

# **Saving the Queen of the Sea**

## Queen Conch Conservation Aquaculture

Megan Davis, Ph.D.

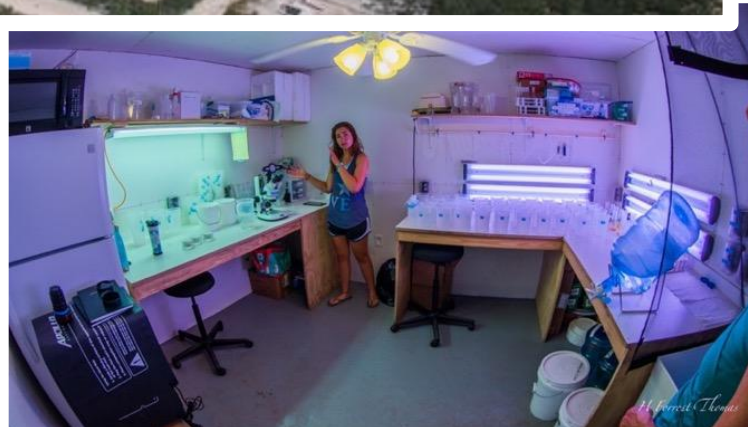
Research Professor, Queen Conch Lab

Florida Atlantic University Harbor Branch  
Oceanographic Institute

Regional workshop: OECS Blue BioTrade Action Plan, May 27<sup>th</sup>, 2022



# 40 Years of Queen Conch Knowledge



# The Queen Conch Lab

Our **mission** is to grow the queen conch for the sake of the species, ecosystem, and people who depend on the fishery.

Our **vision** is for there to be a queen conch farm in every Caribbean nation.

## CONSERVATION



## RESEARCH

## EDUCATION



**HARBOR BRANCH**

FLORIDA ATLANTIC UNIVERSITY\*

**AQUACULTURE**

# Our Vision: A Queen Conch Farm in Every Caribbean Nation

## Queen Conch Lab – HEADQUARTERS

**Fort Pierce, Florida**

Florida Atlantic University Harbor Branch  
Oceanographic Institute

**Grand Bahama, Bahamas**

Bahamas National Trust

**Nassau, Bahamas**

**Great Exuma, Bahamas**

Bahamas National Trust

● Current project sites

○ Prospective project sites

**Lower Town, St. Eustatius**

Caribbean Netherlands  
Science Institute &  
St. Eustatius National Parks  
Foundation

**Dominican Republic**

**Naguabo, Puerto Rico**

Puerto Rico Conch Hatchery:  
FAU Harbor Branch,  
Conservación ConCiencia,  
Naguabo Fishing Association &  
NOAA Fisheries

