**Supplementary material Appendix 1 Table A1:** Marine Protected Areas (MPAs) that include coral habitats which have different protection level and cover a total area ca.180.335 km2 (Alvarado et al., 2017).

|  |  |  |  |
| --- | --- | --- | --- |
| Country | MPA Category | Total | MPAs km2 |
| México | Biosphere Reserves | 4 | 13,582.18 |
| México | National Parks | 6 | 3,268.5 |
| México | Fauna Flora Monument | 1 | 39.96 |
| El Salvador | National Parks | 1 | 206.8 |
| Costa Rica | National Parks | 6 | 3,784.8 |
| Costa Rica | Nature Reserves | 4 | 88.95 |
| Costa Rica | Responsible Fishing Areas | 1 | 773.97 |
| Panamá | National Parks | 3 | 2,255.89 |
| Panamá | Special Zone Marine Protections | 3 | 4,929.86 |
| Panamá | Nature Reserves | 2 | 1.39 |
| Colombia | National Parks | 3 | 1,630.81 |
| Colombia | Fauna Flora Monuments | 1 | 8,571.5 |
| Ecuador | Marine Reserves | 3 | 13,8676 |
| Ecuador | National Parks | 1 | 1,979 |
| Ecuador | Nature Reserve | 2 | 546.17 |

**Supplementary material Appendix 1 Table A2:** Geographical information and sampling effort compiled in 135 locations across of the Eastern Tropical Pacific. We used alphabetic to order the list.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Province** | **Country** | **Location** | **Longitude** | **Latitude** | **Number of transects** | **Transect area (m2)** | **Total sampling area (m2)** |
| PanamaP | Colombia | Bahia solano  | -77.48 | 6.37 | 14 | 50 | 700 |
| PanamaP | Colombia | Cabo corrientes  | -77.53 | 5.61 | 60 | 50 | 3000 |
| PanamaP | Colombia | Cabo Marzo | -77.7 | 6.84 | 32 | 50 | 1600 |
| PanamaP | Colombia | Cupica | -77.55 | 6.69 | 40 | 50 | 2000 |
| PanamaP | Colombia | Golfo tribuga | -77.36 | 5.93 | 24 | 50 | 1200 |
| PanamaP | Colombia | Gorgona | -78.18 | 2.95 | 70 | 60 | 4200 |
| Island | Colombia | Malpelo | -81.61 | 4.01 | 53 | 40 | 2120 |
| PanamaP | Costa rica | Bahia Culebra  | -85.71 | 10.64 | 42 | 50 | 2100 |
| Island | Costa rica | Cocos Island | -87.09 | 5.56 | 130 | 100 | 13000 |
| Island | Costa rica | Cocos Island | -87.09 | 5.56 | 130 | 50 | 6500 |
| PanamaP | Costa rica | Golfo dulce1 | -83.41 | 8.73 | 24 | 50 | 1200 |
| PanamaP | Costa rica | Golfo dulce2  | -83.3 | 8.66 | 33 | 50 | 1650 |
| PanamaP | Costa rica | Golfo dulce3 | -83.35 | 8.58 | 24 | 50 | 1200 |
| PanamaP | Costa rica | Isla del cano | -83.89 | 8.72 | 36 | 50 | 1800 |
| PanamaP | Costa rica | Islas murcielago | -85.89 | 10.87 | 15 | 50 | 750 |
| PanamaP | Costa rica | Islas tortuga | -84.89 | 9.78 | 30 | 50 | 1500 |
| PanamaP | Costa rica | Peninsula de osa | -83.74 | 8.67 | 29 | 50 | 1450 |
| PanamaP | Costa rica | Punta leona | -84.67 | 9.7 | 15 | 50 | 750 |
