

DAFTAR PUSTAKA

- Abidin, H. Z., Andreas, H., Djaja, R., Darmawan, D., & Gamal, M. (2008). Land subsidence characteristics of Jakarta between 1997 and 2005, as estimated using GPS surveys. *GPS Solutions*, 12(1), 23–32. <https://doi.org/10.1007/s10291-007-0061-0>
- Abidin, H. Z., Andreas, H., Gumilar, I., Fukuda, Y., Pohan, Y. E., & Deguchi, T. (2011). Land subsidence of Jakarta (Indonesia) and its relation with urban development. *Natural Hazards*, 59(3), 1753–1771. <https://doi.org/10.1007/s11069-011-9866-9>
- Abidin, H. Z., Andreas, H., Gumilar, I., Sidiq, T. P., & Fukuda, Y. (2013). Land subsidence in coastal city of Semarang (Indonesia): Characteristics, impacts and causes. *Geomatics, Natural Hazards and Risk*, 4(3), 226–240. <https://doi.org/10.1080/19475705.2012.692336>
- Abidin, H. Z., Djaja, R., Darmawan, D., Hadi, S., Akbar, A., Rajiyowiryo, H., Sudibyo, Y., Meilano, I., Kasuma, M. A., Kahar, J., & Subarya, C. (2001). Land Subsidence of Jakarta (Indonesia) and its Geodetic Monitoring System. Dalam *Natural Hazards* (Vol. 23). <https://doi.org/https://doi.org/10.1023/A:1011144602064>
- Aggarwal, A., Srivastava, P. K., Gupta, D. K., & Chatterjee, R. S. (2021). Estimating regional land subsidence in Mehsana urban block, Gujarat: Effect of groundwater induced aquifer compaction. *Materials Today: Proceedings*, 48, 1217–1223. <https://doi.org/10.1016/j.matpr.2021.08.254>
- Al Ghiffari, M. R., Nugroho, D., Afifuddin, Agustan, A., Endyana, C., & Hendarmawan. (2022). Optimization of Loop Closure Phase on LiCSBAS for Ground Deformation Monitoring in Southern Sumatra. *2022 IEEE Asia-Pacific Conference on Geoscience, Electronics and Remote Sensing Technology: Understanding the Interaction of Land, Ocean, and Atmosphere: Smart City and Disaster Mitigation for Regional Resilience, AGERS 2022 - Proceeding*, 6–12. <https://doi.org/10.1109/AGERS56232.2022.10093536>
- Andreas, H., Abidin, H. Z., Sarsito, D. A., & Pradipta, D. (2018). INSIGHT ANALYSIS ON DYKE PROTECTION AGAINST LAND SUBSIDENCE AND THE SEA LEVEL RISE AROUND NORTHERN COAST OF JAVA (PANTURA) INDONESIA. *Geoplanning: Journal of Geomatics and Planning*, 5(1), 101. <https://doi.org/10.14710/geoplanning.5.1.101-114>
- Andreas, H., Usriyah, Zainal Abidin, H., & Anggreni Sarsito, D. (2017). Tidal inundation (“Rob”) investigation using time series of high resolution satellite image data and from institu measurements along northern coast of Java (Pantura). *IOP Conference Series: Earth and Environmental Science*, 71(1). <https://doi.org/10.1088/1755-1315/71/1/012005>
- Bamler, R. (2000). Principles of synthetic aperture radar. *Surveys in Geophysics*, 21(2–3), 147–157. <https://doi.org/10.1023/A:1006790026612>
- Bassols, J. B., Suñé, V. E., Crosetto, M., Barra, A., & Gerard, P. (2021). D-InSAR monitoring of ground deformation related to the dewatering of construction sites. A

- case study of Glòries Square, Barcelona. *Engineering Geology*, 286. <https://doi.org/10.1016/j.enggeo.2021.106041>
- Bemmelen, R. V. (1949). *The Geology of Indonesia*. Martinus Nijhoff, The Hague.
