

## REFERENCES

- Abdelkareem, M., 2017. Targeting flash flood potential areas using remotely sensed data and GIS techniques. *Nat. Hazards* 85, 19–37.  
<https://doi.org/10.1007/s11069-016-2556-x>
- Abdessamed, D., Abderrazak, B., 2019. Coupling HEC-RAS and HEC-HMS in rainfall–runoff modeling and evaluating floodplain inundation maps in arid environments: case study of Ain Sefra city, Ksour Mountain. SW of Algeria. *Environ. Earth Sci.* 78, 1–17. <https://doi.org/10.1007/s12665-019-8604-6>
- Adf, D.P., Montarcih, L., Bce, L., 2017. Conformity evaluation of synthetic unit hydrograph ( case study at upstream Brantas sub watershed , East Java Province of Indonesia ). <https://doi.org/10.1515/jwld-2017-0082>
- Agisoft, 2019. Agisoft Metashape User Manual 160.
- Al-Juaidi, A.E.M., 2018. A simplified GIS-based SCS-CN method for the assessment of land-use change on runoff. *Arab. J. Geosci.* 11. <https://doi.org/10.1007/s12517-018-3621-4>
- Alexander, J., J.Cooker, M., 2016. Moving boulders in flash floods and estimating flow conditions using boulders in ancient deposits. *J. Int. Assoc. Sedimentol.* 1582–1595. <https://doi.org/10.1111/sed.12274>
- Alijanian, M.A., Rakhshandehroo, G.R., K. Mishra, A., Dehghani, M.D., 2017. Evaluation of satellite rainfall climatology using CMORPH, PERSIANN-CDR, PERSIANN, TRMM, MSWEP over Iran.pdf. *Int. J. Climatol.* 37, 4896–4914.
- Archer, D.R., Fowler, H.J., 2018. Characterising flash flood response to intense rainfall and impacts using historical information and gauged data in Britain. *J. Flood Risk Manag.* 11, S121–S133. <https://doi.org/10.1111/jfr3.12187>
- Ashouri, H., Hsu, K.L., Sorooshian, S., Braithwaite, D.K., Knapp, K.R., Cecil, L.D., Nelson, B.R., Prat, O.P., 2015. PERSIANN-CDR: Daily precipitation climate data record from multisatellite observations for hydrological and climate studies. *Bull. Am. Meteorol. Soc.* 96, 69–83. <https://doi.org/10.1175/BAMS-D-13-00068.1>
- Azmeri, A., Isa, A.H., 2018. An analysis of physical vulnerability to flash floods in the small mountainous watershed of Aceh Besar Regency, Aceh province, Indonesia. *Jamba J. Disaster Risk Stud.* 10, 1–6.  
<https://doi.org/10.4102/jamba.v10i1.550>
- Azmeri, Hadihardaja, I.K., Vadiya, R., 2016. Identification of flash flood hazard zones in mountainous small watershed of Aceh Besar Regency, Aceh Province, Indonesia. *Egypt. J. Remote Sens. Sp. Sci.* 19, 143–160. <https://doi.org/10.1016/j.ejrs.2015.11.001>
- Bae, D.H., Lee, M.H., Moon, S.K., 2018. Development of a precipitation–Area curve for warning criteria of short-duration flash flood. *Nat. Hazards Earth Syst. Sci.* 18, 171–183. <https://doi.org/10.5194/nhess-18-171-2018>

