Oyster Restoration:

setting goals for the next decade

Brandon Puckett

David Hanson

Thanks

North Carolina Coastal Federation

Sea Grant North Carolina

NC CATCH

Albemarle - Pamlico National Estuary Program

The Nature Conservancy

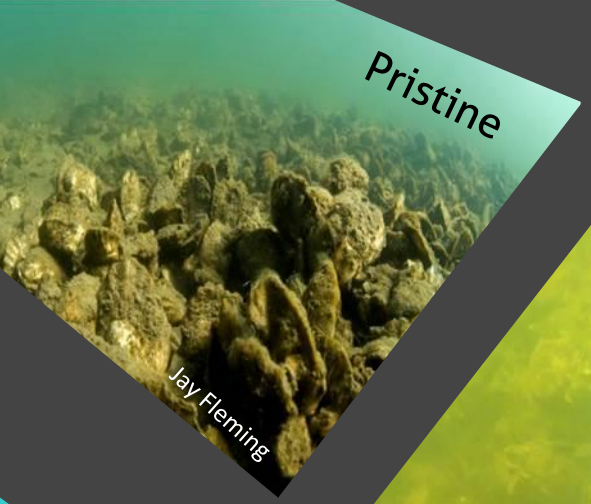
Protecting nature. Preserving life.™

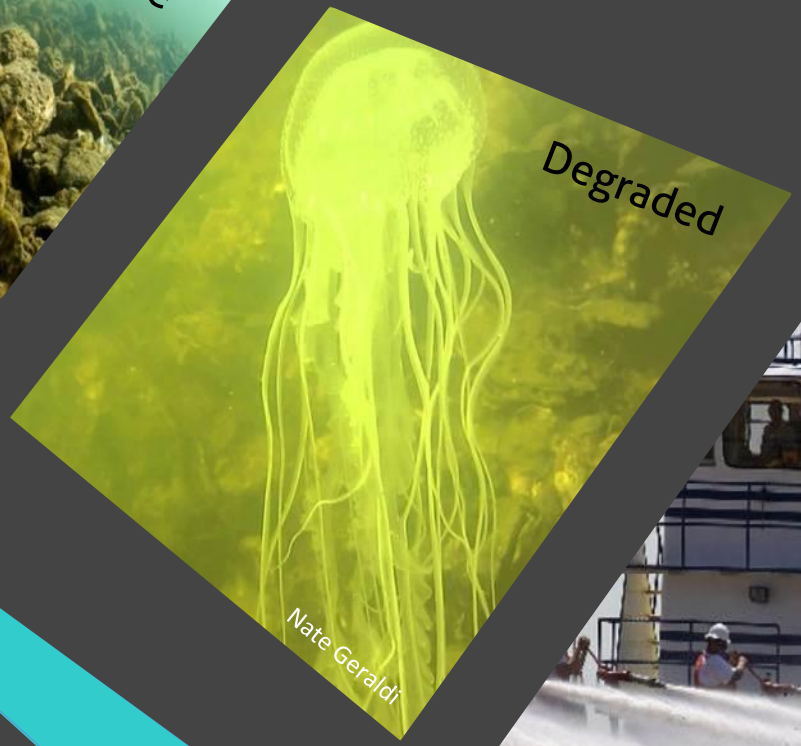
Gulf Coast Aggregates

What is restoration?

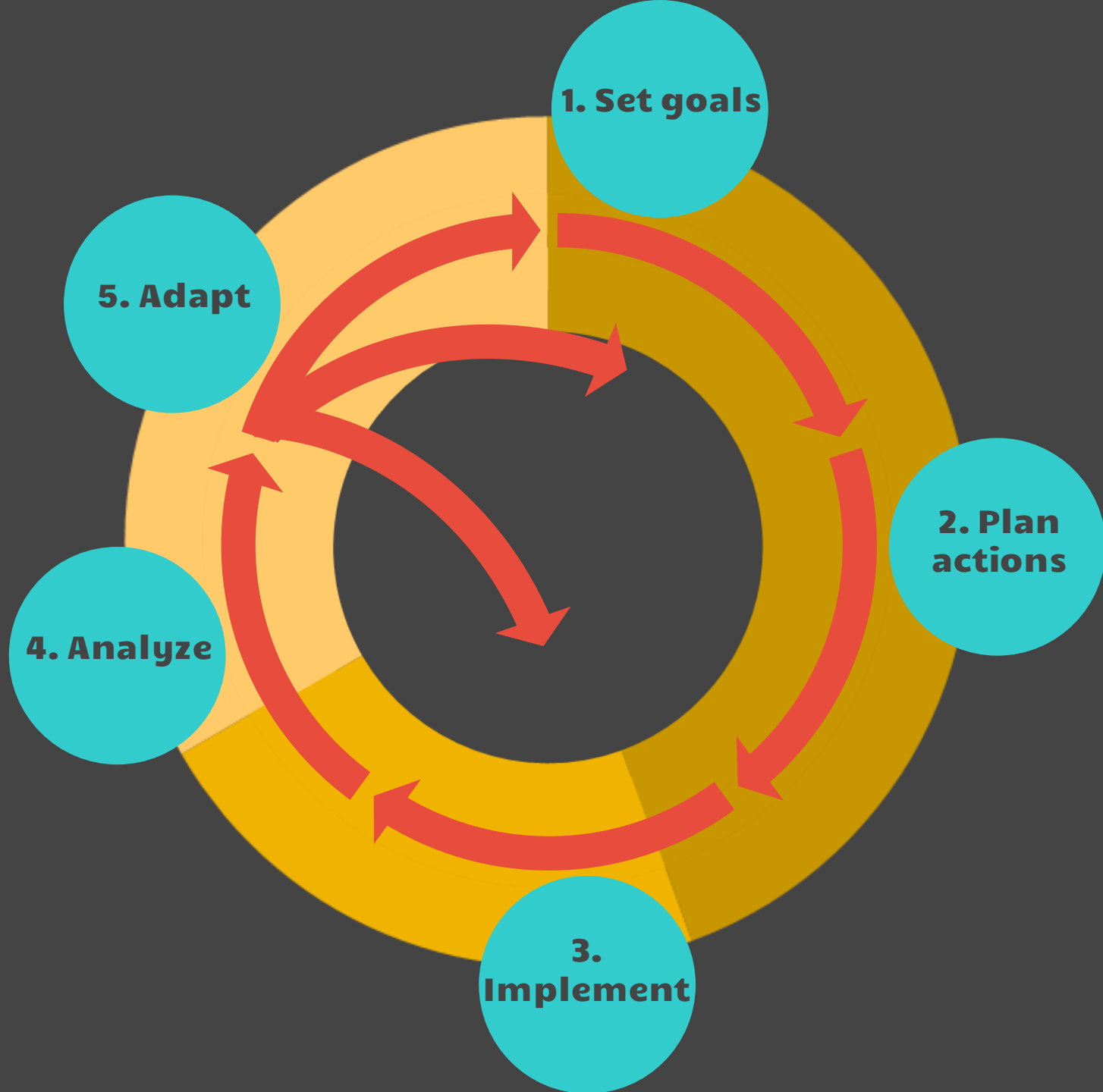
assisting the recovery of a degraded ecosystem.

assisting the recovery of a degraded ecosystem.





CONCEPTUAL FRAMEWORK



Why oyster restoration?

Most imperiled marine habitat on Earth

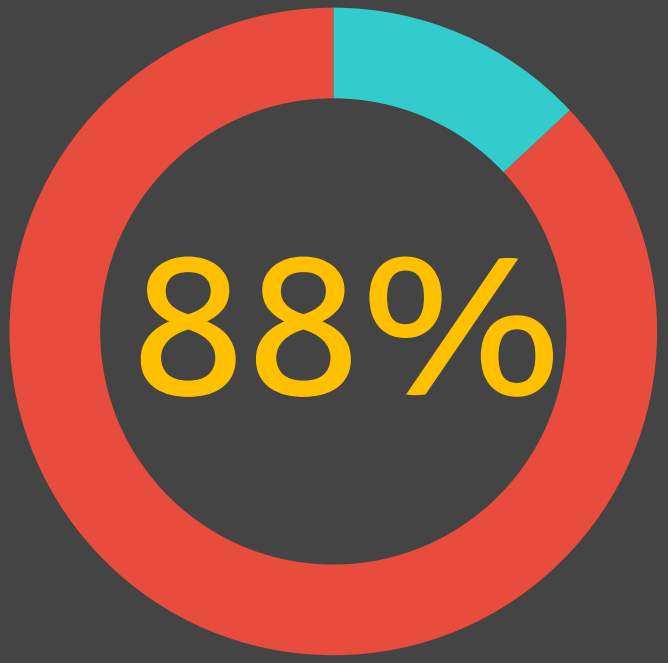
Brumbaugh et al. 2010

Declines...

