

Identifying resilient acroporid populations for effective restoration:  
Mapping genotypic distributions and connectivity in the U.S  
Virgin Islands

Principal Investigators:

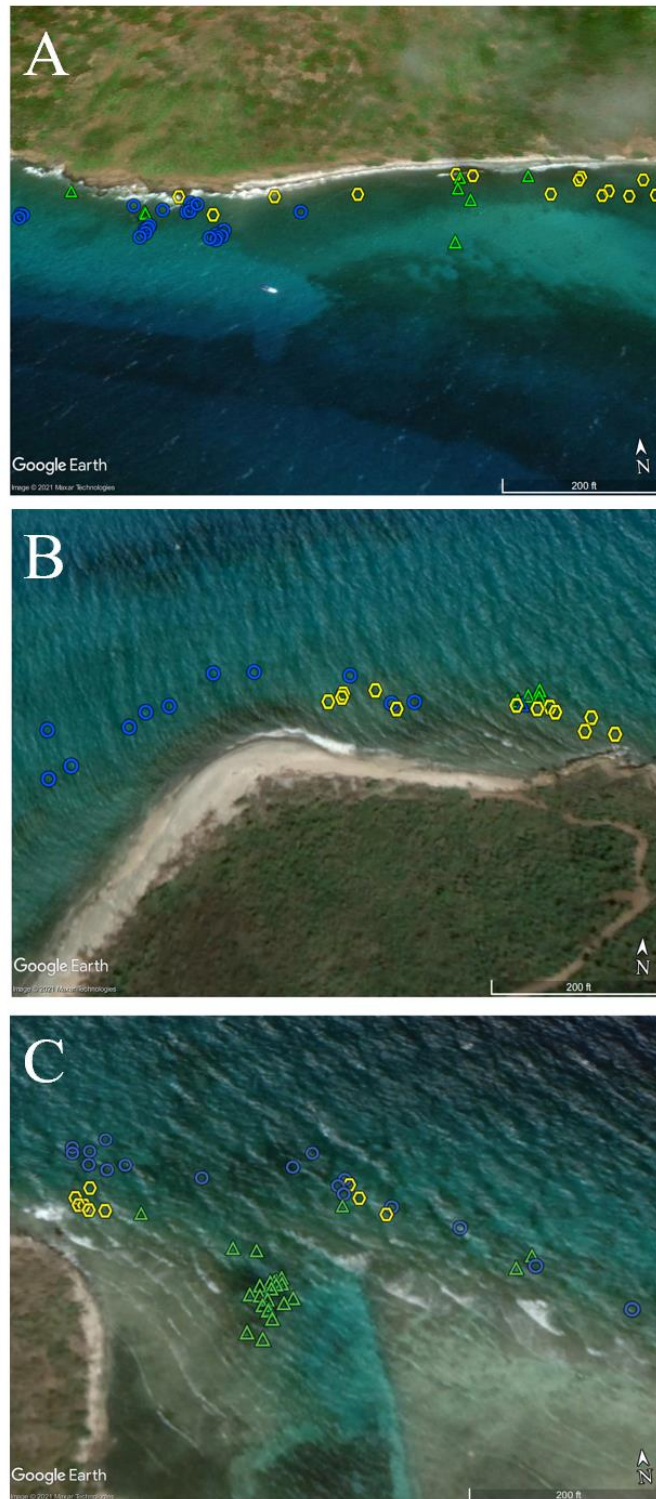
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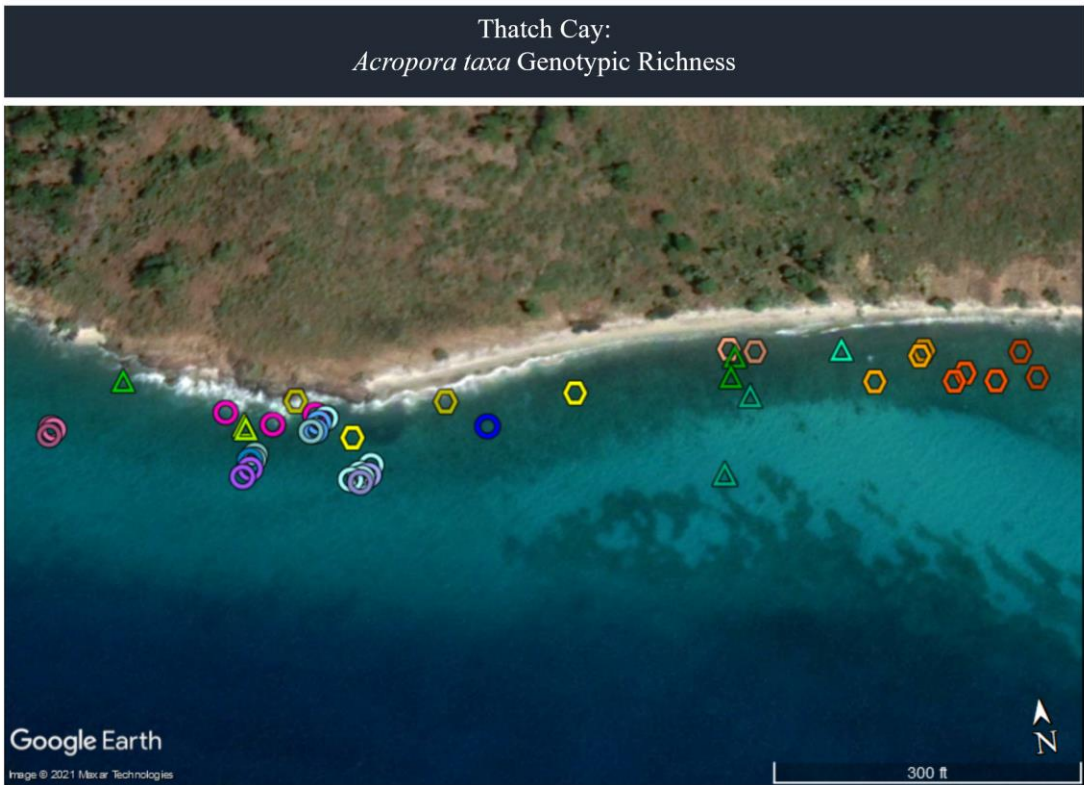
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The distribution of *Acropora* spp. at three sites (Thatch Cay, Lovango Cay, No Name Bay) are well documented based on previous tissue collection and long-term transect analysis (Nylander-Asplin et.al 2021). Rather than mapping by species alone, here we have the unique ability to capture population dynamics with regards to the number of unique genotypes sampled. Mapping the *Acropora* spp. by genotype provides a clearer understanding of the spatial relationships and expanse of distinct genotypes.



