Linking Restoration Impacts to Economic, Health and Wellbeing Benefits for People in the Gulf of Mexico

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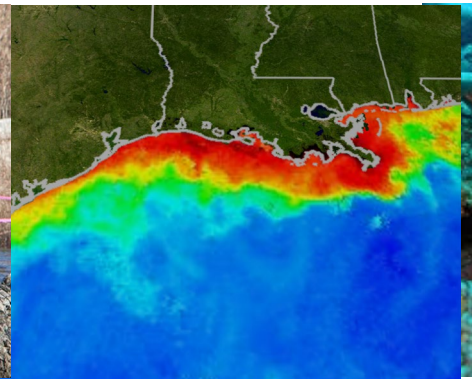
Challenge we want to address

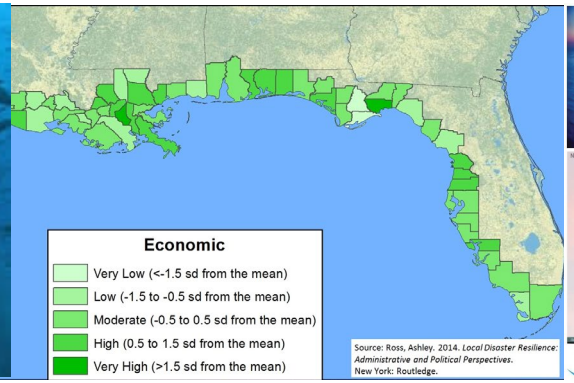
Billions of dollars will be spent on restoration of Gulf ecosystems, but there is no shared platform to guide selection of projects and reporting of restoration progress and effectiveness for the broad set of environmental, social, and economic goals shared by the many institutions working in the Gulf.