Most imperiled marine habitat on Earth

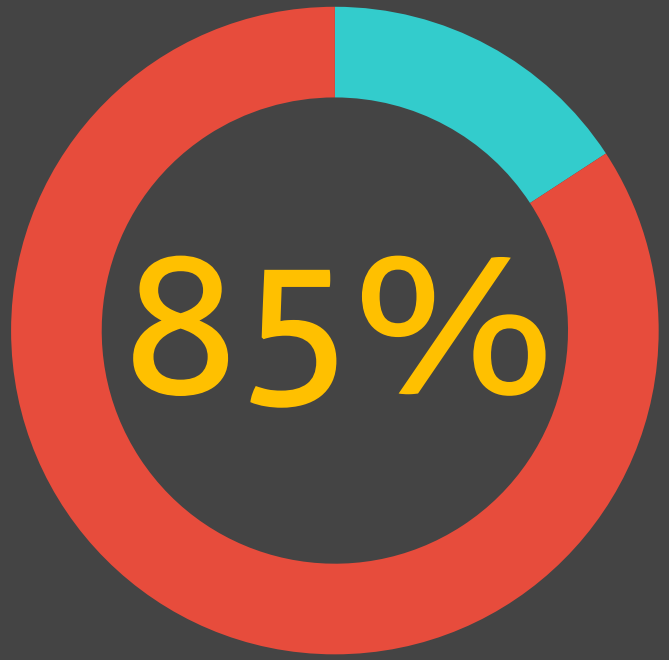
Brumbaugh et al. 2010

Biomass



zu Ermgassen et al. 2012

Filtration

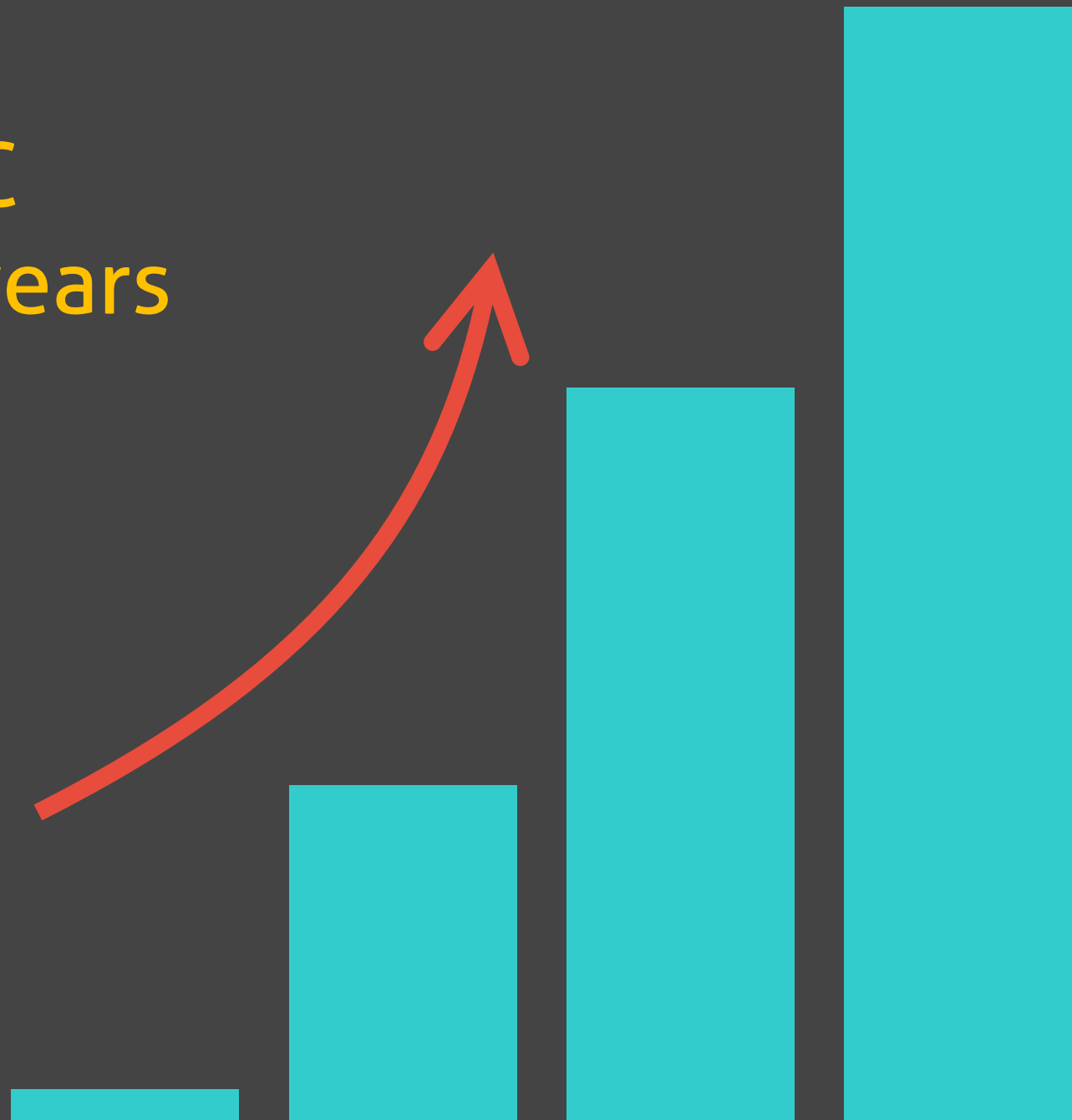


zu Ermgassen et al. 2013

Landings

NC DMF

Number of oyster restoration projects in NC increased 1200% in 20 years



NC DMF

John Fear

News and Observer

John Fear

NC DMF

John Fear

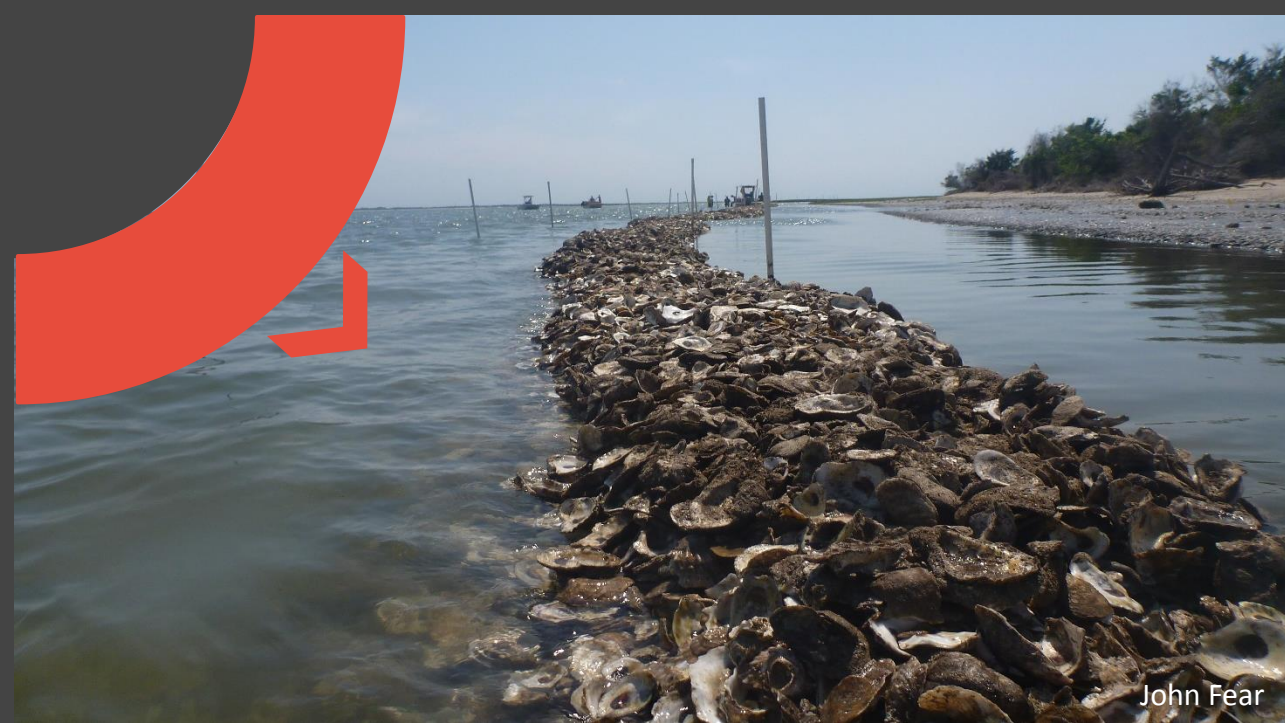
News and Observer

John Fear


NC DMF


John Fear


News and Observer


John Fear

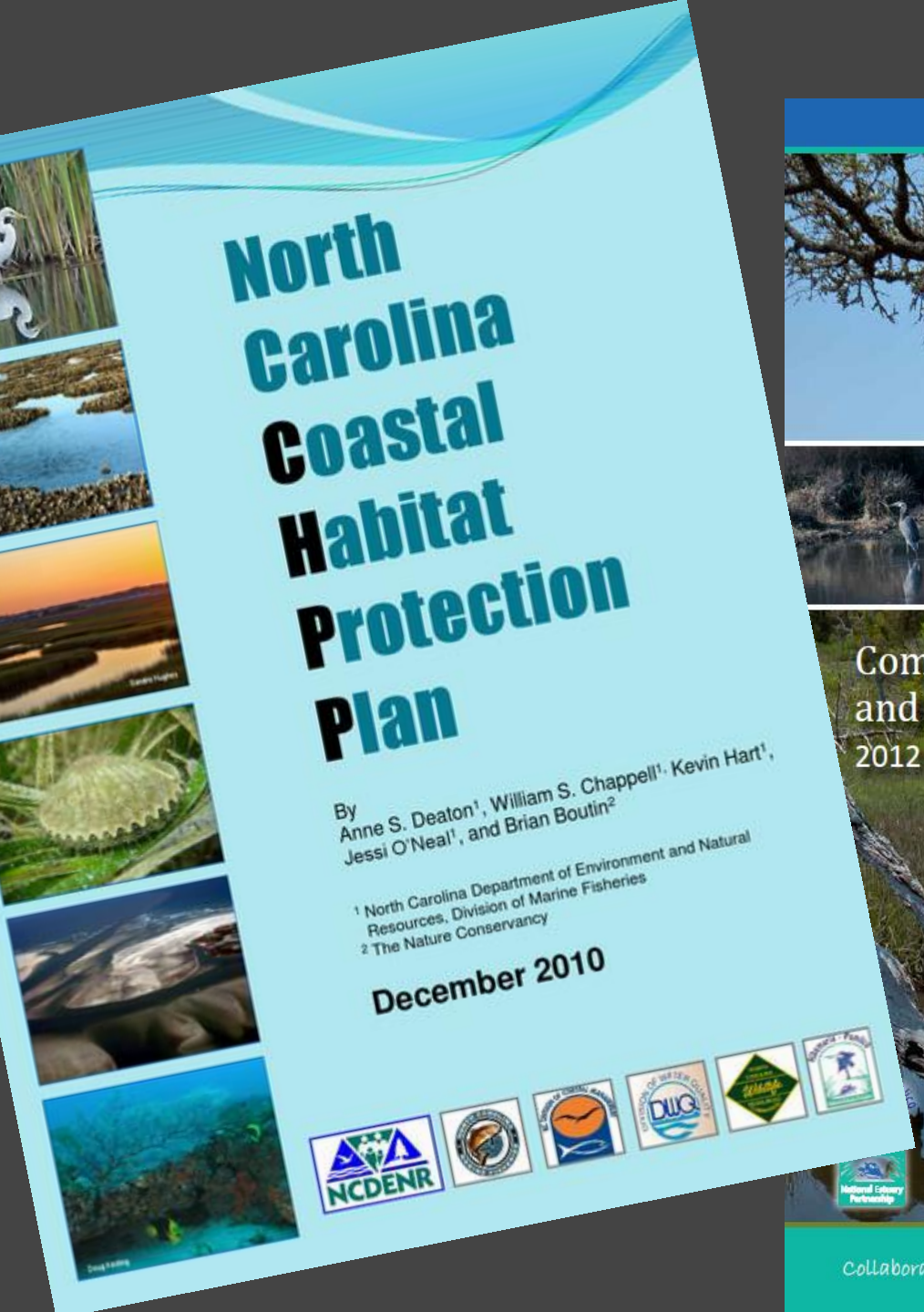
NC DMF

John Fear

News and Observer

John Fear

Guiding documents


North Carolina Coastal Habitat Protection Plan
By
Anne S. Deaton[1], William S. Chappell[1], Kevin Hart[1], Jessi O'Neal[1], and Brian Boutin[2]
[1] North Carolina Department of Environment and Natural Resources, Division of Marine Fisheries
[2] The Nature Conservancy
December 2010
NCDENR


Albemarle-Pamlico National Estuary Partnership
Comprehensive Conservation and Management Plan
2012 - 2022
Collaborative Actions for Protecting and Restoring the Albemarle-Pamlico Ecosystem


Oyster Restoration and Protection Plan for North Carolina:
A Blueprint For Action 2015 - 2020
Prepared by: N.C. Coastal Federation


An oyster population that provides for a healthy coastal environment and economy.
chesapeakbay.net