- Berardino, P., Fornaro, G., Lanari, R., & Sansosti, E. (2002). A new algorithm for surface deformation monitoring based on small baseline differential SAR interferograms. *IEEE Transactions on Geoscience and Remote Sensing*, 40(11), 2375–2383. <https://doi.org/10.1109/TGRS.2002.803792>
- Bhatta, N. P., & Geethapriya, M. (2016). *Closed Loop Control of Soft Switched Forward Converter Using Intelligent Controller IJCTA* (Vol. 9, Nomor 28). <https://www.researchgate.net/publication/317427496>
- Bramanto, B., Gumilar, I., Sidiq, T. P., Rahmawan, Y. A., & Abidin, H. Z. (2023). Geodetic evidence of land subsidence in Cirebon, Indonesia. *Remote Sensing Applications: Society and Environment*, 30. <https://doi.org/10.1016/j.rsase.2023.100933>
- Calderhead, A. I., Therrien, R., Rivera, A., Martel, R., & Garfias, J. (2011). Simulating pumping-induced regional land subsidence with the use of InSAR and field data in the Toluca Valley, Mexico. *Advances in Water Resources*, 34(1), 83–97. <https://doi.org/10.1016/j.advwatres.2010.09.017>
- Cascini, L., Fornaro, G., & Peduto, D. (2009). Analysis at medium scale of low-resolution DInSAR data in slow-moving landslide-affected areas. *ISPRS Journal of Photogrammetry and Remote Sensing*, 64(6), 598–611. <https://doi.org/10.1016/j.isprsjprs.2009.05.003>
- Castañeda, C., Pourthié, N., & Souyris, J.-C. (2011). Dedicated SAR interferometric analysis to detect subtle deformation in evaporite. *International Journal of Remote Sensing*, 1–27. <https://doi.org/10.1080/01431161003631584>
- Chai, J.-C., Shen, S.-L., Zhu, H.-H., & Zhang, X.-L. (2004). Land subsidence due to groundwater drawdown in Shanghai. *Géotechnique*, 54(2), 143–147. <https://doi.org/10.1680/geot.54.2.143.36332>
- Chatrsimab, Z., Alesheikh, A. A., Voosoghi, B., Behzadi, S., & Modiri, M. (2020). Development of a Land Subsidence Forecasting Model Using Small Baseline Subset—Differential Synthetic Aperture Radar Interferometry and Particle Swarm Optimization—Random Forest (Case Study: Tehran-Karaj-Shahriyar Aquifer, Iran). *Doklady Earth Sciences*, 494(1), 718–725. <https://doi.org/10.1134/S1028334X20090056>
- Chaussard, E., Amelung, F., Abidin, H., & Hong, S. H. (2013). Sinking cities in Indonesia: ALOS PALSAR detects rapid subsidence due to groundwater and gas extraction. *Remote Sensing of Environment*, 128, 150–161. <https://doi.org/10.1016/j.rse.2012.10.015>
- Cigna, F., Ramírez, R. E., & Tapete, D. (2021). Accuracy of sentinel-1 PSI and SBAS InSAR displacement velocities against GNSS and geodetic leveling monitoring data. *Remote Sensing*, 13(23). <https://doi.org/10.3390/rs13234800>

- Cihan, A., Zhou, Q., & Birkholzer, J. T. (2011). Analytical solutions for pressure perturbation and fluid leakage through aquitards and wells in multilayered-aquifer systems. *Water Resources Research*, 47(10). <https://doi.org/10.1029/2011WR010721>
- Ding, X., Chen, Y., Zhang, G., & Li, Z. (2014). Monitoring Earth Surface Deformations with InSAR Technology: Principle and Some critical Issues Study of Ground Displacement, Coastal Erosion and Sea Level Rise along Karachi Coast, Pakistan View project Monitoring Earth Surface Deformations with InSAR Technology: Principle and Some critical Issues. Dalam *Journal of Geospatial Engineering* (Vol. 2, Nomor 1). <https://www.researchgate.net/publication/255607985>
- Ding, X. L., Liu, G. X., Li, Z. W., Li, Z. L., & Chen. Y. Q. (2004). Ground Subsidence Monitoring in Hong Kong with Satellite SAR Interferometry. *PHOTOGRAMMETRIC ENGINEERING & REMOTE SENSING*, 70, 1151–1156. <https://doi.org/https://doi.org/10.14358/PERS.70.10.1151>
- Figuerola-Miranda, S., Tuxpan-Vargas, J., Ramos-Leal, J. A., Hernández-Madrigal, V. M., & Villaseñor-Reyes, C. I. (2018). Land subsidence by groundwater over-exploitation from aquifers in tectonic valleys of Central Mexico: A review. Dalam *Engineering Geology* (Vol. 246, hlm. 91–106). Elsevier B.V. <https://doi.org/10.1016/j.enggeo.2018.09.023>
- Fuhrmann, T., & Garthwaite, M. C. (2019). Resolving three-dimensional surface motion with InSAR: Constraints from multi-geometry data fusion. *Remote Sensing*, 11(3). <https://doi.org/10.3390/rs11030241>
- Fujiwara, S., Nishimura, T., Murakami, M., Nakagawa, H., Tobita, M., & Rosen, P. A. (2000). 2.5-D surface deformation of M6.1 earthquake near Mt Iwate detected by SAR interferometry. *Geophysical Research Letters*, 27(14), 2049–2052. <https://doi.org/10.1029/1999GL011291>
- Galloway, D. L., Bawden, G. W., Leake, S., & Leake Hydrology, S. A. (2008). *Land subsidence hazards*.
