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Lab website link: <https://microplasticresearch.wordpress.com/>

## EDUCATION

2006 – 2010 Dr. rer. nat. Institute of Ecology, Leuphana University of Lüneburg, Germany

1999 – 2005 Dipl.-Geol. Department of Geosciences, University of Cologne, Germany

## EMPLOYMENT

2022/03 - present Assistant Research Fellow RCEC, Academia Sinica, Taiwan

2019/08 - 2022/02 Assistant Research Fellow Department of Geosciences, National Taiwan University, Taiwan

2011/01 - 2019/07 Postdoctoral Researcher Department of Geosciences, National Taiwan University, Taiwan

2006/02 - 2010/10 Research Assistant Leuphana University Lüneburg, Germany

2007/04 - 2008/07 Research Assistant Leibniz Institute for Applied Geophysics, Hannover, Germany

2005/01 - 2005/12 Geologist lithosphere – applied 3D geological surveying Ltd. & Co KG, Cologne, Germany

## HONORS & AWARDS

2021 Independent researcher grant from the Ministry of Science and Technology, Taiwan

2019 Independent researcher grant from the Ministry of Science and Technology, Taiwan

## RESEARCH INTEREST

My research interests are two-fold. Coming from a traditional education as Quaternary geologist I have specialized in geochronology mainly using optically stimulated luminescence dating. During my time as PhD student in Germany and as postdoctoral researcher in Taiwan I was involved in projects related to landscape evolution and paleoclimate. In recent years my interest in microplastic pollution of the environment grow larger. As a pioneer in microplastic research in Taiwan I started working on the pollution of beaches around Taiwan. Meanwhile my research has shifted to the aquatic environment, where I investigate the microplastic pollution of Taiwanese rivers.

## RESEARCH HIGHLIGHTS

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## 1. Microplastic pollution of Taiwan's rivers

In recent years, plastic pollution of rivers has been identified as major contributor to the plastic pollution of oceans. Especially rivers in East Asia are considered as one of the most polluting rivers, which contribute nearly 70% of the global total. Additionally, rivers are an important source of fresh water and drinking water. Keeping rivers clean from pollutants is an important task. However, research related to plastic and microplastic pollution didn't get much attention in Taiwan until recent years. Therefore, we started to investigate the pollution of major rivers. Our intense and detailed studies of rivers in Taipei and Taichung has shown widespread pollution with microplastic particles. Particularly in urban areas the levels of pollution are very high. However, the sources of microplastic in rivers are still unclear. Based on our findings we assume that microplastic is generated on land and flushed via storm sewers into the rivers. Moreover, we can fairly assume that all rivers in Taiwan, especially in the urban areas, are polluted with microplastic particles.

## 2. New age constrains for late glacial aeolian sands in Germany

In a collaboration with the Technical University Darmstadt (Germany) we investigated late glacial aeolian sands that have been deposited in the northern Upper Rhine Graben. Generally, it was assumed that deposition of these sands happened in multiple phases during the last glaciation of northern Europe. But the age of the aeolian sands was mainly based on stratigraphic evidence and their location relative to the Rhine and Neckar rivers. Moreover, previous studies about the landscape evolution in the Upper Rhine Graben suggested a simultaneous deposition of loess and aeolian sands, but due to a lack of numerical ages this was never confirmed. Using OSL-dating we could show that the aeolian sands and loess in that area were deposited at the end of the last glaciation. Additionally, we could show that loess and sand deposition happened simultaneously only until 17 ka. Then loess deposition stopped but aeolian sand activity continued.