Population

Ecosystem services

Filtration

Habitat

Stabilization

Economic development

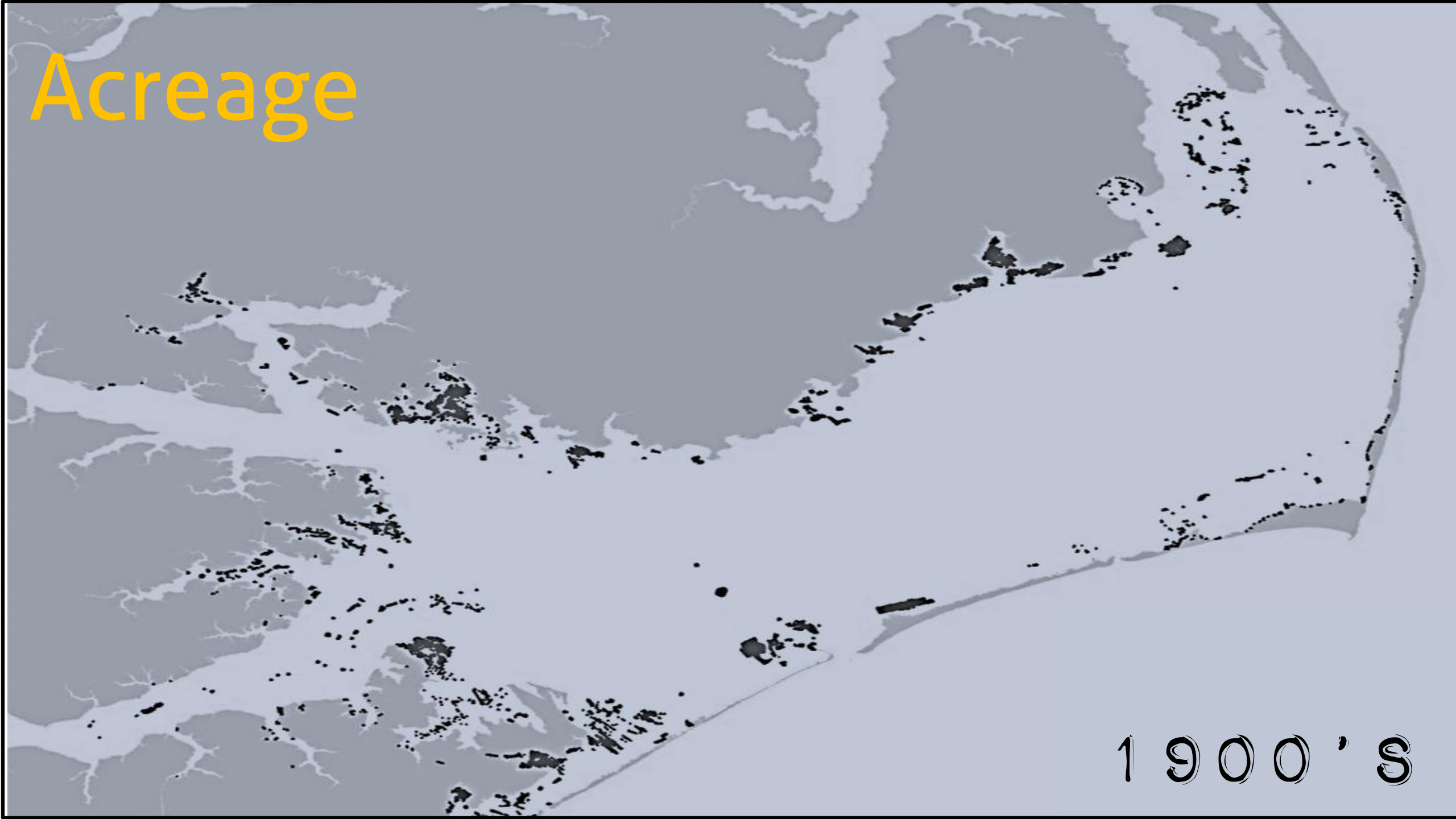
Harvest

Employment

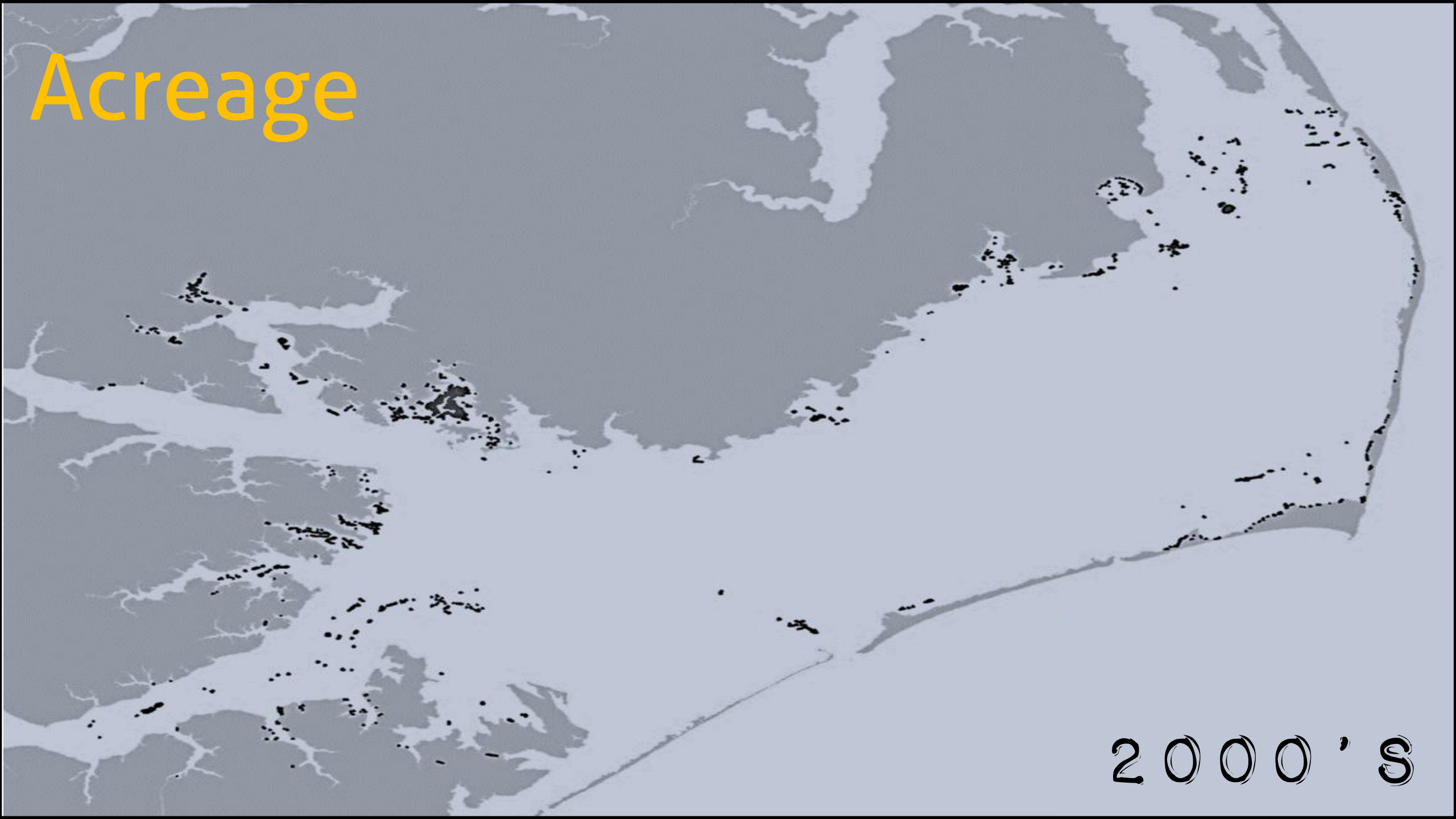
Recreation

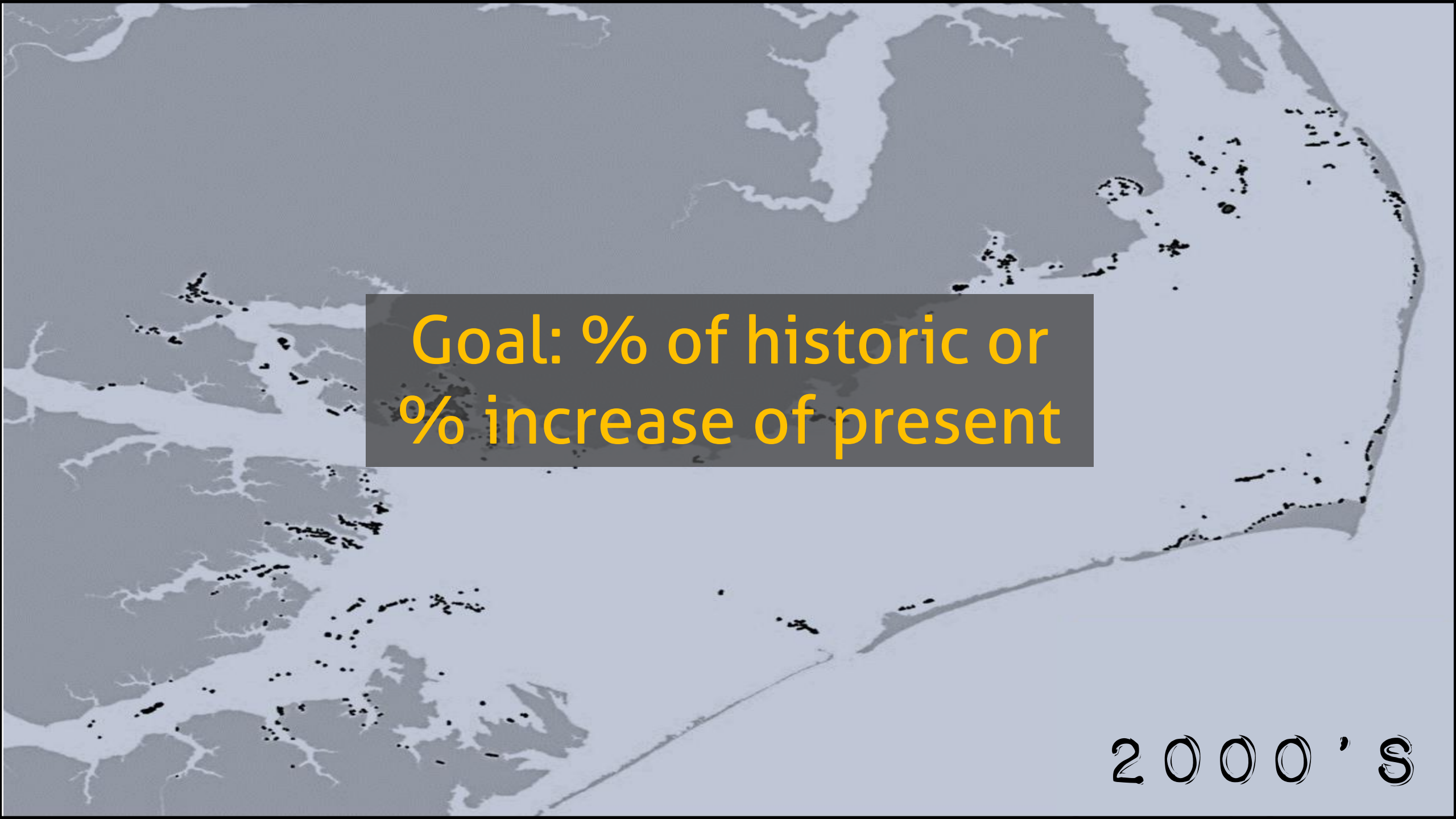
Setting goals: baselines

