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IAEA

International Atomic Energy Agency

**International Symposium on Isotopes in Hydrology,
Marine Ecosystems, and Climate Change Studies**

***^{210}Pb -derived reconstruction of
environmental changes in Amatique
Bay, Guatemala***

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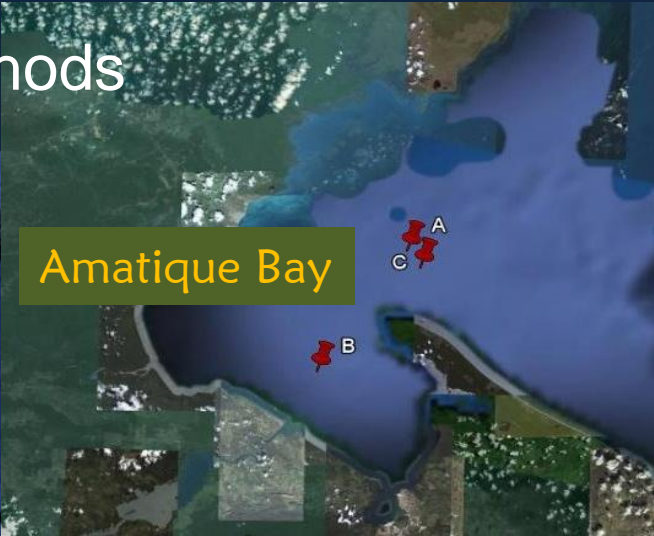
The Wider Caribbean Region



A=Havana Bay, B=Coatzacoalcos River,
C=Amatique Bay, D=Cortés Harbor,
E=Bluefields Bay, F=Portete Bay,
G=Almirante Bay, H=Cartagena Bay,
I=Cariaco Gulf, J=Kingston Bay,
K=Prince Harbor, L=Haina Bay

Sampling site	Core	Latitud N	Longitud W	Depth (m)	MAR (g cm ⁻² y ⁻¹)	C _{org} (%)	C/N
Havana Bay, CUB	BI	23° 08'	82° 20'	8.00	0.06-0.43	1.35-8.07	21-50
Port-au-Prince Bay, HAI	AI	18° 33'	72° 21'	14.00	0.03-0.44	1.06-2.72	14-32
Bluefields Bay, NIC	AI	11 53'	83 45'	1.50	0.10-0.63	0.94-2.22	13-24
Cortes Bay, HON	BI	15° 48'	87° 58'	9.00	n.a.	1.44-2.07	13-20
Cartagena Bay, COL	EI	10° 21'	75° 31'	10.00	0.50-1.09	1.81-3.78	11-17
Almirante Bay, PAN	CI	9 17'	82° 23'	6.00	0.04-0.23	1.80-5.95	7-17
Kingston Bay, JAM	AI	17 58'	76° 46'	14.00	n.a.	1.74-4.33	10-15
Amatique Bay, GUA	BI	15° 54'	88° 42'	20.00	0.03-0.21	0.90-1.70	8-15
Coatzacoalcos River, MEX	AIII	18 14'	94° 27'	25.00	0.69-0.79	0.18-0.70	6-15
Cariaco Gulf, VEN	AI	10° 28'	63° 41'	12.00	0.04-0.39	3.65-4.81	11-13

Sampling and sample preparation methods



Sampling date
6 May 2009

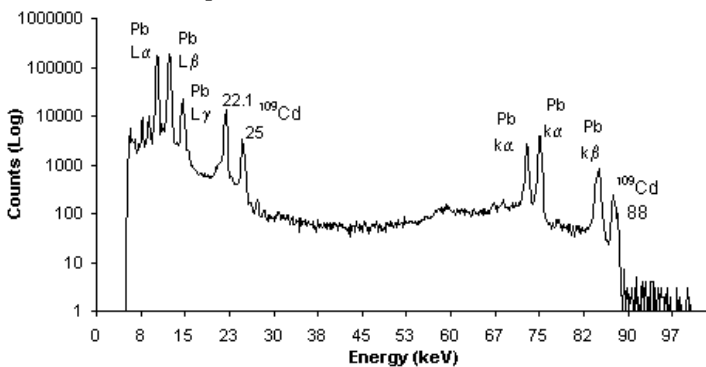
Core selection: LOI – (550 °C, 4 h) (OBIMAR-GUA)



