Response to the first reviewers' comments (RC1) on the paper "*Modeling interactions between tides, storm surges, and river discharges in the Kapuas River delta*".

We want to thank the reviewer for taking the time to review our paper. Their comment has been beneficial and helped us to improve the manuscript. In what follows, the reviewer's comments are presented in bold-italic type, our response in roman type, and modification in color in the main text.

Page 2, 63: can better represent.
Response: The suggestion has been followed.

Page 5: Tidal forcing: The source of the tidal signal at the open boundary is missing. How many harmonics did you use?
Response: The source of the tidal signal at the open boundary is added. The number of harmonics constituents is 15, i.e., M2, S2, K1, O1, N2, P1, K2, Q1, 2N2, MF, MM, M4, MS4, MN4, and S1. We added sentences as follows in the last paragraph of page 5:

"At the open boundaries in the ocean, we prescribe tidal elevation and current of 15 harmonics from the global tides model dataset, the OSU TPXO Tide Models/TPXO9-atlas (Egbert and Erofeeva, 2002). We also retrieve global ocean circulation from HYCOM (Chassignet et al., 2007) at these boundaries".

Wind forcing: The link/source to/of the observed wind velocity is missing. By the way, at which height are the wind data provided by ERA5 and meteorological station?
Response:
The source of observed wind data is now added. Both wind data are measured and modeled at 10 m above the surface. The paragraph is updated as follows:

The wind velocity and the atmospheric pressure data are the ERA5 reanalyzes dataset obtained from the European Canter for Medium-Range Weather Forecast (ECMWF). The data have a spatial resolution of 31 km (Hersbach et al., 2020), while the temporal resolution is hourly and available at 137 vertical levels (0 to 80 km from the surface). But, here, we only selected and used the data that represented wind at the surface. Unfortunately, compared with observational data from the Stasiun Klimatologi Mempawah (http://iklim.kalbar.bmkg.go.id), measured at 10 m above the surface, there are clear difference in amplitude. The observed wind velocity is more significant than the wind velocity from ERA5 during a wind surge (Fig. 4). Therefore, in the case study, we adjust the magnitude of the wind input data (ERA5) during the wind surge event. We multiplied the wind magnitude with a ratio between both peaks (the observed and ERA5 data).

River forcing: Not clear when the observational data are available and for which rivers. Please, clarify.

Response:

The Kapuas River discharge that is available now was observed in the middle stream at Sanggau (about 284 km from the river mouth) from November 2013 to May 2015 (Kästner et al., 2018). On the other hand, the available water level data is observed by Pontianak Maritime Meteorological Station in Pontianak (20 km from the Kapuas Kecil river mouth, the second largest distributary of the Kapuas river). The data is measured hourly from 2010-2012 for only half-days (from 7 a.m. to 7 p.m.). Then, from 2012-2015 they observed the data for 15 hours (from 7 a.m. to 10 p.m.). Finally, from 2016 until now, they observed the hourly data in full days (24 times per day). Unfortunately, in our case study, in which the flood event occurred in December 2018, we don't have the observational data for the discharge, so that we replace it with the output of global discharge data, GFMS (Wu et al., 2014). We implemented sensitivity analysis to evaluate the accuracy of this GMFS's output for the Kapuas River.

Setup: If it is possible, please, create a Table, where you describe all experiments (discharge rate, wind forcing).

Response: The suggestion has been followed. We add a table in the Appendix section.

Table A3. Scenarios used to force the model

Scenario	Duration of simulation	Wind Speed (ms^{-1})	Wind Direction (°)	Pressure (kPa)	Discharge Kapuas (m^3s^{-1})	Discharge Landak (m^3s^{-1})	Tidal Range (m)
Discharge1	1 month	2 - 8	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Discharge2	1 month	2 - 8	0 – 360	100.5 - 101.5	5×10^3	300	1.8
Discharge3	1 month	2 - 8	0 – 360	100.5 - 101.5	7×10^3	300	1.8
Discharge4	1 month	2 – 8	0 – 360	100.5 - 101.5	9×10^3	300	1.8
Wind_1x	1 month	2 – 8	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Wind_1.5x	1 month	3 – 12	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Wind_2x	1 month	4 – 16	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Wind_2.5x	1 month	5 – 20	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Wind_3x	1 month	6 - 24	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Wind_4x	1 month	8 - 32	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Wind_5x	1 month	10 - 40	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Case Study	1 month	2 – 21	0 – 360	100.5 - 101.5	3.3×10^3 – 5×10^3	250-700	1.8

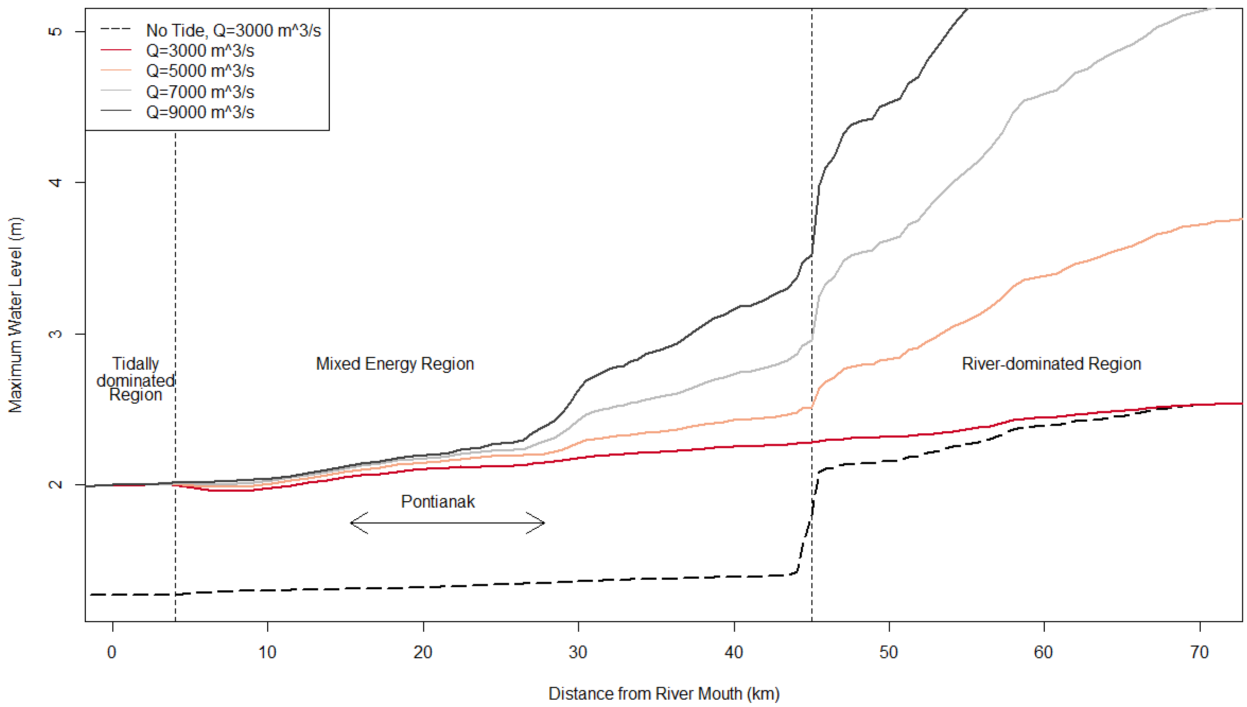
Page 6, 165: What about P1 harmonic? It should be important for the area. Please, give some information about higher harmonics – MO3 and MK3, they would show how well your wetting/drying scheme is working.

