

Coral Disease Treatments

Karen Neely, Ph.D.

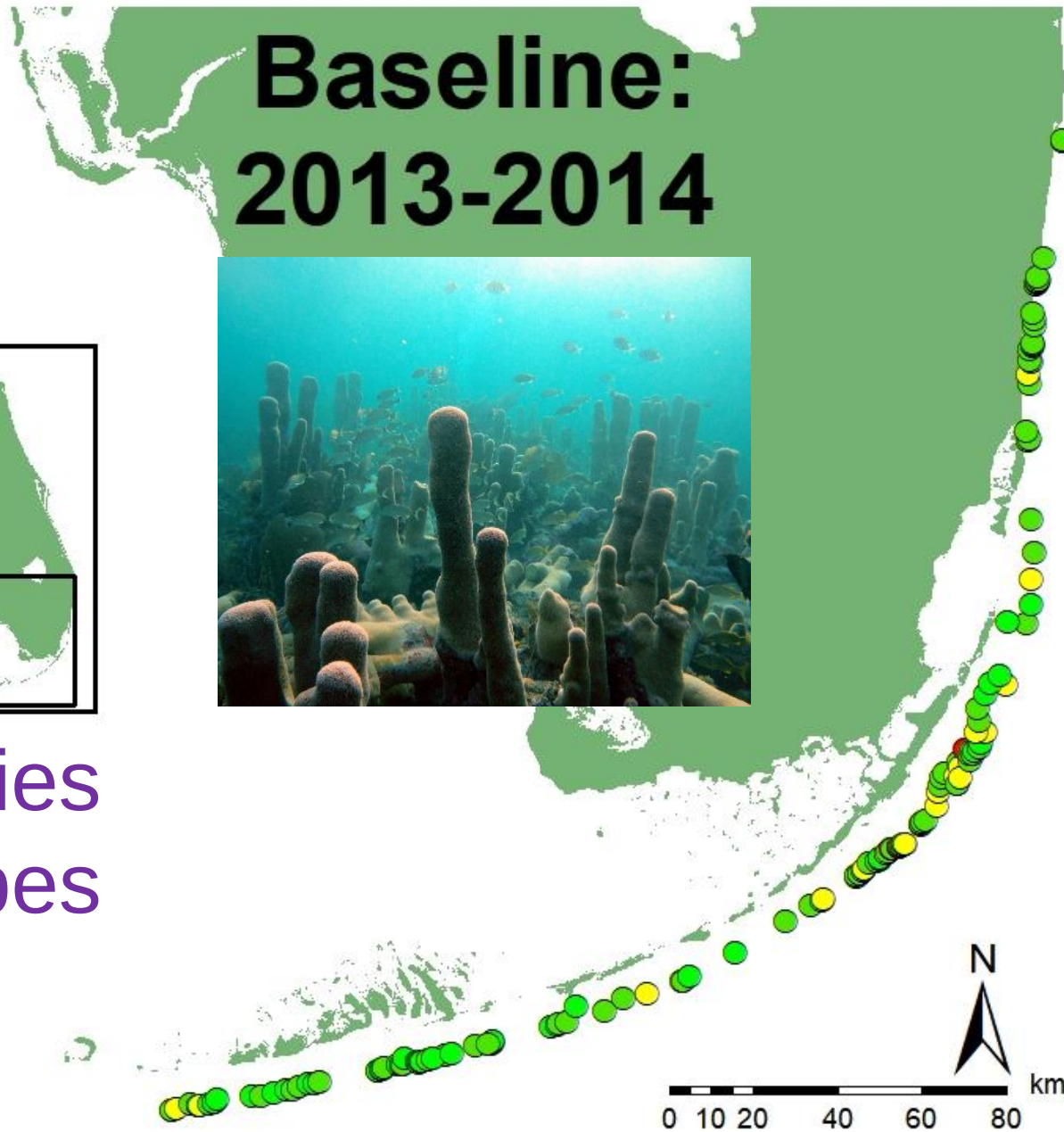
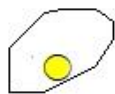