Nuclear techniques to support coastal management

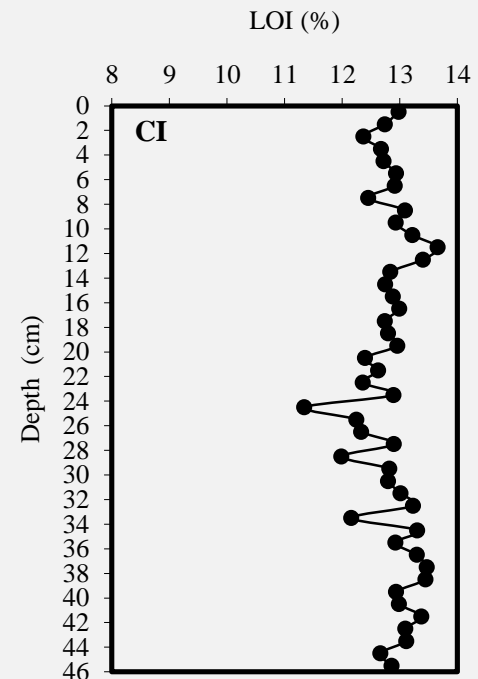
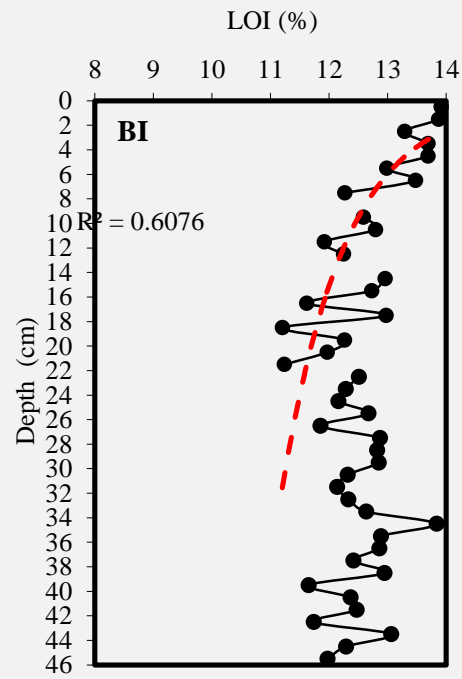
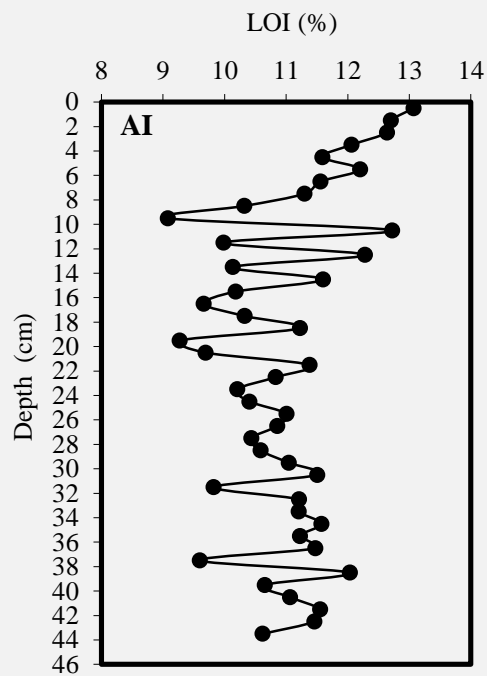