- Gambolati, G., & Teatini, P. (2021). *Land Subsidence and its Mitigation*.
- Gavkosh, M. B., Hosseini, S. M., Ashtiani, B. A., Sohani, Y., Ebrahimian, H., Morovat, F., & Ashrafi, S. (2021). Land subsidence: A global challenge. *Science of the Total Environment*, 778. <https://doi.org/10.1016/j.scitotenv.2021.146193>
- Ghilani, C. D. (2010). *ADJUSTMENT COMPUTATIONS*.
- Hendarto, H., & Standing, J. R. (2019). Influence of groundwater extraction on land subsidence in Jakarta. *17th European Conference on Soil Mechanics and Geotechnical Engineering, ECSMGE 2019 - Proceedings, 2019-September*. <https://doi.org/10.32075/17ECSMGE-2019-0511>
- Hiroshi, Y., Tomokazu, K., & Yu, M. (2023, Oktober 31). *3D Crustal Deformation Revealed by SAR*.
- Hwang, C., Yang, Y., Kao, R., Han, J., Shum, C. K., Galloway, D. L., Sneed, M., Hung, W. C., Cheng, Y. S., & Li, F. (2016). Time-varying land subsidence detected by radar

- altimetry: California, Taiwan and north China. *Scientific Reports*, 6. <https://doi.org/10.1038/srep28160>
- Isya, N. H., Niemeier, W., & Gerke, M. (2019). 3D ESTIMATION of SLOW GROUND MOTION USING INSAR and the SLOPE ASPECT ASSUMPTION, A CASE STUDY: The PUNCAK PASS LANDSLIDE, Indonesia. *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 4(2/W5), 623–630. <https://doi.org/10.5194/isprs-annals-IV-2-W5-623-2019>
- Koch, M., Gaber, A., Darwish, N., Bateman, J., Gopal, S., & Helmi, M. (2019). Estimating Land Subsidence In Relation To Urban Expansion In Semarang City, Indonesia, Using InSAR And Optical Change Detection Methods. *IEEE*, 9686–9689. <https://doi.org/https://doi.org/10.1109/IGARSS.2019.8897970>
- Kuehn, F., Albiol, D., Cooksley, G., Duro, J., Granda, J., Haas, S., Hoffmann-Rothe, A., & Murdohardono, D. (2010). Detection of land subsidence in Semarang, Indonesia, using stable points network (SPN) technique. *Environmental Earth Sciences*, 60(5), 909–921. <https://doi.org/10.1007/s12665-009-0227-x>
- Lanari, R., Bonano, M., Casu, F., De Luca, C., Manunta, M., Manzo, M., Onorato, G., & Zinno, I. (2020). Automatic generation of Sentinel-1 continental scale DInSAR deformation time series through an extended P-SBAS processing pipeline in a cloud computing environment. *Remote Sensing*, 12(18). <https://doi.org/10.3390/RS12182961>
- Lazecký, M., Spaans, K., González, P. J., Maghsoudi, Y., Morishita, Y., Albino, F., Elliott, J., Greenall, N., Hatton, E., Hooper, A., Juncu, D., McDougall, A., Walters, R. J., Watson, C. S., Weiss, J. R., & Wright, T. J. (2020). LiCSAR: An automatic InSAR tool for measuring and monitoring tectonic and volcanic activity. *Remote Sensing*, 12(15). <https://doi.org/10.3390/RS12152430>
- Li, D., Hou, X., Song, Y., Zhang, Y., & Wang, C. (2020). Ground subsidence analysis in Tianjin (China) based on sentinel-1A data using MT-InSAR methods. *Applied Sciences (Switzerland)*, 10(16). <https://doi.org/10.3390/app10165514>
- Lilesand, T., Kiefer, L., & Jonathan, C. (2015). *Remote Sensing and Image Interpretation* (Vol. 7).
