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### Identification of historical lead sources apportionments in estuary sediments from atmospheric aerosols/ NSW/Australia

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## Identification of historical lead sources apportionments in estuary sediments from atmospheric aerosols/ NSW/Australia

### Abstract

Abstract of a poster that presented at the IAC2014 conference.

### Disciplines

Medicine and Health Sciences | Social and Behavioral Sciences

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Y. M. Alyazichi, B. Jones & E. McLean (2014). Identification of historical lead sources apportionments in estuary sediments from atmospheric aerosols/ NSW/Australia. presented at the IAC2014: International Aerosol Conference, Busan, Korea, 28 August - 2 September.

## Identification of historical lead sources apportionments in estuary sediments from atmospheric aerosols/ NSW/Australia.

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Keywords: pollution, lead isotope, marine sediments and atmospheric aerosols

X-Ray fluorescence and stable lead (Pb) isotopic analyses have been determined in surface sediments from urbanized areas in south of Sydney, NSW, Australia. The main objective of this investigation was to determine the histologic record of Pb pollution. Surface and subsurface sediment samples were collected in the study areas. The concentration of lead varied from site to site in the study areas depending on several factors, such as number of discharge points (storm water), population, sediment particles (sand, silt and clay), grain size and mineral composition. The isotope composition found in the sediment samples, expressed here as  $^{206}\text{Pb}/^{204}\text{Pb}$ , is relatively constant at 18.1 at a depth below 35 cm, whereas, the lead isotope declined with decreasing depth. These results are corresponded with increased lead concentration within surface sediment (Fig. 1).

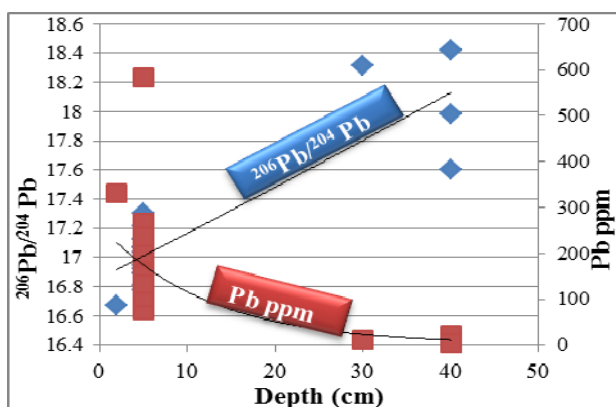


Figure1. Pb concentration and variations of  $^{206}\text{Pb}/^{204}\text{Pb}$  ratio with sediment depth of study areas. Where:G, introduction of lead gasoline-air.

In addition, the lead isotope ratio of Botany Bay and Port Hacking sediment samples is represented by  $^{207}\text{Pb}/^{206}\text{Pb}$  vs.  $^{208}\text{Pb}/^{206}\text{Pb}$  in (Fig.2). The lead isotope ratio of the surface samples lies with and above some samples roof dust samples Chiaradia *et al.* (1997), and below Broken Hill, Mt Isa (the old lead deposited in Australia) and gasoline-air (Gulson, 1986). The lead isotope ratio of the subsurface sediment samples (background) of the study areas was below that of other samples, except the Lake Illawarra samples, which had isotope ratio of 2.1 and 0.85 of  $^{208}\text{Pb}/^{206}\text{Pb}$  and  $^{207}\text{Pb}/^{206}\text{Pb}$  respectively.

As indicated by these figures the isotope ratio has increased with time since European settlement.

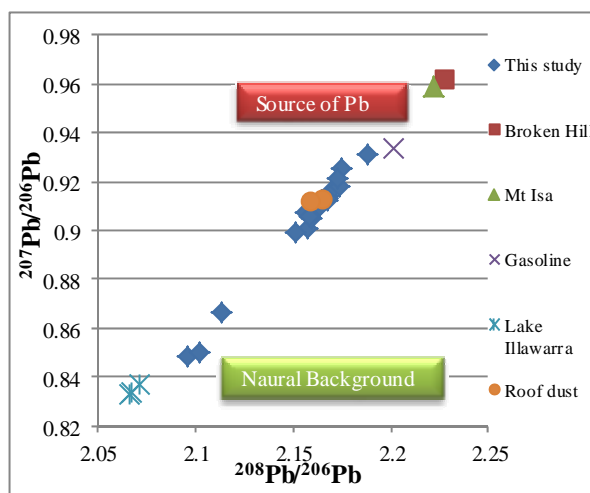


Figure2.  $^{207}\text{Pb}/^{206}\text{Pb}$  vs.  $^{208}\text{Pb}/^{206}\text{Pb}$  plot for sediment samples from study areas compared with other locations.

The source of lead concentration is derived from atmospheric aerosols from consumption gasoline (cars and boats).

### Acknowledgements

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