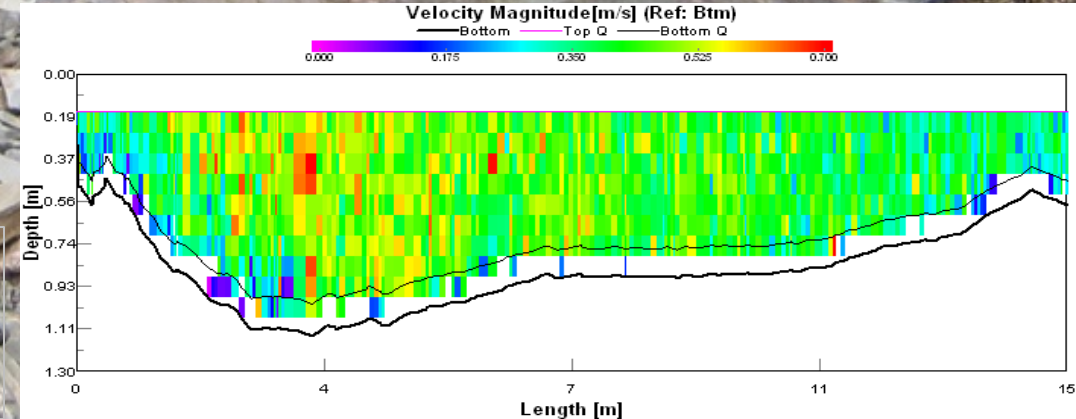
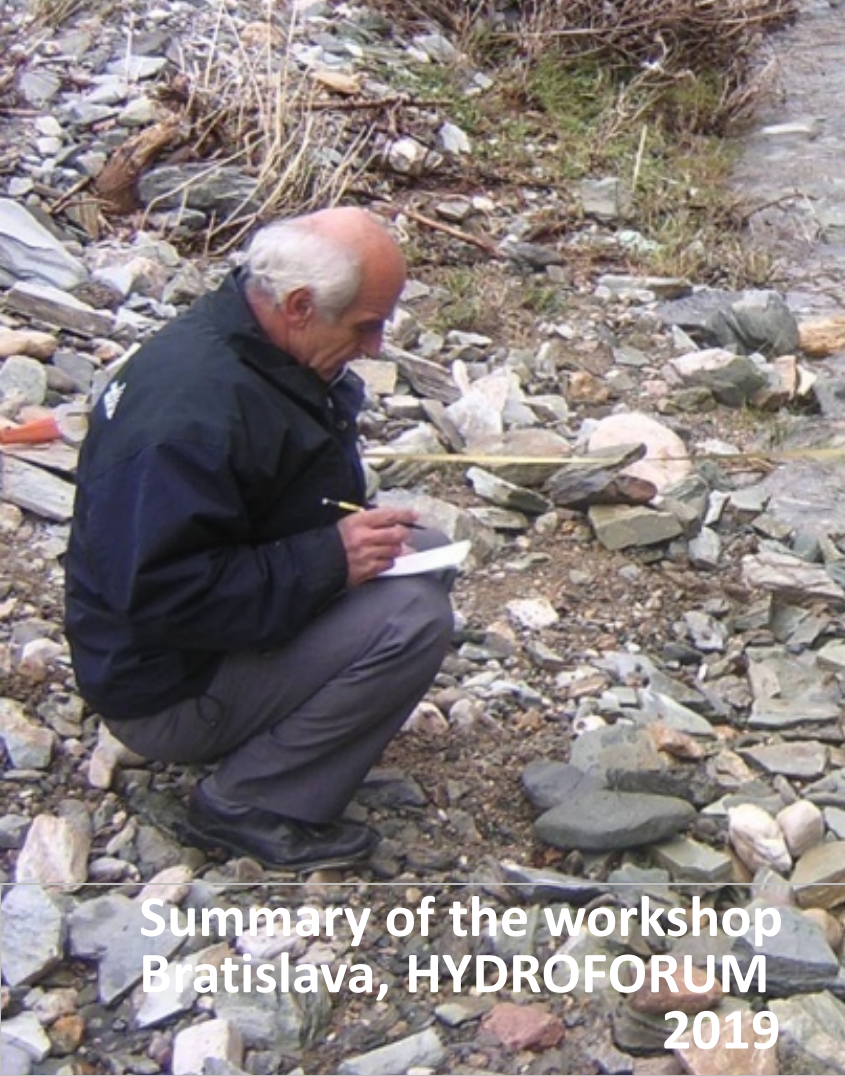
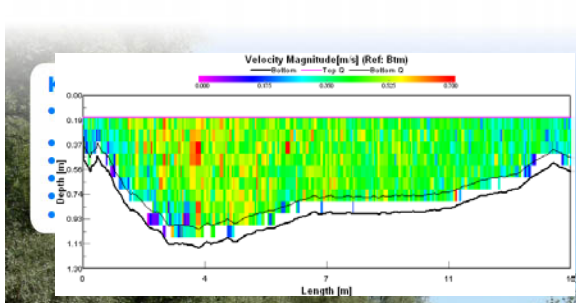