- Li, S., Xu, W., & Li, Z. (2022). Review of the SBAS InSAR Time-series algorithms, applications, and challenges. *Geodesy and Geodynamics*, 13(2), 114–126. <https://doi.org/10.1016/j.geog.2021.09.007>
- Lubis, A. M., Sato, T., Tomiyama, N., Isezaki, N., & Yamanokuchi, T. (2011). Ground subsidence in Semarang-Indonesia investigated by ALOS-PALSAR satellite SAR interferometry. *Journal of Asian Earth Sciences*, 40(5), 1079–1088. <https://doi.org/10.1016/j.jseaes.2010.12.001>
- Luqmanul Hakim, W., Rizqiyanto Achmad, A., Eom, J., & Lee, C.-W. (2020). Land Subsidence Measurement of Jakarta Coastal Area Using Time Series Interferometry with Sentinel-1 SAR Data. *Source: Journal of Coastal Research*, 102, 75–81. <https://doi.org/10.2307/48639221>

- Marfai, M. A., & King, L. (2007). Monitoring land subsidence in Semarang, Indonesia. *Environmental Geology*, 53(3), 651–659. <https://doi.org/10.1007/s00254-007-0680-3>
- Ma, T., Du, Y., Ma, R., Xiao, C., & Liu, Y. (2018). Review: Water–rock interactions and related eco–environmental effects in typical land subsidence zones of China. Dalam *Hydrogeology Journal* (Vol. 26, Nomor 5, hlm. 1339–1349). Springer Verlag. <https://doi.org/10.1007/s10040-017-1708-8>
- Modoni, G., Darini, G., Spacagna, R. L., Saroli, M., Russo, G., & Croce, P. (2013). Spatial analysis of land subsidence induced by groundwater withdrawal. *Engineering Geology*, 167, 59–71. <https://doi.org/10.1016/j.enggeo.2013.10.014>
- Mohammed, O. I., Saeidi, V., Pradhan, B., & Yusuf, Y. A. (2014). Advanced differential interferometry synthetic aperture radar techniques for deformation monitoring: A review on sensors and recent research development. *Geocarto International*, 29(5), 536–553. <https://doi.org/10.1080/10106049.2013.807305>
- Mora, O., Lanari, R., Mallorquí, J. J., Berardino, P., & Sansosti, E. (2002). *A New Algorithm for Monitoring Localized Deformation Phenomena Based on Small Baseline Differential SAR Interferograms*.
- Morishita, Y., Lazecky, M., Wright, T. J., Weiss, J. R., Elliott, J. R., & Hooper, A. (2020). LiCSBAS: An open-source insar time series analysis package integrated with the LiCSAR automated sentinel-1 InSAR processor. *Remote Sensing*, 12(3). <https://doi.org/10.3390/rs12030424>
- Nashrullah, S., Aprijanto, Pasaribu, J. M., Hazarika, M. K., & Samarakoon, L. (2013). STUDY ON FLOOD INUNDATION IN PEKALONGAN, CENTRAL JAVA. Dalam *International Journal of Remote Sensing and Earth Sciences* (Vol. 10, Nomor 2).
