

Ecosystem Services and Benefits of Restored Oyster Reefs

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Ecosystem engineers

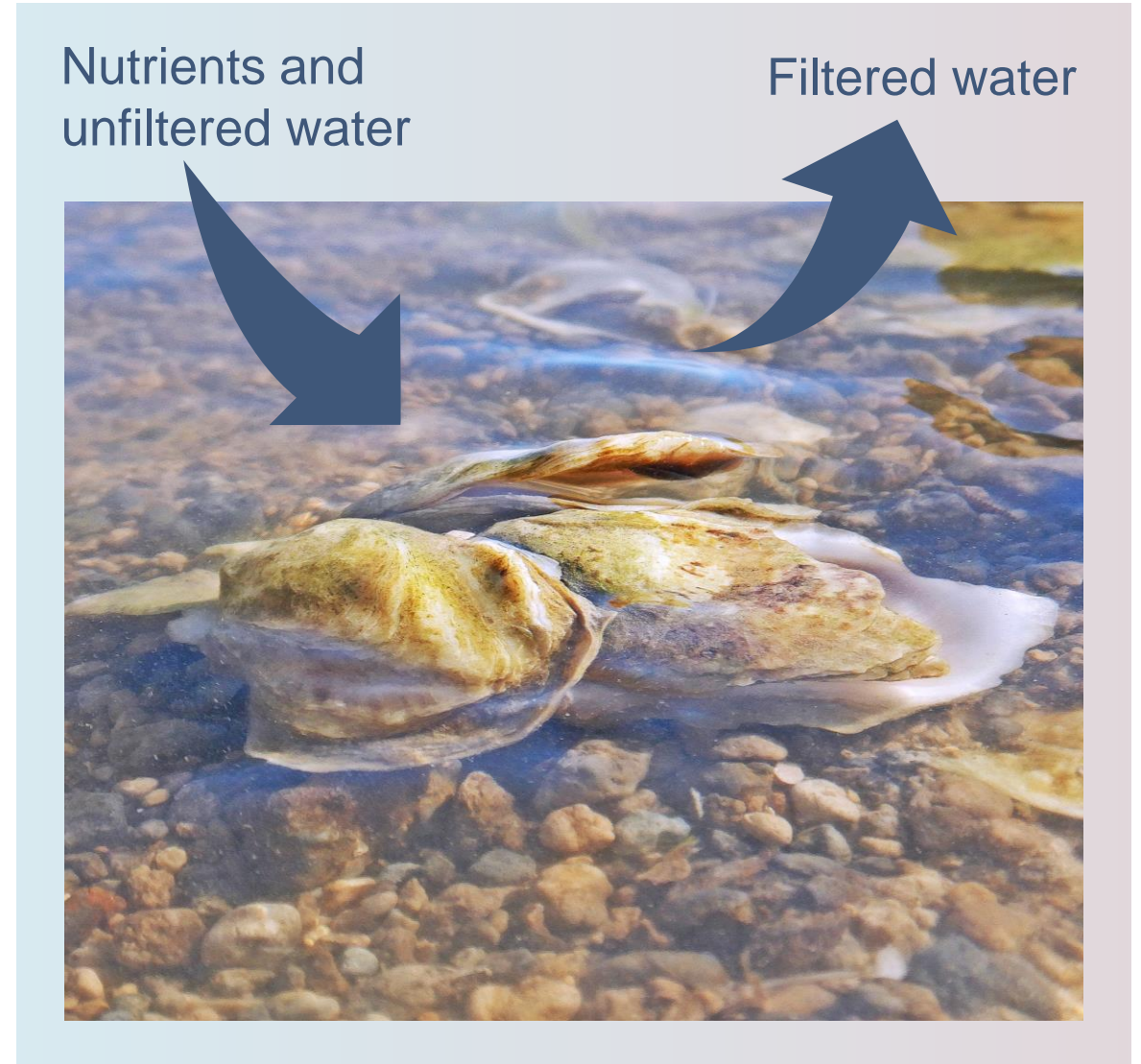
