PNAS

www.pnas.org

Supplementary Information for

Global-scale dispersal and connectivity in mangroves

Tom Van der Stocken[¥], Dustin Carroll[¥], Dimitris Menemenlis, Marc Simard, Nico Koedam

Tom Van der Stocken
Email: tom.van.der.stocken@jpl.nasa.gov or tvdstock@gmail.com
¥ Co-first author

This PDF file includes:

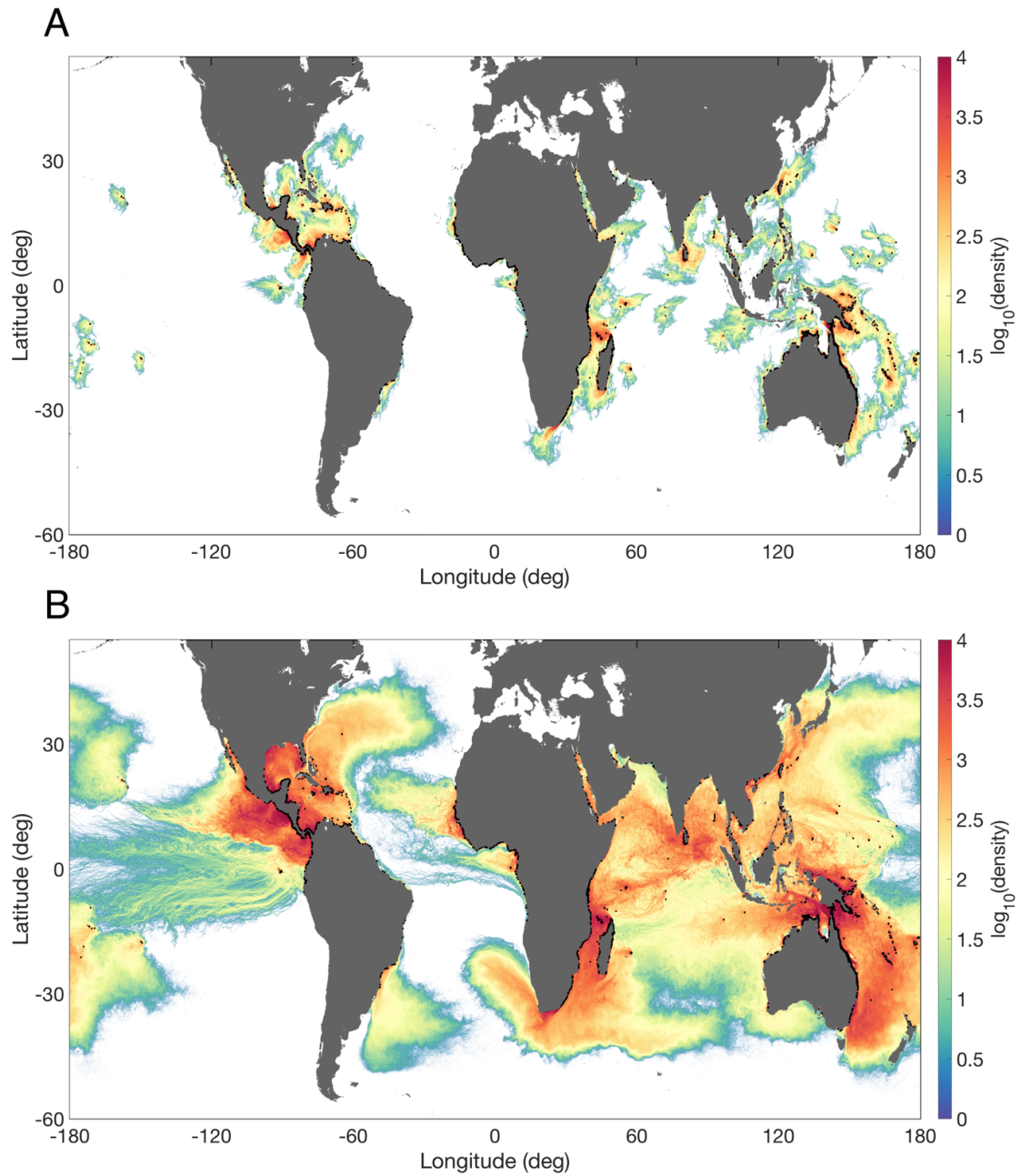> Figs. S1 to S4
> References for SI reference citations