**Fig 1.** *Acropora* samples collected around St. Thomas and St. John in 2017. Colonies were sampled at A) Thatch Cay, B) Lovango Cay and C) No Name Bay. Yellow hexagons represent *A. palmata*, blue circles represent *A. cervicornis*, and green triangles represent *A. prolifera*.



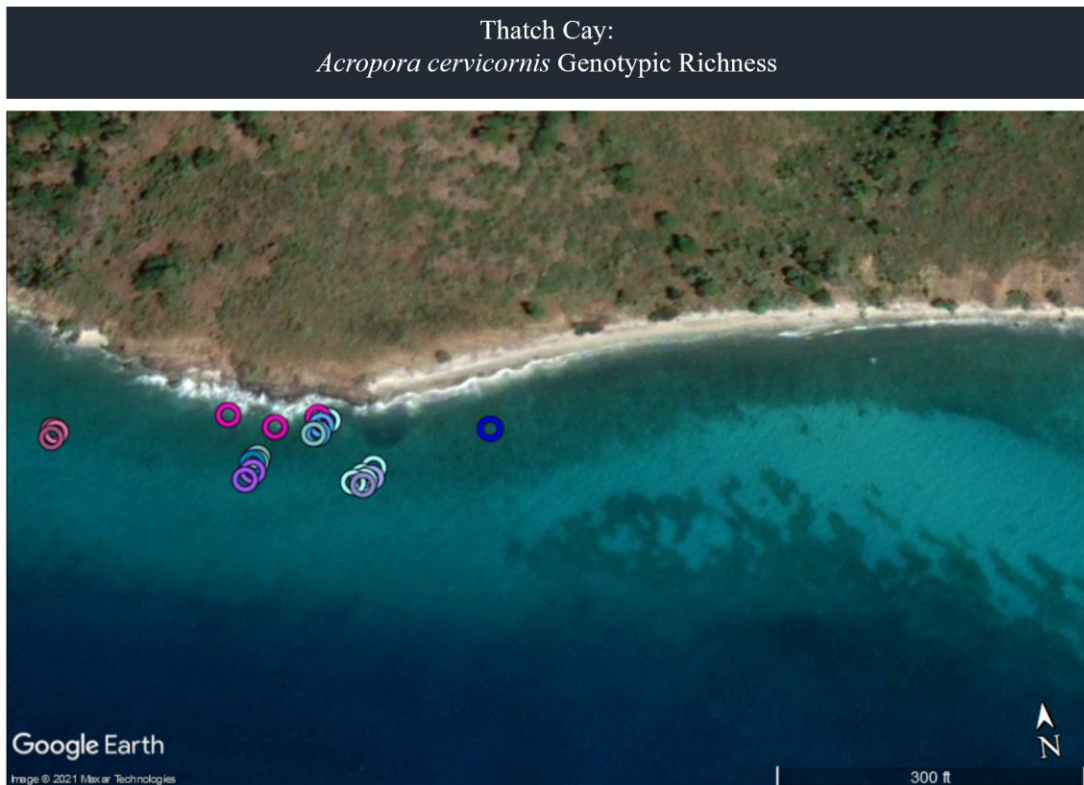
$N$  = number of sampled colonies  
 $N_g$  = number of unique genets  
 $N_g/N$  = genotypic richness.

	Thatch Cay		
	$N$	$N_g$	$N_g/N$
<i>A. cervicornis</i>	22	15	0.68
<i>A. palmata</i>	17	9	0.53
<i>A. prolifera</i>	8	6	0.75



Approximate area of enlargement

**Fig 2.** Genotypic richness of the *Acropora* taxa at Thatch Cay, U.S. Virgin Islands. Circles represent *A. cervicornis*, triangles indicate *A. prolifera* and hexagons detail *A. palmata* distributions. Each unique color represents a unique genotype with similar colors representing more closely related colonies.



$N$  = number of sampled colonies  
 $N_g$  = number of unique genets  
 $N_g/N$  = genotypic richness.

