

## Description of Additional Supplementary Files

**File name:** Supplementary Data 1

**Description:** Pairwise  $F_{ST}$  (Weir and Cockerham 1984) values for the 2021 WGS dataset and based on 29,462 diploid SNPs with a minimum depth of 10 and minor allele frequency greater than 0.05. Significance levels are provided above the diagonal.

**File name:** Supplementary Data 2

**Description:** Pairwise  $F_{ST}$  (Weir and Cockerham 1984) values for the temporal microsatellite dataset. Significance levels are provided above the diagonal.

**File name:** Supplementary Data 3

**Description:** Results from analysis of molecular variance (AMOVA) using the temporal microsatellite dataset and testing for hierarchical patterns of genetic structure among years, sample sites, and samples.

**File name:** Supplementary Data 4

**Description:** Sample collection and descriptive statistics for microsatellite data (averaged across loci) for each sample site at each time point: Inbreeding coefficient ( $F_{IS}$ ), observed ( $H_O$ ) and expected heterozygosity ( $H_E$ ), allelic richness ( $A_r$ ), sample size ( $N$ ) and unique multi-locus genotypes (MLGs).

**File name:** Supplementary Data 5

**Description:** Sample collection details for each timepoint and site. In total 986 colonies of *Acropora* sp. (previously *Acropora tenuis*) were collected from five timepoints (2004, 2009, 2014, 2015, and 2021) and from up to 6 long-term monitoring sites (SL1, SL2, SL4, SS1, SS2, SS3).