Evidences of Arsenic Accumulation in Soils through Irrigation in Maricopa County, AZ

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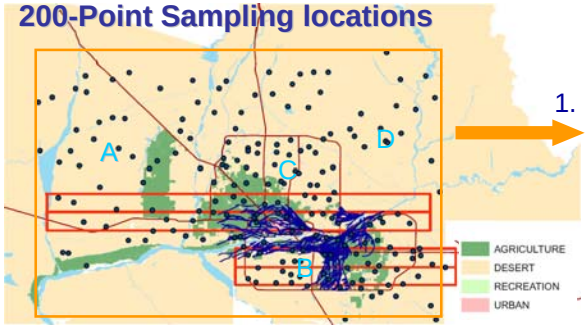

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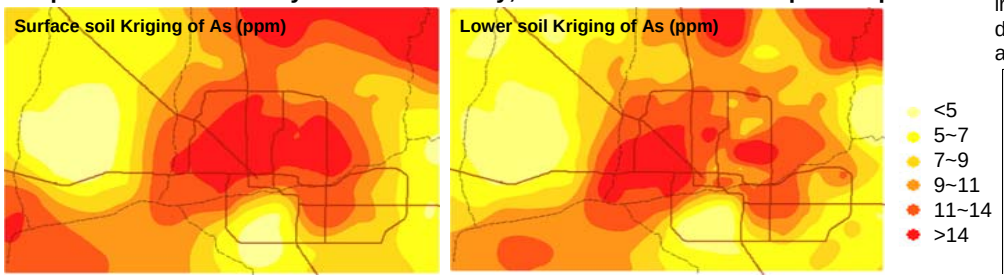

1) Arsenic distribution after Kriging shows overlaps with the agricultural land of 1934 above, for both surface and lower soils. 2) 200 point samples within the two red boxes are compared with the geographic location of rivers at the middle line of the box. There is elevation of As on top of agricultural land, not necessarily near the rivers and canals. 3) Bedrock sample concentrations in ppm (square) are consistent with surrounding 200 point samples (round). The slightly high arsenic in the north of the agricultural land is from natural origin.

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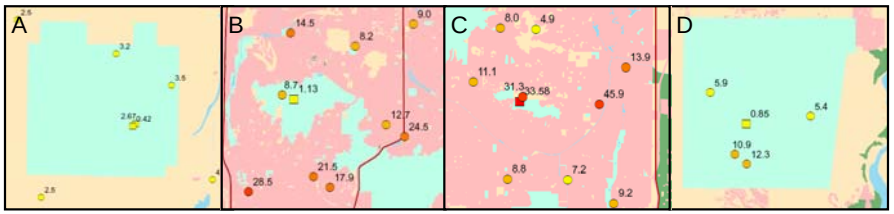

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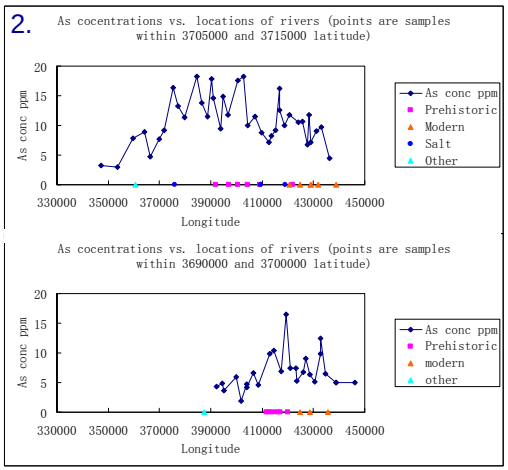
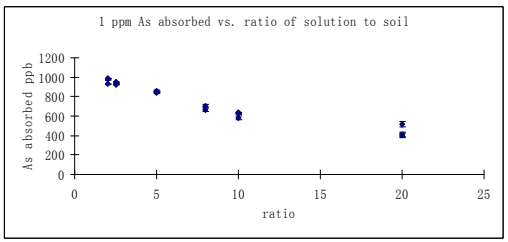
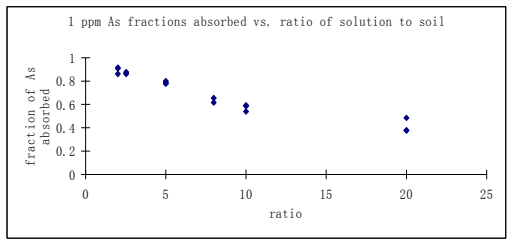
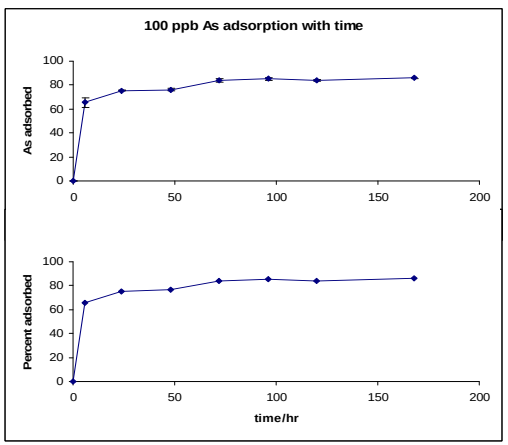
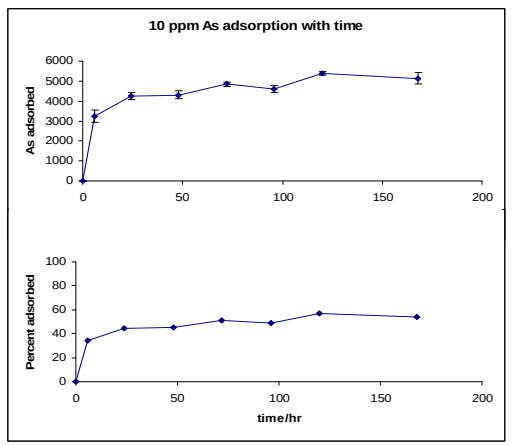