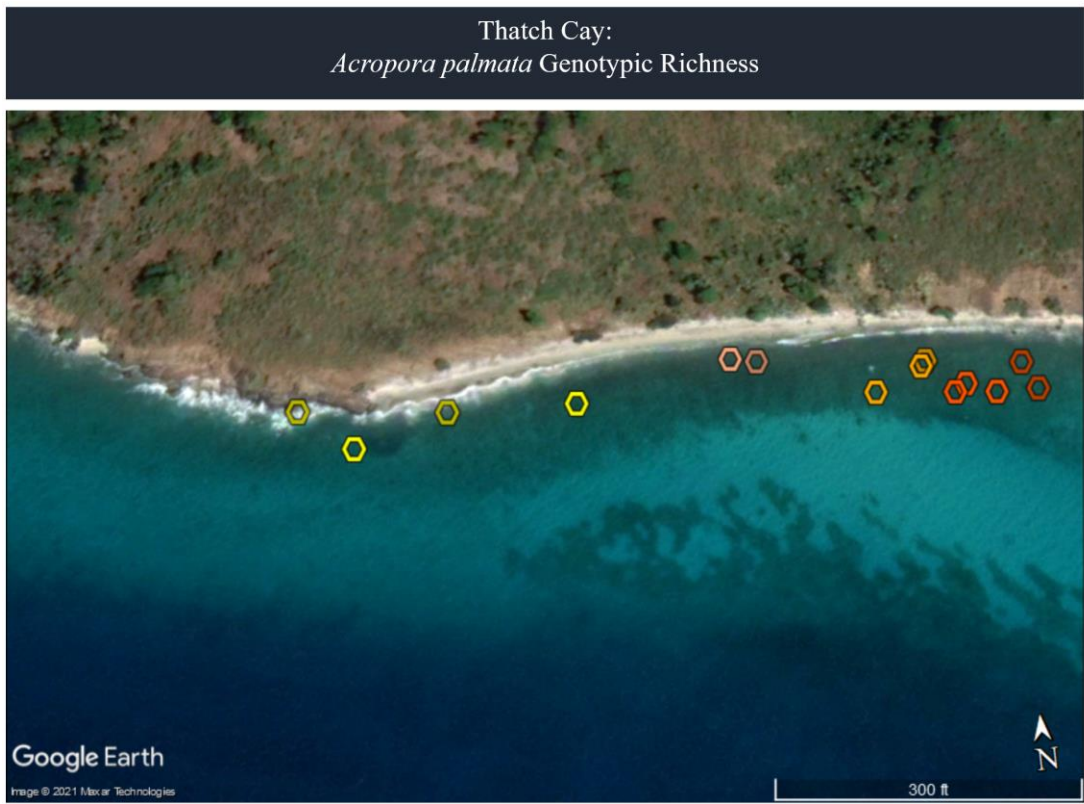
	Thatch Cay		
	$N$	$N_g$	$N_g/N$
<i>A. cervicornis</i>	22	15	0.68
<i>A. palmata</i>	17	9	0.53
<i>A. prolifera</i>	8	6	0.75



Approximate area of enlargement

**Fig 3.** Genotypic richness of the *A. cervicornis* at Thatch Cay, U.S. Virgin Islands. Each color represents a unique genotype where closer colors represent similar, but not identical genotypes. Out of 22 total samples taken, 15 unique genotypes were isolated resulting in a genotypic richness of 0.69  $N_g/N$ .





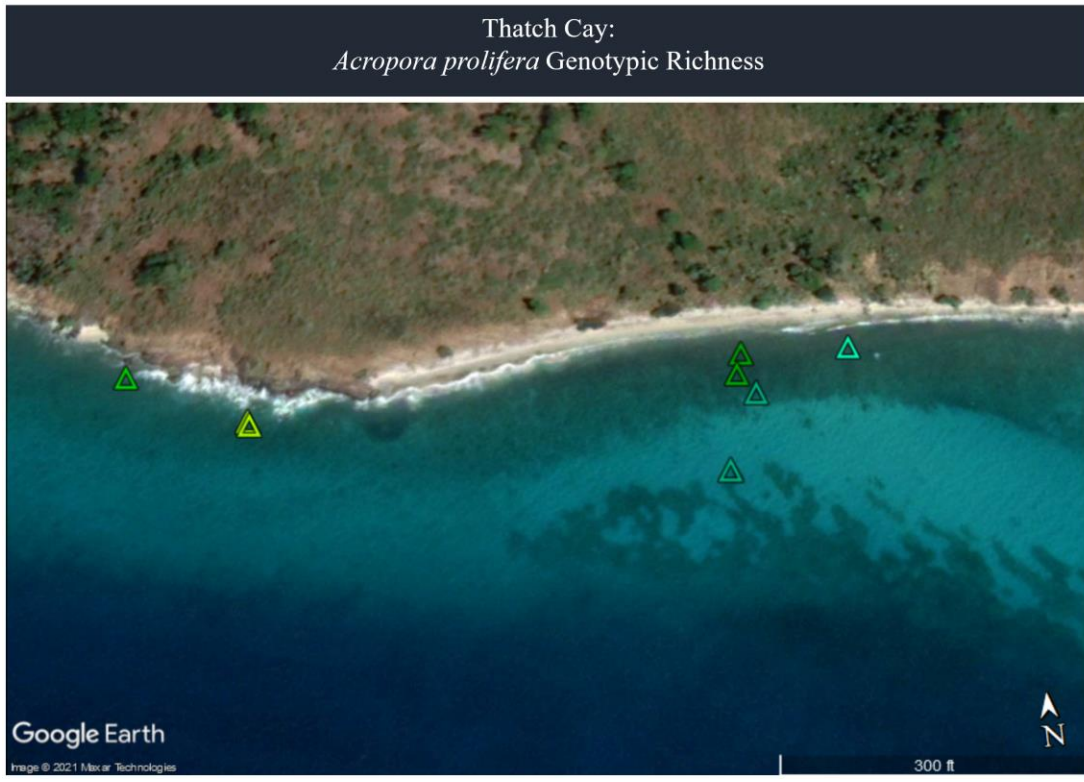
$N$  = number of sampled colonies  
 $N_g$  = number of unique genets  
 $N_g/N$  = genotypic richness.