| PanamaP | Costa rica | Puntarenas coyote samara juanillo | -85.74 | 9.87 | 52 | 50 | 2600 |
| PanamaP | Costa rica | Puntarenas dominico ballena | -83.85 | 9.23 | 89 | 50 | 4450 |
| Island | Ecuador | Galapagos 1 | -91.66 | -0.7 | 59 | 500 | 29500 |
| Island | Ecuador | Galapagos 2 | -90.57 | -0.26 | 12 | 500 | 6000 |
| Island | Ecuador | Galapagos 3 | -90.45 | 0.32 | 19 | 500 | 9500 |
| Island | Ecuador | Galapagos 4 | -90.48 | -1.25 | 17 | 500 | 8500 |
| PanamaP | Ecuador | Horno de pan | -80.81 | -1.5 | 28 | 500 | 14000 |
| PanamaP | Ecuador | Isla de la plata | -81.06 | -1.27 | 148 | 500 | 74000 |
| PanamaP | Ecuador | Isla salango | -80.86 | -1.6 | 46 | 500 | 23000 |
| PanamaP | Ecuador | Llorona | -80.79 | -1.48 | 8 | 500 | 4000 |
| PanamaP | Ecuador | Los ahorcados | -80.84 | -1.68 | 19 | 500 | 9500 |
| PanamaP | Ecuador | Punta mala | -80.84 | -1.56 | 24 | 500 | 12000 |
| PanamaP | Ecuador | Sombrerito | -80.77 | -1.41 | 23 | 500 | 11500 |
| PanamaP | Ecuador | Sucre | -80.78 | -1.48 | 13 | 500 | 6500 |
| PanamaP | El salvador | Los cobanos | -89.84 | 13.59 | 21 | 60 | 1260 |
| Island | France | Clipperton Island | -109.22 | 10.3 | 25 | 50 | 1250 |
| CortezP | Mexico | Bahia san luis gonzaga Mexico Gulf | -114.37 | 29.81 | 6 | 100 | 600 |
| CortezP | Mexico | Bajo seco norte Mexico Gulf | -110.77 | 25.51 | 6 | 100 | 600 |
| CortezP | Mexico | Bajo seco sur Mexico Gulf | -110.53 | 24.76 | 6 | 100 | 600 |
| PanamaP | Mexico | Boquilla | -96.47 | 15.68 | 4 | 80 | 320 |
| CortezP | Mexico | Cabo pulmon Mexico Gulf | -109.46 | 23.49 | 233 | 100 | 23300 |
| PanamaP | Mexico | Carrizalillo | -97.08 | 15.86 | 4 | 80 | 320 |
| PanamaP | Mexico | Colima | -104.39 | 19.08 | 39 | 40 | 1560 |
| PanamaP | Mexico | Dos hermanas | -96.21 | 15.7 | 14 | 80 | 1120 |
| CortezP | Mexico | El cayo Mexico Gulf | -110.6 | 24.87 | 12 | 100 | 1200 |
| PanamaP | Mexico | El faro | -97.07 | 15.86 | 4 | 80 | 320 |
| CortezP | Mexico | El portugues Mexico Gulf | -110.68 | 24.75 | 14 | 100 | 1400 |
| PanamaP | Mexico | Estacahuite | -96.48 | 15.67 | 4 | 80 | 320 |
| PanamaP | Mexico | Isabel | -105.88 | 21.85 | 90 | 40 | 3600 |
| CortezP | Mexico | Isla angel de la guarda Mexico Gulf | -113.56 | 29.55 | 14 | 100 | 1400 |
| PanamaP | Mexico | Isla cacaluta | -96.16 | 15.72 | 26 | 80 | 2080 |
| CortezP | Mexico | Isla carmen Mexico Gulf | -111.17 | 26.02 | 15 | 100 | 1500 |
| CortezP | Mexico | Isla catalana Mexico Gulf | -110.78 | 25.72 | 14 | 100 | 1400 |
| CortezP | Mexico | Isla cerralvo Mexico Gulf | -109.97 | 24.43 | 10 | 100 | 1000 |
| CortezP | Mexico | Isla coronados Mexico Gulf | -111.26 | 26.13 | 10 | 100 | 1000 |
| CortezP | Mexico | Isla danzante Mexico Gulf | -111.26 | 25.81 | 15 | 100 | 1500 |