TRADITIONAL vs MODERN TECHNIQUES AND TECHNOLOGY



Summary of the workshop
Bratislava, HYDROFORUM
2019

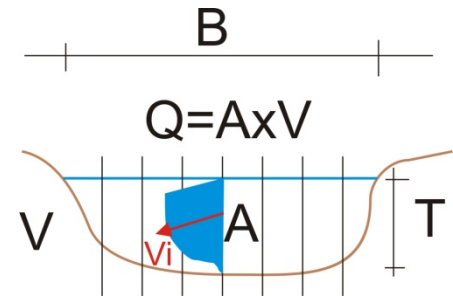
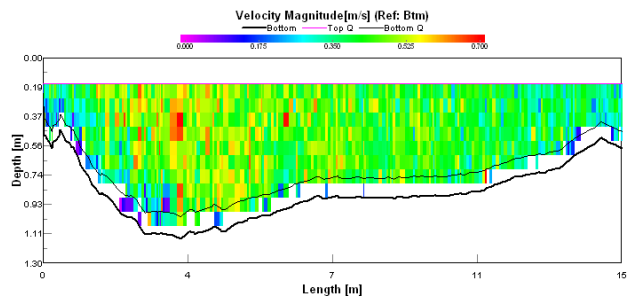
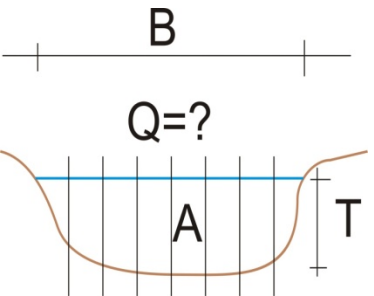


