

# Oyster Restoration Goal Setting; Quantifying Benefits to Target New Investments

Boze Hancock



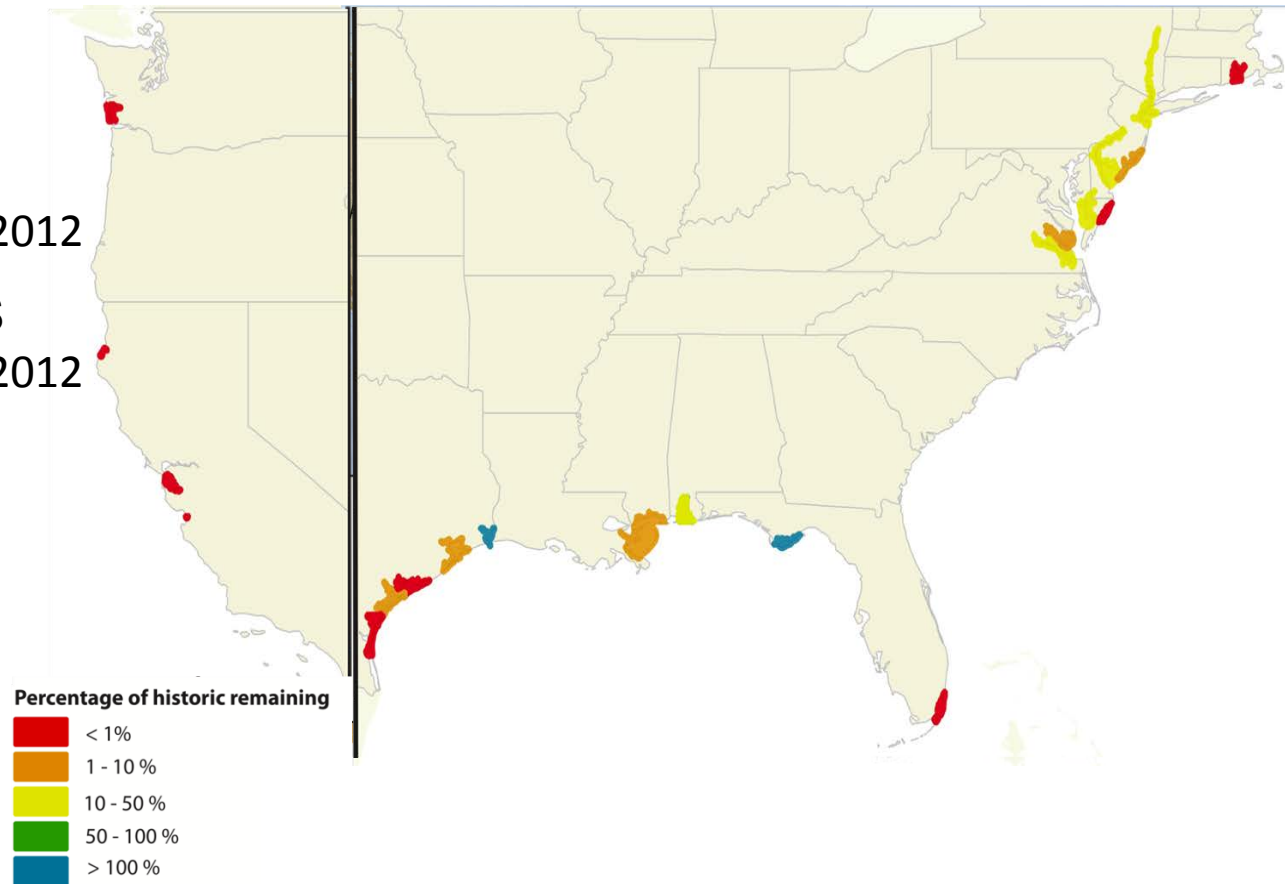


# Oyster Habitats - In Bad Shape

85% Decline Globally  
