Alonso Pizarro UNIBAS (convener) (09:46)
Dear EGU friends!

Welcome to session HS1.1.4 “Advances in river monitoring and modelling”. We are looking forward to discussing exciting displays on fluvial and water-related contributions. I will be the moderator of this chat exiting chat!

With the intention to optimise the interaction, we will discuss only the abstracts with presentations and in order of appearance (see the box to the right). Each author can briefly present his work in a 1-2 sentence introduction (be prepared!!). Then it starts the round of questions! Consider each display will have about 5 minutes of discussion

Jerome Le Coz INRAE (author) (09:41) We confirmed the acceptable accuracy of the transparent velocity head rod, a cheap and easy tool for measuring the discharge of shallow, fast streams.
Ida Westerberg IVL (convener) (09:45) HI all! A question for Jerome: How well did the rod work in high velocity situations? Is it hard to hold it upright against the current?
Jerome Le Coz INRAE (author) (09:47) Yes Ida, there are several issues in high velocity situations: holding it against the current (without hurting your shin...), and also reading the water levels, as the free surface is fluctuating... but we were not limited by this issue, in practice.
philipp.hoehn (09:48) Really nice niche in the inexpensive sector. I could imagine these being valuable temporary monitoring stations if paired up with video processing. Any thoughts on that?
Jerome Le Coz INRAE (author) (09:48) Yes, head rods and video processing are two cheap techniques that could be nicely combined indeed.
Nils Ruther NTNU (09:48) What is about the repeatability of measurement in the stream. Did you repeat the cross sections and what was the result?
Salvador Peña photrack (author) (09:48) Hi all, Jerome: How important is to keep it vertical? How this is assure?
Alonso Pizarro UNIBAS (convener) (09:49) @Jerome, have you tried other rod shapes? (with a more hydrodynamics shape)
Jerome Le Coz INRAE (author) (09:49) @ Nils, yes we did a bit of repetitions but limited tests; Was quite ok.
Jerome Le Coz INRAE (author) (09:50) Salvador, yes, the rod must be vertical. Was not very sensitive though. We plan to add a spirit level to help.
Jerome Le Coz INRAE (author) (09:51) Alonso, we rather tested less hydrodynamic shapes to increase sensitivity to low velocity.
Jerome Le Coz INRAE (author) (09:51) Like concave, semicircular rod, but sensitivity was not increase by much.

Nick Everard EA Convener (09:51)
Jerome, what is the lowest water speed you recommend for this device?

Jerome Le Coz INRAE (author) (09:51) Nick: 20 cm/s (15 cm/s for very good eyes...)
Alonso Pizarro UNIBAS (convener) (09:52) in order to give enough time to each contribution, we have to move on. I am sorry! only last answers
Salvador Peña photrack (author) (09:51) Can you give a upper/lower limits (vel or h) where it can be used?
Jerome Le Coz INRAE (author) (09:52) min/max depth: 5 - 75 cm min/max head: 2 - 100 mm min/max velocity: 10 - 90 cm/s
Salvador Peña photrack (author) (09:53) Thanks Jerome, I like a lot the idea.

Alonso Pizarro UNIBAS (convener) (09:53) We will now start discussing display D43 EGU2020-9943. @Salvador (or co-authors), could you please introduce your work?

Salvador Peña photrack (author) (09:54) We made an analysis of the influence of wind on surface vel measurements via images

Nick Everard EA Convener (09:53) Salvador, does the wind simply slow the mass flow near the surface, or do you see effects from acceleration or deceleration of surface features (ripples etc)?

Salvador Peña photrack (author) (09:54) Nick, in this case it seems to be only an alteration of the velocity at the surface (ripples)

Salvador Peña photrack (author) (09:54) we simply compared wind measurements with vel deviations

Jerome Le Coz INRAE (author) (09:55) Salvador: velocity measurement error or change in the coefficient? (due to change in vertical velocity profile)

Salvador Peña photrack (author) (09:55) Jerome: vel. meas. error

s. dal sasso univ. Basilicata (convener) (09:55) Hi Salvador. This is one of the most important challenges in optical flow measurements. But also background sound levels in ADCP systems are correlated to wind speeds. What do you think about this issue?

Salvador Peña photrack (author) (09:56) Silvano, I have not done much with ADCP to be able to answer your question

Nick Everard EA Convener (09:56) How effectively would an anemometer correct for bias in (or near to) real-time...?

Salvador Peña photrack (author) (09:57) Nick, we think that the anemometer measurements can be use to correct, that is the next step...