- Bathurst, J.C., 1985. Flow resistance estimation in mountain rivers. *J. Hydraul. Eng.* 111, 625–643. [https://doi.org/10.1061/\(ASCE\)0733-9429\(1985\)111:4\(625\)](https://doi.org/10.1061/(ASCE)0733-9429(1985)111:4(625))
- Ben Khalfallah, C., Saidi, S., 2018. Spatiotemporal floodplain mapping and prediction using HEC-RAS - GIS tools: Case of the Mejerda river, Tunisia. *J. African Earth Sci.* 142, 44–51.  
<https://doi.org/10.1016/j.jafrearsci.2018.03.004>
- Bhat, M.S., Alam, A., Ahmad, B., Kotlia, B.S., Farooq, H., Taloor, A.K., Ahmad, S., 2019. Flood frequency analysis of river Jhelum in Kashmir basin. *Quat. Int.* 507, 288–294. <https://doi.org/10.1016/j.quaint.2018.09.039>
- Bisht, S., Chaudhry, S., Sharma, S., Soni, S., 2018. Assessment of flash flood vulnerability zonation through Geospatial technique in high altitude Himalayan watershed, Himachal Pradesh India. *Remote Sens. Appl. Soc. Environ.* 12, 35–47. <https://doi.org/10.1016/j.rsase.2018.09.001>
- Boyer, M., 1954. Estimating the Manning Coefficient From a N. Trans. Am. Geophys. Union 35, 957–961.
- Brunner, G.W., 2016. HEC-RAS River Analysis System, Hydraulic Reference Manual Version 5.0.
- Brunner, M.I., Seibert, J., Favre, A.C., 2018. Representative sets of design hydrographs for ungauged catchments: A regional approach using probabilistic region memberships. *Adv. Water Resour.* 112, 235–244. <https://doi.org/10.1016/j.advwatres.2017.12.018>
- Chen, F.W., Liu, C.W., 2012. Estimation of the spatial rainfall distribution using inverse distance weighting (IDW) in the middle of Taiwan. *Paddy Water Environ.* 10, 209–222. <https://doi.org/10.1007/s10333-012-0319-1>
- Chen, S.C., Lin, T.W., Chen, C.Y., 2015. Modeling of natural dam failure modes and downstream riverbed morphological changes with different dam materials in a flume test. *Eng. Geol.* 188, 148–158.  
<https://doi.org/10.1016/j.enggeo.2015.01.016>
- Chow, V. Te, Maidment, D.R., Mays, L.W., 1988. *Applied Hydrology*, International Edition, McGraw-Hill Book Company. New York.
- Cloete, G., Benito, G., Grodek, T., Porat, N., Enzel, Y., 2018. Geomorphology Analyses of the magnitude and frequency of a 400-year flood record in the Fish River Basin, Namibia. *Geomorphology* 320, 1–17.  
<https://doi.org/10.1016/j.geomorph.2018.07.025>
- Colomina, I., Molina, P., 2014. Unmanned aerial systems for photogrammetry and remote sensing: A review *ISPRS Journal of Photogrammetry and Remote Sensing* Unmanned aerial systems for photogrammetry and remote sensing: A review. *ISPRS J. Photogramm. Remote Sens.* 92, 79–97.  
<https://doi.org/10.1016/j.isprsjprs.2014.02.013>