Fig. S1. Density of simulated mangrove propagule dispersal trajectories across the global ocean. Dispersal trajectories were generated using velocity fields from the ECCO2 project. Particles were released hourly for 1 month *(A)* and 12 months *(B)*, starting on 1 April 2011. Trajectories were aggregated on a 1/24° × 1/24° grid. Solid black circles along coastlines indicate the release locations used from the MRDH database (1). White color represents zero density.
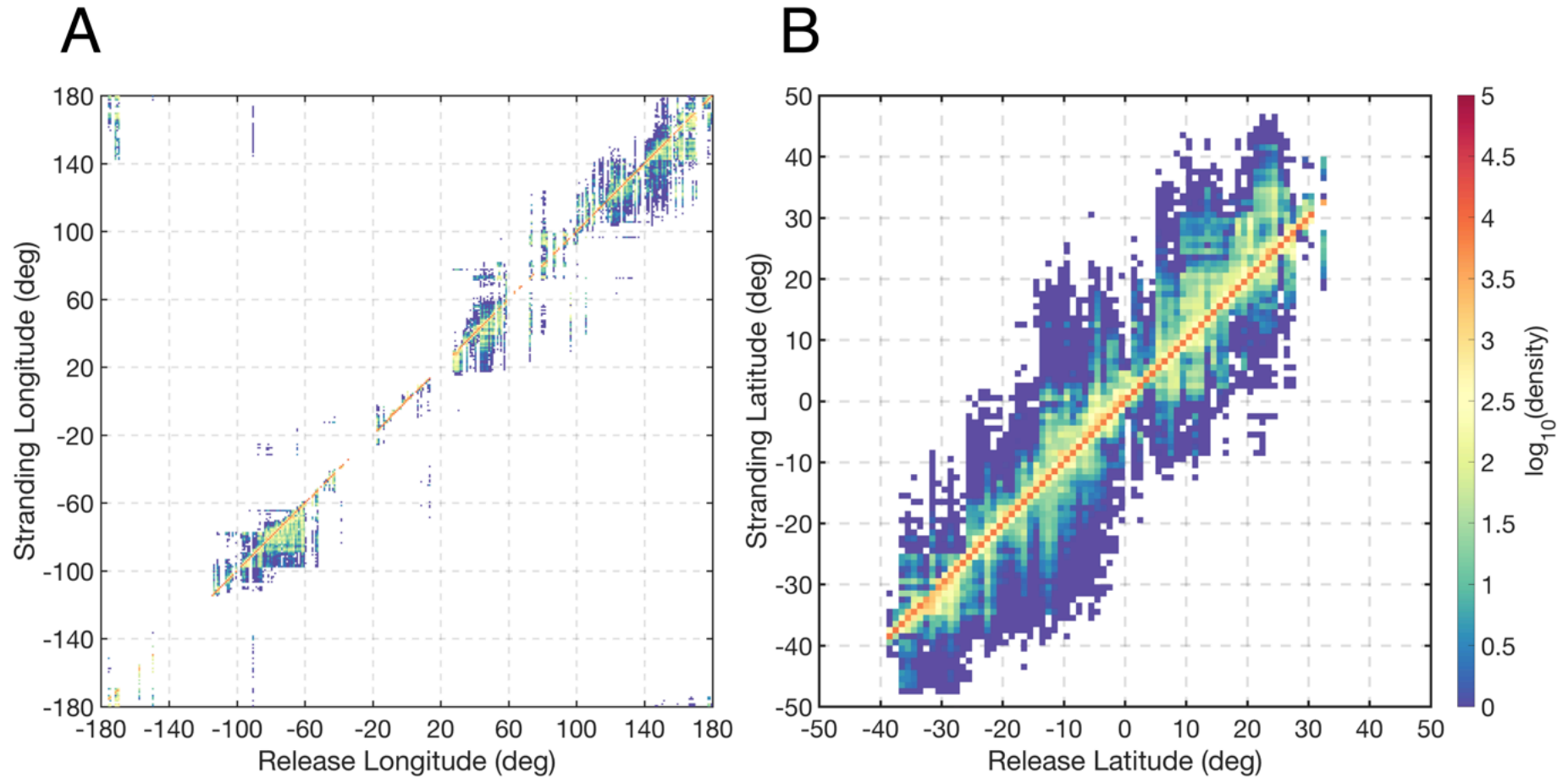
Fig. S2. Global connectivity matrices. Matrices show the simulated connectivity between release location (x-axis) and predicted stranding location (y-axis), for propagules with a minFP of 5 days and a maxFP of 12 months. Matrices were computed for the