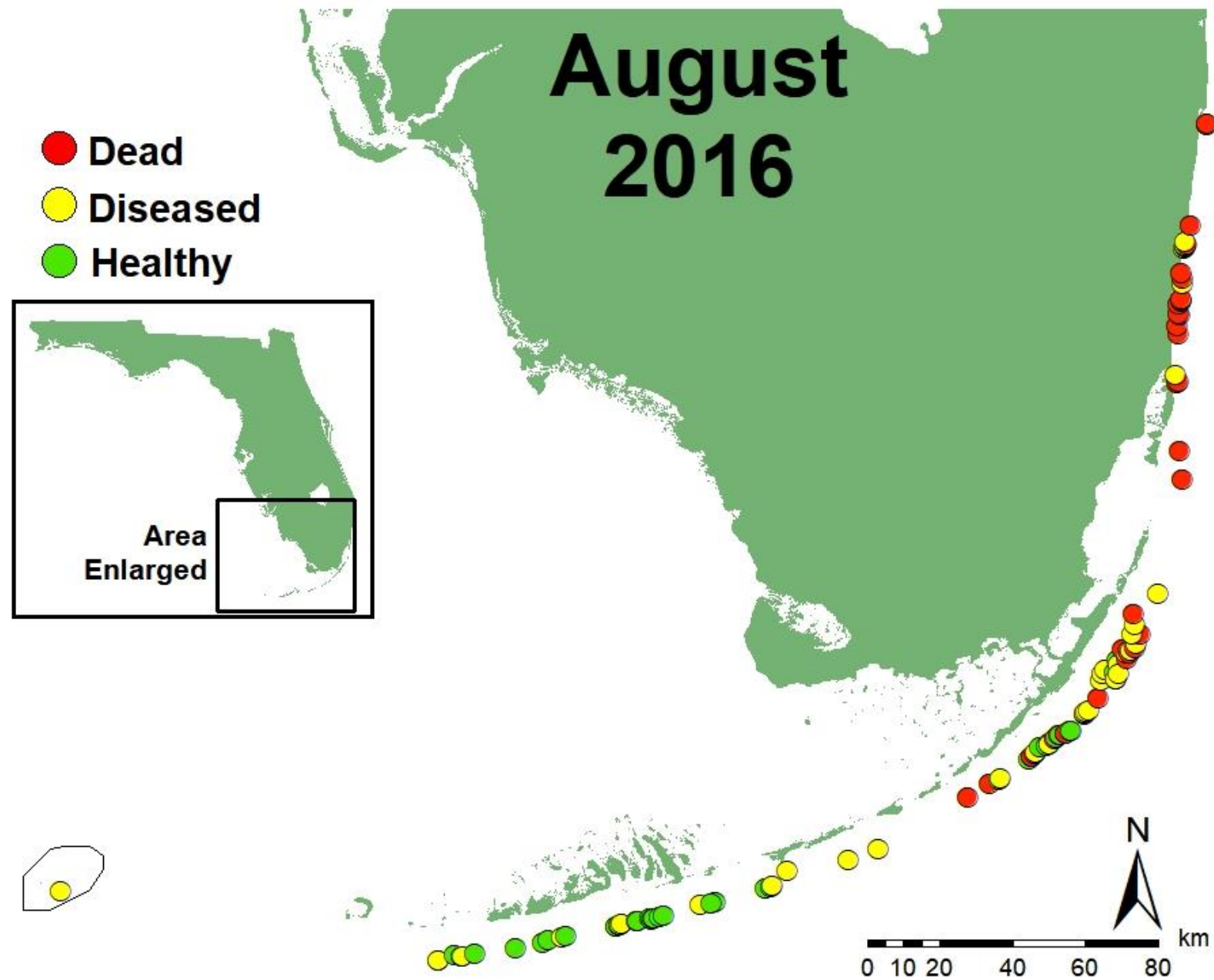
Baseline: 2013-2014

- Dead
- Diseased
- Healthy



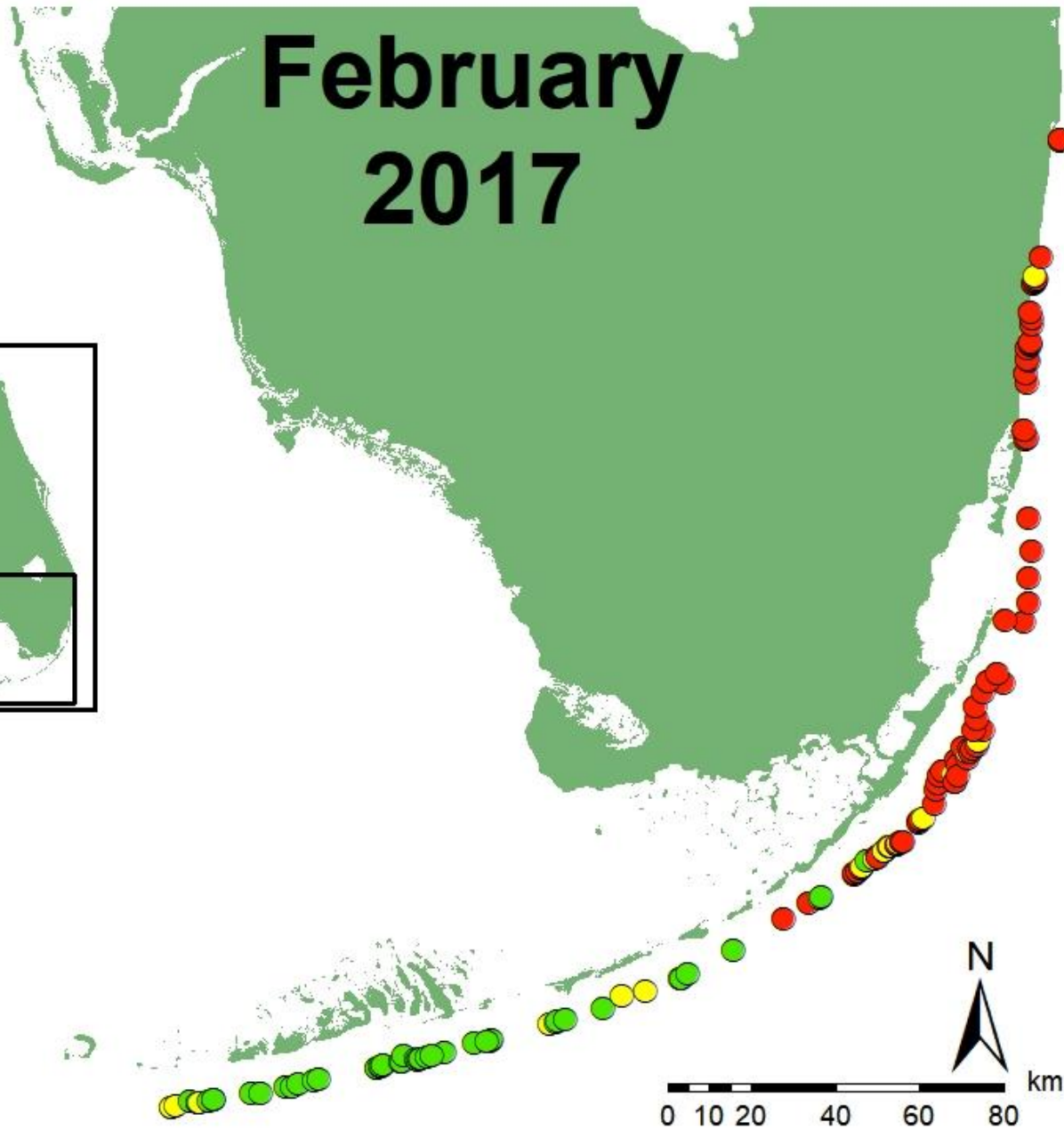
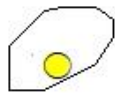
750 colonies
155 genotypes





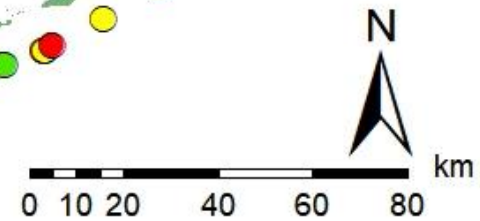
February 2017

- Dead
- Diseased
- Healthy



April 2018

- Dead
- Diseased
- Healthy

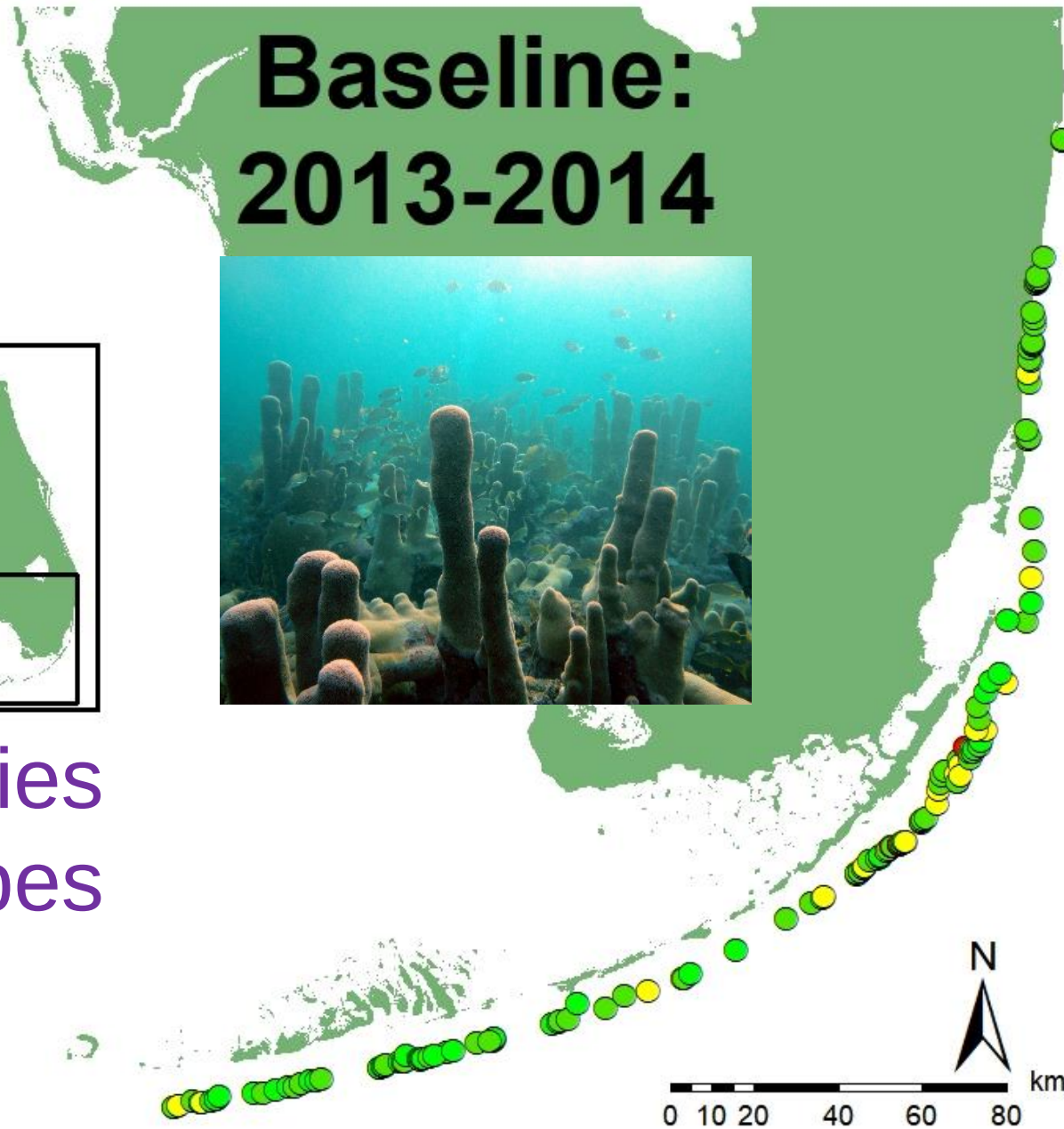
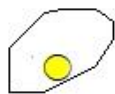


