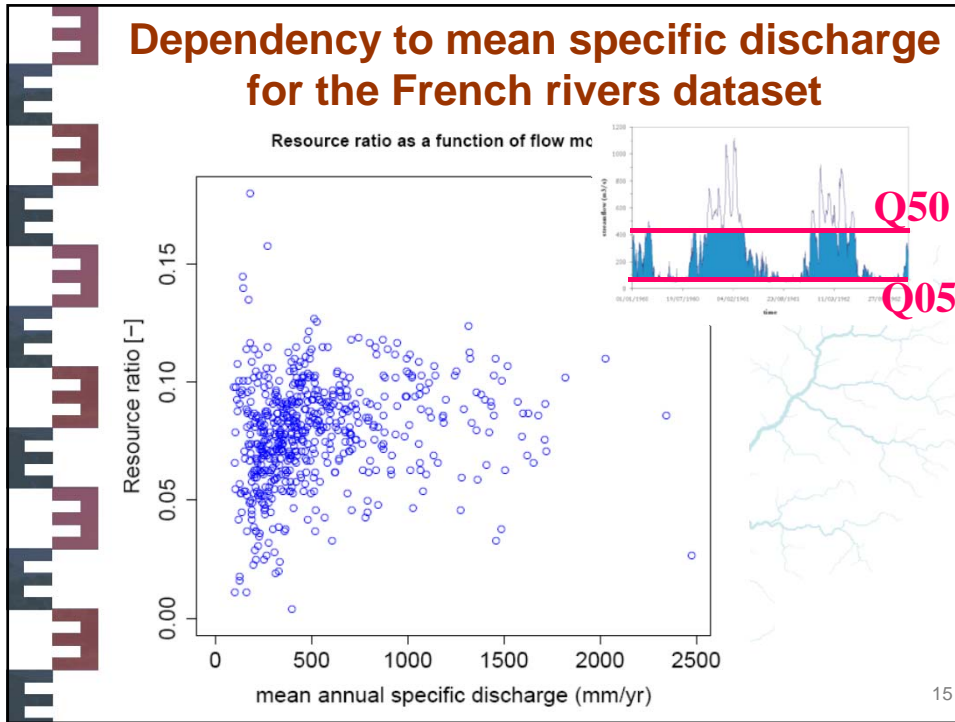
**Quantifying the gap between
streamflow and “water resources”**

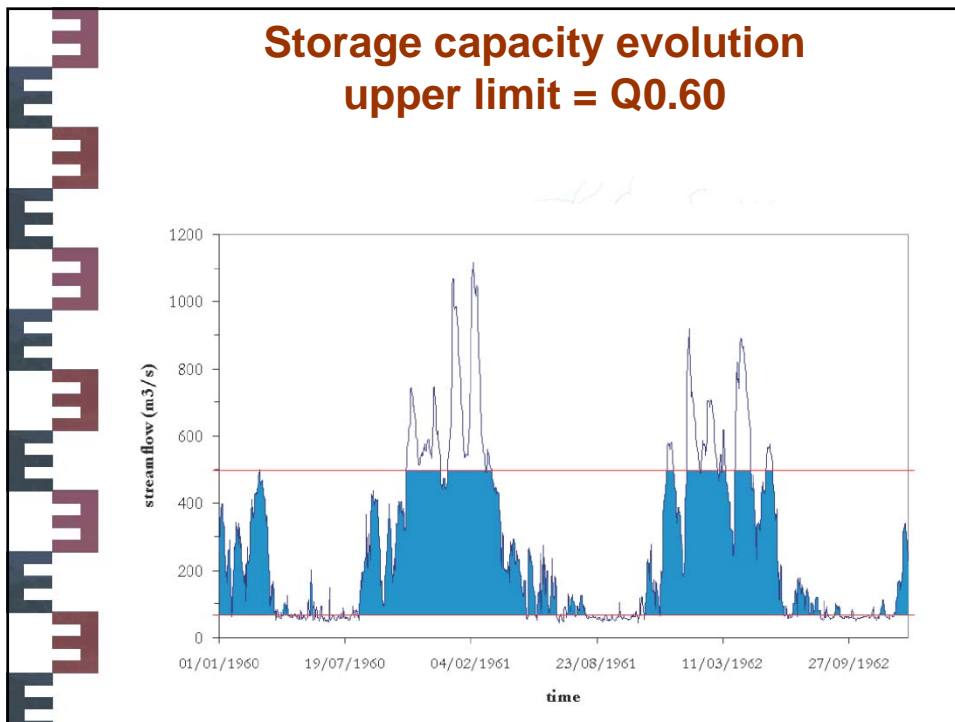
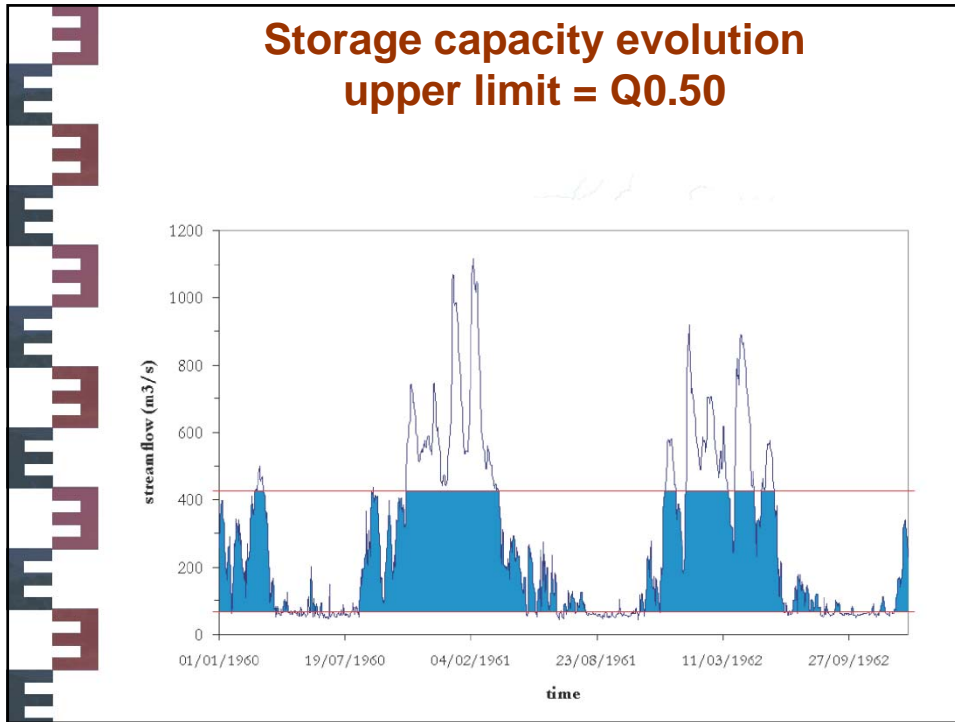