Thatch Cay			
	$N$	$N_g$	$N_g/N$
<i>A. cervicornis</i>	22	15	0.68
<i>A. palmata</i>	17	9	0.53
<i>A. prolifera</i>	8	6	0.75



Approximate area of enlargement

**Fig 4.** Genotypic richness of the *A. palmata* at Thatch Cay, U.S. Virgin Islands. Each color represents a unique genotype, where closer colors represent similar, but not identical genotypes. Out of 17 total samples taken, 9 unique genotypes were isolated resulting in a genotypic richness of 0.53  $N_g/N$ .



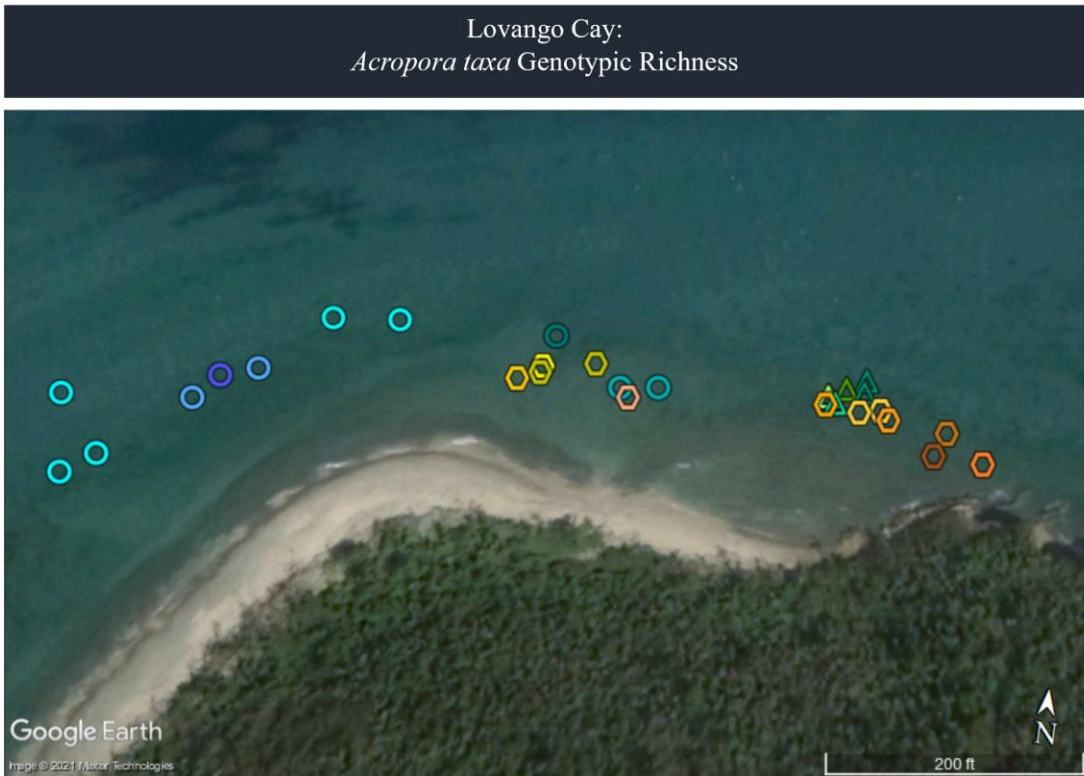
$N$  = number of sampled colonies  
 $N_g$  = number of unique genets  
 $N_g/N$  = genotypic richness.

Thatch Cay			
	$N$	$N_g$	$N_g/N$
<i>A. cervicornis</i>	22	15	0.68
<i>A. palmata</i>	17	9	0.53
<i>A. prolifera</i>	8	6	0.75



Approximate area of enlargement

**Fig 5.** Genotypic richness of the hybrid *A. prolifera* at Thatch Cay, U.S. Virgin Islands. Each color represents a unique genotype, where closer colors represent similar, but not identical genotypes. Out of 8 total samples taken, 6 unique genotypes were isolated resulting in a genotypic richness of 0.75  $N_g/N$ .



