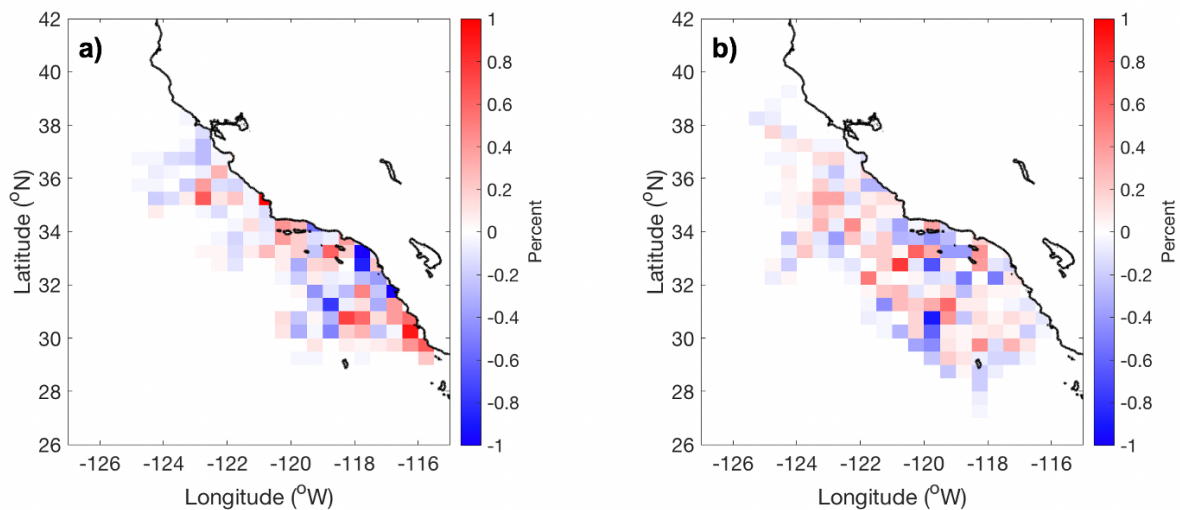
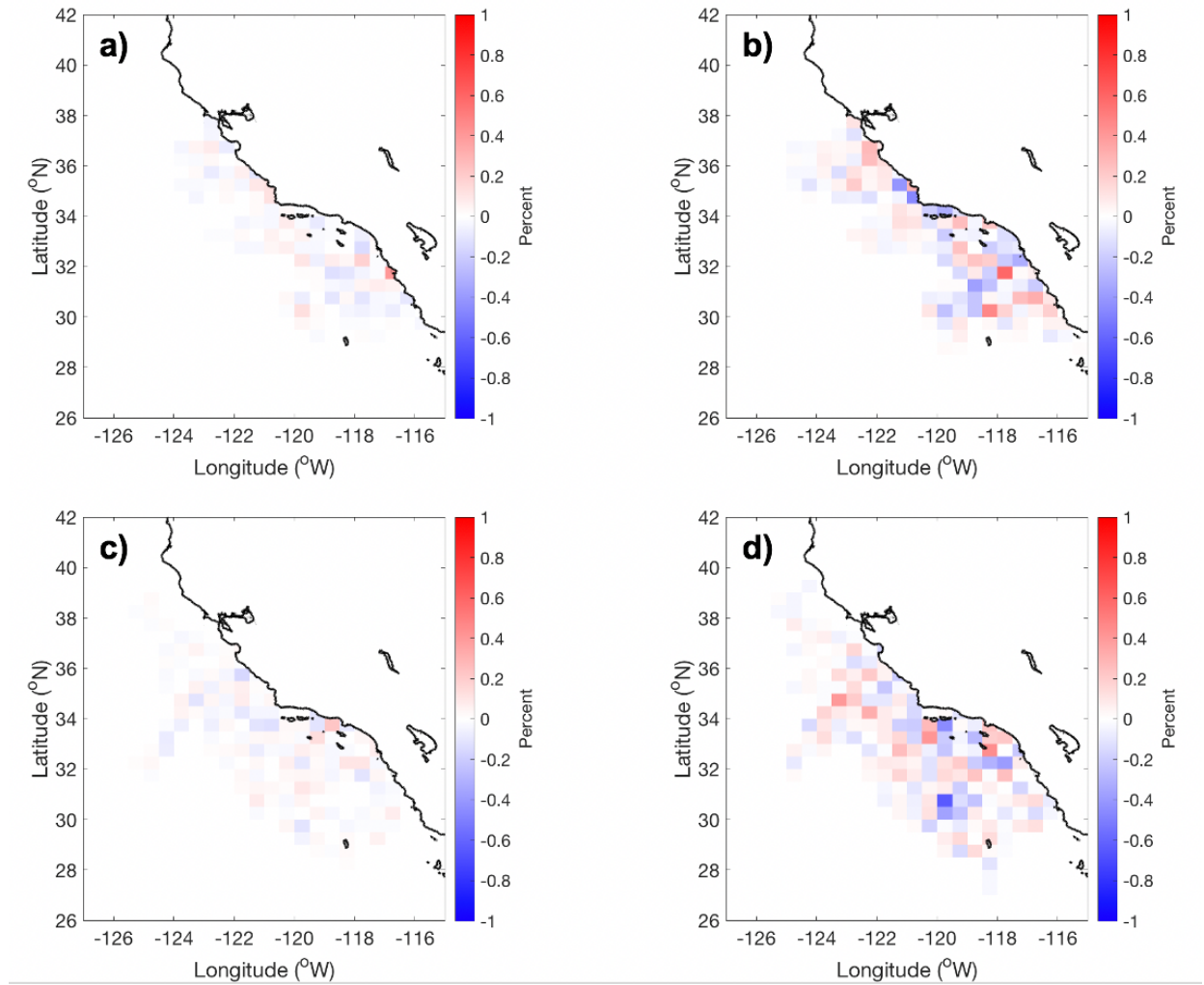