Alonso Pizarro UNIBAS (convener) (09:56) Really interesting work @Salvador! Have you considered on slide 10 to explore these curves based on a monthly time period?

Salvador Peña photrack (author) (09:58) Alonso, yes, we still collecting data, almost one year now. We will keep anlysing it. We also want to do the same in slower flowing river

Jerome Le Coz INRAE (author) (09:57) Salvador, the errors you found was not so big, in my opinion, given the wind strength. You could certainly compare with existing formulas giving the velocity change vs wind measured at 10 m high.

Mark Randall, DNRME Co- Convener (09:57) Did you compare wind measurements at the water surface as well as the higher bridge mounting?

Salvador Peña photrack (author) (09:58) Mark, only at the bridge

Alonso Pizarro UNIBAS (convener) (09:58)
Well, let us move on. Are there other final comments/suggestions?

Jerome Le Coz INRAE (author) (09:58) Very interesting, Salvador. We did similar comparisons for a velocity radar station.

Jerome Le Coz INRAE (author) (09:59) from Alex Hauet: Due to the piers of the bridge, the free surface of the river seems to be very rough (waves). Do you think that it makes the site more sensitive to wind? Do you think that your result can be generalized to other sites?

Salvador Peña photrack (author) (09:59) Thanks, all

Alonso Pizarro UNIBAS (convener) (09:59)
We will now start discussing display D44 EGU2020-10659. @Patrice Carbonneau (or co-authors), could you please introduce your work?

Nick Everard EA Convener (10:02)

Patrice, is there any potential for using the drones to refine imagery to allow water surface velocimetry? Or surface flow type classification as a step towards this?

About this time it became apparent that many users were not able to post questions – effort was put into trying to solve. Some users switched browser, logged out and back in etc.

Alonso Pizarro UNIBAS (convener) (10:02) @Patrice, can you please tell us if you have analysed the influence of the use of different extension area of UASs information? What is the minimum % to consider to minimise the errors?
Alonso Pizarro UNIBAS (convener) (10:04) let us move on! Unfortunately, all of us are facing some issues with the chat! I am really sorry about it
Salvador Peña photrack (author) (10:04) Patrice, what is minimum river width which can be classified? Sentinel iamge resolution is 10m?
Nick Everard EA Convener (10:06) Patrice, if you see this message - really interesting work! Please contact me to talk further/share later!

Alonso Pizarro UNIBAS (convener) (10:06) We will now start discussing display D45 EGU2020-11759 . @Gabriel can you please introduce your display?
Gabe S (10:06)
Here I am, I am awake…In this research, we conducted a proof of concept experiment of a Water Quality mixing model. This is a constant rate tracer measurement method using a known inflow rate and a small difference in either temperature or ECT between the two upstream flows. This was applied at two hydropower sites. Results are promising but more research is needed!

Alonso Pizarro UNIBAS (convener) (10:07) Interesting adaptation of the mixing model to confluences. Based on this idea, what does it depend the mixing lenght on?
Gabe S (10:08) Sorry, can you rephrase your question?
Nick Everard EA Convener (10:08) Gabe, how much influence does temperature have on dilution gauging with salt?
Alonso Pizarro UNIBAS (convener) (10:08) how can you decide where are the locations downstream for temperatures?
Gabe S (10:10) @Nick, This is not a salt dilution gauging. We are using water quality parameter, either temperature or electrical conductivity, to estimate the downstream flow. It is essentially a weighted average equation, assuming the water quality in question is conservative. It requires that you know the Q of one of the upstream inflows, which is the case with a hydropower project, usually to within 1%.
Nick Everard EA Convener (10:10) Sorry Gabe! Juggling many balls!
Ida Westerberg IVL (convener) (10:10) Which factors contributed most to uncertainty in the downstream flow?
Nick Everard EA Convener (10:11) Alonso - can you see if chat is set up correctly - re muted users...? I can't see the setting! 'looks like some of the conveners have muted the chat. HS1.1.4'
Gabe S (10:12) @Alonso, the reach must be fully mixed, just as in any dilution gauging. You can determine the required reach by in-situ dilution gaugings such as salt dilution. This is will change somewhat based on the flow, but generally there is a mixing reach that will be ideal for all flows. Besides mixing reach, you must ensure no local inflows, surface or sub-surface, exist upstream of your probes.
Nick Everard EA Convener (10:12) Just heard from another user who also cannot post questions! I think we have a glitch!
Gabe S (10:13) I'll keep answering. Can you see my answers?