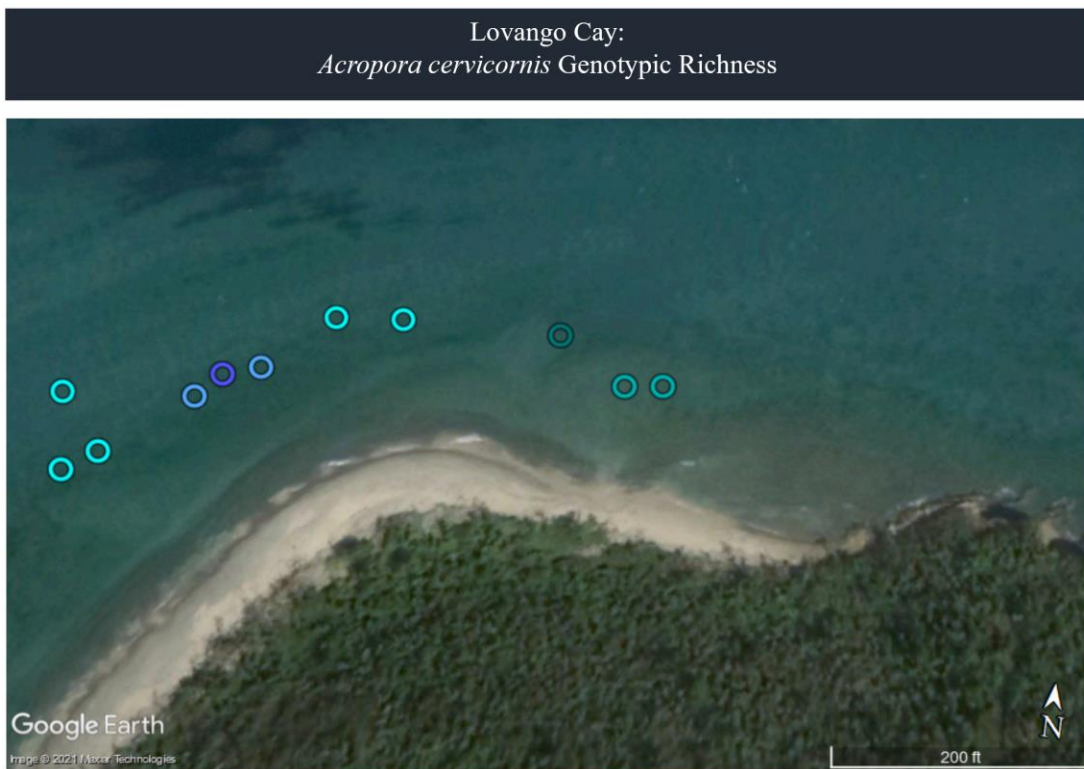
$N$  = number of sampled colonies  
 $N_g$  = number of unique genets  
 $N_g/N$  = genotypic richness.

	Lovango Cay		
	$N$	$N_g$	$N_g/N$
<i>A. cervicornis</i>	12	5	0.42
<i>A. palmata</i>	12	10	0.83
<i>A. prolifera</i>	6	4	0.66



Approximate area of enlargement

**Fig 6.** Genotypic richness of the *Acropora* taxa at Lovango Cay, U.S. Virgin Islands. Circles represent *A. cervicornis*, triangles indicate *A. prolifera* and hexagons detail *A. palmata* distributions. Each unique color represents a unique genotype with similar colors representing more closely related colonies.



$N$  = number of sampled colonies  
 $N_g$  = number of unique genets  
 $N_g/N$  = genotypic richness.

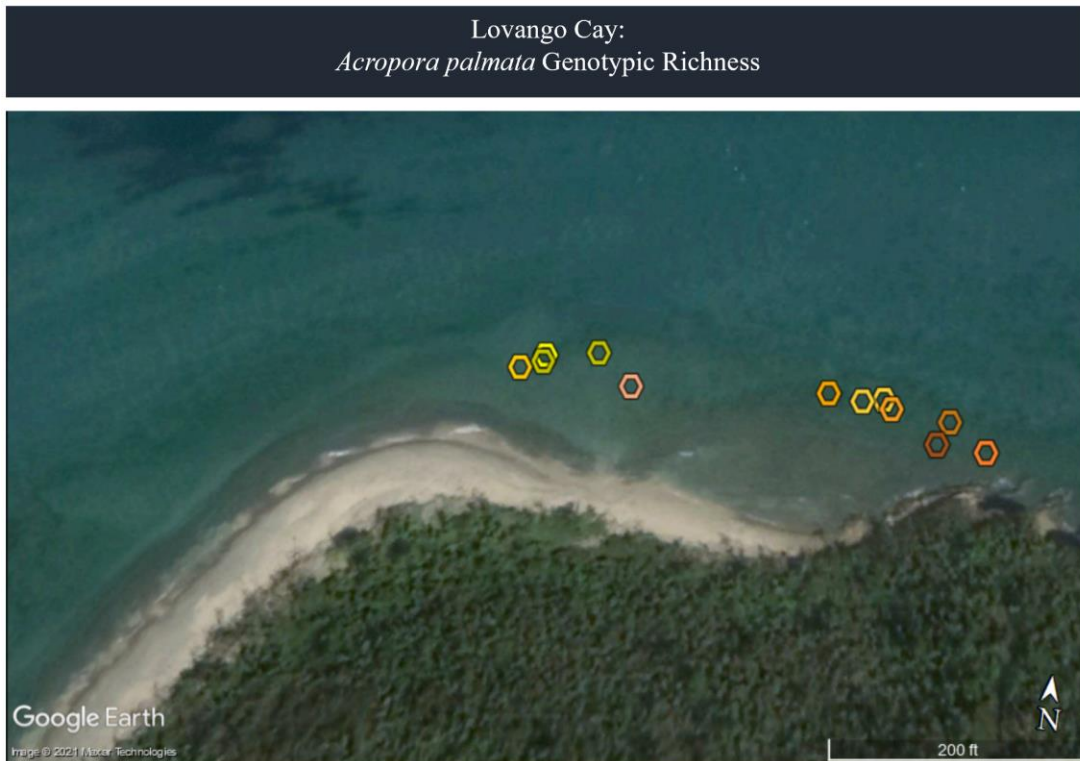
	Lovango Cay		
	$N$	$N_g$	$N_g/N$
<i>A. cervicornis</i>	12	5	0.42
<i>A. palmata</i>	12	10	0.83
<i>A. prolifera</i>	6	4	0.66



Approximate area of enlargement

**Fig 7.** Genotypic richness of the *A. cervicornis* at Lovango Cay, U.S. Virgin Islands. Each color represents a unique genotype, where closer colors represent similar, but not identical genotypes. Out of 12 total samples taken, 5 unique genotypes were isolated resulting in a genotypic richness of 0.42  $N_g/N$ .