Baseline: 2013-2014

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750 colonies
155 genotypes

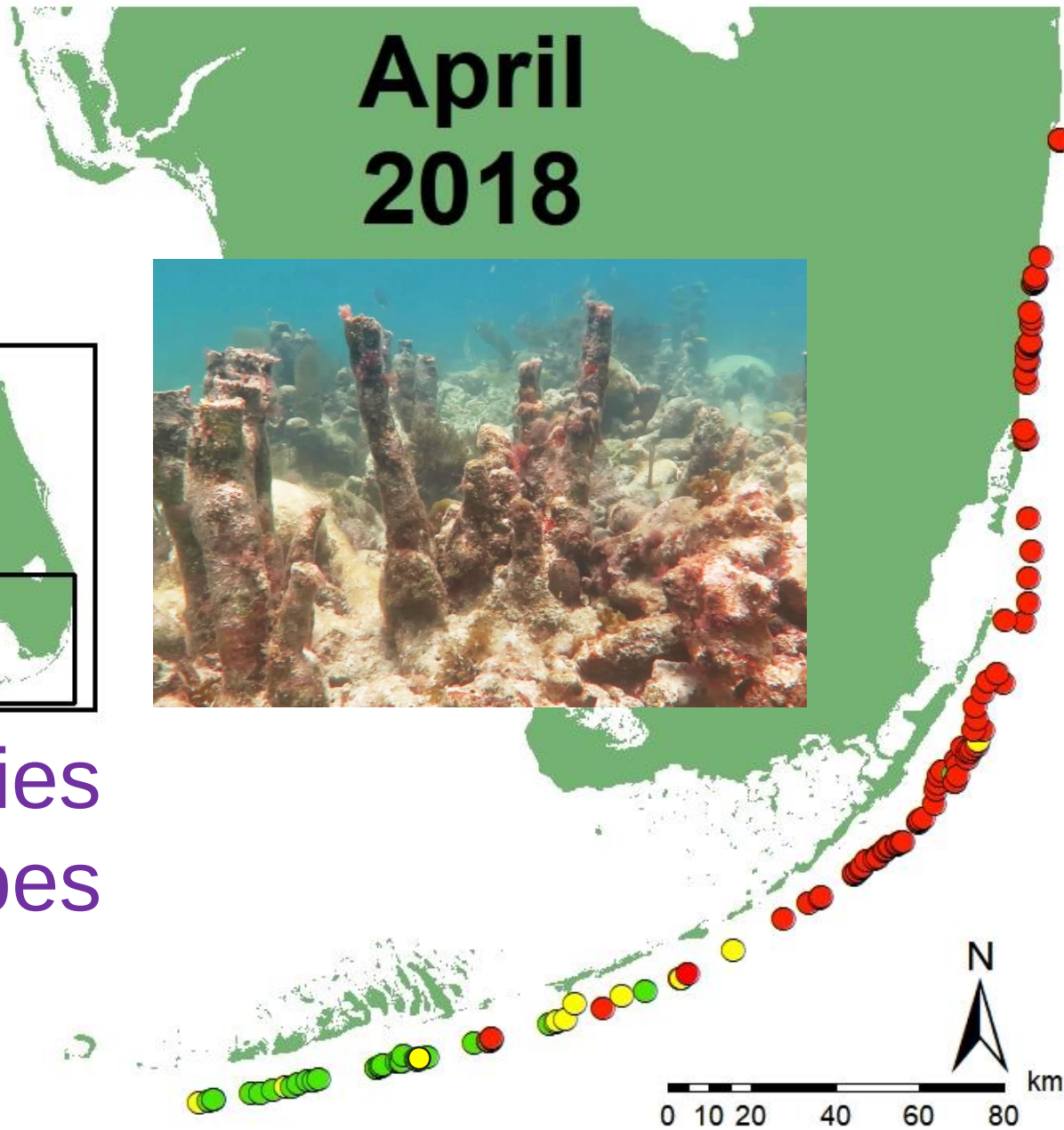


**April
2018**

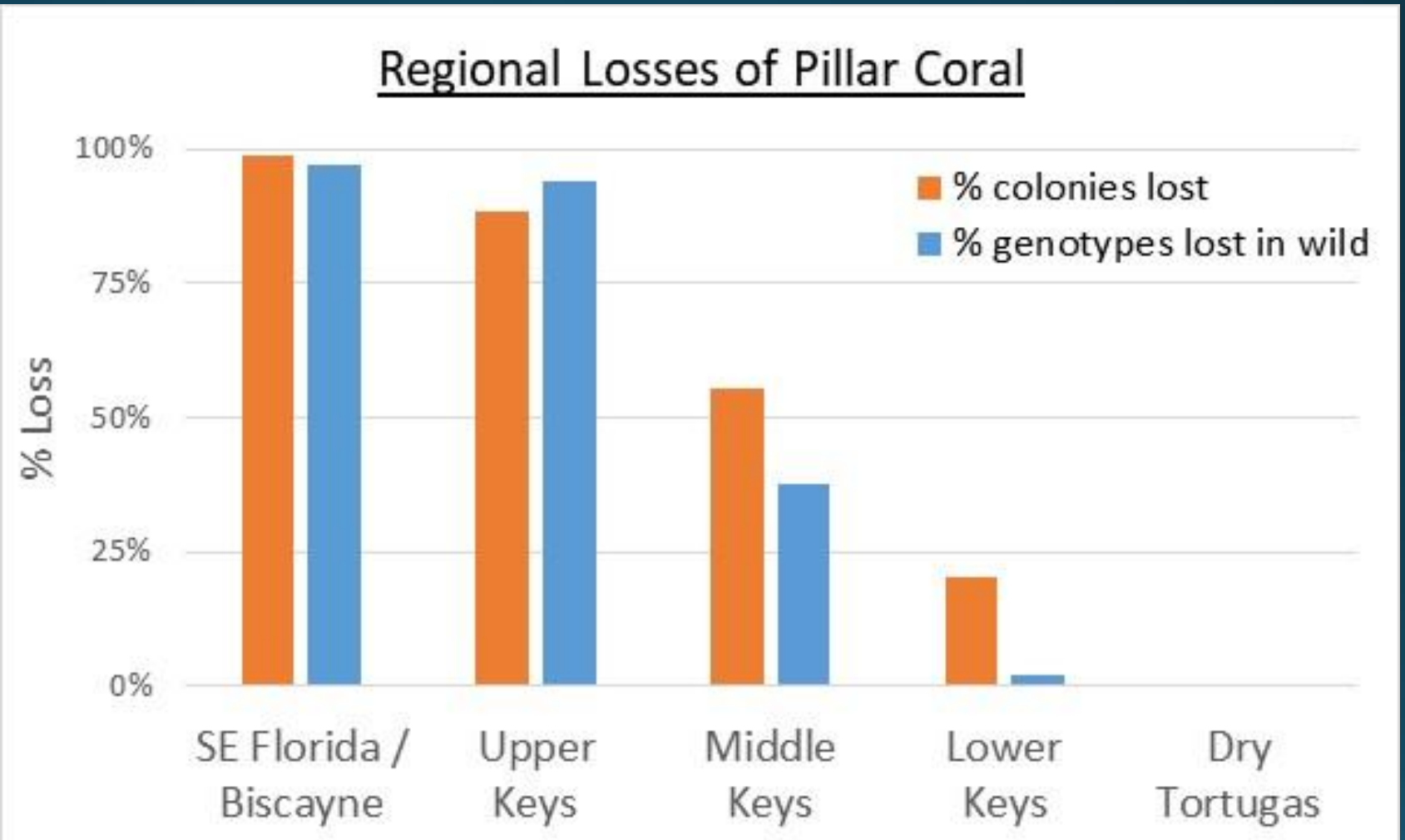
- Dead
- Diseased
- Healthy



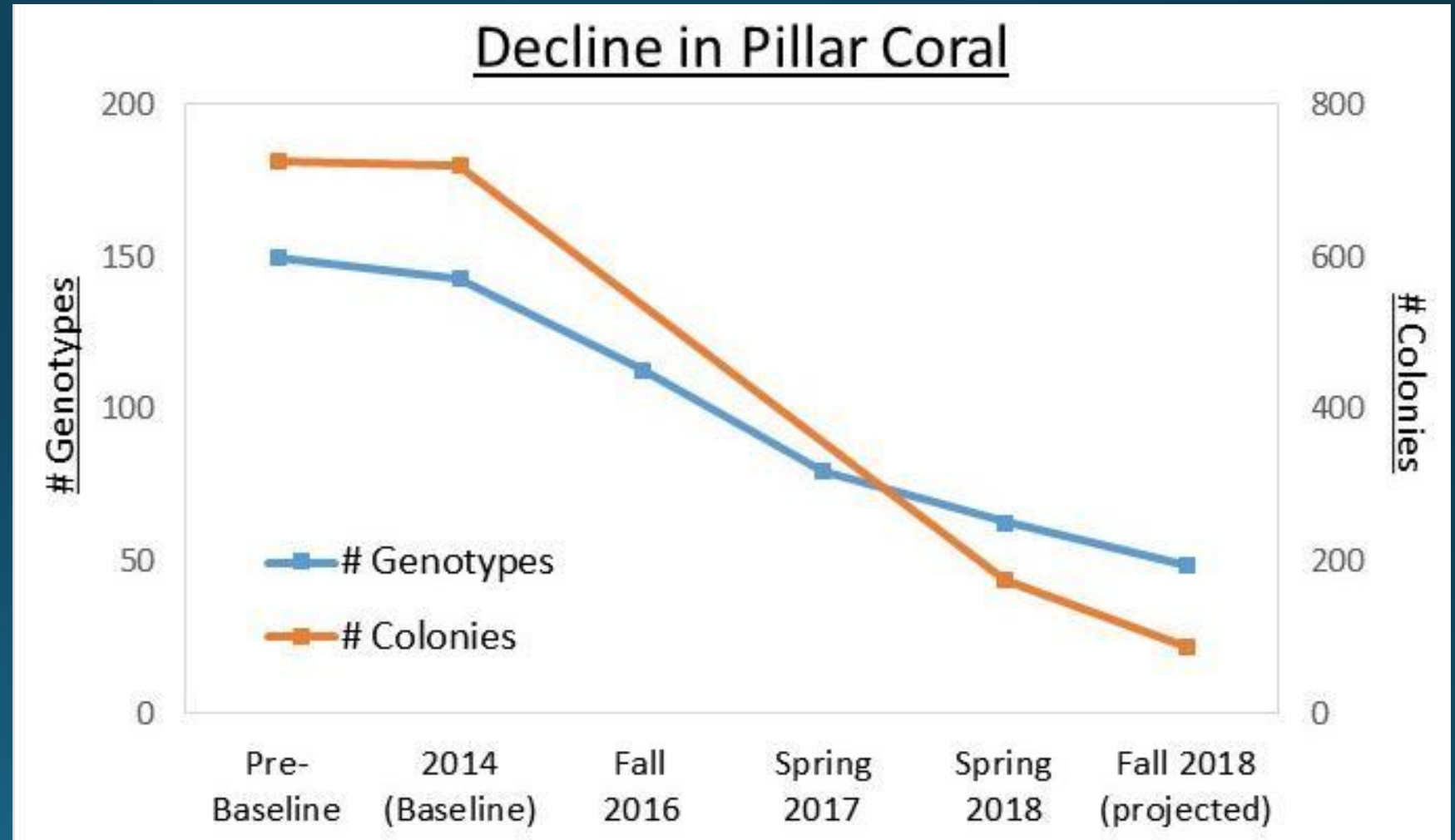