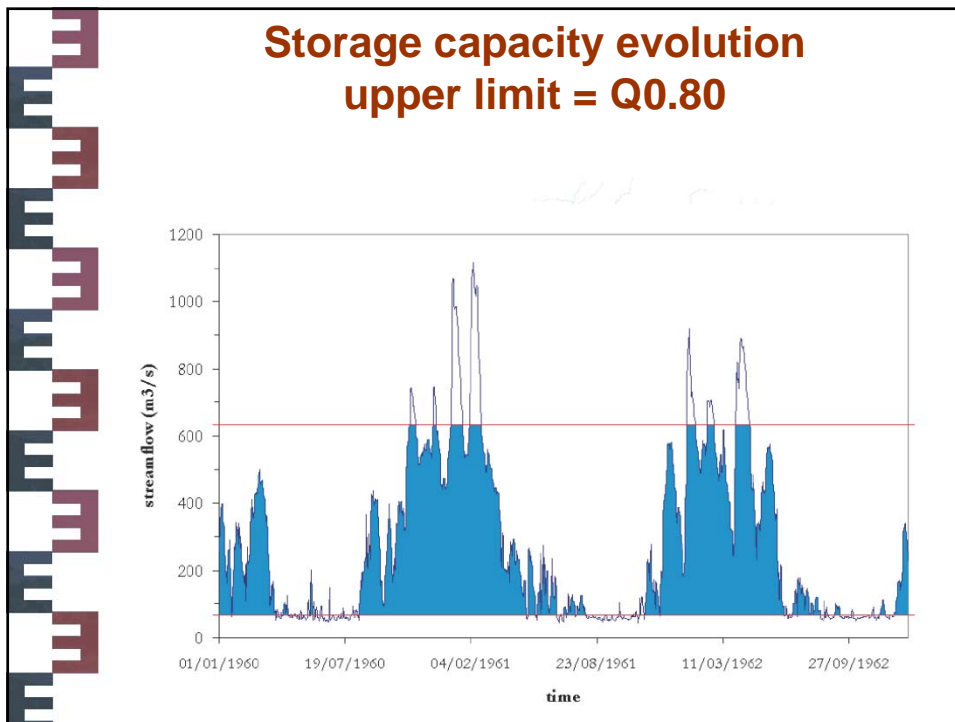
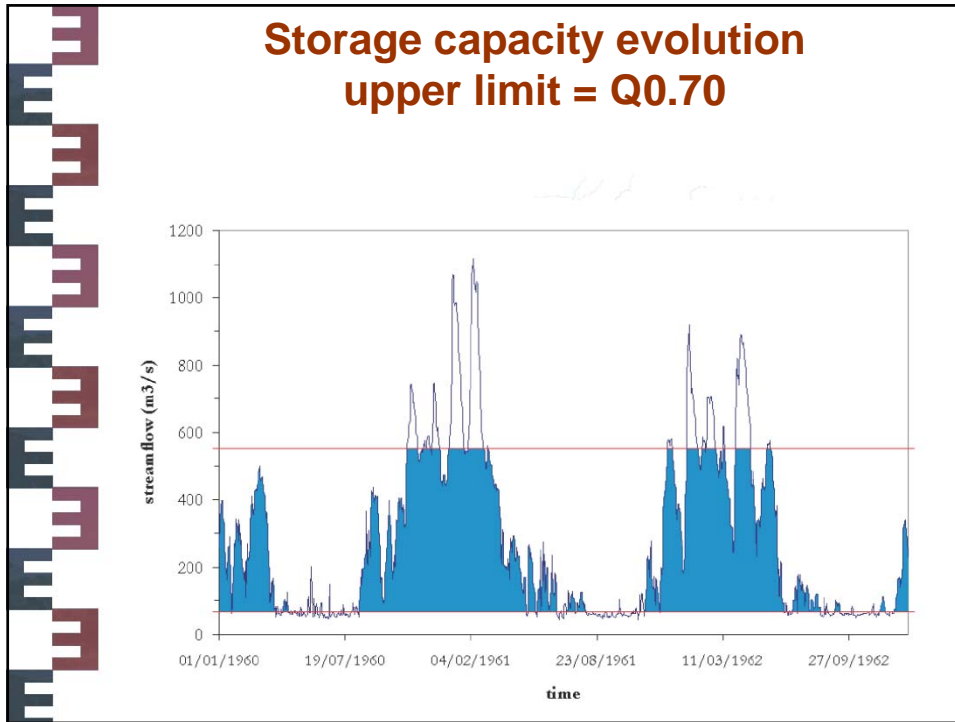
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