

The “mentality” of river basins - what do we need to monitor and to describe for managing river basins in Southern Europe?

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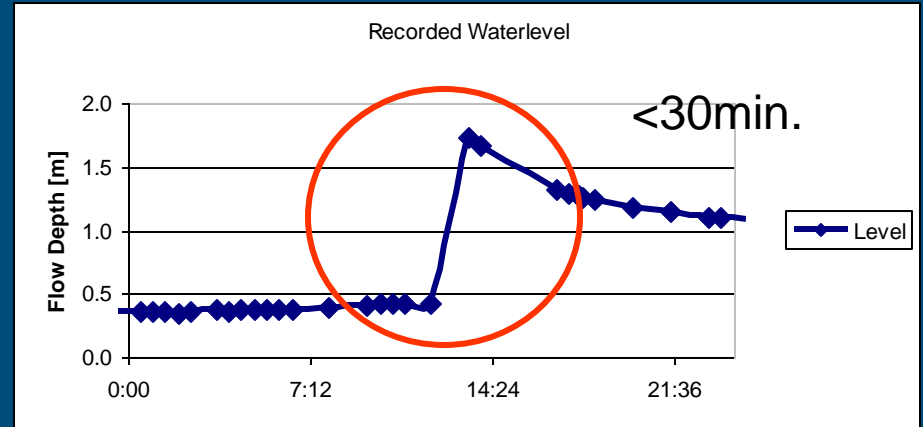


Introduction

- Many Mediterranean rivers are temporary
- Water quality status highly dependent on variable flow patterns
- Pools, moist areas and interstitial flow remain during the dry period
- These are important habitats for repopulation
- Endemic species are adapted to this situation
- River flow is affected by direct withdrawals and by the use of groundwater

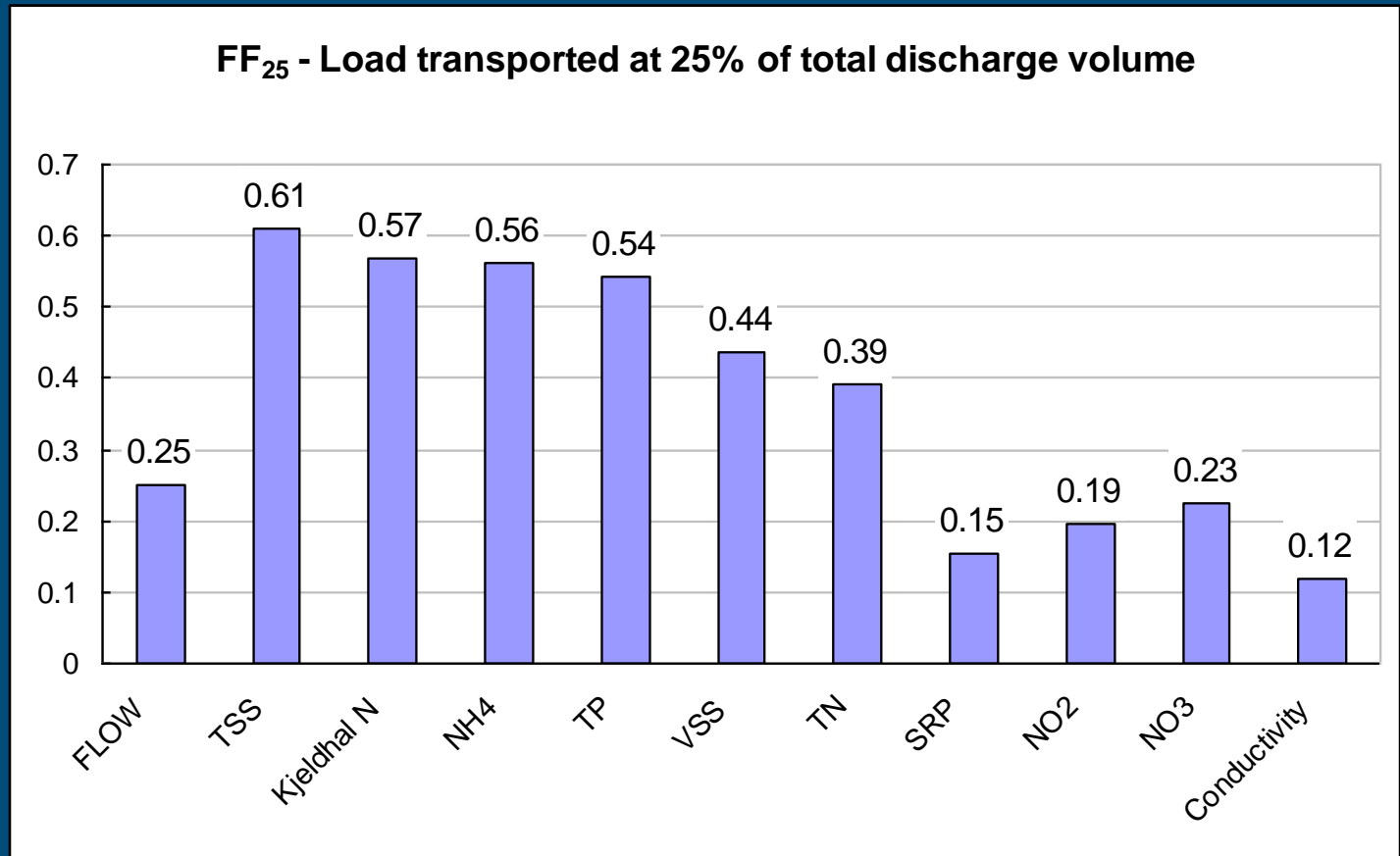
How can we manage these stream types better without having better understanding of the true variability over space and time?