183 colonies
65 genotypes



LOSSES SINCE 2014:
76% colonies
60% genotypes



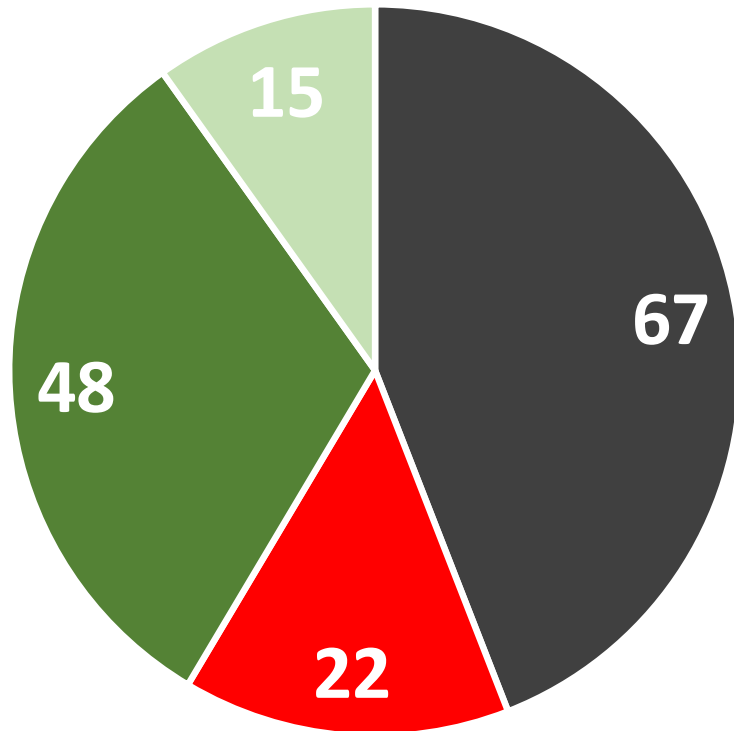
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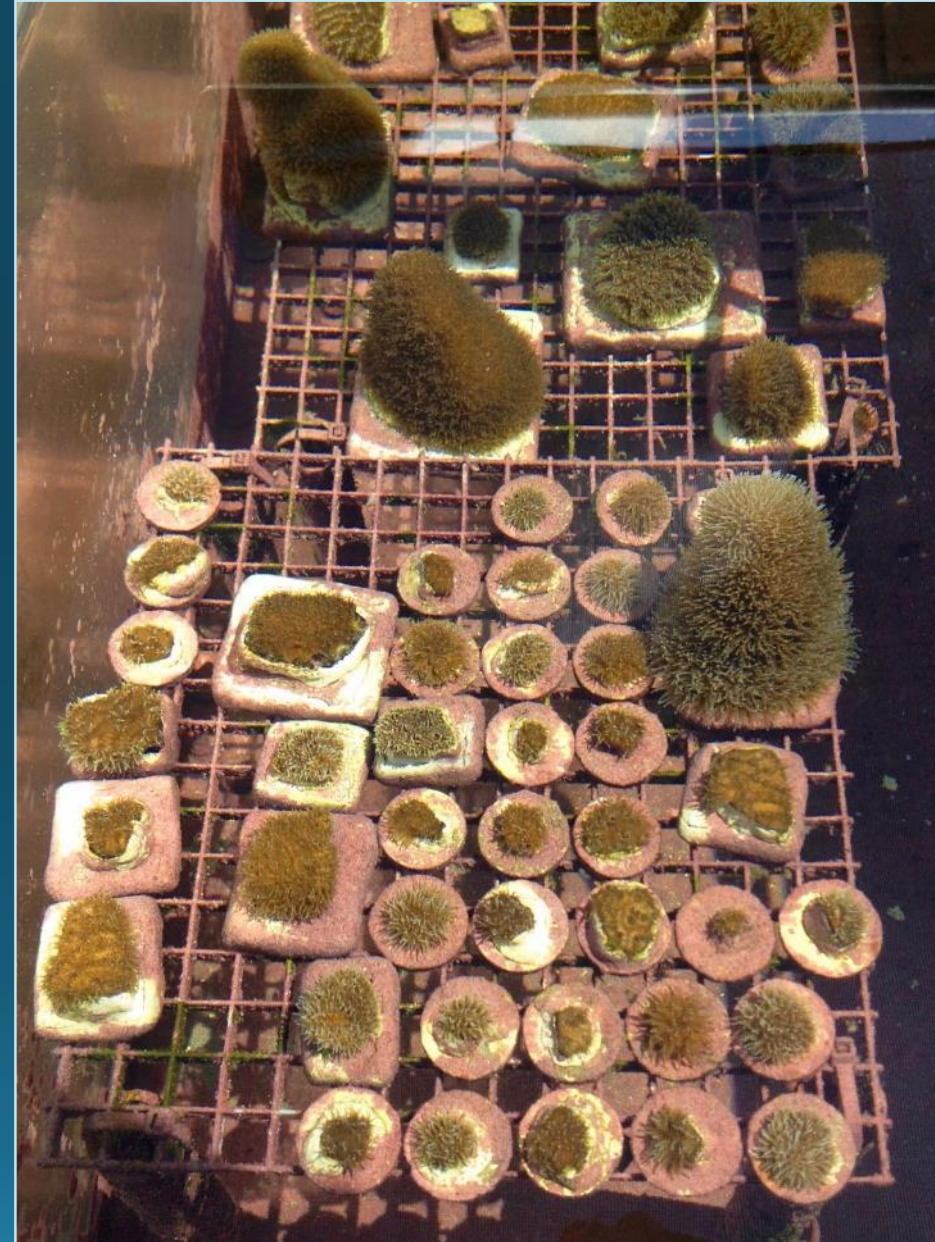
Genetic Banking of Remaining Genotypes