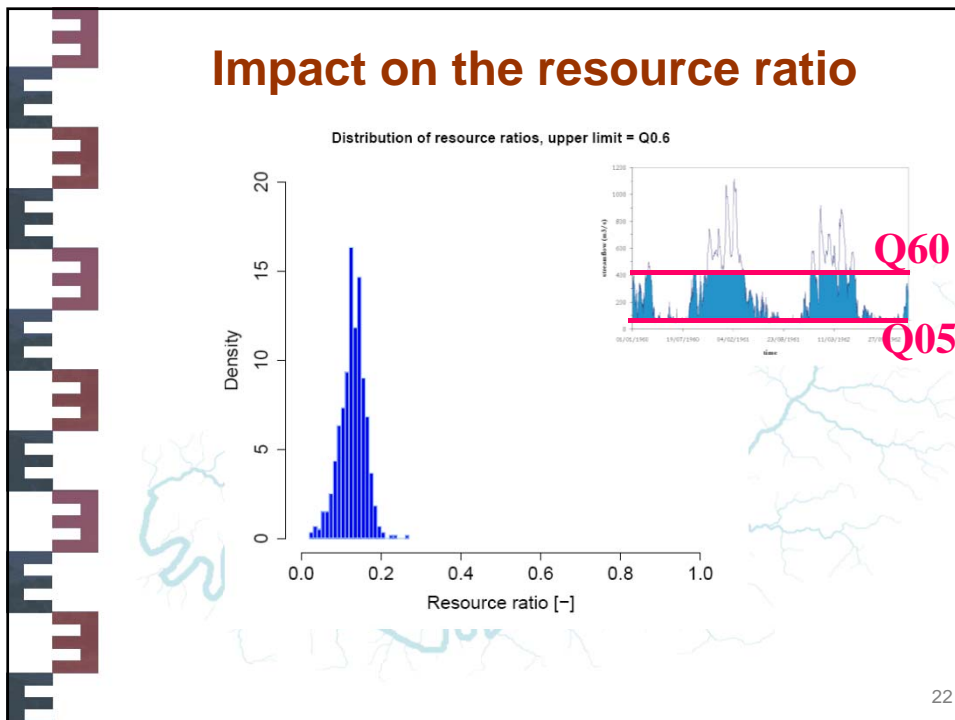
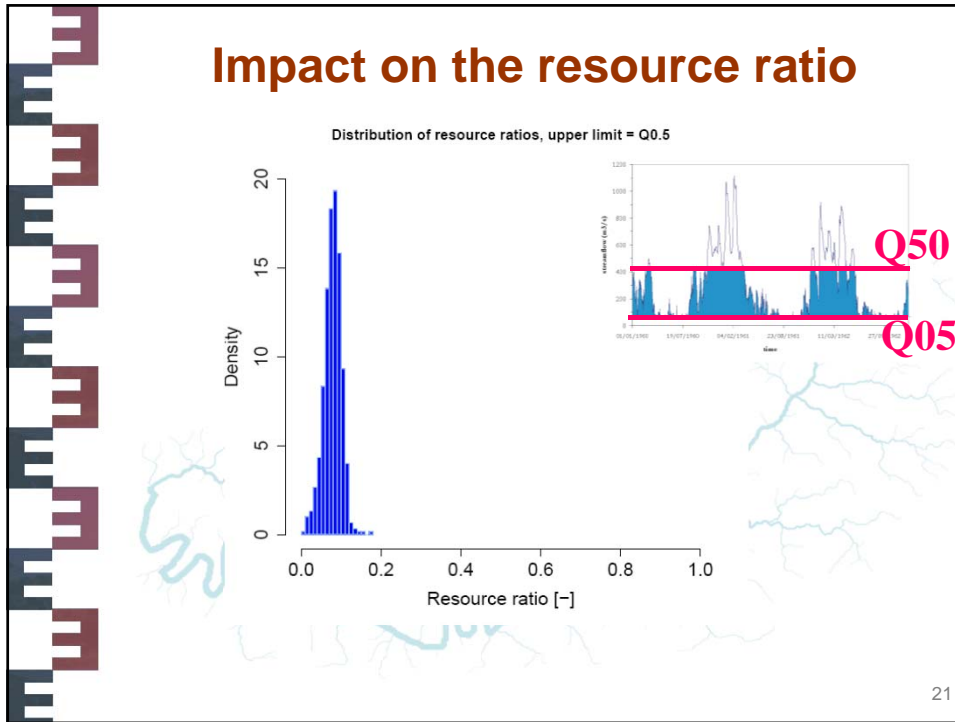