- Ng, A. H. M., Ge, L., Li, X., Abidin, H. Z., Andreas, H., & Zhang, K. (2012). Mapping land subsidence in Jakarta, Indonesia using persistent scatterer interferometry (PSI) technique with ALOS PALSAR. *International Journal of Applied Earth Observation and Geoinformation*, 18(1), 232–242. <https://doi.org/10.1016/j.jag.2012.01.018>
- Radutu, A., Nedelcu, I., & Gogu, C. R. (2017). An overview of ground surface displacements generated by groundwater dynamics, revealed by InSAR techniques. *Procedia Engineering*, 209, 119–126. <https://doi.org/10.1016/j.proeng.2017.11.137>
- Ren, C., Shi, X., Li, X., & Zhang, Z. (2019). *Land Subsidence Monitoring in Nanning Based on Sentinel-1A data and SBAS-InSAR*. 1–4. <https://doi.org/https://doi.org/10.1109/APSAR46974.2019.9048363>
- Rocca, F. L. (2014, Agustus 14). *The Permanent Scatterers Technique to Measure Slow Earth Motion from Space*. <https://doi.org/10.3997/2352-8265.20140044>
- Sarah, D., & Soebowo, E. (2018). Land subsidence threats and its management in the North Coast of Java. *IOP Conference Series: Earth and Environmental Science*, 118(1). <https://doi.org/10.1088/1755-1315/118/1/012042>
- Sidiq, T. P., Gumilar, I., Meilano, I., Abidin, H. Z., Andreas, H., & Permana, A. (2021). Land Subsidence of Java North Coast Observed by SAR Interferometry. *IOP*

Conference Series: Earth and Environmental Science, 873(1).
<https://doi.org/10.1088/1755-1315/873/1/012078>

- Suhadha, A. G., & Harintaka, H. (2024). Multidimensional displacement analysis of Semeru Volcano, Indonesia following December 2021 eruption from multitrack InSAR observation. *Earth Science Informatics*, 17(2), 1539–1552. <https://doi.org/10.1007/s12145-024-01248-z>
- Suribabu, D., Dumka, R. K., Kothyari, G. C., Swamy, K. V., & Prajapati, S. (2022). Identification of crustal deformation in the Saurashtra region, western India: insights from PSI and GNSS derived investigation. *Acta Geodaetica et Geophysica*, 57(4), 639–659. <https://doi.org/10.1007/s40328-022-00399-z>
- Susilo, S., Salman, R., Hermawan, W., Widyaningrum, R., Wibowo, S. T., Lumban-Gaol, Y. A., Meilano, I., & Yun, S. H. (2023). GNSS land subsidence observations along the northern coastline of Java, Indonesia. *Scientific Data*, 10(1). <https://doi.org/10.1038/s41597-023-02274-0>
- Takami, J. (2021). Land Subsidence Monitoring by SBAS-InSAR Technique with the Conversion to Horizontal-Vertical Displacements in Semarang. *Proceedings - 2021 7th Asia-Pacific Conference on Synthetic Aperture Radar, APSAR 2021*. <https://doi.org/10.1109/APSAR52370.2021.9688411>
- Tay, C., Lindsey, E. O., Chin, S. T., McCaughey, J. W., Bekaert, D., Nguyen, M., Hua, H., Manipon, G., Karim, M., Horton, B. P., Li, T., & Hill, E. M. (2022). Sea-level rise from land subsidence in major coastal cities. *Nature Sustainability*, 5(12), 1049–1057. <https://doi.org/10.1038/s41893-022-00947-z>
- Ulinuha, H., Sunantyo, A., & Widjajanti, N. (2019). Analysis of the July 10th 2013 Tectonic Earthquake effect on the Coordinates Changes of Mentawai Segment Monitoring Station. *JGISE: Journal of Geospatial Information Science and Engineering*, 1(2). <https://doi.org/10.22146/jgise.39350>
- Wei, J., Zhengjia, Z., Zhiguo, P., Qingguang, J., Juan, L., Zhenghui, X., & Pengjie, Z. (2022). Reservoir Dam Surface Deformation Monitoring Based on SBAS-InSAR Technology. *International Conference on Geoinformatics, 2022-August*. <https://doi.org/10.1109/Geoinformatics57846.2022.9963817>