Response: The suggestion has been followed. We involved P1, MO3, and MK3 constituents in the tidal analysis. As a result, the contribution of the P1 constituent is significant, while the contribution of MO3 and MK3 constituents is relatively weak. The corresponding figure (Fig. 6 and 7), table (Table A1 and A2), and paragraph (in section 3.1 model validation) have been updated.

Page 6, 180-189: Please, provide the coordinates of the stations.
Response: The coordinates have been added.

Page 7, 195-206: I doubt very much about MXVL analysis and zones defining procedure, especially if we consider mixed energy region. Such behavior of MXWL may signalize about larger river bed area and not about tidal impact. You can, for example, find a difference between MXVL and mean level within the tidal cycle at each location. If this difference is small, it means that the behavior of MXVL can be largely explained by a variation in river bed area. Another strategy is to run experiment with only river forcing and then find a difference between MXVL levels in experiments with tidal and river forcing and with only river forcing.

Response: As suggested, we run experiments only with river forcing (without tidal forcing). We also extended our MXWL analysis area to more upstream. The result is added in Figure 8, as follows:



This result shows the impact of tidal and river discharge interaction on maximum water level along the river. Using the "no tide" scenario, we can see clearly that the maximum water level gradually decreases with a gentle slope in the mixed-energy zone. However, compared to the "Q=3000 m^3/s" scenario, we can see that the MXWL profile is more dynamic when tides are imposed in the simulation. Therefore, it supports the analysis that we mentioned in the paragraph. Based on the figure, we also modified the frontier between mix-energy and river-dominated regions to about 46 km from the river mouth.

Page 8, 253: 'we simulated it but did not show the result here' -> 'not shown'
Response: The suggestion has been followed.

Figure 5: DISCHARGE-> Discharge. The axis font size is too small. 'Note that the Kapuas …. discharge.' – I would remove this sentence from the caption.
Response: The figure has been updated and the suggestion has been followed.

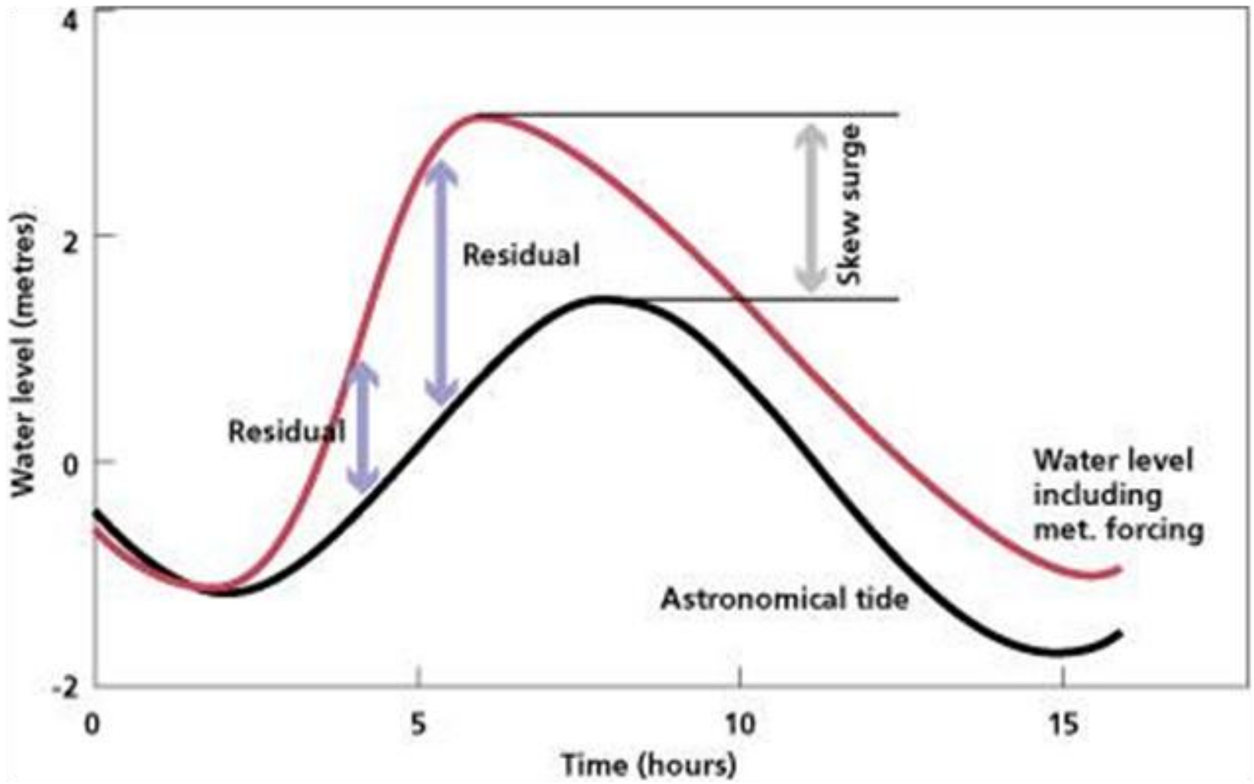
Figure 7: The phases and amplitudes diverge larger from the observational data than they do at the river mouth. What do you think is major reason for that?
Response:
The first reason may be because the propagation of tidal waves upstream is modified by riverbanks width convergence and depth difference (Guo et al., 2014). There is also an influence of the backwater at the observation point within the city (Kästner et al., 2019). Therefore, the amplitude and phase of the tide's constituents are modified. Regarding the bathymetry, the depth of the Kapuas Kecil river mouth is very shallow, while in Pontianak, it is five-fold deeper. Next, it may also be due to asymmetric tides as the impact of the interaction between tidal with river flow (Parker, 1991). As we simulated, the observation point is located in the mixed energy region where tidal and discharge interact in linear and non-linear ways. This interaction may generate other constituents that override and decrease the amplitude and phase of constituents in the river mouth.

Tables A1, A2: The ->the, 'Mouth'->'mouth'. Please, add P1, MO3, MK3. Please, add coordinates of the stations.
Response: The suggestion has been followed. The additional tidal constituents (P1, MO3, and MK3) and the coordinates have been added.

Figure 8: I think should be re-drawn, see the comments above.
Response: The suggestion has been followed. Figure has been updated.