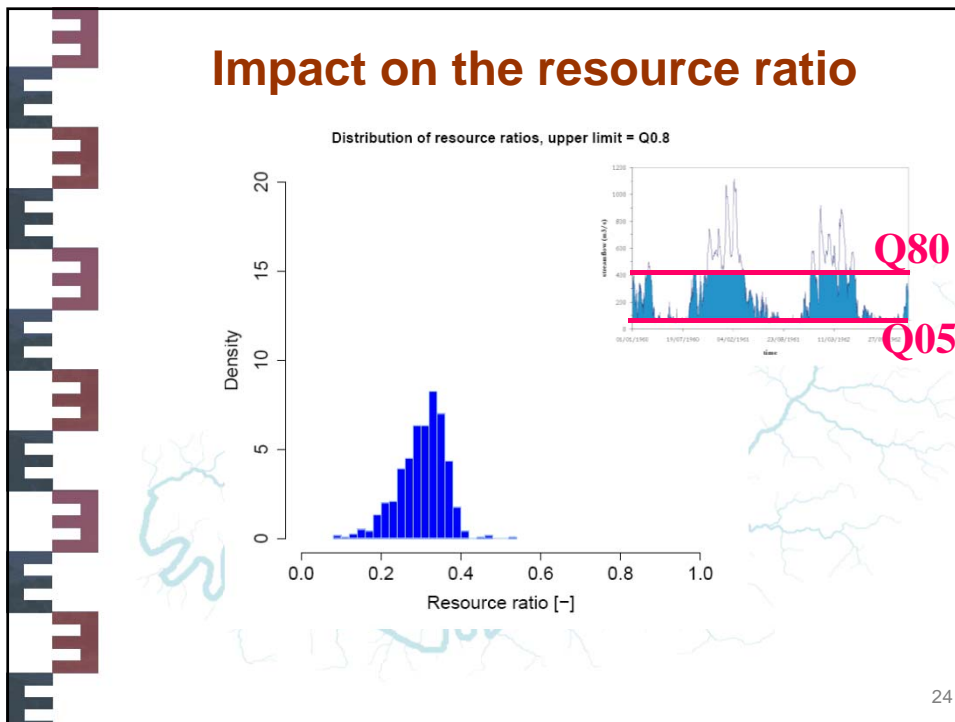
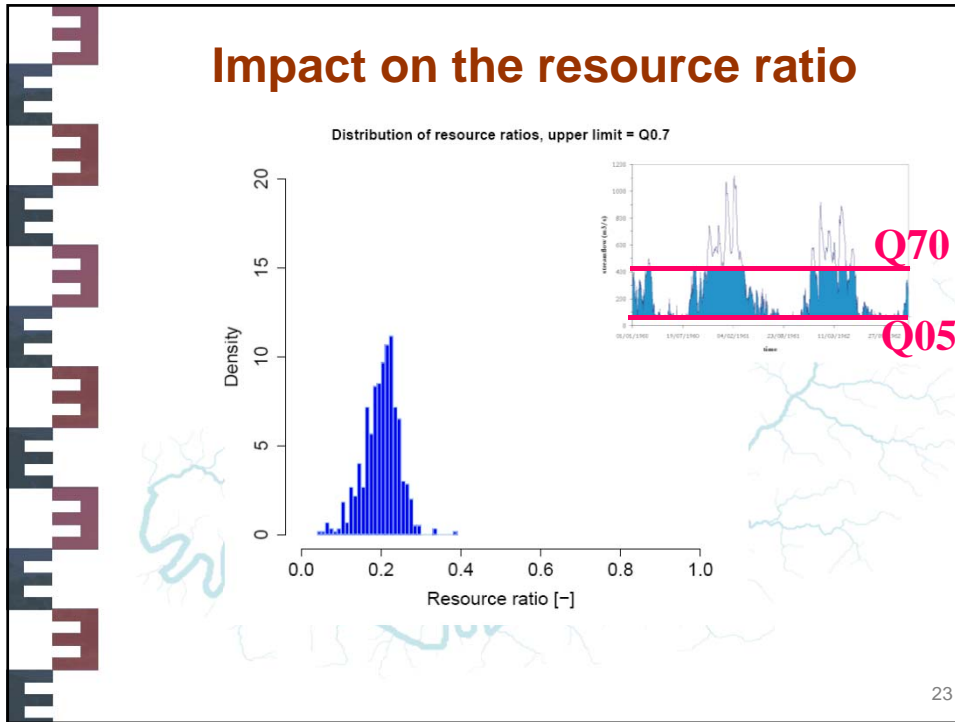