- Widada, S., Zainuri, M., Yulianto, G., Satriadi, A., & Wijaya, Y. J. (2020). Estimation of Land Subsidence Using Sentinel Image Analysis and Its Relation to Subsurface Lithology Based on Resistivity Data in the Coastal Area of Semarang City, Indonesia. *Journal of Ecological Engineering*, 21(8), 47–56. <https://doi.org/10.12911/22998993/127394>
- Wu, J., Shi, X., Xue, Y., Zhang, Y., Wei, Z., & Yu, J. (2008). The development and control of the land subsidence in the Yangtze Delta, China. *Environmental Geology*, 55(8), 1725–1735. <https://doi.org/10.1007/s00254-007-1123-x>
- Wu, Z., Ma, P., Zheng, Y., Gu, F., Liu, L., & Lin, H. (2023). Automatic detection and classification of land subsidence in deltaic metropolitan areas using distributed

- scatterer InSAR and Oriented R-CNN. *Remote Sensing of Environment*, 290. <https://doi.org/10.1016/j.rse.2023.113545>
- Xue, F., Lv, X., Dou, F., & Yun, Y. (2020). A Review of Time-Series Interferometric SAR Techniques: A Tutorial for Surface Deformation Analysis. Dalam *IEEE Geoscience and Remote Sensing Magazine* (Vol. 8, Nomor 1, hlm. 22–42). Institute of Electrical and Electronics Engineers Inc. <https://doi.org/10.1109/MGRS.2019.2956165>
- Xu, Y. S., Shen, S. L., Cai, Z. Y., & Zhou, G. Y. (2008). The state of land subsidence and prediction approaches due to groundwater withdrawal in China. *Natural Hazards*, 45(1), 123–135. <https://doi.org/10.1007/s11069-007-9168-4>
- Ye, S., Xue, Y., Wu, J., Yan, X., & Yu, J. (2016). Progression and mitigation of land subsidence in China. *Hydrogeology Journal*, 24(3), 685–693. <https://doi.org/10.1007/s10040-015-1356-9>
- Yu, H., Xing, M., & Yuan, Z. (2020). Baseline Design for Multibaseline InSAR System: A Review. *IEEE Journal on Miniaturization for Air and Space Systems*, 2(1), 17–24. <https://doi.org/10.1109/jmass.2020.3030862>
- Yuwono, B. D., Prasetyo, Y., & Islama, L. J. F. (2018). Investigation of Potential Landsubsidence using GNSS CORS UDIP and DinSAR, Sayung, Demak, Indonesia. *IOP Conference Series: Earth and Environmental Science*, 123(1). <https://doi.org/10.1088/1755-1315/123/1/012005>
- Zhang, L., Ding, X., & Lu, Z. (2015). Ground deformation mapping by fusion of multi-temporal interferometric synthetic aperture radar images: a review. Dalam *International Journal of Image and Data Fusion* (Vol. 6, Nomor 4, hlm. 289–313). Taylor and Francis Ltd. <https://doi.org/10.1080/19479832.2015.1068874>
- Zhang, P., Guo, Z., Guo, S., & Xia, J. (2022). Land Subsidence Monitoring Method in Regions of Variable Radar Reflection Characteristics by Integrating PS-InSAR and SBAS-InSAR Techniques. *Remote Sensing*, 14(14). <https://doi.org/10.3390/rs14143265>
- Zhang, P., Qian, X., Guo, S., Wang, B., Xia, J., & Zheng, X. (2023). A New Method for Continuous Track Monitoring in Regions of Differential Land Subsidence Rate Using the Integration of PS-InSAR and SBAS-InSAR. *Remote Sensing*, 15(13). <https://doi.org/10.3390/rs15133298>
- Zhang, Z., Hu, C., Wu, Z., Zhang, Z., Yang, S., & Yang, W. (2023). Monitoring and analysis of ground subsidence in Shanghai based on PS-InSAR and SBAS-InSAR technologies. *Scientific Reports*, 13(1). <https://doi.org/10.1038/s41598-023-35152-1>
- Zhou, W., Zhang, W., Yang, X., & Wu, W. (2021). An Improved GNSS and InSAR Fusion Method for Monitoring the 3D Deformation of a Mining Area. *IEEE Access*, 9, 155839–155850. <https://doi.org/10.1109/ACCESS.2021.3129521>