longitude *(A)* and latitude *(B)* of the release and stranding locations. Connectivity data was normalized by the number of release locations per longitude and latitude, respectively, in order not to bias the interpretation of release location density on global connectivity patterns.
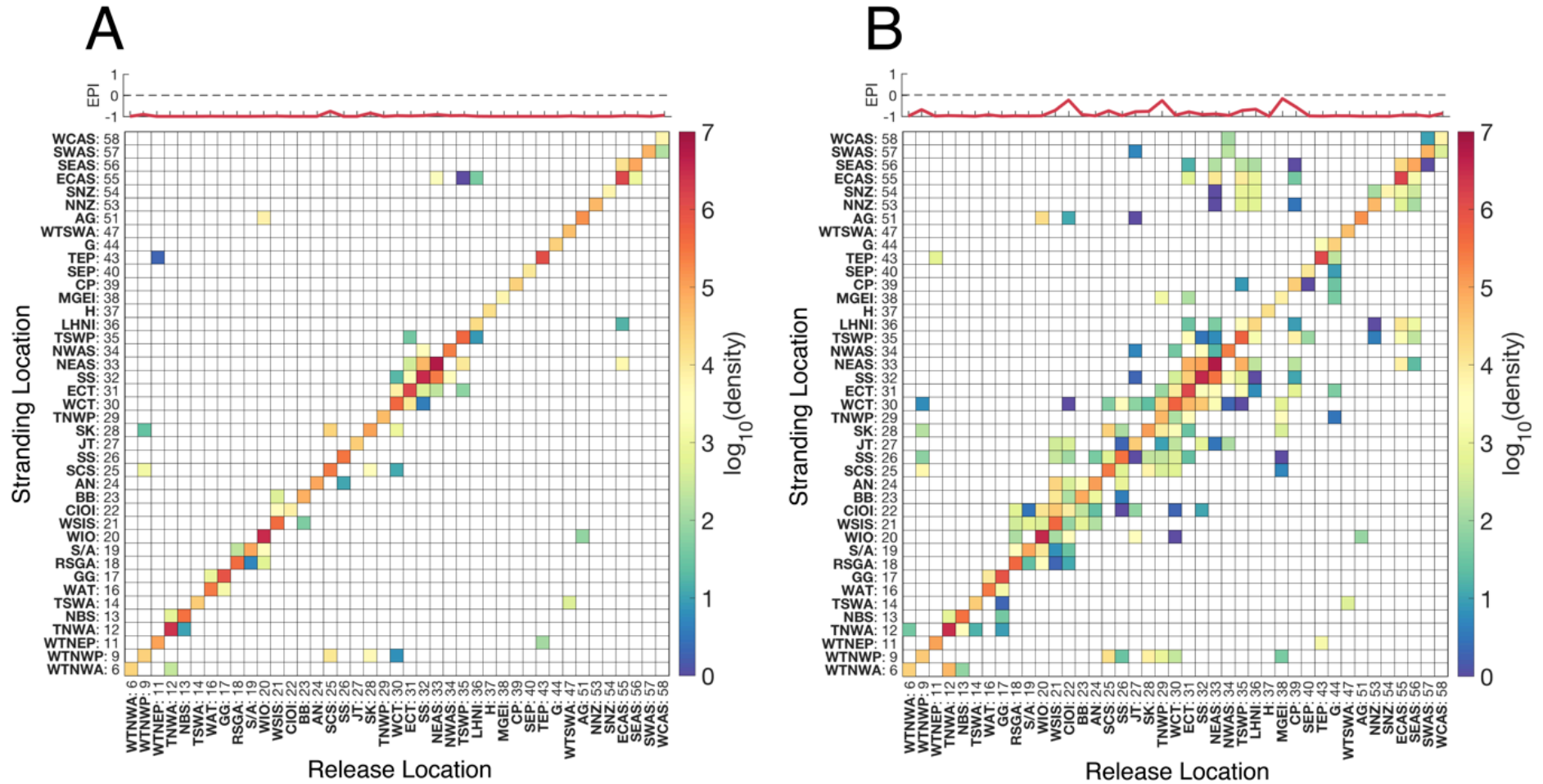
Fig. S3. Global connectivity matrices. Connectivity matrices showing the simulated connectivity between release (x-axis) and predicted stranding (y-axis) locations for propagules with a minFP of 5 days and a maxFP of 1 month *(A)* and 12 months *(B)*. To obtain a biogeographic framework and a tool for ocean-wide conservation planning, the release and stranding locations were binned using the provinces from Spalding et al. (2). Abbreviations