**US  
Virgin  
Islands**

**Antigua**

**Guadeloupe**

**Jamaica**

**Belize**

**Colombian  
Archipelago**

**Willemstad, Curaçao**

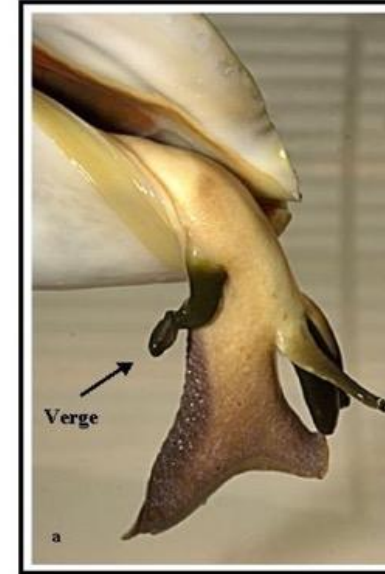
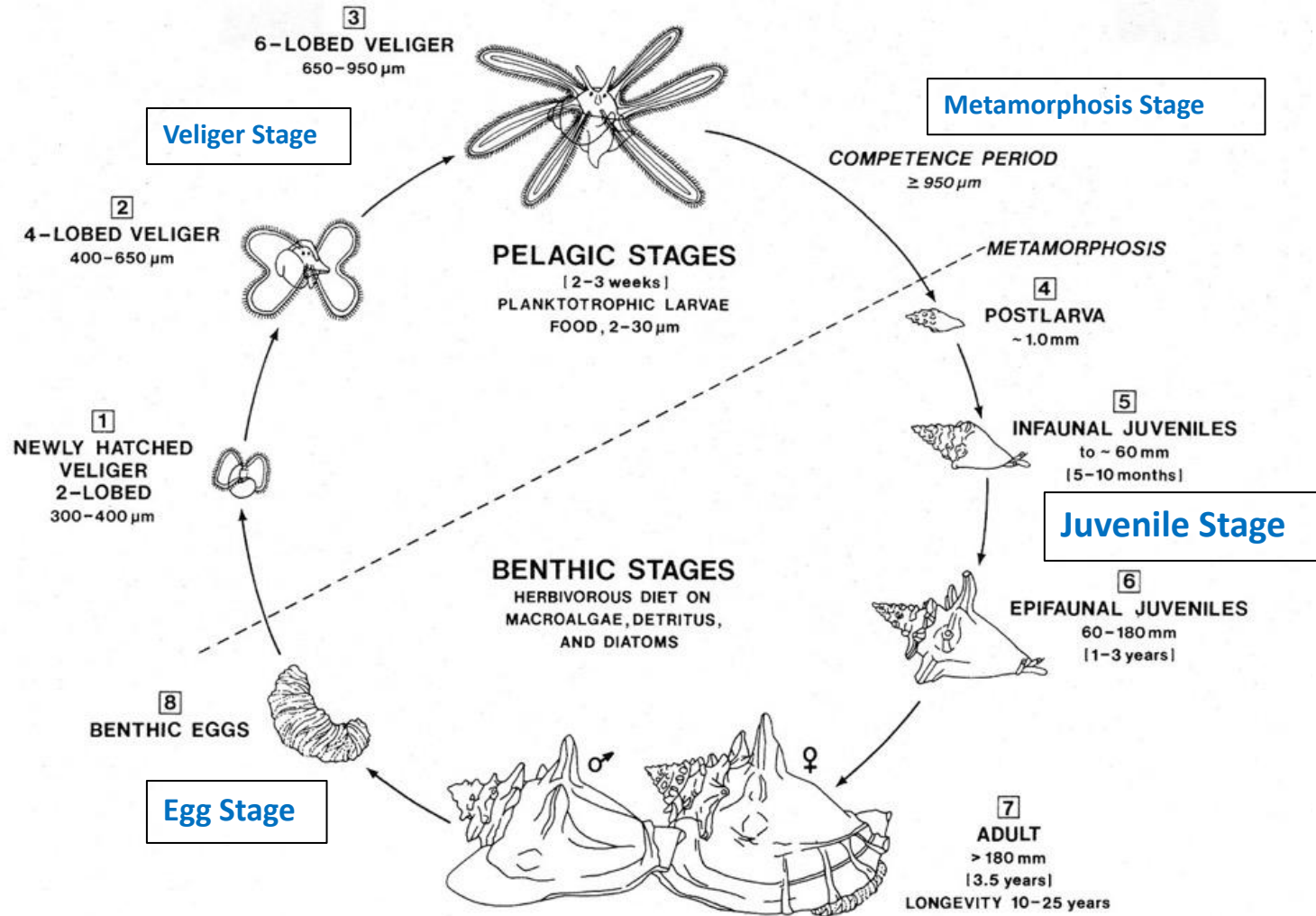
Curaçao Sea Aquarium Conch Hatchery

**St. Vincent and the  
Grenadines**

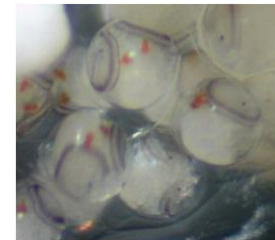
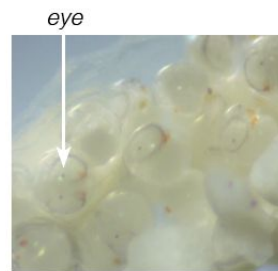
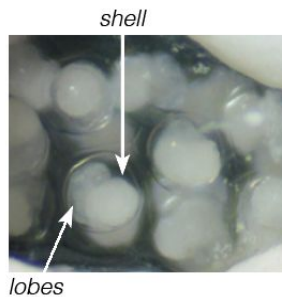
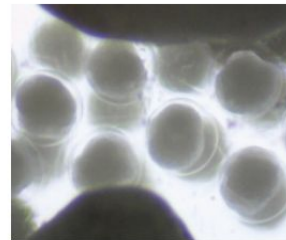
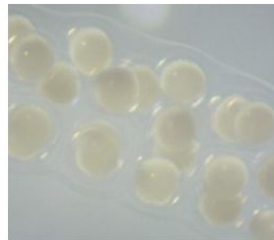
**Trinidad and Tobago**