HABITAT RESTORATION



WATER QUALITY IMPROVEMENT

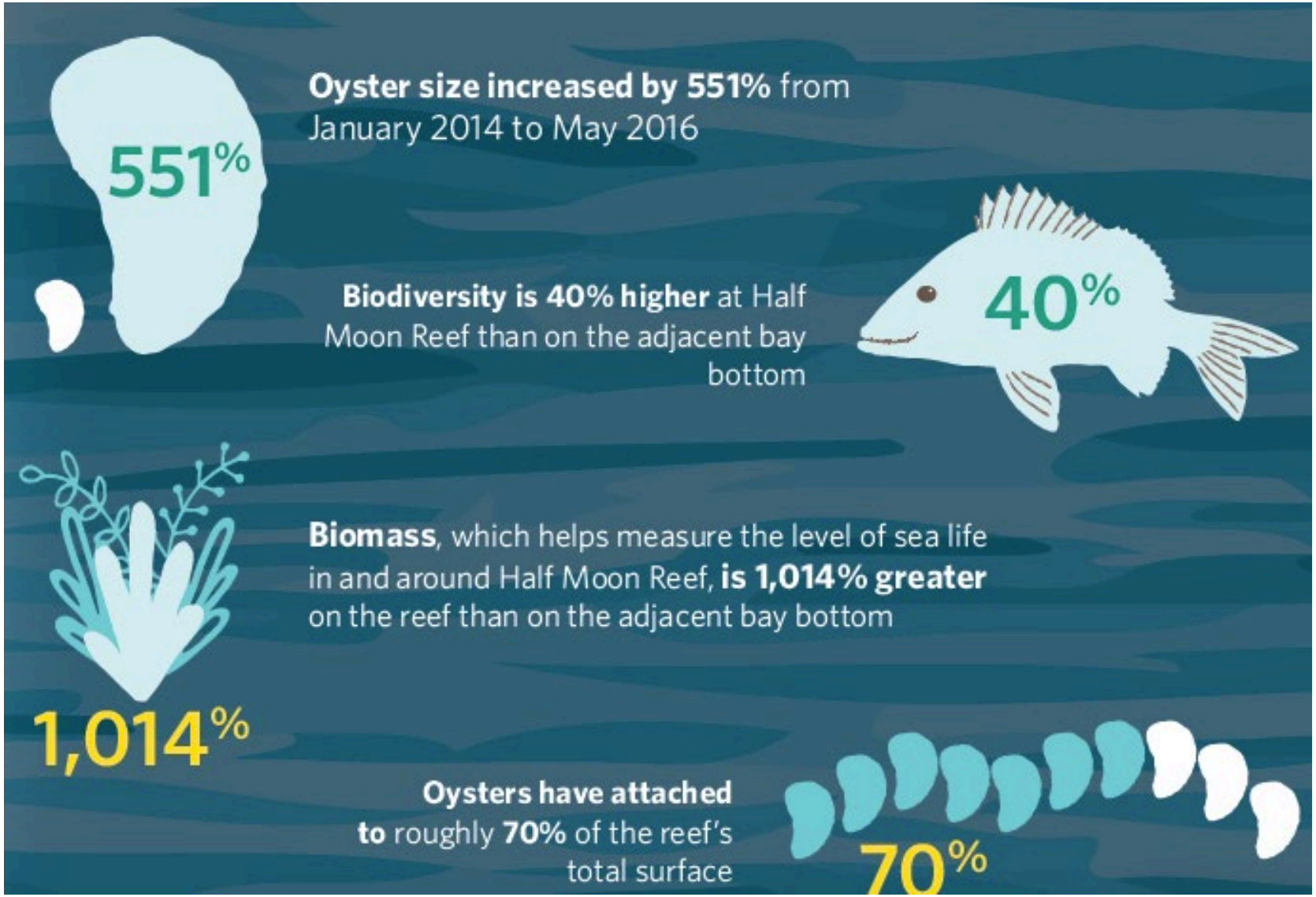
MARINE RESOURCE PROTECTION



COMMUNITY RESILIENCE

ECONOMIC REVITALIZATION

Biophysical impacts



Social and economic impacts

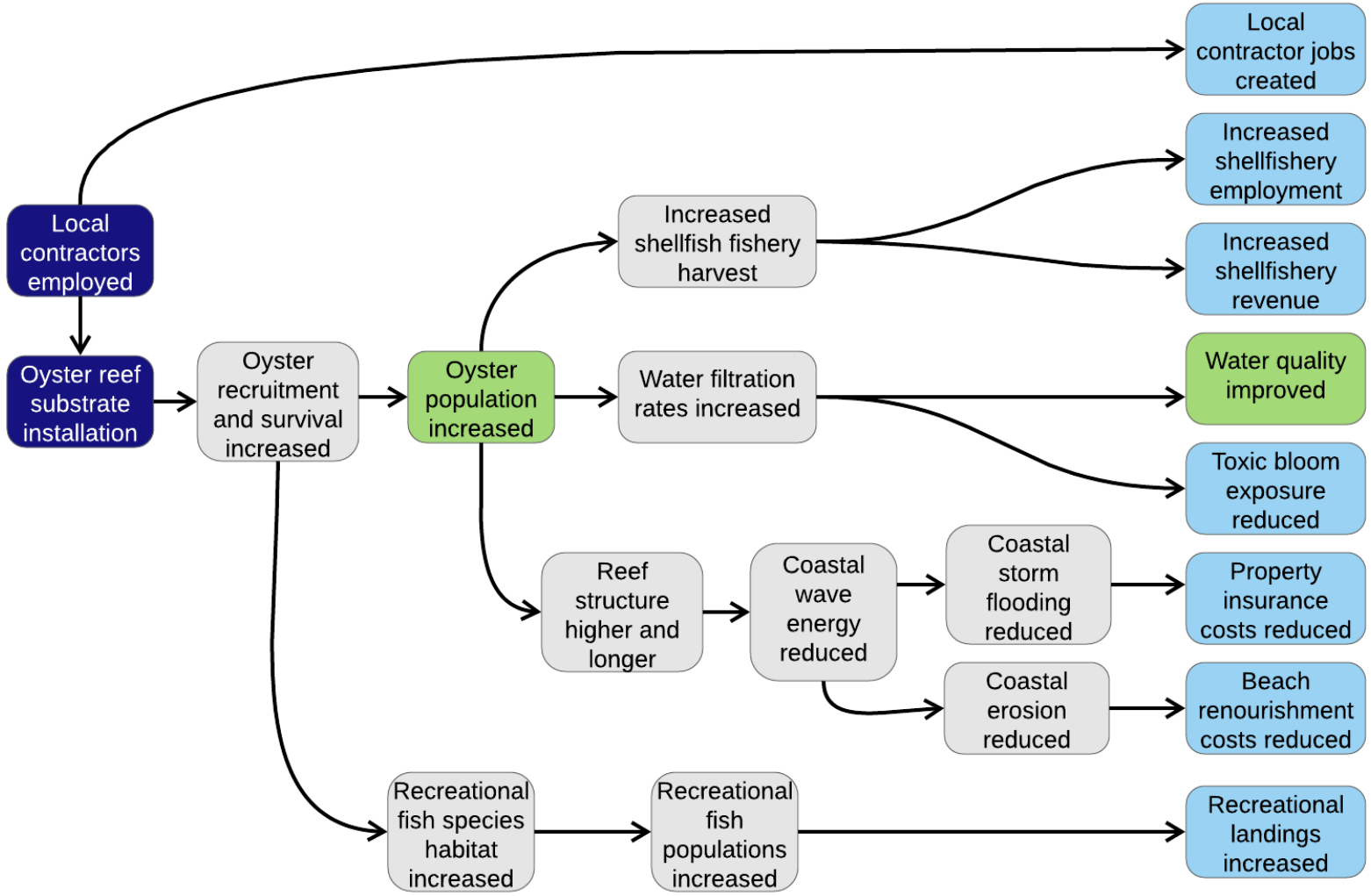
TNC and Texas Sea Grant

Challenges

- Expand what is included as impact -> include socio-economic goals
- Funders need to compare very disparate project types
- Reporting to Congress and States needs to reflect project AND Gulf scale —> metrics need to transfer and roll up
- There's really not that much money —> M and E has to be efficient

Solution

A set of common models and indicators relevant across projects, programs, and locations can facilitate effective project planning and evaluation.



Compare restoration approaches across a broader suite of shared goals

Identify uncertainties and gaps in knowledge that may affect our ability to predict impacts

