

Wrecks in Transition

Monitoring of shipwreck transformation processes using Structure from Motion

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Abstract

In the 18th and 19th centuries, wooden barges, the so-called “Kaffenkähne”, were particularly essential for the transport of building materials, food and other goods within the Mark Brandenburg. They are also an integral part of the contemporary cityscape of Berlin. The few well-preserved witnesses of the Wilhelminian era or “Gründerzeit” are now lying on the bottom of lakes and rivers. At least ten such boats are located in the Werbellinsee in the district of Barnim in Brandenburg. According to our current knowledge, they all date into the 19th century. Since 2007, the shipwrecks are documented and researched by the association Kaffenkahn e.V.

In the last ten years, especially those wrecks have been systematically documented, which lie in a depth of up to 25 m and are therefore easily accessible for divers. In particular, the application of the Structure from Motion method and the use of orthophotos makes the massive and rapid changes to the shipwrecks visible. On the one hand, these changes can be attributed to a changed ecosystem due to immigrant species. On the other hand, looting was noted, which was rarely noticed before the systematic documentation and could only be reported to the responsible authorities in individual cases. Using the example of the so-called ZIEGELWRACK, the importance of an annual monitoring of shipwrecks is shown in order to document the natural and anthropogenically influenced decay of the historic wrecks. The results of our monitoring in the years from 2012 to 2019 have shown that the physical structure has already changed dramatically over the past seven years of observation. In addition to the loss of individual components, such as frames or planks, the theft of bricks, that is parts of the cargo, can be observed. Furthermore, the entire wreck is overgrown with shells that have a strong impact on the appearance and decay process of the shipwreck.



Fig. 1. Condition of the shipwreck ZIEGELWRACK in 2012 (© Kaffenkahn e.V.).



Fig. 2. Condition of the shipwreck ZIEGELWRACK in 2019 (© Kaffenkahn e.V.).

References

- Reinfeld, M. (2018). ‘Forschung vor der Haustür. Die Pfahlbauten und Kaffenkähne im Werbellinsee’, in Schiller, B. and Müller, K. (eds.) *Von Kreta nach Kuba. Gedenkschrift zu Ehren von Veit Stürmer*. Berlin: Logos, pp. 469-482.
- Reinfeld, M. and Knepel, G. (2016). „Und wenn jetzt ein goldenes Schiff den See herunter käme ...“ Unterwasserarchäologische Forschungen an den Kaffenkähnen im Werbellinsee, in Biermann, F. and Heußner, K.-U. (eds.) *Studien zur Archäologie Europas 28: Historische Gewässernutzung im nordostdeutschen Gebiet*. Bonn: Habelt, pp. 297-307.

Sohn, M. (2013). *'Kaffenkähne. Eine vergangene Binnenschiffsform'*. Hennigsdorf: Eigenverlag Sohn-Art.