# SEA CHANGE…

## The Keys to Restoring our Coral Reefs: Innovative Science-Local Partnerships-Global Impact

**Dr. Michael P. Crosby**
President & CEO

**Allison Delashmit**
Director, Keys Regional Operations

*www.mote.org*

# MOTE MARINE LABORATORY & AQUARIUM

## Leading the Way in Global Marine Science and Education

# INTERNATIONAL MARINE SCIENCE DIPLOMACY

# International Center for Coral Reef Research & Restoration (IC2R3) – Summerland Key








# Mote Locations Map

MOTE MARINE LABORATORY & AQUARIUM

# A Beyond 2020 Vision for the future of Mote

- Increase # of PhD's
- Expand Partnerships
- Stimulate S&T based economic development
- Meet 21st Century Grand Challenges

# CORAL ARE SLIPPING INTO FUNCTIONAL EXTINCTION

*Carysfort Reef, Florida Keys*

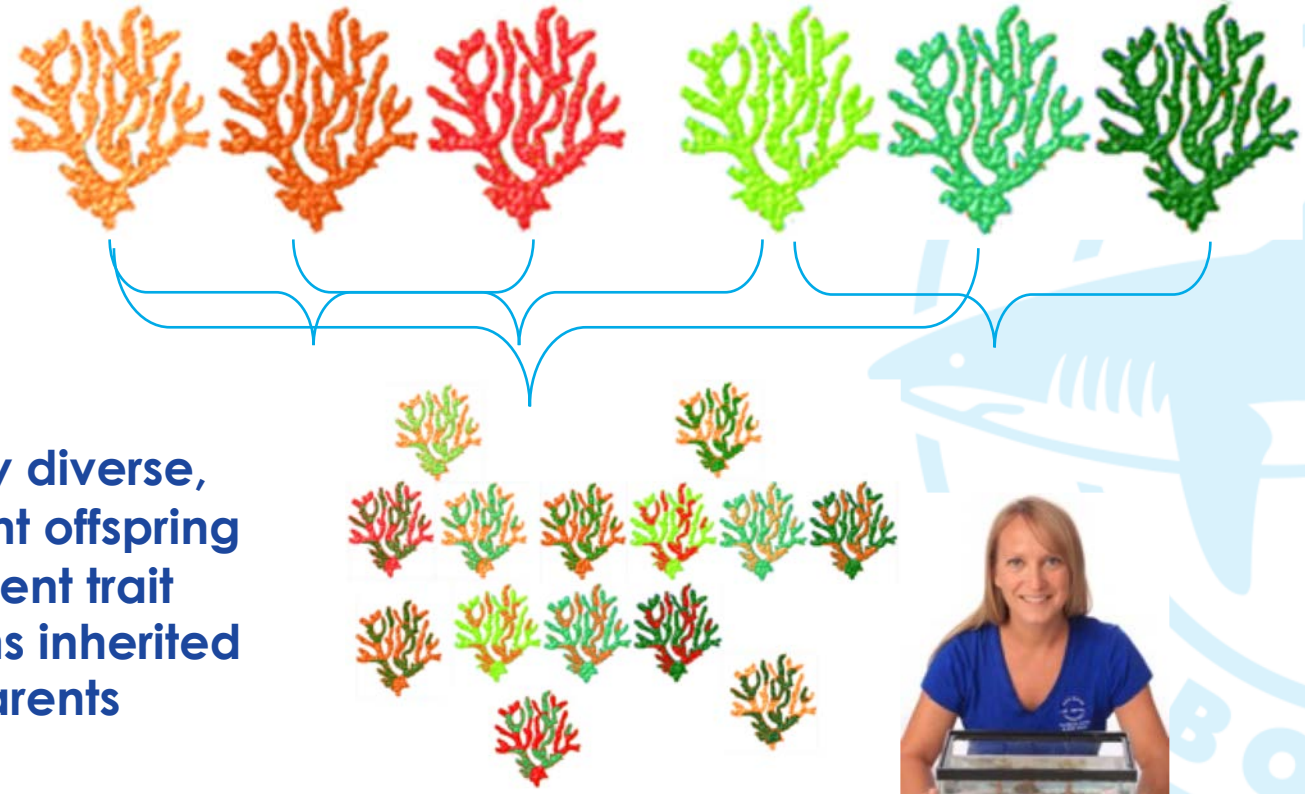
**1980**

**Today**

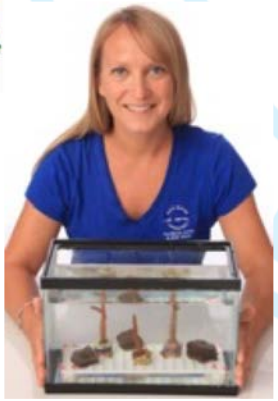

“We’re seeing 50- and 100-year-old corals that are dying. You can’t replace a 50-year-old coral in a decade.”


MICROFRAGMENTING
& RESKINNING

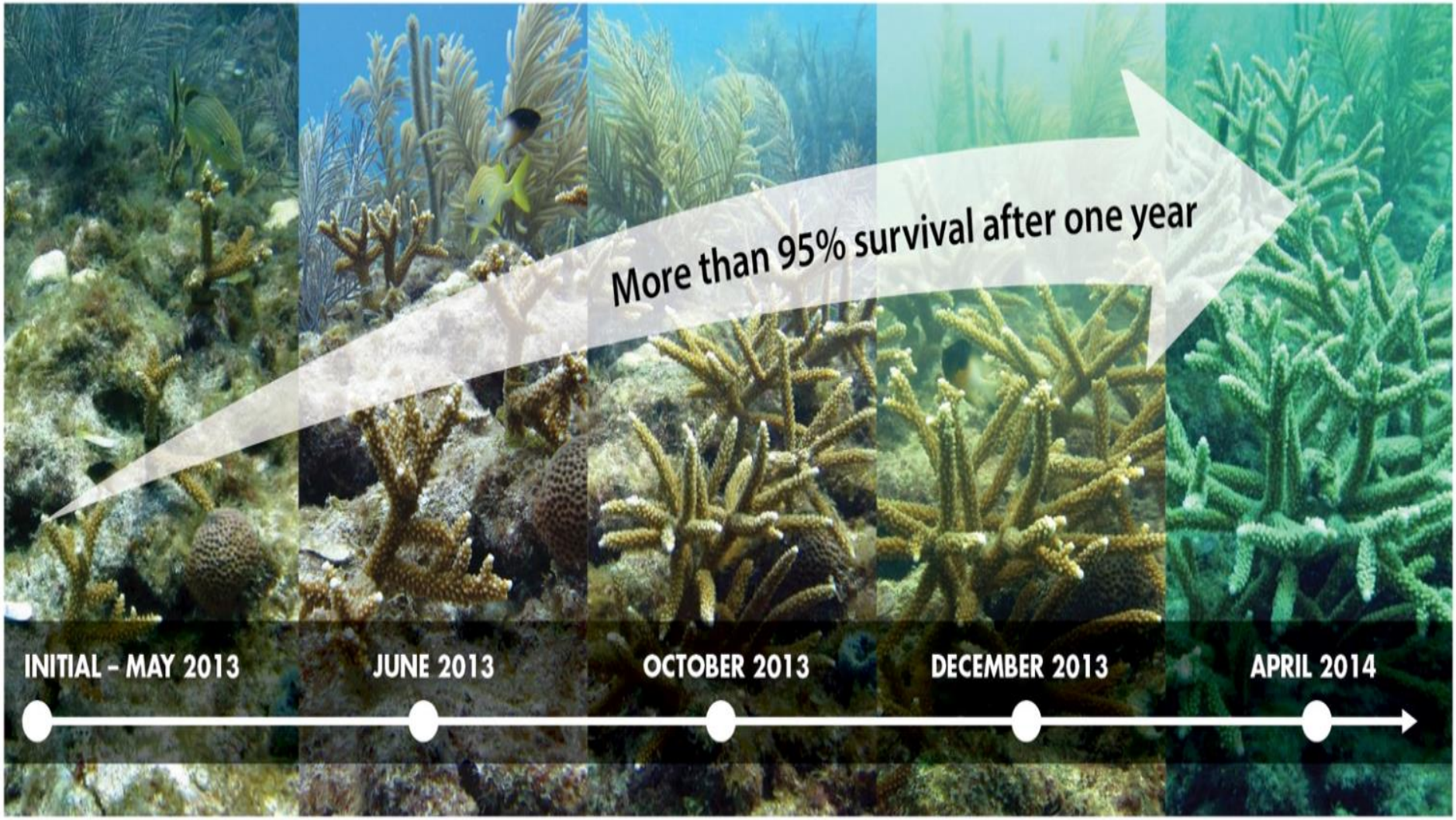
## We Breed Parents with Different Beneficial Traits