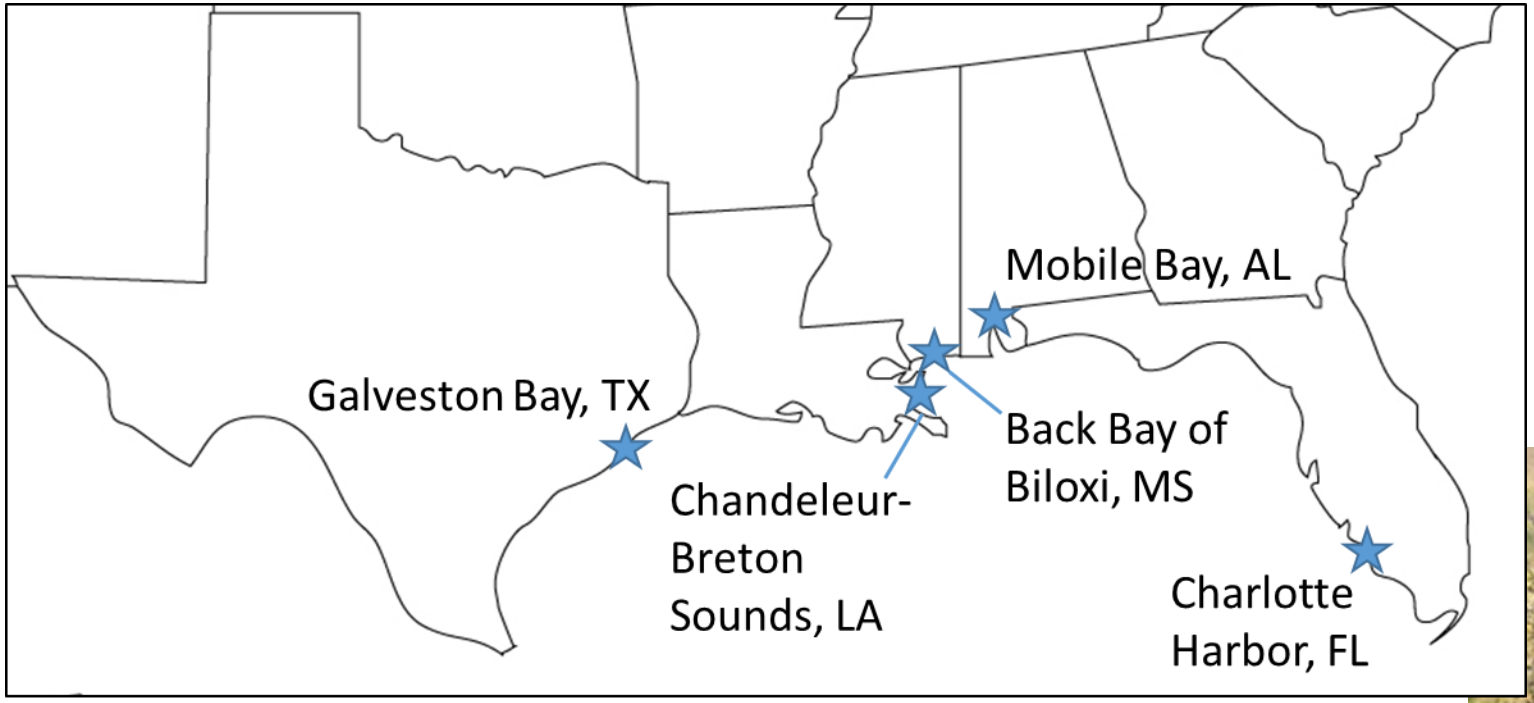
Identify metrics for socio-economic outcomes that can be meaningful across projects and locations.

Goals

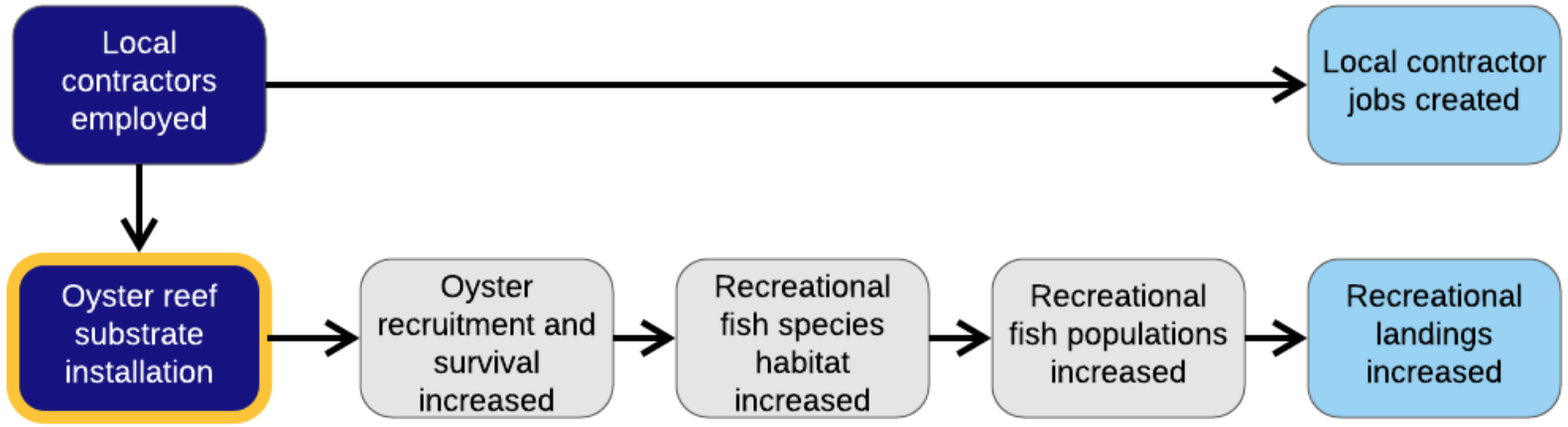
1. Help streamline and simplify application and reporting processes
2. Simplify and improve reporting of project impacts
3. Create a transferable tool