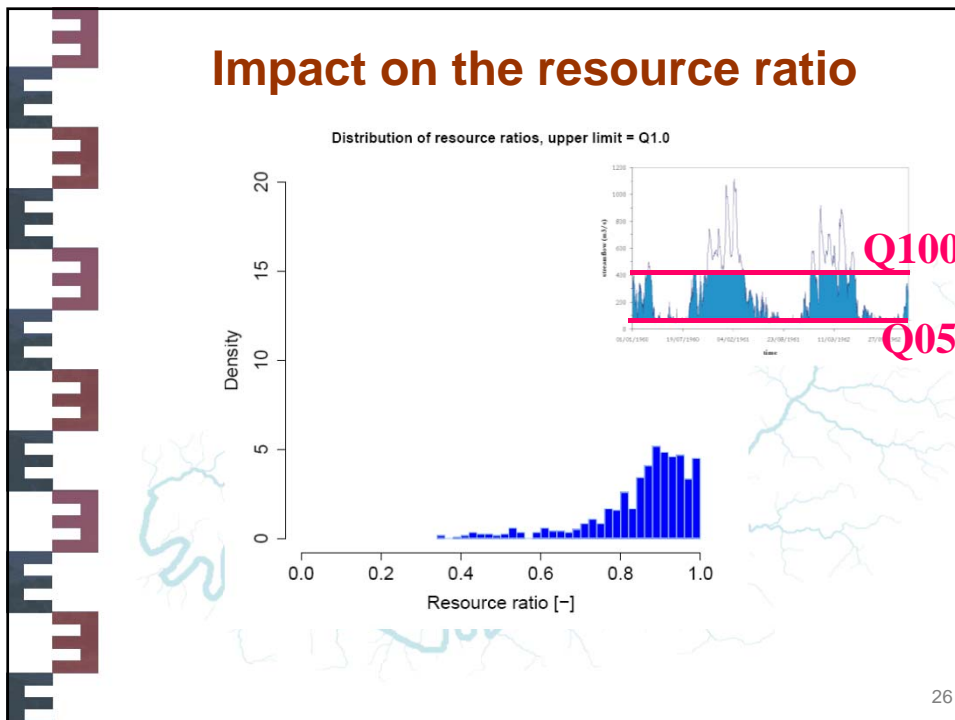
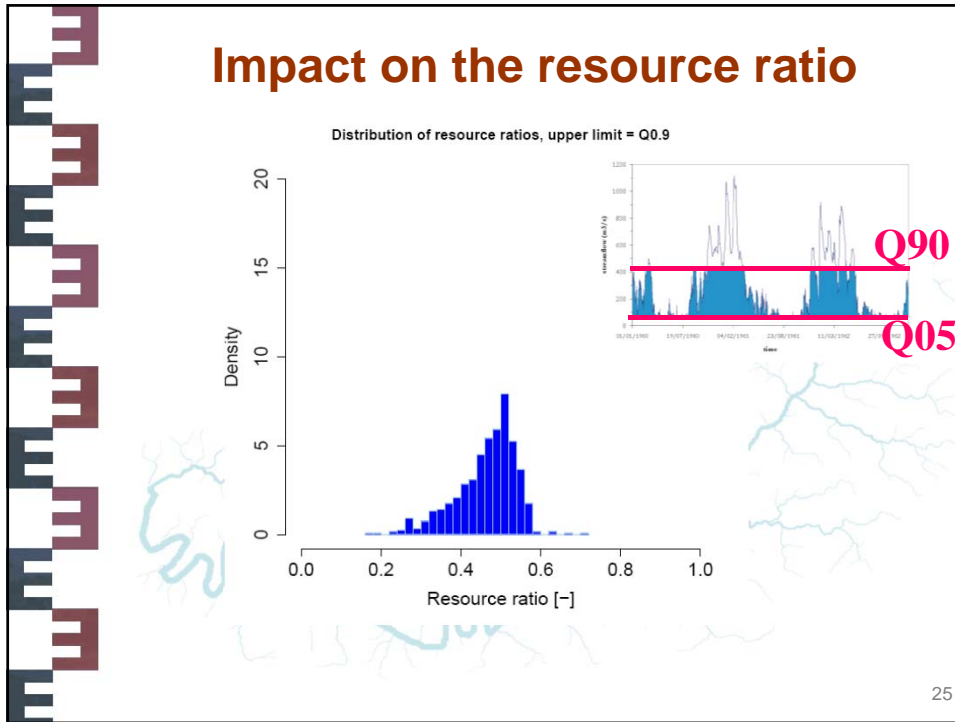







