Appendix from R. E. Snyder et al., "How Much Do Marine Connectivity Fluctuations Matter?"

(Am. Nat., vol. 184, no. 4, p. 523)

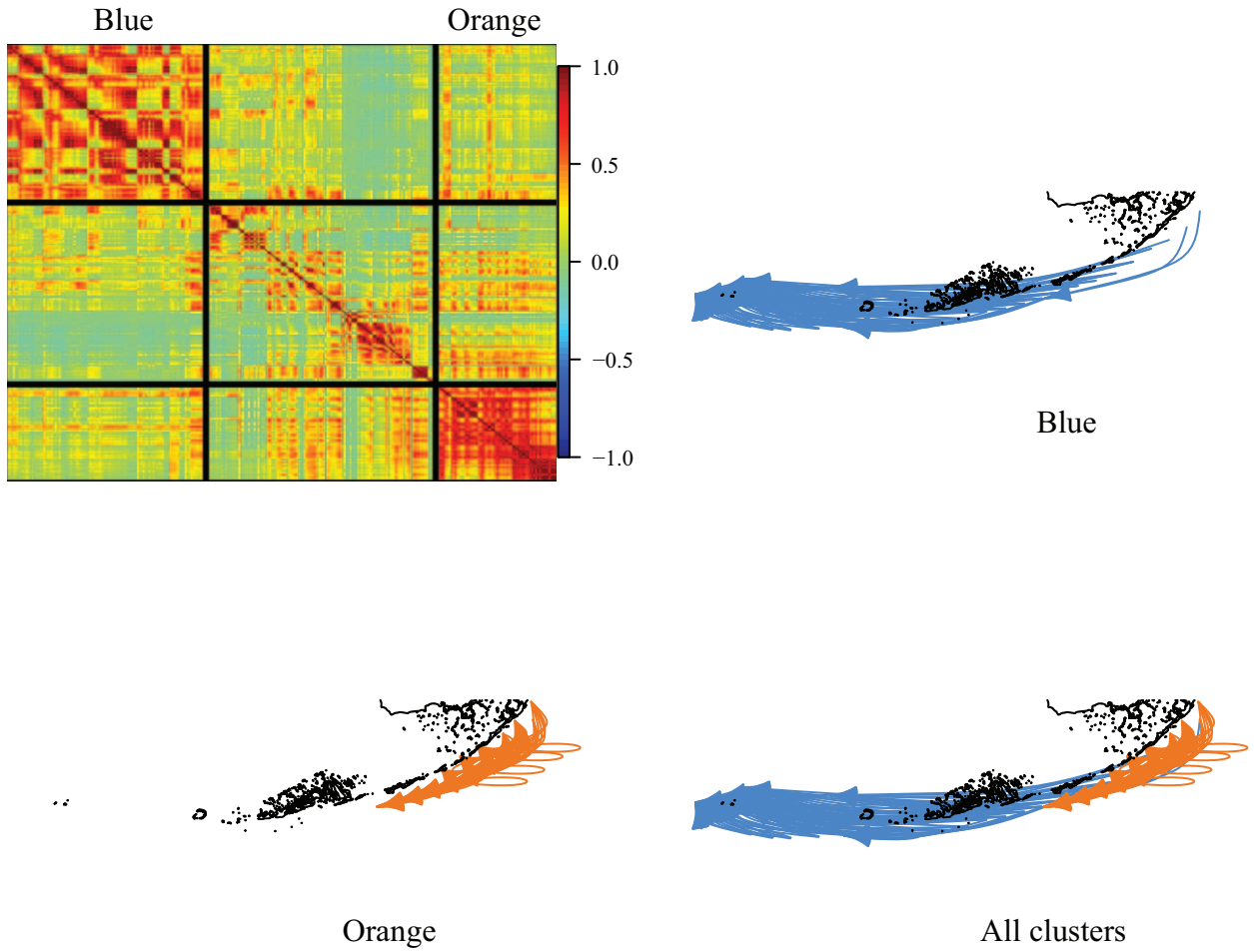

Figure A1: Clustering for the most variable routes (top 20%) with larval migration and without seasonal spawning. The upper-left figure shows the correlation matrix of the most variable entries of the connectivity matrix (routes) and a hierarchical clustering partitioning into two strongly correlated clusters and a group of largely uncorrelated routes. The maps of the Florida Keys show the routes in each of the two clusters as well as all clusters together. Just as with seasonal spawning (fig. 1), the routes are partitioned into upper and lower clusters, with the division around the location of the Pourtales Gyre. The primary difference is that, here, we do not get a small third cluster sitting at the interface.

