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Comparing satellite-derived and modelled ocean currents for predicting oceanic surface drift

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We have assessed the use of satellite derived currents to calculate oceanic surface drift, as an alternative to using currents from an ocean model. Predicted trajectories are compared to observed trajectories of two types of drifting buoys, which are subject to different degree of wind and wave forcing, in addition to the ocean surface current. This variable degree of ocean-, wind- and wave forcing is highly relevant for the practical problem of predicting the drift of e.g. oil to aid cleanup operations, and the drift of floating objects to aid search and rescue operations.
The calculated trajectories are evaluated in terms of separation distance, and a calculated skill score. For the submerged drifters (CODE/DAVIS), we find that a high resolution non-assimilated ocean model gives the best results, whereas a coarser scale assimilated model performs similarly to satellite derived surface currents from the GlobCurrent project (geostrophic + Ekman components). For the wind-exposed drifters (iSphere), the wind-drift contribution is found to be dominating, and there is only a small impact of using any of the available information about ocean currents. The wind drift contribution to the iSphere drift is estimated to 3% of the wind if Stokes drift is included in the calculations, and 4% if the Stokes drift is not included. Including Stokes drift in the calculations gives improvement for the submerged drifters, but shows no improvement for the wind exposed drifters.