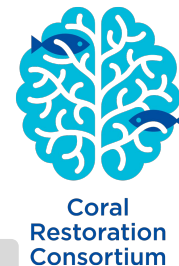




The Coral Restoration Consortium

Dr. Tali Vardi, ECS *for* NOAA Fisheries Office of Science & Technology
Presentation to the International Coral Reef Initiative
Monday, February 1st 2020

Timeline



Workshop to Advance the Science and Practice of Coral Restoration in the Caribbean

2016

Reef Futures

2018

- Leadership Meeting
- Priorities Review

2020

2017

- Formed CRC Steering Committee & Priorities
- Formed Working Groups
- Drafted Governance Document

2019

- Adopted revised Governance Doc.
- Voted in new intl Steering Committee
- Added Regional Groups

2021

Reef Futures

Mission

- *to foster collaboration and technology transfer among coral restoration scientists, practitioners, and managers, and*
- *to facilitate a community of practice that will advance methods to restore coral reefs to keep pace with rapidly changing environmental conditions*

Steering Committee



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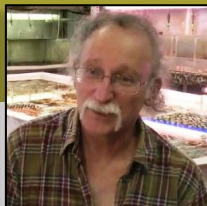


NGOs

- Coral Restoration Foundation*
- The Nature Conservancy/RRN
- Corales de Paz
- RRAP / JCU

Academic

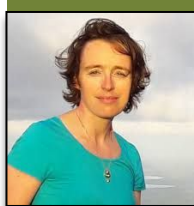
- Boston University
- University of Haifa, Israel
- National Autonomous U. of Mexico



Agencies

- US National Oceanic & Atmospheric Administration*
- UN Environment Program
- US Geological Survey
- Hawaii Department of Aquatic Resources

For Profit



Working Groups



Field-based
Propagation

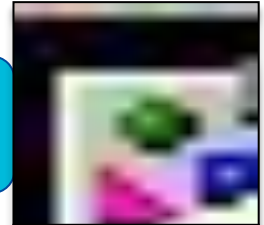


Land-based
Propagation



Larval
Propagation

Monitoring



Genetics



Management



Regional Groups



Meso-America



Latin America



Eastern Tropical
Pacific



Australia

Ad-hoc Groups

Engineering

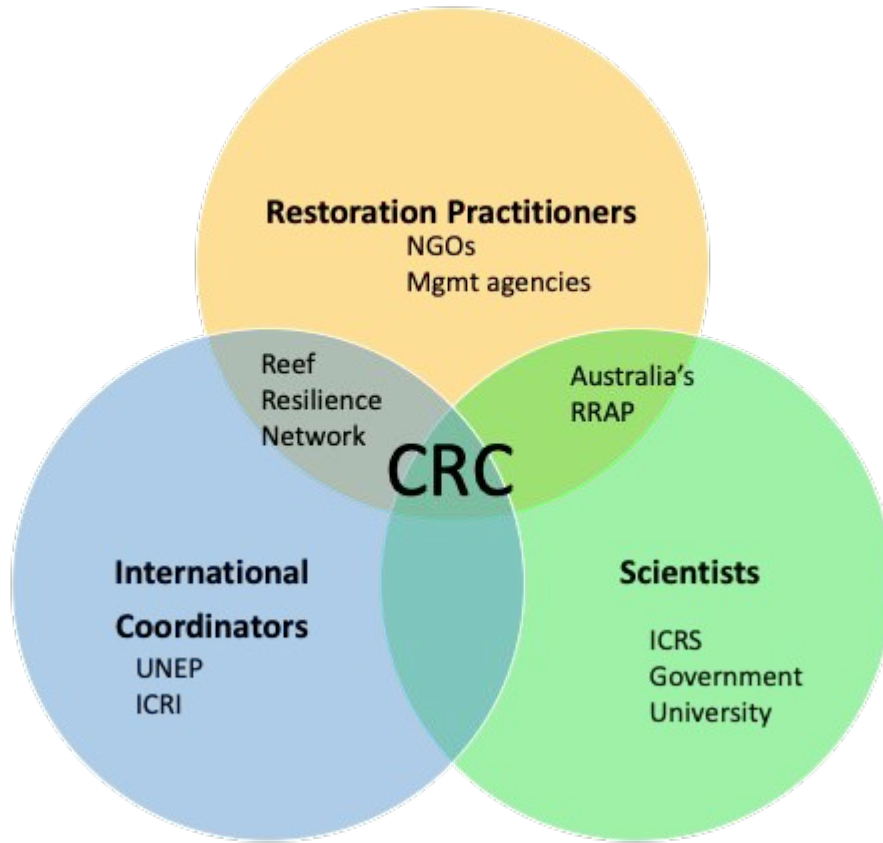


Cryopreservation





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Genetics Working Group








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Ecological Applications, 29(8), 2019, e01978