Salvador Peña photrack (author) (10:13) I can see them, and it works for me
Alonso Pizarro UNIBAS (convener) (10:13) I have tried many times to unmute all the participants but unfortunately, without success. I think if all of us close the chat and enter again, we will be able to solve this issue! I am going out for a couple of seconds
Arnaud Belleville EDF (participant) (10:13) Yes Gabe, I see your answers.

******Trying to sort comms issues…..******

Gabe S (10:17)
@Ida, the factors that affect the uncertainty the most were:

1. Calibration of the Temperature and Conductivity Sensors. Because we are dealing with small delta temperatures, I found the temperature sensors needed to be within 0.04oC of one another. Ideally that is absolute accuracy, but it's ok if it's relative accuracy. This is very tricky to achieve since most commercial sensors only report 0.1oC and have an accuracy of around the same. We found the accuracy needed on the ECT was about 1 uS/cm. This is not so difficult to achieve, but for long-term installations, we found that sensor drift caused too much error. Drift was not an issue with the thermistors. Besides that, local inflows, sensor placement were the biggest source of uncertainty. For example if the temperature probe was not exposed to moving flow, it tended to introduce error. Every time we took manual measurements, insitu, the results were always good to within 5% of the concurrent Salt Dilution flow measurements.

Ida Westerberg IVL (convener) (10:18) Interesting, thanks Gabe!
Alonso Pizarro UNIBAS (convener) (10:18) @Filippo, can you please introduce your work? (D50 EGU2020-4229)

Further comms issues…….
Nick Everard EA Convener (10:21) Should we continue? Those of us with chat working can ask questions! Those who know my email address can send me Qs and I will try to ask them!
Alonso Pizarro UNIBAS (author-convener) (10:21) Hi Laura! @Filippo Bandini should start giving an introduction of his work
Filippo Bandini, DTU (author, convener) (10:22) Hi all, In my presentation we show a method to estimate river discharge and river roughness. There are 2 interesting points in my research: • We tried to remove the need of Ground Control Points (GCPs) required by PIV technique to convert velocity from pixels into metric units. The range to the water surface, measured by an innovative radar system, is used to inform a camera model and compute velocity directly into real-word metric units. This drone-borne technique can be applied in any stream and is essential to automatize the survey operations. • We show an innovative physical-based method (based on uniform flow assumption) to jointly estimate discharge and river roughness (Gauckler-Manning-Strickler coefficient) from i) drone-borne observations of water surface velocity, ii) drone borne observations of water surface slope iii) drone-borne bathymetry measurements. This new method to estimate discharge outperforms the literature-based 0.85 coefficient method, in which mean vertical velocity is estimated as 0.85 times of surface velocity.

Alonso Pizarro UNIBAS (author-convener) (10:23) Thanks @Filippo! Based on your results, the approach you have developed has an accuracy of ca. 15-20% for discharge estimations. In your opinion, what are the critical factors that can minimise the errors?

Filippo Bandini, DTU (author, convener) (10:24) @Alonso. Yes, we typically developed an accuracy of 15-20%.

Micha_Dietze_GFZ (participant) (10:24) Filippo, If I were to estimate roughness, how long would I need to monitor/probe? Speaking of regionalisation of roughness

Nils Ruther NTNU (10:24) TO Filippo: do you think this method could be improved with a more accurate bathymetry. I know at some point compromises have to be done, but just to have an idea. Thanks.

Filippo Bandini, DTU (author, convener) (10:25) The achievable accuracy depends on many factors, including acquatic vegetation density/homogeneity, flow magnitude, water depth, straighness of river course, etc..

Laura Bannatyne Rhodes University (10:25) 20% error for discharge estimations is acceptable for measured discharge, though?

Guy Schumann UoB (10:26) Filippo. Great study. What are the ranges that this works in, for velocity for instance and slope sensitivities?

Jerome Le Coz INRAE (author) (10:27) To Laura: depends whether random or systematic error... I'd say for most hydrological applications 20% is acceptable for random, not for systematic.

Filippo Bandini, DTU (author, convener) (10:27) Our method requires assumption of uniform flow. So it performs better when river slope and river cross section shape are constant through the measured reach

Alonso Pizarro UNIBAS (author-convener) (10:28) Well, let us move on. The next display is D51 EGU2020-4661. @Alex, are you available to introduce your work?

Nick Everard EA Convener (10:28) Fillipo, have you looked at non-contact depth measurement from drones? Ground penetrating radar has been flown on drones I believe

Filippo Bandini, DTU (author, convener) (10:39) @Nick Yes, we have been looking at Ground Penetrating Radar for drones. We will publish a study soon, but there are many challenges with using airborne GPR antennas

Filippo Bandini, DTU (author, convener) (10:28) @Micha_Dietze_GFZ We measure roughness by combining drone-borne water surface slope and water surface velocity measurements. So it takes only a short video and few radar measurements to measure.