Three duplicates are tested with different water to soil ratios and 5:1 (50 ml water and 10 g soil) is selected.





Arsenic absorption is fast at the first 24 hours, and lows down. 6 days is chosen for the completion of reaction.

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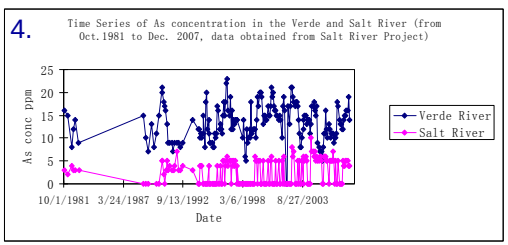

Soil samples from Papago Park and South Mt. with no irrigation history were added to arsenic solutions of different concentration for 6 days, at 0.01$NaNO_3$ and pH around 7. Strong absorption were observed.

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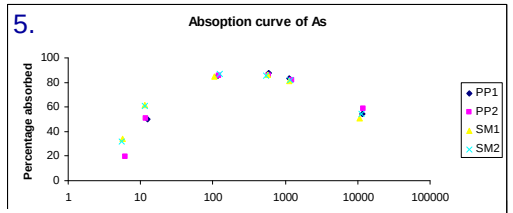

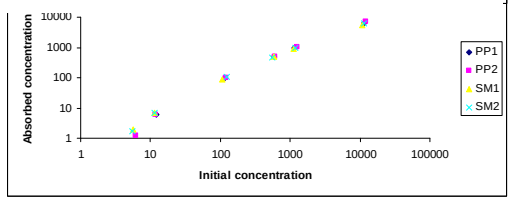

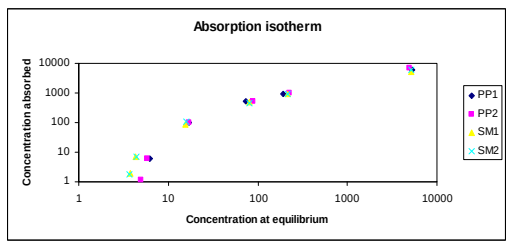

After absorption tests, soil samples were grouped into two sets, one dried in oven at 60°C(1), the other at room temperature (2). One week later both solutions were leached with 0.01M $NaNO_3$ solution for 2 hours to simulation event of rain or irrigation.

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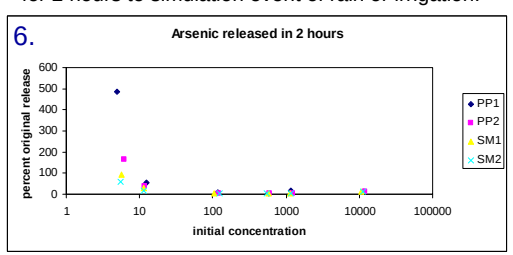

4) The Verde River has high concentrations of As (**18ppb from samples from Cottonwood and Camp Verde**) and comparable discharge every year. 5) There is strong absorptions of arsenic by the local soil samples from 10ppb and above. 6) High temperature might have slightly changed the surface binding of arsenic and soil.