Oysters are reef builders

- Create habitat
- 50x greater than bay bottom

Water filtration

Oysters are suspension feeders

- Remove plankton, sediments, bacteria, nutrients
- 1 oyster = 50 gallons





Shoreline protection

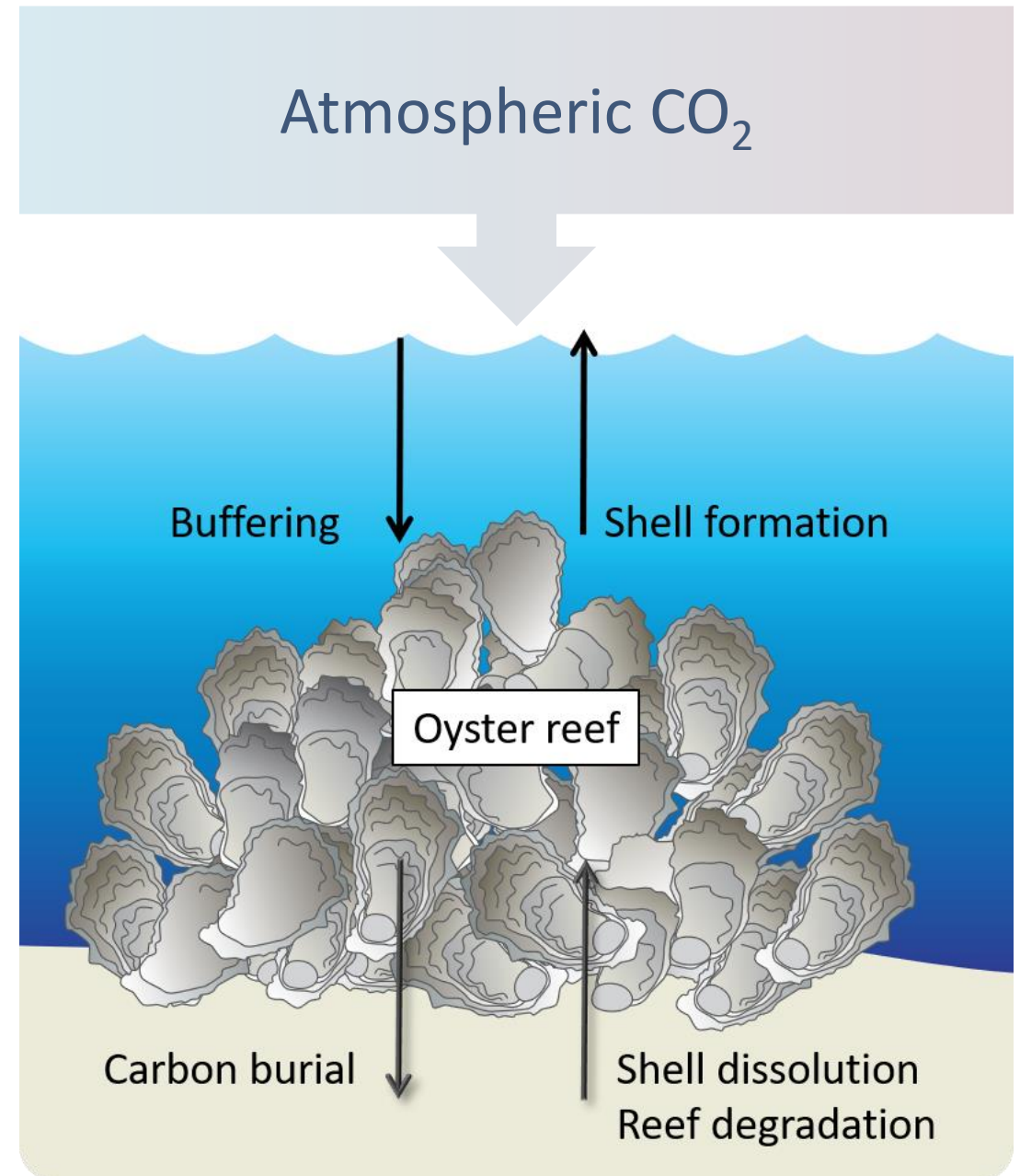
Oyster reefs buffer wave energy

- Stabilize adjacent habitats
- Reduce erosion