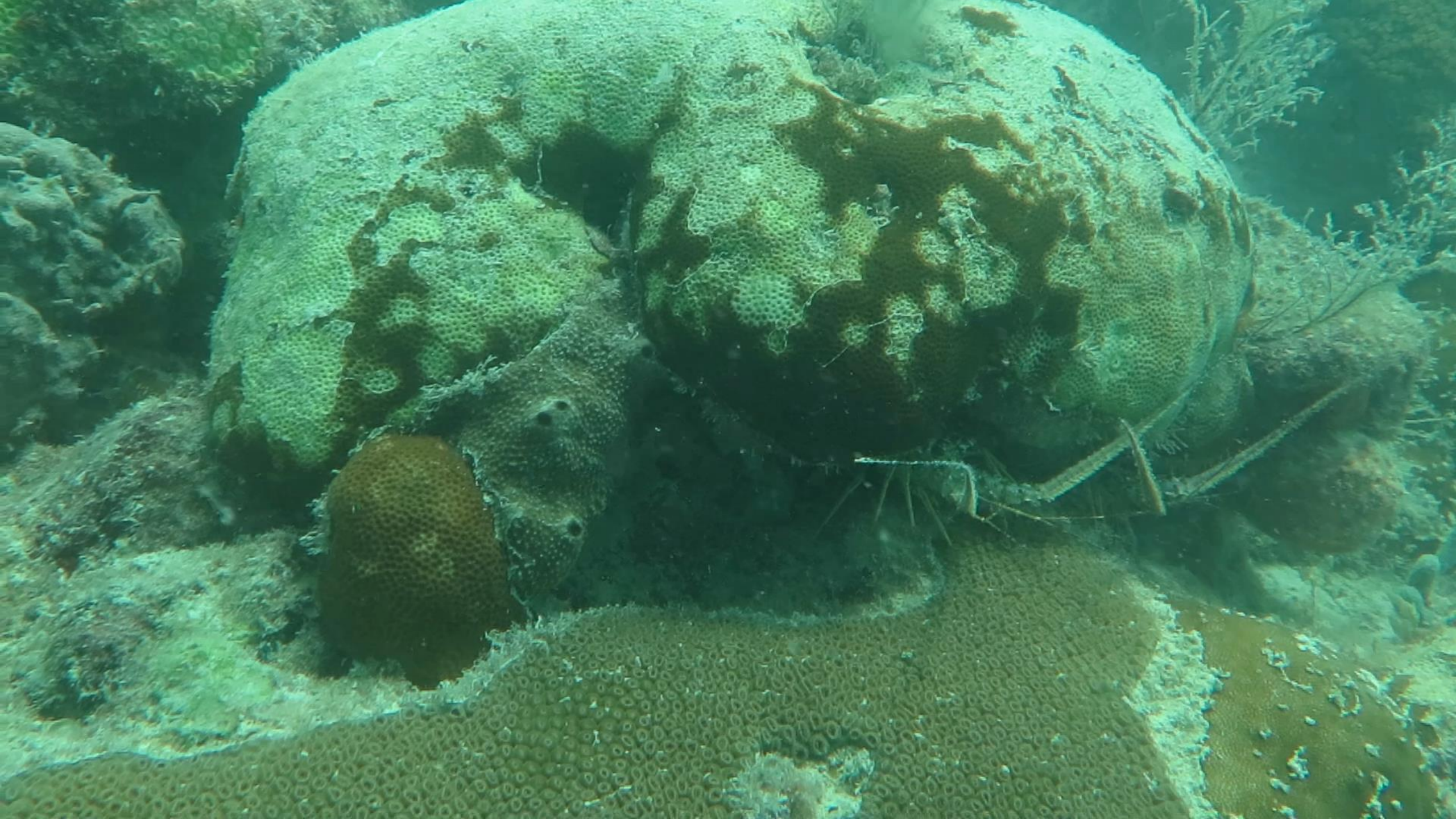
Status of Pillar Coral Genotypes



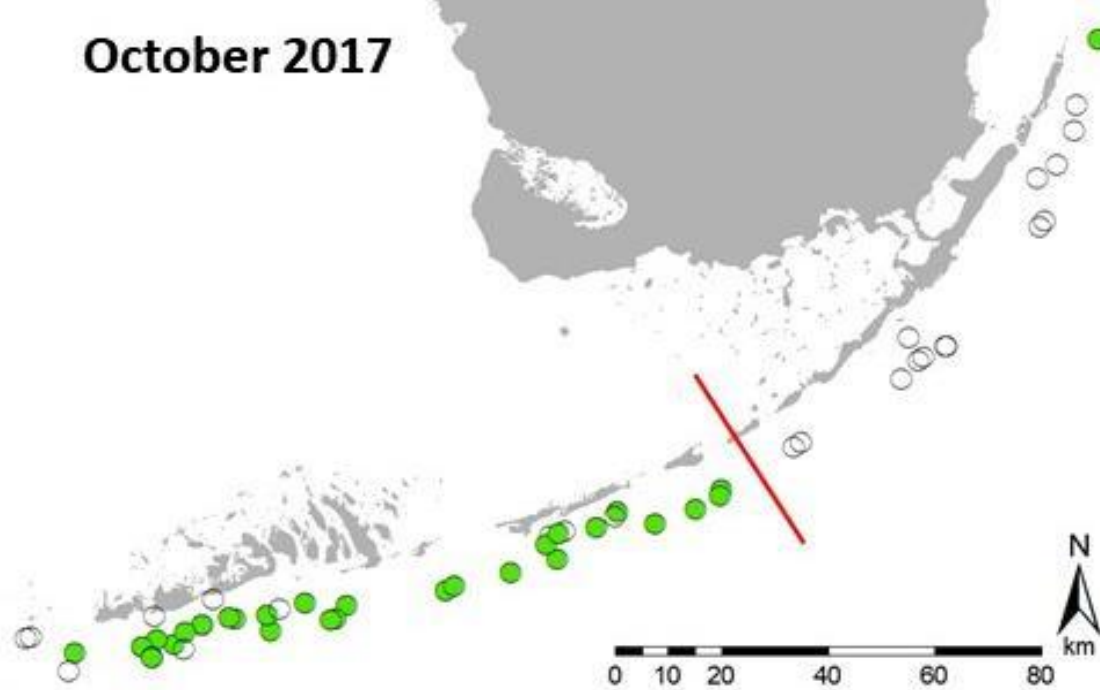
- Extinct
- Gene Banked Only
- Wild & Gene Banked
- Wild Only