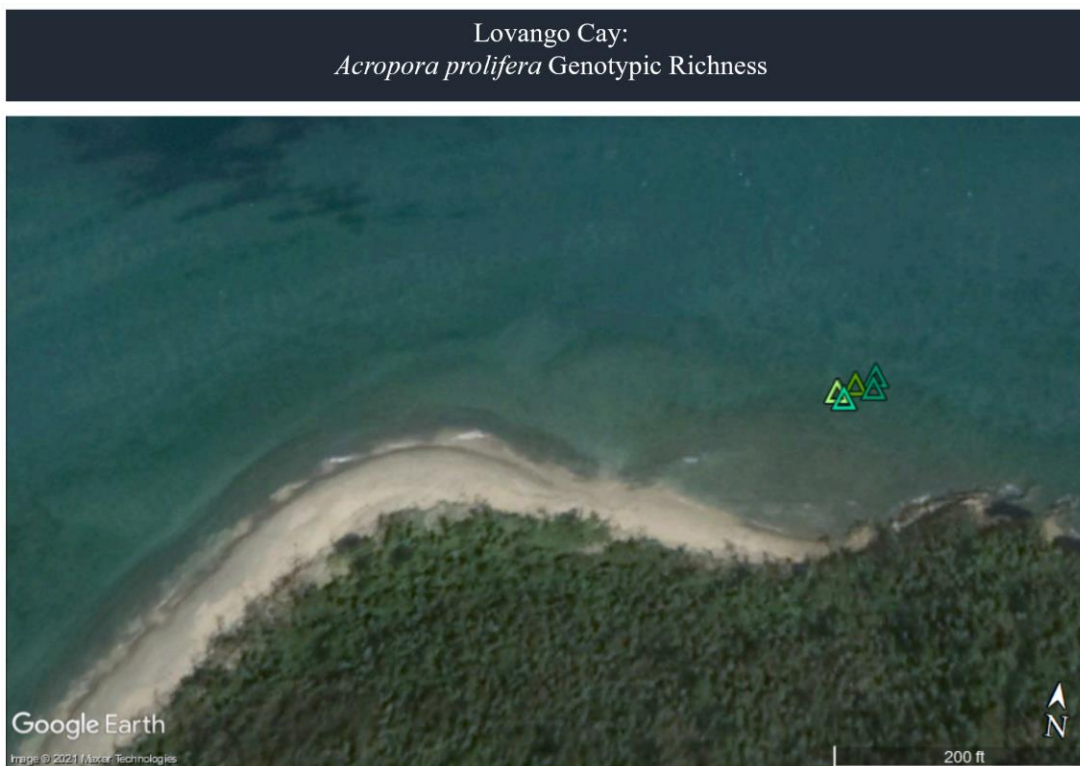
$N$  = number of sampled colonies  
 $N_g$  = number of unique genets  
 $N_g/N$  = genotypic richness.

Lovango Cay			
	$N$	$N_g$	$N_g/N$
<i>A. cervicornis</i>	12	5	0.42
<i>A. palmata</i>	12	10	0.83
<i>A. prolifera</i>	6	4	0.66



Approximate area of enlargement

**Fig 8.** Genotypic richness of the *A. palmata* at Lovango Cay, U.S. Virgin Islands. Each color represents a unique genotype, where closer colors represent similar, but not identical genotypes. Out of 12 total samples taken, 10 unique genotypes were isolated resulting in a genotypic richness of 0.83  $N_g/N$ .



$N$  = number of sampled colonies  
 $N_g$  = number of unique genets  
 $N_g/N$  = genotypic richness.

Lovango Cay			
	$N$	$N_g$	$N_g/N$
<i>A. cervicornis</i>	12	5	0.42
<i>A. palmata</i>	12	10	0.83
<i>A. prolifera</i>	6	4	0.66