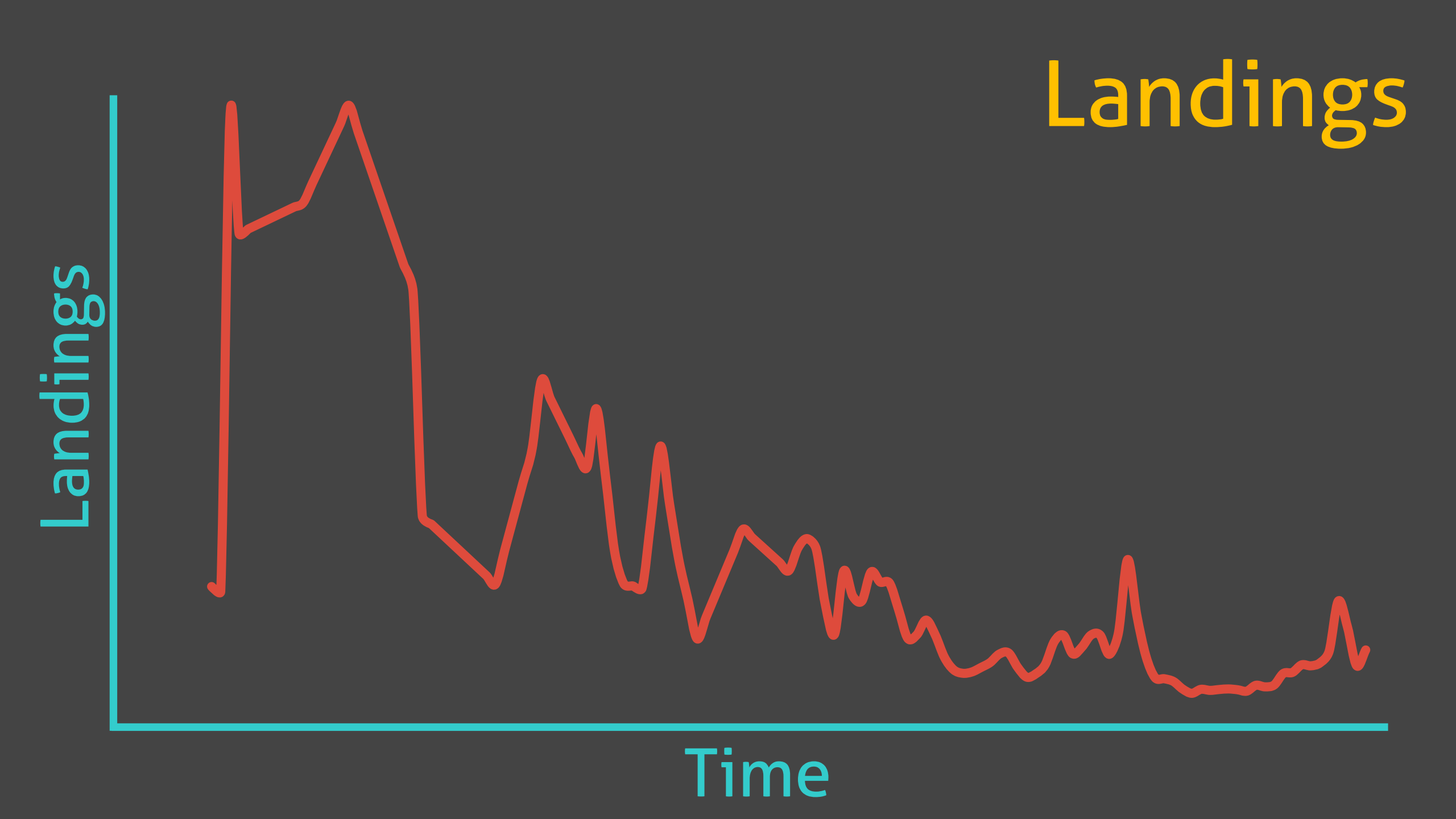
Acreage



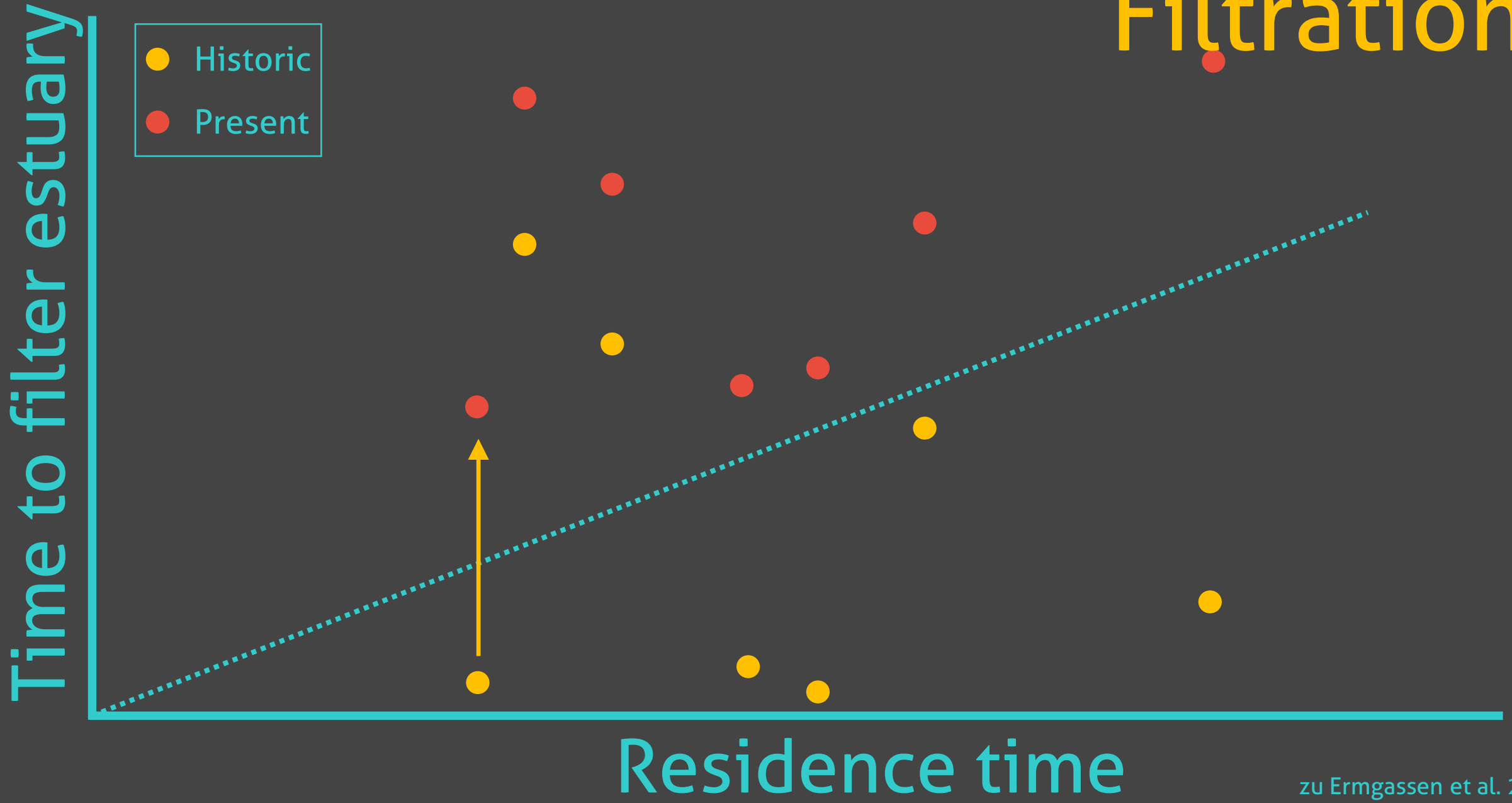
Acreage



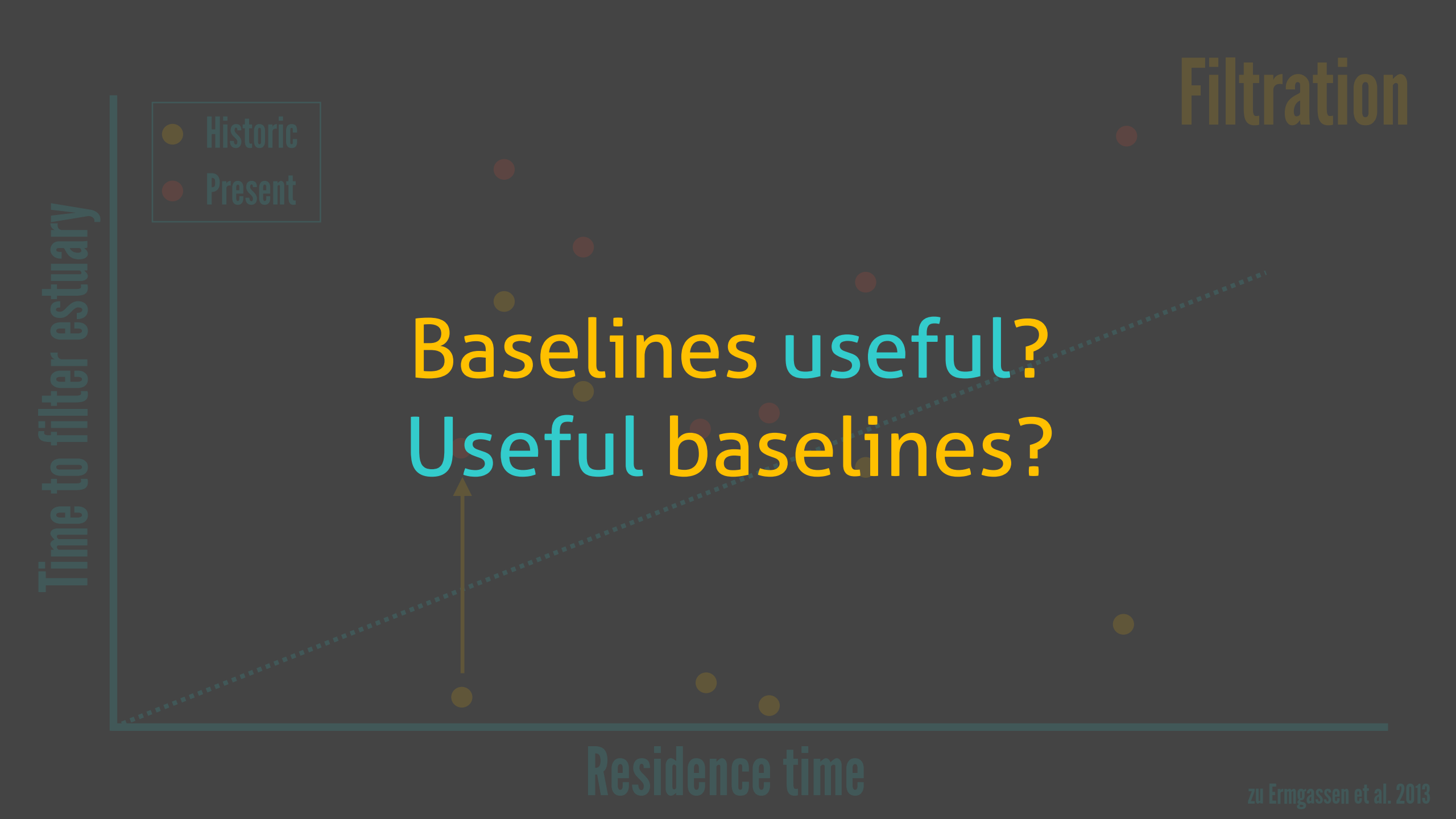

Goal: % of historic or
% increase of present
2000's


Landings
Landings
Time

Filtration



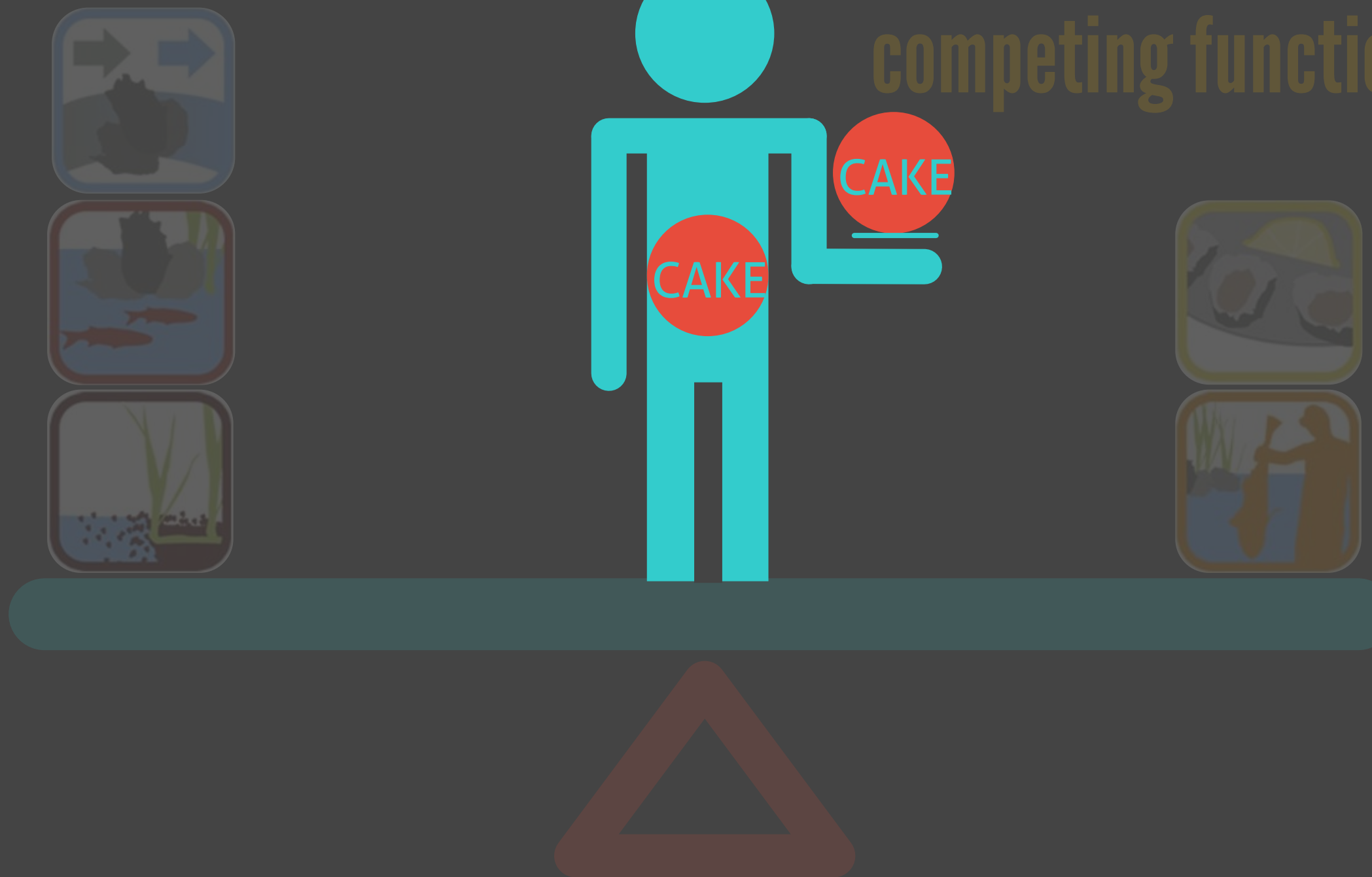
zu Ermgassen et al. 2013