## REPRESENTATIVE PUBLICATIONS (\*: corresponding author)

1. Pflanz, D., **Kunz, A.\***, Hornung, J., Hinderer, M. (2022): New insights into the age of aeolian sand deposition in the northern Upper Rhine Graben (Germany). *Quaternary International*, in press
2. Löwemark, L., Liao, A. C.-Y., Liou, Y.-H., Godad, S., Chang, T.-Y., **Kunz., A.** (2021): Potential and pitfalls of XRF-CS analysis of ion-exchange resins in environmental studies. *Scientific Reports*, 11: 20941. (<https://doi.org/10.1038/s41598-021-00446-9>)
3. Schneider, F., **Kunz, A.\***, Hu, C.-S., Yen, N., Lin, H.-T. (2021): Rapid-survey methodology to assess litter volumes along large river systems – A case study of the Tamsui river in Taiwan. *Sustainability* 13 (16): 8765. (<https://doi.org/10.3390/su13168765>)
4. Wong, G., Löwemark, L., **Kunz, A.\*** (2020): Microplastic pollution of the Tamsui River and its tributaries in northern Taiwan: Spatial heterogeneity and correlation with precipitation. *Environmental Pollution* 260: 113935. (<https://doi.org/10.1016/j.envpol.2020.113935>)

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5. Lee, H., **Kunz, A.**, Shim, W.J., Walther, B.A. (2019): Microplastic contamination of table salts from Taiwan, including a global review. *Scientific Reports* 9: 10145. (<https://doi.org/10.1038/s41598-019-46417-z>)
6. Bancin, L.J., Walther, B.A., Lee, Y.-C., **Kunz, A.\*** (2019): Two-dimensional distribution and abundance of micro- and mesoplastic pollution in the surface sediment of Xialiao Beach, New Taipei City, Taiwan. *Marine Pollution Bulletin* 140: 75-85. (<https://doi.org/10.1016/j.marpolbul.2019.01.028>)
7. Shyu, J.H., Tsai, Y.-L., Ota, Y., Sawai, Y., **Kunz, A.** (2019). Identification of extreme event deposits on the coastal Ilan Plain, northeastern Taiwan. *Quaternary International* 503: 70-78. (<https://doi.org/10.1016/j.quaint.2018.08.012>)
8. Walther, B.A., **Kunz, A.**, Hu, C.-S. (2018). Type and quantity of coastal debris pollution in Taiwan: A 12-year nationwide assessment using citizen science data. *Marine Pollution Bulletin* 135: 862-872. (<https://doi.org/10.1016/j.marpolbul.2018.08.025>)
9. Le Béon, M., Tseng, Y.-C., Klinger, Y., Elias, A., **Kunz, A.**, Surssock, A., Daeron, M., Tapponnier, P., Jomaa, R. (2018). High-resolution stratigraphy and multiple luminescence dating techniques to reveal the paleoseismic history of the central Dead Sea fault (Yammouneh fault, Lebanon). *Tectonophysics* 738-739, 1-15. (<https://doi.org/10.1016/j.tecto.2018.04.009>)
10. **Kunz, A.\***, Urban, B., Tsukamoto, S. (2017). Chronological investigations of Pleistocene interglacial, glacial and aeolian deposits from Schöningen (Germany) using post-IR IRSL dating and pollen analysis. *Zeitschrift der Deutschen Gesellschaft für Geowissenschaften* 168 (1), 81-104. (<https://doi.org/10.1127/zdgg/2016/0080>)
11. Wacha, L., Matoš, B., **Kunz, A.**, Lužar-Oberiter, B., Tomljenović, B., Banak, A. (2017). First post-IR IRSL dating results of Quaternary deposits from Bilogora (NE Croatia): Implications for the Pleistocene relative uplift and incision rates in the area. *Quaternary International* 494: 193-210. (<https://doi.org/10.1016/j.quaint.2017.08.049>)
12. **Kunz, A.\***, Walther, B.A., Löwemark, L., Lee, Y.-C. (2016). Distribution and quantity of microplastic on sandy beaches along the northern coast of Taiwan. *Marine Pollution Bulletin* 111(1), 126-135. (<https://doi.org/10.1016/j.marpolbul.2016.07.022>)
13. **Kunz, A.\***, Pflanz, D., Weniger, T., Urban, B., Krüger, F., Chen, Y.-C. (2014). Optically stimulated luminescence dating of young fluvial deposits of the Middle Elbe River Flood Plains using different age models. *Geochronometria* 41 (1), 36-56. (<https://doi.org/10.2478/s13386-013-0140-7>)
14. Spiske, M., Piepenbreier, J., Benavente, C., **Kunz, A.**, Bahlburg, H., Steffahn, J. (2013). Historical tsunami deposits in Peru: Sedimentology, inverse modeling and optically stimulated luminescence dating. *Quaternary International* 305, 31-44. (<https://doi.org/10.1016/j.quaint.2013.02.010>)