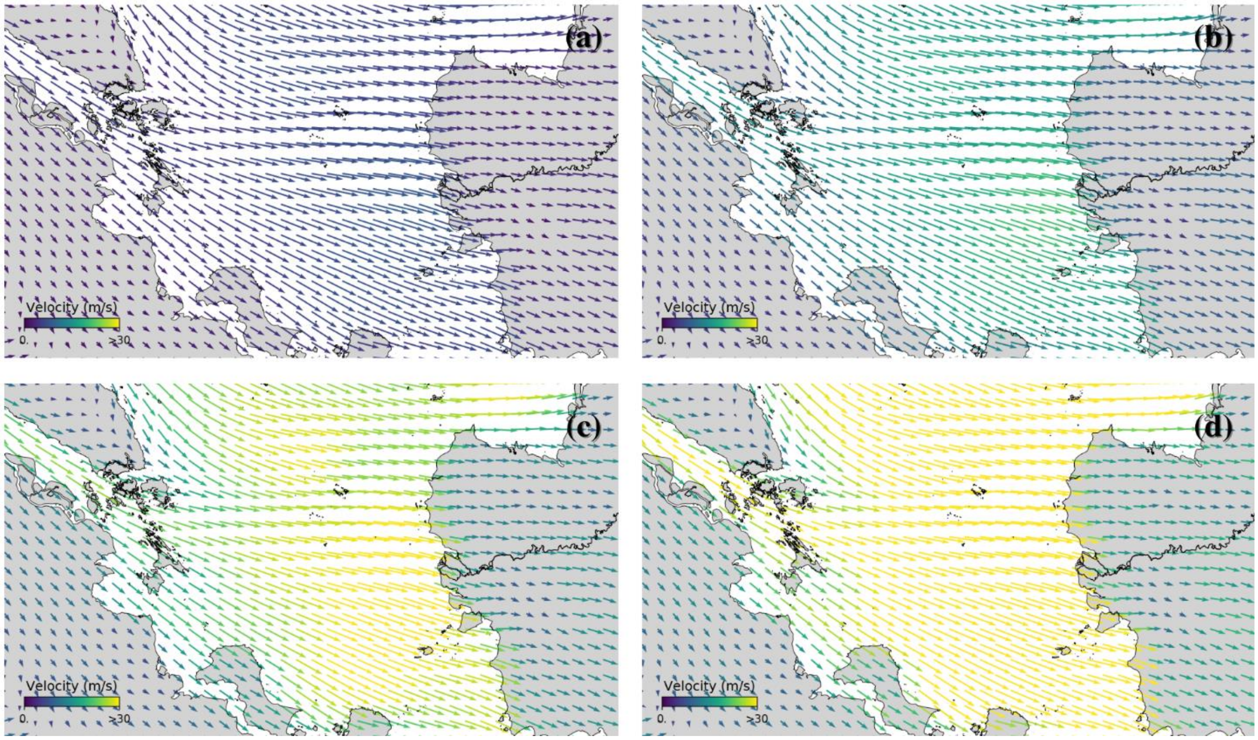
Figure 9: Honestly, I do not understand the dynamical processes behind such a variation in MXVL in first zone (0-4km) within different wind scenarios. It looks artificial. Can you give some explanation? I think it would be very helpful and also add a value to the paper, if you include the maps for each wind scenario for the considered area. You can show the MXWL (within the tidal cycle) difference for the run with wind and tidal+river forcing and with only tidal+river forcing.

Response:
The maximum water level in this zone is the sum of the highest amplitude within the tide cycle and the skew surge. The skew surge represents how high the sea level rises from its expected tide level due to gradient pressure and wind stress. Since the coastal area is shallow, the stronger the wind, the higher the skew surges possibly generated due to interaction between the tide and the surge component (Santamaria-Aguilar and Vafeidis, 2018). The scenario we used in this simulation is the worst scenario of wind, which blows from the ocean to the land.



Schematic of a skew surge (The National Oceanography Centre, 2021)

Following your suggestion, the following figure has been added to the manuscript. It depicts wind direction and magnitude over the domain for (a) scenario Wind × 1, (b) scenario wind × 2.5, (c) scenario wind × 4, and (d) scenario wind × 5.



We then added the MXWL profile without wind stress in Figure 10, which depicts wind surge effects on the maximum water level (MXWL) along the river.

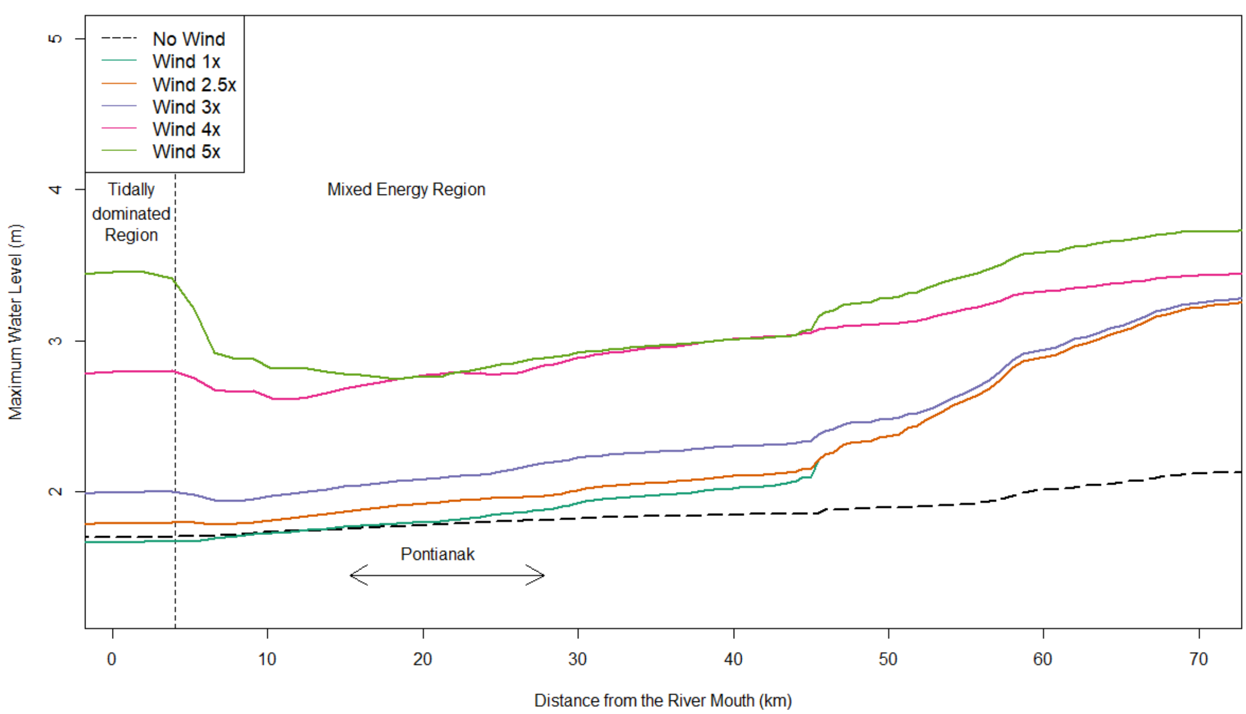


Figure 12: The axis font is hard to read, it is too small. Just a curiosity: what will be with the results, if you decrease 2 times h*?

Response:

The figure has been updated. We used h* to define an area becomes wet or dry in our momentum equation. We have re-run the simulation using h* = 0.1 m. Since we re-ran the model using a higher resolution of DEM and a higher mesh resolution in the case study, the city's canals can now be depicted by the model. Consequently, the inundated area extent is changing.