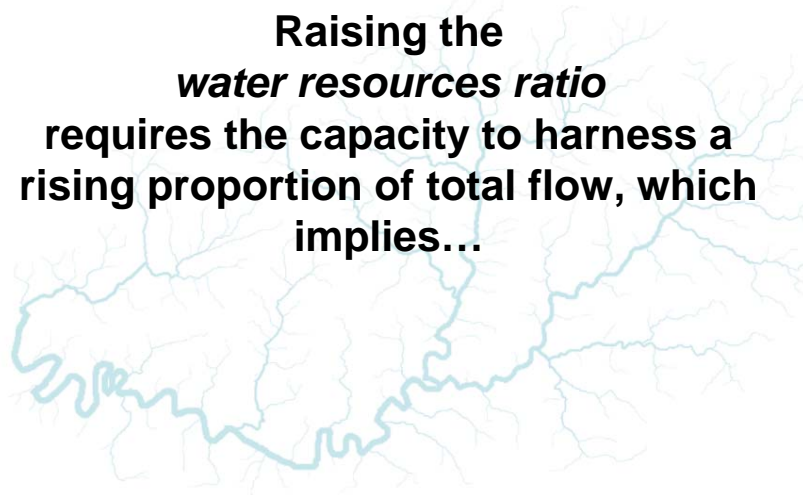










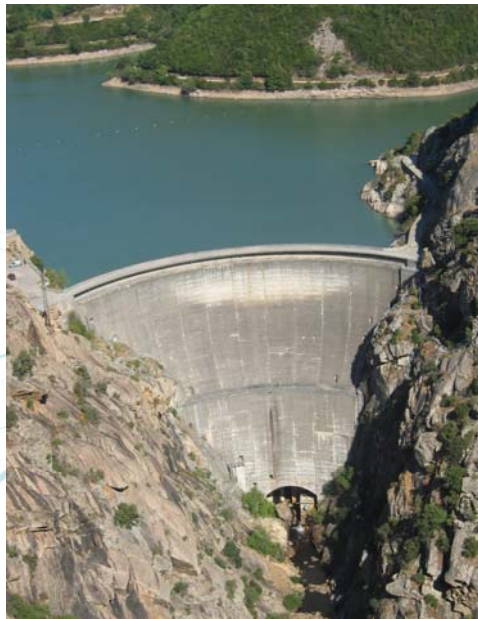
**Raising the
water resources ratio
requires the capacity to harness a
rising proportion of total flow, which
implies...**



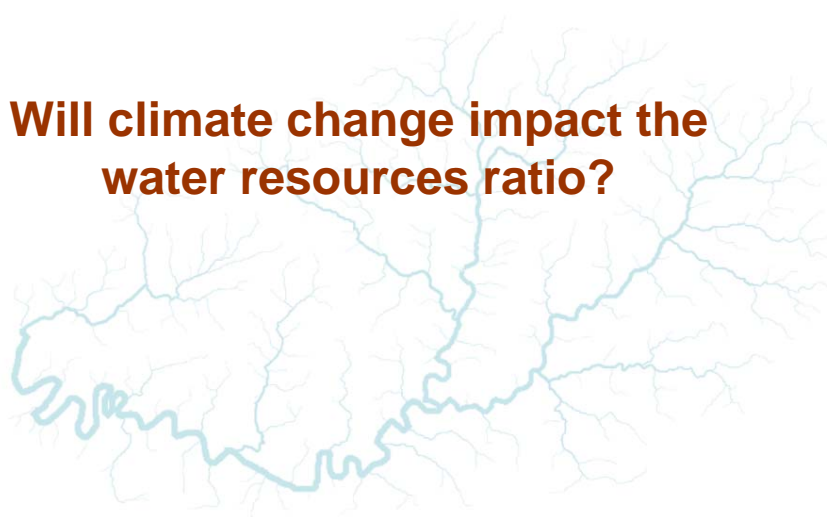

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... storage capacity

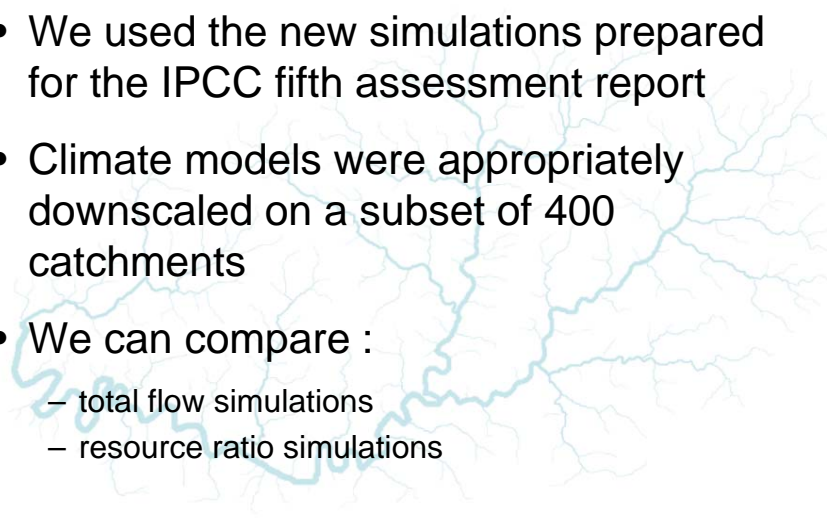



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Will climate change impact the water resources ratio?

