We would like to thank Dr Guy Schumann for his very useful and constructive comments on the paper (hess-2014-240). We have carefully considered the reviewer's comments and worked to include them, when considered appropriate, in the revised version of the manuscript according to the proposed suggestions. Please find below the responses to the reviewer's comments.

Review of the paper 'Evaluation of GFDS' by B. Revilla-Romero et al.. This is an interesting paper reviewing the factors influencing the accuracy of discharge measurement as provided by GFDS. Papers of this type (i.e. evaluation of global Earth monitoring systems and identification/discussion of influencing factors) are highly valuable and absolutely necessary to add both scientific credibility and reliability to a global measurement or/and model system, which will ultimately lead to an increased fidelity and 'trust' in that system by the end-user/decision.

In my opinion, this paper should be published in HESS after addressing some minor to moderate comments:
- Introduction (7334, top of page): Please mention also the International Disaster Charter and efforts such as CEOS etc. in view of space-based support of relief services during disasters.
Author's reply: citation completed on the manuscript as suggested by reviewer.

- 7335 (L 26): Replace 'compared' with 'comparable'.
Author's reply: modified on the manuscript.

- 7337 (L 14): I agree with this statement but would appreciate if the authors added a sentence to this along the lines of: '; the extent to which this is true needs to be fully investigated however.'
Author's reply: added to the manuscript as suggested by reviewer

- 7342: I understand that you want to use linear equations for simplicity but would a simple power-law function not yield similar or better result. Have the authors tried that?
Author's reply:
To test the results using this suggested alternative approach, we used a power-law function:

$$y = k * x^n \quad (1)$$

where y is the in situ observed discharge and x the satellite signal. Then, taking the logarithm of both sides of the Eq.1 yields the linear equation:

$$\log_{10} y = \log_{10} k + n * \log_{10} x \quad (2)$$

where $\log_{10} k$ is the intercept and n the slope. After the calculation of both constants k and n, the power law function can be used to calibrate the GFDS signal into discharge units (m^3s^{-1}) as done when using the linear regression approach. An example is shown in Figure 1c of this document for the same station shown on Figure 3 of the manuscript (Senanga: Long 23.25, Lat. -16.116; Zambezi River).

Applying the different power law functions obtained for each month to the GFDS signal for the same two-year period as on the manuscript, alike GFDS measured discharge values were obtained. The skill scores achieved for the validation using the power law (e.g. Fig. 1d) are similar to those obtained using linear regression. In view of the results and although this approach also produce valid results, we prefer to leave the methodology as it is on the manuscript.

