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Interactive comment on "Modelling origin and transport fate of waste materials on the south-eastern Adriatic coast (Croatia)" *by* M. Tudor and I. Janeković

Anonymous Referee #1

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GENERAL COMMENTS

This study investigates the reasons for a severe waste pollution of the southeastern coast of Croatia in late November 2010. This may be very interesting for the model reconstruction. The results of modeling may be useful for cleanup activity. The topic fits into the scope of Ocean Science. However, the main hypothesis should be additionally justified. The main question is why do you neglect the contribution of Buna-Bojana and the Montenegro coast to the waste flux? Introduction of the manuscript lacks the review of marine litter modeling. The study does not include the description of numerical drifter experiment. Field data are not well structured. Part of them can be omitted. The manuscript needs English editing. Since the subject of the study

is very interesting and the approach is valuable, I recommend major revisions before publishing the manuscript in Ocean Science.

SPECIFIC COMMENTS

1. p. 2939: Title does not correspond well to the main hypothesis, it should be specified, for example as “Modelling the possible waste origin and transport from the Albanian coastline to the south-eastern Adriatic coast (Croatia)”

2. p. 2940, L-4: Reference should be inserted.

3. p. 2940, L-12: Specify, how many hypotheses are tested? Here is one but on page 2941, at line 16, there are two.

4. p. 2940, L-19: Reference should be inserted.

5. p. 2940, L-22: “The heaps of waste were composed mostly of plastic packages, glass bottles, clothes and other typical floating municipal garbage while labels suggested that it’s origin is Albania” – Albanian labels found do not indicate that all waste originated from Albania.

6. p. 2940, L-24: Formally, Albania is not Croatian neighbour country.

7. p. 2941, L-1: Reference should be inserted.

8. p. 2941, L-3-10: Review of modeling floating debris should be extended.

9. p. 2941, L-16: How many hypotheses are tested? On page 2940, at line 12, there is one but here there are two.

10. p. 2941, L-25: “Bathymetry varies over three orders of magnitude” This phrase is not correct because the depths count from zero.

11. p. 2941, Section 2.1 is not well structured because geography, orography, climatology are mixed without any order with atmosphere state and currents.

12. p. 2944, L-6-7: Why do you write about rain-gauge measurements in Italy and

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Greece but do not writhe about the measurements in Albania?

13. p. 2944, L-8: Why do you not write about the Albania rivers?

14. p. 2944, L-15: How do you use AOT?

15. p. 2944, L-19: Why do you put the meteorological model into 2.2 DATA Section?

16. p. 2945, L-3: What does NWP mean?

17. p. 2945, L-26: What does ROMS mean?

18. p. 2946, L-11: AREG has approximately 2.2 km resolution. Then, what is a reason for using ROMS at 2 km resolution?

19. p. 2946, L-12: What is ROMS temporal resolution?

20. p. 2946, L-21: If you use CRR, what for do you need PC?

21. p. 2947, L-2: Events E2, E3, E4 shown in Fig.2 are based on the rain-gauge measurements. What for do you use PC, CRR and TRMM rainfall data?

22. p. 2947, L-17-18: Are the Northern Italy rainfall and the rainfall over the Northern Adriatic important for your study?

23. p. 2947, L-26: Sahara dust is not related to your study.

24. p. 2948, L-5: How do you use PC and CRR for your study?

25. p. 2949, L-8: “Based only on the previous analysis it turns out that E3 episode was the one when intensive rainfall occurred over Albania and was the most likely event that triggered a flash flood” As Fig. 2 and 4 indicate, intensive rainfall occurred also over Montenegro.

26. p. 2949, L-28: “Those measurements suggest that the event (E3) from 8 till 10 November 2010 was capable of flushing the waste material into the Adriatic Sea” The sources of the waste can originate from the Buna-Bojana and Drin watershed.

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27. p. 2950, L-2: “Ocean model results show” Reference to Fig. should be inserted.

28. p. 2950, L-9: “that strengthened the north-west current” In which area?

29. p. 2950, L-11: Section Numerical drifter trajectories: Before this Section, description of setup of numerical experiment should be inserted. You should explain, how you calculate drifter trajectories, write the governing equations. What do you mean saying accumulation, deposition and so on?

30. p. 2952, L-10-11: “Those dates were the most commonly reported as the onset of severe pollution at the Croatian coast” Reference should be inserted.

31. p. 2952, L-22: “There is ambiguity . . .” Your study is based on the results of spin-up simulations, which are very sensitive to initial conditions. But your justification of initial location of the waste sources is based only on the Albanian labels.

32. p. 2952, L-27-28: “The computations further show that not all the waste that was washed into the sea from the Albanian . . . “ Not “the waste” but “the numerical drifters”.

33. p. 2953, L-15: Justify why do you neglect the waste from Buna-Bojana and the Montenegro coast?

34. p. 2953, L-23: This paragraph can be omitted from Conclusions.

35. p. 2954, L-10: “AREG – INGV, Bologna, Italy center for boundary conditions of ROMS model” This sentence should be revised.

36. p. 2960, Fig.1: a) In the text, Kolocep Channel, Ston bay (p. 2951), Sv Jure (Fig.6) are mentioned but not shown on the map. Show them please. b) Explain please a color palette. c) Show please the State borders and all the rivers mentioned in the manuscript.

37. p. 2961, Fig.2: What the symbols mean?

38. Fig.3 can be omitted.

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39. p. 2963, Fig.4: Please zoom the area of interest.

40. Fig.5 can be omitted.

41. p. 2965, Fig.6: Explain please the units for the wind direction.

42. Fig.7 can be omitted.

43. p. 2967, Fig.8: Climatology in embedded figure can be omitted.

44. p. 2968, Fig.9: SST can be omitted; it is not relevant for your study.

TECHNICAL CORRECTIONS

1. p. 2940, L-24: "... Albania, Croatian neighbour country..." is incorrect because there is not mutual border between Albania and Croatia.

2. p. 2941, L-20: misprint – Results.

3. p. 2946, L-16: misprint – Atmospheric.

4. p. 2948, L-21: misprint – typical of.

5. p. 2952, L-20: misprint – us.

6. p. 2957, L-2: misprint – tropics.

7. p. 2961, Fig.2: misprint – Montenegro.

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