Filtration
Historic
Present
Time to filter estuary
Residence time
Baselines useful?
Useful baselines?
zu Ermgassen et al. 2013

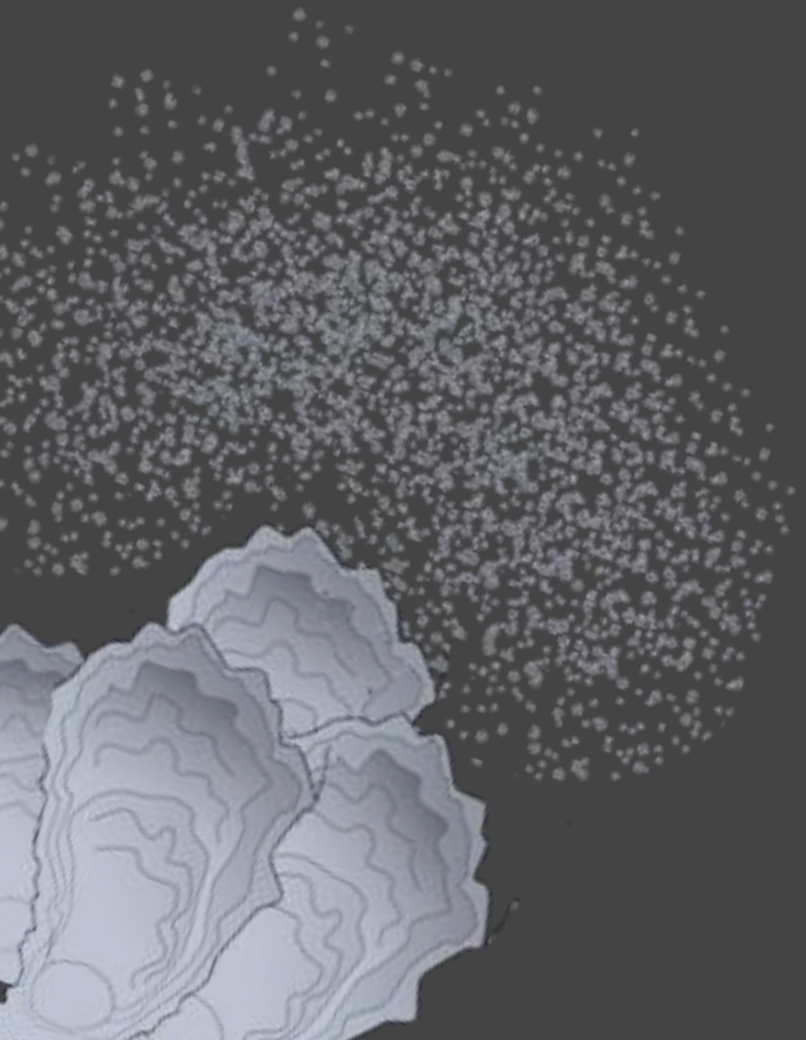
Setting goals: functions

competing functions?

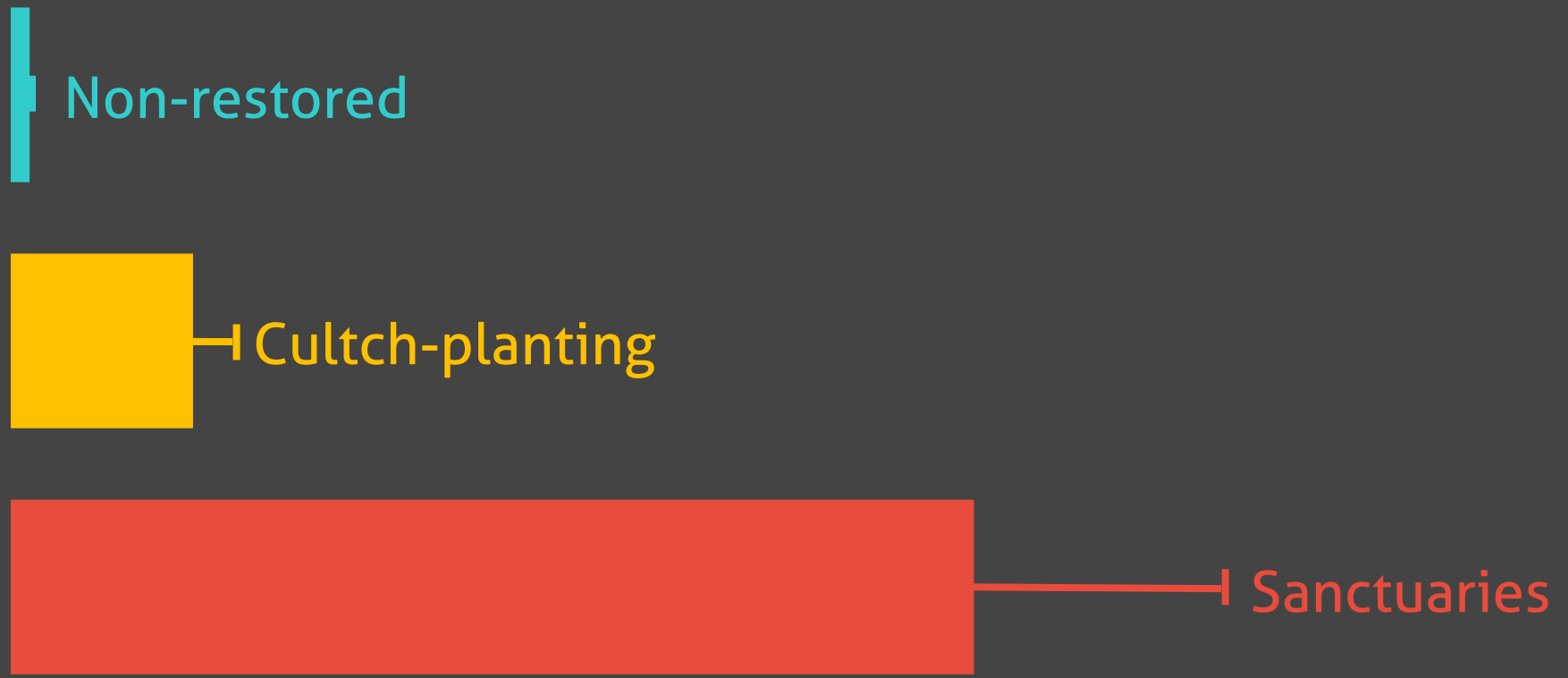
competing functions?