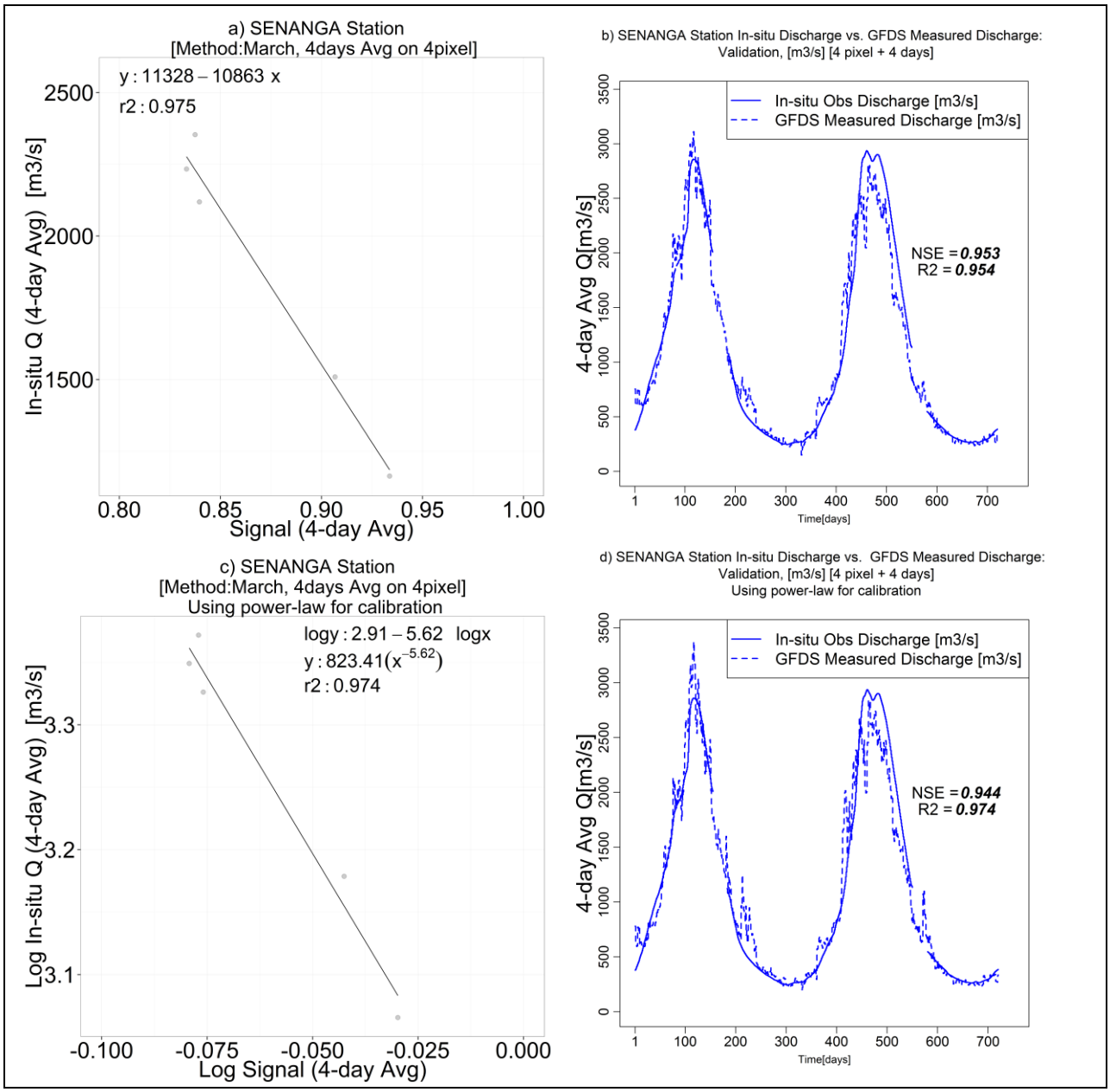

Figure 1 (a) Scatterplot for the Senanga station (Long 23.25, Lat. −16.116) in the Zambezi River (Africa). (b) Validation hydrograph for 2003–2004 and skill scores for Senanga. The (monthly) linear rating equation was used to calibrate the signal into discharge units. Different rating equations were used for different months. (c) Scatterplot for the Senanga station. (d) Validation hydrograph for 2003–2004 and skill scores for Senanga. The (monthly) power-law function was used to calibrate the signal into discharge units. Different equations were used for different months. Note that Figure 3a of the manuscript was amended due to a typo mistake on the linear equation values. (Fig. 1 (a,b) of this document correspond to Fig. 3(a,b) on the manuscript)

- 7343: Since there may be a non-linearity between the station Q and the satellite Q as argued on the previous pages (time lag, etc.), why not employ a Spearman correlation? The Pearson assumes linearity.

Author's reply:
By using a rating equation for each month individually, instead of a single rating equation for the full period, to calibrate the signal into discharge units the derived daily discharge values adjusted better on the timing and also during low flow periods.

As suggested by reviewer, Spearman correlations were calculated for all the stations. Table 1 shows the continental average Pearson and Spearman skill scores. For all continents, average higher values (~106%) were obtained using Spearman correlation in comparison with Pearson score. However, we argue that changing the skill score used on this part of the analysis and for illustration on figures 6-12, will not impact the main findings presented on this manuscript.

Table 1. Mean continental Pearson and Spearman skill scores, obtained on the validation.
*4 stations were excluded on the calculation due to accidental data loss, therefore score varies from manuscript.

Continent	Mean Pearson	Mean Spearman
Africa	0.382	0.403
Asia	0.358	0.438
Europe	0.508	0.537
North America	0.502*	0.538
South America	0.694	0.720
Total	**0.527**	**0.560**

- 7343: The NSE as argued is showing skill in some data or model when NSE > 0 since NSE = 0 means as good as mean in observed data, so why not consider the fact that when NSE > 0, then the use of satellite discharge should be preferred to long term observed mean, which means 'satisfactory' but not 'good' performance.
Author's reply: Sentence edited on the manuscript. Results and figures were already showed number of stations with NSE> 0 and NSE>0.50

- Of course the completeness or incompleteness of each discussion section about the factors influencing the validation / calibration results can be argued forever but I think as a first step analysis and discussing the main factors these sections give a very good appreciation. For that reason maybe the title could be changed to: '.... : a first analysis of the influence of local factors', but I leave that decision to the authors and editor(s).
Author's reply: We acknowledge this suggestion, but would prefer not to make the manuscript's title longer.

- It is great that there is a lot of future work planned on this topic by the team – looking forward to it.
Author's reply: Thank you for your encouragement.

References:

Committee on Earth Observation Satellites (CEOS) Flood Pilot, http://www.ceos.org/, last access: 1 September 2014.

Disaster Charter, 2013. Space and Major Disasters. http://www.disasterscharter.org/, last accessed 1 September 2014.