Local to regional

Models and indicators that work across scale and location

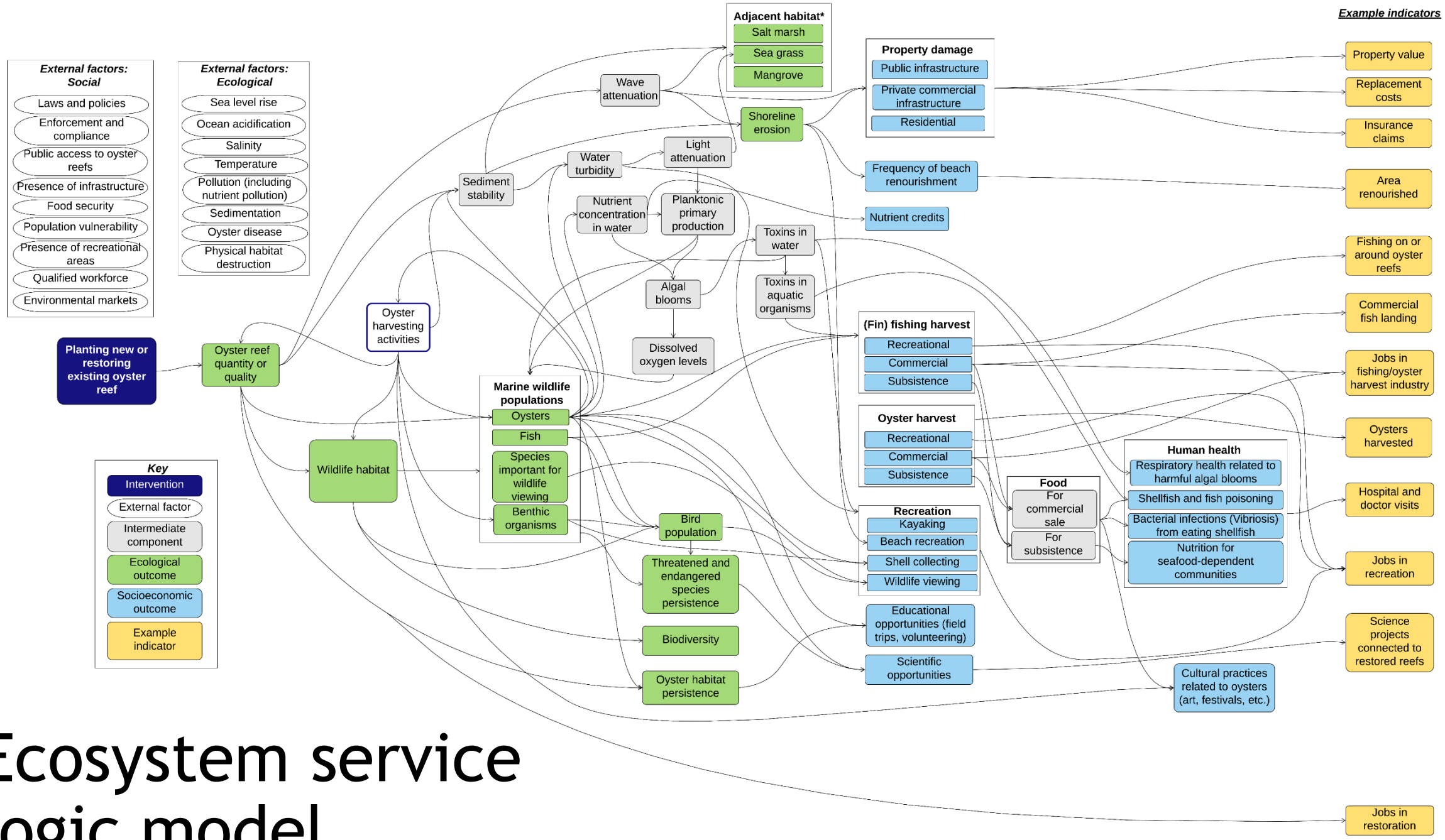


Platform to synthesize & build evidence



- Weak links are research priorities
- Save monitoring costs by focusing on weak links
- Use early projects for higher investment, adaptive management
- Later projects have lower monitoring needs

YEAR 1: Oyster Reef Restoration



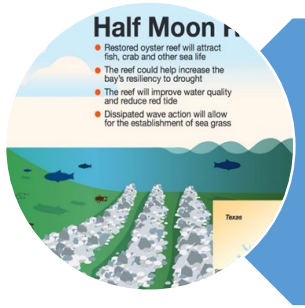
Ecosystem service logic model

*Adjacent habitat could affect many of the other outcomes; those connections are not shown in this model to maintain readability

Oyster restoration techniques

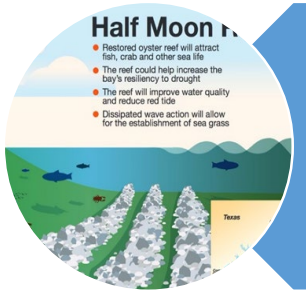
Large-scale structurally
simple SUBTIDAL
Intensively harvested

Large-scale structurally
complex INTERTIDAL
Not-intensively harvested



Large-scale structurally
complex SUBTIDAL
Intensively harvested

Protection or
Enhancement of existing
oyster reef



Large –scale structurally
complex SUBTIDAL
Not-Intensively harvested

Aquaculture projects
INTERDAL or SUBTIDAL
Intensively harvested

Variation in restoration techniques used

	2D, subtidal, intensively harvested	3D, subtidal, intensively harvested	3D, subtidal, not intensively harvested	3D, intertidal, not intensively harvested	Protection and enhancement of existing reef	Oyster aquaculture
Charlotte Harbor, FL			X	X	X	
Back Bay of Biloxi, MS			X	X	X	
Mobile Bay, AL	X	X	X	X	X	X
Galveston Bay, TX	X	X	X	X	X	
Chandeleur & Breton Sounds, LA	X			X		

Priority species influenced by oyster reef restoration

Species important for harvest (fishing or shellfish)

Species important for wildlife watching

Threatened & endangered species

Defining “dominant” outcomes

An outcome is dominant if it is:

1. Tightly linked: the expected change in the outcome is likely to be large and strongly driven by oyster reef restoration