Maybe….maybe not



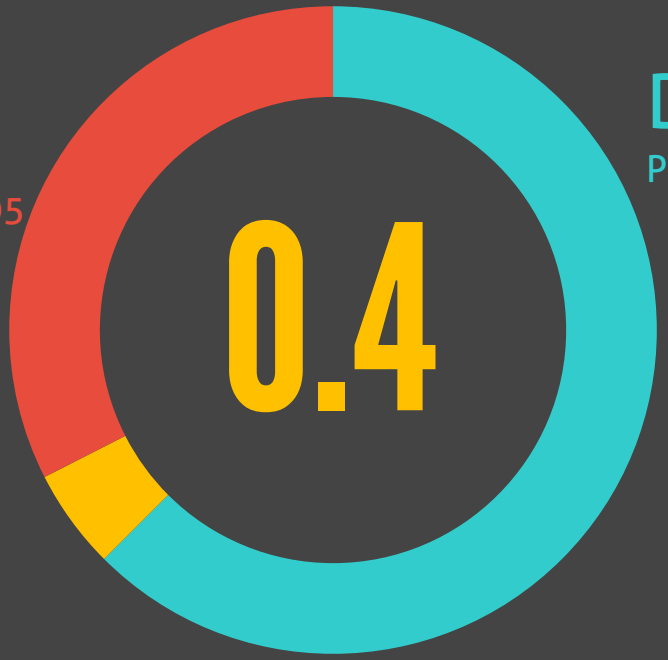
Reproductive output



Peters et al. in review

Nitrogen removal

Tons N per acre per year



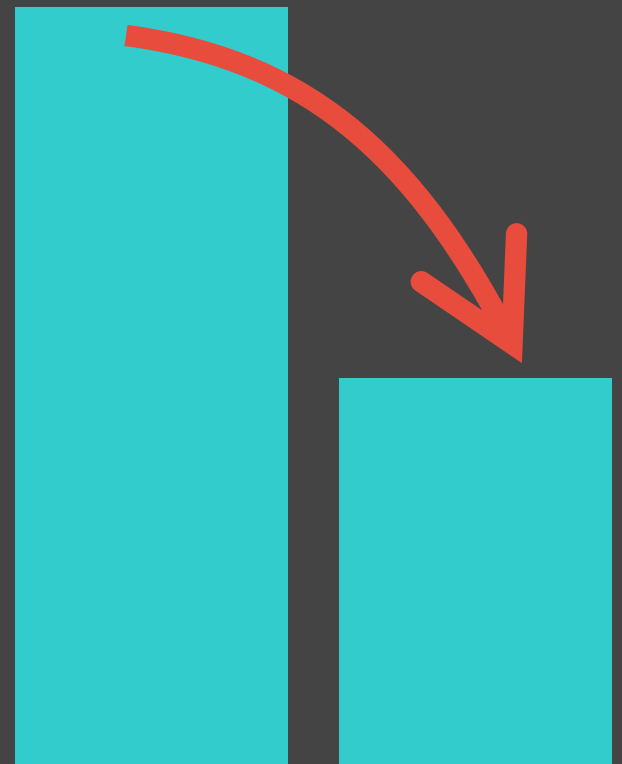
Burial
Newell et al. 2005

Denitrification
Piehler and Smyth 2011

Shell and tissue
Grizzle and Ward 2011

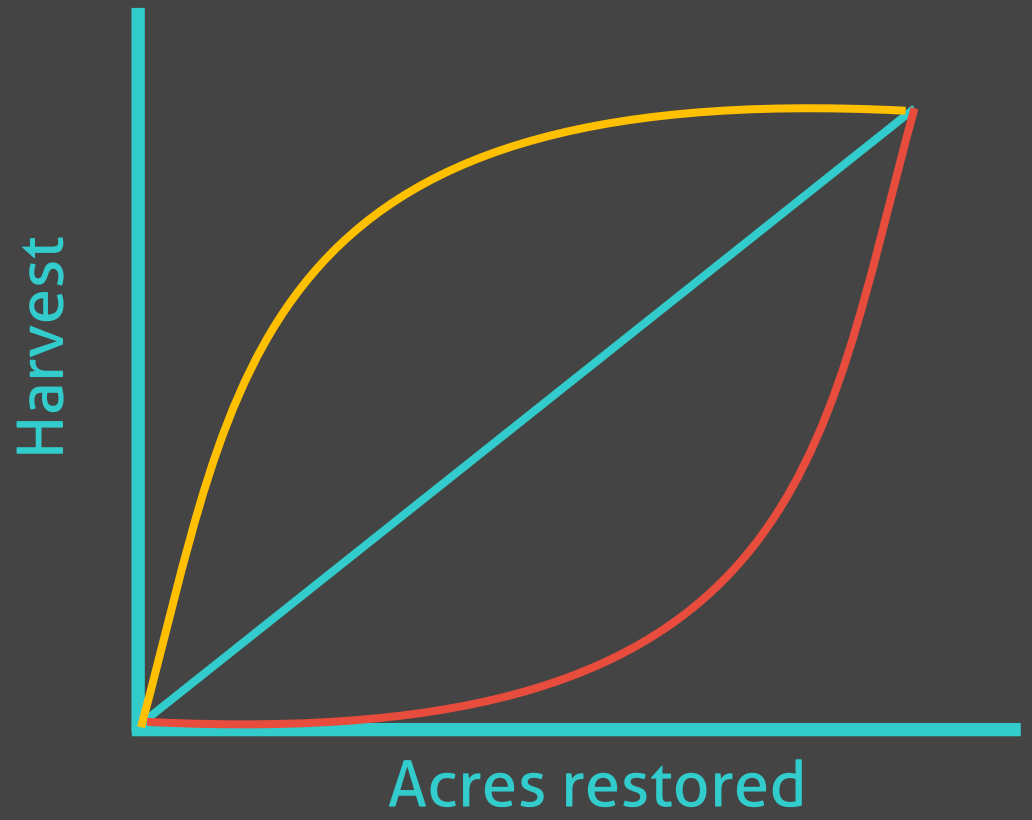
Goal: 100 ton reduction per year

Restore: 250 acres of reef



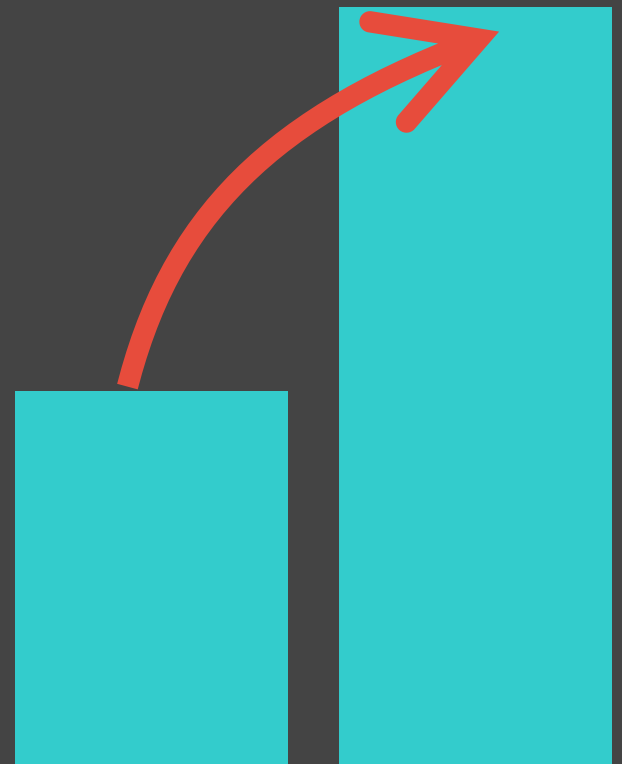
Harvest

Bushels per acre shell per year



Goal: X bushel incr. per year

Restore: Y acres of reef



Harvest

Bushels per acre shell per year

Goal: X bushel incr. per year

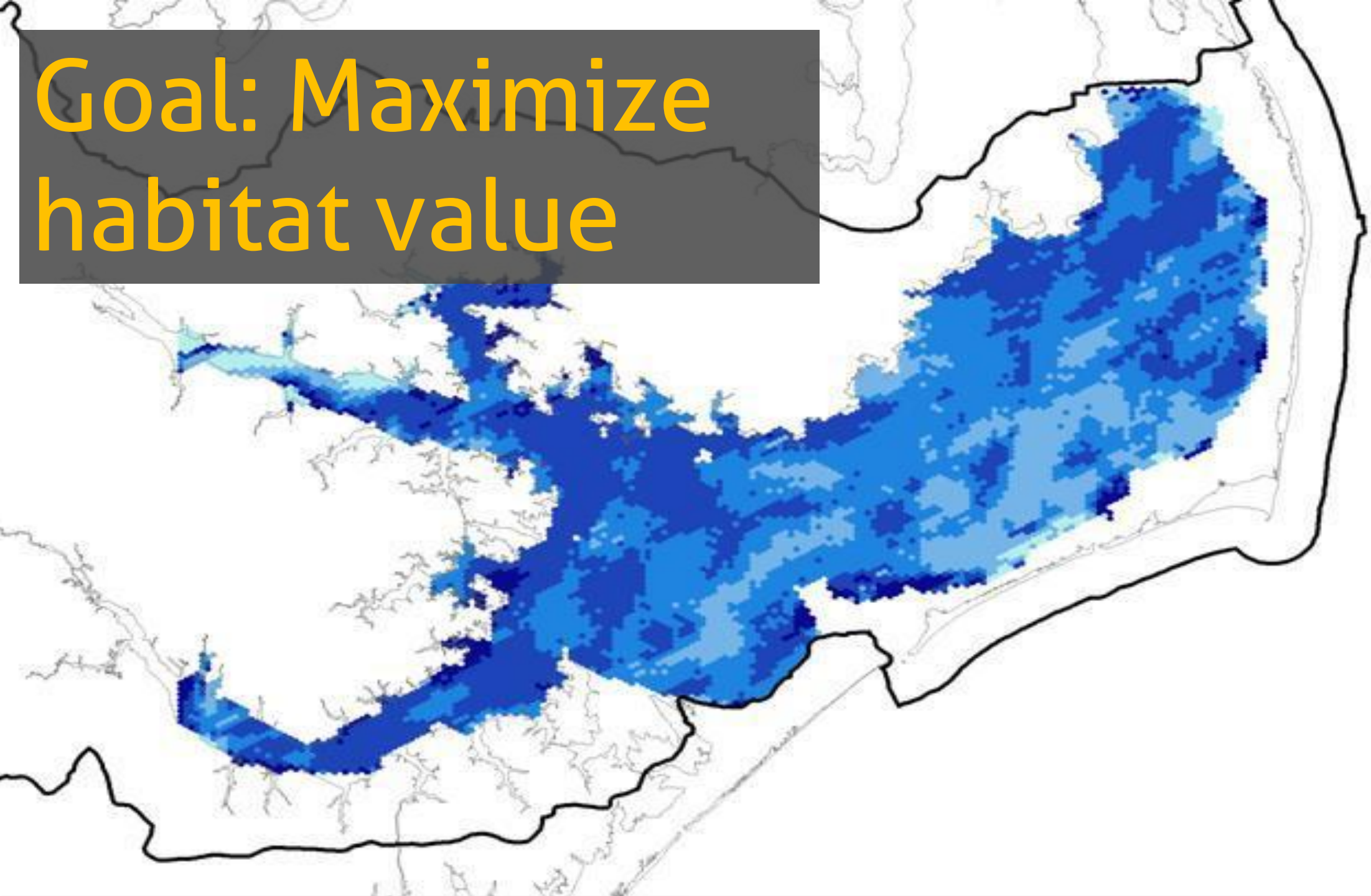
Restore: Y acres of reef

Answer how much is enough?

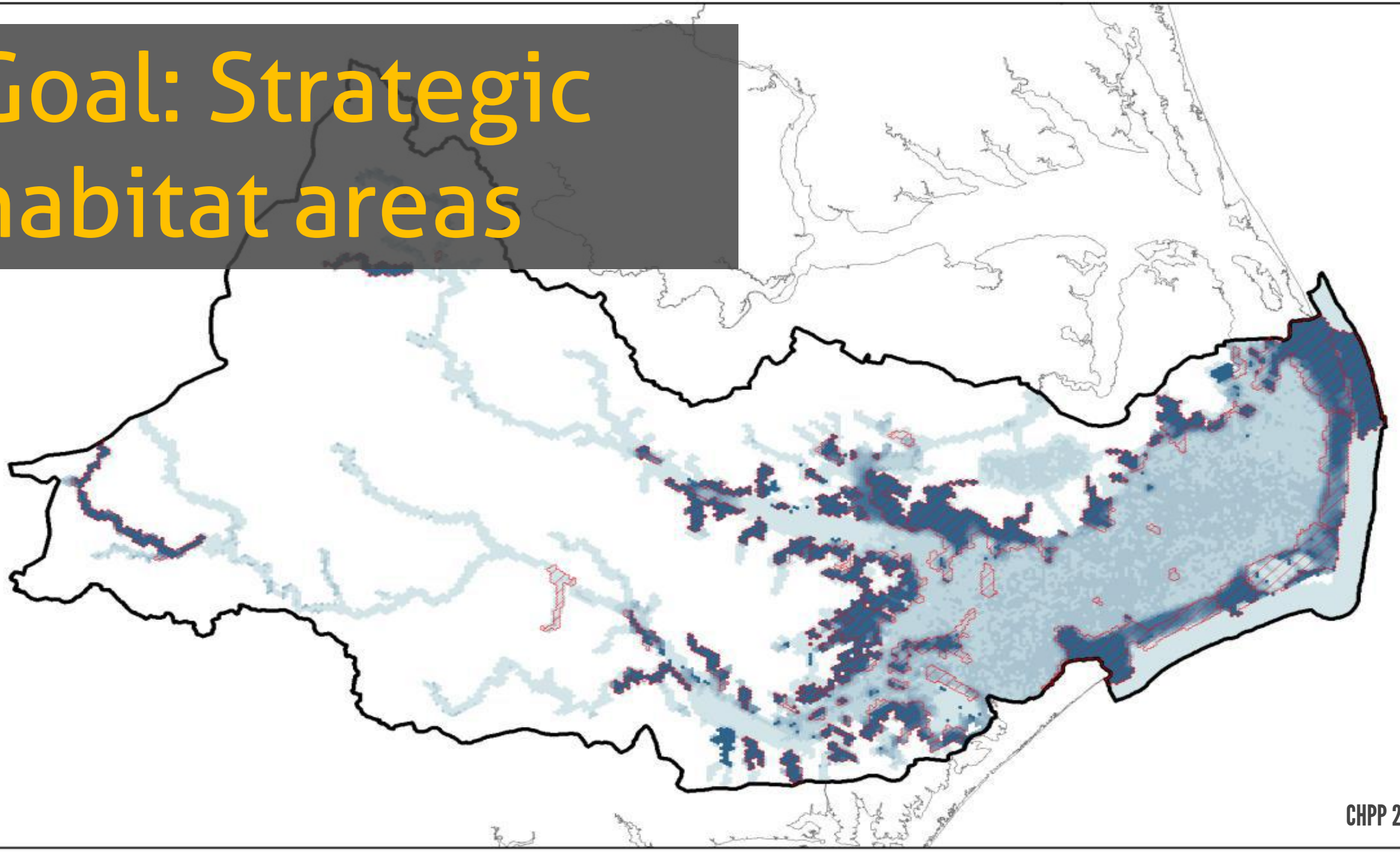
Enough data to provide answers?