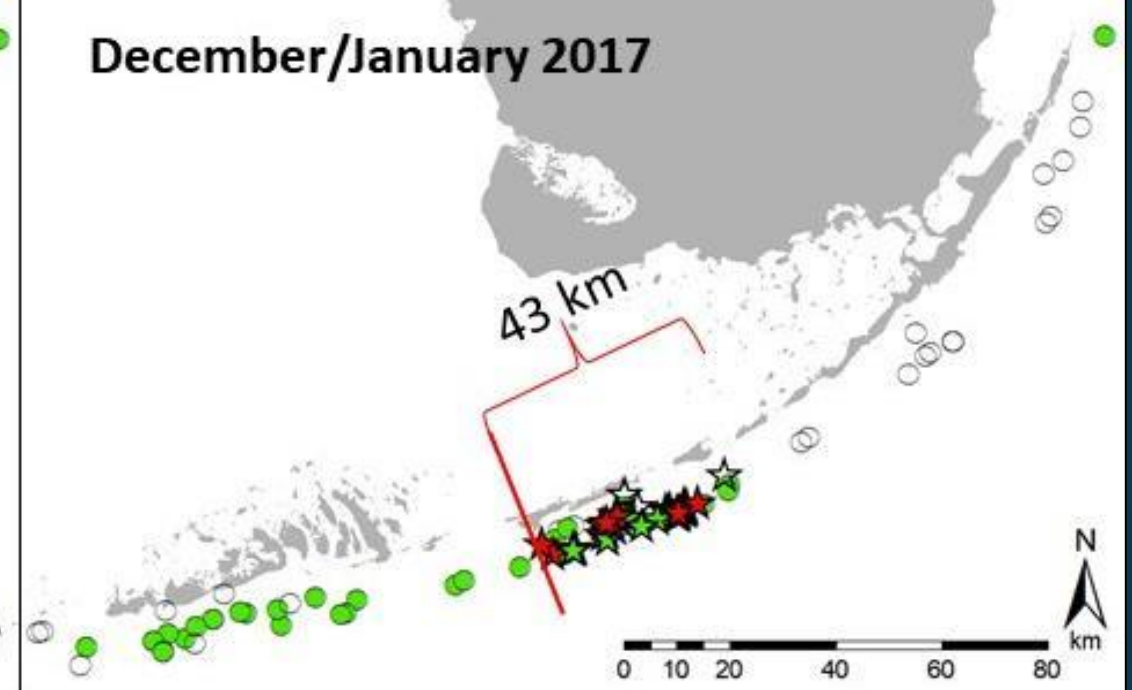




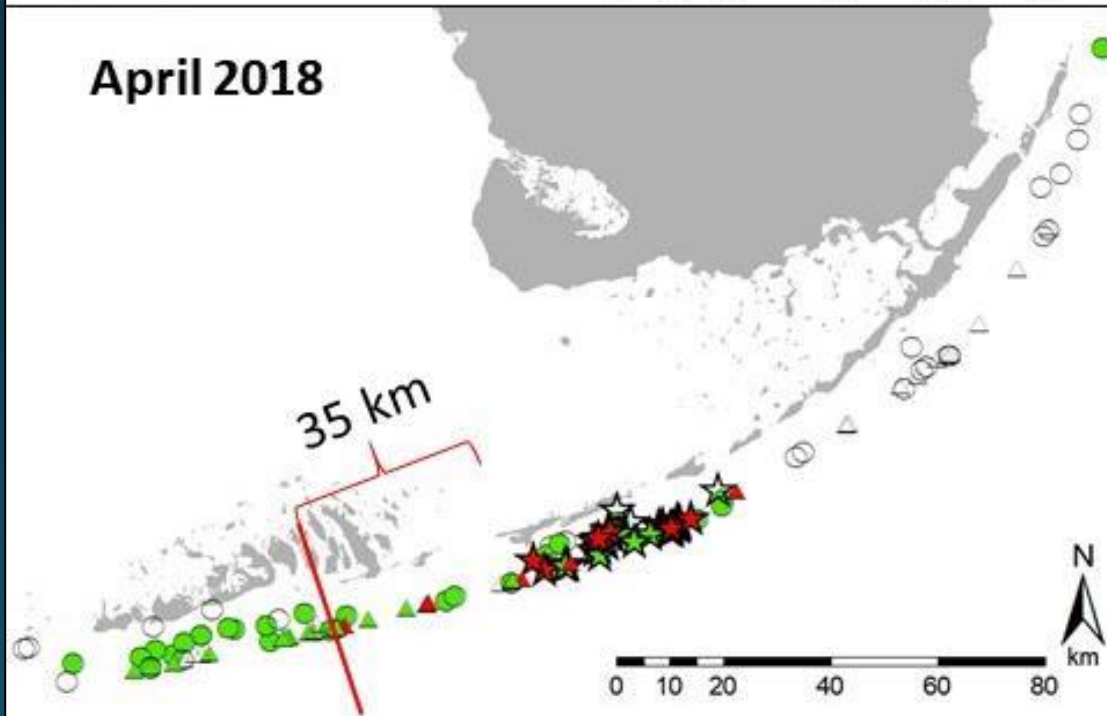
October 2017



December/January 2017



April 2018



Surveys of diseased Maze Coral

- Healthy
- Diseased
- None present

Disease progresses southward
~10-20 km/month.



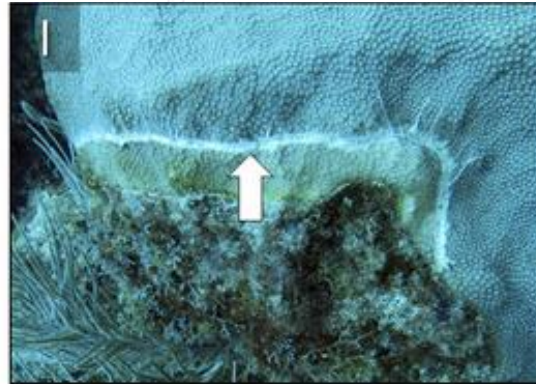
Barrier: Trench and/or Epoxy

March 2015
(Before treatment)

*No before-treatment
photograph*

Chiseled

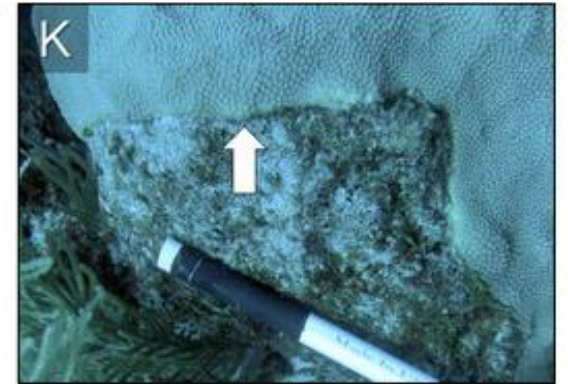
March 2015
(After treatment)



July 2015



October 2015



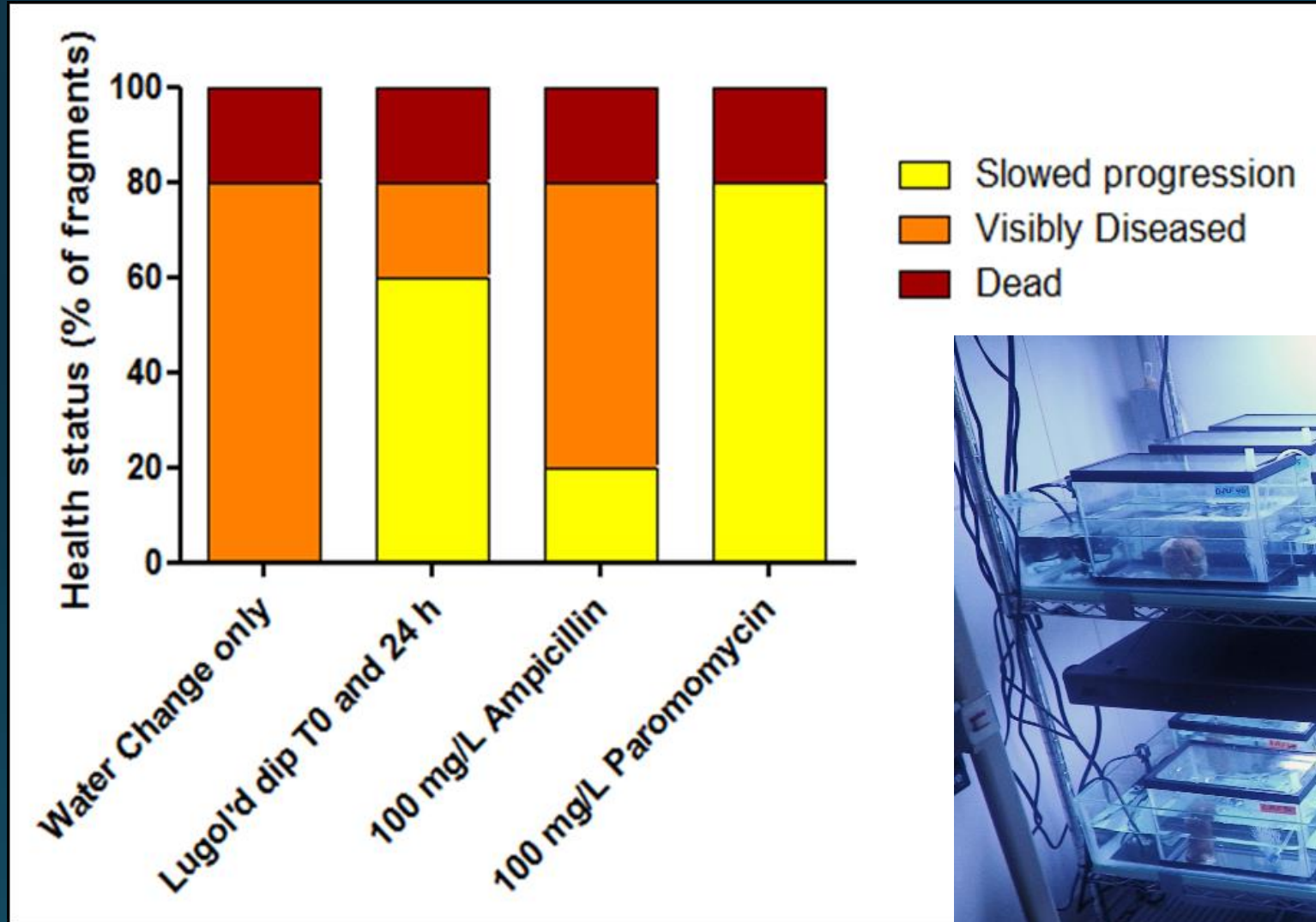
- Trench + Epoxy = some success slowing yellow-band disease in Caribbean

