

Magaly Koch

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ACADEMIC TRAINING

- 1993 **Ph.D.**, Geology, Boston University, Boston, MA, USA
1987 **Post-Graduate Certificate**, Ground Water Hydrology, Polytechnic University of Catalonia (UPC), Barcelona, SPAIN
1986 **M.Sc.**, Geology, University of Cologne, Cologne, GERMANY

RESEARCH INTERESTS

Dr. Magaly Koch is a remote sensing geologist with 30 years of experience in applied environmental research, including groundwater resources (in drylands), land degradation problems (soil salinization), geohazards and human impact in environmental change. She is particularly interested in projects addressing global water scarcity/flooding problems as related to extreme weather conditions through an interdisciplinary approach. Dr. Koch is an expert in optical/hyperspectral and SAR remote sensing applications in natural and applied sciences and has extensive managerial experience in conducting international and multidisciplinary research projects in many parts of the world. She has supervised numerous international projects, mainly in the Middle East (Kuwait, Oman, UAE), Africa (Egypt, Sudan, Ethiopia), Europe (Spain, Italy), and East Asia (Japan, Indonesia). Her recent research work is on integrating earth and disaster science to enable sustainable adaptation and mitigation of coastal zones.

RESEARCH SUPPORT (last 5 years)

- "Collaborative Research: CPS: NSF-JST: Enabling Human-Centered Digital Twins for Community Resilience", NSF, (2024-2027, \$200,199) BU-PI M. Koch (with University of California, Irvine - PI Nalini Venkatasubramanian, Tohoku University - PI Shunichi Koshimura; total project amount: \$1 Million)"
- "IRES Track II: Multidisciplinary Coastal Zone Hazards Institutes - France, Japan, Indonesia", NSF, (2022-2025, \$399,636) PI M. Koch
- "Natural disaster damage assessments using PALSAR-2/-3 and ALOS-3 optical data", Advanced Land Observation Satellite-3/4 (ALOS-3/4) data take grant (EORA3), science program supported by the Japan Aerospace Exploration Agency (JAXA), (2022-2025) PI M. Koch
- "Benchmark Data Development to Classify Damage for Natural Disaster Relief Efforts", NGA, (2020-2022; \$179,904) BU-PI M. Koch (subaward through Tufts Univ., Tufts-PI L. Baise)
- "Building Collapse Detection Using Satellite Imagery After Earthquake Events: Collaborative Research with Tufts University and Boston University", USGS-EHP, (2019-2020; \$44,789) BU-PI M. Koch (Tufts-PI L. Baise)

“IRES Track I: Collaborative Research: U.S.-Indonesian Research Experience for Students on Sustainable Adaptation of Coastal Areas to Environmental Change”, NSF, (2018-2023, \$199,304) PI M. Koch (Co-PI S. Gopal)

PEER REVIEWED JOURNAL PAPERS, BOOK CHAPTERS (last 10 years)