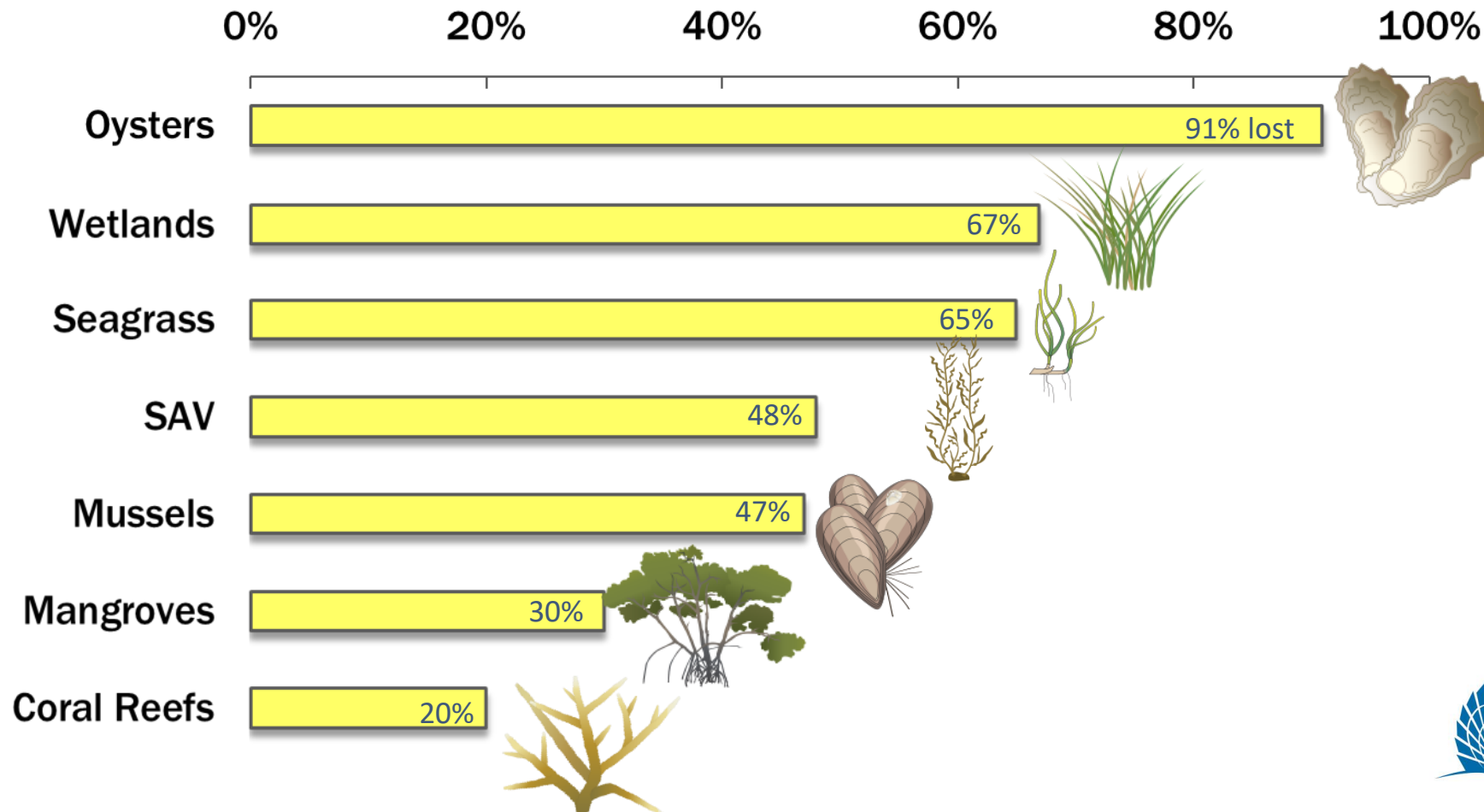
Carbon sequestration

Oysters take up CO_2

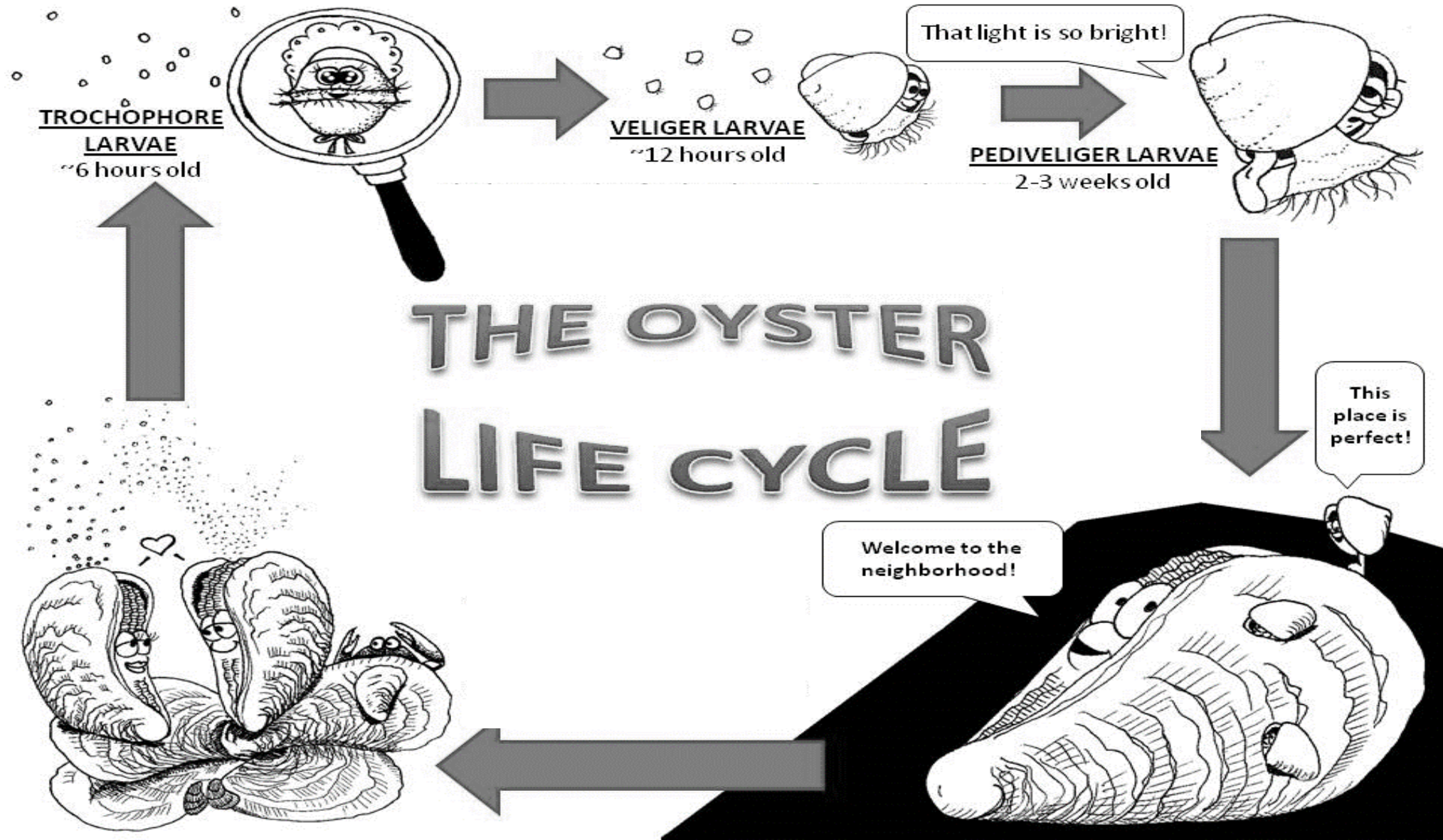
- Stored in shells & sediments
- Mitigate increases in atmospheric CO_2



