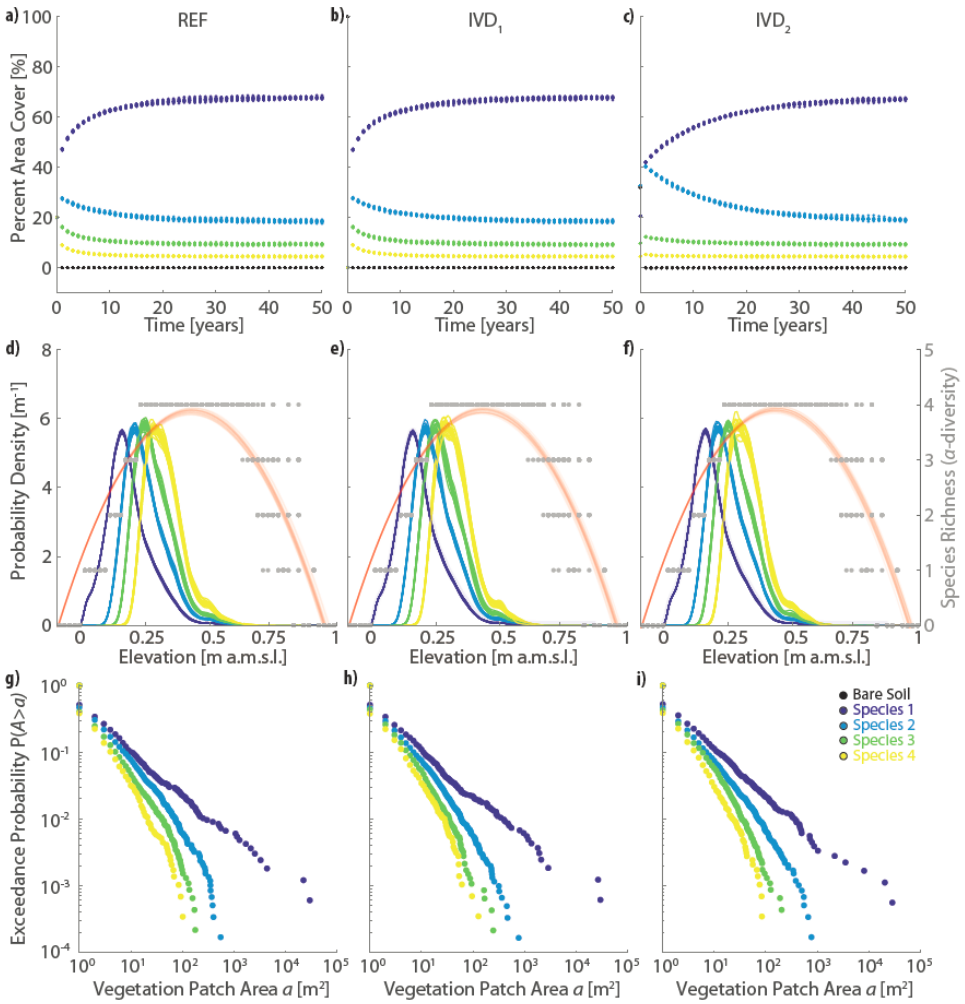
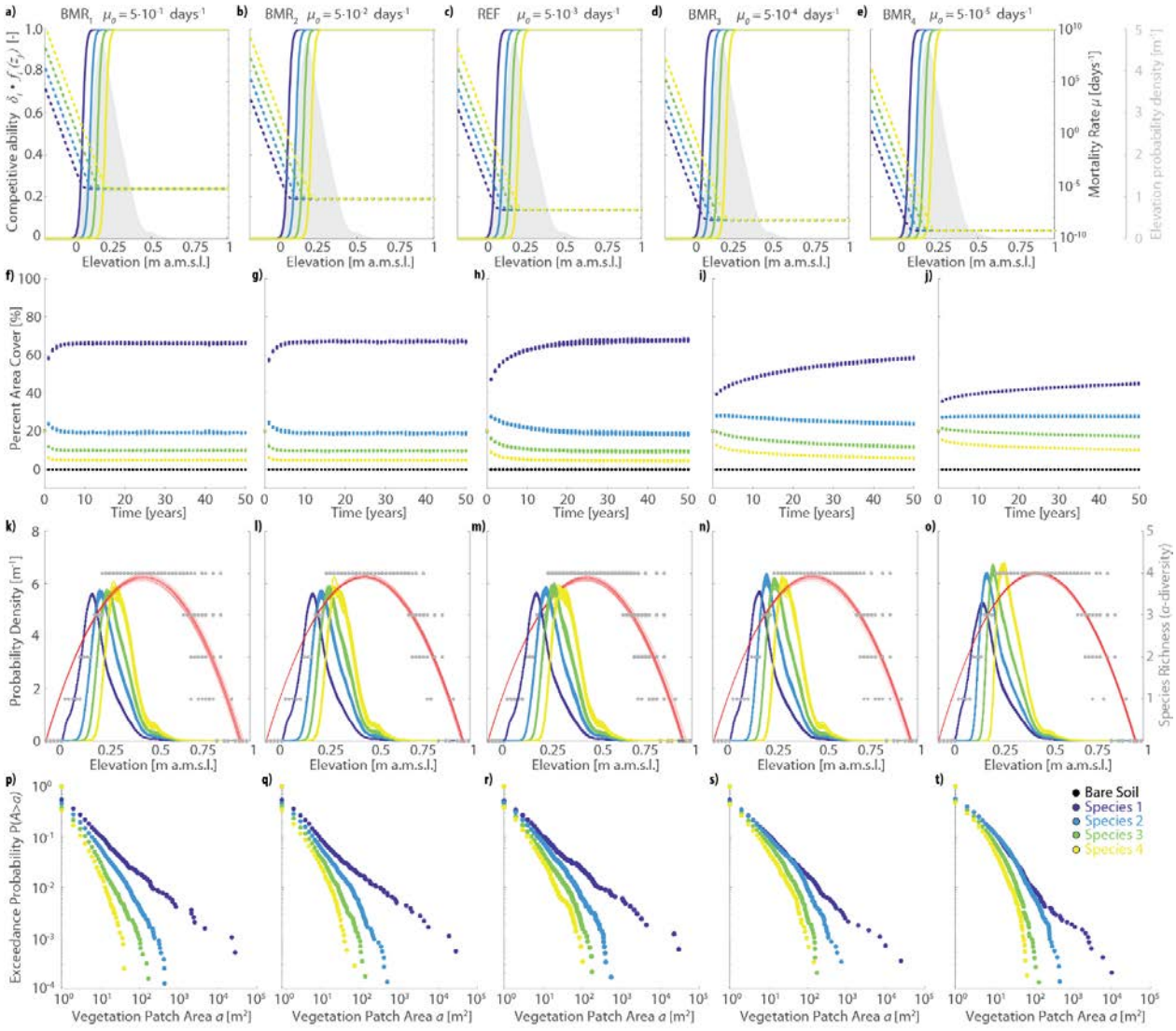
Supplementary Material

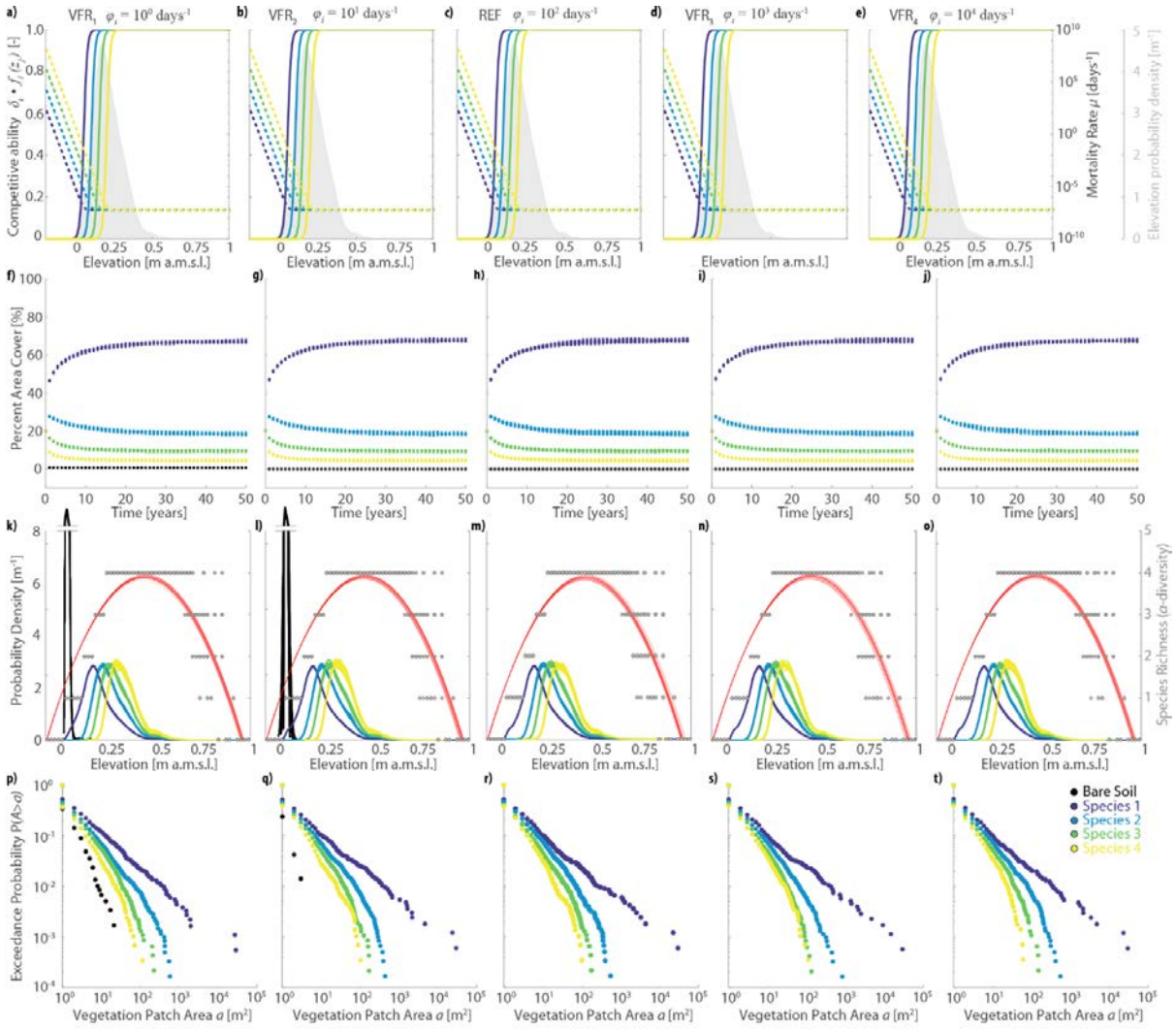
1 Supplementary Figures



Supplementary Figure 1. Effects of initial vegetation distribution on results of the numerical model (IVD series). Results of the reference simulation (REF, random vegetation distribution) are shown in the first column, whereas the second and third columns report the results of the IVD_1 (bare soil condition) and IVD_2 (vegetation distribution such as in Figure 1b) simulations, respectively. Each panel displays data derived from all the 20 numerical simulations performed for each scenario. Different colors denote different vegetation species, including bare soil, according to the legend shown in the lower-right panel. a,b,c) Changes of percent vegetation cover over the whole simulation horizon. d,e,f) Realized vegetation niches (left y-axis) and local species richness (i.e., α-diversity, right y-axis) as a function of marsh elevation at the end of the simulation horizon. Gray dots represent α-diversity point data with red lines showing the best quadratic fit to point data. g,h,i) Empirical probability distributions of spatially-continuous vegetation patch areas are shown based on the exceedance probability for a given vegetation patch size.