**Genetically diverse, stress-tolerant offspring with different trait combinations inherited from parents**

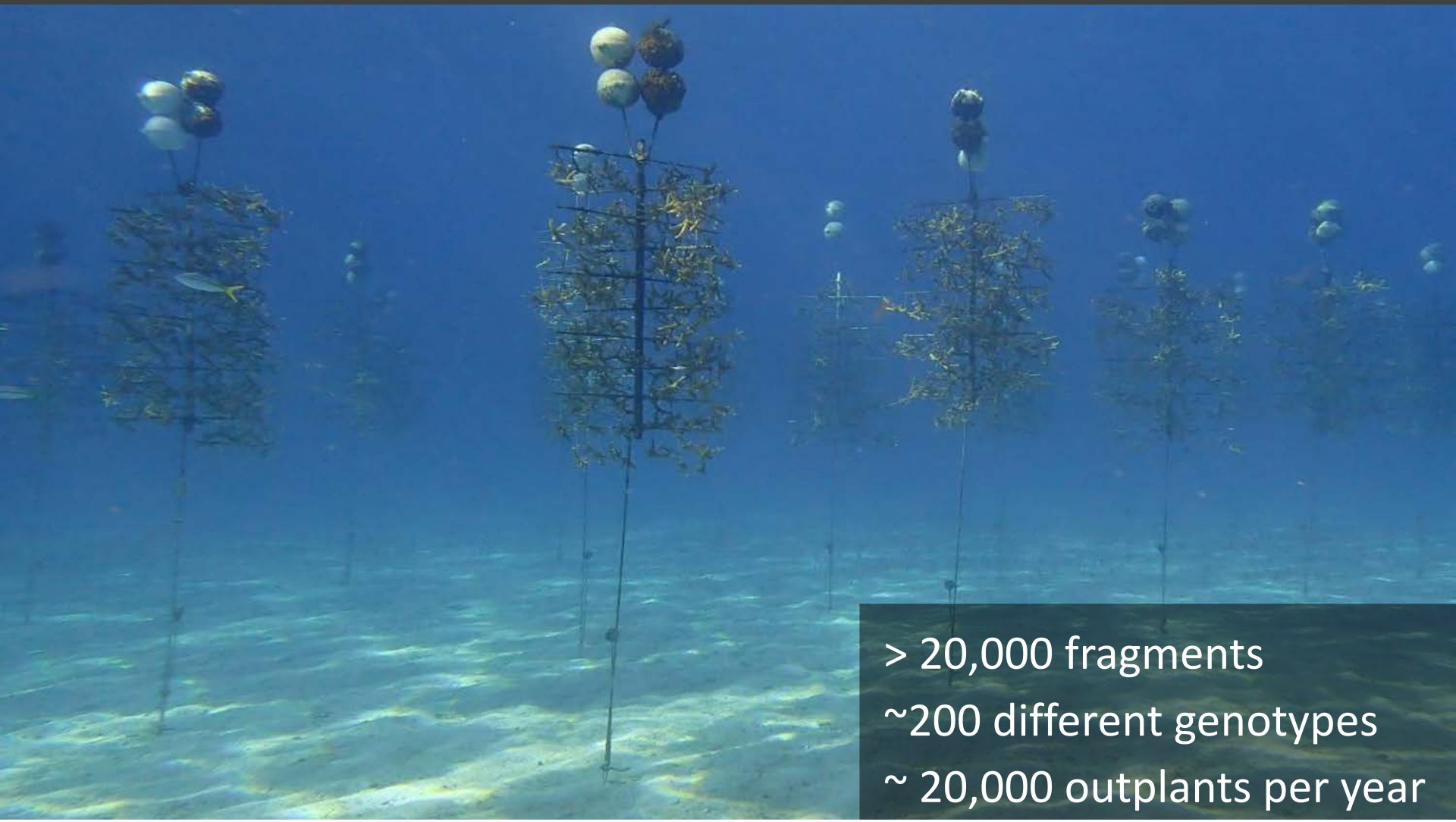


Dr. Erinn Muller

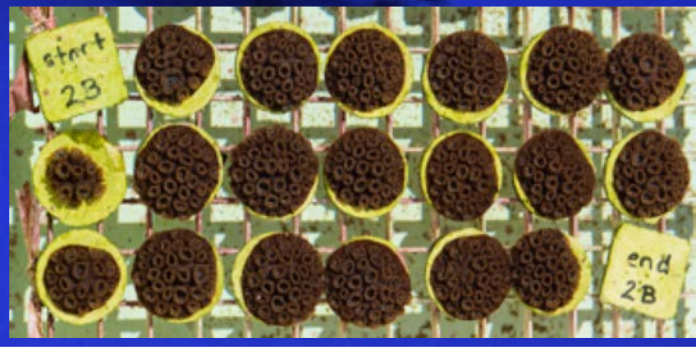

More than 95% survival after one year
INITIAL – MAY 2013
JUNE 2013
OCTOBER 2013
DECEMBER 2013
APRIL 2014