Characterization of intermittend streams



First flush effects

22.9.2003



Obermann et al. (2006)



Basses connectades



Basses desconnectades



Riu sec



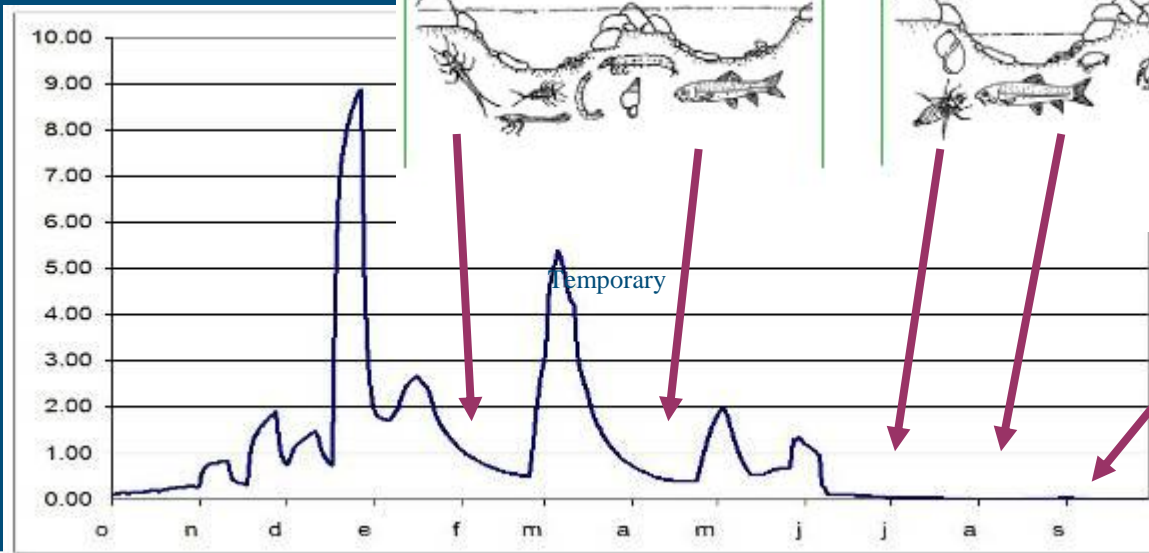
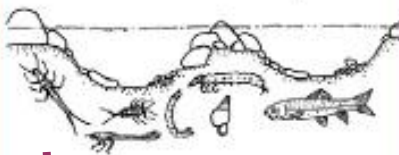
Comunitats de basses i de ràpids