| CortezP | Mexico | Isla el farallon Mexico Gulf | -109.37 | 25.44 | 6 | 100 | 600 |
| CortezP | Mexico | Isla espiritu santo Mexico Gulf | -110.29 | 24.47 | 12 | 100 | 1200 |
| CortezP | Mexico | Isla monserrat Mexico Gulf | -111.05 | 25.74 | 14 | 100 | 1400 |
| PanamaP | Mexico | Isla montosa | -96.08 | 15.77 | 8 | 80 | 640 |
| CortezP | Mexico | Isla patos-isla tiburon Mexico Gulf | -112.51 | 29.27 | 10 | 100 | 1000 |
| CortezP | Mexico | Isla san diego Mexico Gulf | -110.69 | 25.2 | 14 | 100 | 1400 |
| CortezP | Mexico | Isla san esteban Mexico Gulf | -112.56 | 28.67 | 6 | 100 | 600 |
| CortezP | Mexico | Isla san idelfonso Mexico Gulf | -111.43 | 26.62 | 18 | 100 | 1800 |
| CortezP | Mexico | Isla san lorenzo Mexico Gulf | -112.77 | 28.58 | 6 | 100 | 600 |
| CortezP | Mexico | Isla san marcos Mexico Gulf | -112.09 | 27.26 | 16 | 100 | 1600 |
| CortezP | Mexico | Isla san mateo Mexico Gulf | -110.99 | 25.38 | 14 | 100 | 1400 |
| CortezP | Mexico | Isla san pedro martir Mexico Gulf | -112.3 | 28.38 | 16 | 100 | 1600 |
| CortezP | Mexico | Isla san pedro nolasco Mexico Gulf | -111.39 | 27.97 | 24 | 100 | 2400 |
| CortezP | Mexico | Isla santa cruz Mexico Gulf | -110.69 | 25.31 | 10 | 100 | 1000 |
| CortezP | Mexico | Isla tortuga Mexico Gulf | -111.86 | 27.43 | 8 | 100 | 800 |
| PanamaP | Mexico | Islas marietas isla larga cueva del muerto | -105.58 | 20.69 | 5 | 100 | 500 |
| PanamaP | Mexico | Islas marietas isla larga zona restauracion sur | -105.58 | 20.7 | 5 | 100 | 500 |
| PanamaP | Mexico | Islas marietas isla redonda pavonas | -105.56 | 20.7 | 5 | 100 | 500 |
| PanamaP | Mexico | Islas marietas isla redonda tunel amarradero | -105.57 | 20.7 | 5 | 100 | 500 |
| PanamaP | Mexico | Jalisco | -105.12 | 19.56 | 39 | 40 | 1560 |
| PanamaP | Mexico | Jicaral | -96.21 | 15.7 | 24 | 80 | 1920 |
| PanamaP | Mexico | La blanca | -95.58 | 15.94 | 4 | 80 | 320 |
| PanamaP | Mexico | La entrega | -96.13 | 15.75 | 25 | 80 | 2000 |
| PanamaP | Mexico | La india | -96.2 | 15.71 | 12 | 80 | 960 |
| PanamaP | Mexico | La mina | -96.48 | 15.67 | 4 | 80 | 320 |
| CortezP | Mexico | Las animas Mexico Gulf | -112.94 | 28.7 | 11 | 100 | 1100 |
| PanamaP | Mexico | Maguey | -96.15 | 15.73 | 16 | 80 | 1280 |
| PanamaP | Mexico | Manzanillo | -96.1 | 15.77 | 4 | 80 | 320 |
| PanamaP | Mexico | Mazunte | -96.55 | 15.66 | 8 | 80 | 640 |
| PanamaP | Mexico | Michoacan | -103.52 | 18.35 | 48 | 40 | 1920 |
| PanamaP | Mexico | Organo | -96.14 | 15.74 | 8 | 80 | 640 |
| CortezP | Mexico | Puerto libertad Mexico Gulf | -112.73 | 29.9 | 6 | 100 | 600 |
| CortezP | Mexico | Puerto lobos Mexico Gulf | -112.85 | 30.26 | 6 | 100 | 600 |
| PanamaP | Mexico | Punta chahue | -96.12 | 15.75 | 8 | 80 | 640 |