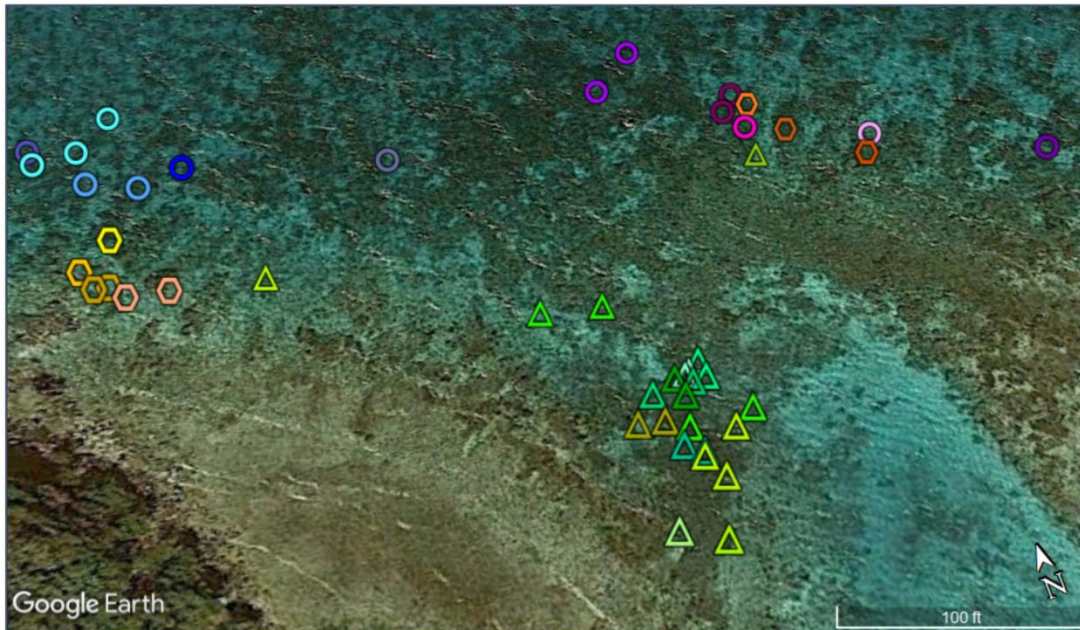


Approximate area of enlargement

**Fig 9.** Genotypic richness of the hybrid *A. prolifera* at Lovango Cay, U.S. Virgin Islands. Each color represents a unique genotype, where closer colors represent similar, but not identical genotypes. Out of 6 total samples taken, 4 unique genotypes were isolated resulting in a genotypic richness of 0.66  $N_g/N$ .



No Name Bay:  
*Acropora* taxa Genotypic Richness



$N$  = number of sampled colonies  
 $N_g$  = number of unique genets  
 $N_g/N$  = genotypic richness.

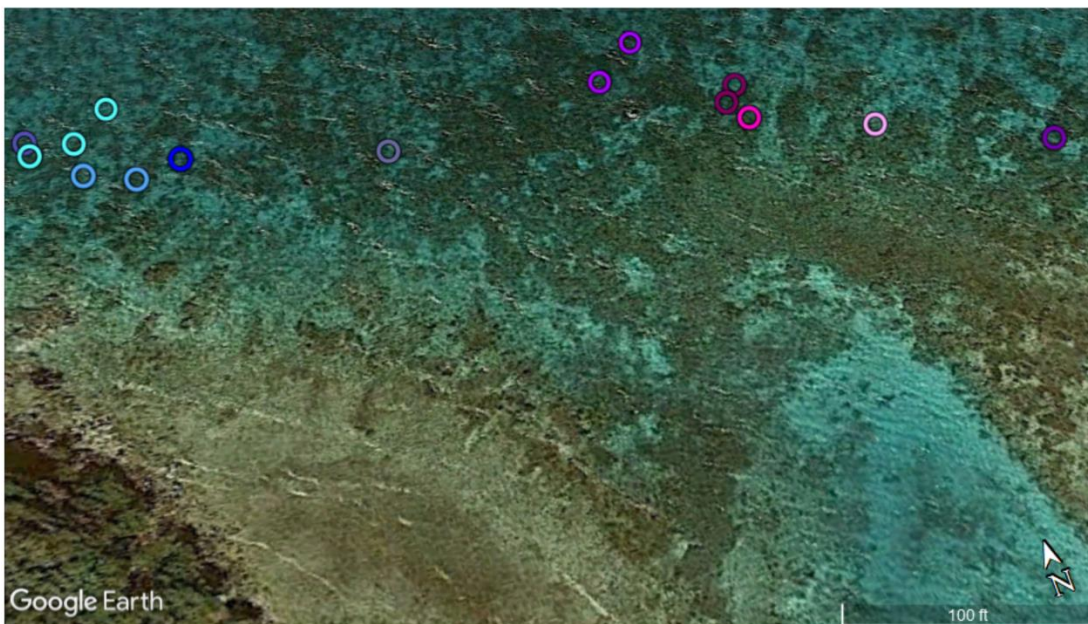
	No Name Bay		
	$N$	$N_g$	$N_g/N$
<i>A. cervicornis</i>	16	11	0.69
<i>A. palmata</i>	11	8	0.73
<i>A. prolifera</i>	25	25	0.6



Approximate area of enlargement

**Fig 10.** Genotypic richness of the *Acropora* taxa at No Name Bay, U.S. Virgin Islands. Circles represent *A. cervicornis*, triangles indicate *A. prolifera* and hexagons detail *A. palmata* distributions. Each unique color represents a unique genotype with similar colors representing more closely related colonies.

No Name Bay:  
*Acropora cervicornis* Genotypic Richness



$N$  = number of sampled colonies  
 $N_g$  = number of unique genets  
 $N_g/N$  = genotypic richness.

	No Name Bay		
	$N$	$N_g$	$N_g/N$
<i>A. cervicornis</i>	16	11	0.69
<i>A. palmata</i>	11	8	0.73
<i>A. prolifera</i>	25	25	0.6