Oyster reefs = imperiled marine ecosystem



Removal of oysters = Removal of habitat





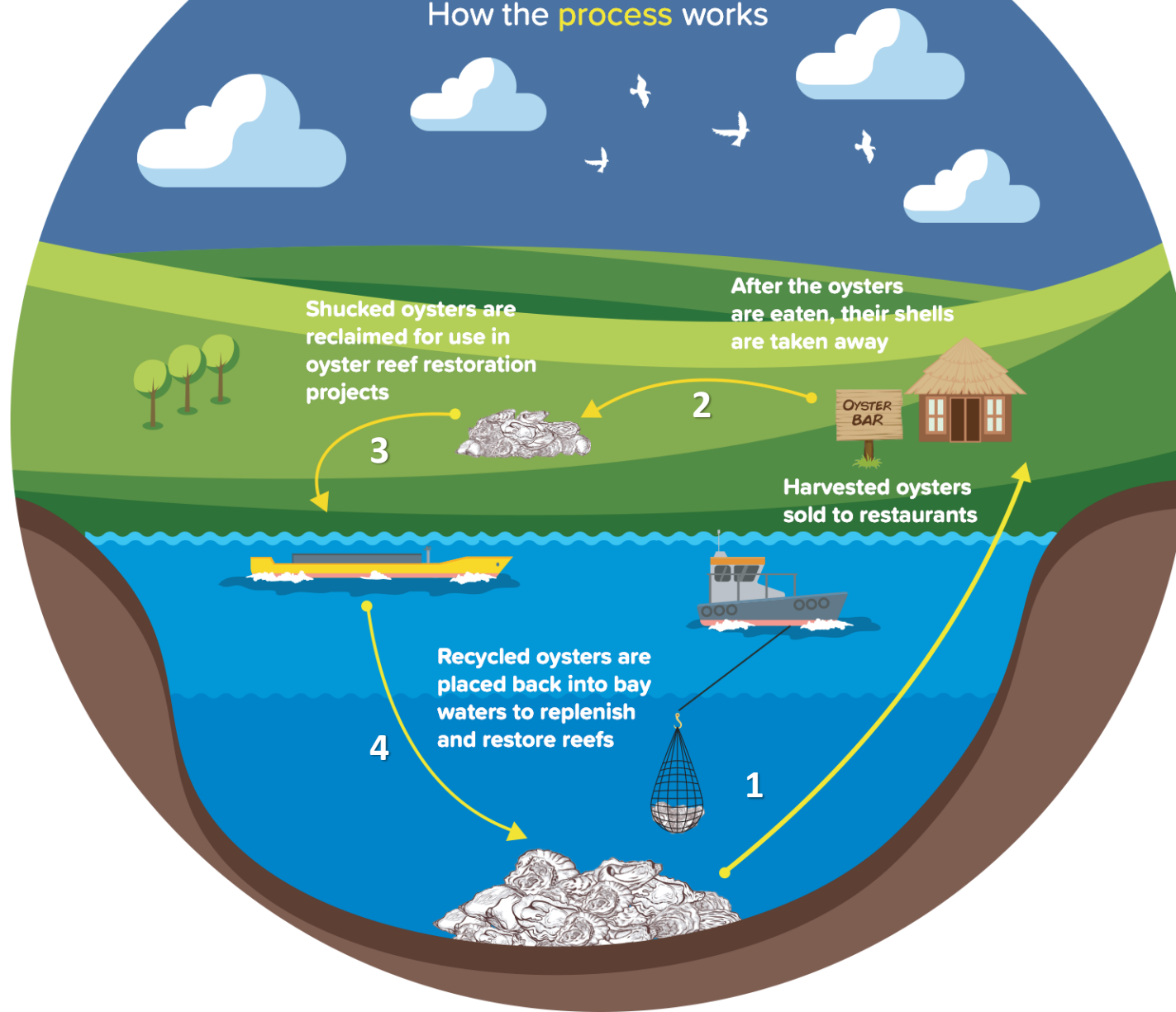
Oyster reef restoration

For replacing lost ecosystem benefits

- Oyster shells or other materials are placed on the bay bottom
- Provides stable surface for larval oysters to attach and grow