- Curebal, I., Efe, R., Ozdemir, H., Soykan, A., Sönmez, S., 2016. GIS-based approach for flood analysis: case study of Keçidere flash flood event (Turkey). *Geocarto Int.* 31, 355–366. <https://doi.org/10.1080/10106049.2015.1047411>
- Dinku, T., Ceccato, P., Grover-Kopec, E., Lemma, M., Connor, S.J., Ropelewski, C.F., 2007. Validation of satellite rainfall products over East Africa's complex topography. *Int. J. Remote Sens.* 28, 1503–1526.  
<https://doi.org/10.1080/01431160600954688>
- Douka, M., Karacostas, T., 2018. Statistical analyses of extreme rainfall events in Thessaloniki, Greece. *Atmos. Res.* 208, 60–77.  
<https://doi.org/10.1016/j.atmosres.2017.08.025>
- Eker, R., Aydın, A., Hübl, J., 2018. Unmanned aerial vehicle (UAV)-based monitoring of a landslide: Gallenzerkogel landslide (Ybbs-Lower Austria) case study. *Environ. Monit. Assess.* 190. <https://doi.org/10.1007/s10661-017-6402-8>
- Elkhrachy, I., 2015. Flash Flood Hazard Mapping Using Satellite Images and GIS Tools: A case study of Najran City, Kingdom of Saudi Arabia (KSA). *Egypt. J. Remote Sens. Sp. Sci.* 18, 261–278.  
<https://doi.org/10.1016/j.ejrs.2015.06.007>
- Ezz, H., 2018. Integrating GIS and HEC-RAS to model Assiut plateau runoff. *Egypt. J. Remote Sens. Sp. Sci.* 21, 219–227.  
<https://doi.org/10.1016/j.ejrs.2017.11.002>
- Farooq, M., Shafique, M., Khattak, M.S., 2019. Flood hazard assessment and mapping of River Swat using HEC-RAS 2D model and high-resolution 12-m TanDEM-X DEM (WorldDEM). *Nat. Hazards* 97, 477–492. <https://doi.org/10.1007/s11069-019-03638-9>
- Forlani, G., Dall'Asta, E., Diotri, F., di Cella, U.M., Roncella, R., Santise, M., 2018. Quality assessment of DSMs produced from UAV flights georeferenced with on-board RTK positioning. *Remote Sens.* 10.  
<https://doi.org/10.3390/rs10020311>
- Frans, J.H., Halema, E.U.M., 2019. Analisis Parameter Alfa Hidrograf Satuan Sintetik Nakayasu Pada Das Di Pulau Flores. *J. Tek. Sipil* 8, 227–240.
- Gholami, V., Asghari, A., Taghvaye Salimi, E., 2016. Flood hazard zoning using geographic information system (GIS) and HEC-RAS model (Case study: Rasht City). *Casp. J. Environ. Sci.* 14, 263–272.
- Ghoneim, E., Foody, G.M., 2013. Assessing flash flood hazard in an arid mountainous region. *Arab. J. Geosci.* 6, 1191–1202.  
<https://doi.org/10.1007/s12517-011-0411-7>
- Habibi, M., Namaee, M.R., Saneie, M., 2014. An experimental investigation to calculate flow resistance in a steep river. *KSCE J. Civ. Eng.* 18, 1176–1184.

<https://doi.org/10.1007/s12205-014-0006-4>

- Haliuc, A., Frantiuc, A., 2012. A study case of Baranca drainage basin flash-floods using the hydrological model of Hec-Ras. *Sci. Ann. Stefan cel Mare Univ. Suceava. Geogr. Ser.* 21, 118. <https://doi.org/10.4316/georeview.2012.21.1.61>
- Hatheway, A.W., 1999. Manufactured gas in California, 1852-1940: Basis for remedial action, *Practice Periodical of Hazardous, Toxic, and Radioactive Waste Management*.
- [https://doi.org/10.1061/\(ASCE\)1090-025X\(1999\)3:3\(132\)](https://doi.org/10.1061/(ASCE)1090-025X(1999)3:3(132))
- Hefley, T.J., Tyre, A.J., Blankenship, E.E., 2013. Statistical indicators and state-space population models predict extinction in a population of bobwhite quail. *Theor. Ecol.* 6, 319–331. <https://doi.org/10.1007/s12080-013-0195-3>
- Hooke, J.M., 2019. Extreme sediment fluxes in a dryland flash flood. *Sci. Rep.* 9, 1–12. <https://doi.org/10.1038/s41598-019-38537-3>
- Huang, J.C., Kao, S.J., Lin, C.Y., Chang, P.L., Lee, T.Y., Li, M.H., 2011. Effect of subsampling tropical cyclone rainfall on flood hydrograph response in a subtropical mountainous catchment. *J. Hydrol.* 409, 248–261. <https://doi.org/10.1016/j.jhydrol.2011.08.037>
- Huang, K., Chen, L., Zhou, J., Zhang, J., Singh, V.P., 2018. Flood hydrograph coincidence analysis for mainstream and its tributaries. *J. Hydrol.* 565, 341–353. <https://doi.org/10.1016/j.jhydrol.2018.08.007>
- Isa, M., Fauzi, A., Susilowati, I., 2019. Flood risk reduction in the northern coast of Central Java Province, Indonesia: An application of stakeholder's analysis. *Jambá J. Disaster Risk Stud.* 11, 1–9. <https://doi.org/10.4102/jamba.v11i1.660>
- Izumida, A., Uchiyama, S., Sugai, T., 2017. Application of UAV-SfM photogrammetry and aerial lidar to a disastrous flood: Repeated topographic measurement of a newly formed crevasse splay of the Kinu River, central Japan. *Nat. Hazards Earth Syst. Sci.* 17, 1505–1519.
- <https://doi.org/10.5194/nhess-17-1505-2017>
- Kim, H., Lee, S.W., Yune, C.Y., Kim, G., 2014. Volume estimation of small scale debris flows based on observations of topographic changes using airborne LiDAR DEMs. *J. Mt. Sci.* 11, 578–591. <https://doi.org/10.1007/s11629-013-2829-8>
- Krisnayanti, D.S., Bolla, M.E., Nasjono, J.K., Wangge, M.J.M., 2019. The analysis of alpha parameter on Nakayasu Synthetic Unit Hydrograph in Timor Island watersheds. *IOP Conf. Ser. Mater. Sci. Eng.* 669.
- <https://doi.org/10.1088/1757-899X/669/1/012015>
- Kron, W., Eichner, J., Kundzewicz, Z.W., 2019. Reduction of flood risk in Europe – Reflections from a reinsurance perspective. *J. Hydrol.* 576, 197–209.
- <https://doi.org/10.1016/j.jhydrol.2019.06.050>
- Kumar, M., Kumar, R., Singh, P.K., Singh, M., Yadav, K.K., Mittal, H.K., 2015.