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15. Wu, T.-S., **Kunz, A.**, Jaiswal, M.K., Chen, Y.-C. (2012). A feasibility study on the application of luminescence dating for quartz from different rock types as a thermochronometer. *Quaternary Geochronology* 10, 340-344. (<https://doi.org/10.1016/j.quageo.2012.04.009>)
16. Urban, B., **Kunz, A.**, Gehrt, E. (2011). Genesis and dating of Late Pleistocene-Holocene soil sediment sequences from the Lüneburg Heath, Northern Germany. *E&G: Quaternary Science Journal* 60, 164-184. (<https://doi.org/10.3285/eg.60.1.01>)
17. **Kunz, A.\***, Frechen, M., Ramesh, R., Urban, B. (2010). Revealing the coastal event-history of the Andaman Islands (Bay of Bengal) during the Holocene using radiocarbon and OSL dating. *International Journal of Earth Sciences* 99 (8), 1741-1761. (<https://doi.org/10.1007/s00531-009-0507-4>)
18. **Kunz, A.\***, Frechen, M., Ramesh, R., Urban, B. (2010). Periods of recent dune sand mobilisation in Cuddalore, Southeast India [Phasen rezenter Dünenaktivität in Cuddalore, Südost-Indien]. *Zeitschrift der Deutschen Gesellschaft für Geowissenschaften* 161 (3), 353-368. (<https://doi.org/10.1127/1860-1804/2010/0161-0353>)
19. **Kunz, A.\***, Frechen, M., Ramesh, R., Urban, B. (2010). Luminescence dating of Late Holocene dunes showing remnants of early settlement in Cuddalore and evidence of monsoon activity in south east India. *Quaternary International* 222 (1), 194-208. (<https://doi.org/10.1016/j.quaint.2009.10.042>)

## **INVITED TALKS**

- 2020 “Microplastic pollution of the environment from a geoscience perspective“ – Department of Earth Sciences, National Central University, Taiwan.
- 2018 “Die Verschmutzung der Umwelt mit Mikroplastik und warum wir uns darüber Sorgen machen sollten. (The pollution of the environment with microplastic and why we should worry about it)” – German Institute Taipei (German Embassy in Taiwan).
- 2016 “The pollution of Taiwan’s beaches with microplastic: Ecological and environmental risks.” – National Taiwan University, Taiwan.
- 2016 “Distribution and quantity of microplastic on sandy beaches along the northern coast of Taiwan Island.” – The 17<sup>th</sup> APEC Roundtable Meeting on the Involvement of the Business/Private Sector in the Sustainability of the Marine Environment in Taipei, Taiwan.

## **MEDIA PRESENCE**

- 2020 Interview about microplastic pollution in Taiwan for the documentary “Plastic Planet” from Taiwanese Da’ ai TV. - Aired on July 12<sup>th</sup>, 2020.  
<https://www.youtube.com/watch?v=qLg8JBF3rd0>
- 2019 Interview for Radio Taiwan International (RTI) about the microplastic pollution of the Tamsui River. – Aired on October 13<sup>th</sup>, 2019.

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<https://de.rti.org.tw/radio/programMessageView/id/101543>

2018 Interview for Radio International Taiwan (RTI) about the microplastic pollution in Taiwan. Aired on August 25<sup>th</sup>, 2018.

<https://de.rti.org.tw/radio/programMessageView/id/54779>

2018 Interview for a documentary from Taiwanese SET News Channel (三立新聞) about the plastic pollution in Taiwan. - Aired on July 21<sup>st</sup> and 22<sup>nd</sup>, 2018.

<https://www.youtube.com/watch?v=0Au7D2Bj7Mc>

2017 Interview for the article “無所不在的海洋微塑膠入侵記” (The ubiquitous marine microplastic invasion) in the Taiwanese newsmagazine 報導者 The Reporter. – Published on February 9<sup>th</sup>, 2017.

<https://www.twreporter.org/a/taiwan-ocean-waste>