Supplementary Figure 2. Effects of changes in vegetation base mortality rate μ_0 (BMR series, μ_0 is assumed to be species-independent). Results of the reference simulation (REF, μ_0=5·10^{-3} days^{-1}) are shown in the central column. The first and second columns report respectively the results of the BMR$_1$ (μ_0=5·10^{-5} days^{-1}) and BMR$_2$ (μ_0=5·10^{-4} days^{-1}) simulations, whereas the fourth and fifth columns show the results of the BMR$_3$ (μ_0=5·10^{-2} days^{-1}) and BMR$_4$ (μ_0=5·10^{-1} days^{-1}) simulations, respectively. Each panel displays data derived from all the 20 numerical simulations performed for each scenario. Different colors denote different vegetation species, including bare soil, according to the legend shown in the lower-right panel. a,b,c,d,e) Patterns of specific competitive ability $\delta_i \cdot f_i(z_j)$ (continuous lines, left y-axis) and mortality rate $\mu_i(z_j)$ (dotted lines, right y-axis) as a function of local marsh elevation (z_j). The gray area denotes the probability density estimates of marsh elevation within the computational domain. f,g,h,i,j) Changes of percent vegetation cover over the whole simulation horizon. k,l,m,n,o) Realized vegetation niches (left y-axis) and local species richness (i.e., α-diversity, right y-axis) as a function of marsh elevation at the end of the simulation horizon. Gray dots represent α-diversity point data with red lines showing the best quadratic fit to point data. p,q,r,s,t) Empirical probability distributions of spatially-continuous vegetation patch areas are shown based on the exceedance probability for a given vegetation patch size.