Oyster Shell Recycling

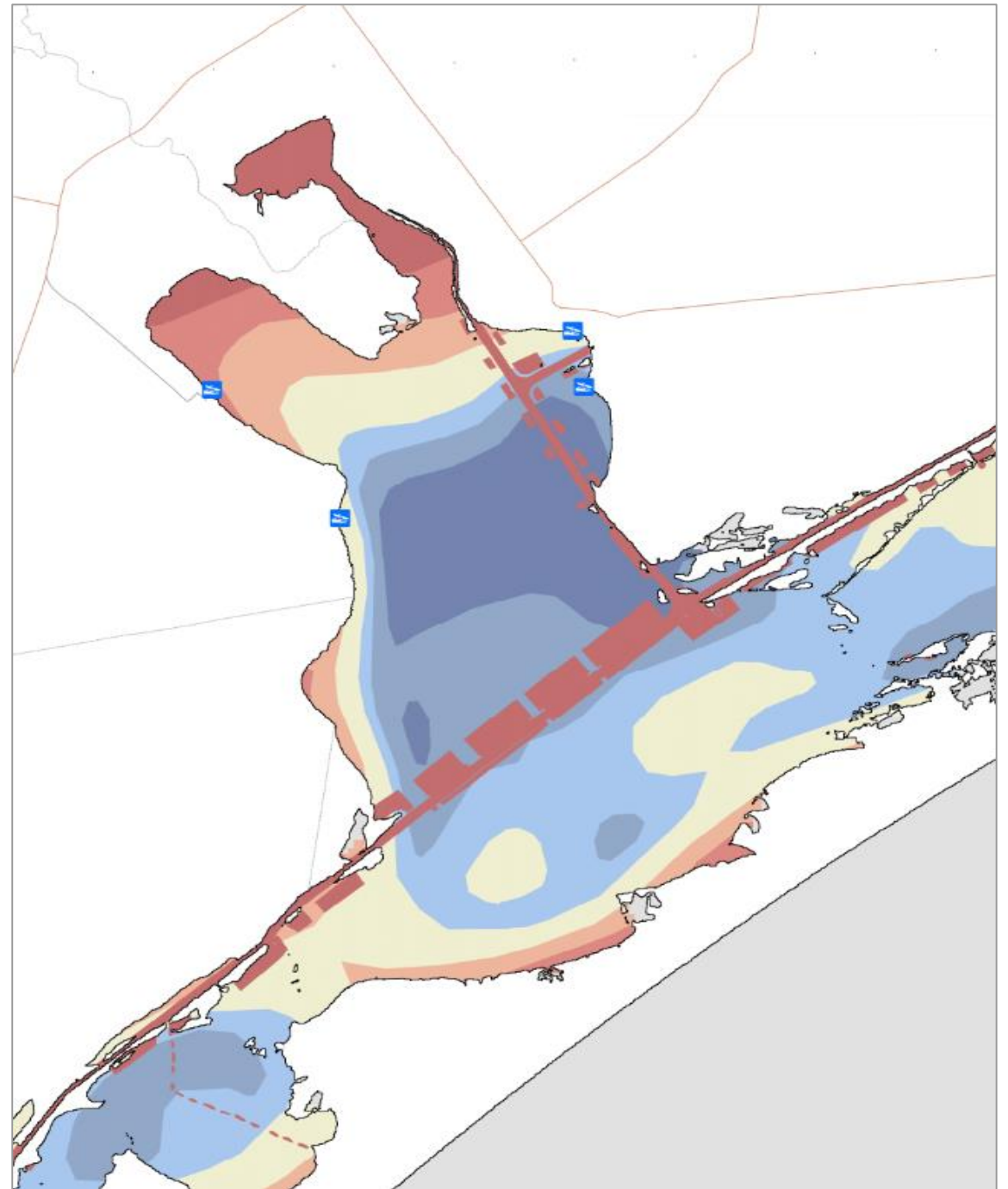
How the **process** works



Restoration Suitability Index

Improve return on investment

- 30+ years of water quality and oyster data
- Identify the best places for reef restoration & sustainability
- Can be modified for aquaculture





Over 20 acres restored

Aransas Bay

- 8 acres
- Adjacent to Goose Island State Park



Over 20 acres restored

Copano Bay

- 6 acres
- Adjacent to Lap Reef



Over 20 acres restored

St. Charles Bay

- 5 acres
- Adjacent to Goose Island State Park



New for 2020!

