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Kyle F. Edwards and John J. Stachowicz. 2011. Spatially stochastic settlement and the coexistence of benthic marine animals. *Ecology* 92:1005-1012

Appendix E - The effect of settlement variation on the strength of competition. For interspecific competition, we first picked four values of *Ascidia* settlement representative of observed temporal variation (10, 20, 30, 40). For each of these values we calculated a spatially averaged *Watersipora* recruitment according to the formula

$$\overline{w} = \frac{1}{\sum_{j=0}^{200}\sum_{i=0}^{200} p(i;\mu_w,k_w)p(j;\mu_a,k_a)} \sum_{j=0}^{200}\sum_{i=0}^{200} \left(i \cdot p(i;\mu_w,k_w)\right)\left(e^{\alpha+\beta j} \cdot p(j;\mu_a,k_a)\right).$$

Here $p(n;\mu_l,k_l)$ is the probability of observing *n* settlers from a negative binomial distribution with mean μ_l and dispersion parameter k_l for species *l*; subscripts *w* and *a* refer to *Ascidia* and *Watersipora*, respectively. The quantity $e^{\alpha+\beta j}$ is *Watersipora* per capita recruitment in the presence of *j Ascidia* settlers, and α and β are respectively the fitted intercept and slope from the generalized linear model for the effect of *Ascidia* on *Watersipora* recruitment. The upper limit of the summations was 200, which is approximately double the maximum observed number of settlers. For ease of implementation, settlers of the two species were assumed to be independently distributed; because settlement of these two species is slightly negatively correlated (Fig. 2*D*), this will result in a conservative estimate of the effect of spatial variation on *Watersipora* persistence. The same procedure was used for estimating the effect of settlement variation on intraspecific competition, with recruitment as a function of settlement derived from curves of the form in Fig. 1A-B.

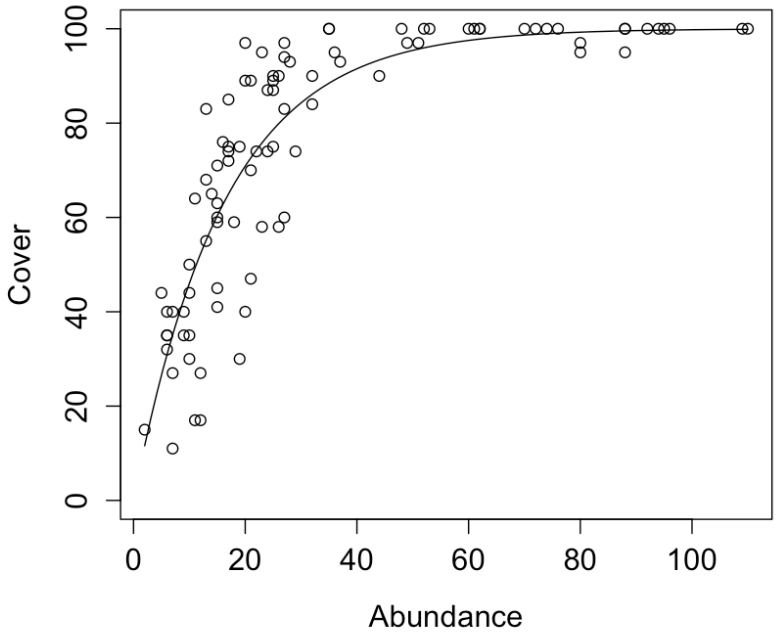

Figure E1. Relationship between abundance and cover for adult *Ascidia*. The same data as shown in Figure 2A in the text. This relationship was used in parameterizing the patch-based simulation. The line represents the fit of the saturating exponential function, y = 100*(1 – exp(-0.062*x)).

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