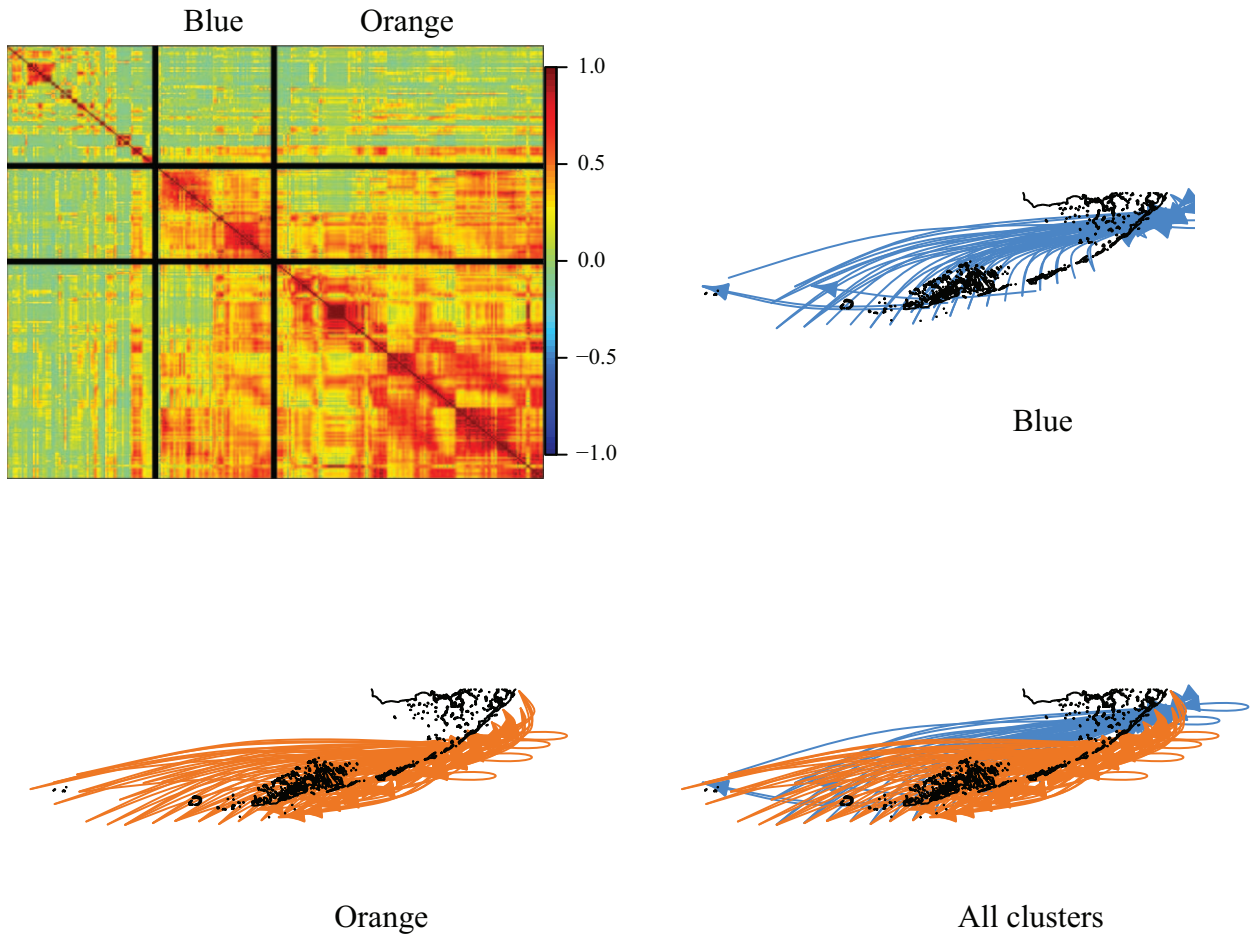

Figure A2: Clustering for the most variable routes (top 20%) without larval migration and without spawning seasonality. The upper-left figure shows the correlation matrix of the most variable entries of the connectivity matrix (routes) and a hierarchical partitioning into two strongly correlated clusters and a group of uncorrelated routes. The maps of the Florida Keys (FK) show the routes in both clusters as well as all clusters together. Just as in the case with seasonal spawning, there is no spatial segregation (fig. 2). This lack of spatial segregation and the strong correlations between groups again suggest that in the absence of larval behavior, connectivity fluctuations are driven by wind, which has a similar effect across the FK.

Table A1. Summary of differences between particle tracking algorithms

	CMS, Paris et al. 2013	Mitarai et al. 2009
Interpolation of velocity on space	Tricubic	Linear
Interpolation of velocity on time	Linear	NA
Integration scheme	Fourth-order Runge-Kutta	Fourth-order Adams-Bashforth-Moulton predictor-corrector scheme
Sub-grid processes parameterization	Diffusivity coefficient	NA
Mortality	Half-life equation	NA
Integration time step (min)	20	15
No. larvae released per spawning site	Variable with lunar cycle (min. 100, max. 1,400)	~75
Migration behavior	Vertical ontogenetic migration parameterized by a matrix of observed mean center of mass and vertical PDFs	NA
Hydrodynamic model resolution	HYCOM horizontal : 1 km vertical : 10 m *z*-coordinate in the mixed layer	ROMS horizontal : 1 km vertical : NA
Nested configuration	Yes	Yes

Note: This study uses the Connectivity Modeling System (CMS) of Paris et al. (2013), while Watson et al. (2012) uses the particle tracking algorithm in Mitarai et al. (2009). HYCOM = hybrid coordinate ocean model, ROMS = regional ocean modeling system. NA = not applicable.