# MOTE LAND-BASED CORAL NURSERIES

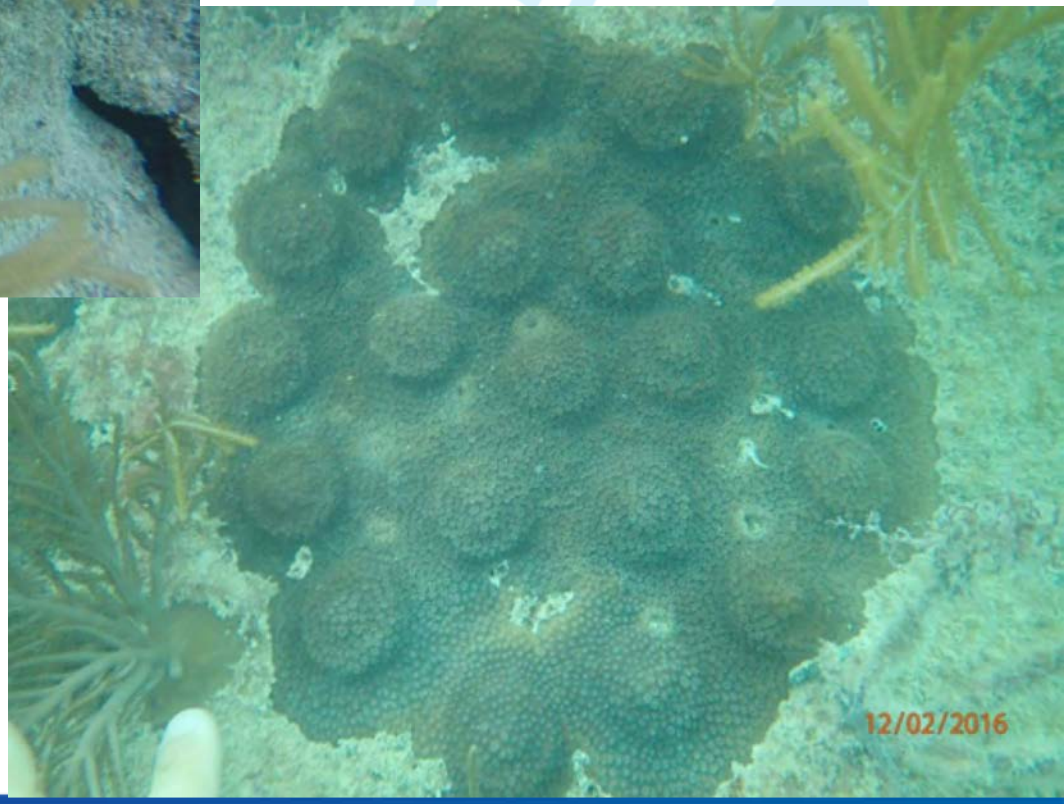
# MOTE IN-WATER CORAL NURSERIES



# Mote's International Coral Gene Bank & Sexual Propagation Lab

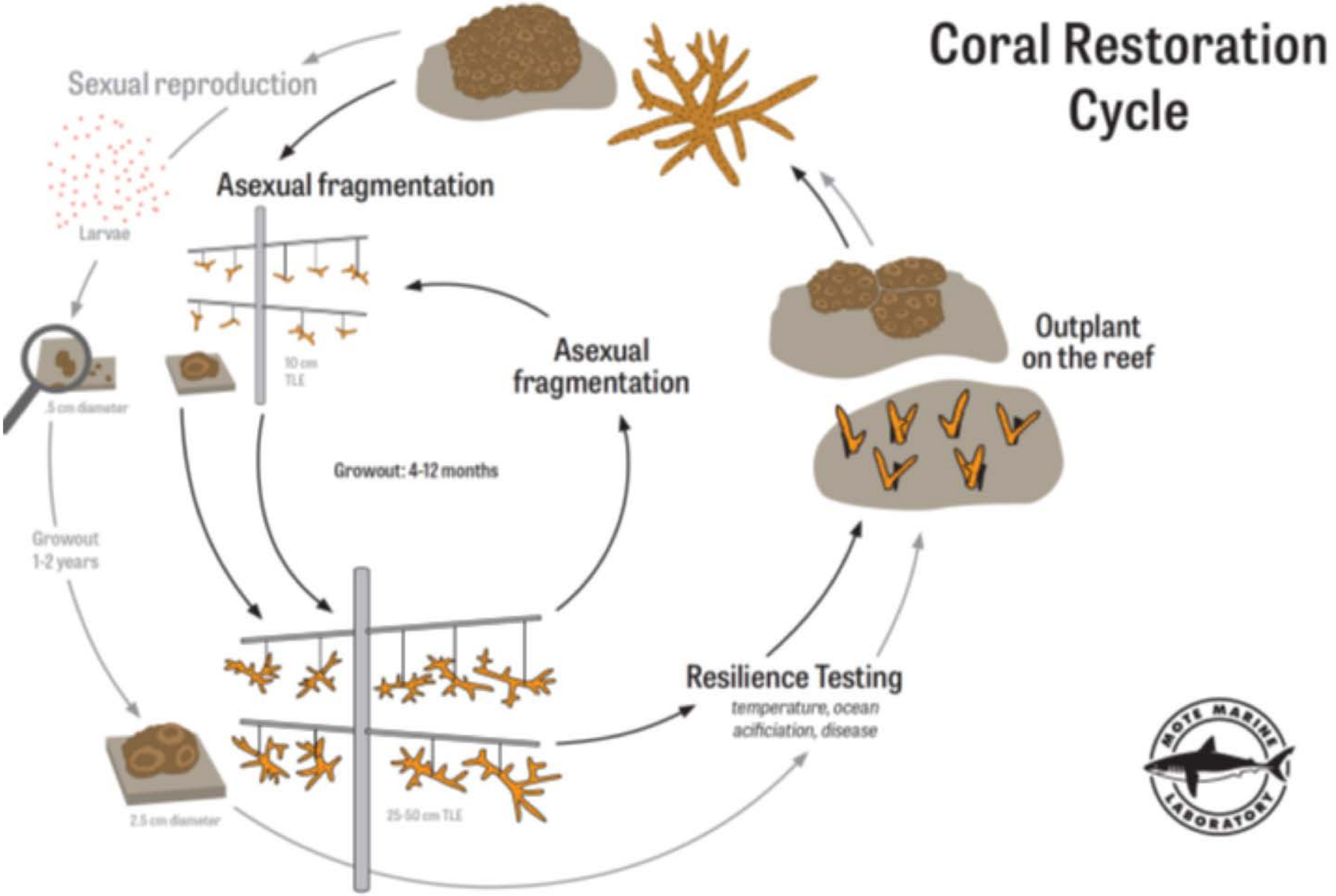


20 Boulder Star Coral fragments planted in 2014




Fusing into a single 50 to 75 year-old size colony in 2016

# MOTE'S RESILIENT REEF RESTORATION CYCLE



TheScientist
EXPLORING LIFE, INSPIRING INNOVATION

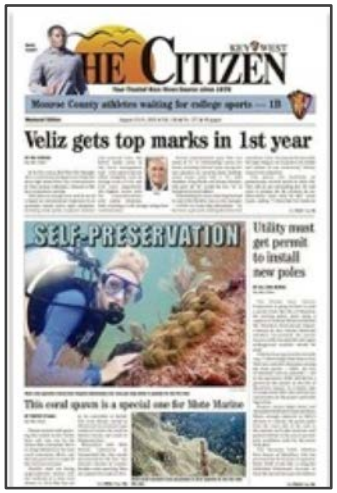


# Restored Corals Spawn Hope for Reefs Worldwide

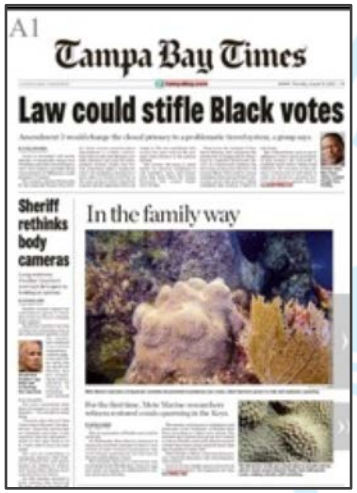
Novel technologies establish a new paradigm for global coral reef restoration, with in situ spawning of mature, environmentally resilient corals in five years instead of decades.