- Sodeinde, O., Koch, M., Moaveni, B. and Baise, L. (2024) One versus All: Identifiability with a multi-hazard and multiclass building damage imagery dataset and a deep learning neural network, *Natural Hazards*, **120**, 8337–8366. (<https://doi.org/10.1007/s11069-024-06500-9>)
- Asadi, A., Baise, L.G., Chatterjee, S., Koch, M. and Moaveni, B. (2024) Regional Landslide Mapping Model Developed by a Deep Transfer Learning Framework Using Post-Event Optical Imagery, *Georisk: Assessment and Management of Risk for Engineered Systems and Geohazards*, **18**(1), 186–210. (<https://doi.org/10.1080/17499518.2024.2316265>)
- Asadi, A., Baise, L.G., Koch, M., Moaveni, B., Chatterjee, S. and Yusupujang, A. (2024) Pixel-based Classification Method for Earthquake-Induced Landslide Mapping Using Imagery, Geospatial Data and Temporal Change Information, *Natural Hazards*, **120**, 5163–5200. (<https://doi.org/10.1007/s11069-023-06399-8>)
- Asadi, A., Baise, L.G., Sanon, C., Koch, M., Chatterjee, S. and Moaveni, B. (2023) Semi-Supervised Learning Method for the Augmentation of an Incomplete Image-based Inventory of Earthquake-Induced Soil Liquefaction Surface Effects, *Remote Sensing*, **15**(19), 4883. (<https://doi.org/10.3390/rs15194883>).
- Ma, Y., Gopal, S., Ma, X., Gallagher, K., Koch, M. and Kaufman, L. (2023) The Deforestation and Biodiversity Risks of Power Plant Projects in Southeast Asia: A Big Data Spatial Analytical Framework, *Sustainability*, **15**(19), 14461. (<https://doi.org/10.3390/su151914461>).
- Langlois, B., Beaulac, L., Berry, K., Anyanwu, O., Simpson, R., Ismanto, A., Koch, M., Coughlan de Perez, E., Griffin, T., and Naumova, E. (2023) Household flood severity and migration extent in Central Java: analysis of the Indonesian Family Life Survey, *International Journal of Environmental Research and Public Health*, **20**(9), 5706. (<https://doi.org/10.3390/ijerph20095706>).
- Langlois, B., Marsh, E., Stotland, T., Simpson, R., Berry, K., Carroll, D.A., Ismanto, A., Koch, M., and Naumova, E. (2023) Usability of existing global and national data for flood related vulnerability assessment in Indonesia, *Science of the Total Environment*, **873**, 162315. (<https://dx.doi.org/10.1016/j.scitotenv.2023.162315>)
- Ridarto, A.K.Y., Zainuri, M., Helmi, M., Kunarso, K., Baskoro, B., Maslukah, L., Endrawati, H., Handoyo, G. and Koch, M. (2023) Assessment of Total Suspended Solid Concentration Dynamics Based on Geospatial Models as an Impact of Anthropogenic in Pekalongan Waters, Indonesia, *Buletin Oseanografi Marina*, **12**(1), 142-152 (<https://doi.org/10.14710/buloma.v12i1.51454>).
- Aimaiti, Y., Sanon, C., Koch, M., Baise, L.G. and Moaveni, B. (2022) War related damage assessment in Kyiv, Ukraine, using Sentinel-1 radar and Sentinel-2 optical images, *Remote Sensing*, **14**(24), 6239 (<https://doi.org/10.3390/rs14246239>).
- Ibrahim, A., Gmail, K.S, Bedair, S., Saada, S.A., Koch, M., and Nosair, A. (2022) An Integrated Approach to Better Understanding the Hydro-Structural Aquifer