X-Ray Fluorescence of Lead from ^{109}Cd

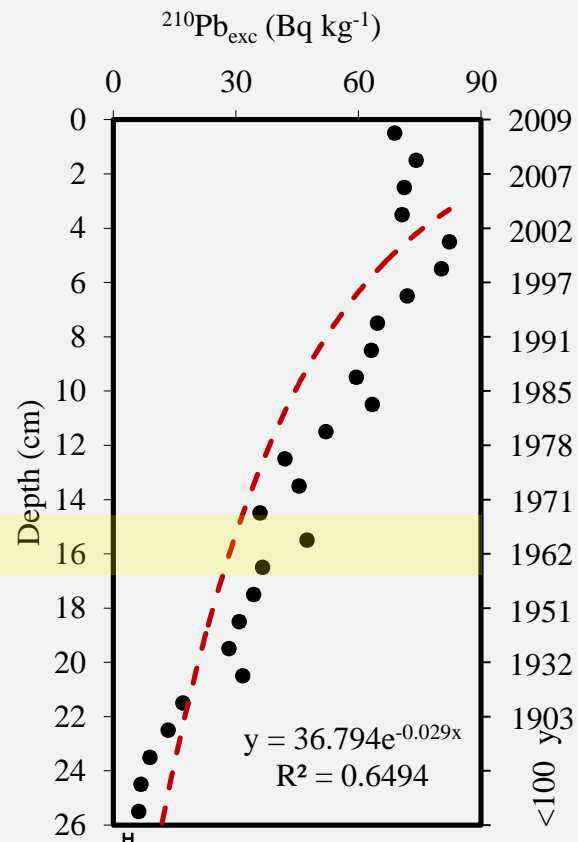
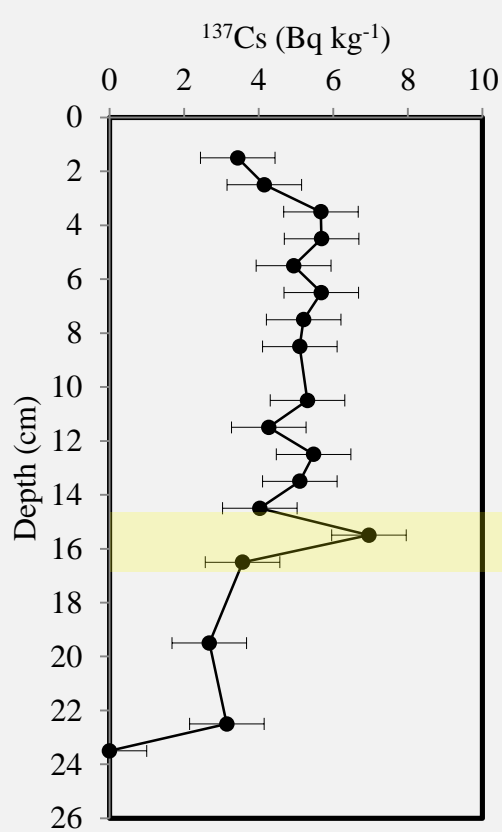


Dating of recent sediments: ^{210}Pb - α -spectrometry (ICMyL-MEX); ^{137}Cs - γ -spectrometry (CEAC-CUBA)
Trace elements: XR-fluorescence (MONACO)
Nutrients: C_{org} , N_{org} – CHN analyzer (ICMyL-MEX)