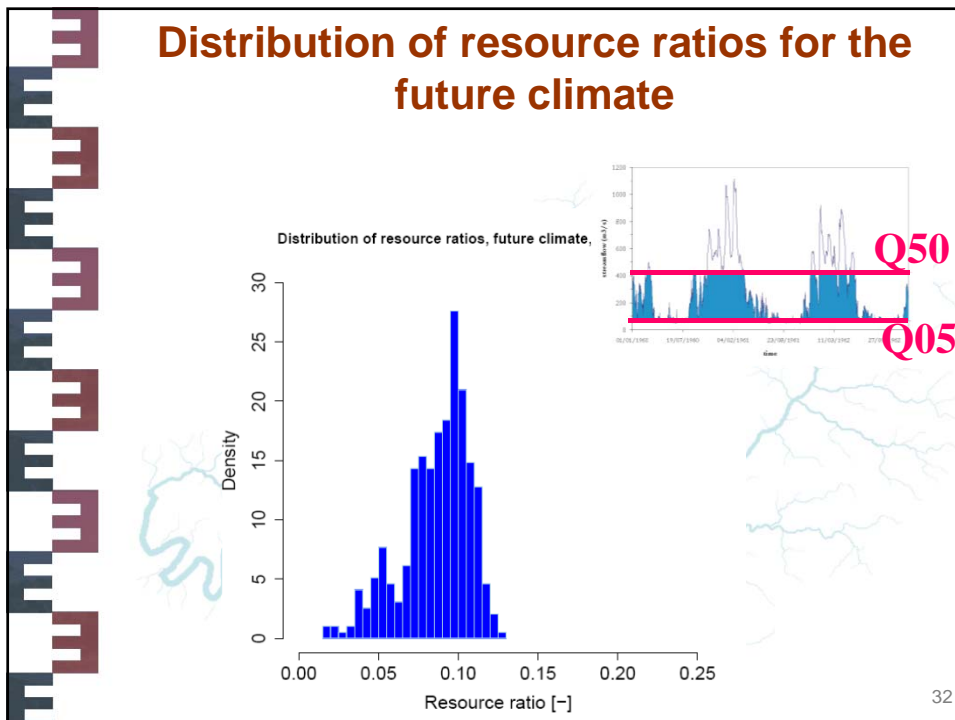
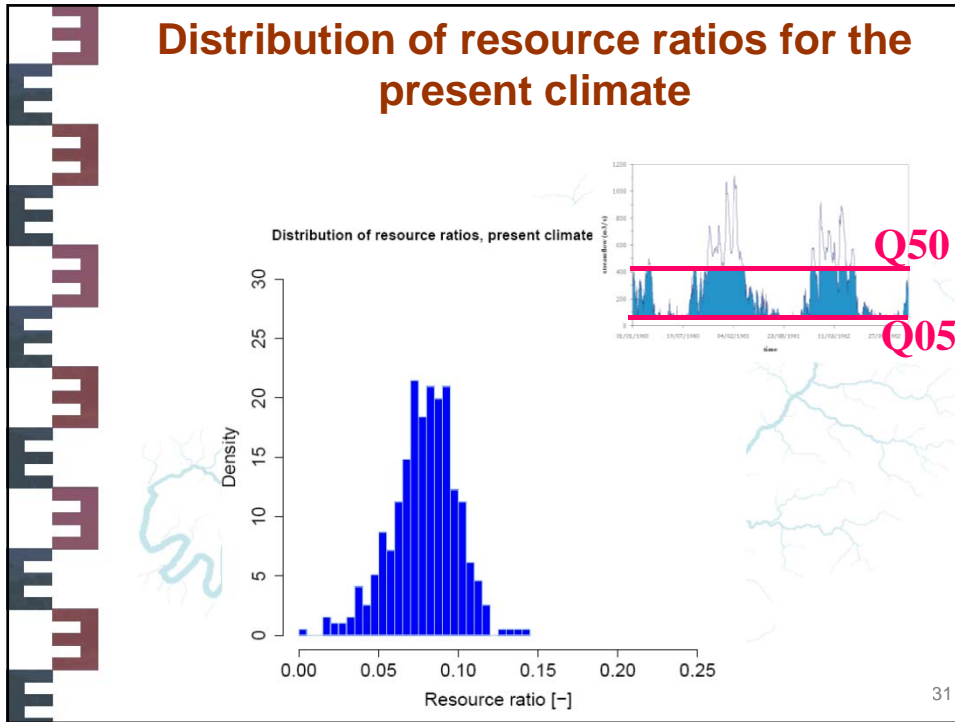
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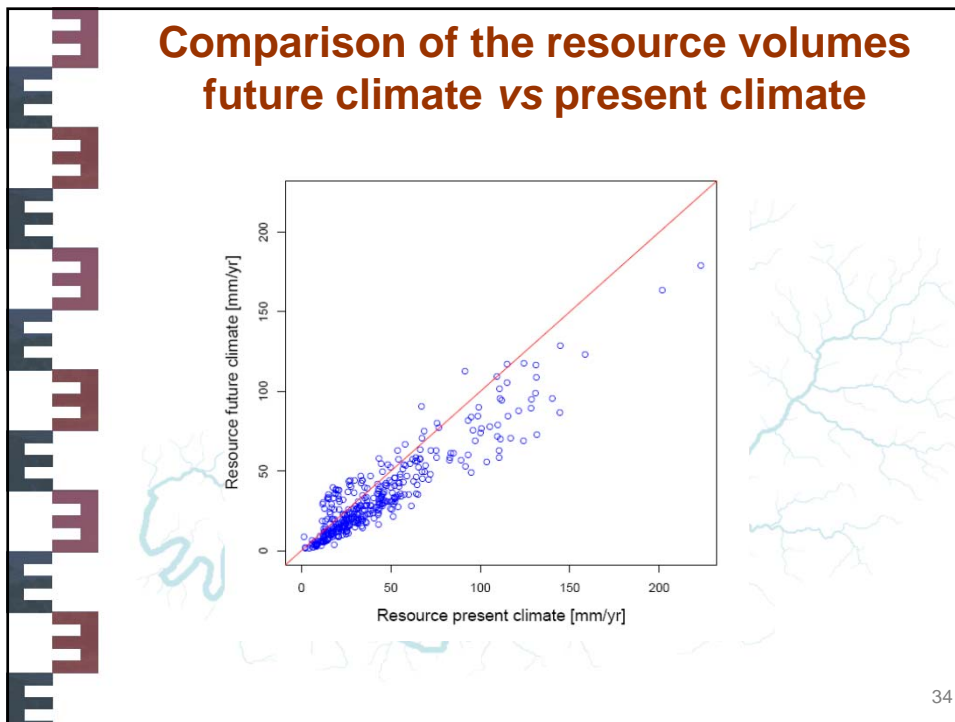
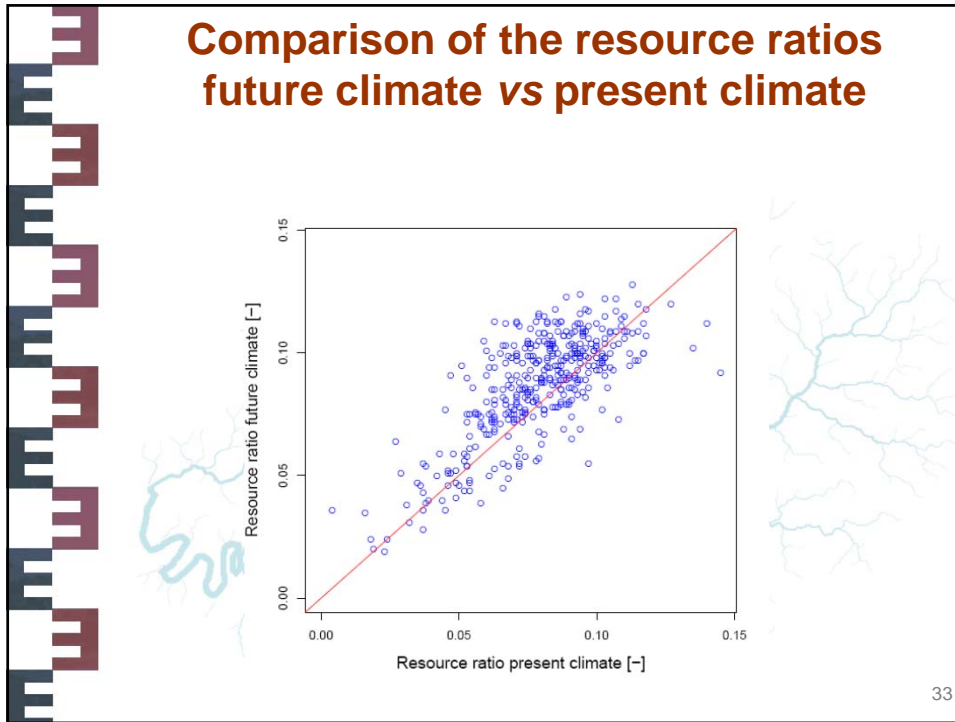



Using IPCC's simulations for 2070-2100

- 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

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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.)

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Conclusion (2)

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

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Thank you



The image features a central collage of four portraits of men. The top-left portrait shows an older man with glasses and a brown jacket. The top-right portrait shows a younger man with a beard and a grey sweater. The bottom-left portrait shows a man with glasses and a grey suit. The bottom-right portrait shows a man in a red sweater. To the left of the portraits is a vertical decorative bar consisting of a series of 'E' characters in alternating colors (dark blue, maroon, dark blue, maroon, etc.). The background of the collage is a light blue branching tree diagram.

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