

# Harbor sediment core samples offer historic evidence of ancient Rome's plumbing

August 29 2017, by Bob Yirka

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A small team of researchers from France and the U.K. has found evidence of lead pipe construction by the early Romans in soil samples taken from harbors near ancient Rome. In their paper published in

*Proceedings of the National Academy of Sciences*, the group outlines their study, which included extracting core samples from Ostia and Portus harbors and analyzing them.

The ancient Romans were well known for their water management techniques. Many of the aqueducts they built to carry water from nearby mountains to Rome still remain today. But the Romans also developed innovative techniques to distribute the water once it reached the city and for carrying sewage from the city to nearby ocean harbors for dumping. Prior research has shown that the [water](#) was carried by terracotta or wooden pipes during some time periods. But there was also a period when lead pipes were used, and the researchers with this new study have found further evidence of them.

To find evidence of the lead pipes, the researchers drilled down into 177 sites at the nearby Ostia and Portus harbors, pulling [sediment](#) samples from each. They then carbon dated the cores and subjected them to chemical analysis. In so doing, they were able to date the various layers of sediment in the harbor and the amount of lead in each.

The team reports that lead levels in the sediment spiked at around 200 B.C. and remained high until around 250 A.D. This, they suggest, indicates that lead pipes used by the Romans were the likely source of the lead contaminants in the harbor soil. Their assessment also suggests that the Romans began using lead piping approximately 150 years earlier than prior studies have shown. The timing of introduction of lead piping would then have come approximately 150 years after the Romans began using the aqueduct system. They note also that the timing of the reduction of lead levels in the sediment coincides with the empire's Imperial period—a time during which civil wars were raging, making it impossible to maintain the extensive plumbing system.

The findings are expected to offer insight into the timeline of events in

ancient Rome, and perhaps establish whether the use of the pipes resulted in lead poisoning among the people of the city, including its leaders.

**More information:** Hugo Delile et al. Rome's urban history inferred from Pb-contaminated waters trapped in its ancient harbor basins, *Proceedings of the National Academy of Sciences* (2017). [DOI: 10.1073/pnas.1706334114](https://doi.org/10.1073/pnas.1706334114)

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