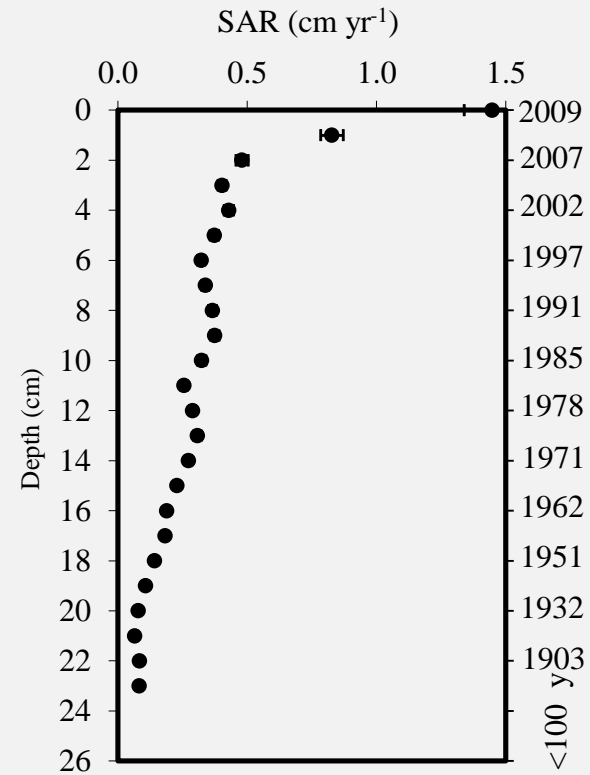
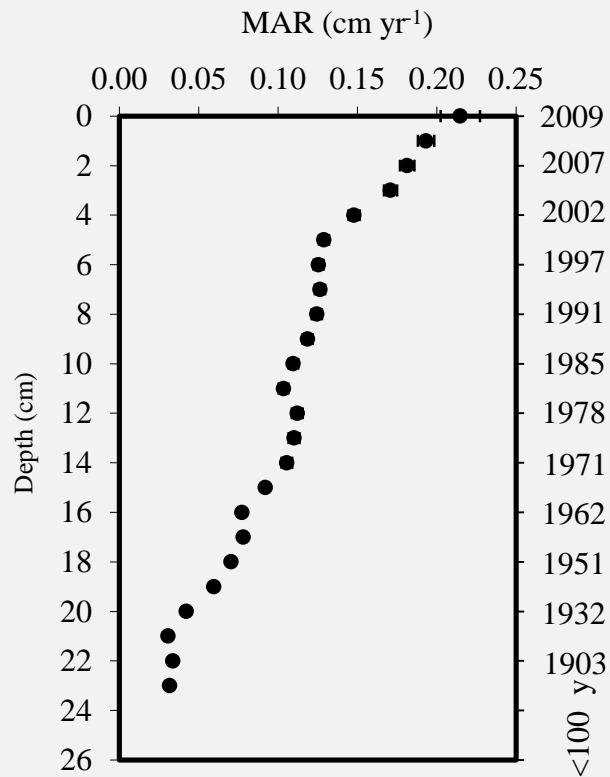
Amatique Bay (core RLA7012-B1)