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Considerations for maximizing the adaptive potential of restored coral populations in the western Atlantic










ILIANA B. BAUMS ^{1,10} ANDREW C. BAKER,² SARAH W. DAVIES,³ ANDRÉA G. GROTTOLI ⁴, CARLY D. KENKEL,⁵
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JOHN E. PARKINSON ^{8,9} AND ANDREW A. SHANTZ ¹



DOI: 10.1111/corl.12687

REVIEW

Molecular tools for coral reef restoration: Beyond biomarker discovery

John Everett Parkinson^{1,2}  | Andrew C. Baker³  | Iliana B. Baums⁴  |
Sarah W. Davies⁵  | Andréa G. Grottoli⁶  | Sheila A. Kitchen¹  |
Mikhail V. Matz⁷  | Margaret W. Miller¹  | Andrew A. Shantz³ | Carly D. Kenkel⁸ 



Conservation Letters
A Journal of the Society for Conservation Biology

WILEY



Monitoring Working Group



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← → ↺ <https://oref.maps.arcgis.com/apps/View/index.html?appid=666410e8008744cab5847421eb5f70d6> ★ 📄 G P ⋮



National Centers for Coastal Ocean Science NOAA National Ocean Service

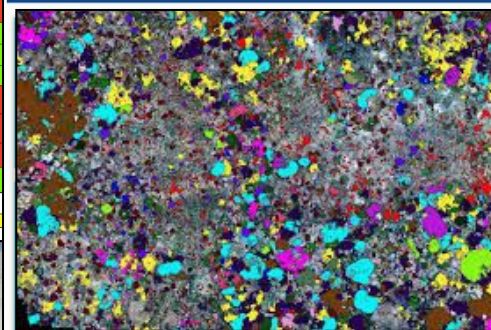
NOAA Technical Memorandum NOS NCCOS #66666

The synthesis provided here is a product of the Coral Restoration Consortium's (CRC) Restoration Monitoring Working Group.

Coral Restoration Evaluation Tool: Metrics of Success for Field-based Nurseries

Field Based NURSERY	project 1	project 2	project 3	project 4	project 5	% of Projects with Score = 1
Nursery is established based on Best Management Practices	1	1	1	1	1	100
Nursery contains multiple species	1	0	1	1	1	80
Nursery contains a high degree of genotypic diversity	1	1	1	1	1	100
Nursery corals have been genotyped	1	0	1	1	1	80
Nursery tracks genotype provenance	0	1	1	1	1	80
Nursery tracks growth and mortality by genotype	0	1	1	1	1	80
Nursery exhibits net coral growth	1	0	1	1	1	80
Nursery exhibits high coral survivorship	1	0	1	1	1	80
Nursery exhibits low prevalence of disease	1	0	1	1	1	80
Nursery exhibits low impact of coral predators	1	1	1	1	1	100
Nursery exhibits limited competition by algae and other competitors	1	1	1	1	1	100
Nursery provides healthy coral outplants that are outplanted on a regular basis	0	0	1	1	1	60
Nursery visits/maintenance based on Best Management Practices	1	1	1	1	1	100
Nursery can be easily expanded/reduced if needed	1	1	1	1	1	100
Nursery Score	79	57	100	100	100	

Photomosaics as a Tool for Monitoring Coral Restoration Success




Orthophoto / Orthoprojection

Larval-propagation WG



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Reproductive Biology, Early Life History & Larval Propagation


CORAL SPECIES FACT SHEET

Diploria labyrinthiformis (grooved brain coral, Linnaeus 1758)