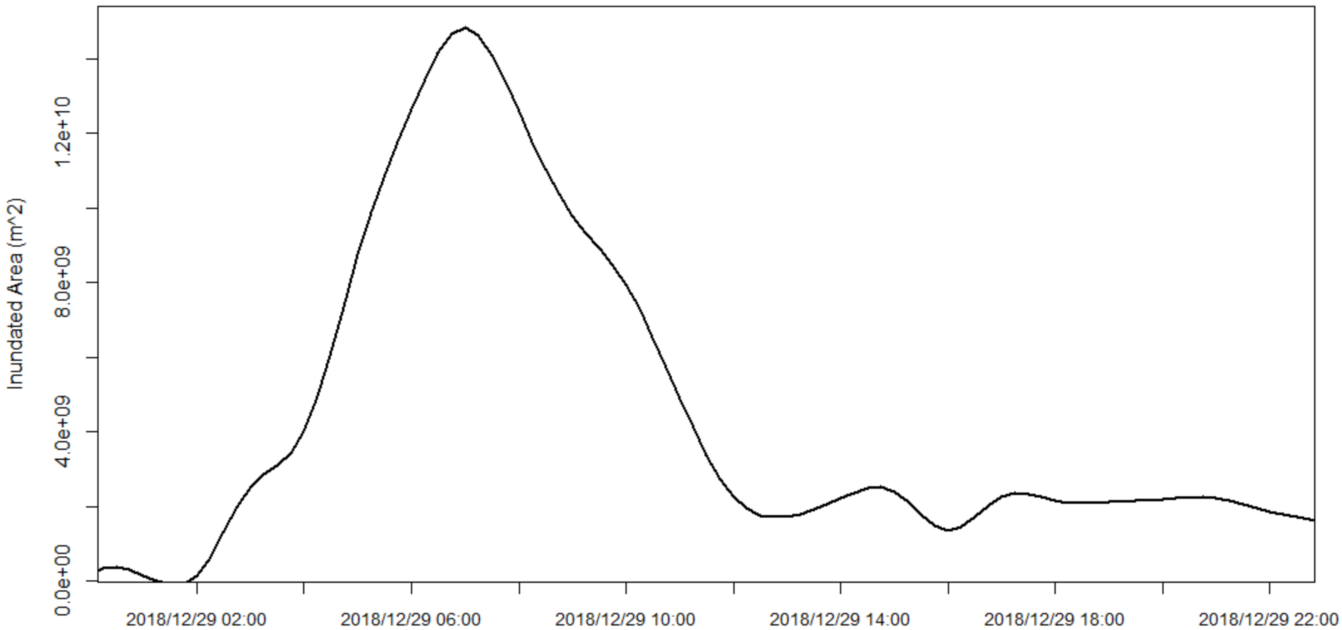


Figure: The total inundated area within the city of Pontianak during the flood event on 29 December 2018

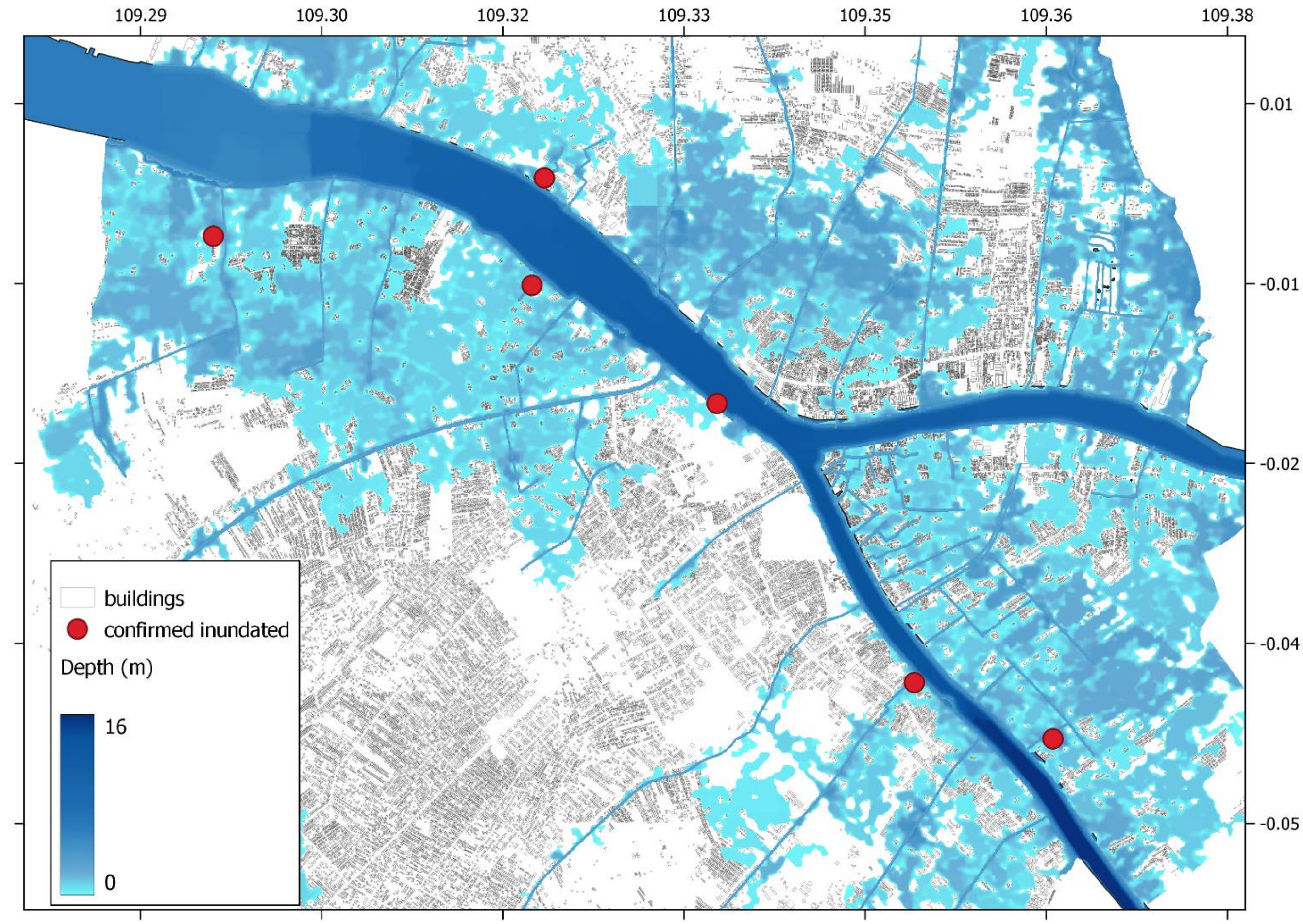


Figure: Inundation extent map and its depth during the flood event on the 29 December 2018 at 06.00 UTC.

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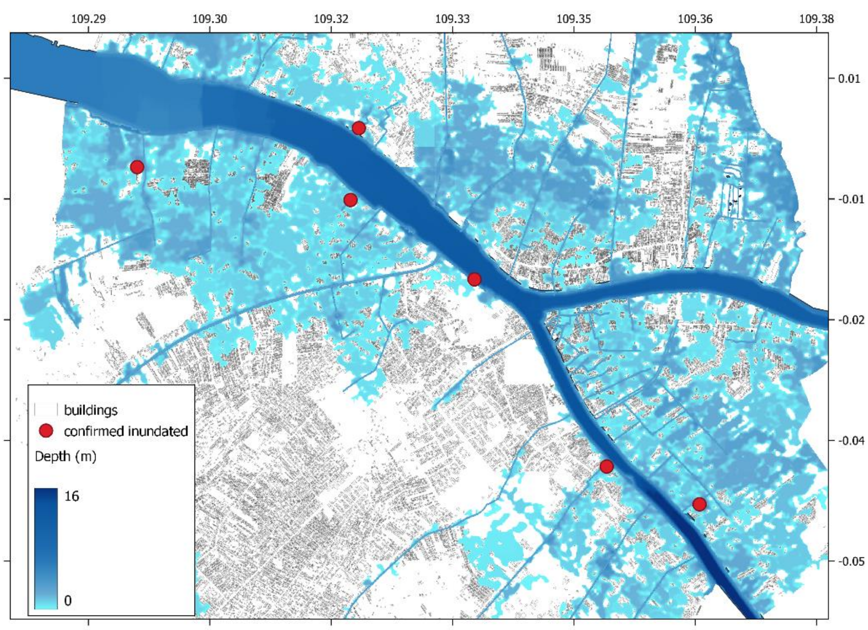
Response to the first reviewers' comments (RC2) on the paper "Modeling interactions between tides, storm surges, and river discharges in the Kapuas River delta".

We want to thank the reviewer for taking the time to review our paper. Their comment has been beneficial and helped us to improve the manuscript. In what follows, the reviewer's comments are presented in italic type, our response in roman type, and modification in color in the main text.