- Potentialities in Hyper-Arid Regions Using Satellite and Land-Based Geophysics, *Surveys in Geophysics*. (<https://doi.org/10.1007/s10712-022-09755-8>).
- Kelly-Fair, M., Gopal, S., Koch, M., Pancasakti Kusumaningrum, H., Helmi, M., Khairunnisa, D. and Kaufman, L. (2022) Analysis of Land Use and Land Cover Changes through the Lens of SDGs in Semarang, Indonesia. *Sustainability*, **14**(13), 7592. (DOI: 10.3390/su14137592).
- Langlois, B., Anyanwu, O., Beaulac, L., Berry, K., Magnuson, A., Ismanto, A., Griffin, T., Coughlan de Perez, E., Koch, M., and Naumova, E. (2022) Usability of the Indonesian Family Life Survey (IFLS) to Examine Recurrent Flooding and Household Food Access in Central Java, Indonesia, *Current Developments in Nutrition*, **6**(S1), 76 (<https://doi.org/10.1093/cdn/nzac050.006>).
- Mather, P.M., and Koch, M. (2022) *Computer Processing of Remotely-Sensed Images: An Introduction*, Fifth Edition. Hoboken, NJ, USA: Wiley-Blackwell, 384 pp.
- Zainuri, M., Helmi, M., Novita, M.G.A., Pancasakti, H., and Koch, M. (2022) Improved Performance of Geospatial Model to Access the Tidal Flood Impact on Land Use by Evaluating Sea Level Rise and Land Subsidence Parameters, *Journal of Ecological Engineering*, **23**(2), 1-11. (<https://doi.org/10.12911/22998993/144785>).
- Youssef, Y.M., Gemal, K., Sugita, M., AlBarqawy, M., Teama, M.A., Koch, M., and Saada, S.A. (2021) Natural and Anthropogenic Coastal Environmental Hazards: An Integrated Remote Sensing, GIS, and Geophysical-based Approach, *Surveys in Geophysics*, **42**, 1109 – 1141. (<https://doi.org/10.1007/s10712-021-09660-6>)
- Rashidian, V., Baise, L.G., Koch, M., and Moaveni, B. (2021) Detecting demolished buildings after a natural hazard using high resolution RGB satellite imagery and modified U-Net Convolutional Neural Networks, *Remote Sensing*, **13**(11), 2176.
- Darwish, N., Kaiser, M., Koch, M., and Gaber, A. (2021) Assessing the Accuracy of ALOS/PALSAR-2 and Sentinel-1 Radar Images in Estimating the Land Subsidence of Coastal Areas: A Case Study in Alexandria City, Egypt, Special Issue "ALOS-2/PALSAR-2 Calibration, Validation, Science and Applications", *Remote Sensing*, **13**(9), 1838. (DOI: 10.3390/rs13091838)
- Gaber, A., Mohamed, A.K., ElGalladi, A., Abdelkareem, M., Beshr, A.M., and Koch, M. (2020) Mapping the Groundwater Potentiality of West Qena Area, Egypt, Using Integrated Remote Sensing and Hydro-Geophysical Techniques, *Remote Sensing*, **12**(10), 1559 (DOI: 10.3390/rs12101559)
- Pitts, J.D., Gopal, S., Ma, Y., Koch, M., Boumans, R., and Kaufman, L. (2020) Leveraging Big Data and Analytics to Improve FEWS Sustainability. *Frontiers in Big Data*, **3** (Section Data Mining and Management), Article 13, 1-16 (DOI: 10.3389/fdata.2020.00013).
- Wirasatriya, A., Kawamura, H., Helmi, M., Sugianto, D.N., Shimada, T., Hosoda, K., Handoyo, G., Putra, Y.D.G., and Koch, M. (2020) Thermal Structure of Hot Events and Their Possible Role in Maintaining the Warm Isothermal Layer in the Western Pacific Warm Pool. *Ocean Dynamics*, **70**. (Published online: 15 April 2020; DOI: 10.1007/s10236-020-01362-8)
- Koch, M. (2020) Integrated earth & disaster science to enable sustainable adaptation & mitigation. In: *Engineering. Information and Agricultural Technology in the Global Digital Revolution*, A. Hendrawan & R. Wijayanti Dual Arifin (eds), Taylor & Francis Group, London, pp. 8-10.

