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Geoscientific Model Development Discussions

Interactive comment on "OpenDrift v1.0: a generic framework for trajectory modeling" *by* Knut-Frode Dagestad et al.

Anonymous Referee #2

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General Comments

The authors present clear description of a new framework for Lagrangian particle modelling, with an emphasis on flexibility and wide scope for ongoing development. The review of literature (Sect. 1.1) is thorough and wide ranging. Justification for the new development (OpenDrift v1.0) is clearly articulated throughout the mansucript. The framework is clearly described (Sect. 2) and various case studies are briefly and clearly presented (Sect. 3). Overall, the manuscript is very well-written, with clear tables and figures throughout. It should be suitable for publication in GMD, subject to minor revisions in response to comments below.

Specific Comments

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Discussion paper

1. p.2, lines 42-46: It is true that the widely used ARIANE trajectory code is rather specifically build around the NEMO family of models. It may be work cited this example here.

2. p.3, end Sect. 1: It would be helpful to conclude the Introduction with a short paragraph outlining the rest of the paper, as is customary.

3. p.4, Table 1: Missing from Table 1 are ARIANE and CMS, the two particle trajectory codes perhaps most widely used by the marine science community.

4. p.17, Figure 4: Can you elaborate, in figure caption or text, what you define as "dispersed"; also, it is not really clear in the figure the distinction between "surface" and "submerged" – this is actually clearer in the figures posted at https://github.com/OpenDrift/opendrift/wiki/Gallery:-OpenOil-(oil-drift-model), where you define only four cases, with "in water" presumably "surface + submerged", which may serve as a better illustration in Sect. 3.2.

5. p.19, lines 434-441: What about the thermodynamics of the finite volume particles that represent the icebergs? Existing ocean-iceberg models take account of changes in iceberg dynamics (wind and water drag forces, also Coriolis and pressure gradient forces) due to changes in dimensions. Melting may not alter volume (and hence dynamics) on short operational timescales (hour-days), but will matter more on longer timescales (weeks-months). It would be useful to elaborate here on the extent of iceberg tracking (and accompanying physics/dynamics) that is currently planned.

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