Beck et al. 2011

64% Decline in Spatial  
Extent US  
Zu Ermgassen et al. 2012

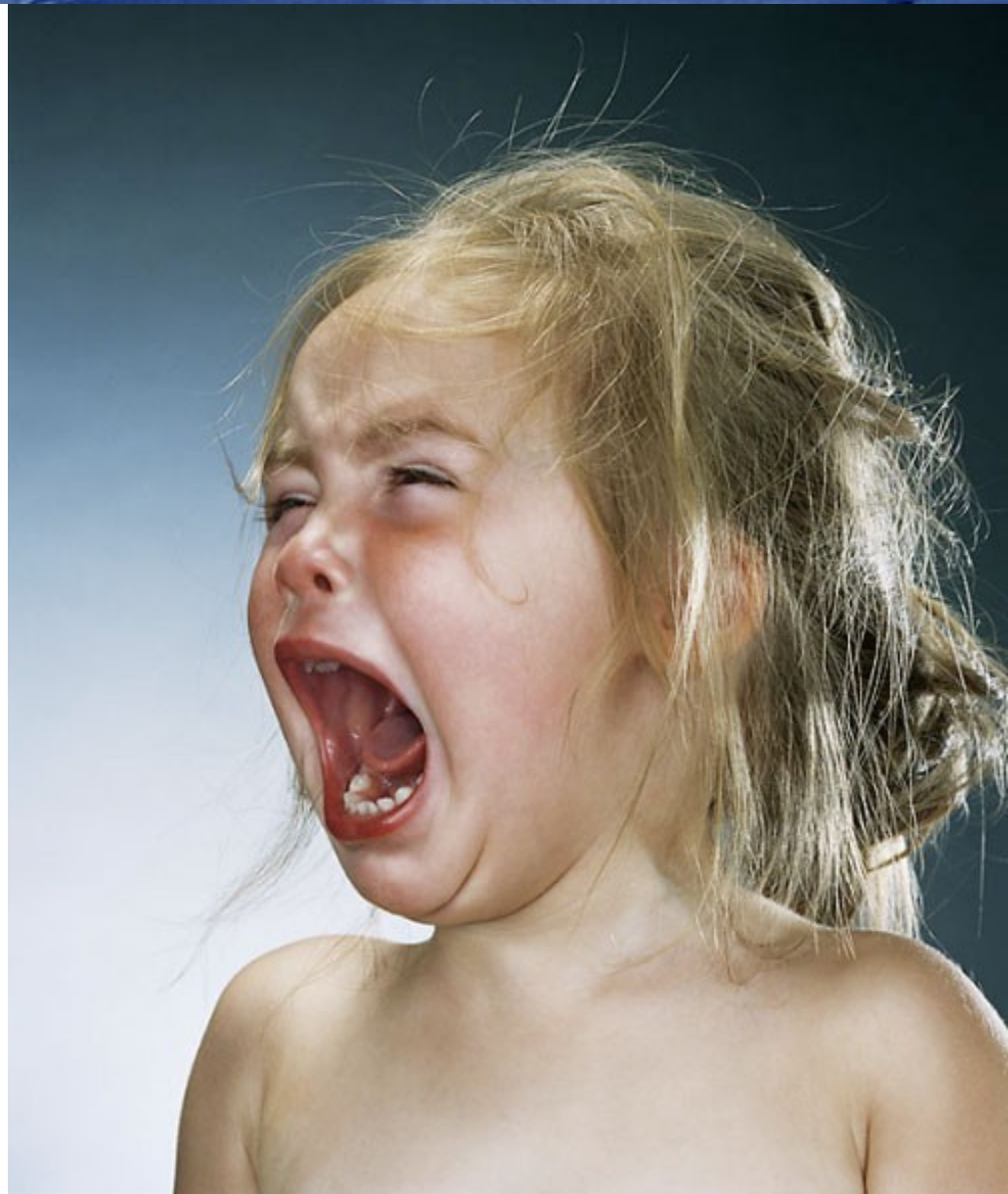
88% Decline in Biomass US  
Zu Ermgassen et al. 2012