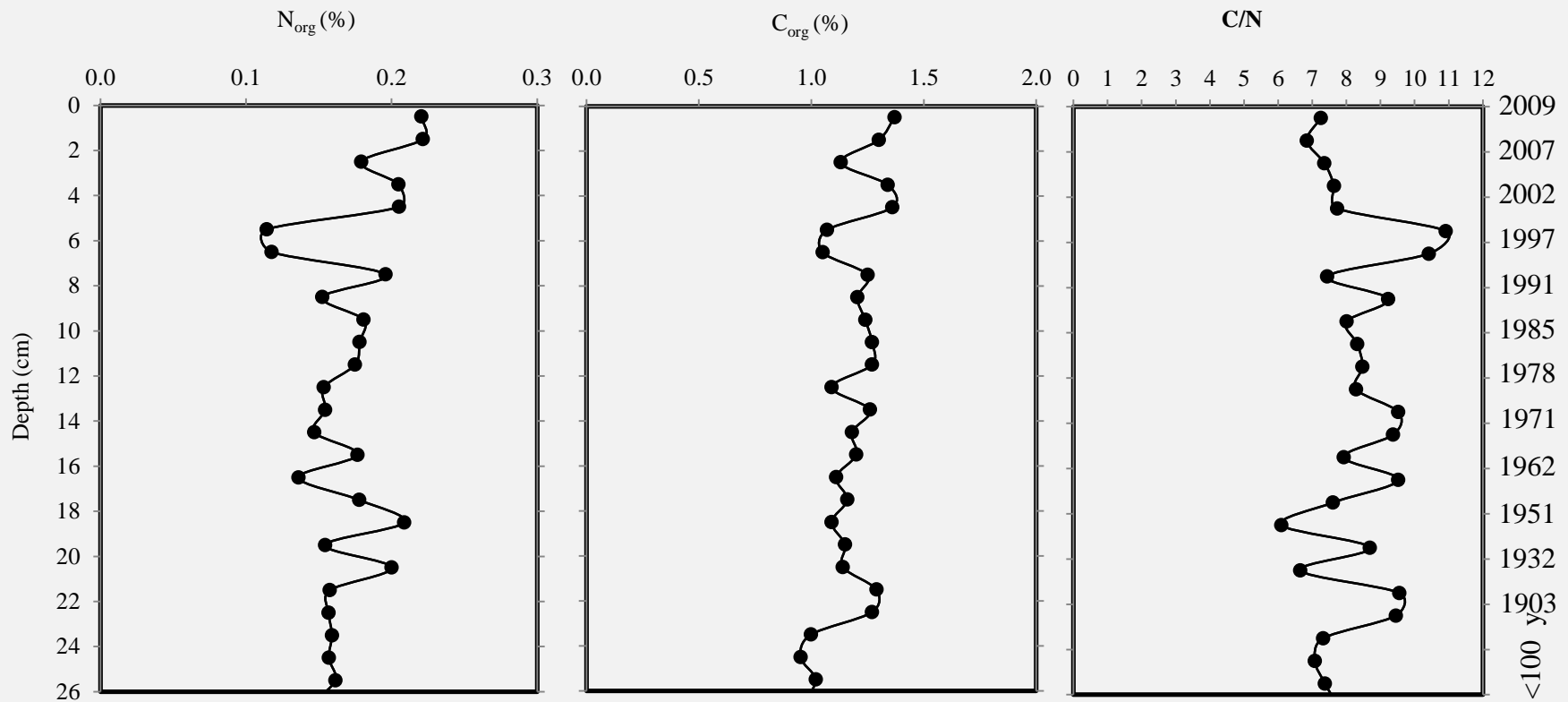
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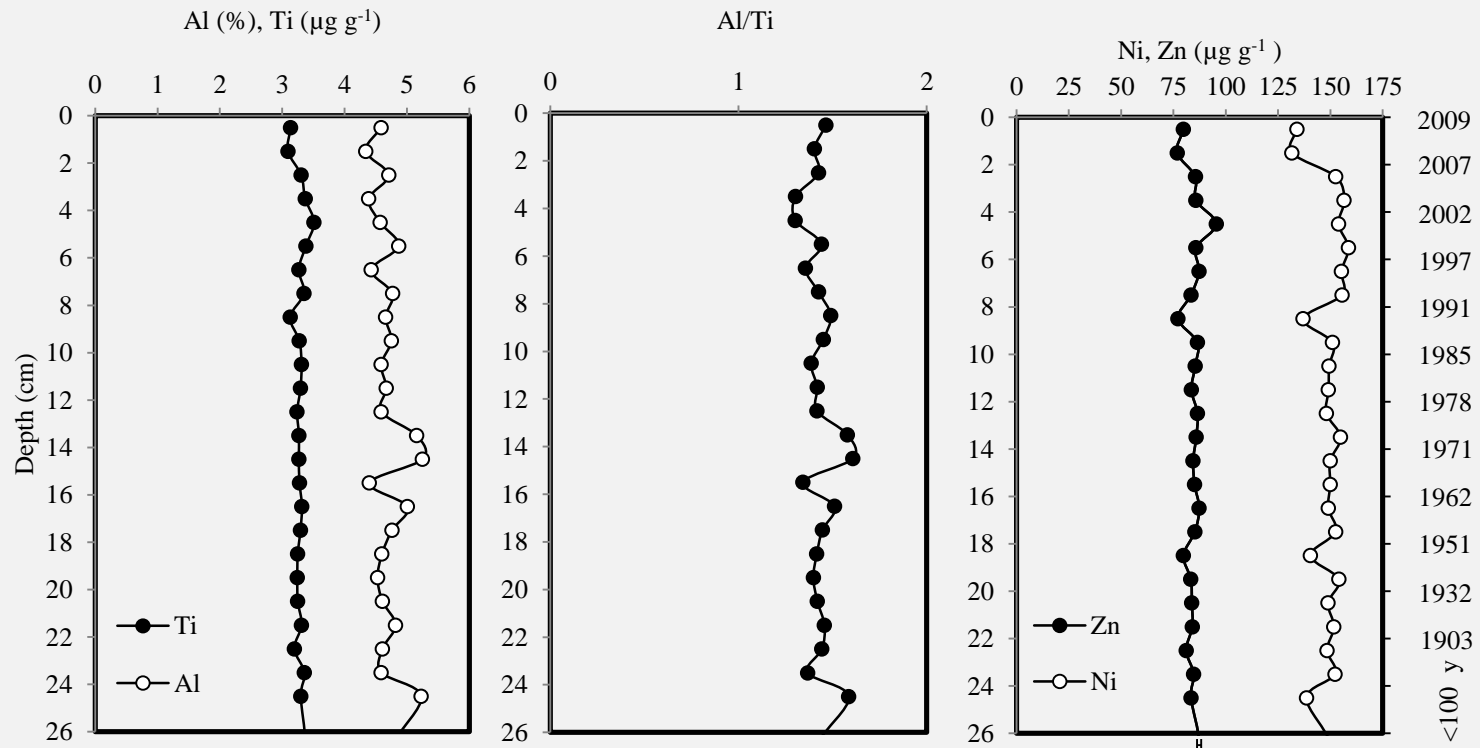