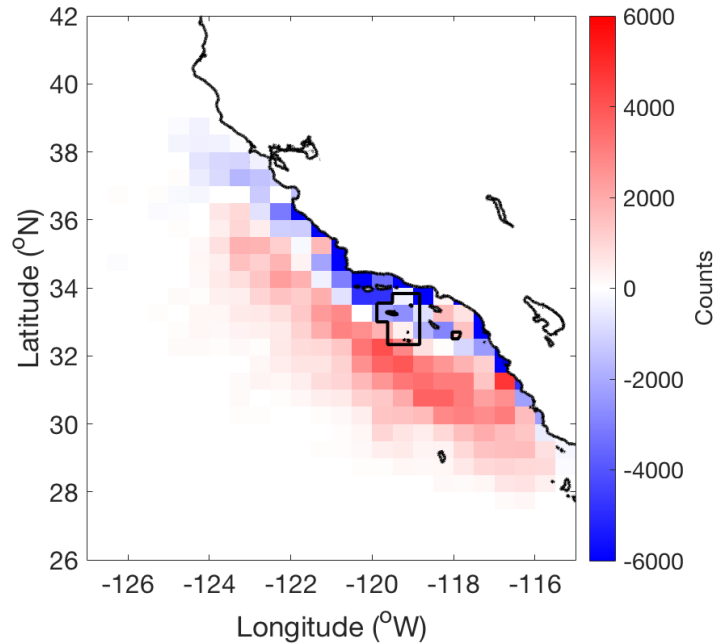
**Supplementary Material:**



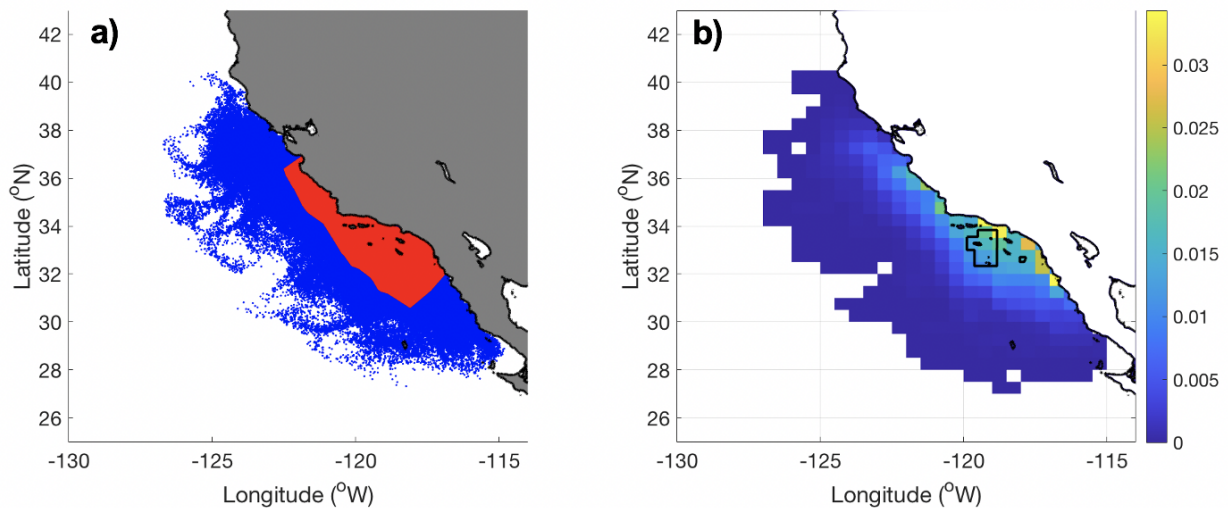
**Fig. S1.** Results of the sensitivity analysis for hourly vs. daily time steps. Hourly minus daily normalized distributions of final particle locations for (a) 1998 and (b) 2022. Color displays the percent difference between the distributions.



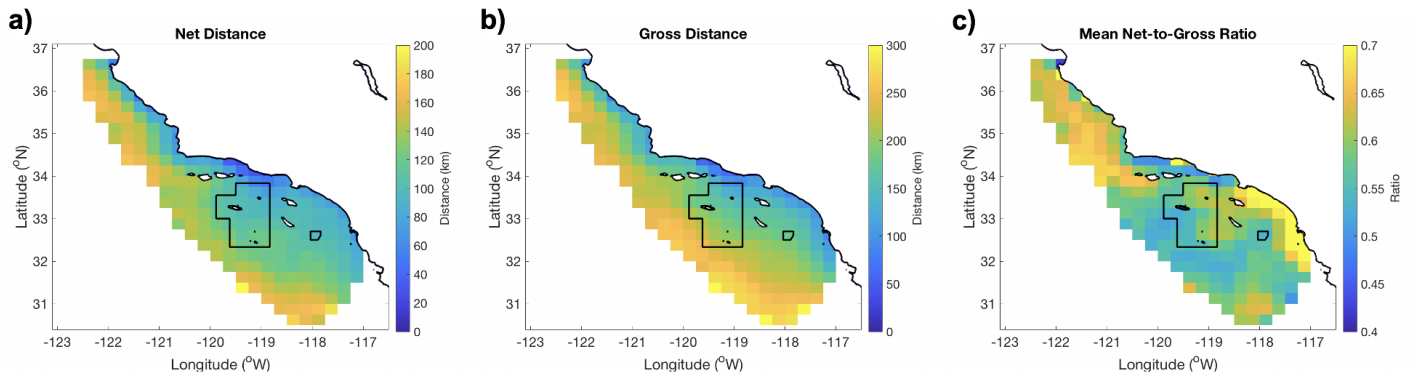
**Fig. S2.** Results of the sensitivity analysis for advecting 10,000, 1,000, and 100 particles. Normalized distributions of final particle locations for (a) 10,000 minus 1,000 particles and (b) 1000 minus 100 particles for the year 1998. Panels c and d are the same, for the year 2022. Color displays the percent difference between the distributions.