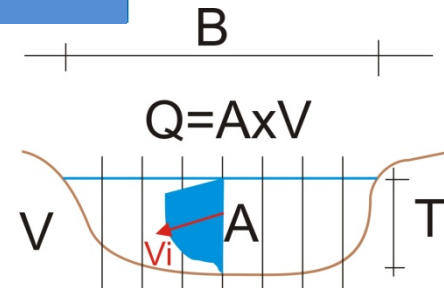
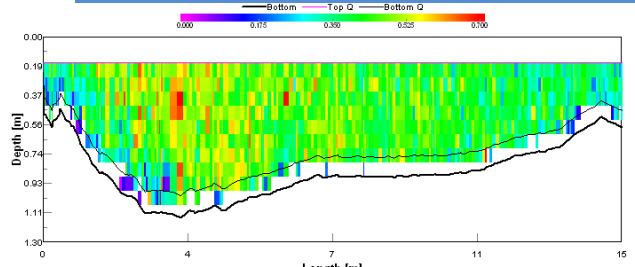
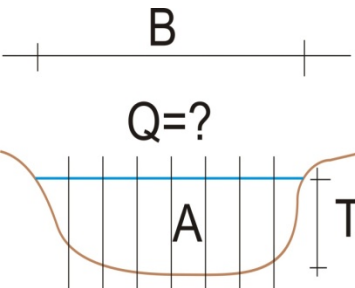
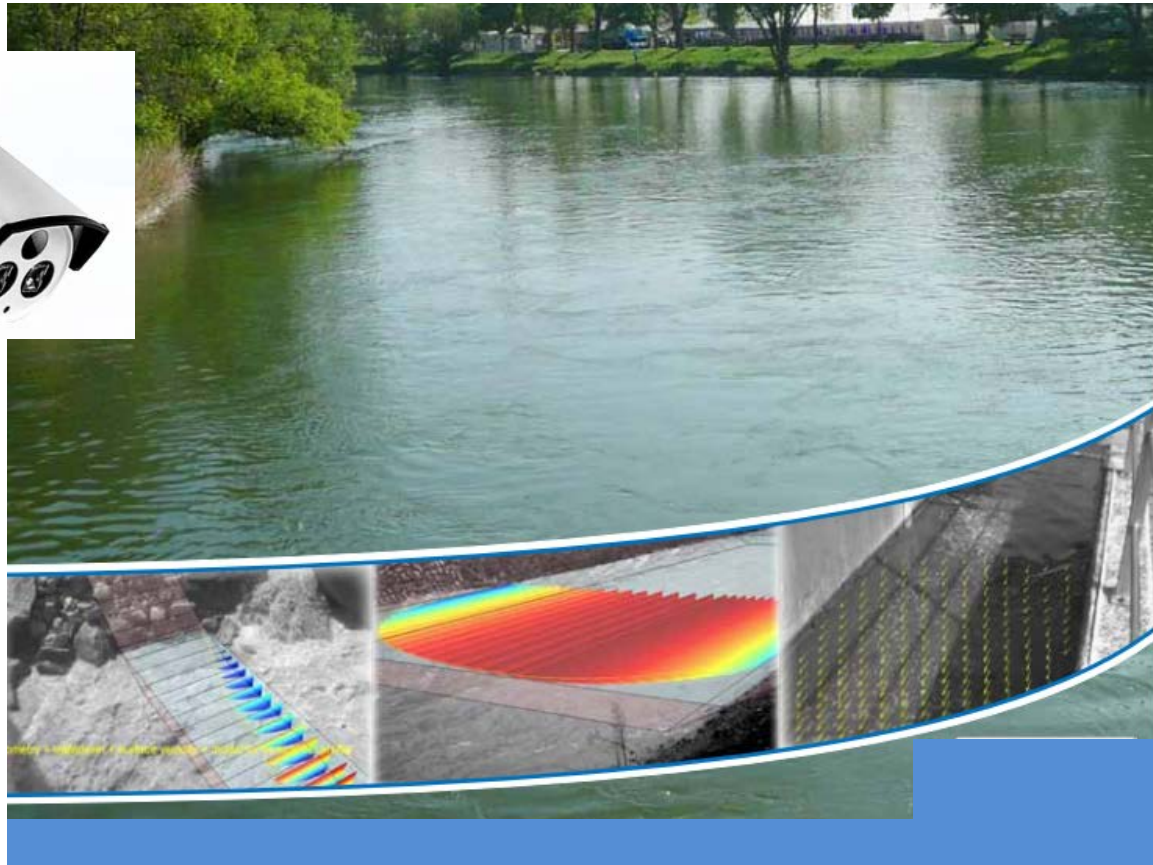


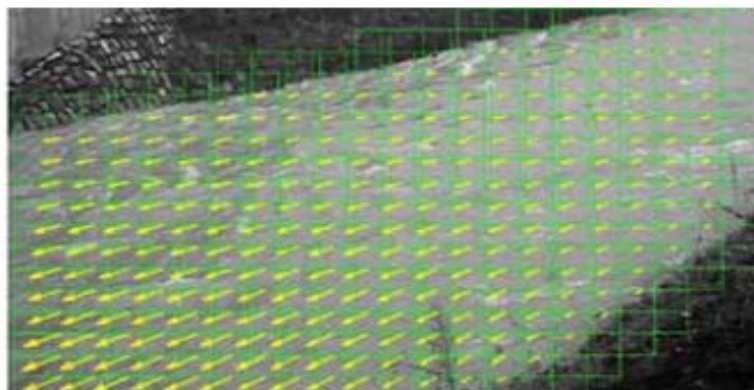
Operation & Evaluation with Tablet-PC and Software AquaProfiler