Setting goals: locations

Goal: Maximize habitat value



Goal: Strategic habitat areas

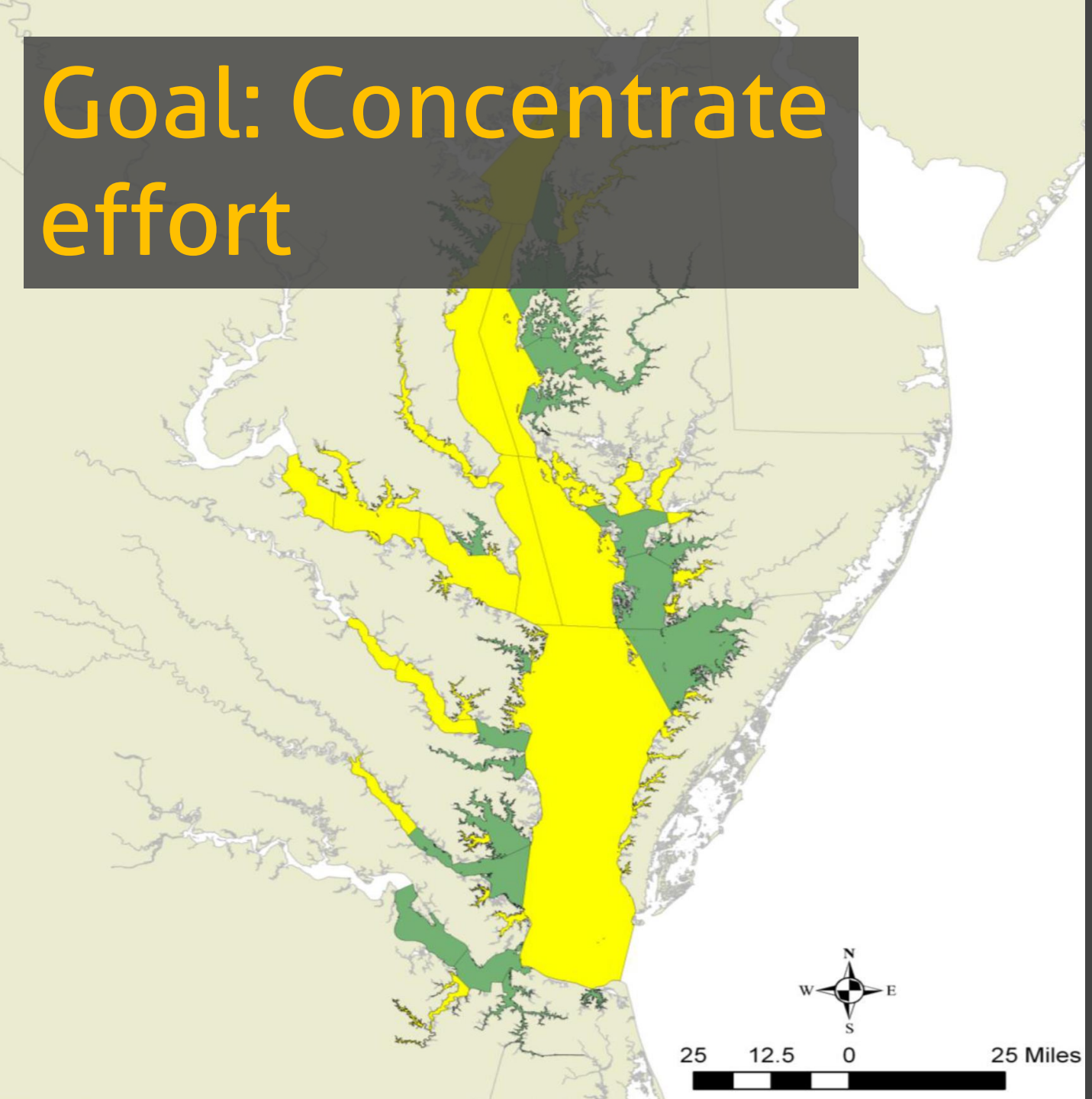


CHPP 2010

Goal: Shellfish closures

UNCW Shellfish Lease Siting Tool

Goal: Concentrate effort



Chesapeake Bay: 20 tributaries by 2025

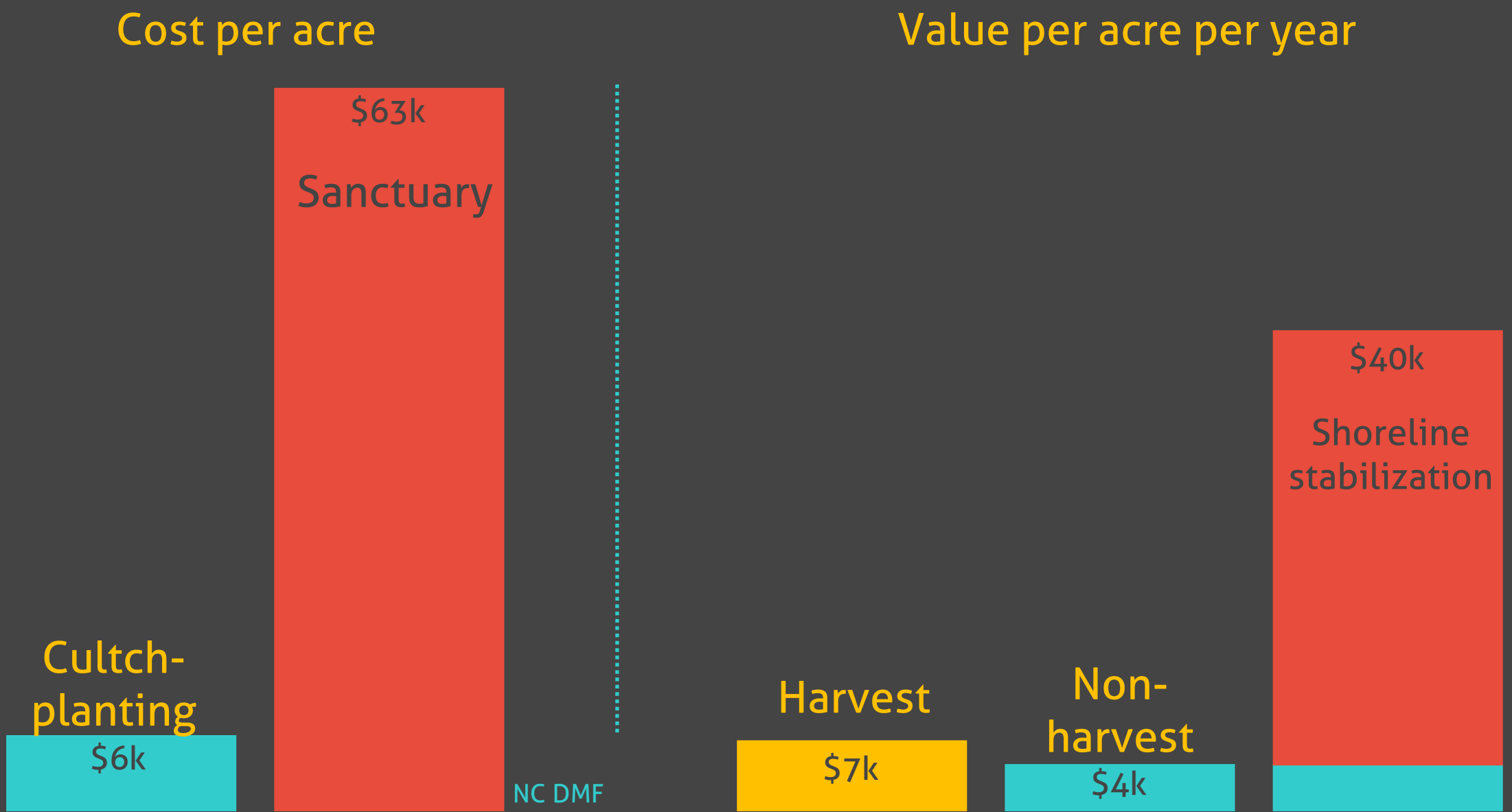
Goal: Concentrate effort

Chesapeake Bay: 20 tributaries by 2025

Provides way to prioritize?