# Life Cycle & Reproduction Overview



# Egg Mass Collection

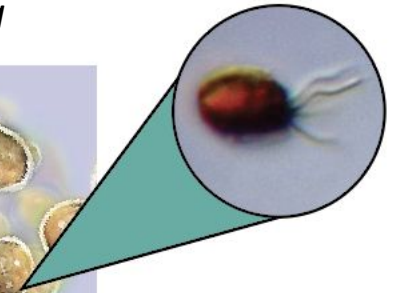
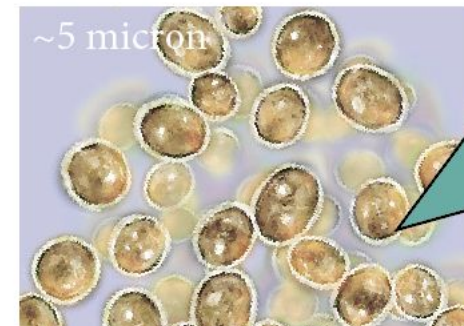


Egg development

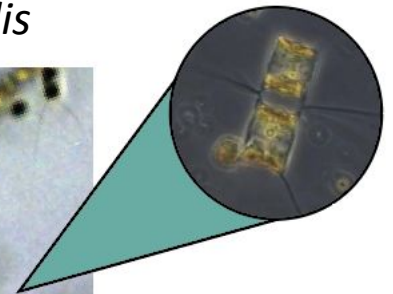
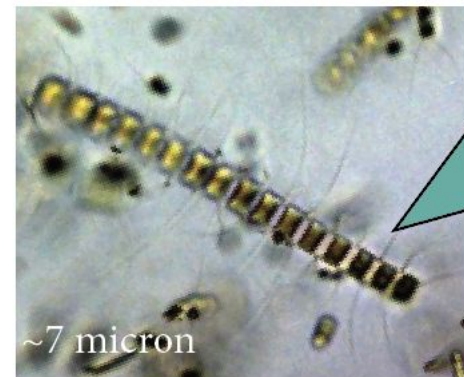
# Growing Microalgae



*Isochrysis galbana*



*Chaetoceros gracilis*



# VELIGER DEVELOPMENT



**STAGE 1:**  
2 lobes



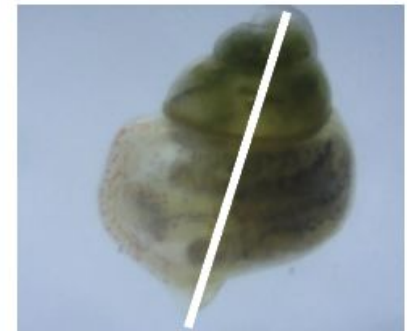
**STAGE 2:**  
4 lobes



**STAGE 3:**  
6 lobes



**STAGE 4:**  
6 elongated  
lobes



**STAGE 5:**  
Shell length is  
1-1.2 mm



**1.5 whorls**



**2 whorls**



**2.5 whorls**



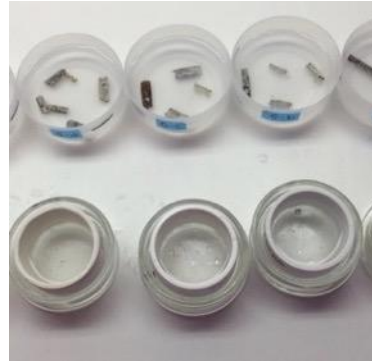
**3 whorls**



**4 whorls**



# METAMORPHOSIS



Newly metamorphosed conch grazing

# Queen Conch Aquaculture

## Aquaculture

- Breeding Area
- Hatchery
- Restoration
- Ranching – Sustainable Seafood

## Socioeconomic Benefits

- Community-Based
- Diversified Livelihoods
- Training in Aquaculture
- Training in Conservation
- Professional Development
- Co-Management of Resources

# Protecting Breeding Stocks in MPAs

- Re-establishing breeding populations
- Protected areas
- Source of egg masses
  - Increase larvae in nature
  - Available for aquaculture



# Community-Based Queen Conch (*Aliger gigas*) Aquaculture for Restoration and Sustainable Seafood Supply in Puerto Rico



Megan Davis: *Research Professor, FAU Harbor Branch*

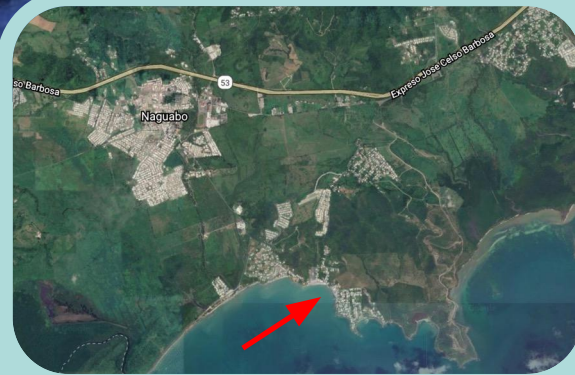
Raimundo Espinoza: *Executive Director, Conservación ConCiencia*