Major

• *The model only predicts flooding at locations near the river (c.f. line manuscript line 242), but the flooding might propagate much further into the city through the drainage channels, which seem not to be well resolved by the model. The SRTM DEM used in this study only states the surface level, the depth and hence flow velocity in the channels will be underestimated. The 30-m resolution furthermore does not horizontally resolve the channels, which are on average 5m wide. The same applies to streets. This is aggravated by the peculiarity of SRTM to measure the highest point within each pixel.*

Response: The highest resolution of our mesh is 50 m; therefore, this level of detail is unreachable for our hydrodynamic model. Since our domain is very wide, using a mesh with a higher resolution than 50 m will make the computational cost expensive, and the non-hydrostatic effect will become non-negligible. As a solution, for a better inundation map extent in the case study, we re-ran a new simulation using another model HEC-RAS (2022), where the boundary conditions are set based on the output of the SLIM model. The domain of this new simulation is only enclosing the city of Pontianak. This new simulation uses 10 m mesh resolution and replaces the SRTM using a higher resolution DEM from DEMNAS (https://tanahair.indonesia.go.id/demnas/). The new DEM map has a 0.27-arcsecond (about 8.3 m) resolution. Therefore, using this strategy, we could evaluate the flows inside the canals that drive inundation over locations far from the river banks. We then modified the flood extent map as follows:



• While the study is interesting, it does not give insight into extreme scenarios. For example, in 2013, the discharge of the Kapuas exceeded 10^4 m3/s (Kastner et al., 2018). This is higher than the high ow scenario of 9000 m3/s in the study, but still not overbank. It would be very insightful to provide a compound extreme value analysis of river discharge, wind and tides, and then create a flood map with likelihood of areas to be flooded in a 10, 100, and 1000 years interval, at best with incorporating the expected sea-level rise.

Response: As we show in the river discharge scenario, increasing the discharge until 9000 m3/s doesn't significantly increase the maximum water level (MXWL) at Pontianak. MXWL in this river zone is influenced by the interaction of tide-surge and discharge altogether. It may explain why the only 10000 m^3/s discharge doesn't drive inundation over the city. It needs other factors, such as storm surge or excessive rainfall, to drive inundation over the city. Regarding flood frequency analysis which considers sea-level rise due to climate change, it will be investigated in future studies.

• The study ignores rainfall-runoff. While it is not significant for the event under study, it is relevant for the general situation in Pontianak, as this results in flooding of large parts of the city every wet season.

Response: As we mentioned in the discussion part, it is part of the limitation of this study. Here, we only consider the interaction between river discharges, tides, and wind surge and how their interaction drive inundation over the city. As presented in the case study, the model focuses on inundation events during low rainfall over the city; therefore, the rainfall impact is not taken into account. We will investigate the rainfall-runoff impact in future studies.

2.2 Hydrodynamic model

***• State,** that the model neglects the water level offset caused by the salinity gradient, and provide at least a short estimating of it (Savenije, 2012).*

Response: Since our model is barotropic, we do not represent salinity. We can therefore not estimate its value from the model results. It could possibly be estimated by using the outputs of HYCOM, but since we don't know if the discharge of the Kapuas river is correctly imposed in HYCOM, there is no guarantee that the freshwater plume (and hence the salinity gradient) will be correct.

***104** The equation stated are the shallow-water equations in non-conservative form, while the text says SLIM solves the conservative form. Hopefully, the latter is the case. Please correct the equations in the manuscript accordingly.*

Response: The equations are already in conservative form. As mentioned in the manuscript, $\boldsymbol{U} = H\bar{\boldsymbol{u}}$ is the horizontal transport (and not velocity).

__106__ The Coriolis force is negligible, as it is nearly zero at the equator, where Pontianak is located. It is certainly many orders of magnitudes smaller than other neglected effects, like temporal variation of roughness, salinity or secondary flows.

Response: We include a large portion of the Karimata Strait in our domain, which the latitude extent from -2.8 degrees to 1.8 degrees. This large portion of the Strait is included because we want to evaluate how wind surge, which may occur offshore, impact MXWL along the Kapuas Kecil. The Coriolis force is indeed not the main force during the dynamics. However, as it is cheap to compute, we did not remove it from the model even if its contribution is very limited.

__116__ A threshold of 0.5 m seems to be too large for elements to be considered dry since flood height in the city is of the same magnitude.

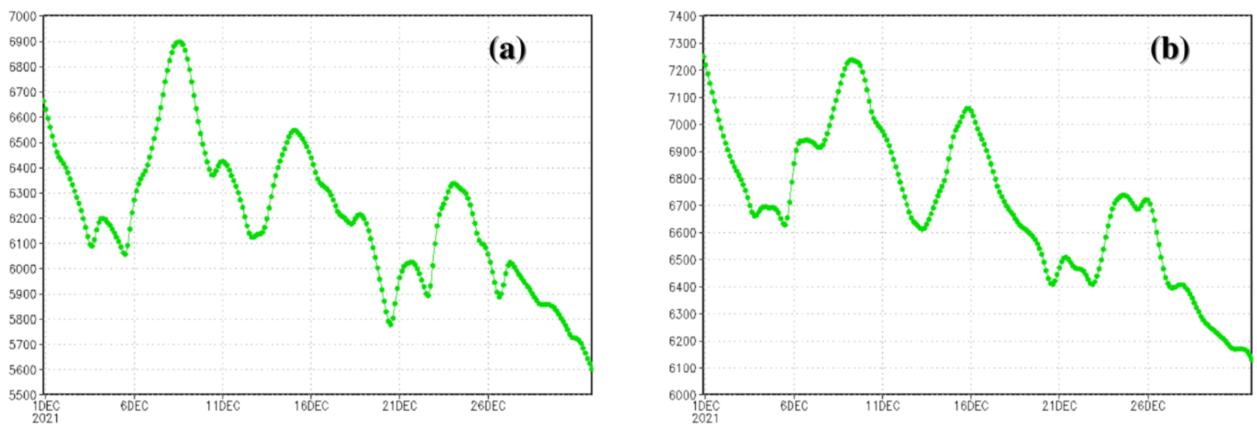
Response: We re-ran the simulation using h* = 0.1 m as the threshold and used a higher resolution of DEM and a higher mesh resolution in the case study; therefore, the inundated area extent is now changing.

2.3 Model setup

• I recommend extending the model domain of the Kapuas further upstream, at best until Sanngau, about 300 km from the sea. Currently, the model extends only 100 km upstream, which results in a spurious reflection of the tide, as the tide travels much farther upstream (Kastner et al., 2019). The boundary of the Landak river seems also to be too close to the sea.

Response:

Many small tributaries are joining, and some distributaries are leaving the Kapuas stream between the current boundary condition and Sanggau. Unfortunately, we do not have these tributaries/distributaries' discharge data. While, based on GFMS output (calculated using real-time TRMM Multi-satellite Precipitation Analysis and Global Precipitation Measurement), there are different discharges between the current boundary and discharge retrieved in Sanggau (see the following figure). So, if we put boundary conditions at Sanggau, it will neglect the contribution of these tributaries and distributaries. Therefore, we decided to put the Kapuas boundary condition 10 km upstream before the Kapuas Kecil branch starting point as a reasonable approach.



The Kapuas River discharge is retrieved from GFMS during December 2021 at (a) Sanggau with discharge range 5600 m^3/s to 6900 m^3/s, and (b) Current boundary condition, located 10 km upstream before the Kapuas Kecil branch starting point, with discharge range 6150 m^3/s to 7250 m^3/s.

Regarding the spurious reflection of the tides, we still have no idea how to prove it. However, our focus in this study is evaluating whether tides still dominantly control the maximum water level to drive inundation over the floodplain in certain areas along the Kapuas Kecil river. Therefore, our result suggests that even though tides travel much further upstream, it doesn't dominantly impact inundation anymore after 46 km further.

• *Mention that the model leaves out several distributaries of the Kapuas, for example the Mendawat branch and Southern Kubu branch, and to which extend this influences the extreme water levels modelled in Pontianak.*
Response: The suggestion has been followed. We added sentences as follows in this section:
"Since we focused on evaluating the impact of tide-surge-discharge interaction on extreme water levels along the Kapuas Kecil branch (particularly in Pontianak), we leave out several distributaries that may not significantly influence that dynamics, such as the Southern Kubu branch."

