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Hydrology and Earth System Sciences
Discussions

Interactive comment on "A conceptual model of organochlorine fate from a combined analysis of spatial and mid/long-term trends of surface and ground water contamination in tropical areas (FWI)" *by* Philippe Cattan et al.

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Dear authors,

I think this paper is of good quality and contributes significantly to the understanding of the environmental fate of CLD on the island of Martinique. However, I have a few comments (see below) that should be addressed in order to make the paper easier to read and understand.

General comments:

1) The word "residence time" is somewhat vague. Please specify at first mention what is exactly meant (e.g. mean transit time). 2) You mention in l. 432 that the 5bCLD/CLD ratio in the commercial product Curlone was 0.0011. How was the ratio in the product Kepone that was applied before? Was the 5bCLD/CLD ratio in the commercial products constant over time, or did it vary between batches of the same product? 3) Can your findings / model be extrapolated to other CLD-contaminated areas in the Antilles, notably the island of Guadeloupe?

Specific comments:

Abstract:

4) p. 1, l. 28: "old geology": I know what you mean, but maybe "old geological substrates" or "old geological formations" would be more appropriate? 5) p. 1, l.29: "theoretical leaching model": maybe "conceptual leaching model" (as in the manuscript title)

Introduction:

6) p. 2, l. 64-65: "acute" and "environmental" are not opposites; better use "chronic" instead of "environmental" (exposure via the environment can be acute or chronic) 7) p. 2, l. 69: "partitioning coefficient (Koc) between the sorbed part on soil organic matter": not comprehensible → needs to be rephrased 8) p. 2, l. 71: "contrasting residence times": What residence times: of water or of CLD?

Materials and Methods:

9) p. 3, l. 111-112: "ferralitic soils (latosols) → ferralsols": What is the difference between the two? The WRB system contains the reference soil groups ferralsols and plinthosols, but not "ferralitic soil (latosols)". 10) p. 6, l. 213: "measurable": maybe more precisely "quantifiable", since it refers to the LOQ 11) p. 6, l. 215: "data item" (or data point): How is this defined? Unique combination of water sample and compound? 12) p. 6, l. 230: eq. 1: explain the indices (i, j, k, l, m, t) 13) p. 6, l. 234: "totally

correlated": express more precisely 14) p. 6, l. 241: "dispersion indices": How can this quantity be interpreted? 15) p. 6, l. 242: "confidence coefficient": What is this? 16) p. 6, l. 248: "Sen trends": What are Sen trends, and what do they mean statistically? (Explain in 1 or 2 sentences.) 17) p. 8, l. 258-262: What are the dimension and unit of the lixiviation rates TCLD and T5bCLD? This does not become entirely clear from eq. 6 because of the various unit conversion factors. I end up with the unit 1/year.

Results:

18) p. 8, l. 279-281: It should be mentioned here how high the ratio 5bCLD/CLD was in the commercial products that were applied, and whether it was constant over time. 19) p. 9, l. 324-325: "shorter residence times were observed for more recent formations": (Are you referring to GW only or also to SW?) This is interesting. I would rather have expected the opposite. Can you briefly explain why hydraulic residence times (mean transit times?) are shorter in the younger geological formations of Martinique than in the older ones? 20) p. 10, l. 344: "water CLD contents below the detection limit appeared less frequently": meaning not entirely clear → rephrase 21) p. 10, l. 384: unit for bulk density is missing 22) p. 13, l. 457: "unweathered formations favour rapid transfers"; Why is that? (cf. comment on l. 324-325) 23) p. 13, p. 468: "we cannot assess it": Assess what?

Conclusions:

24) p. 13, 507-508: "This led to implications regarding where and how to act to reduce impacts": Can you elaborate on this further? Is there really anything that can be done except waiting for CLD to degrade and leach from the system?

Figures:

25) Figure 3: The figure is neat, but too small for reading the legend or for identifying much on the map. → upscale 26) Figure 4: y-axis: The numbers are difficult to interpret. Try lg or non-logarithmised numbers instead of ln. 27) Figure 4: give the unit of

formation age (million years) directly in the figure (e.g. 1.0-0.3 Ma) 28) Figure 6: too small, needs upscaling (if it takes too much space after upscaling, consider shifting it to a SI section). 29) Figure 7: If one doesn't know what Sen trends are, the figure is not understandable.

Tables:

30) Table 2: Table header needs to be rephrased to improve understandability.

Best regards,

Stefan Reichenberger

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