

## Lead isotopes and heavy metal concentrations in Galveston Bay, TX

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### Galveston Bay Industrial Pollution

Galveston Bay, Texas is an anthropogenic estuary where industrial runoff, wastewater, and shipping vessel oil enter the bay via incoming freshwaters. These freshwaters can contain heavy metals, either dissolved in the waters or sorbed onto inflowing sediments, which can be toxic for pelagic and benthic communities in the bay [1]. Because lead (Pb) isotopes do not undergo detectable fractionation in the natural environment, each Pb source possesses a unique isotopic composition by which it can be traced [2]. Galveston Bay surface sediments have been analyzed for both Pb isotopes and heavy metal concentrations to identify heavy metal pollution hotspots, understand pollutant mobility, and constrain pollutant sources and fluxes. During sediment analysis all samples underwent a leaching procedure to distinguish leachable pollutant Pb from residual non-pollutant Pb [3]. Preliminary Pb isotope data from leached Galveston Bay sediments show that leachates fall within the range of previously reported Pb isotopic values for North American coal, similar to pollutants expected from Houston area industries, while residues lie within the Pb isotopic range of marine sediments [4, 5]. These results indicate that pollutant Pb is present in Galveston Bay sediments and may pose a risk to biota within the bay.

[1] Tchounwou *et al.* (2012) *Mol. Clinl. & Env. Toxicol.* **101**, 133-164. [2] Komarek *et al.* (2008) *Env. Intl.* **34**, 562-577. [3] Berger *et al.* (2002) *Jour. Geophy. Res.* **113**, 1-16. [4] Chow & Earl (1972) *Science* **176**, 510-511. [5] Sun (1980) *Phil. Trans. R. Soc. Lond.* **297**, 409-445.