125 *Mention which data source was used to predict boundary conditions at the seaward side. (TPXO?)*
Response: The suggestion has been followed. We added sentences as follows in this section:

"At the open boundaries in the ocean, we prescribe tidal elevation and current of 15 harmonics from the global tides model dataset, the OSU TPXO Tide Models/TPXO9-atlas (Egbert and Erofeeva, 2002). We also retrieve global ocean circulation from HYCOM (Chassignet et al., 2007) at these boundaries".

134 *SRTM is outdated. There is the more recent TDM global elevation map. It has also a 30m resolution but a much higher vertical accuracy.*
Response:
We replaced the SRTM map with a higher resolution map from DEMNAS (https://tanahair.indonesia.go.id/demnas/) to obtain a better inundation map over the city. The new DEM has spatial resolution 0.27-arcsecond (about 8.3 m).

147 *Note that roughness inferred from ADCP measurements are available for the Kapuas (Kastner et al., 2018). Roughness slightly increases with the river discharge.*
Response:
The suggestion has been followed. We re-ran the simulation using the new roughness coefficient, which defined based on (Kästner et al., 2018). However, the result is not too different.

148 *The Kapuas has a sand bed, not a "muddy river bed" (Kastner et al., 2017).*
Response: The suggestion has been followed. We modified the text accordingly.

***174** The NSE is just the PCC applied to hydrological models. Their values should be identical and it is redundant to report both. As the reported values for the NSE and PCC are different, there seems also some inconsistency in their calculations.*

Response: We calculated PCC and NSE parameters using the library HydroGof in R (Zambrano-Bigiarini, 2020). the results show that both values are consistently different. Other studies (Kumar et al., 2020; Zhou et al., 2019) also reported that they implement both PCC and NSE as the goodness of fit in their work, which the result of both values is also different. So, we couldn't find the inconsistency in our calculation. However, we decided to remove the PCC and kept the NSE (from the library HydroGof in R) as the goodness of fit coefficient, as NSE is more common to assess the predictive skill of hydrological models.

• *The bathymetry inset of the Kapuas Kecil shows locations with unreasonably shallow depth of just 3 m, much lower than the thalweg depth of 12 m. This might be due to bathymetry having been directly interpolated from raw data collected by Kastner et al. (2017). The raw data contains stretches of invalid shallow depth gauging due to faulty echo sounding which must be removed by preprocessing for obtaining a reasonably accurate bathymetry.*

Response:

Since we used the Wetting-Drying algorithm, we used both positive (underwater) and negative bathymetries (dry area from DEM) altogether. So, the bathymetry values in the map range from -3 m (upper mean sea-level) to 100 m (under mean sea-level). Minus values represent the dry area and vice versa. The blue areas represent the dry land. For the locations around the river mouth, we compared our bathymetry with the bathymetry map from Garmin (see Figure below). Overall, we found that the river mouth bathymetry is similar (which is shallow).

The bathymetry map around the Kapuas Kecil river mouth from Garmin (https://webapp.navionics.com/?lang=en#boating@10&key=kpIw%7BmyS)

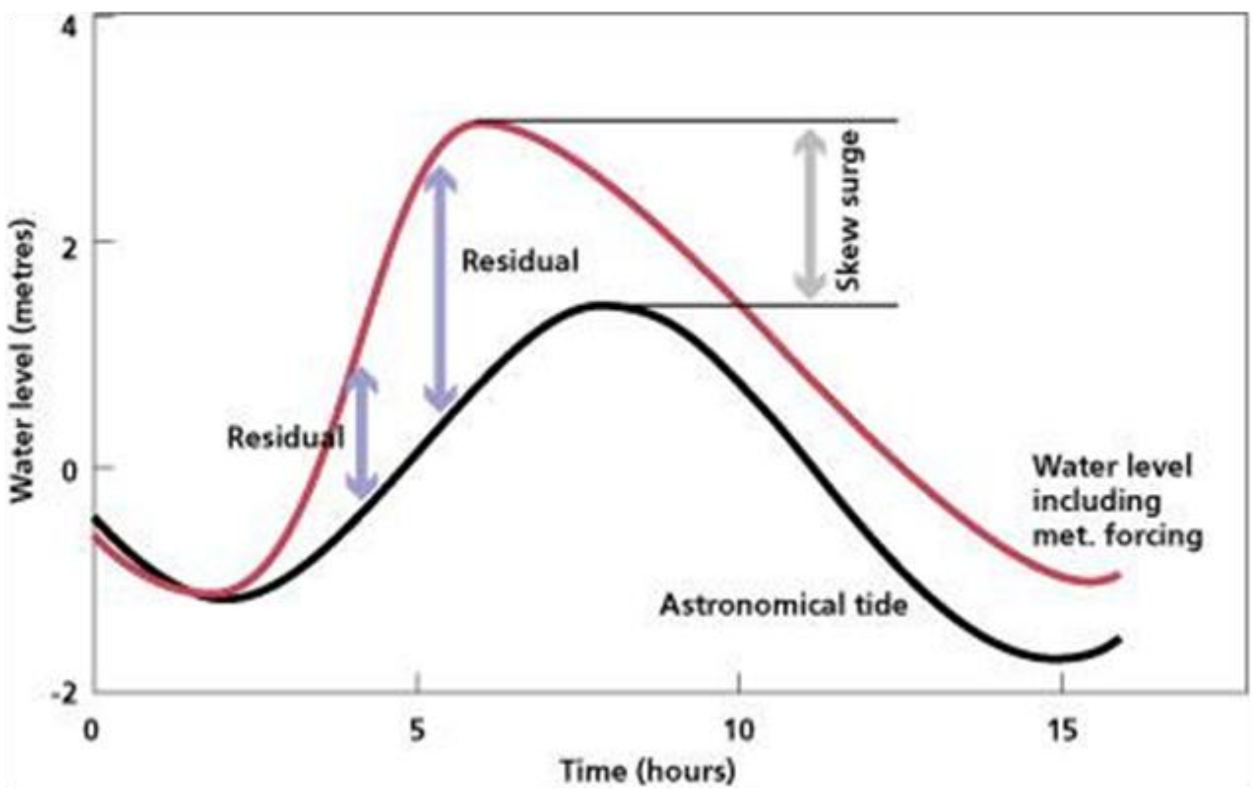
Regarding the Thalweg depth, there is a narrow-deeper flow path for the shipping route, which cross the river mouth (see figure above). However, as we saw in our field trip, ships still cannot pass through this flow path during low tide sessions due to its shallowness. In addition, the bathymetry should also be smoothed in our simulation to make it run stable. The smoothing process is based on mesh points, where, unfortunately, the highest mesh element cannot capture whole of this narrow-deeper path. In some parts, the smoothed map overlays this narrow path using interpolated depth among its surrounding areas. This is the shallow area, which may you saw on the inset map.

• *Figure 5: State at which point the discharge of Wu 2014 was determined, as the Kapuas has several tributaries and distributaries along the coastal plane.*
Response: The suggestion has been followed. We modified the figure's caption as follows:
“River discharge of (a) the Landak (prescribed at coordinate 0.0282S, 109.445E) and (b) the Kapuas (prescribed at coordinate 0.3623S, 109.6394E) retrieved from Wu et al., (2014).”