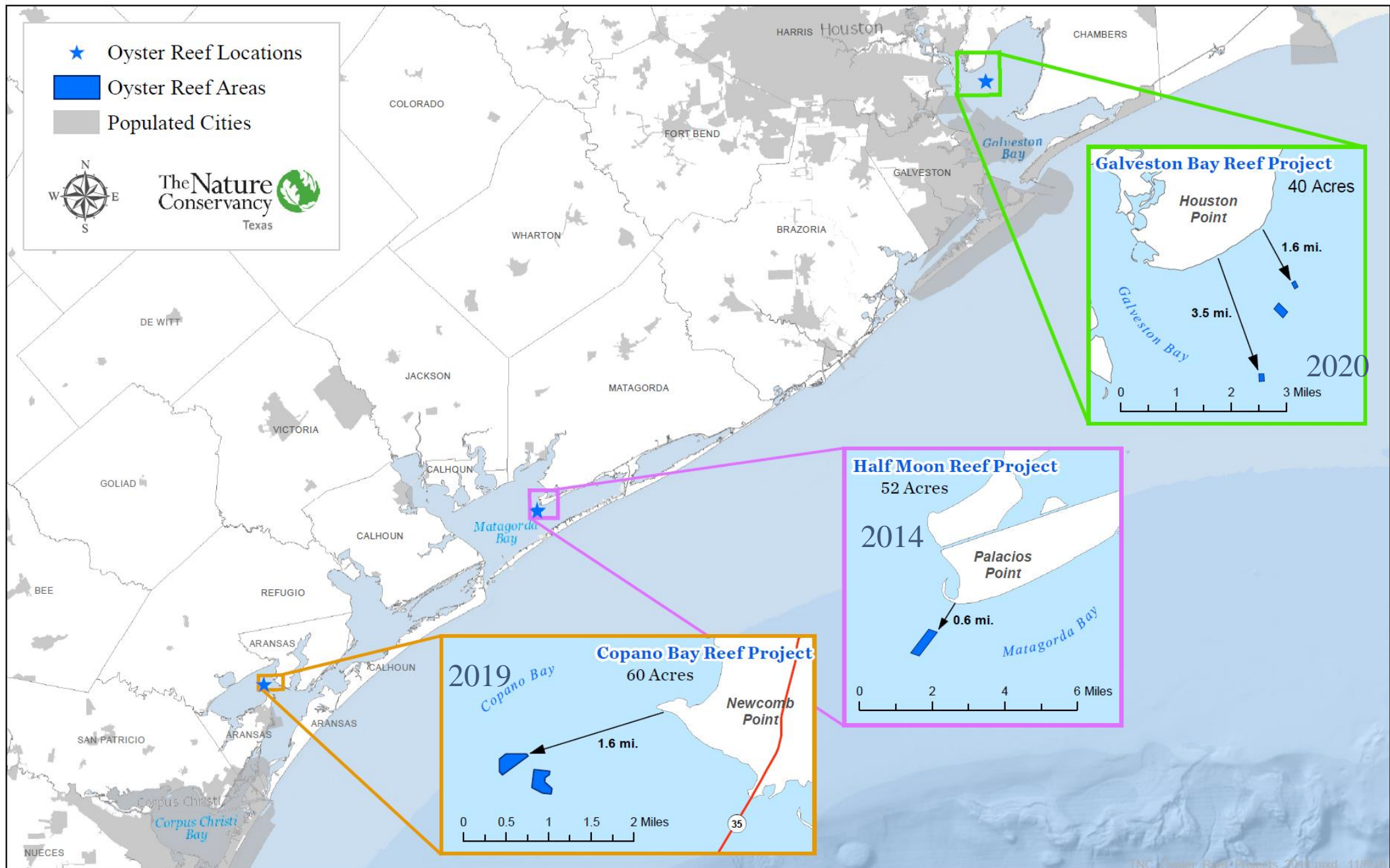
Additional 5 acres in St. Charles Bay

- Adjacent to Goose Island State Park
- TPWD-NOAA Harvey Relief Funds

TPWD Oyster Restoration

<u>Bay System</u>	<u>Year</u>	<u>Acres</u>	<u>Cubic Yds</u>	<u>Totals</u>
Galveston Bay	2009	25	7,142	\$539,436
	2011	177	73,085	\$4,329,893
	2013	30	14,070	\$976,458
	2014	180	72,894	\$4,702,596
	2016	6	5,043	\$383,040
	2017	29	9,670	\$821,280
	2018	5	1,985	
	2019	15	6,125	
Matagorda Bay	2018	11	4,605	
	2019	6	2,292	
Sabine Lake	2014	23	9,211	\$525,000
TOTAL		507	206,122	\$12,277,703

Slide courtesy of Emma Clarkson, Texas Parks and Wildlife Department



Slide courtesy of Julie Sullivan, The Nature Conservancy

Texas Oyster Aquaculture

Providing economic stability and environmental protection

Sustainable Texas oysters from bay to plate — is it possible? The Texas oyster fishery is in a historic decline as increased fishing pressure, hurricanes, freshwater floods and chemical spills have threatened production. Texas is overdue for an oyster aquaculture revolution.

The Harte Research Institute for Gulf of Mexico Studies has partnered with Texas A&M AgriLife Research, Texas Parks and Wildlife Department, Coastal Conservation Association and the Texas Restaurant Association to identify how oyster aquaculture can become an important part of the Texas economy, ensure sustainable and adaptable fisheries, and restore damaged reefs in our bays.