Micha_Dietze_GFZ (participant) (10:30) ok, so this could be scaled "easily" for long stream sections.

Filippo Bandini, DTU (author, convener) (10:32) @Guy. We have tested it for: velocities from ca. 10 cm/s to velocity up to 1.5 m/s, slopes from 0.005%-0.1%

Alonso Pizarro UNIBAS (author-convener) (10:32) @Alex is unfortunately muted. Please, contact him via email if you have any comment (ahau@nve.no)

Filippo Bandini, DTU (author, convener) (10:34) @Nils. YEs, accurate bathymetry could improve the method. But how would you estiamte accurate bathymetry? Each method (e.g. ADCP, echosounder, measuring poles) to estimate bathymetry has uncertainty of 1-3% of depth. I think the biggest challenge to achieve high discharge accuracy is to predict the vertical velocity profiles

Guy Schumann UoB (10:36) thank you Filippo

Alonso Pizarro UNIBAS (author-convener) (10:38) Well, let us move on! @Silvano, can you please give an introduction of your work? (D55 EGU2020-16011)

s. dal sasso univ. Basilicata (convener) (10:39) Yes! In this work we investigated the accuracy of PTV and LSPIV on three real case studies characterised by different seeding and environmental conditions. To this aim, we adopted three metrics for a preliminary description of seeding characteristics on three real case studies based on the calculation of the i) seeding density; ii) index of dispersion of tracers; and, iii) coefficient of variation of tracers' dimension. A multiple linear regression was performed

to statistically evaluate the significance of these metrics on the performances of the two techniques

Alonso Pizarro UNIBAS (author-convener) (10:40) Based on the multiple regression results, it seems that CV of tracer areas presents higher effects on image velocimetry results. Is there any logical explication for that?

s. dal sasso univ. Basilicata (convener) (10:42) Yes, increasing the coefficient of variation of tracers' dimension can negatively impact on the image velocimetry results. This happens because the number of particles effectively detected and cross-correlated at the matching process decrease.

s. dal sasso univ. Basilicata (convener) (10:43) These aspects are currently under research, using numerical simulations to explore them in controlled conditions

Alonso Pizarro UNIBAS (author-convener) (10:46) Let us start with the work D56 EGU2020-17773. @Anette are you there to give a short introduction?

Anette Eltner TUDD (convener & author) (10:46)
To measure surface flow velocities, we introduce a Python based software tool performing the tracking task with particle image velocimetry or particle tracking velocimetry and considering template matching with normalized cross correlation or the Lucas-Kanade algorithm. To improve the robustness of the tracking results, global and local filtering can be applied that implement statistical information about the flow direction, flow steadiness and average velocities. The tool has been validated for UAV and terrestrial datasets captured with RGB and thermal cameras, revealing that velocities can be estimated with accuracies of 0.01 to 0.03 m/s at medium and small-scale rivers.

Jerome Le Coz INRAE (author) (10:46) Anette, thanks, great work. I'm just surprised not to see the comparison with ADCP data (on slides 6 and 8) or am I missing something?

Anette Eltner TUDD (convener & author) (10:47) The comparison on page 6 and 8 is done to ADCP measurements

s. dal sasso univ. Basilicata (convener) (10:47)
Hi Annette! Thank you for sharing your python code and dataset. In your velocimetry tool, how the filtering thresholds (features and tracks) are selected? Automatically or not..

Alonso Pizarro UNIBAS (author-convener) (10:47) Thanks @Anette! why such differences in terms of discharge and velocity using 1200D-I vs 1200D-II? Are they the same camera?

Nick Everard EA Convener (10:47) Anette, are the differences between results from different cameras (slides 5 and 6) a reflection of image quality (or other optical factors) of the cameras, or the angle of view (and resulting visibility of features...)

Anette Eltner TUDD (convener & author) (10:48) The difference are due to different viewing angles.

Micha_Dietze_GFZ (participant) (10:47) Anette, how close does this package bring us to "real time" processing?