3.1 Model validation

***186** Table A1 and A2 and Figure 6 and 7 State for which period and river discharge the tidal constituents and the goodness of fit were determined, as the constituents for the tide in Pontianak and to a limited extent at the river mouth depend on the discharge of the Kapuas.*
Response: The data is observed and simulated for one month in December 2018**.** The simulation retrieved river discharge from GFMS (Wu et al., 2014) and tide from TPXO (Egbert and Erofeeva, 2002). This information has been added in the caption of the figures and tables.

***187** Note that further data for validating the backwater curve in the upstream reach of Pontianak is available (Kastner et al., 2019).*
Response: We thank the reviewer for this suggestion. We will try to do that in a future study. Since we used the maximum water level (MXWL) instead of the mean water level to evaluate the tide-surge-discharge impacts, we didn't analyze the backwater curve in this study. This MXWL includes the skew surge as the impact of the wind surge in our wind scenarios.



Schematic of a skew surge (The National Oceanography Centre, 2021)

• Was a sensitivity analysis for the mouth bar depth performed? This is crucial for the backwater dynamics but probably not very accurate in the bathymetry.

Response: Since our computational domain already covers both river bodies (wet area) and floodplain areas over riverbanks (dry areas), we didn't perform sensitivity analysis for the mouth bar depth.

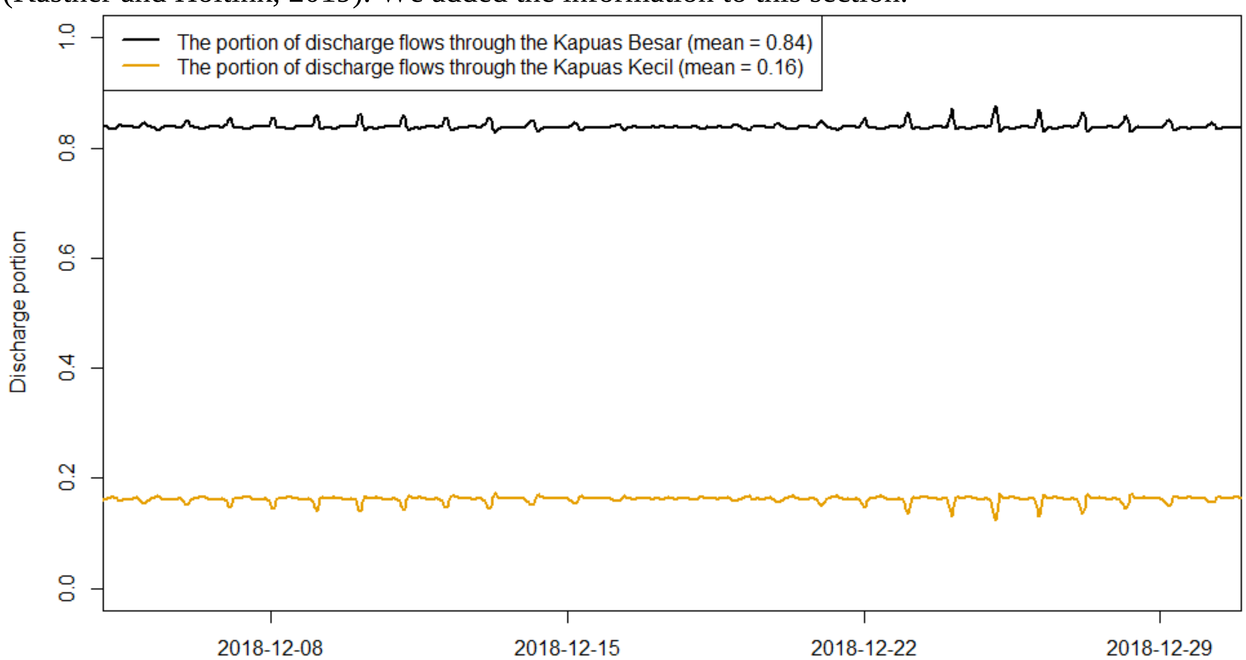
3.2 Impact of river discharge on water levels

• State for which tidal range and date this was computed, and how this compares to the average spring tide in the Kapuas, as the impact of river discharge will depend on how strong the tide is.

Response: The suggestion has been followed. We modified the second paragraph as follows: "At the same time, the Landak River upstream discharge is set to 300 m3/s for all scenarios, and the tide used in the ocean part is retrieved from TPXO for December 2018 with a tidal range of 1.8 m at the river mouth."

• It would be informative to state which fraction of the discharge of the Kapuas is diverted into the Kapuas Kecil towards Pontianak, and to compare this with previous measurements (Kastner and Hoitink, 2019).

Response: We calculated the portion discharge of Kapuas, which diverted through the Kapuas Kecil branch during December 2018, is about 16% (see Figure below), while 84% continue to flow through the Kapuas Besar. This result is close to the observational data, which stated that 17% of the Kapuas discharge flows into the Kapuas Kecil, and 83% continue along the Kapuas Besar (Kästner and Hoitink, 2019). We added the information to this section.



***196** Figure 8: A maximum water level of 2m at the river mouth seems to be by a factor two too large, since the maximum tidal ranges of the Kapuas is about 1.8 m. I guess this is water level with respect meanlower-low-water (mmlw) or lowest astronomical tide (LAT). Indicate this accordingly in the caption of the figure.*

Response: The suggestion has been followed. The figure's caption has been modified.

3.3 Impact of wind surges on water levels

• Same as for 3.2, state in combination of which discharge and tidal range the wind scenarios are computed. An overview of the scenarios in a table would be meaningful.

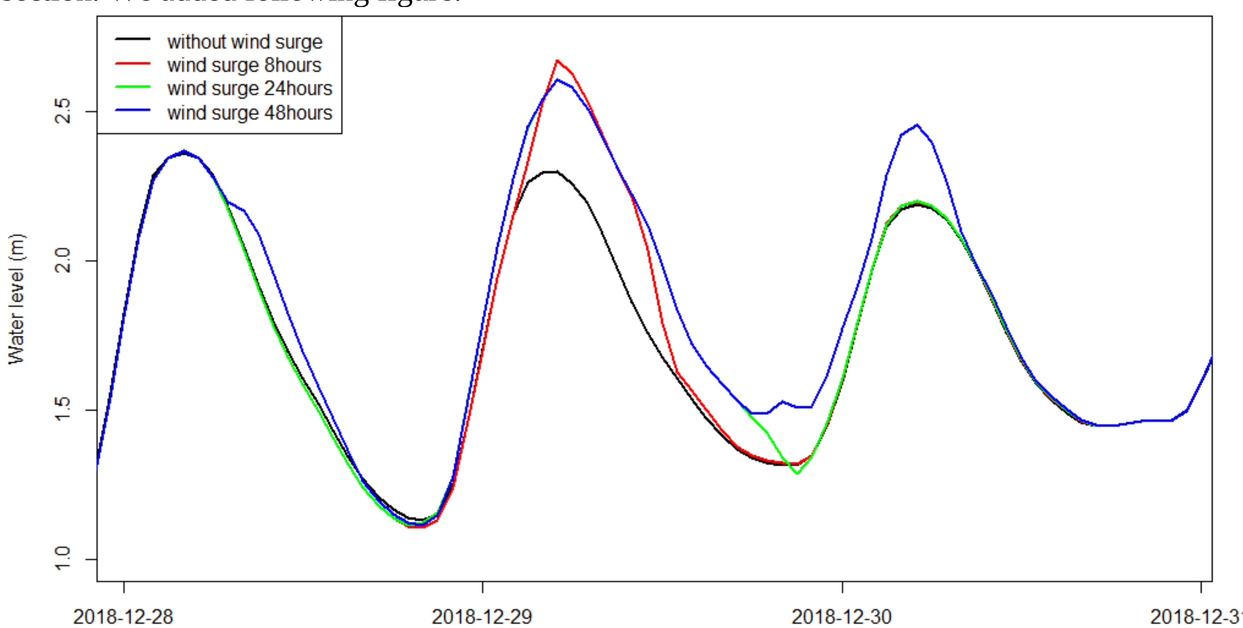
Response: We add a table that describe our scenario in the Appendix section.