Supplementary Figure 3. Effects of changes in vegetation fertility rate φ (VFR series, φ is assumed to be species-independent). Results of the reference simulation (REF, φ=10^2 days^{-1}) are shown in the central column. The first and second columns report respectively the results of the VFR_1 (φ=10^0 days^{-1}) and VFR_2 (φ=10^1 days^{-1}) simulations, whereas the fourth and fifth columns show the results of the VFR_3 (φ=10^3 days^{-1}) and VFR_4 (φ=10^4 days^{-1}) simulations, respectively. Each panel displays data derived from all the 20 numerical simulations performed for each scenario. Different colors denote different vegetation species, including bare soil, according to the legend shown in the lower-right panel. a,b,c,d,e) Patterns of specific competitive ability $\delta_i \cdot f_i(z_j)$ (continuous lines, left y-axis) and mortality rate $\mu_i(z_j)$ (dotted lines, right y-axis) as a function of local marsh elevation (z_j). The gray area denotes the probability density estimates of marsh elevation within the computational domain. f,g,h,i,j) Changes of percent vegetation cover over the whole simulation horizon. k,l,m,n,o) Realized vegetation niches (left y-axis) and local species richness (i.e., α-diversity, right y-axis) as a function of marsh elevation at the end of the simulation horizon. Gray dots represent α-diversity point data with red lines showing the best quadratic fit to point data. p,q,r,s,t) Empirical probability distributions of spatially-continuous vegetation patch areas are shown based on the exceedance probability for a given vegetation patch size.