Carlos Velazquez: *President, Naguabo Fishing Association*





# Naguabo, Puerto Rico



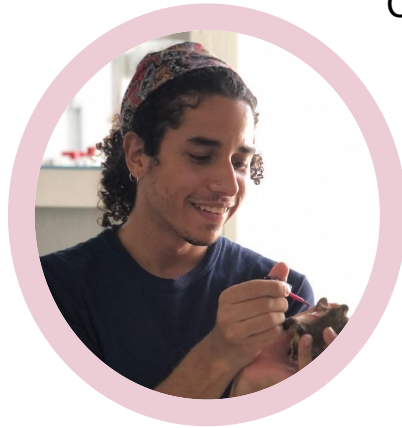
# Partners



**Raimundo Espinoza**  
Founder and Executive Director  
Conservación ConCiencia



**Marie Garcia**  
Hatchery Assistant



**Chalier Dones Ortiz**  
Research Intern



**Paola Sotomayor Landron**  
Research Intern



**Edna Mary Díaz Negrón**  
Aquaculture Manager



**Carlos Velasquez**  
President

and

**Naguabo Fishing  
Association Members**



**Julio Ortiz**  
Treasurer, Fisher



**Megan Davis, PhD**  
Research Professor

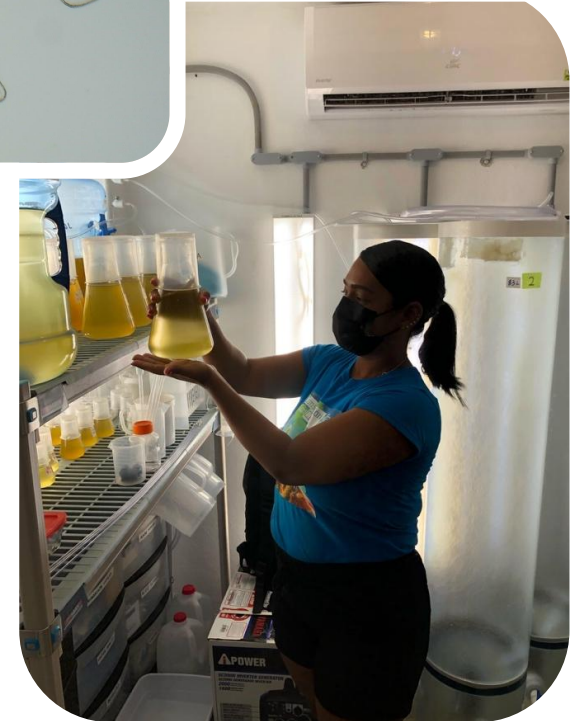
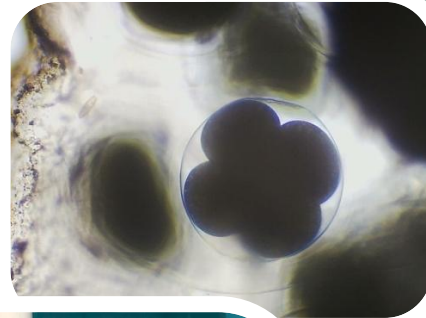
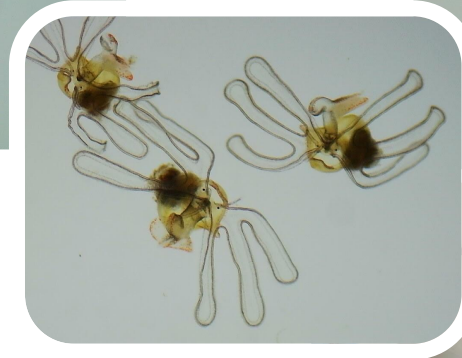
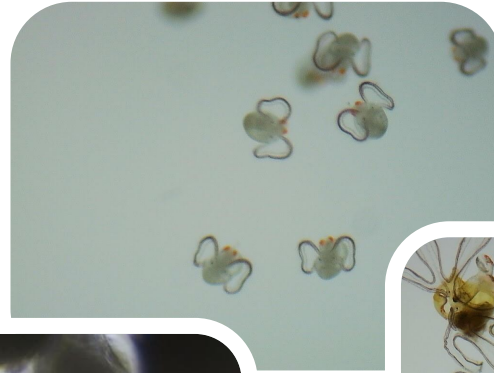
# Project Goals:

To assist with restoration of the queen conch fishery in PR by producing queen conch in a fishers-operated aquaculture facility