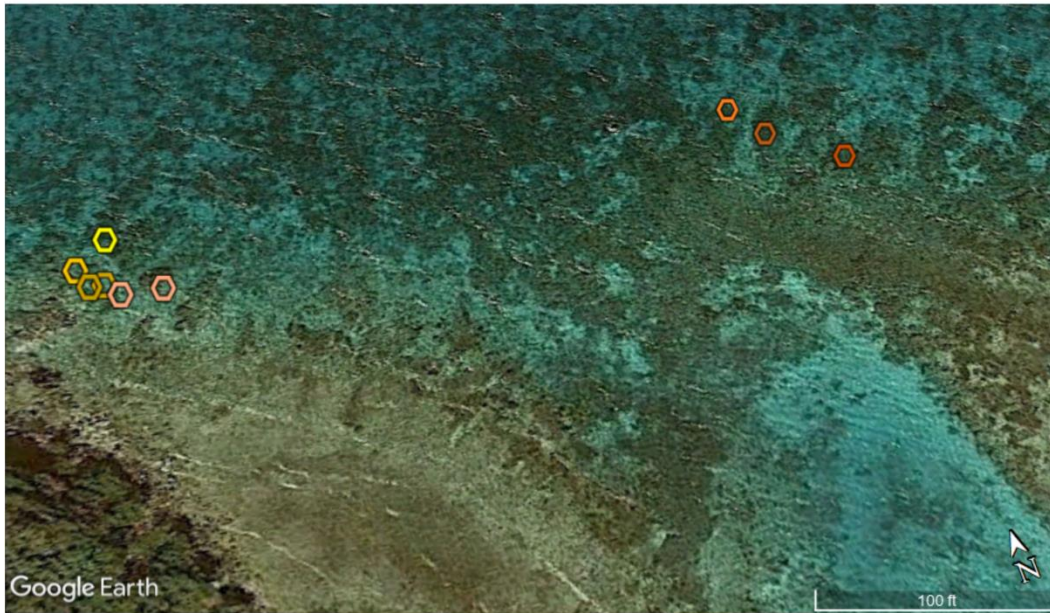


Approximate area of enlargement

**Fig 11.** Genotypic richness of the *A. cervicornis* at No Name Bay, U.S. Virgin Islands. Each color represents a unique genotype, where closer colors represent similar, but not identical genotypes. Out of 16 total samples taken, 11 unique genotypes were isolated resulting in a genotypic richness of 0.69  $N_g/N$ .



No Name Bay:  
*Acropora palmata* Genotypic Richness



$N$  = number of sampled colonies  
 $N_g$  = number of unique genets  
 $N_g/N$  = genotypic richness.

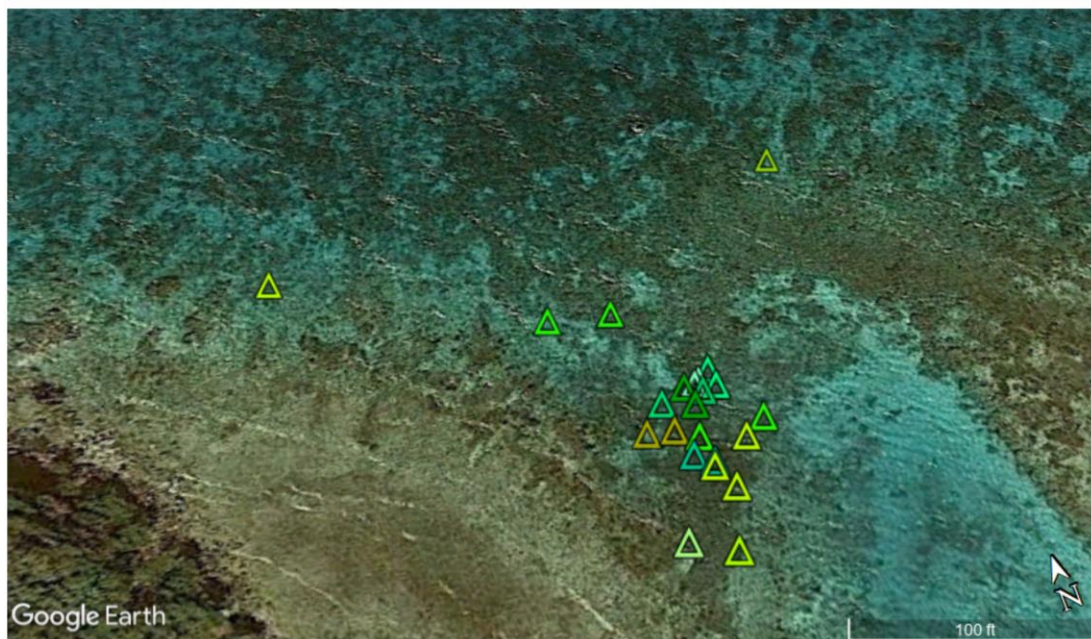
	No Name Bay		
	$N$	$N_g$	$N_g/N$
<i>A. cervicornis</i>	16	11	0.69
<i>A. palmata</i>	11	8	0.73
<i>A. prolifera</i>	25	25	0.6



Approximate area of enlargement

**Fig 12.** Genotypic richness of the *A. palmata* at No Name Bay, U.S. Virgin Islands. Each color represents a unique genotype, where closer colors represent similar, but not identical genotypes. Out of 11 total samples taken, 8 unique genotypes were isolated resulting in a genotypic richness of 0.73  $N_g/N$ .

No Name Bay:  
*Acropora prolifera* Genotypic Richness



$N$  = number of sampled colonies  
 $N_g$  = number of unique genets  
 $N_g/N$  = genotypic richness.

	No Name Bay		
	$N$	$N_g$	$N_g/N$
<i>A. cervicornis</i>	16	11	0.69
<i>A. palmata</i>	11	8	0.73
<i>A. prolifera</i>	25	25	0.6



Approximate area of enlargement

**Fig 13.** Genotypic richness of the hybrid *A. prolifera* at No Name Bay, U.S. Virgin Islands. Each color represents a unique genotype, where closer colors represent similar, but not identical genotypes. Out of 25 total samples taken, 15 unique genotypes were isolated resulting in a genotypic richness of 0.6  $N_g/N$ .