Hanna R. Koch, Erinn Muller, and Michael P. Crosby

# First corals of any slow-growing massive or mounding species documented to sexually reproduce after being restored to the reef





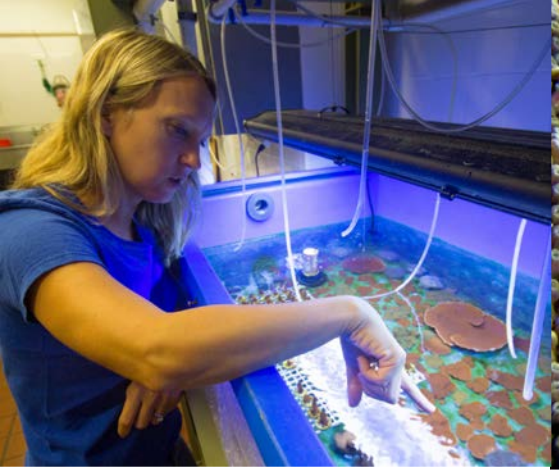





# *THE CORAL LAZARUS EFFECT*

**It is indeed possible to "bring back to life" a dead 50-year-old coral in a matter of years via recent advancements.**

# *The Mote Model for Coral Restoration:*
## Research Innovation + Volunteer Citizen Scientists



## OUR STRATEGIC VISION:

## *FLORIDA KEYS CORAL DISEASE RESPONSE & RESTORATION INITIATIVE*

- Utilize genetic strains that demonstrate enhanced resiliency to increased water temperatures, decreased pH and coral disease,
- Include designs for multiyear monitoring to assess survival and ecosystem health,
- Restore at least 20 acres of coral reefs in the Florida Keys with over 1 million corals to achieve an approximate 30% coral cover in an area equivalent to one-third of the restorable area for the seven Iconic Reefs, and
- Add 2,500 $ft^2$ to Mote's International Coral Gene Bank that will allow for up to 15,000 additional living coral representing approximately 4,000 unique genotypes to be available in perpetuity for ongoing and future research and restoration.

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