

Sediments in Gulf of Naples reveal impact on Roman water distribution after Vesuvius eruption

May 17 2016, by Bob Yirka



Painting by Joseph Mallord William Turner (between 1817 and 1820) Vesuvius in Eruption, watercolor. Credit: Yale Center for British Art.

(Phys.org)—A team of researchers with members from France, the U.S., the U.K. and Italy has found evidence of disruptions to the water delivery system in the area around Naples after the eruption of Mount Vesuvius in AD 79. In their paper published in *Proceedings of the National Academy of Sciences*, the team describes their testing of sediment cores taken from the harbor at Naples, what they found and what their study has revealed about the history of the area.

To bring water to cities, the early Romans built vast waterworks systems using aqueducts and lead pipes—the water that was delivered, unbeknownst to the Romans, contained some amount of lead which in addition to making its way into the bodies of those who drank it, also made it into the ground or other [water systems](#) via sewage. In the case of the cities and towns around Naples, sewage was piped to certain locations where it was dumped directly into the harbor which resulted in sediment build up, some of which contained lead particles. Modern researches studying [sediment cores](#) can analyze the different layers of sediment and note the different amounts of lead in it and the differences in the types of lead, which can offer information about the amount of water brought into the system, and in this case, the changes to the system that came about.

In studying their sediment core samples taken from the harbor, the researchers found marked changes in [lead particles](#) immediately after Mount Vesuvius erupted, likely, they suggest, because the eruption either clogged pipes, or destroyed some of the [water delivery](#) system. Differences in [isotopic composition](#), they noted suggested lead pipes had been brought in from different locations to replace those that had been damaged. They noted also that the original water system had remained in place for approximately 15 years after the eruption before it was finally replaced. The team also found evidence of a continually expanding water system until approximately the fifth century, when natural disasters and invasions led to a sharp decline in upgrades.

The researchers suggest their techniques could be used in other parts of the world, not just the area once covered by the Roman Empire—to better understand population changes, or other events that had an impact on the people that lived there.

More information: Hugo Delile et al. A lead isotope perspective on urban development in ancient Naples, *Proceedings of the National Academy of Sciences* (2016). [DOI: 10.1073/pnas.1600893113](https://doi.org/10.1073/pnas.1600893113)

Abstract

The influence of a sophisticated water distribution system on urban development in Roman times is tested against the impact of Vesuvius volcanic activity, in particular the great eruption of AD 79, on all of the ancient cities of the Bay of Naples (Neapolis). Written accounts on urbanization outside of Rome are scarce and the archaeological record sketchy, especially during the tumultuous fifth and sixth centuries AD when Neapolis became the dominant city in the region. Here we show that isotopic ratios of lead measured on a well-dated sedimentary sequence from Neapolis' harbor covering the first six centuries CE have recorded how the AD 79 eruption was followed by a complete overhaul of Neapolis' water supply network. The Pb isotopic signatures of the sediments further reveal that the previously steady growth of Neapolis' water distribution system ceased during the collapse of the fifth century AD, although vital repairs to this critical infrastructure were still carried out in the aftermath of invasions and volcanic eruptions.

© 2016 Phys.org

Citation: Sediments in Gulf of Naples reveal impact on Roman water distribution after Vesuvius eruption (2016, May 17) retrieved 19 April 2024 from <https://phys.org/news/2016-05-sediments-gulf-naples-reveal-impact.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.