of the provinces are outlined in Fig. 2A. Above the matrix, the export potential index (EPI = (remote stranding – self stranding) / (remote stranding + self stranding)) is a measure of the relative importance of self-stranding and exporting particles to other provinces.
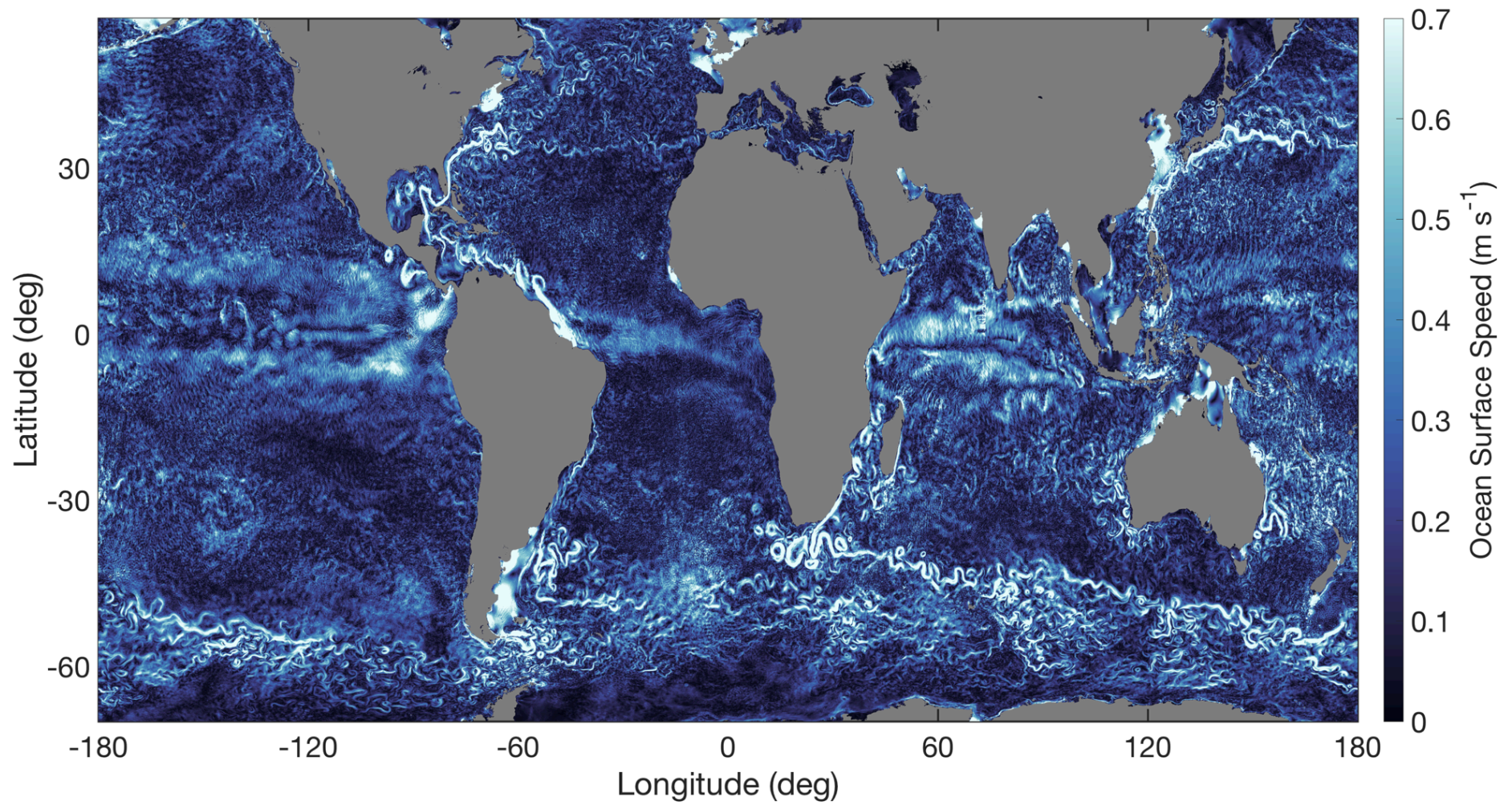
Fig. S4. Snapshot from the 1/24° global ocean ECCO simulation used to compute propagule trajectories. Colors show a snapshot of ocean surface speed on March 6, 2011 (0 h UTC).

References

1. Massó i Alemán S, et al. (2010) The 'Mangrove Reference Database and Herbarium'. *Plant Ecol Evol* 143(2):225–232.
2. Spalding MD, et al. (2007) Marine ecoregions of the world: a bioregionalization of coastal and shelf areas. *BioScience* 57(7):573–583.