Search and Rescue at Sea Aided by Hidden Flow Structures MATTIA SERRA, Harvard University, PRATIK SATHE, UCSB, IRINA RYPINA, ANTHONY KIRINCICH, WHOI, SHANE ROSS, Virginia Tech, PIERRE LERMUSIAUX, THOMAS PEACOCK, MIT, ARTHUR ALLEN, U.S. Coast Guard - Search and Rescue, GEORGE HALLER , ETH Zurich — Every year hundreds of people die at sea because of vessel and airplane accidents. Using recent mathematical results for assessing short-term material transport in unsteady flows, we uncover hidden TRansient Attracting Profiles (TRAPs) in ocean-surface velocity data. Computable from a single velocity-field snapshot, TRAPs act as short-term attractors for all floating objects. We emulate SAR scenarios in three different ocean field experiments, and show that TRAPs computed from measured as well as modelled velocities attract deployed drifters and manikins emulating people fallen in water. TRAPs, which remain hidden to prior Eulerian diagnostics, thus provide critical information for hazard responses, such as SAR and oil spills, and have the potential to save life and limit environmental disasters.

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