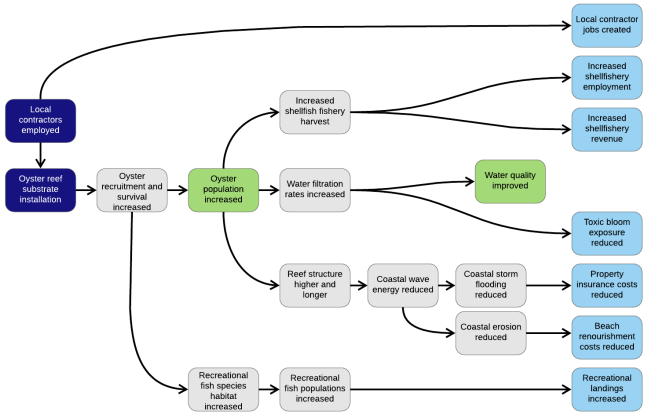
and

2. Important: The expected change in the outcome matters to many people or to groups of special concern

Variation in dominant services

Outcome	Charlotte Harbor	Back Bay of Biloxi	Mobile Bay	Galveston Bay	Chandeleur & Breton Sounds
Recreational fishing	*	*	*	*	*
Oyster habitat persistence	*	*	*	*	*
Biodiversity	*	*	*	*	*
Nutrition for seafood-dependent communities	*	*		*	*
Scientific opportunities related to oyster reefs	*		*	*	*
Jobs in fish/oyster harvest industry	*		*	*	*
Commercial fishing	*		*	*	*
Educational opportunities related to oyster reefs	*	*			*
Jobs in recreation	*		*	*	
Cultural practices related to oyster reefs		*	*		*
Commercial oyster harvest			*	*	*
Wildlife viewing	*	*	*		
Jobs in education & scientific research		*		*	
Damage to residential property		*	*		
Damage to private commercial infrastructure		*	*		
Jobs in oyster reef restoration					*
Kayaking	*				
Threatened & endangered species persistence	*				
Damage to public infrastructure			*		
Recreational oyster harvest					

Socio-behavioral-economic metrics for important outcomes



Impact	Possible indicators
Local contractor jobs created	# of jobs created
Increased shellfishery employment	# of jobs in shellfishery industry
Increased shellfishery revenue	Annual revenue from shellfish industry Annual shellfish harvest
Toxic bloom exposure reduced	# of toxic bloom events # of beach closures from toxic blooms
Oyster population increased	Recreational fishing use around reefs Annual oyster harvest
Water quality improved	Contact recreational activity level

Assess metrics using key criteria

Metrics that are **SMART**:

- **Specific**: A single variable that accurately describes the socio-behavioral-economic (SBE) impact that is to be measured.
- **Measurable and repeatable**: The metric has the capacity to be counted, is consistent, and transferable.
- **Attainable**: Collecting the metric data should be straightforward and cost-effective.
- **Relevant**: The metric is tightly connected with the logic model impacts.
- **Time-bound**: The data can be gathered at the appropriate time or time-frame to reflect what the metric is attempting to show.

Next Steps for Oyster reef restoration

Evidence Library

- Collect evidence and summarize
- Assess confidence in evidence
- Assess gaps

Additional Perspectives

- **Health** (mental health, access to care, toxins)
- **Economic** (chamber of commerce, tourism industry, real estate)
- **Equity** (at risk communities, dependent communities)

Metrics Selection

- Identify metrics that are relevant across the Gulf
- Prioritize metrics that detect project level and regional level change for key outcomes
- Assess feasibility and implementation approach

YEAR 2 – Repeat process with new restoration action(s)

GEMS advisory council

Bill Balboa, Texas Sea Grant

Bob Bendick, The Nature Conservancy

Emily Blejwas, Gulf States Health Policy Center

Laura Bowie, Gulf of Mexico Alliance

Mike Donahue, AECOM

Steve Giordano, NOAA

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Amy Hunter, Alabama DCNR

Annamarie Lopata, National Fish and Wildlife Foundation

David Muth, National Wildlife Federation

Jim Pahl, Louisiana CPRA

George Ramseur, Mississippi DMR

Edmond Russo, US Army Corps of Engineers

Paul Sandifer, College of Charleston

Richard Seiler, Texas CEQ

Gregory Steyer, USGS, NRDA-MAM

Buck Sutter, RESTORE

Kristin Tracz, Walton Family Foundation

Mark Woodrey, Mississippi State University

Products

1. **Regional and local ESLMs & common set of socio-economic metrics** for 2-3 restoration approaches, starting with oyster restoration
    - Available in a report and in a user-friendly online format
    - And… a high level evidence library to inform strength of link between restoration and outcomes and to determine knowledge gaps and therefore critical measures

2. **A how-to guide:** for building new ESLMs and metrics

3. **A use strategy:** How ESLMs and metrics can be integrated and used for planning, funding decisions, monitoring and reporting.

Take home

- Ecosystem services tie biophysical to human and economic outcomes

- Logic models provide a consistent platform for
  - comparing restoration approaches
  - identifying priority metrics

If standardized, massive increase in monitoring efficiency, ability to report across scales

The GEMS Project

Gulf of Mexico Ecosystem Services Logic Models & Socio-economic Indicators

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The Nature Conservancy

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