Catchment delineation and morphometric analysis using geographical information system. *Water Sci. Technol.* 72, 1168–1175.

<https://doi.org/10.2166/wst.2015.303>

Kusumastuti, D.I., Jokowinarno, D., 2012. Time Step Issue in Unit Hydrograph for Improving Runoff Prediction in Small Catchments. *J. Water Resour. Prot.* 04, 686–693. <https://doi.org/10.4236/jwarp.2012.48079>

Lamichhane, N., Sharma, S., 2017. Development of flood warning system and flood inundation mapping using field survey and LiDAR data for the grand river near the city of Painesville, Ohio. *Hydrology* 4.

<https://doi.org/10.3390/hydrology4020024>

Mahmood, S., Rahman, A. ur, 2019. Flash flood susceptibility modeling using geomorphometric and hydrological approaches in Panjkora Basin, Eastern Hindu Kush, Pakistan. *Environ. Earth Sci.* 78, 0. <https://doi.org/10.1007/s12665-018-8041-y>

Manuela, B., Daniel, V., Favre, A.-C., Jan, S., Anna E., S., Vannier, O., 2017. Flood type specific construction of synthetic design hydrographs. *Water Resour. Res.* 17, 1390–1406. <https://doi.org/10.1002/2016WR019535>.Received

Marra, F., Morin, E., Peleg, N., Mei, Y., Anagnostou, E.N., 2017. Intensity – duration – frequency curves from remote sensing rainfall estimates : comparing satellite and weather radar over the eastern Mediterranean. *Hydrol. Earth Syst. Sci.* 2389–2404. <https://doi.org/10.5194/hess-21-2389-2017>

Martínez Ibarra, E., 2012. A geographical approach to post-flood analysis: The extreme flood event of 12 October 2007 in Calpe (Spain). *Appl. Geogr.* 32, 490–500. <https://doi.org/10.1016/j.apgeog.2011.06.003>

Meinen, B.U., Robinson, D.T., 2020. Streambank topography: an accuracy assessment of UAV-based and traditional 3D reconstructions. *Int. J. Remote Sens.* 41, 1–18. <https://doi.org/10.1080/01431161.2019.1597294>

Miao, Q., Yang, D., Yang, H., Li, Z., 2016. Establishing a rainfall threshold for flash flood warnings in China's mountainous areas based on a distributed hydrological model. *J. Hydrol.* 541, 371–386.

<https://doi.org/10.1016/j.jhydrol.2016.04.054>

Moeung, B., Rahardjo, A.P., Istiarto, 2019. Study Flash Flood Characteristics In Nasiri River, West Seram Maluku. *Tek. Sipil* 2019, Fak. Tek. Univ. Muhammadiyah Surakarta 218–224.