Table A3. Scenarios used to force the model

Scenario	Duration of simulation	Wind Speed (ms^{-1})	Wind Direction (°)	Pressure (kPa)	Discharge Kapuas (m^3s^{-1})	Discharge Landak (m^3s^{-1})	Tidal Range (m)
Discharge1	1 month	2 - 8	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Discharge2	1 month	2 - 8	0 – 360	100.5 - 101.5	5×10^3	300	1.8
Discharge3	1 month	2 - 8	0 – 360	100.5 - 101.5	7×10^3	300	1.8
Discharge4	1 month	2 – 8	0 – 360	100.5 - 101.5	9×10^3	300	1.8
Wind_1x	1 month	2 – 8	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Wind_1.5x	1 month	3 – 12	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Wind_2x	1 month	4 – 16	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Wind_2.5x	1 month	5 – 20	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Wind_3x	1 month	6 - 24	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Wind_4x	1 month	8 - 32	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Wind_5x	1 month	10 - 40	0 – 360	100.5 - 101.5	3×10^3	300	1.8
Case Study	1 month	2 – 21	0 – 360	100.5 - 101.5	3.3×10^3 – 5×10^3	250-700	1.8

• Discuss how the storm duration may influence the surge. Currently, only the wind force is studied.

Response: The suggestion has been followed. We added wind surge duration impacts in this section. We added following figure:



And added a paragraph in this section, as follows:

"Besides the wind velocity, the flood duration and flood extent along the river are also influenced by the storm duration (Höffken et al., 2020). Figure 10 shows that the impact of the wind surge duration on the maximum water level is not significant, but the flood event occurred longer. Backwater comes from the river mouth upstream and stays longer inland before flowing back to the ocean."

3.4 Case study

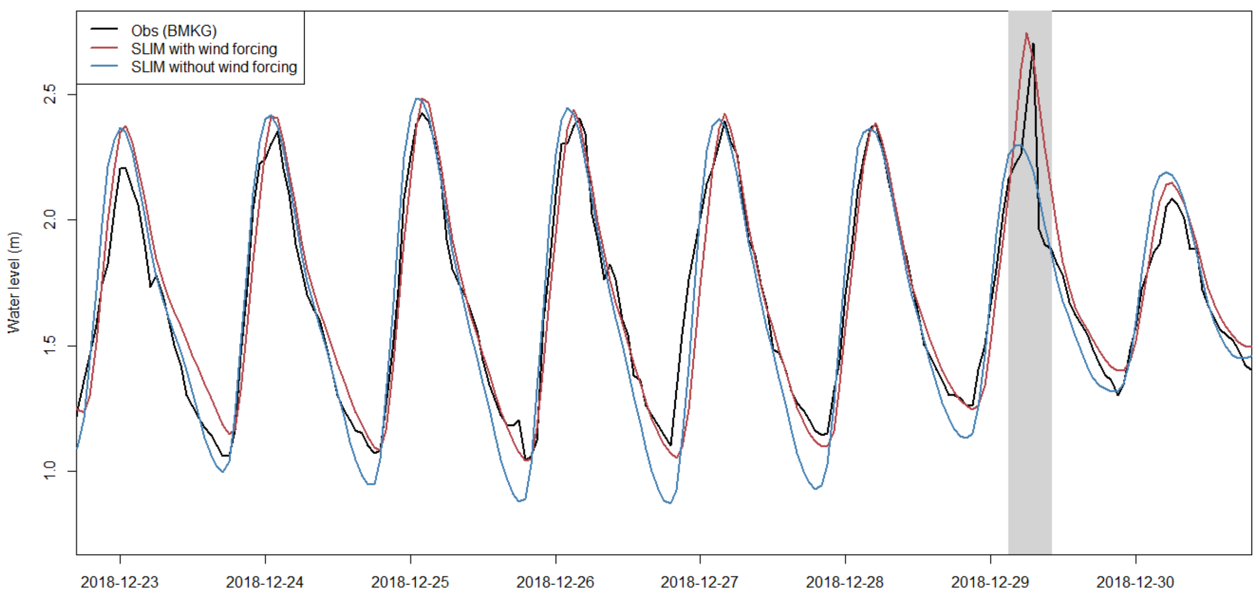
• State the river discharge and the expected tidal range (without storm surge) for the date.

Response: The suggestion has been followed. We added following sentences:

"We simulated the hydrodynamical process without and with storm surge scenarios when the expected tidal range during the event is 1.8 m. Since there was no observed discharge upstream during the date, we imposed the river discharge retrieved from GFMS for Kapuas and Landak rivers (Table A3)."

***227** Figure 10: It would be informative to include model results (or just a fit) without wind forcing for a comparison.*

Response: The suggestion has been followed. We updated Figure 10 by adding the water level dynamics in Pontianak, which simulated without wind forcing. As seen in the figure, based on the "without wind forcing" scenario, the peak water level within the tidal cycle during the event day should be lower than the peak in the previous day. Therefore, the storm is responsible for a 30 cm increase in the water level (grey box in the figure). In addition, the water level surge happened after the tidal cycle passed its peak and in the move to decrease.



Data availability

• Make the data, in particular for the gauging data for Pontianak, available in a public repository, as this is not yet publicly available.

Response:

We have already published the gauged water level in Pontianak for 2018, which we used in the case study, at https://doi.org/10.5281/zenodo.5809647.

Suggested textual improvements

10 *Borneo Island -> Borneo (or the island of Borneo)* **Response:** The suggestion has been followed.

42 *storm surge is -> storm surges are,* **Response:** The suggestion has been followed.

84 *The river flow ends at the Karimata Strait, creating a five-arm delta in its estuary -> The river flows into the Karimata Strait through five major branches.*
Response: The suggestion has been followed.

86 *The largest distributary of the Kapuas River is the Kapuas Kecil River. -> The Kapuas Kecil is the second largest distributary of the Kapuas. (Mind the name!)*
Response: The suggestion has been followed.

87 *The river starts ->The river branch starts,* **Response:** The suggestion has been followed.

87 *20km-> 20 km,* **Response:** The suggestion has been followed.

88 *the river flow creates a junction with the end stream of the Landak River-> the Landak tributary joins the Kapuas Kecil.*
Response: The suggestion has been followed.

89 *West Borneo Province -> the province of West Kalimantan (Use the current name, rather than the old colonial one.)*
Response: The suggestion has been followed.

91 6×10^5 *-> 600 000* **Response:** The suggestion has been followed.

143 *Figure 4: It is preferable to plot the data as points or staircase plots, as it is discontinuous.*
Response: The suggestion has been followed.

193 *"observed data" -> simulated data (since Wu et. al 2014) uses a model*
Response: The suggestion has been followed.

197 *"fully controls" -> dominates -> Tides are still very much important for the (maximum) water level (Kastner et al., 2019)*
Response: The suggestion has been followed.

274 *the delineation of the stream zones -> Unclear, explain what this means.*
Response: We updated the sentence become as follows:
Therefore, the delineation of the compound flooding risk zones based on the MXWL proposed for the Kapuas Kecil River needs further investigation in the future.
158 *Figure 2 can be merged into 1 to save space*
Response: The suggestion has been followed.

186 *Table A2: middle of Pontianak -→specify the exact coordinates*
Response: The coordinates has been added.

***248** eastward wind -> West Wind*
Response: The suggestion has been followed.

***257** Unfortunately, we failed to define -> We could not define*
Response: The suggestion has been followed.

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