Chlorine: Direct Application



- Epoxy + Chlorine = some success slowing black band disease in Hawaii

Antibiotic: in water



Woodley et al. 2018. NOAA report



Antibiotic: direct application



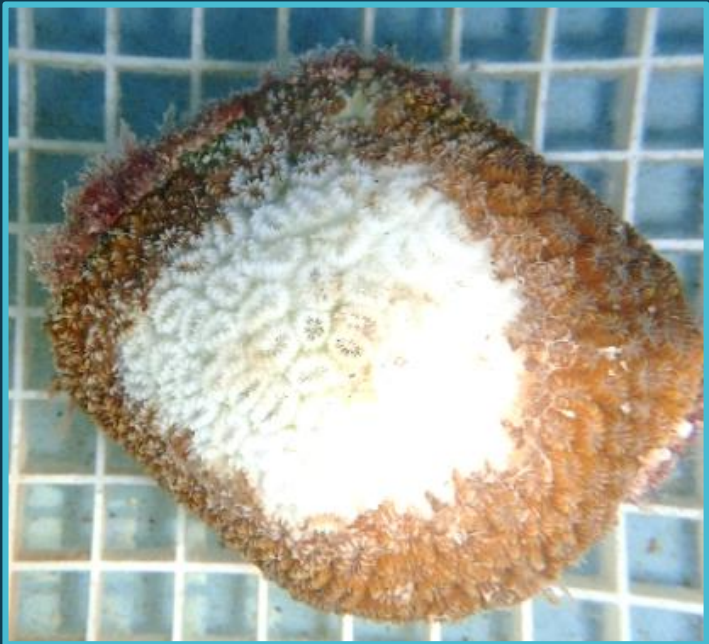
Woodley et al. 2018. NOAA report

Antibiotic: Direct Application



	Species	# Successful	# Unsuccessful	% Successful
Antibiotic Dental Paste (Amputation + Lugols + AB Paste)	DCYL	Lots	0	100%
	DSTO	7	0	100%
	PSTR	2	0	100%
	CNAT	1	0	100%

No treatment: Ineffective (97% mortality)



		Species	# Pass	# Fail	% Success
Control (No treatment)	DSTO		1	8	11%
	CNAT		0	9	0%
	PSTR		0	9	0%
	MMEA		0	6	0%

Untreated Barrier: Ineffective (95% mortality)



	Species	# Pass	# Fail	% Success
Barrier (Clay)	DSTO	0	3	0%
	CNAT	0	3	0%
	PSTR	0	3	0%
	MMEA	2	0	100%
Barrier (Z-Spar)	DSTO	1	2	33%
	CNAT	0	3	0%
	PSTR	0	3	0%
	MMEA	0	1	0%
	MCAV	0	2	0%
Trench Only	DSTO	0	3	0%
	PSTR	0	3	0%
	CNAT	0	3	0%
	MMEA	0	1	0%
Trench + Z-Spar	DSTO	0	3	0%
	PSTR	0	3	0%
	CNAT	0	3	0%
	MMEA	0	3	0%

Chlorine Barrier: Ineffective (90% mortality)

	Species	# Pass	# Fail	% Success
Chlorine Z-Spar	DSTO	1	2	33%
	CNAT	0	3	0%
	PSTR	0	3	0%
Trench + Chlorine Z-Spar	DSTO	1	2	33%
	PSTR	0	3	0%
	CNAT	0	3	0%
	MMEA	0	2	0%
Chlorine Modeling Clay	DSTO	0	5	0%
	CNAT	0	3	0%
	PSTR	1	3	25%
	MMEA	0	4	0%
Chlorine Aves Epoxy	DSTO	0	3	0%
	CNAT	0	3	0%
	PSTR	1	2	33%
	MMEA	1	2	33%

Antibiotic Barrier: Mostly ineffective (79%)

		Species	# Pass	# Fail	% Success
Antibiotics	Amoxicillin Dental Paste	DSTO	0	2	0%
		CNAT	0	3	0%
		PSTR	1	2	33%
		MMEA	0	3	0%
	Amoxicillin Modeling Clay	DSTO	1	1	50%
		PSTR	0	1	0%
		MMEA	0	1	0%
	Amoxicillin & Kanamycin Modeling Clay	DSTO	0	3	0%
		CNAT	0	3	0%
		PSTR	1	2	33%
		MMEA	0	3	0%
	Amoxicillin Aves Epoxy	DSTO	1	2	33%
		CNAT	0	3	0%
		PSTR	0	3	0%
		MMEA	1	2	33%
	Amoxicillin & Kanamycin Z-Spar	DSTO	3	0	100%
		CNAT	1	1	50%
		PSTR	1	2	33%

Antibiotic w/ Trench: Mostly ineffective (75%)



	Species	# Pass	# Fail	% Success
Trench + Amoxicillin Z-Spar	DSTO	0	3	0%
	PSTR	1	2	33%
	CNAT	0	3	0%
	MMEA	1	1	50%
Trench + Amoxicillin Shea Butter	DSTO	0	4	0%
	PSTR	3	1	75%
	CNAT	0	5	0%
	MMEA	4	2	67%
Trench + Amoxicillin Vaseline	DSTO	1	1	50%
	PSTR	1	1	50%
	CNAT	0	2	0%
Trench + Double Dose Amoxicillin Silicone Base	DSTO	0	2	0%
	PSTR	0	3	0%
	CNAT	0	3	0%

Trench + Antibiotic in Silicone Base:

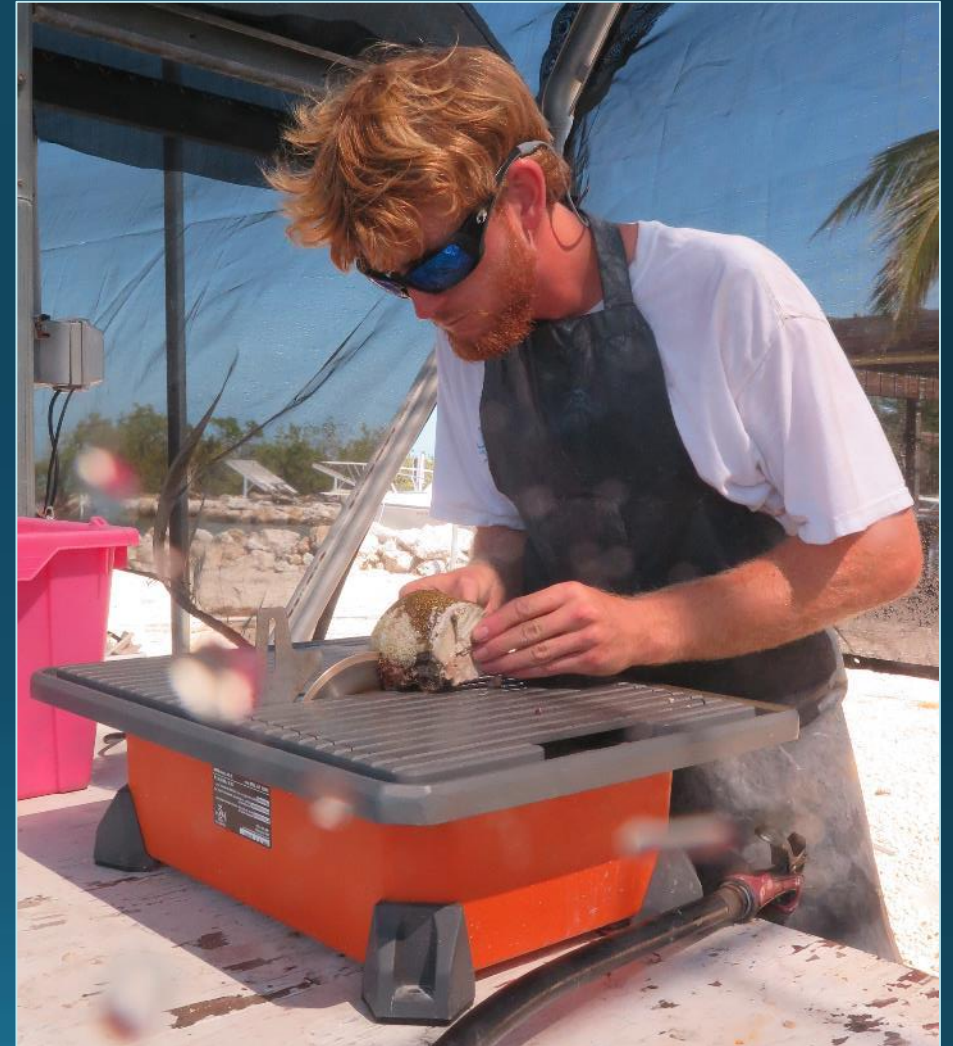
	Species	# Pass	# Fail	% Success
Trench + Amoxicillin Silicone Base	DSTO	3	0	100%
	PSTR	1	2	33%
	CNAT	3	0	100%