Mikael Lennermark, SMHI Sweden (10:48) Hello there! For SaltDilution Q measurement, the CF_t calibration coefficient should be around 0.47. Is there a way in the Uncertainty method to add this? In other words a CF_t of 0.51 would be fair.. 0.55 would be poor

Micha_Dietze_GFZ (participant) (10:48) I mean local processing on site and telemetry of resulting data

Anette Eltner TUDD (convener & author) (10:49) The filtering and tracking thresholds have to be selected manually, for now

Nick Everard EA Convener (10:50) Message from EGU:
All attendees are unmuted right now. Please note that only conveners can mute/unmute people (by using the chat link given in their session dashboard). If anybody cannot enter the chat, they shall please try to use another browser.

Anette Eltner TUDD (convener & author) (10:50) Close to real time. It takes a few seconds for about 10 frames to process them. But there is still quite a lot to do for real time

Alonso Pizarro UNIBAS (author-convener) (10:51) (Remember to vote your best display preference here: www.menti.com and use the code 51 45 34)

Anette Eltner TUDD (convener & author) (10:52) At the moment we are advancing the tool to also process time series of data

Jerome Le Coz INRAE (author) (10:52) Thanks, Anette, I read your slides too fast, sorry.

Anette Eltner TUDD (convener & author) (10:52) No problem :)

Micha_Dietze_GFZ (participant) (10:52) OK, cool. So in the near future we may be able to benefit from near real time series of target variables?

Alonso Pizarro UNIBAS (author-convener) (10:53) Thank you @Anette! really interesting work

Anette Eltner TUDD (convener & author) (10:53) Indeed, this should be possible.

Davide Mancini UNIL (author) (10:53) test

Anette Eltner TUDD (convener & author) (10:53) Thank you

Alonso Pizarro UNIBAS (author-convener) (10:53) @ Sreeparvathy Vijay, are you there to present your work? (D57 EGU2020-398)

sreeparvathy (10:54)
In this study we propose a new fuzzy entropy-based methodology for optimal design of a hydrometric monitoring network. The methodology does not require choice of bin size for discretization of data to estimate entropy measures/indices. Therefore, it alleviates the uncertainty associated with bin size estimation which is a concern in analysis with conventional Shannon entropy-based methodology (SEBM). Advantage of the proposed methodology over SEBM and its related theoretical improvement exponential entropy-based methodology (EEBM) in arriving at optimal design of streamflow monitoring network is demonstrated through performance investigation on Mahanadi basin of India.

Alonso Pizarro UNIBAS (author-convener) (10:55) Really interesting work, exploring the possibility to optimise the number and location of streamgauges. Do you think results may be altered due to increasing or decreasing trends of stream flows? (e.g., climate change effects)

sreeparvathy (10:56) ya it would and one has to take into consideration these factors too while designing..

sreeparvathy (10:56) dpending upon the change in climatic/physiographic conditions the chosen optimal stations has to be updated frequently

Guy Schumann UoB (10:57) To screepa. Nice work. this could be used in optmizing the design for assimilation work

Nick Everard EA Convener (10:57) An update: I am using 'unumate to unumate people, but there is a bug preventing all users appearing in the unmaute list

sreeparvathy (10:58) this methdology could be extended for all hydrological/hydro meterological variables. In my present study we explored the possibility of streamflow only.

Alonso Pizarro UNIBAS (author-convener) (10:58) Thanks for you work @ Sreeparvathy Vijay
Nick Everard EA Convener (10:58) 'unmute' - sorry typing faster than my skill level...
sreeparvathy (10:58) Thank you Alonso
Jerome Le Coz INRAE (author) (10:58) Nice indicator indeed. But it should be crossed with other indicators, eg local human stakes.

Some connection problems resolved….!

Nick Everard EA Convener (10:58) Katie!
Katie Muchan, UKCEH (author) (10:59) Yay I'm in!
Thomas Morlot EDF-DTG (author) (10:59) I am in
Thomas Morlot EDF-DTG (author) (10:59) D64
Giulio Dolcetti TUOS (10:59) Finally!
sreeparvathy (10:59) yes you are right Jerome.. I am currently working on it now to utilise those indicators too
Alonso Pizarro UNIBAS (author-convener) (11:00) excellent! thanks to eveyone who is still in the chat room, despite the problems!
Alonso Pizarro UNIBAS (author-convener) (11:00) @Gemma Coxon, are you available to introduce your work? (D60 EGU2020-3066)
Nick Everard EA Convener (11:00) I will keep hitting the unmute button, this may help, but is not working quite as it should. Welcome those who just joined..!
Gemma Coxon Bristol Uni (author) (11:00)
Hi everyone – nice to join this session virtually. Our contribution focuses on estimating out of bank discharge uncertainty using a hydraulic model (LISFLOOD-FP) and nationally available datasets. The long-term aim is to develop an automated method that could estimate out-of-bank discharge uncertainties over a large sample of catchments to feed in to national flood risk assessments. This work tested the methodology at two gauging stations in the UK – results are promising but more work needed!