Natakusumah, D.K., Harlan, D., Hatmoko, W., 2013. A new synthetic unit hydrograph computation method based on the mass conservation principle. *WIT Trans. Ecol. Environ.* 172, 27–38. <https://doi.org/10.2495/RBM130031>

Nations, U., 2006. Global survey of early warning systems (An assessment of capacities, gaps and opportunities towards building a comprehensive global early warning system for all natural hazards).

- Neppel, L., Desbordes, M., Masson, J.M., 1997. Spatial extension of extreme rainfall events: Return period of isohyets area and influence of rain gauges network evolution. *Atmos. Res.* 45, 183–199. [https://doi.org/10.1016/S0169-8095\(97\)00038-0](https://doi.org/10.1016/S0169-8095(97)00038-0)
- Nguyen, P., Thorstensen, A., Sorooshian, S., Hsu, K., Aghakouchak, A., 2015. Flood forecasting and inundation mapping using HiResFlood-UCI and near-real-time satellite precipitation data: The 2008 Iowa flood. *J. Hydrometeorol.* 16, 1171–1183. <https://doi.org/10.1175/JHM-D-14-0212.1>
- Nieland, C., Mushtaq, S., 2016. The effectiveness and need for flash flood warning systems in a regional inland city in Australia. *Nat. Hazards* 80, 153–171. <https://doi.org/10.1007/s11069-015-1962-9>
- Nikolopoulos, E.I., Destro, E., Maggaioni, V., Marra, F., Boraga, M., 2017. Satellite Rainfall Estimates for Debris Flow Prediction : An Evaluation Based on Rainfall Accumulation – Duration Thresholds. *JJournal Hydrometeorol.* 18, 2207–2214. <https://doi.org/10.1175/JHM-D-17-0052.1>
- O. B. Okeke, Ehiorobo, J.O., 2017. Frequency Analysis of Rainfall for Flood Control in Patani, Delta State of Nigeria. *Niger. J. Technol.* 36, 282–289–289.
- O’Neil, G.L., Saby, L., Band, L.E., Goodall, J.L., 2019. Effects of LiDAR DEM Smoothing and Conditioning Techniques on a Topography-Based Wetland Identification Model. *Water Resour. Res.* 55, 4343–4363. <https://doi.org/10.1029/2019WR024784>
- Ojha, C.S.P., Berndtsson, R., Bhunya, P., 2008. *Engineering hydrology*. Oxford University Press. [https://doi.org/10.1016/0022-1694\(75\)90105-5](https://doi.org/10.1016/0022-1694(75)90105-5)
- Omranian, E., Sharif, H.O., 2018. Evaluation of the Global Precipitation Measurement (GPM) Satellite Rainfall Products over the Lower Colorado River Basin, Texas. *J. Am. Water Resour. Assoc.* 54, 882–898. <https://doi.org/10.1111/1752-1688.12610>
- Pak, S. Il, Oh, T.H., 2010. Correlation and simple linear regression. *J. Vet. Clin.* 27, 427–434. <https://doi.org/10.1148/radiol.2273011499>
- Patel, D.P., Ramirez, J.A., Srivastava, P.K., Bray, M., Han, D., 2017. Assessment of flood inundation mapping of Surat city by coupled 1D/2D hydrodynamic modeling: a case application of the new HEC-RAS 5. *Nat. Hazards* 89, 93–130. <https://doi.org/10.1007/s11069-017-2956-6>
- Priyantoro, D., Limantara, L.M., 2017. Conformity evaluation of synthetic unit hydrograph (case study at upstream Brantas sub watershed, East Java Province of Indonesia). *J. Water L. Dev.* 35, 173–183. <https://doi.org/10.1515/jwld-207-0082>
- Quintero, F., F. Krajewski, W.F., Mantilla, R., Small, S., Seo, B.-C., 2016. A Spatial – Dynamical Framework for Evaluation of Satellite Rainfall Products for Flood Prediction. *J. Hydrometeorol.* 17, 2137–2154. <https://doi.org/10.1175/JHM-D-15-0195.1>
- Rangari, V.A., Sridhar, V., Umamahesh, N. V., Patel, A.K., 2019. Floodplain Mapping