vertical flow velocity PROFILE

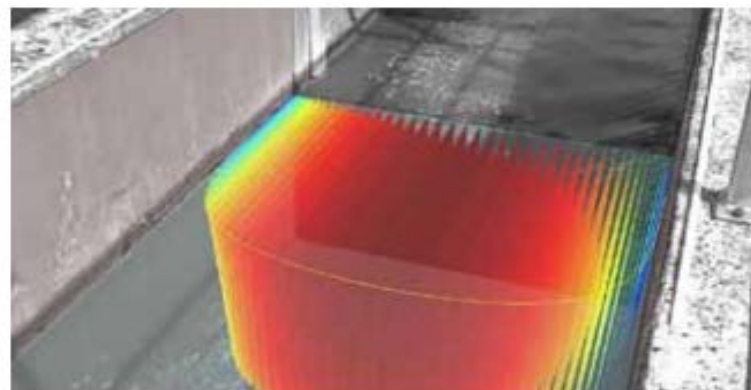
mobile acoustic sensor







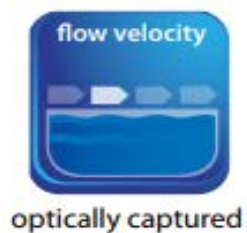
Middle-sized streams



waste water sector



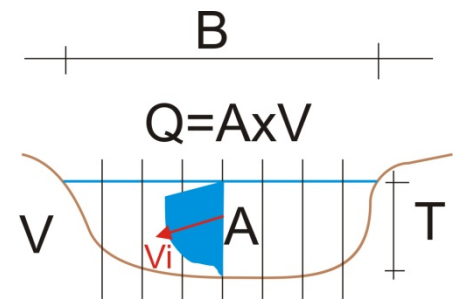
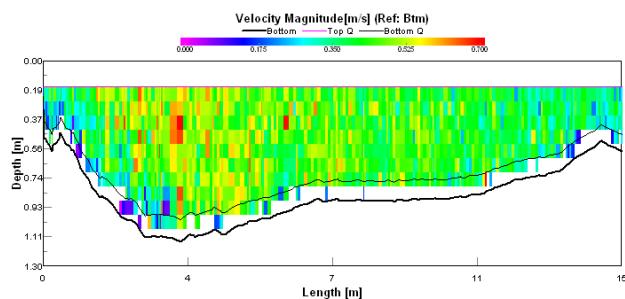
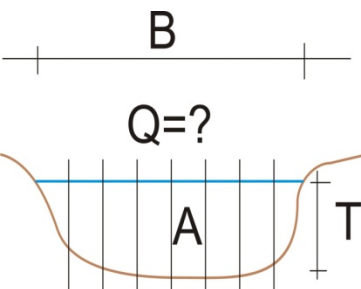
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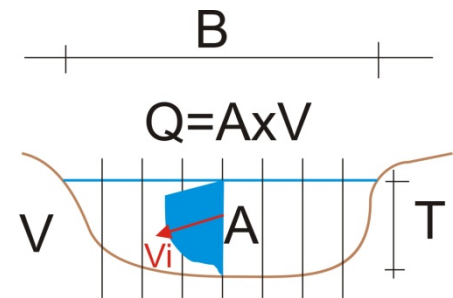
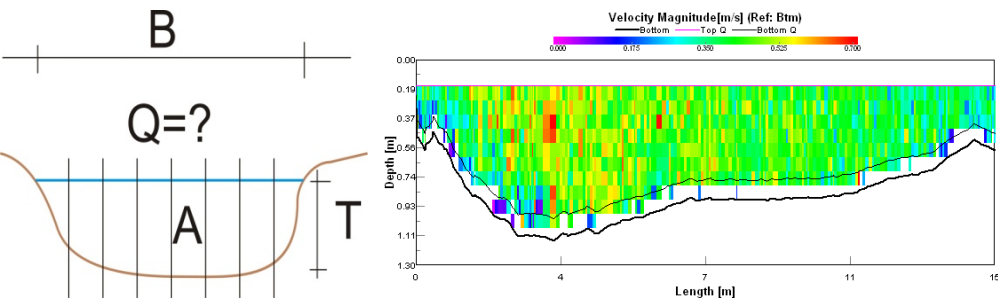