Gemma Coxon Bristol Uni (author) (11:01)
Just to note that this work was undertook by an excellent masters student who just submitted his thesis (Rob – lead author on the slides). Unfortunately Rob can't join us today so I will do my best to answer questions – apologies if there are any I am unable to answer!

Jerome Le Coz INRAE (author) (11:01) Gemma, very interesting, thanks. I understand you first calibrate the main channel friction, the floodplain friction, right? On your example (slide 6), you have overbank gaugings to calibrate the floodplain friction. What you do otherwise, use look-up tables with more uncertain values?
Alonso Pizarro UNIBAS (author-convener) (11:01) Interesting work! How long does it take the calibration process of bed and profile estimates?
Katie Muchan, UKCEH (author) (11:01) Hi Gemma, interesting work, thank you.
The examples given for the Tweed and Severn are larger rivers in the UK and areas known to be have experienced flooding in the past and therefore likely to have modelled upper limbs of rating curves where we would expect good agreement with the LIDAR based bathymetry modelling shown here. I note in the 'next steps' that you are planning to apply the methodology to other stations. Perhaps some smaller catchments or those with clear 'plain extrapolations' of the upper most limb? If you would like advice on particular examples, just let us know!

Gemma Coxon Bristol Uni (author) (11:02) @Jerome -

Thanks! You are correct – we first calibrate the channel friction to the in bank gaugings. While the models were only calibrated to find suitable channel friction values, a range of floodplain friction values were also included as the variability of channel morphology means that overspill onto small portions of the floodplain can occur even at flows below bankfull and floodplain friction may have some limited effect on model performance. The uncertainty bounds then on slide 7 and 8 comes from running the 'best' channel friction model(s) with a range of floodplain frictions. We need to refine the selection of floodplain frictions that we run as currently these are quite wide and obviously will have a large impact on the discharge uncertainties.

Gemma Coxon Bristol Uni (author) (11:03) @Alonso - not long I believe but I didn't run this so I will need to check!

Jerome Le Coz INRAE (author) (11:04) Thx Gemma, makes sense.

Alonso Pizarro UNIBAS (author-convener) (11:04) Thank you @Gemma!

Ida Westerberg, IVL (convener) (11:04) Nice work Gemma

Gemma Coxon Bristol Uni (author) (11:04) @Katie - completely agree! We chose some simpler case studies as a first go for the methodology but now definitely want to move on to some trickier case studies inncluding smaller catchments, ones with clear extrapolations, bridges, weirs etc. Will definitely be in touch for some trickier case studies :)

Katie Muchan, UKCEH (author) (11:05) @Gemma - great, hopefully speak to you soon :)

Alonso Pizarro UNIBAS (author-convener) (11:05)
Let us move on! Thank you again @Gemma. Really interesting work.

@Davide Mancini (or co-authors), could you please introduce your work?
(D62 EGU2020-5296)

Davide Mancini UNIL (author) (11:05)
In brief, this project try to find a way to determine the riverbed topography of braided streams located in high mountain regions. Due to the presence of glaciers and unconsolidated sediment deposits potentially acting as sediment sources, waters of these environments are much more turbid compared to flat rivers. In this context, approaches like two-media photogrammetry (e.g. Dietrich, 2017) to determine bathymetry distribution is limited to very shallow area while classic methods (i.e. total station) are spatially limited and time consuming. Given this, we tried to predict the distribution of water depth by only using simple planimetric information combined with a statistical approach. At this purpose, we chose four independent variables: distance from closer bank (or bar)/local channel width, streamline curvature, convergence and divergence and, finally, total wet area.

Preliminary results are encouraging but futher work is needed…

Alonso Pizarro UNIBAS (author-convener) (11:06) Thank you @Davide. What is the approach to follow to estimate "curvature" or "convergece/divergence" if bathymetric data is not available?

Alonso Pizarro UNIBAS (author-convener) (11:08) [REMEMBER: Please vote your display preference here: www.menti.com and use the code 51 45 34]

Davide Mancini UNIL (author) (11:08)
For curvature, we computed the normals to the centerline (median position of every point defining the wet area)

For divergence and convergence, at the moment the locations are manually defined by users (but we are trying to completely automate this operation)

Jerome Le Coz INRAE (author) (11:08) Some other similar works relied on the inversion of a (2D) hydrodynamical model (eg works from NIWA Christchurch, New Zealand). Are you aware of these works? How would it compare to your statistically-based approach?