- and Management of Urban Catchment Using HEC-RAS: A Case Study of Hyderabad City. *J. Inst. Eng. Ser. A* 100, 49–63. <https://doi.org/10.1007/s40030-018-0345-0>
- Romero, M., Revollo, N., Molina, J., 2010. Flow resistance in steep mountain rivers in Bolivia. *J. Hydrodyn.* 22, 702–707. [https://doi.org/10.1016/S1001-6058\(10\)60018-2](https://doi.org/10.1016/S1001-6058(10)60018-2)
- Saharia, M., Kirstetter, P.E., Vergara, H., Gourley, J.J., Hong, Y., 2017. Characterization of floods in the United States. *J. Hydrol.* 548, 524–535. <https://doi.org/10.1016/j.jhydrol.2017.03.010>
- Sánchez-garcía, C., Schulte, L., Carvalho, F., Carlos, J., 2019. A 500-year flood history of the arid environments of southeastern Spain . The case of the Almanzora River. *Glob. Planet. Change* 181, 102987. <https://doi.org/10.1016/j.gloplacha.2019.102987>
- Sene, K., 2008. Flood warning, forecasting and emergency response. Springer.
- Shi, W., Huang, M., Gongadze, K., Wu, L., 2017. A Modified SCS-CN Method Incorporating Storm Duration and Antecedent Soil Moisture Estimation for Runoff Prediction. *Water Resour. Manag.* 31, 1713–1727. <https://doi.org/10.1007/s11269-017-1610-0>
- Sigar, L., Ranesa, C., Limantara, L.M., Harisuseno, D., 2015. Analisis Rasionalisasi Jaringan Pos Hujan Untuk Kalibrasi Hidrograf Pada DAS Babak Kabupaten Lombok Tengah. *Jurnal Teknik Pengairan.* 6, 46–54.
- Song, Park, Lee, Park, Song, 2019. Flood Forecasting and Warning System Structures: Procedure and Application to a Small Urban Stream in South Korea. *Water* 11, 1571. <https://doi.org/10.3390/w11081571>
- Subramanya, K., 2008. Engineering Hydrology, 3rd Editio. ed. The McGraw-Hill Companies, New Delhi.
- Suharyanto, A., 2016. Prediction of Flood Area Based on the Occurrence of Rainfall Intensity. *GMSARN Int. J.* 10, 129–136.
- Sun, P., Wen, Q., Zhang, Q., Singh, V.P., Sun, Y., Li, J., 2018. Nonstationarity-based evaluation of fl ood frequency and fl ood risk in the Huai River basin , China. *J. Hydrol.* 567, 393–404. <https://doi.org/10.1016/j.jhydrol.2018.10.031>
- Tang, L., Yudong, T., Lin, X., 2014. Validation of precipitation retrievals over land from satellite-based passive microwave sensors. *J. Geophys. Res.* 119, 4546–4567. <https://doi.org/10.1002/2014JD021606>
- Tao, J., Barros, A.P., 2013. Prospects for flash flood forecasting in mountainous regions - An investigation of Tropical Storm Fay in the Southern Appalachians. *J. Hydrol.* 506, 69–89. <https://doi.org/10.1016/j.jhydrol.2013.02.052>
- Terranova, O.G., Gariano, S.L., 2014. Rainstorms able to induce flash floods in a