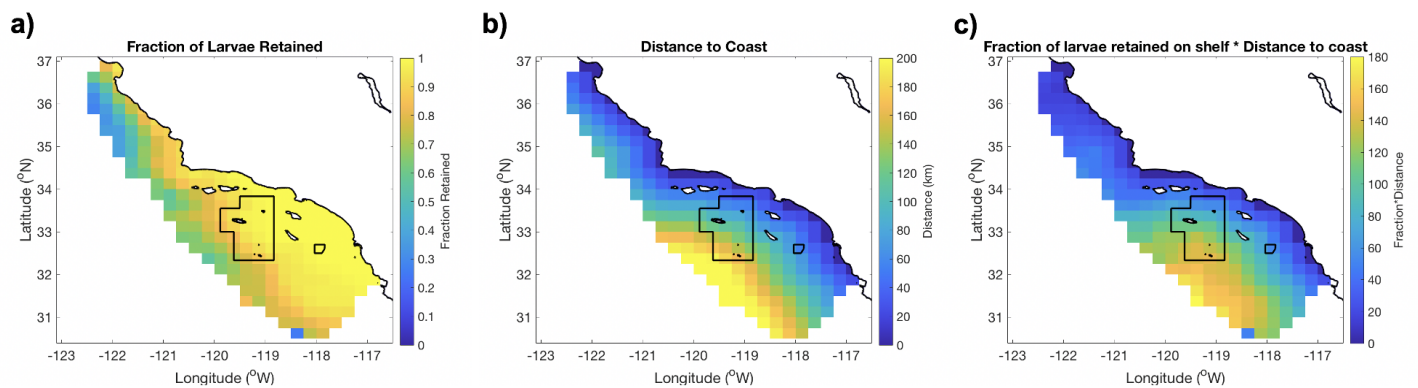
**Fig. S3.** Difference between final particle distributions of geostrophic + Ekman 15 m simulations versus geostrophic simulations. Red values indicate a greater number of particles from the geostrophic + Ekman 15 m simulations, and blue values indicate a greater number of particles from the geostrophic simulations.



**Fig. S4.** (a) Map of particle seed locations (red) and final locations (blue). (b) Histogram of final locations, color corresponds to the percentage of total particles found in that grid cell. Particle simulations are forced by geostrophic velocities.



**Fig. S5.** (a) Mean net distance traveled of particles seeded within each  $0.25^\circ \times 0.25^\circ$  grid cell; (b) mean gross distance traveled of particles seeded within each  $0.25^\circ \times 0.25^\circ$  grid cell; (c) mean net-to-gross ratio of particles seeded within each  $0.25^\circ \times 0.25^\circ$  grid cell. Particle simulations are forced by geostrophic velocities.



**Fig. S6.** (a) Fraction of larvae seeded within each  $0.25^\circ \times 0.25^\circ$  grid cell that were retained on the shelf; (b) distance to coast for each  $0.25^\circ \times 0.25^\circ$  grid cell; (c) fraction of larvae retained on shelf multiplied by distance to coast. Particle simulations are forced by geostrophic velocities.

**Table S1:** Fraction of larvae retained on the shelf for each year and all years combined. Geostrophic velocity fields were used to force the simulations.

<b>Year</b>	<b>Fraction Retained</b>
1998	0.85
1999	0.86
2000	0.86
2001	0.87
2002	0.87
2003	0.81
2004	0.86
2005	0.81
2006	0.84
2007	0.85
2008	0.84
2009	0.85
2010	0.77
2011	0.84
2012	0.84
2013	0.91
2014	0.88
2015	0.87
2016	0.85
2017	0.84
2018	0.90
2019	0.86
2020	0.83
2021	0.86
2022	0.86
<b>All years</b>	<b>0.85</b>