- Rashidian, V., Baise, L.G., and Koch, M. (2020) Using high resolution optical imagery to detect earthquake-induced liquefaction: the 2011 Christchurch earthquake, *Remote Sensing*, **12**(3), 377 (DOI: 10.3390/rs12030377)
- Jeffries, G.R., Griffin, T.S., Fleisher, D.H., Naumova, E.N., Koch, M., and Wardlow, B.D. (2020) Mapping sub-field maize yields in Nebraska, USA by combining remote sensing imagery, crop simulation models, and machine learning. *Precision Agriculture*, **21**(3), 678-694. (DOI: 10.1007/s11119-019-09689-z)
- Menier, D., Mathew, M., Cherfils, J.-B., Sedrati, M., Koch, M., Ramkumar, M., Guillocheau, F., Goubert, E., Gensac, E., and Le Gall, R. (2019) Holocene sediment mobilization in the inner continental shelf of Bay of Biscay: Implications for the regional sediment budget offshore to onshore. *Journal of Coastal Research*, **88**(sp1), 110-121 (DOI: 10.2112/SI88-009.1)
- Wrable, M., Kulinkina, A.V., Liss, A., Koch, M., Cruz, M.S., Biritwum, N-K., Ofosu, A., Gute, D.M., Kosinski, K., and Naumova, E.N. (2019) The use of remotely sensed environmental parameters for spatial and temporal schistosomiasis prediction across climate zones in Ghana. *Environmental Monitoring and Assessment*, **191**(2), 301 (DOI: 10.1007/s10661-019-7411-6)
- Marco-Dos Santos, G., Meléndez-Pastor, I., Navarro-Pedreño, J., and Koch, M. (2019) Assessing water availability in Mediterranean regions affected by water conflicts through MODIS data time series analysis. *Remote Sensing*, **11**(11), 1355 (DOI: 10.3390/rs11111355)
- Wirasatriya, A., Sugianto, D.N., Helmi, Setiawan, R.Y. and Koch, M. (2019) Distinct Characteristics of SST Variabilities in the Sulawesi Sea and Northern Part of the Maluku Sea During Southeast Monsoon. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, **12**(6), 1763-1770. (DOI: 10.1109/JSTARS.2019.2913739)
- Wirasatriya, A., Kawamura, H., Koch, M., and Helmi, M. (2019) Satellite-borne detection of high diurnal amplitude of sea surface temperature in the seas west of the Tsugaru Strait, Japan, during Yamase wind season. *Journal of Oceanography*, **75**(1), 23-36. (DOI: 10.1007/s10872-018-0481-1)
- Gaber, A., Abdelkareem, M., Sayed, I., Koch, M., and El-Baz, F. (2018) Using InSAR coherence for investigating the interplay of fluvial and aeolian features in arid lands: Implications for groundwater potential in Egypt. *Remote Sensing*, **10**(6), 832-849. (DOI: 10.3390/rs10060832)
- Kulinkina, A.V., Walz, Y., Koch, M., Biritwum, N.K., Utzinger, J., and Naumova, E. (2018) Improving spatial prediction of *Schistosoma haematobium* prevalence in southern Ghana through new remote sensors and local water access profiles. *PLOS Neglected Tropical Diseases*, **12**(6): e0006517. First Online: June 4, 2018 (DOI: 10.1371/journal.pntd.0006517)
- Bai, Y., Gao, C., Singh, S., Koch, M., Adriano, B., Mas, E., and Koshimura, S. (2018) A framework of rapid regional tsunami damage recognition from post-event TerraSAR-X imagery using deep neural networks. *IEEE Geoscience and Remote Sensing Letters*, **15**(1), 43-47. (DOI: 10.1109/LGRS.2017.2772349)
- Gaber, A., Darwish, N., and Koch, M. (2017) Minimizing the residual topography effect on interferograms to improve DInSAR results: Estimating land subsidence in Port-Said City, Egypt. *Remote Sensing*, **9**(7), 752-774. (DOI: 10.3390/rs9070752) (open access journal)

- Schmid, T., López-Martínez, J., Serrano, E., D'Hondt, O., Koch, M., Nieto, A., O'Neill, T., Mink, S., Durán, J.J., Maestro, A., Serrano, E., and Guillaso, S. (2017) Geomorphological mapping of ice-free areas using polarimetric RADARSAT-2 data on Fildes Peninsula and Ardley Island, Antarctica. *Geomorphology*, **293**, 448-459. (<http://dx.doi.org/10.1016/j.geomorph.2016.09.031>)
- Koch, M., and Missimer, T.M. (eds.) (2016) Water Resources Assessment and Management in Drylands. Book edition of the Special Issue of the online open access journal *Water*, 300 pp., MDPI publisher, Basel, Switzerland. (<http://www.mdpi.com/books/pdfview/book/216>)
- Erdman, E., Liss, A., Gute, D.M., Rioux, C., Koch, M., and Naumova, E. (2015) Does the presence of vegetation affect asthma hospitalizations among the elderly? A comparison between rural, suburban, and urban areas, *International Journal of Environment and Sustainability (IJES)*, **4**(1), 1-14.
- Gaber, A., Soliman, F., Koch, M., and El-Baz, F. (2015) Using Full-Polarimetric SAR Data to Characterize the Surface Sediments in Desert Areas: A Case Study in El-Gallaba Plain, Egypt, *Remote Sensing of Environment*, **162**, 11-28.