# Historically Abundant, Presently Scarce How do we Influence Restoration?

1. Point out that we  
want it back!

- Aspirational goals,
- % of historic, or  
% increase





# Historically Abundant, Presently Scarce How do we Influence Restoration?

2. Measure benefits  
Set goals based on  
benefits returned

## Goal

- Cleaner water
- Decr. nutrient
- More fish



# Quantify the benefits and value of restoration

## Set goals based on the benefits purchased

### Filtration

Very high filtration rates

Filtration Rates > Flushing Rates

You need X Ha of oyster reef to get there

#### Eastern Oyster

$$FR = 8.02 W^{0.58} e^{(-0.015(T-27))^2}$$

Where W is dry tissue mass,  
T is temperature ° C

zuErmgassen et al. 2012

#### Olympia Oyster

$$FR = 3.60 W^{0.26} e^{-0.011(T-25)^2}$$

Where W is dry tissue mass,  
T is temperature ° C

zuErmgassen et al. 2013

# Quantify the benefits and value of restoration

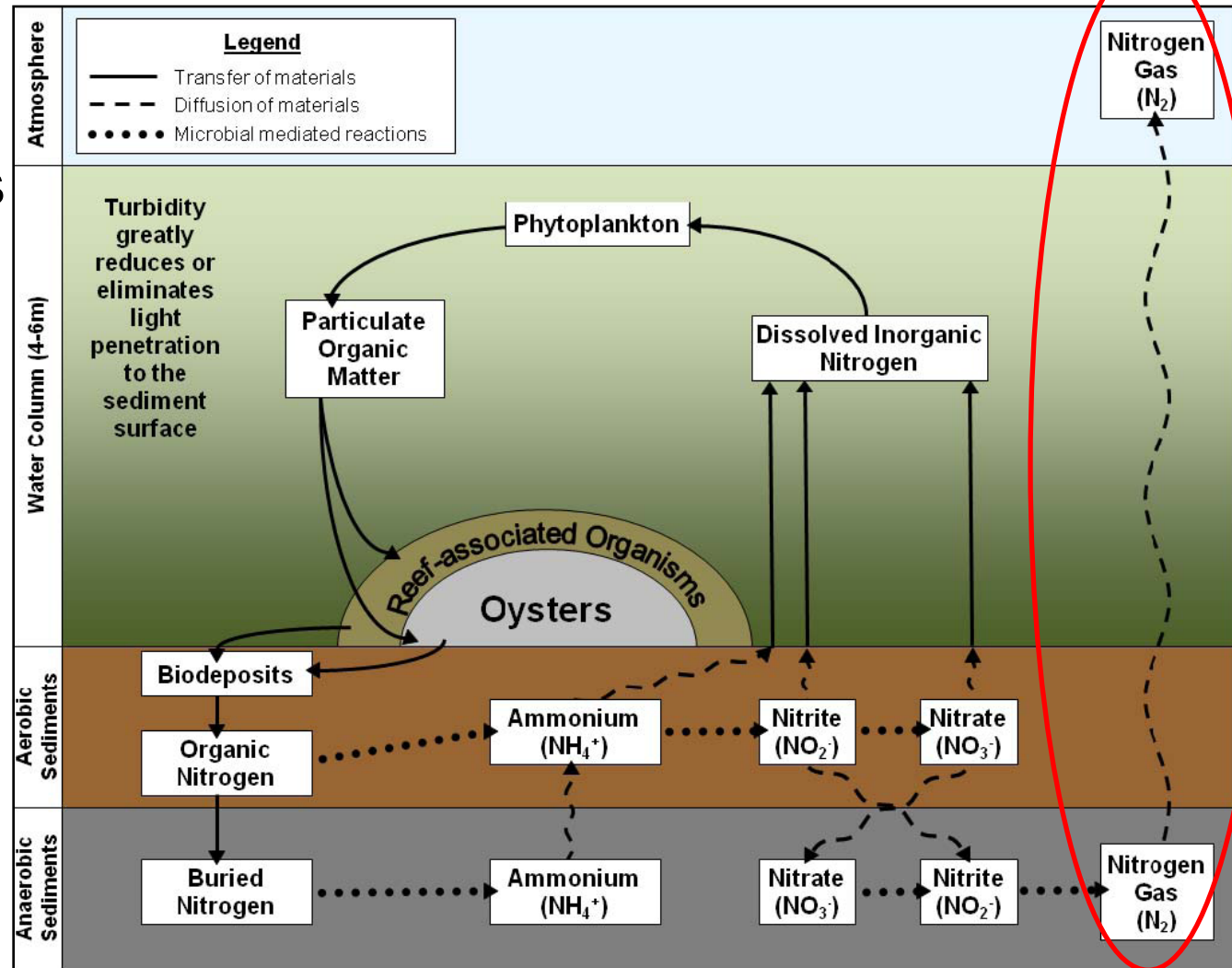
## Set goals based on the benefits purchased

### Denitrification

Highest DNF rates recorded

Nutrient reduction targets

You need Y ha of oyster reef to get there





# Quantify the benefits and value of restoration

## Set goals based on the benefits purchased

### Fish Production

Nutrients + structure  
= food + shelter

↑ juv. survival  
↑ growth

How many fish do  
you want

You need Z ha of  
oyster reef to get there

Pub. in Prep, 2014





Quantify Ecosystem Services

Set Restoration Goals Based On Desired Services

Thanks  
Boze Hancock