| CortezP | Mexico | Punta pulpito Mexico Gulf | -111.44 | 26.51 | 16 | 100 | 1600 |
| Island | Mexico | Revillagigedos clarion | -114.73 | 18.34 | 24 | 50 | 1200 |
| Island | Mexico | Revillagigedos clarion | -114.73 | 18.34 | 24 | 250 | 6000 |
| Island | Mexico | Revillagigedos roca partida Mexico | -112.07 | 19.01 | 14 | 50 | 700 |
| Island | Mexico | Revillagigedos roca partida | -112.07 | 19.01 | 14 | 250 | 3500 |
| Island | Mexico | Revillagigedos san benedicto | -110.82 | 19.33 | 22 | 50 | 1100 |
| Island | Mexico | Revillagigedos san benedicto | -110.82 | 19.33 | 22 | 250 | 5500 |
| Island | Mexico | Revillagigedos socorro | -110.97 | 18.73 | 27 | 50 | 1350 |
| Island | Mexico | Revillagigedos socorro | -110.97 | 18.73 | 27 | 250 | 6750 |
| PanamaP | Mexico | Riscalillo | -96.22 | 15.7 | 24 | 80 | 1920 |
| PanamaP | Mexico | Salchi | -96.34 | 15.68 | 4 | 80 | 320 |
| CortezP | Mexico | San francisquito Mexico Gulf | -112.86 | 28.44 | 8 | 100 | 800 |
| PanamaP | Mexico | Tijera | -96.44 | 15.69 | 8 | 80 | 640 |
| PanamaP | Nicaragua | Sjs1 | -85.81 | 11.15 | 61 | 100 | 6100 |
| PanamaP | Nicaragua | Sjs2 | -85.92 | 11.3 | 83 | 250 | 20750 |
| PanamaP | Nicaragua | Tola | -86.07 | 11.41 | 34 | 100 | 3400 |
| PanamaP | Nicaragua | Tola | -86.07 | 11.41 | 34 | 250 | 8500 |
| PanamaP | Panama | Coiba | -81.7 | 7.45 | 6 | 100 | 600 |
| PanamaP | Panama | Coiba2 | -81.84 | 7.65 | 173 | 100 | 17300 |
| PanamaP | Panama | Coiba3 | -81.81 | 7.89 | 85 | 100 | 8500 |
| PanamaP | Panama | Coiba4 | -81.83 | 7.28 | 69 | 100 | 6900 |
| PanamaP | Panama | Las perlas1 | -79.06 | 8.67 | 143 | 100 | 14300 |
| PanamaP | Panama | Las perlas2 | -78.92 | 8.48 | 10 | 100 | 1000 |
| PanamaP | Panama | Las perlas3 | -78.8 | 8.41 | 16 | 100 | 1600 |
| PanamaP | Panama | Las perlas4 | -79.13 | 8.42 | 15 | 100 | 1500 |
| PanamaP | Panama | Las perlas5 | -79.11 | 8.25 | 32 | 100 | 3200 |
| PanamaP | Panama | Las perlas6 | -78.85 | 8.27 | 15 | 100 | 1500 |

**Supplementary material Figure S1:** The results of the constrained null model analysis. The standardized effect size of the functional richness (SES.FRic) is plotted against the species richness of the fish assemblages. Positive values or higher that zero indicate a higher FRic than expected given the species richness and negative values indicate a lower FRic than expected.



**Supplementary material Figure S2:** Pearson’s correlation among factors considered in this study.



**Supplementary material Figure S3:** Posterior predictive checks of model fits. (a) Species richness; (b) SES. functional richness; (c) Functional evenness; (d) Functional dispersion.



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