Amatique Bay (core RLA7012-B1)



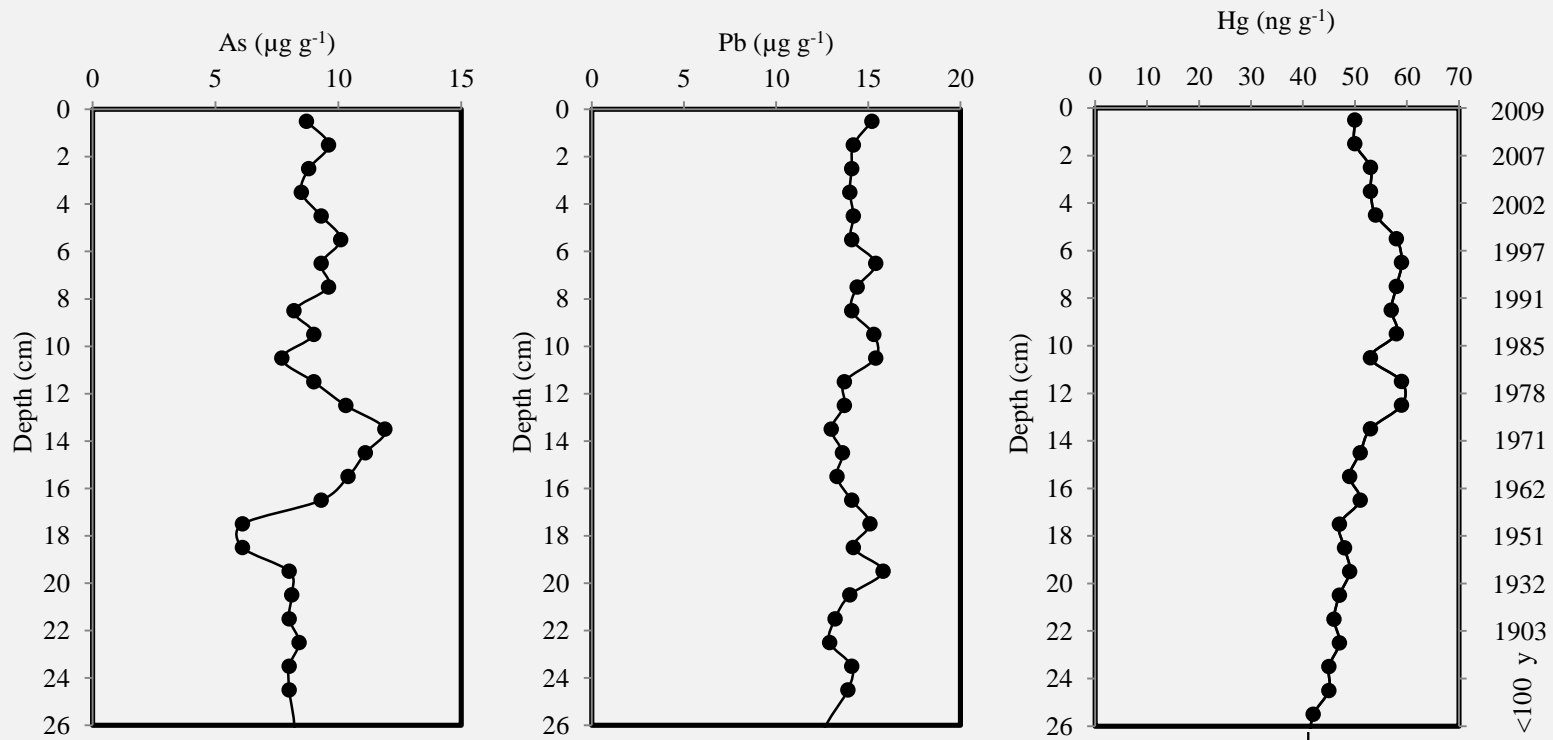
Significant correlation between C_{org} and N_{org}