Filippo Bandini, DTU (author, convener) (11:09) @conveners @alonso. In the page to vote the best display, I cannot see all the displays (basically I could choose only the first displays down to D55 EGU2020-16011, not the last displays). Do you have the same issue?

Davide Mancini UNIL (author) (11:10) Yes, their are mainly based on numberical modelling simulations while our works is purely based on planimetric data

Alonso Pizarro UNIBAS (author-convener) (11:11) @Filippo, there are two slides with the voting option. The last displays are on the 2nd slide. Thank you for mentioning it

Davide Mancini UNIL (author) (11:11) Our idea is to reconstruct the bathymetry by only using data that are routinely acquired during UAVs surveys

Jerome Le Coz INRAE (author) (11:12) Do you use the discharge continuity in each river branch as a constraint?

Alonso Pizarro UNIBAS (author-convener) (11:13)
Thanks! Any question to the authors?

Alonso Pizarro UNIBAS (author-convener) (11:13)
We will now start discussing display D66 EGU2020-18930 . @Katie can you please give an introduction of your work?

Thomas Morlot EDF-DTG (author) (11:14) Why not D64?

Jerome Le Coz INRAE (author) (11:14) You're fired! ;)

Davide Mancini UNIL (author) (11:14) No, for the moment we did not take into account this factor. We will evaluate the model once we will have some robust results, then we can add or remove variable to improve it

Katie Muchan, UKCEH (author) (11:15) Is D64 going first?

Alonso Pizarro UNIBAS (author-convener) (11:15) yes! Im sorry

Alonso Pizarro UNIBAS (author-convener) (11:15) please, @Thomas

Thomas Morlot EDF-DTG (author) (11:16)
Hello everybody.

In this work we are testing some ADCP methods with onboard GPS to measure streamflow velocities, and to geolocalize them properly in difficult field work configurations.

We are looking at GPS quality, streamflow velocity quality … Working with software applications such as Winriver, RiverSurveyor, VMT, QGIS, HYPACK for treatment and post-treatment.

Many technical problems still to be solved to get a robust and operational « package » to measure streamflow velocities (GPS quality, connections, softwares …).

Ida Westerberg, IVL (convener) (11:16) Hi Thomas, which did you find to be the biggest technical problem?

Thomas Morlot EDF-DTG (author) (11:17) Connections problems

Alonso Pizarro UNIBAS (author-convener) (11:17) Thank you @Thomas. Based on your final slide, are you working on the development of software able to standardised all the required "manipulation" of data?

Thomas Morlot EDF-DTG (author) (11:17) ans synchronization

Thomas Morlot EDF-DTG (author) (11:17) Yes we do

Ida Westerberg, IVL (convener) (11:17) Bluetooth connections?

Nick Everard EA Convener (11:17) Thomas, have you looked at positioning systems such as tracking total stations or inertial sensors to improve results in places with poor GPS and further improve precision?

Thomas Morlot EDF-DTG (author) (11:18) We are always trying to get a RTK precision

Thomas Morlot EDF-DTG (author) (11:18) Due to difficult fieldworks configurations it is not always possible

Thomas Morlot EDF-DTG (author) (11:19) Connections problems with radio, Bluetooth and Wifi appear

Alonso Pizarro UNIBAS (author-convener) (11:19)
Thanks! Any final question to the authors?

Thomas Morlot EDF-DTG (author) (11:19) Quite difficult exercise to talk about that in 5min

Thomas Morlot EDF-DTG (author) (11:19) Don not hesitate to kepp in touch with emails

Alonso Pizarro UNIBAS (author-convener) (11:20) please, anyone who is interested in the works presented here, contact the authors for more information/comments/suggestions

Alonso Pizarro UNIBAS (author-convener) (11:20)
@Katie, now is your turn ;) Please, give an introduction of your display: D66 EGU2020-18930

Katie Muchan, UKCEH (author) (11:20)
Hello everyone.

The poster presents results of Service Level Agreement (SLA) performance indicators applied to submissions of river flow data to the UK National River Flow Archive (NRFA) since 2002. The NRFA undertakes an additional level of quality control for data submitted from UK hydrometric monitoring authorities and since the introduction of the SLA, the completeness and quality of data submissions has improved and remained relatively constant for the last ~5 years.

New analysis of the types of issues queried within data submissions shows a variety of reasons, with the logged against low flow data or anomalous spikes (incl. drop outs).