Oyster aquaculture will reduce the need for importing satisfying demands across Texas by providing new production and improved quality. The benefits aren't just economic — oysters are traditionally harvested from public fishing grounds by commercial fishers. Oyster aquaculture destroys the sea bottom as it brings up its catch, loses its benefits oyster reefs provide as hurricane protection and fisheries habitat.

Our research will show how oyster aquaculture can provide economic stability to the state's economy and environment with sustainability into the future.

SUSTAINABILITY

1. Abundant supply
2. A diverse product
3. Thrives in Galveston Bay
4. A truly harvestable resource
5. More consistent guidelines

INDUSTRY

1. We will work with fisherman
2. We will ensure stewards,
3. We will make Texas coast as well as



Aquaculture provides year-round production of oysters



Dr. Joe Fox

Chair for Marine Resource Development

Joe.fox@tamucc.edu

Texas Oyster Mariculture



Oyster Mariculture Legislation

82 passed virtually unanimously in state legislature for Abbott. Cultivated oyster mariculture in Texas penalties related to cultivated oyster mariculture passed in September 2019.

Grow

1.5M acres of bays to overfishing and environmental disasters ranging impacts predictable supply of oysters

Time

High-quality oysters that live and grow as little as 8 months and enhances consumer appeal and

and leftover shell can be used to deter coastal erosion improves recreational reefs

eries facts



Join us in restoring reefs!



Saturday, March 28

Saturday, April 25

8:30-11:30 am

Goose Island State Park



www.HarteResearchInstitute.org/events

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