Build and Operate	Build and operate a pilot-scale conch hatchery and nursery facility at the Puerto Rico Naguabo Commercial Fishing Association
Open to Others	Open the facility for others to learn about queen conch aquaculture, biology, conservation and fisheries
Release	Release hatchery-raised juvenile conch for restoration purposes
Produce a Plan	Produce a plan that recommends other areas in Puerto Rico for conch hatcheries and potential grow-out areas

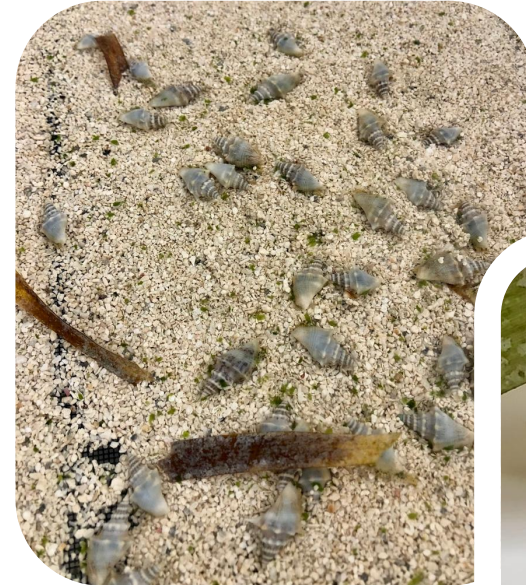


# Hatchery



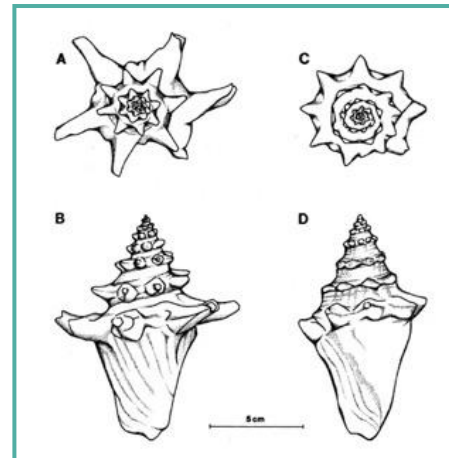


# Juvenile Recirculating Nursery System



# Restoration Considerations

- Shell size (7-9 cm)
- Shell strength
- Morphology (with spines)
- Time of Day and Year (Fall)
- Lunar Phase
- Density (1-5/m<sup>2</sup>)
- Conditioning
- Habitat
- Conch Movement



# Sustainable Seafood

- Ranching
- Grow to Market Size

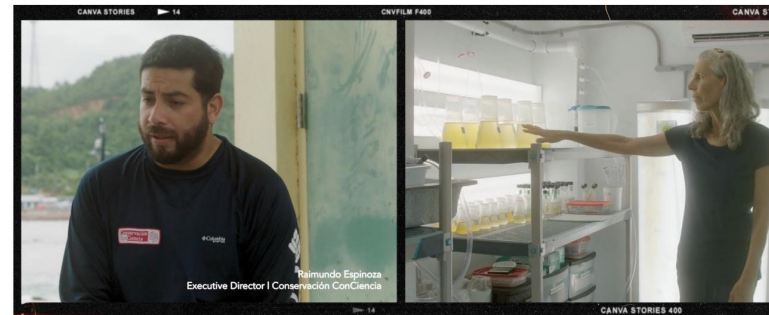


# Resources

- English version: The Queen Conch Aquaculture Manual, 2020. Megan Davis and Victoria Cassar (J. of Shellfish Research)
- Spanish version: 2021. Megan Davis, Victoria Cassar, Raimundo Espinoza, and Alessandro Lovatelli. (FAO – Food and Agriculture Org.)



Development of an online course called **eConch: eLearning for Growing Queen Conch** with 6 modules that feature video content, live virtual presentations, activities, and group discussions.



Five professional quality instructional videos with the production company Timber + Frame



# Next Steps

## Planning

- Site selection and community
- Identifying local community members and staff
- Pilot-Scale Hatchery and Nursery
  - Modification of Existing Infrastructure
  - Mobile Queen Conch Lab



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**Trinidad and Tobago**

**Jamaica**

**Belize**

**Colombian  
Archipelago**

**Willemstad, Curaçao**

Curaçao Sea Aquarium Conch Hatchery



# FAU Harbor Branch Queen Conch Lab Contact Information



## Website

[www.conchaquaculture.org](http://www.conchaquaculture.org)

[www.fau.edu/hboi](http://www.fau.edu/hboi)

## Instagram

@queenconchlab

#queenconchlab

@harborbranch

## Email

Mdavi105@fau.edu