Comunitats de basses



Formes de resistència i organismes terrestres

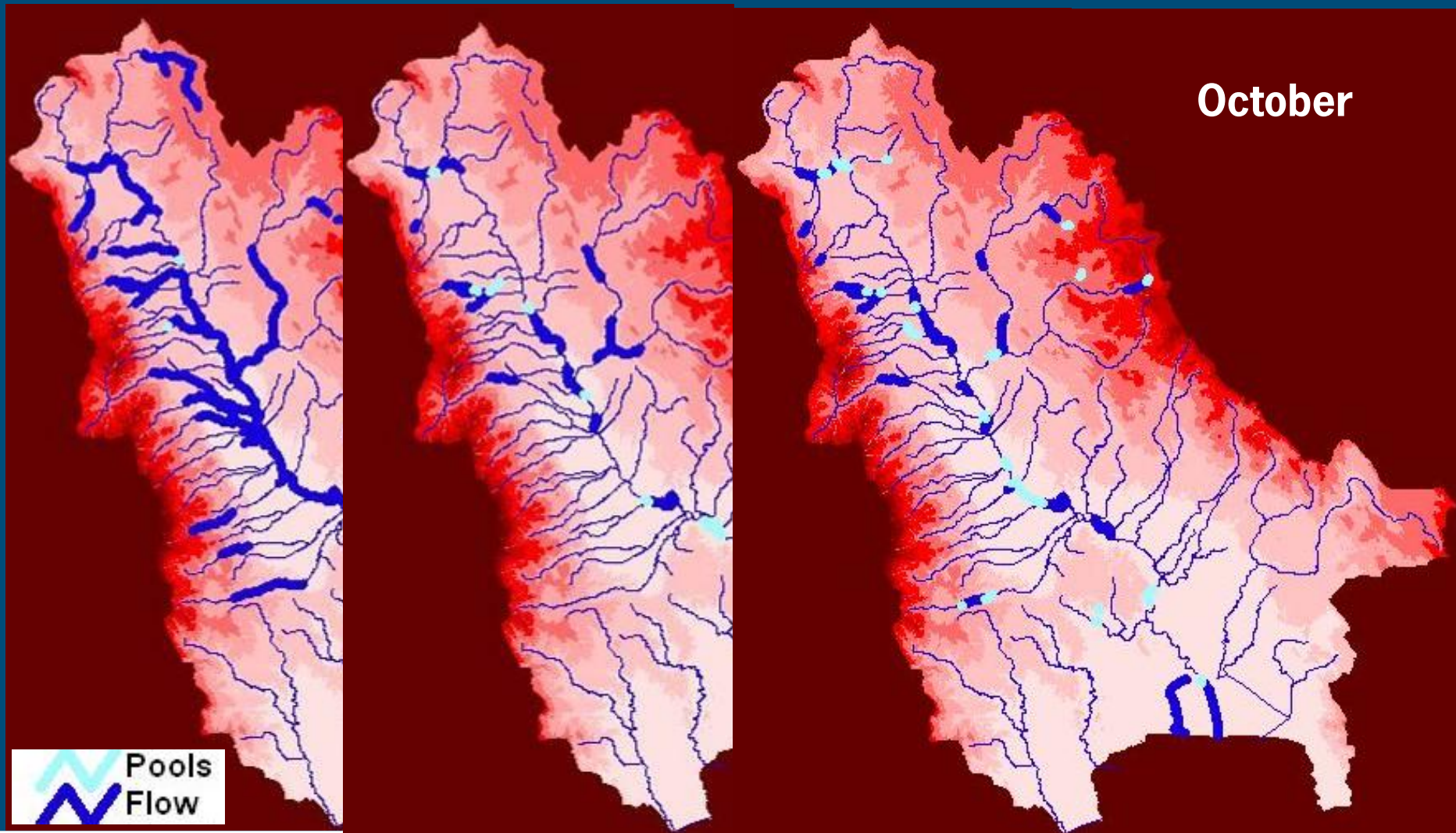


Prat, 2009

Challenges

- Work with many uncertainties in the water balance
- Spatial and temporal characterization of basins; measuring at the outlet is of less use
- Visualizing water availability in the river when there is no flow
- How to link changes in rainfall variability/climate change, landuse/agriculture to spatial and temporal characterization
- Work with different scales:
 - Pool (10 m) – river (10-100 km)
 - Link scales – model – management – river – pool
- Finding management options that contribute to connectivity between nature area's / availability of refuge area's in dry periods during climate change/human impact

Active river network 2007



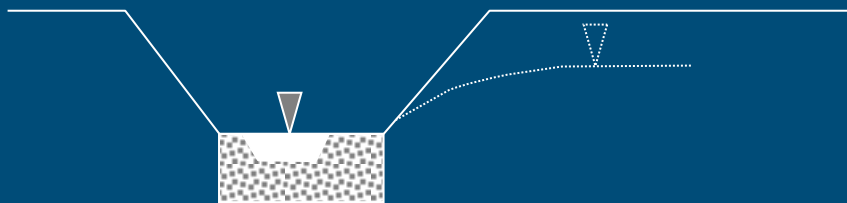
Source: Institute of Inland Water - Hellenic Centre for Marine Research, Greece