Information from participants

TRADITIONAL vs MODERN TECHNIQUES AND TECHNOLOGY

In General

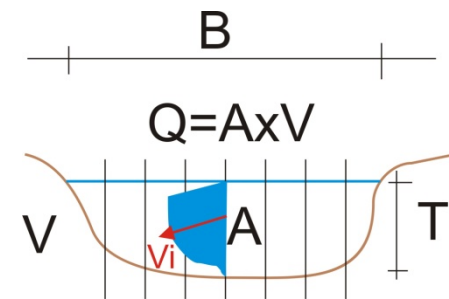
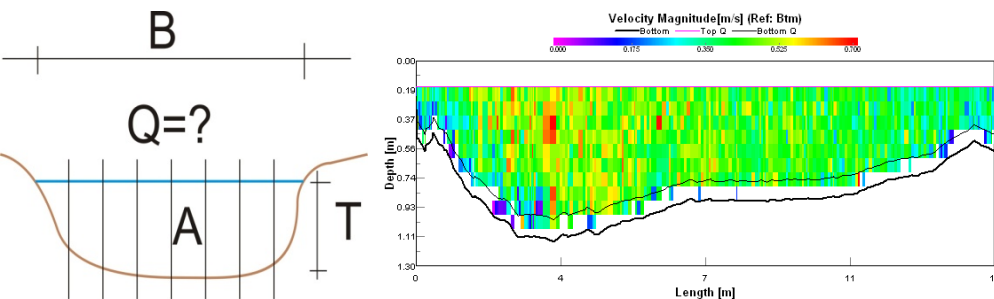
For many countries Current Meter is still main instrument for hydrometric measurements, but in some countries 95% and even more of measurements are done with ADCP's. New techniques (non-intrusive) are just started to be introduce, more like experiment.





Advance of new techniques and technology:

- All people accept new technology and techniques (not only young);
- Less risk for people who are working hydrometry on the field – Security of people is most important;
- Much faster are getting the results (directly on the field) especially for wider rivers;
- More efficient in the results (more measurements in a time period).

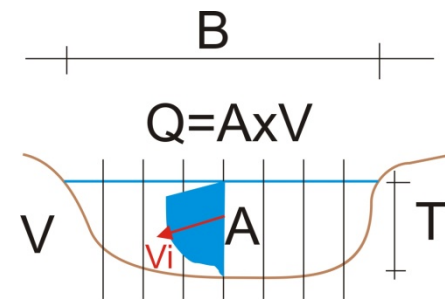
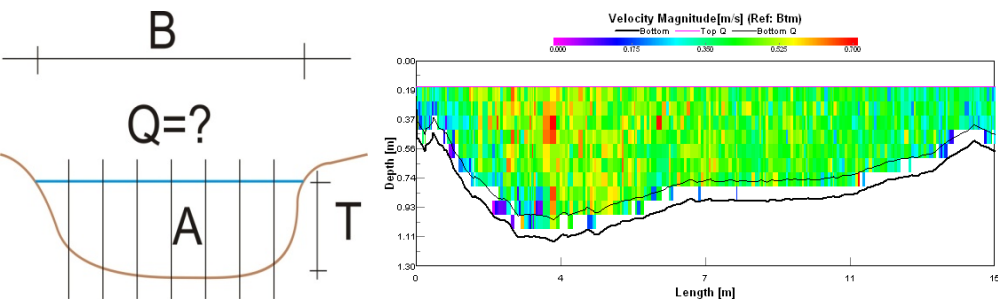




Other Information from participants 1

-In some countries hydrologists perform ADCP measurements for wider rivers, and in mountainous rivers are more willing to use current meters. For wider rivers with current meters they need more time to realize measurements, but with ADCP they are finish very fast. In case of smaller rivers, technicians are more willing to do current meter measurements, especially if the rivers are fast. In that case they are not able to keep ADCP floater in right direction because is difficult to balance, and they need to repeat measurements more time. With current meter they are finishing faster, and they are going home for calculation. This is happening especially when the weather is cold, windy and rainy :)