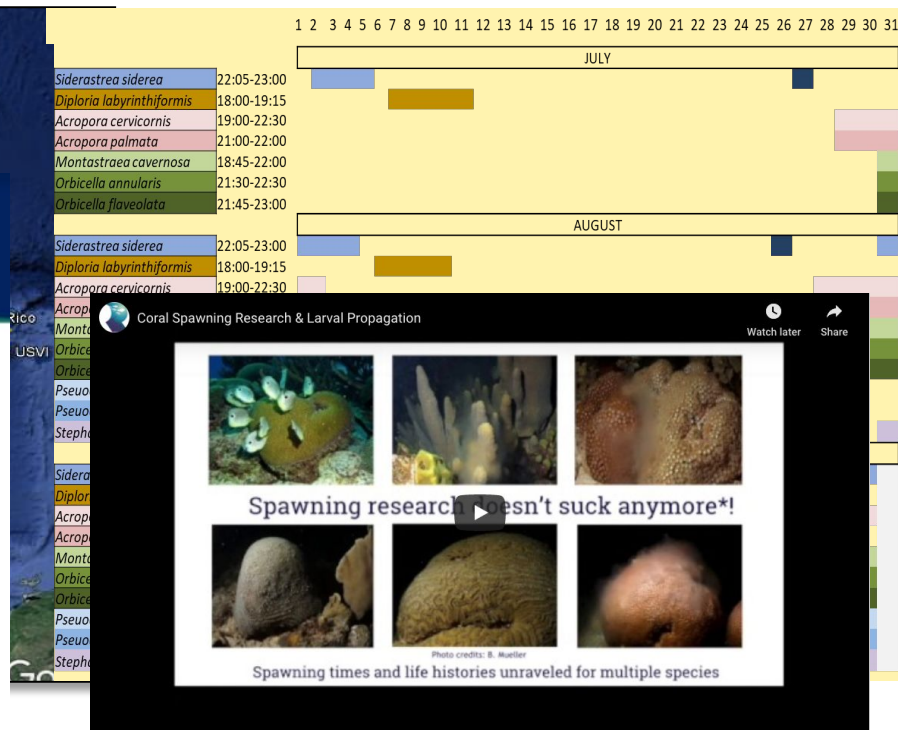
Reproductive biology

Reproductive mode:	Broadcast spawning
Sexual system:	Hermaphroditic
Reproductive events per year:	6 to 7
Gamete bundle size (Ø, µm):	2380 ± 279 (11)
Egg size (Ø, µm):	377 ± 19 (51)
Eggs per gamete-bundle:	88 ± 45 (34)
Eggs per ml of gamete-bundles:	n.a.
Eggs per ml of egg slick:	16230
Sperm per gamete-bundle:	n.a.
Sperm per ml of bundles:	n.a.

*Errors are SD and numbers in brackets are sample sizes



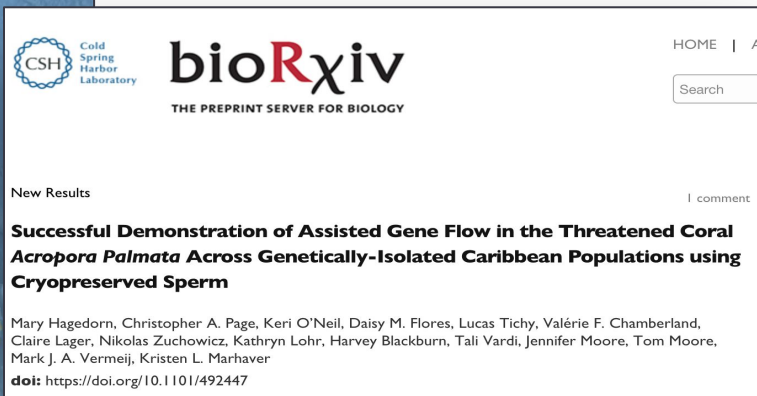
1 *Diploria labyrinthiformis* colony



Land-based, Larval, Cryo Groups



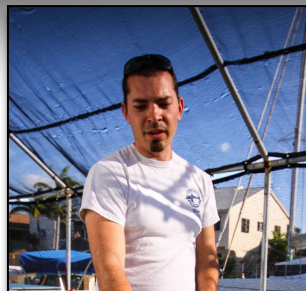
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Mary Hagedorn,
Smithsonian Inst.



Coral Sperm



Chris Page,
Mote



Keri O'Neill,
FLAQ

Kristen Marhaver,
CARMABI



2020-2025 Priorities

- **Increase restoration efficiency**, focusing on scale and cost-effectiveness of deployment
- **Scale-up larval-based coral restoration** efforts, emphasizing recruit health, growth, and survival
- Ensure restoration of threatened coral species proceeds within a **population-genetics management** context
- Support a **holistic approach** to coral reef ecosystem restoration
- Develop and assist the use of **standardized terms and metrics** for coral reef restoration
- Support coral reef restoration practitioners working in **diverse geographic locations**

(Vardi et al. in review)

Questions?

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