This secondary level of quality control and assessment of submissions is vital for the dissemination of UK data to the NRFA’s wide user community.

Alonso Pizarro UNIBAS (author-convener) (11:21) low flows and inconsistency with analogue stations represent one of the largest issues for these river data. These inconsistencies can be atributed to changes in rating curves. However, the "rating changes" is also a variable analysed in this work. Then, what can be the reasons of having problems with low flows and inconsistencies with up- and downstream stations?

Katie Muchan, UKCEH (author) (11:23) We generally find that the 'inconsistency with analogues' queries relate to a small period of time where it could be an error in stage

recording at one site. Whereas those identified as 'rating changes' will often be longer periods of time or where there is a systematic shift/jump in a particular part of the regime

Nick Everard EA Convener (11:24) Katie, how much of improvement do you think is due to improved monitoring technology and resilience of stations? Conversely, have we lost more data, or seen mor equality issues due to recent big floods?

Katie Muchan, UKCEH (author) (11:24) In a paper we are preparing it gives specific examples of some of the types of queries we come across with more explanation which will hopefully help

Alonso Pizarro UNIBAS (author-convener) (11:24)
Thank you @Katie, any final question to the authors?

Alonso Pizarro UNIBAS (author-convener) (11:25)
[REMEMBER: Please vote your display preference here: www.menti.com and use the code 51 45 34]

Katie Muchan, UKCEH (author) (11:25) @Nick in another bit of analysis (which is in the paper in prep) we have split the performance indicators for quality according to data type - structure, open channel, acoustic. Interestingly the acoustic comes off worse (sorry :( ) but is only a small percentage of the number of sites (50 odd of 700) so hard to make a definiteive conclusion

Alonso Pizarro UNIBAS (author-convener) (11:26)
We will now start discussing display D70 EGU2020-10155 . @Dario, can you please give a short introduction?

Katie Muchan, UKCEH (author) (11:26) But in terms of completeness - I think a lot of the improvement is down to increased resilience in terms of having back up stage measurement allowing for infill of gaps

Katie Muchan, UKCEH (author) (11:26) For example. Not enough time to elaborate more, can't type quick enough!!

Dario Pumo, Un. of Palermo IT (author) (11:26)
Good morning everybody! The main objective of this work is to test and compare two free software based on LSPIV: the PIVlab and the FUDAA-LSPIV. We analyzed both synthetic and real image sequences. Synthetic sequences simulate uniformly distributed tracers with constant concentration, moving under controlled conditions. 4 different configurations with different flow velocity (logarithmic cross-section profile) and seeding density are considered. Real sequences derive from field surveys at two natural rivers.

Let’s see some results. Performances for both the software increase for slower flow velocity. PIVLav performs better than FUDAA for the lowest tracer density cases. Real cases confirm many of the evidences from synthetic analyses, with velocities estimated by PIVLab, on average, slightly higher than those estimated by FUDAA. We can conclude that an appropriate parameterization should depend on local flow and environmental conditions; numerical approach could preliminarily drive the experimental setup in real cases. Thanks for your attention.

Nick Everard EA Convener (11:27) EVERYBODY! EGU just gave me a new tip, which may have unmuted everybody! Please try to ask a question if you have one!

Nick Everard EA Convener (11:27) I can also tell you we have 100 users showing in the room!

Salvador Peña photrack (author) (11:28) Which range of velocities did you test?

Alonso Pizarro UNIBAS (author-convener) (11:29) Thank you @Dario, interesting work! Based on your slides, settings parameters for PIVLab were FFT with 3-passes and for FUDAA DCC? If so, why? How are the results imposing the same parametrisation and algorithm?

Dario Pumo, Un. of Palermo IT (author) (11:30) @Salvador,
Starting from the results of an experimental campaign by Le Coz et al., with surface velocity measured by the ADCP technique in a real river (i.e. Ardeche river, France), we derive a reference logarithmic normalized cross-section flow profile.

The SLOW (S) and FAST (F) velocity profiles are obtained multiplying the normalized profile by the average velocity of 0.5 m/s and 1.5 m/s for the S- and the F-profile, respectively. The correspondent average frame-by-frame particle displacement, assuming a frame-rate FR=4 fps, are equal to 42 px (S) and 126 px (F), with values ranging from about 32 px (S case close to the channel banks) to about 161 px (F case in the midstream).

Jerome Le Coz INRAE (author) (11:31) Very interesting work. It would be interesting to look at the correlation maps within each search area and compare the way both software detect and position the correlation peak. Those correlation maps are not saved by Fudaa-LSPIV and likely not by PIVlab either.