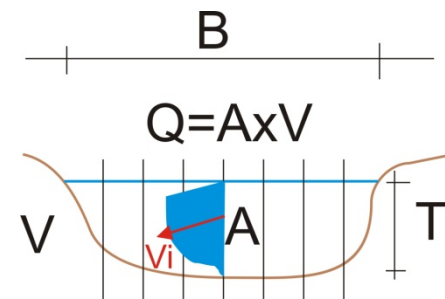
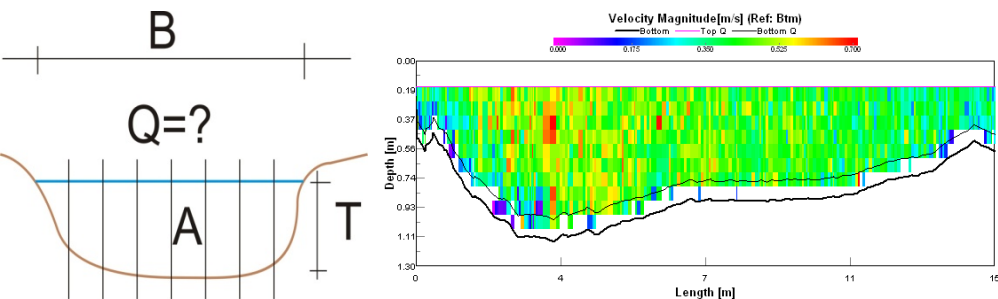
- Measurements depend on the size of the river;
- What type of techniques are used depend on river conditions;
- Shallow and low flows rivers are measured more with current meters;
- Salt dilution method for Small Mountain rivers are in use;





Other Information from participants 2

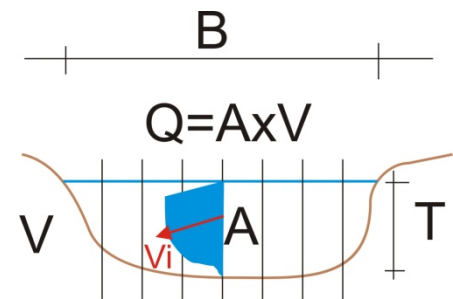
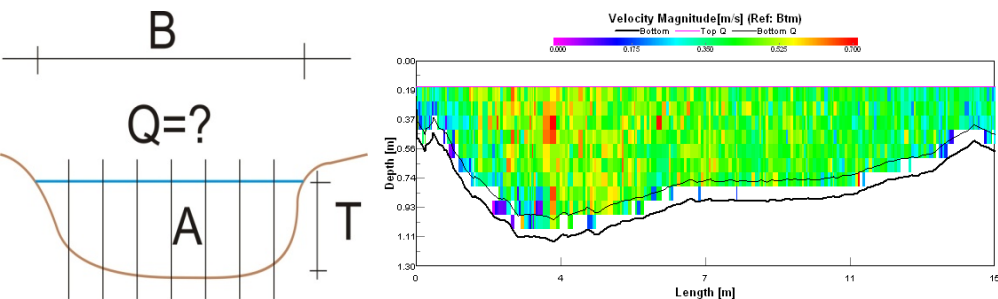
- For some locations still traditional measurement with current meter is good;
- Current meters are in use, but they just started to purchase ADCP's, probably this year will start to implement measurements with ADCP;
- They performed measurements with drowns in a big glacial rivers - Drown is the only option for such a flood - it is not possible to enter the river;
- Data from cameras - it is good when ice break ups, because no other option is in use;
- Current meter measurement is traditional, but now shifts to ADCP, they have older staff - not easy to switch to new methods, and additional education is needed, not too much experience with new technology;
- Drowns are used, they started measurements with cameras 1 year ago, it is very experimental. No any comparisons between drowns/cameras/traditional measurements.





Advice - to take care of:

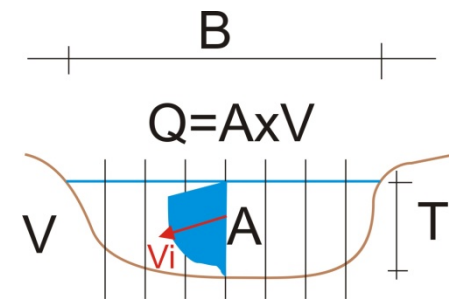
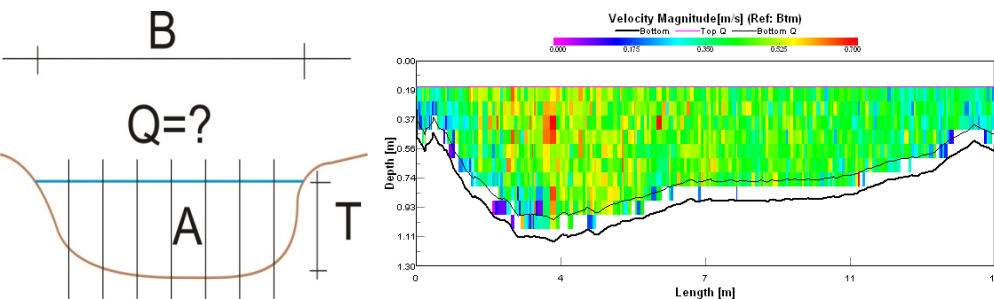
- New technology and techniques are not well presented in the HMS's, not enough education and training concerning new measurements, ADCP and especially non intrusive methods.
- Hydrometric divisions not understand well all process of measurements, they are more willing to do that what is understandable for them;
- From hydraulic perspective - hydraulic education of engineers is important to understand process of measurements. It is necessary to establish the system, which strictly follow the rules;
- Education of hydrometric divisions is very important - it is an issue in the countries. It affects measurements significantly;
- Staff modernization is needed, only a few people can use ADCP. Lack of experience how to setup software;
- During very low flow periods - ADCP did not work well;
- Concerning measurements with cameras – only surface velocity is measured, after every heavy rain, cross-sections are changed, so it is good only for stable cross-sections;
- Comparison of traditional and radar systems in some cases shows difference up to 40%.





Comparison and Quality check of the data

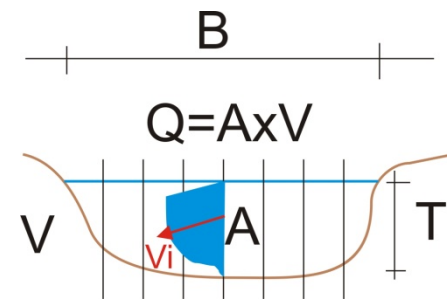
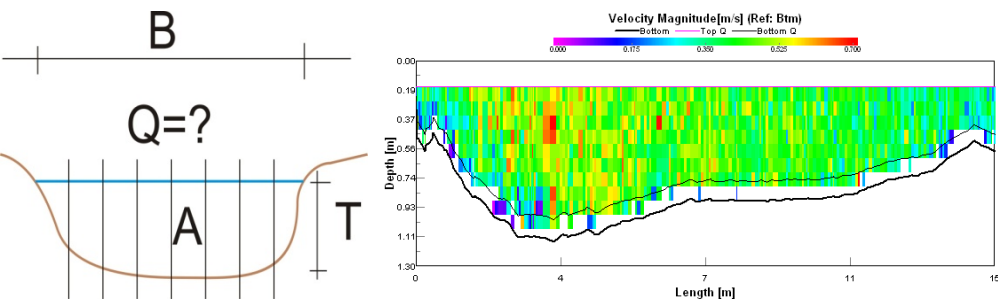
- Not very big studies of Comparison - Traditional vs Modern Measurements;
- Compared data from current meter and ADCP measurement gave results with small deviation – surprisingly;
- Quality check is used - study is being held. ADCP is better – we came much quicker to the results;
- Comparison ADCP vs Current Meter showed reasonable difference;
- ADCP vs Current Meter comparison - 5-7%.
- Several measurements at the same time for the same site - it is needed;
- Comparison ADCP with drowns in big glacial rivers - exactly the same (less than 1%)???





CONCLUSIONS

- There is no question - Hydrologists need to use the new technology for hydrometric measurements in the future;
- More safe and less risk for staff during measurements;
- Results are obtained faster, work is more efficient, at some locations this is the only option;
- Hydrology community need a good education and training to understand all process of measurements with new technology – they need to get good experience;
- Proper regulation for measurements are needed;
- New techniques are not for any river (type of the river) and location – Further improvement of the instruments and methodology is needed;
- Comparison is needed, especially Regional and Transboundary in a way of Regatta measurements.



Thank you for your attention!

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