- 25% mortality
- 0% mortality on 2/3 species



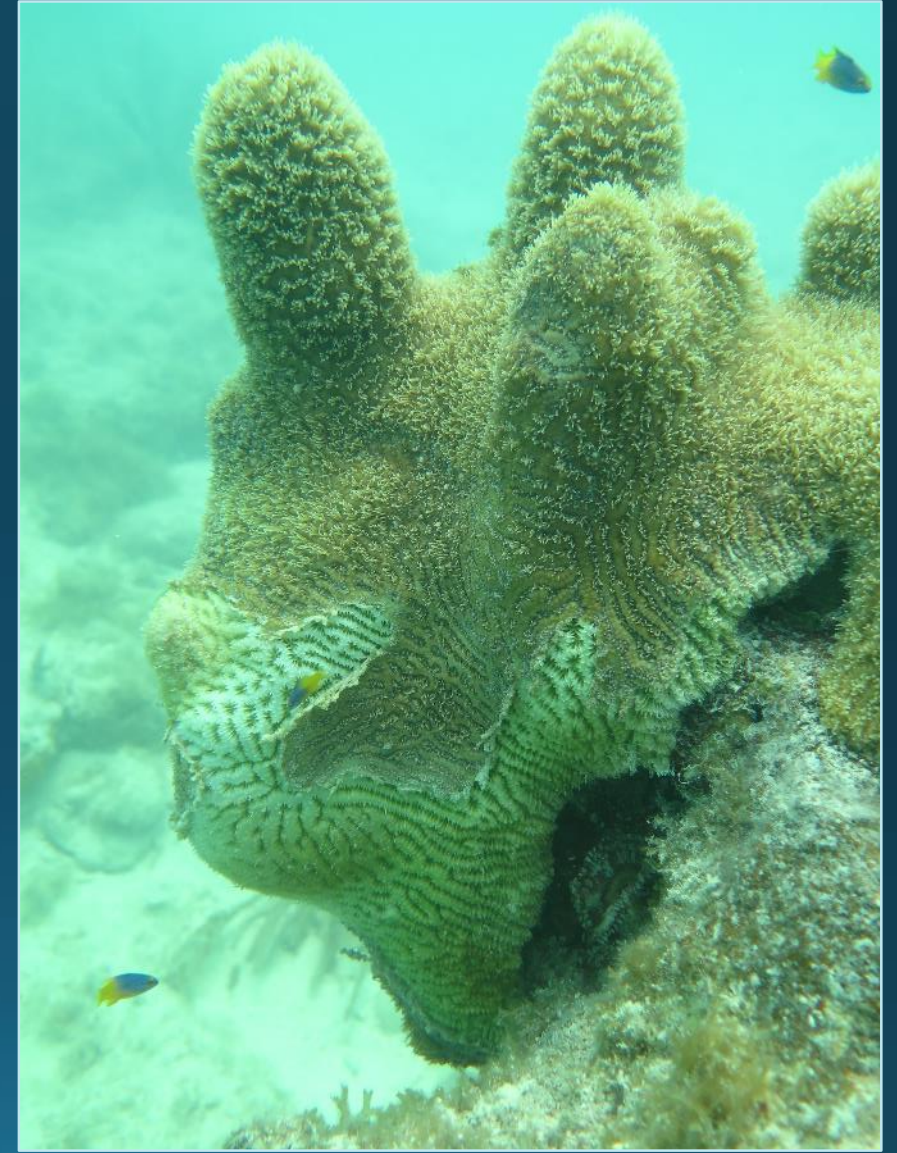
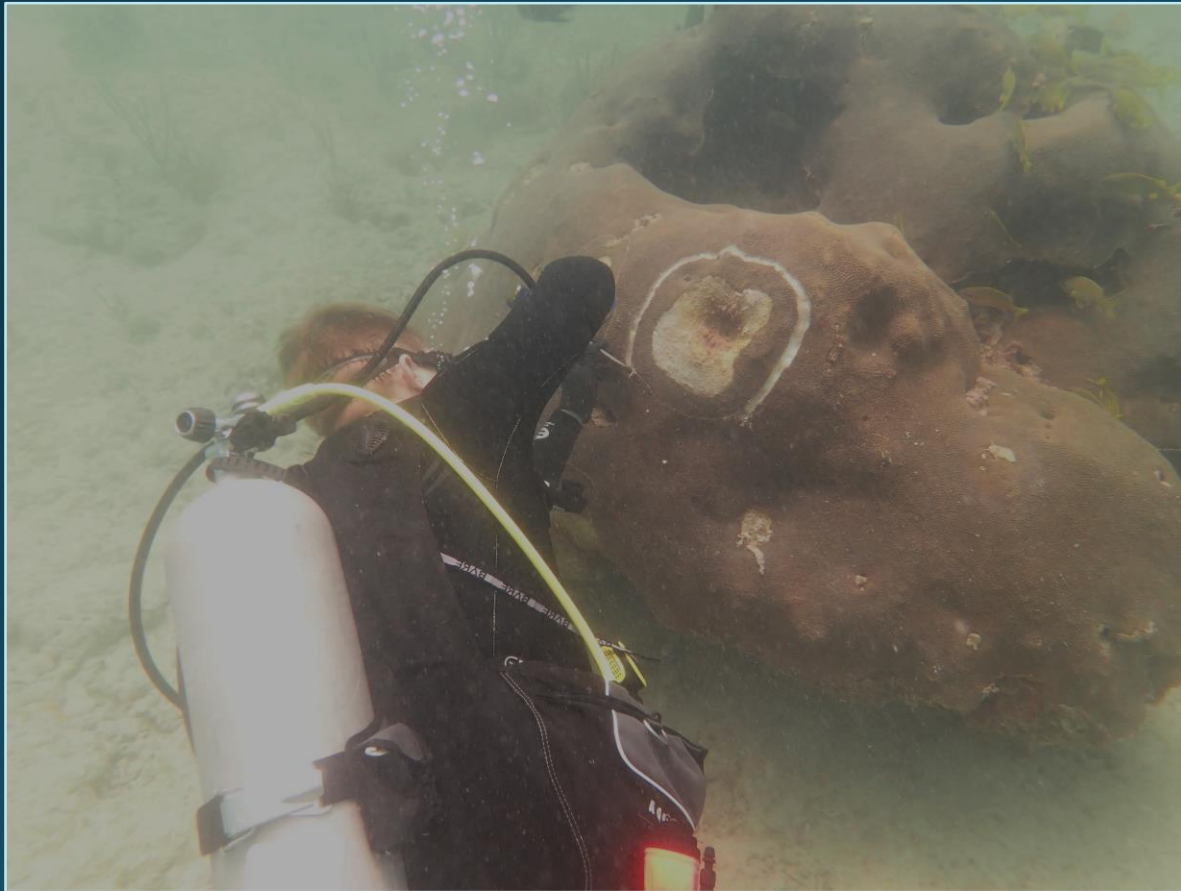
Treatment Summary

- No great method YET, but latest trial promising
- Need to break tissue connections (trench)
- Need the right material for a barrier
- Need to add a treatment (antiseptic/antibiotic)



Other options

- Natural antiseptics, salt, UV light
- Create a “double line” of treatment
- Field test



Field Test (Sombrero Pillar Coral): Cindy Lewis & KML Staff

May
18



Field Test (Sombrero Pillar Coral): Cindy Lewis & KML Staff

May
18



May
23



Field Test (Sombrero Pillar Coral): Cindy Lewis & KML Staff

May
18



May
23



June
1



June
13



Field Test (Sombrero Pillar Coral): Cindy Lewis & KML Staff



June
13



Questions?