GW use – impact on stream flow and pools

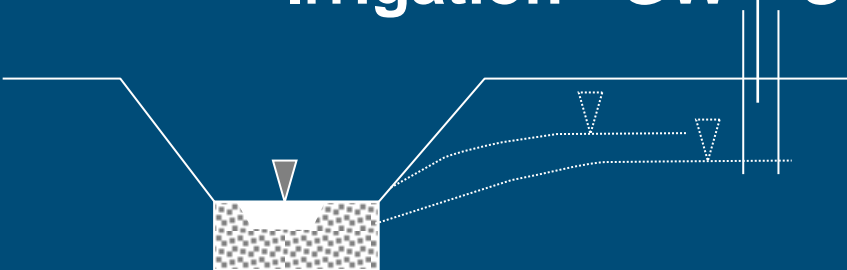
Irrigation wells – GW interaction



GW – Surface water interaction



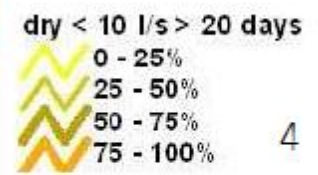
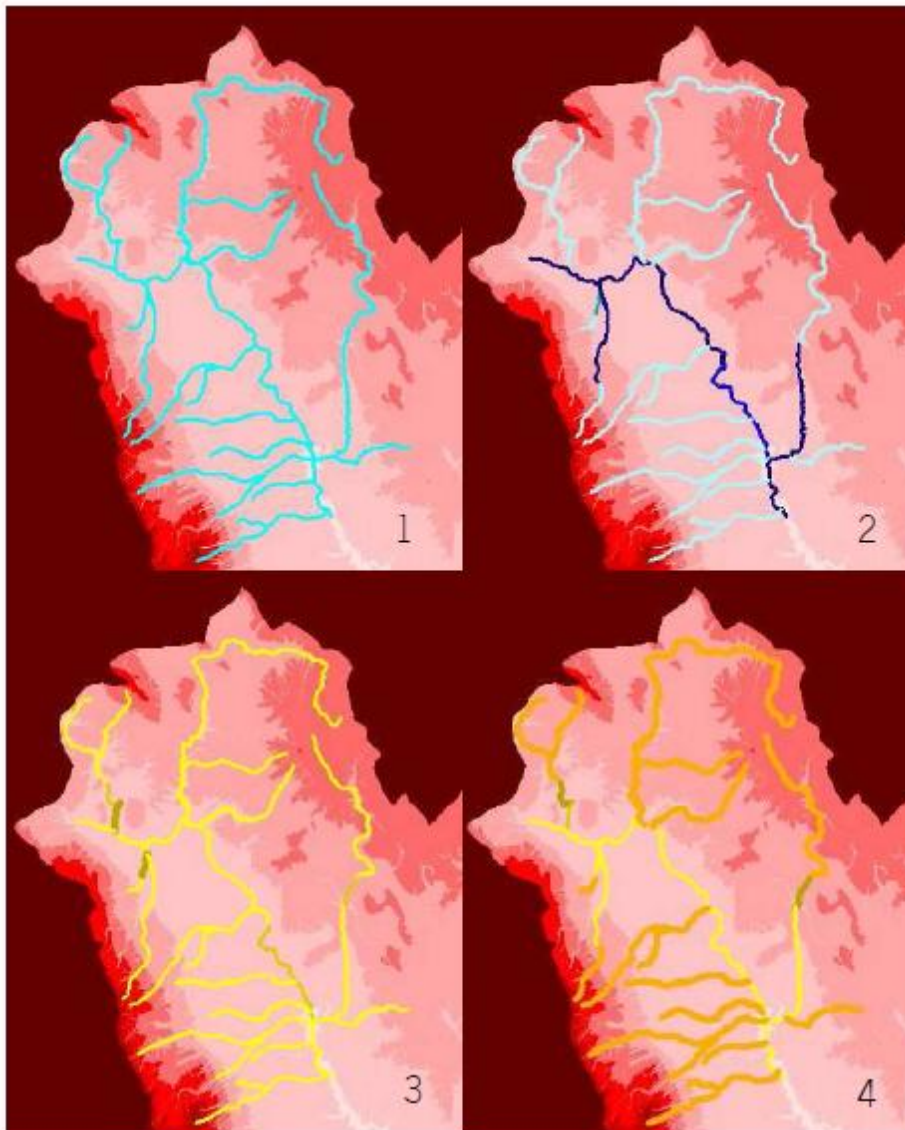
Irrigation - GW + Surface water interaction



August 2007

Irrigation:

3.6 mm/day



Conclusions

- Temporary streams are characterized by a very specific dynamic in water quantity and quality
- Without specific knowledge on the intra seasonal natural stream flow variability and the ecological system, it is impossible to implement the EU WFD adequately
- Without options to differentiate natural stream flow variability (drought) and anthropogenic overconsumption (water scarcity) it is impossible to monitor deviations from the targeted ecological status
- Climate change will increase their relevance in future and requires an increased attention of these stream types in water stress management and development of RBM plans

Thank you for your attention