- Mediterranean-climate region (Calabria, southern Italy). *Nat. Hazards Earth Syst. Sci.* 14, 2423–2434. <https://doi.org/10.5194/nhess-14-2423-2014>
- Valher, A., Gregorič, G., Sušnik, M.A., 2013. Application of Effective Rainfall Method for estimation of Soil Water Content.
- Vaze, J., Teng, J., Spencer, G., 2010. Impact of DEM accuracy and resolution on topographic indices. *Environ. Model. Softw.* 25, 1086–1098.  
<https://doi.org/10.1016/j.envsoft.2010.03.014>
- Wang, W., Chen, X., Shi, P., Van Gelder, P.H.A.J.M., 2008. Detecting changes in extreme precipitation and extreme streamflow in the Dongjiang River Basin in southern China. *Hydrol. Earth Syst. Sci.* 12, 207–221.  
<https://doi.org/10.5194/hess-12-207-2008>
- Willmott, C.J., Ackleson, S.G., Davis, R.E., Feddema, J.J., Klink, K.M., Legates, D.R., Odonnell, J., Rowe, C.M., 1985. Statistics for the Evaluation and Comparison of Models. *J. Geophys. Res.* 90, 8995–9005.  
<https://doi.org/10.1029/JC090iC05p08995>
- Wohl, E.E., 1998. Uncertainty in flood estimates associated with roughness coefficient. *J. Hydraul. Eng.* 124, 219–223.
- Wuensch, K.L., 2011. Chi-Square Tests. *Int. Encycl. Stat. Sci.* 252–253.  
[https://doi.org/10.1007/978-3-642-04898-2\\_173](https://doi.org/10.1007/978-3-642-04898-2_173)
- Xiong, F., Guo, S., Liu, P., Xu, C., Zhong, Y., Yin, J., He, S., 2019. A general framework of design flood estimation for cascade reservoirs in operation period 577.  
<https://doi.org/10.1016/j.jhydrol.2019.124003>
- Yalcin, E., 2018. Two-dimensional hydrodynamic modelling for urban flood risk assessment using unmanned aerial vehicle imagery: A case study of Kirsehir, Turkey. *J. Flood Risk Manag.* 12, 1–14. <https://doi.org/10.1111/jfr3.12499>
- Yang, X., Xie, X., Liu, D.L., Ji, F., Wang, L., 2015. Spatial Interpolation of Daily Rainfall Data for Local Climate Impact Assessment over Greater Sydney Region. *Adv. Meteorol.* 2015. <https://doi.org/10.1155/2015/563629>
- Yong, B., Ren, L., Hong, Y., Gourley, J.J., Tian, Y., Huffman, G.J., Chen, X., Wang, W., Wen, Y., 2013. First evaluation of the climatological calibration algorithm in the real-time TMPA precipitation estimates over two basins at high and low latitudes. *Water Resour. Res.* 49, 2461–2472.  
<https://doi.org/10.1002/wrcr.20246>
- Yoo, C., Lee, J., Chang, K., Yang, D., 2019. Sensitivity evaluation of the flash flood warning system introduced to ungauged small mountainous basins in Korea. *J. Mt. Sci.* 16, 971–990. <https://doi.org/10.1007/s11629-018-4984-4>
- Yuan, J., Emura, K., Farnham, C., Alam, M.A., 2018. Frequency analysis of annual maximum hourly precipitation and determination of best fit probability distribution for regions in Japan. *Urban Clim.* 24, 276–286.



<https://doi.org/10.1016/j.uclim.2017.07.008>

- Zahraei, A., Hsu, K. lin, Sorooshian, S., Gourley, J.J., Hong, Y., Behrangi, A., 2013. Short-term quantitative precipitation forecasting using an object-based approach. *J. Hydrol.* 483, 1–15. <https://doi.org/10.1016/j.jhydrol.2012.09.052>
- Zelda Els, by, van Niekerk, A., 2013. Processing technical Data availability and requirements for flood hazard mapping 1–8.
- Zhang, D. wei, Quan, J., Zhang, H. bin, Wang, F., Wang, H., He, X. yan, 2015. Flash flood hazard mapping: A pilot case study in Xiapu River Basin, China. *Water Sci. Eng.* 8, 195–204. <https://doi.org/10.1016/j.wse.2015.05.002>
- Zhang, G.H., Luo, R.T., Cao, Y., Shen, R.C., Zhang, X.C., 2010. Impacts of sediment load on Manning coefficient in supercritical shallow flow on steep slopes. *Hydrol. Process.* 24, 3909–3914. <https://doi.org/10.1002/hyp.7892>
- Zhang, W., Cao, Y., Zhu, Y., Wu, Y., Ji, X., He, Y., Xu, Y., 2017. Flood frequency analysis for alterations of extreme maximum water levels in the Pearl River Delta. *Ocean Eng.* 129, 117–132.