Amatique Bay (core RLA7012-B1)

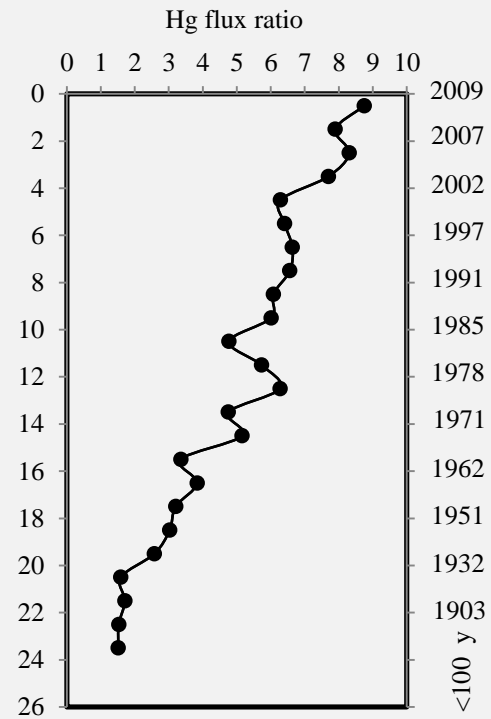
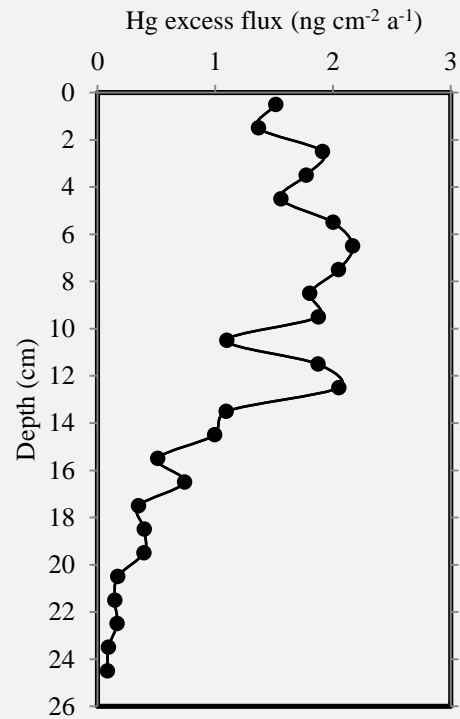


Zn and Ni are significantly correlated with Ti ($P < 0.05$)

Amatique Bay (core RLA7012-B1)



Amatique Bay (core RLA7012-B1)



Conclusions

1. Amatique Bay sediment record showed signs of increasing sediment accumulation rates, starting from the decade of 1920s, and more conspicuously after year 2000, most likely as a result of the urban growth in the surroundings of the bay, fostered by the development of the commercial and tourism activities at Livingston, Santo Tomas Barrios.
2. Geochemical indexes (such as C/N and Al/Ti ratios) have indicated that the sediment source is stable; with organic carbon showing terrigenous pulses and that most trace metals are the result of terrigenous contribution.
3. As, Hg and Pb have cannot be related to terrigenous supply and further analysis are still ongoing to elucidate their origin.



In the name of the RLA/7/012 family, many thanks for your attention!