Setting goals:
Return on investment

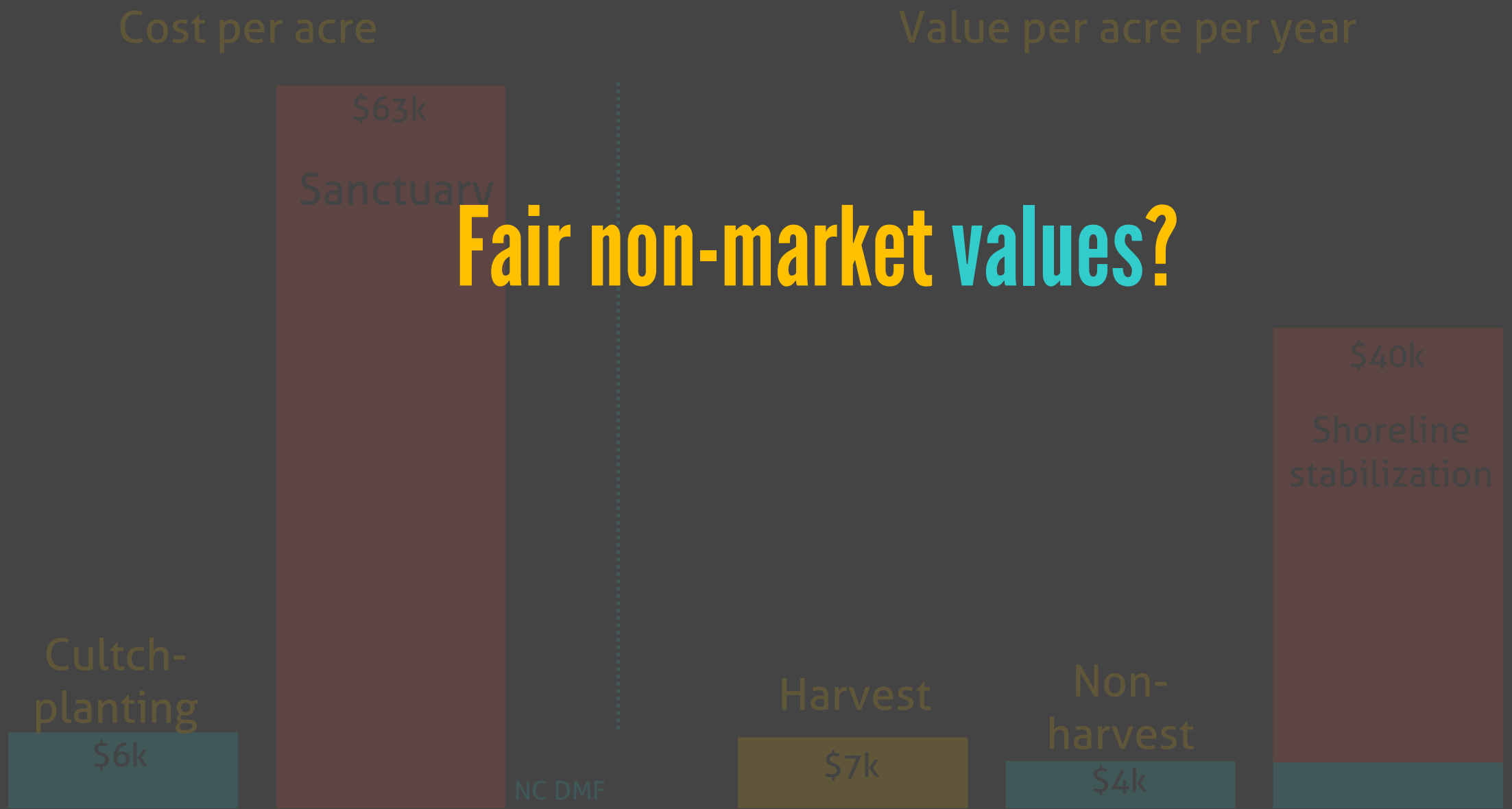
Goal: positive ROI



Mariculture: cost = $0*

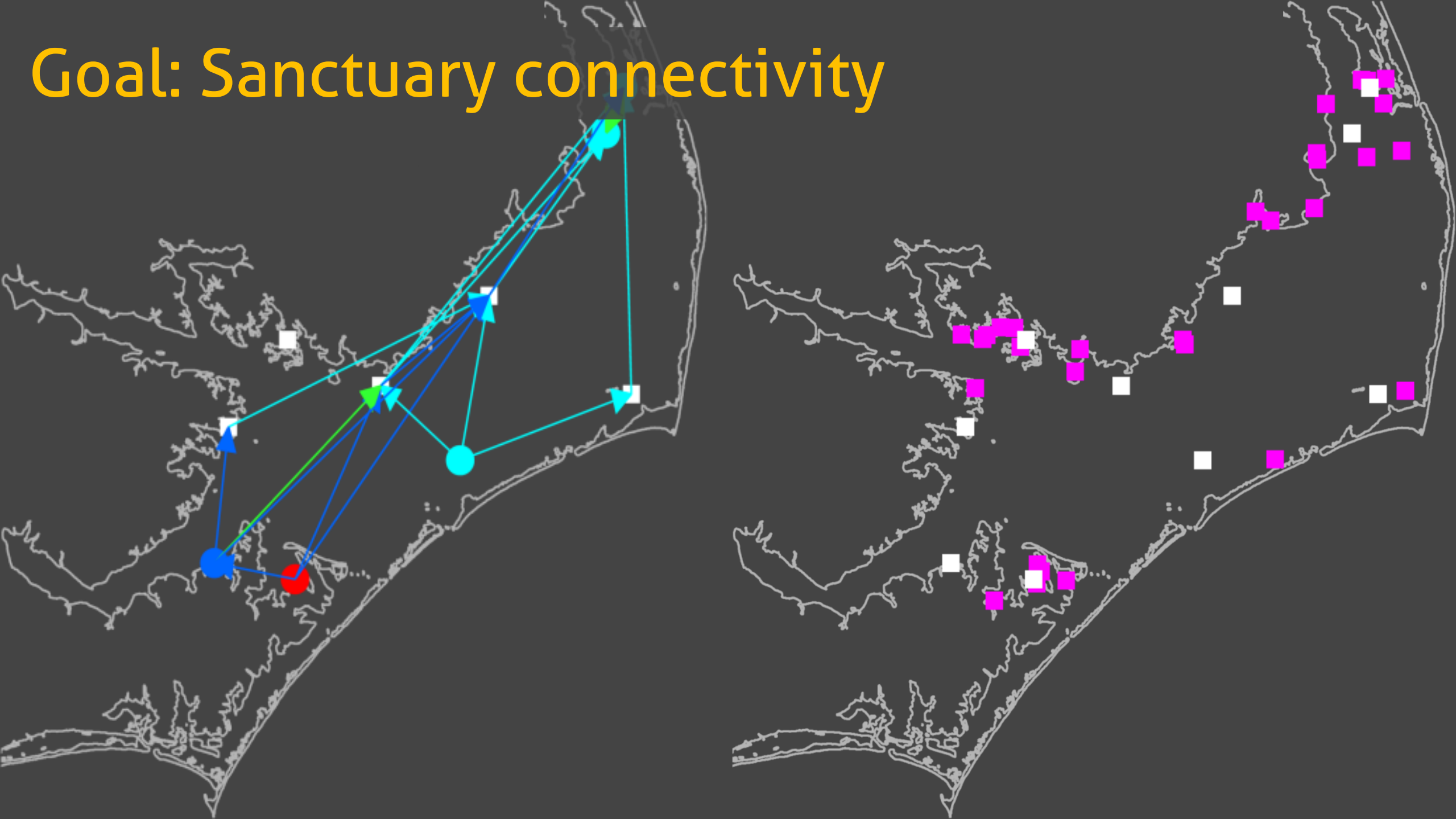
*for taxpayer

Goal: positive ROI

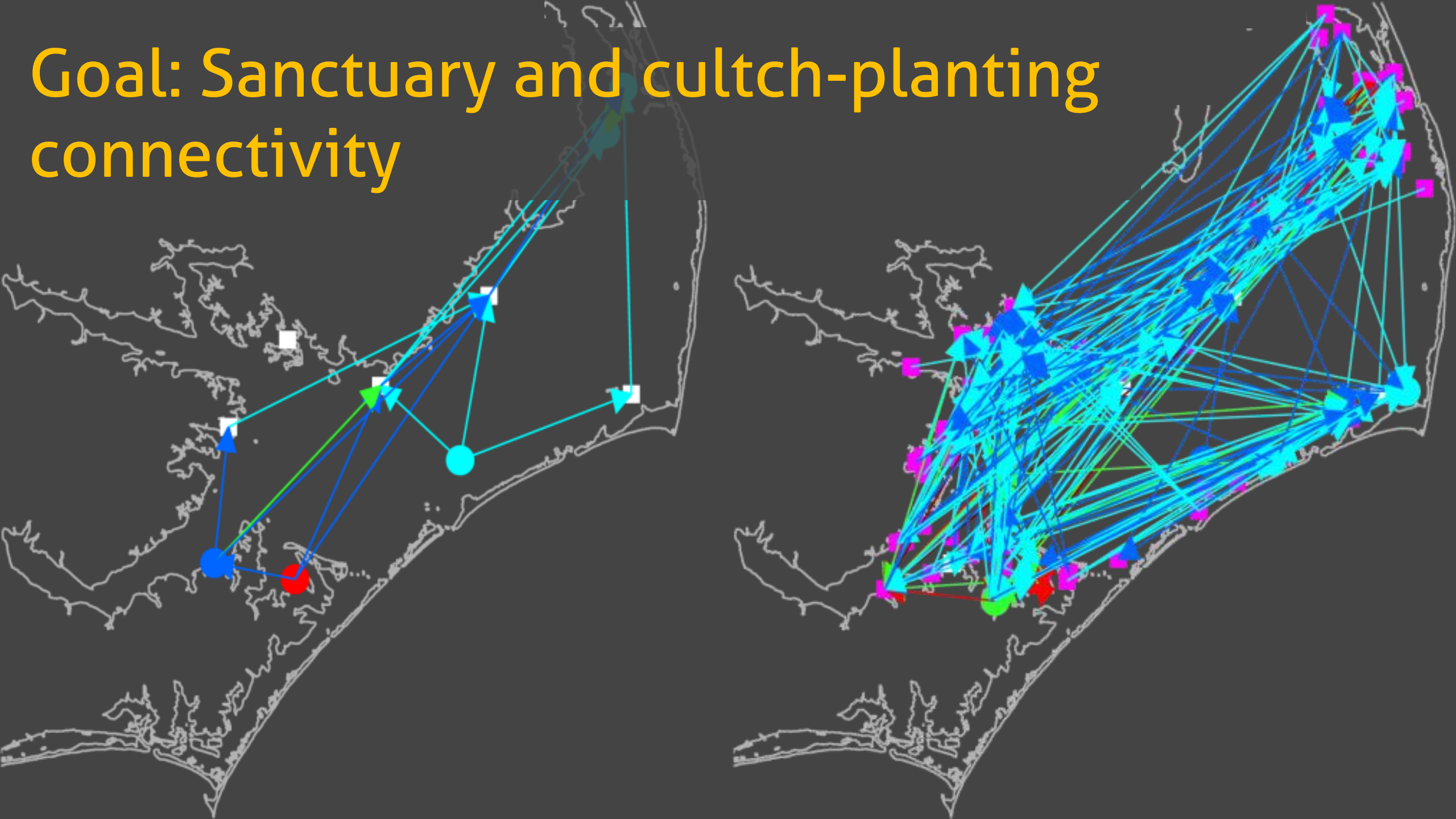


Setting goals: linkages

Goal: Sanctuary connectivity



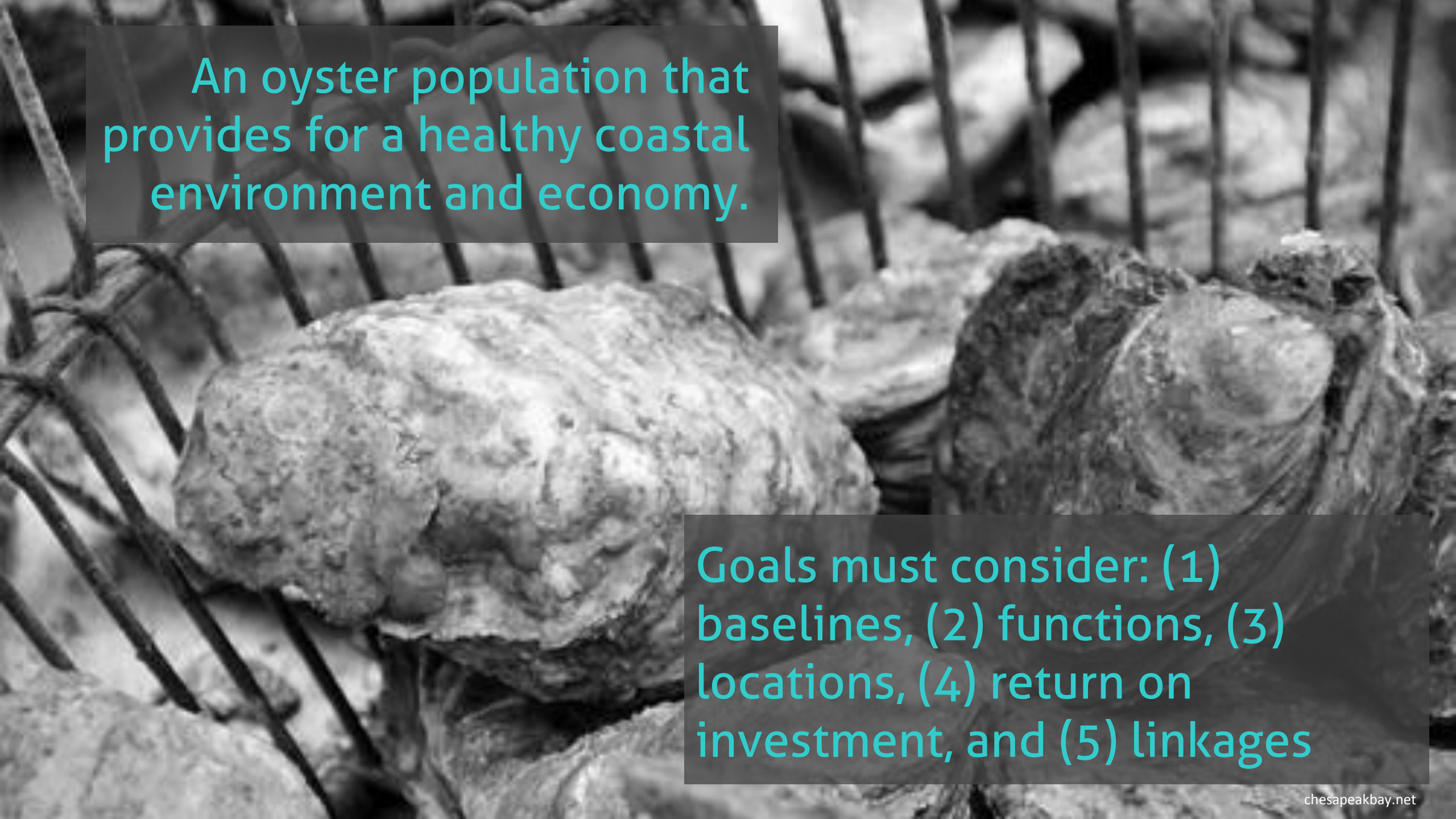
Goal: Sanctuary and cultch-planting connectivity



Goal: Sanctuary and cultch-planting connectivity

Road map for scaling-up?

Conclusions



An oyster population that provides for a healthy coastal environment and economy.

Goals must consider: (1) baselines, (2) functions, (3) locations, (4) return on investment, and (5) linkages